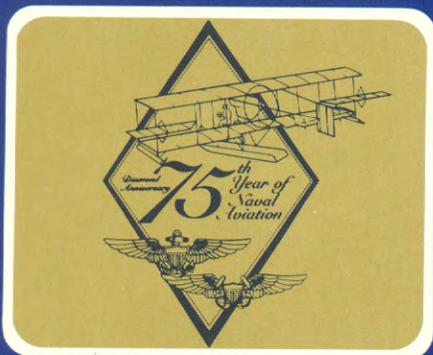
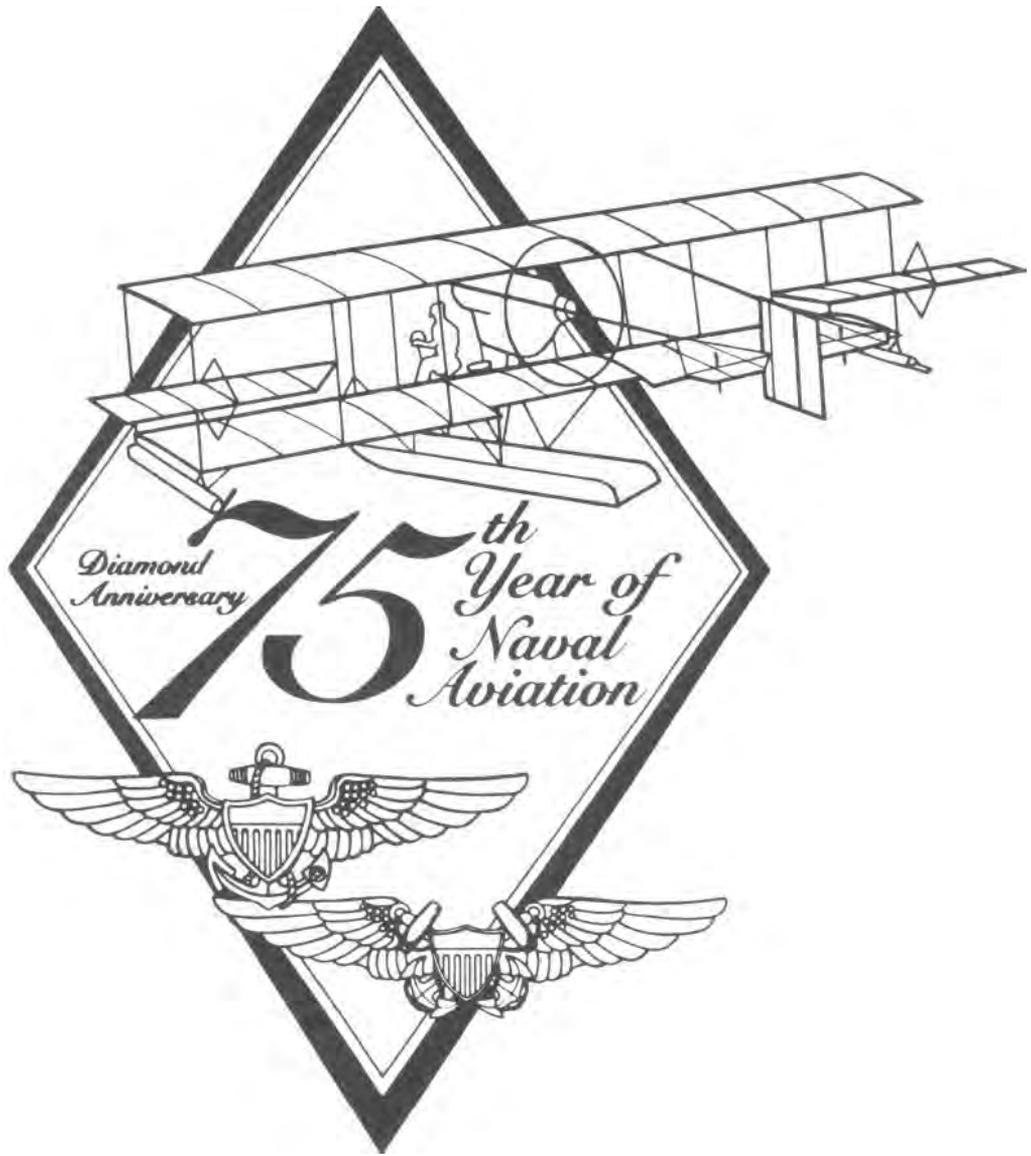


NAVAL AVIATION **1911-1986**

A PICTORIAL STUDY





Naval Aviation 1911-1986

A Pictorial Study

Edited by Sandy Russell and the Staff of Naval Aviation News

Designed by Charles Cooney

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PREFACE

This pictorial history traces the evolution of Naval Aviation from its humble beginnings to its current role as an essential element of U.S. naval warfare. This is not intended to be an in-depth treatment. Rather, it is a short visual monograph designed to capture the essence of Naval Aviation and to convey to the reader something of the imagination, energy and commitment of those who have made the dream a reality.

Appreciation is extended to the helpful personnel at the Naval Historical Center Photo Section, Naval Audiovisual Center Still Media Division (Production Control) and the Defense Audiovisual Agency for their assistance in the photographic research for this history.

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I. Beginnings (1898-1916)

Man has dreamed of flight since antiquity. Greek mythology describes such characters as Bellerophon, who used a golden bridle to catch the winged horse Pegasus, and Icarus, the boy who flew on man-made wings. When the latter ignored warnings not to fly too close to the sun, the heat melted the wax on his wings and he plunged to the sea. During the centuries which followed, many others would fail in this quest. But some persevered and eventually gave birth to the great new development of the 20th century called flight.

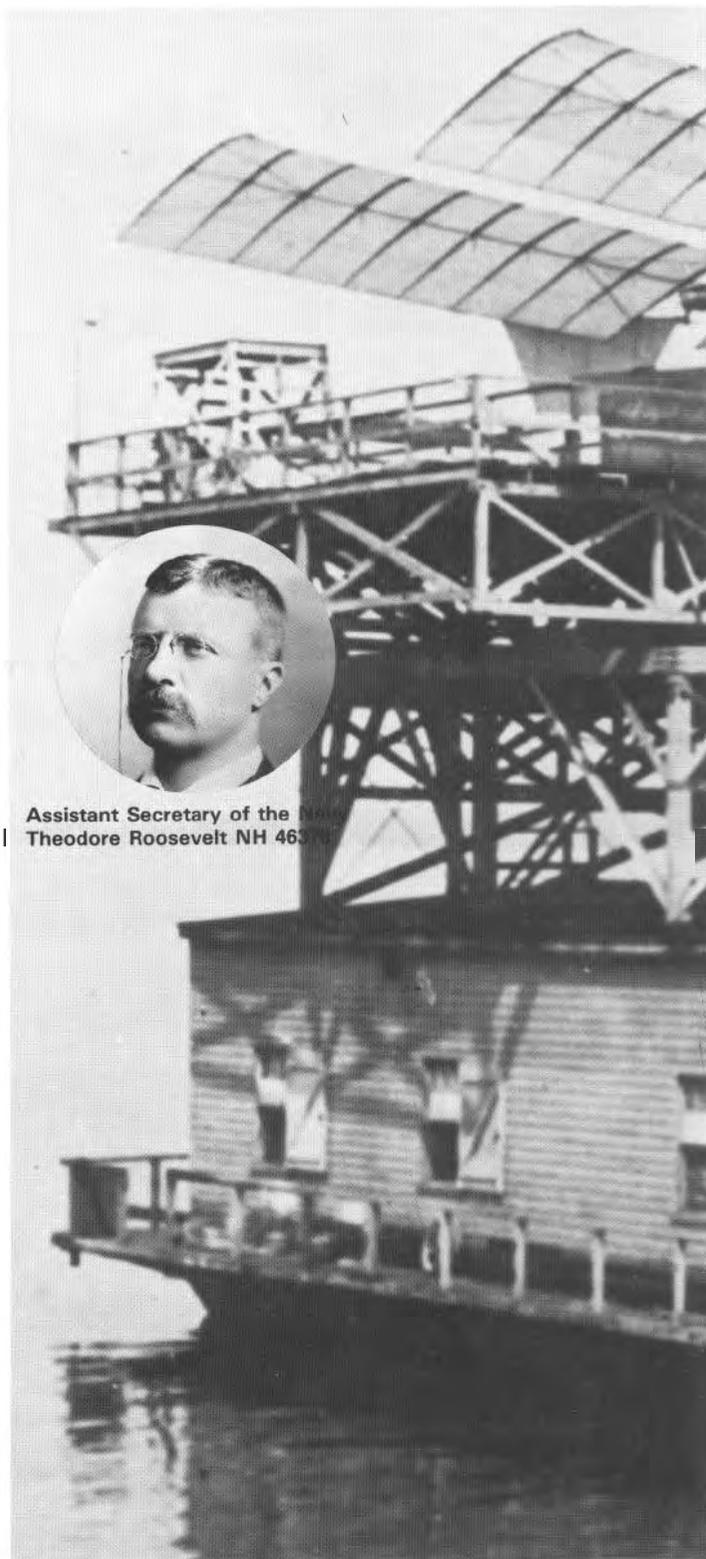
The official beginning of Naval Aviation is recorded as May 8, 1911, when the first officer in charge of aviation, Captain Washington I. Chambers, issued requisitions for two Curtiss biplanes. But, as early as 1898, Assistant Secretary of the Navy Theodore Roosevelt recommended the appointment of a board to study the military applications of Professor Samuel P. Langley's flying machine, the Aerodrome. Although the experiments ended in failure, naval observers continued to attend aviation demonstrations at home and abroad to study this new phenomenon.

By 1909, six years after the world's first sustained flights in a 16-horsepower machine flown by the Wright brothers, a group of officers was urging the purchase of aeroplanes by the Navy. In 1910, civilian airplane builder Glenn Curtiss and civilian pilot Eugene Ely proved to the Navy and the world that aviation could go to sea. On November 14, Ely flew a Curtiss biplane from a specially built platform on the cruiser *Birmingham*. He topped this feat on January 18, 1911, by landing a Curtiss pusher aboard the armored cruiser *Pennsylvania* in San Francisco Bay and flying back to shore.

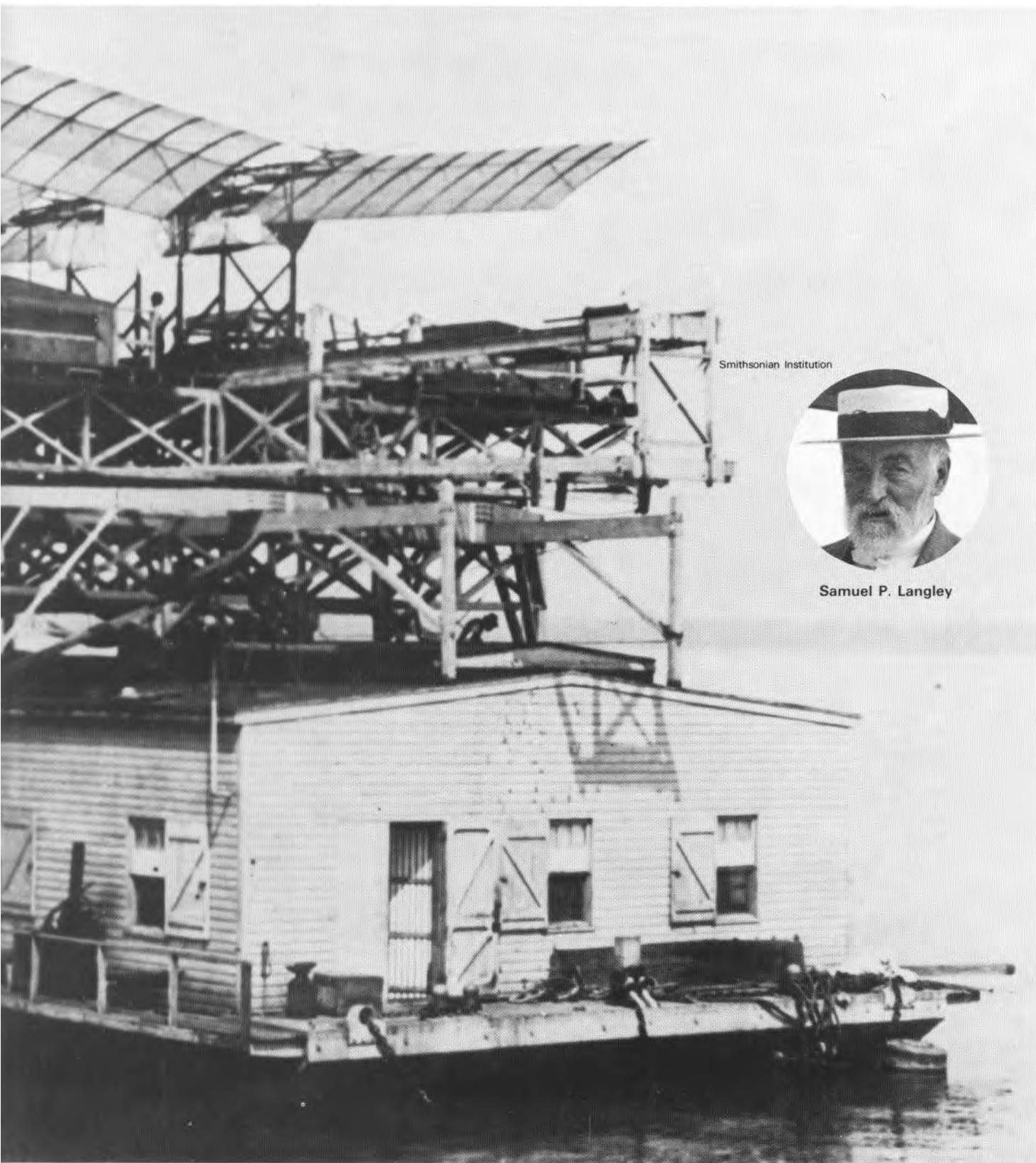
The Navy's growing interest in aviation was apparent in early 1911 when Lieutenant T. G. Ellyson was ordered to Curtiss' aviation camp at North Island, San Diego, Calif., as the first naval officer to undergo flight training. He qualified for his Aero Club of America license on July 6, 1911, in the A-1 *Triad*, the Navy's first aircraft, and subsequently became Naval Aviator No. 1 on March 4, 1913.

The Curtiss A-1 *Triad* was used in the Navy's first attempt to launch an aircraft from a compressed air catapult, at Annapolis in 1912. The launching failed as a crosswind blew the A-1 into the water. However, a subsequent attempt on November 12 was successful when an A-3 piloted by Ellyson was launched at the Washington Navy Yard.

The same year, the Marine Corps entered the world of flight and, from that time on, Marine Aviation developed side by side with its Navy counterpart. On May 22, 1912, Lieutenant Alfred A. Cunningham, USMC, reported to the aviation camp at Annapolis for "duty in connection with aviation." This date is recognized as the birth date of Marine Corps Aviation. He took his flight training at the Burgess aircraft factory in Marblehead, Mass., and was later designated Naval Aviator No. 5.



Assistant Secretary of the Navy
Theodore Roosevelt NH 463



Smithsonian Institution



Samuel P. Langley

In 1898, Assistant Secretary of the Navy Theodore Roosevelt recommended that a board be appointed to study the military applications of Professor Langley's flying machine, the Aerodrome. It is shown here atop a houseboat in the Potomac River, 40 miles below Washington, D.C., on October 7, 1903, just before a trial launch. Note the track on which the machine was propelled by springs and shot into the air. This attempt failed, as did another in December. NH 00247

Deployment of a small group of flyers, the entire aviation element of the Navy, on fleet maneuvers at Guantanamo Bay, Cuba, in January 1913, demonstrated the operational capabilities of aircraft and stimulated interest in aviation among fleet personnel. The first test of the adaptation of aviation to warfare at sea revealed some deficiencies in existing aircraft when two aviation detachments took their planes to Veracruz in the spring of 1914 during the Mexican crisis. On one occasion, Lieutenant P. N. L. Bellinger returned to base with holes from hostile bullets in his plane, the first combat damage received by a Navy aircraft.

When hostilities began in Europe in July 1914, Naval Aviators were sent there as observers to report aviation developments from posts in London, Paris and Berlin. The importance of aviation in the Navy was officially recognized in November with the appointment of a Director of Naval Aeronautics. Throughout 1915 and 1916, advances in technology, experimentation and new administrative procedures pointed to an increased role for aviation in the Navy's mission. During this period, the first contract was let for a lighter-than-air (LTA) craft, the Aeronautical Engine Laboratory was set up at the Washington Navy Yard and the Naval Appropriations Act provided for a Naval Flying Corps, backed by a Naval Reserve Flying Corps.

In 1915, three imaginative Coast Guard officers at Hampton Roads, Va., conceived a plan for air patrols to search for disabled schooners along the Atlantic seaboard. Captain R. M. Chiswell, commander of the Coast Guard cutter *Onondaga*, enlisted the support of two of his junior officers, Lieutenants Norman B. Hall and Elmer F. Stone. Their experiments with a Curtiss plane were so successful that the two younger men obtained permission to pursue their interest in flying. Lt. Hall was assigned to the Curtiss plant at Hammondsport, N.Y., where he learned how to build aircraft.

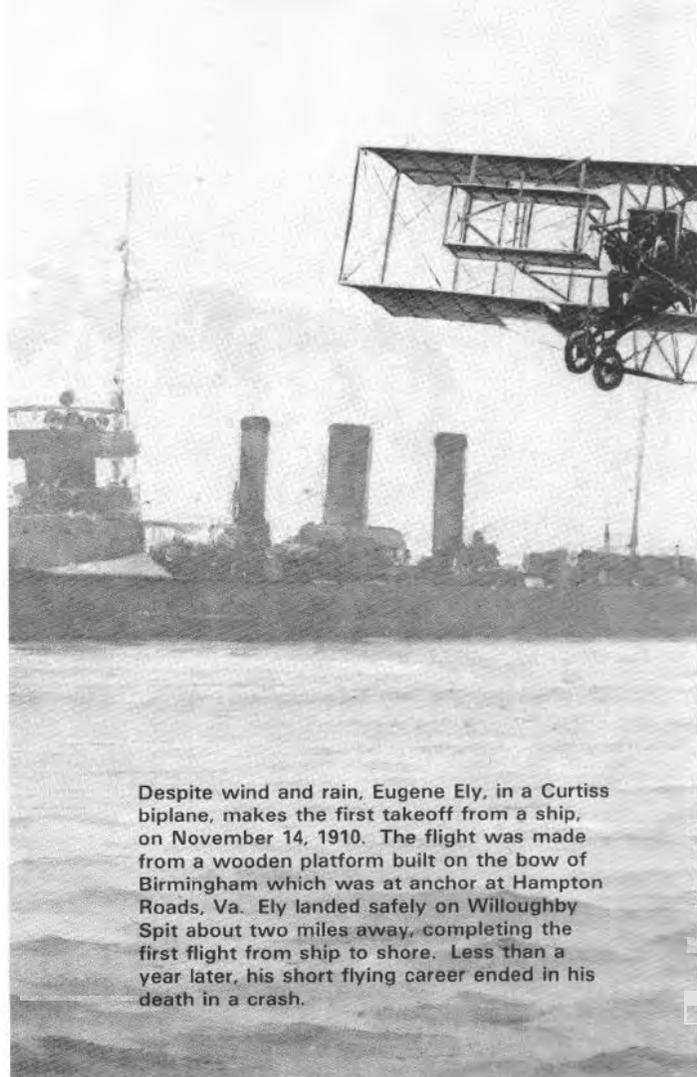
Lt. Stone was sent to the Naval Training School at Pensacola, Fla., along with other Coast Guard personnel. There he earned his Navy Wings of Gold and later became Coast Guard Aviator No. 1. Coast Guard Aviation was born.

During the period from the purchase of the A-1 *Triad* in 1911 to 1917, the Navy concentrated on airplanes capable of operating from the water, and on the devices necessary to launch them from existing ships. On July 12, 1916, Lieutenant G. deC. Chevalier and his AB-3 were launched from the first catapult designed for shipboard use, aboard *North Carolina*, establishing the armored cruiser as the first U.S. Navy ship equipped to carry and operate aircraft.

These beginnings were characterized by unsuccessful starts and unfulfilled hopes, as well as great advances and achievements. The pioneers who contributed the determination and undaunted spirit that were necessary in these early days of "flying by the seat of the pants" can surely take much of the credit for the existence of Naval Aviation today.



Eugene B. Ely
A pioneer civilian aviator who made a spectacular early breakthrough for Naval Aviation by flying from and to the decks of Navy ships.



Despite wind and rain, Eugene Ely, in a Curtiss biplane, makes the first takeoff from a ship, on November 14, 1910. The flight was made from a wooden platform built on the bow of Birmingham which was at anchor at Hampton Roads, Va. Ely landed safely on Willoughby Spit about two miles away, completing the first flight from ship to shore. Less than a year later, his short flying career ended in his death in a crash.

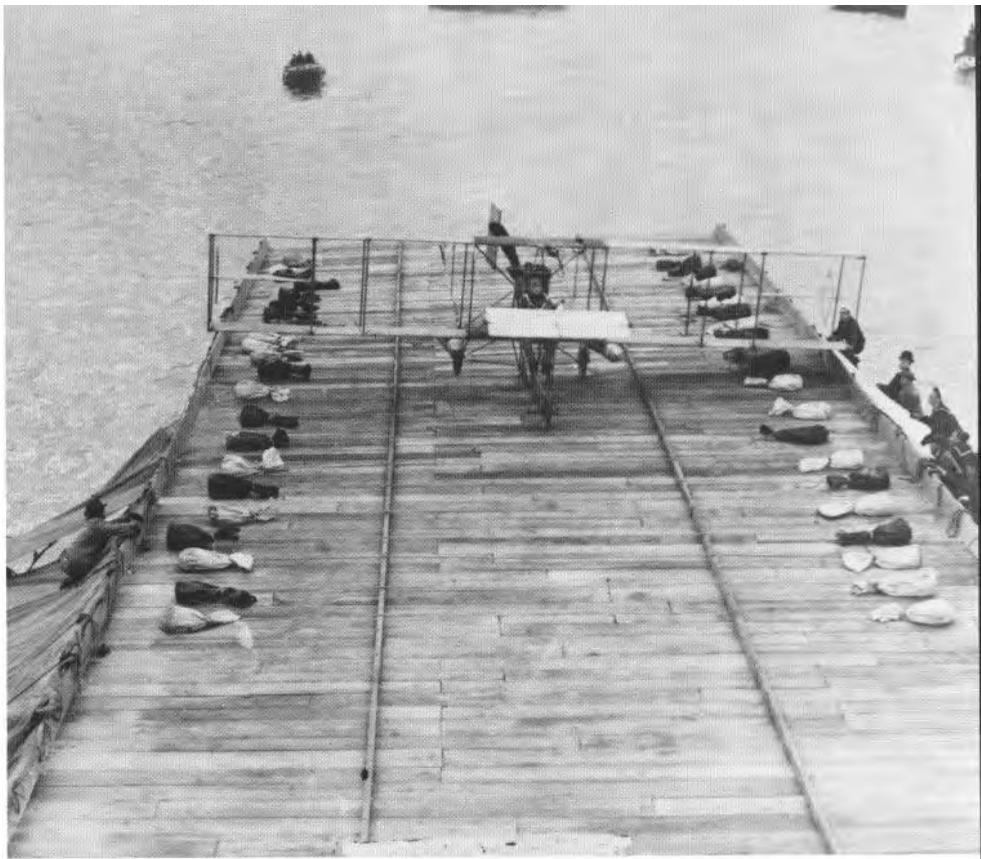
I. Beginnings (1898-1916)



Artist R.G. Smith. Copyright U.S. Naval Institute. Used by permission.

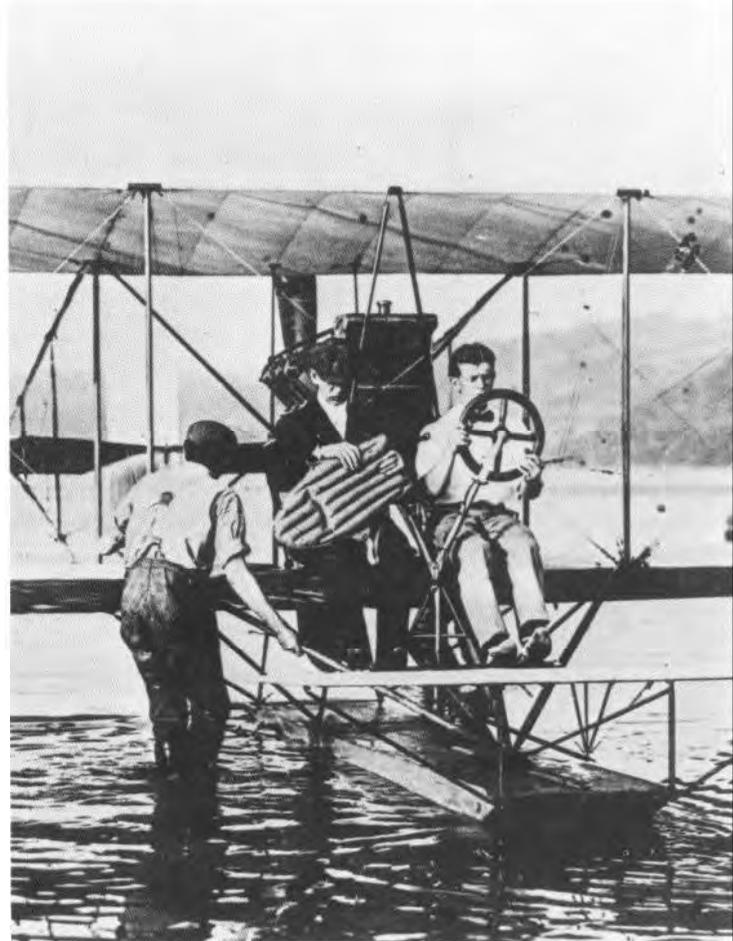
I. Beginnings (1898-1916)

Eugene Ely rolls up the deck of Pennsylvania in a Curtiss pusher on January 18, 1911, in the world's first landing aboard a ship. Although the special jury-rigged deck had safety rails at the edge and vertical guide strips down the center, note the special canvas nets at the sides. Since the grab hooks engaged only about half of the arresting lines, the little biplane almost ran into the superstructure.



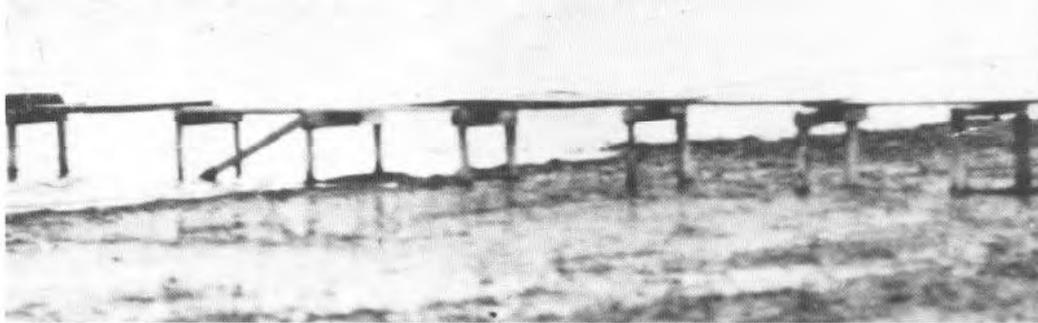
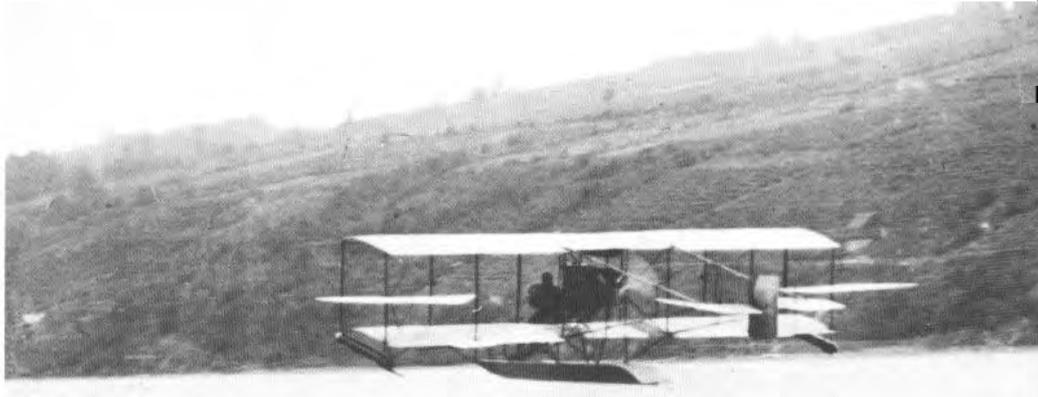
Lt. Theodore G. Ellyson
Naval Aviator #1 was trained by Glenn
Curtiss and worked closely with him in
all aspects of early Naval Aviation. AN
39094

Lt. T.G. "Spuds" Ellyson sits at the controls of
the A-1 with Capt. W.I. Chambers as a
passenger in a trial flight at Hammondsport,
N.Y., in 1911. The original A-1 ordered by the
Navy was an amphibian equipped with both a
large main float and landing gear. NH 1386





Glenn H. Curtiss
Pioneer aircraft designer and pilot who built the Navy's first aircraft and trained the first Naval Aviator.



