FCC ID: PQS-BM29001

Exhibit 2c

Engineering Report on Boomer II 900 MHz

Bandwidth (2.1049) Modulation Characteristics (2.1047)

Assessment of Compliance

for

Measurement of Modulation Characteristics/Occupied Bandwidth in accordance with the FCC Rules & Regulations Part 2.1047/49 and 90

Wireless OEM Modem Module
Boomer II 900 MHz

Wavenet Technologies Pty Ltd.

October 2002

APREL Project No.:WVTB-BoomerII-Modem-3922-2

51 Spectrum Way Nepean ON K2R 1E6
Tel: (613) 820-2730 Fax: (613) 820-4161
email: info@aprel.com

Engineering Report

Subject: **Measurements of Modulation Characteristics/ Occupied Bandwidth in accordance with the FCC Rules & Regulations Part 2.1047/49 and 90**

FCC ID: **PQS-BM29001**

Equipment: **Wireless OEM Modem Module**

Model: **BOOMER II 900 MHz**

Client: **Wavenet Technologies Pty Ltd.**
140 Burswood Rd.
Burswood, Perth, WA 6100
AUSTRALIA

Project #: WVTB-BoomerII-Modem-3922-2

Prepared By: **APREL Laboratories,**
Regulatory Compliance Division
51 Spectrum Way
Nepean, Ontario
K2R 1E6

Approved by: _____ Date: Oct. 18, 2002
Jay Sarkar
Technical Director, Standards & Certification

Submitted by: _____ Date: Oct. 18, 2002
Jay Sarkar
Technical Director, Standards & Certification

Released by: _____ Date: Oct 18/02
Dr. Jack J. Wojcik, P.Eng.

LICENSED PROFESSIONAL ENGINEER J.J. WOJCIK PROVINCE OF ONTARIO

FCC ID: **PQS-BM29001**
Applicant: Wavenet Technologies Pty Ltd.
Equipment: Wireless OEM Modem Module
Model: BOOMER II 900 MHz
Standard: FCC Rules and Regulations Part 2.1047/49 and 90

ENGINEERING SUMMARY

This report contains the results of the Occupied Bandwidth/Bandwidth Limitation measurement performed on a **Wavenet Wireless OEM Modem Module** model BOOMER-II**.** The measurements were carried out in accordance with the FCC Rules and Regulations Part 2.1049. The product was evaluated for bandwidth when it was set at the maximum power level**.**

The Wireless OEM Modem Module is an 896~901 MHz OEM product for integration into customer end user equipment as an OEM modem and interfaces to it via the data interface port.

Modulation Characteristics (FCC Rule PART 2.1047): This test is not applicable, as the device is not capable of voice transmission.

This modem provides profile type for 896-901 MHz, J Spectral Mask, 4-Level FSK RDLAP 9.6, 2.5 kHz deviation.

The results presented in this report relate only to the sample tested.

Summary of the Results

Test Description	Page No.	Test Set-up Figure No.	Results Summary
Bandwidth/bandwidth Limitation Ref. Paragraph 2.1049 and 90	8	1	**Passed**

INTRODUCTION

General

This report describes the results of the occupied bandwidth measurement conducted on a Wavenet Wireless OEM Modem Module, model BOOMER II 900 MHz

Test Facility

The tests were performed for Wavenet Technologies Pty Ltd**.** by APREL Laboratories at APREL's EMI facility located in Nepean, Ontario, Canada. The laboratory operates an (3m and 10m) Open Area Test Site (OATS). The measurement facility is calibrated in accordance with ANSI C63.4-1992.

A description of the measurement facility in accordance with the radiated and AC line conducted test site criteria per ANSI C63.4-1992 is on file with the Federal Communications Commission and is in compliance with the requirements of Section 2.948 of the Commissions rules and regulations. ***APREL's registration number is: 90416***

APREL is accredited by Standard Council of Canada. APREL is also accredited by Industry Canada.

Standard

The evaluation and analysis were conducted in accordance with FCC Rules and Regulations Parts 2.1049/47.

Personnel: The equipment was tested by Y. Chen, EMC Engineer. Methodology was developed and the report written by Jayanta (Jay) K. Sarkar, Technical Director, Standards and Certification.

Test Equipment

The test equipment used during the evaluation is listed in Appendix A.

Environmental Conditions

Measurements were conducted in the EMC Laboratory.
Temperature: 25 °C ± 2, Relative Humidity: 30 - 50 %, Air Pressure: 101 kPa ± 3

FCC SUBMISSION INFORMATION

FCC ID:	**PQS-BM29001**
Equipment (type): As Marketed	**Wireless OEM Modem Module**
Model:	**BOOMER II 900 MHz**
For:	Certification
Applicant:	**Wavenet Technologies Pty Ltd.** 140 Burswood Rd Burswood, Perth, WA 6100 AUSTRALIA
Manufacturer:	**Wavenet Technologies Pty Ltd.** 140 Burswood Rd Burswood, Perth, WA 6100 AUSTRALIA
Evaluated by:	**APREL Laboratories** 51 Spectrum Way Nepean, Ontario Canada K2R 1E6

