

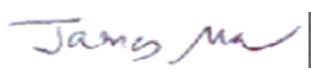
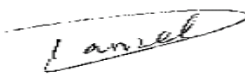
**FCC PART 15.231**  
**EMI MEASUREMENT AND TEST REPORT**

For

**SIGNAL AND BE SEEN SAFETY EQUIPMENT INC**

2770 MT. Seymour Parkway, North Vancouver, BC V7H1E9 CANADA

<b>FCC ID: TU2SGT1600</b>
---------------------------

<b>This Report Concerns:</b> <input checked="" type="checkbox"/> Original Report	<b>Equipment Type:</b> Controller (Remote) - TX
<b>Test Engineer:</b> James Ma 	
<b>Report No.:</b> R0511103	
<b>Report Date:</b> 2005-12-7	
<b>Reviewed By:</b> Daniel Deng / 	
<b>Prepared By:</b> Bay Area Compliance Laboratory Corporation (BACL) 230 Commercial Street Sunnyvale, CA 94085 Tel: (408) 732-9162 Fax: (408) 732-9164	

**Note:** This test report is specially limited to the above client company and product model only. It may not be duplicated without prior written consent of Bay Area Compliance Laboratory Corporation. This report **must not** be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST or any agency of the U.S. Government.

**TABLE OF CONTENTS**

<b>GENERAL INFORMATION.....</b>	<b>3</b>
PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT) .....	3
OBJECTIVE .....	3
RELATED SUBMITTAL(S)/GRANT(S).....	3
TEST METHODOLOGY .....	3
TEST FACILITY .....	3
<b>SYSTEM TEST CONFIGURATION.....</b>	<b>4</b>
JUSTIFICATION .....	4
EUT EXERCISE SOFTWARE .....	4
SPECIAL ACCESSORIES .....	4
SCHEMATICS / BLOCK DIAGRAM .....	4
EQUIPMENT MODIFICATIONS .....	4
CONFIGURATION OF TEST SYSTEM .....	5
<b>SUMMARY OF TEST RESULTS.....</b>	<b>6</b>
<b>§15.203 - ANTENNA REQUIREMENT.....</b>	<b>7</b>
STANDARD APPLICABLE .....	7
ANTENNA CONNECTED CONSTRUCTION .....	7
<b>§15.209, §15.205, §15.231 - RADIATED EMISSION .....</b>	<b>8</b>
MEASUREMENT UNCERTAINTY .....	8
EUT SETUP.....	8
SPECTRUM ANALYZER SETUP .....	8
TEST EQUIPMENT LIST AND DETAILS.....	8
TEST PROCEDURE .....	9
CORRECTED AMPLITUDE & MARGIN CALCULATION .....	9
SUMMARY OF TEST RESULTS .....	9
RADIATED EMISSIONS TEST DATA, 3 METERS .....	9
<b>§15.231(A)(1) - DEACTIVATION .....</b>	<b>11</b>
<b>§15.231(C) – 20DB BANDWIDTH.....</b>	<b>12</b>
REQUIREMENT .....	12
TEST EQUIPMENT LIST AND DETAILS.....	12
TEST RESULT .....	12

---

## GENERAL INFORMATION

---

### Product Description for Equipment Under Test (EUT)

The *SIGNAL AND BE SEEN SAFETY EQUIPMENT INC* product, Model: *SGT1600*, or the "EUT" as referred to this report is a Controller (Remote), which measures approximately 45.72 mm L x 30.48mmW x 7.62mmH with 0.2 l b.

*\*The test data gathered are from production sample, serial number: SG200023, provided by the manufacturer.*

### Objective

This report is prepared on behalf of *SIGNAL AND BE SEEN SAFETY EQUIPMENT INC* in accordance with Part 2, Subpart J, and Part 15, Subparts B and C of the Federal Communication Commissions rules.

The objective of the manufacturer is to determine compliance with FCC rules, Part 15, Sec 231, 205 for radiated emission, 20dB Bandwidth, and Deactivation.

### Related Submittal(s)/Grant(s)

No Related Submittals

### Test Methodology

All measurements contained in this report were conducted with ANSI C63.4 –2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. All radiated and conducted emissions measurement was performed at BACL.

### Test Facility

The Open Area Test site used by BACL to collect radiated and conducted emission measurement data is located in the back parking lot of the building at 230 Commercial Street, Sunnyvale, California, USA with registration number: 90464.

Test site at BACL has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The current scope of accreditations can be found at <http://ts.nist.gov/ts/htdocs/210/214/scopes/2001670.htm>

---

## SYSTEM TEST CONFIGURATION

---

### Justification

The EUT was tested in accordance with ANSI C63.4-2003.

### EUT Exercise Software

N/A

### Special Accessories

The unit was tested with the normally supplied cabling and accessories provided by the supporting equipment and no special accessories were used.

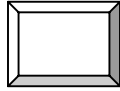
### Schematics / Block Diagram

As shown in following test block diagram, all interface cables used for compliance testing are shielded.

