

55' AIDS TO NAVIGATION BOAT (ANB) OPERATOR'S HANDBOOK

U.S. Department
of Homeland Security

**United States
Coast Guard**



**COMDTINST M16534.2
March 2007**



Commandant
United States Coast Guard

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COMMANDANT INSTRUCTION M16534.2

Subj: 55' AIDS TO NAVIGATION BOAT OPERATOR'S HANDBOOK

1. PURPOSE. This Manual provides technical orientation, performance characteristics, and basic operating procedures for the 55' Aids to Navigation Boat (ANB). It also standardizes boat outfit, storage and equipment layout.
2. ACTION. Area and district commanders, commanders of maintenance and logistics commands, commanding officers of headquarters units, assistant commandants for directorates, Judge Advocate General, and special staff offices at Headquarters shall ensure adherence to the contents of this Manual. To ensure standardization, there is no command requirement with regard to the type or location of equipment carried except as noted. All design or structural alterations are prohibited unless specifically authorized in accordance with this Manual. Internet release authorized.
3. DIRECTIVES AFFECTED. None
4. DISCUSSION. This Manual contains information necessary to safely and efficiently operate the 55' ANB. The operational capabilities, limitations, and emergency procedures are clearly stipulated. The fittings, outfit list, and physical characteristics of the boat are described in detail.
5. PROCEDURE. Operational and unit commanders with a 55' ANB shall ensure the procedures and limitations detailed within this Instruction are followed. Forward any comments, corrections, recommendations, and questions regarding this handbook to the Aid to Navigation Boat Facility Manager in accordance with Chapter 1, Section C.1 of this Manual. Design and structural change requests shall be submitted as outlined in the Naval Engineering Manual, COMDTINST M9000.6 (series).

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C							*				*												*	*	*	
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NON-STANDARD DISTRIBUTION LIST: See Page 2

6. ENVIRONMENTAL ASPECT AND IMPACT CONSIDERATIONS. Environmental considerations were examined in the development of this Instruction and have been determined to be not applicable.
7. FORMS/REPORTS. None.

ROBERT C. PARKER/s/
Rear Admiral, U. S. Coast Guard
Assistant Commandant for Operations Capability

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Table of Contents

CHAPTER 1 INTRODUCTION.....	1-1
SECTION A. WARNINGS, CAUTIONS, AND NOTES.....	1-2
A.1. General.....	1-2
A.2. Warning.....	1-2
A.3. Caution.....	1-2
A.4. Note.....	1-2
SECTION B. FACILITY MANAGER.....	1-3
B.1. General.....	1-3
SECTION C. CHANGES.....	1-4
C.1. General.....	1-4
C.2. Engineering change requests (ECRs).....	1-4
SECTION D. ACTION.....	1-5
D.1. General.....	1-5
D.2. Configuration control.....	1-5
CHAPTER 2 BOAT CHARACTERISTICS.....	2-1
SECTION A. GENERAL DESCRIPTION.....	2-2
A.1. Design.....	2-2
A.2. Manufacturer.....	2-2
A.3. Missions.....	2-2
A.4. Boat specifications.....	2-2
A.5. Superstructure.....	2-6
A.6. Hull.....	2-6
SECTION B. WATERTIGHT COMPARTMENTS.....	2-7
WORK PLATFORM.....	2-8
B.1. Access.....	2-8
B.2. Physical characteristics.....	2-8
LAZARETTE.....	2-9
B.3. Access.....	2-9
B.4. Physical characteristics.....	2-9
MACHINERY SPACE.....	2-10
B.5. Access.....	2-10
B.6. Physical characteristics.....	2-10
FUEL TANKS.....	2-11
B.7. Location.....	2-11
B.8. Physical characteristics.....	2-11
WORKSHOP.....	2-12
B.9. Access.....	2-12
B.10. Physical characteristics.....	2-12
GALLEY/MESS.....	2-13
B.11. Access.....	2-13
B.12. Physical characteristics.....	2-13
HEAD.....	2-14
B.13. Access.....	2-14
B.14. Physical characteristics.....	2-14
BERTHING COMPARTMENT.....	2-15
B.15. Access.....	2-15



B.16. Physical characteristics..... 2-15

FORWARD PEAK 2-16

B.17. Access 2-16

B.18. Physical characteristics..... 2-16

SECTION C. PILOTHOUSE 2-17

C.1. Access..... 2-17

C.2. Physical characteristics 2-17

SECTION D. MAST..... 2-18

D.1. Location 2-18

D.2. Physical characteristics 2-18

SECTION E. DECK EQUIPMENT AND FITTINGS 2-19

MOORING BITT 2-20

E.1. Location..... 2-20

E.2. Physical characteristics..... 2-20

ANCHOR LINE REEL 2-21

E.3. Location..... 2-21

E.4. Physical characteristics..... 2-21

BITTS AND CHOCKS 2-22

E.5. Location..... 2-22

E.6. Physical characteristics..... 2-22

LIFE RINGS 2-23

E.7. Location..... 2-23

E.8. Physical characteristics..... 2-23

LIFE RAFT 2-24

E.9. Location..... 2-24

E.10. Physical characteristics..... 2-24

BOAT HOOKS 2-25

E.11. Location..... 2-25

E.12. Physical characteristics..... 2-25

HANDRAILS AND LIFELINES 2-26

E.13. Location..... 2-26

E.14. Physical characteristics..... 2-26

DECK LOCKERS 2-27

E.15. Location..... 2-27

E.16. Physical characteristics..... 2-27

EMERGENCY DEWATERING PUMP 2-28

E.17. Location..... 2-28

E.18. Physical characteristics..... 2-28

CHAPTER 3 VESSEL SYSTEMS..... 3-1

SECTION A. PROPULSION SYSTEM 3-3

A.1. General..... 3-3

A.2. Engines..... 3-3

A.3. Propeller shafts (A Class)..... 3-4

A.4. Propeller (A, B, and C Class)..... 3-4

SECTION B. PROPULSION CONTROL SYSTEM 3-5

B.1. General..... 3-5

B.2. Engine throttle control..... 3-5

B.3. Engine control/gauge panels (pilothouse)..... 3-5

B.4. Engine control/gauge panels (aft console)..... 3-5

B.5. Engine control/gauge panel (engine room)..... 3-6

SECTION C. JACKET WATER COOLING SYSTEM 3-7

C.1. General..... 3-7

C.2. Engine-driven cooling water pump 3-7



C.3. Coolant reservoir	3-7
C.4. Thermostat.....	3-7
SECTION D. ENGINE SYSTEMS	3-9
ENGINE LUBRICATION SYSTEM	3-10
D.1. General	3-10
D.2. Pump and suction screen	3-10
D.3. Spin-on cartridge filter and bypass valve.....	3-10
D.4. Filter bypass valve	3-10
D.5. Oil cooler bypass valve.....	3-10
ENGINE CRANKCASE VENTILATION SYSTEM.....	3-11
D.6. General	3-11
D.7. Air separator filter	3-11
D.8. Air separator body.....	3-11
FUEL OIL SYSTEM	3-13
D.9. General	3-13
D.10. Primary fuel oil filter assembly (primary fuel filter).....	3-13
D.11. Secondary fuel filter	3-13
ENGINE EXHAUST SYSTEM.....	3-14
D.12. General	3-14
D.13. Piping and mufflers	3-14
D.14. Overboard ports.....	3-14
ENGINE JACKET WATER HEATERS (HOT START)	3-15
D.15. General	3-15
D.16. Thermostat	3-15
ENGINE STARTING SYSTEM	3-16
D.17. General	3-16
D.18. Starter and solenoid.....	3-16
SECTION E. HYDRAULIC STEERING SYSTEM.....	3-17
E.1. General.....	3-17
E.2. Steering System.....	3-17
E.3. Hydraulic Steering Ram	3-17
E.4. Return oil filter	3-17
E.5. Tiller assembly.....	3-17
E.6. Rudders.....	3-17
SECTION F. AC GENERATOR	3-19
F.1. General.....	3-19
F.2. Diesel engine	3-19
F.3. Duplex fuel oil filter assembly (primary fuel filter).....	3-19
F.4. Fuel pump and filter	3-19
F.5. Lubrication system.....	3-19
F.6. Jacket water system.....	3-19
F.7. Saltwater system.....	3-19
F.8. Engine exhaust system.....	3-19
F.9. Diesel engine pilothouse control panel (generator).....	3-20
F.10. Diesel engine machinery space control panel (generator).....	3-20
SECTION G. ELECTRICAL SYSTEMS	3-21
G.1. General	3-21
G.2. 120-VAC power distribution system.....	3-21
G.3. 24-VDC power distribution system.....	3-21
G.4. Power panels.....	3-24
SECTION H. HEATING, VENTILATION, AND AIR CONDITIONING (HVAC) SYSTEMS.....	3-27
H.1. General	3-27
H.2. Machinery space heating and ventilation	3-27
H.3. Cabin Air Conditioning.....	3-27



H.4. Workshop & Crew space Air Conditioning..... 3-27

SECTION I. CRANE..... 3-29

I.1. General (A, B, and C Class)..... 3-29

I.2. Hydraulic oil reservoir (A, B, and C Class)..... 3-29

I.3. Hydraulic pump (A and B Class)..... 3-29

I.4. Hydraulic filter (supply)..... 3-29

I.5. Crane (A Class)..... 3-29

I.6. Deck Winches (A, B, and C Class)..... 3-30

I.7. Hydraulic System Crane and Deck Winches (A Class)..... 3-30

SECTION J. ELECTRONIC NAVIGATION SYSTEM..... 3-31

J.1. General..... 3-31

J.2. Furuno navigation radar..... 3-31

J.3. Depth sounder..... 3-31

J.4. Differential global positioning system (DGPS)..... 3-31

J.5. VHF radios..... 3-32

J.6. Loudhailer/ intercom..... 3-32

SECTION K. MAGNETIC COMPASS..... 3-33

K.1. General..... 3-33

SECTION L. NAVIGATION LIGHTS, SEARCHLIGHTS, FLOODLIGHTS AND SIGNAL DEVICES..... 3-34

L.1. Navigation lights..... 3-34

L.2. Searchlights..... 3-34

L.3. Floodlights..... 3-34

L.4. Boat Horn..... 3-34

SECTION M. FIRE EXTINGUISHING SYSTEMS..... 3-36

M.1. General..... 3-36

M.2. Halon cylinders..... 3-36

M.3. Audible Alarm..... 3-36

M.4. Nozzles and Cylinders..... 3-36

M.5. Portable fire extinguishers..... 3-36

SECTION N. BILGE SYSTEMS..... 3-38

N.1. General..... 3-38

N.2. Bilge pumps and float switches..... 3-38

N.3. Bilge pump panel..... 3-38

SECTION O. GRAY WATER AND SEWAGE SYSTEMS..... 3-40

O.1. Gray water system..... 3-40

O.2. Sewage system..... 3-40

SECTION P. COMPRESSED AIR SYSTEM..... 3-42

P.1. General..... 3-42

P.2. Air compressor..... 3-42

P.3. Air receiver..... 3-42

P.4. Control valves and switches..... 3-42

P.5. Outlet valves for attaching air hoses..... 3-42

SECTION Q. POTABLE WATER SYSTEM..... 3-44

Q.1. General..... 3-44

Q.2. Potable water tanks..... 3-44

Q.3. Service pump..... 3-44

Q.4. Water heater..... 3-44

SECTION R. WINDSHIELD WIPERS AND WASHERS..... 3-46

R.1. General..... 3-46

CHAPTER 4 CREW REQUIREMENTS 4-1

SECTION A. MINIMUM CREW..... 4-3

A.1. General..... 4-3



A.2. <i>Qualified/ certified crewmembers</i>	4-3
A.3. <i>Non-qualified/ certified crewmember</i>	4-3
A.4. <i>Additional crewmembers</i>	4-3
SECTION B. COXSWAIN.....	4-4
B.1. <i>General</i>	4-4
B.2. <i>Authority and responsibility</i>	4-4
B.3. <i>Relief of responsibility</i>	4-4
SECTION C. ENGINEER.....	4-6
C.1. <i>General</i>	4-6
C.2. <i>Qualifications</i>	4-6
C.3. <i>Responsibilities</i>	4-6
SECTION D. CREWMEMBERS	4-7
D.1. <i>General</i>	4-7
D.2. <i>Responsibilities</i>	4-7
SECTION E. PASSENGERS.....	4-8
E.1. <i>General</i>	4-8
E.2. <i>Passengers</i>	4-8
SECTION F. TRAINING	4-9
F.1. <i>General</i>	4-9
F.2. <i>Standards for qualification</i>	4-9
F.3. <i>Training underway</i>	4-9
SECTION G. SAFETY EQUIPMENT	4-10
G.1. <i>Personal protective equipment</i>	4-10
G.2. <i>Protective equipment during buoy handling operations</i>	4-10
CHAPTER 5 OPERATIONAL GUIDELINES	5-1
SECTION A. OPERATING PARAMETERS	5-3
A.1. <i>General</i>	5-3
A.2. <i>Disabling casualties</i>	5-3
A.4. <i>Major discrepancies</i>	5-5
A.5. <i>Minor discrepancies</i>	5-5
A.6. <i>Responsibilities</i>	5-5
A.7. <i>Environmental limits</i>	5-7
SECTION B. PERFORMANCE DATA	5-9
B.1. <i>Fuel consumption</i>	5-9
B.2. <i>Seakeeping</i>	5-10
B.3. <i>Stability</i>	5-12
B.4. <i>Speed</i>	5-12
CHAPTER 6 MISSION PERFORMANCE	6-1
SECTION A. STARTING PROCEDURES	6-3
A.1. <i>Pre-start</i>	6-3
A.2. <i>Lighting off the generator set</i>	6-4
A.3. <i>Transferring power</i>	6-4
A.4. <i>Starting the engines</i>	6-6
A.5. <i>Energizing equipment</i>	6-6
SECTION B. UNDERWAY	6-9
B.1. <i>General</i>	6-9
B.2. <i>Personal protective gear</i>	6-9
B.3. <i>Communication</i>	6-9
B.4. <i>Changing control stations</i>	6-9
SECTION C. HANDLING CHARACTERISTICS.....	6-10
TURNING AND PIVOTING	6-11
C.1. <i>General</i>	6-11



C.2. Split throttle turn 6-11

C.3. Restricted maneuvering..... 6-12

HEAD SEAS..... 6-13

 C.4. General..... 6-13

 C.5. Buoyancy..... 6-13

BEAM SEAS AND FOLLOWING SEAS..... 6-14

 C.6. Operating in beam seas..... 6-14

 C.7. Operating in following seas 6-14

 C.8. White water 6-15

EFFECTS OF WIND 6-16

 C.9. Turning the bow 6-16

EFFECTS OF CURRENT 6-17

 C.10. Vessel stability in current..... 6-17

STATION KEEPING 6-18

 C.11. General..... 6-18

SECTION D. AIDS TO NAVIGATION OPERATIONS..... 6-20

 D.1. General 6-20

 D.2. Personal Protective Equipment..... 6-20

 D.3. Energizing the hydraulic system 6-21

 D.4. Operating the hydraulic system..... 6-21

 D.5. Hoisting the buoy 6-22

 D.6. Pulling chain..... 6-23

 D.7. Setting the buoy..... 6-23

 D.8. Post Evolution..... 6-24

 D.9. Standard hand signals..... 6-25

SECTION E. TOWING..... 6-28

 E.1. General..... 6-28

 E.2. Rigging a vessel for tow..... 6-28

 E.3. Affects of wind with vessel in tow 6-28

 E.4. Tow watch..... 6-28

SECTION F. ANCHORING 6-29

 F.1. General..... 6-29

 F.2. Anchoring the boat 6-29

 F.3. Weighing anchor 6-30

SECTION G. PERSONNEL RECOVERY 6-31

 G.1. General 6-31

 G.2. Key issues..... 6-31

SECTION H. ICE CONDITIONS 6-32

 H.1. General 6-32

SECTION I. SECURING PROCEDURES 6-33

 I.1. Procedures..... 6-33

SECTION J. SECURING PROCEDURES (COLD WEATHER) 6-34

 J.1. Procedures 6-34

APPENDIX A A-1

APPENDIX B..... B-1

APPENDIX C C-1

APPENDIX D D-1

APPENDIX E.....E-1

Index Index-i



List of Figures

Figure 2-2	2-20
Figure 3-1	3-12
Figure 5-1	5-9



Chapter 1 Introduction

Overview

Introduction

This handbook contains information necessary for the safe and efficient operation of the 55' Aids to Navigation Boat (ANB). It defines operational capabilities, limitations, and emergency procedures. In addition, it shows or describes the fittings, outfit list, and physical characteristics of the boat.

In this chapter

This chapter contains the following sections:

Section	Topic	See Page
A	Warnings, Cautions, and Notes	1-2
B	Facility Manager	1-3
C	Changes	1-4
D	Action	1-5



Section A. Warnings, Cautions, and Notes

A.1. General The following definitions apply to Warnings, Cautions, and Notes found throughout the handbook.

A.2. Warning **WARNING**  Operating procedures or techniques that must be carefully followed to avoid personal injury or loss of life.

A.3. Caution **CAUTION!** Operating procedures or techniques that must be carefully followed to avoid equipment damage.

A.4. Note **NOTE**  An operating procedure or technique essential to emphasize.



Section B. Facility Manager

B.1. General

Commandant (CG-37RCB-2) is the facility manager for the 55' ANB. The 55' ANB is a standard boat as defined in the *Boat Management Manual*, COMDTINST M16114.4 (series) and the *Naval Engineering Manual*, COMDTINST M9000.6 (series).



Section C. Changes

C.1. General

Commandant (CG-37RCB) promulgates this handbook and its changes. Submit recommendations for changes to Commandant (CG-37RCB) via standard memo or electronic mail. For more information, contact Commandant (CG-37RCB-2), AtoN Boat Facility Manager at (202) 372-2464.

The address for Commandant (CG-37RCB-2) is:

Commandant (CG-37RCB-2)
U. S. Coast Guard Headquarters
2100 Second Street S.W.
Washington, D.C. 20593-0001
Attn: AtoN Boat Facility Manager

C.2. Engineering change requests (ECRs)

All engineering change requests (ECRs) issued since the ANB has been in service are provided in *Appendix B* of this handbook. ECRs issued after the date of this revision supersede information in this handbook where applicable.



Section D. Action

D.1. General

Operating and supervisory commands and boat crews will comply with the procedures and limitations specified in this publication and any duly issued changes.

D.2. Configuration control

Configuration control for the 55' ANB is critical for standardization of equipment and safety of operations.

NOTE

To maintain fleet wide standardization, unit commanders shall not change or vary the type or location of equipment carried except where noted. Design or structural alterations are prohibited unless specifically authorized by the Office of Naval Engineering, Commandant (CG-45).

NOTE

Prototype testing of 55' ANB configuration changes may only be carried out with the specific authorization of the Office of Naval Engineering, Commandant (CG-45).



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Chapter 2 Boat Characteristics

Overview

Introduction This chapter describes standard 55' ANB features. The systems described briefly in this chapter are covered in detail in Chapter 3, *Vessel Systems*.

NOTE 

All illustrations in this operator's handbook are for familiarization only. The location of machinery and equipment in these illustrations may not accurately reflect proper placement and installation. Refer to the appropriate blueprint, NE-TIMS, technical publication or enclosure to this handbook for proper placement.

In this chapter This chapter contains the following sections:

Section	Topic	See Page
A	General Description	2-3
B	Watertight Compartments	2-7
C	Pilothouse	2-17
D	Mast	2-19
E	Deck Equipment and Fittings (Other Than Buoy Handling)	2-21



Section A. General Description

A.1. Design

The Boat Engineering Branch of the USCG Engineering Logistics Center designed the 55' ANB.

A.2. Manufacturer

The Coast Guard Yard completed the detailed design and contracted the initial production 55' ANB. A total of twenty-two 55' ANB's were constructed. There are 3 classes of vessels that were constructed. The "A" class was constructed by R.E. Derecktor, Inc. of Mamaroneck, NY the hull numbers of these vessels are 55101 to 55112. The "B" class was constructed by Thunderbolt Marine Industries of Savannah, GA the hull numbers of these vessels are 55113 to 55119. The "C" class was constructed by Mitternight Boat Works and the hull numbers are 55120 to 55122.

A.3. Missions

The 55' ANB is designed primarily to service aids to navigation within the inland waters, bays, sounds and harbors of the United States. It is capable and equipped to support multi-mission operations. The 55' ANB has a maximum lifting capacity of 3,600 pounds over the transom and 1,800 pounds elsewhere.

NOTE

Working buoys over the side is unauthorized and will cause catastrophic damage to equipment.

A.4. Boat specifications

The following provides a list of all 55' ANB boat specifications.

