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# Report On

Limited FCC and Industry Canada Testing of the  
SRT Marine Technology Ltd Chronos  
In accordance with FCC CFR 47 Part 80  
and Industry Canada RSS-182

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FCC ID: UYW-4180051  
IC: 7075A-4180051

Document 75929064 Report 02 Issue 1

March 2015



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**REPORT ON**

Limited FCC and Industry Canada Testing of the  
SRT Marine Technology Ltd Chronos  
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182

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**PREPARED FOR**

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Wireless House  
Westfield Industrial Estate  
Midsomer Norton  
Bath  
BA3 4BS

**PREPARED BY**

**Natalie Bennett**  
Senior Administrator, Project Support

**APPROVED BY**

**Ryan Henley**  
Authorised Signatory

**DATED**

04 March 2015

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**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 80 and Industry Canada RSS-182. 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 and Industry Canada Testing of the  
SRT Marine Technology Ltd Chronos  
In accordance with FCC CFR 47 Part 80 and Industry Canada RSS-182



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## 1.1 INTRODUCTION

The information contained in this report is intended to show the verification of Limited FCC and Industry Canada Testing of the SRT Marine Technology Ltd Chronos to the requirements of FCC CFR 47 Part 80 and Industry Canada RSS-182.

Objective	To perform Limited 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	SRT Marine Technology Ltd
Model Number(s)	Chronos
Serial Number(s)	41800500150001
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 80 (2013) Industry Canada RSS-182 (Issue 5, 2012)
Incoming Release Date	Application Form 27 February 2015
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	POR005046 16 January 2015
Start of Test	23 February 2015
Finish of Test	25 February 2015
Name of Engineer(s)	G Lawler



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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 80 and Industry Canada RSS-182 is shown below.

Section	Spec Clause		Test Description	Result	Comments/Base Standard
	FCC	IC			
Transmit					
2.1	80.211	7.9	Emission Limitations	Pass	



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## 1.3 APPLICATION FORM

APPLICANT'S DETAILS			
COMPANY NAME :		SRT Marine Technology Ltd	
ADDRESS :		Wireless House, Westfield industrial estate, Midsomer Norton, Bath BA3 4BS	
NAME FOR CONTACT PURPOSES :		Richard McMahon.....	
TELEPHONE NO: 01761 409500		FAX NO: 01761 410093	
		E-MAIL: richard.mcmahon@srt-marine.com	

EQUIPMENT INFORMATION			
Model name/number	Chronos	Identification/Part number	418-0051
Hardware Version	V1.	Software Version	080200.03.03.**
Manufacturer	SRT Marine Technology	Country of Origin	Hungary
FCC ID	UYVW-4180051	Industry Canada ID	7075A-4180051
Technical description (a brief description of the intended use and operation)			
AIS AtoN with optional sensor			
<u>Supply Voltage:</u>			
[    ]	AC mains	State AC voltage .....	V and AC frequency ..... Hz
[ * ]	DC (external)	State DC voltage 12/24 V	and DC current .....3/1.5..... A
[    ]	DC (internal)	State DC voltage .....	V and Battery type .....
<u>Frequency characteristics:</u>			
Transmitter Frequency range	156.025 MHz to 162.025 MHz		Channel spacing 25kHz.
			(if channelized)
Receiver Frequency range	156.025 MHz 162.025 MHz		Channel spacing 25kHz (if different)
			(if channelized)
Designated test frequencies:			
Bottom: ..... MHz		Middle: ..... MHz Top: ..... MHz	
Intermediate Frequencies :		19.655 MHz	
Highest Internally Generated Frequency :		29.255 MHz	
<u>Power characteristics:</u>			
Maximum transmitter power	12.5 W		Minimum transmitter power 1 W
			(if variable)
[    ]	Continuous transmission		
[ * ]	Intermittent transmission		
	State duty cycle <1%		
	If intermittent, can transmitter be set to continuous transmit test mode? Y/N		
<u>Antenna characteristics:</u>			
[    ]	Antenna connector	State impedance ..... ohm	
[    ]	Temporary antenna connector	State impedance ..... ohm	
[    ]	Integral antenna Type .....	State gain ..... dBi	
[ * ]	External Antenna Type .....	State gain 3 dBi	
<u>Modulation characteristics:</u>			
[    ]	Amplitude		
[    ]	Frequency		
[    ]	Phase		
Can the transmitter operate un-modulated?		Y/N	
ITU Class of emission 16K0GXW			
<u>Battery/Power Supply</u>			
Model name/number	.....	Identification/Part number	.....
Manufacturer	.....	Country of Origin	.....
<u>Ancillaries (if applicable)</u>			
Model name/number	.....	Identification/Part number	.....
Manufacturer	.....	Country of Origin	.....
<u>Extreme conditions:</u>			
Maximum temperature	+55 °C		Minimum temperature -25 °C
Maximum supply voltage	32 V		Minimum supply voltage 10 V



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I hereby declare that I am entitled to sign on behalf of the applicant and that the information supplied is correct and complete.

A handwritten signature in black ink, appearing to be 'Richard McMahon', written over a light blue horizontal line.

Signature :

Name : Richard McMahon

Position held : Engineer

Date : 27/02/2015





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## **1.4 PRODUCT INFORMATION**

### **1.4.1 Technical Description**

The Equipment Under Test (EUT) was a SRT Marine Technology Ltd Chronos. 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 V DC supply.

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

Industry Canada Company Address Code  
IC2932B-1 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 0 - No modifications were made to the test sample during testing.



