All Hands

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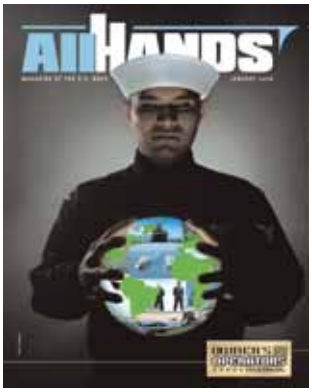
Photo Illustration

OWNER'S and OPERATOR'S manual



[On the Front Cover]

Photo Illustration by
PH1(AW) Shane T. McCoy

[Next Month]

All Hands heads to Egypt for Exercise *Bright Star*. We also talked to the Sailors assigned to Mobile Security Detachment (MSD) 26, while we were in Egypt.

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January

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The Master Chief Petty Officer of the Navy's Naval Heritage/Core Values Reading Guide list can be found at: *www.navy.mil/palib/mcpon/readgide.html*

Each of the books on this list contains sound management concepts and ideas that can be applied to your leadership role in the Navy.

CNO's Introduction:

Welcome to the 2006 edition of the *All Hands* "Owner's and Operator's Manual."

Since *All Hands* began issuing this special edition in 1994, it has become one of the most popular and useful "quick reference" guides for our Navy. In fact, during my visits to the fleet, it is rare for me to enter a space and not see a copy laying open on a workbench or table, or meet a Sailor who hasn't seen the latest edition.

As many of you know, one of the reasons for its popularity is that it provides the answers to many of the questions Sailors and Navy watchers ask most. You'll find just about everything you need to know right here in these pages, from pay rates to weapons systems, ship types to shore installations. I encourage you to use it, read it and keep it close.

The most important feature of this issue is the title itself: "Owner's and Operator's Manual." It speaks right to the heart of what this and every *All Hands* edition is truly about – you, the American Sailor.

You are the owners and operators of our Navy, the lifeblood of the world's most powerful fleet. All our technology and machines aloft, afloat or ashore are but lifeless, empty shells without you to make them work and fight as part of the joint force. A diverse and talented team, you take the sum total of all our tremendous capabilities and wield unparalleled sea power for the nation, its allies and partners.

Make no mistake. It is our job – and our first imperative – to win the nation's wars. It always has been and always will be. And I simply couldn't be more proud of your performance in that regard. As I write this, thousands of you are helping take the fight to the enemy, keeping him on the defensive, disrupting his plans and fostering peace and security for millions of people the world over.

But, as we have clearly seen in the past year, sea power is just as much about providing hope as it is about protecting freedom. When the 2005 "Owner's and Operator's Manual" went to press, many of you were in Indonesia delivering desperately needed aid to tsunami victims in one of the greatest humanitarian undertakings in history.

And as this edition goes to press, you are at it once again, working feverishly to provide relief for those hit hard by hurricanes on our own shores, and the earthquake victims in Pakistan. It is not lost on me, or anyone else, that many of you rebuilding the shattered infrastructure of Pakistan today are the very same Sailors who lost your own homes to Hurricane Katrina last August. Yours is a service and a sacrifice hard to comprehend and yet so easy to see.

My message to all of you is this: stay ready. If past is truly prologue – and I believe it is – our Navy will be just as busy in 2006 as it was in 2005. The national and international demand for ready naval forces will not diminish. Indeed, it will likely grow. The combatant commanders know we bring to the joint effort unique and flexible expeditionary capabilities, regardless of whether that effort requires open conflict or open hands. But they also know we wouldn't be able to deliver those capabilities without your unwavering dedication, talent, professionalism and skill.

This is, after all, your fleet – your Navy. You make it run. Thank you for serving, owning and operating it so incredibly well at this critical time in our nation's history.

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ALL HANDS

Recipient of the following Awards of Magazine Excellence for 2000-2004:

Unified Commands

NAVAL COMPONENT COMMANDS AND NUMBERED FLEETS

The map depicts the Unified Commands having geographic areas of responsibility. The Navy supports those regional Unified Commands with component and numbered fleets.

U.S. NORTHERN COMMAND (USNORTHCOM)

U.S. Fleet Forces Command

Headquarters: Norfolk
Mission: U.S. Fleet Forces Command organizes, mans, trains and equips Navy forces and provides planning support to combatant commanders; deters, detects and defends against homeland maritime threats; and articulates fleet war-fighting and readiness capabilities to the Chief of Naval Operations. CFFC strives to have an effectively prepared total Navy force, ready to win in combat; to authoritatively define consistently accepted fleet readiness and war-fighting capabilities; and to provide transformational change through CONOPs and doctrine development, and agile, powerful and persistent Navy forces and operational planning from combatant commanders to the Chief of Naval Operations.

U.S. 2nd Fleet

Headquarters: Norfolk
Mission: Commander, U.S. 2nd Fleet is responsible for U.S. Navy operations and defense of U.S. interests in the North Atlantic Ocean, and is also responsible for the training/certification of East Coast Carrier Strike Groups and Expeditionary Strike Groups.
Area of Operations (AO): The North Atlantic Ocean
Flagship: Rotational

U.S. PACIFIC COMMAND (USPACOM)

U.S. Pacific Fleet

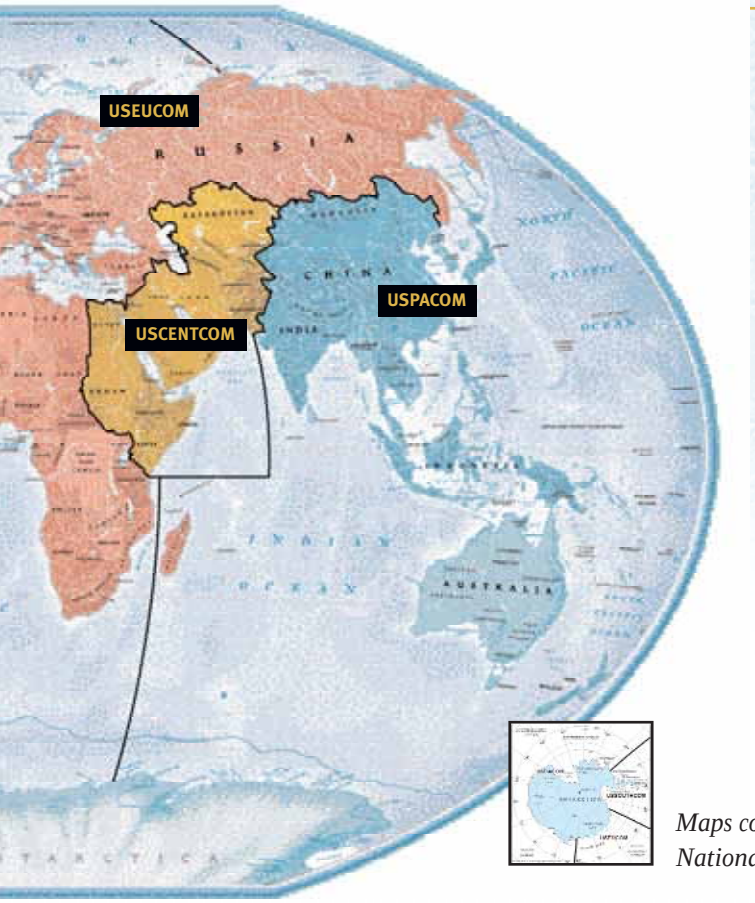
Headquarters: Pearl Harbor
Mission: Commander, U.S. Pacific Fleet (COMPACFLT), operates in support of the USPACOM Theater Security Strategy, and provides interoperable, trained and combat-ready naval forces to Commander, USPACOM and other U.S. combatant commanders, as required. In addition to these traditional Title X responsibilities, COMPACFLT has an increasing operational role as Commander, Joint Task Force 519. This mission requires COMPACFLT to not only maintain the training and readiness of the Joint Task Force headquarters staff, but also command the joint force during times of conflict, crisis or war.

U.S. 3rd Fleet

Headquarters: San Diego
Mission: Commander, U.S. 3rd Fleet is responsible for U.S. Navy operations and defense of U.S. interests in the Pacific Ocean from the North Pole to the South Pole and from the continental West Coast to the international date line. The U.S. 3rd Fleet is responsible for the training/certification of West Coast Carrier Strike Groups and Expeditionary Strike Groups.
AO: The Pacific Ocean from CONUS West Coast to the International Date Line.

U.S. 7th Fleet

Headquarters: Yokosuka, Japan
Mission: Commander, U.S. 7th Fleet's responsibility is to defend and protect the territory, citizens, commerce, sea lanes, allies and other vital interests of the United States; deter aggression with capable, flexible and mobile U.S. naval forces, cooperating closely with other U.S. military services and the forces of allied and friendly nations; if deterrence fails, conduct prompt and sustained combat operations to terminate hostilities on terms favorable to the United States and allies. Commander, U.S. 7th Fleet wears three hats: as operational commander for all naval forces in the region; as a Joint Task Force commander in the event of natural disaster or joint mili-



Maps courtesy of the National Geographic Society.

tary operation; and as the Combined Naval Component Commander for the defense of the Korean peninsula; in the event of hostilities, all friendly naval forces in the theater would fall under 7th Fleet control.
AO: Fifty-two million square miles of the Pacific and Indian Oceans, from the international date line to the waters east of Africa, and from the Kuril Islands in the north to the Antarctic in the south.
Flagship: USS *Blue Ridge* (LCC/JCC 19)

U.S. SOUTHERN COMMAND (USSOUTHCOM)

U.S. Naval Forces Southern Command

Headquarters: Mayport, Fla.
Mission: As the naval component to U.S. Southern Command, Commander, U.S. Naval Forces Southern Command (COMUSNAVSO) commands U.S. naval forces and interacts with partner nations to shape the environment within SOUTHCOM's area of responsibility by developing and executing security cooperation initiatives and conducting counter-drug operations to promote democracy, stability and collective approaches to regional security. When required, COMUSNAVSO responds to crisis to maintain regional stability and protect U.S. national interests, and prepares to meet future hemispheric challenges.
AO: Nearly 16 million square nautical miles of ocean in the Caribbean, eastern Pacific and southern Atlantic, in addition to 30 nations, and 12 dependencies totaling 1/6 of the world's landmass.

U.S. CENTRAL COMMAND (USCENTCOM)

U.S. Naval Forces Central Command/U.S. 5th Fleet/Combined Forces Maritime Component Commander

Headquarters: Manama, Bahrain
Mission: U.S. and coalition forces operating in this region conduct maritime security operations (MSO). MSO set the conditions for security and stability in the maritime environment as well as complement the counter-terrorism and security efforts of regional nations. MSO deny international terrorists use of the maritime environment as a venue for attack or to transport personnel, weapons or other material. Coalition MSO complements the security efforts of regional nations who work toward a common goal against a common enemy – an enemy of peace, an enemy of stability, an enemy of prosperity.
AO: Covering approximately 7.5 million square miles, the area of operations includes the Arabian Gulf, Red Sea, Gulf of Oman and parts of the Indian Ocean. This expanse, comprised of 27 countries, includes three critical chokepoints at the Strait of Hormuz, the Suez Canal and the Strait of Bab al Mandeb at the southern tip of Yemen.

U.S. EUROPEAN COMMAND (USEUCOM)

U.S. Naval Forces Europe (COMUSNAVEUR)/U.S. 6th Fleet

Headquarters: With its headquarters in Naples, Italy, COMUSNAVEUR directs all its naval operations through Commander, U.S. 6th Fleet.
Mission: To be persuasive in peace, decisive in war and preeminent in any conflict. To achieve this, CNE/C6F conducts joint and combined operations in support of unified and allied commanders. To operate, exercise and sustain combat-ready maritime forces to defeat those enemies who would do harm to the United States or its allies. To conduct theater naval security cooperation to promote coalition building and foster regional security in support of U.S. national interests.
AO: More than 21 million square miles including 91 countries and territories. This territory extends from the Cape of Norway through the waters of the Baltic and Mediterranean Seas, most of Europe, parts of the Middle East to the Cape of Good Hope in South Africa.
Flagship: USS *Mount Whitney* (LCC/JCC 20)

Bases Worldwide

▲ Naval Station Pearl Harbor

UNITED STATES

California
- Naval Air Weapons Station (NAWS) China Lake
- Naval Air Facility (NAF) El Centro
- Naval Air Station (NAS) Lemoore
- Naval Base (NB) Coronado
- NB Ventura County
- NB Point Loma
- Naval Station (NS) San Diego
- Naval Post Graduate School Monterey
- Naval Weapons Station (NWS) Seal Beach
- NSA Corona

Connecticut
- Naval Submarine Base (SUBASE) New London

District of Columbia
- Washington Navy Yard

Florida
- NAS Jacksonville
- NAF Key West
- NAS Whiting Field
- NAS Pensacola
- NS Mayport
- NSA Panama City
- NSA Orlando

Georgia
- NAS Atlanta
- Naval Supply Corps School Athens
- SUBASE Kings Bay

Hawaii
- Naval Computer and Telecommunications Area Master Station, Eastern Pacific, Wahiawa
- NS Barking Sands
- NS Pearl Harbor
- Pearl Harbor Naval Shipyard
- Pacific Missile Range Facility, Kauai

Illinois
- NS Great Lakes

Indiana
- NSA Crane

Louisiana
- NAS Joint Reserve Base New Orleans
- NSA New Orleans

Maine
- NAS Brunswick

Maryland
- NAF Washington
- NAS Patuxent River
- NS Annapolis
- U.S. Naval Academy
- NSA Indian Head
- Naval Surface Warfare Center (NSWC) Carderock
- Naval Support Facility (NSF) Thurmont

Mississippi
- Construction Battalion Center (CBC) Gulfport
- NAS Meridian
- NS Pascagoula

Nevada
- NAS Fallon

New Hampshire
- Portsmouth Naval Shipyard

New Jersey
- Naval Air Engineering Station (NAES), Lakehurst
- NWS Earle

New York
- Naval Support Unit (NSU) Saratoga Springs

Pennsylvania
- NAS Joint Reserve Base Willow Grove
- NSA Mechanicsburg
- NSWC Philadelphia

Rhode Island
- NS Newport

South Carolina
- NWS Charleston

Tennessee
- NSA Mid-South

Photo by PH2 John F. Looney

Texas
- NAS Corpus Christi
- NAS Joint Reserve Base Fort Worth
- NAS Kingsville
- NS Ingleside

Virginia
- Naval Amphibious Base (NAB) Little Creek
- NAS Oceana
- NS Norfolk
- NAS Norfolk
- NSA Dahlgren
- NWS Yorktown
- NSA Wallops Island
- Norfolk Naval Shipyard

Washington
- NAS Whidbey Island
- NB Kitsap
- NS Everett
- Naval Undersea Warfare Center (NUWC) Keyport
- Naval Magazine Indian Island
- Puget Sound Naval Shipyard and Intermediate Maintenance Facility

West Virginia
- Naval Security Group, Activity (NSGA) Sugar Grove

WORLDWIDE

Bahamas
- NUWC Bahamas (Andros Island)

Bahrain
- NSA Bahrain

Cuba
- NS Guantanamo Bay

Diego Garcia
- NSF British Indian Ocean Territories

Greece
- NSA Souda Bay

Guam
- Naval Forces Marianas Support Activity

Iceland
- NAS Keflavik

Italy
- NAS Sigonella
- NSA Gaeta
- NSA La Maddalena
- NSA Naples

Japan
- NAF Atsugi
- NAF Misawa
- Commander Fleet Activities (CFA) Okinawa
- CFA Sasebo
- CFA Yokosuka

Korea
- CFA Chinhae

Singapore
- Naval Regional Contracting Center, Singapore

Spain
- NS Rota

United Kingdom
- NAF Mildenhall
- Naval Activities London
- Joint Military Facility (JMF) St. Mawgans

▼ Broadway Pier, San Diego

Photo by PH2(AW/SW) Timothy Smith

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Enlisted Ratings

AB
Aviation Boatswain's Mate
ABE – Equipment
ABF – Fuel
ABH – Handling

AC
Air Traffic Controller

AD
Aviation Machinist's Mate

AE
Aviation Electrician's Mate

AG
Aerographer's Mate

AM
Aviation Structural Mechanic
AME – Equipment

AO
Aviation Ordnanceman

AS
Aviation Support Equipment Technician

AT
Aviation Electronics Technician

AW
Aviation Warfare Systems Operator

AZ
Aviation Maintenance Administrationman

BM
Boatswain's Mate

BU
Builder

CE
Construction Electrician

CM
Construction Mechanic

CS
Culinary Specialist

CT
Cryptologic Technician
CTA – Administration
CTI – Interpretive
CTM – Maintenance
CTN - Networks
CTO – Communications
CTR – Collection
CTT – Technical

DC
Damage Controlman

DM
Illustrator/Draftsman

EA
Engineering Aide

EM
Electrician's Mate

EN
Engineman

EO
Equipment Operator

ET
Electronics Technician

FC
Fire Controlman

FT
Fire Control Technician

GM
Gunner's Mate

GS
Gas Turbine System Technician
GSE – Electrical
GSM – Mechanical

HM
Hospital Corpsman

HT
Hull Maintenance Technician

IC
Interior Communications Electrician

IS
Intelligence Specialist

IT
Information Systems Technician

JO
Journalist

LI
Lithographer

LN
Legalman

MA
Master-at-Arms

MM
Machinist's Mate

MN
Mineman

MR
Machinery Repairman

MT
Missile Technician

MU
Musician

NC
Navy Counselor

OS
Operations Specialist

PC
Postal Clerk

PH
Photographer's Mate

PR
Aircrew Survival Equipmentman

PS
Personnel Specialist

QM
Quartermaster

RP
Religious Program Specialist

SH
Ship's Serviceman

SK
Storekeeper

ST
Sonar Technician
STG – Surface
STS – Submarine

SW
Steelworker

TM
Torpedoman's Mate

UT
Utilitiesman

YN
Yeoman

AN*
Airman

FN*
Fireman

SN*
Seaman

** General Apprenticeship*

Enlisted Sailors wear their job specialty in plain sight. Rating badges, worn on the left sleeve, consist of an eagle (called a crow); chevrons indicating the wearer's rate; and a specialty mark indicating rating. While some of these ratings have historical significance (such as the boatswain's mate), others show the evolution of naval technology in modern times, such as the GS (gas turbine system technician).

