

Fokker F.VIIa/1m Broplan vacuum kit

Monoplane Passenger

Scale 1:72

The Fokker F.VIIa was the temporary culmination of Fokker's initial passenger plane development. The aircraft, which appeared in March 1925, accommodated two pilots and eight passengers. It was an improved version of the F.VII (main modifications were a new wing and a completely revised undercarriage) and set, together with its derivatives the three-engined F.VIIa/3m and the F.VIIb/3m, the standard for passenger transport in the 1920's. The aircraft was also marketed in the USA, where it received the designation Model 6.

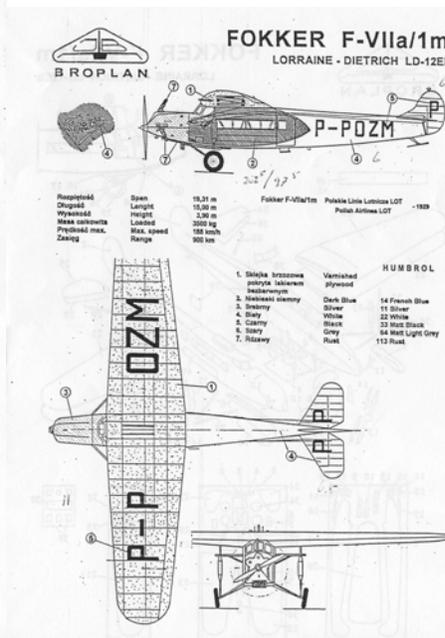
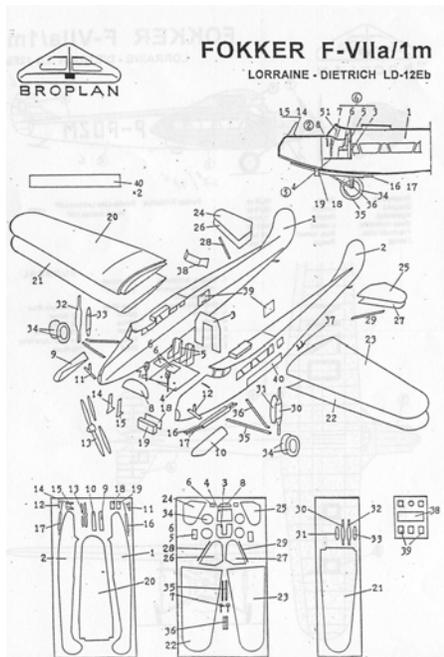
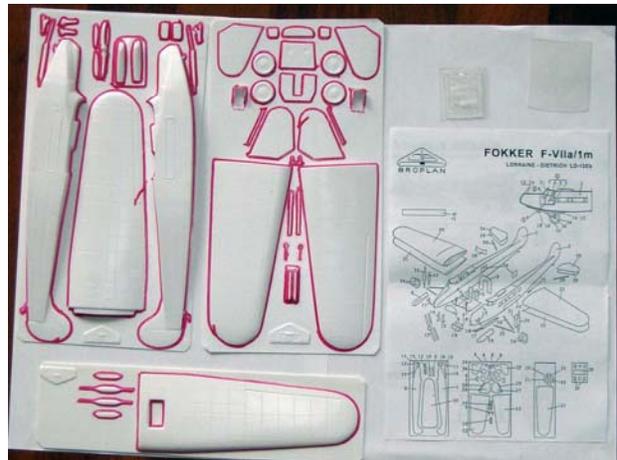


Photograph of sister aircraft of the model (ref. 1)

Kit contents



The kit is packed in a plastic bag and contains three sheets with vacuum formed parts, vacuum formed clear cockpit windows and a clear sheet for the cabin windows. The instruction sheet is rather concise. The kit contains many very small parts, which are difficult to remove from the sheet by the conventional sanding technique. Some details attached to the fuselage (e.g. tail skid) become that thin that they easily break off.



