Fokker S.IIa, resin kit master and prototype

Biplane ambulance

Scale 1:72

The S.IIa was a Fokker S.II trainer, modified by the Dutch Army Air Department (Luchtvaart Afdeling, LVA) into an ambulance airplane. The S.II, which accommodated side-by-side seating of instructor and student, had been designed in 1922 as successor of the Spyker V.2 and 15 copies were delivered to the LVA. They served until 1930 and one of them has been modified to an ambulance aircraft, among other for reasons of budget limitations. The S.II was rather well fit for it thanks to its wide fuselage.

Changes incorporated were the replacement of the 110 HP Oberursel engine by a stronger Armstrong Siddeley Lynx of 220 hp and a construction made from Perspex panels between the top of the fuselage side and the wing. At the rear side the top side of this construction sloped towards the fin and the rear part could be removed, allowing for a stretcher to be slid in towards the front. Next to the pilot, seated at the left side of the cabin, the nurse was facing backwards. A modified access door was located at the right side and the comma-shaped rudder was replaced by a more rectangular shaped one.

The first flight took place in February 1932. The directional stability and the controllability appeared to be insufficient, so a small fin and a larger rudder were introduced. Later the rudder was replaced by a better shaped one, shown on most pictures of the aircraft. In the end the original wheels have been replaced by wheels with balloon tires to improve the comfort of the patients.

Only one copy of the Fokker S.IIa has been built. The aircraft has been used intensively, especially to transport patient from badly accessible islands in the north of the Netherlands and in the Zuiderzee. The S.IIa was captured in May 1940 undamaged by the German occupation forces. Its final fate is not known.

The overall dimensions of the S.IIa were the same as of the original S.II:

	references	*1:72*	*model*
Span (upper wing)	11.22 m	155.8 mm	147.5 mm
Length	7.20 m	100.0 mm	103.6mm
Height	2.80 m	38.9 mm	36.9 mm
Engine	Armstrong Siddeley Lynx, 220 hp		
Crew/passengers	2/1		

There is a 1/72 resin kit of the Fokker S.II by Omega Models, which I have built as the training variant in 2008[1]. I have used this kit as basis for the S.IIa. A comparison of this kit with S.II drawings in my possession did show that the span is rather too small (3-8 mm upper wing and 4-10 mm lower wing), but the fuselage a bit too long (2-8 mm). The dimensions of the parts do

not even agree with the three-view drawing provided in the Omega Models kit, which indicates also a larger span. Another discrepancy is the size and shape of the horizontal tail plane.

When building the S.II training variant I have corrected the shape and place of the cockpit, the horizontal tail plane and the position of the upper wing; span and length I have not changed. Shape and place of the cockpit was not relevant for the S.IIa; this had to be adapted anyhow. The tail plane I have adapted again and the wing position is dependent on the construction of the new fuselage.

Other modifications are:

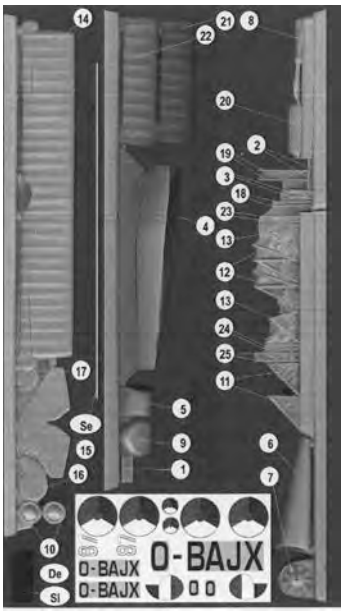
- New nose, engine, propeller and exhaust,
- New fin, horizontal stabilizer and rudders,
- Possibly balloon tires, if I can find suitable originals,
- And the fuselage top of course.

Boundary condition for the wing position is that the forward cabane struts must end at the forward end of the fuselage, just behind the new nose with engine and exhaust.

Omega Models S.II box contents

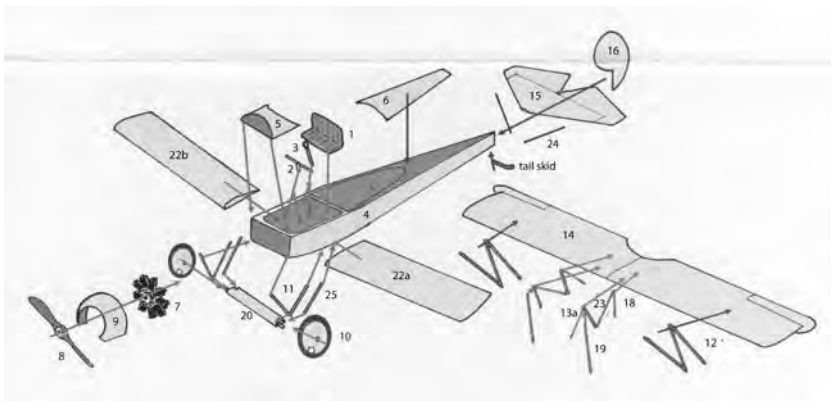
Box contents for the S.II is complete, as shown in the picture at the right. The resin used in the kit I bought was yellow coloured. The decal sheet was not relevant for the Fokker S.IIa variant; a custom decal sheet has been designed.

The instruction sheet is rather simple: a short history of the S.II training aircraft and (incorrect) painting instructions, again not relevant for the S.IIa, a photograph of the numbered parts still on the sprue and an exploded view without any part numbers.



For the S.IIa I have to indicate which S.II parts will be used, which will have to be modified and which parts are not required. The picture at the below is a copy of part of the instruction sheet. I have measured the dimensions of the struts and have estimated their location in the assembled model (I did not keep track of that, when building the training variant). The resulting table is shown above. I have also indicated whether the part is not needed or must be modified. A check on this preliminary assessment can only be made when all masters have been made or the prototype model has been completed.

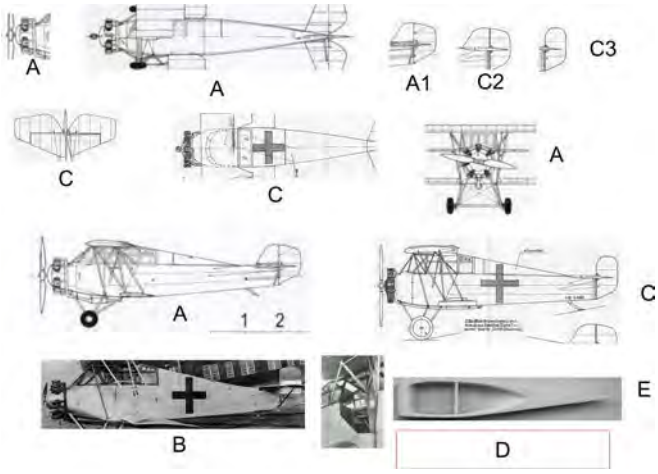
Next I have included the part numbers in the exploded view. Again, the final check can only be made once the prototype model is completed.



