

CHAPTER 1

MISSION AND HISTORY OF NAVAL AVIATION

Today's naval aircraft have come a long way from the Wright Brothers' flying machine. These modern and complex aircraft require a maintenance team that is far superior to those of the past. You have now joined this proud team. You, the Airman Apprentice, will get a basic introduction to naval aviation from this training manual. In the Airman manual, you will learn about the history and organization of naval aviation; the design of an aircraft, its systems, line operations, and support equipment requirements; and aviation safety, rescue, crash, and firefighting.

In this chapter, you will read about some of the historic events of naval aviation. Also, you will be introduced to the Airman Rate and different aviation ratings in the Navy. You will find out about your duties as an Airman. With your basic naval training completed, you have a chance to experience some of the other types of training available to you. Leadership is an important aspect of any military organization, and leadership and training are going to become an everyday part of your life while you are in the Navy. Leadership and teamwork go hand-in-hand, starting right here in the Airman rate.

LEARNING OBJECTIVES

When you have completed this chapter, you will be able to do the following:

1. Identify the overall mission of naval aviation.
2. Name some of the important events in naval aviation.
3. Identify aviation ratings and recognize the duties of these ratings.
4. State the general principles of good leadership as they apply to the Airman.

THE MISSION OF NAVAL AVIATION

Other countries look upon the United States as the leader of the free world. This accomplishment comes partly from our military strength achieved through sea power. The ability to fight in World War II, the Korean War, and the Vietnam War came directly from the Navy's sea power.

The mission of naval aviation is to support our naval forces. This support helps keep vital sea lanes open and denies their use to enemy forces in time of war. To accomplish this task, naval aviation has a primary function. The primary function of naval aviation is to closely coordinate with other naval forces in maintaining command of the seas. Accomplishing this task takes five basic operations:

1. Eyes and ears of the Fleet. Naval aviation has over-the-horizon surveillance equipment that provides vital information to our task force operation.
2. Protection against submarine attack. Antisubmarine warfare operations go on continuously for the task force and along our country's shoreline. This type of mission includes hunter/killer operations to be sure of task force protection and to keep our coastal waterways safe.
3. Aid and support operations during amphibious landings. From the beginning to the end of the operations, support requires a variety of firepower. Providing air cover and support is an important function of naval aviation in modern warfare.

4. Rapid logistic support for ground forces. Logistic support aircraft sustain the mobility of the ground forces. Providing logistic support aircraft is another required function of naval aviation.
5. Search and rescue (SAR) operations. During sea missions, the possibility of a downed aircraft or man overboard always exists. Search and rescue helps reduce the number of lives lost.

As you can see, naval aviation plays many critical roles in the support of the Navy's mission. The overall mission of the Navy depends on the use of highly complex aircraft.

THE HISTORY OF NAVAL AVIATION

The Navy's interest in airplanes as a naval weapon dates back to 1898. Several naval officers became members of an interservice board. Their job was to observe and investigate the military possibilities of the new flying machine. In 1908 and 1909, naval officer observers were present at the public demonstrations staged by the Wright brothers. The following paragraphs chart the history of naval aviation since that first flight.

1910

The first successful launch of an aircraft from a ship was made by Eugene Ely, who flew a Curtiss biplane from a specially built 83-foot wooden platform on the forecastle of the cruiser Birmingham. See *Figure 1-1*.

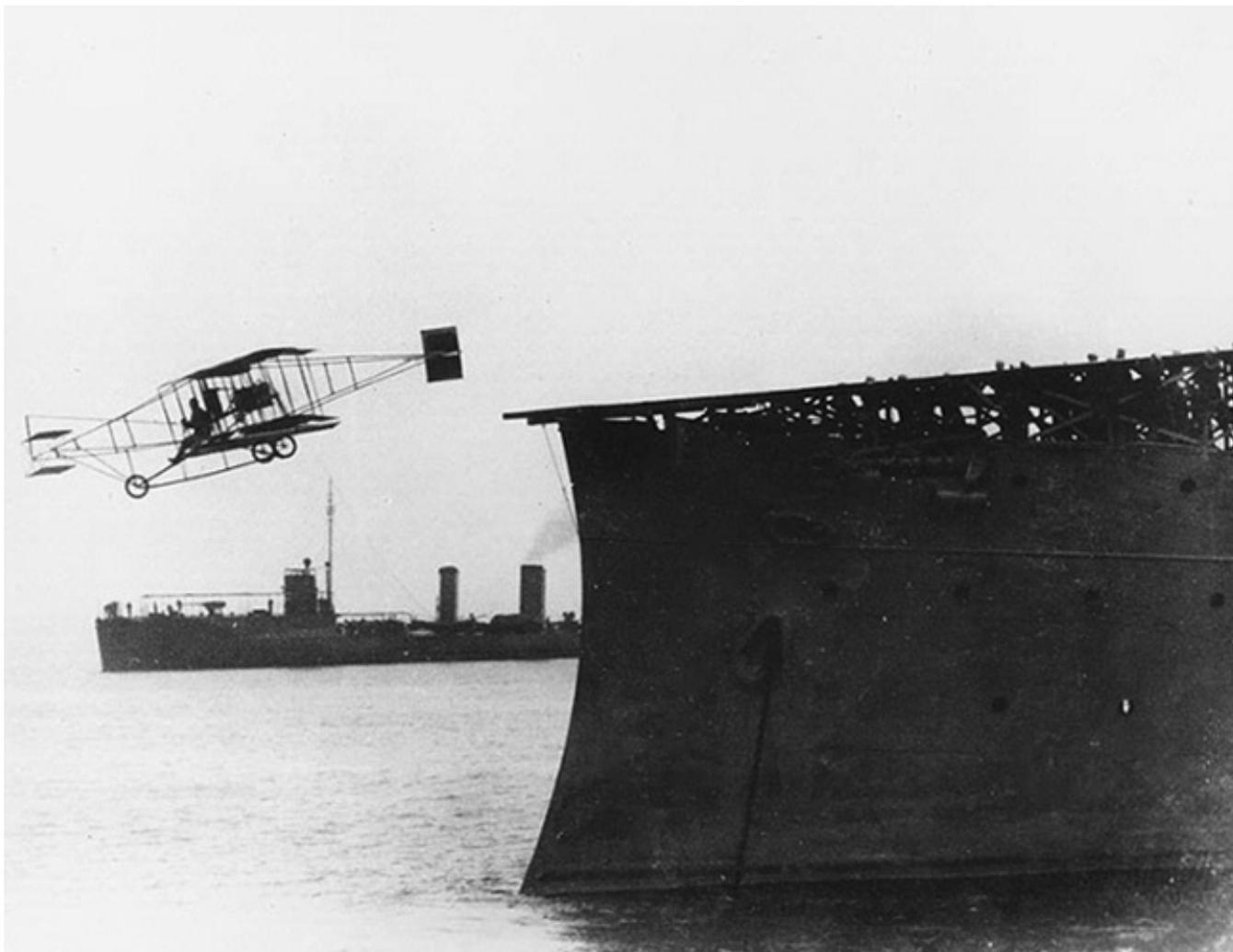


Figure 1-1 — Eugene Ely in the first takeoff from a ship, 14 November 1910.

