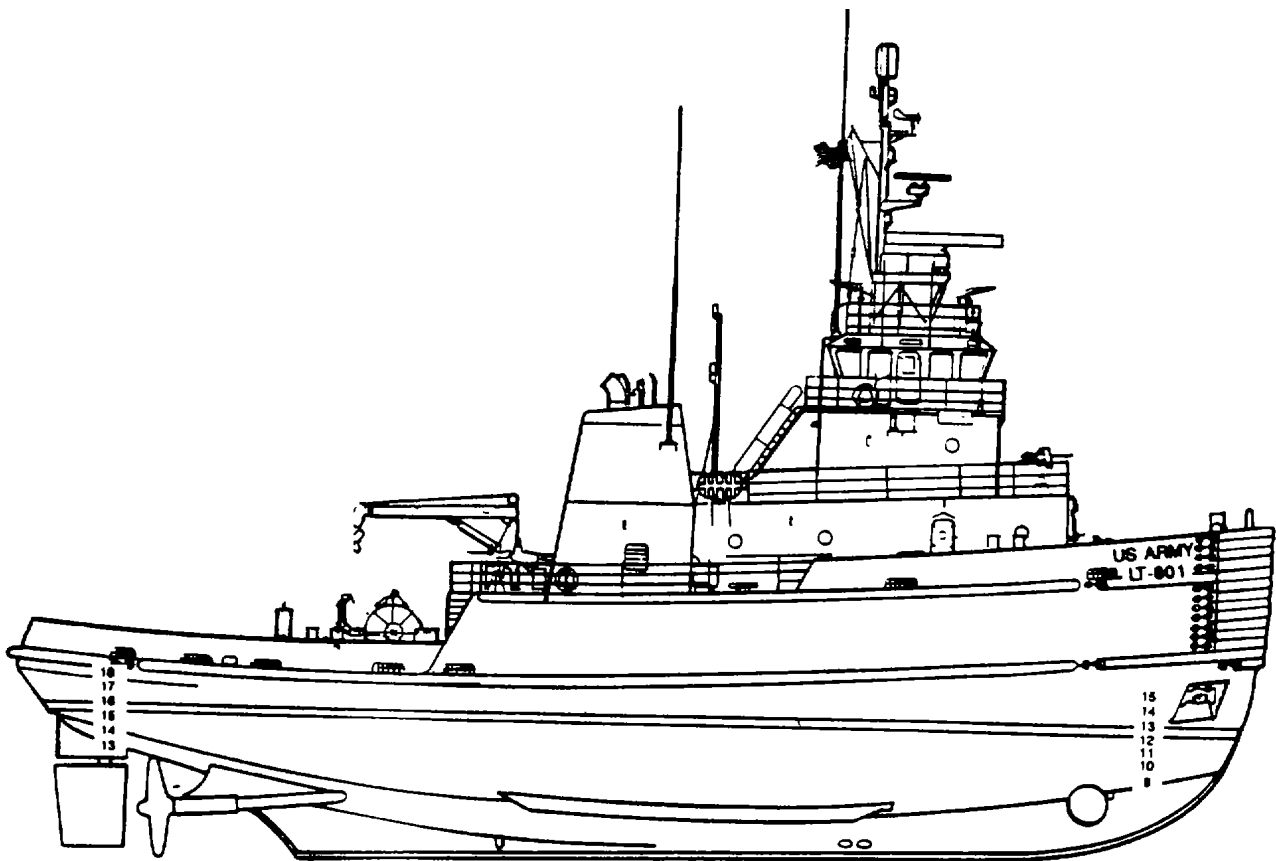


TECHNICAL MANUAL  
OPERATOR'S MANUAL  
FOR  
INLAND  
AND COASTAL  
LARGE TUG (LT)  
NSN 1925-01-247-7110



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HEADQUARTERS, DEPARTMENT OF THE ARMY

16 AUGUST 1991

TECHNICAL MANUAL

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HEADQUARTERS  
DEPARTMENT OF THE ARMY  
WASHINGTON, D.C., 16 August 1991

**OPERATOR'S MANUAL  
for  
INLAND AND COASTAL LARGE TUG (LT)**

**NSN 1925-01-247-7110**

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CHAPTER 1  
INTRODUCTION

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SECTION I. GENERAL INFORMATION

**1-1. Scope.** This is an operator's manual for the Large Tug (LT) (Figure 1-1). The LT performs coastal and ocean towing, docking, and undocking operations with large ocean vessels. These vessels include the SL-7 (FSS) LASH and SEABEE vessels. The LT also handles barges in the open ocean. The LT can provide fire fighting, salvage, and rescue help to other ships and shore installations on a limited basis. The vessel operates in inland waterways, coastal waters, and the open ocean. It can deploy overseas under its own power.