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Warfare Pins/Badges

Astronaut

Naval Astronaut (NFO)

Naval Aviator

Naval Aviation Observer and Flight Meteorologist

Flight Surgeon

Flight Nurse

Naval Flight Officer (NFO)

Aviation Experimental Psychologist and Aviation Physiologist

Enlisted Aviation Warfare Specialist

Naval Aviation Supply Corps

Aircrew

Marine Combat Aircrew

Special Warfare (SEAL)

Special Operations

Special Warfare Combatant-Craft Crewman

Surface Warfare Officer

Enlisted Surface Warfare Specialist

Surface Warfare Nurse Corps

Surface Warfare Medical Corps

Surface Warfare Dental Corps

Surface Warfare Medical Service Corps

Surface Supply Corps

Submarine (officer)

Submarine (enlisted)

Submarine Medical

Submarine Engineering Duty

Submarine Supply Corps

Submarine Combat Patrol

SSBN Deterrent Patrol

SSBN Deterrent Patrol (20 patrols)

Seabee Combat Warfare Specialist (officer)

Seabee Combat Warfare Specialist (enlisted)

Naval Parachutist

Basic Parachutist

Naval Reserve Merchant Marine

Source: *U.S. Navy Uniform Regulation; Navy Uniform Board*

Integrated Undersea Surveillance System (officer)

Integrated Undersea Surveillance System (enlisted)

Master Explosive Ordnance Disposal Warfare

Senior Explosive Ordnance Disposal Warfare

Basic Explosive Ordnance Disposal Warfare

Fleet Marine Force (FMF) Enlisted Warfare Specialist

Diving (officer)

Diving Medical Officer

Master Diver

Diver (medical technician)

First Class Diver

Second Class Diver

Scuba Diver

Deep Submergence (enlisted)

Deep Submergence (officer)

Presidential Service Badge

Vice Presidential Service Badge

Office of the Secretary of Defense

Joint Chiefs of Staff

Recruiting Command for Excellence

Recruiter

Career Counselor

Division Commander for Excellence

Division Commander

Command-at-Sea

Command Ashore/ Project Manager

Small Craft (officer)

Small Craft (enlisted)

Craftmaster

Master Chief Petty Officer of the Navy

Fleet Master Chief Petty Officer

Force Master Chief Petty Officer

Command Master Chief Petty Officer

U.S. Navy Police (officer)

U.S. Navy Police (enlisted)

U.S. Navy Security

U.S. Navy Corrections

U.S. Navy Guard

U.S. Navy Master-at-Arms

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Ships

CRUISERS

Modern U.S. Navy guided-missile cruisers perform primarily in a battle force role. These ships are multi-mission, anti-air warfare (AAW), anti-submarine warfare (ASW), long-range strike and anti-surface warfare (ASUW) surface combatants capable of supporting carrier and expeditionary strike groups (ESG), amphibious forces, or of operating independently and as flagships of surface action groups.

Ticonderoga-class

Power Plant: Four General Electric LM 2500 gas turbine engines; Two shafts, 80,000 shaft horsepower total.
Length: 567 feet
Beam: 55 feet
Displacement: 9,600 tons full load
Speed: 30 plus knots (34.5+ mph)
Aircraft: Two SH-60 *Sea Hawk* (LAMPS III)
Crew: 364 (24 officers, 340 enlisted)
Armament: MK 26 missile launcher (CG 51); *Standard* Missile (MR) or MK-41 vertical launching system (CG 52 through CG 73); *Standard* Missile (MR); Vertical Launch ASROC (VLA) Missile; *Tomahawk* Cruise Missile; Six MK-46 torpedoes (from two triple mounts); Two MK-45 5-inch/54 caliber lightweight guns; Two *Phalanx* CIWS.

Ships:
USS *Thomas S. Gates* (CG 51)
USS *Bunker Hill* (CG 52)
USS *Mobile Bay* (CG 53)
USS *Antietam* (CG 54)
USS *Leyte Gulf* (CG 55)
USS *San Jacinto* (CG 56)
USS *Lake Champlain* (CG 57)
USS *Philippine Sea* (CG 58)
USS *Princeton* (CG 59)
USS *Normandy* (CG 60)
USS *Monterey* (CG 61)
USS *Chancellorsville* (CG 62)
USS *Cowpens* (CG 63)
USS *Gettysburg* (CG 64)
USS *Chosin* (CG 65)
USS *Hue City* (CG 66)
USS *Shiloh* (CG 67)
USS *Anzio* (CG 68)
USS *Vicksburg* (CG 69)
USS *Lake Erie* (CG 70)
USS *Cape St. George* (CG 71)
USS *Vella Gulf* (CG 72)
USS *Port Royal* (CG 73)

▲ USS *Cowpens* (CG 63)

AMPHIBIOUS ASSAULT

Operating as part of the modern U.S. Navy, amphibious assault ships are called upon to perform as primary landing ships for assault operations of Marine expeditionary units. These ships use Air Cushion Landing Craft (LCAC), conventional landing craft and helicopters to move Marine assault forces ashore. In a secondary role, using AV-8B *Harrier* aircraft and anti-submarine warfare helicopters, these ships perform sea control and limited power projection missions.

Photo by PHAN Sarah E. Ard

◀ USS *Nassau* (LHA 4)

Tarawa-class

Power Plant: Two boilers, two geared steam turbines, two shafts, 70,000 total shaft horsepower
Length: 820 feet
Beam: 106 feet
Displacement: 39,400 tons full load
Speed: 24 knots (27.6 mph)
Aircraft, depending on mission: 12 CH-46 *Sea Knight* helicopters; four CH-53E *Sea Stallion* helicopters; six AV-8B *Harrier* attack aircraft; three UH-1N *Huey* helicopters; four AH-1W *Super Cobra* helicopters
Crew: 964 (82 officers, 882 enlisted)
Marine detachment: 1,900 plus
Armament: Two *RAM* launchers; two *Phalanx* 20 mm CIWS mount; three .50 cal. machine guns; four 25 mm MK-38 machine guns

Ships:
USS *Tarawa* (LHA 1)
USS *Saipan* (LHA 2)
USS *Belleau* Wood (LHA 3)
USS *Nassau* (LHA 4)
USS *Peleliu* (LHA 5)

Photo by PHAN Jonathan Chandler

Wasp-class

Power Plant: Two boilers, two geared steam turbines, two shafts, 70,000 shaft horsepower; LHD 8-two gas turbines, 70,000 shaft horsepower, two auxiliary propulsion motors (5,000 hp each)
Length: 844 feet
Beam: 106 feet
Displacement: LHD 5 1-4: 40,650 tons full load; LHD 5 5-7: 40,358 tons full load; LHD 8: 41,772 tons full load
Speed: 20+ knots (23.5+ mph)
Aircraft, depending on mission: 12 CH-46 *Sea Knight* helicopters; Four CH-53E *Sea Stallion* helicopters; Six AV-8B *Harrier* attack aircraft; Three UH-1N *Huey* helicopters; Four AH-1W *Super Cobra* helicopters
Crew: 1,108 (104 officers, 1,004 enlisted).
Marine detachment: 1,894
Armament: Two RAM launchers; two NATO *Sea Sparrow* launchers; three 20mm *Phalanx* CIWS mounts (two on LHD 5-7); four .50 cal. machine guns; four 25mm MK 38 machine guns (LHD 5-7 have three 25mm MK-38 machine guns)

Ships:
USS *Wasp* (LHD 1)
USS *Essex* (LHD 2)
USS *Kearsarge* (LHD 3)
USS *Boxer* (LHD 4)
USS *Bataan* (LHD 5)
USS *Bonhomme Richard* (LHD 6)
USS *Iwo Jima* (LHD 7)
Makin Island (LHD 8)*

DESTROYERS

Destroyers and guided-missile destroyers operate in support of carrier and expeditionary strike groups, surface action groups, amphibious groups and replenishment groups. Destroyers primarily perform anti-submarine warfare duty while guided-missile destroyers are multi-mission [anti-air warfare (AAW), anti-submarine warfare (ASW) and anti-surface warfare (ASUW)] surface combatants.

Photo by PHC Todd P. Cichonowicz

▲ USS *Fitzgerald* (DDG 62)

Arleigh Burke-class

Power Plant: Four General Electric LM 2500-30 gas turbines; two shafts, 100,000 total shaft horsepower, SPY-1 Radar and Combat System Integrator
Length: Flights I and II (DDG 51-78): 505 feet; Flight IIA (DDG 79-98): 509 feet
Beam: 59 feet
Displacement: DDG 51 through 71: 8,315 tons full load; DDG 72 through 78: 8,400 tons full load; DDG 79 and on: 9,200 tons full load
Speed: In excess of 30 knots (34.5 mph)
Aircraft: Hangar on later units. LAMPS III electronics installed on landing deck for coordinated DDG 51/helo ASW operations
Crew: 323 (23 officers, 300 enlisted)
Armament: *Standard* missile; *Harpoon*; Vertical Launch ASROC (VLA) missiles; *Tomahawk*; six MK-46 torpedoes (from two triple tube mounts); one 5-inch/54 caliber MK-45 lightweight gun; two 20mm *Phalanx* CIWS

Ships:
USS *Arleigh Burke* (DDG 51)
USS *Barry* (DDG 52)
USS *John Paul Jones* (DDG 53)
USS *Curtis Wilbur* (DDG 54)
USS *Stout* (DDG 55)
USS *John S. McCain* (DDG 56)
USS *Mitscher* (DDG 57)
USS *Laboon* (DDG 58)
USS *Russell* (DDG 59)
USS *Paul Hamilton* (DDG 60)
USS *Ramage* (DDG 61)
USS *Fitzgerald* (DDG 62)
USS *Stethem* (DDG 63)
USS *Carney* (DDG 64)
USS *Benfold* (DDG 65)
USS *Gonzalez* (DDG 66)
USS *Cole* (DDG 67)
USS *The Sullivans* (DDG 68)
USS *Milius* (DDG 69)
USS *Hopper* (DDG 70)
USS *Ross* (DDG 71)
USS *Mahan* (DDG 72)
USS *Decatur* (DDG 73)
USS *McFaul* (DDG 74)
USS *Donald Cook* (DDG 75)
USS *Higgins* (DDG 76)
USS *O'Kane* (DDG 77)
USS *Porter* (DDG 78)

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USS *Oscar Austin* (DDG 79)
USS *Roosevelt* (DDG 80)
USS *Winston S. Churchill* (DDG 81)
USS *Lassen* (DDG 82)
USS *Howard* (DDG 83)
USS *Bulkeley* (DDG 84)
USS *McCampbell* (DDG 85)
USS *Shoup* (DDG 86)
USS *Mason* (DDG 87)
USS *Preble* (DDG 88)
USS *Mustin* (DDG 89)
USS *Chafee* (DDG 90)
USS *Pinckney* (DDG 91)
USS *Momsen* (DDG 92)
USS *Chung-Hoon* (DDG 93)
USS *Nitze* (DDG 94)
USS *James E. Williams* (DDG 95)
USS *Bainbridge* (DDG 96)
USS *Halsey* (DDG 97)
Forrest Sherman (DDG 98)*
Farragut (DDG 99)*
Kidd (DDG 100)*
Gridley (DDG 101)*
Sampson (DDG 102)*
Truxton (DDG 103)*
Sterett (DDG 104)*
Dewey (DDG 105)*

Photo by PH2 (NAO/AW/SW) Michael Sandberg

▲ USS *Taylor* (FFG 50)

FRIGATES

Frigates fulfill a protection of shipping (POS) mission as anti-submarine warfare (ASW) combatants for amphibious expeditionary forces, underway replenishment groups and merchant convoys.

Oliver Hazard Perry-class

Power Plant: Two General Electric LM 2500 gas turbine engines; 1 shaft, 41,000 shaft horsepower total.
Length: 445 feet; 453 feet with LAMPS III modification.
Beam: 45 feet
Displacement: 4,100 tons full load
Speed: 29+ knots (33.4+ mph)
Aircraft: Two SH-60 (LAMPS III) in FFG 8, 28, 29, 32, 33, 36-61; One SH-2 (Lamps MK-I) in FFG 30, 31.
Crew: 215 (17 officers, 198 enlisted)
Armament: *Harpoon* (from *Standard* Missile Launcher); six MK-46 torpedoes (from two triple mounts); one 3-inch/62 caliber MK-75 rapid fire gun; one *Phalanx* CIWS.

◀ USS *Samuel B. Roberts* (FFG 58)

Ships:
USS *McInerney* (FFG 8)
USS *Boone* (FFG 28)**
USS *Stephen W. Groves* (FFG 29)**
USS *John L. Hall* (FFG 32)
USS *Jarrett* (FFG 33)
USS *Underwood* (FFG 36)
USS *Crommelin* (FFG 37)
USS *Curts* (FFG 38)**
USS *Doyle* (FFG 39)**
USS *Halyburton* (FFG 40)
USS *McClusky* (FFG 41)
USS *Klakring* (FFG 42)**
USS *Thach* (FFG 43)
USS *DeWert* (FFG 45)
USS *Rentz* (FFG 46)
USS *Nicholas* (FFG 47)
USS *Vandegrift* (FFG 48)
USS *Robert G. Bradley* (FFG 49)
USS *Taylor* (FFG 50)
USS *Gary* (FFG 51)
USS *Carr* (FFG 52)
USS *Hawes* (FFG 53)
USS *Ford* (FFG 54)
USS *Elrod* (FFG 55)
USS *Simpson* (FFG 56)
USS *Reuben James* (FFG 57)
USS *Samuel B. Roberts* (FFG 58)
USS *Kauffman* (FFG 59)
USS *Rodney M. Davis* (FFG 60)
USS *Ingraham* (FFG 61)

Photo by Paul Farley

AMPHIBIOUS TRANSPORT DOCK

Amphibious transports are used to transport and land Marines, their equipment and supplies by embarked air cushion or conventional landing craft or amphibious vehicles, augmented by helicopters or vertical take off and landing aircraft in amphibious assault, special operations, or expeditionary warfare missions.

Austin-class

Power plant: Two boilers, two steam turbines, two shafts, 24,000 shaft horsepower
Length: 570 feet
Beam: 84 feet
Displacement: Approximately 17,000 tons (full load)
Speed: 21 knots (24.2 mph)

Aircraft: Up to six CH-46 *Sea Knight* helicopters
Crew: 420 (24 officers, 396 enlisted)
Marine detachment: 900
Armament: Two 25mm MK 38 guns; two *Phalanx* CIWS; and eight .50-caliber machine guns.

Ships:
USS *Austin* (LPD 4)
USS *Ogden* (LPD 5)
USS *Cleveland* (LPD 7)
USS *Dubuque* (LPD 8)
USS *Denver* (LPD 9)
USS *Juneau* (LPD 10)
USS *Shreveport* (LPD 12)
USS *Nashville* (LPD 13)
USS *Trenton* (LPD 14)
USS *Ponce* (LPD 15)

San Antonio-class

Power plant: four sequentially turbocharged marine Colt-Pielstick diesels, two shafts, 41,600 shaft horsepower
Length: 684 feet

Photo courtesy of Northrop Grumman Ship Systems

▲ USS *San Antonio* (LPD 17)

Beam: 105 feet
Displacement: Approximately 24,900 tons (full load)
Speed: in excess of 22 knots (24.2 mph, 38.7 kph)
Aircraft: Launch or land two CH-53E *Super Stallion* helicopters or up to four CH-46 *Sea Knight* helicopters, MV-22 *Osprey* tilt rotor aircraft, AH-l or UI-I—l helicopters
Armament: two *Bushmaster* II 30mm Close in Guns, fore and aft; two Rolling Airframe Missile launchers, fore and aft.
Landing Craft/Assault Vehicles: Two LCACs or one LCU; and 14 Advanced Amphibious Assault Vehicles.
Crew: 361 (28 officers, 333 enlisted)
Embarked Landing Force: 699 (66 officers, 633 enlisted); surge capacity to 800

Ships:
USS *San Antonio* (LPD 17)
New Orleans (LPD 18)*
Mesa Verde (LPD 19)*
Green Bay (LPD 20)*
New York (LPD 21)*
San Diego (LPD 22)*
Anchorage (LPD 23)*
Arlington (LPD 24)*
Somerset (LPD 25)*

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Ships

AMPHIBIOUS DOCK LANDING

Dock Landing Ships support amphibious operations including landings via Air Cushion Landing Craft (LCAC), conventional landing craft and helicopters, onto hostile shores.

