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All Hands looks at what the Navy did this year through the eyes of Navy photographer's mates.

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If you have some spare time, the MCPON has a book for you. The books on the MCPON's Naval Heritage/Core Values Reading Guide (with reference list) can provide hours of entertainment, education and professional development.

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23 Special Pull-out Warfare Pins and Badges & Order of Precedence
Pins, ribbons and badges. Look no further. These charts explain it all in a special pullout section.

27 Naval Reserve Activities
One key to the Navy's success is the coordinated efforts between Reserve and active forces.
From cruisers and destroyers to oilers and mine hunters—here's today's surface Navy.

The Navy uses a wide variety of modern weapons and weapon systems. Today's Sailors are using cutting-edge technology to put ordnance on target.

Whether on board one of the Navy's 12 carriers or at a shore facility, U.S. Navy aircraft remain the best in the world.

The "silent service" is everywhere.

Carrier battle groups continue to provide forward presence and power projection for the 21st century.

This year's Owner's and Operator's Manual is a multimedia edition; inside these pages, you'll find an All Hands Rights and Benefits CD for easy access from your desktop. If you have an Internet connection, the web sites listed in the CD will link to the source sites at all agencies listed. The Navy's world is at your fingertips.
As our great Navy begins 2001, we look ahead in anticipation of an exceptional year. We are the best trained, most capable and most deployable Navy the world has ever seen, and we have put into motion substantial efforts to make our capabilities even more robust — guaranteeing Sailors the tools, the training and the technology needed to perform at the highest levels.

One of the tools available to Sailors right now is this year’s January issue of All Hands — the Owner’s and Operator’s Manual.

This fantastic annual publication provides a snapshot of Navy hardware, capabilities and programs. This year’s edition is even better because it contains an interactive CD ROM, loaded with Rights and Benefits information for Sailors and their families. It includes the most up-to-date information on pay, allowances and benefits available.

I sincerely believe that Sailors are our Navy’s greatest resource. It is our responsibility to ensure our people have all of the information they need to get the job done, and this powerful multi-media package fits the bill. This CD, and the new website it links to, www.Lifelines2000.org/rights, provides quality-of-life support for Sailors in an appropriate high-tech manner for our cyber age.

This issue of All Hands underscores aspects of our work and life, representing Navy quality of service. Success on the job cannot be had without the right resources, nor can it be experienced at sea without the peace of mind that comes from contentment on the home front.

Together, with work and life issues in order, we can provide our Navy and our country the quality of service demanded by the new millennium.

ADM Vern Clark
Chief of Naval Operations
To: The Fleet

“We are the best trained, most capable, most deployable Navy the world has ever seen...”
Year in Review

JANUARY

Carrier Qualifications

Sailors chisel ice off of the 4.5 acre flight deck of USS Harry S. Truman (CVN 75) after a major snow storm hit the U.S. East Coast, Jan. 25, 2000.

DECEMBER 99

5th Fleet Visit

Master Chief Petty Officer of the Navy MMCM(SS/SW/AW) Jim Herdt visited USS Enterprise (CVN 65). During his visit he spent time on the mess decks eating and chatting with Sailors and Marines.
SN Shawn Bowers stands watch aboard USS George Washington (CVN 73) as the forward night lookout, scanning the ocean surface through the “big eyes,” during composite unit exercise (COMPTUEX) in the Gulf of Mexico.

MM2 Robert Rodriguez, of Amarillo, Texas, drives the Scorpio, a tethered unmanned work vehicle as MM2 Robert Duncan of Torrance, Calif., continues to search the ocean floor for the second of two flight recorders from the crash site of Alaska Airlines Flight 261.
Marines and Sailors of the 24th Marine Expeditionary Unit (Special Operations Capable) conduct ship-to-shore familiarization exercises with Ukrainian Soldiers in the Black Sea using Zodiacs and Ukrainian BTR-80s during the first phase of NATO's Exercise Cooperative Partner 2000. The Ukrainian amphibious ship Sagadaidi is anchored to the left in the background.

Giving the OK thumbs up, EOD LT Kathy Miranda, Carrier Air Wing 7 (CAG) CAPT Richard Jaskot and EOD/SEAL personnel practice Special Purpose Insertion and Extraction (SPIE) techniques from an HH-60 helicopter aboard USS Dwight D. Eisenhower (CVN 69).
May
Naval Academy Graduate

After four long years at the U.S. Naval Academy, a Midshipman becomes an Ensign.

Admiral On Deck

Valva Charles W. Moore Jr., Commander, 5th Fleet, renders a salute as he passes through the side boys before coming aboard USS Dwight D. Eisenhower (CVN 69). The Eisenhower and Carrier Air Wing 7 (CVW 7) were on a six-month cruise in the Persian Gulf.
JUNE

**Exercise Strong Angel**

This makeshift refugee camp is one of the sites of exercise *Strong Angel*, located at the base of Puu Paa on the northwest corner of Hawaii. *Strong Angel* was part of the Rim of the Pacific (RIMPAC 2000) exercise that took place in and around the Hawaiian Island chain during the month of June. RIMPAC is the largest maritime exercise in the Asia-Pacific region, bringing together military forces from seven different nations.

AUGUST

**Unitas 2000**

ENS Deldrick Gray confirms the position of the *Aegis* cruiser USS *Ticonderoga* (CG 47) during an aerial drone gunnery exercise with the naval forces of Argentina, Brazil, Uruguay and France. *Ticonderoga* is participating in the Atlantic Phase of *UNITAS 2000*, an annual series naval exercises with South American naval forces in the region.
JULY
International Naval Review 2000

The 16-barge July 4th fireworks display was spectacular from the flight deck of the aircraft carrier USS John F. Kennedy (CV 67) during International Naval Review 2000 (INR 2000). INR 2000 is the Navy's congressionally mandated observance of the millennial year and recognized of the Nation's 224th birthday. More than 25,000 Sailors and Marines from 20 countries enjoyed this week long "Celebration of Seapower for the Millennium."

AUGUST
Welcome Home

OS2 Class Michael Standfill from Virginia Beach, VA, is greeted by his wife and son upon his return from a scheduled six-month deployment aboard USS Mahan (DDG 72). The Norfolk-based destroyer was one of nine ships assigned to the USS Dwight D. Eisenhower's (CVN 69) Carrier Battle Group.
Ceremonial Guard provides honors for the fallen members of **USS Cole (DDG 67)**, upon their return to the United States at Dover AFB, Del.

**OCTOBER**

**USS Cole (DDG 67) Incident**

The United States Navy Ceremonial Guard provides honors for the fallen members of **USS Cole (DDG 67)**, upon their return to the United States at Dover AFB, Del.

**SEPTEMBER**

**Cleared for Landing**

ABAN Steve Reyes and AB Christopher Rogotero signal a helo to land on the flight deck of the amphibious assault ship **USS Essex (LHD 2)** while underway in the sea of Japan.
SEPTEMBER

CARAT 2000

The guided-missile frigate USS Sides (FFG 14) steams along with ships attached to the Royal Brunei Navy in support of CARAT (Cooperation Afloat Readiness and Training) 2000. Carat 2000 is an annual series of bilateral exercises between the United States and Southwest Asian navies designed to promote cooperation and interoperability.

NOVEMBER

Southern Watch

AMSAN Zachariah Wagner prepares to service a jet engine on the flight deck aboard USS George Washington (CVN 73).
The Master Chief Petty Officer of the Navy’s Naval Heritage/Core Values

Reading Guide

This list is updated annually as part of the Chief Petty Officer Initiation Season. The books are available through the Navy Exchange or the Uniform Center toll-free ordering system at 1.800.368.4088

"A" List: Required Reading

- The Fighting Liberty Ships – A Memoir
  by A. A. Hoehling

- A Sailor’s Log: Recollections of Forty Years of Naval Life
  by Rear Adm. Robert D. Evans
  with introduction by Benjamin Franklin Cooling

- Tin Can Sailor - Life Aboard the USS Sterett, ’39 - ’45
  by C. Raymond Calhoun

- Battleship Sailor
  by Theodore C. Mason

- Brave Ship, Brave Men
  by Arnold S. Lott

- We Will Stand by You — Serving in the Pawnee, 1942-1945
  by Theodore C. Mason

- Crossing the Line: A Bluejacket’s World War II Odyssey
  by Alvin Kernan

- Thunder Below
  by Adm. Eugene B. Fluckey, USN (Ret.)

