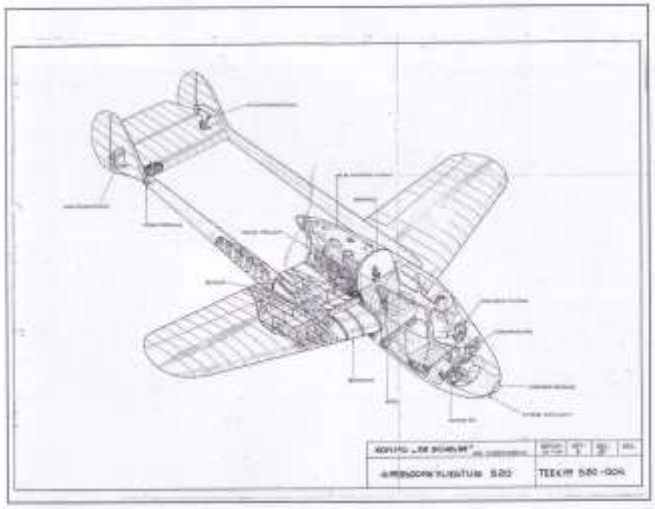
De Schelde S-20 HA Models resin kit

Monoplane trainer and sportsplane

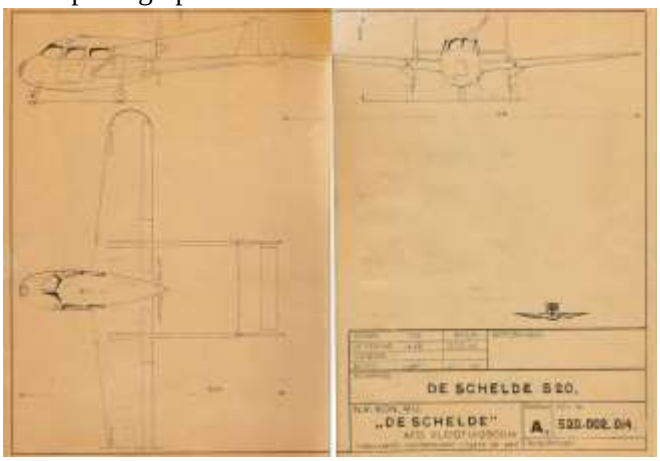
Scale 1:72

After the Scheldemusch and the Scheldemeeuw the S.20 was the next project that was realized by the aviation department of the shipyard De Schelde, for which the design work started in mid-1938. It was a four persons training and sports plane with dual controls, a nosewheel, retractable undercarriage, dual tail booms and a pusher propeller. It had a wooden wing with flaps on the inner wing and fixed Handley Page slots at the wing tip leading edges to prevent early tip stalling. The tail booms were made from aluminum, as was the fuselage, which was however not a stressed skin construction, but the metal panels mounted on rather sturdy frame profiles. The prototype had still a wooden wing, but provisions had been made to replace it with one of metal. The engine was an air cooled Hirth HM 506A with six cylinders in line of 160 hp. The inlet for the engine was in the nose and run through a tunnel in the cabin to the rear mounted engine. Maximum speed was 240 km/hr, the ceiling 5000 m and the range 900 km.

The aircraft made its first flight on March 29th 1940. It has always flown with orange triangles as were obligatory in the Netherlands since September 1939, and it carried the prototype registration Y-200. Documentation in the archives of the NLR (Netherlands Aerospace Laboratory)states that extensive wind tunnel tests have been performed, both for the aircraft itself and the complex air inlet. There seem to have been also some problems with the engine exhaust, which probably explains the strange appearance of the plane on some photographs. It is not clear what happened to the aircraft after the German occupation in May 1940.



From the archives of the Aviodrome museum I have obtained a nice set of photographs and a good drawing. In the book of Van Wijngaarden (ref. xx) I found two drawings representing the 1938 configuration, one a useful cut-away drawing, even if it does not represent the final configuration. In the book “De Nederlandse Vliegtuigen” van Wesselink and Postma (ref. xx) some more photographs are contained.



The photographs showed some more remarkable details. The seats could rotate down and to the outside and served then as a step to enter the cabin. The nosewheel rotates forward in the engine cooling air inlet duct. This picture also shows clearly the doors of the nosewheel bay, which are missing on other photographs. Apparently the doors were replaced by fixed panels during test flights. Here the door of the luggage space behind the cabin is also well visible, as well as the

test probe on the roof. Also, on almost all pictures the end fairing of the tail booms is missing. The reason for this is unknown.

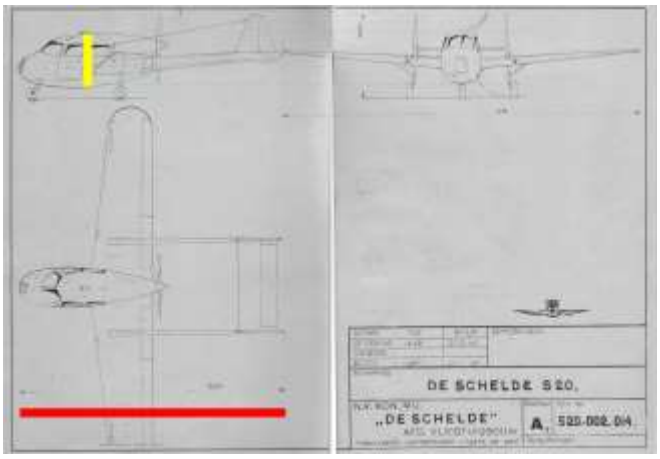
Some data of the S.20 are:

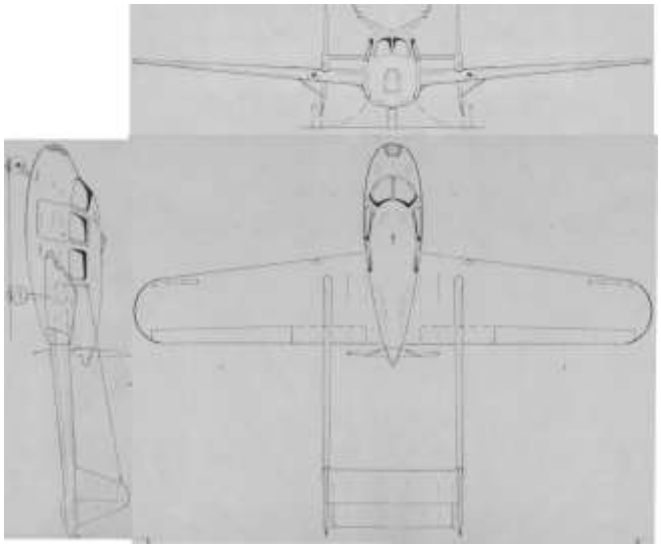
	Ref.	*1:72*	*model*
Span	11.35 m	157.6 mm	
Length	8.65 m	120.1 mm	
Height	2.60 m	36.1 mm	
Engine	Hirth HM 506A of 160 hp		
Crew/passengers	2/2		

