

EMC Technologies (NZ) Ltd

Test Report No 80305.2

Report date: 27th March 2008

TEST REPORT

RF Technology Eclipse 2 VHF Base Station / Repeater

tested to the

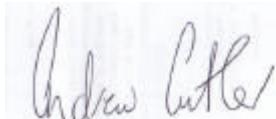
Code of Federal Regulations (CFR) 47

Part 90 –Private Land Mobile Services

Part 15 – Radio Frequency Devices

for

RF Technology Pty Ltd



This Test Report is issued with the authority of:

Andrew Cutler - General Manager



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

EMC Technologies (NZ) Ltd

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1. CLIENT INFORMATION

Company Name RF Technology Pty Ltd

Address 10/ 8 Leighton Place

City Hornsby

Country Australia

Contact Mr Ron Tilley

2. DESCRIPTION OF TEST SAMPLE

Brand Name RF Technology

Model Number Eclipse 2

Product VHF Base Station / Repeater

Manufacturer RF Technology PTY Ltd

Manufactured in Australia

Serial Number 204

FCC ID KREDBS150

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3. COMPLIANCE STATEMENT & RESULT SUMMARY

The **RF Technology Eclipse 2 VHF Base Radio/ Repeater** complies with the limits defined in 47 CFR Part 15, 47 CFR Part 90 and 47 CFR Part 2 when tested in-accordance with the test methods described in 47 CFR Part 2 and ANSI C63.4, 2003.

CLAUSE	TEST PERFORMED	RESULT
90.203	Certification required	Complies
2.1046	RF power output	Noted
90.205	Power and antenna height limits	Complies
2.1047	Modulation Characteristics	
2.1047(a)	Low pass filter response	Complies
2.1047(b)	Modulation limiting characteristics	Complies
90.211(a)	Modulation characteristics	Complies
2.1049	Occupied bandwidth	Noted
2.202	Bandwidths	Noted
90.207	Types of emissions	Complies
90.209	Bandwidth limitations	Complies
90.210	Emission masks	Complies
2.1051	Spurious emissions at antenna terminals	Complies
2.1053	Field strength of spurious radiation	Complies
2.1055	Frequency stability	Noted
90.213	Frequency stability	Complies
90.214	Transient frequency behaviour	Complies
15.109	Radiated emission limits	Complies
15.111	Antenna conducted power measurement	Complies

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4. TEST SAMPLE DESCRIPTION

The sample tested has the following specifications:

Rated Transmitter Output Power

100.0 Watts (50.0 dBm)

Transmitter FCC frequency range

150.0 to 174.0 MHz

Test frequencies

Channel	Frequency MHz	Power Watts	Spacing kHz
1	164.075	100.0	12.5
2	164.075	100.0	25.0

FCC Bands

Part 90: 150 to 174 MHz

Emission Designators / Modes of operation

11k2F3E – Analogue speech

16k0F3E – Analogue speech

Power Supply

AC mains voltage supply at 110.0 Vac.

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5. TEST CONDITIONS

Standard Temperature and Humidity

Temperature Range: +18°C to 30°C

Relative Humidity Range: 20% to 75%

Standard Test Power Source

Standard Test Voltage: 110.0 Vac.

Extreme Temperature

High Temperature: + 50°C maintained.

Low Temperature: - 30 °C maintained.

Extreme Test Voltages

Low Voltage: 93.5 Vac.

High Voltage: 126.5 Vac.

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6. ATTESTATION

The **RF Technology Eclipse 2 VHF Base Station / Repeater** complies with the Code of Federal Regulations (CFR) 47 Part 90 – Private Land Mobile Services and Part 15 – Radio Frequency Devices.

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

EMC Technologies (NZ) Ltd

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7. TEST RESULTS

Certification required

Certification of this device is sought for analogue speech transmissions using 12.5 kHz and 25.0 kHz channel spacing.

25 kHz and 12.5 kHz channel bandwidth certification is sought for this transmitter under section 90.203(j)(3) as:

- certification has been sought after February 14, 1997 and before January 1, 2011.
- the equipment meets the spectrum efficiency standard of one voice channel per 12.5 kHz of channel bandwidth

Result: Complies.

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RF power output

Measurements were carried out at the RF output terminals of the transmitter using a 30 dB power attenuator and a 50 ohm dummy load.

Measurements were carried out when the transmitter was not being modulated.

Measurements were made with the input voltage set to 110.0 Vac and when varied +/- 15%.

Testing was carried out at maximum power output.

Frequency	Voltage (Vac)	Rated (dBm)	Measured (dBm)
164.075	110.0	50.0	49.9

Frequency	Voltage (Vac)	Rated (dBm)	Measured (dBm)
164.075	93.5	50.0	49.9
164.075	126.5	50.0	49.9

Limits:

Clause 90.205(d) of Part 90 specifies (d) 150-174 MHz. The maximum allowable station ERP is dependent upon the station's antenna HAAT and required service area

Result: Complies

Measurement Uncertainty: $\pm 0.5 \text{ dB}$

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Modulation Characteristics

This transmitter is capable of producing analogue speech modulations.

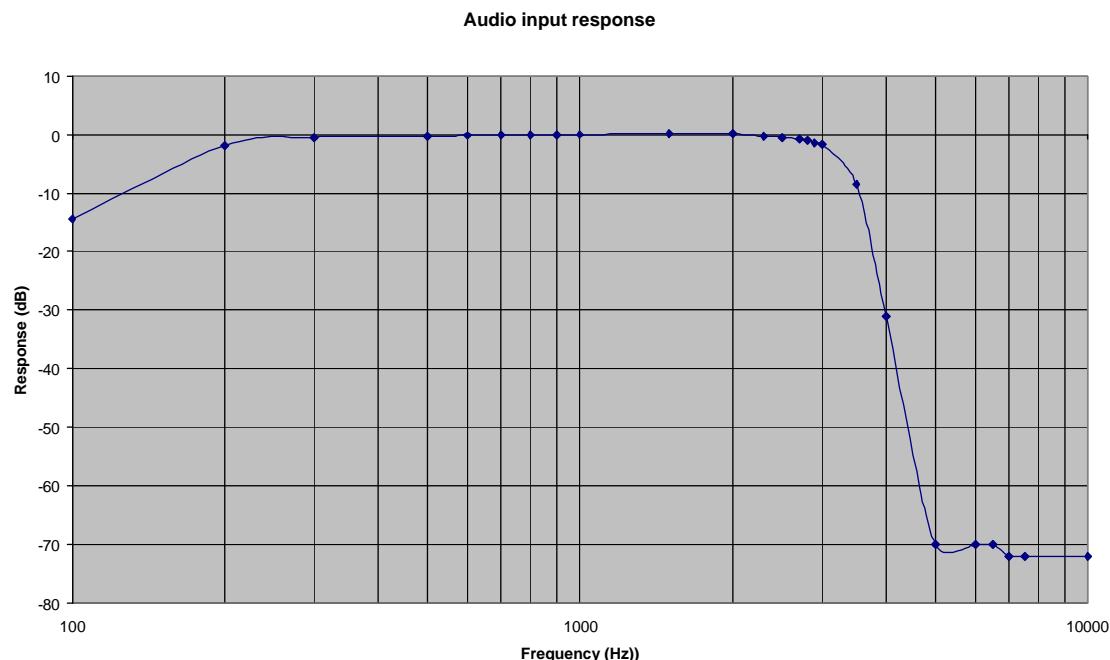
(a) Frequency response of the audio frequency low pass filter between 100 Hz and 15 kHz.

This measurement was carried out using an audio signal generator and an audio modulation analyser.

At 1 kHz an audio signal was applied which was used as a 0 dB response reference.

The frequency of the input signal was then varied and the output response noted. This measurement was carried out from 100 Hz to 5000 Hz as required by Part 2 with further measurements carried out in order to show the full range of this filter.

