

Fokker D.XVI Panther Omega Models¹ resin kit

Sesquiplane fighter

Scale 1:72

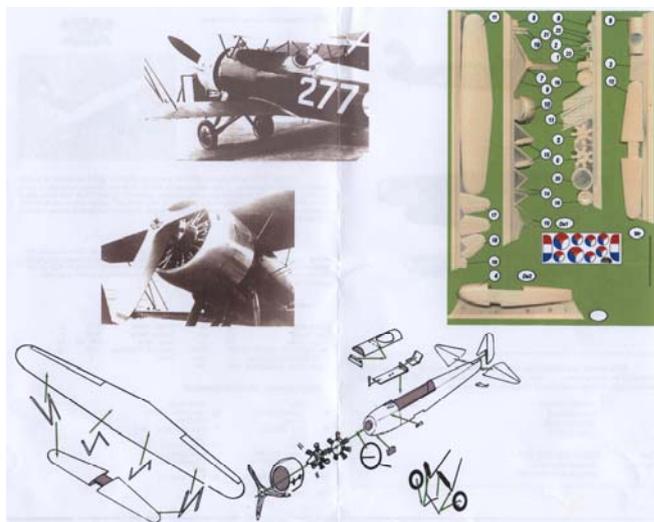
The Fokker D.XVI was the successor of the Fokker D.VII with the Dutch Army Air Department (LVA, Luchtvaart Afdeling). It has been introduced in 1929 in small numbers and there were expectations to sell it, equipped with different engines, also to the Netherlands East Indies Army Air Department (KNIL LA) and to Italy and Hungary. These expectations did not materialize; only a couple of demonstration machines have been sold to Italy, Hungary and finally China. The Dutch D.XVI had originally a 460 hp Armstrong Siddeley Jaguar engine. A difference with the prototypes was the removal of the big wing-bracing strut to the forward fuselage and the wheel axle and a modification of the cabane strut structure (\ / instead of Λ shape).

One of Dutch D.XVI's, the "277" shown in the picture above in its original state, has been modified in 1932 with the stronger Armstrong Siddeley Panther III engine, was in 1935 provided with a NACA cowling and a wooden three-bladed propeller (see the picture at the right), and in 1936 upgraded to the Panther VII. To prevent gun synchronization problems the machine guns were removed. The three-bladed propeller has probably been introduced to maintain the same undercarriage, while accommodating the more powerful engine. The modified 277 has been used for experimental and demonstration purposes and is the subject of this kit in its 1935-1936 version. The D.XVI was replaced from 1933 onwards as a fighter by the D.XVII, which was set-up very much along the same lines, although the last aircraft, the 277, was still in service in 1940.



ity, although my kit contained a fuselage with a weak point, that I had to repair with some putty. Some parts are really very small, like the balance weights for the ailerons and the Venturi tubes, and very well detailed. The NACA cowling is a bit too short, and the fin-rudder needs some correction. The location of the inter-wing struts at the upper wing is not symmetrical and needs correction also. The inter-wing struts are, as usual with resin kits (or kits in this scale in general), a bit oversized (1.0 x 1.2 mm); the undercarriage struts

The kit comes in a sturdy carton box, which contains the 34 resin parts contained in five separate plastic bags, a set of decals printed on a white base lacquer (so they have to be cut out carefully before applying them), a length of 0.6 mm diameter metal wire and an instruction sheet. The decal sheet contains also a decal for the instrument panel. There is no material included for the windscreen. The resin parts are of good qual-



are well proportioned. I guess giving the inter-wing struts the very small diameter of some undercarriage parts (1.0 mm) will make them too fragile to handle and support the weight of the upper wing.

The instruction sheet contains an overview of the parts contained in the kit, a three-view colour drawing of the aircraft (not to scale of the kit) three photographs of the “277” and an exploded view. Some parts cannot be located on the exploded view and the drawing (the exact position of the balance weights and the Venturi tubes no. 23, what to do with the two different oil coolers no. 8 provided). I had to use pictures as the one shown below from my book collection (in this case ref. 4) to find an answer to these questions.