**1-2. Maintenance Forms and Records.**  
Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 738-750, The Army Maintenance Management System (TAMMS).

**1-3. Reporting Equipment Improvement Recommendations (EIRs).** If your LT needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about the equipment. Let us know why you don't like the design or performance. Put it on an SF 368 (Quality Deficiency Report). Mail it to us at: Commander, U.S. Army Tank-automotive and Armaments Command, ATTN: AMSTA-LC-CIP-WT, Rock Island, IL 62199-7630. We'll send you a reply.

**1-4. Nomenclature Cross Reference List.**  
*a. CECOM Equipment.* Table 1-1 is a list of electronic equipment. This list provides a cross reference from the equipment name used in this manual to both government nomenclature and commercial identification.

*b. Non-CECOM Equipment.* Table 1-2 is a list of names used in this manual and their official nomenclature. The official nomenclature is used throughout the manual if not listed.

**1-5. List of Abbreviations.** Special or unique abbreviations and acronyms used in this manual are listed below. Standard abbreviations and acronyms used are in MIL-STD-12.

ABS	American Bureau of Shipping
ADF	automatic direction finder
AFFF	aqueous film forming foam
AMDF	Army Master Data File
AMS	auxiliary machinery space
ARPA	automatic radar piloting aid
ASW	auxiliary sea water
BATTY	battery
BB	bilge and ballast
BOSUN	boatswains
BTTY	battery
CFW	cold fresh water
CH	central hydraulics
CHT	collection, holding, and transfer
CONV	convection
CRSR	crew stateroom
DE	diesel exhaust
DA	Department of the Army
DIST	distribution
DK	deck
DRINKG	drinking
EDG	emergency diesel generator
EDP	emergency distribution panel
EIR	equipment improvement recommendation
EL	emergency lighting
EMERG	emergency
EMG	emergency
EOS	enclosed operating station
EOT	engine order telegraph
FB	fuse box
FLDLTS	floodlights
FSS	fast support ship