The -3 dB roll off was measured to be 3.1 kHz



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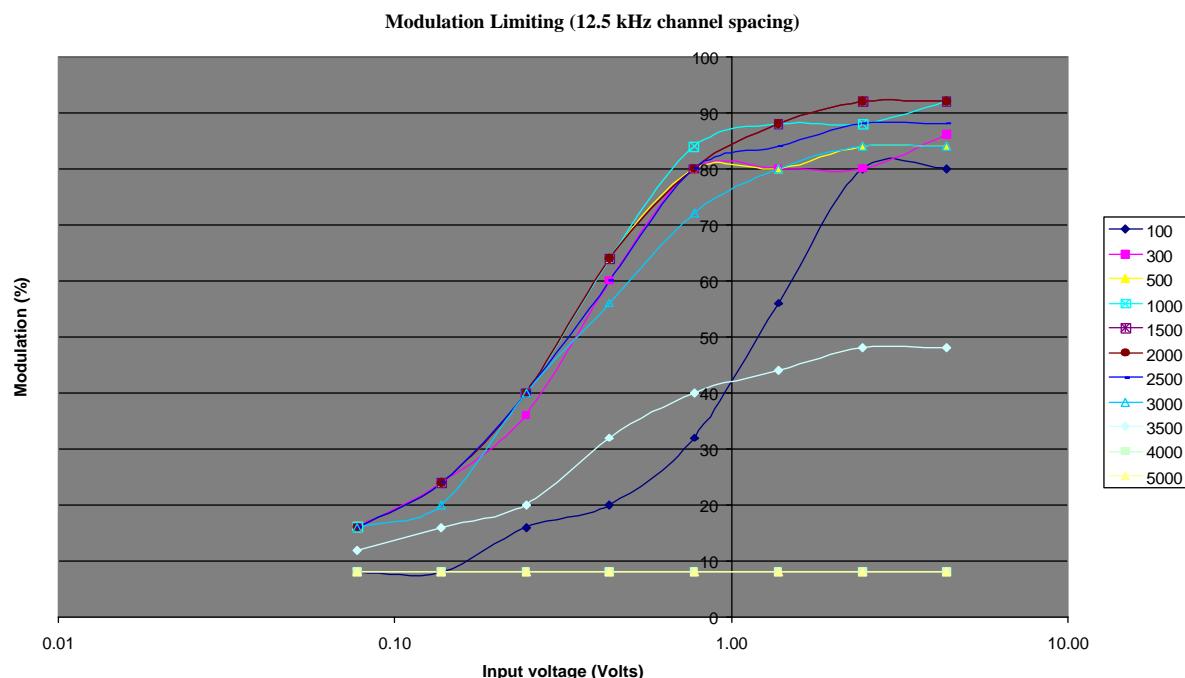
(b) A family of curves showing the percentage of modulation versus the modulation input voltage.

Measurements were made between 100 Hz to 4 kHz.

At each frequency the input voltage was slowly increased with the resulting frequency deviation of the transmitter being recorded.

This deviation was then converted to a modulation percentage where 5 kHz deviation is 100% for 25 kHz channels and 2.5 kHz deviation is 100% for 12.5 kHz channels.

The maximum 12.5 kHz deviation was 2.3 kHz and the maximum 25 kHz deviation was 4.8 kHz

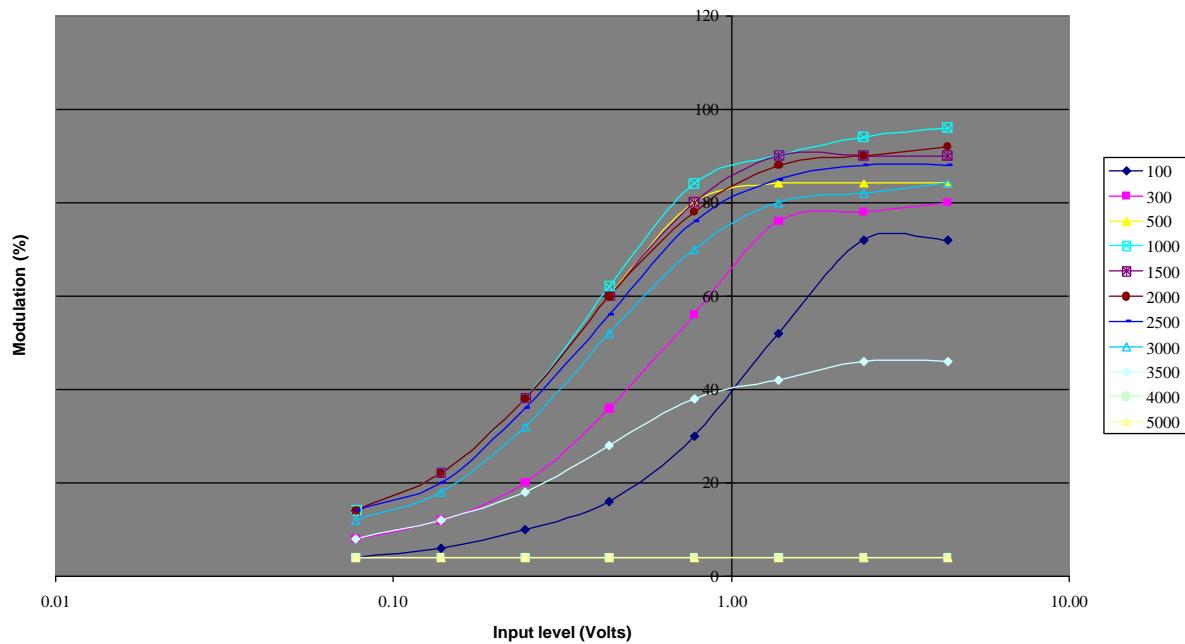


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Modulation limiting (25 kHz channel spacing transmitter)



(d) A curve or equivalent data that shows that the equipment will meet the modulation requirements of the rules under which the equipment is to be licensed.

Limit:

Part 90.211 – Modulation requirements states the transmitter must meet the emission requirements of 90.210. Refer to the Occupied Bandwidth measurements in this report.

Result: Complies

Measurement Uncertainty: $\pm 1\%$.

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Part 90.207 – Emission types:

The following emission types are used:

- F3E: Frequency modulation with analogue speech.

Part 90.209 – Bandwidth limitations:

Analogue Modulation

Using the formulas contained in Part 2.202 the necessary bandwidth calculation for the 12.5 kHz and 25 kHz channel spacing is:

$$B_n = 2 \times D + 2 \times M$$

In theory for 25 kHz channels

Where D = maximum deviation: 5.0 kHz.

Where M = maximum modulation frequency: 3 kHz.

$$B_n = 16 \text{ kHz}$$

When measured

Where D = maximum measured deviation: 4.8 kHz

Where M = low pass filter roll off: 3.1 kHz

$$B_n = 16 \text{ kHz}$$

In theory for 12.5 kHz channels

Where D = maximum deviation: 2.5 kHz.

Where M = maximum modulation frequency: 3 kHz.

$$B_n = 11 \text{ kHz}$$

When measured

Where D = maximum measured deviation: 2.3 kHz

Where M = low pass filter roll off: 3.1 kHz

$$B_n = 10.8 \text{ kHz}$$

This is confirmed in the emission designations, 11k0F3E and 16k0F3E as declared by the client.

Result: Complies

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Occupied Bandwidth

The spectrum masks are defined in:

Section 90.210(d) – Mask B and Mask D have been applied as this transmitter can operate in the band 150 to 174 MHz using authorised bandwidths of 11.25 kHz and 20.0 kHz as per Section 90.209(b)(5) and it has a low pass audio filter installed.

The reference level for the following emission mask measurements has been determined using a resolution bandwidth of 120 kHz with the transmitter modulated.

All measurements have been made with a 30 dB attenuator being placed between the transmitter and the spectrum analyser.

Measurements were made in peak hold with the transmitter operating on 164.075 MHz.

When operating in F3E mode a 2500 Hz tone, which was found to be the frequency of maximum response, that was applied at a level 16 dB higher than that required to achieve 50% modulation.

