



Commander, Naval Air Forces

Aircraft Carrier Embark Brief



Briefing Overview



- **Why do we need a Navy?**
- **Naval Air Force Mission**
- **Navy's Aviation Assets**
- **Employing Naval Aviation**
- **Your Carrier Embark**



Why Do We Need a Navy?

70 % Of the World is covered in water
-- 12 miles off coast is international waters

80 % Of the World's population lives within
100 miles of a coastline
-- CVN's aircraft travel 600 miles



Why Do We Need a Navy?

90 % Of the World's commerce travels over the oceans

90% of global trade by volume travels by water
70% of global trade by value travels by water

Without open sea lanes, our only trading partners would be Canada and Mexico



Why Do We Need a Navy?

95 % Of the World's communications lines pass under the oceans

- People assume communications are by satellite
- The Navy ensures uninterrupted flow

100 % Of the time, the U.S. Navy is steaming around the world





Today's Navy



As of Aug. 7, 2021:

- 347,487 active duty officers, Sailors and midshipmen
- 296 deployable Battle Force ships in service

Ships Underway:

- Forward positioned ships + Subs: 97
- Deployed Ships Overseas: 58 (19%)
- Underway for Training: 42 (14%)

Aircraft Carriers at sea:

- USS Carl Vinson (CVN 70) – Eastern Pacific
- USS Abraham Lincoln (CVN 72) – Eastern Pacific
- USS Ronald Reagan (CVN 76) – Western Pacific
- USS Gerald R. Ford (CVN 78) – Western Atlantic

Amphibious Assault Ships (LHA/LHDs) at sea: 4





Naval Air Forces Mission

“Man, Train, and Equip, deployable combat-ready Naval Aviation forces that win in combat.”

Priorities:

- Warfighting
- People
- Readiness

Focus Areas:

- Current Readiness
- Leading People Every Day
- Future Readiness





Manning

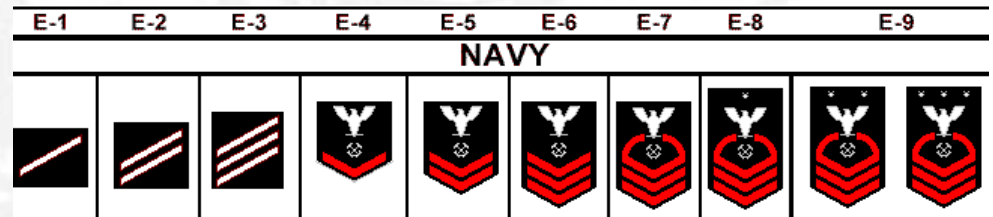
The Navy is divided into separate groups of leaders: Officers and Enlisted

Officers: (W-2 to O-10)



~55,500 Officers. Bachelor's degree to enter, and graduate degrees (or equivalent) by O-4/O-5. Assigned for 24-36 months.

Enlisted: (E-1 to E-10)



~275,000 Enlisted Sailors. HS grads or greater to join. Specialized careers throughout service. Assignments are 36-48 months.

In 2020, less than 27% of HS graduates qualify for Navy service.



Manning

Females: Females make up 19.8 percent of the Navy

- 3.1% Officer
- 16.7% Enlisted

Ethnic diversity throughout the U.S. Navy:

American Indian – 2.2%

Asian – 5.6%

Black/African – 17%

Hawaiian/Islander – 1.1%

Hispanic – 15.7%

Multi-Racial – 7.2%

No Response – 4.9%

White – 46.3%

(US Navy Demographic data as of 1 January 2019)

Recruitment of new Sailors, and retention of existing Sailors are the greatest personnel issues facing the Navy today.



Training

Training: All hands, all the time

-- **Today's Navy is a "technical force"**

--- Operating and maintaining equipment and aircraft requires advanced skills

--- Training includes formal classroom (Class A- and C-Schools) and on-the-job



-- **+35% annual crew turnover**, every command, every year.

--- Perpetual cycle of job rotations with increasing roles and responsibilities

-- **Skill proficiency:**

--- Persistent training and drilling of the crew ensures combat readiness

-- **Sailors in today's Navy are best-educated and trained EVER!**



Naval Air Forces

What We manage:

**Commander
Naval Air Forces**

**+100,000
Sailors /
Personnel**

**11 Aircraft
Carriers**

**21 Aviation
Type-Wings**

**22 Naval Air
Stations**

**168 Fleet, Reserve & Training
Squadrons**

~3,700 Aircraft of various types



Naval Air Forces

Type-Wings are divided into smaller commands / grouping of aircraft, known as squadrons:

Type-Wing Commander (O-6)

Squadron 1

Squadron 2

Squadron 3

Squadron 4

Squadron 5

Squadron 6

Squadron 7

Squadron 8

There are ~168 fleet, reserve, and training squadrons in the Navy

- Squadron is the smallest aviation unit
- Squadrons vary in size from 5 to 40 aircraft
- Led by a Navy Commander (O-5)

Type-Wings provide squadrons and aircraft to operational / combatant commanders (Carrier Air Wings) for deployments around the world



Carrier-Based Aircraft



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

(Advanced Strike-Fighter)

Highly capable across the full mission spectrum, longer range, and aerial refueling capability.

IOC: Sept 2001, Cost: ~\$57 million



EA-18G 'Growler'

(Electronic Warfare)

Integrates electronic warfare technology, communication countermeasures, satellite communications and offensive weapons.

IOC: Sept 2009, Cost: ~\$67 million



Carrier-Based Aircraft



E-2D 'Hawkeye'

(Airborne Early Warning)

Tactical battle management, airborne early warning, command and control aircraft. IOC: Jan 1964 (E-2A); Cost: \$80 million (D).



C-2A 'Greyhound'

(Logistics / Personnel)

Transport of high-priority cargo, mail and passengers. Referred to as the 'COD' (Carrier On board Delivery). IOC 1964; Cost \$38.9 million (1980s).



Navy Aircraft: Carrier-Based

MH-60R Seahawk

- **Primary Function:** Anti-Submarine & Surface Warfare
- **Date Deployed:** 2006
- **Crew:** Three



Multi-Mission helicopters capable of a full range of mission tasking including:

Anti-Submarine and Anti-Surface Warfare, Search and Rescue, Combat Search and Rescue, and Logistics.

Operating from all surface combat ships
(Blackhawk helicopter in Army and Air Force)

MH-60S Knighthawk

- **H-60S Primary Function:** Anti-Surface, Combat Support, Logistics, Search and Rescue
- **Date Deployed:** 2002
- **Crew:** Four





Navy Aircraft: Carrier-Based



F-35C 'Lightning II' (JSF)

- F-35A - Air Force
- F-35B - Marine (vertical take-off)
- F-35C - Navy (folding wings & tailhook)

- Navy's 1st supersonic stealth aircraft
- 5th Generation aircraft
- Commonality of avionics/parts reduces costs
- Carries internal or external weapons
- Robust communications suite
- Increased lethality/survivability
- 1st Operational Squadron, VFA-147
- Unit Cost: \$121.2M

Future Milestones for F-35C:

- CVN operational integration 2020
- Deploying on USS Carl Vinson
- 1st CVN deployment in 2021





Navy Aircraft: Carrier-Based

4 things that make Carrier-Based Aircraft Unique:

- 1) Tailhook
 - 2) Structural Strength
 - 3) Landing Gear
 - 4) Folding Wings
- 1) **Tailhook** withstands engines at full power while the cable stops the aircraft on the flight deck.
 - 2) **Structurally framed/reinforced** to withstand the arresting and launching forces.
 - 3) **Landing gear** with oversized wheels to absorb impact of landing on CVN flight deck.
 - 4) **Wings fold** to conserve space when moving on flight deck and while stored.