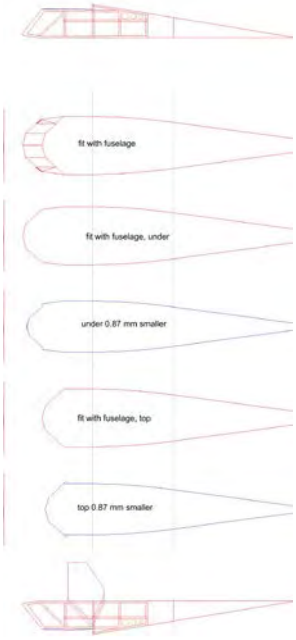
ID	length	width	no.	function	remarks
1			1	bench	not needed
6			1	top aft fuselage	not needed
7			1	engine	not needed
8			1	propeller	not needed
9			1	cowling	not needed
15			1	horizontal tail plane	not needed
16			1	rudder	not needed
2			2	rudder bar	only one needed
3			2	control stick	only one needed
4			1	fuselage	to be modified
5			1	top forward fuselage	to be modified
14			1	upper wing	to be modified
10			2	wheels	
11	13.8	13.6	2	undercarriage V-struts	
12			2	N-struts	TBD
13a	13	14	1	forward cabane V-strut	port
13b	13	14	1	forward cabane V-strut	starboard
17			1	instrument panel	TBD
18	16.4	0.78	2	aft cabane strut	
19	20.8	1.15	2	forward wing support strut	
20			1	undercarriage axle	
22a			1	lower wing	port
22b			1	lower wing	starboard
23	16	1.04	2	aft cabane strut	
24	14.2	0.85	2	tail plane strut	TBD
25	18.8	0.91	2	undercarriage strut	
--			1	tail skid	next to wheels

Modifications

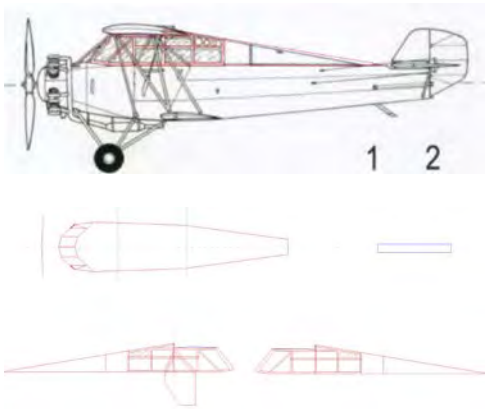
Cabin



The major modification was the closed cabin. Between the two available drawings there were some important differences. To illustrate that I have collected scanned and scaled copies of the different parts of these drawings in CorelDraw. To judge the correctness of these drawings, I have added a photograph of a pure side view of the aircraft. B is the photograph, elements labeled A are parts of ref. 13, and those labeled C come from ref. 12. The side view of A certainly matches the photograph best, certainly the nose and forward cabin section. The rear part of the cabin is less accurate; the place where this part meets the fuselage top I have taken from C. E is a "scan" from the resin fuselage, D is the envelope of this fuselage. I have also included a photograph of the starboard side, showing the particular shape of the door. This is caused because the door has to pass between the aft inverted V of the canopy struts.



I have started to draw the port side view of the cabin in red over side view A, checking continuous the logics with the top and front view. The window frames are 0.5 mm wide. Next I have mirrored this drawing to construct the starboard side view, deriving the shape of the windows and the door from the detailed door picture. The green dotted lines indicate the place where the cabin will be separated in forward, mid and aft part.

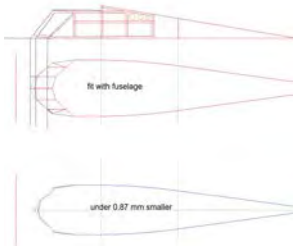


When this had been done I have repeated the exercise with the top view, first making half the drawing, then mirroring it about the centerline. The blue rectangle indicates the envelope of the upper wing cross section.

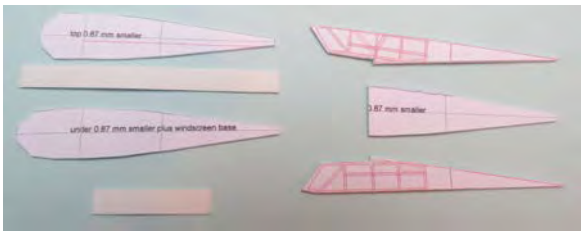
I have printed the top view twice on carton and have cut out the bottom and top cross section to fit it on the fuselage and fin. This showed that the sides of the fuselage at the location of the cabin windows were not straight, but slightly curved. I have trial and error adapted the top view until it fitted the fuselage.

Next I have split the top view in a planar cross section at the bottom of the cabin windows and one at the bottom. These I have modified to serve as a jig to assemble the cabin top by subtracting on all sides 0.87 mm, being the thickness of the walls (0.75 mm) plus the thickness of the window frames (0.12 mm).

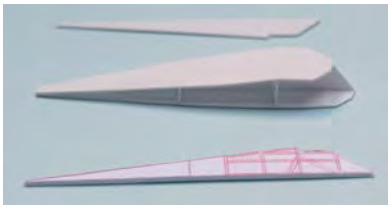
The drawings of the side walls show that the lower side of the windshield curves upward at the front. This is logical as it ends up at the top of the curved nose. But this means that for the jig the windshield frame should be extended to the planar surface, extending the bottom jig surface forward. This exercise is illustrated at the left. The rear part of the top view has been proportionally lengthened to fit the sloped top side of the cabin.

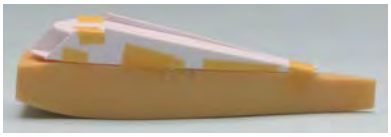


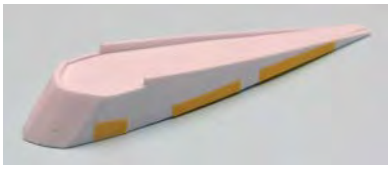
I have printed the drawing and have cut out the shapes. The parts that have to become the assembly jig I have glued on 0.5 mm styrene sheet with diluted Kristal Klear (at the left), the parts that will be used to build the master on 0.75 mm sheet (at the



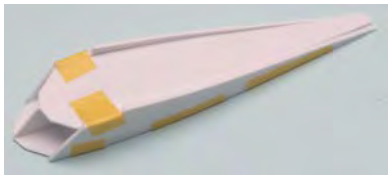
right). I have also cut a strip of 6 mm wide 0.5 mm styrene to mount between the top and bottom horizontal cross sections. The jig parts have been lightly carved on the dotted lines, the cabin side and top on all window frame lines and separation lines.







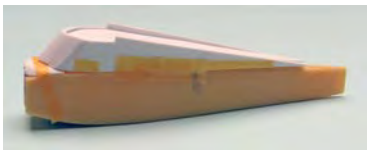
I have assembled the jig part, giving the aft part a slope downward to fit the sloped side walls. The side walls have been bent until they fitted the slight curvature of the forward fuselage. Next I have attached the side walls to the jig with tape; only the forward point of the lower side has been glued to the jig to obtain a rigid, but temporary connection during the assembly of the windscreen parts. A dry fit showed that the width of the upper structure fitted well that of the fuselage.



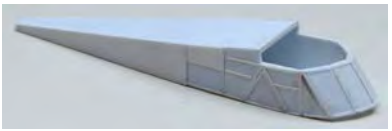
I have cut some strips of 0.75 mm plastic with a width slightly larger than needed to cover the windshield panes and have cut some pieces with oversized length from it. I have started with the central window panes and have adjusted the width and the edges such that they fitted well to the jig and to each other, and have glued them to each other and to the top and bottom surface of the . The two panes next to these I have treated the same way.

I have printed a 11 mm circle (the “footprint” of the nose section) on carton, have cut it out and glued it to the front of the fuselage. Fitting the forward top fuselage to it, this appeared far too high; the mark above the circle shows the height of the top surface of the forward fuselage of the S.IIa according the drawing. So a new forward fuselage top had to be made. I have produced it from a piece of 2 mm thick plastic, sanded to fit the fuselage sides and meeting the circular carton template. The pictures illustrate that quite some material will have to be removed from the S.II forward fuselage to fit the nose part of the S.IIa.

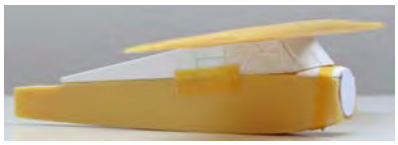
I have dry fitted the cabin part to the fuselage with the new forward top and have made it fit trial and error cutting and sanding the lower edge of the windshield. There is a small gap between side wall and fuselage just behind the top part, but that can easily be corrected during the building. The end result for the overall shape was quite acceptable.



Next I have cut 0.7 mm wide strips from 0.13 mm thick sheet material to use for the window frames. I have also covered the rear of the cabin part, where no windows are present, with 0.13 mm thick sheet. One by one the window frame parts have been applied on both sides and the front of the cabin, glued with ultra-thin Tamiya glue. Also the frame for the top window has been made. I have also removed the rest of the internal reinforcements of the cabin.