Assembly instruction sheet and painting instruction sheet. The wing has been painted with Humbrol 94.

The aircraft size as reported in literature is given in the table below. The relatively large length variation may be explained by the different engines mounted. Ref. 4, 5, 6, 7 and 23 include three-view drawings.

	<i>references</i>	<i>1:72</i>	<i>model</i>
<i>Span</i>	19.30 – 19.32 m	268.1 – 268.3 mm	268.7 mm
<i>Length</i>	14.35 – 14.60 m	199.3- 202.8 mm	204.0 mm
<i>Height</i>	3.69 – 3.90 m	51.3 – 54.2 mm	53.5 mm
<i>Engine</i>	Lorraine- Dietrich LD-12Eb, 450 hp		
<i>Crew/passengers</i>	2/8		

We may conclude that the scale of the kit (c.f. the bold printed values) is excellent.

Fuselage

The fuselage halves are removed from the sheet by sanding and windows of cockpit, cabin and doors are cut out. The two engine covers are manually cut from the sheet (no sanding, as they have a curved interface with the fuselage) and are cut to fit neatly on the nose. The joints to the fuselage are filled up with Milliput epoxy putty, which does not attack the soft polystyrene and are carefully sanded afterwards. As can be seen on the picture one half of the tailskid has been lost already.



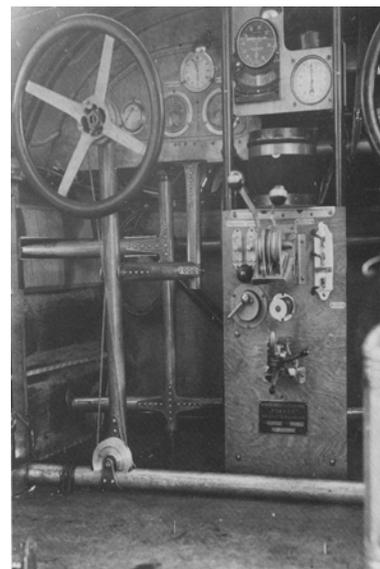
The two fuselage halves (left) and the assembled Lorraine- Dietrich LD-12Eb engine covers (right).

Narrow strips of plasticard are glued to the fuselage halves to allow for easy assembly. The front cabin bulkhead is attached to the fuselage sides and top by means of a U-profile to obtain a stiffer connection and an additional rear cabin bulkhead is produced to improve cabin stiffness. Fuselage interior is painted.



Fuselage halves interior painted and provided with gluing strips. Cockpit-cabin bulkhead mounted. In the middle the additional cabin rear bulkhead made from scrap material.

It appeared from pictures found in literature (ref. 2) that the instrument panel differs quite a lot from the simple arrangement in the kit. I have constructed a mid console is from plasticard strips and rod.

