

Fokker D.V111



This edition of scale matters focuses on the Fokker D.V111.

The FOKKER D.V111 is considered to be the finest German fighters of World War 1, it combined all that had been learnt during the years of aerial combat. The prototype designed by Reinhold Platz was chosen by the German High Command as a result of a flyoff competition at Aldershof, the Dv111's design and performance totally dominated the other aircraft entered. Twelve companies entered 25 prototypes, five of these were Fokker monoplanes.

In the competition. It was nick named the "Flying Razor" due to its unique parasol wing. If the war had continued the D.V111 would have replaced the very successful D.V11.

The first D.V111's entered service at the front in April 1918 and all the pilots that had the pleasure of flying the D.V111 were delighted with the performance of this new fighter. It had outstanding manoeuvrability and a superb climb rate. The initial introduction of the D.V111 was then suspended due to three unexplained crashes.

Production of the D.V111 resumed in September 1918 after an investigation that revealed that the crashes were caused by wing failure due to poor workmanship and substandard

materials. The second production batch of D.V111 reached the front in late October 1918 with only three weeks left till the end of the war the D.V111

The key design elements of the D.V111 was the high mono wing configuration known as a parasol wing. This provided the pilot with very good downward visibility. The wing was relatively thick which enabled the wing to be a cantilever design and fully internally braced. The wing was completely sheeted with plywood which provided a very ridged and strong structure. The parasol wing was also tapered in both width and length which increases aerodynamic efficiency and reduced weigh of the structure. A cantilever wing does not need to be as thick at the tips as the distributed load is least at the tips. The tapered wing also reduces damping in roll allowing for a more effective aileron response for a given aileron size. Other design feature were taken from several other successful aircrafts. The steel-tube and fabric covered fuselage and cowling borrowed from the Dr 1 triplane and the tail section from the D.V11. The engine was the Oberursel rotary engine with 110 horse power which was also used in the Dr.1 Fokker Triplane.

Fokker D.V111 Specification

DIMENSIONS.

Over-all span: 27 feet 7 inches.

Over-all length: 19 feet 4 inches.

Over-all height: 8 feet 6 inches.

At rest: 5 feet 8 1/2 inches.

Engine: 110 H.P. Oberursel.

Propeller: Axial 01476.

Weight empty 848 pounds.

Armament and equipment: 74 pounds.

Crew: 180 pounds.

Gasoline: 113 pounds.

Oil: 23 pounds.

Weight loaded: 1,238 pounds.

Weight per square foot: 11.45 (108 square feet)

Weight per horsepower: 9 (137 H.P. at 1,390 R.P.M.).

Endurance, full throttle at 10,000 feet (including climb): -----

Minimum speed at sea level (lowest throttle): 59 M.P.H.

Landing Speed: 55 M.P.H

WING

Wing Curve: Fokker varying.

Total area, including ailerons: 108 square feet.

UPPER PLANE wing including centre section

Span: 27 feet 7 inches.

Chord: 4 feet 11 inches

Sweepback: 3 3/4 inches.

Area with ailerons: 108 square feet.

Arrangement: On trailing edge of wing.

Upper length: 5 feet 2 1/8 inches.

Upper chord: 10 3/8 inches.

Distance from center of ailerons to longitudinal axis of airplane: 10 feet 3 1/2 inches.

STABILIZER.

Setting: 3.5 deg positive.

FUSELAGE.

Maximum cross section shape:
Round.

Maximum cross section dimension:
3 feet 6 1/2 inches.

LANDING GEAR.

Number of wheels: 2.

Tread: 5 feet 9 5/8 inches.

Shock-absorbing system: Rubber
chord.

Braking device: Tail skid.

DISTRIBUTION OF WEIGHTS.

Weight, empty (with water): 385 kg
(848 lbs)

Armament and equipment: 34kg (74
lbs)

Crew: 82 kg (180 lbs)

Gasoline: 60 kg (113 lbs)

Oil: 10.5 kg (23 lbs)

Weight, loaded: 562 kg (1,238 lbs)

Weight on front wheels (tail skid on
ground): 468 kg (1,032 lbs)

Weight on tail skid (tail skid on
ground): 93 .4 kg (206 lbs)

Weight on front wheels (flying
position): 510.7 kg (1,126 lbs)

Weight on tail skid (flying position):
51 kg (112 lbs)

DESCRIPTION OF POWER PLANT.

