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Global Product Certification
EMC-EMF-Safety Approvals

EMI TEST REPORT

Report No. B080307

Manufacturer:	Grcic Corp. Pty Ltd
Test Samples:	Scorpion Gun, Commando Gun and Ref Gun
Models:	S50, COM and REF
Serial Numbers:	S50-0999-ZG0607, COM-0667-ZG0607 and REF-125-ZG0607
Date of Issue:	22nd April 2008

ilac-MRA NATA Accreditation No. 5292

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Certificate of Compliance

EMC Technologies Report No: B080307

Test Sample Names:	Scorpion Gun, Commando Gun and Ref Gun
Models:	S50, COM and REF
Serial Numbers:	S50-0999-ZG0607, COM-0667-ZG0607 and REF-125-ZG0607
Manufacturer:	Grcic Corp. Pty Ltd 2 Evergreen St CLIFTON BEACH QLD 4879 Australia
Tested For:	Scapequest Pty Ltd (trading as Battlefield Sports)
Address:	2 Evergreen St CLIFTON BEACH QLD 4879 Australia
Phone:	07 4059 1197
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Responsible Officer:	Peter Lander
Test Standard/s:	**EN 61000-6-1:2007** *Electromagnetic Compatibility (EMC) – Part 6-1: Generic standards – Immunity for residential, commercial and light-industrial environments* **EN 61000-6-3:2007** *Electromagnetic Compatibility (EMC) – Part 6-3: Generic standards – Emission standard for residential, commercial and light-industrial environments*
Result of Test:	The test sample complied with requirements of EN 61000-6-1 and EN 61000-6-3 Refer to Report B080307 for full details.
Test Dates:	21/03/2008, 27/03/2008, 29/03/2008, 31/03/2008, 21/04/2008, 22/04/2008

Testing Officers:

Rune Berberg **Andy Colak**

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NATA does not provide accreditation for conducted emissions on telecommunications ports.

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Part 1

Summary of EMC Tests on the Scorpion Gun, Commando Gun and Ref Gun, Manufactured by Grcic Corp. Pty Ltd

1. INTRODUCTION

This report details the results of the test performed on the Scorpion Gun, Commando Gun and Ref Gun, Models: S50, COM and REF.

2. SUMMARY of RESULTS

2.1 Emissions – EN 61000-6-3

Conducted emission:	Not Applicable
Conducted emission – Telecommunications:	Not Applicable*.
Radiated emission:	Complies with a margin of greater than 10 dB.

*** NATA does not provide accreditation for conducted emissions on telecommunications ports.**

2.2 Immunity – EN 61000-6-3

EN 61000-4-2 Electrostatic Discharge	Complies, criterion B
EN 61000-4-3 RF Electromagnetic Fields	Complies, criterion A
EN 61000-4-4 Fast Transients	Complies, criterion B
EN 61000-4-5 Surges	Not Applicable
EN 61000-4-6 RF Common Mode	Complies, criterion A
EN 61000-4-8 Magnetic Field	Not Applicable
EN 61000-4-11 Voltage Dips and Interruptions	Not Applicable

3. DESCRIPTION

3.1 Test Samples

The Equipment Under Test (EUT) was identified as follows:

Manufacturer	:	Grcic Corp. Pty Ltd
Test Samples	:	Scorpion Gun, Commando Gun and Ref Gun
Models	:	S50, COM and REF
Serial Numbers	:	S50-0999-ZG0607, COM-0667-ZG0607 and REF-125-ZG0607
Power Supply	:	7.2 V Battery
Accessories	:	None
Clock frequencies:		3.6864 MHz

The Scorpion Gun, Commando Gun and Ref Gun are Infrared toy guns for indoor/outdoor battlefield games.

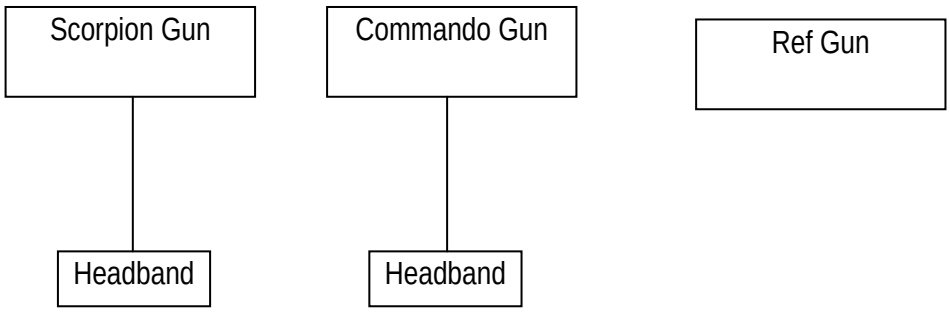
3.2 Modifications

No modifications were performed.

3.3 Test Set Up

The Scorpion Gun, Commando Gun and Ref Gun from Scapequest Pty Ltd was tested in accordance with the requirements of EN 61000-6-1, EN 61000-6-3, EMC Technologies test procedures TP Conducted Emissions, TP Radiated Emissions, TP 8012, TP 1000-4-3, TP 1000-4-5, TP 1000-4-6, TP 61000-4-8, TP Voltage Dips, and the Customer Test Plan in Appendix C.

3.4 Block Diagram



Part 2

Emissions Tests on Scorpion Gun, Commando Gun and Ref Gun, in accordance with EN 61000-6-3

1. INTRODUCTION

Electromagnetic Interference (EMI) tests were performed on the Scorpion Gun, Commando Gun and Ref Gun, Models: S50, COM and REF, tested on behalf of Scapequest Pty Ltd, in accordance with the requirements of EN 61000-6-3.

2. SUMMARY

Conducted emission:	Not Applicable
Conducted emission – Telecommunications:	Not Applicable*.
Radiated emission:	Complies with a margin of greater than 10 dB.

*** NATA does not provide accreditation for conducted emissions on telecommunications ports.**

3. RESULTS

3.1 Conducted Emission Results

3.1.1 AC mains

Not Applicable as the EUT is Battery powered.

3.1.2 Telecommunication Ports

Not Applicable as the EUT does not have any telecommunication ports.

NATA does not provide accreditation for conducted emissions on telecommunications ports.

3.2 Radiated Emission Results

3.2.1 Radiated Emission 30 MHz to 1000 MHz

All measured frequencies complied with the quasi peak limits by a margin of greater than 10 dB.
Refer to Appendix B, Graphs 1 and 2.
Refer to Section 4 for information on measurement uncertainties.

4. MEASUREMENT UNCERTAINTIES

EMC Technologies has evaluated the equipment and the methods used to perform the emissions testing. The estimated measurement uncertainties for emissions tests shown within this report are as follows:

Conducted Emissions

150 kHz to 30 MHz	±3.2 dB

Radiated Emissions

30 MHz to 300 MHz	±5.1 dB
300 MHz to 1000 MHz	±4.7 dB
1 GHz to 18 GHz	±4.6 dB

The above expanded uncertainties are based on standard uncertainties multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

5. CONCLUSIONS

The Scorpion Gun, Commando Gun and Ref Gun, Models: S50, COM and REF, tested on behalf of Scapequest Pty Ltd, complies with the conducted and radiated emission requirements of EN 61000-6-3.

Part 3

Immunity Testing on the Scorpion Gun, Commando Gun and Ref Gun, in accordance with EN 61000-6-1

1. INTRODUCTION

This report is intended to document the conformance of the Scorpion Gun, Commando Gun and Ref Gun, Models: S50, COM and REF, with the Electromagnetic Compatibility requirements of EN 61000-6-1.

2. SUMMARY of TEST RESULTS

EN 61000-4-2 Electrostatic Discharge	Complies, criterion B
EN 61000-4-3 RF Electromagnetic Fields	Complies, criterion A
EN 61000-4-4 Fast Transients	Complies, criterion B
EN 61000-4-5 Surges	Not Applicable
EN 61000-4-6 RF Common Mode	Complies, criterion A
EN 61000-4-8 Magnetic Field	Not Applicable
EN 61000-4-11 Voltage Dips and Interruptions	Not Applicable

3. REGULATIONS AND STANDARDS APPLIED

EN 61000-6-1
Electromagnetic Compatibility (EMC) – Part 6-1: Generic standards – Immunity for residential, commercial and light-industrial environments

EN 61000-4-2:1995
Electromagnetic Compatibility - Part 4: Testing and Measuring Techniques.
Section 2: Electrostatic discharge immunity test.

EN 61000-4-3:2006
Electromagnetic Compatibility - Part 4: Testing and Measuring Techniques.
Section 3: Radiated, radio-frequency, electromagnetic field immunity test.

EN 61000-4-4:2004
Electromagnetic Compatibility - Part 4: Testing and Measuring Techniques.
Section 4: Electrical fast transient / burst immunity test.

EN 61000-4-5:2006
Electromagnetic Compatibility - Part 4: Testing and Measuring Techniques. Section 5: Surge immunity test

EN 61000-4-6:2007
Electromagnetic Compatibility - Part 4: Testing and Measuring Techniques.
Section 6: Immunity to conducted disturbances, induced by radio-frequency fields.

EN 61000-4-8:1993
Electromagnetic Compatibility - Part 4: Testing and Measuring Techniques.
Section 8: Power-frequency magnetic field immunity test.

EN 61000-4-11:2004
Electromagnetic Compatibility - Part 4: Testing and Measuring Techniques.
Section 11: Voltage dips, short interruptions and voltage variations immunity test.

4. TEST REQUIREMENTS & PERFORMANCE CRITERIA

4.1 EN 61000-6-1 Requirements

Clause 1	Scope and object	Noted
Clause 2	Normative references	Noted
Clause 3	Definitions	Noted
Clause 4	Description of locations	Noted
Clause 5	Performance Criteria	Noted
Clause 6	Conditions during testing	Noted
Clause 7	Product documentation	Noted
Clause 8	Applicability	Noted
Clause 9	Immunity test requirements	Tested to requirements of Tables 1 to 5.

4.2 Test Sample Performance Criteria

The following performance criteria were used to determine the pass/fail status for immunity tests.

Performance Criterion A
The apparatus shall continue to operate as intended during and after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.

Manufacturer's criterion: During Radiated Immunity testing and Conducted Immunity testing the guns are allowed to fire, register a hit or reset. The number of hits or number of rounds used does not need to be maintained. This is acceptable as the products are toys for use where no safety implications of the above would be seen and no financial interests are involved.

Performance Criterion B
The apparatus shall continue to operate as intended after the test. No degradation of performance or loss of function is allowed below a performance level specified by the manufacturer, when the apparatus is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is however allowed. No change of actual operating state or stored data is allowed. If the minimum performance level or the permissible performance loss is not specified by the manufacturer, either of these may be derived from the product description and documentation and what the user may reasonably expect from the apparatus if used as intended.

Manufacturer's criterion: Equipment is allowed to display any of the above (Criterion A) while as the stored number of hits and rounds used should be maintained after ESD test events.

Performance Criterion C
Temporary loss of function is allowed, provided the function is self-recoverable or can be restored by the operation of the controls.

The product standard or manufacturer determined the following pass criteria.

Test	Pass	Fail
Electrostatic Discharges	Criterion A or B	Criterion C
RF Electromagnetic Fields	Criterion A	Criterion B or C
Fast Transients	Criterion A or B	Criterion C
Surges	Criterion A or B	Criterion C
RF Common Mode	Criterion A	Criterion B or C
Magnetic Fields	Criterion A	Criterion B or C
Voltage Dips (0% residual)	Criterion A or B	Criterion C
Voltage Dips (70% residual) & Interruptions	Criterion A, B or C	Hardware failure

5. TEST RESULTS - IMMUNITY

5.1 EN 61000-4-2 Electrostatic Discharge

5.1.1 Test Procedure

This test was performed in accordance with EMC Technologies test procedure TP 8012 and EN 61000-4-2. A minimum of ten discharges were applied at each level and polarity.