1911

On 8 May 1911, the Navy purchased its first aircraft from Glenn Curtiss—the A-1 Triad. This date of purchase became the official birthday of naval aviation. The Wright brothers soon sold the Navy a second aircraft. Curtiss and the Wrights agreed to train a pilot and a mechanic.

Eugene Ely landed on a 120-foot wooden platform built on the after turret of the *Pennsylvania* (*Figure 1-2*). Then, Ely launched from the wooden platform and flew back to shore. The day of the "aircraft carrier" had arrived. By the end of 1911, the U.S. Navy had three aircraft, four pilots, and one naval air station located at Greenbury Point, near Annapolis, Maryland. The station eventually moved to North Island, California. Later, the Naval Aeronautic Station, Pensacola, Florida, was established and became the primary training facility for all naval aviators and enlisted aircrew personnel.

1917

When the U.S. declared war on Germany on 6 April 1917, naval aviation had 48 officers and 239 enlisted men. There were 54 aircraft, 1 airship, 3 balloons, and 1 naval air station. By the end of WWI, naval aviation had 6,716 officers; 30,693 enlisted men; 252 land aircraft; and 1,865 flying boats and seaplanes. Naval aviation had grown enormously and was well on its way.

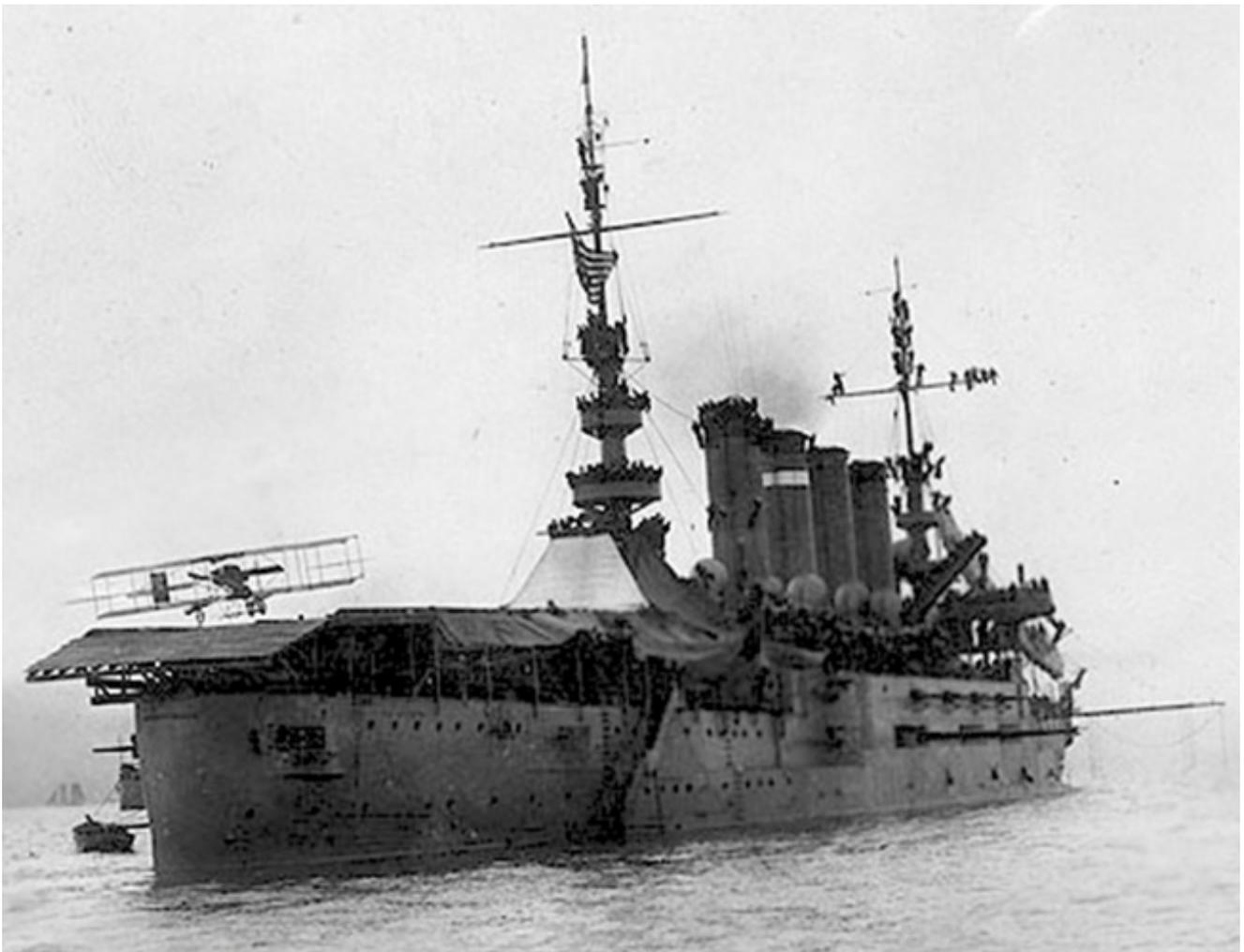


Figure 1-2 — Ely in Curtiss biplane comes aboard the USS Pennsylvania in the first shipboard landing on 18 January 1911.

1922

The converted collier ship *Jupiter* (AC-3) was renamed *USS Langley* and commissioned. It became the first official aircraft carrier (CV-1) supporting fighter and torpedo bomber squadrons. See *Figure 1-3*.

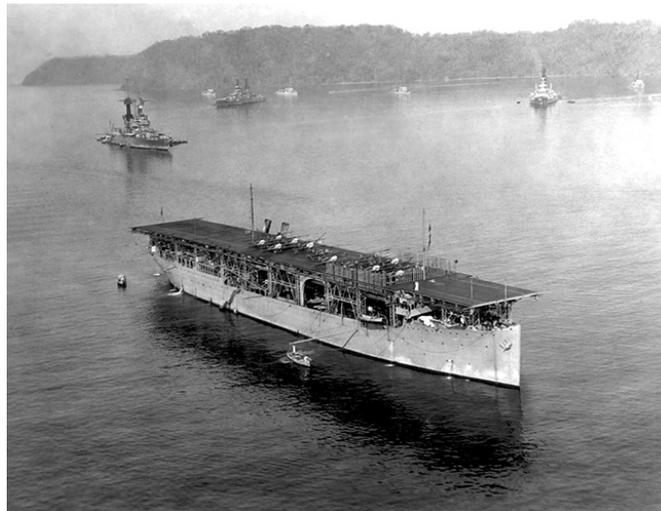


Figure 1-3 — The first Naval aircraft carrier USS Langley (CV-1).

1940s

Five more aircraft carriers joined the carrier task force before the outbreak of World War II.