ENGINE.

Make: Oberursel.

Factory No.: 3332.

A.S. No.: -----

Type: 9-cyl. rotary.

Number in plane: 1.

Location: Nose of fuselage.

Rated H.P.: 110 H.P.

Rated R.P.M.: 1,390.

Bore: 112 m/m or 4.41".

Stroke: 170 m/m; 6.693"

Compression ratio: 4.7:1

Weight, dry: 331 pounds

IGNITION.

Battery or magneto: Magneto

Make: Bosch

Number: 1.

Advance, degrees: 22 deg.

Plugs, make: Bosch 17 D-V.

Type: Metal body, porcelain
insulator.

Gap: 0.020.

CARBURETORS.

Make: Rene Tampier

Type: Bloc tube.

Number: 1.

Mixture control: Manual operated.

COOLING

Air cooled.

EXHAUST PIPES.

Description: No exhaust pipes used, gases exit through exhaust valve.

LUBRICATION.

Capacity oil tank: -----

Dimensions oil tank: -----

Oil used (brand): Castor.

Oil pressure: 2 lbs per sq. in.

Type pump: 4-cylinder plunger
Gnome type.

Description lubrication system: Oil enters pump, is forced through tube

PILOTS OBSERVATIONS

The airplane has a tendency to turn to the right in taxiing, takes off very quickly, climbs very rapidly, and is very manoeuvrable.

It is very easy to fly, and the controls are sensitive. It is tail heavy, but so light on the controls that it is not tiresome to fly.

The visibility is very good.

The machine guns are placed that in the event of a crash, the pilot would undoubtedly be injured by being thrown against the same.

The airplane lands very slowly with a slight tendency to drop the right wing, and to turn to the right on the ground.

The controls for the engine are very inconveniently located, inasmuch as the throttle for the gas is on the left of the fuselage, and the throttle for the air is on the left side of the control stick.

in hollow crank shaft to rear main bearing, remainder of oil to wrist pins, the line through crank shaft is carried on forward and oils front main bearings.

FUEL SYSTEM.

Number of tanks: 1

Location: Fuselage, just rear of engine.

ENGINE CONTROL.

Description: Rod and lever.

PROPELLER.

Make: Edulzug Axial

Number of blades: 2.

Diameter: 260 m/m or 10.21'.

Tips: Not tipped

Some fine reference material.

Vintage Aviator has some fantastic photos of their DV111 replica that they have posted on their web site, these photos provide some really good reference information for the aeromodeller.

<http://thevintageaviator.co.nz/projects/aircraft/fokker-dviii/detail/walkaround?page=0%2C0>

This site sells some really good aviation books especially for the Fokker D.V111 that have many detailed reference photos and drawings. This is the ultimate source for information on the structural details of this unique airplane.

http://www.collectors-edition.de/QAU/InDetail/FokD8/FokD8_english.htm

From the National Aeromodellers and aviators Society Canberra A.C.T. members photo album.

<http://www.naas.org.au/gallery%20Members%20aircraft>

Modelling the FOKKER D.V111

The D.V111 is a very interesting aeromodelling subject, it has all the characteristic to be a very good flying model aircraft as well as a very interesting aircraft. The German colour schemes that the D.V111 were painted in are amount the most beautiful presented aircraft of the time.

Enter John Gottschalk

My dear friend John Gottschalk from Melbourne is a master aeromodeller. John G is a national treasure and one of the finest examples of a master aeromodeller that we have in Australia. John G has a lifetime of aeromodelling master pieces under his belt and is currently finishing another master piece, this time a ¼ scale Fokker D.V111. John G is hopping to have this model finished and ready to fly to commemorate the centenary of the D.V111 first flights.



John G is a very humble delightful man, and an absolute expert model builder, he has an enormous wealth of knowledge on World War 1 aircraft and freely shares his knowledge, he is a highly skilled innovator and fabricator of model machines. John G is also one of the funniest characters I have ever had the pleasure to meet.

