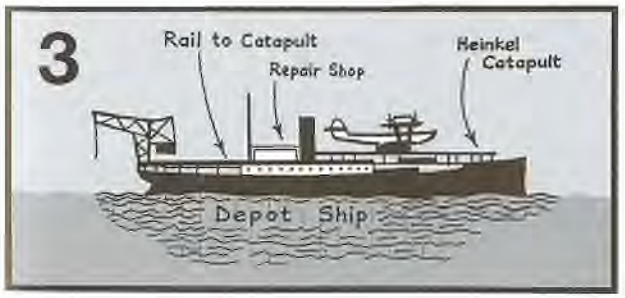
The Catapult Ships

The *Westfalen* Converted merchant ship (ex-N.D.L.); 5243 tons; length 410 feet

Pioneer of the ingenious fleet of Lufthansa catapult-equipped depot ships was the *Westfalen*. Its first trials took place on 29 May 1933, using the Heinkel K-6 pneumatic catapult. In subsequent months the operational system was perfected. The sequence of the transfer, using the "drag-sail" to assist the Dornier Wal's alighting on the high seas, is illustrated in the sequence of drawings below.

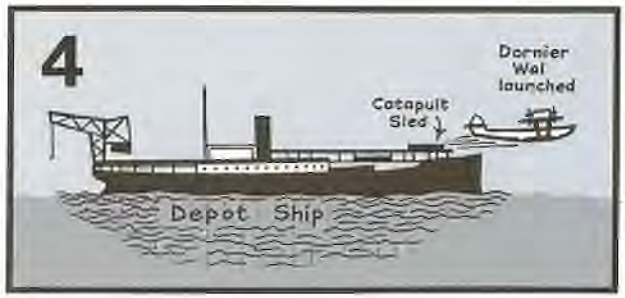
D.L.H.



The *Schwabenland* Diesel motor ship (ex-Schwartzenfels); 8188 tons; length 468 feet

Improvements were made later in the spring of 1934. The *Schwabenland* was stationed off the African coast near Bathurst, while the *Westfalen* was moved to a location near the island of Fernando de Noronha, off the coast of Brazil. This coincided with the introduction of the **"10-Ton" Wal**, an improved version, with longer range. With two depot ships, one at each end of the transatlantic crossing, takeoffs from the ocean were no longer necessary, and greater payloads of fuel and mail were possible.

Syndicato Condor



The *Ostmark* Specially designed; 1280 tons; length 246 feet

In 1936, energetically pursuing this method of achieving the necessary combination of range and payload to achieve transocean range (equally elusive for aircraft manufacturers all over the world), Deutsche Lufthansa introduced another depot ship, the *Ostmark*. In spite of its smaller size, it was even more efficient in recovering and launching the aircraft. The orthodox centrally positioned foremast was replaced by a pair of masts, one each side. These could be lowered sideways so as to allow free space for the launch. By this device, longer catapult rails could be installed, permitting heavier loads on the Dornier Wals (see page 52).

The *Friesenland* Specially designed; 5434 tons; length 452 feet

This fine ship incorporated all the innovative design characteristics learned by the operating experience of the previous ships. It was deployed on the North Atlantic in 1937 and could handle the larger **Blohm & Voss Ha 139** and **Dornier 26** aircraft, which were too much for the *Ostmark*. At the end of the North Atlantic trials, the *Friesenland* transferred to the South Atlantic.

Incidentally, the aircraft were catapulted from the bows of the *Westfalen* and the *Ostmark* but from the stems of the *Schwabenland* and the *Friesenland*.

South Atlantic Airship Service

Experimental and Proving Flights

In 1930 the *Graf Zeppelin* made a trial flight from Friedrichshafen to Recife (then called Pernambuco) at the northeastern corner of South America. It arrived there on 22 May and three days later was safely moored at the Campo dos Affonsos field at Rio de Janeiro. Much of the mail consignment went to the German communities in southern Brazil. The next year, the *Graf* made three more round trips and the **Luftschiffbau Zeppelin** was confident enough to begin scheduled service on a limited commercial basis.

Transatlantic Scheduled Passenger Service

Between April and October 1932, the *Graf Zeppelin* flew nine round trips. The giant airship could accommodate 20 passengers in ten two-berth cabins, for which privilege individual one-way tickets cost about $450 at the prevailing rate of exchange—about $5000 in today's money. The southbound flights took almost exactly three days and the northbound ones rather more than 3½ days. Depending on conditions, the flights were made either nonstop from Friedrichshafen to Recife or with a stop at Seville, Spain.

On 22 March 1935 the Zeppelin company joined with the Reichsluftfahrtministerium (R.L.M.), together with **Deutsche Lufthansa**, to become **Deutsche Zeppelin-Reederei**.

As the accompanying table shows, the service frequency was increased during the mid-1930s and in 1936 the flights were extended to Rio de Janeiro, having previously terminated at Recife. The Brazilian government had built a handsome terminal at Santa Cruz, near Rio, reacting no doubt to the popular belief at the time that airships, not airplanes, were to be the answer to the transocean air service problem.

A Brief Claim to Fame

The Luftschiffbau Zeppelin's flagship could correctly claim to have started the world's first transocean passenger air service open to the general public. The *Graf Zeppelin's* 1932 inauguration preceded the **Pan American** transpacific *China Clipper* service by four years. The airship schedule was admittedly seasonal, operating during the summer months only, and it was less frequent. But its 90-mph average speed was not unacceptably slower than the **Martin M-130**'s 130 mph, it had range to spare, and it carried an average of about 15 passengers per flight, whereas the Martin was normally restricted to only three or four on the critical San Francisco–Honolulu segment.

Thus the airship case still seemed to be valid in 1936. But the dream was shattered when the *Hindenburg* holocaust at Lakehurst, New Jersey, put an abrupt end to all the hopes and aspirations. The *Graf Zeppelin* was actually en route back from South America on the fateful day in May 1937, although the captain did not inform the passengers of the tragedy until arrival. It was a sad end to a great enterprise.

The *Graf Zeppelin* at Berlin, Staaken airfield.

GERMAN SCHEDULED AIRSHIP SERVICES ACROSS THE ATLANTIC 1930–1936

Year	South Atlantic Airship	South Atlantic One-Way Flights	North Atlantic Airship	North Atlantic One-Way Flights
Luftschiffbau Zeppelin				
1930	*Graf Zeppelin*	2[1]		
1931	" "	6[1]		
1932	" "	18	—	—
1933	" "	18		
1934	" "	24		
TOTAL		68		—

DEUTSCHE ZEPPELIN-REEDEREI

1935	*Graf Zeppelin*	32	—	—
1936	*Graf Zeppelin*	22	*Hindenburg*	32
	Hindenburg	12		
1937	*Graf Zeppelin*	2	*Hindenburg*	1[2]
	Hindenburg	2		
TOTALS		70		33

Grand Total: 163 scheduled flights

[1]Experimental and proving flights. [2]Destroyed by fire on arrival at Lakehurst, New Jersey, on 6 May 1937.

The dining room of the *Graf Zeppelin*.

The *Graf Zeppelin* in the shed at Lakehurst, New Jersey.

Zeppelin LZ 127 *Graf Zeppelin*

20 seats (in 2-berth cabins) • 72 mph

Maybach VL II (550 hp) × 5 • 150 tons max. gross lift • 7000 statute miles range

Length 774 feet • Diameter 100 feet

The Case for the Airship

During the formative years of long-range air transport, the lighter-than-air dirigible airship was considered to be the logical solution by many specialists. Outweighing the serious disadvantages of enormous size, high operating costs (mainly because of the large air crew and the small army of ground crew required), and serious vulnerability to fire and weather, the dirigible's range of several thousand miles was far beyond the wildest dreams of any designer of heavier-than-air machines, either landplanes or seaplanes.

The Thoroughbred

In 1920 Dr. Hugo Eckener had taken over from Alfred Colsman as head of the Zeppelin company. He received unintentional encouragement from the United States, which directed the construction by Luftschiffbau Zeppelin of the airship LZ 124 *Los Angeles*, delivered across the Atlantic in a nonstop flight in 1924. Eckener then seized his chance in May 1926 when the Paris Agreement lifted Allied restrictions on aircraft manufacture in Germany. He appealed to the German public to subscribe to the construction of a giant airship, and the government matched these funds. Work started early in 1927, and LZ 127 *Graf Zeppelin* made its maiden flight on 18 September 1928. Uniquely, the five 550-hp Maybach engines were fueled by *Blaugas* as well as by gasoline, and almost a million cubic feet of this gaseous concoction were carried in gas cells separated from the huge hydrogen cells above.

The great airship made its first Atlantic crossing in October 1928 and proceeded to attract newspaper headlines worldwide, as it made a series of demonstration, publicity, and revenue-earning flights within Europe, to the Middle East, and in 1929, most spectacularly, around the world with only three stops. It then went into service to South America (see opposite page).

Exact figures covering its ability to operate at a profit are not available, but shrewd calculations by P. W. Brooks, an impartial authority, suggest that the hidden subsidy assumed to be included in the balance sheet was not an unacceptable proportion of the revenue needed to cover costs. Of course, the tariffs were extremely high; the *Graf Zeppelin's* economics were as impractical as those of the Concorde today.

When the *Hindenburg* disaster in 1937 convinced the industry that the safer, but heavier, helium gas was essential, the *Graf Zeppelin* was retired immediately. But it would not have been able to operate with helium, even if it had been available. And so, in March 1940, it was broken up at Frankfurt, the duralumin no doubt being used for more urgent purposes.

Dr. Hugo Eckener, whose pioneering work and determination came so close to fulfilment.

Aircraft Large and Small

A Motley Crowd

"All things bright and beautiful, all creatures great and small," runs the popular hymn. **Deutsche Luft Hansa**'s fleet at the start of 1932 contained many creatures. One was great but most were small. Few could be described as bright and even fewer as beautiful, even by their creators. The two Junkers-G 38s (opposite page) were unrepresentative of the fleet as a whole, because of their size.

The Dornier Wal's elegant lines were remarkable for an aircraft that had first flown in 1922 (page 37), but most of the fleet looked a little outmoded, if not actually primitive. The Junkers-F 13s were perhaps exceptional. Together with their three-engined cousins, the Junkers-G 24s and the Rohrbach Rolands, they did most of the work. Many types were almost museum pieces, as can be discerned from the table opposite, spending almost all their time on the ground.

Time for a Change

Aesthetics and age apart, the most important aspect of the fleet was that, of the 173 aircraft, 126—almost three-quarters of the total—were single-engined. Fortunately reinforcements were imminent, as the Junkers Flugzeugwerke was about to deliver an aircraft that was to become a legend, as described on pages 44–47.

The **Dornier Do X** was a huge 12-engined flying boat which was much publicized but never a commercial success.

This picture of the **Junkers-G 38** shows the large windows in the wing.

THE D.L.H. MESSERSCHMITT FLEET

Const. No.	Regist. No. Original	Regist. No. 1934	Name	Year Deliv.	Remarks
M 20[1]					
392	D-1480	D-UFON	*Franken*	1928	Lost while chartered to Luftwaffe 1941
421	D-1676	D-UDAL	*Schwaben*	1929	Destroyed during WWII, 1943
442	D-1928	—	*Rheinpfalz*	1930	Destroyed by fire April 1931
540	D-2005	D-UNAH	*Odenwald*	1931	Totally damaged 1936
541	D-2206	—	*Spessart*	1931	Scrapped April 1932
542	D-2025	D-UKUM	*Westerwald*	1931	Destroyed during WWII, 1942
543	D-2026	D-UREK	*Schwarzwald*	1931	Destroyed during WWII, 1942
544	D-2285	D-UVOK	*Sauerland*	1932	Destroyed during WWII, 1942
545	D-2290	D-UXYN	*Fläming*	1932	Totally damaged 1937
546	D-2341	D-UKIP	*Harz*	1932	To VARIG (PP-VAK) 1937
547	D-2349	D-UMOK	*Rhön*	1932	Destroyed during WWII, 1942
548	D-2352	D-UJAR	*Eifel*	1932	Destroyed during WWII, 1943
549	D-2359	D-UHEN	*Hunsrück*	1932	Lost while chartered to Luftwaffe 1941
M 28					
527	D-2059	—	—	1932	Written off 1935

Note The first two M 20s were designated M 20a, the others M 20b.

THE FOCKE-WULF MÖWE SERIES

Const. No.	Regist. No. Original	Regist. No. 1934	Name	Year Deliv.	Remarks
A 17 Möwe					
42	D-1342	—	*Emden*	1928	To D.V.S. Sept. 1933
43	D-1358	—	*Aurich*	1928	To D.V.S. 1933
44	D-1367	—	*Leer*	1928	To D.V.S. Dec. 1933
45	D-1380	—	*Oldenburg*	1928	Destroyed Feb. 1933
46	D-1388	—	*Stade*	1928	Destroyed Dec. 1933
47	D-1403	—	*Lüneburg*	1928	To D.V.S. Sept. 1933
48	D-1416	—	*Osnabrück*	1928	To D.V.S. Sept. 1933
49	D-1430	D-UTOS	*Hannover*	1928	Written off 1936
50	D-1444	D-UNIK	*Münster*	1928	To D.V.S. Dec. 1933
51	D-1484	—	*Bielefeld*	1928	To D.V.S. Dec. 1933
A 29 Möwe					
61	D-1757	—	*Friesland*	1929	To D.V.S. Sept. 1929
62	D-1775	—	*Jeverland*	1929	Destroyed Aug. 1931
58	D-1867	D-ULIP	*Westfalen*	1930	To D.V.S. Sept. 1934
63	D-1922	—	*Saarland*	1930	Destroyed 1930
A 38 Möwe					
108	D-2073	—	*Bückeburg*	1931	To D.V.S. June 1934
109	D-2082	D-UPIN	*Hessen*	1931	To D.V.S. Feb. 1934
110	D-2107	—	*Lippe*	1931	To D.V.S. March 1934
111	D-2114	D-UTAN	*Thüringen*	1931	To D.V.S. June 1934

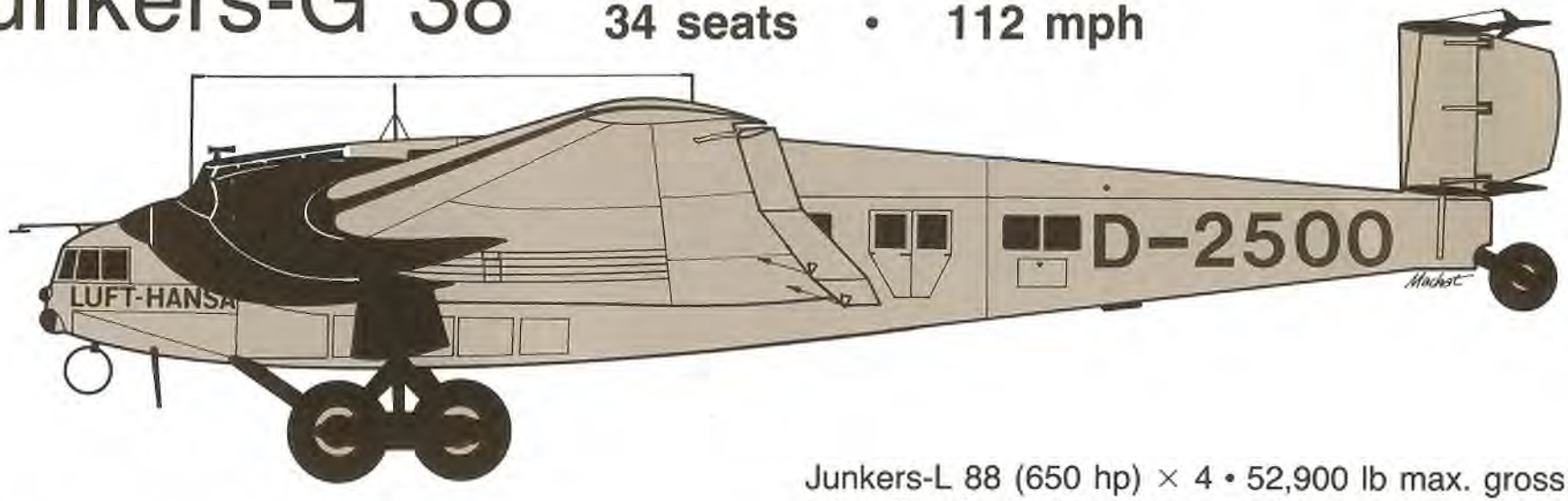
Abbrev. D.V.S.: Deutsche Verkehrsfliegerschule

The **Messerschmitt Me 20**, first delivered in 1928, was still serving **Deutsche Lufthansa** during world War II until 1943.

This **A 17** version of the **Focke-Wulf Möwe** series complemented the larger Junkers types during the 1920s and early 1930s.

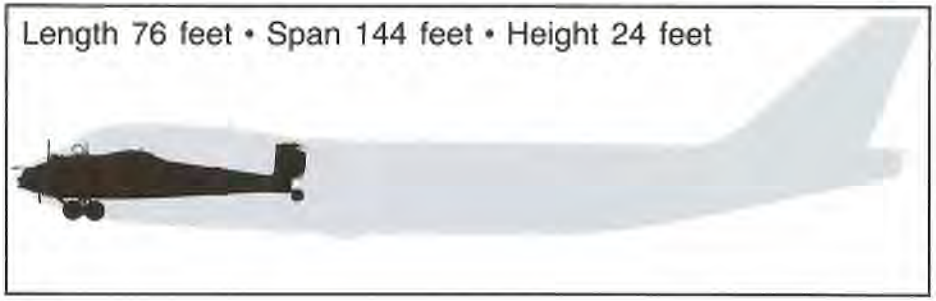
Junkers-G 38

34 seats • 112 mph



Junkers-L 88 (650 hp) × 4 • 52,900 lb max. gross takeoff weight • 1200 statute miles range

Length 76 feet • Span 144 feet • Height 24 feet



Size at any Cost

During the 1920s, German aircraft constructors seemed to be fascinated by large aircraft. In 1928, the *Graf Zeppelin* airship created the impression that size was synonymous with progress; and the heavier-than-air manufacturers followed the trend.

In 1923, Professor Hugo Junkers had designed an enormous 75-ton flying wing, the J 1000, but this project never got off the drawing board. Nevertheless Junkers persisted with his ideas for a big airplane, and on 6 November 1929, the four-engined **Junkers-G 38** made its first flight, four months after that of the mammoth flying boat, the Dornier Do X (page 42). Like the Do X, the G 38 was constructed by order of the German Ministry of Transport, to gain experience in building large aircraft.

Large it may have been. Handsome it was not. Publicists made much of construction features that permitted six passengers to sit inside the thick wing so that they had a forward view like the pilot's. The 26-ton weight was carried on only two wheels, the diameters of which were more than the height of a tall man.

Limited Service

The first G 38, registered D-2000, went into service with **Deutsche Luft Hansa** on 1 July 1931, from Berlin to London, via Hanover and Amsterdam. The second, D-2500, was added in June 1922 on a few selected routes. But in spite of their size—awe-inspiring for the period—the G-38s were not widely deployed. Even with 750-hp Junkers Jumo diesel engines, they cruised at only 127 mph, faster than some aircraft but not spectacularly so.

THE D.L.H. JUNKERS-G 38s

Const. No.	Regist. No. Original	Regist. No. 1934	Name	Disposal
3301	D-2000	D-AZUR	*Deutschland*	Crashed at Dessau 1936
3302	D-2500	D-APIS	*Generalfeldmarschall von Hindenburg*	Destroyed by Royal Air Force bombing at Athens during WW II

Note Both aircraft underwent several modifications, including engine replacement, and each had several type designations.

FLEET OF DEUTSCHE LUFT HANSA
1 January 1932
(before the first Junkers-Ju 52/3m)

Type	First Year	No.	Type	First Year	No.	Type	First Year	No.
Albatros L 73	**1926**	**3**	Focke-Wulf A 38	1931	4	**Junkers-G 31**	**1928**	**5**
Caspar C 32	1929	1	Fokker-Grulich F II	1920	12	Junkers-W 33/34	1928	12
Dornier Merkur	1925	21	Fokker-Grulich F III	1921	7	L.F.G. V 130	1927	1
Dornier Wal	**1923**	**9**	Junkers-A 20	1924	5	Messerschmitt M 20	1929	5
Dornier Super Wal	**1927**	**2**	Junkers-F 13	1919	35	**Rohrbach Roland**	**1926**	**15**
Focke-Wulf A 17a	1928	10	Junkers-F 24	1928	9	**Rohrbach Romar**	**1929**	**3**
Focke-Wulf A 29	1929	2	**Junkers-G 24**	**1925**	**10**	Sablatnig P III	1921	2

Note 126 of the 173 aircraft were single-engined. Others are shown in bold type.

The Standard Workhorse

D.L.H.'s Silver Fleet

The late 1930s witnessed the domination of the Douglas DC-3 as the standard airliner in the United States. Every major U.S. airline had DC-3s, and Eastern Air Lines proudly promoted them with great flair as the Great Silver Fleet. Germany too had a silver fleet, twice as big as Eastern's. Throughout the 1930s, following the introduction of the first **Junkers-Ju 52/3m** in May 1932, **Deutsche Lufthansa** filled the skies of Germany and most of Europe with this reliable airliner.

By the outbreak of World War II, about 80 of D.L.H.'s official fleet inventory of about 145 aircraft were Junkers-Ju 52/3ms. Additional aircraft were operated on loan from the Reichsluftfahrtministerium (Aviation Ministry) and the airline probably operated more than 200 altogether. Those whose life spans can be ascertained with some confidence are listed in the table on this page, and there were many others, not precisely identifiable.

The Junkers 52/3ms of Deutsche Lufthansa composed the biggest single fleet of any one type of commercial transport aircraft ever assembled until the postwar period in the United States. The attrition during World War II, of course, was severe and finally devastating, as described on page 64. By 1945, however, as a fine representative of a thoroughbred line, *Tante Ju* had paid its dues.

THE D.L.H. JUNKERS-JU 52/3m FLEET

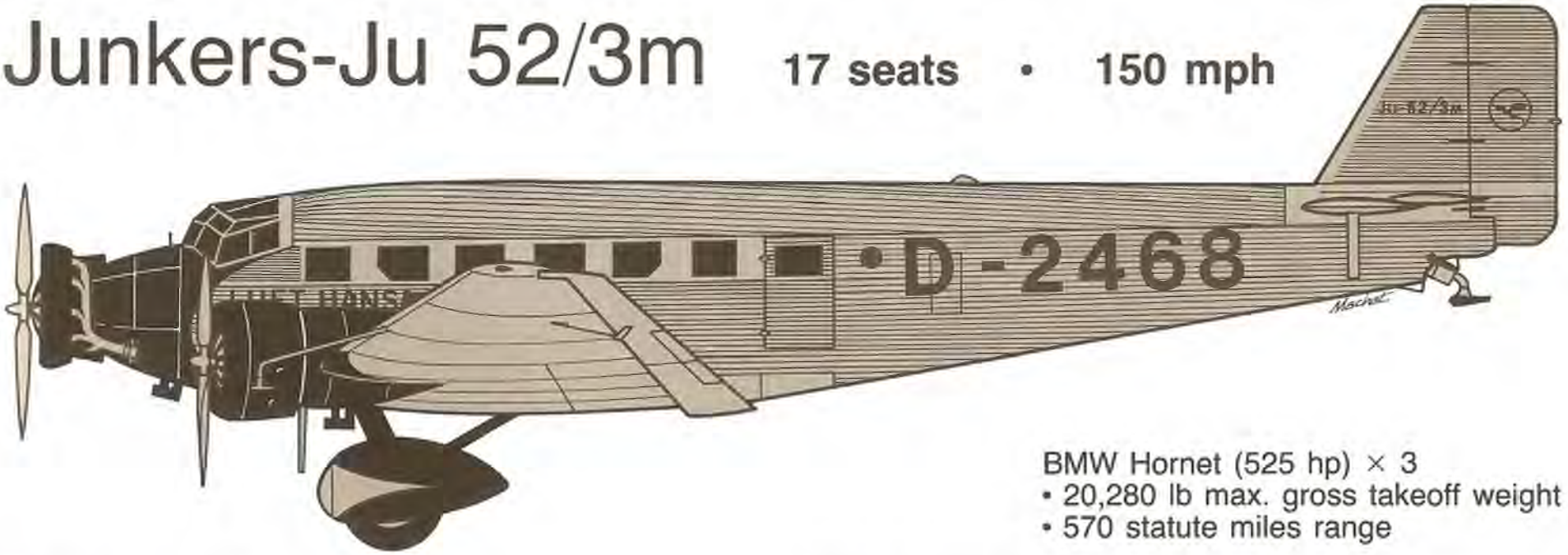
Years of Service		Const.	Regist. No.		
First	Last[1]	No.	Original	1934	Name
1932	1933	4013	D-2201	D-ADOM	*Boelcke*
	1933	4015	D-2202	D-ADYL	*Richthofen*
1933	1934	4019	D-2468	D-AFIR	*Joachim von Schröder*
	1941	4020	D-2490	D-AFYS	*Gustav Doerr*
	1937	4023	D-2526	D-AGAV	*Zephyr/E. Schaefer*
	1942	4022	D-2527	D-AGUK	*M. von Richthofen/Kurt Wolff*
	1941	4025	D-2588	D-AHIH	*Rudolf Kleine*
	1941	4021	D-2600	D-AHUT	*H. J. Buddecke/ Immelmann*
	1941	4026	D-2624	D-AJAN	*Rudolf Berthold*
	1934	4027	D-2640	D-AZEV	*Werner Voss*
	1937	4028	D-2649	D-AJUX	*H. Göring/U. Neckel*
	1942	4029	D-2650	D-AKEP	*Fritz Rumey*
	1942	4030	D-2725	D-AKOK	*Paul Baumer*
1934		4035	D-3049	D-ALAS	*Heinrich Gontermann*
	1941	4036	D-3050	D-ALUN	*Kurt Wintgens*
		4037	D-3051	D-AMAM	*Kurt Wüsthoff*
	1941	4039	D-3123	D-ANAL	*Gustav Leffers*
	1938	4040	D-3127	D-APAR	*Otto Parschau*
		4041	D-3131	D-ARAM	*Werner Voss*
	1935SC	4042	D-3136	D-ASEN	*Paul Billik*
	1934SC	4043	D-3356	D-ABIS	*Kurt Wolff*
	1935	4044	D-3382	D-ABAN	*Emil Thuy*
	1935	4045	—	D-AJYR	*Emil Schäfer*
	D	4046	—	D-ADAL	*Karl Allmenröder*
1934	1942	4047		D-AFER	*Franz Büchner*
	1941D	4048		D-AGIS	*M. von Müller/W. Schmidt*
	D	4049		D-AHUS	*Heinrich Kroll*
	1936	4050		D-AJIM	*U. Neckel/H. Göring*
	1941D	4052		D-AXES	*Hans Berr*
	1936	4053		D-AXAN	*H. J. Buddecke/Immelmann*
	1942	4054		D-ATON	*Erwin Böhme*
	1942	5010		D-ALAN	*Eduard Dostler*
	1941	5014		D-ANOL	*Albert Dossenbach*
	1937	5020		D-AZIS	*Von Bülow/Horst Wessel*
	1935	5021		D-AZAN	*Joachim von Schröder*
	1940Ib	5022		D-AXUT	*Lothar von Richthofen*
		5023		D-AXOS	*Oswald Boelcke*
	1942	5026		D-ABES	*Hermann Thomsen/Fritz Rom*
		5034		D-AHAL	*Otto Bernert*
	1938	5043		D-ARYS	*Hans Kirschstein*
	1940SC	5053		D-AQUQ	*Adolf von Tutschek*
	1940P	5060		D-AMIT	*O. von Beaulieu Marconnay*
	1942	5072		D-ANEN	*Fritz Pueffer*
1935	1938	4068		D-ABIZ	*Erich Albrecht*
		4070		D-ADEF	*Adolf Schinner*
		5278		D-ADEK	*Anton Schulz*
	1938SC	5120		D-ADER	*Hans Wende*
	1940EC	5074		D-APOK	*Max von Mulzer*
	1937	5104		D-AGES	*Otto Kissenberth*
	1940P	5272		D-AGIQ	*Martin Zander*
	1936N	5429		D-AKIY	*William Langanke*
	1939Ib	5096		D-AKYS	*Emil Thuy*
		5180		D-ALYL	*Hans Loeb/Linke Crawford (XI Olympiade 1936 only)*
	1937	5294		D-AMAK	*Volkmar von Arnim*
	1938	4072		D-AMIP	*Fritz Erb*
	1943	5128		D-ANAZ	*Willi Charlett*
	1941	4071		D-ANYF	*Erich Pust*
	1937	5329		D-ANYK	*Wilhelm Schmidt*
	1938SC	4075		D-APEF	*Karl Wessel*
	1938SC	4079		D-APOR	*Olaf Bielenstein*
	1936	4055		D-AQAR	*Walter Höhndorf*
	1936	5078		D-ASIH	*Rudolf Windisch*
	1938	4074		D ASIS	*Wilhelm Curo*
	1936	5169		D-ATAK	*Marschall von Bieberstein*
	1939Ib	4073		D-AVUL	*Bruno Rodschinka*
		5267		D-AVUP	*Kurt Steidel*
	1936	4069		D-ABIK	*Manfred von Richthofen*
	1936N	4077		D-ANOP	*Fritz Simon*
1936		5555		D-AGOO	*Fritz Simon*
	1937SC	5478		D-AJAD	*Robert Weinhard*
	1941	5494		D-AKUQ	*Paul Billik*
	1937	5502		D-ALUE	*Joachim von Schröder*
1937	1938	5777		D-ABUR	*Charles Haar*
	1939	5800		D-AFOP	*Karl Hochmuth*
		5685		D-AGAK	*Ulrich Neckel*
	1943	5740		D-ALAM	*William Langanke*
	1943	5734		D-AMEI	*Fritz von Roeth*
	1938	5683		D-ANOY	*Rudolf von Thüna*
		5682		D-APUP	*Marschall von Bieberstein*
		5748		D-ATAO	*Alfred Bauer*
		5797		D-ATYZ	*Hans Hackmack*
	1939Ib	5851		D-AUJA	*Otto Fink*
	1939Ib	5854		D-AUKE	*Wilo Rabe*
	1943	5693		D-AXAT	*Rudolf Windisch*
1938	1942	5954		D-ABVF	*Franz Wagner*
	1940	4059		D-ACBO	*V. Neubrand (ex-South Africa)*
		6046		D-ADED	*Viktor Neubrand*
	1941	5938		D-AFCD	*Erich Albrecht*
	1939Ib	4060		D-AGFD	*Otto Parschau (ex-S. Africa)*
		6030		D-AGTC	*Wilhelm Curo*
	1942	6047		D-AHFN	*H. Kricheldorf*
	1941	6042		D-AHMS	*Martin Zander*
	1939	5947		D-ANJH	*Hans Loeb*
	1941	5979		D-ANXG	*Hans Kirschstein*
	1942	5919		D-ARDS	*Robert Weichard*
	1940	6014		D-ASFD	*Heinrich Mathy*
		5940		D-ATDB	*Walter Beyer*
	1939	5942		D-AUJG	*Hans Wende*
1939	1943	6432		D-ABEW	*Rudolf von Thüna*
	1941	6385		D-ABFA	*Otto Parschau*
	1942	6386		D-ACEP	*Adolf von Tutscheck*
	1941	6387		D-ADBO	*O. von Beaulieu-Marconnay*
		6660		D-ADBW	*Emil Thuy*
	1943	6066		D-ADHF	*W. Höhndorf*
		6067		D-AFFQ	*Otto Falke*
	1942	6659		D-AGBI	*Max von Mulzer*
		4060		D-AGDA	*Wedige von Froreich*
	1942	6452		D-AGOB	*H. J. Hanake*
	1942	5590		D-AKEQ	*Gustav Rubinius*
		5933		D-AMFR	*Ludwig Hautzmayer*
		6734		D-APGU	*Bruno Rodschinka*
	1943	6149		D-APXD	*Robert Untucht*
		6750		D-APZX	*Raoul Stolsavljevic*
		6442		D-AREB	*Charles Haar*
	1941	6180		D-ARIW	*Joachim Blankenburg*
		6171		D-ARAD	*Volkmar von Arnim*
	1942	6369		D-ASLG	*Alfred Viereck*
		5727		D-ATEA	*Philipp von Blaschke*
	1941	6370		D-AVAJ	*Olaf Bielenstein*
		6561		D-AWAS	*Joachim Blankenburg*
	1942	6372		D-AXFH	*H. E. Lochner*
	1942	1301		D-AZIR	*Fritz Erb*[2]
		6779		D-ARCK	*Van Vlolen*
		6790		D-ARVU	*Hans Wende*
1940	1943	6650		D-ACBE	*Emil Schäfer*
	1941	6670		D-AEAO	*R. Fritsche*
		6775		D-AHGA	*Paul Billik*
	1940SC	6800		D-AHGB	*Rudolf Kleine*
1941	1942	7029		D-APAJ	*Erich Pust*
	1942	7077		D-ASDI	*Rudolf Kleine*
	1942	7089		D-ASHY	*Gustav Doerr*
	1942	7160		D-ATAW	*Lothar von Richthofen*
	1942	7208		D-AYGX	*Johannes Höroldt*
	1943A	7256		D-AVIU	*Th. Schöpwinkel*
1942	1945	7390		D-ACDA	Chartered from Aero O/Y (OH-LAP)
	1944	7493		D-AEAC	Chartered from Aero O/Y (OH-LAO)
1943	1945	4064		D-AIAO	From Ala Littoria (I-BIBI)
	1945	6765		D-AIAT	From Ala Littoria (I-BOAN)

[1] The letters following the years in this column indicate disposal, as follows: A, to Aero O/Y, Finland; D, to Deruluft (1934–37); Ec, to SEDTA, Ecuador; Ib, to Iberia; N, to D.N.L., Norway; P, to D.L.H. Sucursal Peru; SC, to Syndicato Condor, Brazil. [2] *Fritz Erb* was built by A.T.G., Leipzig.

