

*A History of
Sea-Air Aviation*

*Wings Over
The
Ocean
part six*

By John M. Lindley

By comparison with the North Pole, air conquest of the South Pole was generally less hazardous. The South Pole probably claimed the lives of fewer explorers because it was less accessible and therefore required more careful preparations. Prior to a concerted aerial assault on the South Pole, pilots Wilkins, Eielson, and Joe Crosson flew a *Vega* over Graham Land (also called Palmer Peninsula) in Antarctica, thereby beginning serious aerial exploration of that continent. On their flight they discovered that Palmer Peninsula was in fact an archipelago.

Shortly after that, Cdr. Byrd began aerial exploration in Antarctica. He established a base camp called Little America from which he and a crew of four made their historic flight over the South Pole on November 28-29, 1929.



Their plane, a Ford Tri-Motor called the *Floyd Bennett* in honor of their late fellow pilot, functioned without problems and the weather remained favorable throughout the flight out and back from Little America.

In the 1950s the Antarctic once again became the focus of aerial exploration. The U.S. Navy initiated Operation *Deep Freeze* in 1955 as part of its preparations for the International Geophysical Year of 1957-1958. Since American scientists wanted to set up a scientific observation station at the South Pole, Rear Admiral George J. Dufek, the commander of the naval forces in Antarctica, and six companions landed an R4D *Skytrain* at the Pole on October 31, 1956. They were the first visitors to the South Pole since Capt. Robert F. Scott of the Royal Navy reached it in January

1912. RAdm. Dufek and his party remained at the Pole for 49 minutes setting up navigational aids which would assist future delivery of materials for the scientific station. They then took off and returned to their base camp.

Like polar flights, round-the-world flights comprise a category of sea-air aviation firsts all their own. The first organized attempt at a round-the-world flight took six months, from April 4 to September 28, 1924. Eight top-notch Army Air Service pilots left Seattle in four single-engine biplanes. Since their Douglas *World Cruisers* could fly as either landplanes or seaplanes, these Army pilots would be able to land anywhere regardless of how primitive the ground facilities were. Only two of the four planes completed the 26,345-mile circuit of

the globe from Seattle to Seattle via Alaska (where one airplane crashed), Japan, Southeast Asia, Europe, Ireland (where another plane was abandoned due to a faulty fuel pump) and Greenland. One substantial reason why two out of the four planes were able to complete the flight was that the Army had positioned aviation supplies along the route in advance. Even with these supplies, the pilots still had to be their own mechanics and make all necessary repairs.

In 1927 two Americans, Edward Schlee and William Brock, tried to circuit the globe. They departed from Trepassey, Newfoundland, in a Stinson *Detroit* monoplane named the *Pride of Detroit* and flew to England. From there they headed eastward stopping at Munich, Belgrade, Constantinople, Karachi, Allahabad, Cal-

cutta, Rangoon, Hanoi and Hong Kong before reaching Tokyo on September 30. The next leg of their journey, 2,480 miles to Midway Island, was an extremely long and hazardous flight. Friends and relatives put pressure on them not to try it. Schlee and Brock gave in reluctantly; they and their plane came home by ship to San Francisco. Ten years later, Amelia Earhart and her navigator, Frederick J. Noonan, would also try a long trans-Pacific flight in an attempt to circle the globe. They were never seen again.

After Schlee and Brock, round-the-world flights became faster and faster. Wiley Post circled the globe solo in his *Winnie Mae* in 7 days and 19 hours in 1933, breaking the record Post and Harold Gatty had set earlier in 1931. Howard Hughes bettered Post's mark in July 1938 by circling the earth in 3 days, 19 hours and 14 minutes. By 1949 a U.S. Air Force B-50 went around the world nonstop (it refueled in flight) in just over 94 hours. The first nonstop global flight by jet planes came on January 15-18, 1957, when three AF B-52 *Stratofortresses* made the circuit of the earth in 45 hours and 19 minutes. Now astronauts and cosmonauts traveling in space vehicles at thousands of miles per hour have made even that time for a circuit of the globe seem incredibly slow.

