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Report On

Limited FCC Testing of the
Cobham Tactical Communications DC1600 HD Module & SOLO 7
In accordance with FCC CFR 47 Part 15B

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FCC ID: XRF SOL7HDNTX

Document 75926941 Report 01 Issue 1

November 2014



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PREPARED FOR

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APPROVED BY

Ryan Henley
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DATED

05 November 2014

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 15B. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

G Lawler



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SECTION 1

REPORT SUMMARY

Limited FCC Testing of the
Cobham Tactical Communications DC1600 HD Module & SOLO 7
In accordance with FCC CFR 47 Part 15B



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1.1 INTRODUCTION

The information contained in this report is intended to show the verification of Limited FCC Testing of the Cobham Tactical Communications DC1600 HD Module & SOLO 7 to the requirements of FCC CFR 47 Part 15B.

Objective	To perform FCC Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	Cobham Tactical Communications
Model Number(s)	SOLO7
Serial Number(s)	SOLO7HDNTX-198270
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 15B (2013)
Incoming Release Date	Declaration of Build Status 20 September 2014
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	PO-033163-1 05 September 2014
Start of Test	6 July 2014
Finish of Test	6 July 2014
Name of Engineer(s)	G Lawler
Related Document(s)	ANSI C63.4 (2014)



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1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC CFR 47 Part 15B is shown below.

Section	Spec Clause	Test Description	Result	Comments/Base Standard
Idle Mode				
2.1	15.109	Radiated Emissions	Pass	ANSI C63.4 (2003)



1.3 DECLARATION OF BUILS STATUS

MAIN EUT			
MANUFACTURING DESCRIPTION	SOLO7 HD Nano Transmitter 1.98-2.70GHz		
MANUFACTURER	Cobham Tactical Communications and Surveillance		
TYPE	COFDM Transmitter		
PART NUMBER	SOL7HDNTX-198270		
SERIAL NUMBER	030119		
HARDWARE VERSION	V4.0		
SOFTWARE VERSION	SN V1.2		
TRANSMITTER OPERATING RANGE	1.98GHz to 2.70GHz		
RECEIVER OPERATING RANGE	N/A		
COUNTRY OF ORIGIN	United Kingdom		
INTERMEDIATE FREQUENCIES	N/A		
EMISSION DESIGNATOR(S): (i.e. G1D, GXW)	2M5G2D and 2M50D7F		
MODULATION TYPES: (i.e. GMSK, QPSK)	COFDM Radio 2.4GHz 16QAM / QPSK		
HIGHEST INTERNALLY GENERATED FREQUENCY	2.7GHz		
OUTPUT POWER (W or dBm)	100mW		
FCC ID	XRF SOL7HDNTX		
INDUSTRY CANADA ID			
TECHNICAL DESCRIPTION (a brief description of the intended use and operation)	The Nano Transmitter is a COFDM digital video transmitter; it can operate in a variety of transmission bandwidths, with the user trading image quality for range. It can transmit images in a non-line of sight environment up to 1km depending on mode and frequency, its encased in a lightweight weatherproof aluminium chassis suitable for body-worn applications.		
BATTERY/POWER SUPPLY			
MANUFACTURING DESCRIPTION	N/A		
MANUFACTURER			
TYPE			
PART NUMBER			
VOLTAGE			
COUNTRY OF ORIGIN			
MODULES (if applicable)			
MANUFACTURING DESCRIPTION	SOLO7 HD Nano Transmitter 1.98-2.70GHz		
MANUFACTURER	Cobham Tactical Communications and Surveillance		
TYPE	D1600		
POWER	100mW		
FCC ID	XRF SOL7HDNTX		
COUNTRY OF ORIGIN	United Kingdom		
INDUSTRY CANADA ID			
EMISSION DESIGNATOR	2M5G2D and 2M50D7F		
DHSS/FHSS/COMBINED OR OTHER			
ANCILLARIES (if applicable)			
MANUFACTURING DESCRIPTION	N/A		
MANUFACTURER			
TYPE			
PART NUMBER			
SERIAL NUMBER			Page 1 of 1
COUNTRY OF ORIGIN			

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Signature

Date 20/9/2014
Declaration of Build Status Serial Number



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1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a Cobham Tactical Communications DC1600 HD Module & SOLO 7. A full technical description can be found in the manufacturer's documentation.

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.

The EUT was powered from a 12.0 V DC supply.

FCC Measurement Facility Registration Number
90987 Octagon House, Fareham Test Laboratory

1.6 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standard were made during testing.