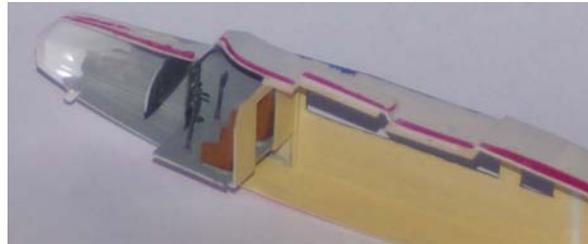


Cockpit interior F.VIIa/1m

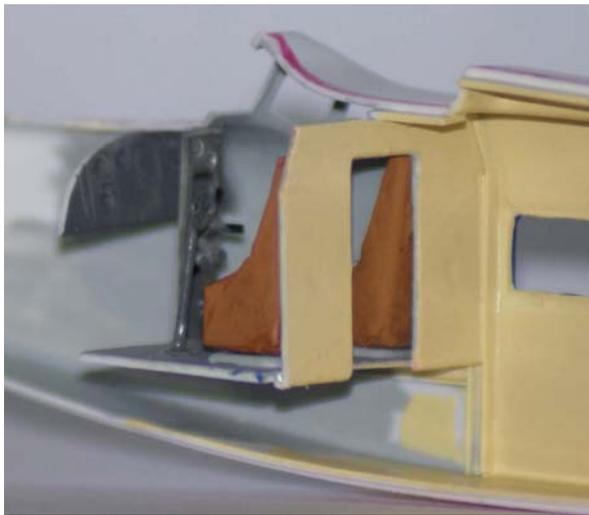


Mid instrument console

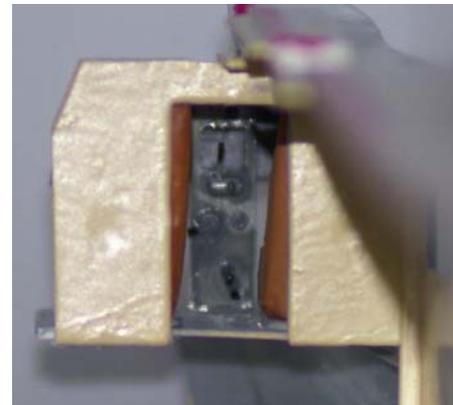
It was impossible to remove the control sticks provided with the kit from the plastic sheet without damaging them, so a new control sticks are constructed from plastic rod and small spoked wheels hubs from a set of HR Model wheels for WW I fighter aircraft.



Cockpit interior painted and mounted. Note the strips glued to the fuselage halves to enable easy and solid assembly of the fuselage halves



Close-up of cockpit interior



The mid instrument console seen through the front bulkhead

The cabin windows are cut from the clear plastic sheet about 2 mm larger than the cutouts in the fuselage. From picture and drawings it can be seen, that there are generally seven and a half cabin windows. Reproducing this exactly would have yielded square instead of rectangular windows, so I decided to model only six and a half window. With a sharp knife the vertical window frame styles are engraved, which are painted aluminium and then wiped off before drying, leaving a good representation of a window frame.

The steel tube frame of the fuselage passes at the inside in front of the windows in a characteristic W-shape and is in the real plane "hidden" in a plywood box. This is simulated in the model by small pieces of 2 x 0.3 mm polystyrene strip painted the same color as the cabin interior of three sides and the color of the fuselage outside on the fourth side.

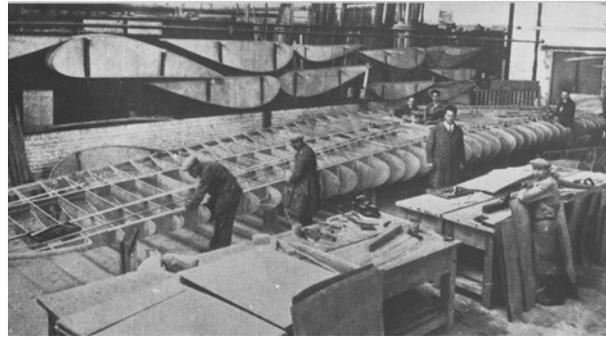
The outer side of the fuselage around the windows is painted in the final color scheme prior to assembling the windows. To obtain the paint pattern as indicated in the instructions, a model shape is cut from carton and the shape is transferred with pencil to the model's fuselage. When the paint is dry, the windows are glued with white glue, and after having dried well the painted strips on the inner side of the windows are again glued with white paint. The cockpit windows are carefully fitted, but not glued yet.



Cabin windows mounted and fuselage frame struts glued to the inside.

Wing assembly

The wing is constructed from two bottom and two top parts. The starboard wing, which includes the central part of the wing, is constructed first; the port part is then attached to it. It requires some careful shifting before the glue “catches” to obtain an optimum match. Even then top and bottom panels are not well aligned. Also, the wing shows a downward dihedral, which is not correct. Photographs in literature show that the wing of the F.VII’s was assembled upside down, resulting in a positive dihedral (ref. 2).



