**CRUISE LOG**

**EX1404L1**

**09 AUG 2014 – 30 AUG 2014**

**INSTRUCTIONS:**

PLEASE INCLUDE FOLLOWING DURING EACH OF YOUR WATCHES:

Mapping log (All information written down in rough log [Green book])

Log what time you assume the watch – **All times UTC**

WX every three hours

Settings changes

Data quality trends

BIST times/filenames, reason for running

XBT/CTD casts

**Key**

PM – Ping Mode

ACM – Angular Coverage Mode

SB – Single Beam

MB – Multibeam

VD – Very Deep

AD – Along Direction

WX – Weather

STBD - Starboard

ED – Extra Deep

WCD – Water Column Data

BBS – Bottom Back Scatter

**JD 221 09 AUG 2014**

Today’s Tasks:

Upgrading SIS

GAMS calibration

Begin patch test at Veatch

1209 TX36 board 19 fail. Tests 1 and 3 – loose Ethernet cable

 Folder: ex09aug14

Recorded SIS 3.92 rescue image with ACRONIS, proceeded to remove SIS, clear database contents and remove POSTGRESQL. Deleted SIS directory, uninstalled psauOODB, removed all Java’s, inspected environment variables, POSTGRESQL directory deleted. Removed environment variables to remove SIS, Java, Perl, SQL references. Verified good SIS base installation, turned off SIS. Proceeded w/ TRU software updates – updated TRU firmware to latest. Reinstalled SIS parameters – began pinging – error rec’d – same as before (July, 2013) DDS, 524. May be due to mutli-homed network. Network interface adjustments: disabled adapters not connected. Ranked TRU-LAN adapter as #1 (top priority) in advanced network settings.

1636 Shut down SIS and TRU – turning back on and errors on BSP + slot 22. Booted again and checked TRU software again. Tx firmware re-updated. Listing 0 + 22 as older firmware 1.1.3, ran firmware again and R

1737 Now reporting U, U, 23, 14, 22 6 errors on cards

* Unplugged half of TX array boards 14+ to check updating on only first half – reported problem on rack 0, elot 0 card. Swapper with card 24 to test
* Booted with card 4 as master, connected to 1-12 boards with 13-24 disconnected
* Firmware reads OK – re-flashed with 1.1.4
* Plugged in 13-24, removed 1-12, boots OK reports 1.1.4
* Re-flashed to 1.1.4—looks OK
* Reconnected all boards & started system –errors-slots 23,22,11,6
* Smell occurred again – powered off and inspected system, found TX RIO set to 115 V, 240 V input verified with multimeter – set input voltage selection switch to 230 V and restarted pinging – OK- stopped and ran BIST – TX BIST failed due to board software – spare inserted into slot 24, SN 385151 – re-flashed & ran BIST on TX Channel 5

2213

Swapped out HV-PSU on EM302 to t-shoot “Low Voltage” errors on TX26 channel tests. No HV-R10 spare available

Telnet has “Initialize TX() Failed on rack O slot 14, 17, 11, 6.

Reapplied software upgrade with just boards 0, 14, 17, 11, 6 connected. Could not push firmware

2243

 Rack O Slots ~~14, 17, 11,~~ 6 are highly suspect boards

**JD222 10 August 2014**

0001 ~~U~~ get, view, upload BSCORR. File from TRU

0321 Stop ping to run BIST (all). Data has been looking good in 1700 m depth. All BIST pass. BIST\_JD222\_1.txt

0330 Start ping. Get error 524. (#2) TX 26 BIST – all green and can ping and detect bottom OK

0355 Restart POS/MV

0455 New SIS survey EX1404L1A for patch test

0535 XBT 0001 for comparison w/ CTD

0548 Start gams CAL

0617 Gams cal requested

0651 Applied CTD in SIS

0709 Gams cal performed

|  |  |  |
| --- | --- | --- |
|  | Old | New |
| Two Ant Sep. | 2.297 | 2.304 |
| Baseline Vector |  |  |
| X | 0.024 | 0.027 |
| Y | 2.296 | 2.304 |
| Z | 0.002 | 0.025 |

0718 Begin transit line 0000

 Heading is green with accuracy at 0.06. Called bridge to transit to southern end of patch test line1 and start patch test.

0728 Start of patch test line 0001. (latency/pitch test)

0739 heading turned red, accuracy at 0.237

0746 heading turned green again (0.017)

0831 XBT 002 Apllied at north end of line 0001

0854 starting turn line 0004

0905 starting line 0005 (pitch test)

1031 Begin turn line 0008

1045 Latency line 0009

1058 XBT 0003 Applied 0009

1232 Updated salinity n SIS to 35.44

1325 End line 0014

 Start turn lne 0015 (heading red during turn)

 Noticed lines 10-14 incremented on their own every ½ hour – need to change this. Changed to every 3 hours for patch test

 (tools—custom—set parameters – logging)

1355 Start line 0016 (line “1” south, 9 knots, pitch test alternate). The ship did some aggressive turns before this line and heading is red

1416 Heading still red (1.094 accuracy). Trying turning POS view off on Wetlab computer (it is running concurrently on EXHypade machine.) This fixed the problem.

1456 Ship is speeding up for water -making for 20 minutes

1457 XBT 00 applied to line 0016

1459 Broke line 0016. Start line 0017. (Line broken because speed is increasing to 11 knots to make water)

1522 Start line 0018 – turn

1529 Start line 0019 – line 2 north

1551 Removed “TRANSIT” survey for GED

1602 Whale sighting, sonar secured per bridge request

1613 Resumed pinging per bridge’s request

1658 End line 0021. Start line 0021. (turn)

1704 Start line 0022 (turn)

1724 Start line 0023 – line 3 south 8.5 knots – heading test alternate

1821 Line 7 + Line 9, timing 0 BIAS

 Line 1 + Line 7, pitch 0 BIAS

1851 Applied XBT 005, line 23.

1855 Ended line 0023. Turning and starting 0024 on turn

1934 Start line 0025 – line 4 west heading test alternate

1835 XBT 005 conducted

2014 End line 0025, start line 0026 for turn

2037 Start line 0027 Line 5- East

2043 XBT 006 conducted

2057 Applied XBT 006 to line 27

2122 Start line 0028 for turn

2133 Start line 0029, heading line running west

2216 Start line 0030 for transit

2239 Start line 0031, line 6 south, roll test

2245 roll line start 0032 180°

2258 Line 25 & Line 29 HDG BIAS OF -.07°

 Total BIAS -.20° in SIS, JH

2307 Increment line to 33 for turn

2319 Start line 0034 for roll test, north

2337 Start line 0035, end roll test, start drift test

.

