TEST REPORT

Report Number: 3128702MPK-001
Project Number: 3128702
July 31, 2007

Testing performed on the
VHF/UHF Hand Held Scanner
Model Number: 0711
FCC ID: ADV0711
to

FCC Part 15, Subpart B

Class: B

for
GRE America

A2LA Certificate Number: 1755-01

Test Performed by:
Intertek
1365 Adams Court
Menlo Park, CA 94025

Test Authorized by:
GRE America
425 Harbor Blvd. Suit B
Belmont, CA 94002

Prepared by: David Chernomordik **Date:** July 31, 2007
David Chernomordik

Reviewed by: Ollie Moyrong **Date:** July 31, 2007
Ollie Moyrong

VERIFICATION OF COMPLIANCE
Report No. 3128702MPK-001

Verification is hereby issued to the named APPLICANT and is VALID ONLY for the equipment identified hereon for use under the rules and regulations listed below.

Equipment Under Test:	VHF/UHF Hand Held Scanner
Trade Name:	GRECOM
Model No.:	0711
Serial No.	000011
Applicant:	GRE America
Contact:	Mr. Teru Takahashi
Address:	425 Harbor Blvd. Suite B Belmont, CA 94002
Country	USA
Tel. number:	650-591-1400
Fax number:	650-591-2001
Applicable Regulation:	FCC Part 15, Subpart B
Equipment Class:	Class B
Date of Test:	July 19-30, 2007

We attest to the accuracy of this report:

David Chernomordik
EMC Technical Manager

Ollie Moyrong
EMC Department Manager

TABLE OF CONTENTS

1.0 General Description

1.1 Product Description

The Equipment under Test (EUT) is 200 Channels VHF/UHF Hand Held Scanning Receiver, model 0711.

Please refer to the attached specifications sheets in Appendix A for more details.

A pre-production version of the sample was received on July 10, 2007 in good condition. As declared by the Applicant, it is identical to production units.

1.2 Related Submittal(s) Grants

This is a single application for certification of a scanning receiver.

1.3 Test Methodology

Both conducted (if applicable) and radiated emission measurements were performed according to the procedures in ANSI C63.4 (2003). All radiated measurements were performed in a semi-anechoic chamber. Radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the **"Data Section"** of this Application.

1.4 Test Facility

The test site and conducted measurement facility used to collect the radiated data is Site 1, a 10 meter semi-anechoic chamber. This test facility and site measurement data have been fully placed on file with the FCC and A2LA accredited.

1.5 Summary of Test Results

Model: 0711
FCC ID: ADV0711

TEST	REFERENCE	RESULTS
Radiated Emission	15.109	Complies
AC Line Conducted Emission	15.107	Complies
Antenna Conducted Emission	15.111	Complies
FCC Part 15.121 Requirement	15.121	Complies *

* Refer to file: ADV0711 REPORT FOR FCC RULE PART 15.121

2.0 System Test Configuration

2.1 Justification

The tests were performed according to the test procedure as outlined in CFR47 Part 15.31 and in ANSI C63.4 (2003).

For emission testing, the equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). During testing, all cables were manipulated to produce worst-case emissions.

For the measurements, the EUT is placed on top of a non-conductive table. If the EUT attaches to peripherals, they are connected and operational (as typical as possible).

For radiated emission measurements, the signal is maximized through rotation and placement in the three orthogonal axes. The antenna height and polarization are varied during the search for maximum signal level. The antenna height is varied from 1 to 4 meters. Radiated emissions are taken at three meters unless the signal level is too low for measurement at that distance. If necessary, a pre-amplifier is used and/or the test is conducted at a closer distance. All readings are extrapolated back to the equivalent three-meter reading using inverse scaling with distance if measured at a closer distance.

2.2 EUT Exercising Software

The unit was setup to receive continuously to simplify the measurement methodology. Care was taken to ensure proper power supply voltages during testing.

2.3 Mode of Operation

The EUT was tested in two modes:

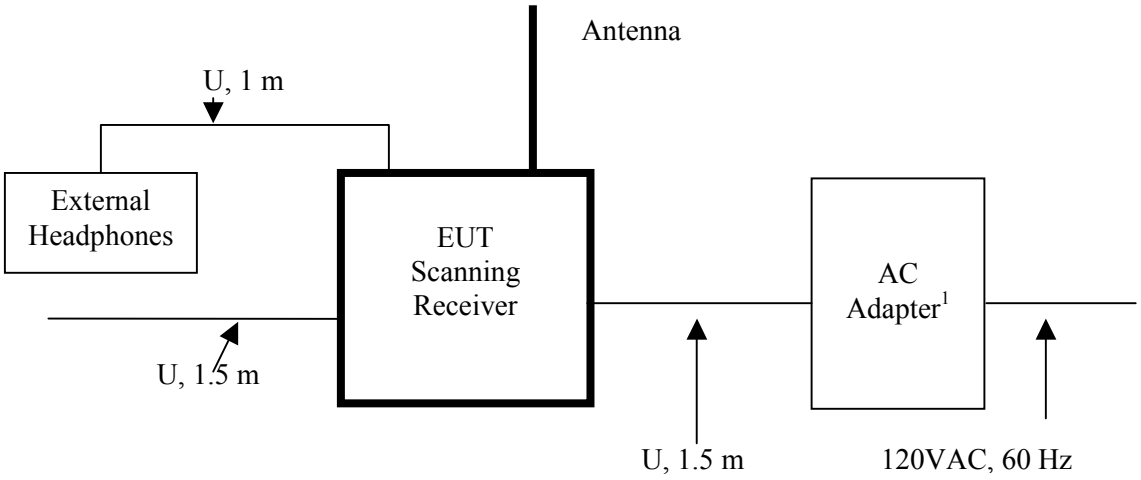
Test Mode 1: The EUT was set to constantly receive at the low, middle and high channels of each band.