Wing assembly in the Fokker factory (ref. 2)

Milliput epoxy putty is first applied to the joint between the two wing halves. After drying and sanding a final thin layer of Tamiya putty is applied to obtain a smooth surface. The panel separation lines, which had been lost in the process, have been engraved again. Triangular aileron control connections have been cut from 1 x 0.25 mm plastic strip. Normal they are only 2 mm high, but in this case they need to be 4.5 mm high to prevent the control cables touching the wing surface. The control cables enter the wing at the rear spar (top side) and front spar (bottom side). Entry holes are drilled with a 0.3 mm drill normal to the surface and then gradually “made horizontal” by turning the drill from the vertical backward to an almost horizontal position.



Drilling holes for control cables



Aileron control connection

The wing is painted with Humbrol 94 and when dry the surface where the registration letters are to be located is painted with clear varnish.

Finally the (custom produced) registration decals are applied with Microscale MicroSet and MicroSol and the completed wing is finished with satin varnish.



Finished wing

Tail assembly

Tail assembly is straightforward. Upper and lower horizontal tail surfaces are removed from the sheet by sanding; the vertical tail surface is an integral part of the fuselage. The interface with the fuselage is sanded until it fits snugly. After sanding the edges the leading edge is slightly rounded, while the trailing edge is tapered off as much as possible. Normal sized control cable attachments (1 x 1.5 mm triangles) are glued at the first inboard rib of the elevator and slightly above the lowest rib of the rudder.



Control cable attachment elevator

Fuselage assembly

The fuselage halves are glued together and after drying well the joint is carefully sanded. Because Tamiya putty tends to soften the plastic when brought in direct contact with it, the fuselage has been given a first coat of paint. When dry, putty is applied at the joint and let to dry well.

Sanding again, and a new coat of paint, adjusting at the same time the shape of the dark blue fuselage section. The front of the fuselage is painted aluminium.

Decals

Registration decals are produced from a computer generated text (CorelDraw) and printed on clear inkjet decal paper from Bel Inc. (ref. 3), which is relatively cheap, although the shipping cost is outrageous. The prints are fixed by spraying them with a solvent base gloss varnish (do not use water base varnish, of course). If in doubt about compatibility: try it first on a small bit of decal paper.

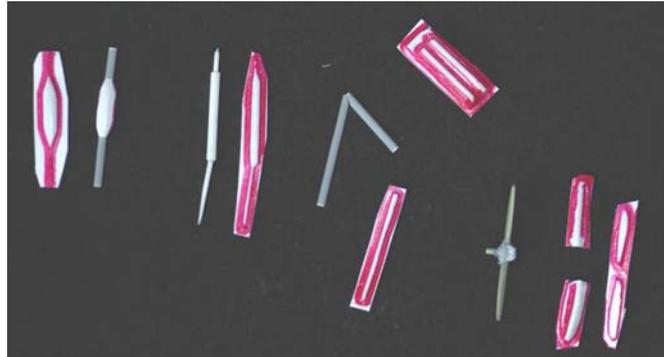
The Fokker signature is taken from decals produced earlier for a KLM F.VIIa. The signature is in yellow, as white text decals cannot be produced on an inkjet or laser printer.



Decals printed on transparent decal paper for inkjets. Font: Square 721 BT with enlarged kerning (scale 1:1).

Landing gear parts and other small parts

The main landing gear legs are supposed to be constructed from vacuum formed parts. However, when re-moved by sanding, the part left is that thin, that it is not possible to support the model with. I have chosen to rebuild them from plastic rods and profiles, which has the additional advantage that they resemble the real gear better. Only the part housing the rubber band springs is retained; half of it is sanded, the other half directly cut from the plastic sheet. Streamlined profile of 2.1 x 0.9 mm is used for the landing gear struts.



Scrap built small parts; from left to right: main landing gear leg, large engine exhaust, main landing gear struts, propeller.