Commercial Aviation and the Mastery of Transoceanic Flight

When Commander John H. Towers and LCdr. Albert C. Read got back to the United States in June 1919 following the flight of the NC-4 to Europe, the New York press asked them what the future was for the airplane in transAtlantic flight. Both responded that in the immediate future the dirigible had all the advantages over the airplane for overseas service. Read also pointed out that crossing the Atlantic by seaplane was not commercially profitable. In contrast, the airship had already proved in flights over land that it could carry profitable passenger loads.

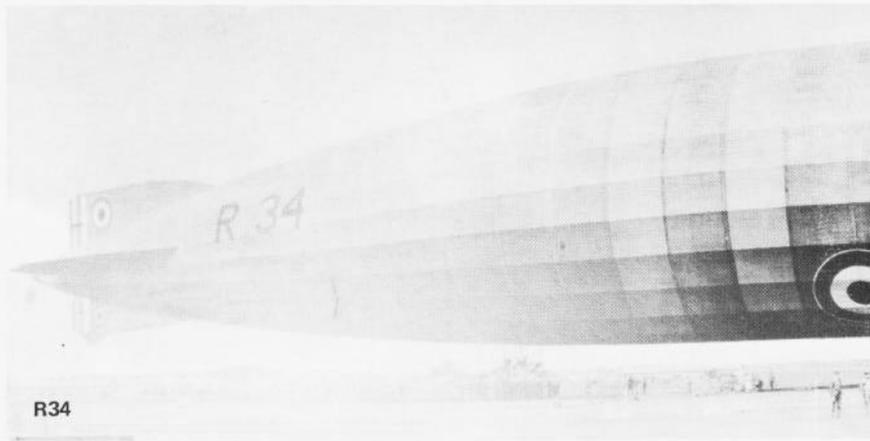
For a time in the 20 years following this interview, the rigid airship did

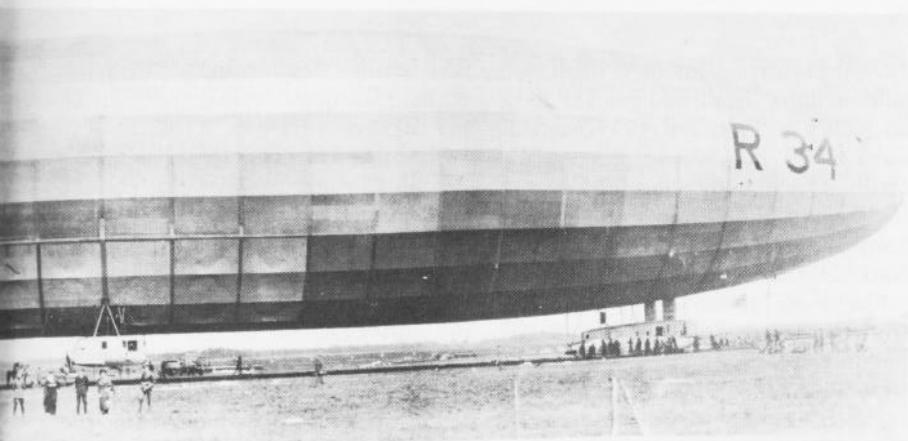
come into its own as the principal passenger carrier for transoceanic flights. Yet this dominance was short lived and by 1939 the dirigible had begun to fade into obscurity as a passenger carrier. The gradual process by which the rigid airship lost out to heavier-than-air craft forms one part of the story of how commercial aviation came to master the problem of transoceanic flight. Thus, this account of the role of commercial flight operations in the history of sea-air aviation must necessarily begin with early transoceanic airship flights.

The first attempt to cross the Atlantic in an airship was a failure. Walter Wellman fitted out a 230-foot dirigible named *America* for a flight to Europe. *America* had two 90-hp engines, a wireless, a lifeboat and a crew of six. It left Atlantic City, N.J., on October 15, 1910. From the outset Wellman and his crew had problems with the lift. Then one of the engines failed. When sparks from the remaining engine threatened to set the hydrogen on fire, Wellman had to shut it down and drift helplessly before the wind. High winds on October 16 prevented a return to the safety of the coast. Wellman hoped they would drift down on Bermuda, but instead they sighted a merchant ship. After making contact with the ship by radio, Wellman brought the airship down close to the water and abandoned it for the safety of the lifeboat and the merchant ship. In five days, *America* had covered only about 1,200 miles; Wellman concluded that a much larger dirigible would be needed for a successful transAtlantic flight.

