Report On

FCC and Industry Canada Testing of the
Triumph Designs Limited
125kHz Immobiliser

COMMERCIAL-IN-CONFIDENCE

FCC ID: YHF125RCU
IC ID: 9053A-125RCU

Document 75909530 Report 01 Issue 2 November 2010

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November 2010

PREPARED FOR

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DATED 25 November 2010

This report has been up-issued to Issue 2 to correct specification references.

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47: Part 15C and Industry Canada RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineers;

B Logan

P Harrison

UKAS TESTING 0141

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SECTION 1

REPORT SUMMARY

FCC and Industry Canada Testing of the
Triumph Designs Limited
125kHz Immobiliser

1.1 INTRODUCTION

The information contained in this report is intended to show verification of the Triumph Designs Limited, 125kHz Immobiliser to the requirements of FCC CFR 47 Part 15C and RSS-GEN.

Objective	To perform FCC and Industry Canada Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Triumph Designs Limited
Part Number(s)	07057
Serial Number(s)	428B800F
Software Version	4070571011
Hardware Version	308-057-1090-A
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 15C: 2009 RSS-GEN: Issue 2: 2007
Incoming Release Date	Declaration of Build Status 07 September 2010
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	DES019962 25 February 2010
Start of Test	28 May 2010
Finish of Test	23 June 2010
Name of Engineer(s)	B Logan P Harrison
Related Document(s)	ANSI C63.4: 2003

1.2 BRIEF SUMMARY OF RESULTS

A brief summary of results in accordance with FCC CFR 47 Part 15C and RSS-GEN is shown below.

Configuration 1 - Stand Alone								
Section	Spec Clause		Test Description	Mode	Test Site	Mod State	Result	Base Standard
	FCC	IC						
2.1	15.209	4.9, 4.10, 4.11 and 7.2.3	Radiated Emissions (Enclosure Port)	125kHz Tx	Bearley	1	Pass	ANSI C63.4
				125kHz Rx	Bearley	0	Pass	
2.2	15.209	4.8	Field Strength Peak Power	125kHz Tx	Octagon House	0	Pass	ANSI C63.4
				125kHz Rx	Octagon House		N/A	

N/A – Not Applicable

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1.3 DECLARATION OF BUILD STATUS

Manufacturer	LDL Technology
Country of origin	Thailand
Technical Description	Motorcycle Immobiliser system, using 125kHz LF
Model No	N/A
Part No	07057
Serial No	428B800F
Drawing Number	C2070570000
Build Status	Volume Producton sample (Off tool & off process)
Software Issue	4070571011
Hardware Issue	308-057-1090-A
FCC ID	YHF 125RCU
IC ID	9053A-125RCU
Highest Operating Frequency	13,225MHz
Signature	R Browning
Date	07/09/10
D of B S Serial No	0001A

Note: This document has been prepared to enable manufacturers with no mechanism for producing their own Declaration of Build Status, to declare the build state of the equipment submitted for test.

No responsibility will be accepted by TÜV Product Service as to the accuracy of the information declared in this document by the manufacturer.

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1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Triumph Designs Limited, 125kHz Immobiliser as shown in the photograph below. A full technical description can be found in the manufacturer's documentation.

Equipment Under Test

Product Service

1.4.2 Test Configuration

Configuration 1: Stand Alone

The EUT was configured in accordance with FCC CFR 47 Part 15C and RSS-GEN.

1.4.3 EUT Cable / Port Identification

Port	Max Cable Length specified	Usage	Type	Screened
12V DC Power	1.0m	Supply	2 core	No
Wiring Harness	2.0m	Multiple use	Multicore	No

1.4.4 Modes of Operation

Mode of operation of the EUT during testing was as follows:

Mode 1 - 125kHz Tx
Mode 2 - 125kHz Rx

Information on the specific test modes utilised are detailed in the test procedure for each individual test.