The large exhaust of the right cylinder bank of the engine is also constructed from rod material. A two bladed propeller of the right size has been recovered from the scrap box and the spinner of the kit is glued to it. With putty it is brought into the correct shape. This procedure has not been very successful; the propeller has been replaced later by one of white metal by Aeroclub Models.



Tailskid

The landing gear parts are provided with small pieces of 0.4 mm diameter brass wire at the end to allow for a reliable connection to wing and fuselage.

As the tailskid was lost in the sanding process, a new tailskid has been produced from plastic rod and strip material too.



Landing gear struts provided with wire reinforcement for fuselage and wing connections

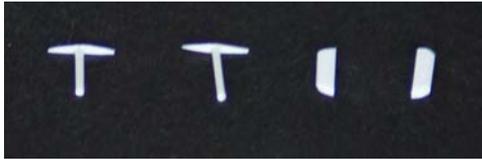
Elevator and rudder control cables

Cable routing

When inspecting photographs and drawings (ref. 1) of the Fokker F.VIIa/1m it appears that the control cables of elevator and rudder are routed through pieces of tubing at the outside of the fuselage above the passenger door and along the windows to control horns and fairings in front of the cockpit window (this is the case with most other pre-war Fokker passenger planes also). This is most clearly illustrated in the drawing in Van der Klaauw's booklet on Fokker passenger aircraft (ref. 2). Some details illustrating the cable routing are produced here.

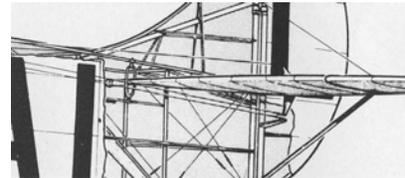
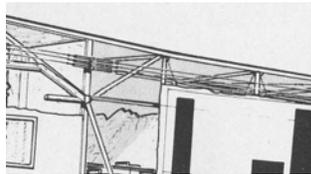
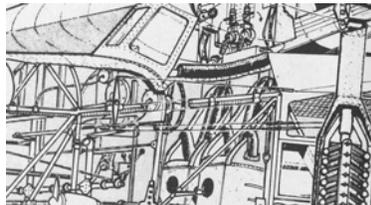
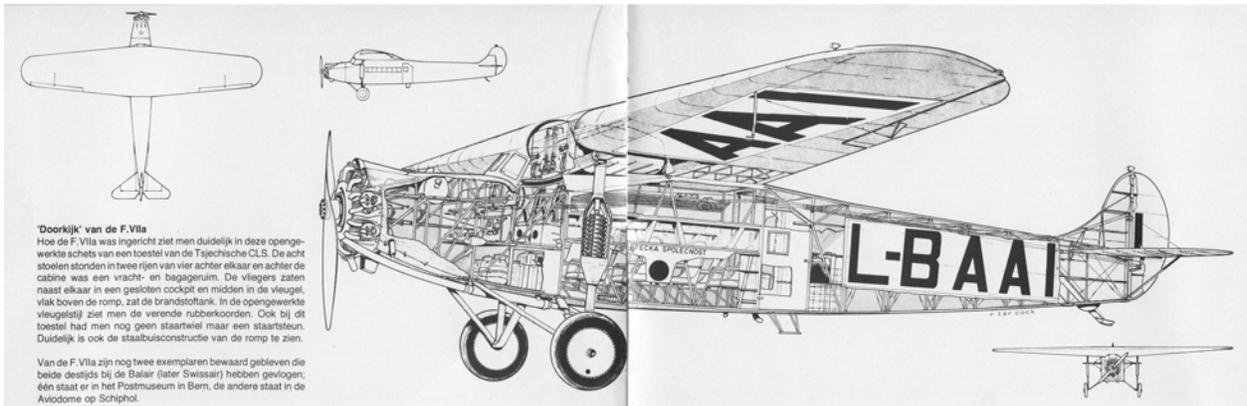


