

Koolhoven F.K.49 HA Models resin

Cartography plane

Scale 1:72

The Koolhoven F.K.49 has been developed on request of the Dutch Ordnance Survey (Topographische Dienst, TD) and the Air Service of the Dutch Army (Luchtvaartafdeling, LVA) and was operated by the LVA. The cooperation between the TD and the LVA existed already longer and for cartography and aerial photography a Fokker F.VIIa/3m or a Fokker C.IV of the LVA was used, for which only the direct operational cost was charged. The last one was not really fit for the task, the observer/photographer was sitting in open air and the available equipment was limited. The LVA used the first aircraft for other missions too -training, transport, bombing flights- so was badly available. The three-engine plane was also relatively expensive in operating. The Royal Dutch Airlines (KLM) had also an aircraft specifically equipped for cartography/aerial photography, the Fokker F.VIII PH-OTO, but this plane was commercially exploited, so even more expensive.

So an alternative was sought, which was less expensive to operate than these aircraft. When the Koolhoven F.K.48 appeared in 1934, a passenger aircraft accommodating six people and motorized by two De Havilland Gipsy Major engines of 135 horsepower, such an alternative seemed available. From the F.K.48 Koolhoven developed in 1934-1935 the F.K.49, equipped with an on-board dark room. The aircraft had dual controls, so it could also be used for training. It accommodated a crew of four, a pilot, a navigator or second pilot, a photographer and an assistant photographer. The aircraft with a very characteristic angular forward fuselage was bought by the LVA, made its first flight on September 22, 1935 and was registered as 950. It was used for reconnaissance and photography missions by the LVA and was operated against direct operational cost by the LVA for the Ordnance Survey for cartography missions. It has been scrapped after the German occupation of the Netherlands in 1940.



Three other versions of the F.K.49 have been developed, which were designated as F.K.49A. Except for the wing and the aft fuselage these were quite different from the LVA F.K.49A.

The main characteristics of the Koolhoven F.K.49 (LVA version, c/n 4901) are:

	<i>Ref.</i>	<i>1:72</i>	<i>model</i>
<i>Span</i>	16.00 m	222.2 mm	223 mm (100.3 %)
<i>Length</i>	11.60 m	161.1 mm	165 mm (102.4 %)
<i>Height</i>	3.12 m	43.3 mm	42 ¹ mm (97.0 %)
<i>Engine</i>	Two De Havilland Gipsy Major I, 130 hp		
<i>Crew/passengers</i>	4		

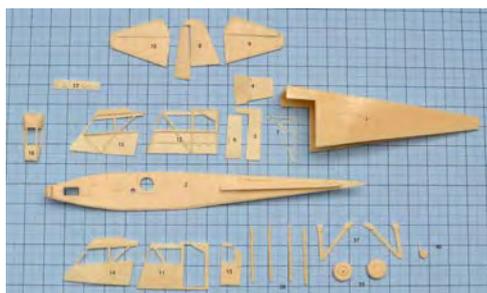
The model is quite well to scale.

The kit

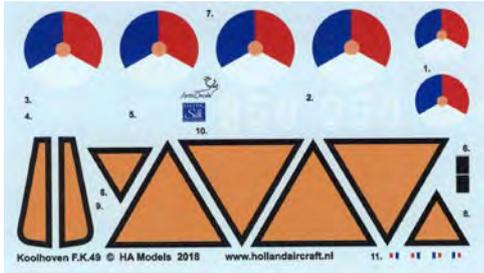
The kit comes in an A5 top charge carton box and contains 58 resin parts, a vacform transparent canopy, a selection of brass and styrene rod and strip of various dimensions, a piece of

transparent plastic sheet for the windows and a piece of white plastic sheet to produce the control horns. All parts are packed in several plastic bags. A 1/72 scale drawing of the model is included (a

scaled copy of the drawing in ref. 3).



The decal sheet is for two different LVA versions, one with the standard red-white-blue-orange roundels and one with the black edged orange triangles and rudder. A small decal sheet is included with Airscrew Co. Ltd. logos for the propellers. Also some templates and are included for (paint masks of) the windows.



The instruction booklet gives a step by step procedure to construct the model, illustrated by photographs of the actual assembly process. It also includes painting instructions and indications for decal placement. The kit also includes a certificate of authenticity, indicating a series of 70 kits has been produced.

