CHIRP 3260
HARBOR / SEA ACCEPTANCE TEST (HAT / SAT)

Part Number:	D229-04331
Serial Number:	K2K -14-0211

D101-04819-Rev4.1
July 2014

Test Completed By: Amy Simoneau

Date of Test: 5 Feb 2016

Name of Customer and Vessel: WHOI RV Neil Armstrong

Location of Test: HAT - Detyens Shipyard Inc North Charleston, SC

Table of Contents

1 Amendment History

Version	Date	Description	Author(s)
1.0	07-Nov-2008	Initial Draft Release	DG
2.0	08-Dec-2010	3.5kHz Configuration	DG
2.01	19-Oct-2011	12kHz Configuration	DG
3.0	05-Mar-2013	3.5kHz/15kHz Configuration - E/V Nautilus	NP
4.0	25-Oct-2013	Generic 3.5kHz/12kHz Configuration	NP
4.1	30-Jul-2014	Transmit Analysis Mode Test Removed, Impedance Setting Modification	NP

2 Introduction

2.1 Objective

This acceptance report verifies that all echosounder equipment is correctly installed and evaluates performance of the Chirp 3260.

2.2 Acceptance Criteria

In general, a test case is "PASSED" when the real outcome corresponds to the expected outcome, otherwise the test case is marked as "FAILED". Expected outcomes are defined separately in each test case.

2.3 Test Equipment

The suggested equipment used in this test is detailed below:

Equipment Type	Model Details
Knudsen EchoSIM Sonar Signal Simulator	P/N: D229-04485 S/N: K2K-07-0634
EchoSIM to Echosounder Communication Cable	MS 3470W12-3P / MS 3476W12-3S
EchoSIM USB Cable	WIESN USB A to B
EchoSIM Power Cable	MS 3470 W12-3P / MS 3476 W12-3S
EchoSIM Control Software	EchoSimulator D409-04334 V1.06
Digital Multimeter	Fluke 28 II True RMS Multimeter

2.4 Test Environment

All testing is to be conducted on board the vessel after installation.

2.5 Test Schedule

The testing should be completed in the order that appears in this document. This acceptance test can be completed in less than 1 day.

2.6 Resources

All levels of testing are to be completed by an engineer or qualified technologist.

2.7 Definition, Acronyms and Abbreviations

KEL	-	Knudsen Engineering Limited
PC	-	Personal Computer
PCB	-	Printed Circuit Board
Rx	-	Receive
SAT	-	Sea Acceptance Test
Tx	-	Transmit
USB	-	Universal Serial Bus

3 EchoSIM Information

3.1 Unit Identification

Hardware Version Information	
	Recorded
Part #	D229-04485
Serial #	K2K-07-0634

3.2 Installation Disk

Installation Disk Label	
Verify the setup disk details as printed on the CD provided with the system.	Recorded
Serial #	Shared mols Echo Sim K2K-07-0634
Part #	D409-04334
Version #	V1.06

3.3 EchoSIM Computer Properties

For the computer on which the EchoSimulator software is installed, record the following system information.

System Information	
Windows Edition	Windows 7 Starter Service Pack 1
Processor	Intel(R) Atom(TM) CPU N455 @ 1.66 GHz 1.67 GHz
Memory (RAM)	1.00 GB
System Type	32-bit Operating System

3.4 EchoSIM Application

Start the EchoSIM software by double clicking on the EchoSimulator executable. Record the version number from the top program bar.

Software Version Information	
	Recorded
EchoSimulator	V1.06

3.5 Firmware Verification

Record the firmware file names (*.bin file located in the EchoSimulator install directory). Open Firmware Loader from the EchoSimulator folder. Select Help –> Sounder Info, and record info as detailed below.