Note As noted in the text, many additional Ju 52/3ms were operated by Lufthansa during World War II, under various arrangements with the Reichsluftfahrtministerium.

Junkers-Ju 52/3m

17 seats • 150 mph



BMW Hornet (525 hp) × 3
- 20,280 lb max. gross takeoff weight
- 570 statute miles range

The Junkers-Ju 52

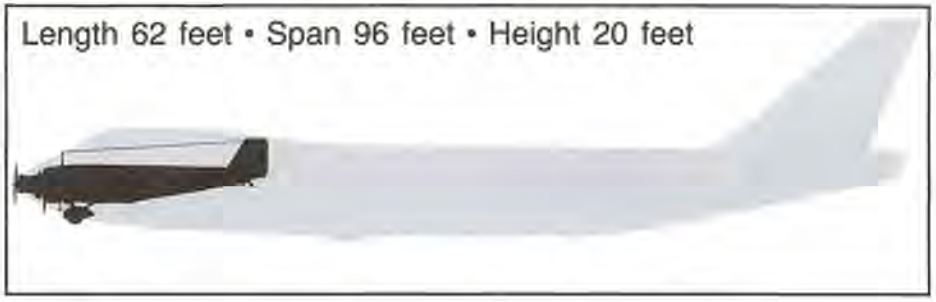
After a decade of building transport aircraft based on the well-proven Junkers corrugated-metal-cladding formula, designer Ernst Zindel produced a further improvement. The **Junkers-Ju 52** made its first flight on 11 September 1930 and drew on the long experience of a famous pedigree that had begun with the F 13 in 1919, moving on to the trimotored G 24 and the larger G 31. Production of the heavyweight G 38 was abandoned. The Ju 52, a single-engined monoplane, was approximately the same size and about a ton lighter in loaded weight than the nine-ton G 31. Built as a freighter, it incorporated similar features such as several freight doors and a hatch in the roof. Its performance was impressive, one taking off in the winter of 1931 from Montreal, Canada, in 17½ seconds, carrying almost four tons of payload. But only seven Ju 52s were built, because the widespread deterioration of the world's economy handicapped Junkers's plans for air freight operations based on Kurt Weil's experience in Persia.

A Better Mousetrap

In 1932, Deutsche Luft Hansa had to transfer two Rohrbach Rolands to Deruluft, to match the standard of the Soviet ANT-9, one of the early Tupolev designs. The German airline badly needed a replacement and Junkers obliged with the **Ju 52/3m**, which made its debut in April 1932. It was simply a Ju 52, but with three smaller engines in the 750-hp range. John Stroud describes it succinctly: "It was destined to become one of the best known European transport aircraft, and was almost certainly the type to be produced in the greatest numbers." Always a cautious commentator, Stroud understates the case, if the service record is any guide.

The Ju 52/3m carried up to 17 passengers or about three tons of freight. It cruised at about 150 mph and was able to use any contemporary airfield surface, even a football field. Its versatility was utilized by the Luftwaffe during World War II, as troop carrier, bomber, and ambulance, and, most spectacularly, in dropping parachutists. An armada of Ju 52/3ms parachuted troops into Allied-held Crete, and 170 of the fleet of 493 were shot down. Soviet sources claim that 676 alone were destroyed in the unsuccessful attempt to relieve Von Paulus's trapped army at Stalingrad.

Length 62 feet • Span 96 feet • Height 20 feet



An Amazing Record

The Ju 52/3m was used all over Europe. **Deutsche Lufthansa** bought them by the dozen. It was sold to many South American countries, to South Africa, and to China. Of the estimated 4,835 built, 2,804 were for the Luftwaffe during World War II. Additional numbers were produced in France as the **A.A.C.1** by the Ateliers Aéronautiques de Colombes, where construction continued after the war ended, as it did in Spain, where CASA maintained production of the **CASA 352/3m** until 1952.

Outmoded technically, the Junkers-Ju 52/3m was nevertheless like a well-worn old car that is kept in reserve because, in an emergency, it always starts and doesn't break down. It stayed on a few airline books until well into the jet age. Even the British used them, before and after the war; in the late 1940s, Air France operated no less than 85 of the A.A.C.1s, second only to the pre-war Lufthansa. The last one is believed to have been retired from service in New Guinea during the late 1960s. A few are still to be seen flying at air shows, and Lufthansa itself proudly maintains one in flying condition as a promotional tribute to a hall-of-fame heritage. Several are exhibited in museums around the world, and one, donated by Lufthansa, has found a home in the National Air and Space Museum in Washington, D.C.

Consolidation in the 1930s

The Passing of an Era

As described on page 42, the fleet of **Deutsche Luft Hansa** in 1932 appeared at first glance to be substantial, numbering 173 aircraft of 24 different types. But numbers were deceptive. The vast majority were old machines. Most were single-engined and well-worn. Some were almost decrepit. Twenty-seven aircraft of ten types had already been disposed of by 1930 (page 20). Now some further survivors of a bygone era were pensioned off.

One curious aspect of this cleaning of the hive was that many of the 1919-vintage Junkers-F 13s and the smaller A-20s, representative of the now-outmoded corrugated-cladding method of construction, resisted any dangerous thinking that they should all be banished to the scrapyard. They proved to be too useful.

The retirement of the Caspar C 32 is worthy of note, as it was a crop-spraying aircraft. D.L.H. also had a C 35, Caspar's eight-seat passenger aircraft. With the Albatros L 73, these were the only biplanes actually purchased by Luft Hansa after 1926.

Cometh the Hour

One good reason for the cleanout was the debut of the **Junkers-Ju 52/3m**, a truly versatile and reliable aircraft, able to perform almost any duty demanded of it. By 1936, 59 of the now-reduced total fleet of 144 were Ju 52/3ms, and they were estimated to be carrying 85% of the total D.L.H. traffic.

They were to be found all over Europe, "taking care of the farm" while the airline planners were courageously branching out into foreign parts in faraway continents. While the overseas pioneers were catapulting themselves—literally—into the aviation history books, the Junkers 52/3m established itself as the flagship of the D.L.H. fleet. As the workhorse of the fleet, the 16-seat trimotor heralded the beginning of a new era of multiengined aircraft service with machines which could, without too much apology, be described as airliners.

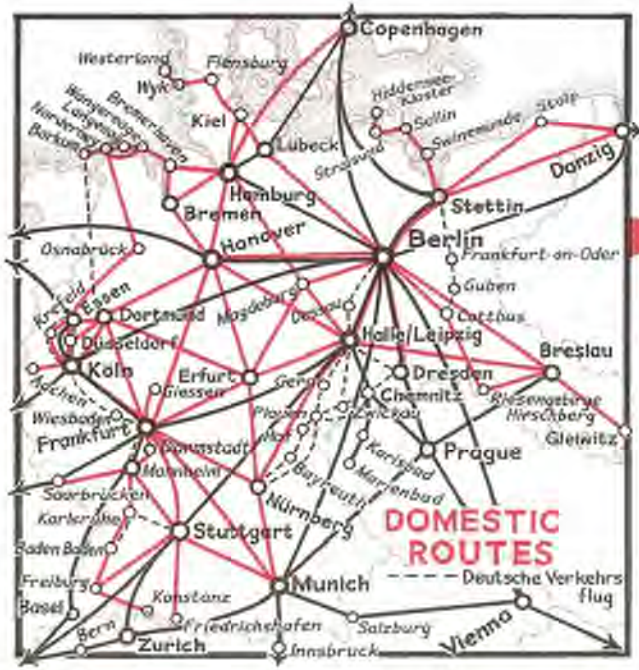
This **L.F.G. V 130 Strela-Land** was used by **Deutsche Lufthansa** until 1936.

DEUTSCHE LUFT HANSA
AIRCRAFT RETIRED 1930–1936

Last Year	Aircraft	Const. No	Regist. No.	Name	Years of Service First	Years of Service Last	Remarks
1930	Caspar C 35	7015	D-7015	*Rostock*	1928	1930	Written off
1933	Caspar C 32	7008	D-1143	*Wismar*	1929	1933	Scrapped
1932	L.F.G. V 130	92	D-455	*Franzburg*	1927	1930	Sold
		93	D-525	*Greifswald*	1927	1930	Sold
		94	D-547	*Randow*	1927	1932	Sold
		96	D-588	*Kolberg*	1927	1929	Sold to Norway
		109	D-759	*Stralsund*	1927	1928	Written off
		110	D-796	*Stettin*	1927	1930	Sold
		112	D-810	*Stolp*	1927	1930	Sold
1933	Albatros L 73	10076	D-960	*Preussen*	1926	1933	Sold to D.V.L.
		10077	D-961	*Brandenburg*	1926	1928	Destroyed
		10118	Never operational		1930	1932	To Bulganan Air Traffic Management
		10119			1930	1932	

Abbrev. D.V.L.: Deutsche Versuchsanstalt für Luftfahrt
Note Other aircraft retired during the 1930–1936 period are listed on other pages: Rohrbachs (22), Dornier Merkur (21), Fw A 29 and A 38 (42), Fokker F II (11), Junkers-G 31 (25), Messerschmitt M 28 (42)

Erhard Milch, whose airline career started with **Danziger Luftpost** in 1921, moved up the political ladder when the Nazis came to power in 1933 and controlled D.L.H.'s policies until the demise of the "old" Lufthansa in 1945.



Tante Ju and *Gooney Bird*

Two of a Kind

Reviewing the critical stage of aircraft development during the interwar period of the 1920s and 1930s, one is tempted to make a comparison between the most successful (because they were built in the largest numbers) transport types from both sides of the Atlantic. The facts and figures showing the similarities between the **Douglas DC-3** and the **Junkers-Ju 52/3m** are shown in the table on this page.

Essentially the aircraft were about the same size. The Douglas was a better performer, having about a third more power, reflected in higher speed, higher all-up weight, and greater carrying capacity. Both were used in large numbers by the commercial airlines, and both served valiantly during World War II in their military colors and configurations.

More DC-3s were built than any other transport aircraft. The Junkers-Ju 52/3m ranked second on the list.

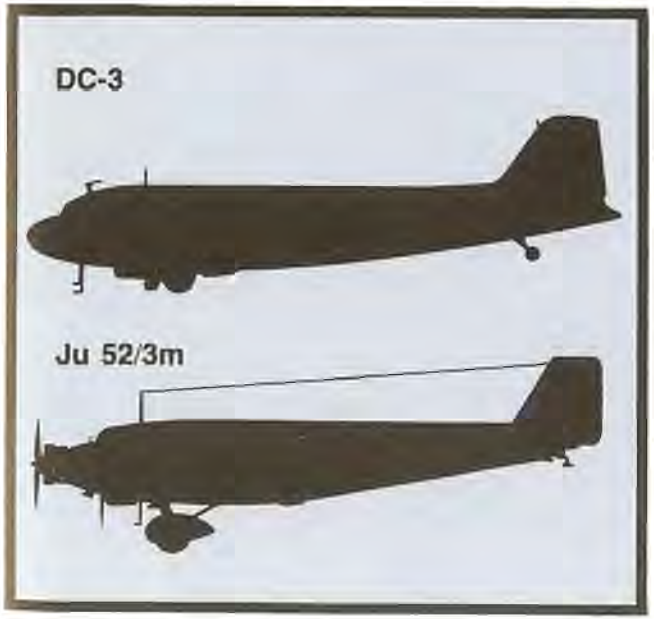
From Different Worlds

The big difference was that the two aircraft were representative of two completely different eras of technology. The Ju-52/3m was built on the same principles as the 1919 Junkers-F 13 and was arguably just a bigger version, with more engines and a refined wing. The DC-3, in contrast, epitomized the introduction of the modern airliner, with multicellular stressed-skin wings superseding the simple spar-and-rib construction of the Junkers; monocoque fuselage replacing a rectangular frame; retractable landing gear; and other refinements. All these had been incorporated in the DC-1 of 1933, usurping the Boeing 247 of the same period.

Technically, therefore, the corrugated skin of the Ju 52/3m represented the end of an era. The streamlined shape of the DC-3 was the flowering of a new. Yet they were both dominant for several years. Curiously the Junkers came on the scene four years earlier than the DC-3 but continued in production seven years longer, partly because in 1945 war-surplus DC-3s were a dime a dozen, whereas most of the Ju 52/3ms had been shot out of the skies, destroyed on the ground, or otherwise consigned to oblivion.

The two aircraft had one characteristic in common. Because of their reliability they were both known by their grateful uniformed clientele by an affectionate nickname. The American *Gooney Bird* had its counterpart in Germany, where the Junkers-Ju 52/3m will always be remembered as *Tante Ju*. It will also be remembered in Washington, D.C., where the Smithsonian Institution is pleased to report that Auntie has come to stay.

The interior of the **Junkers-Ju 52/3m**.



THE JUNKERS-JU 52/3M AND THE DOUGLAS DC-3 COMPARED

Type	Date of First Flight	Date of First Service	Dimensions			Normal Seating	Engines			Max. Gross TOW (lb)	Cruise Speed (mph)	Normal Field Length (ft)	Typical Practical Range (st. miles)	Total No. Built
			Length	Span	Height		No.	Type	Hp (each)					
Junkers Ju 52/3m	April 1932	1932[1]	62'0"	96'0"	14'10"	15–17	3	B.M.W. Hornet[2]	600	20,280	150	2500	500	4835[3]
Douglas DC-3	17 Dec. 1935	25 June 1936	64'6"	95'0"	16'4"	21–28	2	P. & W. Twin Wasp[4]	1200	25,200	180	3000	800	13,750[5]

[1]The first Ju 52/3m (c/n 4013) was delivered to D.L.H. in May 1932. A.B.A. (Sweden) and Aero O/Y (Finland), followed by L.A.B. (Bolivia), were the next operators. [2]The license-built B.M.W. Hornets were the most commonly used. Others included Junkers Jumo diesels. [3]Includes about 4200 military versions, of which 2800 were built during World War II. [4]All the earlier DC-3s, except those for United Air Lines, had Wright Cyclones. [5]All versions, including 2500 Lisunov Li-2s, license-built in the U.S.S.R., and 487 license-built in Japan. Only 423 were built originally as commercial DC-3s.

A **Junkers-Ju 52/3m** at Croydon Airport, London, during the 1930s.

The **Douglas DC-3**, the only transport aircraft built in greater numbers (in both civil and military versions) than the Ju 52/3m.

Into a New Era

A Symbolic Change

On 30 June 1933 the German national airline made a subtle change in its corporate structure, altering its name slightly from Deutsche Luft Hansa A.G. to **Deutsche Lufthansa A.G.** This coincided with a program of reequipment with modern aircraft types to replace the old, thereby changing the corporate image as well as the fleet composition.

Except for continued and expanded production of the ubiquitous Ju 52/3m, so adaptable as to be indispensable, Junkers turned away from the traditional corrugated metallic construction that had been its strength—in more ways than one—for almost two decades. The little single-engined **Junkers-Ju 60**, with a smooth-skinned monocoque fuselage (but retaining the corrugated wing), and its successor, the **Ju 160**, with smooth wing and fuselage, were introduced by Deutsche Lufthansa in 1934 and 1936 respectively. The vintage F 13s and W 34s were retired or scrapped and the last F 13 finally bowed out, still flyable, in 1939, to mark the end of an era.

High Performance

Until the early 1930s, airlines on both sides of the Atlantic had been preoccupied with developing transport aircraft that were reliable, safe, and reasonably comfortable. Economical operation was not a powerful factor as yet, as the airlines were subsidized. Interline competition was almost nonexistent, so the airlines tended to compete with surface transport modes rather than with one another. Then, in 1931, Swissair acquired the **Lockheed Orion**, which cruised at 190 mph, 75% faster than anything on D.L.H.'s books. When the Swiss airline put the Orion on the Zurich-Munich-Vienna route, this seemed like an open challenge.

The German answer was the sleek single-engined **Heinkel He 70**, introduced in 1933, which could more than match the Orion in speed, to the extent that it set several world records for its class. Its fuselage was a duralumin monocoque and its landing gear was retractable, but its wings were wooden. It provided an express air service between Berlin and the other large cities of Germany and became familiarly known as the *Blitz* ("Lightning"). But the Heinkel He 70, weighing less than four tons, could seat only four passengers. Thus the unit costs were very high, and, with burgeoning traffic, Deutsche Lufthansa turned to bigger if not faster airliners than the He 70 and the Ju 160 to carry it through the decade.

The **Junkers-Ju 86**, built as both a commercial and a military aircraft.

The **Heinkel He 70** just before starting engines.

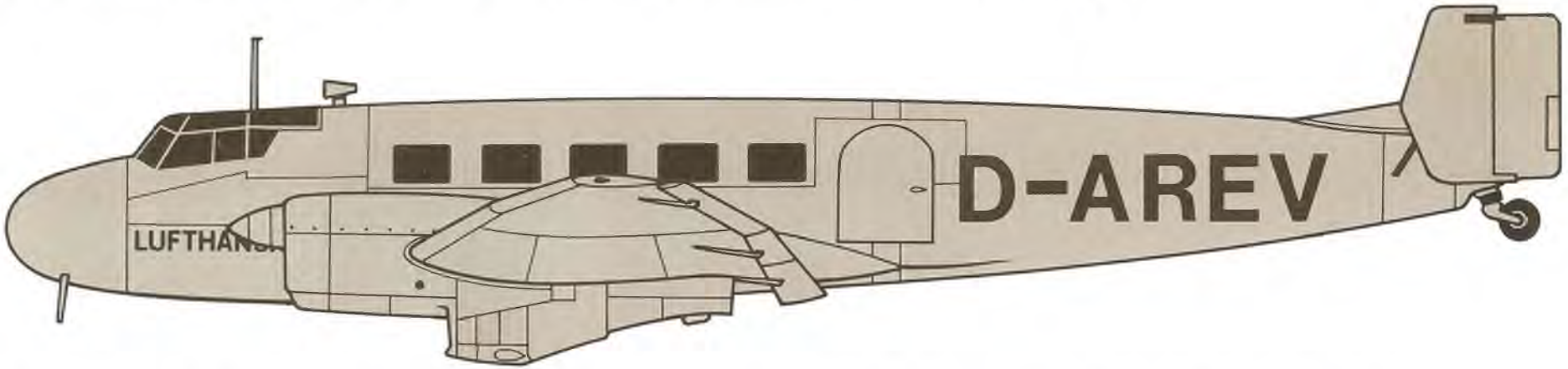
The **Junkers-Ju 160**, extensively used by **Deutsche Lufthansa** on feeder routes during the 1930s.

DEUTSCHE LUFTHANSA'S FIRST MODERN SINGLE-ENGINED AIRCRAFT
Introduced 1933–1936

Const. No.	Regist. No.	Name	Years of Service	
			First	Last
Heinkel He 70				
403	D-UXUX[1]	*Blitz*	1933	1934
437	D-UBAF[2]	*Sperber*	1934	1937
709	D-UBIN	*Falke*	1934	1937
710	D-UDAS	*Habicht*	1934	1935
711	D-UGOR	*Schwalbe*	1934	1937
909	D-UJUZ	*Bussard*	1935	1938
910	D-UPYF	*Adler*	1935	1937
911	D-UBOX	*Geier*	1935	1937
912	D-UNEH	*Condor*	1935	1938
913	D-UQIP	*Rabe*	1935	1938
914	D-USAZ	*Buntspecht*	1935	1938
915	D-UVOR	*Reiher*	1935	1935
916	D-UXUV	*Drossel*	1935	1937
917	D-UMIM	*Albatros*	1935	1938
918	D-UKEK	*Amsel*	1935	1937
Junkers-Ju 60				
4201	D-UPAL	*Pfeil*	1934	1936
Junkers-Ju 160				
4202	D-UNOR	*Luchs*	1935	1936
4206	D-UMEX	*Panther*	1935	1941
4207	D-UPOZ	*Wolf*	1935	1937
4208	D-UFIR	*Luchs*	1936	1941
4209	D-UQOR	*Löwe*	1936	1941
4210	D-ULIK	*Gepard*	1936	1941
4211	D-UPYM	*Puma*	1936	1936
4212	D-UVOX	*Rotfuchs*	1936	1941
4213	D-UKAN	*Marder*	1936	1941
4214	D-UGAZ	*Iltis*	1936	1941
4215	D-UVUX	*Wiesel*	1935	1941
4216	D-UQOL	*Tiger*	1936	1939
4219	D-UFAL	*Jaguar*	1936	1941
4220	D-UGIZ	*Hermelin*	1936	1941
4221	D-UHIL	*Kreuzfuchs*	1936	1941
4222	D-UJIM	*Blaufuchs*	1936	1941
4223	D-URUQ	*Weissfuchs*	1936	1941
4244	D-UBIQ	*Silberfuchs*	1936	1941
4245	D-UJYM	*Nerz*	1936	1941
4246	D-ULUR	*Schakal*	1936	1936
4247	D-UQAS	*Schakal*	1936	1941

[1]Formerly D-3, the D-2537. [2]Formerly D-3114.

Junkers-Ju 86 **10 seats • 177 mph**



Junkers Jumo 205c (600 hp) × 2 • 16,975 lb max. gross takeoff weight • 680 statute miles range

A Diesel-Powered Airliner

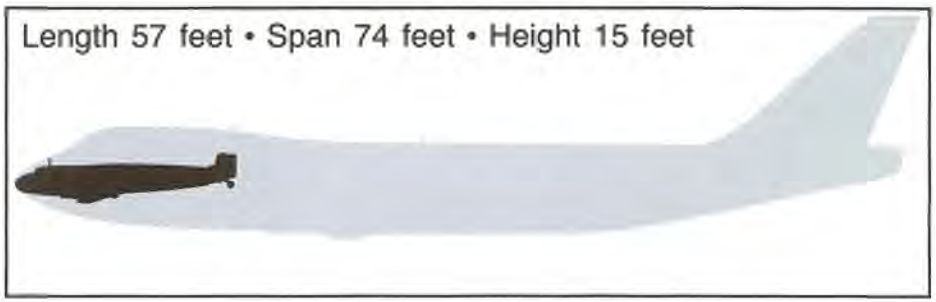
In contrast with many piston-engined aircraft of the 1930s era which were later fitted with diesel engines, the **Junkers-Ju 86** was designed with these from the start. It had two 600-hp Junkers Jumo 205Cs, and like many other aircraft built in Germany at the time, it was designed to be adaptable for both commercial and military users.

It made its first flight on 4 November 1934 and had some problems at first, although D-AXEQ made a 3600-mile nonstop flight from Dessau to Bathurst, West Africa, in 1936, and had ample fuel to spare on arrival. It settled down into service with **Deutsche Lufthansa**, which had about a dozen until 1940. Although the Luftwaffe took some, several remained operational with D.L.H. until May 1945.

A German Export

The Ju 86 did not have the widespread application or popularity of its earlier cousin, the Ju 52/3m, but quite a few were exported. It was especially well received by South African Airways, which had 18, fitted with Rolls-Royce Kestrel or Pratt & Whitney Hornet engines—a rare reversal of the normal gasoline-to-diesel conversion procedure. The aircraft also saw commercial service with Swissair; A.B. Aerotransport, Sweden; L.A.B., Bolivia; LAN-Chile; and an airline in Australia; and five went to the South Manchurian Railway, operating air services in what was then a Japanese overseas territory.

The number of civil Junkers-Ju 86s sold exceeded 40, but the vast majority—as was true for many other transport aircraft of the time—were military versions, of which the total built may have approached 1000. One of these, delivered to the Swedish air force, is still preserved in its museum.



DEUTSCHE LUFTHANSA'S JUNKERS-JU 86 FLEET

Year of Introduction	Const. No.	Regist. No.	Name	Year of Introduction	Const. No.	Regist. No.	Name
1935	4902	D-ABUK		1937	016	D-ANUV	*Wasserkuppe*
1936	4904	D-AREV	*Brocken*[1]		972	D-AKOI	*Kaiserstuhl*
	009	D-AHYP	*Schneekoppe*		973	D-AQEA	*Schauinsland*
	010	D-ALOZ	*Zugspitze*		974	D-ASOE	*Hesselberg*
	011	D-AQER	*Inselberg*		975	D-AVOE	*Obersalzberg*
	012	D-AZAH	*Feldberg*		976	D-AMYO	*Melibokus*[2]
	014	D-AFAF	*Watzmann*		977	D-AJUU	*Vogelsberg*
				1939	246	D-AUME	*Annaberg*
				1940	502	D-ADJO	*Hohentwiel*[3]

[1]Crashed in 1937. [2]Reregistered in 1942 as D-AJEQ, because MYO was the three-letter radio code for "warning—enemy aircraft." [3]Originally ordered for the Japanese-controlled airline in Manchuria.

Modern Airliners

Eyes Across the Sea

The spectacular progress of transport aircraft development in the United States did not pass unnoticed by **Deutsche Luft Hansa**, which ordered three of the revolutionary twin-engined **Boeing 247**s in 1933. The world's first modern airliner, the 247 could carry ten passengers at 165 mph. It had a monocoque fuselage, stressed-skin wing surfaces, and a retractable landing gear. Its all-round performance was better than that of any of D.L.H.'s aircraft at the time.

Two B-247s were delivered to Lufthansa, but instead of the third, a **Douglas DC-2** was delivered to Berlin. Undoubtedly the U.S. construction methods and quality of workmanship of both types were well studied, although German aircraft engineers were no strangers to new techniques. The stressed-skin principle, key element in the structural revolution, had been heralded by Rohrbach's box spar in the 1920s (page 23).

Single-Engined to Twin

And so the D.L.H. fleet composition underwent a radical change. The twin-engined **Heinkel He 111**, all-metal, with monocoque stressed-skin structure, retractable gear, variable-pitch propellers, and ten seats, came into service in 1936. Like the **Junkers 86** (page 49), the He 111 was designed as a bomber, so successfully that 6456 were built, as well as 236 by CASA in Spain. Field Marshal Milch had one for executive use.

Twin to Four

The momentum of modernization was maintained and even accelerated during the latter 1930s. In 1938 the **Heinkel He 116**, a long-range four-engined development of the He 111, was intended for the South Atlantic and the Far East routes, the latter by the ingenious itinerary surveyed by von Gablenz (page 58). A special version, the He 116R, made a nonstop flight of 6200 miles in 1939, but a German air passenger service to the Orient was eventually opened by—who else?—*Tante Ju*.

More promising was the new airliner from Focke-Wulf, the **Fw 200 Condor**. This fine aircraft is fully described on pages 56 and 57.

An Orderly Transition

In four momentous years, from 1935 to 1939, Deutsche Lufthansa had thus moved from operating a predominantly single-engined fleet to one which, in addition to the trusty armada of Junkers-Ju 52/3ms, could boast the fastest and most modern airliners in Europe. The transition is shown in the table on page 62.

THE WORLD'S LARGEST PRE-WAR FOUR-ENGINED LANDPLANE FLEET

Const. No.	Regist. No.	Name	Years of Service First	Years of Service Last	Aircraft Avail. 1939
Focke-Wulf FW 200 Condor (see page 57)			1938	1945	14[1]
Heinkel He 116					
545	D-AJIE	*Lübeck*	1938	1939	3
546	D-ATIO	*Hamburg*	1938		
	D-ARFD	*Rostock*	1939		
Junkers-Ju 90 (see page 51)			1939	1945	10
TOTAL			1938	1945	27

[1]Includes two with Syndicato Condor

The **Boeing 247**, one of two purchased by Deutsche Lufthansa

The **Junkers-Ju 90**, four-engined trailblazer of the European skies

DEUTSCHE LUFTHANSA'S MODERN TWINS

Const. No.	Regist. No.	Name	Years of Service First	Years of Service Last
Boeing 247				
1944	D-AKIN	—	1934	1937
1945	D-AGAR (ex-NC-91Y)	*Feldberg*	1934	1935

Note D-AGAR was destroyed at Nuremburg on 24 May 1935 when another aircraft taxied into it. D-AKIN crashed on a test flight at Hanover on 13 August 1937. Mainly experimental.