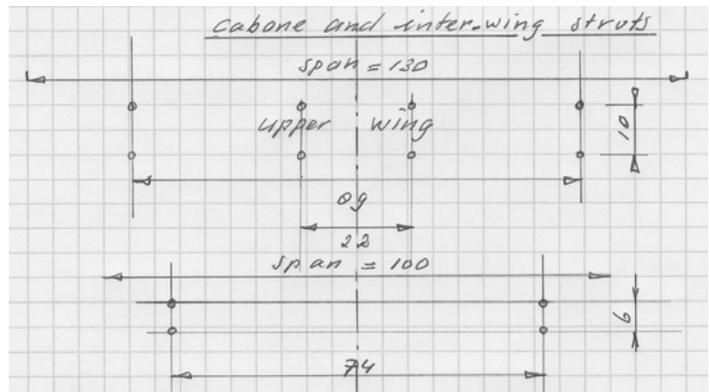
The painting instructions are limited to a list of paint colours (AGAMA and Humbrol codes) to be used without an indication for which parts to use them. The colours suggested for the outside surfaces (Humbrol Matt Chocolate 98 and Matt Blue 25) deviate rather strongly from those listed in De Groot (ref. 12), who recommends LVA khaki RAL 6014 and LVA blue RAL 5018.

Alting (ref. 1), Franquinet (ref. 2), Hegener (ref. 3), Hooftman (ref. 4), Schoenmaker (ref. 5), Wesselink (ref. 6), Gerdessen (ref. 7), Vliegwereld (ref. 8), Fokker Bulletin (ref. 10) and Postma (ref. 11) report the dimensions of the D.XVI, but only Gerdessen does include these for the version with the Panther engine. Franquinet, Hegener, Gerdessen, Vredeling (ref. 9) and Fokker Bulletin show three-view drawings. The kit is slightly too long² and too high (as most kits are), but deviations are acceptable.

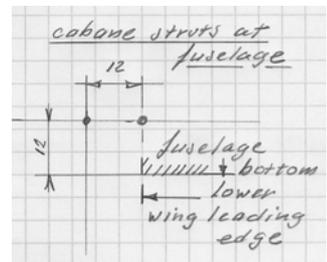
	Ref. ³	1:72	model
Span (upper wing)	9.17-9.40 m	127.4-130.6 mm	130.5 mm
(lower wing)	7.12 m	98.9 mm	99.8 mm
Length	7.20-7.34 m	100.0-101.9 mm	104.1 mm
Height	2.47-2.75 m	34.3-38.2 mm	40.4 ⁴ /42.7 mm
Engine	Armstrong Siddeley Panther III, VII, 590 hp		
Crew	1		
Armament	2 machine guns Vickers M20, FN-Browning M36 ⁵		

Detail dimensions

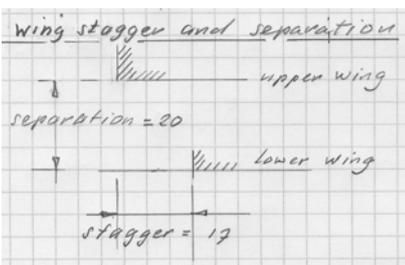
As I wanted to build a nicely detailed model, I have examined the photographs and books in my library on the detailed dimensions of the D.XVI, and specifically of the “277” (the exact positions and diameter of inter-wing, cabane and undercarriage struts, wing separation and stagger, control cable and bracing wire routing). Dimensions are taken in principle from original Fokker drawings (Vredeling, drawings 10664 and 16500) and, when not available there, from the three-view drawings in the booklet of Gerdessen.



The lower wing should have a V-shape of 1.5 mm both sides over its span of 100 mm. The resin part is almost flat and needs to be adjusted a little, something that is easily done prior to assembly by bathing it in hot water and letting it cool down on a flat surface weighting it down in the middle, while lifting the wing tips with plastic strips of 1.5 mm.



The upper wing has the holes for the wing strut position in an asymmetrical location, and the strut location on the upper surface of the lower wing is not indicated at all. The N strut diameter is 60 mm (0.83 mm in 1:72 scale); that of the cabane struts 45 mm (0.63 mm). The rear landing gear struts have the correct diameter (1 mm). The other results are shown in the drawings (dimensions in mm).



