TEST REPORT

Report Number: G100085527MPK-001
Project Number: G100085527
April 30, 2010

Testing performed on the
Hand Held Scanning Receiver
Model Number: RadioShack 20-444/PRO-444
FCC ID: ADV0704

to

FCC Part 15, Subpart B

Class: B

for
GRE America

Test Performed by:	Test Authorized by:
Intertek	GRE America
1365 Adams Court	425 Harbor Blvd. Suite B
Menlo Park, CA 94025	Belmont, CA 94002

Prepared by: _____ **Date:** April 30, 2010
Marcos Rodriguez

Reviewed by: _____ **Date:** April 30, 2010
Ollie Moyrong

VERIFICATION OF COMPLIANCE
Report No. G100085527-001

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:	Hand Held Scanning Receiver
Trade Name:	GRE America
Model No.:	RadioShack 20-444/PRO-444
Serial No.	000015
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:	April 7 -8, 2010

We attest to the accuracy of this report:

Marcos Rodriguez
EMC Engineer

Ollie Moyrong
Engineering Manager

TABLE OF CONTENTS

1.0 General Description

1.1 Product Description

The Equipment under Test (EUT) is a Racing Scanning Receiver, model RadioShack 20-444/PRO-444

A pre-production version of the sample was received on April 5, 2010 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: RadioShack 20-444/PRO-444
FCC ID: ADV0704

TEST	REFERENCE	RESULTS
Radiated Emission	15.109	Complies
AC Line Conducted Emission	15.107	Complies
Antenna Conducted Emission	15.111	Not Applicable*
FCC Part 15.121 Requirement	15.121	Complies **

* Not applicable. The EUT contains a permanently attached antenna. The EUT was tested with the antenna attached for radiated emissions to Part 15 limits.

** Refer to file: "ADV0704 REPORT FOR FCC RULE PART 15.121"

2.0 System Test Configuration

2.1 Justification

The tests were performed according to the test procedures as outlined in CFR47 Part 15.31 and in ANSI C63.4.

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 or ten 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 or ten meter reading using inverse scaling with distance if measured at a closer distance.

2.2 EUT Exercising Software

None.

2.3 Mode of Operation

The EUT was tested in two modes:

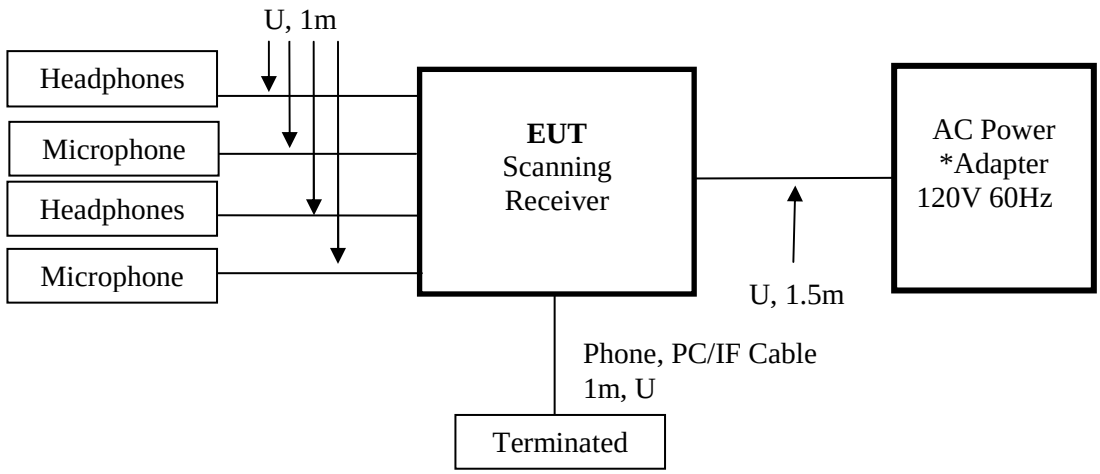
Test Mode 1: The EUT was set to continuously receive at the low, middle and high channels of each band.

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

2.4 Support Equipment List and Description

None.

2.5 Equipment Setup Block Diagram



*Power Adapter: Model: MTR-10053

U: Unshielded
S: Shielded
m: meter

2.6 Equipment Modification

Intertek Testing Services installed no modifications.

