Radioframe Networks, Inc.

MC Series

December 01, 2004

Report No. RAFN0042

Report Prepared By



www.nwemc.com 1-888-EMI-CERT

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22975 NW Evergreen Parkway Suite 400 Hillsboro, Oregon 97124

Certificate of Test

Issue Date: December 01, 2004 Radioframe Networks, Inc. Model: MC Series

	Emissions		
Specification	Test Method	Pass	Fail
FCC 15.107 AC Powerline Conducted Emissions (Receive Mode):2004	ANSI C63.4:2003		
FCC 15.109 Radiated Emissions (Receive Mode):2004	ANSI C63.4:2003		
FCC 15.111 Conducted Spurious Emissions (Receive Mode):2004	ANSI C63.4:2003		
FCC 90.217 and FCC 2.1055 Frequency Stability:2004	TIA/EIA-603:2001		
FCC 90.691 Occupied Bandwidth / Emission Mask:2004	TIA/EIA-603:2001		
FCC 90.217 and FCC 2.1046 Output Power:2004	TIA/EIA-603:2001		
FCC 90.691 and FCC 2.1051 Spurious Conducted Emissions:2004	TIA/EIA-603:2001		
FCC 90.691 and FCC 2.1053 Spurious Radiated Emissions:2004	TIA/EIA-603:2001	\boxtimes	

Modifications made to the product

See the Modifications section of this report

Test Facility

• The measurement facility used to collect the data is located at:

Northwest EMC, Inc.; 22975 NW Evergreen Parkway, Suite 400; Hillsboro, OR 97124

Phone: (503) 844-4066 Fax: 844-3826

This site has been fully described in a report filed with and accepted by the FCC (Federal

Communications Commission) and Industry Canada.

Approved By:
Londo Mathetan
Don Facteau, IS Manager

This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government of the United States of America.

Product compliance is the responsibility of the client, therefore the tests and equipment modes of operation represented in this report were agreed upon by the client, prior to testing. This Report may only be duplicated in its entirety. The results of this test pertain only to the sample(s) tested, the specific description is noted in each of the individual sections of the test report supporting this certificate of test.

Revision History

Revision 05/05/03

Revision Number	Description	Date	Page Number
00	None		

Revision 01/04/05

Accreditations and Authorizations

FCC: Accredited by NVLAP for performance of FCC radio, digital, and ISM device testing. Our Open Area Test Sites, certification chambers, and conducted measurement facilities, have been fully described in reports filed with the FCC and accepted by the FCC in letters maintained in our files. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by the FCC as a Telecommunications Certification Body (TCB). This allows Northwest EMC to certify transmitters to FCC specifications in accordance with 47 CFR 2.960 and 2.962.





NVLAP: Northwest EMC, Inc. is recognized under the United States Department of Commerce, National Institute of Standards and Technology, National Voluntary Laboratory Accreditation Program for satisfactory compliance with the requirements of ISO/IEC 17025 for Testing Laboratories. The NVLAP accreditation encompasses Electromagnetic Compatibility Testing in accordance with the European Union EMC Directive 89/336/EEC, ANSI C63.4, MIL-STD 461E, DO-160D and SAE J1113. Additionally, Northwest EMC is accredited by NVLAP to perform radio testing in accordance with the European Union R&TTE Directive 1999/5/EEC, the requirements of FCC, and the RSS radio standards for Industry Canada.



200629-0 200630-0 200676-0

Industry Canada: Accredited by NVLAP for performance of Industry Canada RSS and ICES testing. Our Open Area Test Sites and certification chambers comply with RSS 212, Issue 1 (Provisional) and have been filed with Industry Canada and accepted. Northwest EMC has been accredited by ANSI to ISO / IEC Guide 65 as a product certifier. We have been designated by NIST and recognized by Industry Canada as a Certification Body (CB) per the APEC Mutual Recognition Arrangement (MRA). This allows Northwest EMC to certify transmitters to Industry Canada technical requirements.



CAB: Designated by NIST and validated by the European Commission as a Conformity Assessment Body (CAB) to conduct tests and approve products to the EMC directive and transmitters to the R&TTE directive, as described in the U.S. - EU Mutual Recognition Agreement



TÜV Product Service: Included in TUV Product Service Group's Listing of Recognized Laboratories. It qualifies in connection with the TUV Certification after Recognition of Agent's Testing Program for the product categories and/or standards shown in TUV's current Listing of CARAT Laboratories available from TUV. A certificate was issued to represent that this laboratory continues to meet TUV's CARAT Program requirements. Certificate No. USA0401C



TÜV Rheinland: Authorized to carryout EMC tests by order and under supervision of TÜV Rheinland. This authorization is based on "Conditions for EMC-Subcontractors" of November 1992.



NEMKO: Assessed and accredited by NEMKO (Norwegian testing and certification body) for European emissions and immunity testing. As a result of NEMKO's laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification (Authorization No. ELA 119).



Technology International: Assessed in accordance with ISO Guide 25 defining the general international requirements for the competence of calibration and testing laboratories and with ITI assessment criteria LACO196. Based upon that assessment Interference Technology International, Ltd., has granted approval for specifications implementing the EU Directive on EMC (89/336/EEC and amendments). The scope of the approval was provided on a Schedule of Assessment supplied with the certificate and is available upon request.



Australia/New Zealand: The National Association of Testing Authorities (NATA), Australia has been appointed by the ACA as an accreditation body to accredit test laboratories and competent bodies for EMC standards. Accredited test reports or assessments by competent bodies must carry the NATA logo. Test reports made by an overseas laboratory that has been accredited for the relevant standards by an overseas accreditation body that has a Mutual Recognition Agreement (MRA) with NATA are also accepted as technical grounds for product conformity. The report should be endorsed with the respective logo of the accreditation body. (NVLAP)



VCCI: Accepted as an Associate Member to the VCCI, Acceptance No. 564. Conducted and radiated measurement facilities have been registered in accordance with Regulations for Voluntary Control Measures, Article 8. (Registration Nos. - Hillsboro: C-1071 and R-1025, Irvine: C-2094 and R-1943, Newberg: C-1877 and R-1760, Sultan: R-871, C-1784 and R-1761)



BSMI: Northwest EMC has been designated by NIST and validated by C-Taipei (BSMI) as a CAB to conduct tests as described in the APEC Mutual Recognition Agreement. License No.SL2-IN-E-1017.



GOST: Northwest EMC, Inc. has been assessed and accredited by the Russian Certification bodies Certinform VNIINMASH, CERTINFO, SAMTES, and Federal CHEC, to perform EMC and Hygienic testing for Information Technology Products. As a result of their laboratory assessment, they will accept test results from Northwest EMC, Inc. for product certification



SCOPE

For details on the Scopes of our Accreditations, please visit: http://www.nwemc.com/scope.asp

What is measurement uncertainty?

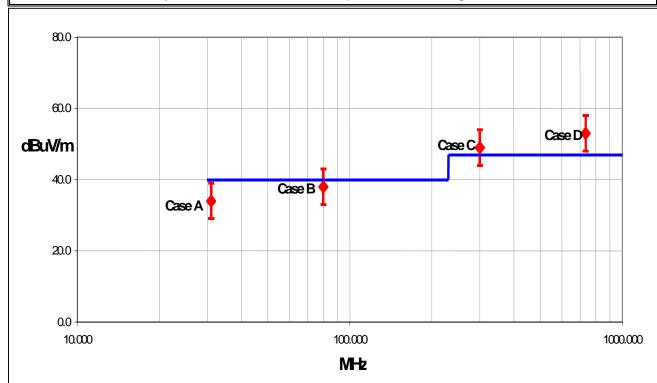
When a measurement is made, the result will be different from the true or theoretically correct value. The difference is the result of tolerances in the measurement system that cannot be completely eliminated. To the extent that technology allows us, it has been our aim to minimize this error. The following statement of measurement uncertainty is used to reflect the accuracy of the measured result as compared with its "true" value. In the case of transient tests (ESD, EFT, Surge, Voltage Dips and Interruptions), the test equipment has been demonstrated by calibration to provide at least a 95% confidence that it complies with the test specification requirements.

The following documents were the basis for determining the uncertainty levels of our measurements:

- "ISO Guide to the Expression of Uncertainty in Measurements", October 1993
- "NIS81: The Treatment of Uncertainty in EMC Measurements", May 1994
- "IEC CISPR 16-3 A1 f1 Ed.1: Radio-interference measurements and statistical techniques", December 2000

How might measurement uncertainty be applied to test results?

If the diamond marks the measured value for the test and the vertical bars bracket the range of + and – measurement uncertainty, then test results can be interpreted from the diagram below.



Test Result Scenarios:

Case A: Product complies.

Case B: Product conditionally complies. It is not possible to say with 95% confidence that the product complies.

Case C: Product conditionally does not comply. It is not possible to say with 95% confidence that the product does not comply.

Case D: Product does not comply.

Measurement Uncertainty

Radiated Emissions ≤ 1 GHz		Value (dB)				
	Probability Biconical		Log Periodic		Dipole		
	Distribution Antenna		Ante	enna	An	tenna	
Test Distance		3m	10m	3m	10m	3m	10m
Combined standard	normal	+ 1.86	+ 1.82	+ 2.23	+ 1.29	+ 1.31	+ 1.25
uncertainty u _c (y)		- 1.88	- 1.87	- 1.41	- 1.26	- 1.27	- 1.25
Expanded uncertainty <i>U</i>	normal (k=2)	+ 3.72	+ 3.64	+ 4.46	+ 2.59	+ 2.61	+ 2.49
(level of confidence ≈ 95%)		- 3.77	- 3.73	-2.81	- 2.52	- 2.55	- 2.49

Radiated Emissions > 1 GHz	Value (dB)		
	Probability Distribution	Without High Pass Filter	With High Pass Filter
Combined standard uncertainty $u_c(y)$	normal	+ 1.29 - 1.25	+ 1.38 - 1.35
Expanded uncertainty <i>U</i> (level of confidence ≈ 95%)	normal (k=2)	+ 2.57 - 2.51	+ 2.76 2.70

Conducted Emissions						
	Probability	Value				
	Distribution	(+/- dB)				
Combined standard uncertainty <i>uc(y)</i>	normal	1.48				
Expanded uncertainty U (level of confidence ≈ 95 %)	normal (k = 2)	2.97				

Radiated Immunity						
	Probability	Value				
	Distribution	(+/- dB)				
Combined standard uncertainty uc(y)	normal	1.05				
Expanded uncertainty <i>U</i> (level of confidence ≈ 95 %)	normal (k = 2)	2.11				

Conducted Immunity						
	Probability	Value				
	Distribution	(+/- dB)				
Combined standard uncertainty <i>uc(y</i>)	normal	1.05				
Expanded uncertainty U	normal (k = 2)	2.10				
(level of confidence ≈ 95 %)	Horriai (K = 2)	2.10				

Legend

 $u_c(y)$ = square root of the sum of squares of the individual standard uncertainties

 $\it U$ = combined standard uncertainty multiplied by the coverage factor: $\it k$. This defines an interval about the measured result that will encompass the true value with a confidence level of approximately 95%. If a higher level of confidence is required, then $\it k$ =3 (CL of 99.7%) can be used. Please note that with a coverage factor of one, uc(y) yields a confidence level of only 68%.

Facilities



California

Orange County Facility

Labs OC01 - OC13

41 Tesla Ave. Irvine, CA 92618 (888) 364-2378 FAX (503) 844-3826



Oregon

Evergreen Facility

Labs EV01 - EV10

22975 NW Evergreen Pkwy., Suite 400 Hillsboro, OR 97124 (503) 844-4066 FAX (503) 844-3826



Oregon

Trails End Facility

Labs TE01 - TE03

30475 NE Trails End Lane Newberg, OR 97132 (503) 844-4066 FAX (503) 537-0735



Washington

Sultan Facility

Labs SU01 - SU07

14128 339th Ave. SE Sultan, WA 98294 (888) 364-2378 FAX (360) 793-2536

Product Description

Revision 10/3/03

Party Requesting the Test	
Company Name:	Radioframe Networks, Inc.
Address:	1120 112th Ave NE, Suite 600
City, State, Zip:	Bellevue, WA 98004
Test Requested By:	Steve Peters
Model:	MC Series
First Date of Test:	08-03-2004
Last Date of Test:	10-20-2004
Receipt Date of Samples:	08-03-2004 and 10-20-2004
Equipment Design Stage:	Pre-Production
Equipment Condition:	No visual damage.

Information Provided by the Party Requesting the Test

Clocks/Oscillators:	Not provided.
I/O Ports:	Antenna Transmit, Antenna Receive, Antenna diversity, Clock in, Ethernet, RS-232 maintenence ports, Tx/Rx test ports, Tx/RX diversity test ports,
	232 maintenence ports, 13/13/ test ports, 13/13/ diversity test ports,

Functional Description of the EUT (Equipment Under Test):
Microcell cellular base station for iDEN radio.

Client Justification for EUT Selection:

The product is an engineering sample, representative of the final product.

Client Justification for Test Selection:

These tests satisfy the requirements for FCC part 90.691, 15.107, 15.109, and 15.111

EUT Photo



Revision 4/28/03

	Equipment modifications							
Item	Test	Date	Modification	Note	Disposition of EUT			
1	Frequency Stability	08/03/2004	No EMI suppression devices were added or modified during this test.	Tested at client facility	EUT remained at client facility			
2	Output Power	08/03/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at client facility			
3	Spurious Conducted Emissions	08/03/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at client facility			
4	Occupied Bandwidth	08/03/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at client facility			
5	Radiated Emissions – Receive mode	10/19/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.			
6	AC Powerline Conducted Emissions	10/19/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.			
7	Radiated Spurious (Out of Band) Emissions	10/20/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT remained at Northwest EMC.			
8	Spurious Conducted Emissions – Receive mode	10/20/2004	No EMI suppression devices were added or modified during this test.	Same configuration as in previous test.	EUT was returned to client following testing.			

Conducted Emissions

Revision 10/1/03

Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. All of the EUT parameters listed below were investigated. This includes, but may not be limited to, CPU speeds, video resolution settings, operational modes, and input voltages.

Operating Modes Investigated:

Receive mode, 20 channels configuration

Power Input Settings Investigated:

-48VDC

Software\Firmware Applied During Test					
Operating system	VX Works	Version	Unknown		
Exercise software	FCC Script	Version	Unknown		
Description					
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FCC script is a text file of commands run from a remote pc through ftp server that sets the radios to transmit. Without running the script, the unit automatically goes into receive mode.

EUT and Peripherals in Test Setup Boundary						
Description	Manufacturer	Model/Part Number	Serial Number			
iDEN Radio Base Station	Radio Frame Networks, Inc.	MC Series System	Engineering Production Unit #1			
Subset of MC Series System	Radio Frame Networks, Inc.	PDU	Unknown			
Subset of MC Series System	Radio Frame Networks, Inc.	RF Shelf	Unknown			
Subset of MC Series System	Radio Frame Networks, Inc.	Radio Blade Shelf	Unknown			
Subset of MC Series System	Radio Frame Networks, Inc.	Base Interface Chassis (BIC)	Unknown			
Subset of MC Series System	Radio Frame Networks, Inc.	Airlink Interface Chassis (AIC)	Unknown			

Remote Equipment Outside of Test Setup Boundary						
Description Manufacturer Model/Part Number Serial Number						
Clock Source	Motorola	Unknown	Unknown			
Equipment isolated from the	Equipment isolated from the EUT so as not to contribute to the measurement result is considered to be outside the test setup boundary.					

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Clock Source	Yes	5.0	No	Base Interface Chassis (BIC)	Clock Source
DC Power	No	6	No	PDU	DC Power
PA = Cabl	e is perman	ently attached to th	ne device. S	hielding and/or presence of ferrite may be	e unknown.

Conducted Emissions

Revision 10/1/03

Measurement Equipment					
Description	Manufacturer	Model	Identifier	Last Cal	Interval
LISN	Solar	9252-50-R-24-BNC	LIN	12/16/2003	13 mo
High Pass Filter	TTE	H97-100k-50-720B	HFC	02/01/2004	13 mo
Quasi-Peak Adapter	Hewlett-Packard	85650A	AQF	12/23/2003	13 mo
Spectrum Analyzer	Hewlett-Packard	8566B	AAL	12/23/2003	13 mo
Spectrum Analyzer Display	Hewlett Packard	85662A	AALD	12/23/2003	13 mo

Test Description

Using the mode of operation and configuration noted within this report, conducted emissions tests were performed. The frequency range investigated (scanned), is also noted in this report. Conducted power line measurements are made, unless otherwise specified, over the frequency range from 150 kHz to 30 MHz to determine the line-to-ground radio-noise voltage that is conducted from the EUT power-input terminals that are directly (or indirectly via separate transformer or power supplies) connected to a public power network. Equipment is tested with power cords that are normally used or that have electrical or shielding characteristics that are the same as those cords normally used. Typically those measurements are made using a LISN (Line Impedance Stabilization Network), the 50 Ω measuring port is terminated by a 50 Ω EMI meter or a 50 Ω resistive load. All 50 Ω measuring ports of the LISN are terminated by 50 Ω .

Measurement Bandwidtl	ns			
Frequency Range	Peak Data	Quasi-Peak Data	Average Data	
(MHz)	(kHz)	(kHz)	(kHz)	
0.01 - 0.15	1.0	0.2	0.2	
0.15 - 30.0	10.0	9.0	9.0	
30.0 - 1000	100.0	120.0	120.0	
Above 1000	1000.0	N/A	1000.0	
Measurements were made using the bandwidths and detectors specified. No video filter was used.				

Completed by:

Holy Arling

CONDUCTED EMISSIONS DATA SHEET EMC Work Order: RAFN0042 EUT: MC Series Date: 10/19/04 Serial Number: N/A Customer: Radioframe Networks, Inc. Temperature: 70 Attendees: none Humidity: 45% Cust. Ref. No.: N/A Barometric Pressure 29.61 Tested by: Holly Ashkannejhad Power: -48VDC Job Site: EV01 SPECIFICATIONS Specification: FCC 15.107 Class A Year: 2003 Method: ANSI C63.4 Year: 2003 SAMPLE CALCULATIONS Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation EUT OPERATING MODES 20 channels receiving **DEVIATIONS FROM TEST STANDARD** No deviations RESULTS Pass Neg Other Holy Soling 80.0 70.0 60.0 50.0 40.0 30.0 20.0 10.0 0.0 0.100 1.000 10.000 100.000 MHz External Compared to Freq Amplitude Transducer Cable Adjusted Spec. Limit Attenuation Detector (blank equal peal [PK] from scan (dB) (dB) (dBuV) (dB) (dB) dBuV dBuV (MHz) 0.322 36.0 0.0 0.0 20.0 ΑV 56.0 66.0 -10.0 0.162 34.4 0.0 0.0 20.0 AV 54.4 66.0 -11.6 0.483 20.0 AV 48.1 66.0 -17.9 0.322 40.7 0.0 0.0 20.0 QP 60.7 79.0 -18.3 0.162 39.4 0.0 0.0 20.0 QP 59.4 79.0 -19.6 33.3 20.0 QΡ 0.483 0.0 0.0 53.3 79.0 -25.7 0.324 42 5 0.0 0.1 20.0 62 6 66.0 -34 0.164 41.9 0.0 0.1 20.0 62.0 66.0 -4.0 0.484 36.6 0.0 0.2 20.0 56.8 66.0 -9.2 3.156 27.5 0.5 20.0 48.0 60.0 -12.0 20.064 1.3 23.9 0.0 20.0 45.2 60.0 -14.8 20.012 23.3 0.0 1.3 20.0 44.6 60.0 -15.4 20.088 0.0 1.3 20.0 60.0 23.2 44.5 -15.5 44.5 20.076 0.0 1.3 20.0 60.0 -15.5 23.2 44.3 3.476 23.8 0.0 0.5 20.0 60.0 -15.7 20.052 23.0 0.0 1.3 20.0 44.3 60.0 -15.7 2.916 23.5 0.0 0.5 20.0 44.0 60.0 -16.0

20.001

20.034

22.4

21.9

0.0

0.0

1.3

1.3

20.0

20.0

43.7

43.2

60.0

60.0

-16.3

-16.8

CONDUCTED EMISSIONS DATA SHEET EMC Work Order: RAFN0042 EUT: MC Series Date: 10/19/04 Serial Number: N/A Customer: Radioframe Networks, Inc. Temperature: 70 Attendees: none Humidity: 45% Cust. Ref. No.: N/A Barometric Pressure 29.61 Tested by: Holly Ashkannejhad Power: -48VDC Job Site: EV01 Specification: FCC 15.107 Class A Year: 2003 Method: ANSI C63.4 Year: 2003 SAMPLE CALCULATIONS Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation EUT OPERATING MODES 20 channels receiving **DEVIATIONS FROM TEST STANDARD** No deviations RESULTS Pos Pass Other Holy Salingha 80.0 70.0 60.0 50.0 40.0 30.0 20.0 10.0 0.0 0.100 1.000 10.000 100.000 MHz External Compared to Freq Amplitude Transducer Cable Adjusted Spec. Limit Attenuation Detector (blank equal peal [PK] from scan (dB) (dB) (dBuV) (dB) (dB) dBuV dBuV (MHz) 0.322 36.0 0.0 0.0 20.0 ΑV 56.0 66.0 -10.0 0.162 34.0 0.0 0.0 20.0 AV 54.0 66.0 -12.0 0.483 20.0 AV 66.0 -17.7 0.322 40.6 0.0 0.0 20.0 QP 60.6 79.0 -18.4 0.162 38.9 0.0 0.0 20.0 QP 58.9 79.0 -20.1 33.5 20.0 QΡ 0.483 0.0 0.0 53.5 79.0 -25.5 -36 0.325 423 0.0 0.1 20.0 62 4 66.0 0.164 40.6 0.0 0.1 20.0 60.7 66.0 -5.3 0.483 35.6 0.0 0.2 20.0 55.8 66.0 -10.2 0.235 33.2 0.2 20.0 66.0 -12.6 3.156 0.5 20.0 47.0 26.5 0.0 60.0 -13.0 3.476 22.5 0.0 0.5 20.0 43.0 60.0 -17.0 2.916 0.0 0.5 20.0 60.0 21.1 41.6 -18.4 41.3 2.846 20.8 0.0 0.5 20.0 60.0 -18.7 0.644 19.7 0.0 0.2 20.0 39.9 60.0 -20.1 21.332 18.4 0.0 1.4 20.0 39.8 60.0 -20.2 5.817 19.0 0.0 0.7 20.0 39.7 60.0 -20.3 3.556 18.5 0.0 0.6 20.0 39.1 60.0 -20.9

21.167

17.7

0.0

1.3

20.0

39.0

60.0

-21.0





Radiated Emissions

Revision 10/1/03

Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. All of the EUT parameters listed below were investigated. This includes, but may not be limited to, CPU speeds, video resolution settings, operational modes, and input voltages.

Operating Modes Investigated:

Receive mode, 20 Channels configuration

Worst Case Operating Mode used for Final Test:

Receive mode, 20 Channels configuration (designated by client or system limitations)

Power Input Settings Investigated:

-48VDC

Worst Case Input Power Setting used for Final Test:

-48VDC (designated by client or system limitations)

Frequency Range Investigated				
Start Frequency	30 MHz	Stop Frequency	5 GHz	

Software\Firmware Applied During Test					
Operating system	VX Works	Version	Unknown		
Exercise software	FCC Script	Version	Unknown		
Description					
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FCC script is a text file of commands run from a remote pc through ftp server that sets the radios to transmit. Without running the script, the unit automatically goes into receive mode.

EUT and Peripherals in Test Setup Boundary					
Description	Manufacturer	Model/Part Number	Serial Number		
iDEN Radio Base	Radio Frame Networks,	MC Series System	Engineering		
Station	Inc.	WC Selles System	Production Unit #1		
Subset of MC Series	Radio Frame Networks,	PDU	Unknown		
System	Inc.	FDO	Olikilowii		
Subset of MC Series	Radio Frame Networks,	RF Shelf	Unknown		
System	Inc.	IXI SHEII	OTIKITOWIT		
Subset of MC Series	Radio Frame Networks,	Radio Blade Shelf	Unknown		
System	Inc.	Nadio Blade Shell	OTIKITOWIT		
Subset of MC Series	Radio Frame Networks,	Base Interface Chassis	Unknown		
System	Inc.	(BIC)	Olikilowii		
Subset of MC Series	Radio Frame Networks,	Airlink Interface Chassis	Unknown		
System	Inc.	(AIC)	OTIKITOWIT		

Remote Equipment Outside of Test Setup Boundary						
Description Manufacturer Model/Part Number Serial Number						
Clock Source	Motorola	Unknown	Unknown			
Equipment isolated from the EUT so as not to contribute to the measurement result is considered to be outside the test setup boundary.						

Radiated Emissions

Revision 10/1/03

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Clock Source	Yes	5.0	No	Base Interface Chassis (BIC)	Clock Source
DC Power	No	6	No	PDU	DC Power
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					

Measurement Equipment						
Description	Manufacturer	Model	Identifier	Last Cal	Interval	
Antenna, Biconilog	EMCO	3141	AXE	12/03/2003	24 mo	
Antenna, Horn	EMCO	3115	AHC	09/07/2004	12 mo	
Pre-Amplifier	Amplifier Research	LN1000A	APS	02/05/2004	13 mo	
Pre-Amplifier	Miteq	AMF-4D-005180-24- 10P	APJ	01/05/2004	13 mo	
Spectrum Analyzer	Hewlett-Packard	8566B	AAL	12/23/2003	13 mo	
Quasi-Peak Adapter	Hewlett-Packard	85650A	AQF	12/23/2003	13 mo	
Spectrum Analyzer Display	Hewlett Packard	85662A	AALD	12/23/2003	13 mo	

Test Description

The final radiated emissions test was performed using the parameters described above as worst case. That final test was conducted at a facility that meets the ANSI C63.4 NSA requirements. The frequency range noted in the data sheets was scanned/tested at that facility. Emissions were maximized as specified, by maximizing table azimuth, antenna height, and cable manipulation.

