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Defense Intelligence Agency Production Center

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CHARACTERISTICS OF U. S. VESSELS, VEHICLES, AND EQUIPMENT FOR AMPHIBIOUS OPERATIONS

SEPTEMBER 1963

PREPARED BY

DEFENSE INTELLIGENCE AGENCY

PRODUCTION CENTER

U.S. Army Military History Institute
Carlisle Barracks, Pa. 17013

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CHARACTERISTICS OF U.S. VESSELS, VEHICLES, AND EQUIPMENT FOR AMPHIBIOUS OPERATIONS

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FOREWORD

This guide on Characteristics of U.S. Vessels, Vehicles, and Equipment for Amphibious Operations contains information required for the accomplishment of the assigned mission of the Production Center. This information, not readily available through other media, is also of interest to outside agencies. Comments on this guide are solicited from all recipients, and should be addressed to:

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HERRON N. MAPLES
Brigadier General, U.S. Army
Chief, Production Center

CHARACTERISTICS OF U.S. VESSELS, VEHICLES, AND EQUIPMENT
FOR AMPHIBIOUS OPERATIONS

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CHAPTER 1

INTRODUCTION

1. Purpose

The purpose of this guide is to present in one reference a summary of the characteristics of U.S. equipment designed specifically for amphibious operations. It is to be used by intelligence officers and their staffs for training and reference.

2. Scope

This guide presents those characteristics of landing craft, landing ships, amphibious vehicles, support ships, and auxiliary equipment which are of special interest to environmental intelligence production.

3. Format

a. The vessels, vehicles, and equipment are described by data sheets and illustrations. Chapters II through VI each treat a different category. Types within each category are presented alphabetically; classes within each type are sequenced by date of introduction.

b. Appendixes A, B, and D present pertinent data of the categories in tabular form for quick, comparative reference. Appendix C is an index of Navy classification symbols. The symbols for some items have been changed as needed to reflect changes in their employment and in Navy organization. Appendix E lists the primary sources used.

4. Definition of Terms used in data sheets and appendixes.

Accommodations -- The normal maximum berths provided during wartime.

Crew -- Number of berths allotted for ship's crew.

Other -- Number of other berths allotted for flag officer's staff, helicopter pilots, landing craft crews, troops, passengers, etc.

Total -- Total number of all berths.

Armament -- Represents armament normally expected to be found on or typical of each particular class or model. The small landing craft (less than 100 feet long) are not intended to have any specific weapon; however, they are easily fitted with one or more machine guns and in some instances have had one 20-mm gun. Actual armament of ships is quite variable between individuals of many classes.

Beaching Slope -- The ideal slope (expressed as ratio of vertical to horizontal distances) on which the vessel could beach. Vessels can land on flatter slopes; but the flatter the slope, the farther from shore the vessel beaches. Bows swing away from the beach if sterns ground on too flat bottoms. Sterns swing if the bottom is too steep. Vessel draft also should be considered when determining if a dry-ramp bleaching can be effected.

Boom Capacity -- The maximum lifting capacity of ship's largest crane or boom in long tons (2,240 pounds).

Capacity -- The normal maximum cargo load expressed in weight or space limitations. It includes space used for stowage of vehicles and bale cargo but does not include ship's bulk fuel, or any ship's supplies.

Class -- A group of vessels within a type with like characteristics. In general the name or number of the first vessel of that design to be constructed is used to designate the entire class.

Crew -- Number of personnel allotted for wartime operation of vessel or vehicle. This characteristic is used for vehicles and small landing craft which do not have living accommodations. Also see under Accommodations.

Date of Introduction -- The year the first item was built or was refitted to perform its present mission.

Displacement -- Displacement is a nautical term for the weight, in pounds or long tons, (2,240 pounds) of a vessel. It is equal to the weight of water which would otherwise occupy the space being occupied by a floating vessel. There are several types of displacement, but only the following types have been used in this guide.

Full load -- Displacement when ready for service in every respect, with liquid in machinery at operating levels and full complement of fuel, ammunition, aircraft, stores, provisions, fresh water, cargo, and crew.

Light -- Displacement when ready for service in every respect, including boat complement, permanent ballast, armament, and liquids in machinery at operating levels, but without any items of consumable or variable load such as crew, stores, provisions, fuel, fresh water, ammunition, and aircraft.

Maximum beaching -- Maximum displacement with which a vessel should beach.

Maximum load -- Gross weight of amphibious vehicles when loaded to maximum capacity.

Normal beaching -- Displacement with which a vessel should beach under less than ideal conditions.

Normal load -- Gross weight of vehicles with designed capacity load.

Surfaced -- Maximum displacement of submarines when reserve buoyancy is equal to volume of empty fuel ballast, main ballast, and safety tanks.

Draft -- Vertical distance from lowest projection of vessel or vehicle to waterline. For ships with drafts of feet and inches the next greatest foot is given, i.e. a ship with draft of 13 feet 3 inches is given as 14 feet. Landing craft, vehicles, and landing ship drafts are given in feet and inches for both forward and stern sections.

Draft fwd -- Draft of the part of the craft forward of amidships which would normally touch bottom first when beaching with specified load and in trim. For LST's this draft is computed at the forefoot. For landing craft it is usually computed from a point farther aft. It is not a precise concept because beaching slope must be considered jointly with draft forward to determine where beaching will occur.

Draft aft -- The deepest draft at the stern or aft of amidships. Usually the deepest draft of a vessel.

Endurance -- Distance vessels or vehicles will travel without refueling beginning with full load displacement. Expressed in nautical miles (6,076 feet).

Full load -- See under Displacement.

Length and Beam -- Overall measurements including any fixed projections. For ships these measurements are given to the nearest foot and for other items as precisely as known.

Light -- See under Displacement.

Mission -- The primary function of a vessel or vehicle. Where more than one model or class of a particular type of vessel or vehicles is described, the mission is stated in an introductory statement and is applicable to all of the type.

Maximum beaching -- See under Displacement.

Maximum load -- See under Displacement.

Normal beaching -- See under Displacement.

Normal load -- See under Displacement.

Number -- This total includes ships in the active fleet, Navy reserve fleet, being built, National Defense Reserve Fleet (NDRF), reserve training fleet, MSTS, and vessels loaned to other nations which have not been stricken from Navy lists. For the smaller vessels and vehicles where it is impossible to give an exact or approximate figure, the adjectives, few and many, have been used to indicate the relative number in existence.

Other -- See under Accommodations.

Propulsion -- The fuel type and horsepower of the engine which propels vehicle or craft.

Speed -- Velocity in nautical miles per hour (knots).

Trial Speed -- Speed in calm waters at full load displacement less one-third fuel and feed water, with a clear bottom, and with propellers delivering the designated full power of the propulsion machinery.

Maximum sustained speed -- Greatest speed vessel can make with full load displacement over long periods of time without damaging propulsion machinery.

Economical speed -- Speed at which vessel can obtain the greatest distance per pound of fuel. This is not the slowest speed because of the auxiliary power requirements of a ship which must be met each hour regardless of the speed at which it is travelling.

Surf -- This figure, based on experience, is the maximum, practical, basic height of breakers which can be negotiated by a particular craft or vehicle. Other natural factors such as wind, currents, breaker type, and breaker periods should also be considered.

Surfaced -- See under Displacement.

Total -- See under Accommodations.

5. Reliability and Precision of Data

a. Data in this guide come for the sources listed in Appendix E. Extensive verification, interpretation and adjustment of the sources have been necessary so that information would be equivalent and in similar units of measure throughout this manual. Conflicts between published sources have been reconciled by using unpublished documents; viz., blueprints, work orders, ships' data cards, and test reports of the responsible service.

b. Characteristic data in this guide are those for a specific vessel or vehicle representative of its class or model and should be considered as such. Characteristics, especially performance, may vary between individuals of a class or model. Date of a group of classes are approximate because the classes are only approximately similar and values such as displacement, accommodations, or endurance, likewise must be accepted as not exact and subject to variations between individuals of the class.

CHAPTER II

LANDING CRAFT

Landing craft are those small boats which are designed to transport or aid in transporting troops and equipment from ships to shore. Except for certain control craft which are not designed to land, they are best utilized for landings on sand beaches with gradients of 1 on 30 to 1 on 60. The greatest number of small landing craft, (LCM(6)s, LCVPs, and LCPLs), are carried to the objective area in AKA's and APA's while the larger types (LCM(8)s and LCUs) are carried by LSD's and LPD's. The following types are included in this chapter:

Landing Craft, Mechanized, Mark III
Landing Craft, Mechanized, Mark VI
Landing Craft, Mechanized, Mark VIII
Landing Craft, Personnel, Large, Mark I
Landing Craft, Personnel, Large, Mark IV
Landing Craft, Utility (501 Class)
Landing Craft, Utility (1466 and 1608 Classes)
Landing Craft, Utility (1610 Class)
Landing Craft, Vehicle, Personnel

LCM(3)

Landing Craft, Mechanized, Mark III

MISSION: To land medium weight vehicles, equipment, or troops

DATE OF INTRODUCTION: 1941

NUMBER: See Remarks

LENGTH AND BEAM: 50.1 by 14 ft

	Full load	Light
DRAFT fwd:	3 ft 6 in	1 ft 2 in
DRAFT aft:	4 ft 6 in	2 ft 1 in
DISPLACEMENT:	112,075 lb	50,700 lb
CAPACITY:	60,000 lb or 100 troops	
BEACHING SLOPE:	1:50	
PROPULSION:	Two 225-hp diesel engines twin propellers	
SPEED:	9.5 knots (full load)	
ENDURANCE:	130 n mi (full load)	
ARMAMENT:	None	
SURF:	8 ft	
CREW:	5	
SERVICE:	Navy	

REMARKS: Originally designed to land 30-ton tanks; this class of LCM is restricted to landing vehicles, cargo, or troops because at the present time no 30-ton tanks are in use. These craft have largely been replaced by LCM(6)'s and LCM(8)'s. These craft can carry 100 combat equipped troops, but for positive planning purposes only 60 troops per craft should be used.

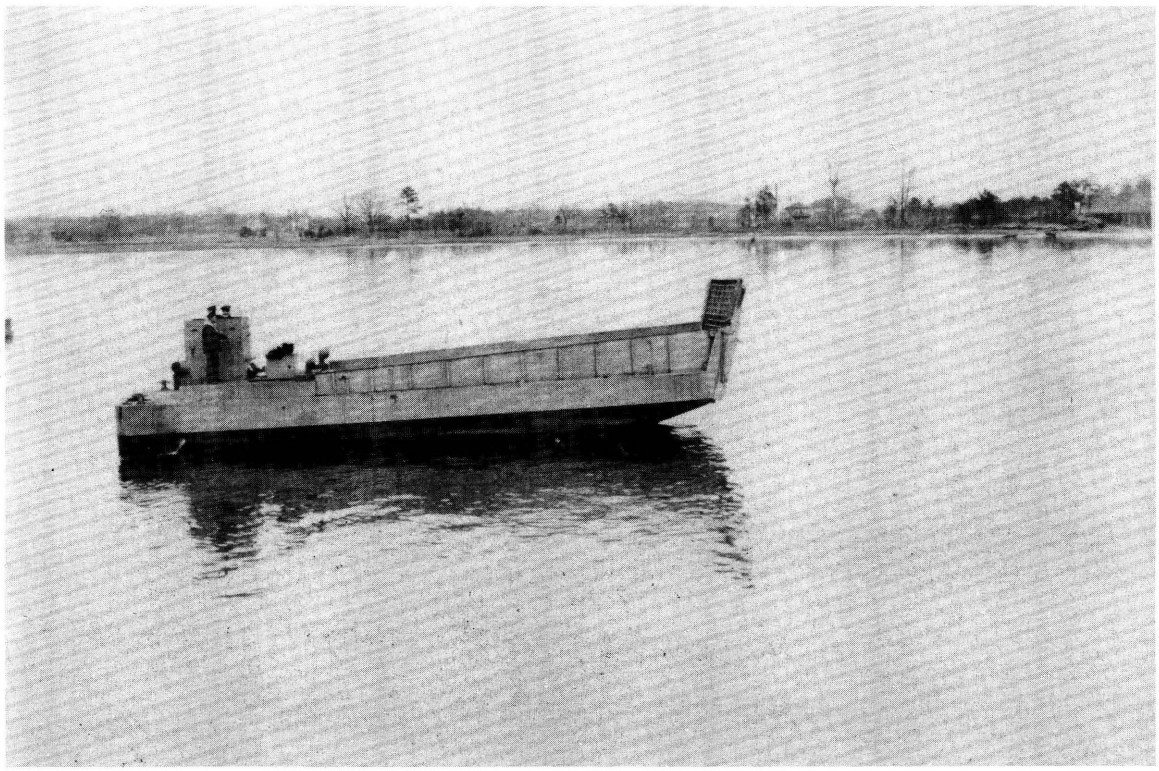


Figure 1.

Landing Craft, Mechanized, Mark III.

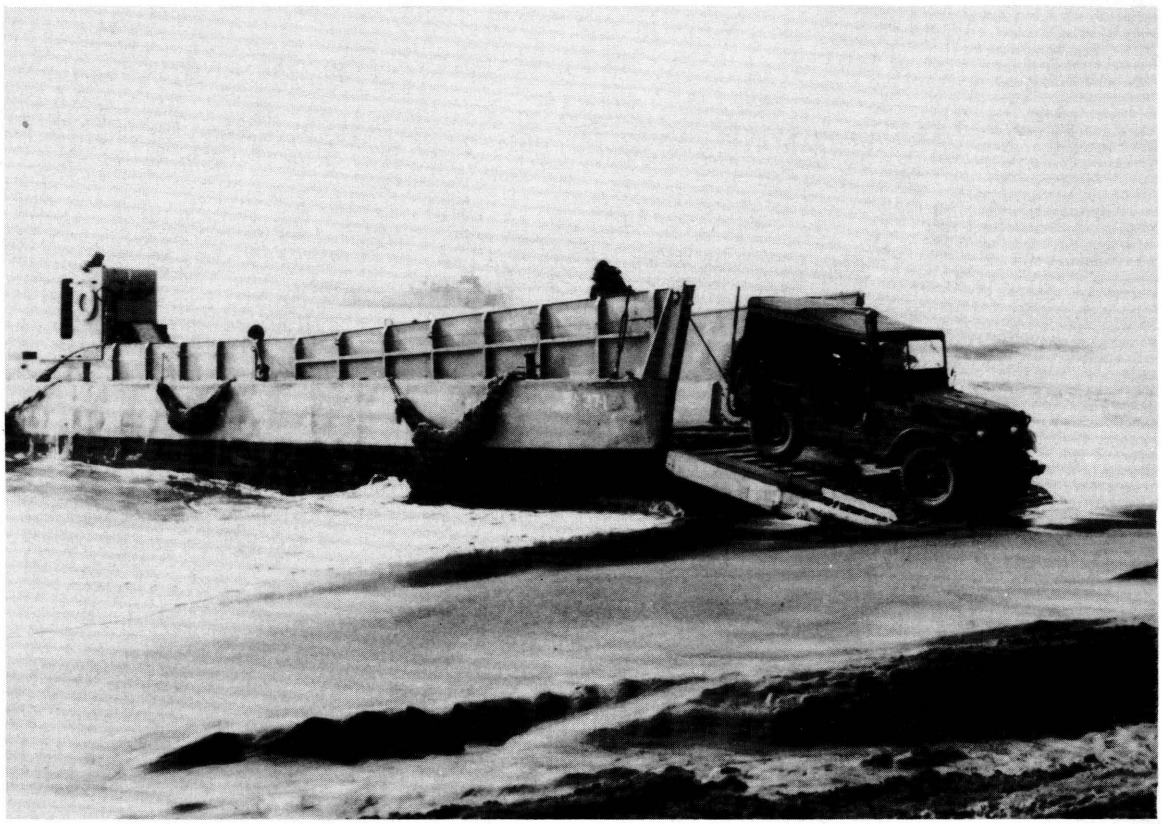


Figure 2.

Landing Craft, Mechanized, Mark VI. Note LCU (501 Class) in background.

LCM(6)

Landing Craft, Mechanized, Mark VI

MISSION: To land vehicles, equipment, or troops

DATE OF INTRODUCTION: 1944

NUMBER: Many. This is the largest group of LCM's.

LENGTH AND BEAM: 56.1 by 14 ft

	Full load	Light
DRAFT fwd:	3 ft	1 ft 2 in
DRAFT aft:	4 ft	2 ft 4 in
DISPLACEMENT:	124,000 lb	52,000 lb

CAPACITY: 68,000 lb or 120 troops

BEACHING SLOPE: 1:50

PROPULSION: Two 225-hp diesel engines
twin propellers

SPEED: 9 knots (full load)

ENDURANCE: 160 n mi (light)
130 n mi (full load)

ARMAMENT: None

SURF: 6 ft

CREW: 5

SERVICE: Army; Navy

REMARKS: These vessels were first constructed by adding a 6-foot section amidships to LCM(3)'s. Up to 120 combat troops can be carried by these craft, but for positive planning purposes only 80 troops per craft should be used.

LCM(8)

Landing Craft, Mechanized, Mark VIII

MISSION: To land vehicles, equipment, or troops

DATE OF INTRODUCTION: 1954

NUMBER: Few

LENGTH AND BEAM: 73.6 by 21 ft

	Full load	Light
DRAFT fwd:	3 ft 10 in	2 ft
DRAFT aft:	5 ft 2 in	3 ft 6 in
DISPLACEMENT:	254,000 lb	121,746 lb
CAPACITY:	120,000 lb or 200 troops	
BEACHING SLOPE:	1:50	
PROPULSION:	Two 325-hp diesel engines twin propellers	
SPEED:	9 knots (full load) 12 knots (light)	
ENDURANCE:	190 n mi (full load)	
ARMAMENT:	None	
SURF:	7 ft	
CREW:	5	
SERVICE:	Army; Navy	

REMARKS: These craft were designed to land one medium tank, but are capable of landing any piece of equipment organic to an infantry division. Although LCM(8)'s are more versatile than LCM(6)'s in the equipment which they can land, LCM(8)'s can be carried only on AKA's and APA's having 60-ton booms and beams greater than 74 ft.

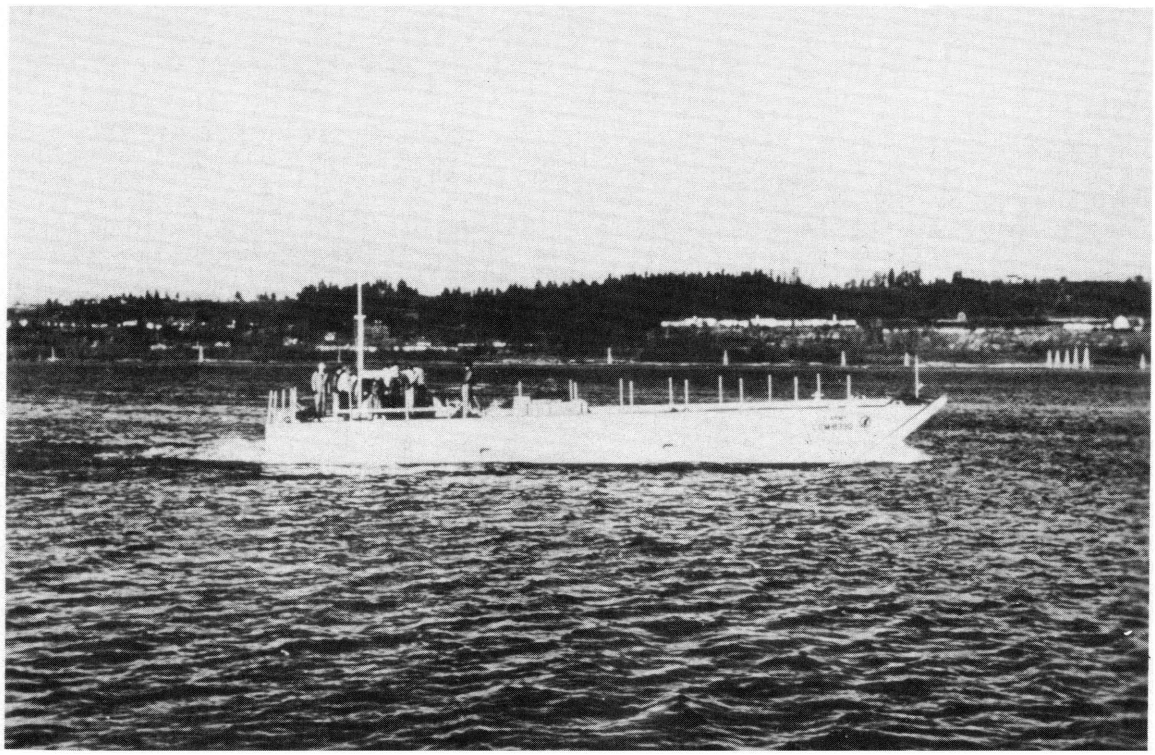


Figure 3.

Landing Craft, Mechanized, Mark VIII.

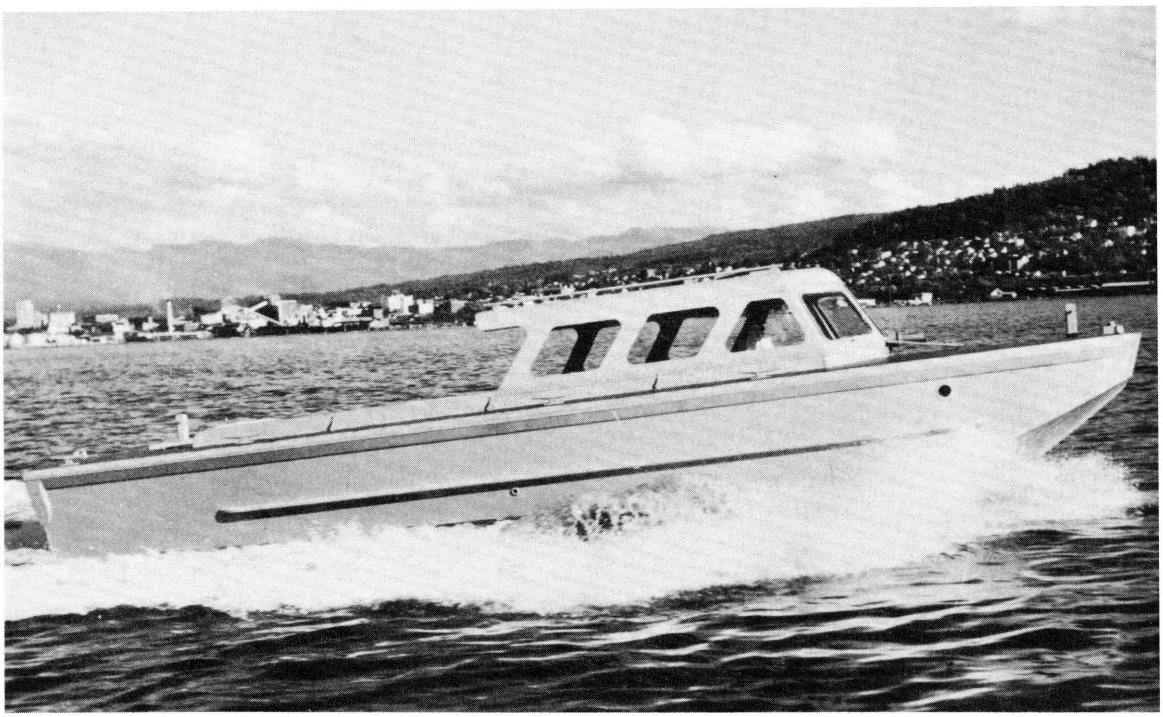


Figure 4.

Landing Craft, Personnel, Large, Mark I. Note cabin which is not found on all of these craft.

LCPL(1)

Landing Craft, Personnel, Large, Mark I

MISSION: To guide and control early waves of an amphibious assault

DATE OF INTRODUCTION: 1941

NUMBER: Many

LENGTH AND BEAM: 35.9 by 10.8 ft

	Full load	Light
DRAFT fwd:	2 ft 10 in	2 ft
DRAFT aft:	3 ft 6 in	2 ft 8 in
DISPLACEMENT:	24,250 lb	14,950 lb
CAPACITY:	8,100 lb or 36 troops	
BEACHING SLOPE:	1:100	
PROPULSION:	One 225-hp diesel engine single propeller	
SPEED:	10 knots (full load)	
ENDURANCE:	110 n mi (full load)	
ARMAMENT:	None	
SURF:	6 ft	
CREW:	3	
SERVICE:	Navy	

REMARKS: Although originally designed to land troops and cargo, these craft, in general, have been replaced by LCVP's and LCM's for these missions. They are mostly used as waveguide-control boats. They are also used as salvage and personnel boats. They are being replaced by LCPL(4)'s for waveguide control.

LCPL(4)

Landing Craft, Personnel, Large, Mark IV

MISSION: To guide and control early waves of an amphibious assault

DATE OF INTRODUCTION: 1958

NUMBER: Few

LENGTH AND BEAM: 35.8 by 11.2 ft

	Full load	Light
DRAFT fwd:	2 ft 6 in	unk
DRAFT aft:	3 ft 6 in	unk
DISPLACEMENT:	19,320 lb	15,000 lb
CAPACITY:	See Remarks	
BEACHING SLOPE:	Not designed to beach	
PROPULSION:	One 300-hp diesel engine single propeller	
SPEED:	19 knots (full load)	
ENDURANCE:	140 n mi (full load)	
ARMAMENT:	None	
SURF:	Not designed to negotiate surf	
CREW:	1 Officer 7 Enlisted	
SERVICE:	Navy	

REMARKS: This is a modified LCPL design on which a convential bow and cabin have been installed. Communications equipment includes radar. They may be used as personnel boats; with crew of three can carry 20 passengers. These craft are being introduced to replace LCPL(1)'s as waveguide control boats.

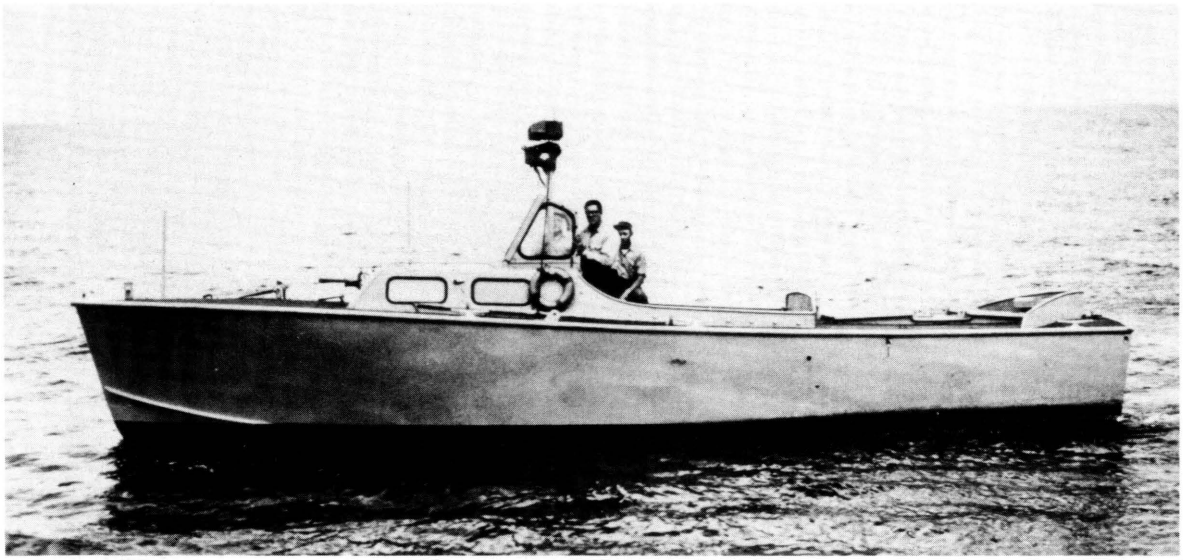


Figure 5.

Landing Craft, Personnel, Large, Mark IV.

Figure 6.

Landing Craft, Personnel, Ramped.

