

BARNSTORMING... with champagne

by DOUGLAS H. ROBINSON

Fifty years ago the world's first airline was carrying up to 24 passengers at a time in pleasure cruises over Germany. While airplanes were flown with up to five passengers who held on wherever they could, the Zeppelin airships of the German Aerial Transportation Company (DELAG) seated their customers in comfortable wicker chairs before large windows in an enclosed cabin, with toilet facilities, running water, a cold buffet and a choice selection of wines, dispensed among the clouds by a white-jacketed steward.

The story of the pre-1914 DELAG experiment, and its sequel of intercity operations in 1919, is not known in detail to most air historians. In particular, it seems necessary to deal with certain myths that have grown up in recent years. Contrary to published statements by one authority, no regular scheduled intercity air line was in operation before 1914. (1) Another authority, who was himself a participant and should have known better, has grossly exaggerated the number of passengers carried. (2) The facts are impressive enough by themselves.

The destruction of Count Zeppelin's fourth airship on 5 August 1908, while it was attempting a 24-hour flight to satisfy a War Ministry requirement, paradoxically seemed to bring him success and an assured future. His stubborn determination to build an airship for the defense of the Fatherland had made Zeppelin a national symbol, and in a spontaneous mass gesture, citizens from all walks of life sent money to forward his patriotic endeavors, the sum amounting in time to nearly 1.5 million dollars. Under pressure from the German Parliament, the War Ministry purchased his fifth airship, and likewise accepted Count Zeppelin's third craft, the first of his creations that had been to some degree successful. But the hostility of the Prussian Army Airship Battalion, promoting its own semi-rigid design, blocked the purchase of any more of Zeppelin's aerial giants. A sixth craft, LZ 6, constructed in the summer of 1909 in the expectation of further military orders, remained unsold. Nor was the Navy interested--for reconnaissance over the sea it demanded larger craft with higher speeds than the 530,000 cubic foot airships of the day, with their top speed of about 30 m.p.h.

To Count Zeppelin this was a bitter disappointment. His enterprise could not survive if it found no market for its products. It was Alfred Colsman, the business director of the Zeppelin firm, who proposed a solution--that commercial airship services be set up

between German cities. Reluctantly, and as a last resort, the Count agreed.

In the use of his ships to earn money. . . he saw his ideas being profaned. Thus the enterprise remained for him, the feudal aristocrat and former military man, a tradesman's undertaking, and he was accustomed to keeping its board of directors at a distance. (3)

At times, Count Zeppelin's attitude seemed one of open hostility, and he resented the fact that the commercial enterprise could not have an experimental ship constantly available for his use at the factory in Friedrichshafen.

The enthusiasm in Germany for aviation in general, and for the Zeppelin in particular, aided Colsman to raise the necessary capital of \$750,000. In the summer of 1909 it became possible to fly many influential citizens aboard the LZ 5 and LZ 6 at the aviation exhibition at Frankfurt. Early in his endeavors Colsman received the backing of the shipping magnate, Albert Ballin, the head of the great Hamburg-America Line. Ballin offered to provide \$25,000 per year for advertising the airline, provided his offices in German cities could have the exclusive right to sell airline tickets. In fact, the DELAG and the HAPAG remained closely associated, and DELAG even came to be considered a part of the shipping empire.

Swept up in the aviation fever, the big cities of the Reich proved willing--even eager--to put up the capital for the airline and to build airship hangars. Frankfurt-am-Main, Baden-Baden, and Dusseldorf vied with each other to be the first cities to boast of a Zeppelin airship; in time, commercial sheds were erected likewise at Hamburg, Potsdam, Gotha, Leipzig and Dresden. On 16 November 1909, the German Aerial Transportation Company (known as DELAG from its initials in German) was founded with headquarters at Frankfurt-am-Main.

In his capacity as business director of the DELAG, Colsman promptly placed an order with himself, as business director of the Zeppelin Company, for a commercial airship. The seventh in the company's series, LZ 7 which the directors of the firm proudly but ill-advisedly resolved to christen *DEUTSCHLAND*, was larger than her predecessors. 486 feet overall and 46 feet in diameter, she had a cylindrical hull, a short, blunt stern and a multiplicity of control surfaces forward as well as aft; and a sharply pointed nose which was particularly unfavorable for streamlining. The eighteen gas cells contained roughly 683,000 cubic feet of hydrogen. The gross lift was about 46,000 pounds, but the weight of the ship herself amounted to 35,000 pounds, leaving only 11,000 pounds "useful lift". Some 2600 to 3300 pounds of fuel and oil were carried; the rest was devoted to the crew (one commander, one engineer, two helmsmen, 4 or 5 machinists), to water ballast, and to the 24 passengers and their comfort. Three 125 h.p. Daimler engines drove, through gears and shafting, sheet aluminum propellers high on the hull. Trial speed was just over 37 m.p.h., and cruising speed about 33 m.p.h. This performance obviously would not permit all-weather intercity flights on schedule, and though the DELAG had allowed the impression to develop that it would provide such service, it was clear that local joy-rides only

(1) Gordon Vaeth, *Graf Zeppelin* (New York: Harper & Bros., 1958), p. 37.

(2) E. A. Lehmann, and H. Mingos, *The Zeppelins* (New York: J.H. Sears & Co., 1927), p. 4. Also Lehmann and Leonhard Adelt, *Auf Luftpatrouille und Weltfahrt*, (Leipzig: Schmidt U. Gunther, 1936), p. 42.

ABOUT THE AUTHOR - Member Douglas H. Robinson, M.D., of Pennington, New Jersey, has become a recognized authority on airships. His book, *The Zeppelin in Combat*, will be available from the publishers later this year, a comprehensive study of the entire subject of Zeppelins in WWI. Dr. Robinson's previous contributions to the JOURNAL include "History Corrected - Loss of the L. 62", "Flight of the L. 59", "Airplane Carrying Airship - The First Experiment", (all in Volume 4); "Hindenburg Retrospect" and "Friedrichshafen Raid" (in Volume 5).