A big step toward airship conquest of the Atlantic came in 1917 when the German Zeppelin LZ104 (L59) made the first intercontinental flight. The Germans sent LZ104 from their airship base at Jamboli, Bulgaria, to Khartoum in the Sudan to carry relief supplies to German forces trapped in that city. When the Zeppelin left Jamboli on November 21, 1917, it carried 15 tons of cargo and a crew of 22. It had to take an indirect route across the Mediterranean to avoid British aircraft based on the Aegean islands; but once over North Africa, LZ104 navigated across the desert to Khartoum by flying from one oasis to the next. While over the desert the sun superheated the hydrogen forcing the crew to valve considerable gas, which meant that in the cool night air after dark, they had to jettison ballast and supplies to maintain sufficient lift. Once the airship reached Khartoum, it found that the German forces there had already been defeated and the Allied forces were in control of the landing area; thus it could do nothing to help. Since relief was too late, on November 23, LZ104 departed for Jamboli which it reached two days later. The round-trip voyage of 4,200 miles had taken 95 hours.

The intercontinental flight of LZ104 had no significant impact on the course of WW I, but it did prove the capability of the dirigible for transoceanic flight. After the war ended in late 1918, the British Air Ministry, under the leadership of its Director of Airships, Air Commodore Edward M. Maitland, set out to prove the superior capabilities of the airship





for long-range commercial operations. The Air Ministry had two new rigid airships, R33 and R34, which were finished too late for use in the war; thus, when the Aero Club of America invited the British government to send an airship to a meeting of the association in May 1919, Maitland decided to send R34. R34 left East Fortune, Scotland, for New York City on July 2 with a crew of 30 men under the command of Maj. G. H. Scott. Just in case the dirigible needed help en route, the Admiralty had stationed two battle cruisers along the proposed route.

At 634 feet long and 80 feet in diameter, R34 was an average size rigid. It cruised at 45 miles per hour with a top speed of 65 miles per hour. Special passengers were Maitland and LCdr. Zachary Landsdowne, USN. En route to Long Island, the airship suffered a cracked cylinder jacket on one of its five engines, which was repaired with chewing gum. A more serious problem, a storm and high winds, arose on July 5 off northern New England. The airship radioed that it was running low on fuel and might have to land before reaching Mineola, Long Island. The U.S. Navy and civil authorities made preparations to handle an emergency landing, but these precautions proved to be unnecessary when R34 reached Long Island on July 6 without further trouble. R34 stayed in the United States for three days and then returned to Pelham, England, July 9-13. The return trip was made without incident. R34 made the 3,260-mile crossing, east to west, in 108 hours, 12 minutes and the west-to-east transit in 75

hours, 3 minutes.

Surprisingly, the R34 crossings were, as airship historian Douglas Robinson notes, "little remarked at the time and there were no public receptions or decorations for the crew." Robinson believes that the reasons why the flight failed to arouse greater enthusiasm for transoceanic airship travel was the lack of interest by the British government, lack of money, and the lack of support.

Despite the failure of R34 to arouse public support and enthusiasm for airship travel, the German zeppelin program after WW I was able to promote successfully the use of dirigibles in commercial transport. Since the Treaty of Versailles limited the Germans to non-military aviation development, they naturally emphasized the employment of the zeppelin in commercial activities. When the Allied Control Commission rescinded the limit on German airship size in 1925, Dr. Hugo Eckener, Count Zeppelin's successor, was able to exploit the potential market for commercial airship transport.

The commercial air transport division of the Zeppelin Company, DELAG, had already made various passenger flights between German cities as early as 1910-1914; thus, when the Allies removed the limitations on the zeppelins, Eckener had the opportunity to expand DELAG's operations to include intercontinental flights. The first airship DELAG put into service for that purpose was the *Graf Zeppelin* (LZ127). Completed in 1928, *Graf Zeppelin* made a round-trip voyage from Friedrichshafen, Ger-

many, to Lakehurst, N.J., in October 1928. The flight over took 111 hours, 43 minutes; the return trip, 71 hours, 7 minutes. Although this flight aroused great popular enthusiasm for airship travel, Eckener realized that at 757 feet long and 99 feet maximum diameter and with a 71-mph cruising speed, *Graf Zeppelin* was too small for regular transAtlantic service. Thus he began to build an even larger rigid airship, the *Hindenburg* (LZ129), which would be completed in late 1935.