Using the mode of operation and configuration noted within this report, a final radiated emissions test was performed. The frequency range investigated (scanned), is also noted in this report. Radiated emissions measurements were made at the EUT azimuth and antenna height such that the maximum radiated emissions level will be detected. This requires the use of a turntable and an antenna positioner. The preferred method of a continuous azimuth search is utilized for frequency scans of the EUT field strength with both polarities of the measuring antenna. A calibrated, linearly polarized antenna was positioned at the specified distance from the periphery of the EUT.

Note: The specified distance is the horizontal separation between the closest periphery of the EUT and the center of the axis of the elements of the receiving antenna. However, if the receiving antenna is a log-periodic array, the specified distance shall be the distance between the closest periphery of the EUT and the front-to-back center of the array of elements.

Tests were made with the antenna positioned in both the horizontal and vertical planes of polarization. The measurement was varied in height above the conducting ground plane to obtain the maximum signal strength. Though specified in the report, the measurement distance shall be 1 meter, 3 meters, 5 meters, 10 meters, or 30 meters. At any measurement distance, the antenna height was varied from 1 meter to 4 meters. These height scans apply for both horizontal and vertical polarization, except that for vertical polarization the minimum height of the center of the antenna shall be increased so that the lowest point of the bottom of the antenna clears the ground surface by at least 25 cm.

Measurement Bandwidt	hs		
Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)
0.01 – 0.15	1.0	0.2	0.2
0.15 - 30.0	10.0	9.0	9.0
30.0 - 1000	100.0	120.0	120.0
Above 1000	1000.0	N/A	1000.0
Measurements were i	made using the bandwidths	and detectors specified. No	video filter was used.

Completed by:

Holy Arling

NORTHWEST **RADIATED EMISSIONS DATA SHEET EMC** Work Order: RAFN0042 EUT: MC Series Date: 10/19/04 Serial Number: Engineering Production Unit #1 Customer: Radioframe Networks, Inc. Temperature: 70 Attendees: none Humidity: 45% Cust. Ref. No.: N/A Barometric Pressure 29.61 Tested by: Holly Ashkannejhad Power: -48VDC Job Site: EV01 SPECIFICATIONS Specification: FCC 15.109(b) Class A Year: 2003 Method: ANSI C63.4 Year: 2003 SAMPLE CALCULATIONS Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation EUT OPERATING MODES 20 channels receiving **DEVIATIONS FROM TEST STANDARD** No deviations RESULTS Pass Other Holy Soling 0.08 70.0 60.0 50.0 dBuV/m 40.0 30.0 20.0 10.0 0.0 10.000 100.000 1000.000 MHz External Distance Compared to Amplitude Height Distance Spec. Limit Frea Factor Azimuth Attenuation Polarity Detecto Adjustment Adjusted (dBuV) (dB) (meters) (dB) (dB) dBuV/m dBuV/m (dB) (MHz) (degrees) (meters) 90.010 56.1 -15.3 179.0 1.0 3.0 0.0 V-Bilog 0.0 40.8 54.0 -13.2 40.000 45.8 -9.7 146.0 3.0 0.0 V-Bilog PΚ 0.0 36.1 49.5 -13.4 96.053 54.9 -14.6 172.0 1.0 3.0 0.0 V-Bilog PΚ 0.0 40.3 54.0 -13.7 PΚ 90.010 54.8 -15.3 186.0 1.5 3.0 0.0 H-Bilog 0.0 39.5 54.0 -14.5 150.000 148.0 1.0 3.0 0.0 V-Bilog PK 38.6 -15.4 52.2 -13.6 0.0 54.0 H-Bilog PΚ 53.0 199.0 3.0 0.0 38.4 -15.6 96.053 -14.6 2.2 0.0 54.0 H-Bilog PK 399.997 45.8 -45 328.0 1.0 3.0 0.0 0.0 41.3 56.9 -15.6 80.024 49.4 -15.8 188.0 1.2 3.0 0.0 V-Bilog PΚ 0.0 33.6 49.5 -15.9 399.997 45.3 -4.5 326.0 1.6 3.0 0.0 V-Bilog PΚ 0.0 40.8 56.9 -16.1 60.000 47.7 -14.5 166.0 3.0 3.0 0.0 H-Bilog PΚ 0.0 33.2 49.5 -16.3 700.014 39.7 0.8 45.0 1.1 3.0 0.0 V-Bilog PΚ 0.0 40.5 56.9 -16.4 V-Bilog 60.000 -14.5 189.0 PΚ 32.4 49.5 -17.1 46.9 1.3 3.0 0.0 0.0 H-Bilog 700.014 38.6 0.8 215.0 1.4 3.0 0.0 PΚ 0.0 39.4 56.9 -17.5H-Bilog 150 000 48 9 -136 309 0 1.5 3.0 0.0 PK 35.3 54.0 -187 0.0

40.000

200.002

80.024

200.002

39.4

44.1

44.8

-9.7

-10.5

-15.8

-10.5

135.0

156.0

60.0

162.0

2.2

1.0

2.2

3.0

3.0

3.0

0.0

0.0

0.0

0.0

H-Bilog

V-Bilog

H-Bilog

H-Bilog

PK

PΚ

PΚ

0.0

0.0

0.0

29.7

33.6

29.0

49.5

54.0

49.5

54.0

-19.8

-20.4

-20.5

-24.0





Frequency Stability

Revision 10/1/03

Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:

Mid

Operating Modes Investigated:

Typical

Data Rates Investigated:

Maximum

Output Power Setting(s) Investigated:

Maximum

Power Input Settings Investigated:

48 Vdc (nominal)

Software\Firmware Applied During Test				
Exercise software	Standard Production Software	Version	N/A	
Description				
The evetem were tested	using standard appreting pro	duction coffware to evereing	the functions of the	

The system was tested using standard operating production software to exercise the functions of the device during the testing.

EUT and Peripherals					
Description	Manufacturer	Model/Part Number	Serial Number		
iDEN Radio Base Station	Radioframe Networks, Inc.	MC Series System	Engineering Production Unit		
Power Supply	HP	6038A	LE44B		

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Leads	none	3.0	none	iDEN Radio Base Station	DC Supply
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.					



Frequency Stability

Revision 10/1/03

Measurement Equipment						
Description	Manufacturer	Model	Identifier	Last Cal	Interval	
Spectrum Analyzer	Tektronix	2784	AAO	01/02/2005	12 mo	
Multimeter	Fluke	79	MMC	12/02/2004	13 mo	
Temperature Chamber	Thermotron	S8C	25-1756-06	09/16/2003	12 mo	

Test Description

Requirement: Per 47 CFR 2.1055 and 90.217, the frequency stability shall be measured with variation of ambient temperature and primary supply voltage. A spectrum analyzer or frequency counter can be used to measure the frequency stability. If using a spectrum analyzer, it must have a precision frequency reference that exceeds the stability requirement of the transmitter. A temperature / humidity chamber is required.

Configuration:

Variation of Supply Voltage

The primary supply voltage was varied from 85% to 115% of nominal. The EUT can only be operated from a 48 Vdc supply, so the DC input voltage was varied from 40.8 Vdc to 55.2 Vdc.

Variation of Ambient Temperature

Using a temperature chamber, the transmit frequency was recorded at the extremes of the specified temperature range (-30° to +50° C) and at 10°C intervals.

Measurements were made at mid frequency in the operational band. A direct connection was made between the RF output of the EUT and a spectrum analyzer. The spectrum analyzer is equipped with a precision frequency reference that exceeds the stability requirement of the EUT.

Completed by:

EMISSIONS DATA SHEET						Rev BETA 01/30/01
EUT: MC Series System				Work Order:		
Serial Number: Engineering Production Unit #1					08/03/04	
Customer: Radioframe Networks, Inc.				Temperature:		
Attendees: Jeff Franck			Greg Kiemel	Humidity:		
Customer Ref. No.: N/A		Power:	48 Vdc	Job Site:	Off-site	
TEST SPECIFICATIONS						
Specification: 47 CFR 2.1055, 90.217	Year: 2003	Method:	TIA/EIA - 603	Year:	2001	
SAMPLE CALCULATIONS						
COMMENTS						
EUT OPERATING MODES						
Transmitting mid band						
DEVIATIONS FROM TEST STANDARD						
None						
REQUIREMENTS						
Minimum frequency stability of 1 part per million (ppm) for						
RESULTS		MINIMUM FREQUENC	YSTABILITY			
Pass 0.08 ppm						
SIGNATURE						
ATU. K. P						
Tested By:						
DESCRIPTION OF TEST						
	Frequency Stability					

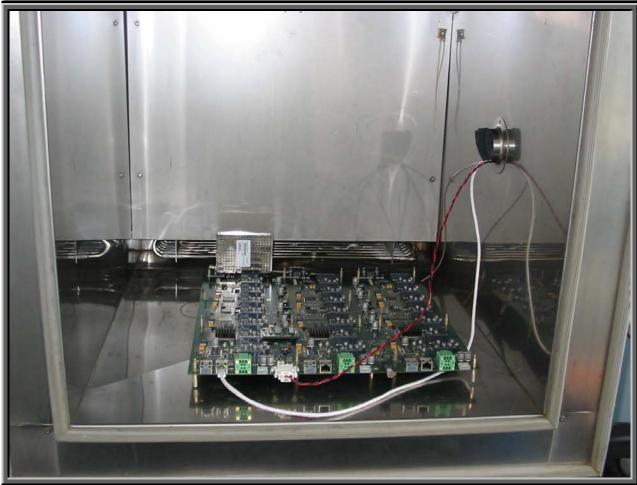
Frequency Stability with Variation of Ambient Temperature (Primary Supply = 120V, 60Hz)

Temp	Assigned Frequency	Measured Frequency	Tolerance	Specification
(°C)	(MHz)	(MHz)	(ppm)	(ppm)
-30	865.61250	865.612500	0.00	1
-20	865.61250	865.612450	0.06	1
-10	865.61250	865.612465	0.04	1
0	865.61250	865.612460	0.05	1
10	865.61250	865.612440	0.07	1
20	865.61250	865.612435	0.08	1
30	865.61250	865.612455	0.05	1
40	865.61250	865.612475	0.03	1
50	865.61250	865.612455	0.05	1

Frequency Stability with Variation of Primary Supply Voltage (Ambient Temperature = 25°C)

Voltage	Assigned Frequency	Measured Frequency	Tolerance	Specification
(Vdc)	(MHz)	(MHz)	(ppm)	(ppm)
55.2 (115%)	865.61250	865.612445	0.06	1
52.8 (110%)	865.61250	865.612445	0.06	1
50.4 (105%)	865.61250	865.612445	0.06	1
48 (100%)	865.61250	865.612445	0.06	1
45.6 (95%)	865.61250	865.612445	0.06	1
43.2 (90%)	865.61250	865.612445	0.06	1
40.8 (85%)	865.61250	865.612445	0.06	1





Revision 10/1/03

Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:
Low
Mid
High

Operating Modes Investigated:

Modulated Carrier

Data Rates Investigated:

Maximum

Output Power Setting(s) Investigated:

Maximum

Power Input Settings Investigated:

48 Vdc (nominal)

Software\Firmware Applied During Test					
Exercise software Standard Production Software Version N/A					
Description					
The system was tested using standard operating production software to exercise the functions of the					
device during the testing.					

EUT and Peripherals					
Description	Manufacturer	Model/Part Number	Serial Number		
iDEN Radio Base Station	Radioframe Networks, Inc.	MC Series System	Engineering Production Unit		
Power Supply	HP	6038A	LE44B		

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Leads	No	3.0	No	iDEN Radio Base Station	Power Supply

Occupied Bandwidth

Revision 10/1/03

Measurement Equipment							
Description	Manufacturer	Model	Identifier	Last Cal	Interval		
Spectrum Analyzer	Tektronix	2784	AAO	01/02/2005	12 mo		
30 dB Dual Directional Coupler	Narda	3282B-30	0230	NCR	NA		
50 ohm, 100W load	RES-NET	RFT100NFE	None	NCR	NA		

Test Description

Requirement: Per 47 CFR 90.691, "The emission limits are as follows: (1) For any frequency removed from the EA licensee's frequency block by up to and including 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 116 Log₁₀(f/6.1) decibels or 50 + 10 Log₁₀(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 12.5 kHz. (2) For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz."

FCC Interpretation Regarding Emission Mask and 90.691

----Original Message----

From: Andrew Leimer [mailto:ALEIMER@fcc.gov] Sent: Wednesday, May 14, 2003

12:21 PM

To: rwacs@att.net

Subject: Re: Part 90 rules

Hello Dean,

How are you doing? I have not heard from you in a while! The following explanation is from the archives. The basic question was if emissions mask g would ever be used. I hope it answers your question:

I found that footnote 3 was added to Section 90.210 as a result of the First R&O, Eighth R&O and 2nd FNPRM in PR Docket 93-144 (FCC 95-501), adopted 12/15/95. Footnote 3 initially said "Equipment in this band licensed to EA systems shall comply with the emission mask provisions of Section 90.691." Note here that this R&O dealt principally with the upper 200 MHz SMR channels which were auctioned in contiguous segments/blocks. Consequently, providing more flexibility in the emission mask that required protection of the "outer" channels in those blocks and to any interior channels in those blocks used by incumbents made sense.

When the Commission subsequently dealt with auctioning the lower 80 channels (non-contiguous channels in each block) and the General Category channels (contiguously allocated channels by block for auction purposes but originally allocated on a single channel basis for site-specific licensing purposes), the

consideration of emission mask caused footnote 3 to be modified as it exists today. Specifically, the Second R&O in PR Docket 93-144 (FCC 97-223), adopted

Occupied Bandwidth

Revision 10/1/03

6/23/97 @ para 80 reasons that applying the same emission mask standards to the lower 230 channels (lower 80 channels and 150 General Category channels) as to the upper 200 channels facilitates the use of common equipment and the combining of all such channels. It further states that Section 90.691 (the emission mask) would apply to "outer" channels used by a licensee "that create

out-of-band emissions that affect another licensee". The MO&O on reconsideration of the 800 MHz 1st R&O (FCC 97-224, adopted 6/23/97) at para 76 agreed with Erricson's recommendation to expand the emission mask provision

of Section 90.691 to "non-EA 800 MHz Part 90 CMRS systems". The decision was based ostensibly on extending the flexibility of the 90.691 emission mask to incumbent licensees (non-EA licensees or non-auction winners) and to those non-SMR channels used by CMRS operators. The paragraph closes by stating that

neither Ericsson or Motorola believe that such relaxation will increase the amount of interference to adjacent channel licensees.

You'll note that there is some similarity between emission mask G (applicable to equipment without audio low pass filters) under Section 90.210 and the emission mask required by Section 90.691. It is my interpretation that footnote 3 under Section 90.210 (the applicability of the emission mask under Section 90.691) was intended principally for Part 90 CMRS systems in the 800 MHz band to provide flexbility and consistency to those operators. As Section

90.210 is written, however, I don't see how we could legally prevent any 800 MHz licensee from using the more flexibile emission mask under Section 90.691.

Bottom line: As the rule is written, it is possible that the "G" mask would never be used by 800 MHz licensees.

>>> Dean Busch 05/14/03 01:22PM >>> Andy;

I hope you can help me with this or at least point me in the right direction.

I have a client that has an EA based radio system that is currently using licensed transmitters with an output of 100mW in the 851 - 866 MHz range. The system is approved under 90.691. If the manufacturer raises the power level to 5 watts per channel output will they need to meet the emissions mask of 90.210 (g) or do they still fall under 90.691.

Thanks

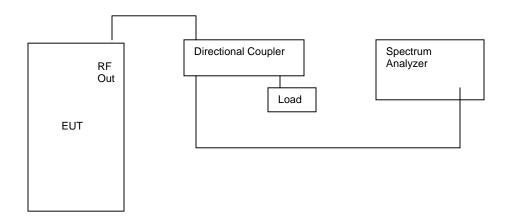
Dean Busch
Radiowave Compliance Services, Inc.

Configuration: The peak measurement was made using a directional coupler between the RF output of the EUT and a spectrum analyzer. The occupied bandwidth / emission mask was measured with the EUT set to low, medium, and high transmit frequencies. At each channel, measurements were made at the highest output settings. The output power is varied by changing the TX Attenuator setting on the EUT's amplifier to the following settings: High Power 11 db, Mid power 29 dB, and Low Power 49 dB.

See emission mask table below. It was concluded that testing at lower power levels was unnecessary since the general limit is -13 dBm. Clearly the high power configuration is worse case.

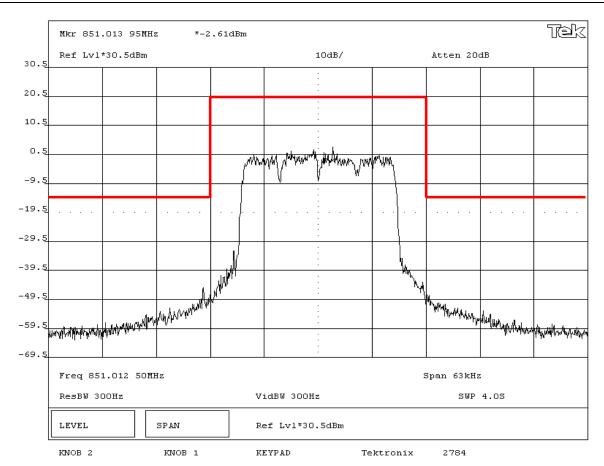
Channel	Output Power	Power (P)	In-band	In-band Attenuation		
	(dBm)	Watts	(0	dBc)		(dBc)
			50 + (10*log P)			
Low	20.49	1.12E-01	40.49	36.14	80	33.49
	0.14	1.03E-03	20.14	36.14	80	13.14
	-19.96	1.01E-05	0.04	36.14	80	-6.96
Mid	22.2	1.66E-01	42.2	36.14	80	35.2
	3.05	2.02E-03	23.05	36.14	80	16.05
	-18.3	1.48E-05	1.7	36.14	80	-5.3
High	20.65	1.16E-01	40.65	36.14	80	33.65
	0.85	1.22E-03	20.85	36.14	80	13.85
	-19.15	1.22E-05	0.85	36.14	80	-6.15

Test Setup Diagram

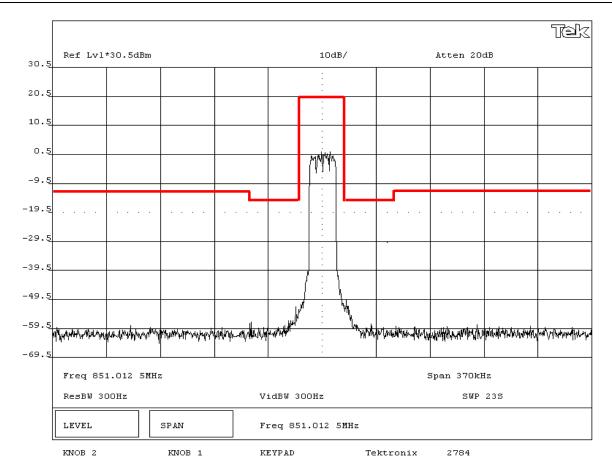


Completed by:

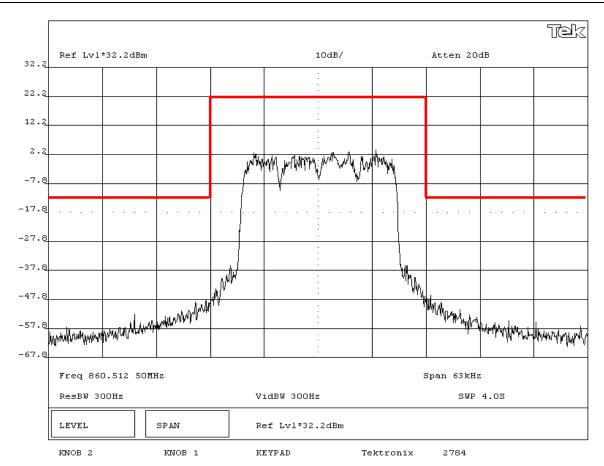
NORTHWEST		EMICOICNIC	DATA OLU			
EMC		EMISSIONS	DATA SH	EEI		Rev BETA 01/30/01
	MC Series System				Work Order:	RAFN0040
Serial Number:	Engineering Production Unit #1				Date:	08/03/04
Customer:	Radioframe Networks, Inc.				Temperature:	73 F
Attendees:	Jeff Franck		Tested by:	Greg Kiemel	Humidity:	41%
Customer Ref. No.:	N/A		Power:	48 Vdc	Job Site:	Off-site
TEST SPECIFICATION	IS					
Specification:	47 CFR 90.691	Year: Most Current	Method:	TIA / EIA - 603	Year:	Most Current
SAMPLE CALCULATION	ONS					
COMMENTS						
EUT OPERATING MOD	DES					
Modulated by 16 QAM						
DEVIATIONS FROM TI	EST STANDARD					
None						
REQUIREMENTS						
Maximum level of any	spurious emission must be attena	uted below the specified emission	n mask. 0 dB reference	is 20.49 dBm		
RESULTS			AMPLITUDE			
Pass						
SIGNATURE						
Tested By:	ADU.K.P					
DESCRIPTION OF TES						
E	mission Mask for E	A-based Systems:	Lowest Chani	nel @ Highe	st Output Pow	er



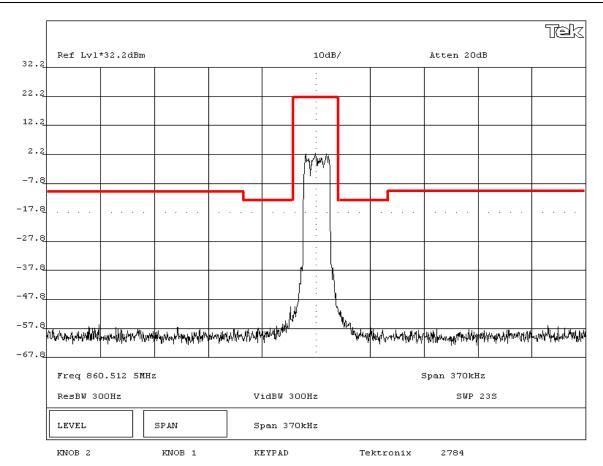
NORTHWEST		EMISSIONS	DATA SH	FFT		Rev BETA
EMC		Livilocioido	DAIA OII			01/30/01
EUT:	MC Series System				Work Order:	RAFN0040
	Engineering Production Unit #1					08/03/04
Customer:	Radioframe Networks, Inc.				Temperature:	73 F
Attendees:	Jeff Franck		Tested by:	Greg Kiemel	Humidity:	41%
Customer Ref. No.:			Power:	48 Vdc	Job Site:	Off-site
TEST SPECIFICATION	IS					
Specification:	47 CFR 90.691	Year: Most Current	Method:	TIA / EIA - 603	Year:	Most Current
SAMPLE CALCULATION	ONS					
COMMENTS						
COMMENTS						
EUT OPERATING MOI	DES					
Modulated by 16 QAM						
DEVIATIONS FROM T						
None						
REQUIREMENTS						
Maximum level of any	spurious emission must be attena	auted below the specified emission	on mask. 0 dB reference	is 20.49 dBm		
RESULTS			AMPLITUDE			
Pass						
SIGNATURE						
Tested By:	ADU.K.P					
DESCRIPTION OF TES						
E	mission Mask for E	A-based Systems:	Lowest Chan	nel @ Highe	st Output Pow	er er



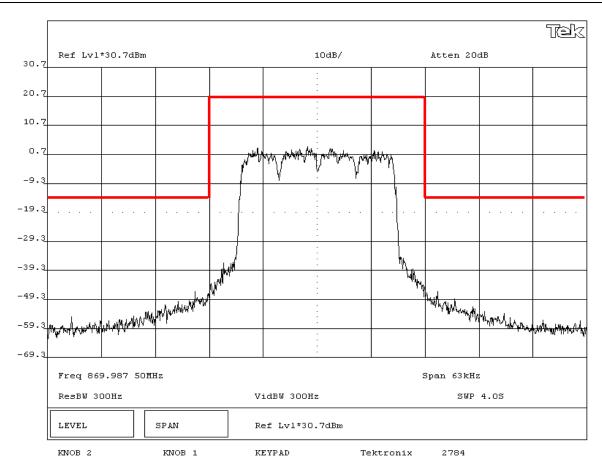
NORTHWEST		EMISSIONS	DATA SH	FET		Rev BETA
EMC		Limitotione				01/30/01
	MC Series System				Work Order:	
	Engineering Production Unit #1					08/03/04
Customer:	Radioframe Networks, Inc.				Temperature:	73 F
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Customer Ref. No.:	N/A		Power:	48 Vdc	Job Site:	Off-site
TEST SPECIFICATION	IS					
Specification:	47 CFR 90.691	Year: Most Current	Method:	TIA / EIA - 603	Year:	Most Current
SAMPLE CALCULATION	ONS					
COMMENTS						
FUT ORFRATING MO	252					
EUT OPERATING MOI Modulated by 16 QAM						
DEVIATIONS FROM T						
None	EST STANDARD					
REQUIREMENTS						
	spurious emission must be attend	auted helow the specified emission	on mask 0 dB reference	is 22 20 dRm		
RESULTS	opanious simosion must be attend	autou zoien ine opeemeu emiee.	AMPLITUDE	, 10 12120 GB.III		
Pass			7 2.1.052			
SIGNATURE						
Tested By:	ADU.K.P					
DESCRIPTION OF TES	ST					
E	Emission Mask for E	A-based Systems:	Middle Chani	nel @ Highe	st Output Pow	er