**JD 223 11 August 2014**

0019 Start line 0036, transit to seeps

 Conducted XBT 007

0047 Applied XBT to line 0036

0107 Start line 0037, on line for seeps

0131 Start line 0038, for turn

0138 Start line 0039, second lien for seeps

0159 Start line 0040 for turn

0207 Start line 0041, third line for seeps

0229 Start line 0042 for turn

0207 Start logging EK60

0238 Start line 0043 fourth line for seeps

0256 Start line 0044 turn

0305 Start line 0045, fifth line for seeps

0330 Start line 0046 for turn

0332 Water column settings changed from 30 log R 20 dB offset to 40 log R 20dB offset

0337 Start line 0047 for first line seeps in reverse

0344 Water column settings changed to 35 log R 20dB offset

0401 Start line 0048 for turn

0427 XBT 0008 Applied 0049

0438 Turn line 0050

0446 Line 0051

0508 Turn Line 0052

0516 Line 0053 (Still turning)

0523 Line 0054

0549 Turn line 0055 (Bridge report Doppler velocity logger had been running but data appears fine)

0600 Line 0056

0616 Begin transit line to roll line area 0057

0617 Changing water column settings back to 30 log R

0706 XBT 009

0715 XBT Applied to line 0057

0740 Begin roll line 0058

0756 Turn line 0059

0809 Roll line 0060

0828 Begin line 0061 – Ping mode very deep

0946 Line 0062

1129 Stopped recording EK60

1235 Starting EK60 Calibration at location SE & Veatch Canyon. Patch test area in approx. 2050 meter water depth. Drifting for calibration

1235 Conducting XBT # 10 fn EK60 Cal. Avg. sound speed between 6-30 m is 1535.233 m/s

1350 Stopped recording EK60 to check sphere and ring-appear to be clogged with seaweed. Ring cleared and substantial seaweed. Ball pulled close to surface and looked good-lowered back into position.

1447 There appears to be a large fish swimming right-around the sphere obscuring ability to get TS measurements going on for ~ 30 minutes. Trying to distract it by fishing off stern and pinging EM302.

1450 Fish moved down to weight. Resuming calibration.

1507 Fish back interfering tried sub-bottom and bow thruster to scare fish.

1618 Moving ship 2NM East to new location with hopefully less biological interference. All overboard lines secured out of water. David Barbee stung on arm by jellyfish retrieving gear.

1730 Calibration gear re-deployed at new location. New area good- not many fish or seaweed in vicinity.

1815 Powered down EM302 for trouble shooting.

2316 Recovering EK60 gear. Calibration complete.

2359 Conducted XBT 011.

**JD 224 12 Aug, 2014**

0029 XBT 011 applied, not logging EM302

0048 Logging EM302 line 0063

0258 Conducted XBT012

0310 XBT 012 applied to line 0063

0320 Stop logging MB 302

0328 Restarting transceiver

0339 Logging EM302 line 0064

0412 Line 0065

0510 XBT 13 applied to line 0066

0513 Line 0066

0520 Turned on Fathometer

0618 Line 0067

0715 XBT 14

0806 Line 0068

0910 Line 0070

Anchored ship in Jamestown Harbor, RI to sit out storm for ~30 hours.

1840 Stopped pinging of 302 (9-11 foot seas predicted for Aug 13th in transit area)

Note: Aug 13th was a weather day. Ship anchored in Jamestown Harbor, RI all day. No mapping data collected. During night watch morning of Aug 14th several additional entries were made to SIS datagram. These changes followed SVP Editor instructions. We could not “unsubscribe” the 4 new entries.

**JD 226 14 Aug, 2014**

1339 Ran all BISTs. All green except for test 7 – TX Channels.

1417 XBT 15. Hit bottom at ~40 m, had to edit .EDF file because we didn’t terminate data collection until after hitting the seafloor.

1432 XBT 15 applied to Line 0072 (not yet logging).

1436 Line 0072 started (depth = 41 m). Current speed is 11 kts.

 EK60 parameters: Pulse duration = 512 us. Sample Interval = 128 us. Band width = 1749 Hz. Power = 200 W.

