



849 NW State Road 45
Newberry, FL 32669 USA
Phone: 888.472.2424 or 352.472.5500
Fax: 352.472.2030
Email: info@timcoengr.com
Website: www.timcoengr.com

FCC PART 15

SCANNING RECEIVER

Applicant	VERTEX STANDARD CO., LTD.
Address	4-8-8 NAKAMEGURO, MEGURO-KU
	TOKYO 153-8644 JAPAN
FCC ID:	K6620415X20
Model Number	VX-8GR
Product Description	AMATEUR RADIO WITH SCANNING RECEIVER
Date Sample Received	3/22/2010
Date Tested	3/30/2010
Tested By	Nam Nguyen
Approved By	Mario de Aranzeta
Report Number	634AUT10TestReport.doc
Test Results	<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



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APPLICANT: VERTEX STANDARD CO., LTD.

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GENERAL REMARKS

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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: 3/31/2010

APPLICANT: VERTEX STANDARD CO., LTD.

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GENERAL INFORMATION

The test results relate only to the items tested.	
DUT Description	AMATEUR RADIO WITH SCANNING RECEIVER
FCC ID	K6620415X20
Model Number	VX-8GR
DUT Power Source	<input type="checkbox"/> 110-120Vac/50- 60Hz
	<input type="checkbox"/> DC Power
	<input checked="" type="checkbox"/> Battery Operated Exclusively
Test Item	<input type="checkbox"/> Prototype
	<input checked="" type="checkbox"/> Pre-Production
	<input type="checkbox"/> Production
Modifications to DUT	None
Test Standards	FCC Part 15, Subpart B, ANSI C63.4-2003

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TEST EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
3-Meter Semi-Anechoic Chamber	Panashield	N/A	N/A	Listed 5/11/07	5/10/10
AC Voltmeter	HP	400FL	2213A14499	CAL 3/23/09	3/23/11
Antenna: Dipole Kit	Electro-Metrics	TDA-30/1-4	153	CHAR 6/10/09	6/10/11
Frequency Counter	HP	5385A	3242A07460	CAL 5/26/09	5/26/11
Hygro-Thermometer	Extech	445703	0602	CAL 1/30/09	1/30/11
Modulation Analyzer	HP	8901A	3435A06868	CAL 5/26/09	5/26/11
Digital Multimeter	Fluke	FLUKE-77-3	79510405	CAL 5/18/09	5/18/11
Analyzer Tan Tower Preamplifier	HP	8449B-H02	3008A00372	CAL 11/21/09	11/21/11
Analyzer Tan Tower Quasi-Peak Adapter	HP	85650A	3303A01690	CAL 11/22/09	11/22/11
Analyzer Tan Tower RF Preselector	HP	85685A	3221A01400	CAL 11/21/09	11/21/11
Analyzer Tan Tower Spectrum Analyzer	HP	8566B Opt 462	3138A07786 3144A20661	CAL 11/24/09	11/24/11
Temperature Chamber	Tenney Engineering	TTRC	11717-7	CHAR 4/25/08	4/25/10

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TEST PROCEDURE

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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 μ 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 μ V	+ 10.36 dB/m	+0.40 dB	=30.36 dB μ 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 powerline 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 EUT 40 cm from the vertical ground wall.

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RADIATED SPURIOUS EMISSIONS

Rules Part No.: 15.109

Requirements:

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

Test Data:

Band A:

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dB μ V	Ant. Polarity	Coax Loss dB	Correction Factor dB	Field Strength dB μ V/m	Margin dB
108	155.25	4.3	H	0.72	16.31	21.33	22.17
108	155.25	4.8	V	0.72	17.29	22.81	20.69
108	310.5	9.7	H	1.11	15.19	26	20
108	310.5	10.2	V	1.11	15.08	26.39	19.61
108	465.75	10.9	V	1.27	17.02	29.19	16.81
122.5	169.75	4.5	V	0.78	16.03	21.31	22.19
122.5	169.75	6.6	H	0.78	15.63	23.01	20.49
122.5	339.5	6.7	H	1.14	14.81	22.65	23.35
122.5	339.5	9.1	V	1.14	14.6	24.84	21.16
122.5	509.25	3.8	H	1.33	18.73	23.86	22.14
122.5	509.25	10.6	V	1.33	18.46	30.39	15.61
137	184.25	4.8	V	0.84	14.25	19.89	23.61
137	184.25	8.9	H	0.84	13.36	23.1	20.4
137	368.5	6.7	V	1.17	15.06	22.93	23.07
137	368.5	7.2	H	1.17	15.17	23.54	22.46

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TEST DATA CONTD.