- The Battle of Cape Esperance – Encounter at Guadalcanal
  by Capt. Charles Cook, USN (Ret.)

- The Golden Thirteen – Recollections of the First Black Naval Officers
  by Paul Stillwell
  with Col. L. Powell

- The Last Patrol
  by Harry Homes

- Raiders from the Sea
  by John Lodwick

- Submarine Diary — The Silent Stalking of Japan
  by Rear Adm. Conwin Mendenhall

- Devotion to Duty – A Biography of Admiral Clifton A. F. Sprague
  by John F. Wukovits

- Every Other Day: Letters from the Pacific
  by George B. Lucas

- In Love and War: Revised and Updated
  by Jim and Sybil Stockdale

- Nimitz
  by E. B. Potter

- Ship’s Doctor
  by Captain Terrence Riley

- What a Way to Spend a War: Navy Nurse POWs in the Philippines
  by Dorothy Still Danner

- Naked Warriors
  by Cmrdr. Frances Douglas Fane
  and Don Moore

- Iwo
  by Richard Wheeler

- Descent Into Darkness
  by Cmrdr. Edward C. Raymer

- Blood on the Sea
  by Robert Sinclair Parkin

- On Watch
  by Adm. Elmo Zumwalt

- Wake of the Wahoo
  by Forrest J. Sterling

- Quiet Heroes
  by Cmrdrs. Frances Omoni

- The Fast Carriers — The Forging of an Air Navy
  by Clark G. Reynolds

- A Most Fortunate Ship — Narrative History of Old Ironsides
  by Tyrone Martin

- A Voice From the Main Deck
  by Samuel Leech

- Amongst My Best Men — African Americans in the War of 1812
  by Gerald T. Altuff

- Life in Mr. Lincoln’s Navy
  by Dennis J. Ringle

- Divided Waters — The Naval History of the Civil War
  by Ivan Musicant

"B" List: Reference

- That Gallant Ship: Yorktown
  by Robert Cressman

- By See, Air, and Land — An Illustrated History of the U.S. Navy and the War in Southeast Asia
  by Edward J. Marolda

- Shield and Sword — The U.S. Navy and the Persian Gulf
  by Marolda and Schneller

- My Father My Son
  by Zumwalt and Zumwalt

- Good Night Officially
  by William M. McBride

- Tin Can Man
  by E. J. Leminger

- Raiders of the Deep
  by Lowell Thomas, introduction by Gary E. Weir

American Naval History — An Illustrated Chronology of the U.S. Navy and Marine Corps, 1775-Present
by Edward J. Marolda

The Book of Navy Songs
by The Trident Society

Gray Steel and Black Oil: Fast Tankers and Replenishment at Sea in the U.S. Navy, 1912-92
by Thomas Wildenberg

Sea Power: A Naval History
by E. B. Potter

Air Raid: Pearl Harbor! — Recollections of a Day of Infamy
by Paul Stillwell

E-Boat Alert — Defending the Normandy Invasion Fleet
by James Foster Ten

Heroes in Dungarees — The Story of the American Merchant Marines in World War II
by John Bunker

Unsung Sailors — The Naval Armed Guard in World War II
by Justin F. Gleichauf
The First Team: Pacific Naval Air Combat from Pearl Harbor to Midway
by John B. Lundstrom

The First Team and the Guadalcanal Campaign: Naval Fighter Combat from August to November 1942
by John B. Lundstrom

Admiral John H. Towers — The Struggle for Naval Air Supremacy
by William F. Trimbble

The Magnificent Mitscher
by Theodore Taylor

At Dawn We Slept
by Gordon W. Prange

Prisoners of the Japanese
by Gavon Davee

The Two Ocean War
by Samuel Eliot Morrison

History of the U.S. Navy, 1775-1941
by Robert W. Love Jr.

by Robert W. Love Jr.

Clash of the Titans
by Walter J. Boyne

Okinawa — The Last Battle of World War II
by Robert Lackie

Normandy
by Vice Adm. William P. Mack

War at Sea
by Nathan Miller

War Beneath the Sea
by Peter Sudfield

Miracle at Midway
by Gordon W. Prance

Authors at Sea: Modern American Writers Remember Their Naval Service
by Robert Shenk

Rocks & Shoals: Naval Discipline in the Age of Fighting Sail
by James E. Vale

The Unsinkable Fleet: The Politics of U.S. Navy Expansion in World War II
by Joel R. Davidson

Run Silent/Run Deep
by Capt. Edward L. Beach

Decision and Dissent with Halsey at Leyte Gulf
by Carl Solberg

PT 105
by Dick Kersey

Submarine Commander
by Paul Schatz

We Pulled Together and Won! Personal Memories of the World War II Era
by Reminiscence Books

War in the Boats
by Capt. William J. Ruhe

Submarine Admiral
by Adm. J.J. Galantin

All at Sea
by Louis R. Harlany

Slow Dance to Pearl Harbor — A Tin Can Ensign in Prewar America
by Capt. William J. Ruhe

The People Navy
by Kenneth J. Hagan

Longitude
by Dava Sobel

U-Boat Commander
by Peter Cramer

Kinkaid of the Seventh Fleet: A Biography of Admiral Thomas C. Kinkaid, USN
by Gerald E. Wheeler

Project Hula: Secret Soviet-American Cooperation in the War against Japan
by Richard A. Russell

Assault from the Sea — The Amphibious Landing at Inchon
by Carlos Uz

Cordon of Steel: The U.S. Navy and the Cuban Missile Crisis
by Curtis Uz

Swift and Effective Retribution — The U.S. Sixth Fleet and the Confrontation with Qaddafi
by Joseph T. Stanik

Revolt of the Admirals
by Jeffrey Barlow

A Quest for Glory: A Biography of Rear Admiral John A. Dahlgren
by Robert J. Schneier

One Hundred Years of Sea Power: The U.S. Navy, 1890-1990
by George Bau

Great U.S. Naval Battles
by Jack Sweetman

Black Shoes and Blue Water: Surface Warfare in the U.S. Navy 1945-1975
by Malcolm Mar

Quiet Warrior: A Biography of ADM Raymond A. Spruance
by Thomas Buell

Anchors and Eagles
by Paul Ackerman

Honor Bound: The History of American Prisoners of War in Southeast Asia, 1961-1973
by S.I. Rochester and F. Wiley

And I Was There
by Rear Adm. Edwin T. Layton

The Lost Ships of Guadalcanal
by Robert D. Ballard

Crossed Currents: Navy Women from World War I to Tailhook
by Jean Ebbert/Marie Beth Hall

"C" List: Reference

History of U.S. Naval Operations in World War II
by Samuel Eliot Morrison

Vol. I: The Battle of the Atlantic

Vol. II: Operations in North African Waters

Vol. III: The Rising Sun in the Pacific

Vol. IV: Coral Sea, Midway and Submarine Actions

Vol. V: The Struggle for Guadalcanal

Vol. VI: Breaching the Bismarcks Barrier

Vol. VII: Aleutians, Gilberts and Marshalls

Vol. VIII: New Guinea and the Marianas

Vol. IX: Sicily — Salerno — Anzio

Vol. X: The Atlantic Battle Won

Vol. XI: The Invasion of France and Germany

Vol. XII: Leyte

Vol. XIII: The Liberation of the Philippines, Luzon, Mindanao, the Visayas

Vol. XIV: Victory in the Pacific

The Golden Thirteen: Recollections of the First Black Navy Officers

January 2001
Navy (and Navy-related) sites can be extremely useful when Sailors want to expand their knowledge of ships, aircraft and weapons systems as well as those commands and areas of the world where they might be stationed next.

The list presented here is nowhere near comprehensive. It is simply meant as a reference to show you what is out there and to help get you started. We've attempted to list sites relating to as many areas of Navy life as possible (and most of them have links to other sites).

The list was accurate at press time. However, site addresses and composition change constantly, so learn to use the various search engines available to find the site (or information) you're looking for.