5.1.2 Test Climatic Conditions

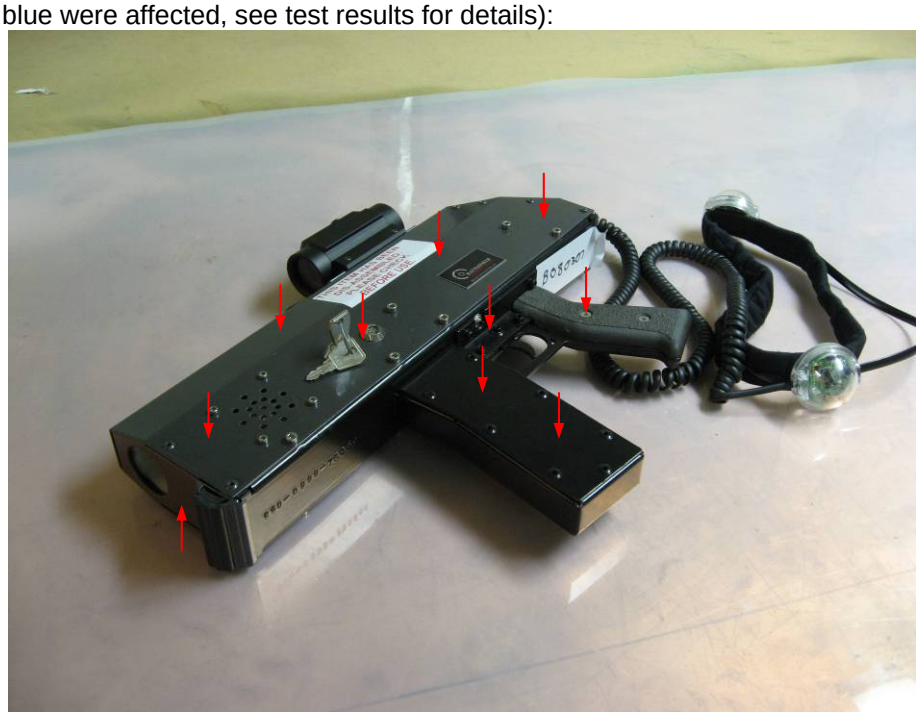
Shielded Room Temperature:	20 - 22 °C
Relative Humidity:	48 - 53 %

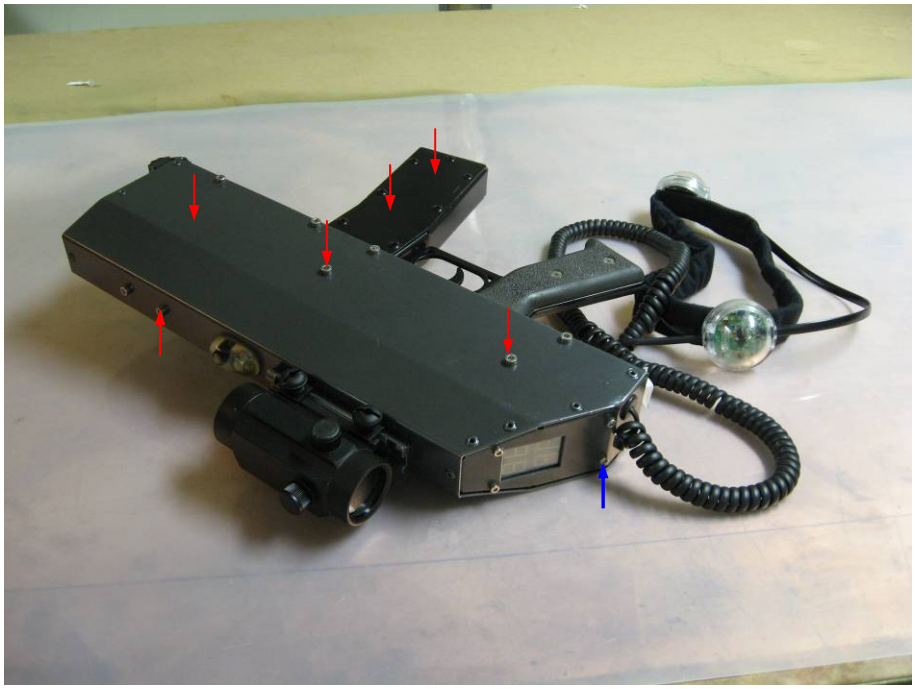
5.1.3 Discharge Points

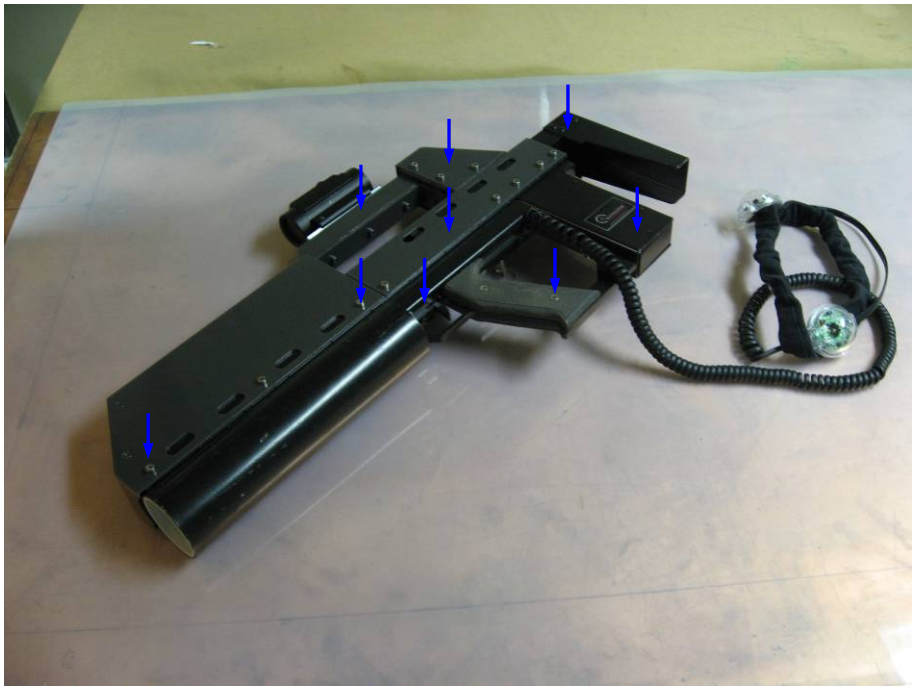
Indirect contact discharges were applied to the horizontal coupling plane (HCP) at one point on each of the four sides of the EUT.

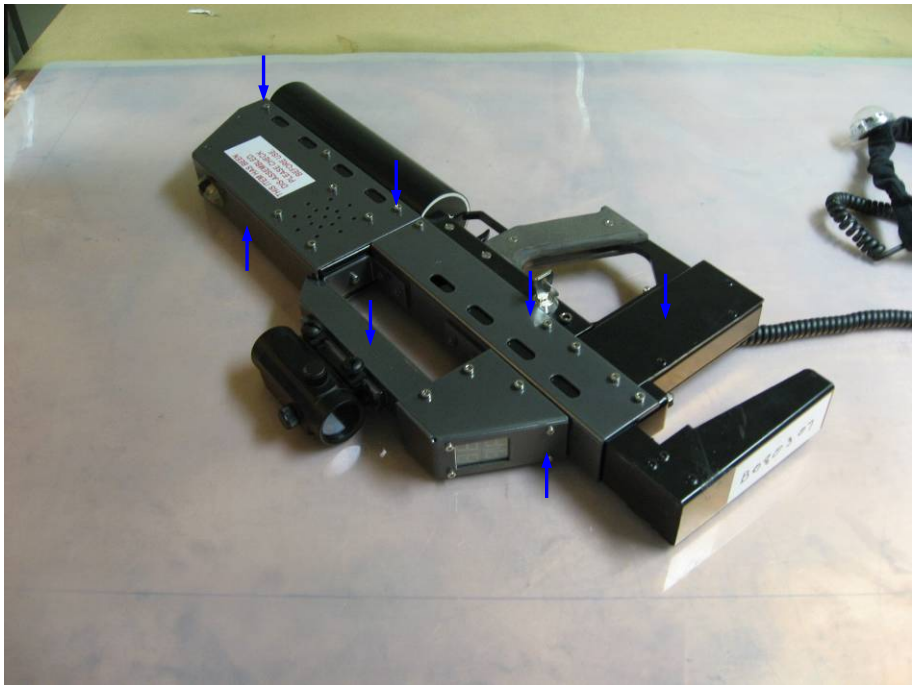
Indirect contact discharges were applied to the vertical coupling plane (VCP) with the VCP placed along each of the four sides of the unit.

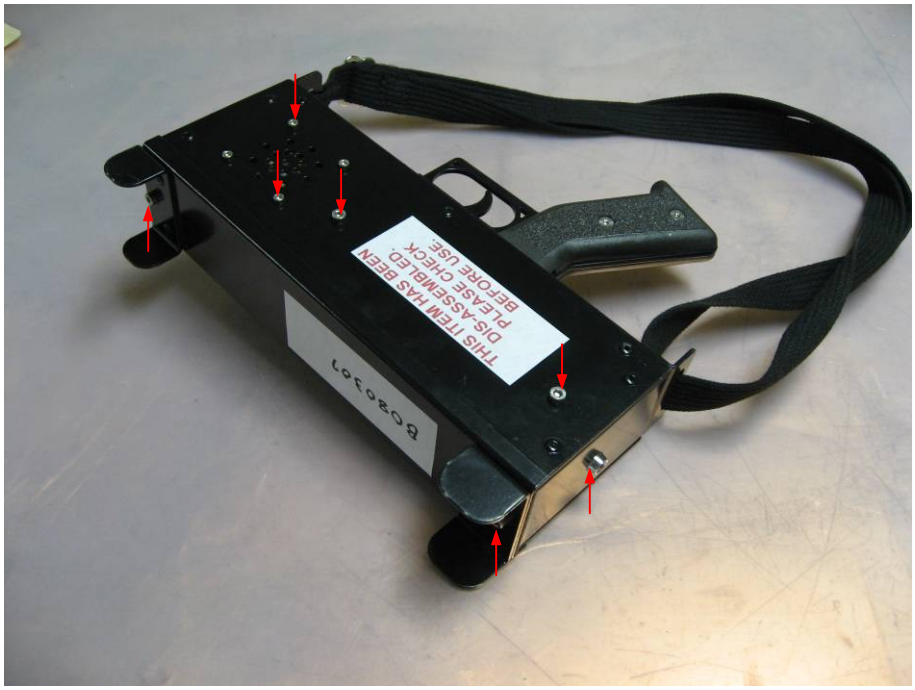
Direct contact discharges were applied to the following points (points highlighted in blue were affected, see test results for details):

