

Appendix B CCGS Earl Grey Vessel Life Extension Electronic Items

Specification No: 14-E006-009-5

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TABLE OF CONTENTS

TABLE OF CONTENTS	1
1.0 ELAC ES5100 ECHO SOUNDER INSTALLATION	4
1.1 IDENTIFICATION	4
1.2 REFERENCES	4
1.2.1 Drawings and Documents	4
1.2.2 Standards	4
1.2.3 Regulations	4
1.3 TECHNICAL	4
1.3.1 Removal of ELAC LAZ 72 Echo Sounder System	4
1.3.2 Associated Cable List.....	5
1.3.3 Disposal and Care / Custody of removed equipment.....	7
1.3.4 Installation of ELAC ES5100 Echo Sounder System	7
1.3.5 Cable installation.....	8
1.3.6 Government Furnished Equipment	9
1.3.7 Material to be supplied by Contractor.....	9
1.4 SET TO WORK / COMMISSIONING	10
1.5 DOCUMENTATION	10
2.0 ICE HOUSING REPLACEMENT (REFIT).....	11
2.1 SCOPE	11
2.2 REFERENCES	11
2.2.1 Drawings and Documents.....	11
2.2.2 Standards	11
2.2.3 Regulations	11
2.3 TECHNICAL	11
2.3.1 Removal of existing Ice Housing.....	11
2.3.2 Disposal and Care / Custody of removed equipment.....	12
2.3.3 Installation of Ice Housings.....	12
2.3.4 Government Furnished Equipment	13
2.3.5 Material to be supplied by Contractor.....	13
2.4 SET TO WORK / COMMISSIONING	13
3.0 TV DISTRIBUTION BACKBONE SYSTEM UPGRADE (REFIT)	14
3.1 IDENTIFICATION	14
3.2 REFERENCES	14
3.2.1 Drawings and Documents.....	14
3.2.2 Standards	14
3.2.3 Regulations	14
3.3 TECHNICAL	14
3.3.1 Removal of existing TV Distribution System.....	14
3.3.2 Installation of New TV Distribution System.....	15

3.3.3	<i>Government Furnished Equipment</i>	17
3.3.4	<i>Material to be supplied by Contractor</i>	17
3.4	SET TO WORK / COMMISSIONING	17
3.5	DOCUMENTATION	18
4.0	DOPPLER SPEED LOG SYSTEM NAVIKNOT 450D INSTALLATION	19
4.1	SCOPE	19
4.2	REFERENCES	19
4.2.1	<i>Drawings and Documents</i>	19
4.2.2	<i>Standards</i>	19
4.2.3	<i>Regulations</i>	19
4.3	TECHNICAL	19
4.3.1	<i>Welding</i>	19
4.3.2	<i>Removal of Doppler Speed Log SRD-331 System</i>	20
4.3.3	<i>Disposal and Care / Custody of removed equipment</i>	22
4.3.4	<i>Installation of Doppler Speed Log Naviknot 450D</i>	22
4.3.5	<i>Grounding</i>	24
4.3.6	<i>Cable installation</i>	24
4.3.7	<i>Government Furnished Equipment</i>	25
4.3.8	<i>Material to be supplied by Contractor</i>	25
4.4	SET TO WORK / COMMISSIONING	26
4.5	DOCUMENTATION	27
5.0	LOCAL AREA NETWORK (LAN) BACKBONE	28
5.1	SCOPE	28
5.2	REFERENCES	28
5.2.1	<i>Drawings and Documents</i>	28
5.2.2	<i>Standards</i>	28
5.2.3	<i>Regulations</i>	28
5.3	TECHNICAL	28
5.3.1	<i>Removal of existing LAN System</i>	28
5.3.2	<i>Disposal and Care / Custody of removed equipment</i>	30
5.3.3	<i>Installation of New LAN</i>	30
5.3.4	<i>Cable installation</i>	30
5.3.5	<i>Government Furnished Equipment</i>	32
5.3.6	<i>Material to be supplied by Contractor</i>	32
5.4	SET TO WORK / COMMISSIONING	33
5.5	DOCUMENTATION	33
6.0	FLEET BROADBAND 500 (FBB500) INSTALLATION	34
6.1	SCOPE	34
6.2	REFERENCES	34
6.2.1	<i>Drawings and Documents</i>	34
6.2.2	<i>Standards</i>	34
6.2.3	<i>Regulations</i>	34

6.3	TECHNICAL	34
6.3.1	<i>Removal of NERA B Satcom System</i>	34
6.3.2	<i>Disposal and Care / Custody of removed equipment</i>	37
6.3.3	<i>Installation of Fleet Broadband 500</i>	37
6.3.4	<i>Grounding</i>	37
6.3.5	<i>Government Furnished Equipment</i>	37
6.3.6	<i>Material to be supplied by Contractor</i>	38
6.4	SET TO WORK / COMMISSIONING	38
6.5	DOCUMENTATION	38
7.0	MASTERCLOCK SYSTEM REPLACEMENT	39
7.1	SCOPE	39
7.2	REFERENCES	39
7.2.1	<i>Drawings and Documents</i>	39
7.2.2	<i>Standards</i>	39
7.2.3	<i>Regulations</i>	39
7.3	TECHNICAL	39
7.3.1	<i>Removal of existing CCTV System</i>	39
7.3.2	<i>Disposal and Care / Custody of removed equipment</i>	40
7.3.3	<i>Installation of New Masterclock System</i>	40
7.3.4	<i>Cable installation</i>	42
7.3.5	<i>Government Furnished Equipment</i>	43
7.3.6	<i>Material to be supplied by Contractor</i>	43
7.4	INSPECTIONS / COMMISSIONING	43
7.5	DOCUMENTATION	44

1.0 ELAC ES5100 ECHO SOUNDER INSTALLATION

1.1 Identification

- 1.1.1 The intent of this specification is to replace the existing ELAC LAZ 72 Echo Sounder system with the new ELAC ES5100 Echo Sounder.

1.2 References

1.2.1 Drawings and Documents

- 1.2.1.1 Existing Echo Sounder System drawings (Reference for Removal):
- a) Dwg. MM678-006-WD (RDF/ LORAN/ECHO SOUNDER)
 - b) Dwg. MM678-033-WD (ECPINS)
 - c) Dwg. MM678-046-WD (GPS Distribution)
 - d) New ELAC ES5100 Echo Sounder System drawing (Reference for Installation):
 - e) Dwg. MM678-063-WD

1.2.2 Standards

- a) Fleet Safety and Security Manual (DFO/5737)
- b) TP127 – Ship’s Electrical Standards
- c) TP3668E – Standards for Navigating Appliances and Equipment
- d) IEEE 45:2002 – Recommended Practice for Electrical Installation on Ships
- e) Specification for the Installation of Shipboard Electronic Equipment (70-000-000-EU-JA-001)

1.2.3 Regulations

- a) Canada Shipping Act, 2001

1.3 Technical

1.3.1 Removal of ELAC LAZ 72 Echo Sounder System

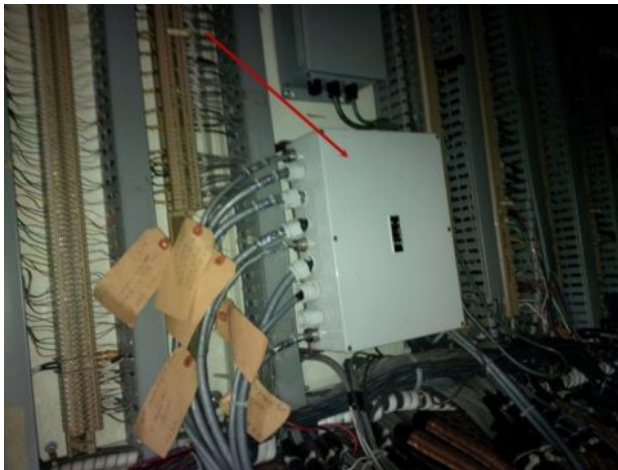
- 1.3.1.1 The Contractor is responsible to remove and re-install to “as delivered” conditions any wall or ceiling panels, or any other type of obstruction in way of wire or component access.
- 1.3.1.2 Remove the ELAC LAZ 72 Echo Sounder Main Display Unit and associated cables from Port end of the Navigation (Nav) Console except the existing AC feed (IE3-16) from swivel base which is required for the new display. Leave swivel base in place to mount the new display unit on. See Photo 1 below for location of Display Unit. See cable list below for all associated cables.