Site List

- www.navy.mil
- www.ncts.navy.mil/no1
- www.navyjobs.com
- www.history.navy.mil
- www.defenselink.mil
- www.nmaa.org
- www.nmcrs.org
- www.redcross.org
- http://neds.nebt.daps.mil
- www.mediacen.navy.mil/pubs/allhands/
- www.mediacen.navy.mil/pubs/cck
- www.history.navy.mil/branches/nh rog5.htm
- www.ncts.navy.mil/navresfor/nrn
- www.cpf.navy.mil
- www.atlanticfleet.navy.mil
- www.comthirdfli.t.navy.mil/c3f
- www.c7f.navy.mil
- www.cnfj.navy.mil
- www.guam.navy.mil
- www.ndw.navy.mil
www.hawaii.navy.mil
www.naples.navy.mil
www.rota.navy.mil
www.yokosuka.navy.mil
www.cnrmc.navy.mil
www.cnbsd.navy.mil
www.surfpac.navy.mil
www.cnsl.spear.navy.mil
www.nvr.navy.mil
www.ussconstitution.navy.mil
www.airpac.navy.mil
www.blueangels.navy.mil
www.chinfol.navy.mil/navpalib/ships/submarines/sub100.html
www.sublant.navy.mil
www.csp.navy.mil
www.sealchallenge.navy.mil/
http://navymedicine.med.navy.mil
www.tricare.osd.mil
www.ucci.com/government/governmentprog.html
www.bupers.navy.mil
www.dfas.mil
www.cnet.navy.mil

http://www.navycollege.navy.mil
www.cnet.navy.mil/nrotc/nrotc.htm
www.cnet.navy.mil/njrotc/njrotc.htm
www.lifelines4qol.org
www.usni.org
www.lonesailor.org
Ranks

**Commissioned Officers**

<table>
<thead>
<tr>
<th>PAY GRADE/RANK</th>
<th>HAT/SHOULDER/COLLAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1 Ensign</td>
<td><img src="image1" alt="Ensign" /></td>
</tr>
<tr>
<td>0-2 Lieutenant Junior Grade</td>
<td><img src="image2" alt="Junior Grade" /></td>
</tr>
<tr>
<td>0-3 Lieutenant</td>
<td><img src="image3" alt="Lieutenant" /></td>
</tr>
<tr>
<td>0-4 Lieutenant Commander</td>
<td><img src="image4" alt="Commander" /></td>
</tr>
<tr>
<td>0-5 Commander</td>
<td><img src="image5" alt="Commander" /></td>
</tr>
<tr>
<td>0-6 Captain</td>
<td><img src="image6" alt="Captain" /></td>
</tr>
<tr>
<td>0-7 Rear Admiral (Lower Half)</td>
<td><img src="image7" alt="Rear Admiral" /></td>
</tr>
<tr>
<td>0-8 Rear Admiral (Upper Half)</td>
<td><img src="image8" alt="Upper Admiral" /></td>
</tr>
<tr>
<td>0-9 Vice Admiral</td>
<td><img src="image9" alt="Vice Admiral" /></td>
</tr>
<tr>
<td>0-10 Admiral</td>
<td><img src="image10" alt="Admiral" /></td>
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</tbody>
</table>

**Warrant Officers**

<table>
<thead>
<tr>
<th>PAY GRADE/RANK</th>
<th>HAT/SHOULDER/COLLAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>W-1 Chief Warrant Officer</td>
<td><img src="image11" alt="Chief Warrant Officer" /></td>
</tr>
<tr>
<td>W-2 Chief Warrant Officer</td>
<td><img src="image12" alt="Chief Warrant Officer" /></td>
</tr>
<tr>
<td>W-3 Chief Warrant Officer</td>
<td><img src="image13" alt="Chief Warrant Officer" /></td>
</tr>
<tr>
<td>W-4 Chief Warrant Officer</td>
<td><img src="image14" alt="Chief Warrant Officer" /></td>
</tr>
</tbody>
</table>
**Enlisted Members**

Enlisted Sailors can be referred to by their rank (for example, Petty Officer Third Class Smith) or by a combination of rank and rating (Yeoman First Class Smith). Personnel in pay grades E-4 through E-6 can be referred by as “petty officer” without regard to specific level (i.e., petty officer second class). Knowing enlisted ranks and ratings isn’t the easiest thing to do, but once accomplished, you can know the individual’s seniority and job specialty with one look at their uniform.

**Enlisted Ranks**

<table>
<thead>
<tr>
<th>PAY GRADE/RANK</th>
<th>HAT/COLLAR</th>
<th>SLEEVE</th>
</tr>
</thead>
<tbody>
<tr>
<td>E-1</td>
<td>Seaman Recruit</td>
<td>NO DEVICE</td>
</tr>
<tr>
<td>E-2</td>
<td>Seaman Apprentice</td>
<td>NO DEVICE</td>
</tr>
<tr>
<td>E-3</td>
<td>Seaman</td>
<td>NO DEVICE</td>
</tr>
<tr>
<td>E-4</td>
<td>Petty Officer Third Class</td>
<td></td>
</tr>
<tr>
<td>E-5</td>
<td>Petty Officer Second Class</td>
<td></td>
</tr>
<tr>
<td>E-6</td>
<td>Petty Officer First Class</td>
<td></td>
</tr>
<tr>
<td>E-7</td>
<td>Chief Petty Officer</td>
<td></td>
</tr>
<tr>
<td>E-8</td>
<td>Senior Chief Petty Officer</td>
<td></td>
</tr>
<tr>
<td>E-9</td>
<td>Master Chief Petty Officer</td>
<td></td>
</tr>
<tr>
<td>E-9*</td>
<td>Master Chief Petty Officer of the Navy</td>
<td></td>
</tr>
</tbody>
</table>

**Line/Staff/Warrant Officer Sleeve Devices**

The specialties of naval officers can be identified by devices worn on the sleeve, shoulder board and collar of certain uniforms.

- **Line**
  - Cryptologic Technician
  
- **Supply Corps**
  - Repair Technician

- **Medical Corps**
  - Intelligence Technician

- **Nurse Corps**
  - Boatswain

- **Medical Service Corps**
  - Data Processing Technician

- **Dental Corps**
  - Engineering/Nuclear Power Technician

- **Physician's Assistant**
  - Aerographer

- **Judge Advocate General Corps**
  - Air Traffic Controller

- **Law Community**
  - Aviation Boatswain

- **Christian Chaplain**
  - Explosive Ordnance Disposal

- **Jewish Chaplain**
  - Aviation Electronics Technician

- **Muslim Chaplain**
  - Aviation Ordnance Technician

- **Civil Engineer Corps**
  - Band Master

- **Ship's Clerk**
  - Ordnance Technician

* Devices for Diving Officer and Security Technician not pictured

* The example shown here illustrates the E-1 through E-9 Boatswain's Mate structure.
Rates

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 Boatswain’s Mate), others show the evolution of naval technology in modern times, such as the GS (Gas Turbine System Technicians).

