PART 2

Test of Strength

1917–1919

A small group of pioneer Navy and Marine Corps aviators had nurtured the early growth of Naval Aviation, but it was too small and poorly equipped to wage war. When the call came in April 1917, one air station was operating, 48 aviators and students were available; 54 aircraft were on hand, but none of them had been designed for the work that would be required.

In the 19 months between declaration of war and the armistice, expansion was remarkable (see Appendix 4). Air stations sprang up on both sides of the Atlantic. Training programs were established at new air stations, on university campuses, and even with private industry. The Naval Reserve Flying Corps produced thousands of aviators, ground officers, mechanics and technical specialists. Aircraft of many types were produced, and one aircraft engine advanced from concept to mass production and operation.

The speed and breadth of the expansion produced expected chaos, but Naval Aviation nonetheless achieved a good wartime record. One of its units was the first from the United States to reach France. Naval aircraft flew more than 3 million nautical miles and attacked and damaged a dozen U-boats. By war's end, Navy and Marine Corps squadrons had organized the Northern Bombing Group which was preparing a round-the-clock air campaign which would have been the first strictly American air offensive of the war. When hostilities ceased, Navy and Marine Corps aviators were using 27 bases in Europe, two in Canada, one in the Canal Zone, one in the Azores, and 12 in the United States.

Naval Aviation's outstanding technical product of the war was the long-distance flying boat. Numerous types appeared but they all bore the look of a single family. The design progressed through the HS-1 and H-16 to the British original known as the F-5L, but all could trace their ancestry to the earlier work of Glenn H. Curtiss. The culmination of work with flying boats in the war was the Curtiss NC type. A product of naval constructors, a Yankee builder of aircraft, and New England yacht manufacturers, the NC type secured a place in aviation history in 1919 as the first aircraft to fly the Atlantic.

The flying boat was so impressive that many Naval Aviators urged its adoption as the major means of taking air power to sea. Others remained of the opinion that aircraft should fly from combatant ships of the fleet, and enthusiasts of lighter-than-air pointed to airship success in the war and urged development of their specialty. The logic of these claims, and the usefulness of these aeronautic types, were not ignored. The 1920s saw development in each area. But even as the war ended, sentiment in favor of the aircraft carrier was gaining currency. In 1919 the Navy decided to convert a collier to a carrier. This decision represented a modest beginning for a program which would occupy the attention of a host of ship builders, aircraft designers and naval tacticians for years to come.

1917

6 January A board of Army and Navy officers recommended to the Secretaries of the War and Navy Departments that an airship of the Zeppelin type be designed and constructed under the direction of the Chief Constructor of the Navy with funds provided equally by the Army and the Navy, and that a board of three Army and three Navy officers be created to insure effective interservice cooperation in prosecution of the work.

8 January A Benet-Mercie machine gun, installed in a flexible mount in the Burgess-Dunne AH-10, was fired at altitudes of 100 and 200 feet above Pensacola, Fla. Both the gun and the aircraft operated satisfactorily during the test.

10 January The first production order for aerial photographic equipment was initiated when the Naval Observatory issued requisitions for 20 aero cameras and accessories to be manufactured by the Eastman Kodak Company.

1917—Continued

15 January *Seattle* (Armored cruiser No. 11) arrived at Culebra, P.R., with an aviation detachment and aircraft on board, for fleet exercises in the Southern Drill Grounds. From this date until 23 March her air detachment operated from ship and temporary shore bases performing scouting and other missions in conjunction with fleet operations.

4 February The Secretary of the Navy directed that 16 nonrigid airships of Class B be procured. Contracts were issued subsequently to the Connecticut Aircraft Corporation, the Goodyear Tire & Rubber Company and the B. F. Goodrich Company.

5 February The Chief of Naval Operations recommended that, in view of the urgent military necessity, eight aeronautic coastal patrol stations be established.

10 February The National Advisory Committee for Aeronautics (NACA) established a patent subcommittee with Lieutenant John H. Towers as a member. The necessity for this subcommittee arose from the fact that the threat of infringement suits being brought by the holders of basic aeronautic patents was causing prohibitive prices for aircraft and general demoralization of the entire industry.

13 February At Pensacola, Fla., Captain Francis T. Evans, USMC, performed the first loop with a seaplane, an N-9 floatplane at 3,000 feet, and then forced it into a spin and successfully recovered. For this contribution to the science of aviation, he was later awarded the Distinguished Flying Cross.

12 March The first interservice agreement regarding the development of aeronautic resources and the operations of aircraft was submitted by a board of Army and Navy officers and approved by the Secretaries of the War and Navy Departments. The agreement recognized a general division of aeronautical functions along lines traditional to the services, but stressed the importance of joint development, organization, and operation, and enunciated basic principles whereby joint effort could be achieved in these areas.

13 March The Bureau of Construction and Repair directed that all seaplanes be finished in an opaque yellow color over all.

24 March The First Yale Unit of 29 men, among which were four destined to hold such high positions in the military departments as Assistant Secretary for War held by F. Trubee Davison, Assistant Secretary of the Navy for Air held by David S. Ingalls, Under Secretary of the Navy and Assistant Secretary of the Navy for Air held by Artemus L. Gates, and Secretary of Defense held by Robert A. Lovett; enlisted in the Naval Reserve Flying Force and four days later left college to begin war training at West Palm Beach. This was the first of several college groups to join up as a unit for war service.

6 April The United States declared that a state of war existed with Germany. The strength of Naval Aviation, Navy and Marine Corps combined, was: 48 officers and 239 enlisted men, 54 airplanes, 1 airship, 3 balloons, and 1 air station.

6 April The Secretary of the Navy, by approval of the recommendation of the Board on Flying Equipment, established standard flight clothing for the Naval Flying Service, and authorized its issuance as Title B equipage. Clothing consisted of a tan sheepskin long coat, short coat and trousers, moleskin hood, goggles, black leather gloves, soft leather boots, waders, brogans and life belts.

7 April By Executive Order, the president directed that the Coast Guard be transferred from the Treasury Department to operate as a part of the Navy until further orders.

14 April The Navy's first guided missile effort began when the Naval Consulting Board recommended to the Secretary of the Navy that $50,000 be apportioned to carry on experimental work on aerial torpedoes in the form of automatically controlled aeroplanes or aerial machines carrying high explosives.

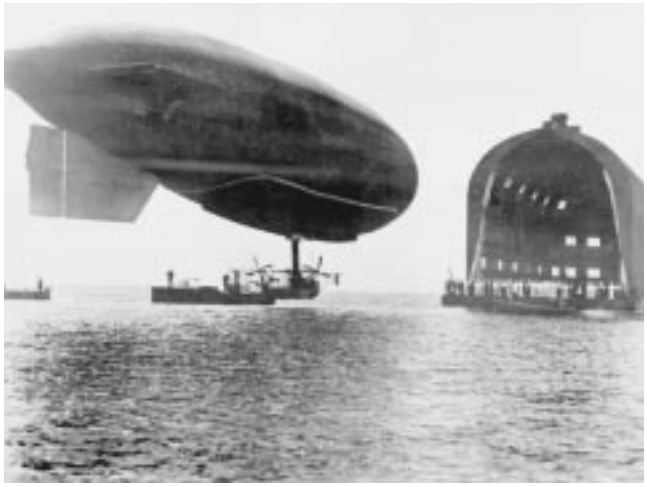
20 April The Navy's first airship, DN-1, made its first flight at Pensacola, Fla. Its performance was unsatisfactory on several counts and, after only two more flights in this month, it was grounded and never flown again.

26 April The catapult installed on *Huntington* (ACR 5) was given its first dead load tests at Mare Island Navy Yard, San Francisco Bay, Calif.

27 April The Marine Aeronautic Company, Advance Base Force, was organized at Marine Barracks, Philadelphia Navy Yard, Pa., by the transfer of personnel from the Marine Aviation Section at Pensacola, Fla., from other Marine Corps units and from the Marine Corps Reserve Flying Corps. Captain Alfred A. Cunningham was in command.

1 May An expansion of the training program was approved which called for assignment of new classes every 3 months and the establishment of a course of

1917—Continued



Navy's first airship approaches floating hangar 19370

18 months duration to qualify officers as pilots of either seaplanes or dirigibles. The program also provided for training enlisted men as aviation mechanics and for selection of a few for pilot training and qualification as quartermaster.

4 May The Commandant of the First Naval District was directed to assume control of the Naval Militia station at Squantum, Mass., for use in air training. On the same date, arrangements were completed to take over the Naval Militia station at Bay Shore, N.Y. These were two of several actions taken immediately after declaration of war to expand the flight training program while stations of a more permanent nature were being built.

5 May The Secretary of War agreed to a proposal of the Secretary of the Navy that a joint board be established for the purpose of standardizing the design and specifications of aircraft. The board, subsequently established, was originally titled "Joint Technical Board on Aircraft, except Zeppelins."

5 May Pensacola, Fla., reported on a test in which a Berthier machine gun, synchronized to fire through the propeller, was fired from a Curtiss R-3 taxiing on water and standing on the beach.

15 May The Secretary of the Navy established an order of precedence for work involved in the preparation for war which placed "aircraft and their equipment" ninth on a list of twenty major fields of material procurement.

