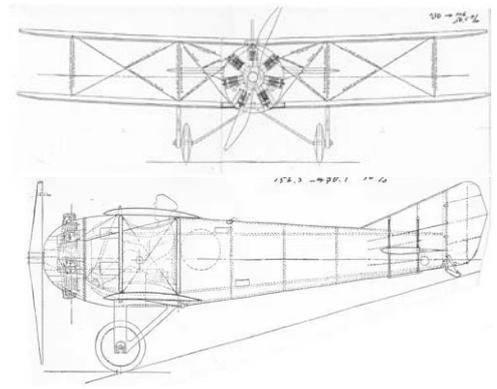
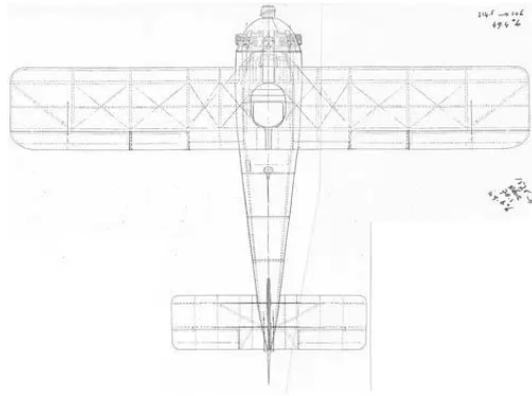
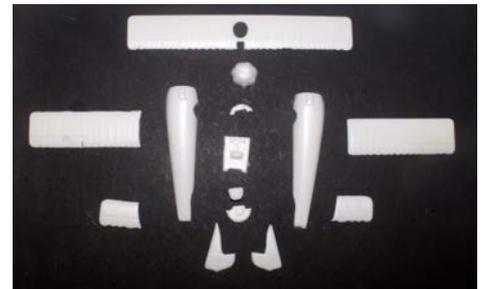
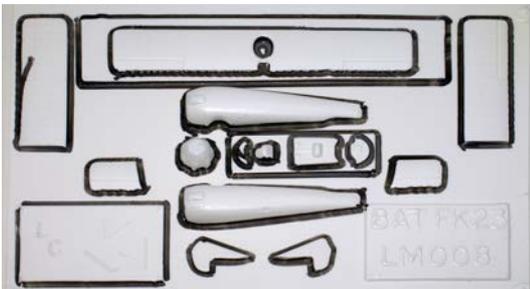


I had to modify it rather much, as it showed only half a top and front view, and the top view showed only one bay instead of two. I have achieved that by mirroring the image and gluing the partial views (physically) together.



The vacuum formed parts of the kit have been removed from the plastic sheet in the standard way: outlined with a felt pen, cut the parts out and process the parts on a sanding plank. As all parts are flat, this is easily achieved.



The item at the bottom left of the sheet is a jig to shape and construct the undercarriage and wing struts and the tailskid. I will not use it; I prefer to build those parts from scratch. Other parts I will not use are the seat, the cockpit floor and the instrument panel. These parts are too crudely formed, and the instrument panel is not correct. I will reproduce the instrument panel of the K-123 replica, of which a picture is shown at the right. It also shows that I will have to reshape the fuselage, which has a rather circular cross section instead of a "pointed" top surface.



The pictures below have been taken at the presentation of the replica after completion of the restoration. I have used these pictures as the basis for my model. The mirrored K-123 under the left wing is authentic; it was present on the linen covering of the recovered F.K.23 parts, which have been used as basis for the replica, as well as the



UK rosette under the other wing. The blue, white and red tail is not original, as can be seen on the picture² at the left, which shows the G-registration on the tail. It is a case of "poetic liberty" of the



team that has restored the K-123 to make the aircraft look a bit more Dutch.

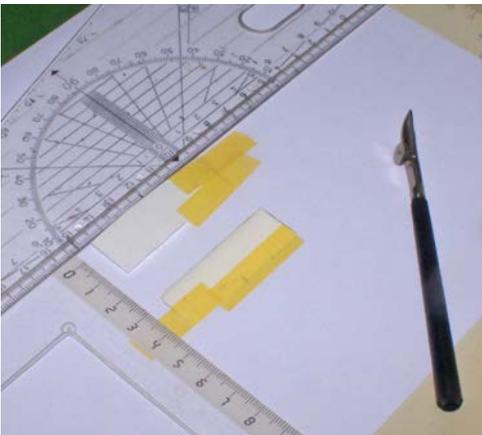


I have drawn the missing registrations with the RAF_WW2_641ATH font, which has been quite a job, and have let them print by a specialized print shop, as I cannot print white decals myself.

A last reference I will use in building the Bantam is an illustration of the cockpit interior shown in the Flight³ article, reproduced at the left. As the view in the cockpit through the hole in the top wing is quite good, it is worthwhile to detail the controls, even on this small scale.

Wings

The wings have, as often is the case with vacuform models of WW I aircraft, only a top surface, so to make the more realistic I have made a lower surface from 0.5 mm (lower wings) and 0.25 mm (upper wing) thick plastic sheet. The wings have according to the drawing also a negative camber of 0.5 mm and have a thickness of 1.5 mm. The top surface is 1.1 mm thick, so must be slightly beefed up. I also wanted to produce the ribs on the lower surface, and for that I have used a method outlined by Harry Woodman in his book *Scale Model Aircraft in Plastic Card*. I considered this also an exercise for the scratch building of the B.A.T. FK.26 Commercial, planned for early 2013. I have started with the lower wing and cut a piece of 0.5 mm plastic sheet to the size of the wing half. I have glued it with double sided tape to a piece of wood and sanded one side of the sheet in a wedge shape to get a razor sharp trailing edge. The top wing surface has received the same treatment.