MANUFACTURER'S DATA

FCC ID No: **PQS-BM29001**

Equipment Type: Wireless OEM Modem Module

Model: BOOMER II 900 MHz

Reference: FCC Rules and Regulations Parts 2 and Part 90

Manufacturer: Wavenet Technologies Pty Ltd

Development Stage of Unit: Prototype

GENERAL SPECIFICATIONS

1. Frequency Range: 896-901 MHz (Transmitter)
2. Measured ERP 1.556 W (31.92 dBm)
3. Emission Designators Per 47 CFR § 2.201 and §2.202
   9K8F1D
4. Antenna Impedance: 50 Ohms

Measurement: Occupied Bandwidth

BOOMER II 900 MHz

Ref: FCC Part 90.210 (J) and 2.1049

Criteria: See Section under criteria

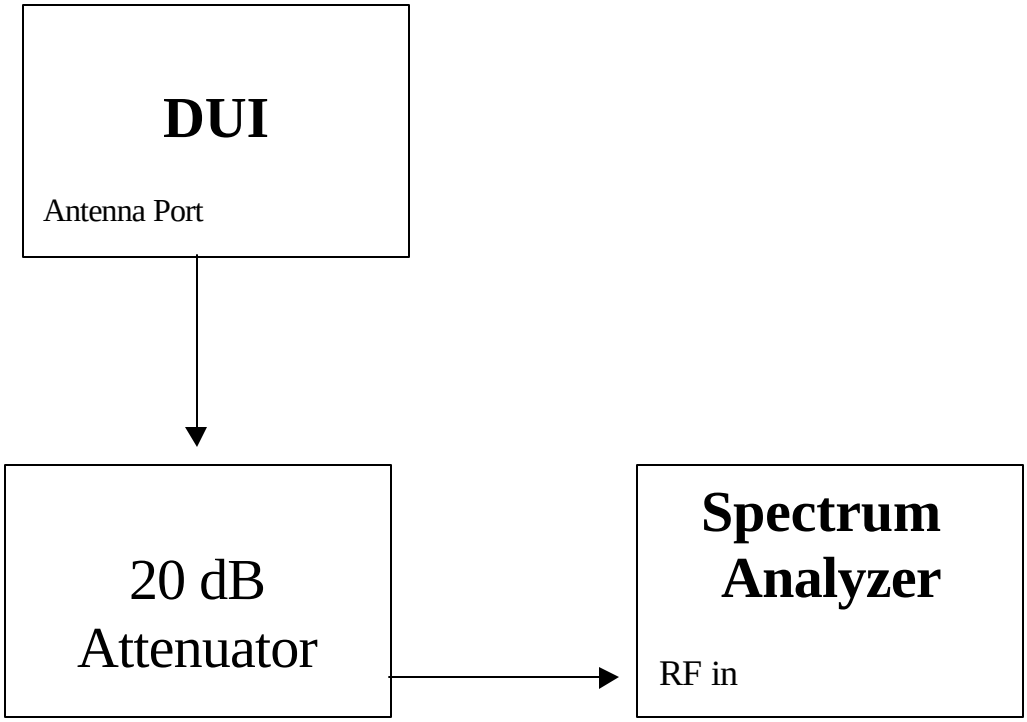
Set-up: See Figure: Test Set-up

Conditions: Temperature: 23 °C ± 2

Equipment: See Appendix A.

Procedure: Occupied bandwidth was measured in accordance with the above noted paragraphs of the F.C.C. Rules and Regulations. A sample of the transmitter output was observed on a spectrum analyzer and side bands were observed and recorded.

Results: **Passed . See Plots**



Occupied Bandwidth
Test Set-up

Section: ***Criteria***

Test: **Occupied Bandwidth**

Ref: **FCC Part 90.210 (h) and 2.1049**

Criteria: **Emission Mask J (896~901 MHz).** For transmitters that are not equipped with an audio low-pass filter pursuant to 90.211(b), the power of any emission must be attenuated below the unmodulated carrier power (P) as follows:

(1) On any frequency removed from the centre of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 2.5 kHz, but no more than 6.25 kHz: At least 53 log (fd/2.5) dB.
(2) On any frequency removed from the centre of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 6.25 kHz, but no more than 9.5 kHz: At least 103 log (fd/3.9) dB.
(3) On any frequency removed from the centre of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 9.5 kHz: At least 157 log (fd/5.3) dB, or 50 + 10 log (P) dB or 70 dB whichever is the lesser attenuation.