Control connections for elevator cables; fairing for rudder cable



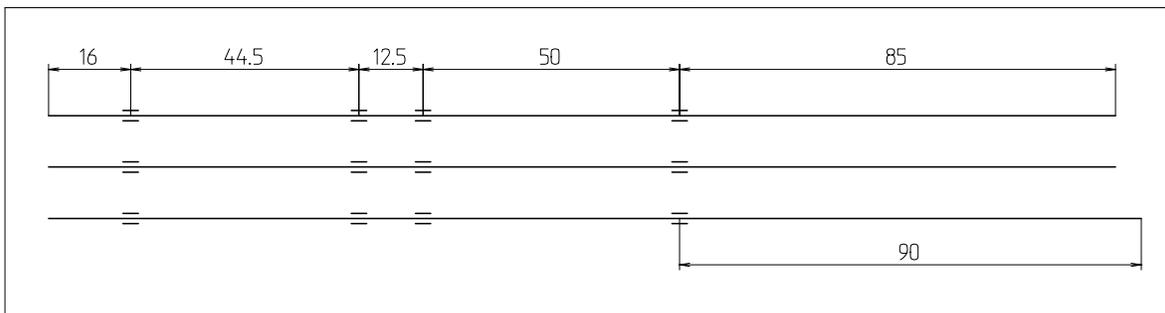
Control connections for elevator cables (left), fairing for rudder cable (right)

The small parts for cable connections are produced from plastic strip and rod material, as shown in the picture.

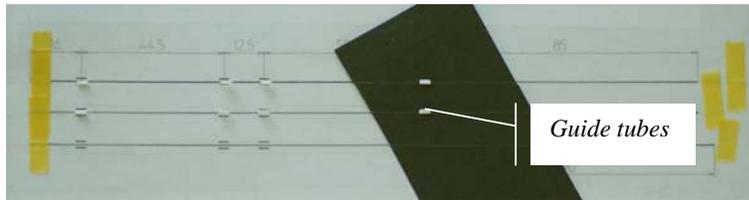


The Fokker F.VIIa/1m; Control cable routing and attachment details

Below a schematic is shown representing this routing. The cables have been contracted from 0.08 mm fishing line, while the tubing is represented by small bits of thick paper glued at the locations indicated in the drawing. The drawing is used as a template after being covered by cello tape.



Control cables at both sides of the fuselage for elevator (top) and rudder (bottom). 0.08 mm nylon fishing line, guide tubes of 3 mm length made of thick paper. Dimensions in mm.



Control cables being assembled on the plastic covered drawing



Set control cables before (left) and after (right) painting

After drying well the tubes are painted blue (the first two) and white, corresponding to the location they will have on the fuselage. Finally the whole assembly will be glued to the (almost finished) model.

Assembling the control cables

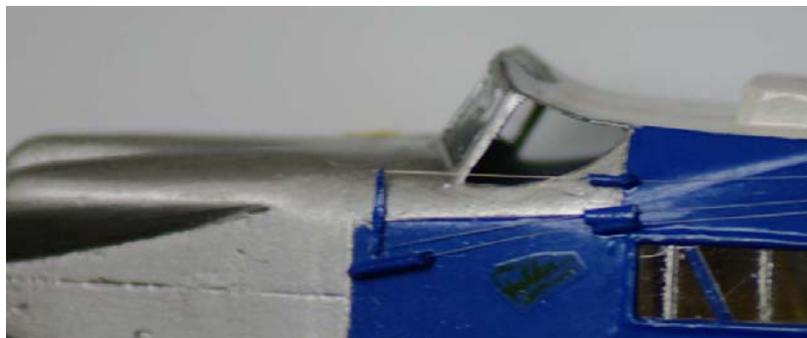
The control cables are glued to the painted (and varnished) fuselage starting with the blue and white tube next to the passenger door outline engraving. They are positioned as close to the lower surface of the wing and the top of the fuselage as possible. The nylon wires are kept in place by small pieces of tape until the glue is dry.