1941

The U.S. Congress declared a state of war with Japan. During World War II, the F-6F Hellcat, F-4U Corsair, SB-2C Helldiver, and TBM Avenger were carrier-based. Patrol aircraft consisted of the PBX/PBM Mariner, PB-4Y, and PV Ventura aircraft. The R-4D Skytrain was used for transport and cargo.

Naval aviation strength was 5,233 aircraft; 5,900 Navy and Marine Corps pilots; and 21,678 enlisted men.

1942

The **Battle of Coral Sea** caused the Japanese to abandon their attempt to land at Port Moresby. Carrier-based aircraft attacked the Japanese task force and their landing forces. This was the first major battle without opposing ships making contact.

The **Battle of Midway** was the turning point of the war in the Pacific. Japan suffered heavy losses to their surface force, their aircraft, and experienced aircraft pilots.

Five carriers took part in the **Battle of Guadalcanal**. Carrier-based aircraft flew interceptor patrols, offensive missions against shipping, and close air support for ground forces until the island was secured.

1943

The Navy entered the helicopter field of aviation by purchasing helicopters from the U.S. Army. Also, the Navy purchased a helicopter manufactured to Navy specifications from the Sikorsky Helicopter Company—the YR-4B. Westinghouse developed the first turbojet engine (19A) for the Navy.

1948

The Navy commissioned its first helicopter squadron—the HU-1, and the first carrier landing was made by a U.S. Navy jet (FJ-1 Fury lands aboard the USS Boxer).

1949

The first use of a pilot ejection seat for an emergency escape was made from an F2H-1 Banshee. Also, a new fighter aircraft was added to the Navy inventory (the F9F-2/5 Panther), and was manufactured by Grumman Aircraft Company.

1950s

Carrier aircraft went into action in the Korean conflict, which ended 27 July 1953.

1953

Naval aircraft conducted initiation test operations aboard the Navy's first angled deck carrier, the USS Antietam.

1954

Guided, air-to-air and air-to-surface missiles were perfected and placed into operation. The Polaris, Sidewinder, Sparrow, and Petrel missiles became standard equipment.

1957

The first successful Automatic Landing System test was done on the USS Antietam. It was designed to bring planes aboard the ship in all weathers without help from the pilot. Also, the first F8U-1 Crusader was delivered to the fleet—the first operationally equipped jet plane in history to fly faster than 1,000 miles per hour (mph).

1959

Four naval aviators were selected as prospective astronauts under Project Mercury—a program of space exploration and manned orbital flight. The Sikorsky HSS-2 amphibious, all-weather, antisubmarine helicopter made its first flight.

1960s

Naval aviation was approaching its golden anniversary, and support of the space program was made a priority as manned orbital flight became a reality. Also, recovering space vehicles became one of the Navy's responsibilities. A carrier recovery ship, carrier-based helicopters, and specially trained crews carried out this mission.

1961

The United States became officially involved in the Vietnam conflict. Naval aviator Alan B. Shepard Jr. became the first American to go into space by completing a flight reaching 116 miles high and 302 miles downrange before recovery by a Navy HUS-1 helicopter and the USS Lake Champlain. Also, the world's first nuclear-powered aircraft carrier, the USS Enterprise (CVAN-65), was commissioned.

1962

The Naval Aviation Museum was established at the Naval Air Station, Pensacola, Florida, by the Secretary of the Navy.

1964

Vertical replenishment by helicopters and picking up stores and delivering them to other surface combat ships began with the commissioning of the combat stores ship USS Mars (AFS-1).

1965

The United States was fully involved in the Vietnam conflict. Seventh Fleet air units began Operation ROLLING THUNDER, a systematic bombing of military targets throughout North Vietnam waged by land- and sea-based A-4 Skyhawks, F-4 Fantoms, A-6 Intruders, and A-7 Corsair aircraft.

1967

Fire broke out on the flight deck of the USS Forrestal (CV-59) and soon spread below decks, igniting bombs and ammunition. Heroic efforts brought the fire under control but damage to the ship and aircraft was severe. These were 132 dead, 62 injured, and two missing and presumed dead. Also, the Aircraft Intermediate Maintenance Department (AIMD) was established by the Chief of Naval Operations (CNO) on all operating aircraft carriers except the one operating with the Naval Air Training Command.

1969

Apollo 11 landed on the moon with naval aviator Neil Armstrong; Edwin Aldrin, United States Air Force (USAF); and Michael Collins, USAF. Armstrong and Aldrin walked on the moon 20 and 21 July.

1970s

Naval aviation beginning its seventh decade heavily embroiled with Vietnam and a growing crisis in the Middle East reemphasized the importance of the U.S. Navy to keeping the sea lanes open. This required the reliability of established and upgraded weapons systems and materials.

1971

The Navy took delivery of the AV-8 Harrier, a fixed wing, vertical takeoff and landing (V/STOL) jet aircraft used for combat, and the EA-6B Prowler, the newest carrier-based sophisticated electronic warfare aircraft. The Navy also received the new CH-53A Sea Stallion, a helicopter devoted exclusively to mine countermeasures. By towing specially designed magnetic and acoustical equipment, the CH-53 locates and activates enemy mines.

1972

The Navy received its first new fighter aircraft in 14 years, the F-14 Tomcat, which replaced the aging McDonnell Douglas F-4 Phantom II. The war continued in Vietnam. Navy and Marine Corps pilots were being rescued, over land and at sea, by Search and Rescue (SAR) helicopter crews.

1973

The Vietnam cease-fire was announced, and U.S. forces started to withdraw. The Navy lost 529 fixed-wing aircraft and 13 helicopters, and the Marine Corps lost 193 fixed-wing aircraft and 270 helicopters in enemy actions. Operation Homecoming began, which provided for the repatriation of

prisoners of war (POWs). The Blue Angels became the Navy Flight Demonstration Squadron, located at Naval Air Station, Pensacola, Florida.

1974

The Navy received its new highly advanced, carrier-qualified, jet-powered, turbofan S-3 Viking antisubmarine warfare aircraft that works in tandem with the SH-3 Sea King and SH-2 Seasprite helicopters in locating and tracking submarines.

1976

The Navy's last operational HU-16 Albatross seaplane, S-2 Tracker antisubmarine warfare aircraft, and C-117 Douglas DC-3 transport aircraft were stricken from service. All arrived or departed Naval Air Station Pensacola, Florida, and can be found at the Naval Aviation Museum, Pensacola, Florida, or Davis Monthan Air Force Base, Arizona, the boneyard for obsolete military aircraft.

1979

Navy carrier forces and air wings responded to five crisis situations around the world: USS Constellation to a conflict between North and South Yemen; USS Saipan during the Nicaraguan turmoil; USS Nassau in response to Russian combat troops in Cuba; USS Kitty Hawk on alert in Korea; USS Kitty Hawk and USS Midway to contingency operations during the Iranian hostage crisis.