As I will build the model with deflected control surfaces, I have separated the ailerons, elevator halves and rudder from wing and tail surfaces. The tail surfaces are easy to separate with a razor blade saw, the ailerons require some work with saw and scriber tools. Also aileron and wing need some correction with putty after the operation.



Although this was the first (pre-)production kit, the parts have few air bubbles (they tend to appear less when production progresses due to mould corrections and setting of the mould). The wing has some systematic ones at the stub of the production process and at the side of the nacelles. I have repaired the air bubbles present with putty and cyanoacrylate glue.

“Standard” repairs

As indicated in the instruction sheet a number of repairs was needed. One of the reinforcements of the tank cover was absent; I have repaired that with a piece of 0.4 x 0.5 mm strip, which is included in the material provided with the kit. The aileron balance weight parts are very fragile and both had lost the weight part. I have repaired that with a piece of 0.75 mm styrene rod, also provided with the kit.



Fuselage

The lower 4 millimeters of the rear fuselage is left free from the solid resin filling the remaining part of the part to accommodate the stiffener of the fuselage bottom and to fit into the ridges along the edges of the bottom. This means that after assembly there would be a gap at the lower side of the rear cabin wall. To close this I have glued a piece of 13 x 3.5 mm sheet of 0.4 mm thick against the front part of the stiffener, as indicated in the instructions.



Next I have assembled the fuselage bottom and rear parts. As they fit quite tight, applying cyanoacrylate glue before assembling the two parts would not work, so I have first “dry fitted” both parts and applied the thin glue on the joint. By capillary effects the glue is then transferred in the joint.



Next a dry fit of the side walls with the rear fuselage, fuselage bottom and wing has been done. The walls fitted well and after cleaning them well, especially the lower edge fitting with the bottom ridges, only minor corrections were necessary.



The bottom of the luggage compartment above the dark room fitted well and has been glued in place. In this configuration I have painted walls, ceiling and floor of the dark room light grey, as well as the back side of the dark room front wall and door. This front wall has been adjusted to the correct height (about 22.5 mm) to fit under the luggage compartment. I have mounted the door in half open position behind the wall and the assembly has been glued in place. Next I have made the tube frame to the correct height and have glued it in front of the wall.



I have mounted the rear port side wall to the aft fuselage, following the assembly method indicated in the instructions: first gluing the lower joint, than the aft and top joint. For the forward side wall I have also followed the indicated procedure, with special attention to the overlap with the rear wall. Although the throttle handles on the left forward side wall had produced well, they appeared to be very fragile, so I have replaced them by a version made

from 0.25 mm metal wire.



I have glued the mounting structure for the camera (part 29) to the floor, aligning it well with the hole in the fuselage bottom. In this configuration I have painted the inner side of the walls and the floor of the cabin.



I have also painted the inner side of the starboard cabin walls, carefully leaving the gluing edges free of paint. The walls have been assembled in the same way as the port side, and the edges, which were still unpainted have been touched up.



Next I have glued the front panel to the fuselage. On the photograph it appeared that it was not mounted correct; the top was not parallel to the top of the fuselage. This was not an error in the part, but an inaccuracy in the placement, which I could not correct without damage to the model. I have repaired this by sanding the top of the front wall and

cutting away part of the horizontal frame of the window.

Cockpit and cabin interior



I have glued the legs under the pilot seat and have corrected the length of the rear legs such that, when the seat was placed on its mounting position (a small square moulded in the fuselage bottom) the seat bottom was parallel to the bottom edge of the cabin windows.



The front fuselage panel and all other parts that had to go into the cabin have been painted prior to assembly. Also a piece of 0.5 mm styrene rod has been painted; this will be used to construct the instrument panel support. I have also glued PE seat belts to the seats.