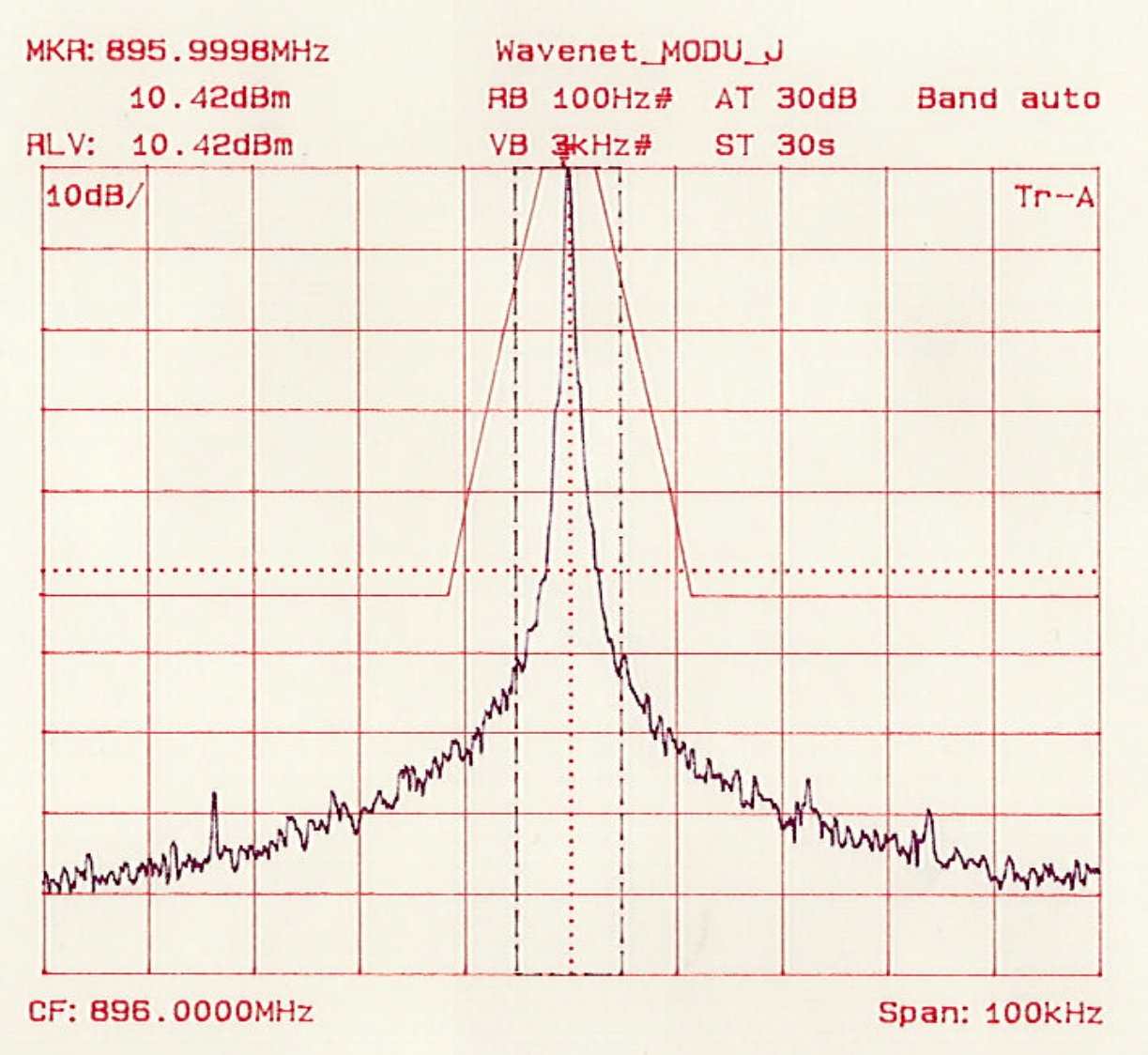
Below is the description of the mask for band 896 –901 MHz: 2 Watts ERP transmitter:

Frequency (MHz)	Formula	Limit (dB)
-26500	50+10 log (P)	-53
-0.0115	157 log (f_d / 5.3)	-53
-0.0095	157 log (f_d / 5.3) or 103 log (f_d / 3.9)	-39.8
-0.0062	103 log (f_d / 3.9) or 53 log(f_d/2.5)	-21.1
-0.0025	53 log (f_d / 2.5)	0.0
0.0025	53 log (fd/2.5)	0.0
0.0062	103 log (f_d / 3.9) or53 log (fd/2.5)	-21.1
0.0095	157 log (f_d / 5.3) or 103 log(f_d/3.9)	-39.8
0.0115	157 log (f_d / 5.3)	-53
26500	50 + 10 log (P)	-53