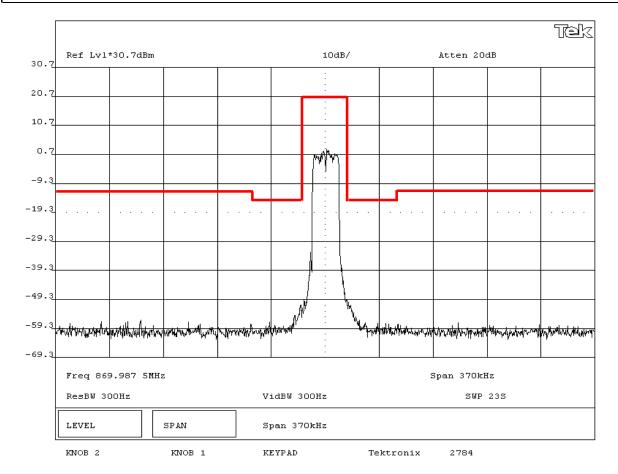
NORTHWEST		EMISSIONS	DATA SH	EET		Rev BETA
EMC		Livilogione	DAIA OII			01/30/01
	MC Series System				Work Order:	
	Engineering Production Unit #1					08/03/04
Customer:	Radioframe Networks, Inc.				Temperature:	73 F
Attendees:	Jeff Franck		Tested by:	Greg Kiemel	Humidity:	41%
Customer Ref. No.:	N/A		Power:	48 Vdc	Job Site:	Off-site
TEST SPECIFICATION	IS					
Specification:	47 CFR 90.691	Year: Most Current	Method:	TIA / EIA - 603	Year:	Most Current
SAMPLE CALCULATION	ONS					
COMMENTS						
EUT OPERATING MOI						
Modulated by 16 QAM						
DEVIATIONS FROM T	EST STANDARD					
None						
REQUIREMENTS		utad balaw the amazified amiani		i- 00 0 dD		
	spurious emission must be attena	luted below the specified emission		IS 22.2 dBm		
RESULTS			AMPLITUDE			
Pass SIGNATURE						
Tested By:	ADU.K.P					
DESCRIPTION OF TES						
E	Emission Mask for E	A-based Systems:	Middle Chani	nel @ Highe	st Output Pow	er

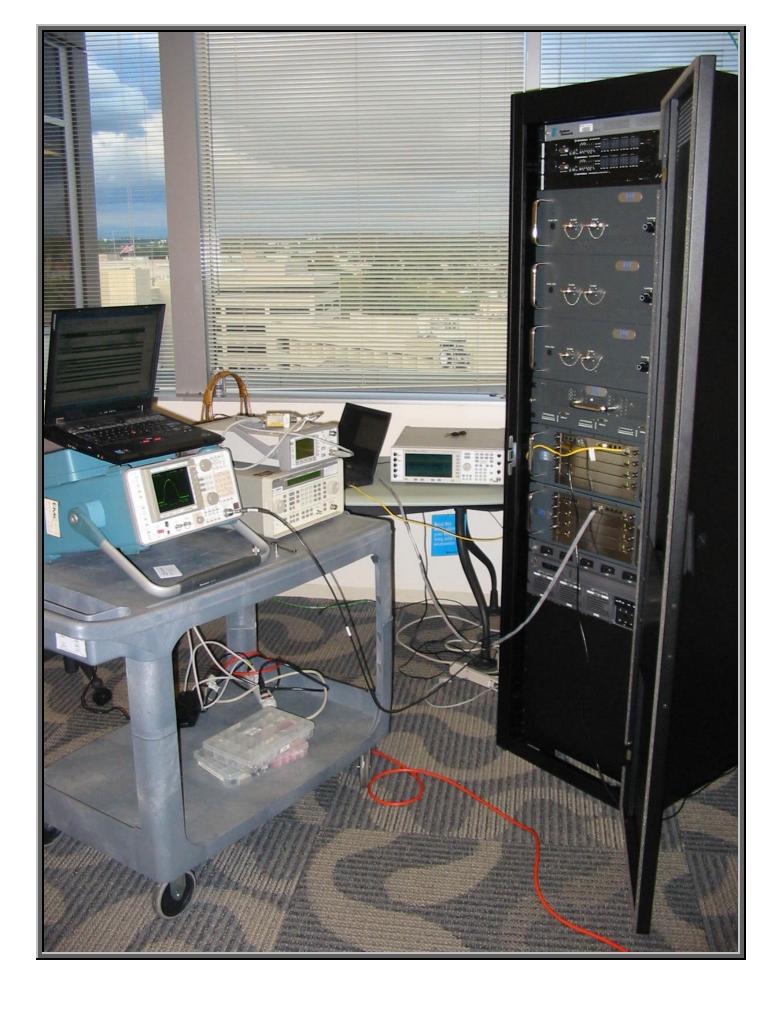


NORTHWEST		EMICOICNIC	DATA OLU			
EMC		EMISSIONS	DATA SH	EEI		Rev BETA 01/30/01
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Specification:	47 CFR 90.691	Year: Most Current	Method:	TIA / EIA - 603	Year:	Most Current
SAMPLE CALCULATION	ONS					
COMMENTS						
EUT OPERATING MOD	DES					
Modulated by 16 QAM						
DEVIATIONS FROM TI	EST STANDARD					
None						
REQUIREMENTS						
Maximum level of any	spurious emission must be attena	uted below the specified emissic	n mask. 0 dB reference	is 20.65 dBm		
RESULTS			AMPLITUDE			
Pass						
SIGNATURE						
Tested By:	ADU.K.P					
DESCRIPTION OF TES						
E	mission Mask for E	A-based Systems:	Highest Chan	nel @ Highe	st Output Pow	/er



EMISSIONS DATA SHEET						
EMC		EMISSIONS	DATA SHEE	: 1		Rev BETA 01/30/01
	MC Series System				Work Order:	RAFN0040
Serial Number:	Engineering Production Unit #1				Date:	08/03/04
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Customer Ref. No.:	N/A		Power: 48 Vo	dc	Job Site:	Off-site
TEST SPECIFICATION	NS					
Specification:	47 CFR 90.691	Year: Most Current	Method: TIA /	EIA - 603	Year:	Most Current
SAMPLE CALCULATI	ONS					
COMMENTS						
EUT OPERATING MO						
Modulated by 16 QAN						
DEVIATIONS FROM T	EST STANDARD					
None						
REQUIREMENTS						
	spurious emission must be attena	uted below the specified emissi		i.65 dBm		
RESULTS			AMPLITUDE			
Pass						
SIGNATURE						
Tested By						
DESCRIPTION OF TE		·	<u>"</u>			
E	Emission Mask for E	A-based Systems:	Highest Channel	@ Highest C	Dutput Pow	er er







Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:	
Low	
Mid	
High	

Operating Modes Investigated:

Modulated Carrier

Data Rates Investigated:

Maximum

Output Power Setting(s) Investigated:
Low
Mid
High

Power Input Settings Investigated:

48 Vdc (nominal)

Software\Firmware Applied During Test						
Exercise software Standard Production Software		Version	N/A			
Description						
The system was tested using standard operating production software to exercise the functions of the device during the testing.						

EUT and Peripherals							
Description	Manufacturer	Model/Part Number	Serial Number				
iDEN Radio Base	Radioframe Networks,	MC Series System	Engineering Production				
Station	Inc.	Mic Selles System	Unit				
Power Supply	HP	6038A	LE44B				

Cables						
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2	
DC Leads	none	3.0	none	iDEN Radio Base Station	Power Supply	
PA = Cable is permanently attached to the device. Shielding and/or presence of ferrite may be unknown.						



Output Power

Measurement Equipment							
Description	Manufacturer	Model	Identifier	Last Cal	Interval		
Spectrum Analyzer	Tektronix	2784	AAO	01/02/2005	12 mo		
Power Meter	Hewlett Packard	E4418A	SPA	07/23/2004	24 mo		
Power Sensor	Hewlett-Packard	8481H	SPB	07/23/2004	24 mo		
Signal Generator	Hewlett-Packard	8648A	TGB	03/16/2004	13 mo		
30 dB Dual Directional Coupler	Narda	3282B-30	0230	NCR	NA		
50 ohm, 100W load	RES-NET	RFT100NFE	None	NCR	NA		

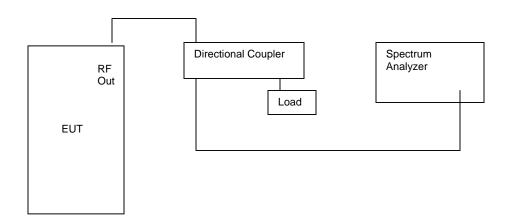
Test Description

Requirement: Per 47 CFR 2.1046 and 90.217, the conducted power output was measured at the RF output terminals after the tune-up procedure.

Configuration: The peak measurement was made using a directional coupler between the RF output of the EUT and a spectrum analyzer. Prior to making the measurement, the test setup (including directional coupler, RF load, spectrum analyzer and coaxial cable) was calibrated using a the power meter and signal source.

The peak output power was measured with the EUT set to low, medium, and high transmit frequencies. The lowest output power, the middle output power, and the highest output power was measured at each channel. The output power was varied by changing the TX Attenuator setting on the EUT's amplifier to the following settings: High Power 11 db, Mid power 29 dB, and Low Power 49 dB. Did not test total power in the band with all 20 blades transmitting or with 8 blades per sector. Rather, it was confirmed that the output power per channel is level across the band (+/- 1.5 dB). Therefore, for MPE estimates, a simple summation of the power in each channel will be sufficient.

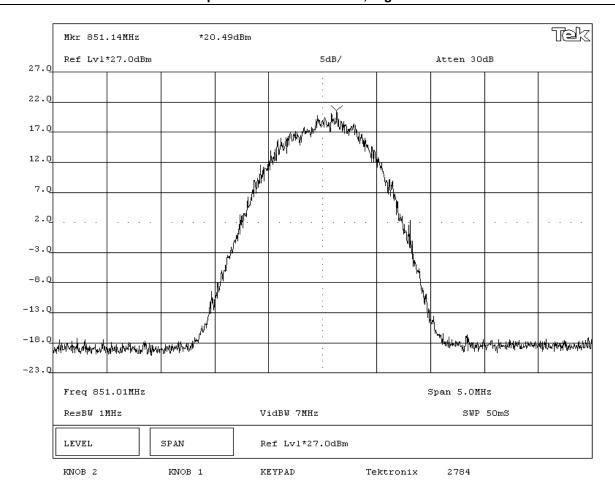
Test Setup Diagram



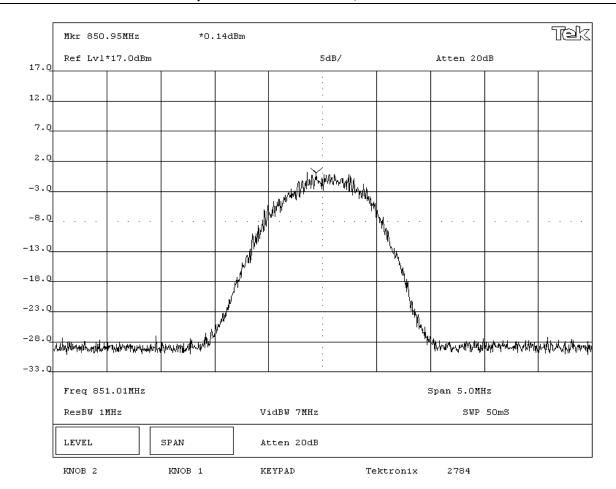
Completed by:

U.K.P

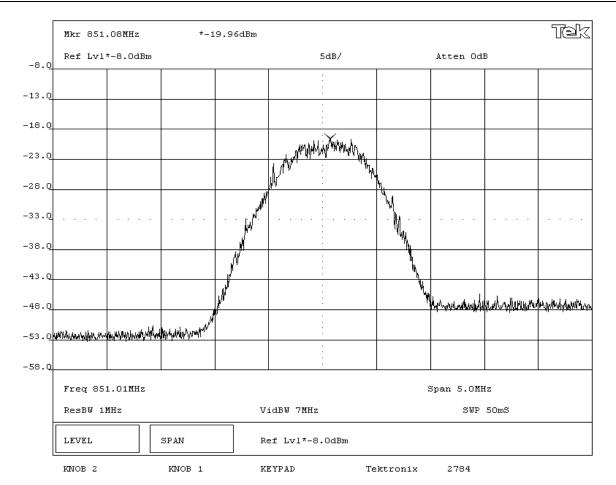
REQUIREMENTS RESULTS AMPLITUDE Pass 20.49 dBm SIGNATURE Tested By: DESCRIPTION OF TEST	EMC EMISSIONS DATA SHEET Rev BETA 01/3001							
Customer: Radioframe Networks, Inc. Attendees: Jeff Franck Customer Ref. No.: N/A Tested by: Greg Kiemel Humidity: 41% Customer Ref. No.: N/A Power: -48 Vdc Job Site: Off-site TEST SPECIFICATIONS Specification: 47 CFR 2.1046 & 90.217 Year: Most Current Method: TIA/EIA-603 Year: Most Current SAMPLE CALCULATIONS COMMENTS Tested in System configuration EUT OPERATING MODES With modulation DEVIATIONS FROM TEST STANDARD None REGUIREMENTS RESULTS AMPLITUDE Pass 20.49 dBm DESCRIPTION OF TEST				·	Work Order:	RAFN0040		
Attendees: Jeff Franck Customer Ref. No.; N/A Power: 48 Vdc Job Site: Off-site TEST SPECIFICATIONS Specification: 47 CFR 2.1046 & 90.217 Year: Most Current Method: TIA/EIA-603 Year: Most Current SAMPLE CALCULATIONS COMMENTS Tested in System configuration EUT OPERATING MODES With modulation DEVIATIONS FROM TEST STANDARD None REGUIREMENTS RESULTS AMPLITUDE Pass JOB SITE STANDARD DESCRIPTION OF TEST	Serial Number: Engineering Production Unit #1	<u> </u>			Date:	08/03/04		
CUSTOMER REF. No.: N/A TEST SPECIFICATIONS Specification: 47 CFR 2.1046 & 90.217 Year: Most Current Method: TIA/EIA-603 Year: Most Current SAMPLE CALCULATIONS COMMENTS Tested in System configuration EUT OPERATING MODES With modulation DEVIATIONS FROM TEST STANDARD None REQUIREMENTS RESULTS AMPLITUDE Pass 20.49 dBm DESCRIPTION OF TEST	Customer: Radioframe Networks, Inc.				Temperature:	73 F		
TEST SPECIFICATIONS Specification: A7 CFR 2.1046 & 90.217 Year: Most Current Method: TIA/EIA-603 Year: Most Current SAMPLE CALCULATIONS COMMENTS Tested in System configuration EUT OPERATING MODES With modulation DEVIATIONS FROM TEST STANDARD None REQUIREMENTS RESULTS AMPLITUDE Pass 20.49 dBm DESCRIPTION OF TEST	Attendees: Jeff Franck		Tested by:	Greg Kiemel	Humidity:	41%		
Specification: 47 CFR 2.1046 & 90.217 Year: Most Current Method: TIA/EIA-603 Year: Most Current SAMPLE CALCULATIONS COMMENTS Tested in System configuration EUT OPERATING MODES With modulation DEVIATIONS FROM TEST STANDARD None REQUIREMENTS RESULTS AMPLITUDE Pass 20.49 dBm DESCRIPTION OF TEST	Customer Ref. No.: N/A	<u> </u>	Power:	-48 Vdc	Job Site:	Off-site		
SAMPLE CALCULATIONS COMMENTS Tested in System configuration EUT OPERATING MODES With modulation DEVIATIONS FROM TEST STANDARD None REQUIREMENTS RESULTS AMPLITUDE Pass 20.49 dBm SIGNATURE DESCRIPTION OF TEST	TEST SPECIFICATIONS							
COMMENTS Tested in System configuration EUT OPERATING MODES With modulation DEVIATIONS FROM TEST STANDARD None REQUIREMENTS RESULTS AMPLITUDE Pass 20.49 dBm SIGNATURE DESCRIPTION OF TEST	Specification: 47 CFR 2.1046 & 90.217	Year: Most Current	Method:	TIA/EIA-603	Year:	Most Current		
Tested in System configuration EUT OPERATING MODES With modulation DEVIATIONS FROM TEST STANDARD None REQUIREMENTS RESULTS AMPLITUDE Pass 20.49 dBm SIGNATURE DESCRIPTION OF TEST	SAMPLE CALCULATIONS							
Pass 20.49 dBm SIGNATURE Tested By: DESCRIPTION OF TEST	Tested in System configuration EUT OPERATING MODES With modulation DEVIATIONS FROM TEST STANDARD None							
Tested By: DESCRIPTION OF TEST	RESULTS		AMPLITUDE					
Tested By:	Pass	ass 20.49 dBm						
Tested By: DESCRIPTION OF TEST								
	Tested By:							
	Output Power - Low Channel, High Power							



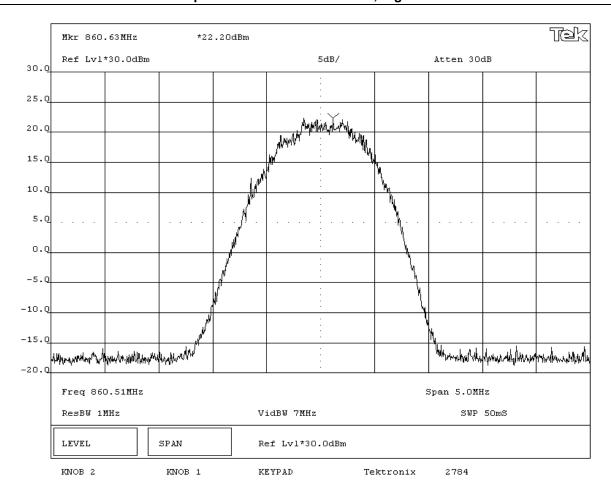
NORTHWEST EMC								
	MC Series System		Work Order:	RAFN0040				
Serial Number:	Serial Number: Engineering Production Unit #1					08/03/04		
Customer:	mer: Radioframe Networks, Inc.					73 F		
Attendees:	Jeff Franck		Tested by:	Greg Kiemel	Humidity:	41%		
Customer Ref. No.:	N/A		Power:	-48 Vdc	Job Site:	Off-site		
TEST SPECIFICATION	IS							
Specification:	47 CFR 2.1046 & 90.217	Year: Most Current	Method:	TIA/EIA-603	Year:	Most Current		
SAMPLE CALCULATION	ONS							
COMMENTS Tested in System conf	<u> </u>							
With modulation								
DEVIATIONS FROM TO None	EST STANDARD							
REQUIREMENTS								
REGUIREMENTS								
RESULTS			AMPLITUDE					
Pass			0.14 dBm					
SIGNATURE								
Tested By:	Tested By:							
DESCRIPTION OF TES	DESCRIPTION OF TEST							
	Output Power - Low Channel, Medium Power							



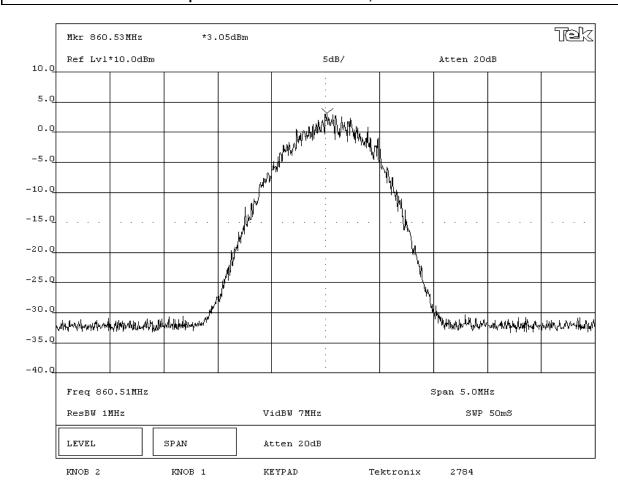
EMC EMISSIONS DATA SHEET Rev BETT 01/30/01						
EUT: MC Series System				Work Order:	RAFN0040	
Serial Number: Engineering Production Unit #1				Date:	08/03/04	
Customer: Radioframe Networks, Inc.				Temperature:	73 F	
Attendees: Jeff Franck		Tested by:	Greg Kiemel	Humidity:	41%	
Customer Ref. No.: N/A		Power:	-48 Vdc	Job Site:	Off-site	
TEST SPECIFICATIONS						
Specification: 47 CFR 2.1046 & 90.217	Year: Most Current	Method:	TIA/EIA-603	Year:	Most Current	
SAMPLE CALCULATIONS						
COMMENTS						
Tested in System configuration						
EUT OPERATING MODES With modulation						
DEVIATIONS FROM TEST STANDARD None						
REQUIREMENTS						
REQUIREMENTS						
RESULTS		AMPLITUDE				
Pass		-19.96 dBm				
SIGNATURE		10.000				
Tested By:						
DESCRIPTION OF TEST						
Output Power - Low Channel, Low Power						



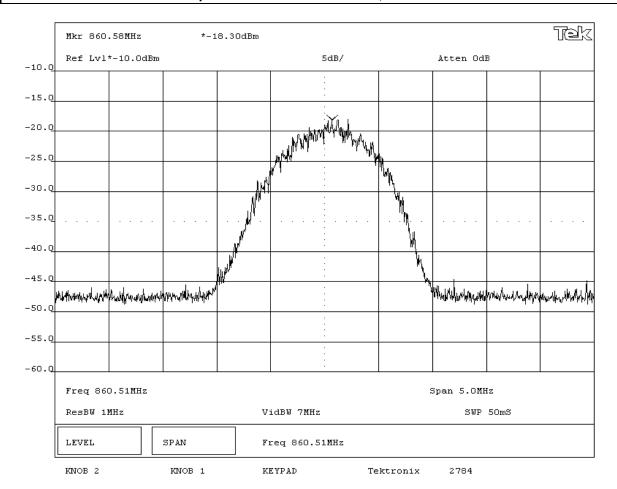
EMISSIONS DATA SHEET								
EUT:	MC Series System	MC Series System						
Serial Number:	Engineering Production Unit #1				Date:	08/03/04		
Customer:	Radioframe Networks, Inc.			-	Temperature:	73 F		
Attendees:	Jeff Franck		Tested by:	Greg Kiemel	Humidity:	41%		
Customer Ref. No.:	N/A		Power:	-48 Vdc	Job Site:	Off-site		
TEST SPECIFICATION	IS							
Specification:	47 CFR 2.1046 & 90.217	Year: Most Current	Method:	TIA/EIA-603	Year:	Most Current		
SAMPLE CALCULATION	ONS							
EUT OPERATING MOI With modulation DEVIATIONS FROM T	Tested in System configuration EUT OPERATING MODES							
None								
REQUIREMENTS								
RESULTS			AMPLITUDE					
Pass	Pass 22.20 dBm							
SIGNATURE	SIGNATURE							
Tested By:								
DESCRIPTION OF TES		not Danier Mc "	. Observat	inh Dames				
	Output Power - Medium Channel, High Power							



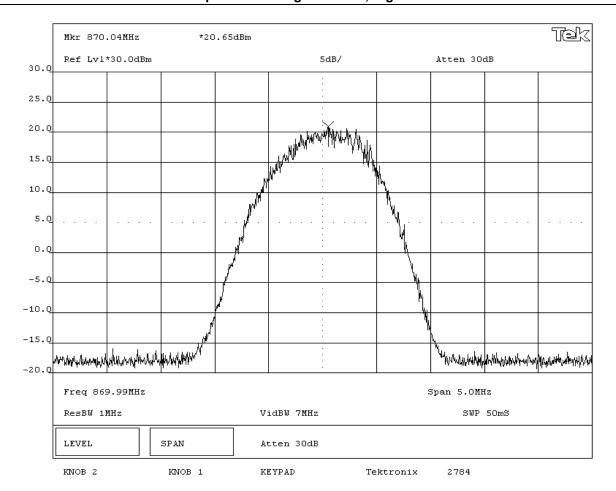
EMC EMISSIONS DATA SHEET								
EUT:	MC Series System				Work Order:			
Serial Number:	Engineering Production Unit #1				Date:	08/03/04		
Customer:	Radioframe Networks, Inc.				Temperature:	73 F		
Attendees:	Jeff Franck		Tested by:	Greg Kiemel	Humidity:	41%		
Customer Ref. No.:	N/A	-	Power:	-48 Vdc	Job Site:	Off-site		
TEST SPECIFICATION	S							
Specification:	47 CFR 2.1046 & 90.217	Year: Most Current	Method:	TIA/EIA-603	Year:	Most Current		
COMMENTS Tested in System conf EUT OPERATING MOD With modulation DEVIATIONS FROM TO None REQUIREMENTS	DES							
RESULTS			AMPLITUDE					
Pass			3.05 dBm					
Tested By:								
Output Power - Medium Channel, Medium Power								



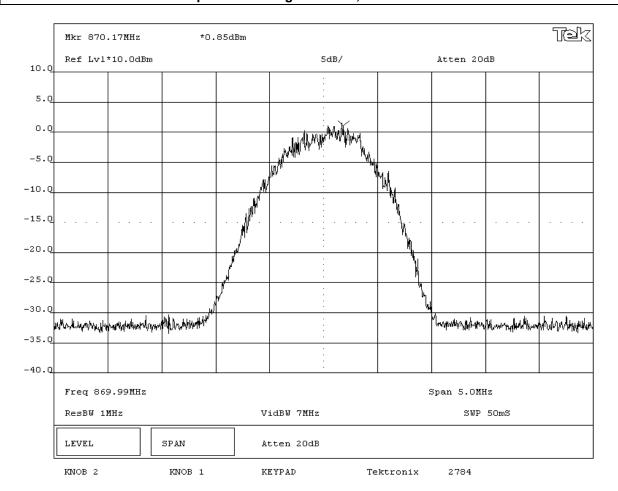
NORTHWEST EMC	EMICOLONIO DATA CHEET							
	MC Series System		Work Order:					
	Engineering Production Unit #1					08/03/04		
	Radioframe Networks, Inc.				Temperature:	73 F		
Attendees:	Jeff Franck		Tested by:	Greg Kiemel	Humidity:			
Customer Ref. No.:	N/A		Power:	-48 Vdc	Job Site:	Off-site		
TEST SPECIFICATION	s							
Specification:	47 CFR 2.1046 & 90.217 Yea	r: Most Current	Method:	TIA/EIA-603	Year:	Most Current		
SAMPLE CALCULATION	ONS							
COMMENTS	!							
Tested in System con								
EUT OPERATING MOI With modulation	DES							
DEVIATIONS FROM T	TOT CTANDARD							
None	EST STANDARD							
REQUIREMENTS								
REGUIREMENTS								
RESULTS			AMPLITUDE					
Pass			-18.30 dBm					
SIGNATURE			. 0.00 42					
Tested By:								
DESCRIPTION OF TES	DESCRIPTION OF TEST							
Output Power - Medium Channel, Low Power								