Test Mode 2: The EUT was set to constantly scan all bands.

2.4 Support Equipment List and Description

Item #	Description	Model No.	Serial No.
1	External headphones	DS	Not Labeled

2.5 Equipment Setup Block Diagram



[1] AC adapter: GRE, AC Adapter, Model: RH4-0900400DU

U: Unshielded
m: meter

2.6 Equipment Modification

Any modifications installed previous to testing by GRE will be incorporated in each production model sold/leased in the United States.

Intertek Testing Services installed no modifications.

3.0 Emission Test Results

AC line conducted emission measurements were performed from 0.15 MHz to 30 MHz. Analyzer resolution is 10 kHz or greater.

Radiated emission measurements and antenna conducted emission measurements were performed from 30 MHz to 8000 MHz. Analyzer resolution is 100 kHz or greater for frequencies from 30 MHz to 1000 MHz, 1 MHz - for frequencies above 1000 MHz.

Preliminary tests were performed to determine the worst-case emission with the EUT tuned to the low, middle and high channels of each band. From these preliminary measurements the EUT was tuned to the frequency with the highest emission and the final scan was performed using the automated test software.

The same procedure was used to determine the worst-case emission level with the EUT setup in scanning mode for each band.

The final recorded data reflects the worst-case result.

A sample calculation and data tables of the emissions are included.

All measurements were performed with peak detection unless otherwise specified.

3.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG + DF

Where FS = Field Strength in dB(μV/m)
RA = Receiver Amplitude (including preamplifier) in dB(μV)
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB(1/m)
AG = Amplifier Gain in dB
DF = Distance Factor in dB

Assume a receiver reading of 52.0 dB(μV) is obtained. The antennas factor of 7.4 dB(1/m) and cable factor of 1.6 dB is added. The amplifier gain of 29 dB is subtracted, giving field strength of 32 dB(μV/m). This value in dB(μV/m) was converted to its corresponding level in μV/m.

RA = 52.0 dB(μV)
AF = 7.4 dB(1/m)
CF = 1.6 dB
AG = 29.0 dB
DF = 0 dB
FS = 52 +7.4 +1.6 –29.0 + 0 = 32 dB(μV/m)
Level in μV/m = Common Antilogarithm [(32 dB(μV/m)/20] = 39.8 μV/m

3.2 Radiated Emission Data

Tested By:	David Chernomordik & Krishna K Vemuri
Test Date:	July 30, 2007

Temperature	**(°C)**	20 ^{0}C
Relative Humidity	**(%)**	50%

The results on the following page(s) were obtained when the device was tested in the condition described in Section 2.

Results:	**Complies** by 7.0 dB

3.2 Test Data (Continued)

Model: 0711
Test Mode: Receiving at particular channel
Test distance: 3 m

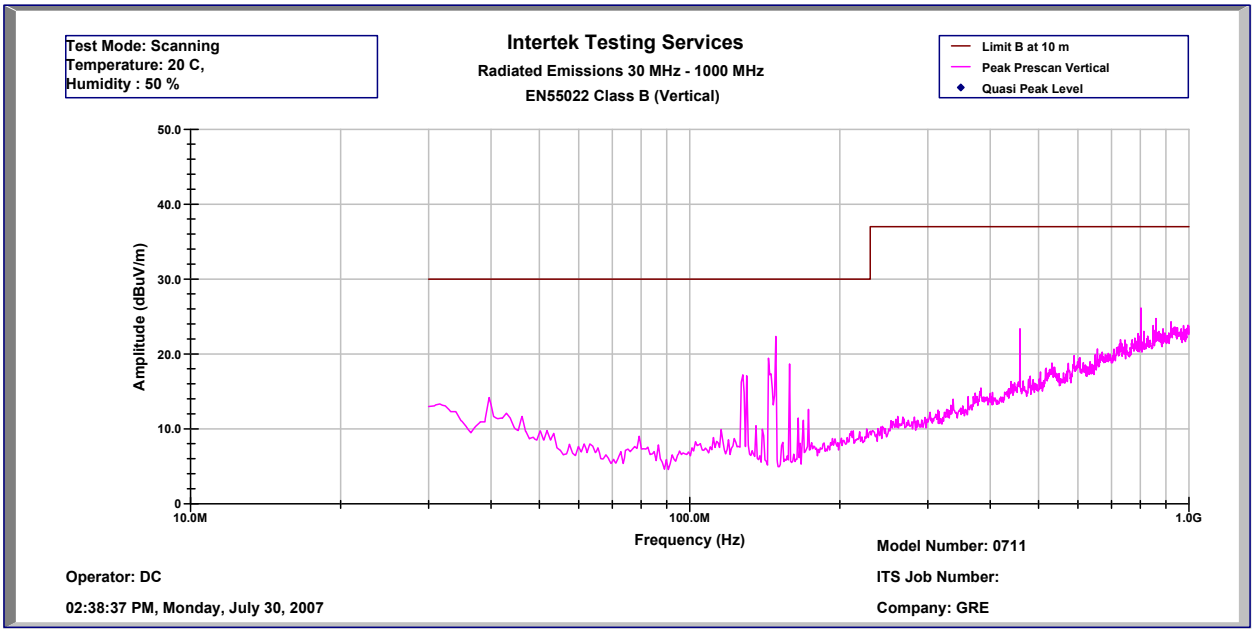
FCC Part 15.109 Class B Radiated Emissions Data