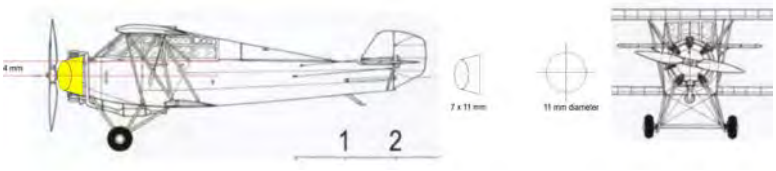
A dry fit on the fuselage and the wing of the Omega Models Fokker S.II kit gave the correct impression. Next I have separated the removable aft part from the forward part of the cabin. The aft part will be reproduced in standard resin, the forward part in transparent resin. After consultation with the casting company I have closed the “ceiling” with 0.13 mm styrene sheet to make casting the transparent part easier. The “ceiling” will disappear in the casted parts.



A final check has been made on the quality of the surface of the forward part of the cabin, which will be casted in transparent resin by spraying it with black lacquer. The result was satisfactory.

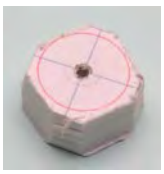
Nose, engine and exhaust

I have made a drawing on the side view and front view for the parts required to build the nose. Both the Aeroclub Models and the Radial Engines & Wheel Lynx engines had a slightly larger diameter than that on the drawing, indicated by the blue circle on the drawing.



The conical part of the nose has a diameter of 11 mm, the total length of the nose including the elliptical part is 7 mm. I have also measured the propeller axis relative to the underside of the window frames. I have marked that position on the front of the fuselage. I have also made a template to check the shape of the nose part after production.

To form the nose I have glued three pieces sheet of 2 mm thick and one piece of 1 mm thick styrene sheet together and have glued the drawing of the 11 mm diameter base on it. I have cut off the corners of the piece and have drilled a 1.5 mm hole in the middle, which fitted the screw in the shaft of the Proxxon drill bit for a circular saw.



I have cut a M1.5 bolt to the required length and have mounted the styrene part. I have put the drill stand in a horizontal position, put the drill in it and have started to sand down the part until the 11 mm diameter.

Next I have sanded the required slope in the part, while frequently checking the diameter. I have rounded the front part according to the drawing. In the end the base diameter measured 10.4 mm, but this fitted well the side and front view of the nose.

I have used the Armstrong Siddeley Lynx engine of Radial engines & wheels 72 as a basis. This part was very finely detailed, but in separating the part from its base some details got lost. The valve rods and part of the intake ducts did not survive the handling. As these parts were anyhow to fine to be reproduced in casting, this is not a problem.

I have glued the engine well centered to the nose base and have marked the place of the cylinders. At three millimeters from the base I have marked the position of the cylinders on the circumference. I have cut off one cylinder from the engine, which surely eliminated the remainder of the valve rods and the lower part of the inlet duct. At the marked place I have drilled a hole in steps from 1.2 mm via 2.3 and 2.4 mm to 2.5 mm and have fitted the cylinder in it. This worked well, so I have completed all holes in this way.

The exhaust is composed of a ring behind the cylinders and a short or long exhaust pipe under the fuselage. According to the drawing the diameter of the ring is 12.5 mm and the tube has a diameter of 1.2 mm. I have first attempted to produce the ring exhaust from styrene, bending it around a wooden rod of 12 mm diameter and heating the styrene to stay in the desired form, but that did not work very well; the shape was rather irregular.

After considering solder as a base material, I have finally decide for 1.25 mm brass rod, again bent around the wooden rod. I have drawn a template indicating the ring diameter and the location of the seven cylinders, glued the ring on the template and have drilled with the drill in the drill stand 0.8 mm superficial holes on the marked locations. 3 mm piece of 0.8 mm styrene rod have been glued in those holes to complete the exhaust ring.

The S.IIa has on the photographs two different exhausts; a long one present on the aircraft with the small rudder or the rudder with the small fin, and a short one with a muffler present on the aircraft with the large vertical tail plane with normal wheels and with balloon tires. I have made both exhausts from 1.2 mm brass rod. The muf-

fler has been made from 2.4 mm styrene tube, made to fit the brass rod.

Fuselage and cabin interior

I have marked the location of the door on the fuselage. This showed that the rear wall of the S.II cockpit was placed too far forward, so I have removed it. With this change and the required change of the forward fuselage I have decided that it was not useful to include the unmodified Omega Models fuselage in the kit, but to use the modified fuselage as a master for the kit part.

I have deepened the fuselage a bit more and have sanded the forward fuselage until it fitted the streamlined forward body. I have also modified the top panel of the forward fuselage a bit to make place for the instrument panel and the wall against which the seat of the nurse will be mounted. The picture shows the parts that will form the fuselage (excluding the cylinders to be mounted in the nose).

For the cockpit furnishing I had only one picture available, shown at the right. It shows a cabinet just behind the door, probably to store the nurse's equipment. The pilot seat is not mounted against a wall, but on a frame, which probably is attached to the fuselage frame tubes further back in the rear fuselage. The seat of the nurse is visible and one of the seat belts lying on the floor. It probably is a folding seat to give the nurse sufficient room to take care of the patient on ground and during the flight. This implies it should be mounted to a wall panel. Both the pilot and nurse seat are leather covered.

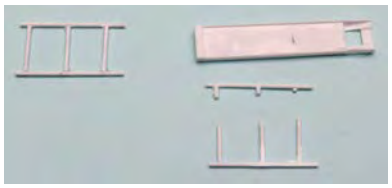
The instrument panel is not visible, neither are the pilot's controls. Quite enough is left to the imagination of the modeler.

I have made the forward wall panel from 1 mm styrene and have fitted that trial and error under the forward fuselage deck. The lower part of the port side has been removed to accommodate the pilot's legs and the rudder bar. I have drilled holes of different diameters in the upper port part of the panel to represent the instrument panel. I have glued a piece of 0.25 mm styrene sheet behind it to facilitate the modeling of instrument dials. From styrene rod of 0.5 and 0.7 mm diameter and pieces of scrap plastic I have modeled the control stick and the rudder bar.

On the starboard side of the panel I have glued two notches, on which the seat of the nurse will be mounted. The back rest of the nurse's seat I have glued against the starboard side of the forward fuselage deck. The nurse's seat itself has been modeled from 1 mm styrene, the (slightly oversized legs from 0.7 mm plastic rod. The cabinet for the medical equipment has been built from pieces of 1 mm styrene, the front side being engraved to resemble the roll door in the picture.

The pilot seat itself has a bottom part of 1 mm styrene, the rear side of which I have sanded in a curved. Around the bottom I have folded some 0.25 mm thick sheet, glued it in place and have held it so until the glue had set. The picture at the left shows the rough product. A second layer of 0.25 mm styrene sheet gave the seat its final shape. The supports for the seat I have produced from 0.7 mm rod.

I have simulated the frame tubes on the inner side of the fuselage with thin strip material and have marked the attachment locations of the seat supports, the control stick and the rudder bar with superficially drilled holes. I have also glued two pieces of strip to the starboard inner wall and the floor to attach the medical equipment cabinet to. A piece of 0.7 mm rod has been glued to the cabinet represents the fuselage tube connecting it to the other fuselage wall.



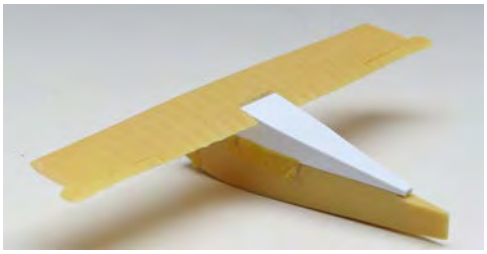
The stretcher I have made from a piece of 0.8 mm styrene, cut to the size shown in the drawing of NVM. The sliding rails have been made from 1 mm angle profile. The actual configuration of the frame tubes in the aft fuselage

cannot be modelled on this scale, so I have limited myself to producing the supports to place the stretcher under an angle. The part at the left will be included in the kit; the modeler has to change it as indicated at the right in the picture.