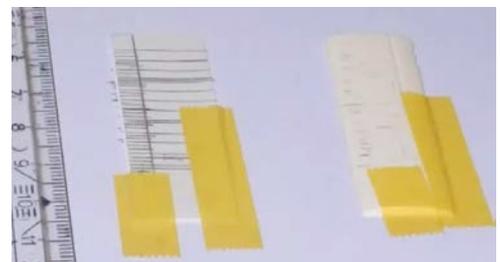
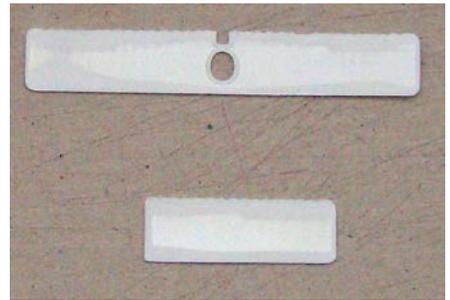
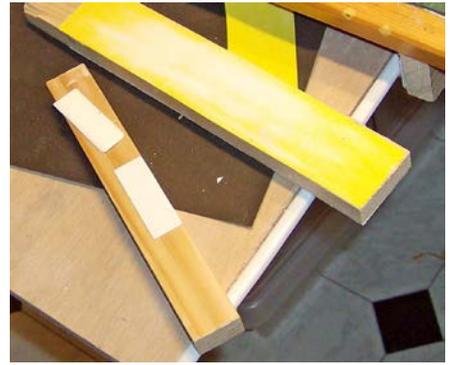
The ribs have been scratched with an old fashioned drawing pen in the piece of plastic, using the top surface of the wing as a template and using the setup on an old drawing board as shown in the picture at the left. The piece of plastic has been placed on the board with the wedge side upwards. Some trials showed that I needed three layer of 180 grams paper under the plastic in order to have the rib lines show at the other side of the surface.

When all ribs (also the short nose ribs) had been scratched, I have sanded a bit of material from the underside of the top surface to obtain the slight upwards bent wing tip and I have formed the camber

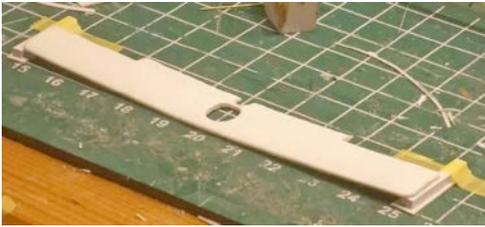
in both top and bottom surfaces by bending the parts over the rounded edge of a piece of wood until the camber of 0.5 mm was reached. I have attached fixed top and bottom part with a couple of small pieces of double sided tape relative to each other and glued the edges with carefully applied Microscale Weld. Although this glue dries rather slowly, the result is a correct profile with a sufficiently sharp trailing edge. When the glue had dried I have trimmed the excess material with a very sharp knife. Possible the wing root still needs correction, as the center section of the wing is straight, while the outer wings have a dihedral of 3 degrees starting at 3 mm from the fuselage, but I will decide on that when assembling lower wing and fuselage.

For the right wing half I have used a slightly different technique. I have copied the rib pattern with 2B pencil on the wedge shaped plastic sheet. This way you can better see whether the ribs are equally spaced. I have glued the two halves with Revell Contacta, used sparingly, which is not easy with the big brush. When everything had dried well, I have the ailerons loose.

The ribs were visible on the lower surface as light coloured stripes, but can hardly be felt, so after painting the will probably disappear completely. Apparently 0.25 mm sheet is too thick to use this technique. Harry Woodman advises in his book to use 0.25 mm, an advice I will follow for the upper wing. I will have to fill up the leading edge with a strip of 0.25 mm thick to obtain the correct thickness and I will have to fill up the room between top and bottom surface at the location of the ailerons.



For the upper wing I have again copied the rib pattern with 2B pencil. I have not sanded the 0.25 mm sheet in a wedge shape, as I thought it was already thin enough. After scoring the sheet, the rib pattern could be felt at the lower side, so it will probably be visible after painting. However, the scoring made the bottom side about 1.5 mm longer than the topside, so the rib pattern on both sides of the wing did not fit any more. I have “corrected” that by cutting a small



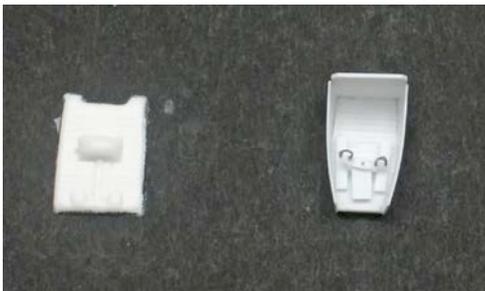
bit away at both sides of the wing centre section, where the wing should get anyhow the 3 degrees dihedral. I have shaped the wing camber again and glued the wing surfaces together with Revell Contacta. When dry I have removed the ailerons and cut the wing at both sides of the centre section. On an improvised rig I have assembled the three components with the correct dihedral (2.4 mm at the tip).



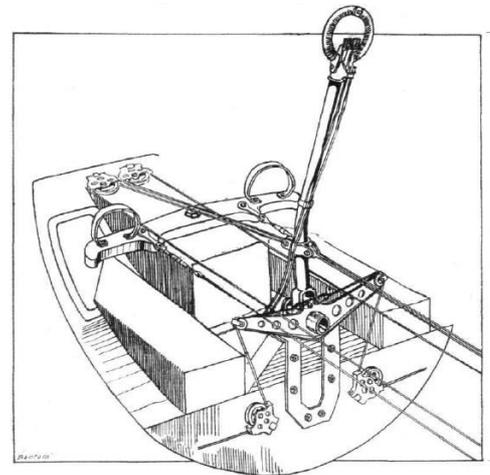
The ailerons and the wing at the location of the ailerons indeed needed a small correction with thick cyano, as top and bottom surface were not attached to each other. I still find the rib pattern not very convincing, the scoring surface is still too hard. Next time I will do it on the cutting mat, which is a bit softer.

Cockpit

In the article of the Flight issue of May 22, 1919³ an excellent illustration of the cockpit details can be found. I have produced from 0.5 and 0.25 mm plastic sheet a box in a shape derived from the three-



view drawing. Quite an improvement compared to the cockpit floor included in the kit. The beams have been made from plastic Evergreen profile and the rudder pedals from 0.25 mm strip and 0.25 mm metal strand.