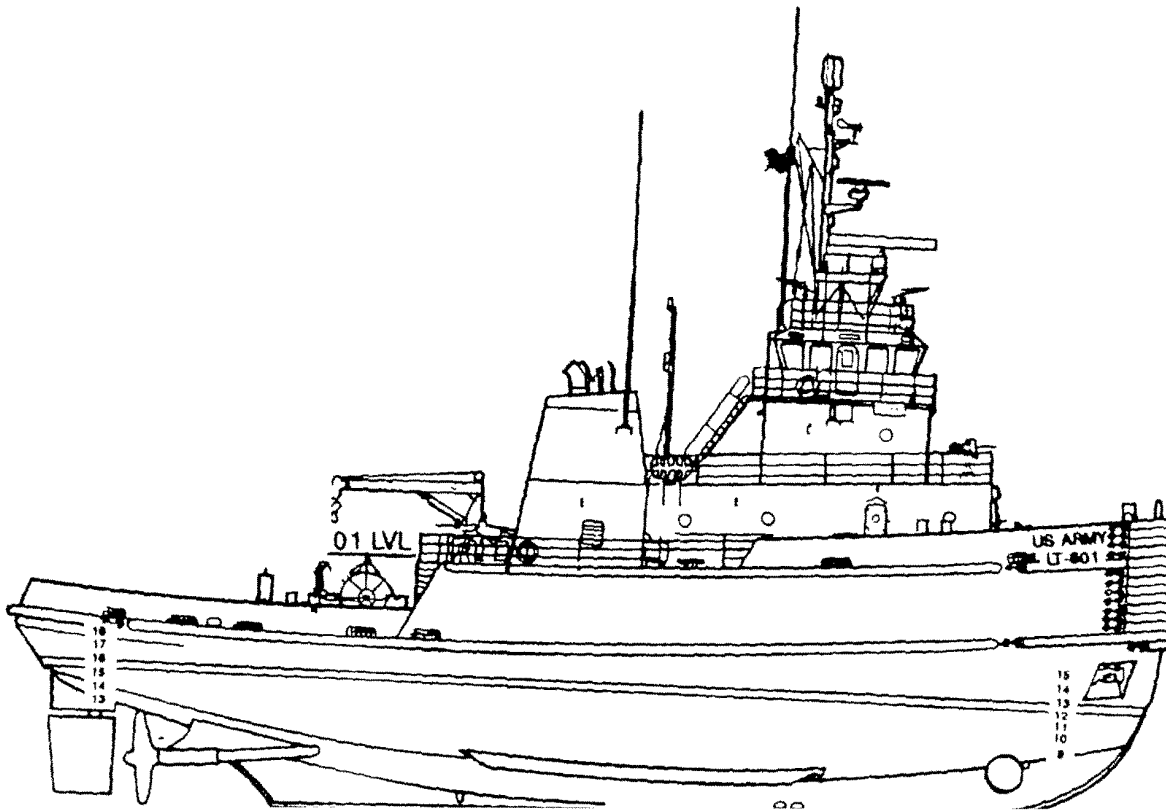


Figure 1-1. Large Tug.

FU	follow-up	REV	reverse
FWC	fresh water cooling	RFAC	refrigeration - air conditioning
GS	general service	RFSS	refrigeration - ship stores
HSLT	high speed, low torque	RHTR	reheater
HVAC	heating, ventilation, and air conditioning	SD	sanitary drain
INFL	inflatable	SF	standard form
KVA	kilovolt amperes	SH	steering hydraulics
LO	lube oil	SSDG	ship service diesel generator
LSHT	low speed, high torque	SSDGJW	ship service diesel generator jacket water steering
LTS	lights	STR	The Army Maintenance Management System
MACHRY	machinery	TAMMS	towing hydraulics
MKR	maker	TH	tank level indicator
MAD	marine sanitation device	TLI	towing
NaCL	sodium chloride (salt)	TOWG	turbocharger
NFU	non follow-up	TURB	turbocharger
OB	oily bilge	TURBO	video cassette recorder
PASSWAY	passage way	VCR	washdown counter-measure
PHC	pilothouse console	WDCM	water tight door
PMCS	preventive maintenance checks and services	WTO	transfer
PW	potable water	XFER	transformers
RCPTS	receptacles	XFMR	transmitter
RECIRCU	recirculating	XMTTR	
REFRIG	refrigeration		
REHTR	reheater		

FITTING		FLANGED	SCREWED	WELDED	BELL AND SFIGOT	SOLDERED
BUSHING						
CAP						
CROSS STRAIGHT SIZE						
ELBOW 45 DEGREE						
90 DEGREE						
TURNED DOWN						
TURNED UP						
LONG RADIUS						
STREET						
JOINT (COUPLING) CONNECTING PIPE						
LATERAL						
PLUG PIPE PLUG						
REDUCER CONCENTRIC						
ECCENTRIC						
TEE STRAIGHT						
OUTLET UP						
OUTLET DOWN						
UNION						
VALVES CHECK STRAIGHTWAY						
GATE						
GLOBE						
ANGLE GLOBE ELEVATION						
GLOBE PLAN						

Graphic Symbols for Pipe Fittings

Table 1-1. Cross Reference List for CECOM Equipment

NO.	COMMON NAME	GOVERNMENT NOMENCLATURE	COMMERCIAL IDENTIFICATION
1.	Radar Set (3 cm) X-Band	AN/SPS-64M16	AS/SPS-640
2.	Radar Set (10 cm) S-Band	AN/SPS-64(V)17	AN/SPS-640
3.	Radar Interswitch Unit	SA-2308/SPS-64M .	SA 2308
4.	Automatic Radio Direction Finder	AN/SRD-26	4005A
5.	Sonar Sounding Set	AN/SQN-13	D600D
6.	Linear Amplifier	AM-7387/URC	MSR 1020
7.	Power Supply	PP-8236/URC	MSR 6212
8.	Antenna Coupler	CU-2417/URC	MSR 4030
9.	Facsimile Recorder-Reproducer	RD-605/UXH	TR-1
10.	Auxiliary Receiver-Transmitter	RT-1600/U	6100
11.	Alarm Signal Generator	SGA319/SRQ	MR 370-13A
12.	High Frequency Radio Telephone Distress Frequency Watch Receiver	R-2414/SRQ	M1511
13.	Telegraph Terminal	AN/SGC-14	3500 ARQ
14.	Radio Receiver	R-2408/URC	MSR 5050
15.	Radio Transmitter	T-1527/URC	MSR 6700
16.	Receiver-Transmitter	RT-1588/SRQ	403A
17.	Communication Modem	MD-1 255/URC	1280A
18.	Interface Unit	J-4795/U	6606
19.	Electronic Equipment Installation Kit	MK2453/G	MK-2453
20.	Doppler Speed Log	AN/SQN-20	DSL-150
21.	Radio Set	AN/PRC-129	RPX-150