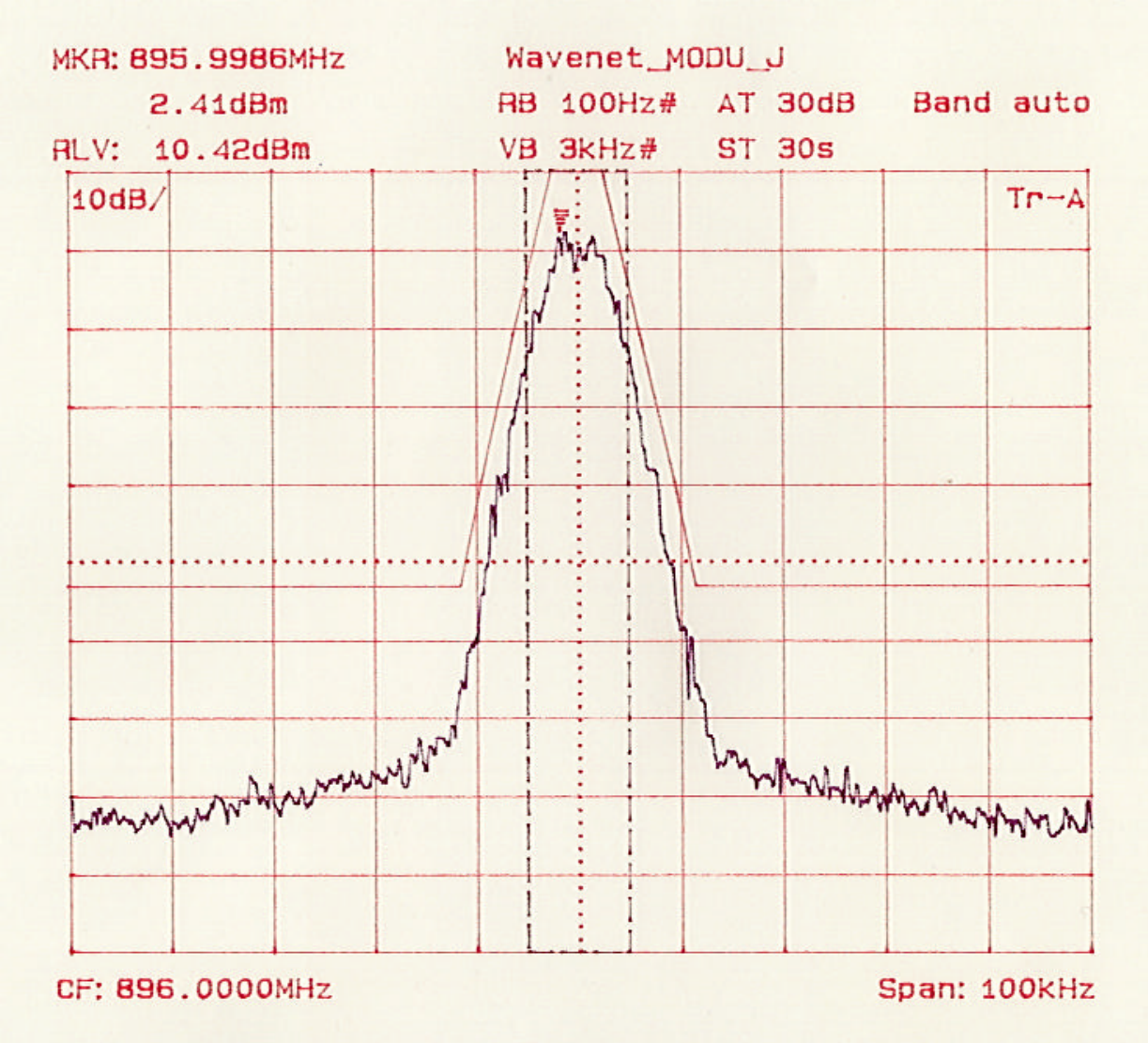
Occupied Bandwidth – Test Results

Wireless OEM Modem Module
WaveNet BOOMER-II 900 MHz

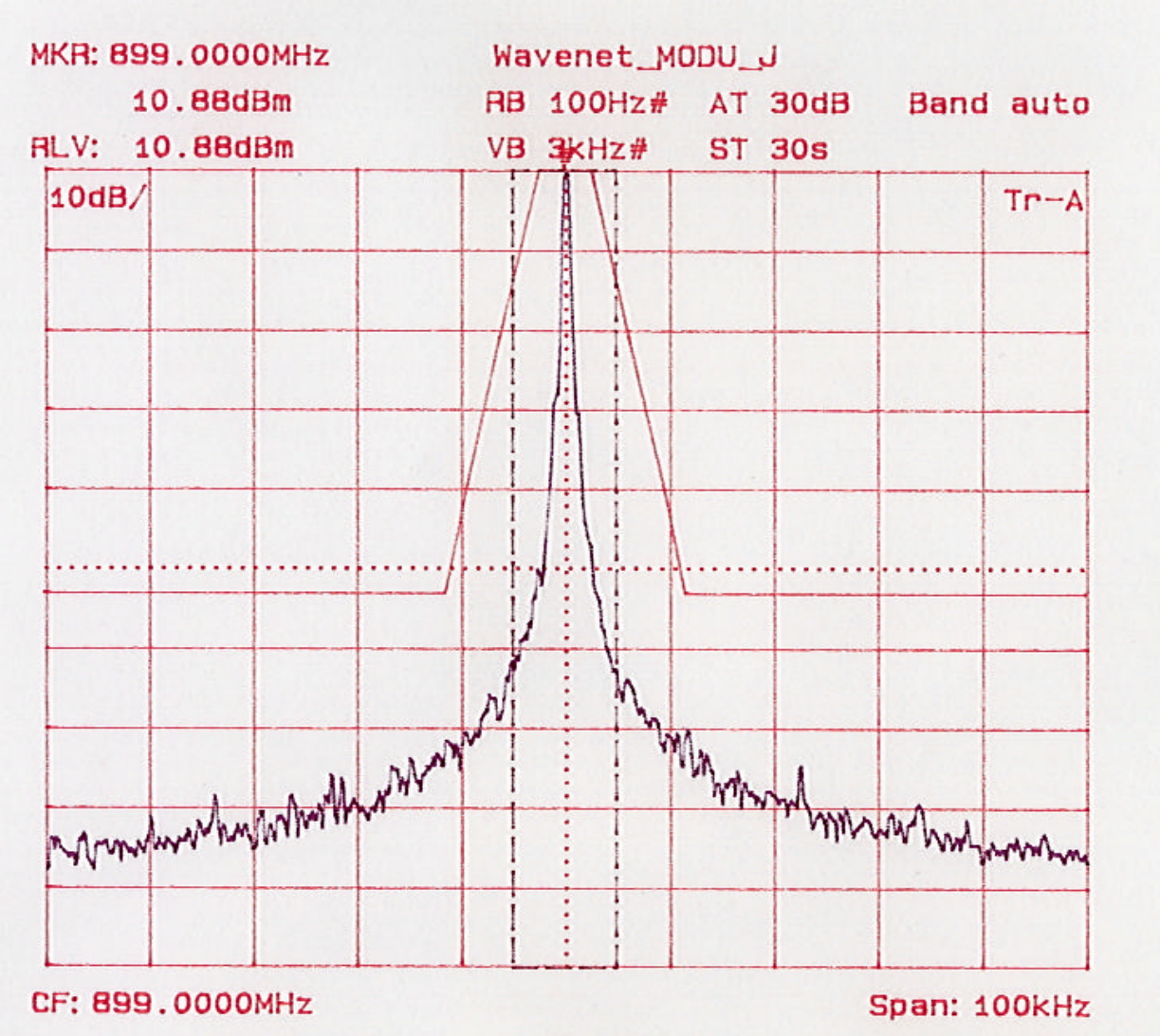