Photo 1



- 1.3.1.3 Remove the ELAC BCD Distribution AK 75 Box from under Steering Console Forward and all associated cables. See Photo 2 below for location of ELAC AK75 BCD Distribution Box. See cable list below for all associated cables.

Photo 2



- 1.3.1.4 Remove the 4 Remote Displays from Steering Console Forward (DAZ13), Port and Starboard Wing Consoles (DAZ15's) and the Aft Winch Control Console (DAZ15) and associated cables back to terminal strip in Consoles. See cable list below for all associated cables.

1.3.2 Associated Cable List

- 1.3.2.1 Remove all associated cables from units above, for reference see DWG# MM678-006-WD and list below.

DI 1-2T from the Main Display Unit to the Transducer Junction Box located in the Engine Room part way down ladder forward bulkhead. See photo below.



DI 1-2 from Main Display Unit to BCD Distribution AK 75 under Steering Console Forward.

DI 1-3 from Main Display Unit to BCD Distribution AK 75 under Steering Console Forward.

DI 1-3 from the BCD Distribution AK 75 under Steering Console Forward to Terminal Block 63 under Steering Console Forward.

DI 2-2 from the BCD Distribution AK 75 under Steering Console Forward to Skipper Sounder on Starboard end of Navigation Console.

DI 3-3 from the BCD Distribution AK 75 under Steering Console Forward to DAZ13 Remote on Starboard wing Console. Terminal Strip in Wing Console (TB87).

DI 3-2 from the BCD Distribution AK 75 under Steering Console Forward to Terminal Block 63 under Steering Console Forward.

DI 3-4 from the BCD Distribution AK 75 under Steering Console Forward to DAZ13 Remote on Port wing Console. Terminal Strip in Wing Console (TB86).

DI 3-5 from the BCD Distribution AK 75 under Steering Console Forward to DAZ13 Remote on Aft Winch Control Console. Terminal Strip (TB69) in Aft Console.

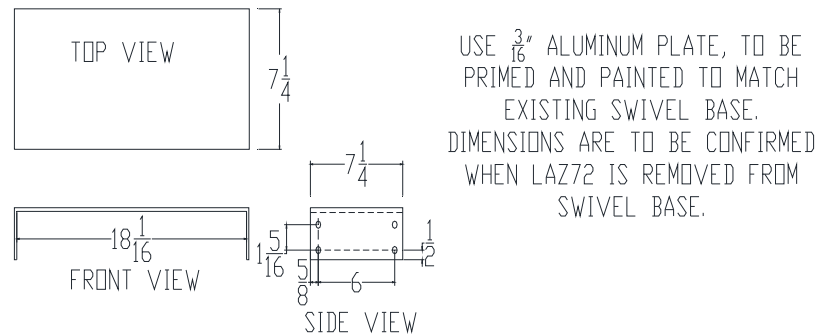
EC-4 from Skipper Sounder to ECPINS MVME 705A Port #1 Pins 3/7

1.3.3 Disposal and Care / Custody of removed equipment

- 1.3.3.1 All removed equipment (Master Display Unit, Remote Displays DAZ13 and DAZ15 (x3) and the BCD Distribution AK75) are to be stored and returned to Canada as Category “A” property. All removed cables are to be properly disposed of as Category “C” property.

1.3.4 Installation of ELAC ES5100 Echo Sounder System

- 1.3.4.1 Install the ES5100 Display and Control Unit on the existing swivel base where the ELAC LAZ72 Display was removed, Port end of Navigation Console; an adapter plate will be required. See drawing below for reference. Use 3/16” aluminum plate to fabricate mounting plate, prime and paint to match existing swivel base. The dimensions are to be confirmed when LAZ72 is removed from the existing Swivel base.



- 1.3.4.2 Install an A/B Data switch on the port end of the Navigation Console near the ES5100 Display and Control Unit noted above.
- 1.3.4.3 Install 2 Mini Expander's under the port end of the Navigation Console in the cabinet where the Taiyo MF/HF DF was removed. Retaining straps will be required to hold the Mini Expanders in place.
- 1.3.4.4 Install an AC receptacle to be used for the 115-24-10 Newmar Power Supply. Terminate the old AC feed from Taiyo IE3-9 in the receptacle.

- 1.3.4.5 Install the 115-24-10 Newmar Power Supply in locker at Port end of Navigation Console.
- 1.3.4.6 Install the Remote Digital Indicator Junction Box in locker at the Port end of Navigation Console.
- 1.3.4.7 Install four (4) DAZ 25 Remote Digital Indicators where the old remote displays were removed, Steering Console Forward, Port Wing Console, Starboard Wing Console and the Aft Winch Control Console. The existing holes may have to be modified to fit new remotes.
- 1.3.4.8 Install a #12 green ground wire from the Earthing Point of the system components to a suitable grounding point on the ship.
- 1.3.4.9 Install an AC receptacle in the Cabinet Port End Navigation Console to be used for the ES5100 Display Terminate the old AC feed from ELAC LAZ 72 IE3-16 in the receptacle.

1.3.5 Cable installation

Install, label, and terminate the following cables as per drawing # MM678-063-WD:

CABLE LABEL	CABLE TYPE	FROM	TO
ES-1	Belden 8408	Connection Box Honeywell ELAC ¼ way down Engine Room	ELAC ES5100 on Port End of Nav Console (X1)
ES-2	Belden 9322	DD20-A GPS distribution O/P G pin 8/9	ELAC ES5100 on Port End of Nav Console (X4)
ES-3	Belden 9322	ELAC ES5100 on Port End of Nav Console (X8)	A/B Switch Port A on Port End of Nav Console
ES-4	Belden 9322	Skipper GDS 101 J-303	A/B Switch Port B on Port End of Nav Console
ES-5	Belden 9322	A/B Switch on Port End of Nav Console	Echo Sounder Expander A located in Cabinet on Port End of Nav Console
ES-6	Belden 9322	Echo Sounder Expander A O/P 4 located in Cabinet on Port End of Nav Console	Echo Sounder Expander B located in Cabinet on Port End of Nav Console
ES-7	Belden 9514	Echo Sounder Expander B located in Cabinet on Port End of Nav Console	Remote Digital Indicator Junction Box located in Cabinet on Port End of Nav

			Console
ES-8	Belden 9316	24VDC Newmar Power Supply Unit located in Cabinet on Port End of Nav Console.	Remote Digital Indicator Junction Box located in Cabinet on Port End of Nav Console
ES-9	Belden 9513	Remote Digital Indicator Junction Box located in Cabinet on Port End of Nav Console	DAZ 25 Digital Remote Steering Console Fwd Bridge
ES-10	Belden 9513	Remote Digital Indicator Junction Box located in Cabinet on Port End of Nav Console	DAZ 25 Digital Remote Starboard Wing Console
ES-11	Belden 9513	Remote Digital Indicator Junction Box located in Cabinet on Port End of Nav Console	DAZ 25 Digital Remote Port Wing Console
ES-12	Belden 9513	Remote Digital Indicator Junction Box located in Cabinet on Port End of Nav Console	DAZ 25 Digital Remote Winch Control Console Aft Bridge
ES-13	Belden 9322	Remote Digital Indicator Junction Box located in Cabinet on Port End of Nav Console	Echo Sounder Expander A located in Cabinet on Port End of Nav Console
ES-14	Belden 9322	Remote Digital Indicator Junction Box located in Cabinet on Port End of Nav Console	Echo Sounder Expander B located in Cabinet on Port End of Nav Console
EC-4	Belden 9322	Echo Sounder Expander A located in Cabinet on Port End of Nav Console	ECPINs Cabinet, Starboard side Bridge, MVME 705A, Port 1 pins 3/7

1.3.6 Government Furnished Equipment

1.3.6.1 ELAC ES5100 Echo Sounder System complete with (x4) DAZ 25 Digital Remotes, (x2) Mini Expanders, Newmar 24VDC Power Supply (115-24-10) and A/B Selection Switch.

1.3.7 Material to be supplied by Contractor

1.3.7.1 The Contractor must supply and install:

- a) 70 meters of Belden 8408 cable;
- b) 25 meters of Belden 9322 cable;
- c) 2 meters of Belden 9514 cable;

- d) 2 meters of Belden 9316 cable;
- e) 40 meters of Belden 9513 cable.

