
XV. Airship Types in the Postwar Period

The airships employed by the Navy after WW II included the operating types used in the war, as well as some modified and several new types/classes. The G and L-types were used briefly in the postwar period. By 1947 all of the L-types had either been sold, stricken or placed in storage. Some of the G-types were still in service with the Naval Airship Training and Experimentation Command in 1947.

During WW II the designations that applied to these four airship classes were ZNP-K for the K-types, ZNN-G and ZNN-L for G and L-types and ZNP-M for the M-type. In 1947, the Navy's General Board modified the airship designation system by dropping the "N" which stood for non-rigid. This was done because the board had scrapped the rigid airship program. After the "N" was dropped, the designations became ZPK, ZTG, ZTL (T was used for training vice N) and ZPM. These changes were published in April.

The first modernized K-type airships were designated ZP2K. On August 7, 1951, a ZP2K, equipped for long endurance flights with in-flight refueling equipment and attachments for picking up sea water as ballast, was delivered to the Navy. The second modification to the K-types led to the designation ZP3K. The final configuration of the ZP3K was flown on November 12, 1952, and accepted at NAS Lakehurst. The airship was updated for ASW operations and was designed especially for carrier-based operation. There were 30 ZP3Ks.

A new-type airship was ordered from Goodyear in 1951 under contract number 51-657. She was designated ZP4K but was of a different design than the original K-type. The new design reflected an increased concern for ASW because of the Korean War.

The first one was delivered to the Navy in June 1954, and 14 more eventually followed with bureau numbers 13191-131926 and 134019-134024. A ZP4K was later fitted with a dacron envelope and flown at Lakehurst.

The follow-on to the ZP4K was a newly designed airship designated ZP5K and ordered on contract number 52-985 in 1952. The first one was delivered in May 1955. A unique feature was the inverted "Y" configuration of the tail structure. The Navy received a total of 12 ZP5Ks which were assigned bureau numbers

Top right, in a reversal of roles, a U.S. submarine goes to the assistance of an updated K-class airship that was disabled during an ASW exercise in 1952. Right, while operating with an escort carrier such as the USS Kula Gulf (CVE-106), airships were capable of conducting at sea replenishment of stores and fuel.



141564-141570, 144239-144241 and 146294-146295.

In 1954, a major change occurred in the designation system for airships. It was similar to the system the Navy used for its other aircraft. The difference was the inclusion of the builder's initial in the airship's designation. The changes were as follows: ZP2K became ZSG-2; ZP3K became ZSG-3; ZP4K-ZSG-4; ZP5K-ZS2G; ZPN-ZPG-1; ZP2N-1 - ZPG-2; and ZP2N-1W - ZPG-2W.

One of the characteristics of the Navy's non-rigid airships over the years had been the letter-class identification of "N" for non-rigid. It is fitting that the story of the last airships operated by the Navy were initially given the class designation of "N."

XVI. LTA Records Set in the 1950s

The story begins with the success of the K-class airships in WW II ASW operations. This diminished the need for the much improved M-class of the late WW II period, only four of which were built. Following the war, it was clear that the improved versions of the K ships could handle many LTA tasks. However, with the installation of radar, towed sonar and other new ASW systems, in addition to the need for greater patrol ranges, there was a need for ships larger than the M-class.

In 1947, the Bureau of Aeronautics initiated a design competition for a larger ASW airship to incorporate the new requirements. Goodyear and Douglas were contenders. The Navy purchased the Douglas design, but subsequent arrangements led to Goodyear building the new Nan ship.

Initial go-ahead in 1948 covered design engineering, mock-up and a ground test propulsion system. Two Wright R-1300-2 air-cooled engines, mounted in the car, drove two reversible-pitch propellers on outriggers, with clutches and transmissions so that either engine could drive both propellers, or use both engines. While this work proceeded, the contract for the ZPN-1 prototype was signed. It would be the largest nonrigid airship built, with an 875,000-cubic-foot envelope, a double-deck car with ample provision for the 14-man crew, extensive ASW equipment and in-flight refueling capability for extended operations refueled by accompanying Navy ships.

