FCC ID: PQSWAVENET-DUAL-V

Exhibit 2c

Engineering Report on

Bandwidth (2.1049) Modulation Characteristics (2.1047)

Assessment of Compliance

for

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

PDA Wireless Modem attachment for Palm V/V_x DWV 100D

Wavenet Technologies Pty Ltd.

June 2001

APREL Project No.:WVTB-Dual Wave V -3279

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: **PQSWAVENET-DUAL-V**

Equipment: **PDA Wireless Modem attachment for Palm V/V_x**

Model: **DWV 100D**

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

Project #: WVTB-Dual Wave V-3729

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

Approved by: _____ Date: June 25, 2001
Jay Sarkar
Technical Director, Standards & Certification

Submitted by: _____ Date: June 25, 2001
Jay Sarkar
Technical Director, Standards & Certification

Released by: _____ Date: June 25/2001
Dr. Jack J. Wojcik, P.Eng.

FCC ID:	**PQSWAVENET-DUAL-V**
Applicant:	Wavenet Technologies Pty Ltd.
Equipment:	PDA Wireless Modem attachment for Palm V/V_X
Model:	DWV 100D
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 PDA Wireless Modem attachment for Palm V/V_x model DWV 100D.** 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 PDA Wireless Modem is an attachment for a Palm PDA and it can also be attached to a PC.

However, the Bandwidth Limitation was carried out only on PDA Wireless Modem attached to Palm V, as bandwidth does not change due to different configurations.

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

Limiting of Modulation: The Modulation levels are fixed for digital modulation levels only and are digitally generated. The Modulation deviation is set during manufacture to the standard RD LAP 19.2 kbps 4 level FSK modulation and MDC 4.8 kbps 2 level FSK. This format is digital non-voice data only, continuous frequency, continuous phase, and frequency shift keying, narrow band frequency modulation.

(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 Technologies PDA Wireless Modem attachment for Palm V/V_x model DWV 100D**.**

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 and recognised by the Federal Communications Commissions (FCC).

Standard

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

Test Equipment

The test equipment used during the evaluation is listed in Appendix A with calibration due dates.

Environmental Conditions

Measurements were conducted in open area test site.

- Temperature: 25 °C ± 2
- Relative Humidity: 30 - 50 %
- Air Pressure: 101 kPa ± 3

This report was written by Jayanta (Jay) Sarkar and tests performed by Roman Kuleba.

FCC SUBMISSION INFORMATION

FCC ID:	**PQSWAVENET-DUAL-V**
Equipment (type): As Marketed	**PDA Wireless Modem attachment for Palm V/V$_x$**
Model:	**DWV 100D**
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:	**PQSWAVENET-DUAL-V**
Equipment Type:	PDA Wireless Modem attachment for Palm V/V_x
Model:	DWV 100D
Reference:	FCC Rules and Regulations Parts 2 and Part 90
Manufacturer:	Wavenet Technologies Pty Ltd
Power Source:	3.6 (nominal) VDC, Lithium Battery
Development Stage of Unit:	Production

GENERAL SPECIFICATIONS

1.	Frequency Range:	806.00 to 821.00 MHz (Transmitter)	
2.	Measured ERP	1.862 (32.7 dBm)	
3.	Emission Designators	(See 47 CFR § 2.201 and §2.202):	20K0F1D
4.	Antenna Impedance:	50 Ohms	

Test: **Occupied Bandwidth**

Ref: FCC Part 90.210 (g) and 2.1049

Criteria: Emission Mask G. 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 displacement frequency (fd in kHz) of more than 5 kHz, but no more than10 kHz: At least 83 log (fd/5) dB.

(2) On any frequency removed from the centre of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 10 kHz, but no more than 250 percent of the authorized bandwidth: At least 116 log fd/6.1) dB, or 50 + 10 log (P) dB, or 70 dB, whichever is the lesser attenuation.

(3) On any frequency removed from the centre of the authorized bandwidth by more than 250 percent of the authorized bandwidth: At least 43 + 10 log (P) dB.