1.3.7.2 For the purpose of adjustments, the Contractor must include a unit cost per 1 meter for the supply and install for 10 meters for each of these cable types:

- a) Belden 8408;
- b) Belden 9322;
- c) Belden 9514;
- d) Belden 9316;
- e) Belden 9513.

1.3.7.3 The Contractor must supply the following:

- a) #6 Green Ground Wire;
- b) (x2) AC outlets complete with boxes, receptacles and plates;
- c) Junction box c/w terminal strips (as shown in MM678-063-WD);
- d) Adaptor plate for ES 5100 Echo Sounder Main Display Unit and DAZ 25 Remote Displays;
- e) All materials required to complete statement of work;
- f) All cables are to be properly secured in existing cable trays, in locations where trays do not exist, appropriate hangers are to be installed.

1.4 Set to Work / Commissioning

1.4.1 The Contractor must arrange for OEM authorized field service representatives (FSR) to conduct the set to work and commissioning of the ELAC ES5100 Echo Sounder System in the presence of the TA and IA.

1.4.2 The FSR must complete installation report as referred to in Section 2.2.5 of manual. Installation report and check can be found in the Technical Manual LAZ 5100 / ES 5100 in chapter 5.1.4. A copy must be sent to ELAC Nautik service centre and one return to the Technical Authority upon completion.

1.5 Documentation

1.5.1 The Contractor must ensure that the Manuals supplied with the new equipment unit are returned to the Technical Authority prior to the acceptance of this item.

1.5.2 The Contractor must ensure a copy of the FSR installation report and check is submitted to the Technical Authority.

1.5.3 The Contractor must revise all “As Fitted” drawings as required in Section 6.1.6 of this Specification.

2.0 ICE HOUSING REPLACEMENT (REFIT)

2.1 Scope

2.1.1 The intent of this specification is to replace the two existing Ice Housings.

2.2 References

2.2.1 Drawings and Documents

2.2.1.1 Existing Echo Sounder System drawings (Reference for Removal):

- a) Dwg. MM678-006-WD (RDF/ LORAN/ECHO SOUNDER)
- b) Dwg. MM678-001-GA (General Arrangement)
- c) New ELAC ES5100 Echo Sounder System drawing (Reference for Installation):
- d) Dwg. MM678-063-WD

2.2.2 Standards

- a) Fleet Safety and Security Manual (DFO/5737)
- b) TP127 – Ship’s Electrical Standards
- c) IEEE 45:2002 – Recommended Practice for Electrical Installation on Ships
- d) Specification for the Installation of Shipboard Electronic Equipment (70-000-000-EU-JA-001)

2.2.3 Regulations

- a) Canada Shipping Act, 2001

2.3 Technical

2.3.1 Removal of existing Ice Housing

2.3.1.1 Disconnect and remove all cables from the Sounder Junction Box (J.B.) located quarter of the way down the Engine Room stairs (Frame 32). Remove old Sounder J.B. See photo 1 below for reference:

Photo 1



- 2.3.1.2 In order to access the Ice Housing the Water Ballast tanks (Port & Starboard) must be vented and gas freed by a marine chemist, it may be classified as a confined space. If so the confined space procedures must be followed to access location if required, as per the Fleet Safety and Security Manual (DFO/5737).
- 2.3.1.3 Pull transducer cables down to the Ice Housing locations (Between Frames 30&31). Remove the Top of the Ice Housings; remove transducer assembly from Ice Housing tops and set aside to be re-installed in new Ice Housings. Remove all castor oil and dispose of in accordance with applicable Federal, Provincial and Municipal regulations, and clean transducers prior re-installing in new Ice Housing after replacement.
- 2.3.1.4 Remove existing Ice Housings from the Hull.
- 2.3.2 Disposal and Care / Custody of removed equipment**
- 2.3.2.1 The removed Ice Housings must be stored and returned to Canada as Category “A” property.
- 2.3.3 Installation of Ice Housings**
- 2.3.3.1 Install the two Ice Housings where the old ones where removed.
- 2.3.3.2 Re-install the transducers in the tops of the newly installed Ice Housings. Supply and fill each of the housings with new Castor Oil. Re-assemble Ice Housings. The

TA must be provided the opportunity to inspect the installed housings at each stage of assembly.

2.3.3.3 Install new Sounder J.B. where existing was removed.

2.3.3.4 Re-route transducer cables back up to the new Sounder J.B. located where existing was removed. Re-connect all cables in Sounder J.B. as per reference drawing (Dwg. MM678-063-WD).

2.3.4 Government Furnished Equipment

- a) Two Ice Housings
- b) Sounder J.B.

2.3.5 Material to be supplied by Contractor

- a) Castor Oil
- b) All materials required to complete statement of work.
- c) All cables are to be properly secured in existing cable trays. In locations where trays do not exist, appropriate hangers are to be installed.

2.4 Set to Work / Commissioning

2.4.1.1 Once the vessel is back in the water the correct operation of the ELAC ES5100 and Skipper Sounder must be verified in accordance with the manufacturer's instructions and standards. The TA and IA must be in attendance for these tests.

3.0 TV DISTRIBUTION BACKBONE SYSTEM UPGRADE (REFIT)

3.1 Identification

- 3.1.1 The intent of this specification is to replace the existing TV Distribution Backbone system with new updated RG6 cable and equipment to have a balanced passive system within +/- 3dB at each drop.

3.2 References

3.2.1 Drawings and Documents

- 3.2.1.1 Existing TV Distribution System drawing (Reference for Removal):
- a) Dwg. MM678-013-BD
 - b) Dwg. MM678-048-BD (EMAIL AT SEA BLOCK DIAGRAM)
- 3.2.1.2 New TV Distribution System drawing (Reference for Installation):
- a) Strum Engineering Associates: Dwg # 001-212-E-3001.
 - b) Strum Engineering Associates: Dwg # 001-212-E-3001 (Showing Test signal injection point)

3.2.2 Standards

- a) Fleet Safety and Security Manual (DFO/5737)
- b) TP127 – Ship’s Electrical Standards
- c) IEEE 45:2002 – Recommended Practice for Electrical Installation on Ships
- d) Specification for the Installation of Shipboard Electronic Equipment (70-000-000-EU-JA-001)

3.2.3 Regulations

- a) Canada Shipping Act, 2001

3.3 Technical

3.3.1 Removal of existing TV Distribution System

- 3.3.1.1 The Contractor is responsible to remove and re-install to “as delivered” conditions any wall or ceiling panels, or any other type of obstruction in way of wire or component access.
- 3.3.1.2 The Contractor must remove and dispose of all components and cabling from the original TV/AM/FM Distribution System as Category “C” property. Starting after the Drake Amplifier DA-7533, start with cables AD-2 and AD-17 to all drop

locations as per Dwg. MM678-013-BD. The bulkhead boxes and wire mold are to remain in place as they will be used in the new installation.

3.3.2 Installation of New TV Distribution System

- 3.3.2.1 The contractor must install items 3 and 4 (Splitters) as per Strum Engineering Associates Dwg. #001-212-E-3001. All 3 and 4 way splitters are to be installed as close as possible to the identified frame location.
- 3.3.2.2 The contractor must install all Diplexers (DP) in the deck head directly above the outlet boxes except in the MCR where the diplexer must be mounted on the bulkhead directly underneath the printer on the Port bulkhead (No Bulkhead Box in MCR).
- 3.3.2.3 The Contractor must run 500m of new Belden 1694A (RG6) cable between devices all the way to the bulkhead boxes as per Strum Engineering Associates Dwg # 001-212-E-3001.
- 3.3.2.4 The contractor must run a Belden 1694A RG6 cable from the E-Mail at Sea rack in the Officer's Mess and Lounge to the Electronics Equipment room forward bulkhead behind the door and leave approximately 6m at each end locations for future use. The cable must be labelled at both ends and each side of bulkhead penetrations with cable label (SATTV-20).
- 3.3.2.5 For the purpose of adjustments, the Contractor must include a unit cost per 1 meter for the installation for 10 meters for this cable type.
- 3.3.2.6 The contractor must terminate all runs between the devices at the exception of the bulkhead box using FS6U connectors with crimp tool CPLCCT-SLM and tip LMTIP-S.
- 3.3.2.7 The contractor must terminate all runs at the bulkhead box using FS6US connectors with crimp tool CPLCCT-SLM and tip LMTIP-WP. These are to be mounted in the boxes using the wall plates, inserts and modules. The cable connected to the diplexer port label 10 – 806 MHz must be connected to the outlet side labelled TV. The other port label 950 – 2150 MHz must be connected to the un-label port.
- 3.3.2.8 All un-used port on the on the splitters and outlets must be terminated using a BTF-TP 75ohm Terminator.

