World War One Aircraft Models

I have always held a fascination with early military aircraft. After serving for 27 years in the Royal Air Force, I became a Military Aerospace Technical Author. As most modelers, I got involved in the world of construction kits at an early age, but stopped for most of my service career and for some years afterwards.

I started modeling again a few years ago and now enjoy the challenge of building aircraft of World War One. Since posting photographs of my completed models online, various modelers have asked if I would create 'build logs' for my future builds, which is what I now do for each build. These build logs can be downloaded from my web site (link below).

I don't consider myself a 'master' of this craft, but hope to be able to pass on what I have learned. As such, here is my build log, which covers the 2023 release of the 'KatModel' 1:32 scale model of the Austro-Hungarian Phönix C.I.

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INTRODUCTION

Before I start with the build log, I'd like to show how I've set up my work area. I prefer to keep the work area as clear as I can (I've lost too many small items in the past). I think it's important to have the tools etc you need ready to hand and other, non-essential stuff tucked out of the way until needed. I'm lucky in that I have my 'man cave', which is sorted into a modelling area,
airbrush spray booth in addition to my work station PC, games PC and games console.

AFTER MARKET

AFTER MARKET

Figure

'Kellerkind Miniaturen' German mechanic (54/101).

Rigging accessories (as required)

'Steelon' or 'Stroft GTM' 0.08 and 0.12mm diameter mono-filament,
'Gaspatch' 1/48th scale metal turnbuckles (Type A and Anchor Points),
'Albion Alloy's' Brass or Nickel-Silver tube and rod.

Resin

'Proper Plane' Morell Anemometer (RD-008),
'Proper Plane' Continental 760x100 wheels (RW-002).

Weapons

'GasPatch' un-jacketed Schwarzlose 07-12 machine gun (17-32112).

Photo-etch

'PART' 1:48th scale controls & turnbuckles (S48-087),
'Aber' hand tools (35-A68).

Metal mesh

'Plus Model' model mesh (038).

Decals

'Aviattic' WW1 CDL (aged varnish) (ATT32094), 'Aviattic' Linen Weave effect (ATT32236),
'Airscale' generic WW1 dial (AS32 WW1), 'LF Models' Austro-Hungarian propeller labels (C3205),
'Lukgraph' Dark Plywood (DEC005), 'MDP' clear decal paper (laser paper).

Sundries (as required)

Paints

'Tamiya' Acrylic, 'Humbrol' Acrylic, 'Mr. Metal Colour', 'Citadel' water based, 'Alclad II' Lacquers,
'AK Interactive' Primer (Grey AK758, White AK759), 'Tamiya' Fine Surface Primer (Grey/White),
'Tamiya' Semi-Gloss (x35) or Gloss (22), 'Mig' A-Stand Aqua Gloss (A.Mig-2503),
'MRP' acrylic lacquers, 'Mr. Surfacer' 500/1000/1200, 'Windsor & Newton' Griffin Alkyd oil paint.

Adhesives

'Tamiya' liquid cements, PVA Adhesive (e.g. 'MicroScale' Micro Krystal Clear),
'VMS Fleky' CA adhesive (Slow, Thin and Resin), 'Revell' Contacta Professional cement,
'Araldite' two part epoxy adhesive.

Thinners

'Mr. Colour' Levelling Thinners 400,
'Tamiya' Acrylic thinner (X20A).

Fillers

'Perfect Plastic Putty'.

Solutions

'MicroScale' MicroSol/MicroSet decal solutions, 'White Spirits/Odourless Thinners',
'VMS' Metal Prep 4K, 'Black-It' solution, Clear Resin.

Tube, wire, thread

'PlusModel' lead wire, 'Modelkasten' 0.2 mm diameter black line (1.5),
'MFH' 0.4 mm diameter flexible black tube (P-961), 'EZ' white line (Heavy).

Weathering mediums (as required)

'Flory' Clay washes and Pigments, 'Prismacolour' Verithin Metallic Silver pencil (753),
'Tamiya' Weathering Master (Set C, D and E),
'AK Interactive' Kerosene (AK2039) and Engine Oil (AK2019) washes.

Display Base

Etched Plaque (name plate), 'Inperspective' custom made Acrylic base and cover,
'Lars op't Hof Scenery' grass mat (Summer pasture with weeds LH10.66).

THE AIRCRAFT

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This model represents the Phönix C.I, Serial No.121.57 of Flik 57/Rb, operating from San Godega di Urbano aerodrome (Italian Front) during October, 1918.

References:

'Windsock' date file No.150 - Phönix C.I (Paolo Varriale).
On-line resources (various).

Combat formations:

An Austro-Hungarian front-line combat group was known as a Fliegerkompagnie (Flik) with seven or eight pilots (though on paper it should have as many as 20). By late 1918 there were 82 Flik's. In 1917 the Flik's were designated by their roles, determined by a letter appended to the Flik's identification number:
Jagdfliegerkampagnie (J, fighter squadron).
Photoaufklarerkompagnie (P, photo reconnaissance squadron).
Divisionsfliegerkompagnie (D, short-range reconnaissance squadron).
Fernaufklarerkompagnie (F, long range reconnaissance squadron).
Grossflugzeugkompagnie (G, bomber squadron).
Schlachtfliegerkompagnie (S, ground attack squadron).
Korpsfliegerkompagnies (K, another short range reconnaissance squadron).
Reihenbildaufklarerkompagnie (Rb, a photo recon unit specializing in serial photography).

The Phönix C.I:

The Phönix C.I was based initially on the Hansa-Brandenburg C.II aircraft and was produced by 'Phönix' (Phönix Flugzeug-Werke) and 'Lloyd' (Ungarische Lloyd Flugzeug und Motorenfabrik AG). Those produced by 'Phönix' were serial No:121.01 to 121.160 and those from 'Lloyd' serail No:49.01 to 49.100. The first Phönix' produced protype was 121.01, powered by the 185hp Daimler engine and began test flying in June 1917. The second 121.02 arrived in July and was modified with a lowered upper wing of increased wing span and lengthened fuselage, allowing the pilots cockpit to be positioned further rearwards. As the performance was not adequate the Hiero 230hp engine was fitted and flight tests began in August. The second aircraft in this batch of 24 delivered, having a two-piece upper wing, new fuselage and twin V shaped interplane struts. The first of the revised aircraft began reaching the Italian front in during April-May of 1918 and were mainly consigned to Flik Rb (reconnaissance squadrons). The aircraft proved popular with its crews due in the main to its speed. Unfortunately the production and quality of the delivered aircraft suffered under the ever increasing constraints of war. For example, inferior plywood had to be used for covering the fuselage, leading to warping and wrinkling of the fuselage surfaces, as can be seen in many photographs of the aircraft taken in 1918. After the war the aircraft were operated by other countries, such as Czechoslovakia, Serbia, Hungary and Sweden. A total of 98 aircraft were delivered by 'Phönix' and although 'Lloyd' were contracted to produce aircraft, none were delivered during WW1. After WW1 companies such as 'Lloyd' and 'FMV' produced aircraft for other Nations, such as Hungary, Romania, Sweden and the Kingdom of Yugoslavia. The Swedish version, called the E.1, was nicknamed the 'Dront' (the extinct DoDo) and had some changes introduced, including fitting the 220hp Benz engine and extra cabane struts.