The control connections for the elevator are cemented in place next as shown in the figure. The blue tubes next to the cockpit window are aligned such that the control cables lead in a straight line to them. The rudder control cable is cut to the correct length, after which the cable fairing is glued to the cable. When dry the fairing is cemented in place as shown in the figure.

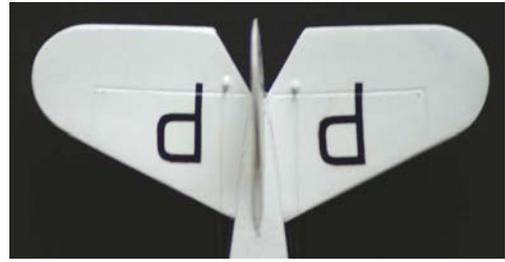
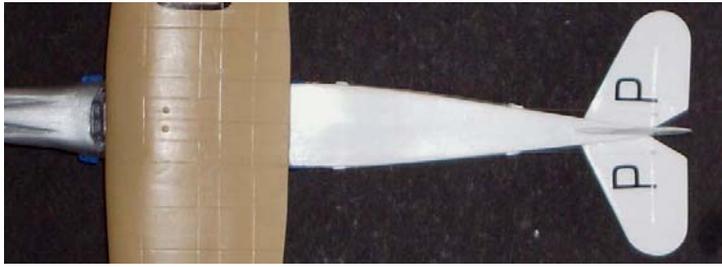


Guide tube fixation

Finally, the control cables are cemented to the elevator and rudder control horns.



Elevator (top) and rudder (bottom) control cable interface



Top view of elevator and rudder control cables



Control cable fixation to fuselage

The cockpit windows

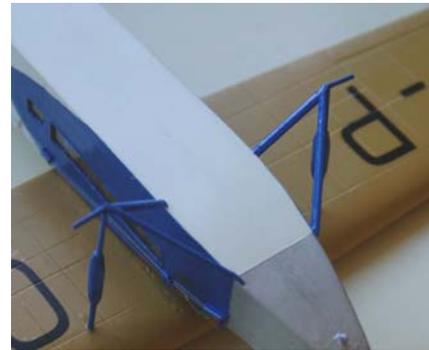
The cockpit windows (one front and two side windows; the sides under the wing were open) are made with Humbrol Clearfix. The opening is about the maximum size windows with this material can be made.



Cockpit windows

Assembling the main landing gear

The wing is glued to the fuselage after test fitting it and, if necessary, adjusting its fit such that no gap between wing and fuselage top is apparent. The vertical landing gear legs are test fitted in the 0.5 mm holes drilled in the wing and the distance from the axle to the wing lower surface is measured. The length of the landing gear legs is adjusted if required. From the position of the vertical leg the location of the holes in the fuselage for the horizontal landing gear struts is determined. The small, 0.5 mm diameter holes are drilled in the fuselage and the gear is cemented in place checking continuously that the main landing gear is perpendicular to the lower wing surface.



Landing gear assembly

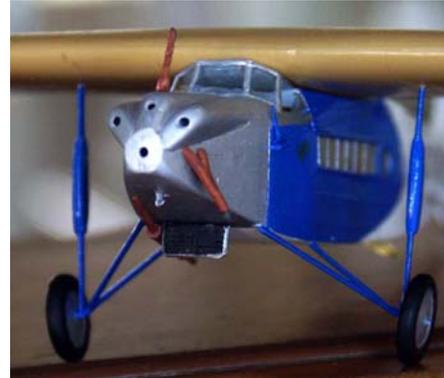
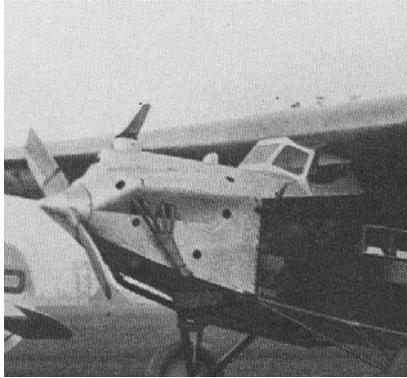
Passenger cabin stairs

The stairs below the passenger door have been produced from 0.4 mm wire and scrap material from HR Model photo etched parts for WW I machine guns.