Whidbey Island-class

Power Plant: Four Colt Industries, 16 Cylinder diesels, two shafts, 33,000 shaft horsepower
Length: 609 feet
Beam: 84 feet
Displacement: 15,939 tons (full load)
Speed: 20+ knots (23.5+ mph)
Landing Craft: Four Air Cushion Landing Craft
Crew: 413 (22 officers, 391 enlisted)
Marine Detachment: 402 plus 102 surge
Armament: two 25mm MK-38 Machine Guns; two 20mm *Phalanx* CIWS mounts and six .50 cal. machine guns
Ships:
USS *Whidbey Island* (LSD 41)
USS *Germantown* (LSD 42)
USS *Fort McHenry* (LSD 43)
USS *Gunston Hall* (LSD 44)
USS *Comstock* (LSD 45)
USS *Tortuga* (LSD 46)
USS *Rushmore* (LSD 47)
USS *Ashland* (LSD 48)

Photo by PH1 Robert R. McRill

◀ USS *Gunston Hall* (LSD 44)

Photo by JO1 Bruce Cummins

▲ USS *Mount Whitney* (LCC 20)

Harpers Ferry-class

Power Plant: Four Colt Industries, 16 cylinder diesels, two shafts, 33,000 shaft horsepower
Length: 609 feet
Beam: 84 feet
Displacement: 16,708 tons (full load)
Speed: 20+ knots (23.5+ mph)
Landing Craft: Two Air Cushion Landing Craft
Crew: 419 (22 officers, 397 enlisted)
Marine detachment: 402 plus 102 surge
Armament: two 25mm MK-38 Machine Guns, two 20mm *Phalanx* CIWS mounts and six .50 cal. machine guns

Ships:
USS *Harpers Ferry* (LSD 49)
USS *Carter Hall* (LSD 50)
USS *Oak Hill* (LSD 51)
USS *Pearl Harbor* (LSD 52)

AMPHIBIOUS COMMAND

Amphibious Command ships provide command and control for fleet commanders. Commissioned in 1970, these are the only ships to be designed initially for an amphibious command ship role. Earlier amphibious command ships lacked sufficient speed to keep up with a 20-knot amphibious force. Subsequently, both ships became fleet flagships. USS *Blue Ridge* became the 7th Fleet command ship in 1979, and USS *Mount Whitney* became the 2nd Fleet command ship in 1981. USS *Coronado* (AGF 11) is the flagship for Commander 3rd Fleet. *Mount Whitney* and *Coronado* were transferred to Military Sealift Fleet Services Command, but are still in commission.

Blue Ridge-class

Power Plant: Two boilers, one geared turbine, one shaft; 22,000 horsepower
Length overall: 634 feet
Beam extreme: 108 feet
Displacement: 18,874 tons (full load)

Speed: 23 knots (26.5 mph)
Aircraft: All helicopters except the CH-53 *Sea Stallion* can be carried
Crew: 842 (52 officers, 790 enlisted)

Ships:
USS *Blue Ridge* (LCC 19)
USS *Mount Whitney* (LCC/JCC 20)

Coronado-class

Power Plant: Two boilers, geared turbines, two shafts, 24,000 shaft horsepower
Length: 570 feet
Beam: 100 feet
Displacement: 16,912 tons
Speed: 21 knots
Aircraft: two light helicopters
Crew: 516 ships company + 120 flag staff
Armament: two *Phalanx* close-in-weapons system, two 12.7mm MGs

Ships:
USS *Coronado* (AGF 11)

MINE WARFARE

Avenger-class ships are designed as mine hunter-killers capable of finding, classifying and destroying moored and bottom mines. The last three MCM ships were purchased in 1990, bringing the total to 14 fully-deployable, oceangoing *Avenger*-class ships. These ships use sonar and video systems, cable cutters and a mine detonating device that can be released and detonated by remote control. They are also capable of conventional sweeping measures. *Osprey*-class (MHC 51) are also designed as mine hunter-killers. MHC 51 has a 15-day endurance and depends on a support ship- or shore-based facilities for re-supply.

Avenger-class

Power Plant: Four diesels (600 horsepower each), two shafts with controllable pitch propellers
Length: 224 feet
Beam: 39 feet
Displacement: 1,312 tons (full load)
Speed: 14 knots
Crew: 84 (8 officers, 76 enlisted)
Armament: Mine neutralization system, two .50 caliber machine guns

Ships:
USS *Avenger* (MCM 1)**
USS *Defender* (MCM 2)**
USS *Sentry* (MCM 3)**
USS *Champion* (MCM 4)**
USS *Guardian* (MCM 5)
USS *Devastator* (MCM 6)
USS *Patriot* (MCM 7)
USS *Scout* (MCM 8)
USS *Pioneer* (MCM 9)
USS *Warrior* (MCM 10)
USS *Gladiator* (MCM 11)**
USS *Ardent* (MCM 12)
USS *Dextrous* (MCM 13)
USS *Chief* (MCM 14)

Osprey-class

Power Plant: Two diesels (800 hp each); two VoithSchneider (cycloidal) propulsion systems
Length: 188 feet
Beam: 36 feet
Displacement: 893 ton(full load)
Speed: 10 knots
Crew: 51 (5 officers, 46 enlisted)
Armament: Two .50 caliber machine guns, Nine Neutralization Systems and other mine countermeasures systems

Ships:
USS *Osprey* (MHC 51)**
USS *Heron* (MHC 52)**
USS *Pelican* (MHC 53)**
USS *Robin* (MHC 54)**
USS *Oriole* (MHC 55)**
USS *Kingfisher* (MHC 56)**
USS *Cormorant* (MHC 57)**
USS *Black Hawk* (MHC 58)**
USS *Falcon* (MHC 59)**
USS *Cardinal* (MHC 60)
USS *Raven* (MHC 61)
USS *Shrike* (MHC 62)**

▼ **USS *Ardent* (MCM 12)**

Photo by PH1 Robert R. McRill

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▼ USS *Typhoon* (PC 5)

COASTAL PATROL SHIPS (PC)

The primary mission of these ships is coastal patrol and interdiction surveillance, an important aspect of littoral operations outlined in the Navy's strategy, SeaPower 21. The *Cyclone*-class PCs are particularly suited for the maritime homeland security mission and have been employed jointly with the U.S. Coast Guard to help protect our nation's coastline, ports and waterways from terrorist attack. These ships provide the U.S. Navy with a fast, reliable platform that can respond to emergent requirements in a shallow water environment. The lead ship of the class, *Cyclone* (PC 1), was decommissioned and turned over to the U.S. Coast Guard in 2000 and five more were turned over to the Coast Guard in 2004.

Cyclone-class (Patrol Coastal)

Propulsion: Four Paxman diesels; four shafts; 3,350 shaft horsepower.
Length: 170 feet
Beam: 25 feet
Displacement: 331 tons (full load)
Speed: 35 knots (40 mph)
Crew: 28 (Four officers, 24 enlisted)

Armament: One MK 96 and one MK 38 25mm machine guns; Five .50 caliber machine guns; two MK 19 40mm automatic grenade launchers; Two M-60 machine guns.

Ships:
USS *Hurricane* (PC 3)
USS *Typhoon* (PC 5)
USS *Sirocco* (PC 6)
USS *Squall* (PC 7)
USS *Chinook* (PC 9)
USS *Firebolt* (PC 10)
USS *Whirlwind* (PC 11)
USS *Thunderbolt* (PC 12)

LITTORAL COMBAT SHIP (LCS)

LCS is a fast craft designed to operate in hostile near-shore environments. Two different designs are being built for Flight Zero, a monohull and a trimaran. Both have reconfigurable payloads for interchangeable mission packages that focus on anti-submarine, mine and surface warfare.

Lockheed Martin has begun construction on the first ship, LCS 1 Freedom, with ship delivery scheduled for FY07. General Dynamics will begin construction next year with delivery scheduled for FY08.

▼ *Freedom*, (LCS 1) (Lockheed Martin design concept)

▼ LCS 2 (General Dynamics design concept)

▶ USS *La Salle* (AGF 3), the Dutch frigate HNLMS Jacob Van Heemskerck (F 812) and USS *Emory S. Land* (AS 39)

Photo by PHAN Josh Kinter

Photo by PH2 Peter J. Carney

AUXILIARY SHIPS

The fast combat support ship (AOE) is the Navy's largest combat logistics ship. The AOE has the speed and armament to keep up with the carrier strike groups. It rapidly replenishes Navy task forces and can carry more than 177,000 barrels of oil; 2,150 tons of ammunition; 500 tons of dry stores; and 250 tons of refrigerated stores. It receives petroleum products, ammunition and stores from shuttle ships and redistributes these items simultaneously to carrier strike group ships. This reduces the vulnerability of serviced ships by reducing alongside time. Congress appropriated the funds for the lead ship of the AOE 6 (*Supply* class) in 1987. *Supply* and *Rainier* (AOE 7) were transferred to Military Sealift Command and placed back in service as a "United States Naval Ship." All are now MSC.

RESCUE & SALVAGE

Rescue and salvage ships render assistance to disabled ships, provide towing, salvage, diving, firefighting and heavy lift capabilities. They can debeach stranded vessels, heavy lift capability from ocean depths, towing of other vessels, and manned diving operations. For rescue missions, these ships are equipped with fire monitors forward and amidships which can deliver either firefighting foam or sea water. The salvage holds of these ships are outfitted with portable equipment to provide assistance to other vessels in dewatering, patching, supply of electrical power and other essential service required to return a disabled ship to an operating condition.

Power Plant: Four "Caterpillar 399" diesels, two shafts, 4,200 horsepower
Length: 255 feet
Beam: 51 feet
Draft: 16 feet, 9 inches
Displacement: 3,282 tons (full load)
Speed: 14 knots (16.1 mph)
Endurance: 8,000 miles (12,872 km) at 8 knots

Salvage capability: 7.5-ton capacity boom forward; 40-ton capacity boom aft
Heavy lift: Capable of a hauling force of 150 tons
Diving Depth: 190 feet, using air
Crew: 100 (6 officers, 94 enlisted)
Armament: Two .50 caliber machine guns; two MK-38 25mm guns

Safeguard-class (Salvage Ships)

USS *Safeguard* (ARS 50)
USS *Grasp* (ARS 51)
USS *Salvor* (ARS 52)
USS *Grapple* (ARS 53)

SUBMARINE TENDERS

Submarine tenders furnish maintenance and logistic support for nuclear-powered attack submarines and are the largest of the active auxiliaries. Their crews are made up mostly of technicians and repair personnel.

Emory S. Land-class

Power Plant: Two boilers, geared turbines, one shaft, 20,000 shaft horsepower
Length: 644 feet
Beam: 85 feet
Displacement: Approximately 23,493 tons (full load)
Speed: 20 knots (23 mph)
Aircraft: None
Crew: 1,363 (97 officers, 1,266 enlisted)
Armament: Two 40mm guns, and four 20mm guns

Ships:
USS *Emory S. Land* (AS 39)
USS *Frank Cable* (AS 40)

OTHER SHIPS IN COMMISSION

USS *Constitution*
USS *Pueblo* (AGER 2)
Self Defense Test Ship (EDDG 31)

(Source: Navy Fact File)

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MSC Ships

NAVAL FLEET AUXILIARY FORCE (NFAF)

Ammunition Ships T-AE

USNS *Kilauea* (T-AE 26)
USNS *Flint* (T-AE 32)
USNS *Shasta* (T-AE 33)
USNS *Mount Baker* (T-AE 34)
USNS *Kiska* (T-AE 35)

Combat Stores Ships T-AFS

USNS *Niagara Falls* (T-AFS 3)
USNS *Concord* (T-AFS 5)
USNS *San Jose* (T-AFS 7)
USNS *Spica* (T-AFS 9)
USNS *Saturn* (T-AFS 10)

Fast Combat Support Ships T-AOE

USNS *Supply* (T-AOE 6)
USNS *Rainer* (T-AOE 7)
USNS *Arctic* (T-AOE 8)
USNS *Bridge* (T-AOE 10)

Hospital Ships T-AH

USNS *Mercy* (T-AH 19)
USNS *Comfort* (T-AH 20)

Advanced Auxiliary Dry Cargo/Ammunition Ships T-AKE

USNS *Lewis and Clark* (T-AKE 1)
USNS *Sacagawea* (T-AKE 2)

Underway Replenishment Oilers T-AO

USNS *Henry J. Kaiser* (T-AO 187)
USNS *Joshua Humphreys* (T-AO 188)
USNS *John Lenthall* (T-AO 189)
USNS *Walter S. Diehl* (T-AO 193)
USNS *John Ericsson* (T-AO 194)
USNS *Leroy Grumman* (T-AO 195)
USNS *Kanawha* (T-AO 196)
USNS *Pecos* (T-AO 197)
USNS *Big Horn* (T-AO 198)
USNS *Tippecanoe* (T-AO 199)
USNS *Guadalupe* (T-AO 200)
USNS *Patuxent* (T-AO 201)
USNS *Yukon* (T-AO 202)
USNS *Laramie* (T-AO 203)
USNS *Rappahannock* (T-AO 204)

▲ USNS *Mercy* (T-AH 19)

Fleet Ocean Tugs T-ATF

USNS *Catawba* (T-ATF 168)
USNS *Navajo* (T-ATF 169)
USNS *Sioux* (T-ATF 171)
USNS *Apache* (T-ATF 172)

SPECIAL MISSION SHIPS

Acoustic Survey Ship T-AG

USNS *Hayes* (T-AG 195)

Cable Laying/Repair Ship T-ARC

USNS *Zeus* (T-ARC 7)

Command Ship T-AGF

USS *Coronado* (T-AGF 11)

Command Ship LCC

USS *Mount Whitney* (LCC/JCC 20)

Missile Range Instrumentation/Navigation Test Support Ships T-AGM

USNS *Observation Island* (T-AGM 23)
USNS *Invincible* (T-AGM 24)
USNS *Waters* (T-AGS 45)

Ocean Surveillance Ships T-AGOS

USNS *Victorious*(T-AGOS 19)
USNS *Effective* (T-AGOS 21)
USNS *Loyal* (T-AGOS 22)
USNS *Impeccable* (T-AGOS 23)

Oceanographic Survey Ships T-AGS

USNS *John McDonnell* (T-AGS 51)
USNS *Pathfinder* (T-AGS 60)
USNS *Sumner* (T-AGS 61)
USNS *Bowditch* (T-AGS 62)
USNS *Henson* (T-AGS 63)
USNS *Bruce C. Heezen* (T-AGS 64)
USNS *Mary Sears* (T-AGS 65)

Special Mission Chartered Ships

SSV *C-Commando*
MV *Cory Chouest*
MV *Dolores Chouest*
MV *Kellie Chouest*
MV *Caro1yn Chouest*

High Speed Vessels (HSV)

HSV *Swift* (HSV 2)

PREPOSITIONING PROGRAM/MARITIME PREPOSITIONING PROGRAM

Container Ships T-AK

MV *Capt. Steven L. Bennett* (T-AK 4296)
MV *Maj. Bernard F. Fisher* (T-AK 4396)
MV *A1C William A. Pitsenbarger* (T-AK 4638)
MV *MV TSgt. John A. Chapman*(T-AK 323)
MV LTC *John U.D. Page* (T-AK 4496)
MV *SSG Edward A. Carter, Jr.* (T-AK 4544)

Photo by PH2 Timothy Smith

Maritime Prepositioning Ships T-AK

MV *Cpl. Louis J. Hauge, Jr.* (T-AK 3000)
MV *PFC William B. Baugh* (T-AK 3001)
MV *PFC James Anderson, Jr.* (T-AK 3002)
MV*1st Lt. Alex Bonnyman* (T-AK 3003)
MV *Pvt. Franklin J. Phillips* (T-AK 3004)
MV *Sgt. Matej Kocak* (T-AK 3005)
MV *PFC Eugene A. Obregon* (T-AK 3006)
MV *Maj. Stephen W. Pless* (T-AK 3007)
MV*2nd Lt. John P. Bobo* (T-AK 3008)
MV *PFC Dewayne T. Williams* (T-AK 3009)
MV *1st Lt. Baldomero Lopez* (T-AK 3010)
MV *1st Lt. Jack Lummus* (T-AK 3011)
MV *Sgt. William R. Button* (T-AK 3012)
USNS *1st Lt. Harry L. Martin* (T-AK 3015)
USNS *Gunnery Sgt. Fred W. Stockham* (T-AK 3017)
USNS *Lance Cpl. Roy M. Wheat* (T-AK 3016)

Transport Tankers T-AOT

SS *Chesapeake* (T-AOT 5084)
SS *Petersburg* (T-AOT 9101)

Aviation Logistics Ships T-AVB

SS *Wright* (T-AVB 3)
SS *Curtiss* (T-AVB 4)