Phönix C.I Serial No.121-57:

These aircraft were produced by both the Phönix and Lloyd companies for the Austro-Hungarian KuK Luftfahrtruppen. This aircraft was one of a batch of later aircraft built by Phönix (Serial batch 121.49 to 121.160), ordered in May 1918 but only started being accepted late in the war during August 1918. This particular aircraft has been shown in colour profiles with what appears to be a dull yellow and medium green. However, it's thought more likely that the colours were a light and dark grey on the upper surfaces, fuselage and struts. The undersides were Clear Doped Linen (CDL). The only markings on the aircraft were the crosses on the top of the upper wing, undersides of the lower wings and rear fuselage/rudder. The fuselage sides had the serial number 121-57 in black and a data stencil was applied to the lower left front of the fuselage side. A small serial number was on both sides of the rudder bottom and the 'Phönix' company logo on both sides of the top of the rudder.

The wheel outer covers on Flik 57/Rb (Reihenbildaufklarerkompagnie photo reconnaissance unit specializing in serial photography), were painted as quartered black and white. The manufacturing company logo was located on both sides at the forward, top of the rudder.

Specifications:

Length - 7.6 m (25 ft)

Span - 11 m (36 ft)

Height - 2.95 m (9 ft 8.5 inch)

Empty weight - 820kg (1,808 lbs)

Maximum weight - 1,240kg (2,374 lbs)

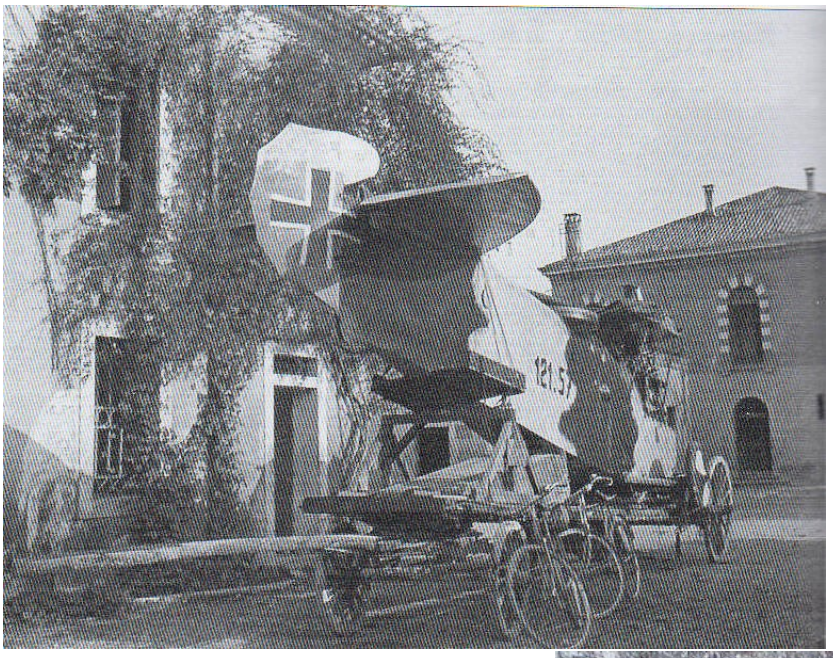
Maximum speed - 175 km/h (109 mph)

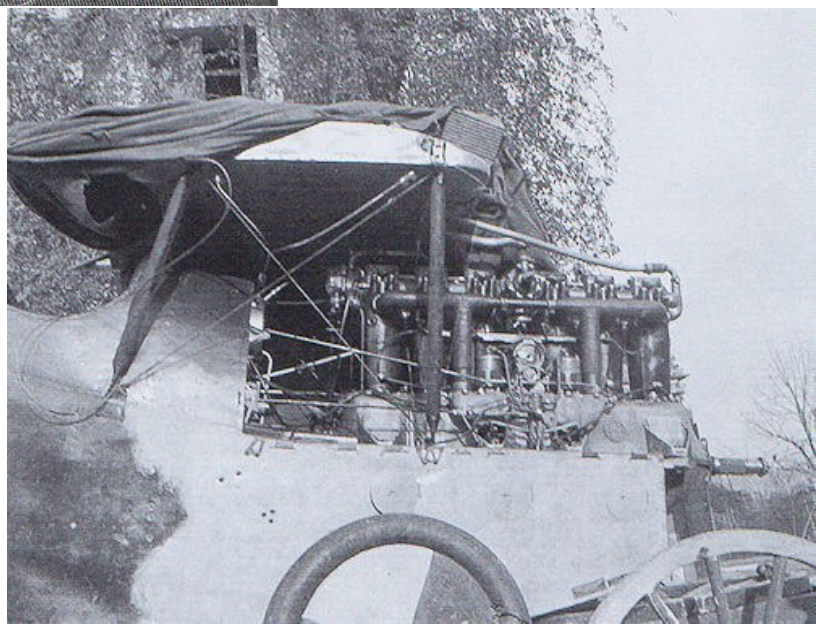
Endurance - 2hr 50 min

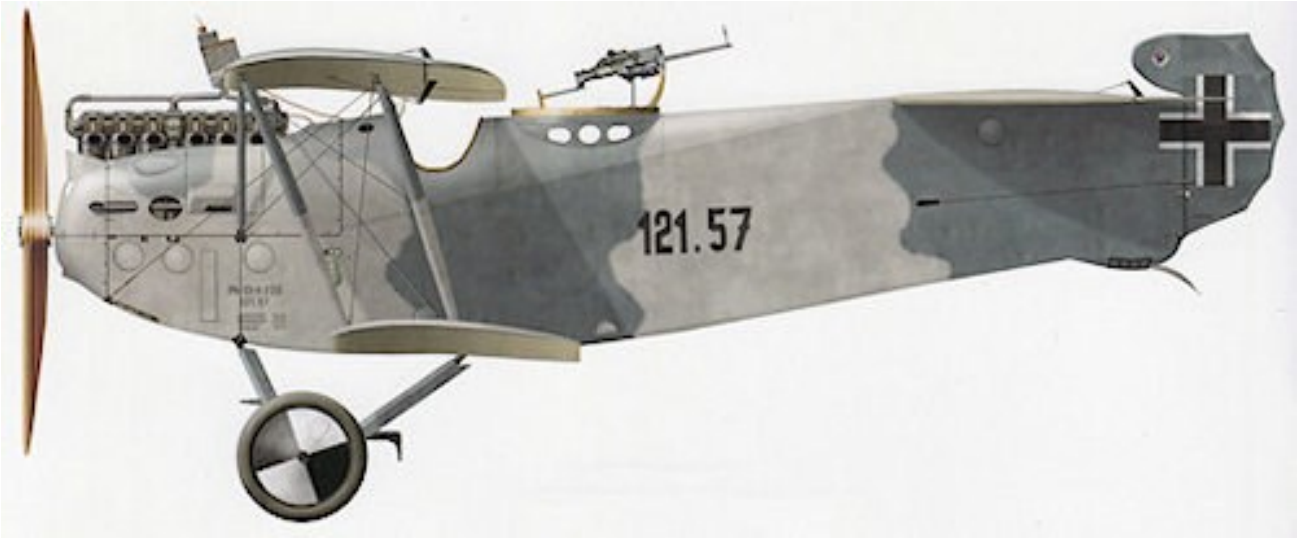
Engine - Hiero 230hp

Weapons - Two 8mm Schwarzlose M16 machine guns.