Douglas DC-2				
1318	D-ABEQ	*Taunus*	1935	1937

Note Acquired in lieu of the third Boeing 247. Delivered in February 1935 via Fokker, it was sold to LOT, Poland, in February 1937. Experimental only.

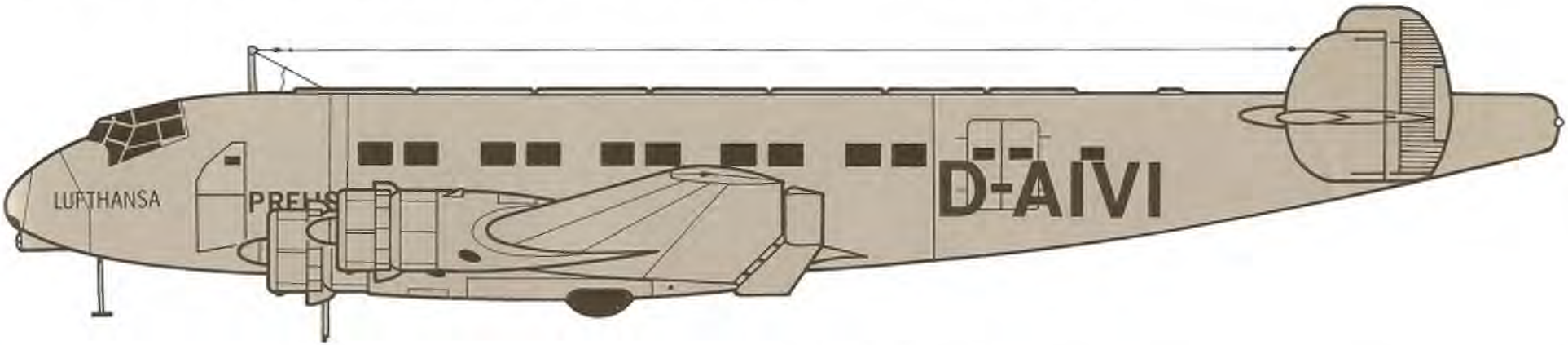
Heinkel He 111				
715	D-ALIX	*Rostock*	1935	1937
1828	D-AMEY	*Nürnberg*	1936	1940
1829	D-AQYF	*Leipzig*	1936	1940
1830	D-AXAV	*Köln*	1936	1937
1831	D-ABYE	*Königsberg*	1936	1940
1832	D-AQUA	*Breslau*	1936	1940
1833	D-ATYL	*Karlsruhe*	1936	1940
1968	D-AHAO	*Dresden*	1936	1936
2534	D-AEQA	*Halle*	1936	1940
2535	D-AYKI	*Magdeburg*	1937	1940
1884	D-ACBS	*Augsburg*	1938	1940
1885	D-ADCF	*Dresden*	1938	1940
Junkers-Ju 86 (see page 49)				

THE FOCKE-WULF FW 58 WEIHE FLEET
Replacement for the Junkers F 13

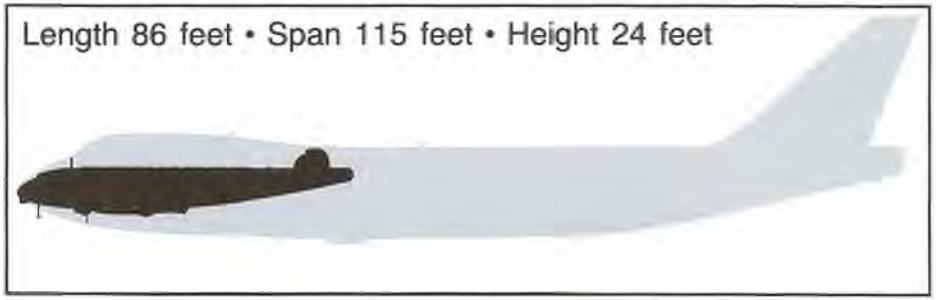
2697	D-ONBR	—	1938	1944
2698	D-OAFD	—	1938	1944
2699	D-OORK	—	1938	1943
2700	D-OBJH	—	1938	1944
3100	D-OTRE	*Rhein*	1939	1942
3101	D-OHLM	*Donau*	1939	1942
3102	D-OUPG	*Aquin* (PP-CBM)	To Syndicato Condor, 1939	
3103	D-OKDN	*Cacuri* (PP-CBN)		
3104	D-OVXF	*Elbe*	1939	1942

Note First four (unnamed) aircraft used for aerial photography, before passing to Luftwaffe. Others used for commuter services.

Junkers-Ju 90 40 seats • 200 mph



BMW 132H (830 hp) × 4
- 50,700 lb max. gross takeoff weight
- 775 statute miles range



The Big One from Dessau

The Junkers company had built a large airliner before, the ponderous G 38 of 1929 (page 43), but this had not been a success, in spite of its elephantine size, 25-ton weight, and windows in the leading edge of the thick wing so that privileged passengers could enjoy a forward view. Almost a decade later, in 1937, another 25-ton airliner, the **Ju 90**, developed from the Ju 89 bomber, emerged from the factory at Dessau. With smooth skin and flush riveting, it had clean modern lines, it was fast and powerful, and it looked good.

In some respects, it could be compared with the Boeing 307. Both had four engines, both had the same medium range of about 750 miles with full load, and total production, modest numbers in each case, was about the same. The 307 could carry 33 people in pressurized comfort and went into service with T.W.A. in 1940. The Ju 90 was not pressurized, but it was bigger, able to carry 40, and appeared on the European scene two years earlier, going into service with **Deutsche Lufthansa** in 1938.

The medium-range German contender, able to fly nonstop from Germany to the southern European capitals, nevertheless had a spotty career. The prototype, aptly named *Der Grosse Dessauer*, broke up in flight during the testing program on 6 February 1938. Because of barely a year of peacetime use immediately before the outbreak of World War II, it never became well known outside the German sphere of influence, although two were ordered by South African Airways. Military versions were built for the Luftwaffe, including the **Ju 290**, three of which were operated by D.L.H. in 1944–1945.

The Ju 90 represented a notable technical advance in commercial airliner construction. In partnership with the long-range Focke-Wulf Condor, it could have asserted German commercial aviation supremacy in Europe, had World War II not erupted in September 1939.

DEUTSCHE LUFTHANSA'S JUNKERS-JU 90 FLEET

Year of Introd.	Const. No.	Regist. No.	Name	Remarks
1937	4913	D-AALU	*Der Grosse Dessauer*	Prototype; first flight 7 June 1937; crashed 6 Feb. 1938; not D.L.H.
1938	4914	D-AIVI	*Preussen*	Crashed at Bathurst during tropical trials Nov. 1938.
	4915	D-AURE	*Bayern*	Bombed at Stuttgart Sept. 1944
	4916	D-ADLH	*Sachsen*	Delivered as *Schwabenland*; to Junkers for tests and mods, 1939; DLH, 1940–42.
1939	001	D-ABDG	*Württemberg*	Operated by D.L.H. until 1942
	005	D-AEDS	*Preussen*	
	003	D-ADFJ	*Baden*	
	006	D-ASND	*Mecklenburg*	
	007	D-AFHG	*Oldenburg*	
1940	008	D-ATDC	*Hessen*	
	009	D-AJHB	*Thüringen*	
	010	D-AVMF	*Brandenburg*	

Note Const. nos. 002 and 004 would have been ZS-ANG and ZS-ANH of South African Airways, but were never delivered.

North Atlantic Rehearsal

Dornier 18 Flights

On 13 February 1936, a Dornier Wal flying boat made a preliminary survey flight from Hamburg to the Azores, via Las Palmas, Canary Islands. Meanwhile, the elegant **Dornier 18** was undergoing trials, in preparation for making four round trips across the North Atlantic between 5 September and 20 October, from Lisbon to New York, via the Azores and Bermuda. Then the depot ship *Schwabenland* (see pages 38–39) was transferred from its South Atlantic duties to take up position near Horta, in the Azores.

The Blohm & Voss Ha 139 Flights

The following year this experimental series of flights was intensified. Handsome **Blohm & Voss Ha 139** four-engined floatplanes replaced the Dornier 18, while a brand-new depot ship of advanced design, the *Friesenland*, reinforced the *Schwabenland*. Between 13 August and 20 November 1937, with the depot ship catapults augmenting the takeoff performance, the Ha 139s *Nordwind* and *Nordmeer* made seven flights each way between Horta, the Azores flying-boat base, and New York, in times ranging from 14½ to 19 hours.

In 1938 the third series of flights had the *Schwabenland* based at Horta and the *Friesenland* at Port Washington, on Long Island, New York, where Pan American Airways had developed a flying-boat base in preparation for the launching of its Boeing 314 transatlantic scheduled service in the summer of 1939. With the positioning of the depot ships at each end of the route, an average saving of about two hours per flight was possible in both directions, and the Ha 139s made 26 crossings between 21 July and 20 October 1938.

A summary of all the catapult-launched flights, both from the ocean liners and from the depot ships, is shown in the accompanying table.

The **Ha 139** is hoisted aboard the *Schwabenland*.

GERMAN CATAPULT EXPERIMENTAL PROGRAM
ON THE NORTH ATLANTIC
Ocean Liners

Year	Aircraft Type	Ship Used	One-Way Flights
1929	Heinkel He 12	*Bremen*	7
1930	Heinkel He 12	*Bremen*	18
	Heinkel He 58	*Europa*	4
1931	Heinkel He 12	*Bremen*	13
	Heinkel He 58	*Europa*	17
1932	Heinkel He 58	*Bremen*	17
	Junkers-Ju 46	*Europa*	18
1933	Junkers-Ju 46	(both ships)	34
1934	" "	" "	36
1935	" "	" "	34
TOTAL			198

Note Aircraft were catapulted westbound to New York, and eastbound to Southampton, Amsterdam, Bremerhaven, and Cologne.

The **Blohm & Voss Ha 139** at Port Washington, New York.

Depot Ships

Year	Aircraft Type	Route and Ships Used	One-Way Flights
1936	Dornier 18	Azores *(Schwabenland)*–Bermuda–New York	4
	" "	Azores *(Schwabenland)*–Sydney (N.S.)–New York	4
1937	Blohm & Voss Ha 139	Azores *(Friesenland)*–New York *(Schwabenland)*	14
1938	Blohm & Voss Ha 139	Azores *(Schwabenland)*–New York *(Friesenland)*	26[1]
TOTAL			48

[1]Total flights permitted by U.S. authorities was 28. But flights 8 and 9 were performed by the FW 200 Condor on its record-breaking flight (see page 56) as a substitution.

AIRCRAFT USED
FOR THE
NORTH ATLANTIC CATAPULT SHIP PROGRAM

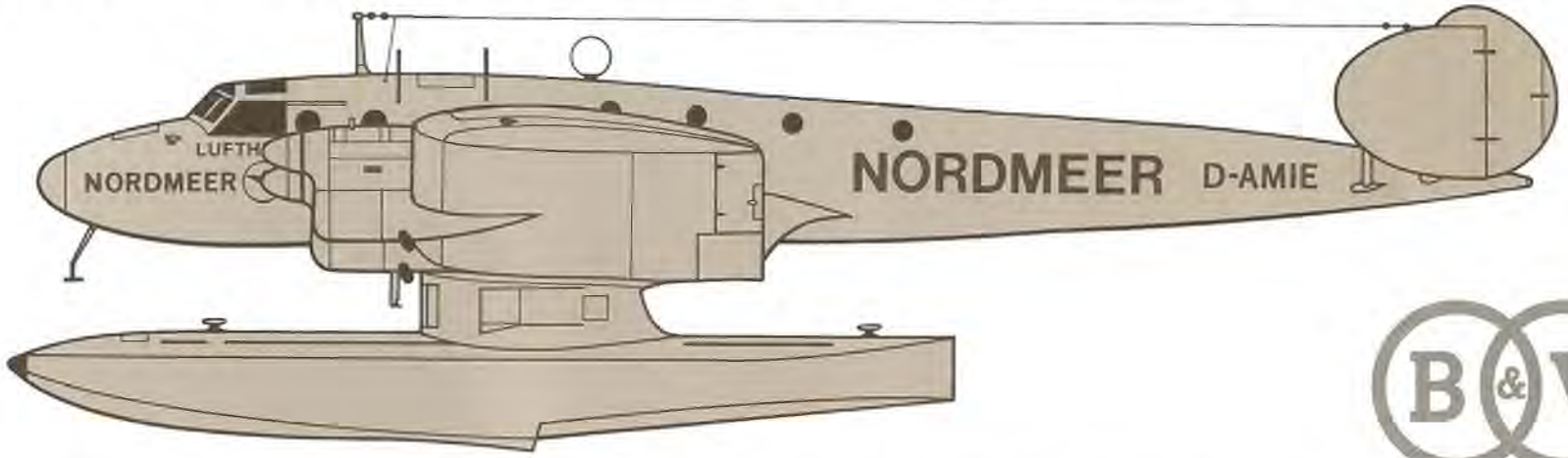
Const. No.	Regist. No.	Name	Remarks
Heinkel He 12 (owned by Norddeutscher Lloyd)			
334	D-1717	*New York*	Assigned to liner *Bremen* 1929; crashed 6 Oct. 1931
Heinkel He 58 (owned by Norddeutscher Lloyd)			
365	D-1919	*Atlantik*	Assigned to liner *Europa* 1930; renamed *Bremen* when reassigned 1932
Junkers-Ju 46			
2715	D-2244 (D-OKUV)	*Europa*	Assigned to liner *Europa* 1932–33
2720	D-2271	*Hamburg*	Assigned to liner *Bremen* 1933; transferred to Syndicato Condor, as PP-CAU *Tocantins*, 17 Jan. 1934
2744	D-2419 (D-UGUS)	*Mars* (*Jupiter*)	Landplane. *Mars*, not used on catapult flights; reregistered as D-OLMP; sold to Synd. Condor as PP-CBK 1939 *Tingua*
2745	D-2491 (D-UHYL)	*Sirius*	Assigned to liner *Bremen* 1934; reregistered as D-OBRA 1937; sold to Hansa 1939
2773	D-3411 (D-UBUS)	*Europa*	Assigned to liner *Europa* 1934; sold to Hansa 1939
Dornier Do 18 (used only with depot ship *Schwabenland*)			
661	D-ABYM	*Aeolus*	
663	D-ARUN	*Zephir*	
Blohm & Voss Ha 139 (used only with depot ships)			
181	D-AMIE	*Nordmeer*	
182	D-AJEY	*Nordwind*	
217	D-ASTA	*Nordstern*	Ha 139B (slightly larger and heavier)

Note Other Do 18s were the prototype D-AHIS *Monsun*, D-AANE *Zyklon* (c/n 677), and D-AROZ *Pampero* (c/n 255). *Pampero* was lost in the S. Atlantic 1 Oct. 1938.

The **Dornier Do 18.**

Blohm & Voss Ha 139

1000 lb. mail • 161 mph



Junkers Jumo 205c (600 hp) × 4 • 38,580 lb max. gross takeoff weight • 3000 statute miles range

Elegant Efficiency

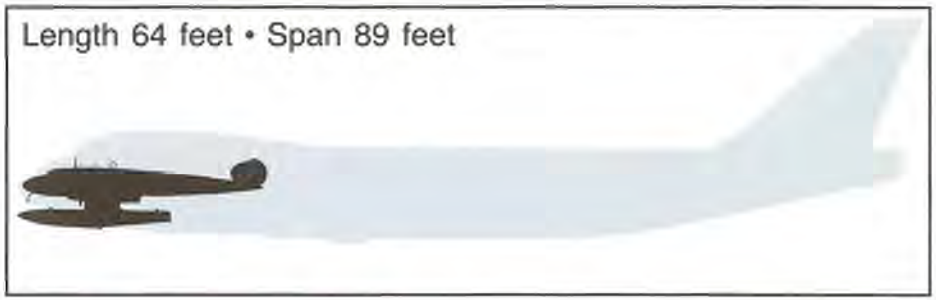
The entry, in the mid-1930s, into a field already graced by famous names such as Junkers, Dornier, Heinkel, and Focke-Wulf by the Hamburg shipbuilders **Blohm & Voss** was somewhat surprising. In the event, the firm's associate, **Hamburger Flugzeugbau**, produced an aircraft that was unique not only for its elegant and instantly eye-catching design, but also for its remarkable strength and performance that met unusually stringent specifications.

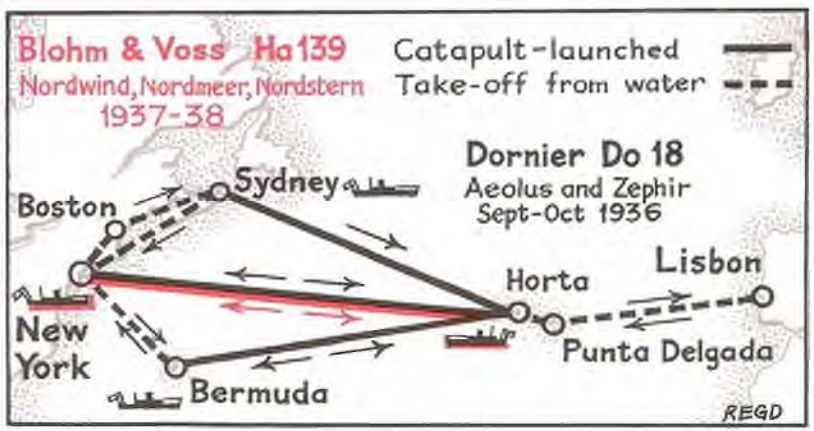
The **Ha 139**, designed by Dr. Richard Vogt, was required to upgrade the German long-range transocean operations, for which the pioneering Dornier Wal was outdated and newer Dorniers such as the Do 26 were not yet available. It had to be capable of being launched from the powerful Heinkel pneumatic catapults installed on the latest depot ships and thus had to be stressed to withstand a form of mechanical torture. The center section of the spar was made of chrome-molybdenum sheet steel, formed into a flat hollow tube which also served as the main fuel tank. The four engines were 600-hp Junkers Jumo diesels, driving three-bladed Junkers-Hamilton variable-pitch propellers. The radiators were in the mountings for the large floats.

An Impressive Performer

The first two Ha 139s were completed in 1936 and went into service with **Deutsche Lufthansa** in March 1937, performing excellently on a series of experimental flights between the depot ships based in the Azores and at Port Washington, New York (see table on opposite page). They were also used briefly in 1939 on the South Atlantic.

Because of its attractive lines, the Ha 139 was larger than it looked at first glance. Its normal loaded weight was 35,384 pounds, or, when catapulted, 38,690 pounds—almost exactly the loaded weight of a Sikorsky S-42 *Clipper* and only about 4000 pounds less than that of a Shorts S-23 Empire flying boat. It was almost certainly the largest floatplane ever built. The difference in takeoff weights, incidentally, is an indication of why the Germans persevered with the catapults. The extra 3300 pounds could be used for fuel, permitting a range of transatlantic proportions.





End of the Airship Era

North Atlantic Scheduled Air Service

While **Pan American Airways** can justly claim to have started the first *sustained* scheduled North Atlantic air services in 1939 with the **Boeing 314** flying boat, the **Deutsche Zeppelin Reederei** *Hindenburg*'s regular service from Frankfurt to New York throughout the summer of 1936 is often forgotten. It performed uneventfully, with an average journey time of 52 hours eastbound and 65 hours westbound against the prevailing winds. The one-way fare was $400, equivalent to ten times that amount today, or twice the price of a Concorde ticket; the service was probably profitable.

It was the star attraction of the aviation world in 1936. **American Airlines** advertised with pride a direct DC-3 connection to Lakehurst from Newark, then New York's air terminus. The *Hindenburg* took sports fans straight from Lakehurst to the Olympic Games in Berlin, and the airship carried the Olympic insignia to mark the occasion. (See page 40 for the service record.)

The smoking room of the *Hindenburg*.

The control car of the *Hindenburg*.

The passenger lounge of the *Hindenburg*.

The Great Disaster

Pride came before more than simply a fall. Measured in human lives lost, the historic conflagration on 6 May 1937 at Lakehurst, New Jersey, as the *Hindenburg* was about to come to its moorings after its maiden voyage of the season, was far from being the worst disaster in aviation history. The miracle was that far more people (62) actually survived than lost their lives (36). However, the disaster was not only witnessed by hundreds but was filmed and shown to millions worldwide in a dramatic movie sequence so often repeated that millions more, of future generations not even born at the time, were later to have the image indelibly imprinted on their memories of events.

The controversy raged, and still resurfaces occasionally, as to whether the United States should have supplied helium for the *Hindenburg*. This is irrelevant. With full knowledge of the danger of hydrogen, with its high flashpoint risk, the company should never have operated with it. But perhaps it had no choice, considering the competitive and political environment of the times. One decision, however, was inescapable on 6 May 1937. Airships would never operate commercially again.

The LZ 129 *Hindenburg*.

Zeppelin LZ 129 *Hindenburg*

50 seats (in 2-berth cabins) • 77 mph

Daimler-Benz MB 502 (1000 hp) × 4 • 270 tons max. gross lift • 8400 statute miles range

A Hesitant Beginning

Encouraged by the success of the *Graf Zeppelin* (see pages 40–41), the Zeppelin company embarked on a larger airship project that, if completed, would have been the **LZ 128**. Half as big again as the *Graf*, it would have carried half again as many passengers, even though it was designed to be about the same length. But after the British airship **R101** crashed at Beauvais, France, in October 1930, the designers concluded that the new airship must have nonflammable helium rather than hydrogen gas, and that the engines must be fueled by less volatile diesel oil rather than by gasoline or *Blaugas*.

The Greatest Airship of Them All

And so, in 1931, work started on the new **LZ 129**, for which the German government cooperated with the State of Württemberg in building the massive construction shed, as well as paying for the airship itself. Unfortunately, the United States possessed a monopoly of the world's supply of helium, and refused to supply the precious gas to Germany. The United States was apprehensive about the possible future military use of airships, and the authorities in Washington were taking no chances.

The LZ 129 had to be redesigned, using hydrogen in the gas bags, and more powerful 1300-hp engines, Daimler Benz MB 502 (LOF 6) diesels; it needed only four, compared with the Graf's five. Named the *Hindenburg* for its first flight on 4 March 1936, it was twice as big as the *Graf Zeppelin* in volume. It could carry 50 passengers, and its total load-carrying capability was 32 tons, of which 11 tons were ballast. Its still-air range was a staggering 8700 miles. Its construction and entry into service represented a triumph of German engineering.

Length 804 feet • Diameter 135 feet

Postscript

The *Hindenburg*'s passenger accommodation had been increased to 72 for the stillborn 1937 season. Interestingly, this was almost the same as the **Pan American Boeing 314**'s 70 seats, but the *Hindenburg* could carry them in far greater luxury and ten times as far. But the series production of airships was impossible, as was the prospect of coping with more than one at a time at the airports. The *Hindenburg* needed a ground crew of 240 men to receive it, and about half a square mile of space. In practical terms, airship services could only have been maintained for the privileged few, and further development of the breed was speculative, at best.

Historic Landplane Sortie

A Record-Breaking Flight

On 10 August 1938 a **Focke-Wulf Fw 200 Condor**, piloted by Capt. Henke of **Lufthansa**, flew nonstop from Berlin to New York. Registered D-ACON, the aircraft took off from the Staaken airfield in Berlin and landed at Floyd Bennett Field, because this was the only New York air terminal with adequate concrete runways. The nonstop distance of close to 4000 miles was covered in 24 hr 36 min, at an average speed of 160 mph.

The Lufthansa aircraft maintenance staff on board the *Friesenland*, the depot ship stationed at Port Washington for the Azores–New York experimental program, using catapult launching (see page 52), inspected D-ACON, gave it a clean bill of health, and three days later dispatched it back to Berlin, where it received an enthusiastic welcome.

The Writing on the Wall

More than any other single flight, D-ACON's dramatic achievement established beyond doubt that landplanes could outperform flying boats, however elegant and spacious the latter were. Recognizing belatedly that heavy wing and wheel loadings could be compensated for by solid hard runways, aircraft designers the world over conceded that the era of the commercial flying boat was nearing its demise.

Other factors were to accelerate this trend. Chief among these was the enormous program of airfield construction undertaken by the United States—aided considerably by technical teams from **Pan American Airways**—during World War II. But the Fw 200, more than any other single airliner, even the pressurized **Boeing 307 Stratoliner**, heralded an irreversible change of course in the development of the commercial airliner.

The **Condor** welcomed at Berlin after its triumphal return flight in 1938.

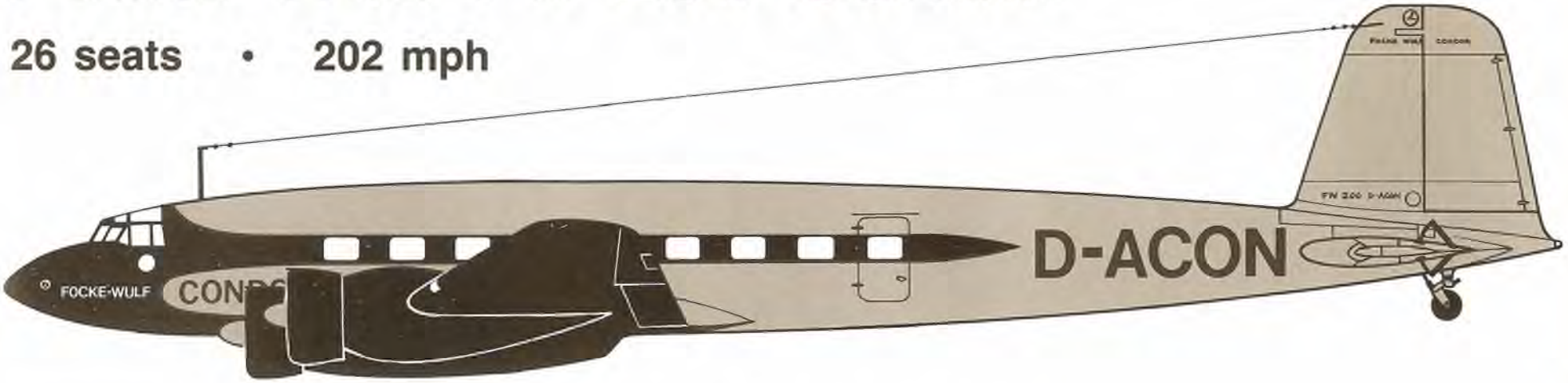
THE FOCKE-WULF FW 200 CONDORS

Const. No.	Regist. No.	Name	Year Deliv.	Remarks
2000	D-ACON	*Brandenburg*	1937	Name only when flown as prototype, D-AERE. Record nonstop Berlin–New York, New York–Berlin, 10–13 Aug., 1938. Berlin–Tokyo, 28–30 Nov. 1938. Ditched and written off, Manila, 6 Jan. 1939
2484	D-AETA	*Westfalen**	1937	Operated until 1945
2893	D-ADHR	*Saarland**	1938	Written off in accident 1941
2895	D-AMHC	*Nordmark**	1938	Written off 1943
2994	D-ARHW	*Friesland**	1938	Crashed into sea 29 Nov. 1944
2995	D-ASBK	*Holstein*	1939	Diverted to **Syndicato Condor** as PP-CBJ *Arumani*
2996	D-AXFO	*Pommern*	1939	Diverted to **Syndicato Condor** as PP-CBI *Abaitara*
3098	D-ACVH	*Grenzmark*	1939	To Reichsluftfahrtministerium. Used by von Ribbentrop to visit Moscow 1939
3099	D-ARHU	*Ostmark*	1939	To Reichsluftfahrtministerium. Renamed Immelmann III and used as Adolf Hitler's personal aircraft.
3324	D-ABOD	*Kurmark**	1939	Crashed 22 April 1940, during invasion of Norway
0001	D-ACWG	*Holstein*°	1940	
0009	D-ASHH	*Hessen*°	1940	Last service, Barcelona–Berlin, 14 April 1945; crashed at Piesenkofen, Bavaria, 21 April 1945
0020	D-AMHL	*Pommern*°	1940	Operated until 1945
0021	D-ASVX	*Thüringen*°	1940	Flew the last D.L.H. service on 5 May 1945, Aalborg–Flensburg
2894	OY-DAM	*Dania*	1938	Delivered to **D.D.L.**, Denmark, by Kurt Tank, 14 July 1938. May have opened first Fw 200 scheduled service two weeks later. To England 8 April 1940 and seized. To BOAC as *Wolf*. Damaged beyond repair 12 July 1941 at White Waltham in Luftwaffe raid.
2993	OY-DEM	*Jutlandia*	1938	Delivered to **D.D.L.** Nov. 1938; flew on Copenhagen–Berlin–Vienna service until crash landing at Vienna, 17 Dec. 1941; repaired and served until 1945. Resumed service after World War II but badly damaged at Northolt in 1946 and scrapped.

Note Those marked * delivered to Deutsche Lufthansa under contract. Those marked ° delivered to Deutsche Lufthansa but also used by Luftwaffe for logistics support during invasion of Norway, 1940.

Focke-Wulf Fw 200 Condor

26 seats • 202 mph



BMW 132G (720 hp) × 4 • 32,000 lb max. gross takeoff weight • 775 statute miles range

An Inspired Project

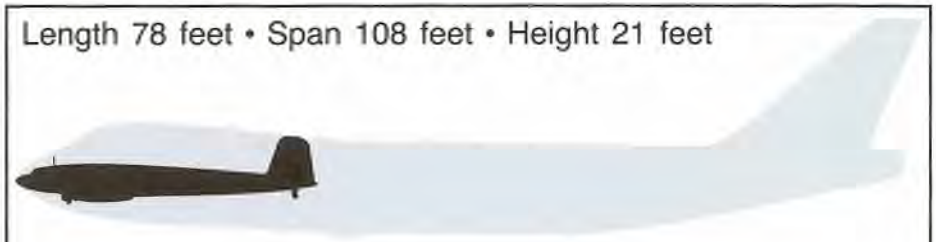
In the summer of 1936, as the DC-3 entered service and the *Hindenburg* flew the Atlantic airways, the Bremen aircraft constructor Focke-Wulf began work on a revolutionary four-engined landplane. The **Fw 200 Condor** made its maiden flight just one year later. Its designer, Kurt Tank, had produced an aircraft that outperformed all others. It could carry 26 passengers at high speed, and could fly, with a smaller load, over long distances. Two notable demonstration flights are described on pages 56, opposite, and 59.