While the Zeppelin Company was building the *Hindenburg*, the *Graf Zeppelin* made several historic flights which greatly increased popular support for airship travel. In March 1929, the *Graf* flew to the eastern Mediterranean, passing over Egypt, Crete, Cyprus, Jerusalem, the Dead Sea and Athens before returning home via Vienna. Eckener then decided to make a round-the-world flight with the *Graf Zeppelin*. Here the problem was not aeronautical or technical but financial. Eckener's airship could not carry enough passengers (20 passengers and a crew of 26) to make the flight pay for itself. Eckener received support, however, from German newspapers, William Randolph Hearst and stamp collectors to make the flight possible. *Graf Zeppelin* thereupon set out on what became two round-the-world flights: Friedrichshafen to Friedrichshafen and Lakehurst to Lakehurst.

First the *Graf* left its shed in Friedrichshafen on August 1, 1929, for Lakehurst where it arrived on August 5. It left Lakehurst three days later and returned to Friedrichshafen on August 10. On the 15th it departed Friedrichshafen for Tokyo via Siberia. After crossing all of Siberia and the Sea of Okhotsk, it arrived in Tokyo on August 19. Four days later it left the Japanese capital for San Francisco. It skirted a typhoon and made the first Pacific crossing by an airship in 67 hours, arriving in San Francisco on August 25. From there it flew to Los Angeles, then across the United States to Lakehurst (August 29) and then back to Friedrichshafen. The round trip from Lakehurst to Lakehurst had taken 21 days and 7½ hours with little

more than 7 days spent on the ground at various ports of call.

In the early 1930s Eckener carried out more prestige flights to publicize commercial airship transportation. In 1930 *Graf Zeppelin* flew to Brazil via Spain. In 1931 it participated in Arctic flights as part of the "Aeroarctic" program to explore and map the icy north. Then between August and October, DELAG began to use the *Graf* for regular scheduled passenger flights to South America. It made 9 round-trip transAtlantic flights in 1932 and in 1933; 12 in 1934; 16 in 1935 and, together with the new *Hindenburg*, made a total of 19 trans-Atlantic flights in 1936. The future of transAtlantic airship travel seemed bright and financially feasible until May 6, 1937. On that day a disastrous fire destroyed *Hindenburg* while she was being moored at Lakehurst, N.J., and killed 62 of the 97 persons on board, again calling into question the safety of hydrogen-filled airships and producing much adverse publicity.

Despite the destruction of *Hindenburg*, the record of that airship and the *Graf Zeppelin* in commercial transport is impressive. In nine years of flying, *Graf Zeppelin* made 650 flights (many transoceanic) and carried more than