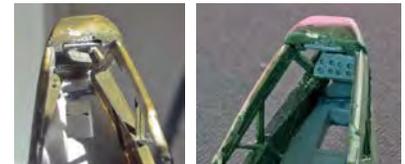
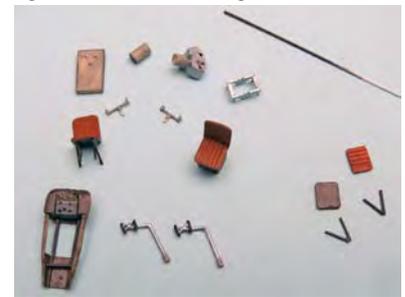
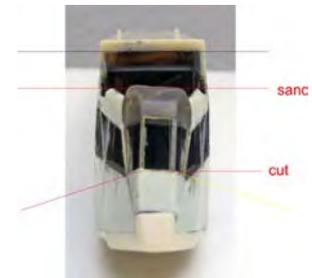
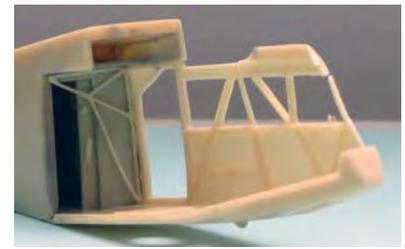
The rudder bar for the pilot has been glued in the nose; it appeared quite difficult to do so; in the narrow space it is difficult to manoeuvre with a pair of tweezers. The instrument panel appeared a bit too large, so I have removed a couple of tenth of a millimeter from both sides. Also this part was difficult to assemble.



Worst of all was the small frame, made of pieces of 0.5 mm styrene rod. It was impossible to place it under the instrument panel, let alone to glue it. As a consequence also the compass could not be placed against the frame. So for the kit I have changed the assembly order: First equip the front wall with instrument panel, frame and compass, as shown in the picture, next glue the rudder bar in place and finally glue the front wall to the fuselage. I have adapted the instruction sheet accordingly.



When I dry fitted the control columns, they appeared to be too wide; it would end up next to the seat instead of in front. About 1.5 mm of the "horizontal" part had to be removed. Also the larger diameter lower part had to be cut off, but that was planned; it was only there to make the casting process easier. The pilot seat was sitting too high, so I have shortened the legs a bit.





The rest of the assembly of the “furniture” was easy: Control column and pilot seat, rudder bar, control column and seat for the navigator/second pilot, instrument panel and drift meter for the photographer.

I have applied the decal on the top of the camera, have glued it to the support frame under the desired angle and have glued the assembly to the ring around the hole in the cabin floor.

Last pieces to be assembled in the cabin are the



two folding seats. I have mounted one in folded position and one in extended position.

Wing

I have mounted the engines to the wing, as the joint between engine and wing requires quite some rework with putty and sanding, and that could best be done prior to assembly of the wing to the fuselage.



When fitting the wing to the fuselage, I had to force the fuselage walls too far apart to fit the wing on the fuselage, which led even to a fracture in one of the walls. So I have cut away most of the width of the frame tubes moulded with the wing, until a tight fit was achieved. The instruction sheet has been modified accordingly.



Tail surfaces

Although the mounting pins of stabilizer halves and fin had been reproduced well in resin, they lag the strength to ensure a good connection of those parts to the fuselage. So I have replaced them by 0.4 mm brass pins. As they never end up on the same place of the original pins, I have also drilled new holes in the correct places in the aft fuselage.



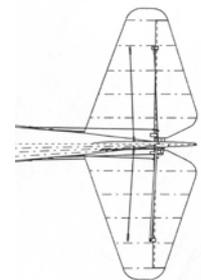
I have painted the tail surfaces a couple of times before gluing them to the fuselage, continuously checking whether they were normal to the mounting surface. This way the joints can be retouched, when the last layers of paint are applied to the fuselage.



The tail stabilizer struts have been made from 25 mm long pieces of 0.5 mm styrene rod, with slanted ends to fit the stabilizer and the fuselage.



I have opened up the six 0.3 mm holes in stabilizer and fin, through which the rigging lines have to pass and fed 0.06 mm black painted fishing line through them. After having tensioned them with some pieces of tape, I have fixed them with a drop of cyanoacrylate glue in the holes at the underside of the stabilizer. This was not correct, as I found out afterwards when inspecting the drawing; the forward rigging line feeds through the holes in the stabilizer to the underside of the fuselage sides. So I have removed the lines by drilling again the hole in the stabilizer and I have also drilled 0.3 mm holes in the bottom of the side walls, 6 mm from the fuselage trailing edge.



I have first glued two pieces of fishing line in the holes at the fuselage wall lower edge and, when dry, fed them through the holes in the stabilizer to the top of the fin, where I have tensioned them and fixed them with a drop of cyanoacrylate glue. When this was drying I have glued the stabilizer struts in place. Finally the excess fishing line has been cut off carefully.