1980s

As Naval aviation approached its "Diamond Anniversary" decade, war erupted between Iraq and Iran as U.S. carrier forces maintained their deployment cycles in support of the Iranian crisis in the Arabian Sea, and provided humanitarian support to Cuban refugees in the Caribbean and defense capabilities for the Panama Canal. An increase in new technology and research produced new versions of the F/A-18 Hornet, SH-60 Seahawk, OV-10 Bronco, MH-53 Sea Stallion, and the V-22 Osprey, a fixed-wing, tilt-rotor aircraft.

1981

The first flight of the Space Shuttle (Columbia), with an all-Navy crew, launched from Cape Canaveral, Florida.

1983

Combat amphibious assault operations commenced on the island of Grenada. Navy and Marine Corps air support was provided by Carrier Airwing Six (CVW-6) aboard USS Independence.

1986

Naval aviation celebrated its 75th anniversary while U.S. carrier forces attacked Libyan targets with HARM, Harpoon, and Shrike missiles. The F-14 Tomcat, F-18 Hornet, and A-6 Intruder aircraft conducted low-level bombing and fighter support for the operation.

1988

Helicopter Squadron (HCS-5) was established. The first of its kind, it had a primary mission of combat search and rescue (strike rescue) and special warfare support. It operates the H-60 Seahawk.

1990s

This decade began with a "new world" order. The collapse of the Soviet Union left the United States as the world's only superpower. In the Middle East, Iraq invaded Kuwait, and a massive armada of U.S. naval and allied forces converged on the region in support of Operations DESERT SHIELD and Desert Storm.

1991

The Navy launched massive aerial attacks with Tomahawk cruise missiles at predetermined targets in Iraq and Kuwait. U.S. naval, Marine Corps, Air Force, and allied aircraft of all types made a quick and decisive blow to the Iraqi ground and air forces, resulting in the liberation of Kuwait and the end of the Persian Gulf War.

1992

The USS Lexington, the Navy's unsinkable "Blue Ghost" of World War II, was decommissioned and turned into a memorial museum ship. The Navy takes delivery of its newest training aircraft, the T-45 Goshawk, which replaced the aging T-2 Buckeye and TA-4 Skyhawk.

1993

The Secretary of Defense lifted the ban on combat flights for women and allowed assignments on combat vessels. U.S. naval surface and air forces maintained a vigilant presence in the Persian Gulf in support of the United Nations Security Counsel's "No-Fly" zone over Iraq.

1994

The first of many female naval aviators successfully passed fleet carrier qualifications in combat aircraft. The USS Eisenhower becomes the first combat ship to receive permanently assigned women.

1995

The first female naval aviator went into space, and the F-117A Stealth fighter/bomber became operational. The entire U.S. armed services had regionalized and downsized, and U.S. forces maintained support for operations in Bosnia and other areas of the world. New technology and the national interest will determine the future of the Navy, and naval aviation will always have a major role.

1996

McDonnell Douglas delivered the first of seven F/A-18 Super Hornets to Naval Air Warfare Center Aircraft Division, Patuxent River, MD, to begin three-year flight test program to prepare the aircraft for duty aboard fleet aircraft carriers.

7 June, VMU-1, the Marine Corps' first Unmanned Air Vehicles and show (UAV) squadron, deploys to Bosnia-Herzegovina.

5 August, Admiral Jay L. Johnson a naval aviator who flew F-8 Crusaders during Vietnam and later the F-14 Tomcat, was sworn in by Secretary of the Navy John Dalton as the 26th CNO.

13 September, Commander Ruth Forrest became the Navy's first woman Aircraft Intermediate Maintenance Department officer aboard an aircraft carrier when she joined the USS John F. Kennedy (CV-67).

1997

1 March, operational testing and evaluation of the Improved Fresnel Lens Optical Landing System (IFLOLS) began as an F/A-18 Hornet from Naval Air Warfare Center Aircraft Division, Patuxent River, MD.

15 March, the first V-22 Osprey built to production standards was delivered to Naval Air Warfare Center Aircraft Division, Patuxent River, MD, for testing and evaluation.

1998

Navy aircraft from USS Enterprise and USS Carl Vinson spearhead attacks on Iraq in Operation Desert Fox.

The Navy released plans to select 12 Limited Duty Officers (LDO) and Chief Warrant Officers (CWO) as Naval Flight Officers (NFO). One new NFO was scheduled to be assigned to each patrol squadron, with periodic selection boards held to determine their replacements as needed.

1999

24 March, Navy and Marine Corps aircraft from the USS Theodore Roosevelt (CVN-71) and USS Kearsarge (LHD-3) participated in Operation Allied Force, the three-month-long bombing campaign of Kosovo.

2000s

2000

In ongoing efforts to balance sea-shore rotation, the Secretary of the Navy approved the merger of the Aviation Storekeeper (AK) and Storekeeper (SK) ratings.

The successful conclusion of the F/A-18E/F Super Hornet operation evaluation announced, recommending its introduction into the fleet.

1 March, Secretary of Defense William S. Cohen approved the merger of the Aviation Structural Mechanic (Structures), AMS, and the Aviation Structural Mechanic (Hydraulics), AMH, ratings.

12 August, naval aviation assets were alerted to support Russian efforts to recover the Russian Oscar II class submarine Kursk (K-141), which sank in the Barents Sea due to an accidental explosion.

12 October, while refueling in Aden, Yemen, en route to a port visit in Bahrain during her deployment with the USS George Washington (CVN- 73) battle group, destroyer USS Cole (DDG 67) was damaged by a terrorist bomb carried on board an inflatable speed boat, killing 17 sailors and wounding 42. Cole suffered flooding in the engineering spaces, but heroic damage control efforts saved her. Naval aviation assets, including USS Tarawa (LHA 1), responded immediately, providing support throughout the crisis.

24 October, Test pilot Tom Morgenfeld flew the X-35A Joint Strike Fighter for its first flight at Lockheed Martin, Palmdale, CA.

2001

11 January, Navy changed the status of LCDR Michael Scott Speicher, VFA-81, from killed in action/body not recovered to missing in action. On 17 January 1991, Speicher was flying his F/A-18 Hornet from the USS Saratoga (CV 60) when he was shot down over Iraq.

28 January, Navy agreed to allow Sailors in the Aviation Machinist's Mate and Aviation Structural Mechanic ratings to apply skills learned in "A" School toward an associate's degree in aviation maintenance technology.

11 September, Hijackers flew two Boeing 767 airliners, American Airlines Flight 11 and United Airlines Flight 175, into the twin World Trade Center towers in New York City, collapsing both and devastating nearby buildings. Two Boeing 757s were also hijacked: American Airlines Flight 77 crashed into the Pentagon, and United Airlines Flight 93 was seized for a second attack against the Nation's capital, and the plane crashed in southern Pennsylvania. The terrorist atrocities killed as many as 3,000 people from over 80 nations.

30 September, the first U.S. flag raised over the rubble of the World Trade Center in New York City was hoisted onboard USS Theodore Roosevelt (CVN 71).

Operation Enduring Freedom (OEF) commences, Naval Aviation plays a major role since no land basing is available in early parts of the war. On 7 October 2001 aircraft from the USS Enterprise launched the first strike of the war in retaliation of the terrorist attacks on 11 September 2001.