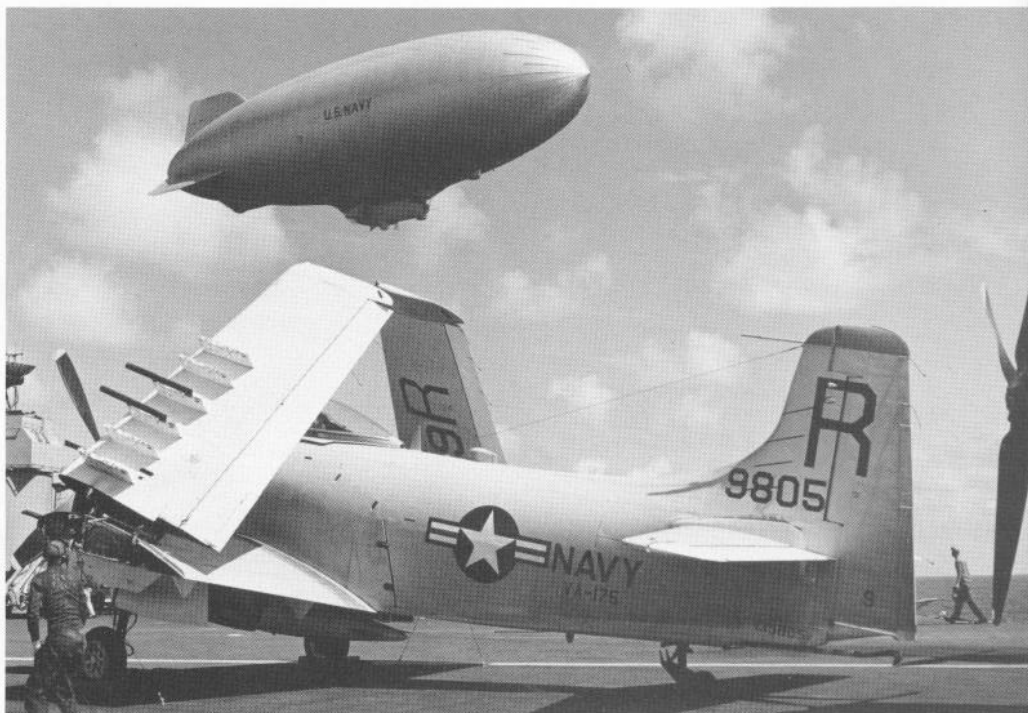
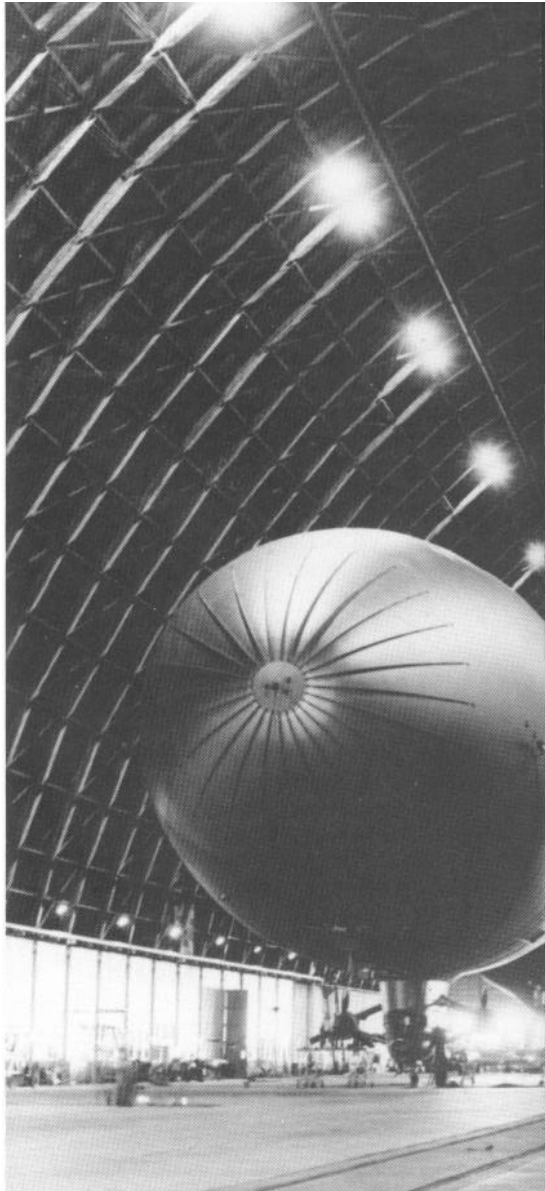
In January 1950, the ground test rig was running, but even this lead wasn't enough when transmission difficulties encountered later in the year delayed the first flight into 1951. Meanwhile, production versions were ordered as the ZP2N-1, which had many improvements,