1448 Logging stopped – need to log in as operator instead of survey.

1456 Heading is red. Heading accuracy = 0.279 deg.

1504 EK-60 stopped.

1510 Re-started CNAV and POSMV to fix heading. After reboot heading turned green.

1606 ET Conway working to try to remove items from datagram, 302 is not collecting data.

1700 Conducting XBT 16

1719 Applied XBT 16 to line 71

1721 Logging to line 73

1722 Pinging on EK-60 and logging

1726 Do not process line 72

1921 Line 73 finished. Logging Line 74.

2020 Conducting XBT17

2032 Applied XBT17 to line 74

2122 Start Line 0075, End Line 0074

2204 Conducted XBT 018

2210 Applied XBT 018 to Line 0075

2322 Start Line 0076, End Line 0075

2330 Conduct XBT 019

2336 Applied XBT 019 to Line 0076

2351 Start pinging and logging SBP, Tx Pulse: .5ms, Tx Power: 1

**JD 227 August 15, 2014**

0028 Conduct XBT 020

0035 Applied XBT 020 to Line 0076

0121 Start Line 0077, End Line 0076

0155 Conducted XBT 021

0201 Applied XBT 021 to Line 0077

0308 Conducted XBT 022

0317 Applied XBT 022 to Line 0077

0321 Start Line 0078, end Line 0077

0400 Begin Watch Erin, Tim, Rachel

0429 XBT 023 applied to line 078

0645 XBT 024 applied to line 079

0844 XBT 025 applied to line 080

1035 XBT 026 applied to line 081

1119 Called bridge to slow down to 8.5-9 knots

1123 End line 081, begin line 082

1129 Heading light red

1253 Heading light green

1304 SV profile yellow

1311 XBT #27 cast

1322 End line 082, begin line 083

1326 XBT #27 applied to line 083

1349 Heading lamp red. Heading accuracy 0.442

1412 Pulled EM 302 max angles in to70/70 since we are losing outer beams at 3500m depth.

1422 Changed max angle on EM 302 to 55/55

1425 Max angles changed to 52/52

1433 Changes SBP power to 3, pulse length still at 32 ms. (3640 meters of depth), changed min depth to 500 meters.

1521 End line 083. Begin line 084.

1553 Heading lamp green. Heading accuracy .017

1631 Changed SBP range to 1000 meters (from 500m). Water depth decreasing.

1655 Changed EM 302 max angle to 70/70. Depth at 2300m.

1734 XBT #28 cast

1744 XBT #28 applied to line 086

1733 Start line 086 – turn

1747 Start line 087

1830 End line #77, start line #88 on turn.

1837 Begin line #89. Max angle on EM 302 changed to 75/75.

1943 XBT #29 Cast

1958 XBT #29 applied to line 0089 (see note at 2227, not actually applied)

2014 Start line 0090 for turn

2025 Accuracy .321 Heading lamp red

2026 Start line 0091 on survey track

2040 Heading lamp Green, Accuracy .018

2054 Heading camp green

2130 Heading lamp red accuracy 0.278

2201 Conducted XBT 030

2224 Applied XBT 030 to line 0091

2226 Start line 0092

2227 XBT 029 Not actually applied to line

2239 Changed MAX angles on 302 to 44/44

2326 “Depth” is yellow, reading 4532.2

2334 Heading Lamp Red, accuracy .279

2335 Conducted XBT 031

2337 Start Line 0093

2346 Start Line 0094 for survey line

2350 Applied XBT 031 to Line 0094

2358 Changed max depth to 6000, depth warning NOT yellow, outer beams now 75

**JD 228, August 16, 2014**

0012 Changed minimum on EK60 to 6m

0016 Heading lamp back to green

0134 Heading lamp red .815

0146 Stopped logging EM 302, SBP, EK60. Reset POS due to large heading error. Do not process Line 0095. Ended Line 0094

0153 All POS green, start logging EM 302, Start Line 0096. Start recordin EK 60. Start new line SBP.

0215 End Line 0097. Start line 0096 for turn

0253 Conducted XBT 0032

0304 Applied XBT 0032 to line 0097

0325 Heading lamp red

0354 Increased EK60 pulse length to 2048

0406 Started logging EK60, was not logging for ~2hr

0502 XBT 0033

0524 Changed Knudsen settings

 From: Tx Pulse 64ms – Tx Power 3

 To: Tx Pulse 2ms -- Tx Power 2

0058 Lost tracking on ER60 & Subbottom while going over mound

0706 XBT 0034

0715 Applied XBT0033 to line 0099

0800 XBT 0035

0809 XBT applied to line 0099

0911 Begin line 0102 over mound

1000 XBT 0036

1007 Applied XBT to line 0102

1101 Turn line 0103

1133 Begin line 0104

1200 Heading Lamp Red Accuracy 1.131

1251 Going 6 knots

1322 Stopped logging all sonars figure 8 turns

1330 Heading accuracy 0.785

1340 figure 8 testing complete heading lamp green 0.019 accuracy

1341 All sonar restarted logging EM302- line 0105

1344 Conducting XBT 037

1355 XBT 037 applied to line 0105

1415 End line 0105 (turn). Begin Line 0106

1423 Heading is red again (didn’t see it change) Accuracy 0.898

1538 Put POS MV in standby to try and re-initialize Nar settings. Restarted in Nav.

1539 Stopped logging on all sonars

1541 Heave and attitude re-initialized, position back in.

1548 Powered POS down, try restart, DGPS (C-Nav) powered down and restarted

1551 Attitude re-initialized, green

1552 Position re-initialized, green

1554 Heave re-initialized, green

1557 Velocity and Heading re-initialized, green

1558 Logging on EM 302/EK60/ Sub-bottom

1615 Heading accuracy lost- 103-red

1628 changed EM302 Max angles to 45/45

1644 Start line 108 turn

1645 All sonars stop logging for loss of steerage test

 Two antenna separation 2.304

 Heading cal threshold 0.500

 Heading connectivity 0.000

 Baseline Vector

 X=0.027

 Y=2.304

Z=0.025

1558 Start line 107

1644 Start line 108

1828 Cal requested

1855 POS-MV powered-off/ C-Nav as well

1856 Reboot all systems, coming back online

1900 Attitude-green, position-green

1902 Heave-green

1904 Velocity-green

2022 All lamp green except heading/accuracy set to 3.2 and decreasing/ ET’s noted need 2 new antenna

2022 Believed to notice secondary receiver not working

2031 Conducting XBT 038

2037 XBT 038 applied to line 0109

2038 All sonars logging

2042 Heading accuracy is 1.138

2045 Tested SBP on transmit power 4 for more penetration. Subseabed layering absent and chirp lord-turn back to 3.

2058 Heading accuracy green for 2 min now 0.251

2158 Changed max angles 35/35

2238 Start Line 0110

2250 Change outer beams to 40/40

2252 Turned off Doppler log to see affect on data

2256 Conducted XBT 039

2300 Applied XBT 039 to Line 0110

2302 Turned on Doppler log, anomaly gone and remained gone

2323 Outer beams changed to 50/50

2328 EK 60 minimum changed to 6m

2347 Conducted XBT 040

2352 Applied XBT 040 to Line 0110

JD 229, August 17, 2014

0005 Changed SBP Max 4500, min 2500

0013 MB 302 outer beams changed 65/65, K 60 max changed to 4000

0040 Start Lin 0111

0042 Power changed to 2 on SBP

0103 Power changed to 3 SBP, EK 60 max 5000

0112 Changed MB 302 outer beams to 50/50

0220 Changed MB 302 outer beams to 35/35

0227 Start Line 0112 for turn

0228 Conducted XBT 041

0243 Applied XBT 041 to Line to 0112

0244 Start Line 0113 for survey line

0247 Secondary receiver is working and heading is green, accuracy .017, believed to be 7hr since secondary worked

0251 Changed SBP pulse to 32ms an power to 2

0336 Heading green, accuracy 0.322

0342 Start Line 0114, do not process

0342 Start Line 0115 for turn

0348 Start Line 0116

0355 Heading light red- poor GAMS heading, accuracy (35-60°), and attitude heading accuracy 0.774

0400 Watch Erin, Tim, Rachel

0407 Begin line 0117

0432 XBT 042 applied to line 0117

0542 Heading light green

0643 XBT 043 applied to line 0118

0833 Start turn line 0120

0846 Heading light red

0903 XBT 044 applied to line 0121

0911 Software caused communication abort-POS, message 10053, saved message log on Hypack Local C:/POSMV, appear to be functioning with red heading light as before. Occurred during XBT operation