The picture at the right shows the remainder of the cockpit furniture. Clockwise starting from twelve o’clock: The pilot seat, made from 0.5 and 0.25 mm thick plastic sheet, PE seat belts, a grey painted piece of 0.25 mm wire for the throttle mechanism, the control stick with at the bottom the aileron cable mechanism, fishing line for the control cables, throttle, the cockpit bay with the rudder bar, the “pulleys” for the elevator cables (pins of 0.25 mm wire) and the top rear bulkhead from the kit already assembled. In the middle the instrument panel, a piece of black painted plastic covered by an equal piece of brown painted plastic. Instrument dials and hands have been scratched in the black paint. In the center of the panel a piece of rod, painted brass with a blue front, simulating the central instrument (a component with a gimballed suspension⁴). I have made the sides of the cockpit bay high enough, such that they reach the top of the fuselage. The front will still be covered once the interior is completed.



Next I have attached pieces of fishing line to the rudder bar, to the elevator pulleys and to the control stick. They run through holes in the rear bulkhead of the cockpit bay.

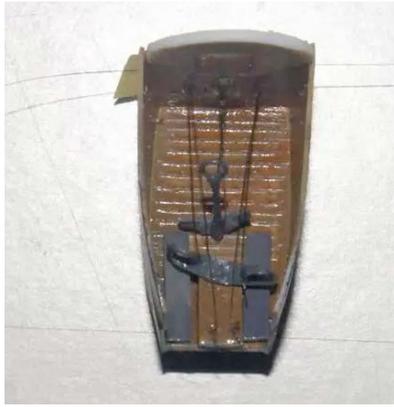


Next the control stick has been glued in place and the wires have been tensioned and glued to the rear of the bulkhead.

Then I have glued the seat in place. The control cables pass under the seat. Also the seat belt has been glued to the seat. The shoulder straps will only be applied, when the wing is in place.

The front cover has been glued on to of the cockpit bay. This is essential as it prevents to look in the cockpit through the cooling openings in the fuselage.

At the right a rear view of the cockpit (with loose instrument panel) is shown. Last thing to do is to glue the throttle in place (picture below).



Fuselage

I have taped the two fuselage halves very well together to carve a symmetric opening for the cockpit. The two halves have been aligned on the engraved panel lines, as these are the best absolute references. The hole for the cockpit has first been made by drilling with increasing drill bit diameters, and then finalized with a scalpel, comparing the model continuously with the scale drawing.

The forward part of the fuselage has seven openings to let the cooling air of the seven cylinders pass. Their shape is engraved in the plastic. The K-123 replica has short, oval openings, in the three-view drawing they are rectangular, and the engraved ones are long, and rather larger ovals. I have chosen some middle way. I have first drilled two holes of 0.8 mm and enlarged them to 1.5 mm. The two holes have been joined with a pointed scalpel to form an oval and finalize the shape. Some holes needed to be corrected with putty, as they turned out to be too large.

I had opened up the steps in the fuselage to climb over the wing to the cockpit, but closer inspection of the photographs of the replica showed that they are closed with a small door. So I have closed them again with a small piece of plastic. Also I have glued narrow strips of 0.25 mm plastic alternating on both halves of the

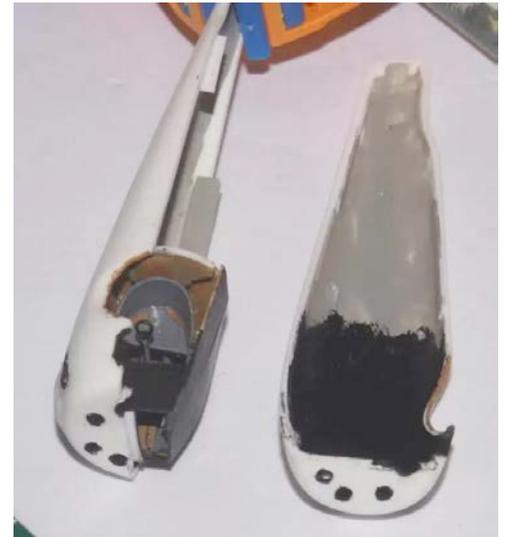


fuselage. This is not really necessary, as the plastic is rather thick so it has sufficient gluing surface, but this way it is also easier to dry-fit the fuselage

Now the cockpit bay can be mounted in the fuselage. This has required quite some trial and error corrections on the rear bulkhead to fit correctly. The cockpit has been glued with ample thick cyano in one fuselage half and the fuselage has been closed. It fitted quite well for a vacform kit.



The next step is to fit the instrument panel, the top of which just passes over the circular cross-section of the fuselage. The front of the cockpit opening has been cut out straight to get the panel in the right position, and it has been glued with thick cyano glue. In the process I lost the small blue gimbaled instrument in the middle.



The pointed fuselage back has been produced from 0.13 mm thick styrene sheet, which can be treated as paper. I have glued it with Microscale Weld, and resisting points with thin cyano glue. With proper sanding of the edges



the joint should not be noticeable any more.

I have also prepared the vertical tail surface, separated the rudder and glued the fin to the fuselage. The round piece of plastic, serving as a transition between the fuselage and the nose cone containing the engine has been glued in place. Putty has been applied to get a sharp corner of the front fuselage,



fitting exactly the nose cone. The holes are to get some view from engine to cooling apertures. Reproducing the actual configuration, illustrated in the photograph below, would have required to large a modification of the kit. The fuselage is now ready to be finished.



