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## FCC PART 15

### SCANNING RECEIVER

<b>Applicant</b>	VERTEX STANDARD CO., LTD.
<b>Address</b>	4-8-8 NAKAMEGURO, MEGURO-KU
	TOKYO 153-8644 JAPAN
<b>FCC ID:</b>	K6620335X40
<b>Model Number</b>	FTM-350R
<b>Product Description</b>	AMATEUR RADIO WITH SCANNING RECEIVER
<b>Date Sample Received</b>	12/8/2009
<b>Date Tested</b>	12/10/2009
<b>Tested By</b>	Joe Scoglio
<b>Approved By</b>	Mario de Aranzeta
<b>Report Number</b>	2992AUT9TestReport.doc
<b>Test Results</b>	<input checked="" type="checkbox"/> PASS <input type="checkbox"/> FAIL

THE ATTACHED REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL  
WITHOUT THE WRITTEN APPROVAL OF TIMCO ENGINEERING, INC.



Certificate # 0955-01



## TABLE OF CONTENTS

GENERAL REMARKS .....	3
GENERAL INFORMATION .....	4
TEST EQUIPMENT LIST .....	5
TEST PROCEDURE .....	6
RADIATED SPURIOUS EMISSIONS .....	7
POWER LINE CONDUCTED INTERFERENCE .....	8
38 dB REJECTION RADIO .....	9

APPLICANT: VERTEX STANDARD CO., LTD.

FCC ID: K6620335X40

REPORT #: V\VERTEX\_STANDARD\2992AUT9\2992AUT9TestReport.doc

## **GENERAL REMARKS**

The attached report shall not be reproduced except in full without the written permission of Timco Engineering Inc.

### **Summary**

The device under test does:

fulfill the general approval requirements as identified in this test report  
 not fulfill the general approval requirements as identified in this test report

### **Attestations**

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025 requirements.



Testing Certificate # 0955-01

I attest that the necessary measurements were made, under my supervision, at:

Timco Engineering Inc.  
849 NW State Road 45  
Newberry, FL 32669



### **Authorized Signatory Name:**

Mario de Aranzeta C.E.T.  
Compliance Engineer/ Lab. Supervisor

**Date:** 12/10/2009

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FCC ID: K6620335X40

REPORT #: V\VERTEX\_STANDARD\2992AUT9\2992AUT9TestReport.doc

**GENERAL INFORMATION**

The test results relate only to the items tested.	
<b>DUT Description</b>	AMATEUR RADIO WITH SCANNING RECEIVER
<b>FCC ID</b>	K6620335X40
<b>Model Number</b>	FTM-350R
<b>DUT Power Source</b>	<input type="checkbox"/> 110–120Vac/50– 60Hz <input checked="" type="checkbox"/> DC Power <input type="checkbox"/> Battery Operated Exclusively
<b>Test Item</b>	<input type="checkbox"/> Prototype <input checked="" type="checkbox"/> Pre-Production <input type="checkbox"/> Production
<b>Modifications to DUT</b>	None
<b>Test Standards</b>	FCC Part 15, Subpart B, ANSI C63.4-2003