Large, Medium-speed Roll-on/Roll-off Ships T-AKR

USNS *Watson* (T-AKR 310)
USNS *Sisler* (T-AKR 311)
USNS *Dahl* (T-AKR 312)
USNS *Red Cloud* (T-AKR 313)
USNS *Charlton* (T-AKR 314)
USNS *Watkins* (T-AKR 315)
USNS *Pomeroy* (T-AKR 316)
USNS *Soderman* (T-AKR 317)

High-Speed Vessel (HSV)

MV *WestPac Express* (HSV 4676)

SEALIFT FORCE

Fast Sealift Ships T-AKR

USNS *Algol* (T-AKR 287)
USNS *Bellatrix* (T-AKR 288)
USNS *Denebola* (T-AKR 289)
USNS *Pollux* (T-AKR 290)
USNS *Altair* (T-AKR 291)
USNS *Regulus* (T-AKR 292)
USNS *Capella* (T-AKR 293)
USNS *Antares* (T-AKR 294)

Photo by PH2 Michael Sandberg

▲ High Speed Vessel *Swift* (HSV 2)

Photo by Paul Farley

▲ USNS *Arctic* (T-AOE 8)

Large, Medium-speed Roll-on/Roll-off Ships T-AKR

USNS *Gordon* (T-AKR 296)
USNS *Gilliland* (T-AKR 298)
USNS *Shughart* (T-AKR 295)
USNS *Yano* (T-AKR 297)
USNS *Bob Hope* (T-AKR 300)
USNS *Fisher* (T-AKR 301)
USNS *Seay* (T-AKR 302)
USNS *Mendonca* (T-AKR 303)
USNS *Pililaau* (T-AKR 304)
USNS *Brittin* (T-AKR 305)
USNS *Benavidez* (T-AKR 306)

Transport Tankers T-AOT

USNS *Paul Buck* (T-AOT 1122)
USNS *Samuel L. Cobb* (T-AOT 1123)
USNS *Richard G. Matthiesen* (T-AOT 1124)
USNS *Lawrence H. Gianella* (T-AOT 1125)
MV *Montauk*

Long-term Chartered Container Ships

MV *Baffin Strait*

Ice-strengthened Container Ships

MV *American Tern*

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SeaBees

1ST NAVAL CONSTRUCTION DIVISION (1NCD) AND NAVAL CONSTRUCTION FORCES COMMAND (NCFC)

The mission of the 1st Naval Construction Division/Naval Construction Forces Command is to organize, train, operate and maintain the naval construction force, to command and control naval construction regiments and Seabee readiness groups, and to develop, coordinate and implement policy and requirements to man, equip and train Seabees. Navy Seabees deploy around the world to provide construction support for U.S. forces as well as humanitarian assistance.

1NCD/NCFC, Norfolk
1NCD(FWD), Pearl Harbor

NAVAL CONSTRUCTION REGIMENTS (NCR)

Naval construction regiments exercise administrative and operational control of two or more naval mobile construction battalions or other naval construction force units operating in a specific geographic area or operating in support of a specific military operation.

Active
22NCR, Gulfport, Miss.
30NCR, Pearl Harbor

Reserve
3NCR, Marietta, Ga.
1NCR, Port Hueneme, Calif.
7NCR, Newport, R.I.
9NCR, Fort Worth

Photo by JO1 Mark H. Overstreet

▲ BU1 William White, assigned to Naval Mobile Construction Battalion (NMCB) 24, uses a concrete saw to prepare an airfield runway expansion joint trench for repair, aboard the air base in Al Asad, Iraq.

SEABEE READINESS GROUPS (SRG)

The mission of the Seabee Readiness Groups is to exercise tactical control of homeported naval construction battalions, provide military and technical training for active and Reserve units and ensure maximum effectiveness and operational readiness of naval construction force units.

Active
20th 20SRG, Gulfport, Miss.
31st 31SRG, Port Hueneme, Calif

NAVAL MOBILE CONSTRUCTION BATTALIONS (NMCB)

Naval Mobile Construction Battalions (NMCB) provide responsive military construction support to Navy, Marine Corps and other forces in military operations, construct base facilities and conduct defensive operations. In addition to standard wood, steel, masonry and concrete construction, NMCBs also perform specialized construction such as water well drilling and battle damage repair. They are able to work and defend themselves at construction sites outside of their base camp and convoy through unsecured areas. In times of emergency or disaster, NMCBs conduct disaster assistance and recovery operations.

Active
NMCB 1, Gulfport, Miss.
NMCB 5, Port Huememe, Calif.
NMCB 7, Gulfport, Miss.
NMCB 3, Port Huememe, Calif.
NMCB 74, Gulfport, Miss.
NMCB 4, Port Huememe, Calif.
NMCB 133, Gulfport, Miss.
NMCB 40, Port Huememe, Calif.

Reserve

NMCB 14, Jacksonville, Fla.
NMCB 15, Belton, Mo.
NMCB 21, Lakehurst, N.J.
NMCB 17, Fort Carson, Colo.
NMCB 23, Fort Belvoir, Va.
NMCB 18, Fort Lewis, Wash.
NMCB 24, Huntsville, Ala
NMCB 22, Fort Worth, Texas
NMCB 26, Mt. Clemens, Mich.
NMCB 25, Fort McCoy, Wis.
NMCB 27, Brunswick, Maine
NMCB 28, Shreveport, La.

UNDERWATER CONSTRUCTION TEAMS (UCT)

Underwater construction teams provide construction, inspection and repair of ocean facilities such as wharves, piers, underwater pipelines, moorings, boat ramps, etc. They are capable of diving to 190 feet using scuba or surface supplied air to perform work underwater.

Active

UCT 1, Norfolk
UCT 2, Port Hueneme, Calif.

CONSTRUCTION BATTALION MAINTENANCE UNITS (CBMU)

Construction battalion maintenance units provide maintenance and construction support to military bases on both coasts through numerous detachments that deploy to construct and maintain base camps and fleet hospitals.

Active

CBMU 202, Norfolk
CBMU 303, San Diego

NAVAL CONSTRUCTION FORCE SUPPORT UNIT (NCFSU)

The naval construction force support unit provides augment construction; engineering and logistics; and specialized equipment support for a naval construction regiment and other units.

Reserve

NCFSU 2, Port Hueneme, Calif.

NAVAL AMPHIBIOUS CONSTRUCTION BATTALIONS (ACB)

Organized under Commander, Naval Surface Forces, the primary mission of the amphibious construction battalion is to provide ship to shore transportation of fuel, materials and equipment in support of amphibious ready groups, Marine expeditionary forces and brigade-sized operations, and maritime pre-positioned force (MPF) operations. Transport of equipment and materials is accomplished primarily by means of barge ferry operations. ACBs construct elevated and floating causeway piers; install ship-to-shore fueling systems; erect 1,300-person camps; and provide camp support, perimeter defense and construction support.

Active

ACB 2, Norfolk
ACB 1, Coronado, Calif.

Photo by PH3 Todd Frantom

▲ CM2 Albert B. Johnson spends countless hours working with his 70-ton, link-belt crane. Johnson received a Purple Heart when he was injured by a vehicle-borne improvised explosive device (VBIED) while helping Marines build barricades on a road north of Baghdad, Iraq.

OWNER'S and OPERATOR'S manual

Pay Chart

Proposed Monthly Basic Pay Table

(effective Jan. 1, 2006)

Years of Service

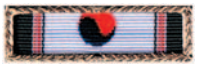
Pay Grade	<2	2	3	4	6	8	10	12	14	16	18	20	22	24	26
Enlisted Members															
E-9	0	0	0	0	0	0	4,022.10	4,113.30	4,228.20	4,363.50	4,499.40	4,717.80	4,902.30	5,097.00	5,394.00
E-8	0	0	0	0	0	3,292.50	3,438.30	3,528.30	3,636.30	3,753.30	3,964.50	4,071.60	4,253.70	4,354.80	4,603.50
E-7	2,288.70	2,498.10	2,593.80	2,720.70	2819.40	2,989.50	3,084.90	3,180.30	3,350.40	3,435.60	3,516.30	3,565.80	3,732.60	3,840.60	4,113.60
E-6	1,979.70	2,178.00	2,274.30	2,367.60	2465.10	2,685.00	2,770.50	2,865.30	2,948.70	2,978.10	2,998.50	2,998.50	2,998.50	2,998.50	2,998.50
E-5	1,814.10	1,935.30	2,028.60	2,124.60	2273.70	2,402.10	2,496.60	2,526.60	2,526.60	2,526.60	2,526.60	2,526.60	2,526.60	2,526.60	2,526.60
E-4	1,662.90	1,748.10	1,842.60	1,935.90	2018.40	2018.40	2018.40	2018.40	2018.40	2018.40	2018.40	2018.40	2018.40	2018.40	2018.40
E-3	1,501.20	1,595.70	1,692.00	1,692.00	1,692.00	1,692.00	1,692.00	1,692.00	1,692.00	1,692.00	1,692.00	1,692.00	1,692.00	1,692.00	1,692.00
E-2	1,427.40	1,427.40	1,427.40	1,427.40	1,427.40	1,427.40	1,427.40	1,427.40	1,427.40	1,427.40	1,427.40	1,427.40	1,427.40	1,427.40	1,427.40
E-1	1,273.50	1,273.50	1,273.50	1,273.50	1,273.50	1,273.50	1,273.50	1,273.50	1,273.50	1,273.50	1,273.50	1,273.50	1,273.50	1,273.50	1,273.50
E-1 with less than four months:			1,178.10												
Warrant Officers															
W-5	0	0	0	0	0	0	0	0	0	0	0	5,720.10	5,916.30	6,113.10	6,311.10
W-4	3,328.80	3,581.10	3,684.00	3,785.10	3,959.40	4,131.30	4,305.90	4,475.70	4,651.50	4,927.20	5,103.60	5,276.10	5,454.90	5,631.00	5,811.00
W-3	3,039.90	3,166.80	3,296.40	3,339.30	3,475.50	3,631.50	3,837.30	4,040.40	4,256.40	4,418.40	4,579.80	4,649.10	4,720.80	4,876.80	5,032.50
W-2	2,673.90	2,826.60	2,960.40	3,057.30	3,140.70	3,369.60	3,544.50	3,674.40	3,801.30	3,888.30	3,961.50	4,100.70	4,239.00	4,379.10	4,379.10
W-1	2,361.30	2,554.50	2,683.80	2,767.50	2,990.40	3,124.80	3,243.90	3,376.80	3,465.00	3,544.80	3,674.70	3,773.10	3,773.10	3,773.10	3,773.10
Commissioned Officers															
O-10	0	0	0	0	0	0	0	0	0	0	0	12,818.70	12,818.70	12,818.70	12,818.70
O-9	0	0	0	0	0	0	0	0	0	0	0	11,689.50	11,857.50	12,101.10	12,525.60
O-8	8,271.00	8,541.90	8,721.60	8,772.00	8,996.10	9,371.10	9,458.10	9,814.20	9,916.20	10,222.80	10,666.20	11,075.40	11,348.70	11,348.70	11,348.70
O-7	6,872.70	7,191.90	7,339.80	7,457.10	7,669.80	7,879.50	8,122.50	8,364.90	8,607.90	9,371.10	10,015.80	10,015.80	10,015.80	10,015.80	10,015.80
O-6	5,094.00	5,596.20	5,963.40	5,963.40	5,985.90	6,242.70	6,276.60	6,276.60	6,633.30	7,263.90	7,634.10	8,004.00	8,214.60	8,427.60	8,841.30
O-5	4,246.50	4,783.50	5,115.00	5,177.10	5,383.50	5,507.40	5,779.20	5,978.70	6,236.10	6,630.60	6,818.10	7,003.80	7,214.40	7,214.40	7,214.40
O-4	3,663.90	4,241.40	4,524.30	4,587.60	4,850.10	5,131.80	5,482.20	5,755.80	5,945.40	6,054.30	6,117.60	6,117.60	6,117.60	6,117.60	6,117.60
O-3	3,221.40	3,651.90	3,941.70	4,297.50	4,503.00	4,728.90	4,875.30	5,115.90	5,240.70	5,240.70	5,240.70	5,240.70	5,240.70	5,240.70	5,240.70
O-2	2,783.10	3,170.10	3,651.00	3,774.30	3,852.00	3,852.00	3,852.00	3,852.00	3,852.00	3,852.00	3,852.00	3,852.00	3,852.00	3,852.00	3,852.00
O-1	2,416.20	2,514.60	3,039.60	3,039.60	3,039.60	3,039.60	3,039.60	3,039.60	3,039.60	3,039.60	3,039.60	3,039.60	3,039.60	3,039.60	3,039.60
Commissioned Officers (With more than 4 years of active service as an Enlisted Member or Warrant Officer)															
O-3E	0	0	0	4,297.50	4,503.00	4,728.90	4,875.30	5,115.90	5,318.40	5,434.50	5,592.90	5,592.90	5,592.90	5,592.90	5,592.90
O-2E	0	0	0	3,774.30	3,852.00	3,974.70	4,181.40	4,341.60	4,460.70	4,460.70	4,460.70	4,460.70	4,460.70	4,460.70	4,460.70
O-1E	0	0	0	3,039.60	3,246.30	3,366.00	3,488.70	3,609.30	3,774.30	3,774.30	3,774.30	3,774.30	3,774.30	3,774.30	3,774.30

(source: Defense Authorization Act FY 2006)

Order of Precedence

The following display represents the correct order of precedence for medals and/or ribbons most likely to be worn today on the Navy uniform. Additional information on the proper display, placement or additional devices is found in SECNAVINST 1650.1G and the U.S. Navy Uniform Regulations (NAVPERS 15565I).

Philippine Presidential Unit Citation


Republic of Korea Presidential Unit Citation

Republic of Vietnam Presidential Unit Citation

Republic of Vietnam Gallantry Cross Unit Citation

Republic of Vietnam Civil Actions Unit Citation

United Nations Service Medal

United Nations Medal

NATO Medals

Multinational Force and Observers Medal

Inter American Defense Board Medal

Republic of Vietnam Campaign Medal

Kuwait Liberation Medal (Kingdom of Saudi Arabia)

Kuwait Liberation (Kuwait)

Rifle Marksmanship Medal

Pistol Marksmanship Medal

Source: www.npc.navy.mil

Devices

GOLD STAR
Denotes subsequent awards of the same Navy decoration

SILVER STAR
Worn in lieu of five gold stars

BRONZE STAR
Represents participation in campaigns or operations, multiple qualification or an additional award to any of the various ribbons on which it is authorized. Also worn to denote first award of the single-mission Air Medal after Nov. 22, 1989.

SILVER SERVICE STAR
Worn in lieu of five bronze stars

BRONZE OAK LEAF CLUSTER
Represents second and subsequent entitlements of awards

SILVER OAK LEAF CLUSTER
Worn for the 6th, 11th, or in lieu of five bronze oak leaf clusters

WINTERED OVER
For wintering over on Antarctic continent – a clasp for Antarctic Service Medal; a suspension ribbon and a disc for the service ribbon; bronze for the first winter; gold for the second winter; and silver for the third

"V" DEVICE
Authorized for acts or service involving direct participation in combat operations

HOURGLASS
Issued for each succeeding award of the Armed Forces Reserve Medal

EUROPE AND ASIA CLASPS
Worn on the suspension ribbon of the Navy Occupation Service Medal

FLEET MARINE FORCE COMBAT OPERATIONS INSIGNIA
For Navy personnel attached to Fleet Marine Force units participating in combat operations

SILVER "E"
Denotes Expert Marksman qualification

BATTLE "E" DEVICE

BRONZE "S"
Denotes Sharpshooter Marksman qualification

"M" DEVICE
Denotes Naval Reserve mobilization in support of certain operations

STRIKE/FLIGHT DEVICE
Bronze Arabic numeral denotes the total number of strike/flight awards of the Air Medal earned subsequent to April 9, 1962

"3/16" PALM
Worn on the Republic of Vietnam Gallantry Cross Unit Citation and Republic of Vietnam Civil Actions Unit Citation ribbons

"E" DEVICE
Denotes four or more Battle "E" Awards

KUWAIT LIBERATION CLUSTER

REPUBLIC OF VIETNAM CAMPAIGN CLASP

U.S. Armed Forces Ranks

	Air Force	Army	Marine Corps	Navy & Coast Guard
E-9	Chief Master Sergeant of the Air Force Chief Master Sergeant, First Sergeant, Command Chief Master Sergeant	Sergeant Major of the Army Sergeant Major, Command Sergeant Major	Sergeant Major of the Marine Corps Sergeant Major, Master Gunnery Sergeant	Master Chief Petty Officer of the Navy / Coast Guard Master Chief Petty Officer, Fleet/Force/Command Master Chief Petty Officer
E-8	Senior Master Sergeant, First Sergeant	Master Sergeant, First Sergeant	First Sergeant, Master Sergeant	Senior Chief Petty Officer
E-7	Master Sergeant, First Sergeant	Sergeant First Class	Gunnery Sergeant	Chief Petty Officer
E-6	Technical Sergeant	Staff Sergeant	Staff Sergeant	Petty Officer First Class

