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FCC ID: BBOESD9201

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Equipment List

Used?	Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
X	3-Meter OATS	TEI	N/A	N/A	Listed 1/13/03	1/13/06
	3/10-Meter OATS	TEI	N/A	N/A	Listed 3/26/01	3/26/04
	Tan Tower Spectrum Analyzer	HP	8566B Opt 462	3138A07786 3144A20661	CAL 8/31/01	8/31/03
	Tan Tower RF Preselector	HP	85685A	3221A01400	CAL 8/31/01	8/31/03
	Tan Tower Quasi-Peak Adapter	HP	85650A	3303A01690	CAL 8/31/01	8/31/03
	Tan Tower Preamplifier	HP	8449B-H02	3008A00372	CHAR 3/4/01	3/4/03
	Blue Tower Spectrum Analyzer	HP	8568B	2928A04729 2848A18049	CAL 4/15/03	4/15/05
	Blue Tower RF Preselector	HP	85685A	2926A00983	CAL 4/15/03	4/15/05
	Blue Tower Quasi-Peak Adapter	HP	85650A	2811A01279	CAL 4/15/03	4/15/05
X	Silver Tower Spectrum Analyzer	HP	8566B Opt 462	3552A22064 3638A08608	CAL 10/14/02	10/14/04
X	Silver Tower RF Preselector	HP	85685A	2620A00294	CAL 10/14/02	10/14/04
X	Silver Tower Quasi-Peak Adapter	HP	85650A	3303A01844	CAL 10/14/02	10/14/04
X	Silver Tower Preamplifier	HP	8449B	3008A01075	CHAR 1/28/02	1/28/04
	Biconnical Antenna	Electro-Metrics	BIA-25	1171	CAL 4/26/01	4/26/03
X	Biconnical Antenna	Eaton	94455-1	1096	CAL 10/1/01	10/1/03
	Biconnical Antenna	Eaton	94455-1	1057	CAL 3/18/03	3/18/05
	BiconiLog Antenna Log-Periodic Antenna	EMCO Electro-Metrics	3143 LPA-25	9409-1043 1122	CAL 10/2/01	10/2/03
	Log-Periodic Antenna	Electro-Metrics	EM-6950	632	CHAR 10/15/01	10/15/03
X	Log-Periodic Antenna	Electro-Metrics	LPA-30	409	CAL 3/4/03	3/4/05
	Log-Periodic Antenna	Eaton	96005	1243	CAL 5/8/03	5/8/05
	Dipole Antenna Kit	Electro-Metrics	TDA-30/1-4	152	CAL 3/21/01	3/21/04
	Dipole Antenna Kit	Electro-Metrics	TDA-30/1-4	153	CAL 9/26/02	9/26/05
	Double-Ridged Horn Antenna	Electro-Metrics	RG-180	2319	CAL 2/17/03	2/17/05
	Horn Antenna *(at 3 meters)	Electro-Metrics	EM-6961	6246	CAL 3/31/03	3/31/05
	Horn Antenna *(at	Electro-	EM-6961	6246	CAL	6/4/05