Frustrated Potential

Deutsche Lufthansa took delivery of both the Fw 200 and the Junkers-Ju 90 in May 1938. The Condor went into service in June, from Berlin to Vienna, Frankfurt, and Munich. In November 1938 a Condor flew to Tokyo, a distance close to 9000 miles, in 46 hours. This outstanding airliner also went into service with the Danish **D.D.L.** in July 1938 and with **Syndicato Condor**, Brazil, in 1939 (page 32). It was ordered by airlines in Finland and Japan and by Lufthansa's Chinese partner, Eurasia; but it never entered service with them.

The outbreak of World War II put an end to ambitious plans for worldwide Condor marketing and sales. Besides the two prototypes and the ten aircraft of the first Fw 200 series, no less than 46 of the advanced Fw 200Bs were ordered by the summer of 1939. It was subsequently developed as a military long-range reconnaissance aircraft with the capability of bombarding shipping with a small bomb load. But it was never used as a heavy bomber. During the war it undertook long-range sorties between Bordeaux, France, and Stavanger, Norway, flying in a wide arc around the British Isles, often taking 16 hours in surveillance of Allied convoys. The two airfields were among the few in Europe at the time that could boast concrete runways.

Length 78 feet • Span 108 feet • Height 21 feet



The **Focke-Wulf 200 Condor** at Floyd Bennett Field, New York, after its nonstop flight from Berlin in 1938.

Eastward Bound

Across Siberia

German airline aspirations in the Far East had focused on the establishment of a route through the Soviet Union. This was a geographically obvious solution, and the first tentative exploratory trips had been accomplished, not without incident, during the mid-1920s (see page 24). The objective was to fashion a direct route to Peiping, in cooperation with the Soviet airline, via Moscow and the larger cities along the whole length of the Trans-Siberian Railway.

Starting on 27 August 1928, in a cooperative venture by **Deutsche Luft Hansa** and the Soviet airline **Dobrolet**, a Junkers-W 33 D 1472 *Ural* flew from Berlin to Irkutsk, via Moscow and other intermediate stops. It made an immediate turnaround and was back in Berlin on 2 September, having flown the 7630 miles in 76 hr 15 min flying time. One week later the same aircraft repeated the exercise, this time tarrying awhile in Irkutsk to make some local surveys of possible onward extensions.

In August 1929 the famous airship *Graf Zeppelin* flew across northern Siberia on its round-the-world flight, taking 101 hr 49 min for the first nonstop segment of the journey, Berlin to Tokyo. It carried 20 passengers, who paid handsomely for the privilege—40,000 marks each.

Change of Plan

Everything seemed to be going well. In 1930, **Deutsche Luft Hansa** established **Eurasia** (see page 26) as an associate airline in China, to secure a sound base at the far end of a prestigious transcontinental air route. At first the rail line was to be followed all the way to the Manchurian border; but this was not only circuitous, it was dangerous, as Eurasia discovered when one of its aircraft was forced down near Manchuli and its crew held captive by the local keepers of the law. A shortcut was sought across northern Sinkiang (then known as Chinese Turkestan), and a W 33 survey flight was made from Peiping to Urumchi in December 1931.

It was the end of the line in more ways than one. In 1933 the Soviet Union ceased to cooperate and the Germans had to seek a new route.

A heroes' welcome for **Von Gablenz** and his crew after their adventure in western China. Captain Von Schroeder is on the left.

Over the Pamirs

Fortunately, **Deutsche Lufthansa** could fall back on another plan. Necessity being the mother of invention, Lufthansa began to consider a route which presented a much bigger challenge than the conquest of the oceans. For given the choice of the world's highest mountain massif or the world's stormiest oceans, most pilots would, in the 1930s, have chosen the latter for safety.

In June and July 1936, Capt. Drechsel made a survey flight in a **Junkers-Ju 52/3m** to Kabul. With this technically advanced aircraft, compared with the single-engined W 33s, he took the opportunity to survey the forbidding Hindu Kush and Pamir mountain ranges, his 7600-mile flight taking only 55 hr 43 min flying time. Possibly as important as the survey itself was the establishment of a meteorological station high up in the Pamirs.

The **Junkers-W 33** *Ural*, which made a pioneer flight to Irkutsk and back in 1928.

Karl August Freiherr von Gablenz, a great pilot and great operational and visionary innovator of blind flying and transocean flying techniques, pictured here both as a pilot and as an executive.

The **Junkers-Ju 52/3m** in China.

The strategy was to utilize the Wakhan region, a narrow strip of Afghan territory which acts as a buffer zone between India (now Pakistan) and the Soviet Union. By following the Pyandzh river valley and negotiating the 16,000-foot-high Wakhan Pass, it is possible to cross into China along this "Afghan Corridor" without overflying either the Soviet Union or India. Accordingly, to examine the feasibility of such an itinerary, the "Pamir Expedition" left Berlin in August 1937. Freiherr von Gablenz, flying with the **Junkers-Ju 52/3m** D-ANOY *Rudolf von Thüna*, piloted by Capt. Untucht, was partnered by Capt. Drechsel in another Ju 52, D-AMIP. They left Kabul on 24 and 26 August respectively, and D-ANOY, with a refueling stop at Ansi, arrived at Sian, Eurasia's main base at the time, on 27 August. D-AMIP landed about 20 miles short of Sian and was later transferred to Eurasia.

On the return flight, D-ANOY had engine trouble and had to make a forced landing near Cholan, in southern Sinkiang. The crew were promptly arrested and jailed by unfriendly troops from the local garrison. Held hostage for several weeks and badly treated, they eventually reached Kabul on 27 September having been "rescued" by a more sympathetic Chinese army contingent. They arrived back in Berlin on 10 October, to a heroes' welcome.

The "corridor" of Afghan territory, devised as a political buffer between Russian and British interests in the 19th century, served as a neutral passage for German survey flights to China.

A Far East Route at Last

Into the Middle East

As early as November 1930, a **Junkers-W 33** had made an experimental mail and freight flight to Baghdad, as an extension of **Deutsche Luft Hansa**'s existing route to the east as far as Istanbul; but the little single-engined aircraft was not adequate for sustained service. On 29 October 1937, however, a scheduled mail and freight route opened to Baghdad, and this was extended to Teheran, Persia (Iran), with full passenger service, on 1 April 1938. The aircraft used was the versatile **Junkers-Ju 52/3m**, and two weeks later, on 15 April, it flew to Herat and Kabul, the Afghan capital, to open the longest route on the Lufthansa system at that time.

Auntie Ju Spreads Her Wings

By the late 1930s, D.L.H. had many sleek and fast aircraft, but the challenging assignment to open a Far Eastern Service fell upon the trusty "old faithful," the Ju 52/3m trimotor, which had first gone into service in 1932. Its resilience and reliability had become legendary, and several had already been ferried out to **Eurasia**, the German airline affiliate in China, in 1934 and 1935.

After a survey flight all the way to Tokyo, flown on 22 April 1939 with Freiherr von Gablenz himself aboard, *Tante Ju* opened a twice-monthly scheduled service to Bangkok, on 25 July of that year. The journey took 4½ days by the southern route, via Baghdad, the Persian Gulf, and India; the 14-to-17-seat aircraft was fitted with only six special seats, to provide comfort for the long flight.

But this was little more than a token gesture. World War II erupted in Europe at the end of August. One aircraft, D-ANJH, had crashed at Rangoon on the return flight, and the third aircraft to arrive at Bangkok was confiscated. The crew managed to escape with their aircraft to Shanghai, whence they were able to reach their compatriots in Eurasia.

On the Brink of a Breakthrough

In a dramatic flight matching its famous round-trip across the North Atlantic on 10 August 1938, the four-engined **Focke-Wulf Fw 200 Condor**, D-ACON, left Berlin on 28 November 1938 and reached Tokyo on the 30th. Making only three stops, it covered the 8870 miles in 48 hr 10 min, heralding a new era in airline operations to the Far East. Such a speed was far better than the British flying boats or any other landplane at the time could match. Alas, the Condor had to ditch in Manila Bay on its return journey, and the outbreak of war prevented any further flights.

Originally, D-ACON was to have made a round-the-world flight, but U.S. authorities refused landing rights in New York, Los Angeles, and Hawaii. In fact, the New York flight (page 52) was made by an astute manipulation of the flight program allocated to the Azores–New York depot ships and the Blohm & Voss Ha 139s.

Had a favorable political climate prevailed, there is little doubt that Deutsche Lufthansa could, by 1940 at the latest, have opened full Fw 200 services to Tokyo, as well as to New York and Buenos Aires. It would have been the world's first successful long-range landplane airliner.

The **Focke-Wulf 200 Condor** made a dramatic flight to Tokyo in 1938 but never went into service on the Far East route.

The trusty old *Tante Ju* finally opened a Lufthansa scheduled route to the Far East in 1939.

Outposts on the Pacific Rim

SEDTA

Until 1937, German commercial aviation interests had been confined to Brazil, where Syndicato Condor (page 32) had a nationwide network. In Colombia, however, Juan Trippe, Pan American's wily leader, had usurped German control of SCADTA (page 28) as early as 1931, by an agreement under which Trippe had a free hand in Colombia, and Condor's presence in Brazil was not challenged. But D.L.H. was anxious to expand its routes more effectively to the Pacific Ocean.

On 24 July 1937 it established the **Sociedad Ecuatoriana de Transportes Aéreos (SEDTA)** in Quito, Ecuador. The driving force was none other than Fritz Hammer, the dynamic Condor Syndikat salesman-promoter. SEDTA had no support from the Ecuadorian government. It chartered its **Junkers-W 34**s and **Junkers-Ju 52/3m**s from Lufthansa in the spring of 1938, and was dependent on its own revenues and on D.L.H.'s help to cover costs.

A **Junkers-Ju 52/3m** of **D.L.H. Sucursal Perú**.

THE FLEET OF SEDTA (ECUADOR)
1938–1941

Regist. No.	Const No.	Name	Remarks
Junkers-W 34			
D-OJIL	489	—	Crashed 4 March 1938, killing Fritz Hammer, one of the founders of Condor Syndikat
HC-SAA	2608	*Pichincha*	Ex-D-OGIF, crashed 11 Sept 1939, repaired, and transferred to Condor as PP-CBO 14 Jan. 1941
Junkers-Ju 52/3m			
HC-SAB	5915	*Ecuador*	Ex-D.L.H. (D-APDF); crashed 10 Dec. 1938
HC-SAC	5053	*Guayas*	Ex-D.L.H. (D-AQUG); to Syndicato Condor as PP-CBR 13 Jan 1939
HC-SAD	5283	*Aconcagua*	Ex-D.L.H. (D-AENF, chartered from Syndicato Condor 25 April 1941; requisitioned by air force, passed to USAAF as C-79 (42-52883) May 1942
HC-SAE	5109	*Azuay*	From Syndicato Condor 20 Nov. 1939; requisitioned by air force
PP-CBG	4075	—	Chartered from Syndicato Condor 10 Feb. 1941 and returned
D-APDF	5915		—

Death of a Master Salesman

The first few months of operation were soon marked by tragedy. Hammer was killed in the W 34 D-OGIF when it crashed on 4 March 1938. More than any single individual, he had carried the German commercial airline flags into foreign lands, using innovative marketing methods and displaying great tenacity and verve. In the art of founding new airlines he was decades ahead of his time.

SEDTA's proposal in May 1940 to open a service to the Galapagos Islands—not yet featured in the tourism brochures—sounded alarm bells in Washington. The U.S. airline PANAGRA was designated to operate its DC-2s precisely in parallel with SEDTA's Ju 52/3ms. Even *Tante Ju* was no match for the DC-2, especially since its fuel supplies were cut off. On 5 September 1941, the Ecuadorian government, under U.S. pressure, requisitioned the remaining Junkers trimotors. One of them was transferred to the U.S.A.A.F. as the sole C-79 and used in Costa Rica by the U.S. Roads Administration.

Peruvian Branch Office

On 24, May 1938, **Deutsche Lufthansa Sucursal Perú** began service from Lima, Peru, to Arequipa and La Paz, Bolivia. This completed an ingenious multinational route across the middle of South America, entirely German-sponsored. It reached from Rio de Janeiro and São Paulo, Brazil, to Corumbá, on the Bolivian frontier, by **Syndicato Condor**; thence to La Paz by **L.A.B.**, the German-influenced airline in Bolivia; and finally to Lima and the Pacific Ocean by D.L.H. Sucursal. (See page 31.)

The Peruvian airline was not an associate or subsidiary. It was an overseas branch of D.L.H. and had no local shareholding. Its fleet consisted of two **Junkers 52/3m**'s, which were adequate for the limited task required. A connection with SEDTA in Ecuador was never made, although no doubt the idea was in the minds of the Lufthansa planning staff in Berlin.

THE FLEET OF D.L.H. SUCURSAL PERU
1938–1941

Regist. No.	Const. No.	Name	Remarks
Junkers-Ju 52/3m			
OA-HHA	5060	*Huascarán*	Ex-AMIT; to Peruvian govt. 31 March 1941
OA-HHB	5043	*Misti*	Ex-D-ARYS, crashed 26 June 1938
OA-HHC	5272	*Huanday*	Ex-D-AMIQ, to Peruvian govt. 31 March 1941
OA-HHD	5283	*Aconcagua*	Ex-D-AENF, chartered to SEDTA 29 Nov. 1940

Note All aircraft were delivered during 1938.

Pressure from the United States led to the Peruvian government's withdrawal of the operating permit, and flights were suspended on 31 March 1941. As in the case of Ecuador, PANAGRA was waiting in the wings to take over.

LUFTHANSA BEZIRKSDIREKTION SÜDAMERIKA
(SOUTH AMERICAN REGIONAL MANAGEMENT)

Regist. No.	Const. No.	Name	Delivery Date	Remarks
Junkers-Ju 52/3m				
D-ARUW	4038	*Caiçara*	1938	To Syndicato Condor 11 Sept 1939 (PP-CAV)
D-AGST	5261	*Maipo*	31 March 38	To Syndicato Condor 11 Sept 1939 (PP-CAZ)
D-AENF	5283	*Aconcagua*	1 April 37	To Syndicato Condor 11 Sept 1939 (PP-CBA)
D-APEF	4075	*Pagé*	24 Sept 38	To Syndicato Condor 11 Sept 1939 (PP-CBG)
D-AMYE	5656	*Los Andes*	7 June 37	To Syndicato Condor 11 Sept 1939 (PP-CBL)

Notes D-AENF made the first D.L.H. Buenos Aires-Santiago flight on 13 Sept. 1937. D-ARUW made the first D.L.H. Rio de Janeiro-Natal flight on 1 Oct. 1938. D-APEF made the first D.L.H. Rio de Janeiro-Buenos Aires flight on 4 Nov. 1938.

Dramatic Rescue

The Hazards of War

Apart from the severe problems of terrain, climate, and maintenance, **Eurasia**'s and **China National Aviation Corporation**'s aircraft were targets for Japanese attack. Possibly the most spectacular incident—matching that of the famous "DC-2½" adventure when a C.N.A.C. DC-3, after being strafed by the Japanese, limped home with one DC-2 replacement wing—was an astonishing salvage operation performed in southern China on 13 April 1939. A Eurasia **Junkers-Ju 52/3m**, *Eu XIX*, was machine-gunned and bombed just north of the Indo-Chinese (now Vietnamese) frontier, and crash-landed on a mountain slope, tearing off its landing gear. An injured Capt. Rathje—the same who had narrowly missed death in the "Mongolian Incident" (see page 26)—was carried on a stretcher through the jungle for five days before reaching help in Indo-China on the railroad to Hanoi.

Miracles Take a Little Time

Any transport aircraft was a priceless asset in wartorn China in 1939, and this one was considered much too precious to leave to rot on a mountainside. Accordingly, under the supervision of Ing. Schneider, a German master mechanic of Eurasia, 33 pack animals, loaded with spare parts and equipment, were sent to the crash site.

The series of pictures tells the story better than words. The aircraft was repaired and almost 1000 workers methodically dug out a runway on the steep slope. It was a masterpiece of ingenuity and improvisation. On 15 October, only six months after the crash, and with only 4 feet to spare on each side of the 900-foot mud-surfaced strip, Eu XIX flew to Kunming to resume its much-needed logistics support for the Chinese.

A German Airline Empire

Built-in Handicaps

Compared to the other European "empire" networks, serving dominions and colonies overseas, the German intercontinental map at the outbreak of World War II in 1939 was not too impressive. Germany had been deprived of all its overseas territories after World War I and its former adversaries controlled all the commercially significant airspace in the Eastern Hemisphere. Without sovereignty, Germany had no territorial bargaining cards to play; privileges to overfly, land, or carry traffic were granted reluctantly.

Bricks Without Straw

German airlines were thus obliged to seek other avenues of geographical and political opportunity. **Junkers Luftverkehr** and then **Deutsche Luft Hansa** were at first active in the U.S.S.R., but political problems in 1933 ended this promising line of development towards the Far East, where D.L.H. had set up an airline in China, itself beginning to shake off the shackles of colonialism. Substantial progress was made, however, in South America, with cooperation from neutral Spain and Portugal, and with help from German expatriates and citizens in Brazil and other countries.

D.L.H. had been prepared to open services across the North Atlantic in 1939 with the **Focke-Wulf Fw 200 Condor** and the **Dornier Do 26** flying boat as the standard-bearers. But Martin Wronsky had been denied U.S. landing rights. Six Blohm & Voss BV 222 six-engined flying boats had also been ordered for luxury passenger service across the oceans; but these, together with seven more, were used for long-range reconnaissance during World War II.

Had the war not intervened, Deutsche Lufthansa could have developed a prestigious long-haul route network and would have been a force to be reckoned with in the world of international air transport. Instead, D.L.H. was obliged to contrive an amalgam of joint services, partnerships, and associated airlines. It was a masterpiece of improvisation.

Even in 1939 at the outbreak of World War II, two **Dornier Wals** were still operating in the Baltic.

The long-range **Heinkel 116** was due for delivery in 1940 to supplement the Focke-Wulf Condor, but it never went into regular service.

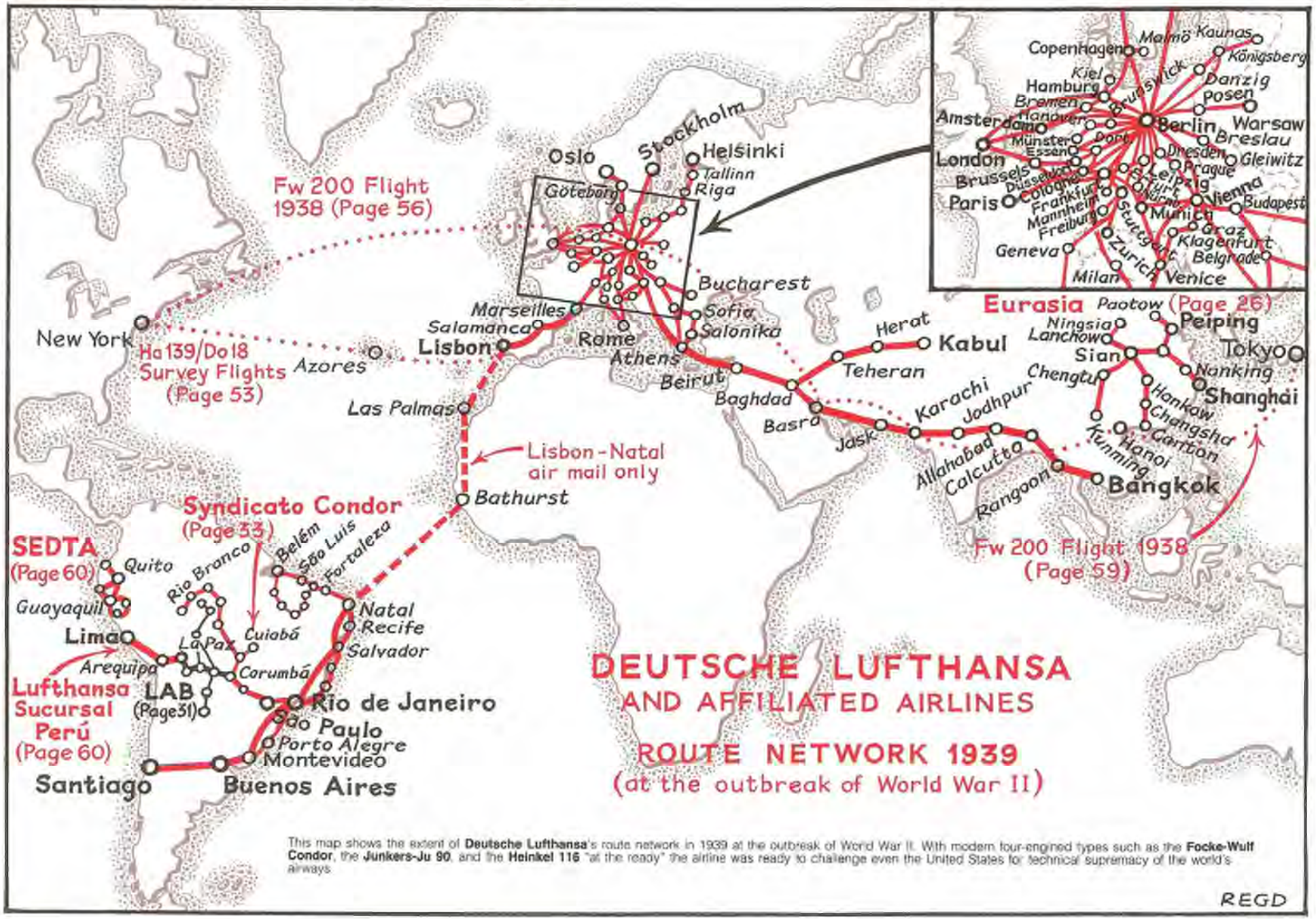
When World War II broke out, Lufthansa had nine **Heinkel 111s**. Like the Heinkel 111s, the **Junkers-Ju 86s** were quickly requisitioned for the Luftwaffe.

MODERNIZATION OF THE D.L.H. FLEET
1932–1939

Aircraft Category and Type	Normal Seats	1932 No.	1932 Total Seats	1936 No.	1936 Total Seats	1939 No.	1939 Total Seats
EARLY TYPES							
Single-engined							
Junkers-F 13/A 20/W 33/34	4	49	196	9	36	2	8
Fokker F II/F III	4	18	72	1	4	—	—
Dornier Merkur	6	21	126	—	—	—	—
Focke-Wulf Möwe	8	16	128	—	—	—	—
Junkers-F 24	9	9	81	—	—	—	—
Others (Caspar 32, Ju 46)	—	2	—	3	—	—	—
Single-engined subtotal		115	603	13	40	2	8
Twin-engined							
Dornier Wal	10	9	90	5	50	2	20
Other twins (Romar, Albatros)	8	4	32	—	—	—	—
Trimotors							
Ju-G 24/31	9	15	135	1	9	—	—
Rohrbach Roland	10	13	130	—	—	—	—
Multi-engined subtotal		41	387	6	59	2	20
Total Early Types		156	990	19	99	4	28
INTERIM TYPES							
Single-engined							
Messerschmitt M 20	10	12	120	5	50	8	80
Trimotor							
Junkers-Ju 52/3m	16	2	32	59	944	78	1248
Four-engined							
Junkers-G 38	34	2	68	1	34	1	34
Total Interim Types		16	220	65	1028	87	1362
MODERN TYPES							
Single-engined							
Junkers Ju 160	6	—	—	18	108	16	96
Henkel He 70	4	—	—	12	48	—	—
Focke-Wulf Fw 58	6	—	—	—	—	8	48
Twin-engined							
Heinkel He 111	10	—	—	7	70	9	90
Junkers Ju 86	10	—	—	6	60	13	130
Dornier Do 18	—	—	—	2	—	—	—
Four-engined							
Focke-Wulf Fw 200	26	—	—	—	—	4	104
Junkers-Ju 90	40	—	—	—	—	4	160
Dornier Do 26	—	—	—	—	—	2	—
Total Modern Types		—	—	45	286	56	628
TOTAL FLEET		170	1210	129	1413	147	2018

Note All figures as at 31 December. By the end of 1939 there were probably as many as ten Fw 200s and ten Ju 90s on D.L.H.'s register, but at least half of these were impressed into military service.

Lufthansa in 1939



This map shows the extent of **Deutsche Lufthansa**'s route network in 1939 at the outbreak of World War II. With modern four-engined types such as the **Focke-Wulf Condor**, the **Junkers-Ju 90**, and the **Heinkel 116** "at the ready" the airline was ready to challenge even the United States for technical supremacy of the world's airways.

REGD

Lufthansa and the War Effort

The Bubble Bursts

Just when **Deutsche Lufthansa** had reached a high point in its development, all progress was brought to a halt by the outbreak of World War II on 3 September 1939. In line with nations on both sides of the war, German commercial airline services open to the public were discontinued.

The transition was swift and effective. Since 1933, Erhard Milch, a member of the airline's executive board since 1926, had also been Secretary of State of the Reichsluftfahrtministerium. The machinery for converting D.L.H. into an effective transport division of the armed forces was thus already in place and under control.

A Fleet Transformed

Of the 145 aircraft on Lufthansa's books at the end of 1939, 22 **Heinkel 111**s and **Junkers-Ju 86**s were promptly requisitioned. Within three years, the fleet was reduced to 59, of which 47 were **Junkers-Ju 52/3m**s and the rest an odd mixture of obsolescent single-engined types and such representatives of the latest four-engined technology as the **Focke-Wulf Fw 200 Condor** and the **Junkers-Ju 90**.

Fleet reductions by Air Ministry requisition and by enemy action continued as the war ebbed and flowed around an alternately expanding and contracting Third Reich. Relief came from C.L.S., K.L.M., and SABENA (see table), from aircraft chartered from Iberia and Aero O/Y, seizure from Ala Littoria, and more charters from Air France in 1943. D.L.H.'s fleet in its last summer of 1944 included such unlikely types as the **Douglas DC-2** and **DC-3**, the **Bloch 220**, and the **Savoia Marchetti S.73**.

Two **Fokker F VIIb/3m**s, built in Czechoslovakia under license by Avia, and operated by C.L.S. (OK-ABP and OK-ABS), worked for Lufthansa during 1939 as D-AABP and D-AABS. In the occupied countries, the airlines cooperated with Lufthansa and a new airline, **Slovenská Letecká Akciová Společnost (S.L.S.)**, operated in Slovakia from 1939 to 1944, with a fleet that included Junkers-Ju 86s.

The fleet count at the end of 1944 was officially 34 : 31 Junkers *Tante Jus* and 3 **Focke-Wulf Fw 58**s. But all except three of the Junkers were chartered to the air force. Yet during the last few months into the spring of 1945 some incredible efforts were made to uphold the deeply entrenched traditions of a great airline. Three **Junkers-Ju 290**s, improved versions of the four-engined Ju 90s, and even commerical conversions of the **Ju 88** bomber were added for sporadic operations to support the FW 200 Condors and Ju 52/3ms.

Business as Usual

Deutsche Lufthansa had a patriotic duty to link Germany with friendly and neutral countries, but there were voices of dissent within the airline. Some members disagreed with the policies of the Nazi regime, notably Klaus Bonhoeffer, head of the legal department, assisted by one of the company's lawyers, Otto John. Bonhoeffer was arrested after the attempted assassination of Hitler on 20 July 1944, and was subsequently executed. John was able to escape to a neutral country.

But as the Allied forces began to advance toward Germany from east, south, and west, the routes were curtailed. As described on the opposite page, like captains going down with their ships, a nucleus of Deutsche Lufthansa staff were still reporting for duty long after they could so easily have found excuses to be elsewhere.

LUFTHANSA'S DOUGLAS FLEET IN THE WAR YEARS

Const. No.	Regist. No. or Name			Lufthansa Service	
	Original	Luftwaffe	Lufthansa	From	To
DC-2 (ex-C.L.S., Czechoslovakia)					
1582	OK-AIB	—	D-AAIB	July 40	24 March 41[1]
1565	OK-AID	VG + FV	D-AAID	July 40	Jan. 41[2]
1562	OK-AIC	—	D-AAIO	July 40	27 March 41[1]
DC-2 (ex-K.L.M., Netherlands)					
1365	PH-AKS	NA + LF	D-ABOW	1 Aug. 40	11 Feb. 44[3]
1355	PH-AKI	NA + LD	D-ADBK	25 July 40	
1363	PH-AKO	SG + KV	D-AEAN	July 40	May 45[4]
1364	PH-AKR	PC + EB	D-AIAS	July 40	"
1366	PH-AKT	NA + LA	D-AIAV	21 July 40	9 Aug. 40[3]
1356	PH-AKJ	PC + EC	D-AJAW	July 40	"
DC-3 (ex-C.L.S., Czechoslovakia)					
2023	OK-AIE	Mährisch-Ostrau	D-AAIE	24 Aug. 39	9 Dec. 44[2]
2024	OK-AIF	Brünn	D-AAIF	24 Aug. 39	43[2]
2086	OK-AIG	—	D-AAIG	24 July 40	21 April 44[3]
1973	OK-AIH	Prag	D-AAIH	24 Aug. 39	29 Oct. 40[3]
DC-3 (ex-K.L.M., Netherlands)					
2110	PH-ASR	VE – PR	D-ABBF	16 Sept. 40	9 Dec. 42[3]
1935	PH-ALH	PC + EA	D-ABUG	Aug. 40	
2036	PH-ASK	NA + LB	D-AOFS	18 June 40	April 45[4]
1943	PH-ALV	NA + LC	D-ARPF	1 June 40	May 45[4]
2142	PH-ASM	NA + LE	D-ATJG	15 June 40	
DC-3 (ex-SABENA, Belgium)					
2093	OO-AUH	—	D-ATZP	6 Aug. 43	5 May 45[4]

Notes: [1]Transferred to Aero O/Y, Finland. [2]Destroyed by enemy action during World War II. [3]Crashed during World War II. [4]Still in service in 1944. The DC-2 D-AEAN and the DC-3 D-ATZP were in service on the last day of the war. DC-3 D-ARPF was scrapped in England in 1950.

Final Countdown

Rise and Fall of the Third Reich

Throughout history, the complex frontiers of Europe have been in a constant state of flux, according to the demands of military conquest, the decisions of peace treaties, or even the fancies of royal families. But never did the map of Europe undergo such a convulsion as during the five short years of World War II, when the Nazi rulers of Germany enlarged the Reich to the scale of the old Holy Roman Empire, only to see it collapse like a house of cards.