16 May The Aircraft Production Board was established by resolution of the Council of National Defense as a subsidiary agency to act in an advisory capacity on questions of aircraft production and procurement. Membership included a representative from each service, the Navy's being Rear Admiral David W. Taylor. Reconstitution of the Board by Act of Congress on 1 October 1917, transferred its control to the War and Navy Departments, enlarged its membership for greater service representation, and changed its title to Aircraft Board.

17 May Aircraft machine gun procurement— The Chief of Naval Operations requested purchase of 50 aircraft machine guns synchronized to fire through propellers and 50 for all-around fire.

17 May Captain Noble E. Irwin was ordered to the Material Branch to relieve Lieutenant John H. Towers as Officer-in-Charge of the aviation desk in the Office of the Chief of Naval Operations. Lieutenant Towers, who remained as an assistant to Irwin, was given additional duty orders to the Bureau of Navigation as Supervisor, Naval Reserve Flying Corps.

17 May The Navy awarded a contract to the Curtiss Exhibition Company to train 20 men of the Naval Reserve Flying Force as aviators at the company field at Newport News, Va.

18 May Experimental self-sealing fuel tanks, consisting of double walled galvanized iron containing layers of felt, gum rubber and an Ivory soap-whiting paste, were demonstrated to representatives of the Army and Navy by the Bureau of Standards.

19 May A distinguishing insignia for all United States Government aircraft was described in a general order which directed that it be placed on all naval aircraft. The insignia called for a red disc within a white star on a blue circular field to be displayed on the wings and for red, white and blue vertical bands on the rudder, with the blue forward.

19 May The Secretary of the Navy directed that the building (bureau) number of each aircraft be placed in figures three inches high at the top of the white vertical band on each side of the rudder. As a result of this order, the practice of assigning numbers to aircraft, as AH, was discontinued and the building (bureau) or serial number became the sole means of identifying a particular aircraft.

1917—Continued

19 May The Chief of Naval Operations requested that two small seaplanes and one pilot be detailed for duty in connection with radio experimentation at Pensacola, Fla.

23 May The initial production program to equip the Navy with the aircraft necessary for war was recommended by the Joint Technical Board on Aircraft, to consist of 300 school machines, 200 service seaplanes, 100 speed scouts and 100 large seaplanes. The N-9 and R-6 were listed as the most satisfactory for school and service seaplanes, but the remaining two types were not sufficiently developed to permit a selection.

28 May *Huntington* (ACR 5) arrived at Pensacola, Fla., from Mare Island, Calif. While there, and until 1 August 1917, she was used in various aeronautic experiments involving the operation of seaplanes and kite balloons from her deck.

29 May The Navy awarded a contract to the Goodyear Tire & Rubber Company of Akron, Ohio, to train 20 men as LTA pilots.

30 May The Navy's first successful dirigible, the B-1, landed in a meadow 10 miles from Akron, Ohio, completing an overnight test flight from Chicago, Ill. The B-1 was manufactured at Akron by Goodyear, assembled in Chicago, and piloted on this flight by Goodyear pilot, Ralph H. Upson.

4 June The construction of five prototype models of 8- and 12-cylinder Liberty motors was authorized by the Aircraft Production Board and the Joint Technical Board on Aircraft. The design of these engines, based on conservative engineering practices especially adapted to mass production techniques, had been worked out in a room in a Washington, D.C., hotel by J. G. Vincent of the Packard Motor Car Company and E. J. Hall of the Hall-Scott Motor Car Company.

5 June The first U.S. military unit sent to France in World War I, the First Aeronautic Detachment, arrived in Pauillac, France, aboard *Jupiter* (AC 3). The Detachment, consisting of seven officers and 122 enlisted men, including the element aboard *Neptune* (AC 8) which arrived at St. Nazaire on 8 June, was commanded by Lieutenant Kenneth Whiting. Offloading was completed by 10 June.

11 June All aviation personnel and aircraft were transferred from *Seattle* (Armored cruiser No. 11) as she made ready for convoy duty at the Brooklyn Navy Yard, N.Y. Her raised catapult, while left on board, was lowered and secured to the deck where it would not interfere with normal operations at sea.

14 June The establishment of patrol stations along the Atlantic coast was implemented as the first contract for base construction was let. The contract covered sites on Long Island, N.Y., located at Montauk, Rockaway and Bay Shore.

Hispano-Suiza engine version of the N-9 trainer 1312

1917—Continued

17 June A joint Army-Navy Mission (called the Bolling Mission after its senior member, Major R. C. Bolling), of which the Navy members were Commander George C. Westervelt and Lieutenant Warren G. Child, sailed for Europe to study air developments among the Allies and recommend a policy and program for the American air services.

22 June Enlisted men of the First Aeronautic Detachment began preliminary flight training in Caudron landplanes under French instructors at the Military Aviation School, Tours, France. At about the same time, 50 men of the Detachment were sent to St. Raphael, France, for training as mechanics.

22 June Change No. 11 in uniform regulations was the first to make special provision for aviators. It provided for a summer service flying uniform of Marine Corps khaki in the same pattern and design as service whites, to be worn when on immediate active duty with aircraft. The order also provided for a working dress uniform made as a coverall from canvas, khaki or moleskin of the same color as the flying uniform.

4 July The first 8-cylinder Liberty motor arrived in Washington, D.C., for testing by the Bureau of Standards, having been assembled at the Packard Motor Car Company from parts made by manufacturers in plants scattered from Philadelphia, Pa., to Berkeley, Calif. Design, manufacture, and assembly of this motor had required less than six weeks.

7 July Lieutenant Kenneth Whiting, commanding the First Aeronautic Detachment, cabled the Secretary of the Navy reporting the results of his negotiations with the French in regard to training and establishment of air stations and requested departmental approval. Under the terms of the agreement, the first of several concerned with the expansion of Naval Aviation overseas, the French agreed to train personnel of the Detachment at existing French Army Aviation Schools (pilots at Tours, France, and mechanics at St. Raphael, France), and to start construction of three patrol stations for American use, located at Dunkirk, France, the mouth of the Loire River (Le Croisic, France), and the mouth of the Gironde (St. Trojan, France), and a training station at Lake Lancanau (Moutchic, France).

9 July A group of 24 potential Naval Aviators under Ensign Frederick S. Allen as Officer-in-Charge, reported at the University of Toronto for the start of flight training under the Canadian Royal Flying Corps (RFC). This training was arranged by an agreement with the Army and the RFC that 25 men from the Navy would be included in the contingent of 100 Americans for which the Government of Canada had agreed to provide flight training.

10 July A plan for training student officers of the Naval Reserve Flying Corps was circulated for comment. It proposed a program in three parts: (1) A Ground School for indoctrination into the Navy and study of subjects related to aircraft and flight, (2) a Preliminary Flight School for flight training through 5 to 10 hours of solo, and (3) a Completing Flight

American built HS flying boats moored at NAS Moutchic, one of the main training bases in France 1053802

1917—Continued

School for advanced flight training and qualification as a Naval Aviator and a commission as Ensign, USNRF. This plan was implemented without the benefit of a formal directive by the establishment of the Ground School in the same month and the later division of flight training into elementary and advanced courses.

23 July Ground instruction for prospective pilots and for aviation ground officers began at the Massachusetts Institute of Technology (MIT) with a class of 43 students comprising the Naval Air Detachment under command of Lieutenant Edward H. McKitterick. In this, and in similar programs later established at the University of Washington, Seattle, Wash., and the Dunwoody Institute, Minneapolis, Minn., large numbers of officers were indoctrinated and introduced to the fundamentals of aviation.

24 July A large obstacle to the effective expansion of aircraft production was removed by formation of the Manufacturers Aircraft Association to handle the business of a Cross Licensing Agreement by which member companies had full access to all patents held by other members at fixed low rates.

26 July The Army Navy Airship Board endorsed a proposal by the Bureau of Mines for the experimental production of helium and recommended the allotment of $100,000 to construct a small plant for the purpose. This action, subsequently approved by both Departments, initiated helium production in the United States.

27 July An act of Congress authorized the president to take possession of North Island, San Diego, Calif., for use by the Army and Navy in establishing permanent aviation stations and aviation schools. The arrival of Lieutenant Earl W. Spencer on 8 November 1917, under orders to establish and command a station for the purpose of training pilots and mechanics and conducting coastal patrols, marked the beginning of the present NAS North Island.

27 July Construction of the Naval Aircraft Factory at the Navy Yard, Philadelphia, Pa., was authorized for the purposes of constructing aircraft, undertaking aeronautical developments and providing aircraft construction cost data.

8 August The approval by the Secretary of the Navy for plans to establish one training and three coastal patrol stations in France was the first of several dealing with an overseas base construction program that was expanded successively and ultimately provided 27

Woman at work in Naval Aircraft Factory, World War I (NH)2493

Naval Air Station at Treguier, France, showing HS-1 flying boats used in patrol over the English Channel 72979

1917—Continued

locations in France, England, Ireland and Italy, from which naval air units were operating at the close of the war.

10 August Ground was broken for the Naval Aircraft Factory at the Philadelphia Navy Yard, Pa.

14 August In an experiment initiated through the impetus of Rear Admiral Bradley A. Fiske, and conducted by Lieutenant Edward O. McDonnell at Huntington Bay, Long Island, N.Y., a dummy torpedo was launched from a seaplane, but struck the water at an unfavorable angle and ricocheted, nearly striking the plane. This event marked the beginning of serious Navy interest in launching torpedoes from aircraft.

