

**ITS** Intertek Testing Services

*Evaluation of Compliance with FCC-Specified Guidelines for  
Human Exposure to Radio Frequency Electromagnetic Fields*

on the

**4 Watts ERP RF CDPD Amplifier  
Model: AirBooster 350  
for  
Sierra Wireless, Inc.**

Date of Test: October 25, 1999

Job # J99027747

Total No. of Pages Contained in this Report: 8 + data pages

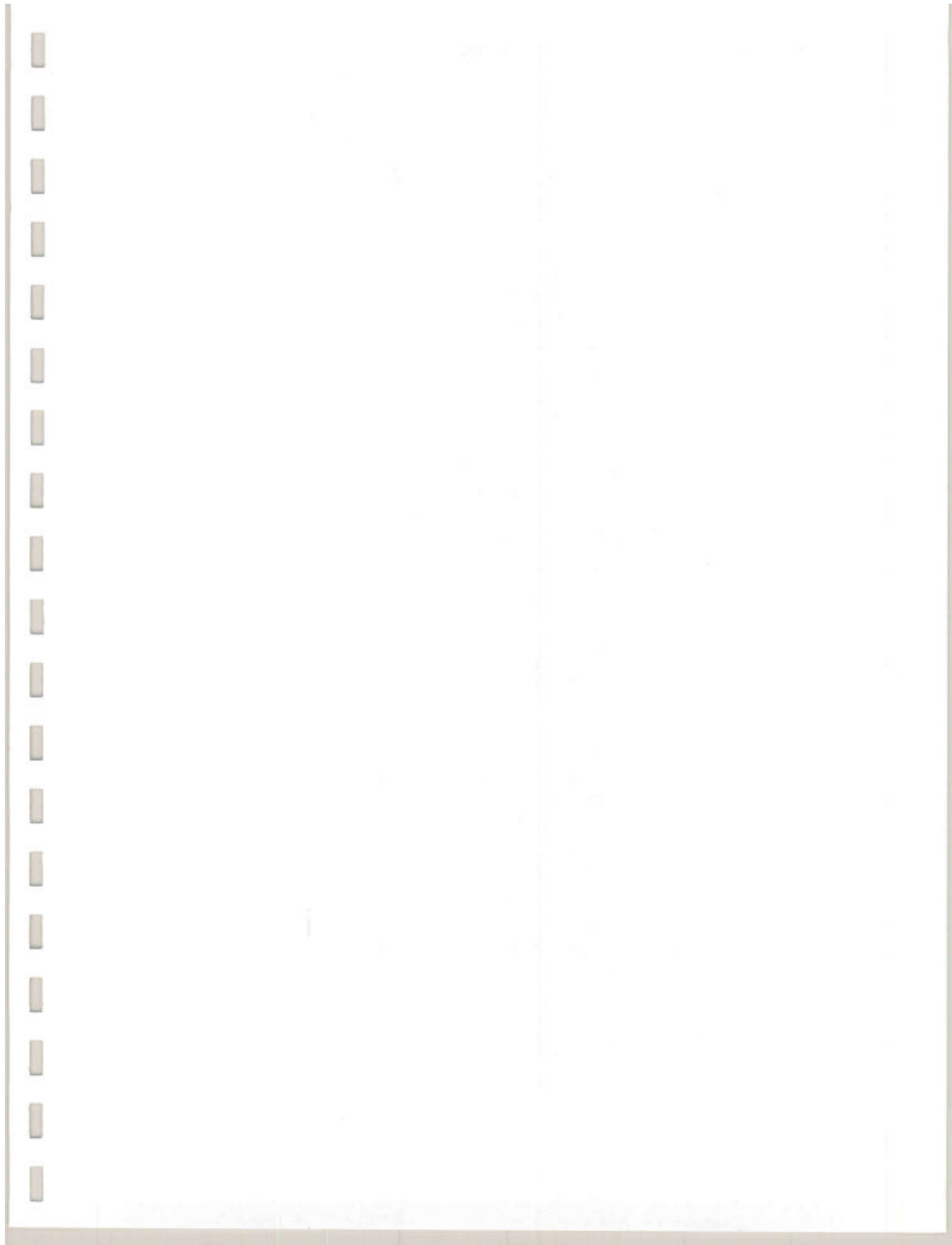
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FCC 2.1091 & ANSI 95.1-1992

**Intertek Testing Services NA Inc.**

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**VERIFICATION OF COMPLIANCE**  
**No. J99027747**

Verification is hereby issued to the named APPLICANT and is VALID ONLY for the equipment identified hereon for use under the rules and regulations listed below.