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

3.0 Emission Test Results

Radiated emission measurements were performed from 30 MHz to 5000 MHz. Antenna conducted emission measurements performed from 30 MHz to 10000 MHz. Analyzer resolution is 100 kHz or greater for frequencies from 30 MHz to 1000 MHz, 1 MHz – for frequencies above 1000 MHz.

Tests were performed with the EUT tuned to the low, middle and high channels of each band and with the EUT setup in scanning mode. The final recorded data reflects the worst-case results.

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

All measurements were performed with peak detection unless otherwise specified.

Limits for Electromagnetic Radiated Disturbance, FCC Section 15.109(b)

Frequency (MHz)	**Class B at 3m dB(μV/m)**
30-88	40.0
88-216	43.5
216-960	46.0
Above 960	54.0

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:	Marcos Rodriguez
Test Date:	April 7-8, 2010

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

Results:	**Complies**

3.2 Test Data (Continued)

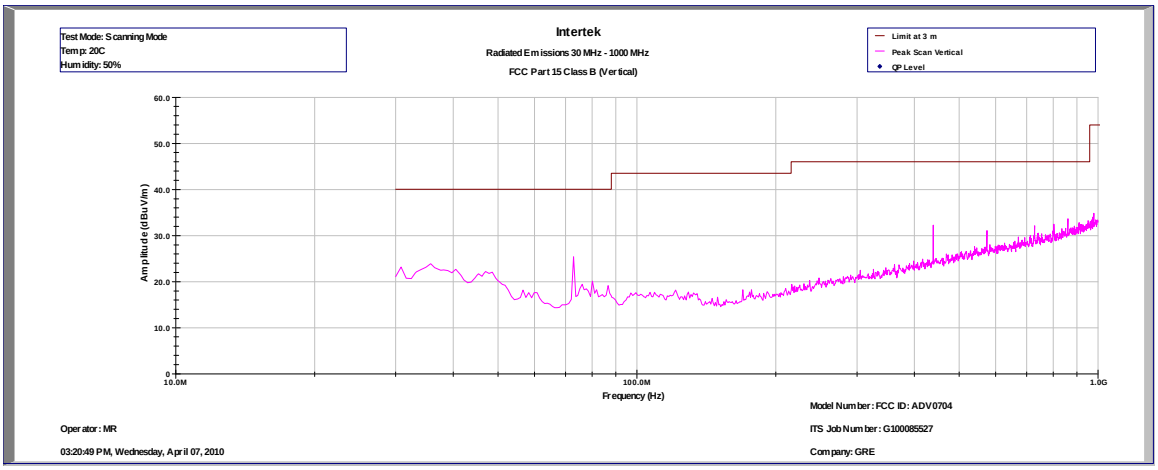
FCC Part 15.109 Class B Radiated Emissions Data

Test Mode: Tuned Frequency
Test distance: 3 m
Date of Test: April 8, 2010

Tuned Frequency	L.O. Frequency	Antenna Polarization	Quasi-PK FS	Limit @3m	RA	AG	CF	AF	Margin
MHz	MHz	H/V	dB(uV/m)	dB(uV/m)	dB(uV)	dB	dB	dB(1/m)	dB
450.0	428.600	V	32.9	46.0	47.0	32.0	16.4	1.5	-13.1
460.0	438.600	V	34.8	46.0	48.9	32.0	16.4	1.5	-11.2
470.0	448.600	V	35.8	46.0	49.5	32.0	16.8	1.5	-10.2

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)



Intertek Testing Services
Radiated Emissions 30 MHz- 1000 MHz
FCC Part 15 Class B (Pk-Vertical)