15 August The Bureau of Construction and Repair authorized the Curtiss Company to paint the wings of naval aircraft with "English-Khaki-Gray-Enamel" and all aircraft manufacturers to use either opaque yellow or clear varnish on floats and hulls. These, the initial variations to the color scheme that had been established the preceding March, were followed by so many other exceptions that no standard existed for the next six months. The trend, however, was to use an opaque yellow finish for school machines and to use a khaki finish, similar to that used on British aircraft, for service machines.

25 August The NC flying boat development was initiated by Chief Constructor David W. Taylor in a memo which outlined certain general requirements of an airplane needed in war and directed his staff to investigate the subject further. In part, Taylor stated: "The 'United States [Liberty] Motor' gives good promise of being a success, and if we can push ahead on the airplane end, it seems to me the submarine menace could be abated, even if not destroyed, from the air. The ideal solution would be big flying boats or the equivalent, that would be able to fly across the Atlantic to avoid difficulties of delivery, etc."

25 August The 12-cylinder Liberty motor passed a 50-hour test with a power output of 301 to 320 horsepower, preliminary to being ordered into mass production.

4 September The technical members of the Bolling Mission, having just returned from studying air developments in Europe, submitted a report to the Secretaries of War and Navy. Among other things they recommended that air measures against submarines take precedence over all other air measures, that the United States establish and operate as many coastal patrol stations in Europe as possible, and that European aircraft be obtained for use at those stations until the more satisfactory types manufactured in the United States became available.

7 September In tests which led to additional orders for 300 Simon radio transmitters, radio signals, sent from an R-6 seaplane flying from NAS Pensacola, Fla., were received by Naval Radio Station New Orleans, La., 140 miles distant.

7 September A forestry green winter service flying uniform, of the same design as the summer uniform, was authorized for all officers assigned to aviation duty.

7 September A winged foul anchor was adopted as an official device to be worn on the left breast by all qualified Naval Aviators. Before the wings were issued, use of the letters "U.S.", which had been incorporated in the first design, was abandoned by order of 12 October 1917 and the design adopted was essentially that of the wings worn today.

8 September A site at Naval Operating Base, Hampton Roads, Va., was established as an air training station and patrol base to conduct experimental work in seaplane operation. Detachments under training at the Curtiss School at Newport News, Va., and at Squantum, Mass., transferred to this location in October, and on 27 August of the next year, the Naval Air Station was formally established.

17 September A kite balloon from *Huntington* (ACR 5) was hit by a squall and while being hauled down struck the water so hard that the observer, Lieutenant (jg) Henry W. Hoyt, was knocked out of the basket and caught underwater in the balloon rigging. As the balloon was pulled toward the ship, Patrick McGunigal, Ships Fitter First Class, jumped overboard, cleared the tangle and put a line around Lieutenant Hoyt so that he could be hauled up on deck. For this act of heroism, McGunigal was later awarded the Medal of Honor.

18 September A production program of 1,700 operational type aircraft was established on the basis of a report issued this date by the Joint Technical Board on Aircraft.

26 September Lieutenant Louis H. Maxfield, commanding the Naval Air Detachment at Akron, Ohio, reported the qualification of 11 students, including himself, as lighter-than-air pilots and requested their

1917—Continued

designation as Naval Aviator (Dirigible). These men, the first trained specifically as dirigible pilots, were subsequently assigned Naval Aviator numbers ranging from 94 to 104.

6 October The Secretary of War authorized the Navy to use a part of the Army landing field at Anacostia, D.C., for the erection and maintenance of a seaplane hangar. Terms of use were within those of a revokable license and with the understanding that the Army might have joint use of the Navy area at any time. In the following January, NAS Anacostia, D.C., was established to provide a base for short test flights, to provide housing and repair services for seaplanes on test flights from NAS Hampton Roads, Va., and the Army station at Langley Field, Va., and to set up new seaplane types for study by those responsible for their construction and improvement.

11 October The catapult, aircraft and all aeronautics gear were removed from *North Carolina* (ACR 12) at the Brooklyn Navy Yard, N.Y.

13 October After serving on convoy duty without using her aeronautic gear except for one attempt with a kite balloon, *Huntington* (ACR 5) transferred her equipment ashore at New York. This transfer, and the subsequent departure of aviation personnel, marked the end of the operational test with aircraft on board combatant ships that had started with the *North Carolina* (ACR 12) in 1916.

14 October The Marine Aeronautic Company at Philadelphia, Pa., was divided into the First Aviation Squadron, composed of 24 officers and 237 men, and the First Marine Aeronautic Company, composed of 10 officers and 93 men. On the same day, the First Marine Aeronautic Company transferred to the Naval Air Station at Cape May, N.J., for training in seaplanes and flying boats and on 17 October the First Aviation Squadron transferred to the Army field at Mineola, Long Island, N.Y., for training in landplanes.

16 October The first power driven machine was started at the Naval Aircraft Factory, just 67 days after ground was broken.

21 October First flight test of Liberty engine—The 12-cylinder Liberty engine was flown successfully for the first time in a Curtiss HS-1 flying boat at Buffalo, N.Y. This flight and other successful demonstrations led to the adoption of both the engine and the airplane as standard service types.

22 October Special courses to train men as inspectors were added to the Ground School program at MIT with 14 men enrolled. Eventually established as an Inspector School, this program met the expanding need for qualified inspectors of aeronautical material by producing 58 motor and 114 airplane inspectors before the end of the war.

24 October The first organization of U.S. Naval Aviation Forces, Foreign Service, which had evolved from the First Aeronautic Detachment, was put into operation as Captain Hutch I. Cone relieved Lieutenant Commander Kenneth Whiting of command over all Naval Aviation forces abroad.

24 October Routine instruction in flight and ground courses began at NAS Moutchic, France, established as a training station serving naval air units in Europe.

2 November Twelve men who had organized as the Second Yale Unit and had taken flight training at their own expense at Buffalo, N.Y., were commissioned as Ensigns, USNRF, and soon after received their designations as Naval Aviators.

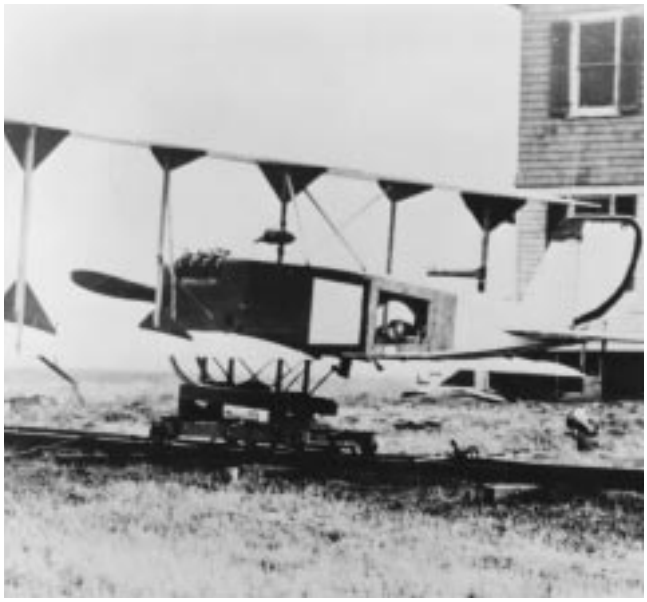
5 November To coordinate the aviation program, Captain Noble E. Irwin, Officer-in-Charge of Aviation, requested that representatives of bureaus having cognizance over some phase of the program meet regularly each week in his office for the purpose of discussing and expediting all matters pertaining to aviation.

9 November Permission was received from the Argentine Government to use three Argentine Naval Officers, recently qualified as U.S. Naval Aviators, as instructors in the ground school at Pensacola, Fla.

10 November A Navy "flying bomb," manufactured by the Curtiss Company, was delivered to the Sperry Flying Field at Copiague, Long Island, N.Y., for test. Also called an aerial torpedo, the flying bomb was designed for automatic operation carrying 1,000 pounds of explosive with a range of 50 miles and a top speed of 90 miles per hour. In addition to this specially designed aircraft, N-9s were also converted for automatic operations as flying bombs that were closely related to the guided missile of today.

14 November A major step in assuring the success of the Navy's World War I aircraft production program was taken when the Secretary of War, Newton D. Baker, approved a recommendation "that priority be given by the War Department to naval needs for aviation material necessary to equip and arm seaplane bases."

1917—Continued



Ancestor of guided missile, World War I flying bomb 651988

15 November A Committee on Light Alloys, with Naval Constructor Jerome C. Hunsaker a member, was established within the NACA to intensify efforts to develop light metal alloys for aeronautical use.

18 November U.S. aerial coastal patrols in European waters began with Tellier seaplanes from LeCroisic, France, at the mouth of the Loire River. This seaplane patrol station, the first of eight established in France, was established 27 November under command of Lieutenant William M. Corry.

21 November A demonstration of the Navy N-9 flying bomb at Amityville, Long Island, N.Y., was witnessed by Major General George O. Squier, USA, Chief Signal Officer. Subsequently the Army established a parallel aerial torpedo project.