1.5 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure and an open test area as appropriate.

The EUT was powered from a 12V DC supply.

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory
90986 TUV Bearley, Snitterfield Road Test Laboratory

Industry Canada Accreditation
IC2932B-1 Octagon House, Fareham Test Laboratory
IC2932E TUV Bearley, Snitterfield Road Test Laboratory

1.6 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standards or test plan were made during testing.

Product Service

1.7 MODIFICATION RECORD

The table below details modifications made to the EUT during the test programme. The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
0	As supplied by the customer	Not Applicable	Not Applicable
1	The instrument pack and the associated loom for the instrument pack were removed from the EUT wiring loom.	Rob Brownrigg	16 June 2010

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SECTION 2

TEST DETAILS

FCC and Industry Canada Testing of the
Triumph Designs Limited
125kHz Immobiliser

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2.1 RADIATED EMISSIONS (ENCLOSURE PORT)

2.1.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.207
RSS-GEN, Clause 4.9, 4.10, 4.11 and 7.2.3

2.1.2 Equipment Under Test

125kHz Immobiliser, S/N: 428B800F

2.1.3 Date of Test and Modification State

26 April 2010 - Modification State 0
23 June 2010 - Modification State 1

2.1.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of ANSI C63.4.

A preliminary profile of the Spurious Radiated Emissions was obtained by operating the EUT on a remotely controlled turntable within a semi-anechoic chamber. Measurements of emissions from the EUT were obtained with the Measurement Antenna in both polarisations or face as approriate. The profiling produced a list of the worst-case emissions together with the EUT azimuth and antenna polarisation.

Using the information from the preliminary profiling of the EUT, the list of emissions was then confirmed or updated under Open Site conditions. Emission levels were maximised by adjusting the antenna height (where required), antenna polarisation or face and turntable azimuth.

Emissions within the restricted bands defined in 15.205 were measured in accordance with 15.209. Emissions identified within the range 9kHz – 1GHz were formally measured using a CISPR Quasi-Peak detector, except for frequency ranges 9-90kHz and 110-490kHz where a peak detector was used (worst case). No emissions exceeded the average limit using a peak detector

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1
- Mode 2

2.1.6 Environmental Conditions

	26 April 2010	23 June 2010
Ambient Temperature	21°C	21°C
Relative Humidity	25%	34%
Atmospheric Pressure	1021mbar	1021mbar

Product Service

2.1.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15C and RSS-GEN for Radiated Emissions (Enclosure Port).

The test results are shown below.

