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Testing laboratory TESTCOM Praha

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TEST REPORT

8551-PT-R0070-12

Date of issue: April 2nd, 2012

Customer: Racom s r.o.
Mírová 1283
592 31 Nové Město na Moravě
Czech Republic

Manufacturer: Racom s r.o.
Mírová 1283
592 31 Nové Město na Moravě
Czech Republic

Subject of the test: Radio parameters

Kind of equipment: Radiomodem &Router

Type: RipEX-400

Serial number: 10748106, 10812107

Test procedure (used standard): TIA-603-D (June 2010)

The results of the tests have been obtained following the procedures reported in this Report and are related only to the tested item, date, place and conditions of the test. Test Report does not substitute any other document that may be required by national authorities according to relevant regulations. These tests were carried out beyond the accreditation of Czech Metrology Institute - Testing laboratory TESTCOM Praha.
Measurement equipment, date and place of test, ambient and test conditions, results of testing and statements of compliance and other relevant information are written in the Annex 1 of this Test Report.

Tested by:

Jiří Novotný

Český metrologický institut -85-

Head of the Department:

Marek Svoboda, Ph.D.

End of test report

CONTENTS

1. Technical Summary And Test Results

1.1 Technical Summary

Applicant:	**Racom s r.o.** **Mírová 1283** **592 31 Nové Město na Moravě**
Manufacturer:	**Racom s.r.o.** **Mírová 1283** **592 31 Nové Město na Moravě** **Czech Republic**
Produced By:	**Racom s.r.o., Czech Republic**
Kind of Equipment:	**Radiomodem & Router**
Type Designation(s):	**RipEX-400**
RF Power:	**0.1 W to 10 W**
Alignment Range:	**400 MHz to 470 MHz**
Switching Range:	**32; 38 MHz**
Number of Units:	**2**
Date of Receipt of Unit(s):	**12.3.2012**
Start of Test:	**12.3.2012**
Finish of Test:	**21.3.2012**

1.2 Test Results of Unit No. 1 Transceiver

Type Designation:	**RipEX-400**
Code:	**RipEX-400**
Serial No.:	**10748106**
Channel Separation:	**6.25; 12.5; 25 kHz**
Transmitter Part:	
CH 1	**400.0125 MHz**
CH 2	**406.125 MHz**
CH 3	**415.025 MHz**
CH 4	**431.9875 MHz**
Power Supply Range:	**Vnom = 24 V DC**
Temperature Range:	**Tnom = Ambient temperature**

Ambient temperature: (20 ± 1) °C
Relative humidity: (28 ± 10) %

Transmitter operating unmodulated

The measurement was carried out at maximum power level

Clause 2.2.12: **TRANSMITTER UNWANTED EMISSIONS: RADIATED SPURIOUS**

SPURIOUS EMISSIONS								
CH 1			CH 2			CH 3		
Freq. [MHz]	Bandwidth [kHz]	Level [dBm]	Freq. [MHz]	Bandwidth [kHz]	Level [dBm]	Freq. [MHz]	Bandwidth [kHz]	Level [dBm]
800.030	100	-40.3	812.258	100	-40.6	830.065	100	-42.1
For all other frequencies the spurious emissions were detected at least 20 dB below the limit.								
Measurement uncertainty			+4.4 dB/-4.5 dB					

SPURIOUS EMISSIONS								
CH 4			CH 5			CH 6		
Freq. [MHz]	Bandwidth [kHz]	Level [dBm]	Freq. [MHz]	Bandwidth [kHz]	Level [dBm]	Freq. [MHz]	Bandwidth [kHz]	Level [dBm]
863.975	100	-44.8	- -	- -	- -	- -	- -	- -
For all other frequencies the spurious emissions were detected at least 20 dB below the limit.								
Measurement uncertainty			+4.4 dB/-4.5 dB					

Clause 3.2.12: **LIMIT** (47 CFR 90.210 Emission mask (e))

FREQUENCY RANGE	30 MHz to 5 GHz (approx. 10^{th} harmonic)
RADIATED SPURIOUS EMISSIONS	$dB_c = 55 + 10 \log_{10} (P)$ where P = RF output power [W] or an equivalent absolute level of -25.0 dBm (3 µW)