22 November A Tellier seaplane piloted by Ensign Kenneth R. Smith, with Electrician's Mate Wilkinson and Machinist's Mate Brady on board, was forced down at sea on a flight out of NAS LeCroisic, France, to investigate the reported presence of German submarines south of Belle Isle. Two days later, and only minutes before their damaged plane sank, they were rescued by a French destroyer. It was the first armed patrol by a U.S. Naval Aviator in European waters.

24 November In discussing the development of aircraft torpedoes and torpedo planes, the Chief of Naval Operations pointed out that available aircraft could carry no more than a 600-pound ordnance load and thus were incapable of delivering a torpedo with an explosive charge large enough to seriously damage a modern warship. This problem, the size of an effective torpedo versus the capabilities of aircraft, retarded torpedo plane development in World War I and continued as an important factor in the post war years.

1 December NAS Pauillac, France, was established as an active assembly and repair station supporting all naval air stations in France.

5 December The policy regarding helicopter development was established by the Secretaries of the War and Navy Departments on the basis of recommendations made by the Joint Technical Board on Aircraft. Basically, need for improvements in powerplants and propellers was recognized as necessary if a successful helicopter was to be obtained, but actual support of development efforts was to be limited to moral encouragement until a vendor had demonstrated a helicopter of military value.

7 December Fighter-type aircraft development was initiated with the Secretary's authorization for the Curtiss HA, or "Dunkirk Fighter." This single-pontoon seaplane was equipped with dual synchronized machine guns forward and dual flexible machine guns in the rear cockpit.

7 December The Naval Aeronautic Station Pensacola, Fla., was redesignated a Naval Air Station.

22 December The addition of an Aerography School in the training program at MIT was marked by the start of classes with one student enrolled. A major portion of the school's new instruction program was carried out at the Blue Hill Observatory, Harvard University, but some classes were also held at the Aerographic Laboratory on the MIT campus. Of 55 men enrolled in the school, 54 qualified as aerologists by the end of the war.

31 December The First Aviation Squadron of the Marine Corps, commanded by Captain William M. McIlvain, USMC, transferred from Mineola, N.Y., to Gerstner Field, Lake Charles, La., for advanced training in landplanes.

1918

1 January The Experimental and Test Department at Pensacola, Fla., was transferred to NAS Hampton Roads, Va., to overcome difficulties arising from the remoteness of the former location from the principal manufacturing and industrial areas.

1918—Continued

Naval aircraft on beach at Pensacola, World War I 426915

21 January The First Marine Aeronautic Company, Captain Francis T. Evans, USMC, commanding, arrived at Naval Base 13, Ponta Delgada, Azores, to fly antisubmarine patrols over convoy lanes in the Azores area.

25 January The Supervisor, Naval Reserve Flying Corps requested that Dr. Alexander McAdie, Director of Blue Hill Observatory, Harvard University, be enrolled as a Lieutenant Commander in the Naval Reserve and be assigned to the Aviation Office in CNO to organize a Naval Aerological Organization.

3 February Aerial gunnery training for prospective Naval Aviators and enlisted men began under Canadian Royal Flying Corps instructors at the Army field at Camp Taliaferro, Fort Worth, Tex.

8 February A change in national aircraft insignia was promulgated by the Navy which replaced the white star with concentric circles of red and blue around white, and reversed the order of the red, white and blue vertical bands on the rudder, placing the red nearest the rudder post.

21 February NAS Bolsena, Italy, was established, Ensign William B. Atwater commanding. The first of two air stations established in Italy during World War I, Bolsena was used primarily as a flying school.

22 February The Director of Naval Communications was requested to provide wireless transmitting and receiving equipment at five naval air stations on the Atlantic coast and at San Diego, Calif., and Coco Solo, Panama, to permit pilots on patrol to communicate with their bases. The following May, this request was expanded to cover all naval air stations.

22 February NAS Queenstown, Ireland, an assembly and repair station for all naval air stations in Ireland, was established, Lieutenant Commander Paul J. Peyton commanding.

26 February In recognition of the importance to flight operations of data on weather phenomena in the upper atmosphere, and acting largely on the recommendations of Lieutenant Commander Alexander McAdie, formerly of Harvard University's Blue Hill Observatory, the Chief of Naval Operations established an allowance list of aerographic equipment for air stations abroad.

28 February The president issued a proclamation, effective in 30 days, that prohibited private flying over the United States, its territorial waters and its possessions without a special license issued by the Joint Army and Navy Board on Aeronautic Cognizance.

1 March The dirigible station at Paimboeuf, France, where several aviation personnel had been on duty with the French since November 1917, was taken over by American forces and established as a Naval Air

1918—Continued

Station, Lieutenant Commander Louis H. Maxfield in command.

3 March Dirigibles in France—The AT-1 (Astra-Torres), having been obtained from the French on 1 March, made its first flight under American control at Paimboeuf, France. Prior to the armistice, the Navy obtained 12 dirigibles from the French.

6 March The Bureau of Navigation established instrument allowances for naval aircraft allotting a compass, two altimeters and a clock for service seaplanes and flying boats; a compass, altimeter, clock and statoscope for dirigibles and free balloons; and an altimeter and clock for kite balloons and training planes.

6 March An unmanned flying-bomb type plane was launched successfully and flown for 1,000 yards at the Sperry Flying Field, Copiague, Long Island, N.Y. The launching device was a falling weight type catapult.

7 March The Office of the Director of Naval Aviation was established in the Office of the Chief of Naval Operations and the Aviation Section became a Division.

9 March A revised training program for Naval Aviators, Seaplanes, was initiated which provided that, after a period of general training, all student aviators specialize in one of three general types of seaplanes; that they follow a syllabus which divided the program into elementary, advanced, and advanced specialization courses; and designated the stations at which the respective courses would be given.

15 March The Bureau of Construction and Repair directed that all new naval aircraft be painted in low visibility naval gray enamel.

19 March As combat operations underlined the need for Aviation Intelligence Officers, Commander, Naval Aviation Forces, Foreign Service, distributed a circular letter defining the duties and functions performed by such officers at Royal Navy Air Stations with the suggestion that provisions for similar services be made at naval air stations "as may seem expedient." Supplementary letters clarified the duties and functions and on 31 October it was specifically stated that Aviation Intelligence Officers be specially trained for this work.

19 March A formation of flying boats, on long range reconnaissance off the German coast, was attacked by German seaplanes. Ensign Stephan Potter shot down one of the attackers and was credited officially as being the first American Naval Aviator to shoot down an enemy seaplane.

21 March The HA seaplane, or "Dunkirk Fighter," made its first flight at Port Washington, Long Island, N.Y., with Curtiss test pilot Roland Rohlfs at the controls and Captain Bernard L. Smith, USMC, occupying the second seat.

25 March Ensign John F. McNamara, flying out of RNAS Portland, England, made the first attack on an enemy submarine by a U.S. Naval Aviator. For his attack, reported by Admiral Sims as "apparently successful," Ensign McNamara was commended by the Secretary of the Navy for his "valiant and earnest efforts on this particular occasion."

27 March The first aircraft built at the Naval Aircraft Factory, the H-16, Serial No. A-1049, was flown for the first time. The H-16 was used in antisubmarine patrol from U.S. and European stations, and for this purpose was equipped with two 230-pound bombs and five Lewis machine guns; one forward, two aft, and two amidships.

30 March The Curtiss 18-T or "Kirkham" triplane fighter was ordered from Curtiss Engineering Corporation. This single-engine, two-seater landplane was fitted with two synchronized and two flexible guns.

First NAF-built H-16 leaving assembly building NAF 2121

1918—Continued

15 April The First Marine Aviation Force, commanded by Captain Alfred A. Cunningham, USMC, was formed at NAS Miami, Fla., from personnel of the First Aviation Squadron and the Aeronautic Detachment, USMC, both of which had disbanded the day before. A Headquarters Company and four squadrons designated A, B, C and D, were organized within this Force on 16 June and it was later transferred overseas to operate as the Day Wing of the Northern Bombing Group.

16 April The first detachment of trained aerologists, consisting of nine officers and 15 enlisted men, departed for duty at naval air stations in Europe.

17 April Lieutenant William F. Reed, Jr., reported at NAS Pensacola, Fla., for what was then called "aerographical" duty, the first such assignment ever made to a naval air station.

23 April The first shipment of Liberty engines to Naval Aviation units in France was received at the assembly and repair station, NAS Pauillac, France.

27 April The airship AT-1, commanded by Lieutenant Frederick P. Culbert and a crew made up of Ensigns Merrill P. Delano, Arthur D. Brewer and Thomas E. McCracken, completed a 25-hour 43-minute flight out of Paimboeuf, France, during the course of which three convoys were escorted through a mined zone. For their flight, the longest on record for an airship of the type, the commanding officer and crew were officially commended by the French Minister of Marine.

30 April Northern Bombing Group—The Secretary of the Navy approved a plan, recommended by the General Board and developed by U.S. Naval Forces in Europe, for air operations to be undertaken in the Dunkirk-Zeebrugge region against German submarine support facilities by a specially organized unit later designated the Northern Bombing Group, and directed that bureaus and offices expedite assembly of the necessary personnel and equipment.

6 May NAS Coco Solo, Panama, was established, Lieutenant Ralph G. Pennoyer commanding, to maintain patrols over the seaward approaches to the Panama Canal.