(3) Alfred Colsman, *Luftschiff Voraus!* (Stuttgart & Berlin: Deutsche Verlags-Anstalt, 1933), p. 112.



Left -
The DELAG passenger airship VIKTORIA LUISE on one of her early trial flights at Friedrichshafen, Feb. 1912.
(Photo - Luftschiffbau Zeppelin)

Below left -
The passenger cabin of one of the pre-war DELAG airships, probably the VIKTORIA LUISE, in her hangar.
(Photo - Luftschiffbau Zeppelin)

Below right -
Inside the cabin, with tables set for dining, and a bottle of champagne on the sill at the right.

could be made in the vicinity of the sheds.

Since the DELAG had nothing to sell but the novelty and pleasure of an aerial journey, it was all the more necessary that the passenger quarters be safe, comfortable and attractive. The cabin amidships was solidly built and therefore contributed largely to the high fixed weight of the craft. As a publicity release of the DELAG described it,

It is so constructed as an integral part of the ship that the longitudinal framing of the airship at the same time forms the framing of the cabin. It is further braced so securely in position by twelve pairs of steel cables that it will hang immovable from them even if, through some unlikely accident, a couple of struts should bend or break. All metal parts of the cabin frame are covered on the inside with mahogany, while the ceiling and walls consist of mahogany plywood. Rich mother-of-pearl inlays on the ceiling beams and pillars cause the cabin to appear as an extraordinarily comfortable and elegant room. The floor, which is constructed with absolute safety of five-layer plywood, is covered with carpet. Large sliding windows permit an unhindered view in all directions. The light wicker-work furniture provides comfortable seats. (4)

On 19 June 1910, DEUTSCHLAND was completed and be-

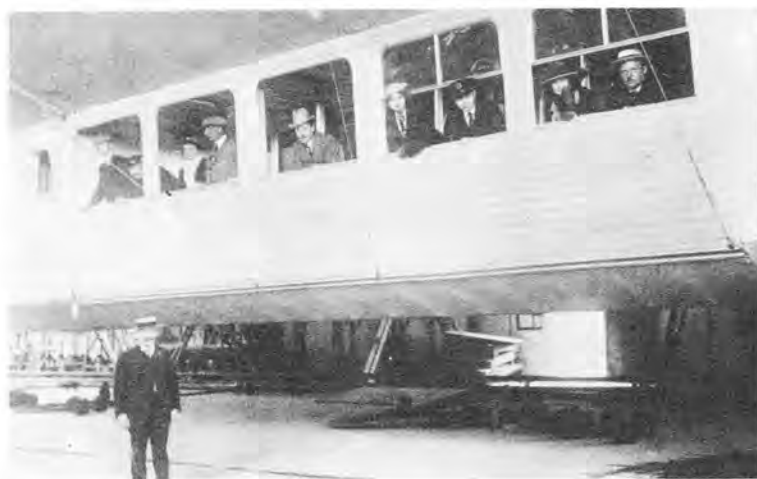
(4) Deutsche Luftfahrts-Aktien-Gesellschaft, Passagier-Fahrten mit Zeppelin-Luftschiffen, (Hamburg, 1911), P.6.

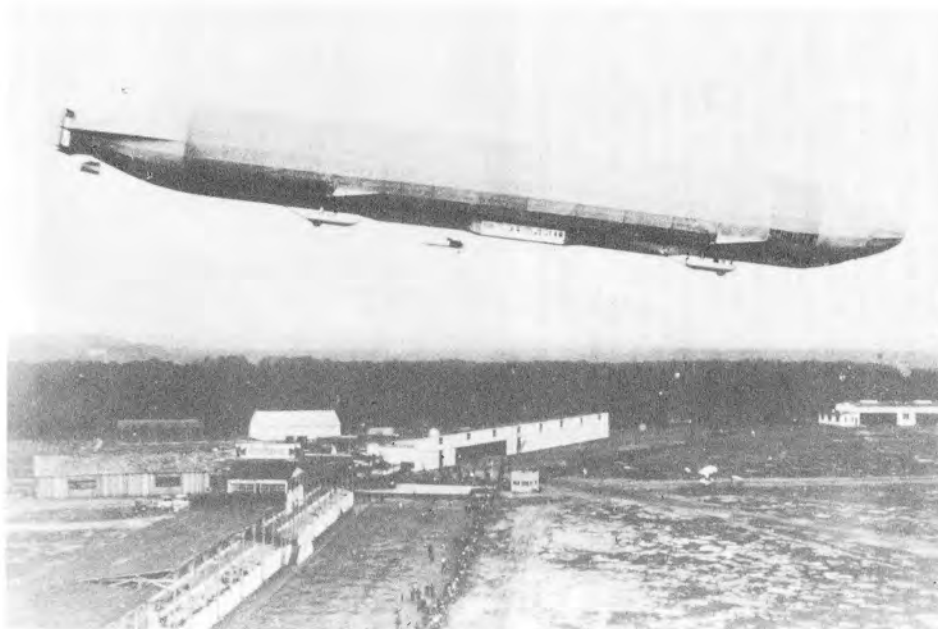
tween then and June 21 had made four trial flights in Friedrichshafen. Lacking any real experience in the air in the short flights of LZ 6 and her predecessors, the Zeppelin people felt constrained to hire a Captain Kahlenberg, of the Prussian Airship Battalion, to command the new giant. And since the city of Dusseldorf had rushed a wooden hangar to completion ahead of their rivals, it was there that DEUTSCHLAND was transferred on June 22nd.

For the first cruise from the Ruhr town, on June 28th, twenty-three journalists had been invited, with Alfred Colsman as host. Intending a flight of no more than three hours, the newspapermen were served a light breakfast of champagne and caviar soon after the take-off, which was made on time although no weather report had been received. This was the first of several errors which, piled one on top of another, were to turn the summer morning joy ride into a nightmare journey of nine hours, from which passengers and crew were lucky to escape with their lives.