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBμV	Ant. Polarity	Coax Loss dB	Correction Factor dB	Field Strength dBμV/m	Margin dB
150	197.25	6.5	V	0.89	16.58	23.97	19.53
150	197.25	11.6	H	0.89	16.03	28.52	14.98
150	394.5	6.1	H	1.19	15.94	23.23	22.77
150	394.5	11.5	V	1.19	15.65	28.34	17.66
174	126.75	3.7	H	0.68	11.96	16.34	27.16
174	126.75	4.9	V	0.68	12.62	18.2	25.3
174	253.5	4.1	V	1.01	12.64	17.75	28.25
174	253.5	6.1	H	1.01	12.64	19.75	26.25
174	380.25	5.4	H	1.18	15.41	21.99	24.01
174	380.25	7.3	V	1.18	15.31	23.79	22.21
174	507	7.8	H	1.32	18.53	27.65	18.35
174	507	12.5	V	1.32	18.32	32.14	13.86
198	150.75	4.2	H	0.7	16.13	21.03	22.47
198	150.75	5.6	V	0.7	17.22	23.52	19.98
198	301.5	9.7	V	1.1	14.51	25.31	20.69
198	301.5	12.1	H	1.1	14.52	27.72	18.28
198	452.25	4.8	H	1.25	16.88	22.93	23.07
198	452.25	10.9	V	1.25	16.67	28.82	17.18
222	174.75	3.8	V	0.8	15.24	19.84	23.66
222	174.75	4.6	H	0.8	14.56	19.96	23.54
222	349.5	7.8	H	1.15	14.99	23.94	22.06
222	349.5	9.1	V	1.15	14.6	24.85	21.15
222	524.25	6.1	H	1.37	18.73	26.2	19.8
222	524.25	6.3	V	1.37	18.05	25.72	20.28
300	347.25	4.7	V	1.15	14.6	20.45	25.55
300	347.25	5	H	1.15	14.95	21.1	24.9
350	397.25	3.7	V	1.2	15.67	20.57	25.43
350	397.25	4	H	1.2	16.02	21.22	24.78
420	372.75	4.4	V	1.17	15.16	20.73	25.27
420	372.75	5.5	H	1.17	15.26	21.93	24.07
445	397.75	6.1	H	1.2	16.03	23.33	22.67

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TEST DATA C ONTD.

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBμV	Ant. Polarity	Coax Loss dB	Correction Factor dB/m	Field Strength dBμV/m	Margin dB
445	397.75	8.2	V	1.2	15.68	25.08	20.92
470	422.75	7.2	H	1.22	16.28	24.7	21.3
470	422.75	12.3	V	1.22	16.03	29.55	16.45
540	492.75	8.1	H	1.29	17.61	27	19
540	492.75	12.3	V	1.29	17.76	31.35	14.65
635	682.25	4.7	H	1.68	21	27.38	18.62
635	682.25	5.4	V	1.68	20.5	27.58	18.42
635	2,046.70	12.3	H	2.93	31.32	46.55	7.45
635	2,046.75	11.5	V	2.93	31.32	45.75	8.25
635	2,729.00	8.7	V	3.41	32.55	44.66	9.34
635	4,093.50	10.4	H	4.55	33.69	48.64	5.36
803	755.75	7.5	V	1.81	20.66	29.97	16.03
803	755.75	8	H	1.81	21.6	31.41	14.59
803	1,511.50	9.7	H	2.51	28.07	40.28	13.72
803	1,511.50	11.7	V	2.51	28.07	42.28	11.72
803	3,023.00	14.4	V	3.62	32.61	50.63	3.37
803	3,023.00	17.3	H	3.62	32.61	53.53	0.47
803	4,534.50	10.8	H	4.77	34.1	49.67	4.33
900	852.75	13.5	H	1.93	22.66	38.09	7.91
900	852.75	14.4	V	1.93	22.18	38.51	7.49
900	1,705.50	9.2	H	2.66	29.32	41.18	12.82
900	1,705.50	12.9	V	2.66	29.32	44.88	9.12
900	2,558.20	8	V	3.29	32.51	43.8	10.2
900	3,411.00	9.8	H	3.97	32.76	46.53	7.47
1,000.00	952.75	8.6	H	2.03	23.38	34.01	11.99
1,000.00	952.75	11.3	V	2.03	22.58	35.91	10.09
1,000.00	1,905.50	8.7	V	2.82	30.6	42.12	11.88
1,000.00	1,905.50	9	H	2.82	30.6	42.42	11.58
1,000.00	2,858.20	11.2	V	3.5	32.57	47.27	6.73
1,000.00	3,811.00	11.7	H	4.33	33.3	49.33	4.67