Configuration 1 - Mode 1

30MHz to 1GHz

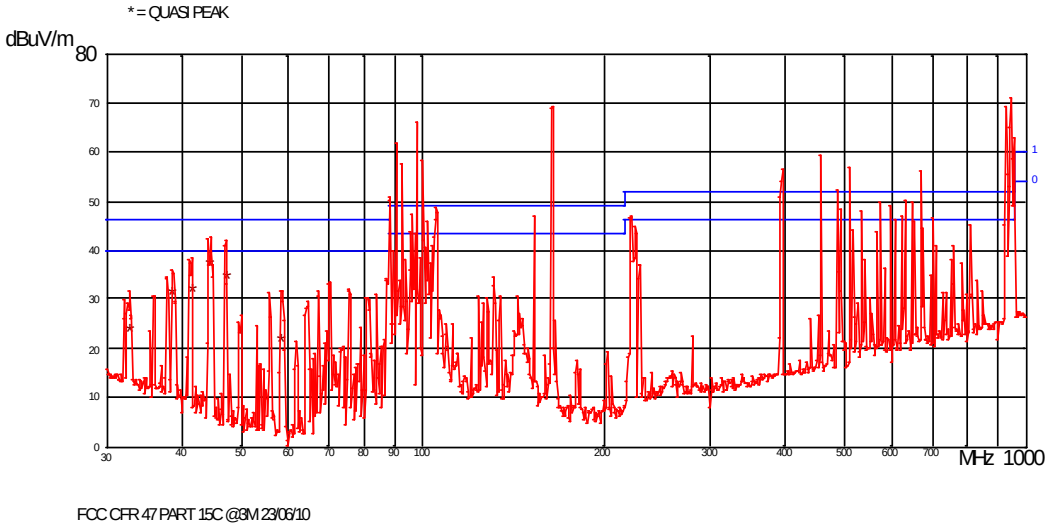

Table of Results

measured QP values					
Frequency MHz	Level. dBuV/m	Margin dB	Pol h/v	Height m	Azimuth deg.
32.6850	23.8	-16.2	v	1.00	0
38.4960	31.4	-8.6	v	1.00	0
41.4540	32.4	-7.6	v	1.00	0
44.4649	37.7	-2.3	v	1.00	0
47.1417	34.6	-5.4	v	1.00	183
58.1803	21.9	-18.1	v	1.00	0

* Limit exceeded

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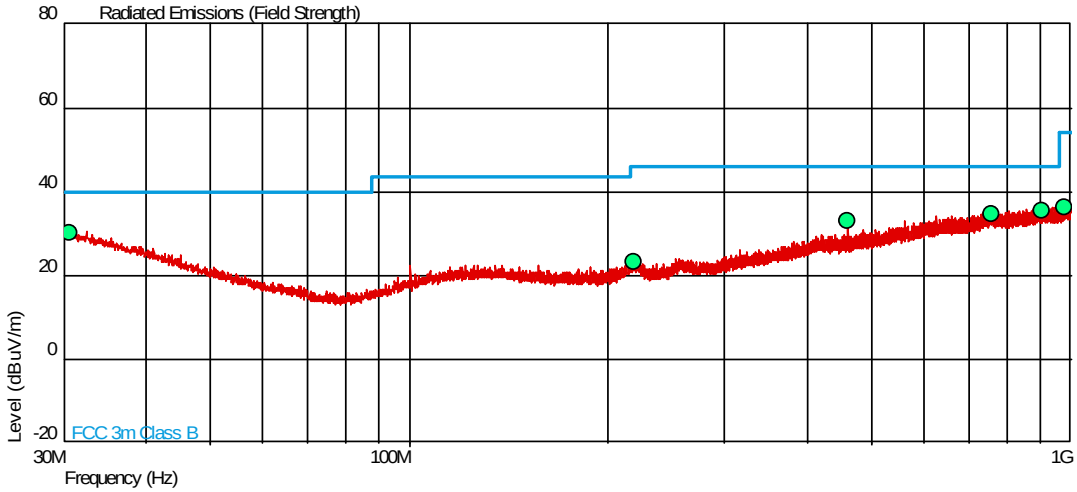
Configuration 1 - Mode 2

30MHz to 1GHz



Frequency (MHz)	QP Level (dBµV/m)	QP Level (µV/m)	QP Limit (dBµV/m)	QP Limit (µV/m)	QP Margin (dBµV/m)	QP Margin (µV/m)	Angle (Deg)	Height (m)	Polarity	
30.581	30.3	32.70	40.0	100	-9.7	67.30	212	1.05	Vertical	
217.970	23.2	14.45	46.0	200	-22.8	185.55	44	1.62	Horizontal	
460.615	33.0	44.67	46.0	200	-13.0	155.33	337	1.00	Vertical	
759.949	34.6	53.70	46.0	200	-11.4	146.30	85	3.94	Vertical	
907.074	35.5	59.57	46.0	200	-10.5	140.43	224	1.00	Horizontal	
981.585	36.3	65.31	54.0	500	-17.7	434.69	117	1.00	Horizontal	

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2.2 FIELD STRENGTH PEAK POWER

2.2.1 Specification Reference

FCC CFR 47 Part 15C, Clause 15.209
RSS-GEN, Clause 4.8

2.2.2 Equipment Under Test

125kHz Immobiliser, S/N: 428B800F

2.2.3 Date of Test and Modification State

28 May 2010 - Modification State 0

2.2.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.2.5 Test Method and Operating Modes

The test was applied in accordance with the test method requirements of ANSI C63.4.