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10 meters) Horn Antenna	Metrics ATM	19-443-6R	None	6/4/03 No Cal Required	
Passive Loop Antenna	EMC Test Systems	EMCO 6512	9706-1211	CHAR 7/10/01	7/10/03
Harmonic Mixer with Horn Antenna	Oleson Microwave Labs	M08HW/A	F30425-1	CHAR 4/25/03	4/25/05
Harmonic Mixer with Horn Antenna	Oleson Microwave Labs	M12HW/A	E30425-1	CHAR 4/25/03	4/25/05
LISN	Electro- Metrics	ANS-25/2	2604	CAL 10/9/01	10/9/03
LISN	Electro- Metrics	EM-7820	2682	CAL 3/12/03	3/12/05
Termaline Wattmeter	Bird Electronic Corporation	611	16405	CAL 5/25/99	5/25/01
Termaline Wattmeter	Bird Electronic Corporation	6104	1926	CHAR 9/7/01	9/7/03
Oscilloscope	Tektronix	2230	300572	CAL 7/3/03	7/3/05
System One	Audio Precision	System One	SYS1-45868	CHAR 4/25/02	4/25/04
Temperature Chamber	Tenney Engineering	TTRC	11717-7	CHAR 1/22/02	1/22/04
AC Voltmeter	HP	400FL	2213A14499	CAL 10/9/01	10/9/03
AC Voltmeter	HP	400FL	2213A14261	CHAR 10/15/01	10/15/03
AC Voltmeter	HP	400FL	2213A14728	CHAR 10/15/01	10/15/03
Digital Multimeter	Fluke	77	35053830	CHAR 1/8/02	1/8/04
Digital Multimeter	Fluke	77	43850817	CHAR 1/8/02	1/8/04
Digital Multimeter	HP	E2377A	2927J05849	CHAR 1/8/02	1/8/04
Multimeter	Fluke	FLUKE-77-3	79510405	CHAR 9/26/01	9/26/03
Peak Power Meter	HP	8900C	2131A00545	CAL 7/2/03	7/2/05
Power Sensor	Agilent Technologies	84811A	2551A02705	CAL 7/2/03	7/2/05
Power Meter	HP	432A	1141A07655	CAL 4/15/03	4/15/05
Power Sensor	HP	478A	72129	CAL 4/15/03	4/15/05
Power Meter And Sensor	Bird	4421-107 & 4022	0166 & 0218	CAL 4/16/03	4/16/05
Digital Thermometer	Fluke	2166A	42032	CAL 1/16/02	1/16/04
Thermometer	Traulsen	SK-128		CHAR 1/22/02	1/22/04
Thermometer	Extech	4028	14871-2	CAL 3/7/03	3/7/05
X Hygro-Thermometer	Extech	445703	0602	CAL	10/4/04

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X	Coaxial Cable #65	General Cable Co.	E9917 RG233/U	Timco #65	CHAR	1/23/04
	Coaxial Cable #106	Unknown	Unknown	Timco #106	CHAR	1/23/04
	Injection Probe	Fischer Custom Communications	F-120-9A	270	CAL	6/1/03
	Power Line Coupling/Decoupling Network	Fischer Custom Communications	FCC-801-M2-16A	01048	CAL	8/29/03
	Power Line Coupling/Decoupling Network	Fischer Custom Communications	FCC-801-M3-16A	01060	CAL	8/29/03
	VHF/UHF Current Probe	Fischer Custom Communications	F-52	130	CAL	8/30/03
	Passive Impedance Adapter	Fischer Custom Communications	FCC-801-150-50-CDN	01117 & 01118	CAL	8/29/03
	Radiating Field Coil	Fischer Custom Communications	F-1000-4-8/9/10-L-1M	9859	CAL	10/15/00
	EMC Immunity Test System	Keytek	CEMASTER	9810210	CAL	2/1/04
	AC Power Source	California Instruments	1251RP	L05865		
	AC Power Source	California Instruments	PACS-1	X71484		
	Isotropic Field Probe	Amplifier Research	FP5000	22839		
	Isotropic Field Probe	Amplifier Research	FP5000	300103		
	Capacitor Clamp	Keytek	CM-CCL	9811359	No Cal Required	
	Amplifier	Amplifier Research	10W1000B	23117	No Cal Required	
	Field Monitor	Amplifier Research	FM5004	22288	No Cal Required	
	ELF Meter	F. W. Bell	4060	Not Serialized		

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TEST PROCEDURES

GENERAL: This report shall NOT be reproduced except in full without the written approval of TIMCO ENGINEERING, INC.

RADIATION INTERFERENCE: Testing was done in accordance with ANSI C63.4-2001. Section 15.35(b) specifies the use of an average detector in this band. In addition, the peak level of an emission shall not exceed the average limit by more than 20 dB using a minimum Resolution Bandwidth (RBW) of 1 MHz and minimum Video Bandwidth (VBW) OF 1 MHz. The following procedure is designed to determine if there are any spurious emissions from the local oscillator within the band of interest along with any additional spurious emissions caused by other circuitry within the device.