I have also modeled a cabin door from 0.8 mm styrene sheet to include the option of building the model with an open door. Using the door and triangular window cut out from fuselage and cabin for this purpose is probably unfeasible. The last item to be modeled was the table or luggage storage device, located at the port side behind the pilot.

Wings

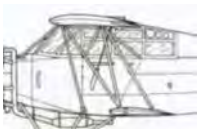
The aft part of the wing center section had to be modified to fit the top part of the cabin in it. I have drawn a rectangular cut-out of 7 mm deep from the wing trailing edge and have cut in the sides with a razor saw and have cut in the forward edge with a knife on the top and bottom surface. A small pressure with a set of pliers removed the piece. When dry fitting the fuselage in it, the wing thickness appeared to be almost a millimeter greater than the cabin side wall height. I have solved that by cutting a new cabin roof from 0.75 mm sheet of the size of the "fit with fuselage under" template. Gluing it in place eliminated the height difference, as is shown in the dry fit.



I wanted to have a well-defined location and a firm connection of the lower wing halves, so I have drilled a 0.75 mm hole in the wing root at the place of the forward spar, where the wing struts are attached. For the masters I have glued a 0.75 mm brass rod in it, for the kit this will be reproduced in resin, but the builder has the choice to replace it with a piece of brass rod.

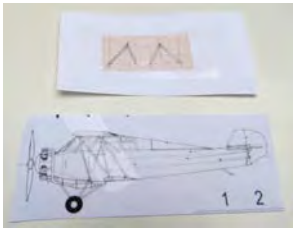
To determine the place of the hole corresponding with the pin on the fuselage sides I have used the wings as a stamp, dipping it in black lacquer. I have assumed that the middle strut of the wing struts was vertical. I have drilled the 0.75 mm holes and have dry-fitted the wings to the fuselage.

However, looking to the photographs and the drawings my assumption turned out to be completely wrong: the lower wing is shifted more backward. So I have repeated the process with the correct shift of the lower wings, using the top view of the drawing.



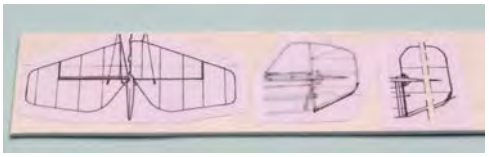
I have attached the lower wing provisionally to the fuselage. This showed a gap between lower wing and fuselage at the trailing edge. I have filled that up with slivers of 2 mm styrene sheet.

I have marked the attachment points of the canopy struts to the fuselage with superficial holes and have cut pieces of 0.7 mm styrene rod to the correct length of the middle strut of the N-strut and the V-struts between fuselage and upper wing. I have constructed the V-struts scale 2:1 on paper and have reduced this drawing 50% to serve as a template. For the N-strut I have used the side view drawing with a small correction at the lower wing as a template. The struts have been made slightly longer than required to enable exact fitting when building the kit. The remaining struts will be included in the kit in the form of styrene rod of several diameters.



Tail planes

I have used the small vertical tail plane and the horizontal tail plane from the NVM drawing and the large one from the Russian website



drawing; these seemed to me to correspond best to the photographs. I had no clear drawing or photograph of the intermediate situation with a fin and the small tail plane, I have tentatively modeled this variant. Both rudders had to be modified slightly to fit the fuselage and the photographs better. I have glued a copy of the drawings on 1 mm sheet and have cut them out. I have also reconstructed the small fin, which has been combined with the small rudder after initial flight testing, from the one picture it showing it.

I have cut the tail planes from the plastic sheet and have marked the ribs and the separations between control surfaces and the fixed parts first with a knife and afterwards with a panel line scriber.

Undercarriage

The photographs show that the S.IIa flew with two different types of undercarriage. The earlier versions with the small rudder and the rudder with the small fin had the same landing gear as the Fokker S.II trainer. This landing gear apparently was also still used when the rudder had been enlarged until it was replaced by a landing gear with balloon tires.

I have used the almost perfect side view of the aircraft to establish the correct size of the wheels and the landing gear struts. The diameter of the wheel is 8.4 mm, that of the rim is 2.1 mm. The height (equal to the width for a balloon tire) is than 3.15 mm. It can also be clearly seen that all three landing gear struts converge to one point in this later version. The configuration of the V-struts for both versions appeared to be (almost) identical. I have constructed the V-struts the same way as the V-struts for the wing, taking into account the outward slope of the struts.

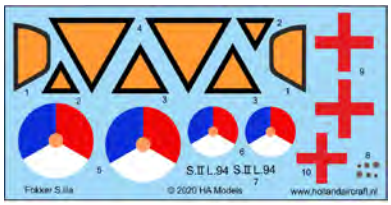
The wheel axle in the earlier version is covered by a streamline body as with the S.II. The axle for the balloon-type landing gear is composed from three parallel tubes, of which the middle one serves as axle suspended to the two outer tubes, which are firmly connected to the V-struts. So there is a slight difference between the two configurations. The undercarriage struts bracing the V struts to the rear will be included in the kit as styrene rod, and will have to be cut to size and fitted by the builder of the kit. To get the wheel axle at the same height for both configurations I have lengthened the V-strut for the configuration with the balloon tires a bit.

The tail skid is conventional; I have modeled it from assorted pieces of rod and strip.

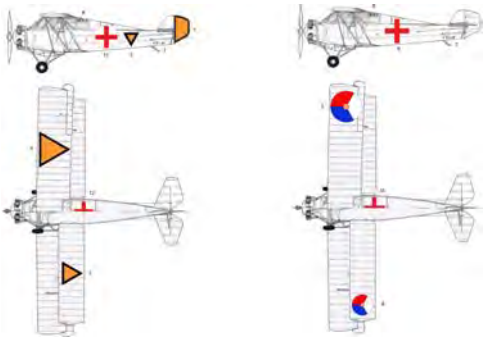
To construct the master for the balloon tires I have used the same method as for constructing the nose. I have glued three pieces of 1 mm styrene together and have glued the print of the tire on top. I have drilled a 1.5 mm hole in the middle and have mounted it on the Proxxon bit of the tool for sawing and grinding. The outside of the wheel has been shaped by sanding it down, the inner side has been shaped roughly by means of a countersink drill and a normal drill bit. The hub is a circle of 2.5 mm diameter punched from 0.25 mm thick sheet and the diameter of the hole for the axle has been decreased by inserting pieces of styrene and brass tube.

Decals

I have made a drawing for the decals. One picture showed also the S.IIa with orange triangles, so I have included also the decals for that version. Also, in those pictures the red cross was set in a white circle, so I have included that also in the decal set. I have made a print on paper, cut them out and attached them on the model to check their correct dimensions. I have sent the drawings to Arctic Models to have them checked and to get a quotation.



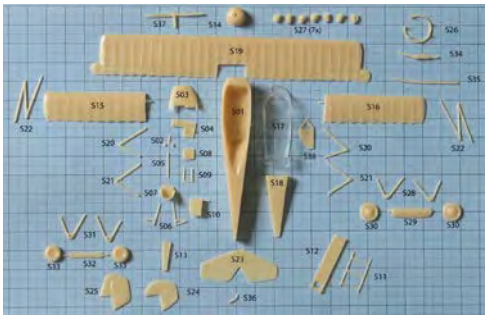
However, a new picture of the S.IIa with orange triangles surfaced, which made it very clear that in that configuration the red cross was placed in a white circle. So I have drawn this configuration also, and shipped them to Arctic Models for print.



As I was drawing anyhow, I decided to also make the illustration for decal placement for the building instructions. From the first version of this drawing it became clear, that the registration number was too large, so I changed it from 2 mm high to 1.3 mm, and have printed them on my inkjet printer in 50+ copies.