3.3.2.9 The following locations are fitted with bulkhead boxes:

Bridge Deck:

- a) **Radar closet**

Forecastle Deck:

- a) Captain's Day Room;
- b) **Captain's Night Room;**
- c) Chief Engineer's Day Room;
- d) **Chief Engineer's Night Room;**
- e) Chief Officer's Cabin;
- f) Senior Engineer's Cabin;
- g) Logistic Officer's Cabin.

Boat Deck:

- a) **Seaman Cabin (x2)**
- b) Winchman and Spare Cabin
- c) **Quartermasters Cabin (x2)**
- d) 3rd Officer's Cabin
- e) 2nd Officer's Cabin
- f) Engineer's Office
- g) Seaman Cabin (x2) Amidships
- h) **Boatswain Cabin**
- i) Chief Cook's Cabin
- j) 2nd Engineer's Cabin
- k) 3rd Engineer's Cabin
- l) **Oiler's (x2)**
- m) **Ship's office**

Main Deck:

- a) **Seaman Cabin (x2)**
- b) Steward and Spare Cabin
- c) Steward and Spare cabin
- d) Officer's Mess and Lounge
- e) **Cadet's Cabin (x2)**
- f) Oiler and Spare
- g) Crew's Mess
- h) Crew's Lounge

Note: 10 of the above locations have a single wire mold going to the Bulkhead Box. Those locations in **bold above** may require an extra wire mold for the second cable from the duplexer if both runs don't fit down a single wire mold.

3.3.3 Government Furnished Equipment

- a) Belden 1694A RG6 Cable (600m)
- b) 4-Way Splitters (Blonder Tongue CAT No LPD-4 (x7)
- c) 3-Way Splitters (Blonder Tongue CAT No LPD-3P (x6)
- d) L-Band Diplexer (Blonder Tongue CAT No LUV-2150 (x31)
- e) FS6U Connectors (x143 required, supplied x175)
- f) FS6US Connectors (x60 required, supplied x70)
- g) Wall Plates Ivory (x29 required, supplied x35)
- h) Inserts and Modules Ivory (x58 required, supplied x60)
- i) Crimping tool CPLCCT-SLM (x1)
- j) Crimping tips LMTIP-S for FS6U and LMTIP-WP for FS6US (x2 ea)
- k) Prep Tool PSA59/6 (x1)
- l) BTF-TP 75ohm Terminator (x40)

Note: All extra material supplied with crimping and prep tools are to be returned to Canada upon completion.

3.3.4 Material to be supplied by Contractor

- 3.3.4.1 All materials required to complete statement of work. All cables are to be properly secured in existing cable trays. Contractor must report to the TA for his consideration if additional fixtures are required to secure cables.

3.4 Set to Work / Commissioning

- 3.4.1.1 The TV Distribution system must be tested by a CCG Technical representative to ensure all drops are balanced to within +/- 3dB from each other. A signal must be injected at the head end diplexer in the Electronic Equipment Room in the port labelled 10 – 806 MHz, the frequency must be set at 211.25 MHz and the level must be set at 0dB, measure signal dB level at each outlet labelled TV only. The outlets should all be within +/- 3dB of each other and the results must be entered in the table below. The Contractor must report the results of the testing to the TA.

Location	Injected signal at head	Signal level at outlet
Radar closet	211.25 MHz at 0dB	
Captain's Day Room		
Captain's Night Room		
Chief Engineer's Day Room		
Chief Engineer's Night Room		
Chief Officer's Cabin		
Senior Engineer's Cabin		
Logistic Officer's Cabin		
Seaman Cabin (x2)		
Winchman and Spare Cabin		
Quartermasters Cabin (x2)		
3rd Officer's Cabin		
2nd Officer's Cabin		
Engineer's Office		
Seaman Cabin (x2) Amidships		
Boatswain Cabin		
Chief Cook's Cabin		
2nd Engineer's Cabin		
3rd Engineer's Cabin		
Oiler's (x2)		
Ship's office		
Seaman Cabin (x2)		
Steward and Spare Cabin		
Steward and Spare cabin		
Officer's Mess and Lounge		
Cadet's Cabin (x2)		
Oiler and Spare		
Crew's Mess		
Crew's Lounge		
MCR		

3.5 Documentation

- 3.5.1 The Contractor must revise all "As Fitted" drawings as required in Section 6.1.6 of this Specification.

4.0 DOPPLER SPEED LOG SYSTEM NAVIKNOT 450D INSTALLATION

4.1 Scope

- 4.1.1 The intent of this specification is to replace the existing SRD331 Doppler Speed Log system with the new Naviknot 450D Speed Log. All Government Furnished Equipment are listed under Article 4.3.7.

4.2 References

4.2.1 Drawings and Documents

- 4.2.1.1 Existing SRD331 Doppler Speed Log System drawing (Reference for Removal):
- a) Dwg. MM678-009-WD (SRD331 Speed Log)
 - b) Dwg. MM678-033-WD (ECPINS)
 - c) Dwg. MM678-007-WD (GYRO)
 - d) Dwg. MM678-019-WD Sh1/3 (X&S Band Radar)
 - e) Dwg. MM678-025-WD (Aft Looking Radar)
 - f) New Naviknot 450D System drawing (Reference for Installation):
 - g) Dwg. MM678-062-WD
 - h) Sperry supplied electronic manual Stock No. 056800 Rev. P; Jan 2013

4.2.2 Standards

- a) Fleet Safety and Security Manual (DFO/5737)
- b) TP127 – Ship's Electrical Standards
- c) IEEE 45:2002 – Recommended Practice for Electrical Installation on Ships
- d) Specification for the Installation of Shipboard Electronic Equipment (70-000-000-EU-JA-001)
- e) Welding?

4.2.3 Regulations

- a) Canada Shipping Act, 2001

4.3 Technical

4.3.1 Welding

- 4.3.1.1 Gate valve located at frame 41 under the Bow Thruster must be replaced Ref: MM678-009-WD (SRD331 Speed Log); welding services will be required to remove the existing Gate Valve welded in Hull and GFE Gate Valve will have to be welded in place of the old Gate Valve. Welding must be done in accordance with Section 2.7 of the CCGS EARL GREY VLE Specification. Transducer will have to be removed first as noted in 4.3.2.

4.3.2 Removal of Doppler Speed Log SRD-331 System

- 4.3.2.1 The Contractor is responsible to remove and re-install to “as delivered” conditions any wall or ceiling panels, or any other type of obstruction in way of wire or component access.
- 4.3.2.2 The Contractor must remove all components and cabling from the original Doppler Speed Log SRD331 refers to Drawing. MM678-009-WD. Note: Breaker #10 in Panel IE3 in wheelhouse must be lock/tag out prior working on the system. Confirm with TA it is the correct breaker prior to lock/tag out system.
- 4.3.2.3 Remove the SRD331 Doppler Speed Log Control Display Unit and associated cables from Navigation Console. Retain the AC feed IE3-10 (from Breaker #10 panel IE3 in Wheelhouse), Remove Terminal Strip behind Control Display Unit. See cable list at 4.3.2.8.
- 4.3.2.4 See Photo1 below for location of Control Display Unit.

Photo 1:



- 4.3.2.5 Remove the Electronics Unit from the Bow Thruster Compartment and all associated cables.
- 4.3.2.6 Remove the Speed Log Transducer from the Gate valve in the Hull beneath the Bow Thruster, this work to be coordinated with the work in Section 24.0. See cable

list at 4.3.2.8. See Photo 2 below for location of Electronic Unit Bow Thruster Compartment.

Photo 2:



- 4.3.2.7 Remove the Port and STBD Remote Displays and associated cables from location shown in Photos 3/4 below. See cable list at 4.3.2.8.

Photo 3



Photo 4



- 4.3.2.8 Remove all remaining cables see DWG# MM678-009-WD and list below as a reference.