The second mistake was in proceeding with the wind towards the picturesque Wupper Valley, instead of to windward towards the less attractive Rhine plain. Thus, when the breeze unexpectedly freshened, the slow and clumsy craft found herself to leeward of her base and unable to make headway, particularly after one engine failed. The captain from the Airship Battalion had committed a serious error in judgment. Slowly the Zeppelin was forced stern-first, despite wide-open engines. Lacking radio, Kahlenberg began throwing overboard messages requesting all the Army garrisons in the vicinity to stand by to help land the ship.

Late in the afternoon the hungry and exhausted passengers of the DEUTSCHLAND watched uncomprehend-

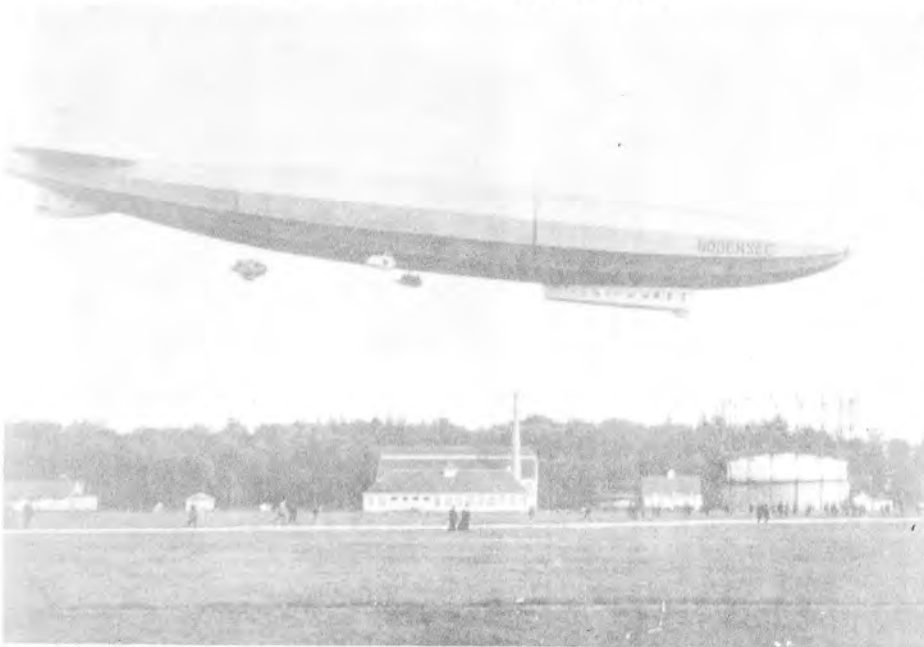




The "lucky ship" of the DELAG, the SCHWAHEN at Johannisthal in 1911. The pioneer German flyer, Helmuth Hirth, was flying in a Taube type, beyond. (Photo - Friedrich Moch)



The Luftschiff SACHSEN. The problem of bringing dirigibles to the ground always seemed to involve the use of men clinging to ropes, even years later.



The best known of the DELAG's postwar airships, the BODENSEE made a host of friends throughout Germany and Sweden for airship travel. (Photo - Luftschiffbau Zeppelin)



The NORDSTERN, the last of the DELAG airships, complete but uninflated in its hangar at Friedrichshafen in early 1920. (Photo - Luftschiffbau Zeppelin)

ingly as the helpless vessel drove towards a towering thunderstorm looming to the north over the historic Teutoberger Forest. Reaching the storm front, the Zeppelin was tossed up to 3500 feet. Quantities of the buoyant hydrogen blew from the overdistended gas cells during this involuntary ascent. Heavy from both gas loss and rain, there was only one way to go -- down. The crew were helpless to control the airship as she plunged downward into the pines of the Teutoberger Forest, and in no time the proud giant, bearing the name of the Fatherland, was a splintered wreck. Miraculously, there was no fire. One crew member, leaping from the rear gondola, broke a leg. The shaken journalists were aided to climb down the thirty feet separating the passenger cabin from Mother Earth, and during the next few days the remains were cut up with saws and axes and dispatched to Friedrichshafen.

One sequel to the disaster was that Colman prevailed on Dr. Hugo Eckener, the Zeppelin Company's publicity agent, to take the place of the unlucky Kahlenberg as Flight Director of the DELAG. Yet Eckener had almost as much to learn, and was to have his share of bad luck in the process.

The summer of 1910 had barely begun, and the DELAG wished to take advantage of its publicity. LZ 6, lengthened since its flights of the previous year, was dusted off and modified with a cabin. On August 21st, under Eckener's command LZ 6 was transferred to Baden-Baden. The hangar erected by the city, at Oos near the outskirts, proved to be advantageously situated in a narrow valley where the winds were always light and rarely blew across the shed axis during docking and undocking. Flights were made almost daily, including excursions with brief landings in Mannheim and Stuttgart. On September 14th, during a similar "goal flight" to Heilbronn, motor trouble caused LZ 6 to turn back. That afternoon, in the hangar, mechanics were cleaning the gondolas with gasoline. One of the engines was started; a fire broke out which turned into a fatal conflagration when another mechanic emptied a can of gasoline on it by mistake. The DELAG operating personnel had received a needed lesson on the dangers of the volatile fuel but at much cost; this was the end of flight operations for the year. Yet the unhappy LZ 6, which had never found a buyer, was worth more to her owners dead than alive. Insurance payments from Lloyd's of London gave the Zeppelin enterprise a needed "shot in the arm" and permitted completion of the DELAG's next ship, the LZ 8 DEUTSCHLAND II.