including a larger envelope of 1,011,000 cubic feet.

The ground rig resumed running in early 1951, with power plant installation in the N-1 in April, and first flight in June. It was soon realized that the ballonets would have to be replaced because of fabric characteristics, but this was postponed until after the Board of Inspection and Survey (BIS) trials. Late in 1950, flight testing was interrupted for modifications, including increased fin strength and reduced control system friction.

Early 1952 saw final solution of the fin design problem, with tail surfaces further modified for final tests at Akron, followed by June delivery to Lakehurst, and Navy Preliminary Evaluation (NPE) in July. The NPE results were disappointing, particularly in the airship's performance and further tests followed to explore specific improvements. Meanwhile the first production ZP2N-1 was approaching completion and an AEW version of the N-type, the ZWN-1, was begun. Activity came to a halt at Goodyear during a fall strike, and the first ZP2N-1 did not fly until May 1953. By this time the ZWN-1 had been redesignated ZP2N-1W, a prototype ordered, and first flight scheduled for September 1954. It would feature larger radar antennas

Right, postwar airships, including ZP4Ks (later designated ZSG-4s) and ZP5Ks (later designated ZS2G-1s), in their hangar at NAS Glynco, Ga., 1956. The rear left and front right airships are the ZP5Ks. Below, a new postwar airship, designated ZP5K (later redesignated ZSSG-1), operates with USS Franklin D. Roosevelt (CVA-42) near Guantanamo Bay, Cuba, in 1956.





inside the envelope than could be mounted externally without excessive drag.

Lakehurst operations with N-1 and flight testing of the ZPPN-1 at Akron continued through spring, summer and into fall. Mock-up inspection of the -1W took place in May. While the flights of N-1 showed the potential of the Nans, they also confirmed the need for the larger envelope, as in the case of the ZP2Ns. In November, N-1 was deflated for the ballonet replacement, and was subsequently overhauled and rebuilt with a larger 975,000-cubic-foot envelope.

After a delay to correct a transmission problem, the first ZP2N-1 was delivered to Lakehurst late in the year for Navy trials. A ballonet failure, due to overpressurization in January 1954, required corrective action to the pressure system, but the fourth ZP2N-1 was delivered that month. Spring saw the first APS-20B installation in the fifth ship, with BIS trials of the new radar at Lakehurst. The airships were also redesignated at about this time, with the Ns becoming ZPGs. The ZP2N-1 and 1W became ZPG-2 and 2W, respectively. The first fully-equipped ZPG-2 was delivered from Akron to the fleet for operational use in July.