During this frenzied era, **Deutsche Lufthansa**'s route network reflected the fortunes of this war, as the map series below illustrates. In 1940, during the period of preliminary sparring before the invasion of the Low Countries and the breach of the Maginot Line, services were maintained to neutral countries. (Map 1)

In little less than a year, after blitzkriegs to the west and to the Balkans, Deutsche Lufthansa expanded from the Arctic Circle to the Mediterranean and to the Balkan capitals. Particularly noteworthy were the routes to Lisbon and Stockholm, where German and British airline personnel eyed each other in a mood of mutual nonbelligerence. (Map 2)

This state of affairs did not last long. The tide of war turned and the Allies closed in inexorably. As the Axis forces retreated, D.L.H. adapted to each new emergency, first curtailing and then abandoning routes, often under artillery fire or when enemy troops were literally at the airfield perimeters. (Map 3)

The Last Stand

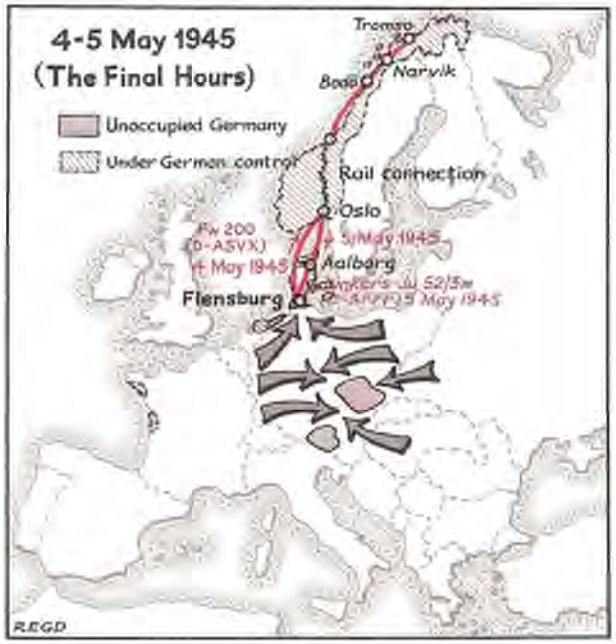
During the last two weeks of the war, Deutsche Lufthansa was still in operation, but the end was near. There were forced landings, diversions, and encounters with enemy aircraft, including one occasion when the attacking Mosquito crashed but the D.L.H. Ju 290 survived. Vienna was evacuated on 5 April 1945; U.S. and Soviet troops met at Torgau, not far south of Berlin, on 25 April; Munich was occupied by American troops on 30 April. Some Lufthansa aircraft were stranded in a pocket of precariously held territory in Austria and Moravia and were abandoned or destroyed. (Map 4)

Deutsche Lufthansa moved out of Berlin on 22–23 April and took up temporary—very temporary—residence at Warnemünde, in one of the few small enclaves of territory on the Baltic coast not yet crushed within the giant Allied pincer movement. This refuge soon became too hot to hold, and all aircraft flew onward to Flensburg, in Schleswig. By this time, the fleet consisted of a **Focke-Wulf Fw 200 Condor**, a **Douglas DC-2** and a **DC-3**, a couple of **Junkers-Ju 52/3m**'s, and a **Junkers-Ju 88**.

Finis

The last flights were made by the Fw 200 D-ASVX *Thüringen*, on a scheduled trip on 3 May to Oslo (only five minutes late) and arriving back in Flensburg after overnighting at Aalborg, on 5 May; and by the Ju 52/3m D-AFFF, which had been conducting an emergency courier service between Aalborg and Oslo and checked in on the same day. The dismembered route along the coast of Norway, operated by Ju 52/3m floatplanes, simply carried on until someone on the Allied side told everyone to stop. (Map 5)

Canadian troops entered Flensberg on 6 May 1945, and all German forces of the northern commands surrendered the following day. Disciplined to the end, the largest prewar airline in Europe was grounded. For the record, Deutsche Lufthansa A.G. was officially liquidated on 1 January 1951, and final settlements were made in 1965.



A New Start

Tragic Postscript

One of the great world promoters and pacesetters of air transport before World War II was Martin Wronsky, who had been the first to examine systematically the economics and operations of air transport while a director of Deutsche Luft-Reederei in 1919. He became a driving force in the commercial affairs of the old Lufthansa, particularly in the development of long-range international services in the early 1930s, and later represented the airline in important international negotiations. He was respected enough to be appointed U.S. custodian for D.L.H. after World War II.

In 1945 he tried to revive the fine traditions of the old company and planned to make the Hansa Werkstätten GmbH and the Hansa Reise und Verkehr GmbH the nuclei of a new airline. Alas, in submitting the paperwork to the American authorities, he was accused of falsifying a questionnaire on his background. He had not mentioned his association with the National Socialist Party, which he had been obliged to join in 1933. One of the airline industry's great pioneers, who had been almost ostracized by his colleagues during his latter career, Martin Wronsky took his own life on 12 December 1946.

Büro Bongers

In 1950, Hans M. Bongers, former traffic director of the old Lufthansa, tried to establish an agency for airlines, to gain experience until Germany could once again operate air services. But the British occupation authorities would not grant the necessary permission. He thereupon set up his own consultancy business, the **Büro Bongers**, at Bitburg, where he lived. On 29 May 1951, Dr. Seebohm, the Minister of Transport, appointed him as adviser to the government of the Federal Republic, reporting to the **Vorbereitungsausschuss Luftverkehr (V.A.L.)**, or Aviation Preparatory Committee, which began work on 9 November 1951 and made its final report in October 1952.

Luftag

By this time the government had, on 26 September 1952, already resolved to form an airline, and on 6 January 1953, a provisional stock company was founded, the **Aktiengesellschaft für Luftverkehrsbedarf (Luftag)**. It was backed by the federal government, the Deutsche Bundesbahn, and the state of Nordrhein-Westfalen. The first chairman was Dr. Weigelt, who had been a member of the board of directors of the old company when it was formed in 1926 and had been vice-chairman since 1936. His deputy was Kurt Knipfer, head of the air transport division of the Air Ministry; Bongers and Gerhard Höltje, another Lufthansa old-timer, were members of the executive committee. The capital was 6,000,000 marks.

On 26 June 1953, Luftag ordered four **Lockheed L-1049G Super Constellation**s for the long-haul routes, and on 28 September, four **Convair 340**s were acquired for the short-haul routes. In November of that year, Luftag increased its capital to 25,000,000 marks by the admission of private shareholders. On 2 December a contract was placed to develop the airport and to establish an engineering base at Hamburg.

Rebirth

On 6 August 1954, Luftag changed its name to **Deutsche Lufthansa Aktiengesellschaft** and the capital was increased to 50,000,000 marks. Trading simply as **Lufthansa**, it began its first scheduled services, after some trials and proving flights, on 1 April 1955. The Convairliners D-ACOH and D-ACEF inaugurated the first German domestic routes, Munich-Frankfurt-Cologne-Hamburg and Hamburg-Düsseldorf-Frankfurt-Munich, on the same day. Until then, the internal services had been operated by other European airlines such as S.A.S. and SABENA.

The Federal Republic regained full air sovereignty, in ratification of the Paris Agreements, on 5 May. Three international routes, originating in Hamburg, were promptly started, to Madrid on 15 May, to London on 16 May, and to Paris on 17 May. The new Lufthansa was under way.

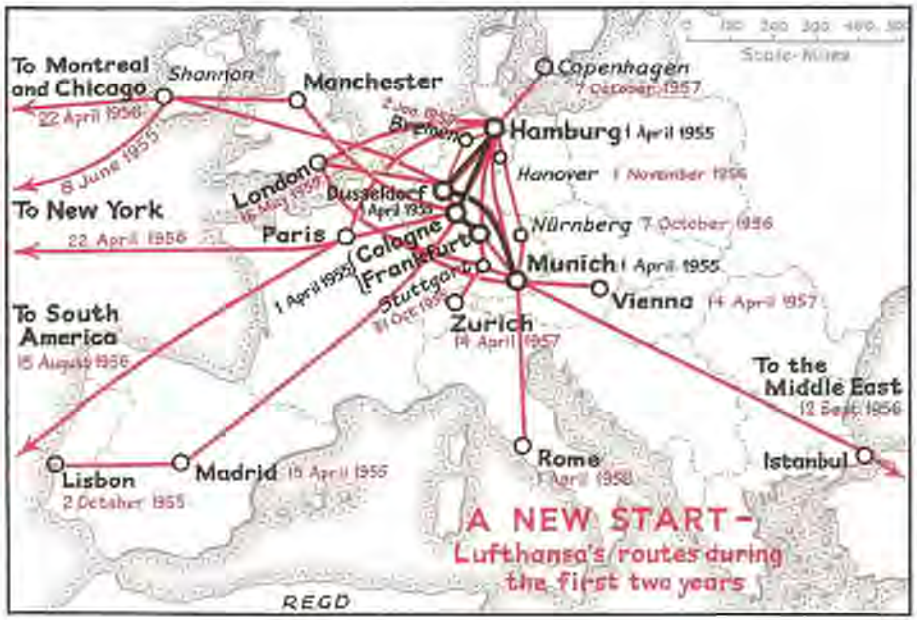
LUFTHANSA'S CONVAIRLINERS

Const. No.	Regist. No.	Date of Deliv.	Disposal
Convair 340[1]			
198	D-ACAD	20 Aug. 1954	Sold to General Air 16 April 1969
210	D-ACEF	26 Oct. 1954	Sold to General Air 18 April 1969
211	D-ACIG	18 Oct. 1954	Sold to J.A.T. 17 March 1969
213	D-ACOH	28 Oct. 1954	Sold to General Air 1 February 1971
Convair 440 Metropolitan			
408	D-ACIB	31 March 1957	Sold to Air Algérie 21 June 1968
409	D-ACUM	31 March 1957	Sold to Air Algérie 21 June 1968
448	D-ACYL	8 Aug. 1957	Sold to Tellair 17 March 1969
451	D-ACAP	16 Aug. 1957	Sold to Air Algérie 21 June 1968
460	D-ACEX	17 Sept. 1957	Sold to Air Algérie 21 June 1968
464	D-ACAT[2]	1 Nov. 1961	Crashed 28 Jan. 1968
470	D-ACEK[2]	1 Nov. 1961	Sold to J.A.T. 21 Jan. 1968

[1]The Convair 340s were modified to Convair 440s during the winter of 1957–58.
[2]D-ACAT and D-ACEK were from *Condor Luftreederei*.

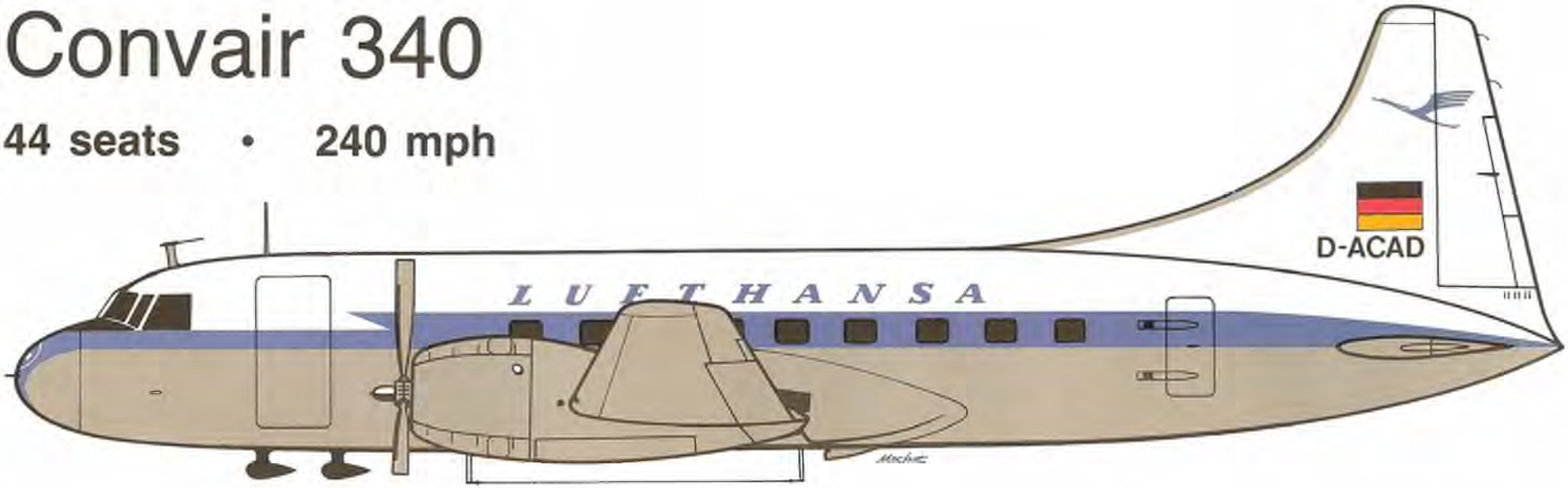
Hans M. Bongers *(top)*, who laid the groundwork for the rebirth of the new **Deutsche Lufthansa** in 1953.

Gerhard Höltje *(bottom)*, head of **Lufthansa**'s flight operations and engineering in the 1960s, steered the airline into the jet age.



Convair 340

44 seats • 240 mph



Pratt & Whitney R2800-CB16 (2400 hp) × 2 • 45,000 lb max. gross takeoff weight • 700 statute miles range

Development

After World War II the United States airlines, experiencing a boom in traffic, demanded supplies of new aircraft in all categories. In the competition for the short-haul airliner to upgrade the routes then served by the reliable but venerable Douglas DC-3, the **Martin** company seemed to have the edge at first. The **Model 2-0-2** went into service in November 1947, but it was unpressurized and had a structural deficiency. United Air Lines withdrew its support for the **Model 3-0-3**, but T.W.A. and Eastern started service with the improved and pressurized **Model 4-0-4** in October 1951.

By this time, however, most of the U.S. airlines, followed by those in Europe and elsewhere, had turned to Consolidated-Vultee, or Convair, as it became known, for its fine series of twin-engined short-haul airliners. American Airlines had sponsored the **Convair 240** with an unprecedented order for 100 in 1945, reduced later to 75 but still a welcome launching stimulus for the 40-seat replacement for the DC-3.

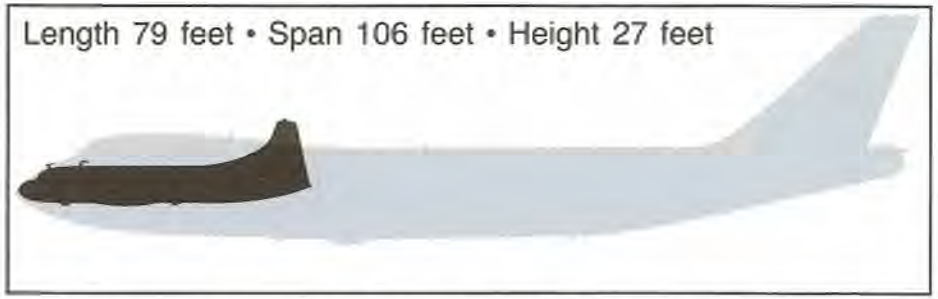
Choice of Models

American Airlines put the Convair 240 into service on 1 June 1948, but the most popular model of the Convairliner series was the **Convair 340**, slightly larger than the 240 with an extra row of four-abreast seats. United Air Lines introduced it on 16 November 1952, just at the time when preparations were being made to form the postwar Luftag, which was to be the nucleus of the reborn Lufthansa.

At this time a technical battle was raging for technical leadership in the construction of commercial airliners. The British manufacturers were setting a challenging pace. The first jet airliner, the de Havilland Comet 1, went into service in 1952, and the first turboprop, the Vickers Viscount, on 18 April 1953. The operator of the latter was British European Airways (B.E.A.), which threatened to dominate the European airways with a large fleet.

Lufthansa had a difficult choice to make. The four-engined turboprop Viscount appeared to be technically, and possibly economically, superior. But the Convairliner came from an established manufacturer, and the American standards of support for the product, born of long experience of severe competition, were superior to those of the British, comparatively new to the business of commercial airliner marketing overseas.

Length 79 feet • Span 106 feet • Height 27 feet



Lufthansa took a conservative approach. It ordered the Convairliner and even reordered the more advanced **Convair 440 Metropolitan** for service in 1957, preferring to wait until the Viscount had proved itself in service and had been further developed.

THE CONVAIRLINERS

Series	Engines		Dimensions (ft)		
	Type	Hp (each)	Length	Span	Seats
240	P & W R2800-CA18	1000	75	92	40
340	P & W R2800-CB16	1200	79	106	44
440 Metropolitan	P & W R2800-CB17	1400	79	106	52

Note Other versions of the Convairliner had turboprop engines but were not used in Europe

Back to the Atlantic

Claiming a Birthright

If ever an airline had a case for what the Civil Aeronautics Board in the U.S.A. termed "grandfather rights," then Lufthansa could stake a good claim for time-honored rights to fly commercial services across the Atlantic Ocean. As several previous pages in this book narrate, the German airline, together with its associated airship company and affiliates in South America, had pioneered the routes across both the North and South Atlantic. Surveys of the northern route had been made by von Gronau as early as 1930 (page 34); mail flights had been made from ocean liners (36) and from depot ships (38, 52); the *Graf Zeppelin* had operated a South Atlantic service during the mid-1930s (40); and the *Hindenburg* had operated for a year across the North Atlantic in 1936. The **Focke-Wulf Fw 200 Condor**, by flying nonstop from Berlin to New York and back in 1938 (56), had laid claim to the technical capability of starting a landplane service between Europe and North America.

A Tradition Maintained

The new **Lufthansa** reestablished the traditions of the old in convincing fashion. Having been prevented from starting an airline earlier than in the mid-1950s, it had been able to bypass the problems of introducing early models of the postwar airliners and had not had to share the burden of solving all the technical and operational problems which only day-in, day-out airline service can reveal. Just as it had introduced the Convair 340, a developed version of the original Convairliner, it was able to skip the first generation of classic piston-engined airliners that laid the foundations of the postwar intercontinental route network after World War II.

On 8–9 June 1955 the crane emblem was proudly carried on a Lockheed **L-1049G Super Constellation** from Hamburg to New York, via Düsseldorf and Shannon. A few days earlier, on one of the proving flights, one of the guests on the "Super-G" was Commandant James Fitzmaurice, who had been one of the three-men crew who had made the first nonstop east-west crossing of the North Atlantic in 1928 (page 34). Lufthansa attained full IATA membership shortly thereafter, on 29 June 1955.

Consolidation

On 22–23 April 1956, Lufthansa inaugurated a new North Atlantic service, the "Manchester Mid-Western." It provided, for the first time, a direct service from the north of England to North America, both to Montreal, Canada, and Chicago, as a second destination in the United States. The move was bold and innovative but carefully analyzed and planned, an approach that was to be the hallmark of Lufthansa's methods in the years to come. Originating from Hamburg, one of the two weekly flights called at Düsseldorf, the other at Frankfurt—this latter city still only a staging point until it became the center of operations in 1960.

Four months later, on 15–16 August, the German flag was carried once more to South America, reviving memories of pioneering during the 1930s. The route was Hamburg–Düsseldorf (or Frankfurt)–Paris–Dakar–Rio de Janeiro. The second flight, on 18–19 August, continued on to São Paulo and Buenos Aires. Both were operated under a joint agreement with Air France, and this became a complete cost- and revenue-sharing pool agreement on 1 July 1957. By this time, Montevideo had been added to the South American route, on 10 April. A year earlier, on 12 September 1956, a Super-G had reestablished Lufthansa in the Middle East, with a route to Teheran, via Istanbul, Beirut, and Baghdad.

LUFTHANSA'S L-1049G SUPER CONSTELLATIONS

Const. No.	Regist. No.	Date of Deliv.	Disposal
4602	D-ALAK	29 March 1955	Crashed Rio de Janeiro 11 Jan. 1959
4603	D-ALEM	19 April 1955	Scrapped 1 April 1967
4604	D-ALIN	29 April 1955	Presented to Hamburg Airport 7 Sept. 1967
4605	D-ALOP	28 May 1955	Sold 2 Aug. 1967
4637	D-ALAP	20 Feb. 1956	Scrapped Dec. 1968
4640	D-ALEC	28 March 1956	Retired 6 Oct. 1967; sold 8 March 1968
4642	D-ALOF	25 July 1956	Retired 6 Oct. 1967; sold 8 Dec. 1967
4647	D-ALID	7 Aug. 1956	Retired 6 Oct. 1967; sold 23 Feb. 1968

The **Lockheed Model L 1049G**

Lockheed L-1049G Super Constellation

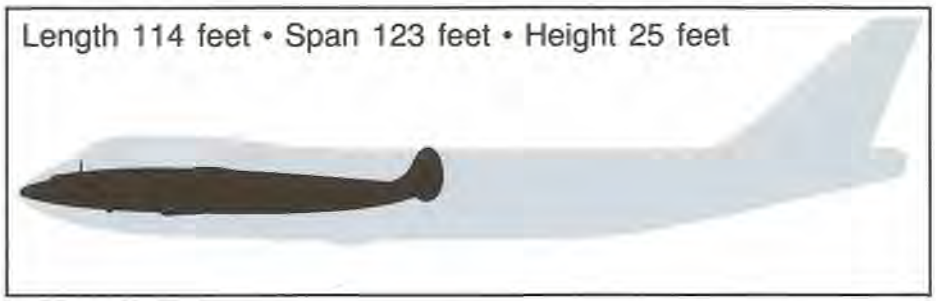
85 seats • 335 mph

Wright 972 TC (3250 hp) × 4 • 137,500 lb max. gross takeoff weight • 4600 statute miles range

A Thoroughbred Line

One of the best-known development stories of commercial airliner history is the way in which the **Lockheed Constellation** was produced, in almost complete secrecy, during World War II, in what was to become known as designer Kelly Johnson's "Skunk Works" at the Lockheed plant at Burbank, California. Inspired by Howard Hughes, owner of T.W.A., it made its first flight on 9 January 1943. It combined pressurized comfort with high speed; it was faster than any Douglas aircraft and took Washington by storm when Hughes and Jack Frye flew the prototype to Washington in less than seven hours on 19 April 1944.

T.W.A. put the "Connie" into service on the transcontinental route from New York to Los Angeles on 1 March 1946. Its comfort and speed combined with an elegance of design which quickly attracted the attention of the public and the airline industry alike. Although most of the big flag carriers and trunk airliners resumed postwar long-haul services with the trusty Douglas DC-4, they soon ordered the Constellation, which was 70 mph faster—almost half again as fast—and had 60 seats against the DC-4's 44 in normal layout.



Fierce Competition

A battle royal began between Douglas, hitherto the dominant commercial aircraft constructor, and Lockheed, which had been a poor second in prewar competition for the airline market. **United Air Lines**, faithful to Douglas, opened a **DC-6** coast-to-coast schedule on 27 April 1947. Douglas had been spurred into action and had produced a faster and pressurized version of its four-engined transport. Both aircraft had severe problems. The Constellation was grounded during the late summer of 1946 and the DC-6 during the winter of 1947–1948.

United introduced a better DC-6, the **DC-6B**, on 11 April 1951, but T.W.A. trumped this ace with the Super Constellation **Model 1049** on 10 September 1952, this development having been baptized into service by **Eastern Air Lines** on 17 December 1951. Douglas then responded with the **DC-7** with **American Airlines** service on 29 November 1953, and T.W.A. came back with the **Model 1049G** on 1 April 1955. This was to prove the most popular of all the Lockheed Constellation series.

Riding on the Wave

The Lockheed-Douglas rivalry was evident on the North Atlantic, where Pan American favored the Douglas stable and had the DC-6, DC-7B, and finally the DC-7C to take it through to the jet age. Some European airlines took the Douglas product, some the Lockheed, and many took both. Lufthansa would have preferred the DC-6B and had even signed a letter of intent for ten, but Douglas would not agree to the terms. And so Lufthansa went to Lockheed, and had the benefit of coming in at a late stage, like a star tennis player seeded until the final rounds of a tournament.

When, therefore, Lufthansa entered the fiercely competitive transatlantic market in 1955, it was able to face all challengers with an airliner second to none. Combined with a standard of service and reliability that was also second to none, the German flag carrier served notice that it would, in the future, be a force to be reckoned with.

Turbine Power

Struggle for Leadership in Europe

Even as, in 1953, **Luftag** decided to start European services with the route-proven Convairliners, **British European Airways (B.E.A.)** had started a new era in air transport by introducing the **Vickers Viscount** on its main-line services. In combination with the Airspeed Ambassador, B.E.A. gained undisputed domain over European airline skies during the 1950s. By 1956 the superiority of turbine power over the piston engine was firmly established and Vickers was already marketing a larger version of the original Viscount Series 700. B.E.A.'s first **Viscount 802** went into service on 13 February 1957, to strengthen the British airline's dominance even further.

The smooth-riding turbine-engined type simply had the edge in passenger appeal, giving B.E.A. high load factors, with consequent higher revenue-earning and profit-making potential to reinforce the parity with the Convairliner in operating costs. **Lufthansa** had to match the competition.

The Viscount

On 15 June 1956, Lufthansa ordered nine of the larger Viscounts, Series 814, even though more Convairliners were soon to enter service, to Zurich and Vienna on 14 April and to Copenhagen on 6 October 1957. Brussels and Rome were added to the map on 1 April 1958.

The first Viscount service was from Munich to London, and the familiar crane symbol on the turboprop's tail was to be seen all over Europe within a matter of a few months. New services were started to Milan on 1 April 1959, to Stockholm on 20 April, to Athens on 10 May, and to Barcelona on 24 May.

A Bold Initiative

On 8 November 1957, Hans Bongers, in a visionary memorandum to Air France—possibly with an eye to the north, where the three airlines of Scandinavia had amalgamated to form the S.A.S. consortium—proposed a cooperative union, to be called **Europair,** between Air France, Alitalia, Swissair, SABENA, and Lufthansa. Costs and revenues would be shared under an equitable formula which took into account various economic indices, traffic shares, and political and commercial considerations. Swissair declined, but K.L.M. agreed to attend the first meeting in Brussels on 29 December 1958. K.L.M. later withdrew. On 20 May 1959, traffic quotas were fixed at 34% for Air France, 30% for Lufthansa, 26% for Alitalia, and 10% for SABENA. The name of the joint airline was changed to **Air Union**, and full agreement was reached on tricky questions of cabotage and colonial traffic.

The proposed metamorphosis of the European air traffic system would have gone into effect on 1 April 1960, but Air Union never got under way or off the ground. Even with political moves afoot to establish the European Common Market, the formula did not have enough safeguards or flexibility to allow for unforeseen circumstances. And so a promising experiment in international cooperation was stillborn.

Later, in the 1970s, **K.S.S.U.** was to be a common-supplier maintenance, overhaul, and spares pool for **K**.L.M., **S**.A.S., **S**wissair, and **U**.T.A.; while **ATLAS** was a similar combination of Air France, Alitalia, Lufthansa, and SABENA. Hans Bongers's Air Union had been a prophetic harbinger of future developments in cooperation in the technical if not in the political arena.

While the **Viscount** began a new era, the piston-engined **Convairliner** still provided stiff competition as the last standard-bearer of a previous generation.

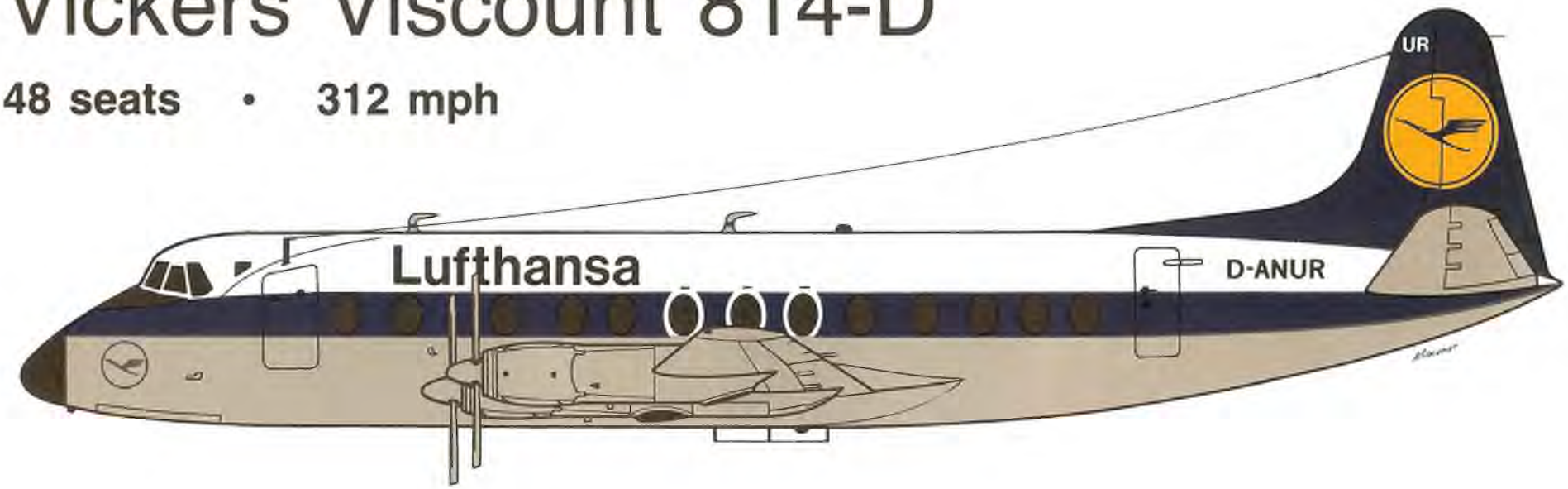
LUFTHANSA'S VISCOUNT 814-D FLEET

Const. No.	Regist. No.	Date of Deliv.	Disposal
338	D-ANUN	5 Oct. 1958	To Condor 5 Feb. 1962–27 Aug. 1969; sold 7 June 1971
339	D-ANOL	19 Dec. 1958	To Condor 12 March 1964–22 Jan. 1969; sold to Br. Midland (G-AWXI) 22 Jan. 1969
340	D-ANAD	10 Jan. 1959	Retired 27 March 1970; sold 7 June 1971
341	D-ANIP	15 Feb. 1959	To Condor 1 Nov. 1961–1 Nov. 1967; retired 31 March 1971; sold 7 June 1971
342	D-ANUR	8 March 1959	To Condor 15 March 1963–27 Aug. 1969; retired 31 March 1971; sold 13 Jan. 1972
343	D-ANEF	26 March 1959	Retired 31 March 1971; sold 13 Jan. 1972
344	D-ANIZ	4 April 1959	Retired 8 Dec. 1969; sold 7 June 1971
368	D-ANAM	17 April 1959	Retired 12 Feb. 1970 and used for training
369	D-ANAB	29 April 1959	Retired 28 Nov. 1969; sold 12 Nov. 1970
370	D-ANAC	30 July 1961	Retired 1 July 1969; sold (G-AYOX) 19 Dec. 1970
447	D-ANAF	30 Nov. 1961	Retired 30 Jan. 1969 and used for training from 12 April 1972

The **Vickers Viscount V-814-D**

Vickers Viscount 814-D

48 seats • 312 mph



Rolls-Royce Dart (1650 ehp) × 4 • 64,500 lb max. gross takeoff weight • 2100 statute miles range

Matching the Market

On 13 June 1945, at a meeting of the Second Brabazon Committee of the British Ministry of Aircraft Production, **Vickers-Armstrongs**, builders of the wartime Wellington bomber, proposed a new airliner, the **VC-2 Viceroy**, with four Armstrong-Siddeley Mamba turboprop engines. It had only 24 seats—fewer than a four-abreast DC-3—and this was clearly too small. By the time the **Series V.630**, as the VC-2 was redesignated, made its first flight on 16 July 1948, it was a 32-seater, powered by Rolls-Royce Darts.