Lt. T.G. Ellyson makes a successful takeoff in the A-1 using an inclined wire rigged from the beach down to the water. After he had the engine running at full speed, a signal was given to release the plane. Ellyson held the machine on the wire as long as possible and then made his takeoff, rising into the air. This was one of the first experiments in the Navy's search for a shipboard launching device but it proved to be an impractical solution. USN 427805



Capt. Washington I. Chambers
Was a driving force in establishing an aeronautical organization within the Navy.



Lt. Alfred A. Cunningham
Naval Aviator #5 was the first Marine to be designated a Naval Aviator and is known as the father of Marine Corps Aviation.



Marine Corps Lt. Alfred A. Cunningham pilots a Curtiss seaplane. He learned to fly seaplanes at the Burgess Factory in Marblehead, Mass., taught by the men who built them, and later took instruction in landplane flying at the Army Signal Corps Aviation School. USMC 5652-5

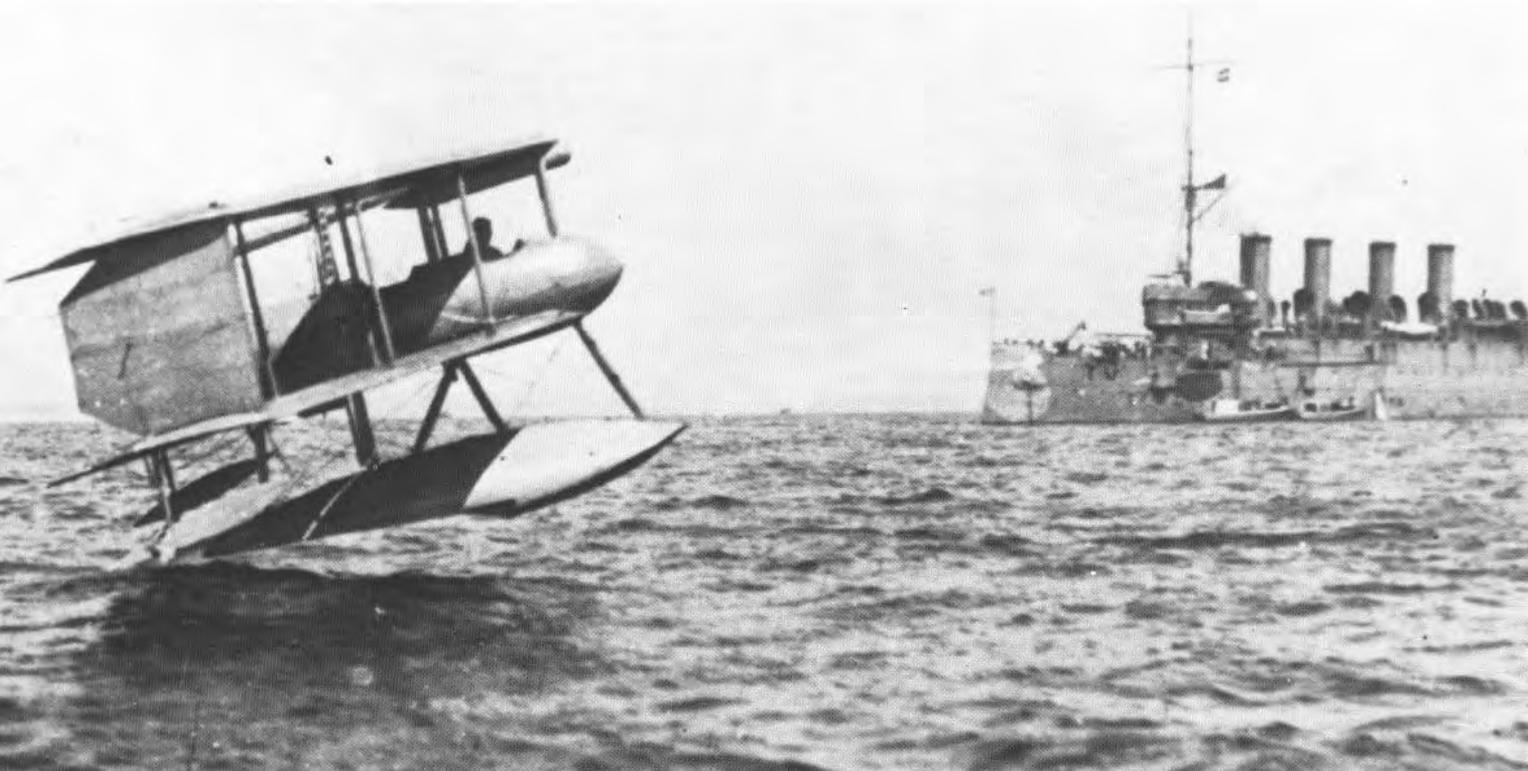
I. Beginnings (1898-1916)

Early aircraft are lined up in front of their canvas hangars on the flight beach at the Naval Aeronautic Station, Pensacola, in March 1914. It was the Navy's first permanent air station, established by Lt.Cdr. Henry C. Mustin in January 1914, together with a flying school. The first flight was made from the station on February 2 by Lt. J.H. Towers and Ens. G. deC. Chevalier.

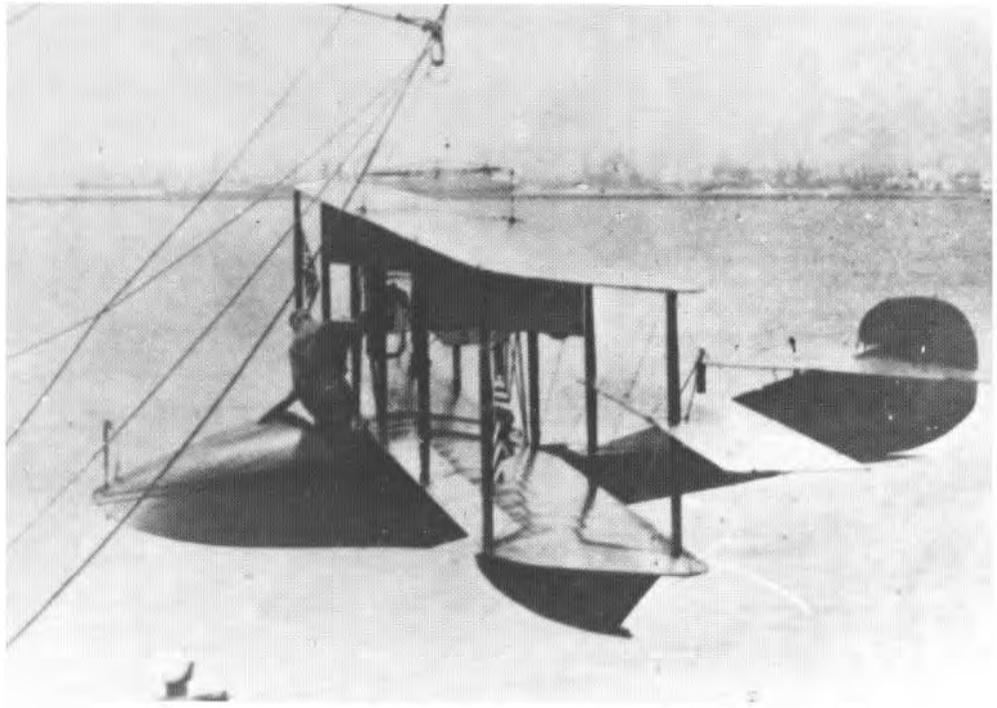


Cdr. Henry C. Mustin
Naval Aviator #11 was the first to get airborne from a catapult on a ship underway, North Carolina, on November 15, 1915. NH 47676

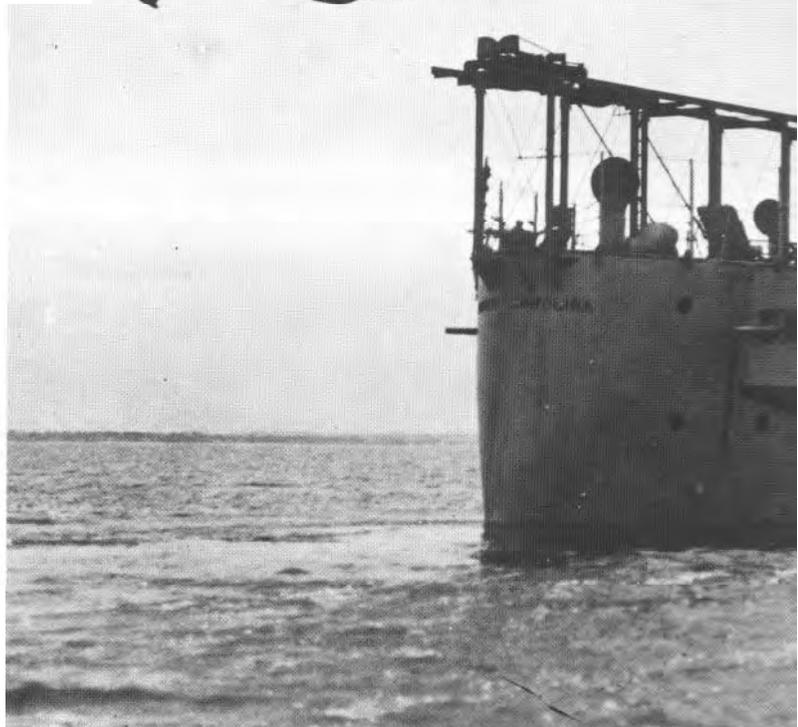
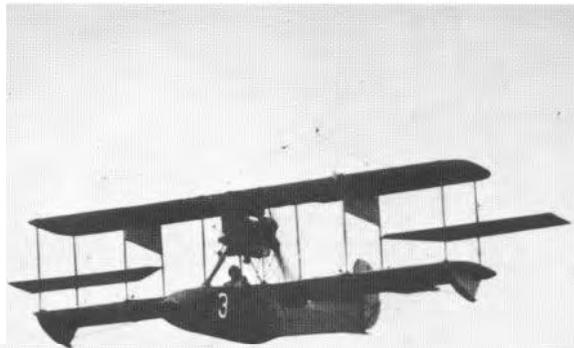
The AH-7 swept-wing Burgess-Dunne hydroaeroplane operates off Pensacola in March 1916, with USS Columbia (CA-16) in the background. In May 1914, Naval Constructor Holden C. Richardson had recommended that the Navy buy two of these planes to study the new development in aeronautical design. NH 2243



A Curtiss AB-3 flying boat with Ltjg. P.N.L. Bellinger is hoisted into the sea from USS Mississippi in April 1914 to search for mines in Vera Cruz harbor. USN 410394



This flying boat, piloted by Lt. G. deC. Chevalier, was catapulted successfully from North Carolina in Pensacola Bay on July 12, 1916. The launching device, first tested by Lt.Cdr. Henry C. Mustin the year before, was the first catapult designed for shipboard use. North Carolina became the first ship in the U.S. fleet to carry and operate aircraft. AN 15463



Lt. Patrick N.L. Bellinger Naval Aviator #8 scored many firsts in the development of Naval Aviation and was commander of the NC-1 flying boat



II. Put to the Test (1917-1919)

When the United States entered WW I in April 1917, the small group of Navy and Marine Corps Aviators who had promoted the growth of Naval Aviation was not equipped for combat. The Naval Air establishment had only one air station, a training base at Pensacola, Fla., 54 aircraft (mostly training planes), 48 aviators and students, and 239 enlisted men.

During the 19 months of U.S involvement in the war, however, 39 new naval air stations were established, 27 of them overseas. Thousands of young men became pilots, ground officers, mechanics and technical specialists in the Naval Reserve Flying Corps. From a force of 43 pilots, 193 enlisted men and 54 aircraft, Naval Aviation's resources expanded by war's end to 3,049 pilots, 43,452 enlisted troops, over 2,000 aircraft and 15 lighter-than-air craft.

Early in June 1917, the first U.S. military detachment to reach France was an aviation unit led by Lieutenant Kenneth Whiting, a submariner turned

aviator who contributed much to early aviation development. This small contingent was followed by others, including the First Yale Unit, a group of students who organized a flying unit in 1916 that later became part of the Naval Reserve. One member-of this group was David S. Ingalls, who later became the first ace in Navy history and the only Navy ace in WW I.

U.S. naval aircraft were used primarily for convoy duty, for antisubmarine warfare and to bomb enemy submarine installations. Until American airplanes could be built and shipped to Europe, the aviators used foreign aircraft. Some of these planes were too light to carry machine guns or bombs and the pilots flew with pistols, rifles or shotguns for protection. Hand grenades and even bricks were thrown when nothing else was available.

Development of the long-distance flying boat was an important by-product of the war. Numerous types appeared, from the F-boat for training to the HS, H-12 and H-16 patrol bomber flying boats. All



Father of the Naval Air Reserve F. Trubee Davison was a young Yale student who translated a dream into action. In 1916, he organized the First Yale Unit, a group of students who were interested in flying and later became part of the Naval Reserve. Back row, left to right: John M. Vorys, Artemus L. Gates, Albert J. Ditman, Allen W. Ames, David H. McCulloch, F. Trubee Davison, Robert A. Lovett and Erl C.B. Gould. Front row: Wellesley Laud-Brown, "Ella" the mascot, and Henry P. Davison.

were designs of the American inventor Glenn Curtiss. The British operating these aircraft in the harsh North Sea environment improved on these models out of necessity. The end result was the F5L which saw considerable operational use in the U.S. Navy for a number of years after the war.

Although the Navy-Curtiss (NC) planes were finished too late to take part in the war, one of them, the NC-4, made a trailblazing transatlantic crossing in May 1919. It was the first time any aircraft had flown across the Atlantic Ocean.

On May 8 of that year, three NC aircraft, dubbed "Nancy Boats" by the press, with Commander John H. Towers in command, took off from NAS Rockaway Beach, N.Y., for Trepassy Bay, Newfoundland. Here, they waited for good weather until May 16 to continue their journey. Of the three, only the NC-4, commanded by Lieutenant Commander Albert C. Read, with pilot Lieutenant Junior Grade Walter Hinton and copilot Lieutenant Elmer F. Stone, USCG, reached its destination in the Azores. The NC-1 and NC-3, hampered by unfavorable weather and navigation difficulties, landed at sea. Cdr. Towers sailed NC-3 into the Azores, but the aircraft was so greatly damaged that it could not continue. NC-1 capsized and sank when taken in tow.

NC-4 continued to Lisbon, achieving the first aerial crossing of the Atlantic on May 27. Read and his crew flew on to Plymouth, England, arriving on May 31 to complete the record flight.

Many aviators were satisfied with the capabilities of the flying boat as the primary means of sea-air power, while others thought aircraft should be able to operate from combatant ships. Still another group promoted the development of lighter-than-air craft.

The Navy's LTA program actually began on June 1, 1915, with an order for one nonrigid airship, later designated DN. In 1919, the Navy Department authorized the acquisition of its first rigid airships, ZR-1 and ZR-2, as well as the establishment of a supporting air station, NAS Lakehurst, N.J.

The years that followed also brought advancements in the flying boat but, as WW I ended, interest was already beginning to swing toward a specially constructed flush-deck carrier. In 1919, Congress authorized the conversion of the collier *Jupiter* to the carrier *Langley*, the first of such ships in the U.S. Navy.



At the outbreak of WW I, Naval Aviation was still in its embryonic stages. Young men were drawn to this new call to adventure by recruiting posters such as this. Lt. Kenneth Whiting led the Navy's First Aeronautic Detachment to Europe in May 1917.

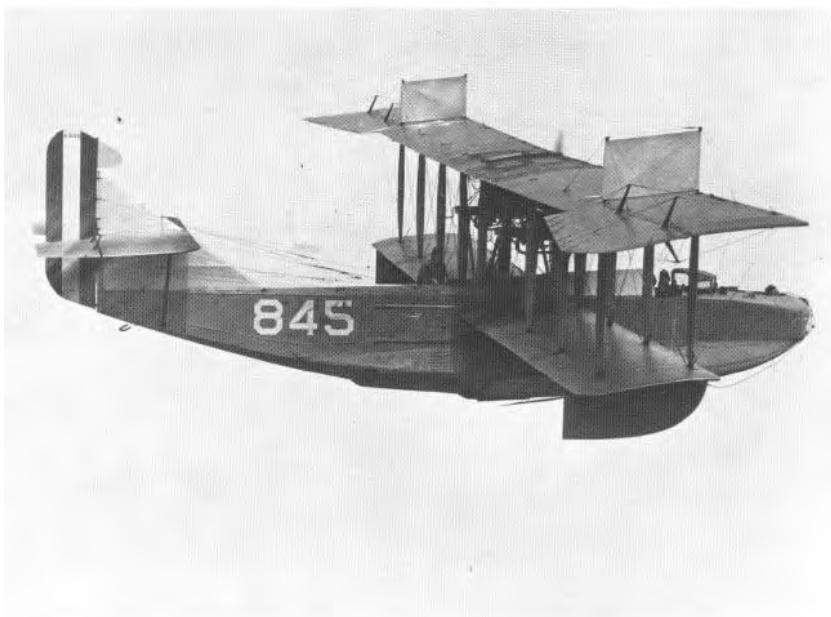
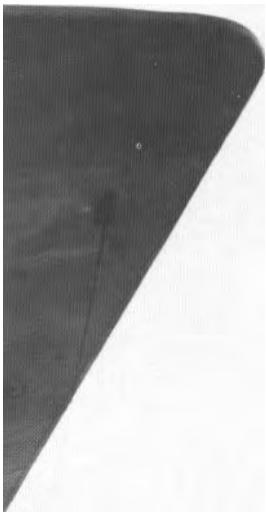


Lt. Kenneth Whiting
Naval Aviator #16

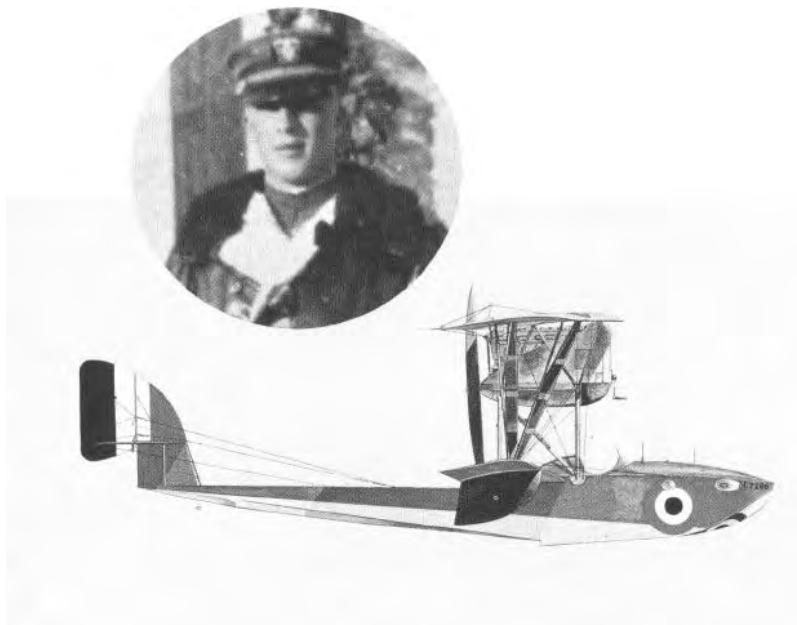
II. Put to the Test (1917-1919)



An early Curtiss-designed seaplane, the N-9, was the standard Navy trainer of WW I. This one is pictured at NAS Pensacola in 1917. With a 100-hp engine and an empty weight of 1,860 lbs., it was the seaplane version of the Army's Jenny with larger wings, ailerons, vertical tail and radiator. The Navy procured 510 N-9s in all, 94 from Curtiss, 360 from Burgess, and 5 from the Army. More than 50 were built from spare parts at Pensacola. The first one was delivered in 1916 at a cost of approximately \$8,000. NH 90238



This 1918 Curtiss H-16 Navy Flying Boat was designed primarily for antisubmarine patrol. It had two 360-hp Liberty engines, 95-foot wing span, and a crew of four (pilot, assistant pilot, mechanic and radio operator). The H-16 was the first aircraft produced at the Philadelphia Naval Aircraft Factory. USN 1072



The first U.S. Naval Aviators arriving in Europe had no American-built aircraft to fly and used various Allied aircraft instead. Ens. C.H. Hammann, flying an Italian Macchi 5 seaplane, was Naval Aviation's first Medal of Honor winner.

II. Put to the Test (1917-1919)



A major U.S. naval air training base in France during WW I was NAS Moutchic. Here, several HS flying boats, which were the first American-built aircraft to be assembled in France, are beached. USN 1053802



Lt. David S. Ingalls. Navy's first ace.

Artist John Ficklen



From July 18 to September 24, 1918, while flying with RAF Squadron No. 213, Lt. David S. Ingalls, USNRF, shot down four enemy aircraft and an observation balloon, for which he was awarded the Distinguished Flying Service Cross by the United States and Britain. He was the U.S. Navy's only ace in WW I.



Photographed on April 27, 1917, the Navy's first nonrigid airship, DN-1, maneuvers on the water at Pensacola, Fla. Due to manufacturing problems and poor engines, it could barely get airborne. AN 8293

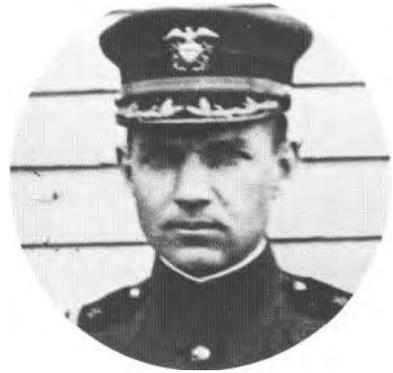


14 OCTOBER 1918. 2ND LT RALPH TALBOT, USMC, PILOT, AND GYSGT ROBERT GUY ROBINSON, USMC, OBSERVER WHILE ON AN AIR RAID OVER PITTHAM, BELGIUM, BECAME DETACHED FROM THEIR FORMATION BECAUSE OF MOTOR TROUBLE AND WERE ATTACKED BY TWELVE ENEMY SEVENTY PLANE. ONE ENEMY PLANE WAS BROUGHT DOWN. ROBINSON WAS SHOT THROUGH THE ELBOW AND HIS GUN JAMMED. HE CLEARED IT WITH ONE HAND. RETURNING TO THE FIGHT, ROBINSON WAS SHOT IN THE HEAD. ONE MORE ENEMY PLANE WAS BROUGHT DOWN WITH MOTOR FAILING AND HIS OBSERVER UNCONSCIOUS. TALBOT LANDING ROBINSON AT THE NEAREST BASTION. FOR THESE OUTSTANDING ACTS OF HEROISM ABOVE AND BEYOND THE CALL OF DUTY, THEY WERE AWARDED NAVY MEDALS OF HONOR.

The first WW I raid-in-force by the Day Wing of the Northern Bombing Group on October 14, 1918, was conducted by eight planes of Marine Day Squadron 9 over Pittham, Belgium. For extraordinary heroism on this and an earlier raid, 2nd Lt. Ralph Talbot, USMC, and his observer, GySgt. R.G. Robinson, USMC, were awarded Medals of Honor. USN NPC-KV40-48

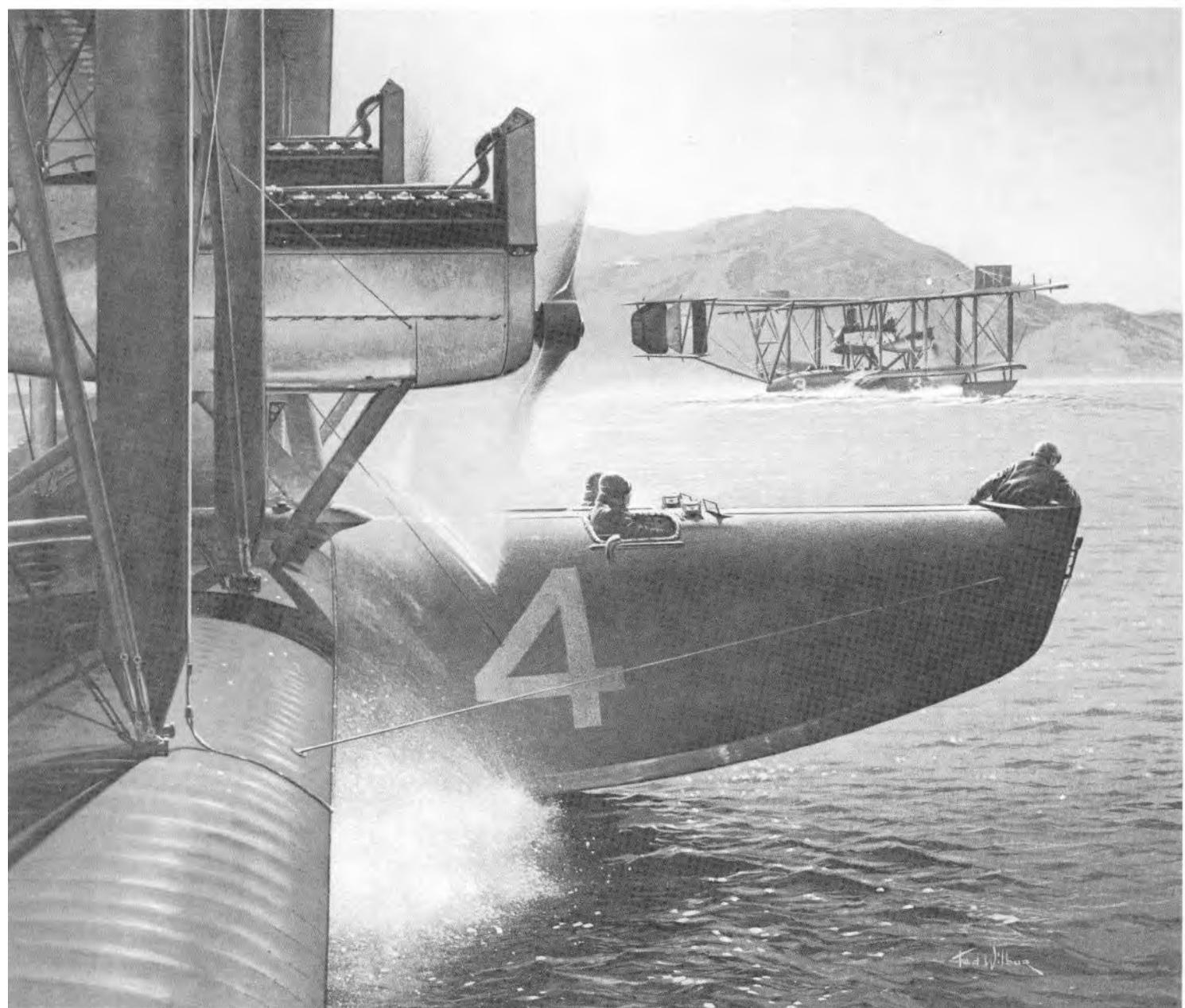
II. Put to the Test (1917-1919)

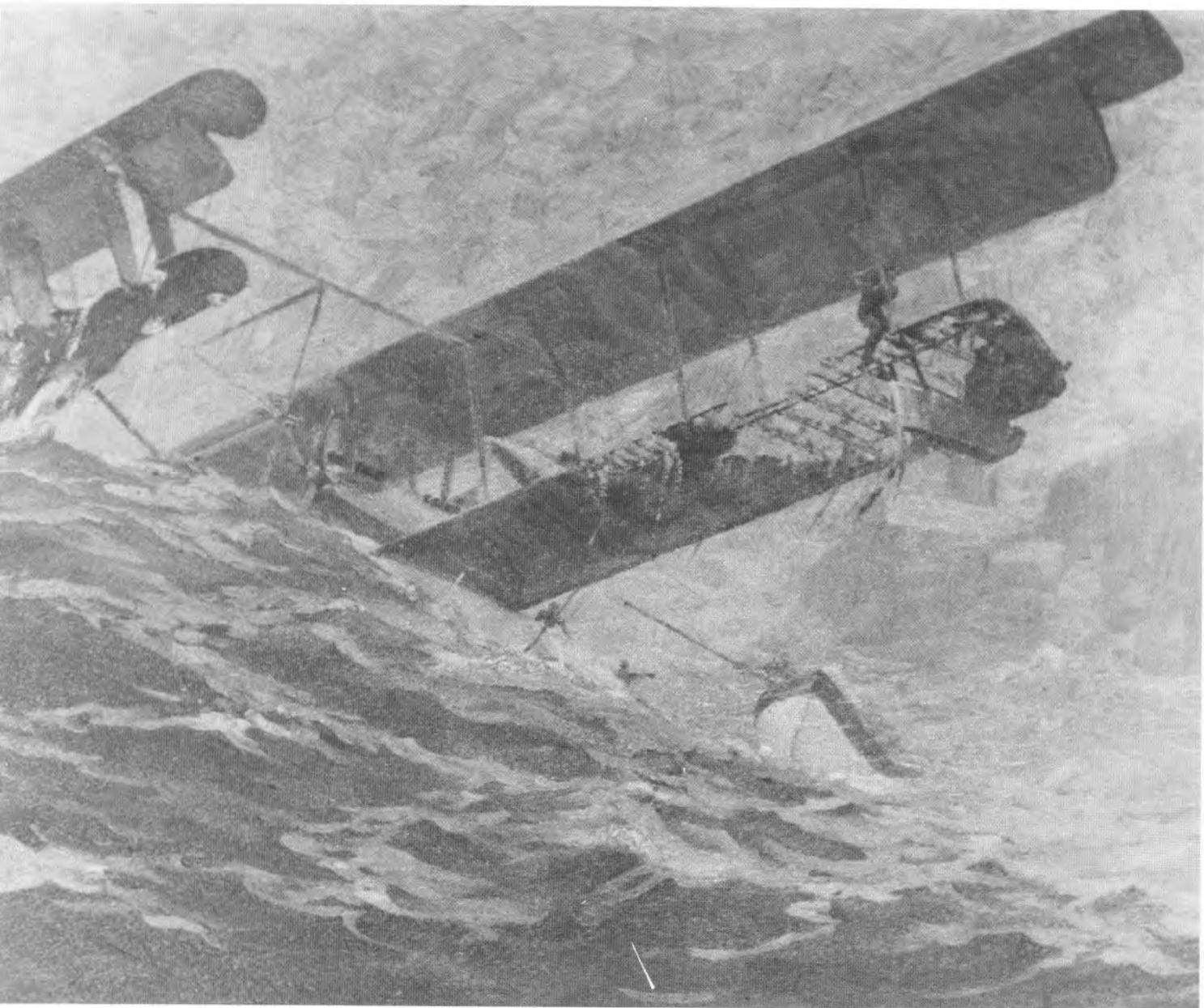
Cdr. John H. Towers
Naval Aviator #3
Commanded the flight of the NCs.