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## **SECTION 2**

### **TEST DETAILS**

Limited FCC and Industry Canada Testing of the  
SRT Marine Technology Ltd Chronos  
In accordance with FCC CFR 47 Part 80 and Industry Canada RSS-182



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## **2.1 EMISSION LIMITATIONS**

### **2.1.1 Specification Reference**

FCC CFR 47 Part 80, Clause 80.211  
Industry Canada RSS-182, Clause 7.9

### **2.1.2 Equipment Under Test and Modification State**

Chronos S/N: 41800500150001 - Modification State 0

### **2.1.3 Date of Test**

24 February 2015

### **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**

Radiated; A preliminary profile of the Spurious Radiated Emissions was obtained up to the 10th harmonic 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 Horizontal and Vertical Polarisation. 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 Alternative Open Site conditions. Emission levels were maximised by adjusting the antenna height, antenna polarisation and turntable azimuth.

The EUT was set to transmit on maximum power with both channels operating simultaneously.

For any emissions found the EUT was then removed from the chamber and replaced with a substitution antenna. Using a signal generator the level was adjusted to achieve the same value on the measuring instrument as previously recorded with the EUT. The final result was determined by a calculation using the signal generator level, antenna gain and cable loss.

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

The test was applied in accordance with the test method requirements of FCC CFR 47 Part 80.211(f)(3).

### **2.1.6 Environmental Conditions**

Ambient Temperature	20.2°C
Relative Humidity	25.0%



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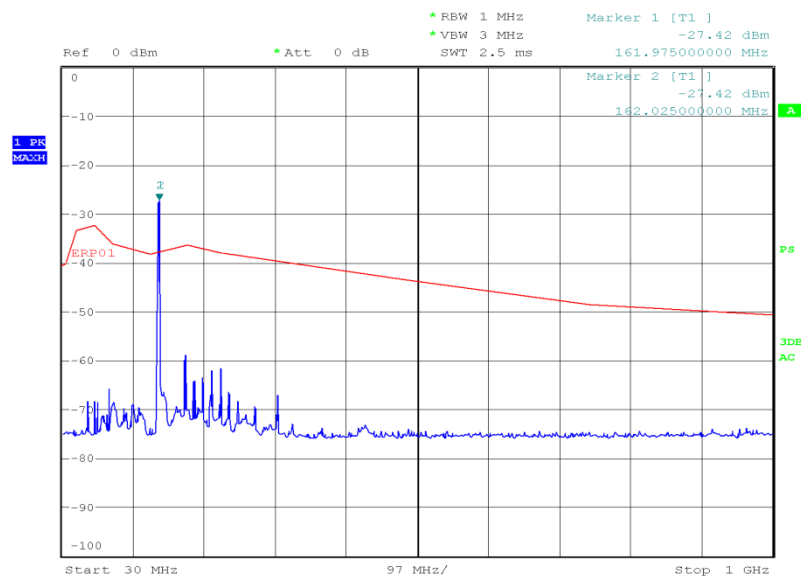
## 2.1.7 Test Results

12 V DC Supply

Radiated

161.975 MHz and 162.025 MHz

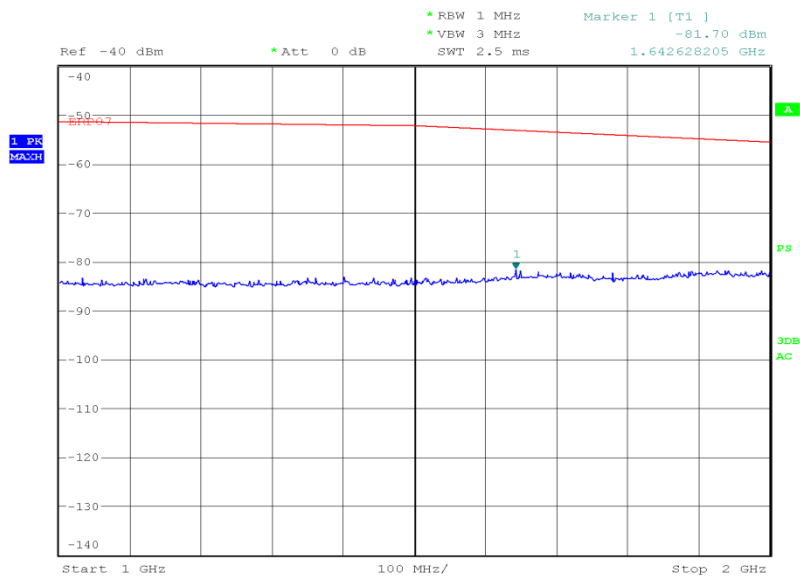
30 MHz to 1 GHz



Date: 24.FEB.2015 22:50:34



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1 GHz to 2 GHz

Date: 24.FEB.2015 23:06:32

Limit Clause 80.211(f)(3)>250 % of authorised bandwidth:  $43 + 10 \log P$  OR -13 dBm



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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
<b>Section 2.1 - Emission Limitations</b>					
Antenna (Double Ridge Guide, 1GHz-18GHz)	EMCO	3115	234	12	2-May-2015
Screened Room (5)	Rainford	Rainford	1545	24	26-Jun-2015
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Power Supply Unit	Farnell	TSV-70	2043	-	O/P Mon
Hygrometer	Rotronic	A1	2138	12	3-Dec-2015
Multimeter	Iso-tech	IDM101	2422	12	22-Jan-2016
Antenna (Bilog)	Chase	CBL6143	2904	24	10-Jun-2015
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	27-Oct-2015
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

TU – Traceability Unscheduled

O/P MON – Output Monitored with Calibrated Equipment



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### 3.2 MEASUREMENT UNCERTAINTY

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

Test Discipline	MU
Emission Limitations	30 MHz to 1 GHz: $\pm 5.1$ dB 1 GHz to 40 GHz: $\pm 6.3$ 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  
(Not UKAS Accredited).

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