Overview

A major change has been not to use the S.II kit of Omega models as a basis. The modification to the fuselage is too big to leave it to each modeler, while the original wing struts would not fit (they did not already fit well when building the original kit). So basically only the modified wings, fuselage, the undercarriage axle and wheels have been used as masters for the S.IIa kit. There are some 51 parts to be reproduced in resin, as shown in the picture at the right. I have numbered them in the most probable assembly order, starting with the cabin interior, followed by the attachment of the nose. Then the forward fuselage can be finished and the cabin roof attached. Next follow the tail planes and the lower wings. The upper wing will be attached and the wing struts made to size and installed. Then the exhaust ring and the engine can be assembled. After having chosen the undercarriage and exhaust pipe configuration they can be installed under the fuselage. Finally the propeller is mounted.



Actual assembly of the prototype will learn if this is the right way of doing it.

Building the prototype

Having received the first two sets of resin parts I have removed them from the sprues and have carefully cleaned them. Most parts were well casted with few air bubbles and also the transparent parts were good, almost injected plastic quality. There were some problems with the horizontal tail plane (S23), which was too thin, and with one of the balloon tires (S33), which showed an unintended bubble. The former was solved by sanding, the latter I discussed with the casting company to find a solution. One or two parts broke when cleaning them, but they could be repaired easily. Also initially a number of parts was casted only once, while two copies are required per kit. Temporarily this has been solved by combining parts of both kits.

I have given the parts a bath in soapy water and have started the assembly. Cleaning the transparent parts was not evident; IPA made the resin very sticky and foggy. In drying the fog disappeared mostly, but the some stickiness stayed and the component was very sensitive for finger prints. Cleaning with water and a drop of detergent made the component also foggy, but this disappeared completely in drying.

I have decided to build the model with defected control surfaces. I have removed the aileron from the upper wing and have marked them left and right. I have also removed the rudder and the elevator halves from the tail surfaces, again marking right and left. As I needed the illustration for the instruction sheet, I have removed the rudder for both configurations, A-B and C-D-E. I will build configuration E (big rudder, balloon tires, short exhaust and orange triangles.

I have given the control surfaces a coat of grey primer and I have cut 3 mm high control horns from a piece of 0.4 mm thick plastic. They have been glued in place, carefully aligning the components on the opposite sides of the surfaces.

Fuselage


To illustrate the configuration with open door I have cut away the door from the fuselage and the triangular window from the cabin upper part. The fuselage jab was rather straight forward, the only difficulty being to cut out the lower part of the door, as that was lower than the fuselage bottom. Cutting out the triangular window posed some more problems. I used gloves to prevent finger prints. As the resin was sticky, the sawdust attached to the component and could not be removed well. The resin appeared still to be rather flexible too; the component deformed under the force of sawing. Fortunately I used the part with an air bubble in the front window for it and not the good copy. I also noticed that it is rather difficult to saw on the fine line separating the door window frame from the cabin window frames.

Fitting the door in the opening cut out in the fuselage it appeared to have a slightly different shape. I have corrected that by gluing a piece of 0.7 mm thick styrene to the side, sanding it to the right dimension. From a piece of transparent plastic I have cut trial-and-error the triangular window. Notwithstanding these problems a dry fit of fuselage and cabin top gave the right impression.

After a discussion with the casting company I have decided to build the model with a closed door, mainly because cutting the triangular window from the cabin top with a saw exerts to much force on the part, which always remains a bit flexible. In fact, the material is rather tough and deforms too easily when working it. A better way to cut it is with a pair of nippers, after scoring the separation lines with a knife, but that is not always successful. I don't want to risk the only surviving prototype with that. Also sanding the material is difficult; it is better to cut it bit by bit to the right dimensions. A fundamental solution for the open door configuration is modification of the master, but it is too expensive to do that now.

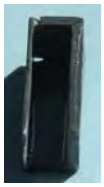
The medical cabinet (S10) in one of the two sets was missing the piece of rod simulating the fuselage frame tube it was attached to, in the other one a piece of white styrene was attached to it. Apparently the original bit got stuck in the mould and attached again to the second copy being casted. I am curious to see how the next copies come out of the mould. I have glue the supports to the pilot seat; this way it is easier to paint.

I have mounted pieces of 0.7 mm styrene rod between the two aft fuselage frame tubes casted with the fuselage. Next it a painting session followed. The fuselage interior was painted light grey, rudder bar, control stick medical cabinet were painted dark grey. I have also glued the horizontal tail plane to the fuselage, taking care that it was well perpendicular to the fuselage sides.

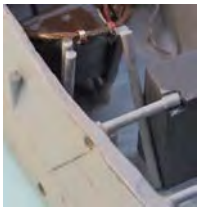
Now the cabin furniture could be mounted. I have first glued the painted instrument panel and forward bulkhead under the top nose panel. Next I have glued rudder bar in the most forward hole casted in the cabin floor. The top nose panel has been glued in place and I have also glued the nose to the fuselage to make it easier to sand the forward fuselage in the correct shape.

Next I have painted the pilot seat and equipped it with PE seat belts from my stock. The assembly has been glued in the two rear holes casted in the floor. I have shortened the control stick and I have glued it in the middle hole in the floor. I have mounted the seat of the nurse in folded position, because in deployed position it interfered with the pilot sea have included an instruction to reduce the width of the part in the building instructions.

The medical cabinet has been provided with a rear wall made from a piece of 0.5 mm styrene sheet; without this it would be possible to see the inside when the model is built with a detachable aft cover. The cabinet has been painted and glued in place in the cabin and a piece of 0.7 mm styrene rod has been fitted between the cabinet and the port fuselage wall to model the fuselage frame tube to which the cabinet is mounted. I have glued a long seatbelt half for the nurse seat to the bottom of the starboard fuselage wall, as was also the case in the actual aircraft.



The support of the pilot seat assembly has been made from 0.7 mm styrene rod. One piece leads from the top of the right hand seat frame to the bottom of the medical cabinet, a second piece from the top of the left hand support to the skewed fuselage tube, moulded with the port fuselage wall.

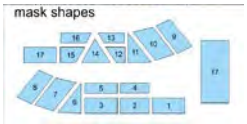


The last part of the cabin furniture is the stretcher. The tube supports have been produced from the ladder shaped part in the kit. At the front (the shortest stub) it has been cut to a height of 3 mm, reducing at the end to zero.

Next I have dry fitted the stretcher in the fuselage with the detachable hood in place, moving the stretcher as much as possible backwards and I have noted the position of the transverse frame tubes on the stretcher to indicate the place where the stubs of the support must fit. I have glued the supports to the stretcher.

After dry fitting another time the stretcher with the aft and forward top part of the cabin structure in place I have glued the stretcher support to the fuselage frame tubes. With the top part and the wing in place it gives the right impression. I have also painted the white line along the edges of the detachable part, which is visible on a number of pictures.

I have used the damaged cabin top part to make the paint masks, each one cut trial and error to the right size. The triangle at the top is the mask for the missing triangular window at the starboard side. Next I have taken the pieces off and glued them on a piece of styrene, which I have scanned. The scanned image has been imported in CorelDraw and I have drawn the individual masks and numbered them. From this drawing a paint masks have been produced on different materials by fellow modelers, who were in the possession of the Silhouette cutting plotter.



I have tested these products on the first canopy on traces left on the glass surface, ease of application, coverage during painting and ease of removal. Of course the correct size of the paint masks has also been checked during the process. This has been tested on the bad cast of the clear part and corrections have been incorporated in a next issue of the paint masks. In the appendix the detailed results are reported, here I mention only the final choice.

When separating the clear part from its sprue it repeatedly broke damaging the aft edge of the top surface. To prevent this, I have worked the separation lines alternating with a sharp knife and a razor blade saw until the cut became visible at the inner side. This procedure worked well, and I have included it with an illustration in the building instructions.

Next I have applied the updated paint masks on the canopy. After having applied a coat of grey I have checked the coverage carefully, a second coat appeared to be needed.