Master production

Processing the drawings

I have taken the De Schelde drawing of February 20th 1940 in the Aviodrome documentation set as baseline for the model. I have first checked the accuracy of the drawing by scaling a black and white copy of the drawing by 1/72 relative to the length indicated in the drawing. This showed that the main dimensions in the different views were correct, but the location and dimensions of the windows between top view and side view

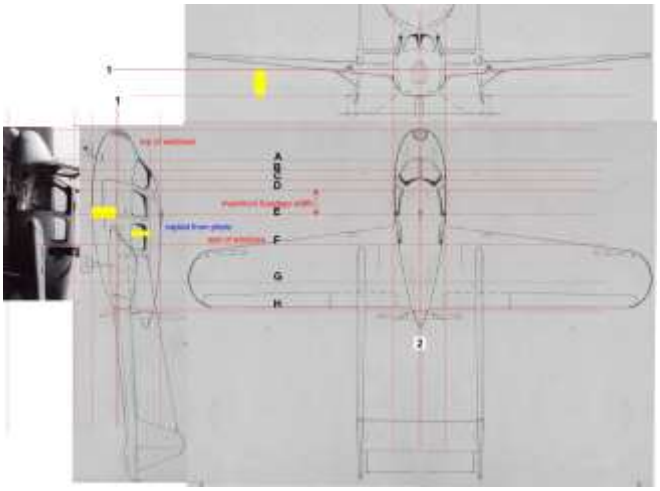




were not consistent. Also, I had to mirror the front and top views, as the first one was deformed a bit due to imperfect matching of the two files included in the Aviodrome documentation set and the second one was not complete.

Next I have rearranged the views corrected the dimensions where required such that the three views were consistent. In this form the drawing will provide sufficient information to produce the wing, the tail booms and the tail surfaces.

The fuselage requires a bit more work. From the drawing it is already apparent that the location of the windows in top and side view is not consistent. I have checked this by using the photograph showing the side of the fuselage, scaling it to the fuselage height as given in the drawing. This confirmed the correct location of the windows in the top view. I have also copied the height of the windows from the photograph to the side view with a yellow rectangle. The picture showed that the shape of the forward section of the fuselage was slightly different too, so I have traced this in the photograph and have copied this trace on the drawing.



I have determined the location of the maximum width of the fuselage and have indicated that in the top and front view. The same has been done in the horizontal plane in front and side view, indicated with the double line 1 spaced by 0.5 mm, which will be the base to construct the fuselage cross sections on. The longitudinal cross section has been indicated with the double line 2. The green line indicates the separation between the window section to be executed as a vacuum formed part and the remaining part of the fuselage, which will

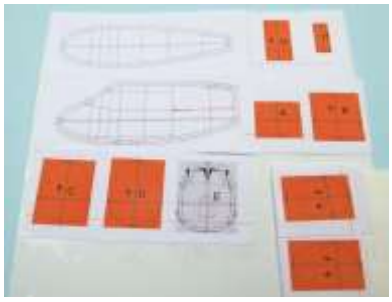
be composed out of normal resin parts. At each of the letters A through H a cross section has to be constructed, where only cross section E could be taken directly from the front view. For the other cross sections only the width and the height was known and possibly some intermediate points for cross sections B, C, D and F.

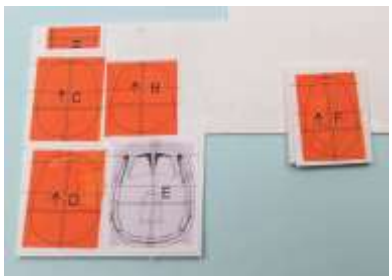
I have traced the fuselage top and side view and have used the *Contour* function of CorelDraw to generate two contours 0ne millimeter outside and inside the trace. With a red line I have also indicated the cabin floor in the side view.

I have constructed rectangles at each of the cross-sections A through H with the height and width at that location. I have traced the front view E and have given it the same treatment at the side and top view. On each of the cross-sections I have copied the inner contour and have fitted these one millimeter from the width and height of the rectangles. This is a reasonable approximation of the shape of the cross section at the locations. The red line, indication the cabin floor, shows that this part will have to be made cut to fit once the fuselage outside is finished.

At cross section F the separation between the windows part of the cabin and the aft fuselage will be made, so here two copies of *F* will be mounted of 1 mm thick styrene. All other cross sections will be removed once the skin of two layers of 0.5 mm thick styrene will be applied and the separation between the windows section and the top and bottom part of the aft fuselage section has been made.

Fuselage master





I have glued a print of the cross sections on the styrene sheet and have started to cut them from the sheet, starting with the sections of the top and side view. The places where the parts were interfacing with each other I have cut in lightly, such that they remained visible once the paper had been removed. The side view I have cut at the place of the double line. Next I have glued them together, ensuring they were well perpendicular to each other.

After having glued the four parts of the aft cross section *F* to the assembly I have changed the approach. The part where the cabin windows must come will be build up from two layers of 0.4 mm thick strips with 0.25 mm strip building up the window frames. To achieve this the place of the top and bottom of the window section should be marked on each of the relevant cross sections. So I have drawn in each of those cross sections two horizontal lines copied from the side view drawing. Cross section *F* will be the rear wall of the cabin.

Next I have glued the second cross section *F* and the rectangular cross sections *G* and *H* to the fuselage, three copies of the last one to form the aft part of the fuselage. They will be sanded in the correct shape in accordance with the other fuselage cross sections. I have continued to add the other (quarter) cross sections, aligning them carefully with each other.

I have glued a styrene strip of 2.5 x 0.5 mm on both sides of the fuselage along the marks indicating the separation between the lower and upper (window) part of the fuselage. When the glue had set, a second strip followed below it.