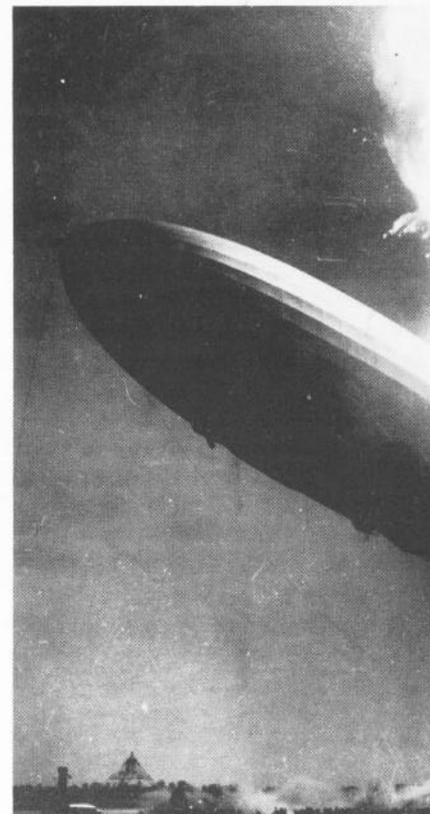
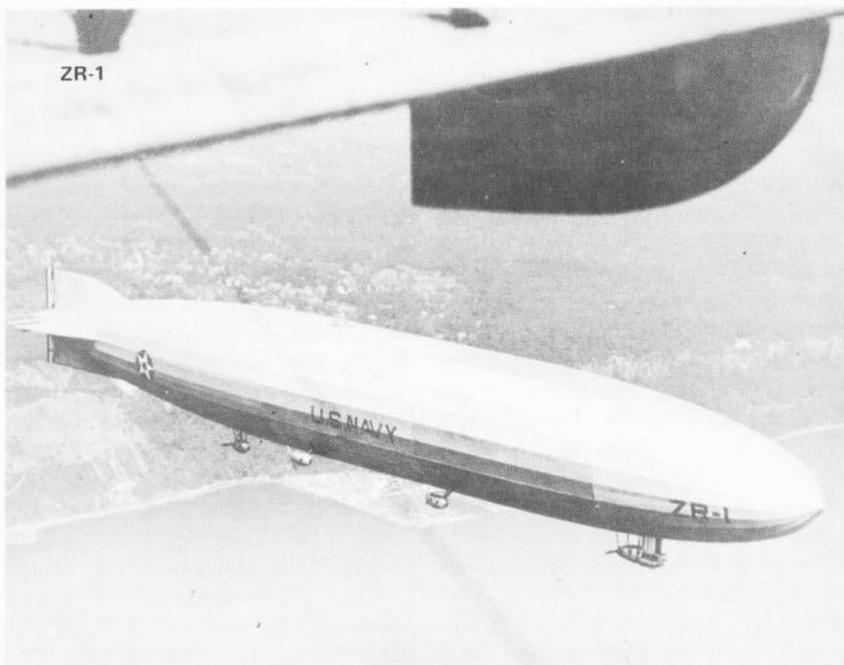
18,000 passengers for more than one million miles. *Hindenburg* made only 56 flights in 1936 and 1937 but still managed to carry 2,656 passengers a total of 190,000 miles. After the *Hindenburg* disaster, worsening relations between the United States and Nazi Germany, combined with the public image of the airship as unsafe, severely hampered further commercial airship travel. The outbreak of WW II effectively ended any further German commercial passenger transport by dirigible.

Prior to 1940 the flights of German zeppelins operated by DELAG were the only successful commercial airship transport operations. The British had tried in the late 1920s to establish commercial air transport by rigid airship to Canada, Egypt and India, but their efforts had failed. The British Air Ministry had funded the construction of two airships, R100 (built by a civilian company) and R101 (built by the Air Ministry). They made their first test flights in 1929-1930. Then in July 1930, R100 flew to Montreal and back to England, weathering some bad storms en route. After difficulties in its flight tests and subsequent modifications, R101 was provisionally certified as airworthy and prepared for the

first of the "Empire flights" to India. Without adequate testing and trials of the later modifications, R101 took off on October 4, 1930. After crossing the English Channel to France, it crashed near Beauvais.

At first the rigid dirigible seemed to be more promising than heavier-than-air craft for long-haul air transport. In the early 1930s the success of the *Graf Zeppelin* tended to reinforce this conclusion; yet even discounting the disasters of R101 and *Hindenburg*, the rigid dirigible did not become the dominant type of aircraft for long-haul (especially transoceanic) commercial transport. The reasons why heavier-than-air craft were to become dominant are, in retrospect, quite clear, although they were not as apparent in the 1930s.

Even though the rigid airships, especially the zeppelins, demonstrated a high degree of regularity of operation, their record of punctuality was poor. Block time for the transAtlantic flights fluctuated up to twelve hours. Peter Brooks, historian of the modern airliner, argues that, even if helium had been substituted for explosive hydrogen in *Graf Zeppelin* or *Hindenburg*, there still would have been problems with the financial feasibility of com-



mercial airship transport. Helium has less lifting capacity than hydrogen; thus, a helium-filled airship carries a smaller payload than the same airship filled with hydrogen. Brooks estimates that if helium had replaced hydrogen, lighter-than-air costs per seat-mile would have been 50 to 100 percent greater than they were with hydrogen. In addition, he finds that "It is doubtful whether the rigid airship could have achieved acceptable safety standards in worldwide scheduled operation." Thus Brooks concludes that the *Hindenburg* disaster and WW II, coupled with the technical development of heavier-than-air craft by 1946, meant that for practical use on long-haul air routes over both land and sea "the much slower and, by comparison, operationally unproven rigid airship — even filled with helium — had no chance of revival."