### Equipment Modifications

No modifications were made to the EUT.

## Configuration of Test System



EUT

## SUMMARY OF TEST RESULTS

Results reported relate only to the product tested, serial number: SG200023.

FCC Rules	REQUIREMENTS	RESULT
FCC 15.203	Antenna Requirement	Pass
FCC 15.205, 15.209, 15.231(b)	Restricted Bands of Operation and Spurious Radiated Emissions	Pass
FCC 15.207 (a)	Conducted Emissions	N/A
FCC 15.231(a)(1)	Deactivation	Pass
FCC 15.231(b)(2)	Pulse desensitization or derating was not required because peak measurements were employed	N/A
FCC 15.231(c)	20dB Bandwidth	Pass

---

## **§15.203 - ANTENNA REQUIREMENT**

---

### **Standard Applicable**

According to § 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

Refer to statement below for compliance.

“The antenna for this device is an integral antenna that the end user cannot access”.

### **Antenna Connected Construction**

The antenna connector is designed with permanent attachment and no consideration of replacement.

## §15.209, §15.205, §15.231 - RADIATED EMISSION

### Measurement Uncertainty

All measurements involve certain levels of uncertainties. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at BACL is  $\pm 4.0$  dB.

### EUT Setup

The radiated emission tests were performed in the open area 3-meter test site, using the setup accordance with the ANSI C63.4 - 2003. The specification used was the FCC Subpart C limits.

### Spectrum Analyzer Setup

According to FCC CFR 47, Section 15.33, the EUT was tested to 3.15GHz.

During the radiated emission test, the CISPR quasi-peak detection was employed:

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal Date
HP	Amplifier, Pre	8447D	2944A10198	2005-08-17
Sunol Science	30MHz – 2 GHz Antenna	JB1	A03105-3	02/11/2005
Agilent	Analyzer, Spectrum	E4446A	US44300386	2005-11-10

\* **Statement of Traceability:** BACL attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.



## Test Procedure

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations.

According to §15.231, Intentional radiators operating under the provisions of this section shall demonstrate compliance with the limits on the field strength of emission, based on the average value of the measured emissions. As an alternative, compliance with the limits may be based on the use of measurement instrumentation with a CISPR quasi-peak detector.

## Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Indicated Reading} + \text{Antenna Factor} + \text{Cable Factor} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{FCC Limit}$$

## Summary of Test Results

According to the data in the following table, the EUT complied with the FCC 15.231 standards, and had the worst margin of:

**- 0.8 dB at 314.08 MHz in the Vertical polarization**  
(test data are within the measurement uncertainty  $\pm 4.0\text{dB}$ )

## Radiated Emissions Test Data, 3 meters

### Environmental Conditions

Temperature:	18 ° C
Relative Humidity:	56%
ATM Pressure:	1016mbar

*The testing was performed by James.ma on 2005-11-29.*

## Radiated Emissions Test Data, 3 meters

INDICATED			TABLE		ANTENNA	CORRECTION FACTOR		CORRECTED AMPLITUDE	FCC 15.231	
Frequency	QP	Direction	Height	Polar	Antenna Loss	Cable Loss	Amp.	Corr. Ampl.	Limit	Margin
MHz	dB $\mu$ V	Degree	Meter	H/ V	dB	dB	dB	dB $\mu$ V/m (AV)	dB $\mu$ V/m	dB
314.08	84.0	50	1.8	V	13.8	3.8	27.5	74.1	74.87	-0.8*
314.08	81.6	0	2.0	H	13.8	3.8	27.5	71.7	74.87	-3.2*
942.00	46.0	280	2.8	H	22.6	7.1	27.2	48.5	54.87	-6.4
628.00	51.2	270	2.1	H	19.0	5.5	28.4	47.3	54.87	-7.6
628.00	49.0	280	2.2	V	19.0	5.5	28.4	45.1	54.87	-9.8
942.00	33.0	250	1.0	V	22.6	7.1	27.2	35.5	54.87	-19.4

---

**§15.231(a)(1) - DEACTIVATION**

---

This remote is a manually operated transmitter and it is deactivate the transmitter less than 5 second of being release.

## §15.231(c) – 20dB BANDWIDTH

### Requirement

Per 15.231(c), the bandwidth of the emission shall be no wider than 0.25% of the center frequency for devices operating above 70MHz and below 900MHz. For devices operating above 900MHz, the emission shall be no wider than 0.5% of the center frequency bandwidth is determined at the points 20 dB down from the modulated carrier.

### Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Cal. Date
Agilent	Spectrum Analyzer	E4446A	US44300386	2005-11-10

\* **Statement of Traceability: BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

### Test Result

Temperature:	21° C
Relative Humidity:	37%
ATM Pressure:	1032mbar

*The testing was performed by James.ma on 2005-11-30.*

Fund. Frequency (MHz)	20dB Bandwidth Emission (KHz)	Limit (KHz)	Result
314	255.403	785	Compliance

Please refer to the following plot.

