Question #1: The radiated emissions test results in section 3.6 of the revised report were taken at 10 meters, and compared to the 3 meter FCC limits. Please retest the radiated spurious emissions at a distance of 3 meters as required by ANSI C63.4, and show the limits in section 15.209.

Answer: The administrative section 3.5 had a typographical error in the emission limits column. The limit is 3M field and not 10M Field. The typographical error has been corrected and the data in 3.6 is reverified to ascertain that the limits are accurate at 3M Field distance.

Open Field Radiated Emissions Per FCC Part 15 SubPart B

3.5. Administrative Details

Test Date(s)	April 11, 2001
Emission Limits	Class B
Distance	3M Field
Test Technician(s)	O'Lanre Owoborode
Antenna Used	Biconical Antenna, model # EMCO 3104, S/N 3459 and Log Periodic Antenna, model # EMCO 3146, S/N 2075 (calibrated 01/19/2001, next calibration due date is 01/19/2002)

3.6. Test Results

The table below shows a summary of the highest amplitudes of the radiated emissions from the equipment under test at various antenna heights, antenna polarization, and EUT orientations.

Indicated Frequency MHz	Amplitude dBuV/M	Antenna dB	Cable dB	Correction Amplitude dBuV/M	T/Tab Angle Degree	Height M	Antenna Polarization	FCC 15 Limit dBuV/M	Class B Margin dB
49.16	11.0	7.7	2.7	21.4	180	1.0	VB	40.0	-18.6
62.05	11.8	8.3	2.9	23.0	0	1.0	VB	40.0	-17.0
65.40	11.0	7.9	2.9	21.8	0	1.0	VB	40.0	-18.2
66.50	13.6	7.5	2.9	24.0	0	1.0	VB	40.0	-16.0
75.90	21.0	4.1	3.2	28.3	315	1.0	VB	40.0	-11.7
75.90	13.7	4.1	3.2	21.0	180	2.0	HB	40.0	-19.0
78.05	13.2	3.7	3.2	20.1	45	2.5	HB	40.0	-19.9
85.07	9.0	3.9	3.3	16.2	45	1.0	VB	40.0	-23.8
132.00	6.0	10.2	4.2	20.4	0	1.0	VB	43.0	-22.6
199.96	5.0	12.3	5.2	22.5	135	1.0	HB	43.0	-20.5
200.00	14.3	9.2	5.2	28.7	135	2.0	HL	43.0	-14.3
204.00	12.3	9.3	5.3	26.9	135	1.0	VL	43.0	-16.1
286.30	9.7	12.6	6.6	28.9	180	1.0	VL	46.0	-17.1
286.40	13.0	12.6	6.6	32.2	180	2.0	HL	46.0	-13.8
333.30	6.7	12.5	7.4	26.6	180	1.0	HL	46.0	-19.4

747.50	4.5	18.8	12.2	35.5	0	1.0	VL	46.0	-10.5

No emissions of significant levels were observed between 30 MHz and 1000MHz. There were no significant emissions above 1GHz.

Conclusion

The Condor / Raven Meter meets the requirements of the test reference for Open Field Radiated Emissions.

Question #2 The radiated emissions test results in section 4.5 of the revised report show the harmonic emissions listed as MHZ when actually it appears that they should be in GHz. Also, the FCC limits are refereed to as "Class C", which is incorrect. Please clarify and resend the data table.

Answer: The administrative section 4.5 had a typographical error in the emission limits column. The limit is SubPart C and not Class B. The typographical error has been corrected.

Fundamental Harmonic & Spurious Emissions of the LAN (NCI) module
Per FCC Part 2 Section 47 CFR §2.1053 & Part 15 Section 47 CFR §15.209

4.4. Administrative Details

Test Date(s)	April 12-13, 2001
Emission Limits	SubPart C
Test Technician(s)	O'Lanre Owoborode

4.5. Test Results

The table below shows a summary of the highest amplitudes of the radiated emissions from the equipment under test at various antenna heights, antenna polarizations, and EUT orientations.