The longest amphibious aerial assaults in history on 25 November 2001, Marine ground units are airlifted from Arabian Sea to Kandahar Afghanistan, as the Taliban regime collapses.

2002

3 March, Operation Anaconda commences. USS John F. Kennedy (CV 67) battle group launched strikes in support of ground troops that led to some of the fiercest fight during OEF.

2003

1 January, the merger of the aviation storekeeper (AK) and storekeeper (SK) became effective for enlisted paygrades E1 to E6, with E7 and above eligible for the exams over succeeding months.

Operation Iraqi Freedom commenced in March. Naval Aviation plays a major role.

1 April, Army PFC Jessica D. Lynch, 19, captured by the Iraqis when her convoy was ambushed on 23 March; was rescued from Saddam Hospital, An Nasiriyah. The daring operation by Task Force (TF) 20, including CH-46E Sea Knights from HMM-165 embarked onboard USS Boxer (LHD 4), CH-53E Super Stallions and Navy SEALs, began at midnight and was supported by Marines from TF Charlie, who staged a diversionary attack to draw away the Iraqi irregulars.

1 May, President George W. Bush arrived onboard USS Abraham Lincoln (CVN 72) in an S-3B Viking, side number 700, BuNo 159387, piloted by VS-35 XO Commander John Lussier, to declare an end to major combat operations in Iraq.

2004

19 January, the Airframe and Powerplant Program was established at Center for Naval Aviation Technical Training (CNATT) Pensacola, FL, giving Navy aviation technicians the opportunity to earn the Federal Aviation Administration's Airframe and Powerplant License, a civilian aviation standard certification.

October, some naval aviation "A" schools students began moving from NAS Pensacola, FL, to NAS Oceana, VA, as part of STAR-21, designed to streamline training by having students attend schools in the same geographical areas as their permanent duty stations.

26 October, a magnitude 9.0 earthquake occurred off the west coast of northern Sumatra, Indonesia, triggering a massive tsunami across the Indian Ocean littoral. In places reaching 30 feet high in shallow waters and 6 miles wide, the tsunami killed more than 275,950 people. The USS Abraham

Lincoln (CVN 72) carrier strike group visiting Hong Kong when the disaster struck; the USS Bonhomme Richard (LHD- 6) expeditionary strike group, visiting Guam; as well as P-3C Orions from Patrol Squadrons 4 and 8 immediately responded. The new year began with these and other Naval Aviation assets at the forefront of the historic relief effort, which was designated Operation Unified Assistance.

2005

On 30 August 2005 numerous ships and aircraft assisted with disaster relief in wake of hurricane Katrina.

2006

25 January, the Navy announced that it sought applications from 30 E-5 to E-7s for a trial Flying Chief Warrant Officer Program for possible fleet-wide introduction.

8 March, the last two F-14Ds to fly combat missions, BuNo 161159 of VF-213, piloted by CAPT William G. Sizemore II; and a Tomcat from VF-31, piloted by Lt. Bill Frank; launched from USS Theodore Roosevelt (CVN 71) to provide close air support to Marines and soldiers fighting terrorists in Iraq.

Air Force Chief of Staff Gen. T. Michael Moseley announced the name of the F-35 Joint Strike Fighter as Lightning II during a ceremony at Lockheed Martin facilities in Fort Worth, Texas.

The final aircraft carrier operational launch of the F-14 Tomcat occurred onboard USS Theodore Roosevelt (CVN 71) when aircraft No. 112, BuNo 163147, of VF-31, piloted by Lt. Blake Coleman with Radar Intercept Officer (RIO) LCDR Dave Lauderbaugh launched.

The EA-18G Growler made its maiden flight at Lambert International Airport in St. Louis, MO.

2007

The V-22 Osprey enters service.

2008

The Navy accepted the delivery of G4, the first EA-18G Growler maintenance trainer, BuNo 166858, at NAS Whidbey Island. The service intends to procure 88 operational Growlers to replace EA-6B Prowlers.

2009

The USS George HW Bush is commissioned, and the keel is laid for the next generation of carriers (Ford class).

25 February, BF-2, the second short takeoff/vertical landing F-35B Lightning II, made its first flight at Fort Worth, Texas.

10 March, following a review of additional information received since 1991, the Navy changed the status of Capt. Michael S. Speicher from "Missing/Captured" to "Missing-In-Action." On 17 January 1991, Aircraft 403, BuNo 163484, an F/A-18C, piloted by Speicher from VFA-81, embarked aboard USS Saratoga (CV 60), had launched for a night strike over Iraq. An (apparent) Iraqi surface-to-air missile shot down 403, making Speicher the first U.S. casualty of Operation Desert Storm.

September, MQ-8 Firescout UAV deploys for the first time aboard USS McInerney (FFG 8).

2010

Navy and Marine ships and aircraft brought humanitarian relief in response to a massive earthquake that kills more than 230,000.

18 December, the Electromagnetic Launch System launches aircraft for the first time at Lakehurst, NJ.

2011

Naval Aviation celebrates its centennial of 100 years of history.

THE AIRMAN RATE

During the early years of naval aviation, enlisted personnel came from similar surface ratings in the Navy. The first requirement was for aircraft mechanics. Personnel came from the Machinist's Mate rating and became Machinist's Mate (Aviation). Later, this rating became the Aviation Machinist's Mate (AMM) rating.

Special training was necessary during World War II. These specialties became part of a basic rating. There were several specialties that became part of the AMM rating.

In 1948, there was a major change in the aviation rating structure. The Airman rate came into being. The titles and/or initials of some aviation ratings changed. For example, the initials for the Aviation Machinist's Mate rating changed from AMM to AD. The letter D in the Aviation Machinist's Mate initials (AD) avoids confusion with the Aviation Structural Mechanic (AM). The specialties moved to the basic AD rating or other basic ratings. Personnel in the Aviation Machinist's Mate Carburetor Mechanic (AMMC), Aviation Machinist's Mate Flight Engineer (AMMF), Aviation Machinist's Mate Propeller Mechanic (AMMP), and Aviation Machinist's Mate Gas Turbine Mechanic (AMMT) specialties became ADs.

The Aviation Machinist's Mate Hydraulic Mechanics (AMMH) became a part of the Aviation Structural Mechanic (AM) rating. The Aviation Machinist's Mate Instrument Mechanics (AMMI) became a part of the Aviation Electrician's Mate (AE) rating. Many other titles and changes to ratings occurred at that time.

New ratings were established after 1948. They are the Aviation Maintenance Administrationman (AZ), Aviation Support Equipment Technician (AS), Aviation Antisubmarine Warfare Operator (AW), and Aviation Antisubmarine Warfare Technician (AX). In 1958, additional E-8 and E-9 paygrades (senior Chief and master chief) were established.

During this period, the title of the Airman rate has not changed, even though the advancement of aviation has caused the requirements of the rate to change. The requirements will continue to change in the future. You can find the requirements for all ratings in the Manual of Navy Enlisted Manpower and Personnel Classifications and Occupational Standards, NAVPERS 18068.