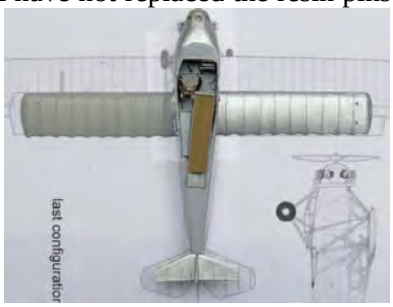
The result of the paint session was satisfactory, no paint had leaked under the masks. But the Kip Washi tape adhesive left traces on the glass, which could not be removed with water, nor gasoline and could only be partially disguised with a coat of clear varnish.

So a new set of paint masks has been produced from Frisk foil and again the framework has been painted. This time some paint had run under the masks, which after careful removal still left dull places on the glass. I now had only one copy of the glass part left, so the last attempt should be successful. This time I have taken all possible precautions. After application of the masks I have first applied a layer of water based gloss varnish, then the two layers of grey and one layer of mahogany brown, finishing with another layer of gloss varnish. This gave the desired result.

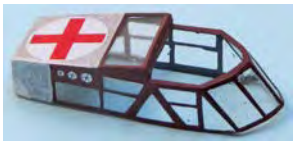
The picture at the left shows from left to right the five attempts on a row.

I have glued the fin to the stabilizer, adjusting it well to the fuselage end and perpendicular to the stabilizer surface.

In order to aligning the lower wings well to the fuselage I have mounted them over the drawing, which I had protected from the glue with a couple of pieces of sellotape. I have not replaced the resin pins at the wing root by brass ones; increasing the diameter of the holes in the fuselage a bit gave a sufficiently strong connection. The picture shows that the drawing, downloaded from the internet, is not too accurate; the wing leading edge is not straight. The span of the wing is smaller than that on the drawing, the same is the case for the upper wing, the span of which is some 5 mm to small[2]. Luckily this does not affect the overall proportion of the model. I have also started to paint the model aluminium, as I will apply the decals on the fuselage before I start mounting the upper wing and the struts. I have given the whole assembly a coat of gloss varnish.



The model was now still well accessible and still sturdy enough to apply the decals on the fuselage and the cabin top. As I am building the version of the S.IIa as it has flown after September 1939 with orange triangles and a red cross in a white circle and also with a detachable aft fuselage top, the white circle on the fuselage sides has to be cut in three parts: one part on the lower fuselage, one part on the cabin top and one part on the removable part. For the other versions the red-white-blue-orange roundels must be separated if the ailerons are mounted in a deflected position and the red cross, if the aft top is removable. To help cutting the decals beforehand I have made a template on transparent plastic indicating the cutting lines.



I have started with applying the decals of the aeration openings at the top of the cabin walls and the smaller red cross in a circle on top side. Applying the red cross on the side of the fuselage I have done in a specific order to align the different parts well. First the top part has been separated according to the template and about 3 mm from the side a vertical cut has been made in the top part. The biggest part has been applied to the removable part, which has then been attached temporarily to the fuselage with a couple of pieces of tape. Then the lower part of the decal has been applied to the fuselage, aligning it well with its upper part. Finally I have applied the small part of the white circle to the cabin top part, again aligning it well to the other two parts of the decal. I have sealed all decals with a coat of gloss varnish and have glued the cabin top to the lower fuselage with white glue. Some small gaps have been filled with white glue too and the aluminium finish has been retouched where required.

Upper wing and wing struts

Before gluing the upper wing, I had to adapt the forward upper edge of the cabin top a bit to avoid too large gaps. I have glued the upper wing to the cabin top also with white glue, keeping it well parallel to the lower wing and carefully adjusting the distance between upper and lower wing. The white glue easily filled the remaining gaps, and no paint correction was necessary.


I have mounted the struts between upper wing and fuselage. I have started with the aft V-strut, the one with almost equal legs, adjusting the length and chamfered lower edges trial-and-error, until a proper fit was achieved. Next I have mounted the forward V-strut, following the same procedure. Here I had to take care not to cut the forward -long- leg too short.

I have repeated the procedure for the V-struts at the other side of the fuselage. The V-strut construction has been finished by fitting a piece of 0.5 mm styrene rod between the apex of the two V-struts just below the upper wing lower surface.

I have cut a length of 0.5 mm brass rod to size to form the push-pull rod of the aileron mechanism to the port side of the fuselage.

The N-struts between the outer upper and lower wing were just the right size, although I had made the masters slightly over size. This was probably due to some late modifications of the cabin top, but may also have been caused by some remaining deformations after the correction of the shape of the part in hot water. The last struts to be applied were the ones between the apex of the forward V-strut and the bottom side of the fuselage. I have made these from a length of 1.0 mm styrene rod, cut trial-and-error to size. A piece of 0.5 mm styrene rod has been glued between the two forward members of the N-struts in the middle between upper and lower wing.

Engine

I have glued the seven cylinders to a piece of styrene rod to make the painting easier (and losing the tiny parts more difficult. I have painted the cylinders black and have dry brushed them with gun metal. The exhaust ring and the two exhausts have been painted black as on the pictures the exhaust does not show any rust. I have drilled a hole in the end of the exhaust pipes.

Before mounting the cylinders the small exhaust at the rear of the cylinders has been removed as they interfere with the stubs on the exhaust ring. Also, the stubs on the exhaust ring have been shortened to 2.3 mm measured from the base of the ring. I have mounted the top cylinder first, attaching it first with a drop of Microscale Kristal Klear and adjusting its position carefully. A drop of cyanoacrylate glue has fixed its position. The exhaust ring could now be moved over the nose and has been left hanging loose until all cylinders were in place, aiding the correct location of these in the process.



I have glued the remaining six cylinders the same way as the first one, aligning them well relative to each other and to the stubs on the exhaust ring. Gluing the stubs of the exhaust ring to the cylinders has completed the engine assembly. The exhaust could only be mounted after the undercarriage had been assembled and the rigging wires applied.

Undercarriage

As I have built version E of the S.IIa, the aircraft as it has flown from September 1939 until May 1940, the undercarriage with balloon tires had to be mounted. I have first enlarged the holes for the axle in the two V-struts a bit, so it could pass under the right angle through the holes. I have mounted the V-struts and the axle, taking care the construction was well symmetrical and that the wing tips were on equal distance to the ground plane when the model was resting on its legs. The rear support struts for the undercarriage I have made from 1.0 mm styrene rod, cutting it trial and error to size and with one slanted end.

The tail skid has been glued in place as well as the two support struts

for the tail plane, made from 0.7 mm styrene rod.

The next step was the application of the rigging wires for the undercarriage structure. I have started with drilling three 0.3 mm holes in the fuselage underside, two next to the middle undercarriage struts and one in the middle between the two forward struts. 0.3 mm holes have also been drilled in the forward and aft rod, composing the axle assembly, two in each rod. I have fed the 0.06 mm black painted fishing line through the holes, starting from the holes in the axle assembly and have glued them in the holes in the fuselage underside. Next the lines have been tensioned and glued in the axle holes.

To complete the undercarriage I have glued the wheels with balloon tires to the axle. Now the short exhaust could be mounted. I have guided it carefully between the rigging wires and have supported the end with a small piece of styrene. According to the photographs the exhaust should have been mounted closer to the fuselage underside, but the rigging lines prevented this.

As the kit includes also an undercarriage for the S.IIa versions with the original S.II tires, I had to evaluate also the building of that option. The routing of the rigging wires is slightly different, as the V-struts offer more space for their attachment, so I have drilled two 0.3 mm holes next to each other at the apex of the V. The holes in the fuselage underside are on the same place as with the balloon tires undercarriage. I have used the fuselage that I had used to cut out the cabin door for mounting the undercarriage. The aft struts have been made again from 1 mm styrene rod cut to fit.

The rigging wires have been applied in the usual way, feeding them first through the holes in the V-struts, then gluing them in the holes in the fuselage underside and when the glue had set, tensioning the wires and gluing them in the holes in the V-struts. To complete the undercarriage I have glued the S.II type wheel to the stubs on the axle assembly. I had to lengthen one of the stubs with a piece of styrene rod.

