



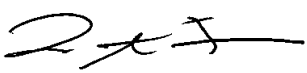
**The Bodine Company
FCC Part 15, Certification Application
FEBnet Node Spread Spectrum Transceiver**

**February 22, 2005
UST Project Number: 05-0069**



I certify that I am authorized to sign for the manufacturer and that all of the statements in this report and in the Exhibits attached hereto are true and correct to the best of my knowledge and belief:

UNITED STATES TECHNOLOGIES, INC. (AGENT RESPONSIBLE FOR TEST):

By: 

Name: Louis A. Feudi

Title: Operations Manager

Date: February 22, 2005

**The Bodine Company
236 Mt. Pleasant Road
Collierville, TN 38017**

By: _____

Name: _____

Title: _____

Date: _____

This report shall not be reproduced except in full. This report may be copied in part only with the prior written approval of U.S. Technologies. The results contained in this report are subject to the adequacy and representative character of the sample provided.

MEASUREMENT/TECHNICAL REPORT

COMPANY NAME: **The Bodine Company**

MODEL: **FEBnet Node Spread Spectrum Transceiver**

FCC ID: **SZW-FEBNET01**

DATE: **February 22, 2005**

This report concerns (check one): Original grant X
Class II change _____

Equipment type: **Spread Spectrum Transceiver**

Deferred grant requested per 47 CFR 0.457(d)(1)(ii)? yes _____ No X

If yes, defer until: _____
date

N.A. agrees to notify the Commission by N.A.
date

of the intended date of announcement of the product so that the grant can be issued on that date.

Report prepared by:

United States Technologies, Inc.
3505 Francis Circle
Alpharetta, GA 30004

Phone Number: (770) 740-0717
Fax Number: (770) 740-1508

TABLE OF CONTENTS

AGENCY AGREEMENT LETTER OF CONFIDENTIALITY

SECTION 1 GENERAL INFORMATION

- 1.1 Product Description
- 1.2 Related Submittal(s)

SECTION 2 TESTS AND MEASUREMENTS

- 2.1 Configuration of Tested EUT
- 2.2 Test Facility
- 2.3 Test Equipment
- 2.4 Modifications
- 2.5 Test Procedure and Results
- 2.6 Antenna Description
- 2.7 Peak Power (Bandedge Antenna Conducted at Antenna Terminal)
- 2.8 Antenna Conducted Spurious Emissions
- 2.9 Peak Radiated Spurious Emissions
- 2.10 Average Radiated Spurious Emissions
- 2.11 Minimum 20 dB Bandwidth
- 2.12 Number of Hopping Channels
- 2.13 Average Time of Occupancy per Channel
- 2.14 Power Line Conducted Emissions for Transmitter
- 2.15 Radiated Emissions for Digital Device & Receiver (47 CFR 15.109a)
- 2.16 Power Line Conducted Emissions for Digital Device and Receiver FCC Section 15.107
- 2.17 Channel Separation

SECTION 3 LABELING INFORMATION

SECTION 4 BLOCK DIAGRAM(S)/ SCHEMATIC(S)

SECTION 5 PHOTOGRAPHS

SECTION 6 THEORY OF OPERATION

SECTION 7 TUNE UP PROCEDURE

SECTION 8 USER'S MANUAL

SECTION 9 RF EXPOSURE INFO

LIST OF FIGURES AND TABLES

FIGURES

- 1) Test Configuration
- 2) Photograph(s) for Spurious and Conducted Emissions
- 3) Peak Output Power
- 4) Conducted Spurious Emissions
- 5) Peak Radiated Spurious Emissions
- 6) 20 dB Bandwidth
- 7) Number of Hopping Channels
- 8) Average Time of Occupancy
- 9) Channel Separation

TABLES

- 1) EUT and Peripherals
- 2) Test Instruments
- 3) Peak Power Output
- 4) Peak Radiated Spurious Emissions
- 5) Average Radiated Spurious Emissions
- 6) 20 dB Bandwidth
- 7) Number of Hopping Channels
- 8) Conducted Emissions
- 9) Radiated Emissions for Digital Device and Receiver
- 10) Channel Separation

SECTION 1

GENERAL INFORMATION

GENERAL INFORMATION

1.1 Product Description

The Equipment Under test is the, The Bodine Company's, FEBnet Node.

