# FCC ID: K66VX-6000 M. Flom Associates, Inc. - Global Compliance Center 3356 North San Marcos Place Suite 107 Of the theorem. M www.mflom.com general@mflom.com (480) 926-3100, FAX: 926-3598

Date:	September 5, 2001
Federal Communicatio Via: Electronic Fili	
Attention:	Authorization & Evaluation Division
Applicant: Equipment: FCC ID: FCC Rules:	Vertex Standard Co., Ltd. VX-6000V K66VX-6000V Radiofrequency Radiation Exposure Limits 47 CFR 1.1310 MPE - Mobiles x Fixed Based Station x

Gentlemen:

On behalf of the Applicant, enclosed please find the Supplemental Test Data Report, the whole for Environmental Assessment (MPE) of the referenced equipment as shown.

We trust the same is in order. Should you need any further information, kindly contact the writer who is authorized to act as agent.

Sincerely yours

Morton Flom, P. Eng.

enclosure(s) cc: Applicant MF/cvr

M. Flom Associates, Inc. - Global Compliance Center 3356 North San Marcos Place, Suite 107, Chandler, Arizona 85225-7176 www.mflom.com general@mflom.com (480) 926-3100, FAX: 926-3598

ENVIRONMENTAL ASSESSMENT

for

MOBILES & FIXED BASE STATION

for

FCC ID: FCC ID: K66VX-6000V Model:VX-6000V

to

FEDERAL COMMUNICATIONS COMMISSION

47 CFR 1.1310 (MPE) Radiofrequency Radiation Exposure Limits

DATE OF REPORT: September 5, 2001

ON THE BEHALF OF THE APPLICANT:

Vertex Standard Co., Ltd.

AT THE REQUEST OF:

P.O. UPS 8/21/2001

Vertex Standard USA Inc. 17210 Edwards Rd. Cerritos, CA 90703

Attention of:

Mikio Maruya, Executive Vice President (800) 255-9237; FAX: (800) 477-9237 (562) 404-2700, x280; FAX: -1210 m.maruya@vxstdusa.com

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Morton Flom, P. Eng.

# TABLE OF CONTENTS

# RULEDESCRIPTIONPAGETest Report1Identification of the Equipment Under Test2Standard Test Conditions and Engineering Practices41.1310Environmental Assessment5

PAGE	NO.	1 of	12.	

Required information per ISO/IEC Guide 25-1990, paragraph 13.2:

- a) TEST REPORT (SUPPLEMENTAL)
- b) Laboratory: M. Flom Associates, Inc. (FCC: 31040/SIT) 3356 N. San Marcos Place, Suite 107 (Canada: IC 2044) Chandler, AZ 85225
- c) Report Number: d0190004
- d) Client: Vertex Standard USA Inc. 17210 Edwards Rd. Cerritos, CA 90703
- e) Identification: VX-6000V FCC ID: K66VX-6000V Description: VHF FM Mobile Transceiver
- f) EUT Condition: Not required unless specified in individual tests.
- g) Report Date: September 5, 2001 EUT Received: August 21, 2001
- h, j, k): As indicated in individual tests.
- i) Sampling method: No sampling procedure used.
- 1) Uncertainty: In accordance with MFA internal quality manual.
- m) Supervised by:

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Morton Flom, P. Eng.

- n) Results: The results presented in this report relate only to the item tested.
- o) Reproduction: This report must not be reproduced, except in full, without written permission from this laboratory.

