**Dornier Do X**

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| **Do X** |
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| **Role** | Flying boat |
| **Manufacturer** | [Dornier](http://en.wikipedia.org/wiki/Dornier) |
| **Designed by** | Dr. [Claudius Dornier](http://en.wikipedia.org/wiki/Claudius_Dornier) |
| **First flight** | [12 July](http://en.wikipedia.org/wiki/July_12) [1929](http://en.wikipedia.org/wiki/1929) |
| **Primary user** | [Lufthansa](http://en.wikipedia.org/wiki/Lufthansa) |
| **Number built** | 3 |

The **Dornier Do X** was the largest, heaviest and most powerful [flying boat](http://en.wikipedia.org/wiki/Flying_boat%22%20%5Co%20%22Flying%20boat) in the world when it was produced by the [Dornier](http://en.wikipedia.org/wiki/Dornier%22%20%5Co%20%22Dornier) company of [Germany](http://en.wikipedia.org/wiki/Germany%22%20%5Co%20%22Germany) in 1929. The aircraft was conceived by Dr. [Claudius Dornier](http://en.wikipedia.org/wiki/Claudius_Dornier%22%20%5Co%20%22Claudius%20Dornier), starting in 1924,[[1]](http://en.wikipedia.org/wiki/Dornier_Do_X#cite_note-SM-0#cite_note-SM-0) and took seven years to design and another two years to build. In the design process, a one-to-one wooden [mock-up](http://en.wikipedia.org/wiki/Mock-up%22%20%5Co%20%22Mock-up), the first in aviation history, was built.

It was financed by the German Transport Ministry and was manufactured in a specially designed plant at Altenrhein,[[1]](http://en.wikipedia.org/wiki/Dornier_Do_X#cite_note-SM-0#cite_note-SM-0) on the [Swiss](http://en.wikipedia.org/wiki/Switzerland%22%20%5Co%20%22Switzerland) portion of [Lake Constance](http://en.wikipedia.org/wiki/Lake_Constance%22%20%5Co%20%22Lake%20Constance), in order to circumvent the [Treaty of Versailles](http://en.wikipedia.org/wiki/Treaty_of_Versailles%22%20%5Co%20%22Treaty%20of%20Versailles), which forbade aircraft to be built in Germany after [World War I](http://en.wikipedia.org/wiki/World_War_I%22%20%5Co%20%22World%20War%20I).

While popular with the public, a lack of commercial interest and a number of (non-fatal) accidents prevented more than three models from being built.

**Design**

The Do X had an all-[duralumin](http://en.wikipedia.org/wiki/Duralumin%22%20%5Co%20%22Duralumin) hull, with wings composed of a [steel](http://en.wikipedia.org/wiki/Steel%22%20%5Co%20%22Steel)-reinforced duralumin framework covered in heavy [linen](http://en.wikipedia.org/wiki/Linen%22%20%5Co%20%22Linen) fabric, covered with [aluminum](http://en.wikipedia.org/wiki/Aluminum%22%20%5Co%20%22Aluminum) paint.

It was initially powered by twelve 525 [hp](http://en.wikipedia.org/wiki/Horsepower%22%20%5Co%20%22Horsepower) (391 [kW](http://en.wikipedia.org/wiki/Kilowatt%22%20%5Co%20%22Kilowatt)) [Siemens](http://en.wikipedia.org/wiki/Siemens) Jupiter [radial engines](http://en.wikipedia.org/wiki/Radial_engine%22%20%5Co%20%22Radial%20engine) (6 tractor propellers and 6 pushers), mounted in six tower nacelles on the wing. The air-cooled [Jupiter](http://en.wikipedia.org/wiki/Bristol_Jupiter%22%20%5Co%20%22Bristol%20Jupiter) engines were prone to overheating, and only able to lift the plane to an altitude of 425 m (1,400 ft). The engines were supervised by an engineer, who also controlled the throttle. The pilot would ask the engineer to adjust the power, in a manner similar to that used on maritime vessels. After completing 103 flights in 1930, the Do X was refitted with 610 hp (450 kW) [Curtiss](http://en.wikipedia.org/wiki/Curtiss-Wright_Corporation%22%20%5Co%20%22Curtiss-Wright%20Corporation) Conqueror [water-cooled](http://en.wikipedia.org/wiki/Water-cooled%22%20%5Co%20%22Water-cooled) 12-cylinder [inline engines](http://en.wikipedia.org/wiki/Inline_engine_%28aviation%29%22%20%5Co%20%22Inline%20engine%20%28aviation%29). Only then was it able to reach the altitude of 500 m (1,650 ft) necessary to cross the Atlantic.

The plane was designed to carry 66 passengers long distance or 100 on shorter flights. The luxurious accommodation approached the standards of transatlantic liners. On the main deck was a smoking room with its own [wet bar](http://en.wikipedia.org/wiki/Wet_bar%22%20%5Co%20%22Wet%20bar), a dining salon, and seating for the 66 passengers, which could be converted to sleeping berths for night flights. Aft of the passenger spaces was an all-electric galley, lavatories, and cargo hold. The cockpit, navigational office, engine control and radio rooms were on the upper deck. The lower deck held fuel tanks and nine watertight compartments, only seven of which were needed to provide full flotation.