This craft, identical in almost every respect to her predecessor, was completed at Friedrichshafen on 30 March 1911. Meanwhile, in anticipation of a full summer of profitable passenger service, the DELAG brought out an informative brochure for prospective passengers. The first paragraph announced that the charge for excursions of 1-1/2 to 2 hours would be 200 marks--approximately \$50--while longer flights with landings at a distance would be priced according to the time in the air. The airship DEUTSCHLAND was described in detail, while a chapter, "The Attraction of Airship Travel," attempted to allay the anxieties of nervous prospects:

Most people will believe that it takes great courage to entrust themselves to the gondola of an airship and to undertake a journey through the limitless realm of the air. They seem to imagine that it is a feat comparable to that of a tight-rope walker or a roofer, accustomed to working imperturbably on the highest point of a church weather vane. But whoever has sat just once in the cabin of a Zeppelin airship will abandon such fantastic ideas. Like streaks of mist, anxiety and doubt will blow away. For the ascent of an airship takes place in such unexpected and complete tranquillity that the passenger will literally not be aware of the motion if he shuts his eyes. Or,

instead of looking down at the spectators growing smaller and smaller, he lets his eyes stray towards the horizon. (5)

But the same brochure explicitly disavowed any early intention of operating a regular intercity passenger service:

The great attractiveness of a Zeppelin journey notwithstanding, it is not to be expected that the dirigible airship of today will take the place of the steamer or the railroad. Indeed, as numerous flights in the past year have demonstrated, one can reach any desired destination even in very difficult wind conditions, and flights to destinations have a place in our program. But it is not yet possible to develop a network of airlines, with regular timetables scheduled in advance; and ultimately, this is the important factor that gives today's steamship and railroad their unique character as modern transportation media. Aviation is still too new to satisfy such extensive obligations. It is, so to speak, a Sunday excursion instrument, suited almost exclusively to pleasure, but hardly to everyday drudgery. Also, our cautiousness in presently undertaking passenger flights only in favorable weather tends to produce the same effect. (6)

But for all this reassurance, the disaster to the first DEUTSCHLAND was to be repeated almost as promptly with the second. Under Eckener's command, she journeyed north via Baden-Oos and Frankfurt to Dusseldorf, where she arrived on April 11. Flights were made with passengers during the next month, and on May 16 the ship was scheduled to make a further excursion. By now, the DELAG had come to regret the location of the Dusseldorf shed, sited amidst fluctuating winds which could unpredictably catch the fragile Zeppelin abeam as she was being walked out of her berth by 250 to 300 men. A high wind screen had been built 50 meters out into the field, and it was hoped that this would protect DEUTSCHLAND II as she was being walked out. A gusty cross-wind made Eckener reluctant to fly, but the presence of a crowd of spectators and a full load of paying passengers swayed his judgment. Too late he realized his mistake. As soon as the stern projected beyond the shelter of the wind-screen, the monster was driven sideways and the ground crew dragged off their feet by the force of the wind. Up over the screen went the giant hull, where it remained impaled thirty feet in the air, the broken back suggesting a slain dragon. Amazingly, there was no fire. Ladders had to be erected to rescue the passengers from their precarious location. "I paid for my weak-kneed decision by damaging the ship so badly that she had to be almost completely rebuilt, and thereafter was cured of such impulsive acts," wrote Eckener. (7) Never again would he take a chance to satisfy the expectations of the public, whether his command was the LOS ANGELES, GRAF ZEPPELIN or HINDENBURG.

As Eckener thought over the experiences of the past year, he realized that the DELAG, blissfully ignorant of the hazards and dangers of aerial navigation, had been taking great risks and that many changes were necessary. Firstly, from commanding officer through rudder men and mechanics, there had not been enough experience with handling the ships in the air, with the effect of temperature changes, gas purity, and rain and other loads on the lift of the

(5) Ibid, P. 9.

(6) Ibid, P. 12.

(7) Hugo Eckener, *My Zeppelins* (London: Putnam & Co., Ltd., 1958), P. 16.

airships and with the problems of rudder and elevator control at low speeds while taking off and landing. Secondly, the Daimler engines were not reliable, and frequent breakdowns threatened the loss of ships flying in windy weather. Thirdly, the DELAG's weather forecasting requirements could not be met by the existing meteorological service, and the airline would have to set up its own weather reporting network with observation stations at each airship base. Lastly, men alone, even 300 of them, could not control the huge ships as they were walked out of the hangars in a cross wind.

Another commercial Zeppelin, LZ 10, was already under construction at the time of the Dusseldorf disaster and on 26 June 1911 she made her first flight. On July 15th she was accepted by the airline and christened SCHWABEN. Fated to be known as "the lucky ship of the DELAG," she was destined, under Eckener's command, to make the Zeppelin a household word throughout Germany. 1553 paying passengers first ventured into the air aboard her. Shorter than the two DEUTSCHLANDS, and handier, SCHWABEN was the first Zeppelin fitted with the reliable 145 h.p. Maybach engine, especially designed for airships, and with these she attained the very satisfactory trial speed of 47 m.p.h.

The hangar at Baden-Oos, sited in the sheltered valley, was SCHWABEN'S first berth. It was Eckener's inspiration to install there so-called "docking rails" extending from the shed several hundred feet out onto the field. On these rolled trolleys to which the Zeppelin was made fast fore and aft, being thereby restrained from moving sideways in cross-winds. And with all these precautions and improvements, success came at last. Through the tranquil late summer months the Zeppelin made frequent local excursions, going farther afield as the season advanced, to Frankfurt, Dusseldorf, and ultimately to Berlin. The cost of the long inter-city flights--up to \$150--was no deterrent. For patriotic Germans, it became "the thing" to view the Fatherland from a Zeppelin. On 3 August 1911, a fifteen-week-old baby, carried in the arms of her proud parents, became the youngest person yet to fly. And the fresh air and the exhilaration of flight sharpened the appetite. A wine list and menu shows that SCHWABEN passengers dined first class at the small tables by the open windows: (8)

WINES

	bottle	$\frac{1}{2}$ bottle
1903 Zeltinger Rothlay Auslese	\$1.50	.87¢
1909 Berncastler Doctor	1.50	.87¢
1906 Rauenthaler Abigl	1.37	.75¢
1904 Chateau Pichon-Longueville	1.50	.87¢
1904 Moulin a Vent	1.25	.75¢
1908 Liebraumilch Kirchenstuck Auslese	1.50	.87¢

CHAMPAGNES

G.H. Mumm Cordon Rouge (tres sec)	5.00	2.63
Burgeff Extra Cuvee	2.50	1.37

MENU

Best Beluga caviar, per portion	1.25
Strassburg pate de foie gras, per jar	.75¢
Westphalian ham	.60¢
Pomeranian breast of goose	.60¢
Fine sliced cold meats	.60¢
Cold French capon	3.00 to 3.50
Salad	.25¢ to .37¢
Dessert	.37¢

More important, the people whom Count Zeppelin had wanted to impress from the beginning were swept up in the enthusiasm developed by the flights of the SCHWABEN.