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FCC ID: K6620335X40

REPORT #: V\VERTEX\_STANDARD\2992AUT9\2992AUT9TestReport.doc

**TEST EQUIPMENT LIST**

<b>Device</b>	<b>Manufacturer</b>	<b>Model</b>	<b>Serial Number</b>	<b>Cal/Char Date</b>	<b>Due Date</b>
3/10-Meter OATS	TEI	N/A	N/A	Listed 3/20/07	3/19/10
3-Meter OATS	TEI	N/A	N/A	Listed 2/5/09	2/5/12
3-Meter Semi-Anechoic Chamber	Panashield	N/A	N/A	Listed 5/11/07	5/10/10
Analyzer Open-Frame Tower Preamplifier	HP	8449B	3008A01075	CAL 7/22/09	7/22/11
Analyzer Open-Frame Tower Quasi-Peak Adapter	HP	85650A	2043A00305	CAL 10/26/09	10/26/11
Analyzer Open-Frame Tower RF Preselector	HP	85685A	3107A01282	CAL 7/22/09	7/22/11
Analyzer Open-Frame Tower Spectrum Analyzer	HP	8566B/85662A	2627A03154/ 2648A14276	CAL 7/22/09	7/22/11
Antenna: BiconiLog	EMCO	3143	9409-1043		No Cal Required
Antenna: Biconnical	Eaton	94455-1	1057	CAL 1/15/08	1/15/10
Antenna: Log-Periodic	Electro-Metrics	LPA-25	1122	CAL 12/15/08	12/15/11
LISN	Electro-Metrics	ANS-25/2	2604	CAL 10/16/09	10/16/11
Signal Generator	HP	8640B	2308A21464	CAL 8/4/09	8/4/11

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FCC ID: K6620335X40

REPORT #: V\VERTEX\_STANDARD\2992AUT9\2992AUT9TestReport.doc

## TEST PROCEDURE

**General:** This report shall NOT be reproduced except in full without the written approval of TIMCO ENGINEERING, INC.

**Radiation Interference:** The test procedure used was ANSI Standard C63.4-2003 using a spectrum analyzer with a pre-selector. The bandwidth of the spectrum analyzer was 100 kHz with an appropriate sweep speed. The analyzer was calibrated in dB above a microvolt at the output of the antenna. The video bandwidth was always greater than or equal to the RBW.

**Formula Of Conversion Factors:** The Field Strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dB $\mu$ V) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the Preselector was accounted for in the Spectrum Analyzer Meter Reading.

**Example:**

Freq (MHz)	Meter Reading	+ ACF	+CL	= FS
33	20 dB $\mu$ V	+ 10.36 dB/m	+0.40 dB	=30.36 dB $\mu$ V/m @ 3m

**ANSI C63.4-2003 Section 10.1.7 Measurement Procedures:** The unit under test was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The table used for radiated measurements is capable of continuous rotation. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

If power line conducted testing was required for this device, the situation was similar for the conducted measurement except that the table did not rotate. The EUT was setup as described in ANSI C63.4-2003 with the DUT 40 cm from the vertical ground wall.

APPLICANT: VERTEX STANDARD CO., LTD.

FCC ID: K6620335X40

REPORT #: V\VERTEX\_STANDARD\2992AUT9\2992AUT9TestReport.doc

## RADIATED SPURIOUS EMISSIONS

Rules Part No.: 15.109

**Requirements:**

Frequency	Limits
30 – 88	40.0 dB $\mu$ V/m measured @ 3 meters
80 – 216	43.5 dB $\mu$ V/m measured @ 3 meters
216 – 960	46.0 dB $\mu$ V/m measured @ 3 meters
Above 960	54.0 dB $\mu$ V/m measured @ 3 meters

**Test Procedure:** The procedure used was ANSI C63.4-2003. The frequency was scanned from 30 MHz to 1.0 GHz. When an emission was found, the table was rotated to produce the maximum signal strength. The DUT was measured in three (3) orthogonal planes.

Emissions attenuated more than 20 dB below the permissible value are not reported.

**Test Data:**

Emission Frequency MHz	Meter Reading dB $\mu$ V	Ant. Polarity	Coax Loss dB	Correction Factor dB/m	Field Strength dB $\mu$ V/m	Margin dB
66.70	11.9	V	0.56	5.80	18.26	21.74
66.70	12.7	H	0.56	5.56	18.82	21.18
86.70	8.0	V	0.62	10.57	19.19	20.81
86.70	13.8	H	0.62	9.84	24.26	15.74
161.20	11.7	V	0.74	16.90	29.34	14.16
161.20	16.4	H	0.74	16.35	33.49	10.01
168.80	8.5	V	0.78	16.14	25.42	18.08
168.80	14.8	H	0.78	15.74	31.32	12.18
176.00	11.2	V	0.80	15.06	27.06	16.44
176.00	17.7	H	0.80	14.34	32.84	10.66
235.60	11.4	V	0.97	11.59	23.96	22.04
235.60	22.5	H	0.97	11.78	35.25	10.75
260.30	6.5	V	1.02	12.91	20.43	25.57
260.30	15.5	H	1.02	12.92	29.44	16.56
310.00	7.3	V	1.11	15.10	23.51	22.49
310.00	14.6	H	1.11	15.20	30.91	15.09
391.70	7.0	V	1.19	15.62	23.81	22.19
391.70	12.3	H	1.19	15.85	29.34	16.66

