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Report On

FCC and Industry Canada Testing of the
Navico NAIS-400
In accordance with FCC CFR 47 Part 80
and Industry Canada RSS-182

COMMERCIAL-IN-CONFIDENCE

FCC ID: RAY-NAIS400
IC ID: 4697A-NAIS400B

Document 75918695 Report 02 Issue 1 August 2012

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REPORT ON

FCC and Industry Canada Testing of the
Navico NAIS-400
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Document 75918695 Report 02 Issue 1

August 2012

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APPROVED BY

Mark Jenkins
Authorised Signatory

DATED 28 August 2012

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 2, 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

UKAS TESTING 0141

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CONTENTS

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SECTION 1

REPORT SUMMARY

FCC and Industry Canada Testing of the
Navico NAIS-400
In accordance with FCC CFR 47 Part 80 and Industry Canada RSS-182

1.1 INTRODUCTION

The information contained in this report is intended to show verification of the FCC and Industry Canada Testing of the Navico NAIS-400 to the requirements of FCC CFR 47 Part 80 and Industry Canada RSS-182.

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	Navico
Applicant	SRT Marine Technology Ltd
Model Number(s)	NAIS-400
Serial Number(s)	P222NAIS400FTU02
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 80 (2011) Industry Canada RSS-182 (Issue 4, 2003)
Incoming Release Date	Declaration of Build Status 06 August 2012
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	POR003308 10 July 2012
Start of Test	5 August 2012
Finish of Test	5 August 2012
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 - FCC					
2.1	80.211	4.4, 6.3, 6.3.1 and 6.9	Emission Limitations	Pass	

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1.3 DECLARATION OF BUILD STATUS

Manufacturer	Navico Auckland Ltd
Country of origin	Hungary
UK Agent	SRT Marine Ltd
Technical Description	Class B Transceiver
Model No	NAIS-400
Part No	421-0001
Serial No	Sample 1
Drawing Number	421-0001
Build Status	Mod -5
Software Issue	040200.01.05
IC ID	4697A – NAIS400B
FCC ID	RAY-NAIS400

Signature

Richard McMahon

Date 06th August 2012

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 Navico NAIS-400. 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 Accreditation
90987 Octagon House, Fareham Test Laboratory

Industry Canada Accreditation
IC2932B-1 Octagon House, Fareham Test Laboratory

1.6 DEVIATIONS FROM THE STANDARD

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

1.7 MODIFICATION RECORD

Modification 0 - No modifications were made to the test sample during testing.

Product Service

SECTION 2

TEST DETAILS

FCC and Industry Canada Testing of the
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In accordance with FCC CFR 47 Part 80 and Industry Canada RSS-182

2.1 EMISSION LIMITATIONS

2.1.1 Specification Reference

FCC CFR 47 Part 80, Clause 80.211
Industry Canada RSS-182, Clause 4.4, 6.3, 6.3.1 and 6.9

2.1.2 Equipment Under Test and Modification State

NAIS-400 S/N: P222NAIS400FTU02 - Modification State 0

2.1.3 Date of Test

5 August 2012

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

The EUT was initially connected to a Modulation Analyser and the EUT set to transmit. Using an Audio Analyser, an audio frequency was swept between 100Hz to 5kHz to find the frequency which produced the highest deviation.

The amplitude at this frequency was then increased to give a deviation of 2.5kHz.

Then at a frequency of 2.5kHz the amplitude recorded above was increased by 16dB to provide the Final Modulated level.

The EUT transmitting on full power was then connected to a Spectrum Analyser. The modulated carrier was checked (for the bottom and top channels of the EUT) against the emission limitation.