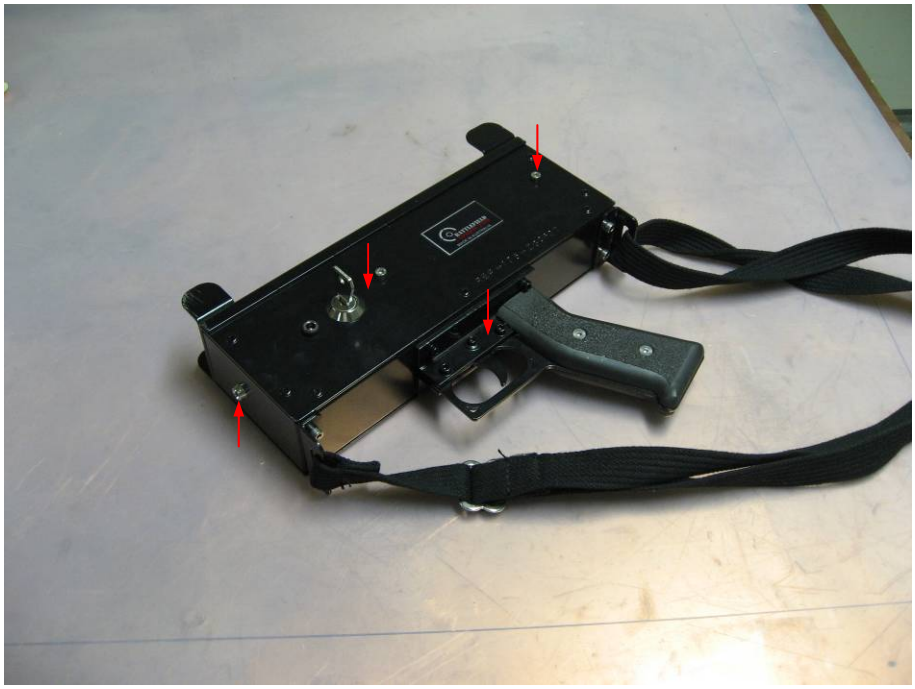




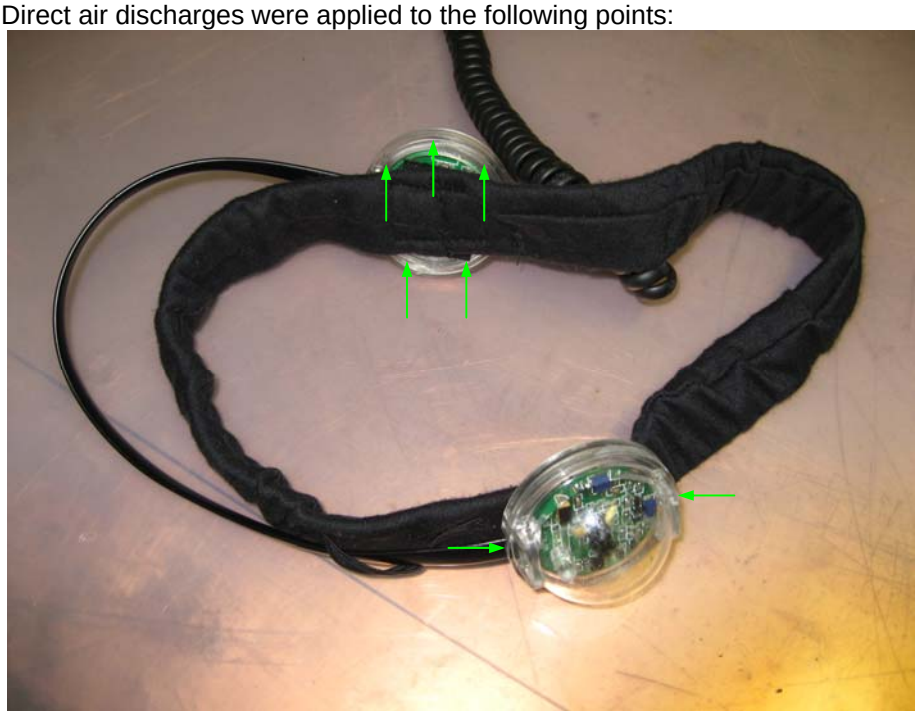








Direct air discharges were applied to the following points:



5.1.4 Results

5.1.4.1 Air Discharge

Air Discharges	Level	Voltage (kV)	Result
Insulating Surfaces	1	±2	Complies, Criterion A
Insulating Surfaces	2	±4	Complies, Criterion A
Insulating Surfaces	3	±8	Complies, Criterion A

Notes: No discharge possible

Conclusion: No effect. The EUT complied with the Criterion A requirements of EN 61000-6-1.

5.1.4.2 Contact Discharge

Contact Discharges	Level	Voltage (kV)	Result
Horizontal Coupling Plane	1	±2	Complies, Criterion A
Horizontal Coupling Plane	2	±4	Complies, Criterion A
Vertical Coupling Plane	1	±2	Complies, Criterion A
Vertical Coupling Plane	2	±4	Complies, Criterion A
Direct	1	±2	Complies, Criterion B
Direct	2	±4	Complies, Criterion B

Notes: On the points highlighted Blue the LED display would become corrupted. The EUT automatically recovers.

Conclusion: Some effect. The EUT complied with the Criterion B requirements of EN 61000-6-1.

5.2 EN 61000-4-3 RF Electromagnetic Fields

5.2.1 Test Procedure

This test was performed in accordance with EMC Technologies test procedure TP 1000-4-3 and EN 61000-4-3.

The radiating antenna was positioned at a distance of 3 m from the EUT. The dwell time at each frequency was 3 s with a step rate of 1 % of the fundamental frequency. Vertical and horizontal antenna polarisations were tested in separate sweeps for each side of the EUT. Four sides of the EUT were tested. All three guns were tested together.

5.2.2 Test Climatic Conditions

Shielded Room Temperature: 24 °C
Relative Humidity: 60 %

5.2.3 Results

Side	Field Level	Modulation	Frequency Band	Result
Front	3 V/m	1 kHz 80 % AM	80 MHz to 1000 MHz	Complies, Criterion A
Rear	3 V/m	1 kHz 80 % AM	80 MHz to 1000 MHz	Complies, Criterion A
Left	3 V/m	1 kHz 80 % AM	80 MHz to 1000 MHz	Complies, Criterion A
Bottom	3 V/m	1 kHz 80 % AM	80 MHz to 1000 MHz	Complies, Criterion A

Notes: On the horizontal polarity between 98 and 107 MHz the LED on the Ref Gun lights up. The Commando gun registers as being shot then resets after a few times. At 119 MHz the Scorpion Gun starts firing then registers as “dead.” No effect seen on the Vertical polarity.

Conclusion: Some effect. The EUT complied with the requirements of Criterion A according to the manufacturer’s specification and the requirements of EN 61000-6-1.

5.3 EN 61000-4-4 Fast Transients

5.3.1 Test Procedure

This test was performed in accordance with EMC Technologies test procedure TP 1000-4-4 and EN 61000-4-4.

5.3.2 Test Climatic Conditions

Shielded Room Temperature: 22 °C
Relative Humidity: 53 %

5.3.3 Signal ports

Port	Injection Method	Level	Voltage (kV)	Repetition Rate (kHz)	Result
Cable between gun and headband	Capacitive Clamp	1	±0.25	5	Complies, Criterion B
	Capacitive Clamp	2	±0.5	5	Complies, Criterion B

Notes: The LEDs on the headband and gun lights up and the guns occasionally fires during the test. The EUT recovers without intervention.

Conclusion: Some effect. The EUT complied with the Criterion B requirements of EN 61000-6-1.

5.3.4 Input and output DC power ports

Not Applicable as the EUT does not have any DC power lines greater than 3 m.

5.3.5 Input and output AC power ports

Not Applicable as the EUT is Battery powered.

5.4 EN 61000-4-5 Surges

Not Applicable as the EUT does not have any lines requiring surge testing.

5.5 EN 61000-4-6 RF Common Mode

5.5.1 Test Procedure

This test was performed in accordance with EMC Technologies test procedure TP 1000-4-6 and IEC 61000-4-6.

The dwell time at each frequency was 3 s with a step rate of 1 % of the fundamental frequency.

5.5.2 Test Climatic Conditions

Shielded Room Temperature: 22.5 °C
Relative Humidity: 58 %

5.5.3 Results

Line	Injection Method	Voltage (V rms)	Modulation	Frequency Band	Result
Cable at Gun-end	BCI Probe	3	1 kHz 80 % AM	150 kHz to 80 MHz	Complies, Criterion A
Cable at Headband-end	BCI Probe	3	1 kHz 80 % AM	150 kHz to 80 MHz	Complies, Criterion A

Notes: Between 24 and 30 MHz, and 59 and 78 MHz the guns would occasionally register as being “shot” or “dead” and would occasionally reset.

Conclusion: Some effect. The EUT complied with the requirements of Criterion A according to the manufacturer’s specification and the requirements of EN 61000-6-1.

5.6 EN 61000-4-8 Power Frequency Magnetic Fields

Not Applicable as the EUT does not have devices suceptible to magnetic fields.

5.7 EN 61000-4-11 Voltage Dips and Interruptions

Not Applicable as the EUT is Battery powered.

6. CONCLUSION

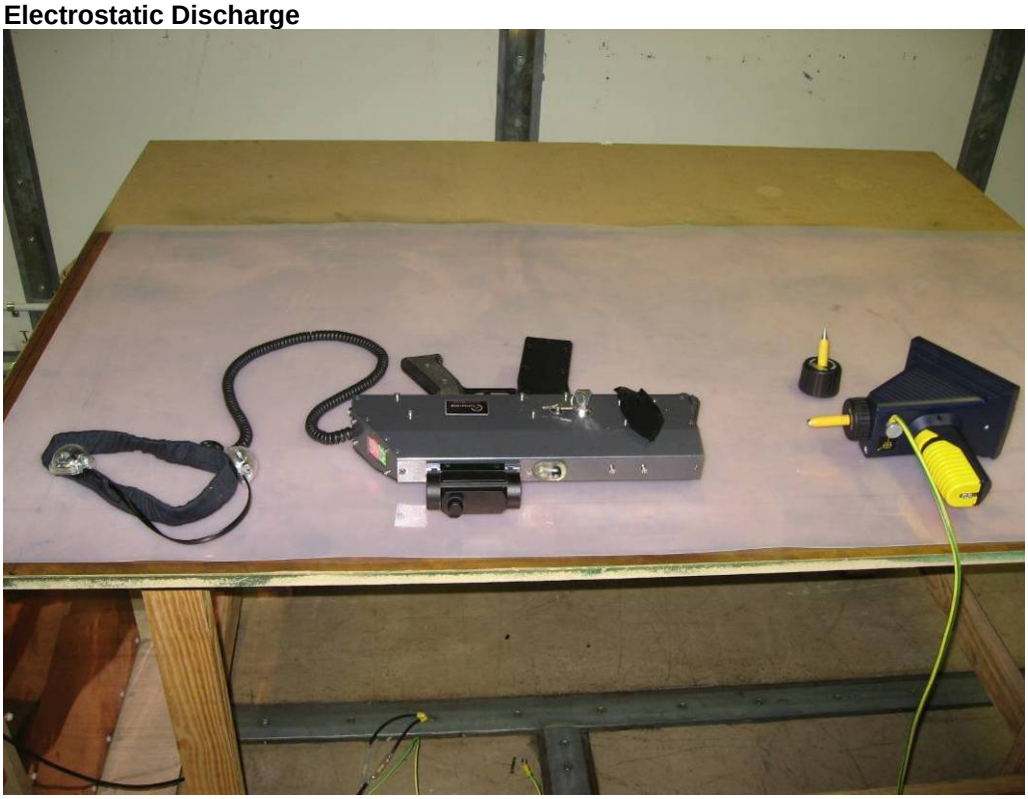
The Scorpion Gun, Commando Gun and Ref Gun, Models: S50, COM and REF, tested on behalf of Scapequest Pty Ltd, complied with the requirements of EN 61000-6-1.