Fuselage roof

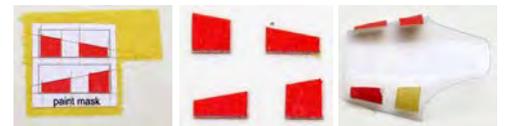
The fuselage roof is a transparent, vacuum formed part, as it contains four small windows. I have first removed the base of the part and next the forward and rear part the usual way by sanding it on a flat surface. The kit provides a paper template for the final shape of the roof, which I have cut out exactly on its outline and glued to the plastic with diluted Microscale Kristal Klear, which does not attack the plastic and can easily be removed and cleaned afterwards. I took care that the forward side of part and template were well aligned.



Next I have started to cut away bit by bit and trial and error the excess plastic, fitting it to fuselage and wing. I have not cut the horizontal sides at all (the template is in fact not wide enough) and have kept one millimetre away from the boundary of the template. I have marked the outline of the windows with the point of a knife, but this is not necessary, or should even be avoided. After removing the paper template a final check on the fit has been performed.



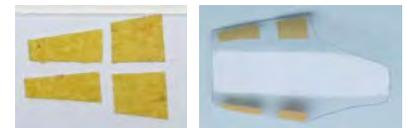
The kit contains a print for paint masks for the four windows in the roof. I have glued these with diluted Kristal Klear to some pieces of Tamiya tape, which I had attached to a piece of styrene. The excess material has been removed and the four masks have been applied to the roof. It does not matter, whether only the tape shape is applied or the tape with the mask still attached.



I have decided to paint the roof prior to assembly, first with a layer of light grey, and then several layers of khaki until sufficient cover had been achieved. However, the result of the painting exercise was not brilliant; paint has crawled under the tape and brush strikes were visible, mainly caused by application of too thick layers. So I have removed all paint with white spirit and Revell Paint Remover and have restarted.



To obtain thinner paint masks I have glued a piece of writable Scotch tape under the paper template and under that a piece of Tamiya tape. Next I have cut out the paint mask shapes with a sharp knife and have separated the Tamiya tape from the Scotch tape with knife point and tweezers, and have applied these thin mask to the cabin roof. I have applied first a layer of gloss varnish to the roof to "seal" the paint masks, followed by several thin layers of light grey and khaki. When removing the paint masks a correctly painted cabin roof resulted.



Fuselage windows

I have glued the template for the cockpit and cabin windows with diluted Microscale Kristal Klear on the piece of transparent plastic, have checked the maximum height of the windows and have cut out the shapes, leaving half a millimetre along the outline. I have made the round shape for the camera window fitting in the hole in the floor trial and error with a file.



Mounting the cabin windows took quite some time, they had to be repeatedly fitted and reworked to match the shape of the window frames. I have glued the windows with sparingly applied Microscale Kristal Klear; any resulting gaps I have filled also with Kristal Klear, because it is more transparent than white glue, when dried.



Propellers, nacelles and exhausts

I have painted the propellers with Humbrol Natural wood and applied a wood grain with dry brushed burnt sienna oil paint, very much diluted with painting medium. The hub has been painted steel.

When the oil paint had dried, I have given the propellers a coat of gloss varnish and



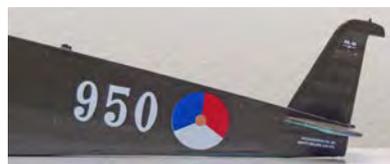
have applied the red, white and blue decals to the tips and the logos halfway each blade.

The exhausts have been painted steel and dry-brushed with rust. As I found the colour too reddish, I have given them a second dry brush with gun metal.



Decals

I have painted wing and ailerons prior to assembly and have prepared it with Microscale gloss varnish² for decal application. As the decals are printed on a continuous film, they have to be cut out as close to the image as possible. The decals handle very well, they require only a ten second batch of water, are very thin and support Microscale Set and Sol very well. I have glued the ailerons temporarily to the wing in neutral position with Microscale Kristal Klear and have applied Set to the place where the decals had to go. After a minute or so I have cut the decals on the separation between wing and aileron with a very sharp knife. I have applied Sol to both parts of the separated decal to make it bend as sharp as possible around the corners. This worked well. I have finished the wing with a coat of satin varnish, again from Microscale.



I have applied the decals to the fuselage according to the four-view drawing. I have glued the wheel to the oleo struts and the very small decals of the Dunlop logo and markings have been applied to the tires. Although the text is very small, it still is quite well readable.



