

Kongsberg Underwater Technology, Inc.
19210 33rd Ave West Suite A
Lynnwood, WA 98036, USA.
Tel. (425) 712-1107, Fax (425) 712-1197
Support: km.support.lynnwood@kongsberg.com
Km.hydrographic.support@kongsberg.com
Support World Wide (Norway) +47 815 35 355



KONGSBERG

Service Report

CUSTOMER: NOAA	VESSEL/FACTORY/SITE: Okeanos Explorer	DATE: 05/17/2013
LOCATION: Charleston, SC	ENGINEER: Tony Dahlheim	SERIAL/FILE No:
WORKORDER / PO: W131924-LBR	ACCOUNT/PROJECT No:	CONTRACT No:

EQUIPMENT DELIVERED/INSTALLED/REPLACED.

QTY	Part Desc.	Part No.	Serial No.	Comments.
1	RX32	309057	400746	Ships spares
1	HWS N5	HWS-122803	5005	Installation

1. Main Purpose of Visit.

Impedance check on 1728 elements on EM302 TX array. Replace HWS10 with new HWS N5, install SIS and configure N5. Also perform EM302 calibration. Perform EK60 18kHz calibration.

2. Technical Report.

May 10th - 11th 2013.

Flight from Seattle to Charleston SC the 10th. 11th Came aboard vessel Okeanos Explorer and started with the Impedance testing of the EM302 array. Performed Impedance checks on all 1728 elements using the Cypher 60 Impedance analyzer with relay box. All this data will be sent back to the office for a full evaluation of results. Deytens shipyard will be responsible for hours worked to test the EM302 TX array.

Sunday May 12th, 2013.

Backed up PU parameters, User settings, and various screen shots of the EM302 HWS 10 Computer. Started up the HWS N5 computer and found that SIS 3.9.2 has been already installed on N5. Imported PU parameters and user settings from HWS 10 SIS PC.

→ This failure was note result of shipyard actions. -M.L

Updated EM302 TRU using SIS media I brought with me. After some testing found that tomcat6 service was not running in back ground. Discovered antivirus software was installed on HWS N5 by NOAA personnel. Deleted parts of antivirus program and had to un-install SIS and reload SIS software. Imported PU parameters and user settings and SIS seems to be operating normal with the tomcat6 running in back ground. Advised NOAA personnel not to load antivirus software on EM302 HWS N5 SIS PC.

Performed BIST test on EM302 system. Found channel 30 on RX32 board slot #4 is defective. Confirmed this using the stave display within SIS. Replaced RX32 board slot #4 serial number 371408 with ships spare on board serial number 400746. Updated EM302 RX32 using SIS media and all is operational with the EM302 RX boards.

Performed extended BIST test on TX channels for EM302 system and found these results:

Slot 6	Slot 8	Slot 12	Slot 13	Slot 16
Ch:21 High Z	Ch:6 Open	Ch:2 High Z	Ch:0 High Z	Ch:18 Low voltage
	Ch:9 Open	Ch:33 High Z	Ch:1 High Z	
		Ch:34 High Z	Ch:2 High Z	
		Ch:35 High Z		

Due to the age of the system this appears to be normal. EM302 system can lose about 10% of the TX channels and still be operational. This is currently only 11 channels out of 1728 channels. NOAA personnel will be responsible for monitoring the TX array over time to check if more TX channels show results like these ones shown above.

Monday, May 13, 2013.

Configured EM302 HWS N5 PC running on Windows 7 64 bit operating system and performed system check on system. All appears to be operational at this time. Will monitor EM302 system on sea trial.

EK60 program not starting on EK60 PC. Found that this PC has antivirus programs installed and may be preventing EK60 program to launch. Went into Administrator mode and launched the program and EK60 program seems to be operational. Request NOAA personnel delete all antivirus programs from all Kongsberg computers.

Started logging data with EM302 during transit to EM302 calibration site.

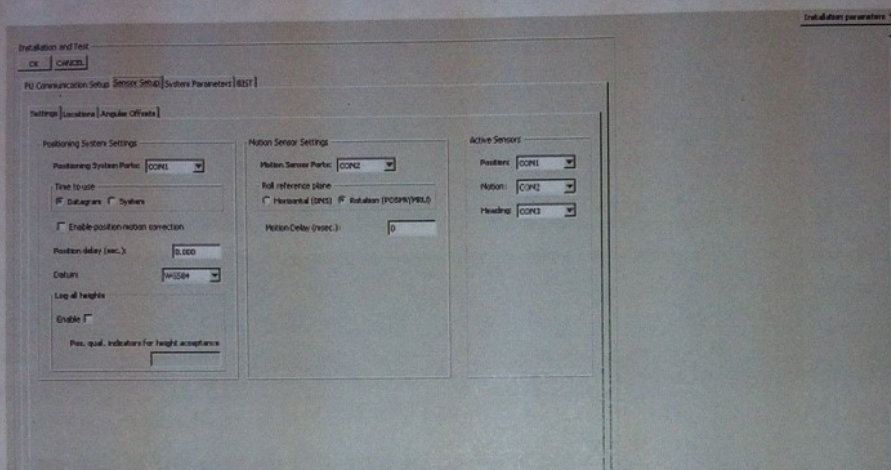
Tuesday, May 14, 2013.