I have continued to glue strips on the fuselage, 0.4 mm thick at the windows section and 0.5 mm thick on the other places. I have not covered the top of the nose section; that will be filled with epoxy putty and will be solid resin in the model. While getting closed to the curved part of the cross sections, I have used 1.5 mm wide strips instead of the wider ones.

About half way the covering exercise I have glued a 0.4 mm strip along the upper limit of the window part of the fuselage as indicated by the carved lined in the cross sections.

I have filled up the remaining space mainly with 1.5 mm wide strips. The top of the front side/window I have filled with a triangular piece of 0.4 mm thick sheet. The last pieces of strip I have cut carefully to an approximately correct size and form, gluing them with extra thin Tamiya glue. This completed the first layer of covering.

I have treated the surface of the fuselage with Revell Plasto putty and have sanded it smooth. This putty contains glue and attaches very well to the styrene. Also, the strips of the second layer strips attaches as well to the styrene as to the putty. I have placed the strips overlapping with those of the first layer to get a strong, 1 mm or 0.8 mm thick styrene wall.

After marking the horizontal cut at the lower side of the cabin windows with a panel scriber I have prepared a bit of Milliput epoxy putty to form the top of the nose. I have carefully fished the cut with a saw, separating the two fuselage halves. To compensate for the material lost by the sawing I have glued a 1 mm wide strip of 0.4 mm thick under the upper fuselage half.

I have started to remove piece by piece the cross sections and the horizontal and vertical shapes from the bottom part with a knife and pointed plyers. The part kept its shape very well.

Next I have glued a 1 mm wide strip of 0.25 mm thick styrene forming the lower edge of the widow section, leading it at the nose according to the drawing. A second strip has been glued xx mm above it, which formed the top of the window section. To achieve a smooth transition to the roof I have glued a third strip above it.

I have glued a piece of 0.4 x 0.5 mm vertically at the aft edge of the window section, as well as the style in the middle of the front window. I have drawn the skewed window styles according to the positions measured in the drawings and the side view photograph. I have cut the styles from 2 x 0.25 mm styrene strip and glued them in place.

I have attached the bottom and top parts of the fuselage together with tape and have drawn the outline of the doors on both sides. I have glued pieces of tape next to the outlines and have engraved them with a panel scriber.

To produce the rounded corners of the windows I have used a technique I had applied earlier for the cockpit of the Q.E.D. yacht. I have punched a number of 3 mm diameter holes in a piece of 0.25 mm thick styrene sheet, drawn a square of properly angled parallelogram around each and cut the sheet on those lines. The small “quarter” round I have glued in the corners between the styles.

The next step was to separate the cabin part from the aft part of the upper fuselage with a saw. Only the former with be made as a vacuum formed part, the latter will be made from resin. After sawing I have glued a piece of 0.4 mm styrene sheet to the rear of the cabin part to compensate for the material lost in sawing. As the inside of the cabin part master will be filled with resin, I have removed part of the cross sections to make the filling process easier.

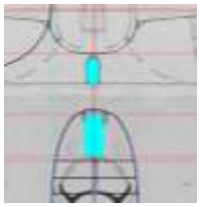
I have removed all cross section from the aft part and have sanded the inside such that the sharp edges were less prominent. On the rear side I have glued a 5 mm diameter piece of 1 mm thick styrene, which will from the base for the propeller. I have rounded the edges below it to improve the resemblance with the original.

However, this was not sufficient. The photographs of the lower part of the rear side of the S.20 clearly show a sharp edge, not visible on the drawings of the aircraft. I could not make that by sanding the parts I had constructed because the walls were not thick enough. So I have filled the rear part of them with some Milliput putty and have started sanding them when the putty had hardened sufficiently and have removed the excess puuty. The result was satisfactory. I have given the inner surface of these parts a coat of cyanoacrylate glue to make it smooth for casting.

The final work on the cabin part exterior was the placement of the skewed round angles of the cabin windows and the sanding of the top of the nose to obtain the flatter appearance as shown in the photographs.

I have filled the cabin canopy part with clear polyester resin and have put it aside to set. When it had hardened sufficiently I have finished the lower surface with Revell Plasto putty. I have packed the master for the canopy and have shipped it to Rob Taurus in the Czech Republic.

Next I have drawn with a pencil the outline of the nosewheel bay on the underside of the nose, copying the dimensions from the drawing. In opening the bay up I realized that something more had to be done, as the nose lower cavity needed to be made compatible with the resin casting process. In addition, I also wanted the nose to be as heavy as possible to prevent a tail sitting model.



As a consequence the frames in the nose had to be removed completely and the nose would have to be filled with polyester resin. Also, I had to make a plug to fit in the nosewheel bay opening to stop the resin from flowing out. The plug I have made from a piece of styrene strip and a piece of tube cot overlength.

I have filled the nose cavity with the resin and have stored the fuselage vertically to let the resin harden. After removing the plug I have cleaned the excess resin and finished the wall in the cabin with putty.

I have cut some slanted pieces from 3.2 mm and 1.2 mm styrene tubes, cut them to size and have glued them as air scopes to the upper part of the aft fuselage.

Cabin and cockpit

The lower part of the cabin rear wall is part of the lower fuselage, the top part has been made from 1mm styrene to fit inn the aft top part of the fuselage. I have made fit a piece of 0.5 mm styrene trial and error in the lower fuselage part to form the cabin floor and have mounted a piece of styrene on the rear side of it as the lower part of the passenger bench. From several pieces of styrene I have formed the tunnel for the engine cooling air, which runs from the from to the from to the rear over the floor,

After measuring the space available in the cabin I have shaped the parts of the seats from 1 mm thick styrene sheet and have engraved a striped pattern in the bottom and back. I have assembled the parts and sanded them in the shape as shown on the cut away drawing. The back of

the passenger bench I have cut from 0.5 mm sheet, thickening the top with some strips of the same thickness. The arm rest has also been cut from the same material.

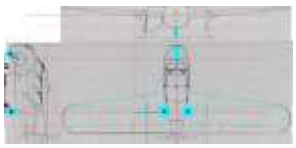
I have made two control columns from 0.5 mm brass wire and 0.5 mm and 1 mm styrene rod.