Phönix 121.57 being transported for repairs after an accident in 1918

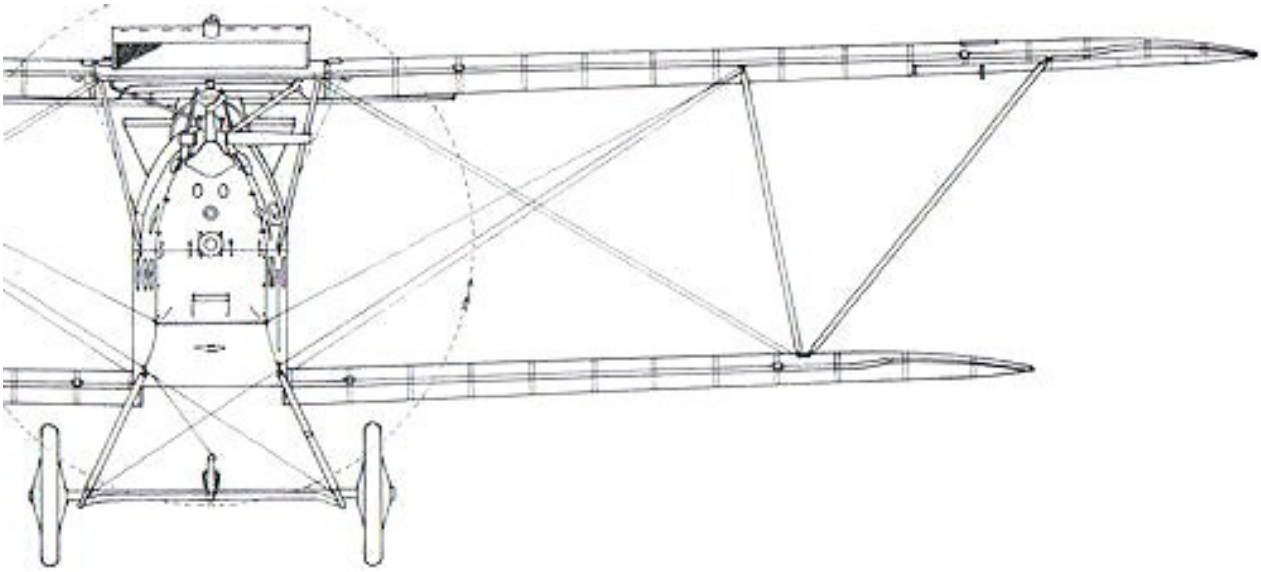




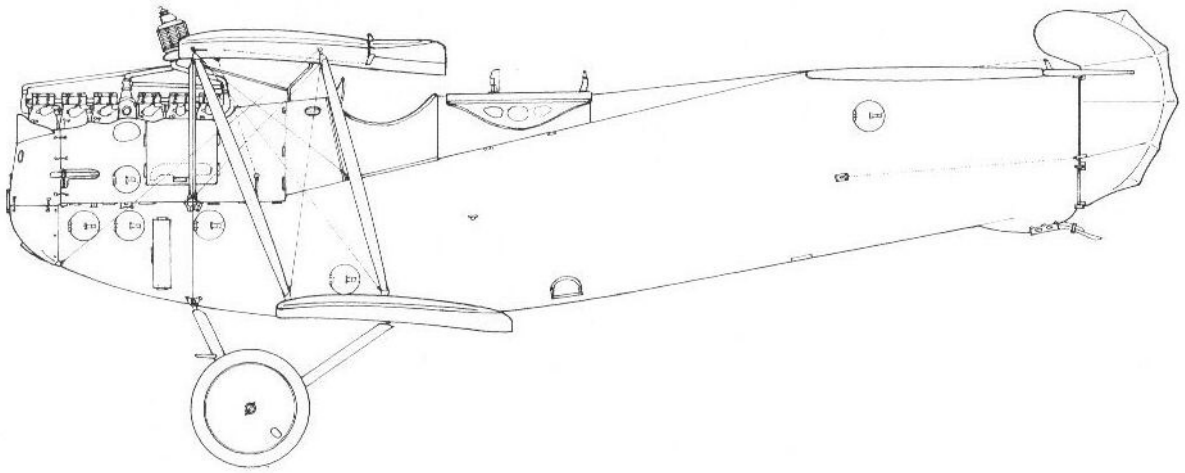


Another aircraft of Flik 57/Rb

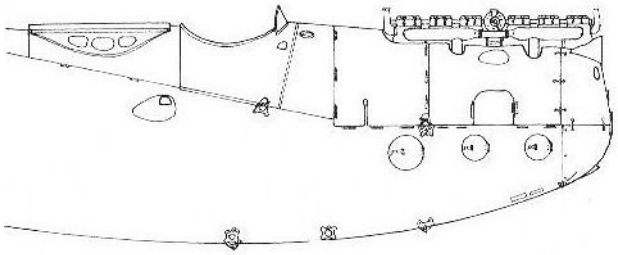
Front view



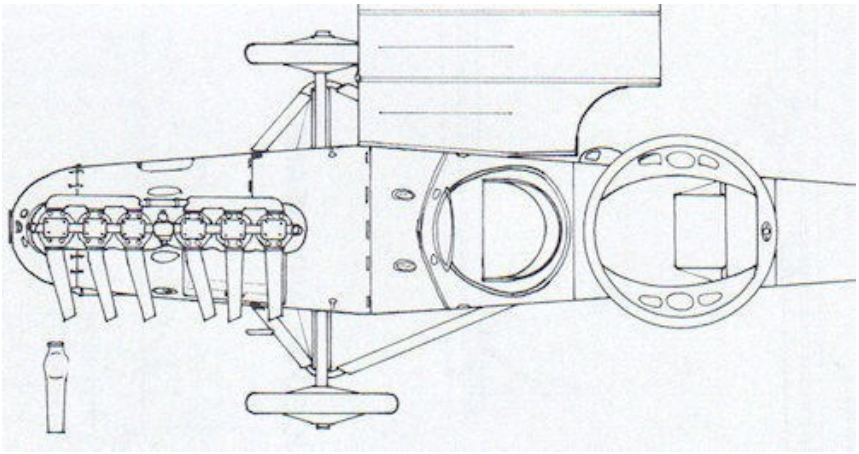
Port (left) side view



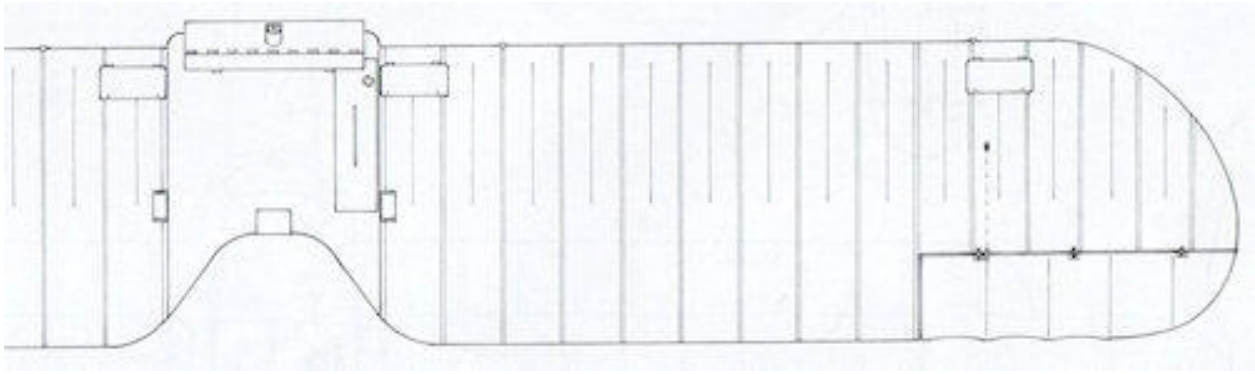
Starboard (right) side view



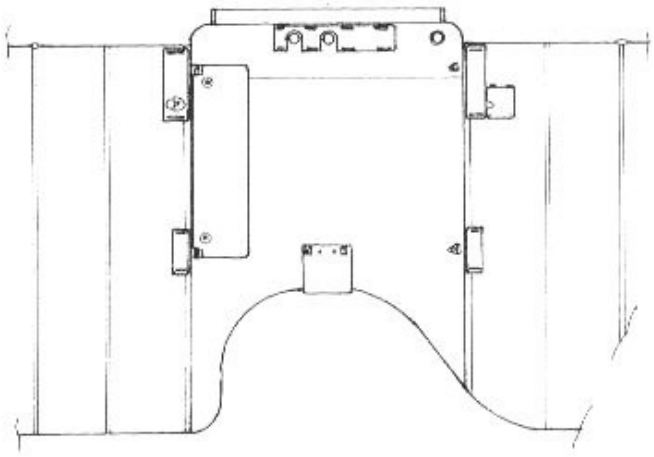
Top view of fuselage



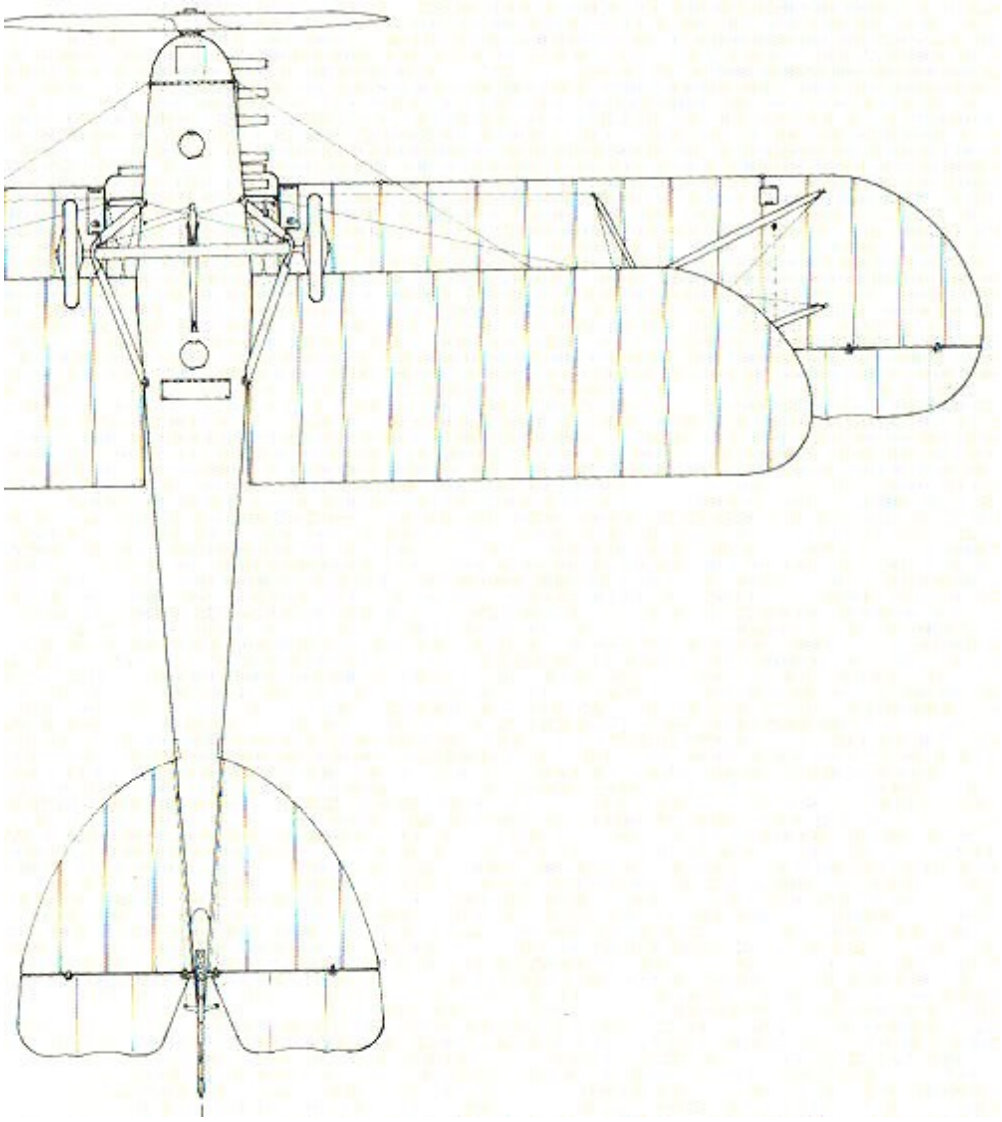
Top of upper wing



Underside of upper wing centre section



Underside view



PART 1
MODEL KIT

PART 1 - MODEL KIT

('KatModel')

KatModel are a resin kit manufacturer based in Poland. This 1/32nd scale model of the Phönix C.I is possibly an upscaled version of their smaller 1/48th scale kit. The parts count for the entire kit is **only 32 parts**. The wings and fuselage halves are resin moulded and all other parts 3D printed.

Resin parts:

The quality of the moulded resin wings and fuselage halves are generally not the best. I found some residue on the parts which needs to be washed away. Also there was some slight warping evident, which should be able to be straightened with immersion if hot water. The wings do have metal rods moulded internally, but these are thin and will not be strong enough to retain the shape of the parts. The rods are also very close to, if not actually through the surfaces of the wings. There are no locating rods or pegs on any parts. The wings surfaces have imperfections, such as small 'blow holes' and molding lines, which will need to be filled and/or sanded smooth. Metal rods may need adding to the wings to help locate and support the parts to the fuselage. The parts have a lot of resin flash at their edges, which needs to be removed. Much of the surface detail (fasteners, panels etc) seems over-scale and thick, so could be removed and replaced with either scratch made or photo-etch parts.