<b>Equipment Under Test:</b>	4 Watts ERP RF CDPD Amplifier
<b>Trade Name:</b>	Sierra Wireless
<b>Model No.:</b>	AirBooster 350
<b>Serial No.:</b>	Not Labeled
<b>Applicant:</b>	Sierra Wireless, Inc.
<b>Contact:</b>	Mr. Dominique Kwan
<b>Address:</b>	13575 Commerce Parkway, Suite 150 Richmond, BC V6V 2L1
<b>Tel. number:</b>	(604) 231-1181
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<b>Applicable Regulation:</b>	FCC 2.1091 & ANSI C95.1:1992
<b>Equipment Class:</b>	Uncontrolled Environments
<b>Date of Test:</b>	October 25, 1999

*We attest to the accuracy of this report:*



*Xi-Ming Yang*  
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Test Engineer

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## 1.0 Introduction

This report is designed to show compliance with the FCC Part 2.1091 Radio Frequency Radiation Exposure Evaluation for mobile and unlicensed devices. The test procedures and limits, as described in American National Standards Institute C95.1-1992, were employed. A description of the product and operating configuration, the various provisions of the rules, the methods for determining compliance, and a detailed summary of the results are included within this test report.

## 2.0 Description of Equipment

The Sierra Wireless, Inc. Model AirBooster is a 4 watts ERP RF CDPD amplifier with frequency range from 824 - 849 MHz.

The amplifier is used with the following antennas:

1. Larsen Model MM3 800 FME - magnetic mount 3.4 dBd gain
2. Antenna World Model CLR-877 magnetic mount 3 dBd gain

## 3.0 Test Summary

The CDPD Amplifier was tested by Intertek Testing Services as documented herein, and the energy emitted by the EUT was found to be below the recommended levels of Maximum Permissible Exposure for Uncontrolled Environments in FCC 1.1310 (ANSI C95.1: 1992).

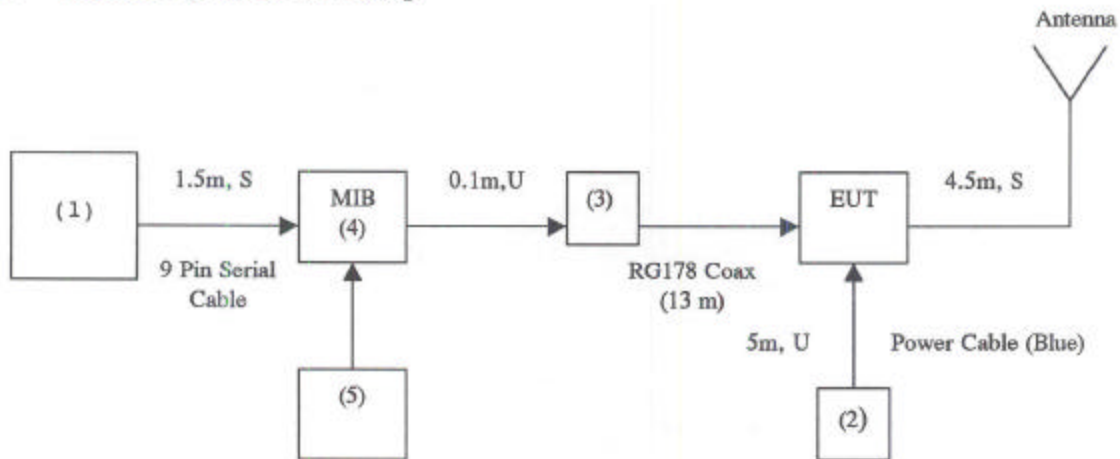
Therefore, in reference to the limits set forth in FCC 1.1310 use of the equipment is deemed to be safe with respect to human exposure to Radio Frequency Electromagnetic Fields, when used in a normal fashion.

4.0 System Test Configuration

4.1 Support Equipment

Item #	Description	Model No.	Serial No.	FCC ID
1	IBM Computer	ThinkPad	2600-50UAS00DVC	MLZ315
2	GW DC Power Supply	GPR-6030	N/A	N/A
3	Sierra Modem	SB300	206-00065973	N7N0EM2
4	Sierra Interface Test Band	M1E	N/A	N/A
5	AC Adaptor	NDIE1000L00	N/A	N/A

4.2 Block Diagram of Test Setup



\* = EUT  
 \*\* = No ferrites on video cable  
 S = Shielded;  
 U = Unshielded  
 F = With Ferrite

Sierra Wireless, Inc., CDPD Amplifier

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4.3 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it).