The following information highlights some of John G's progress on his D.V111 and provides an insight into the skill, commitment and scale modelling passion that he displays.

Fuselage

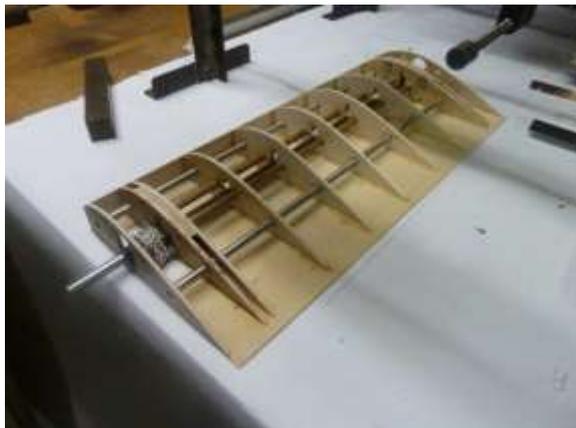


The fuselage is constructed in a similar way to the original aircraft except it is predominantly hard wood longerons (a longitudinal structural component of an aircraft's fuselage) instead of welded tubes. Ply box section is used for the front of

the fuselage to provide a solid engine bulkhead and to attach the cabane inter plane struts and undercarriage mounting. Carbon fibre solid rod has been used to provide bracing instead of wire and makes for a very strong structure.



Undercarrage



John G has replicated the undercarriage in a very similar way to the original aircraft. This method proves to be very effective and over time the bungee cord can be adjusted to set the correct spring rate. Having a sprung undercarriage reduces the shock loading on the whole aircraft considerably and helps the aircraft survive the test of time.



John G has machined nylon or delrin axil bushings to hold the bungee cord in place and provide the required spacing bush for the wheel, note the axil has been drilled to allow a split pin to hold the wheel on.



Wheels

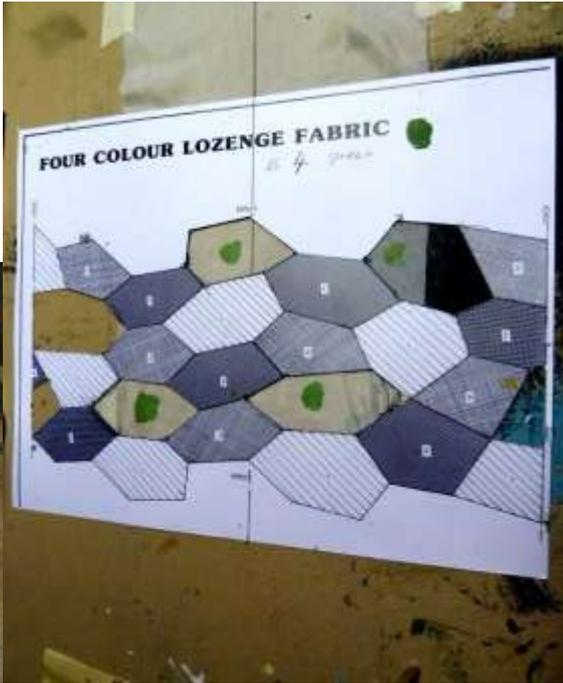


John G has fabricated the wheel by spinning them up on the lathe and making them out of several pieces. The wheels are very strong and have been lightened using an end mill. The spokes are simulated using balsa triangles and once covered they really look good.



The wheel tire is fabricated using rubber tube or solid, a range of which can be found at Clark rubber.

Colour Scheme



Starting with the 4 pots of weather shield paint a hand traced stencil a nice brush and many hours of work, the end result looks fantastic..





Pilot accommodation



John G has produced some really nice detail in the pilot's seat and harness including the functioning buckles. The pilot looks very pleased to be in the hot seat. The view over the two machine guns really looks the part.



I hope to report on more progress by John Gottschalk in the next addition of scale matters. We are heading up to Caboolture Airfield to the The Australian Vintage Aviation Society Great War flying display over the 21st and 22nd April and may get some more detailed photos of replica D.V111's.

Until next time happy building and plenty of flying.