I have temporarily attached a nose cone and an exhaust ring to the fuselage to demonstrate the attachment of the long exhaust. The placement was easier than that of the short exhaust; due to the smaller diameter there was less interference with the rigging wires. The exhaust has been supported to the fuselage underside with a piece of styrene strip.

Control surfaces

I have glued ailerons, elevator halves and rudder, which I had painted black before applying the orange and black decals, with the desired angles of deflection. After opening up all slanted holes for the control cables, I have started by mounting the cables, again made from 0.06 mm black painted fishing line, for the elevator. Gluing the in the holes first went easy, but it was rather difficult to tension the line; there was too little place to attach the tape to hold them under tension until the glue had dried. In the end I used the Revell FIX-kit UV hardening glue, and that worked very well, also for the rudder control cables. For the short pieces of line required for the ailerons there was no need to tension them; when the lines was inserted in the slanted holes it stayed out of itself in the right and straight position.

The model has been completed by applying the decals to the wings. One of the triangles on the lower wing was missing its white base layer, hence the orange is slightly transparent. An additional, corrected triangle will be included in the kit.

Back-up cabin top structure

I had asked to cast two copies of the cabin top in the normal, yellow resin to modify them in a cabin top with window openings as an alternative for the rather vulnerable clear resin top. I have drilled holes in the window panes with different sizes of drills, taking care not to damage and weaken the frames.

I have started to cut carve with a sharp, pointed scalpel the starboard front window, being the weakest, as it has the least support and –also- an air bubble in the top edge. This went quite alright. When done I have reinforced the weak spot with ample cyanoacrylate glue. Bit by bit I have carved out the other windows, working from the front to the back. Except for a bloody finger, when I did not pay attention to the scalpel lying in the table, this gave no problems. To check the final result I have dry-fitted the cabin top to the (partial) model with the S.II undercarriage. The part had kept its correct dimensions during the processing. The master has been finished by locally passing a file and coating it with clear varnish. It has been shipped to the casting company.

Summary

The original idea to produce only a number of modified parts for the Omega Models Fokker S.II resin kit had to be scrapped quite early in the development of the masters. Main reason was that the fuselage would have required too much modification work from the builder, but also that most struts would have to be supplied, as the originals in the Omega kit were already badly fitting. In the end only the wings, the wheels and axle for the oldest S.IIa version and a heavily modified fuselage from the Omega kit have been used as masters.

The resulting model is relatively easy to build, as the cabin structure supports the upper wing well, which makes the strut attachment much easier. The fuselage-nose region still requires a fair amount of sanding work to obtain a smooth transition. The glass cabin is difficult to paint; the material is very sensitive to tape adhesive and difficult to clean without losing its transparency. The engine construction from individual cylinders requires careful alignment, but the exhaust ring is a good help for this. In positioning of the short exhaust care must be taken to prevent interference with the undercarriage rigging wires. The final result represents the original quite well.

Below some pictures of the completed model are shown.


S.II L.94


S.II L.94

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Appendix Fokker S.IIa documentation

Paint table

HE = Humbrol Enamel, VMA = Vallejo Model Air, VMC = Vallejo Model Colour, RA = Revell Aqua

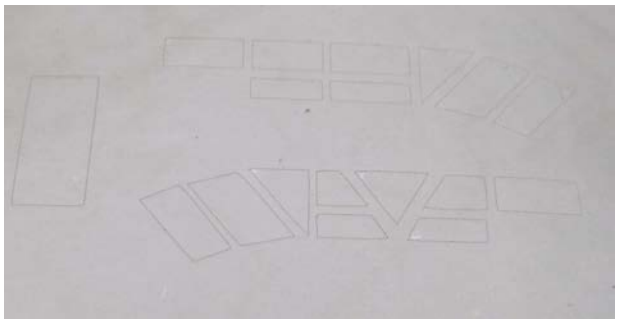
Code	*Colour*	*Where*
HE 21	White	Edge of detachable cabin roof
HE 22	Black	Engine cylinders; fin (of variant with orange triangles); exhaust; rudder for post-1939 version
HE 53	Gun metal	Engine cylinders (dry brush)
HE 62	Leather	Pilot and nurse seat cushions
HE 110	Natural wood	Stretcher
HE 125	Dark grey	Window frames; stretcher frame and rails; instrument panel, control stick, rudder bar
HE 127	Light grey	Cabin floor and interior walls; control horns
RA 36178	Tank grey	Tires
VMC 70.870	Medium sea grey	Canopy (first coats)
VMC 70.846	Mahogany brown	Canopy (last coat)
VMA 71.062	Aluminium	Fuselage and wings, all struts, propeller

Test of paint masks

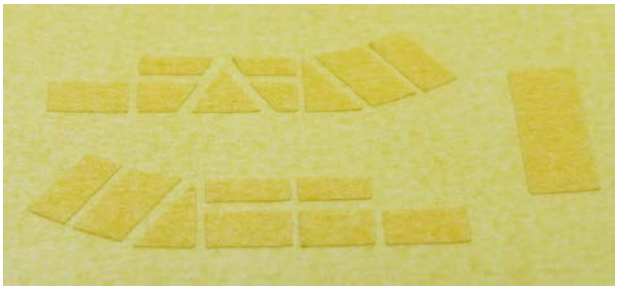
The paint masks have been made with a Silhouette (cutting) plotter in the materials shown below.

Oramask

Frisk foil



Two layers of Kip Washi tape



On the best copy of the clear resin part I have tested whether the paint mask left a trace after removal. It appeared that the Oramask mask left a trace that could be removed with a wet cotton stick, exerting a rather large force. The glue of the Frisk and Kip masks left hardly any trace.

I have applied the Oramask paint mask on the top window of the clear resin part, the Frisk foil paint masks on the left side and the Kip Washi paint masks on the right side. Application was easiest for the Frisk foil, which is the stiffest, and least easy for the flexible Kip tape.

After application of the masks I have first painted the cabin with Vallejo Model Color 70.xxx blue grey and then with a layer of Vallejo Model Color 70.xxx Mahogany. Before application of the second layer I have covered the aft part, which had not to be painted mahogany, with normal Tamyia tape. After removal of the tape I got the results shown below.

The Frisk foil masks.

The masks were not easy to remove. The paint mask at the right was a bit too large and must be corrected, the rectangular one at the right was applied too much to the left. As the frisk foil is transparent, it is difficult to see if a mask is applied correctly. Some small spots are damaged in removing the mask.

The Oramask masks.

The masks were not easy to remove. The grey paint has come under the masks and could not be removed without damaging the other paint work. The Tamiya tape took away most of the grey paint of the top part.

The Kip tape masks.

The masks were easy to remove. The lower window masks are not high enough, and must be corrected, as well as the right upper window mask. The triangular window mask is too wide. The mahogany paint has flowed under the Tamyia tape applied over the grey paint.

The two front windows at the left are covered with Frisk foil masks, the two at the right with Kip tape masks. The view shows that the mask on the second window from the left has not been applied correctly.

The other pictures of the inside show that even one layer of grey under the covers sufficiently well to hide the dark mahogany paint of the second layer.

However, to cover well too layers of grey paint should be applied on the parts that are not receiving a final layer of mahogany.

To conclude: The Kip Washi tape masks are preferred, because the prevent very well the paint flowing under the masks, and leave no visible trace of the clear part. They are easy to remove, which compensates largely the more difficult application. Frisk foil is as a second choice is not recommended, because of the risk of small paint leaks, that are difficult to remove afterwards.

However, the Kip Washi appeared still to leave adhesive traces on the glass part, so in the end the (newly cut) Frisk foil masks have been used with a first layer of clear gloss varnish applied before applying the next layers of paint. This gave no problems.

Photographs and drawings

If no reference is given, the pictures have been taken from the Internet/Wikipedia.