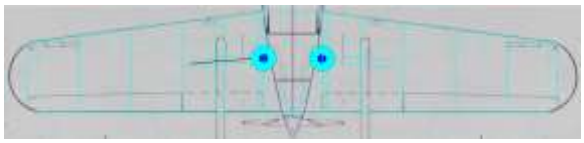
I have attempted to model the instrument panel in styrene with two layers of 0.5 mm styrene with holes of the correct diameter drilled in the top one, but that was not a success. So I have decided to draw a decal for it. The basic structure of the instrument panel is a shape of 0.5 mm styrene with two slices of 1.6 mm rod where the steering wheels will be mounted. The back is made from 2.5 mm thick styrene sanded to the correct thickness and slope to fit against the nose bulkhead. The mid console has also been made from 0.5 mm styrene. The handles on it will have to be made from styrene and brass rod that will be included in the kit.

Wing

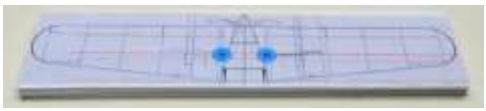
Before starting with the construction of the master for the wing, some drafting had to be done again, as the drawings of the S20 do not show the undercarriage in retracted configuration. On the drawings and photographs the nosewheel and the main wheels appear to have almost the same diameter. As the nosewheel is retracted forward into the air intake duct, it would have been more logical to use a smaller nosewheel.

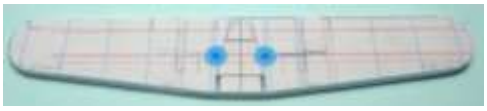
I have determined the position and dimensions of the retracted wheels from the three view drawing, corrected if necessary by information from the photographs. It shows that the main wheel bays extend a bit in the fuselage lower side, which is confirmed by the photographs. The exact location can only be determined after the production of the wing. In the drawing I have also indicated the located of the wing spars, derived from the cut away drawing and an assumed location of panel lines.





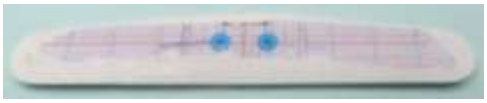
From the front view drawing I could deduce that the wing was 4.5 mm thick at the root and 1.2 mm at the tip. I have glued a copy of the drawing on a stack of three layers of 1.5 mm thick styrene sheet with diluted Microscale Kristal Klear.





I have cut the rough outline of the wing with a figure saw and sanded the excess material off. Next I have drawn the wing thickness on both the front and the rear side of the wing and have carved the location of the wing spars of the top and bottom surface. The side view drawing showed that the lower surface was not flat, but showed a slight camber. From the cut away drawing I could deduce that -as usual- the maximum wing thickness was at the forward wing spar, so that carved line should stay visible when sanding the profile in the wing.

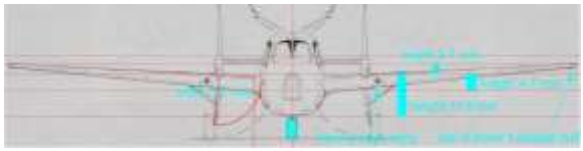
I have started sanding the taper in the wing from4.5 mm at the root to 1.2 mm at the tip, keeping the top surface untouched. Next I have sanded the profile in the wing, based on the one, very sketchy in the side view drawing. The wing underside is almost flat, a lot of material had to be removed from the top surface. I have used a sanding machine with coarse sandpaper clamped in a workmate to sand the wing in the rough profile and have finished it with the normal sanding equipment.



I have taped a print of the wing drawing to wing and have transferred the rib, spar, wheel bay, aileron and flap pattern by pin pricks to the wing underside. I have engraved the panel lines with a scriber and have drilled small holes on the circumference of the wheel bays.


These holes have been connected with a knife and the material along the outline has been removed. The wheel bays have been finished with a diamond mill to the correct diameter and depth. A check with a wheel showed that the shape was correct. Some erroneous engravings I have corrected with a bit of cyanoacrylate glue. I have repeated the exercise to produce the panel lines on the top side of the wing.

The next step was to devise a way to achieve the correct dihedral of the wing and to attach the wing halves to the fuselage. Going back to the drawing of the front view I have selected the top of the lower fuselage as reference plane. This plane is 11.8 mm above the lowest point of the fuselage, and the wing tips are 2.7 mm above the reference plane. This provides a means to align the wings with the fuselage in vertical direction. I have checked whether it was necessary to take the dihedral into account in attaching the wings to the fuselage, but the 0.2 mm spanwise difference between top and bottom surface of the wings can easily been bridged with a thin piece of strip. The fuselage side is vertical at the location where the wing must be attached, so there is no difference between the top and bottom cut out in the wing. The vertical position of the wing root is determined by the alignment of the trailing edge of the wing with the lower edge of the rear fuselage, 4.7 mm below the reference plane.



I have made the recesses for the main undercarriage legs in the wing underside by carving the 2 mm wide outline 2 mm with a panel line scriber, deepening them with a scalpel and finishing them with a diamond mill. I have also engraved the panel lines in the wing top surface. Drawn in black is the outline of the aft fuselage, where the wing has to be attached to.

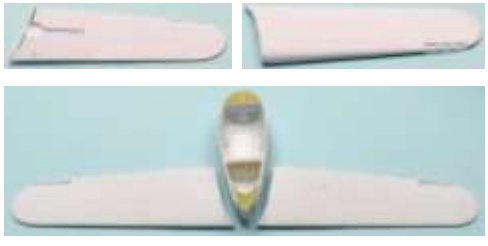
Next I have transferred the location of the Handley Page slots to the wing tips with a pin and have drilled 0.7 mm holes over the length of the slots from the top slanted forward. I have connected the holes with scalpels and have enlarged the slits a bit and fished them nicely. The two separations in each slot I have made from 1 x 0.4 mm strip.


I have cut the wing halves with the saw on the black straight line; fitting the wing to the fuselage will be done trial and error.

I have drilled two holes of 1.8 mm in the wing root parallel to the wing spars, fitting a styrene rod of 1.6 mm, which will be used for a pin-hole connection between wing halves and fuselage wing stubs.

To determine the correct location and angle of the wing I have made drawn the reference line (is the top of the lower fuselage part) in the side view drawing, mirrored it and have printed it on carton. I have cut it out this template, taped it to the lower fuselage and have drawn the lower outline of the wing profile on the fuselage. Along this line I have glued a 0.4 x 0.5 mm styrene strip against which the wing will have to be mounted.


Next I have drilled two 1.8 mm holes in each wing root, roughly parallel to the wing spars. In these holes 1.6 mm styrene rod will be mounted, serving as a pin-hole connection for wing attachment. With a knife and a sanding roll I have removed the excess material at the wing root, checking frequently the fit with the fuselage. As the picture shows, part of the wheel bay disappears, it must be reconstructed in the fuselage underside.