AVIATION RATINGS

A basic knowledge of the duties and skills of the Airman rate is necessary. You can obtain this knowledge either at a service school or by experience and self-study.

The **general aviation ratings** identify personnel from paygrades E-4 through E-9. Exceptions do exist where a general rating begins and/or ends at other paygrades.

The **aviation service ratings**, subdivisions of a general rating, require specialized training within that general rating. For example, the Aviation Boatswain's Mate (AB) rating has three service ratings (ABE) (ABF) and (ABH). These service ratings begin at paygrade E-4. An example of a general rating that does not have any service ratings is the Aviation Ordnanceman (AO) rating. The aviation ratings career progression paths are shown in *Figure 1-4*.

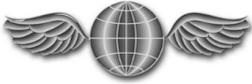
AB - Aviation Boatswain's Mate (Note 1)	AC - Air Traffic Controller	AD - Aviation Machinist's Mate	AE - Aviation Electrician's Mate
			
AG - Aerographer's Mate	AM - Aviation Structural Mechanic (Note 2)	AO - Aviation Ordnanceman	AS - Aviation Support Equipment Technician
			
AT - Aviation Electronics Technician	AW - Naval Aircrewman (Note 3)	AZ - Aviation Maintenance Administrationman	PR - Aircrew Survival Equipmentman
			
Notes			
<p>*Note 1: "Aviation Boatswain's Mate" is used at paygrade E-9 only. Leading to AB: ABE (Launching & Recovering Equipment), ABF (Fuels), and ABH (Aircraft Handling). *Note 2: "Aviation Structural Mechanic" is used at paygrade E-8 only. Leading to AM: AME (Safety Equipment), and AM. *Note 3: "Naval Aircrewman" five service ratings. These ratings are the AWF, AWO, AWR, AWS, and AWV.</p>			

Figure 1-4 — Paths of advancement for enlisted personnel.

DESCRIPTION OF AVIATION RATINGS

The following paragraphs contain a description of each aviation rating.

Aviation Boatswain's Mate (AB)

The AB rating is made up of the three service ratings, E-4 through E-7 paygrades. These ratings are the ABE, ABF, and the ABH ratings.

Aviation Boatswain's Mate, Launching And Recovery Equipment (ABE)

A description of the ABE rating includes the following:

- Operate, maintain, and perform organization maintenance on hydraulic and steam catapults, barricades, arresting gear, arresting gear engines, and associated equipment ashore and afloat.
- Operate catapult launch and retract panels, consoles, firing panels, water brakes, chronographs, blast deflectors, and cooling panels.
- Rig, inspect, proof-load cables and fittings, and pour wire rope sockets.
- Perform aircraft-handling duties related to the operation of aircraft launching and recovery equipment.

Aviation Boatswain's Mate, Fuels (ABF)

A description of the ABF rating includes the following:

- Operate, maintain, and perform organizational maintenance on aviation fueling and lubricating oil systems in CVs (aircraft carriers), LPHs (amphibious assault ships), and LPDs (amphibious transport docks), including aviation fuel and lubricating oil service stations and pump rooms, piping, valves, pumps, tanks, and portable equipment related to the fuel system.
- Operate, maintain, and repair valves and piping of purging and protective systems within the air department spaces aboard ship.
- Supervise the operation and servicing of fuel farms, and equipment associated with the fueling and defueling of aircraft ashore and afloat.
- Operate and service motorized fueling equipment.
- Maintain fuel quality surveillance and control in aviation fuel systems ashore and afloat.
- Train, direct, and supervise firefighting crews, fire rescue teams, and damage control parties in assigned fuel and lubricating oil spaces.
- Observe and enforce fuel-handling safety precautions.

Aviation Boatswain's Mate, Aircraft Handling (ABH)

A description of the ABH rating includes the following:

- Direct the movement and spotting of aircraft ashore and float.
- Operate, maintain, and perform organizational maintenance on ground-handling equipment used for moving and hoisting of aircraft ashore and afloat.
- Supervise the securing of aircraft and equipment.
- Perform crash rescue, firefighting, crash removal, and damage control duties.
- Perform duties in connection with launching and recovery of aircraft.

Air Traffic Controller (AC)

A description of the AC rating includes the following:

- Perform air traffic control duties in air control towers, radar air traffic control facilities, and air operations offices ashore and afloat.
- Operate radiotelephones, light signals and systems, and direct aircraft under Visual Flight Rules (VFR) and Instrument Flight Rules (IFR) conditions.
- Operate surveillance radar, precision radar, and identification equipment (IFF).
- Operate ground- and carrier-controlled approach systems.
- Assist pilots in the preparation and processing of flight plans and clearances.
- Maintain current flight-planning information and reference materials.

Aviation Machinist's Mate (AD)

A description of the AD rating includes the following:

- Maintain aircraft engines and their related systems, including induction, cooling, fuel, oil, compression, combustion, turbine, gas turbine compressor, exhaust, and propeller systems.
- Preflight aircraft.
- Conduct inspections on engine and engine related systems.
- Field-test and adjust engine components, including fuel controls, pumps, valves, and regulators.
- Remove, repair, and replace compressor and turbine blades and combustion chamber liners.
- Preserve and depreserve engines, engine accessories, and components.
- Supervise engine work centers.

Aviation Electrician's Mate (AE)

A description of the AE rating includes the following:

- Maintain electrical and instrument systems, including power generation, conversion, and distribution systems, aircraft batteries, and interior and exterior lighting.
- Maintain electrical control systems of aircraft, including hydraulic, landing gear, flight control, utility, power plant, and related systems.
- Maintain instrument electrical systems, such as aircraft engine, flight, and noninstrument-type indicating and warning systems to include automatic flight control and stabilization systems, aircraft compass systems, attitude reference systems, and inertial navigation systems.

Aerographer's Mate (AG)

A description of the AG rating includes the following:

- Observe, collect, record, and analyze meteorological and oceanographic data.
- Make visual and instrumental observations of weather and sea conditions.
- Operate meteorological satellite receivers and interpret and apply satellite data.
- Interpret meteorological and oceanographic codes and enter data on appropriate charts.
- Operate ancillary computer equipment for the processing, dissemination, and display of environmental data.
- Perform preventive maintenance on meteorological and oceanographic equipment.
- Prepare warnings of severe and hazardous weather and sea conditions.
- Forecast meteorological and oceanographic conditions.

- Prepare and present briefings concerning current and predicted environmental conditions and their effect on operations.

Aviation Structural Mechanic (AM)

The AM rating consists of two service ratings, E-4 through E-7 paygrades. These ratings are the AME and AM ratings.