The world's first flight across the Atlantic began from NAS Rockaway, N.Y., on May 8, 1919. Three Navy-Curtiss (NC) flying boats, under the command of Cdr. John H. Towers, departed for Trepassey Bay, Newfoundland, and Lisbon, Portugal, with a planned stop in the Azores. Only one, the NC-4, made it all the way to Plymouth, England, arriving on May 31.

Artist Ted Wilbur. Copyright U.S. Naval Institute. Used by permission.





Artist C E Ruttan



Cdrs. H.C. Richardson and G.C. Westervelt and Lt.Cdr. J.C. Hunsaker. The three Naval Constructors who worked with Glenn Curtiss to design the NC-4. Richardson was Naval Aviation's first maintenance officer.

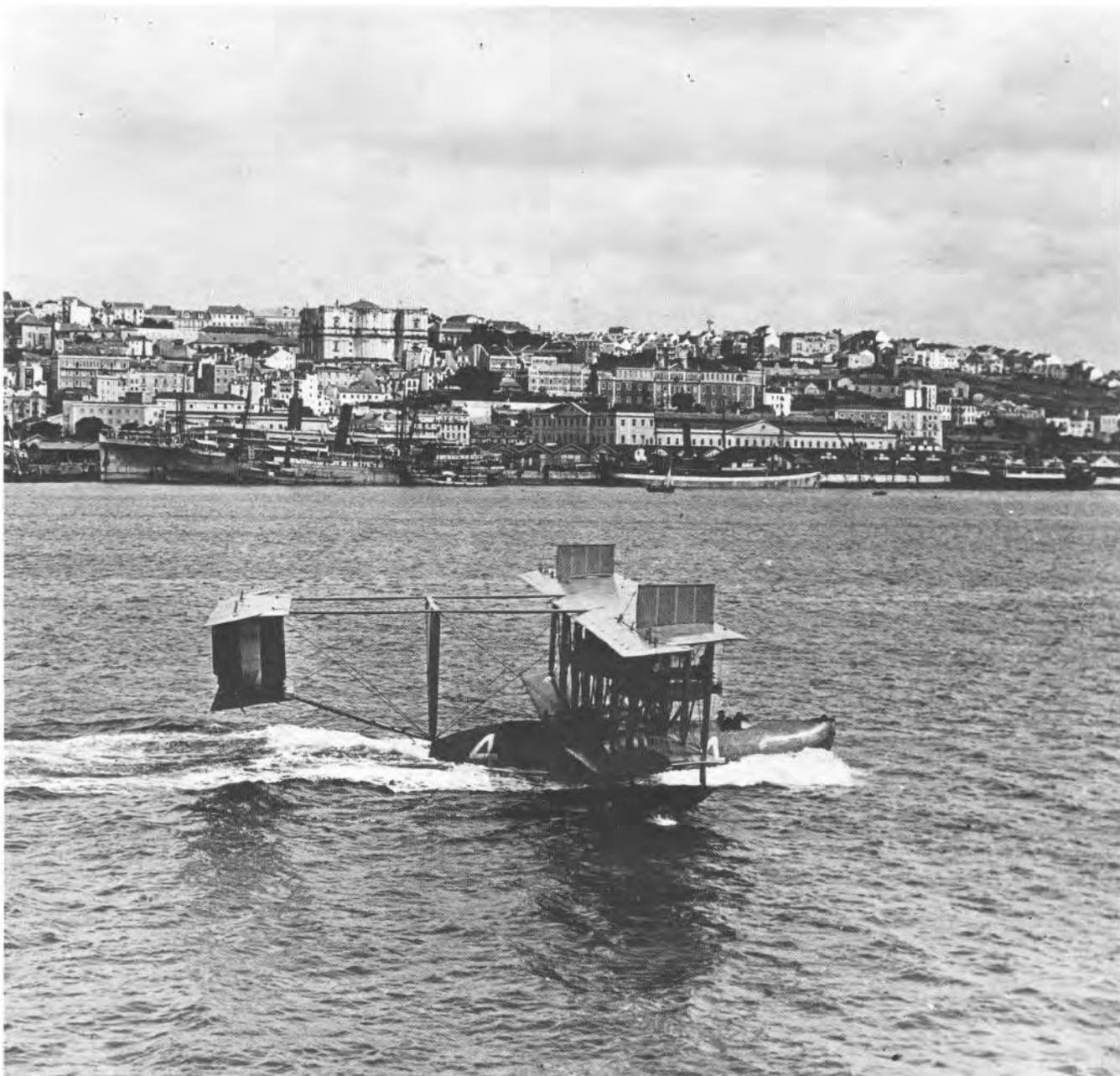
NC-1 and NC-3 landed in heavy seas before reaching the Azores. Both were damaged and unable to continue the flight. In this oil painting by C.E. Ruttan, NC-1 is taken in tow by the steamship Iona. The aircraft later capsized and sank. NC-3, commanded by Towers, drifted within sight of the Azores, started her engines and taxied in under her own power. Neither crew suffered any personnel losses.



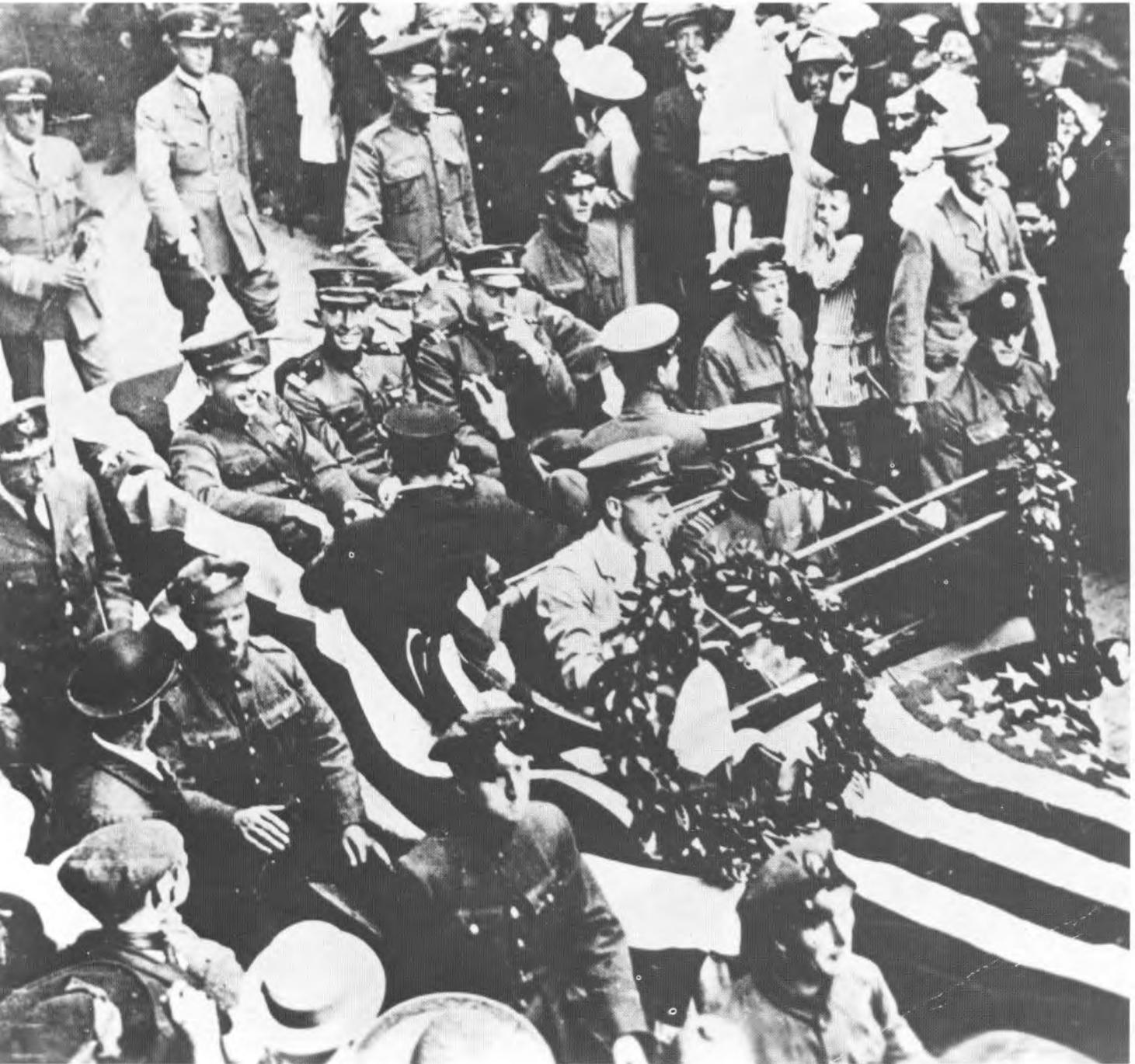
II. Put to the Test (1917-1919)

Despite the adverse weather conditions, NC-4 flew on to the Azores.

On May 27, NC-4 arrived in Lisbon, Portugal, where she was greeted by cheers, whistles and sirens. USN 650875



II. Put to the Test (1917-1919)



The triumph of the NC-4 drew international applause. Continuing on to Plymouth, England, the crew was treated to a hero's welcome. USN 1022025



The crew of NC-4: L-R, E.C. Rhoads, USN, chief special mechanic; Lt. J.L. Breese, USNRF, flight engineer; Ltjg. Walter Hinton, USN, pilot; Lt. Elmer F. Stone, USCG, pilot; and Lt.Cdr. Albert C. Read, USN, aircraft commander. Not pictured is radio operator Ens. H.C. Rodd, USN. USCG G-APA-10-15-73(04)

Section 1

The New York Times.

Section 1

VOL. LXVIII. NO. 22,008

NEW YORK, SUNDAY, JUNE 1, 1919. 114 PAGES, In Nine Parts.

FIVE CENTS

NC-4 FINISHES NEW YORK-PLYMOUTH FLIGHT; DRIVES STRAIGHT THROUGH FOG TO HER GOAL; SHE MADE 3,925 MILES IN 57 1/4 FLYING HOURS

FIRST DETAILS OF NC-4'S ARRIVAL AT LISBON

Liberty Engines Functioned Well and Passage Was So Smooth That Crew Had Comfortable Shave in Final Hour.

PICTURESQUE SCENE AS SHE LANDED ON THE WATER

Crew Taken to the Rochester Where Amid Notes and Massed Sailors They Stood at Attention to the Strains of National Anthem

Due to extraordinary calm today, the following description of the flight, filed at Lisbon on 29.20.19, is a full and complete report of the flight, as given by the crew, and the first details of the flight, made from the first bulletin of the Army Department, received in America.

By WALTER BEAUFAY.

Special to The New York Times.

LONDON, Tuesday, May 27.—"There she is!" At four minutes to 10 afloat tonight the cry burst from the lips of the sleep-eyed lookout on the U. S. S. Rochester's water line, which was being towed by the tug, a few hundred yards astern from the water line of the American tug.

The fog in the waters of the bay appeared a tiny speck, white within against the purple gloom of the night, with its long wings of smoke's billowing—"like a balloon being inflated," as the artist Thayer described it, "like a balloon being inflated," as the artist Thayer described it, and before it came the ship.

NC-4's Journey from New York to Plymouth Across the Atlantic.

LUSTY BRITISH CHEERS FOR FLIER

Gracefully She Drops in Plymouth Harbor, Escorted from Far Out at Sea by British Airplanes.

GREETED BY MAYOR AT THE MAYFLOWER DOCK

Acclaimed by Throngs in Narrow Streets—500 Mile Trip from Ferrol Made At 72-Mile Clip—Leaky Radiator Caused Wondego Halt.

By LEONARD E. HOLMES.

LONDON, May 27.—The great airplane NC-4 was formally welcomed by the British Admiralty on Thursday.

The vessel left the harbor's anchorage on the Clyde at 8 o'clock tonight, a great crowd watching. She will probably make a voyage over part of England before proceeding to her base at East Fortune.

It is announced that an attempt will be made to fly across the Atlantic from England within the next fortnight.

The length of the NC-4 is 62 ft. and the diameter 20 ft. She weighs 10,000 lbs. and carries 1,000 lbs. of fuel. She is powered by two Liberty engines, each of 250 horse power. These are designed to run at a maximum speed of 1,200 revolutions a minute, at which speed the propeller makes 1,600 revolutions. The maximum speed is 120 miles an hour.

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IRISH PERMIENT LAID TO WALSH

Freeman's Journal Quoted Him as Saying American People Respected Republic.

RAISED EXTREME HOPES

Spain Fain Forward to Houston Post.

British B-34 Ready to Fly in Fortnight; Will Try to Cross Ocean from England

LONDON, May 27.—The great airplane B-34 was formally welcomed by the British Admiralty on Thursday.

The vessel left the harbor's anchorage on the Clyde at 8 o'clock tonight, a great crowd watching. She will probably make a voyage over part of England before proceeding to her base at East Fortune.

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III. The Twenties (1920-1929)

Technological progress and continued adaptation of aircraft to fleet use characterized Naval Aviation during the twenties. There were important organizational changes as well. In 1921, Congress established a Bureau of Aeronautics with Rear Admiral William A. Moffett as its first Chief. The position of Naval Aviation was further secured with the creation of an Assistant Secretary of the Navy for Air, a post first held by Edward P. Warner and then by David S. Ingalls, the Navy's first ace.

From a small air detachment with each fleet, the Navy's air arm grew to three aircraft carriers with assigned fighter, torpedo and bombing squadrons; patrol squadrons operating from seaplane tenders; and scouting aircraft regularly assigned to battleships and cruisers. Naval aircraft went to sea with better instruments, radios and bombsights. Efficient and reliable air-cooled radial engines came into being during this period. They proved to be so successful that this type engine was used in Navy planes until all-jet aircraft entered the fleet.

The Navy and Marine Corps participated widely in the Schneider, Curtiss Marine, Pulitzer and Thompson races of the 1920s and early 1930s. Air racing during this period had a far more functional purpose than merely putting on a good show for a thrill-seeking audience. The machines were test beds for innovative designs and the races drove these planes to their outermost limits. The high-performance aircraft of WW II and beyond were a direct legacy of this colorful era. Sleek U.S. Navy racing planes and pilots like Acosta, Williams, Gorton, Rittenhouse, Grant, Jeter and Tomlinson took top honors in some of the world's great speed contests. Marines like Lutz and Page did the same.

Meanwhile, *Langley*, the Navy's first aircraft carrier, had been commissioned in March 1922. In October of that year, Lieutenant V. C. Griffin made the first takeoff from *Langley*, and a few days later Lt. Cdr. G. deC. Chevalier made the U.S. Navy's first carrier landing while the ship was underway.

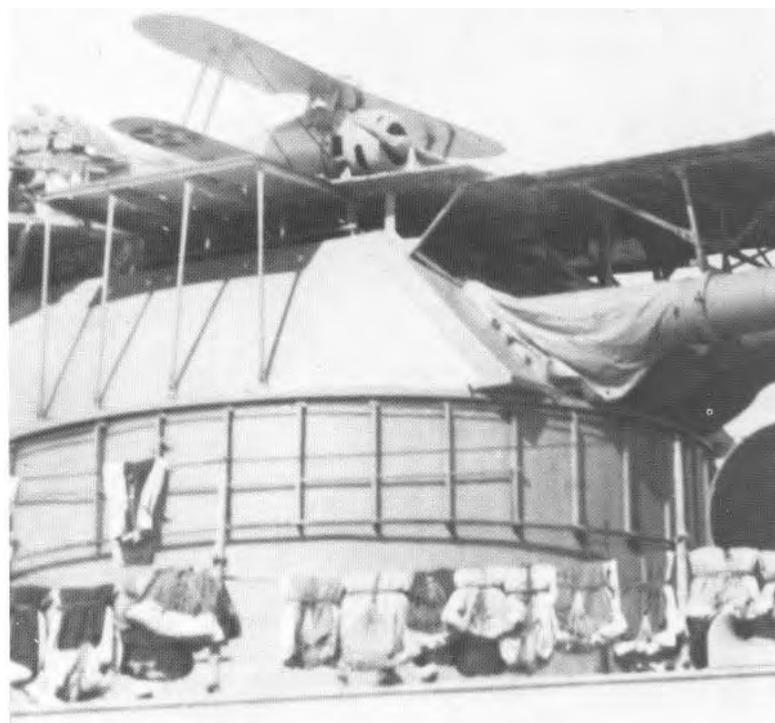
During the 1920s, the Navy worked out takeoff and landing techniques and developed arresting and launching devices. One early platform for testing an arrestment system was a huge turntable. Lieutenant A. M. Pride headed the project which produced a system that was activated by compressed air, and later by a powder charge. Its success provided valuable experience in the development of future arresting devices.

Experimental development of large patrol planes continued. In 1925, Commander John Rodgers and his crew attempted to fly a PN-9 from San Francisco to Hawaii. Although unpredicted headwinds caused them to run out of fuel short of their goal, a



The Bureau of Aeronautics under RAdm. William A. Moffett was established as an organizational unit of the Navy Department in September 1921. NA 80-G-458493

The 1920s saw much attention centered on marrying the airplane to fleet operations. Here, a Nieuport 28, one of 12 acquired from the Army's WW I inventory, was positioned atop a flying-off platform mounted over a turret of the battleship *Arizona* (BB-39). The year was 1921. NH 43918





world's distance record for seaplanes was established. Rigging a makeshift sail, Rodgers and company sailed the aircraft backwards to their destination, demonstrating the ruggedness of the metal-hulled PN-9 and its ability to hold the sea in adverse conditions.

Naval Aviation as an offensive weapon made enormous strides as tactics were developed to match the improved capabilities of the aircraft. The techniques of dive-bombing, torpedo attack, spotting for gunfire and scouting were refined. Marine Corps expeditionary troops learned the value of and perfected the close air support mission. Navy aircrews made training flights from advanced bases and put the knowledge acquired to new uses in photographic surveys and polar exploration.

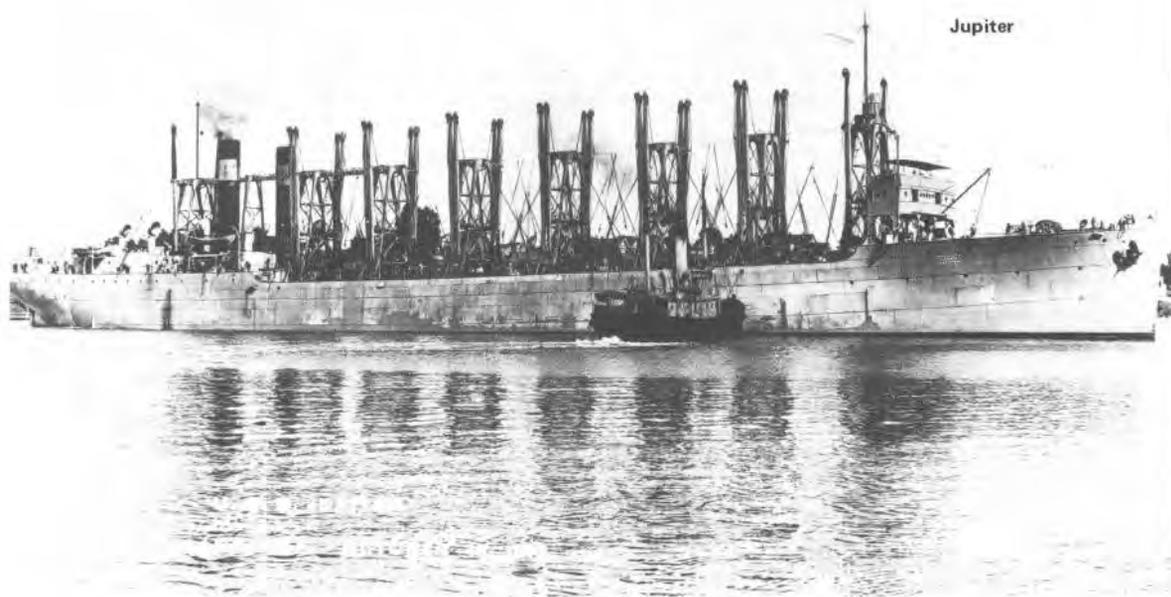
In May 1926, Lieutenant Commander Richard E. Byrd and Aviation Pilot Floyd Bennett made the first flight over the North Pole, in a Fokker trimotor named *Josephine Ford*. Cdr. Byrd added another historic milestone to his naval career in November 1929 when he flew the Ford trimotor *Floyd Bennett* over the South Pole, becoming the first man to fly over both Poles.

In June 1926, elements of the Alaskan Aerial Survey Expedition embarked on an aerial photographic mapping mission never before attempted — to survey the unexplored regions of the mainland of southeastern Alaska. Under the command of Lieutenant B. H. Wyatt, the expedition was composed of five officers and 40 enlisted men, the tender *Gannet*, the barge *YF 88* which housed a photo lab, and three Loening amphibians. To carry on this work, the Alaskan Aerial Survey Detachment was established in April 1929 at San Diego, under the leadership of officer in charge Lieutenant Commander Arthur W. Radford.

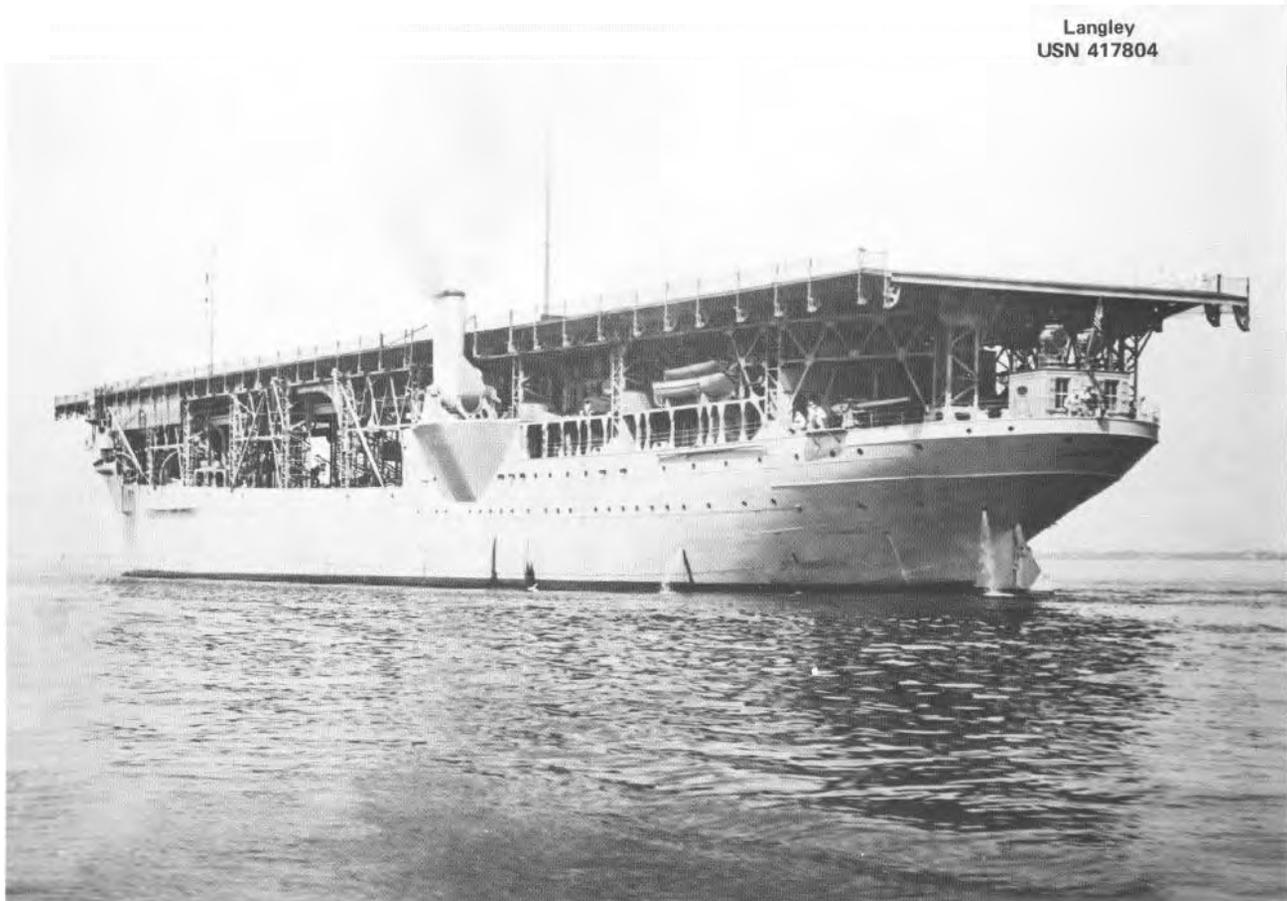
Added to these significant developments in Naval Aviation during the years following WW I was the expanded operation of the rigid airship. Capable of long-range scouting missions and of carrying their own fighter protection, the huge airships could also travel at three times the speed of the fastest surface vessel. Several tragic accidents eventually led to the abandonment of the rigid airship during the 1930s, but the nonrigid blimp went on to provide valuable service during WW II.

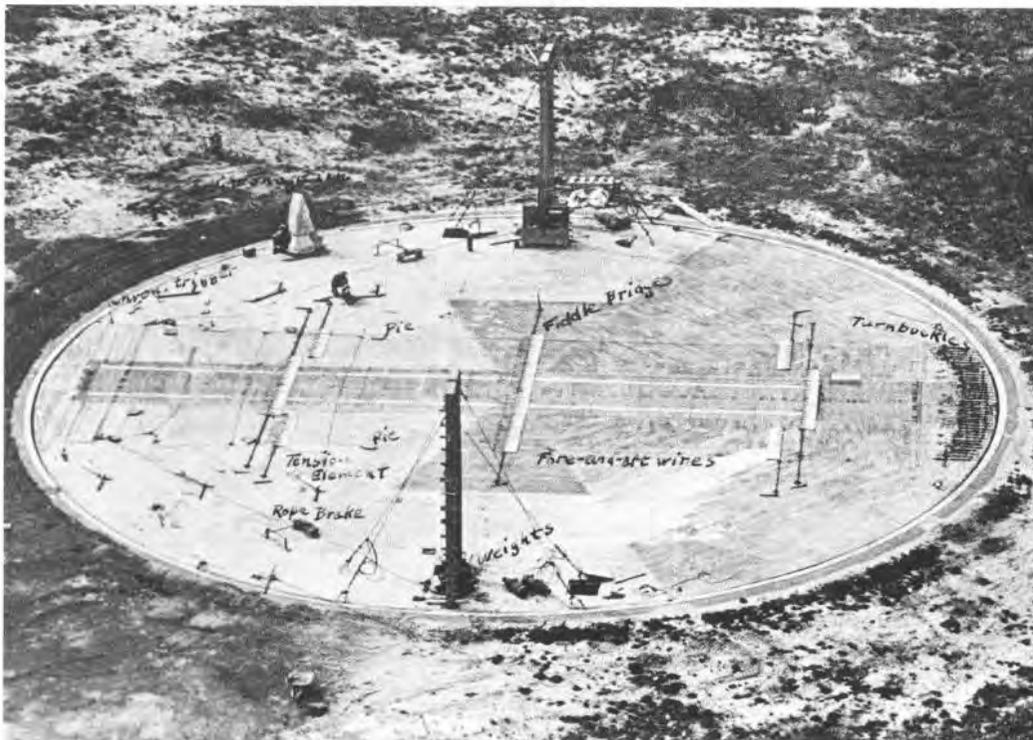
Advancements in aircraft and tactics highlighted the twenties, and the carrier established itself as an integral part of fleet operations. By the end of the decade, two sister carriers, *Lexington* and *Saratoga*, had been commissioned and added to the fleet. These two historic vessels were among the few carriers responsible for stemming the Japanese onslaught in the Pacific in 1942.