15 May The Bureau of Steam Engineering reported that the Marconi SE 1100 radio transmitter, designed for use on the H-16 flying boat, had demonstrated dependability in voice communications at distances up to 50 nautical miles and in code communications at up to 120 nautical miles. This was one of the first radio sets used in, and the first tube set developed for, naval aircraft.

18 May The Chief of Naval Operations set training goals to provide pilots for foreign service, and to meet them, directed that eight elementary training squadrons be operated, two at Key West, Fla., four at Miami, Fla., and two at Bay Shore, N.Y.; that elementary training at Pensacola, Fla., be discontinued as

Curtiss (Krikham) 18-T experimental fighter 1061648

1918—Continued

soon as students on board were graduated; and that six advanced training squadrons be organized there to begin training patrol plane and night bomber pilots as soon as practicable.

24 May The first consignment of American-built flying boats, six HS-1s aboard *Houston* (AK 1) and two aboard *Lake Placid* (a Navy cargo ship), arrived at Pauillac, France.

13 June The first American-built aircraft to be assembled in France, an HS-1, made its first flight at Pauillac, France, piloted by Lieutenant Charles P. Mason, USN, with Commander James B. Patton, USN, and Lieutenant William B. Jameson, USNRF, as passengers.

19 June NAS Pensacola, Fla., began taking upper atmospheric weather soundings to provide information on wind velocity and direction, needed for navigational training flights. Recording instruments were carried aloft by a kite balloon, a technique developed by the station meteorological officer, Lieutenant W. F. Reed.

30 June The first Navy pilots of the Night Wing, Northern Bombing Group, to take special training with British units, marked the completion of their course by participating as observers in a night bombing raid by Royal Air Force (RAF) Squadron 214.

1 July An act of Congress repealed all laws relating to the National Naval Volunteers (NNV) and authorized the president to transfer as a class all its members, in their confirmed ranks and ratings, to the Naval Reserve, the Naval Reserve Flying Corps or the Marine Corps Reserve.

7 July The Naval Aircraft Factory completed its first order for 50 H-16 flying boats.

20 July The RAF Station, Killingholme, England, from which U.S. Navy pilots had been flying patrols since February 1918, was turned over to American forces and established as a Naval Air Station, Lieutenant Commander Kenneth Whiting in command.

21 July A surfaced German submarine, firing on a tugboat and three barges three miles off Nauset Beach on Cape Cod, Mass., was attacked by two seaplanes from NAS Chatham, Mass. After firing on both aircraft, the submarine submerged and escaped.

24 July NAS Porto Corsini, Italy, the only U.S. Navy seaplane patrol station established in Italy during World War I, was placed in operating status, Lieutenant Wallis B. Haviland commanding.

25 July The Secretary of War approved a recommendation by the Joint Army and Navy Airship Board, thus completing an inter-service agreement which assigned responsibility for the development of rigid airships to the Navy.

27 July The N-l, first experimental aircraft designed and built at the Naval Aircraft Factory, made its fourth successful flight and its first test of the Davis gun for which it was designed. Lieutenant Victor Vernon piloted and Lieutenant Sheppard operated the gun which gave what was reported as a very satisfactory performance against a target moored in the Delaware River near the factory.

30 July Headquarters Company and Squadrons A, B, and C of the First Marine Aviation Force arrived at Brest, France, on board *DeKalb* (a Navy troop transport). Upon disembarking, they proceeded to airdromes between Calais, France, and Dunkirk, France, for operations as the Day Wing, Northern Bombing Group. With the arrival, the squadrons were redesignated 7, 8, and 9 respectively.

HS flying boats at Naval Air Station Brest, one of two receiving and assembly plants established in France 1053803

1918—Continued

5 August A flying boat piloted by Ensign Ashton W. Hawkins with Lieutenant (jg) George F. Lawrence as second pilot, took off from NAS Killingholme, England, in rain and poor visibility at 10:30 p.m. to patrol a course intercepting a reported Zeppelin raid. The patrol was made in good weather above the clouds without sighting the enemy and came down through heavy weather at South Shields, England, at 5:30 a.m. almost out of fuel. It was the first American night combat patrol out of Killingholme and may have been the first of the war by a U.S. Naval Aviator.

11 August Ensign James B. Taylor made the initial flight in the Loening M-2 Kitten landplane at Mineola, Long Island, N.Y. This aircraft, which was intended for use aboard ship, was not successful; but is of special interest because it was the first monoplane developed under Navy contract; was one of the smallest aircraft ever built for the Navy with an empty weight of less than 300 pounds, and, although equipped with a British ABC motor for flight, was designed for use with a two-cylinder Lawrance 30-horsepower air-cooled engine which was the predecessor of the large American air-cooled radial engines.

15 August Independent offensive operations of the Northern Bombing Group began as Ensign Leslie R. Taber of Air Squadron 1, piloted a Caproni bomber in a night raid on the submarine repair docks at Ostend, Germany. Ensign Charles Fahy was second pilot and D. C. Hale rear gunner on the flight.

19 August NAS Halifax, Nova Scotia, the first of two air stations established in Canada, was placed in operating status to conduct patrols over the northern approaches to the Atlantic coast, Lieutenant Richard E. Byrd commanding.

19 August In trial runs observed by Naval Constructors Holden C. Richardson and Charles N. Liqued, the Kirkham 18-T experimental triplane fighter, built by the Curtiss Company, achieved speeds of 161, 162, and 158 miles per hour, over a measured course.

21 August A flight of bombers and fighters from NAS Porto Corsini, Italy, was intercepted by a superior force of Austro-Hungarian planes over the Austro-Hungarian naval base at Pola on the Adriatic Sea. During the ensuing fight, one American plane was forced down 3 miles from the harbor entrance. Ensign Charles H. Hammann, whose fighter plane was also damaged, evaded his pursuers and landed alongside the downed pilot; took him on board and flew back to base. For his extraordinary heroism in effecting the rescue under hazardous conditions, Ensign Hammann was later awarded the Medal of Honor.

1 September In a reorganization of aviation forces abroad, the Commander, U.S. Naval Aviation Forces, Foreign Service, was assigned to the Staff of the Commander, U.S. Naval Forces Operating in European Waters, as the Aide for Aviation, and unit commands were set up for France, England, Ireland, Italy, and the Northern Bombing Group to control and direct the operations of stations and units in their respective areas.

3 September The first naval air operations from bases in Ireland began from NAS Lough Foyle with patrols over the North Channel entrance to the Irish Sea.

23 September The flywheel catapult, a forerunner of those installed aboard the *Lexington* and *Saratoga*, was used successfully to launch a flying bomb at Copiague, Long Island, N.Y. Development of this catapult by the Sperry Company had been undertaken in connection with the Bureau of Ordnance flying bomb project.

23 September The Aircraft Radio School at Pensacola, Fla., began a course of instruction for Aircraft Radio Electricians which included code work, semaphore and blinker study, gunnery, and laboratory work. This school was transferred subsequently to Harvard University.

24 September Lieutenant (jg) David S. Ingalls, while on a test flight in a Sopwith Camel, sighted an enemy two-seat Rumpler over Nieuport. In company with another Camel he attacked and scored his fifth aerial victory in 6 weeks to become the Navy's first ace. For this and other meritorious acts while serving as a fighter pilot with Royal Air Force Squadron 213, he was awarded the Distinguished Flying Cross by the British Government and the Distinguished Service Medal by the president of the United States.

25 September Chief Machinist's Mate Francis E. Ormsbee went to the rescue of two men in a plane which had crashed in Pensacola Bay, Fla. He pulled out the gunner and held him above water until help arrived, then made repeated dives into the wreckage in an unsuccessful attempt to rescue the pilot. For his heroism, Chief Ormsbee was awarded the Medal of Honor.

1 October Some of the earliest recorded food-dropping missions were flown by Marine Corps pilots

1918—Continued

Captain Francis P. Mulcahy, Captain Robert S. Lytle, and Lieutenant Frank Nelms. On this day and the next, they made repeated low level runs in the face of enemy fire and delivered 2,600 pounds of food and badly needed supplies to a French regiment surrounded by German troops near Stadenburg.

4 October The first of the NC flying boats, the NC-1, made its initial flight at NAS Rockaway, N.Y., with Commander Holden C. Richardson, CC, and Lieutenant David H. McCulloch pilots.

14 October The first raid-in-force by the Northern Bombing Group in World War I was made by eight planes of Marine Day Squadron 9, which dropped 17 bombs totaling 2,218 pounds on the German held railroad junction at Thielt, Belgium. For extraordinary heroism on this and on an earlier raid in engaging enemy aircraft at great odds, 2nd Lieutenant Ralph Talbot, and his observer, Gunnery Sergeant Robert G. Robinson, were later awarded the Medal of Honor.

15 October The Bureau of Steam Engineering reported that five Hart and Eustiss reversible pitch propellers were under construction for use on twin-engine dirigibles. In addition, two Hart and Eustiss variable pitch propeller hubs for the F-5L were being ordered.

17 October A pilotless N-9 training plane, converted to an automatic flying machine, was launched successfully at Copiague, Long Island, N.Y., and flew a prescribed course, although the distance gear failed to land the airplane at a preset range of 14,500 yards. The plane was last seen over the Bay Shore Air Station at an altitude of 4,000 feet, flying eastward.