I have cut the wings normal to the trailing edge on a line 2 mm from the fuselage, have glued the pins in the wing root and have cut the excess rod off.

I have attached the wings with the wing stubs with tape, have fixed the fuselage on a template made of 1.5 mm and 1.0 mm styrene sheet glued together and have glued the wings to the fuselage with Revell Contacta glue, ensuring the trailing edge was well straight. When the glue had dried I have finished the joints with thick cyanoacrylate glue, filling up all visible gaps.

When everything had well dried I have removed the wing from the fuselage section.

As part of the wheel bays is located in the fuselage lower side, I have milled that part in the fuselage, hoping that it would not be deeper than the wall thickness. again to the fuselage section and the pins do their work as the should: it fitted perfectly. I have also constructed a wing-fuselage "fairing" with Tamiya putty.

On the wing two glass tubes are placed just in front of the main wing spar and inboard of the tail booms. They are probably gauges to check the fuel level, as the fuel tanks are located there. I have drilled two 0.7 mm holes there to mount a small piece of rod. I have also made the place for the two landing lights in the wing leading edge.

Undercarriage

According to the scale drawing the wheels had to have a diameter of 7 mm. I did not find wheels of the required diameter and appearance in my scrap box, so I had to construct them from scratch. I have punched discs of 7 mm from 1 mm and 0.5 mm thick styrene sheet and have punched a 3 mm hole in the discs of 1 mm thick. After gluing the discs together, I have finished the circumference with putty and have sanded the "tires" in the required shape.

I have constructed from 1.0 mm styrene rod and a brass tube of 1.3 x 1.1 mm the main undercarriage legs. I have used two slices of 1.7 and 1.5 mm brass tube to produce the lower flange of the leg cylinder and have made the scissors from 0.4 mm styrene sheet. The nose wheel leg has also been made from pieces of 0.4 mm styrene sheet and from a piece of 1.2 mm rod.

After assembly of the main legs, gluing the components with cyanoacrylate glue, I have constructed the side supports (probably the retraction actuators) from 0.5 mm brass rod and 0.8 x 0.6 mm brass tubes, the lower part of the cylinder being small slices of 1.0 x 0.8 mm aluminium tube. I have glued a small piece of styrene to the main landing gear legs as attachment point for theside supports. Some photographs show wheel doors under the nose and some others show long, narrow wheel doors attached to the side supports. These I have constructed from 0.4 mm styrene sheet material. I have drilled superficial holes in the wheel bays where the legs and side supports should be located.

Engine and propeller

The Hirth engine does well fit in the aft fuselage with its narrow shape and hanging cylinders, the only disadvantage being the long air inlet duct from the nose to the engine[1]. In the model only the exhaust pipe and the cooling air exhaust will be visible.

The pictures show two configurations for the exhaust, one an oval channel just at the starboard side of the aft fuselage, one a circular grid at the end of the fuselage. The round grid will be made with a decal, same way as the grid in front of the air intake.

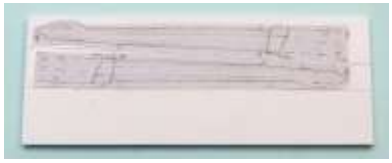
I have modeled the oval channel from a piece of 1.5 mm thick styrene sheet, hollowed by a row of 1.0 mm drilled holes, connected with a knife. I have glued this exhaust to the top aft fuselage with ample thick cyanoacrylate glue to fill up the gaps and have fished the joint with putty. I have also added a small air scoop at the left side of the top aft fuselage.

The propeller is a wooden Heine propeller and on the scale drawing it has a diameter of 29 mm, corresponding to 2.09 m. On the internet I found a picture of a black varnished Heine propeller of 2.30 m, which I have reduced to 29 mm diameter, which I will use to produce the master for the kit. I also found a picture of the Heine logo and of a typical identification plate. They correspond quite well to the details visible on the S.20 photograph.

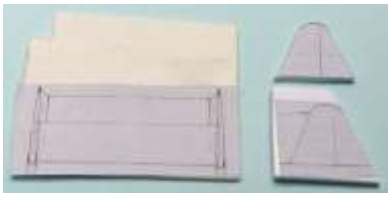
As I have done in the past, I used multi-layered plywood to model the propeller, four layers of 0.5 mm thick each, glued together with white glue and sanding the profile in it. I have made the leading and trailing edge a bit more straight to resemble the original better. The spinner I have made of an assembly of styrene tubes and rod of different diameters, sanding it in shape.

Tail booms, tail surfaces and small bits

According to the drawing the tail booms have a width of 2.2 mm at the wing, tapered to 1.5 mm at the end. I have glued a sheet of 0.75 mm and one of 1.5 mm styrene together and have glued a copy of the booms in the side view drawing to it.

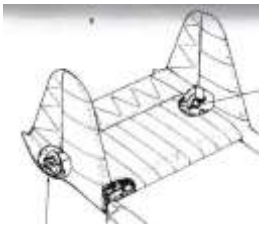


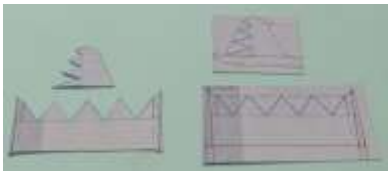
I have cut the outline with a jigsaw and cleaned it up with sanding files. I have checked the fit to the wing and have adjusted it to get the correct angle as given on the drawing. I have rounded the top and bottom of the boom and have given the mounting surface with the wings a slide slope to compensate for the dihedral of the wings.



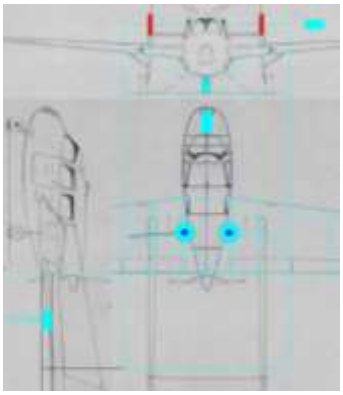
On the drawing the vertical tailplane had a maximum thickness of 1.5 mm, the horizontal tailplane was 1 mm thick. I have glued partial copies of the drawing on pieces of styrene sheet with corresponding thicknesses with photo glue and have cut out the shapes with a knife. I have sanded each of the surfaces in a streamline shape.