4.3.2.9 CABLE LIST

IE3-10-3 from Master Display back to Terminal strip in Nav Console
IE3-10-2 from Electronics Unit in Bow Thruster Compartment back to terminal strip in Nav Console remove Junction Box from Electronic Equipment Room
IE3-10-4 between STBD Wing Console Remote Display and Terminal strip in Nav Console

IE3-10-1 between Port Wing Console Remote Display and Terminal strip in Nav Console

DL-3 from Main Display Unit back to Junction Box in Electronic Equipment Room

DL-4 from Main Display Unit back to STBD Wing Remote Display

DL-5 from Main Display Unit back to Port Wing Remote Display

DL-6 from Main Display Unit back to Junction Box Located in Nav Console Forward STBD end

DL-3 from Electronics Unit in Bow Thruster Compartment up to Junction Box located in Electronic Room, Remove Junction Box as well.

LOG-GYRO (3)

Aft RDR-3 from Main Display Unit to Aft Looking Radar

XRDR 11 from Main Display Unit to X Band Radar

SRDR 12 from Main Display Unit to S Band Radar

EC-20 from Main Display Units to ECPINS cabinet SIU Distribution Card Port #3, TB2 pins 7/8

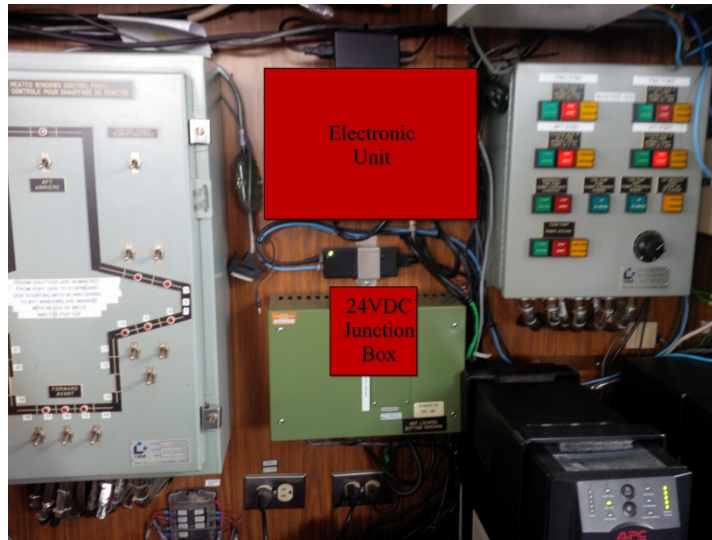
4.3.3 Disposal and Care / Custody of removed equipment

- 4.3.3.1 All removed equipment (Control Display Unit, Electronics Unit, Transducer c/w cable and Port and STBD wing Remote Displays) are to be stored and returned to Canada as Category “A” property. All other cables are to be disposed of as Category “C” property.

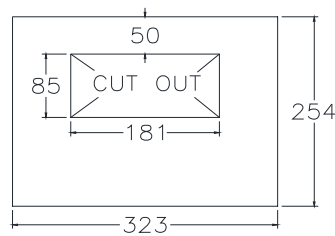
4.3.4 Installation of Doppler Speed Log Naviknot 450D

- 4.3.4.1 Install the Pre-Amplifier in Bow Thruster compartment where the Electronics Unit was removed see Photo 2 above. This work must be done in conjunction with the work being done in Section 24 of the CCGS EARL GREY VLE Specification.
- 4.3.4.2 Install the new Transducer inside the newly installed Gate valve, run cable along same route as original transducer cable and terminate in Pre-Amplifier as per supplied drawing, MM678-062-WD. Note: Ensure the Transducer is correctly aligned.
- 4.3.4.3 Install the Electronics Unit and 24VDC Junction Box in the forward Port side end of the Navigation Console where the RT146 Transceivers were previously removed, see Photo 5 below.

Photo 5:

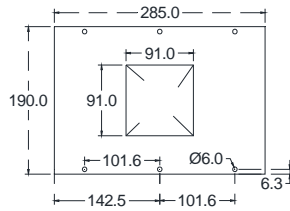


- 4.3.4.4 Install Power Supply Unit where terminal strip was removed behind old SRD331 Control and Display Unit.
- 4.3.4.5 Install Control Display Unit in location of removed SRD331 Control Display Unit in the Navigation Console as per Photo 1 above. An adaptor plate will be required to mount the new CDU in Navigation console, see below for plate dimension and cut out.



MAKE PLATE FROM $\frac{3}{16}$ ALUMINUM,
PLATE TO BE POWDER COATED
BLACK, DIMENSION SHOWN IN MM.

- 4.3.4.6 Install Universal Digital Remotes and associated junction boxes in location of removed SRD331 Remote Display Unit on the Port and STBD Wing Console as per Photos 3/4 above. An adaptor plate will be required to mount the new Universal Remote Display in Port and STBD wing consoles, see below for plate dimension and cut out.



MAKE PLATE FROM $\frac{3}{16}$ ALUMINUM,
PLATE TO BE POWDER COATED TO
MATCH EXISTING, DIMENSION SHOWN
IN MM, DIMENSIONS ARE THE SAME
FOR TOP AND BOTTOM HOLES.

- 4.3.4.7 Note: The console tops are being modified, therefore the existing SRD331 Remote boxes will be removed and the UDRs must be mounted in the console top with junction box inside the console in the designated cut outs. The Contractor must determine the mounting location and arrangement based on consultation with the Technical Authority.

4.3.5 Grounding

- 4.3.5.1 Install a #12 green ground wire from the Earthing Point of the system components with the exception of the pre-amplifier to a suitable grounding point on the Ship. The Pre-Amplifier requires a #6 green wire for grounding.

4.3.6 Cable installation

- 4.3.6.1 Install, label, and terminate the following cables as per Dwg MM678-062-WD, use existing cable ways and transits:

CABLE LABEL	CABLE TYPE	FROM	TO
DL-1	Factory Supplied	CDU in Nav Console	Electronics Unit forward Port side Nav Console.
DL-2	Belden 9369	Electronics Unit forward Port side Nav Console.	Pre-Amplifier in Bow Thruster Compartment
DL-3	Belden 9369	Electronics Unit forward Port side Nav Console.	24VDC Junction Box forward Port side Nav Console.
DL-4	Belden 9369	Port Universal Digital Remote Junction Box on Port Wing Console.	24VDC Junction Box forward Port side Nav Console.
DL-4-1	Factory Supplied	Port Universal Digital	Port Universal Digital Remote

		Remote on Port Wing Console.	Junction Box on Port Wing Console.
DL-5	Belden 9369	STBD Universal Digital Remote Junction Box on Port Wing Console.	24VDC Junction Box forward Port side Nav Console.
DL-5-1	Factory Supplied	STBD Universal Digital Remote on Port Wing Console.	STBD Universal Digital Remote Junction Box on Port Wing Console.
DL-6	Belden 9318	24VDC Power Supply Unit behind Control and Display Unit in Nav Console.	Electronics Unit forward Port side Nav Console.
DL-7	Belden 9314	24VDC Power Supply Unit behind Control and Display Unit in Nav Console.	24VDC Junction Box forward Port side Nav Console.
DL-7-1	Belden 9314	24VDC Junction Box forward Port side Nav Console.	Pre-Amplifier in Bow Thruster Compartment
DL-8	Belden 9322	Electronics Unit forward Port side Nav Console.	Navipilot 4000 Steering Control Unit in Forward Console (Navipilot 4000 to be installed during VLE, Leave approximately 20' inside console)
IE3-10	Existing cable	Panel IE3 Breaker #10	24VDC Power Supply Unit behind Control and Display Unit in Nav Console.
DL-9	Belden 9322	Electronics Unit forward Port side Nav Console.	X Band Radar Display STBD End Nav Console Wheelhouse
DL-10	Belden 9322	Electronics Unit forward Port side Nav Console.	S Band Radar Display Fwd Port Wheelhouse
DL-11	Belden 9322	Electronics Unit forward Port side Nav Console.	Aft looking Radar Display Port Wing Console Wheelhouse
DL-12	Belden 9322	Electronics Unit forward Port side Nav Console.	ECPINS STBD End of Nav Console Wheelhouse

4.3.7 Government Furnished Equipment

4.3.7.1 Doppler Speed Log Naviknot 450D System c/w Gate Valve, Transducer, 24VDC Power Supply and (x2) Universal Digital Remotes.