TEST EQUIPMENT USED: 034, 036, 041, 053, 056, 062, 150, 151, 154, 156, C132

REMARKS: - -

Ambient temperature: (20 ± 1) °C
Relative humidity: (28 ± 10) %

Transmitter operating unmodulated

The measurement was carried out at minimum power level

Clause 2.2.12: **TRANSMITTER UNWANTED EMISSIONS: RADIATED SPURIOUS**

SPURIOUS EMISSIONS								
CH 1			CH 2			CH 3		
Freq. [MHz]	Bandwidth [kHz]	Level [dBm]	Freq. [MHz]	Bandwidth [kHz]	Level [dBm]	Freq. [MHz]	Bandwidth [kHz]	Level [dBm]
For all frequencies the spurious emissions were detected at least 20 dB below the limit.								
Measurement uncertainty			+4.4 dB/-4.5 dB					

SPURIOUS EMISSIONS								
CH 4			CH 5			CH 6		
Freq. [MHz]	Bandwidth [kHz]	Level [dBm]	Freq. [MHz]	Bandwidth [kHz]	Level [dBm]	Freq. [MHz]	Bandwidth [kHz]	Level [dBm]
For all frequencies the spurious emissions were detected at least 20 dB below the limit.								
Measurement uncertainty			+4.4 dB/-4.5 dB					

Clause 3.2.12: **LIMIT** (47 CFR 90.210 Emission mask (e))

FREQUENCY RANGE	30 MHz to 5 GHz (approx. 10^{th} harmonic)
RADIATED SPURIOUS EMISSIONS	$dB_c = 55 + 10 \log_{10} (P)$ where P = RF output power [W] or an equivalent absolute level of -25.0 dBm (3 µW)

TEST EQUIPMENT USED: 034, 036, 041, 053, 056, 062, 150, 151, 154, 156, C132

REMARKS: - -

1.3 Test Results of Unit No. 2 Transceiver

Type Designation:	**RipEX-400**
Code:	**RipEX-432**
Serial No.:	**10812107**
Channel Separation:	**6.25; 12.5; 25 kHz**
Transmitter Part:	
CH 1	**432.0125 MHz**
CH 2	**451.025 MHz**
CH 3	**469.9875 MHz**
Power Supply Range:	**Vnom = 24 V DC**
Temperature Range:	**Tnom = Ambient temperature**

Ambient temperature: (22 ± 1) °C

Relative humidity: (27 ± 10) %

Transmitter operating unmodulated

The measurement was carried out at maximum power level

Clause 2.2.12: **TRANSMITTER UNWANTED EMISSIONS: RADIATED SPURIOUS**

SPURIOUS EMISSIONS								
CH 1			CH 2			CH 3		
Freq. [MHz]	Bandwidth [kHz]	Level [dBm]	Freq. [MHz]	Bandwidth [kHz]	Level [dBm]	Freq. [MHz]	Bandwidth [kHz]	Level [dBm]
864.030	100	-42.2	902.057	100	-38.1	939.982	100	-42.3
For all other frequencies the spurious emissions were detected at least 20 dB below the limit.								
Measurement uncertainty			+4.4 dB/-4.5 dB					

Clause 3.2.12: **LIMIT** (47 CFR 90.210 Emission mask (e))

FREQUENCY RANGE	30 MHz to 5 GHz (approx. 10^{th} harmonic)
RADIATED SPURIOUS EMISSIONS	$dB_c = 55 + 10 \log_{10} (P)$ where P = RF output power [W] or an equivalent absolute level of -25.0 dBm (3 µW)

TEST EQUIPMENT USED: 034, 036, 041, 053, 056, 062, 150, 151, 154, 156, C132

REMARKS: - -

Ambient temperature: (22 ± 1) °C Relative humidity: (27 ± 10) %

Transmitter operating unmodulated

The measurement was carried out at minimum power level

Clause 2.2.12: **TRANSMITTER UNWANTED EMISSIONS: RADIATED SPURIOUS**

SPURIOUS EMISSIONS								
CH 1			CH 2			CH 3		
Freq. [MHz]	Bandwidth [kHz]	Level [dBm]	Freq. [MHz]	Bandwidth [kHz]	Level [dBm]	Freq. [MHz]	Bandwidth [kHz]	Level [dBm]
For all frequencies the spurious emissions were detected at least 20 dB below the limit.								
Measurement uncertainty			+4.4 dB/-4.5 dB					

