

**FCC ID: B32OMNI3600**

**Exhibit 2**

**Engineering Report  
a)ERP (2.1046)**

# Assessment of Compliance

for

Measurement of Effective Radiated Power (ERP) in accordance  
with the FCC Rules & Regulations Part 2.1046 and 90

**Wireless Handheld Point of Sale Terminal**

**VeriFone, INC.**



March 2002

APREL Project No.: VERA-OMNI 3600-3858

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## Engineering Report

**Subject:** Measurement of Effective Radiated Power (ERP) in accordance with the FCC Rules & Regulations Part 2.1046 and 90

**FCC ID:** B32OMNI3600

**Equipment:** Wireless Handheld Point of Sale Terminal

**Model:** OMNI 3600

**Client:** VeriFone Inc.  
3755 Atherton Road  
Rocklin, CA 95765-3701  
U.S.A.

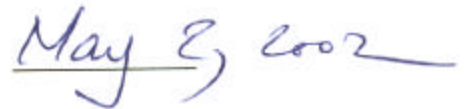
**Project #:** VERA-OMNI 3600-3858

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

Approved by:

  
**Jay Sarkar**  
Technical Director, Standards & Certification

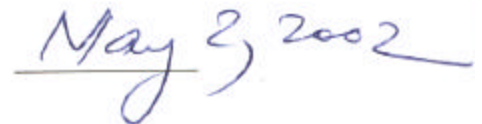
Date:

  
May 2, 2002

Submitted by:

  
**Jay Sarkar**  
Technical Director, Standards & Certification

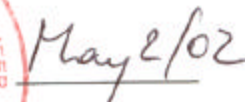
Date:

  
May 2, 2002

Released by:

  
**Dr. Jack J. Wojcik, P.Eng.**

Date:

  
May 2/02



**FCC ID:** B32O3600  
**Applicant:** VeriFone Inc.  
**Equipment:** Wireless Handheld Point of Sale Terminal  
**Model:** OMNI 3600  
**Standard:** FCC Rules and Regulations Part 2.1046 and 90

### ENGINEERING SUMMARY

This report contains the results of the effective radiated power (ERP) measurement performed on a Wireless Handheld Point of Sale Terminal of VeriFone Inc., model OMNI 3600 operating with a built-in Research in Motion Mobitex R902M, in the frequency range of 896-901 MHz, radio transmitter. The measurements were carried out in accordance with the FCC Rules and Regulations Part 2.1046 and 90. The product was evaluated for ERP when it was set at the maximum power level and the antenna is in the upright position (pointing directly at the sky).

Omni 3600 was tested for ERP at high, middle, and low frequencies with the maximum ERP obtained at channel No.: 720 with the frequency being 899.00 MHz. The test data is presented in this report under the section: Test Results. The measured ERP is 1.905 W.

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
RF Power Output as Radiated Ref. Paragraph 2.1046 and 90	8	1	<b>Passed</b>

## INTRODUCTION

### General

This report describes the results of the effective radiated power (ERP) measurement conducted on a VeriFone Inc. Wireless Handheld Point of Sale Terminal operating with a built-in Research in Motion Mobitex R902M, in the frequency range of 896-901 MHz radio transmitter.

### Test Facility

The tests were performed for **VeriFone Inc.** 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 2.1046 and the appropriate limits (Part 90).

### 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: 20 °C ± 2
- Relative Humidity: 30 - 50 %
- Air Pressure: 101 kPa ± 3

Personnel: The test was performed by Roman Kuleba and the report written by Jayanta (Jay) Sarkar.