3D printed parts:

Generally the quality if the 3D printed parts is good with very little, in any, surface print striation lines etc. The various struts, once removed from their support trees will be very fragile and probably easily broken, so replacing these with metal tubing may be necessary. The tailplane has some surface undulations, which will need to be filled and sanded. Again, some warping of parts is evident.

Corrections:

NOTE: *The kit as supplied does not seem to have been researched accurately as there are anomalies that need to be corrected or enhanced.* ***Some of these are listed below*** *and others covered during the build.*

The kit is not supplied with any instructions/paint guide or decals.

There is no internal detail in the fuselage and the 3D printed cockpit totally incorrect.

The trailing edges of the wings are over thick, probably due to upscaling from the smaller model and require thinning to a more in-scale thickness.

The windshield is printed as a half hoop frame, but will need acetate sheet cut and applied to represent the windscreen.

The landing gear assembly is printed as a one piece assembly, but is round and over scale.

The engine is printed as a complete assembly and is a fair representation of the Hiero 230hp engine.

The engine access panels details are too thick and require reduction.

The fuselage hatch panels are too thick and require reduction.

Some fuselage hatch panels require removal.

The rudder control cables are molded solid and need to be removed.

The underside of the upper wing centre section lack detail.

The upper and lower wing support rods are too small and therefore weak.

Aircraft markings and stencils need to be created.

Rigging and control cables need to be created.