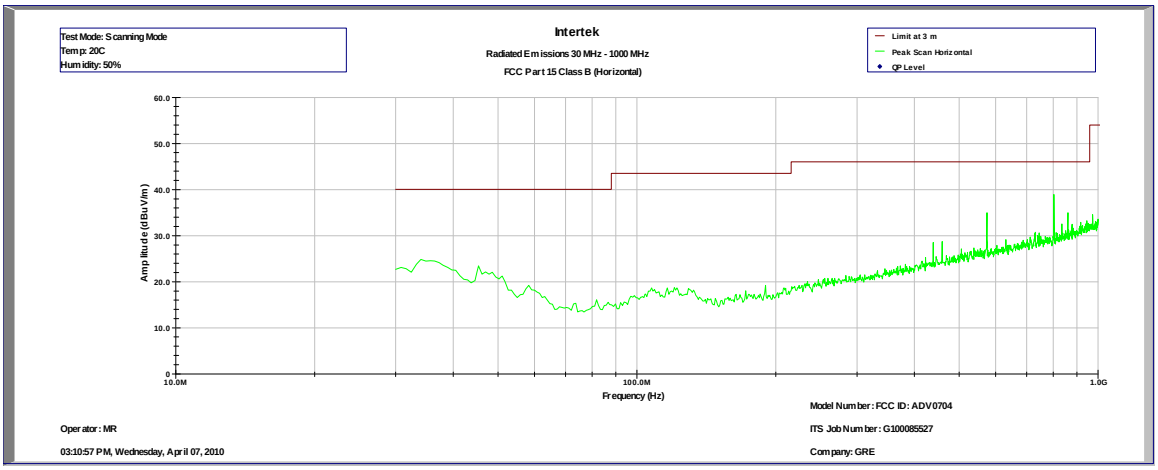
Operator: MR
Model Number: FCC ID: ADV0704
ITS Job Number: G100085527
7-Apr-10
Company: GRE

Frequency	Peak FS	Limit@3m	Margin	RA	CF	AG	DCF	AF
(MHz)	dB(uV/m)	dB(uV/m)	dB	db(uV)	dB	dB	dB	dB(1/m)
3.57E+07	23.8	40.0	-16.2	27.3	0.7	32.1	10.5	17.4
7.28E+07	25.3	40.0	-14.7	38.5	1.0	32.0	10.5	7.4
4.39E+08	32.3	46.0	-13.7	34.6	2.5	32.1	10.5	16.8
9.79E+08	34.8	54.0	-19.2	28.0	3.8	30.9	10.5	23.5

Test Mode: Scanning Mode
Temp: 20C
Humidity:
50%

Frequency range of investigation was 30 MHz – 5 GHz. No emissions were detected above the noise floor above 1 GHz. The noise floor was at least 20 dB below the limit.

3.2 Test Data (Continued)



Intertek Testing Services
Radiated Emissions 30 MHz - 1000 MHz
FCC Part 15 Class B (Pk-Horizontal)

Operator: MR
Model Number: FCC ID: ADV0704
ITS Job Number: G100085527

7-Apr-10
Company: GRE

Frequency	Peak FS	Limit@3m	Margin	RA	CF	AG	DCF	AF
(MHz)	dB(uV/m)	dB(uV/m)	dB	dB(uV)	dB	dB	dB	dB(1/m)
3.40E+07	24.8	40.0	-15.2	27.5	0.7	32.1	10.5	18.2
5.74E+08	34.9	46.0	-11.1	35.4	2.8	32.2	10.5	18.4
8.03E+08	38.9	46.0	-7.1	36.3	3.4	32.2	10.5	21.0
8.60E+08	35.0	46.0	-11.0	31.3	3.5	32.0	10.5	21.6

Test Mode: Scanning Mode
Temp: 20C
Humidity:
50%

Frequency range of investigation was 30 MHz – 5 GHz. No emissions were detected above the noise floor above 1 GHz. The noise floor was at least 20 dB below the limit.

3.3 Test Configuration

The following photographs show the testing configurations used.