## FCC SUBMISSION INFORMATION

**FCC ID:** B32O3600

**Equipment:** Wireless Handheld Point of Sale Terminal

**Model:** OMNI 3600

**For:** Certification

**Applicant:** **VeriFone Inc.**  
3755 Atherton Road  
Rocklin, CA 95765-3701  
U.S.A.

**Manufacturer:** **VeriFone Inc.**  
3755 Atherton Road  
Rocklin, CA 95765-3701  
U.S.A.

**Evaluated by:** **APREL Laboratories**  
51 Spectrum Way  
Nepean, Ontario  
Canada K2R 1E6

**Test:** RF Power Output as Radiated (ERP)

**Ref.:** FCC Part 2 paragraph 2.1046 and 90

**Criteria:** N/A

**Set-up:** See Figure No. 1.

**Equipment:** See Appendix A.

**Methodology:** RF Power Measurement by Radiated Method (ERP):

Test site: The radiated RF power measurement was taken at APREL Laboratory's open area test site (OATS). This open area test site is calibrated to ANSI C63.4 document and a description of the measurement facility is on file with the Federal Communications Commission and is in compliance with the requirement of Section 2.948 of the Commissions rules and regulations. (FCC File No.: 90416)

The test was set-up as illustrated in Fig.1. The Wireless Handheld Point of Sale Terminal was configured to operate at maximum power. The equipment under test was placed on a turntable positioned 3 m away from the calibrated receiving antenna, which in turn was connected to the spectrum analyzer.