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Band B:

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBμV	Ant. Polarity	Coax Loss dB	Correction Factor dB/m	Field Strength dBμV/m	Margin dB
108	154.35	3.7	V	0.72	17.29	21.71	21.79
108	154.35	4.1	H	0.72	16.27	21.09	22.41
108	308.7	10.4	V	1.11	15.01	26.52	19.48
108	308.7	14.5	H	1.11	15.1	30.71	15.29
108	463.05	8.8	V	1.26	16.96	27.02	18.98
122.5	168.85	3.8	H	0.78	15.74	20.32	23.18
122.5	168.85	4.4	V	0.78	16.14	21.32	22.18
122.5	337.7	16.5	H	1.14	14.82	32.46	13.54
122.5	337.7	19.4	V	1.14	14.58	35.12	10.88
122.5	506.55	8.5	H	1.32	18.49	28.31	17.69
122.5	506.55	15.2	V	1.32	18.29	34.81	11.19
137	183.35	7.4	V	0.83	14.3	22.53	20.97
137	183.35	14.4	H	0.83	13.43	28.66	14.84
137	366.7	14.1	H	1.17	15.13	30.4	15.6
137	366.7	21.7	V	1.17	15	37.87	8.13
137	550.05	7.6	H	1.45	18.6	27.65	18.35
137	550.05	10.6	V	1.45	18.1	30.15	15.85
150	196.35	10.3	V	0.89	16.31	27.5	16
150	196.35	18.1	H	0.89	15.78	34.77	8.73
150	392.7	12.4	H	1.19	15.88	29.47	16.53
150	392.7	23.8	V	1.19	15.63	40.62	5.38
174	127.65	5.4	H	0.68	12.19	18.27	25.23
174	127.65	7.4	V	0.68	12.84	20.92	22.58
174	255.3	6.4	V	1.01	12.71	20.12	25.88
174	255.3	7.1	H	1.01	12.71	20.82	25.18
174	382.95	12.7	H	1.18	15.52	29.4	16.6
174	382.95	14.4	V	1.18	15.39	30.97	15.03
174	510.6	9.3	V	1.33	18.49	29.12	16.88
198	151.65	5.2	V	0.71	17.23	23.14	20.36
198	151.65	5.8	H	0.71	16.17	22.68	20.82
198	303.3	9.7	V	1.1	14.63	25.43	20.57

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TEST DATA CONTD.