Electromagnetic Radiated Disturbance Setup Photograph

3.3 Test Configuration Photograph (Continued)

Electromagnetic Radiated Disturbance Setup Photograph

3.4 Test Configuration Photograph (Continued)

Electromagnetic Radiated Disturbance Setup Photograph

3.4 AC Line Conducted Emission Data

Tested By:	Marcos Rodriguez
Test Date:	April 8, 2010

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

Results:	**Complies**

3.5 Test Data (Continued)

Intertek
Line Conducted Emissions 150 kHz – 30 MHz
EN 55022 Class B (Line 1)

Operator: MR Model Number: RadioShack 20-444/PRO-444

April 8, 2010 Company: GRE

Frequency MHz	Av Level (dBuV)	QP Level (dBuV)	Av Limit (dBuV)	QP Limit (dBuV)	Av Margin (dB)	QP Margin (dB)
0.279	32.9	44.2	52.3	62.3	-19.4	-18.1
0.299	26.4	38.8	51.7	61.7	-25.3	-23.0
0.350	36.4	45.2	50.3	60.3	-13.9	-15.1
0.368	27.1	40.1	49.8	59.8	-22.7	-19.7
0.599	25.5	38.2	46.0	56.0	-20.5	-17.8
0.657	25.0	38.3	46.0	56.0	-21.0	-17.7
0.699	25.3	37.8	46.0	56.0	-20.7	-18.2
0.732	24.6	37.6	46.0	56.0	-21.4	-18.4

Test Mode: 120VAC 60Hz
Temperature: 20 C
Humidity: 50 %

3.4 Test Data (Continued)

Intertek
Line Conducted Emissions 150 kHz – 30 MHz
EN 55022 Class B (Line 2)

Operator: MR Model Number: RadioShack 20-444/PRO-444

April 8, 2010 Company: GRE

Frequency MHz	Av Level (dBuV)	QP Level (dBuV)	Av Limit (dBuV)	QP Limit (dBuV)	Av Margin (dB)	QP Margin (dB)
0.278	27.6	43.3	52.3	62.3	-24.8	-19.0
0.302	20.6	36.7	51.7	61.7	-31.1	-24.9
0.350	30.8	44.9	50.3	60.3	-19.5	-15.3
0.528	23.7	38.5	46.0	56.0	-22.3	-17.5
0.591	21.3	38.9	46.0	56.0	-24.7	-17.1
0.656	21.0	37.6	46.0	56.0	-25.0	-18.4
0.705	20.9	37.5	46.0	56.0	-25.1	-18.5
0.796	21.8	36.8	46.0	56.0	-24.2	-19.2
0.842	20.7	37.3	46.0	56.0	-25.3	-18.7
0.889	19.4	35.2	46.0	56.0	-26.6	-20.8
0.930	17.5	35.1	46.0	56.0	-28.5	-20.9
1.180	20.8	37.6	46.0	56.0	-25.2	-18.4
1.260	21.5	37.5	46.0	56.0	-24.5	-18.5
1.650	19.2	34.8	46.0	56.0	-26.8	-21.2