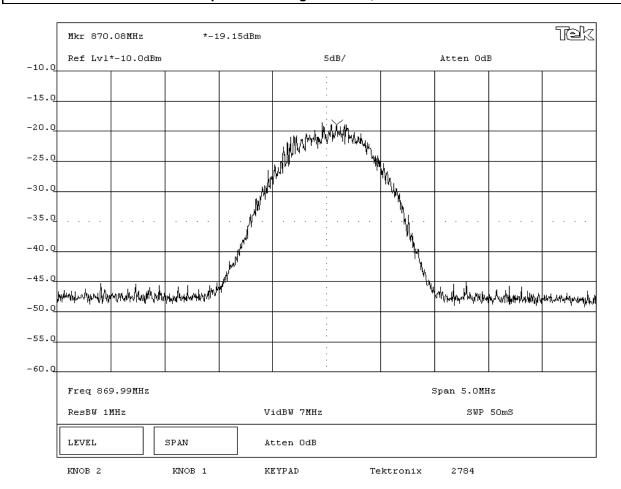
NORTHWEST	EMISSIONS I	DATA SH	EET		Rev BETA 01/30/01	
EUT: MC Series System			·	Work Order:	RAFN0040	
Serial Number: Engineering Production U	nit #1			Date:	08/03/04	
Customer: Radioframe Networks, Inc.				Temperature:	73 F	
Attendees: Jeff Franck		Tested by:	Greg Kiemel	Humidity:	41%	
Customer Ref. No.: N/A		Power:	-48 Vdc	Job Site:	Off-site	
TEST SPECIFICATIONS						
Specification: 47 CFR 2.1046 & 90.217	Year: Most Current	Method:	TIA/EIA-603	Year:	Most Current	
SAMPLE CALCULATIONS						
COMMENTS Tested in System configuration EUT OPERATING MODES With modulation DEVIATIONS FROM TEST STANDARD None REQUIREMENTS						
RESULTS		AMPLITUDE				
Pass	20.65 dBm					
SIGNATURE						
Tested By:) 					
DESCRIPTION OF TEST	O to the second second	01				
Output Power - High Channel, High Power						

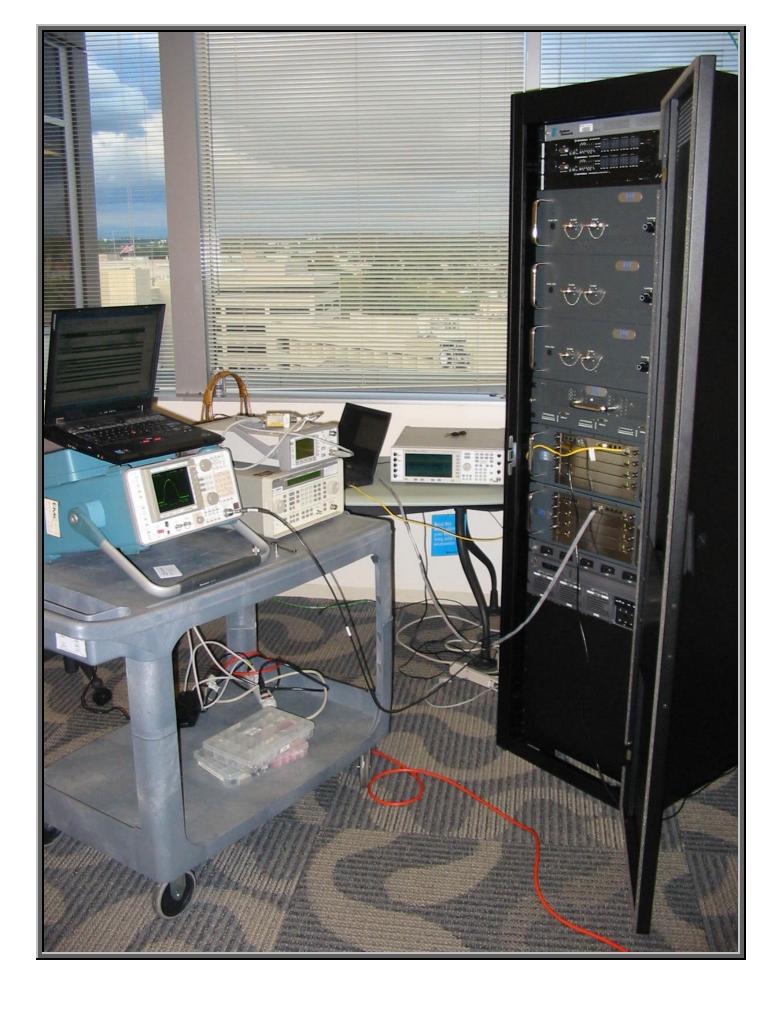


NORTHWEST EMC		EMISSIONS I	DATA SH	EET		Rev BETA 01/30/01
	MC Series System				Work Order:	RAFN0040
Serial Number:	Engineering Production Unit #1				Date:	08/03/04
Customer:	Radioframe Networks, Inc.	•			Temperature:	73 F
Attendees:	Jeff Franck		Tested by:	Greg Kiemel	Humidity:	41%
Customer Ref. No.:	N/A	•	Power:	-48 Vdc	Job Site:	Off-site
TEST SPECIFICATION	s					
Specification:	47 CFR 2.1046 & 90.217	Year: Most Current	Method:	TIA/EIA-603	Year:	Most Current
SAMPLE CALCULATION	ONS					
COMMENTS Tested in System conf EUT OPERATING MOD With modulation DEVIATIONS FROM TE None REQUIREMENTS	DES					
RESULTS			AMPLITUDE			
Pass	ss 0.85 dBm					
SIGNATURE Tested By:	ADU.KIP					
DESCRIPTION OF TES	řΤ					
Output Power - High Channel, Medium Power						



EMISSIONS DATA SHEET						
EUT:	MC Series System				Work Order:	RAFN0040
Serial Number:	Engineering Production Unit #1				Date:	08/03/04
Customer:	Radioframe Networks, Inc.				Temperature:	73 F
Attendees:	Jeff Franck		Tested by:	Greg Kiemel	Humidity:	41%
Customer Ref. No.:	N/A		Power:	-48 Vdc	Job Site:	Off-site
TEST SPECIFICATION	S					
Specification:	47 CFR 2.1046 & 90.217	Year: Most Current	Method:	TIA/EIA-603	Year:	Most Current
SAMPLE CALCULATION	ONS					
COMMENTS Tested in System conf	<u> </u>					
With modulation						
DEVIATIONS FROM TE	EST STANDARD					
None						
REQUIREMENTS						
RESULTS			AMPLITUDE			
Pass	-19.15 dBm					
SIGNATURE						
Tested By:	ATU.K.P					
DESCRIPTION OF TES	ST					
Output Power - High Channel, Low Power						





Spurious Conducted Emissions

Revision 10/1/03

Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:
Low
Mid
High
3 Signal
8 Signal
20 Signal
Operating Modes Investigated:
Modulated Carrier
Data Rates Investigated:
Maximum
Output Power Setting(s) Investigated:
Lowest
Middle
Maximum
Power Input Settings Investigated:
48 Vdc (nominal)

Frequency Range Invest	gated		
Start Frequency	0 MHz	Stop Frequency	9 GHz

Software\Firmware Applied During Test						
Exercise software	Standard Production	Version	N/A			
Exercise software	Software		IN/A			
Description						
The system was tested using standard operating production software to exercise the functions of the						
device during the testing.						

Spurious Conducted Emissions

Revision 10/1/03

EUT and Peripherals							
Description	Manufacturer	Model/Part Number	Serial Number				
iDEN Radio Base	Radioframe Networks,	MC Series System	Engineering Production				
Station	Inc.	IVIC Series System	Unit #1				
Power Supply	HP	6038A	LE44B				

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
DC Leads	No	3.0	No	iDEN Radio Base Station	Power Supply

Measurement Equipment							
Description	Manufacturer	Model	Identifier	Last Cal	Interval		
Spectrum Analyzer	Tektronix	2784	AAO	01/02/2005	12 mo		
30 dB Dual Directional Coupler	Narda	3282B-30	0230	NCR	NA		
50 ohm, 100W load	RES-NET	RFT100NFE	None	NCR	NA		

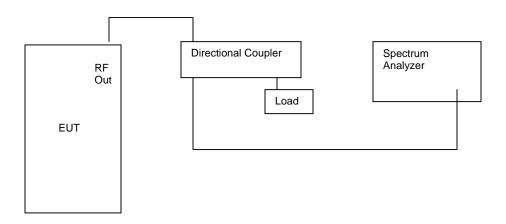
Test Description

Requirement: Per 47 CFR 90.691, "any emission appearing on a frequency 25 kHz or more removed from the assigned frequency must be attenuated at least 30 dB below the un-modulated carrier. For any frequency removed from the EA licensee's frequency block greater than 37.5 kHz, the power of any emission shall be attenuated below the transmitter power (P) in watts by at least 43 + 10Log10(P) decibels or 80 decibels, whichever is the lesser attenuation, where f is the frequency removed from the center of the outer channel in the block in kilohertz and where f is greater than 37.5 kHz." Per 47 CFR 2.1051, the spurious emissions were measured at the RF output terminals with analyzer plots made for each modulation type.

Configuration: The peak measurement was made using a directional coupler between the RF output of the EUT and a spectrum analyzer. The spurious conducted emissions were measured with the EUT set to low, medium, and high transmit frequencies. At each channel, measurements were made for the lowest output power, the middle output power, and the highest output settings. The output power was varied by changing the TX Attenuator setting on the EUT's amplifier to the following settings: High Power 11 db, Mid power 29 dB, and Low Power 49 dB.

The FCC's three tone test for intermodulations products was also performed. Per Publication number 670583 from the FCC's Knowledge Database (http://gullfoss2.fcc.gov/prod/oet/cf/kdb/), the IM test(s) is done with three signals of equal magnitude - at their highest rated output level - for each type of modulation. The signals are spaced so that two are near to each other at one edge of the pass band and the other signal is alone at the other edge of the pass band. This placement will potentially produce both in-band and out-of-band IM products. The three signal test was performed in exactly this way. At the maximum output power, both in-band and out-of-band measurements were made. The IM test was then repeated with 8 signals, and then again with 20 signals.

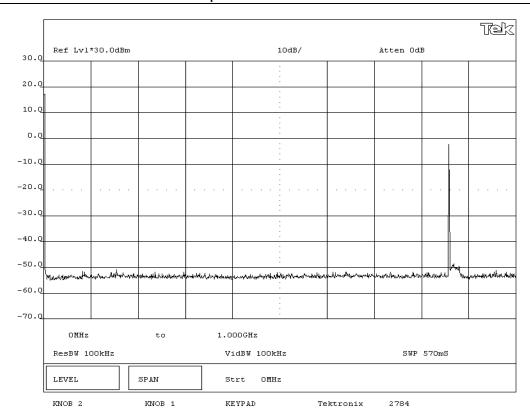
Test Setup Diagram



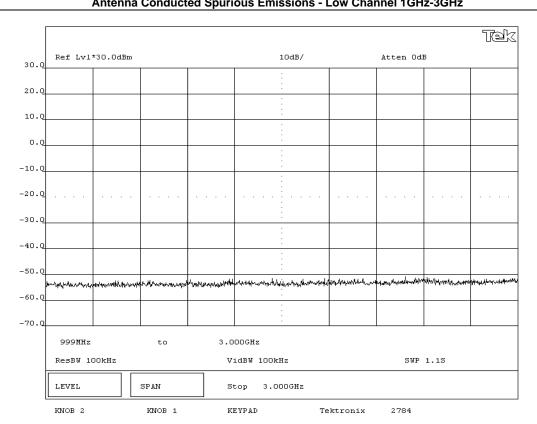
Completed by:

U.K.P

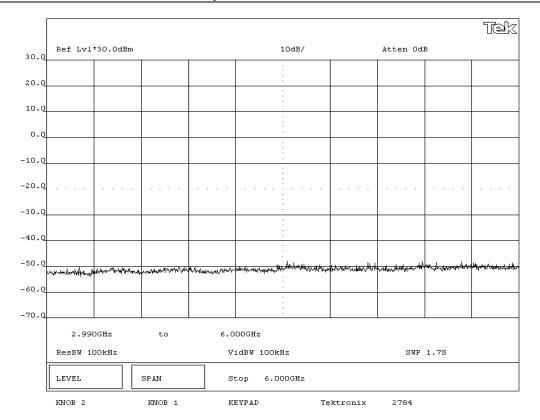
NORTHWEST	EMISSIONS	DATA SHEET		Rev BETA			
EMC	LIVIIOSIONS	DATA SHEET		01/30/01			
EUT: MC Series System			Work Order:	RAFN0040			
Serial Number: Engineering Production Unit #	1		Date:	08/03/04			
Customer: Radioframe Networks, Inc.			Temperature:	73 F			
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:	41%			
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	Off-site			
TEST SPECIFICATIONS							
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001			
SAMPLE CALCULATIONS							
COMMENTS							
Tested in System Configuration							
EUT OPERATING MODES							
With modulation at medium output power level (appro	ox. 0 dBm)						
DEVIATIONS FROM TEST STANDARD							
None							
REQUIREMENTS							
Maximum level of any spurious emission must be atte	enauted below the specified emission	mask.					
RESULTS							
Pass							
SIGNATURE							
_							
An U.K.P							
///]							
Tested By:							
DESCRIPTION OF TEST							
	dusted Countries For	inniana I am Channal Ol	ALI- 40LI-	<u>'</u>			
Antenna Con	lauctea Spurious Em	issions - Low Channel 0N	/IHZ-1GHZ				



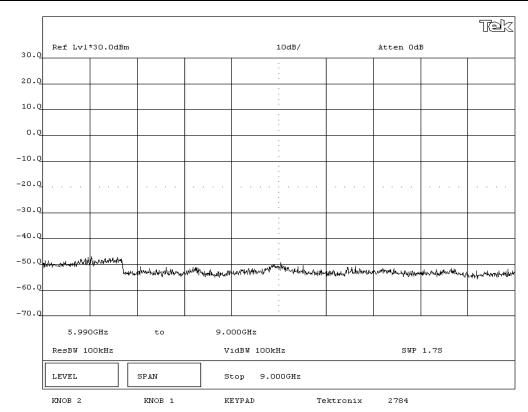
NORTHWEST EMC		EMISSIONS I	DATA SH	EET		Rev BETA 01/30/01
EUT: MC Ser	ries System				Work Order:	RAFN0040
Serial Number: Engine	ering Production Unit #1				Date:	08/03/04
Customer: Radiofr	rame Networks, Inc.				Temperature:	73 F
Attendees: Jeff Fra	anck		Tested by:	Greg Kiemel	Humidity:	41%
Customer Ref. No.: N/A			Power:	48 Vdc	Job Site:	Off-site
EST SPECIFICATIONS						
Specification: 47 CFR	2.1051 & 90.691	Year: 2003	Method:	TIA / EIA - 603	Year:	2001
SAMPLE CALCULATIONS						
COMMENTS Sested in System Configuration OFFICE OFFI	utput power level (approx.	0 dBm)				
lone	ANDARD					
EQUIREMENTS						
Maximum level of any spuriou	is emission must be attena	uted below the specified emission	mask.			
ESULTS						
ass						
IGNATURE						
Tested By:	HU.K.P					
DESCRIPTION OF TEST						
	Antenna Cond	ucted Spurious Em	issions - Lov	v Channel 1	GHz-3GHz	_



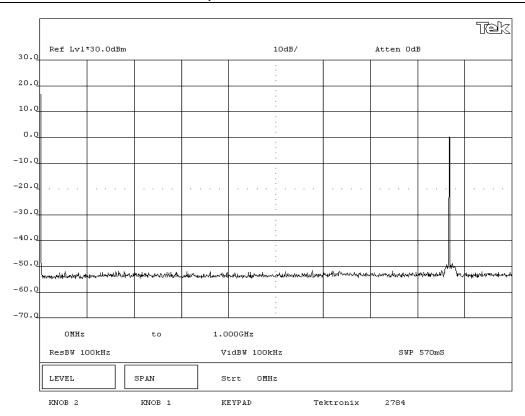
NORTHWEST EMC		EMISSIONS I	DATA SH	EET		Rev BETA 01/30/01	
EUT:	MC Series System				Work Order:	RAFN0040	
Serial Number:	Engineering Production Unit #1				Date:	08/03/04	
Customer:	Radioframe Networks, Inc.				Temperature:	73 F	
Attendees:	Jeff Franck		Tested by:	Greg Kiemel	Humidity:	41%	
Customer Ref. No.:	N/A		Power:	48 Vdc	Job Site:	Off-site	
TEST SPECIFICATION							
Specification:	47 CFR 2.1051 & 90.691	Year: 2003	Method:	TIA / EIA - 603	Year:	2001	
SAMPLE CALCULATION	DNS						
DEVIATIONS FROM TE None	DES edium output power level (approx. (O dBm)					
REQUIREMENTS			<u> </u>				
Maximum level of any RESULTS	spurious emission must be attena	uted below the specified emission	mask.				
	·						
Pass SIGNATURE							
Tested By:							
DESCRIPTION OF TES	DESCRIPTION OF TEST						
	Antenna Conducted Spurious Emissions - Low Channel 3GHz-6GHz						



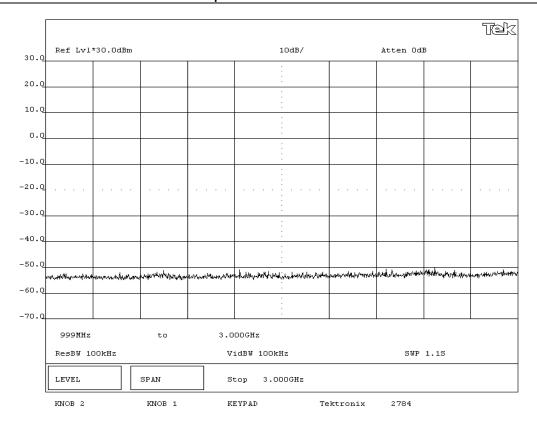
NORTHWEST EMC		EMISSIONS I	DATA SH	EET		Rev BETA 01/30/01		
EUT:	MC Series System				Work Order:	RAFN0040		
Serial Number:	Engineering Production Unit #1				Date:	08/03/04		
	Radioframe Networks, Inc.				Temperature:	73 F		
Attendees:	Jeff Franck		Tested by:	Greg Kiemel	Humidity:	41%		
Customer Ref. No.:	N/A		Power:	48 Vdc	Job Site:	Off-site		
TEST SPECIFICATION	S							
Specification:	47 CFR 2.1051 & 90.691	Year: 2003	Method:	TIA / EIA - 603	Year:	2001		
SAMPLE CALCULATION	ONS							
EUT OPERATING MOD With modulation at me	Tested in System Configuration EUT OPERATING MODES With modulation at medium output power level (approx. 0 dBm) DEVIATIONS FROM TEST STANDARD None							
	spurious emission must be atten	auted below the specified emission	mask.					
RESULTS								
Pass								
SIGNATURE								
Tested By:	ADU.K.P							
DESCRIPTION OF TES	ESCRIPTION OF TEST							
	Antenna Conducted Spurious Emissions - Low Channel 6GHz - 9GHz							



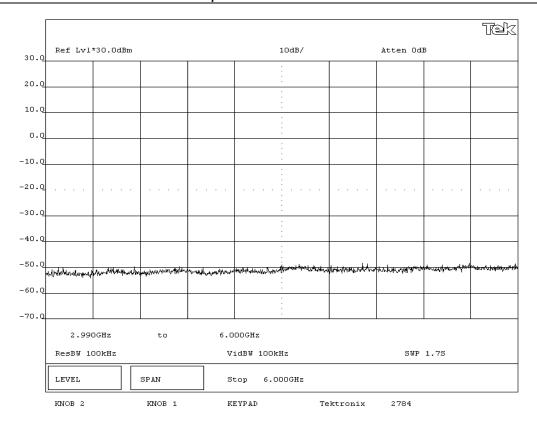
NORTHWEST EMC		EMISSIONS	DATA SH	EET		Rev BETA 01/30/01
EUT:	MC Series System				Work Order:	RAFN0040
Serial Number:	Engineering Production Unit #1				Date:	08/03/04
Customer:	Radioframe Networks, Inc.				Temperature:	73 F
Attendees:	Jeff Franck		Tested by:	Greg Kiemel	Humidity:	41%
Customer Ref. No.:	N/A		Power:	48 Vdc	Job Site:	Off-site
TEST SPECIFICATION	S					
Specification:	47 CFR 2.1051 & 90.691	Year: 2003	Method:	TIA / EIA - 603	Year:	2001
COMMENTS Tested in System Configure Operating Modulation at me		0 dBm)				
DEVIATIONS FROM TE	ST STANDARD					
REQUIREMENTS						
	snurious emission must be atten	auted below the specified emission	n mask			
RESULTS						
ass						
SIGNATURE						
Tested By:	ADU.K.P					
DESCRIPTION OF TES	Т					
	Antenna Conducted Spurious Emissions - Mid Channel 0MHz-1GHz					



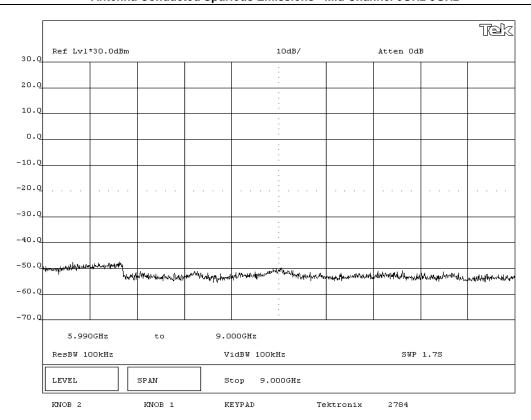
NORTHWEST EMC	EMISSIONS	DATA SH	EET		Rev BETA 01/30/01
EUT: MC Series System				Work Order:	RAFN0040
Serial Number: Engineering Production Unit #1				Date:	08/03/04
Customer: Radioframe Networks, Inc.				Temperature:	73 F
Attendees: Jeff Franck		Tested by:	Greg Kiemel	Humidity:	41%
Customer Ref. No.: N/A		Power:	48 Vdc	Job Site:	Off-site
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method:	TIA / EIA - 603	Year:	2001
SAMPLE CALCULATIONS					
Tested in System Configuration EUT OPERATING MODES With modulation at medium output power level (approx DEVIATIONS FROM TEST STANDARD None	c. 0 dBm)				
REQUIREMENTS					
Maximum level of any spurious emission must be atter	nauted below the specified emissi	on mask.			
RESULTS					
Pass					
SIGNATURE					
Tested By:					
DESCRIPTION OF TEST					



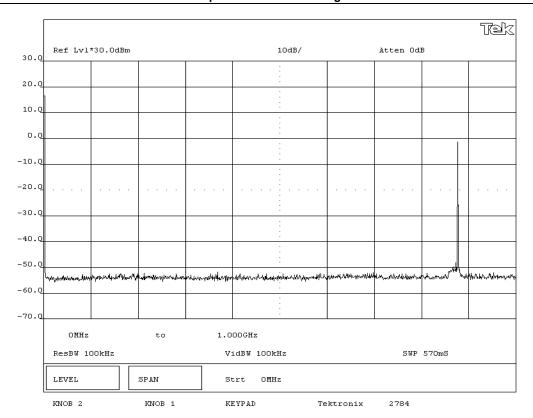
NORTHWEST EMC	EMISSIONS	DATA SH	EET		Rev BETA 01/30/01
EUT: MC Series System				Work Order:	RAFN0040
Serial Number: Engineering Production Unit #	ı			Date:	08/03/04
Customer: Radioframe Networks, Inc.				Temperature:	73 F
Attendees: Jeff Franck		Tested by:	Greg Kiemel	Humidity:	41%
Customer Ref. No.: N/A		Power:	48 Vdc	Job Site:	Off-site
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method:	TIA / EIA - 603	Year:	2001
SAMPLE CALCULATIONS					
Tested in System Configuration EUT OPERATING MODES With modulation at medium output power level (appro DEVIATIONS FROM TEST STANDARD Jone	ox. 0 dBm)				
REQUIREMENTS					
Maximum level of any spurious emission must be atte	enauted below the specified emission	mask.			
RESULTS					
Pass					
SIGNATURE					
Tested By:					
DESCRIPTION OF TEST					
Antenna Con	ducted Spurious Em	issions - Mid	Channel 3G	Hz - 6GHz	