(8) Deutsche Luftfahrts-Aktien-Gesellschaft, Passagier-Fahrten mit Zeppelin-Luftschiffen (Hamburg, 1913).

General von Moltke, the Minister of War, formerly an advocate of the airplane, called for the purchase of nine Zeppelin airships. And giving in at last to the pressure of public opinion, Navy Minister, Admiral von Tirpitz ordered a Zeppelin in the spring of 1912.

Following the winter lay-up in Oos, SCHWABEN was back in the air by 30 March 1912. The DELAG enterprise had expanded: Still another ship, the slightly larger VIKTORIA LUISE, named for the Kaiser's only daughter, was completed and entered service on 4 March flying from Frankfurt, she and SCHWABEN met at Mannheim on April 4th and cruised together over Heidelberg. A setback occurred when SCHWABEN burned on the field at Dusseldorf on June 28th, the fire having been sparked by static electricity in the rubberized fabric gas cells. No passengers were aboard and no one was injured. The investigation led the Zeppelin Company to fabricate their gas cells henceforth of gold beaters' skin. A sister to VIKTORIA LUISE, the HANSA, was completed on July 30th to take the place of SCHWABEN. The two passenger craft used the new double hangar at Hamburg. The first Navy airship crew began training at Hamburg on 1 July 1912, handling VIKTORIA LUISE on passenger flights under the tutelage of the civilian crew headed by Captain Erich Blew. In September, as their training approached completion, the Navy's Kapitaneutnant Hanne and his men flew HANSA in the Fleet Parade concluding the fall manoeuvres of the High Seas Fleet. Truly, the DELAG, with its experienced civilian operating personnel, was "the university of the air," and as war approached, perhaps its most important contribution was the training of airship flight crews for the Imperial Army and Navy.

By 1913 the DELAG enterprise was a going concern. Through careful operations and observance of Dr. Eckener's safety-first precepts, hundreds of flights were made that spring, summer and fall. A third ship, SACHSEN, was completed on 3 May 1913 and based at the new hangar in Leipzig. On June 9 she made the first flight to Vienna, the capital of Germany's Austrian ally. In this year, also, there appeared handsomely bound guide books for sale to the DELAG passengers flying from the various bases, strikingly illustrated with many aerial photographs depicting the scenery north, south, east and west of the sheds. The captain's choice of route depended on the wind direction. Books were published for travellers flying from Hamburg, Frankfurt, Baden-Oos, Dusseldorf, Berlin and Leipzig.

When tragedy struck at the German Naval Airship Division in the fall of the year, the DELAG was called on for help. Within the space of a few weeks, the first naval airship, L 1, went down at sea in a storm, and the new L 2 exploded on a trial flight near Berlin killing all 28 persons aboard. Practically all the trained naval airship personnel were wiped out in these disasters. The admiralty assigned three new crews, and chartered the DELAG's SACHSEN as a training ship. Dr. Eckener was engaged to direct the training of the naval personnel, and Captain Lehmann and his men in SACHSEN continued to handle her on the training flights. Eight days after the L 2 disaster, on 25 October 1913, SACHSEN transferred to Dresden and began training the new naval crews. By April 9th the fully proficient Navy crews proceeded to Friedrichshafen to take delivery of a craft of their own, L 3.

Thus, in the summer of 1914, all three commercial airships were in service--VIKTORIA LUISE from Frankfurt, HANSA from Potsdam near Berlin, and SACHSEN from Leipzig. As before, the giant craft, the symbols of Teuton supremacy, sailed serenely through the warm summer skies, loaded with proud passengers regaling themselves on the sight of the Fatherland unrolling only a few hundred feet below the cabin windows. Optimistic about the future, the DELAG ordered a new ship, LZ 26, a great advance on previous Zeppelins with a framework of a new, lighter alloy, duralumin; a better streamlined hull, with the keel partially en-

closed; and clean, simple cruciform fins and control surfaces at the stern. Instead of the clumsy propellers on brackets on the hull, the forward engine drove a propeller directly coupled to the rear of the car. The gondolas were open as usual, but before she was accepted as the Army's Z XII on December 14, 1914, the LZ 26's cars were enclosed--the first craft to show this necessary improvement.

War was at hand. On mobilization the three DELAG craft were taken over by the German Army, augmenting the six Zeppelins it then had on hand. HANSA was assigned to the VII Army Corps, VIKTORIA LUISE to the XVIII Corps, and SACHSEN to the XIX Corps. The two older craft were promptly relegated to training--HANSA continuing with the Army, VIKTORIA LUISE going to the Navy under her former captain, Oberleutnant zur See der Reserve Erich Blew. But SACHSEN despite her clumsy appearance and low performance, was considered modern enough to serve in combat. In the fall of 1914 she made "war flights" from the Army shed in Cologne, bombing Antwerp on the night of September 2nd. At year's end she transferred to the less-active Russian front, and in September, 1915, was turned over to the Navy as a training ship in place of the worn-out VIKTORIA LUISE. Lehmann, SACHSEN's erstwhile captain, became one of the best-known Army commanders. Continuing with the Zeppelin Company after the war he commanded the GRAF ZEPPELIN and HINDENBURG. He died from injuries sustained in the Lakehurst disaster of May 6, 1937. After much hard use, the three DELAG veterans were dismantled as obsolete during the course of the war.

Though the Zeppelin Company constructed 86 rigid airships for the German Army and Navy during the war years, it had looked forward to a genuine scheduled commercial air service over great distances with the coming of peace. Indeed, Count Zeppelin himself had proposed to build a steel-frame airship of 2,830,000 cubic foot volume which, as a feature of the planned Dusseldorf World Fair of 1916, would fly from there to America.