Engine

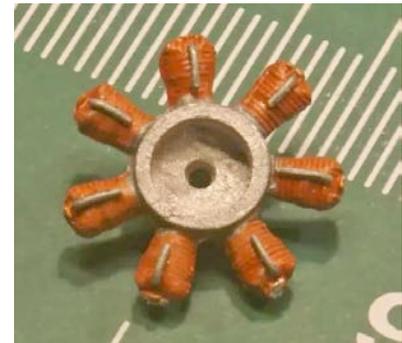
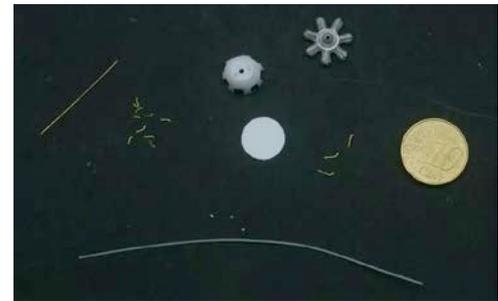
The Wasp engine has two short exhausts per cylinder. Twelve of them are short curved exhaust pointing sideways, the two remaining ones are led to the carburettor ring behind the engine to prevent ice deposit. The exhaust are too prominent to delete, but too small to model them exactly. I have modelled them by small 0.9 mm long ends of 0.55 mm diameter plastic tube⁵ and painted them gun metal (Humbrol 53). The two larger pipes going to the carburettor ring I have made from 0.4 mm brass wire, also painted gunmetal.

Each cylinder has a single inlet pipe at the rear side of the engine, of which the top is visible once the nose cone is in position. I have produced these from 0.4 mm brass wire, slightly bent at the top, which I have painted aluminium (Humbrol 56). The cylinders have been painted red brown (Humbrol 100), which approaches the colour of the original best. The crankcase has been painted aluminium and the valve pusher rods and valves silver (Humbrol 11).

To fit the engine in the nose cone wide slits have to be cut. Their location and size is marked on the part. This weakens the part considerably, so I have strengthened it by "painting" it with thick cyano glue. On the picture at the right the components for the engine assembly are shown: Clock wise, starting from the engine itself, the piping to the carburettor ring, the 0.55 mm plastic rod for the exhausts and three exhausts cut to size, the inlet pipes and the nosecone. In the middle the circular piece of plastic sheet that will form the interface between fuselage and nose cone.

Next I have glued the inlet pipes to the rear side of the engine and done a trial mounting of two exhaust pipes (picture at left; note the size of the exhaust pipe at the right). It appeared very difficult to mount these in the right place and to point them in the right direction at the same time. This problem has been solved by drilling small, 0.7 mm holes in the white metal cylinders (not an easy job), separating location and direction adjustment. I have also dry fitted the engine in the nosecone, adjusting the size and place of the cut outs as required.

The picture at the left shows the engine with all 14 exhausts mounted. On the photographs of the K-123 replica (which has the original engine, a reason why it cannot be a flying replica) the spark plugs at the front side of the cylinders just can be seen. I have modelled these with 0.06 mm black painted fishing line, which appeared still difficult to bend. The last picture shows the finished engine in its nose cone.

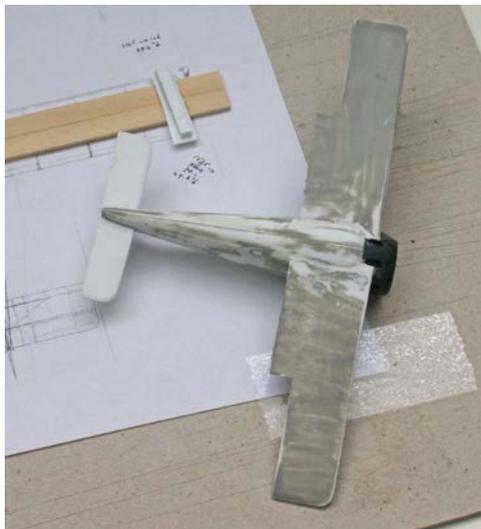


Wing and tail plane assembly

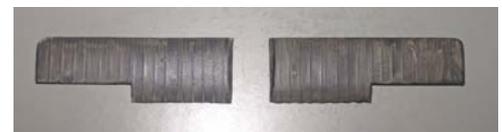
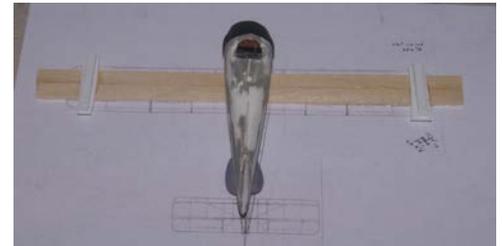
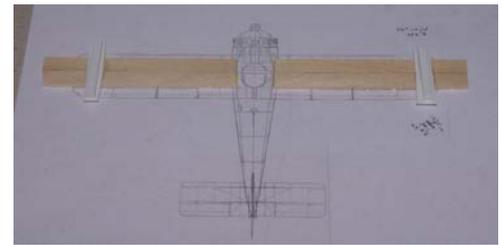
To assemble lower wing halves and the fuselage a jig has to be built, as the round fuselage bottom is 1.5 mm lower than the wing lower surface. Also the interface of the wing root to the fuselage is rather strongly curved, while the parts as they come from the sheet are straight. And also the lower needs to get its 3 degrees dihedral. I have built the rig over the 1:72 scale top view of the F.K.23. On the paper I have glued some pieces of 1.5 mm thick wooden strips at both sides of the fuselage, as the bottom of the fuselage must touch the paper surface. For the wing tips I have used the same supports as I have used for the upper wing. The fuselage has been fixed to the surface with kneaded eraser. I have well aligned both wing halves and the fuselage.

In this position the span is some 5 to 6 mm larger than on the drawing, which shows the same span as the upper wing. I have drawn a line at the wing root parallel to the fuselage with a soft pencil. So quite some material has to be removed, and the interface must also be given the correct angle to fit the fuselage shape correctly.

This has been done, while continuously fitting the wings in the jig against the fuselage, and the wings have been glued in place with thick cyano glue. Some joints still had to be filled with putty, but span, dihedral and location relative to the fuselage seemed correct.



When the glue had well dried, the fuselage – lower wing assembly has been removed from the jig, and the joints between fuselage and wing have been filled with Tamyia putty, which I still prefer over the sticky Revell equivalent. I have removed the excess putty with a knife (the wing leading edge is formed completely from putty) and finished the joints with 400 and 1200-grain water resistant sanding paper. The narrow joint at the upper side I have filled with Vallejo putty, which is easier to apply in this restricted area thanks to the small nozzle of the tube. I have also glued the horizontal tail surfaces to the fuselage with thick cyano glue, as I trusted this better to give sufficient strength to the ill-fitting interface.