[Source: ref 11]

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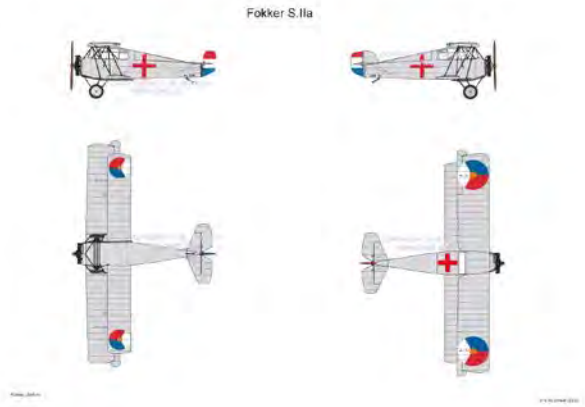
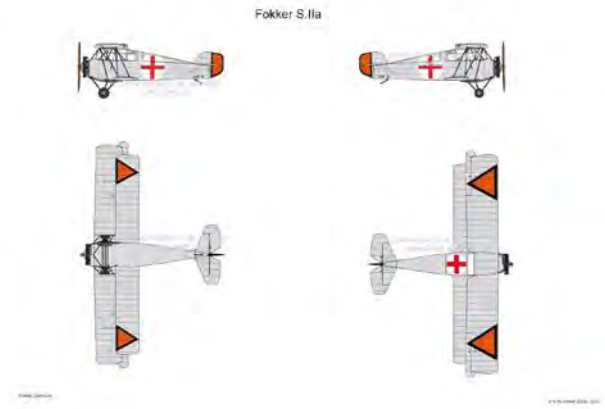
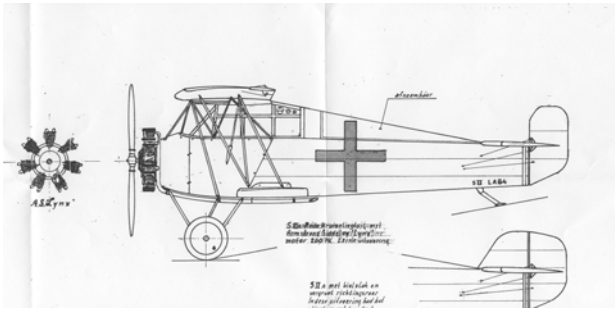




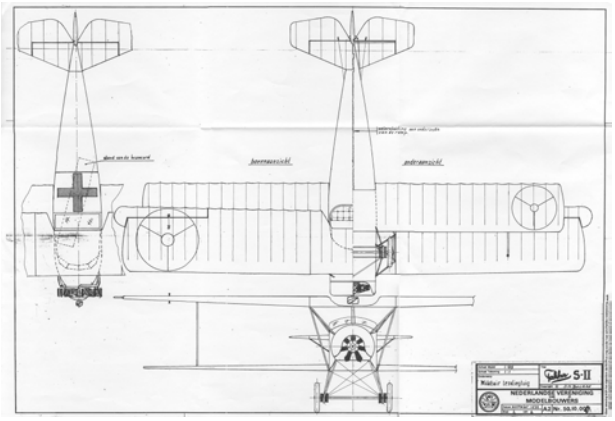
[Source: ref 14] Note that the position of the triangles in this drawing of Wilco Jonker are not the regulatory ones. Photographic evidence shows that for the S.IIa they were correctly placed half way the wings. Also, there was a small orange triangle between the red cross and the end of the fuselage (see picture below; ref. 16).

[Source: ref 16]

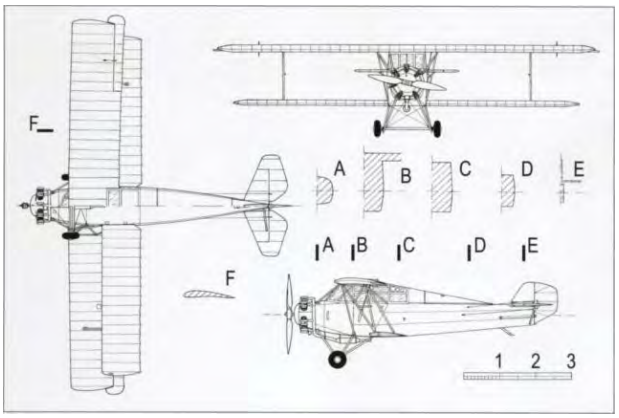
[Source: Wikipedia]



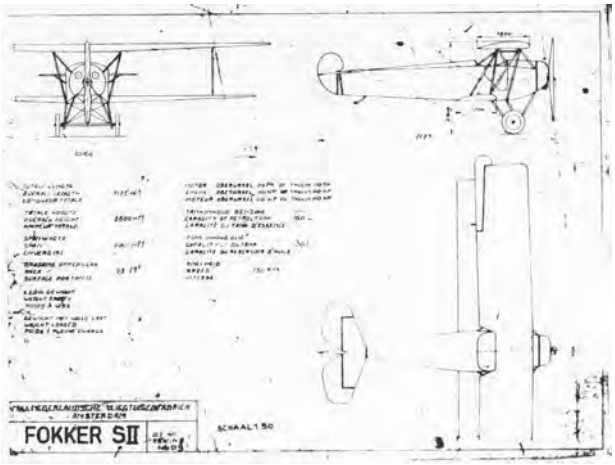
[Source: ref 12]



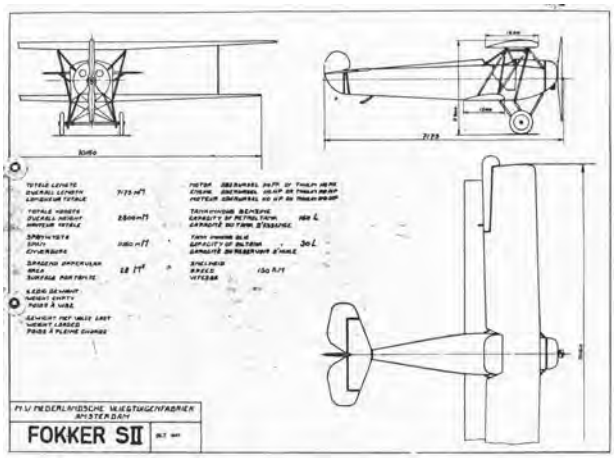
[Source: ref 12]



[Source: ref 13]

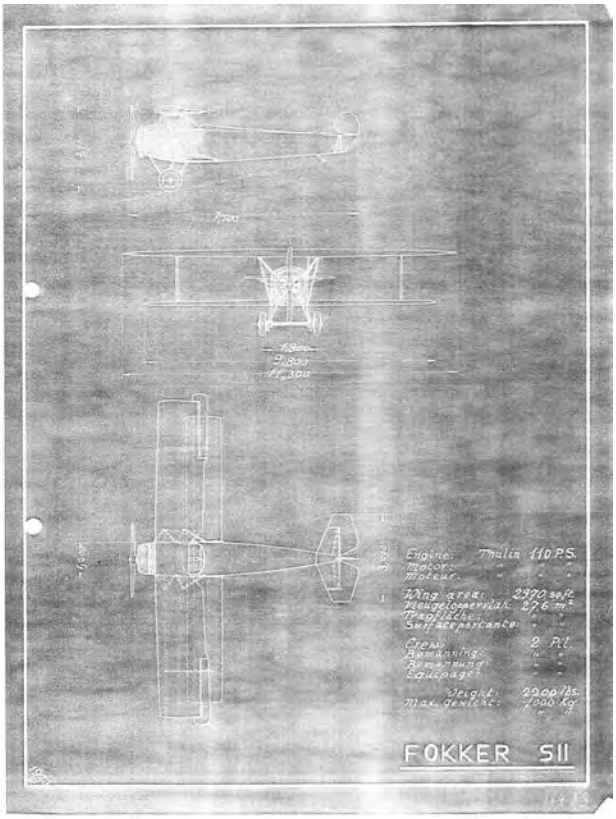


[Source: ref 15]



[Source: ref 15]

[Source: ref 14]



[Source: ref 15]

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[1] C.f. the building report at http://www.hollandaircraft.nl/F35_Fokker_SII.pdf

[2] Logically this is also the case with the original Fokker S.II kit of Omega Models.