Firmware Version Information	
	Recorded
Bin File	K2K08039.bin
Serial #	K2K-00-4294967295
Board Type	Echo Simulator
Part #	D409-04335
Version #	1.14

4 Installation and Power On

4.1 Installation Inspection

	Pass/Fail	Sign
Inspect echosounder for any evidence of physical damage	Pass	
Inspect cables for any evidence of physical damage	Pass	
Inspect cable end connectors for any evidence of physical damage	Pass	
Inspect that equipment is installed correctly	Pass	
Inspect that cables are installed correctly	Pass	

4.2 Initial Power On

	Pass/Fail	Sign
Verify that cables are connected according to Knudsen Chirp 3260 Installation Manual	Pass	
Verify that correct AC input voltage is present. Hold and monitor for 30 seconds observing any fluctuations	Pass	
Apply power. System power light should be illuminated.	Pass	

5 Echosounder Software Setup

5.1 Installation Disk

Installation Disk Label	
Verify the setup disk details as printed on the CD provided with the system.	**Recorded**
Serial #	K214-0024-USB
Part #	D429-04216 - V2.92
Version #	V2.92

5.2 SounderSuite Computer Properties

For the computer on which the SounderSuite software is installed, record the following system information.

System Information	
Windows Edition	Windows 7 Professional Service Pack 1
Processor	Intel(R) Xeon(R) CPU E3-1230 V2 @ 3.30GHz 3.30GHz
Memory (RAM)	8.00 GB
System Type	64-bit operating system

5.3 SounderSuite Applications

Start the EchoControl software by double clicking on the EchoControlClient executable. Record the Client version information from the top program bar. To view the Server window, double click on the "K" in the task bar. Record the Server version information from the top program bar.

Version Information	
	Recorded
EchoControlClient	Part# D409-04184 V 2.73
EchoControlServer	Part# D409-04185 V. 2.79

5.4 Firmware Verification

Record the firmware file names (*.bin file located in the SounderSuite-USB install directory)

Version Information	
	Recorded
Bin File	K2K14004.bin

In EchoControlClient, select Help –> Sounder Info –> Module Summary. Record details below.

	Module 1 (3.5 kHz)	Module 2 (12 kHz)
Module Identification		
Serial #	K2K-14-0277	K2K-14-0278
Board Type	Single Channel-16 Bit	Single Channel -16 Bit
Firmware		
Firmware Part #	D409-04195	D409-04195
Firmware Version #	2.85	2.85

5.5 Channel Configuration

In EchoControlClient, select Controls –> Usage Configuration. Configure channels as detailed below.

	Module 1 (3.5kHz)	Module 2 (12kHz)
Signal Generation		
Waveform	Chirp	Chirp
Center Freq./Bandwidth		
Frequency [kHz]	3.500 kHz	12.000 kHz
Bandwidth [kHz]	3.000 kHz	5.000 kHz
Stop/Start Frequencies		
Start Freq [kHz]	2.308 kHz	9.758 kHz
Stop Freq [kHz]	5.308 kHz	14.758 kHz
Detection		
Envelope Detect	Square Law	Square Law
Filter Windowing		
Decimation	Rectangular	RectAngular
Main Signal	Rectangular	Rectangular
Analytic	Rectangular	Rectangular
Lowpass	Rectangular	RectangulAR
Transmit	RectAngular	Rectangular
SEG-Y Format		
SEG-Y Carrier Type	None	None

	Pass/Fail	Sign
Software is installed, versions are as expected, configuration is as expected	Fail	

Software installed, config ok.
version does not match label on disk
installed: April 2014 label: Sept 2014 v 292
will contact Knudsen for update

6 3.5 kHz Channel EchoSIM Testing

6.1 Transducer Check

	Pass/Fail	Sign
Set the EchoSim to Transducer Test Mode. Connect the transducer cable to the marked Transducer connector on the EchoSim. Using the Adjust Frequency keypad, enter frequency of 2.0kHz. Press Start test button. Record measured impedance value. Repeat steps in 500Hz increments up to 10.0kHz. Confirm that impedance at resonance matches expected value based on transducer model and array configuration.	Pass	