FEBnet Node is part of the FEBnet System. The FEBnet System provides communication with many fluorescent emergency ballasts to relay information such as test results and emergency ballast testing commands. The FEBnet Node converts RS-485 data to and from the wireless network. It serves as a communication intermediary between each emergency ballast and the rest of the FEBnet System.

1.2 Related Submittal(s)/Grant(s)

The EUT will be used with part of a system to send/receive data. The transceiver presented in this report will be used with other like transmitters.

The EUT is subject to the following authorizations:

- a) Certification as a transceiver
- b) Verification as a receiver and digital device

The information contained in this report is presented for the certification & verification authorization(s) for the EUT.

SECTION 2

TESTS AND MEASUREMENTS

TEST AND MEASUREMENTS

2.1 Configuration of Tested System

The sample was tested per ANSI C63.4, Methods of Measurement from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (1992). Conducted and radiated emissions data were taken with the test receiver or spectrum analyzer's resolution bandwidth adjusted to 9 kHz and 120 kHz, respectively. All measurements are peak unless stated otherwise. The video filter associated with the spectrum analyzer was off throughout the evaluation process. Interconnecting cables were manipulated as necessary to maximize emissions. Block diagrams of the tested systems are shown in Figure 1. Test configuration photographs for spurious and fundamental emissions are shown in Figure 2a -b.

The sample used for testing was received by U.S. Technologies on February 8, 2005 in good condition.

2.2 Test Facility

Testing was performed at US Tech's measurement facility at 3505 Francis Circle, Alpharetta, GA. This site has been fully described and submitted to the FCC, and accepted in their letter marked 31040/SIT. Additionally this site has also been fully described and submitted to Industry Canada (IC), and has been approved under file number IC2982.

2.3 Test Equipment

Table 2 describes test equipment used to evaluate this product.

2.4 Modifications

No modifications were made by US Tech, to bring the EUT into compliance with FCC Part 15, Class B Limits for the transmitter portion of the EUT or the Class B Digital Device Requirements.

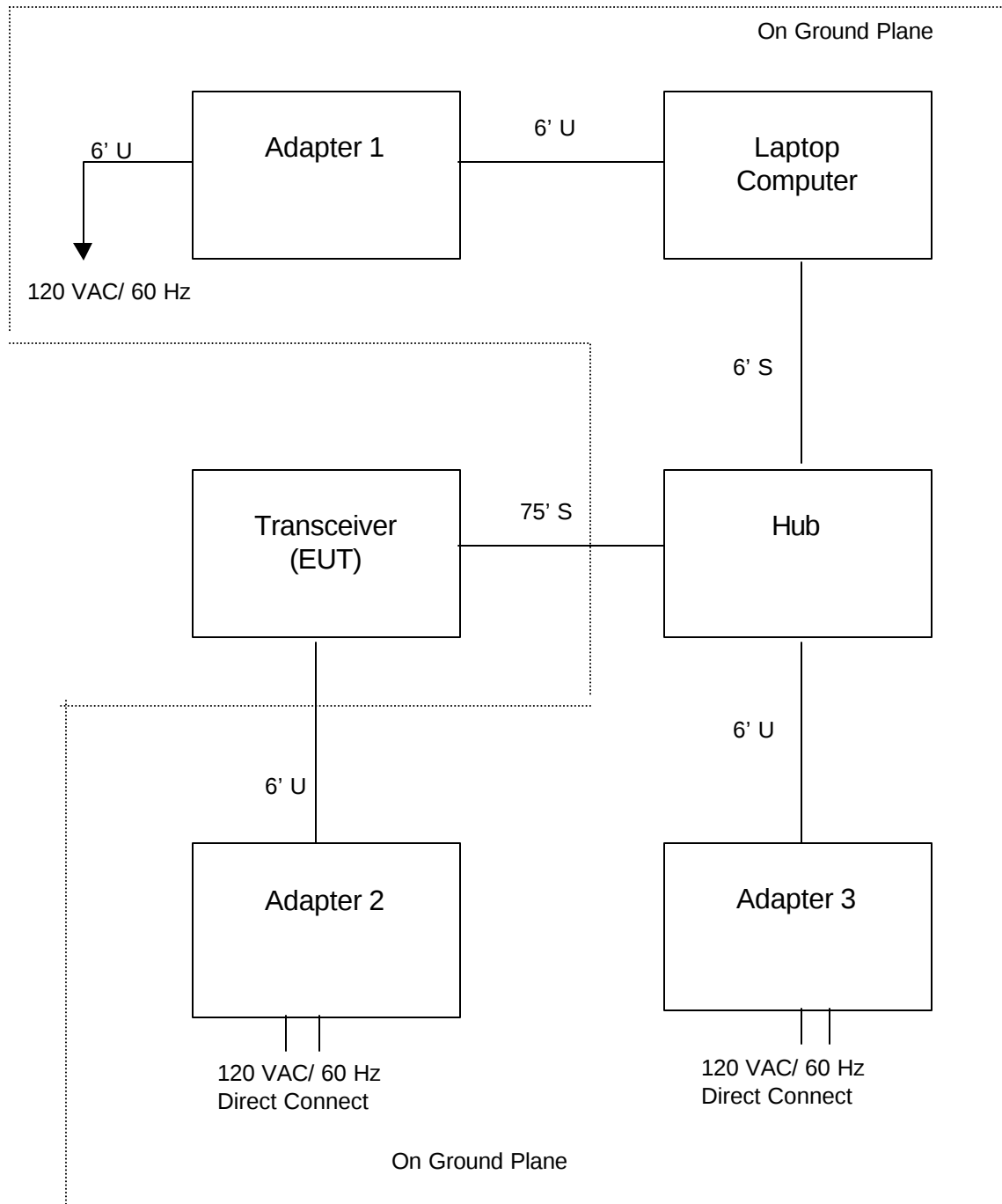
FIGURE 1**TEST CONFIGURATION (Radiated Emissions)**