Table 1-2. Cross Reference List for Non-CECOM Equipment

COMMON NAME	OFFICIAL NOMENCLATURE
Main Engine	Engine, Diesel
Ship Service Diesel Generator	Generator Set, Ship Service
Emergency Generator	Generator Set, Emergency
Pump Drive Engine	Engine Set, Pump Drive
Bow Thruster Engine	Engine Set, Bow Thruster
Lube Oil Purifier	Lube Oil Purification System
Reverse Osmosis Watermaker	Reverse Osmosis Fresh Water Desalinator
Fuel Oil Filter/Coalescer	Fuel Oil Coalescer
Machinery Plant Monitoring System Range	Engine Room Monitoring System Range, Electric, 480 V
Fryer	Deep Fat Fryer
Electric Griddle	Griddle, Self Heating
Toaster	Toaster, Electric
Dishwasher	Dishwashing Machine
Garbage Disposal	Food Waste Disposer

**1-6. Glossary.** Definitions for unique and unusual terms used in this manual are provided below.

AFFF- Aqueous film forming foam is a solution of 6% detergent and 94% water; is used as an extinguishing agent on flammable liquid fires.

Clinometer - Instruments for measuring the angles of roll and pitch.

Fresh Water - Desalinated water not fit for human consumption.

FM-200 - A compound of carbon, fluorine and hydrogen (CF<sub>3</sub>CHCFCF<sub>3</sub>). It is colorless, odorless and electrically non-conductive. It suppresses fire by a combination of chemical and physical mechanisms without affecting the available oxygen.

HALON - A halogenated fire extinguishing agent which leaves no corrosive or abrasive residue after use.

Hydropneumatic Tank - Compressed air pressurized water tank.

Potable Water - Desalinated water which has been further treated and is fit for human consumption.

Remote valve operator - device used for remote operation of valves.

Scope - amount of tow line streamed between towing vessel and towed vessel, less towed vessel's bridle and pendant.

Water Washdown System (WWS) – The WWS, built of all stainless steel components, is installed in the Engine Room and Auxiliary Machinery Space I (AMS I). The WWS is a hydrogen fluoride (HF) gas mitigating water washdown system (WWS) which provides general overhead coverage to the protected spaces. The WWS is a simple overhead sprinkler grid which is piped directly to the existing firemain. It receives seawater from the No. 1 Fire and General Service Pump which is powered electrically from the emergency bus:



**WARNING**

**The WWS is not designed nor intended to be a stand alone fire extinguishing system. It is designed to be used in conjunction with the installed FM-200 fixed fire extinguishing system.**  
**PURPOSE OF WWS:**

The W W S, upon activation, serves to:

- Quickly reduce the temperature within the protected space.
- Minimize production of Hydrogen Fluoride (HF) Gas which is produced as a result of FM-200 agent decomposition in contact with hot surfaces and flame at temperatures above 1300°F.
- Aid scrubbing of any HF Gas generated.
- Expedite ventilation of the protected space.

## SECTION II. EQUIPMENT DESCRIPTION

**1-7. Equipment Characteristics, Capabilities, and Features.**

*a. Characteristics.* The LT is used for coastal and ocean towing, docking and undocking operations with large ocean vessels such as the SL-7 (FFS), LASH, and SEABEE vessels. The LT is capable of producing 54 long tons of Bollard Pull. It can tow five 231 A type barges with a payload capacity of 733 long tons per barge or five 231 B type liquid cargo barges with a payload capacity of 578 long tons per barge. The LT can sustain a minimum speed of 5 knots in Sea State 4 when under full tow as described above.