The rudders and elevator had ribs in an zigzag shape as shown in the cut away drawing and one of the photographs. So I have drawn such a pattern in the three view drawing, made a print on carton and cut it out as a template to engrave the robs in the control surfaces.





I have engraved the ribs in the tail planes, also some in the fixed parts at the attachment points of the “V’s”, a logical place where hinges would be placed.



I have glued the vertical tail surfaces to the tail booms, minimizing the number of parts that will have to be casted. This is technically feasible and decreases the casting cost.

To ease the assembly of the tail booms I decided to include a jig for that purpose in the kit. In the scale drawing I have determined the position of the wing underside at the location of the forward wing spar, the boom at the wing trailing edge and at the fin relative to the ground plane. I have cut a ground plate and the three jig plates from 1 mm styrene. I have glued some strips on the ground plate to define the place of the walls.

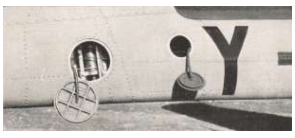
Next I have temporarily fixed the walls to the ground plate and have attached the wings to the lower fuselage with tape. I have fitted this assembly to the jig, which required a couple of corrections, illustrating minor differences between the drawing and the actual parts.

The last parts, for which masters had to be produced, were the Venturi tube, the antenna mast on the port tail boom and a tube on the nose. I have made them of 1.2 mm styrene rod, sanded in shape and provided with holes as required. To give some support in handling these I have glued some thin strip and rod material to them.

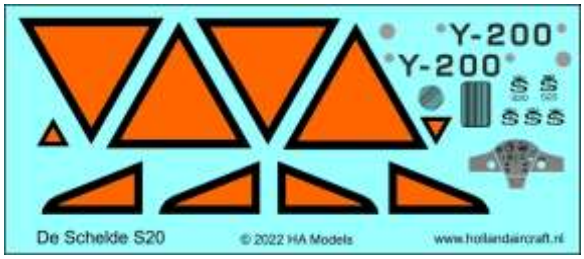
Decals

I my collection photographs I found one picture taken almost normal to the instrument panel. I have straightened that out and rotated it and have used it as the basis for the panel of the model. I have downloaded from the Internet a collection of cockpit instruments and placed them in the drawing. The white spots in the panel are the locations of the steering wheels.

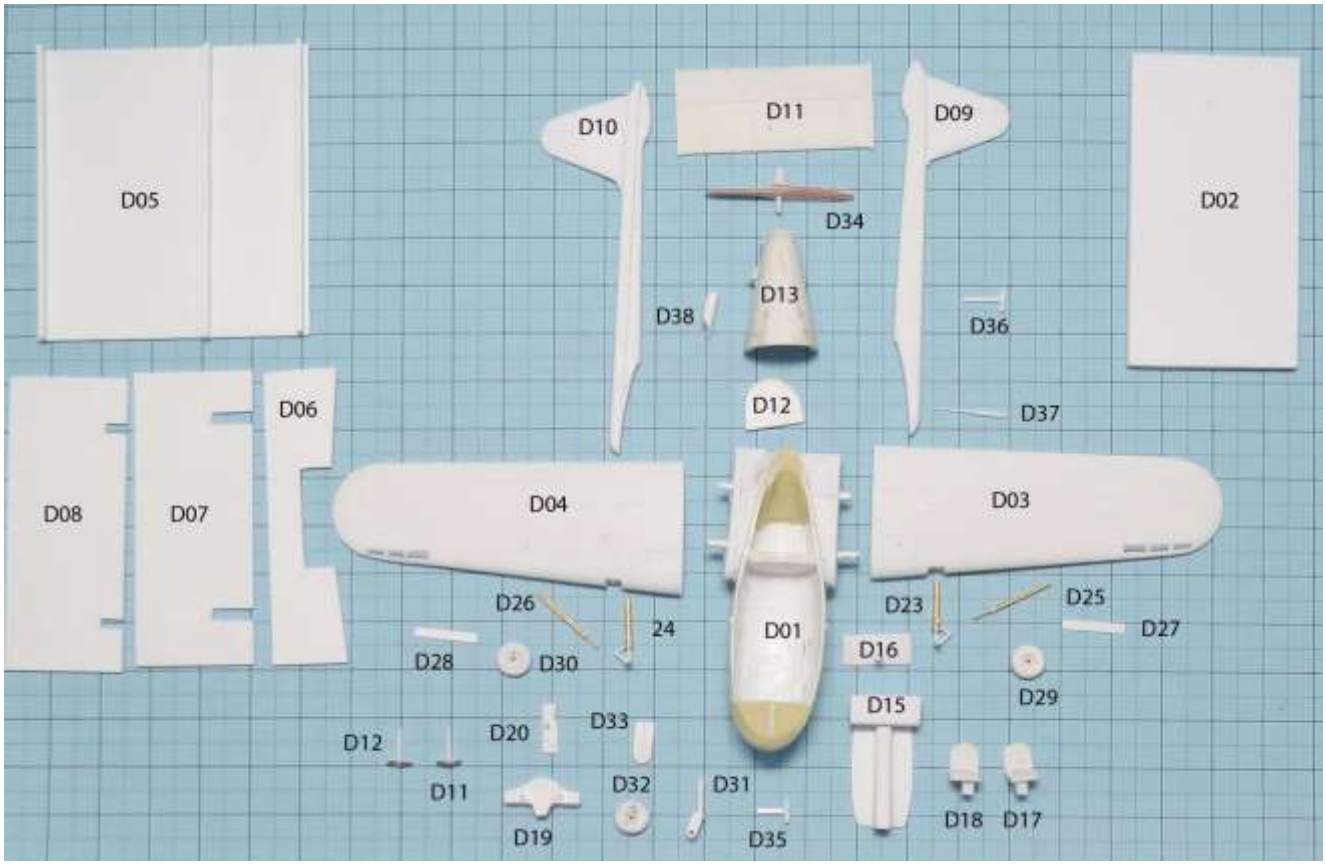
According to the pictures the orange triangles on the wings are a bit smaller than the regulatory dimensions; they leave the ailerons free. Their location is correct. The location of the triangles on the tail booms is too much forward and the black edge is too narrow. This is understandable, because if they would have the correct dimension (1.4 mm), there would not be any orange left.