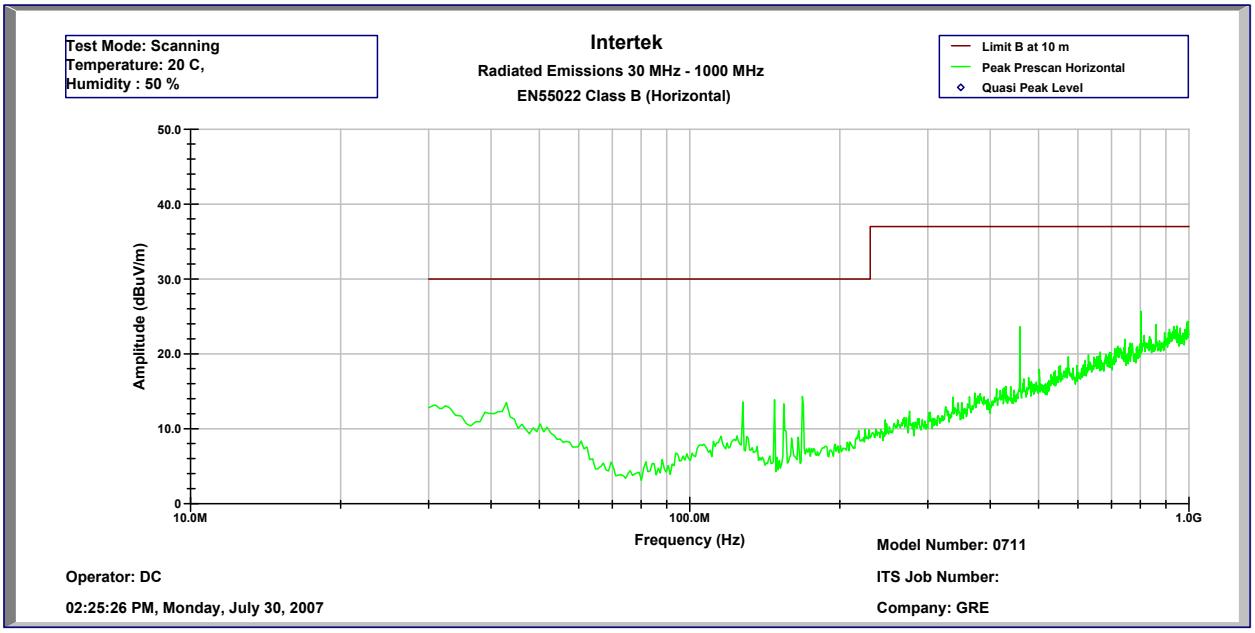
Tuned Frequency	L.O. Frequency	Antenna Polarization	FS at 3 m	FS Limit at 3 m	Margin	RA	AG	CF+3 dB ext. att.	AF
MHz	MHz	H/V	dB(μV/m)	dB(μV/m)	dB	dB(μV)	dB	dB	dB(1/m)
29,0	39,7	V	18,3	40,0	-21,7	30,3	31,2	3,4	15,8
41,5	52,2	V	7,3	40,0	-32,7	22,4	31,2	3,4	12,7
54,0	64,7	V	11,2	40,0	-28,8	30,0	31,2	3,5	8,9
108,0	118,7	H	12,9	43,5	-30,6	28,3	31,2	3,7	12,1
122,5	133,2	V	15,2	43,5	-28,3	30,9	31,2	3,7	11,8
137,0	147,7	V	20,5	43,5	-23,0	39,0	31,2	3,8	8,9
137,0	126,3	V	26,9	43,5	-16,6	41,7	31,2	3,7	12,7
155,5	144,8	V	30,2	43,5	-13,3	48,4	31,2	3,8	9,2
174,0	163,3	H	18,2	43,5	-25,3	36,7	31,2	3,8	8,9
380,0	123,1	H	14,0	43,5	-29,5	29,2	31,2	3,7	12,3
446,0	145,1	V	19,6	43,5	-23,9	37,8	31,2	3,8	9,2
512,0	167,1	V	21,4	43,5	-22,1	39,2	31,2	3,8	9,6

Notes: 1. Negative signs (-) in the Margin column signify levels below the limit.
2. All readings below 1 GHz are quasi-peak, above 1 GHz – average.
3. All other readings not reported are at least 20 dB below the limit.
4. For L.O. frequency calculation, see Appendix A