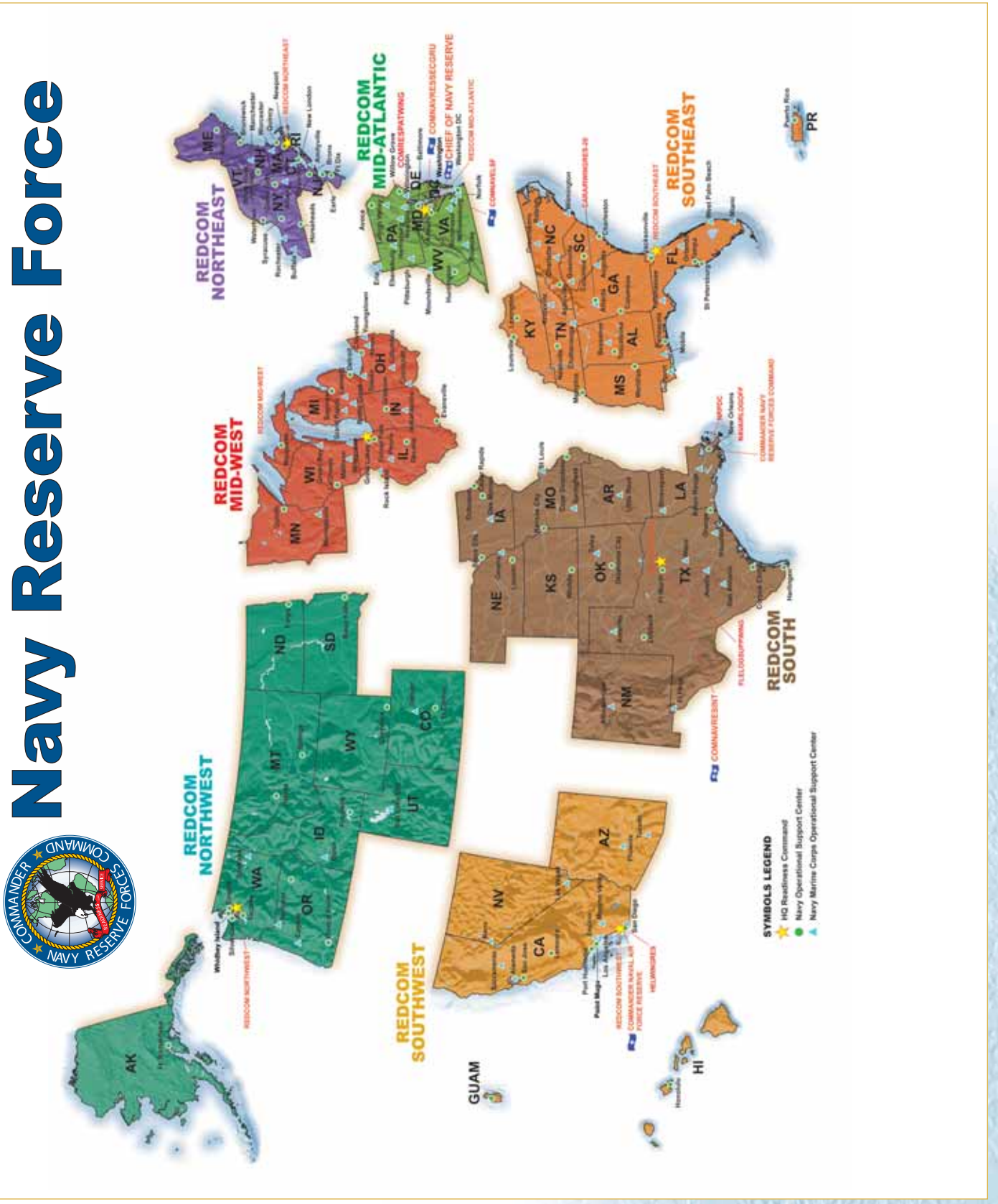
Officers	Air Force • Army • Marines Officer Ranks	Navy • Coast Guard Officer Ranks
O-10	General of the Air Force / Army *(Reserved for Wartime)* General	Fleet Admiral *(Reserved for Wartime)* Admiral / Commandant of the Coast Guard
O-9	Lieutenant General	Vice Admiral
O-8	Major General	Rear Admiral
O-7	Brigadier General	Rear Admiral *(Lower Half)*
O-6	Colonel	Captain

Devices shown are the same for all services.

	Air Force	Army	Marine Corps	Navy & Coast Guard
E-5	Staff Sergeant	Sergeant	Sergeant	Petty Officer Second Class
E-4	Senior Airman	Corporal, Specialist	Corporal	Petty Officer Third Class
E-3	Airman First Class	Private First Class	Lance Corporal	Seaman
E-2	Airman	Private	Private First Class	Seaman Apprentice
E-1	Airman Basic	Private	Private	Seaman Recruit
Warrant Officers	No Warrant	Warrant Officer 1	Warrant Officer 1	Warrant Officer 1 (Coast Guard only)
		Chief Warrant Officer 2	Chief Warrant Officer 2	Chief Warrant Officer 2
		Chief Warrant Officer 3	Chief Warrant Officer 3	Chief Warrant Officer 3
		Chief Warrant Officer 4	Chief Warrant Officer 4	Chief Warrant Officer 4
		Chief Warrant Officer 5	Chief Warrant Officer 5	Chief Warrant Officer 5

O-5	Lieutenant Colonel	Commander
O-4	Major	Lieutenant Commander
O-3	Captain	Lieutenant
O-2	First Lieutenant	Lieutenant Junior Grade
O-1	Second Lieutenant	Ensign

Reserve Map


Navy Reserve Force
COMMANDER NAVY RESERVE FORCES COMMAND
REDCOM NORTHWEST
REDCOM MID-WEST
REDCOM NORTHEAST
REDCOM MID-ATLANTIC
REDCOM SOUTHWEST
REDCOM SOUTH
REDCOM SOUTHEAST
AK
WA
OR
ID
MT
ND
SD
WY
UT
CO
MN
WI
MI
IL
IN
OH
NE
IA
KS
MO
OK
AR
TX
LA
NM
AZ
NV
CA
GUAM
HI
ME
VT
NH
NY
MA
CT
RI
NJ
PA
DE
MD
DC
WV
VA
KY
TN
NC
SC
GA
AL
MS
FL
PR
SYMBOLS LEGEND
HQ Readiness Command
Navy Operational Support Center
Navy Marine Corps Operational Support Center

Submarines

Photo by Paul Farley

▲ USS *Philadelphia* (SSN 690)

ATTACK SUBMARINES

Attack submarines are designed to seek and destroy enemy submarines and surface ships. A number of Third World countries are acquiring modern, state-of-the-art, non-nuclear submarines. Countering this threat is the primary mission of U.S. nuclear-powered attack submarines. Other missions range from intelligence collection and special forces delivery to anti-ship and strike warfare. The *Seawolf*-class submarine is designed to be exceptionally quiet, fast and well-armed, with advanced sensors. It is a multi-mission vessel, capable of deploying to forward ocean areas to search out and destroy enemy submarines and surface ships and to fire missiles in support of other forces.

Los Angeles-class

Power Plant: One nuclear reactor, one shaft
Length: 360 feet
Beam: 33 feet
Displacement: Approx. 6,900 tons submerged
Speed: 20+ knots (23+ miles per hour, 36.8 +kph)
Crew: 134 (13 officers, 121 enlisted)
Armament: *Tomahawk* missiles, VLS tubes (SSN 719 and later), MK-48 torpedoes, four torpedo tubes
Ships:
USS *Los Angeles* (SSN 688)
USS *Philadelphia*(SSN 690)
USS *Memphis* (SSN 691)
USS *Bremerton* (SSN 698)
USS *Jacksonville* (SSN 699)
USS *Dallas* (SSN 700)
USS *La Jolla* (SSN 701)
USS *City of Corpus Christi* (SSN 705)
USS *Albuquerque* (SSN 706)
USS *Minneapolis-St. Paul* (SSN 708)
USS *Hyman G. Rickover* (SSN 709)
USS *Augusta* (SSN 710)
USS *San Francisco* (SSN 711)
USS *Houston* (SSN 713)
USS *Norfolk* (SSN 714)
USS *Buffalo* (SSN 715)
USS *Salt Lake City* (SSN 716)
USS *Olympia* (SSN 717)
USS *Honolulu* (SSN 718)
USS *Providence* (SSN 719)
USS *Pittsburgh* (SSN 720)
USS *Chicago* (SSN 721)
USS *Key West* (SSN 722)
USS *Oklahoma City* (SSN 723)
USS *Louisville* (SSN 724)
USS *Helena* (SSN 725)
USS *Newport News* (SSN 750)
USS *San Juan* (SSN 751)
USS *Pasadena* (SSN 752)
USS *Albany* (SSN 753)
USS *Topeka* (SSN 754)
USS *Miami* (SSN 755)
USS *Scranton* (SSN 756)
USS *Alexandria* (SSN 757)
USS *Asheville* (SSN 758)
USS *Jefferson City* (SSN 759)
USS *Annapolis* (SSN 760)
USS *Springfield* (SSN 761)
USS *Co1umbus* (SSN 762)
USS *Santa Fe* (SSN 763)
USS *Boise* (SSN 764)
USS *Montpelier* (SSN 765)
USS *Charlotte* (SSN 766)
USS *Hampton* (SSN 767)
USS *Hartford* (SSN 768)
USS *Toledo* (SSN 769)
USS *Tucson* (SSN 770)
USS *Columbia* (SSN 771)
USS *Greeneville* (SSN 772)
USS *Cheyenne* (SSN 773)

Seawolf-class

Power Plant: One nuclear reactor, one shaft
Length: 353 feet
Draft: 35 feet
Beam: 40 feet
Displacement: 8,060 tons surfaced; 9,150 tons submerged
Speed: 25+ knots (28+ mph)
Crew: 134 (13 officers; 121 enlisted)
Ships:
USS *Seawolf* (SSN 21)
USS *Connecticut* (SSN 22)
USS *Jimmy Carter* (SSN 23)

Virginia-class

Power Plant: One nuclear reactor, one shaft
Length: 377 feet
Beam: 34 feet
Displacement: Approx. 7,800 tons
Speed: 25+ knots (28+ miles per hour, 46.3+ kph)
Crew: 134 officers and enlisted
Armament: *Tomahawk* missiles, VLS tubes, MK-48 torpedoes, four torpedo tubes, advanced mobile mines, and unmanned undersea vehicles.
Ships:
USS *Virginia* (SSN 774)
Texas (SSN 775)*
Hawaii (SSN 776)*
North Carolina (SSN 777)*

BALLISTIC MISSILE SUBMARINES

Strategic deterrence has been the sole mission of the fleet ballistic missile submarine (SSBN) since its inception in 1960. The SSBN provides the nation's most survivable and enduring nuclear strike capability. The *Ohio*-class submarine replaced aging fleet ballistic missile submarines built in the 1960s and is far more capable.

Ohio-class/*Trident* ballistic missile submarines provide the sea-based "leg" of the triad of U.S. strategic deterrent forces. The first four *Ohio*-class submarines are converting to guided missile submarines (SSGN) with an additional capability to transport and support Navy special operations forces.

Ohio-class

Power Plant: One nuclear reactor, one shaft
Length: 560 feet
Beam: 42 feet
Displacement: 16,764 tons surfaced; 18,750 tons submerged
Speed: 20+ knots (23+ mph)
Crew: 155 (15 Officers, 140 Enlisted)
Armament: 24 tubes for *Trident II*, D-5 Intercontinental Ballistic Missiles, MK-48 torpedoes, four torpedo tubes.
Ships:
USS *Henry M. Jackson* (SSBN 730)
USS *Alabama* (SSBN 731)
USS *Alaska* (SSBN 732)
USS *Nevada* (SSBN 733)
USS *Tennessee* (SSBN 734)
USS *Pennsylvania* (SSBN 735)
USS *West Virginia* (SSBN 736)
USS *Kentucky* (SSBN 737)
USS *Maryland* (SSBN 738)
USS *Nebraska* (SSBN 739)
USS *Rhode Island* (SSBN 740)
USS *Maine* (SSBN 741)
USS *Wyoming* (SSBN 742)
USS *Louisiana* (SSBN 743)

Photo by PH3 Chris Olsen

▲ USS *Pennsylvania* (SSBN 735)

Ships undergoing conversion to SSGN:
USS *Ohio* (SSGN 726)
USS *Michigan* (SSGN 727)
USS *Florida* (SSGN 728)
USS *Georgia* (SSGN 729)

DEEP SUBMERGENCE RESCUE VEHICLES

Deep Submergence Rescue Vehicles (DSRV) perform rescue operations on submerged, disabled submarines of the U.S. Navy or foreign navies. DSRVs can embark up to 24 personnel for transfer to another vessel. The DSRV also has an arm to clear hatches on a disabled submarine and a combined gripper and cable cutter. The gripper is able to lift 1,000 pounds.

Power Plant: Electric motors, silver/zinc batteries, one shaft, 15 shaft horsepower, four thrusters, 7.5 horsepower.
Length: 49 feet
Beam: 8 feet
Displacement: 38 tons
Speed: 4 knots
Maximum Depth: 5,000 feet
Sonar: Search and navigation
Crew: Two pilots, two rescue personnel and the capacity for 24 passengers
Ships:
DSRV *Mystic*
DSRV *Avalon*

SUBMERSIBLE RESEARCH VEHICLES

NR 1, a nuclear–powered ocean engineering and research submarine, is the first deep submergence vessel using nuclear power. NR l's missions have included search, object recovery, geological survey, oceanographic research, and installation and maintenance of underwater equipment. NR 1 is generally towed to and from remote mission locations by an accompanying surface tender, which is also capable of conducting research in conjunction with the submarine.

Power Plant: One nuclear reactor, one turbo-alternator; Two external motors, two propellers, Four ducted thrusters (two horizontal, two vertical)
Length: 150 feet
Displacement: 400 tons
Diameter: 12 feet
Maximum Operating Depth: 2,375 feet
Crew: 7 (2 officer, 3 enlisted, 2 scientists)
Armament: None
Ships:
NR-l (Nuclear)

* *Under Construction*

OWNER'S and OPERATOR'S manual

Submarines

Photo by JO3 Wes Eplen

▲ *Mystic* (DSRV 1)

RESEARCH SUBMARINE

USS *Dolphin* (AGSS 555) is the Navy's only operational diesel-electric, deep-diving research and development submarine. The submarine has since amassed an impressive record of scientific and military accomplishments, and now serves as a unit of the U.S. Naval Submarine Force, U.S. Pacific Fleet, under Commander, Submarine Development Squadron 5.

Features: Because she was designed as a test platform, USS *Dolphin* can be modified both internally and externally to allow installation of up to 12 tons of special research and test equipment. The submarine has internal and external mounting points, multiple electronic hull connectors, and up to 10 equipment racks for project use.

General Characteristics

Power Plant: Diesel/Electric; Two GM 12-cylinder, 425 HP engines
Length: 165 feet
Displacement: 950 tons full load
Diameter: 18 feet
Operating Depth: 3,000 feet
Crew: 51+ (5 officer, 46 enlisted, and up to 5 scientists)
Armament: None
Ships:
USS *Dolphin* (AGSS 555)

LARGE SCALE VEHICLE 2 (LSV 2)

LSV 2 *Cutthroat*, the world's largest unmanned autonomous submarine, offers the capability to conduct a wide variety of studies dramatically improving the acoustic and operational performance of future submarines. *Cutthroat*, a 205-ton, large scale submarine test vehicle, is used to affordably explore and test emerging technologies and to conduct physics—based experiments. Specific emphasis will be on stealth, hydrodynamics, hydroacoustics and propulsion designs to permit technology insertion into current and future submarines.

General Characteristics

Propulsion: Electric drive (3,000 shaft horsepower (shp) plant coupled with electric motor controller, expandable to 6,000 shp with additional motor controlled modules)
Length: 111 feet
Diameter: 10 feet
Weight: 205 tons
Armament: None
Crew: None
Ships:
Cutthroat (LSV 2)

Aircraft Carriers

Photo by PH3 Josh Kinter

▲ (From left to right) **USS *Dwight D. Eisenhower* (CVN 69), USNS *Arctic* (T-AOE 8), USS *Harry S. Truman* (CVN 75) and USS *Enterprise* (CVN 65)**

The aircraft carrier continues to be the centerpiece of the forces necessary for forward presence. Whenever there has been a crisis, the first question has been: "Where are the carriers?" Carriers support and operate aircraft that engage in attacks on airborne, afloat, and ashore targets that threaten free use of the sea; and engage in sustained operations in support of other forces.

Aircraft carriers are deployed worldwide in support of U.S. interests and commitments. They can respond to global crises in ways ranging from peacetime presence to full-scale war. Together with their onboard air wings, the carriers have vital roles across the full spectrum of conflict.

Nimitz-class

Length, overall: 1,092 feet
Flight Deck Width: 252 feet
Beam: 134 feet
Displacement: Approx. 97,000 tons
Aircraft: 85
Speed: 30+ knots (34.5+ miles per hour)
Crew: 3,200; Air Wing: 2,480
Armament: Two or three (depending on modification) NATO *Sea Sparrow* launchers, 20mm *Phalanx CIWS* mounts: (three on *Nimitz* and *Dwight D. Eisenhower* and four on *Carl Vinson* and later ships of the class.)