Found bad pings in geo display on SIS stating zero in depths on screen this seems not to affect the raw data being collected by the EM302 system. Will contact Norway main office about this issue in the geo display. See figure 1 below.

Pre-Installation parameters under angular offsets

Roll	Pitch	Heading
0.00	-0.725	0.00

Installation parameters Sensor Setup settings



(Figure 2)

After the calibrations were performed the results for timing was determined to be zero. Pitch was inconclusive due to the fact the 8 knots lines that were run I saw a -0.1 offset then at 4 knots lines I saw pitch to be zero but Caris saw a -0.05. Did not enter any of these results into the installation parameters. Heading calibration came out to -0.15 in the SIS calibration routine and Caris came up with -0.1. We split the difference and came up with a -0.13 for heading. Roll came up with zero in SIS and Caris. The new installation parameters for angular offsets are now seen below.

Installation parameters under angular offsets

Roll	Pitch	Heading
0.00	-0.725	-0.13

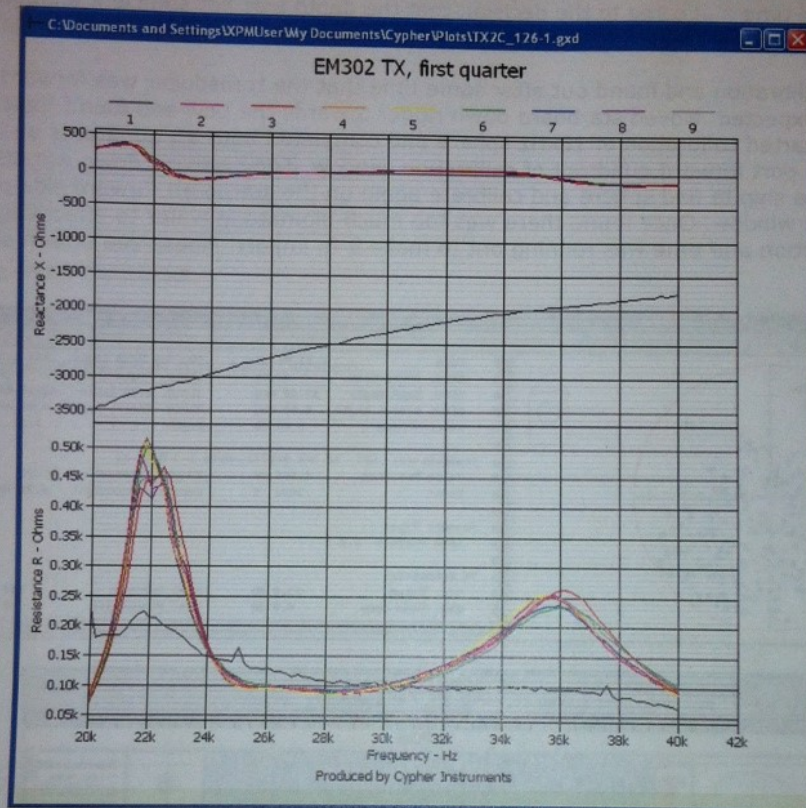
Performed RX noise levels tests using the BIST menu starting with zero RPM's increasing to 175 RPM's at 10.9 knots. These RX noise levels all appear to be normal.

Survey reference surface was performed by NOAA personnel overnight.

Wednesday, May 15, 2013.

Installed down rigger pole mounts and down rigger reel mounts on ship for future EK60 18 KHz calibration. One on port side all the way forward and the second, port side aft and the third starboard side just aft of the survey door.

Went over Cypher testing results and so far the results match up with the extended BIST TX channels tests. Please see below for an example of TX2C_126-1 cable, slot 6, ch:21, High Z, element 397.