**Operation**

The engineer in the machine centre operated the throttles of the 12 engines

The *Flugschiff* (flying ship), as it was called, was launched for its first test flight on 12 July, 1929 with 14 crew. In order to satisfy skeptics, on its 70th test flight on 21 October the plane carried 169 people; 150 passengers (mostly production workers and their families, and a few [journalists](http://en.wikipedia.org/wiki/Journalist%22%20%5Co%20%22Journalist)), 10 crew and 9 'stowaways', who did not hold tickets for the already popular plane. The flight broke the [world record](http://en.wikipedia.org/wiki/World_record%22%20%5Co%20%22World%20record) for the number of people aboard an airplane, not to be beaten for another fifteen years. The plane taxied for 50 seconds before slowly ascending to an altitude of only 200 m (650 ft). As a result of the ship's size, passengers were asked to crowd together on one side or the other to help the aircraft make turns. It flew for 40 minutes at a maximum speed of 170 km/h (105 mph), finally landing on Lake Constance.

To introduce the plane to the potential United States market the Do X took off from [Friedrichshafen](http://en.wikipedia.org/wiki/Friedrichshafen%22%20%5Co%20%22Friedrichshafen), [Germany](http://en.wikipedia.org/wiki/Germany) on 3 November 1930, piloted by [Friedrich Christiansen](http://en.wikipedia.org/wiki/Friedrich_Christiansen%22%20%5Co%20%22Friedrich%20Christiansen), commencing a transatlantic test flight, with New York as intended final destination.[[1]](http://en.wikipedia.org/wiki/Dornier_Do_X#cite_note-SM-0#cite_note-SM-0) The route took the Do X to the [Netherlands](http://en.wikipedia.org/wiki/Netherlands%22%20%5Co%20%22Netherlands), [England](http://en.wikipedia.org/wiki/England), [France](http://en.wikipedia.org/wiki/France), [Spain](http://en.wikipedia.org/wiki/Spain), and [Portugal](http://en.wikipedia.org/wiki/Portugal%22%20%5Co%20%22Portugal). The journey was interrupted at [Lisbon](http://en.wikipedia.org/wiki/Lisbon%22%20%5Co%20%22Lisbon) on 29 November 1930, when a [tarpaulin](http://en.wikipedia.org/wiki/Tarpaulin%22%20%5Co%20%22Tarpaulin) made contact with a hot exhaust pipe and started a fire that consumed most of the portside wing. After sitting in Lisbon harbor for six weeks while new parts were fabricated and the damage repaired, the flying boat continued (with several further mishaps and delays) along the Western African coast, across the Atlantic to South America (where the crew were greeted as heroes by the local German émigré communities).

The aircraft then went north to the United States, finally reaching [New York](http://en.wikipedia.org/wiki/New_York_City%22%20%5Co%20%22New%20York%20City) on [27 August](http://en.wikipedia.org/wiki/August_27) [1931](http://en.wikipedia.org/wiki/1931).[[1]](http://en.wikipedia.org/wiki/Dornier_Do_X#cite_note-SM-0#cite_note-SM-0) Here the plane and crew spent the next nine months as the Do X's engines were overhauled, and thousands of sightseers made the trip to Glenn Curtiss Airport (now [LaGuardia Airport](http://en.wikipedia.org/wiki/LaGuardia_Airport%22%20%5Co%20%22LaGuardia%20Airport)) to tour the leviathan of the air. However, the economic downturn of the [Great Depression](http://en.wikipedia.org/wiki/Great_Depression) scrubbed Dornier's marketing plans. The return trip began on [21 May](http://en.wikipedia.org/wiki/May_21) [1932](http://en.wikipedia.org/wiki/1932) from New York to [Newfoundland](http://en.wikipedia.org/wiki/Newfoundland_%28island%29%22%20%5Co%20%22Newfoundland%20%28island%29), on to the [Azores](http://en.wikipedia.org/wiki/Azores%22%20%5Co%20%22Azores), and finally landing on [Müggelsee](http://en.wikipedia.org/wiki/M%C3%BCggelsee%22%20%5Co%20%22M%C3%BCggelsee), [Berlin](http://en.wikipedia.org/wiki/Berlin) on 24 May,[[1]](http://en.wikipedia.org/wiki/Dornier_Do_X#cite_note-SM-0#cite_note-SM-0) where the Do X was met by a cheering crowd of 200,000.