A.4.a. Physical characteristics

"A" Class 55101-55112	
Hull Length	55' 0"
Length Overall	58' 4" (w/ rub rails)
Hull Beam	16' 1 1/4"
Beam Overall	16' 9"
Freeboard	
Bow	5' 10"
Amidships	5' 0"
Aft	4' 9"
Draft (normal operating condition)	5' 2"
Highest Points:	
Fixed	14' 7"
Unfixed	25' 0"



Engines	Twin Detroit Diesel – M12V-71-T1
Rated Horsepower	540 BHP at 2300 RPM
Reduction Gear	Twin Disc – Model MG-514M, 2.5:1 reduction
Propellers	Fixed 3 bladed, 38” diameter, 32”pitch
Fuel Type	Diesel
Fuel Capacity	
100%	960 GAL
95% (usable)	912 GAL
Electrical Generation	21.5-kW, single phase, 120 VAC, 60-Hz unit, operating at 1800 RPM
Displacement	
Hoisting condition (boat, full fuel, outfit; no crew or cargo)	63,900 LBS
Normal operating condition (Hoisting condition + 4 crewmembers @ 210 LBS ea)	65,800 LBS
Fully loaded condition (Normal operating condition + cargo)	74,066 LBS
Trailer Information	The ANB was not designed to be transported on a boat trailer. Over the road delivery should be performed by a licensed commercial shipping company.
Potable Water Capacity	240 GAL
Sewage Capacity	35
Grey Water Capacity	110

A.4.b. Physical characteristics

“B” Class 551113-55119

Hull Length	55’ 0”
Length Overall	58’ 9” (w/ rub rails)
Hull Beam	16’ 3/4”
Beam Overall	16’ 10”
Freeboard	
Bow	5’ 10”
Amidships	5’ 0”
Aft	4’ 9”
Draft (normal operating condition)	5’ 11”
Highest Points:	
Fixed	14’ 7”
Unfixed	25’ 0”



Engines	Twin Detroit Diesel – M12V-71-T1
Rated Horsepower	540 BHP at 2300 RPM
Reduction Gear	Twin Disc – Model MG-514M, 2.5:1 reduction
Propellers	Fixed 3 bladed, 38” diameter,
32” pitch	
Fuel Type	Diesel
Fuel Capacity	
100%	960 GAL
95% (usable)	912 GAL
Electrical Generation	21.5-kW, single phase, 120 VAC, 60-Hz unit, operating at 1800 RPM
Displacement	
Hoisting condition	63,900 LBS
(boat, full fuel, outfit; no crew or cargo)	
Normal operating condition	65,800 LBS
(Hoisting condition + 4 crewmembers @ 210 LBS ea)	
Fully loaded condition	74,066 LBS
(Normal operating condition + cargo)	
Trailer Information	The ANB was not designed to be transported on a boat trailer. Over-the-road delivery should be performed by a licensed commercial shipping company.
Potable Water Capacity	240 GAL
Sewage Capacity	35
Grey Water Capacity	110

A.4.c. Physical characteristics

“C” Class 55120-55122

Hull Length	55’ 0”
Length Overall	58’ 0” (w/ rub rails)
Hull Beam	16’ 4”
Beam Overall	17’ 0”
Freeboard	
Bow	5’ 10”
Amidships	5’ 0”
Aft	4’ 9”
Draft (normal operating condition)	5’2”
Highest Points:	
Fixed	14’ 7”
Unfixed	25’ 0”
Engines	Twin Detroit Diesel – M12V-



	71-T1
Rated Horsepower	540 BHP at 2300 RPM
Reduction Gear	Twin Disc – Model MG-514M, 2.5:1 reduction
Propellers	Fixed 3 bladed, 38” diameter, 32” pitch
Fuel Type	Diesel
Fuel Capacity	
100%	900 GAL
95% (usable)	855 GAL
Electrical Generation	21.5-kW, single phase, 120 VAC, 60-Hz unit, operating at 1800 RPM
Displacement	
Hoisting condition (boat, full fuel, outfit; no crew or cargo)	63,900 LBS
Normal operating condition (Hoisting condition + 4 crewmembers @ 210 LBS ea)	65,800 LBS
Fully loaded condition (Normal operating condition + cargo)	74,066 LBS
Trailer Information	The ANB was not designed to be transported on a boat trailer. Over-the-road delivery should be performed by a licensed commercial shipping company.
Potable Water Capacity	240 GAL
Sewage Capacity	35
Grey Water Capacity	110
A.4.d Operating Parameters	
Crew Capacity	4
Maximum Passengers	45
Maximum Seas (transiting)	6’
Maximum Seas (servicing aids)	3’
Maximum Winds (knots)	30 KTS
Range (NM) (at 10 knots) in Calm Water	900 NM
Endurance	4 days
Maximum Operating Distance from Shore	20 NM
Top RPM and Speed	2300 RPM (21 KTS)
Cruising RPM and Speed	1400 RPM (@12 KTS)
Towing Capacity (displacement tons)	15 displacement tons
Ice Breaking Capability	Light surface ice up to 1”
A.4.e AtoN Operating	
Cargo Capacity	4,000 LBS
Maximum Hoisting Capacity (Buoy, Safe Working Load over stern):	3,600 LBS
Maximum Sea State for Buoy	



Parameters	Operations:	3'
	Maximum Sea State for Transiting:	
	No load:	6'

A.5. Superstructure The boat’s deckhouse is located on the main deck between Frames 3 and 6.5. It has three accesses (except the “A” class which has only two: starboard side and aft) from the main deck. The superstructure contains the steering stations, galley and all electronic navigation systems.

A.6. Hull The hull is made of 5086 aluminum alloy plate. The hull is divided into five watertight compartments numbered from bow to the transom. The deepest draft, 5 feet 2 inches, is located between Frame 10 and 11. The propulsion system is a straight drive configuration with the engines and reduction gears close-coupled in the engine room. The propeller shaft runs aft from the reduction gear through the struts between Frames 13 and 14.

A.6.a. Hull construction The hull consists of a 5/16-inch 5086 aluminum alloy plate from the bow to six inches forward of Frame 13 and 3/8 inch 5086 aluminum alloy from six inches forward of Frame 13 through to Frame 15 and including the platform. The Frames are spaced at 44 inch intervals to provide structural reinforcement. The rub rails are made of D-shaped rubber for the sides of the hull and donnage/synthetic for the transom.

A.6.b. Hull reference points Frames are numbered from transom to bow at 44 inch intervals. Longitudinal spacing is 16 inches.

Item	Location
Frame 2	Bow bitt
Frame 3	Hand rails on the bow begin. AC cooling water discharge on the port side.
Frame 9	The depth finder transducer is located in lazarette.
Frame 10-11	The boats deepest draft.
Frame 11-12	The sea chest strainer located on the starboard side of the keel.
Frame 12	The shafts penetrate the hull and are supported by struts located between frames 13-14.
Frame 14	The propellers are located approximately 5’1” below the waterline.
Frames 14-15	The rudder post penetrates the hull.



Section B. Watertight Compartments

Introduction The 55' ANB has five main watertight compartments separated by bulkheads:

1. Forepeak Bow to Bulkhead 2.
2. Crew's quarters Bulkhead 2 to 5.
3. Workshop Bulkhead 5 to 8.
4. Machinery compartment Bulkhead 8 to 13.
5. Lazarette Bulkhead 13 to transom.
6. Aft Work Platform—extends 3ft aft of transom.

In this section This section contains general information regarding the location of/access to and physical characteristics of the following areas of the boat:

Topic	See Page
Work Platform	2-8
Lazarette	2-9
Machinery Space	2-10
Fuel Tanks	2-11
Workshop	2-12
Galley/Mess	2-13
Head	2-14
Berthing Compartment	2-15
Forepeak/Void	2-16



Work Platform

B.1. Access

Transom aft-extending 3 feet aft is a work platform which is built as an integral part of the hull. Its top is approximately 15 inches above the waterline and it has a vee notch for buoys at the aft end. Carried on this platform is a hinged pipe guard which lowered into the water manually and serves to protect the propellers when backing down on a buoy. Access to the work platform is from the two flush mounted scuttles located on the port and starboard side.

B.2. Physical characteristics

The voids serve as buoyancy chambers.



Lazarette

B.3. Access

The lazarette is located between Bulkhead 13 to the transom. The lazarette can be accessed from the port side for the “A” class and starboard side for the “B” and “C” class from the main deck.

B.4. Physical characteristics

A permanently installed ladder is located on Bulkhead 13 and directly below the hatch. The hatch can be opened from the main deck utilizing a key wrench or from inside the compartment with a permanently attached handle.

The following major pieces of equipment are located in the lazarette:

- tiller assembly
- 2 halon bottles with discharge valve
- tow line reel
- steering gear hydraulic unit
- rudder posts

Equipment descriptions are provided in *Chapter 3* of this handbook.



Machinery Space

B.5. Access

The machinery space is located below the main deck between Bulkheads 8 and 13. It is accessible through a flush mounted scuttle aft on the portside or starboard side depending on the class of vessel.

B.6. Physical characteristics

An escape hatch is located on the main deck centerline of the machinery. The hatch is oval and has a clear opening of 16 inches by 24 inches. It is aluminum and can be opened or closed from the main deck with key wrench.

The machinery space has a natural ventilation system and is protected from fire by a fixed halon flooding system.

The following pieces of equipment are located in the machinery space:

- port and starboard propulsion engines, gauge panels and associated equipment
- ship service generator
- port and starboard propulsion engine fuel filters
- steering hydraulic oil reservoir
- crane hydraulic oil reservoir
- 24-VDC breaker
- battery charger
- engine starting batteries (2 Batteries A Class)
- engine starting batteries and generator (4 Batteries B Class)
- reduction gear oil cooler (2)
- fwd bilge pumps

Equipment descriptions are provided in *Chapter 3* of this handbook.



Fuel Tanks

B.7. Location The fuel tanks are located port and starboard side in the workshop area and are equipped with suction, return fill and vent lines.

B.8. Physical characteristics Each fuel tank is constructed of aluminum has a separate 2 inch fill connection, sounding rod, stripping connection, and flameproof vent with 40-mesh screen. Fuel supply and return piping is constructed of IPS black iron for A Class, and 316L Stainless Steel for the B and C Class.

The fill and sounding tubes in the main deck are fitted port and starboard for fuel tanks and two calibrated sounding rods are provided.



Workshop

B.9. Access

The workshop is located below the main deck forward of the machinery space. Access to this area is through the berthing area QWTD or a weather tight door accessible from the main deck aft of the pilothouse just starboard of the centerline.

B.10. Physical characteristics

Workshop equipment and furnishings consist of the following items:

- storage shelves
- portable face washing station
- hanging locker
- potable water heater
- potable water pump and bladder
- a/c raw water pumps
- a/c unit
- electrical distribution panel and transformer
- grey water discharge pump
- grey water tank
- fuel tanks
- bilge pump

There are 120-VAC and 12-VDC outlets.

The hanging locker is used to stow rain gear, foul weather jackets, anti-exposure overalls and personal flotation devices.



Galley/Mess

B.11. Access The galley/mess area is located on the port side aft in the pilot house. Access to this area is through a weather tight door accessible from the main deck aft of the pilothouse port of the centerline.

B.12. Physical characteristics The following equipment and furnishings are provided in the galley/mess area:

- stainless steel countertop with sink
 - 6-cubic-foot refrigerator/freezer
 - four-burner electric range and oven
 - microwave oven
 - automatic coffee maker
 - TV/VCR/DVD
 - mess table
 - bench seats (2) with stowage underneath
 - cabinets and drawers next to refrigerator
-



Head

B.13. Access

The head is located in the crew's quarters on the port side "A" class. Access to this area is through a quick-acting watertight door accessible from the workshop or the pilothouse just starboard of the centerline. The "B" and "C" class the head is located on the starboard side. Access to this area is through a quick-acting watertight door accessible from the workshop or the pilothouse on the port side.

B.14. Physical characteristics

The head consists of the following items:

- a toilet
 - a shower
 - stainless steel sink and countertop
 - associated fixtures and fittings
 - storage space behind the mirror
 - heater
 - powered exhaust fan
-



Berthing Compartment

B.15. Access The berthing compartment is located between Frames 2 and 5. Access to the berthing area is through a QWTD at Bulkhead 5 in the work shop or by the ladder in the pilothouse (A class starboard side and B/C class port side).

B.16. Physical characteristics The berthing compartment contains the following equipment and furnishings:

- double-high crew berths (2)
- berth lights (4)
- clothing lockers (4)
- linen locker (1)
- stowage spaces (2) provided below the lower berths
- storage lockers



Forward Peak

B.17. Access The forward peak is a storage chamber accessed through a flush deck-mounted hatch located on the main deck just forward of bulkhead.

B.18. Physical characteristics Forepeak area is utilized to store the anchor line and reel.



Section C. Pilothouse

C.1. Access

The pilothouse is made of aluminum and located between Frames 3 and 6.5. There are three accesses (except the A class which has only two: starboard side and aft) from the maindeck.

C.2. Physical characteristics

The pilothouse equipment includes helmsman console with main engine controls, gauges and steering wheel. Other items are the chart table, Differential Global Positioning System (DGPS), stand alone computer, flat screen monitors, radar, compass, depth sounder, VHF radios, loudhailer and air horn. The pilothouse also provides a dinette and combination stove, refrigerator and sink unit.

System controls and monitoring will be discussed with description and operation of individual systems in subsequent chapters of this handbook.



Section D. Mast

D.1. Location

The mast is mounted atop the pilothouse on a hinged fitting and supported by two port and starboard mast support legs that retain the mast in a vertical position utilizing shoulder bolts, nuts and washers.

D.2. Physical characteristics

The mast is constructed of 3-inch 5086 H32 aluminum pipe. The height of the mast above the pilothouse is 14 feet 7 inches. A yardarm constructed of 1-inch aluminum pipe is welded to the mast.

Attached to the mast and yardarm are the following components:

- anchor light
 - masthead light
 - restricted maneuvering light (upper)
 - floodlights (2)
 - lower tow light
 - restricted maneuvering light (middle)
 - restricted maneuvering light (lower)
 - stern tow light
 - stern light
 - rope pulley (port and starboard side of mast yardarm) with nylon line and snap hooks
-



Section E. Deck Equipment and Fittings (Other than Buoy Handling)

Introduction

This section contains general information regarding the location and physical characteristics of the following deck equipment and fittings (other than buoy handling):

Topic	See Page
Mooring Bitt	2-22
Anchor Line Reel	2-23
Bits and Chocks	2-24
Life Rings	2-25
Life Raft	2-26
Boat Hooks	2-27
Handrails and Lifelines	2-28
Deck Lockers	2-29
Emergency Dewatering Pump	2-30



Mooring Bitt

E.1. Location The mooring bitt (**figure 2-1**) is installed on the foredeck centerline, forward of the pilothouse forward of Bulkhead 2.

E.2. Physical characteristics The mooring bitt is positioned so that the anchor line can lead through the center of the bull nose from the forepeak to the main deck. The mooring bitt is fabricated from 4-inch aluminum pipe. A Thompson plug is fitted into the top of the mooring bitt.



Figure 2-1
Mooring Bitt



Anchor Line Reel

E.3. Location One anchor line reel is mounted inside the forepeak, centerline forward.

E.4. Physical characteristics The fabricated aluminum anchor line reel is 16 inches in diameter and is mounted to allow the anchor line to be stored properly.



Bitts and Chocks

E.5. Location

One closed chocks and 10 mooring bitts are located around the deck edge of the hull at the following locations:

- One (1) closed chock set into bulwark, centerline at the bow.
- Two (2) mooring bitts on the foredeck, port and starboard, just forward of the pilothouse.
- Two (2) mooring bitts on the main deck, port and starboard, located at Frame 5.
- Two (2) mooring bitts on the main deck, port and starboard, located aft of the deck boxes.
- Two (2) mooring bitts on the main deck, port and starboard, located at Frame 14.
- Two (2) mooring bitts on the transom.

E.6. Physical characteristics

The chocks and bitts provide provisions for making up lines to the hull when in port or underway.



Life Rings

E.7. Location Two life rings are installed on aluminum brackets on the port and starboard exterior sides of the pilothouse.

E.8. Physical characteristics The life rings are the unicellular type; plastic body life rings with 2-inch retro-reflective tape, 30 inches in diameter with an electric, self-lighting, gravity-activated float light, and 75 feet of $\frac{3}{8}$ -inch polypropylene line.



Life Raft

E.9. Location

One 6-person life raft is stored in a weather-tight, fire-retardant container with a hydro-static release atop the pilothouse, forward of the mast, in a float-free life raft cradle.

E.10. Physical characteristics

The life raft's sea-painter is attached to a shackle on top of the pilothouse by a weak link. In the event the boat is sinking, the weak link will automatically cast off the life raft before any damage is incurred to it.



Boat Hooks

E.11. Location Two boat hooks are mounted horizontally port and starboard on the outboard side of the pilothouse located under the hand rail.

E.12. Physical characteristics Two boat hooks are secured to the pilothouse with permanent brackets. The hooks are bronze or brass with wooden handles approximately 8-12 feet long and shall be engraved with boat's hull number.



Handrails and Lifelines

E.13. Location	Handrails are position throughout the perimeter of the main deck.
E.13.a. On the foredeck	Fixed handrails are installed from the bow to the deck boxes with two openings on each side for access.
E.13.b. On the buoy deck	Removable stanchions and safety chains are installed from the deck boxes aft to include transom.
E.14. Physical characteristics	The characteristics of the handrails are as follows:
E.14.a. On the foredeck	An opening between the port and starboard handrails is provided at the bow. The handrails and stanchions are constructed of 1 ¼-inch schedule 40 pipe.
E.14.b. On the buoy deck	The stanchions are constructed of 1 ¼-inch schedule 40 pipe. Two additional horizontal rails, constructed of ¾-IPS schedule 40 pipe, spaced 15 inches apart, are located below the top rail. The 6-foot opening along the middle of the buoy deck edge, port and starboard sides, is protected by two removable sections of ¼-inch stainless steel chain attached to the stanchions by snap hooks and connect links on one end, and shackles on the other end.



Deck Lockers

E.15. Location Deck lockers are installed port and starboard on the main deck; forward end of the buoy deck.

E.16. Physical characteristics The lockers are made from aluminum with an aluminum lid.



Emergency Dewatering Pump

E.17. Location The emergency dewatering pump is mounted aft of the pilothouse on the port side.

E.18. Physical characteristics The emergency dewatering pump is a gasoline-powered, centrifugal (P-6) type pump, rated at approximately 250 GPM with a dewatering height of 12 feet.

WARNING 

The P-6 fire fighting capability is intended to only provide personnel protection or to aid in removing survivors from a burning platform.



Chapter 3

Vessel Systems

Overview

Introduction

This chapter discusses the boat's mechanical, electrical, and manual operating systems. It describes basic characteristics and provides information to allow the boat's crew to operate effectively.

In this chapter

This chapter contains the following sections:

Section	Topic	See Page
A	Propulsion System	3-3
B	Propulsion Control System	3-5
C	Jacket Water Cooling System	3-7
D	Engine Systems	3-9
E	Hydraulic Steering System	3-17
F	AC Generator	3-19
G	Electrical Systems	3-21
H	Heating, Ventilation and Air Conditioning (HVAC) Systems	3-27
I	Crane	3-29
J	Electronic Navigation System	3-31
K	Magnetic Compass	3-33
L	Navigation Lights, Searchlights, Floodlights and Signal Devices	3-35
M	Fire Extinguishing Systems	3-37
N	Bilge System	3-39
O	Gray Water and Sewage Systems	3-41
P	Compressed Air System	3-43
Q	Potable Water System	3-45
R	Windshield Wipers and Washers	3-47



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Section A. Propulsion System

A.1. General

The propulsion system is comprised of two marine diesel engines each driving a fixed propeller through a reduction gear and solid, continuous shaft. The propellers are installed for right-hand ahead rotation on the starboard shaft and left-hand ahead rotation on the port shaft.

A.2. Engines (A, B, and C Class)

The boats propulsion system consists of two Detroit Diesel Model 12V-71-TI turbocharged diesel engines each rated 540 SHP @ 2300 RPM. The lubricating oil system capacity is approximately 10 gallons of SAE 40 oil. The cooling system capacity is approximately 23 gallons per engine.

NORMAL OPERATING CONDITIONS

Jacket Water Temp.	160-195°F	Oil Pressure
18-60 PSI		
Red Gear Pressure	215-325 PSI	

Each engine is equipped with a Twin Disc Omega MG-514M reverse-reduction gear with a basic reduction gear ratio of 2.5 to 1. With the engine turning at its maximum rated RPM of 2300, the propeller shaft turns at 920 RPM.

Maximum allowable oil temperature is 210°F (99°C).



A.3. Propeller shafts (A Class)

Shafts are 2 3/4" diameter x 12'-3" long, and are made from Armco Aquamet-17 boat shafting. Propeller end is machined to SAE standards for propeller taper, key, keyway, and thread. Coupling end is machined to suit coupling, and shaft keys are 5/8" square stainless steel type 316L.

(B and C Class)

Shafts are 2 3/4" diameter 12' 6 1/4" long, made of Armco Aquamet-17 boat shafting. Propeller end is machined to SAE standard for propeller taper, key, keyway, and thread. Coupling end is machined to suit coupling and shaft keys are 5/8" square keyway stock stainless steel Type 316L.

A.4. Propeller (A, B, and C Class)

Two propellers are provided with one left hand on the portside and one right hand on the starboard side to give outboard turning propellers (as viewed when looking forward). Propellers are Columbian "Hydroflite" 3-blade with 38" diameter and 32" pitch. Material is nickel-aluminum bronze. Propeller regular nut and jamb nut is hex head with 2" diameter x 4 1/2 threads per inch RH. The nuts are made of Armco Aquamet 17 stainless steel. When propellers are removed and reinstalled, use a light coating of waterproof grease on the shaft taper. The jamb nut is to be installed against the propeller hub. Shaft cotter pins are 1/4" diameter x 2 1/2" long either stainless steel or monel.



Section B. Propulsion Control System

B.1. General The pilothouse control console is the primary control station. Main controls are steering wheel, and main engine controls. Aft control station console is located on port side aft of deckhouse. Main controls are steering valve, engine controls, crane and deck winch controls.

B.2. Engine throttle control Engine throttle controls are Morse twin S/HD, with “43-C” control cables, and are located to the left of the steering unit. The pilothouse throttle controls are on the port side, and at the aft control station they are on the inboard or starboard side.

Electronic throttle controls are under development and an Engineering Change will follow.

Clutch controls are actuated by “pull-pull” cable connected to Morse model MD-24 control heads which are located to the right of the steering unit.