Although the German military collapse of November, 1918, was almost complete, the directors of the Zeppelin Company could not foresee the political and economic chaos that would prevail in Germany for at least five years more, the harsh terms of the Versailles Treaty, or the specific restrictions of the London Protocol of 1921, which forbade Germany to build rigid airships larger than 1,000,000 cubic feet--too small either for military usefulness or transatlantic commerce. Thus, the Luftschiffbau Zeppelin's first thought in the last months of 1918 was to revise a proposed Navy design for a high-altitude bombing draft of 3,800,000 cubic feet, to be designated the AMERICA AIRSHIP. Perceiving that this was too ambitious a project at a time of great uncertainty, the Zeppelin Company Board of Directors took up the question of a "small passenger airship." The end result of this planning was to be a remarkably efficient high-speed craft which, operated by a revived DELAG, maintained for the first time a regularly scheduled passenger service between Friedrichshafen and Berlin.

It was never pretended that this would be a paying proposition--in fact, the Zeppelin firm lost nearly \$40,000 in less than six months of operation--but as advertising for the speed, convenience and safety of airship travel, the latter-day DELAG effort was a spectacular success and undoubtedly would have led promptly to bigger things, were it not for the restrictions imposed by the victorious Allies. With the ordinary transportation media in a state of chaos, the first justification for a small 20-passenger craft of at least 700,000 cubic feet was "to relieve the railroad and transportation emergency in Germany." At the first meeting to discuss the plan, Alfred Colsman pointed out, "(a) We will be putting our money to work, (b) we will have work, and (c) we will be making use of our plant," while Count Zeppelin's nephew, Baron

Gemmingen, asked, "If it succeeds, won't it be good publicity for everything that we plan to undertake further?"

After some discussion and preparation of various alternative plans by Dr. Paul Jaray, the project director, the final design was completed in March. The ship made her first flight on 20 August 1919, and was christened BODENSEE. During the four years of war, pressure from the Navy had compelled the Zeppelin Company to discard the Count's peculiar theories of aerodynamics, and the LZ 120 BODENSEE appeared only remotely related to the clumsy VIKTORIA LUISE, HANSA and SACHSEN of the pre-war years. She was in fact the first fully streamlined rigid airship, 396.3 feet long, 61.4 feet in diameter, and the hull had no parallel section. The gas volume was 706,200 cubic feet, approximately that of the SACHSEN, but where the pre-war ship had a useful lift of only 16,300 pounds, the efficient BODENSEE could carry 22,000 pounds. With her clean design, the new rigid had the highest trial speed yet recorded for an airship--82.4 m.p.h.--even though her four 245 h.p. engines developed as "altitude motors" for raiding airships during the war, could not be run wide open below 6000 feet. The most striking innovation was the placement of the passenger cabin. After some debate as to whether it should not be amidships, it was decided to locate it forward, with the control car built integrally into its fore part. The overall length of this external structure was about 80 feet, and being well forward of the center of lateral pressure of the hull, it made the ship somewhat unstable about the yaw axis. (To compensate for this, the upper fin was enlarged even before the first flight, but later, when the ship was rebuilt, it was reduced in size, as the excessive stability it conferred was considered responsible for the fact that some of the passengers were seasick). The long gondola was divided into five compartments, each seating four people. (Up to six additional passengers could be carried in wicker chairs in the aisle if the lift sufficed). Forward was a private compartment for a single V.I.P. passenger, who paid double fare, and aft were washrooms and a buffet. Though the meals served by the steward were not advertised as prominently as in pre-war days, he was undoubtedly well patronized on the 370 mile run between Friedrichshafen and Berlin-Staaken, which BODENSEE was scheduled to make in seven hours. The ship of course carried up-to-date radio equipment. The crew numbered 16: the captain, the navigator, the flight engineer, four steersmen, eight machinists, and a steward. Evidently one of them doubled as radio man.

The trial flights revealed only minor shortcomings: the wind-driven radio generator overheated badly, and on the third flight, "the discharge from the water-closet flies back into the radiators of the after gondola." Direktor Dr. Durr requested that notices be placed at the individual passenger seats: "Throwing objects out the windows is most strictly forbidden (strengstens verboten) because of danger to the ship."

The first scheduled flight north was on 24 August 1919. Thereafter flights took place daily, Sundays included, north on odd days of the month, laying overnight in one of the big Zeppelin Company building hangars at Staaken near Berlin, and proceeding south the next morning. Sometimes afternoon excursions were made over Berlin, after the northbound flight to Staaken, and until October 4, there was usually an intermediate landing in Munich. The published schedule called for a 9 a.m. departure from Friedrichshafen or Staaken, and a 4 p.m. arrival, but this was usually bettered, the fastest run over the 370-mile distance being made in slightly under four hours, comparing very favorably with the pre-war running time by rail of sixteen hours. As the DELAG's travel brochure put it, in a lyrical burst of eloquence:

The magic journey which began at 10 a.m. on Lake Constance is already completed before the fifth hour in the afternoon. No dust, such as weights down the body after a long train ride, no frayed nerves, but the spirit is surfeited with new, never-suspected impressions. Proud and happy one returns to earth, proud to have seen that which for thousands of years has only been longed for and longingly written of in fiction. A grateful departing glance rests on the gray, plump body of the airship, then one goes by swift auto into the tumult of the metropolis, there to submerge oneself, happy and unrecognized like the Prince of Fairyland. (9)

In its intercity operations, the DELAG tried to deal with many problems that confront modern airlines. Their advertising stated that the airship's commander was solely responsible for operations, and if he decided not to fly, the disappointed passengers could only claim a refund of the fare they had paid in advance. The "no-show" or the late arrival was not entitled to get his money back.

Each passenger was allowed to carry 15 kilograms (33 lb.) of luggage free of charge. For the next 15 kilos, a charge of 5 marks (\$1.25) per kilo was made, and 10 marks (\$2.50) per kilo for any higher amount, but even so, most passengers were found willing to pay to carry all their baggage with them, at a considerable profit to the company. Some mail was carried on almost every flight, and during November, 1919, when rail service between north and south Germany was totally disrupted, BODENSEE carried the largest amount of mail in her short career--as much as 1760 pounds on November 14. On this same day a stringed quartet was aboard, and gave a concert in flight!