896-901 MHz Frequency Band
Mask J



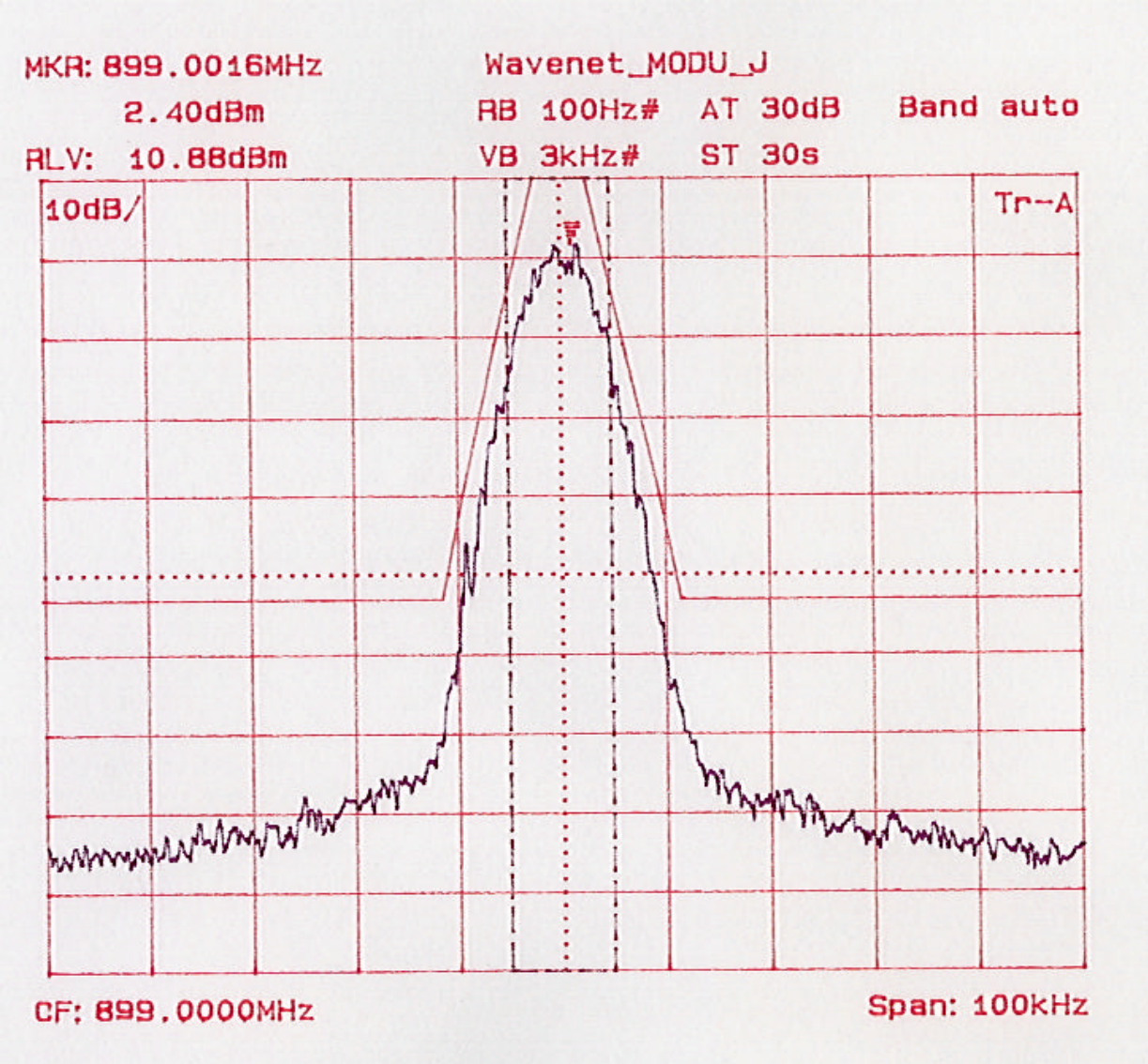
Occupied Bandwidth
Unmodulated Carrier
Mask J
Transmitting Frequency: 896 MHz