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FCC ID: K6620335X40

REPORT #: V\VERTEX\_STANDARD\2992AUT9\2992AUT9TestReport.doc

## POWER LINE CONDUCTED INTERFERENCE

**Rules Part No.:** Part 15.107

**Requirements:**

Frequency (MHz)	Quasi Peak Limits (dB $\mu$ V)	Average Limits (dB $\mu$ V)
0.15 – 0.5	66 – 56	56 – 46
0.5 – 5.0	56	46
5.0 – 30	60	50

**Test Procedure:** ANSI Standard C63.4-2003. The spectrum was scanned from 0.15 to 30 MHz.

**Test Data:**

NOTE DUT DC POWERED ONLY

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FCC ID: K6620335X40

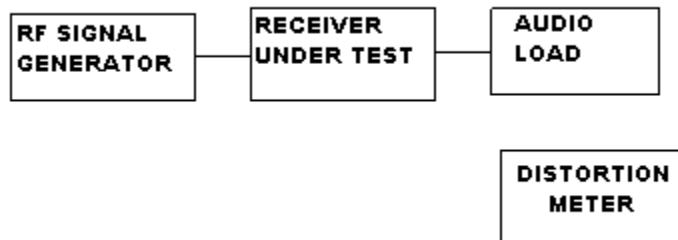
REPORT #: V\VERTEX\_STANDARD\2992AUT9\2992AUT9TestReport.doc

## 38 dB REJECTION RADIO

**RULES PART NUMBER:** 15.121(b)

**REQUIREMENTS:** 38dB REJECTION RATIO TO SENSITIVITY OF THE RECEIVER.

### TEST SET-UP



- a. Equipment connected as illustrated
- b. A standard signal was applied to the receiver input terminals.
- c. Receiver output audio output was adjusted for rated output.
- d. The RF Signal generator was adjusted to the lowest level to produce a 12dB SINAD without the audio output dropping more than 3dB. Make note of sensitivity level.
- e. This was done across the different bands to establish a reference level. The reference taken was the worse case sensitivity.
- f. The output of the signal generator was then adjusted to a level of 60dB above the reference level at a frequency of 824.5MHz.
- g. With the level set 60dB above the level measured in step e.
- h. Set squelch on receiver to threshold, the signal level required to open the squelch must be lower than the level measured in step d.
- i. Cause the receiver to scan or step-it through its complete range of frequencies.
- j. If receiver stops or unsquelches on any frequency, record the frequency and then adjust the level until a 12dB SINAD is produced. This level must be greater than 38dB above the level in step e.
- k. Repeat steps f through j for frequencies 836.0, 848.5, 869.1, 881.0, & 893.5MHz.

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FCC ID: K6620335X40

REPORT #: V\VERTEX\_STANDARD\2992AUT9\2992AUT9TestReport.doc

**TEST RESULTS:** The DUT meets the 38dB REJECTION RATIO.

generator setting	signal	above level in step e		
824.5 MHz	341.375MHz	45 dB		
836.0 MHz	347.125 MHz	47 dB		
	394.375 MHz	61 dB		
848.5 MHz	353.37 MHz	52 dB		
	550.400 MHz	55 dB		
869.1MHz	363.675MHz	54 dB		
881.0MHz	369.625MHz	57 dB		
893.5MHz	375.875MHz	59 dB		

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REPORT #: V\VERTEX\_STANDARD\2992AUT9\2992AUT9TestReport.doc