1.7 MODIFICATION RECORD

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
Serial Number: SOLO7HDNTX-198270			
0	As supplied by manufacturer.	N/A	N/A
1	High Linearity setting was activated in the test software to improve the level of the shoulders of the transmission for compliance with Emission mask B of FCC 90.210.	M Russell	09/06/2014
2	The EUT was returned to the manufacturer in order for the RF output power to be re-calibrated as previous measurements were higher than expected. The reduction was 2 dB (Approx).	Cobham	11/06/2014

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



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SECTION 2

TEST DETAILS

Limited FCC Testing of the
Cobham Tactical Communications DC1600 HD Module & SOLO 7
In accordance with FCC CFR 47 Part 15B



2.1 RADIATED EMISSIONS

2.1.1 Specification Reference

FCC CFR 47 Part 15B, Clause 15.109

2.1.2 Equipment Under Test and Modification State

SOLO7 S/N: SOLO7HDNTX-198270 - Modification State 2

2.1.3 Date of Test

6 July 2014

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 Procedure

A test environment and testing arrangement meeting the specification of ANSI C63.4 was used during all testing. The Equipment Under Test (EUT) was set upon a non-conducting platform at an elevation of 80 cm above a horizontal reference ground plane.

The horizontal reference ground plane encompasses a turntable which is used to adjust the azimuth of the EUT. An antenna positioner is used to elevate the measuring antenna above the horizontal reference ground plane whereby the antenna elevation is adjustable between 1 m and 4 m.

Exploratory radiated emissions measurements were made by azimuth emissions searches over a range of 0° and 360°. These exploratory radiated emissions measurements were made using a peak detector over a frequency range of 30 MHz to 13 GHz, with the measuring antenna in both vertical and horizontal polarizations.

At least six of the greatest peak emissions, frequency positions were selected from the exploratory radiated emissions measurements for further evaluation as final measuring points.

To ascertain the azimuth and measuring antenna polarization that yields the highest peak emission level, each final measurement frequency was investigated by continuous azimuth emissions searching with the measuring antenna in both vertical and horizontal polarizations. For each final measurement frequency, the respective peak emission azimuth and measuring antenna polarization was used during a measuring antenna elevation search from 1 m to 4 m. Each final measurement frequency was then measured with the EUT azimuth, measuring antenna height and polarization that yielded the greatest peak emission level.

Final measurement points over the frequency range of 30 MHz to 1 GHz were measured using a quasi-peak detector. Final measurement points over the frequency range of 1 GHz and 13 GHz were measured using peak and average methods. Peak measurements were made using a peak detector with 1 MHz resolution and video bandwidths. Average measurements were made using a resolution bandwidth of 1 MHz and a video bandwidth of 30 kHz.

All final measurements were assessed against the Class B emission limits in Clause 15.109 of FCC CFR 47 FCC Part 15B.



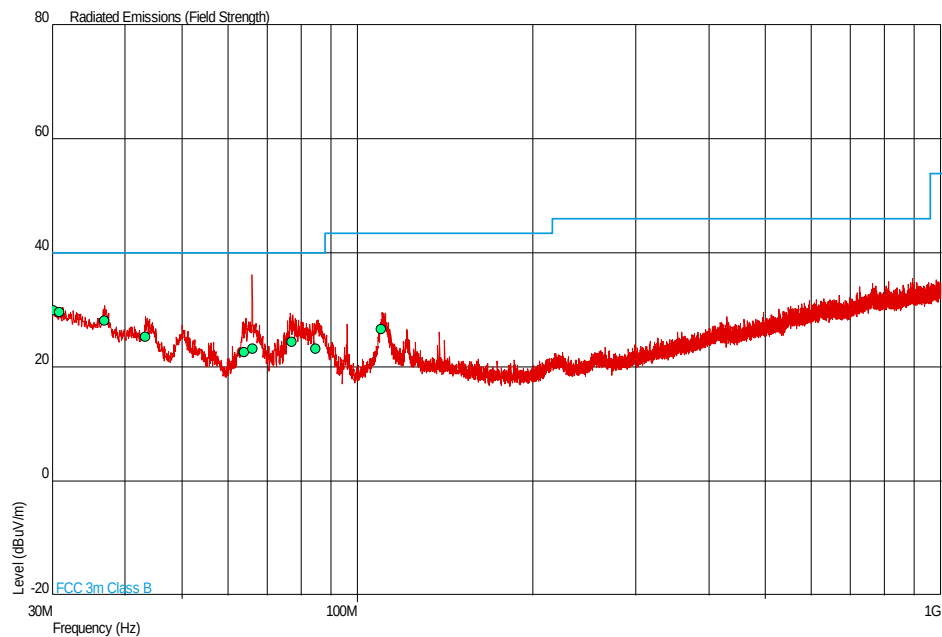
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2.1.6 Environmental Conditions