3.2 Test Data (Continued)

Model: 0711
Test Mode: Scanning all channels
Test distance: 10 m





3.3 AC Line Conducted Emission Data

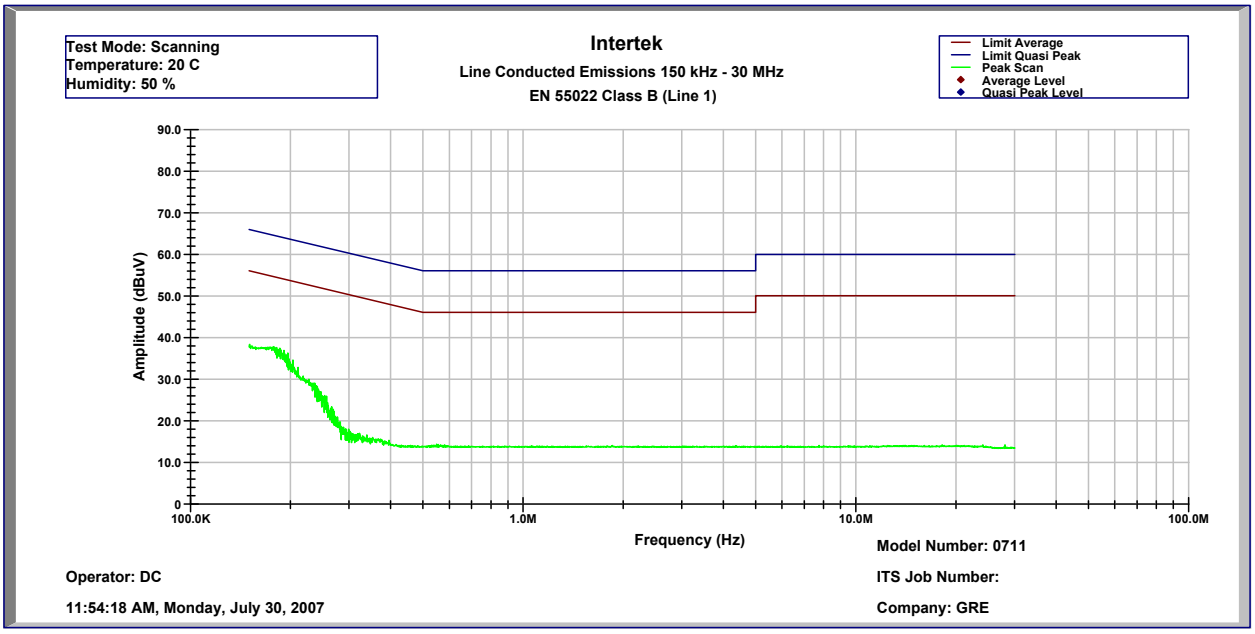
Tested By:	David Chernomordik
Test Date:	July 30, 2007

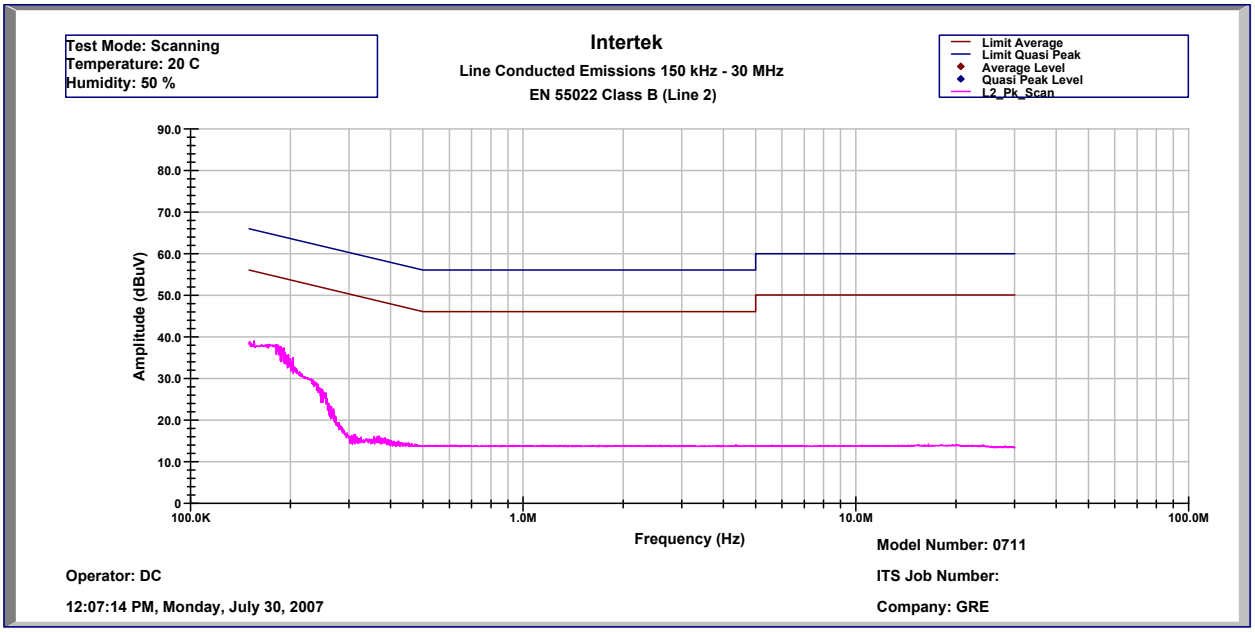
Temperature	**(°C)**	20 ^{0}C
Relative Humidity	**(%)**	50%

The results on the following page(s) were obtained when the device was tested in the condition described in Section 2.