Aviation Structural Mechanic, Safety Equipment (AME)

A description of the AME rating includes the following:

- Maintain safety belts, shoulder harnesses, and integrated flight harnesses in aircraft; inertia reels; seat and canopy ejection systems; gaseous and liquid oxygen systems; life raft ejection systems; fire-extinguishing systems, excluding fire detection systems; portable fire extinguishers; emergency egress systems; air-conditioning, heating, cabin and cockpit pressurization, ventilating, and anti-G systems; visual improvement systems; other utility systems; and associated lines, fittings, rigging, valves, and control mechanisms.
- Replenish liquid and gaseous oxygen systems.
- Remove and install oxygen system valves, gauges, converters, and regulators.
- Inspect, remove, install, and rig ejection seats, shoulder harnesses, lap belts, and face-curtain mechanisms.
- Inspect, remove, install, and adjust firing mechanisms and cartridges for ejection seats, lap belts, and canopies.
- Operate and maintain liquid nitrogen and liquid and gaseous oxygen shop transfer and recharge equipment.
- Perform preflight, postflight, and other periodic aircraft inspections.

Aviation Structural Mechanic (AM)

A description of the AM rating includes the following:

- Maintain hydraulic systems, including main and auxiliary power systems and unit actuating subsystems; landing gear; brakes; and related pneumatic systems, including reservoir pressurization, emergency actuating systems, and associated pumps, valves, regulators, actuating cylinders, lines, and fittings.
- Service pressure accumulators, emergency air bottles, oleo struts, reservoirs, and master brake cylinders.
- Inspect, remove, and replace components of hydraulic systems.
- Bleed hydraulic systems.
- Adjust brakes, and replace linings and pucks.
- Replace gaskets, packing, and wipers in hydraulic components.
- Maintain aircraft fuselages, wings, fixed and movable surfaces, airfoils, empennages, seats (except ejection seats), wheels and tires and their components, controls, and mechanisms.
- Remove, install, and rig flight control surfaces.
- Fabricate and assemble metal parts, and make minor repairs to aircraft skin.
- Install rivets and metal fasteners.
- Build up wheels and tires.
- Paint.
- Perform dye penetrant inspections.
- Perform daily, preflight, postflight, and other aircraft inspections.

Aviation Ordnanceman (AO)

A description of the AO rating includes the following:

- Inspect, maintain, and repair armament equipment, including aircraft guns, gun accessories, non-computing gun sights, aerial target equipment, and handling equipment; and aviation ordnance equipment, including ammunition suspension, release, launching, and arming equipment.
- Store, maintain, assemble, load, and fuse aviation ammunition.
- Load nuclear weapons and aerial mines and torpedoes.
- Load supplementary stores.
- Assemble, test, load, and maintain air-launch guided missiles.
- Operate small arms ranges.
- Supervise the operation of armories, aviation ordnance shops, and aviation ammunition storage facilities.

Aviation Support Equipment Technician (AS)

A description of the AS rating includes the following:

- Service, test, and perform organizational- and intermediate-level maintenance and repair of automotive electrical systems in mobile and self-propelled aviation support equipment and aviation armament-handling equipment. This includes generating, starting, lighting, and ignition systems; electrical components and wiring in auxiliary electrical power units used in servicing aircraft; electrical control systems in gas turbine compressor units and air-conditioning systems; and electrical and electronic circuits and components in general aircraft-servicing equipment.
- Service and maintain storage batteries.
- Perform maintenance inspections of aviation support equipment.
- Service, test, maintain, and repair gasoline and diesel engines and associated automotive systems, hydraulic systems, pneumatic systems, and structural components in mobile and self-propelled aviation support equipment.
- Maintain gas turbine compressor units and air-conditioning systems used in servicing aircraft.
- Maintain and operate gas turbine compressor unit test stands.
- Maintain hydraulic test and service equipment, air compressors, jacks, workstands, and associated equipment.
- Perform body and fender metalwork and painting.
- Weld, braze, solder, cut, shape, and patch metal.
- Adjust and repair brake systems.
- Inspect and replace tires and tubes.
- Operate hydraulic test stands.

Aviation Electronics Technician (AT[I] and AT[O])

Descriptions of both AT ratings include the following:

- **AT(I)** performs intermediate-level preventive and corrective maintenance on aviation electronic components supported by conventional and automatic test equipment, including repair of weapons replaceable assemblies and shop replaceable assemblies. AT(I) also performs microminiature component repair and test equipment qualification and associated test bench preventive and corrective maintenance.

- **AT(O)** performs organizational-level preventive and corrective maintenance on aviation electronics systems to include communications, radar, navigation, antisubmarine warfare sensors, electronic warfare, data link, fire control, tactical displays, and associated equipment.

Naval Aircrewman (AW)

The AW rating is made up of the five service ratings. These ratings are the Aircrewman Mechanical (AWF), Aircrewman Operator (AWO), Aircrewman Tactical Helicopter (AWR), Aircrewman Helicopter (AWS), and Aircrewman Avionics (AWV).

- **AWF:** Serves as flight engineer/crew chief/loadmaster onboard P-3C, EP-3, E-6B, C-2, C-12, and C-130 aircraft. Proficient with all in-flight aircraft emergency requirements and knowledgeable with all aircraft flight systems.
- **AWO:** Operates tactical mission systems to detect, classify, track, and attack enemy submarines while onboard P-3C and P-8A aircraft. Operates tactical support center systems at shore installations and tactical mobile systems in expeditionary units. Also operates multiple types of UAV payload systems.
- **AWR:** Operates tactical mission systems to detect, classify, and attack enemy submarines while onboard SH-60B and SH-60R aircraft. Also operates tactical support center systems at shore installations and tactical mobile systems in expeditionary units. Primary rescue swimmer during SAR missions.
- **AWS:** Serves as the utility aircrewman onboard HH-60H, MH-60S, H-46, and MH-53 aircraft operating a wide range of equipment from mine hunting sensors to close in combat weapons systems. Primary rescue swimmer during SAR missions.
- **AWV:** In-flight technician/troubleshooter onboard P-3C, EP-3, and E-6B aircraft. Maintains and troubleshoots all avionics equipment while in flight. Operates communication systems and electronic warfare equipment onboard E-6B and EP-3 aircraft. Operates and maintains tactical support center systems at shore installations and tactical mobile systems in expeditionary MTOC units.

Aviation Maintenance Administrationman (AZ)

A description of the AZ rating includes the following:

- Perform administrative, managerial, and clerical duties required in implementing and supporting the Naval Aviation Maintenance Program (NAMP).
- Plan, program, and coordinate scheduled and unscheduled maintenance tasks and the incorporation of changes and modifications to aircraft and equipment.
- Set up and maintain status boards.
- Collect, compile, analyze, and record data pertaining to the history, operation, maintenance, configuration, receipt, and transfer of naval aircraft and related aeronautical equipment.
- Prepare reports and correspondence.
- Determine requirements for the requisition, control, and issue of change kits.
- Requisition departmental instructions, forms, and technical data.
- Organize, maintain, and operate technical libraries.
- Perform other duties as required when attached to organizational, intermediate, and depot maintenance activities or aviation staff commands.