Measurements of the fundamental from the EUT were obtained with the Measurement Antenna in both Face On and Edge On Polarisations. The fundamental frequency was maximised by adjusting the antenna polarisation and turntable azimuth. A peak detector was used with the trace set to max hold. The maximum result was recorded.

The measurements were performed at a 3m distance unless otherwise stated.

The test was performed with the EUT in the following configurations and modes of operation:

Configuration 1 - Mode 1

2.2.6 Environmental Conditions

	28 May 2010
Ambient Temperature	22.8°C
Relative Humidity	31%
Atmospheric Pressure	1013mbar

Product Service

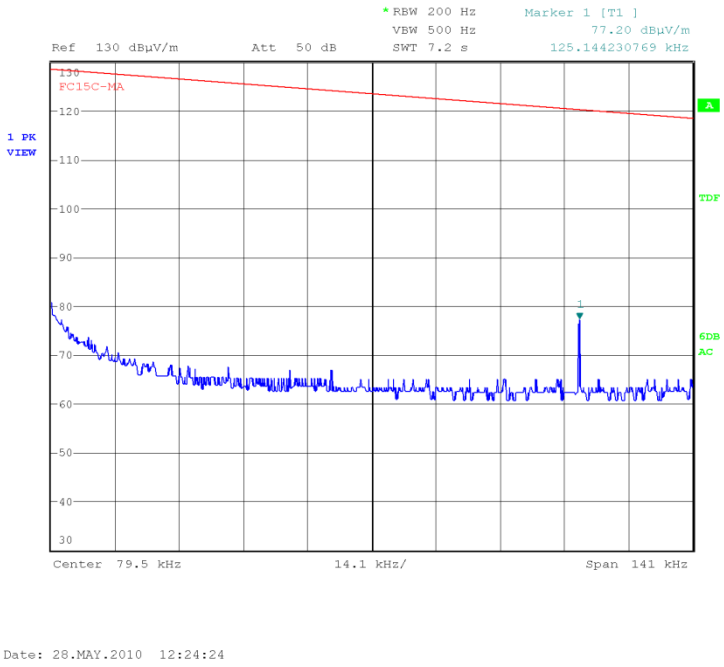
2.2.7 Test Results

For the period of test the EUT met the requirements of FCC CFR 47 Part 15C and RSS-GEN for Field Strength Peak Power.

The test results are shown below.

Configuration 1 - Mode 1

Face On



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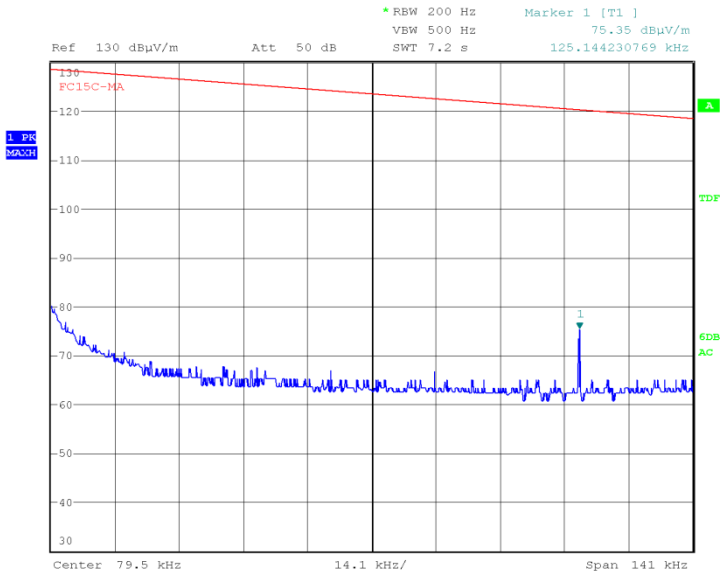
Edge On