Clause 3.2.12: **LIMIT** (47 CFR 90.210 Emission mask (e))

FREQUENCY RANGE	30 MHz to 5 GHz (approx. 10^{th} harmonic)
RADIATED SPURIOUS EMISSIONS	$dB_c = 55 + 10 \log_{10} (P)$ where P = RF output power [W] or an equivalent absolute level of -25.0 dBm (3 µW)

TEST EQUIPMENT USED: 034, 036, 041, 053, 056, 062, 150, 151, 154, 156, C132

REMARKS: - -

1.5 Summary of Test Results

P = Complied with the requirements of the specification for this test (used standard)
F = Not complied with the requirements of the specification for this test (used standard)
N/A = Not applicable

Unit No. 1

Clause of the standard: Parameter ..... **Result**

Clause 2.2.12: TRANSMITTER UNWANTED EMISSIONS: RADIATED SPURIOUS ..... P

Unit No. 2

Clause of the standard: Parameter ..... **Result**

Clause 2.2.12: TRANSMITTER UNWANTED EMISSIONS: RADIATED SPURIOUS ..... P

2. Test Equipment

Lab Id. No.	Test equipment	Type	Manufacturer	Serial No.
002	Spectrum Analyzer	8595A	Hewlett-Packard	3132 A
006	Signal Generator	8657B	Hewlett-Packard	3133 U
007	Signal Generator	8657B	Hewlett-Packard	3133 U
011	RF Millivoltmeter	URV 4	Rohde-Schwarz	871889/047
014	Attenuator 20 dB/30 W	RBU-30	Rohde-Schwarz	825 723/009
017	Attenuator 40 dB/1 kW	RBS 1000	Rohde-Schwarz	835922/007
022	4-Port Junction Box	DVU 4	Rohde-Schwarz	832731/004
024	Regulating Transformer	TST 280/6	RFT	740 889
026	Heating Chamber	3524/11	Feutron	142/88
027	Freezing Chamber	NZ 350-40	Frigera	35/88
028	Shielded Chamber	-	Siemens	-
029	Digital Multimeter	M-3850	Metex	EB 127 259
030	4-Port Junction Pad	MA1612A	Anritsu	M54131
031	Digital Oscilloscope	9310AM	Le Croy	9310 3310
034	Spectrum Analyzer	8563E	Hewlett-Packard	3436A02701
035	Tracking Source	85644A	Hewlett-Packard	3407A00177
036	Preamplifier	87405A	Hewlett-Packard	3207A00368
037	Step Attenuator	8494A	Hewlett-Packard	3308A23005
038	Step Attenuator	8495A	Hewlett-Packard	3308A15336
039	Attenuator 10 dB/100 W	RBU 100	Rohde-Schwarz	836121/007
041	Anechoic Chamber	-	Frankonia	-
042	Environmental Chamber	KWP 450/70	Weiss	221/18068
043	Directional Bridge	8721A	Hewlett-Packard	-
048	Signal Generator	8664A	Hewlett-Packard	3546A01039
050	Power Splitter	11667A	Hewlett-Packard	0000A21292
051	Dual Directional Coupler	778D	Hewlett-Packard	16738
052	Simulated Man	-	Testcom	-
053	Spectrum Analyzer	8595E	Hewlett-Packard	3726U00949
055	Termination 50 Ohm/1 W	378NF	Narda	-
056	Termination 50 Ohm/1 W	378NM	Narda	-
057	Termination 50 Ohm/1 W	378NM	Narda	-
058	Attenuator 3 dB/20 W	768-3	Narda	-
059	Attenuator 6 dB/20 W	768-6	Narda	-
060	Attenuator 10 dB/20 W	768-10	Narda	-
061	Attenuator 10 dB/20 W	768-10	Narda	-
062	Attenuator 20 dB/50 W	776B-20	Narda	-
063	Attenuator 15 dB/50 W	776B-30	Narda	-
064	Attenuator 30 dB/150 W	769-30	Narda	06472
065	Step Attenuator	745	Narda	02698
066	Dual Directional Coupler	-	Tesla	-
067	Attenuator 8 dB/1 kW	RFA1000NFF8Z	RES-NET	9851
068	Dual directional Coupler	-	Tesla	185
069	Signal Generator	83732A	Hewlett-Packard	3520A00697
072	Attenuator 30 dB/50 W	776B-30	Narda	-
073	Signal Generator	SMIQ03B	Rohde-Schwarz	100522
074	Thermometer - Hygrometer	C3120A	Comet System	-
075	Thermometer - Hygrometer	C3120A	Comet System	-
076	Isolating Transformer	LTS 006	RFT	310329
077	Digital Oscilloscope	9310AM	Le Croy	5935
078	Signal Generator	8657A	Hewlett-Packard	2849U01178