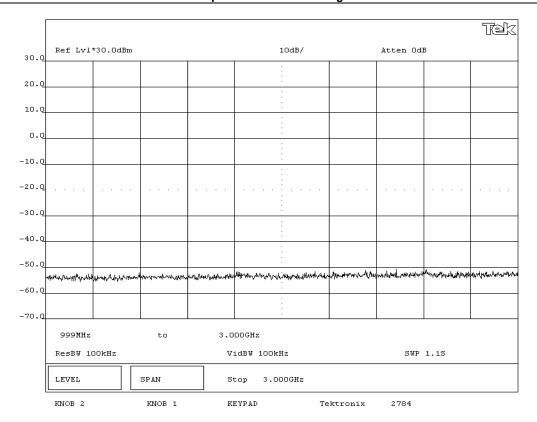
NORTHWEST	EMISSIONS	DATA SHE	-		Rev BETA
EMC	LIVIIOSIONS	DATA SITL			01/30/01
EUT: MC Series System				Work Order:	RAFN0040
Serial Number: Engineering Production Unit	#1			Date:	08/03/04
Customer: Radioframe Networks, Inc.				Temperature:	73 F
Attendees: Jeff Franck		Tested by: Gree	g Kiemel	Humidity:	41%
Customer Ref. No.: N/A		Power: 48 V	'dc	Job Site:	Off-site
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA	/ EIA - 603	Year:	2001
SAMPLE CALCULATIONS					
COMMENTS Tested in System Configuration EUT OPERATING MODES					
With modulation at medium output power level (appr	rox. 0 dBm)				
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
Maximum level of any spurious emission must be at	tenauted below the specified emiss	ion mask.			
RESULTS					
Pass					
SIGNATURE					
Tested By:					
DESCRIPTION OF TEST					
Antenna Conducted Spurious Emissions - Mid Channel 6GHz-9GHz					



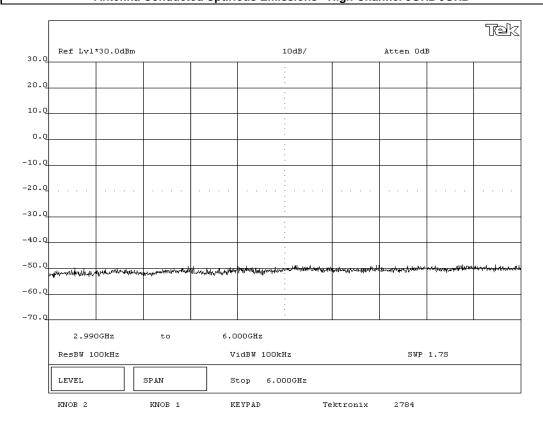
NORTHWEST	EMISSIONS	DATA SHEET		Rev BETA
EMC	LIMIOOICIAO	DATA SHEET		01/30/01
EUT: MC Series System			Work Order:	
Serial Number: Engineering Production Unit #1			Date:	08/03/04
Customer: Radioframe Networks, Inc.			Temperature:	73 F
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:	
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	Off-site
TEST SPECIFICATIONS				
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001
SAMPLE CALCULATIONS				
COMMENTS				
Tested in System Configuration				
EUT OPERATING MODES				
With modulation at medium output power level (approx	. 0 dBm)			
DEVIATIONS FROM TEST STANDARD				
None				
REQUIREMENTS				
Maximum level of any spurious emission must be atter	auted below the specified emission	mask.		
RESULTS				
Pass				
SIGNATURE				
Tested By:				
DESCRIPTION OF TEST				
Antenna Cond	lucted Spurious Em	issions - High Channel 0M	//Hz-1GHz	



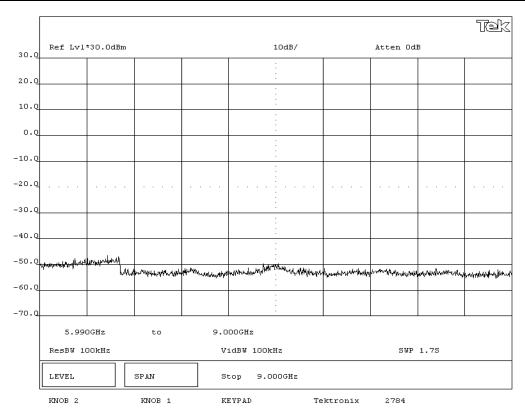
NORTHWEST EMC	EMISSIONS	DATA SH	EET		Rev BETA 01/30/01
EUT: MC Series System				Work Order:	RAFN0040
Serial Number: Engineering Production Unit #1				Date:	08/03/04
Customer: Radioframe Networks, Inc.				Temperature:	73 F
Attendees: Jeff Franck		Tested by:	Greg Kiemel	Humidity:	41%
Customer Ref. No.: N/A		Power:	48 Vdc	Job Site:	Off-site
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method:	TIA / EIA - 603	Year:	2001
SAMPLE CALCULATIONS					
Tested in System Configuration EUT OPERATING MODES With modulation at medium output power level (appro DEVIATIONS FROM TEST STANDARD None	к. 0 dBm)				
REQUIREMENTS					
Maximum level of any spurious emission must be atte	nauted below the specified emission	n mask.			
RESULTS					
Pass					
SIGNATURE					
Tested By:					
DESCRIPTION OF TEST					
Antonna Con	ducted Spurious Em	iecione - Hia	h Channel 1	CH2-3CH2	



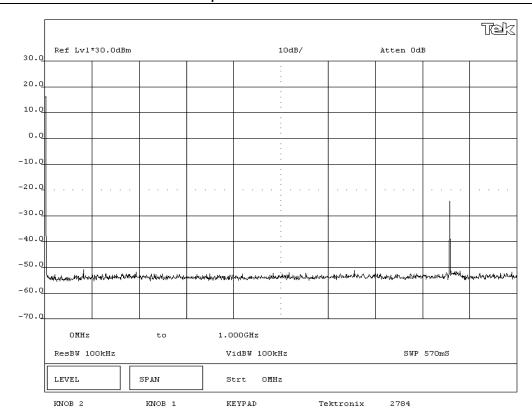
EMISSIONS DATA SHEET						
EUT: MC Series System			Work Order:	01/30/01 RAFN0040		
Serial Number: Engineering Production Unit #1				08/03/04		
Customer: Radioframe Networks, Inc.			Temperature:	73 F		
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:			
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	Off-site		
TEST SPECIFICATIONS						
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001		
SAMPLE CALCULATIONS						
COMMENTS Tested in System Configuration						
EUT OPERATING MODES						
With modulation at medium output power level (appro	v 0 dRm)					
DEVIATIONS FROM TEST STANDARD	x. v dBill)					
None						
REQUIREMENTS						
Maximum level of any spurious emission must be atte	nauted below the specified emission	mask				
RESULTS						
Pass						
SIGNATURE						
Tested By:						
DESCRIPTION OF TEST						
Antenna Conducted Spurious Emissions - High Channel 3GHz-6GHz						



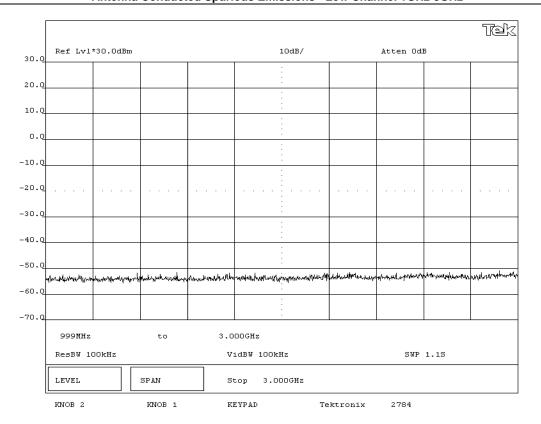
NORTHWEST EMC	EMISSIONS I	DATA SHEET		Rev BETA 01/30/01			
EUT: MC Series System			Work Order:				
Serial Number: Engineering Production Unit #1				08/03/04			
Customer: Radioframe Networks, Inc.			Temperature:				
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:				
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	Off-site			
TEST SPECIFICATIONS							
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001			
SAMPLE CALCULATIONS			,				
COMMENTS Tested in System Configuration EUT OPERATING MODES							
With modulation at medium output power level (approx. 0	dBm)						
DEVIATIONS FROM TEST STANDARD							
None							
REQUIREMENTS							
Maximum level of any spurious emission must be attenau	ted below the specified emission	mask.					
RESULTS							
Pass							
SIGNATURE							
Tested By:							
DESCRIPTION OF TEST	DESCRIPTION OF TEST						
Antenna Conducted Spurious Emissions - High Channel 6GHz-9GHz							



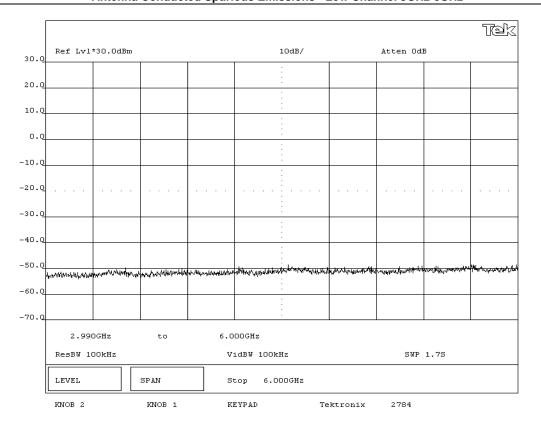
NORTHWEST ENAC	EMISSIONS	DATA SHEET		Rev BETA		
EMC	Elimoorono	DATA OHEET		01/30/01		
EUT: MC Series System			Work Order:			
Serial Number: Engineering Production Unit #1				08/03/04		
Customer: Radioframe Networks, Inc.			Temperature:			
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:			
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	Off-site		
TEST SPECIFICATIONS						
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001		
SAMPLE CALCULATIONS						
COMMENTS						
Tested in System Configuration						
EUT OPERATING MODES						
With modulation at low output power level (approx20	dBm)					
DEVIATIONS FROM TEST STANDARD						
None						
REQUIREMENTS						
Maximum level of any spurious emission must be atte	nauted below the specified emission	ı mask.				
RESULTS						
Pass						
SIGNATURE						
Tested By:						
DESCRIPTION OF TEST						
Antenna Conducted Spurious Emissions - Low Channel 0MHz-1GHz						



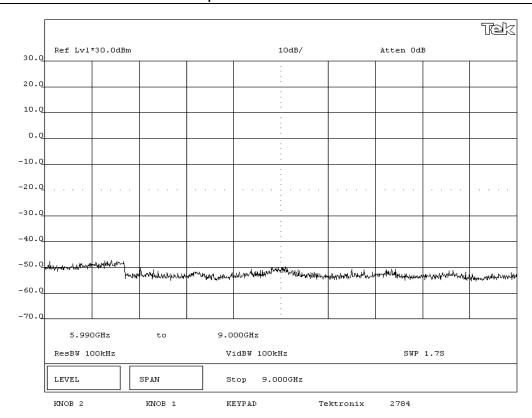
EMISSIONS DATA SHEET						
EUT: MC Series System			Work Order:	01/30/01 RAFN0040		
Serial Number: Engineering Production Unit #1			Date:	08/03/04		
Customer: Radioframe Networks, Inc.			Temperature:	73 F		
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:	41%		
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	Off-site		
TEST SPECIFICATIONS						
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001		
SAMPLE CALCULATIONS						
COMMENTS Tested in System Configuration						
EUT OPERATING MODES						
With modulation at low output power level (approx20	dBm)					
DEVIATIONS FROM TEST STANDARD						
None						
REQUIREMENTS						
Maximum level of any spurious emission must be atte	nauted below the specified emission	n mask.				
RESULTS						
Pass						
SIGNATURE						
Tested By:						
DESCRIPTION OF TEST						
Antenna Conducted Spurious Emissions - Low Channel 1GHz-3GHz						



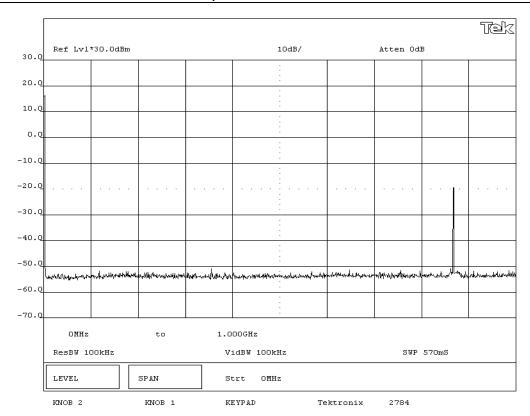
EMISSIONS DATA SHEET						
EUT: MC Series System			Work Order:	01/30/01 RAFN0040		
Serial Number: Engineering Production Unit #1			Date:	08/03/04		
Customer: Radioframe Networks, Inc.			Temperature:	73 F		
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:	41%		
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	Off-site		
TEST SPECIFICATIONS						
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001		
SAMPLE CALCULATIONS						
COMMENTS Tested in System Configuration						
EUT OPERATING MODES						
With modulation at low output power level (approx20	dBm)					
DEVIATIONS FROM TEST STANDARD						
None						
REQUIREMENTS						
Maximum level of any spurious emission must be atte	nauted below the specified emission	mask.				
RESULTS						
Pass						
SIGNATURE						
Tested By:						
DESCRIPTION OF TEST						
Antenna Conducted Spurious Emissions - Low Channel 3GHz-6GHz						



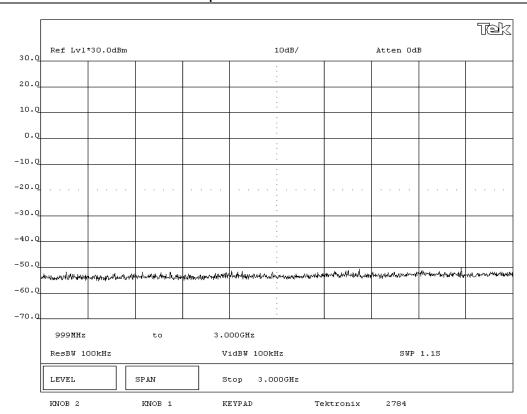
NORTHWEST	EMICCIONE	DATA CU			
EMC	EMISSIONS	DATA SH	EEI		Rev BETA 01/30/01
EUT: MC Series System				Work Order:	RAFN0040
Serial Number: Engineering Production Unit #1				Date:	08/03/04
Customer: Radioframe Networks, Inc.				Temperature:	73 F
Attendees: Jeff Franck			Greg Kiemel	Humidity:	
Customer Ref. No.: N/A		Power:	48 Vdc	Job Site:	Off-site
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method:	TIA / EIA - 603	Year:	2001
SAMPLE CALCULATIONS					
COMMENTS					
Tested in System Configuration					
EUT OPERATING MODES					
With modulation at low output power level (approx20 dBm)					
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
Maximum level of any spurious emission must be atten-	auted below the specified emission	mask.			
RESULTS					
Pass					
SIGNATURE					
ANU.KIP					
\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\					
Tested By:					
DESCRIPTION OF TEST					
Antonna Cond	ucted Spurious Emi	ecione Low	Channal 60	H- OCH-	
Antenna Conducted Spurious Emissions - Low Channel 6GHz - 9GHz					



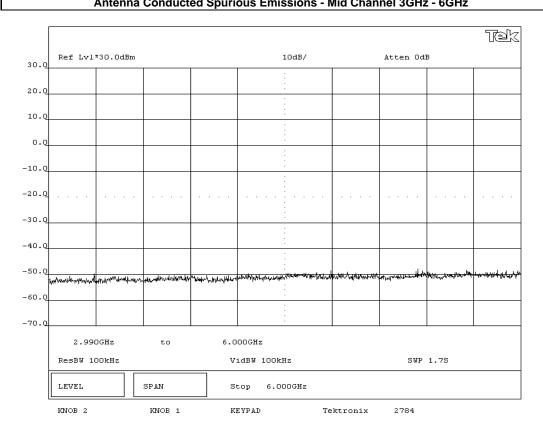
NORTHWEST	FMISSIONS	DATA SHEET		Rev BETA
EMC	LIMIOSICIAS	DATA SHEET		01/30/01
EUT: MC Series System			Work Order:	
Serial Number: Engineering Production Unit #1				08/03/04
Customer: Radioframe Networks, Inc.			Temperature:	73 F
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:	41%
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	Off-site
TEST SPECIFICATIONS				
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001
SAMPLE CALCULATIONS				
Tested in System Configuration EUT OPERATING MODES With modulation at low output power level (approx: DEVIATIONS FROM TEST STANDARD None RECUIREMENTS Maximum level of any spurious emission must be att RESULTS		n mask.		
Pass				
SIGNATURE				
Tested By:				
DESCRIPTION OF TEST				
Antenna Cor	nducted Spurious En	nissions - Mid Channel 0M	IHz-1GHz	



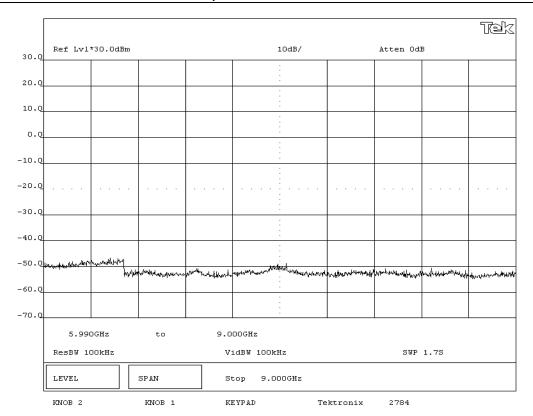
NORTHWEST EMC	EMISSIONS	DATA SHEET		Rev BETA
EUT: MC Series System			Work Order:	01/30/01 RAFN0040
Serial Number: Engineering Production Unit #1				08/03/04
Customer: Radioframe Networks, Inc.			Temperature:	
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:	
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	Off-site
TEST SPECIFICATIONS				
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001
SAMPLE CALCULATIONS				
Tested in System Configuration EUT OPERATING MODES With modulation at low output power level (approx2 DEVIATIONS FROM TEST STANDARD	0 dBm)			
None REQUIREMENTS				
Maximum level of any spurious emission must be atte	anautad balaw the specified emiss	ion mask		
RESULTS	chadea below the specifica chiliss	ion music.		
Pass				
SIGNATURE				
Tested By:				
DESCRIPTION OF TEST				
Antenna Cor	nducted Spurious E	missions - Mid Channel 1G	Hz-3GHz	•



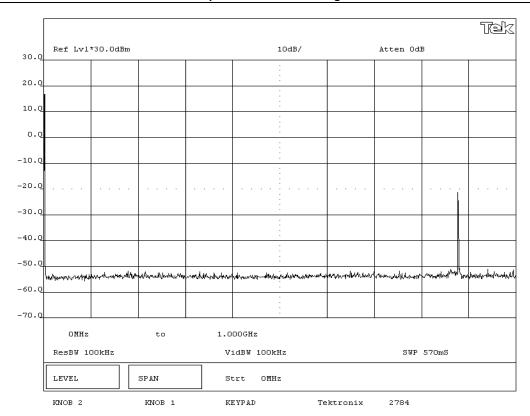
ORTHWEST EMC		EMISSIONS I	DATA SH	EET		Rev BETA 01/30/01
EUT: MC Serie	s System				Work Order:	RAFN0040
Serial Number: Engineer	ing Production Unit #1				Date:	08/03/04
Customer: Radiofra	me Networks, Inc.				Temperature:	73 F
Attendees: Jeff Fran	ck		Tested by:	Greg Kiemel	Humidity:	41%
Customer Ref. No.: N/A			Power:	48 Vdc	Job Site:	Off-site
EST SPECIFICATIONS						
Specification: 47 CFR 2	.1051 & 90.691	Year: 2003	Method:	TIA / EIA - 603	Year:	2001
SAMPLE CALCULATIONS						
OMMENTS ested in System Configuration UT OPERATING MODES Vith modulation at low output p	oower level (approx20 c	Bm)				
DEVIATIONS FROM TEST STAN	IDARD					
REQUIREMENTS						
	emission must be attena	uted below the specified emission	mask.			
ESULTS						
ass						
SIGNATURE						
Tested By:	RU.K.P					
DESCRIPTION OF TEST						
	Intenna Cond	ucted Spurious Em	issions - Mid	Channel 30	Hz - 6GHz	



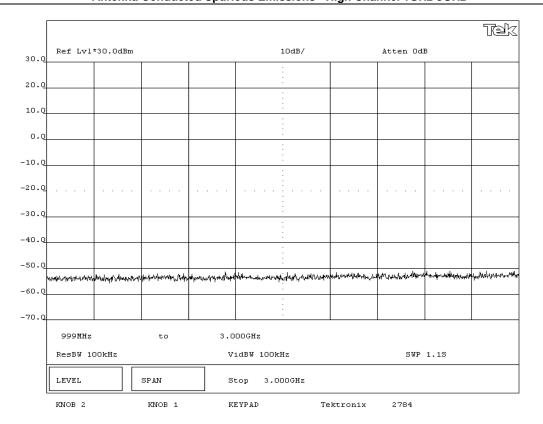
NORTHWEST	EMISSIONS	DATA SHEET		Rev BETA	
EMC	Emicolono	DATA OHEET		01/30/01	
EUT: MC Series System			Work Order:		
Serial Number: Engineering Production Unit #	1			08/03/04	
Customer: Radioframe Networks, Inc.			Temperature:		
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:		
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	Off-site	
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001	
SAMPLE CALCULATIONS					
EUT OPERATING MODES With modulation at low output power level (approx2) DEVIATIONS FROM TEST STANDARD Vone REQUIREMENTS Maximum level of any spurious emission must be att RESULTS		n mask.			
Pass					
SIGNATURE					
Tested By:					
DESCRIPTION OF TEST					
Antenna Conducted Spurious Emissions - Mid Channel 6GHz-9GHz					



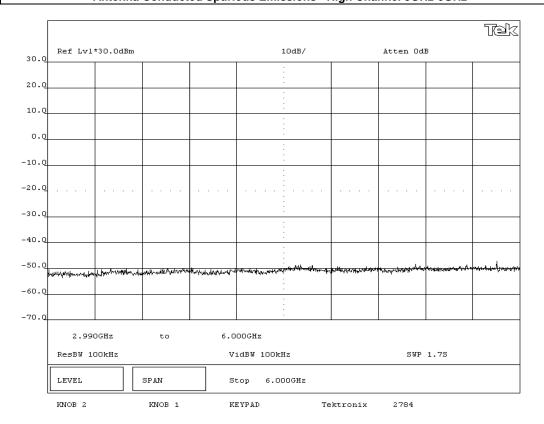
NORTHWEST EMC	FMISSIONS	DATA SHEET		Rev BETA	
		D/(1/(011221		01/30/01	
EUT: MC Series System			Work Order:		
Serial Number: Engineering Production Unit #	1			08/03/04	
Customer: Radioframe Networks, Inc.			Temperature:		
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:		
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	Off-site	
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001	
SAMPLE CALCULATIONS					
Tested in System Configuration EUT OPERATING MODES With modulation at low output power level (approx DEVIATIONS FROM TEST STANDARD None REQUIREMENTS Maximum level of any spurious emission must be att RESULTS	, in the second	n mask.			
Pass					
SIGNATURE					
Tested By:					
DESCRIPTION OF TEST					
Antenna Conducted Spurious Emissions - High Channel 0MHz-1GHz					



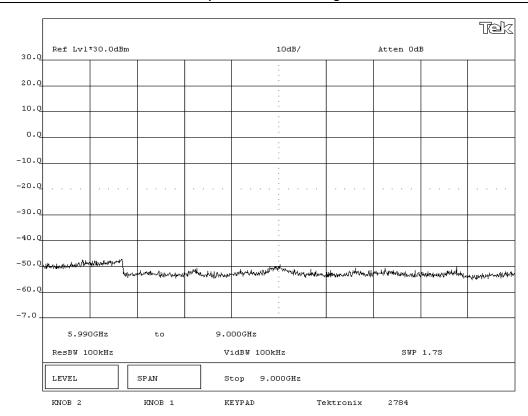
EMISSIONS DATA SHEET						
EUT: MC Series System			Work Order:	01/30/01 RAFN0040		
Serial Number: Engineering Production Unit #	1		Date:	08/03/04		
Customer: Radioframe Networks, Inc.			Temperature:	73 F		
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:	41%		
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	Off-site		
TEST SPECIFICATIONS						
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001		
SAMPLE CALCULATIONS						
COMMENTS Tested in System Configuration						
EUT OPERATING MODES						
With modulation at low output power level (approx2	0 dBm)					
DEVIATIONS FROM TEST STANDARD						
None						
REQUIREMENTS						
Maximum level of any spurious emission must be atte	enauted below the specified emission	ı mask.				
RESULTS						
Pass SIGNATURE						
Tested By:						
DESCRIPTION OF TEST						
Antenna Conducted Spurious Emissions - High Channel 1GHz-3GHz						



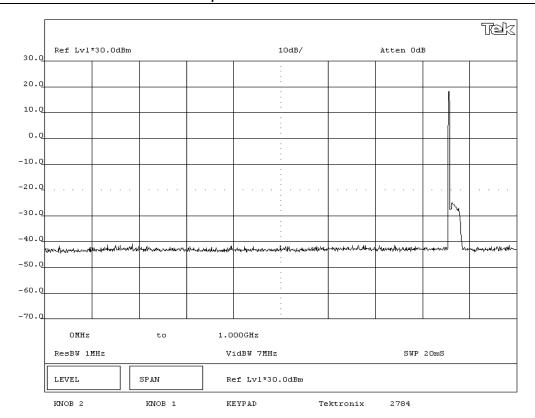
EMISSIONS DATA SHEET						
EUT: MC Series System		-	Work Order:	01/30/01 RAFN0040		
Serial Number: Engineering Production Unit #			Date:	08/03/04		
Customer: Radioframe Networks, Inc.			Temperature:	73 F		
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:	41%		
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	Off-site		
TEST SPECIFICATIONS						
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001		
SAMPLE CALCULATIONS						
COMMENTS Tested in System Configuration						
EUT OPERATING MODES						
With modulation at low output power level (approx2	0 dBm)					
DEVIATIONS FROM TEST STANDARD						
None						
REQUIREMENTS		<u> </u>				
Maximum level of any spurious emission must be atte	nauted below the specified emission	i mask.				
Pass Pass						
SIGNATURE						
Tested By:						
DESCRIPTION OF TEST						
Antenna Conducted Spurious Emissions - High Channel 3GHz-6GHz						