1038 Begin turn line 0122

1102 XBT 045 applied to line 0122

1237 Heading accuracy .932

1243 Heading lamp green

1247 Start line 0124-turn

1253 Requested 400m shift to portside

1300 Sifted 850m to portside

1309 Start line 0125

1330 Asked bridge to revert to original line plan (which is shifting current line scheme east ~800)

1348 Heading lamp green, 0.017 accuracy

1352 Start line 0126-turn

1402 start line 0127-survey

1405 Shifted 1000m to starboard

1407 Increased SBP power to 3 over steeper terrain

1414 XBT 046 cast

1425 XBT 046 applied to line 0127

1518 Changing line to 500 m port (west) to reduce holidays

1602 End line 0127, Start line 0128

1636 XBT 047 cast and applied to line 0128

1648 End line 128, start turn line 129

1705 Start line 0130-survey

1730 Noticed GPS not coming into SBPET’s troubleshooting issues

1741 Position is red

1745 Restarting EK60 and SBP was no updating GPS

1749 EK60 and SBP-recording CNAV froze up and had to be restarted

1800 SBP: reduced phase overlap to 20%, increased gain to 60dB

1838 300m to starboard side

1905 Start Line 0131

1936 Conducted XBT 048

1940 XBT048 applied to line 0131

1959 Heading went red

2105 End line 0131, start line 0132 DNP (cut line 132), start line 0133

2159 Conducted XBT 049

2205 XBT 049 applied to line 0133

2232 Start line 0134, for turn

2236 Start line 0135, transit to next turn

2251 Start line 0136, turn

2255 Start line 0137, survey

2314 Heading turned green

2351 Conducted XBT 050

2359 XBT 050 applied to line 0137

JD 230 August 18, 2014

0009 Heading turned red

0021 Heading turned green

0055 Start line 0138

0124 Heading turned red

0125 Start line 0139 for s-turn

0138 Heading turned green

0146 Start line 0140 for survey

0256 Conducted XBT 057

0305 Applied XBT 051 to line 0140

0333 Start line 0141 for S-turn

0346 Start line 0142 for Survey

0406 Doppler turned on

0507 Start turn line 0143

0542 Start line 0144 for survey

0549 Haven’t performed XBT due to storm

0719 Still in storm. 5-6 ft seas w/lightning. Seas are slapping the stern and causing noise in the data

0812 Decreased pulse length of single beam on top of sea mount plateau

0953 Water spout off stbd bow

1034 Breaking line early to avoid storm. No XBT on shift due to continuous lighting.

1035 Begin turn line 0147

1056 End line 0147. Begin line 0148

1130 XBT #52

1200 Heading lamp red. Accuracy 0.889

1223 Changed SBP Transmit power to 2 (depth 2830)

1226 Doppler log turned off 5 minutes ago

1232 Changed EK-60 to 1024 pulse and 800w

1256 End line 0148. Begin line 0149

1420 XBT #53 cast

1431 XBT #53 applied to line 0149

1456 End line 0149. Begin line 0150

1523 Heading lamp green. Accuracy 0.019

1550 End line 0150. Begin turn line 0151

1612 End turn line 0151. Begin line 0152

1622 Heading accuracy jumped to 0.103

1624 Heading lamp turned red. Accuracy is 0.238. Satellites falling out of view.

1710 Checked POS, Secondary GNSS feed has no satellites.

Heading accuracy= 0.670

1731 XBT 54 Cast.

1749 XBT 54 applied to line 0152

1812 Heading lamp green. Accuracy 0.020

1812 End line 152. Begin line 153

1905 Heading lamp turned red

2006 Stop survey line 153, start turn line 154- Needed to turn around and fill large gap where multibeam lost bottom.

2012 Heading is green

2013 Start line 0155 to fill gap

2013 Conducted XBT 055

2021 XBT 055 applied to line 0155

2028 Heading is red. 0.282

2032 Change along direction -1 to help return

2034 Start line 156 for turn

2039 Start line 0157, transit back line to start survey

2054 Start line 0158 on survey line

2117 Depth on EM302 and EK60 off by room SBP fuzzy

2203 Increase SBP power to 3

2238 Start line 0159 for turn

2255 Conducted XBT 056

2302 Start Line 0160 for survey line

2302 Cut SBP line to isolate turn

2306 Applied XBT 056 to Line0160

2310 Changed gain on SBP from auto to 40 dB

JD 231, August 19, 2014

0022 Start line 0161 for turn, cut SBP line for turn

0027 No navigation data on secondary receiver

0042 Start line 0162 for survey line

0043 Change gain on SBP to 50 dB

0119 Conducted XBT 057

0129 Applied XBT 057 to line 0162

0151 Start line 01163 for turn

0154 Start line 0164 for transit to next line, new SBP line

0247 Start line 0165 for turn, cut SBP line

0253 Start line 0166 for survey line, cut SBP line

0341 Conducted XBT 058

0347 Applied XBT to line 0166

0552 XBT 059 Applied to line 0167

0800 XBT 060 Applied to line 0168

0932 Start line 0170 for turn

0941 Start line 0171

1010 XBT 061 applied to line 0171

1116 Start line 0172 for turn

1140 Start survey line 0173

1241 SBP gain set to 35 (used auto to determine value, then switched to manual)

1309 Start line 0174 EM302

 Advance line SBP

1312 Start line 075 EM 302

 Advance line SBP

1322 Conducting XBT 062 (correct coordinates from caris 38.47551 N, 61.519346 W)

1336 XBT 062 applied to line 175

1338 Start line 0176 turn

1657 Start line 0177 turn

1407 End line 177 and start line 178 after filling gap in data

1429 Minimum depth changed to 1300 meters

1441 Min depth on 302 changed to 2500

1607 End line 178, begin line 179

1635 XBT 63 cast

1643 XBT 63 applied to line 0179

1740 Speed 9.4 speeding up for about 30 min to avoid another vessel

1742 Pulse at 32 on SBP and mode gain changed 42/ pulse changed ball and 16ms

1808 SBP gain was auto for a bit and auto adjusted to 93dB. Now constant.

1810 End line 179. Begin line 180.

1815 Speed down in range of 8.5-9 knots.

1822 Set SBP gain to 50 dB.

1833 Changed gain value to 37 SBP

1909 SBP gain change 51 dB

1935 Conducting XBT 64

1945 End line 180. Begin line 181.

1945 Cut SBP for turn

2002 XBT 64 applied to line 0181

2005 Cut line 0181 cut SBP for turn Begin 182

2008 Cut line 182; begin line 183.

2104 Heading lamp red

2208 Begin line 184

2209 XBT #65 cast.

2217 XBT #65 applied to line 184