LCP(R)

Landing Craft, Personnel, Ramped

MISSION: To land and retrieve personnel during amphibious operations

DATE OF INTRODUCTION: 1942

NUMBER: See Remarks

LENGTH AND BEAM: 36 by 10.8 ft

	Full load	Light
DRAFT fwd:	2 ft 6 in	1 ft 10 in
DRAFT aft:	3 ft 6 in	2 ft 6 in
DISPLACEMENT:	24,100 lb	13,500 lb
CAPACITY:	8,100 lb or 36 troops	
BEACHING SLOPE:	1:40	
PROPULSION:	One 225-hp diesel engine single propeller	
SPEED:	10 knots (full load)	
ENDURANCE:	110 n mi at 10 knots	
ARMAMENT:	None	
SURF:	6 ft	
CREW:	3	
SERVICE:	Navy	

REMARKS: These craft have largely been replaced by LCVP's for landing troops and are now primarily used as underwater-demolition-team, salvage, waveguide control, and personnel boats.

LCU

Landing Craft, Utility

This type of craft may be used to land any type of cargo normally transported across the beach during amphibious operations. It is capable of landing heavy tanks, yet its shallow draft permits it to land on beaches with gradients as flat as 1:100. The 501 and 1610 Classes have their superstructures on the starboard side, permitting them to be stern-loaded from ramps or to serve as causeways from LST's to beach. Although the LCU can be transported to the objective area completely assembled in the well deck of an LSD or as a deckload on an LST, it can also be sectionalized into three parts for transporting on other vessels.

The LCU was developed during WW II as a landing craft for landing tanks and first designated Landing Craft Tank (LCT). Because of their versatility in carrying different types of loads the name was changed to Landing Ship Utility (LSTS). After nine months the symbol was changed to LSU. The present name, Landing Craft Utility (LCU) was adopted in 1952.

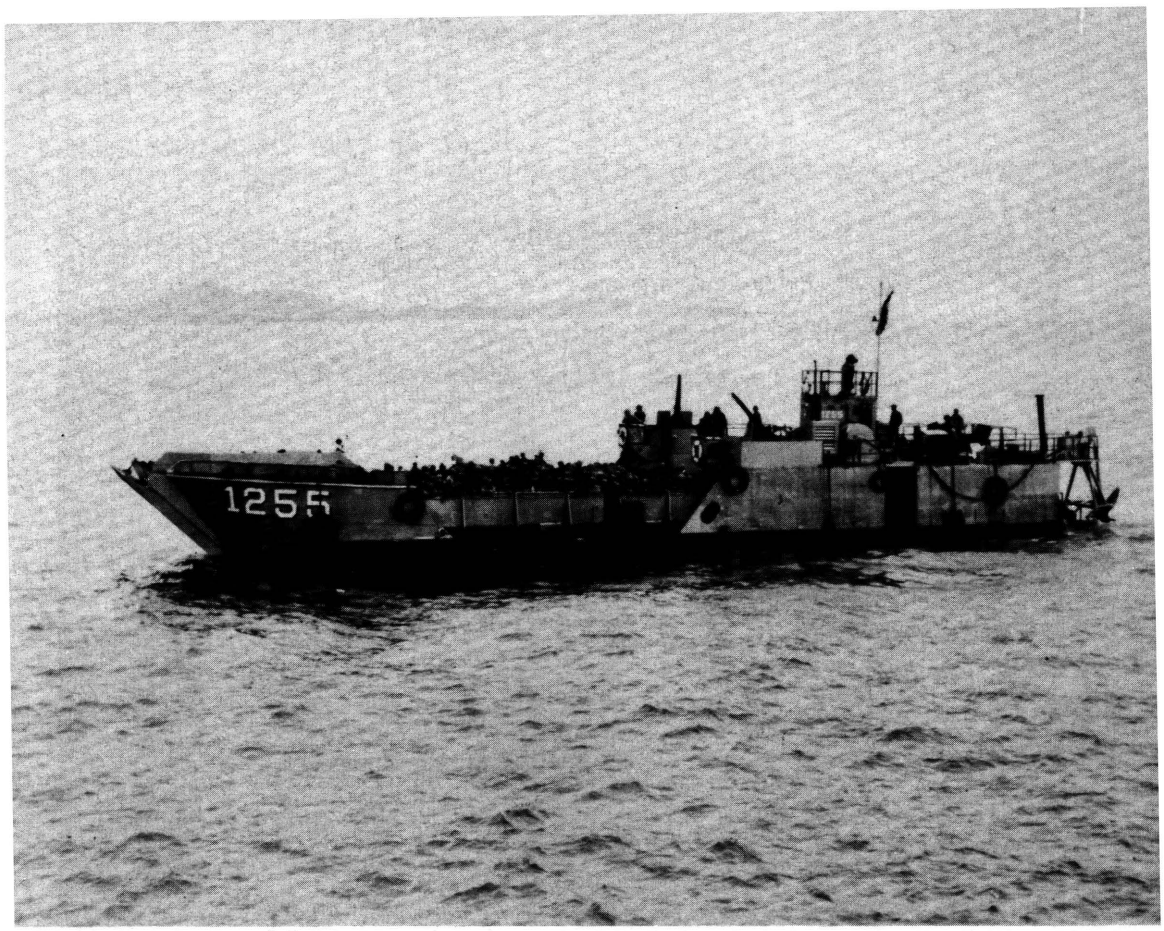


Figure 7.

Landing Craft, Utility (501 Class). Note stern anchor which is used to retract from beach.

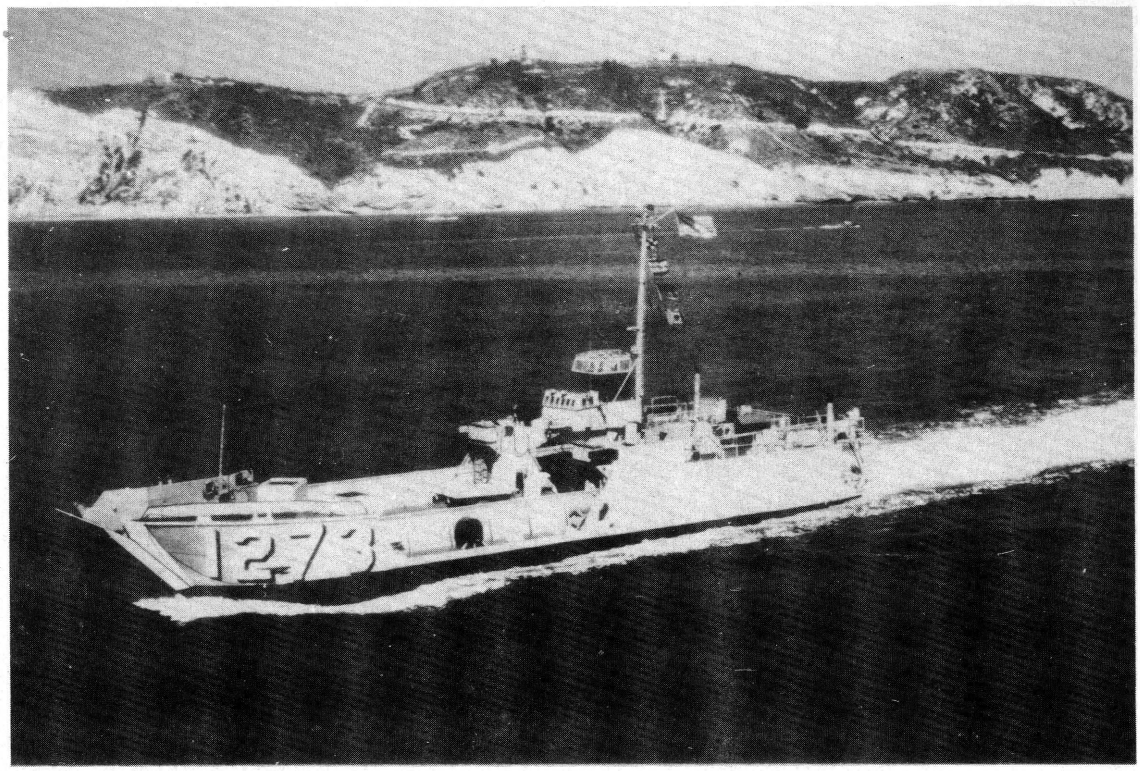


Figure 8.

Landing Craft, Utility (501 Class) which has been arcticized. Note difference in superstructure between this LCU and the one shown in Fig. 7.

LCU (501 Class)

Landing Craft, Utility, 501 Class

MISSION: To land heavy vehicles, tanks, or equipment

DATE OF INTRODUCTION: 1943

NUMBER: 72

LENGTH AND BEAM: 119 by 32 ft

	Full load	Light
DRAFT fwd:	3 ft 7 in	6 in
DRAFT aft:	4 ft	3 ft 3 in
DISPLACEMENT:	309 tons	143 tons

CAPACITY: 150 tons or 750 troops

BEACHING SLOPE: 1:50

PROPULSION: Three 225-hp diesel engines
Three propellers

SPEED: 5 knots (full load)
8 knots (light)

ENDURANCE: 1,200 n mi (full load)

ARMAMENT: Two single 20 mm

SURF: 7 ft

ACCOMMODATIONS:	Crew	Other	Total
Officers	0	0	0
Enlisted	13	0	13

SERVICE: Army; Navy

REMARKS: Six craft in this class have been refitted for arctic operations. Superstructure on starboard side permits stern loading. Typical load in three M-48 tanks.

LCU (1466 and 1608 Classes)

Landing Craft, Utility, 1466 and 1608 Classes

MISSION: To land heavy vehicles, tanks, or equipment

DATE OF INTRODUCTION: 1954 (1466 Class); 1957 (1608 Class)

NUMBER: 32 (1466 Class); 2 (1608 Class)

LENGTH AND BEAM: 118.7 by 34.7 ft

	Full load	Light
DRAFT fwd:	3 ft	4 in
DRAFT aft:	5 ft 2 in	3 ft 1 in
DISPLACEMENT:	395 tons	196 tons
CAPACITY:	170 tons	

BEACHING SLOPE: 1:50

PROPULSION: Three 225-hp diesel engines
Three propellers

SPEED: 5 knots (1466 Class full load)
10 knots (1466 Class light)

ENDURANCE: 1,250 n mi (full load)

ARMAMENT: Two single 40 mm

SURF: 7 ft

ACCOMMODATIONS:	Crew	Other	Total
Officers	0	0	0
Enlisted	14	0	14

SERVICE: Army; Navy

REMARKS: LCU's 1608 and 1609 were designated as the 1608 Class because of an improved propulsion system which slightly increased their speed. Other characteristics and performances are identical. These craft have the superstructures built across the stern which eliminates the stern-loading features of the 501 Class.

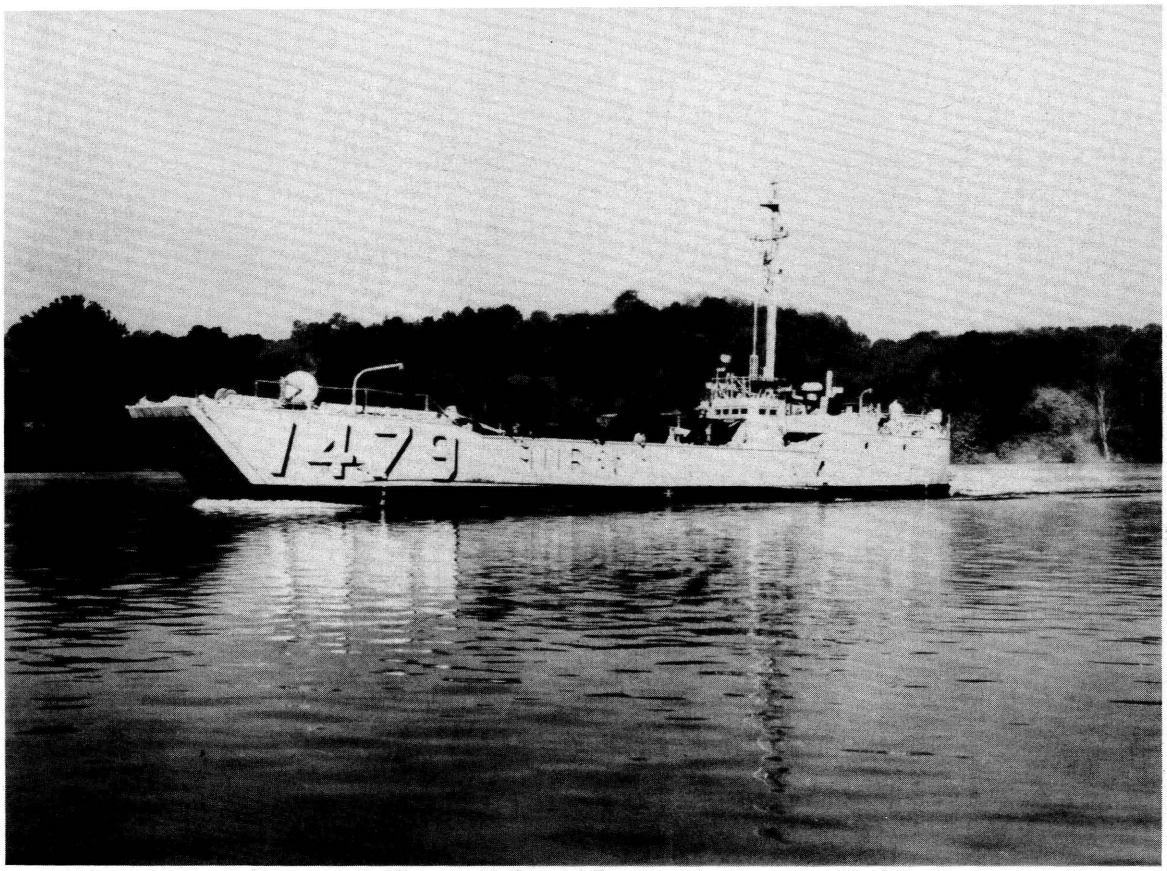


Figure 9.

Landing Craft, Utility (1466 Class).

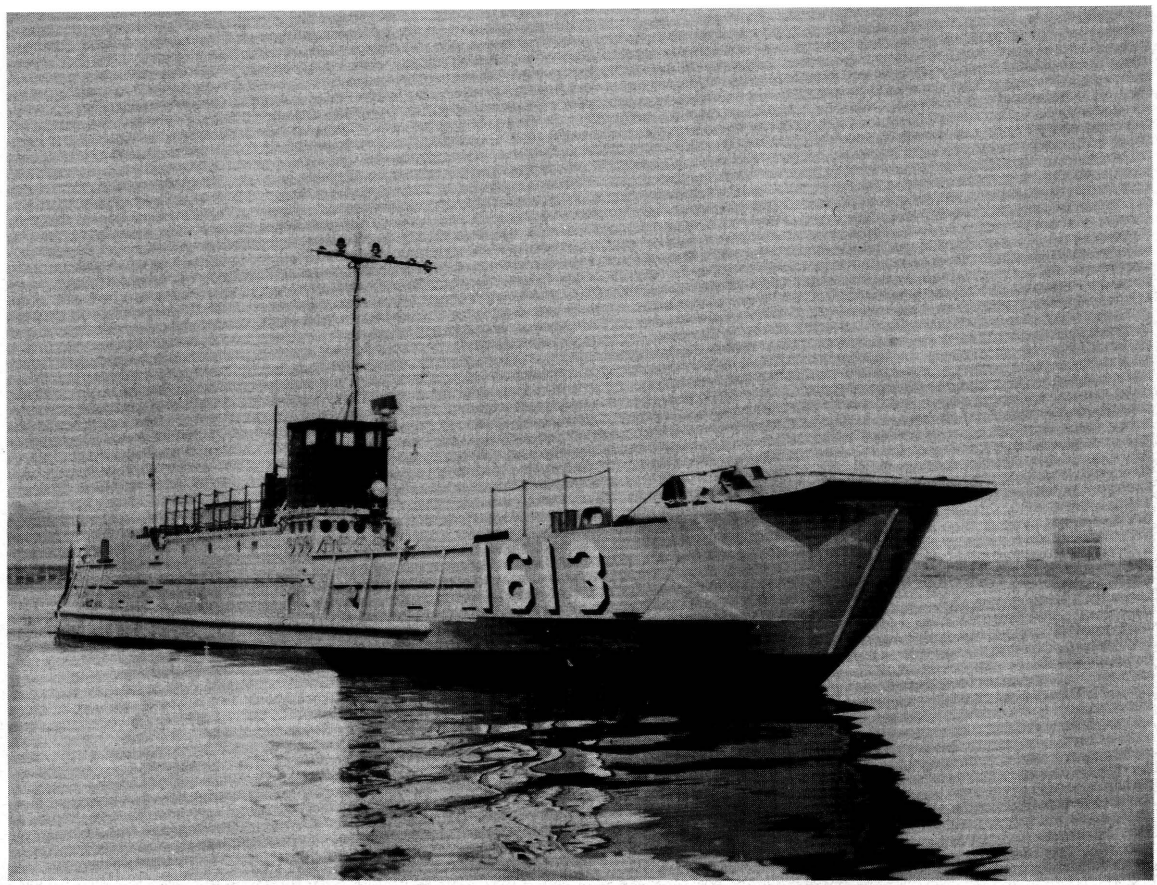


Figure 10.

Landing Craft, Utility (1610 Class). The articulated ramp shown above has since been replaced with a solid ramp.

LCU (1610 Class)

Landing Craft, Utility, 1610 Class

MISSION: To land heavy vehicles, tanks, or equipment

DATE OF INTRODUCTION: 1958

NUMBER: 15

LENGTH AND BEAM: 135.2 by 29 ft

	Full load	Light
DRAFT fwd:	3 ft 6 in	unk
DRAFT aft:	6 ft 10 in	unk
DISPLACEMENT:	375 tons	172 tons
CAPACITY:	190 tons	

BEACHING SLOPE: 1:50

PROPULSION: Four 500-hp diesel engines
twin propellers

SPEED: 8 knots (full load)

ENDURANCE: 1,200 n mi (full load)

ARMAMENT: unk

SURF: 7 ft

ACCOMMODATIONS:	Crew	Other	Total
Officers	0	0	0
Enlisted	14	0	14

SERVICE: Navy

REMARKS: The prototype vessels of this class had an articulated ramp as shown on Figure 10. These are being replaced with conventional ramps. Superstructure on starboard side permits stern loading. LCU's 1620 and 1622 have modified propulsion systems, but other characteristics are similar to the other vessels in this class.

LCVP

Landing Craft, Vehicle, Personnel

MISSION: To land and retrieve personnel, cargo, and light vehicles during amphibious operations

DATE OF INTRODUCTION: 1941

NUMBER: Many

LENGTH AND BEAM: 35.7 by 10.5 ft

	Full load	Light
DRAFT fwd:	2 ft 2 in	unk
DRAFT aft:	3 ft 5 in	unk
DISPLACEMENT:	20,600 lb	16,400 lb

CAPACITY: 8,100 lb or 36 troops

BEACHING SLOPE: 1:40

PROPULSION: One 225-hp diesel engine single propeller

SPEED: 9 knots (full load)

ENDURANCE: 110 n mi (full load)

ARMAMENT: None

SURF: 5 ft

CREW: 3

SERVICE: Navy

REMARKS: These craft may be transported to the objective area nested on deck or hung at davits. They form the largest part of the normal boat complement of AKA's and APA's.

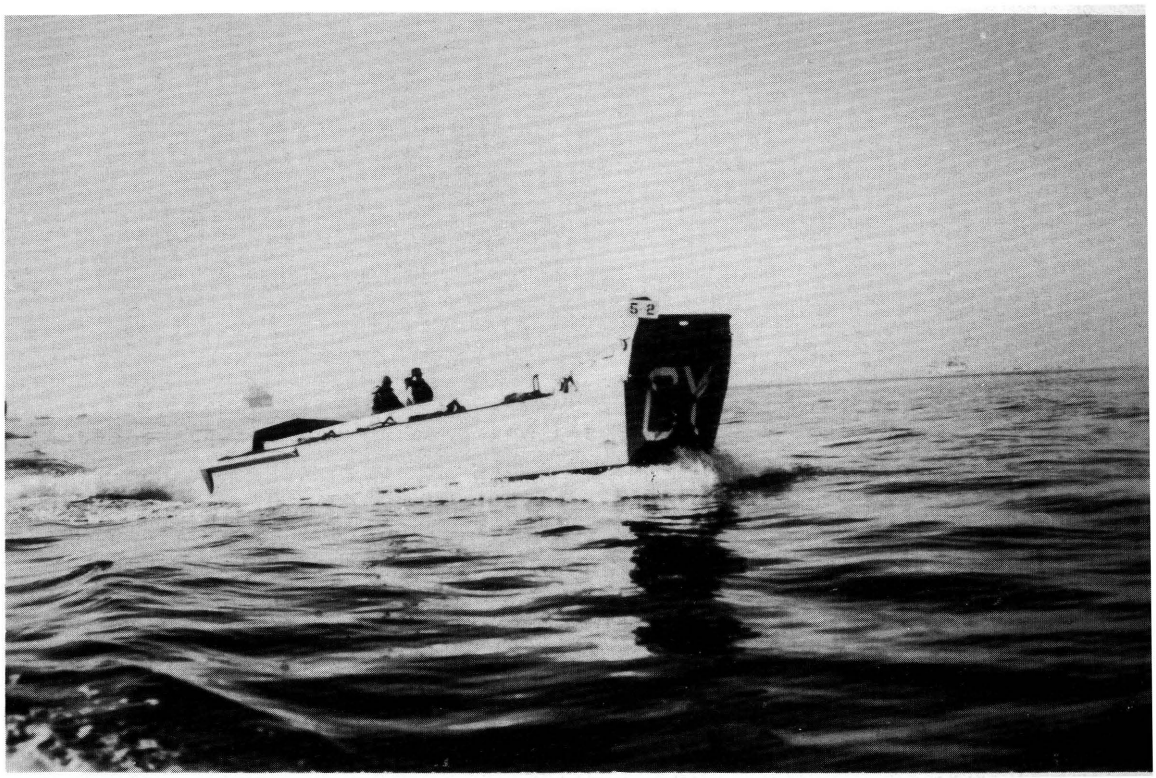


Figure 11.

Landing Craft, Vehicle, Personnel. APA's in background.

CHAPTER III

LANDING SHIPS

Landing ships, except for LSD's, have, as their name implies, the ability to land and retract from certain types of shores (ideally sand beaches with gradients of 1 on 40 to 1 on 60 in the nearshore zone). They differ from Landing craft in that they are able to travel long distances to objective areas under their own power. Their ability to transport and land large numbers of vehicles makes them the "backbone" of the amphibious task force. The following types are included in this chapter:

Beach Discharge Lighter
Landing Ship, Medium
Landing Ship, Medium, Rocket (401 and 501 Classes)
Landing Ship, Tank (1, 491, and 542 Classes)
Landing Ship, Tank (1153 Class)
Landing Ship, Tank (1156 Class)
Landing Ship, Tank (1171 Class)

BDL

Beach Discharge Lighter

MISSION: To transport large quantities of wheeled and tracked vehicles from ship to beach

DATE OF INTRODUCTION: 1957

NUMBER: 1

LENGTH AND BEAM: 338 ft by 65 ft

	Full load	Normal beaching	Light
DRAFT fwd:	7 ft 8 in	4 ft	3 ft
DRAFT aft:	13 ft 8 in	10 ft	5 ft 8 in
DISPLACEMENT:	4,040 tons	2,340 tons	1,549 tons
CAPACITY:	2,300 tons	600 tons	NA

BEACHING SLOPE: 1:50

SPEED: 10 knots (normal beaching load)
8.5 knots (full load)

ENDURANCE: 4,800 n mi at 8.5 knots

ARMAMENT: None at present
will probably carry 2 twin 40-mm

ACCOMMODATIONS:	Crew	Other	Total
Officers	3	0	3
Enlisted	37	204	241

SERVICE: Army

REMARKS: This type of vessel is constructed on a ferryboat-type hull to provide maximum deck area for stowage of vehicles and at the same time be loaded to full tonnage capacity. The BDL is designed to be used with the Comet Class AK which is equipped with a stern ramp. This ramp allows vehicles to be transferred to the BDL under their own power. A unique feature of the BDL is a plunger at the bow which pushes downward to help retract the vessel from the beach. Propulsion and steering is provided by two vertical axis, variable pitch propellers.

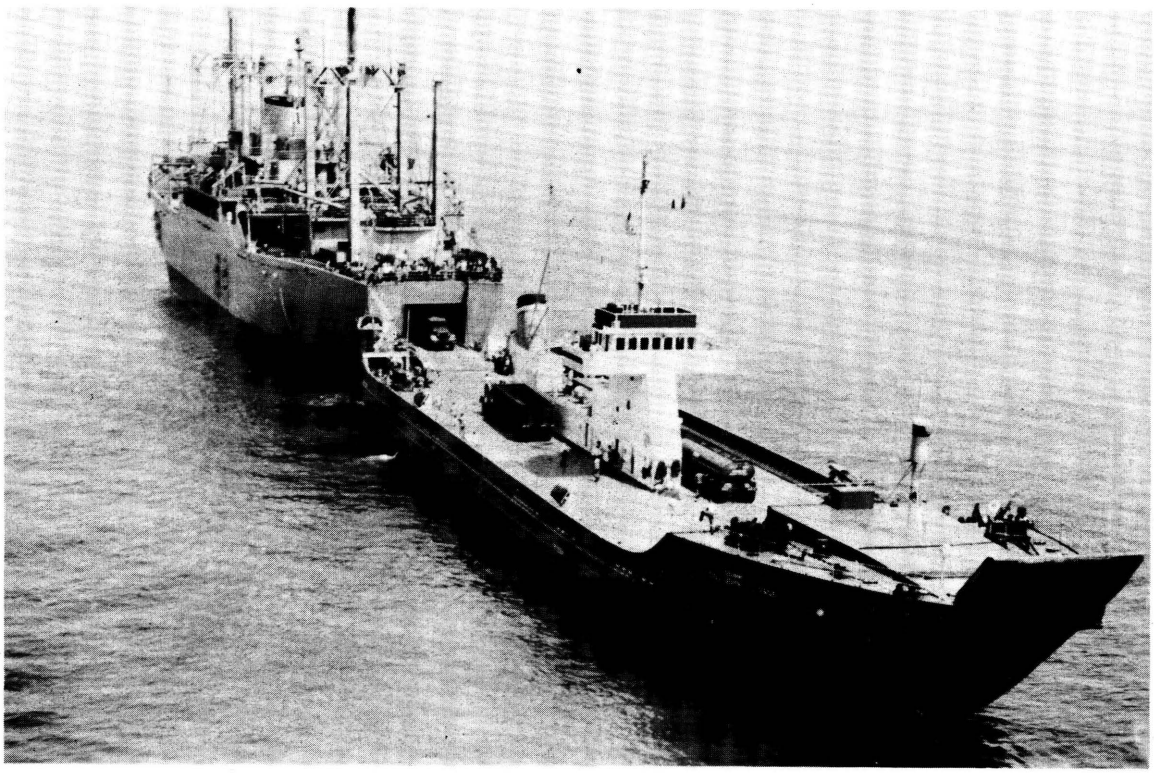


Figure 12.

Beach Discharge Lighter John U.D. Page in foreground, cargo ship U.S.N.S. Comet in background.