The other decals are for the round cooling air exhaust grid and the rectangular grid for the air intake. I have included the three round hatches for access to the tail surface mechanisms with the registration. On the vertical tail the De Schelde logo plus the type number is placed. Two other logos will be on the doors and one on the cabin aft wall.



The picture below gives an overview of all masters for the parts. Only the canopy is missing.



Building the model

Final assembly

Below some pictures of the finished model are shown.

References

1. T. Wesselink & T. Postma, *De Nederlandse Vliegtuigen, Alle vliegtuigen ooit in Nederland ontworpen en gebouwd*, p. 121, Unieboek B.V., Bussum, 1982
2. H. Hooftman, *Nederlandse Vliegtuig Encyclopedie, Scheldemusch en Scheldemeeuw*, pp. 82-95, 202, Cockpit-Uitgeverij, Bennekom, 1978
3. W. Schoenmaker & T. Postma, *Klu Vliegtuigen, De vliegtuigen van de Koninklijke Luchtmacht vanaf 1913*, p. 78, ISBN 90 6013 966 6, 1987
4. H. Hooftman, *Van Brik tot Starfighter, Deel I: Met stofbril en leren vliegkap*, pp. 144, 154-155, La Rivière & Voorhoeve, Zwolle, 1962
5. F. Troost, S. van der Zee & W. van Zoetendaal, *Salto Mortale - Fokker in bedrijf 1911-1996*, p. 170, ISBN 907557410X, 1998
6. H. Berfelo, Private communication
7. Documentation set of the Aviodrome museum archive
8. P. van Wijngaarden, *N.V. Koninklijke Maatschappij De Schelde, Afdeling Vliegtuigbouw*, Uitgeverij Wiel Eijdems, Eygelshoven, ISBN 978-90-821390-1-3, 2014
9. Het Vliegveld, pp. 112-114, mei 1940

Appendix Documentation De Schelde S.20

Paint table

HE = Humbrol Enamel, RA = Revell Aqua, VMA = Vallejo Model Air, WEM = White Ensign Models

Code	*Colour*	*Where*
HE 14	Blue	Rudder
HE 19	Red	Rudder
HE 22	White	Rudder
HE 85	Coal black	Exhausts
HE 125	Dark grey	Seat, control stick, rudder bar
HE 127	Mid grey	Fuselage frame tubes
HE 129	Light grey	Fuselage inner walls
HE 186	Brown	Edge of cockpit opening
RA 36178	Tank grey	Tires
VMA 71.062	Aluminium	Propeller, wheel hubs, cooler
WEM ADC04	LVA khaki	All outer surfaces

Photographs and drawings

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

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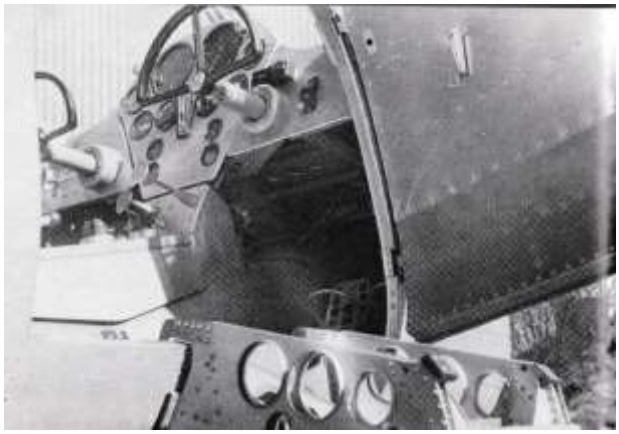

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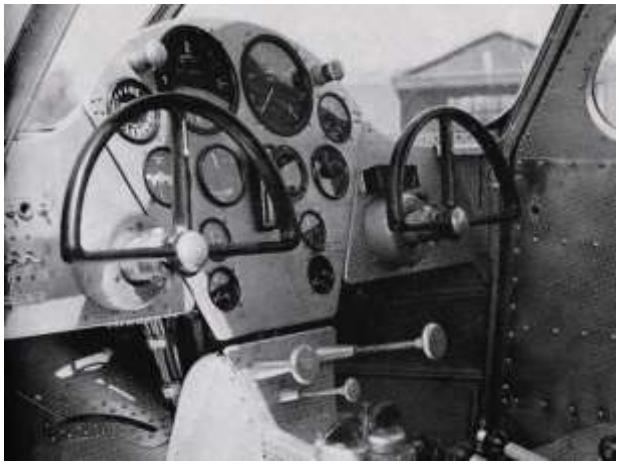

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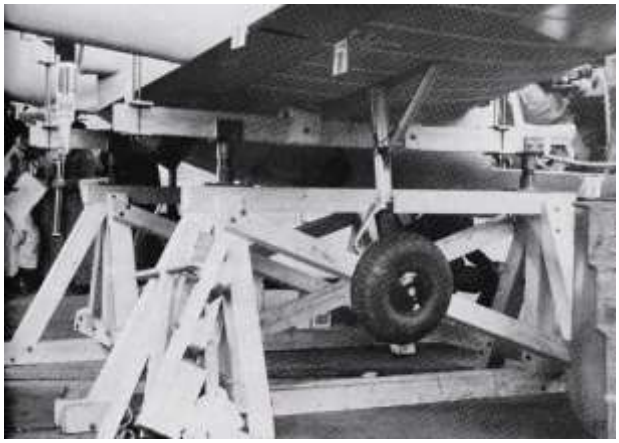

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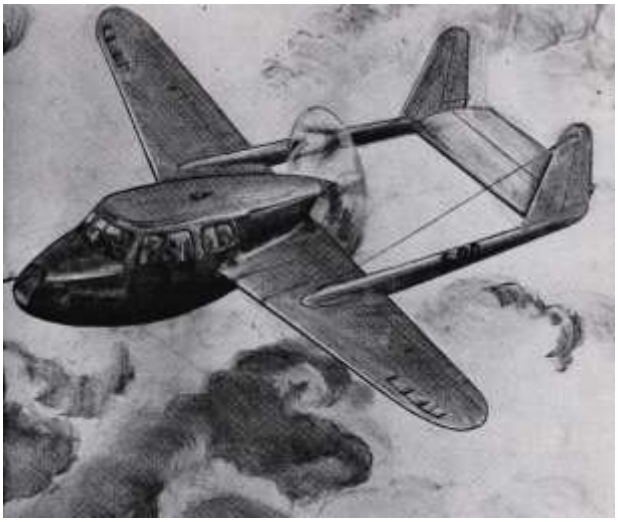