It is remarkable that the aircraft did not have a fairing between fuselage and wing; apparently the aerodynamics in 1918 did not yet have discovered the detrimental drag that is the consequence of not having such a fairing.

Intermezzo

When I compared upper and lower wing of the Bantam in this phase, I noticed a number of annoying defects. The span of the lower wing was some 2 mm larger than that of the upper wing, its dihedral was larger (about 1 mm at the wing tip) and a close inspection of the photographs of the K-123 showed that the upper wing did not have a horizontal center section, but was angled in the middle. The drawing was not clear on this last point, and had deceived me. These errors would cer-

tainly be visible on the completed model, as the two wings are very close together and have no stagger. So I had to decide on a repair with "minimum damage consequences", modify upper or lower wing.

I have made the choice to modify the upper wing; remove the lower wing from the fuselage would certainly cause more damage, and I judged the probability of a satisfactory result lower. Also, it would not correct the center section problem.

So I have removed separated the center section again from the two outer wings, cut the center section in the middle and have added a small slice of 1 mm thick plastic to both outer wings. The bit of added plastic has been carefully cut in shape with a very sharp scalpel. I have adapted the jig to the upper wing configuration by gluing a piece of 1.5 mm wooden strip on the fuselage center line in the top view drawing and adding two slices of 1 mm thick plastic to the tip supports. The wing halves have been joined in the jig and left to dry. When checking both wings against each other, they now have equal span and dihedral.

Next I have given the model its first coat of paint: the fuselage black and white (Humbrol 85 and 22), the topside of wing and tail surfaces khaki (Humbrol 155) and the underside linen (Humbrol 71 with a bit of white). I have measured the location where the struts should come starting from the wing tips. This fitted within the millimeter with the double wing ribs formed in the wing. I have marked their location and the wing spars marked with a 2B pencil. This same procedure was repeated for the bracing wire holes in the tail surfaces. Then came the tedious task to drill the 90-odd 0.3 mm holes to accommodate the 92 bracing wires and control cables as indicated in the table in the appendix. The photograph at the right shows the speckled wing surfaces when that was done.

I have glued the nosecone-cum-engine to the fuselage. It was difficult to fit, and does not really have the spherical outlook of the original. In my opinion it would have been a better option to mount individual cylinders to a nose that is an integral part of the fuselage. In the process I have sacrificed the inlet pipes at the rear of the engine; it was really impossible to fit them in the limited space available. The fuselage painting has been finished and the black and orange bands have been carefully painted on, using narrow strips of tape to mark them of. The bands still needed manual correction, as a bit of paint had run under the tape. The white band at the wing root was bounded by a narrow strip of aluminium. I have made that from a strip silver painted Tamiya tape.

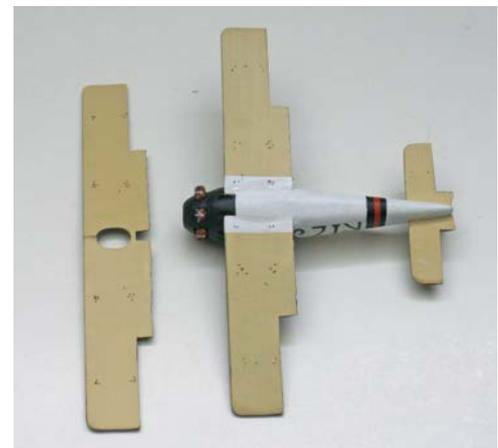
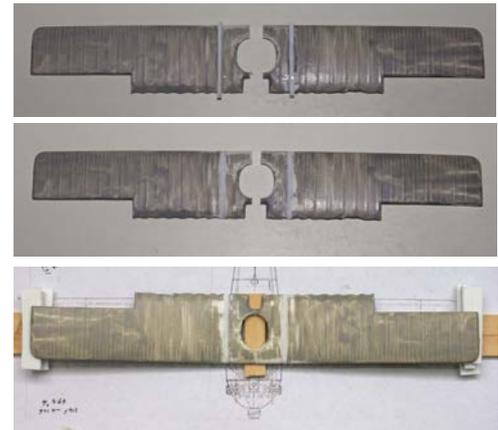
Next I have applied the decals on the fuselage. As the originals supplied with the kit were too large for the size of the fuselage, I have copied the curly K-123 and decreased its size. The decals BAT and FK 23 I have drafted



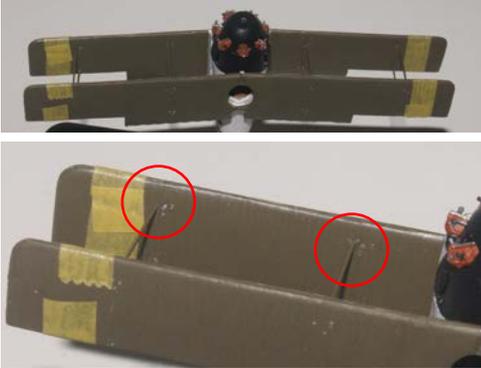
anew and I have printed all black decals on inkjet decal paper, applied a layer of gloss varnish and have put them in place on the fuselage when they had well dried. I had to use still quite some Microscale SET to make them flow well over

the small curvature fuselage. Finally I have finished fuselage, top-side of the lower wing and bottom side of the upper wing with satin varnish.

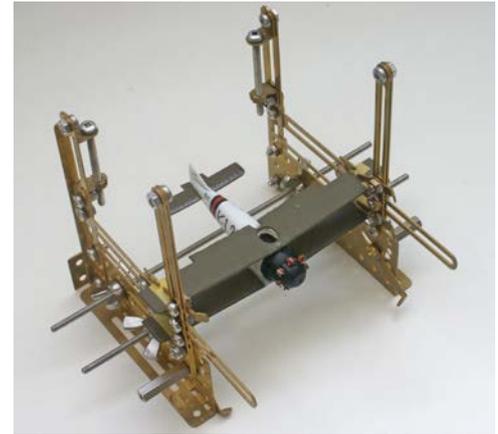
To mount the upper wing I have used the my Aeroclub biplane mounting rig, a good thing to do, because the upper wing is only



resting on two points on top of the fuselage (for the real aircraft these are two hinges for the upper wing halves). When mounting the wing, it broke again into its two composing halves, but that was easily repaired. After careful adjustment of the rig the eight brass streamline profile wing struts have been made to size one by one, fitted and glued in place.