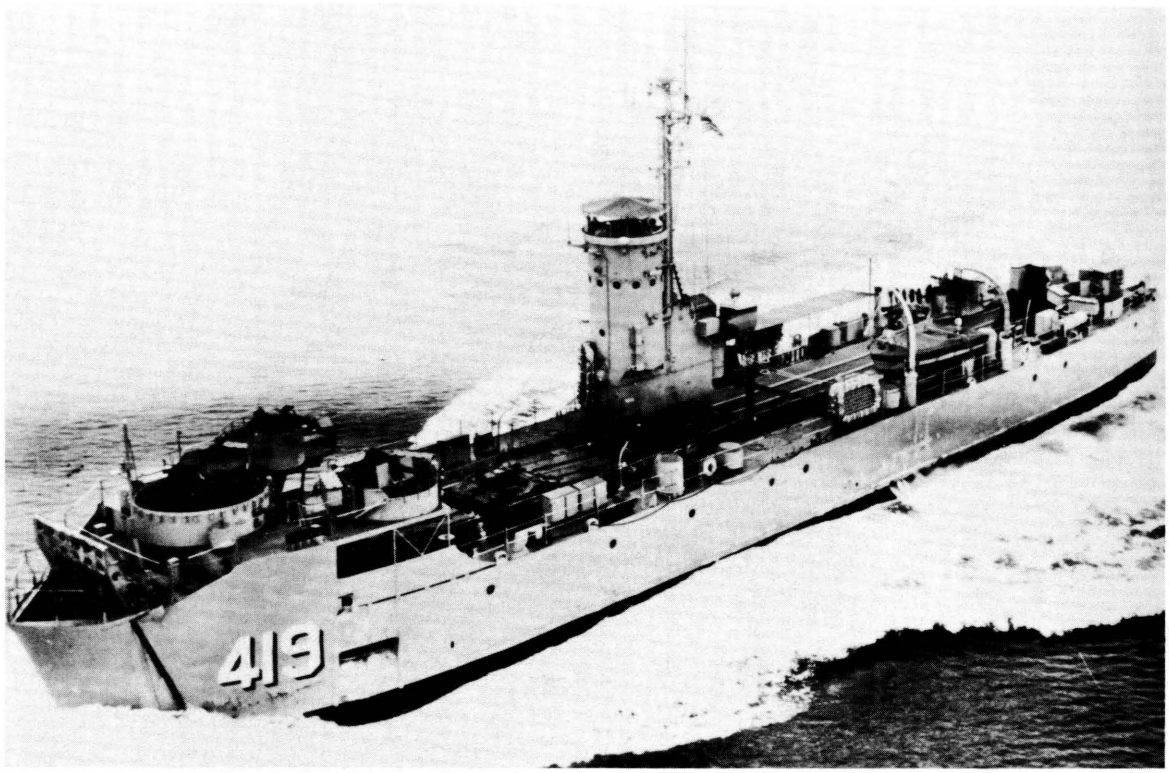


Figure 13.

Landing Ship, Medium.

LSM

Landing Ship, Medium

MISSION: To transport and land amphibious vehicles, other combat vehicles, equipment, and supplies in amphibious assault

DATE OF INTRODUCTION: 1943

NUMBER: 13

LENGTH AND BEAM: 204 by 35 ft

	Full load	Normal beaching	Light
DRAFT fwd:	6 ft 4 in	3 ft 6 in	2 ft 6 in
DRAFT aft:	8 ft 3 in	7 ft	5 ft 6 in
DISPLACEMENT:	1,042 tons	743 tons	560 tons
CAPACITY:	446 tons	147 tons	NA

BEACHING SLOPE: 1:58

SPEED: 13 knots (trial)
12.8 knots (max sustained)
6.7 knots (economical)

ENDURANCE: 3,828 n mi at 12.8 knots
7,985 n mi at 6.7 knots

ARMAMENT: One twin 40-mm

ACCOMMODATIONS:	Crew	Other	Total
Officers	4	3	7
Enlisted	55	46	101

SERVICE: Navy

REMARKS: Typical load for these vessels is nine DUKW's and attendant personnel. Hundreds of these vessels were built during WW II, but are now being rapidly stricken from Navy lists. Many of those still in commission are loaned to foreign countries.

LSMR (401 and 501 Classes)

Landing Ship, Medium, Rocket, 401 and 501 Classes

MISSION: To provide fire support for landing forces in amphibious assault

CLASSES: 401 and 501

DATE OF INTRODUCTION: 1945

NUMBER: 4 (401 Class); 8 (501 Class)

LENGTH AND BEAM: 204 (401 Class), 206 (501 Class) by 35 ft

	Full load	Light
DRAFT fwd:	7 ft	5 ft 3 in
DRAFT aft:	9 ft 8 in	8 ft 5 in
DISPLACEMENT:	1,289 tons	1,025 tons

BEACHING SLOPE: 1:58

SPEED: 13 knots (trial)
12.7 knots (max sustained)
7 knots (economical)

ENDURANCE: 3,408 n mi at 12.7 knots
4,475 n mi at 7 knots

ARMAMENT: Ten 5-in rocket launchers
One 5"/38 cal
Two twin 40-mm

ACCOMMODATIONS:	Crew	Other	Total
Officers	7	0	7
Enlisted	134	0	134

SERVICE: Navy

REMARKS: These vessels were converted from LSM's to create a shallow-draft vessel for "close-in" neutralization of shore defenses prior to the assault and as a fire-support ship for troops ashore. Each ship carries 5,000, 5-in rockets which can be fired at a sustained rate of 300 per minute at ranges up to 10,000 yards. The 401 and 501 Classes have the same characteristics except for the length as shown on the above data table. These craft have the same mission as the IFS; however, they still retain their ability to beach.

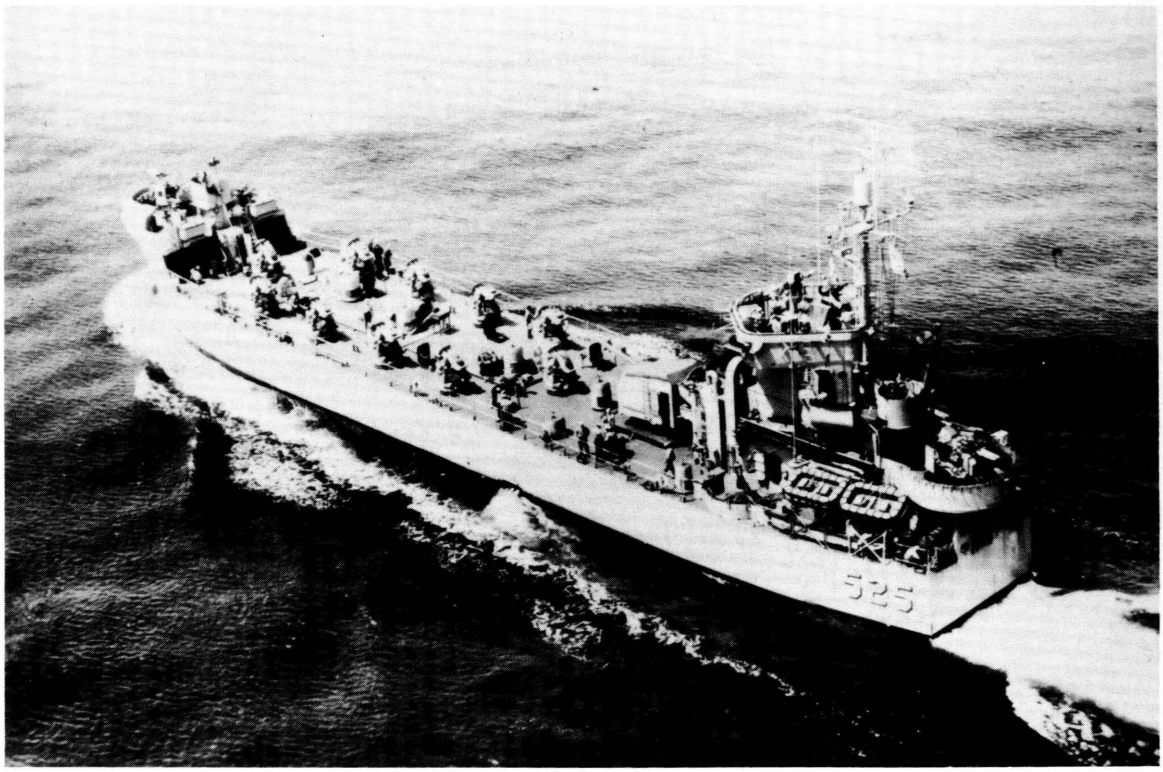


Figure 14.

Landing Ship, Medium, Rocket (501 Class).

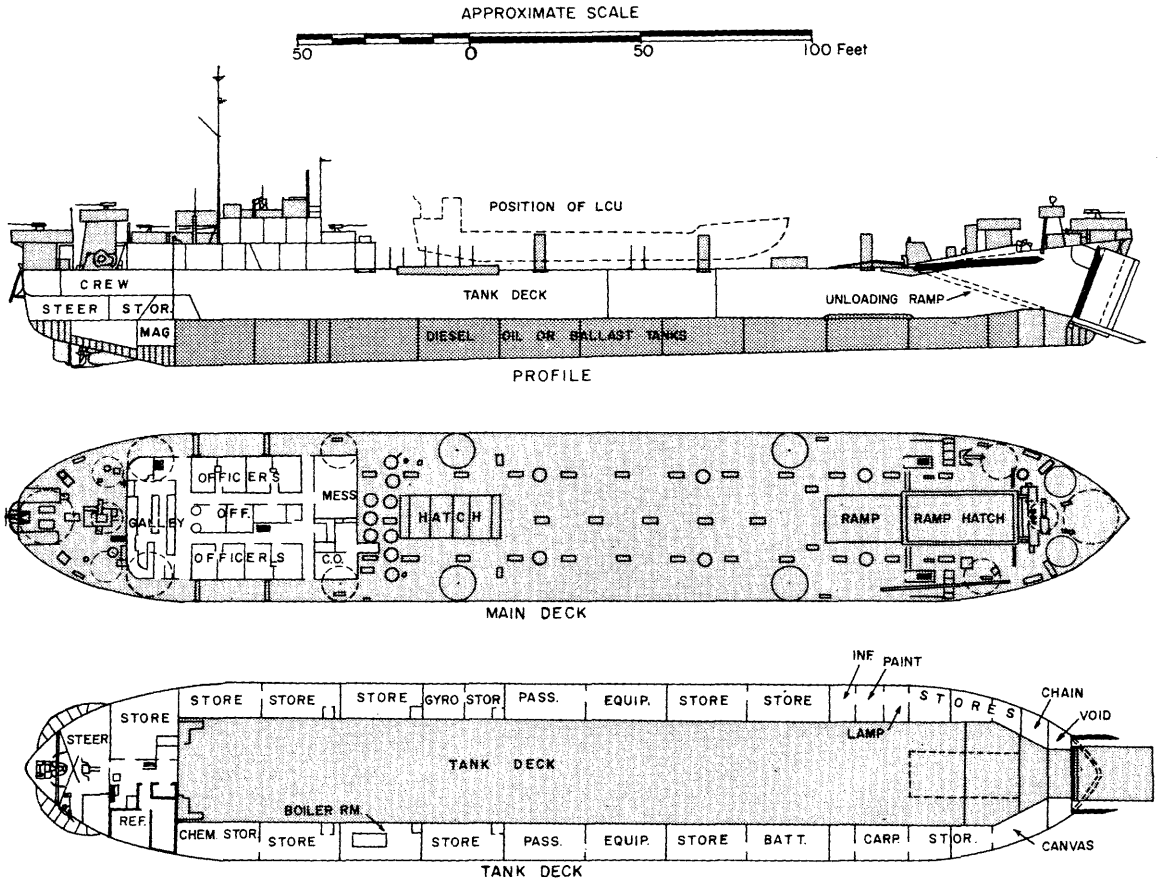


Figure 15.

Diagrams of Landing Ship, Tank (542 Class).

LST

Landing Ship, Tank

The primary function of the LST's is to transport and land tanks or other vehicles on a beach. Because of their versatility and size they may be used to transport almost any type of cargo. With modifications they have been used as aircraft carriers, refueling vessels, general cargo ships, mine squadron flagships, and for various other functions.

The normal beaching load is 445 to 500 tons, depending on the class. The maximum beaching load limit of 803 to 900 tons (depending on class) requires the ship to beach in deeper water and may require a causeway for unloading cargo. For this purpose a 60-section pontoon causeway unit may be lashed to each side of the ship and carried to the objective area. Vessels of this type may also be unloaded without beaching, in which case the cargo may be increased by approximately 40 percent.

When a heavy deckload is to be carried, such as an LCU, shoring must be installed which decreases the capacity of the tank deck.

LST's 1 through 512 were built with an elevator between tank deck and main deck capable of 30-ton loads. A ramp instead of an elevator was placed in LST's subsequent to construction of LST 512, except LST 531 which again had an elevator.

There are six classes of LST's. The first three of these classes in general differ only in the arrangement of their internal machinery. Therefore, they have been grouped together for descriptive purposes.

LST (1, 491, and 542 Classes)

Landing Ship, Tank, 1, 491, and 542 Classes

DATE OF INTRODUCTION: 1942 (1 Class); 1943 (491 Class); 1944 (542 Class)

NUMBER: 15 (1 Class); 9 (491 Class); 68 (542 Class)

LENGTH AND BEAM: 328 by 50 ft

	Full load	Max Beaching	Normal Beaching
DRAFT fwd:	8 ft 3 in	5 ft 3 in	4 ft 4 in
DRAFT aft:	14 ft 1 in	10 ft 2 in	10 ft
DISPLACEMENT:	4,080 tons	2,868 tons	2,422 tons
CAPACITY:	1,212 tons	803 tons	446 tons

BEACHING SLOPE: 1:50

SPEED: 12 knots (trial)
10.8 knots (max sustained)
8 knots (economical)

ENDURANCE: 19,800 n mi at 10.8 knots
39,000 n mi at 8 knots

ARMAMENT: Two twin 40-mm
Four single 40-mm

BOOM CAPACITY: 5 tons

ACCOMMODATIONS:	Crew	Other	Total
Officers	7	10	17
Enlisted	106	127	233

SERVICE: Navy

REMARKS: These classes of LST's have 4,500 square feet of space in tank deck and 4,400 square feet on main deck available for cargo. However, usable space on main deck is reduced by approximately 1,200 square feet when pontoons are side carried.

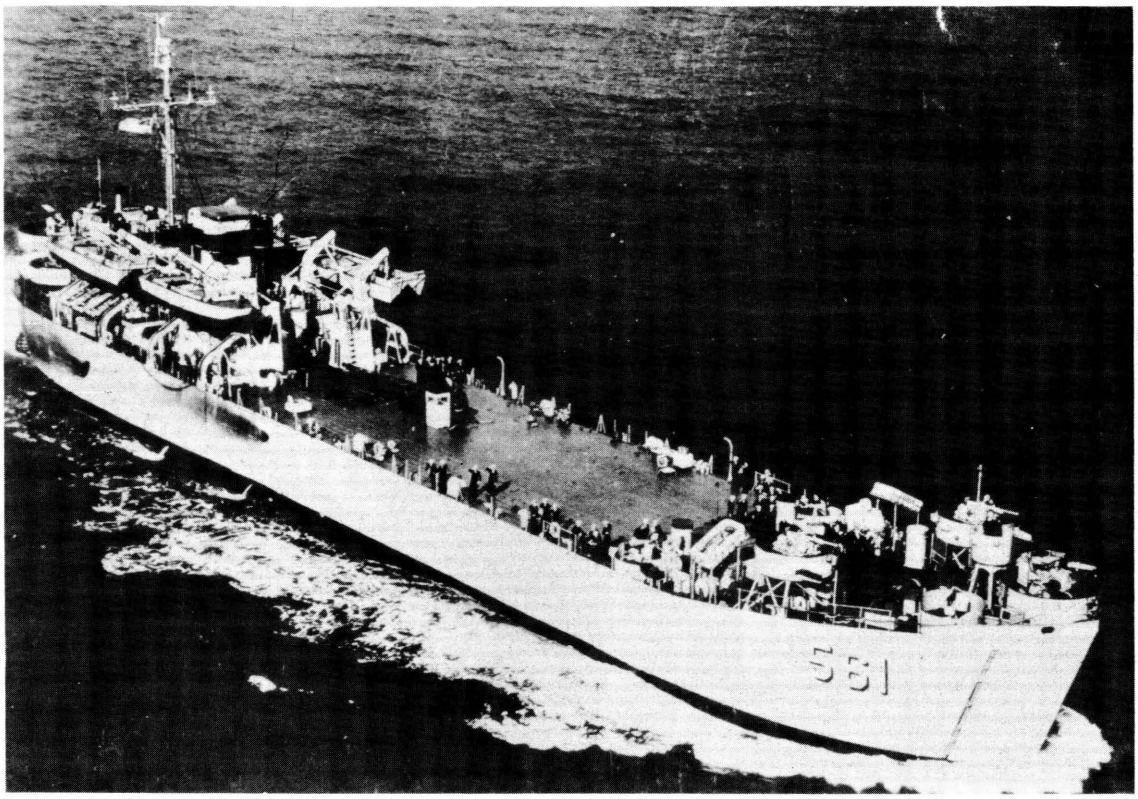


Figure 16.

Landing Ship, Tank (542 Class).

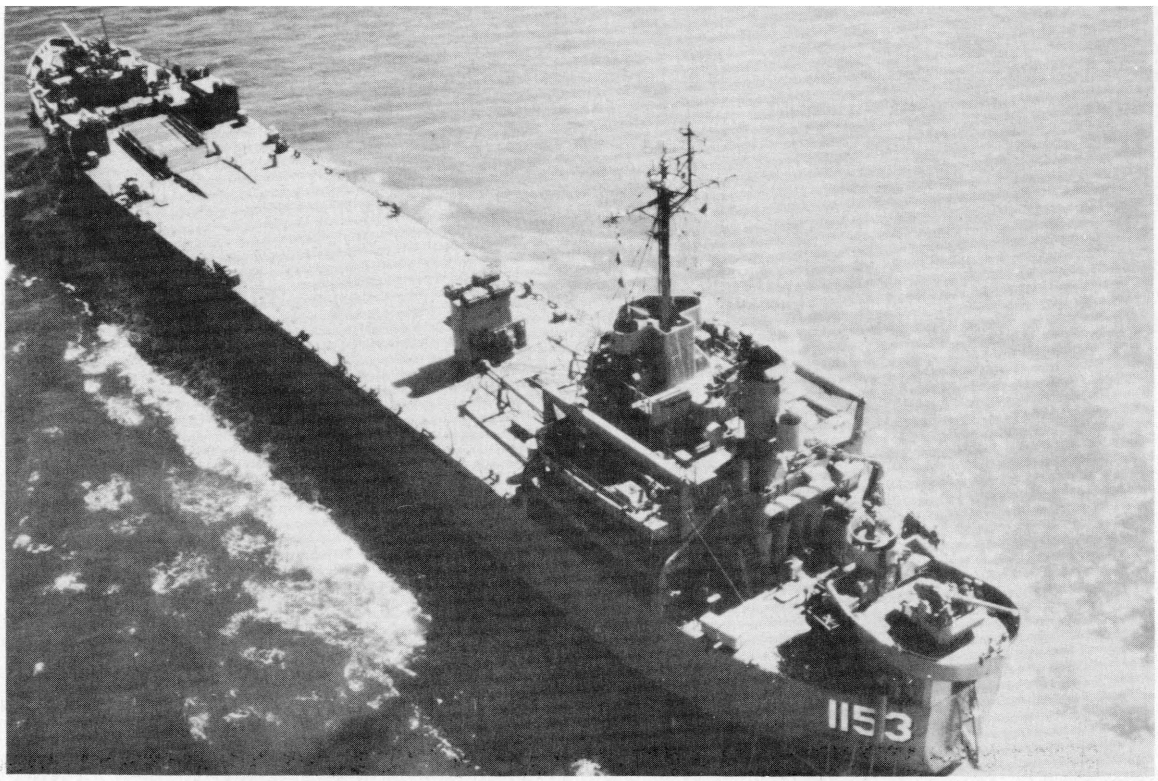


Figure 17.

Landing Ship, Tank (1153 Class). Note LCVP's hanging at davits.

LST (1153 Class)

Landing Ship, Tank, 1153 Class

DATE OF INTRODUCTION: 1947

NUMBER: 1

LENGTH AND BEAM: 382 by 54 ft

	Full load	Max beaching	Normal beaching
DRAFT fwd:	9 ft 6 in	3 ft 11 in	3 ft 4 in
DRAFT aft:	16 ft 3 in	11 ft 11 in	11 ft 3 in
DISPLACEMENT:	6,006	4,749 tons	4,492 tons
CAPACITY:	2,060 tons	803 tons	446 tons

BEACHING SLOPE: 1:50

SPEED: 14 knots (trial)
13 knots (max sustained)
10 knots (economical)

ENDURANCE: 5,900 n mi at 13 knots
7,800 n mi at 10 knots

ARMAMENT: Two single 5"/38 cal

BOOM CAPACITY: 7 tons

ACCOMMODATIONS:	Crew	Other	Total
Officers	10	17	27
Enlisted	170	155	325

SERVICE: Navy

REMARKS: The only class of LST's powered by steam. The LST 1153 in this class has been modified to carry and pump ashore 226,000 gallons of gasoline and 70,000 gallons of diesel fuel. The only other vessel in this class (LST 1154) has been converted to an AVB.

LST (1156 Class)

Landing Ship, Tank, 1156 Class

DATE OF INTRODUCTION: 1952

NUMBER: 15

LENGTH AND BEAM: 384 by 56 ft

	Full load	Max beaching	Normal beaching
DRAFT fwd:	8 ft 3 in	4 ft 11 in	3 ft 6 in
DRAFT aft:	15 ft 10 in	10 ft 8 in	11 ft
DISPLACEMENT:	5,800 tons	5,208 tons	4,851 tons
CAPACITY:	1,395 tons	803 tons	446 tons

BEACHING SLOPE: 1:50

SPEED: 14 knots (trial)
13.5 knots (max sustained)
11.5 knots (economical)

ENDURANCE: 8,500 n mi at 13.5 knots
16,000 n mi at 11.5 knots

ARMAMENT: Three twin 3"/50 cal

BOOM CAPACITY: 7 tons

ACCOMMODATIONS:	Crew	Other	Total
Officers	9	15	24
Enlisted	153	377	530

SERVICE: Navy

REMARKS: This was the first class of LST's to be equipped with a turntable to facilitate vehicle stowage. It is located in the forward part of the tank deck and can handle 75-ton loads. This class of LST has 7,500 square feet of space in tank deck and 6,500 square feet on main deck available for cargo. However, usable space on main deck is reduced by approximately 3,600 square feet when pontoons are side carried.

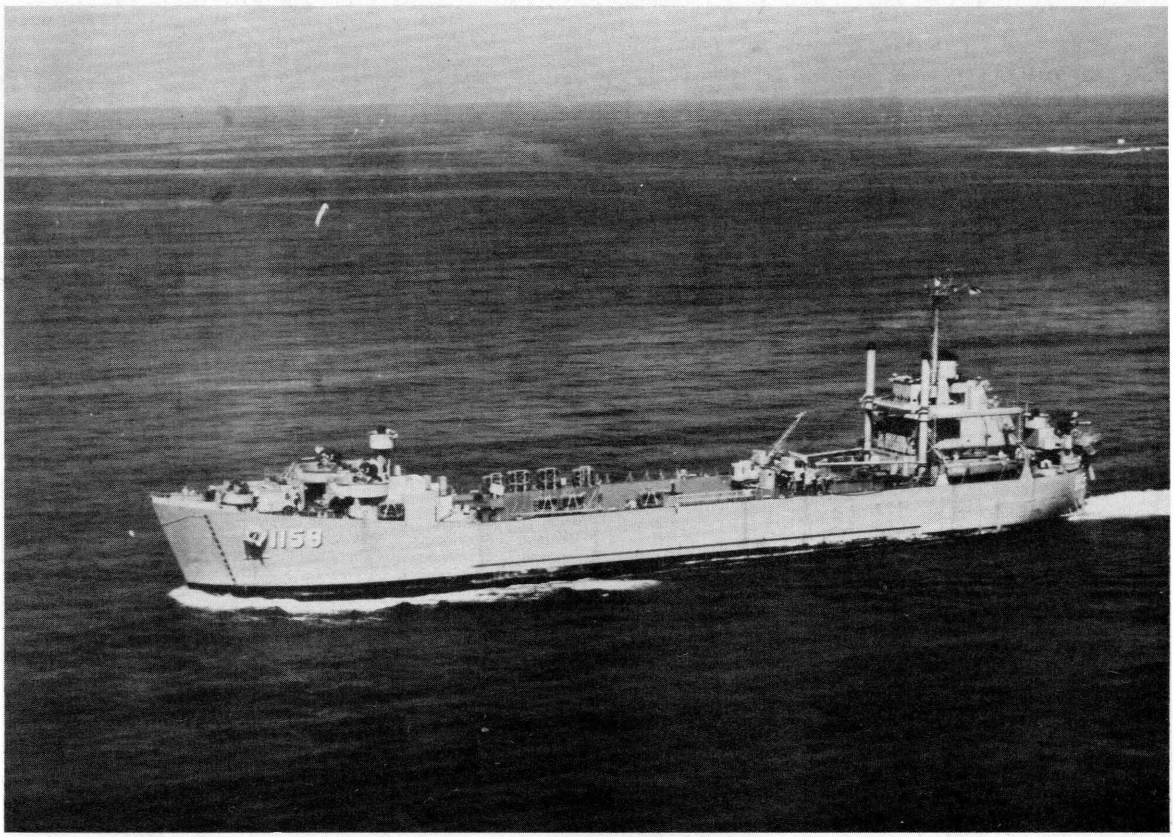


Figure 18.

Landing Ship, Tank (1156 Class). Crane on main deck is not an integral part of vessel. Note ridge on hull near waterline which helps support pontoons when carried side loaded.

Figure 19.

Landing Ship, Tank (1171 Class).

LST (1171 Class)

Landing Ship, Tank, 1171 Class

DATE OF INTRODUCTION: 1957

NUMBER: 7

LENGTH AND BEAM: 442 by 62 ft

	Full load	Max beaching	Normal beaching
DRAFT fwd:	9 ft 8 in	8 ft	4 ft 9 in
DRAFT aft:	16 ft 1 in	15 ft 2 in	13 ft
DISPLACEMENT:	7,494 tons	6,544 tons	6,144 tons
CAPACITY:	1,850 tons	900 tons	500 tons

BEACHING SLOPE: 1:50

SPEED: 17 knots (trial)
15 knots (max sustained)
12 knots (economical)

ENDURANCE: 6,480 n mi at 15 knots
12,000 n mi at 12 knots

ARMAMENT: Three twin 3"/50 cal

BOOM CAPACITY: 10 tons

ACCOMMODATIONS:	Crew	Other	Total
Officers	13	22	35
Enlisted	157	427	584

SERVICE: Navy

REMARKS: Two of the vessels in this class have been refitted to transport and pump ashore 250,000 gallons of bulk fuel. This class of LST has 9,800 square feet of space in tank deck and 7,686 square feet on main deck available for cargo. However, usable space on main deck is reduced by approximately 1,450 square feet when pontoons are side carried.

CHAPTER IV

AMPHIBIOUS VEHICLES

The single characteristic common to all amphibious vehicles is their ability to operate on both land and water. They are divided into three general groups. The first group (BARC's, DUKW's, and LARC's) were developed by the Transportation Corps and primarily designed for transporting supplies and equipment from ship to dumps on or close behind the shore. The second group (LVT's) were developed by the Navy for the Marine Corps primarily as personnel carriers in assault landings. The third group includes those vehicles able to cross rivers and other small bodies of water, but which are insufficiently seaworthy for use in ocean operations. Only the first two groups have been described in this chapter and include the following:

Barge, Amphibious, Resupply, Cargo
Truck, Amphibious, 2 1/2-ton, 6x6
Lighter, Amphibious, Resupply, Cargo (5-ton)
Lighter, Amphibious, Resupply, Cargo (15-ton)
Landing Vehicle, Tracked, Howitzer, Mark VI
Landing Vehicle, Tracked, Personnel, Mark V
Landing Vehicle, Tracked, Personnel, Mark VI

BARC

Barge, Amphibious, Resupply, Cargo

MISSION: To transport cargo and vehicles from ship to beach or a short distance inland to transfer point

DATE OF INTRODUCTION: 1952 (1st prototype)

NUMBER: 24 in use; 5 under construction

DIMENSIONS: 62.5 by 26.6 by 19.4 ft

	Max load	Normal load	Light
DRAFT fwd:	9 ft 3 in	7 ft 11 in	6 ft
DRAFT aft:	10 ft	8 ft 8 in	7 ft 2 in
DISPLACEMENT:	183 tons	143 tons	87.1 tons
CAPACITY:	93.5 tons or 200 troops	53.5 tons or 125 troops	NA

	Land	Water
SPEED:	13 knots	6 knots
ENDURANCE:	190 n mi	91 n mi

CREW: 3

PROPULSION: Each of the 4 wheels are powered by a 165-hp diesel engine; the twin propellers are each powered by 2 of these engines while waterborne

ARMAMENT: None

GROUND CLEARANCE: 1 ft 4 in (normal load)

SURF: 10 ft

SERVICE: Army

REMARKS: Prototype model had operator's cab in front. This was later moved to stern to reduce hazards of going through surf. They have been successfully bow- and side-launched from the decks of LST's. Under optimum conditions the BARC can ascend a 40% grade.