Aircrew Survival Equipmentman (PR)

A description of the PR rating includes the following:

- Inspect, maintain, and repair parachutes, survival equipment, and flight and protective clothing and equipment.
- Pack and rig parachutes.
- Pack and equip life rafts.
- Repair and test oxygen regulators and liquid oxygen converters removed from aircraft.
- Fit and maintain oxygen masks, flight clothing, anti-exposure suits, and anti-G suits.
- Operate and maintain carbon dioxide transfer and recharge equipment.
- Conduct inspections of survival equipment; supervise operation of parachute lofts and survival equipment work centers.

AIRMAN DUTIES

The five major duties you will perform as an Airman are as follows:

1. Maintain support equipment, compartments, and buildings.
2. Stand security watches.
3. Move aircraft.
4. Participate in working parties.
5. Perform routine duties involved in the operation of a naval aviation activity afloat or ashore.

You will probably have to perform some duties that don't fall into any of the above categories. However, these five duties cover the majority of the tasks you will have to perform.

It's only natural that your first duties will be relatively basic and routine. As you gain knowledge and skill, you will earn more complex responsibilities. You may become a member of the line maintenance crew. At first, you will probably chock the aircraft's wheels and tie the aircraft down at the end of the flying day. Later, you get more responsible jobs to handle on the line, such as giving taxi signals to pilots, refueling aircraft, and inspecting aircraft. Your job may be helping petty officers with certain phases of aircraft line maintenance. The way you perform your job will have a direct bearing on how soon you will receive more advanced assignments. Learn everything you can about each job. Ask questions and observe how qualified personnel accomplished things.

Sometimes you may think there are no other job possibilities for the Airman except washing aircraft, standing watches, and cleaning spaces. This type of work is necessary, and all personnel do it at some time. Your own efforts will determine your readiness for other jobs. The Navy needs well-trained personnel, so work in an inspired manner regardless of your chosen rating.

Likewise, when you get aboard ship, you will probably think that your job is only moving aircraft from one spot to another. As with your work ashore, you will have more responsible jobs as you learn your duties afloat.

ASSIGNMENTS

As an Airman Recruit, you will work in one of the more progressive areas of the naval service—naval aviation.

As an Airman Apprentice or Airman, you can expect various assignments. Your job may be on an aircraft carrier as ship's company, where you will work in a variety of jobs. You may work in an operating carrier squadron. Carrier squadrons are shore-based, but when the air wing goes aboard a carrier, the squadron will accompany it. You may work in a patrol squadron. Patrol squadrons are on

naval air stations in the United States and deploy to overseas bases. You may also work in a training squadron. Your assignment could be with fixed-wing or rotary-wing aircraft.

Shore assignments include naval air stations, naval air facilities, or aircraft intermediate maintenance departments. There are other billet possibilities for the Airman, but those are the major ones. The team assignment is not the important thing. The important thing is to become an integral part of the team. Always do your best to make your team the Navy's finest.

LEADERSHIP

In the Navy, leadership begins early. As an Airman Recruit or Airman Apprentice, you have a limited leadership role. However, you should begin to find out the principles of good leadership. For you to perform your responsibilities as a petty officer, you must display the qualities of good leadership. Why not learn as much as possible about leadership now? Leadership is learned. Those who have become Navy leaders have done so through the application of the principles of leadership from an early age.

This training manual does not present an extended leadership course. However, you will find some of the general principles of leadership in the following paragraphs. If you wish to read more about this subject, refer to Basic Military Requirements, Naval Education and Training (NAVEDTRA) 14325, and Military Requirements for Petty Officer Third and Second Class, NAVEDTRA 14504. Both of these training manuals contain information about leadership.

Military Requirements for Petty Officer Third and Second Class, NAVEDTRA 14504, is primarily for personnel who are preparing for petty officer third class. You may wish to study it to get a head start in leadership training. However, no single publication can give you all the information you need. Your divisional training petty officer or the Educational Services Office (ESO) will assist you in finding resources.

A thorough knowledge of the work a person is doing is a decided advantage to the prospective leader. It is important that you learn everything you can about the rate requirements of an Airman. You may find yourself in a position where your shipmates come to you for assistance with a problem. When you are able to help with their problems (without embarrassing them), you are on your way to becoming a leader.

You may even be able to do the right things automatically. In this case, it will be a relatively easy job for you to become the type of leader the Navy needs. However, as stated previously, leadership is learned. If you have to think about how you are conducting yourself when giving help, you are normal.

End of Chapter 1

Mission and History of Naval Aviation Introduction

Review Questions

- 1-1. Leadership and what other element are now a part of your everyday Navy life?
- A. Training
 - B. Motivation
 - C. Maintenance
 - D. Organization
- 1-2. The Navy purchased its first aircraft on what date?
- A. 14 June 1910
 - B. 30 October 1911
 - C. 8 May 1911
 - D. 21 April 1898
- 1-3. What is the primary function of naval aviation?
- A. Supply the fleet with aircraft for deployment on aircraft carriers
 - B. Provide the fleet with aircraft pilots and aircrewman
 - C. Coordinate with other naval forces in maintaining command of the seas
 - D. Support amphibious landing operations
- 1-4. How many basic operations make up the primary function of naval aviation?
- A. 5
 - B. 6
 - C. 7
 - D. 8
- 1-5. What ship was called the Navy's unsinkable "Blue Ghost" of World War II?
- A. USS Saratoga
 - B. USS Enterprise
 - C. USS Wasp
 - D. USS Lexington
- 1-6. What battle was the turning point of the war in the Pacific?
- A. Antietam
 - B. Chosin
 - C. Dien Bien Phu
 - D. Midway

- 1-7. What year was the Vietnam cease-fire announced?
- A. 1845
 - B. 1968
 - C. 1972
 - D. 1973
- 1-8. Which aviation rating performs administrative, managerial, and clerical duties required in implementing and supporting the Naval Aviation Maintenance Program (NAMP)?
- A. AD
 - B. AM
 - C. AZ
 - D. PR
- 1-9. Which of the following ratings maintains aircraft engines and related systems?
- A. AD
 - B. AM
 - C. AZ
 - D. PR
- 1-10. Removing, installing, and rigging the flight control surfaces on naval aircraft is the responsibility of what rating?
- A. AD
 - B. AM
 - C. AZ
 - D. PR
- 1-11. Which rating inspects, maintains, and repairs armament equipment?
- A. AB
 - B. AC
 - C. AE
 - D. AO
- 1-12. What is the name of the first official aircraft carrier?
- A. USS Lexington
 - B. USS Langley
 - C. USS Nimitz
 - D. USS America
- 1-13. Which of the following duties will you perform as an Airman?
- A. Repair parachutes
 - B. Weld
 - C. Move aircraft
 - D. Plan flights

1-14. What is the official birthday of naval aviation?

- A. 3 April 1892
- B. 7 June 1910
- C. 8 May 1911
- D. 6 June 1944

1-15. After what year was the Aviation Maintenance Administrationman rate established?

- A. 1948
- B. 1962
- C. 1970
- D. 1982

RATE TRAINING MANUAL – USER UPDATE

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