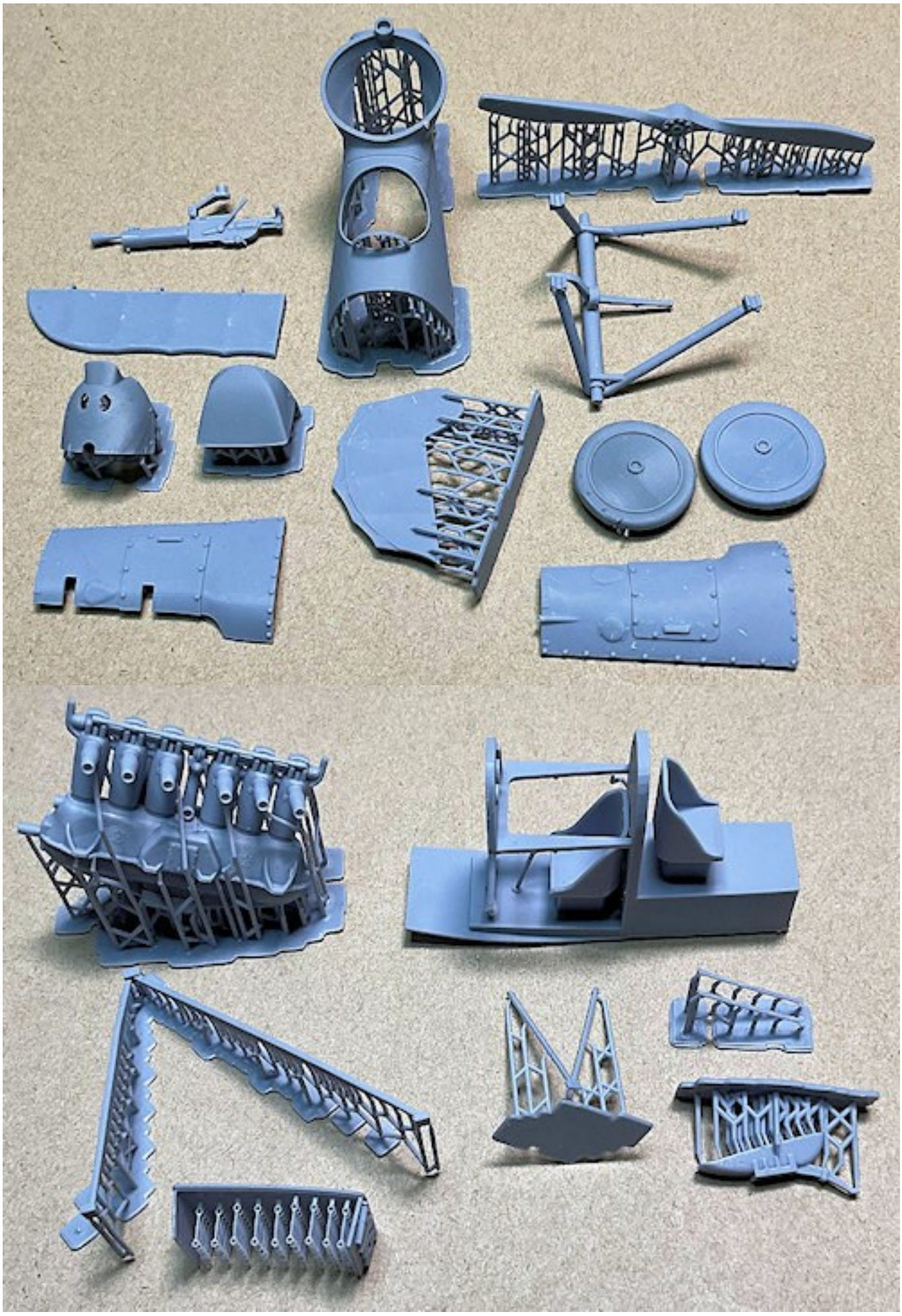
Cockpit decking panel needs to be modified.

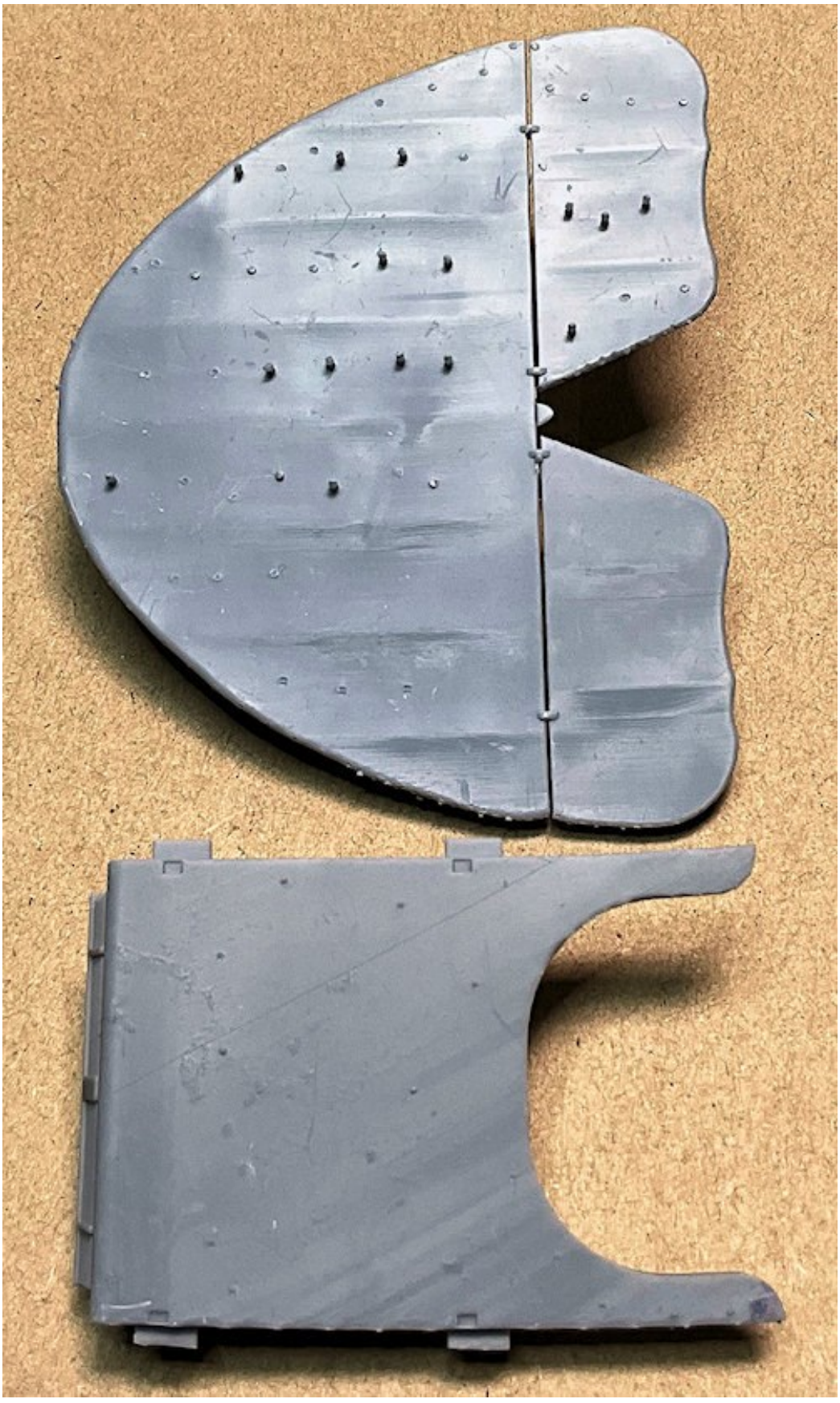
Access hatches on the upper and lower wings need to be corrected.

Some parts are warped and need to be corrected.

Some parts have surface imperfections that require attention.

Corrections or enhancements will be detailed in the relevant Parts of this build log.