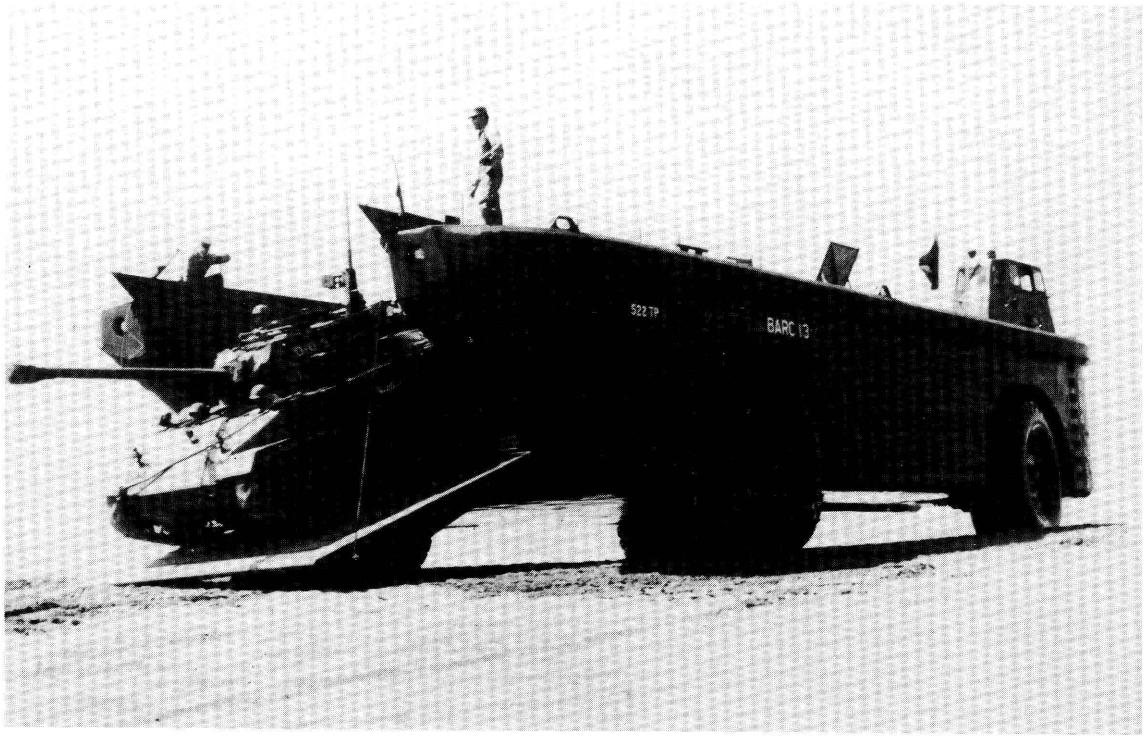


Figure 20.

Barge, Amphibious, Resupply, Cargo.

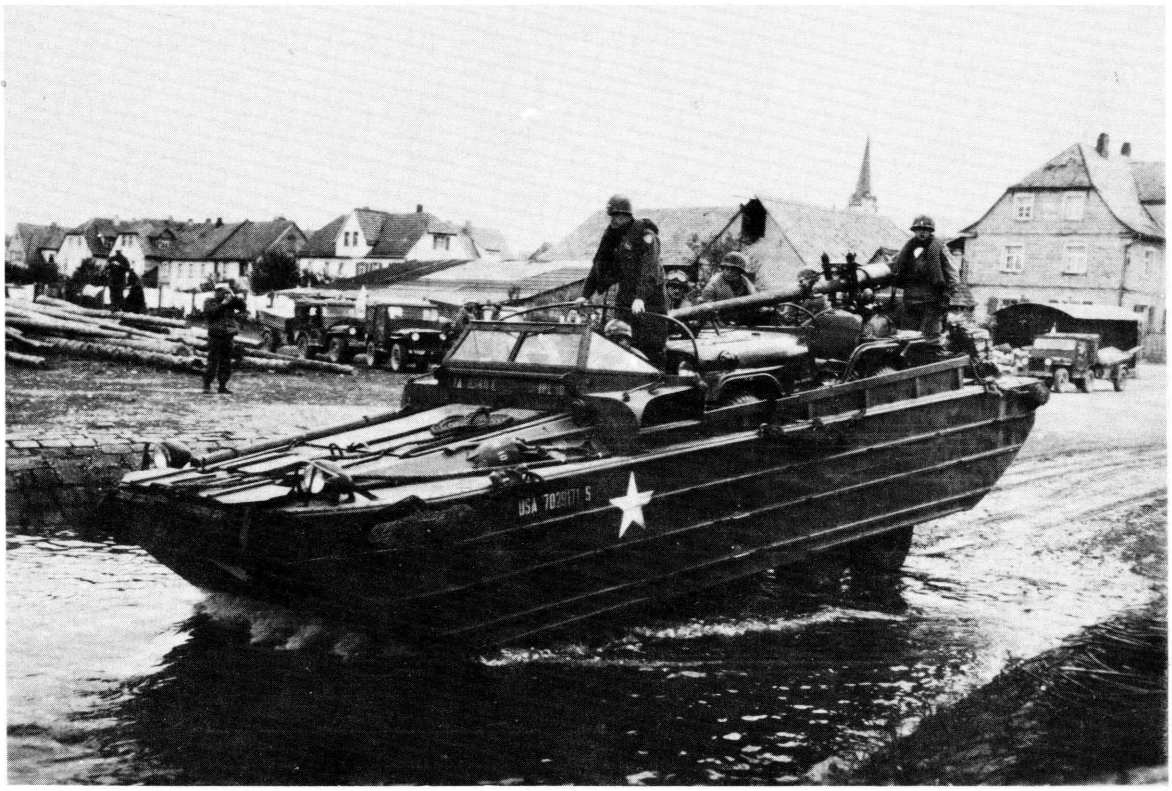


Figure 21.

Truck, Amphibious, 2 1/2-ton, 6x6.

DUKW

Truck, Amphibious 2 1/2-Ton, 6 x 6

MISSION: To transport troops and light cargo from ship to beach or a short distance inland to transfer points

DATE OF INTRODUCTION: 1942

NUMBER: Many

DIMENSIONS: 31 by 8.2 by 7.7 ft

	Max load	Normal load	Light
DRAFT fwd:	unk	3 ft 6 in	unk
DRAFT aft:	unk	4 ft 3 in	unk
DISPLACEMENT:	22,600 lb	18,600 lb	13,000 lb
CAPACITY:	9,000 lb	5,000 lb or 25 troops	NA

	Land	Water
SPEED:	43.5 knots	5.5 knots
ENDURANCE:	240 n mi	33 n mi

CREW: 2

PROPULSION: One 100-hp gasoline engine; 6-wheel drive on land; single propeller; steered in water by front wheels and small rudder

ARMAMENT: Usually none, but may be equipped with one .30 or .50 cal MG

GROUND CLEARANCE: 11 1/2 in

SURF: 5 ft

SERVICE: Army; Navy; Marine Corps

REMARKS: Tire pressure is controlled by driver from cab. This enables vehicles to perform well in sand. Winch at stern can be used in conjunction with an A-frame for unloading cargo. Under optimum conditions the DUKW can ascend a 60% grade. Two of these vehicles can be connected with a special frame to make a catamaran for transporting vehicles. Dimensions for height given above are with canopy and windshield folded, with these up, height is 8.8 feet. They are presently being replaced by LARC-5's.

LARC-5

Lighter, Amphibious, Resupply, Cargo (5-Ton)

MISSION: To transport cargo in over-the-shore operations from ship to inland transfer points

DATE OF INTRODUCTION: 1960

NUMBER: Few

DIMENSIONS: 35 by 10 by 10.2 ft

	Normal load	Light
DRAFT fwd:	4 ft 1 in	3 ft 3 in
DRAFT aft:	4 ft 3 in	3 ft 9 in
DISPLACEMENT:	31,000 lb	20,180 lb
CAPACITY:	10,000 lb	NA

	Land	Water
SPEED:	26 knots	7.8 knots
ENDURANCE:	200 n mi	104 n mi

CREW: 2

PROPULSION: One 300-hp diesel engine; single propeller

ARMAMENT: None

GROUND CLEARANCE: 1 ft 3 in

SURF: Has successfully negotiated 9 ft surf; base surf height unknown

SERVICE: Army

REMARKS: This vehicle was designed to replace the DUKW as an amphibious carrier of light cargo. Vessel has strengthened aluminum hull allowing it to enter water at 9 knots. Side panels can be removed enabling forklift to unload palletized cargo. Under optimum conditions the LARC-5 can ascent a 60% grade.

Figure 22.

Lighter, Amphibious, Resupply, Cargo (5-ton), being unloaded with side panels removed.

Figure 23.

Lighter, Amphibious, Resupply, Cargo (15-ton).

LARC-15

Lighter, Amphibious, Resupply, Cargo (15-Ton)

MISSION: To transport cargo in over-the-shore operations from ship to inland transfer points

DATE OF INTRODUCTION: See remarks

NUMBER: Few

DIMENSIONS: 45 by 14.5 by 18.8 ft

	Normal load	Light
DRAFT fwd:	5 ft	4.9 ft
DRAFT aft:	5 ft 6 in	5 ft 1 in
DISPLACEMENT:	75,200 lb	42,100 lb
CAPACITY:	30,000 lb	NA

	Land	Water
SPEED:	25 knots	8.2 knots
ENDURANCE:	200 n mi	104 n mi

CREW: 2

PROPULSION: Two 300-hp diesel engines; single propeller

ARMAMENT: None

GROUND CLEARANCE: 1 ft 4.5 in

SURF: Has successfully negotiated 12-ft surf; base surf height unknown

SERVICE: Army

REMARKS: These aluminum-hulled vehicles have a bow ramp for discharging vehicles and removable side panels for unloading palletized cargo. They have been adopted as standard, but only a few prototype models have been built. Under optimum conditions the LARC-15 can ascend a 50% grade. The cab on this vehicle is forward while on land and aft when waterborne. This is possible because dual controls allow operator to face either direction.

LVTH(6)

Landing Vehicle, Tracked, Howitzer, Mark VI

MISSION: To provide fire support for initial amphibious assault forces

DATE OF INTRODUCTION: 1953

NUMBER: See Remarks

DIMENSIONS: 29.7 by 11.7 by 10.5 ft

	Max load	Normal load	Light
DRAFT fwd:	NA	5 ft 10 in	unk
DRAFT aft:	NA	6 ft 3 in	unk
DISPLACEMENT:	86,600 lb	84,200 lb	74,210 lb

CAPACITY: With max load vehicle cannot operate in water; carries only ammunition-100 RDS of 105-mm (water), 151 RDS (land), and 2,000 RDS .30 cal; and 1,050 RDS of .50 cal

	Land	Water
SPEED:	26 knots	5.9 knots
ENDURANCE:	165 n mi	50 n mi

CREW: 6

PROPULSION: One 810-hp gasoline engine; tracks provide propulsion while waterborne

ARMAMENT: One 105-mm howitzer; one .30 cal MG
One .50 cal MG

GROUND CLEARANCE: 11 in

SURF: 10 ft

SERVICE: Marine Corps

REMARKS: This is a basic LVTP(5) which has been refitted with different armament. It has replaced the LVT(A)(4)'s, and LVT(A)(5)'s as the Marine Corps' amphibious fire-support vehicle. Under optimum conditions the LVTH(6) can traverse such obstacles as 70% slopes, 12-ft-wide ditches, and 3-ft-high vertical walls or escarpments. Armor varies from 1/4 inch on top to 1 inch in front and bottom. The first modification has been made on these and the latest models are symbolized as LVTH(6)A1.

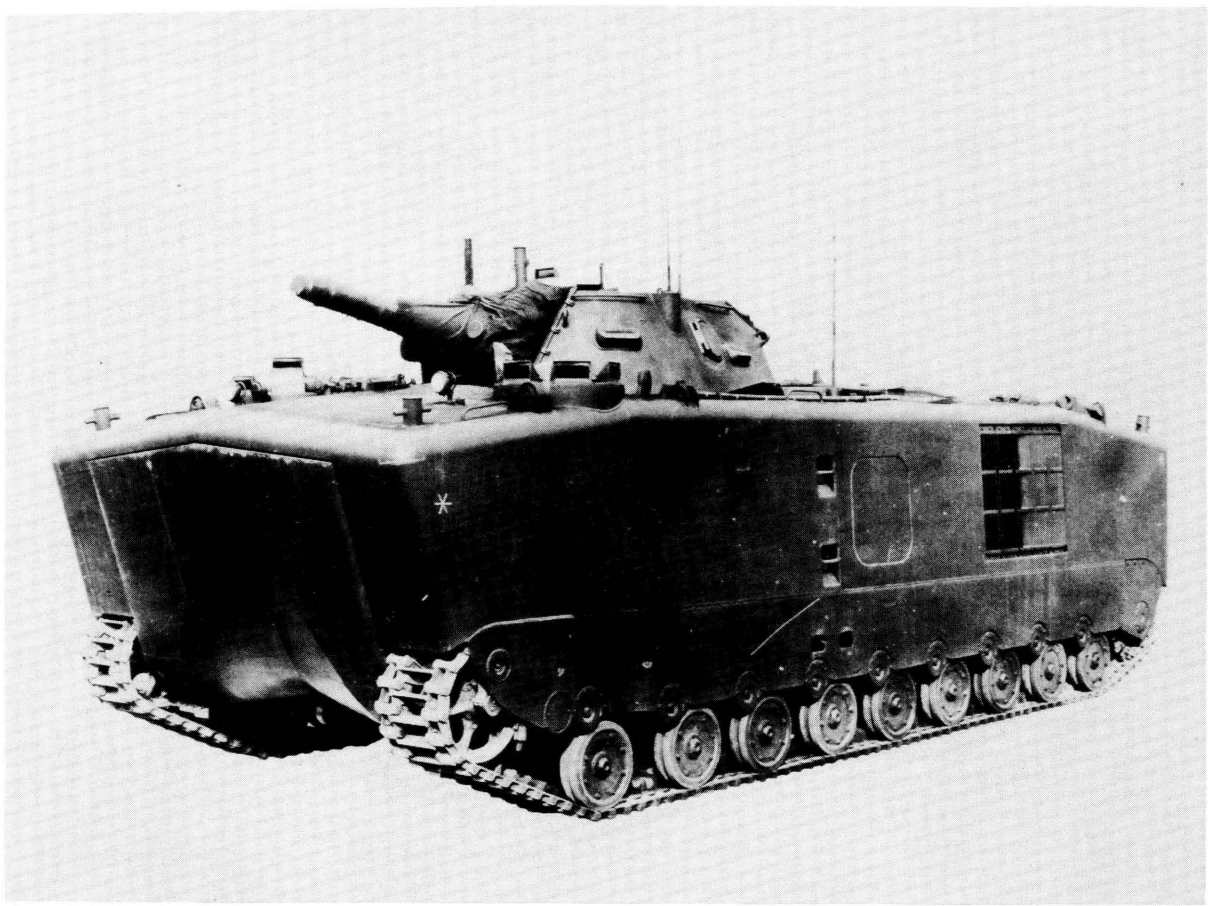


Figure 24.

Landing Vehicle, Tracked, Howitzer, Mark VI.

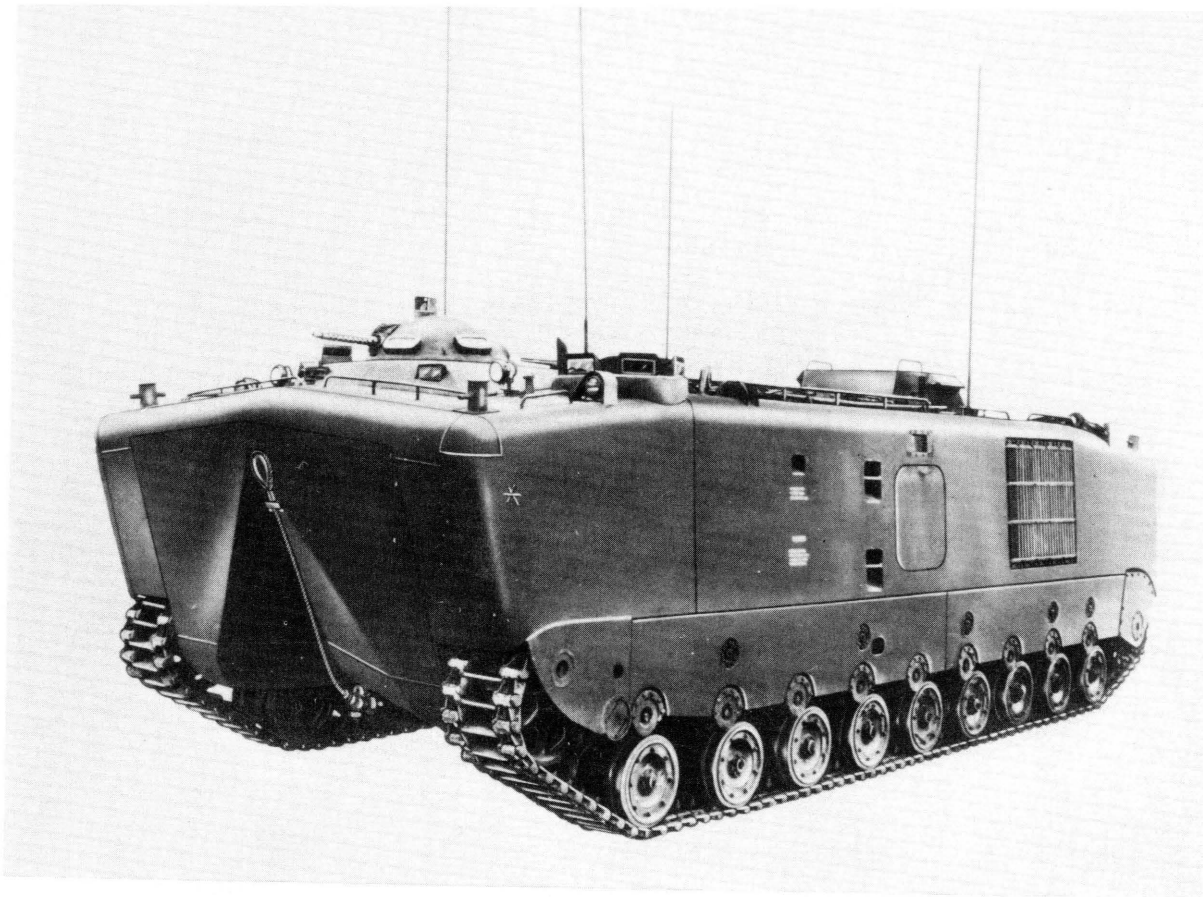


Figure 25.

Landing Vehicle, Tracked, Personnel, Mark V.

LVTP(5)

Landing Vehicle, Tracked, Personnel, Mark V

MISSION: To land combat troops and their equipment in amphibious assault

DATE OF INTRODUCTION: 1952

NUMBER: See Remarks

DIMENSIONS: 29.7 by 11.7 by 10 ft

	Max load	Normal load	Light
DRAFT fwd:	NA	5 ft 10 in	unk
DRAFT aft:	NA	6 ft 1 in	unk
DISPLACEMENT:	87,780 lb	81,780 lb	64,200
CAPACITY:	18,000 lb or 34 troops (land only)	12,000 lb or 34 troops (max water)	NA
	Land	Water	
SPEED:	26 knots	5.9 knots	
ENDURANCE:	165 n mi	50 n mi	

CREW: 3

PROPULSION: One 810-hp gasoline engine; tracks provide propulsion while waterborne

ARMAMENT: One .30 cal turret-mounted MG

GROUND CLEARANCE: 11 in

SURF: 10 ft

SERVICE: Marine Corps

REMARKS: Armor varies from 1/4 inch on top to 1 inch on ramp and bottom. Under optimum conditions the LVTP(5) can traverse such obstacles as 70% slopes, 12-ft-wide ditches, and 3-ft-high vertical walls or escarpments. Modifications to this vehicle which enable it to perform specific functions include the LVTR(1) which has an 11-foot long, 7,000 pound capacity boom mounted on the bow; the LVTC which has three additional radios; the LVTAA which mounts twin 40-mm AA guns; and the LVTE which has a mine excavator blade mounted on the bow. Only one or two LVTAA's were built and they proved impractical.

LVTP(6)

Landing Vehicle, Tracked, Personnel, Mark VI

MISSION: To land combat troops in amphibious assault

DATE OF INTRODUCTION: See Remarks

NUMBER: See Remarks

DIMENSIONS: 21.6 by 10.8 by 9.3 ft

	Normal load	Light
DRAFT fwd:	4 ft 6 in	unk
DRAFT aft:	4 ft 10 in	unk
DISPLACEMENT:	50,600 lb	38,900 lb
CAPACITY:	8,000 lb or 20 troops	NA
	Land	Water
SPEED:	28.6 knots	4.8 knots
ENDURANCE:	222 n mi	37 n mi

CREW: 2

PROPULSION: Two 215-hp gasoline engines; tracks provide propulsion while waterborne

ARMAMENT: One .30 cal turret-mounted MG

GROUND CLEARANCE: 18 in

SURF: Has successfully negotiated 10-ft surf; base surf height unknown

SERVICE: Marine Corps

REMARKS: These are not standard vehicles, but six prototype models are now undergoing performance tests. Production model characteristics may vary slightly from prototype model characteristics. Armor varies from 1/4 inch on top to 5/8 inch on sides and bottom. Under optimum conditions the LVTP(6) can traverse such obstacles as 60% slopes, 8-ft-wide ditches, and 32-in-high vertical walls or escarpments.

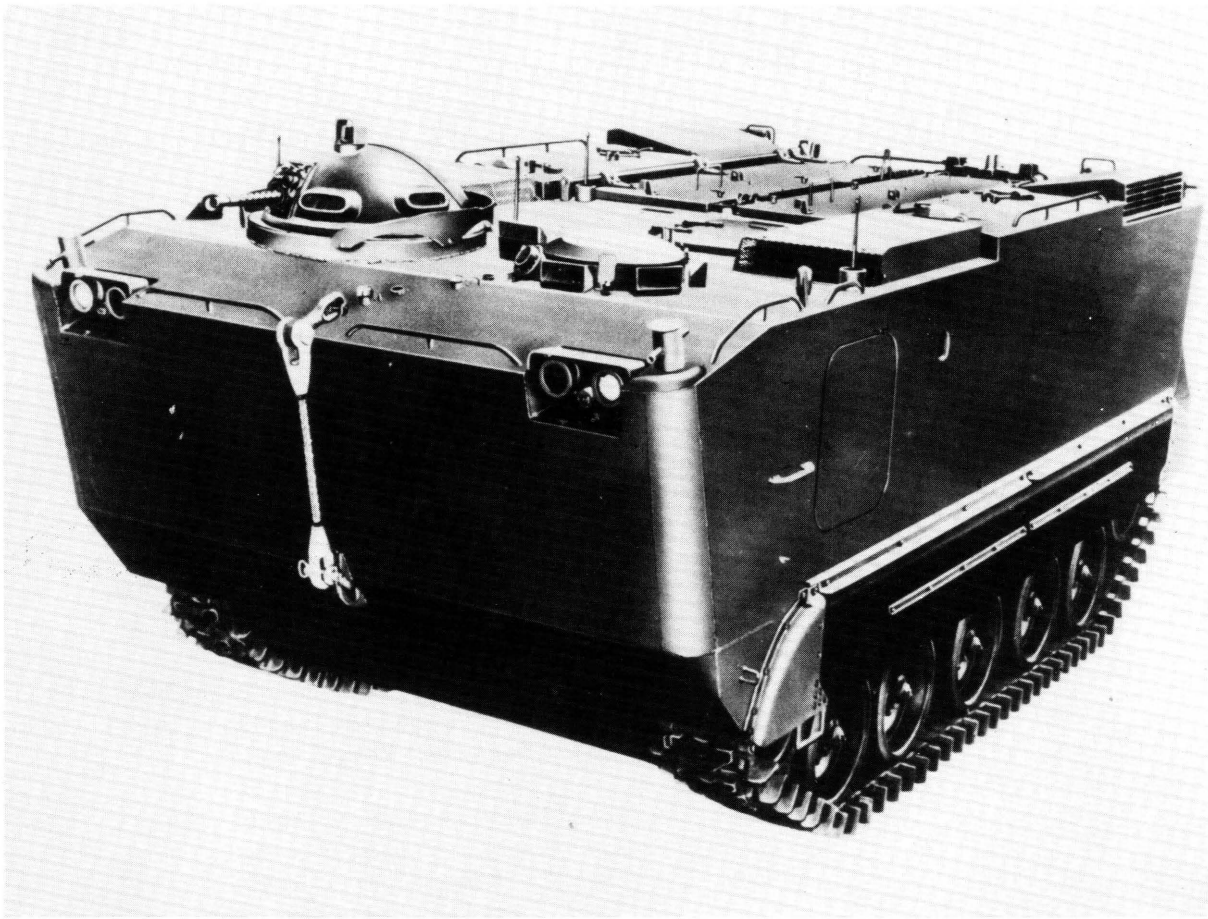


Figure 26.

Landing Vehicle, Tracked, Personnel, Mark VI.

CHAPTER V

SUPPORT SHIPS

Either directly or indirectly, almost all of the ships in the Navy support amphibious operations i.e. destroyers provide protection from submarines, carriers provide air support, tankers provide refueling facilities, minesweepers clear the landing lanes, etc. However, there is a large group of Navy vessels which have as their primary mission the support of amphibious operations. These, along with the Comet Class Cargo Ship which is of special interest, are described in this chapter and include the following:

Amphibious Force Flagship
Cargo Ship (Comet Class)
Attack Cargo Ship
Attack Transport
High Speed Transport
Transport Submarine
Inshore Fire-support Ship
Amphibious Transport, Dock
Amphibious Assault Ship
Landing Ship, Dock

AGC

Amphibious Force Flagship

The mission of the AGC is to provide command facilities, including extensive radio, radar, visual communications, and office installations for a Naval Amphibious Task Force Commander, Amphibious Troop Commander, Tactical Air Group Commander, and their staffs during amphibious assault operations. Facilities are also provided for making weather and surf forecasts, developing and printing photographs, and reproducing maps and charts. All of the AGC's currently active in the Navy Fleet have a helicopter platform aft of the mizzen kingpost.

There are three classes of AGC's. These are very similar, and have been grouped together for descriptive purposes.