...continued

Lab Id. No.	Test equipment	Type	Manufacturer	Serial No.
080	Interval Counter	SR620	Stanford Research	3352
081	Time and Frequency Precise Generator	GPG24	Dicom s.r.o.	0108251
082	Power Meter	437B	Hewlett-Packard	3125U05716
083	Step Attenuator	DPSP	Rohde-Schwarz	880607/044
084	Power Splitter	11636A	Hewlett-Packard	04464
085	Power Splitter	11667A	Hewlett-Packard	19894
087	Termination 50 Ohm/1 W	378NF	Narda	-
108	Notch Filter	-	Kathrein	-
111	RF Test Fixture	-	Testcom	-
112	AF Test Fixture	-	Testcom	-
123	Power Supply	YE 2 T	Mesit	PC 001
127	Power Supply	TSZ 75	ZPA	547 1255
134	Notch Filter 15 - 90 MHz	SF 1	Schomandl	10046
135	Notch Filter 85 - 260 MHz	SF 2	Schomandl	10004
136	Notch Filter 210 - 500 MHz	SF 3	Schomandl	10010
137	Notch Filter 500 - 1000 MHz	SF 4	Schomandl	10016
142	Radiocommunication Tester	CMTA 54	Rohde-Schwarz	838262/005
143	AF Transformer	CM - Z39	Rohde-Schwarz	835844/0002
144	Power Amplifier 9 kHz - 220 MHz	BSA 0122-20	Bonn Elektronik	943954A
145	Power Amplifier 200 - 1000 MHz	BLWA 2010-20	Bonn Elektronik	943954B
146	Precision Dipole 30 - 300 MHz	VHAP	Schwarzbeck	705
147	Precision Dipole 30 - 300 MHz	VHAP	Schwarzbeck	706
148	Precision Dipole 300 - 1000 MHz	UHAP	Schwarzbeck	728
149	Precision Dipole 300 - 1000 MHz	UHAP	Schwarzbeck	729
150	Biconical Broadband Antenna to 300 MHz	VHBB 9124 + BA 9106	Schwarzbeck	0204/93
151	Biconical Broadband Antenna 0.3 - 1 GHz	UBA 9116	Schwarzbeck	313/93
152	Short Dipole 25 - 80 MHz	VHAA 9110	Schwarzbeck	140
154	Broadband Horn Antenna 0.8 - 4.5 GHz	BBHA 9120-A	Schwarzbeck	215
155	Broadband Horn Antenna 0.8 - 4.5 GHz	BBHA 9120-A	Schwarzbeck	216
156	Broadband Horn Antenna 2 - 14 GHz	BBHA 9120-C	Schwarzbeck	309
157	Broadband Horn Antenna 2 - 14 GHz	BBHA 9120-C	Schwarzbeck	310
160	ACP Filter	ACPX 107-125-A	COMNET Sys	736001
161	ACP Filter	ACPX 107-200-A	COMNET Sys	736002
162	ACP Filter	ACPX 107-250-A	COMNET Sys	736003
163	Noise Generator	RG 1	Wandel-Goltermann	467250 G
164	Colour Noise Filter	-	Testcom	-
165	Transmission Measuring Set	PMD-1	Wandel-Goltermann	454632 B
166	Power Supply	6653A	Hewlett-Packard	US36400106
167	Power Supply	6653A	Hewlett-Packard	US36400120
169	Notch filter 1.4 – 2.0 GHz	-	Testcom	-
170	Level Amplifier	PSV-39	Wandel-Goltermann	B-0011
171	Bit Error Rate Meter	BER Meter	Radom	-
174	Ferrite Circulator	CKU 355H	Tesla	2900024/001
175	Ferrite Circulator	CKU 356	Tesla	2900056/001
176	Power Supply	6634A	Hewlett-Packard	3004A-02063
177	Power Supply	6634A	Hewlett-Packard	3326A-03226
178	Amplifier 10 – 1000 MHz	ZFL-1000VH	Mini-Circuits	-
179	Amplifier 1 – 500 MHz	ZHL-5W-1	Mini-Circuits	-
202	Video-Millivoltmeter	VMV 21	Tesla	86 114
306	Tuneable Filter 60 – 180 MHz	-	Tesla	-
C132	Preamplifier	PE1524	Pasternak	0104