# PAGE NO. 2 of 12.

# IDENTIFICATION OF THE EQUIPMENT UNDER TEST (EUT)

## NAME AND ADDRESS OF APPLICANT:

Vertex Standard Co., Ltd. 4-8-8 Nakameguro, Meguro-Ku Tokyo 153-8644 Japan

## MANUFACTURER:

Applicant

FCC ID:

K66VX-6000V

VX-6000V

MODEL NO:

DESCRIPTION:

TYPE OF EMISSION:

16K0F3E, 11K0F3E

VHF FM Mobile Transceiver

FREQUENCY RANGE, MHz: 148 to 174

POWER RATING, Watts:50 to 110\_\_\_\_\_\_Switchable\_\_\_\_\_\_XVariable\_\_\_\_\_\_N/A

MODULATION:

	AMPS
	TDMA
	CDMA
x	OTHER

ANTENNA:		HELICAL
		MONOPOLE
		WHIP
	Х	OTHER

NOTE: For RF Safety test antenna gain taken at the upper range of expected gain (i.e. 0 dBd) and RF Power set to highest nominal power across all channels.

# PAGE NO.

3 of 12.

M. Flom Associates, Inc. is accredited by the American Association for Laboratory Association (A2LA) as shown in the scope below.

		erican Association for Laboratory Accreditation
		SCOPE OF ACCREDITATION TO ISO/IEC 17025-1999
THE AMERICAN ASSOCIATION FOR LABORATORY ACCREDITATION		M. FLOM ASSOCIATES, INC. Electronic Testing Laboratory 3356 North San Macco Place, Suite 107 Chandler, AZ 85225 Morton Flom Phone: 480 926 3100
ACCREDITED LABORATORY		ELECTRICAL (EMC)
	Valid to: December 31,	, 2002 Certificate Number: 1008-01
A2LA has accredited	In recognition of the suc this laboratory to perfor	ccessful completion of the A2LA evaluation process, accreditation is granted to m the following <u>electromagnetic compatibility tests</u> :
M. FLOM ASSOCIATES, INC.	Tests	Standard(s)
Chandler, AZ	RF Emissions	FCC Part 15 (Subparts B and C) using ANSI C63.4-1992; CISPR 11; CISPR 13; CISPR 14; CISPR 22; EN S501; EN S5013; EN S5014; EN S5022; EN S0081-1; EN S50081-2;
for technical competence in the field of		ICES-003; AS/NZS 1044; AS/NZS 1053; AS/NZS 3548; AS/NZS 4251.1; CNS 13438
Electrical (EMC) Testing	Harmonic Currents	EN 61000-3-2
	Fluctuation and Flicker	
The accreditation covers the specific tests and types of tests listed on the agreed scope of accreditation. This laboratory meets the requirements of ISO/IEC 17025 - 1999 "General Requirements for the Competence of Testing and Calibration Laboratories" and any additional program requirements in the identified field of testing. Testing and calibration laboratories that comply with this International Standard also	RF Immunity	EN: 50082-1, 50082-2, 60 <i>bth excluding "Power Frequency</i> Magnetic Field Immanity" and "Voltage Dips, Short Interruptions, and Line Voltage Variations "); ASINZS 4251.1
operate in accordance with ISO 9001 or ISO 9002.	Radiated Susceptibility	EN 61000-4-3; ENV 50140; ENV 50204; IEC 1000-4-3; IEC 801-3
Presented this 2 <sup>nd</sup> day of March, 2001.	EFT	EN 61000-4-4; IEC 1000-4-4; IEC 801-4
and the second sec	Surge	EN 61000-4-5; ENV 50142; IEC 1000-4-5; IEC 801-5
Al Al For the Accreditation Council Certificate Number 108.01 Valid to December 31. 2002	47 CFR (FCC)	2, 21, 22, 23, 24, 74, 80, 87, 90, 95, 97
		Peter Mlny-
For tests or types of tests to which this accreditation applies, please refer to the laboratory's Electrical (EMC) Scope of Accreditation	5301 Buckeystown Pike, Suite	2350 • Frederick, MD 21704-8373 • Phone: 301-644 3248 • Fax: 301-662 2974 🏵

"This laboratory is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this report have been determined in accordance with the laboratory's terms of accreditation unless stated otherwise in the report."

Should this report contain any data for tests for which we are not accredited, or which have been undertaken by a subcontractor that is not A2LA accredited, such data would not covered by this laboratory's A2LA accreditation.

# PAGE NO.

4 of 12.