Below is the description of the mask for band 806-821/851-866 MHz: 1.585 Watts transmitter (P= 1.585 W)

Frequency (MHz)	Formula	Limit (dB)
-26500	43+10 log (P)	45
-0.050	43+10 log (P)	45
-0.050	50+10 log (P)	52
-0.0175	116 log (f_d / 6.1)	53
-0.010	116 log (f_d / 6.1) or 83 log(f_d /5)	25
-0.005	83 log(f_d /5)	0
0.005	83 log(f_d /5)	0
0.010	116 log (f_d / 6.1) or 83 log(f_d/5)	25
0.0175	116 log (f_d / 6.1)	53
0.050	50+10 log (P)	52
0.050	43+10 log (P)	45
26500	43+10 log (P)	45

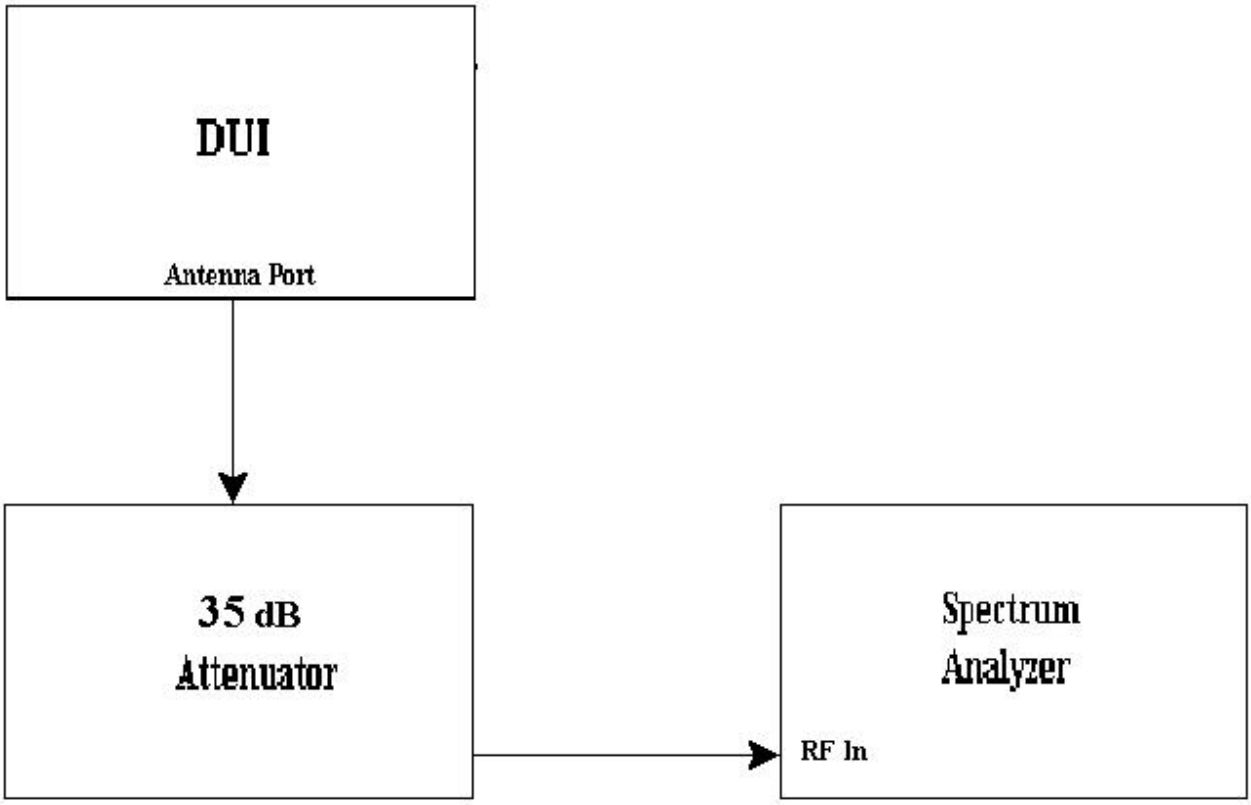
Set-up: See Figure: Test Set-up

Conditions: Temperature: 23 °C ± 2
Voltage Supply: 3.6 VDC

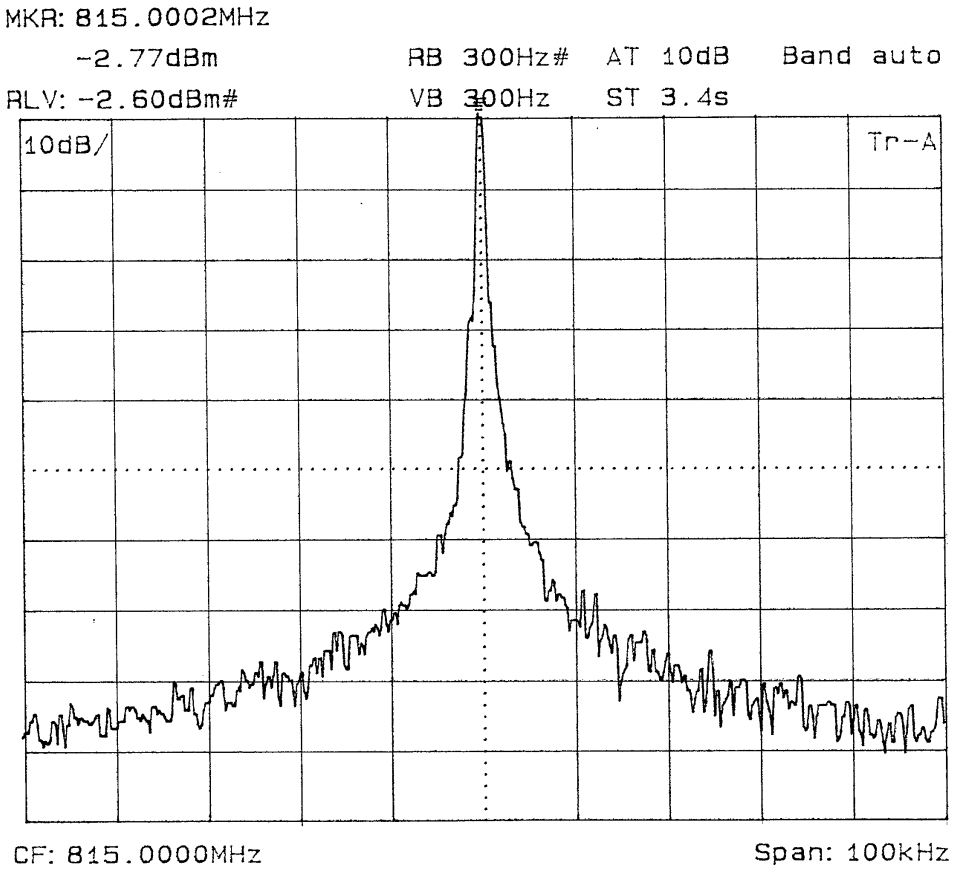
Equipment: See Appendix A.

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.