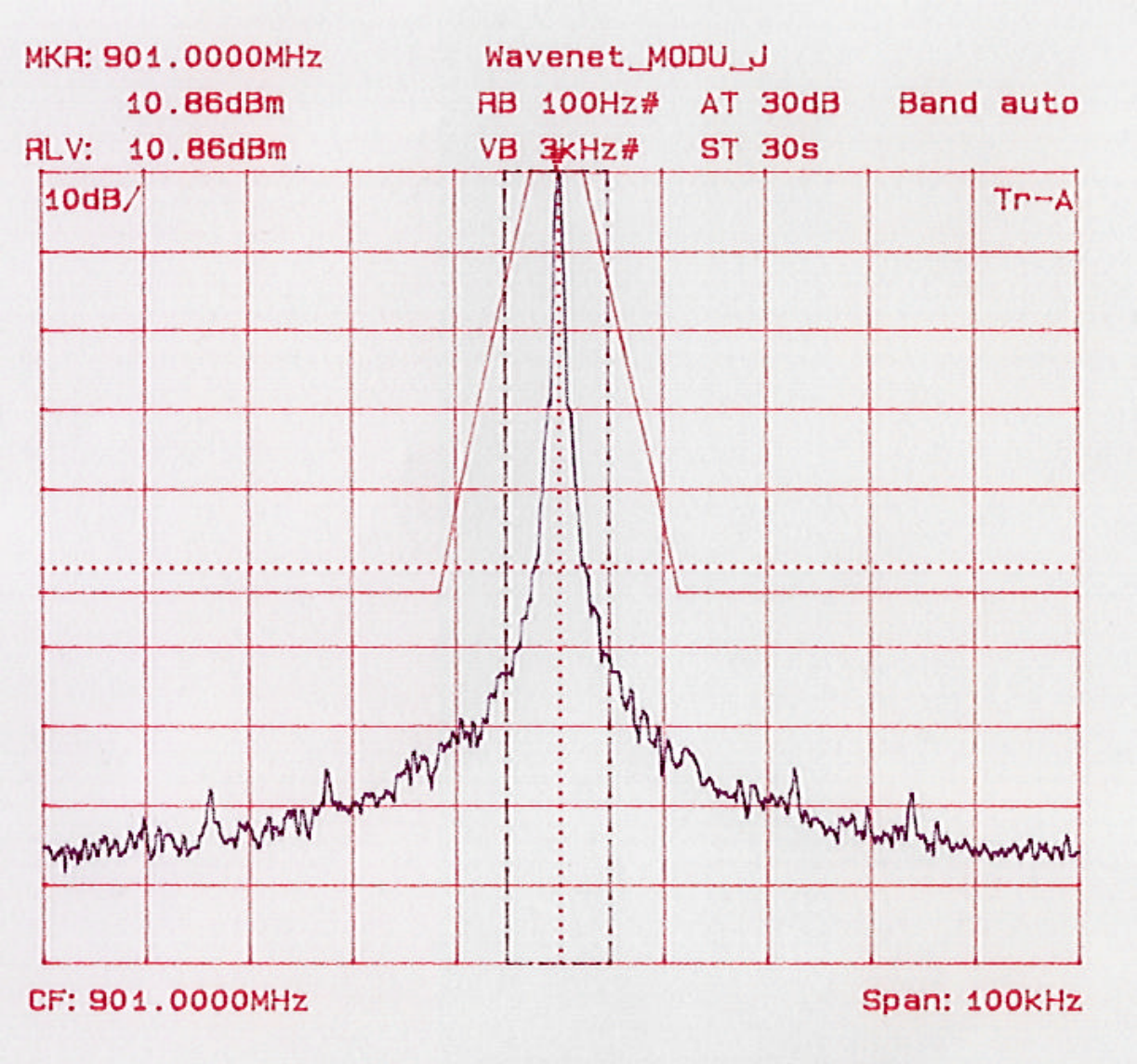
Occupied Bandwidth
Modulated Carrier: RDLAP 9.6 kbps
Mask J
Transmitting Frequency: 896 MHz