BIS trials of the ZPG-2 were completed in December, and ZX-11 began extended operational trials early in 1955, while another ZPG-2 went to Naval Air Development Unit, South Weymouth, Mass., for all-weather tests with emphasis on extreme winter-weather conditions. The first flight of the ZPG-2W



In the foreground is the N-1 airship, the prototype for the Navy's last great series of airships designed for long-range patrol. A K-type airship is in the background.



early in the year coincided with increased interest in the use of nonrigid airships as part of the national early warning network. The ZWG-1, designed specifically for this mission, was ordered but was subsequently replaced by a much-modified ZPG design as the ZPG-3W. Larger radar antennas were installed inside the 1,516,000-cubic-foot envelope, while the higher-powered Wright R-1820-88 engines were returned to external nacelles.

With the first ZPG-2W delivered to Lakehurst in May, production and operation of the ZPGs continued, interrupted by a suspension cable failure problem that resulted in grounding the ships for replacement with redesigned cable assemblies during the summer. By end of the year, the mock-up inspection of the ZPG-3W had been completed, as well as first delivery of a ZPG-2W to ZP-3.

Before the ZPG-3W made her first flight in July 1958, production of the 12

ZPG-2s and five ZPG-2Ws purchased had been completed and the -2s had set a number of records for extended-duration flights. Four ZPG-3Ws were subsequently delivered, but a fatal accident to the first one at sea in the summer of 1960 and a change in early warning mission left the ZPG-2s as the major LTA long-endurance aircraft.

Operations continued into the fall of 1961, when all fleet operations were ended. Two research and development ZPG-2s continued their special assignments as a flying wind tunnel and an ASW research laboratory through August 1962, and then all Navy LTA operations came to an end.

The Navy's last airships were sophisticated vehicles and lighter-than-air advocates of the day believed them to be competitive with other airborne vehicles in the Naval Aviation inventory, particularly in the areas of airborne early warning (AEW) and antisubmarine

The moored airship is a ZPG-3W, the largest non-rigid airship built in the world. It was the last type of airship the Navy built before bringing a close to its LTA era in 1962. Directly above the ZPG-3W is a ZPG-2W. Both of these airships were designed for airborne early warning duties. In the background is a postwar K-type airship.

warfare. One of their strong points was the ability to remain in the air for long periods of time. Every opportunity was taken to demonstrate this unique capability and in the process many new records were established.

The first of these was set in May 1954. A ZPG-2 airship under Commander Marion Eppes departed NAS Lakehurst for an endurance flight which took her north to Nova Scotia, east to Bermuda and then south to Nassau, the Caribbean Sea and the Gulf of Mexico. The airship landed at NAS Key West on May 25 with

an elapsed time of 200.1 hours in the air. It was a notable achievement and Cdr. Eppes was awarded the Harmon International Trophy for his achievement.

At about this time, the Chief of Naval Operations ordered a series of tests to evaluate the all-weather, continuous-patrol capabilities of the airship. These features were of particular concern during the 1950s because the U.S. was seeking a reliable, high-endurance AEW platform which could detect incoming enemy bombers.

Beginning January 14, 1957, a continuous patrol was maintained for 10 days, 200 miles off the coast of New Jersey, by personnel from the Naval Air Development Unit, South Weymouth and Airship Airborne Early Warning Squadron 1.

The weather proved to be the roughest part of the test. It was the worst the area had experienced in 35 years. The crews and their airships dealt with snow, freezing rain, icing, sleet, fog, rain, zero temperatures and high surface winds. During the patrol, all military and commercial aircraft were grounded due to severe weather, but the airships kept going and continued their patrols without mishap.

With these tests completed successfully, the drama involving the final phase of the tests, a long-distance flight, took center ring. The Navy was out to do nothing less than break the long-distance record set by the German rigid airship *Graf Zeppelin* in 1929, when she flew nonstop from Friedrichshafen, Germany, to Tokyo, Japan, a distance of 6,980 miles, without refueling. There had not been a transatlantic airship flight in 12 years.

The long-distance flight had its origins



Above, a view of a ZPG-3W cockpit. The N-series airships were the first non-rigid airships to have controls similar to those of an airplane. Below, a ZS2G-1 airship operating at NAS Lakehurst. In the background is a ZPG-2W airborne early warning airship.