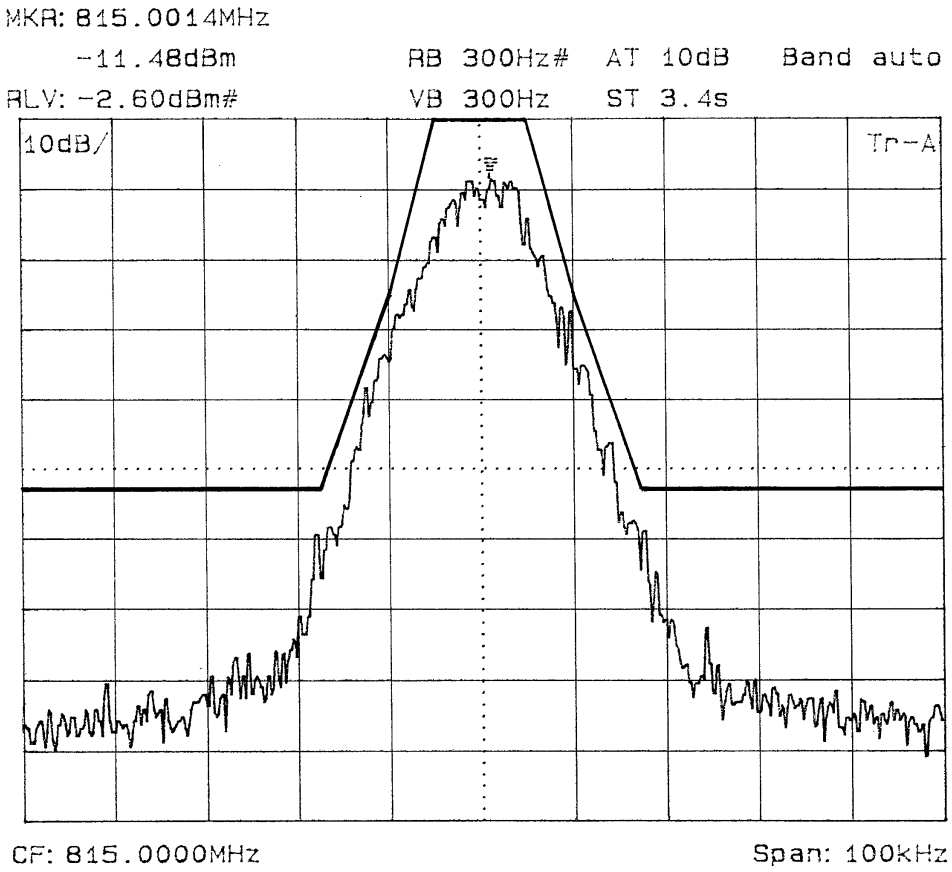
Results: **Passed . See Plots**



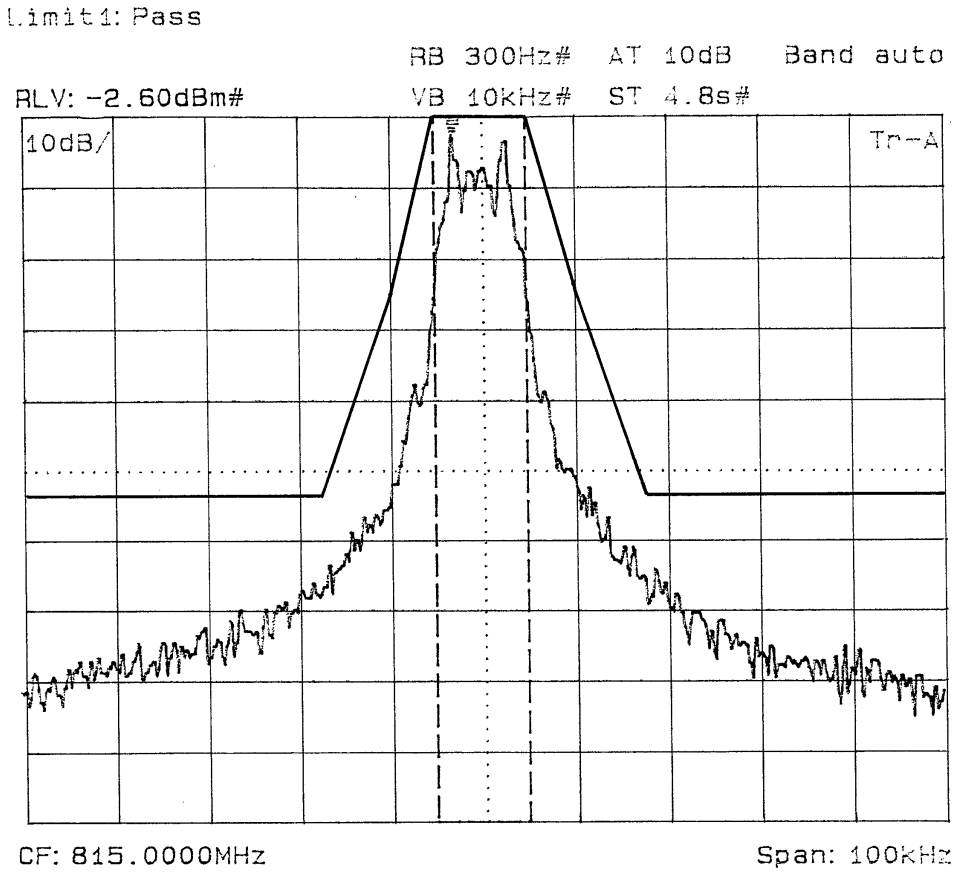
Occupied Bandwidth
Test Set-up



Occupied Bandwidth
Transmit Frequency: 815.00 MHz
Unmodulated Carrier



Occupied Bandwidth
Transmit Frequency: 815.00 MHz
Modulated Carrier-RD-LAP



Occupied Bandwidth
Transmit Frequency: 815.00 MHz
Modulated Carrier-MDC

Test Equipment