Results:	**Complies** by 16.0 dB

3.3 Test Data (Continued)





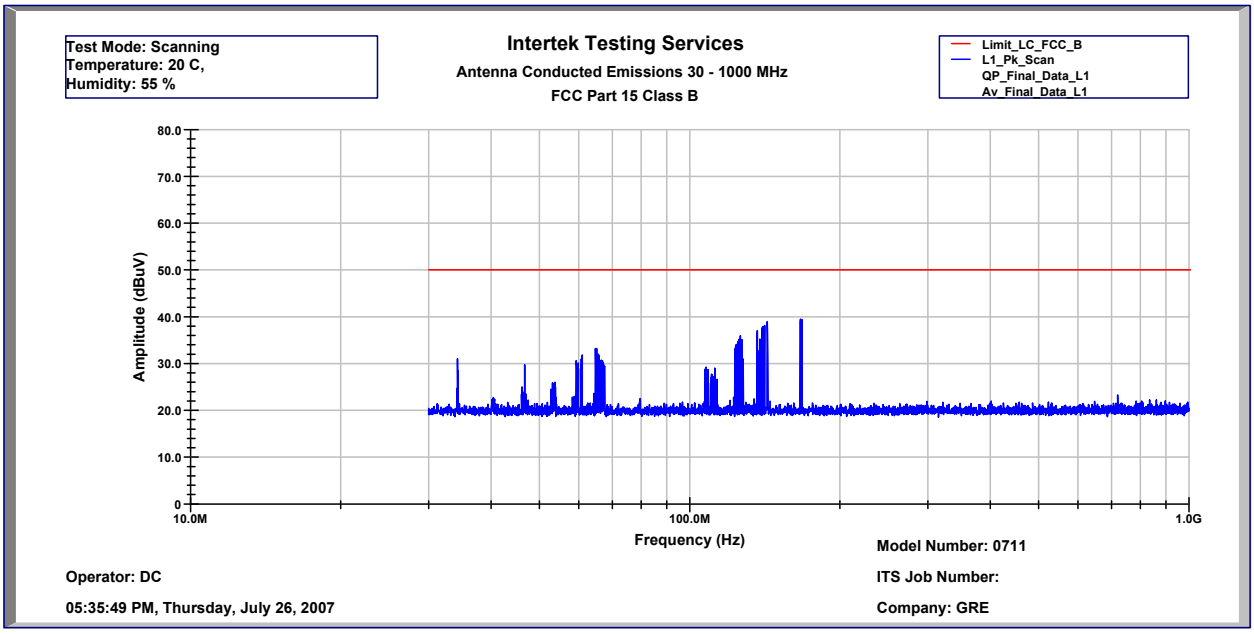
3.4 Antenna Conducted Emission Data

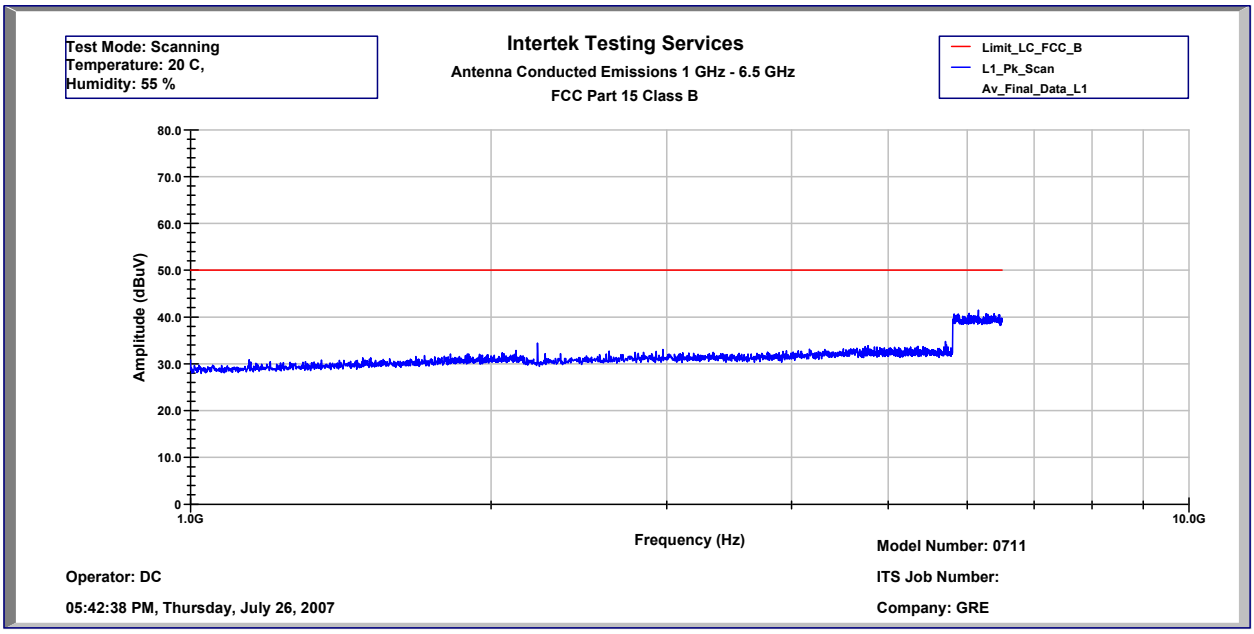
Tested By:	David Chernomordik
Test Date:	July 30, 2007

Temperature	**(°C)**	20 ^{0}C
Relative Humidity	**(%)**	50%

The results on the following page(s) were obtained when the device was tested in the condition described in Section 2.