B.3. Engine control/gauge panels (pilothouse) The pilothouse is equipped with a port and starboard engine gauge panel on the pilothouse console. The start, stop, and alarm switches are located on the pilothouse console to the left side of the steering wheel. Each gauge panel contains the following controls and indicators:

- gear (clutch/transmission) oil pressure gauge
 - jacket water temperature gauge
 - tachometer
 - engine oil pressure gauge
 - shaft tachometer
-

B.4. Engine control/gauge panels (aft console) The Aft Console is equipped with a tachometer, shaft tachometer, and start and stop switches for each engine.



B.5. Engine control/gauge panel (engine room)

The machinery space (engine room) is equipped with a gauge panel. Each panel contains the following controls and indicators:

- engine oil pressure
- gear (clutch/transmission) oil pressure gauge
- marine gear oil temperature
- jacket water temperature
- tachometer

B.6. Emergency shutdown controls (main engines)

Emergency shutdown pull knobs for the main engines are located on the front port side of the pilothouse console and on the starboard side of the aft control console. Push/pull cables connect the shutdown knobs to the engine remote air shut-off valve to secure air to the engine for emergency shutdown. The generator emergency shutdown will be discussed with the AC generator system.

CAUTION !

If the Emergency shutdowns are engaged they must be manually reset on each engine.



Section C. Jacket Water Cooling System

- C.1. General** The jacket water-cooling system includes the engine-driven cooling water pump, coolant reservoir, thermostat, and lube oil cooler.
-
- C.2. Engine-driven cooling water pump** A gear-driven cooling water pump provides flow of the jacket water through the engine and lube oil cooler.
-
- C.3. Coolant reservoir** The coolant reservoir provides storage and expansion for a 50-50 water/ethylene-glycol antifreeze mixture for the jacket water-cooling system. An 8-PSIG pressure cap is installed in the top of the reservoir for filling and to relieve excessive system pressure.
-
- C.4. Thermostat** The thermostat in the jacket water-cooling system is designed to maintain the jacket water-cooling temperature at 175 to 185.



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Section D. Engine Systems

Introduction This section provides information about systems or components that are required for or support the operation of the marine diesel main propulsion engines.

In this section This section contains the following information:

Topic	See Page
Engine Lubrication System	3-10
Engine Crankcase Ventilation System	3-11
Fuel Oil System	3-13
Engine Exhaust System	3-14
Engine Jacket Water Heaters (Hot Start)	3-15
Engine Starting System	3-16



Engine Lubrication System

D.1. General	<p>The main diesel engines are equipped with a pressure type, wet sump oil system. The system consists of:</p> <ul style="list-style-type: none">• pump and suction screen• spin-on cartridge filter• filter bypass valve
D.2. Pump and suction screen	<p>The oil pump, which is gear driven by the engine, takes suction on the sump through an oil screen. The pump creates oil flow through the oil cooler.</p>
D.3. Spin-on cartridge filter and bypass valve	<p>The oil filter mounted on the inboard side of each engine is a spin-on type disposable cartridge filter.</p>
D.4. Filter bypass valve	<p>A bypass valve is provided to divert oil around the filter element should it become clogged.</p>
D.5. Oil cooler bypass valve	<p>The oil cooler is located on the engine, starboard side of each engine. The cooler uses jacket water-cooling to cool the engine oil. Oil flows from the cooler to the filter.</p>



Engine Crankcase Ventilation System

D.6. General The crankcase ventilation system (**figure 3-1**) routes the fumes produced by the engine oil system back through the engine air intake system.

D.7. Air separator filter An air separator filter, mounted on the inlet flange for the turbocharger, receives fumes from the engine crankcase via a crankcase regulator and manifold assembly attached to the tappet cover.

D.8. Air separator body The air separator body is designed to remove oil from the engine oil fumes and return the oil back to the engine oil pan via a check valve and hose connected to the bottom of the air separator and the oil pan.

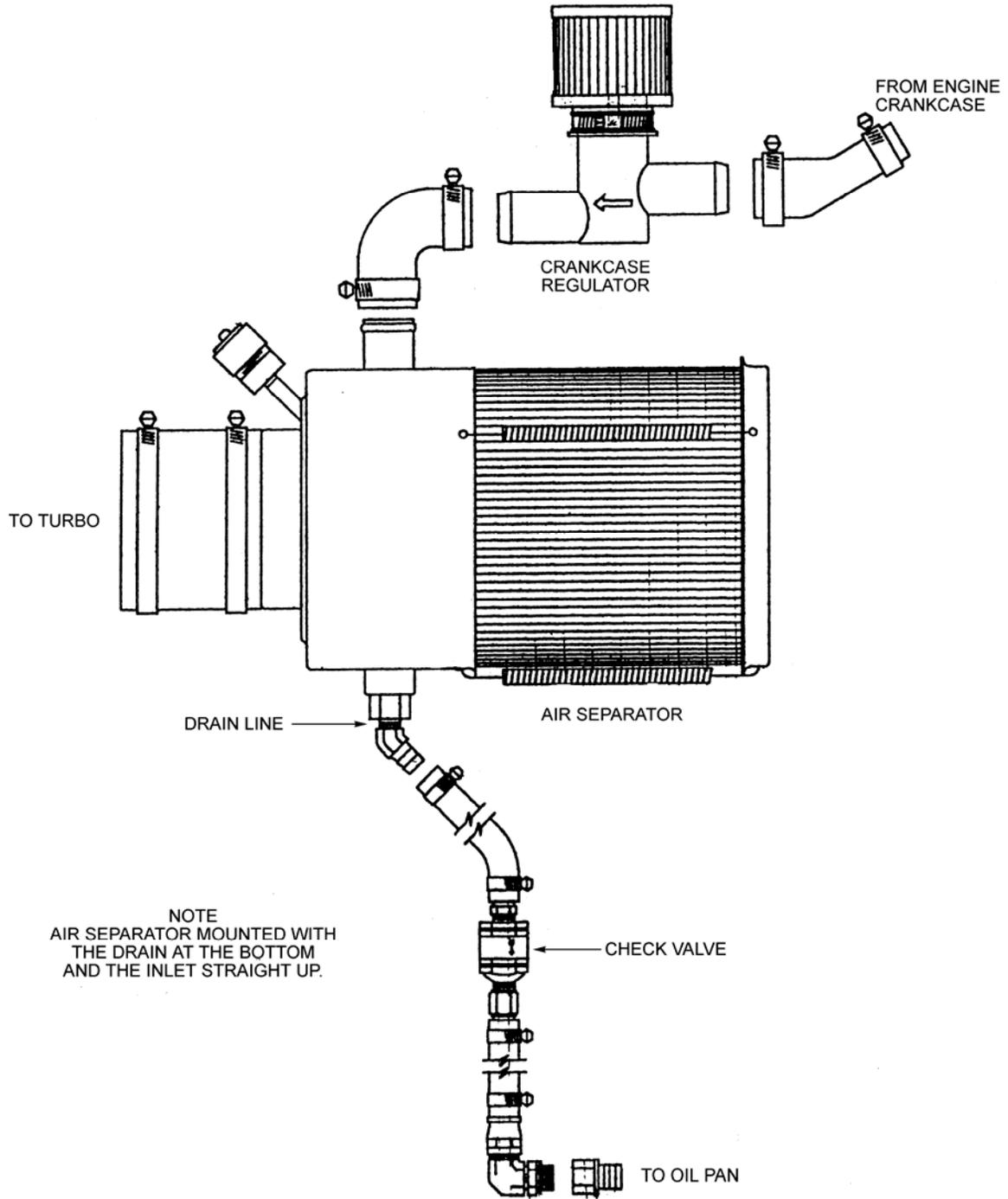


Figure 3-1
Engine Crankcase Ventilation System



Fuel Oil System

D.9. General The fuel oil system provides fuel to the main propulsion diesel engines and the service generator diesel engines and is composed of:

- primary fuel oil filter assembly
- secondary fuel filter

D.10. Primary fuel oil filter assembly (primary fuel filter) Each engine has a primary fuel filter/separator that is mounted on a frame on the inboard side of each engine. It filters from the suction side of the engine-driven fuel pump. The separator portion of the filter is designed to remove large solid particles and to coalesce the small amount of water that falls to the bottom of the filter bowl. A drain plug on the bottom of the filter bowl is provided to remove collected contaminants and water.

D.11. Secondary fuel filter The secondary fuel filter is mounted on the starboard side of the engine and filters the fuel from the discharge side of the engine-driven fuel pump, prior to the injectors.



Engine Exhaust System

D.12. General The main diesel engines each utilize a separate, wet type exhaust system.

D.13. Piping and mufflers The exhaust system consists of two stainless steel pipes that attach to the each engine turbo with a V-band and a hose to the muffler that is hard piped to the overboard discharge.

D.14. Overboard ports The overboard ports for the exhaust system are above the waterline, forward of Frame 13.



Engine Jacket Water Heaters (Hot Start)

D.15. General A 2500-watt, 220-VAC, electric heater is installed in the jacket water system on each main diesel engine.

D.16. Thermostat Units are factory set maintain the jacket water temperature from 100 to 120°F.



Engine Starting System

D.17. General The main engine starting system is comprised of a 24-VDC starter, 2 start buttons, and a start solenoid for each starter.

D.18. Starter and solenoid The starter and solenoid are mounted together on the port side of the engine. Main engine starting can be accomplished in the pilothouse or on the aft console.



Section E. Hydraulic Steering System

- E.1. General** The power steering system is hydraulically operated by the wheel in the pilothouse and a lever mounted on the aft console.
-
- E.2. Steering System** The helm pump is gear driven on starboard engine. It is located on the back of the engine above the reduction gear and to the right of the raw water. The systems consists of a 35-gallon tank, a gear driven pump, helm, aft steering valve, hydraulic ram, bypass valve and miscellaneous pipes and hoses.
-
- E.3. Hydraulic Steering Ram** The hydraulic steering ram is located in the lazarette space, attached to the rudderposts. There is a bypass valve that when used allows the rudders to be turned with the emergency tiller.
-
- E.4. Return oil filter** A 25-micron spin-on oil filter in the return line prior to the reservoir filters oil returning from the steering system.
-
- E.5. Tiller assembly** The tiller assembly is located in the lazarette and converts the force of the hydraulic cylinder into a port and starboard mechanical movement to position the rudders as commanded from the pilothouse. The actuating cylinder connects to the starboard tiller (bellcrank). A tie bar connects the starboard tiller to the port tiller.
-
- E.6. Rudders** The rudders are twin, spade type rudders. The rudder stocks (shafts) are fabricated from stainless steel alloy; same alloy used to fabricate the propeller shafts. The rudder shafts pass through a rudder log with a bearing, a lip seal and a thrust bearing at the top of the rudder log, and a bearing at the bottom of the rudder log.
-



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Section F. AC Generator

F.1. General	The AC generator set is a 21.5 KW, 120/240 volt VAC 60 HZ, operating at 1800 RPM. The generator set is mounted in the machinery space aft.
F.2. Diesel engine	The Onan generator set is powered by a Cummins engine. The generator is directly coupled to the diesel engine.
F.3. Duplex fuel oil filter assembly (primary fuel filter)	The diesel engine for the generator set has a primary filter mounted on a frame assembly, directly starboard of the generator set under the deck plate. The filter is on the suction side of the engine-driven fuel pump. The separator portion of the filter is designed to remove large particles and to coalesce small amounts of water. A drain plug on the bottom of the filter bowl is provided to remove collected contaminants and water.
F.4. Fuel pump and filter	The engine-driven fuel pump and secondary filter are mounted on the engine directly below the oil filter. The secondary fuel filter is located on a frame on the starboard side of the generator.
F.5. Lubrication system	The engine lubrication system is a self-contained (Use 15W40), wet sump system, incorporating a spin-on, full-flow filter and 8-quart oil system capacity. The lubrication filter is located on the same side of the engine as the dipstick.
F.6. Jacket water system	The jacket water system consists of a reservoir/expansion tank, a pump and an expansion tank cooler. The reservoir requires a 50-50 mixture of freshwater and ethylene glycol antifreeze. The reservoir is fitted with a 7-PSI pressure cap. The centrifugal engine-driven pump pumps the jacket water through the engine and cooler. The system is designed to keep the jacket water below 210 °F.
F.7. Saltwater system	The generator saltwater system provides cooling water to the generator expansion tank to cool the jacket water. The system uses a centrifugal type pump with a neoprene impeller that is mounted on the outboard side of the engine near the dipstick. The pump is rated at approximately 9GPM at 10PSI.
F.8. Engine exhaust system	The generator engine uses a separate wet type exhaust system. The exhaust system consists of a muffler, hoses, and overboard port.



F.9. Diesel engine pilothouse control panel (generator)

A control panel located on the pilothouse console for the generator set provides the following controls and gauges:

- oil temperature gauge
- hourmeter
- oil pressure gauge
- jacket water temperature gauge
- START/STOP switch

F.10. Diesel engine machinery space control panel (generator)

A control panel located in the machinery space on the generator set provides the following controls and gauges:

- oil temperature gauge
- hourmeter
- oil pressure gauge
- jacket water temperature gauge
- gauge control button
- START/STOP switch

The gauge control button interprets the electrical signal to the pilothouse gauges and diverts it to the machinery space gauges when pushed.



Section G. Electrical Systems

G.1. General	The 55' ANB electrical system includes both AC and DC power distribution systems from several sources.
G.2 120-VAC power distribution system	AC power is provided from two separate sources: (1) the ship service generator and (2) shore power. The diesel generator circuits and shore power circuits are interlocked to prevent simultaneous operation. The 120/220 main VAC panel is located in the workshop.
G.2.a. Ship service generator	The 21.5 KW, single-phase, 120/220 VAC, the generator is the normal source of power when underway or at anchor. The generator is located in the machinery space aft.
G.2.b. Shore power	The shore power receptacle is located on the outside of the pilothouse, on the portside, aft. The isolation transformer is single phase 240/120v.
G.3. 24-VDC power distribution system	The 24-VDC power distribution system is capable of receiving power from three different sources during different boat operating scenarios. The three sources are: (1) alternators (main engine driven), (2) battery charger, and (3) battery bank.
G.3.a. 12 VAC Electronics Panel	<p>The 12-VAC electronics panel is feed from the 24 VAC (electronics main breaker) to the electronics breaker panel, located inboard of the 24 VAC panel, then thru 24 VAC to 12 VAC converters and then to the electronics themselves. This panel provides power to the following components:</p> <ul style="list-style-type: none">• Loud hailer & depth sounder• VHF Radio• DGPS• blue light• radar• triton



**G.3.b. 120/220
Main VAC
Breaker Panel**

The 120/220 main VAC panel is located in the workshop, forward port side. The panel receives inputs from the shore power receptacle or from the service generator. The following is a sample of the “A” Class panel components and may vary depending on class:

- shore tie
- generator
- galley unit (220 VAC)
- potable water heater (220 VAC)
- port engine hot start (220 VAC)
- workshop heaters (220 VAC)
- engine room and lazarette lights (110 VAC)
- aft console outlet (110 VAC)
- workshop air conditioning (110 VAC)
- potable water pump (110 VAC)
- gray water holding tank pump (110 VAC)
- starboard engine hot start (220 VAC)
- air compressor (220 VAC)
- head heater (220 VAC)
- crew space heater (220 VAC)
- workshop outlets & crew space lights (110 VAC)
- crew space outlets (110VAC)
- workshop lights (110 VAC)
- head lights (110 VAC)
- vacu-flush holding tank pump (110VAC)
- generator to shore tie switch
- voltmeter
- ammeter
- feeder circuit breaker
 - to pilothouse 120/220 VAC panel

**G.3.c. Service
Alternators**

Each main engine is equipped with a 24 volt, 75-amp DC alternator with voltage regulator type generator arranged for parallel operation. The generators supply power for charging the 24-volt batteries that are used for main engine and generator starting and for providing power to the 24-volt DC electrical system.



G.3.d. Battery charger

Battery charger is located on the port side outboard of the port engine. The battery charger is an American Monarch serial number B76578 fitted with a charging ammeter. This unit has an input of 120 volts AC single phase and provides a maximum of 40 amps for charging the 24-volt DC batteries. An interlock is provided to prevent the battery charger from charging the batteries during main engine starting and running. Disconnect breakers are on the unit and in the pilothouse 120/220 VAC panel.

G.3.e. Battery banks

- There are two batteries, each 12 volt 200 ampere-hours, connected in series to give 24 volt DC power for this low voltage DC electrical system. There are two (2) batteries, each 12 Volt 220 ampere-hours. Two connected in series to provide 24 VDC power for the D.C. electrical system and the main engine starting circuit.
 - There are switches (3) on the port bulkhead over the muffler for sending power the starters on (1) port engine, (2) starboard engine and (3) generator.
-



G.4. Power panels

The following four primary power panels are provided for power distribution:

- 24 VDC power panel
 - 120/220 VAC main VAC panel
 - 120/220 VAC pilothouse panel
 - 12 VAC electronics panel
-

G.4.a. 24 VDC power panel

The 24-VDC power panel (LC2) is located in the engine room, starboard, directly aft of the starboard fuel oil tank. The panel supplies power to the following components:

- pilothouse vital panel
 - steering system HPU
 - port main engine control power
 - CO₂ system
 - engine room/workshop emergency lighting
 - sewage vacuum pump
 - potable water pump
 - buoy handling hydraulic system control
 - A/C condensate pumps #1 and #2
 - main engine control power
-

G.4.b. 24 VDC breaker panel

The 24 VDC panel is located on the port side of the pilothouse console. The panel supplies power to the following components:

- navigation lights
 - red mast lights
 - port shaft tachometer
 - starboard shaft tachometer
 - aft defroster
 - forward defroster
 - search light
 - engine room fire detection
 - workshop bilge pumps
 - engine room, lazarette forepeak, & crews space bilge pumps
 - bilge alarm horn
 - compass & gauge lights
 - windshield wipers
 - engine room lights
 - vacu-flush head
 - port engine start
 - starboard engine start
 - electronics main
-



G.4.c. 120 VAC
pilothouse power
panel

The 120 VAC pilothouse power panel is located below the forward console, starboard side. Breakers on this panel provide power to the following components:

- battery charger breaker
 - port pilothouse heater breaker
 - port outlets breaker
 - forward pilothouse lights breaker
 - mast floodlights breaker
 - crane outlet breaker
 - starboard heater breaker
 - pilothouse air conditioner breaker
 - aft pilothouse lights breaker
 - workshop ladder light breaker
-



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Section H. Heating, Ventilation, and Air Conditioning (HVAC) Systems

H.1. General	Heating and air conditioning is provided to the pilothouse, workshop, and crews space. The machinery space has only ventilation, no air conditioning. The heating system heats the pilothouse, workshop and berthing.
H.2. Machinery space heating and ventilation	No heating is provided for the machinery space. Online equipment underway and in port keeps the space warm. The space has natural ventilation.
H.2.a. Machinery space temperature	The machinery space is provided with natural ventilation system. The ventilation to the machinery space is designed to keep air flowing trough the space. The machinery space is kept warm by the machinery that is online and the main engine heaters.
H.2.b. Supply/Exhaust ventilation ducts	The machinery space supply/intake ventilation ducts are located on the main deck aft of the deck boxes. Plates are located in the port/starboard deck box to block the airflow in a case where the Halon System would have to be discharged.
H.3. Cabin Air Conditioning	The cabin air conditioning unit is located under the console on the starboard side.
H.4. Workshop & Crew space Air Conditioning	The workshop and crew space air conditioning is the same as the cabin except that there is an air handler in the workshop and one in the crews space.



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Section I. Crane

I.1. General (A, B, and C Class) The crane and deck winch hydraulic system consists of the following components:

- Alaskan Marine Crane
- PTO (Power Take-Off)
- Hydraulic pump
- two cross deck winches
- 6 control valves
- hydraulic reservoir

Control of the buoy handling equipment is from the aft console.

I.2. Hydraulic oil reservoir (A, B, and C Class) The hydraulic oil reservoir is located in the machinery space (engine room) out board side of the port engine. The reservoir has a 45-gallon capacity of fluid 2135 hydraulic.

I.3. Hydraulic pump (A and B Class) The hydraulic system consists of a single pump, rated at 1200 RPM, driven from power take-off on the port engine. Hydraulic crane pump manufactured by Vickers Hydraulics, Model no. 25V21-1C10-180/181 rated at 18.6 GPM.

(C Class) The hydraulic crane and deck winch system is powered by a Vickers, Series 35 VQ, Hydraulic Vane Pump. The pump is driven off of the port main engine PTO.

I.4. Hydraulic filter (supply) The hydraulic filter is located on the discharge side of the hydraulic pump. The filter is a spin-on, disposable filter.

I.5. Crane (A Class) The crane is a Model MCK-420-KM, manufactured by Alaska Marine Crane, Inc. It is a fully hydraulic articulated crane, installed on the aft deck with a 20' outreach, swing rotation arc of 360° and providing 1,800 pounds of lift anywhere within the sweep envelope of the crane head and 3,600 lbs over the buoy notch.

(B Class) The crane is a Model MCK-420-KM, manufactured by Alaska Marine Crane, Inc. It is a fully hydraulic articulated crane, installed on the aft deck with a 20' outreach, swing rotation arc of 360 degrees and providing 1800 pounds of lift anywhere within the sweep envelope of the crane head and 3,600 lbs over the buoy notch.



(C Class) The crane is a Model MCK-420-RM, manufactured by Alaska Marine Crane, Inc. It is a fully hydraulic articulated crane, installed on the aft deck with an 20' outreach, swing rotation arc of 360 degrees and providing 1600 pounds of lift anywhere within the sweep envelope of the crane head and 3,600 lbs over the buoy hatch.

I.6. Deck Winches (A, B, and C Class) Each deck winch is rated 1800 pounds line pull with a line speed (no load) of 80 to 100 feet per minute. Deck winches are located port and starboard on the aft deck with controls at port aft console.