For each transmitter frequency, the received signal was **maximised** by rotating the turntable and adjusting the height of the receiving antenna. To obtain the actual ERP, the Terminal was replaced by a vertically polarised half-wave dipole antenna resonant to that frequency and fed by a RF power amplifier and signal generator. The center of the dipole antenna was placed precisely in the same location as the Terminal. It was ensured that the orientation of the rotating table and the height of the receiving antenna were unmoved. The signal generator level was adjusted until the peak reading on the spectrum analyzer was identical to that obtained when the Terminal was on the turntable. The two signals were matched by superimposing one signal to the other on the spectrum analyzer screen. The output of power amplifier was disconnected from the substitute dipole antenna and connected to a RF power meter. The effective radiated power was read directly form the power meter.

**The process was repeated for two more channels.**

**Results:** See Table 1

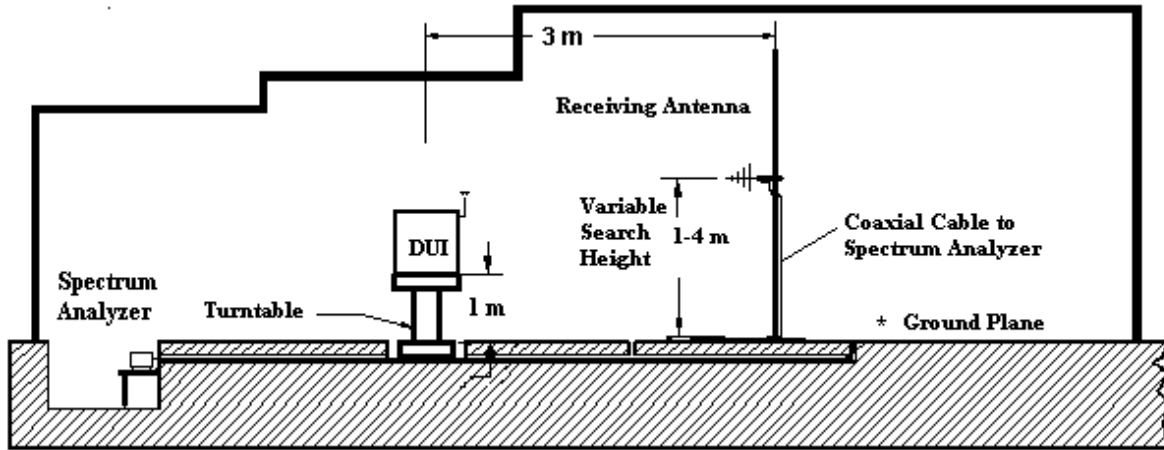
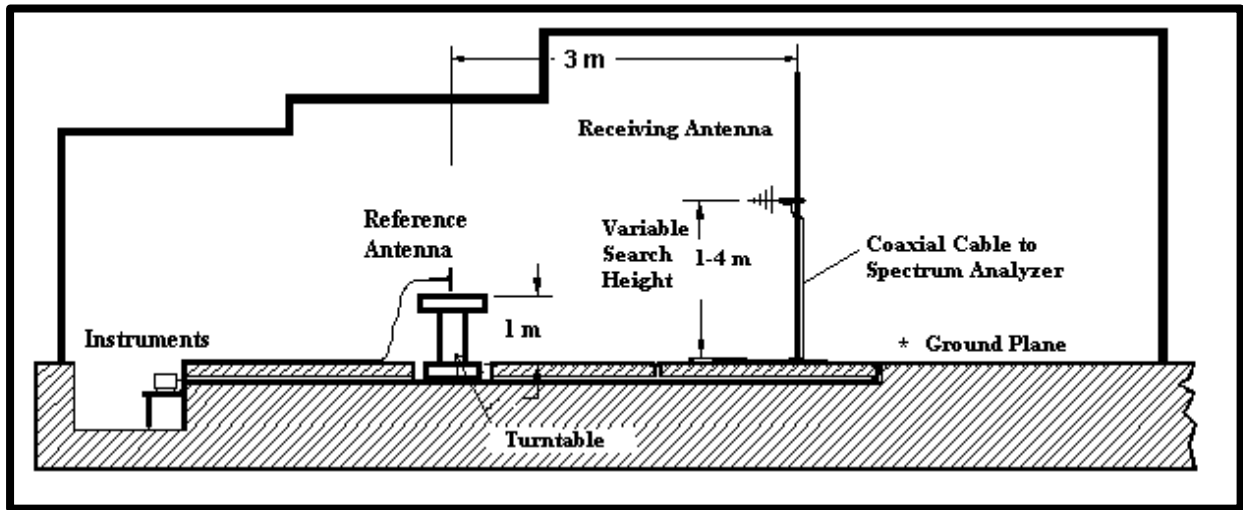