Result: Complies

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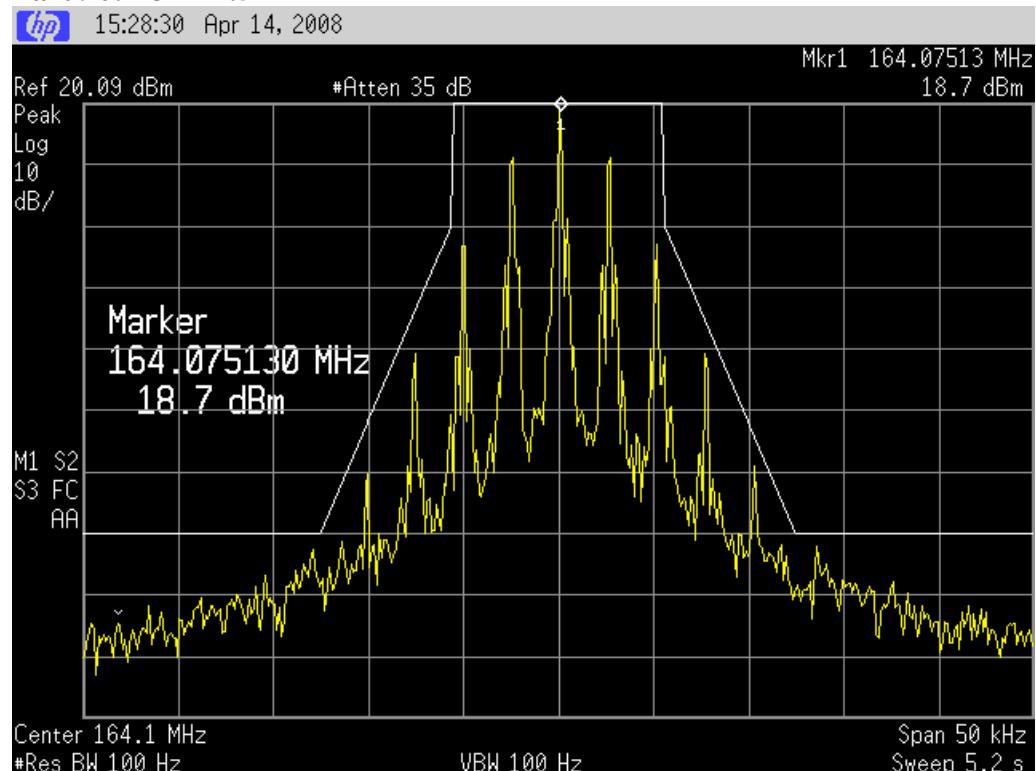
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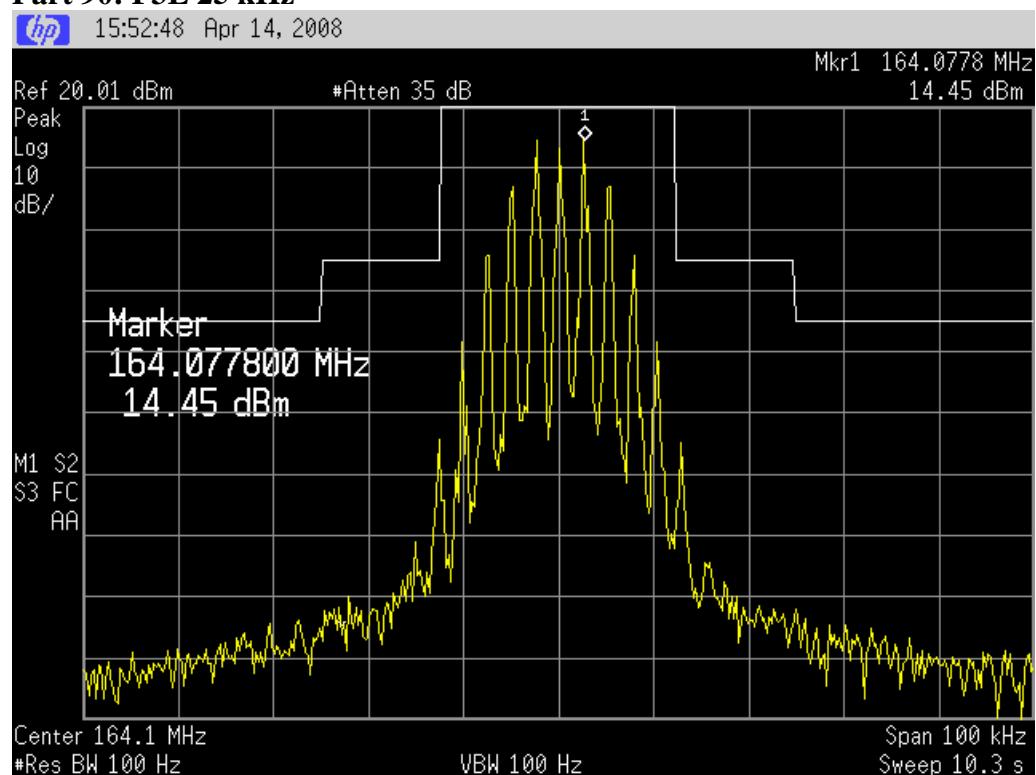
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Part 90: F3E 12.5 kHz



Part 90: F3E 25 kHz



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Transmitter spurious emissions at the antenna terminals

Frequency: 164.075 MHz

Spurious emission (MHz)	Emission level (dBm)	Limit (dBm)
2584.500	-69.7	-20.0
3446.050	-61.9	-20.0
4307.550	-42.0	-20.0
5169.050	-43.0	-20.0

No other emissions observed above -70.0 dBm.

Limit:

Part 90.210(d) Mask D, (3) on any frequency removed from the centre of the authorised bandwidth by a displacement frequency of more than 12.5 kHz shall be attenuated by at least $50 + 10 \log (P)$ or 70 dB whichever is the lesser attenuation.

The spurious emission limit defined by Mask D has been applied as this transmitter can operate using channel spacings of 12.5 kHz.

Part 2.1051 states that emissions greater than 20 dB below the limit need not be specified.

Part 2.1057 states that the spectrum should be investigated up to the 10th harmonic if the transmitter operates below 10 GHz.

Some emissions less than -40 dBm have been reported for completeness.

The rated power of 100 watts gives a limit of -20 dBm.

No measurements were made above the 10th harmonic.

Result: Complies

Measurement Uncertainty: ± 3.3 dB

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Receiver spurious emissions at antenna terminals

Receive frequency: 164.075 MHz

Spurious emission (MHz)	Emission level (dBm)	Limit (dBm)
906.525	-105.0	-57.0

All other emissions observed less than -90.0 dBm.

The receiver has an intermediate frequency of 45 MHz.

Limit:

In accordance with CFR 47 Part 15, section 15.111 the power of any emission at the antenna terminal should not exceed 2 nW (-57.0 dBm).

Result: Complies

Measurement Uncertainty: ± 3.3 dB

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Field strength of the transmitter spurious emissions

Frequency: 164.075 MHz

Frequency (MHz)	Level (dBuV/m)	Level (dBm)	Limit (dBm)	Polarity	MARGIN (dB)
328.150	61.2	-36.2	-20.0	Vertical	16.2
328.150	65.5	-31.9	-20.0	Horizontal	11.9
492.225	57.9	-39.5	-20.0	Vertical	19.5
492.225	62.0	-35.4	-20.0	Horizontal	15.4
656.300	62.0	-35.4	-20.0	Vertical	15.4
656.300	57.7	-39.7	-20.0	Horizontal	19.7
820.375	71.0	-26.4	-20.0	Vertical	6.4
820.375	68.7	-28.7	-20.0	Horizontal	8.7
984.450	56.0	-41.4	-20.0	Vertical	21.4
984.450	53.5	-43.9	-20.0	Horizontal	23.9
1148.525	64.5	-32.9	-20.0	Vertical	12.9
1148.525	62.7	-34.7	-20.0	Horizontal	14.7
1312.600	67.4	-30.0	-20.0	Vertical	10.0
1312.600	63.7	-33.7	-20.0	Horizontal	13.7
1476.675	62.0	-35.4	-20.0	Vertical	15.4
1476.675	62.1	-35.3	-20.0	Horizontal	15.3
1640.750	66.2	-31.2	-20.0	Vertical	11.2
1640.750	64.5	-32.9	-20.0	Horizontal	12.9
1804.825	64.0	-33.4	-20.0	Vertical	13.4
1804.825	66.1	-31.3	-20.0	Horizontal	11.3
1968.900	55.1	-42.3	-20.0	Vertical	22.3
1968.900	59.3	-38.1	-20.0	Horizontal	18.1

When operating in transmit mode no significant emissions were detected between the harmonic emissions.

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 January 18th, 2007

The transmitter was tested while transmitting continuously while attached to a dummy load.

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Also attached to the device were a dummy load on the receiver antenna port, laptop computer to the Ethernet Port and a mouse to the USB port.

A user interface box was attached to the large DB9 type connector

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 $50 + 10 \log (P)$.

The rated power of 100 W 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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Field strength of the receiver spurious emissions

Receive frequency: 164.075 MHz

Intermediate frequency: 45 MHz

Frequency (MHz)	Vertical (dBuV/m)	Horizontal (dBuV/m)	Limit (dBuV/m)	Polarity	Margin (dB)
209.073	27.5	25.2	46.0	Vertical	18.5
418.146	-	-	46.0	Vert/Hort	-
627.219	-	-	46.0	Vert/Hort	-
836.292	-	-	46.0	Vert/Hort	-
1045.365	-	-	54.0	Vert/Hort	-
1254.438	-	-	54.0	Vert/Hort	-
1463.511	-	-	54.0	Vert/Hort	-
1672.584	-	-	54.0	Vert/Hort	-
1881.657	-	-	54.0	Vert/Hort	-
2090.730	-	-	54.0	Vert/Hort	-

Other emissions observed

Frequency (MHz)	Vertical (dBuV/m)	Horizontal (dBuV/m)	Limit (dBuV/m)	Polarity	Margin (dB)
115.198	19.0	20.1	43.5	Horizontal	23.4
119.445	15.0	-	43.5	Vertical	28.5
140.798	-	32.1	43.5	Horizontal	11.4
163.983	21.0	19.7	43.5	Vertical	22.5
166.398	27.5	34.6	43.5	Horizontal	8.9
168.030	21.0	22.6	43.5	Vertical	22.5
172.080	-	25.6	43.5	Horizontal	17.9
191.998	23.3	-	43.5	Vertical	20.2
217.600	21.7	30.5	46.0	Horizontal	15.5
281.600	22.5	31.2	46.0	Horizontal	14.8
330.000	22.0	27.2	46.0	Horizontal	18.8
462.000	32.9	33.9	46.0	Horizontal	12.1
594.000	27.2	32.5	46.0	Horizontal	13.5
726.000	41.6	40.2	46.0	Vertical	4.4
858.000	40.2	39.2	46.0	Vertical	5.8
990.000	35.2	38.6	54.0	Horizontal	15.4
1122.000	45.6	43.5	54.0	Vertical	8.4
1122.000	50.2	50.1	74.0	Vertical	23.8
1254.000	41.2	37.4	54.0	Vertical	12.8
1254.000	48.1	46.3	74.0	Vertical	25.9

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

Attached to the device were a dummy load on the transmitter antenna port, a dummy load on the receiver antenna port, a laptop computer to the Ethernet Port and a mouse to the USB port.

A user interface box was attached to the large DB9 type connector.

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 January 18th, 2007.

Below 1000 MHz a quasi peak detector was used with a bandwidth of 120 kHz.