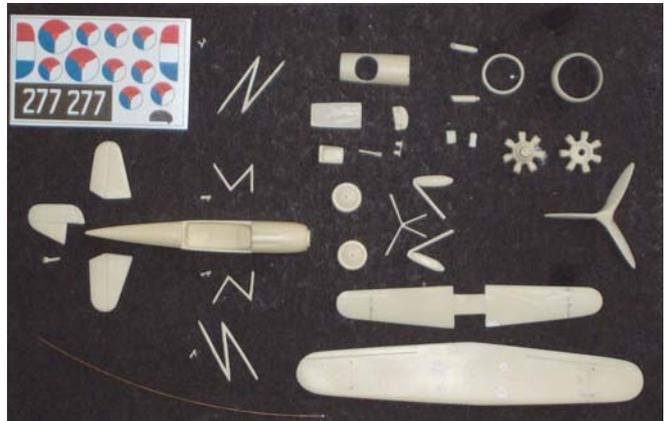
The Venturi tube location is in the middle between both lower wing spars, about 9.5 mm from the lower fuselage surface.

The control cable routing is difficult to reconstruct; from one picture it seems that a double aileron control cable is routed from the fuselage to both sides of the upper wing at the forward cabane strut attachment. There is a

connection of the aileron cables to the balance weights on top of the ailerons, and it looks like there is a conventional connection to a control horn at the lower side of the aileron (the prototype had conventional control horns at top and bottom of the ailerons). From the drawing the internal routing of the elevator and rudder cables is clear, but the location where they leave the fuselage cannot be distinguished clearly on the photographs, except that it has to be after the place where the fuselage roundels are attached. Rudder control horns are located on the hinge line 1.2 mm from the bottom of the rudder.

Bracing wire routing has been derived completely from Gerdessen and photographs.

All locations were marked on the resin parts, and small holes were drilled to accommodate struts and cables. The picture at the right shows the parts of the kits after cleaning them. When checking the dimensions of the inter-wing struts it appeared that they were too wide at the bottom (8 mm in stead of 6). This might be corrected, but may change the vertical position. I have opted to construct new inter-wing struts from plastic rod material, offering also the opportunity to go to a smaller diameter. The picture at the right shows the cleaned parts of the kit. The rudder paddles have been borrowed from another kit.



Painting scheme

The painting scheme is given in the table. Numbers are Humbrol codes.

2	Emerald	Navigation light	11	Silver	Seat belt fixtures, NACA cowling inside and outside, engine crankcase, propeller hub
15	Midnight blue	Lower part rudder, propeller tips	19	Bright red	Navigation lights, upper part rudder, propeller tips
22	White	Middle part rudder, propeller tips	33	Matt black	Tyres, inside exhaust tubes, oil cooler, front surface air inlet
53	Gun metal	Engine cylinders	110	Natural wood	Propeller
113	Rust	Exhaust tubes	115	Russian blue 6 (LVA blue)	Fuselage, wing and tail lower surfaces
117	US light green (green)	Seat belts	125	US dark grey (dark grey)	Controls, seat, cockpit tubes, instrument panel, Venturi tubes, cockpit stairs, inter-wing cabane, tail and undercarriage struts, engine air inlet
129	US gull grey (light grey)	Fuselage inside	66+	LVA khaki	Fuselage top and sides, wing and tail upper surfaces
			163	50/50	

Decals

I have not used the roundel decals supplied with the set; I prefer those of Dutch Decal. The registration number decals have been carefully cut out and the individual digits transferred to the fuselage.

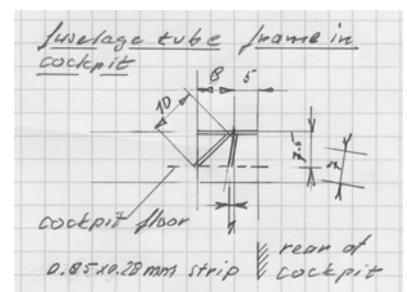
Cockpit

The inside of the cockpit, the lower side of the cockpit cover and the bottom panel have been painted light grey; the pilot's seat, rudder pedals, control stick and instrument panel, dark grey and have been assembled. I took a set of seat belts from my stock and painted them green and the fittings silver. Rudder pedals and stick have been glued to the cockpit floor and the floor glued inside the fuselage. To make it fitting well relative to the instrument panel and the hole in the cockpit cover, I had



to cut about one mm off the back end of the platform.