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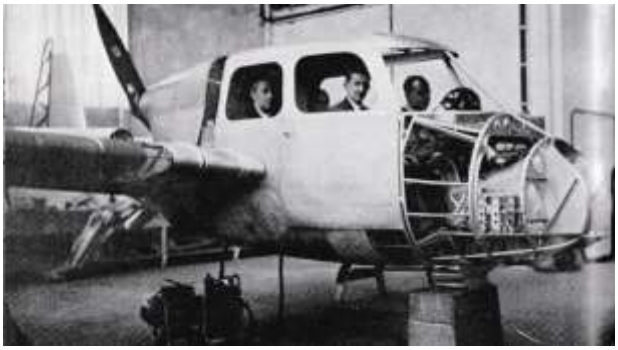

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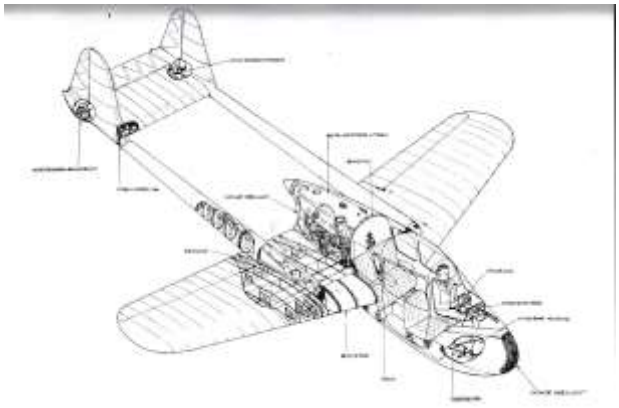

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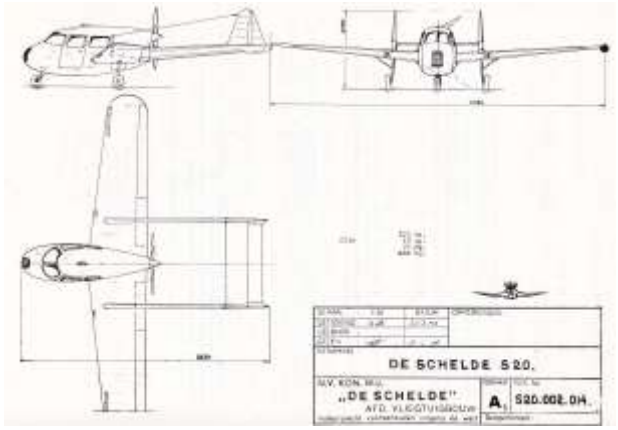

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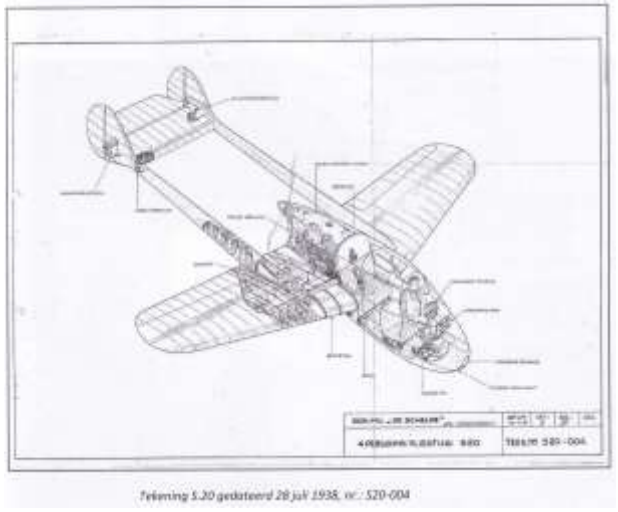

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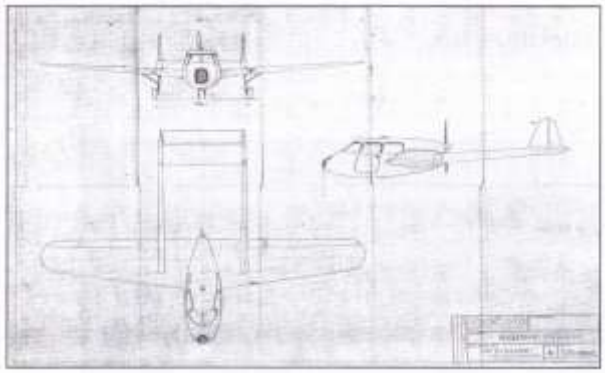

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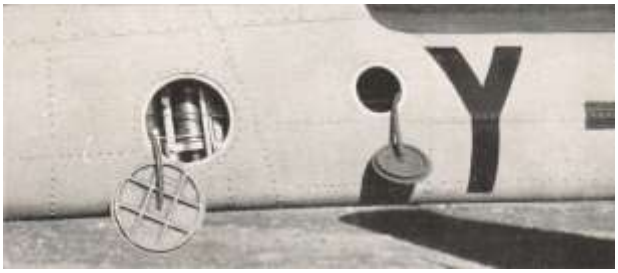

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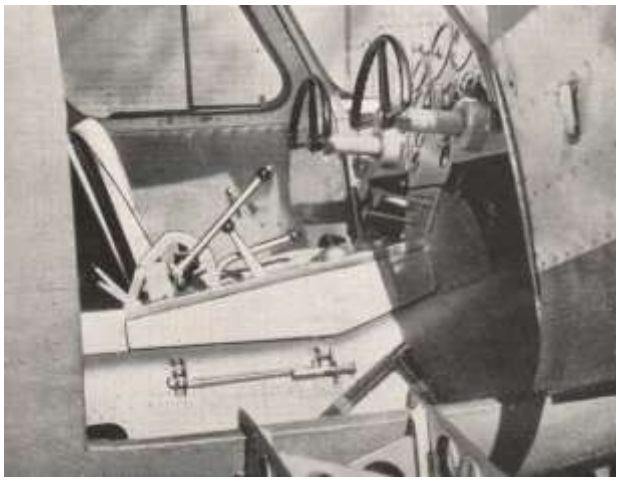

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[1] This appeared to be a problem area, as was illustrated by extensive wing tunnel testing and the often changing configuration of the air inlet and outlet openings and the nosewheel bay. On one picture the nosewheel is extended in flight and the bay has been covered with

(permanent?) panels. There also have been problems with an overheating and cracking exhaust, of which also some photographic evidence exists.