

Air and Space this Week

Item of the Week

ALBERT READ AND THE FLIGHT OF THE NC-4

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The U.S. military became interested in aerial operations when Taddeus Lowe demonstrated, on the National Mall where the Smithsonian National Air and Space Museum now stands, the potential military reconnaissance value of hot air balloons. With the development of progressively-large and more capable airships in less than a decade after Kittyhawk, both Army and Navy became interested in aviation's military potential in the pre-War years. When the Daily Mail, a major British newspaper, offered a prize of £10,000 for the first transatlantic flight, interest soared. But WWI intervened.

Aviation proved its value in the Great War, for reconnaissance and ground support operation, and for the support and defense against the same. Aviation technology, spurred by wartime necessity, advanced rapidly. The U.S. Navy also became very interested in aviation during WWI, ordering a number of "flying boats" (Curtiss F5L) from the Curtiss Aeroplane and Motor Company that were used almost exclusively for shorter-range anti-submarine patrolling.

Curtiss was also working on the design of a larger flying boat, capable of patrolling farther from its base and carrying a meaningful amount of armament. It was called the "Navy Curtiss," and one of them would make history ...

HISTORICAL SETTING

The military value of heavier-than-air aviation was conclusively demonstrated to the army, and navy establishments of the world at the onset of WWI, in 1914. Most aircraft manufacturers of the time had the hands full with orders for land-based aircraft, so the Navy's needs were met but slowly. To move things along, the U.S. Congress appropriated \$1M for a "Naval Air Service" in 1915, giving the Navy the funds necessary to design and start building the military flying boats and the better engines that would be needed. The next Congress, in 1916, appropriated \$5M to speed development and manufacture along, and that helped, too. The 1917 Congress funded a three-year program and established an Aircraft Production Board that oversaw engine development.

America's nascent Naval Aviation program boomed during the Great War. In 1917, the Navy had a grand total of 45 pilots and 50 seaplanes. Within one year, there would be 823 aviators, 100 seaplanes for operations, and another 324 seaplanes to be used for training. Federal policy at the time required the Navy not to rely exclusively on private industry for all its aircraft needs,

so a Naval Aircraft Factory was built next to the Philadelphia Naval Yard, with construction beginning in October, 1917. The Navy chose the Curtiss H-16 as the basic design, made modifications in consultation with the Royal Navy, and use WWI-proven Liberty engine for propulsion. The first aircraft built flew 228 days after the factory construction broke ground. The NAF produced a goodly number of flying boats, but the need soon outstripped its manufacturing capacity, requiring the Navy to farm out building of aircraft and/or aircraft components to private industry.

NC-4

The Curtiss H-16 design was too small for the Navy's long-range reconnaissance needs. At the same time the H-16 started production, RAdm [David Taylor](#), the Chief of the Navy's Construction and Repair, looked ahead to meeting the recon situation, supporting the development of zeppelins and of a seaplane with much longer range than the H-16. His designers, working with Curtiss' team, came up with the design for a very large seaplane that could carry a big load of bombs/depth charges and be long-legged and durable enough to fly across the Atlantic rather than be ferried across, as with the H-16. The result was known as "Navy Curtiss," or NC for short. It was a biplane with a 250' wing span, three engines, and a boat-like hull. Taylor's outfit ordered four of them to be built.

Taylor, Curtiss, and the Navy all wanted to showcase the advanced capabilities of the NC flying boat. And they were planning to make a public demonstration of the NCs capabilities by flying them across the Atlantic, a feat never-before completed! The range requirements did not allow for a flight from, say, New York to London, but it did allow for a Newfoundland-to-Azores leg of a multi-leg route.

New studies of the design and the capabilities of the engines planned for the four NCs showed that the engines generated less power than designers allowed for. And in spite of Taylor's enthusiastic pushing, Josephus Daniels, the Navy Secretary, did not give the project high priority (Daniels was also a staunch teetotaler, which is why the U.S. Navy was "dry," and the Royal Navy was not!). The engine and Daniels problems delayed production. Taylor brought in two additional companies to help Curtiss with building the NCs components, in order to speed the project along. Completed aircraft were to be sent to flight test on Long Island.

The NC design was difficult to construct. *NC-1* was built first, and Curtiss completed it nine-months after building commenced. It made its first test flight in October, 1918, carrying 50 passengers (and a stow-away) aloft, but demonstrated that its engines were not capable of carrying the load desired, which included a six-person flight crew, 1800 gallons of gasoline, gallons of oil and spare parts, and the weight of armaments. WWI ended the following month, and the *Daily Mail* renewed its prize offer.

NC-1 underwent modifications that would be used in the subsequent three, including acquiring a more powerful engines and creating a center engine nacelle that housed two of the higher-power engines, one a "pusher" and the other a "puller." The four were completed to the revised design by the end of April, 1919. Their test flights revealed a few weaknesses and

involved several mishaps, resulting in *NC-2* being unusable; it was cannibalized for spare parts for the other three. But the desire to showcase the new flying boats was unabated.