Above 1000 MHz an average and a peak detector were used with a bandwidth of 1 MHz.

The receiver was tested while receiving continuously.

Limit:

The field strength limits as per CFR 47 Part 15, section 15.109 have been applied.

Result: Complies

Measurement uncertainty +/- 4.1 dB

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Frequency Stability

Frequency stability measurements were between - 30 °C and + 50°C in 10°C increments.

At each temperature the transmitter was given a period of 30 minutes to stabilise.

The transmitter was then turned on and the frequency error measured after a period of 1 minute.

The AC mains supply to the device was varied by +/- 15%.

Nominal Frequency: 164.075 MHz

Temp.	- 15%	110 Vac	+ 15%
+50°C	+92.0	+92.0	+92.0
+40°C	+70.0	+70.0	+70.0
+30°C	+83.0	+83.0	+83.0
+20°C	+79.0	+79.0	+79.0
+10°C	+19.0	+19.0	+19.0
0°C	+17.0	+17.0	+17.0
-10°C	+40.0	+40.0	+40.0
-20°C	+48.0	+48.0	+48.0
-30°C	+46.0	+46.0	+46.0

Limit:

Part 90.213 states that in the 150–174 MHz band base stations operating with 12.5 kHz channel spacing must have a frequency stability of 2.5 ppm.

This transmitter operates on 164.075 MHz

2.5 ppm = 2.5 x 164.075 = 377 Hz.

Result: Complies

Measurement Uncertainty: ±30 Hz

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Transmitter Transient Performance

Transient frequency behaviour measurements are applicable to wide band and narrow band transmitters operating in the frequency band 150 – 174 MHz.

Measurements were carried out at 164.075 MHz using the method described in TIA-603 and EN 300-086.

In summary this method calls for the use of an external signal generator tuned to 164.075 MHz with a output level 0.1 % (-30 dB) of the level from the transmitter with a 1 kHz tone with a frequency deviation of 12.5 or 25 kHz being applied to the input of a modulation analyser along with the output from the transmitter.

The modulation analyser produces an amplitude difference signal and a frequency difference signal, which are applied to the input of a storage oscilloscope.

The unmodulated transmitter is then keyed which produces a trigger pulse that is AC coupled to the oscilloscope that produces a display on the screen.

The result of the change in the ratio of power between the test signal from the signal generator and the transmitter output will produce 2 separate sides on the oscilloscope picture.

One will show the 1000 Hz test modulation and the other will be the frequency difference of the transmitter versus time.

Results:

Spacing	Period t_1 (kHz)	Period t_2 (kHz)	Period t_3 (kHz)
12.5 kHz	-	-	-
25.0 kHz	-	-	-

Limits:

Time Interval	Period	12.5 kHz	25 kHz
		Deviation (kHz)	Deviation (kHz)
T_1	5 mS	± 12.5	± 25.0
T_2	20 mS	± 6.25	± 12.5
T_3	5 mS	± 12.5	± 25.0

Result: Complies

Measurement Uncertainty: Frequency difference ± 1.6 kHz

Time period ± 1 ms

EMC Technologies (NZ) Ltd

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EMC Technologies (NZ) Ltd

Test Report No 80305.2

Report date: 27th March 2008

12.5 kHz transmitter turn on (164.075 MHz)

Green Trace = 1 kHz tone with FM deviation of 12.5 kHz.

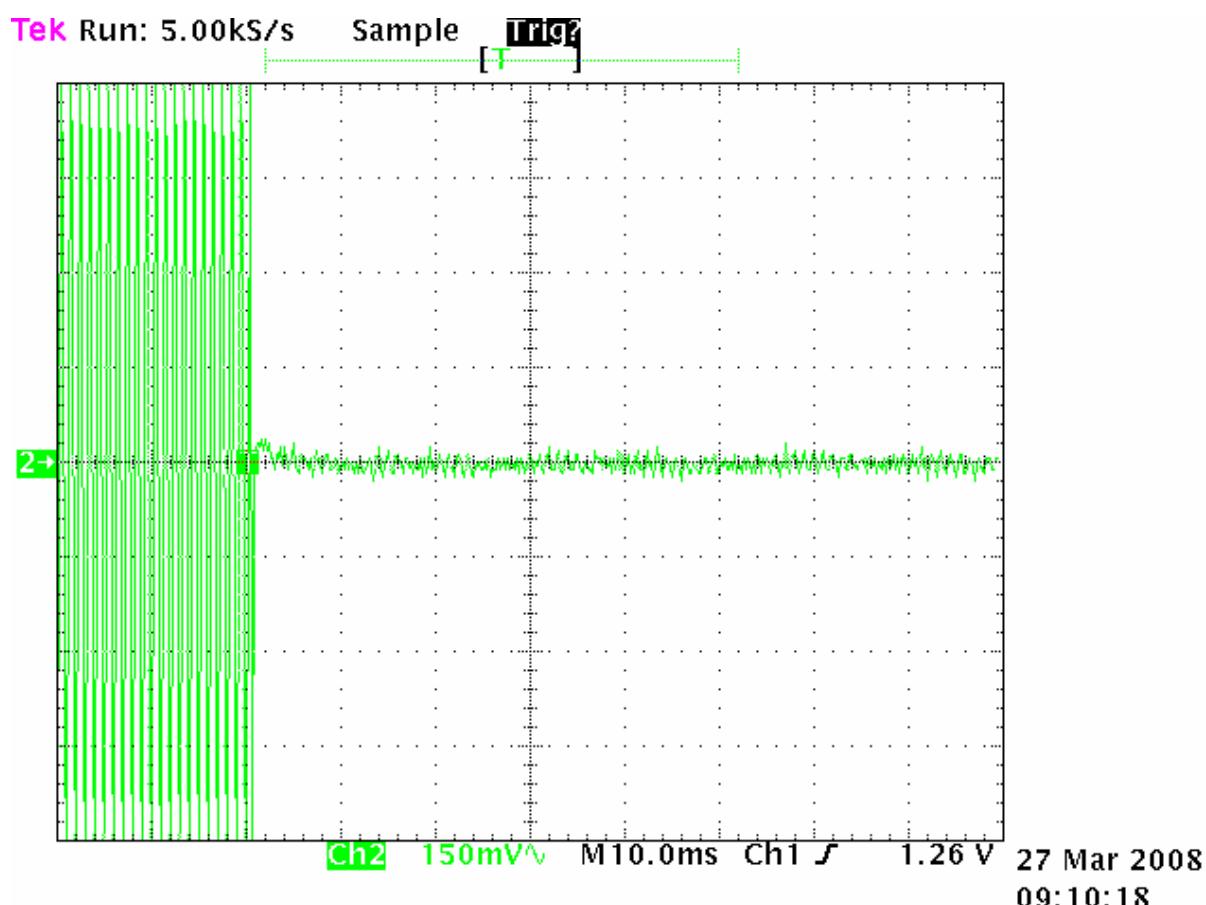
Green trace has been maximised to give full screen indication of +/- 12.5 kHz.
Therefore each Y axis division = 3.125 kHz per division.
The X axis has been set to a sweep rate of 10 mS/division.

Triggering has been set to occur 2 divisions from the left hand edge (20 mS).

t_{on} occurs at 20 mS.

t_1 occurs between 2.0 and 2.5 divisions from the left hand edge.
 t_2 occurs between 2.5 and 4.5 divisions from the left hand edge.

No transient response can be observed during t_1 and t_2 .



