

# TIMCO ENGINEERING INC.

849 NW State Road 45

Newberry, Florida 32669

<http://www.timcoengr.com>

888.472.2424 F 352.472.2030 email: [sid@timcoengr.com](mailto:sid@timcoengr.com)



## Test Report

Product Name: RADAR DETECTOR

FCC ID: BBOXRS9400

Applicant:

**COBRA ELECTRONICS CORPORATION  
6500 WEST CORTLAND STREET  
CHICAGO, IL 60707**

**Date Receipt: DECEMBER 11, 2003**

**Date Tested: DECEMBER 29, 2003**

APPLICANT: COBRA ELECTRONICS CORPORATION

FCC ID: BBOXRS9400

REPORT #: C\COBRA\1633UT3\1633UT3TestReport.doc

COVER PAGE

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## Equipment List

<b>Device</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Serial Number</b>	<b>Cal/Char Date</b>	<b>Due Date</b>
<b>3/10-Meter OATS</b>	<b>TEI</b>	<b>N/A</b>	<b>N/A</b>	<b>Listed 3/26/01</b>	<b>3/26/04</b>
<b>3-Meter OATS</b>	<b>TEI</b>	<b>N/A</b>	<b>N/A</b>	<b>Listed 1/13/03</b>	<b>1/13/06</b>
<b>Biconnical Antenna</b>	<b>Eaton</b>	<b>94455-1</b>	<b>1057</b>	<b>CAL 3/18/03</b>	<b>3/18/05</b>
<b>Biconnical Antenna</b>	<b>Eaton</b>	<b>94455-1</b>	<b>1096</b>	<b>CAL 10/1/01</b>	<b>10/1/03</b>
<b>Biconnical Antenna</b>	<b>Electro- Metrics</b>	<b>BIA-25</b>	<b>1171</b>	<b>CAL 4/26/01</b>	<b>4/26/03</b>
<b>Log-Periodic Antenna</b>	<b>Eaton</b>	<b>96005</b>	<b>1243</b>	<b>CAL 5/8/03</b>	<b>5/8/05</b>

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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.

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**APPLICANT:** COBRA ELECTRONICS CORPORATION

**FCC ID:** BBOXRS9400

**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 12.2 GHz:	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	11,700.00	9.7	H	9.77	29.8	49.27	4.73
10,500.0	11,747.80	10.5	V	9.82	29.8	50.12	3.88
10,500.0	11,940.40	10.4	H	10.03	29.8	50.23	3.77
10,500.0	11,997.00	10.6	V	10.10	29.7	50.40	3.60
10,500.0	12,181.60	9.9	H	10.28	29.7	49.88	4.12
10,500.0	12,200.00	10.4	V	10.30	29.7	50.40	3.60

\* 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:** NAM NGUYEN

**DATE:** DECEMBER 29, 2003

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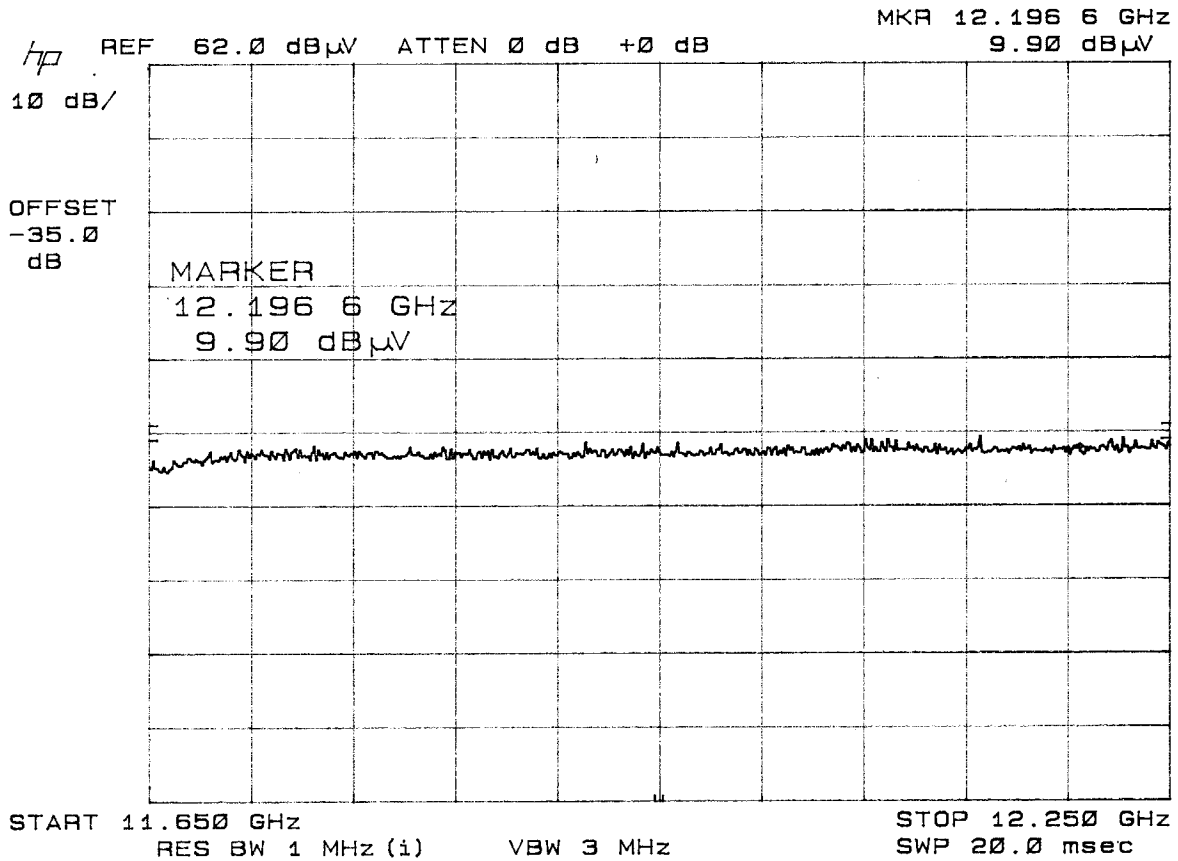
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## HORIZONTAL LINE PLOT