<table>
<thead>
<tr>
<th>Rate</th>
<th>Specialty</th>
</tr>
</thead>
<tbody>
<tr>
<td>AB</td>
<td>Aviation Boatswain's Mate</td>
</tr>
<tr>
<td>AC</td>
<td>Air Traffic Controller</td>
</tr>
<tr>
<td>AD</td>
<td>Aviation Machinist's Mate</td>
</tr>
<tr>
<td>AE</td>
<td>Aviation Electrician's Mate</td>
</tr>
<tr>
<td>AG</td>
<td>Aerographer's Mate</td>
</tr>
<tr>
<td>AK</td>
<td>Aviation Storekeeper</td>
</tr>
<tr>
<td>AM</td>
<td>Aviation Structural Mechanic</td>
</tr>
<tr>
<td>AO</td>
<td>Aviation Ordnanceman</td>
</tr>
<tr>
<td>AS</td>
<td>Aviation Support Equipment Technician</td>
</tr>
<tr>
<td>AT</td>
<td>Aviation Electronics Technician</td>
</tr>
<tr>
<td>AW</td>
<td>Aviation Warfare Systems Operator</td>
</tr>
<tr>
<td>AZ</td>
<td>Aviation Maintenance Administrationman</td>
</tr>
<tr>
<td>BM</td>
<td>Boatswain's Mate</td>
</tr>
<tr>
<td>BU</td>
<td>Builder</td>
</tr>
<tr>
<td>CE</td>
<td>Construction Electrician</td>
</tr>
<tr>
<td>CM</td>
<td>Construction Mechanic</td>
</tr>
<tr>
<td>CT</td>
<td>Cryptologic Technician</td>
</tr>
<tr>
<td>DC</td>
<td>Damage Controlman</td>
</tr>
<tr>
<td>DK</td>
<td>Disbursing Clerk</td>
</tr>
<tr>
<td>DM</td>
<td>Illustrator/Draftsman</td>
</tr>
<tr>
<td>DT</td>
<td>Dental Technician</td>
</tr>
<tr>
<td>EA</td>
<td>Engineering Aide</td>
</tr>
<tr>
<td>EM</td>
<td>Electrician's Mate</td>
</tr>
<tr>
<td>EN</td>
<td>Engineman</td>
</tr>
<tr>
<td>EO</td>
<td>Equipment Operator</td>
</tr>
<tr>
<td>ET</td>
<td>Electronics Technician</td>
</tr>
<tr>
<td>EW</td>
<td>Electronics Warfare Technician</td>
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<td>FC</td>
<td>Fire Controlman</td>
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<tr>
<td>FT</td>
<td>Fire Control Technician</td>
</tr>
<tr>
<td>GM</td>
<td>Gunner's Mate</td>
</tr>
<tr>
<td>T-AOT (Tankers)</td>
<td>SS Potomac (T-AOT 181)</td>
</tr>
<tr>
<td>-----------------</td>
<td>------------------------</td>
</tr>
<tr>
<td></td>
<td>USNS Henry J. Kaiser (T-AOT 187)</td>
</tr>
<tr>
<td></td>
<td>USNS Petersburg (T-AOT 5075)</td>
</tr>
</tbody>
</table>

**SEALIFT PROGRAM**

**T-AKR (Fast Sealift)**
- USNS Algoi (T-AKR 287)
- USNS Belleau (T-AKR 286)
- USNS Denebola (T-AKR 289)
- USNS Pulley (T-AKR 290)
- USNS Atlan (T-AKR 291)
- USNS Regulus (T-AKR 292)
- USNS Capella (T-AKR 293)
- USNS Antares (T-AKR 294)

**Roll-on/Roll-off**
- MV Strong Texan

**T-AK (Break Bulk Ship)**
- MV Green Wave (T-AK 2050)

**T-AK (Combination)**
- MV Maersk Constellation (T-AK 9555)

**Down Range Support**
- MV Seaco Clipper
- MV Sea Mark III

**Container**
- MV Sagamore

**T-AOT (Tankers)**
- MV Gus W. Darnell (T-AOT 1121)
- MV Paul Buck (T-AOT 1122)
- MV Samuel L. Cobb (T-AOT 1123)
- MV Richard G. Matthisen (T-AOT 1124)
- MV Lawrence H. Gianella (T-AOT 1125)
- MV Valiant (T-AOT 94)

**T-AKR (Large, Medium-Speed, Roll-on/Roll-off)**
- USNS Shugart (T-AKR 295)
- USNS Gordon (T-AKR 296)
- USNS Yano (T-AKR 297)
- USNS Fisher (T-AKR 301)
- USNS Seay (T-AKR 302)
- USNS Mendocino (T-AKR 303)**
- USNS Plialeau (T-AKR 304)**
- USNS Britton (T-AKR 305)**
- USNS Benavidez (T-AKR 306)**

**READY RESERVE FORCE**

**T-AK (Break Bulk)**
- SS Cape Nome (T-AK 1014)
- SS Cape Ann (T-AK 5009)
- SS Cape Alexander (T-AK 5010)
- SS Cape Archway (T-AK 5011)
- SS Cape Avinaf (T-AK 5013)
- SS Cape Johnson (T-AK 5075)
- SS Cape Juby (T-AK 5077)

**T-AK (Barge Carriers)**
- SS Cape Fear (T-AK 5081)
- SS Cape May (T-AK 5063)
- SS Cape Mendocino (T-AK 5064)
- SS Cape Mohican (T-AKR 5085)

**T-AKR (Roll-on/Roll-off)**
- SS Comet (T-AKR 7)
- SS Meteor (T-AKR 9)
- SS Cape Island (T-AKR 10)
- SS Cape Intrepid (T-AKR 11)
- MV Cape Texan (T-AKR 112)
- MV Cape Taylor (T-AKR 113)
- GTS Adm Wm. M. Callaghan (T-AKR 1001)
- MV Cape Orlando (T-AKR 2044)
- MV Cape Ducato (T-AKR 5051)
- MV Cape Douglas (T-AKR 5082)
- MV Cape Domingo (T-AKR 5083)
- MV Cape Decision (T-AKR 5054)
- MV Cape Diamond (T-AKR 5055)
- SS Cape Isabel (T-AKR 5052)
- MV Cape Hudson (T-AKR 5066)
- MV Cape Henry (T-AKR 5067)
- MV Cape Horn (T-AKR 5068)
- MV Cape Edmont (T-AKR 5069)
- SS Cape Inscription (T-AKR 5078)
- MV Cape Lambert (T-AKR 5077)
- MV Cape Lobos (T-AKR 5078)
- MV Cape Knox (T-AKR 5082)
- MV Cape Kennedy (T-AKR 5083)
- MV Cape Race (T-AKR 9660)
- MV Cape Washington (T-AKR 9661)
- MV Cape Wrath (T-AKR 9681)
- MV Cape Vincent (T-AKR 9666)
- MV Cape Rise (T-AKR 9676)
- MV Cape Ray (T-AKR 9679)
- MV Cape Victory (T-AKR 9701)
- MV Cape Trinity (T-AKR 9711)

**T-ACS (Auxiliary Crane)**
- SS Keystone State (T-ACS 1)
- SS Gem State (T-ACS 2)
- SS Grand Canyon State (T-ACS 3)
- SS Flickertail State (T-ACS 5)
## Monthly Basic Pay Table

**Effective January 1, 2001**

<table>
<thead>
<tr>
<th>PAY GRADE</th>
<th>YEARS OF SERVICE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>COMMISSIONED OFFICERS</td>
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<table>
<thead>
<tr>
<th>PAY GRADE</th>
<th>YEARS OF SERVICE</th>
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</thead>
<tbody>
<tr>
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<td>WARRANT OFFICERS</td>
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<tr>
<td>0-2E</td>
<td>2</td>
</tr>
<tr>
<td>0-1E</td>
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</tr>
</tbody>
</table>

Unofficial Proposal 3.7 Percent Pay Rate Increase

Note: Basic Pay for 0-7 to 0-10 is limited to Level III of the Executive Schedule and Basic Pay for 0-5 and Below is limited to Level V of the Executive Schedule.

Source: Defense Finance and Accounting Service (www.dfas.mil/money)
## Warfare Pins & Badges

<table>
<thead>
<tr>
<th>Naval Astronaut</th>
<th>Naval Astronaut (NFO)</th>
<th>Naval Aviator</th>
<th>Balloon Pilot (obsolete)</th>
<th>Naval Aviation Observer and Flight Meteorologist</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naval Flight Surgeon</td>
<td>Naval Flight Nurse</td>
<td>Naval Flight Officer</td>
<td>Aviation Experimental Psychologist and Aviation Psychologist</td>
<td>Enlisted Aviation Warfare Specialist</td>
</tr>
<tr>
<td>Naval Aviation Supply Corps</td>
<td>Aircrew</td>
<td>Marine Combat Aircrew</td>
<td>Special Warfare</td>
<td>Special Operations</td>
</tr>
<tr>
<td>Surface Warfare (officer)</td>
<td>Surface Warfare (enlisted)</td>
<td>Surface Warfare (nurse)</td>
<td>Surface Warfare (medical)</td>
<td>Surface Warfare (dental)</td>
</tr>
<tr>
<td>Surface Warfare (medical service)</td>
<td>Surface Warfare (supply)</td>
<td>Submarine (officer)</td>
<td>Submarine (enlisted)</td>
<td>Submarine (medical)</td>
</tr>
<tr>
<td>Submarine (engineering duty)</td>
<td>Submarine (supply)</td>
<td>Submarine Combat Patrol</td>
<td>SSBN Deterrent Patrol (20 patrols)</td>
<td>SSBN Deterrent Patrol (12 patrols)</td>
</tr>
<tr>
<td>Seabee Combat Warfare Specialist (officer)</td>
<td>Seabee Combat Warfare Specialist (enlisted)</td>
<td>Naval Parachutist</td>
<td>Basic Parachutist</td>
<td>Naval Reserve Merchant Marine</td>
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</table>
Order of Precedence - U.S. Navy