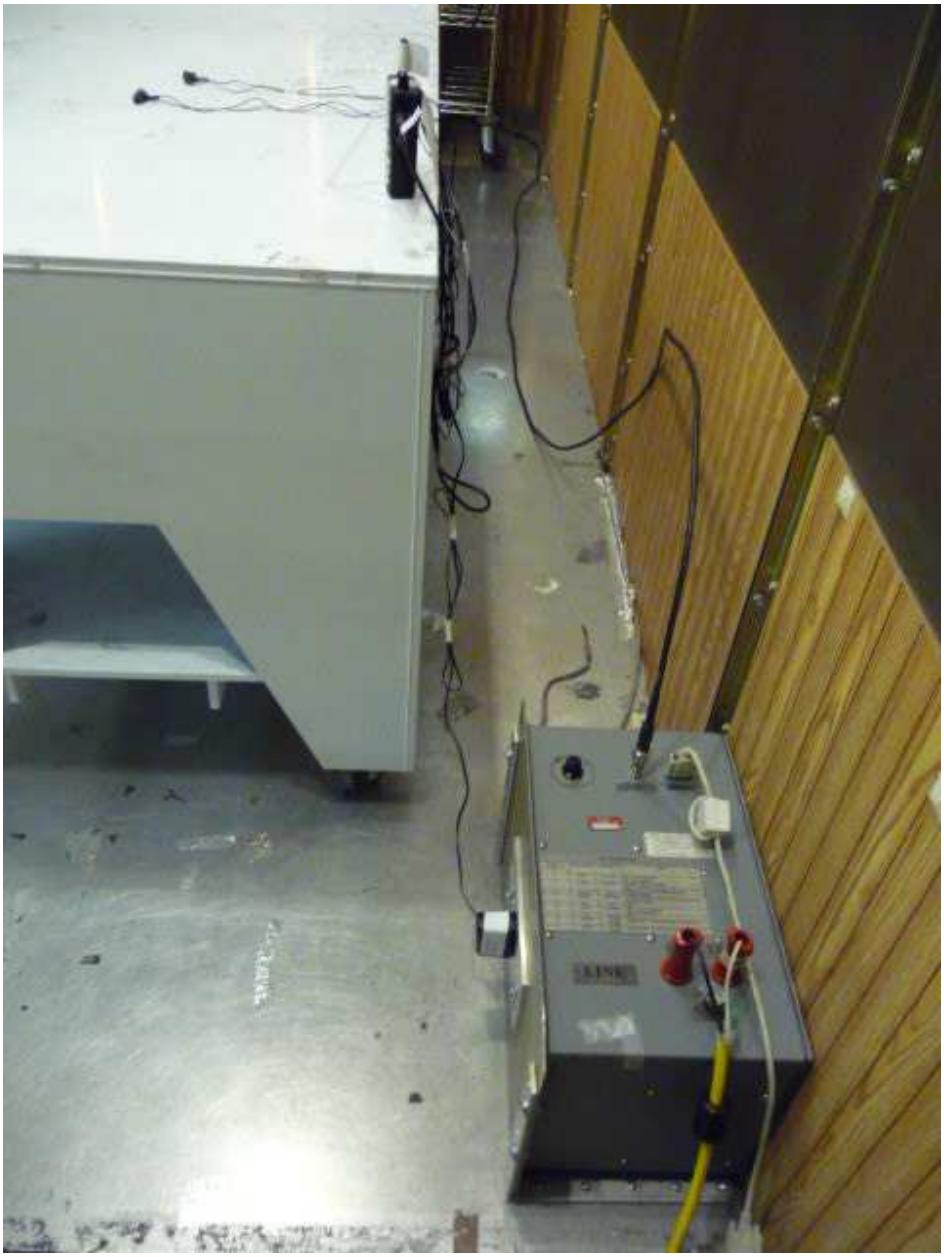
Test Mode: 120VAC 60Hz
Temperature: 20 C
Humidity: 50 %

3.6 Test Configuration Photographs

The following photographs show the testing configurations used.

AC Mains Line-Conducted Disturbance Setup Photograph

3.7 Test Configuration Photograph (Continued)



AC Mains Line-Conducted Disturbance Setup Photograph

3.6 Antenna Conducted Emission Data

Not applicable. The EUT contains a permanently attached antenna. The EUT was tested with the antenna attached for radiated emissions to Part 15 limits.

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
RF Filter Section	Hewlett Packard	85460A	3448A00267	12	12/04/10
EMI Receiver	Hewlett Packard	8546A	3710A00373	12	12/04/10
BI-Log Antenna	Antenna Research	LPB-2513/A	1154	12	06/23/10
Pre-Amplifier	Sonoma	310N	185634	12	11/19/10
LISN	FCC	FCC-LISN-50-50-M-H	2011	12	09/25/10
Horn Antenna	EMCO	3115	9107-3712	12	11/03/10
Pre-Amplifier	Miteq	AMF-4D-001180-24-10P	799159	12	07/28/10

5.0 Document History

Revision/ Job Number	Writer Initials	Date	Change
1.0 / G100085527	MR	April 30, 2010	Original document

Appendix A LO Frequency Calculation

GENERAL RESEARCH OF ELECTRONICS, INC.

How to calculate FCC ID: ADV0704 OSC Frequency

1. FCC ID: ADV0704 formula for 1st Local oscillation

   Receive Freq. at 450MHz - 470MHz

   OSC Freq. (MHz) =Receive Freq. (MHz) - 21.4 (MHz)

2. Example

   -1 Receive Freq. at 450MHz

   OSC Freq. (MHz) =450 (MHz) - 21.4 (MHz)=428.6 (MHz)

   -2 Receive Freq. at 470MHz

   OSC Freq. (MHz) =470 (MHz) - 21.4 (MHz)=448.6 (MHz)

3. 2nd Local oscillation: 20.950MHz