A close-up view of a ZPG-3W being prepared for undocking. The triangular-shaped mooring mast had a two-foot-wide center shaft and was seven stories high.

in the early fifties when the Navy's LTA advocates were struggling to prove the capabilities and suitability of airship operations in a modern and fast-moving Navy. The success of the airship in WW II had been eclipsed by the new advances in fixed-wing aircraft. Thus, it was thought necessary to demonstrate anew the capabilities of the airship platform to prove it could perform the duties required for ASW and AEW operations. These requirements were accentuated by the growing need for a reliable airborne platform which could operate around the clock in all types of weather.

The crew of the *Snow Bird* (the name of the ZPG-2 airship used in the long-distance flight) was a specially selected group of volunteers. Each man had a special talent which would contribute to the success of the operation. The pilot in command was Commander Jack R. Hunt, supported by two copilots, Commander Ronald W. Hoel and Lieutenant Commander Robert S. Bowser. Navigators for the flight were Lieutenants Stanley W. Dunton and Charles J. Eadie. Lieutenant John R. Fitzpatrick and Mr. Edgar L. Moore of Goodyear served as flight engineers. Moore was the only civilian to make the flight. The crew chief was CPO Lee N. Steffen who also doubled as radarman and radioman. Aerology and photography work was done by Petty Officer First Class William S. Dehn, Jr. Petty Officer First Class Thomas L. Cox and Petty Officer Second Class James R. Burkett were the flight mechanics, while Petty Officer First Class Carl W. Meyer was the electrician. Petty Officer Second Class Francis J. Maxymillion worked with Chief Steffen as radioman and radarman. Petty Officer Second Class George A. Locklear, served as rigger and doubled with Petty Officer First Class Dehn as cooks for the flight. Cdr. Hoel was the commanding officer of the Naval Air Development Unit at South Weymouth and senior officer on board the flight, but Cdr. Hunt flew as airship commander. Cdr. Hunt and Lt. Cdr. Bowser were the only two LTA pilots on the flight.

Extensive preparations had been made for the flight. Fuel consumption was carefully calculated and graphically plotted. Every item taken aboard was carefully weighed to ensure the ZPG-2 airship would be within the weight limits necessary for correct fuel consumption and lift rate. Other problems, such as weather reports and communication links, were meticulously worked out. Tension and excitement brought the crew to a high pitch of enthusiasm as the hour drew near for takeoff. On Monday, March 4, 1957, at 1832 (EST) *Snow Bird* lifted off from Naval Air Station, South Weymouth for her epic-making flight.

Problems with strong crosswinds were experienced on takeoff but they were overcome and *Snow Bird* was airborne. Cdrs. Hunt and Hoel and Petty Officer Locklear had to repair Lt. Eadie's bunk, which was smashed on takeoff because of the weight of equipment stored on it. Aside from this mishap, the first few hours of flight were proceeding according to plan.

Snow Bird experienced her second problem not more than 600 miles at sea. The airship entered a storm area where snow was falling, with a fair amount of turbulence in the air. The previous three phases of the tests had proven the airship's capability to withstand bad weather and the crew was confident of her ability to survive without mishap. The problem resolved itself as *Snow Bird* moved out of the storm area.

It was early morning, March 6, and the log read, "Lights below...freighter. Radar shows no land...good...there are peaks in the Azores." *Snow Bird* was making good speed and, as they neared the Azores, the mountainous islands could have presented a problem. Altitude was 1,000 feet, well below the peaks.

The transatlantic flyers were assisted by a wind blowing from the southwest which was acting as a tail wind for the airship. The critical decision now was whether to head southward toward the

easterly trade winds which would help them on their return flight. The problem lay in the leg south where they would be bucking a head wind which would slow their southerly journey and require greater consumption of fuel. The crew grew more anxious as they awaited weather reports from Fleet Weather Central in Washington, D.C.