Unsettled conditions in the faction-torn republic had their effect on the airship service. Already, in the second edition of the DELAG travel brochure published in October, 1919, the fare between Berlin and Friedrichshafen was listed as 575 marks--\$144 at the pre-war rate of exchange. "The price increase has been made necessary by constantly increasing operating costs." And on the same page is stamped an indication of continuing runaway inflation--"After November 1, 20% increase due to rising costs." Meanwhile Dr. Eckener had felt compelled to warn his subordinates to economize rigidly in their use of gasoline. Since fuel prices in the Berlin area were "exorbitant," and only 4.8 tons were stored in Staaken, BODENSEE was ordered to carry a full load of fuel--5070 pounds--on departing from Friedrichshafen. Loading only 880 pounds in Staaken, she would then have 3750 pounds for the return flight, enough in ordinary weather. Furthermore, the commanders were directed to save fuel by operating on less than four engines. With three engines running at cruising speed, the flight would be prolonged by 55 minutes, but 240 pounds of fuel would be saved, at a saving of about 900 marks (\$225).

With a thoroughly trained crew of Navy veterans (her usual commander was Hans Kurt Flemming, former C.O. of the naval airships L 13, L 55 and L 60), BODENSEE had few misadventures. Three times the ship could not be brought out of the Staaken shed due to cross-winds. On November 3, the Zeppelin made a forced landing in a snowstorm at Wolmirstedt, just north of Magdeburg and about 75 miles from Berlin. The landing rope short-circuited a high-tension line, but the airship was undamaged and returned to Berlin next day. On November 24, the airship, flying south from Staaken, met such violent head winds that she had to turn back.

A few days later, on December 5, BODENSEE made her last passenger voyage. A few experimental flights followed, and on December 11 the little airship was laid up for the winter in the large Friedrichshafen Factory Shed II.

BODENSEE made a host of friends, both German and foreign, for the airship and for commercial aviation. She was always full, and there was usually a waiting list two to six weeks long. For those who could afford the fare, the Zeppelin provided swift and comfortable service from the south German border to the capital, and many travelers came to Friedrichshafen simply to take advantage of the air service. One of the most influential foreigners was the American industrialist, Harry Vissering, who, after a flight in BODENSEE, became a lighter-than-air enthusiast and spent the rest of his life selling the rigid airship to his fellow Americans. (10)

The DELAG was looking forward to an even more successful year in 1920. NORDSTERN had been completed, BODENSEE was cut in two and extended. Gas volume of both ships was now 795,000 cubic feet and the useful lift 25,350 pounds. But there would be no more commercial operations. From the Interallied Commission of Control, via the German Government, came the order that the two ships were not to be flown. Presently the DELAG learned that the two commercial craft, together with surviving naval Zeppelins, were to be surrendered to the Allied powers. The reasons variously given for the inclusion of the commercial craft are that (a) they were built from surplus war material, and (b) they had to be surrendered in partial compensation for seven naval Zeppelins destroyed by their crews at the North Sea bases two days after the High Seas Fleet was scuttled at Scapa Flow. An American observer testified that "there is no doubt in the mind of the undersigned that the design of the BODENSEE, and its actual construction, represent a Peace and not a War Condition." The plain truth was that France and Britain were bent on destroying the German airship industry, the former from motives of revenge, the latter from a determination to dominate post-war airship commerce.

Colsman is said to have boasted that he could have gotten the prohibition rescinded, but it would not be worth while as the two airships could not operate at a profit. At all events, they never flew before they were surrendered. On 8 June 1921, NORDSTERN made her first flight, and on June 13 flew to St. Cyr near Paris. Subsequently christened MEDITERRANEE, she flew intermittently for the French Navy, and in 1926 was dismantled at the base at Cuers near Toulon. BODENSEE was flown to Ciampino near Rome in July and served the Italian Navy under the name of ESPERIA, until she too was dismantled in 1927.

The subsequent transoceanic cruises of the GRAF ZEPPELIN, completed on 18 September 1928, and of the HINDENBURG, which first took to the air on 4 March 1936, were merely extensions of the DELAG concept. Better known than the earlier commercial airships, these intercontinental air pioneers operated under another name. But their operations, their methods, and their personnel, had developed from the early stumbling endeavors of the light-hearted pioneers who had ventured into the unknown years before with their cargoes of trusting tourists--"barnstorming with champagne."

(10) Harry Vissering, Zeppelin: The Story of a Great Achievement (Chicago: 1922).

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(9) DELAG-HAPAG, brochure for BODENSEE passengers (no title) (Berlin 1919), p. 5.

100th Flight of the BODENSEE

Flight Time: 5 Hours 7 Min.

Total Distance: 395 Mi.
Average Speed: 76.5 M.P.H.

TIME	ALTITUDE ABOVE SEA LEVEL	TEMPERATURE		RELEASE OF BALLAST	MOTORS			OWN SPEED	BASE COURSE	DRAFT	COURSE STEERED	WEATHER	DIRECTION	WIND STRENGTH MPH	DISTANCE FROM LAST POINT	SPEED FROM LAST POINT MPH	SHIP'S POSITION
		AIR	GAS		1	2	3										
9.28	1310 Ft.	28.4	28.4		Half Speed				28°	2°	38°	FOG	SOUTH	1.1	M1.		TAKEOFF
9.55	2380 Ft.	"	"	From 9.43	Full			73.4	"	3°	33°	CLEARING	SSW	6	33.5	83.3	BIBERACH
10.12	"	"	"						"	3°	28°	"	WSW	9-11	22.6	80.2	UIM
10.28	"	32.0	28.4						34°	"	36°	MISTY	"	"	22.4	76.5	AALEN
11.20	1890 Ft.	37.4	37.2						60°	20°	30°	"	SSW	11	59.6	74.6	NURNBERG
11.32	2460 Ft.	"	"						16°	3°	35°	GUSTY	SSE	9	14.9	81.5	GRAFENBERG
11.52	"	"	"						44°	9°	55°	"	"	"	27.3	"	KULMBACH
12.03	2630 Ft.	"	"						13°	"	30°	"	"	"	36.6	79.6	LOBENSTEIN
12.18	"	"	"						29°	"	35°	"	SOUTH	9	21.2	70.9	NEUSTADT
12.46	1970 Ft.	"	"						"	"	21°	"	SW	6	33.0	79.0	WEISSENFELS
12.56	1430 Ft.	"	"						"	"	"	"	"	"	10.6	80.9	MERSEBURG
1.00	1150 Ft.	41.0	44.6	1.25	Half				"	10°	11°	"	"	"	8.7	74.6	HALLE
1.42	985 Ft.	"	"	1.45	Full				36°	"	36°	"	"	9	58.4	"	BRUCK
2.03	"	"	"		Half				45°	"	56°	"	"	9	31.0	"	POTSDAM
2.12	"	"	"						Various	"	"	"	"	"	8.7	"	STAACKEN
2.35	165 Ft.	"	"		Stop				"	"	"	"	"	"	6.2	"	LANDING
									"	"	"	"	"	"	39.5	"	