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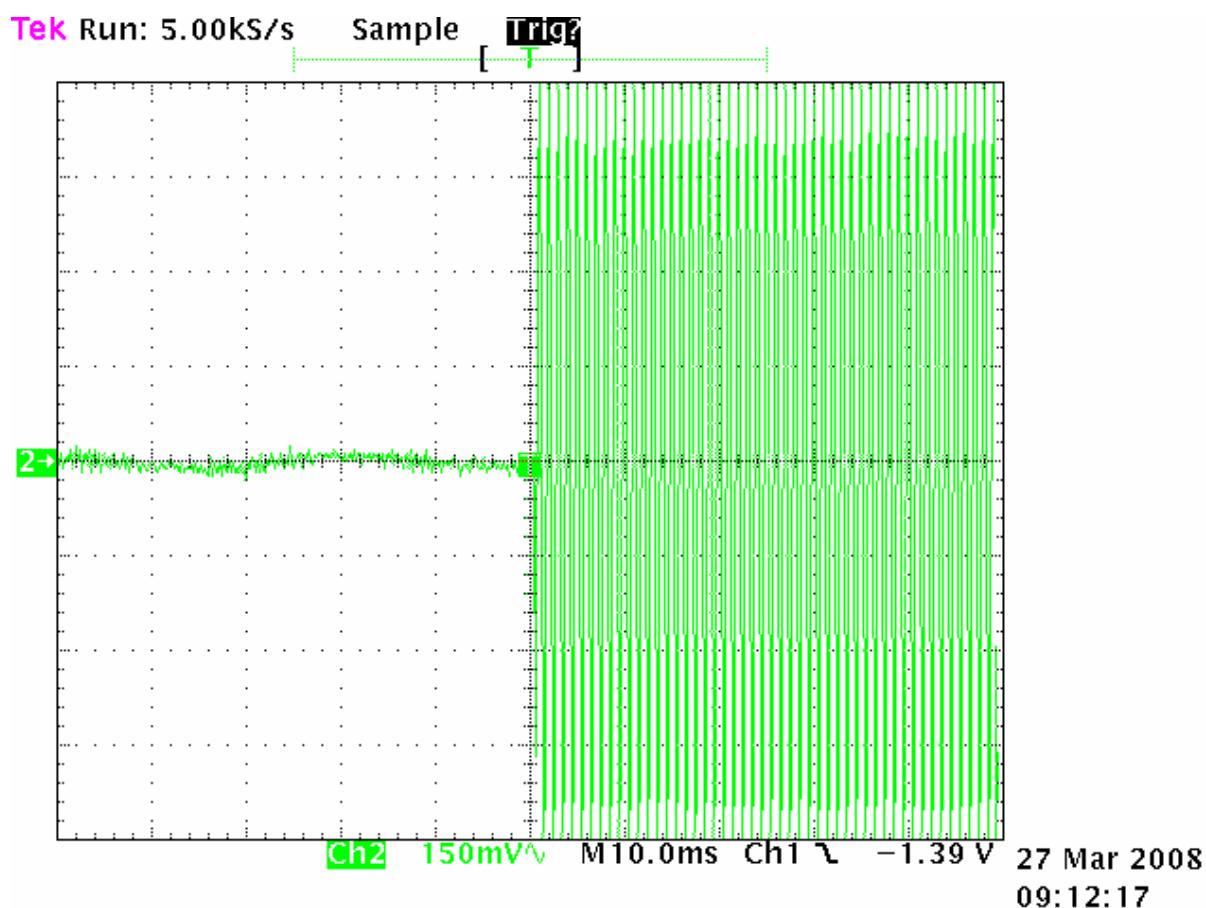
Therefore each Y axis division = 3.125 kHz per division.

The X axis has been set to a sweep rate of 10 mS/division

The display of the 1 kHz signal rising has been positioned 5 divisions from the left hand edge (50 mS). This is position *toff*.

t3 occurs between 4.5 and 5.0 divisions from the left hand edge..

No transient responses can be observed before *toff*.



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25.0 kHz transmitter turn on (164.075 MHz)

Green Trace = 1 kHz tone with FM deviation of 25.0 kHz.

Green trace has been maximised to give full screen indication of +/- 25.0 kHz.

Therefore each Y axis division = 6.25 kHz per division.

The X axis has been set to a sweep rate of 10 mS/division.

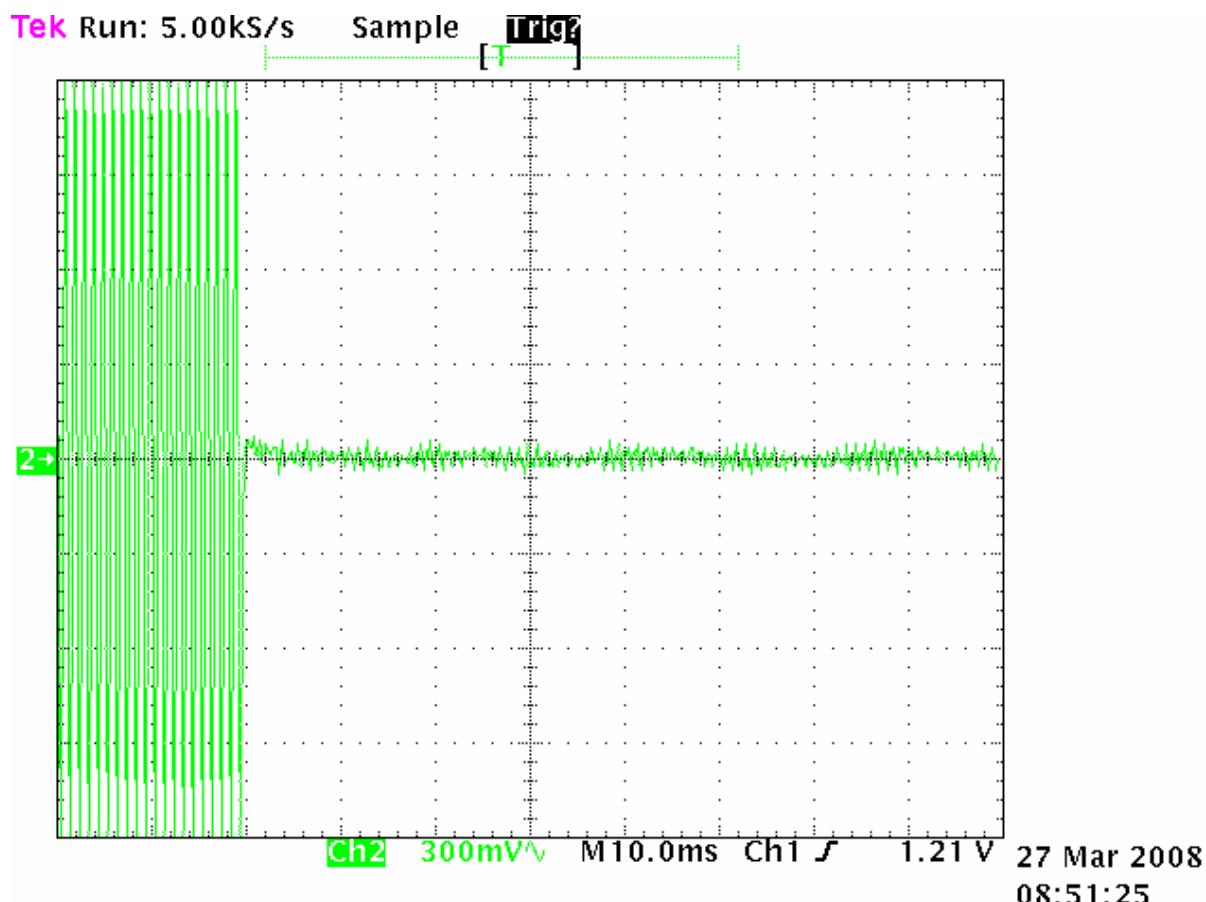
Triggering has been set to occur 2 divisions from the left hand edge (20 mS).

t_{on} occurs at 20 mS.

t_1 occurs between 2.0 and 2.5 divisions from the left hand edge.

t_2 occurs between 2.5 and 4.5 divisions from the left hand edge.

No transient response can be observed during t_1 and t_2 .



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25.0 kHz transmitter turn off (164.075 MHz)

Green Trace = 1 kHz tone with FM deviation of 25.0 kHz.

Green trace has been maximised to give full screen indication of +/- 25.0 kHz.

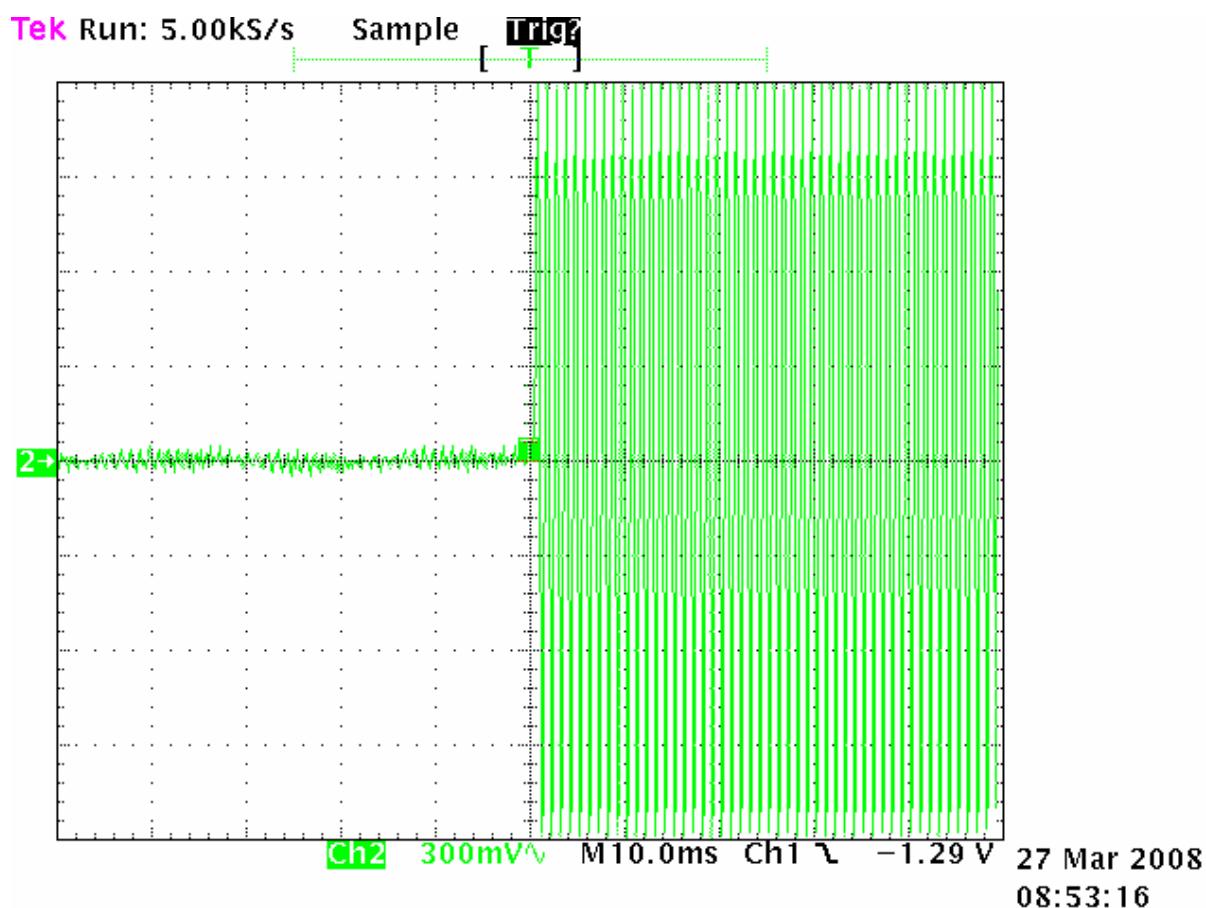
Therefore each Y axis division = 6.25 kHz per division.