Results:	**Complies** by 9.0 dB


Test Mode: Scanning
Temperature: 20 C,
Humidity: 55 %
Intertek Testing Services
Antenna Conducted Emissions 30 - 1000 MHz
FCC Part 15 Class B
Limit_LC_FCC_B
L1_Pk_Scan
QP_Final_Data_L1
Av_Final_Data_L1
Amplitude (dBuV)
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
10.0M
100.0M
1.0G
Frequency (Hz)
Model Number: 0711
ITS Job Number:
Company: GRE
Operator: DC
05:35:49 PM, Thursday, July 26, 2007


Test Mode: Scanning
Temperature: 20 C,
Humidity: 55 %
Intertek Testing Services
Antenna Conducted Emissions 1 GHz - 6.5 GHz
FCC Part 15 Class B
Limit_LC_FCC_B
L1_Pk_Scan
Av_Final_Data_L1
Amplitude (dBuV)
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0
1.0G
10.0G
Frequency (Hz)
Model Number: 0711
ITS Job Number:
Company: GRE
Operator: DC
05:42:38 PM, Thursday, July 26, 2007

4.0 List of Test Equipment

Measurement equipment used for emission compliance testing utilized the equipment on the following list.

Equipment	Manufacturer	Model/Type	Serial #	Cal Int	Cal Due
Spectrum Analyzer	Rhode-Schwarz	FSP-40	100030	12	9/12/07
RF Filter Section	Hewlett Packard	85460A	3448A00267	12	9/11/07
EMI Receiver	Hewlett Packard	8546A	3710A00373	12	9/11/07
BI-Log Antenna	ARA Inc.	LPB-2513/A	1154	12	8/29/07
LISN	FCC	FCC-LISN-50-50-M-H	2012	12	7/31/07
Pre-Amplifier	Sonoma	11900A	9912A05634	12	8/11/07

Appendix A – Local Oscillator Frequency calculation

GENERAL RESEARCH OF ELECTRONICS, INC.

How to calculate FCC ID: ADV0711 OSC Frequency

1. FCC ID ADV0711 formula for 1st Local OSC are different due to frequency

-1 Receive Freq. at 29MHz – 54MHz (VHF Low Band)

OSC Freq. (MHz) =Receive Freq. (MHz) + 10.7 (MHz)

-2 Receive Freq. at 108MHz – 136.975MHz (AIR Band)

OSC Freq. (MHz) =Receive Freq. (MHz) + 10.7 (MHz)

-3 Receive Freq. at 137MHz – 174MHz (VHF Hi Band)

OSC Freq. (MHz) =Receive Freq. (MHz) - 10.7 (MHz)

-4 Receive Freq. at 380MHz – 512Hz (UHF Low Band)

OSC Freq. (MHz) =(Receive Freq. (MHz) - 10.7 (MHz))/3

2. Example

-1 Receive Freq. at 29MHz (VHF Low Band)

OSC Freq. (MHz) =29 (MHz) + 10.7 (MHz)
=39.7 (MHz)

-2 Receive Freq. at 108MHz (AIR Band)

OSC Freq. (MHz) =108 (MHz) – 10.7 (MHz)
=118.7 (MHz)

-3 Receive Freq. at 137MHz (VHF Hi Band)

OSC Freq. (MHz) =137 (MHz) – 10.7 (MHz)
=126.3 (MHz)

-4 Receive Freq. at 380MHz (UHF Low Band)

OSC Freq. (MHz) =(380 (MHz) - 10.7 (MHz))/3
=123.1 (MHz)

Appendix B – ADV0711 Specification

GENERAL RESEARCH OF ELECTRONICS, INC.
Phone: +813-5439-3611
Fax: +813-5439-3644
SHIBA NO.3 AMEREX BLDG.
No. 12-17 MITA 3-CHOME, MINATO-KU
TOKYO 108-0073, JAPAN

Tokyo: Sep. 26, 2006
Reference No. F06004

SPECIFICATIONS

SUBJECT: VHF/UHF DIRECT ENTRY PROGRAMMABLE AM/FM HANDHELD SCANNER with SKYWARN, WX SAME and SPECTRUM SWEEPER
Model 0711

1. GENERAL

1.1. Programmable channel : 10 bank 20 channel (200 channel) memory banks
5 pre-programmed band for one touch search
Tune from the channel frequency
7 WX pre-programmed frequencies with 1050 Hz alert system
WX alert and SAME receiving with 7 FIPS(Federal Information Processing Standard) area code memories.
1 priority channel
153 preprogrammed frequencies

1.2. Receiving system : PLL synthesizer dual-conversion superheterodyne

1st IF 10.7 MHz : The 1st Local OSC frequency for VHF Low and AIR band employs upper side of receiving frequency range.
:The 1st Local OSC frequency for VHF High and UHF Low band employs lower side of receiving frequency range.