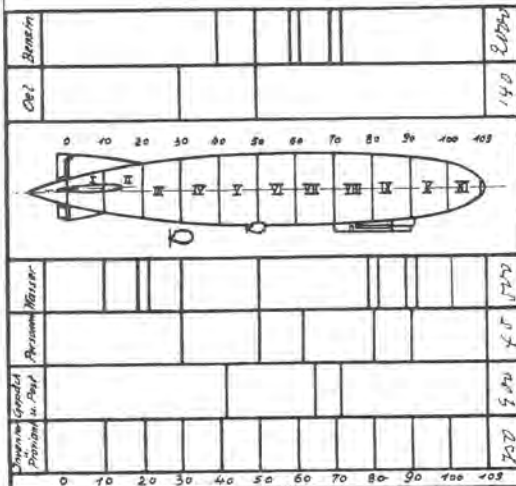
Consumption of Supplies:
(a) Gasoline 2200 Lb.
(b) Oil 110 Lb.
(c) Gas 35,200 Cu. Ft.

BAROMETER - 28.43"

PRESSURE HEIGHT - Lake Constance

100te Fahrt des Passagierluftschiffes Bodensee am 29. 11. 1919
Zielfahrt Friedrichshafen nach Staaken.

Laftverteilung:



kg
Benzin 2000 25 Ballast 2000
Öl 140 1 Ballast 80
Wasserballast 200 820
2 Befugung 360 10
Inventar 100 200
Koffer 100 200
Dienstab 720 310
Zufuhrung (Zoll, Kasse, Schatz) kg
Mengen bei 100% Füllung 720 kg

2000 1000
v - 2 " e - 3 " e
h - 724 mm s - 0.114
rb - 70
Nachfüllmenge 1800 cdm

Mittelst = 7400 kg
Leertgewicht = 14000 kg
Fahrtgewicht = 21400 kg
Substanz bei 100% = 2000 cdm h = 724 mm t Luft = -2 t Wasser = -3 s = 1.114 r = 70 = 22000 kg
Differenz = 100 kg
Freier Auftrieb = 100 kg
Reduzierte Nutzlast = 9200 kg

Befugung: 1. Führer: Heinen
2. Steuermann (Helfer, Führer): W. Hermann - Hamuschka
3. Zehnerfeuer: Heinen, Braun
4. Fährfeuer: Hamuschka - Linkefeld
5. Steuerbordgondel: W. Linkefeld
6. Backbordgondel: Heinen, Linkefeld
7. Achtergondel: Heinen, Linkefeld, Heinen, Linkefeld
8. Kellner: Kubis

Legter Wetterbericht:

Windmessungen:

über Nord + Nord Europa
in Ost Deutschland

Pool Süd 5
300 m
1000 m
1000 m

Below is a translation of the flight log of the BODENSEE shown at left.

100TH FLIGHT OF THE PASSENGER AIRSHIP BODENSEE ON NOVEMBER 29, 1919.
SCHEDULED FLIGHT, FRIEDRICHSHAFEN TO STAACKEN

LOAD DISTRIBUTION:

	Gasoline	Oil	Water	Persons	Baggage & Mail	Stores
	4410	309	1100	43	1990	1690

LB.
Gasoline 4410 25 Passengers 4410
Oil 309 1 Guest 176
Water Ballast 1100 Baggage 1810
17 Crew 2970 Mail 22
Spare Parts 1320 Provisions 530
& Stores 330

Service Load 10,470 Useful Load 6950

Useful Lift with 100% Filling 17,420 LB.

AIR

T. = 28.4°F.
BAR. = 28.43 In.
Rel. Humidity = 70%

GAS

T. = 26.6°F
SP. Gravity = 0.104
Added Gas Filling = 63,600 Cu. Ft.

USEFUL LIFT = 17,420 LB.
WEIGHT EMPTY = 30,870 LB.
FLYING WEIGHT = 48,290 LB.

Lift with 100% Volume (706,000 Cu. Ft.): BAR.

28.43 in. T. AIR 28.4° SP. 0.104, Humidity 70% = 48,600 LB.
T. GAS 26.6° Gr.

Difference = 310 LB.
Free Lift = 330 LB.
Reduced Useful Lift = 20,400 LB.

Crew: 1. Commander - Heinen
2. Quartermaster (2nd in command) - Wittenmann, Hamuschka
3. Rudder Man - Molnar, Braun
4. Elevator Man - Samst, Hinkelder
5. Starboard Gondola - Weiss, Leichte
6. Port Gondola - Wegner, Hetka
7. After Gondola - Klefer, Hink, Rieder, Christ
8. Steward - Kubis

Latest Weather Report:

Wind Measurements:

Low Over West + North Europe
High Over East Germany

Lake Constance South 11 M.P.H.
1000 Ft. S.W. by W. 18 M.P.H.
1650 Ft. S.W. 15-1/2 M.P.H.
2600 Ft. S.W. 20 M.P.H.