*b. Capabilities.* The LT is capable of self-delivery to overseas locations. It has a maximum range of 5000 nautical miles with 25 percent fuel reserve. The LT can handle high side, high flare ships.

*c. Features.* The LT is capable of providing limited fire fighting, salvage, and rescue help to other ships and shore installations. The vessel has control stations in the pilothouse and enclosed operating stations located aft on the 01 Level (near the tow winch control station) and on the port and starboard bridge wings. Each auxiliary control station contains engine speed and steering controls, bow thruster controls, and rudder angle indicator. Included in each control station are the indicators necessary for the safe operation of the LT.

**1-8. Location and Description of Major Components.**

Major components and compartments of the LT are discussed below.

*a. Decks.* LT decks shown in Figure 1-2 are described as follows:

(1) 04 Level. The Pilothouse Top (04 Level) contains radio antennas, fire monitors, binnacle, mast (supporting radar antennas, towing lights and masthead lights), and searchlights.

(2) 03 Level. The 03 Level contains the pilothouse, standard bearing repeaters, auxiliary control stations (port and starboard) and side lights (port and starboard).

(3) 02 Level. The 02 Level includes, but is not limited to, the damage control center, radio room, arms control room, medical locker, electronic stores, life rafts, machine gun mounts, and the aft mast.

(4) 01 Level. The 01 Level includes, but is not limited to, machine gun mounts (aft port and starboard), aft control station, workboat, boat handling crane, and port and starboard anchor windlasses. Interior features include the Chief Engineer's stateroom, Captain's stateroom, Officers' staterooms (port and starboard), NCO's stateroom, emergency generator room, fan room, and engine room air intake (port and starboard).

(5) Main deck. The Main Deck includes but is not limited to, boatswains store, crew's staterooms (port and starboard), galley (including chill, freeze, and thaw rooms), foul weather gear locker, fan room, mess/recreation space, life jacket locker, damage control locker, laundry space, and paint locker. The aft section contains the towing winch (port and starboard), capstan, tow bar, rudder motors, tow pins (port and starboard), tow rollers (port and starboard), NBC locker, and garbage can rack.

(6) Below main deck. Below the main deck are the fore peak, miscellaneous storeroom, auxiliary machinery spaces (fore and aft), workshop, engine room, dirty oil tank, fuel oil day tanks (port and starboard), potable water tanks (port and starboard), steering gear room, towing gear locker, tube oil tank, enclosed operating station, spare parts storeroom, bow thruster compartment, and chain locker.

*b. External Features.* External features are depicted in Figures 1-3 through 1-8.

(1) LT External features (Figure 1-3).

(a) ANIURC-92 Antenna (starboard), linear amplifier MSR 1020 antenna (port) (1).

(b) Aft mast (2). Structure for mounting pushing/towing lights.

(c) Automatic direction finder sense antenna (3).

(d) Distress transceiver antenna (4).

(e) Marine facsimile antenna (5).

(f) Omega set antenna (6).

(g) Bull nose (7). Fixture used to guide towing hawser.