4.3.8 Material to be supplied by Contractor

4.3.8.1 The Contractor must supply and install 50 meters of Belden 9314 cable.

- 4.3.8.2 The Contractor must supply and install 5 meters of Belden 9318 cable.
- 4.3.8.3 The Contractor must supply and install 60 meters of Belden 9369 cable.
- 4.3.8.4 The Contractor must supply and install 40 meters of Belden 9322 cable.
- 4.3.8.5 For the purpose of adjustments, the Contractor must include a unit cost per 1 meter for the supply and install for 10 meters for each of these cable types.
 - a) Belden 9314
 - b) Belden 9318
 - c) Belden 9369
 - d) Belden 9322
 - e) #6 Green Ground Wire
 - f) #12 Green Ground Wire
- 4.3.8.6 The Contractor must supply 3 Junction boxes c/w with terminal strips (as shown in MM678-062-WD).
- 4.3.8.7 The Contractor must supply an Adaptor plate for Control and Display Unit and Universal Remotes.
- 4.3.8.8 All materials required to complete statement of work. All cables are to be properly secured in existing cable trays. In locations where trays do not exist, appropriate hangers are to be installed.

4.4 Set to Work / Commissioning

- 4.4.1 The Contractor must arrange for OEM authorized field service representatives (FSR) to conduct the set to work and commissioning of the Doppler Speed Log Naviknot 450D System. The TA must be in attendance for the commissioning and set to work.
- 4.4.2 The Contractor must perform Doppler Transducer Calibration 2 Way Trial Runs as per Chapter 7, section 7.2 of the supplied Operation, Installation and Service Manual (056352/C, 06 Dec 2011). Record the setup in the configuration table in Appendix A of the supplied Operation, Installation and Service Manual (056352/C, 06 Dec 2011), a copy of the completed table must be provided to Technical Authority.

4.5 Documentation

- 4.5.1 The Contractor must ensure that the Sperry Marine Supplied CD (Manuals on CD-ROM) Stock No. 056800 Rev. P; Jan 2013 supplied with the new equipment unit is returned to Technical Authority prior to the acceptance of this item.
- 4.5.2 A copy of the completed set up configuration table must be provided to Technical Authority.
- 4.5.3 The Contractor must revise all “As Fitted” drawings as required in Section 6.1.6 of this Specification.

5.0 LOCAL AREA NETWORK (LAN) BACKBONE

5.1 Scope

- 5.1.1 The intent of this specification is to replace the existing Local Area Network (LAN) Backbone system with new updated fiber and equipment.

5.2 References

5.2.1 Drawings and Documents

- 5.2.1.1 Existing LAN System drawings (Reference for Removal):

- a) Dwg. MM678-021-WD (LAN System)
- b) Dwg. MM678-047-RL (LAN Rack Layout)

- 5.2.1.2 New LAN System drawing (Reference for Installation):

- a) Dwg. MM678-065-WD

5.2.2 Standards

- a) Fleet Safety and Security Manual (DFO/5737)
- b) TP127 – Ship’s Electrical Standards
- c) IEEE 45:2002 – Recommended Practice for Electrical Installation on Ships
- d) Specification for the Installation of Shipboard Electronic Equipment (70-000-000-EU-JA-001)
- e) Standard Technical Architecture for Shipboard Computer Systems (46-000-000-ES-TE-001)

5.2.3 Regulations

- b) Canada Shipping Act, 2001

5.3 Technical

5.3.1 Removal of existing LAN System

- 5.3.1.1 Remove and dispose of all components and cabling from the original LAN System drawing except the 96 Port Patch Panel. The Patch Panel is to be stored and return to Canada as Category “A” property upon completion of Vessel Life Extension.

- 5.3.1.2 Remove the existing LAN System as per attached Drawing# MM678-021-WD. This includes the following:

- a) 96 Port patch Panel in Equipment Rack in Electronic Equipment Room.
- b) Junction Box located at end of Alleyway on Forecastle Deck
- c) Drop Boxes from the following locations:
 - 1. Nav Console Fwd side (LAN-0)
 - 2. Nav Console (LAN-1)
 - 3. Bridge Computer (J6)

4. Captain (J1)
5. Chief Eng. (J2)
6. First Officer (J3)
7. Senior Eng. (J4)
8. Log Officer's Cabin (J5)
9. Engineer's Office (J9)
10. Ships Office (LAN-7)
11. Ship's Office (LAN-8)
12. Bosun's Cabin (LAN-5)
13. VSCS EMAS Rack Drop (LAN-12)
14. Officer's mess (LAN-2)
15. MCR (LAN-4)

5.3.1.3 Remove all associated cables from units above, see DWG# MM678-006-WD and list below for reference:

LAN-0 from the 96 Port patch Panel in Equipment Rack in Electronic Equipment Room to the Nav Console FWD side

LAN-1 from the 96 Port patch Panel in Equipment Rack in Electronic Equipment Room to the Nav Console

LAN-2 from the 96 Port patch Panel in Equipment Rack in Electronic Equipment Room to the Officer's Mess

LAN-4 from the 96 Port patch Panel in Equipment Rack in Electronic Equipment Room to the MCR

LAN-5 from the 96 Port patch Panel in Equipment Rack in Electronic Equipment Room to the BOSUN Cabin

LAN-7 from the 96 Port patch Panel in Equipment Rack in Electronic Equipment Room to the Ship's Office

LAN-8 from the 96 Port patch Panel in Equipment Rack in Electronic Equipment Room to the Ship's Office

LAN-10 from the 96 Port patch Panel in Equipment Rack in Electronic Equipment Room to the Junction Box located at end of hallway between Captain and Chief Eng. Room

LAN-11 from the 96 Port patch Panel in Equipment Rack in Electronic Equipment Room to the Junction Box located at end of hallway between Captain and Chief Eng. Room

LAN-12 from the 96 Port patch Panel in Equipment Rack in Electronic Equipment Room to the VSCS Rack

All other cables from the Junction Box back to the Drop boxes.

5.3.2 Disposal and Care / Custody of removed equipment

5.3.2.1 The 96 Port patch Panel is to be stored and returned to CCG as Category “A” property. All removed cables are to be disposed of as Category “C” property.

5.3.3 Installation of New LAN

5.3.3.1 The Contractor must install a new Belden AX104683 Patch Panel in the Equipment Rack where existing was removed, Electronic Equipment Room Forecastle deck, see Dwg. #MM678-047-RL.

5.3.3.2 The Contractor must install drop box model Belden A0643206 in the following locations where existing boxes were removed:

- a) Nav Console Fwd side
- b) Nav Console
- c) Bridge Computer
- d) Captain
- e) Chief Eng.
- f) First Officer
- g) Senior Eng.
- h) Log Officer’s Cabin
- i) Engineer’s Office
- j) Bosun’s Cabin
- k) Ships Office (x2)
- l) VSCS EMAS Rack Drop
- m) Officer’s mess (Gym / Recreation area)
- n) MCR

5.3.3.3 The Contractor must install new drop boxes model Belden A0643206 In the following locations:

- a) VSCS EMAS Rack Drop (Inside Rack next to existing)
- b) MCR (Inside Console Port End)

Note: See new LAN Dwg. #MM678-065-WD for reference.

5.3.4 Cable installation

5.3.4.1 Install, label, and terminate the following cables using Corning FAN-BT25-06 FANOUT KIT 6 Fiber 25” and Corning 95-050-99-x UNICAM LC connector 50UM OM3 OM4 as per drawing # MM678-065-WD:

CABLE LABEL	CABLE TYPE	FROM	TO
LAN-1	Belden B9C132 POI 6 OM3-50.	Patch Panel Located in Equipment Rack in Electronic Equipment Room	Bridge Nav Console Forward side, Wheelhouse
LAN-2	Belden B9C132 POI 6 OM3-50.	Patch Panel Located in Equipment Rack in Electronic Equipment Room	Bridge Nav Console, Wheelhouse
LAN-3	Belden B9C132 POI 6 OM3-50.	Patch Panel Located in Equipment Rack in Electronic Equipment Room	Bridge Computer, Wheelhouse
LAN-4	Belden B9C132 POI 6 OM3-50.	Patch Panel Located in Equipment Rack in Electronic Equipment Room	Captain's Cabin, Forecastle Deck
LAN-5	Belden B9C132 POI 6 OM3-50.	Patch Panel Located in Equipment Rack in Electronic Equipment Room	Chief Engineer's Cabin, Forecastle Deck
LAN-6	Belden B9C132 POI 6 OM3-50.	Patch Panel Located in Equipment Rack in Electronic Equipment Room	Chief Officer's Cabin, Forecastle Deck
LAN-7	Belden B9C132 POI 6 OM3-50.	Patch Panel Located in Equipment Rack in Electronic Equipment Room	Senior Engineer's Cabin, Forecastle Deck
LAN-8	Belden B9C132 POI 6 OM3-50.	Patch Panel Located in Equipment Rack in Electronic Equipment Room	Log Officer's Cabin, Forecastle Deck
LAN-9	Belden B9C132 POI 6 OM3-50.	Patch Panel Located in Equipment Rack in Electronic Equipment Room	Engineer's Office, Boat Deck
LAN-10	Belden B9C132 POI 6 OM3-50.	Patch Panel Located in Equipment Rack in Electronic Equipment Room	Bosun's Cabin, Boat Deck
LAN-11	Belden B9C132	Patch Panel Located in	Ship's Office, Boat Deck

