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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

COMMERCIAL-IN-CONFIDENCE

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

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REPORT ON

Limited FCC and Industry Canada Testing of the
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Document 75929064 Report 02 Issue 1

March 2015

PREPARED FOR

SRT Marine Technology Ltd
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Midsomer Norton
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PREPARED BY

Natalie Bennett
Senior Administrator, Project Support

APPROVED BY

Ryan Henley
Authorised Signatory

DATED 04 March 2015

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
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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 UYW-4180051 Industry Canada ID 7075A-4180051
Technical description (a brief description of the intended use and operation)
AIS AtoN with optional sensor

Supply Voltage:
[ ] 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 .....

Frequency characteristics:
Transmitter Frequency range 156.025 MHz to 162.025 MHz Channel spacing 25kHz. (if channelized)
Receiver Frequency range 156.025 MHz 162.025 MHz (if channelized) Channel spacing 25kHz (if different)
Designated test frequencies:
Bottom: ..... MHz Middle: ..... MHz Top: ..... MHz
Intermediate Frequencies : 19.655 MHz
Highest Internally Generated Frequency : 29.255 MHz

Power characteristics:
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

Antenna characteristics:
[ ] Antenna connector State impedance ..... ohm
[ ] Temporary antenna connector State impedance ..... ohm
[ ] Integral antenna Type ..... State gain ..... dBi
[*] External Antenna Type ..... State gain 3 dBi

Modulation characteristics:
[ ] Amplitude [*] Other
[ ] Frequency DetailsGMSK
[ ] Phase (GMSK, QSPK etc)
Can the transmitter operate un-modulated? Y/N
ITU Class of emission16K0GXW

Battery/Power Supply
Model name/number ..... Identification/Part number .....
Manufacturer ..... Country of Origin .....

Ancillaries (if applicable)
Model name/number ..... Identification/Part number .....
Manufacturer ..... Country of Origin .....

Extreme conditions:
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.

Signature :

Name : Richard McMahon

Position held : Engineer

Date : 27/02/2015

Product Service

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
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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 Polarisations. 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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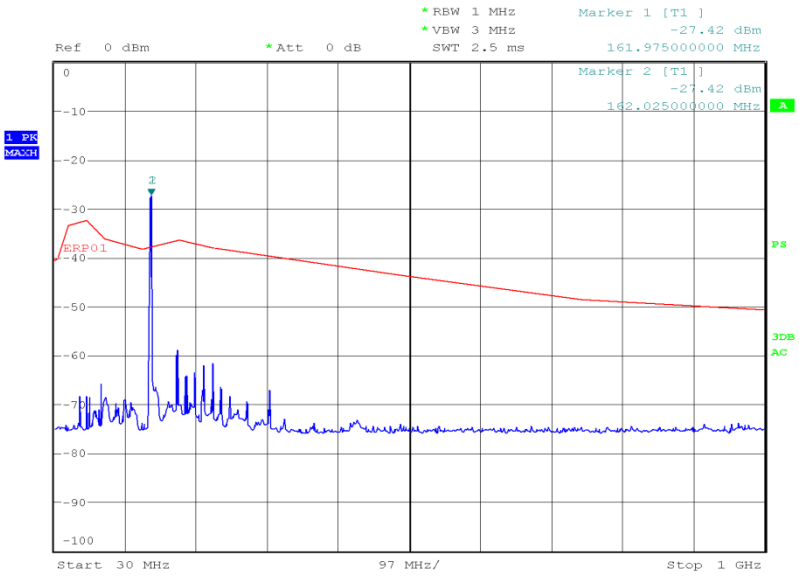
2.1.7 Test Results

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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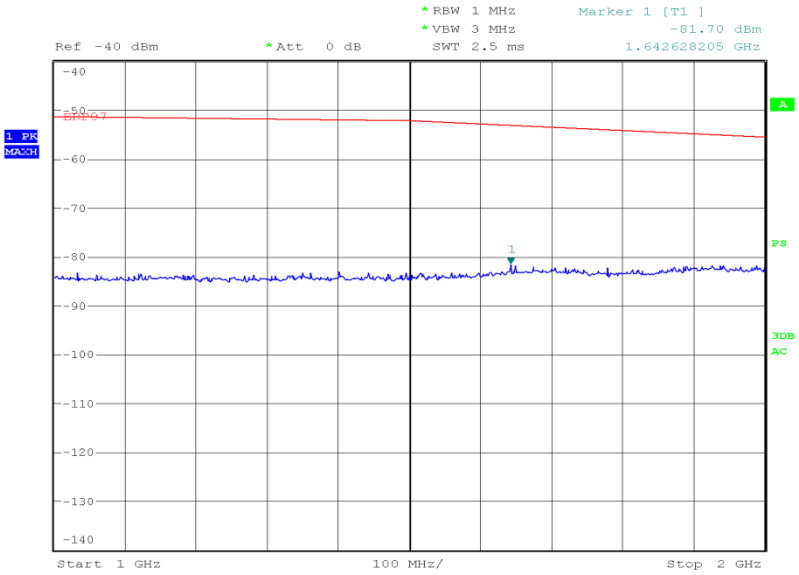
1 GHz to 2 GHz



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

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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 - Emission Limitations					
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
Hygromer	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: ± 5.1 dB 1 GHz to 40 GHz: ± 6.3 dB

SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT

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).