The X axis has been set to a sweep rate of 10 mS/division

The display of the 1 kHz signal rising has been positioned 5 divisions from the left hand edge (50 mS). This is position *toff*.

t3 occurs between 4.5 and 5.0 divisions from the left hand edge..

No transient response can be observed before *toff*.



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Radio Frequency Hazard Information

As per Section 1.1310 and Section 2.1091 certification of this transmitter is sought using the Controlled / Occupational exposure limits as detailed in OST/OET Bulletin Number 65.

The power of 100 watts is to be used in a base station environment where the use of the transmitter will be employment related.

Calculations have been made using the General Public/Uncontrolled Exposure limits.

Minimum safe distances have been calculated below.

$$\text{Power density, } W/m^2 = E^2/3770$$

Occupational / Controlled Exposure limit: 0.58 mW/cm^2 ($f/300 = 174 \text{ MHz}/300$)

General Population / Uncontrolled exposure limit: 0.12 mW/cm^2 ($f/1500 = 174 \text{ MHz}/1500$)

The minimum distance from the antenna at which the MPE is met is calculated from the equation relating field strength in V/m, transmit power in watts, transmit antenna gain, transmitter duty cycle and separation distance in metres:

$$E, \text{ V/m} = (\sqrt{30 * P * G}) / d$$

Controlled

$$E = 0.58 \text{ mW/cm}^2 = E^2/3770$$

$$E = \sqrt{0.58 * 3770}$$

$$E = 46.8 \text{ V/m}$$

Uncontrolled

$$E = 0.12 \text{ mW/cm}^2 = E^2/3770$$

$$E = \sqrt{0.12 * 3770}$$

$$E = 21.3 \text{ V/m}$$

The rated maximum transmitter power = 100.0 watts.

Transmitter operated using a quarter wave whip antenna with a gain of 2.15 dBi (1.64).

The transmitter is a base station that would typically be used with a duty cycle of 100%

Controlled

$$d = \sqrt{(30 * P * G * DC) / E}$$

$$d = \sqrt{(30 * 100 * 1.64 * 1.0) / 46.8} = \sqrt{(30 * 100.0 * 1.64 * 1.0) / 21.3}$$

$$d = \underline{1.5 \text{ metres}}$$

Uncontrolled

$$d = \underline{3.3 \text{ metres}}$$

Result: Complies

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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
Attenuator 10 dB	Hewlett Packard	HP8491A	24838	E1329
Attenuator 20 dB	Weinschel	49-20-43	GC-104	E1308
Audio Analyzer	Hewlett Packard	8903A	2216A01713	E1146
Biconical Antenna	Schwarzbeck	BBA 9106		RFS 3612
Frequency Counter	Hewlett Packard	HP 5342A	1916A01713	E1224
Level generator	Anritsu	MG443B	M61689	E1143
Log Periodic Antenna	Schwarzbeck	VUSLP9111	9111-228	3785
Measurement Receiver	Rohde & Schwarz	ESCS 30	847124/020	E1595
Modulation Analyzer	Rohde & Schwarz	FMA	837807/020	E1552
Modulation Analyzer	Hewlett Packard	8901B	2608A00782	E1090
Oscilloscope	Tektronics	745A	B010643	1569
Power Attenuator	Weinschel	49-20-43	GC104	E1308
Power Supply	Hewlett Packard	6032A	2743A-02859	E1069
RF Power Meter	Hewlett Packard	HP 436A	2512A22439	E1198
Rubidium Oscillator	Ball Efratom	FRS - C	4287	E1053
Selective Level Meter	Anritsu	ML422C	M35386	E1140
Signal Generator	Rohde & Schwarz	SMHU.58	838923/028	E1493
Spectrum Analyzer	Hewlett Packard	E7405A	US39150142	3776
Thermal chamber	Contherm	M180F	86025	E1129
Thermometer	DSIR	RT200	035	E1049
Turntable	EMCO	1080-1-2.1	9109-1578	RFS 3709
Horn antenna	Electrometrics	RGA-60	6234	E1494
Microwave Pre Amplifier	Hewlett Packard	8349B	2644A01659	-

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 last updated on January 18th, 2007.

All testing has been carried out in accordance with the terms of EMC Technologies (NZ) Ltd's International Accreditation New Zealand (IANZ) Accreditation to ISO/IEC 17025.

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

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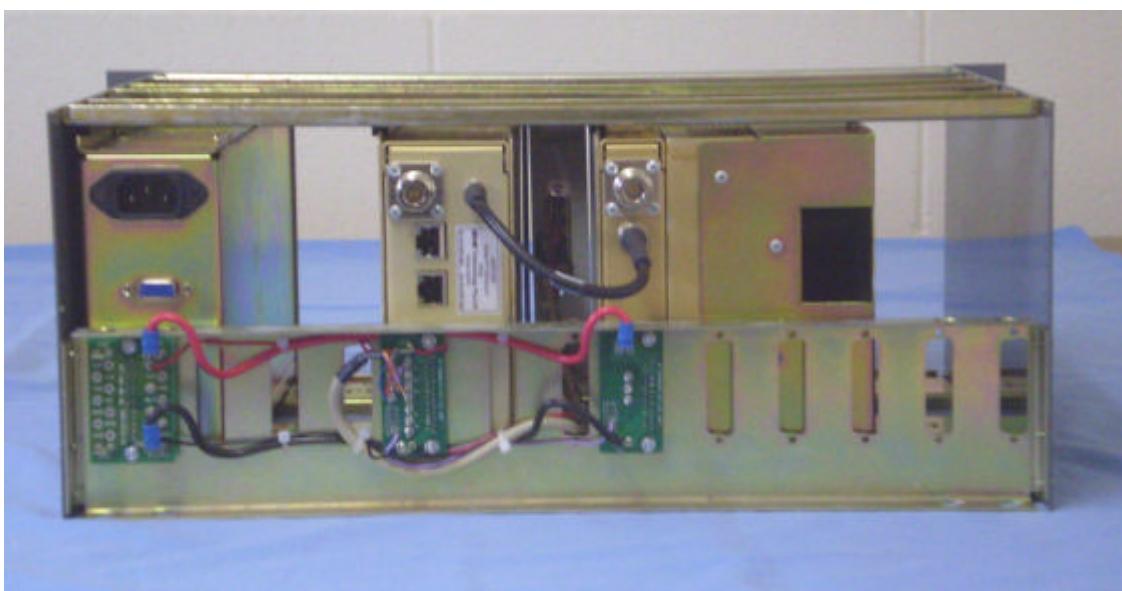
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10. PHOTOGRAPH (S)

External Views

Complete System, PSU, Eclipse 2, 100 watt PA



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Power supply module



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Eclipse 2 Radio



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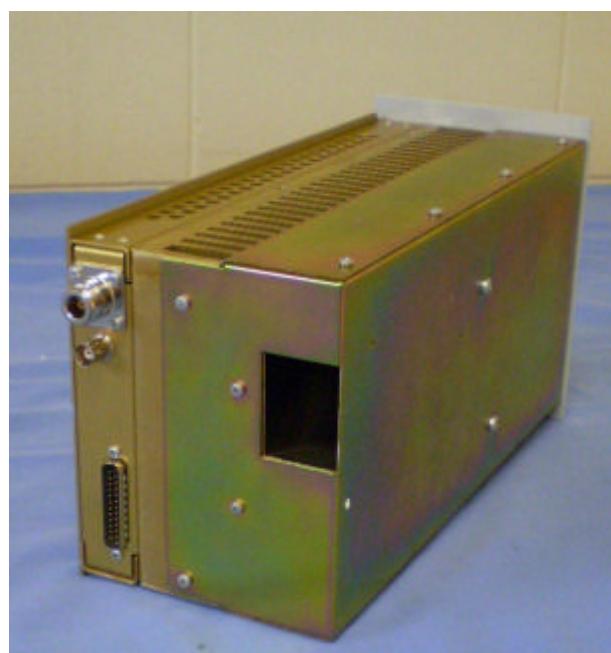
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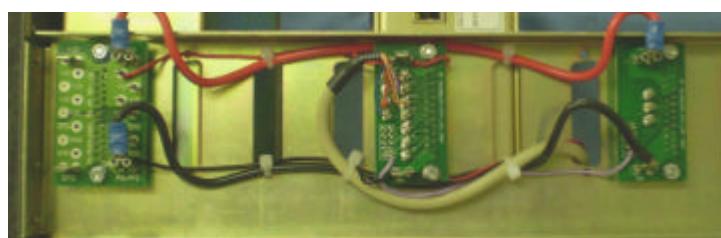
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100 watt power amplifier