# STANDARD TEST CONDITIONS and ENGINEERING PRACTICES

Except as noted herein, the following conditions and procedures were observed during the testing:

In accordance with ANSI C63.4-1992/2000, section 6.1.9, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of  $10^{\circ}$  to  $40^{\circ}$ C ( $50^{\circ}$  to  $104^{\circ}$ F) unless the particular equipment requirements specify testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of  $10^{\circ}$  to  $90^{\circ}$  relative humidity.

Prior to testing, the EUT was tuned up in accordance with the manufacturer's alignment procedures. All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.

Measurement results, unless otherwise noted, are worst case measurements.

PAGE NO.	5 of 12.
Name of test:	Environmental Assessment
Specification:	FCC: 47 CFR 1.1310
Measurement Guide:	ANSI/IEEE C95.1 1992
<u>Test Equipment:</u>	Maximum Permissible Exposure (MPE) measurement system, consisting of: Narda 8717-1174R, Radiation meter Narda 8761D, E-field probe (300 kHz - 3 GHz) (Calibrated Nov-98)
Measurement Procedure:	1. The following measurements were performed with a Narda probe using ANSI/IEEE C95.1 as a guide.
	2. Prior to making any measurements, the measurements system was calibrated in accordance with the manufacturer's procedures.
	3. The EUT's radiating element (antenna) was placed on a 1 m tall table for ease of testing. For equipment normally operated on a metal surface, a ground plane was used.
	4. The remaining equipment necessary to operate the EUT was maintained at a distance from the measurement arrangement suitable to minimize interference with the measurements.
	5. The minimum safe distance was calculated from the formula Power Density = EIRP / $4\pi R^2$ (Peak Watts/m <sup>2</sup> ). The calculation is shown with the measurement data.
	6. With the EUT operating at maximum power, a search was initiated for worst case emissions with the probe raised and lowered over a range of 0.2 to 2 meters in height and over a horizontal plane of $0^{\circ}$ to $360^{\circ}$ .
	7. Average values were calculated for the whole body $(0.2-2.0m)$ , lower body $(0.2-0.8m)$ and upper body $(1.0-2.0m)$ .
Results:	Attached.

PAGE NO.

6 of 12.

<u>TEST SETUP</u>: Maximum Permissible Exposure (MPE)

STATE:



PAGE NO.	7 of 12.
Name of test:	R.F. Radiation Exposure
FCC Rules: Description, EUT:	1.1307, 1.1310, 1.1311, 2.1091 See page 2 of Test Report
Test Frequency, MHz Antenna Gain Antenna Model	= 0 dBd
Rated Probe:	Narda 8761D Probe = 10 $\mu\text{W/cm}^2$ to 20 $\text{mW/cm}^2$
LIMITS: Uncontrolled Exposure 47 CFR 1.1310 Table 1, (B)	1.34-30 MHz:Limit $[mW/cm^2] = (180/f^2)$ 30-300 MHz:Limit $[mW/cm^2] = 0.2$
Limit: Uncontrolled H	= 43.9 dbm + 0 dBm = 43.9 dBm or 25 Watts, 50% Duty Cycle
Results:	Probe Height, m Power Density, mW/cm <sup>2</sup>

Results:	Probe Height, m	Power Density, mW/cm <sup>2</sup>
at tested distance	2.0	0.09
	1.8	0.12
	1.6	0.16
	1.4	0.18
	1.2	0.18
	1.0	0.11
	0.8	0.07
	0.6	0.04
	0.4	0.03
	0.2	0.03

Power Density Calculations:	The measured power density readings were summed and the results divided by the number of readings to calculate the average.
For whole body:	Average of 0.2 to 2.0 m, $mW/cm^2 = 0.101$
For lower body:	Average of 0.2 to 0.8 m, $mW/cm^2 = 0.028$
For upper body:	Average of 1.0 to 2.0 m, $mW/cm^2 = 0.140$