2nd IF 455 kHz : The 2nd Local OSC frequency employs lower side of 1st IF.

1.3. Frequency range :

Freq.	Step	Mode
29.0000–54.0000 MHz	5 kHz	FM
108.0000–136.9875 MHz	12.5 kHz	AM
137.0000–143.9875 MHz	12.5 kHz	FM
144.0000–148.0000 MHz	5 kHz	FM
148.0125–150.7875 MHz	12.5 kHz	FM
150.8000–161.9950 MHz	5 kHz	FM
162.0000–174.0000 MHz	12.5 kHz	FM
380.0000–512.0000 MHz	12.5 kHz	FM

– Continued –

1.4. One touch search	:	MAR (Marine band) FD/PD (Fire and Police department) AIR (AIR band) HAM (HAM band) WX (Weather Frequency)
1.5. WX 7 frequencies with alert function	:	162.400, 162.425, 162.450, 162.475, 162.500, 162.525, 162.550 MHz
1.6. Scanning rate	:	40 channels/sec.
1.7. Search rate	:	80 steps/sec.
1.8. Display	:	LCD with back-lighting
1.9. Speaker	:	Built-in ϕ 36 mm 8 Ohms dynamic speaker
1.10. Audio output (10 % T.H.D.)	:	180 mW at DC 6 Volts (Battery)
1.11. Operating voltage	:	DC 6 Volts (4 AA cells)
1.12. Ext. power or charge voltage	:	AC adapter: GA-06D-2670(9 Volts 400 mA) Regulated DC 10 Volts
1.13. Dimension	:	Approx. 63 (W) x 40 (D) x 145 (H) mm
1.14. Weight	:	Approx. 220 g without an antenna and batteries
1.15. Accessory	:	Rubber antenna, Belt clip, Owner's manual, Normal battery holder and Rechargeable battery holder
1.16. Memory backup	:	No battery back-up required, EEPROM used

2. ELECTRICAL

Standard Test Condition

(1)	Power source voltage	:	6 Volts DC (Battery)
(2)	Antenna impedance	:	50 Ohms
(3)	Test temperature	:	25 degrees C
(4)	Standard signal level	:	100 μV
(5)	Modulation frequency	:	1 kHz
(6)	Reference FM deviation	:	3.0 kHz
(7)	Reference AM modulation	:	60%
(8)	Reference audio output	:	75 mWatts
(9)	Audio output load	:	8 Ohm resistive load

			Nominal	Limit
2.1.	Frequency range :	VHF Low		29–54 MHz
		Aircraft		108–136.9875 MHz
		VHF High		137–174 MHz
		UHF Low		380–512 MHz
2.2.	Sensitivity :	VHF Low	0.5 μV	1 μV
	(S+N)/N = 20 dB	Aircraft	1 μV	3 μV
	Dev.: 3 kHz at 1 kHz	VHF High	0.5 μV	2 μV
	Mod.: 60% at 1 kHz	UHF Low	0.7 μV	3 μV
2.3.	WX alert tone decode sensitivity :	WX	0.3 μV	1 μV
	1050 Hz 3 kHz Dev. at 162.400 MHz			
2.4.	WX alert tone decode range :		1050 ±30 Hz	±40 Hz
	4 kHz Dev. 1 μV at 162.400 MHz			
2.5.	WX SAME :		0.7μV	2μV
	4 kHz Dev. at 162.4 MHz			
2.6.	WX alert tone priority checking time:		3.0 sec.	2–4 sec.
	Note: When receiving WX alert in Priority operation, the priority sampling time up to 2 sec. is added to this depending on Alert tone transmission timing.			
	WX alert time only checking time:		5.0 sec.	4–6 sec.
2.7.	Image ratio :	VHF Low at 41 MHz	40 dB	30 dB
		Aircraft at 124 MHz	15 dB	8 dB
		VHF High at 154 MHz	15 dB	8 dB
		UHF		Not specified
2.8.	Squelch sensitivity (Band center)			
	Threshold :	AM/FM	0.5 μV	2 μV
	Tight: (S+N)/N :	AM	20 dB	10 dB
		FM	25 dB	15 dB
2.9.	Selectivity :	–6 dB	±10 kHz	±14 kHz
		–50 dB	±18 kHz	±25 kHz
2.10.	Spurious rejection :	VHF Low at 41 MHz	50 dB	30 dB
	(Except Primary image)	VHF High at 154 MHz	50 dB	30 dB
		UHF Low		Not specified
2.11.	IF rejection	: 10.7 MHz at 154 MHz	70 dB	60 dB