DB25 wiring



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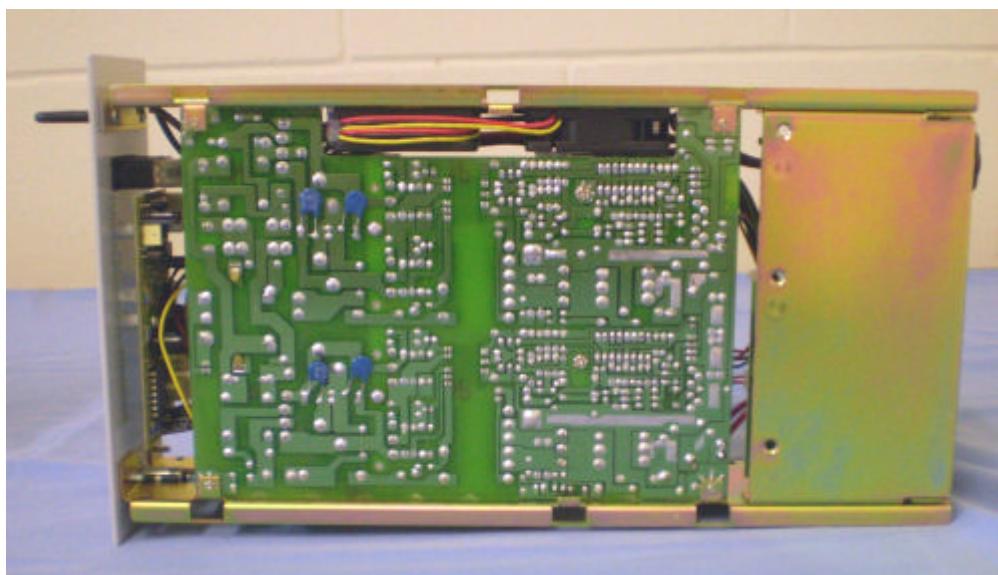
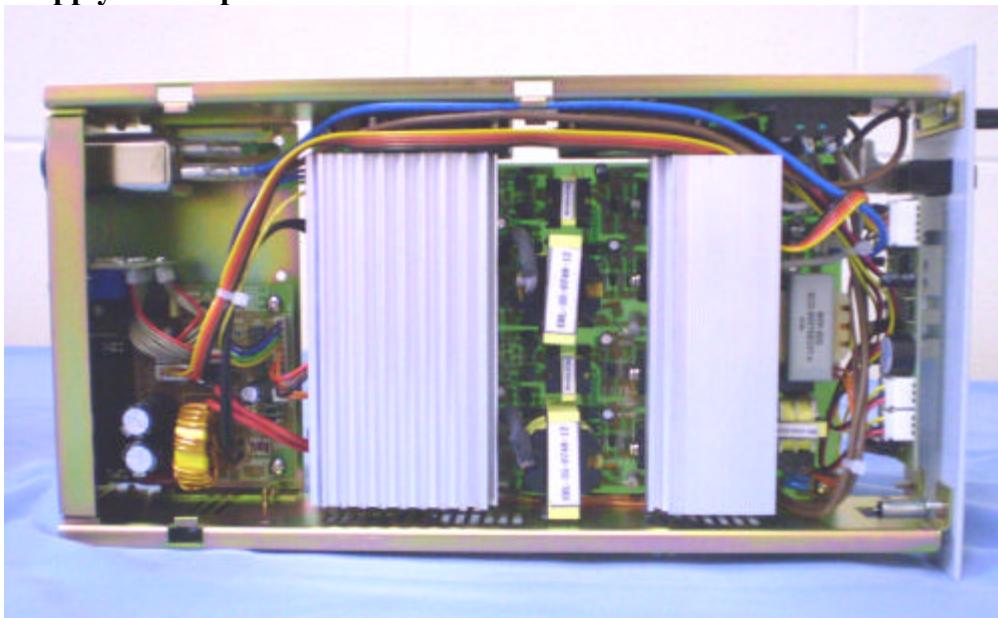
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Internal Views

Power supply PCB top view



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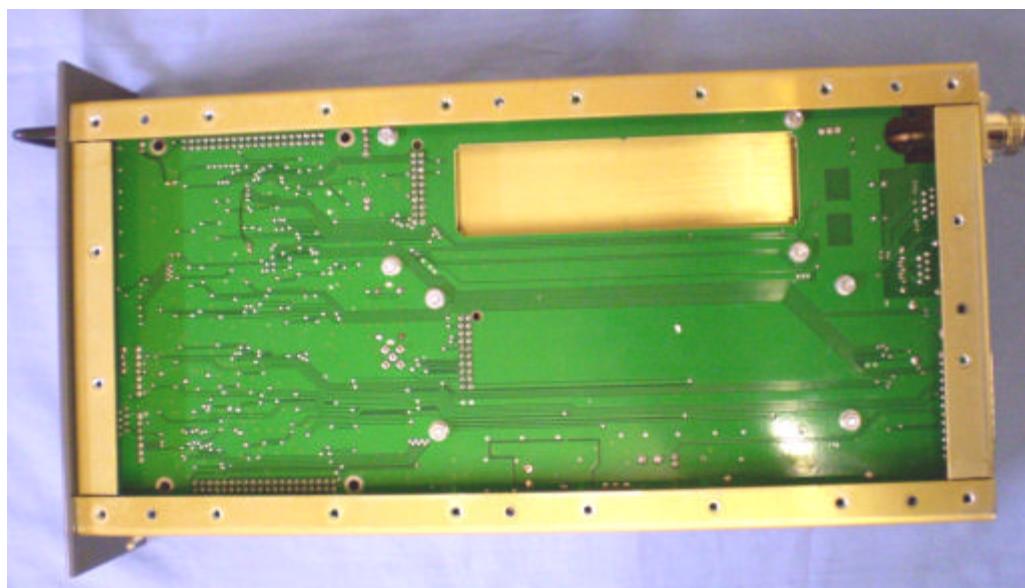
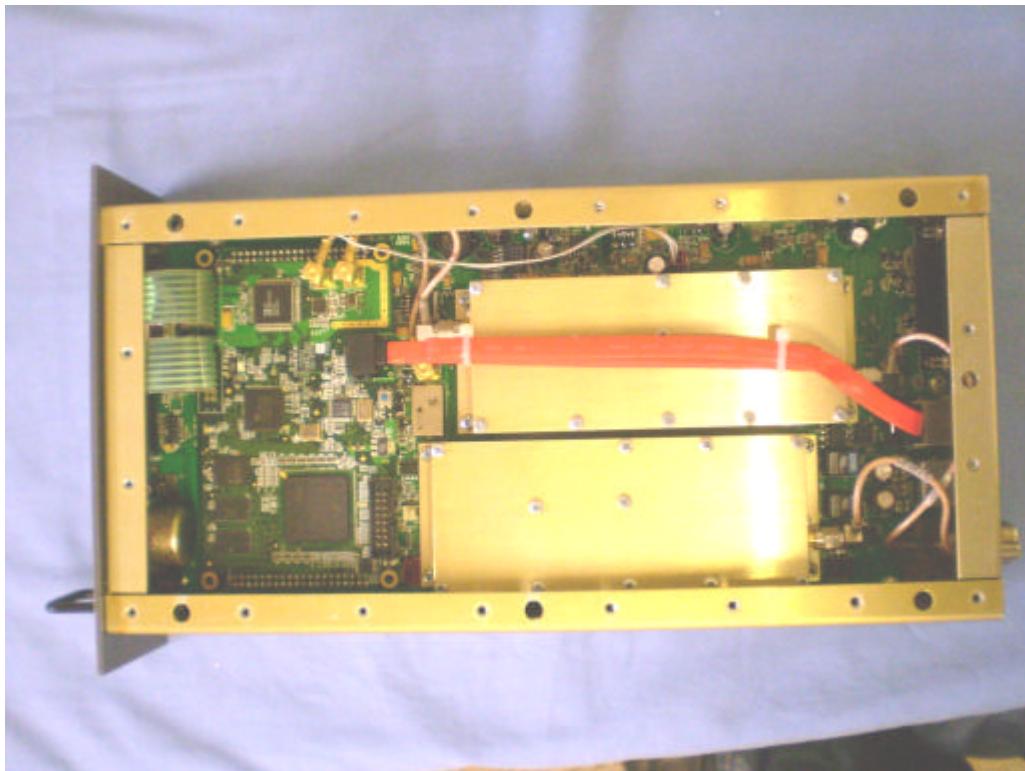
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Eclipse 2