These items add weight. CVN aircraft may not fly as fast or as far as Air Force aircraft; but with a CVNs ability to move around the world, they don't have to fly great distances to engage an enemy.



Ship / Shore-Based Aircraft



CMV-22 'Osprey'

(Logistics / Personnel)

Tilt-rotor aircraft that will replace the C-2A Greyhound in 2020s. Transport of high-priority cargo, mail and passengers.



MH-53E 'Sea Dragon'

(Anti-Mine Helicopter)

Airborne Mine Countermeasures aircraft. Vertical shipboard logistics and assault support capable.



Shore-Based Aircraft



EP-3E 'Aries II'

Intelligence & Reconnaissance

Navy's only land-based signals intelligence (SIGINT) reconnaissance aircraft. Built on P-3 Orion airframe.



P-8 'Poseidon'

Multi-Mission Maritime Surveillance

Patrol and reconnaissance aircraft capable of conducting a variety of combat warfare missions. These capabilities are enhanced through secure, interoperable, net-ready systems.



Shore-Based Aircraft



E-6A/B 'Mercury'

Airborne Command Post
Communications and Strategic Airborne
Command Post. Survivable, reliable, and
endurable; provides comms between the
National Command Authority (NCA) and
U.S. strategic forces (Boeing 707)



C-40 'Clipper'

Personnel / cargo transport
Cost effective, proven and reliable
airframe, with low maintenance costs
due to the prevalence of aircraft around
the world.
(Boeing 737)



Unmanned Aircraft



MQ-25 'Stingray'

Navy's first unmanned carrier-based aircraft, which will provide airborne tanking capability with airborne surveillance and reconnaissance capability.



MQ-4C 'Triton'

Triton provides operational and tactical users a continuous source of information to maintain a tactical overview of the maritime battle space.

MQ-8B/C 'Fire Scout'

Fire Scout operates from air-capable surface ships and significantly improves over-the-horizon surveillance capability





Navy Training Aircraft



T-6B II Texan Basic Flight Trainer



TH-57 Sea Ranger Helicopter Trainer



T-45 Goshawk Basic Jet Trainer – first 10 aircraft carrier landings before F/A-18 flights



T-44 Pegasus Multi-engine Trainer for future E-2C, C-2, and multi-engine pilots



U.S. Navy Aircraft Carriers



USS Nimitz (CVN 68), Bremerton, WA (first in class)

USS Eisenhower (CVN 69), Norfolk, VA

USS Carl Vinson (CVN 70), San Diego, CA

USS Theodore Roosevelt (CVN 71), Bremerton, WA

USS Abraham Lincoln (CVN 72), San Diego, CA

USS George Washington (CVN 73), Hampton, VA (refuel)

USS John C. Stennis (CVN 74), Hampton, VA (refuel)

USS Harry S. Truman (CVN 75), Norfolk, VA

USS Ronald Reagan (CVN 76), Yokosuka, Japan

USS George H.W. Bush (CVN 77), Norfolk, VA

USS Gerald R. Ford (CVN 78), Norfolk, VA

Nimitz Class Statistics

Flight Deck Area: 4.5 acres

Displacement: 97,000 tons

Speed: 30+ knots

Aircraft: 65+

Personnel: Ship 2,800

Air Wing 2,000

Staff 200

Catapults: 4, steam powered

Cost: ~\$8.5B FY12 (CVN77)

Ford Class Statistics

Flight Deck Area: 4.6 acres

Displacement: 100,000 tons

Speed: 30+ knots

Aircraft: 65+

Personnel: Ship 2,440

Air Wing 2,000

Staff 200

Catapults: 4, Electromagnetic

Cost: ~\$12.6B FY15 (1st 3 CVNs)



Gerald R. Ford Class CVN

Integrated Island

Smaller Island
Re-Positioned Aft
& Outboard

Dual Band
Radar

Joint Precision
Approach and
Landing System

New Propulsion/Electric Plant

All Electric Aux Services

Zonal Electrical
Distribution System

New Propulsion
Plants

Improved Weapon & Material Handling

Advanced Weapons
Elevators

Enlarged Flight
Deck Footprint

"Pit Stop"

Advanced Arresting Gear

Aircraft Elevators (3)
Stbd Sponson Redesign

Enhanced Flight Deck

2 Hangar Bays

#4 Catapult Unrestricted

Electromagnetic Aircraft
Launching System (4)

Underwater Protection

Improved Survivability

Evolved Sea
Sparrow Missile

Enhanced Ship Self Defense

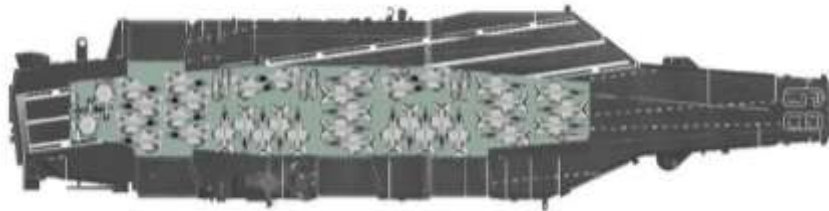
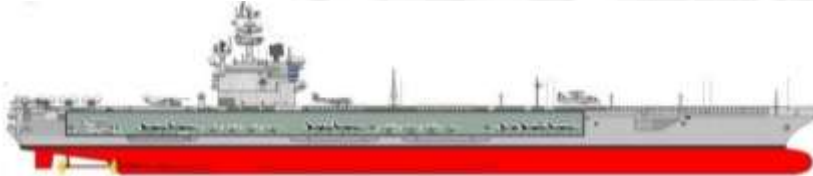




Aircraft Carrier vs LHD/LHA



Nimitz-Class Aircraft Carrier (Super Carrier)



(1,092)

Displacement: 97,000 tons

Aircraft: F/A-18E/F Super Hornet, F/A-18C Hornet, EA-18G Growlers, E-2C/D Hawkeyes, C-2 Greyhound, SH-60R/S Seahawk

Dimensions: 1,092 x 252 feet

Speed: 30 knots

Ship's Personnel: 2,800 **With Air Wing & Staff:** 5,000

Mission: 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 power projection operations in support of U.S. and coalition forces.

America-Class Amphibious Assault Ship



(844)

Displacement : 45,000 tons

Aircraft: F-35B Lightning II, MV-22 Osprey, CH-53E Sea Stallion, UH-1 Huey, AH-1Z Super Cobra, MH-60S Seahawk

Dimensions: 844 x 106 feet

Speed: 20 knots

Ship's Personnel: 1,059 **Marine Contingent:** 2,500

Mission: Provide the U.S. Marine Corps with a means of ship-to-shore movement by helicopter in addition to movement by landing craft.



U.S. Navy Aircraft Carriers



Nuclear-Powered Aircraft Carrier Value:

Unmatched Superiority: No other nation can put to sea on a single ship, the maritime combat power of a CVN and its Air Wing.

- **Size:** Supports +65 aircraft and adaptable to future air wing growth
- **Deploy & redeploy:** Endurance & flexibility are hallmarks of a nuclear aircraft carrier.
- **Mobile airfield:** Makes adversary targeting a complex problem.
- **Survivable:** Can evade enemy attack, more so than land-based locations.
- **Sovereign U.S. territory:** Does not require host nation permission to employ forces.





U.S. Navy Aircraft Carriers

Nuclear-Powered Aircraft Carrier Value:

Lethality: A large-deck nuclear aircraft carrier with an embarked carrier air wing is a lethal military force:

- **Speed:** Reduces transit time, hard to target.
- **Reach:** Combat ops exceed 1,000 nm, with in-flight refueling
- **Mass:** Strike/fighter aircraft can engage multiple targets
- **Precision:** Pinpoint accuracy and tailored warheads
- **Sustained Operations:** Weeks of operations without resupply.





U.S. Navy Aircraft Carriers

The New Arms Race: Aircraft Carriers

CVNs Matter: World maritime powers have recognized the value of aircraft carriers, and are actively expanding their existing fleets.

(See back-up slides for additional aircraft carriers of other nations)





Value of CVNs: 50 years of service

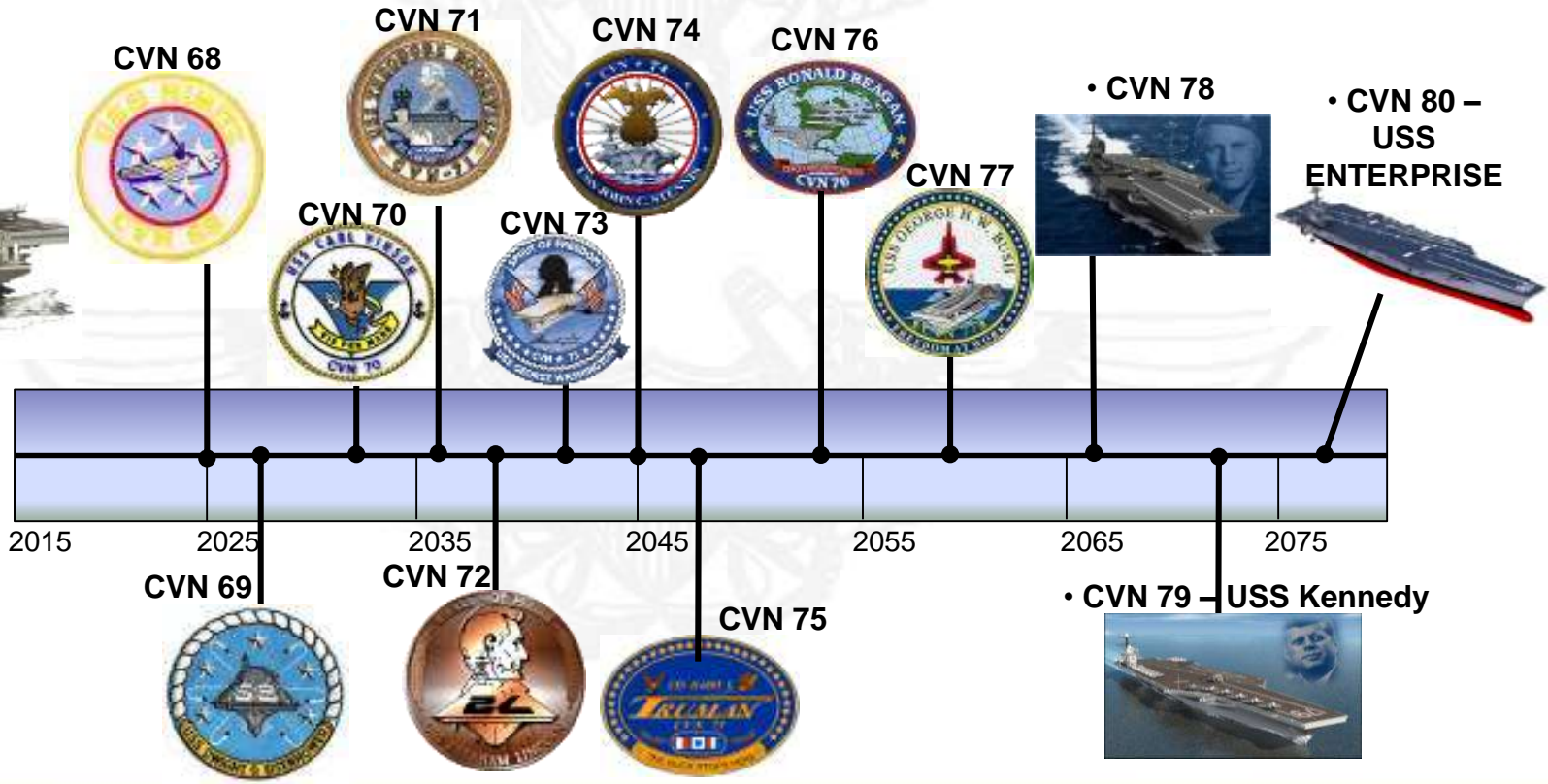
NIMITZ Class: 10 Aircraft carriers spanning 84 years in service, from 1975 through 2059

- Over half way through the service life of the NIMITZ Class CVN force
- **When a CVN retires, it retires as an unequalled, world-class combat ship. Their importance does not diminish with age**

FORD Class: 1 aircraft carrier (10 planned), serving 2017 until 2110 (Planned)



Years CVNs scheduled to retire:





Air Wings Continually Evolve



• Nimitz New – 1975

- F-4J Phantom / F-14 Tomcat
- A-6 Intruder / A-7 Corsair II
- S-3 Viking
- RA-5 Vigilante
- E-2B Hawkeye
- EA-6B Prowler
- C-2 Greyhound
- SH-3 Sea King / SH-46 Sea Knight

• NIMITZ – 2000s

- F/A-18E/F Super Hornet
- F-14D Super Tomcat
- F/A-18 A/C Hornet
- E-2C Hawkeye
- EA-6B Prowler
- SH-60B/F Sea Hawk
- C-2 Greyhound

• NIMITZ Retires – 2025

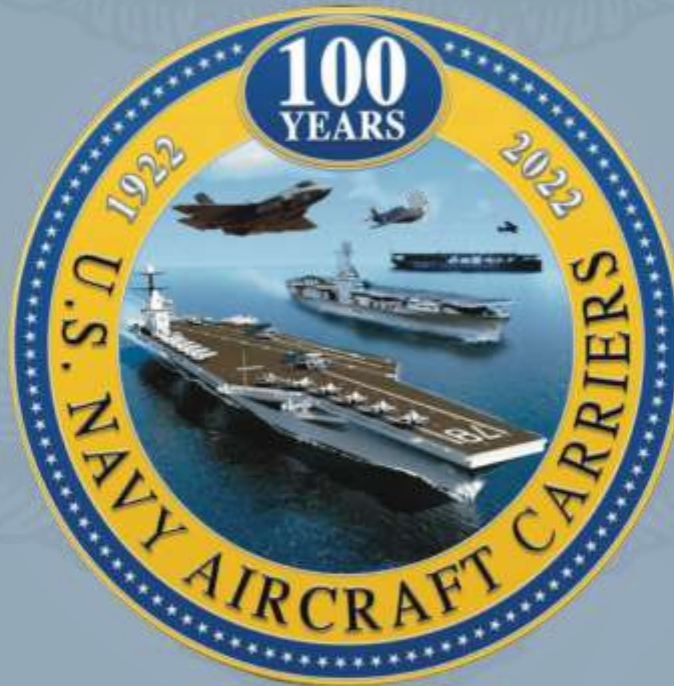
- F-35C Lightning II
- F/A-18E/F Super Hornet
- E-2D Advanced Hawkeye
- EA-18G Growler
- MH-60R/S Sea Hawk
- CMV-22 Osprey
- MQ-25 Stingray

A CVN and Carrier Strike Group remains relevant as its Air Wing EVOLVES to match changing threats and technologies



Centennial of Aircraft Carriers

On 20 March 1922, the United States Navy made history when it recommissioned the USS Jupiter as the United States Navy's first aircraft carrier USS Langley (CV 1).

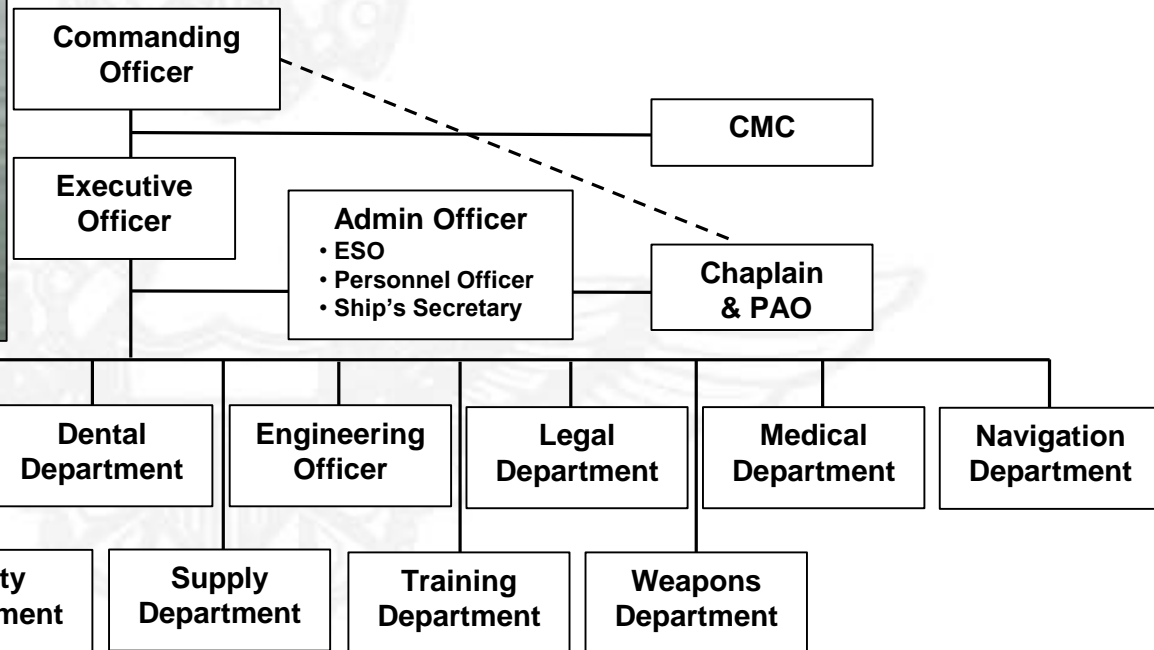


Today, two classes of nuclear-powered aircraft carriers (Nimitz and Ford-classes) lead the fleet as they deter aggression and assure national security.



U.S. Navy Aircraft Carriers

Chain of Command





Carrier Air Wing composition

- VFA-1 12 x F/A-18E or F-35C
 - VFA-2 12 x F/A-18E
 - VFA-3 10 x F/A-18F
 - VFA-4 10 x F/A-18F
 - VAQ-5 5 x EA-18G
 - VAW-6 4 x E-2D
 - HSC-7 8 x MH-60S
 - HSM-8 11 x MH-60R
 - VRC-9 2 x C-2A
- Fighter/Attack
- Electronic Warfare
- Airborne Early Warning
- Multi-use helicopters
- Logistics



~ 74 aircraft, with helicopters on most escorting ships



Carrier Strike Group



A CSG is of a mix of 6 – 8 ships including:



- Nuclear Powered Aircraft Carrier
- Arleigh Burke-Class Destroyers
- Ticonderoga-Class Cruisers
- Combat Stores Ship
- ~ Fast Attack Class Submarine



Operational Forces: CSG

Carrier Strike Group: *'The ultimate manifestation of Naval power & power projection'*





The Carrier Strike Group Value

Combatant Commanders know the value of CSGs, and are unrelenting in their requests for aircraft carrier deployments to protect, deter, fight, and win, within their theater of operations.

- In high-end warfare, Carrier Strike Groups constantly move, complicating an enemy's targeting; and can launch strikes in collaboration with Joint Forces.
- Support operational and diplomatic objectives. CSGs are one of the most requested assets among Fleet and combatant commanders.
- “You must be present to win.” The mobility and flexibility that a CSG can bring to a region with its surface ships and aircraft carrier, can influence nations for hundreds of miles.
- The CSG provides national command authority and regional commanders: options, access, and forward presence that allows for a rapid response to a wide spectrum of threats.
- CSG escort ships ensure the survivability of the aircraft carrier, enabling the U.S. to continue its role as a key guarantor of peace and stability around the world.



The Carrier Strike Group ships



Ticonderoga Class Cruiser



Multi-mission Air Warfare (AW), Undersea Warfare (USW), Naval Surface Fire Support (NSFS) and Surface Warfare (SUW) capable. Supports carrier battle groups, amphibious forces, or operates alone and as flagships of surface action groups. **Cost:** About \$1 billion each.

Arleigh Burke Destroyer

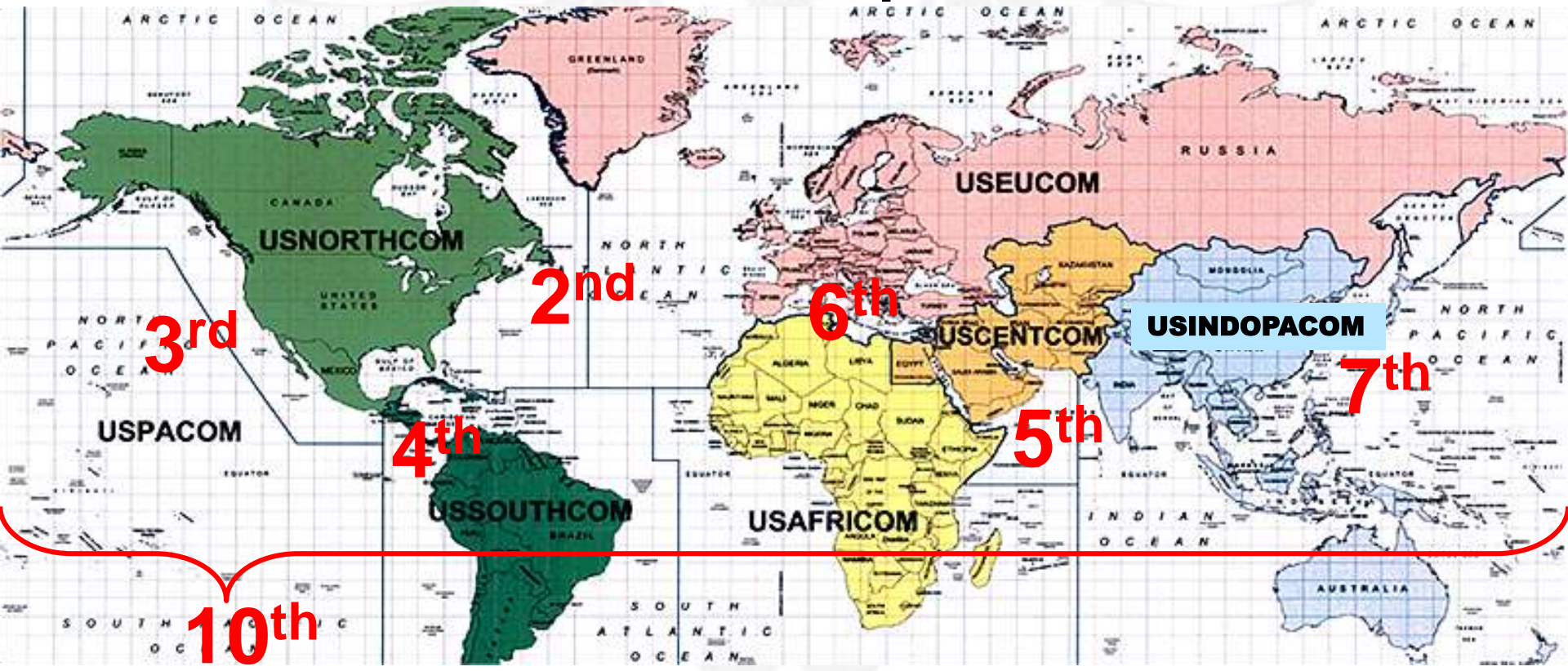
Guided missile destroyers provide multi-mission offensive and defensive capabilities. They can operate independently or as part of Carrier Strike Groups, Surface Action Groups, and Expeditionary Strike Groups.





Employing Naval Aviation

We are a force provider



The DoD Unified Command Plan sets missions and geographic responsibilities among combatant commanders. The Navy's numbered Fleets report to those DoD commanders and provide a worldwide presence, unmatched deterrence, and allows for control of the seas



Employing Naval Aviation

Forward Presence, Deterrence, and Sea Control

CVNs deploy from
San Diego, CA

CVN s deploy from
Norfolk, VA

Deployed aircraft
carrier in 5th Fleet

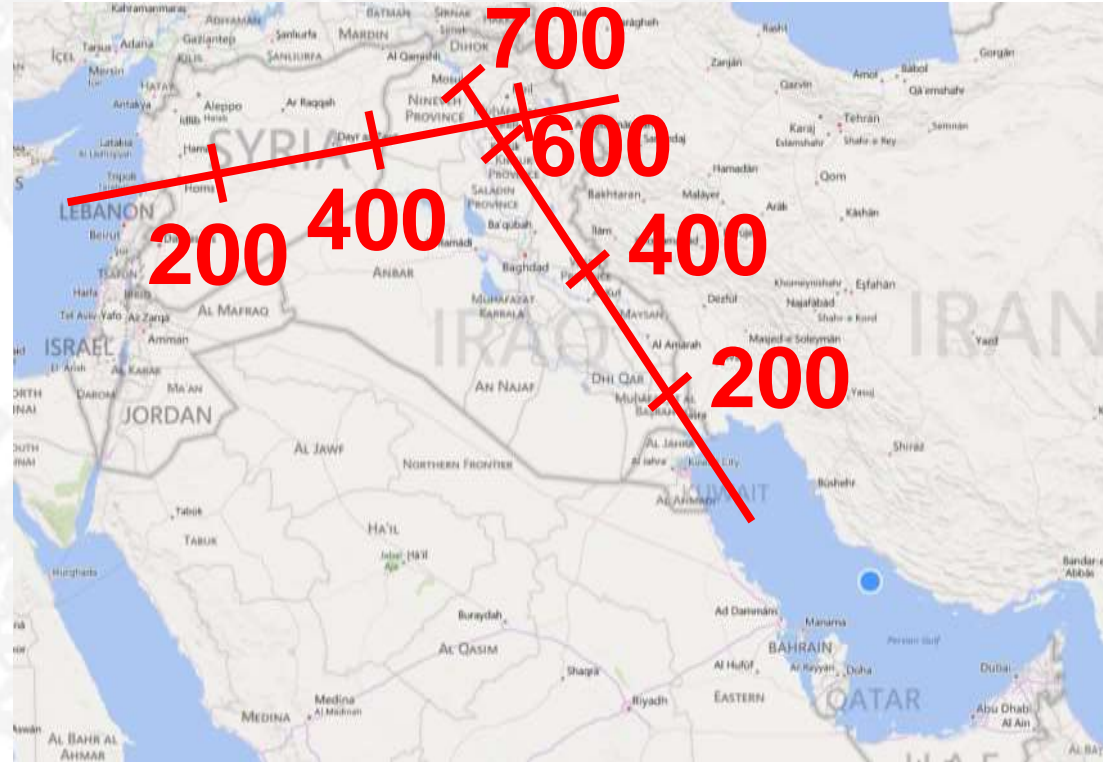
Forward deployed
aircraft carrier in
Japan

Aircraft Carrier mobility is critical to mission success
7 Day Response: ~3360 Nautical Miles @ 20 knots



Employing Naval Aviation

Power Projection



CVN-based combat missions against ISIS aggression in Northern Iraq and Syria



Employing Naval Aviation

Underway Replenishment



The ability of CVNs and U.S. Navy ships to remain 'on station' is vital to sustained operations and U.S. interests



Employing Naval Aviation

Maritime Security & Humanitarian Assistance

Maritime Security efforts focus on common, global threats including: proliferation, smuggling, piracy, and terrorism. Naval Aviation assets provide long-range patrol and escort security for vessels transiting around the world



Humanitarian Aid Relief provides an immediate disaster response that saves lives. CVNs and LHDs can deliver water, food, and survival items to a devastated region within days, prior to relief organizations.



Navy Humanitarian Aid successes:

- 2014 Philippines Typhoon
- 2011 Japan Earthquake & Tsunami
- 2010 Haiti Earthquake
- 2004 Indian Ocean Tsunami



Your Aircraft Carrier Embark





Your flight in the C-2A "COD"



Squadron: VRC-30 Providers

Length: 57 feet, 7 inches

Max. gross take-off weight:
57,000 lbs..

Max. Cruising Speed:
300 knots (345 mph)

Max. Passenger capacity: 26

Travel time: 30-60 minutes.

Seats face to back of plane



Your flight in the CMV-22B Osprey

Squadron: VRM-30 Titans

Length: 57 feet, 4 inches

Max. gross take-off weight:
60,500 lbs..

Max. Cruising Speed:
280 knots (345 mph)

Max. Passenger capacity: 22

Travel time: 30-60 minutes.

Seats face inward from side
of aircraft





What You'll Experience

- Landing on Aircraft Carrier
- Observe day/night flight ops
 - Flight Deck and Vulture's Row
- Meet the crew
 - Encourage you to engage Sailors
- Tour the ship
- Dine with the crew
 - Wardroom, CPO and Mess Decks
- Berth in stateroom
- Aircraft launch from ship



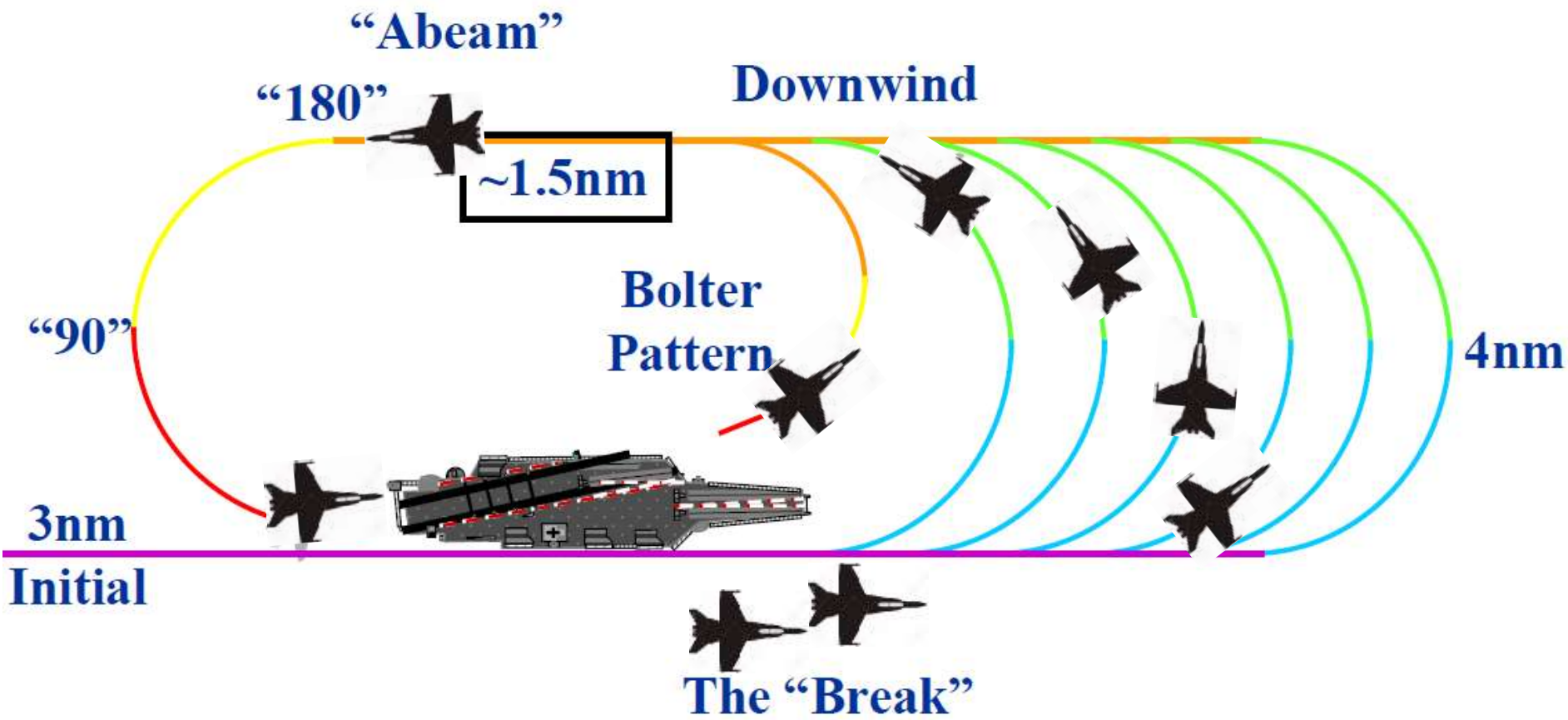


The Flight Deck



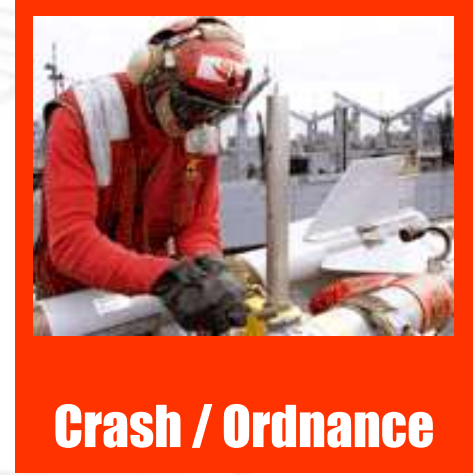


Carrier Landing





Flight Deck Rainbow Wardrobe





Your Embark: Engage the Crew

We encourage you to talk with the Officers and Sailors that you encounter throughout your journeys on the ship:

- Sailors will treat you with dignity and respect.
- Guests should maintain proper etiquette while aboard.



The pride, dignity, honor, and professionalism displayed by our Officers and Sailors is one of the primary messages that we hope you will take back with you to your communities.



Welcome Aboard!



USS Nimitz (CVN 68)

Commissioned: May 3, 1975
Dimensions: 1,092 x 252 feet
Area of Flight Deck: 4.5 acres
Displacement: 95,000 tons
Speed: 30 + knots
Aircraft: 65+
Personnel: Ship 2,800
Air Wing 2,000





QUESTIONS?





Back-up Slides:





Carriers of the World



United Kingdom

(Queen Elizabeth)

Displacement: 70,600 tons

Dimensions: 920 x 230 ft..

Speed: 25 knots

Personnel: 1,600

Aircraft: 40 - 50

Types: F-35B Lightning, H-

47 Chinook, Agusta

Westland Apache, Merlin,

Wildcat, Merlin Crowsnest

AEW



China (2) & Russia

(Soviet-era design)

Displacement: 67,500 tons

Dimensions: 999 x 236 ft..

Speed: 28 knots

Personnel: 1,200

Aircraft: 40-China/41-Russia

Types:

China: Shenyang J-15,
Changhe Z-18, Harbinm Z-9.

Russia: Su-33, MiG-29, Su-25,
Ka-27



India

(Vikrant & Vishal)

Displacement: 65,000 tons

Dimensions: 860 x 200 ft..

Speed: 28 knots

Personnel: 1,400

Aircraft: 30

Types: Mikoyan MiG-29K,
HAL Tejas, Kamov Ka-31,
Westland Sea King, HAL
Dhruv.



France

(Charles de Gaulle)

Displacement: 42,500 tons

Dimensions: 858 x 211ft.

Speed: 27 knots

Personnel: 1,950

Aircraft: 40

Types: Rafale M, Super
Etendard, E-2C Hawkeye,
SA365 Dauphin, EC725
Caracal, AS532 Cougar.



Carriers of the World



Brazil

(Clemenceau-Class)

Displacement: 32,800 tons

Dimensions: 869 x 104 ft..

Speed: 32 knots

Personnel: 1,920

Aircraft: 39

Types: A-4KU Skyhawks, AS 532 SC Cougars, HB 350 & HB 355 Ecureuils, SH-3 Sea Kings.

Italy

(Cavour)

Displacement: 27,000 tons

Dimensions: 800 x 127 ft..

Speed: 28 knots

Personnel: 1,200

Aircraft: 30

Types: AV-8B Harrier II, Agusta Westland EH-101A AEW, other helicopters.

Spain

(Príncipe de Asturias)

Displacement: 16,700 tons

Dimensions: 643 x 80 ft..

Speed: 26 knots

Personnel: 830

Aircraft: 29

Types: Av-8B Harrier II Bravo, Sikorsky Sea king SH-3H, Agusta AB-212, Sikorsky SH-3 AEW.

Thailand

(*Chakri Naruebet*)

Displacement: 11,486 tons

Dimensions: 599.2 x 100 ft..

Speed: 25.5 knots

Personnel: 675

Aircraft: 30

Types: Sikorsky SH-60 Seahawk, MH-60S Knighthawk.



Navy Comparison

Russia's Navy:

- 1 aircraft carrier
- 1 battlecruiser
- 3 cruisers
- 15 destroyers
- 10 frigates
- 81 corvettes
- 20 landing ship tanks
- 32 landing craft
- 15 special-purpose ships
 - 1 patrol ships
- 42 patrol boats
- 46 mine countermeasures
 - 3 special-ops subs
- 64 submarines

China's Navy:

- 2 aircraft carrier
- 33 destroyers
- 50 frigates
- 41 corvettes
- 109 missile boats
- 6 Amphibious transport
- 32 landing ship tanks
- 31 landing ship medium
- 94 submarine chasers
- 17 gunboats
- 29 mine countermeasure
- 75 submarines
- 12 replenishment ships

United States' Navy:

- 20 Aircraft Carriers (+LHA/LHD)
- 22 Cruisers
- 69 Guided Missile Destroyers
- 19 Littoral Combat Ships
- 2 Command Ships
- 11 Amphibious Transport (LPD)
- 12 Landing ship Dock (LSD)
- 73 Submarines
- 13 Coastal Patrol (PC)
- 10 Mine Countermeasure
- 25 Supply/Replenishment
- (+77 Auxiliary, non-combat)



Employing Naval Aviation

Lines of Effort:

- Strengthen Naval Power at and from the Sea
- Achieve high velocity outcomes
- Strengthen our Navy team for the future
- Expand and strengthen our network of partners

Central Themes:

- The Navy will become more agile.
- The Navy will compete in ways that are sustainable.
- The Navy, fighting with the Joint Force and with our allies and partners, will control the high end of maritime conflict.





Naval Air Forces

What Commander Naval Air Forces manages:

11 Aircraft Carriers – Nuclear-powered, Nimitz & Ford classes

21 Aviation Wings – Numerous squadrons make up a Wing

168 fleet, reserve, and training squadrons – Smallest command-level unit

22 Naval Air Stations – Located around the world

3700+ aircraft – Operational aircraft of various types

100,000+ Sailors/personnel – Work directly, or indirectly, supporting Naval Aviation



Squadrons and Designations



Squadron Types:

- HSC** = Helicopter Sea Combat Squadron
- HSM** = Helicopter Maritime Strike Squadron
- HT** = Helicopter Training Squadron
- VAQ** = Electronics Warfare Squadron
- VAW** = Airborne Early Warning Squadron
- VFA** = Fighter Attack Squadron
- VP/VPU/VUP** = Patrol Squadron
- VQ** = Fleet Air Reconnaissance
- VR/VRC** = Fleet Logistics Support Squadron
- VT** = Training Squadron
- VX** = Research / Experimental

Squadron Designations:

The letters specify the mission or type of squadron

- A:** Attack
- C:** Composite / Transport
- E:** Electronic
- F:** Fighter
- H:** Helicopter
- M:** Multi-mission / Mine
- P:** Patrol
- Q:** Electronics / Intelligence
- R:** Logistics
- S:** Strike / Sea / Submarine
- T:** Trainer
- U:** Utility
- V:** Fixed-Wing
- X:** Special Research
- W:** Warning / Radar



Aircraft and Designations

Aircraft Types:

F/A-18E/F Super Hornet
F-35C Lightning II
E/A-18G Growler
MH-60R Seahawk
MH-60S Knighthawk
E-2C/D Hawkeye
C-2A Greyhound > CMV-22B Osprey
P-3C Orion > P-8 Poseidon
EP-3 Aries II
MQ-8 Fire Scout (UAV)
MQ-25 Stingray
E-6A/B Mercury
C-40 Clipper

Aircraft designations:

The letter(s) before the hyphen specifies the mission or type of aircraft.

A: Attack

C: Transport

E: Electronic

F: Fighter

H: Helicopter

K: Tanker

M: Multi-mission

P: Patrol

Q: Unmanned / Intelligence

T: Trainer

V: Vertical



Navy Aircraft: Carrier-Based

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

(Advanced Strike-Fighter)

Highly capable across the full mission spectrum, long range, and aerial refueling capability



- **Primary Function:** Multi-role attack and fighter aircraft.
- **Initial Operational Capability (IOC):** Sept 2001.
- **Unit Cost:** ~\$57 million
- **Propulsion:** Two F414-GE-400 turbofan engines. 22,000 pounds (9,977 kg) static thrust per engine.
- **Length:** 60.3 feet (18.5 meters).
- **Height:** 16 feet (4.87 meters).
- **Wingspan:** 44.9 feet (13.68 meters).
- **Weight:** Maximum Take Off Gross Weight is 66,000 pounds (29,932 kg).
- **Airspeed:** Mach 1.8+.
- **Ceiling:** 50,000+ feet.
- **Range:** Combat: 1,275 nautical miles (2,346 kilometers)



Navy Aircraft: Carrier-Based



Primary Function: Airborne Electronic Attack

Initial operational capability (IOC) Sept 2009

Unit Cost: ~\$67 million

Propulsion: Two F414-GE-400 turbofan engines. 22,000 pounds (9,977 kg) static thrust per engine

Length: 60.2 feet (18.5 meters)

Height: 16 feet (4.87 meters)

Wingspan: 44.9 feet (13.68 meters)

Weight: 48,000 lbs..

Ceiling: 50,000 feet

Range: Combat: 850+ nautical miles

Crew: 2

EA-18G 'Growler'

(Electronic Warfare)

Integrates electronic attack technology, communication countermeasures, satellite communications and offensive weapons





Navy Aircraft: Carrier-Based

E-2D 'Hawkeye'

(Airborne Early Warning)
Tactical battle management,
airborne early warning,
command and control aircraft



- **Primary Function:** Airborne Command & Control, Battle Space Management.
- **Date Deployed:** January 1964 (E-2A)
- **Unit Cost:** \$80 million.
- **Propulsion:** Two Allison T-56-A427 turboprop engines; (5,100 shaft horsepower each).
- **Length:** 57 feet 6 inches (17.5 meters).
- **Height:** 18 feet 3 inches (5.6 meters).
- **Wingspan:** 80 feet 7 inches (28 meters).
- **Weight:** Max. gross, take-off: 53,000 lbs.. (23,850 kg) 40,200 lbs. basic (18,090 kg).
- **Airspeed:** 300+ knots (345 miles, 552 km. per hour).
- **Ceiling:** 30,000 feet (9,100 meters).
- **Crew:** Five.



Navy Aircraft: Carrier-Based

C-2A 'Greyhound'

(Logistics / Personnel)

Transport of high-priority cargo, mail, and passengers to aircraft carriers. Referred to as the 'COD' (Carrier On board Delivery)



- **Primary Function:** Carrier On-board Delivery (COD) aircraft
- **Unit Cost:** ~\$38.96 million (1980s)
- **Propulsion:** Two Allison T56-A-425 turboprop engines; 4,600 horsepower each
- **Length:** 56 feet 10 inches (17.3 meters)
- **Height:** 17 feet 2 inches (5.28 meters)
- **Wingspan:** 80 feet 7 inches (24.5 meters)
- **Weight:** Max. Gross, take-off: 57,500 lbs. (26,082 kg)
- **Airspeed:** Cruise - Approximately 260 knots; Max - Approximately 343 knots
- **Ceiling:** 30,000 feet (9,144 meters)
- **Range:** 1,000 nautical miles (1150.78 statute miles)
- **Crew:** Four



Navy Aircraft: Carrier-Based



- **Primary Function:** Long-range resupply missions for CVNs at sea.
- **Date Deployed:** 2009 (Marine Corps)
- **Propulsion:** Two, Rolls-Royce Liberty AE1107C engines, 6,200 shaft horsepower
- **Length:** 63 feet
- **Height:** 22 feet, w/nacelles vertical.
- **Wingspan:** 84.6 feet with rotors turning
- **Weight:** Max. gross, vertical take-off: 52,600 lbs.. Short take-off 57,000 lbs.
- **Airspeed:** Cruise: 280 knots
- **Ceiling:** 25,000 feet (7,620 meters).
- **Range:** 2,100 nautical miles with auxiliary fuel tanks
- **Crew:** 4
- **Cargo:** 22 Personnel

CMV-22 'Osprey'

(Logistics / Personnel)

Replacing C-2A Greyhound starting in 2021. Transport of high-priority cargo, mail, and passengers.





Navy Aircraft: Shore-Based



P-3C 'Orion'

Maritime Surveillance (retiring)



- **Primary Function:** Anti-Submarine warfare and Anti-Surface Warfare
- **Propulsion:** Four Allison T-56-A-14 turboprop engines (4,600 hp each)
- **Length:** 116.7 feet (35.57 meters)
- **Height:** 33.7 feet (10.27 meters)
- **Wingspan:** 99.6 feet (30.38 meters)
- **Weight:** Maximum takeoff, 139,760 pounds (63,394 kilograms)
- **Airspeed:** 411 knots; Cruise, 328 knots
- **Ceiling:** 28,300 feet (8,626 meters)
- **Range:** 2,380 nautical mile radius
- **Crew:** 3 pilots, 2 flight officers, 2 engineers, 3 sensor operators and 1 in-flight technician

EP-3E 'Aries II'

Signals Intelligence/ Reconnaissance



Navy Aircraft: Shore-Based

P-8 'Poseidon'

Maritime Surveillance (new)

Multi-mission maritime patrol and reconnaissance aircraft. Efficiently conducts anti-submarine warfare, anti-surface warfare, intelligence, surveillance, reconnaissance, and humanitarian response.



- **Primary Function:** Anti-Submarine Warfare (ASW) and Anti-surface Warfare (ASuW), Intelligence, Surveillance and Reconnaissance (ISR)
- **Propulsion:** 2 CFM 56-7B engines. 27,300 lbs.. thrust
- **Length:** 129.5 feet (39.47 m).
- **Height:** 42.1 feet (12.83 m).
- **Wingspan:** 123.6 feet (37.64 m)
- **Weight:** Maximum gross takeoff, 189,200 pounds (85,820 kg)
- **Airspeed:** 490 knots
- **Ceiling:** 41,000 feet
- **Range:** 1,200 nautical miles radius with four hours on station
- **Crew:** Nine



Navy Aircraft: Shore-Based



E-6A/B 'Mercury'

Communications and Strategic Forces Airborne Command Post, known as TACAMO: Take Charge and Move Out (Boeing 707)



- **Primary Function:** Communications relay for fleet ballistic missile submarines and airborne command post for U.S. Strategic forces.
- **Date Deployed:** October 1998.
- **Unit Cost:** 141.7 million.
- **Propulsion:** Four CFM-56-2A-2 High bypass turbofans.
- **Length:** 150 feet, 4 inches (45.8 meters).
- **Height:** 42 feet 5 inches (12.9 meters).
- **Wingspan:** 148 feet, 4 inches (45.2 m).
- **Weight:** Max gross, take-off. 342,000 lbs. (154,400 kg).
- **Airspeed:** 522 knots, 600 miles (960 km)
- **Ceiling:** Above 40,000 feet.
- **Range:** 7,590 statute miles
- **Crew:** 22



Navy Aircraft: Shore-Based



C-40 'Clipper'

Personnel / cargo transport. Boeing 737 airframe. 3 configurations: All-passenger configuration, all-cargo, or combination of pallets and passengers.



- **Primary Function:** Fleet logistics support.
- **Date Deployed:** April 2001
- **Propulsion:** Two CFM56-7 SLST engines.
- **Length:** 110 feet 4 inches (33.63 meters).
- **Height:** 41 feet 2 inches (12.55 meters).
- **Wingspan:** 117 feet 5 inches (35.8 m).
- **Weight:** Max. 171,000 lbs. (77,564 kg)
- **Taxi:** 171,000 lbs. (77,564 kg)
- **Landing:** 134,000 lbs. (60,781 kg)
- **Zero fuel:** 126,000 lbs. (57,153 kg).
- **Airspeed:** Range: 0.78 to 0.82 Mach (585 to 615 mph, 940 to 990 kph).
- **Ceiling:** 41,000 feet (12,497 meters).
- **Range:** 3,142 nautical miles (3,452 statute miles) with 121 passengers or 40,000 lbs.. (18,144 kg) of cargo.
- **Crew:** Four.



Navy Unmanned Aircraft

MQ-4C 'Triton'

Autonomously operated aircraft that provides a persistent maritime ISR capability using multiple sensors. Provides a continuous source of information to maintain a tactical overview of the maritime battle space.



- **Primary Function:** Maritime Intelligence, Surveillance, and Reconnaissance
- **Propulsion:** Rolls-Royce AE3007H
- **Endurance:** 24 + hours
- **Length:** 47.6 feet (14.5 m)
- **Wingspan:** 130.9 feet (39.9 m)
- **Height:** 15.4 feet (4.7 m)
- **Speed:** 320 knots
- **Crew:** Five per ground station



Navy Unmanned Aircraft



MQ-8B 'Fire Scout'

MQ-8B currently operates from air-capable surface ships. Significantly improves over-the-horizon surveillance capability, with day and night real-time ISR target acquisition



MQ-8C 'Fire Scout'

MQ-8C is being introduced to the Fleet with a range of 150 nautical miles and a 700 pounds payload capacity. Larger and more capable than the MQ-8B, it will be a force multiplier in the coming years.



Navy Unmanned Aircraft



MQ-25 'Stingray'

Navy's first unmanned carrier-based aircraft, will provide airborne tanking capability with surveillance and reconnaissance capability which will enhance carrier capability and versatility.

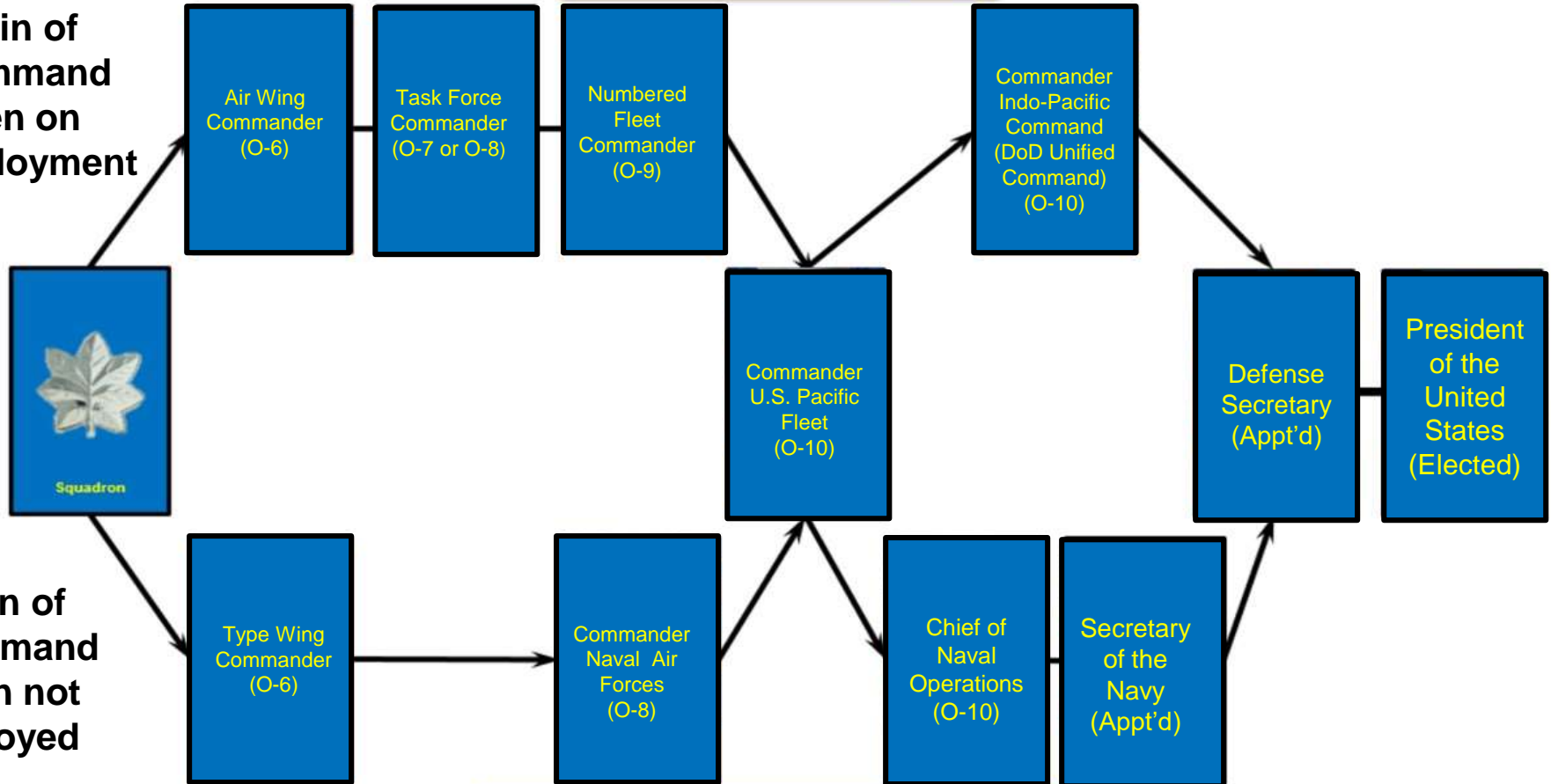
The MQ-25 system will deliver a robust organic refueling capability to make better use of current combat strike fighters while extending the range of CVN combat aircraft.



Navy Organization and Leaders

Operational Chain (Warfighting)

Chain of Command when on deployment



Administrative Chain (Man, Train and Equip)

Chain of Command when not deployed