APPENDIX A1
Photographs – Test Set Up

Radiated Emissions

APPENDIX A2
Photographs – Test Set Up

Electrostatic Discharge

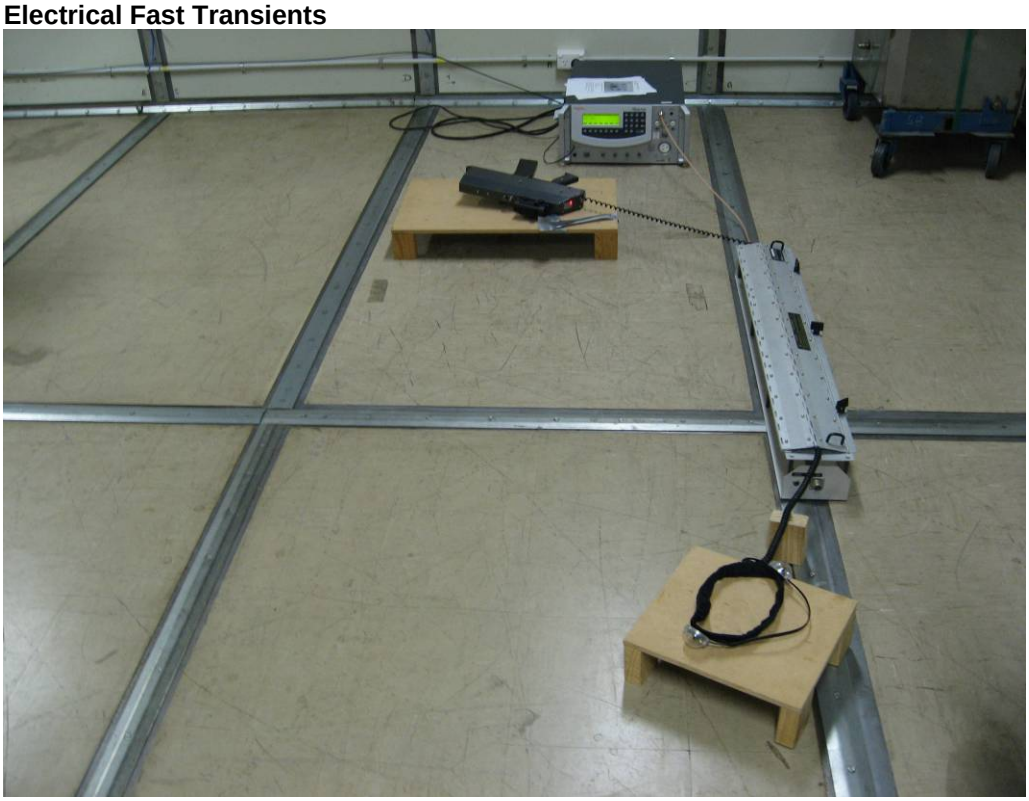


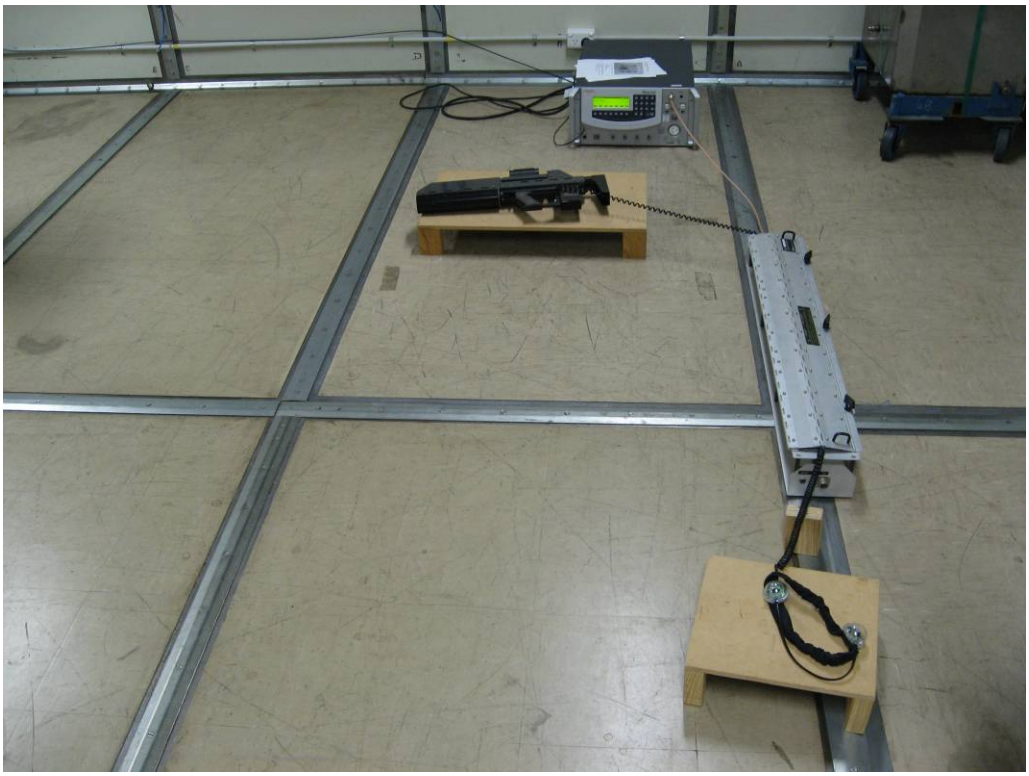
APPENDIX A3
Photographs – Test Set Up

Radiated Immunity

APPENDIX A4
Photographs – Test Set Up

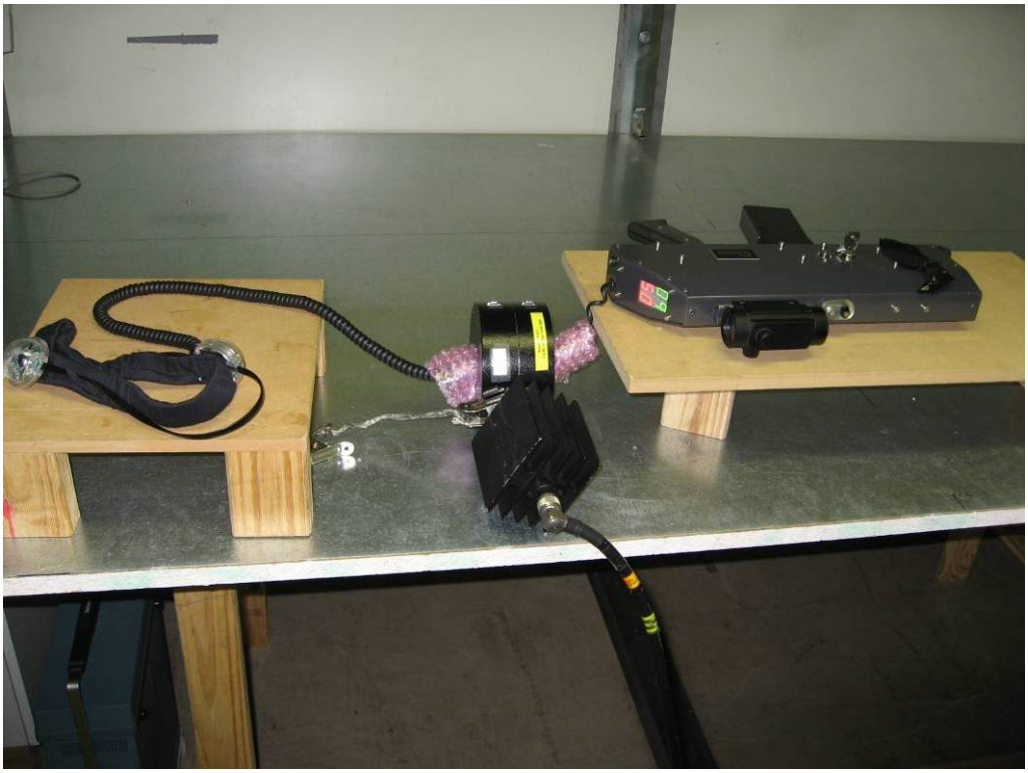
Electrical Fast Transients





APPENDIX A5
Photographs – Test Set Up

Conducted Immunity

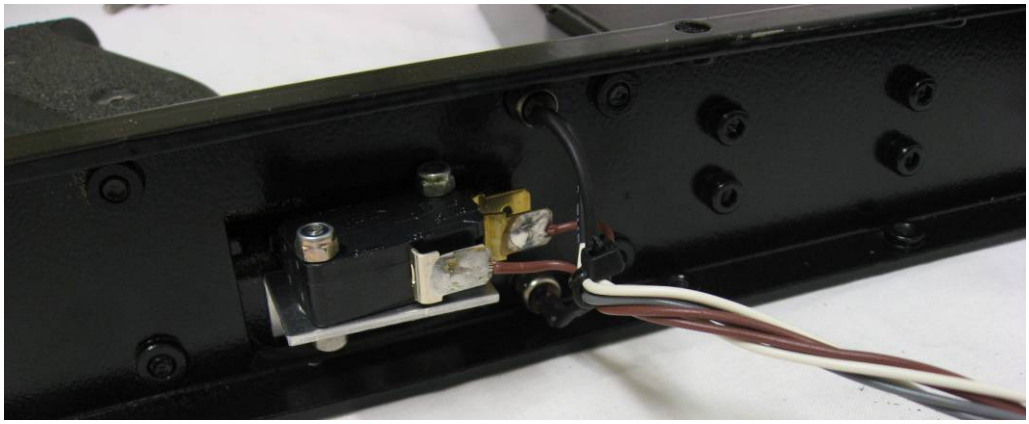


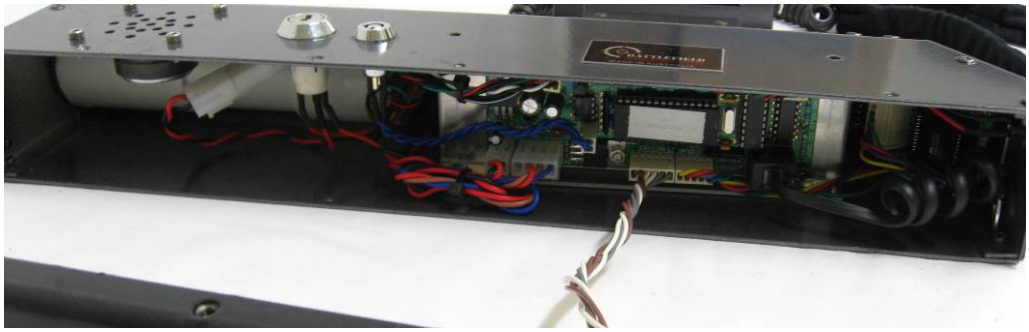
APPENDIX A6
Photographs – Identification