2317 XBT 066 Conducted

2323 XBT 066 applied to line 0184

2330 Start mew SBP line, Gain changed to 43dB, range 500

JD 232, August 20, 2014

0008 Start line 0185

0038 Start new SBP line, gains set to 60dB, tough tracking bottom

0050 Start new SBP line, gain 43dB

0117 Start line 0188, cut SBP line, turn

0132 Start line 0187, cut SBP line for turn

0136 Conducted XBT 067

0140 Start line 0188, cut SBP for survey line

0145 Applied XBT 067 to line 0188

0156 Cut SBP line, gain 55dB

0334 SBP line cut; Gain 50dB, line cut for turn 0189

0338 XBT 068 Applied to line 0189

0354 Start line 0190, SBP line cut. Still gain 50dB

0543 XBT 069

0554 Start turn line 0191

0634 Begin line 0192

0756 XBT 070

0839 Begin turn line 0193

0851 Begin line 0194

0930 XBT 071 applied to line 0194

1049 Begin turn line 0195; ship is being pushed; going 11 knots, slowing down

1105 Ship is crabbing due to strong current

1201 XBT #072 cast

1212 XBT #072 applied to line 0196

1255 Speed surging to 9 kts, asked bridge to keep at 8 kts

1301 Heading accuracy 1.158

1305 Start line 0197 for turn

1327 End turn line 0197, begin line 0198

1456 XBT #073 cast

1501 Start line 0199, start line SBP

1504 XBT #073 applied to line 0199

1514 Stopped pinging and logging MB to perform BIST test

1527 Started logging 0200 to MB

1540 SBP range changed from 1000 to 500

1634 SV Profile yellow Waiting to see if it changes before casting another XBT

1641 Conducting XBT #074

1647 XBT #04 applied to line 0200

1653 Heading accuracy 1.124

1728 Start line 0201

1732 Start new line SBP range adjusted from 500 to 50

1738 Pulse on SBP changed to 16ms

1753 End line 201, start 202 turn. Break line on SBP

1807 End line 202, start line 203 and break line on SBP

2009 XBT 75 cast

2021 XBT 75 applied line 204

2058 Start SBP line range 500dB gain 42

2208 Start lone 0205

2209 Conducted XBT 076

2214 Applied XBT 076 to line 0205

2251 Cut SBP line, Gain 60dB

2313 Cut SBP line, gain 45dB

2344 Change range to 100m, start new line

JD 233 August 21, 2014

0007 Start line 0206

0017 Start SBP line range zoom, gain 50dB

0037 Conducted XBT 077

0044 Applied XBT 077 to line 0206

0128 Start line 0208, start SBP line 41dB, 100m ring- Do not process line 0207

0148 Start line 0209 and cut SBP Line

0150 Opened max angles to 75

0223 Start SBP Line, 60 dB gain, range 500

0240 Start SBP Line, 60dB, range 1000m

0256 Conducted XBT 078

0302 Applied XBT 078 to Line 0209

0340 Start SBP Line, Range 200m Gain 40dB

0348 Start line 0210

0400 Changed min depth on 302 to 600m

0406 Sub-bottom range change to 1000

0431 Changed gain to 50 dB

0506 Conducted XBT 079

0620 Call from Bridge-strong current. Full speed ahead, going 7.3 knots. Ship is crabbing.

0637 Applied XBT 080 to line 0121-surface velocity was in the red

0737 Change SBP Range to 200; Gain to 45 dB

0852 Conducted XBT 081, Applied to line 0122

0947 Start SBP line 213

1012 Start SB line 214, range 200m, Gain45dB

1049 Conducted XBT 082, applied to line 0214

1213 Start line 0215

1216 Approaching mount. Changed range to 1000m on SBP

.1335 XBT 083 cast edited EDF

1352 XBT 083 applied to line 0215. SV still yellow

1412 End line 0214. Begin line 0215.

1221 Re-exported EDF w corrected salinity (36.2 instead of 35.2), but SV still red. Going to redo XBT incase bumps/spike were from wire contacting ship.

1430 XBT #084 cast.

1437 XBT #084 applied to line #0216. Sv is white again.

1526 Start SBP line changed phase to 200

1558 SBP range changed to 500

1603 SBP range changed to 1000

1611 Begin line 0217

1716 Port side angle set to 47°

1726 XBT #085 cast

1734 XBT #085 applied to line 0217

1751 SBP line started changed range from 1,000 to 50m

1802 SBP range set to 50

1813 Begin line 218

1817 Begin line 219 turn

1831 Port side angle opened to 75°

1841 Begin line 220

1949 SBP set to 500

1904 SBP set to 1000

1933 XBT #086 cast

1940 XBT #086 applied to line 220

1941 SBP pulse to 16.0 ms, Power to 2

2037 Start SBP line, gain 80 dB, range 1000m

2041 Start line 0221, start SBP line, gain 40dB, range 500m

2101 Start SBP line gain 38dB range 100m

2146 Increased SBP range to 1000m, start new line

2153 Called to increase speed, but we are going as fast as we can against current (~8kts)

2207 XBT 087 cast, while casing SV profile an SV used turned yellow

2216 XBT 087 applied

2214 lost bottom and beams-working downstairs, restarting pinging

2218 started multibeam pinging- no response message

2221 Turning around to recover line. SBP EK60 back online. SIS still offline

2224 multibeam started pinging-depth and beams are red. Error message: no response from echo sounders

2225 multibeam pinging- depth and beams still red

2226 Restarting SIS

2229 Pinging

2231 multibeam responsive

2232 Start line 0222-filling gaps

2300 Start SBP line. Gain 56 range 1000m

2304 Start line 0223, SBP new line for turn, gain 44dB

2317 Start line 0224, SBP new line back on survey line

2329 Start SBP line, gain 36 range 1000m

2348 Start SBP line gains 54

2348 MB nadir beams are having tough time tracking bottom

2357 Start SBP line, gain 38dB

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0004 Start SB line, gain 30 pulse 4ms

0039 Start SBP line gain 55

0050 XBT #88 cast

0058 XBT #88 applied to line 224

0059 Start SBP line, pulse 16ms power 2 gain 80

0108 Start SBP line, gain 50db

0126 Start line 0225

0132 End SBP line. Experimenting with TVG setting Range 200m TVG set to bottom referred, manual gain=0dB

0145 Changed SBP transmit power to 2, still TVG bottom ref’d

0151 Switched to Auto gain to see difference with TVG. Looks worse.

0154 Changed SBP range to 50, gain manual 37 dB.

0216 Changed SBP gain to manual=0, TVG bottom ref’d changed range to 200

0225 Start line 0226 and SBP for turn

0225 changed SBP back to manual with no TVG. Turn line.