TABLE 1
EUT and Peripherals

PERIPHERAL MANU.	MODEL NUMBER	SERIAL NUMBER	FCC ID:	CABLES P/D
Transceiver (EUT) The Bodine Company	FEBnet Node	02097184	None	75' S 6' U
Hub The Bodine Company	None	None	None	None
AC Adapter 1 Gateway	ADP-50SB	ALS00340061	None	6' U 6' U Power Cord 120 VAC/ 60 Hz
Laptop Gateway	Solo 3350	BCB21250139	None	6' S
AC Adapter 2 Sino-America	SA106A-0512-6	None	None	Direct Connect 120 VAC/ 60 Hz
AC Adapter 3 Sino-America	SA106A-0512-6	None	None	6' U Direct Connect 120 VAC/ 60 Hz

Detail of I/O Cables Attached to EUT

DESCRIPTION OF CABLE	DETAILS OF CABLE			CABLE LENGTH
Power	Manufacturer and Part Number			6'
	Shield Type	Shield Termination	Type of Backshell	
	N/A	N/A	N/A	
Terminal	Manufacturer and Part Number			75'
	Shield Type	Shield Termination	Type of Backshell	
	F	360	N/A	

TABLE 2
TEST INSTRUMENTS

EQUIPMENT	MODEL NUMBER	MANUFACTURER	SERIAL NUMBER	DATE OF LAST CALIBRATION
SPECTRUM ANALYZER	8558B	HEWLETT-PACKARD	2332A10055	2/19/04
SPECTRUM ANALYZER	8593E	HEWLETT-PACKARD	3205A00124	11/29/04
SIGNAL GENERATOR	8648B	HEWLETT-PACKARD	3642U01679	10/13/03
RF PREAMP	8447D	HEWLETT-PACKARD	2944A06291	4/29/04
BICONICAL ANTENNA	3110B	EMCO	9307-1431	5/18/04
LOG PERIODIC	3146	EMCO	3110-3236	6/30/04
LISN (x 2) 8028-50-TS24-BNC	8028	SOLAR ELE.	910494 & 910495	1/20/04
HORN ANTENNA	SAS-571	A. H. SYSTEMS	605	04/26/04
PREAMP	8449B	HEWLETT PACKARD	3008A00480	06/23/04
CALCULATION PROGRAM	N/A	N/A	Ver. 6.0	N/A