I.7. Hydraulic System Crane and Deck Winches (A Class) The hydraulic system consists of a single pump, rated at 1200 RPM, and driven by a power take off on the port engine gearbox. The six valves for controlling the crane and deck winches are located on the port aft control console and comprise a modular manifold unit. Valves are open center constant circulating type.

Piping is pickled seamless steel schedule 80, with 3000 pound screwed steel fittings. Suction hose connection to pump is Aeroquip no. 2661-24 hose with cadmium plated fittings.

(B Class) The hydraulic system consists of a single pump, rated at 1200 rpm, driven from power take-off on the port engine. The six valves for controlling the crane and deck winches are located on the port aft control stand and comprise a modular manifold unit. Valves are open center constant circulating type. Hydraulic crane pump manufactured by Vickers Hydraulics, Model no. 25V21-1C10-180/181 rated at 18.6 GPM.

Piping is 316-L stainless steel Schedule 80 with 3000 pound screwed fittings. Suction hose connection to pump is Parker 301 double wire braided hose, with reusable fittings.

NOTE 

System was initially filled with Gulf Harmony 32 hydraulic fluid, formerly HAR44.

(C Class) The hydraulic system consists of a single pump, rated at 1200 rpm, driven from power take-off on the port engine. The six valves for controlling the crane and deck winches are located on the port aft control stand and comprise a modular manifold unit. Valves are open center constant circulating type. Hydraulic crane pump manufactured by Vickers, Series 35 VQ Hydraulic Vane Pump.

Piping is 1/2" 316-L stainless steel pipe. Suction hose connection to pump is Parker Flexible Hose with stainless steel fitting.



Section J. Electronic Navigation System

- J.1. General** The electronic navigation system consists of the SINS (Scaleable Integrated Navigation System) package.
-
- J.2. Furuno navigation radar** The Furuno radar set display unit is mounted from the overhead in the pilothouse, starboard side of the helmsman wheel. The Furuno antenna and receiver/transmitter unit is mounted on the centerline on top of the pilothouse forward of the life raft cradle. The antenna swing circle is 46 inches. The system requires 24 VDC for operation.
-
- J.3. Depth sounder** The depth sounder monitor is mounted on the forward console in the pilothouse, port side of the helmsman wheel. A through-hull mounted transducer located between Frames 12 and 13 in the engine room behind the generator, transmits an ultrasonic energy wave into the water, listens for echoes from the ultrasonic wave, and then displays the returning echoes converted into units of depth on the display in the pilothouse. A remote indicator for the depth sounder is located on the aft console. The system requires 12 VDC for operation.
-
- J.4. Differential global positioning system (DGPS)** The DGPS display locations vary depending on class, in the vicinity of the chart table. The DGPS antenna is mounted on the mast above the aft deck lights. The system requires 12 VDC for operation.
-



J.5. VHF radios Two VHF receiver/transmitters (radiotelephones) are capable of transmitting on 53 and receiving on 92 Marine VHF radiotelephone channels. The receiver/transmitter units are mounted on the overhead in the pilothouse. A whip antenna for each unit is mounted on top of the pilothouse, forward, outboard, port and starboard side. One of the radios is set to continuously guard channel 13 and one to continuously guard channel 16. The radios operate on 12 VDC.

J.6. Loudhailer/intercom The loudhailer/intercom provides for listening and hailing exterior manned (weather decks) locations. The loudhailer is located in the forward pilothouse above the console. The loudhailer operates on 12 VDC.

The loudhailer can also provide nine different navigational sound signals, audible foghorn patterns that correspond to vessel operating conditions.



Section K. Magnetic Compass

K.1. General

The magnetic compass is mounted on the centerline of the forward console in the pilothouse. The compass has 5-degree increments on a 5-inch card dial, four lubber lines at 90 degrees, and is backlighted. The compass deviation card provides the date the compass was last swung and the deviation from the major cardinal points.



Section L. Navigation Lights, Searchlights, Floodlights and Signal Devices

L.1. Navigation lights

The navigation lights are controlled from a light switch box mounted port side of the console below the depth sounder. There are 8 toggle switches that provide for lighting configurations based upon the boat's operating configuration; underway, anchor, towing astern, towing alongside (inland), buoy operations underway, buoy operations at anchor, towing alongside (International), and off.

The following is a list of installed navigation lights:

- red light - port side of pilothouse
 - green light - starboard side of pilothouse
 - white light (all around) - anchor light, top of the mast
 - white light (forward) - masthead light, second light from top of the mast
 - red light (all around) - restricted maneuvering light (upper), third light from top of the mast
 - amber light (aft) - stern tow light, fourth light from the top of the mast
 - white light (forward) - lower tow light, fifth light from top of the mast
 - white light (all around) - restricted maneuvering light (middle), sixth light from top of the mast
 - amber light (aft) - stern tow light, seventh light from top of the mast
 - white light (aft) - stern light, eighth light from top of the mast
 - red light (all around) - restricted maneuvering light (lower), bottom of mast
-

L.2. Searchlights

One 24-VDC searchlight is mounted on top of the pilothouse on the port/starboard side depending on class. The remote control is located on the console.

L.3. Floodlights

Two 120-VAC, 150-watt white floodlights are mounted on the mast yardarm, and provide illumination for the aft deck. A breaker in the 110/240 breaker panel turn the floodlights on and off.

L.4. Boat Horn

There is one horn mounted on top of the pilothouse on the port/starboard side depending on class. The horn is supplied air from the air compressor. The button for operating the horn is located on the front of console.



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Section M. Fire Extinguishing Systems

- M.1. General** A fixed Halon 1301 flooding system is provided to extinguish a fire in the machinery space. The system can be locally actuated by pulling the pin on the Halon 1301 control head located in the lazarette, or remotely from a pull station located in the pilothouse on the seat back on the “A” Class and on the console for the “B” and “C” Class.
-
- M.2. Halon cylinders** Two 40-pound Halon cylinders are designed to dump Halon through three nozzles in the machinery space. The cylinders are installed in the lazarette on the forward bulkhead.
-
- M.3. Audible Alarm** An audible alarm will sound in the pilothouse to indicate high temperature (190 +/-10) in the engine room. Ensure personnel evacuate the space prior to discharge of the Halon System.
-
- M.4. Nozzles and Cylinders** When discharged Halon will flow through two nozzles that discharge into the engine room and to cylinders that when the pressure of the discharged Halon enters them will shut down the engines.
-
- M.5. Portable fire extinguishers** Five 10-pound dry chemical and a 15-pound CO₂ hand-held fire extinguishers are provided throughout the boat. Ten-pound dry chemical extinguishers are located in the berthing area, workshop, pilothouse, engine room, and lazarette. The 15-pound CO₂ extinguisher is located in the engine room. An AFFF extinguisher is located in the pilothouse and engine room per EC 55ANB-A-50.
-



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Section N. Bilge Systems

N.1. General

The bilge system consists of installed bilge pumps, float switches and a bilge pump control panel. The system is designed to remove small amounts of water that occur due to condensation, small leaks, or water used to clean decks and other surfaces.

N.2. Bilge pumps and float switches

Each compartment has a fixed, submersible bilge pump that operates on 24 VDC. The machinery space has one bilge pump, mounted forward on the centerline of the bilge. The bilge pumps are rated at approximately 30 GPM. The bilge pump overboard discharges are located on the port side of the hull. The float switches are installed to turn on a light on the control panel to indicate when the bilge level is approximately 3 ½" deep. If the level in the bilge reaches approximately 8" the horn will sound and bilge pump will automatically turn on.

N.3. Bilge pump panel

The bilge pump panel is located on the starboard side of the forward control console in the pilothouse. The panel provides switches and lights for *manual* or *automatic* control of the six bilge pumps located in the following areas:

- forward peak
 - berthing area
 - workshop
 - engine room
 - lazarette
-



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Section O. Gray Water and Sewage Systems

O.1. Gray water system

The gray water system is designed to receive wastewater from the galley sink, shower drain, and head sink and discharge it to the gray water holding tank.

O.1.a. Gray water holding tank

Water through a grease trap and enters the 80-gallon gray water holding tank. The tank is located under the deck plates in the workshop on the centerline.

O.1.b. Gray water pump

The gray water pump is a 115-VAC, Jabsco macerator type pump. The pump and controls are located in the closet in the workshop. The pump takes suction directly from the gray water tank and discharges to the gray water shore tie connection, portside pilothouse.

O.2. Sewage system

The sewage system is designed to receive waste from the marine toilet in the head and discharge through the discharge pump, to the macerator tank, and then it will go either into the holding tank or overboard.

O.2.a. Sewage holding tank

A 30-gallon sewage-holding tank is located behind the bulkhead in the shower. The pump for pumping the holding tank to the shore connection is located in the vicinity of the holding tank.

O.2.b. Macerator pump

A macerator pump, operating on 120 VAC is designed to pump into the sewage-holding tank or go directly overboard. The pump is located above the tank behind the bulkhead in the shower. The three-way valve for pumping to the tank or overboard is located behind shower enclosure.



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Section P. Compressed Air System

P.1. General

A low pressure, compressed air system is provided for the operation of pneumatic tools and other maintenance activities. The system consists of the following:

- air compressor
 - air receiver
 - control valves and switches
 - outlet valves for attaching air hoses
-

P.2. Air compressor

The compressor is a two-stage, reciprocating type air compressor driven by a 120-VAC motor. The air compressor is located in the engine room, starboard side forward. The air compressor is rated at 125 PSI.

P.3. Air receiver

A 30-gallon air receiver is located in the engine room below the air compressor. The air receiver stores the air for the system.

P.4. Control valves and switches

A pressure switch on the receiver will turn the air compressor *on* when the receiver pressure drops below 100 PSI, and *off* when the pressure in the receiver reaches 125 PSI.

P.5. Outlet valves for attaching air hoses

A filter is located in the engine room on the receiver discharge line, prior to the hose outlets. Hose outlets are located in the engine room, on deck behind the starboard deck box. The "C" Class valve is located in the starboard deck box.



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Section Q. Potable Water System

Q.1. General

The potable water system consists of the following:

- potable water tank
 - service pump
 - pressure tank
 - water heater
 - hose connection
-

Q.2. Potable water tanks

The potable water tank has a capacity of 240 gallons and is located in the pilothouse under the dining table in the starboard aft corner. A fill connection is located on the starboard side of the main deck. A gauge is mounted in the tank next to the bulkhead.

Q.3. Service pump

The service pump for the potable water system is powered by a 120 VAC motor. The pump is located in the workshop under the ladder. The pump operates automatically from an internal pressure switch, turning the pump *on* at 20 PSI and *off* at 40 PSI. The pump takes suction on the potable water tanks and discharges to the pressure tank.

Q.4. Water heater

The water heater has a 30-gallon capacity and utilizes a submersible 120-VAC-heating element. The heater is located in the workshop port/starboard, depending on class, side aft.



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Section R. Windshield Wipers and Washers

R.1. General

Windshield wipers and washers are installed on each forward facing window. The wipers are variable speed and utilize 24-VDC motors. The individual wiper controls are located on the console starboard side.



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Chapter 4 Crew Requirements

Overview

Introduction

The *Boat Operations and Training (BOAT) Manual, COMDTINST M16114.32 (series) Volume I, COMDTINST M16114.33 (series) Volume II* provides minimum standards and guidelines for competence on board the 55' ANB. Each crewmember should be familiar with the duties of the other crewmembers in addition to his/her own duties. It is important for a crewmember to know and commit to memory all-important characteristics of the boat and its equipment, and which procedures to follow in the event of a casualty. Each crewmember should mentally rehearse the procedures each member of the crew would follow during any operational casualty. Teamwork is the common thread that allows the crew to succeed. Whenever the opportunity is available, the crew should get the boat underway to practice operational and emergency procedures.

In this chapter

This chapter contains the following sections:

Section	Topic	See Page
A	Minimum Crew	4-3
B	Coxswain	4-5
C	Engineer	4-7
D	Crewmembers	4-9
E	Passengers	4-11
F	Training	4-13
G	Safety Equipment	4-15



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Section A. Minimum Crew

- A.1. General** The minimum number of crewmembers for the 55' ANB is four, of which three must be certified. Normally four crewmembers are required for transit and five for buoy handling. If the fifth crewmember is a break-in rigger he/she has to be a certified crewman first.
-
- A.2. Qualified/certified crewmembers** The certified individuals must include at least one coxswain, one engineer. The third and fourth certified individual crewmember may be an additional coxswain or engineer.
-
- A.3. Non-qualified/certified crewmember** If the fourth member of the crew is not certified at any position, at a minimum they must have completed Chapter 2 (sections A & B) with the exception of First Aid of the PQS tasks of the *Boat Operations and Training (BOAT) Manual, COMDTINST M16114.32 (series) Volume I, COMDTINST M16114.33 (series) Volume II.*
-
- A.4. Additional crewmembers** The nature of the response, local requirements, missions assigned and special operations will dictate the need for additional certified crewmembers.
-



Section B. Coxswain

B.1. General

The Coast Guard places great trust in each coxswain and his or her ability to accomplish the assigned missions in a safe and professional manner even under adverse conditions. The position of coxswain is one of high regard and great responsibility.

The coxswain is responsible for the boat, its crew, and passengers during every mission. The coxswain assigns and directs all on board functions during each operation.

B.2. Authority and responsibility

The extent of the authority and responsibility of the coxswain is specified in *United States Coast Guard Regulations, COMDTINST M5000.3 (series)*, as follows:

"The coxswain shall be responsible, in order of precedence, for the safety and conduct of passengers and crew; the safe operation and navigation of the boat assigned; and the completion of the sortie or mission(s) assigned or undertaken pursuant to USCG policy and regulations. An underway coxswain will at all times respond, within the limits of capabilities and legal authority to observed hazards to life or property, and violations of law or regulations."

The coxswain is the direct representative of the Commanding Officer or Officer-in-Charge and as such, (subject to *Articles 88-89* of the *UCMJ*) has the authority and responsibilities that are independent of rank or seniority in relation to other personnel embarked. The authority and responsibility of the coxswain exist only when the boat is engaged on a specific sortie or mission.

B.3. Relief of responsibility

The only person embarked in the boat who may relieve the coxswain of the responsibility as described above is:

- The Commanding Officer, Officer-in-Charge, Executive Officer, or Executive Petty Officer.
 - A senior officer at the scene of a distress emergency, or other abnormal situation, who exercises authority under the provisions of *USCG Regulations*, whether or not other units are involved.
-



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Section C. Engineer

C.1. General The position of boat engineer is one of great responsibility. The knowledge and skill of the engineer can make the difference in completing the mission under adverse conditions.

C.2. Qualifications The boat engineer must be a certified crewmember prior to obtaining certification as a boat engineer since this individual is required to perform duties in both capacities.

C.3. Responsibilities The primary responsibilities of this position include operational and underway maintenance of the propulsion and auxiliary systems.

The engineer may also serve, if qualified, as:

- Safety observer
 - Buoy Deck Crewmember
 - Buoy Deck Supervisor
 - Buoy Deck Crane Operator
 - Emergency Medical Technician
 - other such duties as may be assigned by the coxswain in support of operational and training sorties or missions.
-



Section D. Crewmembers

D.1. General

The crewmember is primarily responsible for assisting the coxswain as required during all evolutions or maneuvers, including all buoy-handling operations.

D.2. Responsibilities

The crewmembers may also serve, if qualified, as:

- Safety Observer
- Buoy Deck Crewmember
- Buoy Deck Supervisor
- Buoy Deck Crane Operator
- Emergency Medical Technician
- Other such duties as may be assigned by the coxswain in support of operational and training sorties or missions.

NOTE

Each break-in crewmember must take the time to study the duties of the other crewmembers, in addition to his or her duties since it may be necessary to perform any given duty in the event of an emergency. The *Boat Operations and Training (BOAT) Manual COMDTINST M16114.32 (series) Volume I, COMDTINST M16114.33 (series) Volume II* provides the standards for qualification as coxswain, boat engineer, and crewman aboard the ANB.



Section E. Passengers

E.1. General

Qualification, certification and assignment as a crewmember on a 55' ANB require considerable time, effort, and practice. The individual must learn the characteristics of the boat and its missions, as well as the adverse conditions of the sea and the environment in which the boat operates. They should be provided with adequate safety or personal protective equipment based on the mission or situation. At a minimum, each shall wear a properly equipped personal flotation device (PFD).

E.2. Passengers

Since passengers may not have any vessel or equipment knowledge, it is important they receive a basic safety brief prior to getting underway or soon after coming aboard.

NOTE

The basic safety brief should cover man overboard; abandon ship, and location of life raft.



Section F. Training

F.1. General

Qualification, certification and assignment as a crewmember on a 55' ANB require considerable time, effort, and practice. The individual must learn the characteristics of the boat and its missions, as well as the adverse conditions of the sea and the environment in which the boat operates. Each break-in crewmember must take the time to study his or her duties in addition to the duties of the other crewmembers since it may be necessary to perform any given duty in the event of an emergency.

F.2. Standards for qualification

The *Boat Operations and Training (BOAT) Manual COMDTINST M16114.32 (series) Volume I, COMDTINST M16114.33 (series) Volume II* provides the standards for qualification as coxswain, engineer, crewmember and ATON crewmember aboard the 55' ANB.

NOTE

Additional AtoN mission-specific training requirements may be required in accordance with local unit training program.

F.3. Training underway

Where staffing permits, additional personnel who have met the requirements set forth in section A.3 of this chapter may participate in underway evolutions in a trainee capacity. To become proficient as a crewmember on any boat, an individual must get underway and practice his or her skills repeatedly.



Section G. Safety Equipment

G.1. Personal protective equipment

During all 55' ANB operations, crewmembers shall wear personal protective equipment as required by the *Aids to Navigation Manual-Seamanship, COMDTINST M16500.21* (series) and the *Rescue and Survival Systems Manual COMDTINST M10470.10* (series).

NOTE

The coxswain is responsible for ensuring that all required personal safety equipment is worn properly and all jewelry is removed.

G.2. Protective equipment during buoy handling operations

The following equipment shall be available for use during buoy handling operation:

- hard hat with chin strap
- safety toed boots
- personal flotation device (PFD)
- leather gloves (unless handling lines)
- eye protection (safety goggles/safety glasses)
- rubber gloves
- rubber apron when handling batteries
- knife
- safety harness
- hearing protection

All crewmembers shall follow the guidelines provided in the ATON Deck Supervisor Course.



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Chapter 5

Operational Guidelines

Overview

Introduction

This chapter describes how to use the 55' ANB in the safest and most efficient manner. These policies and performance criteria should be used as guidelines for ANB operations. Within these guidelines, consider local operating conditions, district regulations and the skill of the crew to determine how the ANB's capability is to be used. These factors must be considered prior to each sortie or mission.

In this chapter

This chapter contains the following sections:

Section	Topic	See Page
A	Operating Parameters	5-3
B	Performance Data	5-9



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Section A. Operating Parameters

A.1. General

The readiness of the 55' ANB shall be continuously monitored to insure that it is capable of unrestricted operations. This monitoring is accomplished through a variety of programs, including daily boat checks, the boat Planned Maintenance System (PMS) schedule, annual engineering inspections and annual Ready for Operations (RFO) evaluations.

For the purpose of this section, Operational Commanders are defined as commanders of Sectors, Groups, Activities, Air Stations, Districts and Greater Antilles Section, who exercise direct operational control of a subordinate unit with a standard boat. See *U.S. Coast Guard Boat Operations and Training (BOAT) Manual, Volume I COMDTINST M16114.32 (series), and Volume II COMDTINST M16114.33 (series)*.

Operating parameters for the ANB and crewmembers include the following areas:

- disabling casualties
- restrictive discrepancies
- major discrepancies
- minor discrepancies
- responsibilities
- environmental limits

A.2. Disabling casualties

Disabling casualties are those that make the boat not serviceable. Appendix D contains a listing of disabling casualties. If a disabling casualty is identified when the boat is moored, the boat shall not get underway until the casualty is corrected.

NOTE

The Operational Commander may authorize, in writing, the movement of the boat (for short distances) under its own power only to facilitate haul-outs or corrective maintenance. In the event that the boat sustains a disabling casualty while underway, the boat shall immediately return to the nearest safe mooring, if possible. In many cases the boat will require assistance from another vessel.

Disabling casualties shall be reported immediately to the Operational Commander by the most expeditious means; followed by a boat status message as soon as possible but no later than 12 hours after the casualty is discovered. The boat shall be immediately placed in "Charlie" status and repaired. If the casualties cannot be repaired within 48 hours, a CASREP shall be sent within 24 hours of the casualty.



A.3. Restrictive discrepancies Restrictive discrepancies are those that restrict the operations of the boat such that it can perform some missions, but not all missions safely. Appendix E contains a listing of restrictive discrepancies.

A.3.a. Reporting restrictive discrepancies Restrictive discrepancies shall be reported to the Operational Commander if the discrepancy cannot be repaired within 1 hour. The boat shall be immediately placed in a "Charlie" status and shall not get underway until the discrepancy is corrected, or a waiver has been granted by the Operational Commander. If the discrepancy cannot be repaired within 48 hours, a CASREP shall be sent within 24 hours of the discrepancy. The Operational Commander is responsible for monitoring the progress of repairs to these discrepancies.

A.3.b. Waivers Boats with restrictive discrepancies shall only be operated if the Operational Commander has issued a written waiver. The waiver shall:

- list the discrepancy,
- describe the conditions under which the boat may be operated, and
- provide concurrence on the measures to be taken to lessen or negate the hazard posed by the discrepancy.

A verbal waiver is authorized, as long as a written waiver will be received by the unit within 4 hours.

A.3.c. Discrepancy underway In the event the boat sustains a restrictive discrepancy while underway, the coxswain should not normally proceed without authorization, unless aborting the mission would increase the level of risk. The situation and recommendations must be effectively communicated to the Operational Commander to allow for prudent risk assessment by all levels.