0237 Changed SBP power to 3. Made no difference, turned back to 2.

0245 Start line 0227 and SBP line on survey line

0309 XBT# 89 cast

0315 XBT #89 applied to line 227

0327 Start SBP line, gain 50dB range 500

0340 Start SBP line, gain 55dB range 1000, power 3.

0436 Going over seamount reduced SBP Tx to 2 and gain to 29 dB

0439 New SBP line reducing range to 200 m

0445 Planning computer rebooted on its own

0456 Holiday on peak of seamount

0513 Changed SBP range 500; gain 28 dB

0515 Gain 38 dB-SBP range 1000

0527 Gain 55 dB

0527 Fog horn blowing, rain and lightning

0528 MB blowing out changed along direction -1

0537 Data blowouts, changed MB along direction -2

0610 XBT 90 applied to line 0228

0624 SBP new line, set Tx to 3 and gain at 56 dB

0636 Changed max/min angles on 302 to 40/40, slowed to 7.5 knots

0643 Changed min/max depth on 302 to 4000/5000 SV exceeding max threshold. No XBT due to WX, ship rolling badly

0649 Set max angles on 302 to 35/35

0651 Asked bridge to change heading to 070° to see if ride and data improve. Lost bottom in turn

0702 Changed Ek60 power 1000W, Testing heading 085°

0708 Data worse on experimental headings, returning to survey line

0737 XBT 91 conducted, applied to line 0230

0819 Reduced SBP Tx power to 2 and gain at 79 dB

0823 Reduced SBP gain to 50 dB

0831 End turn, start line 232, New line plan (San Pablo 3), New SBP Line

0847 MB along track -2

0935 Beginning turn line 233

0958 Strong current making it difficult to get online

1000 Begin line 234

1009 Bridge unable to hold course, switching back to previous line plan, begin line 235

1031 XBT 92 conducted, applied to line 0235

1206 Start line 0236 – turn.

1207 Cut SBP for turn.

1218 Start 237 turn.

1219 Heading accuracy 0.506

1200 Line plan was shifted 2,200 m to make up for sea state and current.

1230 Start line 238 – survey/change SBP line

1230 SBP settings changed to 32 ms pulse, range 500, gain 34

1327 XBT 093 cast.

1332 XBT 093 applied to line 0238.

1430 End line 0238. Start line 0240.

1432 SV Profile yellow

1442 Start new SBP line. Changed gain to 40 and range to 1000.

1510 XBT 094 cast, but looks like wire touched ship. Files deleted.

1515 XBT 095 cast.

1516 SV went red for a moment, then back to yellow.

1524 XBT 095 applied to line 239.

150 SV Profile is yellow again.

1557 SV Profile is white.

1600 Changed MB min depth to 2000 m

1605 Wiggle in ship trackline because bridge had to change steering pumps.

1630 Begin line 240.

1725 End SBP line, start new: range = 500, pulse = 16, gain = 39

1817 XBT 096 cast.

1822 XBT 096 applied to line #240.

1823 Begin line #241 – turn.

1847 Begin line #242 and cut SBP.

1938 Gain changed to 53dB-started new line at 1,000 range

2004 Start line 0243 mb

2009 Start line 0245 DO NOT PROCESS line 244

2021 Start line 246

2026 Start line 247- change SBP line gain 55

2041 Along direction changed to due to bad coverage

2051 Conducted XBT 097

2057 Applied XBT 097 to line 247

2103 Start SBP line, gain 39

2107 Change along direction back negative to -5

2118 New SBP line with gain 50

2130 New SBP line, gain 35dB

2210 Asked to pull back speed to 7.5-8 kts

2226 Start line 0248

2247 Start SBP line, Gain 40dB

2257 Conducted XBT098

2311 Applied XBT 098 to line 0248

2312 SVP profile applied and SVP profile turned RED -> tried reprocessessing, repeat XBT

2316 Conducted XBT 099

2321 XBT applied to line 0248

2346 Start SBP line, Gain 36

2359 Start SBP line, Gain 55

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0004 Conducted XBT 100

0017 Applied XBT 100 to line 0248

0026 Started line 0249

0042 Requested shift to starboard 500m. Now on line.

0111 Start SBP line, gain 43dB

0120 asked bridge to do next line 3,800 south of current line and head west

0124 End survey line 249, start turn 250. Start now SBP

0147 End line 0250, start line 0251, new SBP line with Gain 47

0217 Conducted XBT 101

0223 XBT 101 applied to line 0251

0257 Start SBP line, gain 35 dB

0316 Start line 0252 and SBP for transit to new line plan

0327 Conducted XBT 102

0333 Applied XBT 102 to Line 0252

0348 Start SBP Line, Gain 47 dB

0359 Start line 0253 and SBP for turn

0425 Begin line 0254

0506 SBP Gain 40 dB

0515 XBT 103 applied to line 254

0540 SBP gain 50 dB

0625 Turn line 255

0636 Start line 256

0754 XBT 104 applied to line 256

0902 XBT 105 applied to line 257

0921 New SBP line, set Tx to 2 and gain at 43 dB

0957 XBT 106 applied to line 257

1012 New SBP line; set Tx:3, range: 1000, dB at 84

1034 6 dB SBP gain and Tx:2

1058 61 db SBP gain

1115 29 dB SBP gain

1124 46 dB SPB gain

0836 Start line 257

1036 Start line 258

136 Begin line 259

1244 Begin line 260- turn

1253 XBT107 cast. KVM down, ET had to reset Raritan KVM units, then we logged back into mission computers

1316 New SBP file

1317 XBT 107 applied to line 260

1322 New SBP file, pulse=32, power=3, gain=40, range=200

1346 Start MB line 0261- start SB line survey changed gain to45db

1424 SBP range changed to 500m

1447 Changed SIS min/max 800/5500

1448 Slowing to 6 knots ~30min because another vessel

1455 Bridge called maintaining speed of 7.5-8 kts vessels going to the left of us

1505 EK60 lost bottom