Date: 28.MAY.2010 13:57:06

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SECTION 3

TEST EQUIPMENT USED

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3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.1 EMC - Radiated Emissions					
Screened Room (5)	Rainford	Rainford	1545	36	11-Feb-2011
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Turntable/Mast Controller	EMCO	2090	1607	-	TU
Test Receiver	Rohde & Schwarz	ESVP	1669	12	12-Nov-2010
Antenna Mast	EMCO	1050	1707	-	TU
Turntable Controller	Various	RH253	1708	-	TU
Spectrum Analyser	Rohde & Schwarz	EZM	1823	-	TU
Antenna (Bilog, 20MHz-2GHz)	York Electronics	CBL6111B	1868	24	20-Aug-2010
Antenna (Bilog)	Chase	CBL6143	2904	24	4-Dec-2011
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	1-Sep-2010
Section 2.2 EMC – Field Strength Peak Power					
Antenna (Active Loop, 9kHz-30MHz)	Rohde & Schwarz	HFH2-Z2	333	24	10-Jul-2010
Screened Room (5)	Rainford	Rainford	1545	36	11-Feb-2011
Turntable/Mast Controller	EMCO	2090	1607	-	TU
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	1-Sep-2010

TU – Traceability Unscheduled

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3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	Frequency / Parameter	MU
Radiated Emissions, Bilog Antenna, AOATS	30MHz to 1GHz Amplitude	5.1dB*
Radiated Emissions, Horn Antenna, AOATS	1GHz to 40GHz Amplitude	6.3dB*
Conducted Emissions, LISN	150kHz to 30MHz Amplitude	3.2dB*
Conducted Emissions, ISN	150kHz to 30MHz Amplitude	2.1dB
Substitution Antenna, Radiated Field	30MHz to 18GHz Amplitude	2.6dB
Discontinuous Interference	150kHz to 30MHz Amplitude	3.0dB*
Interference Power	30MHz to 300MHz Amplitude	3.0dB*
Radiated E-Field Susceptibility	10MHz to 6GHz Test Amplitude	2.0dB†
Conducted Susceptibility RF	50kHz to 1000MHz Amplitude EM Clamp Method of Test CDN Method of Test BCI Clamp Method of Test Direct Injection Method of Test	 3.1dB• 1.2dB• 1.1dB• 1.2dB•
Conducted Susceptibility LF	DC to 150kHz	1.0%†
Power Frequency Magnetic Field	50Hz/60Hz Amplitude	0.45%
Magnetic Emissions	9kHz to 30MHz Amplitude	3.4dB*
Magnetic Field/Flux iaw EN 50366	10Hz to 400kHz	2.64%
Harmonics and Flicker	The test was applied using proprietary equipment that meets the requirements of EN 61000-3-2 and EN 61000-3-3	—
Mains Voltage Variations and Interrupts	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-11	—
Fast Transient Burst	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-4	—
Electrostatic Discharge	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-2	—
Surge	The test was applied using proprietary equipment that meets the requirements of EN 61000-4-5	—
Vehicle Transients	The test was applied using proprietary equipment that meets the requirements of ISO 7637-1 and 2	—
Compass Safe Distance	Azimuth Accuracy	0.10°
Channel Occupancy/Separation	19.1kHz	N/A
Maximum Output Power	Not Applicable	±0.5dB
Number of Channels	Not Applicable	N/A
20dB Bandwidth	19.1kHz	±0.5dB

Worst case error for both Time and Frequency measurement 12 parts in 10^6.

* In accordance with CISPR 16-4-2
† In accordance with UKAS Lab 34
• In accordance with EN61000-4-6

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SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT

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4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

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This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).