<table>
<thead>
<tr>
<th>Medal of Honor</th>
<th>Navy Cross</th>
<th>Defense Distinguished Service Medal</th>
<th>Distinguished Service Medal</th>
<th>Silver Star</th>
<th>Defense Superior Service Medal</th>
<th>Legion of Merit</th>
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<tbody>
<tr>
<td>Distinguished Flying Cross</td>
<td>Navy/Marine Corps Medal</td>
<td>Bronze Star</td>
<td>Purple Heart</td>
<td>Defense Meritorious Service Medal</td>
<td>Meritorious Service Medal</td>
<td>Air Medal</td>
</tr>
<tr>
<td>Joint Service Commendation Medal</td>
<td>Navy/Marine Corps Commendation Medal</td>
<td>Joint Service Achievement Medal</td>
<td>Navy/Marine Corps Achievement Medal</td>
<td>Combat Action Ribbon</td>
<td>Presidential Unit Citation</td>
<td>Joint Meritorious Unit Award</td>
</tr>
<tr>
<td>Navy Unit Commendation</td>
<td>Meritorious Unit Commendation</td>
<td>Battle &quot;E&quot; Ribbon</td>
<td>POW Medal</td>
<td>Good Conduct Medal</td>
<td>Naval Reserve Meritorious Service Medal</td>
<td>Fleet Marine Force Ribbon</td>
</tr>
<tr>
<td>Vietnam Service Medal</td>
<td>Southwest Asia Service Medal</td>
<td>Armed Forces Service Medal</td>
<td>Humanitarian Service Medal</td>
<td>Military Outstanding Volunteer Service Medal</td>
<td>Sea Service Deployment Ribbon</td>
<td>Navy Arctic Service Ribbon</td>
</tr>
<tr>
<td>Naval Reserve Sea Service Ribbon</td>
<td>Navy/Marine Corps Overseas Service Ribbon</td>
<td>Navy Recruiting Service Ribbon</td>
<td>Armed Forces Reserve Medal</td>
<td>Naval Reserve Medal</td>
<td>Philippine Presidential Unit Citation</td>
<td>Republic of Korea Presidential Unit Citation</td>
</tr>
<tr>
<td>Republic of Vietnam Gallantry Cross Unit Citation</td>
<td>Republic of Vietnam Civil Actions Unit Citation</td>
<td>Republic of Vietnam Service Medal</td>
<td>United Nations Service Medal</td>
<td>United Nations Medal</td>
<td>NATO Medal</td>
<td>Multinational Force and Observers Medal</td>
</tr>
<tr>
<td>Devices</td>
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</tr>
</tbody>
</table>
| **Gold Star**
Denotes each subsequent award of the same Navy decoration. |
| **Silver Star**
Worn in the same manner as the gold star, in lieu of five gold stars. |
| **Bronze Service 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 the same manner as the bronze service star, in lieu of five bronze service 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 the Antarctic continent - a clasp for Antarctic Service Medal, a suspension ribbon and a disc for the service ribbon of bronze for first winter; gold for the second winter, and silver for the third winter. |
| **"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 Marksmanship qualification. |
| **Bronze "M"**
Denotes Naval Reserve mobilization in support of certain operations. |
| **"M" Device**
Denotes Sharpshooter Marksmanship qualification. |
| **Strike/Flight Device**
Bronze Arabic numeral denotes the total number of strikes/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" Wreath**
Denotes four or more Battle "E" Awards. |
### CRUISERS
- **Ticonderoga-class**
  - USS Ticonderoga (CG 47)
  - USS Yorktown (CG 48)
  - USS Vincennes (CG 49)
  - USS Valley Forge (CG 50)
  - 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)

- **Normandy-class**
  - 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)

### DESTROYERS
- **Spruance-class**
  - USS Spruance (DD 963)
  - USS Paul F. Foster (DD 964)
  - USS Kinkaid (DD 965)
  - USS Hewitt (DD 966)
  - USS Elliot (DD 967)
  - USS Arthur W. Radford (DD 968)
  - USS Peterson (DD 969)
  - USS Caron (DD 970)
  - USS David R. Ray (DD 971)
  - USS Oldendorf (DD 972)
  - USS John Young (DD 973)
  - USS O’Brien (DD 975)
  - USS Briscoe (DD 977)
  - USS Stump (DD 978)
  - USS Moosbrugger (DD 980)
  - USS John Hancock (DD 981)
  - USS Nicholson (DD 982)
  - USS Cushing (DD 985)
  - USS O’Bannon (DD 987)
  - USS Thorn (DD 988)
  - USS Deyo (DD 999)
  - USS Fife (DD 991)
  - USS Fletcher (DD 992)
  - USS Hayler (DD 997)

- **Arleigh Burke-class**
  - 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)
USS Oscar Austin (DDG 79)
Roosevelt (DDG 80)*
Winston S. Churchill (DDG 81)*
Lassen (DDG 82)*
Howard (DDG 83)*
Burkeley (DDG 84)*
McClelland (DDG 85)*

**FRIGATES**

Oliver Hazard Perry-class

- USS McInerney (FFG 8)
- USS Wadsworth (FFG 8)**
- USS Clark (FFG 11)**
- USS George Phillip (FFG 12)**

- USS Samuel Eliot Morison (FFG 13)**
- USS Sides (FFG 14)**
- USS Estocin (FFG 15)**
- USS John A. Moore (FFG 19)**
- USS Boone (FFG 28)
- USS Stephen W. Groves (FFG 29)**
- USS Stark (FFG 31)
- USS John L. Hall (FFG 32)
- USS Jarret (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 Thatch (FFG 43)

- USS DeWert (FFG 45)
- USS Rentz (FFG 46)
- USS Nichols (FFG 48)
- USS Vandegrift (FFG 49)
- 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)

* Under Construction
** Naval Reserve Force, Active
**USS Sirocco (PC 6)**
**USS Squall (PC 7)**
**USS Zephyr (PC 8)**
**USS Chinook (PC 9)**
**USS Firebolt (PC 10)**
**USS Whirlwind (PC 11)**
**USS Thunderbolt (PC 12)**
**USS Shamal (PC 13)**

**PATROL COASTALS**

**Cyclone-class**
- USS Cyclone (PC 1)
- USS Tempest (PC 2)
- USS Hurricane (PC 3)
- USS Monsoon (PC 4)
- USS Typhoon (PC 5)
- USS Sirocco (PC 6)
- USS Squall (PC 7)
- USS Zephyr (PC 8)
- USS Chinook (PC 9)
- USS Firebolt (PC 10)
- USS Whirlwind (PC 11)
- USS Thunderbolt (PC 12)
- USS Shamal (PC 13)

**Osprey-class**
- 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)

**AUXILIARY SHIPS**

**Sacramento-class/Supply-class**
- (Fast Combat Support)
- USS Sacramento (AOE 1)
- USS Camden (AOE 2)
- USS Seattle (AOE 3)
- USS Detroit (AOE 4)
- USS Supply (AOE 6)
- USS Rainier (AOE 7)
- USS Arctic (AOE 8)
- USS Bridge (AOE 10)

**Safeguard-class**
- (Salvage)
- USS Safeguard (ARS 50)
- USS Grapple (ARS 53)

**Emory S. Land-class**
- (Submarine Tenders)
- USS Emory S. Land (AS 39)
- USS Frank Cable (AS 40)

* Under Construction
** Naval Reserve Force, Active
ATTACK SUBMARINES

**Los Angeles-class**
- 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 708)
- USS Albuquerque (SSN 706)
- USS Portsmouth (SSN 707)
- 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 718)
- USS Olympia (SSN 717)
- USS Honolulu (SSN 718)
- USS Providence (SSN 719)
- USS Pittsburgh (SSN 720)