Finally I have applied the red-white-blue decals to the propeller tips and the Airscrew Co. logos to each blade. The picture shows the tip decals are not wide enough to cover the width of the blade³. Also, the logos are so small that it is impossible to see whether they are placed straight without a magnifying glass.

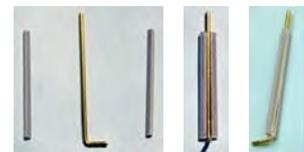


Undercarriage

I have constructed both main landing gear legs as indicated in the instruction sheet



from a piece of 1 mm brass rod and two pieces of (half) streamline profile. I have first made them to the prescribed length of 28 mm and have drilled the 1 mm hole in the underside of the nacelles to a depth that the streamline part just touches the nacelle. Next I have made the test set-up



as shown in the instructions to accurately set the wings horizontally. This was done trial and error. Here it is essential to mark the legs with port or starboard.

To locate the position of the landing gear V-struts I have first made a thin carton strip of 100 mm length and have used that to measure the distance from the rear end of the fuselage to the lower edge of the walls and have made a cut with a razor saw there. This is the place where the aft member of the V-strut must be located. The mounting interface of the V-struts themselves I have shaped by means of a couple of files to obtain a good fit to the fuselage. I have painted the struts khaki for the top side and LVA blue for the underside.



Other parts

Tail surfaces, ailerons and rudder have been painted separately; elevator halves and ailerons LVA blue and khaki, the rudder red, white and blue. I have cut control horns for tail surfaces and ailerons from the piece of 0.4 mm plastic provided and have glued them to elevator halves and ailerons. I have also glued a very small control horn on the trim surface of the aileron. Unfortunately I have made the trim surface on the port wing instead of the starboard one.



Also the balance weights have been glued to the ailerons, adjusting the mounting surface to make the weight pointing slightly downwards, when the aileron is in neutral position. I

The tiny Venturi tubes have been glued to pieces of 0.25 x 0.5 mm styrene strip to hold them better during painting. Part of the strip also served as bracket to attach them under the nose. I have painted the tubes dark grey.



Final assembly

I have fitted the wing on the fuselage and have fed thin cyanoacrylate glue in the joint between wing underside and fuselage walls with the help of a thin metal wire. The gap between the aft part of the wing and the fuselage I have closed by means of Vallejo putty, removing the excess putty with a moistened cotton stick. When dry the putty has been painted LVA blue and khaki.



The roof fitted well on the fuselage. I have first glued the aft part to the wing with Microscale Kristal Clear, aligning the roof well in the center. When that had set I have glued the side edges to the top of the fuselage walls, applying anaerobic cyanoacrylate glue sparingly with a metal wire.



The gaps between the roof and the wing and fuselage walls I have filled with white glue. When dry they have been painted khaki.



Next I have again aligned the wing tip height by dry fitting the undercarriage legs in the same set up as before. In adjusting the length of the main struts I have made a mistake, leading to an additional loss of strut length of 2 mm. This illustrates that it is essential to mark the struts and to note which strut must be shortened. The gaps between the V-struts and the fuselage have been filled with white glue.



The exhausts have been mounted under the nacelles, both at the right side of them. The large exhaust with the heat exchanger for the cabin heating goes under the port nacelle, the small one under the starboard one.



The support of the large exhaust to the nacelle has been made from a piece of 0.4 mm brass wire and I have formed the tube hot air between the heat exchanger and the nacelle from a piece of 0.5 mm styrene rod. Both have been fitted in place by trial and error.

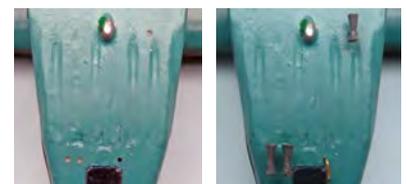
I have made a 0.5 mm superficial hole at the crossing of the rear spar and second inboard wing rib panel lines and have mounted the air driven pump on it.



Next I have mounted the tail wheel in the 0.5 mm hole, drilled under the end of the fuselage, maintaining the resin shaft, which had been cast with it. I have also drilled two slanted holes in the underside of the fuselage xx mm from the end and glued control cables in it, made from 0.06 mm fishing line, which have been fixed to the tail wheel ring structure. The shaft did not survive the vibration test during the transport to a modeling event, so the resin shaft has been removed, an 0.5 mm hole has been drilled in the wheel part and a piece of 0.5 mm brass rod glued in it. I have opened up the holes in the fuselage underside again, removed the control cables, have glued the wheel in place and applied new control cables.