Fortunately for Vickers and the entire British aircraft industry, **British European Airways (B.E.A.),** for which the aircraft was destined, insisted that even this was too small for the forecast traffic growth in Europe, a view that was confirmed by the public response to some experimental flights made between 29 July and 23 August 1950. By the time B.E.A. put the revolutionary turboprop into service on 18 April 1953, it had been enlarged to a comfortable 40-seater, designated the **Series V.700,** and renamed the **Viscount.**

B.E.A.'s launching order was for 20 **V.701s**, and Vickers was to sell more than 450 Viscounts of all series, the biggest success in the history of British commercial aircraft production. B.E.A.'s insistence on the V.700 specification was a creditable and visionary decision—in striking contrast with its subsequent appalling move to force de Havilland to shorten the fuselage of another potential world-beater, the medium-haul three-engined Trident.

The Stretched Version

Almost without exception, the developed and invariably larger version of any commercial airliner has always been the most successful. Technical problems are ironed out, engine development permits higher weights and payloads and more range. Production can be made from the same jigs, with consequent economies in construction costs. And so it was with the Viscount.

B.E.A. ordered 12 of the larger Viscount 801 on 11 February 1953, and modified this on 14 April 1954 to the **Series 802**, with even better Dart engines. It entered service on 13 February 1957, and another version, the Series 806, was added on 27 January 1958. A further refinement, the Series 810, was the most successful of all.

Longer-range variants, first developed for the Australian transcontinental route, had the suffix -D. **Lufthansa's Viscount 814-Ds**, therefore, were long-range aircraft, and the "4" indicated that it was the fourth customer after B.E.A.

Goodbye to Propellers

Keeping up the Pressure

During the last years of the four-engined propeller-driven airliners, the competition for intercontinental market shares raged unabated on the world's main air arteries, although there was an occasional case of mutually profitable pool agreements. When Lufthansa entered the North Atlantic market in 1955, traffic was increasing rapidly in the wake of the introduction of tourist fares, by unanimous agreement by IATA members, in 1952. By 1957, transatlantic passenger air traffic had reached the level of shipping volume, which thereafter began to decline.

As all the IATA members charged the same fares, competition was partly by the quality of service offered. Even this could be a problem as IATA tried to exert control over the standard of meals offered—there was a great debate over the definition of a sandwich—and of seating width and pitch.

Equipment Competition

The only element in a competitive environment over which the airline retained control was thus the quality of the flying equipment, and thus the need for promoting the very best aircraft was never more intense. The **Douglas DC-7C**, the "Seven Seas" as it was neatly called, was used by some airlines, the **Super Constellation** by others—the choice was fairly equally balanced among the dozen or so flag carriers. Pan American and B.O.A.C. used the **Boeing 377 Stratocruiser**, mainly on first-class services on busy prestige routes such as New York–London; and B.O.A.C. and the Israeli airline El Al introduced the **Bristol Britannia**, the "Whispering Giant," in 1957.

Nonstop Transatlantic

During the last years of the propeller era, genuine nonstop services began between European capitals and the eastern cities of North America, mainly New York. Such convenience, avoiding irritating stops en route, was one of the few competitive elements left to the airlines, and was, of course, equipment-related. El Al captured the mood well with its "No Goose, No Gander" slogan—a reference to former essential refueling stops in the eastern wilderness of Canada and Newfoundland—when it introduced nonstop Britannia service on 22 December 1957.

Into this arena came the **Lockheed L.1649A Starliner**, Kelly Johnson's last effort to extract the ultimate range out of the Constellation series. It was promoted vigorously by the part-creators of the pedigree line, T.W.A., still led by a shrewd and determined, if somewhat irrational, Howard Hughes. T.W.A. put the Starliner on the North Atlantic on 1 July 1957, but only Air France and Lufthansa, of the competing airlines, followed suit.

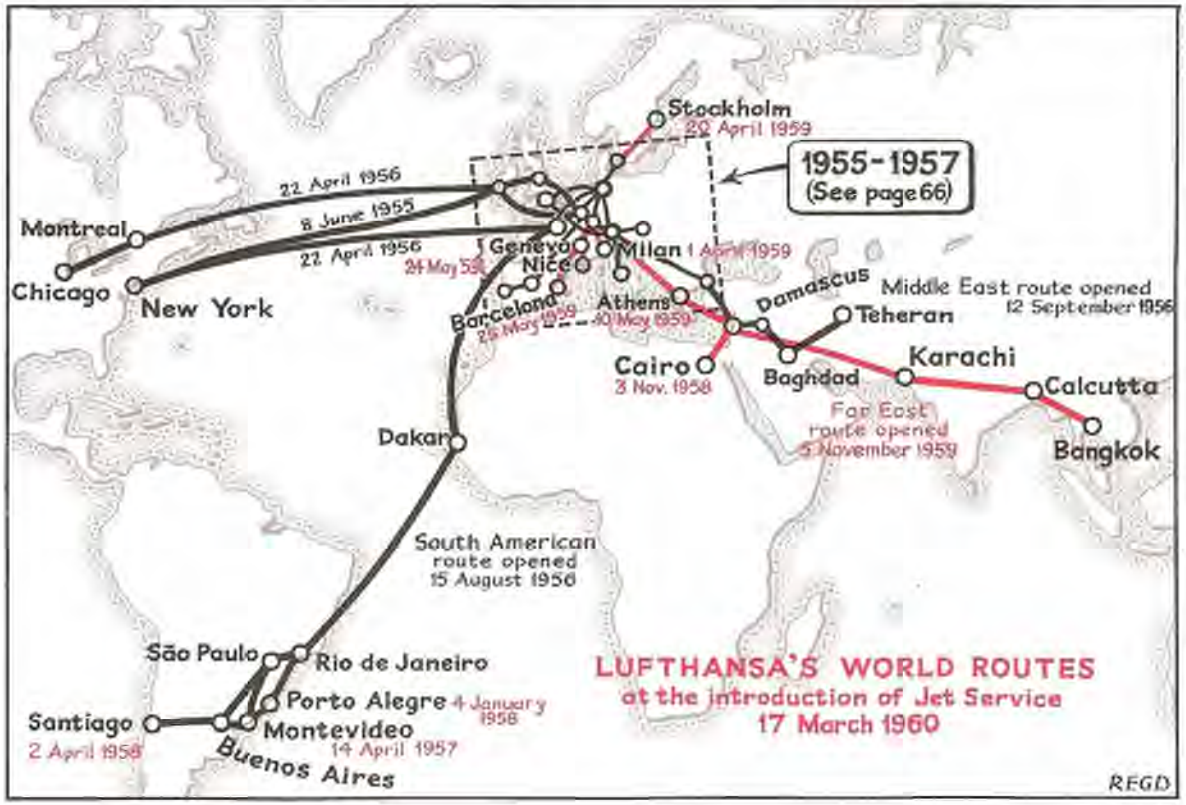
Lufthansa had ordered four L.1649A **Super Stars** on 24 May 1956. Service began on 15 December 1957, and on 13 February 1958, a Hamburg-originating flight opened nonstop Atlantic service from Frankfurt to New York.

The Ultimate First Class

The IATA obsession with standardization had a loophole. Airlines were allowed to indulge their first-class passengers without protest from IATA, normally eager to stereotype everything. The two Stratocruiser operators had an advantage. The "Strat's" main attraction was the small downstairs bar where passengers could break the tedium of the 14-hour journey. Lufthansa's offering to its elite clientele was to fit the L.1649A (normally with 86 seats in economy class) with eight first-class and 18 deluxe-class seats, plus four beds, for a total of only 30. B.O.A.C.'s and Pan American's *Sovereign*- and *President*-class passengers may have had the bar; but none was pampered more than Lufthansa's *Senator Service* passengers.

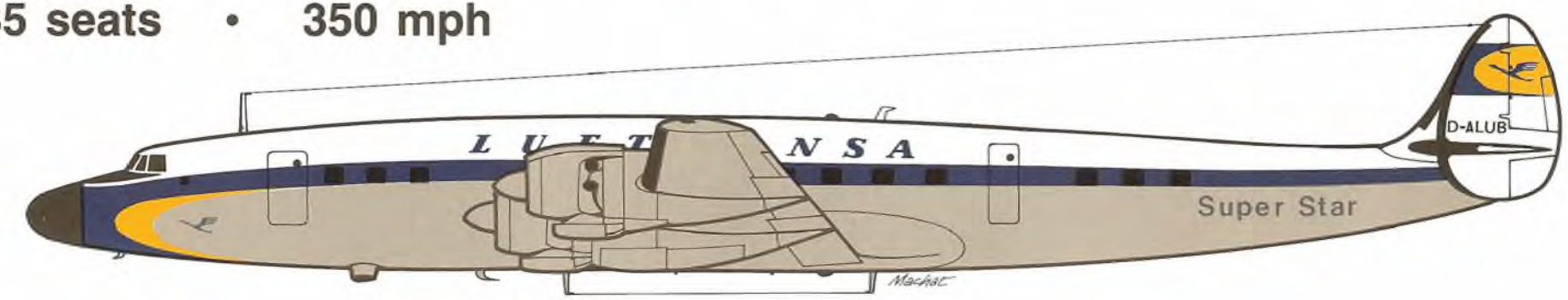
The veteran **Douglas DC-3** was still pressed into service for special operations and feeder routes during the 1950s and early 1960s.

The **Lockheed Model L 1649A**, last of a great line.



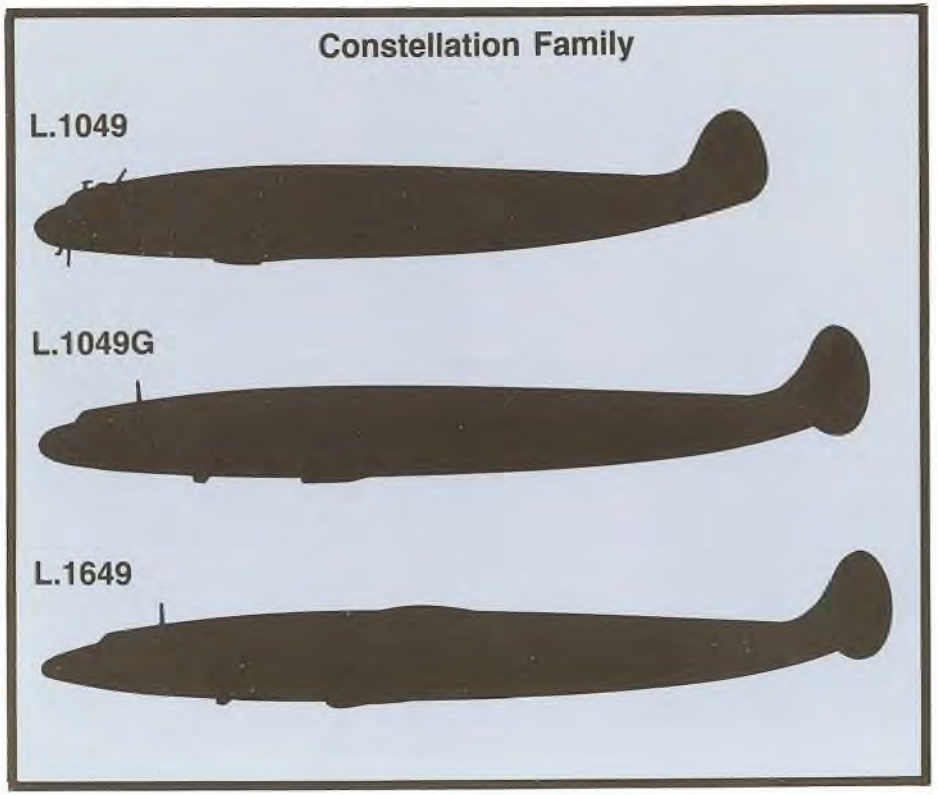
Lockheed L.1649A Starliner

85 seats • 350 mph



Wright 998TC (3400 hp) × 4 • 156,000 lb max. gross takeoff weight • 5280 statute miles range

Constellation Family



Length 116 feet • Span 150 feet • Height 25 feet

LUFTHANSA'S L.1649A SUPER STARS

Const. No.	Regist. No.	Date of Deliv.	Disposal
1034	D-ALUB	27 Sept. 1957	Converted to freighter and named *Isar*, 1 July 1960; sold 27 Jan. 1966
1040	D-ALAN	20 Dec. 1957	Converted and named *Neckar*, 1 July 1960; chartered to World Airways 11 Oct. 1962–13 Feb. 1964; sold 17 Feb. 1966
1041	D-ALER	9 Jan. 1958	To Deutsche Flugdienst 1 March 1960; sold to Trek Airways 13 Feb. 1964
1042	D-ALOL	17 Jan. 1958	To Deutsche Flugdienst, 1 March 1960; sold to Trek Airways 1 March 1964

Into the Jet Age

Phenomenal Growth

By operating only the best aircraft of the propeller era and by offering superb service, in punctuality, reliability, and cabin standards, **Lufthansa** had regained with remarkable speed the leadership it had lost through the dormant period from the end of World War II until its resumption in 1955. Traffic was still growing during the 1960s at 30% or 40% per year. The jet age began in earnest toward the end of 1958, with B.O.A.C.'s Comet 4s and Pan American's Boeing 707s across the North Atlantic. Simultaneously, IATA-agreed economy fares stimulated traffic—to help fill the seats—by penetrating further down the discretionary income pyramid.

The Boeing 707

By this time Lufthansa had rejoined the upper echelons of the world's leading airlines. It had ordered five **Boeing 707-430s**, with Rolls-Royce Conway engines, on 23 January 1957. These were placed on the nonstop Frankfurt–New York route on 17 March 1960, and frequency was increased to a daily flight on 1 April. On 20 May, service to the U.S. West Coast started, to San Francisco, and nonstop Frankfurt-Chicago flights began the next day.

An Ambition Fulfilled

A few months before Lufthansa's jet age began, an old ambition, dating back to 1939, had been realized: a route to the Far East. A Super Constellation had started service to Bangkok, via Karachi and Calcutta, on 1 November 1959, in cooperation with Alitalia and the French airlines Air France and T.A.I. Now, on 23 January 1961, the Boeing 707 extended this route to Tokyo. Lufthansa veterans must have reminisced to the time when the Junkers-Ju 52/3m began its stillborn operation and when the Focke-Wulf 200 Condor flew to Tokyo in record time.

The Boeing 720-B

One of the main problems faced by the leading jet airlines was that the available traffic to fill 150-seat Boeing 707s or Douglas DC-8s consistently and profitably was restricted to densely traveled routes. The jets were twice as big and three times as productive as the types they replaced. Not all routes were like Frankfurt–New York. Many generated less traffic, yet just as many airlines competed for it. The airlines needed a jet aircraft that was smaller but could fly just as far. Boeing came up with the answer: the 125-seat **Boeing 720-B,** shorter in the fuselage but with just as much range as its contemporary parent.

Lufthansa ordered four B-720-Bs on 30 January 1960 and four more later. It deployed them on its more lightly traveled routes to South America on 20 May 1961, and to the Middle East soon after on 1 July. Jet routes to Africa were added in 1962, to Lagos on 4 March, and to Johannesburg on 14 May.

The Intercontinental Jet

In a process of constant refinement, Lufthansa reinforced its long-range jet fleet by ordering, on 31 October 1961, the first of its fleet of **Boeing 707-330 Intercontinental** jets. This was possibly the most successful single long-haul type of what were known as the Big Jets—although this claim would be challenged by the DC-8-63. Lufthansa inaugurated a polar route to the Orient, via Fairbanks, Alaska, on 28 May 1964, giving a new dimension to the Japanese market. (Anchorage was closed temporarily because of an earthquake.) The last continent, Australia, was added on 3–5 April 1965, with Boeing 707-330 service to Sydney.

By the mid-1960s, therefore, barring a few minor adjustments, Lufthansa's world map was complete. In company with its competitors, it was now ready to concentrate on its medium- and short-haul routes, and to upgrade them to modern jet standards.

The **Boeing 720B**.

This was the scene at Hamburg when Lufthansa's first jet aircraft, a **Boeing 707-430** (D-ABOB), was delivered on 2 March 1960.

LUFTHANSA'S BOEING 707 AND 720 FLEET

Const. No.	Regist. No	Name	Date of Deliv.
707-430 (707A)			
17718	D-ABOB	*Hamburg*	24 Feb. 1960
17719	D-ABOC	*Berlin*	10 March 1960
17720	D-ABOD	*Frankfurt*	24 April 1960
17721	D-ABOF	*München*	1 Oct. 1960
18056	D-ABOG	*Bonn*	17 March 1961
707-330B (707B)			
18462	D-ABOV	*Duisburg*	28 Feb. 1963
18463	D-ABOT	*Düsseldorf*	5 March 1964
18819	D-ABOX	*Köln*	10 Jan. 1965
18923	D-ABUB	*Stuttgart*	4 Aug. 1965
18926	D-ABUC	*Bremen*	5 Oct. 1965
18927	D-ABUD	*Nürnberg*	24 Nov. 1965
18928	D-ABUF	*Hannover*	28 Dec. 1965
18929	D-ABUG	*Essen*	7 Jan. 1966
18930	D-ABUH	*Dortmund*	19 Jan. 1966
18931	D-ABUK	*Bochum*	27 March 1966
19315	D-ABUL	*Duisburg*	20 Jan. 1967
19316	D-ABUM	*Bremen*	30 Jan. 1967
707-330C (707C)			
18937	D-ABUA	*Europa*	10 Nov. 1965
18932	D-ABUE	*America*	11 March 1966
19317	D-ABUI	*Asia*	6 March 1967
20123	D-ABUJ	*Africa*	27 Feb. 1969
20124	D-ABUO	*Australia*	8 May 1969
20395	D-ABUY	*Essen*	16 Oct. 1970
720B			
18057	D-ABOH	*Köln*	9 March 1961
18058	D-ABOK	*Düsseldorf*	28 April 1961
18059	D-ABOL	*Stuttgart*	3 May 1961
18060	D-ABOM	*Nürnberg*	3 June 1961
18248	D-ABON	*Hannover*	5 Jan. 1962
18249	D-ABOP	*Bremen*	12 Jan. 1962
18250	D-ABOQ	*Essen*	23 March 1962
18251	D-ABOR	*Dortmund*	27 Feb. 1962

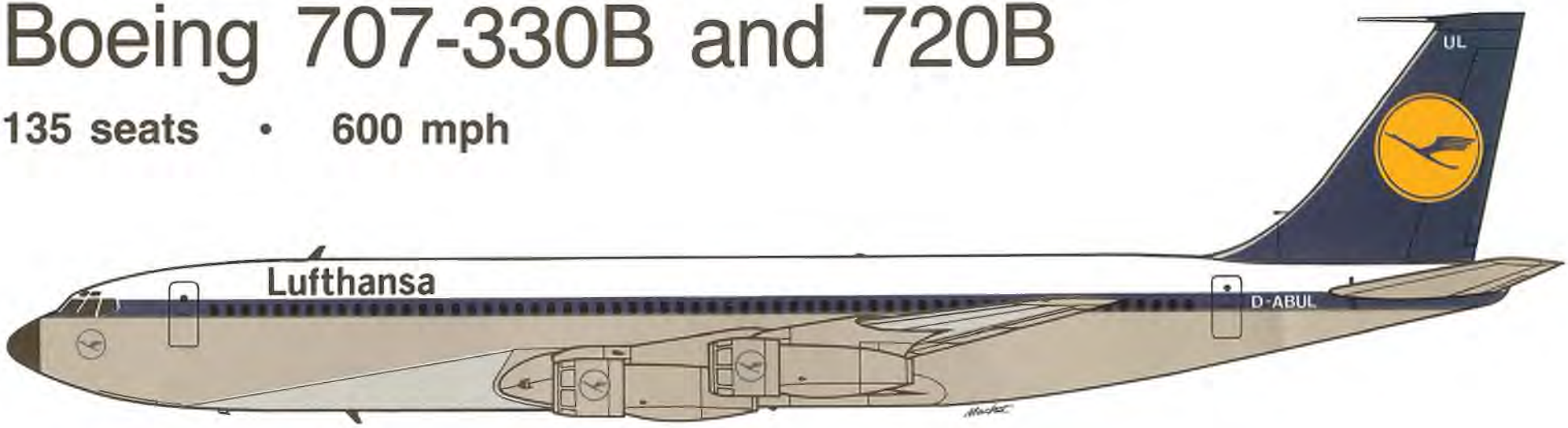
Note Of the total fleet of **Boeing 707s**, two crashed, D-ABOT at Delhi on 19 December 1973, and D-ABUY near Rio de Janeiro on 26 July 1979. All the others, except D-ABOD (retained for training and still in use), were sold over a protracted period from 1967 to 1985.

The last revenue service by a Lufthansa B-707 was by D-ABUL, from Rio to Hamburg, on 29 December 1984, by which time it had accumulated 70,716 flying hours. D-ABUF, retired from Lufthansa service on 28 June 1984, had flown 72,925 hours, the highest of any B-707-300 series.

Two of the **Boeing 720Bs** crashed, both on training flights, on 4 December 1961 and 15 July 1964, respectively. The others were sold between 1964 and 1966.

Boeing 707-330B and 720B

135 seats • 600 mph



Pratt & Whitney JT3D (18,000 lb thrust) × 4 • 168 tons max. gross takeoff weight • 4000 statute miles range

Length 153 feet • Span 146 feet • Height 42 feet

A Pedigree Line

Although the British **B.O.A.C.**, with the **de Havilland Comet 1**, could claim to have started the first commercial jet service on 2 May 1952, and the Soviet Union's **Aeroflot** began **Tupolev Tu-104** jet service on 15 September 1956, the jet age did not get into full swing until **Pan American** put the **Boeing 707-121** into service on the New York–London route on 26 October 1958. The Comet 1 service had lasted almost two years, but had ended in tragedy and the grounding of the aircraft. The Tu-104's deployment was confined to the U.S.S.R. and the overseas routes of the Czech airline, C.S.A. But within two years of Pan Am's service inauguration, Boeing 707s were flying all over the world, and the very name Boeing had become as familiar a term as Ford or Mercedes.

Although the 707's fuselage could not be lengthened to the same extent as the Douglas DC-8's, Boeing made the best use of its fine airliner, producing versions with better range and load-carrying capability. Some airlines specified the **Rolls-Royce Conway** as the power plant, especially those from the British Commonwealth; but other leading airlines chose the Conway too, including **Lufthansa**. (See ***Pan Am: An Airline and Its Aircraft*** for a fuller analysis and description of the Boeing types.)

The Smaller Boeing

The **Boeing 720** was a smaller version of the 707, designed to fit the routes of lower passenger traffic potential. It was 16 feet shorter than the 707, but only a discerning eye could distinguish one from the other. Built to a specification by **United Air Lines**, which took the first delivery in 1960, it had some limited success.

Boeing soon produced a long-range version, with Pratt & Whitney JT3D-3 engines, designated the **Boeing 720B**. This had enough power and operating economy to fly 4000 miles with full payload, and for a short period it had the longest range of any commercial airliner. Lufthansa, which put 720Bs into service in 1961, was the first non-U.S. airline to buy this variant.

The Europa Jet

The Medium-Haul Boeing

Lufthansa had started North Atlantic services with the Boeing 707 on 17 March 1960. Satisfied that it had taken care of the problems of long-haul jet air services for a whole aircraft generation, it turned to the needs of short- and medium-haul traffic within Europe, and to the European hinterland in the Middle East and North Africa.

Easily rejecting the possible claims of the British Trident, when that pioneering design was compromised by an extraordinary decision to shrink it in size and power, Lufthansa ordered twelve **Boeing 727-100** medium-haul trijets on 28 February 1961. Designated the **B-727-30**, the first of these went into service on 12 April 1964 and were called **Europa Jets**.

Subsequently, as the accompanying table shows, Lufthansa recognized the versatility of this airliner, the biggest money-maker in history, by regularly ordering more, mostly the larger Boeing 727-200s. This steady supply not only kept pace with the ever-increasing traffic demands of a prospering and tourism-happy Europe, it updated the fleet periodically, replacing older aircraft with more efficient variants.

The **Boeing 727-30**, the original "short-bodied" version.

The **Boeing 727-230 Europa Jet** in flight.

LUFTHANSA'S FLEET OF BOEING 727s

Const No.	Regist. No.	Name
727-30 (727A)		
18360	D-ABIB	*Augsburg*
18361	D-ABIC	*Saarbrücken*
18362	D-ABID	*Braunschweig*
18363	D-ABIF	*Mannheim*
18364	D-ABIG	*Kiel*
18365	D-ABIH	*Wiesbaden*
18366	D-ABIK	*Heidelberg*
18367	D-ABIL	*Lübeck*
18368	D-ABIM	(Condor)
18369	D-ABIN	*Münster*
18370	D-ABIP	*Mainz*
18371	D-ABIQ	*Karlsruhe*
18933	D-ABIR	*Aachen*
18934	D-ABIS	*Freiburg*
18935	D-ABIT	*Heidelberg*
18936	D-ABIV	*Kassel*

Note The seven aircraft D-ABIK–D-ABIR were transferred to Condor Flugdienst in the later 1960s.

Const. No.	Regist. No.	Name
727-30QC (727C)		
19008	D-ABIW	*Bielefeld*
19009	D-ABIX	*Würzburg*
19010	D-ABIZ	*Gelsenkirchen*
19011	D-ABIA	*Pforzheim*
19012	D-ABIE	*Oberhausen*
19310	D-ABII	*Wuppertal*
19311	D-ABIO	*Hagen*
19312	D-ABIU	*Ulm*
19313	D-ABIY	*Aachen*
19314	D-ABIJ	*Krefeld*
19793	D-ABBI	*Mainz*
727–230 (727B)		
20430	D-ABCI	*Karlsruhe*
20431	D-ABDI	*Lübeck*
20525	D-ABFI	*Münster*
20526	D-ABGI	*Leverkusen*
20560	D-ABHI	*Mönchengladbach*
20673	D-ABKI	*Bremerhaven*
20674	D-ABLI	*Ludwigshafen*
20757	D-ABQI	*Hildesheim*

Const. No.	Regist. No.	Name
20788	D-ABRI	*Esslingen*
20789	D-ABSI	*Hof*
20675	D-ABMI	(Condor)
20676	D-ABNI	
20677	D-ABPI	
20790	D-ABTI	
20791	D-ABVI	
20792	D-ABWI	
20899	D-ABKA	*Heidelberg*
20900	D-ABKB	*Augsburg*
20901	D-ABKC	*Braunschweig*
20902	D-ABKD	*Freiburg*
20903	D-ABKE	*Mannheim*
20904	D-ABKF	*Saarbrücken*
20905	D-ABKG	*Kassel*
20906	D-ABKH	*Kiel*
20918	D-ABKJ	*Wiesbaden*
21113	D-ABKK	(Condor)
21114	D-ABKL	
21442	D-ABKM	*Hagen*
21618	D-ABKN	*Ulm*
21619	D-ABKP	*Krefeld*
21620	D-ABKQ	*Mainz*
21621	D-ABKR	*Bielefeld*
21622	D-ABKS	*Oberhausen*
21623	D-ABKT	*Aachen*

Note The 727-30s were delivered from February 1964 to April 1966; the 727-30QCs from February 1967 to January 1968; and the 727-230s from January 1971 to January 1979.

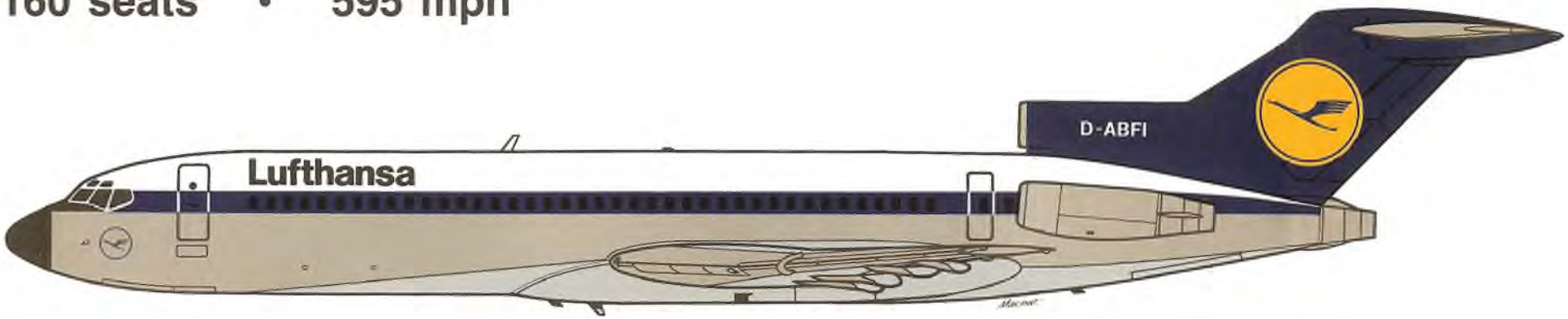
All the 727-30s and 727-30QCs have been traded back to Boeing, or sold to various airlines and aircraft trading companies.

The **Boeing 727-30QC**, the "quick-change" mixed passenger-cargo version.

The **Boeing 727-230**, the "stretched" version and the most successful of the series.