**Seawolf-class**
- USS Seawolf (SSN 21)
- USS Connecticut (SSN 22)
- Jimmy Carter (SSN 23)*

**Virginia-class**
- Virginia (SSN 774)*
- Texas (SSN 775)
- SSN 776
- SSN 777

**Sturgeon-class**
- USS Perche (SSN 683)

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 Columbus (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)

*Special missions or experimental variants are marked with an asterisk.*
**Benjamin Franklin-class**

- USS *Kamehameha* (SSN 642)
  (ex-SSBN 642)

**BALLISTIC MISSILE SUBMARINES**

**Ohio-class**

- USS *Ohio* (SSBN 726)
- USS *Michigan* (SSBN 727)
- USS *Florida* (SSBN 728)
- USS *Georgia* (SSBN 729)
- 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)

**Deep Submergence Rescue Vehicles**

- DSRV *Mystic*
- DSRV *Avalon*

**Submersible Research Vehicles**

**Submarine NR-1 (Nuclear)**

- USS *Dolphin* (AGS 555)
  * Under Construction

*Photo by DP Jason Everett Miller*  
The deep submergence rescue vehicle  
*Mystic* (DSRV 1)
Carriers

Enterprise-class
USS Enterprise (CVN 65)

Kitty Hawk & John F. Kennedy-classes
USS Kitty Hawk (CVN 63)
USS Constellation (CVN 64)
USS John F. Kennedy (CVN 67)

*Under Construction

Nimitz-class
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)
Ronald Reagan (CVN 76)*

USS Dwight D. Eisenhower (CVN 69)

USS Abraham Lincoln (CVN 72)
**Aircraft**

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

The F/A-18E/F will provide the carrier battle 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**: 20,000 lbs maximum takeoff.
- **SPEED**: Mach 1.8+.
- **CEILING**: 52,000 ft.
- **RANGE**: 2,452 nm.
- **ARMAMENT**: 20mm MK-61 Vulcan cannon; Sidewinder, Sparrow and AIM-7 Sparrow air-to-air missiles; Maverick, Harpoon, Strike, HARM, SLAM-ER and Joint Direct Attack Munition (JDAM); Walleye and other bombs and rockets.
- **CREW**: 1 or 2.

**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.

- **WINGSPAN**: 64 ft, 1.5 in.
- **LENGTH**: 62 ft, 8 in.
- **HEIGHT**: 18 ft.
- **WEIGHT**: 34,349 lbs. maximum takeoff.
- **SPEED**: Mach 1.68.
- **CEILING**: 10,000 ft.
- **RANGE**: 1,800 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).

**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**: 35,000 lbs. maximum takeoff.
- **SPEED**: 622 mph.
- **CEILING**: 41,200 ft.
- **COMBAT RANGE**: 955 nm.
- **ARMAMENT**: HARM.
- **CREW**: 4 (one pilot, three electronic warfare officers).
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: 21 ft, 3.75 in.
WEIGHT: 51,285 lbs. maximum takeoff
SPEED: 389 mph
CEILING: 37,000 ft
RANGE: 1,541 nm (ferry range)
CREW: 8 (two pilots, three mission systems operators)

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: 5 ft, 10.5 in.
WEIGHT: 77,000 lbs. maximum takeoff
SPEED: 340 mph
CEILING: 3,500 ft.
RANGE: more than 1,040 nm (with freight)
CREW: 3 (one pilot, one co-pilot, one flight engineer)

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: 98 ft, 8 in.
LENGTH: 53 ft, 4 in.
HEIGHT: 22 ft, 9 in.
WEIGHT: 52,539 lbs. maximum design gross weight
SPEED: 318 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)
Shore-Based

E-6A Mercury

The E-6A provides secure, survivable, jam-resistant strategic communications while performing the Navy’s TACAMO mission. The E-6B program has been established to upgrade TACAMO operational capabilities and will perform both TACAMO and airborne command post mission with installed equipment.

WINGSPAN: 148 ft. 2 in.
LENGTH: 152 ft. 11 in.
HEIGHT: 42 ft. 8 in.
WEIGHT: 341,000 lbs. maximum takeoff
SPEED: 523 mph
CEILING: 42,000 ft.
RANGE: more than 6,400 nm (E-6A); 5,500 nm (E-6B)
CREW: 18 (E-6A); 23 (E-6B)

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 1960s. Both versions provide multi-mission intelligence, surveillance, reconnaissance and combat capability to theater commanders worldwide.

WINGSPAN: 132 ft. 7 in.
LENGTH: 154 ft. 10 in.
HEIGHT: 53 ft. 8.5 in.
WEIGHT: 146,000 lbs. maximum permissible
SPEED: 473 mph
CEILING: 28,000 ft.
RANGE: 1346 nm with three hours on station
ARMAMENT: Harpoon and Maverick; torpedoes; mines
CREW: 12 (two pilots, three flight officers, two sensors, two sensor operators, one in-flight technician)

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: 162 ft. 10 in.
LENGTH: 109 ft. 6 in.
HEIGHT: 38 ft. 10 in.
WEIGHT: 175,000 lbs. maximum takeoff
SPEED: 400 mph maximum
CEILING: 28,000 ft.
RANGE: 4,480 nm
CREW: 4 (two pilots, one navigator, one loadmaster)

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: 7 (one pilot, one co-pilot, one crew chief, two attendants and 90 passengers)
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.

WINGSSPAN: 64 ft, 6 in.
LENGTH: 43 ft, 9 in.
HEIGHT: 15 ft.
WEIGHT: 12,500 lbs, maximum takeoff
SPEED: 208 mph, maximum
CEILING: more than 35,000 ft
RANGE: 1,965 nm
CREW: pilot only (or crew of two side by side)

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.

WINGSSPAN: 30 ft, 9.75 in.
LENGTH: 38 ft, 4 in.
HEIGHT: 16 ft.
WEIGHT: 14,061 lbs, maximum takeoff
SPEED: 225 mph
RANGE: 928 nm
CEILING: 40,000 ft
CREW: 2 (one instructor, one student)

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.

WINGSSPAN: 45 ft, 10.75 in.
LENGTH: 39 ft, 9.5 in.
HEIGHT: 15 ft, 1.75 in.
WEIGHT: 10,660 lbs, maximum takeoff
SPEED: 267 mph
RANGE: 980 nm
CEILING: 81,000 ft
CREW: 2 (one instructor, one student)

Trainers
T-34C Turbomentor
The T-34C is the Navy's aircraft for primary pilot and navigator training. Six training squadrons are equipped with the Turbomentor. As of mid-1998, 313 T-34Cs remained in service, along with one NTT-34C developmental aircraft. The Raytheon T-6A Texan II will replace the T-34C beginning in 2003.

WINGSSPAN: 33 ft, 4 in.
LENGTH: 26 ft, 8.5 in.
HEIGHT: 10 ft, 11 in.
WEIGHT: 4,474 lbs, maximum takeoff
SPEED: 288 mph
RANGE: 850 nm
CEILING: more than 30,000 ft
CREW: 2 (one instructor, one student)

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

WINGSSPAN: 38 ft, 1.5 in.
LENGTH: 38 ft, 3.5 in.
HEIGHT: 14 ft, 9.5 in.
WEIGHT: 13,179 lbs, maximum takeoff
SPEED: 322 mph
RANGE: 908 nm
CEILING: 40,400 ft
CREW: 2 (one instructor, one student)
**T-4J Skyhawk**

The TA-4J two-seat trainer version of the famous A-4 Skyhawk attack aircraft serves in one training squadron and one fleet composite squadron. As of mid-1998, 51 TA-4Js remained in service. The Skyhawk is being replaced in the pilot training role by the T-45A/C Goshawk.

**Specifications:**
- **Wingspan:** 27 ft. 6 in.
- **Length:** 40 ft. 3.25 in.
- **Height:** 18 ft.
- **Weight:** 24,500 lbs. maximum takeoff
- **Speed:** 675 mph
- **Range:** 1,785 nm
- **Crew:** 2 (one instructor, one student)

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**T-39N 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 aircraft Sabreliner remained in service as of mid-1998.