Now that the model could stand on its wheels, I could mount the Venturi tubes and small tubing under the nose. I have drilled three superficial 0.5 mm holes under the nose on the locations of the Venturi tubes and a 0.5 mm hole for the small tube next to the window. This last one I have produce from a piece of 0.4 mm brass wire, bent in a 90 degree angle. I have shortened the Venturi mounting studs to 2 mm and have glue them in place.



Next step was mounting the control surfaces, elevator in down position, rudder corresponding to the deflection of the tail wheel. I have glued each control surface with three drops of cyanoacrylate glue. As the decal on the starboard aileron was not very well aligned with decal on the wing, I have mounted that aileron in down position.



The propellers have been glued in place with Microscale Kristal Klear to compensate for the play in the holes in the nacelles. I have assembled the pitot tube from pieces of 0.4 mm brass wire and have glued it in the hole of the starboard wing as indicated on the drawing.



The forward cabin windows have sliding frames. I have glued a piece of aluminium radiator tape on a piece of plastic and cut narrow strips from it and have applied these on the windows.



I have made the control cables from 0.06 mm black lacquered fishing line and applied them to rudder and elevator, first gluing them in the slanted holes in the aft fuselage, then tensioning them over the control horns with a pair of tweezers until

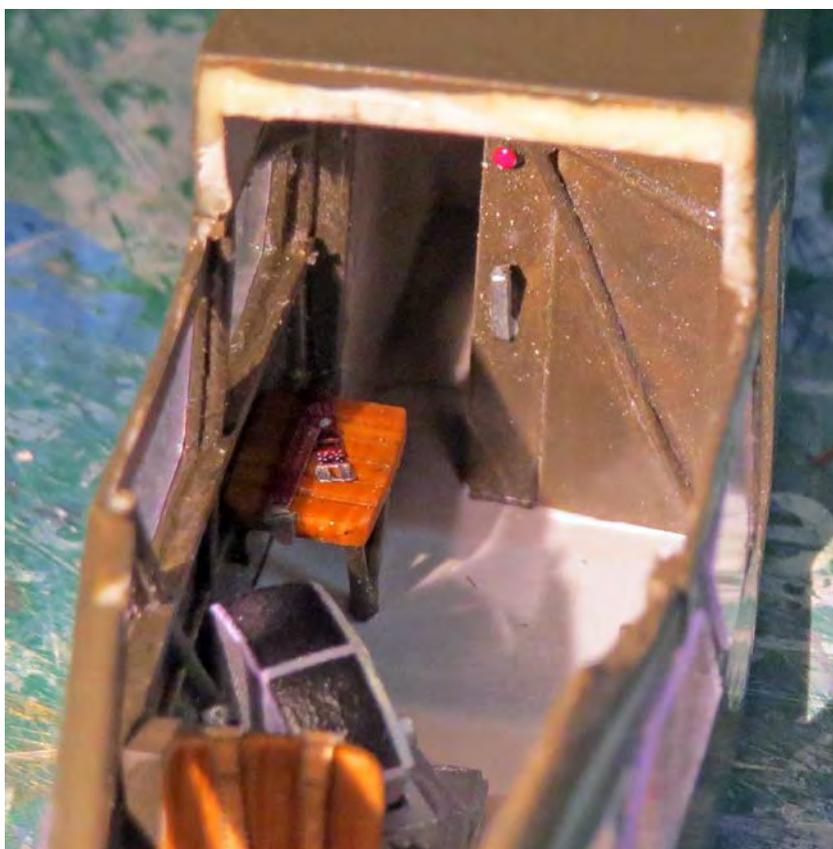


the glue had dried. The same procedure has been followed for the aileron control surfaces. A piece of 0.2 mm metal wire has served as the push-pull rod of the aileron trim surface. This completed the model assembly.

In summary: The model is relatively easy to build, most parts fit very well. Special attention is required in mounting and aligning the front wall and adjusting the main landing gear struts to keep the wings level. Fitting the cabin windows takes quite some time. Care should be taken to mark control surfaces and landing gear components to ensure that they end up at the right place in the model.

Below some pictures of the finished model are shown. I have also included some picture of the cabin interior, which are hardly visible any more on the assembled model.