	POI 6 OM3-50.	Equipment Rack in Electronic Equipment Room	
LAN-12	Belden B9C132 POI 6 OM3-50.	Patch Panel Located in Equipment Rack in Electronic Equipment Room	Ship's Office (New), Boat Deck
LAN-13	Belden B9C132 POI 6 OM3-50.	Patch Panel Located in Equipment Rack in Electronic Equipment Room	VSCS EMAS Rack, Officer's Lounge (Gym/Recreational Area) Main Deck
LAN-14	Belden B9C132 POI 6 OM3-50.	Patch Panel Located in Equipment Rack in Electronic Equipment Room	VSCS EMAS Rack (New), Officer's Lounge (Gym/Recreational Area) Main Deck
LAN-15	Belden B9C132 POI 6 OM3-50.	Patch Panel Located in Equipment Rack in Electronic Equipment Room	Officer's Lounge (Gym/Recreational Area) Main Deck
LAN-16	Belden B9C132 POI 6 OM3-50.	Patch Panel Located in Equipment Rack in Electronic Equipment Room	MCR, Deck Below Main Deck
LAN-17	Belden B9C132 POI 6 OM3-50.	Patch Panel Located in Equipment Rack in Electronic Equipment Room	MCR (New), Deck Below Main Deck

5.3.5 Government Furnished Equipment

- a) A0643206 MDVO Media Box 6 port Almond (Drop Box x20)
- b) AX104683 Fiberexpress Ultra HD Patch Panel 4U (Patch panel x1)
- c) B9C132 POI 6 OM3-50. 10G (Fiber Cable)
- d) 95-050-99-X Unicam LC Connector 50um OM3 OM4 (x250)
- e) Corning FAN-BT25-06 FANOUT KIT 6 Fiber 25" (x40)

5.3.6 Material to be supplied by Contractor

5.3.7 The Contractor must supply and install 500 meters of B9C132 POI 6 OM3-50. 10G (Fiber Cable).

5.3.8 For the purpose of adjustments, the Contractor must include a unit cost per 1 meter for the installation for 10 meters for this cable type.

- 5.3.9 All materials required to complete statement of work. All cables are to be properly secured in existing cable trays. In locations where trays do not exist, appropriate hangers are to be installed.

5.4 Set to Work / Commissioning

- 5.4.1 The Fiber Optic Cable runs must be tested using an Optical Time Domain Reflectometer (OTDR) with Encircled Flux compliance. The test must meet the requirements outlined in the Standard Technical Architecture for Shipboard Computer Systems document. Testing at both 850nm and 1300nm is to be conducted. All fibers must have less than a 3dB loss in either direction.

5.5 Documentation

- 5.5.1 A report containing results sheets as outlined in appendix H.6 must be provided for each run. End face inspection results with photo should be attached for each termination.
- 5.5.2 The Contractor must revise all “As Fitted” drawings as required in Section 6.1.6 of this Specification.

6.0 FLEET BROADBAND 500 (FBB500) INSTALLATION

6.1 Scope

- 6.1.1 The Contractor must replace the NERA Saturn B installed on CCGS Earl Grey by a SAILOR 500 Fleet Broadband system.

6.2 References

6.2.1 Drawings and Documents

- 6.2.1.1 Existing NERA Saturn System drawing (Reference for Removal):
a) Dwg. MM678-039-WD (NERA Saturn Bm Satcom)
- 6.2.1.2 New FBB 500 System drawing (Reference for Installation):
a) Dwg. MM678-067-WD

6.2.2 Standards

- a) Fleet Safety and Security Manual (DFO/5737)
- b) TP127 – Ship's Electrical Standards
- c) IEEE 45:2002 – Recommended Practice for Electrical Installation on Ships
- d) Specification for the Installation of Shipboard Electronic Equipment (70-000-000-EU-JA-001)

6.2.3 Regulations

- a) Canada Shipping Act, 2001

6.3 Technical

6.3.1 Removal of NERA B Satcom System

- 6.3.1.1 Panel IM10, Breaker #2 must be locked / tagged out as per procedures prior to starting the removal and remain as such until installation is complete.
- 6.3.1.2 Disconnect the AC/DC Power Supply, the Datacom Switch Unit and Cisco Router from Smart UPS APC1500 forward Navigation (Nav) Console Port side (top Black Unit).
- 6.3.1.3 Remove existing NERA B Dome. The existing Coax Cable (LMR600) is to be re-used in the new installation.
- 6.3.1.4 The AC cable for Dome heater is to be removed back to Panel IM10 breaker #2 inside Wheelhouse. Breaker should be labelled as spare.

- 6.3.1.5 Remove existing BDE, A/B Switch, Data Com Switch Unit, Printer, Cisco router and associated cables except the two telephone cables and LAN cable connected to the Fiber Converter. See Photo 1 below for reference.

Photo 1:



- 6.3.1.6 Remove the Power Supply from the bottom port side of Radar Transceiver Closet, shown in Photo 2.

Photo 2



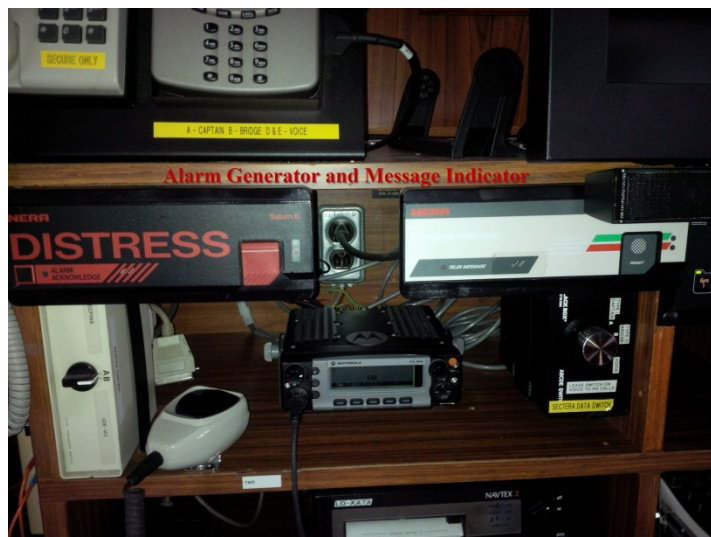
- 6.3.1.7 Remove the NERA B Handset from the port end of Nav Console, shown in Photo 3.

Photo 3



- 6.3.1.8 Remove Existing Alarm generator, Message indicator from Nav Console on the bridge as shown in Photo 4.

Photo 4



6.3.2 Disposal and Care / Custody of removed equipment

6.3.2.1 All removed equipment (Satellite Dome, BDE, Power Supply, Printer, Handset, Datacom Switch Unit, Cisco Router, A/B Switch, Alarm Generator and Message Indicator) are to be stored and returned to Canada as Category “A” property. All other cables are to be disposed of as Category “C” property.

6.3.3 Installation of Fleet Broadband 500

6.3.3.1 Install and bolt new Fleet Broadband antenna mount adapter on the existing NERA B dome pedestal using rubber gasket between adaptor and existing pedestal on top of Water Monitor Platform.

6.3.3.2 Install Fleet Broadband antenna on adapter and use existing LMR600 cable. Cable will have to be cut to proper length and re-terminated.

6.3.3.3 Install Fleet Broadband Power supply under top of Nav Console Forward Port Side where Cisco Router was removed. Connect new Power Supply into existing UPS and label SAC-4. Use supplied cable to connect Fleet Broadband terminal to Power Supply and label SAC-3.