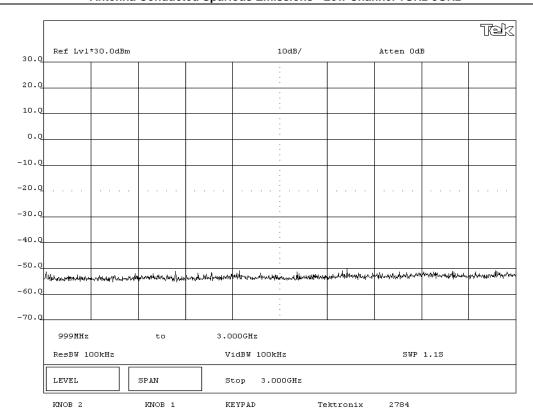
NORTHWEST EMC		EMISSIONS I	DATA SH	EET		Rev BETA 01/30/01
EUT:	MC Series System				Work Order:	RAFN0040
Serial Number:	Engineering Production Unit #1				Date:	08/03/04
Customer:	Radioframe Networks, Inc.				Temperature:	73 F
Attendees:	Jeff Franck		Tested by:	Greg Kiemel	Humidity:	41%
Customer Ref. No.:	N/A		Power:	48 Vdc	Job Site:	Off-site
TEST SPECIFICATIONS	6					
Specification:	47 CFR 2.1051 & 90.691	Year: 2003	Method:	TIA / EIA - 603	Year:	2001
SAMPLE CALCULATIO	NS					
DEVIATIONS FROM TE None REQUIREMENTS Maximum level of any :	output power level (approx20 d ST STANDARD	Bm) uted below the specified emission	mask.			
RESULTS						
Pass						
Tested By:						
DESCRIPTION OF TES	Т					
Antenna Conducted Spurious Emissions - High Channel 6GHz-9GHz						



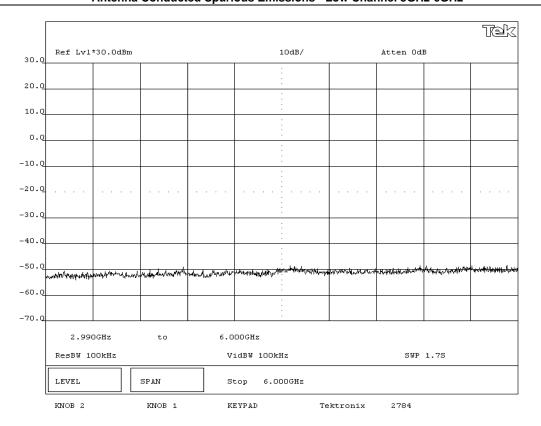
NORTHWEST	EMISSIONS	DATA SHEET			
EMC	EMISSIONS	DATA SHEET		Rev BETA 01/30/01	
EUT: MC Series System			Work Order:	RAFN0040	
Serial Number: Engineering Production Unit #	1		Date:	08/03/04	
Customer: Radioframe Networks, Inc.			Temperature:	73 F	
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:		
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	Off-site	
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001	
SAMPLE CALCULATIONS					
1					
COMMENTS					
Tested in System Configuration					
EUT OPERATING MODES					
With modulation at highest output power level (appro	x. +20 dBm)				
DEVIATIONS FROM TEST STANDARD					
None					
REQUIREMENTS					
Maximum level of any spurious emission must be att	enauted below the specified emission	mask.			
RESULTS					
Pass					
SIGNATURE					
_					
An U.K.P					
(1/.7)					
Tested By:					
DESCRIPTION OF TEST					
	ducted Courieus Em	inciana Law Channal Ol	ALL- ACLI-		
Antenna Conducted Spurious Emissions - Low Channel 0MHz-1GHz					



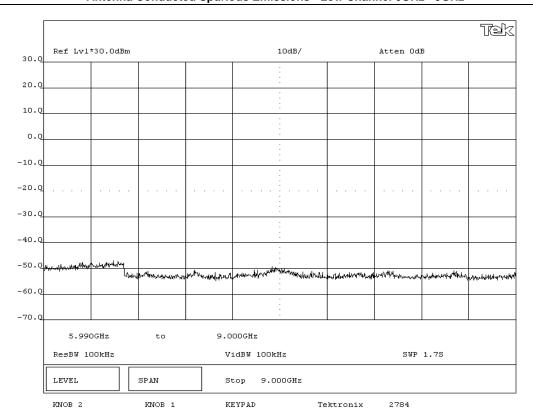
EMC EMISSIONS DATA SHEET						
EUT: MC Series System				Work Order:	RAFN0040	
Serial Number: Engineering Production Unit #1				Date:	08/03/04	
Customer: Radioframe Networks, Inc.				Temperature:	73 F	
Attendees: Jeff Franck		Tested by:	Greg Kiemel	Humidity:	41%	
Customer Ref. No.: N/A		Power:	48 Vdc	Job Site:	Off-site	
TEST SPECIFICATIONS						
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method:	TIA / EIA - 603	Year:	2001	
SAMPLE CALCULATIONS						
COMMENTS Tested in System Configuration EUT OPERATING MODES With modulation at highest output power level (approx. +20 dBm)						
DEVIATIONS FROM TEST STANDARD						
None						
REQUIREMENTS						
Maximum level of any spurious emission must be attended	uted below the specified emission	mask.				
RESULTS						
Pass						
SIGNATURE						
Tested By:						
DESCRIPTION OF TEST	DESCRIPTION OF TEST					
Antenna Conducted Spurious Emissions - Low Channel 1GHz-3GHz						



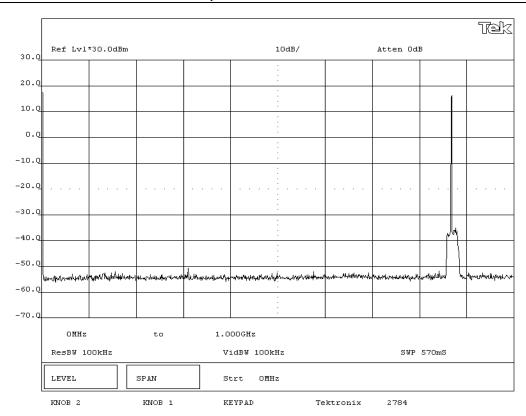
EMISSIONS DATA SHEET						
EUT: MC Series System		Work Order:	RAFN0040			
Serial Number: Engineering Production Unit #1			Date:	08/03/04		
Customer: Radioframe Networks, Inc.			Temperature:	73 F		
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:	41%		
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	Off-site		
TEST SPECIFICATIONS						
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001		
SAMPLE CALCULATIONS						
COMMENTS						
Tested in System Configuration						
EUT OPERATING MODES						
With modulation at highest output power level (approx	+20 dBm)					
DEVIATIONS FROM TEST STANDARD						
None						
REQUIREMENTS						
Maximum level of any spurious emission must be attena	uted below the specified emission	mask.				
RESULTS						
Pass						
SIGNATURE						
Tested By:						
DESCRIPTION OF TEST						
Antenna Conducted Spurious Emissions - Low Channel 3GHz-6GHz						



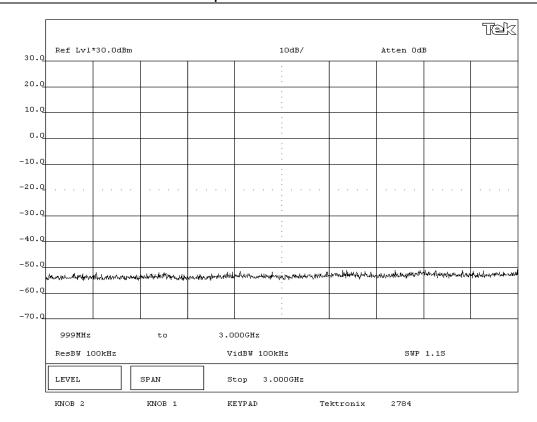
NORTHWEST EMC	EMISSIONS	DATA SHEET		Rev BETA 01/30/01	
EUT: MC Series System			Work Order:		
Serial Number: Engineering Production Unit #	1		Date:	08/03/04	
Customer: Radioframe Networks, Inc.			Temperature:	73 F	
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:	41%	
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	Off-site	
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001	
SAMPLE CALCULATIONS					
Tested in System Configuration EUT OPERATING MODES With modulation at highest output power level (appro DEVIATIONS FROM TEST STANDARD None EGOUIREMENTS	x. +20 dBm)				
Maximum level of any spurious emission must be att	enauted below the specified emission	nn mask			
RESULTS	onacioa polon ano operanea ennoci	on machi			
Pass					
SIGNATURE					
Tested By:					
DESCRIPTION OF TEST					
Antenna Conducted Spurious Emissions - Low Channel 6GHz - 9GHz					



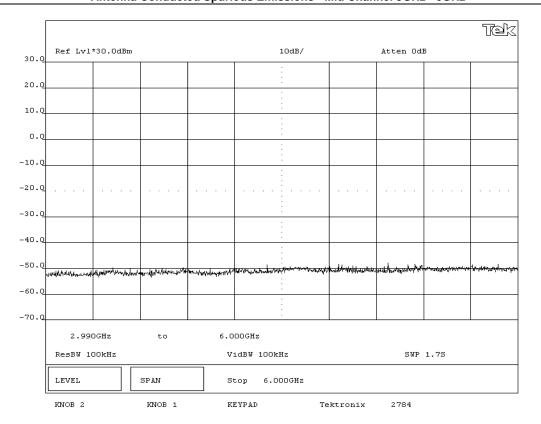
ORTHWEST EMC	EMIS	SIONS DATA S	HEET		Rev BETA 01/30/01
EUT:	MC Series System			Work Order:	RAFN0040
Serial Number:	Engineering Production Unit #1			Date:	08/03/04
Customer:	Radioframe Networks, Inc.			Temperature:	73 F
Attendees:	Jeff Franck	Teste	by: Greg Kiemel	Humidity	: 41%
Customer Ref. No.:	N/A	Po	wer: 48 Vdc	Job Site:	Off-site
TEST SPECIFICATION	8				
Specification:	47 CFR 2.1051 & 90.691 Year: 20	D3 Met	hod: TIA / EIA - 603	Year:	2001
COMMENTS Sested in System Conf CUT OPERATING MOD With modulation at hig DEVIATIONS FROM TE	ES hest output power level (approx. +20 dBm)				
	spurious emission must be attenauted below the	specified emission mask.			
RESULTS					
Pass					
Tested By:					
DESCRIPTION OF TES	Т				
Antenna Conducted Spurious Emissions - Mid Channel 0MHz-1GHz					



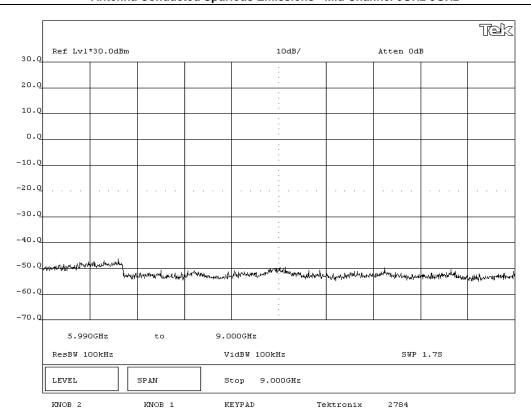
NORTHWEST EMC	EMISSIONS	DATA SH	EET		Rev BETA 01/30/01
EUT: MC Series System				Work Order:	RAFN0040
Serial Number: Engineering Production Unit #1				Date:	08/03/04
Customer: Radioframe Networks, Inc.				Temperature:	73 F
Attendees: Jeff Franck		Tested by:	Greg Kiemel	Humidity:	41%
Customer Ref. No.: N/A		Power:	48 Vdc	Job Site:	Off-site
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method:	TIA / EIA - 603	Year:	2001
SAMPLE CALCULATIONS					
EUT OPERATING MODES With modulation at highest output power level (appro- DEVIATIONS FROM TEST STANDARD None	c. +20 dBm)				
REQUIREMENTS					
Maximum level of any spurious emission must be atte	nauted below the specified emission	mask.			
RESULTS	The state of the s				
Pass					
SIGNATURE					
Tested By:					
DESCRIPTION OF TEST					
Antenna Cor	ducted Spurious En	nissions - Mic	Channel 10	3Hz-3GHz	



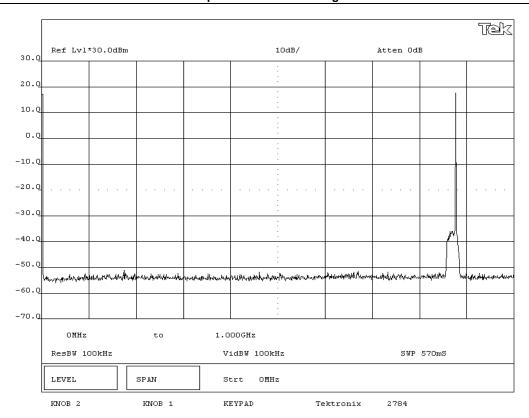
EMISSIONS DATA SHEET						
EUT: MC Series System		-	Work Order:	01/30/01 RAFN0040		
Serial Number: Engineering Production Unit #1			Date:	08/03/04		
Customer: Radioframe Networks, Inc.			Temperature:	73 F		
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:	41%		
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	Off-site		
TEST SPECIFICATIONS						
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001		
SAMPLE CALCULATIONS						
COMMENTS Tested in System Configuration						
EUT OPERATING MODES						
With modulation at highest output power level (approx	+20 dBm)					
DEVIATIONS FROM TEST STANDARD	120 45)					
None						
REQUIREMENTS						
Maximum level of any spurious emission must be atter	auted below the specified emission	mask.				
RESULTS	·					
Pass						
SIGNATURE						
Tested By:						
DESCRIPTION OF TEST						
Antenna Conducted Spurious Emissions - Mid Channel 3GHz - 6GHz						



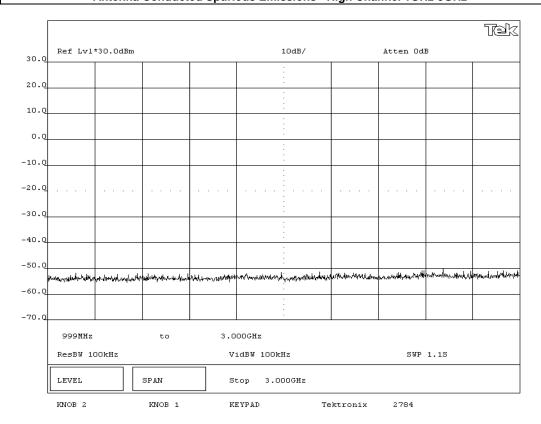
NORTHWEST	EMISSIONS	DATA SHEET		Rev BETA
EMC	LIMISSICIAS	DATA SHEET		01/30/01
EUT: MC Series System		Work Order:	RAFN0040	
Serial Number: Engineering Production Unit #	Date:	08/03/04		
Customer: Radioframe Networks, Inc.	Temperature:	73 F		
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:	41%
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	Off-site
TEST SPECIFICATIONS				
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001
SAMPLE CALCULATIONS				
ested in System Configuration EUT OPERATING MODES With modulation at highest output power level (appro SEVIATIONS FROM TEST STANDARD IONE	vx. +20 dBm)			
REQUIREMENTS Maximum level of any spurious emission must be att	anguted below the appointed amigai	an maak		
waximum level of any spurious emission must be att RESULTS	enauted below the specified emission	on mask.		
Pass				
Tested By:				
DESCRIPTION OF TEST				
Antenna Co	nducted Spurious E	missions - Mid Channel 6G	Hz-9GHz	_



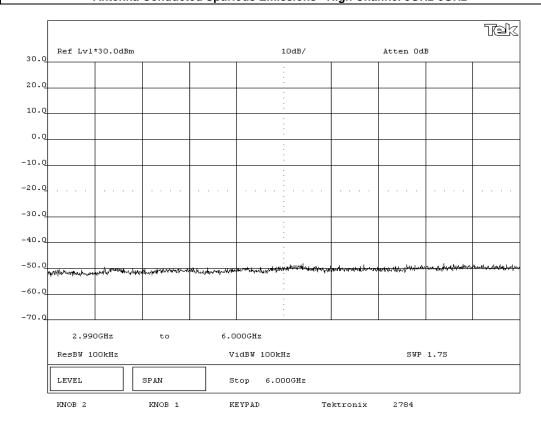
NORTHWEST	EMISSIONS	DATA SHEET		Rev BETA			
EMC	EMISSIONS	DATA SHEET		01/30/01			
EUT: MC Series System	Work Order:	RAFN0040					
Serial Number: Engineering Production Unit #	Date:	08/03/04					
Customer: Radioframe Networks, Inc.			Temperature:	73 F			
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:				
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	Off-site			
TEST SPECIFICATIONS							
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001			
SAMPLE CALCULATIONS							
COMMENTS							
Tested in System Configuration							
EUT OPERATING MODES							
With modulation at highest output power level (appro	x. +20 dBm)						
DEVIATIONS FROM TEST STANDARD							
None							
REQUIREMENTS							
Maximum level of any spurious emission must be att	enauted below the specified emissior	mask.					
RESULTS							
Pass							
SIGNATURE							
An U.K.P							
Tested By:							
DESCRIPTION OF TEST							
	dusted Counieus En	inniana Iliah Ohammal Ol	ALI- 40LI-	<u>'</u>			
Antenna Cor	iauctea Spurious Em	issions - High Channel 0	VIHZ-1GHZ				



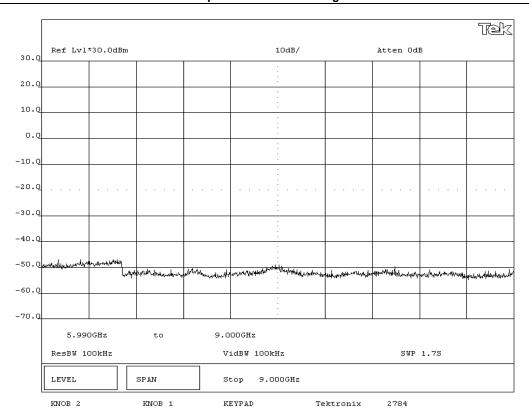
EMISSIONS DATA SHEET							
EUT: MC Series System				Work Order:	RAFN0040		
Serial Number: Engineering Production Unit #1				Date:	08/03/04		
Customer: Radioframe Networks, Inc.	Customer: Radioframe Networks, Inc.						
Attendees: Jeff Franck		Tested by:	Greg Kiemel	Humidity:	41%		
Customer Ref. No.: N/A		Power:	48 Vdc	Job Site:	Off-site		
TEST SPECIFICATIONS							
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method:	TIA / EIA - 603	Year:	2001		
SAMPLE CALCULATIONS							
COMMENTS							
Tested in System Configuration							
EUT OPERATING MODES							
With modulation at highest output power level (approx.	+20 dBm)						
DEVIATIONS FROM TEST STANDARD None							
REQUIREMENTS							
Maximum level of any spurious emission must be attended							
RESULTS	luted below the specified emission	IIIdSK.					
Pass							
SIGNATURE							
Tested By:							
DESCRIPTION OF TEST	DESCRIPTION OF TEST						
Antenna Conducted Spurious Emissions - High Channel 1GHz-3GHz							



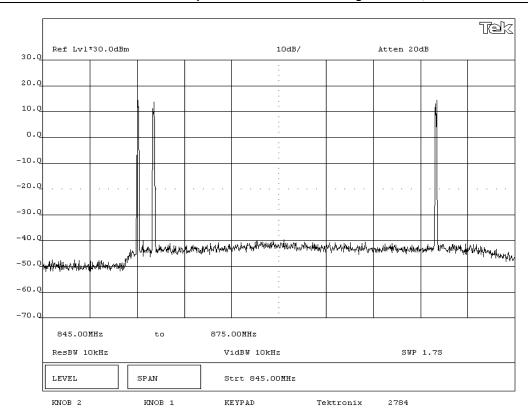
EMISSIONS DATA SHEET							
EUT: MC Series System			Work Order:	01/30/01 RAFN0040			
Serial Number: Engineering Production Unit #1		08/03/04					
Customer: Radioframe Networks, Inc.	Temperature:	73 F					
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:				
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	Off-site			
TEST SPECIFICATIONS							
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001			
SAMPLE CALCULATIONS							
COMMENTS Tested in System Configuration							
EUT OPERATING MODES							
With modulation at highest output power level (approx	+20 dBm)						
DEVIATIONS FROM TEST STANDARD							
None							
REQUIREMENTS							
Maximum level of any spurious emission must be atte	nauted below the specified emission	n mask.					
RESULTS	·						
Pass							
SIGNATURE							
Tested By:							
DESCRIPTION OF TEST							
Antenna Conducted Spurious Emissions - High Channel 3GHz-6GHz							



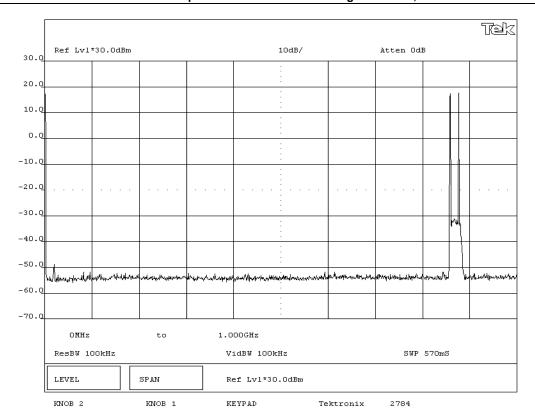
NORTHWEST	EMISSIONS	DATA SHEET		Rev BETA			
EMC	LIMISSICIAS	DATA SHEET		01/30/01			
EUT: MC Series System		Work Order:	RAFN0040				
Serial Number: Engineering Production Unit #	Date:	08/03/04					
Customer: Radioframe Networks, Inc.			Temperature:	73 F			
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:	41%			
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	Off-site			
TEST SPECIFICATIONS							
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001			
SAMPLE CALCULATIONS							
COMMENTS							
Tested in System Configuration							
EUT OPERATING MODES							
With modulation at highest output power level (appro	x. +20 dBm)						
DEVIATIONS FROM TEST STANDARD							
None							
REQUIREMENTS							
Maximum level of any spurious emission must be att	enauted below the specified emission	n mask.					
RESULTS							
Pass							
SIGNATURE							
An U.K.P							
Tested By:							
DESCRIPTION OF TEST							
	ducted Country 5	inniana Iliah Ohamud 2	NI- 00II-				
Antenna Con	lauctea Spurious Em	issions - High Channel 60	HZ-9GHZ				



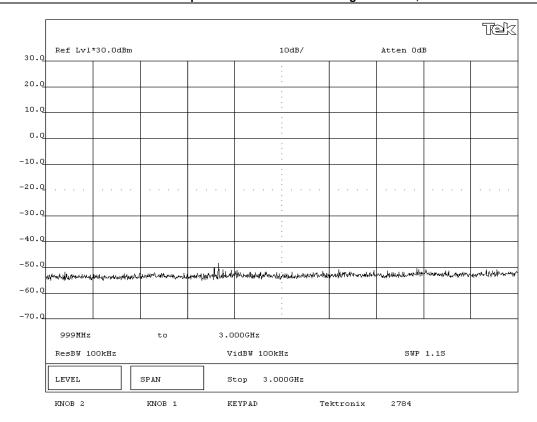
NORTHWEST	EMISSIONS	DATA SHEET		Rev BETA
EMC	LIVIISSICINS	DATA SHELI		01/30/01
EUT: MC Series System			Work Order:	RAFN0040
Serial Number: Engineering Production Unit #	Date:	08/03/04		
Customer: Radioframe Networks, Inc.				73 F
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:	41%
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	Off-site
TEST SPECIFICATIONS				
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001
SAMPLE CALCULATIONS				
COMMENTS				
Tested in System Configuration				
EUT OPERATING MODES				
With modulation at highest output power level (appro	ox. +20 dBm)			
DEVIATIONS FROM TEST STANDARD				
None				
REQUIREMENTS				
Maximum level of any spurious emission must be att	enauted below the specified emissio	n mask.		
RESULTS				
Pass				
SIGNATURE				
AMU.Kip				
AUT.				
Tested By:				
DESCRIPTION OF TEST				
Antenna Condi	ucted Spurious Emis	sions - Three Signal IM Te	st, In Band	