2.6 Antenna Description (Paragraph 15.203)

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

The Model The Bodine Company FEBnet Node Spread Spectrum Transceiver incorporates a Hirose H.FL connector and will be used with approved antennas only. This device will currently be used with the following antenna:

1. Nearson, P/N S467FL-L-MM-915S, Range: 902-928 MHz, 50 Ohm impedance, 2.0 dBi Gain, Omni, Vertical Polarization, Half-Wave Dipole

2.7 Peak power within the band 902 – 928 MHz per FCC Section 15.247(b)

Peak power within the band 902 – 928 MHz has been measured with a spectrum analyzer by connecting the spectrum analyzer directly via a short cable to the antenna output terminals or across the antenna leads on the PCB as specified by the manufacturer. The spectrum analyzer was set for a 50 Ω impedance with the VBW $\geq$ RBW 6 dB bandwidth. The results of the measurements are given in Table 3 and Figure 3a1 through Figure 3a3.

Fundamental Frequencies were measured at Low Channel, Mid Channel, High Channel.

TABLE 3
PEAK POWER OUTPUT

Frequency of Fundamental (MHz)	Measurement (dBm)*	Measurement (mW)*	FCC Limit (Watt)
903.120	11.17	13.09	1.0
910.265	9.95	9.89	1.0
917.795	10.05	10.12	1.0

Power = Antilog (dBm/10) = Antilog (11.17/10) = Antilog 1.117 = 13.09

*** Measurement includes 0.1 dB for cable loss**

Test Date: February 15, 2005

Tester

Signature:  **Name:** David Blethen

Figure 3a1.
Peak Power per FCC Section 15.247(b) (Low Channel)