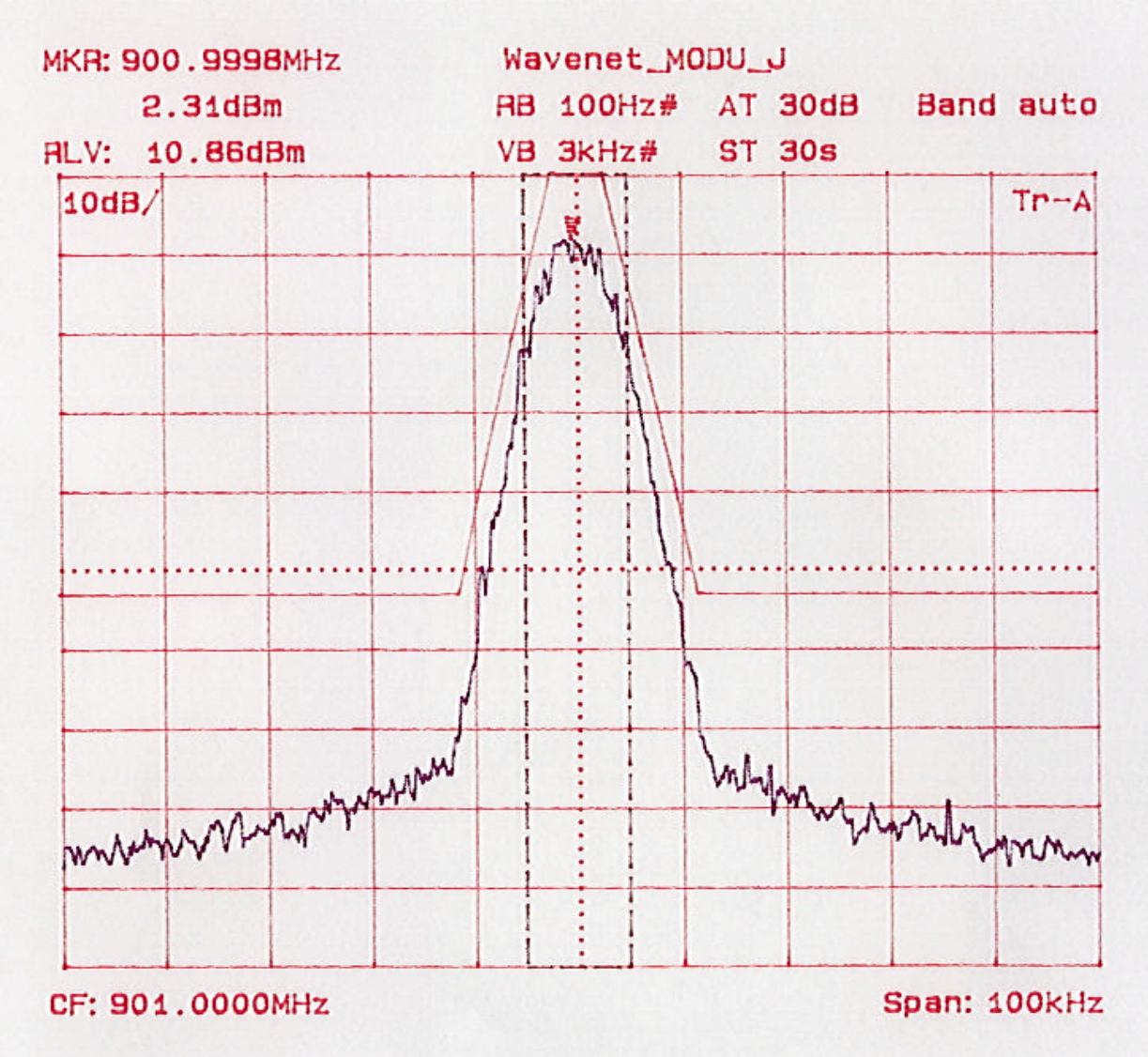
Occupied Bandwidth
Unmodulated Carrier
Mask J
Transmitting Frequency: 899 MHz



Occupied Bandwidth
Modulated Carrier: RD-LAP 9.6 kbps
Mask J
Transmitting Frequency: 899 MHz



Occupied Bandwidth
Unmodulated Carrier
Mask J
Transmitting Frequency: 901 MHz



Occupied Bandwidth
Modulated Carrier: RD-LAP 9.6 kbps
Mask J
Transmitting Frequency: 901 MHz