Carriers
USS *Nimitz* (CVN 68)
USS *Dwight D. Eisenhower* (CVN 69)
USS *Carl Vinson* (CVN 70)
USS *Theodore Roosevelt* (CVN 71)
USS *Abraham Lincoln* (CVN 72)
USS *George Washington* (CVN 73)
USS *John C. Stennis* (CVN 74)
USS *Harry S. Truman* (CVN 75)
USS *Ronald Reagan* (CVN 76)
George H.W. Bush (CVN 77)*

John F. Kennedy-class

Length, overall: 1052 feet
Flight Deck Width: 252 feet
Beam: 130 feet
Displacement: 82,000 tons
Speed: 30+ knots (34.5 mph)
Aircraft: 85
Crew: 3,117; Air Wing: 2,480
Armament: *Sea Sparrow* missiles with box launchers, Three 20mm *Phalanx* CIWS mounts.

Carriers
USS *John F. Kennedy* (CV 67)

Enterprise-class

Length, overall: 1,101 feet 2 inches
Flight Deck Width: 252 feet
Beam: 133 feet
Displacement: 89,600 tons
Speed: 30+ knots (34.5 mph)
Aircraft: 85
Crew: 3,350, Air Wing: 2,480
Armament: Two *Sea Sparrow* missile launchers, three 20mm *Phalanx* CIWS mounts

Carriers
USS *Enterprise* (CVN 65)

Kitty Hawk-class

Length, overall: 1062.5 feet
Flight Deck Width: 252 feet
Beam: 130 feet
Displacement: Approx. 80,800 tons
Speed: 30+ knots (34.5+ mph)
Aircraft: 85
Crew: 3,150, Air Wing: 2,480
Armament: *Sea Sparrow* launchers, three 20mm *Phalanx* CIWS mounts

Carriers
USS *Kitty Hawk* (CV 63)

* *Under Construction*
Source: U.S. Navy Fact File

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Aircraft

Photo by Air Force Tech. Sgt. Rob Tabor

▲ F-14D *Tomcat*

CARRIER BASED

F/A-18E/F *Super Hornet*

The F/A-18E/F will provide the carrier strike group with a strike fighter that has significant growth potential and increased range, endurance and ordnance-carrying capabilities. It will eventually replace the F-14 on carrier decks.

Wingspan: 44 ft., 8.5 in.
Length: 60 ft., 1.25 in.
Height: 16 ft.
Weight: 66,000 lbs. maximum takeoff
Speed: Mach 1.8+
Ceiling: 50,000 ft.
Range: 462 nm
Armament: 20mm MK-61 *Vulcan* cannon; *Sidewinder, Sparrow* and *AMRAAM* air-to-air missiles; *Maverick, Harpoon, Shrike, HARM, SLAM-ER* and Joint Direct Attack Munition (JDAM); *Walleye* and other bombs and rockets.
Crew: 1(E)or 2(F), depending on model

Photo by PH3 Jonathan Chandler

▲ F/A-18C *Hornet*

SQUADRONS

VFA-11 Red Rippers
VFA-14 Tophatters
VFA-31 Tomcatters
VFA-32 Swordsmen
VFA-41 Black Aces
VFA-102 Diamondbacks
VFA-103 Jolly Rogers
VFA-143 Puking Dogs

F/A-18 *Hornet*

The F/A-18 is an all-weather, attack aircraft that can also be used as a fighter. In its fighter mode, the F/A-18 is used primarily as an escort and for fleet air defense. In its attack mode, it is used for force projection, interdiction and close-air support.

Wingspan: 37.5 ft.
Length: 56 ft.
Height: 15 ft., 3.5 in.
Speed: Mach 1.8+
Range: 290 nm
Armament: 20mm MK-61 *Vulcan* cannon; *Sparrow III* and *Sidewinder* air-to-air missiles; laser-guided and general purpose bombs; *Harpoon* and *HARM*
Crew: 1(A,C) or 2(B,D), depending on model

SQUADRONS

Blue Angels
VFA-2 Bounty Hunters
VFA-15 Valions
VFA-22 Fighting Redcocks
VFA-25 Fist of the Fleet
VFA-27 Royal Maces
VFA-34 Blue Blasters
VFA-37 Bulls
VFA-81 Sunliners
VFA-82 Marauders
VFA-83 Rampagers
VFA-86 Sidewinders
VFA-87 Golden Warriors
VFA-94 Mighty Shrikes
VFA-97 Warhawks
VFA-105 Gunslingers
VFA-106 Gladiators
VFA-113 Stingers
VFA-115 Eagles
VFA-122 Flying Eagles
VFA-125 Rough Raiders
VFA-131 Wildcats
VFA-136 Knighthawks
VFA-137 Kestrels
VFA-146 Blue Diamonds
VFA-147 Argonauts
VFA-151 Fighting Vigilantes
VFA-154 Black Knights
VFA-192 Golden Dragons
VFA-195 Dambusters
VFA-201(USNR) Hunters
VFA-204(USNR) River Rattlers
VFC-12(USNR) Fighting Omars

F-14 *Tomcat*

The F-14 is a supersonic, twin-engine, variable sweep-wing fighter designed to attack and destroy enemy aircraft at night and in all weather conditions. The F-14 can track up to 24 targets simultaneously with its advanced weapons control system and engage any of them with one of its six *Phoenix* missiles while continuing to scan the airspace. The F-14 Tomcat is being phased out and replaced by the F/A-18E/F Super Hornet.

Wingspan: 64 ft., 1.5 in.
Length: 62 ft., 8 in.
Height: 16 ft.
Weight: 74,349 lbs. maximum takeoff
Speed: Mach 1.88
Ceiling: 50,000 ft.
Range: 1,600 nm (with external fuel)
Armament: 20mm MK-61 *Vulcan* cannon; *Sparrow, Sidewinder* and *Phoenix* air-to-air missiles; laser-guided and general purpose bombs
Crew: 2 (one pilot, one radar intercept officer)

SQUADRONS

VF-213 Black Lions
VF-31 Tomcatters

EA-6B *Prowler*

The EA-6B, a twin-engine, mid-wing aircraft designed for carrier and advanced base operations, is used to provide an umbrella of protection for strike aircraft by jamming enemy radar, electronic data links and communications. The EA-6B is a fully integrated electronic warfare system, combining long-range, all-weather capabilities with advanced electronic countermeasures.

Wingspan: 53 ft.
Length: 59 ft., 10 in.
Height: 16 ft., 3 in.
Weight: 65,000 lbs. maximum takeoff
Speed: 622 mph
Ceiling: 41,200 ft.
Range: 955 nm
Armament: *HARM*
Crew: 4 (one pilot, three electronic warfare officers)

SQUADRONS

VAQ-128 Fighting Phoenix
VAQ-129 Vikings
VAQ-130 Zappers
VAQ-131 Lancers
VAQ-132 Scorpions
VAQ-133 Wizards
VAQ-134 Garudas
VAQ-135 Black Ravens
VAQ-136 Gauntlets
VAQ-137 Rooks
VAQ-138 Yellowjackets
VAQ-139 Cougars
VAQ-140 Patriots
VAQ-141 Shadowhawks
VAQ-142 Gray Wolves
VAQ-209(USNR) Star Warriors

▶ S-3B *Viking*

Photo by PHAN Kristopher Wilson

S-3B *Viking*

The S-3B, a jet aircraft used for anti-submarine and anti-surface warfare, is extremely versatile and can be equipped for tanking, mining and limited electronic surveillance.

Wingspan: 68 ft., 8 in.
Length: 53 ft., 4 in.
Height: 22 ft., 9 in.
Weight: 52,539 lbs. maximum design gross weight
Speed: 518 mph
Ceiling: more than 35,000 ft.
Range: more than 2,000 nm (combat)
Armament: torpedoes, bombs, *Harpoon* and *Maverick*
Crew: 4 (one pilot, two flight officers and one sensor operator)

SQUADRONS

VS-22 Checkmates
VS-24 Scouts
VS-29 Dragonfires
VS-31 Top Cats
VS-32 Maulers
VS-33 Screwbirds
VS-35 Blue Wolves
VS-38 Red Griffins
VS-41 Shamrocks

▼ EA-6B *Prowler*

Photo by PHCS Mahlon K. Miller

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Aircraft

E-2C *Hawkeye*

The E-2C is the Navy's all-weather, carrier-based tactical warning and control system aircraft. It provides airborne early warning and command and control functions for the battle group. Additional missions include: surface surveillance coordination, strike and interceptor control, search and rescue guidance and communications relay.

Wingspan: 80 ft., 7 in.
Length: 57 ft., 8.75 in.
Height: 18 ft., 3.75 in.
Weight: 53,288 lbs. maximum takeoff
Speed: 389 mph
Ceiling: 37,000 ft.
Range: 1,541 nm (ferry range)
Crew: 5 (two pilots, three mission systems operators)

SQUADRONS

VAW-77(USNR) Night Wolves
VAW-112 Golden Hawks
VAW-113 Black Eagles
VAW-115 Liberty Bells
VAW-116 Sun Kings
VAW-117 Wallbangers
VAW-120 Greyhawks
VAW-121 Bluetails
VAW-123 Screwtops
VAW-124 Bear Aces
VAW-125 Tigertails
VAW-126 Seahawks

▼ E-6B *Mercury*

U.S. Navy photo

C-2A *Greyhound*

The C-2A is the principal aircraft used for COD (carrier on-board delivery) of personnel and materiel. It can deliver a payload of up to 10,000 lbs.

Wingspan: 80.5 ft.
Length: 57 ft., 10 in.
Height: 15 ft., 10.5 in.
Weight: 57,000 lbs. maximum takeoff
Speed: 310 mph
Ceiling: 33,500 ft.
Range: more than 1,040 nm (with freight)
Crew: 3 (one pilot, one co-pilot, one flight engineer)

SQUADRONS

VRC-30 Providers
VRC-40 Rawhides

▼ C-2A *Greyhound*

Photo by PHAN Ashley Gayton

SHORE-BASED

E-6B *Mercury*

The E-6B *Mercury* aircraft provides a survivable communications link between national decision makers and the country's arsenal of strategic nuclear weapons. The E-6B enables the President of the United States and the Secretary of Defense to directly contact submarines, bombers and missile silos protecting our national security through deterrence.

Wingspan: 148 feet, 2 inches
Length: 152 feet, 11 inches
Height: 42 feet 5 inches
Weight: 341,000 lbs. maximum take-off
Speed: 523 mph
Ceiling: 42,000 feet
Range: more than 5,500 nm
Crew: 23

SQUADRONS

VQ-3 Ironman
VQ-4 Shadows
VQ-7 Roughnecks

Photo by PH3 Shannon R. Smith

▲ P-3C *Orion*

P-3C Orion/EP-3E Orion (Aries II)

The P-3, a land-based, long-range patrol aircraft, has been in the Navy since the l960s. Both versions provide multi-mission intelligence, surveillance, reconnaissance and combat capability to theater commanders worldwide.

Wingspan: 99 ft., 8 in.
Length: 116 ft., 10 in.
Height: 33 ft., 8.5 in.
Weight: 146,000 lbs. maximum permissible
Speed: 473 mph
Ceiling: 28,300 ft.
Range: 1,346 nm with three hours on station
Armament: *Harpoon* and *Maverick*; torpedoes; mines
Crew: 10 (three pilots, three flight officers/engineers, three sensor operators, one in-flight technician)

SQUADRONS

VP-1 Screaming Eagles
VP-4 Skinny Dragons
VP-5 Mad Foxes
VP-8 Tigers
VP-9 Golden Eagles
VP-10 Red Lancers
VP-16 War Eagles
VP-26 Tridents
VP-30 Pro's Nest
VP-40 Fighting Marlins
VP-45 Pelicans
VP-46 Grey Knights
VP-47 Golden Swordsmen
VP-62(USNR) Broad Arrows
VP-64(USNR) The Condors
VP-65(USNR) Tridents
VP-66(USNR) The Liberty Bells
VP-69(USNR) Totems
VP-92(USNR) Minutemen
VP-94(USNR) Crawfishers
VQ-1 World Watchers
VQ-2 Sandeman
VPU-1 Old Buzzards
VPU-2 Wizards

C-130 *Hercules*

The C-130 is probably the most versatile tactical transport aircraft ever built. Its uses have been almost limitless: transport, electronic surveillance, search and rescue, space-capsule recovery, helicopter refueling, gunship and special cargo delivery.

Wingspan: 132 ft., 7 in.
Length: 97 ft., 9 in.
Height: 38 ft., 10 in.
Weight: 175,000 lbs. maximum takeoff
Speed: 400 mph maximum

Photo by PH2 Lou Rosales

▲ C-130 *Hercules*

Ceiling: 28,000 ft.
Range: 4,460 nm
Crew: 4 (two pilots, one navigator, one loadmaster)

SQUADRONS

VR-53 (USNR) Capital Express
VR-54 (USNR) Revelers
VR-55 (USNR) Minutemen
VR-62 (USNR) Nor'easters

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Aircraft

C-9B/DC-9 *Skytrain II*

The C-9B is used for fleet logistics support and military sealift.

Wingspan: 93 ft., 5 in.
Length: 119 ft., 3.5 in.
Height: 27.5 ft.
Weight: 121,000 lbs. maximum takeoff
Speed: 575 mph
Range: 2,185 nm
Crew: 5 (one pilot, one co-pilot, one crew chief, two attendants and 90 passengers)

SQUADRONS

VR-46(USNR) Eagles
VR-52(USNR) The Taskmasters
VR-56(USNR) Globemasters
VR-57(USNR) Conquistadores
VR-58(USNR) Sunseekers
VR-61(USNR) Islanders

C-40A *Clipper*

The C-40A *Clipper* provides critical logistics support to the Navy. Its flight deck features a flight management computer system with an integrated GPS.

The U.S. Navy Reserve, which operates and maintains the aircraft, is the first customer for the newest member of the Boeing Next-Generation 737 family. The *Clipper* was ordered by the Navy to replace its fleet of aging C-9 *Skytrains*. The C-40A is the first new logistics aircraft in 17 years to join the Navy Reserve. Currently, the Navy Reserve provides 100 percent of the Navy's worldwide in-theater medium and heavy airlift.

Wingspan: 112 feet 12 inches
Length: 110 feet 4 inches
Height: 41 feet 2 inches
Weight: 171,000 lbs. Maximum gross, take-off
Speed: 0.78 to 0.82 Mach
Range: 3,000 nm with 121 passengers or 40,000 lbs. of cargo.
Ceiling: 41,000 feet
Range: 3,000 nm, with 121 passengers or 40,000 lbs of cargo
Crew: Four

C-12 *Huron*

The UC-12B/F/M *Huron* is a utility transport, equipped with high floatation landing gear and tip tanks. The UC-12F and UC-12M models also have hydraulically retractable landing gear.

Wingspan: 54 ft., 6 in.
Length: 43 ft., 9 in.
Height: 15 ft.
Weight: 12,500 lbs. maximum takeoff
Speed: 298 mph maximum
Ceiling: more than 35,000 ft.
Range: 1,965 nm
Crew: pilot only (or crew of two side by side)

TRAINERS

T-6A *Texan II*

The T-6A *Texan II* is a tandem-seat, turboprop trainer whose mission is to train Navy and Marine Corps pilots and Naval Flight Officers.

The aircraft is one component of the Joint Primary Aircraft Training System (JPATS) along with simulators, computer-aided academics, and a Training Integration Management System (TIMS). The joint program, that will replace Navy T-34C aircraft, uses commercial-off-the-shelf (COTS) subsystems to the maximum extent possible. The Navy's total T-6A requirement is 328 aircraft. The Navy aircraft and ground-based training systems will be completely supported and maintained by commercial vendors with intermediate maintenance provided for selected systems at the operating site.

Wingspan: 33.4 feet
Length: 33.3 feet
Height: 10.8 feet
Weight: 6,500 lbs. maximum takeoff weight
Speed: 270 knots
Range: 850 nm (max)
Ceiling: 31,000 feet
Crew: Two (instructor pilot, student pilot)

▼ T-6A Texan II

Photo by Jeff Doty

T-34C *Turbomentor*

The T-34C is used to provide primary flight training for student pilots. As a secondary mission, approximately 10 percent of the aircraft provide pilot proficiency and other aircraft support services to Commander, Naval Air Force, U.S. Atlantic Fleet; Commander, Naval Air Force, U.S. Pacific Fleet; and Naval Air Systems Command's "satellite sites" operated throughout the continental United States. The T-34C was procured as a commercial-derivative aircraft certified under an FAA Type Certificate. The T-34C was derived from the civilian Beechcraft Bonanza. Throughout its life, the aircraft has been operated and commercially supported by the Navy using FAA processes, procedures and certifications.