**Final Fate**

Germany's original Do X was turned over to [Lufthansa](http://en.wikipedia.org/wiki/Lufthansa%22%20%5Co%20%22Lufthansa), the national airline, after the financially strapped [Dornier](http://en.wikipedia.org/wiki/Dornier%22%20%5Co%20%22Dornier) Company could no longer operate it. After a successful 1932 tour of German coastal cities, Lufthansa planned a Do X flight to [Vienna](http://en.wikipedia.org/wiki/Vienna%22%20%5Co%20%22Vienna), [Budapest](http://en.wikipedia.org/wiki/Budapest), and [Istanbul](http://en.wikipedia.org/wiki/Istanbul%22%20%5Co%20%22Istanbul) for 1933. The voyage ended after nine days when the plane's tail section tore off during a botched, over-steep landing on a [reservoir](http://en.wikipedia.org/wiki/Reservoir%22%20%5Co%20%22Reservoir) lake near the city of [Passau](http://en.wikipedia.org/wiki/Passau%22%20%5Co%20%22Passau).[[1]](http://en.wikipedia.org/wiki/Dornier_Do_X#cite_note-SM-0#cite_note-SM-0) While the fiasco was successfully covered up and the plane repaired, it was then flown to Berlin,[[*clarification needed*](http://en.wikipedia.org/wiki/Wikipedia%3APlease_clarify)] where it became the centerpiece of Germany's new aviation museum in 1934.

It remained an exhibit until it was destroyed in a [RAF](http://en.wikipedia.org/wiki/RAF%22%20%5Co%20%22RAF) air raid during [World War II](http://en.wikipedia.org/wiki/World_War_II%22%20%5Co%20%22World%20War%20II) in late November 1943. While never a commercial success, the Dornier Do X was the largest aeroplane of its time, a pioneer in demonstrating the potential of an international passenger air service and one of the most impressive aircraft built. A successor, the [Do-XX](http://en.wikipedia.org/w/index.php?title=Do-XX&action=edit&redlink=1" \o "Do-XX (page does not exist)), was envisioned by Dornier but never advanced beyond the design study stage.

**Further models**

Three Do Xs were constructed in total: the original operated by [Dornier](http://en.wikipedia.org/wiki/Dornier%22%20%5Co%20%22Dornier), and two other machines based on orders from [Italy](http://en.wikipedia.org/wiki/Italy%22%20%5Co%20%22Italy) - the X2 (named *Umberto Maddalena*) and X3 (named *Alessandro Guidoni*). The Italian variants were essentially identical to the original with the exception of the powerplant and engine mounts. Each craft was powered by [Fiat](http://en.wikipedia.org/wiki/Fiat%22%20%5Co%20%22Fiat) A-22R V12 water-cooled engines, with the six motor mounts being covered by a streamlined fairing. The Do X2 entered service in August, 1931, and the X3 followed in May, 1932. Both ships were based at the seaplane station at [La Spezia](http://en.wikipedia.org/wiki/La_Spezia%22%20%5Co%20%22La%20Spezia), on the [Ligurian Sea](http://en.wikipedia.org/wiki/Ligurian_Sea%22%20%5Co%20%22Ligurian%20Sea).

Italy's Do X3 *Alessandro Guidoni*, one of the three Do X's built.

Both orders originated with [SANA](http://en.wikipedia.org/wiki/Navigazione_Aerea%22%20%5Co%20%22Navigazione%20Aerea), then the [Italian](http://en.wikipedia.org/wiki/Italy%22%20%5Co%20%22Italy) state airline, but the aircraft were requisitioned and used by the Italian Air Force primarily for prestige flights and public spectacles. After plans for a first-class passenger service (Genoa-Gibraltar) were deemed unfeasible, the X2 and X3 may have been used for training and transport flights (one rumor has it that a Do X even ferried troops to [Ethiopia](http://en.wikipedia.org/wiki/Ethiopia%22%20%5Co%20%22Ethiopia) in February, 1935). No evidence exists of their fate; presumably they were quietly broken up for scrap around 1935.

**Operators**

* [Germany](http://en.wikipedia.org/wiki/Germany) : [Lufthansa](http://en.wikipedia.org/wiki/Lufthansa)

* [Italy](http://en.wikipedia.org/wiki/Italy) : [Regia Aeronautica](http://en.wikipedia.org/wiki/Regia_Aeronautica); SANA (state airline)

**Specifications (Do XIa)**

**General characteristics**

* Crew: 10-14
* Capacity: 66-100 passengers
* Length: 41 m (134 ft 2 in)
* [Wingspan](http://en.wikipedia.org/wiki/Wingspan): 48 m (157 ft 5 in)
* Height: 10 m (33 ft)
* Wing area: 450 m² (4,844 ft²)
* Empty weight: 28,250 kg (62,280 lb)
* [Max takeoff weight](http://en.wikipedia.org/wiki/Maximum_Takeoff_Weight): 56,000 kg (123,460 lb)
* Powerplant: 12× [Curtiss Conqueror](http://en.wikipedia.org/wiki/Curtiss_Conqueror) water-cooled 12-cylinder inline, 455 kW (610 hp) each

Performance

* [Maximum speed](http://en.wikipedia.org/wiki/V_speeds#Vno): 211 km/h (131 mph)
* [Cruise speed](http://en.wikipedia.org/wiki/V_speeds#Vc): 175 km/h (109 mph)
* [Range](http://en.wikipedia.org/wiki/Range_%28aircraft%29): 1,700 km (1,056 mi)
* [Service ceiling](http://en.wikipedia.org/wiki/Ceiling_%28aeronautics%29): 500 m (1,650 ft)