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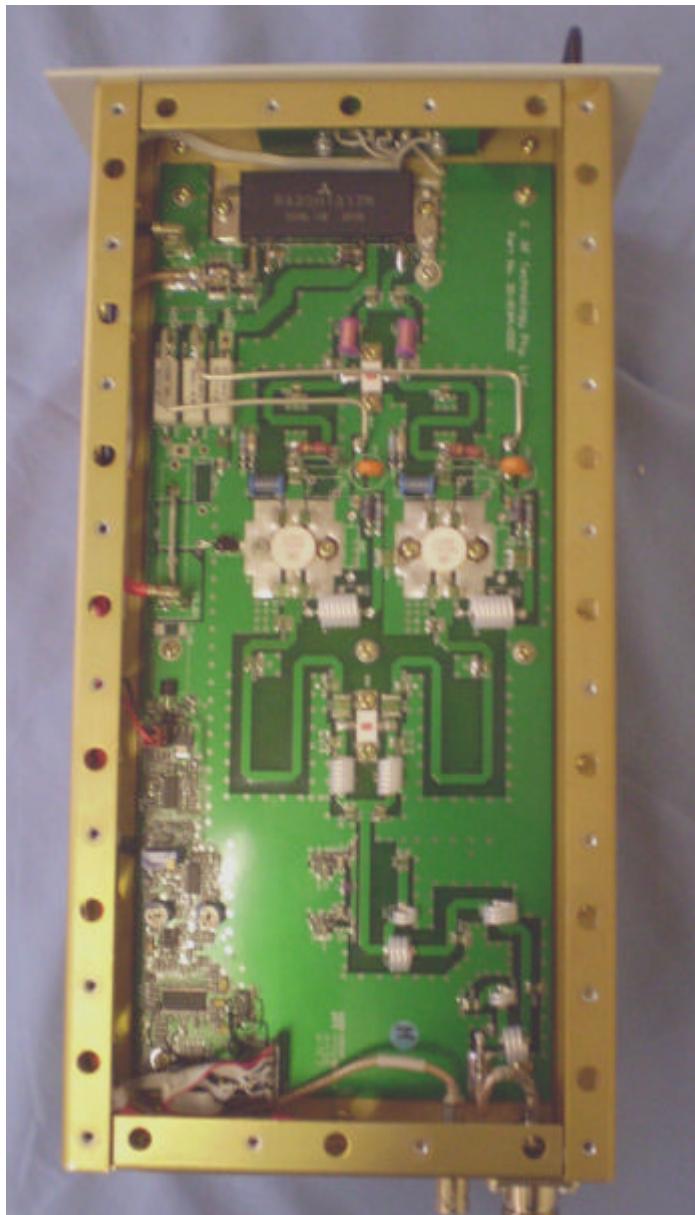
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100 watt power amplifier



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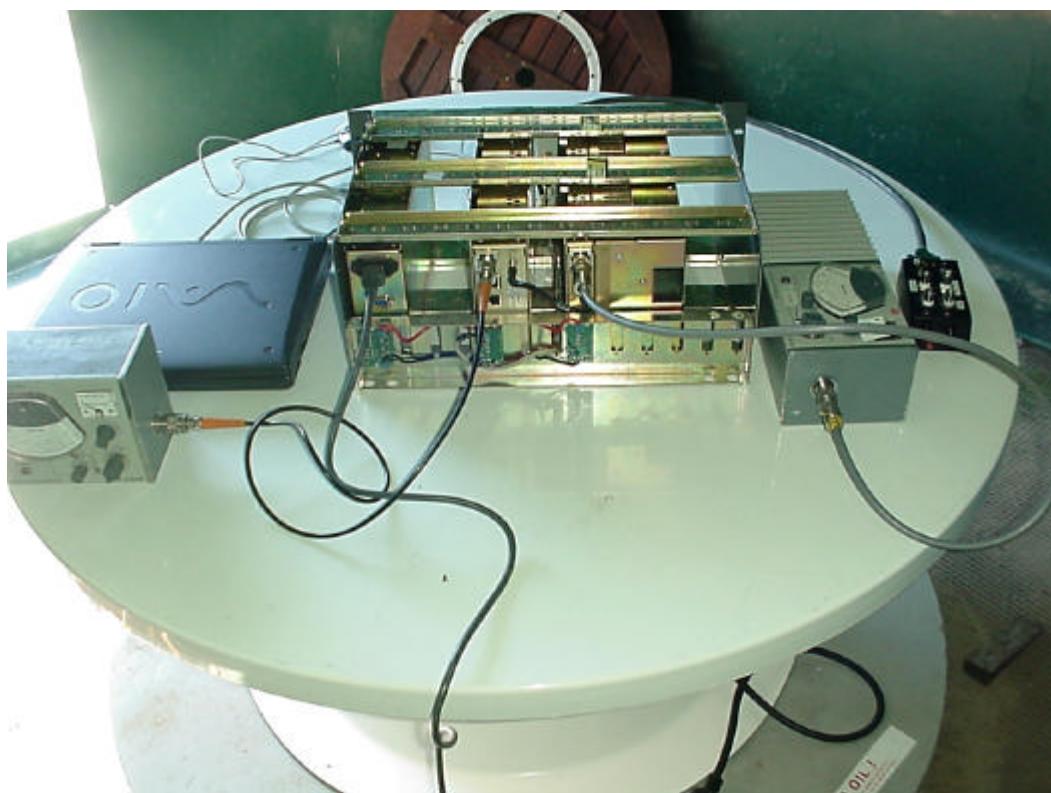
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Radiated emissions test set up



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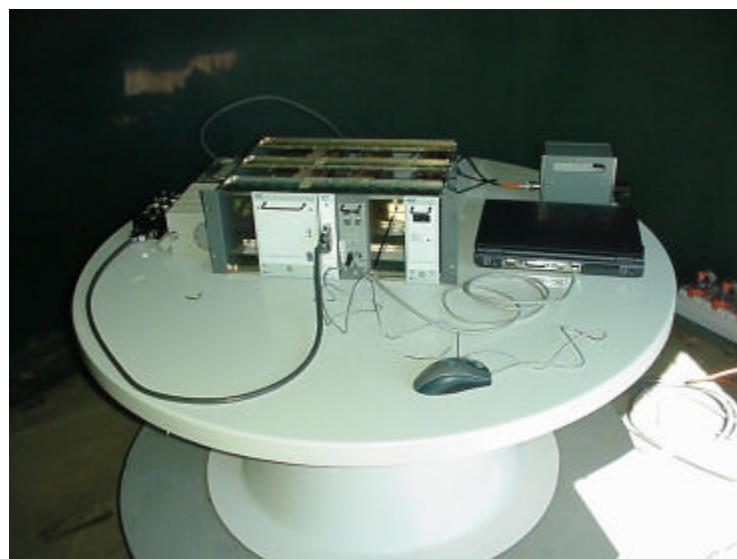
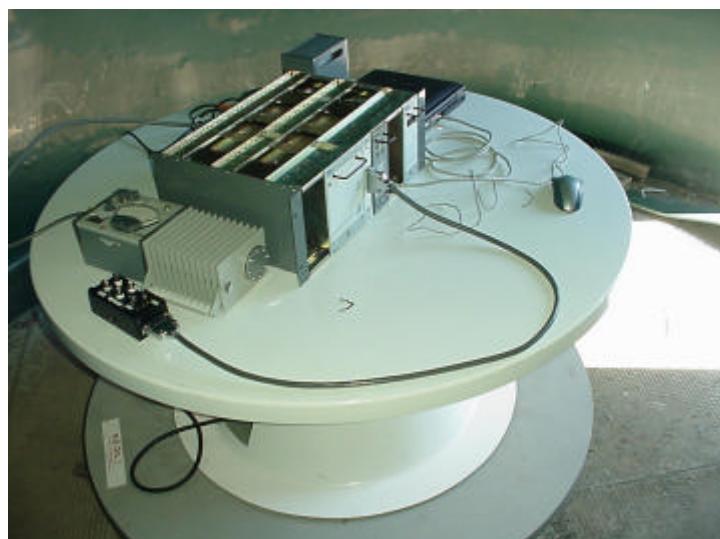
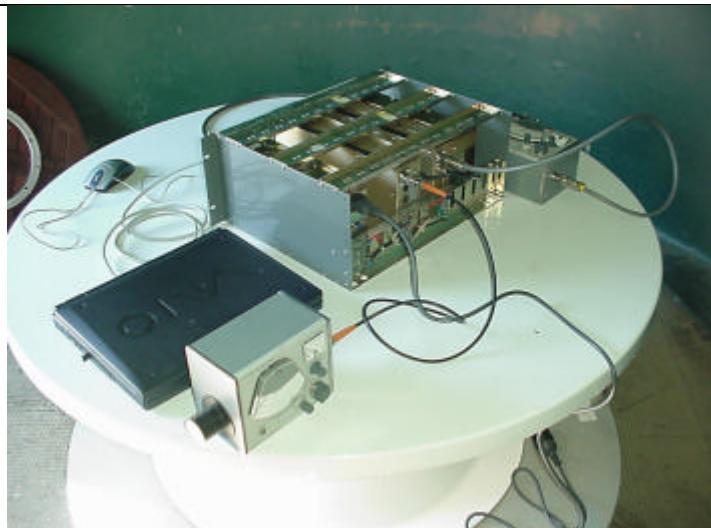
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