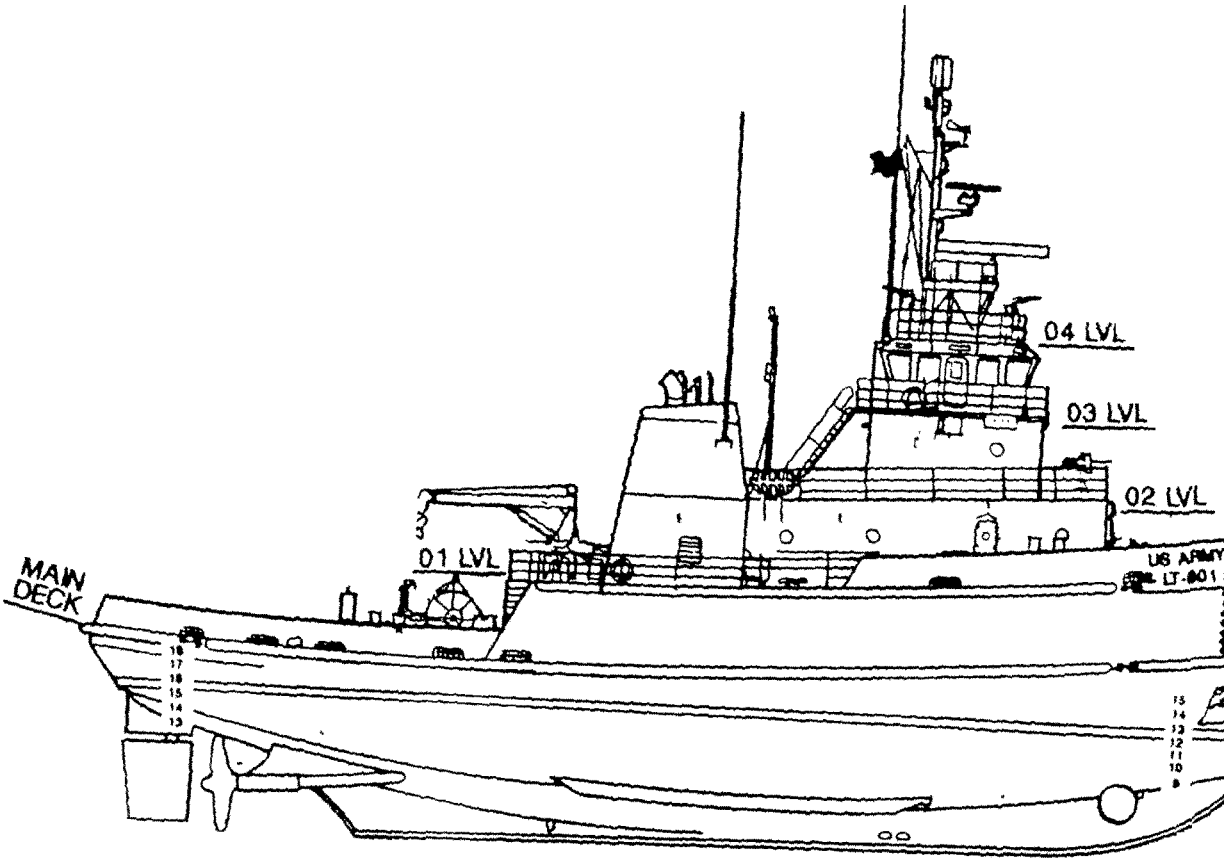


Figure 1-2. LT Decks.