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PAGE NO.	8 of 12.	
Name of test:	R.F. Radiation Expos	sure
FCC Rules: Description, EUT:	1.1307, 1.1310, 1.13 See page 2 of Test B	
Test Frequency, MHz Antenna Gain Antenna Model	= 0 dBd	
Rated Probe:	Narda 8761D Probe =	10 $\mu\text{W/cm}^2$ to 20 $\text{mW/cm}^2$
LIMITS: Uncontrolled Exposure 47 CFR 1.1310 Table 1, (B)	1.34-30 MHz: 30-300 MHz:	Limit [mW/cm <sup>2</sup> ] = 100 Limit [mW/cm <sup>2</sup> ] = (180/f <sup>2</sup> ) Limit [mW/cm <sup>2</sup> ] = 0.2 Limit [mW/cm <sup>2</sup> ] = f/1500 Limit [mW/cm <sup>2</sup> ] = 1.0
	= 43.9 dbm + 0 dBm = Duty Cycle Exposure = 0.2 mW/cm <sup>2</sup>	= 43.9 dBm or 25 Watts, 50%
_		
Results:	Probe Height, m	Power Density, mW/cm <sup>2</sup>
at tested distance	2.0	0.10
	1.8 1.6	0.12 0.17
	1.4	0.16
		0.10

1.0

0.8

0.6

0.2

Power Density Calculations:

For whole body: For lower body: For upper body: The measured power density readings were summed and the results divided by the number of readings to calculate the average. Average of 0.2 to 2.0 m,  $mW/cm^2 = 0.132$ Average of 0.2 to 0.8 m,  $mW/cm^2 = 0.098$ Average of 1.0 to 2.0 m,  $mW/cm^2 = 0.155$ 

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0.19

0.17

0.11

0.04

0.04

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PAGE NO.	9 of 12.	
Name of test:	R.F. Radiation Expos	sure
FCC Rules: Description, EUT:	1.1307, 1.1310, 1.13 See page 2 of Test R	-
Test Frequency, MHz Antenna Gain Antenna Model		
Rated Probe:	Narda 8761D Probe =	10 $\mu\text{W/cm}^2$ to 20 $\text{mW/cm}^2$
LIMITS: Uncontrolled Exposure 47 CFR 1.1310 Table 1, (B)	30-300 MHz:	Limit [mW/cm <sup>2</sup> ] = (180/f <sup>2</sup> ) Limit [mW/cm <sup>2</sup> ] = 0.2 Limit [mW/cm <sup>2</sup> ] = f/1500
Power, Conducted, W Power + Ant. Gain, W		= 43.9 dBm or 25 Watts, 50%
Limit: Uncontrolled : Tested Distance:	-	Exposure, Mobile Operation
_		
Results:	Probe Height, m	Power Density, mW/cm <sup>2</sup>
at tested distance	2.0	0.07
	1.8	0.11

at tested distance	2.0	0.07
	1.8	0.11
	1.6	0.18
	1.4	0.19
	1.2	0.17
	1.0	0.13
	0.8	0.09
	0.6	0.05
	0.4	0.05
	0.2	0.03

Power Density Calculations:	The measured power density readings were summed and the results divided by the number of
	readings to calculate the average.
For whole body:	Average of 0.2 to 2.0 m, $mW/cm^2 = 0.107$
For lower body:	Average of 0.2 to 0.8 m, $mW/cm^2 = 0.055$
For upper body:	Average of 1.0 to 2.0 m, $mW/cm^2 = 0.142$