III. The Twenties
(1920-1929)

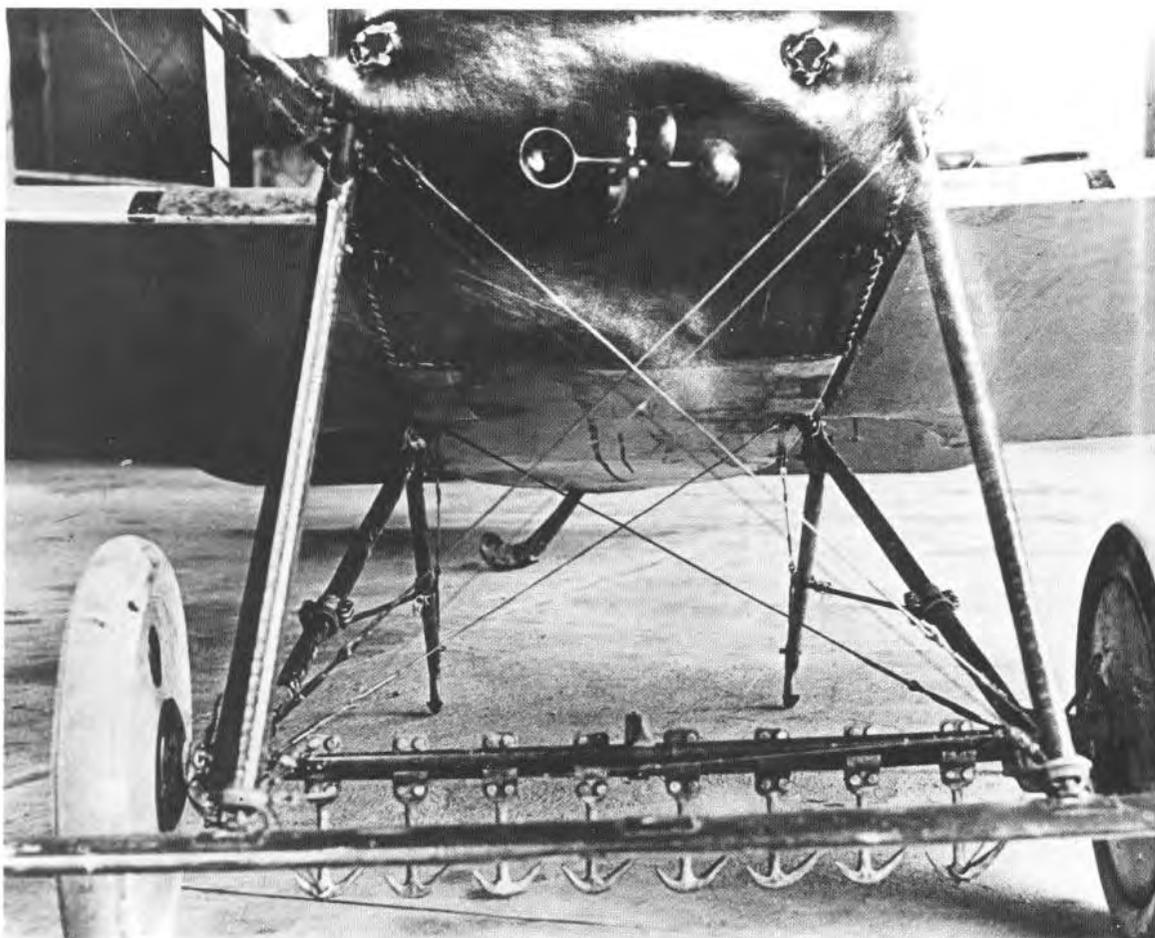


The U.S. Navy's first floating airfield. On March 20, 1922, the former collier Jupiter was commissioned as the aircraft carrier Langley (CV-1).





Much time and effort was expended to develop a practical arresting system for the new carrier. A dummy platform was erected at NAS Hampton Roads, Va., to try out various ideas. One arrangement, later employed on Langley, used a series of hooks attached to the undercarriage of the aircraft.

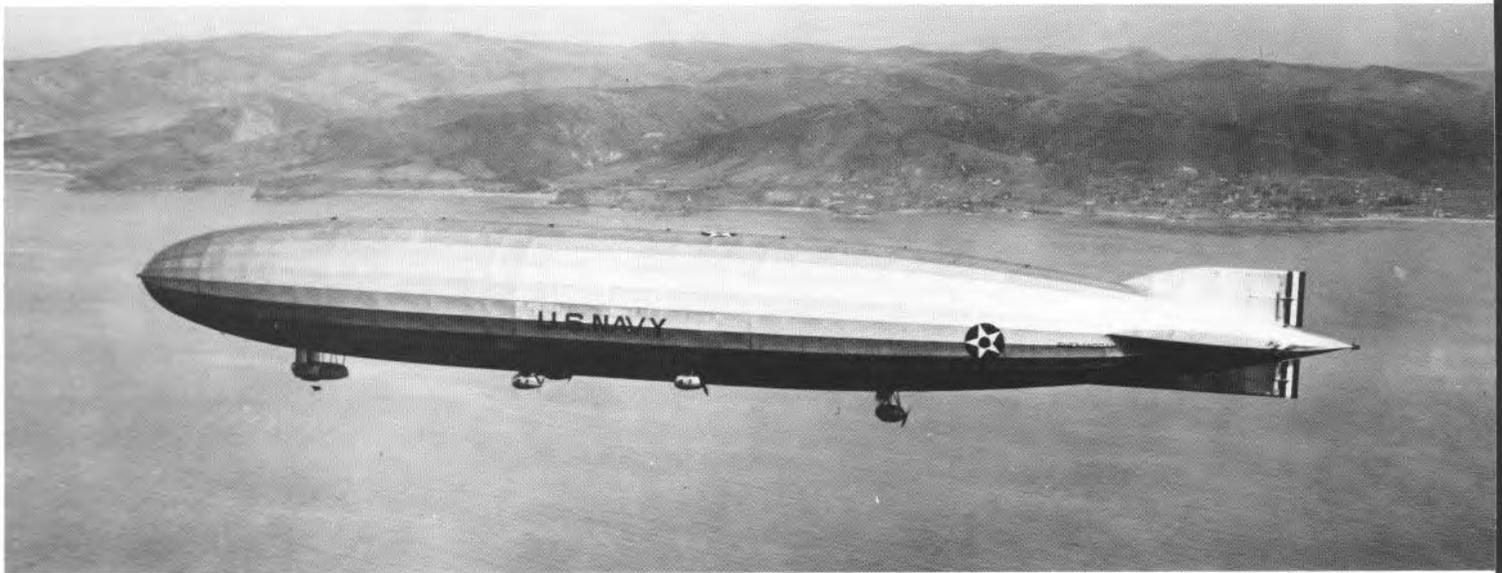


III. The Twenties (1920-1929)

Griffin (left) and Chevalier NH 76210

The U.S. Navy's first takeoff from an aircraft carrier was made from Langley by Lt. Virgil C. Griffin in a Vought VE-7SF on October 17, 1922. Langley was at anchor in the York River, Va. Lt.Cdr. Godfrey deC. Chevalier made the first landing while underway off Cape Henry, Va., on October 26. Shown here is Chevalier just prior to touchdown. NA 19-NS-26-1





The Navy's first rigid airship, Shenandoah (ZR-1), made its maiden flight in September 1923. It was also the first dirigible to use helium instead of hydrogen. USN 428443



Williams

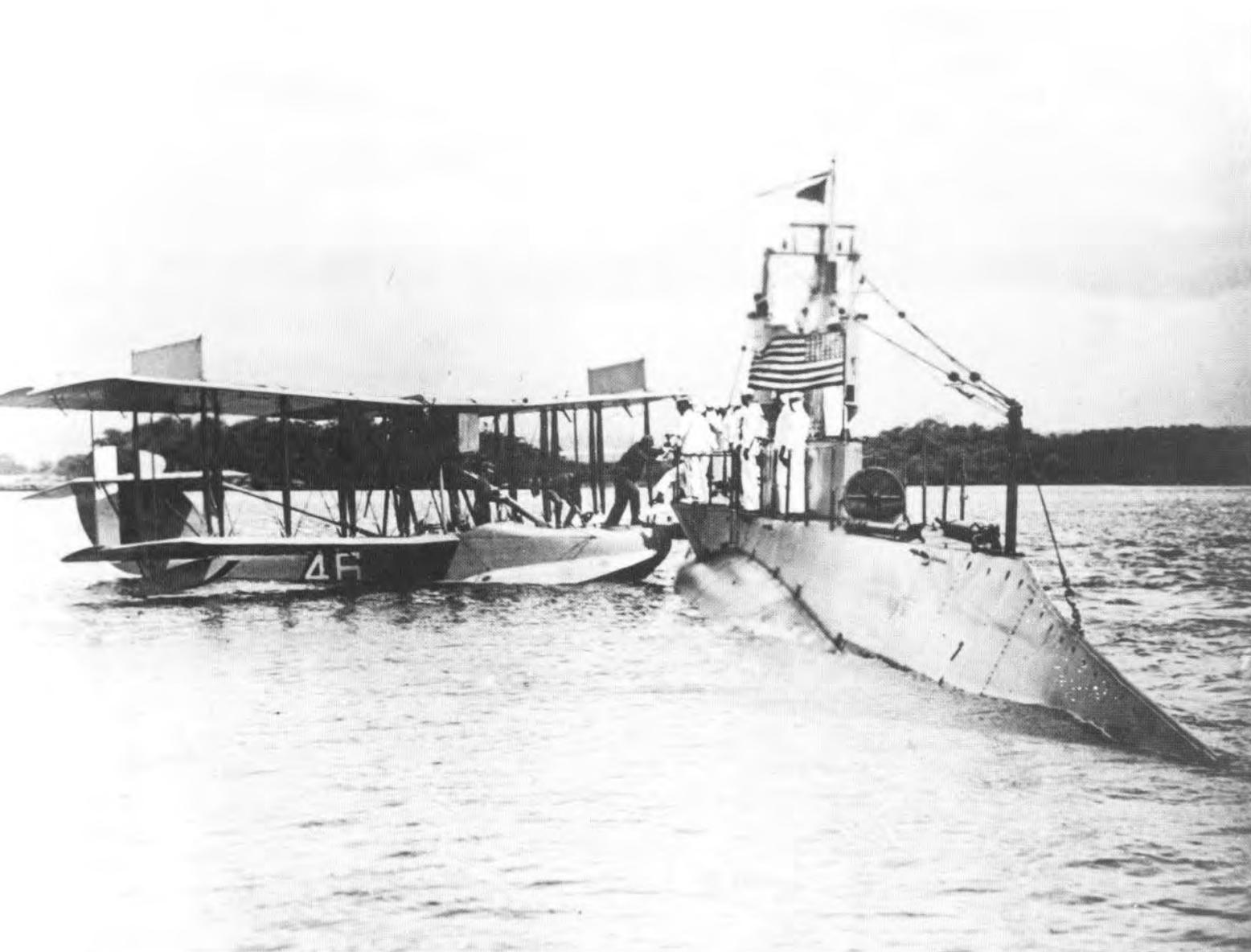


The air races of the 1920s served as developing grounds for the combat aircraft which began to take form in the late 1930s. U.S. Navy aircraft and pilots took many top honors in the great racing events of the decade, including the Curtiss Marine, Pulitzer and Schneider Cup competitions. Pictured is Lt. Alford A. "Al" Williams on a takeoff run during the Pulitzer races of 1923, where he set two new world speed records for 100 and 200 kilometers. AN 8877

III. The Twenties (1920-1929)

The MacMillan Arctic Expedition to Greenland of 1925 employed a Naval Air Detail under Lt.Cdr. Richard E. Byrd to probe further northward over the ice cap. Shown here is one of the three Loening OL-2 amphibians used in the endeavor. NH 44242

Integration of the airplane into fleet operations continued as an overriding theme. Here, a Curtiss HS-2L flying boat participated in operations with an S-1 type submarine in 1924. NH 60769



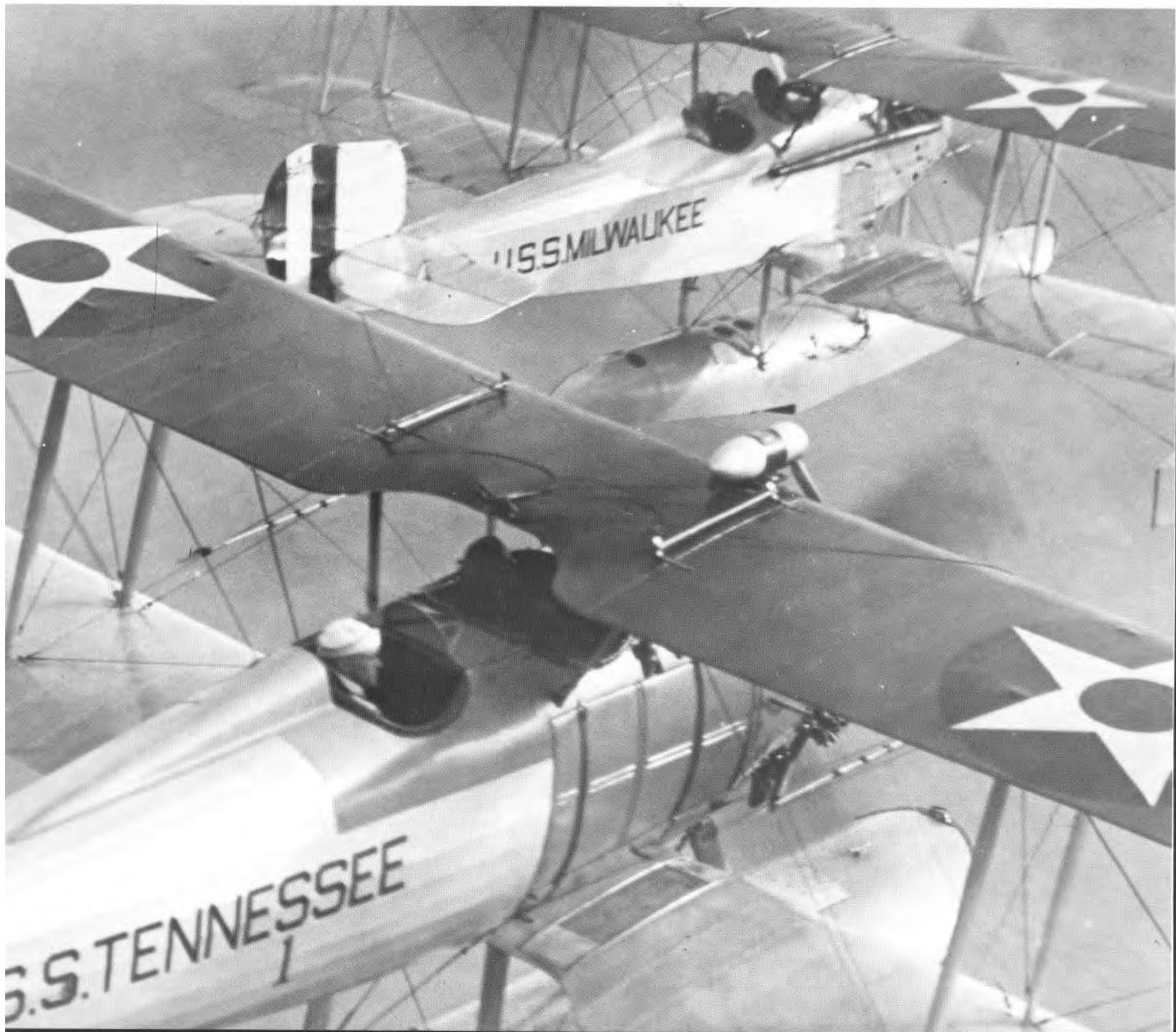
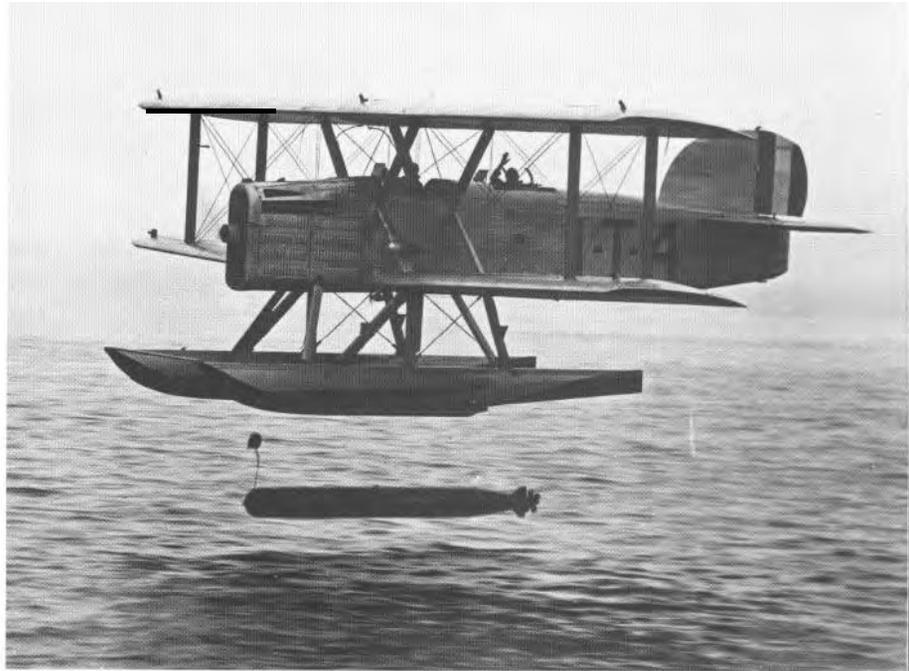


In a dramatic attempt to fly nonstop from San Francisco to Hawaii in 1925, Cdr. John Rodgers and his crew, in a PN-9 flying boat, went down at sea short of their goal. Rigging a sail from wing fabric, they proceeded by wind power to their destination. The actual distance flown in this endeavor became a new world record for Class C seaplanes, which remained unbroken for nearly five years. Left to right are third pilot Kiles R. Pope, pilot Lt. Bryron J. Connell, aircraft commander Rodgers, mechanic William H. Bowlin and radioman Otis G. Stantz.

III. The Twenties (1920-1929)

The decade of the twenties saw considerable experimentation with aerial torpedoes. Here, a Douglas DT-2 makes a drop.

The use of catapult-launched scout aircraft from battleships and cruisers became routine. Shown here are a Vought VE-9H from the cruiser Milwaukee (CL-5) and a Vought UO-1 from the battleship Tennessee (BB-43). NH 72919



Byrd NA 306-NT-549-6



Bennett NH 55481



1926 marked the world's first flight over the North Pole. Lt.Cdr. Richard E. Byrd and Aviation Pilot Floyd Bennett used this trimotored Fokker TA-1 in their successful attempt. Byrd repeated this feat over the South Pole in 1929 with Bernt Balchen as pilot.



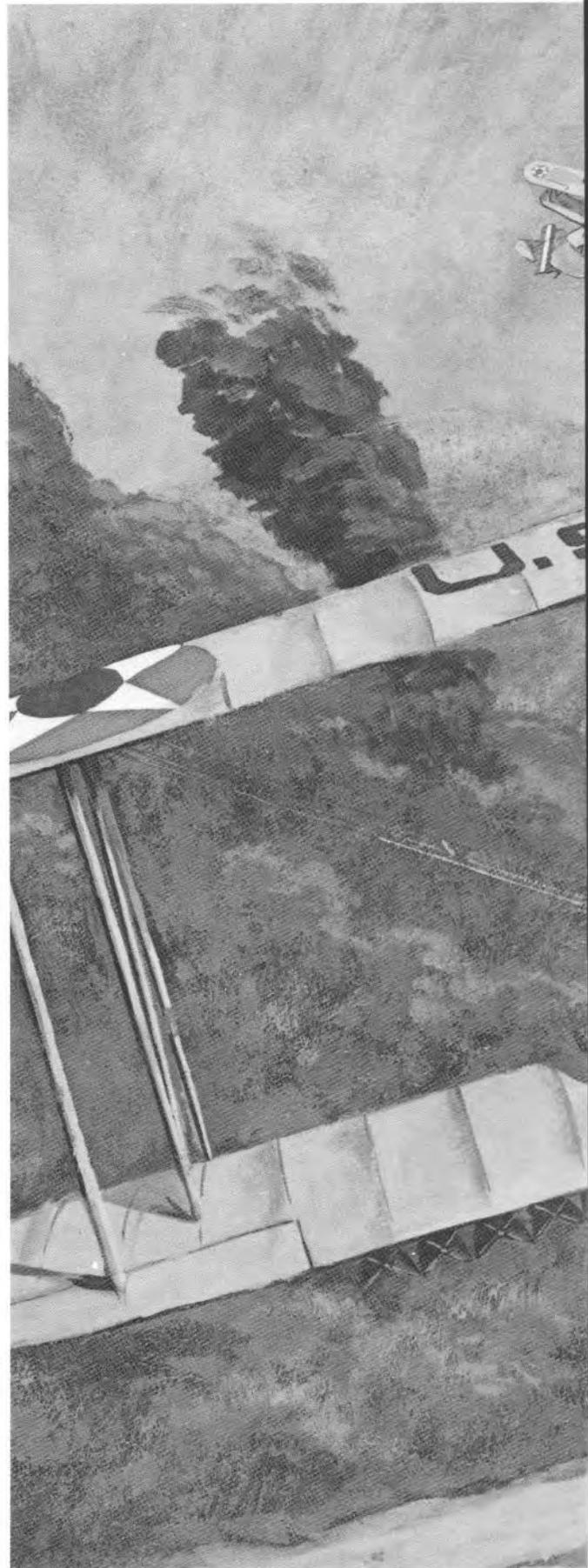
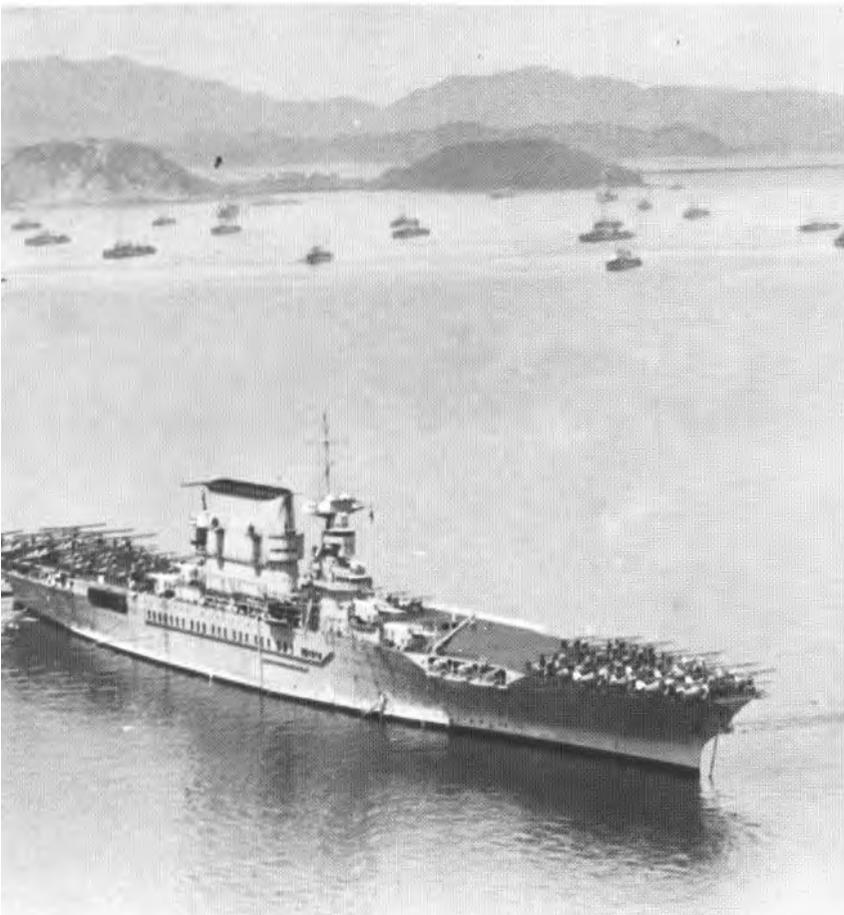
The Navy also investigated the feasibility of operating aircraft from submarines. In May 1926, the submarine S-1 surfaced and launched a Cox Klemin XS-2. USN 1053777

III. The Twenties (1920-1929)

Artist Lt.Col. A. Michael Leahy. USMCR(Ret.).
Copyright U.S. Naval Institute. Used by permission.

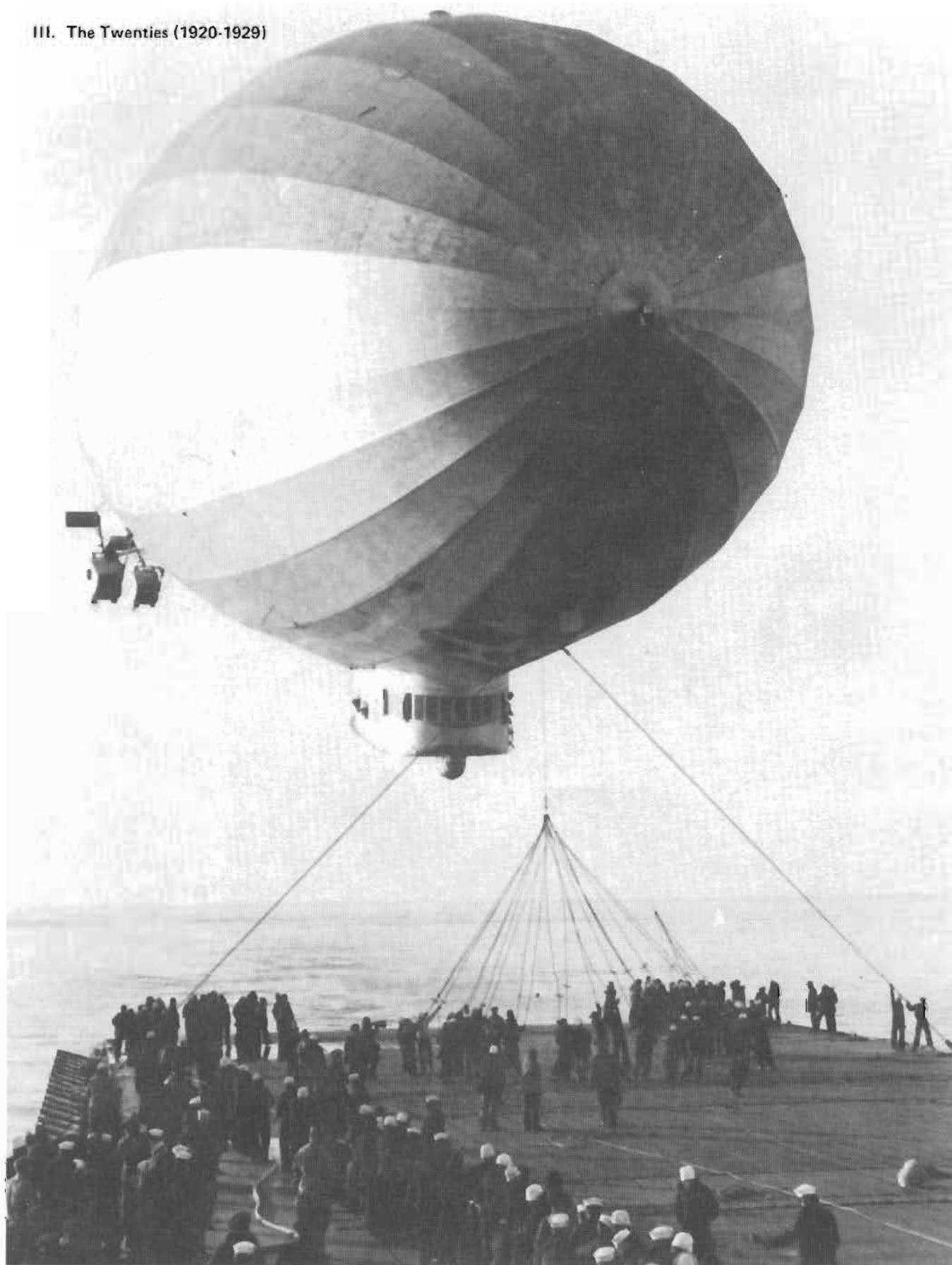
The Marines also made strides during the twenties toward development of the airplane's mission in terms of the Corps' own special brand of warfare. These Curtiss OC-2 Falcons provided credibility to the concept of close air support during the Nicaraguan campaign.