Heavier-than-air craft achieved dominance in long-range and transoceanic commercial air transport only very gradually. The dirigible could, of course, compensate for having a slower speed than airplanes with its greater range and bigger payload. In the 1920s and '30s individual airplanes were able to make impressive transoceanic flights. Nevertheless, many of these

record flights had no future as regular scheduled air transport. Both landplanes and seaplanes needed to use all their available space for fuel (which weighed six pounds per gallon) on transoceanic flights. An airline has to provide permanent scheduled services to the public, not occasional record flights and dangerous stunts. Thus, the development of transoceanic passenger service depended, in part, upon the gradual improvement of aircraft and the accumulation of flying experience.

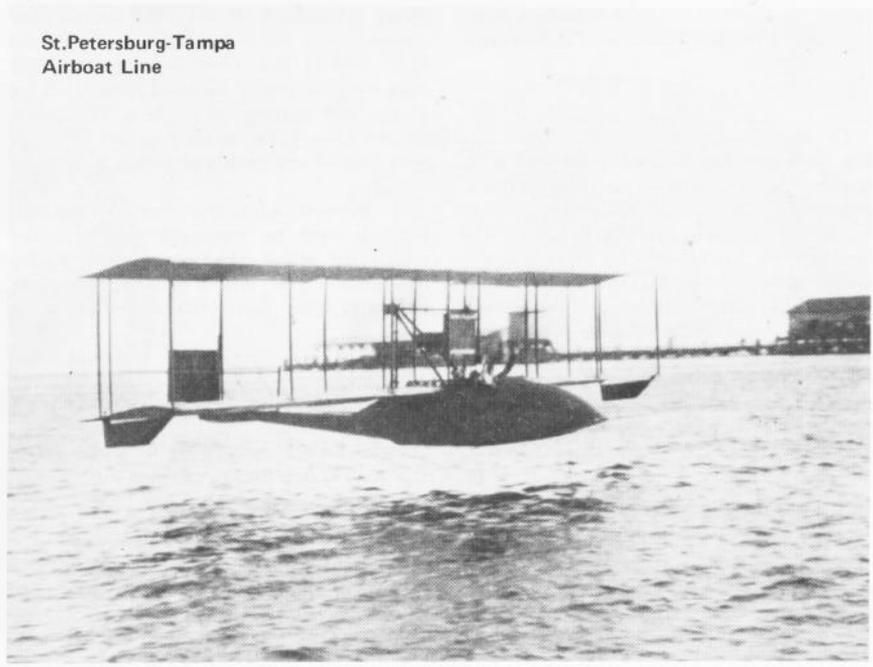
The earliest known air transport service began in 1911. During that year, tentative efforts to establish air mail service were made in India, England and the United States. None of these scheduled air mail routes lasted very long. In 1914 Tony Jannus, a pilot, and the St. Petersburg-Tampa Airboat Line provided the first air passenger service. Using a two-seat Benoist Type XIV flying boat, Jannus flew from St. Petersburg across Tampa Bay to Tampa, some 18 miles away. Jannus only made the flight when there were passengers willing to pay the fare which was \$5.00 one way. Two round trips per day was the schedule. If there were enough passengers to justify the use of a second flying boat, Tony's brother, Roger,

piloted the other aircraft. Both flying boats were biplanes powered by 75-hp Roberts engines.

After the city of St. Petersburg signed a contract for this air transport service, regular scheduled flights began on January 1, 1914. The city fathers wanted the fast air travel over Tampa Bay because the alternatives for getting to Tampa were poor. Travelers could choose a once-a-day two-hour boat ride, a long railroad trip or a difficult automobile ride over dusty roads. The flight with Tony Jannus, in contrast, took 20-23 minutes. To aid the establishment of this new enterprise, the city fathers also provided a subsidy guarantee of \$50 per day in January and \$25 per day in February and March. In January the airline was able to repay \$360 of the subsidy, and it paid its own way in February and March. When the contract with St. Petersburg ran out on March 31, the owners of the airline decided to terminate operations due to the drop in the local tourist business. During its three months or so of operation, the St. Petersburg-Tampa line carried 1,204 passengers without mishap and on only eight days were flights cancelled due to bad weather or mechanical breakdowns. *To be continued*



Hindenburg in flames, May 1937.



St. Petersburg-Tampa Airboat Line