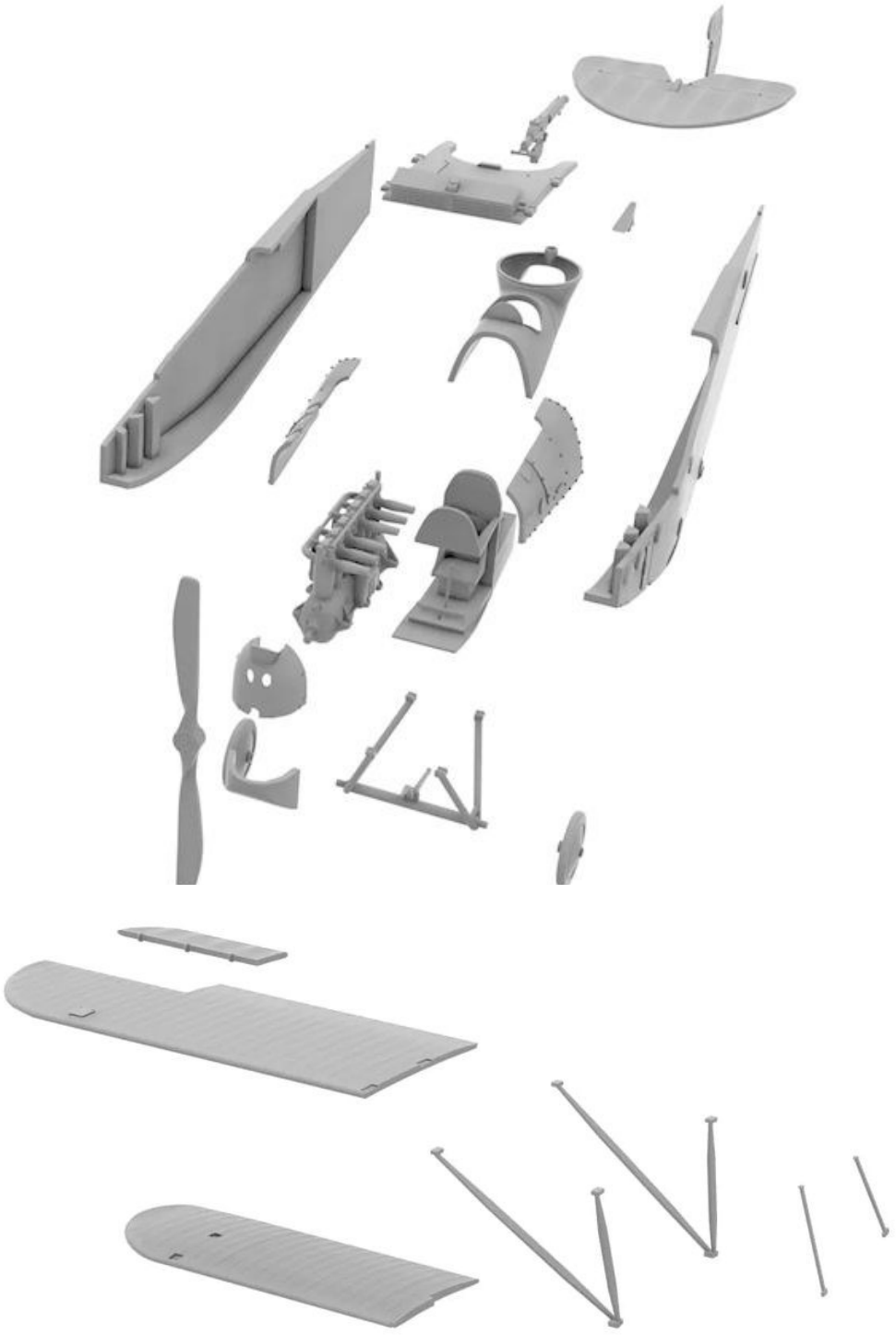


Conclusion:

This model was bought in May 2023 and I believe was one of the first and early versions of the aircraft produced by ‘KatModel’. Therefore, I assume that is why the kit is not of good quality. Possibly models produced now are better researched and the quality of the parts may be better.

It’s best to wash all of the parts in warm soapy water and dry and much as possible in order to remove any residual mould release agents. Also, to make sure the resin is fully cured, leave the parts in sunlight for a day or two to allow the natural Ultra-Violet light to complete curing. Extra researched detail, if possible, should be added to better represent the actual aircraft. Information for this aircraft is scarce and therefore some changes to the model will need to be based on ‘educated guesswork’.

As such this particular release of the kit is certainly for the more experienced modeler, as much is needed to modify or correct the model.



PART 2
WOOD EFFECTS

PART 2 - WOOD EFFECTS

General:

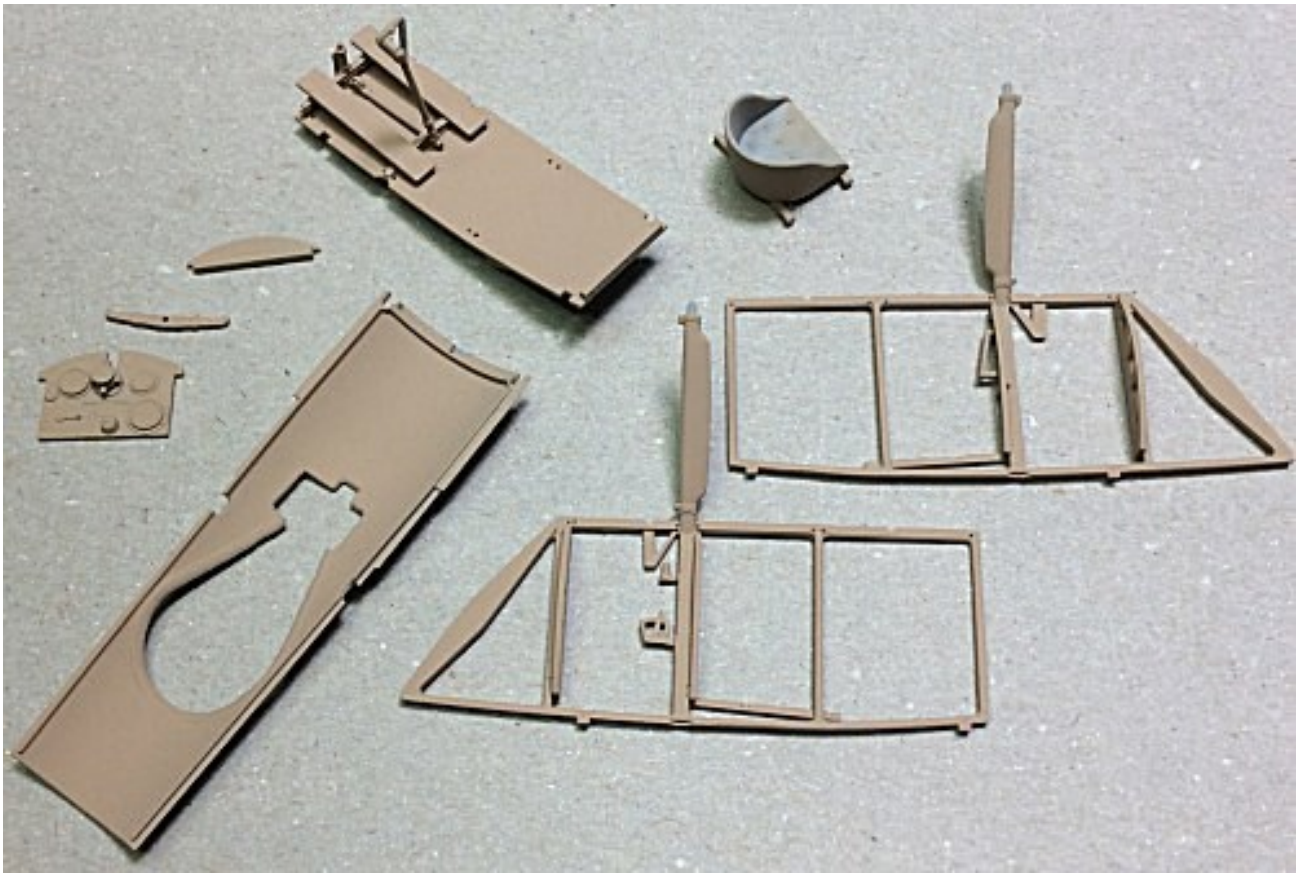
Parts of the model that are supposed to be made of wood can prove to be a challenge to replicate a wood finish to the part. Some after market companies produce accurate wood decals, which can be used to cover larger areas, such as cockpit decking and fuselage panels. However, decals can't easily be used to create realistic wood finish to smaller items or parts that don't lend themselves to having decals applied. To do this requires brush painting, using such as acrylic or oil paints, which can be enhanced with various washes or filters.