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBμV	Ant. Polarity	Coax Loss dB	Correction Factor dB/m	Field Strength dBμV/m	Margin dB
198	303.3	12	H	1.1	14.66	27.76	18.24
222	175.65	5	V	0.8	15.11	20.91	22.59
222	175.65	10.6	H	0.8	14.4	25.8	17.7
222	351.3	11.5	H	1.15	15	27.65	18.35
222	351.3	18.1	V	1.15	14.63	33.88	12.12
222	526.95	10.4	H	1.38	18.62	30.4	15.6
222	526.95	13.3	V	1.38	17.88	32.56	13.44
300	346.35	12.1	V	1.15	14.6	27.85	18.15
300	346.35	12.8	H	1.15	14.93	28.88	17.12
300	692.7	4.4	H	1.69	21	27.09	18.91
300	692.7	6.5	V	1.69	20.53	28.72	17.28
300	1,039.05	11	V	2.13	27.63	40.76	13.24
300	1,385.40	11.6	H	2.41	27.91	41.92	12.08
300	1,731.75	11.7	V	2.69	29.48	43.87	10.13
300	1,731.75	13.8	H	2.69	29.48	45.97	8.03
300	2,078.10	8.9	V	2.95	31.4	43.25	10.75
300	2,078.10	10	H	2.95	31.4	44.35	9.65
350	396.35	10.9	H	1.2	15.99	28.09	17.91
350	396.35	16.5	V	1.2	15.66	33.36	12.64
350	792.7	11.9	V	1.89	20.93	34.72	11.28
350	792.7	12.9	H	1.89	21.6	36.39	9.61
350	1,585.40	12.4	H	2.57	28.55	43.52	10.48
350	1,585.40	13.5	V	2.57	28.55	44.62	9.38
420	373.65	9.5	H	1.17	15.27	25.94	20.06
420	373.65	14	V	1.17	15.17	30.34	15.66
420	747.3	9.8	H	1.79	21.52	33.11	12.89
420	747.3	10.6	V	1.79	20.65	33.04	12.96
420	1,494.60	11.7	V	2.5	28	42.2	11.8
420	1,494.60	12.3	H	2.5	28	42.8	11.2
445	398.65	12.3	H	1.2	16.06	29.56	16.44
445	398.65	18.5	V	1.2	15.69	35.39	10.61
445	797.3	12.8	V	1.89	20.97	35.66	10.34
445	797.3	14.4	H	1.89	21.6	37.89	8.11

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TEST DATA CONTD.

Tuned Frequency MHz	Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity	Coax Loss dB	Correction Factor dB	Field Strength dBuV/m	Margin dB
445	1,594.60	13.1	V	2.58	28.61	44.29	9.71
445	1,594.60	13.8	H	2.58	28.61	44.99	9.01
470	423.65	21.3	V	1.22	16.04	38.56	7.44
470	423.65	23.1	H	1.22	16.31	40.63	5.37
470	847.3	12.8	V	1.92	21.97	36.69	9.31
470	847.3	13.2	H	1.92	22.57	37.69	8.31
470	1,694.60	12.4	H	2.66	29.25	44.31	9.69
470	1,694.60	12.8	V	2.66	29.25	44.71	9.29
540	493.6	17.2	H	1.29	17.64	36.13	9.87
540	493.65	20.8	V	1.29	17.77	39.86	6.14
540	987.3	5.6	H	2.08	23.95	31.63	22.37
540	987.3	7.2	V	2.08	23.15	32.43	21.57
540	1,974.60	9.4	H	2.88	31.04	43.32	10.68
540	2,468.25	8.2	V	3.23	32.42	43.85	10.15
540	2,468.25	10.9	H	3.23	32.42	46.55	7.45
580	533.6	20.6	V	1.4	17.84	39.84	6.16
580	533.6	22.6	H	1.4	18.43	42.43	3.57
580	1,600.80	10.8	H	2.58	28.65	42.03	11.97
580	1,600.80	11.5	V	2.58	28.65	42.73	11.27
580	2,134.40	11.2	H	2.99	31.55	45.74	8.26
580	2,668.00	11.4	V	3.37	32.53	47.3	6.7
580	2,668.00	11.5	H	3.37	32.53	47.4	6.6

APPLICANT: VERTEX STANDARD CO., LTD.

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POWER LINE CONDUCTED INTERFERENCE

Rules Part No.: Part 15.107

Requirements:

Frequency (MHz)	Quasi Peak Limits (dBμV)	Average Limits (dBμV)
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: Not applicable.

APPLICANT: VERTEX STANDARD CO., LTD.

FCC ID: K6620415X20

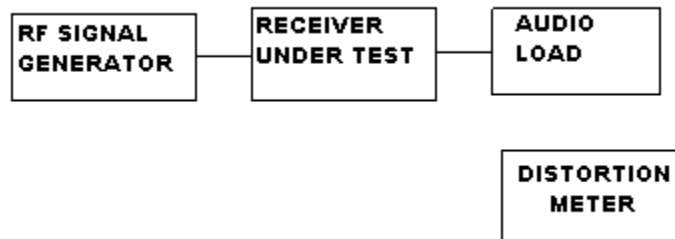
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38 dB REJECTION RATIO

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.

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

APPLICANT: VERTEX STANDARD CO., LTD.

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