2.1.6 Environmental Conditions

Ambient Temperature	20.5°C
Relative Humidity	56.0%

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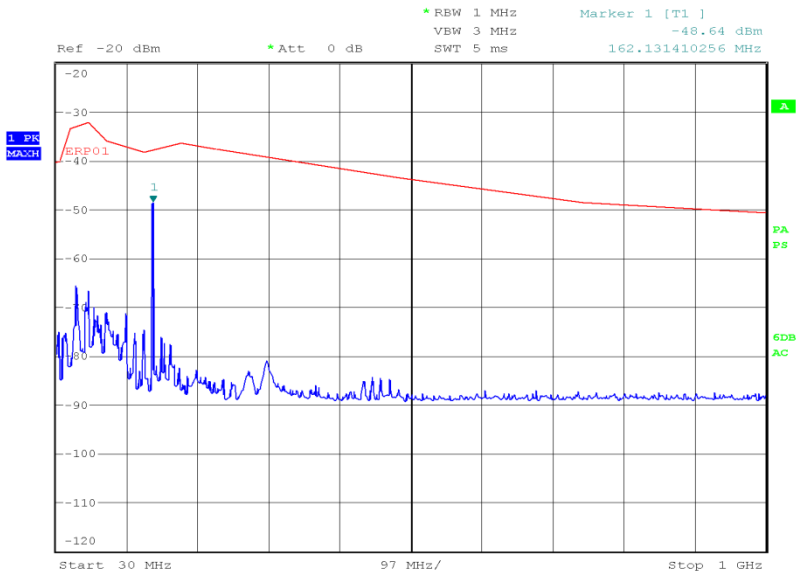
2.1.7 Test Results

12 V DC Supply

Radiated

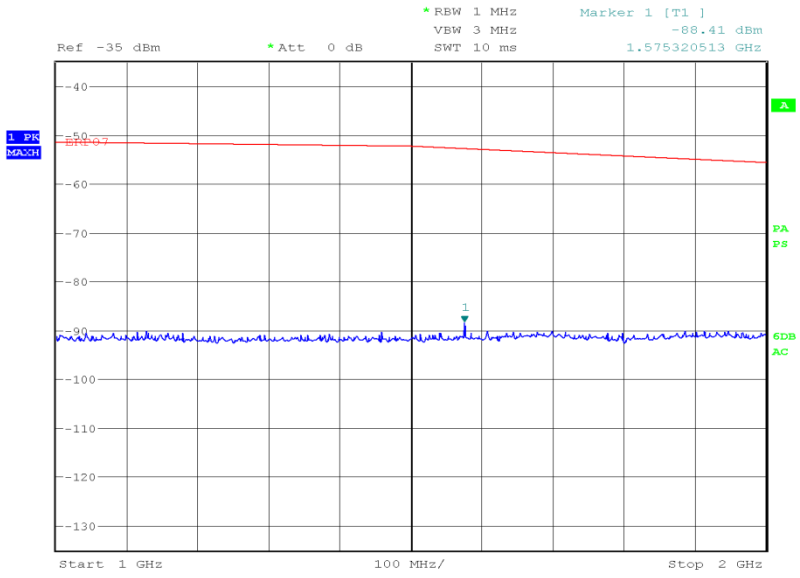
161.975 MHz

30MHz - 1GHz



Date: 5.AUG.2012 13:11:23

1GHz - 2GHz



Date: 5.AUG.2012 13:13:18

Limit Clause 80.211

Emission Mask

On any frequency removed from the assigned frequency by more than 50 % up to and including 100 % of the authorized bandwidth: At least 25 dB

On any frequency removed from the assigned frequency by more than 100 % up to and including 250 % of the authorized bandwidth: At least 35 dB

Outside the Emission Mask

>250 % of authorised bandwidth 43+10 Log P **OR** -13 dBm

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SECTION 3

TEST EQUIPMENT USED

Product Service

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					
Transient Limiter	Hewlett Packard	11947A	15	12	1-Dec-2012
LISN (1 Phase)	Chase	MN 2050	336	12	23-Mar-2013
Screened Room (5)	Rainford	Rainford	1545	36	25-Dec-2013
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	12-May-2013
GPS/SBAS Simulator	Spirent	STR4500	3056	-	TU
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	29-Sep-2012
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	12	26-Aug-2012
Tilt Antenna Mast	maturo Gmbh	TAM 4.0-P	3916	-	TU
Mast Controller	maturo Gmbh	NCD	3917	-	TU

TU – Traceability Unscheduled

3.2 MEASUREMENT UNCERTAINTY

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

Test Discipline	MU
Emission Limitations	Radiated: ± 3.08 dB Conducted: ± 3.454 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).