1514 Changed 302 tilt to zero. Min/Max angles to 40/40

1546 Start line 2

1606 Start line 263- turn; end/start SBP

1622 Start line 264, end/start SBP

1627 XBt 108 cast

1634 XBT 108 applie to line 264

1730 Fire Drill. Watch is watching safety videos. Derek in control room.

1749 Asked bridge to increase speed to 8-8.5 knots.

1802 End survey line 264, start turn line 265

1805 End turn line 265 start survey line 266 start new SBP line, pulse=16, power=3, range=100, gain=37

1817 Changed 302 max angles to 70/70

1827 302 max/min depths 2500-5000m

1845 Start line 0267-starting motor propulsion test for engineers. (10 min)

1924 XBT 109 cast. Spikes in SV profile- did not use.

1928 XBT 110 cast

1935 XBT 110 applied to line 267

1947 Begin line 268

2010 Changed long direction for 0 to -5.

2049 XBT 111 conducted

2055 Applied XBT 111 to line 0268

2059 EK60 SBP and MB having tough time tracking bottom rough waves hitting head on

2117 Start line 0269 and SBP line for turn

2129 Start line 0270 and SBP line fore-run previous survey line SBP gain 34db

2135 Start line 271 Survey

2150 Cut SBP line, change gain to 47dB

2255 Cut SBP line, reduced power to 2. Gain 41dB

2259 Conducted XBT 0112

2304 Applied XBT 112 to line 0272

2303 Start line 0272 and SBP for turn and transit, gain 80

2324 Start line 0273 and SBP, on survey line, increase power 3

2325 Beams RED, all sonars having tough time finding bottom, Beams: 131/432, Depth Red: 5098

2328 Beams and depth no longer RED, EK60 still hard to locate bottom

2330 Start new SBP line, decrease power 2, gain 75

2334 Change Beam angle to 65/65

2341 Changed EK pulse to 2048 and depth 1600m

2352 Start SBP line, decrease gain to 33dB

2355 Start SBP line, gain 67dB

JD 236 August 24, 2014

0017 Changing settings on EM60/ SBP to try to find bottom.

0056 Cut line, start line 0274, SBP for transit to next line

0109 Conducted XBT 113

0115 Applied XBT 113 to line

0113 Start line 0275, and SBp on survey line, gain 80d

0131 New SBP line, decrease gain to 65dB

0140 New SBP line, decrease gain to 27dB

0149 SBP power 1, pulse 8ms, range 500m, newline

0152 New Ek file, pulse=1024, power=800 watts

0207 Stop survey line 275, turn line 276, New SBP line for turn

0226 Start line 0278, new SBP, gain 32db

0226 Asked to bring survey speed from 7.0-7.6kts to 8.5-9kts

0240 Reduced survey speed due to rough conditions

0250 Start new SBP line, power 2, pulse 16ms, range 1000m, gain 45dB

0320 Start new line 0278, new SBP for turn

0324 Start line 0279 and new SBP on survey line.

0416 56 dB Gain

0500 Gain 39 dB, Range 200 for flat on SBP

0500 Start line 0280, new SBP

0505 XBT 114 Conducted, applied to line 0280

0552 XBT 115 applied to line 280

0803 New SBP line, range 500

0837 No XBT due to lightening

0846 New SBP line, gain 53 dB

0851 New SBP line, range 1000

0856 New SBP line, gain 85 dB

0920 SBP new line, gain 94 dB

0934 SBP new line, gain 96 dB

0945 SBP new line, gain 81 dB

0954 New line 0284, SBT set Tx: 2 and gain @ 74 dB

1015 SBT 116 applied to line 0284

1046 New SBP line, set gain to 69 dB

1108 Gain change SBP 56 dB

1148 New SBP line, Tx: 3, gain: 74 dB

1259 New SBP line range = 200, gain = 51, pulse = 8 ms

1308 Begin line 286 – turn. Break SBP line.

1345 Begin line 287.

1350 XBT 117 cast.

1356 XBT 117 applied to line 287.

1546 Begin line 58.

1657 XBT 118 cast

1701 XBT 118 applied to line 288

1709 Start line 289 turn

1710 SBP line advanced turn

1737 Start line 290 survey and SBP

1750 Shifts 150m to starboard side

1801 Shift complete

1818 Shift back and organized line plan 150m to port

1823 Shift complete

1930 bow thruster hydraulic test

1937 End line 0290. Start line 0291

1945 Testing complete

2011 Reduced power to 2 on SBP, gain 37dB

2008 XBT cast 119

2013 XBT 119 applied to line 291

2028 Start line 0292 and cut SBP for transit to next line decrease to gain to 45db

2124 Start line 0294 and SBP for turn

2131 Start line 0295 and SBP on survey line

2212 Start new SBP line, reduced power to 2, phase 8ms, gain 35dB

2205 Changed 302 tilt to -2

2213 302 Max depth 3000

2229 XBT cast 120

2235 XBT 120 applied

2200 Enabled “slope” filtering 302 (this being off may cause erroneous soundings)

2246 Start new SBP line, increase gain to 45db

2331 Start line 0296

2338 New SBP line, decrease power to 1, gain 35dB

2357 Start new SBP line, reduce gain to 29dB

JD 237 August 25,2014

0008 Start new SBP line, increase gain to 50dB

0025 New SBP line, increase power to 2, pulse 16ms, gain 60dB

0034 New SBP line, increase power to 3, gain 60dB

0100 New SBP line, decrease power to 2, range 500m gain 40dB

0102 Start line 0297 and SBP for turn

0113 Start line 0298 and SBP for transit to next line, pulse 8ms

0131 Start line 0299 and SBP for turn

0142 Start line 300 and SBP on survey line

0149 Conducted XBT 121

0155 Applied XBT 121 to line 0300

0153 Asked bridge to slow down due to waves, 7.5-8

0157 New SBP line, range inc to 1000m. gain 55dB

0244 MB 302 losing bottom due to rough waves

0251 New SBP line, reduce to power 1, gain 50 dB

0300 New SBP line, inc. power to 2, pulse 16ms

0334 XBT #122

0340 XBT #122 applied to line 0300

0343 Start line 0301