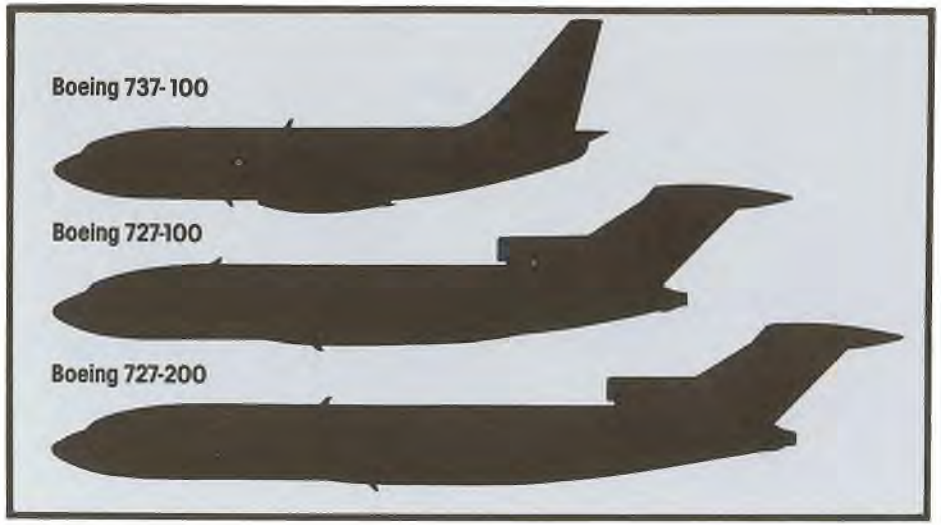
Boeing 727-230

160 seats • 595 mph

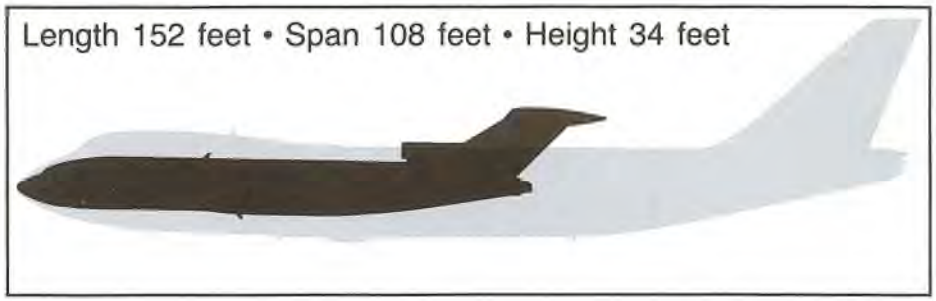


Pratt & Whitney JT8D-7 (14,000 lb thrust) × 3 • 86 tons max. gross takeoff weight • 2150 statute miles range

The table on this page outlines the main characteristics of the different versions of the **Boeing 727** and the **Boeing 737** series operated by **Lufthansa**. The early development of the 727, with Eastern Air Lines as the launching carrier in 1964, is reviewed on page 75 of the pilot book of this series, ***Pan Am: An Airline and Its Aircraft***. Similarly, the later development of the Boeing 737 is described on page 77 of the same book, which notes that in this case, Lufthansa was the launching airline. As the tables on the opposite page show, the German company was an important customer for both types, contributing in no small measure toward Boeing's marketing success in Europe.



Length 152 feet • Span 108 feet • Height 34 feet



THE BOEING TWINS AND TRIJETS

Type	First Flight Date	Dimensions			Pass. Seats	Engines			Max. Gross TOW (lb)	Cruise Speed (mph)	Normal Range (st. miles)	No. Built
		Length	Span	Height		No.	Type	Thrust (each; lb)				
727-100	9 Feb. 1963	133'2"	108'	34'	119	3	P&W JT8D	14,000	160,000	605	2650	1824
727-200	27 July 1967	152'2"	108'	34'	163	3	P&W JT8D-7	14,000	172,000	595	2150	
737-100	9 April 1967	94'	93'	37'1"	103	2	P&W JT8D-7	14,000	100,500	570	1840	2000+
737-200	8 Aug. 1967	100'	93'	37'1"	115	2	P&W JT8D-9	14,500	114,500	570	2135	
737-300	24 Feb. 1984	109'9"	94'9"	36'6"	141	2	CFM 56-3	20,000	135,000	558	2660	

The City Jet

The Short-Haul Boeing

Warming to the advantages of an all-Boeing fleet, with commonality of spares holding and maintenance costs, Lufthansa made a procurement decision that astonished the airline world. Hitherto, U.S.-manufactured airliners had always been sponsored by U.S. airlines. Lufthansa now became the first non-U.S. airline to be the launching customer for a new U.S. type, which furthermore became the highest-selling single commercial airplane in history, with sales exceeding 2000.

The historic order, made in February 1965, was for 21 **Boeing 737-100s**. Based on the same fuselage cross section as the Boeing 727 and 707, but with two wing-mounted engines, it seemed to be going against the fashion of rear-mounted engines, initiated by the French Caravelle and successfully followed by the British B.A.C. One-Eleven and the Douglas DC-9. But the greater fuselage width was a powerful selling point and had passenger appeal.

Lufthansa put the Boeing 737 **City Jets** into service on 10 February 1968 and subsequently deployed the 727 and the 737 interchangeably, matching the size and range, from the 90-seat 737-100 to the 170-seat 727-200, according to traffic demand. By the mid-1970s, Lufthansa and its nonscheduled subsidiary, Condor Flugdienst, were operating more than 70 of both types, and only the arrival on the European scene of the wide-bodied twin-jet Airbus put a stop to the flow of Boeing deliveries from Seattle. Incidentally, all Lufthansa Boeing aircraft carry the number 30 as the last two digits, i.e. 737-130, as this is the Boeing customer designator.

The **Boeing 737-100**, the original version of the world's best-selling commercial jet, of which Lufthansa was the launching customer.

LUFTHANSA'S FLEET OF BOEING 737-100s AND 200s

Const. No.	Regist. No.	Name
737-130 (737A)		
19013	D-ABEA	*Coburg*
19014	D-ABEB	*Regensburg*
19015	D-ABEC	*Osnabrück*
19016	D-ABED	*Flensburg*
19017	D-ABEF	*Kempten*
19018	D-ABEG	*Offenbach*
19019	D-ABEH	*Solingen*
19020	D-ABEI	*Oldenburg*
19021	D-ABEK	*Konstanz*
19022	D-ABEL	*Mülheim a.d.R.*
19023	D-ABEM	*Wolfsburg*
19024	D-ABEN	*Tübingen*
19025	D-ABEO	*Göttingen*
19026	D-ABEP	*Wilhelmshaven*
19027	D-ABEQ	*Koblenz*
19028	D-ABER	*Goslar*
19029	D-ABES	*Friedrichshafen*
19030	D-ABET	*Baden-Baden*
19031	D-ABEU	*Heilbronn*
19032	D-ABEV	*Marburg*
19033	D-ABEW	*Bayreuth*
19794	D-ABEY	*Worms*
737-230 (737C)		
20253	D-ABBE	*Remscheid*
20254	D-ABCE	*Landshut*
20255	D-ABDE	*Bamberg*
20256	D-ABFE	*Trier*
20257	D-ABGE	*Erlangen*
20258	D-ABHE	*Darmstadt*
737-230 (737B)		
22114	D-ABFA	*Regensburg*
22113	D-ABFB	*Flensburg*
22115	D-ABFC	*Würzburg*
22116	D-ABFD	*Bamberg*
22117	D-ABFF	*Gelsenkirchen*
22118	D-ABFH	*Pforzheim*
22119	D-ABFK	*Wuppertal*
22120	D-ABFL	*Coburg*
22121	D-ABFM	*Osnabrück*
22122	D-ABFN	*Kempten*
22123	D-ABFP	*Offenbach*
22124	D-ABFR	*Solingen*
22125	D-ABFS	*Oldenburg*
22402	D-ABFT	(Condor)
22126	D-ABFU	*Mülheim a.d.R.*
22127	D-ABFW	*Wolfsburg*
22128	D-ABFX	*Tübingen*
22129	D-ABFY	*Göttingen*
22130	D-ABFZ	*Wilhelmshaven*
22131	D-ABHA	*Koblenz*
22132	D-ABHB	*Goslar*
22133	D-ABHC	*Friedrichshafen*
22635	D-ABHD	(Condor)
22134	D-ABHF	*Heilbronn*
22135	D-ABHH	*Marburg*
22136	D-ABHK	*Bayreuth*
22137	D-ABHL	*Worms*
22138	D-ABHM	*Landshut*
22139	D-ABHN	*Trier*
22140	D-ABHP	*Erlangen*
22141	D-ABHR	*Darmstadt*
22142	D-ABHS	*Remscheid*
22636	D-ABHT	(Condor)
22143	D-ABHU	*Konstanz*
22634	D-ABHW	*Baden-Baden*
22637	D-ABHX	(Condor)

Note The 737-130s were delivered from May 1968 to 6 February 1969, the 737-230s from December 1969 to February 1971, and the 737-230s from May 1971 to March 1982. Most of the 737-130s were sold to People Express.

A final batch of 737-230s was delivered between January and March 1985:

23153	D-ABMA	*Idar-Oberstein*
23154	D-ABMB	*Ingolstadt*
23155	D-ABMC	*Norderstedt*
23156	D-ABMD	*Paderborn*
23157	D-ABME	*Schweinfurt*
23158	D-ABMF	*Verden*

LUFTHANSA'S BOEING 737-330 FLEET

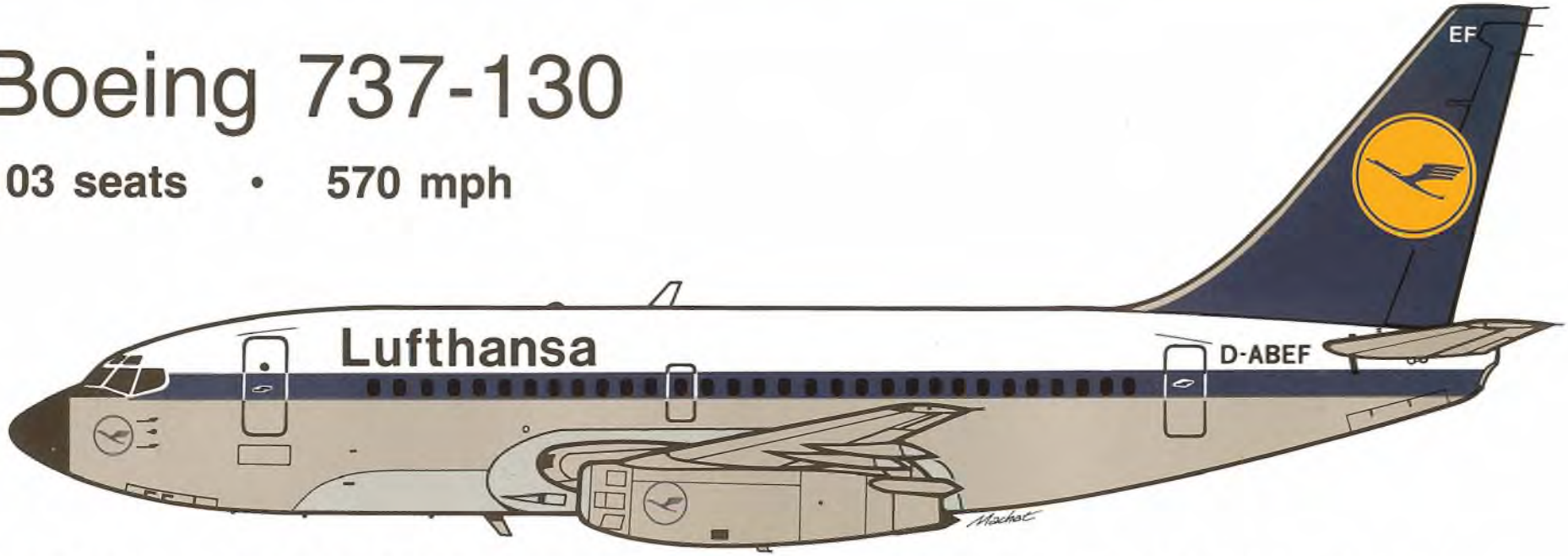
Const. No.	Regist. No.	Name
23522	D-ABXA	*Giessen*
23523	D-ABXB	*Passau*
23524	D-ABXC	*Delmenhorst*
23525	D-ABXD	*Siegen*
23526	D-ABXE	*Hamm*
23527	D-ABXF	*Minden*
23528	D-ABXH	*Cuxhaven*
23529	D-ABXI	*Berchtesgaden*
23530	D-ABXK	*Ludwigsburg*
23531	D-ABXL	*Neuss*
23833	D-ABWA	
23834	D-ABWB	
23835	D-ABWC	(Condor)
23836	D-ABWD	
23837	D-ABWE	
23871	D-ABXM	*Herford*
23872	D-ABXN	*Böblingen*
23873	D-ABXO	*Schwäbisch-Gmünd*
23874	D-ABXP	*Fulda*
23875	D-ABXR	*Celle*

Note The 737-330s were delivered from August 1986 to February 1988. More are on order, including 39 of the advanced 737-500 version.

Herbert Culmann, chairman of the executive board from 1972 to 1982.

Boeing 737-130

103 seats • 570 mph



Pratt & Whitney JT8D-7 (14,000 lb thrust) × 2 • 50 tons max. gross take-off weight • 1840 statute miles range

The **Boeing 737-200** (freighter version).

Length 94 feet • Span 93 feet • Height 37 feet

The **Boeing 737-300**. The engine intakes are flattened for ground clearance.

Delivering the Goods

An Old Tradition

Air freight is a very specialized category of air transport. It needs special ground equipment and handling and special aircraft with stronger and heavier floors and bulkheads, ingeniously designed larger doors, and on-board apparatus. Air freight travels only one way, whereas most passengers make round-trips. The traffic is often seasonal. The net result is that airlines find profitable air freight operation difficult to achieve, most companies giving it low priority and customarily carrying freight only as fill-up loads on passenger aircraft.

Lufthansa has traditionally taken a different view, believing that, properly organized and capitalized, the air freight business can be profitable. Demonstrating its faith, on 4 December 1957—within 2½ years of its first transatlantic passenger service—Lufthansa added an all-cargo flight on the same route, leasing an aircraft from Transocean Air Lines. It used a **Douglas C-54**, forefather of the DC-4, unpressurized and comparatively slow, but the air freight did not object.

The business was successful enough for nonstop **Super Constellations** to be introduced in March 1959, and in 1961 Lufthansa chartered space on **Canadair CL-44**s operated by Seaboard World Airlines. This Canadian-built aircraft was a variant of the Bristol Britannia, and engineered so that the whole of the rear fuselage and tail was hinged into a "swing-tail" to permit maximum rear-end loading into the entire cross section of the fuselage.

Jet Air Freight

Throughout the period of dynamic growth during the 1960s, when Lufthansa regained its leading airline role in Europe, the **Boeing 707** air freighters were given as high a status as the passenger aircraft. This respect was applied as much to the ground facilities as to the aircraft. Thus, on 2 October 1971, barely a year after delivery of Europe's first Boeing 747 wide-bodied jet, the world's largest freight-handling hall was opened at Frankfurt Airport, which by then had become the air freight hub for much of Europe. This event was promptly followed by the delivery to Lufthansa, on 10 March 1972, of the world's first all-cargo **Boeing 747**, and for several years it was the only one of its kind.

On 19 April Lufthansa introduced Boeing 747 all-freight service on the Frankfurt-New York route at a frequency of six days per week, and four years later Lufthansa ordered its first half-passenger, half-freight **Boeing 747-200B "Combi"** to meet the varying demands of a fluctuating market and routes of different freight traffic densities.

By the late 1980s, Lufthansa had become the largest scheduled air freight operator in the world.

German Cargo Services (G.C.S.)

By this time the cargo division was operating as an autonomous unit, with its own allocated aircraft. On 10 March 1977, as an almost inevitable development, **German Cargo Services GmbH (G.C.S.)** was founded as a wholly owned subsidiary to operate air freight charters, mainly with Boeing 707s, to supplement the scheduled air freight services.

On 1 June 1983, it placed an order for four **McDonnell Douglas DC-8-73**s. These were former Douglas DC-8s, substantially modified and restructured by the **Cammacorp** company. Though their "narrow" bodies made them less attractive for normal passenger service, their General Electric/SNECMA CFM 56-2 turbofan engines gave them low operating costs, and they were ideal for freight. G.C.S. took delivery of the first aircraft on 12 July 1984 and put them into service almost immediately, replacing the Boeing 707s.

A **Douglas C-54** cargo aircraft, used by **Lufthansa** for its first all-cargo flights.

Lufthansa occasionally leased a **Curtiss C-46** for supplementary cargo operations.

THE DC-8-73s

Const. No.	Regist. No.
45991	D-ADUI
46003	D-ADUA
46044	D-ADUE
46047	D-ADUO
46106	D-ADUC

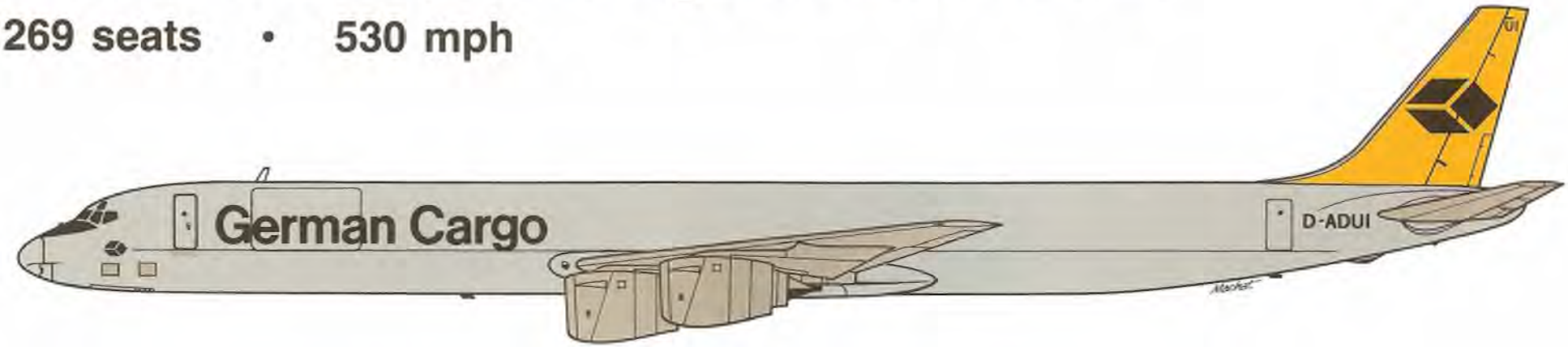
Boeing 707s were used for exclusive all-cargo services during the 1960s and later used by Lufthansa's affiliated **German Cargo Services**.

The **Cammacorp** conversion of the **Douglas DC-8**, the "Dash-Seventy" series.

Lufthansa's **Boeing 747F** is loaded through both the nose and fuselage cargo doors.

Cammacorp-Douglas DC-8-73

269 seats • 530 mph



CFM International CFM56 (24,000 lb thrust) × 4 • 177 tons max. gross takeoff weight • 5200 statute miles range

An Inspired Rescue Operation

During the mid-1970s, just as the wide-bodied Boeing 747s, DC-10s, and TriStars were threatening to sweep aside the last remnants of the once-proud fleets of 707s, DC-8s, and VC-10s, a remarkable operation was staged to rescue one of the earlier generation (now described as "narrow-bodied") from complete obliteration. In 1977, Jackson McGowan, who had been president of the Douglas Aircraft Company during the height of its marketing success in the 1960s, led a group of investors to form **Cammacorp**, headquartered at El Segundo, a Los Angeles satellite city near the airport, and once home of a Douglas wartime production line. The sole purpose of Cammacorp was to perpetuate the service life of the "stretched" **Douglas DC-8-60 Series**.

The idea was simple. The 19,000-pound-thrust Pratt & Whitney JT-3D engines would be replaced by 24,000-pound-thrust CFM56 engines, produced jointly by the General Electric and the French SNECMA engine manufacturers. These were not only more powerful but were far more economical, enhancing further the profit potential of an aircraft which some airlines had admitted to be "the nearest thing to printing your own money."

New Lease on Life

McGowan sold the idea to a number of influential airlines, some of which already had DC-8-60s. Delta's DC-8-61s, for example, were converted at Delta's own base in Atlanta, from kits supplied by Cammacorp. For other customers, Cammacorp did the work, sometimes purchasing aircraft itself, and proceeded to inject them with new life at a modest production line at Tulsa. The cost was about $4,000,000–$5,000,000 per conversion, and both passenger and freight versions came off the line.

The first customers, in 1979 and 1980, were United Air Lines and Delta Air Lines, both for the **DC-8-71**. After the first flight on 15 August 1982, and F.A.A. certification, Delta took the first delivery in April 1982. Altogether 110 DC-8-61s, -62s, and -63s were converted to -71s, -72s, and -73s. **German Cargo Services (G.C.S.)** was one of the customers for the **DC-8-73**. Mission accomplished, Cammacorp shut its doors in December 1986.

One Last Fling

The Douglas DC-8 had been dear to Jackson McGowan's heart, and he made sure that it would leave its imprint in the record books. On 29 March 1984, the pilot of a Cammacorp demonstrator DC-8-72 asked for clearance into the Los Angeles International Airport, stating that he had come from Cairo. A curious air traffic controller inquired, "Cairo, Illinois?" Not so. The aircraft had just flown 8230 statute miles nonstop in 15 hr 46 min from Egypt and still had 1½ hours of fuel left.

The Jumbo Jet Takes Over

Sharing the Leadership

When **Pan American** introduced the Boeing 707 in 1958 to introduce the first great jet age, it had a head start over most of its competition. Almost a year and a half was to pass before Lufthansa mounted its jet challenge, in March 1960. A decade later, the nature of the competition and the balance of power across the Atlantic had undergone a subtle change. European airlines such as Air France, British Airways, and Lufthansa were no longer overawed by threatened U.S. dominance of the transatlantic airways. When Pan American launched the new wide-bodied era with its **Boeing 747** service on 22 January 1970, **Lufthansa** was not far behind with its inaugural from Frankfurt to New York on 26 April, only three months later.

Following that epoch-making year, Lufthansa steadily built up its fleet of the giant airliner, for deployment on the most heavily traveled routes. Matching the flying equipment with its customarily sound ground support, it opened the world's largest maintenance hangar at Frankfurt in 1970, and the world's first all-cargo Boeing 747 service began in April 1972 (page 80).

The Momentum Continues

Lufthansa did not favor the Boeing 747SP, which, to achieve Pan American's demand for nonstop New York–Tokyo capability, had had to trade off several seat rows of revenue-earning capacity. Instead the German carrier selected, and possibly insisted upon, the **Boeing 747SL**—Special Long-Range—version of the standard-sized 747 and put it into service on a two-stop route to Sydney, Australia, on 14 December 1976. This was followed up by the biggest single aircraft order in Lufthansa history, on 14 July 1977, for five of the 747SLs and six B-727s, totaling about $1 billion. Simultaneously arrangements were made to retire or dispose of the earlier Jumbos so as to reduce the average longevity of the fleet.

The last Boeing 707 was retired on 31 December 1984. Henceforward all Lufthansa's long-range routes were operated by wide-bodied aircraft, Boeing 747s or DC-10s. Perhaps one of the most unusual route assignments—and one only possible with a true Jumbo Jet—was that from Turin, Italy, to Detroit. In association with Alitalia and General Motors, an extraordinary cargo service began on 1 June 1987, with each Boeing 747 carrying 56 Pininfarina car bodies to the Cadillac Allanté assembly line.

Lufthansa's Boeing **747-230.**

LUFTHANSA'S BOEING 747 FLEET

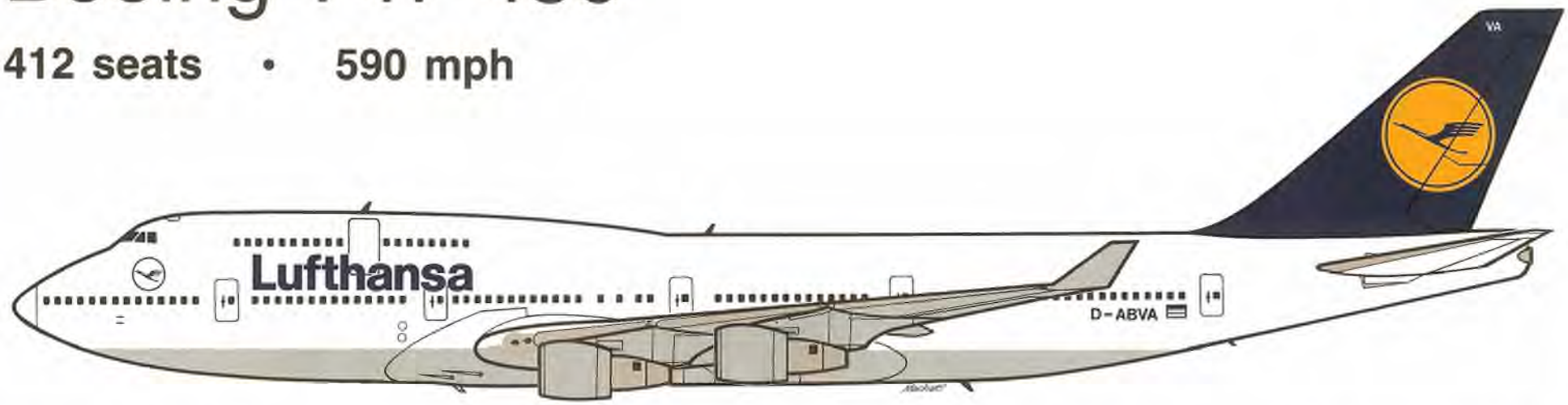
Const. No.	Regist. No.	Name	Year Deliv.
747-130 (747A)			
19746	D-ABYA	*Nordrhein-Westfalen*	1970
19747	D-ABYB	*Hessen*	1970
19748	D-ABYC	*Bayern*	1970
747-230 (747B)			
20372	D-ABYD	*Baden-Württemberg*	1971
20493	D-ABYF	(Condor)	1971
20527	D-ABYG	*Niedersachsen*	1972
20559	D-ABYH	(Condor)	1972
747-230F (747F)			
20373	D-ABYE		1972
747-230B Combi (747D)			
21220	D-ABYJ	*Hessen*	1976
21221	D-ABYK	*Rheinland-Pfalz*	1976
21380	D-ABYL	*Saarland*	1978
21568	D-ABYM	*Schleswig-Holstein*	1978
21643	D-ABYR	*Nordrhein-Westfalen*	1979
21644	D-ABYS	*Bayern*	1979
22363	D-ABYT	*Hamburg*	1980
22669	D-ABYW	*Berlin*	1981
22670	D-ABYX	*Köln*	1982
22671	D-ABYY	*München*	1982
23286	D-ABYZ	*Frankfurt*	1985
23287	D-ABZA	*Düsseldorf*	1985
23393	D-ABZC	*Hannover*	1986
23509	D-ABZE	*Stuttgart*	1987
747-230B (747E)			
21589	D-ABYN	*Baden-Württemberg*	1978
21590	D-ABYP	*Niedersachsen*	1979
21591	D-ABYQ	*Bremen*	1978
23407	D-ABZD	*Kiel*	1986
23622	D-ABZH	*Bonn*	1987
747-230F Freighter (747C)			
21592	D-ABYO	*America*	1978
22668	D-ABYU	*Asia*	1981
23348	D-ABZB	*Europa*	1985
23621	D-ABZF	*Africa*	1986
	D-ABZI	*Australia*	1988

Note Ten 747-400s are now in the fleet.

A **Boeing 747 freighter.**

Boeing 747-430

412 seats • 590 mph

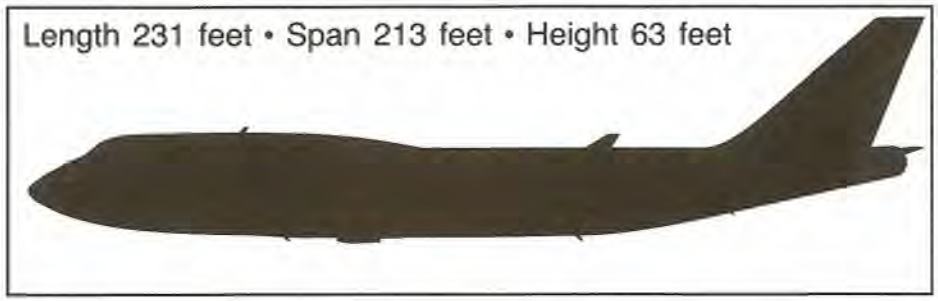


General Electric CF6-80 (58,000 lb thrust) × 4 • 435 tons max. gross takeoff weight • 8400 statute miles range

The aircraft illustrated above, the **Boeing 747-430**, is the latest development of the great airliner which, with its popular nickname, the Jumbo Jet, has become the symbol of mass air travel. **Lufthansa** ordered six of these aircraft on 23 June 1986, and from 1989 onward, with 11 orders and 12 options, will gradually replace its earlier versions of the 747.

The whole fleet is listed on the opposite page. It started with the earliest 747-100 Series, in 1970, the beginning of the career of the giant airliner, when it seemed far too big for all but the few most heavily traveled routes of the world. Starting cautiously with three, Lufthansa has already taken delivery of 32, not including the 747-430s to come. They fly to every corner of Lufthansa's world, which by 1990 embraced 183 destinations in 85 countries—more than reached by any other international airline.

The different types of wide-bodied aircraft, in their original versions, are listed in the table below. The Boeing 747 types up to the B-747-300 are tabulated on page 80 of ***Pan Am: An Airline and Its Aircraft***, the first book in this series about the world's great airlines.



WIDE-BODIED TYPES COMPARED
based on original series of each

Type	First Flight Date	Dimensions			Mixed Class Seating	Engines			Max. Gross TOW (lb)	Cruise Speed (mph)	Normal Range (st. miles)	Approx. No. Built[1]	Launch Customer
		Length	Span	Height		No.	Type	Thrust (each, lb)					
B-747-100	2 Sept. 1969	231'0"	195'8"	63'5"	350	4	P&WJT9D	43,500	710,000	595	5000	800+	Pan Am
DC-10-10	29 Aug. 1970	181'5"	195'4"	58'1"	270	3	GE CF6	41,000	455,000	580	3000	382	American
L-1011-1	16 Nov. 1970	177'8"	155'4"	55'4"	260	3	R/R RB211	42,000	430,000	580	3000	244	Eastern
A 300-B2	28 Oct. 1972	175'11"	147'1"	54'3"	230	2	GE CF6-50	51,000	302,000	570	1600	600+	Air France

[1]All types, including developed versions, e.g. 747SP and DC-10-30, but not the narrower-fuselaged Airbus A 320.

Nonscheduled Diversification

Explosion of Mass Air Tourism

During the first 15 years after World War II there was a clear class distinction between the scheduled and nonscheduled airlines of Europe. The nations either owned or supported airlines which were recognized as official flag carriers. Small independent companies had to fight, mostly in vain, for traffic and operating rights. Well-established airlines such as S.A.S., K.L.M., and B.E.A. had inherited—and arguably had earned—such privileges as their birthright. The gulf between the two types of commercial operators was a form of aviation apartheid.

By the early 1960s, however, intensive travel demands by tourists who were prepared to exchange scheduled convenience for cheap fares enabled many small companies to find a niche in the regulation-protected scheduled airline armor. Nonscheduled flights, operated around the clock, with every seat filled, became as profitable as scheduled flights, operated during restricted hours and little more than half full. With guaranteed contracts comprising packages of air travel, hotel, and ground services, the Inclusive Air Tour was born. The expansion was phenomenal, the competition intense. Some airlines survived by the wit of individual entrepreneurs. Others were absorbed by flag carriers which, faced with the inexorable flood of mass air tourism, adopted a policy of "if you can't beat 'em, join 'em."