22 October The twin-engine dirigible C-1, commanded by Major Bernard L. Smith, USMC, and with crew consisting of Lieutenant Ralph A. D. Preston, USNRF, Lieutenant (jg) Donald T. Hood, USNRF, Ensign Warner L. Hamlen, USNRF, Ensign Marcus H. Estorly, USNRF, and two civilian mechanics, M. Roulette and James Royal, was delivered at NAS Rockaway, N.Y., having flown that day from Akron, Ohio, via Washington, D.C. The Aero Club of America later awarded Smith and Hamlen its Medal of Merit for this flight.

11 November An armistice was signed ending the hostilities of World War I. In the 19 months of the United States' participation, the strength of Naval Aviation had grown to a force of 6,716 officers and 30,693 men in Navy units, and 282 officers and 2,180 men in Marine Corps units, with 2,107 aircraft, 15 dirigibles, and 215 kite and free balloons on hand. Of these numbers 18,000 officers and men and 570 aircraft had been sent abroad.

17 November NAS Hampton Roads, Va., reported that an H-16 flying boat, equipped with a radio direction finder using the British six-stage amplifier, received signals from the Arlington, Va., radio station at a distance of 150 miles.

22 November Lieutenant Victor Vernon and Mr. S. T. Williams dropped a 400-pound dummy torpedo from an F-5L at the Naval Aircraft Factory in the initial test of a torpedo launching gear upon which development had begun the preceding July.

23 November Use of titles "Navigation Officer" and "Aerographic Officer" in naval air station organization was authorized by the Chief of Naval Operations to identify officers trained to perform the special duties involved.

27 November The NC-1 took off from Rockaway Beach, N.Y., with 51 persons aboard, establishing a new world record for persons carried in flight.

2 December Efforts to develop aircraft to operate from ships were renewed by the Office of the Chief of Naval Operations request that the Bureau of Construction and Repair provide aircraft of the simplest form, lightly loaded, and with the slowest flying speed possible.

12 December In a test to determine the feasibility of carrying fighter aircraft on dirigibles, the C-1 lifted an Army JN-4 in a wide spiral climb to 2,500 feet over Fort Tilden, N.Y., and at that height released it for a free flight back to base. The airship was piloted by Lieutenant George Crompton, Dirigible Officer at NAS Rockaway, N.Y., and the plane by Lieutenant A. W. Redfield, USA, commanding the 52d Aero Squadron based at Mineola, N.Y.

26 December Ensign Thomas E. Maytham, piloting a B-type airship, completed a flight from Key West, Fla., to Tampa, Fla., Cape Sable, Fla., Palm Beach, Fla., and return that covered approximately 690 miles. This bettered his earlier endurance mark of 32 hours with a continuous flight of 40 hours 26 minutes. Although recognized only as an American record, this time surpassed by more than 25 hours the existing world mark.

30 December Lieutenant Thomas C. Rodman, piloting an H-16 flying boat at Pensacola, Fla., scored the

1918—Continued

Navy's first win in the Curtiss Marine Trophy Race, an annual competition set up by Glenn H. Curtiss in 1915 to encourage seaplane development. The contest was on the basis of miles traveled in 10 hours of flight, with extra mileage credit for passenger load. In winning, Rodman carried 11 passengers 670 statute miles and received credit for 970 miles.

1919

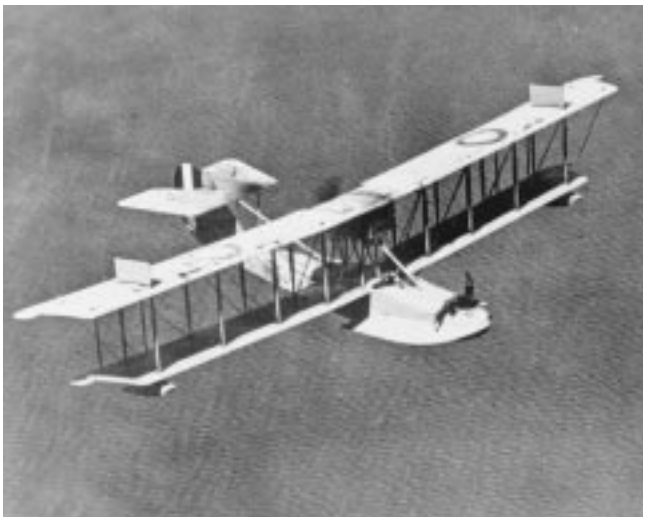
23 January Ensign Fitzwilliam W. Dalrymple and Chief Machinist's Mate Frederick H. Harris took off at NAS Miami, Fla., in a single-engine pusher flying boat, HS-2L, and with benefit of special gas tanks, remained airborne for 9 hours 21 minutes.

3 February Captain George W. Steele, Jr., assumed command of Fleet Air Detachment, Atlantic Fleet, on board his flagship, *Shawmut* (CM 4), in the Boston Navy Yard, Mass. Established for the purpose of testing the capabilities of aviation to operate with fleet forces, the new command marked the beginning of a permanent provision for aviation in fleet organization. Although all elements of the detachment were not immediately assembled, its composition was: *Shawmut* (CM 4) flagship and tender, a seaplane squadron of six H-16 flying boats under Lieutenant Commander Bruce G. Leighton, an airplane division of three landplanes under Lieutenant Commander Edward O. McDonnell on *Texas* (BB 35) and a kite-balloon division of six balloons on various ships and the *Shawmut* (CM 4), under Lieutenant (jg) John G. Paul.

9 February The submission of aerological data, obtained at various naval air stations, to the U.S. Weather Bureau for use in coordinated study of weather conditions, commenced with the report submitted by NAS Pensacola, Fla.

17 February The Fleet Air Detachment which had completed assembly at Guantanamo Bay, Cuba, on the 15th, began operations with the fleet by participating in long range spotting practice. On this day and in subsequent exercises, the detachment gave a practical demonstration of the capabilities of aircraft and of the advantages to be derived from the coordinated employment of air and surface units.

7 March In a test at NAS Hampton Roads, Va., Lieutenant (jg) Frank M. Johnson launched an N-9 landplane from a sea sled making approximately 50 knots. The sea sled was a powerful motor boat designed to launch an aircraft at a point within range of the target and had been developed experimentally at the recommendation of and under the guidance of Commander Henry C. Mustin as a means of attacking German submarine pens. The sea sled was manufactured by Murray and Tregurtha of South Boston, Mass.



HS-2L flying boat powered by Liberty motor 1053768

9 March Lieutenant Commander Edward O. McDonnell, piloting a Sopwith Camel, made the first flight from a turret platform on a U.S. Navy battleship as he successfully took off from the No. 2 turret of *Texas* (BB 35), lying at anchor at Guantanamo Bay, Cuba.

12 March The feasibility of using voice radio and telephone relay for air to ground communications was demonstrated as Lieutenant Harry Sadenwater, in an airborne flying boat, carried on a conversation with the Secretary of the Navy who was seated at his desk in the Navy Department some 65 miles away.

13 March The Chief of Naval Operations issued a preliminary program for postwar naval airplane development. Specialized types desired were fighters, torpedo carriers and bombers for fleet use; single-engine, twin-engine and long distance patrol and bomber planes for station use; and a combination land and seaplane for Marine Corps use.

21 March A gyrocompass developed by the Sperry Gyroscope Company for the Navy was tested in an aircraft. Although this particular instrument was not found acceptable, this is the first recorded instance of tests of this device which was later to prove an invaluable navigational instrument for long-range flight.

7 April The Seaplane Squadron and *Shawmut* (CM 4) of Fleet Air Detachment left Guantanamo Bay,

1919—Continued

Cuba, for the United States after almost seven weeks of participation in fleet exercises, during which time the squadron had operated entirely afloat and had no support from shore bases.

8 April Captain Thomas T. Craven was detached from the Bureau of Navigation for duty in the Office of the Chief of Naval Operations where, in the following month, he relieved Captain Noble E. Irwin as Director of Naval Aviation.

10 April The roll-up of naval air stations in Europe, which had begun on 31 December 1918 with the disestablishment of Porto Corsini, Italy, was completed as the Assembly and Repair Base at Eastleigh, England, was demobilized.

26 April An F-5L flying boat, equipped with two 400-hp Liberty engines and piloted by Lieutenant H. D. Grow out of Hampton Roads, Va., completed a flight of 20 hours and 19 minutes in which it covered 1,250 nautical miles. Although the flight was not made under FAI supervision and was prior to the date on which seaplanes were recognized as a separate class for record purposes, this time was better than any recognized seaplane duration record until May 1925.

28 April Lieutenant Commander Richard E. Byrd, who developed and tested navigational equipment for the forthcoming transatlantic flight, requested the Naval Observatory to supply bubble levels which he adapted for attachment to navigational sextants, thereby providing an artificial horizon which made it possible to use these instruments for astronomical observations from aircraft.

8 May Seaplane Division One, comprised of three NC flying boats, took off from NAS Rockaway, N.Y. at 10:00 a.m. for Halifax, Nova Scotia, on the first leg of a projected transatlantic flight. Commanding the Division, and the NC-3, was Commander John H. Towers. The NC-4 was commanded by Lieutenant Commander Albert C. Read. The NC-1 was commanded by Lieutenant Commander Patrick N. L. Bellinger.