Simulator Frequency	Measured Impedance
2.0 kHz	275 Ω
2.5 kHz	100 Ω
3.0 kHz	48 Ω
3.5 kHz	28 Ω
4.0 kHz	22 Ω
4.5 kHz	30 Ω
5.0 kHz	46 Ω
5.5 kHz	47 Ω
6.0 kHz	39 Ω
6.5 kHz	31 Ω
7.0 kHz	24 Ω
7.5 kHz	19 Ω
8.0 kHz	15 Ω
8.5 kHz	13 Ω
9.0 kHz	13 Ω
9.5 kHz	18 Ω
10.0 kHz	17 Ω

6.2 Simulator Mode

6.2.1 Depth Tracking

	Pass/Fail	Sign
Make the following settings on echosounder: The test is PASSED if all measured depths are +/- 1m. **System Controls : Working Units = Meters, Sound Speed=1500m/s,** **Range/Phase : Range = Adjust, Phase Mode = Manual,** **Minimum = 0, Maximum = 5000** **Tx Blanking set to 0.5 for Ranges 5, 10, and 20 and then set to 5 for remainder** **Depth Channels: Tx pulse = 1ms, Tx Power = 1, Gain Mode = Auto, Process Shift = 0** **Set the EchoSim to Simulator Mode and connect to the 50 Ohm load.**		

Range	Simulator Depth	Digitized Depth	Difference (m)
5	1	.62	.38
	4		
10	2		
	8		
20	5		
	15		
50	12		
	36		
100	25		
	75		
200	50		
	150		
500	125		
	375		
1000	250		
	750		
2000	500		
	1500		
5000	1250		
	3750		

6.2.2 Signal Analysis

	Pass/Fail	Sign
Set the EchoSim to Simulator Mode and connect to the 50 Ohm load. Set the echosounder transmit power to 1, pulse length to 0.5ms, and range to 2000m. Set the depth on the simulator to 100m. Record the voltage, power, and measured pulse length. Vary pulse lengths up to 64ms and record all results in the following tables. Repeat steps for all power levels.		

6.2.2.1 Transmit Power 1

Set Pulselength [ms]		0.5	1.0	2.0	4.0
Measured Pulselength [ms]					
Voltage [V]	Measured				
Power [W]	Measured				

Set Pulselength [ms]		8.0	16.0	32.0	64.0
Measured Pulselength [ms]					
Voltage [V]	Measured				
Power [W]	Measured				

6.2.2.2 Transmit Power 2

Set Pulselength [ms]		0.5	1.0	2.0	4.0
Measured Pulselength [ms]					
Voltage [V]	Measured				
Power [W]	Measured				

Set Pulselength [ms]		8.0	16.0	32.0	64.0
Measured Pulselength [ms]					
Voltage [V]	Measured				
Power [W]	Measured				

6.2.2.3 Transmit Power 3

Set Pulselength [ms]		0.5	1.0	2.0	4.0
Measured Pulselength [ms]					
Voltage [V]	Measured				
Power [W]	Measured				

Set Pulselength [ms]		8.0	16.0	32.0	64.0
Measured Pulselength [ms]					
Voltage [V]	Measured				
Power [W]	Measured				

6.2.2.4 Transmit Power 4

Set Pulselength [ms]		0.5	1.0	2.0	4.0
Measured Pulselength [ms]					
Voltage [V]	Measured				
Power [W]	Measured				

Set Pulselength [ms]		8.0	16.0	32.0	64.0
Measured Pulselength [ms]					
Voltage [V]	Measured				
Power [W]	Measured				

7 12kHz Channel EchoSIM Testing

7.1 Transducer Check

	Pass/Fail	Sign
Set the EchoSim to Transducer Test Mode. Connect the transducer cable to the marked Transducer connector on the EchoSim. Using the Adjust Frequency keypad, enter frequency of 8.0kHz. Press Start test button. Record measured impedance value. Repeat steps in 500Hz increments up to 16.0kHz. Confirm impedance at resonance matches transducer specification.	Pass	

Simulator Frequency	Measured Impedance
8.0 kHz	500 Ω
8.5 kHz	500 Ω
9.0 kHz	500 Ω
9.5 kHz	500 Ω
10.0 kHz	500 Ω
10.5 kHz	332 Ω
11.0 kHz	188 Ω
11.5 kHz	102 Ω
12.0 kHz	74 Ω
12.5 kHz	71 Ω
13.0 kHz	99 Ω
13.5 kHz	157 Ω
14.0 kHz	213 Ω
14.5 kHz	312 Ω
15.0 kHz	476 Ω
15.5 kHz	500 Ω
16.0 kHz	500 Ω

