I. General Information

PRODUCT TESTED:	Ultra Max Advanced Digital System FCC ID: BVCUMADSNE	
TEST DATE:	April 1st, 2004	
SUMMARY OF RESULTS:		
47 CFR 15.209	RADIATED EMISSIONS	PASS

1.1 Test Methodology

This purpose of this document is to report the parameter effected by adding the Wide Exit Loop System antenna [AMS-3010] to the antennas used by the Ultra Max Advanced Digital System, FCC ID: BVCUMADSNE, namely radiated emissions.

Radiated emission testing was performed according to the procedures in ANSI C63.4-1992 and the requirements of 15.31, 15.33, 15.35, and 15.209. Radiated emissions measurements below 30MHz were performed at a distance 15 meters and the results were extrapolated to the distance specified per 15.31 and 15.209 invoking the 2-point extrapolation method.

1.2 Permissive Change Description – Degradation of Data Originally Submitted

The AMS-3010 Wide Exit Loop is an alternate antenna that can be used with the Ultra Max Advanced Digital System, FCC ID: BVCUMADSNE.

The reason that this data is being submitted is due to the increase of the level of the harmonics due primarily to the increased size of the loop aperture. The data is reported in Section IV and a table comparing the new and submitted data is included for comparison.

II. Radiated Emissions

Radiated emissions data are presented in Section V "Data", Part B "Radiated Emissions". The product demonstrated compliance with the requirements of 15.209. Radiated emissions measurements were performed at 15 meters. Propagation loss was determined measuring the emissions at 15 and 30 meters and extrapolating the results to 300 meters as required.

Maximum radiation was determined by first assessing symmetry while applying incremental rotation of the turntable. The product exhibited semi-circular symmetry. Measurements were taken at radials of 22.5° throughout 180 degrees; the measurement antenna was rotated for maximum pickup about the vertical axis of the measurement antenna at each radial. The maximum emission was determined to be with the measurement loop antenna in the vertical polarization, parallel to the radiating loop of the pedestal.

III. LIST OF MEASURING EQUIPMENT

The equipment used for determining compliance of the Ultra Max system with the requirements of 15.209 is marked with an "X" in the first column of the table below.

	Model	Description	Vendor	Serial #
X	ALP -70	Loop Antenna	Electro Metrics	163
	3110B	Biconnical Antenna	Electro Metrics	1017
	3146	Log Periodic Antenna	EMCO	3909
	3825/2	Line Imp Stable Network	EMCO	1562
	3816/2NM	Line Imp Stable Network	EMCO	9703 1064
	6060B	Frequency Generator	Giga-tronics	5850202
	FM2000	Isotropic Field Monitor	Amplifier Research	15171
	FP2000	Isotropic Field Probe	Amplifier Research	15214
	888	Leveler	Amplifier Research	14998
	75A220	Low Band Amplifier	Amplifier Research	15208
	10W1000A	High Band Amplifier	Amplifier Research	15138
	PEFT Junior	EFT Generator	Haefely Trench	083 180-16
	PEFT Junior	Capacitive Cable Clamp	Haefely Trench	083-078-31
	NSG435	ESD Simulator	Schaffner	1197
	NSG431	ESD Simulator	Schaffner	1267
X	HP8591EM	EMC Analyzer	Hewlett - Packard	3649A01066
		Power Source	Pacific Instruments	

	F-2031	EM Injection Clamp	Fischer Cust. Comm.	30
	FCC-801-M3-16	Coupling Decoupling Nwk	Fischer Cust. Comm.	58
	FCC-801-M3-16	Coupling Decoupling Nwk	Fischer Cust. Comm.	59
	F-33-1	RF Current Probe	Fischer Cust. Comm.	304
	EM 7600	Transient Limiter	Electro-Metrics	187
	Roberts Ant	Tunable Dipole Set	Compliance Design	003282
	Roberts Ant	Tunable Dipole Set	Compliance Design	003283
	HP8594E	Spectrum Analyzer	Hewlett Packard	3246A00300
X	HP8447F Opt 64	Dual Preamplifier	Hewlett Packard	2805A06072

IV. Data

Radiated Emissions

Project Name	ADS 216NE	Filename	ADS Radiated Emissions
EUT Name	AMS 3010	Serial Number	
Engineer	Stanley Strzelec	Phone Number	
Date of Test	4/1/2004	Test Name	Radiated Emissions 47CFR15.209
Reg. Technician	Mac Elliott	Proj. Ldr	Mac Elliott

Freq	S.A.	Det	BW	Ant Fac	Filter	DCF	DCCF	Correct'd	FCC Limit
kHz	dBuA			dB		dB		dBuV/m	dBuV/m
58	65.5	pk	9kHz	62.3		-78.75	-17.86	31.2	32.3/300
116	37.8	pk	9kHz	56.7	1.9	-78.75	-17.86	-0.2	26.3/300
174	53.6	pk	9kHz	53.2	0.1	-78.75	-17.86	10.3	22.8/300
232	29.6	pk	9kHz	50.6	0.5	-78.75	-17.86	-15.9	20.3/300
290	44.8	pk	9kHz	48.7	0.4	-78.75	-17.86	-2.7	18.4/300
348	21.1	pk	9kHz	47.3	0.4	-78.75	-17.86	-27.8	16.8/300
406	30.7	pk	9kHz	46.1	0.4	-78.75	-17.86	-19.4	15.4/300
464	13.3	pk	9kHz	45.2	0.2	-78.75	-17.86	-37.9	14.3/300
522	22.6	pk	9kHz	44.4	0.2	-18.22	-17.86	31.1	33.3/30
580	10.8	qp	9kHz	43.6	0.2	-18.22	-17.86	18.5	32.3/30
58/15	max	pk	9k		67.0				
58/30	max	pk	9k		48.8				

Part 3 Calculation of Distance Correction Factor

Dist_Corr_Factor [DCF (x)] = 20 * P log(Test Dist / X) = 20 * 3.02 log (15 / x)
DCF(300) = -78.75
DCF(30) = -18.22

Where P is the roll-off exponent . P is found as follows:
P = (Level(at Distance 1) - Level(at Distance 2)) / 20 log (Distance 2 / Distance 1)
=(67.0-48.8)/(20*log(30/15))
= 3.02

12.8
TX on time: ms

TX total time: 100 see fcc 15.35 - TX On Time / Total Time taken over 100 ms interval – 9 cycles – 1 blanking interval
Duty Cycle Correction Factor [DCCF] = 20*log (12.8/100ms)
= -17.9

10* 18 loop 2 ferrites opposing [normal config] - 16 A left ferrite / 15 A right ferrite - 4.5Apk loop
120vac 60hz

Difference from Data Originally Submitted

Frequency	AMS 3010	Original Filing	Change (dB)
58	31.2	29	**2.2**
116	-0.2	-23.1	**22.9**
174	10.3	-15.4	**25.7**
232	-15.9	-32.6	**16.7**
290	-2.7	-27.4	**24.7**
348	-27.8	-45.3	**17.5**
406	-19.4	-39.7	**20.3**
464	-37.9	-52.7	**14.8**
522	31.1	4.2	**26.9**
580	18.5	----------	**N/A**