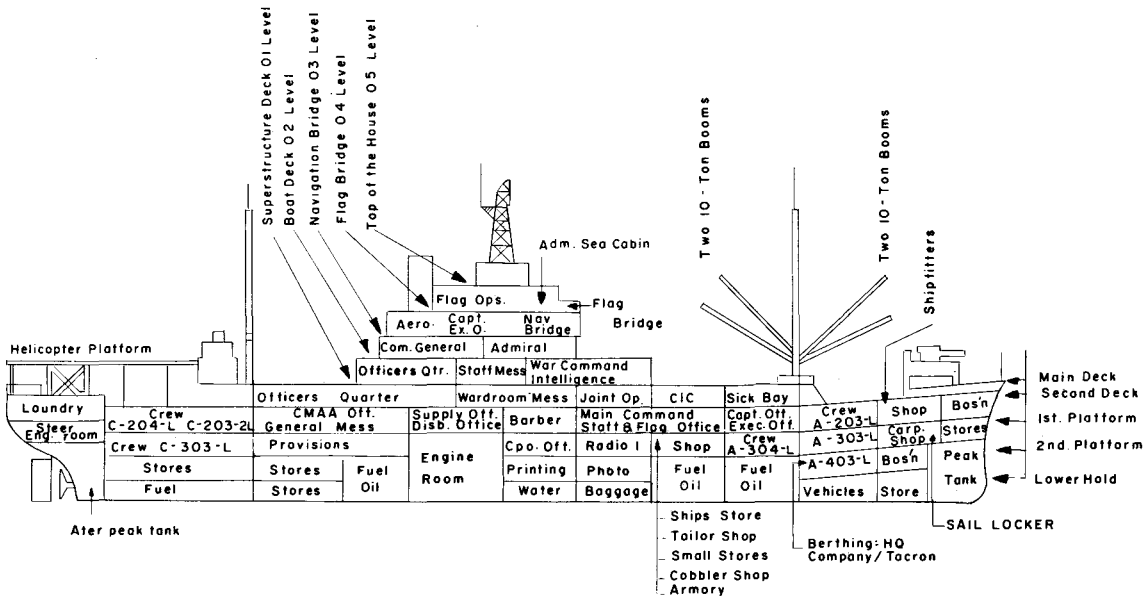


Figure 27.

Inboard profile of Mount McKinley Class Amphibious Force Flagship.

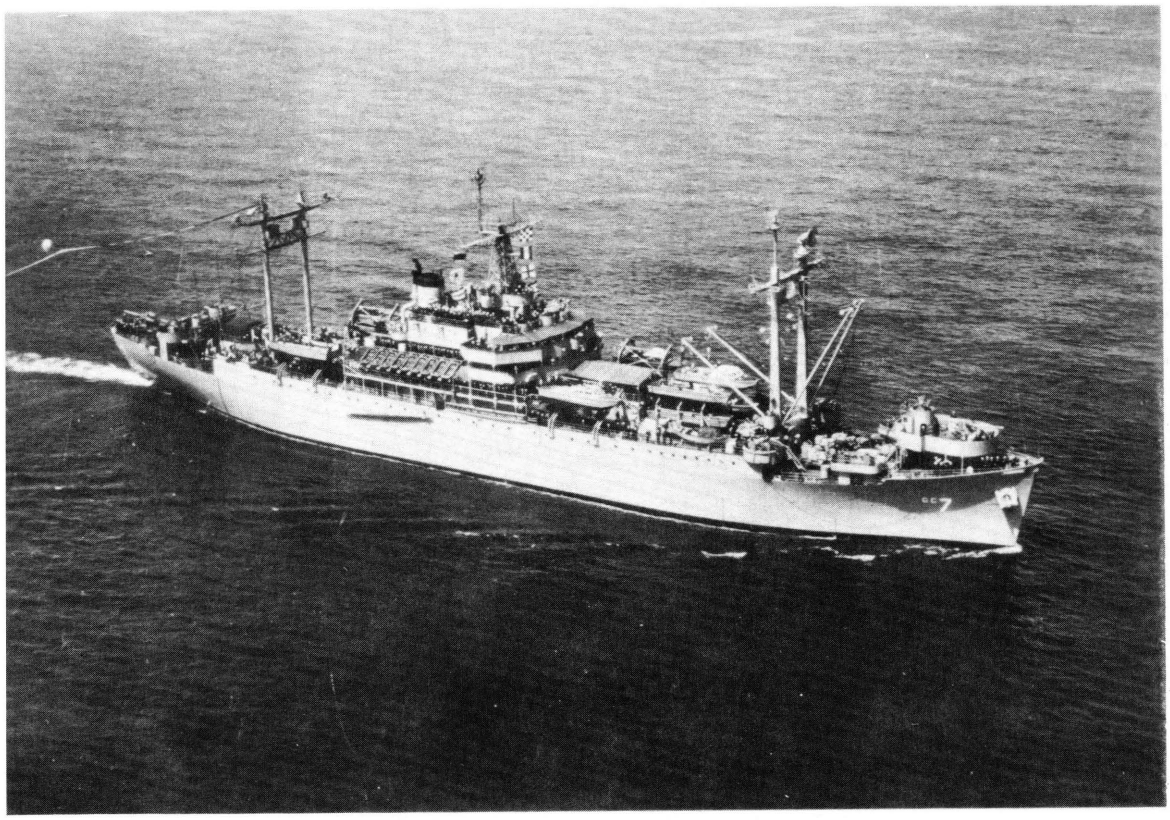


Figure 28.

Amphibious Force Flagship U.S.S. Mount McKinley which is typical of AGC's. Note LCVP's and LCPL(1)'s. A helicopter platform has been added aft of the Mizzen Kingpost since photo was taken.

AGC

Amphibious Force Flagship, All Classes

DATE OF INTRODUCTION: 1943 to 1945

CLASSES: Appalachian, Mount McKinley, and Adirondack

NUMBER: 8 in group (5 active) 1 to 4 in each class

LENGTH AND BEAM: 459 by 63 to 65 ft

	Full load	Light
DRAFT:	24 to 25 ft	15 ft
DISPLACEMENT:	12,560 to 13,040 tons	7,240 to 7,510 tons

CAPACITY: 12,360 cu ft which includes 455 to 600 sq ft usable for vehicle stowage

SPEED: 16 knots (trial)
14.3 to 15.5 knots (max sustained)
10 to 11.4 knots (economical)

ENDURANCE: 21,000 to 29,333 n mi at max sustained speed
28,000 to 36,800 n mi at economical speed

ARMAMENT: Two 5"/38 cal
Four twin 40-mm

BOOM CAPACITY: 5 to 10 tons

ACCOMMODATIONS:	Crew	Other	Total
Officers	36 to 46	114 to 171	151 to 217
Enlisted	464 to 481	355 to 729	819 to 1,200

REMARKS: The accommodations of AGC's are mostly for personnel of the various command staffs with the total accommodations varying as much as 350 berths. If required, officer berths can be used for enlisted men or vice versa. The AGC carries no combat troops, but it does land the landing force commander's staff. This staff varies in size, but is usually about 50 officers and 200 enlisted. Three LCVP's and three LCPL's are normally carried for this purpose.

AK

Cargo Ship

AK's are general cargo ships and do not have as a primary mission the support of amphibious operations. However, the Comet Class is quite useful for amphibious operations because of a system of internal ramps for driving vehicles to various decks of the vessel and a stern ramp which can be used to transfer vehicles to BDL's for movement to the beach.

AK (Comet Class)

MISSION: To transport vehicles

DATE OF INTRODUCTION: 1958

NUMBER: 1 (AK 269)

LENGTH AND BEAM: 499 by 78 ft

	Full load	Light
DRAFT:	27 ft	17 ft
DISPLACEMENT:	18,286 tons	8,175 tons

CAPACITY: 60,000 sq ft parking space and 176,500 cu ft available for cargo

SPEED: 18 knots (max sustained)

ENDURANCE: 13,000 n mi at max sustained speed

ARMAMENT: None

BOOM CAPACITY: 60 tons

ACCOMMODATIONS:	Crew	Other	Total
Officers	16	0	16
Enlisted	35	12	47

REMARKS: At the present time time this vessel is assigned to MSTS and is operated by a civilian crew. During wartime this crew would have to be increased if armament were added.

Figure 29.

Cargo Ship U.S.N.S. Comet. Note stern ramp and two doors on side of hull. For another view of this vessel see Fig. 12.

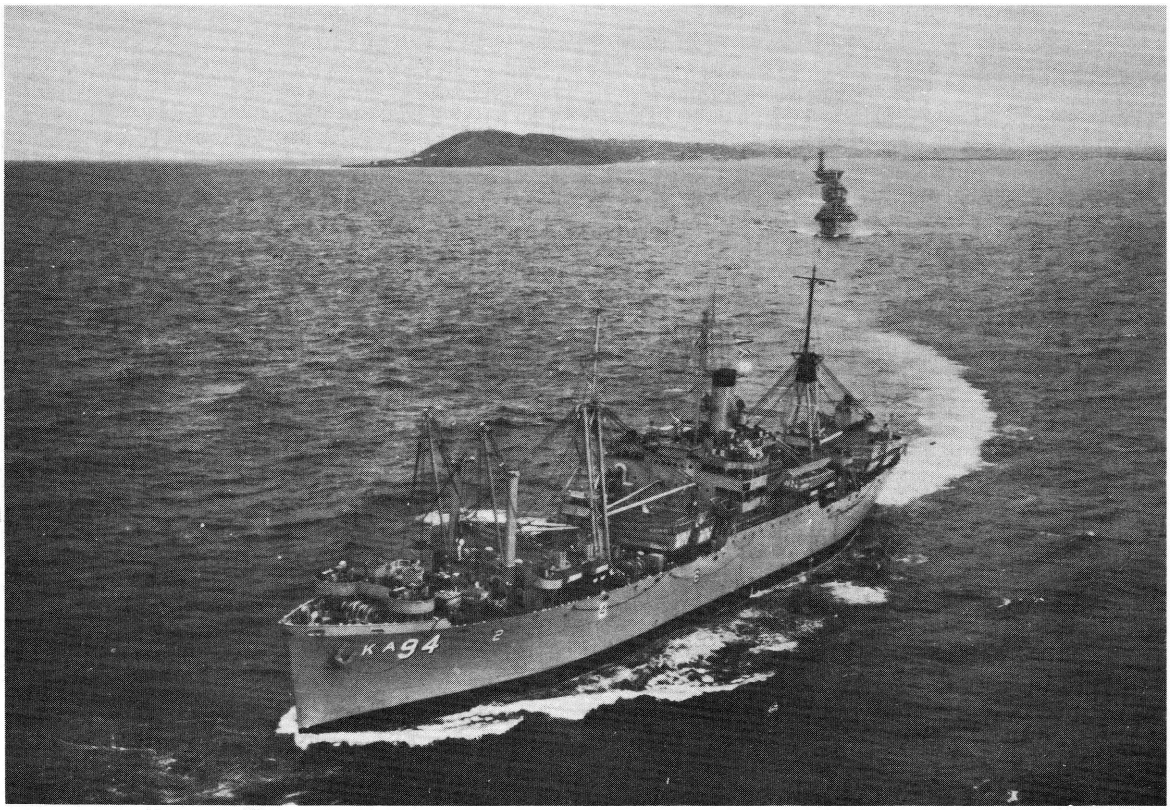


Figure 30.

Attack Cargo Ship U.S.S. Winston which is typical of AKA's constructed during WW II. Note large number of booms for transferring cargo to landing craft. Small numbers painted on hull immediately below bulwark are to guide landing craft to loading positions. Fig. 31 shows another typical AKA.

AKA

Attack Cargo Ship

The mission of the AKA is to transport assault equipment and attendant personnel, ammunition, and supplies to an objective area. Vessels of this type carry landing craft for ship-to-shore movement of cargo. During the assault phase of an amphibious operation, these craft are used to augment the landing craft of APA's in the ship-to-shore movement of combat troops.

As with most ships with a cargo capacity, the hatch opening and hold dimensions vary even within classes. Some vessels are best suited for carrying vehicles while others are better suited for bale cargo even though all the AKA's can carry both. In general, capacities are restricted by space rather than weight.

There are 11 classes of AKA's. Ten of the classes were built during WW II and have similar characteristics. These ten classes have been grouped and described together. The U.S.S. Tulare is the only AKA constructed since WW II and is described separately.

AKA

Attack Cargo Ship, World War II Group

DATE OF INTRODUCTION: 1940 to 1945

CLASSES: Procyon, Bellatrix, Libra, Andromeda, Achernar, Algol, Arneb, Uvalde, Winston, and Rankin

NUMBER: 40 in group; 1 to 7 in each class

LENGTH AND BEAM: 458 to 460 ft by 63 to 64 ft

	Full load	Light
DRAFT:	26 to 28 ft	16 to 23 ft
DISPLACEMENT:	11,000 to 14,450 tons	6,131 to 8,327 tons

CAPACITY: 199,000 to 363,000 cu ft which includes 15,000 to 37,000 sq ft usable for vehicle stowage

SPEED: 17 knots (trial)
15 to 16.1 knots (max sustained)
9 to 12 knots (economical)

ENDURANCE: 11,000 to 15,400 n mi at max sustained speed
14,376 to 18,000 n mi at economical speed

ARMAMENT: 40-mm to 5"/38 cal

BOOM CAPACITY: 30 to 60 tons

ACCOMMODATIONS:	Crew	Other	Total
Officers	15 to 41	5 to 25	40 to 58
Enlisted	235 to 338	61 to 301	348 to 631

REMARKS: Typical landing craft complement is 2 LCM(3)'s, 6 LCM(6)'s, 14 LCVP's, and 2 LCPL's. At the present 18 of these vessels are in the National Defense Reserve Fleet (NDRF) and several others are in the Navy Reserve. Marine Corps Planning Figures for these types of ships allow 15,400 square feet for vehicles and 84,000 cubic feet for bale cargo.

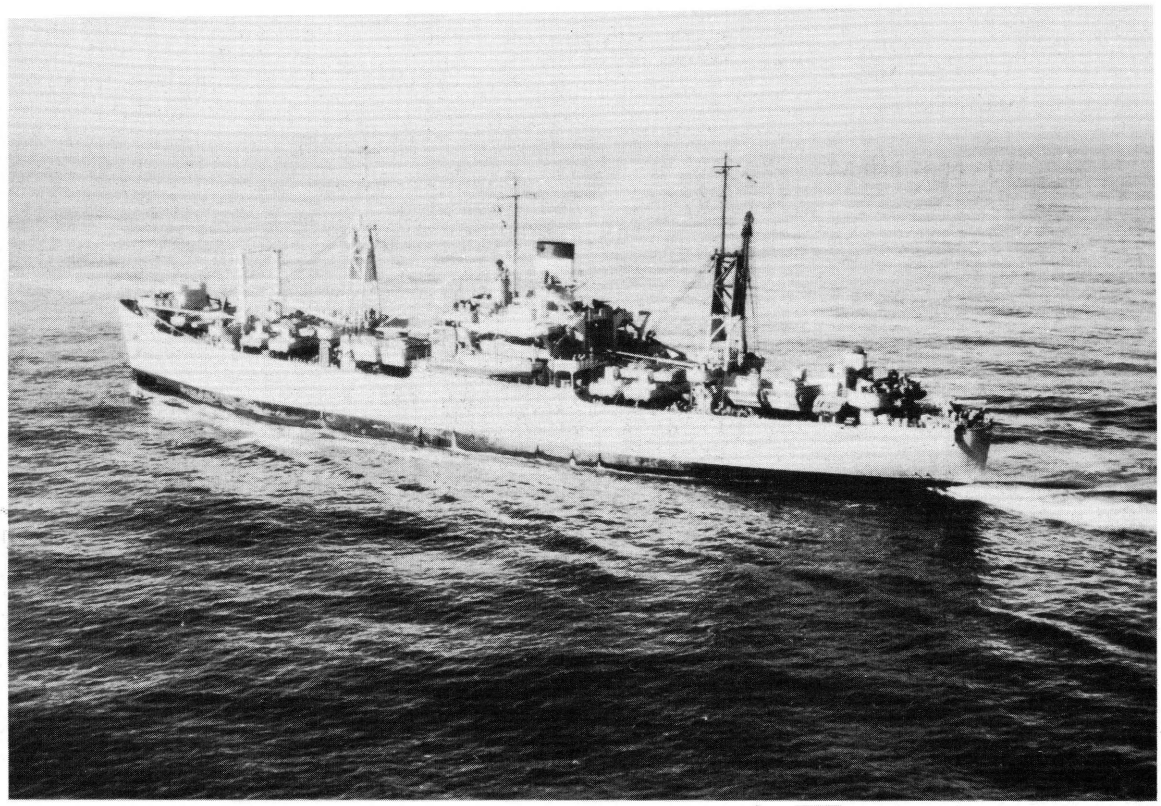


Figure 31.

Attack Cargo Ship U.S.S. Algol which is typical of AKA's constructed during WW II. Note LCVP's nested in LCM's.

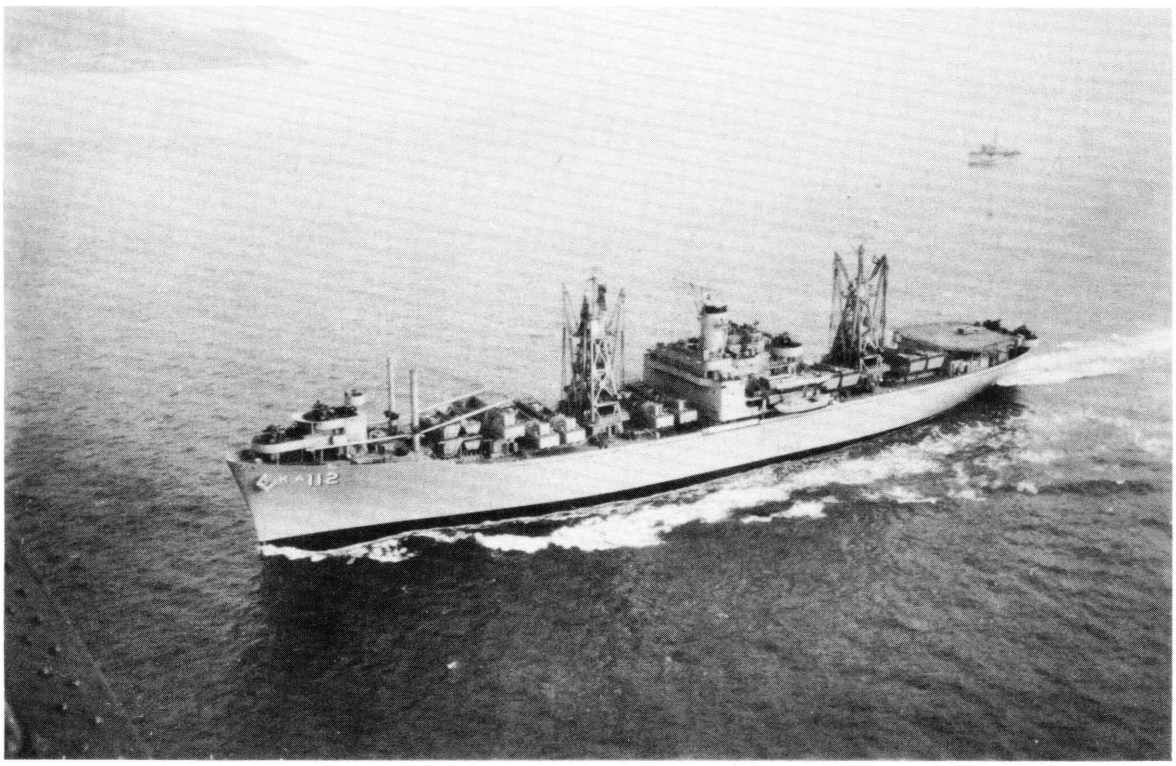


Figure 32.

Attack Cargo Ship U.S.S. Tulare. Note helicopter platform on stern. Also note large number of landing craft being carried.

AKA

Attack Cargo Ship, Tulare Class

DATE OF INTRODUCTION: 1956

NUMBER: 1 (AKA 112)

LENGTH AND BEAM: 564 by 76 ft

	Full load	Light
DRAFT:	28 ft	24 ft
DISPLACEMENT:	17,500 tons	9,050 tons

CAPACITY: 310,662 cu ft which includes 24,000 sq ft usable for vehicle stowage

SPEED: 24 knots (max sustained)
17.8 knots (economical)

ENDURANCE: 10,368 n mi at max sustained speed
15,575 n mi at economical speed

ARMAMENT: Six twin 3"/50 cal

BOOM CAPACITY: 60 tons

ACCOMMODATIONS:	Crew	Other	Total
Officers	38	18	56
Enlisted	401	301	702

REMARKS: The hull of this vessel was laid down as a "Mariner Class" commercial cargo ship. It was acquired during construction by Navy and completed as a new class of AKA. The commercial-type hull gives vessel greater speed and capacity than other classes of AKA's. Although helicopters are not part of the ship's operational equipment, the vessel has a helicopter platform and refueling facilities, permitting support of helicopters based on other ships. Marine Corps Planning Figures for this vessel allow 23,600 square feet for vehicles and 77,700 cubic feet for bale cargo.

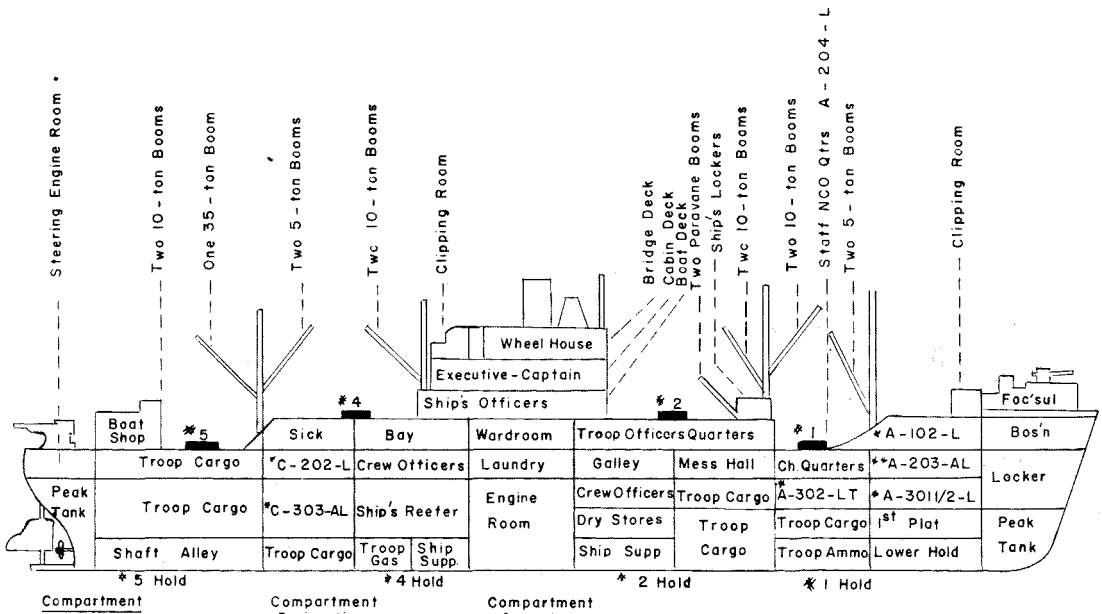
APA

Attack Transport

The mission of the APA is to transport assault troops with their equipment and initial supplies to the objective area. Landing craft carried by these vessels are augmented by craft from AKA's for the ship-to-shore movement of troops.

The Arthur Middleton, Crescent City, and Bayfield Classes are all C 3 Maritime hulls and are designated as Flagships. The Haskell Class are converted victory ships and are Non-Flagships.

There are six classes of APA's. The vessels in five of these classes were all constructed during WW II and have been grouped and described together.



Compartment	Compartment Designation	Compartment Capacity
*A-204-L	Staff NCO Qtrs	20
*A-102-L	Able	174
**A-203-AL	Baker (Rec)	
*A-301-1/2-L	Charlie	173
*A-302-LT	Dog	304
*C-202-L	Easy	271
*C-303-AL	Fox	270
	Total	1212

** Denotes Troop Enlisted Berthing A-203-AL
This compartment is presently being used (in peacetime)
For training and recreation If requtred for
Berthing 250 bunks can be rigged.

Figure 33.

Inboard Profile of Attack Transport, Haskell Class.

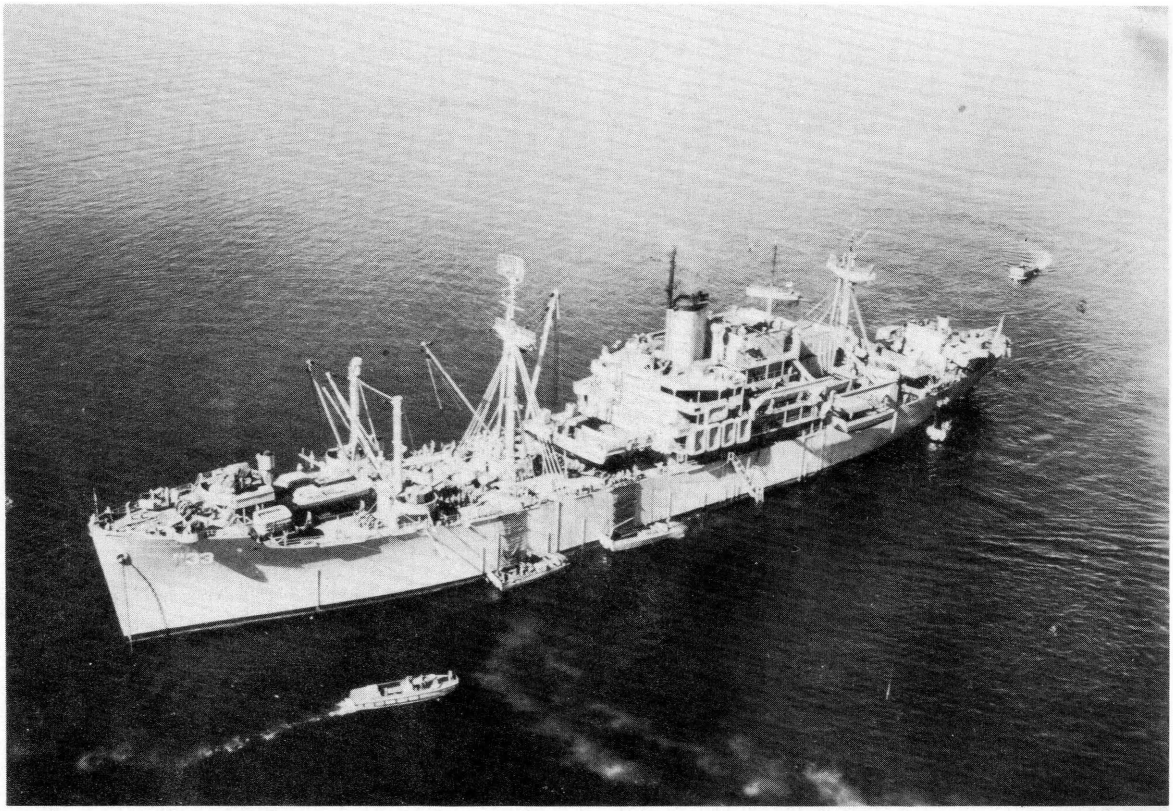


Figure 34.

Attack Transport U.S.S. Bayfield which is typical of APA's constructed during WW II. Note LCVP's alongside embarking troops. Also note LCP(R) in foreground.

APA

Attack Transport, World War II Group

DATE OF INTRODUCTION: 1941 to 1944

CLASSES: President, Arthur Middleton, Crescent City, Bayfield, Haskell

NUMBER: 44 in group; 3 to 29 in each class

LENGTH AND BEAM: 455 to 492 ft by 62 to 70 ft

	Full load	Light
DRAFT:	24 to 28 ft	14 to 21 ft
DISPLACEMENT:	10,471 to 15,850 tons	7,107 to 11,040 tons

CAPACITY: 80,000 to 167,000 cu ft which includes 10,000 to 11,000 sq ft usable for vehicle stowage

SPEED: 17 to 18 knots (trial)
16 to 17 knots (max sustained)
9 to 12.3 knots (economical)

ENDURANCE: 7,350 to 14,700 n mi at max sustained speed
10,150 to 17,000 n mi at economical speed

ARMAMENT: 40-mm to 5"/38 cal

BOOM CAPACITY: 30 to 35 tons

ACCOMMODATIONS:	Crew	Other	Total
Officers	28 to 34	93 to 132	127 to 160
Enlisted	325 to 347	1,010 to 1,498	1,353 to 1,845

REMARKS: Typical landing craft complement is 4 LCM(6)'s, 16 LCVP's and 3 LCPL's. At the present 24 of these vessels are in the National Defense Reserve Fleet (NDRF) including all 3 vessels of the President Class. Several others are in the Navy's Reserve Fleet. Marine Corps Planning Figures for these types of ships allow 6,900 square feet for vehicles and 51,000 cubic feet for bale cargo.