7.2 Simulator Mode

7.2.1 Depth Tracking

			Pass/Fail	Sign
Make the following settings on echosounder: The test is PASSED if all measured depths are +/- 1m. System Controls : Working Units = Meters, Sound Speed=1500m/s, Range/Phase : Range = Adjust, Phase Mode = Manual, Minimum = 0, Maximum = 5000 Tx Blanking set to 0.5 for Ranges 5, 10, and 20 and then set to 5 for remainder Depth Channels: Tx pulse = 1ms, Tx Power = 1, Gain Mode = Auto, Process Shift = 0 Set the EchoSim to Simulator Mode and connect to the 50 Ohm load.				
Range	**Simulator Depth**	**Digitized Depth**	**Difference (m)**	
5	1			
	4			
10	2			
	8			
20	5			
	15			
50	12			
	36			
100	25			
	75			
200	50			
	150			
500	125			
	375			
1000	250			
	750			
2000	500			
	1500			
5000	1250			
	3750			

7.2.2 Signal Analysis

	Pass/Fail	Sign
Set the EchoSim to Simulator Mode and connect to the 50 Ohm load. Set the echosounder transmit power to 1, pulse length to 0.5ms, and range to 2000m. Record the voltage, power, and measured pulse length. Vary pulse lengths up to 64ms and record all results in the following tables. Repeat steps for all power levels.		

7.2.2.1 Transmit Power 1

Set Pulselength [ms]		0.5	1.0	2.0	4.0
Measured Pulselength [ms]					
Voltage [V]	Measured				
Power [W]	Measured				

Set Pulselength [ms]		8.0	16.0	32.0	64.0
Measured Pulselength [ms]					
Voltage [V]	Measured				
Power [W]	Measured				

7.2.2.2 Transmit Power 2

Set Pulselength [ms]		0.5	1.0	2.0	4.0
Measured Pulselength [ms]					
Voltage [V]	Measured				
Power [W]	Measured				

Set Pulselength [ms]		8.0	16.0	32.0	64.0
Measured Pulselength [ms]					
Voltage [V]	Measured				
Power [W]	Measured				

7.2.2.3 Transmit Power 3

Set Pulselength [ms]		0.5	1.0	2.0	4.0
Measured Pulselength [ms]					
Voltage [V]	Measured				
Power [W]	Measured				

Set Pulselength [ms]		8.0	16.0	32.0	64.0
Measured Pulselength [ms]					
Voltage [V]	Measured				
Power [W]	Measured				

7.2.2.4 Transmit Power 4

Set Pulselength [ms]		0.5	1.0	2.0	4.0
Measured Pulselength [ms]					
Voltage [V]	Measured				
Power [W]	Measured				

Set Pulselength [ms]		8.0	16.0	32.0	64.0
Measured Pulselength [ms]					
Voltage [V]	Measured				
Power [W]	Measured				

8 EchoControlClient

8.1 Controls and Settings Verification

These tests are to be completed under normal operation with the transducers connected directly to the echosounder (final setup).

	Pass/Fail	Sign
Verify that the echosounder is receiving and displaying data as expected.	Pass	
Set up any necessary peripherals. Verify that peripheral data is being transferred as anticipated.	Pass	
Set the Echosounder up to record KEB, KEA, and SEG-Y data on both channels. Verify that files are being recorded to the specified folder.	Pass	
Using the PostSurvey application, open one of the previously recorded KEB files.	Pass	
Using the PostSurvey application, open one of the previously recorded SEG-Y files.	Pass	
Using the Notepad application (or similar), open one of the previously recorded KEA files.	Pass	

9 Installation Notes

Notes	
1	
2	
3	
4	
5	
6	

10 Failure Action

Any failures found throughout the acceptance test are to be noted in this section, and corrective action is to be identified.

Section	Description of Failure	Corrective Action