The plan was for the three *NC* flying boats to make a 4500-mile trans-Atlantic trip in stages, from Long Island to Halifax to Trepassey Bay in Newfoundland to the Azores (1400 miles) to Lisbon, to Plymouth. The Navy provided a total of 68 destroyers, deployed in intervals along the planned route, to provide navigation, weather, and lifeguard support.

The three *NCs* took off from Long Island's Rockaway Naval Air Station on May 8, 1919. Their crews contained a number of future admirals; *NC-4's* commander was one ...

ALBERT READ

Albert Cushing Read was born on March 29, 1887, in Lyme, New Hampshire. Little has been published about his early life, other than his family was wealthy and socially prominent. He was appointed to the U.S. Military Academy at West Point, graduating in 1907. He made ensign in 1908, and entered flight training soon thereafter, becoming Naval Aviator #24 in 1915. I could find no record of his WWI service, but he did make Lt. Commander before May, 1919. He was assigned to command *NC-4* for the trans-Atlantic flight.

Later in his career, Lt.Cdr. Read commanded the *USS Ajax*, a former collier-turned seaplane tender, and the aircraft squadrons of the Asiatic Fleet. He then commanded the Norfolk Naval Base. During WWII, he trained naval aviators, and retired soon after V-J Day. He was inducted into the National Aviation Hall of Fame in 1965 passed away on October 10, 1967.

THE MISSION

NC-1* and *NC-3

The commander of *NC-1* was LtCdr Patrick N.L. Bellinger. One of his crew was Marc Mitscher, the future WWII admiral. *NC-3* was commanded by future Admiral John Towers, who also commanded the squadron. It is difficult to learn much more about their full crews.

All three flying boats took off OK, but *NC-4* suffered problems that forced stopping at the Naval Air Station in Chatham, Massachusetts (more on that later). The remaining two arrived at Halifax, where they needed refueling and an overnight stay. Prior to departure the next morning, cracks were found in their propellers which required them to be replaced, delaying their departure for a day. The two then flew off to Newfoundland, where they would wait for *NC-4* to join them. The delay proved longer than expected, and when the weather looked good on May 15, Tower ordered *NC-1* and *NC-3* to proceed to the Azores without *NC-4*.

Both flying boats were so laden with fuel and supplies that they could not take off successfully. The attempt and the required reduction in load would delay their flight to the 16th. The bright side of that problem was that *NC-4* managed to catch up to the other two. Weather still looked good, so all three were set to leave Newfoundland on the evening of the 16th. The flight time to the Azores was so long that a late-afternoon departure was desired, because that would allow

for a daylight landing the following afternoon, much more desirable than a sea landing in the dark that would be required by a morning departure.

Alas, a dangerous landing would be required by both *NC-1* and *NC-3* anyway. The planes separated a bit during the night on purpose, to reduce the risk of mid-air collision. However, a dense fog developed after the Sun rose on the 17th. The flying boats were running low on fuel.

Towers in the *NC-3* spotted a ship in the murk that he took to be one of the lifeguard destroyers. It wasn't. It was the British cruiser *Marblehead* and flying toward it took *NC-3* further off course before the mis-identification was recognized. Towers knew he had flown far enough to be close to the Azores, and fuel was really getting low, so he decided to land and try to get an accurate navigational fix. The fog and high waves made the landing so rough that the nacelle supports for the central engines collapsed, turning *NC-3* into a non-flying boat.

Bellinger in *NC-1* had a similar problem, without the *Marblehead*. He landed safely, but the high waves prevented his taking off again. Waves continued to damage the *NC-1*, and the crew would have been lost had it not been for the timely appearance of a Greek freighter, the *Ionia*, which rescued the *NC-1* crew and took the flying boat under tow. Heavy seas continued to batter *NC-1*, and after three days it finally sank.

The odyssey of *NC-3* was even more harrowing. Towers had ill-advisedly removed *NC-3's* radio transmitter in an effort to reduce weight, so he could not call for help. Towers was able, however, to determine his position, from which he realized that the *NC-3* would drift to their Azores destination in a few days. They barely made it, drifting and taxiing for 53 hours, but *NC-3* would never fly again.

And then there was one.

NC-4

Read's *NC-4* crew included Lt. Elmer Stone (pilot), Chief Machinist's Mate Eugene Rhoades, Lt. W.K. Hinton (engineer), Ensign Herbert C. Rodd (radio operator), and Lt. J.L. Breese (reserve engineer). *NC-4* suffered a dangerous drop of oil pressure in its central-aft engine, the pusher. Read pressed on, but a connecting rod failed in the central-forward engine, the puller, soon thereafter. The *NC-4* could not remain aloft on the two remaining engines, and *NC-4* made a forced landing about 80 miles east of Cape Cod. Radio operator Rodd was unable to raise any of the supporting destroyers, so Read and company had to taxi back to Chatham, as stated previously. There was only one available engine there, and it was less powerful than the one that failed; it was installed anyway. The oil pressure problem was resolved, so off they went. Another drop in oil pressure required a sea landing and quick repair, and *NC-4* was able to catch up with the other three in Newfoundland. There a more-powerful engine was available, so the one replaced in Chatham was itself replaced, making *NC-4* good to go. As they approached the Azores, *NC-4* suffered from the same dense fog that had imperiled the others. Read was thinking about making a dangerous landing in the soup, but radio operator Rodd managed to pick up radio bearings and weather info from one of the fog-concealed support destroyers. After 15 hours in the air, the undercast parted enough for Read to see the greenery of Flores

Island, one of the western Azores, which gave Read a good fix on his position. He set course for his intended destination in that island group, Ponta Delgada, but rapidly-deteriorating weather conditions compelled to land earlier, at Fayal Island, and take refuge in its harbor, Horta. A cruiser, the [*USS Columbia*](#) (CL-12), was stationed there, and Read was able to learn about the status of the *NC-1* and *NC-3*.