APA

Attack Transport, Paul Revere Class

DATE OF INTRODUCTION: 1958

NUMBER: 2

LENGTH AND BEAM: 564 by 76 ft

	Full load	Light
DRAFT:	27 ft	20 ft
DISPLACEMENT:	16,838 tons	10,709 tons

CAPACITY: 137,974 cu ft which includes 10,487 sq ft usable for vehicle stowage

SPEED: 22 knots (max sustained)
11 knots (economical)

ENDURANCE: 10,000 n mi at max sustained speed
18,200 n mi at economical speed

ARMAMENT: Four twin 3"/50 cal

BOOM CAPACITY: 60 tons

ACCOMMODATIONS:	Crew	Other	Total
Officers	55	132	187
Enlisted	491	1,632	2,123

REMARKS: Originally constructed in 1953 and 1954 as cargo vessels with "Mariner" type hulls, these ships were later converted to APA's. Vessels in this class have facilities which enable them to serve as command ships for amphibious operations of battle-group size. Vessels have helicopter platform and refueling facilities for the one helicopter aboard. By nesting LCVP's in LCM's, vessels in this class can carry a deckload of nine LCM(6)'s, eight LCVP's, and three LCPL's. Marine Corps Planning Figures for these ships allow 7,700 square feet for vehicles and 54,100 cubic feet for bale cargo.

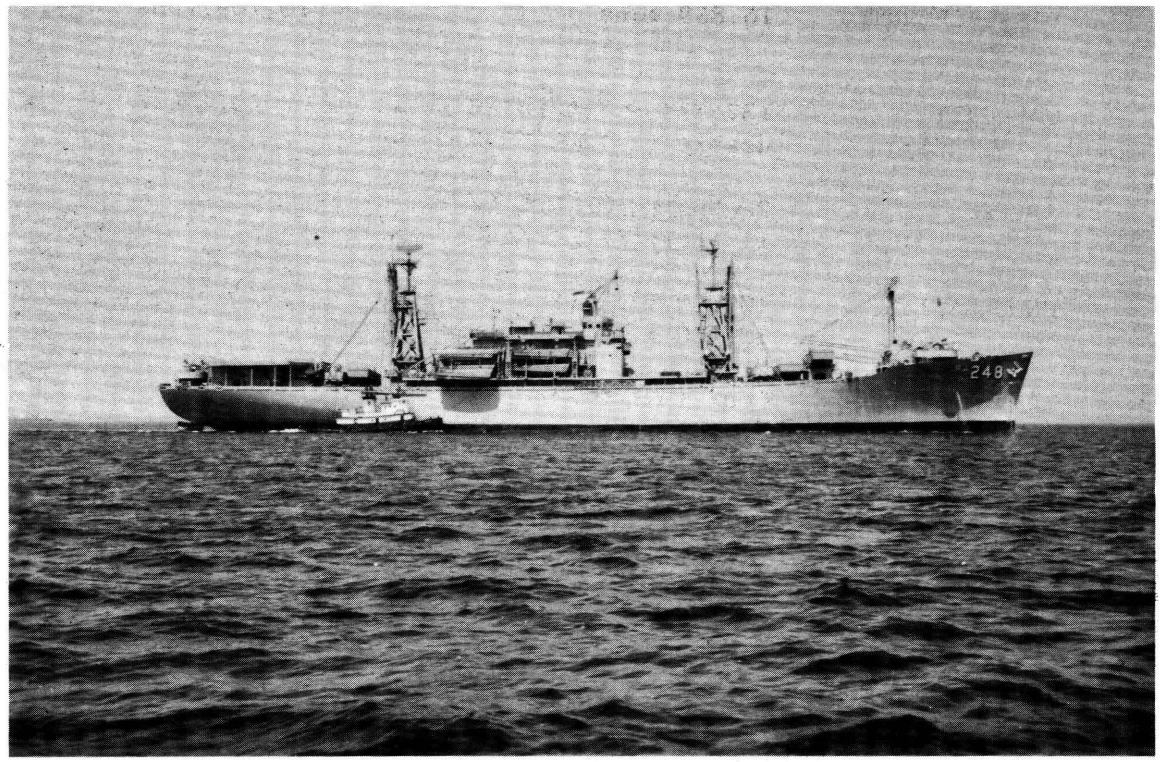


Figure 35.

Attack Transport U.S.S. Paul Revere. Note tug alongside. Also note helicopter platform at stern.

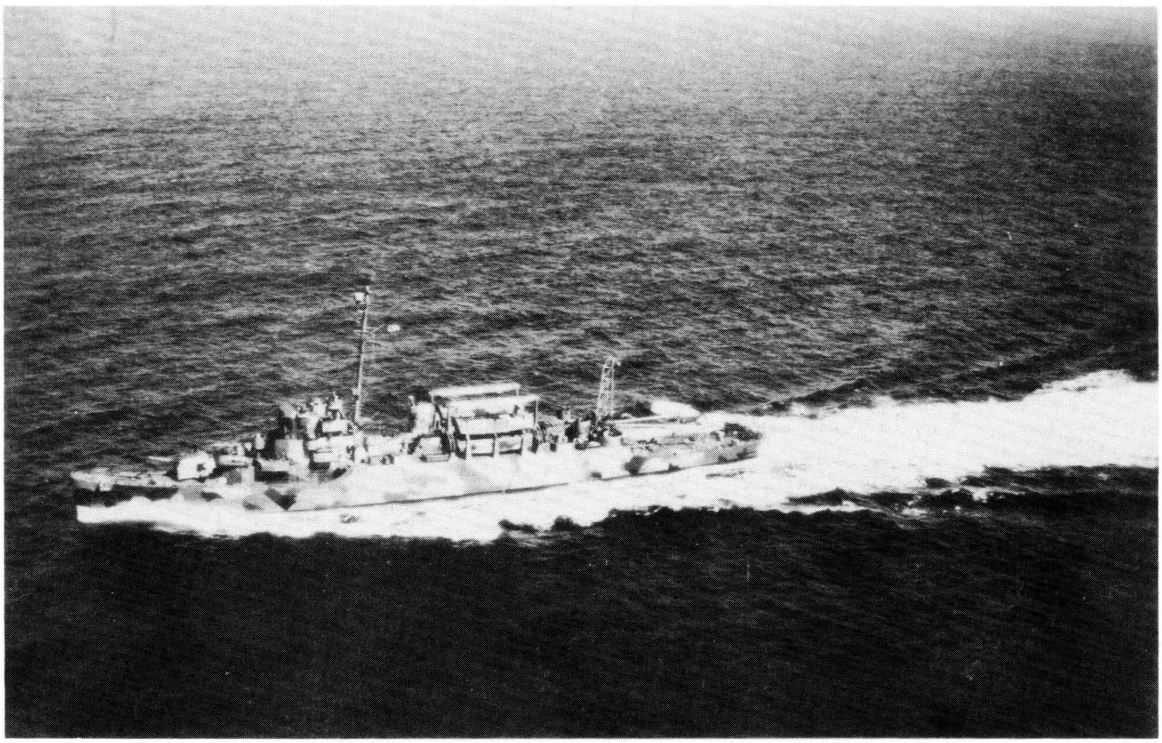


Figure 36.

High Speed Transport, Charles Lawrence Class. Note high bridge and lattice mizzenmast.

APD

High Speed Transport

The APD is intended as a highly mobile base for the support of an underwater demolition team, raiding party, reconnaissance unit, or any other small troop unit and their essential equipment. It may also be used as a fire-support ship or for anti-submarine warfare. The first vessels of this type were built as Destroyers and converted to APD's by the removal of two boilers and part of the armament. The vessels currently in existence were all constructed on Escort Vessel (DE) hulls. The Charles Lawrence and Laning Classes were constructed on Class 198 DE hulls and have a higher bridge than those vessels in the Crosley and Knudson Classes, which were constructed on Class 224 DE hulls. The Laning and Knudson Classes have communication facilities and staff accommodations which enable them to serve as APD squadron flagships or control vessels for ship-to-shore traffic.

APD

High Speed Transport, All Classes

DATE OF INTRODUCTION: 1944

CLASSES: Charles Lawrence, Crosley, Laning, and Knudson

NUMBER: 66 in group; 3 to 33 in each class

LENGTH AND BEAM: 306 by 37 ft

	Full load	Light
DRAFT:	13 to 14 ft	9 to 10 ft
DISPLACEMENT:	2,027 to 2,130 tons	1,390 to 1,730 tons

CAPACITY: 2,100 cu ft

SPEED: 24 knots (trial)
20 to 22 knots (max sustained)
9.4 to 12 knots (economical)

ENDURANCE: 2,000 to 2,960 n mi at max sustained;
4,434 to 5,300 n mi at economical speed

ARMAMENT: One 5"/38 cal, 40-mm;
depth charges and anti-submarine torpedoes

BOOM CAPACITY: None to 5 tons

ACCOMMODATIONS:	Crew	Other	Total
Officers	8 to 11	14 to 17	25 to 28
Enlisted	170 to 180	65 to 177	245 to 347

REMARKS: New unretractable Sonor gear is being installed on these vessels which will increase draft by four feet.

Figure 37.

High Speed Transport, Knudson Class.

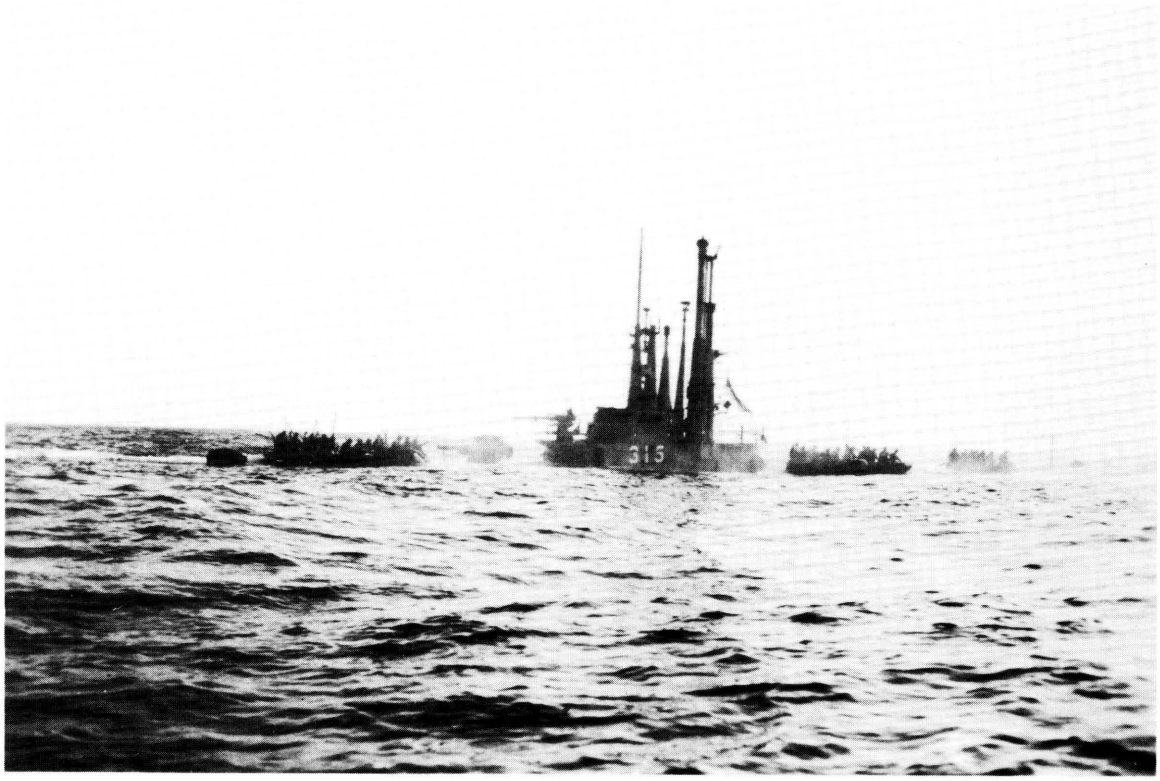


Figure 38.

Transport Submarine U.S.S. Sealion partially submerged to allow troops in rubber boats to float off deck.

APSS

Transport Submarine

MISSION: To covertly transport, land, and reembark small troop units and their equipment

DATE OF INTRODUCTION: 1948

NUMBER: 2

LENGTH AND BEAM: 312 by 27 ft

	Surfaced	Light
DRAFT:	18 ft	unk
DISPLACEMENT:	2,145 tons	1,590 tons

CAPACITY: 33 tons

ENDURANCE AND SPEED:
6,500 n mi at 14.5 knots (max sustained surface)
8,000 n mi at 13 knots (economical surface)
7,000 n mi at 6 knots (snorkel)
7.5 n mi at 7.5 knots (max submerged)
96 n mi at 2.0 knots (silent submerged)

ARMAMENT: One 5"/25 cal, one 40-mm, U.S.S. Sealion; U.S.S. Perch unarmed

ACCOMMODATIONS:	Crew	Other	Total
Officers	8	4	12
Enlisted	68	76	144

REMARKS: The vessels in this class were originally Balao Class submarines which were converted to this type by the removal of all torpedo tubes and forward engines. By reducing cargo, troop accommodations can be increased by 30. Rubber boats are carried for landing troops. At one time the U.S.S. Perch had a cylindrical hangar on deck aft of the conning tower which could accommodate a jeep and a 75-mm howitzer. This did not prove satisfactory and has been removed. Limiting hatch diameter is 28 inches.

IFS

Inshore Fire-Support Ship

MISSION: To provide fire support for landing forces in amphibious assault

DATE OF INTRODUCTION: 1955

NUMBER: 1

LENGTH AND BEAM: 245 by 39 ft

	Full load	Light
DRAFT:	10 ft	8 ft
DISPLACEMENT:	1,560 tons	1,040 tons

SPEED: 15 knots (trial)
14.5 knots (max sustained)
12 knots (economical)

ENDURANCE: 4,320 n mi at max sustained speed
5,500 n mi at economical speed

ARMAMENT: One 5"/38 cal
Two twin 40-mm
Eight 5-in rocket launchers

ACCOMMODATIONS:	Crew	Other	Total
Officers	9	3	12
Enlisted	140	4	144

REMARKS: Shallow draft enables vessel to move close inshore for neutralization of shore defenses or to provide fire support for troops ashore. The primary differences between this vessel and the LSMR's is that the IFS was originally intended as a fire-support ship and is not designed to beach; whereas, the LSMR's are modified LSM's and are structurally capable of landing. The IFS carries 300 rounds of 5"/38-cal ammunition and 5,000 rockets. It can fire 300 rockets per minute at ranges up to 10,000 yards.

Figure 39.

Inshore Fire-Support Ship. Also see Fig. 42.

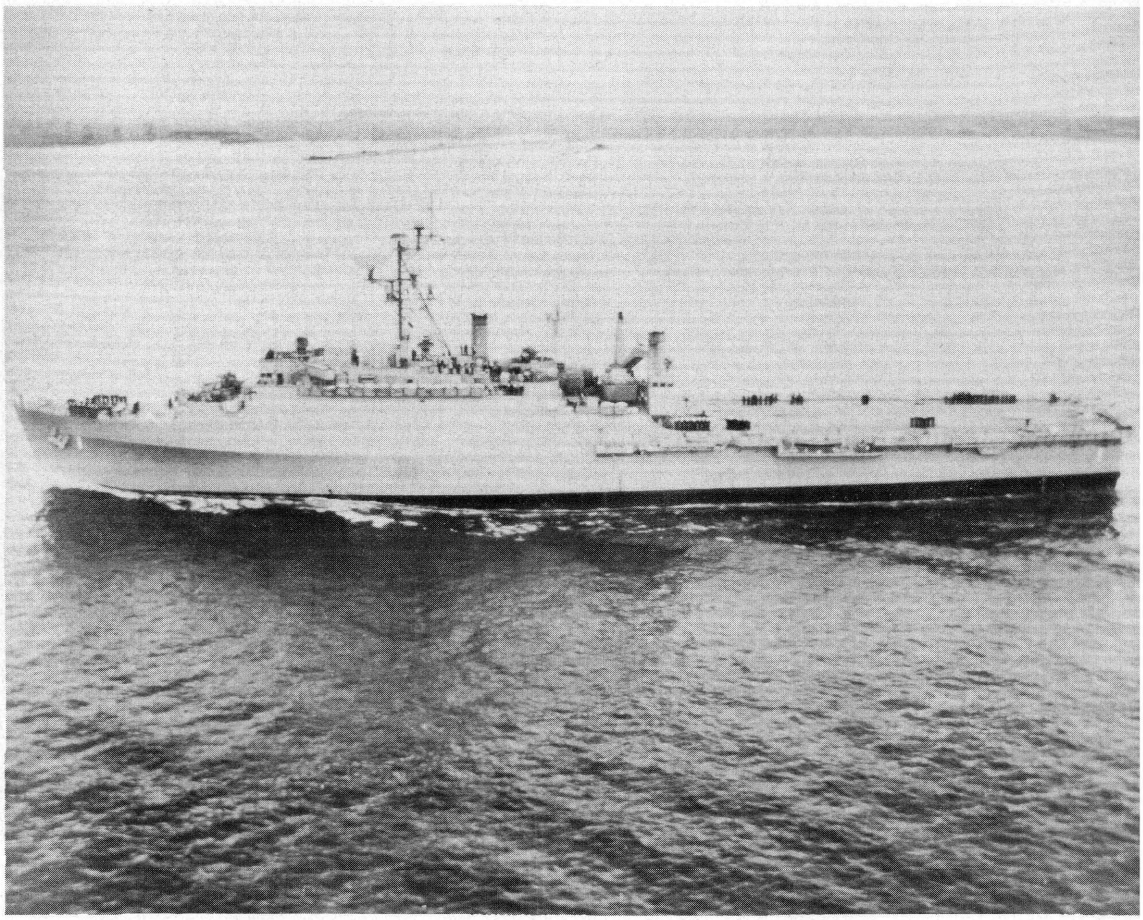


Figure 40.

Amphibious Transport Dock U.S.S. Raleigh.

LPD

Amphibious Transport, Dock

MISSION: To transport and land troops and their essential equipment by means of embarked landing craft or amphibious vehicles augmented by helicopters

DATE OF INTRODUCTION: 1962

NUMBER: 1 (9 under construction or authorized)

LENGTH AND BEAM: 521 by 82 ft

	Full load	Light
DRAFT:	21 ft	14 ft
DISPLACEMENT:	13,820 tons	8,000 tons

CAPACITY: 2,500 tons

SPEED: 21 knots (est max sustained)
16 knots (est economical)

ENDURANCE: 9,600 n mi (est 16 knots economical)

ARMAMENT: Four twin 3"/50 cal

BOOM CAPACITY: 60,000 lb

ACCOMMODATIONS:	Crew	Other	Total
Officers	27	73	100
Enlisted	435	896	1,331

REMARKS: This new type of vessel combines features of both APA's and AKA's with the basic hull of the "Thomaston" class LSD's. It can carry landing craft in a covered well deck, the roof of which is a helicopter platform. Certain designated ships will provide command facilities and accommodations for a transport division commander and staff. Vessel has stowage space for nine LCM(6)'s, four LCM(8)'s or one LCU and three LCM(6)'s in the well deck. LPD 4 (Austin) and subsequent vessels will be 48 feet longer than LPD 1 (Raleigh) class. This will increase cargo capacity to 3,900 tons.

LPH

Amphibious Assault Ship

The LPH is designed to embark, transport, and land troops with their essential equipment and supplies by means of embarked helicopters of the landing force or by landing craft provided by other ships. When not employed to land troops, the LPH may be used to conduct Anti-Submarine Warfare (ASW) operations by means of embarked ASW helicopters.

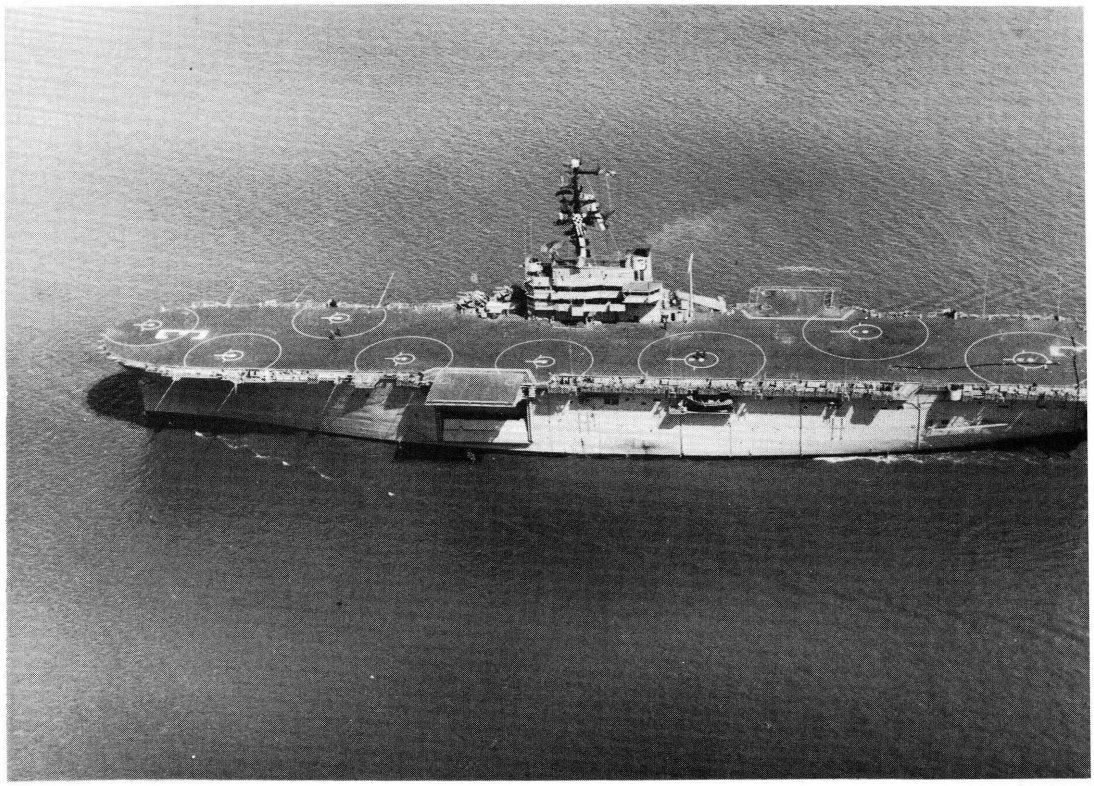


Figure 41.

Amphibious Assault Ship, Iwo Jima Class, U.S.S. Okinawa

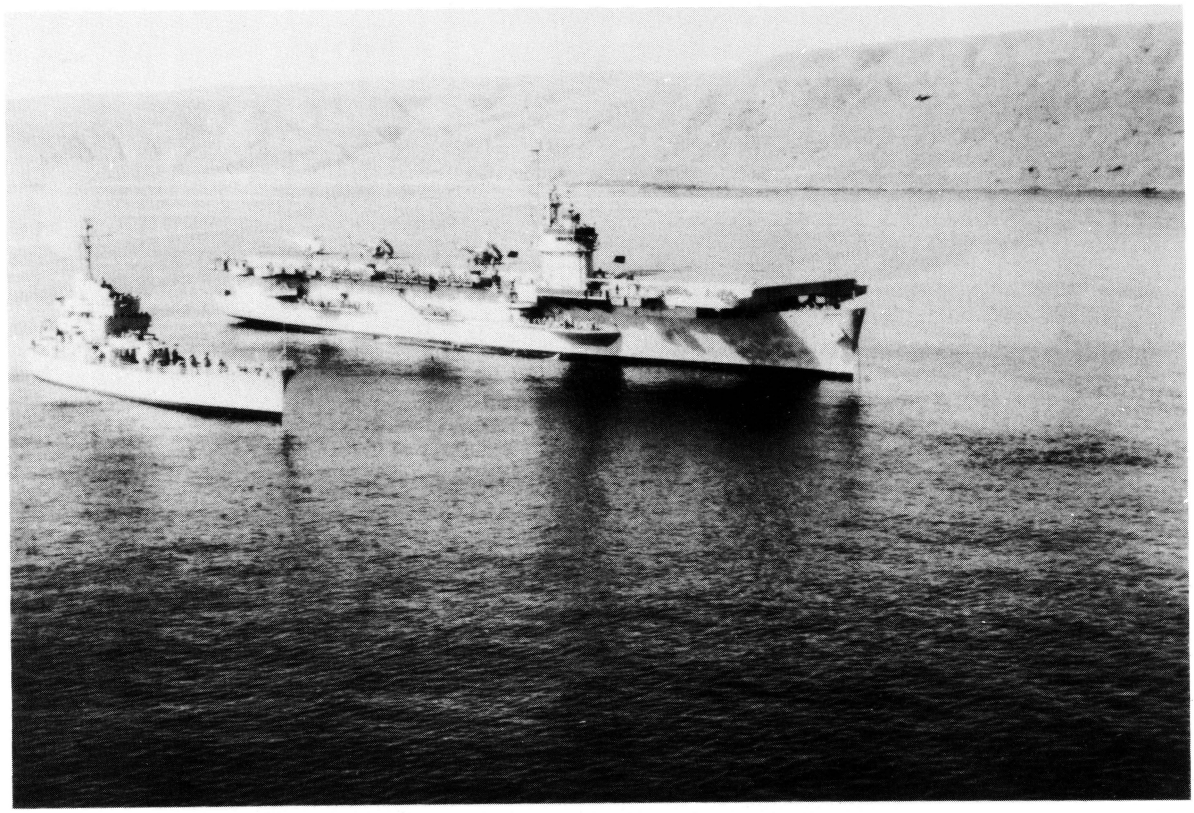


Figure 42.

Amphibious Assault Ship U.S.S. Thetis Bay. Vessel to left is the Inshore Fire-Support Ship which is also shown in Fig. 39.

LPH

Amphibious Assault Ship, Thetis Bay Class

DATE OF INTRODUCTION: 1957

NUMBER: 1 (LPH 6)

LENGTH AND BEAM: 499 by 108 ft

	Full load	Light
DRAFT:	22 ft	unk
DISPLACEMENT:	11,060 tons	9,030 tons

CAPACITY: 17,766 cu ft which includes 1,043 square feet usable for vehicles

SPEED: 19 knots (trial)
18.9 knots (max sustained)
10 knots (economical)

ENDURANCE: 8,619 n mi at 15 knots
9,868 n mi at 11 knots

ARMAMENT: Eight twin 40-mm

BOOM CAPACITY: 14,000 lb

ACCOMMODATIONS:	Crew	Other	Total
Officers	40	98	138
Enlisted	483	1,017	1,500

REMARKS: This vessel was originally constructed in 1944 as a Class 55 Escort Aircraft Carrier (CVE). It was refitted in 1956 to evaluate the feasibility of landing assault troops by helicopter and redesignated as Assault Helicopter Aircraft Carrier (CVHA). This designation was later changed to LPH. Typical helicopter complement for this type is 15 UH-34's or CH-37's.

LPH

Amphibious Assault Ships, Boxer Class

DATE OF INTRODUCTION: 1958

NUMBER: 3

LENGTH AND BEAM: 888 by 136 ft

	Full load	Light
DRAFT:	30 ft	unk
DISPLACEMENT:	37,900 tons	25,000 tons

CAPACITY: See Remarks

SPEED: 33 knots (trial)
30.9 knots (max sustained)
12 knots (economical)

ENDURANCE: 4,000 n mi at max sustained speed
17,600 n mi at economical speed

ARMAMENT: Four twin 5"/38 cal

BOOM CAPACITY: 15 tons

ACCOMMODATIONS:	Crew	Other	Total
Officers	55	221	276
Enlisted	999	1,905	2,904

REMARKS: Vessels in this class are Essex Class ASW-support aircraft carriers (CVS) serving as interim LPH's. They are capable of transporting and operating 30 CH-37 helicopters. 658,400 cu ft of space (39,840 square feet) in hangar decks is usable for stowage of vehicles or cargo. However, this space must be shared with helicopters carried.