The first thing to do is to ensure the model parts are cleaned, normally with warm water with washing up fluid and something like an old tooth brush. Once cleaned and thoroughly dried, the primer coat can be applied. I use 'AK Interactive' Grey (AK758) or White (AK759) acrylic primer. Once the primer is dry, you can start applying the wood effect to the applicable parts, such the cockpit framework, decking, seat supports, rudder bar, instrument panel and of course, the wing struts and propeller. With practice, this method can also be used on larger areas, such as fuselage panels.

Preparation:

To start, apply a suitable base colour. For most painting I use an airbrush and only resort to brush painting when dealing with small items, when I add a few drops of 'Mr. Colour' Levelling Thinner', which aids brush painting. For most wood effect, I use 'Tamiya' Wooden Deck Tan (XF78) or Dark Yellow (XF60), suitably thinned with 'Tamiya' Thinners (X20A). Allow this base coat to fully dry (if you can't smell the paint, then it's dry).

Example of base coat using 'Tamiya' Wooden Deck Tan (XF78)



Wood effect - Method 1:

DecoArt Crafters Acrylic' paints:

For the next step I use 'DecoArt Crafters Acrylic' paints, either Burnt Umber or Burnt Sienna. These are similar to standard acrylic oil paints, but are water based instead of oil based. This paint is not as thick as oil based paint and is more creamy, so can be brushed and controlled more easily. Also, as it is water based, it's easy to clean your brushes, and if really necessary, can be thinned slightly with water. In addition, the paints dry as quickly as normal acrylic paints, avoiding the disadvantage of using true oil paints, which can take days to fully dry.

Place a small amount of the oil paint onto a non-absorbent surface and using a suitable oil paint brush (I use a slightly curved brush), wipe a small amount of the paint onto the brush. For larger areas, such as decking or panels etc I use a small piece of fine sponge to apply the paint.

Apply the paint to the applicable item, using light strokes and in the required direction. Apply the paint along struts and across instrument panels and other smaller items. This gives variation to the wood effect and for the wing struts, is correct for the direction of the wood grain. If you apply too much paint, just brush or sponge it off immediately before it dries. Although the paint is water based, don't try to thin any applied paint with water as it will lift the paint, which builds up into clumps. If required, a second light coat can be applied. Always wait until a first coat has fully dried before applying a second coat, otherwise the first coat will 'drag' and lift from the surface.

Once painting is complete, clean the brush in water.

Below is an example of the Burnt Umber oil paint applied to a cockpit side frame.

Wood effect - Method 2:

Windsor & Newton' Griffin (Alkyd) oil paints:

NOTE: *The wood effects can also be achieved using 'Windsor & Newton' Griffin (Alkyd) paints.*

Mask off the area as required.

NOTE: *When airbrushing 'Tamiya' acrylic paints, I thin the paints using 'Mr. Colour' Self-Levelling Thinners (400), which is commonly referred to as 'unicorn tears' or just 'MLT'.*

Airbrush the areas with 'Tamiya' Dark Yellow (XF60) or similar.

Brush a covering coat of the 'Windsor & Newton' Griffin Alkyd paint , such as Burnt Sienna**,** over the areas.

Leave the oil paint to settle for about ten minutes.

Decant a small amount of White Spirits into a suitable dish.

Dip a broad flat oil brush into the White Spirit then wipe the brush on a sheet of kitchen roll, which should not deposit any fibres in the oil paint.

Brush the oil paint over the area, in the desired direction, wiping the brush on the sheet of kitchen roll to remove residual oil paint.

Repeat dipping and wiping the brush in the White Spirits and brushing the oil paint until the desired density and finish is achieved.

Leave the oil paint to fully dry, which normally takes approximately 24 hours.

Once the oil paint is fully dry, airbrush a semi-gloss clear coat, such 'Tamiya' Semi-Gloss (x35) or similar, with a few drops of 'Tamiya' Clear Orange (X26) to give a varnished look to the finish.

Surface finish:

Once the oil paint layers have dried, the final top coats can be applied to give the final effect of varnished wood.

'Tamiya' have 'Clear' coloured Acrylic paints, which are intended to be mixed with either Flat Clear (XF86), Semi-Gloss Clear (X35) or Clear (X22), to give the required finish but with a tint of the added 'Clear' colour. I use the Clear Yellow (X24) or Clear Orange (X26) to add a varnished tint to the clear coat. If using the 'Tamiya' Clear, I add 'Tamiya' Thinners (X20A), which does improve airbrushing and avoids pooling.

Below is an **example** of the applied mix on the propeller.

NOTE: *Once you are confident using this method of replicating wood finishes, you can vary both the colour of the acrylic base coat and tinting of the sealing coat, to replicate other types of wood used in aircraft construction.*

Once the lacquer coats are thoroughly dry, any detail painting, decals or final weathering can be applied to the parts, as required.

PART 3
WEATHERING

PART 3 - WEATHERING

There are many different types of weathering mediums available now to modellers of aircraft, ships, vehicles and figures, in model of any type. These weathering mediums can be washes based on enamel, clay or ink. Weather pastels, applied by sponge' as well as oil paints of various sorts are also plentiful. Some modellers have even used water colour paints, and pencils. The following are the basic weathering mediums I tend to use on most of my models.

Flory Model clay washes:

The washes I tend to use are the 'Flory Models' Clay Wash 'Grime' and 'Dark Dirt', which come in various shades and consist of a suspended and very fine clay pigment. They are brushed over the surface to be weathered and dry in around 30 minutes. When dry, use either a piece of good, absorbent kitchen roll or a soft brush to remove as much of the clay wash as you need to achieve the desired effect. The kitchen roll can be used dry or very slightly dampened. If dampened, the dried clay is re-activated and the clay wash can be more easily be removed or worked as required.

First I seal the surface with an airbrushed semi-matte clear coat, such as 'Tamiya' Semi-Gloss (x35), which dries quickly. A gloss coat tends to stop the clay wash 'gripping' the surface when it is applied and it can run off or just puddle. A more matte coat can cause the clay wash to 'grip' too much, making it difficult to remove or even to wash it off completely.

NOTE 1: The more glossy the applied sealing coat is, the more the chance there is that the applied 'Flory' clay wash will not spread fully, but rather form puddles or beads of wash. If this happens, add a few drops of ordinary kitchen washing up liquid to the clay wash. This will break the surface tension of the wash, allowing it spread fully.