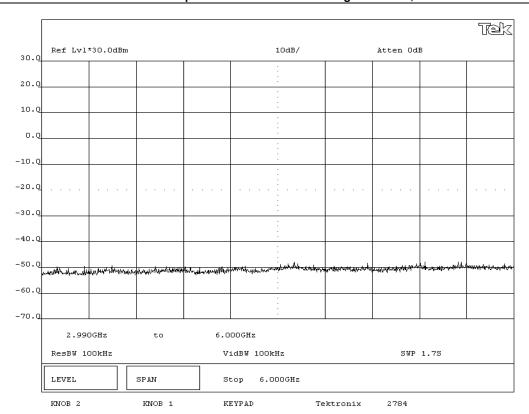
NORTHWEST	EMISSIONS	DATA SHEET		Rev BETA
EMC		371171 311221		01/30/01
EUT: MC Series System	Work Order:			
Serial Number: Engineering Production Unit #	Temperature:	08/03/04		
Customer: Radioframe Networks, Inc.				
Attendees: Jeff Franck Customer Ref. No.: N/A		Tested by: Greg Kiemel Power: 48 Vdc	Humidity:	
		Power: 48 Vdc	Job Site:	Off-site
TEST SPECIFICATIONS Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Vann	2001
SAMPLE CALCULATIONS	fear: 2003	Method: IIA / EIA - 603	rear:	2001
BANIFEE CALCOLATIONS				
COMMENTS				
Tested in System Configuration				
EUT OPERATING MODES				
With modulation at highest output power level (appro	x +20 dBm)			
DEVIATIONS FROM TEST STANDARD	x. +20 dbiii)			
None				
REQUIREMENTS				
Maximum level of any spurious emission must be atte	enauted below the specified emission	mask		
RESULTS	mateu zelen ale epeemea emiselen	· maoni		
Pass				
SIGNATURE				
Tested By:				
rested by:				
DESCRIPTION OF TEST				
Antenna Conduc	tad Spurious Emissia	ons - Three Signal IM Test	L OMHZ-1GH	7
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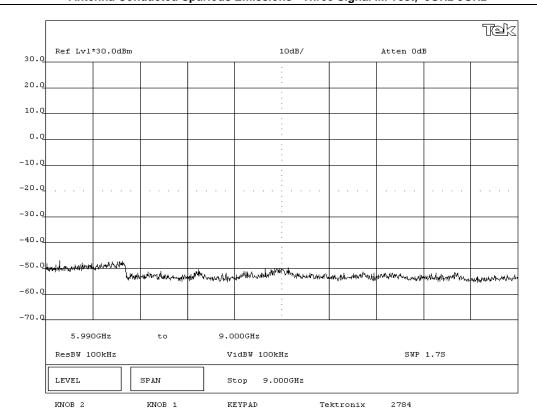
NORTHWEST EMC	EMISSIONS	DATA SHEET		Rev BETA
EUT: MC Series System			Work Order:	01/30/01 RAEN0040
Serial Number: Engineering Production Unit #	1			08/03/04
Customer: Radioframe Networks. Inc.				73 F
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:	
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	
TEST SPECIFICATIONS				
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001
SAMPLE CALCULATIONS				
COMMENTS Tested in System Configuration EUT OPERATING MODES With modulation at highest output power level (appro DEVIATIONS FROM TEST STANDARD None	xx. +20 dBm)			
REQUIREMENTS				
Maximum level of any spurious emission must be att	enauted below the specified emiss	sion mask.		
RESULTS				
Pass				
SIGNATURE Tested By:				
DESCRIPTION OF TEST				
Antenna Conduc	ted Spurious Emis	sions - Three Signal IM Test	, 1GHz-3GH	Z



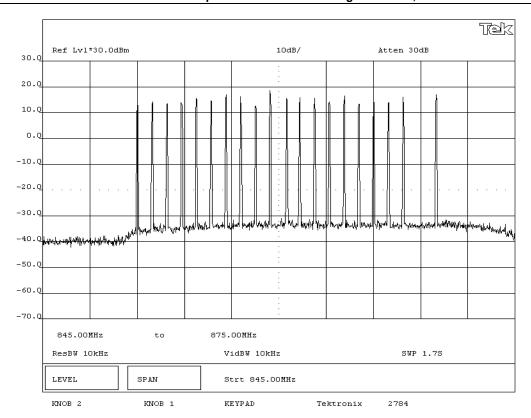
NORTHWEST EMC	EMISSIONS	S DATA SHEET		Rev BETA
EUT: MC Series System			Work Order:	01/30/01 RAEN0040
Serial Number: Engineering Production Unit #	1			08/03/04
Customer: Radioframe Networks. Inc.				73 F
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:	
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	
TEST SPECIFICATIONS				
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001
SAMPLE CALCULATIONS				
COMMENTS Tested in System Configuration EUT OPERATING MODES With modulation at highest output power level (appro DEVIATIONS FROM TEST STANDARD None	x. +20 dBm)			
REQUIREMENTS				
Maximum level of any spurious emission must be atte	enauted below the specified emis	sion mask		
RESULTS	sination policies and opposition critical	olon machi		
Pass				
SIGNATURE				
Tested By:				
DESCRIPTION OF TEST				
Antenna Conduc	ted Spurious Emis	sions - Three Signal IM Test	, 3GHz-6GH	z



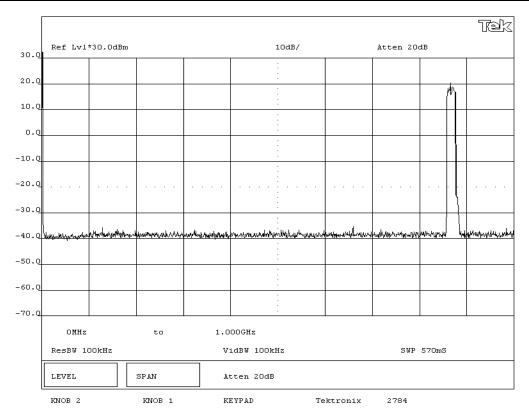
NORTHWEST EMC	EMISSIONS	DATA SHEET		Rev BETA	
EUT: MC Series System			Work Order:	01/30/01 RAFN0040	
	Serial Number: Engineering Production Unit #1				
Customer: Radioframe Networks, Inc.	Temperature:	73 F			
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:		
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	Off-site	
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001	
SAMPLE CALCULATIONS					
Tested in System Configuration EUT OPERATING MODES With modulation at highest output power level (appro DEVIATIONS FROM TEST STANDARD None EGQUIREMENTS Maximum level of any spurious emission must be at	, in the second	ion mask			
RESULTS	onation below the opposition office	The state of the s			
Pass					
SIGNATURE					
Tested By:					
DESCRIPTION OF TEST					
Antenna Conduc	ted Spurious Emiss	sions - Three Signal IM Test	. 6GHz-9GH	z	



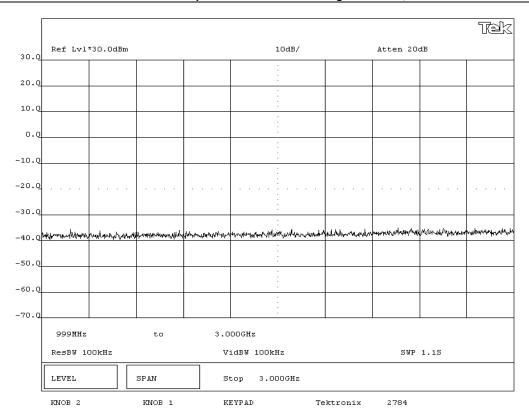
NORTHWEST	EMICCIONE	DATA CH	CCT.				
EMC	EMISSIONS	DATA SH	EEI		Rev BETA 01/30/01		
EUT: MC Series System				Work Order:	RAFN0040		
Serial Number: Engineering Production Unit #1				Date:	08/04/04		
Customer: Radioframe Networks, Inc.				Temperature:	73 F		
Attendees: Jeff Franck		Tested by:	Greg Kiemel	Humidity:	41%		
Customer Ref. No.: N/A		Power:	48 Vdc	Job Site:	Off-site		
TEST SPECIFICATIONS							
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method:	TIA / EIA - 603	Year:	2001		
SAMPLE CALCULATIONS							
COMMENTS							
Tested in System Configuration							
EUT OPERATING MODES							
With modulation at highest output power level (approx.	+20 dBm)						
DEVIATIONS FROM TEST STANDARD							
None							
REQUIREMENTS							
Maximum level of any spurious emission must be atten	auted below the specified emission	mask.					
RESULTS							
Pass							
SIGNATURE							
An U.K.P							
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Tested By:							
DESCRIPTION OF TEST							
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Antenna Conducted Spurious Emissions - 20 Signal IM Test, In Band							



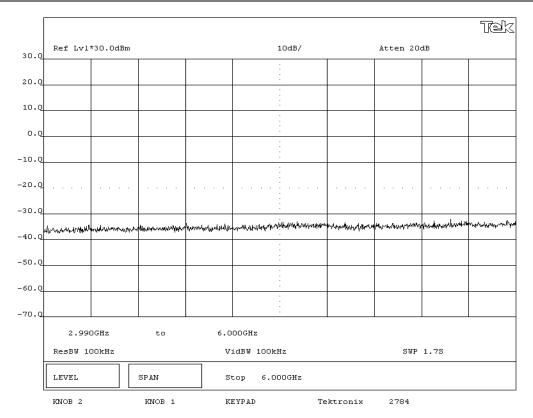
NORTHWEST EMC		EMISSIONS I	DATA SH	EET		Rev BETA 01/30/01
EUT:	MC Series System				Work Order:	RAFN0040
Serial Number:	Serial Number: Engineering Production Unit #1					08/04/04
	Radioframe Networks, Inc.				Temperature:	73 F
Attendees:	Jeff Franck Tested by: Greg Kiemel				Humidity:	41%
Customer Ref. No.:	N/A		Power:	48 Vdc	Job Site:	Off-site
TEST SPECIFICATION	S					
Specification:	47 CFR 2.1051 & 90.691	Year: 2003	Method:	TIA / EIA - 603	Year:	2001
COMMENTS Tested in System Conf EUT OPERATING MOD With modulation at hig DEVIATIONS FROM TE None	IES hest output power level (approx.	+20 dBm)				
REQUIREMENTS						
	spurious emission must be atten	auted below the specified emission	mask.			
RESULTS		<u> </u>				
Pass						
SIGNATURE						
Tested By:	ARU.KIP					
DESCRIPTION OF TES	Т					
	Antenna Conducted Spurious Emissions - 20 Signal IM Test, 0MHz-1GHz					



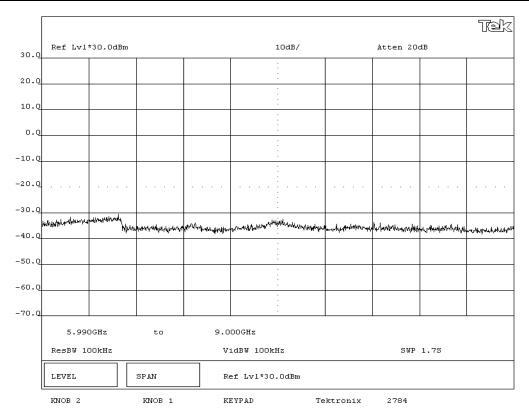
NORTHWEST EMC		EMISSIONS I	DATA SH	EET		Rev BETA 01/30/01
EUT:	MC Series System				Work Order:	RAFN0040
Serial Number:	Engineering Production Unit #1				Date:	08/04/04
Customer:	Radioframe Networks, Inc.				Temperature:	73 F
Attendees:	Jeff Franck		Tested by:	Greg Kiemel	Humidity:	41%
Customer Ref. No.:	N/A		Power:	48 Vdc	Job Site:	Off-site
TEST SPECIFICATION	S					
Specification:	47 CFR 2.1051 & 90.691	Year: 2003	Method:	TIA / EIA - 603	Year:	2001
SAMPLE CALCULATION	ONS					
EUT OPERATING MODE With modulation at high	Tested in System Configuration EUT OPERATING MODES With modulation at highest output power level (approx. +20 dBm) DEVIATIONS FROM TEST STANDARD					
REQUIREMENTS						
Maximum level of any	spurious emission must be attena	uted below the specified emission	mask.			
RESULTS						
Pass						
SIGNATURE						
Tested By:	Tested By:					
DESCRIPTION OF TES	DESCRIPTION OF TEST					
	Antenna Conducted Spurious Emissions - 20 Signal IM Test, 1GHz-3GHz					



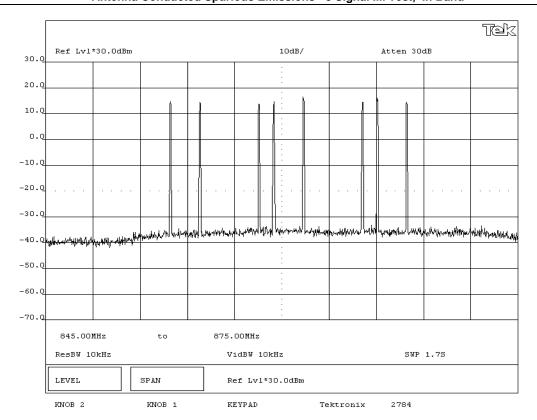
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EMC	EMISSIONS	DATA SH	EEI		Rev BETA 01/30/01	
EUT: MC Series System	•			Work Order:	RAFN0040	
Serial Number: Engineering Production	Unit #1			Date:	08/03/04	
Customer: Radioframe Networks, In	nc.			Temperature:	73 F	
Attendees: Jeff Franck		Tested by:	Greg Kiemel	Humidity:	41%	
Customer Ref. No.: N/A		Power:	48 Vdc	Job Site:	Off-site	
TEST SPECIFICATIONS						
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method:	TIA / EIA - 603	Year:	2001	
SAMPLE CALCULATIONS						
COMMENTS						
Tested in System Configuration		•	•	•		
EUT OPERATING MODES						
With modulation at highest output power level	(approx. +20 dBm)					
DEVIATIONS FROM TEST STANDARD						
None						
REQUIREMENTS						
Maximum level of any spurious emission must	be attenauted below the specified emission	n mask.		•	•	
RESULTS						
Pass				•	•	
SIGNATURE						
. 1.1/.	\cap	•		•		
An U. Kirl						
- VJ						
Tested By:						
DESCRIPTION OF TEST						
	ndusted Courieus Emis	olono 20 Cia	nol IM Took	20U- COU-		
Antenna Conducted Spurious Emissions - 20 Signal IM Test, 3GHz-6GHz						



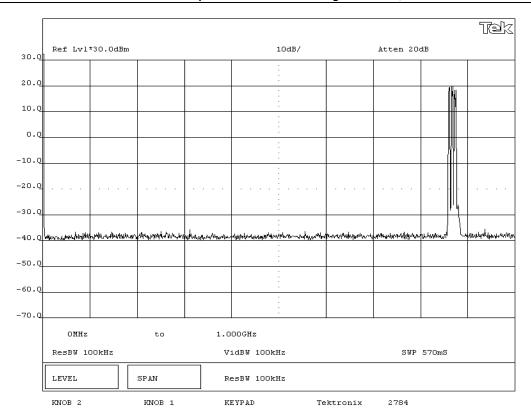
EMISSIONS	DATA SH	EET		Rev BETA 01/30/01		
EUT: MC Series System			Work Order:			
Serial Number: Engineering Production Unit #1		08/04/04				
Customer: Radioframe Networks, Inc.			Temperature:			
Attendees: Jeff Franck	Tested by:	Greg Kiemel	Humidity:			
Customer Ref. No.: N/A	Power:	48 Vdc	Job Site:	Off-site		
TEST SPECIFICATIONS						
Specification: 47 CFR 2.1051 & 90.691 Year: 2003	Method:	TIA / EIA - 603	Year:	2001		
SAMPLE CALCULATIONS						
COMMENTS						
Tested in System Configuration						
EUT OPERATING MODES						
With modulation at highest output power level (approx. +20 dBm)						
DEVIATIONS FROM TEST STANDARD						
None						
REQUIREMENTS						
Maximum level of any spurious emission must be attenauted below the specified emission	n mask.					
RESULTS						
Pass						
SIGNATURE						
Tested By:						
DESCRIPTION OF TEST						
Antenna Conducted Spurious Emissions - 20 Signal IM Test, 6GHz-9GHz						



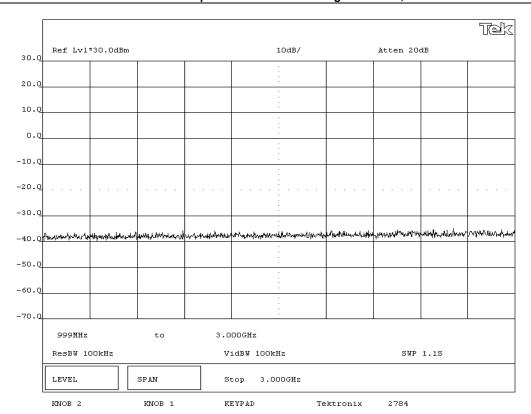
NORTHWEST EMC		EMISSIONS I	DATA SH	EET		Rev BETA 01/30/01
EUT:	MC Series System				Work Order:	RAFN0040
Serial Number:	Engineering Production Unit #1				Date:	08/04/04
Customer:	Radioframe Networks, Inc.				Temperature:	73 F
Attendees:	Jeff Franck		Tested by:	Greg Kiemel	Humidity:	41%
Customer Ref. No.:	N/A		Power:	48 Vdc	Job Site:	Off-site
EST SPECIFICATION	S					
Specification:	47 CFR 2.1051 & 90.691	Year: 2003	Method:	TIA / EIA - 603	Year:	2001
AMPLE CALCULATION	NS					
DEVIATIONS FROM TE	NES hest output power level (approx.	-20 dBm)				
None						
REQUIREMENTS			<u> </u>			
RESULTS	spurious emission must be attena	uted below the specified emission	mask.			
Pass						
SIGNATURE						
Tested By:						
DESCRIPTION OF TES	T					
	Antenna Cond	ucted Spurious Em	issions - 8 S	ignal IM Tes	I. In Band	



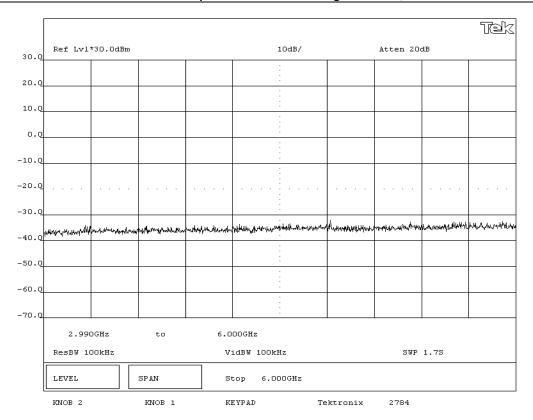
NORTHWEST EMC		EMISSIONS I	DATA SH	EET		Rev BETA 01/30/01
EUT:	MC Series System				Work Order:	RAFN0040
Serial Number:	Engineering Production Unit #1				Date:	08/04/04
Customer:	Radioframe Networks, Inc.				Temperature:	73 F
Attendees:	Jeff Franck		Tested by:	Greg Kiemel	Humidity:	41%
Customer Ref. No.:	N/A		Power:	48 Vdc	Job Site:	Off-site
TEST SPECIFICATIONS	6					
Specification:	47 CFR 2.1051 & 90.691	Year: 2003	Method:	TIA / EIA - 603	Year:	2001
SAMPLE CALCULATIO	NS					
DEVIATIONS FROM TE None REQUIREMENTS Maximum level of any s	ES hest output power level (approx. + ST STANDARD	20 dBm) uted below the specified emission	mask.			
RESULTS						
Pass						
Tested By:						
DESCRIPTION OF TES	Т					
Antenna Conducted Spurious Emissions - 8 Signal IM Test, 0MHz-1GHz						



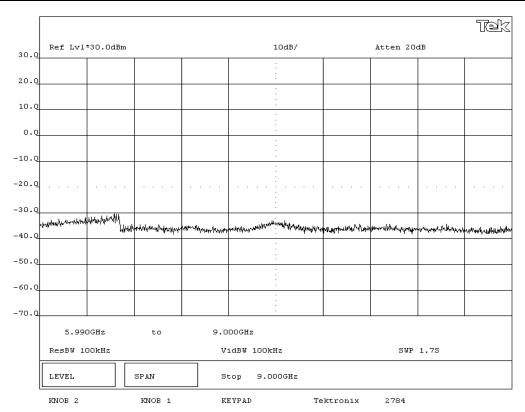
NORTHWEST EMC	EMISSIONS	S DATA SHEET		Rev BETA 01/30/01
EUT: MC Series System			Work Order:	
Serial Number: Engineering Production Unit #	Date:	08/04/04		
Customer: Radioframe Networks, Inc.			Temperature:	73 F
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:	41%
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	Off-site
TEST SPECIFICATIONS				
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001
SAMPLE CALCULATIONS				
Tested in System Configuration EUT OPERATING MODES With modulation at highest output power level (appro DEVIATIONS FROM TEST STANDARD	ox. +20 dBm)			
None				
REQUIREMENTS				
Maximum level of any spurious emission must be att	enauted below the specified emiss	sion mask.		
RESULTS				
Pass				
SIGNATURE				
Tested By:				
DESCRIPTION OF TEST				
Antenna Cond	lucted Spurious En	nissions - 8 Signal IM Test, 1	GHz-3GHz	

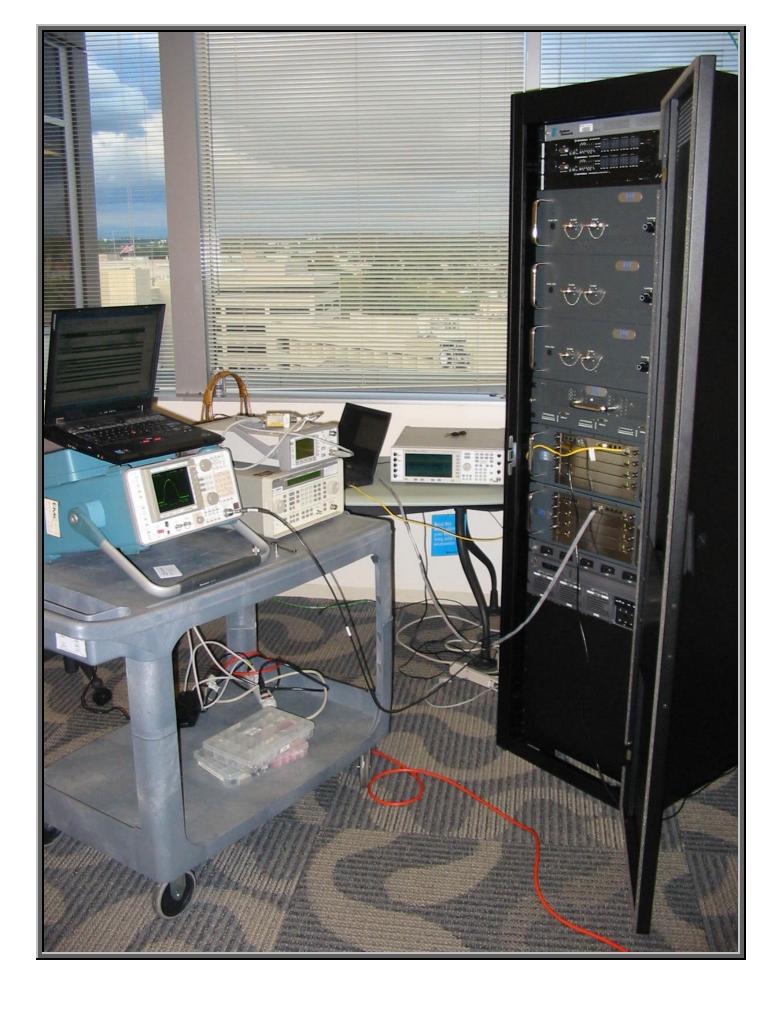


EMISSIONS DATA SHEET					
EUT: MC Series System			Work Order:	01/30/01 RAFN0040	
Serial Number: Engineering Production Unit #1	Date:	08/03/04			
Customer: Radioframe Networks, Inc.	Temperature:	73 F			
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:	41%	
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	Off-site	
TEST SPECIFICATIONS					
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001	
SAMPLE CALCULATIONS					
COMMENTS Tested in System Configuration EUT OPERATING MODES With modulation at highest output power level (approx DEVIATIONS FROM TEST STANDARD None REQUIREMENTS Maximum level of any spurious emission must be attena	,	mask.			
RESULTS					
Pass					
SIGNATURE Tested By:					
DESCRIPTION OF TEST					
Antenna Conducted Spurious Emissions - 8 Signal IM Test, 3GHz-6GHz					



NORTHWEST EMC	EMISSIONS I	DATA SHEET		Rev BETA 01/30/01	
EUT: MC Series System			Work Order:		
Serial Number: Engineering Production Unit #1				08/04/04	
Customer: Radioframe Networks, Inc.			Temperature:		
Attendees: Jeff Franck		Tested by: Greg Kiemel	Humidity:		
Customer Ref. No.: N/A		Power: 48 Vdc	Job Site:	Off-site	
TEST SPECIFICATIONS				J	
Specification: 47 CFR 2.1051 & 90.691	Year: 2003	Method: TIA / EIA - 603	Year:	2001	
SAMPLE CALCULATIONS					
COMMENTS					
Tested in System Configuration					
EUT OPERATING MODES					
With modulation at highest output power level (approx. +2)	n dBm)				
DEVIATIONS FROM TEST STANDARD	o ubiii)				
None None					
REQUIREMENTS					
Maximum level of any spurious emission must be attenaut	ed helow the specified emission	mask			
RESULTS	ou below the opeomica emice.em	Thubit.			
Pass					
SIGNATURE					
Tested By:					
DESCRIPTION OF TEST					
Antenna Conducted Spurious Emissions - 8 Signal IM Test, 6GHz-9GHz					





Spurious Conducted Emissions – Receive Mode

Revision 10/1/03

Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:

20 channels distributed across the band (omni mode)

Operating Modes Investigated:

Receive Mode

Power Input Settings Investigated:

-48 Vdc.

Software\Firmware Applied During Test						
Exercise software Standard Production Software Version N/A						
Description						
The system was tested using standard operating production software to exercise the functions of the device during the testing.						