Wingspan: 33 feet, 5 inches
Length: 28 feet, 8 inches
Height: 9 ft., 11 in.
Weight: 4,425 Lb.
Speed: 322 mph
Ceiling: 25,000 ft .
Range: Approx. 600 nm
Crew: Two (instructor pilot, student pilot)

SQUADRONS

VT-2 Doer Birds
VT-3 Red Knights
VT-4 Mighty Warbucks
VT-6 Shooters
VT-10 Wildcats
VT-27 Boomers
VT-28 Rangers

T-45A *Goshawk*

The T-45A *Goshawk*, a carrier-capable trainer aircraft, is replacing the T-2C *Buckeye* and TA–4J *Skyhawk* as the Navy's strike trainer. The Navy has 187 T-45s in service.

Wingspan: 30 ft., 9.75 in.
Length: 39 ft., 4 in.
Height: 14 ft.
Weight: 14,081 lbs. maximum takeoff
Speed: 625 mph
Range: 826 nm
Ceiling: 40,000 ft.
Crew: 2 (one instructor, one student)

SQUADRONS

VT-7 Eagles
VT-21 Redhawks
VT-22 Golden Eagles

Photo by Sheri Crowe

▲ T-34C *Turbomentor*

T-2 *Buckeye*

The T-2 is a two-seat trainer used to school pilots and flight officers in basic and intermediate strike training.

Wingspan: 38 ft., 1.5 in.
Length: 38 ft., 3.5 in.
Height: 14 ft., 9.5 in.
Weight: 13,179 lbs. maximum takeoff
Speed: 522 mph
Range: 909 nm
Ceiling: 40,400 ft.
Crew: 2 (one instructor, one student)

SQUADRONS

VT-9 Tigers
VT-86 Sabre Hawks

Photo by PH2 Daniel J. McLain

▲ T-2C *Buckeye*

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Aircraft

T-44A *Pegasus*

The T-44A is used to train Navy and Air Force pilots to fly multi-engine, turbo-prop aircraft such as the P-3 and the C-130.

Wingspan: 45 ft., 10.75 in.
Length: 39 ft., 9.5 in.
Height: 15 ft., 1.75 in.
Weight: 10,950 lbs. maximum takeoff
Speed: 267 mph
Range: 960 nm
Ceiling: 31,000 ft.
Crew: 2 (one instructor, one student)

SQUADRON

VT-31 Wise Owls
VT-35 Stingrays

T-39N/G *Sabreliner*

The seven T-39N *Sabreliners* in service are used to train naval flight officers in radar navigation and airborne radar-intercept procedures. These aircraft replaced the Cessna T-47A during the early 1990s; the T-47As had replaced earlier T-39Ds in the training role. One T-39D rapid-response airlift *Sabreliner* remained in service as of mid-1998. The eight T-39Gs are used for student non-radar training.

Wingspan: 44 ft., 5.25 in.
Length: 48 ft., 4 in.
Height: 16 ft.
Weight: 20,000 lbs. maximum takeoff
Speed: Mach .8
Range 1,777 nm
Ceiling: 27,000 ft.
Crew: 2 (one instructor, one student)

RQ-2A *Pioneer* Unmanned Aerial Vehicle (UAV)

The *Pioneer* UAV system performs a wide variety of reconnaissance, surveillance, target acquisition and battle damage assessment missions. The UAV's low radar cross section, low infrared signature and remote control versatility provides a degree of cover for the aircraft. *Pioneer* provides the tactical commander with real-time images of the battlefield or target. Since first deployed as a land-based system in 1986, *Pioneer* is currently configured for operations on five LPD class ships with a sixth ship under modifications.

The documented success of *Pioneer* in supporting combat operations and providing the battlefield commander critical intelligence information established the utility and importance of UAVs in combat.

Wingspan: 16.9 ft
Length: 14.0 ft
Weight: Max design gross take-off: 416 pounds
Speed: 110 knots (109.37 mph).
Ceiling: 15,000 feet
Range: 100+ nm

Photo by PH2 Daniel J. McLain

▲ **RQ-2B *Pioneer* Unmanned Aerial Vehicle (UAV)**

HELICOPTERS

SH/HH-60 *Seahawk*

The *Seahawk* is a twin-engine helicopter used for anti-submarine warfare, search and rescue, drug interdiction, anti-ship warfare, cargo lift and special operations. The SH-60B is an airborne platform based aboard cruisers, destroyers and frigates, that deploys sonobuoys and torpedoes in an anti-submarine role while extending the range of the ship's radar capabilities. The SH-60F is carrier based. The HH-60A is designed to accomplish today's combat search and rescue mission as well as other replenishment and utility functions.

Length: 40 ft., 11 in. (rotors and tail pylon folded)
Height: 17 ft.
Weight: 21,884 lbs. maximum takeoff
Speed: 169 mph
Range: 380 nm
Crew: 3-4

SQUADRONS

HS-2 Golden Falcons
HS-3 Tridents
HS-4 Black Knights
HS-5 Nightdippers
HS-6 Indians
HS-7 Dusty Dogs
HS-8 Eight-ballers
HS-10 War Hawks
HS-11 Dragonslayers
HS-14 Chargers
HS-15 Red Lions
HS-75 (USNR) Emerald Knights
HCS-4 (USNR) Red Wolves

Photo by PH3 Kevin S. O'Brien

▲ MH-60S *Seahawk*

HCS-5 (USNR) Firehawks
HSL-37 Easy Riders
HSL-40 Airwolves
HSL-41 Seahawks
HSL-42 Proud Warriors
HSL-43 Battle Cats
HSL-44 Swamp Fox
HSL-45 Wolfpack
HSL-46 Grandmasters
HSL-47 Saberhawks
HSL-48 Vipers
HSL-49 Scorpions
HSL-51 Warlords
HSL-60(USNR) Jaguars

MH-60 *Knighthawk*

The MH-60 is a twin-engine helicopter used for logistics support, vertical replenishment, search and rescue, naval special warfare support and future missions to include organic airborne mine countermeasures and combat search and rescue.

Length: 41 ft., 4 in.
Height: 17 ft.
Weight: Max. take-off 22,500 lbs.
Speed: 209 mph.
Range: 250 nm
Ceiling: 13,000 ft.
Crew: Four

SQUADRONS

HC-3 Pack-Rats
HSC-25 Island Knights
HSC-26 Chargers
HSC-28 Dragon Whales
HSC-21 Blackjacks

H-3 *Sea King*

The first version of this workhorse anti-submarine warfare helicopter was flown more than 38 years ago. The H-3's versatility was emphasized during Operation *Desert Shield/Desert Storm* when 36 *Sea Kings*, flying from carriers, logged more than 5,000 hours conducting combat SAR, special operations, maritime interdiction operations, logistics support and mine hunting. The SH-3H has been replaced in the fleet by SH-60F and HH-60H aircraft. The UH-3Hs are programmed to be replaced by the CH-60 version of the Sikorsky *Blackhawk/Seahawk*.

Length: 72 ft., 8 in.
Height: 16 ft., 10 in.
Weight: 21,000 lbs. maximum takeoff
Speed: 166 mph
Ceiling: 14,700 ft.
Range: 542 nm
Armament: MK46/50 torpedoes, 7.62mm machine guns
Crew: 3-4

SQUADRONS

HC-2 Fleet Angels
HSC-21 Blackjacks
HC-85(USNR) Golden Gators
HS-75(USNR) Emerald Knights

▼ SH-60B *Seahawk*

Photo by PH3 Patrick M. Bonafede

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Aircraft

Photo by PH1 Bart A. Bauer

▼ MH-53E *Sea Dragon*

TH-57 *Sea Ranger*

The TH-57 *Sea Ranger* is used to train several hundred student naval aviators with 45 TH-57Bs (for primary visual flight rules training) and 71 TH-57Cs (for advanced instrument flight rules training) in two helicopter training squadrons at NAS Whiting Field, Milton, Fla. Two TH-57Cs configured for RDT&E are used for photo, chase and utility missions at the Naval Air Warfare Center Aircraft Division at Patuxent River, Md.

Length: 39 ft.
Height: 10 ft.
Weight: 3,200 lbs. maximum takeoff
Speed: 138 mph
Ceiling: 20,000 ft., pressure altitude
Range: 368 nm
Crew: 5 (one pilot, four student pilots)

SQUADRONS

HT-8 Eightballers
HT-18 Vigilant Eagles

MH-53E *Sea Dragon*

The MH-53E, a mine-countermeasures derivative of the CH-53E *Super Stallion*, is heavier and has a greater fuel capacity than the *Super Stallion*. Capable of transporting up to 55 troops, the MH-53E can carry a 16-ton payload 50 nautical miles, or a 10-ton payload 500 nautical miles. In its primary mission of airborne mine countermeasures, the MH-53E is capable of towing a variety of mine-countermeasures systems.

Length: 99 ft. (rotors turning)
Height: 29 ft., 5 in. (tail rotor turning)
Weight: 73,500 lbs. maximum takeoff
Speed: 196 mph
Ceiling: 18,500 ft.
Range: 1,120 nm
Crew: 3 to 8 (two pilots, 1 to 6 crewmen)

SQUADRONS

HC-4 Black Stallions
HM-14(USNR) Vanguard
HM-15(USNR) Blackhawks

SPECIAL SQUADRONS

VC-6 Firebees
VX-1 Pioneers
VX-9 Vampires
TACRON-11 Dirigimi
TACRON-12 Talons
TACRON-21 Blackjacks
TACRON-22 Skylords

▼ TH-57 *Sea Ranger*

Photo by PH3 Joseph M. Bullavac

Spec Warfare

Photo by PH2 Eric S. Logsdon

▲ SEALs during Advanced Cold Weather Training in Kodiak, Alaska.

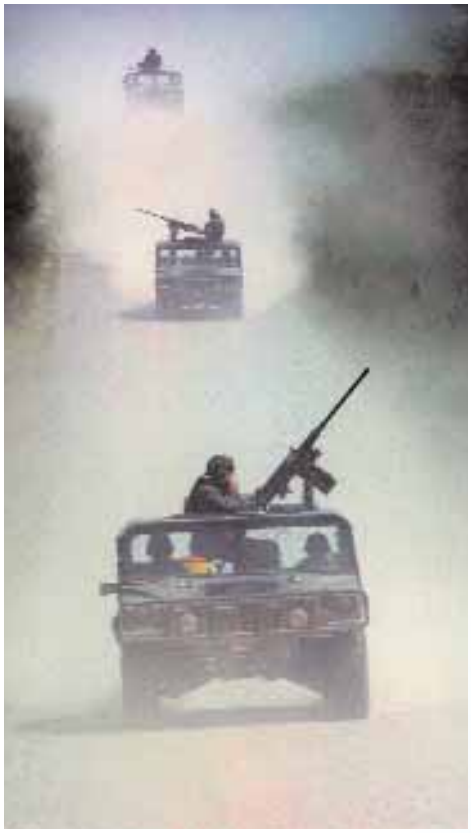

Photo by PH1 Shawn Eklund

▲ Navy SEALs (Sea, Air, Land) receive tactical mobility training from Naval Special Warfare Group (NSWG) 2 Training Detachment (TRADET). NSWG-2 TRADET trains all of the East Coast SEAL teams before they deploy to support missions throughout the world.

COMMANDER NAVAL SPECIAL WARFARE COMMAND, CORONADO, CALIF.

Commander, Naval Special Warfare Group (NSWG) 1, Coronado, Calif.

SEAL Teams 1/3/5/7
Logistics Support Unit 1, Coronado, Calif.
Naval Special Warfare Unit (NSWU) 1, Guam
NSWU 3, Bahrain

Commander, NSWG 2, Little Creek, Va.

SEAL Teams 2/4/8/10
Logistics Support Unit 2, Little Creek, Va.
NSWU 2, Germany
NSWU 10, Spain

Commander, NSWG 3, Coronado

SEAL Delivery Vehicle Team (SDVT) 1, Pearl City, Hawaii
SDVT 2, Coronado, Calif.

Commander, NSWG 4, Little Creek, Va.

SBT 12, Coronado, Calif.
SBT 20, Little Creek, Va.
SBT 22, Stennis, Miss.

NAVAL SPECIAL WARFARE CENTER, CORONADO, CALIF.

Naval Small Craft Instruction and Technical Training School (NAVSCIATTS), Stennis, Miss.

NAVY PARACHUTE TEAM, "LEAP FROGS," CORONADO, CALIF.

NAVAL SPECIAL WARFARE COMMAND (RESERVE FORCE)

Commander, Naval Special Warfare Operational Support Group (OSG), Coronado, Calif.

Operational Support Team (OST) 1, Coronado, Calif.

OST 2, Little Creek, Va.
Plus 59 Operational Support Units based on capabilities and location.

Source: Naval Special Warfare Command (Active-duty Force as of Jan. 1, 2006)

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Weapons

STRATEGIC STRIKE

Trident II (D-5)

Larger and with longer range than the *Trident I*, the *Trident* II was first tested aboard a submarine in March 1989 and deployed in 1990.

Dimensions: 83 x 528 in.
Weight: 130,000 lbs.
Warhead: Designed to carry 12 W76/MK 4 or eight W88/MK 5
Propulsion: Solid-fuel rocket
Range: 4,000 nm.

GENERAL-PURPOSE BOMBS

The MK-80 series general-purpose bomb family was created in the late 1940s and has been the standard air-launched bomb for the services ever since. The general-purpose bomb family is designed to provide blast and fragmentation effects and is used extensively in a number of configurations including laser-guided bombs (LGBs), joint direct attack munitions (JDAM) and air-delivered mining applications. The unguided versions of the general-purpose bomb can also be delivered in freefall or retarded modes depending upon mission requirements.

There were four basic versions of these bombs in inventory for many years:

- 250 pound MK-81,
- 500 pound MK-82/BLU 111
- 1,000 pound MK-83/BLU 110 and
- 2,000 pound MK-84/BLU 117.

Production of the 250-pound general-purpose bomb has been discontinued and it is no longer carried in the active inventory. The remaining versions of the MK-80 series bombs are being converted from the MK designation to the bomb-loaded unit (BLU) designation during new production. The Navy's MK-80 series bombs remaining in inventory are filled with H-6 high explosive; the newer BLU series bombs incorporate a PBXN-109 explosive that provides less sensitive characteristics and is considered safer to handle and stow.

Photo by PH3 Justin S. Osborne

▲ GBU-12 laser-guided bomb

Laser-Guided Bomb (LGB) Kits

Laser-guided bomb kits were developed to enhance the terminal accuracy of air-launched, general-purpose bombs and entered the fleet's inventory in 1968 An LGB kit consists of a Computer Control Group and Air Foil Group. The kit is normally attached to a general-purpose bomb to form an LGB.

Joint Direct Attack Munition (JDAM)

Joint direct attack munitions kits were jointly developed with the U.S. Air Force to provide increased accuracy for air-launched bombs. The JDAM kit consists of a tail kit and mid-body strakes attached to a general purpose or penetrator bomb body. Guidance and control is provided by global positioning system aided inertial navigation system.

Dimensions: (JDAM and warhead) GBU-31 (v) 2/B: 152.7 inches (387.9 centimeters); GBU-31 (v) 3/B: 148.6 inches (377.4 centimeters); GBU-32 (v) 2/B: 119.5 inches (303.5 centimeters)
Weight: (JDAM and warhead) GBU-31 (v) 2/B: 2,036 pounds (925.4 kilograms); GBU-31 (v) 3/B: 2,115 pounds (961.4 kilograms); GBU-32 (v) 2/B: 1,013 pounds (460.5 kilograms)
Wing Span: GBU-31: 25 inches (63.5 centimeters); GBU-32: 19.6 ins. (49.8 centimeters)
Range: Up to 15 miles (24 kilometers)

Joint Stand-off Weapon (JSOW)

The joint standoff weapon is an air-launched "drop-and-forget" weapon that is capable of approximately 40 nautical mile stand-off ranges. JSOW provides the fleet with a strike interdiction capability against soft targets such as fixed and relocatable air defense elements, parked aircraft command and control facilities, light combat vehicles, industrial elements and enemy troops. Currently, two variants of JSOW are planned: AGM-154A, that uses general-purpose submunitions and JSOW C that employs a unitary type warhead.

Dimensions: 160 inches (4.1 meters); box shaped diameter 13 inches (33.02 cm) on a side; 106 inches (2.69 meters) wingspan

Weight: From 1,065 pounds (483 kilograms) to 1,500 pounds (681 kilograms)

Range: Low altitude launch - 15 nautical miles (27.78 kilometers), High altitude launch - 65 nautical miles (120.38 kilometers)

Warhead(s): BLU-97 - Combined effects bomblets, BLU-108 - Sensor fused weapon, Broach multi-stage warhead

HARM (High-Speed Anti-Radar Missile)

HARM is the standard anti-radar missile in the U.S. inventory. It's used as both a strike-protection and anti-ship weapon. First deployed aboard USS *Kitty Hawk* (CV 63) in January 1984. First used in combat in April 1986 during raids on Libya.

Dimensions: 10 m x 13 ft. 7 in. x 44 in. wingspan

Weight: 798 lbs.

Warhead: 146 lbs.

Range: Depends on launch speed/altitude

Propulsion: Dual-thrust rocket motor (Mach 2+)

HARPOON/SLAM-ER

The *Harpoon* and Stand-Off Land Attack Missile - Expanded Response (SLAM-ER) missiles are derivatives from the original Harpoon, which was conceived in 1965.

