



## **Unit IV – The US Navy**

### **Chapter 2 - Naval Aviation**

#### **Section 2 – Naval Aircraft and Missions**



# What You Will Learn to Do

Understand the background of US Navy aviation and learn about Navy aircraft in use today



# Objectives

1. Describe naval aviation and missions



# Key Terms

**Surveillance** - Close observation of the enemy

**Logistics** - The aspect of military or naval operations that deals with the procurement, distribution, maintenance and replacement of material and personnel

**VTOL** - Vertical takeoff or landing; refers to either the capability or to the aircraft that has it



# Key Terms

## **Rotor-**

An assembly of rotating horizontal airfoils (wings), such as on a helicopter

## **Nacelle -**

A separate, streamlined enclosure on an aircraft for sheltering the crew or cargo or housing an engine



# Naval Aircraft and Missions

Aircraft of the same type are grouped into **squadrons** for training, maintenance and administration.

Aircraft of various squadrons combine and deploy as **operational air groups** aboard ships.

The strike group's mission determines the types and numbers of squadrons.



# Naval Aircraft and Missions



<b>Designation</b>	<b>Squadron</b>	<b>Type Aircraft</b>
VFA	Fighter Attack	F/A-18 Hornet
VAQ	Electronic Warfare	EA-6B Prowler
VAW	Carrier Airborne Early Warning	E-2C Hawkeye
VP	Maritime Patrol	P-3C Orion
VQ	Fleet Air Reconnaissance	E-6B Mercury EP-3E Aries II
VRC	Fleet Logistics Support	C-2A Greyhound
HS	Sea Control, Helicopter, Anti-submarine	SH-60B Seahawk
HC	Helicopter Support	MH-60 Knighthawk MH-53 Sea Dragon



# Fighter/Attack Aircraft

## *F/A-18 Hornet:*

- US's first carrier-launched strike-fighter; single seat
- 37 tactical squadrons
- From 10 aircraft carriers

Proved itself in Desert Storm, taking hits, recovering, undergoing repair, and flying the next day



Blue Angels



# Fighter/Attack Aircraft

The *E/F Super Hornet* models of the F/A-18s joined the fleet in 1995.

E is a single seater, F is a two-seater.



Capable of:

- Speeds over Mach 1.8
- Flying at altitudes up to 50,000 feet
- Operating at a range of over 1,300 miles



# Fighter/Attack Aircraft

*Super Hornet* can fly a greater variety of missions:

- Air superiority
- Reconnaissance
- Air defense suppression
- Fighter escort
- Close air support
- Precision strikes



Longer range, tougher planes than F-14 (which is replaced)  
40% less operating costs, 75% less labor/flight hour



# Fighter/Attack Aircraft

The *F/A-18G Growler*, with the world's most advanced electronic surveillance and jamming, replaced the EA-6B *Prowler*.





# Airborne Early Warning

## *E-2C Hawkeye:*

- An all-weather, carrier-based tactical warning and control system aircraft
- Provides airborne early warning
- Provides command and control functions for the battle group
- **Surveillance** coordination
- Strike-and-interceptor control
- Search-and-rescue guidance
- Relaying communication





# Airborne Early Warning

## *Hawkeye 2000:*

- Newer version of the E-2C *Hawkeye*
- Flies ahead of the battle group collecting streams of data to provide commanders with the big picture of battle on land or sea
- New mission computers / Improved radar displays
- Cooperative Engagement Capability (CEC)
- Carries crew of five, two pilots; three mission system operators
- Range of 1500 miles
- Speed can exceed 300 knots





# Airborne Early Warning

## *E-6B Mercury:*

- The Navy's strategic airborne command post
- Communication relay for fleet ballistic missile submarines
- Can launch land-based ICBMs



Ceiling: 40,000 feet  
Range: 7,500 miles  
Speed: 600 mph



# Undersea Warfare

## *P-3C Orion:*

- Navy's only land-based anti-submarine warfare aircraft
- First delivery—July 1962
- Designation changes—P3V to P-3
- Models—P-3A, P-3B, P-3C
- Navy has upgraded multiple systems on the aircraft

Will be replaced by the P-8 Multi-mission Maritime Aircraft (MMA)

*Poseidon* beginning in 2013



P-3C Orion



# Logistics Aircraft

## *C-2A Greyhound:*

- Twin-engine cargo/passenger aircraft
- Primary mission is carrier on-board delivery (C.O.D.)
- Delivers up to 10,000 pounds of cargo, passengers, or both
- Is undergoing extensive overhauling to extend service life and upgrade systems including midair collision avoidance and ground (terrain) proximity warning





# Logistics Aircraft



The C-9 *Skytrain* (DC-9) is used primarily for fleet logistic support.



The C-12F *Huron* twin-engine turboprop is used to transport equipment/passengers between naval air stations.



# Logistics Aircraft



## *C-130 Hercules:*

Four-engine turboprop aircraft capable of takeoffs and landings from short runways, while hauling cargo and/or personnel



# Trainers



The *T-45A Goshawk* is a two-seat, carrier-capable, jet trainer aircraft used for intermediate and advanced pilot training.



The single-engine, two seat turbo prop *T-6A Texan II* represents the next generation of primary basic trainers.



# Unmanned Aerial Vehicles (UAV)

## *RQ-2A Pioneer:*

- Initially a land-based system, now used at sea as well
- Performs a variety of missions providing real-time:
  - Reconnaissance
  - Surveillance  
(battlefield or target)
  - Target acquisition
  - Battle damage assessment

Speed: 100 mph

Ceiling: 15,000 feet

Range: 115 miles





# Rotary-Wing Aircraft

Since World War II, the helicopter has become an important part of naval operations.

Helicopters are used in:

- Transfer of supplies
- Undersea warfare (USW)
- Mine warfare
- Search and rescue operations
- Special warfare





# Undersea Warfare

## *SH-60 Seahawk:*

- Twin-engine helicopter
- Deployed aboard cruisers, destroyers, frigates and carriers
- Primary mission is to detect and destroy enemy submarines
- Also used for:
  - Search and Rescue
  - Advance Scouting
  - Special Operations
  - Cargo Lift and Drug Interdiction





# Mine Warfare



## *MH-53E Sea Dragon:*

- Operates from carriers and other warships
- Primary mission is airborne mine countermeasures, seeking out and destroying enemy minefields
- Can also deliver troops and cargo



# Rotary-Wing Aircraft Training



## *TH-57 Sea Ranger:*

- Primary training helicopter for students becoming naval aviators
- Also used for some photo and utility missions



# VTOL

## *V-22 Osprey:*

- Operates as a helicopter for takeoff and landings
- Becomes a propeller airplane after takeoff
- A **tiltrotor** aircraft with a 38-foot **rotor** system and engine/transmission **nacelle** on each wing tip
- Once airborne, nacelles rotate 90°  
so the Osprey becomes a high-speed, fuel-efficient turbo prop airplane
- Wings rotate for storage
- Ceiling = 25,000 feet
- Speed = 272+ knots





# VTOL

## *V-22 Osprey:*

- Since its first flight in 1989, there have been great expectations of the *V-22 Osprey*
- Despite some concerns about safety, significant purchases are planned for the future:
  - Marine Corps – 360
  - Air Force – 50
  - Navy - 48





# Chapter Conclusion



The challenge for today's Navy is to integrate aircraft with the fleet, making full use of the power of nuclear carriers, jet aircraft, helicopters, and large long-range patrol planes.



# Questions?