Ambient Temperature 21.1°C
Relative Humidity 46.0%

2.1.7 Test Results

30 MHz to 1 GHz

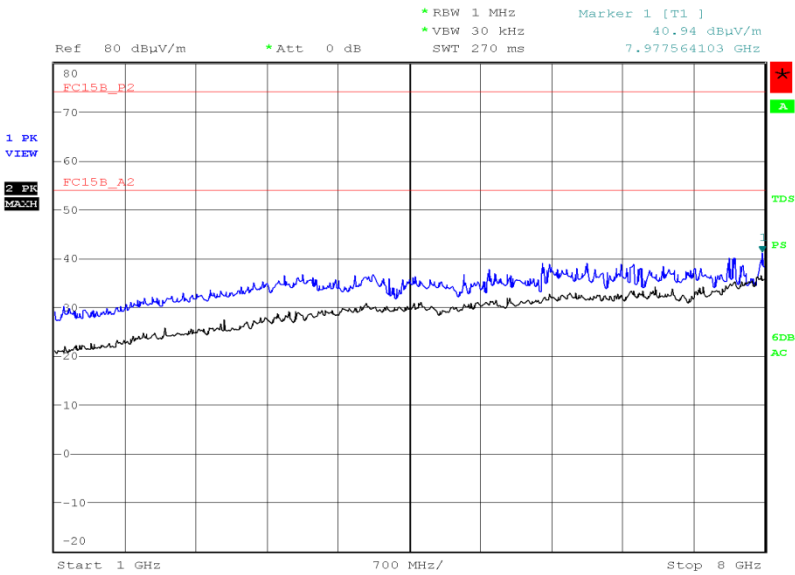


Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (dV/m)	Angle (Deg)	Height (m)	Polarity
30.124	29.9	31.3	40.0	100	-10.1	-68.7	261	3.99	Horizontal
30.904	29.6	30.2	40.0	100	-10.4	-69.8	0	1.00	Vertical
36.853	28.1	25.4	40.0	100	-11.9	-74.6	149	1.00	Vertical
43.391	25.4	18.6	40.0	100	-14.6	-81.4	73	1.00	Vertical
64.008	22.5	13.3	40.0	100	-17.5	-86.7	232	1.00	Vertical
66.090	23.2	14.5	40.0	100	-16.8	-85.5	9	1.03	Vertical
77.290	24.5	16.8	40.0	100	-15.5	-83.2	126	1.00	Vertical
84.929	23.3	14.6	40.0	100	-16.7	-85.4	71	1.00	Vertical
109.782	26.6	21.4	43.5	150	-16.9	-128.6	360	1.00	Vertical



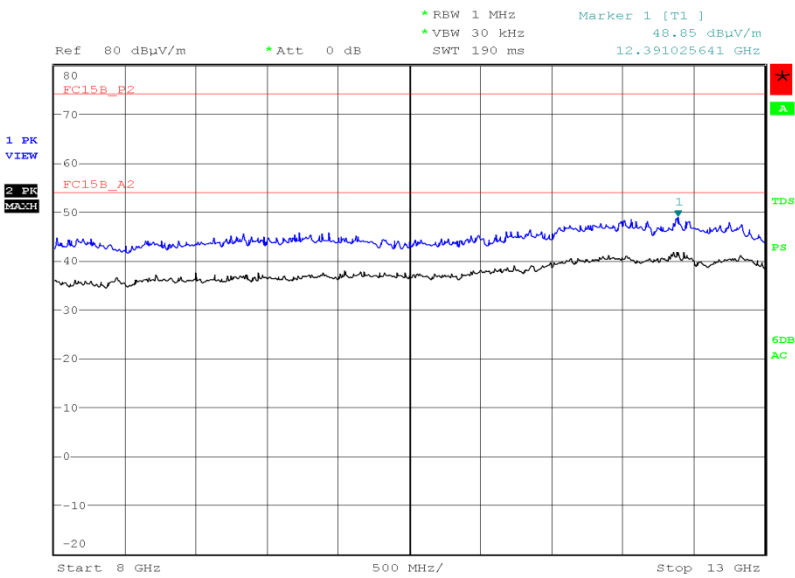
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1 GHz to 8 GHz



Date: 6.JUL.2014 09:59:34

8 GHz to 13 GHz



Date: 6.JUL.2014 09:50:41



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SECTION 3

TEST EQUIPMENT USED



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 - Radiated Emissions					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	2-May-2015
Pre-Amplifier	Phase One	PS04-0086	1533	12	19-Dec-2014
Screened Room (5)	Rainford	Rainford	1545	24	10-Jan-2015
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	10-Jun-2015
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	22-Oct-2014
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	-	TU
Tilt Antenna Mast	maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	maturo GmbH	NCD	3917	-	TU
1 Metre K Type Cable	Rhophase	KPS-1501A-1000-KPS	4106	12	5-Nov-2014
1GHz to 8GHz Low Noise Amplifier	Wright Technologies	APS04-0085	4365	12	1-Oct-2014

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	MU
Radiated Emissions	30MHz to 1GHz: ± 5.1 dB 1GHz to 40GHz: ± 6.3 dB



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SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT



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4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT



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
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