The reporting procedure is as follows:

Step	Procedure
1	The coxswain shall immediately notify the parent unit with all pertinent information and a recommendation as to whether to continue or abort the mission.
2	The parent unit shall pass along the information pertaining to the casualty, the current mission, and recommendations to the Operational Commander.
3	The <u>Operational Commander</u> shall immediately notify the unit as to whether or not continuing the mission is authorized, and the conditions under which the boat may be operated.



A.4. Major discrepancies

Major discrepancies are those that degrade the effectiveness of the boat to perform one or more missions. Appendix E contains a listing of major discrepancies. The occurrence of major discrepancies shall be documented. A plan to correct these discrepancies shall be formulated and carried out. The Operational Commander is responsible for monitoring the status of repairs to these discrepancies.

A.5. Minor discrepancies

Minor discrepancies do not affect the operational readiness of the boat. However, a boat with minor discrepancies does not meet the standardization criteria established for the boat. The occurrence and repair of minor discrepancies shall be documented and monitored at the station/unit level.

In the event that the addition of portable equipment, not part of the standard boat outfit, is necessary to meet mission needs, units are authorized to temporarily carry this extra equipment. This authorization is on a case-by-case basis only, and care must be taken to properly secure any extra gear and to ensure it does not interfere with safe egress or the boat's standard outfit/systems. Under no circumstances shall permanent alterations be made to power, stow or in any way accommodate extra equipment.

A.6. Responsibilities

The coxswain is always responsible for the safe operation of the boat. The coxswain must decide if the mission warrants subjecting the crew and boat to the danger defined by the mission, weather and sea conditions anticipated.

A.6.a. Disabling casualty - underway

In the event that the boat sustains a disabling casualty while underway, the boat shall immediately return to the nearest safe mooring, if able. In many cases the boat will require assistance from another vessel.

A.6.b. Restrictive discrepancy - underway

In the event the boat sustains a restrictive discrepancy while underway, the coxswain should not normally proceed without authorization, unless aborting the mission would increase the level of risk. The situation and recommendations must be effectively communicated to the Operational Commander to allow for prudent risk assessment by all levels. The following is the procedure for communicating the discrepancy while underway:



Step	Procedure
1	The coxswain shall immediately notify the parent unit with all pertinent information and a recommendation as to whether to continue or abort the mission.
2	The parent unit shall pass along the information pertaining to the casualty, the current mission, and recommendations to the Operational Commander.
3	The <u>Operational Commander</u> shall immediately notify the unit as to whether or not continuing the mission is authorized, and the conditions under which the boat may be operated.

Casualty/Discrepancy	Consequence	Required Action
<p><u>Disabling Casualty</u> "Boat is not serviceable."</p>	<p>Not authorized to get underway. Notify Operational Commander immediately by the most expeditious means, and follow up by a boat status message.</p>	<p>Assign "Charlie" status to the boat, and commence repairs immediately. Submit CASREP if applicable.</p>
<p><u>Restrictive Discrepancy</u> "Boat and crew cannot perform <u>all</u> missions safely."</p>	<p>Operations restricted. Notify Operational Commander if repairs cannot be made in 1 hour.</p>	<p>Create repair plan and set deadline for completion of repairs. Operational Commander shall monitor progress of repairs. Any operations before restrictive discrepancies are repaired require written waiver (see A.3.b. above) from the Operational Commander. Submit CASREP if applicable.</p>
<p><u>Major Discrepancy</u> "Boat and crew can perform all missions but <u>some</u> degradation in effectiveness or readiness should be expected."</p>	<p>Operations unrestricted. Discrepancy occurrence and repair is documented.</p>	<p>Maintenance plan is carried out. Operational Commander shall monitor status of repairs to the discrepancies.</p>
<p><u>Minor Discrepancy</u> "Boat and crew readiness not affected nor impaired. Boat does not meet standards."</p>	<p>Operations unrestricted. Discrepancy occurrence and repair is documented.</p>	<p>Maintenance plan is carried out. Unit's OIC monitors completion of maintenance/ repair.</p>



**A.7.
Environmental
limits**

The 55' ANB is built to operate safely under weather conditions within its design limits. With approval from the Operational Commander, crews may operate the boat in conditions that exceed the environmental limits; however, the coxswain is ultimately responsible and must always make the final determination whether the boat and crew can safely perform the mission.

The following are critical operational and environmental limitations:

- maximum sea state for buoy operation (2 feet)
- maximum sea state for transiting (6 feet)
- up to 3,600-pound lifting capability at 15 foot radius over stern, up to 3,000 – pound capability at 20 foot radius over stern.

NOTE 

These limits may be exceeded by approval of the Operational Commander; ONLY after appropriate risk assessment for the situation at hand is made. On-scene conditions provided by the on-scene commander and ANB coxswain must be considered in the risk assessment process. The coxswain retains the final on-scene decision as to whether or not an action may be safely executed.



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B.2. Seakeeping Positioning the vessel with respect to the wind, seas, other craft, and established routes of navigation is essential to prevent damage to the hull or injuries to the crew.

WARNING 

The coxswain is responsible for ensuring that all required personal safety equipment is worn, and worn properly.

B.2.a. Operating in beam seas

Operating with the seas on the beam is more uncomfortable than dangerous when following basic small boat handling guidelines. The danger exists when operations occur in conditions that approach or exceed wind and sea limitations. Use the following techniques to minimize danger:

- Tacking - With large seas on your beam, tack across the seas at a slight angle in a zigzag fashion. This prevents exposure of the beam to heavy swells.
- Changing Course - To change course heading, allow the boat to lose headway, turn the wheel hard over, and apply power to come smartly to the new heading.

WARNING 

The position of the boat in relation to a breaking wave crest is critical. Severe wave slap will occur in the area approximately two boat lengths in either direction of the breaking water, however, this area presents less danger of capsizing.

CAUTION !

When operating in beam seas, do not allow the boat to become "dead-in-the-water" and be hit broadside by a wave.

B.2.b. Operating in following seas

Following seas present the greatest dangers to the 55' ANB. The vessel does not have the balanced buoyancy or ability to lay-to in a following sea like a motor lifeboat. With the wide, flat stern, large following seas become a serious problem. The operational limitations are the controlling guideline and must be followed at all times. Consider the following points and techniques when operating under these conditions:

- Operation in a following sea involves a risk of surfing on the face of a swell or breaker. This situation is extremely dangerous. Control of the boat may be impossible.
 - Do not power the boat over the crest of a wave and into the trough of the next wave or bury the bow into the back of the next wave.
 - The 55' ANB has the tendency to slip down the back of the seas, heeling heavily at the bottom of the trough.
-



IF...	THEN...
The boat is being pulled back.	Increase the throttles to gain additional forward momentum.
The boat continues being pulled back.	Be alert for "sluggish" helm response and higher engine RPM (cavitation).
Either situation occurs.	Immediately back off the throttles losing forward momentum, then apply full throttle and rudders and try to kick out of the wave.
<div style="border: 1px solid black; padding: 5px; display: inline-block;"> Carefully observe the seas off the stern to ensure maneuvering room. </div>	
Riding the back of the wave is not possible.	Try to prevent seas from overtaking, breaking under, or breaking over the transom.

CAUTION !

B.2.c. Operating in white water

If white water is observed overtaking from astern, quickly stop all forward motion and gain sternway before the white water reaches the propellers and rudders. If this is not possible, another option is to come about smartly; present the bow to the sea, and gain sufficient headway to establish rudder and throttle control before the white water reaches the boat. Again, carefully observe the seas off the stern to ensure maneuvering room.



B.3. Stability

Stability is a measure of a ship or boat's ability to return to its original position when it is disturbed by a force such as winds, heavy seas or rudder angle, and the force is then removed. By virtue of hull design and equipment placement, the ANB displays positive stability. Positive stability means that the ANB will return to its original position after being disturbed by an external force.

The positive stability of the ANB is greatly affected by any additional heavy loads that are placed above the water line. Any buoys that are secured to the buoy deck will have an adverse affect on the reserve stability and righting arm of the ANB.

The ANB has a tendency to roll during buoy handling operations as a result of winds or sea state conditions and it may be unsafe to assume that the maximum safe capacity of the crane can be achieved.

Ensuring the bilge areas are always free of water, eliminating the free surface affect of liquids in the bilges is essential to maintaining stability of the ANB.

NOTE

Do not use rapid accelerations from dead-in-the-water (DIW) to full speed except when necessary. This conserves fuel and helps prolong engine life.

B.4. Speed

Typically, at full load, the ANB achieves 21 knots at 2300 engine RPM, with a fuel rate of approximately 11 GPH. At full load plus cargo (4,000 pounds), the ANB achieves 21 knots at 2300 engine RPM with a fuel rate of approximately 12 GPH.

NOTE

Maximum speed/power should be used only when operationally necessary. Under non-urgent conditions, proceed at cruise speed.

CAUTION !

Use a "crash stop" only when absolutely necessary. Crash stops place significant strain on the propulsion system.

NOTE

There is a *four-second* delay from full ahead to full astern before the propulsion plant responds to the throttle command. *(There are some concerns as to the 100% correctness of this note.)*



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Chapter 6

Mission Performance

Overview

Introduction

The actions and techniques described in this chapter are products of field experience. They are intended to give boat crewmembers information on how the 55' ANB performs and reacts in various mission scenarios. The information is not intended to provide the "only way" to perform an action or complete a mission. Boat crews should use effective communications and teamwork skills along with this general information to adapt their actions to each unique mission scenario.

Information in this section alone does not qualify a crewmember. Observe these procedures and apply skills developed through practice to effectively use the ANB to perform missions.

In this chapter

This chapter contains the following sections:

Section	Topic	See Page
A	Starting Procedures	6-3
B	Underway	6-9
C	Handling Characteristics	6-11
D	Aids to Navigation Operations	6-21
E	Towing	6-29
F	Anchoring	6-31
G	Personnel Recovery	6-33
H	Ice Conditions	6-35
I	Securing Procedures	6-37
J	Securing Procedures (Cold Weather)	6-39



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Section A. Starting Procedures

A.1. Pre-start

The following procedures must be completed before starting a cold engine, and should be repeated before each mission.

Step	Action
1	Inspect bilges for excessive amounts of water. Look for signs of spilled fuel or oils. Pump and clean as necessary.
2	Sound fuel oil tank. Ensure fuel oil is maintained at 95 percent (950 gallons). Fuel sounding tubes are port and starboard along the aft sides of pilothouse.
Check the following fluid levels:	
<p>CAUTION!</p> <p>Do not open the coolant expansion tank cap on a hot engine.</p> <ul style="list-style-type: none"> • Engine oil level filled to FULL mark. • Reduction gear oil filled to FULL mark. 	
<p>NOTE </p> <p>Reduction gear oil will normally be above the "FULL" mark when the engine is off. The reduction gear oil level must be checked again with the engine running at idle. At idle, the level must be between the "FULL" and the "LOW" marks on the dipstick.</p> <ul style="list-style-type: none"> • Check coolant by removing cap and looking into the expansion tank. Maintain level at least 1 inch below filler neck to allow for expansion. Do not allow level to fall below radiator tubes. DO NOT OVERFILL. 	
3	Check sea strainers for cleanliness and open sea suction valves.
4	Ensure fuel supply valves are <i>open</i> to fuel tank.
5	Check all belts for proper tension.
6	De-energize hot starts for both engines and GENSET if applicable.
7	Energize 24-VDC main disconnect in engine room.
8	Energize (turn to "ON") battery start switches for both engines and GENSET.
9	Ensure all three 120-VAC panels are energized as needed at the main breaker panel located in the engine room or workshop. (<i>Location will vary by boat "Class"</i>).
10	Secure battery charger. Rotate battery selector switch to GENSET. Energize battery charger. (<i>This process may vary by boat "Class"</i>).



A.2. Lighting off the generator set

The following procedures must be performed in preparation for generator light off:

CAUTION !

Always let the engine cool down before removing the expansion tank coolant pressure cap. Turn the cap slowly and do not open fully until the pressure is relieved. Do not open the cap on a hot engine.

A.2.a. Preparation

Step	Action
1	Verify the coolant expansion tank level is full.
2	Check the oil: Oil must be at the FULL level mark on the dipstick.
3	Ensure that the fuel system is aligned to support operation of the diesel generator set.
4	Visually inspect the bottom of the fuel oil filter bowl on the RACOR filter for the presence of water and sediment. Drain and dispose of as required. <i>(This process may vary by boat "Class")</i> .
5	Visually inspect the engine for loose or missing components and repair as required.

A.2.b. Light off

The following procedures must be performed to light off the generator set:

CAUTION !

Excessive cranking can overheat the starter motor and cause it to fail. Do not crank the engine for more than 30 seconds at a time. If engine fails to start, wait two minutes prior to attempting another start.

Step	Action
1	Hold the START-RUN-STOP switch at the local panel in the START position.
2	If the engine starts, release the switch and verify positive lube oil pressure. Stop the engine immediately if no oil pressure or less than 20 PSI is indicated on the oil pressure gauge.
3	Once the engine has started, verify that the oil pressure is 35 - 60 PSI and that the coolant temperature is between 170 and 210 °F during operation.

A.3. Transferring power

The following procedures must be performed to transfer power from shore to ship and from ship to shore:



A.3.a. From shore to ship

The following procedures must be performed to transfer power from shore to ship:

Step	Action
1	Ensure the generator is operating.
2	Verify the engine parameters are normal.
3	Verify the line circuit breaker is closed. (Normally located on side of the generator panel.)
4	Shift power at the main distribution panel from “shore” to “generator” . Depending on class, the shore power breaker may need to be secured on the main distribution panel.
5	Verify proper operating parameters and proper operation 120 VAC supplied equipment.
6	Open shore power feed breaker on the pier.
7	Disconnect and stow shore power cable.

A.3.b. From ship to shore

The following procedures must be performed to transfer power from ship to shore:

Step	Action
1	Verify shore power is available and capable of handling the boats in port requirements. The shore-tie breaker capacity is 120/240 single phase 100 amps.
2	Connect the shore power cable to the boat's shore power receptacle.
3	Energize the shore power feeder breaker on the pier.
4	Shift power at the main distribution panel from “generator” to “shore” .
5	With all loads removed from generator set, run for five minutes to allow generator to cool down.
6	Then momentarily position the CONTROL PANEL switch on the local generator control panel to the <i>stop</i> position to secure generator.



A.4. Starting the engines

The following procedures must be performed to start the engines with the Glenndinning (electronic) throttle controls:

Step	Action
1	Set throttle levers to <i>neutral</i> position at all operating stations, <i>energize throttle system and select control station, place throttle system in “WARM” mode</i> , ensure proper fuel system alignment, and secure hot starts.
<div style="border: 1px solid black; padding: 5px;"> During light off, the throttle must be recognized prior to starting the engine. </div>	
<div style="border: 1px solid black; padding: 5px;"> Engine will start without oil pressure! Check levels prior to light off. </div>	
2	Energize alarms, depress the START button until the engine starts. Initial start-up should occur at the local panel. Check for overboard cooling water discharge.
3	Visually check the gauges in the engine room for proper operation and operating ranges.
4	Repeat the steps 2 and 3 for the second engine.

NOTE

CAUTION !

A.5. Energizing equipment

The following steps must be completed prior to getting underway:

Step	Action
1	<i>Close (turn on)</i> all of the remaining breakers on the 24-VDC and 120-VAC power panels as needed. Ensure air compressor is energized for horn.
2	Energize and test all installed electronic components.
3	Conduct operational test on the steering system. Ensure stop-to-stop movement on the rudder angle indicator.
4	When a control station is selected with the throttle levers in <i>neutral</i> , the red TAKE light should illuminate.
5	<i>Test throttle operation in forward and reverse. Test should be conducted while throttle is in “TROLL” mode.</i>



NOTE *sw*

Light sequence at station taking control: Prior to pressing the TAKE button, light blinks 1 time every 2 seconds (Inactive station heartbeat). After pressing TAKE button 1 time, TAKE light will blink (slow blink-handles **not** in appropriate position, fast blink-handles in correct position). Control transfer is complete after pressing TAKE button second time, a solid TAKE light indicates transfer complete.

6	Repeat steps 3, 4 and 5 at each control station.
7	Ensure gear is properly stowed and watertight integrity is set.
8	Inform coxswain on the status of all engineering and electronic systems and if the boat is ready to get underway.
9	Ensure potable water tank is 100 percent (240 gallons).
10	Energize Lectra San sewage system at 24 VDC panel.

NOTE *sw*

Federal and Local regulations determine whether treated sewage can be pumped overboard or into holding tank. Ensure holding tank is empty, prior to operating in restricted pumping areas.

11	Energize the installed electronics.
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Section B. Underway

B.1. General After getting underway, observe all appropriate machinery gauges. If an abnormal condition develops, take corrective action to prevent further damage. Refer to Chapter 7 of this handbook, *C. G. Boat Operations and Training (BOAT) Manual, Volume I COMDTINST M16114.32 (series), and Volume II COMDTINST M16114.33 (series)*, or the appropriate manufacturer's technical publication.

B.2. Personal protective gear Always observe the requirements of this handbook; *Boat Crew Seamanship Manual, COMDTINST M16114.5 (series), and Rescue and Survival Systems Manual, COMDTINST M10470.10 (series)* for wearing protective clothing, personal flotation devices and boat crew signal kits.

B.3. Communication Crew communications and coordination is the key to safe operations. Crewmembers should inform the coxswain of their location when moving about the deck. Engine noise can make crew communications difficult on the 55' ANB; speak loudly and clearly repeating as necessary until acknowledged.

B.4. Changing control stations The following are the steps necessary to change control stations aboard the 55' ANB:

Step	Action
1	Always place active throttle station in <i>neutral</i> position prior to changing control stations. Coxswain/Helmsman should alert the crew to their intention to shift control stations.
2	Select intended helm position.
3	Proceed to the new control station and press the TAKE (press button twice), to take control of throttles from that station.
4	The aft steering console joystick will over-ride the forward steering station.
<p><i>This method applies to 55' ANB that have completed Electronic Throttle EC.</i></p>	
5	Move the throttles out of the <i>neutral</i> position to verify control.

NOTE



Section C. Handling Characteristics

Introduction

Boat handling is a complex skill that requires extensive knowledge and practical underway experience to build confidence and skill levels. Properly handling a 55' ANB requires forethought and finesse. Always know the boat's handling features, monitor the prevailing weather conditions, and take into account the vessel's limiting factors.

In this section

This section contains the following information:

Topic	See Page
Turning and Pivoting	6-12
Head Seas	6-14
Beam Seas and Following Seas	6-15
Effects of Wind	6-17
Effects of Current	6-18
Station Keeping	6-19



Turning and Pivoting

C.1. General

The 55' ANB rotates in a transverse direction about a vertical axis on its pivot point. The fore and aft location of the pivot point is just forward of amidships when the boat is at rest. As the boat moves ahead or astern, the pivot point moves either forward or aft, respectively. Turning the helm to move the bow port or starboard will cause the stern to swing in the opposite direction. Depending on the position of the pivot point, the stern could swing through a greater distance than the bow at the same angle. The higher the forward speed, the farther the forward movement of the pivot point.

C.2. Split throttle turn

The split throttle turn is a low-speed maneuver. It is important when changing the boat's heading (to the weather or another vessel) or when moving the bow or stern in a limited area. In either situation, the forces involved must be considered. The rudder can use screw discharge current from the ahead engine to help pivot the stern. Because boats operate more efficiently ahead, some headway may develop.

C.2.a. Helm amidships

The following procedures should be followed when performing a split throttle turn with helm amidships:

NOTE

The turn described is to *port*. The procedures can be duplicated in an opposite manner for a *starboard* turn.

Step	Action
1	At dead-in-the-water and throttles in <i>neutral</i> , simultaneously clutch <i>ahead</i> with starboard engine, and clutch <i>astern</i> with port engine (keep both engine RPMs the same, though in opposite direction).
2	Note the arcs described by bow and stern as the vessel swings through 360 degrees to determine vessel pivot point.
3	If vessel moved forward (along its centerline) during the rotation, slightly increase astern RPM to compensate.
4	Simultaneously shift throttles so port is clutch <i>ahead</i> and starboard is clutch <i>astern</i> ; note how long it takes to stop and reverse direction of swing.



5	Again check bow and stern arcs as vessel swings through 360 degrees then stop the swing.
<p>At some level of power for each vessel and drive train arrangement, cavitation will occur with split throttles. Know at what throttle settings cavitation occurs. More power will not increase turning ability and might cause temporary loss of maneuverability until cavitation subsides. In critical situations, loss of effective power could leave a vessel vulnerable.</p>	

NOTE 

C.3. Restricted maneuvering

In restricted maneuvering, some operators choose to use only the throttles, leaving the rudders amidships. This technique can work well but operators should be familiar with combined rudder and propulsion techniques, which may be required in high wind situations, or with vessels alongside.



Head Seas

C.4. General Traveling into head seas normally presents no problems if operations remain within the defined wind and sea limiting factors.

C.5. Buoyancy The buoyancy of the wide, flat stern of the 55' ANB has a greater lifting factor than the bow. When operating at or near the maximum sea-limiting factor, the coxswain must maneuver constantly using both the rudders and main engines to keep the bow from burying into the seas.



Beam Seas and Following Seas

C.6. Operating in beam seas Operating with the seas on the beam is more uncomfortable than dangerous when following basic small boat handling guidelines. The danger exists when operations occur in conditions that approach or exceed wind and sea limitations. Use the following techniques to minimize danger:

C.6.a. Tacking With large seas on the beam, tack across the seas at a slight angle in a zigzag fashion. This prevents exposure of the beam to heavy swells.

C.6.b. Changing course To change course heading, allow the boat to lose headway, turn the wheel hard over, and apply power to come smartly to the new heading.

WARNING  Do not allow the boat to become "dead-in-the-water" and be hit broadside by a wave.