3. Additional Information

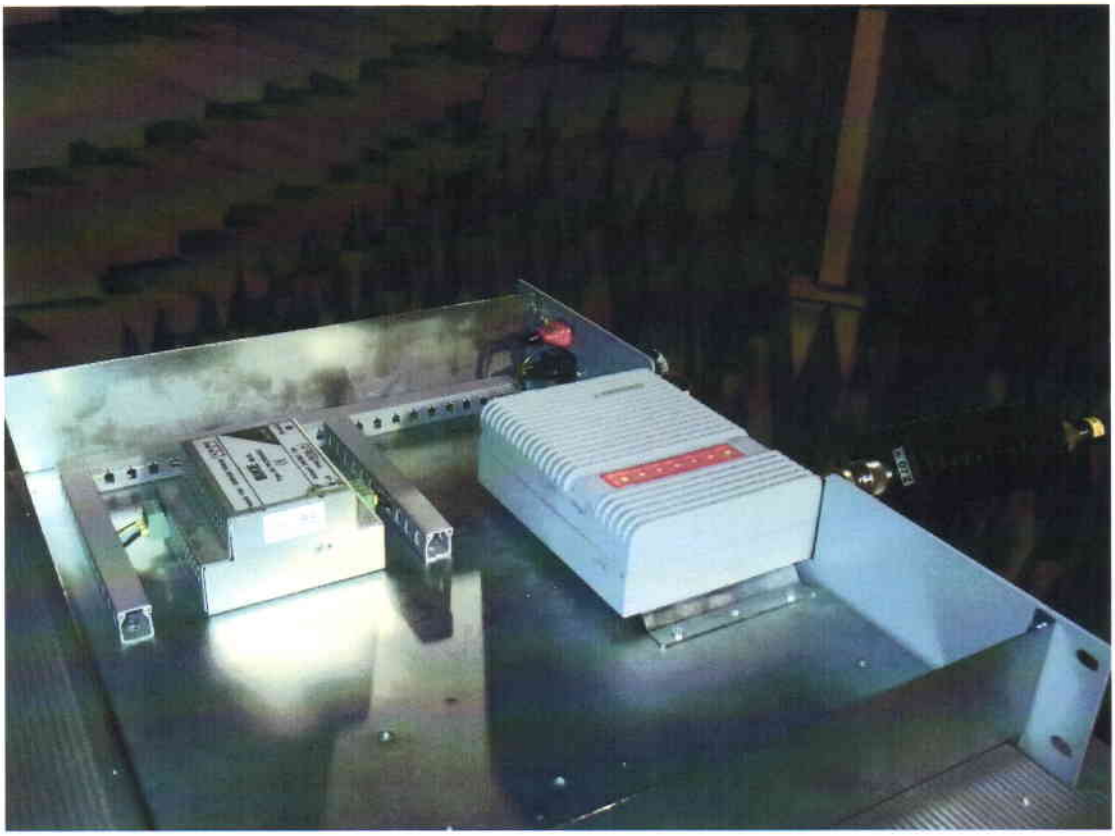
There was carried out only measurement of the following parameter on the request of applicant:

Clause 2.2.12: Transmitter Unwanted Emissions: Radiated Spurious.