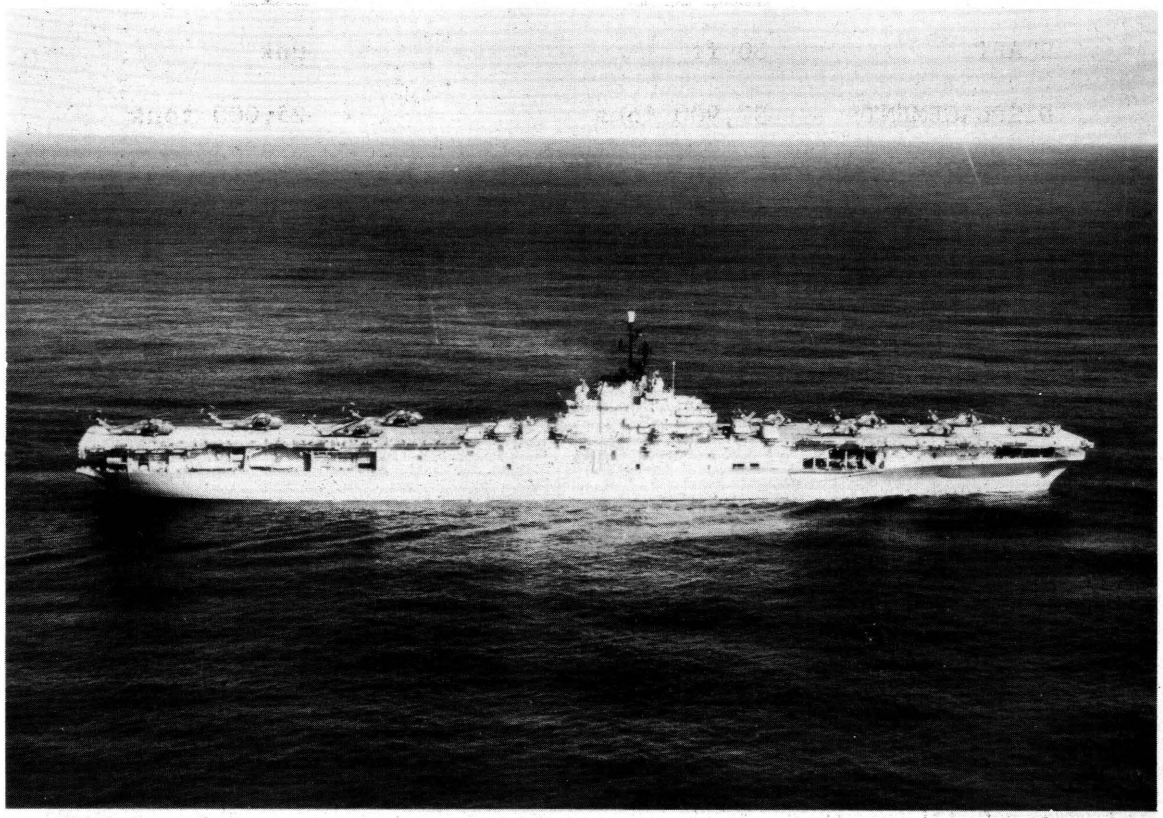


Figure 43.

Amphibious Assault Ship U.S.S. Boxer. Note assault transport helicopters on flight deck.

Figure 44.

Amphibious Assault Ship U.S.S. Iwo Jima.

LPH

Amphibious Assault Ship, Iwo Jima Class

DATE OF INTRODUCTION: 1961

NUMBER: 2 (3 under construction)

LENGTH AND BEAM: 592 by 105 ft

	Full load	Light
DRAFT:	27 ft	unk
DISPLACEMENT:	18,000 tons	11,000 tons

CAPACITY: 90,000 cu ft which includes 6,000 square feet usable for vehicle stowage (does not include helicopter stowage space)

SPEED: 20 knots (max sustained)
11.5 knots (economical)

ENDURANCE: 10,000 n mi at max sustained speed
16,600 n mi at economical speed

ARMAMENT: Four twin 3"/50 cal

BOOM CAPACITY: 20 tons

ACCOMMODATIONS:	Crew	Other	Total
Officers	61	221	282
Enlisted	536	1,905	2,441

REMARKS: These vessels will be the first of this type to be originally constructed as LPH's. They will carry two LCVP's, two LCPL's, and approximately 20 CH-37 helicopters. Each of the helicopters is capable of transporting 20 combat troops or 9,000 lb of cargo. The LPH 9 (Guam) which is under construction will be slightly different from the Iwo Jima and will probably constitute the beginning of a new class of LPH's.

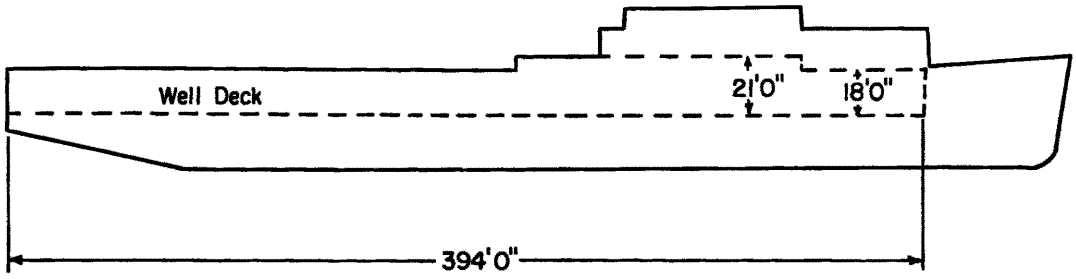
LSD

Landing Ship, Dock

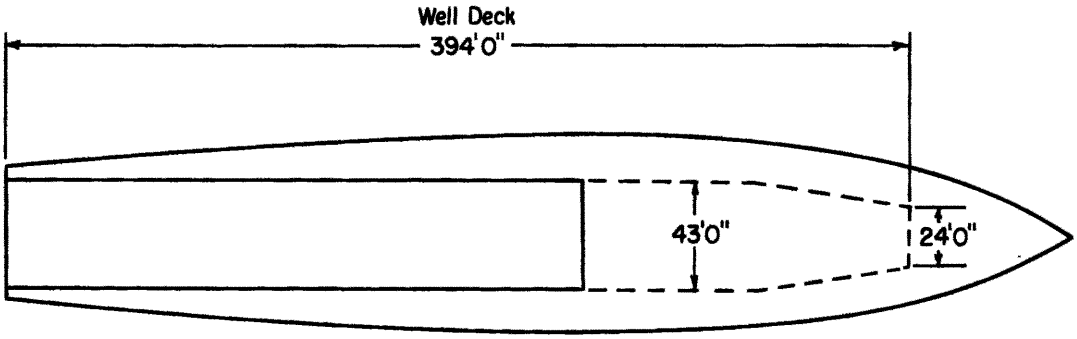
This type of vessel is not, as the name implies, a "landing ship." It cannot beach but is designed to transport and launch loaded amphibious vehicles or landing craft with their crews and embarked personnel. The unique feature of the LSD is the well deck which can be flooded, allowing amphibious vehicles or landing craft to embark or disembark under their own power. This flooding system also allows the vessel to serve as a drydock for craft and small ships.

The versatility of the LSD is increased by the use of temporary decks. A superdeck may be installed over the after portion of the well deck which gives sufficient clearance for LCU's to use the well deck while the superdeck is used for a helicopter platform or for stowage of vehicles. A "half deck" may be installed in the forward portion of the well deck to provide additional stowage for vehicles. A water barrier may be installed in the well deck to keep the forward portion dry while the after portion is flooded. Figure 45 shows the various deck arrangements commonly used.

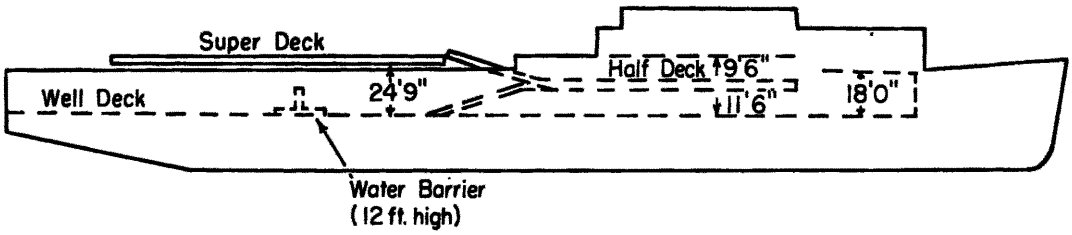
There are six different classes of LSD's. Five of these classes were constructed during WW II and are very similar. These have been grouped and described together. The Thomaston Class is quite different from the other classes and is described separately.



Profile of LSD
No Temporary Decks Installed



Plan View of LSD
No Temporary Decks Installed



Profile of LSD
With Half Deck, Super Deck
and Water Barrier Installed

Figure 45.

Diagrams of Landing Ship Dock showing well deck with and without temporary decks installed. Dimensions are for the WW II group of LSD's. Deck arrangements are the same for all LSD's.

Figure 46.

Landing Ship, Dock U.S.S. Cabildo which is typical of LSD's constructed during WW II. Note super deck which may be used as helicopter platform. Vessels in background are submarines.

LSD

Landing Ship Dock, World War II Group

DATE OF INTRODUCTION: 1943 to 1946

CLASSES: Ashland, Gunston Hall, Casa Grande, Cabildo, and Fort Marion

NUMBER: 21 in group; 1 to 9 in each class

LENGTH AND BEAM: 458 by 72 ft

	Full load	Light
DRAFT:	18 ft	14 ft
DISPLACEMENT:	7,935 to 9,385 tons	4,960 to 5,380 tons

CAPACITY: 1,700 to 2,000 tons (without temporary decks installed)

SPEED: 16 knots (trial)
14.5 to 16 knots (max sustained)
8 to 12 knots (economical)

ENDURANCE: 5,230 to 9,700 n mi at max sustained speed
9,775 to 14,300 n mi at economical speed

ARMAMENT: Two twin 40-mm
Two quad 40-mm

BOOM CAPACITY: 35 tons

ACCOMMODATIONS:	Crew	Other	Total
Officers	13 to 18	20 to 33	38 to 46
Enlisted	249 to 335	115 to 290	420 to 625

REMARKS: When well deck is flooded, draft is approximately 30 ft. Typical load for these vessels is 3 LCU's preloaded with 9 M48 Tanks, or 18 LCM(6)'s, or 47 DUKW's.

LSD

Landing Ship Dock, Thomaston Class

DATE OF INTRODUCTION: 1954

NUMBER: 8

LENGTH AND BEAM: 510 by 84 ft

	Full load	Light
DRAFT:	21 ft	17 ft
DISPLACEMENT:	12,132 tons	6,880 tons

CAPACITY: 2,400 tons (without temporary decks installed)

SPEED: 21.3 knots (trial)
21 knots (max sustained)
12 knots (economical)

ENDURANCE: 6,800 n mi at max sustained speed
12,500 n mi at economical speed

ARMAMENT: Eight twin 3"/50 cal

BOOM CAPACITY: 50 tons

ACCOMMODATIONS:	Crew	Other	Total
Officer	13	36	49
Enlisted	263	454	717

REMARKS: Has operating facilities for one helicopter. Typical load for this class is three LCU's preloaded with 9 M48 Tanks, or 18 LCM(6)'s. Normal boat complement is three LCVP's and one LCPL.

Figure 47.

Landing Ship, Dock (Thomaston Class).

CHAPTER VI

AUXILIARY EQUIPMENT

Amphibious landings are the most difficult of all military operations even under ideal conditions. Moreover, usually because of tactical or strategic reasons, landings must be made within a limited geographic area where no beaches with ideal physical properties exist. To facilitate the movement of men and supplies across these beaches the equipment described in this chapter was developed. These are as follows:

Aerial Tramway
Barge Type Self-Elevating Pier
Pontoon Section MKT6B
Pontoon Section MKT7A
Pontoon Section MKT8
Pontoon Section MKT11

Aerial Tramway

The aerial tramway is a transport system designed to carry cargo from a ship terminal to an inland transfer point. This system consists of a sea terminal and intermediate platform barges (usually self-elevating barges), a sea terminal tower, intermediate towers, a land anchor, sky cars, track cables, and traction cables. Length of the system determines the number of intermediate towers and platform barges and footage of cables. Normally six sky cars are assigned to the system, allowing four for operation and two as replacements.

When erected in a suitable environment, this system is designed to operate in snow, rain, and 40-m.p.h. winds. It can move 240,000 pounds of cargo per hour up to a distance of three miles. In general, it can handle any type of cargo within the overall dimensions of 30 by 9 by 10 feet and not exceeding a gross weight of 20,000 pounds.

The present aerial tramways are still being evaluated and have not been adopted as standard equipment. However, they have been used in the New Over-the-Beach Discharge Exercises (NODEX) in France.

Research is being carried on to create a continuous circuit system where the loaded sky cars would travel on one track and the empty sky car would return on another. This arrangement would have a greater capacity than the present system where the sky cars are limited to one track.

Figure 48.

Aerial tramway in operation during a "New Over-the-Beach Discharge Exercise" (NODEX) in France. Land anchor and sky cars are not shown in illustration. See also Fig. 49.

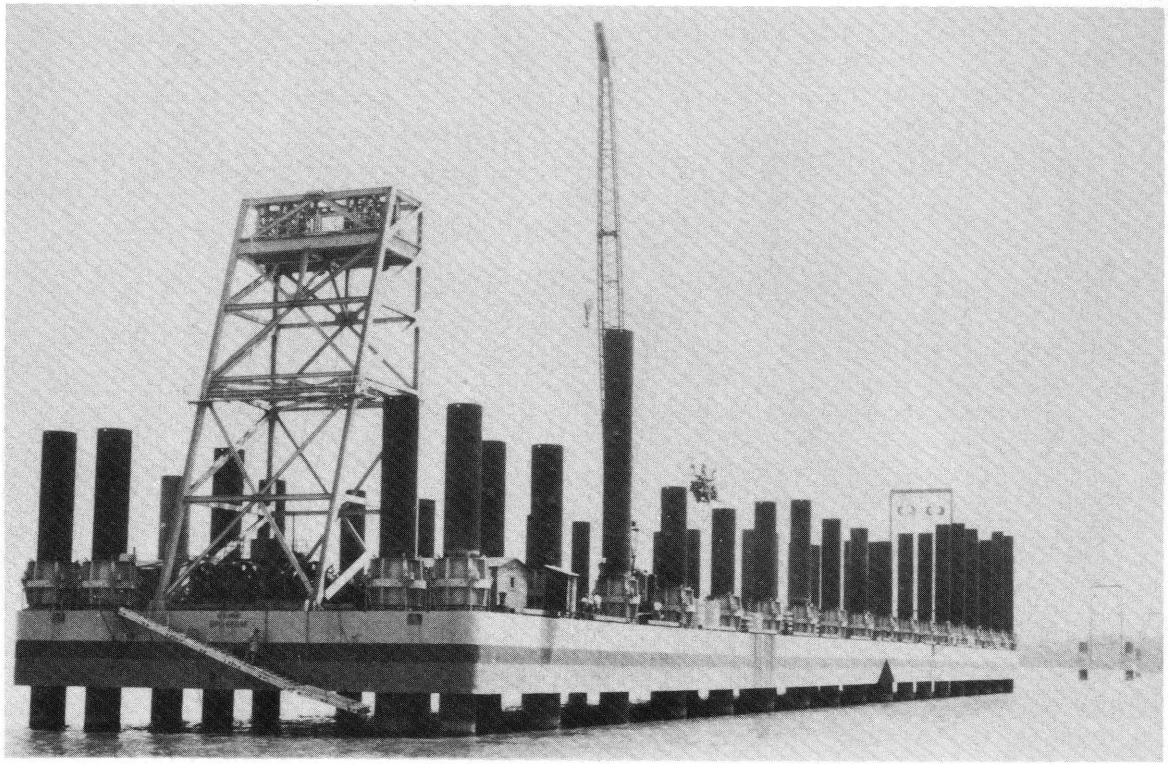


Figure 49.

Two barge type self-elevating piers being used as the sea terminal for tramway shown in Fig. 48. Note sky car.

BPL

Barge Type Self-Elevating Pier

These transportable piers can be quickly erected to provide a temporary or permanent ship terminal as for aerial tramways. By stowing caissons on deck the entire unit is capable of being towed to foreign areas. At the assembly site a deck crane lifts the caissons into their sockets. Hydraulic jacks on the caissons are then used to raise the barge the desired height above water.

BPL (250X60)

BARGE:

Length	250 ft
Beam	60 ft
Hull depth	10 ft 2 in
Weight	1,482.4 tons (light)
	1,844.4 tons (full load)

CAISSON:

Number	12
Length	100 ft
Diameter	6 ft
Weight	25.7 tons each; 308.4 tons total

BPL (427X90)

BARGE:

Length	427 ft
Beam	90 ft
Hull depth	15 ft 3 in
Weight	4,618.3 tons (light)
	5,339.5 tons (full load)

CAISSON:

Number	38
Length	100 ft
Diameter	6 ft
Weight	25.7 tons each; 976.6 tons total

Pontoon Sections

Causeways built of pontoon sections are used for unloading the cargo from LST's when the nearshore bottom slope or ship's load prohibits normal beaching. These causeways are normally constructed by bolting together 66 pontoon sections to form a unit 14 feet wide and 175 feet long. Two of these units may be carried to the objective area lashed to the sides of an LST. If more than one of these units are used for a causeway, they are normally lashed together in a lapped-end juncture, the amount of overlap depending on surf conditions. Normal length of a 2-unit causeway with this type of juncture is 300 feet. Causeways of this type have a draft of about 1 foot and can support 75 moving tons.

Mark T6B

CHARACTERISTICS:

Length	5 ft 1/2 in
Width	7 ft
Height	5 ft 1/2 in
Weight	2,200 lb
Shape	rectangular

REMARKS:
Used for the interior sections of pontoon units.

Mark T7A

CHARACTERISTICS:

Length	7 ft
Width	7 ft
Height	5 ft 1/2 in
Weight	3,560 lb
Shape	curved bilge

REMARKS:
Used for the end sections of pontoon units other than the inshore end of pontoon causeways.

Mark T8

CHARACTERISTICS:

Length	5 ft 1/2 in
Width	7 ft
Height	4 ft 11 3/8 in (wide end) 3 ft 6 in (narrow end)
Weight	2,200 lb
Shape	sloped deck

REMARKS:
Used with Mark T11 section for ramped end of pontoon causeway.

Mark T11

CHARACTERISTICS:

Length	5 ft 1/2 in
Width	7 ft
Height	3 ft 6 in (wide end) 1 ft (narrow end)
Weight	1,950 lb
Shape	ramp end

REMARKS:
Used as the inshore end of pontoon causeway.

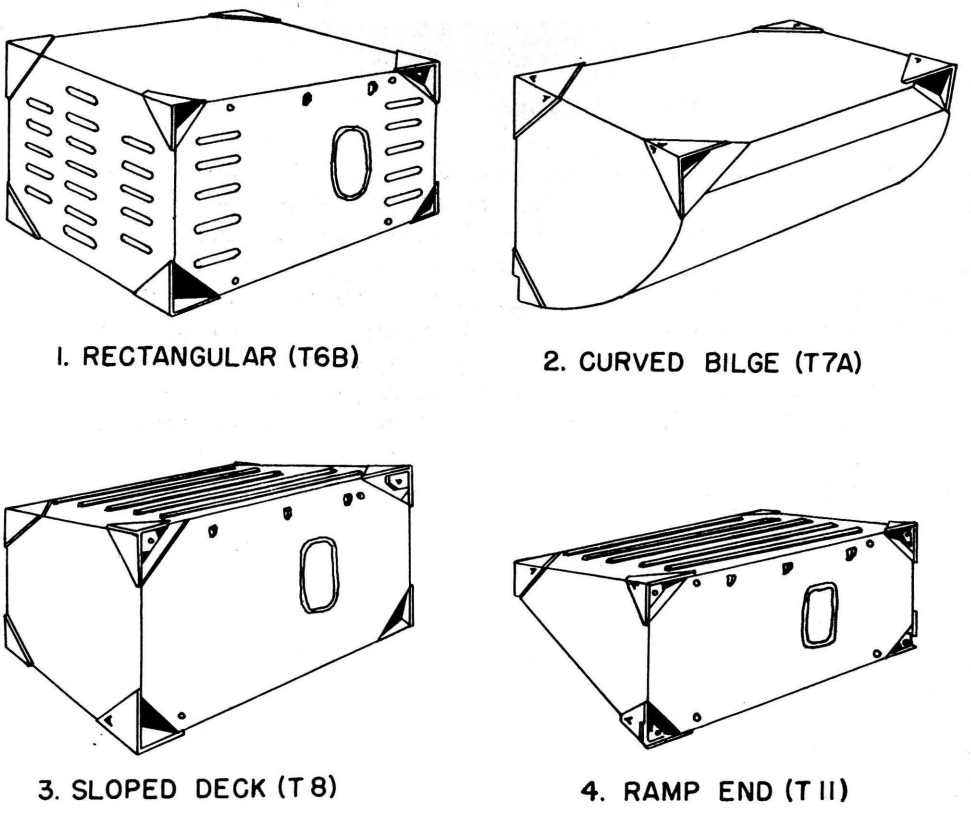


Figure 50.

Pontoon Sections.

Figure 51.

Sixty-section Pontoon units fastened together to form causeway.

APPENDIX A

LIMITING FACTORS IN LOADING LANDING CRAFT, LANDING SHIPS, AND AMPHIBIOUS VEHICLES

TYPE	DOOR CLEARANCES		CARGO COMPARTMENT SIZE	
	WIDTH	VERTICAL	WIDTH	LENGTH
LANDING CRAFT				
LCM(3)	10'11"	unrestricted	10'11"	31'6"
LCM(6)	10'11"	unrestricted	10'11"	37'6"
LCM(8)	14' 6"	unrestricted	14' 6"	44'
LCP(R)	3' 4"	unrestricted	7' 9"	*
LCU(501)	12' 6"	unrestricted	12' 6" to 26'	101'8"
LCU(1466)	14' 6"	unrestricted	14' 6" to 30'	77'6"
LCU(1608)	14' 6"	unrestricted	14' 6" to 30'	77'6"
LCU(1610)	14'	unrestricted	18' to 25'	121'
LCVP	6'10"	unrestricted	7' 5"	17'3"
LANDING SHIPS				
BDL	22'	13'8"	**	**
LSM	14'	14'	12' to 22'8"	185'11"
LST(1)	12'6"	13'9"	24'	222'6"
LST(491)	12'6"	13'9"	24'	222'6"
LST(542)	12'6"	13'9"	24'	222'6"
LST(1153)	14'2"	16'6"	30'5"	280'
LST(1156)	14'2"	17'	32'9"	275'9"
LST(1171)	15'6"	17'3"	30'6"	320'
AMPHIBIOUS VEHICLES				
BARC	14'6"	unrestricted	13'8"	37'5"
DUKW	not applicable		6'10"	12'5"
LARC-5	not applicable		8' 8"	16'
LARC-15	9'	unrestricted	13'4"	24'
LVTP(5)	7'	5' 6"	7' 3"	15'
LVTP(6)	5' 2"	5' 2"	5' 6 1/2 "	14'4"

*LCP(R) Asymetrical in plan. Port side 17'6" long, starboard 18'8" long, amidship 21'4" long (occupied by engine cover).

**Limiting length and width of BDL unknown. Deck area available for cargo is 17,800 sq. ft. Conventional trailer truck can freely drive aboard, turn around deck house island, and drive off.

APPENDIX B

COMPARATIVE TABLE OF LANDING CRAFT, LANDING SHIPS, AND AMPHIBIOUS VEHICLES CHARACTERISTICS

TYPE	PAGE	LENGTH (FEET)	BEAM (FEET)	LIGHT DISPLACEMENT (TONS)	MAX SUSTAINED SPEED (KNOTS)	NORMAL BEACHING CAPACITY (TONS)	BEACHING DRAFT FWD (FEET)	BEACHING DRAFT AFT (FEET)
LANDING CRAFT								
LCM(3)	8	50.1	14	22.6	9.5	26.8	3.5	4.5
LCM(6)	11	56.1	14	23.2	9	30.4	3	4
LCM(8)	12	73.6	21	54.4	9	53.6	3.8	5.2
LCP(R)	19	36	10.8	6.0	10	3.6	2.5	3.5
LCU(501)	23	119	32	143	5	150	3.5	4
LCU(1466)	24	118.7	34.7	196	5	170	3	5.2
LCU(1608)	24	118.7	34.7	196	6	170	3	5.2
LCU(1610)	27	135.2	29	172	8	190	3.5	6.8
LCVP	28	35.7	10.5	7.3	9	3.6	2.2	3.4
LANDING SHIPS								
BDL	32	338	65	1,549	8.5	600	4	10
LSM	35	204	35	560	12.8	147	3.5	7
LST(1-542)	40	328	50	1,780	10.8	446	4.3	10
LST(1153)	43	382	54	2,250	13	446	3.3	11.2
LST(1156)	44	384	56	2,590	13.5	446	3.5	11
LST(1171)	47	442	62	3,560	15	500	4.8	13
AMPHIBIOUS VEHICLES								
BARC	50	62.5	26.6	87.1	6 (water) 13 (land)	53.5	7.9	8.7
DUKW	53	31	8.2	5.8	5.5 (water) 43.5 (land)	2.2	3.5	4.3
LARC-5	54	35	10	9	7.8 (water) 26 (land)	4.5	4.1	4.3
LARC-15	57	45	14.5	18.8	8.2 (water) 25 (land)	13.4	5	5.5
LVTP(5)	61	29.7	11.7	28.7	5.9 (water) 26 (land)	5.4	5.8	6.1
LVTP(6)	62	21.6	10.8	17.4	4.8 (water) 28.6 (land)	3.6	4.5	4.8

APPENDIX C
INDEX OF NAVY CLASSIFICATION SYMBOLS

The following is a list of symbols officially used to designate Navy vessels and vehicles. Many of the symbols are infrequently encountered by the geographic analyst, while others, particularly those with an amphibious function, are of prime importance. Certain of the symbols are not currently used by the Navy, since it has no vessels or vehicles of that type in its present inventory. These have been indicated as "symbol inactive" under the "Classification" column. Some of the amphibious types in this list are obsolete or are under development and have been indicated as such. An attempt has also been made to correlate changes in symbol designations. The prefix "T" indicates a Navy vessel assigned to the Military Sea Transport Service (MSTS). The suffix "N" indicates the vessel has nuclear propulsion. For example, the cargo ship "Comet" is symbolized as T-AK and the submarine "Nautilus" is symbolized as SS(N).