- 1) Determine the frequency of the peak emission:
Start Frequency 11.7 GHz
Stop Frequency 12.2 GHz
RBW equal to or greater than 1 MHz
VBW equal to or greater than 1 MHz
Detector Function Peak
Maximize the emissions with regards to device orientation, antenna polarization, and antenna height. Sweep the band using Max Hold for a minimum of 2 minutes. Record this frequency for measuring the peak emission. In addition record the frequency of other spurious emissions noted.
- 2) Determine the peak level of the emission:
Center Frequency Set to the frequency determined in Step 1 RBW Equal to or greater than 1 MHz VBW Equal to or greater than 1 MHz
Detector Function Peak Measure the value of the peak emission using Max Hold for a minimum of 2 minutes. This can be done at zero span or a frequency span where the analyzer does not show a "Measurement Uncalibrated" message. Record the peak value. If the peak measurement is compliant with the average limit an average measurement is not necessary. If the peak value exceeds the average limit by less than 20 dB proceed to Step 3.
- 3) Determine the average level of the emission:
Center Frequency Set to the frequency determined in Step 1
Span Zero
RBW Equal to or greater than 1 MHz
VBW Equal to or greater than 10 Hz
Detector Function Peak
This measurement uses video averaging and must be done in Linear mode. The analyzer Reference Level is adjusted so that a signal is clearly visible on the screen. Measure the value of the emission using Max Hold for a minimum of 2 minutes. Record this as the average value. Step 2 and Step 3 should be repeated for other spurious emissions.

The ambient temperature of the UUT was 80°F with a humidity of 70%.

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TEST PROCEDURES CONTINUED

FORMULA OF CONVERSION FACTORS: The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the Preselector was accounted for in the Spectrum Analyzer Meter Reading.

Example:

Freq (MHz) METER READING + ACF = FS
33 20 dBuV + 10.36 dB = 30.36 dBuV/m @ 3m

ANSI STANDARD C63.4-1992 10.1.7 MEASUREMENT PROCEDURES: The unit under test was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The table used for radiated measurements is capable of continuous rotation. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

APPLICANT: COBRA ELECTRONICS CORPORATION
FCC ID: BBOESD9201
NAME OF TEST: RADIATION INTERFERENCE
RULES PART NUMBER: 15.109
REQUIREMENTS:

30 to 88 MHz:	40.0 dBuV/M @ 3 METERS
88 to 216 MHz:	43.5 dBuV/M
216 to 960 MHz:	46.0 dBuV/M
ABOVE 960 MHz:	54.0 dBuV/M
11.7 to 12.2GHz:	54.0dBuV/m

TEST RESULTS: A search was made of the spectrum from 30 to 1000MHz and from 11.7 to 12.2GHz the measurements indicate that the unit DOES meet the FCC requirements. Measurements in the 11.7 to 12.2GHz band were made with a Standard Gain Horn. The measurements in the 11.7 to 12.2GHz band represent the ambient noise levels. The attached plots were made with peak detector with the analyzer in a maximum hold for 2 minutes.

TEST DATA:

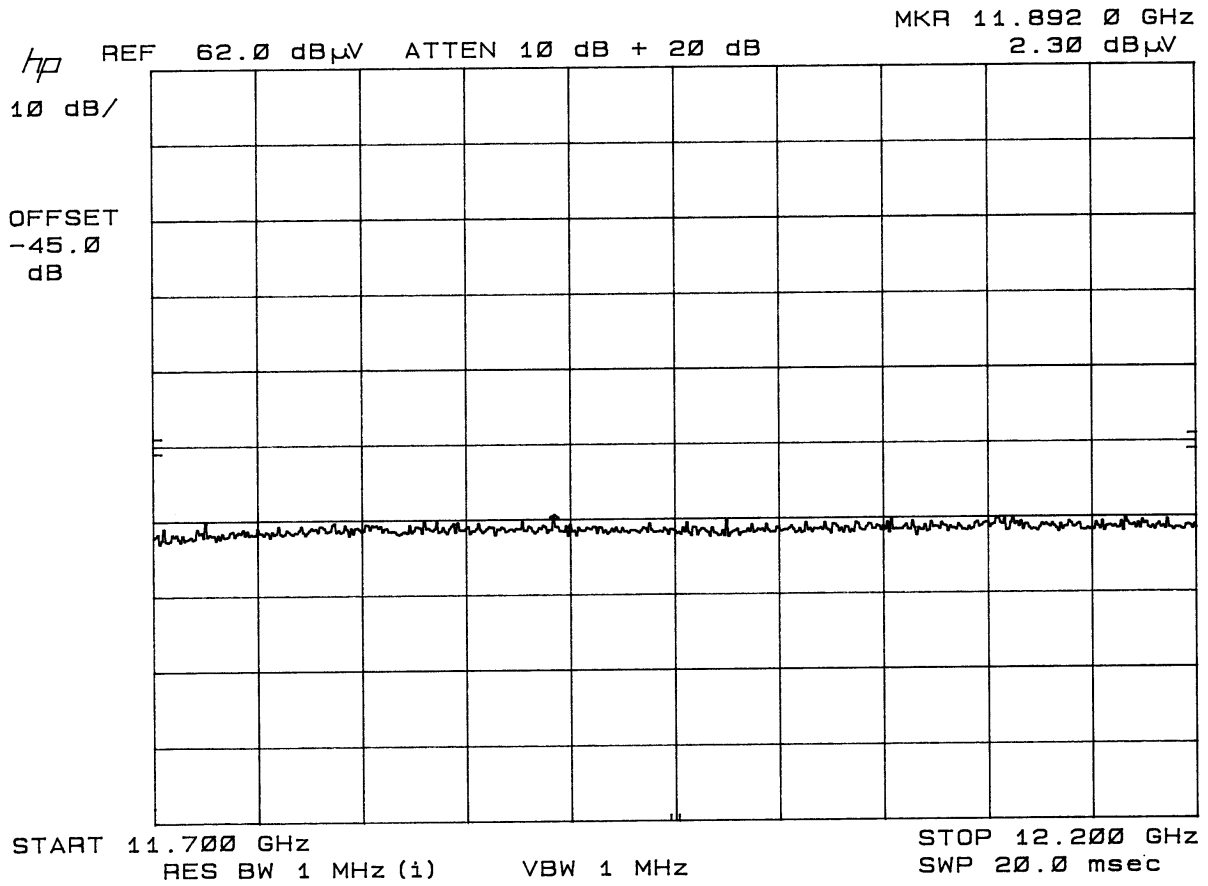
Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	ANT. POLARITY	Coax Loss dB	Correction Factor dB	Field Strength dBuV/m	Margin dB
10,500.0	11,725.00	1.0	H	9.96	29.80	40.76	13.24
10,500.0	11,725.00	1.9	V	9.96	29.80	41.66	12.34
10,500.0	11,866.00	1.8	V	10.11	29.80	41.71	12.29
10,500.0	11,866.00	2.9	H	10.11	29.80	42.81	11.19
10,500.0	11,892.00	1.3	H	10.14	29.80	41.24	12.76
10,500.0	11,892.00	2.3	V	10.14	29.80	42.24	11.76
10,500.0	12,054.00	1.3	H	10.30	29.70	41.30	12.70
10,500.0	12,054.00	1.9	V	10.30	29.70	41.90	12.10
10,500.0	12,112.00	2.0	V	10.35	29.70	42.05	11.95
10,500.0	12,112.00	2.6	H	10.35	29.70	42.65	11.35

* The EUT is operating on the following bands; 10.525GHz(X-Band), 24.150GHz(K-Band), 33.4-36.0GHz(KA Band)

SAMPLE CALCULATION: FSdBuV/m = MR (dBuV) + ACFdB.

PERFORMED BY: JOSEPH SCOGLIO **DATE:** JULY 22, 2002

VERTICAL LINE PLOT



HORIZONTAL LINE PLOT