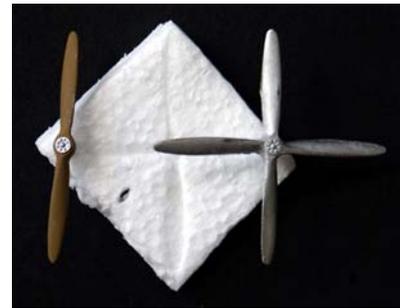
The engine exhausts

The exhaust arrangement of the three cylinder banks of the Lorraine-Dietrich LD-12Eb engine is rather particular, as can be seen in the photographs below. The original exhausts for the top and left bank and the custom-made right bank exhaust are painted rust brown and glued in place.



The propeller

The propeller is produced from a four bladed airscrew (Aeroclub 1:72; P036, wood, 11'6") by removing two blades. It is painted wood color streaked with red brown.



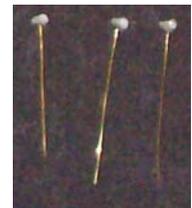
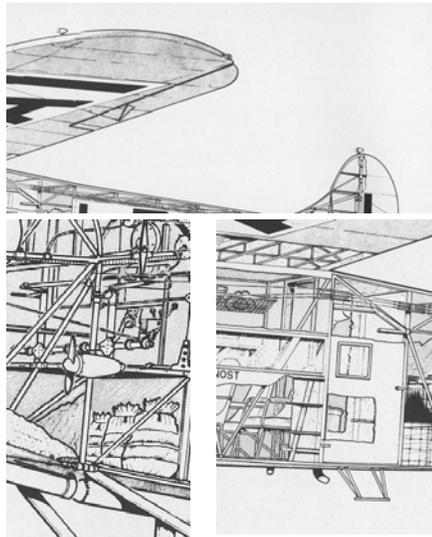
Navigation lights, generator and toilet exhaust

Navigation light have been produced from scrap material (attitude control engine nozzles from a MIR Space Station model), mounted to a 0.4 mm wire and painted grey. They have been mounted at the top of the wing tips and the rudder. The front of the right navigation light has been painted green, of the left one red and of the tail one silver.

The dynamo has been made of scrap plastic parts; the propeller has been cut from scrap photo etched material.

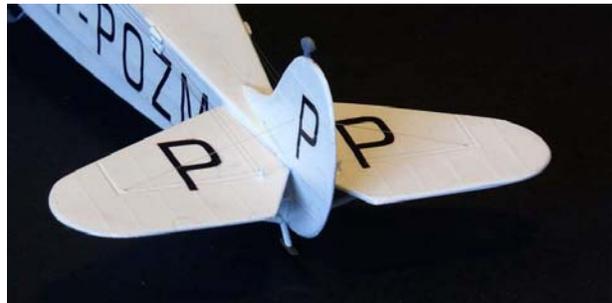
The toilet exhaust has also been produced from a scrap plastic parts adjusted to resemble the exhaust in Van der Klaauw's drawing.

The generator body has been painted grey, the fins aluminium. The exhaust has been painted grey. They have been cemented in a position derived from photographs and the drawing.



Finished model

After assembly the aileron control cables and the horizontal tail bracing have been mounted (again 0.08 mm nylon fishing line) as well as the propeller. Excess glue has been removed and the model has been retouched with paint and satin varnish where necessary. Below some pictures of the finished model are shown. I have also added an extensive list of references. Unfortunately most of them are in Dutch, but ref. 1 is also available in English.



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