Harpoon

Air, surface-launched, anti-ship, all-weather cruise missile. Originally designed as an air-to-surface missile for the P-3 *Orion*, the *Harpoon*, which entered service in 1977, can now be carried by virtually all naval platforms.

Dimensions: 12.6 ft. long-air launched; 15.2 ft. long-surface launched.

Weight: 1,160 lbs. (air launch), 1,459 lbs. (ASROC launcher), 1,520 lbs. (SAM launcher), 1,523 lbs. (capsule/canister launch)

Speed: High subsonic speeds

Warhead: 488.5 lbs. HE (blast; semi-armor piercing)

Propulsion: Turboject (cruise) w/solid-fuel booster for ship launch

Range: 75 nm.

Stand-Off Land Attack Missile-Expanded Response (SLAM-ER)

SLAM-ER is an upgrade to the SLAM and is currently in production. *SLAM-ER* has a greater range (150+ miles), a titanium warhead for increased penetration and software improvements which allow the pilot to retarget the impact point during the terminal phase of attack. It is also the first land-attack missile equipped with automatic target acquisition for precision targeting.

Maverick

The *Maverick* is a short-range, air-to-surface, tactical missile. The version used by the Navy carries a warhead designed to penetrate large, hard targets. First deployed in August 1972.

Dimensions: 8.2 ft. long; 12 in. diameter; 2.4 ft. wing span

Weight: 635 lbs.

Warhead: 300 lbs.

Propulsion: Two-stage, solid-fuel rocket motor

Speed: Supersonic

Range: Approx. 14 nm.

▼ **AGM-88** ***High-Speed Anti-Radiation (HARM)***

Photo by PH3 Jonathan Chandler

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Weapons

Tomahawk Cruise Missile

An all-weather, ship- or submarine-launched, cruise missile. *Tomahawks* have proven to be highly survivable weapons due to their low radar detectability and terrain/wave-skimming flight. First deployed in 1986.

Dimensions: 18.3 ft. long (20.6 ft. with booster); 20.4 in. diameter; 8.9 ft. wingspan
Weight: 2,650 lbs. (3,200 lbs. with booster)
Warhead: 1,000 lbs. (conventional) or conventional submunitions dispenser with combined-effect bomblets
Propulsion: Turbojet (cruise); solid-fuel booster (launch)
Speed: Subsonic
Range: 870 nm. (land attack/conventional warhead)

Penguin Anti-ship Missile

The Norwegian-designed and built *Penguin* anti-ship missile is carried aboard Lamps III helicopters. First deployed in 1993.

Dimensions: 10 ft long; 11.2 in. diameter; 39 in. wingspan
Weight: 847 lbs.
Propulsion: Solid-fuel rocket motor/solid-fuel booster
Warhead: 265 lbs., semi-armor piercing
Range: 25 nm.
Speed: Mach 1.2

ANTI-AIR WARFARE (AAW) AIRCRAFT GUNS

M61A1

This 20mm Gatling gun, which also forms the basis for the *Phalanx* Close-In Weapons System (see "Anti-aircraft Warfare" section), is mounted aboard the F/A-18 *Hornet* and F-14 *Tomcat*.

Caliber: 20mm//62
Muzzle Velocity: 3,400 ft./sec.
Rate of Fire: 4,000 or 6,000 rounds/min.
Weight: 841 lbs. total (gun, feed system, ammunition)

▼ AIM-7 *Sea Sparrow*

Photo by PH3 Milosz Reterski

SURFACE-TO-AIR MISSILES

Rolling Airframe Missile (RAM)

Developed jointly with the Federal Republic of Germany, RAM provides ships with a low-cost, self-defense system against anti-ship missiles.

Dimensions: 9.25 ft. long; 5 in. diameter; 1.5 ft. wingspan
Weight: 162 lbs.
Warhead: 25 lbs.
Propulsion: Solid-fuel rocket
Range: 5 nm.
Speed: Supersonic

STANDARD MISSILE-2 (SM-2)

Designed as a surface-to-air and surface-to-surface missile, the Standard missile is currently employed in two variations: SM-2 MR (medium range) and SM-2 ER (Extended Range).

The first *Standard* missile entered the fleet in 1970. The SM-2 ER arrived in 1981.

SM-1/SM-2 MR

Dimensions: 14.7 ft. long; 13.5 in. diameter; 3.6 ft. wingspan
Weight: 1,380 lbs.
Warhead: Proximity fuse/high-explosive
Propulsion: Dual thrust/solid-fuel rocket
Range: 40 to 90 nm.

SM-2 ER

Dimensions: 26.2 ft long; 13.5 in. diameter; 5.2 ft. wingspan
Weight: 2,980 lbs.
Warhead: Proximity fuse/ high-explosive
Propulsion: Two-stage/solid-fuel rocket; sustainer motor and booster motor
Range: 65 to 100 nm.

AIR-TO-AIR MISSILES

Advanced, Medium-Range, Air-to-Air Missile (AMRAAM)

An all-weather, all-environment, radar guided missile developed as a follow-on to the *Sparrow* missile series. AMRAAM is smaller, faster, lighter and has improved capabilities against very low-altitude and high-altitude targets in an electronic countermeasure environment. Its active radar, in conjunction with an inertial reference unit and microcomputer system makes the missile less dependent on the aircraft fire control system enabling the pilot to aim and fire several missiles at multiple targets. The AMRAAM is a result of a joint U.S. Navy and U.S. Air Force development effort and is in service with numerous NATO and Allied countries. The AMRAAM was deployed in September 1991 and is carried on the F/A-18 *Hornet*.

Dimensions: 12 ft. (long); 7 in. diameter; 21 in. wingspan
Weight: 335 lbs.
Propulsion: High performance, solid fuel rocket motor
Warhead: Blast fragmentation; high explosive
Speed: Supersonic

AIM-54 *Phoenix* Missile

The *Phoenix* missile is the Navy's only long-range, air-to-air missile. The missile is designed for use in all-weather and heavy jamming environments. The improved *Phoenix*, the AIM-54C, can better counter projected threats from tactical aircraft and cruise missiles.

Dimensions: 13 ft. long; 15 in. diameter; 36 in. wingspan
Weight: 1,024 pounds
Propulsion: Solid propellant rocket motor
Warhead: 135 lb., proximity fuse, high explosive
Range: In excess of 100 nm.
Speed: In excess of 3,000 mph

Photo by PH2 Todd Frantom

▲ AIM-9M Sidewinder

Sparrow

A highly-maneuverable, all-weather, beyond-visual-range, semi-active radar homing air-to-air missile used by the United States, NATO and other allied forces. A shipboard version, the *Sea Sparrow*, provides U.S. Navy and NATO ships with an effective, anti-air weapon. First deployed in 1958, numerous models and upgrades have occurred to the *Sparrow* missile family. Current air-to-air versions are carried on the F-14 and F/A-18 aircraft.

Dimensions: 12 ft. long; 8 in. diameter; 3.4 ft. wingspan
Weight: 500 lbs.
Warhead: 88 lbs. annular blast fragmentation
Propulsion: Solid-fuel rocket motor
Speed: Supersonic

Sidewinder

The *Sidewinder* is a short-range, infrared, within visual range air-to-air missiles used by the United States, NATO and other allied nations. The missile has been through a number of modernizations and the current fleet weapon is the AIM-9M. The missile is an all-aspect, heat-seeking missile with improved capabilities against countermeasures. A major modification to the AIM-9M *Sidewinder* is the AIM-9X.

The AIM-9X is a joint U.S. Navy and U.S. Air Force program that upgrades the missile with a staring focal plan array in the seeker, and extremely agile airframe and state-of-the-art signal processors resulting in enhanced target acquisition, missile kinematics and improved infrared counter-countermeasure capabilities. The missile's high off boresight capability can be coupled to a helmet-mounted cueing system that will revolutionize the way that air-to-air missiles are employed. The Sidewinder is currently deployed on the F-14, F/A-18, AV-8 and AH-1 aircraft

Dimensions: 9.6 ft. long; 5 in. diameter; 2.1 ft. wingspan
Weight: 190 lbs.
Propulsion: High performance, solid-fuel rocket motor
Warhead: 20.8 blast fragmentation
Speed: Supersonic

Weapons

▼ *Close-In Weapon System* (CIWS)

PHAN Theron Godbold

SHIPBOARD GUNS

MK-45 – 5-inch/54-caliber lightweight gun

This 54-caliber, lightweight gun provides surface combatants accurate naval gunfire against fast, highly-maneuverable, surface targets, air threats and shore batteries during amphibious operations.

Caliber: 5 inch/54 inch
Shell Weight: 70 lbs.
Firing Rate: 20 rounds per minute
Muzzle Velocity: 2,650 ft./sec
Range: 13 nm.
Magazine Capacity: 475 to 500 rounds
Weight: 47,820 lbs.

MK-38 – 25 mm machine gun system

The Navy version of the Army *Bushmaster*, or "Chain Gun." This single-barrel, air-cooled, heavy machine gun meets the needs of ships throughout the fleet, especially those operating in the Arabian Gulf.

Caliber: 25mm/87
Round Weight: 1.1 lbs.
Muzzle Velocity: 1,100 m/sec
Range: 2,700 yds.
Type of Fire: Single shot; 175 rounds/min. in automatic

MK-75 – 76mm/62 caliber 3-inch gun

Best suited for use aboard smaller combat vessels, the MK-75 features rapid fire capability with low manning requirements. The gun was approved for fleet use in 1975 and was first deployed aboard USS *Oliver Hazard Perry* (FFG 7) in 1978.

Caliber: 3-inch/62
Firing Rate: 85 rounds/min.
Muzzle Velocity: 925 m/sec
Range: 10 nm.
Weight: 7.35 tons

Phalanx Close-In Weapons System (CIWS)

The *Phalanx* CIWS combines a 20mm Gatling gun with search and tracking radar to provide surface ships with terminal defense against anti-ship missiles. The system underwent operational tests and evaluation on board USS *Bigelow* (DD 942) in 1977 and went into production in 1978 with the first systems installed aboard USS *Coral Sea* (CV 43) in 1980. The original versions used rounds made from depleted uranium that have since been replaced by tungsten rounds.

Caliber: 20mm/53
Firing Rate: 1,000-3,000 rounds/min.
Muzzle Velocity: 3,650 ft./sec
Range: 6,000 yds.

60mm Mortar

Often combined with the M-60 machine gun, the 60mm mortar is used aboard patrol boats (PBs).

Caliber: 60mm
Firing Rate: 10 rounds/min. (trigger mode); 18 rounds/min. (drop mode)
Muzzle Velocity: 500 ft./sec
Range: 1,850 to 2,000 yds.

▼ MK-45 5-inch/54 caliber lightweight gun

Photo by PH2 Michael Sandberg

ANTI-SUBMARINE WARFARE (ASW) TORPEDOES

MK-46

The MK 46 MOD 5A(S) torpedo achieved its initial operational Capability and was introduced into the fleet in 1979. It can be launched from fixed and rotary wing aircraft and surface combatants VLA and torpedo tubes. Full-up MK 46 torpedoes are no longer being produced. In 1987, a major upgrade program enhanced the performance of the MK 46 Mod 5A(S) in shallow water.

A service life extension program was initiated in 1992 to extend the life of the MK 46 Mod 5A(S), convert it to the MK 46 Mod 5A(SW), and to provide additional shallow water and bottom avoidance modes. The MK 46 Mod 5A(SW) was introduced to the Fleet in 1996.

Dimensions: 8.5 ft. long, 12.75 in. diameter
Weight: 512 lb.
Range:: More than 8,000 yds.
Speed: 45 Knots
Propulsion: Two-speed, reciprocation external combustion
Warhead: 96 lbs. of PBXN-103
Depth: Greater than 1,200 ft.

MK-48

The MK-48 Torpedo is a long-range, high-speed, deep-depth, wire-guided acoustic homing weapon designed to combat slow diesel submarines, fast, deep diving nuclear submarines and high-performance surface ships and can be carried aboard all Navy submarines. Developed by the Applied Research Laboratory, Pennsylvania State University, and Westinghouse Electric Corporation, Baltimore, the MK-48 and its subsequent variants have been in service with the Navy since 1972.

In 1975 an operational requirement was issued by the CNO to develop modifications to the MK-48 to keep pace with threat advancements. This development effort was accelerated to neutralize the former Soviet Alpha threat and resulted in the MK-48 MOD 4 that achieved Initial Operational Capability in 1980.

Additional efforts resulted in development of the digital advanced capability (ADCAP) MK-48 MOD 5 that is carried by *Los Angeles* and *Seawolf*-class attack submarines and some *Ohio*-class ballistic missile submarines. The MK-48 MOD 5 became operational in 1988 and was approved for production a year later.

Although full-up torpedoes have not been produced since 1994, modifications (ADCAP MODS) produced by Northrup Grumman and Raytheon Systems Corporation have enhanced its countermeasure rejection capability, increased its guidance and control processing and memory and improved its shallow water capabilities. This newest variant is designated the MK-48 MOD 6.

Dimensions: 19 feet long, 21 in. diameter
Weight: 3,434 lbs. (MK-48) 3,695 (MK-48 ADCAP)
Range: Greater than 8 nm.
Speed: Greater than 28 Knots
Propulsion: Positive displacement Piston-type engine with OTTO fuel II
Warhead: Not given
Depth: Not given

Photo by PH1 Brien Aho

▲ MK-50 Torpedo

MK-50

The MK-50 torpedo began low-rate initial production in 1987. The MK-50 can be launched from all ASW aircraft and from torpedo tubes aboard surface combatants. It is an advanced lightweight digital torpedo designed for use against faster, deeper-diving and more sophisticated submarines.

The stored chemical energy propulsion system develops full power at all depths and is capable of multi-speed operations required by the tactical situation. Although full-up torpedoes have not been produced since 1993, the Block I software upgrade program has enhanced the MK 50's shallow water and countermeasure capability. Also a new longer-lasting, safer and cheaper stored chemical energy propulsion system is currently being introduced.

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Weapons

Dimensions: 9.3 ft. long, 12.75 in. diameter
Weight: 750 lbs.
Range: In excess of 14,000 yds.
Speed: Multiple speeds with a top speed in excess of 40 knots
Propulsion: Close-cycle Stored Chemical Energy Propulsion System
Warhead: Approximately 100 lbs. high explosive shaped charge
Depth: 3,600 ft.

MINES

MK-67 Submarine Launched Mobile Mine (SLMM)

Based on the MK 37 torpedo, the SLMM is a submarine-deployed mine used for covert mining in hostile environments. The MK-67 began active service in 1987.

Type: Submarine-laid bottom mine.
Dimensions:13.4 ft. long; 19 in. diameter
Detection System: Magnetic/seismic target detection devices (TDDs)
Depth Range: Shallow water
Weight: 1,735 pounds
Explosives: 515 pounds of high explosive

MK-65 *Quickstrike*

The *Quickstrike* is a family of shallow-water, aircraft-laid mine used primarily against surface ships. The MK-65 mine is a thin-walled mine casing. MK-62 and MK-63 mines are converted, general-purpose bombs. All were approved for service use in the early 1980s.

Type: Aircraft-laid bottom mine.
Dimensions: MK-65 mine is 10.7 ft. long; 21 in. diameter (29 in. across fins; MK-62 and MK-63 mines vary in length depending on flight gear used
Detection System: Magnetic/seismic/ or magnetic/seismic/pressure target detection devices (TDDs) are used on various models.
Depth Range: Shallow water
Weight: MK-62, MK-63 and MK-65 are 500, 1,000 and 2,000 pound class respectively
Explosives: Various loads

▼ MK-50 Torpedo

Photo by PH1 Brien Aho

Photo by PHC Chris Desmond

▲ MK-6 Training Mines

MK-60 *Captor*

The *Captor* is the Navy's primary, anti-submarine weapon. This deep-water mine is designed to be laid by aircraft or submarines and is anchored to the ocean floor. Its acoustic detection system is designed to seek hostile submarines, while ignoring surface craft and friendly submarine acoustic signatures. Upon detection of a hostile submarine, the *Captor* launches an MK-46 Mod 4 torpedo. First fleet use in 1979.

Type: Aircraft, ship or submarine-laid, magnetically-moored mine.
Dimensions: Aircraft/Ship laid: 12 ft. long/21 in. diameter; Submarine laid: 11 ft. long/21 in. diameter
Detection System: Reliable acoustic path (RAP) sound propagation.
Depth Range: Up to 3,000 ft.
Weight: Air/Ship laid: 2,370 pounds; submarine laid: 2,056 pounds
Explosives: 96 pounds of PBXN 103 high explosive MK-46 torpedo.

MK-56

The MK-56 mine is primarily an ASW mine (the oldest still in use). It reached initial operating capability in 1962.

Type: Aircraft-laid, moored mine
Dimensions: 9.5 ft. long (without fairing); 23 in. diameter
Detection System: Total field magnetometer.
Depth Range: intermediate water
Weight: 2,000-pound class
Explosives: 360 pounds of high explosive

Sources: Atlantic Ordnance Command, Yorktown, Va.; Strategic Systems Programs; Naval Sea Systems Command, Naval Air Systems Command, The U.S. Naval Institute Guide to World Naval Weapons Systems, 1997-1998.

STATEMENT OF OWNERSHIP

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