WARNING  The position of the boat in relation to a breaking wave crest is critical. Severe wave slap will occur in the area approximately two boat lengths in either direction of the breaking water, however, this area presents less danger of capsize.

C.7. Operating in following seas Following seas present the greatest dangers to the 55' ANB. The vessel does not have the balanced buoyancy or ability to lay-to in a following sea like a motor lifeboat. With the wide, flat stern, large following seas become a serious problem. The operational limitations are the controlling guideline and must be followed at all times. Consider the following points and techniques when operating under these conditions:

- Operation in a following sea involves a risk of surfing on the face of a swell or breaker. This situation is extremely dangerous. Control of the boat may be impossible.
- Do not power the boat over the crest of a wave and into the trough of the next wave or bury the bow into the back of the next wave.
- The 55' ANB has a tendency to slip down the back of seas, heeling heavily at the bottom or trough.



IF...	THEN...
The boat is being pulled back.	Increase the throttles to gain additional forward momentum.
The boat continues being pulled back.	Be alert for "sluggish" helm response and higher engine RPM (cavitation).
Either situation occurs.	Immediately back off the throttles losing forward momentum, then apply full throttle and rudders and try to kick out of the wave.
<p>CAUTION ! Carefully observe the seas off the stern to ensure maneuvering room.</p>	
Riding the back of the wave is not possible.	Try to prevent seas from overtaking, breaking under, or breaking over the transom.

C.8. White water

If white water overtaking from astern is observed, quickly stop all forward motion and gain sternway before the white water reaches the propellers and rudders. If this is not possible, another option while carefully timing the wave period, is to come about smartly; present the bow to the sea, and gain sufficient headway to establish rudder and throttle control before the white water reaches the boat. Again, carefully observe the seas off the stern to ensure maneuvering room.



Effects of Wind

C.9. Turning the bow

The 55' ANB, with its high cabin area near the bow and low freeboard aft, will tend to ride stern to the wind. The ANB will make leeway (drift downwind) at a speed proportional to the wind velocity and the amount of sail area.

C.9.a. Restricted maneuvering

In restricted maneuvering situations (ATON operations, alongside, at marinas, piers, wharves, etc.), analyzing the environmental conditions and using them to help rather than hinder operations is the way to deal with the large sail area created by the bow and superstructure.

C.9.b. Towing in winds

Bow into weather towing approaches become very difficult if the wind exceeds 30 knots. Once the wind catches the bow, it can be difficult to turn the bow back up into wind while station keeping. Stern-to approaches often solve this problem.



Effects of Current

C.10. Vessel stability in current

One of the environmental forces that affect the vessel is the current. It is important to remember that the coxswain has no control over the current or any other environmental force. The design of the 55' ANB, with its high cabin area near the bow, twin engines and responsive rudder control, makes it a stable vessel if the coxswain observes and is aware of existing current conditions.

C.10.a. Operating in current conditions

Current will act on the vessel's underwater hull. Current will generally cause a vessel to drift over the ground. A one-knot current may affect the 55' ANB to the same degree as 30 knots of wind. A strong current opposite the wind could move a vessel upwind.

C.10.b. Recognizing current conditions

The coxswain and other crewmembers should be aware of existing signs of current flow and where current shear might be present. Large stationary objects such as a breakwater or jetty will cause a major change in the amount and direction of the current. On the downstream side of a jetty or breakwater, the crewmembers should be aware of current eddy. Caution should be taken when in current around floating piers or those with open pile supports. Crewmembers should look for current wake or flow patterns around buoys or piers. When current goes against the wind, the wave pattern will be steeper and closer together. Extreme caution should be taken when operating in conditions where current and wind are funneled one against the other. Tide rips, breaking bars and gorge conditions will make handling the 55' ANB extremely challenging. Making leeway when drifting downstream (down current) requires a change in approach (actual track vs. intended track) to prevent overshooting your landing.



Station Keeping

C.11. General

Station keeping requires concentration to maintain a constant heading and position. The boat tends to work well with its stern to the wind as the bow tends to "weathervane" downwind. If stern-to station keeping is not an option, the operator must use extra care to counteract environmental factors.



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Section D. Aids to Navigation Operations

D.1. General

The 55' ANB is a stern-loading buoy boat with the buoy deck aft for more space and a Crane located on the stern. The 55' ANB has the following operating characteristics:

- Crane has a working load limit of 3,600 pounds and a deck capacity of 4,000 pounds.
- The boat has two deck winches with a working load limit of 1,500 pounds each. The deck winches work independently.
- Is twin screw and has dual steering stations located in the pilothouse and one on the buoy deck.
- Can relieve floating aids with a combined weight (buoy, chain, sinker) not to exceed 4000 pounds. Although the WLL of the crane is 3,600, do not to bring a sinker on deck that will exceed the deck capacity. Verify deck load to ensure not to overload the deck. Dor-Mor sinkers are an authorized alternative.
- Because this boat is stern loading, it must back into the wind or current to work buoys. When making the approach, the Crane should be in a position to allow easy hook up with the whip depending on size or class of the buoy.

Prior to any buoy deck evolution, the Buoy Deck Supervisor (BDS) ensures daily inspection of all rigging equipment is completed.

D.2. Personal Protective Equipment

The following personal protective equipment shall be worn at all times while the buoy hydraulic system is energized and operating.

- Hard hat with chin strap
 - Safety glasses (ANSI Z87.1) rated
 - Personal floatation device appropriate for weather conditions
 - SAR Vest (may be removed during buoy operations by direction of the CO/OINC and coxswain.)
 - Safety toed boots
 - Leather gloves (unless handling lines)
 - Knife
-

**NOTE** 

Removal of all jewelry (watches, rings ect.) during Buoy deck evolution is mandatory.

D.3. Energizing the hydraulic system

Perform the following procedures to properly energize the hydraulic system:

Step	Action
1	Ensure hydraulic oil reservoir capacity is approximately 35 gallons - normal operating level.
2	Perform visual check of hydraulic system components for static leaks and any physical damage to system components (e.g. crane, deck winches).
3	Verify PTO is engaged.
4	Verify hydraulic system pressure (2000 PSI) on local pressure gauge and visually inspect pressurized system components for leaks.

D.4. Operating the hydraulic system

Perform the following procedures to properly operate the hydraulic system:

Step	Action
1	Ensure that all hydraulic system controls on the aft console are in the <i>neutral</i> position.
2	Verify system pressure.
3	Establish communications with buoy deck crew prior to actuating deck winches or crane controls.
4	Perform required system check of cross deck winches and crane prior to buoy deck operations.



D.5. Hoisting the buoy

NOTE 

The following information is the STANDARD evolution for buoy operations with the chain stopper on the 55 ANB.

NOTE 

Perform safety brief prior to buoy operations.

WARNING 

Ensure chain guard is in the down position prior to buoy evolution.

The boat is maneuvered to the buoy and is maintained in a steady position. When the coxswain is ready, "hook it when you can" is passed. The Buoy Deck Supervisor now has permission to bring the buoy aboard. Perform the following procedures to properly hoist the buoy:

CAUTION!

Do not use weather hitches to mouse the hooks.

Step	Action
1	Hook the whip into the buoy utilizing mechanical line reeving device and a short synthetic sling. Lift the buoy until the whip is supporting the weight of the aid.
	Do not use weather hitches to mouse the hooks.
2	Hoist buoy to the deck level, connect cross deck, remove reeving line, and mouse the hook.
3	Hoist the buoy high enough to drag on deck.
4	Slew the crane while heaving around on the cross deck. Ensure the load is kept close to the deck.
5	Once the buoy is on deck place the chain in the chain-stopper using a chain hook and pass the pelican hook.
6	Gripe buoy and disconnect the mooring from the buoy.



D.6. Pulling chain

Perform the following procedures to safely pull chain:

Step	Action
1	Spot the crane over the chain stopper located above the vee notch at the stern.
2	Attach whip to the mooring inboard of the chain stopper and release the pelican hook.
<p>CAUTION! Do not side load the buoy chain when pulling chain.</p>	
3	While chain is up and down, heave around on the whip removing chain from stopper. Reposition crane to facilitate seating the chain in the stopper. This is repeated until the mooring is at short stay
4	If the mooring is fouled or if unable to break the sinker from the bottom, place chain in stopper, clear the whip from the chain, set the pelican hook. Come ahead on the boat and break the sinker from the bottom.
<p>CAUTION! Always use the chain stopper when breaking or dragging a sinker.</p>	
5	Once at short stay place mooring back in the chain stopper, pass the pelican hook and advise coxswain.
6	When the coxswain gives permission, pull the chain until the sinker is in sight.
7	Position the crane so that when the sinker is lifted it will clear the stern. Utilize the cross deck to stabilize the sinker while bringing it aboard.
8	Bring the sinker on deck and gripe.



D.7. Setting the buoy

NOTE

Perform the following procedures to properly set the buoy:	
Ensure chain guard is in the down position prior to setting sinker.	
Step	Action
1	With the sinker and buoy positioned on deck, position the boom until the whip is centered over the sinker.
2	Attach the whip to the sinker's pigtail and mouse the hook.
3	Utilize the cross deck to stabilize the sinker while bringing it aboard.
4	Fake the chain on deck. Leave enough chain to properly hang sinker (approx 10 feet) and place chain in the pelican hook and chain stopper.
5	Lift the sinker just high enough to clear the deck
6	Boom down until the sinker clears the stern and the chain is resting in the v-notch with the weight supported by the chain stopper.
7	Unhook the whip.
8	Position the crane so that the whip is over the buoy. Attach the cross deck to assist in stabilizing the buoy if necessary.
9	Hook whip into the buoy, mouse the hook, shackle the buoy to the mooring, break the gripes and lift the buoy until it clears the deck, keeping it as close to the deck as possible. Trip the pelican hook.
10	Move the buoy over the stern. Un-mouse the crane hook and clear the cross deck. Lower the buoy until it is clear of the work platform.
11	Maneuver the boat into position. The Buoy Deck Supervisor will pass "Ready on Deck." On the coxswain's command to "Stand By," clear the pin on the chain stopper resting a hammer on the tripping bail.
12	Upon the coxswain's command to "Set the Buoy," trip the chain stopper, float the buoy, clear the hook and pull away.

D.8. Post Evolution

Perform the following procedures to properly secure the buoy handling system:	
Step	Action
1	Stow Crane, re-spool cross deck winch cables.
2	Disengage PTO.
3	Stow all gear.
4	Conduct debrief.



**D.9. Standard
Hand signals**

 <p>A person in a white hard hat, sunglasses, and orange life vest with arms raised in a fist.</p>	 <p>A person in a white hard hat, sunglasses, and orange life vest with both arms raised in a fist.</p>	 <p>A person in a white hard hat, sunglasses, and orange life vest with hands clasped in front of the chest.</p>
<p>Avast or stop</p>	<p>Emergency stop</p>	<p>Dog down or Secure</p>
 <p>A person in a white hard hat, sunglasses, and orange life vest pointing forward with both hands.</p>	 <p>A person in a white hard hat, sunglasses, and orange life vest with the right index finger pointing up.</p>	 <p>A person in a white hard hat, sunglasses, and orange life vest with hands clasped in front of the chest.</p>
<p>Deck Supervisor transfer (After tapping on side of the helmet)</p>	<p>Raise the whip (Opposite to lower)</p>	<p>Slew Port or Starboard</p>



<p>Raise boom</p>	<p>Boom up hold the load</p>	
		<p>In some cases there may be the need for special signals not covered in this chart.</p> <p>The Boom/Crane Operator and the Buoy Deck Supervisor (BDS) must agree upon special signals in advance. These signals shall not conflict with the standard signals.</p>
<p>Inhaul on the cross deck</p> <p>A waving motion towards yourself</p> <p>Pointing at the cable to be worked</p>	<p>Pay out on the cross deck</p> <p>A waving motion away from you</p> <p>Pointing at the cable to be worked</p>	



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Section E. Towing

E.1. General

The 55' ANB has enough power to handle any towing job likely encountered. The coxswain should consider all factors concerning weather, sea state, distance to tow, and size of vessel before attempting each tow. The 55' ANB is capable of towing vessels up to a length of 75 feet and less than 50 gross vessel tons. Towing operations can safely be performed in seas of less than 6 foot and winds less than 30 knots.

CAUTION!

During normal operations, engines should not overload for more than a few seconds, if at all. Continually overloading the engines shortens the service life of the engines significantly.

E.2. Rigging a vessel for tow

The preferred towing technique to utilize with the 55' ANB is to tow alongside. If necessary to tow from astern, the following guidelines are provided:

The 55' ANB was originally outfitted with 600 feet of a 5" double-braided nylon line. Units must procure or manufacture bridle to meet towing requirements.

The tow bitt is located on the after portion of the crane pedestal. Towing from this point is made difficult by the crane location directly forward of the bitt. Working the bitt from the Port or Starboard side (*depending on boat "Class"*) becomes necessary due to the deck configuration.

NOTE

Familiarization with the requirements of the *Boat Crew Seamanship Manual, COMDTINST M16114.5 (series)*, Chapter 17, Towing, will greatly assist in making the towing evolution a safe and successful operation.

E.3. Affects of wind with vessel in tow

The coxswain should be aware of additional affects the wind may have on the 55' ANB with another vessel in tow. In addition, the coxswain should be aware of substantially increased fuel usage with a large vessel in tow.

E.4. Tow watch

The tow watch should be extremely vigilant in observing the condition and ride of the tow. When towing vessels lower than the 55' ANB transom, or when towing with a long towline, chafing can occur along the transom. The tow watch should closely monitor this and react as necessary.



Section F. Anchoring

F.1. General The 55' ANB is fitted with an anchoring system used when the boat must stand by a location or in an emergency.

F.2. Anchoring the boat A 32-pound *Fortress FX55* danforth anchor is stowed on the forward, starboard bulkhead of the pilothouse under the window. The anchor is mounted in a bracket and held in place by a quick release pin. The anchor line consists of 300 feet of 2 ³/₄ double-braided nylon line and 6 feet of ½-inch BBB galvanized chain with swivel attached. The anchor line is stowed in the forepeak.

Take the following steps to safely anchor the boat:

CAUTION!

When handling the anchor, two crewmembers are recommended.

Step	Action
1	Remove weather tight Thompson plug from forward bitt and retrieve anchor line. Pass the line through the open bullnose, and fair-lead outboard of all deck fittings. Per the coxswain's direction, fake out the appropriate amount of anchor line on deck. Connect anchor with anchor shackle. Allow space for proper working of bitt and safety of anchor detail.
2	While one crewmember tends the anchor line at the forward bitt and as directed by the coxswain, remove the anchor from the bracket on the forward pilothouse bulkhead.
3	As directed by the coxswain, the anchor should be lowered over the side well clear of the boat.
4	Once the anchor is tending <i>up and down</i> , the coxswain should back down until the desired amount of scope is attained and the anchor line is secured.



F.3. Weighing anchor

Take the following steps to safely weigh anchor:

CAUTION!

It is recommended to use two crewmembers to weigh the anchor and tend the bitt.

Step	Action
1	Position one crewmember at the bitt and one between the bitt and the bullnose. As the coxswain moves the boat slowly forward, the forward crewmembers take up the slack in the line while maintaining one round turn at the bitt.
2	Once the anchor is at "short stay," the anchor line should be secured at the forward bitt.
3	Crewmembers can then attempt to break the anchor free from the bottom. If unable to do so, the crewmembers shall stand clear of the line while the coxswain maneuvers the boat slowly until the anchor breaks free.
4	Once free, the crewmembers can pull the remaining anchor line and the anchor onboard.
5	When the anchor is aboard, the coxswain should take up a stable course so that the crewmembers can stow the anchor and ground tackle.



Section G. Personnel Recovery

G.1. General Person in the water situations are divided into two categories:

1. **Crewmembers:** Individuals from your boat, (reducing the size or your crew for response).
2. **Victims:** Other persons in the water, (allowing use of the full crew).

G.2. Key issues Key issues in PIW retrieval include:

Feature	Description
Freeboard	With a high freeboard the 55' ANB does not offer an ideal PIW retrieval point on the main deck. The work platform has a freeboard of 1.32' at full load. This is the preferred location for PIW retrieval. Use of the swimmer's harness is recommended and extreme caution is to be utilized pending on scene weather conditions.
Maneuvering	The boat's speed and ease of handling greatly assist in returning and maneuvering for pickup. Though not appropriate in all conditions, variation of the standard techniques might speed recovery. For instance, by splitting the shafts one ahead and one astern, the 55' ANB will turn in tight circle to come back on the person in the water.
NOTE 	Because the work platform deck is aft, the person in the water will be in close proximity to the propellers during recovery. Minimize use of the shafts when alongside the person in the water.
Sail Area	With any amount of wind, the high superstructure and shallow draft will cause the boat's stern to turn into the wind with its bow pointed in the direction the wind is blowing (downwind). This condition could cause pickup problems when getting in close. Carefully assess how to compensate for the wind, seas, currents or any combination of them. PIW recovery should be with the bow into the wind and seas.
Crew Member Recovery	If an injured crewmember is in the water, carefully assess the risk. Exercise extreme caution if necessary to use a swimmer.



Section H. Ice Conditions

H.1. General

With aluminum hull construction, the 55' ANB is not designed to break ice as a mission and should avoid operations in this capacity if at all possible. In slush conditions, ensure that the seawater cooling system is checked regularly to ensure clogging has not occurred. Operations at high speed (during cold weather) will increase the likelihood of topside icing due to freezing spray.

WARNING

Excessive topside icing will greatly affect the boat's stability and righting arm. To maintain stability characteristics and reserve buoyancy, **no more than 4 inches of ice** is allowed to accumulate on the deck and cabin top (moderate wind and seas).

NOTE

Be aware that freezing spray may seal hatches and scuttles thus limiting immediate or emergency access (i.e. deck box stowage).

WARNING

During ice conditions the raw water recirculating system is designed to free the sea chest of ice. The recirculating system is designed for in-port use only and utilized only when the engines are at idle.



Section I. Securing Procedures

I.1. Procedures The following procedures should be repeated after each mission:

Step	Action
1	Secure all electrical and electronic components in the pilothouse.
2	Secure engines using pushbuttons in the pilothouse and secure engine and ALARM switches on 24-VDC panel, following in reverse the procedures in Chapter 6, Section A.4.
3	Shift electrical load from ship to shore power following in reverse the procedures in <i>Chapter 6, Section A.3.b</i> of this handbook.
4	Shift battery charger back to FWD bank, using the procedures in Chapter 6, Section A.1 (Depending on Class).
5	Secure all breakers in the 24-VDC power panel in the pilothouse, except for those required to maintain fire, flooding, and lighting systems.
6	De-energize (turn to “OFF”) battery start switches for the engines and GENSET.
7	Secure fuel supply valves to engines.
8	<i>Close</i> generator and engine seawater suction valves.
9	Check all machinery fluid levels and refill as necessary.
<p>CAUTION! Do not check engine coolant levels until temperature has dropped to 140 °F or below.</p>	
<p>NOTE ☞ It may be necessary to wait 30 minutes to obtain an accurate reading on engine lube oil levels.</p>	
10	Conduct a visual inspection of the engine room bilges for any obvious abnormalities.
11	Clean engine room bilges and machinery.
12	Sound fuel oil tank and refill to 95 percent (950 gallons).
13	Secure all watertight doors, hatches, and covers. Close all weather-tight doors.
14	Energize all engine hot starts.
15	Wash the boat down with freshwater, unless directed otherwise.
<p>NOTE ☞ Keeping the boat clean and neat is very important to control corrosion. Maintaining corrosion control is the responsibility of everyone in the crew.</p>	
<p>NOTE ☞ The mission is not complete until the boat is ready for the next mission.</p>	



Section J. Securing Procedures (Cold Weather)

J.1. Procedures The following procedures should be repeated after each mission when the water temperature reaches 40 degrees F. and below:

Step	Action
1	Secure all electrical and electronic components in the pilothouse.
2	Secure engines using pushbuttons in the pilothouse and secure both engine ignition and ALARM on the 24-VDC panel, following in reverse the procedures in <i>Chapter 6, Section A.4</i> .
3	Shift battery charger back to the FWD bank, using procedures in Chapter 6, Section A.1 (Depending on Class).
4	Secure all breakers in the 24-VDC power panels located in the pilot house except for those required to maintain fire, flooding alarm panel, and lighting systems.
5	Ensure all space heaters are not obstructed by or in close proximity with any flammable materials.
6	Shift electrical load from ship to shore power following procedures in <i>Chapter 6, Section A.3.b</i> of this handbook.
7	De-energize (Turn to “OFF”) battery switches for both engines and GENSET.
<p>CAUTION!</p> <p>Do not check engine coolant levels until temperature has dropped to 140 °F or below.</p>	
<p>NOTE </p> <p>It may be necessary to wait 30 minutes to obtain an accurate reading on engine lube oil levels.</p>	
8	Secure fuel supply valves to engines.
9	<i>Close</i> generator and engine seawater suction valves.
10	Check all machinery fluid levels and refill as necessary.
11	Conduct a visual inspection of the engine room bilges for any obvious abnormalities.



Step	Action
12	Clean engine room bilges and machinery.
13	Energize all engine hot starts.
14	Sound fuel oil tank and refill to 95 percent (950 gallons).
15	Secure all watertight doors, hatches, and covers. Close all weather-tight doors.
16	Wash the boat down with freshwater if air temperature is not expected to fall below 32 degrees within 6 hours of securing.
	<p>Keeping the boat clean and neat is very important to control corrosion. Maintaining corrosion control is the responsibility of everyone in the crew.</p>
	<p>The mission is not complete until the boat is ready for the next mission.</p>

NOTE 

NOTE 



Appendix A

55' ANB Outfit List

Overview

Introduction

This appendix is the outfit list for the 55' ANB outfit. No deviation from this list is authorized, except in the event that the addition of portable equipment, not part of the standard boat outfit, is necessary to meet mission needs, units are authorized to temporarily carry this extra equipment.