Condor Flugdienst

One such marriage of convenience was the Lufthansa-Condor partnership. On 23 December 1955, **Deutsche Flugdienst GmbH** was formed in Frankfurt by Norddeutscher Lloyd, the Hamburg-Amerika Line, the Deutsche Bundesbahn, and Lufthansa. With three **Vickers Viking**s, it began service on 1 May 1956 to Palma de Mallorca, the first of many resorts throughout the Mediterranean. In 1960 Lufthansa purchased the entire company, and the next year it bought **Condor Luftreiderei**, which had two **Convair 240**s; it combined the two on 1 November 1961 to form **Condor Flugdienst GmbH**.

Lufthansa's position was consolidated further on 1 January 1968 by the acquisition of **Sudflug International**, another German charter airline. Lufthansa had allocated Viscounts to its junior partner in 1962, and Boeing 727 jets were added in 1965. On 1 May 1971, Condor became the first nonscheduled airline to operate its own **Boeing 747**, and in August the same year it gained the distinction of carrying the record number of passengers on any single airline flight, when 490 happy tourists from Frankfurt disembarked at Las Palmas, Canary Islands. On 14 May 1972, Condor 747s began charter service to New York, to establish tranoceanic credentials. Closer to home, on 6–7 September 1972, Condor broke a political barrier by becoming the first West German airline to carry visitors to the famous Leipzig Trade Fair in East Germany.

Condor has become one of the world's largest nonscheduled airlines. Its aircraft's distinctive yellow tails have become almost as familiar a sight at many of the world's busy airports as the emblem of its parent company. It has operated both Boeing 747s and **DC-10**s (pictured opposite), and its current fleet includes 737-300s and A310-300s. Its market is geared to long-range inclusive air tours. Condor's fleet of 17 jets in 1990 is operated by Südflug in the highly competitive business of mass air travel.

Cargolux

Consistent with its policy of expanding its share of the air freight market as well as the air passenger market in the nonscheduled arena, Lufthansa increased its influence in December 1987 by purchasing a 24.5% share of **Cargolux**, the Luxembourg nonscheduled all-cargo carrier. It was founded on 4 March 1970 by a consortium from Iceland, represented by Loftleidir Icelandic Airlines; Sweden, represented by A.B. Salenia, a shipping company; and Luxair, representing the home country. As with Condor, Lufthansa has secured a firm foothold in the nonscheduled air charter market by taking an interest in one of the largest participants. Cargolux currently operates six Boeing 747 freighters.

An Old Link Renewed

More than 60 years ago, in establishing a bridgehead for operations to South America, the old **Deutsche Luft Hansa** helped to set up one of Spain's first airlines, the first to be named **Iberia**, in 1927. After many vicissitudes, partly related to the Spanish government's wish to retain control over its own airline destinies, and later because of the conflicts of the Spanish Civil War, Lufthansa's interests waxed and waned according to political fortunes (see page 32).

The connection has, however, always been strong, and for several periods, Lufthansa supplied aircraft to the rejuvenated Iberia before the war; and possibly as a mark of traditional friendship, Madrid was the first destination to be served on the postwar Lufthansa's international network.

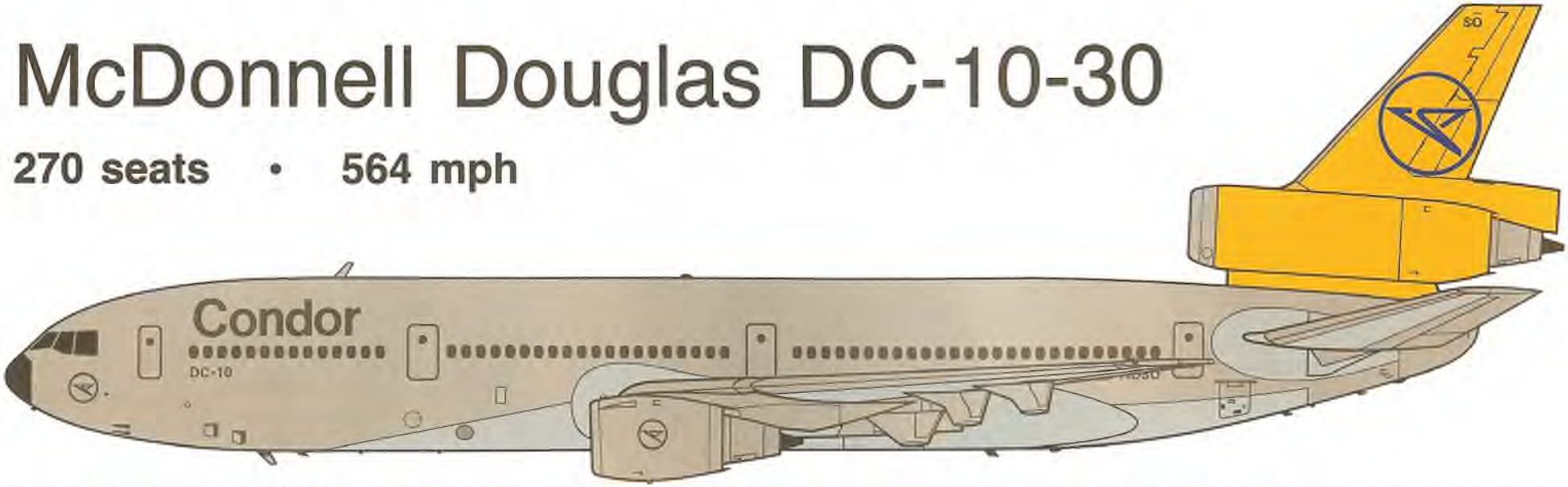
The cooperation between the airlines of Spain and Germany was recently strengthened with commercial considerations outweighing those of politics. To meet Spain's natural aspirations to obtain a larger slice of the enormous inclusive-tour market, a new airline was established at the very heart of the holiday traffic, Palma de Mallorca. On 24 February 1988, **Viva** was founded, with **Lufthansa** holding 46% of the shares. The acronym stands for **Vuelos Internacionales de Vacaciones, S.S.A.**, and the initial fleet of Boeing 737-300s began service in the spring of 1988. In 1990, Iberia decided it wanted fewer charters in Spain so Lufthansa turned over its shares in Viva.

This **Vickers Viking**, seen in **Lufthansa**'s markings, was first used by **Deutsche Flugdienst**, which later merged with **Condor Luftreiderei**.

This **Boeing 737-300** shows the striking markings of **Viva**, a Spanish charter airline in which Lufthansa held a substantial interest.

McDonnell Douglas DC-10-30

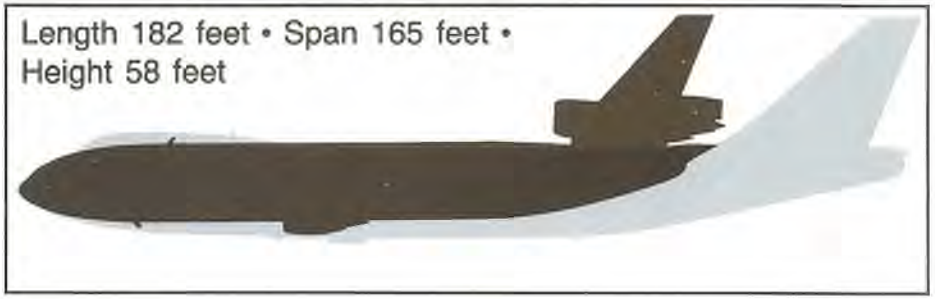
270 seats • 564 mph



General Electric CF6-50c (51,000 lb thrust) × 3 • 286 tons max. gross takeoff weight • 4600 statute miles range

When **Lufthansa** put its first Boeing 747s into service on the North Atlantic route in April 1970, it realized that many years would pass before the traffic density on many of its other intercontinental routes would justify adequate frequencies of aircraft of the Jumbo Jet size. Accordingly, on 23 September 1970 it ordered four **McDonnell Douglas DC-10** trijet wide-bodied airliners, which had about three-quarters of the capacity of the Boeing. The first DC-10s entered service on the South American route in January 1974.

The aircraft continued to work those long-distance routes which could not support the Boeing 747 size yet demanded the sophisticated modernity of wide-bodied comfort. The latest example of such shrewd deployment was the inauguration, on 1 April 1987, of nonstop service from the West German hub at Frankfurt to Washington, D.C., where Dulles International Airport now serves a commercial community which has outgrown the confines of the federal capital.



LUFTHANSA'S MCDONNELL DOUGLAS DC-10-30S

Const. No.	Regist. No.	Name	Year Deliv.
47921	D-ADAO	*Düsseldorf*	1973
47922	D-ADBO	*Berlin/Bochum*	1974
47923	D-ADCO	*Frankfurt*	1974
47924	D-ADDO	*Hamburg/Duisburg*	1974
47925	D-ADFO	*München*	1974
47926	D-ADGO	*Bonn*	1975
47927	D-ADHO	*Hannover*	1975
47928	D-ADJO	*Essen*	1975
47929	D-ADKO	*Stuttgart*	1975
46917	D-ADLO	*Nürnberg*	1975
46965	D-ADMO	*Dortmund*	1977
46595	D-ADPO	(Condor)	1979
46596	D-ADQO	(Condor)	1979
48252	D-ADSO	(Condor)	1981

One of the **Airbus A300B4**s that **Condor** used.

A **McDonnell-Douglas DC-10-30** of **Condor**.

A European Mainliner

The First Airbuses

Within two months of the first **Airbus A300B** flight, **Lufthansa** ordered three (plus four on option) on 20 December 1972. **Air France** had sponsored the whole project, but Lufthansa's support no less effective in setting the seal on the integrity of the Airbus idea. The order was modified on 7 May 1973 to the **A300B2** version of the basic design, and the first one entered Lufthansa service on 1 April 1976.

Flexing the Airbus Muscles

Since then Lufthansa's enthusiasm for the breed has strengthened to the level of advocacy. The first of five larger **A300B4**s was delivered on 29 September 1977, and further orders followed. On 2 April 1979, Lufthansa and **Swissair** were the joint launching customers for the **Airbus A310**, a smaller version of the A300B. No token gesture, the order was for 50, of which 25 were firm, and worth $1.5 billion (U.S.). The first Lufthansa A310 entered service on a domestic route, Frankfurt-Stuttgart, on 10 April 1983. The first A310-300 long-range jet began transatlantic service in March 1990.

The order book for the Airbus family was further modified as the production line at Toulouse became more flexible to meet varying market demands. Seven larger **A300-600**s were ordered in July 1985, and the first of these entered service in April 1987. Eleven of the smaller, narrow-bodied **Airbus A320**s were in the fleet by May 1990; 20 more are on order. The airline also has ordered 20 **A321** models.

Throwing Down the Gauntlet

Most dramatic of the series of important demonstrations of faith in a European airliner industry was Lufthansa's sponsorship of the **Airbus A340**. This is a four-engined version, designed primarily to challenge that segment of the long-haul market currently occupied by the McDonnell Douglas and Lockheed trijets. It may well be the most serious threat so far to the supremacy of a United States industry that has dominated the world air transport market since 1930, interrupted only slightly by the short-lived British and French challenges in the 1950s.

Lufthansa reached preliminary agreement for 15 A340s, with an option on 15 more, on 14 February 1987. The final deliveries, to start in 1992, will be split between the -200 version, with accent on very long range, and the -300, with more seats but still transoceanic range.

With Lufthansa's influential stamp of approval, Airbus Industrie has thrown down the gauntlet to McDonnell Douglas and—is it possible?—the omnipotent Seattle manufacturer itself.

Heinz Ruhnau, chairman of Lufthansa since 1982.

The flight deck of the **A320** is in striking contrast with that of the prewar **Junkers-Ju 52/3m** (above).

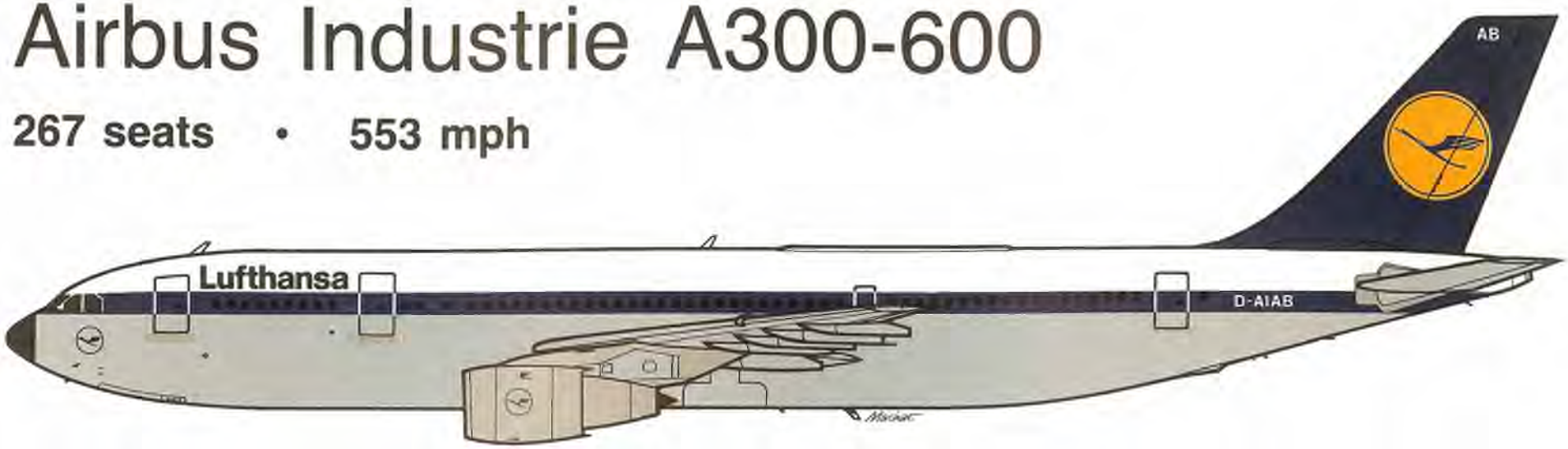
The flight deck of the **Airbus Industrie A320** *(left)*, the "narrow-bodied" Airbus, representing the latest state of the art. There are no central control columns, and no mechanical linkages with the controls—the so-called "fly-by-wire" system.

LUFTHANSA'S AIRBUS FLEET (TO 1989)

Const. No.	Regist. No.	Name	Year Deliv.
A 300 B2			
21	D-AIAA	*Garmisch-Partenkirchen*	1976
22	D-AIAB	*Rüdesheim am Rhein*	1976
26	D-AIAC	*Lüneburg*	1976
48	D-AIAD	*Westerland-Sylt*	1977
52	D-AIAE	*Neustadt a.d. Weinstr.*	1978
132	D-AIAF		1981
A 300 B4			
53	D-AIBA	*Rothenburg o.d. Tauber*	1977
57	D-AIBB	*Freudenstadt/Schwarzwald*	1978
75	D-AIBC	*Lindau/Bodensee*	1979
76	D-AIBD	*Erbach/Odenwald*	1979
77	D-AIBF	*Kronberg/Taunus*	1979
A 300-600			
380	D-AIAH	*Lindau*	1987
391	D-AIAI	*Erbach*	1987
401	D-AIAK	*Kronberg*	1987
405	D-AIAL	*Stade*	1987
408	D-AIAM	*Rosenheim*	1987
411	D-AIAN	*Nördlingen*	1987
414	D-AIAP	*Bingen*	1987
A 310A			
191	D-AICA	*Neustadt a.d. Weinstr.*	1984
201	D-AICB	*Garmisch-Partenkirchen*	1983
230	D-AICC	*Kaiserslautern*	1983
233	D-AICD	*Detmold*	1983
237	D-AICF	*Rüdesheim am Rhein*	1983
254	D-AICH	*Lüneburg*	1983
257	D-AICK	*Westerland-Sylt*	1983
273	D-AICL	*Rothenburg a.d. Tauber*	1984
356	D-AICM	(Condor	1985
359	D-AICN	(Condor)	1985
360	D-AICP	(Condor)	1985
397	D-AICR	*Freudenstadt* (Condor 1988)	1986
400	D-AICS	*Recklinghausen*	1986
A 310B			
434	D-AIDA	(Condor)	1987

Airbus Industrie A300-600

267 seats • 553 mph



General Electric CF6-80c (59,000 lb thrust) × 2 • 182 tons max. gross takeoff weight • 3700 statute miles range

A European Airliner

The early history of the **Airbus** consortium, builders of the **A300** family of airliners, is reviewed on page 87 of ***Pan Am: An Airline and Its Aircraft***, the pilot book of this airline series. The Airbus was originally an Anglo-French project, but the U.K. withdrew and Germany eagerly took its place. Britain eventually returned as a full member, rather than as a subcontractor, in January 1979.

After the first A300 flight, on 28 October 1972, progress was slow. The impressive production capacity of the U.S. manufacturers had enabled them to put the Douglas DC-10 and the Lockheed TriStar into service in 1970, two years earlier than the A300. Even so, after a slow start, Airbus began to build a solid order book.

The Right Answer

The Airbus Industrie design team at Toulouse demonstrated remarkable faith in the twin-engined concept as the most economical solution to short-haul air travel. As time went on, the permanency of the air traffic distribution curve, emphasizing the inescapable demographic elements of population and distance, dictated the emphasis on short-haul routes and the need for an airliner to match the demand. Airbus, meanwhile, reinforced by sustained engine developments, was able both to stretch and to compress the size and range of the A300. Simultaneously, the attitudes of the regulatory authorities became more flexible as engine efficiency and reliability reached truly impressive levels. In contrast with the early days, when overwater flights by twin-engined aircraft were regarded by the authorities as bordering on the suicidal, the latest variants of the Airbus family are flying across the Atlantic.

A Complete Family

The most important development occurred in July 1978 when **Lufthansa** and **Swissair** jointly ordered the smaller **A310**, which first flew on 3 April 1982 and included a digital flight deck (with only two crew members) and the extensive structural use of lightweight composite materials. These improvements were later incorporated in a larger and longer-range **A300-600**, first ordered by the national airline of Saudi Arabia, Saudia.

Extending its grasp of the short-haul markets even further in March 1984, Airbus Industrie launched the smaller, narrow-bodied A320, in which the control stick is placed at the side of the cockpit, thus providing better vision and freedom of movement for the pilots. Fiber-optic technology replaces mechanical linkages between the flight deck and the controls, to introduce the revolutionary "fly-by-wire" technique.

Further down the road, the Airbus family will include a 295-seat long-range four-engined version, the **A340**, and an even larger twin, the 328-seat **A330**, which will have transatlantic range. For the first time since the 1950s, when the Comet, the Viscount, and the Caravelle pointed the way toward the jet age, Europe is once again taking the technical lead in the development of the commercial airliner and helping to shape the future course of air transport.

THE AIRBUS FAMILY

Type	First Flight Date	Dimensions			Pass Seats	Engines		Max. Gross TOW (lb)	Normal Range (st. miles)	No. Built
		Length	Span	Height		No.	Type			
A300 B2	28 Oct. 1972[1]	175'11"	147'1"	54'3"	281	2	G.E. CF6-50C	302,000	1615	300+
A300 B4	26 Dec. 1974	175'11"	147'1"	54'3"	269	2	G.E. CF6-50C	330,690	2994	
A300-600	7 July 1983	177'5"	147'1"	56'6"	267	2	G.E. CF6-80C2	363,750	3710	
A310	3 April 1982	153'1"	144'	51'10"	234	2	P & W JT9D-7R4[3]	291,010	3224	150+
A320[2]	22 Feb. 1987	123'3"	111'3"	38'9"	150	2	CFM 56-5	145,500	2300	300+
A340	May 1992[4]	208'10"	192'5"	54'11"	295	4	CFM 56-5	542,335	7800	89[5]

[1]First flight date of original A300B. First flight of the A300 B2 was 28 June 1973. [2]All types are wide-bodied, except the A320. [3]Swissair, Lufthansa specified General Electric CF6 engines. [4]Estimated date. [5]Orders by April 1988.

They Also Serve

Regional Requirement

During the 1970s when the Economic Miracle reinstated West Germany as a world power, its people used their increasing incomes not only to buy new cars and houses but to do what Germans have always done: to travel, for business, for vacations, or just to visit friends. Such travel did not aspire necessarily only to jet to New York or Tokyo, or to seek sun and sand at Las Palmas or Dubrovnik. It included the wish to travel easily and quickly throughout the length and breadth of Germany.

A natural sequel to this aspiration was the creation of a number of small regional airlines, equipped mainly with small commuter aircraft to serve the smaller cities that could not support Lufthansa's Boeing 737s.

Formation of D.L.T.

One of these was **Ostfriesische Lufttaxi GmbH (O.L.T.)** (East Friesian Air Taxi), founded at Emden, on the North Sea coast, on 11 December 1970. It took over Ostfriesischen Lufttaxi Dekker und Janssen O.H.G., founded in 1958, and changed its name on 29 December 1972 to **Ostfriesische Lufttransport GmbH**, finally changing again to **D.L.T.—Deutsche Luftverkehrsgesellschaft mbH** on 17 October 1974. It later disposed of its local routes to the Friesian resorts so as to concentrate on regional services.

These latter tended to be on the periphery of West Germany, not only in the North Sea area but also in the extreme south, with routes from Friedrichshafen, and in northeast Bavaria. The fleet consisted of four 18-seat **de Havilland (Canada) DHC-6 Twin Otter**s, augmented in 1977 by six 30-seat **Shorts 330**s. Then, on 29 June 1978, D.L.T. was restructured as a ***Partner der Lufthansa*** and the headquarters transferred to Frankfurt. Lufthansa's interest in D.L.T. was 40%, the remaining control being held by Aktiengesellschaft für Industrie und Verkehrswesen (A.G.I.V.).

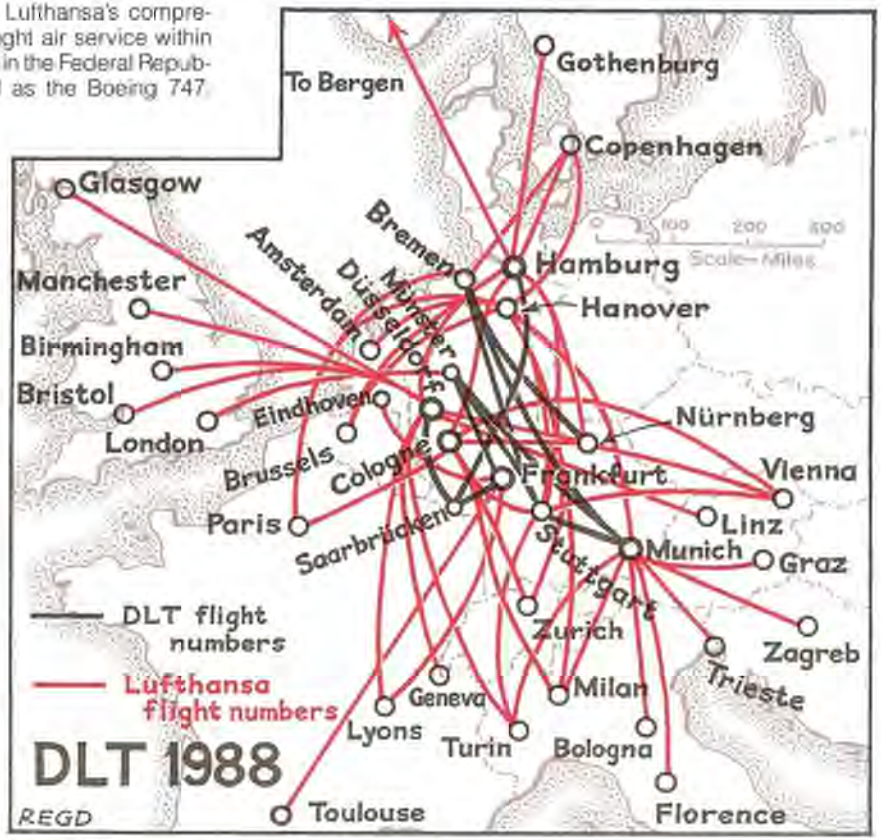
Modern Feeder Aircraft

Since then D.L.T. has become more than simply a local regional airline. In March 1981 it introduced the 44-seat **Hawker-Siddeley HS-748**, and the route network expanded considerably during the next few years to put hitherto deprived German cities on the airline map. Connections were made to most of Germany's neighboring countries, to provide service, for example, to provincial cities in Italy, Austria, the Netherlands, and the U.K.

On 3 February 1986 the 28-seat **Embraer Brasilia**, an excellent feeder airliner from Brazil, entered service; and during the summer of 1987 the **Fokker F-50**, latest of a fine line of turboprop twins from the Netherlands, rounded off the modernization of the D.L.T. fleet. Supplemented by aircraft such as the Jetstream and the Metroliner, chartered from other German regional carriers, D.L.T. now makes a substantial contribution (as the accompanying map shows) to Lufthansa's comprehensive airline system, which has brought air service within convenient reach of almost every citizen in the Federal Republic with the diminutive Brasilia as well as the Boeing 747. Lufthansa now holds 52% of D.L.T.

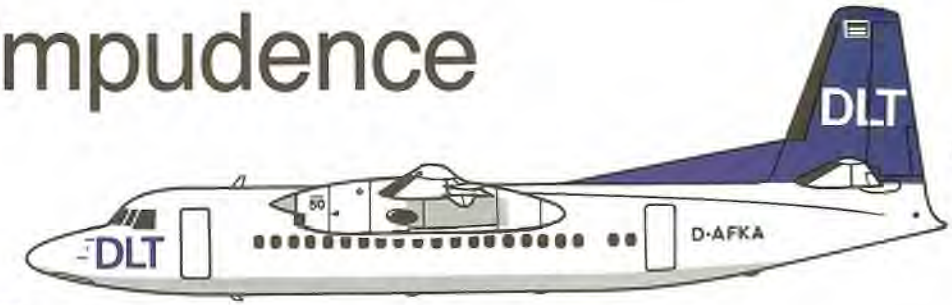
The **Hawker-Siddeley** (originally **Avro**, now **British Aerospace**) **748**.

The **Embraer 120 Brasilia**, Brazil's contribution to the feeder airline fleets of the world.



The **D.L.T.** network of today compares in extent with that of the prewar Lufthansa's European system in the early 1930s.

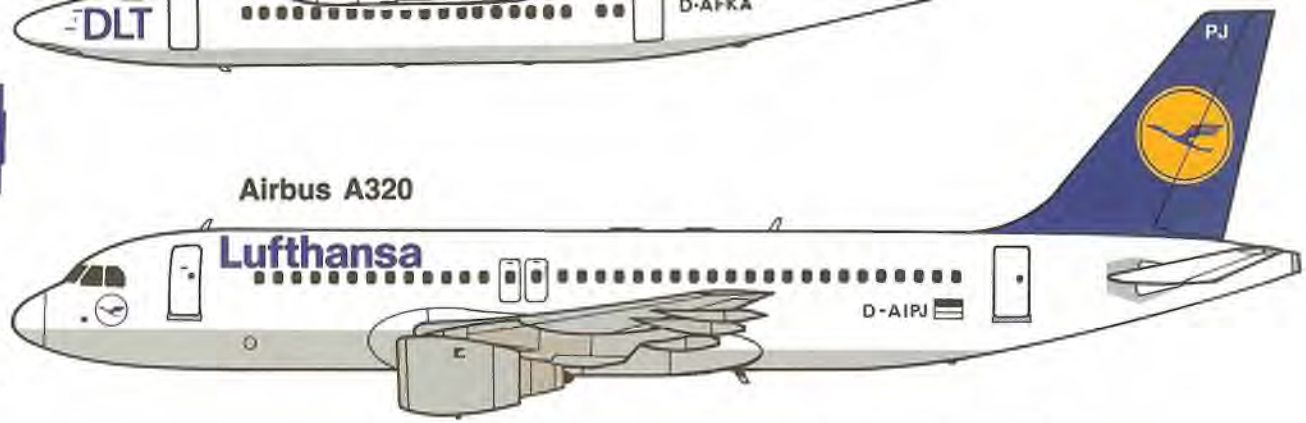
Dignity and Impudence



Fokker 50

Shorts SD 330

Airbus A320



Lufthansa's **A320** fleet will be registered D-AIPA through D-AIPT, with the exception of G, O, and Q.

Lufthansa Airport Express
(operates as a four-car unit)

The aircraft illustrated on this page are representative of the feeder types serving mainly the smaller cities of Germany and providing connections to provincial cities in neighboring countries. The **Airbus A320** could be regarded both as serving the lowest echelon of Lufthansa's main-line system—and the heir apparent to the versatile Boeing 737 Series—and the highest echelon of the feeder-route system, and is likely to be in service in such roles until the next century.

The **Lufthansa Airport Express** train is a novel solution to travel connections between a major traffic hub and neighboring cities which are too close to make air travel cost-effective for the operator or time-saving for the traveler. The Airport Express is operated by the **Deutsches Bundesbahn** exclusively for Lufthansa; airline tickets are required, and airline cabin service standards are provided by Lufthansa staff. It links Frankfurt Airport directly with Coblenz, Bonn, Cologne, and Düsseldorf, at the same time offering the passengers a delightful tour of the castles and vineyards of the scenic Rhineland Gorge. A second Airport Express train began operating between Frankfurt Airport and Stuttgart in May 1990.

FEEDING THE MAIN-LINE ROUTES
REPRESENTATIVE EQUIPMENT USED

Type	First Flight Date	Dimensions			Pass. Seats	Engines			Max. Gross TOW (lb)	Cruise Speed (mph)	Normal Range (st. miles)	Operator
		Length	Span	Height		No.	Type	Hp (each)				
Airbus A320	22 Feb. 1987	123'3"	111'3"	38'9"	150	2	CFM6-5	23,500 (lb thrust)	145,505	560	2303	Lufthansa[1]
Fokker F-50	28 Dec. 1985	82'8"	95'2"	28'2"	50	2	P & W 124	2160	43,500	320	1300	D.L.T.
HS 748	24 June 1960	67'	102'6"	24'10"	44	2	R-R Dart	2280	46,500	290	690	D.L.T.
Shorts S-330	22 Aug. 1974	58'	74'8"	16'3"	30	2	P & W PT6A	1173	22,900	220	450	D.L.T.
Embraer 120	27 July 1983	65'7"	64'11"	20'10"	30	2	P & W PW118	1800	25,353	345	1,000	D.L.T.
Lufthansa Express	27 March 1982	358'	9'7"[2]	12'11"[3]	164	16	Electric Motors[4]	240 Kw	472,000	125	—	Deutsche Bundesbahn

[1]Included for purposes of comparison only. [2]Loading gauge width. [3]Loading gauge height. [4]Four power units in each of four cars. The units are manufactured by A.E.G., Brown-Boveri, and Siemens.

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