Symbol	Function*	Classification
AB	Ser	Crane (Symbol inactive)
ABSD	Ser	Advance Base Section Dock (Changed to AFDB)
AC	Aux	Collier (Symbol inactive)
ACM	Mine	Auxiliary Mine Layer (Symbol inactive)
ACV	Aux	Auxiliary Aircraft Carrier (Changed to CVE)
AD	Aux	Destroyer Tender
ADG	Aux	Degaussing Vessel
AE	Aux	Ammunition Ship
AF	Aux	Store Ship
AFD	Ser	Auxiliary Floating Dock (Changed to AFDL)
AFDB	Ser	Large Auxiliary Floating Dry Dock
AFDL	Ser	Small Auxiliary Floating Dry Dock
AFDM	Ser	Medium Auxiliary Floating Dry Dock
AFS	Aux	Combat Store Ship
AG	Aux	Miscellaneous
AGB	Aux	Icebreaker
AGC	Amph	Amphibious Force Flagship
AGD	Ser	Seagoing Dredge (Symbol inactive)
AGDE	Aux	Escort Research Ship
AGEH	Aux	Hydrofoil Research Ship
AGL	Aux	Lighthouse Tender
AGM	Aux	Missile Range Instrumentation Ship
AGMK	Aux	Major Communications Relay Ship
AGOR	Aux	Oceanographic Research Ship
AGP	Aux	Motor Torpedo Tender (Symbol inactive)
AGR	Aux	Radar Picket Ship
AGS	Aux	Surveying Ship

AGSC	Aux	Coastal Surveying Ship
AGSL	Aux	Satellite Launching Ship
AGSS	Aux	Auxiliary Submarine
AH	Aux	Hospital Ship
AHP	Aux	Evacuation Hospital Ship (Symbol inactive)
AK	Aux	Cargo Ship
AKA	Amph	Attack Cargo Ship
AKD	Aux	Cargo Ship, Dock (Previous Symbol for Deep-hold Cargo Ship)
AKI	Aux	General Store Ship Issue (Changed to AKS)
AKL	Aux	Light Cargo Ship
AKN	Aux	Net Cargo Ship
AKS	Aux	General Stores Issue Ship
AKSS	Aux	Cargo Submarine (Symbol inactive)
AKV	Aux	Cargo Ship and Aircraft Ferry
AL	Aux	Light Ship (Symbol inactive)
AM	Mine	Mine Sweeper (Symbol inactive)
AMb	Mine	Mine Sweeper, Harbor (Symbol inactive)
AMC	Mine	Coastal Mine Sweeper (Symbol inactive; See MSC and MSC(O))
AMCU	Mine	Mine Hunter (Symbol inactive)
AMS	Mine	Motor Mine Sweeper (Symbol inactive)
AN	Aux	Net Laying Ship
AO	Aux	Oiler
AOE	Aux	Fast Combat Support Ship
AOG	Aux	Gasoline Tanker
AOSS	Aux	Submarine Tanker
AOR	Aux	Replenishment Fleet Tanker
AP	Aux	Transport
APA	Amph	Attack Transport
APB	Aux	Self-Propelled Barracks Ship
APb	Aux	Base Repair Ship (Symbol inactive)
APC	Aux	Small Coastal Transport
APD	Amph	High Speed Transport
APF	Aux	Administrative Flagship (Symbol inactive)
APG	Aux	Supporting Gunnery Ship (Symbol inactive)
APH	Aux	Transport Fitted for Evacuation of Wounded (Symbol inactive)
APL	Ser	Barracks Ship (Non-self-propelled)
APM	Amph	Mechanized-Artillery Transport (changed to LSD)
APN	Ser	Non-Mechanized-Artillery Transport (Symbol inactive)
APP	Ser	Troop Barge-Class A (Symbol inactive)
APR	Aux	Rescue Transport (Symbol inactive)
APS	Amph	Transport Submarine (changed to APSS)
APT	Ser	Troop Barge-Class B (Symbol inactive)
APV	Aux	Transport and Aircraft Ferry (Symbol inactive)
APY	Amph	Giant "Y" Boats (changed to LSI)
AR	Aux	Repair Ship
ARB	Aux	Battle Damage Repair Ship

ARC	Aux	Cable Repairing or Laying Ship
ARD	Ser	Auxiliary Floating Dry Dock
ARG	Aux	Internal Combustion Engine Repair Ship
ARH	Aux	Heavy-Hull Repair Ship (Symbol inactive)
ARL	Aux	Landing Craft Repair Ship
ARM	Aux	Heavy-Machinery Repair Ship (Symbol inactive)
ARS	Aux	Salvage Ship
ARSD	Aux	Salvage Lifting Vessel
ARST	Aux	Salvage Craft Tender
ARV	Aux	Aircraft Repair Ship
ARVA	Aux	Aircraft Repair Ship (Aircraft)
ARVE	Aux	Aircraft Repair Ship (Engine)
AS	Aux	Submarine Tender
ASR	Aux	Submarine Rescue Vessel
ASSA	Aux	Cargo Submarine (changed to AKSS)
ASSP	Amph	Transport Submarine (changed to APSS)
AT	Aux	Tug, Ocean-going (changed to ATO)
ATA	Aux	Auxiliary Ocean Tug
ATF	Aux	Fleet Ocean Tug
ATL	Amph	Tank Landing Craft (changed to LST)
ATO	Aux	Auxiliary-Ocean Tug, Old (Symbol inactive)
ATR	Aux	Rescue Ocean Tug (Symbol inactive)
AV	Aux	Seaplane Tender
AVB	Aux	Advanced Aviation Base Ship
AVC	Aux	Large Catapult Lighter (Symbol inactive)
AVD	Aux	Seaplane Tender Destroyer (Symbol inactive)
AVG	Aux	Aircraft Escort Vessel (changed to ACV)
AVM	Aux	Guided Missile Ship
AVP	Aux	Small Seaplane Tender
AVR	Aux	Aircraft Rescue Vessel (Symbol inactive)
AVS	Aux	Aviation Supply Ship
AVT	Aux	Auxiliary Aircraft Transport
AW	Aux	Distilling Ship
AWK	Aux	Water Tanker
AZ	Aux	Airship Tender (Lighter than air) (changed to AV)
BB	War	Battleship
BBG	War	Guided Missile Capital Ship (Symbol inactive)
BM	War	Monitor (Symbol inactive)
CA	War	Heavy Cruiser
CAG	War	Guided Missile Heavy Cruiser
CB	War	Large Cruiser (Symbol inactive)
CBC	War	Large Tactical Command Ship (Symbol inactive)
CC	War	Command Ship (Previous Symbol for Battle Cruiser)
CF	War	Flying-Deck Cruiser (Symbol inactive)
CG	War	Guided Missile Cruiser
CL	War	Light Cruiser
CLAA	War	Anti-Aircraft Light Cruiser
CLC	War	Tactical Command Ship (Symbol inactive)

CLG	War	Guided Missile Light Cruiser
CLK	War	Cruiser-Hunter Killer Ship (Symbol inactive)
CM	Mine	Minelayer (Symbol inactive; see MMA, MMC, and MMF)
CMC	Mine	Coastal Minelayer (changed to MMC)
CV	War	Aircraft carrier (changed to CVA)
CVA	War	Attack Aircraft Carrier
CVB	War	Aircraft Carrier, Large (changed to CVA)
CVE	War	Escort Aircraft Carrier (Symbol inactive)
CVHA	Amph	Assault Helicopter Aircraft Carrier (changed to LPH)
CVHE	War	Escort Helicopter Aircraft Carrier (Symbol inactive)
CVL	War	Small Aircraft Carrier
CVS	War	ASW Support Aircraft Carrier (Previous Symbol for Seaplane Carrier)
CVU	War	Utility Aircraft Carrier (Symbol inactive)
DD	War	Destroyer
DDC	War	Corvette (Symbol inactive)
DDE	War	Escort Destroyer
DDG	War	Guided Missile Destroyer
DDK	War	Hunter Killer Destroyer (Symbol inactive)
DDR	War	Radar Picket Destroyer
DE	Pat	Escort Vessel
DEC	Amph	Control Escort Vessel (Symbol inactive)
DER	Pat	Radar Picket Escort Vessel
DL	War	Frigate
DLG	War	Guided Missile Frigate
DM	Mine	Minelayer, Destroyer
DMS	Mine	Minesweeper, Destroyer (Symbol inactive)
IFS	Amph	Inshore Fire Support Ship
IX	Aux	Unclassified Miscellaneous
LBP	Amph	Personnel Landing Boats (Symbol inactive)
LBS	Amph	Support Landing Boats (Symbol inactive)
LBV	Amph	Vehicle Landing Boat (Symbol inactive)
LCA	Amph	Landing Craft Assault (Under Development)
LCC (1)	Amph	Landing Craft Control, MKI (Obsolete)
LCC (2)	Amph	Landing Craft Control, MKII (Obsolete)
LCFF	Amph	Landing Craft Infantry, Flotilla Flagship (changed to LSFF)
LCI (FF)	Amph	Landing Craft Infantry, Flotilla Flagship (changed to LCFF)
LCIG	Amph	Landing Craft Infantry, Gunboat (changed to LSIG)
LCIL	Amph	Landing Craft Infantry, Large (changed to LSIL)
LCIM	Amph	Landing Craft Infantry, Mortar (changed to LSIM)
LCIR	Amph	Landing Craft Infantry, Rocket (changed to LSIR)

LCM (2)	Amph	Landing Craft, Mechanized MKII (Obsolete)
LCM (3)	Amph	Landing Craft, Mechanized MKIII
LCM (6)	Amph	Landing Craft, Mechanized MKVI
LCM (8)	Amph	Landing Craft, Mechanized MKVIII
LCPL	Amph	Landing Craft Personnel, Large
LCP (N)	Amph	Landing Craft Personnel, Nested (Obsolete)
LCPR	Amph	Landing Craft Personnel, Ramped
LCSL	Amph	Landing Craft Infantry, Support (changed to LSSL)
LCS (S)(1)	Amph	Landing Craft Support, Small MKI (Obsolete)
LCS (S)(2)	Amph	Landing Craft Support, Small MKII (Obsolete)
LCT	Amph	Landing Craft Utility (changed to LSTS)
LCT (5)	Amph	Landing Craft Tank MKV (changed to LCT)
LCT (6)	Amph	Landing Craft Tank MKVI (changed to LCT)
LCT (7)	Amph	Landing Craft Tank MKVII (changed to LSM)
LCU	Amph	Landing Craft Utility
LCV	Amph	Landing Craft Vehicle (Obsolete)
LCV (2)	Amph	Landing Craft Vehicle MKII (Obsolete)
LCVP	Amph	Landing Craft Vehicle, Personnel
LPD	Amph	Amphibious Transport Dock
LPH	Amph	Amphibious Assault Ship
LSD	Amph	Landing Ship Dock
LSFF	Amph	Landing Ship Flotilla Flagship (Symbol inactive)
LSI	Amph	Landing Ship Infantry (Obsolete)
LSIG	Amph	Landing Ship Infantry Gunboat (Obsolete)
LSIL	Amph	Landing Ship Infantry, Large (Obsolete)
LSIM	Amph	Landing Ship Infantry, Mortar (Obsolete)
LSIR	Amph	Landing Ship Infantry, Rocket (Obsolete)
LSM	Amph	Landing Ship Medium
LSMR	Amph	Landing Ship Medium, Rocket
LST	Amph	Landing Ship, Tank
LSTH	Amph	Landing Ship, Tank (casualty evacuation) (Symbol inactive)
LSTS	Amph	Landing Ship Utility (changed to LSU)
LSSL	Amph	Landing Ship Support, Large (Obsolete)
LSU	Amph	Landing Ship Utility (changed to LCU)
LSV	Amph	Landing Ship, Vehicle (Obsolete)
LVT (1)	Amph	Landing Vehicle, Tracked MKI "Alligator" (Obsolete)
LVT (2)	Amph	Landing Vehicle, Tracked MKII "Water Buffalo" (Obsolete)
LVT (3)	Amph	Landing Vehicle, Tracked MKIII (Obsolete)
LVT (3)(c)	Amph	Landing Vehicle, Tracked, Covered MKIII (Obsolete)
LVT (4)	Amph	Landing Vehicle, Tracked MKIV (Obsolete)
LVT (5)	Amph	Landing Vehicle, Tracked MKV (changed to LVTP-5)
LVT (A)(1)	Amph	Landing Vehicle Tracked, Armored MKI "Water Buffalo" (turret type) (Obsolete)

LVT (A)(2)	Amph	Landing Vehicle Tracked, Armored MKII "Water Buffalo" (canopy type) (Obsolete)
LVT (A)(3)	Amph	Landing Vehicle Tracked, Armored MKIII (Obsolete)
LVT (A)(4)	Amph	Landing Vehicle Tracked, Armored (Obsolete)
LVT (A)(5)	Amph	Landing Vehicle Tracked, Armored (Obsolete)
LVTAA-1	Amph	Landing Vehicle Tracked, Anti-Aircraft Artillery Weapons Carrier MKI (under development)
LVTAA-X-1	Amph	Landing Vehicle Tracked, Weapons Carrier (Experimental) MK I
LVTC	Amph	Landing Vehicle Tracked, Control
LVTE-X-1	Amph	Landing Vehicle Tracked, Engineer (Experimental) MKI
LVTH (6)	Amph	Landing Vehicle Tracked, Howitzer MKVI
LVTH (A)(6)	Amph	Landing Vehicle Tracked Howitzer, Armored MKVI (changed to LVTH (6))
LVTH-X-4	Amph	Landing Vehicle Tracked, Howitzer (Experimental) MKIV
LVTP-5	Amph	Landing Vehicle Tracked, Personnel MKV
LVTR-1	Amph	Landing Vehicle Tracked, Recovery MKI
LVTR-X-1	Amph	Landing Vehicle Tracked, Recovery (Experimental) MKI
LVTU-X-1	Amph	Landing Vehicle Tracked, Utility Cargo Vehicle (Experimental, 1st Cargo)
LVTU-X-2	Amph	Landing Vehicle Tracked, Utility Cargo Vehicle (Experimental) MKII
MCS	Mine	Mine Countermeasures Support Ship
MHA	Mine	Minehunter, Auxiliary
MHC	Mine	Minehunter, Coastal
MM	Mine	Minelayer, Fleet (changed to MMF)
MMA	Mine	Minelayer, Auxiliary
MMC	Mine	Minelayer, Coastal
MMF	Mine	Minelayer, Fleet
MSA	Mine	Minesweeper, Auxiliary (Symbol inactive)
MSB	Ser	Mine Sweeping Boat
MSC	Mine	Minesweeper, Coastal (nonmagnetic)
MSC (0)	Mine	Minesweeper, Coastal (old)
MSF	Mine	Minesweeper, Fleet (steel hulled)
MSI	Ser	Minesweeper, Inshore
MSO	Mine	Minesweeper, Ocean (nonmagnetic)
MSS	Mine	Minesweeper, special
PC	Pat	Submarine Chaser (173')
PCC	Pat	Submarine Chaser, Control (173') (Symbol inactive)
PCE	Pat	Escort (180')
PCEC	Pat	Escort Control (180') (Symbol inactive)
PCER	Pat	Rescue Escort (180')

PCH	Pat	Submarine Chaser, Hydrofoil
PCS	Pat	Submarine Chaser (136')
PCSC	Pat	Submarine Chaser, Control (136') (Symbol inactive)
PE	Ser	Eagle (training ship) (Symbol inactive)
PF	Pat	Patrol Escort (Previous Symbol for Frigate)
PG	Pat	Gunboat (Symbol inactive)
PGM	Pat	Motor Gunboat
PR	Pat	River Gunboat (Symbol inactive)
PT	Ser	Motor Torpedo Boat (Symbol inactive)
PTC	Pat	Motor Boat-Subchaser (Symbol inactive)
PTF	Pat	Fast Patrol Boat
PY	Pat	Yacht
PYC	Ser	Coastal Yacht
SC	Pat	Submarine Chaser (110')
SCC	Pat	Submarine Chaser, Control (110') (Symbol inactive)
SF	War	Fleet Submarine (Symbol inactive)
SM	War	Mine Laying Submarine (Symbol inactive)
SS	War	Submarine
SSA	Aux	Cargo Submarine (changed to AKSS)
SSB	War	Fleet Ballistic Missile Submarine
SSC	War	Fleet Submarine (Cruiser Type)
SSG	War	Guided Missile Submarine
SSK	War	Anti-Submarine Submarine
SSO	Aux	Submarine Oiler (changed to AOSS)
SSP	Aux	Submarine Transport (changed to APSS)
SSR	War	Radar Picket Submarine (Symbol inactive)
SST	Ser	Target and Training Submarine
TA	Amph	Amphibian Tractor (Symbol inactive)
TAA	Amph	Amphibian Tractor, Armored (Symbol inactive)
TKA	Amph	Amphibian Truck (Symbol inactive)
TLL	Amph	Tank Lighter (Symbol inactive)
TLLW	Amph	Tank Lighter, Medium Tank-well type (Symbol inactive)
X	Ser	Submersible Craft
XMAP	Mine	Sweeper Device (Inactive symbol)
YAG	Ser	Miscellaneous Auxiliary
YC	Ser	Open Lighter
YCF	Ser	Car Float
YCK	Ser	Open Cargo Lighter
YCV	Ser	Aircraft Transportation Lighter
YD	Ser	Floating Derrick
YDT	Ser	Diving Tender
YF	Ser	Covered Lighter (Self-Propelled)
YFB	Ser	Ferryboat or Launch
YFD	Ser	Yard Floating Dry Dock
YFN	Ser	Covered Lighter (Non-Self-Propelled)
YFNB	Ser	Large Covered Lighter
YFND	Ser	Drydock Companion Craft

YFNX	Ser	Lighter (Special Purpose)
YFP	Ser	Floating Power Barge
YFR	Ser	Refrigerated Covered Lighter (Self-Propelled)
YFRN	Ser	Refrigerated Covered Lighter (Non-Self-Propelled)
YFRT	Ser	Covered Lighter (Range Tender)
YFT	Ser	Torpedo Transportation Lighter
YFU	Ser	Harbor Utility Craft
YG	Ser	Garbage Lighter (Self-Propelled)
YGN	Ser	Garbage Lighter (Non-Self-Propelled)
YHB	Ser	Houseboat
YLA	Amph	Open Landing Lighter (Inactive symbol)
YM	Ser	Dredge
YMP	Ser	Motor Mine Planter
YMS	Ser	Auxiliary Motor Minesweeper
YNG	Ser	Gate Vessel
YO	Ser	Fuel Oil Barge (Self-Propelled)
YOG	Ser	Gasoline Barge (Self-Propelled)
YOGN	Ser	Gasoline Barge (Non-Self-Propelled)
YON	Ser	Fuel Oil Barge (Non-Self-Propelled)
YOS	Ser	Oil Storage Barge
YP	Ser	Patrol Vessel
YPD	Ser	Floating Pile Driver
YR	Ser	Floating Workshop
YRB	Ser	Submarine Repair and Berthing Barge
YRBM	Ser	Submarine Repair, Berthing, and Messing Barge
YRDH	Ser	Floating Dry Dock Workshop (Hull)
YRDM	Ser	Floating Dry Dock Workshop (Mach.)
YRL	Ser	Covered Lighter (Repair)
YSD	Ser	Seaplane Wrecking Derrick
YSR	Ser	Sludge Removal Barge
YTB	Ser	Large Harbor Tug
YTL	Ser	Small Harbor Tug
YTM	Ser	Medium Harbor Tug
YTT	Ser	Torpedo Testing Barge
YV	Ser	Drone Aircraft Catapult Control Craft
YW	Ser	Water Barge (Self-Propelled)
YWN	Ser	Water Barge (Non-Self-Propelled)

*Amph - Amphibious; Aux - Auxiliary; Pat - Patrol; Ser - Service; War - Warship.

APPENDIX D

SAMPLE BEACHING LOADS FOR LANDING CRAFT, LANDING SHIPS, AND AMPHIBIOUS VEHICLES

	Plan 1	Plan 2	Plan 3
LANDING CRAFT			
LCM(3)	60 trps.	2 Ontos (M-50)	1 105-mm. how. and 1 2½-ton trk.
LCM(6)	80 trps.	3 jeeps	1 105-mm. how. and 1 2½-ton trk.
LCM(8)	200 trps.	2 D-8 bulldozers	1 M-48 tk. and 40 trps.
LCP(R)	36 trps.	1278 indiv. cmbt. rat.	141 rds. of 105-mm. ammo.
LCU(501)	5 M-41 lt. tks.	6 2½-ton trks. and 4 jeeps	3 M-48 med. tks.
LCU(1466)	5 M-41 lt. tks.	8 2½-ton trks.	3 M-48 med. tks.
LCU(1608)	5 M-41 lt. tks.	8 2½-ton trks.	3 M-48 med. tks.
LCU(1610)	6 M-41 lt. tks.	8 2½-ton trks.	3 M-48 med. tks.
LCVP	36 trps.	1 jeep with tlr. and 17 trps.	1 105-mm. how. and 15 trps.
LANDING SHIPS			
BDL	100 2½-ton trks.	20 M-48 med. tks.	50 M-59 pers. carr.
LSM	9 DUKW's	3 M-48 med. tks.	5 LVTP(5)s
LST(1-542)	32 2½-ton trks.	10 M-48 med. tks.	8 M103 tks.
LST(1153)	35 2½-ton trks.	10 M-48 med. tks.	8 M103 tks.
LST(1156)	40 2½-ton trks.	10 M-48 med. tks.	8 M103 tks.
LST(1171)	69 2½-ton trks.	15 M-48 med. tks.	45 M-59 pers. carr.
AMPHIBIOUS VEHICLES			
BARC	9 jeeps	1 2½-ton trk. and 1-ton tlr.	2 M-59 pers. carr.
DUKW	25 trps.	1 105-mm. how.	12 litter pnts.
LARC-5	25 trps.	1 105-mm. how.	25 55-gal. drums of gas.
LARC-15	4 jeeps	1 2½-ton trk.	75 55-gal. drums of gas.
LVTP(5)	34 trps.	1 jeep with tlr.	1 105-mm. how.
LVTP(6)	20 trps.	1 jeep	138 rds. of 105-mm. ammo.

APPENDIX E

REFERENCES

In addition to the published references listed below, sources used to compile this EIG include Bureau of Ship's Characteristics Sheet (design specification data sheets), blueprints, Ship's Characteristics Cards, Ship's Loading Characteristics Pamphlets, and miscellaneous information sheets compiled by various branches of the Army and Navy of the United States.

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Senior Advisor, 416th Engineer Brigade, Cicero, Illinois Area Command (USAR), Cicero USAR Center	1
Waterways Experiment Station	2
Commanding Officer, 2nd Engineer Amphibious Support Command	5

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U.S. Atlantic Fleet	1
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Commander 1st Fleet	1
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Commander 6th Fleet	1
Commander 7th Fleet	1

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Commander U.S. Naval Force Japan	1
Commander U.S. Naval Force Iceland	1
Commander U.S. Naval Force Marianas	1
Commander U.S. Naval Force Philippines	1
Commander U.S. Naval Force Korea	1
Commander Middle East Force	1
Commander South Atlantic Force	1
Commander Key West Force	1
Commander U.S. Taiwan Patrol Force Pacific Fleet	1
U.S. Commander Eastern Atlantic	1

4. Type Commands

Commander Amphibious Force U.S. Pacific Fleet	1
Commander Amphibious Force U.S. Atlantic Fleet	1
Commander Mine Force U.S. Atlantic Fleet	1
Commander Mine Force U.S. Pacific Fleet	1

Commander Service Force U.S. Pacific Fleet 1
Commander Service Force U.S. Atlantic Fleet 1
Commander Submarine Force U.S. Atlantic Fleet 1
Commander Submarine Force U.S. Pacific Fleet 1
Commander Training Command U.S. Pacific Fleet 1
Commander Training Command U.S. Atlantic Fleet 1
Commanding General Fleet Marine Force Pacific 1
Commanding General Fleet Marine Force Atlantic 1

5. Amphibious Commands

Commander Amphibious Training Command U.S. Pacific Fleet . . 1
Commander Amphibious Training Command U.S. Atlantic Fleet . 1
Commander Amphibious Group 1 1
Commander Amphibious Group 2 1
Commander Amphibious Group 3 1
Commander Amphibious Group 4 1
Commander Amphibious 7th Fleet 1
Commander Naval Beach Group 1 1
Commander Naval Beach Group 2 1
Western Pacific Detachment Naval Beach Group 1 1
Beach Master Unit 1 1
Beach Master Unit 2 1
Assault Craft Unit 1 1
Assault Craft Unit 2 1
Beach Jumper Unit 1 1
Beach Jumper Unit 2 1
Western Pacific Detachment Beach Master Unit 1 1

6. Fleet Training Groups

Commander Fleet Training Group Charleston, South Carolina . 1
Commander Fleet Training Group Key West, Florida 1
Commander Fleet Training Group Newport, Rhode Island 1
Commander Fleet Training Group Norfolk, Virginia 1
Commander Fleet Training Group San Diego 1
Commander Fleet Training Western Pacific 1
Fleet Training Group Guantanamo Bay, Cuba 1
Commander Fleet Training Group Pearl Harbor, Hawaii 1
Officer in Charge Underway Training Unit Norfolk, Virginia . 1
Amphibious Operational Training Unit U.S. Atlantic Fleet . . 1
Amphibious Operational Training Unit U.S. Pacific Fleet . . 1
Landing Force Training Units Amphibious Training Command
Atlantic Fleet 1
Landing Force Training Units Amphibious Training Command
Pacific Fleet 1
U.S. Naval Cargo Handling Battalion Number 1 1
U.S. Naval Cargo Handling Battalion Number 2 1

7. Sea Frontier Commands

Commander Eastern Sea Frontier	1
Commander Hawaiian Sea Frontier	1
Commander Western Sea Frontier	1
Commander Caribbean Sea Frontier	1

8. Landing Ship and Amphibious Squadrons

Commander Landing Fleet Flotilla 1	1
Commander Landing 1 Squadron 1	1
Commander Landing 1 Squadron 3	1
Commander Landing 1 Squadron 9	1
Commander LST Division 92	1
Landing Craft Utility Squadron 1	1
Commander Service Squadron 1	1
Commander Service Squadron 2	1
Commander Service Squadron 3	1
Commander Service Squadron 4	1
Commander Service Squadron 6	1
Commander Service Squadron 8	1
Commander Amphibious Squadron 1	1
Commander Amphibious Squadron 2	1
Commander Amphibious Squadron 3	1
Commander Amphibious Squadron 4	1
Commander Amphibious Squadron 5	1
Commander Amphibious Squadron 6	1
Commander Amphibious Squadron 7	1
Commander Amphibious Squadron 8	
Commander Amphibious Squadron 10	1
Commander Amphibious Squadron 12	1

9. Amphibious Ships

USS El Dorado	(AGC 11)	1
USS Mount McKinley	(AGC 7)	1
USS Pocono	(AGC 16)	1
USS Taconic	(AGC 17)	1
USS Bayfield	(APA 33)	1
USS Cambria	(APA 36)	1
USS Chilton	(APA 38)	1
USS George Clymer	(APA 27)	1
USS Fremont	(APA 44)	1
USS Henrico	(APA 45)	1
USS Francis Marion	(APA 249)	1
USS Monrovia	(APA 31)	1
USS Paul Revere	(APA 248)	1
USS Boxer	(LPH 4)	1
USS Stone County	(LST 1141)	1
USS Terrell County	(LST 1157)	1
USS Tayuga County	(LST 1158)	1
USS Tom Green County	(LST 1159)	1
USS Wexford County	(LST 1168)	1

10. Reserve Fleets

Commander Pacific Reserve Fleet	1
Commander Atlantic Reserve Fleet	1

11. Construction Battalions

Commander Naval Construction Battalions U.S. Atlantic Fleet	1
Commander Naval Construction Battalions U.S. Pacific Fleet	1
Mobile Construction Battalion 1	1
Mobile Construction Battalion 2	1
Mobile Construction Battalion 3	1
Mobile Construction Battalion 4	1
Mobile Construction Battalion 5	1
Mobile Construction Battalion 6	1
Mobile Construction Battalion 7	1
Mobile Construction Battalion 8	1
Mobile Construction Battalion 9	1
Mobile Construction Battalion 10	1
Mobile Construction Battalion 11	1
Amphibious Construction Battalion 1	1
Amphibious Construction Battalion 2	1
US Naval Construction Battalion Base Unit	1

12. MSTS Offices

US Naval Control of Shipping Officer (Bahrian)	1
Commander Military Sea Transportation Service	1
Commander Military Sea Transportation Service Atlantic Fleet	1
Commander Military Sea Transportation Service Eastern Atlantic and Mediterranean Area	1
Commander Military Sea Transportation Service Pacific Area	1
Commander Military Sea Transportation Service Far East Area	1

13. Miscellaneous

Atlantic Fleet Air Intelligence Training Center	2
Pacific Fleet Air Intelligence Training Center	2
Commanding General First Marine Division FMF	1
Commanding General Second Marine Division FMF	1
Commanding General Third Marine Division FMF	1
Commander in Chief U.S. European Command	1
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US Military Assistance Command Thailand	1
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Fleet Intelligence Center Pacific	2
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Fleet Training Center, Norfolk	1
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Oceanographer, U.S. Navy Oceanographic Office	1
District Intelligence Officer 1 Naval District	1
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District Intelligence Officer 9 Naval District	1
District Intelligence Officer 15 Naval District	1
District Intelligence Officer 14 Naval District	1
District Intelligence Officer 17 Naval District	1
District Intelligence Officer 8 Naval District	1
District Intelligence Officer 3 Naval District	1
District Intelligence Officer 5 Naval District	1
District Intelligence Officer 4 Naval District	1
District Intelligence Officer 11 Naval District	1
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