The 55' ANB Machinery Information Catalog Allowance (MICA) provides national stock numbers (NSNs) and ordering information for all outfit list items.

CAUTION!

This authorization is on a case-by-case basis only, and care must be taken to properly secure any extra gear and to ensure it does not interfere with safe egress or the boat's standard outfit/systems. Under no circumstances shall permanent alterations be made.

In this Appendix

This appendix contains the outfit list for the following areas of the boat:

Area	See Page
Aft Voids	A-2
Lazarette	A-3
Workshop	A-4
Berthing Compartment and Head	A-6
Forward Peak	A-7
Pilothouse	A-8
Buoy Deck Port Deck Box	A-9
Buoy Deck Starboard Deck Box	A-10
Buoy Deck/ Main Deck	A-11



Aft Voids

It is not permissible to use voids as storage; therefore, there is no outfitting in the voids.



Lazarette

<u>Item</u>	<u>Quantity</u>
Boat Fender	4 each
Marine Grapnel (chain and 100' of line)	1 each
Rated Screw Pin Alloy Shackles with ledgeable manufacture markings (1/2 inch to 1 5/8)	6
Ship Scraper (Buoy Scraper)	2 each
Sewage Discharge Jumper Hose (Depending on Class)	1 each
Non-Metallic Hose (25' garden hose) Spare	1 each



Workshop

<u>Item</u>	<u>Quantity</u>
Bench & Pipe Vise (Optional)	1 each
Bolt Cutter (36-inch)	1 each
50-Foot Extension Cord	1 each
Face Shield	2 each
Sheave Gauge	1 set
Caliper	1 each
Wiping Rag	1 box
Pelican Hook Assembly ($\frac{5}{8}$ -inch, grade 8)	1 each
Split Key Hammer (Optional)	2 each
Pin Hammer (Optional)	2 each
Single Leg Chain Picking Pennant ($\frac{1}{2}$ -inch x 3-foot, grade 8)	2 each
Shackle	Various
Chain Hook	2 each
Ball-Diamond-Ball (boat) Dayshape	1 set
Hand Tools	As required for unit ops
Pneumatic Tools	As required for unit ops
Electrical Tools	As required for unit ops
Personal Protective Gear	As required for unit ops
ATON Equipment	As required for unit ops
Garbage Can with Cover	1 each
PFD, CG-Approved Type III (various sizes) with PML and Whistle Attached	5 total



Workshop

<u>Item</u>	<u>Quantity</u>
Splash Proof Goggles	2 pairs
Chemical Aprons	2 pairs
Chemical Gloves	2 pairs



Berthing Compartment/ Head

<u>Item</u>	<u>Quantity</u>
Blood Born Pathogens PPE Kit	4 each
Floor Mat (shower)	1 each
Paper Towel	4 pkg
Sanitary Brush	1 each
Shower Curtain (vinyl)	1 each
Bed Blanket (wool)	6 each
Bed Sheet (white)	12 each
Pillow	4 each
Pillowcase (white)	6 each
PFD Type I (Adult Size)	4 each
PFD Type I (Child Size)	2 each



Forward Peak

<u>Item</u>	<u>Quantity</u>
300' of 2 3/4" DBN Line With BBB galvanized Chain & Swivel	1 each



Pilothouse

<u>Item</u>	<u>Quantity</u>
General Purpose First Aid Kit	1 each
Hand-Held Binoculars	2 each
Binocular Box (wood)	1 each
Ship's Bell	1 each
Walking Cane (lacquer free dead man stick)	1 each
Manual Sound Producing Device	1 each
Medical Splint & Bandage Kit	1 each
Nautical Slide Rule	1 each
Navigator's Drafting Instrument Set	1 set
Parallel Rule	1 each
Weem's Plotter	1 each
Pencil	1 dozen
Stopwatch	1 each
Wastepaper Basket	1 each
Survival Vests (properly outfitted)	6 each
Boat Pyro	1 kit
Electronic Calculator	1 each
Search Pattern Slide Rule	1 each



Buoy Deck Port Deck Box

<u>Item</u>	<u>Quantity</u>
DC Kit (kit contains the following)	1 kit
Parachute Bag NSN 8460-00-606-8366	1
1"X8" WOODEN WEDGE	2
2"X8" WOODEN WEDGE	3
3"X11" WOODEN WEDGE	2
3"X18" WOODEN WEDGE	1
3"X12" WOODEN WEDGE	3
7" ROUND PLUG	1
5" ROUND PLUG	2
3" ROUND PLUG	3
2" ROUND PLUG	4
1" ROUND PLUG	3
WOODEN MALLET	1
LEATHER GLOVES	1
HOSE CLAMPS	NUMEROUS
FLATHEAD SCREWDRIVER	1
CROSSCUT SAW	1
HATCHET	1
C-CLAMPS	2
PLIERS	2
VICE GRIPS	2
OKUM	BAG
MARLIN	1
FIRE BLANKET	1
2'X3' RUBBER GASKET	1
TAPE MEASURE	1
Spill Kit	1 each
Engine room Vent Covers	1each
Sledge Hammer	1each
Wrecking Bar (24 Inch)	1 each
Fire Axe	1 each



Buoy Deck Starboard Deck Box

<u>Item</u>	<u>Quantity</u>
Lead Line Assembly	1 each
Mooring Lines	4 each
Tag Lines	4 each
Skiff Hook	1 each
Surface Swimmer gear	1 Kit
Engine Vent Cover	1 each
T- Handle Wrenches	As Required



Buoy Deck / Main Deck

<u>Item</u>	<u>Quantity</u>
Cutting Torch Outfit (Optional)	1 each
Rescue Heaving Lines	4 each
Boat Hook	2 each
Portable Pump and Kit (P-6)	1 each
Anchor (32LB Fortress)	1 each



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Appendix B

55' ANB Engineering Change Requests (ECRs)

Overview

Introduction

This appendix contains a list of authorized ECRs for the 55' ANB.

NOTE

For a complete breakdown of the Engineering Change Request Number, see the *Naval Engineering Manual, COMDTINST M9000.6 (series), Chapter 41.*

In this Appendix

This appendix contains the ECRs for the 55' ANB.

Topic	See Page
Engineering Change Requests (ECRs)	B-3



Appendix B - 55' ANB Engineering Change Requests (ECRs)

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Engineering Change Requests (ECRs)

ECR Number	Subject
55 ANB (A)-1	Deck Box/ Engine Room Air Intake System
55 ANB (A)-2	Replacement of DECCA Radar w/ AN/SPS-66
55 ANB (A)-1, amend #1	Radar replacement; Amendment #1
55 ANB-3	Inflatable Life Raft Installation
55 ANB-3, amend #1	Inflatable Life Raft Installation, Amendment #1
55 ANB-4	Halon Discharge, Engine Shut Down Interlock
55 ANB (A)-5	Replacement of Aluminum S/W piping w/ hose
55 ANB (A)-6	Installation of Additional Navigation Light
55 ANB-7	Access to Fresh Water Tank
55 ANB a-(A)-8	Instructions for Halon 1301 F/E system
55 ANB a-(A)-9	Bilge Pump Float Switch Replacement
55 ANB a-(B)-10	Loudhailer/ Depth Sounder Installation
55 ANB a-(B)-11	Loran C Receiver Installation
55 ANB a-(B)-11, amend #1	Loran C Receiver Installation, Amendment #1
55 ANB a-(B)-12	Battery Sump Tank Float Switch Replacement
55 ANB a-(A)-13	Float Free Life Raft Stowage Bracket
55 ANB a-(A)-14	Life Raft Inflation Cylinder Replacement
55 ANB a-(B)-15	Shaft Tachometer Replacement
55 ANB a-(B)-16	Voltage Regulator Replacement
55 ANB A-(B)-17	Engine Throttle Control Replacement



ECR Number	SUBJECT
55 ANB A-(A)-18	Depth Sounder Replacement
55 ANB A-(A)-19	Visual ID Modification
55 ANB A-(A)-20	MCX-1000-DES Radio Installation
55 ANB A-(B)-21	Spin-on Secondary Fuel Filter
55 ANB A-(B)-21, amend #1	Spin-on Secondary Fuel Filter, Amendment #1
55 ANB a-(B)-22	Air Conditioner S/W Overboard Discharge
55 ANB a-(B)-23	Forward Grey Water Tank Removal
55 ANB a-(B)-24	A/C Cooling Supply Pumps
55 ANB a-(C)-25	Deck Winch Replacement
55 ANB a-(C)-25, amend #1	Deck Winch Replacement, Amendment #1
55 ANB a-(B)-26	Oil Filter Replacement
55 ANB a-(A)-27	Bow Bitt Modification
55 ANB a-(C)-28	Crane Replacement and Hydraulic System Installation
55 ANB a-(B)-29	“A” & “B” Class Generator Upgrade
55 ANB a-(C)-30	Towing Hawser Reel and Storage Shelf Installation
55 ANB-C-31	“C” Class Hull Modification
55 ANB-A-32	DGPS Installation
55 ANB-C-33	Sliding Window Installation
55 ANB-C-34	Sewage System Upgrade
55 ANB-A-35	AIRSEP Kit Upgrade
55 ANB-A-36	Mast Upgrade
55 ANB-A-37	Engine Access Hatch Dogs



ECR NUMBER	SUBJECT
55 ANB-B-38	Alaskan Crane Pad eye Installation
55 ANB-C-39	Fire Pump Removal
55 ANB-A-40	Anchor Relocation and Upgrade
55 ANB-B-41	Astro Spectra VHF-FM Installation
55 ANB-A-42	Depth Sounder Upgrade
55 ANB-A-43	Mast Bonding Installation
55 ANB-B-44	Removal of Deck Wash Down System
55 ANB-A-45	Winch Emergency Release System Installation
55 ANB-C-46	Work Platform Scuttles
55 ANB-(A)-47	ONAN Generator Replacement
55 ANB (B)-48	ATON DGPS RCVR Replacement
55 ANB (B)-49	Furuno 1933C/NT Radar install
55 ANB (A)-50	AFFF Extinguisher install
55 ANB (C)-51	Forward Searchlight Replacement



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Appendix C

55' ANB Materiel Inspection Checklist

Overview

Introduction

1. This appendix is meant to be a systematic means to inspect ANY 55' ANB and to ensure the entire boat is prepared to meet mission demands. Also, this enclosure should be used in conjunction with Appendix A and B.
2. This checklist may be locally reproduced.

In this Appendix

This appendix contains the Materiel Inspection Checklist for the 55' ANB. This inspection list covers the following areas of the boat:

No.	Area	See Page
I.	Hull	C-5
II.	Buoy Deck	C-7
III.	Lazarette	C-11
IV.	Forward Deck	C-13
V.	Forward Peak	C-15
VI.	Exterior Pilothouse	C-17
VII.	Pilothouse Cabin Top	C-19
VIII.	Interior Pilothouse	C-21
IX.	Engine Room	C-25
X.	Workshop	C-29
XI.	Head	C-32
XII.	Berthing Compartment	C-33



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Materiel Inspection Checklist

Boat number: _____
ANT: _____
Date: _____

- References:**
- *55' ANB Operator's Handbook*, COMDTINST M16534.2 (series)
 - *Naval Engineering Manual*, COMDTINST M9000.6 (series)
 - *Coatings and Color Manual*, COMDTINST M10360.3 (series)
 - *Coast Guard Rescue and Survival Systems Manual*, COMDTINST M10470.10 (series)

Inspection standards: The following inspection standards apply to the 55' ANB boat's hull, superstructure, machinery, equipment, outfit, and all installed systems and accessories:

- Operates smoothly and correctly
- Free of grease, oil, rust, and corrosion
- All fluid levels and pressure readings are within tolerances
- Protective coatings applied correctly and neatly
- Free of rips, tears, abrasions, and cracks
- Outfit and equipment correctly installed, adjusted and stowed to specs and design
- Labels, test dates, and placards properly indicated.
- Free of non-standard/unapproved installations or equipment
- Maintained according to current manufacturer's guidelines and Commandant Directives

Inspection guidelines: Inspection requires a minimum of *two* personnel, preferably one Boatswain's Mate and one Machinery Technician, both of who possess extensive 55' ANB experience and a strong working knowledge of the contents of all references listed above. This material inspection checklist is only applicable to boats in a "Bravo" or "Ready for Sea" condition. Each item on the checklist should be judged against applicable standards and references. Additional discrepancies, uninstalled engineering change requests (ECRs), etc. should be listed.

Inspected by: _____ **Date:** _____
Inspected by: _____ **Date:** _____



I. Hull

ITEM	SAT	UNSAT	REMARKS
Rubrail			
Paint			
Lettering/Numbering/Decal			
Hull (Visible Surfaces)			
Waterline			
Wood/Linarite Fenders			

REMARKS: _____



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II. Buoy Deck

ITEM	SAT	UNSAT	REMARKS
Engine Intake Vent			
Port Deck Winch			
Wire Rope			
Hook Assembly			
Hydraulic Hoses/Piping			
Rudder Guard			
Hydraulic Motor			
Hydraulic Hoses			
Rescue Heaving Line			
Drop Pump w/Can			
Drop Pump Bracket			
Deck Box			
O ₂ /Acetylene Brackets (Optional)			
Fwd Handrails			
Chocks/Cleats			
Safety Chains			
Aft Handrail			
110V Outlet			
Engine Room Exhaust Vent			
Crane			
Date of Last Weight Test			
Date of Last Level I, II or III			
Winch			
Wire Rope			
Hook Assembly			
Hydraulic Hoses/Piping			
Rams			
Chain Stopper Assembly			
Starboard Deck Winch			
Wire Rope			
Hook Assembly			
Hydraulic Hoses/Piping			
Engine Room Exhaust Vent			
110V Outlet			



ITEM	SAT	UNSAT	REMARKS
Engine Room Scuttle			
Hinges			
Gasket			
Knife Edge			
Dogs & Wedges			
Locking Device			
Alignment			
Safety Chains			
Bits			
Deck Box			
Compress Air Supply			
Bull Chain Padeyes (2 ea)			
Buoy Deck Equipment			
Hammers			
Buoy Scraper			
Pelican Hook Assembly			
Tie Down Straps			
Single Leg Picking Pennant			
Chain Hooks			
Mooring Lines (4 ea)			
Fenders (4 ea)			
Aft Control Console			
Depth Sounder Display			
Engine Controls			
Gauges			
Redlined			
Labeled			
Helm Control			
Rudder Angle Indicator			
Port Emergency Stops			
Starboard Emergency Stops			
Buoy Deck Hydr Control Panel			
Labels			
Port Winch Control			
Starboard Winch Control			
Crane Controls			



REMARKS: _____



III. Lazarette

ITEM	SAT	UNSAT	REMARKS
Scuttle			
Hinges			
Gasket			
Knife Edge			
Dogs & Wedges			
Locking Device			
Alignment			
<i>Bulkheads</i>			
Fwd			
Port			
Aft			
Starboard			
<i>Overhead</i>			
Lighting			
Wiring/Stuffing Tubes			
Steering Components			
Dry Chemical Fire Extinguisher			
Hydraulic Lines			
General Stowage/Cleanliness			
Halon System			
Deck			
<i>Aft Void</i>			
Covers			
Bulkheads			
Overhead			
Paint (should not be painted)			
Fuel Sounding Rod			
Transducer			

REMARKS: _____



IV. Forward Deck

ITEM	SAT	UNSAT	REMARKS
Deck Coverings			
Exterior Berthing Hatch			
Forward Handrails			
Chock			
Forepeak Vent			
Potable Water Vent			
Potable Water Fill			
Potable Water/Deck Supply			
Sewage Discharge			
Fwd Handrails			
Boat Hooks			
Fuel Tank Vents			
Fill Pipes			
Heaving Lines			
Line Reeving Device			
Forward Bitt			

REMARKS: _____



V. Forward Peak

ITEM	SAT	UNSAT	REMARKS
<i>Forepeak Scuttle</i>			
Hinges			
Gasket			
Knife Edge			
Dogs & Wedges			
Locking Device			
Alignment			
Grease Fittings (Depending on Class)			
Anchor Line (2 3/4 " DBN 300-ft)			
Thimble			
Swivel			
Chain			
<i>Bulkheads</i>			
Fwd			
Port			
Starboard			
Aft			
Deck			

REMARKS: _____



VI. Exterior Pilothouse

ITEM	SAT	UNSAT	REMARKS
Wiring/Stuffing Tubes			
Wiper Motors			
Wiper Arms/Blades			
Windows			
Ships Bell w/Lanyard			
Door Stops/Latches			
Weather Tight Door			
Hinges			
Gasket			
Knife Edge			
Dogs, Wedges & Rollers			
Locking Device			
Alignment			
Deck			
Handrails			
Rescue Heaving Line with Bag			
Bulkhead			
Windows			
Life Ring			
Line			
Stenciling			
Float Light w/Clip			
Date			
Shore-Tie			
Anchor FX-55			
Deck			
Handrails			
Rescue Heaving Line with Bag			
Bulkhead			
Windows			
Life Ring			
Line			
Stenciling			
Float Light w/Clip			
Dated			



REMARKS: _____



VII. Pilothouse Cabin Top

ITEM	SAT	UNSAT	REMARKS
<i>Deck</i>			
EPIRB (Optional)			
Loud Hailer Speaker			
Radio Antenna P/S			
Horn			
Spotlight			
DGPS Antenna			
Running Lights			
Radar Antenna			
Life Raft			
Inspection Date			
Life Raft Bracket			
Life Raft Weak Link			
TV Antenna (Optional)			
<i>Mast</i>			
VHF-FM Radio Antennas			
Nav Lights			
Anchor			
Mast			
Restricted Maneuvering			
Towing			
Wiring/Stuffing Tubes			
Halyards			
Ensigns			
Deck Work Lights			

REMARKS: _____



VIII. Interior Pilothouse

ITEM	SAT	UNSAT	REMARKS
<i>Overhead</i>			
Insulation			
Wiring			
<i>Labels</i>			
Stuffing Tubes			
Lighting			
Window Heater/Wiper Control			
Fwd			
Port			
Starboard			
Heated Window Switch			
Deck Light Switch			
Window Defrosters (Depending on Class)			
Port			
Starboard			
<i>Fwd Console</i>			
120-Volt Electrical Panel			
Labels			
Depth Finder			
Engine Controls			
Helm			
Rudder Angle Indicator			
Binnacle/Magnetic Compass			
Deviation Table/Date			
Gauges			
Redlined			
Labeled			
Searchlight Control			
Radar			
Flat Screen Monitor			



ITEM	SAT	UNSAT	REMARKS
Steering Station Control			
Bilge Pump Panel/Labels			
Oily Water Discharge Placard			
Loudhailer Microphone			
Under Console			
Wiring			
Bulkhead			
Battle Lantern			
Date			
Fwd A/C Unit Control			
10 lb Dry Chemical Extinguisher			
Date			
Alarm Panels			
24-Volt Electrical Panel			
Labels			
Pilothouse Light Switch			
Deck Light Switch			
110V Outlet			
Wire Runs			
Window/Latch			
Chart Table			
Computer (Optional)			
Flat Screen Monitor			
Keyboard			
CPU			
Mouse			
Computer UPS			
Printer			
Drawers/Latches			
Heater			
<i>Manual Horn</i>			
Charts			
Weems/Slide Rule			
Dividers			
Pencils			
Tide Book			
RPM/Speed/Fuel Curve			



ITEM	SAT	UNSAT	REMARKS
Light List/Coast Pilot			
Overhead			
Loudhailer/Intercom			
VHF-FM Radio			
GPS/DGPS			
Secure VHF-FM Radio			
Helm Chair			
Deck			
Deck Matting			
A/C Saltwater Pump Switch			
Entertainment Unit			
TV			
Radio			
Microwave Oven/Bracket			
Refrigerator			
Coffee Maker			
Stove Top			
Sink/Faucet			
Lower Cabinets			
Latches			
Piping/Valves Under Sink			
Clock			
Table			
AFFF Extinguisher			

REMARKS: _____



IX. Engine Room

ITEM	SAT	UNSAT	REMARKS
Battle Lantern			
Date			
Hydr Winch Control			
Piping			
<i>#2 Main Engine</i>			
Starter			
Alternator			
Hot Start			
Lube Oil System			
Governor/Linkage			
Cooling System			
Expansion Tanks			
Piping/Lagging			
Exhaust Piping/Lagging			
Exhaust Muffler			
Engine Mounts/Framing			
<i>Electrical System</i>			
<i>Fuel Oil System</i>			
Fuel Lines			
Shut-Off Valves			
Belt-Guard			
Engine Mounts			
<i>Generator</i>			
Starter			
Hot Start (Optional)			
Lube Oil System			
Governor/Linkage			
Cooling System			
Expansion Tanks			
Piping/Lagging			
Exhaust Piping/Lagging			



ITEM	SAT	UNSAT	REMARKS
Exhaust Muffler			
Engine Mounts/Framing			
Electrical System			
Fuel Oil System			
Fuel Lines			
Shut-Off Valves			
Belt-Guard			
Engine Mounts			
AFFF Extinguisher			
15lb CO ₂ Extinguisher			
Hydr Tank			
Fill Screen			
Filter Gauge			
Fittings			
#1 Main Engine			
Hot Start			
Starter			
Alternator			
Lube Oil System			
Governor/Linkage			
Cooling System			
Expansion Tank			
Piping/Lagging			
Exhaust Piping/Lagging			
Exhaust Muffler			
Engine Mounts/Framing			
Electrical System			
Fuel Oil System			
Fuel Lines			
Shut-Off Valves			
Belt Guard			
Engine Mounts			
Battery Charger			
24-Volt Panel			
<i>Overhead</i>			
Lights			
Wiring Stuffing Tubes			