Reports for the evening of March 6 were not favorable. Nevertheless, *Snow Bird* turned south and attempted to economize on fuel with slow engine speeds. Weather reports on the morning of the 7th continued to call for unfavorable wind conditions on this heading. A course change was made and *Snow Bird* headed east, going to single-engine operation to conserve fuel.

Minor problems began to crop up. An engine sputtered or the air pressure alarm went off, causing brief periods of anxiety before each situation was rectified. The wind, however, continued to be the major problem. The voyage had been planned to allow for a moderate consumption of fuel which would keep *Snow Bird* in the air for 12 days. If she continued to experience head wind problems, there would not be enough for the return flight. The airship commander briefed the crew on the possibility of landing at Port Lyautey, Morocco, to take on fuel in keeping with contingency



Members of the *Snow Bird* crew that set the long-range endurance and distance records for an airship in 1957.



The ZPG-2 Snow Bird as it departed NAS South Weymouth, Mass., on its record-breaking flight in March 1957.

plans. A portable mooring mast had been stowed aboard *Super Constellation* which was to fly ahead of *Snow Bird* and be available at designated landing sites if needed. *Snow Bird* continued eastward and delayed the decision about landing. Nevertheless the *Super Connie* was directed to fly to Port Lyautey and make contingency preparations in case the airship had to land.

On the evening of the 7th, lights were sighted on the southwest tip of Portugal. *Snow Bird* headed south at this point toward the Canary and Cape Verde Islands. One leg of the trip had been completed. This in itself was a significant achievement, for an airship had not crossed the Atlantic since the days of WW II. Further, the crossings made by ZP-14 in 1944 and 1945 were by way of the Azores. *Snow Bird's* nonstop transatlantic crossing was the first for a nonrigid airship.

The winds along the Portuguese coast were out of the south but not as strong as had been encountered further out to sea, and *Snow Bird* was able to make better time. By the morning of the 8th, the airship had passed Casablanca, the weather had improved and conditions looked better for the return trip. The decision was made at this time not to land at Port Lyautey. The log read, "Now we're committed." It was the beginning of the long leg home. As they neared the Canary Islands late on the evening of the

8th, the log read, "Good tailwind. Crew happy."

On the evening of March 9, after five days in the air, *Snow Bird* passed the Cape Verde Islands heading for the Caribbean. It was a long 2,500 miles to Puerto Rico.

Habitability aboard *Snow Bird* was proving to be palatable. Morale was high and the close quarters did not appear to bother anyone. Life was very similar to what might be expected aboard a small surface vessel crossing the Atlantic. Even the gentle motion of the control car was similar to the movement of a small ship. The car was 83 feet long and 11 and one-half feet wide, and was divided into two levels. The upper deck had comfortable bunks and a wardroom equipped with a modern galley. The lower spaces housed the operational part of the car. This was where all the controls for flying the airship, as well as the equipment necessary to perform the mission assigned, were located.

The dietary needs of the men had been an important part of the planning for the journey. Variety, space requirements and preservation were all taken into consideration when food was ordered and brought aboard. It was necessary to set up a ration system to ensure an adequate supply for the entire trip. This was accomplished by placing each day's ration in separate bags. It also prevented any one item from being consumed

ahead of schedule. A total of 1,017 pounds of food had been loaded aboard *Snow Bird* for the flight.

The trip had thus far provided a variety of diversions. Icebergs had been sighted during the early part of the journey in the northern Atlantic. A large number of birds, sharks and whales were always on hand. It was especially exhilarating to see another aircraft or a surface vessel come into view. It made one think of the excitement which must have been generated in the days of sailing vessels when another ship was seen on the horizon after a long period at sea.

The routine of watches and operational duties during the voyage was accompanied by good-natured banter. An entry in the log for March 10 indicated that Cdr. Hoel and Lt. Fitzpatrick each owed a round of beer for inadvertently ringing the air pressure alarm bell. In fact, a sign was made for them for their watch. It read "Welcome to the Bell Ringer's Club."