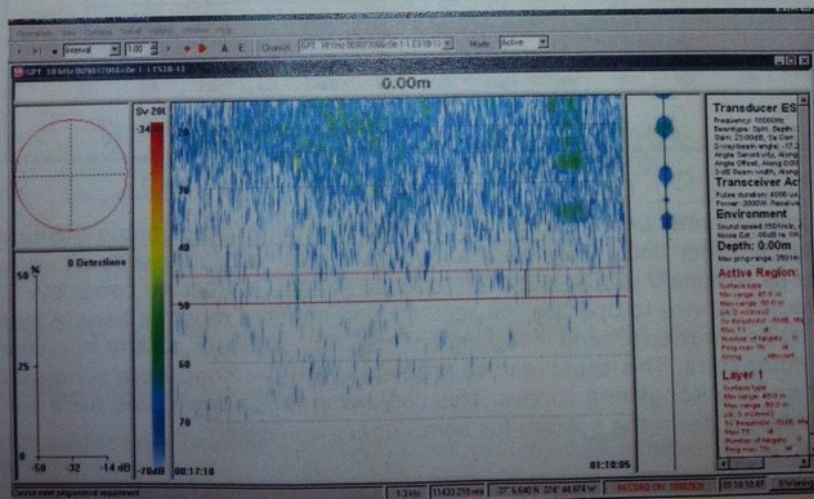
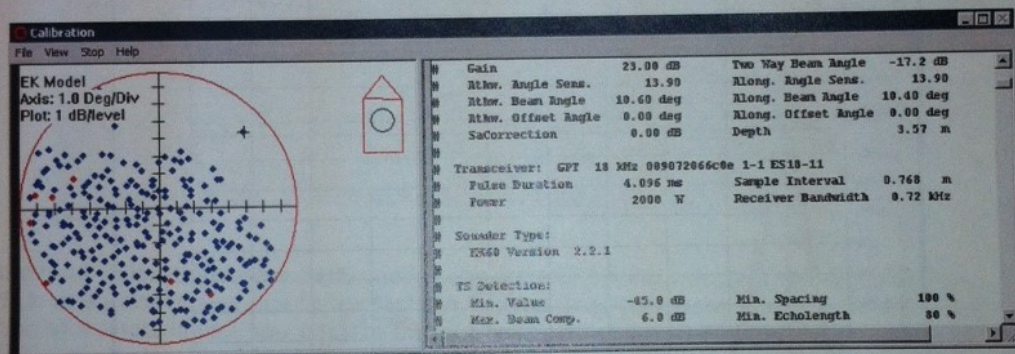


NOAA has implemented two accounts on HWS N5 computer one running SIS under User account and the other under Administrator account. User account needs all rights and permissions as administrator account for tomcat6 service to operate correctly. SIS needs this background service to operate. All security and updates must be handle by NOAA. Kongsberg does not recommend installing any security software on any Kongsberg data acquisition computers. This could lead to problems with the Kongsberg sonars and performance of the Kongsberg sonars. This could also mean down time for a sonar when security has taken down the system for some unknown reason.

Thursday, May 16, 2013.

Started the calibration with the EK60 18kHz at 35 Meters of depth. Could not find sphere after some time and came to the decision that the depth was not sufficient enough to calibrate the EK60 18 kHz. Started transit to waters about 100 meters of depth.

Started calibration and found out after some time that the transducer was forward of what we expected. Moved starboard down rigger towards the bow and found the 18 kHz sphere. Started calibration of 18kHz sphere and completed both aft quadrants and about half of the port forward quadrant of calibration window. Tried moving down riggers and moving the ship to find sphere and calibrate again on the starboard forward side of calibration window. Once found there was too much biomass in water to effectively do the calibration and time was running out to make it to import. Please see screen shots below.



Friday, May 17, 2013.

Transit back to Norfolk over the night.

3. Software Details.

SYSTEM	VERSION
SIS EM302	3.9.2
EK60	2.2.1

4. Concerns/Remarks.

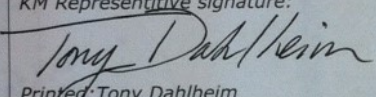
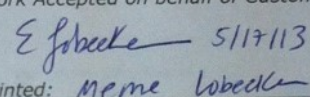
Remarks:

Unsuccessful calibration of EK60 18kHz system.

5. Time Sheet.

DAY	PLACE: PORT- ONSHORE, OFFSHORE, TRAVEL	ACTIVITIES	TIME FROM - TO	HOURS	OVERTIME
05/10/2013	Travel	Flight Seattle - Charleston, SC	14:00 - 1:30	8	
05/11/2013	Port-onshore	Impedance testing	7:30 - 21:30	14	
05/12/2013	Port-onshore	Installation/Testing	7:30 - 18:30	11	
05/13/2013	Offshore	Testing	7:30 - 19:30	12	
05/14/2013	Offshore	Testing	7:30 - 19:30	12	
05/15/2013	Offshore	Testing	7:30 - 19:30	12	
05/16/2013	Offshore	Testing	7:30 - 19:30	12	
05/17/2013	Offshore	Testing	7:30 - 19:30	12	

6. Signatures.

DATE:	KM Representative signature:	Work Accepted on behalf of Customer signature:
05/17/2013	 Printed: Tony Dahlheim	 Printed: Meme Lobeduck