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PAGE NO.	10 of 12.			
Name of test:	R.F. Radiation Exposure			
FCC Rules: Description, EUT:	1.1307, 1.1310, 1.1311, 2.1091 See page 2 of Test Report			
Test Frequency, MHz Antenna Gain Antenna Model	= 0 dBd			
Rated Probe:	Narda 8761D Probe = 10	$\mu \texttt{W}/\texttt{cm}^2$ to 20 $\texttt{mW}/\texttt{cm}^2$		
LIMITS: Controlled Exposure 47 CFR 1.1310 Table 1, (A)	3.0-30 MHz: Lin 30-300 MHz: Lin	<pre>mit [mW/cm<sup>2</sup>] = 100 mit [mW/cm<sup>2</sup>] = (900/f<sup>2</sup>) mit [mW/cm<sup>2</sup>] = 1.0 mit [mW/cm<sup>2</sup>] = f/300 mit [mW/cm<sup>2</sup>] = 5.0</pre>		
Power, Conducted, W = 110 Power + Ant. Gain, W 50.5 dBm + 0 dBd = 110 Watts, 100% Duty Cycle Limit: Controlled = 1.0 mW/cm <sup>2</sup> Tested Distance: 76 cm Controlled Exposure, Base Station				
Results: at tested distance	Probe Height, m 2.0	Power Density, mW/cm <sup>2</sup> 0.15		
	1.8	0.33		
	1.6	0.71		
	1.4	0.98		
	1.2	0.95		
	1.0	0.92		

0.6

0.4

0.2

Power Density Calculations:

For whole body: For lower body: For upper body: The measured power density readings were summed and the results divided by the number of readings to calculate the average. Average of 0.2 to 2.0 m,  $mW/cm^2 = 0.497$ Average of 0.2 to 0.8 m,  $mW/cm^2 = 0.233$ Average of 1.0 to 2.0 m,  $mW/cm^2 = 0.673$ 

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0.33

0.25

0.25

0.10

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PAGE NO.	11 of 12.			
Name of test:	R.F. Radiation Exposure			
FCC Rules: Description, EUT:	1.1307, 1.1310, 1.1311, 2.1091 See page 2 of Test Report			
Test Frequency, MHz Antenna Gain Antenna Model	= 0 dBd			
Rated Probe:	Narda 8761D Probe = 10	$\mu \texttt{W}/\texttt{cm}^2$ to 20 $\texttt{mW}/\texttt{cm}^2$		
Exposure	0.3-3.0 MHz: Li 3.0-30 MHz: Li 30-300 MHz: Li 300-1500 MHz Li 1500-100,000 MHz: Li	$\begin{array}{llllllllllllllllllllllllllllllllllll$		
Power, Conducted, W = 110 Power + Ant. Gain, W 50.5 dBm + 0 dBd = 110 Watts, 100% Duty Cycle Limit: Controlled = 1.0 mW/cm <sup>2</sup> Tested Distance: 76 cm Controlled Exposure, Base Station				
Results: at tested distance	Probe Height, m	Power Density, mW/cm <sup>2</sup> 0.15		
at tested distance	2.0 1.8	0.15		
	1.6	0.72		
	1.4	0.95		
	1.2	0.98		
	1.0	0.93		

0.6

0.4

0.2

Power	Density
Calcul	ations:

For whole body: For lower body: For upper body: The measured power density readings were summed and the results divided by the number of readings to calculate the average. Average of 0.2 to 2.0 m,  $mW/cm^2 = 0.498$ Average of 0.2 to 0.8 m,  $mW/cm^2 = 0.233$ Average of 1.0 to 2.0 m,  $mW/cm^2 = 0.675$ 

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0.33

0.26

0.24

0.10

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PAGE NO.	12 of 12.			
Name of test:	R.F. Radiation Exposure			
FCC Rules: Description, EUT:	1.1307, 1.1310, 1.1311, 2.1091 See page 2 of Test Report			
Test Frequency, MHz Antenna Gain Antenna Model	= 0 dBd			
Rated Probe:	Narda 8761D Probe = 10 $\mu$ W/cm <sup>2</sup> to 20 mW/cm <sup>2</sup>			
Exposure	0.3-3.0 MHz: I 3.0-30 MHz: I 30-300 MHz: I 300-1500 MHz I 1500-100,000 MHz: I	Limit [mW/cm <sup>2</sup> ] = (900/f <sup>2</sup> ) Limit [mW/cm <sup>2</sup> ] = 1.0 Limit [mW/cm <sup>2</sup> ] = f/300		
Power, Conducted, W = 110 Power + Ant. Gain, W 50.5 dBm + 0 dBd = 100 Watts, 100% Duty Cycle Limit: Controlled = 1.0 mW/cm <sup>2</sup> Tested Distance: 74 cm Controlled Exposure, Base Station				
_				
Results:	Probe Height, m	Power Density, mW/cm <sup>2</sup>		
at tested distance	2.0 1.8	0.13 0.35		
	1.6	0.76		
	1.4	0.96		
	1.2	0.94		
	1.0	0.89		