The welded tube frame inside the cockpit has been simulated with small bits of 0.85 x 0.28 mm dark grey painted plastic strip according to the drawing at the right. It has been installed prior to the pilot seat. The hip seat belts of the set were glued to the pilot seat. According to photographs the shoulder



straps were attached to the outside side of top of the fuselage behind the pilot. The instrument panel decal has been transferred to the instrument panel and the panel glued in place.

Fuselage and tail planes

The cockpit cover has been glued to the fuselage, and the joint finished flush. The top elevator control cables leave the fuselage at 15 mm from the rudder hinge line and 8 mm from the fuselage bottom; the bottom elevator cables at 15 mm and 3 mm from the fuselage bottom and the rudder control cables at the location of the horizontal tail plane leading edge 1.5 mm above the fuselage bottom. The aileron control cables at the fuselage top 55.5 mm from the rudder hinge line and at 4 mm from the fuselage centre line. At all these locations 0.3 mm holes have been drilled, sloped as much as possible in the direction of the cable routing towards the control horns or the upper wing. At the location of the Venturi tubes a 0.8 mm (superficial) hole has been drilled

I have glued the lower wing to the fuselage and corrected the joint. I have drilled 1.4 mm diameter superficial holes at the locations where the undercarriage is attached to the fuselage (at the location of the lower wing front spar, 2.5 mm behind the wing's leading edge and at the location of the upper wing front spar, 12 mm before the lower wing's leading edge). 0.3 mm holes have been drilled at the location of the cockpit stairs (5 mm behind the lower wing trailing edge). Wing and fuselage have been painted according to the painting scheme and decals have been applied to the fuselage.

When fitting the rudder cum fin to the fuselage the lower side was not flush with the fuselage lower side. I have corrected this by removing 1.5 mm from the lower edge of the fin. I have attached the control horns to the rudder 1.5 mm above the lower edge. The rudder has been painted red, white and blue and the fin LVA khaki before gluing it to the fuselage.

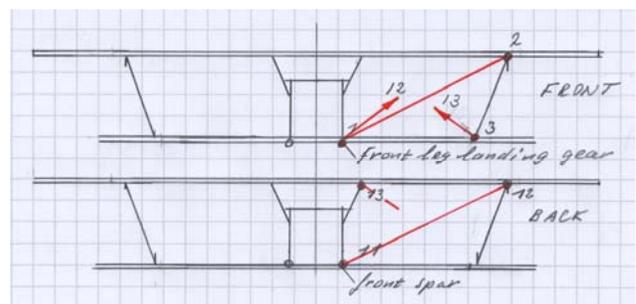
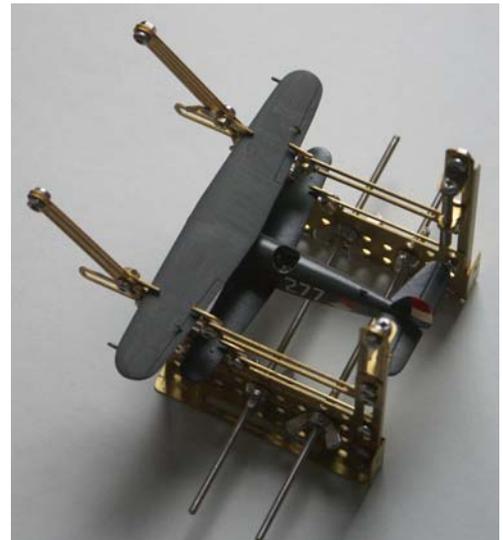
Wing

Prior to assembly of the upper wing 0.3 mm holes have been drilled at the locations where control cables for ailerons, rudder and elevator leave the fuselage and the upper wing. Rudder, elevator and lower side of the ailerons have been provided with control horns left over from a HR Model photo-etched set of spoked wheels. I have mounted navigation lights made from 1.2 mm diameter plastic rod to the upper wing tips and the top of the rear fuselage and balance weights have been mounted to the ailerons.