The carriers Lexington (CV-2) and Saratoga (CV-3) were commissioned in November and December 1927, respectively. Saratoga is seen anchored off Panama in the late 1920s.





III. The Twenties (1920-1929)





Airships participated in fleet operations. Here, Los Angeles (ZR-3) is seen with carriers Lexington (CV-2) and Saratoga (CV-3) and the airship tender Patoka (AO-9). The accompanying photo shows Los Angeles landing aboard Saratoga in 1928. NA 80-G-463051



Lt. Charles E. Rosendahl survived the crash of Shenandoah on September 3, 1925, and later commanded Los Angeles. He was a lifelong advocate of Navy lighter-than-air. NA 80-G-186732

IV. The Thirties (1930-1939)

The economic depression of the early thirties slowed the expansion of Naval Aviation. But, surprisingly, research and development continued.

Lieutenant Apollo Soucek topped his own world altitude record of 1929 when he flew his *Apache* to a new height of 43,166 feet. Other tests on September 23, 1931, set the stage for future vertical flight. Lt. A. M. Pride piloted the Navy's first rotary-wing aircraft, an XOP-1 autogiro, landing aboard and taking off from *Langley* while underway.

Official Navy participation in air races was drastically curtailed in the thirties due to economic restrictions. Under a congressional mandate to complete a five-year program of building up and maintaining 1,000 aircraft and two large airships, it became necessary to limit costs. Navy withdrawal from official competition was a disappointment to many — especially men like Lieutenant Al Williams, who elected to continue on his own.

Some of the gains in aviation technology dur-

ing the thirties included improved radios, super-charged engines, controllable-pitch propellers, retractable landing gear and folding wings. The most obvious change in heavier-than-air craft, however, was the transition from biplane to single-wing design. New aircraft such as the TBD-1 torpedo bomber, F4F fighter and the PBY patrol plane began to take form.

Hydraulic arresting gear and catapults were installed in the three carriers that joined the fleet in the 1930s. *Ranger*, the first U.S. Navy ship to be built from the keel up as an aircraft carrier, was commissioned in 1934 — followed by *Yorktown* and *Enterprise* in 1937 and 1938, respectively.

Increased numbers of aircraft were used during the thirties, turning what had previously been individual feats into the coordinated efforts of squadrons. In 1934, six Consolidated P2Y-1s of VP-10F, commanded by Lieutenant Commander K. McGinnis, made a nonstop flight from San Fran-



Naval Aviation entered the 1930s having received the first deliveries of the new Boeing F4B-1 fighter a few months before. This well-known classic made its first appearance aboard *Langley* and *Lexington*. David S. Ingalls, Assistant Secretary of the Navy and the Navy's first ace during WW I, had one modified for his use as an executive aircraft. Improved versions of the F4B remained in service throughout the decade. USMC 514948



Lt. Apollo Soucek, flying a Wright Apache aircraft, set a new world altitude record of 43,166 feet in June 1930. NA 80-G-416204

USN 460290

cisco to Pearl Harbor in 24 hours and 35 minutes. This record bettered the best previous time and exceeded the distance record for mass flights in C Class seaplanes.

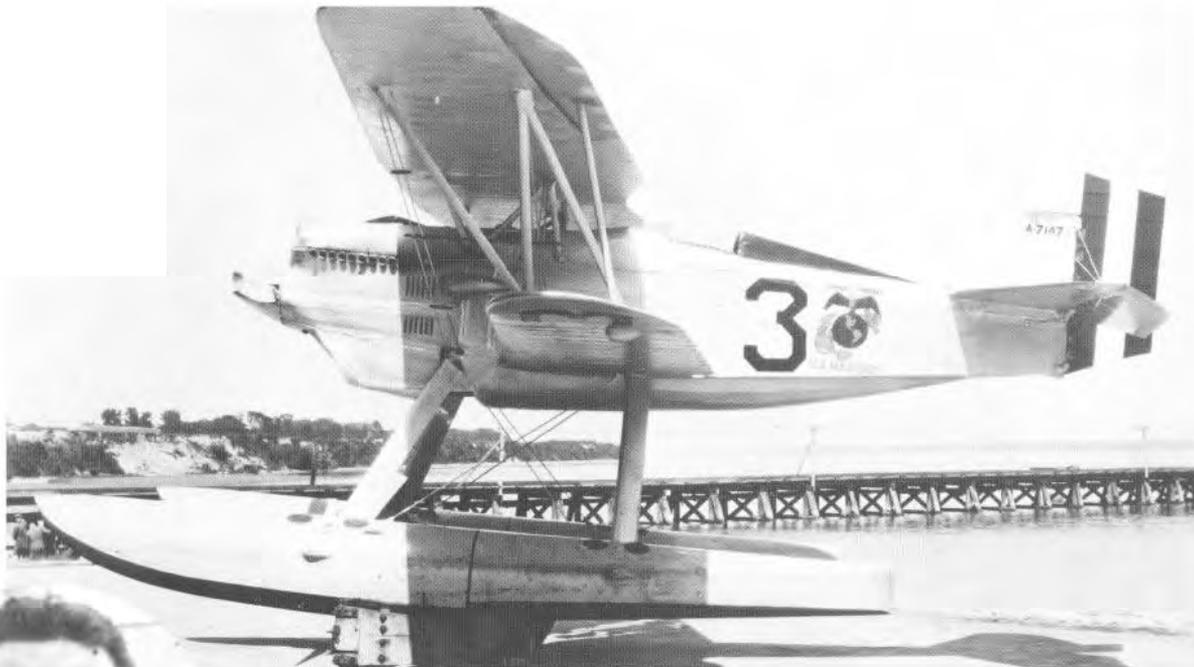
Passage of the Aviation Cadet Act on April 15, 1935, created the grade of Aviation Cadet in the Navy and Marine Corps reserves. The new program offered pilot training to qualified individuals between the ages of 18 and 28 who would receive one year of flight instruction, benefits of pay, uniform gratuities and insurance. After serving three additional years on active duty, participants were commissioned ensigns or second lieutenants, paid a bonus of \$1,500 and returned to inactive duty as members of the Reserves.

With the commissionings of the giant rigid airships *Akron* and *Macon* early in the decade, the Navy finally had vehicles capable of long-range reconnaissance missions. Aside from their increased size and technical improvements over

previous rigid airships, they were also capable of carrying aircraft. On the underside of their gigantic hulls was a T-shaped door through which aircraft could be hoisted or lowered on a trapeze recovery/launch device to and from an internal hangar. Though ZRS-4 and ZRS-5 were considered unique among airships of the day, their contributions to fleet operations were short-lived. The crashes of *Akron* in 1933 and *Macon* in 1935 ended the Navy's rigid airship program. Nonrigid airships, however, continued to operate successfully for many years and were used extensively for convoy and antisubmarine warfare during WW II.

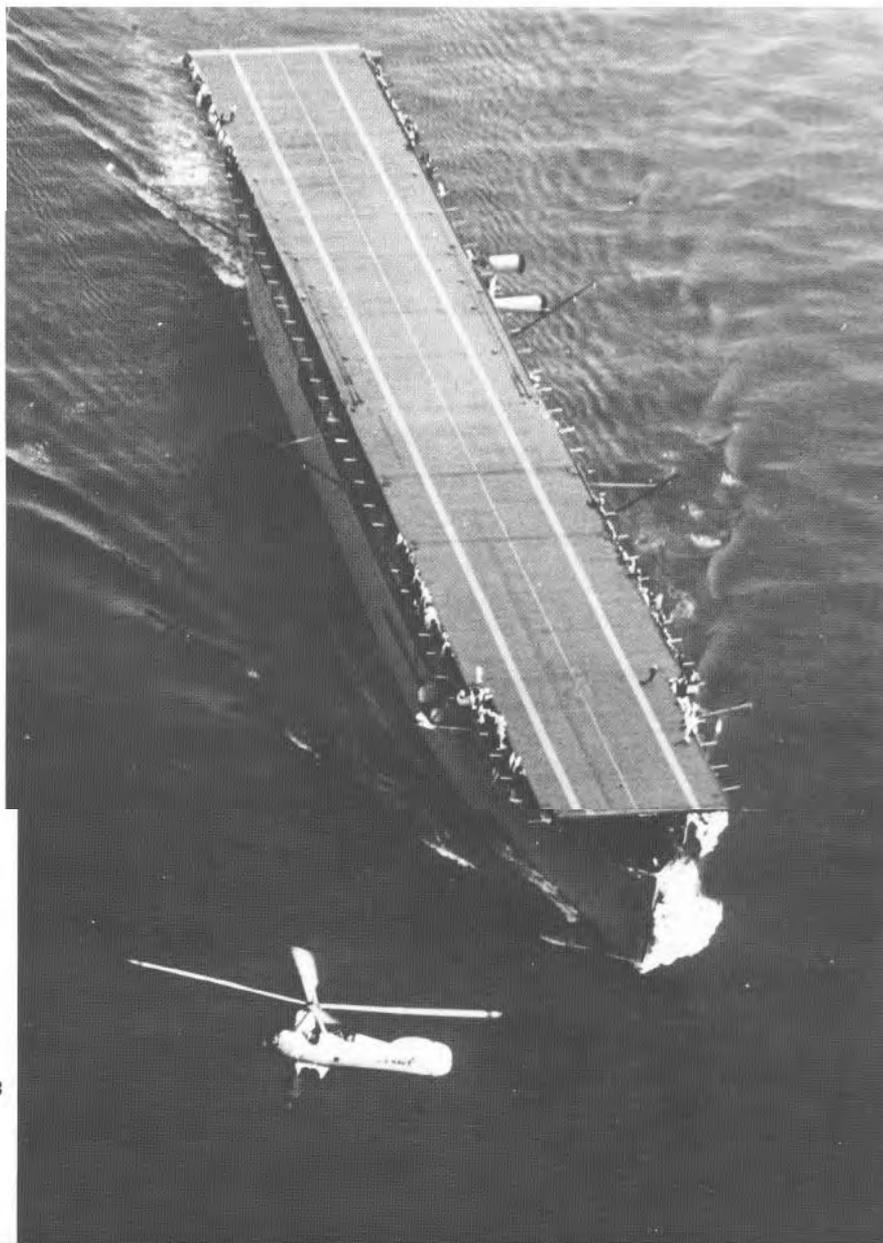
As signs of another world conflict appeared in Europe and East Asia, Naval Air continued to grow. Pilot training and aircraft procurement were stepped up and new carrier designs were on the boards. As the decade drew to a close, Naval Aviation was being accepted as an integral arm of U.S. naval power.

IV. The Thirties (1930-1939)

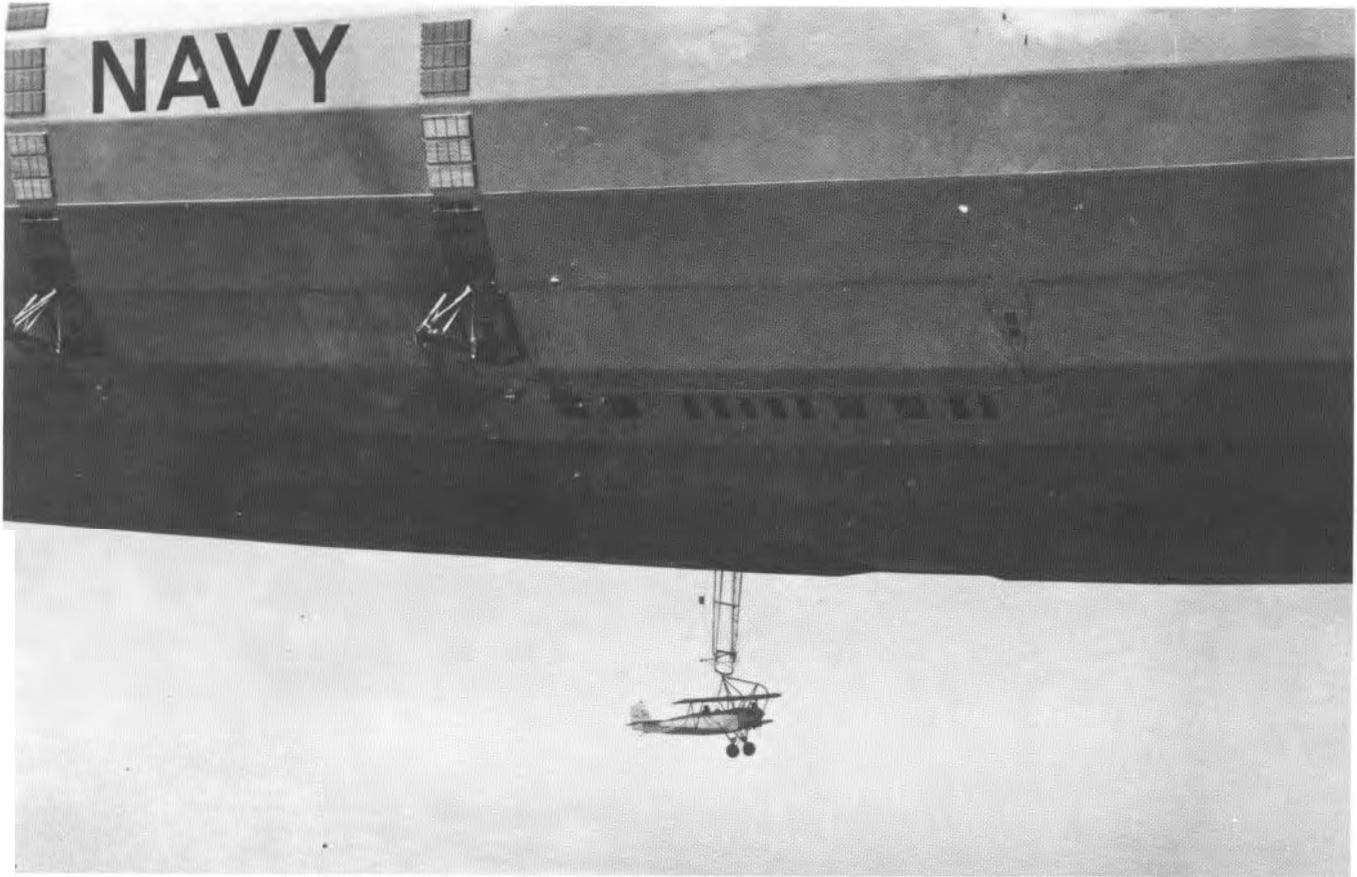


USN 460434

The last Curtiss Marine Trophy Race was flown over the Potomac River off NAS Anacostia in May 1930. Marine Capt. Arthur H. Page took top honors in a Curtiss F6C-3 fighter with a speed of 164.08 miles per hour. Page lost his life in this aircraft months later at the National Air Races.



USN 466608



The airship Akron was commissioned in October 1931 and in May of the following year made her first recovery of aircraft. Here, a Consolidated N2Y hooks on. Tragedy struck in April 1933 when Akron crashed in a severe storm off the New Jersey coast, killing 73, including Chief of the Bureau of Aeronautics RAdm. William A. Moffett. USN 416528



The U.S. Navy ordered its first rotary-wing aircraft, the Pitcairn XOP-1, in January 1931. Lt. Alfred M. Pride, who had done so much to develop the Navy's original arresting gear system, made the first rotary-wing landings and takeoffs aboard Langley while she was underway in September of that year.

USN 215856





Settle NA 306-NT-87213



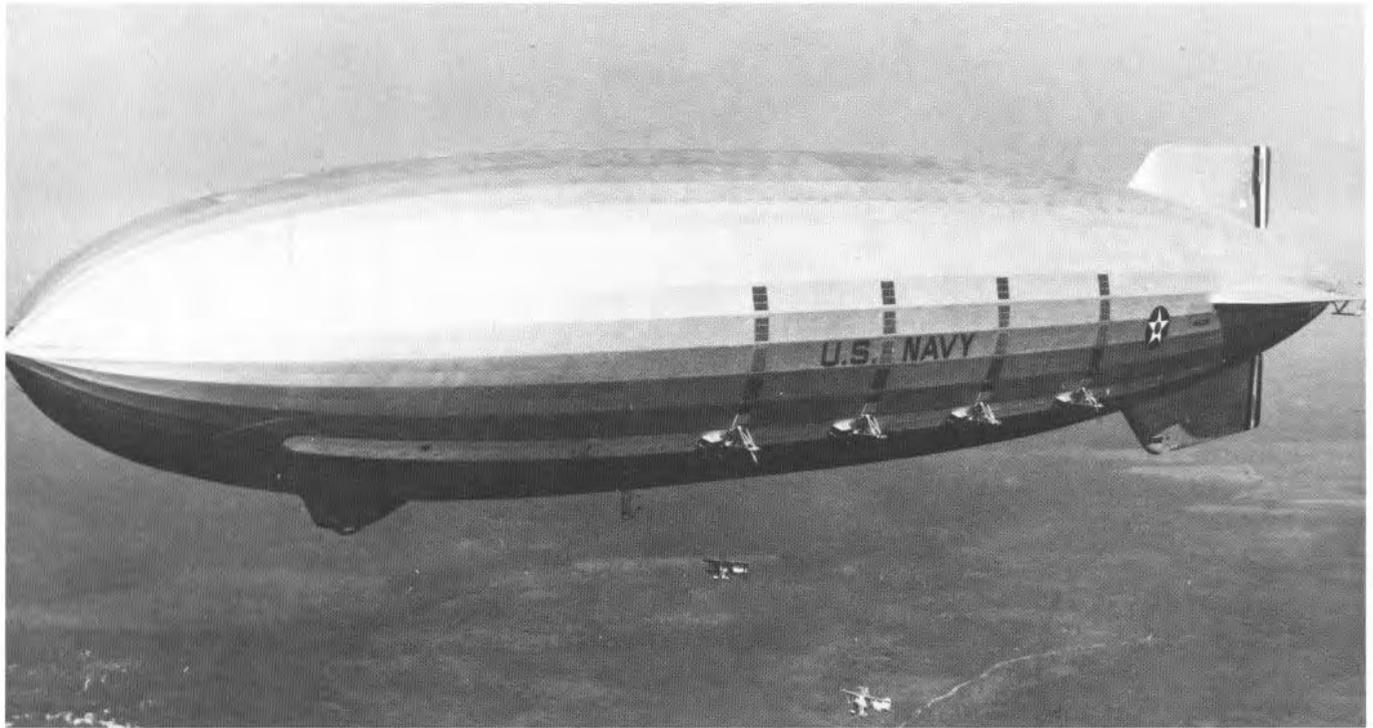
Lt.Cdr. Thomas G. "Tex" Settle, USN, and Maj. Chester L. Fordney, USMC, set a world's altitude record of 61,237 feet in a 600,000-cubic-foot free balloon on November 20, 1933. Here, the balloon is shown being readied for flight at the Akron, Ohio, municipal airport.

IV. The Thirties (1930-1939)

In January 1934, six Consolidated P2Y-1 patrol aircraft of Patrol Squadron 10F, under Lt.Cdr. Knefler "Soc" McGinnis, flew from San Francisco to Honolulu in 24 hours and 35 minutes, setting several records and demonstrating the increased reliability and flexibility of patrol aviation.
USN 17806



IV. The Thirties (1930-1939)

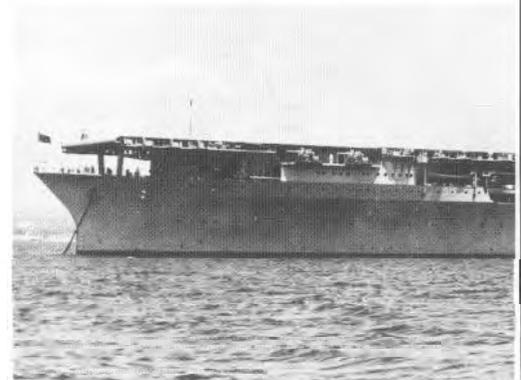


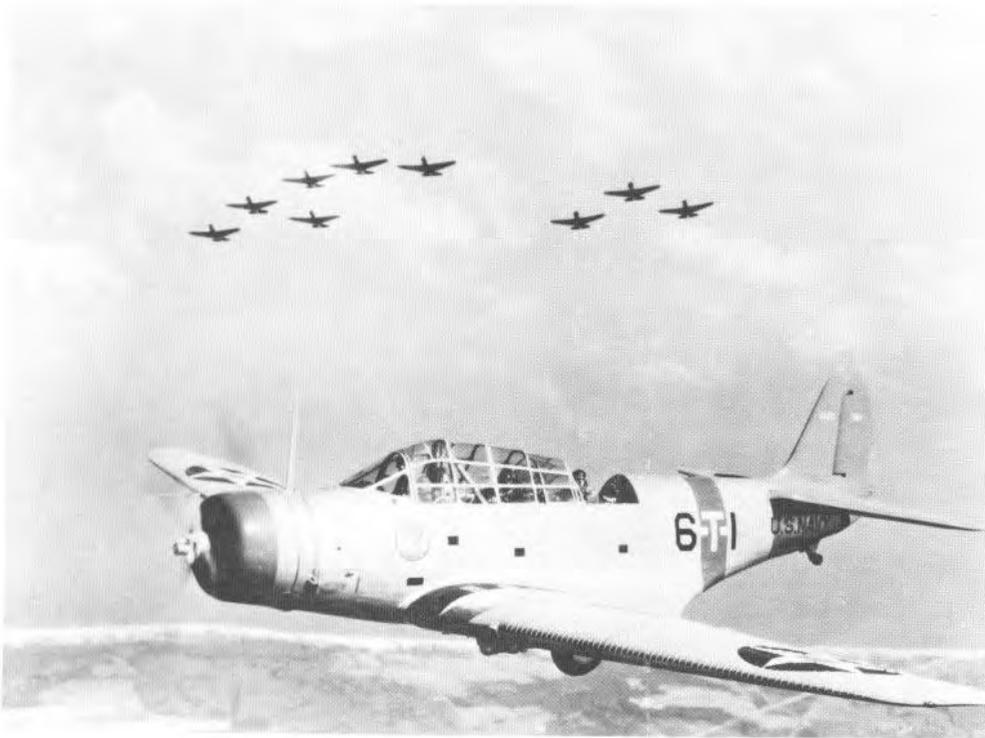
The airship Macon, which was commissioned in June 1933, continued to make a case for the big dirigibles working with fleet units and participating in fleet exercises throughout 1934. This photo shows her about to recover two of her Curtiss F9C-2 Sparrowhawk fighters. Macon crashed off Point Sur, Calif., on February 12, 1935, killing two crew members and signaling the end of rigid airships in the U.S. Navy.



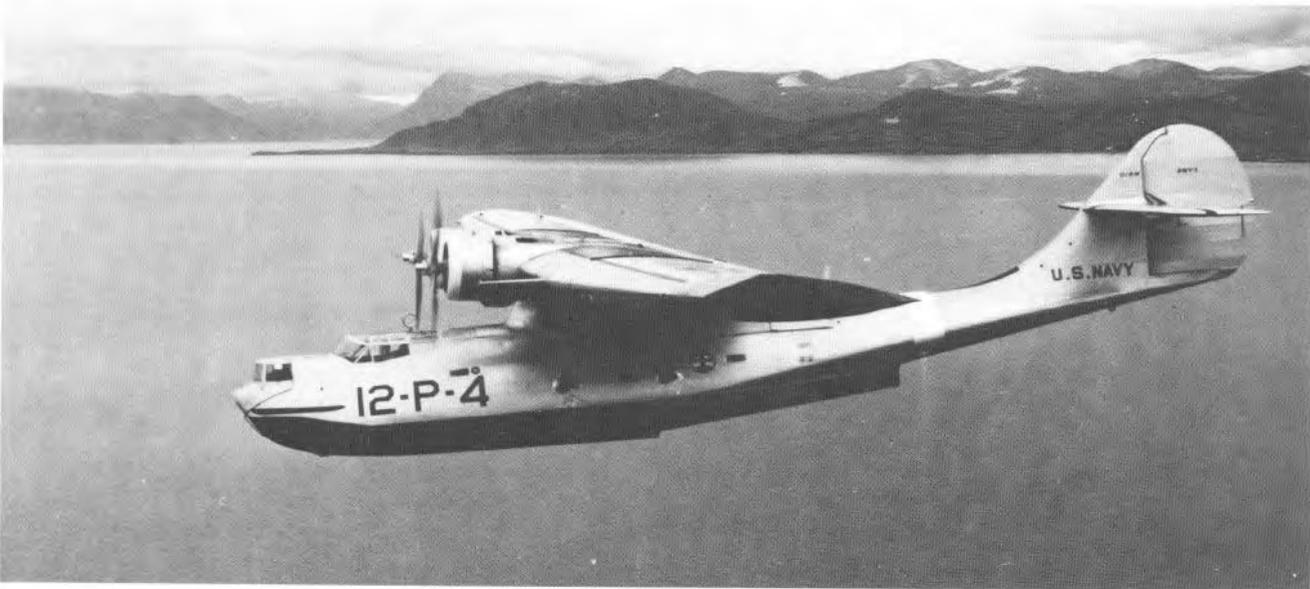
One of Macon's F9C-2 Sparrowhawks. NH 77428

Ranger, the first U.S. Navy ship to be built as a carrier from the keel up, was commissioned in Norfolk, Va., on June 4, 1934, and two months later conducted her first air operations off Cape Henry, Va.





By the end of the decade, it was clear that monoplanes were the aircraft of the future. The first Douglas TBD-1 Devastator, like those shown here, was delivered to Torpedo Squadron 3 in October 1937. Other monoplane aircraft were in the final stages of development. USN 19342



War clouds were gathering quickly. In September 1939, President Roosevelt ordered the Navy to establish a Neutrality Patrol to guard the sea approaches to the United States and the West Indies. Consolidated PB1Y-1 aircraft patrolled the Atlantic from Greenland to the northern coast of South America.

V. World War II (1940-1945)

Rumblings of war again reached across the oceans and Naval Air units would soon be called to protect American interests in connection with the spreading conflict. German U-boats brought the threat of naval warfare into the western Atlantic, and President Roosevelt ordered the Navy to establish a neutrality patrol to keep an eye on any approaches to the U.S. coast.

The attack on Pearl Harbor on December 7, 1941, demonstrated the power of sea-based aviation as Japanese carrier planes devastated America's principal naval base in the Pacific and eliminated a major portion of the Navy's surface power. But, aided by her distance from the enemy and her industrial strength, the United States rallied and produced the needed ships, aircraft, equipment, and trained pilots which made up the forces needed to ensure victory.

In a real sense, Naval Aviation came of age during WW II.

With the wartime expansion of Naval Aviation, the Navy was confronted with a training problem unprecedented in its experience. To meet the fast-growing need for pilots, ground officers at air stations and enlisted personnel in aviation ratings, functional training commands were established. Separate air commands provided operational, primary, intermediate, technical and naval airship training. To ensure standardization and uniform excellence of flight instruction, the Flight Standardization Board was established, whose members made regular visits to the primary training bases and flew with the instructors to check on their aptitude, procedures and current knowledge. In 1943, the Training Division of the Bureau of Aeronautics was transferred to the newly created Deputy Chief of Naval Operations for Air, and the Chief of Naval Air Training was established with cognizance over all primary, intermediate and operational training commands.

Naval Air power began the fight with one small and seven large aircraft carriers; five patrol wings and two Marine aircraft wings; 5,233 aircraft, including training types; 10 dirigibles; and 5,900 officers and 21,678 enlisted members. During the war, the force grew to over 100 carriers of various types, 40,900 aircraft, 168 airships, 60,095 pilots and 370,760 aviation support personnel.

Early in the war, enemy submarine contacts and the sinking of merchant ships were almost a daily occurrence in U.S. coastal waters. This reaffirmed the need for fleet airship groups and their

squadrons. Coastal patrol and escort of convoys became their primary missions, in addition to the general utility role. During wartime operations, the Navy's airship fleet made 55,900 operational flights totaling 550,000 hours. Only one airship was lost to enemy action.

Tactics and doctrine developed in the twenties and thirties were perfected during the forties, and new combat techniques were added to the Navy's inventory.

As the war progressed, the Navy placed much emphasis on instrument flight training and procured airborne radar for fleet aircraft. Combat requirements in the early days of the war in the Pacific resulted in the development of aircraft capable of night operations.

The PBY *Catalinas*, or *Cats*, were the only long-range patrol aircraft available in nearly adequate numbers during the first years of the war. Though they were slow and vulnerable by day, airborne radar which became available in 1942 allowed them to become "surefooted" and deadly at night against enemy surface and shore installations. Ingenious *Cat* crews of VP-11 experimented with mixtures of soap and lamp black to give their aircraft a coating that made them difficult to see against the night sky, earning them the name *Black Cats*. The first official *Black Cat* squadron was VP-12, which operated its PBY-5As from Henderson Field on Guadalcanal, scouring the New Georgia Sound for Japanese warships and cargo vessels that came south at night to supply their troops and to bombard U.S. positions. As the allied offensive gathered momentum, the *Black Cats* moved westward in the vanguard, operating from tenders and makeshift bases and accounting for the sinking or disabling of hundreds of thousands of tons of enemy shipping.