During assembly it appeared that the holes for both inner and outer struts of the left lower wing had not been made on the correct place. I have mounted the struts correctly, and filled up the wrong holes with thick cyano glue, have carefully sanded the spots and applied a bit of khaki paint to correct it. Also the struts have been retouched to repair damage caused by the assembly.



Bracing lines

I have applied the bracing lines, made of black painted 0.06 mm fishing line, according to my usual method thought the pre-drilled holes. It is easiest to start the process from the light coloured underside of the wings; that way hole and line are well visible. It is essential to insert all lines that end up at one (wing of fuselage) location at the same time, before gluing them, otherwise the holes not yet used will get blocked. The lines are either glued (when inserted in a blind hole) or fixed with a piece of tape and tensioned.

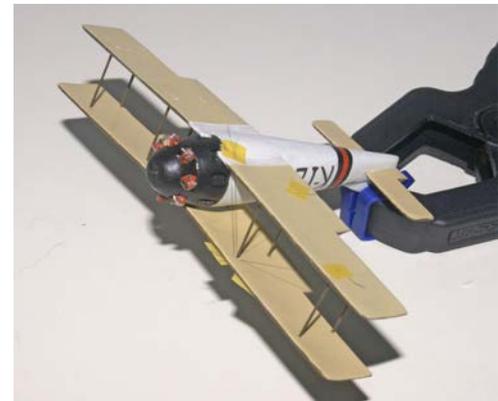
The top picture at the right shows all lines ending up at the top of the left inboard forward wing strut inserted and tensioned, the one at the



left that with the lines leading to the top of all four inboard wing struts attached. In this condition the lines have been secured with a drop of thin cyano glue on the top of the upper wing and let to dry.

This process has been continued with the remaining wing bracing wires, finally resulting in the completely braced wings shown in the second picture at the right. I have modified the list of bracing wires and control cables to reflect the assembly order.

I have left the glued joints overnight to settle well, and have removed the excess fishing line and the remaining dried glue from the wing surface the next day. When this is done with a sharp (new) scalpel blade almost no traces



of glue and line are left and the surface does not need to be treated with putty any more; a light sanding is sufficient. This is illustrated in the two last pictures (before and after painting another layer of linen) at the right above. The only bracing still to be done now is that of the horizontal tail plane, but that can only be done after the application of the decals on the tail. The surfaces of the wing, tail plane, ailerons and elevator where decals have to be applied have been finished with gloss varnish.

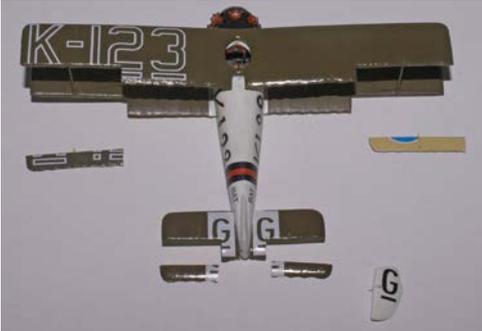
Undercarriage

The kit contains a rig to shape the main undercarriage from streamline profile strips. However, I have built them up over a copy of the three view drawing from 1.6 mm and 2.1 mm profile strip for the frames and 0.9 mm rod for the wheel axles. The first was contained in the material of the kit; the last two came from my stock, as the other material in the kit did not have the right dimensions. The tail-skid has been constructed from 1.6 mm streamline profile strip (cut in shape) and bits of 0.25 mm scrap strip.

The undercarriage legs have been painted white, as well as the streamline profiled support struts, that will be mounted between the wheel axle and the underside of the fuselage. The elastic band shock absorbers have been drawn with a black fine liner. I have painted the tires light grey.

Final assembly

Final assembly starts with the application of the decals on wings and tail surfaces. As the registrations and English roundel are partly covering the ailerons and elevator, I had to cut the custom printed ALPS decals⁶ before applying them. To do so without risking the decals I have printed a copy of the decal set, cut out the relevant images K-123 in white, G in white and the roundel), fitted them on the model and marked the place where they should be cut. I then have cut the

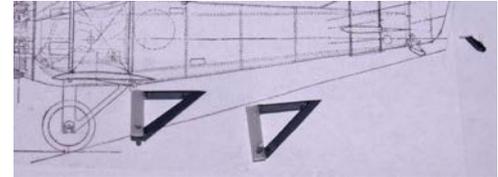


decals using the marked copy as a template, and applied first the part on wing or tail plane and then the corresponding part on aileron or elevator, shifting the position until it matched the part on wing or tail plane. I

have used Microscale Set to ensure a good adherence to the surface. The photographs show the result before sealing the decals. I have also applied a thin strip of silver painted Tamiya tape at the edges of the white part of the wing roots, as this appears clearly on the original aircraft (see also the picture of the air pump).

A detail that still has to be added is the air pump to pressurize the fuel tank. I have produced it from 0.7 mm plastic rod (pump housing), 0.25 mm plastic strip (bracket and air screw) and 0.25 mm metal strand (pump line and airscrew axle).

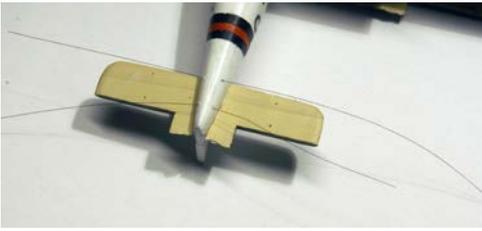
But first I have sealed the decals with Revell AquaColor clear gloss varnish, which is well compatible with the ALPS decals and finished



absorbers have been drawn with a black fine liner.