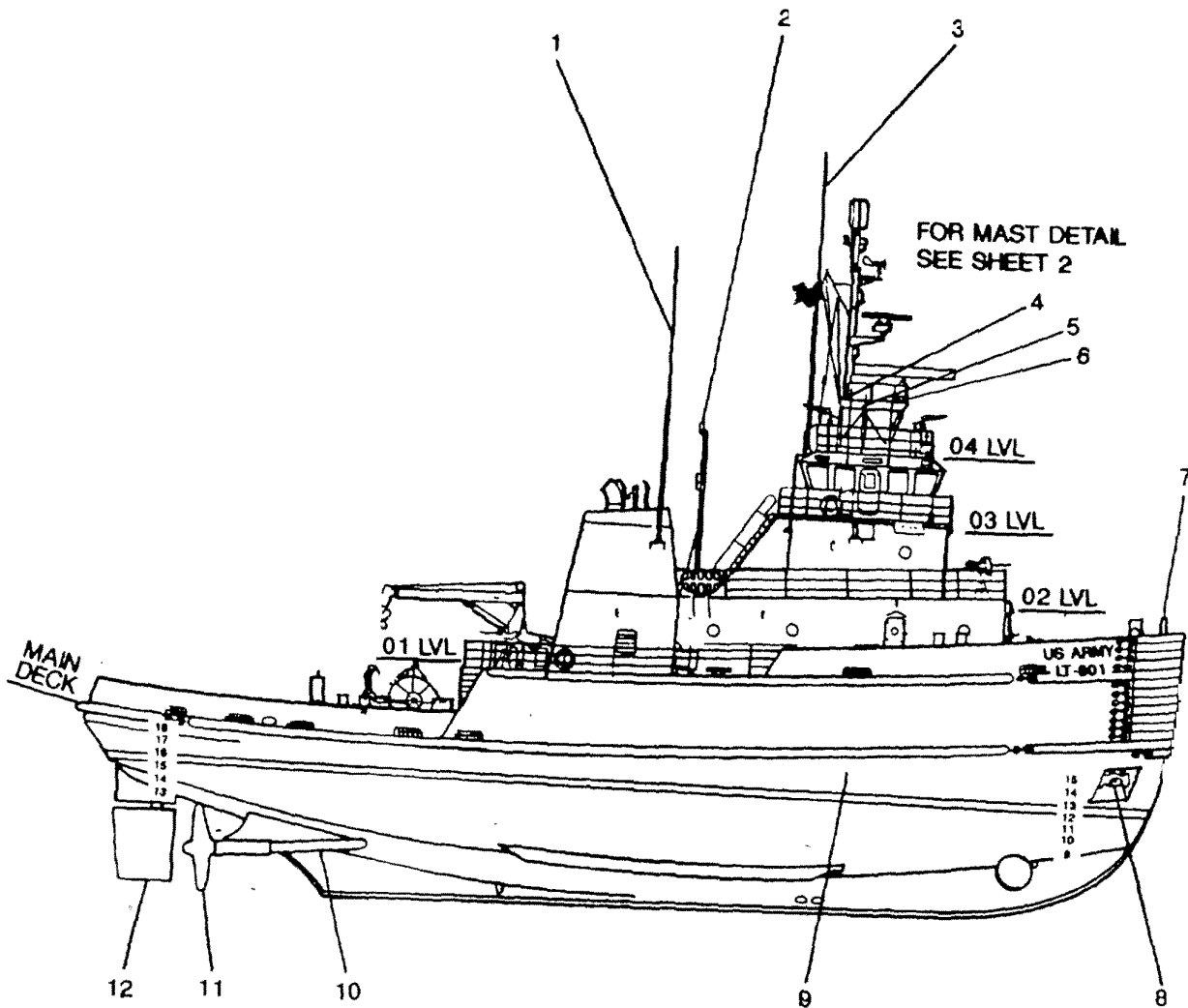
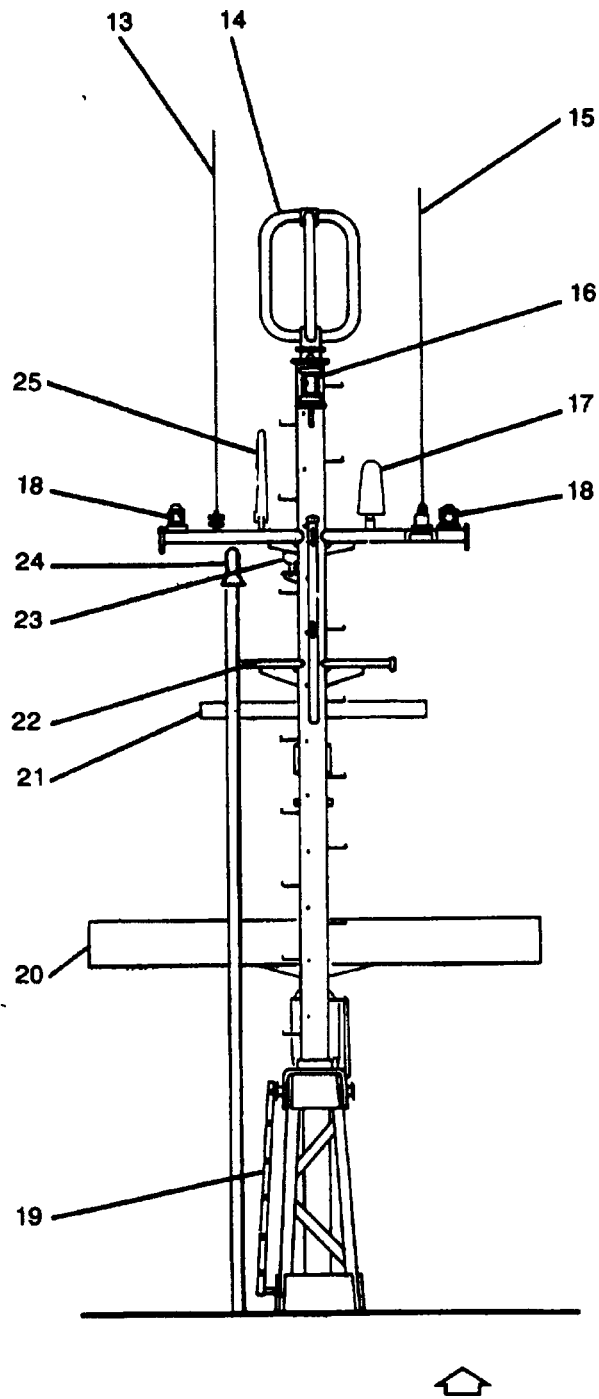
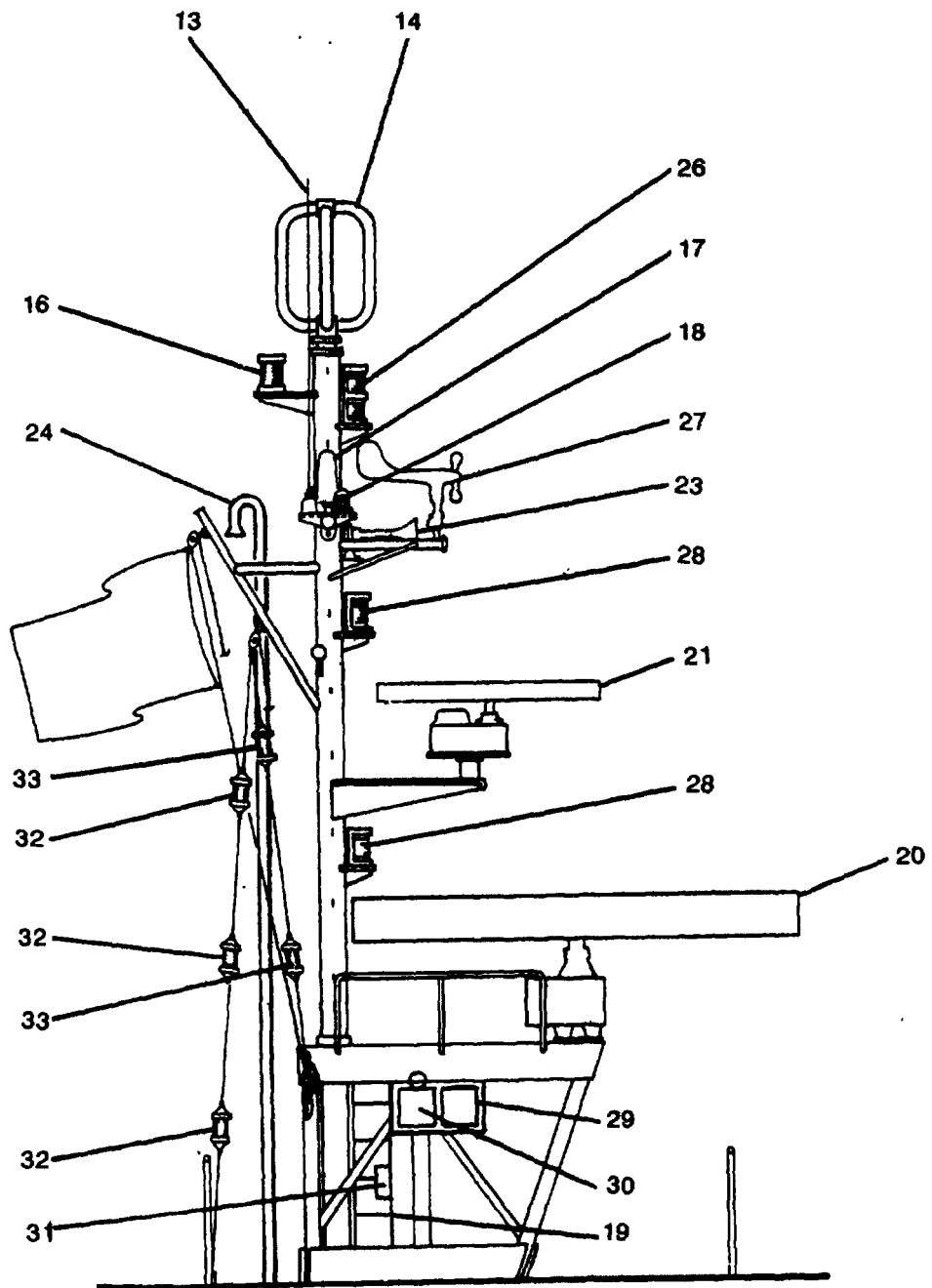


Figure 1-3. LT External Features (Sheet 1 of 4).



AFT, LOOKING UP

Figure 1-3. LT External Features (Sheet 2 of 4).



STBD LOOKING INBOARD

Figure 1-3. LT External Features (Sheet 3 of 4).