In conjunction with the night patrol operations, the first carrier-based night intercept attempts were initiated from *Enterprise* during the Gilbert Islands campaign in November 1943. Separate night attack and night intercept missions converged to form a night combat air group, CVLG(N)-41, aboard *Independence* in the summer of 1944, soon joined by CVG(N)-90 embarked on *Enterprise*.

From those successful, innovative night operations, all-weather flying evolved. Instruments, equipment, techniques and tactics were developed so that carrier-based aircraft could operate in any environment.

Advances in technology and stepped-up ship

construction contributed greatly to the effectiveness of Naval Aviation in the war years. Radar and other improved electronics made it possible for airmen to virtually see in the dark to detect underwater prowlers. New *Essex*-class carriers gave the fleet improved striking power, and some major naval engagements were fought entirely with air power without opposing surface forces visually sighting each other. Large numbers of smaller escort carriers provided tactical air power in the Atlantic and Pacific, close air support of amphibious landings on jungle islands, and improved capability against enemy submarines. Patrol aviation was expanded to cover all the waters of the globe.

The young airmen of the twenties had grown wiser with experience. Equipped with WW II aircraft,

weapons and tactics, they had checked the Japanese advances at the Battles of the Coral Sea and Midway, stemmed the onslaught at Guadalcanal, and turned the tide in the Pacific from Tarawa and Kwajalein to Saipan and the Gulf of Leyte, to Iwo Jima and Okinawa, and finally carried the offensive to the Japanese homeland.

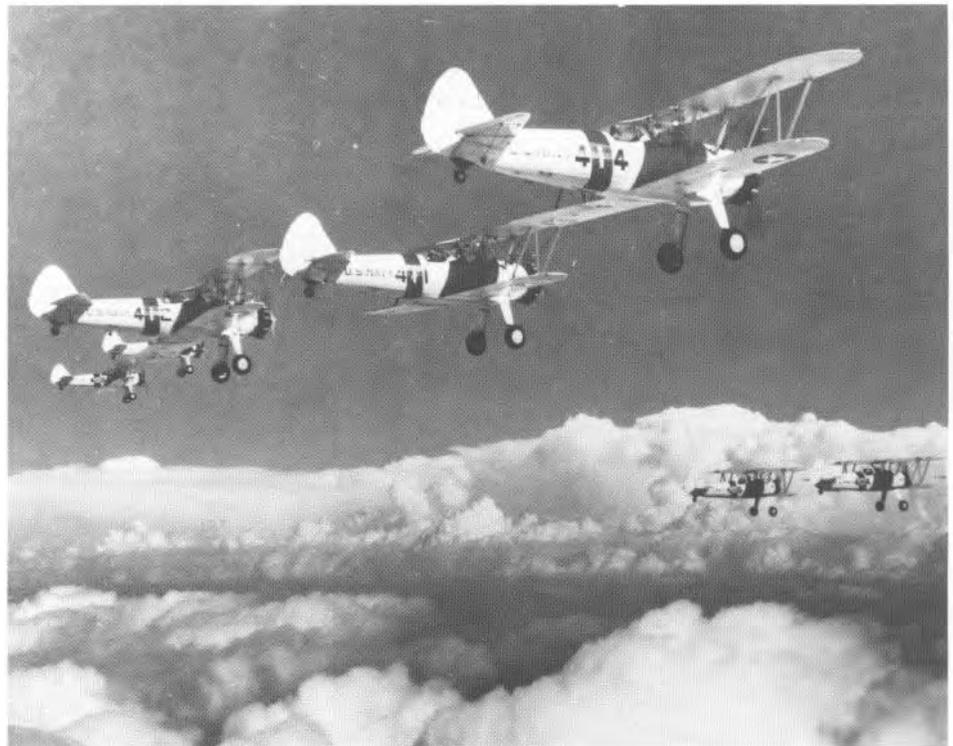
In the course of the war, Navy and Marine Corps pilots destroyed 15,000 enemy aircraft, sank 174 Japanese warships and, in the Atlantic, destroyed 63 German U-boats. The Navy's air arm played a major part in achieving control of the seas and final victory. By war's end, Naval Aviation had emerged as one of the Navy's most flexible and devastating weapons.



On December 7, 1941, "a day that will live in infamy," Japanese carrier aircraft attacked Pearl Harbor. USN 16871



Fortunately, at the time of the attack on Pearl Harbor, the three aircraft carriers assigned to the U.S. Pacific Fleet, including Saratoga shown here with a full flight deck, were at sea. NH 92500



Americans dug in for the long task ahead. Naval Aviation expanded by leaps and bounds. The venerable N2S Stearman biplanes trained thousands of Naval Aviators for the fleet. NA 80-G-41554

V. World War II (1940-1945)



The Navy needed support personnel for its burgeoning air arm. Women as well as men answered the call. Here, Waves learn how to tear an aircraft engine down and put it back together again. NH 86160

New Navy pilots found carrier operations a challenge. Landing signal officers (LSOs) had one of the toughest jobs of all. USN 319008



V. World War II (1940-1945)



O'Hare USN OOR-10036

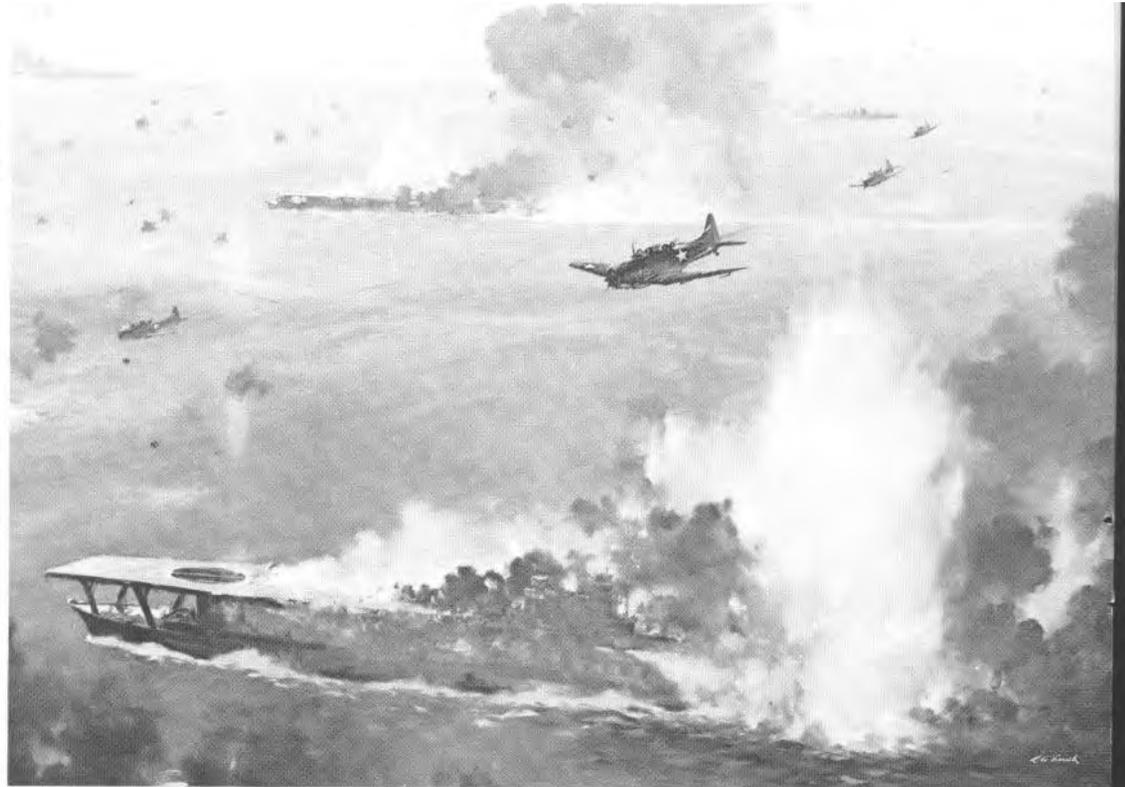


Thach NA 80-G-64835

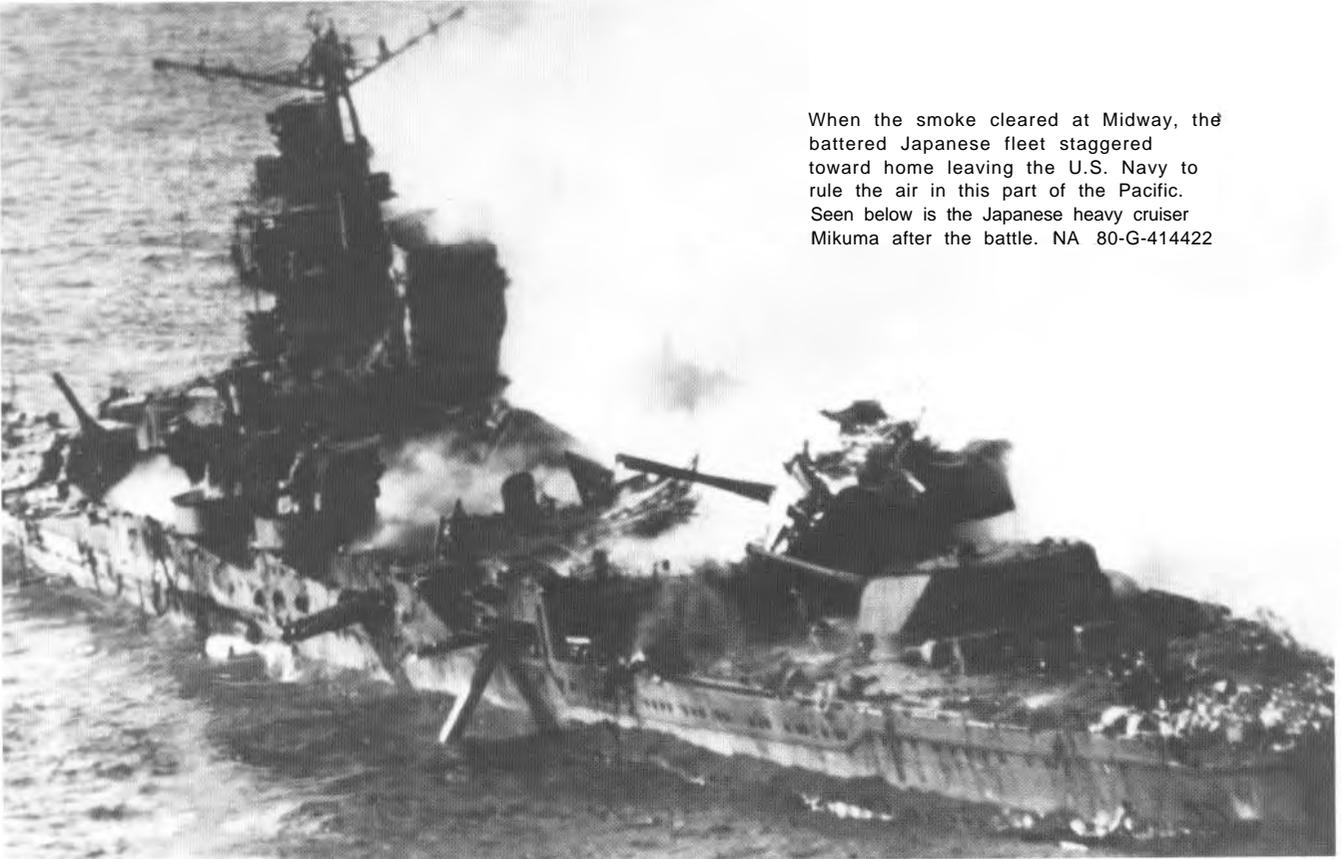


Naval Aviators developed new techniques to cope with the fast and highly maneuverable Japanese fighters known as Zeroes. An especially innovative tactic was the famous Thach Weave devised by Lt.Cdr. John S. "Jimmy" Thach while he was commanding officer of Fighter Squadron 3. One of Thach's pilots, Lt. Edward H. "Butch" O'Hare, became the Navy's first WW II ace, at the Battle of the Coral Sea. Thach and O'Hare are shown here in their Grumman F4F Wildcat fighters in early 1942. NA 80-G-10613

The Battle of Midway was the turning point of the war in the Pacific. Here, Douglas SBD Dauntless dive-bombers work over Japanese carriers.



Artist R.G. Smith, McDonnell Douglas Corporation



When the smoke cleared at Midway, the battered Japanese fleet staggered toward home leaving the U.S. Navy to rule the air in this part of the Pacific. Seen below is the Japanese heavy cruiser Mikuma after the battle. NA 80-G-414422



An SBD Dauntless in the Pacific. NA 80-G-473572



Geiger USMC 10712

The U.S. invaded the Solomons in mid-1942. Marines flying from the captured enemy airstrip, renamed Henderson Field, held firm against fierce Japanese efforts to retake Guadalcanal. Maj. Gen. Roy Geiger commanded the Second Marine Air Wing at Henderson.



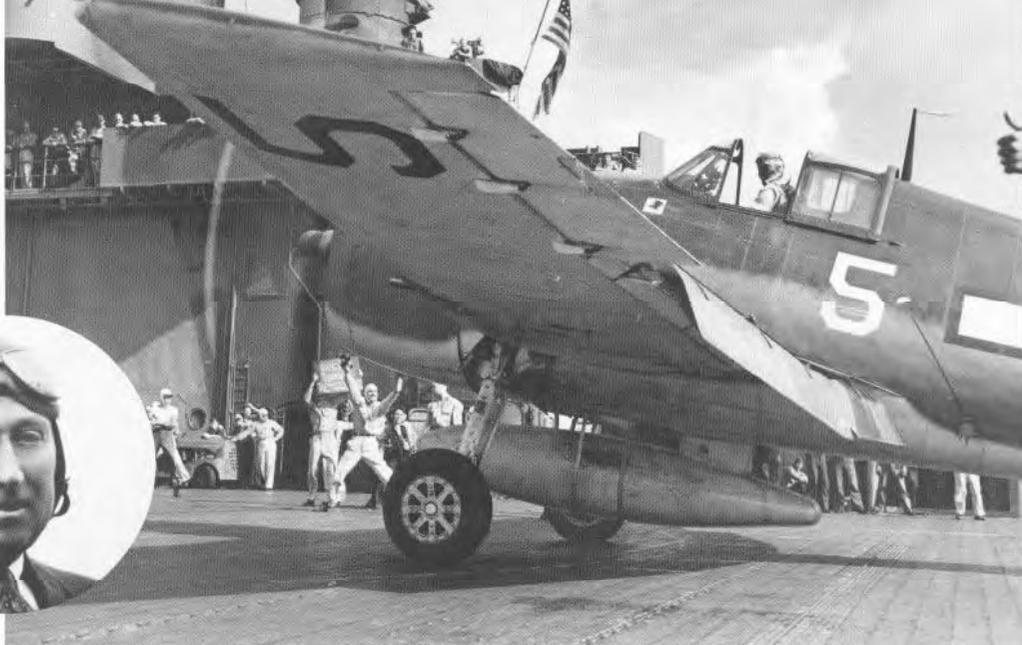
V. World War II (1940-1945)

The great air battles now focused on driving the Japanese from the Solomons. Fighter squadrons like the Grim Reapers of Fighter Squadron 10 under aggressive commanders like Lt.Cdr. James H. "Jimmy" Flatley, Jr., led the way. NA 80-G-412048



Flatley

Called the most significant U.S. Navy fighter of WW II, the Grumman F6F Hellcat entered service in early 1943. By the end of hostilities, it would account for the destruction of over 5,000 enemy aircraft, almost 75 percent of all the Navy/Marine Corps air-to-air victories. Here, a Hellcat is about to take off from Yorktown (CV-10). USN 248440



USN 248440

Leroy Grumman, Naval Aviator #1216 and founder of the Grumman Aircraft Engineering Corp., built some of the Navy's most famous aircraft.

Grumman Aerospace Corporation



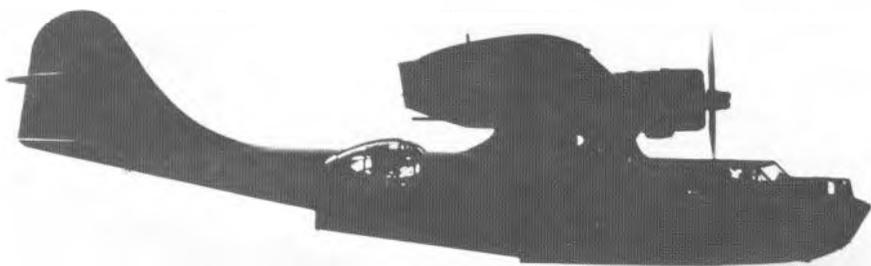
Boyington USMC 302309

Maj. Gregory "Pappy" Boyington's Black Sheep squadron, flying from the island of Vella Lavella, offered to down a Japanese Zero for every baseball cap sent to them by major league players in the World Series. They received 20 caps and shot down many more enemy aircraft. Boyington was the Marine Corps' top ace of WW II. USMC 68317

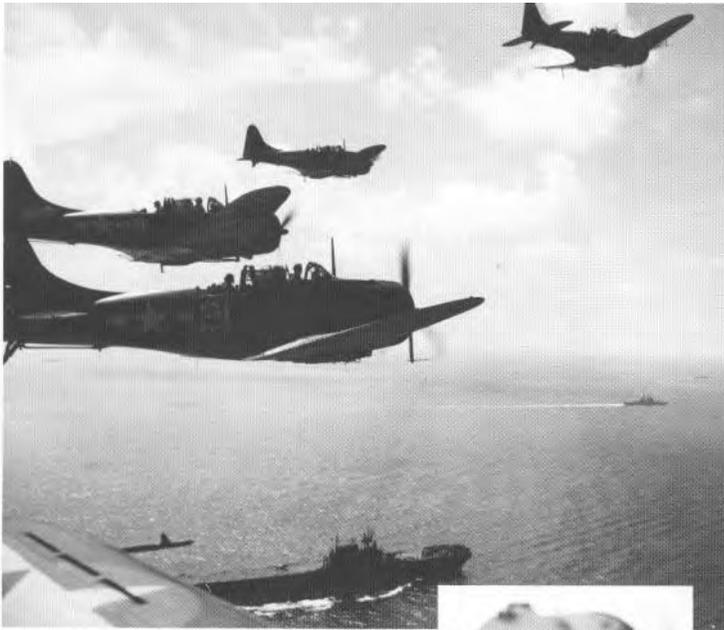


Taff

PBY Catalina flying boats from Black Cat squadrons prowled the south and southwest Pacific at night in search of Japanese combatant and cargo vessels. They left a trail of burning ships from the Solomons to the Philippines. Cdr. C.O. Taff commanded the first official Black Cat squadron, Patrol Squadron 12. USN 11379



V. World War II (1940-1945)



The fast carrier task force had come to be recognized as the cutting edge of naval power in the Pacific. Adm. Marc A. Mitscher was one of the most highly regarded of carrier task force commanders and an acknowledged master of the tactical employment of Naval Air power. USN 251067

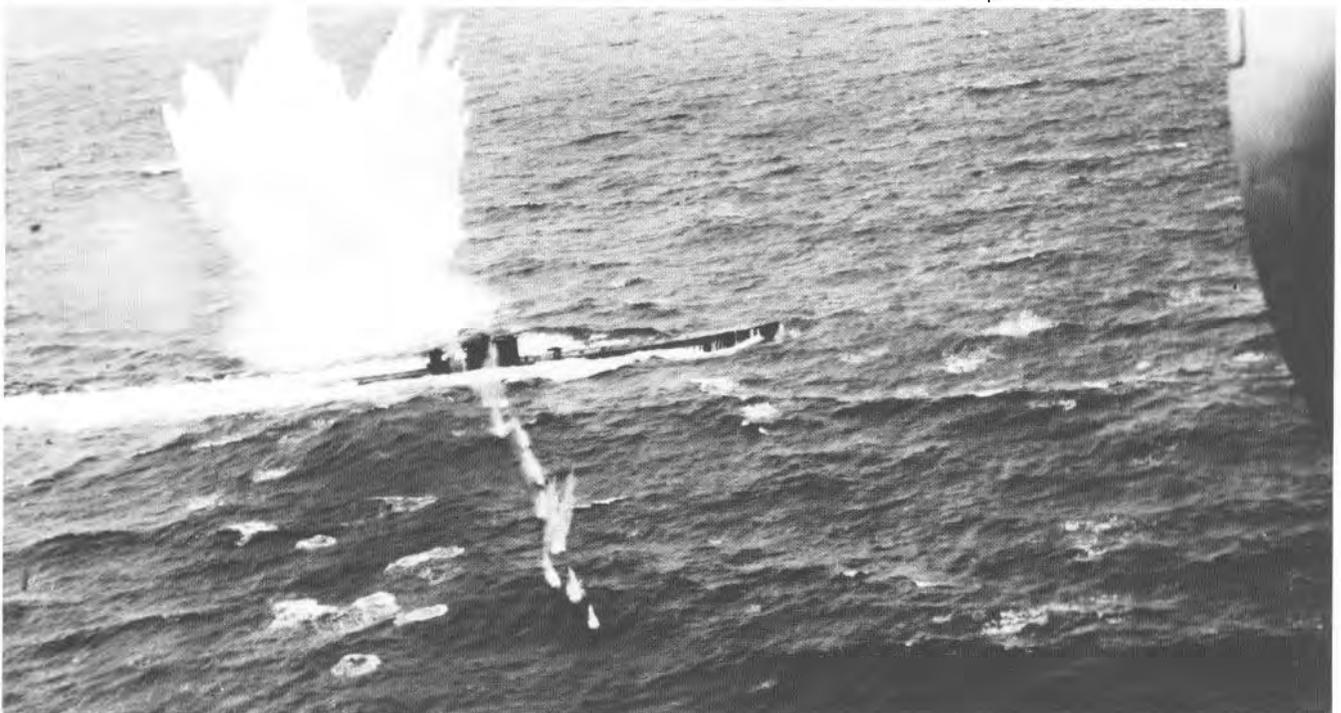


Mitscher



Nonrigid airships called blimps were used extensively to control the submarine menace.

This German U-boat met its end in the Atlantic at the hands of Consolidated PB4Y pilots and crewmen. USN 44360





Cdr. David McCampbell became the Navy's top ace of WW II, with 34 victories to his credit. McCampbell was also awarded the Congressional Medal of Honor. USN 258195



WW II produced many technical advances in Naval Aviation. Here, a Martin PBM Mariner makes a spectacular climbout using jet-assisted takeoff (JATO).



As the war moved ever closer to the Japanese homeland, the opposition became more desperate. Here, the escort carrier Sangamon (CVE-26) has a close call as a stricken kamikaze aircraft plunges into the sea close aboard. USN 700580

Naval Aviation is well represented on VJ day in a massive flyover of the U.S. fleet in Tokyo Bay, September 2, 1945. NA 80-G-421130



VI. Post WW II and Korean Operations (1946-1953)

After WW II, demobilization was rapid. Aircraft carriers went into mothballs and aircraft were retired to desert storage at NAF Litchfield Park, Ariz. The number of personnel on duty dropped to one-fourth of the wartime peak by mid-1946.

Ironically, even in this period of greatly reduced forces, technological changes and scientific advances were accelerating, with constant readjustment of plans, organizational changes and revisions in tactical doctrine. The Department of Defense was established in 1947 and reorganized in 1949. The Naval Air Reserve program, soon to prove its worth, was revitalized and strengthened.

Naval Aviation went forward into new fields. Jet operations began from carrier decks; long-range, carrier-based planes were designed; and helicopters replaced the float planes which had served so long and well aboard battleships and cruisers. Airborne early warning equipment and the techniques for its use extended the range of radar. Flights at unprecedented heights and speeds prompted the design of new flight clothing and an automatic means of bailing out of damaged aircraft. Advances in ordnance, navigational gear and electronic sighting devices changed tactical doctrine. Guided missiles and nuclear weapons also influenced the course of Naval Air development.

In an environment of decreasing budgets, with various services competing for a share of the available funds, disputes inevitably arose. Aircraft carriers were called too expensive, vulnerable and obsolete, but these arguments ended in June 1950 when North Korean troops poured across the 38th parallel in an attempt to overrun their southern neighbor.

When the President ordered support of South Korean forces, the Navy responded immediately by moving ships and aircraft to Korean waters. Jet planes went into combat for the first time from U.S. carrier decks. Helicopters played an important part in Korea, particularly in the search and rescue role of retrieving downed aviators and wounded from combat areas. Reserve squadrons were recalled to active duty, proving the value of maintaining the proficiency of veteran aviation personnel. Navy and Marine Corps aircraft, though they often tangled with North Korean MiGs, concentrated on close air support and interdiction. Railroads, bridges, supply depots and troop concentrations became the targets of the Navy/Marine Corps team, as once again the need for rapidly deployable carrier-based air power was dramatically demonstrated.

While Naval Aviation was involved mainly in combat operations in the Western Pacific, other squadrons patrolled the Mediterranean to ensure the preservation of peace in that section of the globe. Sixth Fleet ships and aircraft, as well as

others outside the combat area, continued training operations. Research and development, although accelerated during this period, did not shift appreciably to the war effort but continued toward long-range goals advancing Naval Aviation. Research in missiles and high-speed flight provided new data which led to improvements in aircraft and weapons design. Modernization of the aircraft carrier to handle jet aircraft continued and new features were introduced, including the steam catapult and angled flight deck.

In comparison with the WW II experience, the total Naval Air force employed in Korea was small, but its achievement in some respects surpassed those of the earlier conflict. Carriers were used in combat for longer periods and ordnance expenditure exceeded the earlier per-flight delivery. From the opening of hostilities until the truce in 1953, Navy and Marine Corps aircraft flew more than one-third of all the combat sorties flown by U.S. aircraft in Korea.

The Korean war proved once again the need for a nation's navy to control the sea. Yet it was in the Korean interior that Naval Aviation demonstrated its potency and flexibility. Striking vigorously at the enemy's inland communications, Naval Aviators, flying from U.S. carriers, exercised aerial command where it hurt the most — in the enemy's backyard.

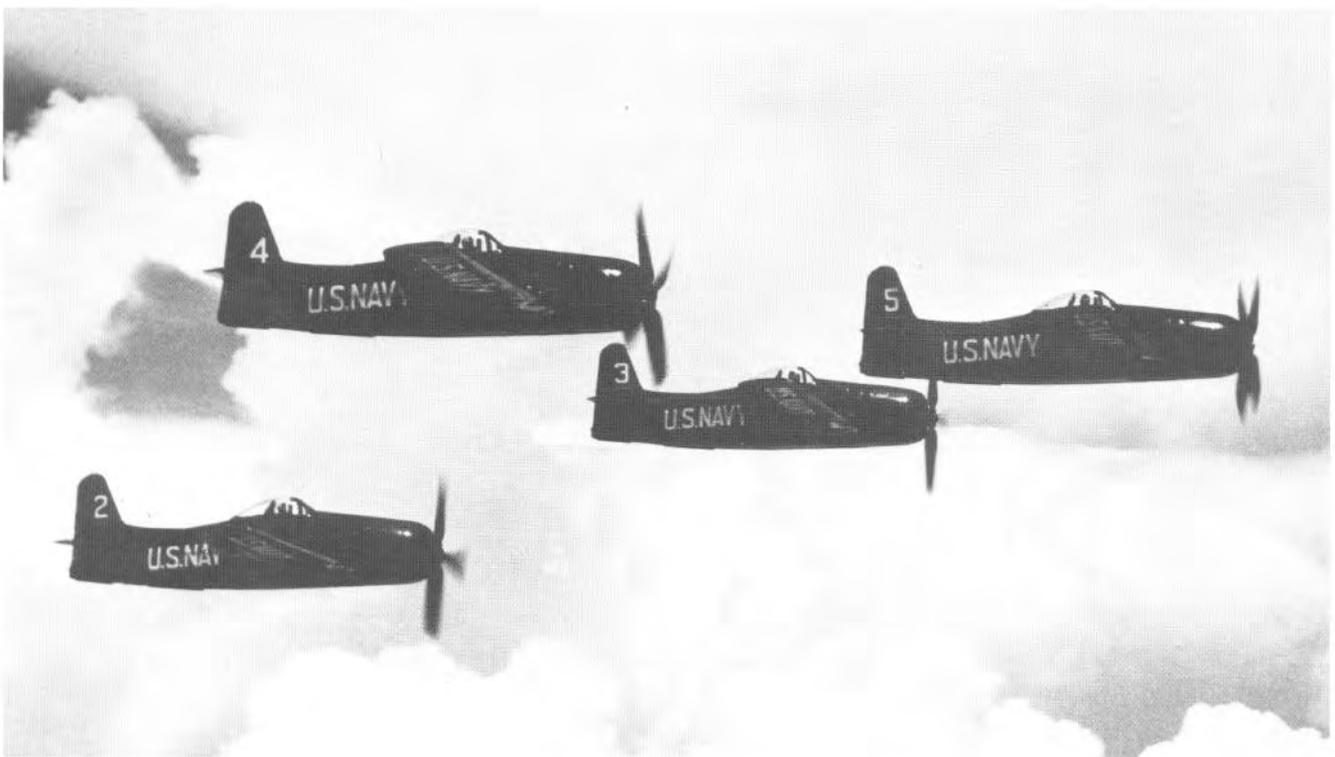


Glenn L. Martin, early aviator/inventor and founder of the Glenn L. Martin Company, championed the cause of large flying boats for both naval and commercial use.