Test Setup

Scorpion Gun

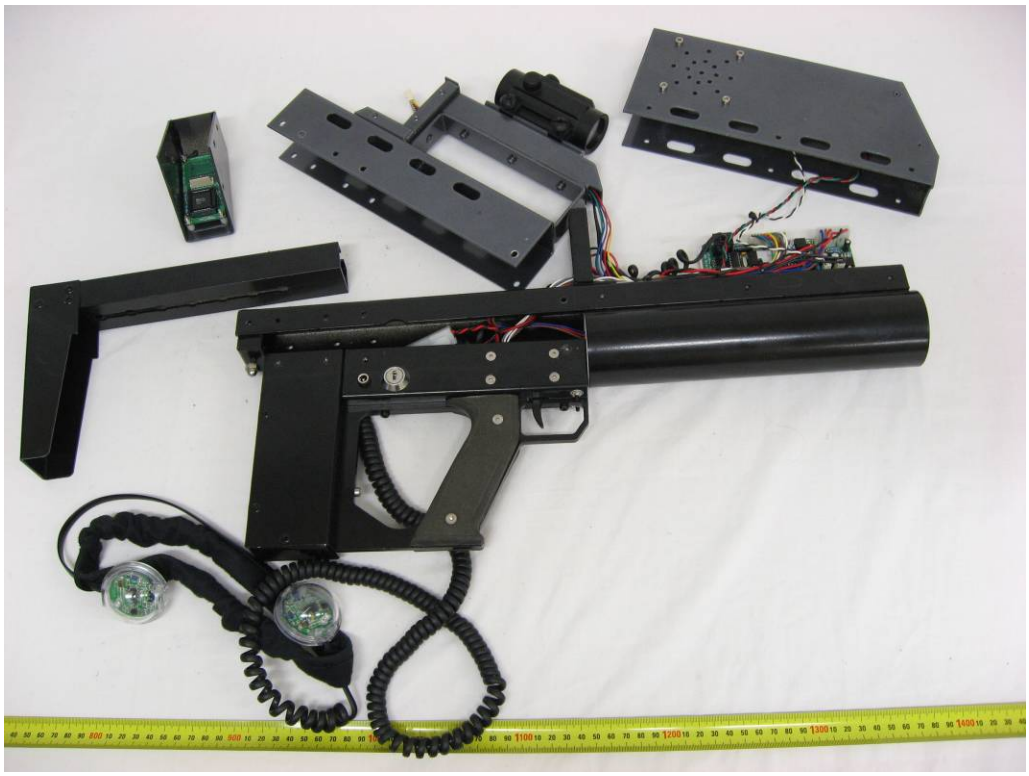
APPENDIX A7
Photographs – Identification



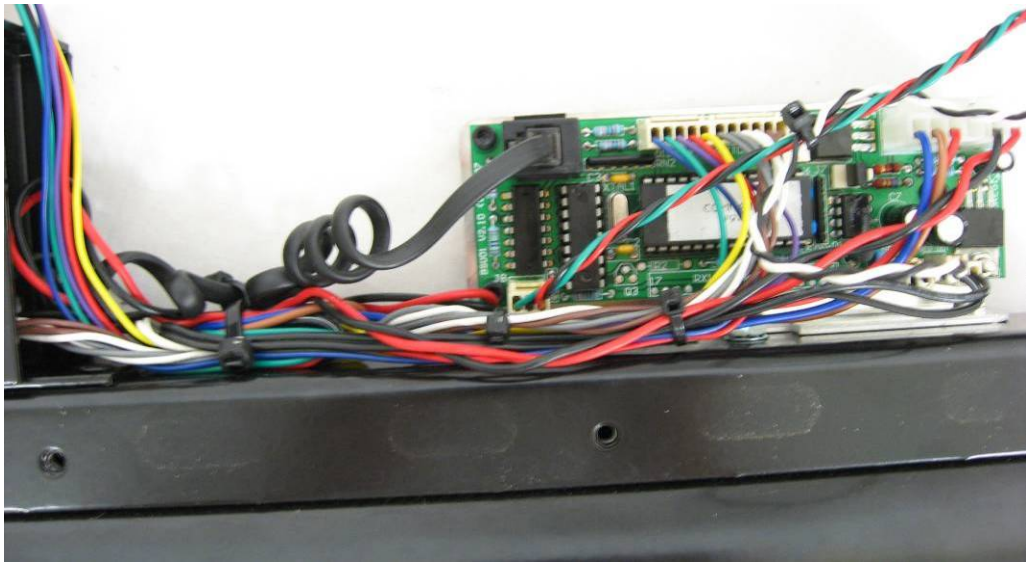


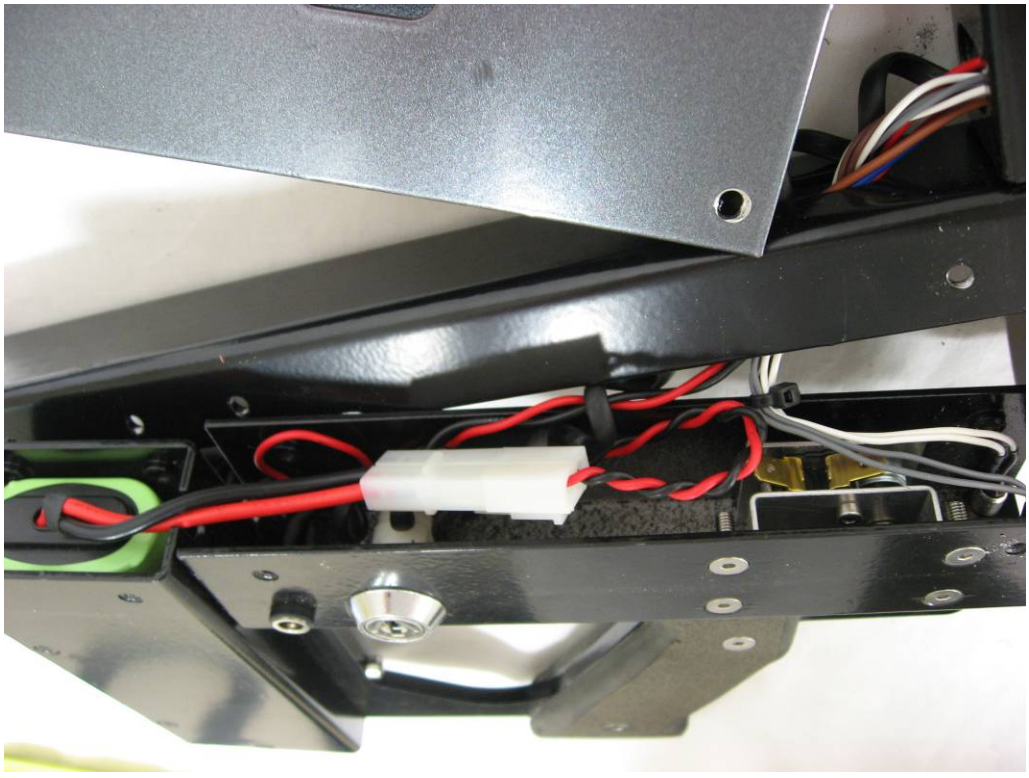
Commander Gun

APPENDIX A8
Photographs – Identification

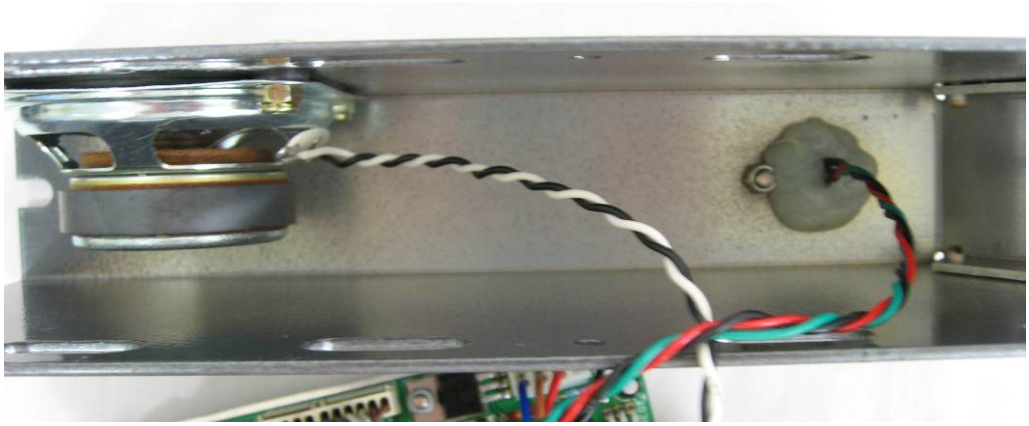


APPENDIX A9
Photographs – Identification



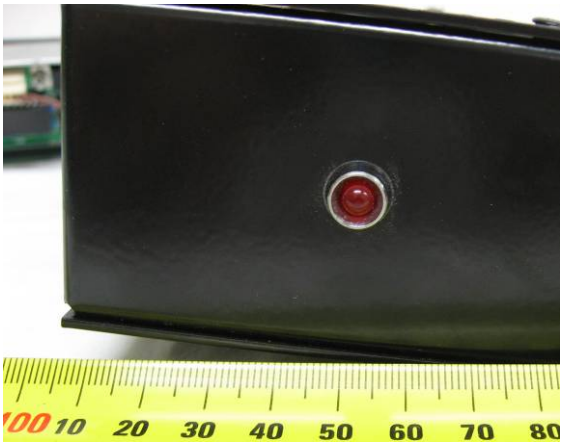


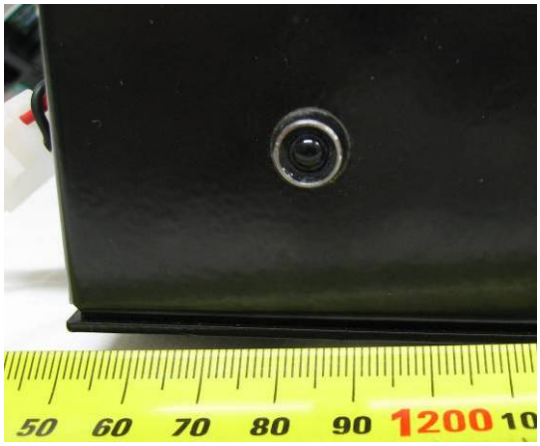
APPENDIX A10
Photographs – Identification



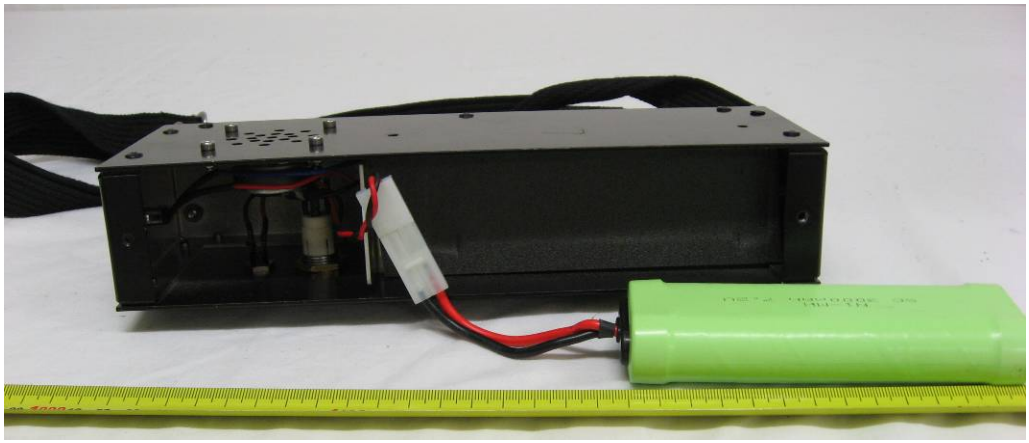
Ref Gun

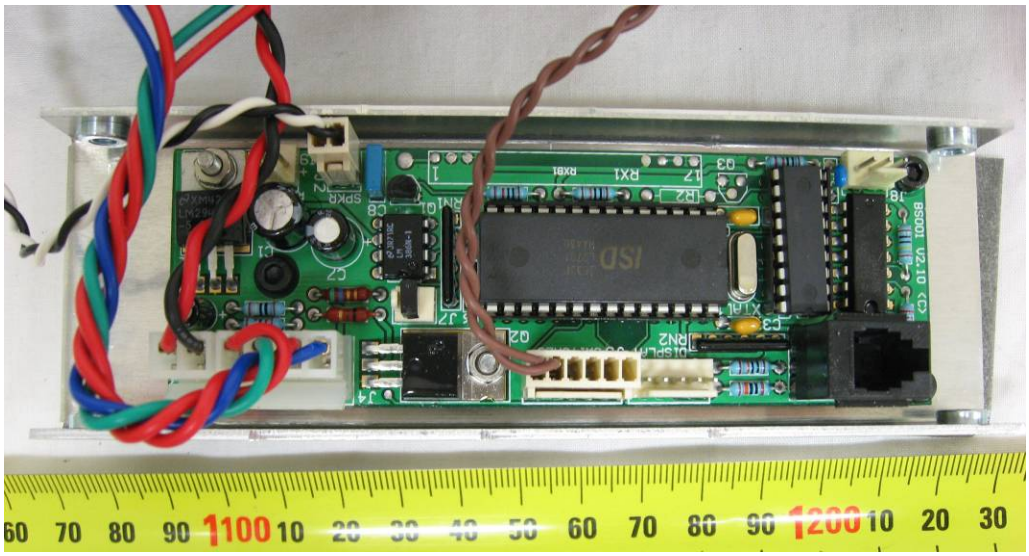
APPENDIX A11
Photographs – Identification