**Specifications:**
- **Wingspan:** 44 ft. 5.25 in.
- **Length:** 48 ft. 4 in.
- **Height:** 16 ft.
- **Weight:** 20,000 lbs. maximum takeoff
- **Speed:** Mach 3
- **Range:** 1,777 nm
- **Ceiling:** 27,000 ft.
- **Crew:** 2 (one instructor, one student)

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**SH/HH-60 Seahawk**

The SH-60E 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.

**Specifications:**
- **Length:** 46 ft. 11 in. (rotors and tail) (sleeper)
- **Height:** 17 ft.
- **Weight:** 21,884 lbs. maximum takeoff
- **Speed:** 69 mph
- **Range:** 380 nm
- **Armament:** MK46/50 torpedoes (SH-60B/F); 7.62mm or .50-caliber machine guns (SH-60B); Hellfire and Penguin air-to-surface missiles
- **Crew:** 3 (two pilots, one crewman (SH-60B); or 4 (two pilots, two crewmen (SH-60F)).

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**CH-46 Sea Knight**

The CH-46D is a tandem-rotor transport helicopter designed for both land- and sea-based operations. It can accommodate 25 passengers or 15 litters, with two medical attendants or 10,000 lbs. of sling-loaded cargo.

**Specifications:**
- **Length:** 44.3 ft.
- **Height:** 16.7 ft.
- **Weight:** 23,000 lbs. maximum takeoff
- **Speed:** 162 mph
- **Ceiling:** 10,000 ft.
- **Range:** 150 nm
- **Crew:** 3 (two pilots, one crewman)

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**SH-60 Sea Hawk**
**SH-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.

**Sea Ranger**

**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**: 43 ft.
**Height**: 14 ft.
**Weight**: 4,000 lbs. maximum takeoff
**Speed**: 126 mph
**Ceiling**: 8,700 ft.
**Range**: 128 nm
**Armament**: MK46/50 torpedoes, 7.62mm machine guns
**Crew**: 3 (two pilots, one sensor operator)

**MH-53 Sea Dragon/CH-53 Sea Stallion**
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**: 7,030 ft.
**Range**: 1,220 nm
**Crew**: 3 to 4 (two pilots, 1 to 2 crewmen)

**SH-2G Seasprite**
The SH-2G Seasprite first flew in 1959 and served long as a utility and search-and-rescue helicopter and later as the first light airborne multipurpose system (LAMPS) helicopter.

**Length**: 33 ft. 4 in. (nose and blades folded)
**Height**: 10 ft. 6 in. (rotors turning)
**Weight**: 12,000 lbs. normal takeoff
**Speed**: 115 mph
**Ceiling**: 2,500 ft.
**Range**: 367 nm
**Armament**: MK46/50 torpedoes, 7.62mm machine guns
**Crew**: 3 (two pilots, one sensor operator)
The Paveway series was developed to increase the accuracy of laser-guided bombs. All use standard MK-80 series bombs with Paveway kits attached to guide the explosives to their targets. The first of the Paveway series entered the fleet in 1968.

MK-80 Series

- **MK-81** (250 lbs.; 9 in. x 76.1 in.)
- **MK-82** (500 lbs.; 10.8 in. x 90.9 in.)
- **MK-83** (1,000 lbs.; 14 in. x 110.9 in.)
- **MK-84** (2,000 lbs.; 18 in. x 154 in.)

**Strategic Strike**

**Trident I (C-4)**

The Trident I replaced the Poseidon in the Navy's ballistic missile inventory. It became operational in 1978 and is carried on Ohio-class ballistic missile submarines.

- **Dimensions:** 74 x 406 in.
- **Weight:** 70,000 lbs.
- **Warhead:** Eight 100-kT Mk 4 MIRV
- **Propulsion:** Solid-fuel rocket
- **Range:** 4,350 nm.
- **Manufacturer:** Lockheed-Martin

**Trident II (D-5)**

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

- **Dimensions:** 83 x 528 in.
- **Weight:** 130,000 lbs.
- **Warhead:** Eight to 12 MK-5 RV or 14 150-kT MIRV or 7 300-kT MARV
- **Propulsion:** Three-stage, solid-fuel rocket
- **Range:** 6,000 nm.
- **Manufacturer:** Lockheed-Martin

**Joint Stand-off Weapon (JSOW)**

Joint Stand-off Weapon (JSOW) planned to replace the Paveway, Skipper and Maverick laser-guided weapons. JSOW was designed as a drop-and-forget weapon to protect delivery aircraft.

- **Dimensions:** 13.26 in. x 174 in. x 160 in. (L x W x H)
- **Wing Span:** 106 in.
- **Weight:** 1,065 lbs.
- **Warhead:** BLU-97 or BLU-108 bomblets
- **Propulsion:** Unpowered; glide range of 15 nm. (low alt.), 40 nm. (high alt.)
- **Manufacturer:** Raytheon

**Paveway Laser-Guided Bomb**

The Paveway series was developed to increase the accuracy of laser-guided bombs. All use standard MK-80 series bombs with Paveway kits attached to guide the explosives to their targets. The first of the Paveway series entered the fleet in 1968.
**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. wing span
**Weight:** 847 lbs.
**Propulsion:** Solid-fuel rocket motor/solid-fuel booster
**Warhead:** 265 lbs, semi-armor piercing
**Range:** 25 nm Speed: Mach 1.2
**Manufacturer:** Koningsberg Vapenfabrikk (Norway)

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**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. 2 in. x 44 in. wing span
**Weight:** 796 lbs.
**Warhead:** 146 lbs.
**Range:** Depends on launch speed/altitude
**Propulsion:** Dual-thrust rocket motor (Mach 2+)
**Manufacturer:** Raytheon

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**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 ft. wing span
**Weight:** 435 lbs.
**Warhead:** 300 lbs.
**Propulsion:** Two-stage, solid-fuel rocket motor
**Speed:** Supersonic
**Range:** Approx. 14 nm
**Manufacturer:** Hughes/Raytheon

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**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/submarine-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 and submarine launched.
  **Weight:** 1,160 lbs. (air launch), 1,459 lbs. (ASROC launch), 1,520 lbs. (SAM launch), 1,523 lbs. (capsule/canister launch)
  **Speed:** High subsonic speeds
  **Warhead:** 488.5 lbs. HE (blast; semi-armor piercing)
  **Propulsion:** Turbojet (cruise) w/solid-fuel booster for ship/ submarine launch
  **Range:** 75 to 80 nm for surface-launched; 120 nm for air launched
  **Manufacturer:** The Boeing Company

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**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; 8.8 ft. wing span
**Weight:** 2,850 lbs. (12,000 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)
**Manufacturer:** General Dynamics

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**SLAM-ER**

The SLAM-ER (Expanded Response) is an upgrade 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 of the missile during the terminal phase of attack (the last five miles).

**Dimensions:** 14 ft long
**Weight:** 1,400 lbs.
**Speed:** In excess of 150 nm
**Manufacturer:** The Boeing Company

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**AGM-154 JSOW weapon**

AGM-154 JSOW weapon

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**JANUARY 2001**
**ANTI-AIR WARFARE (AAW)**

**Anti-Aircraft Guns M61A1**

This 20mm Gatling gun, which also forms the basis for the Phalax 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)

**MANUFACTURER:** General Electric

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**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. wing span

**WEIGHT:** 162 lbs.

**WARHEAD:** 25 lbs.

**PROPUSSION:** Solid-fuel rocket

**RANGE:** 5 nm

**SPEED:** Supersonic

**MANUFACTURER:** Raytheon

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**Standard Missiles-1 (SM-1)/ Standard Missiles-2 (SM-2)**

Designed as a surface-to-air and surface-to-surface missile, the Standard missile is currently employed in two variations: SM-1/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 ER**

**DIMENSIONS:** 14.7 ft. long; 3.5 in. diameter; 3.6 ft. wing span

**WEIGHT:** 1,100 lbs. (SM-1); 1,380 lbs. (SM-2)

**WARHEAD:** Proximity fuse/high-explosive

**PROPLICATION:** Dual thrust/solid-fuel rocket

**RANGE:** 15 to 20 nm. (SM-1); 40 to 90 nm. (SM-2)

**MANUFACTURER:** Raytheon

**SM-2 ER**

**DIMENSIONS:** 26.2 ft long; 13.5 in. diameter; 5.2 ft. wing span

**WEIGHT:** 2,980 lbs.

**WARHEAD:** Proximity fuse/high-explosive

**PROPLICATION:** Two-stage/solid-fuel rocket: sustainer motor and booster motor

**RANGE:** 65 to 160 nm

**MANUFACTURER:** Raytheon

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**Air-to-Air Missiles**

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

An all-weather, beyond-visual-range, air-to-air missile designed as a follow-on to the Sparrow missile series. Less dependent on the aircraft’s fire control system for guidance, the missile frees the pilot to aim and fire multiple missiles while evading enemy fire. The AMRAAM program is the result of a joint agreement between the U.S. and its NATO allies to develop and share production technology. The AMRAAM was deployed in September 1991 and is carried aboard the F/A-18 Hornet.