Weather and high seas would keep *NC-4* at Horta for three days before they could safely take off for the short hop to Ponta Delgado, arriving without incident. The weather that had dogged them so far delayed them again, and *NC-4* wasn't able to resume its next planned flight leg until the morning of May 27. The weather had improved, the line of support destroyers was in place, and *NC-4* landed in the Tagus Estuary and taxied town Lisbon that evening.

They had successfully completed a flight from the continental USA to the European continent! A celebration with the good citizens of Lisbon occupied much of May 28. Read wanted to cap his trans-Atlantic feat with the planned flight to Plymouth. He took off on the morning of the 29th, but engine trouble required an emergency landing and repair. Not wanting to risk a night landing at Plymouth, Read resolved to stop short that evening at El Ferrol, where he and his crew spent the night. They took off on the morning of the 31st without further incident, and landing in Plymouth harbor early that afternoon.

Mission Accomplished!

THE AFTERMATH

NC-4's success was Big News. But aviation technology was advancing rapidly, and *NC-4*'s feat would soon be swept off the front pages. John Alcock and Arthur Brown became the first to cross the Atlantic, non-stop this time, in June, 1919, a mere month after *NC-4* completed its mission. Gago Coutinho and Sacadura Cabral successfully flew across the South Atlantic in 1922. And, of course, Charles Lindbergh was the first to fly the Atlantic solo, non-stop, in May, 1927.

From the [National Air and Space Museum](#): "The *NC-4* was put on public display in Central Park in New York City and in several other locations, including Philadelphia and Washington, D.C. The hull of the *NC-4* was exhibited at the Smithsonian Institution in 1920 and it was transferred to the Smithsonian in 1927. The remaining components were retained in Navy storage until they were obtained by the Smithsonian in 1961. The Smithsonian decided to fully restore the *NC-4* for the 50th anniversary of the first transatlantic crossing. With the assistance of three Navy technicians, the restoration of the *NC-4* was completed and the aircraft was displayed on the National Mall for the anniversary celebration on May 8, 1969. After the brief exhibition, the *NC-4* was disassembled and placed in storage until it was loaned to the Naval Aviation Museum in Pensacola, Florida, in 1974."

NC-4 is proudly displayed in the South Wing exhibit area of the Naval Aviation Museum.

DIDJA KNOW?

NC-4's Lt. Elmer Stone was not a Naval officer; he was in the U.S. Coast Guard. What's more, he was Coast Guard Aviator #1! So how and when did the Coast Guard come into being?

The United States Revenue Cutter Service was founded on August 4, 1790, with the duty of collecting importation tariffs as part of the Department of Treasury. Their duties increased after the Slave Trade Act of 1794, when they were tasked with intercepting slave ships.

The United States Life-Saving Service grew out of a Massachusetts Humane Society mariner rescue service that operated much like a volunteer fire department. The Federal government got into the life-saving business with the Newell Act of 1848, which made \$10,000 available to establish unmanned rescue stations along the Jersey coast, and additional funding from the MHS for similar facilities on the Massachusetts coast. Both sets of stations were managed by the Revenue Cutter Service.

The Great Carolina Hurricane of 1854 killed many sailors in coastal Atlantic waters, highlighting the fact that existing lifesaving stations were inadequate. Some additional funding was provided by Congress, but the capacity for lifesaving services was only marginally increased. In 1871, Sumner Kimball was appointed to be the Chief of the Revenue Marine Division, and his first task was to order an inspection tour of existing lifesaving stations. The inspection showed a shocking situation, which allowed Kimball to land a \$200,000 appropriation for a big upgrade, including full-time crews for the lifesaving stations, and allowing for stations to be maintained from Maine to Texas. In 1878, the lifesaving stations were organized under the U.S. Department of the Treasury into the U.S. Life-Saving Service.

The U.S. Coast Guard was established on January 28, 1915 when the U.S. Revenue Cutter Service and the U.S. Life-Saving Service were merged. 3Lt. Elmer Stone began Naval Flight Training on March 21, 1916. He would become Coast Guard Aviator #1 soon thereafter!

When WWI was declared, the Coast Guard was put under the operational control of the U.S. Navy. On April 1, 1967 the Coast Guard was transferred from the Department of the Treasury to the newly-formed Department of Transportation, and on March 1, 2003, it was transferred to the newly-formed Department of Homeland Security. Whatever its place in the org chart, the Coast Guard is one of the U.S. Armed Services, and its men and women have performed great service to America!

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The Aftermath

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