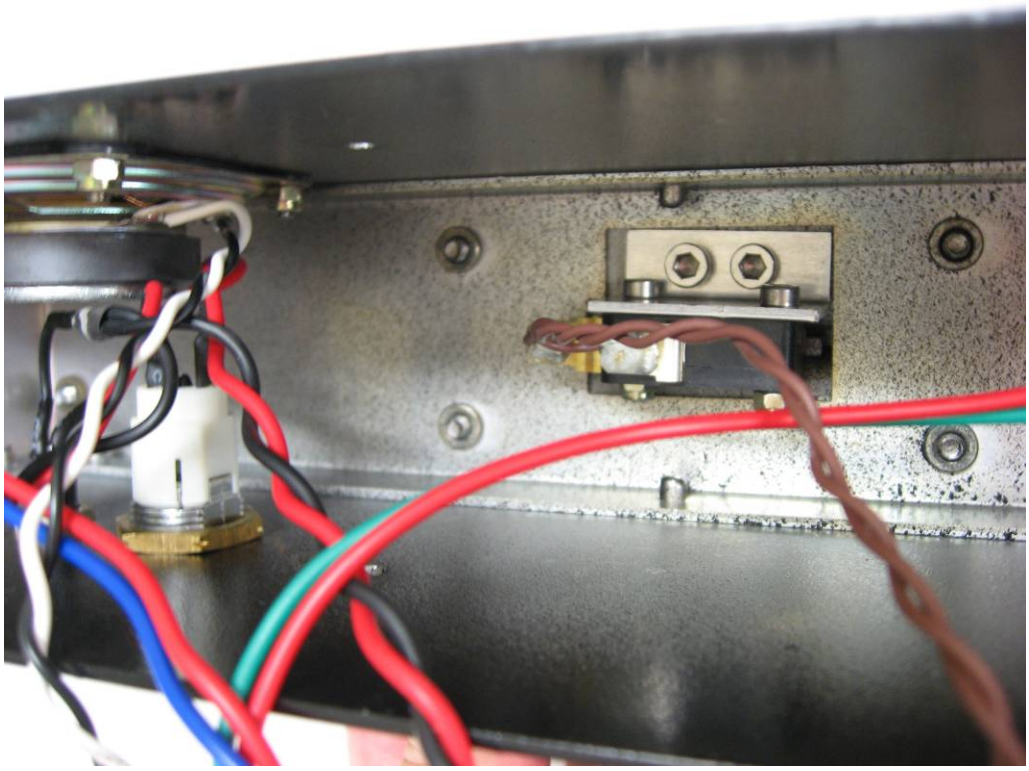


APPENDIX A12
Photographs – Identification

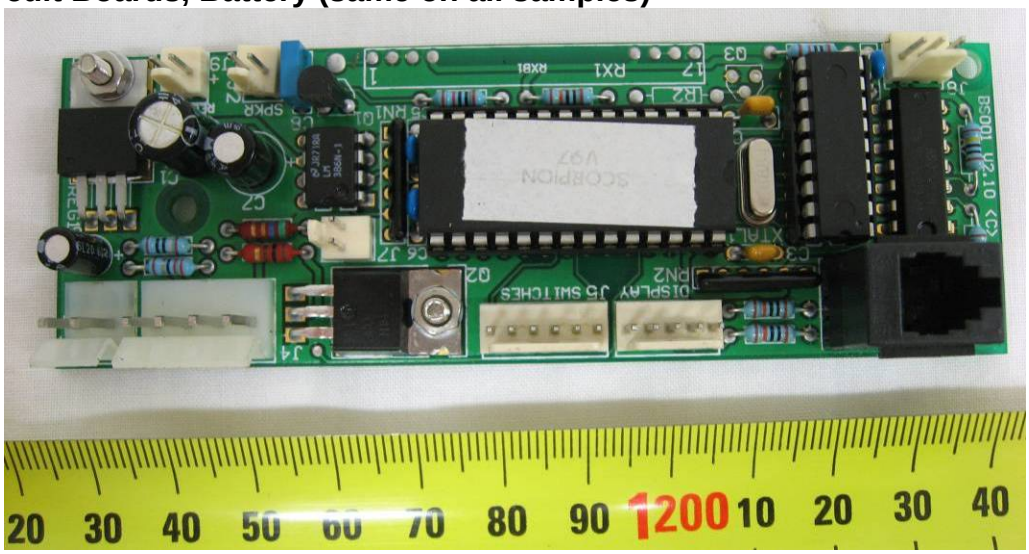




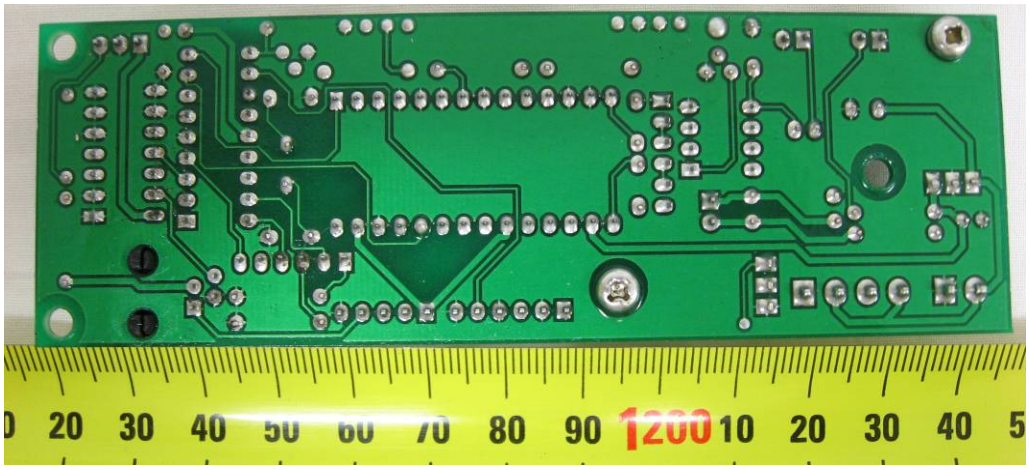
APPENDIX A13
Photographs – Identification

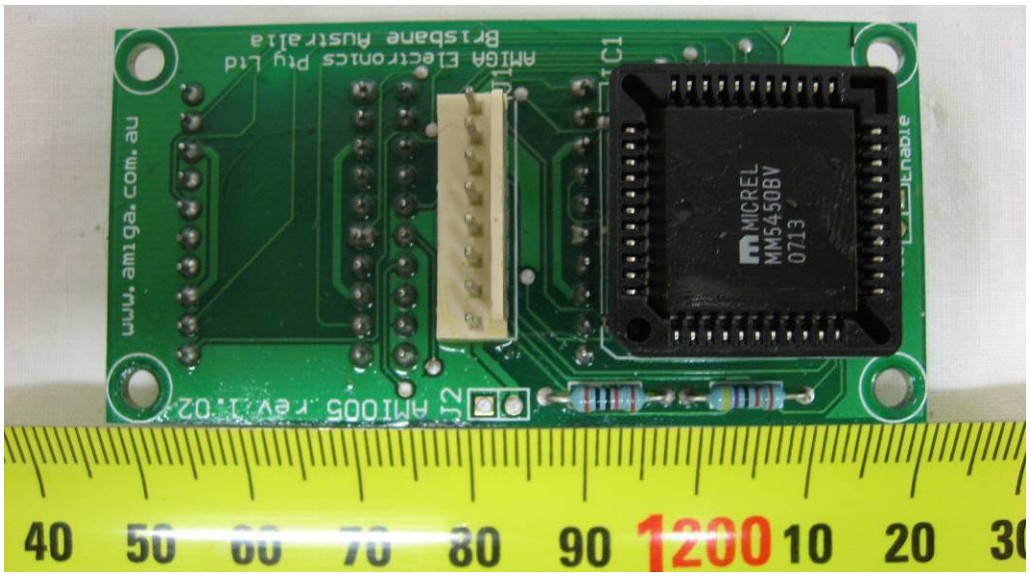


Circuit Boards, Battery (same on all samples)

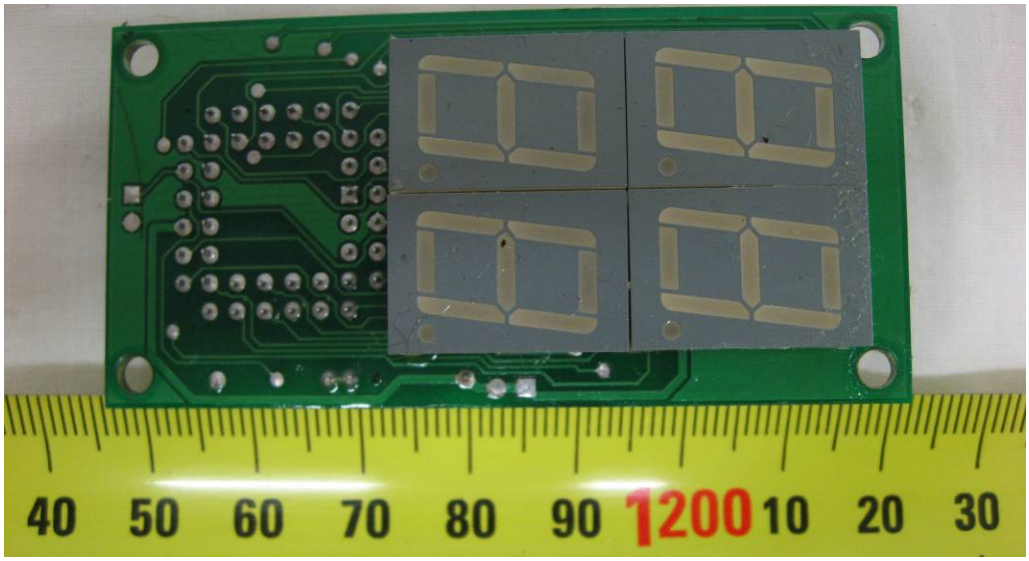


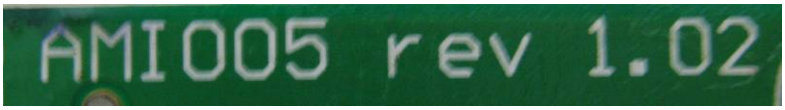
APPENDIX A14
Photographs – Identification