0.6

0.4

0.2

Power Density Calculations:

For whole body: For lower body: For upper body: The measured power density readings were summed and the results divided by the number of readings to calculate the average. Average of 0.2 to 2.0 m,  $mW/cm^2 = 0.540$ Average of 0.2 to 0.8 m,  $mW/cm^2 = 0.343$ Average of 1.0 to 2.0 m,  $mW/cm^2 = 0.672$ 

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0.52

0.51

0.32

0.12

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# (The following will be placed in the Instruction Manual)

## MANDATORY SAFETY INSTRUCTIONS TO INSTALLERS & USERS

Use only manufacturer or dealer supplied antenna.

# Antenna Minimum Safe Distance: 59.5 cm for Mobile, 76 cm for Base.

Antenna Gain: zero dBd referenced to a dipole.

The Federal Communications Commission has adopted a safety standard for human exposure to RF (Radio Frequency) energy which is below the OSHA (Occupational Safety and Health Act) limits.

Antenna Mounting: The antenna supplied by the manufacturer or radio dealer must not be mounted at a location such that during radio transmission, any person or persons can come closer than the above indicated minimum safe distance to the antenna i.e. <u>59.5 cm</u> for Mobile, 76 cm for Base.

To comply with current FCC RF Exposure limits, the antenna must be installed at or exceeding the minimum safe distance shown above, and in accordance with the requirements of the antenna manufacturer or supplier.

Base Station Installation: The antenna should be fixed-mounted on an outdoor permanent structure. RF Exposure compliance must be addressed at the time of installation.

Antenna Substitution: Do not substitute any antenna for the one supplied or recommended by the manufacturer or radio dealer. You may be exposing person or persons to harmful radio frequency radiation. You may contact your radio dealer or the manufacturer for further instructions.

WARNING: Maintain a separation distance from the antenna to a person(s) of at least 59.5 cm for Mobile, 76 cm for Base .

You, as the qualified end-user of this radio device must control the exposure conditions of bystanders to ensure the minimum separation distance (above) is maintained between the antenna and nearby persons for satisfying RF Exposure compliance. The operation of this transmitter must satisfy the requirements of Occupational/Controlled Exposure Environment, for work-related use. transmit only when person(s) are at least the minimum distance from the properly installed, externally mounted antenna.

# SPECIAL NOTE: CAUTION

For Users and Installers:

This device can operate with an R.F. power output of 50 watts to 110 watts.

When used as a Mobile, the device <u>MUST</u> be used at an R.F. power output of 50 watts with a duty cycle of 50% and at a minimum safe distance of 59.5 cm to comply with FCC R.F. Exposure Limits.

When used as a Base Station, the device can be used with an R.F. power output of 110 watts or less at a minimum safe distance of 76 cm to comply with FCC R.F. Exposure Limits.

# TESTIMONIAL AND STATEMENT OF CERTIFICATION

# THIS IS TO CERTIFY THAT:

- THAT the application was prepared either by, or under the direct supervision of, the undersigned.
- 2. THAT the technical data supplied with the application was taken under my direction and supervision.
- THAT the data was obtained on representative units, randomly selected.
- 4. THAT, to the best of my knowledge and belief, the facts set forth in the application and accompanying technical data are true and correct.

N. June P. Eng

Morton Flom, P. Eng.

CERTIFYING ENGINEER: