

# Junkers

## Pioneer of Aviation

( Exhibition guide )



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## **Outline about Activities and Technical Developments of Prof. Hugo Junkers in the Area of Aircraft Technique**

**1915** - First self-supporting all metal aircraft J 1

**1917** - Foundation of the Junkers-Fokker Flugzeugwerke AG

**1919** - First all metal aircraft F 13

**1919** - Junkers Flugzeugwerke AG

**1921** - Foundation of the air traffic department

**1924** - Development and construction of the G 24

**1924** - Versatile aircraft W 33

**1926** - First flight of a G 31 as three-engined commercial aircraft

**1926** - Foundation of the Luft Hansa

**1928** - Delivery of a G 31 as the 1000<sup>th</sup> Junkers-aircraft

**1928** - Atlantic crossing with a W 33

**1929** - G 38 – the largest landplane at that time

**1931** - Ju 52/3m – the best-known Junkers aircraft  
used worldwide

**1932** - Ju 60 – a single-engined high-speed commercial aircraft



## **Preface**

Hugo Junkers is the father of civil commercial aviation. His first all metal aircraft F 13 set standards and in its typical corrugated metal design, it dominated an era of aircraft history of more than two decades. In the twenties and thirties of the 19<sup>th</sup> century the use of Duralumin and an own development of aero-engines made Germany a leading nation in aviation by his aircraft developments.

His achievements in the international development of airlines are inseparably connected to the name Junkers. This attitude made him a pacifist and let him negate the armament plans of the National Socialists.

In 1931 he introduced his Ju 52/3m, lovingly called “Auntie Ju”, which was a further milestone and a commercial success. Some of these aircraft are still airworthy today and make the experience of those days’ flying possible. After his forced retreat from his company in Dessau, the aircraft factory was used for military purposes. By the creation of the Technikumuseum Dessau, a memorial is supposed to be erected to the scientist, technician and ingenious inventor Hugo Junkers.

# Junkers – Pioneer of Aviation

Even at his time in Aachen Junkers carried out aerodynamically examinations in his own wind tunnel. In his Dessau gas appliance factory he was involved in the rebuilding of an airplane of his colleague Prof. Reissner in 1909. However, nobody at this time thought of an own aircraft development and manufacturing. The outbreak of the First World War induced the 54 years old Junkers, pressurized by Prof. Reissner in Aachen, to use his experiences in metalworking and his knowledge of research techniques for the construction of aircraft. In 1914 he was given the task of the development of an all metal aircraft by the military. The first Junkers J 1, a self-supporting monoplane made of sheet metal, was manufactured within 6 months.

The following aircraft J 2 to J 7 was manufactured in a small number at Junkers & Co. The sketches were partly not translated into practice and were only studies or rather production pattern.

In 1917 the company grounds still existing today were bought for a planned mass production, and with Fokker as partner the Junkers-Fokker-Flugzeugwerke AG were founded. With the construction of the J 10, considerable preparatory work was done for the first all metal cabin aircraft F 13, which was built from 1919 and started its triumphal march around the world. But only the J 14, one of eleven aircraft projects, was used in the military.

By the war production of aircraft Junkers grew from a small businessman to an industrialist. In 1914 he started with 15 workers, and in 1918 more than 1200 employees were working in his factory. The J 10 was the first all metal aircraft in the world and used for civil flights after the war. At the same time, they were rebuilt to passenger and post aircraft.

In the years after World War I. Junkers' attitude to airplane production changed. His aim was to develop aircraft only for civil aviation.

## Civil Aircraft Construction after World War I

The end of World War I also reduced the work for the new aircraft factories in Dessau. The number of employees fell from ca. 2000 to 200 after the termination of the war aircraft production. This was the first bigger wave of dismissals in a Junkers factories. Only the core personnel was retained. Junkers tried to start new with the J10 using as civil aircraft. In addition, there were two implementation variants of an aircraft for passengers:

J 12 - as four-seated passenger airplane

J 14 - a ten-seated civil airplane

carried out as shoulder-wing monoplane

But these were just plans - only the F 13 was carried out. This aircraft planed for four passengers and a two man crew set a high-altitude flight record of 22,146 ft with eight persons on September 13<sup>th</sup> 1919. A notable achievement!

There were also imitators abroad: since Junkers constructed the F13, the low-wing monoplane dominated the manufacturing of commercial aircraft. The typical corrugated metal design let its marks in the era of aircraft manufacturing for over two decades.

The use of corrugated Duralumin was another important stage of development. The aluminum obtained more strength and stability by heat treatment.

### The Treaty of Versailles and the 20s:

From 1920 on the article 201 included restrictive regulations and inspections in the production of aircraft. Not even Junkers did escape.

The usage of the F 13 was delayed. Many manufacturers moved their production into foreign countries. After 1920 Junkers temporarily built his aircraft in Sweden and Fili near Moscow. The restrictions were relaxed after 1922.

In December 1921 Junkers founded the department air traffic in Dessau in order to promote his aircraft. At that time a lot of foreign airlines were founded that were united to the Junkers-Luftverkehrs-AG in 1924

At the end of 1921 a Junkers aerial photo center was founded, which enabled the commercialization of aerial photographs and geodesy data. The Junkers F 13, which was at the beginning equipped with several engines, for example a BMW IIIa or rather a Mercedes D IIIa, got a L 5-engine built in that was manufactured in Dessau from 1928 on. The aircraft cabin and drive had to be coordinated to form a unity, so Prof. Junkers explained. The L5-engine was a heavy 310 hp oil engine. In Dessau the aircraft engine construction was progressing parallel to the widening of aircraft production.

The F 13 flew successfully in nearly all countries that had air traffic and Junkers' aircraft construction gained international reputation within a short time.

Prof. Junkers was far ahead of his time, as he presented the project J 1000 in 1923. This should be a huge civil aircraft with a span of 235 ft. Comfortable cabins for 100 passengers were planned in the thick wing. A cruising speed of 124,3mph would have been reached with four diesel engines of a total performance of 300 hp.

The number of personnel rose to ca. 3000 by August 1924. The development did not go continuously. In the middle of the twenties the sales in Germany started to stagnate, only export secured survival. Therefore new projects for aircraft were forced, and the G 24, first three-engined aircraft with heavy oil engines, were produced from 1924 on.

In 1924/25 the airport in Mosigkau with its grassy runway was closed and a new one with a concrete runway opened on the new area between Alten and Kühnau. (This project was started in 1920 but only finished four years later because of difficult legal conditions and property distributions.) This was an indispensable condition for larger aircraft like the G 24.

In 1926 two new aircraft appeared in the production program. The W 33 was planned for freight air traffic, but was also used as courier and passenger aircraft. This type of aircraft is famous for its Atlantic crossing. In 1928 the Atlantic was for the first time successfully flown across in East-West direction. In New York the crew was celebrated tumultuously, although the landing had taken place in Newfoundland on an offshore island. Today the W33-Bremen is situated as a loan in Bremen, but should be transferred back to Dearborn, USA. The second new development was the G 31, it was used by Lufthansa. In 1928 a G 31 was the 1000<sup>th</sup> aircraft that was constructed in Dessau.

The G 38, the largest four-engined landplane at that time, was even constructed during the early world economic crisis. It set new standards and was far ahead of its time. From 1930 to 36 it flew for the Lufthansa, but was not economically successful. The development used up millions and the company had no receipts. The last aircraft designed by Junkers, the Ju 52, was a commercial success. Ca. 5000 of this aircraft were built, more than of the Jumbo-Jet .

Today eight airworthy airplanes are existing, one of them as a traditional aircraft at Lufthansa.

After Junkers had been forced to resign from his companies in Dessau, the development of aircraft continued under the name "JFM Dessau". The continuous development resulted in types as the Ju160 and the Ju 90. The latter was built as large commercial aircraft and flew as high-speed commercial aircraft for the Lufthansa. This aircraft planned for 40 passengers became well-known under the name "Der große Dessauer".

The main emphasis of the further development was established on militaristic field. Junkers good reputation all over the world for his civil aircraft manufacturing was misused for military purposes. Junkers could not prevent this. The militaristic use led to the closure and the dismantling of the Dessau factories after the end of the war.

## Exhibits from the Field of Aircrafts:

### F 13 - 1919



Commercial aircraft  
single-engine low-wing monoplane,  
2 men crew in an open cockpit.  
The first all metal cabin aircraft of the world, which made the name  
Junkers as constructor of aircraft well-known all over the world.

Model 1:10

### G 24 - 1925



The first three-engined commercial aircraft with a span of 100 ft.  
From the end of the twenties on it flew for Lufthansa. Three Junkers L 5  
heavy oil diesel were used. Its shape is similar to a stretched F 13.  
A cabin for nine passengers.

Model 1:10

## W 33 - 1926



Versatile aircraft designed for cargo transport.  
Single-engined low-wing monoplane.  
First flight in 1926.  
An aircraft of this type crossed the Atlantic in East-West direction.

Model 1:10

### **Airfield**



The Junkers factory airfield, where many flying records began, is part of the national aviation history.

The airfield exists since 1925, and with its characteristic V- shape, it has a length of 10,500 ft. Today it is partly re-established by the development of an shopping center. One part is used as “Verkehrslandeplatz Dessau” for private and commercial air traffic.

## Airport Tempelhof



After the foundation of the Luft Hansa AG in 1926, the Berlin airport Tempelhof was extended to a hub with international meaning. The bold terminal building of the thirties as model scenery illustrates together with the Ju52 the connection between the Lufthansa and the most flown aircraft of that time.

### G 38 - 1929



The largest landplane built at that time. The wings have a span of 144 ft and seats for six passengers. To the front, they had a view outside. Only two of this aircraft were in existence.

Model 1:10

## Documentation Measurement - Hochschule Anhalt



The Anhalt University of Applied Sciences had taken precision measurements at the fuselage of the Dessau Ju 52 within the context of an surveying by the course Bauingenieurswesen (*building engineering*). The results of this thesis of a degree were considered for the renovation.

### Ju 52 - 1931



The best-known and most popular commercial aircraft. About 5000 of the three-engined version with BMW-radial engines were built. After a short time, this type of aircraft flew over all continents at the service of 27 airlines at least. In 1937, 85% of the Lufthansa fleet were Ju 52.

In 1937 our airplane in the museum was built in Bernburg and it was in military service as military transport plane with the label 1Z BY. A squadron Ju 52 could not begin their return flight after a munitions transport to Narvik, Norwegen due to lack of petrol. In spring 1940 the aircraft which had landed on the ice of the lake Hartvikvan sunk into the lake. And in 1986 they were salvaged with three further planes from a depth of 230ft in a costly rescue action. After several years of restoration, the Ju 52 presented itself as the jewel of the exhibition.

## Ju 60 - 1932



The single-engined deep-wing monoplane for eight passengers was the last aircraft whose construction was conducted by Prof. Junkers during his time in Dessau.

A high-speed commercial aircraft with a smooth metal sheathing as well as retractable undercarriage.

The model shows the first plane "Pfeil" (*arrow*) with the label D – 2400. There were no further planes ordered - the serial production first started with the further development of the Ju 60 – the Ju 160.

## Sailplane "Möwe" (*seagull*)



Junkers was an active sponsor of gliding. Therefore he made a gliding hall and gliders available on his factory airport. Through the gliding, young employees should be motivated for motor sport and a later training as pilots.

A gliding club with the name "Hugo Junkers" is still existing today.

The airplane "Möwe" that is shown was used in active flying sport, but selected for the benefit of new types.