Indicated Frequency GHz	Amplitude dBuV/M	Antenna dB	Cable dB	Corrected Amplitude dBuV/M	Height M	Antenna Polarization	FCC 15 Limit dBuV/M	Margin dB
1.580	26.4	16.1	2.00	44.5	1.0	VB	54.0	-9.50
2.379	10.5	23.3	4.73	38.53	1.0	VB	54.0	-15.47
3.168	10.2	25.5	5.16	40.86	1.0	VL	54.0	-13.14
3.960	5.3	26.4	5.43	37.13	1.0	HL	54.0	-16.87
4.752	2.7	28.2	5.50	36.40	1.0	VL	54.0	-17.60
5.546	3.2	28.8	6.74	38.74	1.0	VH	54.0	-15.26
6.337	4.8	32.9	8.63	46.33	1.0	VH	54.0	-7.67
7.131	2.1	33.1	9.31	44.51	1.0	VH	54.0	-9.49
7.923	1.8	33.6	10.8	46.20	1.0	VH	54.0	-7.80

No emissions of significant levels were observed.

Conclusion

The Condor / Raven Meter meets the requirements of the test reference for Harmonics and Spurious Emissions.

Question #3 Section 8 gives the field strength measurement for the fundamental frequency at 792.3MHz, equal to 60dBuV/m. This is failing the FCC 15.209 limit of 46dBuV/m in that frequency range. Please explain how the device complies with section 15.209, when the report is showing non-compliant data.

Answer: The data is re-verified and the results are contained below:

Test: RF Power Output Radiated
Specification: 47 CFR 2.1046(a)
Guide: EIA/IS-19-B-1988 & TIA/EIA/IS-137-A-1996

Radiated Measurement Procedure

The EUT was placed on an open-field site and its radiated field strength at a known distance was measured by means of a spectrum analyzer. Data packets were transmitted numerous times, while the receiving antenna placed 1 meter from the transmit antenna captured the signal power. Equivalent loading was calculated from the equation.

$P_t = ((E \times R)^2 / 49.2)$ watts, where R = 1m.

E = Signal amplitude in v/m
Measurement accuracy is $\pm$1.5dB

Frequency MHz	dBµV/m	Corr. Factor dBµV/m	Corr. Amp. dBµV/m	µV/m @ 1m	ERP Watts
792.3	29.2	20.8	50.0	316	2.03nW

$50dB\mu V/M = Log^{-1}(50/20)$

$50dB\mu V/M = 316\mu V/M$

$P = (E \times R)^2 / 49.2$

$= (316 \times 1)^2 / 49.2$

$= 2.03nWatt$

RF Safety Exposure per FCC Requirement

The Maximum Permissible Exposure (MPE) distance per ANSI C95.1 table 2 for uncontrolled environment is

f (MHz) / 1500 [mW / cm^2]. The numeric value of the gain for the antenna is 2(3dBi). Therefore power density is:

$2.03 \times 10^{-9} \times 2.0 / (4\pi r^2) = (792 / 1500) \times 10$

$r = 2.03 \times 10^{-9} = 5.28 (2\pi r^2)$

$[(2.03 \times 10^{-9}) / 2\pi \times 5.28)]^{½}$

r = 0.00078cm

Therefore, the maximum calculated MPE distance r is 8.1cm. The installation instructions shall indicate that at least 2.00078cm (0.00078 + 2 margin) separation shall be provided between the antenna and the people.

Additional Revisions made to the report

Part 5
Maximum Field Strength for Fundamental
Per FCC Part 15 Section 47 CFR §15.209

5.1. EUT Configuration

The Condor/Raven Meter was set up in accordance with the suggested configuration given in FCC Measurement Procedure ANSI C63.4-1992. The measurement instrumentation used was a Hewlett Packard 8569B Spectrum Analyzer with detector and bandwidth parameters as stipulated in C63.4-1992.

5.2. Test Procedure

The Condor/Raven Meter was placed on the test table. The EUT was configured for maximum response by transmitting continuously. Signal was monitored with a HP 8566B Spectrum Analyzer, using the EMCO Double-Ridged Waveguide Horn Antenna, model 3115. Unless stated otherwise, the antenna to EUT distance was 1 meter.

$\mathbf{E_{out}}$ = Measured value + antenna correction + cable correction –Amplifier Gain (if provided)

The plot in the next page shows that transmitted power 50dBuV is lower than the specified maximum limit of 54dBuV

39.2 – 10(DF) + 2.8 (CL) + 18 (AF) = 50dBuV

Legends

DF Distance Factor
CL Cable Loss
AF Antenna Factor

Section 6. Dwell Time Test Per FCC Part 15 Section 47 CFR §15.233 is cancelled as it is no longer applicable