The giant Martin JRM-1 Marshall Mars flying boat began service with Navy Transport Squadron 2 in February 1946. Mars aircraft were the largest operational flying boats ever built. USN 1053758

**VI. Post WW II and Korea
(1946-1953)**

The birth of the Blues. 1946 marked the beginning of the Navy's famous flight demonstration team, the Blue Angels. Flying F6F Hellcats and led by Lt.Cdr. Roy M. "Butch" Voris, the team put on their first show in Jacksonville, Fla., that year. A short time later, the Blues switched to the more maneuverable F8F Bearcats.





Lockheed-California Company

A Lockheed P-2V Neptune named the Truculent Turtle set a new world distance record in September-October 1946 when it flew from Perth, Australia, to Columbus, Ohio (11,236 miles), without stopping or refueling. Pilots who participated in the historic flight were, left to right: Cdrs. Eugene Rankin, Walter Reid and Thomas Davies and Lt.Cdr. Roy Tabeling. Davies was the aircraft commander.



McDonnell Aircraft Corporation

The jets are coming. A McDonnell FD-1 Phantom flown by Lt.Cdr. James Davidson made the first U.S. tests of jet adaptability to the aircraft carrier in a series of successful takeoffs and landings aboard Franklin D. Roosevelt (CV-42) on July 21, 1946.



VI. Post WW II and Korea (1946-1953)

In August 1947, Cdr. Turner F. Caldwell piloted the Douglas D-558-1 Skystreak to a world's speed record of over 640 miles per hour. His record was broken five days later in the same aircraft by another Naval Aviator, Maj. Marion E. Carl, USMC, with a speed of over 650 miles per hour.



Marine Aviators continued to hone their close air support skills in training maneuvers. Here, F4U Corsairs provide cover for Marine reservists at MCAS El Toro, Calif.

Operation High Jump (1946-47) was the largest Antarctic expedition ever mounted. Douglas R4D (C-47) aircraft, equipped with both wheels and skis and mounting JATO bottles, took off from the carrier Philippine Sea and landed ashore.





Lt.Cdr. W.T. Amen, flying an F9F Panther in Korea, became the first Navy pilot to shoot down a jet aircraft. USN 421821

The Grumman F9F Panthers were the first jet fighters used by the Navy in combat. Here, a Panther attacks a North Korean-held bridge.



The Douglas AD Skyraider, ordered during the closing stages of WW II, was a potent weapon during the Korean War. USN 113374



Another new jet fighter, the twin engine McDonnell F2H Banshee, joined the fray in Korea. USN 433960

VI. Post WW II and Korea (1946-1953)



In war, Naval Aviators are often called upon to make the ultimate sacrifice. One of these was Ens. Jesse L. Brown, the Navy's first black aviator. He died of injuries suffered in a crash in North Korea when his plane was downed by anti-aircraft fire.

Test operations began aboard Antietam, the Navy's first angled deck aircraft carrier, in January 1953. USN 477063



In April 1953, the Navy's first jet seaplane fighter, the Convair XFSY-1 Sea Dart, made its first flight at San Diego. This aircraft never became operational.



Maj. John F. Bolt, USMC, flying with the Fifth Air Force in Korea, downed his fifth and sixth MiGs to become the first Naval Aviator to attain five victories in jet aerial combat. USMC A348324



Adm. Arthur W. Radford was the first naval officer to be appointed Chairman of the Joint Chiefs of Staff, serving from June 1953 until he retired in August 1957. USN 438923



Goodyear Tire & Rubber Company

The first production model of the N-class airship made its first flight at Akron, Ohio, in March 1953.

VII. A New Age (1954-1959)

Despite the truce in Korea, the contending forces in the world remained wary of one another and the scene of international tensions shifted from the Far East to the Middle East. Once again the Navy was called to represent the nation in a critical area; once again, Naval Aviation provided much of the muscle being flexed as a caution to adventurism by hostile powers. As world political temperatures cooled, rose and cooled again, U.S. naval forces went about their peacetime role of patrolling troubled waters, evacuating refugees and providing support to threatened friends.

All the while, the advance of science and its military applications brought new weapons and new tactics into Naval Aviation. Air-to-air and air-to-surface missiles not only became standard fleet aerial weapons but were also introduced into flight training. A whole new family of high-performance jet aircraft joined the fleet for operation aboard the modernized WW II ships and the new *Forrestal*-class carriers being built.

Special attention to the problems of antisubmarine warfare brought about the organization of task groups designed to combat this growing enemy threat. Progress was made in ASW tactics using carrier-based and land-based fixed-wing aircraft, together with helicopters and surface units. The amphibious assault mission made new strides with the concept of vertical assault, which employed helicopters to speed personnel and materials from shipboard to points ashore. At first, using a modified *Essex*-class carrier and, later, a specially designed helicopter assault carrier, this aspect of Naval Aviation grew into a considerable force.

It was not so much that the carrier had replaced the battleship as the basic element of naval power, but that aviation had been woven into every phase of naval activity. The effectiveness of carrier aviation in amphibious assault operations clearly demonstrated in Korea — where a task force gave continuous support to a field army for 37 months — that aviation had brought land and naval forces closer together than ever before.

After the end of Korean hostilities, the Navy continued its efforts in technical and scientific development. The mirror landing system and the ground level ejection seat were introduced. The keel was laid for the world's first nuclear-powered aircraft carrier, *Enterprise*. Also during this time, the fleet ballistic missile *Polaris* entered its test phase.

Events of the late fifties were largely dominated by exploration in space. Successful orbits by the *Vanguard* and *Explorer I* satellites provided the impetus for the Navy's involvement in the space pro-

gram. For the first time, Naval Aviators were assigned to NASA as prospective astronauts. The future held many challenges in space for Navy and Marine Corps pilots.

In the years to come, Naval Aviators would make many valuable contributions to the space effort, leaving Naval Aviation's calling card on the doorstep of the universe.



Test pilot J.F. "Skeets" Coleman made the first flight in the Convair XFY-1 vertical takeoff aircraft, known as the Pogo Stick, at NAS Moffett Field, Calif., on August 1, 1954. Although this aircraft never became operational, it provided valuable knowledge for future VTOL experiments. Coleman was awarded the Harmon International Trophy in 1955 for his contributions. USN 639930





A Douglas R4D Skytrain made the first landing of an aircraft at the South Pole on October 31, 1956. The plane named Que Sera Sera, carrying RAdm. George J. Dufek, Commander CTF 43 (Operation Deep Freeze), was piloted by Lt.Cdr. C.S. Shinn. USN 805653



Forrestal (CVA-59), first of the supercarriers and first carrier designed to handle jet aircraft, was commissioned at the Norfolk Naval Shipyard, Portsmouth, Va., on October 1, 1955. USN 1047009



The Martin P6M Seamaster, a swept-wing seaplane powered with four jet engines and incorporating a new hull design, made its first flight on July 14, 1955.

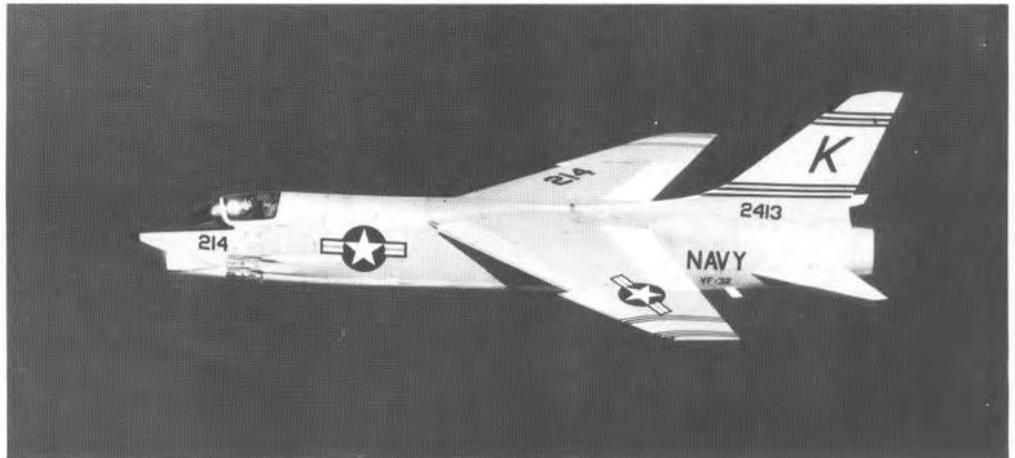
Glenn L Martin Company

VII. A New Age (1954-1959)



By 1957, the mirror landing system was in routine use aboard aircraft carriers. Here, a Douglas A-4 Skyhawk is reflected in Saratoga's mirror as it catches a wire on landing.

The first Chance Vought F8U-1 Crusader was delivered to a fleet unit (Fighter Squadron 32) on March 25, 1957. The XF8U-1 exceeded the speed of sound on its maiden flight exactly two years previously.



Chance Vought Aircraft, Inc.



On July 16, 1957, Maj. John Glenn, USMC, broke the transcontinental speed record in an F8U-1P Crusader at an average speed of 723.517 miles per hour. This was the first upper-atmosphere, supersonic flight from the West to the East Coast.



McDonnell Douglas Corporation



A Douglas F3D Skyknight lands aboard Antietam (CVS-36) off Pensacola, Fla., beginning the first shipboard tests of the automatic carrier landing system (ACLS).

Bell Aircraft Corporation



Carpenter



Schirra



Glenn



Shepard



NASA

Cdr. Forrest S. Petersen made his first flight in the X-15 on August 25, 1958. Petersen made five flights in this research aircraft, which was designed to withstand extreme altitudes and speeds as high as 4,000 miles per hour.

Four Naval Aviators, three Navy and one Marine, were among the seven men selected as astronauts under Project Mercury for space exploration and manned orbital flight: Lt. M.S. Carpenter, USN; Lt. Col. J.H. Glenn, Jr., USMC; Lt. Cdr. W.M. Schirra, Jr., USN; and Lt. Cdr. A.B. Shepard, Jr., USN.



The twin-jet McDonnell Douglas F4H-1 Phantom made its first flight at St. Louis, Mo., on May 27, 1958. The aircraft was flown by test pilot Robert C. Little.

VIII. The Sixties (1960-1969)

During the sixties, Naval Aviation celebrated its golden anniversary, said goodbye to some faithful old friends and welcomed new ones into its forces. The venerable flying boat passed into history, along with the Navy's lighter-than-air program which came to an end with the disestablishment of the last two airship patrol squadrons in 1961 and the last flight of a Navy airship on August 31, 1962.

Advances in science and their military applications continued to produce new weapons and high-performance aircraft. Air-to-air and air-to-surface missiles had become standard aerial weapons. New families of faster, heavier and more sophisticated jet aircraft made their appearance, including a vertical short takeoff and landing (V/STOL) aircraft, the AV-8A. Many improvements were made in antisubmarine warfare equipment and tactics. The first amphibious assault ship, *Iwo Jima*, was commissioned and others were built to capitalize on the unique capabilities of helicopters in vertical assault and replenishment. Atomic power went to sea aboard nuclear-powered *Enterprise*, commissioned November 25, 1961.

The Navy's role in space rapidly expanded during the 1960s. In May 1961, Commander Alan B. Shepard became the first American to go into space as his space capsule *Freedom 7* reached an altitude of 116 miles high and 302 miles downrange from Cape Canaveral in Florida. Manned orbital flight became a reality when Lieutenant Colonel John H. Glenn, Jr., USMC, and his spacecraft *Friendship 7* took three turns around the earth in February 1962.

Years later, other Naval Aviators made history with *Apollo 8*'s first flight to the moon in 1968, and the first lunar landing in 1969 when Neal A. Armstrong took the first walk on the moon.

Navy ships and squadrons made the recoveries of all the astronauts from the *Mercury*, *Gemini* and *Apollo* space shots and carried out the same recovery missions for the later *Skylab* series. Satellites developed by Navy scientists expanded our knowledge of space, and the Navy space surveillance and satellite navigation systems gave to all nations an accurate means of traveling the earth's oceans.

Along with this exciting look into the future through space exploration, Naval Aviation of the sixties dealt with some rather unsettling earthly matters. This decade brought new international crises which involved U.S. naval forces. Aerial reconnaissance revealed the introduction of Soviet ballistic missiles into Cuba and, in the ensuing blockade, naval aircraft again played an important role. Other conflicts arose in Africa, the Middle East, Berlin and the Caribbean nations. In Southeast Asia, in response to an attempt by North Vietnam to overthrow the government of a free nation, the United States went to the assistance of South Vietnam. Marine Aviation went ashore to resist the enemy attacks and was able to use effectively its portable expeditionary airfield systems under combat conditions.

U.S. involvement in the Vietnamese conflict became America's longest participation in any war, lasting nearly 10 years.

Artist Ted Wilbur for NASA



Cdr. Alan B. Shepard became the first American to be rocketed into space on May 5, 1961. His space capsule, *Freedom 7*, was launched from Cape Canaveral and recovered at sea by a Marine corps HUS-1 helicopter. NH 69954



ZP-1 and ZP-3, the last operating units of the lighter-than-air branch of Naval Aviation, were disestablished at NAS Lakehurst, N.J., on October 31, 1961. The last flight of a Navy airship took place at Lakehurst on August 31, 1962.

Iwo Jima (LPH-2) was commissioned at Bremerton, Wash., on August 26, 1961. She was capable of handling one helicopter squadron and was the first ship designed and built for amphibious assault. NH 69957



VIII. The Sixties (1960-1969)

Lt.Col. John Glenn, USMC, became the first American to orbit the earth on February 20, 1962. Glenn is shown here entering the Friendship 7 spacecraft prior to launch.

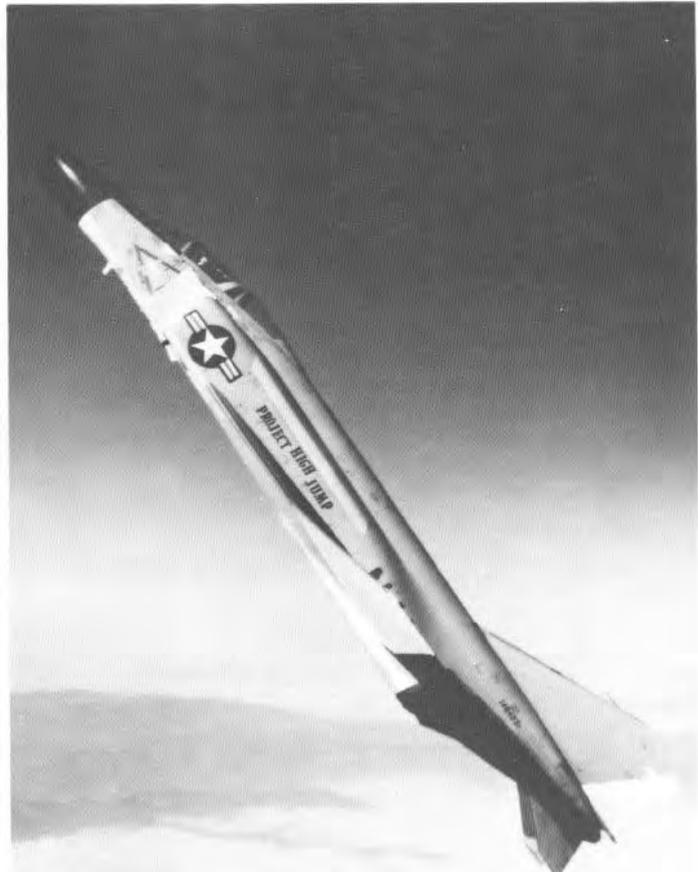


NASA

The Navy's first nuclear-powered aircraft carrier, Enterprise (CVAN-65), was commissioned at Newport News, Va., on November 25, 1961. The first air operations aboard the new ship were carried out in mid-January of 1962.

K 44003-





U.S. Navy aircraft continued to pound enemy positions in Vietnam. Here, an A4 Skyhawk releases a bomb on a Viet Cong stronghold in South Vietnam.
USN 1113917

A McDonnell Douglas F4H-1 Phantom made a clean sweep of world time-to-climb records at NAS Brunswick, Maine, and NAS Point Mugu, Calif., during February, March and April of 1962.



On October 22, 1962, President John F. Kennedy imposed a naval quarantine on Cuba. Here, the Soviet cargo ship Okhotsk is overflown by a Lockheed P2V-7 Neptune of Patrol Squadron 18.

VIII. The Sixties (1960-1969)



The XC-142A, an experimental tri-service V/STOL transport aircraft, makes its first carrier landings aboard Bennington off San Diego, Calif., on May 18, 1966. Navy, Marine and Army pilots took turns at the controls.



On June 17, 1965, while escorting a strike into North Vietnam, two F-4B Phantoms engaged four MiG-17s and shot down two, scoring the first U.S. MiG kills in Vietnam. Shown here, from left to right, are pilots Lt. Jack E.D. Batson, Jr., and Cdr. Louis C. Page, Jr., and flight officers Lt.Cdr. Robert B. Doremus and Lt. John C. Smith, Jr.

October 1965 finds the annual Operation Deep Freeze in full swing. Here, a Lockheed LC-130F Hercules turns up at the South Pole. USN 827486



PH1 Gerald R. Kessens



PH1 Robert E. Woods

Equipped with a wide array of electronics and sensory search devices, the S-2E Tracker was used to detect, track and destroy enemy submarines. During more than 20 years of service, S-2 aircraft flew over six million hours and made almost three-quarter million carrier landings, with an overall accident rate of only .69 per 10,000 hours.

Lt. T.S. Storck



Bell UH-1 Hueys of the Navy's Helicopter Attack Squadron Light 3 provided close air support for U.S. and Vietnamese Navy Riverine operations. USN 1131628

The last operational seaplane flight was made by a Martin SP-5B Marlin flying boat of Patrol Squadron 40 at NAS North Island, Calif., on November 6, 1967.



VIII. The Sixties (1960-1969)



On February 1, 1966, Ltjg. Dieter Dengler took off from Ranger in his A-1H Skyraider on an interdiction mission against a line of communication targets in North Vietnam. In the attack, heavy ground fire crippled the aircraft and Dengler crash-landed in Laos. He was taken prisoner and held for months until he escaped on June 29. Suffering from jaundice and malnutrition, he made his way through the jungle for 21 days. On the morning of the 22nd day, he laid out an SOS on a bed of rocks. An Air Force A-1 spotted him and sent a helo to his rescue. Dengler is shown here a year later preparing for a flight in an A-4 Skyhawk.

J. T. Purcell

U.S. naval forces continued to apply pressure on the North Vietnamese from the Gulf of Tonkin. Here, a Vought A-7A Corsair II of Attack Squadron 147 flies over the carrier Ranger (CVA-61) in December 1968.

F-4 Phantoms from Marine Fighter Attack Squadron 232 are refueled by KC-130 tankers on a transpacific flight to Vietnam. USMC A26244





Footprint on the moon. On July 20, 1969, former Naval Aviator Neil Armstrong, mission commander of Apollo 11, became the first man to walk on the moon.

PHC A. R. Hill



Light Attack Squadron 4, the first Navy squadron of its type, was commissioned on January 3, 1969, and deployed to Vietnam in March. Operating North American Rockwell OV-10A Bronco aircraft from airfields in the Mekong Delta, the squadron provided fixed-wing air support for Riverine operations. USN 1139900

IX. The Seventies (1970-1979)

The war in Vietnam dragged on into the early part of the seventies, with the United States still heavily involved. Seventh Fleet carriers and aircraft units saw most of the Navy's air action during the conflict.

Naval Air combat operations were aided by new weapons, such as the *Walleye* television glide bomb



The war in Vietnam spilled over into the 1970s. *Ranger* is shown on *Yankee Station* in the Gulf of Tonkin.

which automatically homes in on a target. Helicopters proved their value by serving as aerial gunships and flying freight trains. During Operation *Market Time*, land-based patrol aircraft provided valuable support by scanning the South Vietnamese coastline to locate enemy vessels and alert surface forces for interception.

Seventh Fleet aircraft executed the most extensive aerial mining operation in history, blockading the enemy's main supply routes. Naval Aviation's efforts in this regard may well have been the deciding factor in bringing the hostilities to an end. An uneasy truce finally resulted in U.S. disengagement and the return of American prisoners of war in 1973.

Naval Air throughout the seventies was plagued by a material inventory decline which began after the Vietnamese war. Defense spending was curtailed because of the high inflation rate oppressing the world's industrial nations. Nevertheless, Naval Aviation continued to make progress in the areas of research and development.

In the early 1970s, the Navy introduced the F-14 *Tomcat*, and the Marine Corps accepted the AV-8 V/STOL *Harrier*. Additions to the fleet of the new S-3A *Viking* and the light airborne multipurpose system (LAMPS) — combining shipboard electronics with the SH-2D helicopter to extend the ranges of shipboard ASW and antiship missile defense systems — were intended to withstand the ever-increasing submarine threat. Later in the decade, two more nuclear-powered supercarriers, *Nimitz* and *Eisenhower*, were commissioned and a new fighter/

attack aircraft, the F/A-18 *Hornet*, underwent flight trials.

Naval Air power continued to play a major part in U.S. Navy fleet operations during this decade. In 1975, aviation units assisted in the evacuation of civilian refugees fleeing the North Vietnamese takeover of South Vietnam. Four years later, the Navy's air arm helped rescue thousands of Indochinese "boat people" who took to the seas to escape mounting Communist tyranny. Later in 1979, air elements were called upon for a show of strength during periods of tension in Cuba, Iran and Afghanistan.

Throughout the seventies, U.S. dependence on foreign oil sources reemphasized the country's reliance upon the Navy to keep sea lanes open and commerce moving. With aviation ships and aircraft integrated into the fleet, U.S. naval power was able to accomplish this task.

The modern supercarriers deployed troops and equipment virtually anywhere in the world. Carrier-based antisubmarine aircraft and shore-based patrol

PHC Davis



K 84668

planes continued to guard our strike forces against the undersea menace, while fighter and attack aircraft provided protection from the enemy air threat. Helicopters expanded their role as vital extensions of Naval Aviation with missions encompassing search and rescue, vertical replenishment, medical evacuations, personnel and cargo lift, antisubmarine warfare, minesweeping and reconnaissance. These missions, combined with the Marine Corps' close air support of ground troops, gave the U.S. unequalled strength in sea and air operations.

As the seventies drew to a close, Naval Aviation had further secured its place as a dynamic and effective element of United States sea power.



The Navy's newest carrier-based electronic warfare aircraft, the Grumman EA-6B Prowler, entered service with Tactical Electronic Warfare Squadron 129 at NAS Whidbey Island, Wash.

Ltj. George Gillett

The Navy and Marine Corps participated in a number of disaster relief activities in 1970. An injured Peruvian earthquake victim is carried across the flight deck of Guam (LPH-9) after being evacuated by an H-46 Sea Knight from Marine Medium Helicopter Squadron 365. On the other side of the world, a Navy corpsman from Okinawa (LPH-3) immunizes a victim of Typhoon Joan, which ripped through the Philippines killing hundreds and leaving countless others homeless.



IX. The Seventies (1970-1979)



Sgt. D.C. Motley

The Marine Corps' first AV-8A Harrier was accepted on January 6, 1971. The Harrier is shown here during carrier suitability trials aboard Coronado (LPD-11) in April of that year. USMC A701621



A Lockheed P-3 Orion of Patrol Squadron 56 keeps a watchful eye on a disabled Russian Hotel-class nuclear submarine in the North Atlantic in 1972.



Cunningham

On May 10, 1972, Lt. Randy Cunningham and Ltjg. William Driscoll of VF-96 became the Navy's only Vietnam War aces and first "dual" aces, having together as a pilot/flight officer team participated in the downing of five aircraft during action in Southeast Asia.



Driscoll



JOSN George Roska

A Navy SH-3A Sea King helicopter surveys the scene over a flood-ravaged town in Pennsylvania in June 1972. Air units from Guam (LPH-9) provided relief assistance to flood victims.
USN 1152051



NASA



Following a 28-day flight, the three-man, all Navy crew of Skylab II splashes down in the Pacific and is met by pararescue men from Ticonderoga (CVS-14) on June 22, 1973. Left to right above are Cdr. Joseph P. Kerwin, MC, science pilot; Capt. Charles Conrad, Jr., mission commander; and Cdr. Paul J. Weitz, pilot.

IX. The Seventies (1970-1979)



Lt. Cdr. S.G. Riley

A 12-helicopter detachment of RH-53D Sea Stallions of Helicopter Mine Countermeasures Squadron 12 began sweeping the Suez Canal for mines in April 1974 as part of Project Nimbus Star. KN 21641



On February 22, 1974, Ltjg. Barbara Ann Allen became the first woman to be designated a Naval Aviator, at NAS Corpus Christi, Texas. USN 1155635





An LSE (landing signal enlisted) directs a Kaman SH-2F Seasprite to a safe landing on the deck of the frigate Lang (FF-1060). Such helicopters are used to extend the range of surface ships in antisubmarine warfare. K 109843

The first operational Lockheed S-3A Vikings were accepted by Carrier Anti-Submarine Squadron 41 on February 20, 1974. This S-3 is shown with magnetic anomaly detection (MAD) boom extended. K 105917



PH1 B.L. Kuykendall



The Grumman F-14 Tomcat fighter joined the fleet in late 1972. Here, it is seen pursuing its quarry, an F-4 Phantom II, in simulated air combat maneuvers. USN 1155922

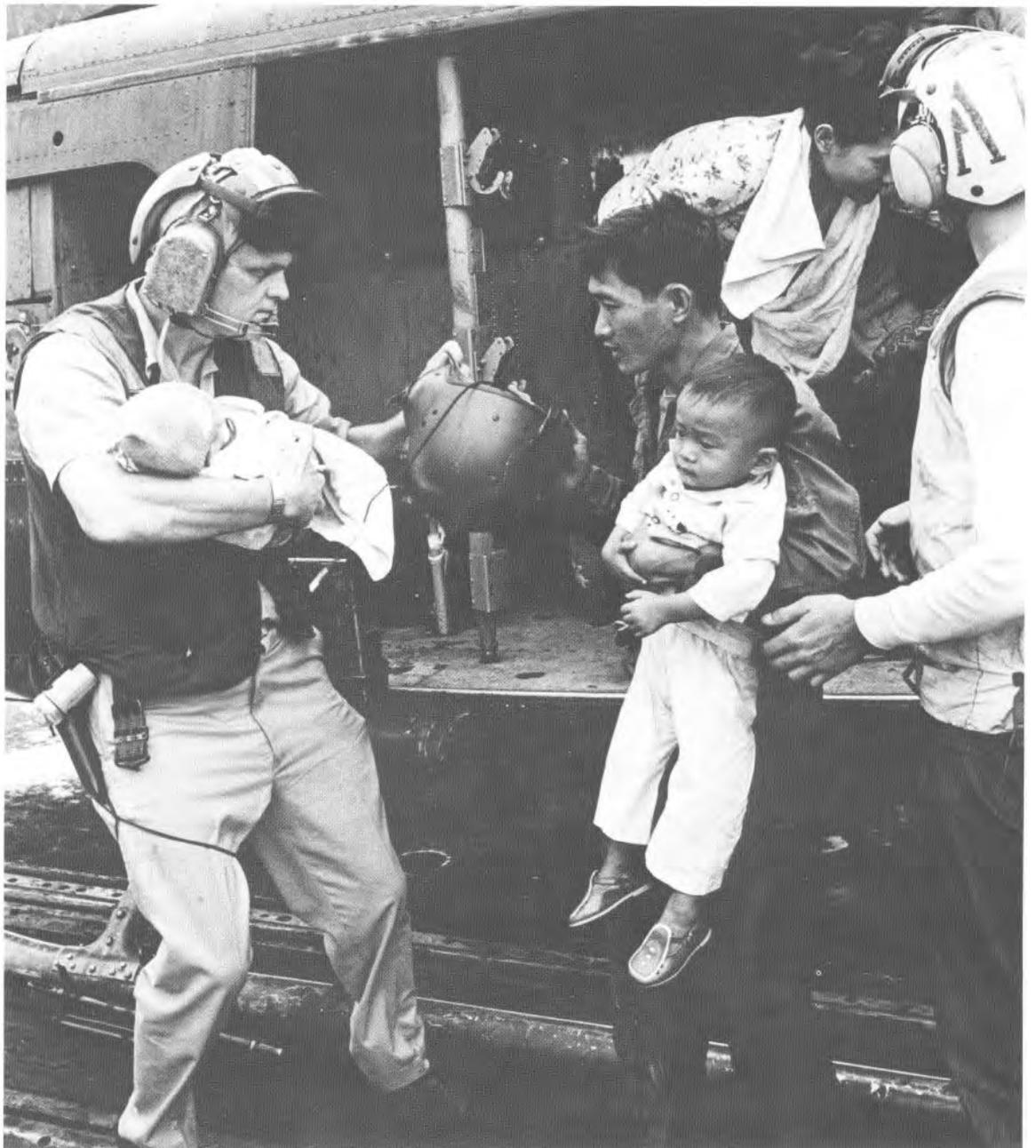
IX. The Seventies (1970-1979)

Navy and Marine Corps helicopters perform evacuation duties as South Vietnam falls to North Vietnamese forces in April 1975.