6.3.3.4 Install Fleet Broadband terminal in location where NERA B BDE was removed, Nav Console Forward Port side. Connect the telephone cable from the voice port on the modular box to PHONE/FAX 1 (located closest to antenna connector) and telephone cable from the FAX port on the modular box to PHONE/FAX2. Connect the existing yellow CAT5e patch cable from the existing Fiber/UTP converter to Port LAN 2 on BDE, label SAC-6.

6.3.3.5 Install Thrane IP Handset on Bridge Port end of Nav Console where existing NERA B handset was removed.

6.3.4 Grounding

6.3.4.1 Install a #12 green ground wire from the Earthing Point of the BDE to a suitable grounding point on the Ship. The Dome must be grounded to the existing pedestal (not the adaptor) using a #6 green wire.

6.3.5 Government Furnished Equipment

- a) Fleet Broadband 500 c/w Dome, BDE, Power Supply and IP Thrane Handset.
- b) N Type Male connector for LMR600FR
- c) Antenna Adaptor Mounting Stand and Rubber Gasket

6.3.6 Material to be supplied by Contractor

- a) #6 Green Ground Wire
- b) #12 Green Ground Wire
- c) All materials required to complete statement of work. All cables are to be properly secured in existing cable trays. In locations where trays do not exist, appropriate hangers are to be installed.

6.4 Set to Work / Commissioning

6.4.1 The Contractor must arrange for CCG authorized field service representative (FSR) to conduct the set to work and commissioning of the Fleet Broadband System.

6.4.2 The system installed on the vessel has to be registered with the BGAN Network through Shared Services Canada and they will require both the Financial Codes (IS Org and IS Ref) from the vessel. The contact person is:

Joy Sheng
Telecom Specialist
Service Management & Delivery
Information Technology Services Branch
Shared Services Canada
11 Laurier Street, Portage III, 5A2, Gatineau QC K1G 4A8
Tel: 819-956-4995
Fax: 819-956-8351
Joy.Sheng@spc-ssc.gc.ca

6.5 Documentation

6.5.1 The Contractor must ensure that the Fleet Broadband 500 manuals supplied with the new equipment unit are returned to the Technical Authority prior to the acceptance of this item.

6.5.2 The Contractor must revise all “As Fitted” drawings as required in Section 6.1.6 of this Specification.

7.0 MASTERCLOCK SYSTEM REPLACEMENT

7.1 Scope

- 7.1.1 The intent of this specification is to replace the existing Wempee Clock System with a new updated Masterclock System to provide better reliability and common time to all systems.

7.2 References

7.2.1 Drawings and Documents

- 7.2.1.1 Existing Electric Clock System drawing (Reference for Removal):
 a) Dwg. MM678-001-WD (Electric Clock System)
- 7.2.1.2 New Masterclock System drawing (Reference for Installation):
 a) Dwg. MM678-069-WD
 b) Dwg. MM678-053-RL

7.2.2 Standards

- a) Fleet Safety and Security Manual (DFO/5737)
- b) TP127 – Ship’s Electrical Standards
- c) IEEE 45:2002 – Recommended Practice for Electrical Installation on Ships
- d) Specification for the Installation of Shipboard Electronic Equipment (70-000-000-EU-JA-001)
- e) Standard Technical Architecture for Shipboard Computer Systems (46-000-000-ES-TE-001)

7.2.3 Regulations

- a) Canada Shipping Act, 2001

7.3 Technical

7.3.1 Removal of existing CCTV System

- 7.3.1.1 Remove all components and cabling from the original Electric Clock System as per drawing MM678-001-WD. Dispose of all cablings as Category “C” property.
- 7.3.1.2 Master Clock Unit located in the end of Nav Console Port side and the remote clocks in the following locations:
 a) Captain’s day room
 b) Captain’s night room
 c) Chief Engineer’s cabin
 d) First Mate’s cabin
 e) Senior Engineer’s cabin

- f) Ship's Office
- g) Engineer's Office
- h) Officer's Mess Lounge
- i) Galley
- j) Crew's mess
- k) MCR

7.3.2 Disposal and Care / Custody of removed equipment

- 7.3.2.1 The equipment noted above is to be stored stored and returned to Canada as Category "A" property.

7.3.3 Installation of New Masterclock System

- 7.3.3.1 The contractor must install 12 Masterclocks NTDS24. 11 clocks will be installed where the existing clocks were removed and a new Masterclock on the Bridge above Navigation Console as per photo below:



- 7.3.3.2 The Contractor must remove the blank panel in the Email at Sea Rack (EMAS) located below the Drake modulator (31ru as per Dwg MM678-053-RL). Install the TE Connectivity Patch Panel 1RU 24 Port – part# TE1933307-1 (x1) in same location.
- 7.3.3.3 The Contractor must install a Fiber to UTP Converter in the Engineering Office, Ship's Office and MCR. The Fiber to UTP Converters must be plugged into the local UPS for Computers. See photos below for locations of converters.

Engineer's Office



Ship's Office



MCR



7.3.4 Cable installation

Install, label, and terminate the following cables as per MM678-068-BD:

CABLE LABEL	CABLE TYPE	FROM	TO
CE-1	1300SB CAT5e	Masterclock above Nav Console in Wheelhouse	POE Switch forward Port side of Nav Console
CE-2	1300SB CAT5e	Masterclock Senior Engineer's Cabin	TE Connectivity Patch Panel 1U Electronic Equipment Room Port Bulkhead
CE-3	1300SB CAT5e	Masterclock Chief Officer's Cabin	TE Connectivity Patch Panel 1U Electronic Equipment Room Port Bulkhead
CE-4	1300SB CAT5e	Masterclock Chief Engineer's Day Cabin	TE Connectivity Patch Panel 1U Electronic Equipment Room Port Bulkhead
CE-5	1300SB CAT5e	Masterclock Captain's Day Cabin	TE Connectivity Patch Panel 1U Electronic Equipment Room Port Bulkhead
CE-6	1300SB CAT5e	Masterclock Captain's Night Cabin	TE Connectivity Patch Panel 1U Electronic Equipment Room Port Bulkhead
CE-7	1300SB CAT5e	Masterclock Engineer's Office	Fiber to UTP Converter Engineer's Office
CE-8	1300SB CAT5e	Masterclock Ship's Office	Fiber to UTP Converter Ship's Office
CE-9	1300SB CAT5e	Masterclock Officer's Lounge	TE Connectivity Patch Panel 1U Port 5 EMAS Rack (E-mail at Sea Rack) Officer's Lounge
CE-10	1300SB CAT5e	Masterclock Galley	TE Connectivity Patch Panel

			1U Port 6 EMAS Rack (E-mail at Sea Rack) Officer's Lounge
CE-11	1300SB CAT5e	Masterclock Crew's Mess	TE Connectivity Patch Panel 1U Port 7 EMAS Rack (E-mail at Sea Rack) Officer's Lounge
CE-12	1300SB CAT5e	Masterclock MCR	Fiber to UTP Converter MCR

7.3.5 Government Furnished Equipment

- a) Masterclock NTP Driven Clocks NTDS24 (x12)
- b) Fiber to UTP converter (POE) GTP-802 (x3)
- c) Fiber patch cables 1m (x4)
- d) 1300SB Cat5e cable (300m)
- e) TE - 5-569550-3 – Metal RJ-45 Connector (x20)
- f) TE – 9-336513-7 - black boot (x20)
- g) TE - 3-231652-0 Hand tool and dye set. White dot for specified connector (x1)
- h) TE Connectivity Patch Panel 1RU 24 Port – part# TE1933307-1 (x1)

7.3.6 Material to be supplied by Contractor

- 7.3.6.1 The Contractor must install 200 meters of 1300SB CAT5e cable. Cable remaining at the end of installation must be returned to CCG.
- 7.3.6.2 For the purpose of adjustments, the Contractor must include a unit cost for the installation for 10 meters for this cable type.
- 7.3.6.3 All materials required to complete statement of work. All cables are to be properly secured in existing cable trays. In locations where trays do not exist, appropriate hangers are to be installed.

7.4 Inspections / Commissioning

- 7.4.1 The Contractor must ensure the TA has the opportunity to inspect the installation of the system prior to the arrival of the CCG Technical representative.
- 7.4.2 The Masterclock System will be configured and set to work by CCG Technical representative.

7.5 Documentation

- 7.5.1 The Contractor must ensure that the Masterclock system manuals supplied with the new equipment unit are returned to the Technical Authority prior to the acceptance of this item.
- 7.5.2 The Contractor must revise all “As Fitted” drawings as required in Section 6.1.6 of this Specification.