Appendix C - 55' ANB Materiel Inspection Checklist

ITEM	SAT	UNSAT	REMARKS
Smoke Detector			
Heat Sensor (190 degs)			
Bilge			
Deck Plates			
Batteries			
Bilge Pump			
Bilge Alarm			
Pipes/Valves			

REMARKS: _____



X. Workshop

ITEM	SAT	UNSAT	REMARKS
Overhead			
Insulation			
Heater			
Lights			
Junction Boxes/Stuffing Tubes			
Wiring			
Hydr Pipes			
Eyewash Station			
Eyewash Placard			
Pipes/Valves			
Forward Bulkhead			
Storage Lockers			
Battle Lantern			
Date			
110/12V Outlets			
Storage Shelves			
Shore Power Transformer			
Storage Cabinet			
A/C & Heating Unit			
Piping			
Wiring			
Dry Chemical Extinguisher			
Dates			
<i>Aft Bulkhead</i>			
Wiring/Stuffing Tubes			
<i>Deck</i>			
Deck Matting (Optional)			
Deck Plates			
<i>Bilge</i>			
Wiring			
Stuffing Tubes			
Vacuum Tank			



ITEM	SAT	UNSAT	REMARKS
Piping/Hoses			
Potable Water Pressure Tank			
Hot Water Tank			
Potable Water Pressure Gauge			
Bilge (corrosion)			
Location Optional for the Following:			
<i>PFD/PYRO</i>			
<i>Survival Vest (6 ea)</i>			
Boat Pyrotechnics			
First Aid Kit (Location Optional)			

REMARKS: _____



XI. Head

ITEM	SAT	UNSAT	REMARKS
Insulation			
Lighting			
Wiring & Stuffing Tubes			
Vent Pipe			
Hydr Pipes			
Curtain Runners			
Curtain			
Towel Dispenser			
Drain Vent Pipe			
Light			
Mirror			
Sink/Faucet			
Pipes/Valves			
Shower Fixture			
Toilet			
Piping			
<i>Deck</i>			
Deck Matting			
Deck			
Shower Drain			
Door			
Hinges			
Vent			
Latch			

REMARKS: _____



XII. Berthing Compartment

ITEM	SAT	UNSAT	REMARKS
Smoke Detector			
Insulation			
Lighting			
Wiring			
Stuffing Tubes			
Overhead Hatch			
Hinges			
Gasket			
Knife Edge			
Dogs, Wedges and Rollers			
Locking Device			
Linen Locker			
Battle Lantern			
Date			
Topside Berth			
Stowage Area			
Rack Lights			
Bottom Berth			
Stowage Area			
Rack Lights			
Heater			
A/C Unit			
Wiring & Stuffing Tubes			
Piping/Insulation			
Valves			
A/C Control			
110V Outlet			
Thermostat			
Light Switch			
Watertight Door			
Hinges			
Gasket			
Knife Edge			
Dogs, Wedges & Rollers			



ITEM	SAT	UNSAT	REMARKS
Locking Device			
Alignment			
<i>Deck</i>			
Deck Matting			
Deck Plates			
<i>Bilge</i>			
Wiring & Stuffing Tubes			
Bilge Pump			
Float Switch			
Piping			
Corrosion/Pitting			

REMARKS: _____



Appendix D

55' ANB Disabling Casualties

Overview

Introduction This appendix contains disabling casualties for the 55' ANB. Refer to *Chapter 5, Section A* of this handbook for steps to follow if any of these casualties occur.

In this appendix The disabling casualties list covers the following subject areas:

Topic	See Page
Engine Parameters	D-3
Engineering System Components	D-3
Electronic/Navigation	D-3
Safety	D-4
General Material	D-4



Disabling Casualty List

Engine parameters

-
- Reduction gear pressure below 257 PSI (while engaged at 1800 RPM).
 - Engine lube oil pressure below 30 PSI (at cruising speed).
 - Engine fresh water temperature below 140 °F or above 205 °F.
-

Engineering system components

- Engine fails to start.
- Uncontrollable overheating.
- Metallic/non-metallic noise: metal on metal/fuel-knock/bearing/clicking.
- Excessive shaft or engine vibration.
- Engine surging/over speed (over 50 RPM).
- Loss of engine governor control.
- Reduction gear fails to engage (forward or reverse).
- Fuel oil dilution 2.5 percent or above.
- Water in engine lube oil (emulsified white milky oil).
- Lube oil in engine jacket water.
 - More than a light sheen.
 - Floating unmixed lube oil separated from the water.
- Continuous electrical breaker trip.
- Starting batteries will not charge.
- Steering system inoperative.
- Engine motor mounts hardware loose or missing.
- Excessive shaft packing leak:
 - Packing leak while rotating trickle or steady stream.
 - Packing leak while not rotating more than 15 drops per minute.

Electronic/navigation

No electronic means of signaling distress (i.e., no radio, etc.).
Electronics will not energize.



Safety

- Any fuel oil or lube oil dripping* on a hot surface (hot surface is defined as a surface greater than 400 °F, even if covered by insulation).
- Electrical arcing and sparking, odor of insulation overheating.
- Turbocharger lube oil supply line leaking onto hot surface or not fire rated/fire sleeved.
- Fixed HALON flooding system inoperative, PLUS no portable fire extinguishers (unserviceable).
- Emergency alarms inoperative (bilge, lube oil pressure, high water temperature).

* To determine if fuel oil or lube oil dripping is occurring, a clean sheet of paper may be placed under a suspected leak to collect and detect any drops that fall.

General material

- Hull breach below the waterline.
-



Appendix E

55' ANB Restrictive and Major Discrepancies

Overview

Introduction This appendix contains restrictive and major discrepancies for the 55' ANB. Refer to *Chapter 5, Section A* of this handbook for steps to follow if any of these casualties occur.

In this appendix This appendix contains the following information:

Topic	See Page
Restrictive Discrepancies	E-2
Major Discrepancies	E-5



Restrictive Discrepancies

Engine and vessel systems

-
1. Engine performance:
 - a. Maximum RPM (norm 2100 - 2200) – less than 2350 RPM.
 - b. Engine freshwater temperature not to exceed 205 °F.
 2. Leaks more than 15 drops per minute:
 - a. Jacket water.
 - b. Lube oil.
 - c. Hydraulic oil.
 - d. Reduction gear oil.
 3. Excessive shaft packing leak
 - a. Packing leak while rotating, limit RPMs to speed where leak starts.
 4. Any fuel oil dripping* (falling onto a surface which is not hot) within ten (10) minutes.
 5. Bilge pumps inoperative.
 6. Bilge system check valves installed improperly or unserviceable.
 7. Inoperative/inaccurate pressure/temperature alarms or gauges.
 8. Any detectable exhaust leaks into machinery space/hull.
 9. Missing exhaust lagging or system blankets.
 10. Failure of any emergency system:
 - a. Fuel shut-off valves do not fully close.
 - b. Engine blower shutdown is inoperative (manually from open or enclosed steering).
 11. Loose/missing fittings, nuts, bolts, brackets, etc.:
 - a. Missing or loose shafting bolts:
 - 1) Gear output flange.
 - 2) Propeller shaft coupling.
 - 3) Propeller shaft flange.
 - b. Steering system:
 - 1) Rudder post nuts.
 - 2) Steering ram mounts.
 12. Buoy handling equipment inoperative or damaged:
 - a. Buoy crane actuators, hydraulic system and winch hardware, hoses, fittings cables.
 - b. Cross deck winch hardware, hoses, fittings, and wire rope.
-



-
- c. Pelican hook and associated ground tackle show physical damage, distortion.
13. Buoy handling equipment and rigging gear not inspected:
- a. Weight handling equipment not of proper grade, that has not been calibrated or pull tested annually, and material condition that degrades equipment.
 - b. Buoy handling system Level I inspection/annually.
 - c. Buoy handling system Level II & III inspection/ every four years IAW BCMP.
14. Undersized engine mounting bolts and/or constructed of inferior grade material.
15. AC generator inoperative.
16. Sea chest valve inoperative (closed).
- * To determine if fuel oil is dripping, a clean sheet of paper may be placed under a suspected leak to collect and detect any drops that fall.

Boat outfit

-
- 1. Fire extinguishers not secured in brackets, expired weight test.
 - 2. Mast support bracket hardware loose/missing.
 - 3. Underweight HALON bottle.
 - 4. HALON system pressure switches not operating properly.
 - 5. Boat pyrotechnics unserviceable/missing.
 - 6. Survival vest missing.
 - 7. Portable dewatering pump kit incomplete/inoperative/missing.
-



**Electronics/
navigation**

1. Compass:
 - a. Deviation table missing.
 - b. Compass deviation over 5 degrees.
2. Electronics:
 - a. VHF radio inoperative.
 - b. Depth sounder inoperative.
 - c. DGPS inoperative.
 - d. Radar inoperative.
 - e. ATONIS/APPS Program inoperative.

**General
materiel and
Safety**

1. Watertight integrity:
 - a. Holes/cracks in a watertight structure.
 - b. Cracks through a watertight scuttle/hatch.
 - c. Failure of a watertight closure to seal.
 - d. Loose dogs/dogging arms on watertight doors/hatches/scuttles.
 - e. Any noticeable gap at gasket seams.
 2. Stern dunnage missing.
 3. Navigation lights inoperative.
 4. Removal or Alteration to emergency egress route.
 5. Weight handling equipment not of proper grade, that has not been calibrated or pull tested, and material condition that degrades equipment.
-



Major Discrepancies

Engine and vessel systems

1. Leaks less than 15 drops per minute:
 - a. Jacket water.
 - b. Raw water.
 - c. Lube oil.
 - d. Hydraulic oil.
 - e. Reduction gear oil.
2. Any fuel leak (piping/fittings/tank) that drips less than one (1) drop within ten (10) minutes.
3. Bilge pump hoses missing hose clamps.
4. Loose/missing fittings, nuts, bolts, brackets, etc.:
 - a. Hardware on the engines used for attaching equipment.
 - b. Battery terminals loose or corroded.
 - c. Engine electronic control cables loose or disconnected.
(Morse control cables loose or tight).
5. Flexible hoses and gauge lines used for petroleum based products not either fire rated or fire sleeved (fire sleeve properly banded at both ends).
6. Fluid levels below minimum required.
7. Engine guard's inadequate/missing around moving machinery.
8. Protruding exhaust lagging securing wire.
9. Alternator failure.

NOTE

There are sufficient redundant systems that this should not be a disabling casualty. Loss of both alternators would not prohibit the boat from performing all of its missions.

10. Any standard boat machinery, with the exception of those listed on the disabling or restrictive list, not operating properly.
-



Boat outfit

1. Improperly stowed, secured, or inspected equipment:
 - a. Deck locker covers.
 - b. All drawers and cabinets in workshop.
 - c. Oxygen and acetylene bottles.
 - d. Life raft.
 - e. Portable dewatering pump.
 - f. Survival vest.
 2. Hydrostatic testing of fixed/portable cylinders not completed.
 3. Fire extinguisher PMS not recorded on equipment tag or improperly completed.
-

**Electronics/
navigation**

1. Compass light inoperative.
 2. Expired deviation table.
 3. Any standard boat electronics, with the exception of those listed on the restrictive list, not operating properly.
-

**General
material and
safety**

1. Watertight integrity:
 - a. Improperly filled holes, through bulkhead fittings, i.e., stuffing tubes.
 - b. Hardware bolted through a watertight hatch, scuttle, or bulkhead.
 2. Scuttle not flush with the deck causing a tripping hazard.
 3. Inability to open or close doors, hatches, or scuttles.
 4. Hatch and scuttle safety locks do not engage when item is in the *open* position.
 5. Missing breaker or open hole in any power distribution panel.
 6. Any standard boat machinery or system, with the exception of those listed on the disabling or restrictive lists, not operating properly.
-



Appendix F

List of Acronyms

Overview

Introduction This appendix contains a list of the acronyms used throughout the handbook.

In this appendix This appendix contains the following information:

Topic	See Page
List of Acronyms	F-2



ACRONYM	DEFINITION
A/C	Air Conditioning
AC	Alternating Current
ATON	Aids to Navigation
BUSL	Buoy Utility Stern Loading
CPU	Central Processing Unit
DC	Direct Current
DGPS	Differential Global Positioning System
DIW	Dead-in-the-Water
ECR	Engineering Change Request
ECS	Electronic Chart System
FLOCS	Fast Lubricating Oil Change System
FPM	Feet Per Minute
GPS	Global Positioning System
HPU	Hydraulic Power Unit
HVAC	Heating, Ventilation, and Air Conditioning
IPS	International Pipe Standard
LC	Load Center
LOA	Length Overall
NATON	National Aids to Navigation
NOAA	National Oceanographic and Atmospheric Association
PFD	Personal Flotation Device
PMS	Planned Maintenance System
PSI	Pounds Per Square Inch
PTO	Power Take-Off
QAWTD	Quick-Acting Watertight Door
RFO	Ready for Operations
UMI	Universal Marine Interface
UPS	Uninterrupted Power Supply
VAC	Volts Alternating Current



Index

120/220 main VAC panel, 3-22
 120-VAC motor, 3-42
 120-VAC panel, 6-3
 120-VAC power panel, 6-6
 120-VAC-heating element, 3-44
 12-VAC electronics panel, 3-21
 24-VDC breaker, 2-9
 24-VDC motor, 3-46
 24-VDC panel, 6-32, 6-34
 24-VDC power distribution system, 3-21
 24-VDC power panel, 3-24, 6-32
 24-VDC searchlight, 3-34
 24-VDC starter, 3-16

A

AC generator, 3-6, 3-19
 AFFF extinguisher, 3-36
 aft control console, 3-6, 3-30
 aft control station, 3-5
 air compressor, 3-34, 3-42, 6-6
 air horn, 2-16
 air hose, 3-42
 air receiver, 3-42
 alarm, 3-5, 3-36, 6-6, 2, 6-3
 alternator, 3-21
 anchor, 3-34, 6-29, 6-30
 anchor line, 6-29
 anchor line reel, 2-20
 anchoring system, 6-29

B

battery bank, 3-21
 battery charger, 3-21, 3-23, 3-25, 6-3, 6-32, 6-34
 beam seas, 5-10, 6-14
 berthing, 3-27
 berthing area, 2-11, 2-14, 3-36, 3-38
 berthing compartment, 2-14
 bilge, 5-12, 6-3, 6-33, 6-34, 2
 bilge pump, 3-24, 3-38
 bilge system, 3-38
 bitt, 2-5, 6-28, 6-29, 6-30
 boat handling, 6-10

boat hooks, 2-24
 boat specification, 2-2
 bow, 2-25
 buoy deck, 5-12, 6-20
 Buoy Deck Supervisor, 4-6, 4-7, 6-20, 6-22, 6-24
 buoy handling, 2-18
 buoy handling equipment, 3-29
 buoy handling hydraulic system control, 3-24
 buoy handling operation, 4-10
 buoy operations at anchor, 3-34
 buoy operations underway, 3-34
 buoyancy, 5-10
 buoyancy chamber, 2-7
 bypass valve, 3-10, 3-17

C

cartridge filter, 3-10
 casualty, 5-4, 5-6, *See*
 chain stopper, 6-23, 6-24
 chemical extinguishers, 3-36
 chocks, 2-21
 communications, 6-9
 compressed air system, 3-42
 control console, 3-5
 control heads, 3-5
 control station, 6-6, 6-9
 coolant reservoir, 3-7
 cooling system capacity, 3-3
 cooling water pump, 3-7
 coxswain, 4-3, 4-4, 4-6, 4-7, 4-9, 5-4, 5-5, 5-6, 5-7, 6-7, 6-9, 6-13, 6-17, 6-20, 6-22, 6-23, 6-24, 6-28, 6-29, 6-30
 crane, 3-29
 crankcase ventilation system, 3-11
 crew, 4-1, 4-3, **4-4**, 5-1, 5-5, 5-6, 5-7, 5-10
 crewmember, 4-1, 4-3, **4-6**, 4-7, 4-8, 4-9, 6-1, 6-29, 6-30, 6-31
 cross deck winch, 3-29, 6-21
 current, 6-17, 6-20, 6-31

D



deck equipment and fittings, 2-18
deck lockers, 2-26
deck winch, 3-5, 3-29, 6-24
deck winch system, 3-29
deckhouse, 2-4
depth sounder, 2-16, 3-21, 3-31, 3-34
DGPS, 3-21, 3-31, 4, 5, 14, 6-5
diesel engine, 3-3, 3-10, 3-14, 3-15, 3-19
disabling casualty, 5-3, 5-5

E

electric heater, 3-15
electronic navigation system, 3-31
electronic throttle controls, 3-5
emergency, 6-29
emergency dewatering pump, 2-27
emergency egress route, 6-5
emergency lighting, 3-24
emergency medical technician, 4-6, 4-7
emergency procedure, 1-1, 4-1
emergency shutdown, 3-6
emergency shutdown controls, 3-6
emergency system, 6-3
emergency tiller, 3-17
engine, 3-6, 6-4
engine control, 2-16, 3-5
engine lubrication system, 3-10, 3-19
engine room, 3-6, 3-29, 3-31, 3-36, 3-38, 3-42, 6-3, 6-6, 6-33, 6-34, 6-35
engine seawater suction valve, 6-33, 6-34
engine starting system, 3-16
engine throttle controls, 3-5
engineer, 4-3, 4-6, 4-9
engineering and electronic systems, 6-7
engineering change request, 1-4
engineering change requests, 3
engineering inspection, 5-3
environmental limitations, 5-7
environmental limits, 5-3, 5-7

F

facility manager, 1-3
fire extinguisher, 3-36, 2
fire in the machinery space, 3-36
fittings, 2-13, 2-18, 3-30, 6-29, 6-4, 6-6
float switches, 3-38
flooding, 6-34

flooding system, 3-36, 2, *See*
following seas, 5-10, 6-14
forepeak, 2-19, 2-20, 6-29
forward peak, 3-38
freeboard, 6-31
fuel filter, 3-13, 3-19
fuel filter/separator, 3-13
fuel oil system, 3-13
fuel oil tank, 3-24, 6-3
fuel pump, 3-13, 3-19
fuel supply valves, 6-33
fuel tank, 6-3
furuno antenna, 3-31
furuno radar, 3-31
generator, 3-19, 3-20, 3-21, 3-31, 6-4, 6-5, 6-33

G

gray water holding tank, 3-40
gray water pump, 3-40
gray water shore tie, 3-40
gray water system, 3-40
gray water tank, 3-40

H

Halon cylinders, 3-36
handrails, 2-25
head seas, 6-13
heater, 3-27
heating, 3-27
heating and air conditioning, 3-27
helm pump, 3-17
high water temperature, 2
horn, 3-34
hose, 3-20
hose connection, 3-30
hose outlets, 3-42
hull, 2-21, 3
HVAC, 3-27
hydraulic crane, 3-29
hydraulic filter, 3-29
hydraulic oil reservoir, 3-29, 6-21
hydraulic pump, 3-29
hydraulic reservoir, 3-29
hydraulic steering ram, 3-17

I

ice, 6-32



- J**
- jacket water system, 3-15, 3-19
jacket water-cooling system, 3-7
- L**
- life raft, 2-23, 3-31
life rings, 2-22
loudhailer, 2-16
loudhailer/intercom, 3-32
lubricating oil system, 3-3
- M**
- macerator pump, 3-40
machinery space, 3-6, 3-19, 3-20, 3-21, 3-27, 3-29, 3-36, 3-38
magnetic compass, 3-33
maneuvering, 6-31
mast, 2-17, 2-23, 3-31, 3-34
mess, 2-12
mooring bitt, 2-19, 2-21
muffler, 3-14, 3-20, 3-23
- N**
- navigation lights, 3-34
- O**
- oil cooler, 3-7, 3-10
oil pump, 3-10
Operational Commander, 5-3, 5-4, 5-5, 5-6
overboard port, 3-20
overboard ports, 3-14
- P**
- personal flotation devices, 6-9
pilothouse, 2-24, 3-5, 3-31, 3-36, 6-34
piping, 2-10, 6-6
potable water heater, 3-22
potable water system, 3-44
power panel, 3-24, 3-25
power steering system, 3-17
propeller, 5-11, 6-15
propeller shafts, 3-4
propulsion engines, 3-9
propulsion system, 3-3
- R**
- radio, 28, 6-5
radiotelephone, 3-32
reduction gear, 2-4, 2-9, 3-3, 3-17
remote indicator, 3-31
restricted maneuvering, 3-34, 6-12, 6-16
rub rails, 2-5
- rudders, 3-17, 5-11, 6-12, 6-13, 6-15
- S**
- safety, 4-4, 4-8
safety chains, 2-25
sail area, 6-31
saltwater system, 3-19
seawater cooling system, 6-32
service pump, 3-44
sewage system, 3-40, 6-7
sewage-holding tank, 3-40
shore power, 3-21, 3-22, 6-5
solenoid, 3-16
space heater, 6-34
split throttle, 6-11
stability, 5-12
stanchions, 2-25
starter, 3-16
station keeping, 6-16, 6-18
suction screen, 3-10
superstructure, 2-4, 6-16, 6-31
- T**
- thermostat, 3-7
tiller assembly, 2-8, 3-17
tow watch, 6-28
towing, 3-34, 5-9, 6-16, 6-28
training, 4-6, 4-7
transfer power, 6-4
transmission, 3-5, 3-6
transom, 6-15
- U**
- underway, 3-21, 3-27, 3-34, 4-1, 4-8, 6-9
- V**
- vacuum pump, 3-24
ventilation, 2-9, 3-27
VHF radio, 2-16
- W**
- washers, 2-17, 3-46
water heater, 2-11, 3-44
watertight door, 2-13, 6-33, 6-35
white water, 5-11, 6-15
wind, 6-16
windshield wipers, 3-46
work platform, 6-24
workshop, 3-21, 3-22, 3-24, 3-25, 3-27, 3-36, 3-38, 3-40



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