14–15 May The airship C-5, Lieutenant Commander Emory W. Coil commanding, made a record flight from Montauk Point, Long Island, N.Y., to St. Johns, Newfoundland, covering the 1,050 nautical miles in 25 hours and 50 minutes.

16 May Around 6 p.m., three NC flying boats took off from Trepassey Bay, Newfoundland, for the long overwater flight to the Azores.

16 May Ensign Herbert C. Rodd, radioman on the NC-4, intercepted a radio message from the steamship *George Washington* 1,325 miles distant. A radio message from one of the NCs was also intercepted by the radio station, Bar Harbor, Maine, when the plane was 1,400 miles away.

17 May After more than 15 hours in the air, the NC flying boats neared the Azores. At 1323 GMT, the NC-4 landed at Horta, Azores. The other NC boats were not so fortunate; both had lost their bearings in thick fog and landed at sea to determine their positions. But in landing they sustained damage and were unable to resume flight. The NC-3 drifted backwards toward the Azores and arrived at Ponta Delgada, Azores, at 6:30 p.m. on 19 May. The NC-1 sustained additional damage in the heavy seas and was taken under tow by the Greek steamer *Ionia*, but the tow lines soon parted. *Gridley* (DD 92) then attempted to tow the NC-1 but the aircraft pulled adrift again and broke up and sank. Her entire crew was taken on board *Ionia* and arrived at Horta, Azores at 12:30 p.m. on 18 May.

27 May At 8:01 p.m. the NC-4 landed in the harbor at Lisbon, Portugal, completing the first crossing of the Atlantic Ocean by air. The only one of three NC boats to reach the Azores by air, the NC-4 arrived the afternoon of the 17th, and after a layover of 10 days, covered the last leg of the crossing to Lisbon. Lieutenant Commander Albert C. Read was in command and Lieutenant Elmer F. Stone, USCG, Lieutenant James L. Breese, Lieutenant (jg) Walter K. Hinton, Ensign Herbert C. Rodd and Chief Machinist's Mate Eugene S.

C-5 airship attempted transatlantic crossing 1061650

1919—Continued

Rhoads made up the crew. The NC-4 flight terminated at Plymouth, England, on 31 May.

12 June A contract was issued for the construction of a revolving platform at Hampton Roads, Va., for use in experimental development of techniques and equipment for landing aircraft aboard ship.

21 June The Bureau of Construction and Repair reported a modification to the aircraft color scheme whereby stretched fabric surfaces were to be finished with aluminum enamel. Thus, wing and tail surfaces and in some instances the fuselage surfaces were to be aluminum-colored while the specified color for other exterior surfaces continued to be naval gray enamel.

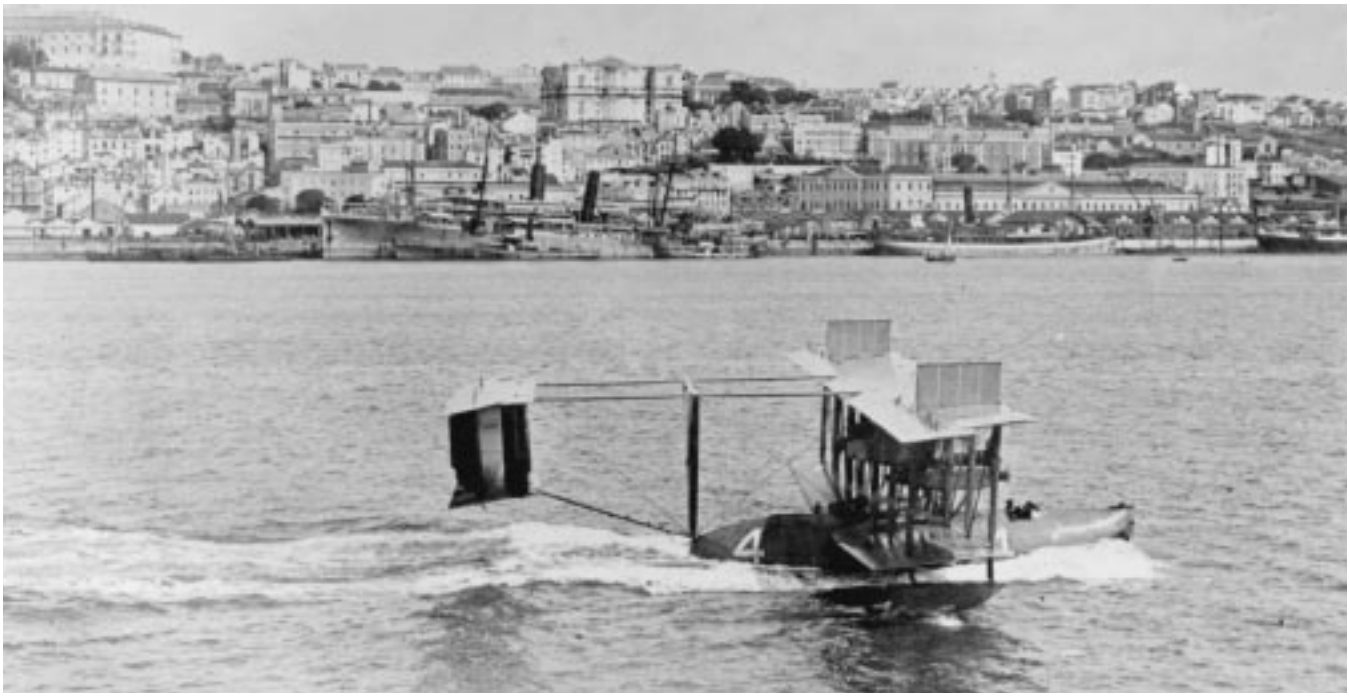
23 June The General Board submitted the last of a series of reports to the Secretary of the Navy on a policy for developing a naval air service. On the conclusion that aviation had become an essential arm of the fleet, the board urged adoption of a broad program for peacetime development that would establish a naval air service "capable of accompanying and operating with the fleet in all waters of the globe." Approved with some modification by the Secretary on 24 July, this program provided the direction for a number of actions taken in the following months.

25 June NAS Anacostia, D.C., reported experiments in which aircraft carried aloft instruments to measure temperature and humidity of the upper atmosphere.

1 July The Secretary of the Navy authorized installation of launching platforms on two main turrets in each of the eight battleships.

2 July The Officer-in-Charge of the Navy Detachment under instruction in landplanes at the Army Air Service School, Langley Field, Va., reported that the 27 Naval Aviators on board had completed the preliminary flight phase in JN-4s and were rapidly nearing the end of the formation flight syllabus in DH aircraft. This training was in preparation for the operation of landplanes from battleship turrets.

11 July The Naval Appropriations Act for fiscal year 1920 made several important provisions for the future of Naval Aviation. Among others it provided for conversion of *Jupiter* (AC 3) into an aircraft carrier, later named *Langley*; for conversion of two merchant ships into seaplane tenders, only one of which, later named *Wright* (AZ 1), was completed, and for construction of one rigid dirigible later designated ZR-1 and named *Shenandoah* and purchase of another from abroad later designated ZR-2 (R-38). In a more restrictive sense, the act limited to six the heavier-than-air stations that could be maintained along the coasts of continental United States.



NC-4, commanded by LCDR A. C. Read, completed first transatlantic flight, Lisbon, Portugal, May 27, 1919 650875

1919—Continued

Crew of the NC-4—1st LT E. F. Stone, USCG, CMM E. C. Rhoads, LT(jg) Walter Hinton, ENS H. C. Rodd, LT J. L. Breese, LCDR. A. C. Read—with CAPT R. H Jackson 1061649

SecNav with transatlantic flyers (1) Read, SecNav Daniels, Towers, Asst SecNav Roosevelt, Bellinger (2) Rodd, Sadenwater, Barin, Richardson, McCulloch, (3) Breese, Lavender (4) Rhoads, Christensen, Stone, Hinton 45354

1919—Continued

1 August To merge aviation with other naval activities, the Aviation Division of the Office of the Chief of Naval Operations was abolished and its functions reassigned to other divisions and to the Bureau of Navigation. The Director of Naval Aviation retained his title as head of the Aviation Section of the Planning Division. In the reorganization, the Aircraft Test Board was transferred to the Board of Inspection and Survey.

9 August Construction of the rigid airship ZR-1, the future *Shenandoah* and the Navy's first rigid airship, was authorized by the Secretary of the Navy. This airship was constructed at the Naval Aircraft Factory and assembled at Lakehurst, N.J.

19 August The Secretary of the Navy ordered use of the pre-war white star national insignia on all naval aircraft in place of the concentric circle design adopted for the war. By this order, the red, white and blue vertical bands on the rudder reverted to their prewar position, blue being forward.

23 August A general order directed that during dirigible flights parachutes be carried for each person on board. The following November, this directive was amplified to apply also to flights in kite balloons and added the further requirement that life preservers be carried in all lighter-than-air craft during flights over water.

22 October The Secretary of War approved the Navy's request that 18 Naval Aviators and 10 mechanics be given landplane training at the Air Service Training School at Carlstrom Field, Arcadia, Fla., and two days later approved a similar program at March Field, Riverside, Calif. This training, an extension of the program already conducted under the Army at Langley Field, Va., had been requested by the Secretary of the Navy as necessary to the successful operation of scouting aircraft from battleship turrets.