Test Equipment

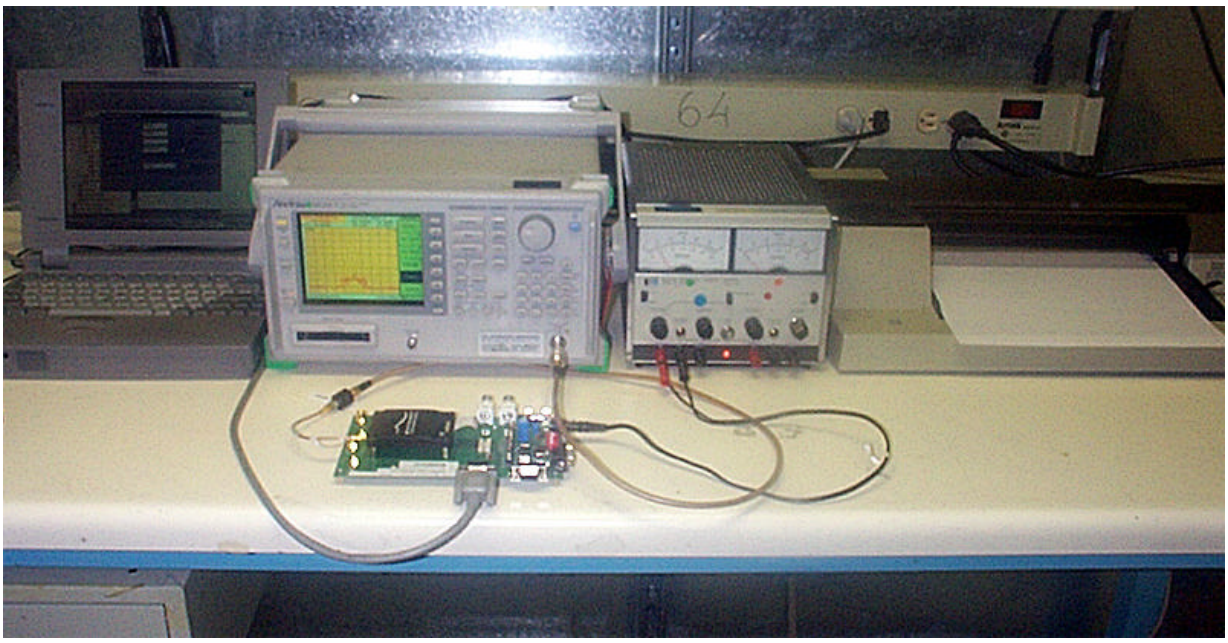
List of Equipment used

Description	Manufacturer	Model #	Asset #	Calibration Due Data
Spectrum Analyzer	Anritsu	MS2667C	301386	Sept. 5, 2003
Power Meter	HP	HP438A	301417	Sept. 5, 2003
20 dB Attenuator	Narda	4774-20	301533	Oct. 15, 2003

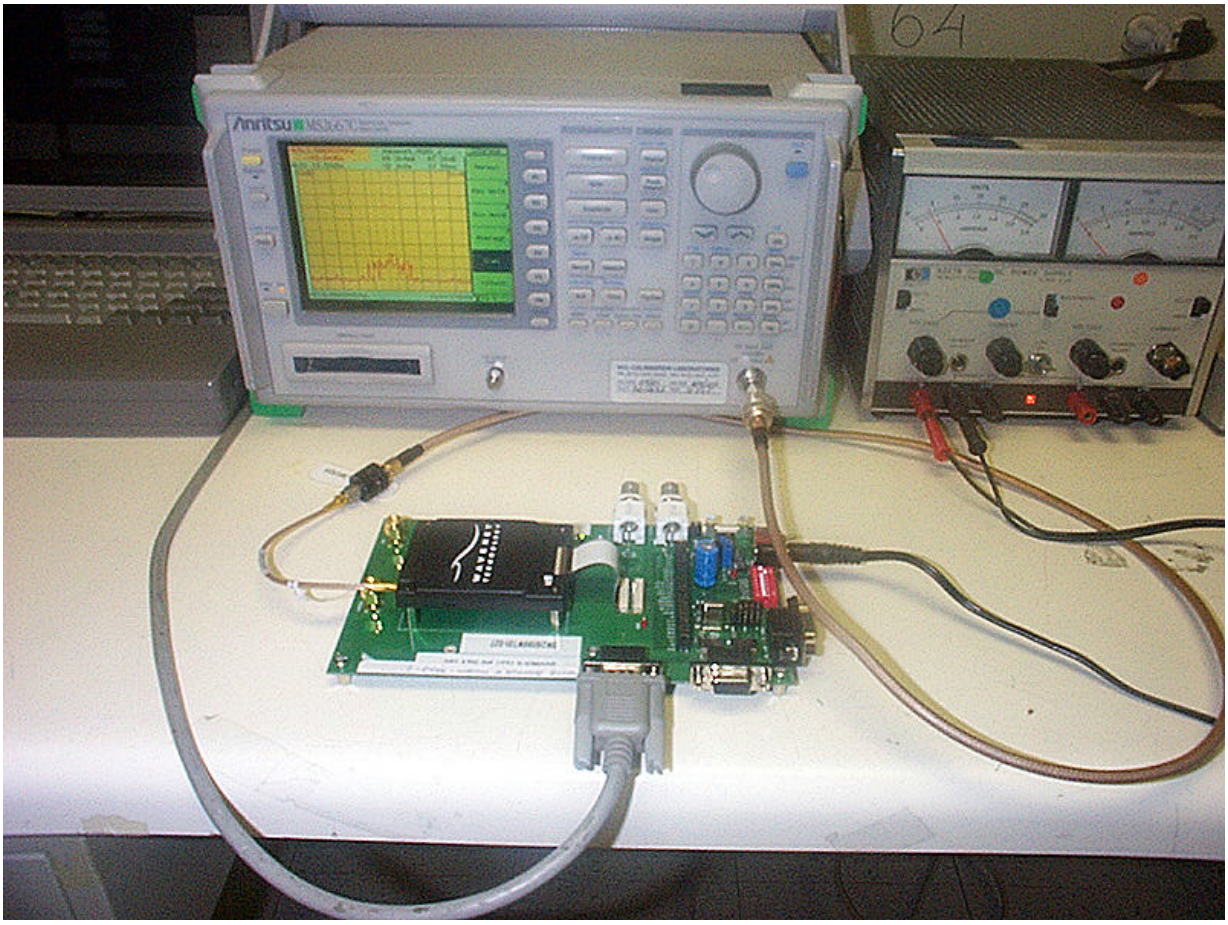
Appendix

Photographs

Wireless OEM Modem Module
WaveNet BOOMER-II
900 MHz



Occupied Bandwith – Testing Setup
Mask J



Testing Occupied Bandwidth on
Wireless OEM Modem Module
WaveNet BOOMER-II
900 MHz