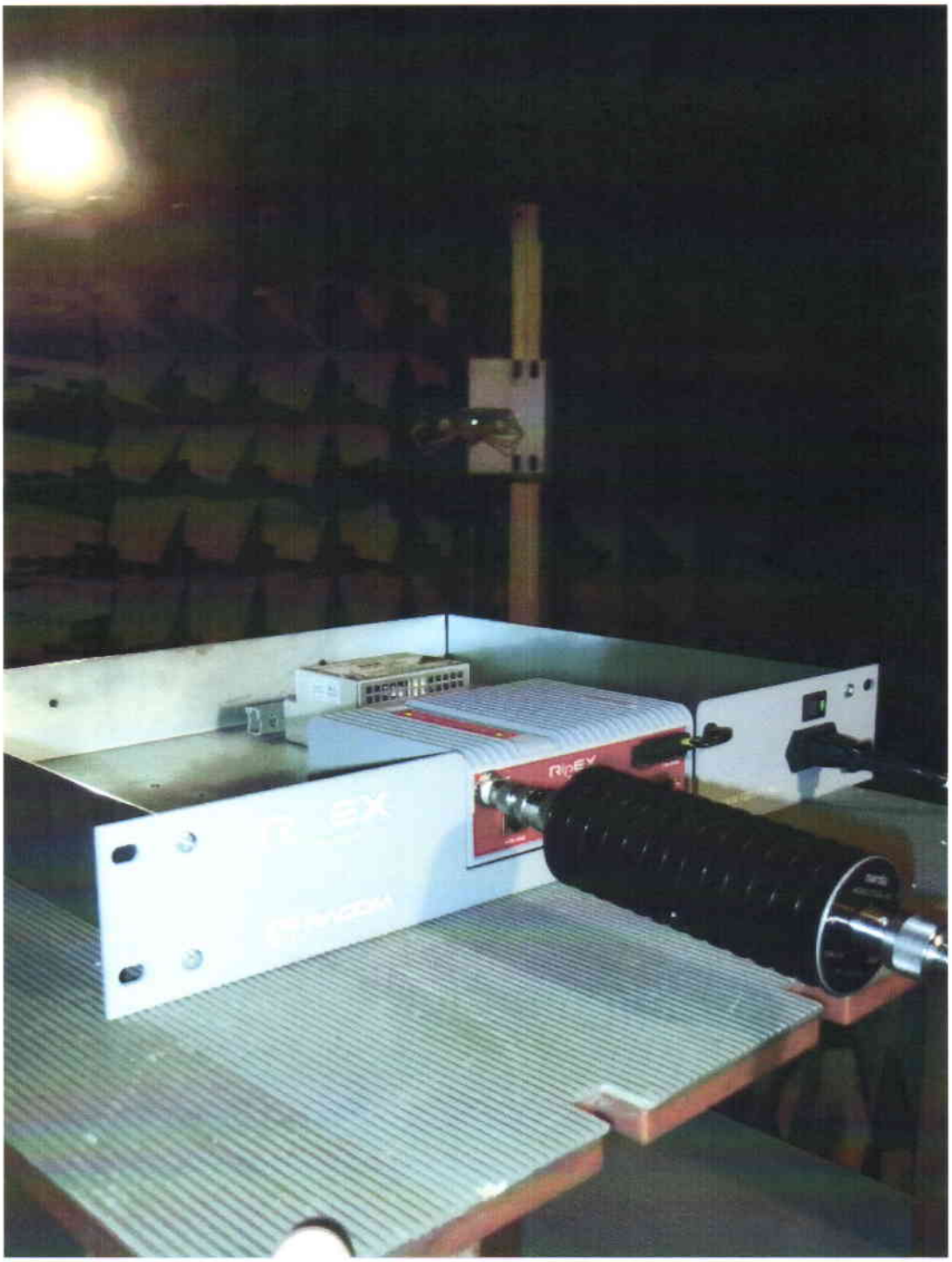
4. Photographs Of Equipment

List of photographs:

PHOTOGRAPH 1: Overall view of tested unit



PHOTOGRAPH 2: Test site for radiated emissions – one view



PHOTOGRAPH 3: Test site for radiated emissions – second view