1 November The Aerological School at NAS Pensacola, Fla., opened with a class of one Marine Corps and four Navy officers.

18 November The Secretary of the Navy informed the Secretary of War that, in response to his request, arrangements had been made for six Army men to attend the enlisted men's course in meteorology at Pensacola, Fla., and suggested they report about 1 December when classes were scheduled to start.

21 November Engineering plans for the conversion of *Jupiter* (AC 3) to an aircraft carrier, originally completed 5 July were modified, and a summary specification was issued by the Bureau of Construction and Repair. In addition to an unobstructed "flying-on and flying-off deck," stowage space for aircraft and facilities for repair of aircraft, the new plans provided for catapults to be fitted on both forward and aft ends of the flying-off deck.

5 December The Secretary of the Navy approved the basic agreement covering procurement of the R-38 (ZR-2) rigid airship from the British Air Ministry.

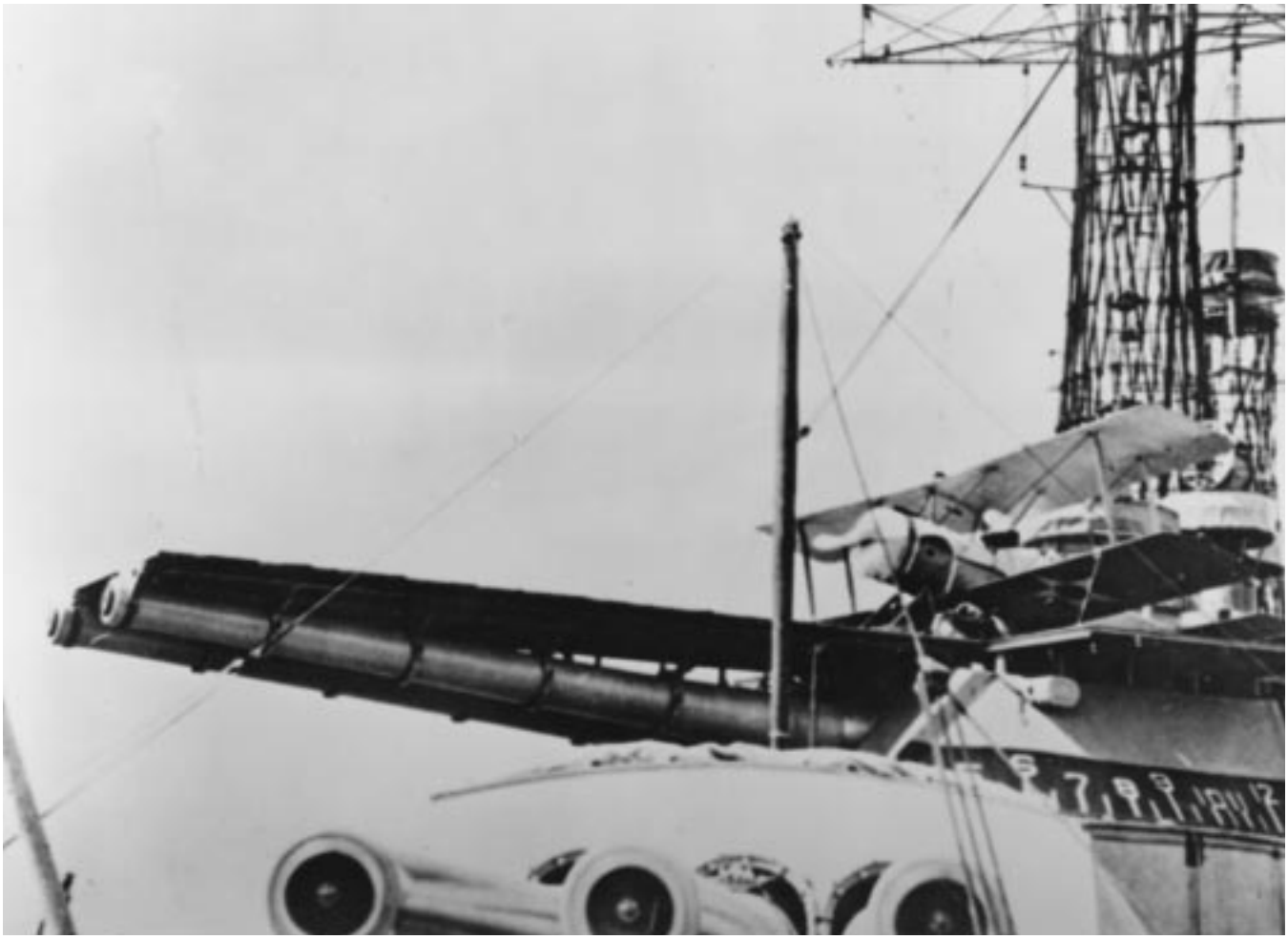
F-5L American adaptation of British flying boat 644471

F-boat, a World War I trainer, at Pensacola 177954

The Curtiss H-12, a twin engine flying boat, represented an early World War I step in aircraft development NH 60768

Thomas-Morse S-5 powered with rotary engine 1053765

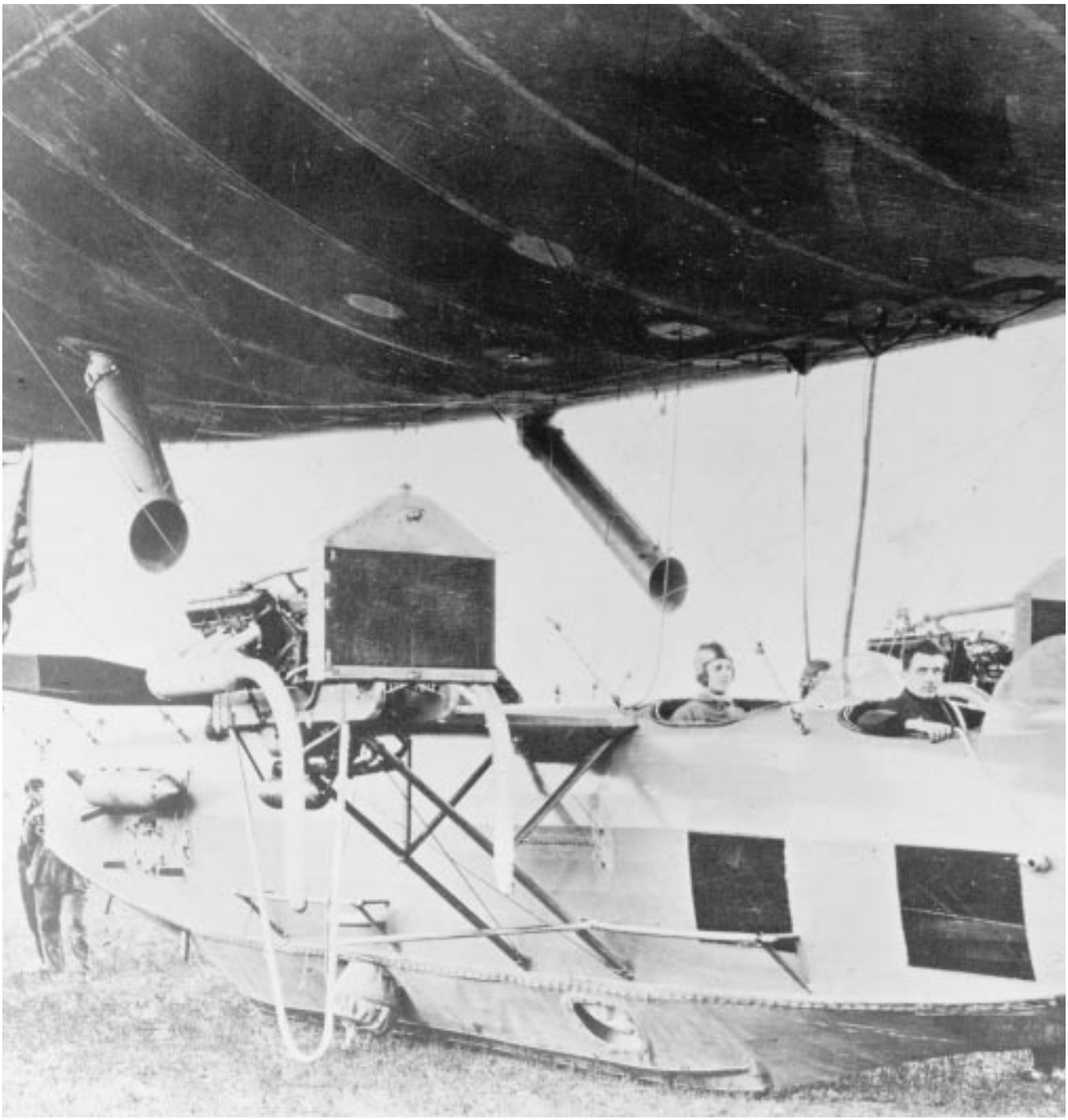
Sea sled, high speed boat for transport and launch of bombers, Caproni landplane on board, November 1918 229907



Turret platform helped adapt planes to ships 428436

Davis recoilless ASW gun, mounted on H-1 1053766

Launching torpedo from R-type aircraft, a means of increasing Naval aviation's offensive power 1061481



Gondola of C-class with bomb in rack 1053767