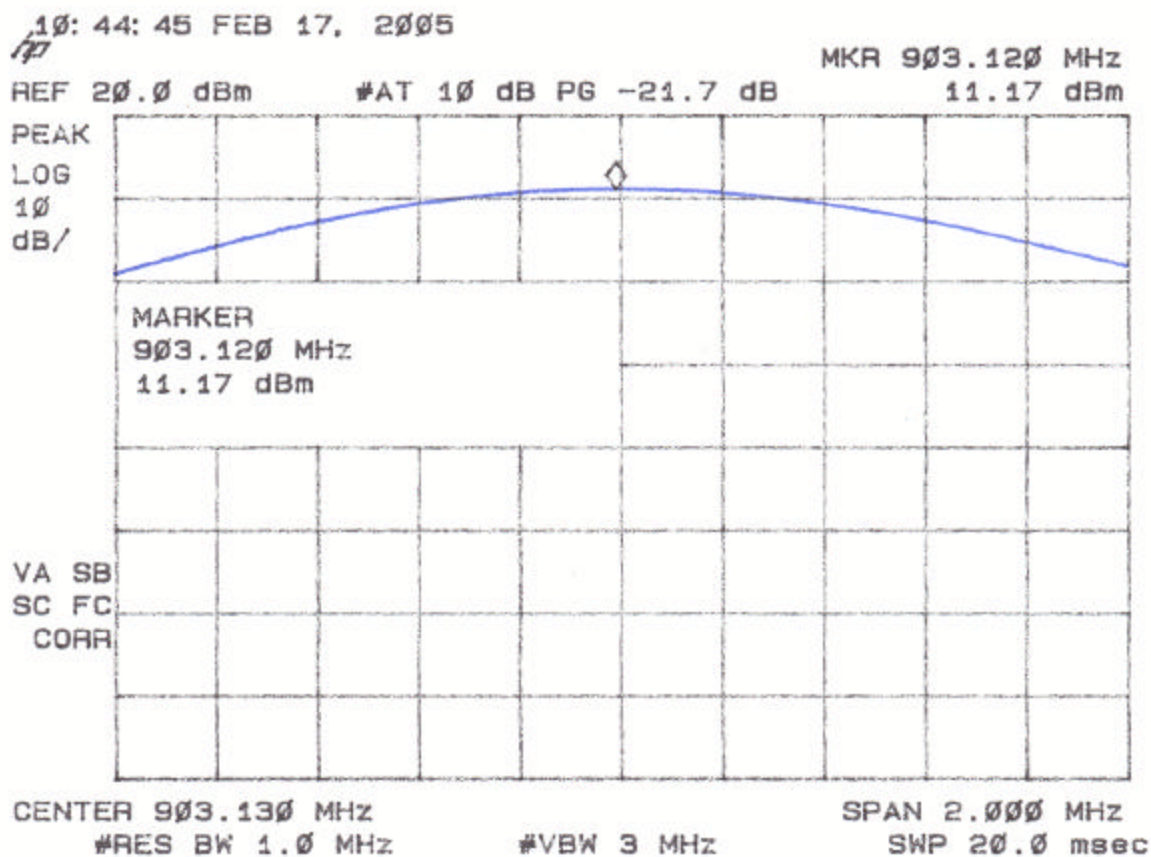


Figure 3a2.
Peak Power per FCC Section 15.247(b) (Mid Channel)

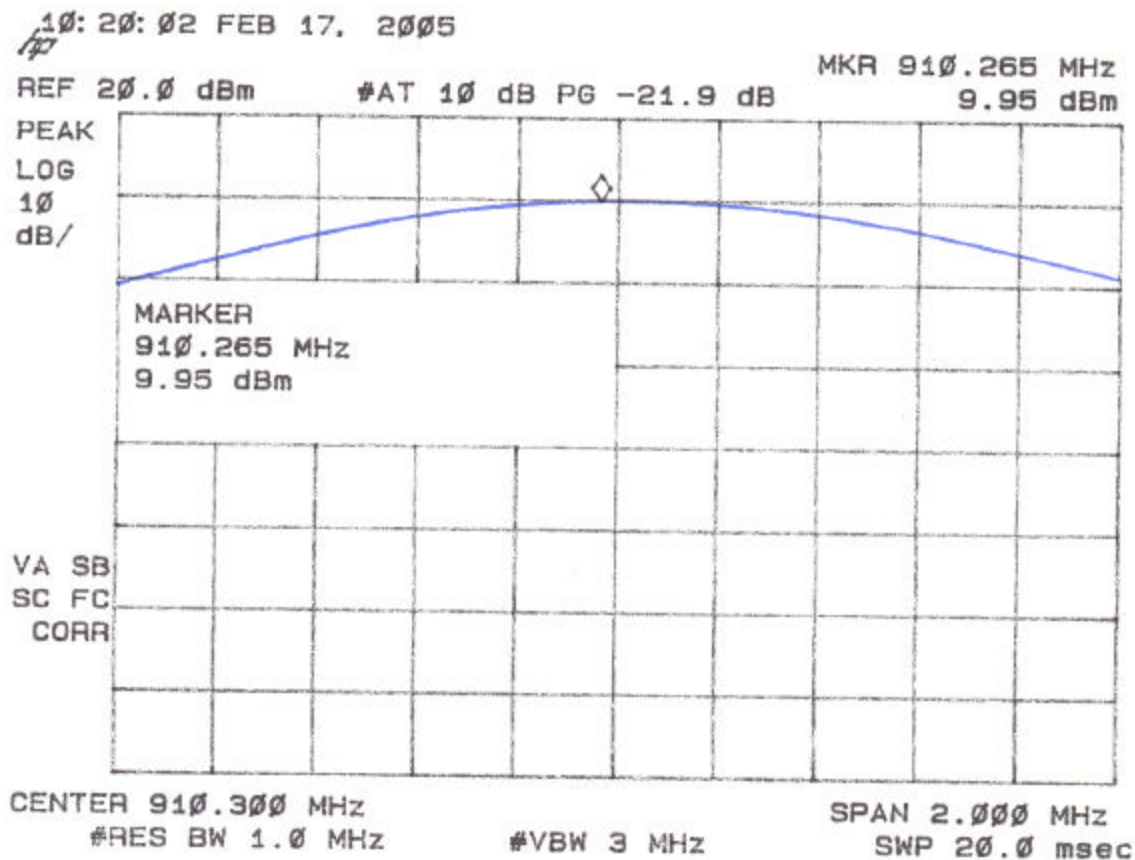


Figure 3a3.
Peak Power per FCC Section 15.247(b) (High Channel)