Figure 1.a Test set up for the Radiated Power (ERP) Measurement in OATS (not to scale)



Fig. 1.b APREL's OATS (Open Area Test Site)





**Figure 1.c Test set up for the Radiated Power (ERP) Measurement in OATS (not to scale)  
The terminal is replaced by Reference Dipole Antenna.**

**Table 1.  
RF Output Power Measurement  
ERP  
Substitution Method**

Channel No.	Nominal Transmit Frequency	Measured Output Power ERP	ERP
	(MHz)	(dBm)	(W)
480	896.00	32.2	1.641
720	899.00	32.8	1.905
880	901.00	32.0	1.585

Test performed by: LuChen Robinson Date: March 2002

## APPENDIX A

### List of Test Equipment

**List of Equipment used**

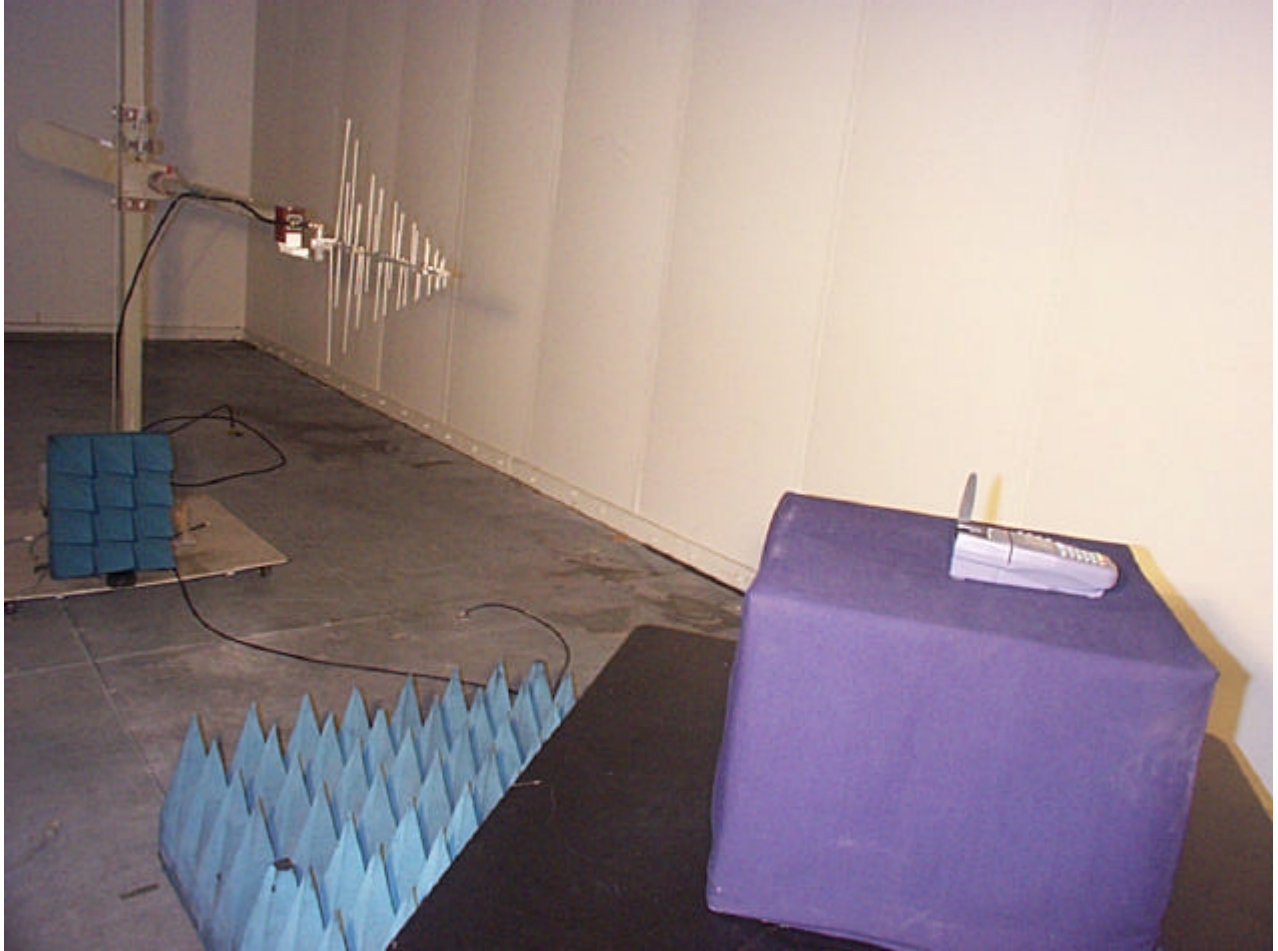
<b>Description</b>	<b>Manufacturer</b>	<b>Model #</b>	<b>Asset #</b>	<b>Calibration Due Data</b>
Spectrum Analyzer	Anritsu	MS2661C	301330	Dec 10, 2002
Power Meter	Rhode & Schwarz	NRVS	100851	July 21, 2002
20 dB Attenuator	Pasternack	PE7002-20	301370	May 18, 2002
Signal Generator	Hewlett-Packard	HP 8340B	100955	Oct 5, 2002
RF Power Amplifier	Amplifier Research	25W100M	100735	CBT
Reference Half wave Dipole	APREL Inc.	D-8355	N/A	June 16, 2002
Log Periodic Antenna	Eaton	ALP-1	100553	July 21, 2002
Turntable with Controller	EMCO	1060-1.241	100506	CNR
Computer Controlled Antenna Position Mast	EMCO	1051-12	100507	CNR
OATS	APREL Inc.	3m & 10m	N/A	N/A