0430 Changed along direction from -2 to -4, appears to improve data quality

0602 Applied XBT 123 to line 0302

0616 Start line 0303 for turn

0616 New SBP line, gain 42 dB

0659 Start line 0304

0659 New SBP line, gain 45 dB

0827 XBT #124 applied to line 0304

1007 New SBP line, gain set to 83 dB

1037 New SBP, TX:3, gain set to 83dB

1050 XBT 125 applied to line 305

1117 Asked bridge to swatch from 270° to 90° turns

1140 Begin line 307 turn line gain SBP 74

1210 End line 307. Start line 308 (Turn is over)

1211 Cut SBP line. Gain @ 35dB

1240 Stopped and started SBP line changed range and gain values

1254 Shifted 1,000 to starboard to fill gap

1257 EM302 min depth to 2500

1309 Changed line North (to port) 800m

1357 SBP start new line changed range

1357 XBT #126 cast

1404 XBT #126 applied to line 0308

1411 End line 0308. Start line 0309

1611 End line 0309. Start line 0310

1626 Begin line 311 turn. End/Begin SBP

1647 Bridge slowing to 6kts for about 40 min for traffic

1706 XBT #127 Cast

1712 XBT #127 applied to line #311

1729 Begin line #312

1902 Start line 0313- turn/advanced line for SBP

1904 SBP pulse length changed to 16ms

1933 Start line 0314- Survey line

1946 Conducting XBT #128

1950 XBT#128 applied to line 0314

2027 New SBP line gain increase to 60dB

2043 New SBP line reduce power to 2

2148 Survey line 315 end, turn 316 begin, new SBP

2157 End turn, 316 start survey line 317, new SBP

2200 XBT#129 cast

2211 XBT#129 applied to line 317

2246 Start new SBP line, gain 40dB

2254 Increased power to 3 on SBP

2317 Start line 0318 and SBP for turn

2327 Stat line 0319 and SBP, on survey line

2345 Moved survey line 800m south (starboard), coverage power due to sea state

JD 238 August 26, 2014

0008 Changing 302 tilt to -5

0028 Start new SBP line, gain 49

0031 Shifted lines another 300m south, pitch and roll bad, data poor

0057 Conducted XBT 130

0104 Applied XBT 130 to line 319

0052 Tried aeration filter on 302- didn’t seem to help, turned it off switched min/max to 35/35

0117 New SBP line, gain 80db

0127 Start line 0320, loss of data cannot find bottom

0315 XBT Cast #131

0325 Applied XBT #131 to line 320

0320 Turned off slope filter on 302

0407 New SBP line, Tx:3, gain at 96 dB

0502 Ending line 0321 early, start line 0322; in flat terrain

0503 New SBP line

0513 Moved line spacing 700 m north

0522 Start line 323

0526 Saw edge of seamount going back to originalline

0541 Begin line 325

0555 XBT cast #132, applied to line 325

0600 New SBP line, Tx: 3, Pulse: 32 ms, Gain: 45 dB

0619 New SBP line, set range to 1000 m

0640 New SBP line, range 500 m, Gain 96 dB

0648 Begin turn line 0326, line spacing 2200 m

0815 XBT # 133, applied to line 0327

0709 Start line 327

0845 Change SBP range 1000

1041 XBT #134, applied to line 328

1054 Bridge is shifting line south 700 m for data gap coverage to 1500 m line spacing

1114 New SBP line, Gain @ 71 dB

1322 Begin line # 331

1348 XBT#135 cast/ Not applied due to spikes

1356 XBT# 136 cast

1402 XBT#136 applied to line 331

1417 New SBP file reduced SBP pulse to 16, range = 100, gain = 37dB

1448 End Manning survey line 331, start transit line 332. We are not going to do Sheldrake/Gosnold crossline today. Going to port as directly and quickly as possible.

1503 Have switched 302 tilt from -6 to zero. No much pitch right now.

1739 Conducting XBT#137

1746 Applied XBT#137 to line 333

1826 9-10kts heading accuracy is 0.810

1846 Start line 334

2016 XBT Cast #138

2021 XB #138 applied to line 334

2045 Start line 0335

2204 XBT cast #139

2209 Applied XBT 139 to line 0335

2145 Start line 0336

JD August 27, 2014

0054 XBT Cast #140

0103 Applied XBT 140 to line 336

0410 XBT #141 conducted, applied to line 0338

0419 New SBP line, range 500, gain 40 dB

0508 Range 1000

0534 SBP range 100, gain 39 dB

0624 SBP range 200

0636 XBT 142 to line 339

0742 SBP 143 to line 340

1001 SBP range 500 gain 33 dB

1008 XBT #144 conducted, applied to line 0341

1019 Sound velocity changed near the seamount, need new XBT cast

1021 XBT #145 conducted, applied to line 0341

1022 New SBP line, gain 61 dB

1045 Start line 0342

1114 SBP gain 55 dB

1213 Stopped SBP line

1245 End line 0342 Start line 0343

1336 XBT #146 applied to line 0343

1341 XBT #146 applied to line 343

1445 End line 0343. Begin line 0344

1456 XBT#147 cast

1501 XBT #147 applied to line 0344

1646 End line 0344. Begin line 0345

1702 XBT 148 cast

1707 XBT 148 cast

1845 Begin line 346

1957 Changed SBP file, gain 27 dB, pulse = 8 ms

2022 Changed Tx Pulse to 16 ms from 8 ms, restarted ecolong

2045 Start line 0347

2043 Conducted XBT 0149

2050 Applied XBT 0149 to line 0347

2152 Conducted XBT 0150

2157 Applied XBT 0150 to 0347

2246 Start line 0348

2259 New SBP line, gain 38 db

2338 New SBP line, gain 50 dB

2355 New SBP line, gain 42 dB, Power 1

JD August 28, 2014

0009 Conducted XBT 151, applied to line 348

0004 Conducted XBT 152

0112 Applied XBT to line 349

0116 Start newEK60 line and SBP line pulse 4 ms, gain 30, EK60 pulse 512 vs. 600 w power

0225 Conduct XBT 0153

0229 Applied XBT 0153 to line 0349

0244 Start line 0350

0418 SBP range 10m, gain 3dB

0615 XBT #154 to line 0350

0710 XBT #155 to line 0352

0846 SHUT DOWN SURVEY OPS AT 50m