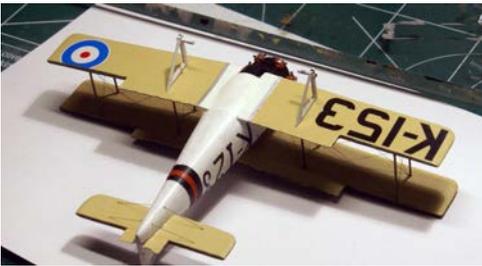


wing, tail and rudder surfaces with satin varnish⁷.



But first I have mounted the bracing wires of the horizontal tail plane. Two short and two long ends of fishing line have been glued in the 0.3 mm holes in the lower rear side of the rear fuselage and then looped around through the holes in the stabilizer until meeting in one of the holes, tensioned with a piece of tape and glued with a drop of thin cyano. When dry, the ends have been cut with a sharp scalpel.

I have also glued two ends of fishing line in the holes of the vertical stabilizer, which will be later connected to the rudder control horns.



Now the more fragile parts of the model have to be mounted, to start with the undercarriage. The two legs of the main undercarriage are positioned under the inner wing struts. This was a novel solution at the time; in most, if not all cases the undercarriage was mounted under the fuselage. The topside of the two legs, that were already painted, has been

sanded to follow the contour of the underside of the wing and have been glued with thick cyano. The wheels have been mounted on the axles with the opening for the valve on the inside, and the struts supporting the undercarriage from the middle of the fuselage underside have been cut on the correct size, and glued with a tiny drop of thick cyano. I had to glue the wheel to the axle to position them correctly close to the undercarriage legs.

Next it was the turn to some small stuff. The bracket of the air pump had to be made a bit smaller; it showed too big on the model. Gluing it on its place was quite a job; it got easily entangled with the bracing wires, but finally I have managed to glue it in the right position. In hindsight it might have been easier to mount the pump before applying the bracing wires. The bracing tubes, two long ones and four short ones, have been made from 0.25 mm black painted metal wire.

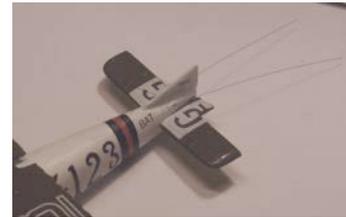
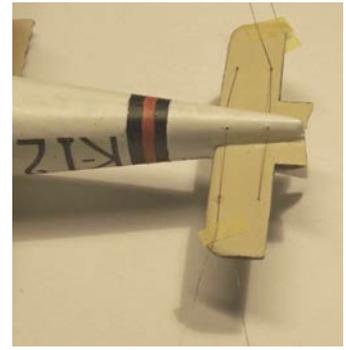


I have determined the correct length trial and error to just fit the distance between the bracing wires. The short ones of less than 2 mm length were rather difficult to position; the slightly elastic fishing line shot them away like a catapult stone, even when they had been dipped in glue.

At this stage the control surfaces have been mounted. I have given the elevator a down position,

as usually is the case when nobody is at the controls, the rudder slightly right, corresponding to the rudder bar position, and the ailerons also a slight right roll. As the rudder is now in place, the tailskid, which is attached to rudder and rear fuselage (it is moving with the rudder), can be mounted.

Applying the aileron control cables, again made from 0.06 mm black painted fishing line, is straightforward. First I have made sure all holes in the ailerons and wing were well opened, as they tend to fill up with paint and varnish. I have glued two long lengths of line in



each of the two slanted holes drilled in the top surface of the upper wing and two short lengths in those drilled in the underside of the lower wing.

When the joints had dried I have tensioned them with a piece of tape over the control horns and applied a small drop of thin glue to fix them there. Finally guiding the lines through the holes in the ailerons, fixing them on the lower ailerons and cutting off the excess fishing line. The control cables have been fixed to the rudder control

horns also.

A last detail added was the pitot tube on the right outward wing strut. The tubing leading to the upper wing I have made again out of fishing line.

After a careful touch up of the paintwork the model was finished.

In summary a nice model to build, which needed however quite some scratch work, as usually is the case with vacuum formed models. The experiment of engraving the ribs in the lower surface of the wings was not very successful, although the final result was acceptable. Major shortcoming of the kit was the shape of the nose and the chosen method to accommodate the engine. It would have been better to mould the nose together with the fuselage halves and to mount individual cylinders. Also, decals for the wing and tail surfaces of the K-123 are missing. That is no problem for the black ones (they are easily printed with an inkjet printer on decal paper), but for the white ones a professional printer is needed. Also, the decals for the fuselage are too big; they need to be made smaller, which again is no problem as they are black. Do not forget to make a scan, however, because the curly ones are difficult to draw correctly yourself. The UK roundel can be obtained from any other source. I did not check the size of the decals for the other versions, but I do not expect problems there. Below some pictures of the finished model are shown.









References

1. R.A. Arnken, *De Ontwikkeling van het Vliegtuig*, pp. 47-48, 73, Gottmer, Haarlem, 1946
2. T. Wesselink & T. Postma, *Koolhoven, Nederlands vliegtuigbouwer in de schaduw van Fokker*, pp. 32-35, ISBN 90 228 3890 0, 1981
3. H. van der Meer, *F.K.23*, all pp, 1996
4. D. Top, *Frits Koolhoven en zijn Vliegtuigproductie*, pp. 28-30, 1996
5. H. Hooftman, *Nederlandse Vliegtuig Encyclopedie, Burgerluchtvaart in Nederland, Deel 1; Van H-NABA tot PH-AEZ*, p. 56, Cockpit-Uitgeverij, Bennekom, 1979
6. Anon., *Koolhoven Vliegtuigen, 1910-1940*, p. 4, 1940
7. H.J. Hazewinkel, *Vliegtuigbouw in Fokkers Schaduw, De geschiedenis van al die andere Nederlandse vliegtuigbouwers*, p. 24, 1988
8. S. Van der Zee, *Vergeten legende, Frits Koolhoven 1886-1946*, p. 160, ISBN 90-234-7057-5, 2001
9. T. Wesselink, *Koolhoven Vliegtuigen*, pp. 71-85, ISBN 978-90-818510-2-2, 2012