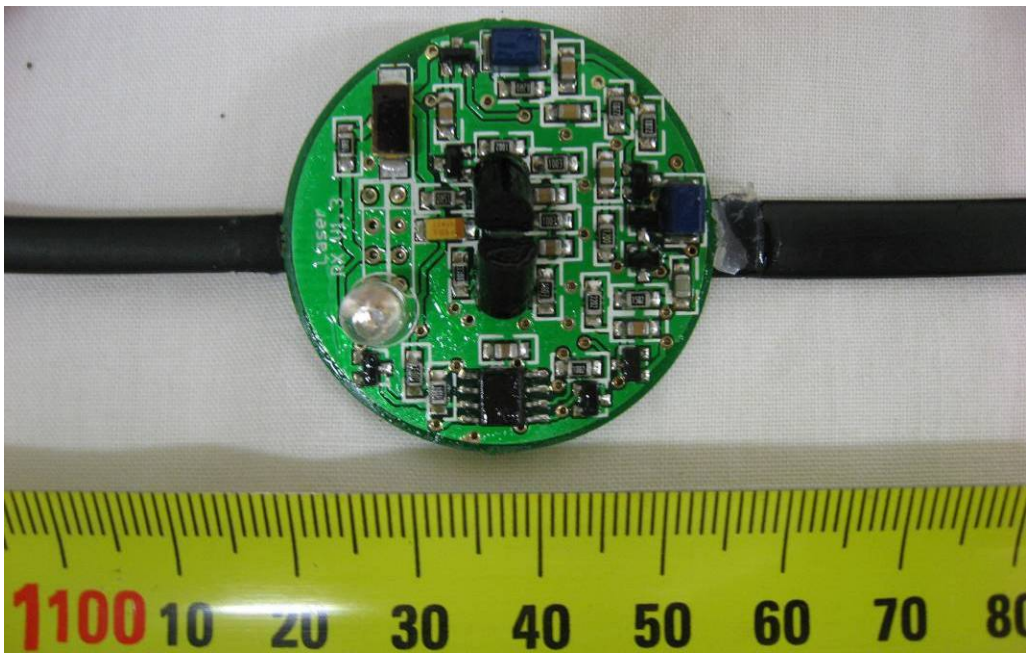
APPENDIX A15
Photographs – Identification



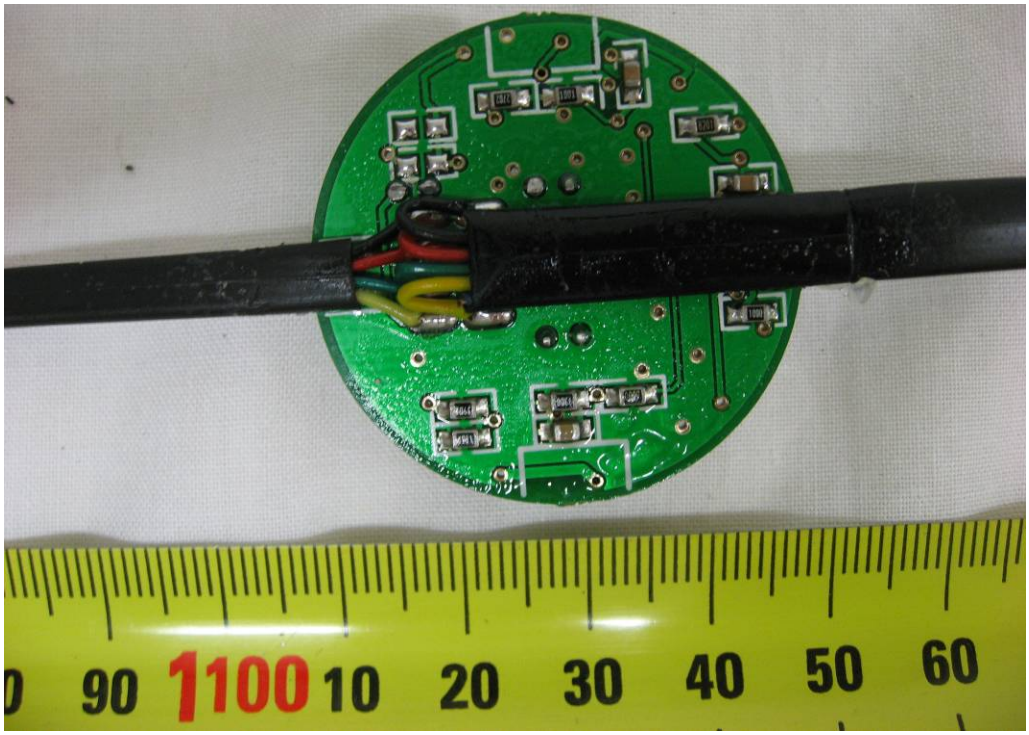


APPENDIX A16
Photographs – Identification

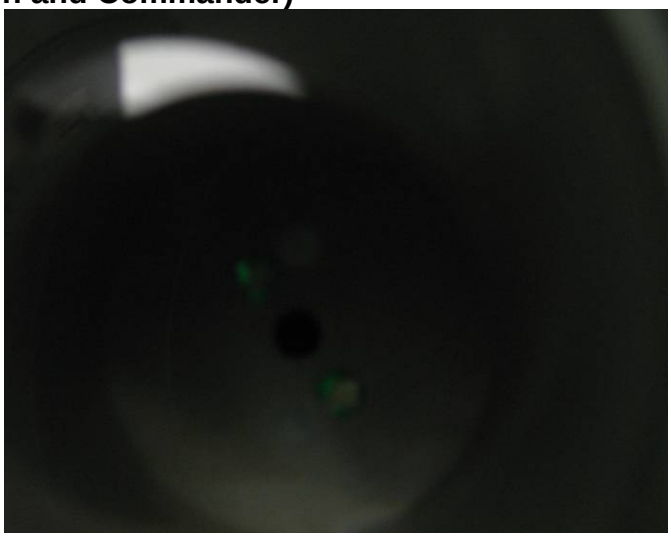
Headband Unit (Scorpion and Commander)



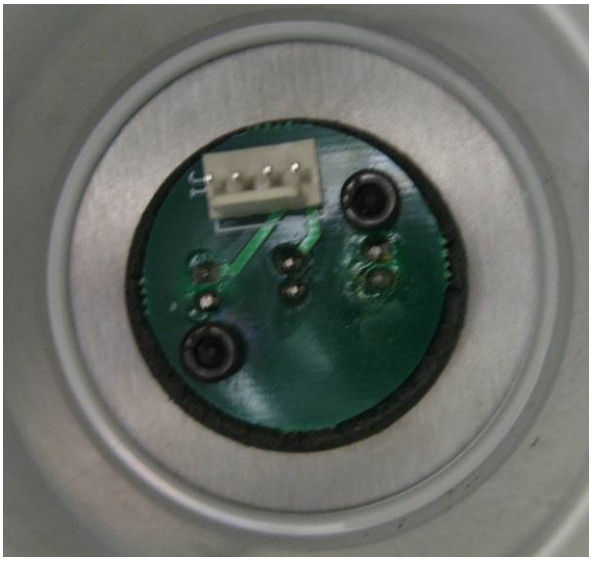
APPENDIX A17
Photographs – Identification



LEDs (Scorpion and Commander)



APPENDIX A18
Photographs – Identification



APPENDIX B

Graphs of Measurements

RADIATED EMISSION: Enclosure

Graph 1:	30 MHz to 1000 MHz	Vertical Polarisation
Graph 2:	30 MHz to 1000 MHz	Horizontal Polarisation

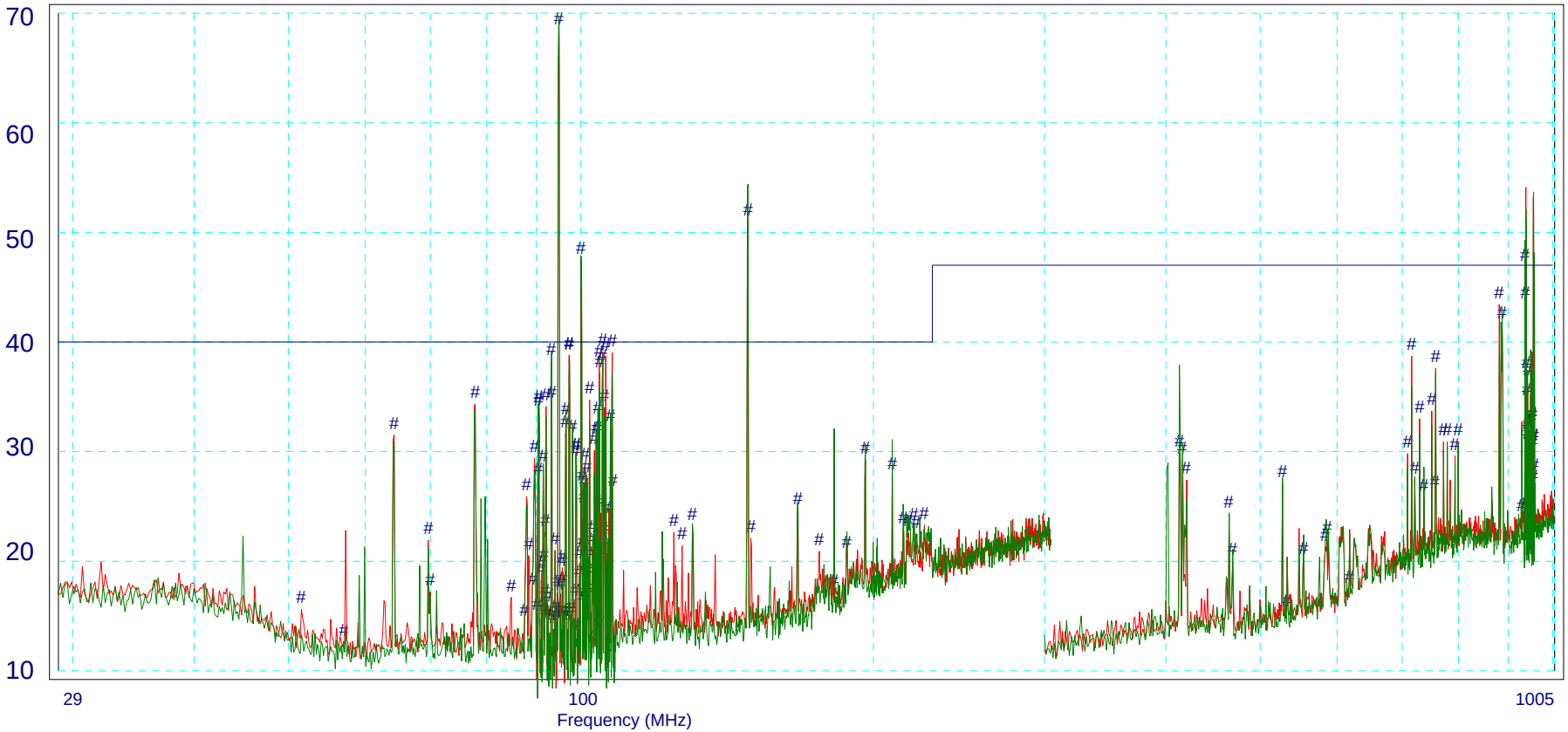
EMC Technologies Pty. Ltd. - Global Product Certification

EN 61000-6-3
Radiated Emissions (dBuV/m)
= Ambient

Job No:B080307

p:\PCF\080307_1.PCF
Test Date: 21/03/2008

GRAPH No. 1



Scapequest Pty Ltd
Model: S50, COM and REF
Serial No: S50-0999-ZG0607, COM-0667-ZG0607, REF-125-ZG0607