**DIMENSIONS:** 12 ft. (long); 7 in. diameter; 21 in. wing span

**WEIGHT:** 335 lbs.

**PROPLICATION:** High performance, directed rocket motor

**WARHEAD:** Blast fragmentation; high explosive

**SPEED:** Supersonic

**MANUFACTURER:** Raytheon

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*Advanced Medium-Range Air-to-Air Missiles AMRAAM and AIM-7 Sparrow missiles*
The Phoenix Missile

The Navy's only long-range, air-to-air missile. The missile has been designed for use in an all-weather, heavy-jamming environment. First deployed in 1974.

**DIMENSIONS:** 13 ft. long; 15 in. diameter; 3 ft. wing span
**WEIGHT:** 1,024 lbs.
**PROPULSION:** Solid-fuel rocket motor
**WARHEAD:** 136 lbs; proximity fuse; high explosive
**RANGE:** In excess of 100 nm
**SPEED:** In excess of 3,000 mph
**MANUFACTURER:** Raytheon

**Sparrow**

A highly-maneuverable, all-weather, all-altitude, air-to-air missile found throughout the U.S. and NATO forces.


**DIMENSIONS:** 12 ft. long; 8 in. diameter; 3.4 ft. wing span
**WEIGHT:** 500 lbs.
**WARHEAD:** 90 lbs. annular blast fragmentation
**PROPULSION:** Solid-fuel rocket motor
**RANGE:** In excess of 30 nm
**SPEED:** In excess of 2,660 mph
**MANUFACTURER:** Raytheon

**Sidewinder**

The Sidewinder is a short-range, heat-seeking, anti-air missile carried by fighter aircraft. The missile's high-explosive warhead and infrared, heat-seeking guidance system have contributed to the program's long life. The first prototype was fired successfully in 1953 and the initial production version became operational in 1956. The current version, AIM-9M, began fleet use in 1983. The Sidewinder is one of the oldest, least-expensive and most-successful missiles in the entire U.S. inventory.

**DIMENSIONS:** 9.6 ft. long; 5 in. diameter; 2.1 ft. fin span
**WEIGHT:** 190 lbs.
**PROPULSION:** Single-stage, solid-fuel rocket motor
**WARHEAD:** 20.8 lb blast fragmentation
**SPEED:** Supersonic
**RANGE:** 8.7 plus nm
**MANUFACTURER:** Raytheon/Ford Aerospace/Loral

**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 naval 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/67
**ROUND WEIGHT:** 1.1 lb.
**MUZZLE VELOCITY:** 1,100 m/sec
**RANGE:** 2,700 yds.
**TYPE OF FIRE:** Single shot; 175 rounds/min. in automatic
**MANUFACTURER:** Crane Division, Naval Surface Warfare Center

**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
**RATE OF FIRE:** 85 rounds/min.
**MUZZLE VELOCITY:** 925 m/sec
**RANGE:** 10 nm
**WEIGHT:** 3,399 tons
**MANUFACTURER:** FMC Naval Systems Division and OTD Melara

**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
**RATE OF FIRE:** 1,000-3,000 rounds/min.
**MUZZLE VELOCITY:** 3,650 ft/sec
**RANGE:** 6,000 yds.
**MANUFACTURER:** Hughes Missile Systems Company

**60mm Mortar**

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

**CALIBER:** 60mm
**RATE OF FIRE:** 10 rounds/min. (trigger mode); 18 rounds/min. (drop mode)
**MUZZLE VELOCITY:** 500 ft/sec
**RANGE:** 1,850 to 2,000 yds.
**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.

**DIMENSION:** 8.5 ft. long, 12.75 in. diameter  
**WEIGHT:** 512 lb.  
**RANGE:** More than 8,000 yds.  
**SPEED:** 45 knots  
**PROPULSION:** Two-speed, reciprocating external combustion  
**WARHEAD:** 96 lbs. of PBXM-103  
**DEPTH:** Greater than 1,200 ft.  
**ORIGINAL MANUFACTURER:** Alliant Techsystem, Honeywell

**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, Md., the MK-48 and its subsequent variants have been in service with the Navy since 1972.

In 1975 an operational requirement was issued by OPNAV 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 which achieved Initial Operational Capability in 1980.

Additional efforts resulted in development of the digital advanced capability (ADCAP) MK-48 MOD 5 which 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 significantly reduced the weapon's radiated noise, 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.

**DIMENSION:** 19 feet long, 31 in. diameter  
**WEIGHT:** 3,434 lbs. (MK-48) 3,695 (MK-48 ADCAP)  
**RANGE:** Greater than 8 nmi.  
**SPEED:** Greater than 28 knots  
**PROPULSION:** Positive displacement Piston-type engine with OTTO fuel II  
**WARHEAD:** Bulk Charge 650 lbs. of high explosive  
**DEPTH:** Greater than 1,200 ft.  
**ORIGINAL MANUFACTURER:** Gould

**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.

**DIMENSION:** 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 Storied Chemical Energy Propulsion System  
**WARHEAD:** Approximately 100 lbs. high explosive shaped charge  
**DEPTH:** 3,600 ft.  
**ORIGINAL MANUFACTURER:** Alliant Techsystem, Westinghouse

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**RIM-7P Sea Sparrow missile**

**An MK-46 exercise torpedo**
**Mines**

**MK-67 SLMM (Submarine Launched Mobile Mine)**

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 1983.

**TYPE:** Submarine laid bottom mine.

**DIMENSIONS:** 13.4 ft. long; 19 in. diameter

**DETECTION SYSTEM:** Magnetic/seismic or Magnetic/seismic/pressure target detection devices (TDDs)

**DEPTH RANGE:** Up to 600 ft. (183 meters)

**WEIGHT:** 1,658 pounds (754 kilograms)

**EXPLOSIVES:** 330 pounds (150 kilograms) of high explosive

**MK-65 Quickstrike**

The Quickstrike is a shallow-water, aircraft-laid mine used primarily against surface ships. The MK 65 is a 2,390 lb. bomb fitted with a thin-walled mine casing. Older Quickstrike versions (MK-62, MK-63 and MK-64) were converted streamlined bombs of the 500 lb., 1,000 lb. and 2,000 lb. sizes. First fleet service in 1983.

**TYPE:** Aircraft laid bottom mine.

**DIMENSIONS:** 10.6 ft. long; 28 in. diameter

**DETECTION SYSTEM:** Magnetic/seismic/pressure target detection devices (TDDs) are used on various models.

**DEPTH RANGE:** Up to 600 ft. (183 meters)

**WEIGHT:** 2,390 pounds (1,086 kilograms)

**EXPLOSIVES:** Various loads

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**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.

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**MK-56 and MK-57**

The MK-56 ASW mine (the oldest still in use) was developed in 1966.

**TYPE:** Aircraft-laid, moored mine (MK-56); submarine-laid, magnetically-moored mine (MK-57).

**DIMENSIONS:** (MK 56) 9.5 ft. long, 22.4 in. diameter; (MK 57) 10 ft. long, 21 in. diameter

**DETECTION SYSTEM:** Total field magnetic exploder.

**DEPTH RANGE:** Up to 1,000 ft.

**WEIGHT:** MK 56: 2,000 pounds; MK 57: 2,059 pounds

**EXPLOSIVES:** MK 56: 360 pounds HBX-3; MK 57: 340 pounds HBX 3

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**Sources:**

- Naval Sea Systems Command
- Naval Air Systems Command
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