Appendix Bracing lines and control cables

The entries in the table below indicate the most convenient order of applying the bracing lines and control cables. Glue the lines only when all lines at a specific position have been placed to prevent clogging of pre-drilled holes.

line	from	to	type	remarks
1	Inner left forward wing strut top	Inner left rear wing strut bottom	Single	
2	Forward left bottom wing root	Inner left forward wing strut top	Double	Crosses line 13; crossing linked by short bar
3	Inner left forward wing strut top	Outer left forward wing strut bottom	Single	Crosses line 14; crossing linked by long bar
4	Inner right forward wing strut top	Inner right rear wing strut bottom	Single	
5	Forward right bottom wing root	Inner right forward wing strut top	Double	Crosses line 17; crossing linked by short bar
6	Inner right forward wing strut top	Outer right forward wing strut bottom	Single	Crosses line 14; crossing linked by long bar
7	Inner left forward wing strut bottom	Inner left rear wing strut top	Single	

<i>line</i>	<i>from</i>	<i>to</i>	<i>type</i>	<i>remarks</i>
8	Rear left bottom wing root	Inner left rear wing strut top	Double	Crosses line 15; crossing linked by short bar
9	Inner left rear wing strut top	Outer left rear wing strut bottom	Single	Crosses line 16; crossing linked by long bar
10	Inner right forward wing strut bottom	Inner right rear wing strut top	Single	
11	Rear right bottom wing root	Inner right rear wing strut top	Double	Crosses line 19 crossing linked by short bar
12	Inner right rear wing strut top	Outer right rear wing strut bottom	Single	Crosses line 16; crossing linked by long bar
13	Forward top fuselage left	Inner left forward wing strut bottom	Single	Passes between lines 2 crossing linked by short bar
14	Inner left forward wing strut bottom	Outer left forward wing strut top	Single	Crosses line 3; crossing linked by long bar
15	Rear top fuselage left	Inner left rear wing strut bottom	Single	Passes between lines 8 crossing linked by short bar
16	Inner left rear wing strut bottom	Outer left rear wing strut top	Single	Crosses line 22; crossing linked by long bar
17	Forward top fuselage right	Inner right forward wing strut bottom	Single	Passes between lines 5 crossing linked by short bar
18	Inner right forward wing strut bottom	Outer right forward wing strut top	Single	Crosses line 3; crossing linked by long bar
19	Rear top fuselage right	Inner right rear wing strut bottom	Single	Passes between lines 11 crossing linked by short bar
20	Inner right rear wing strut bottom	Outer right rear wing strut top	Single	Crosses line 9; crossing linked by long bar
21	Outer left forward wing strut bottom	Outer left rear wing strut top	Single	
22	Outer left forward wing strut top	Outer left rear wing strut bottom	Single	
23	Outer right forward wing strut bottom	Outer right rear wing strut top	Single	
24	Outer right forward wing strut top	Outer right rear wing strut bottom	Single	
25	Underside upper left wing inner struts	Forward nose cowl left	Left drag wire	
26	Underside upper right wing inner struts	Forward nose cowl right	Right drag wire	
25	Forward top fin left	Forward left horizontal tail plane	Single	Combined mounting 21 through 24
26	Forward left horizontal tail plane	Forward bottom rear fuselage left	Single	Combined mounting 21 through 24
27	Forward bottom rear fuselage right	Forward right horizontal tail plane	Single	Combined mounting 21 through 24
28	Forward right horizontal tail plane	Forward top fin right	Single	Combined mounting 21 through 24
29	Rear top fin left	Rear left horizontal tail plane	Single	Combined mounting 25 through 28
30	Rear left horizontal tail plane	Rear bottom rear fuselage left	Single	Combined mounting 25 through 28
31	Rear bottom rear fuselage right	Rear right horizontal tail plane	Single	Combined mounting 25 through 28
32	Rear right horizontal tail plane	Rear top fin right	Single	Combined mounting 25 through 28
33	Outer left lower wing underside front spar	Control horn lower left aileron	Control single	Combined mounting 29 through 33
34	Control horn lower left aileron	Trailing edge lower left aileron	Control single	Combined mounting 29 through 33
35	Trailing edge lower left aileron	Trailing edge upper left aileron	Control single	Combined mounting 29 through 33
36	Trailing edge upper left aileron	Control horn upper left aileron	Control single	Combined mounting 29 through 33
37	Control horn upper left aileron	Outer left upper wing topside front spar	Control single	Combined mounting 29 through 33
38	Outer right lower wing underside front spar	Control horn lower right aileron	Control single	Combined mounting 34 through 38
39	Control horn lower right aileron	Trailing edge lower right aileron	Control single	Combined mounting 34 through 38
40	Trailing edge lower right aileron	Trailing edge upper right aileron	Control single	Combined mounting 34 through 38
41	Trailing edge upper right aileron	Control horn upper right aileron	Control single	Combined mounting 34 through 38
42	Control horn upper right aileron	Outer right upper wing topside front spar	Control single	Combined mounting 34 through 38
43	Bottom left fin	Control horn left rudder	Control single	
44	Bottom left fin	Control horn left rudder	Control single	

¹ <http://www.koolhoven.com/>

² The photograph can be seen on [http://www.nuentoen.nl/fotos/107336/191 ... elta.html](http://www.nuentoen.nl/fotos/107336/191...elta.html)

³ The drawing can be downloaded from <http://www.flightglobal.com/pdfarchive/view/1919/1919%20-%2000662.html>

⁴ Possibly this is not original, but typical for the replica.

⁵ I have first tried to mount bent pieces of 0.55 mm plastic rod, but it appeared really impossible to achieve a reproducible result.

⁶ I have designed the decals with CorelDraw and they have been printed by Fireball Modelworks (<http://www.fireballmodels.info/>).

⁷ I use a mixture of 50/50 Revell matt and gloss enamel. This is easy to apply with a brush and dries rather fast.