Aircrewmembers load food and supplies aboard the Snow Bird in preparation for its flight.



The camaraderie during the journey extended to a surprise party held for PO Dehn in honor of his birthday on March 12. PO Locklear put his inventive culinary skills to work and baked a cake in an electric frying pan. Candles had not been a priority item for the trip but the problem was solved when filter-tip cigarettes were substituted. It was a complete surprise to PO Dehn and the party was enjoyed by all hands.

Tension and excitement began to mount on March 12. This was the eighth day of the voyage and *Snow Bird* was closing in on the record for continuous non-refueled flight, which was 200 hours and 12 minutes aloft. *Snow Bird* officially eclipsed this record at 0245 (EST) on March 13, and broke a second record later that day. The distance record established by the German airship *Graf Zeppelin* in August 1929 fell when *Snow Bird* passed the 6,980-mile mark in her tricontinental journey.

Snow Bird continued her flight, having established two new world records. On March 15, 1957, at 1844, *Snow Bird* landed at NAS Key West. The voyage took

264.2 hours and covered a distance of 9,448 miles. No airship of any type had ever flown that far or remained aloft that long without refueling.

Snow Bird was met by a large crowd. Crew members were personally congratulated by Admiral William F. Halsey, Jr., on behalf of President Dwight D. Eisenhower and the U.S. Navy. Awards were presented and special commendations read. It was a great moment for the 14 members of *Snow Bird's* crew and a proud achievement for the United States.

For his contributions as commander and pilot of *Snow Bird's* record flight, Cdr. Hunt was awarded the Harmon International Trophy on November 12, 1958. The award was presented to him by President Eisenhower.

XVII. The Demise of LTA and a Possible Revival

Despite such impressive demonstrations, there followed a slow reduction in the airship force. On June 28, 1957, ZPs

1 and 4 were disestablished, and ZX-11 was disestablished on December 1 of that same year. Still, there was hope that decision makers could be convinced of the value of the airship to Naval Aviation and that the trend could be reversed.

During this period, airships continued to undertake unusual projects not in the realm of normal operations. In 1958, a ZPG-2 was assigned to assist in an arctic weather research project, which was to evaluate the use of airships in the harsh arctic environment. The airship proceeded across the Arctic Circle without incident. Mail and supplies were dropped to scientists at their arctic ice station and a number of scientific experiments were conducted by the airship's crew before they returned to South Weymouth on August 12, 1958. In all, it had been a 9,400-mile journey, the longest arctic flight ever made by a non-rigid airship.

But the stand-down continued. On November 30, 1959, ZP-2, the oldest airship patrol squadron in the Navy, went out of business. ZW-1 was redesignated ZP-1 on January 3, 1961, and continued as an ASW squadron. But the handwriting was on the wall.

That same month, an N-series airship flew cross-country from NAS Lakehurst to MCAF El Toro to participate in an oceanographic research project off the coast of Calif. Her return flight in March of that year was the last major long-distance flight of an airship in the U.S. Navy.

On June 21, 1961, the Secretary of the Navy announced plans to terminate the Navy's LTA program and, by the end of October 1961, ZPs 1 and 3 were disestablished. They were the last operating units of the Navy's LTA branch.

The last flight of a naval airship on August 31, 1962, saw the end of the LTA era in the Navy. During the following decade, various individuals and organizations attempted to rekindle the Navy's interest in LTA. These attempts were generally not successful although some minor studies on LTA were conducted. During the energy crisis in 1973 the Navy, as well as many other government departments, made fuel economy the number one priority. With energy conservation in mind, the Navy established an LTA Project Office at Naval Air Development Center, Warminster, Pa., on July 29, 1975. The purpose of the office was to investigate the status of LTA technology, in terms of new advances and improvements in technology and the economic feasibility of LTA applications in various roles.

The LTA Project Office studied the development of heavy-lift hybrid airships and evaluated airships for maritime surveillance and other missions. Through these studies, standard design