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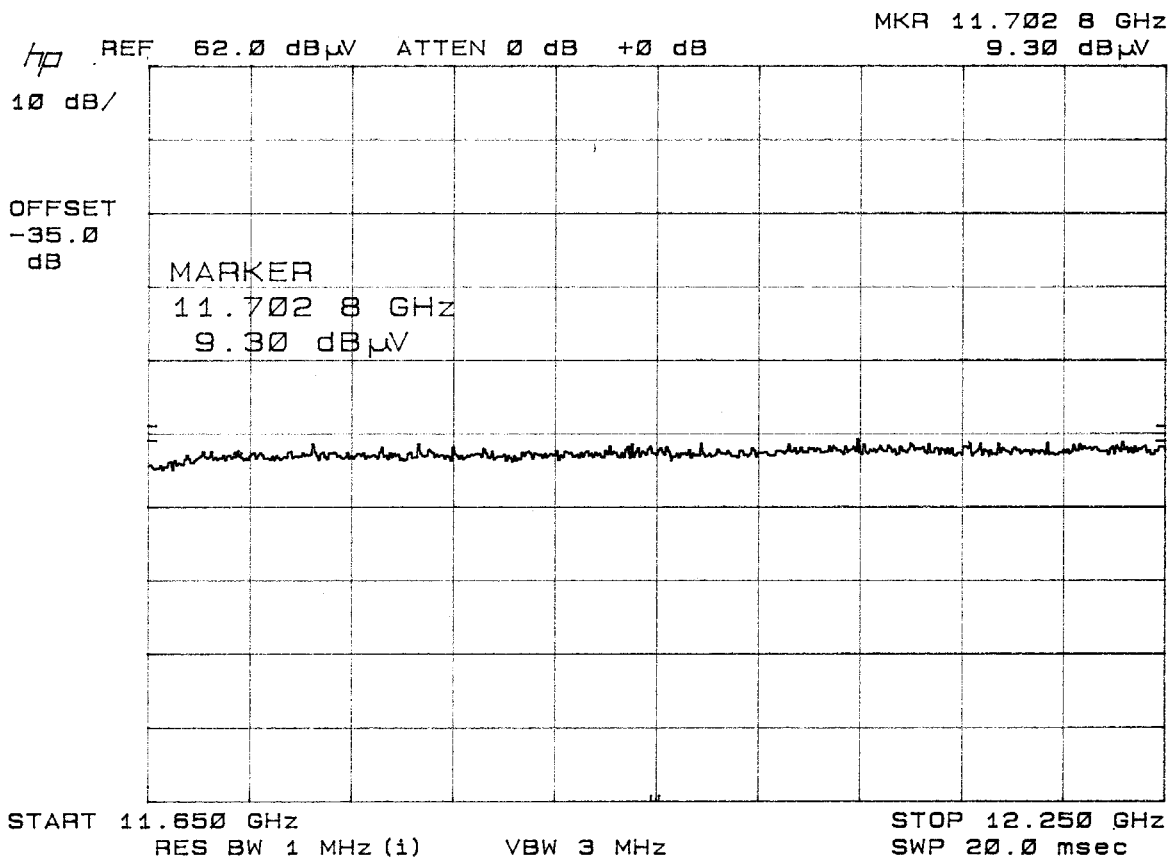
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## VERTICAL LINE PLOT



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