The location of the cabane struts at the upper wing has been corrected (22 mm separation in stead of 24 mm in the kit) and the holes in the lower wing have been drilled according to the drawing. I have used the Aeroclub biplane assembly jig to assemble the wing. The wing stagger of the D.XVI is too large for the assembly jig, so I had to remove some bolts to allow for it. I have fitted the inter-wing and cabane struts after positioning the lower wing and fuselage and the upper wing correctly in the jig. For the inter-wing struts I have used 0.85 mm plastic rod material, for the cabane struts 0.65 mm plastic rod. The tail plane struts are produced from 0.5 mm plastic rod. All struts have been painted dark grey prior to assembly (with a small touch up afterwards). After assembly also the wing paint had to be retouched on some places, as it had been damaged in the jig.

The 0.3 mm holes for the bracing wires have been drilled in the struts and the forward fuselage at front undercarriage leg and the lower wing spar in this phase according to the drawing at the below. Also the holes for the horizontal and vertical stabilizer bracing have been drilled.

After construction of the struts in the jig I have compared them to the struts supplied in the kit. It appears that the inter-wing struts are a bit too long (they correspond to a wing separation of 22 mm); the cabane struts have the correct length. There is some uncertainty about the positioning of the rear cabane strut; according to some photographs and drawings of the prototype (with the A-shaped cabane construction) it seems to be at



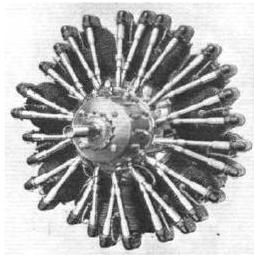
tached to the fuselage at a more rearward position than according to the one drawing of the production D.XVI in Gerdessen. I have chosen the position according to Gerdessen.

Undercarriage

I have mounted first the undercarriage legs (parts 15), using the crossbars (part 19) to determine the correct angle. The crossbars need considerable rework to fit nicely and two short pieces of 1.05 mm plastic rod have to be mounted at the lower ends to be able to attach the wheels. Mounting the undercarriage is not easy, but after several tries I have managed. The picture shows the undercarriage assembly before retouching the paintwork and attaching the wheels. The tailskid is slightly too large; to obtain the correct "slope" of the aircraft when resting on its wheels I have removed the basis of the skid and have added a skate, as shown in the photographs of the 277.



Engine and propeller



The engine is well modelled in two parts. The central hub is slightly too long, so I took about 2 mm off. Although the valve rods are modelled in the resin, they show up too little, so I have glued 28 pieces of 0.3 mm metal strand in place after painting the cylinders gun metal and the crank case silver. First the left valve rods of each cylinder were attached and then the right ones. This way it resembles the Panther engine as depicted in Wikipedia (ref. 13) quite well. The ring shaped part of the exhaust has been joined and painted rust

brown, as well as the two straight exhaust tubes; the opening of the two exhaust tubes has been painted matt black. I have painted the propeller natural wood and on each tip narrow red, white and blue bands.



Cowling

The NACA cowling is not correctly modelled in the kit. The diameter/length ratio according to the available photographs is about 3/2, which corresponds to a length of 12 instead of 10 mm. This is conformed by another picture showing the 277 in perfect side view.



Also, the cowling on the pictures has clearly the shape of a parallel cylinder, while the cowling in the kit shows a decreasing diameter towards the rear (so more like a Townend ring). So I

have added a 2.5 mm wide strip of 0.55 mm thick plasticard to the rear of the cowling and have corrected the shape by several layers of putty and thorough sanding. The separation lines at both sides have been engraved anew and the cowling has been

painted silver inside and out. After the first coat of paint some unequal spots still needed correction. After final painting I have accentuated the separation line with a thin black liner. I have produced a small air inlet, which is missing in the kit, from scrap plastic and glued it to the lower side of the NACA cowling. The inlet has been painted dark grey with a matt black front surface.