			Nominal	Limit
2.12. Acceptable radio frequency displacement at EIA RS-204D	:	VHF 154 MHz	±6 kHz	±3 kHz
2.13. Signal to noise ratio	:	VHF Low at 41 MHz	50 dB	30 dB
RF : 100 μV		Aircraft at 124 MHz	45 dB	30 dB
Dev. : 3 kHz at 1 kHz		VHF High at 154 MHz	45 dB	30 dB
Mod. : 60% at 1 kHz		UHF at 450 MHz	35 dB	25 dB
2.14. Residual noise Vol. min. and Squelched	:	at 154 MHz	0.5 mV	2 mV
2.15. Scanning rate	:	406-505 MHz (in 1MHz: Intervals)	40 ch/sec.	35–45 ch/sec.
2.16. Search rate	:	162.25-167.25 MHz	80 steps/sec.	75–95 steps/sec.
2.17. Scan and Search delay time	:		2 sec.	1–3 sec.
2.18. Priority sampling	:		2 sec.	1.5–2.5 sec
2.19. Audio output (T.H.D. 10 %)	:	RF input : 100 μV at 154 MHz		
8 Ohms R Load, 1 kHz		Battery 6 Volts	180 mWatts	150 mWatts
		Ext. power DC 9 Volts	240 mWatts	200 mWatts
2.20. T.H.D. at 50 mWatt output	:	RF input : 100 μV at 154 MHz	3 %	8 %
2.21. Audio max. power	:	RF input : 100 μV at 154 MHz		
8 Ohm internal speaker		Battery 6 Volts	250 mWatts	200 mWatts
		Ext. power DC 9 Volts	320 mWatts	250 mWatts
32 Ohm at earphone mono/stereo (each phone)				
		Battery 6 Volts	17 mW/10 mW	25 mWatts
		Ext. power DC 9 Volts	22 mW/12 mW	32 mWatts
2.22. Audio frequency response at –6 dB	:	RF input : 100 μV at 154 MHz	300 Hz	200–400 Hz
			2.0 kHz	1.5–3.0 kHz
2.23. Intermediate frequency	:	1st 10.7 MHz		
		2nd 455 kHz		

			Nominal	Limit
2.24. Current drain (154 MHz)	:	Vol. Max.	130 mA	150 mA
Battery 6 Volts		Squelched	45 mA	60 mA
Ext. power DC 9 Volts		Vol. Max.	140 mA	170 mA
		Squelched	45 mA	60 mA

2.25. Charging current (Ni-MH Battery 1500 mA/h)

1) AC adapter charging current: 150 mA 100–200 mA

Note: This specification is obtained AC 120 Volts with model GA-06D-2670 without the scanner on after ten hours.

2) DC adapter (regulated) : charging current (at 10 V) 150 mA 100–200 mA

Note: This specification is obtained DC 10 Volts without the scanner on after ten hours.

2.26. Birdies and step frequency when search : Under discussion

2.27. Filter : Monolithic crystal filter for 10.7 MHz and ceramic filter for 455 kHz

2.28. Antenna impedance : 50 Ohms

2.29. Temperature range : Test to specification between: +18°C – +35°C
Operate (Need not meet spec.): -10°C – +60°C

2.30. Low BATT indicator : 3.9 Volts 3.9 ±0.3 Volts

3. OPERATING CONTROLS AND CONNECTIONS

3.1. Volume control with power switch

3.2. Squelch control

3.3. Keyboard

3.4. LCD indicator:
7 digits frequency
3 digits memory channel
FD/PD, AIR, HAM, MAR, WX
10 banks indication
Other indications
SRCH, SCAN, MAN, PGM, DLY, L/O, PRI, Key lock, B, ▲ , ▼ , -b-, -t-, CH, L-r, ALErt,

P, Error, OFF tonE, on tonE, L-O Fr-Full, stalker, SEndInG, rECd, Lo VHF, HI VHF, UHF, 0M, 6M, 2M, 70CM, -dUPL-,

3.5. BNC type antenna connector

3.6. Earphone jack (D = 3.5 mm stereo)

3.7. External power jack and charge jack (EIAJ RC-5320A Voltage classification 3)

3.8. PC Interface and Clone jack(D=3.5mm mono)

3.9. Battery compartment

4. KEY FUNCTION

MAR
FD/PD
AIR
HAM
WX
SCAN/MANual
PRIority/ALERT
TUNE/CLEAR
▲ and ▼
ProGraM
key lock/LIGHT
Lock-Out/Lock-Out ReView
ENTer
Decimal point/DELAY
10 numeric key/bank selector
skywarn
sweeper

5. FEATURES

5.1. 5 pre-programmed bands (MAR, FD/PD, AIR, HAM, WX) for one touch search

5.2. 200 channel memories

5.3. 200 channels automatic scanning for VHF to UHF band

5.4. QUICK PROGRAM when receive signals up to 200 channels

5.5. HYPERSCAN, 45 channels/sec. scanning rate and 80 steps/sec. searching rate

5.6. "Zeromatic" tuning system

5.7. 10 digit channel and frequency display with all function indicators

5.8. 200 channels lock-out in scan mode

5.9. Built-in priority channel

5.10. WX alert and SAME receiving with 10 FIPS(Federal Information Processing Standard) area code memories

5.11. Spectrum Sweeper function

5.12. Skywarn function

5.13. Lock/Out ReVieW key to confirm lock out frequency sequentially

5.14. Change the direction at the searching by ▲(up) or ▼(down)

5.15. 2 second scan and search delay

5.16. Manual selection for channel

5.17. Scan mode [Cleard channels (000.000 freq.) do not scan.]

5.18. Tune from the channel frequency

5.19. Program mode

5.20. Key lock for safety

5.21. Key tone

5.22. LCD back-lighting

5.23. Low battery indicator by LCD

5.24. Duplicate frequency check system

5.25. Clone the memory to the other unit

5.26. 153 preprogrammed frequencies

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