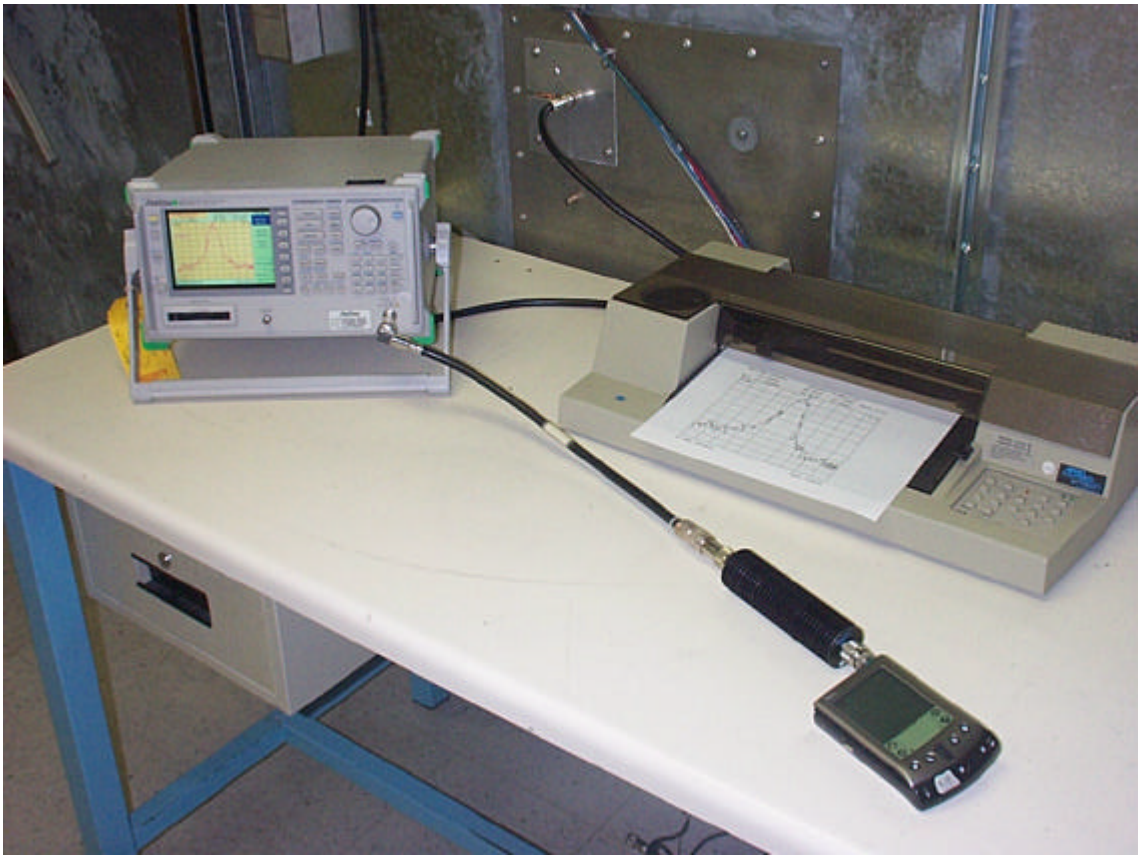
List of Equipment used

Description	Manufacturer	Model #	Asset #	Calibration Due Data
Spectrum Analyzer	Anritsu	MS2661C	301330	Dec 10, 2001
Power Meter	Rhode & Schwarz	NRVS	100851	July 21, 2001
35 dB Attenuator	Microlab	FXR AD-30N	-	CBT

Appendix

Photographs

PDA Wireless Modem DWV 100D with Palm V



Testing Occupied Bandwidth on
Palm V and DWV 100D Wireless Modem