EUT and Peripherals			
Description	Manufacturer	Model/Part Number	Serial Number
iDEN Radio Base Station	Radio Frame Networks, Inc.	MC Series System	Engineering Production Unit #1
Subset of MC Series System	Radio Frame Networks, Inc.	PDU	Unknown
Subset of MC Series System	Radio Frame Networks, Inc.	RF Shelf	Unknown
Subset of MC Series System	Radio Frame Networks, Inc.	Radio Blade Shelf	Unknown
Subset of MC Series System	Radio Frame Networks, Inc.	Base Interface Chassis (BIC)	Unknown
Subset of MC Series System	Radio Frame Networks, Inc.	Airlink Interface Chassis (AIC)	Unknown

Remote Equipment Outside of Test Setup Boundary						
Description Manufacturer Model/Part Number Serial Number						
Clock Source	Motorola	Unknown	Unknown			
Equipment isolated from the EUT so as not to contribute to the measurement result is considered to be outside the test setup boundary						

Spurious Conducted Emissions – Receive Mode

Revision 10/1/03

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Clock Source	Yes	5.0	No	Base Interface Chassis (BIC)	Clock Source
DC Power	No	6	No	PDU	DC Power

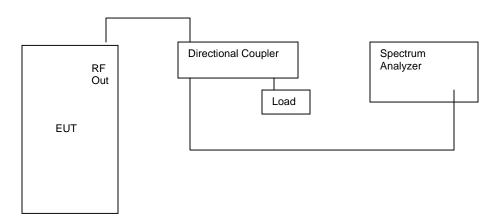
Measurement Equipment								
Description	Manufacturer	Model	Identifier	Last Cal	Interval			
Spectrum Analyzer	Tektronix	2784	AAO	02/26/2003	24 mo			

Test Description

Requirement: Per 47 CFR 15.111, receivers that operate (tune) in the frequency range 30 to 960 MHz that provide terminals for the connection of an external receiving antenna may be tested to demonstrate compliance with the provisions of Section 15.109 with the antenna terminals terminated, provided the conducted power at the antenna terminals at any frequency within the range of measurements specified in Section 15.33 (30 MHz to 5 GHz for cellular receiver) does not exceed 2.0 nW (-57 dBm).

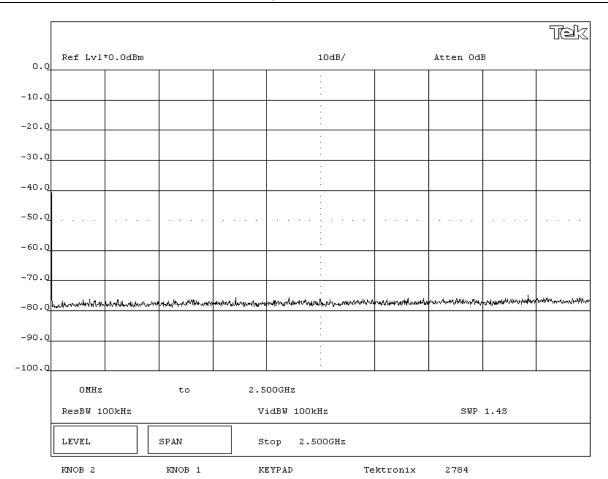
Configuration: A spectrum analyzer was used to scan from 30 to 5 GHz. A 100 kHz resolution bandwidth was used. No video filtering was employed. A 20dB external attenuator was used on the RF input of the spectrum analyzer.

Test Setup Diagram

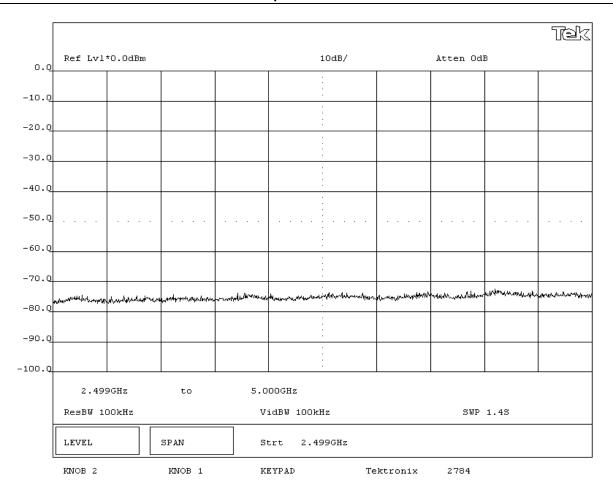


Completed by:

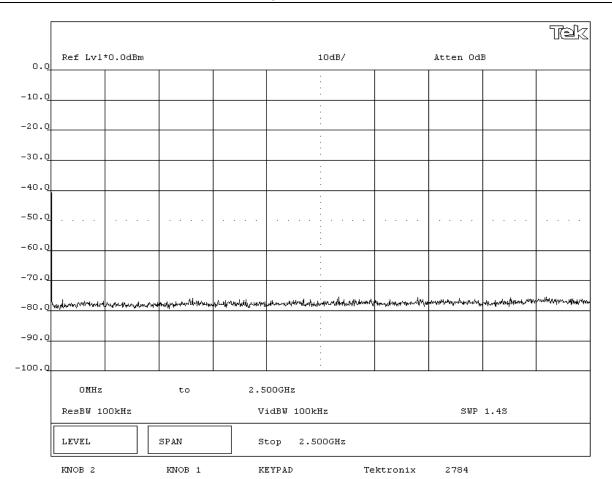
EMC		EMISSION	S DATA SH	EET		Rev BETA				
			0 271171 011			01/30/01				
	MC Series				Work Order:					
	Engineering Production Unit #1	Date: 10/20/04								
Customer:	Radio Frame Networks	Temperature: 74° F								
Attendees:	Dean Bush Tested by: Rod Peloquin N/A Power: -48 VDC				Humidity: 48% RH					
Customer Ref. No.:		Job Site: EV01								
TEST SPECIFICATION	IS									
Specification:	47 CFR 15.111(a)	Year: 2004	Method:	ANSI C63.4	Year:	2003				
SAMPLE CALCULATION	ONS									
COMMENTS										
20 channels omni										
EUT OPERATING MODES										
Receive mode										
DEVIATIONS FROM TEST STANDARD										
None										
REQUIREMENTS										
The power at the antenna terminal at any frequency within the range of measurements specified in 15.111 shall not exceed 2.0 nanowatts (-57 dBm).										
RESULTS										
Pass										
SIGNATURE										
Tested By:	Rolly be Relenge									
DESCRIPTION OF TES	ST									
Antenna Conducted Spurious Emissions - 2.5GHz - 5GHz										



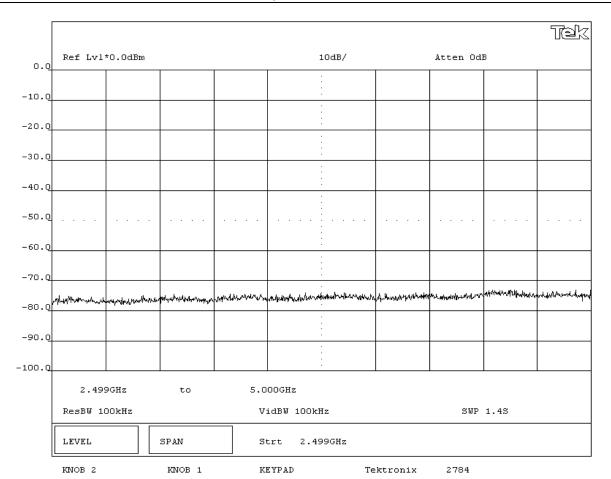
EMC EMISSIONS DATA SHEET						
EUT:	MC Series			Work Order:	RAFN0042	
Serial Number:	Engineering Production Unit #1			Date:	10/20/04	
Customer:	Radio Frame Networks			Temperature:	74° F	
Attendees:	Dean Bush		Tested by: Rod Peloquin	Humidity:		
Customer Ref. No.:			Power: -48 VDC	Job Site:	EV01	
TEST SPECIFICATION						
Specification:	47 CFR 15.111(a)	Year: 2004	Method: ANSI C63.4	Year:	2003	
COMMENTS						
20 channels omni						
EUT OPERATING MOD	DES					
Receive mode						
DEVIATIONS FROM T	EST STANDARD					
None						
REQUIREMENTS						
	nna terminal at any frequency with	hin the range of measurements sp	pecified in 15.111 shall not exceed 2.0 nanowar	tts (-57 dBm).		
RESULTS	<u> </u>					
Pass						
Tested By:						
DESCRIPTION OF TES	ST .					
	Antenna Conducted Spurious Emissions - 2.5GHz - 5GHz					



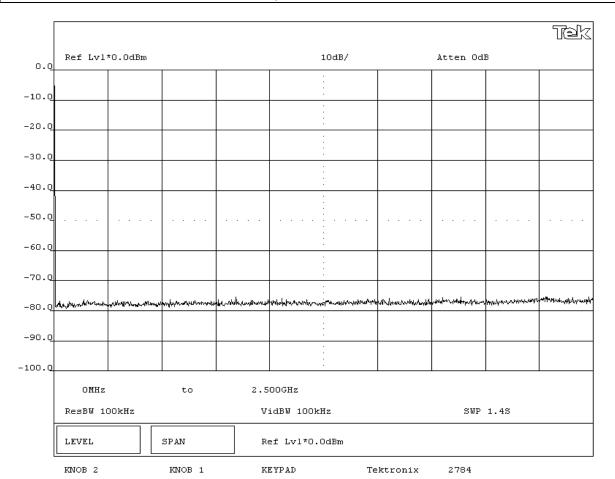
EMISSIONS DATA SHEET				Rev BETA		
						01/30/01
	MC Series				Work Order:	
	Engineering Production Unit #1					10/20/04
Customer:	Radio Frame Networks				Temperature:	74° F
Attendees:	Dean Bush		Tested by:	Rod Peloquin	Humidity:	48% RH
Customer Ref. No.:	N/A		Power:	-48 VDC	Job Site:	EV01
TEST SPECIFICATION	IS					
Specification:	47 CFR 15.111(a)	Year: 2004	Method:	ANSI C63.4	Year:	2003
SAMPLE CALCULATION	ONS					
COMMENTS 20 channels omni						
EUT OPERATING MOI	DES					
Receive mode						
DEVIATIONS FROM T	EST STANDARD					
None						
REQUIREMENTS						
•	nna terminal at any frequency with	in the range of measurements s	specified in 15.111 shall r	not exceed 2.0 nanow	atts (-57 dBm).	
RESULTS						
Pass						
SIGNATURE						
Tested By:	Roeling la Reling					
DESCRIPTION OF TES						
Antenna Conducted Spurious Emissions - 2.5GHz - 5GHz						



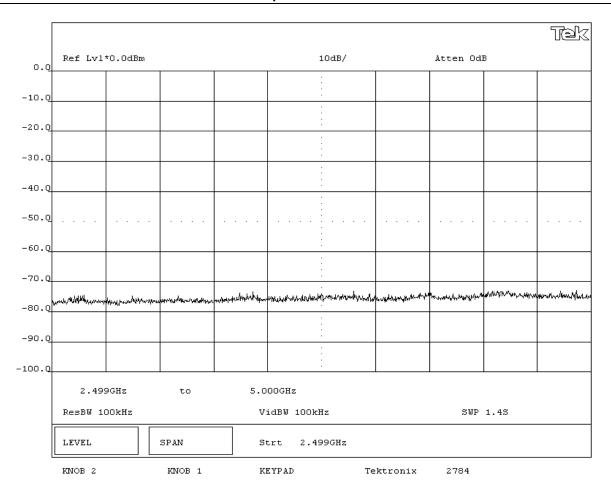
EMISSIONS DATA SHEET							
EMC		EMISSIONS I	JATA SHEET		Rev BETA 01/30/01		
EUT:	MC Series			Work Order:	RAFN0042		
Serial Number:	Engineering Production Unit #1			Date:	10/20/04		
Customer:	Radio Frame Networks			Temperature:	74° F		
Attendees:	Dean Bush		Tested by: Rod Peloquin	Humidity:	48% RH		
Customer Ref. No.:	N/A		Power: -48 VDC	Job Site:	EV01		
TEST SPECIFICATION	S						
Specification:	47 CFR 15.111(a)	Year: 2004	Method: ANSI C63.4	Year:	2003		
SAMPLE CALCULATION	ONS						
COMMENTS							
20 channels omni							
EUT OPERATING MOD	DES						
Receive mode							
DEVIATIONS FROM T	EST STANDARD						
None							
REQUIREMENTS							
	nna terminal at any frequency with	nin the range of measurements spe	ecified in 15.111 shall not exceed 2.0 nanowa	tts (-57 dBm).			
RESULTS							
Pass							
SIGNATURE	SIGNATURE						
Rochy La Reling							
······································							
DESCRIPTION OF TES							
Antenna Conducted Spurious Emissions - 2.5GHz - 5GHz							



NORTHWEST EMC		EMISSIONS I	DATA SHEET		Rev BETA 01/30/01
EUT:	MC Series			Work Order:	RAFN0042
Serial Number:	Engineering Production Unit #1			Date:	10/20/04
Customer:	Radio Frame Networks			Temperature:	74° F
Attendees:			Tested by: Rod Peloquin	Humidity:	
Customer Ref. No.:			Power: -48 VDC	Job Site:	EV01
TEST SPECIFICATION					
Specification:	47 CFR 15.111(a)	Year: 2004	Method: ANSI C63.4	Year:	2003
COMMENTS					
20 channels omni					
EUT OPERATING MOD	DES				
Receive mode					
DEVIATIONS FROM T	EST STANDARD				
None					
REQUIREMENTS					
	nna terminal at any frequency with	in the range of measurements spe	ecified in 15.111 shall not exceed 2.0 nanowat	tts (-57 dBm).	
RESULTS					
Pass					
Tested By:					
DESCRIPTION OF TES	ST				
Antenna Conducted Spurious Emissions - 2.5GHz - 5GHz					



EMISSIONS DATA SHEET							
EMC		EMISSIONS I	JATA SHEET		Rev BETA 01/30/01		
EUT:	MC Series			Work Order:	RAFN0042		
Serial Number:	Engineering Production Unit #1			Date:	10/20/04		
Customer:	Radio Frame Networks			Temperature:	74° F		
Attendees:	Dean Bush		Tested by: Rod Peloquin	Humidity:	48% RH		
Customer Ref. No.:	N/A		Power: -48 VDC	Job Site:	EV01		
TEST SPECIFICATION	IS						
Specification:	47 CFR 15.111(a)	Year: 2004	Method: ANSI C63.4	Year:	2003		
SAMPLE CALCULATION	ONS						
COMMENTS							
20 channels omni							
EUT OPERATING MOI	DES						
Receive mode							
DEVIATIONS FROM T	EST STANDARD						
None							
REQUIREMENTS							
	nna terminal at any frequency with	nin the range of measurements spe	ecified in 15.111 shall not exceed 2.0 nanowat	ts (-57 dBm).			
RESULTS							
Pass							
SIGNATURE	SIGNATURE						
Rochy la Roling							
DESCRIPTION OF TES	ST						
5255111 -11511 OF 120		Conducted Spuriou	s Emissions 2 5GU- 50	2U-7			
Antenna Conducted Spurious Emissions - 2.5GHz - 5GHz							





Spurious Radiated Emissions

Revision 10/1/03

Justification

The individuals and/or the organization requesting the test provided the modes, configurations and settings available to evaluate. While scanning the radiated emissions, all of the EUT parameters listed below were investigated. This includes, but may not be limited to, antennas, tuned transmit frequency ranges, operating modes, and data rates.

Channels in Specified Band Investigated:

Various channels spread equally within the allowable band.

Operating Modes Investigated:

Typical

Other Settings Investigated:

Configured in 20 channel omni mode with maximum base station power confirguration.

Frequency Range Invest	igated		
Start Frequency	30 MHz	Stop Frequency	9 GHz

Software\Firmware Applied During Test					
Exercise software Standard Production Software Version N/A					
Description					
The system was tested using standard operating production software to exercise the functions of the device during the testing.					

Revision 10/1/03

EUT and Peripherals			
Description	Manufacturer	Model/Part Number	Serial Number
iDEN Radio Base Station	Radio Frame Networks, Inc.	MC Series System	Engineering Production Unit #1
Subset of MC Series System	Radio Frame Networks, Inc.	PDU	Unknown
Subset of MC Series System	Radio Frame Networks, Inc.	RF Shelf	Unknown
Subset of MC Series System	Radio Frame Networks, Inc.	Radio Blade Shelf	Unknown
Subset of MC Series System	Radio Frame Networks, Inc.	Base Interface Chassis (BIC)	Unknown
Subset of MC Series System	Radio Frame Networks, Inc.	Airlink Interface Chassis (AIC)	Unknown

Remote Equipment Outside of Test Setup Boundary						
Description Manufacturer Model/Part Number Serial Number						
Clock Source Motorola Unknown Unknown						
Equipment isolated from the	Equipment isolated from the EUT so as not to contribute to the measurement result is considered to be outside the test setup boundary					

Cables					
Cable Type	Shield	Length (m)	Ferrite	Connection 1	Connection 2
Clock Source	Yes	5.0	No	Base Interface Chassis (BIC)	Clock Source
DC Power	No	6	No	PDU	DC Power

Revision 10/1/03

Measurement Equipment								
Description	Manufacturer	Model	Identifier	Last Cal	Interval			
Spectrum Analyzer	Hewlett-Packard	8566B	AAL	12/23/2003	13 mo			
Antenna, Biconilog	EMCO	3141	AXE	12/03/2003	24 mo			
Antenna, Horn	EMCO	3115	AHC	09/07/2004	12 mo			
Pre-Amplifier	Amplifier Research	LN1000A	APS	02/05/2004	13 mo			
Pre-Amplifier	Miteq	AMF-4D-005180-24-10P	APJ	01/05/2004	13 mo			
High Pass Filter	Micro-Tronics	HPM50114	HFN	05/23/2004	13 mo			

Test Description

Requirement: Per 2.1053 and 90.691, the Field Strength of Spurious Radiation was measured in the farfield at an FCC Listed OATS up to 9 GHz. Spectrum analyzer, signal generator, and linearly polarized antennas were used to measure radiated harmonics and spurious emissions. The orientation of the EUT and measurement antenna were manipulated to maximize the level of emissions. The EUT was configured to transmit at the highest output power into a dummy load at low, mid, and high frequencies.

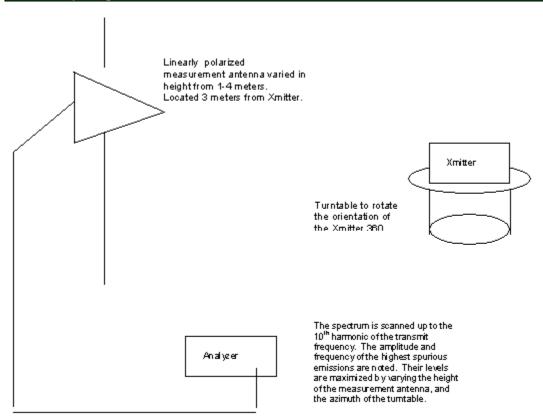
The substitution method as described in TIA/EIA-603 Section 2.2.12 was used for the highest spurious emissions. Preliminary measurements were made using the alternate limit at 3 meters of 87.5 dBuV/m.

Test Methodology: For licensed transmitters, the FCC references TIA/EIA-603 as the measurement procedure standard. TIA/EIA-603 Section 2.2.12 describes a method for measuring radiated spurious emissions that utilizes an antenna substitution method:

At an approved test site, the transmitter is place on a remotely controlled turntable, and the measurement antenna is placed 3 meters from the transmitter. The turntable azimuth is varied to maximize the level of spurious emissions. The height of the measurement antenna is also varied from 1 to 4 meters. The amplitude and frequency of the highest emissions are noted. The transmitter is then replaced with a ½ wave dipole that is successively tuned to each of the highest spurious emissions. A signal generator is connected to the dipole (horn antenna for frequencies above 1 GHz), and its output is adjusted to match the level previously noted for each frequency. The output of the signal generator is recorded, and by factoring in the cable loss to the dipole antenna and its gain; the power (dBm) into an ideal ½ wave dipole antenna is determined for each radiated spurious emission.

Bandwidths Used for Me	asurements			
Frequency Range (MHz)	Peak Data (kHz)	Quasi-Peak Data (kHz)	Average Data (kHz)	
0.01 - 0.15	1.0	0.2	0.2	
0.15 – 30.0	10.0	9.0	9.0	
30.0 – 1000	100.0	120.0	120.0	
Above 1000	1000.0	N/A	1000.0	
Measurements were made using the bandwidths and detectors specified. No video filter was used.				

Test Setup Diagram



Completed by:

NORTHWEST **Apparent Power Data Sheet EMC** EUT: MC Series Work Order: RAFN0042 Serial Number: Engineering Production Unit #1 Date: 10/20/04 Customer: Radioframe Networks, Inc. Temperature: 70 Attendees: Dean Bush Humidity: 45% Cust. Ref. No.: N/A Barometric Pressure 29.61 Tested by: Rod Peloquin Power: -48VDC Job Site: EV01 SPECIFICATIONS Specification: 47 CFR 90.691 and 2.1053 Method: TIA/EIA-603 Year: 2003 Year: 2001 SAMPLE CALCULATIONS Radiated Emissions: Field Strength = Measured Level + Antenna Factor + Cable Factor - Amplifier Gain + Distance Adjustment Factor + External Attenuation **EUT OPERATING MODES** 20 channels configured in sector omni mode radiating into dummy loads DEVIATIONS FROM TEST STANDARD RESULTS Pass Other Rolly be Reling 0.0 -10.0 -20.0 -30.0 -40.0 -50.0 -60.0 -70.0 -80.0 1000.000 10000.000 MHz Compared to Height Polarity EIRP EIRP Spec. Limit Freq Azimuth Detector Spec. (degrees) (meters) (Watts) (dBm) (dBm) (dB) (MHz) 1716.048 156.0 1.2 V-Horn 0.0000 -41.6 -13.0 -28.6 1711.102 156.0 V-Horn 0.0000 -41.9 -13.0 -28.9 1716.048 161.0 1.3 H-Horn PΚ 0.0000 -44.7 -13.0 -31.7 1721.000 V-Horn -44.8 48.0 1.1 0.0000 -13.0 -31.8 1721.000 230.0 H-Horn PΚ 0.0000 -46.0 -13.0 -33.0 1.3 PΚ -33.3 1711.102 0.0000 -46.3 -13.0 91.0 1.3 H-Horn 1725.947 -33.6 PΚ 0.0000 -46.6 103.0 1.1 V-Horn -13.0 1706.148 103.0 1.7 H-Horn PΚ 0.0000 -48.0 -13.0 -35.0 1706.148 152.0 2.8 V-Horn PΚ 0.0000 -48.2 -13.0 -35.2 1725.947 242.0 1.5 H-Horn 0.0000 -49.1 -13.0 -36.1

V-Horn

H-Horn

0.0000

0.0000

-51.8

-52.9

-13.0

-13.0

-38.8

-39.9

1733.371

1733.371

163.0

180.0

1.2

1.2

	RTHWEST MC	Ap	pare	nt Po	ower	Dat	a Sh	eet			REV df4.3 09/20/2004
		MC Series							Work Order:		2
Se		Engineering Production Unit #1								10/20/04	
		Radioframe Networks, Inc. Dean Bush						1	emperature: Humidity:		
C	ust. Ref. No.							Barome	tric Pressure		
		Rod Peloquin			Power:	-48VDC		24.00	Job Site:		
	PECIFICAT										
S		47 CFR 90.691 and 2.1053							Year:		
SAMDI	Method E CALCUL	TIA/EIA-603							Year:	2001	
		: Field Strength = Measured Level + Antenr	a Factor + Ca	ble Factor - Am	nplifier Gain +	Distance Adiu	stment Factor	+ External Att	enuation		
		Adjusted Level = Measured Level + Trans									
СОММЕ	ENTS										
EUT OF	PERATING	MODES									
20 chann	els configured	I in sector omni mode radiating into dum	my loads								
DEVIAT No deviat		M TEST STANDARD									
RESUL										Run #	
Pass											2
Other							10	, -	0		
							Hocking	Le Re	leng		
							0				
							-	Test	ted By:		•
	0.0										_
	40.0										
	-10.0										
	-20.0										_
	-30.0										
_											
dBm	-40.0										
쁑											
	-50.0										_
	•										
	-60.0										
	00.0										
	-70.0										_
	-80.0										
		<u> </u>								100	000 000
	1000.00	J								100	000.000
					MHz						
		1 1									Compared to
	Freq	Azimuth	Height			Polarity	Detector	EIRP	EIRP	Spec. Limit	Spec.
	MHz)	(degrees)	(meters)					(Watts)	(dBm)	(dBm)	(dB)
	1000.004					V-Horn	PK	0.0000		-13.0	-36.5
	1000.004	201.0	1.3			H-Horn	PK	0.0000	54.6	-13.0	-41.0

NORTHWEST EMC	Ар	parent Pow	ver Data Sh	eet	REV df4.3 09/20/2004
	T: MC Series			Work Order	RAFN0042
	er: Engineering Production Unit #1				10/20/04
	r: Radioframe Networks, Inc.			Temperature:	
	s: Dean Bush			Humidity:	
Cust. Ref. No				Barometric Pressure	
	y: Rod Peloquin	Р	ower: -48VDC	Job Site:	
TEST SPECIFICA					
	n: 47 CFR 90.691 and 2.1053			Year:	2003
	d: TIA/EIA-603				2001
SAMPLE CALCU					
Radiated Emission	ns: Field Strength = Measured Level + Antenna	a Factor + Cable Factor - Amplifier	Gain + Distance Adjustment Facto	r + External Attenuation	
Conducted Emission	ns: Adjusted Level = Measured Level + Transd	ucer Factor + Cable Attenuation Fa	ctor + External Attenuator		
EUT OPERATING 20 channels configure	i MODES ed in sector omni mode radiating into dumi	ny loads			
No deviations. RESULTS	DM TEST STANDARD				Run#
Pass					3
Other					
			Rocky	Tested By:	
0.0					
-10.0					
-20.0					
-30.0					
-40.0 					
-50.0		•			
-60.0		*			
-70.0					
90.0					
-80.0 <u> </u>	0	100.0 M F			1000.000
Freq (MHz)	Azimuth (degrees)	Height (meters)	Polarity Detector	EIRP EIRP (Watts) (dBm)	Spec. Limit Spec. (dBn) Compared to
90.00 90.00		1.0 1.6	V-Bilog PK H-Bilog PK	0.0000 -53.9 0.0000 -59.0	