4.4 Software Exercise Program

No special software was used during the tests.

4.5 Mode of Operation During Test

Transmitting full power (4W).

4.6 Modifications Required for Compliance

The following modifications were installed during compliance testing in order to bring the product into compliance (Please note that this list does not include changes made specifically by Teledex Corporation prior to compliance testing):

No modifications were installed by Intertek Testing Services.

Sierra Wireless, Inc., CDPD Amplifier

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**5.0 Radiated Emissions****5.1 Radiated Emission Limits, FCC 1.1310**

The following exposure limits apply to equipment use in Uncontrolled Environments:

**Maximum Permissible Exposure for Uncontrolled Environments**

Frequency Range (MHZ)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) E-field, H-field (mW/cm <sup>2</sup> )	Averaging Time (Minutes)
0.3 - 1.34	614	1.63	*100	30
1.34 - 30	824/f	2.19/f	*180/f <sup>2</sup>	30
30 - 300	27.5	0.073	0.2	30
300 - 1500	-	-	f/1500	30
1500 - 100,000	-	-	1.0	30

\* = Plane-wave equivalent power density.

Dashes "-" are used to indicate that there is no limit under the guideline.



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## 5.2 Site Description and List of Test Equipment.

All tests were performed on Open Area Test Site.

Measurement equipment used for radiated emission compliance testing utilized some of the equipment on the following list:

Manufacturer	Equipment	Model Number	Calibration Due
Holaday	Field Strength Meter	HI-3004EX	5/17/00

## 5.3 Test Procedure

The test was performed at 836 MHz. The antenna was placed on a 0.8m wooden table on open site. The antenna was connected to the EUT. EUT output power was measured at RF output connector. EUT has 36.5 dBm power output.

The sensor of the field strength meter was moved around the antenna to obtain the maximum reading of the field strength meter. The measurements were performed at the distance 0.2m and 0.3m from the antenna.

## 5.4 Field Strength Calculation

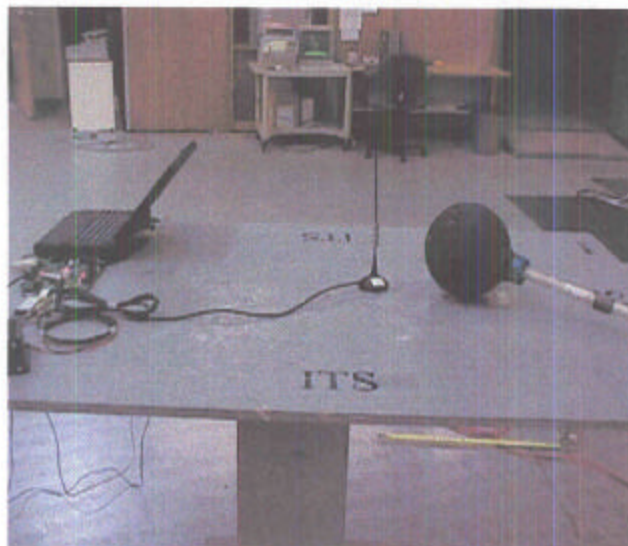
The field strength was measured directly from the meter. The power density (PD in  $W.m^2$ ) was calculated using the following formula:

$$Pd = E^2/120\pi$$

Where E is Field Strength in V/m

5.5 Configuration Photographs

**Radiated Emission**



## 5.6 Test Data

The results on the following page(s) were obtained when the device was tested in the condition described in section 4.

Amplifier Used with Larsen Antenna			
Test Distance m	Maximum Field Strength Reading V/m	Calculated Power Density mW/cm <sup>2</sup>	FCC Limit for Time- Averaging Interval of 30 min. mW/cm <sup>2</sup>
0.1	55	0.80	0.54
0.2	30	0.23	0.54
0.3	25	0.17	0.54
0.5	15	0.06	0.54
1.0	10	0.027	0.54
1.5	5.5	0.008	0.54

Amplifier Used with Antenna World Antenna			
Test Distance m	Maximum Field Strength Reading V/m	Calculated Power Density mW/cm <sup>2</sup>	FCC Limit for Time- Averaging Interval of 30 min. mW/cm <sup>2</sup>
0.1	55	0.80	0.54
0.2	30	0.23	0.54
0.3	25	0.17	0.54
0.5	15	0.06	0.54
1.0	10	0.027	0.54
1.5	5.5	0.008	0.54

Judgment: The EUT will pass FCC limit at a distance 0.2m or longer from EUT.

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**6.0 Miscellaneous Information or Other Comments**

None.