# APPENDIX B

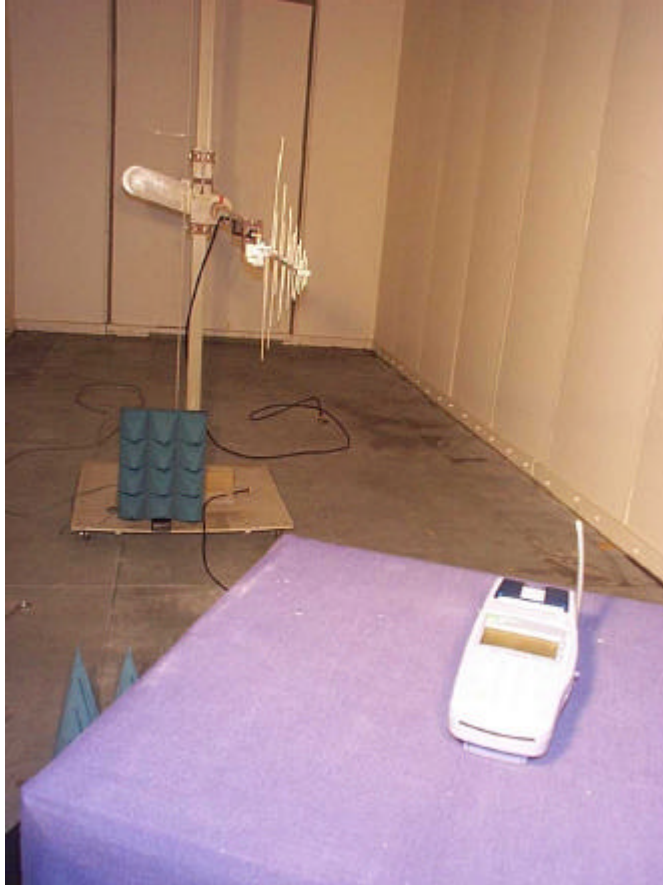
## *PHOTOGRAPHS*



**VeriFone Inc. Handheld Point of Sale Terminal  
Omni 3600**

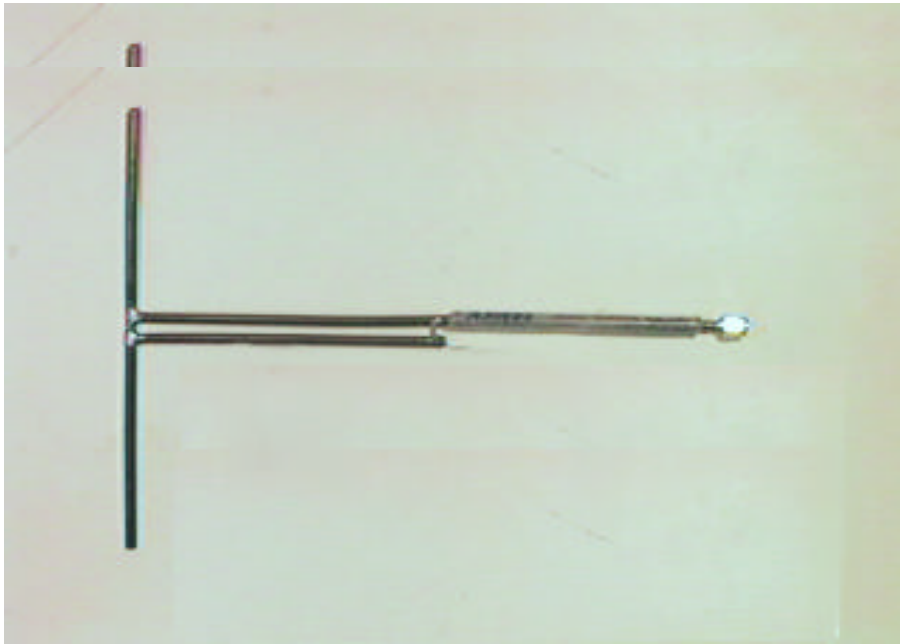


### **ERP evaluation at the OATS**



### **Evaluation in the OATS**





**Reference dipole Antenna Used for ERP Measurement**