Limits:
C22-A10 CISPR 22 CLASS A 10 metre QP LIMITS

Legend:
Vertical Ambients
Vertical Emissions

Ver 5.5 Build 154
Milbong OATS
t:A2230208 c1:COAT0309_10M c2:NONE p:A0510708 a:
Site ID: OATS, Milbong, Queensland
Test Officer:Rune Berberg

Source:
080307r18 , 9 , 10 ,11 ,12 ,2 , 3 , 4
080307r119 ,20 ,21 ,22 ,23 ,29 ,30 ,31

EMC Technologies (Brisbane) 1/15 Success St, Acacia Ridge,4110, QLD, Australia
Phone+(617) 3875 2455 Fax+(617) 3875 2466

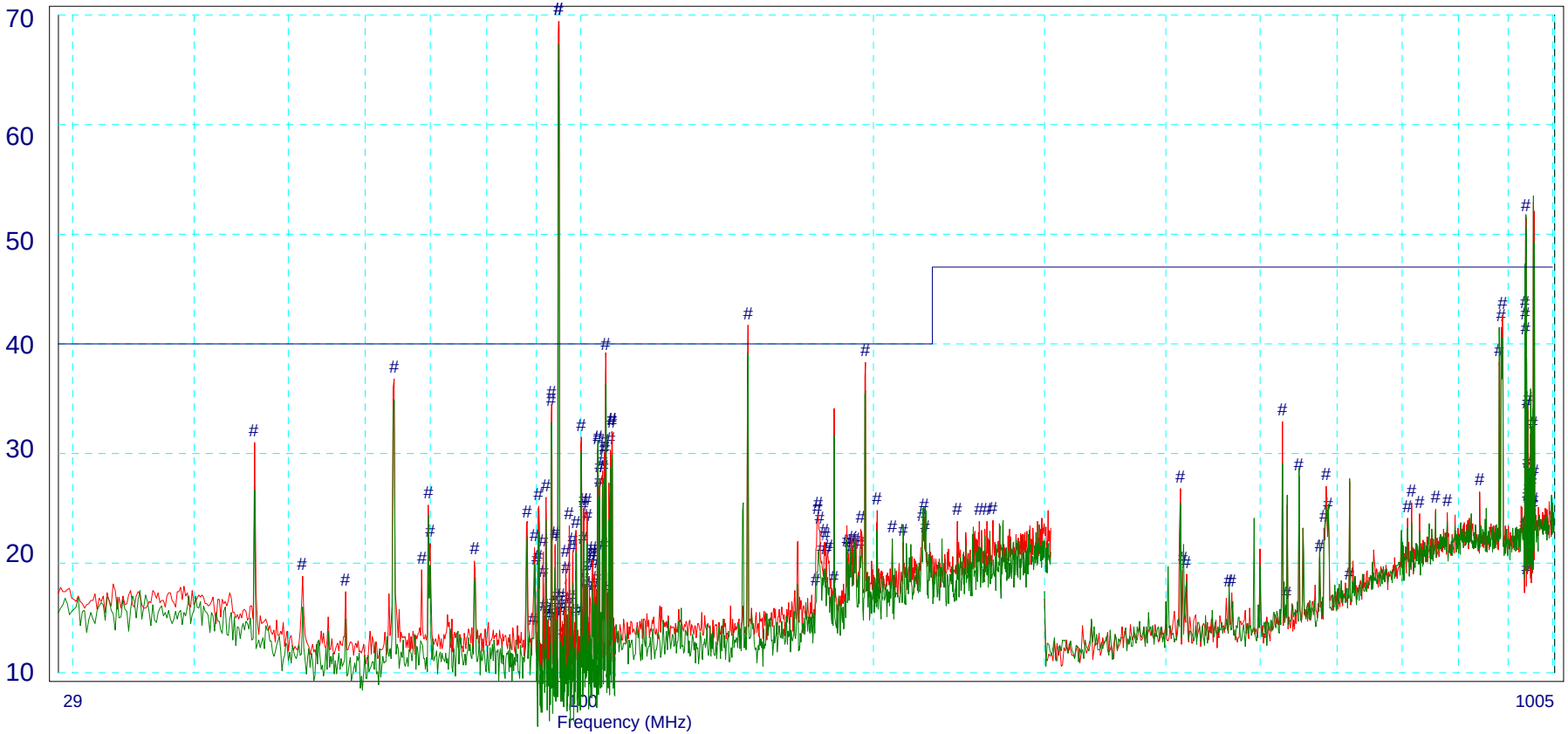
EMC Technologies Pty. Ltd. - Global Product Certification

EN 61000-6-3
Radiated Emissions (dBuV/m)
= Ambient

Job No:B080307

p:\PCF\080307_2.PCF
Test Date: 21/03/2008

GRAPH No. 2



Scapequest Pty Ltd
Model: S50, COM and REF
Serial No: S50-0999-ZG0607, COM-0667-ZG0607, REF-125-ZG0607

Limits:
C22-A10 CISPR 22 CLASS A 10 metre QP LIMITS

Legend:
Horizontal Ambients
Horizontal Emissions

Ver 5.5 Build 154
Milbong OATS
t:A2230208 c1:COAT0309_10M c2:NONE p:A0510708 a:
Site ID: OATS, Milbong, Queensland
Test Officer:Rune Berberg

Source:
080307r114 ,15 ,16 ,17 ,18 ,5 , 6 , 7
080307r124 ,25 ,26 ,27 ,28 ,32 ,33 ,34

EMC Technologies (Brisbane) 1/15 Success St, Acacia Ridge,4110, QLD, Australia
Phone+(617) 3875 2455 Fax+(617) 3875 2466

APPENDIX C

Customer Test Plan

Test Plan
EMC Testing

Date: 06/04/2008

Rev: B

Checked By: Ivy Grcic

TABLE OF CONTENTS

1. INTRODUCTION

To test the Scorpion, Commando and Ref gun (S50, COM and REF), to evaluate emissions performance and susceptibility performance.

1.1. Test Requirements

Testing is to be performed using procedures and criteria contained in EN 61000-6-3:2007 and EN 61000-6-1:2007.

1.2. Product Description

Infrared toy gun for indoor/outdoor battlefield games.

1.3. EUT Operating Conditions / Test Modes

To be tested powered on, not firing. The effect of firing should be investigated during emission testing to verify that this does not increase emissions.

1.4. Product Specifications

Manufacturer: Grcic Corp. Pty Ltd (Manufactured for Battlefield Sports)

Model No.: S50, COM and REF
Clock Circuit Speed: 3.6864MHz
Microprocessor: RL16F628

1.5. Build Level

1.5.1. Main Assembly

-

1.5.2. Options

None

1.6. Support Equipment

Charger provided for charging batteries, but not to be used during testing as guns do not charge when power on. In charge mode only the battery is connected to the charger, none of the electronics inside the guns are connected.

1.7. EUT Configuration

EUT is to be tested as a table top unit along the guidelines contained in the relevant standards for all testing, in the following configuration:

Block diagram not appliacable

1.8. Performance Criteria

The infrared guns (EUT) should comply with one of the following performance criteria as specified within this test plan.

Criteria A:

The EUT shall continue to operate as intended during the testing.

During Radiated Immunity testing and Conducted Immunity testing the guns are allowed to fire, register a hit or reset. The number of hits or number of rounds used does not need to be maintained. This is acceptable as the products are toys for use where no safety implications of the above would be seen and no financial interests are involved.

Criteria B:

The EUT shall continue to operate as intended after the test. It may however exceed its design specifications during test.

Equipment is allowed to display any of the above (Criterion A) while as the stored number of hits and rounds used should be maintained after ESD test events.

Criteria C:

Temporary loss of function is permitted provided that this is self recoverable or can be restored by the operation of controls eg. Normal operation resumes after a power down/power on cycle. No permanent damage is to be sustained.

Not applicable.

2. EMISSIONS TESTING EN 61000-6-3

2.1. Requirements

Testing is to be performed using procedures contained in:

EN 61000-6-3:2007
- Radiated Emission Class B only (no AC Mains)

2.2. Performance Criteria

The infrared toy guns (EUT) must meet the limits of the above standards.

3. IMMUNITY TESTING TO EN61000-6-1:2007

3.1. EN 61000-4-2 Electrostatic Discharge Testing

3.1.1. Requirements

Testing is performed using the procedures and criteria contained in EN 61000-4-2.

3.1.2. Types of Discharges

Air and contact discharges are to be applied.

3.1.3. Application Points

Discharges are to be applied to all operator accessible areas.

3.1.4. Number of Discharges

At least ten (10) single discharges are to be applied at each point.

3.1.5. Severity Level

Air discharge:	Level 3 (8kV)
Contact Discharge:	Level 2 (4kV)

3.1.6. Performance Criteria

Criteria B – EN61000-6-1:2007, as specified in the test plan. All operating anomalies are to be reported.

3.2. EN 61000-4-3 - RF Immunity Testing Amplitude Modulation

3.2.1. Requirements

Testing is performed using the procedures and criteria contained in EN 61000-4-3 and EN61000-6-1:2007

3.2.2. Frequency Range

80 to 1000 MHz

3.2.3. Field Strength

3 V/m with a 1kHz 80% amplitude modulation.

3.2.4. Performance Criteria

The Criteria as specified in this test plan and as permitted by EN61000-6-1:2007 performance Criteria A.

During Radiated Immunity testing the guns are allowed to fire, register a hit or reset. The number of hits or number of rounds used does not need to be maintained. This is acceptable as the products are toys for use where no safety implications of the above would be seen and no financial interests are involved.

3.3. EN 61000-4-4 Electrical Fast Transient Burst Testing

3.3.1. Requirements

Testing is to be performed using the procedures and criteria contained in EN 61000-4-4 and EN61000-6-1:2007 levels required.

3.3.2. Lines to be tested

Control cable between guns and head bands.

3.3.3. Duration of Test

Nominal 1 minute on all cables.

3.3.4. Polarity of Test Voltage

Both polarities are mandatory.

3.3.5. Severity Level

Level 1 (0.5 kV).

3.3.6. Performance Criteria

Criteria B – EN61000-6-1:2007 as specified in the test plan. All operating anomalies are to be reported.

3.4. EN 61000-4-5 Surges

3.4.1. Requirements

Testing not required.

3.4.2. Lines to be tested

None

3.5. EN 61000-4-6 Conducted Disturbance

3.5.1. Requirements

Testing is to be performed using the procedures and criteria contained in EN61000-4-6 and EN61000-6-1:2007 levels required.

3.5.2. Lines to be tested

Control cable between guns and head bands.

3.5.3. Frequency Range

150kHz to 80 MHz.

3.5.4. Severity Level

Level 3 – 3Vrms with1kHz 80% amplitude modulation.

3.5.5. Performance Criteria

Criteria as specified in this test plan and EN61000-6-1:2007 Criteria A. All operating anomalies are to be reported.

During Conducted Immunity testing the guns are allowed to fire, register a hit or reset. The number of hits or number of rounds used does not need to be maintained. This is acceptable as the products are toys for use where no safety implications of the above would be seen and no financial interests are involved.

3.6. EN 61000-4-8 Magnetic Fields

3.6.1. Requirements

Not required, as the EUT's does not have any devices susceptible to magnetic fields. Refer to the standard for details.

3.7. EN 61000-4-11 Voltage Dips and Interruptions

3.7.1. Requirements

Not required. No AC Mains. Product is battery operated only.

4. ORDER OF TESTING

Testing is to be conducted as follows:-

‘at EMC Technologies discretion and convenience.’

5. TEST REPORTS

A EN 61000-6-3:2007 and EN 61000-6-1:2007 Test Report is required if the Infrared guns (EUT) complies with this Test Plan’s requirements.