K 107612

PH3 Harold Brown





Tarawa (LHA-1), the first in a new class of amphibious assault ships, undergoes sea trials prior to her commissioning in May 1976. USN 1163814



PH3 Bob Weissleder

Women take on jobs in Naval Aviation in increasing numbers. Airman Kimberly Warnock preflights an SH-2 Seasprite helicopter at NAS North Island, Calif., in December 1977. USN 1171292



The nuclear-powered aircraft carrier Nimitz (CVN-68) cruises with the nuclear-powered guided missile cruiser California (CGN-36) on station in the Mediterranean as part of Task Force 60, in September 1976. USN 1168241

JO2 R. Leonard

IX. The Seventies (1970-1979)



Christmas 1979 found Midway (CV-41), above, and Kitty Hawk (CV-63), right, on station in the Arabian Sea in response to the hostage crisis in Iran. USN 1176315



McDonnell Douglas Corporation

The Navy's new strike fighter, the McDonnell Douglas F/A-18 Hornet, makes its first flight on November 18, 1978.

PH1 Art Legare



KN 30373

X. Naval Air in the 1980s

Naval Aviation has come a long way in its 70-plus years. The striking contrast between the Curtiss A-1 *Triad* amphibian of 1911 and the McDonnell Douglas F/A-18 *Hornet* strike fighter of the eighties reflects the progress that has been made in technology alone. With the introduction of new aircraft into the Navy's inventory, the modern force is constantly updating its capabilities.

During the early years of the 1980s, the new SH-60B helicopter demonstrated tremendous potential in antisubmarine warfare. As part of LAMPS MK III, the aircraft provides surveillance and targeting information on surface targets, performs search and rescue operations and is used for vertical replenishment and gunfire support. Shipboard electronics and support facilities are the other major elements of LAMPS MK III. The SH-60B *Seahawk* went to sea for the first time in January 1981. Its landing aboard *McInerney* (FFG-8) while underway was aided by the ship's recovery assist, securing and traversing (RAST) gear, designed to recover a helicopter in adverse sea states. Later that year, another new helicopter, the three-engine CH-53E *Super Stallion*, became operational with the Marine Corps. The Free World's largest helicopter, the CH-53E can transport over 16 tons of cargo or ferry 55 fully equipped Marines, and is capable of delivering aircraft aboard carriers.

In February 1981, Fighter Attack (later renamed Strike Fighter) Squadron 125 became the first squadron to receive the new F/A-18 and was designated the *Hornet* training unit. The first operational F/A-18s entered service in the Marine Corps, with VMFA-314, in January 1983. This initiated the Navy-wide transition from F-4s and A-7s to the new strike fighter. Designed for increased reliability and maintainability and improved performance over existing systems, the *Hornet* should pay off handsomely in both manpower and dollar savings over the long term.

In the 1980s, the Navy has continued to refine its electronics and missile capabilities and update its aircraft and carriers. The AN/SSQ-2 directional command active sonobuoy system (DICASS) and the AN/SSQ-77 vertical line array DIFAR(VLAD) represent the first major improvements in the sonobuoy field since 1968. An A-7E *Corsair II* launched the first AGM-65F imaging infrared *Maverick* missile, and the first night flight of a conventional land attack *Tomahawk* cruise missile was conducted aboard a Navy A-6 *Intruder*.

Improved aircraft will fill the skies in the eighties. The Navy received the first production version of the P-3C *Orion* Update III, equipped with a new acoustic processing system for faster analysis of sonobuoy signals, while the Naval Air Training

Command moved into the TH-57C *SeaRanger* advanced instrument trainer. The NFO training pipeline got a boost in late 1984 with the phaseout of the T39D and transition to the new T-47A undergraduate NFO training system. In addition, a new undergraduate jet flight training aircraft and training system were developed to replace the Training Command's T-2Cs and TA-4Js. Originally called VTXTS, the program has been redesignated T45TS, to include the entire training system using the T-45 *Hawk* aircraft. Plans call for the first flight of a T-45A in July 1988.

New aviation ships joined the fleet in the early part of the decade. The amphibious assault ship *Pelelieu* (LHA-5) and the nuclear-powered *Carl Vinson* (CVN-70) were commissioned in 1980 and 1982, respectively. The first of a new class of amphibious assault ships, the LHD *Wasp* class, is scheduled for delivery in 1989. The combination of the LHD, deploying AV-8Bs and/or a mix of other aircraft, together with the new air cushion landing craft (LCAC), will be a formidable element of future amphibious assault operations.

Along with the technological advances that have highlighted Naval Aviation's eighth decade to date, people continue to share center stage. In 1982, the first graduates of the Limited Duty Officer Aviator Program received their Wings of Gold. Established two years earlier, the program enables enlisted personnel to receive flight training and be commissioned.

Women made Naval Aviation headlines with several firsts in 1983. An all-female crew in a C-1A *Trader* from VRC-30 conducted an operational mission that terminated in a carrier arrested landing. Lieutenant Leslie Provo became the first woman to be designated a landing signal officer, and Lieutenant Colleen Nevius was the first female graduate of the U.S. Naval Test Pilot School.

But present-day aviators were not the only ones to be recognized for their achievements. Twelve pioneers of Naval Air were enshrined in the Naval Aviation Hall of Honor, which was dedicated at the Naval Aviation Museum, NAS Pensacola, Fla., in October 1981. Six more selectees were inducted in May 1983, four in 1984 and eight in 1986.

These achievements are continuing testimony to the fact that Naval Aviation's strength is in its people, not only those who fly the aircraft but those who maintain them. Aircraft and weapons are only as good as the people who make them perform. During 1982 and 1983, naval air units had the opportunity to reinforce that fact when called upon to assist in international conflicts. U.S. Marines landed in Beirut as part of the multinational peacekeeping force in Lebanon in the fall of 1982 and remained

there until late 1983, supported by carriers and their air wings stationed offshore. Also last fall, aircraft and crews from CVW-6 aboard *Independence* (CV-62) supported Marine combat amphibious assault operations in Grenada, while patrol squadrons conducted surveillance operations and reserve transport units fulfilled the support mission.

Besides successful operations in international events, Naval Aviation in the eighties has moved forward in the space program. An all-Navy crew manned the Space Shuttle *Columbia* in April 1981 on her maiden voyage. In November of that year, astronaut Captain Richard H. Truly, USN, rode aboard *Columbia* to become one of the first men to fly into space and return in a previously-used spacecraft. In November 1982, former Navy and Marine Corps aviators were on board the Space Shuttle during its first operational flight. As a con-

sequence of the Navy's expanded role in space, the Naval Space Command was established in 1983, headed by Capt. Truly, to consolidate the Navy's space-related activities. And, on February 7, 1984, astronaut Captain Bruce McCandless II, USN, made history when he took the first untethered walk in space.

Naval Aviation marked a major milestone in 1986 with its 75th birthday. Many celebrations highlighted the year, including Vice President George Bush's official kickoff ceremony in January; a week of events in Pensacola, Fla., surrounding the actual birth date, May 8; and reenactment of the NC-4 flight also in May.

The Diamond Anniversary Year's activities represent a fitting tribute to Naval Air in the 1980s.

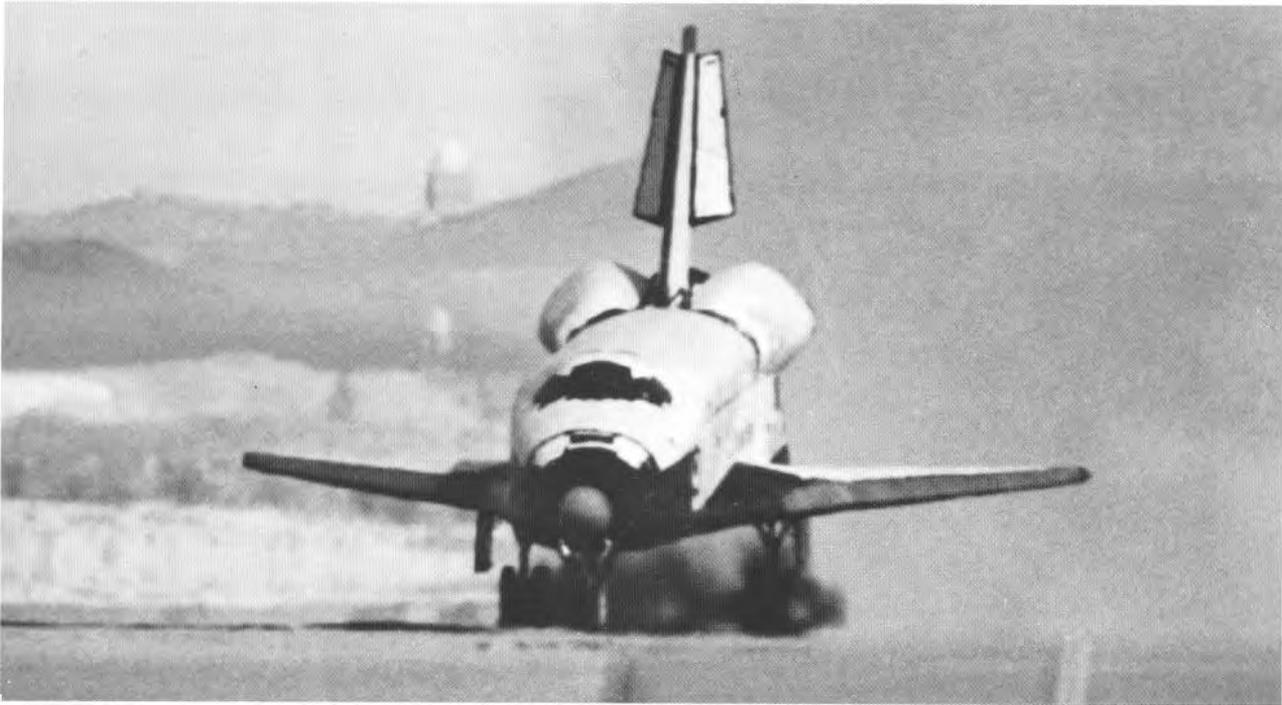
PHAN M.M. Battistella



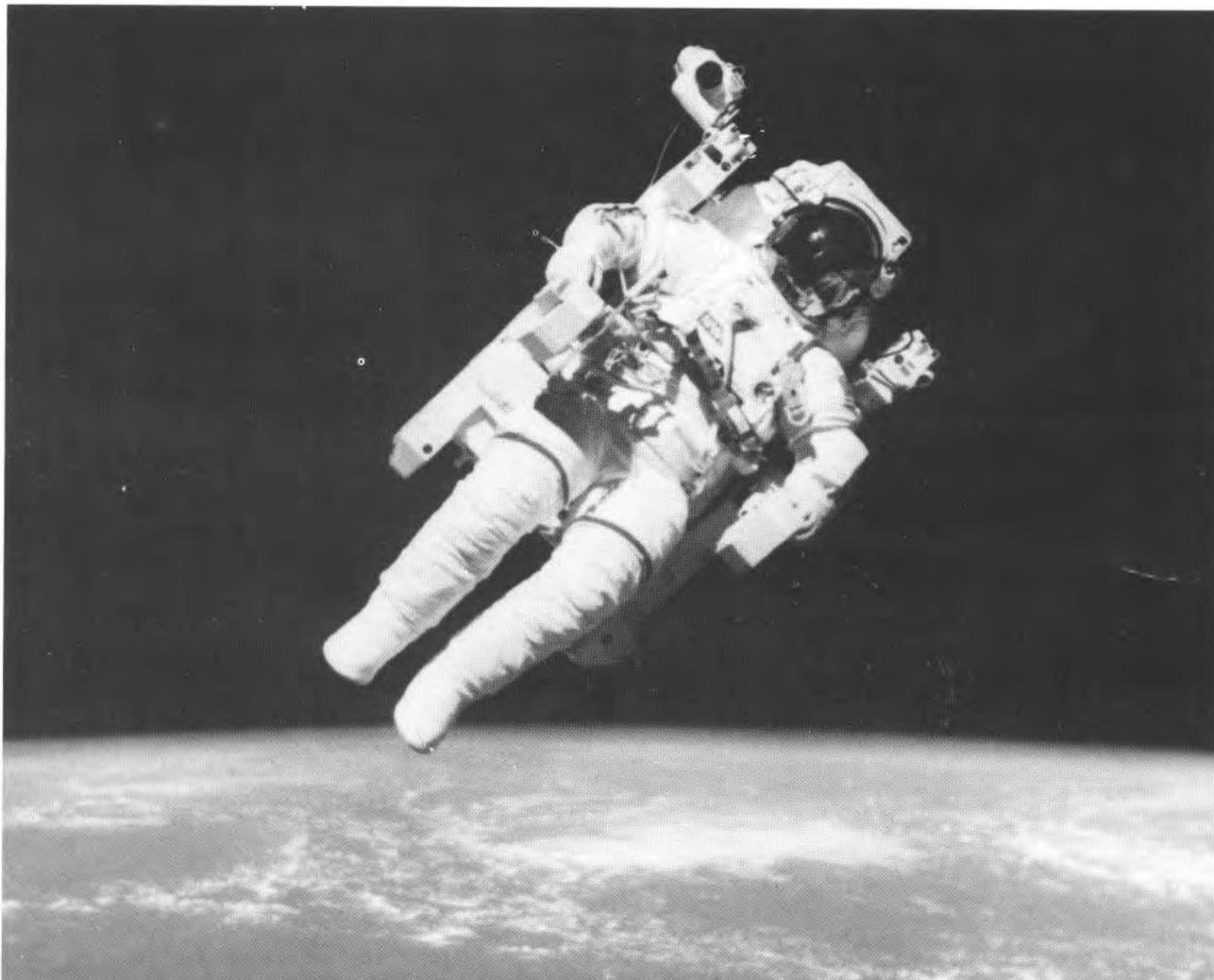
RH-53D Sea Stallions of Fleet Logistics Support Squadron 24 provide disaster relief assistance to victims of a devastating earthquake at Avellino, Italy, in November 1980.



X. Naval Air in the 1980s



Above, the Space Shuttle Columbia makes its first flight from Kennedy Space Center, Fla., on April 12, 1981, returning to earth at Edwards AFB, Calif., on the 15th. At the controls were Naval Aviators John Young and Bob Crippen. Below, Astronaut and Naval Aviator Capt. Bruce McCandless made the world's first untethered space walk from the Space Shuttle Challenger in February 1984. This marked the first time the nitrogen-propelled manned maneuvering unit was used in space.



NASA



Bell Helicopter Textron's XV-15 tilt-rotor aircraft made 54 takeoffs and landings aboard Tripoli (LPH-10) in 1982. Formerly called the JVX, it was designated the V-22 Osprey for the Navy and MV-22A for the Marine Corps version in 1985. The aircraft combines the speed, range and altitude of a fixed-wing turboprop airplane with the efficient hover capability of a helicopter.

J. D. Soils



The nuclear-powered aircraft carrier Carl Vinson (CVN-70) on station in the Indian Ocean in June 1983. USN DN-SC-84-00144



The first LDO Aviators, Ens. Mike Gray (left) and Ens. Doug McGowan, try on a large pair of wings for size.



The era of Navy enlisted pilots came to a close on January 31, 1981, when the last Naval Aviation Pilot, ACCM R. K. Jones, retired after 38 years of naval service. In this photo taken earlier in his career, Jones (right) prepares to preflight a US-2B Tracker at NAS Rota, Spain. USN 1161168

JOC Kirby Harrison



McDonnell Douglas Corporation

A P-3 Orion of Air Test and Evaluation Squadron 1 boasts a new air-to-surface capability in the form of a Harpoon missile.

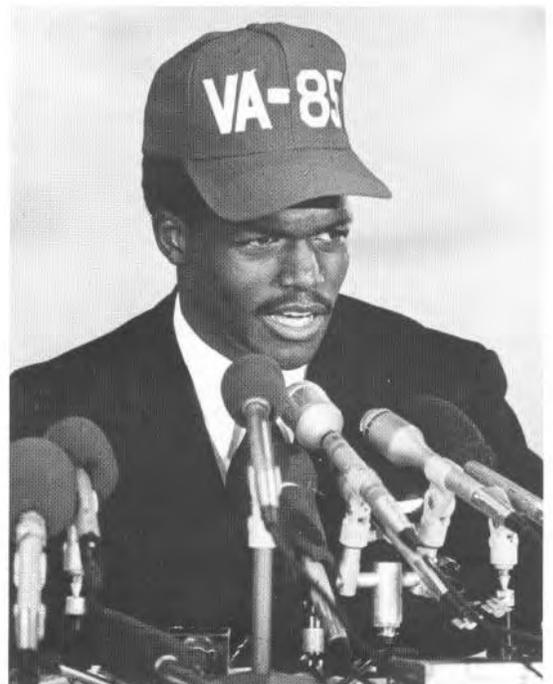


Future Naval Aviators and Naval Flight Officers march past an old T-28 Trojan training aircraft at NAS Pensacola, Fla. The last instructional flight of the T-28 took place in February 1984, ending the aircraft's 31-year career in the Training Command.



PH2 Nelson Schouten

A Sikorsky HH-3 Sea King of Helicopter Combat Support Squadron 9 plucks a downed airman from a lake in Idaho during a training exercise. This Naval Reserve squadron is ready to conduct combat search and rescue missions in all-terrain conditions, day and night.



Naval Flight Officer Lt. Robert O. Goodman, Jr., arrives back in the United States after being held by the Syrians for almost a month. Goodman's aircraft was downed by missile fire on December 4, 1983.



JOC Kirby Harrison

NAS Sigonella, Italy, has become an important base in the Mediterranean. Here, a variety of aircraft crowd together on the Sigonella parking apron.



During operations in the Mediterranean, two F-14 Tomcats from Nimitz shot down two SU-22 aircraft following an unprovoked attack by the Soviet-built jets. The VF-41 Tomcats, deployed with Carrier Air Wing 8, were flown by (left to right above) Lt. Jim Anderson and Lt. Larry Muczynski; and Cdr. Hank Kleemann and Lt. Dave Venlet.



The Blue Angels Flight Demonstration Squadron poses for a photograph with its logistics aircraft "Fat Albert."



Sikorsky CH-53E Super Stallions of Helicopter Combat Support Squadron 4 get together for a spectacular group shot near NAS Norfolk, Va.

X. Naval Air in the 1980s

A mock-up of the new T-45A jet trainer to be produced in a joint venture by British Aerospace and McDonnell Douglas was on display at the Pentagon in April 1984. The aircraft is expected to enter service with the U.S. Navy in the late 1980s.



JO2 Timothy J. Christmann

Theodore Roosevelt Collection, Harvard College Library



President Theodore Roosevelt

Richard Blakely



"Speak softly and carry a big stick." USS Theodore Roosevelt (CVN-71) is launched at Newport News, Va., on October 27, 1984.

Frank B. Mormillo



These McDonnell Douglas F/A-18 strike fighters of Marine Fighter-Attack Squadron 314 were photographed after refueling from a KC-130R tanker over the Pacific.

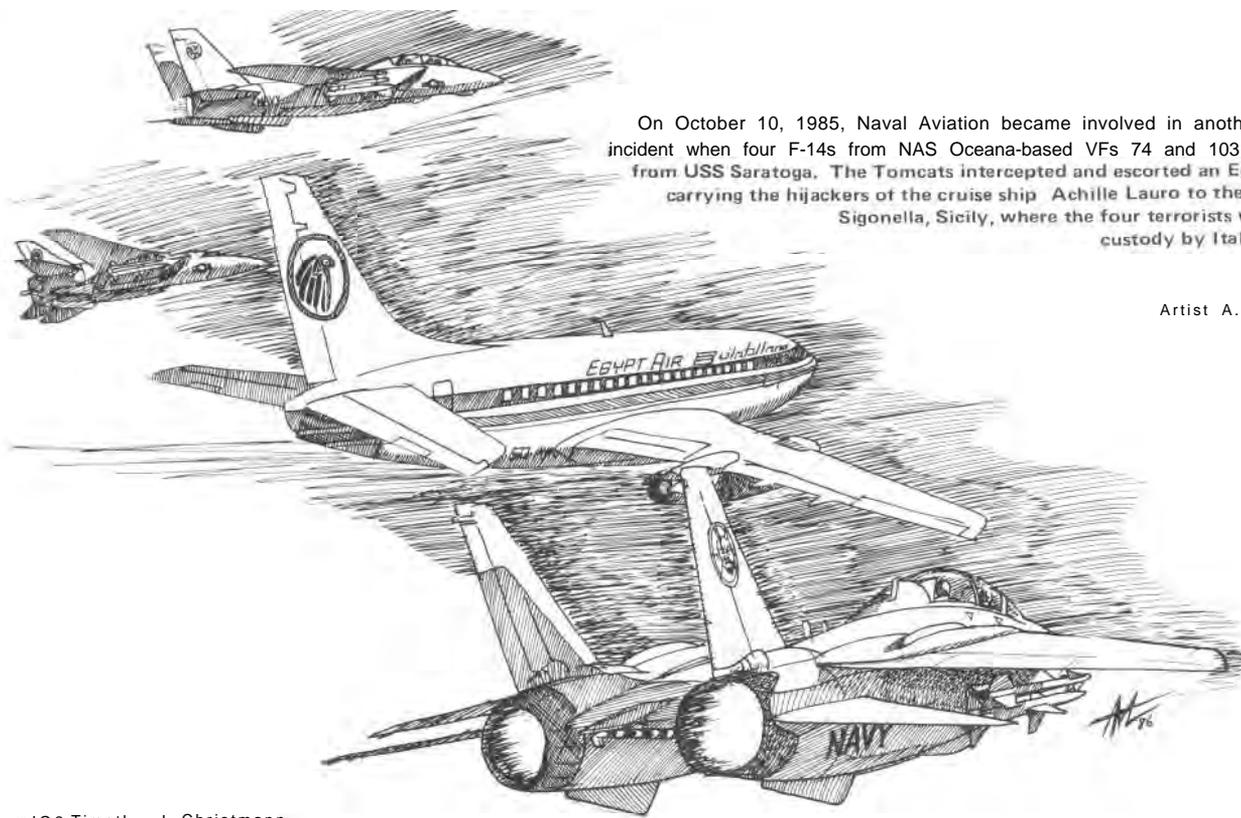
Operation Urgent Fury: The first contingent of CH-46 assault helicopters of Marine Medium Helicopter Squadron 261 (reinf) lands at LZ Racecourse, near Pearls Airport, with Marines of the 22nd Marine Amphibious Unit during the rescue operation on Grenada.



Artist A. Michael Leahy

On October 10, 1985, Naval Aviation became involved in another international incident when four F-14s from NAS Oceana-based VFs 74 and 103 were launched from USS Saratoga. The Tomcats intercepted and escorted an Egyptian airliner carrying the hijackers of the cruise ship Achille Lauro to the NATO base at Sigonella, Sicily, where the four terrorists were taken into custody by Italian authorities.

Artist A. Michael Leahy



JO2 Timothy J. Christmann



JO2 Timothy J. Christmann

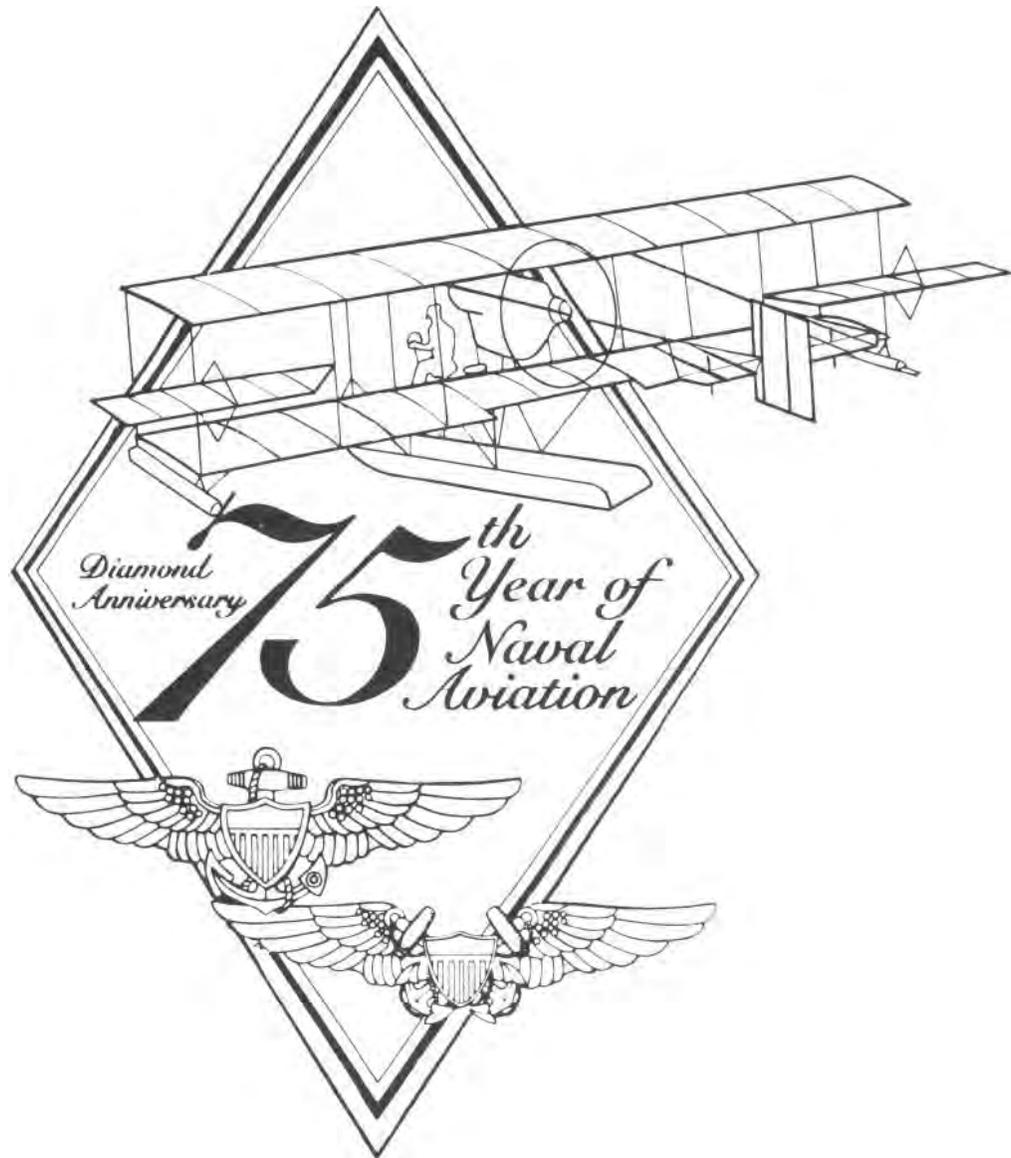
The Royal Maces of VA-27 became the first recipients of the Grampaw Pattibone Trophy on January 15, 1986. The annual award recognizes the individual or organization that contributed the most toward aviation safety awareness through communications. In photo, SecNav John F. Lehman, Jr. (left) and Cdr. Joseph Sciarra, C.O. of VA-27, stand beside the cast bronze trophy.

Lt. Colleen Nevius became the first woman graduate of the U.S. Naval Test Pilot School on June 10, 1983.



National Air and Space Museum

Vice President George Bush was presented an oil painting by noted aviation artist Capt. Ted Wilbur, USNR(Ret.), during the official inaugural marking the year-long observance of the Diamond Anniversary of Naval Aviation at the National Air and Space Museum, Washington, D.C., on January 22, 1986. From left to right: Frank Bennack, President, Hearst Corporation; SecNav John F. Lehman, Jr.; VAdm. Edward H. Martin, DCNO(Air Warfare); Ted Wilbur; and Vice President Bush.



Conclusion

Aviation has had a tremendous impact on man's life, bringing many changes that are still unfolding and expanding infinitely into space. Naval Aviator and astronaut Neal Armstrong's "...one small step for a man, one giant leap for mankind" in 1969, after the first lunar landing, was only one of many rungs on the ladder skyward.

Certainly, the design, maneuverability, armaments and speed of today's aircraft surpass

anything that Chambers and Ellyson ever dreamed. The years ahead will surely see the introduction of more improved aircraft and systems, as well as advances in satellites, computers and communication technology that were never thought possible just a few years ago.

With all of these exciting possibilities, Naval Aviation's story is certain to be a continuing saga in the history of the United States. ■