References

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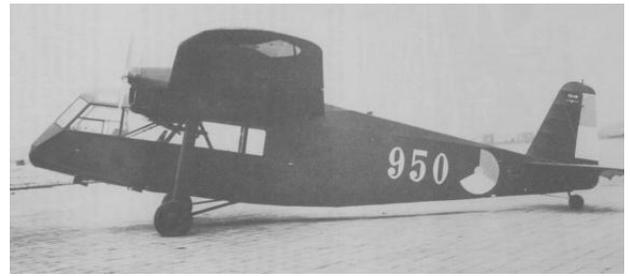
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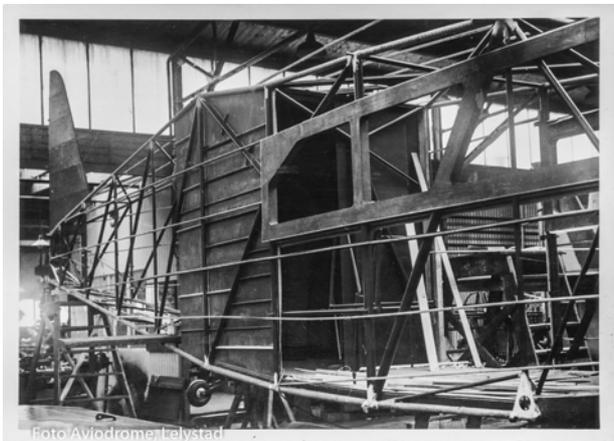
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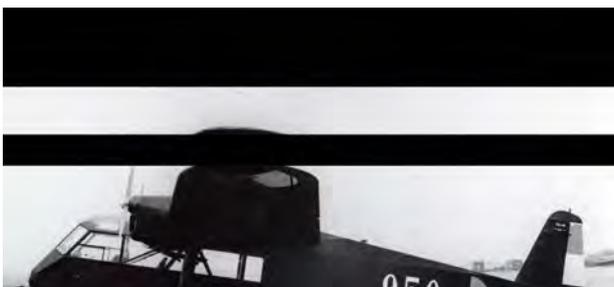
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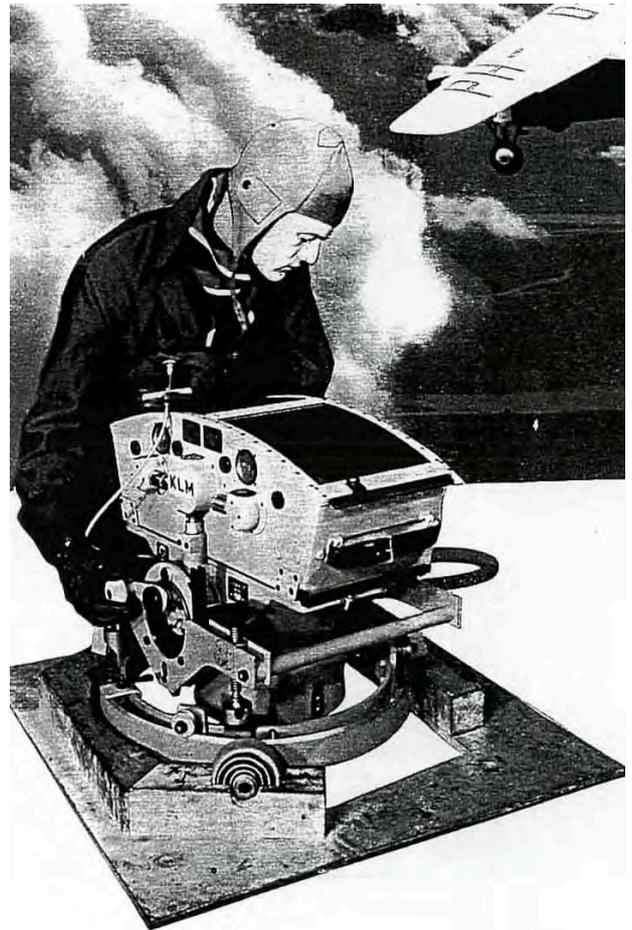
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¹ This low value has been caused by bad “bookkeeping” during the trimming of the landing gear oleo struts.

² This acrylic varnish can be applied with a soft brush without leaving any brush strokes.

³ Extra and wider propeller tip decals are supplied with the series production kits.