Although the fuselage appears to be correctly shaped when comparing it to photographs and drawings of the D.XVI with Jaguar engine, too large a gap between the cowling and the fuselage is present, when fitting the engine and cowling to the fuselage. Apparently the shape of the fuselage of the original aircraft has been modified and rounded for the 277 with Panther engine to leave a narrower gap between cowling and the fuselage directly behind the engine. I have not corrected the fuselage for this discrepancy, as that is a lot of work (and I discovered it too late also), but such a modification would certainly improve the likeliness of the model. It also would make it easier to fit the exhaust pipes between the legs with shock absorber and the inner V-shape of the undercarriage, leaving also more room for the oil cooler. With the current model that is not possible; I had to fit them inside the V-shape.

Final assembly

On the model as it stands now a final coat of paint of top and bottom wing has been applied, the decals have been attached and an overall coat of satin varnish had been applied.

The engine and ring exhaust have been mounted to the fuselage next. As it is very crowded at the forward fuselage, the order of mounting the parts is rather important. For example fitting the oil cooler before the two exhaust pipes makes it impossible to pass the pipes through the undercarriage struts and mounting the Venturi tubes after the wing bracing cables risks damaging these. According to the photographs of the 277 the two engine exhausts should pass under the fuselage and over the undercarriage cross bars. This is not possible with the rather fat exhausts, so I have made them pass under the cross bars inside the main landing gears. It is better to produce new exhaust tubes of a smaller diameter from scrap material (a thing I did not do). From the pictures it also appears that they are slightly bent and a bit longer than the parts included in the kit. That way also more room would become available for fitting the oil cooler. After gluing the two exhaust pipes to the ring exhaust, the cowling has been attached. I have drilled two 0.3 mm holes in the smaller version of the oil cooler and inserted a short length of black painted 0.25 mm metal strand into them, as from the side view picture it appears that it is not directly mounted to the fuselage, but via some tubing (there is anyhow not enough place to fit them directly to the fuselage). The cooler has been glued to the fuselage just in front of the undercarriage legs over the exhaust pipes.



The cockpit stairs have been produced from 0.25 mm diameter wire and painted khaki. I have added control cables and bracing wires (0.08 mm fishing line). The Venturi tubes have been glued in the 0.8 mm holes in the fuselage. The bars stabilizing the wing bracing cables have been made out of 0.25 mm metal strand and glued in place. The seat belt shoulder straps have been glued in place.



The (very small) windshield has been cut from clear plastic, bent slightly and glued in place with white glue. The wing bracing cable stabilization bars are made of 0.25 mm metal strand, left in its original silver finish. They are glued in place with viscous cyano glue. To finish up I have glued the propeller in place. In summary the order of final assembly tasks was:

- | | | |
|-------------------------------------|---|--|
| 1. Venturi tubes, | 8. Control cables to elevator and rudder, | 15. Seat belt shoulder straps, |
| 2. Cockpit stairs, | 9. Last coat of paint top upper wing, | 16. Top and bottom aileron control cables, |
| 3. Aileron control cables, | 10. Engine with ring exhaust, | 17. Windscreen, |
| 4. Tail bracing cables, | 11. Two exhaust pipes, | 18. Wing bracing cable stabilization bars, |
| 5. Tail control cables to fuselage, | 12. NACA cowling, | 19. Propeller, |
| 6. Wing bracing cables, | 13. Wheels, | |
| 7. Horizontal tail plane struts, | 14. Oil cooler, | |

Note that all parts have been painted before assembly. Below some pictures of the finished model are shown.







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13. http://en.wikipedia.org/wiki/Armstrong_Siddeley_Panther#Specifications_.28Panther_VII.29

¹ www.omega-models.com

² Although Gerdessen quotes the same length for the Panther version of the D.XVI, it is conceivable that the larger engine led to a greater length.

³ Bold printed values from Gerdessen (ref. 7) for the Panther engined version.

⁴ In ground resting position.

⁵ Guns have been removed after introduction of the three-blade propeller for fear of malfunctioning of the synchronisation mechanism.

⁶ This colour is discontinued; a reasonable substitute is Humbrol 230 (Prussian Blue) and 47 (Sea Blue) in a 60/40 proportion.