NOTE 2: Always decant the amount of clay wash you need, rather than dipping the brush directly into the wash bottle. Dipping into the wash bottle can transfer contaminants from the brush into the wash, will can cause the wash to become thick and unusable.

NOTE 3: When a sealing coat is applied over areas treated with clay wash weathering, the intensity of the applied wash tends to darken. This should be considered when removing the clay wash, otherwise the final effect may appear too dark.

NOTE 4: 'Flory' current range of washes are: Dark Dirt, Grime, Black, Light (white), Mud, Sand, Rust and Concrete. All of these washes can be mixed to create many colour shades for different weathering finishes.

To apply the clay wash is just a matter of brushing all over the surface to be weathered. It doesn't matter really how much is applied as it can be left on for any period, as it is easily removed without any effect on the surface underneath. If you don't achieve your desired effect, you can wash it all off and start again. Use a soft brush or absorbent kitchen roll, which are dry or ***very slightly*** dampened, to brush or wipe off the clay wash in the direction of airflow over the model. Even then, dab them onto a dry piece of the paper, until they are almost dry. Any wetter and you'll find that you are removing too much of the clay wash. If that happens you can re-apply the wash and start again. If you're not happy with the final effect, you can easily remove the clay wash by brushing with a wet brush or even airbrush water over the surface. Dry off the surfaces washed and then re-apply the clay wash and try again until you are satisfied. The technique is to 'damp' brush or wipe over the surface to re-activate the clay wash and at the same time, to smear it over areas that had no clay wash. It'll dry within 30 minutes. Then very lightly brush and/ or use a piece of damp absorbent paper to remove as much you want until you get the desired effect. Once finished, run the brush under a tap to rinse out any residual clay pigments. Finally, seal the surface with your chosen clear coat, which will seal in the applied clay wash.

Chipping effects:

To give the effect of chipped and weathered paint/varnish to metal engine cowls and forward fuselage panels etc, chipping fluids can be used. To achieve this effect, first prime the areas with a suitable primer then airbrush the metallic finish desired. Once dry, a chipping fluid, such as 'AK Interactive' Medium Chipping fluid or 'Vallejo' chipping fluid is airbrushed over the painted areas. An alternative is to use a cheap hair spray. This forms a barrier which will allow the top coat to be chipped off. Finally the required top coat colour is applied.
Once fully dry, moisten the top coat with water, which softens the paint. Then with a cut down (stiff) brush and wood cocktail stick, gently tease off the top coat paint. Take care when doing this as 'too much chipping' can't really be covered up. In that event you would have wet the top coat and remove it all with an old toothbrush or similar and then when dry, re-spray the top coat and try again. Once the desired effect was achieved, I sealed the surfaces with an airbrushed clear coat of 'Tamiya' Semi-Gloss (X35).

'Tamiya' Weathering Master sets: Each of these 'Tamiya' produced weathering sets contain three 'tablets' of different colours and an applicator, which has a brush on one end and a sponge on the other. The tablets have a wax look and feel and can be applied onto painted surfaces to reproduce various finishes. It's best to use these as the final surface treatment, as being a 'Wax', any treated surfaces can't be painted or sealed.

Pigments: Pigments, such as those produced by 'Flory Models' or 'Humbrol' are effectively very fine 'dusts', which can be applied to a model to re-create dust, dirt, stains etc. They can be applied by dry brushing or mixed with other mediums to create paintable solutions.

Washes: Washes can be applied to either enhance panel lines etc or to add a 'filter' of colour onto a painted surface. They can be purchased ready made from various manufacturers or can be 'home made' using such as oil paints with a suitable thinning agent. I tend to use 'AK Interactive' products.

Water colour pencils:

Water colour pencils can be used to add weathering detail. The colour s applied to the model part then brushed gently with a brush, slightly dampened with water. This dilutes the pencil marking, allowing it to be faded as desired. 'AK Interactive' produce these 'weathering' pencils, which are marketed specifically for the modeller, although other artist water colour pencils can be used, such as 'Derwent' Inktense 24 ink pencils.

Oil paint:

A technique used more frequently now is oil paint ‘dot and drag’. Basically an oil paint of the desired colour is placed onto a piece of cardboard, which over a hour or so, soaks out the linseed oil in the paint, leaving a drier pigment. The pigment is ‘dotted’ onto the painted surface where it is required then dragged with a brush previously wetted with ‘Tamiya’ X20 enamel thinners then wiped virtually dry.
Softly ‘flick’ the brush to drag the pigment in the direction required, which will blend it in a thin layer.
The amount of pigment left showing depends on the effect you require. Always keep the brush wiped clean to avoid a build up of pigment and remoisten and wipe dry often. The more paint you drag, the less pigment is left showing. Blending different coloured pigments can create stains from smoke/gun blast, rain marks/runs, dirt/dust and oil/fuel stains.
A good quality oil paint and thinners are essential to produce a good finish. Some quality oil paints can be too ‘gritty’ when leached of linseed oil, so I use ’Abteilung 502’ oil paints and ‘Tamiya’ enamel thinners (X20).

PART 4
DECALS

PART 4 - DECALS

‘Standard’ type decals:

NOTE: *The following is **applicable only** for decals on a **painted surface**. If decals are to be placed on top of previously applied decals, the decal setting solutions may ’eat’ into the previous decals. In this case a sealing clear coat should be airbrushed over the first decals, to provide a barrier against the setting solutions.*

Ensure the painted surface is smooth and free from any surface imperfections.

Airbrush a clear gloss sealing coat, such as ‘Mig’ A-Stand Aqua Gloss (A.Mig-2503), ‘Tamiya’ Clear (X22) or similar to provide a smooth surface.

NOTE: *‘MicroSet’ solution softens the decal to allow it to conform to the painted surface. Once applied, do not attempt to move the decal too much or it may tear.*

Wet the area using a light coat of ‘MicroScale’ **MicroSet** solution.

Apply the decal after it has soaked in ‘warm’ water enough to start to loosen the decals from its carrier backing.

Carefully move the decal into the correct position.

Once the decal is correctly positioned, use a flat brush to brush the water out from under the decal, working from the centre of the decal out towards the edges. I then use a dry cotton bud in the same manner. Finally, wearing cotton gloves, I apply slight pressure and slide my fingers across the decal to finally push the decal onto the surface.

NOTE: *‘MicroSol’ solution will soften the decal to allow it to conform fully to the painted surface. The solution usually causes the decal to wrinkle, but this is normal as the decal semi-dissolves to the surface. Once the solution has been applied, never try to disturb the decal as it will tear. Leave the solution for several hours to do its job, after which the decal will return to a smooth surface, but conformed fully to the painted surface.*

Wet the decal surface with a light coat of ‘MicroScale’ **MicroSol** solution.

Leave the solution for several hours to fully dry and set the decal.

Once fully dry and set, airbrush a sealing coat over the decal, dependant of your desired finish. I tend to use ‘Tamiya’ Semi-Gloss (X35) or similar.

‘Aviattic’ decals:

The ‘Aviattic’ decals are different in both production techniques and application to those of the more traditional decal manufacturers. Traditional decals are normally created using processes such as silk screen printing and are pre-shaped for the particular model markings. When placed in warm water they will detach from the backing sheet and can then be slid onto the model surface and when they are correctly positioned, wiped with a semi-dry brush or cotton bud etc, to expel any water from under the decal. Once fully dry, decal softeners, such as ‘MicroSol’ and/or ‘MicroSet’ can be applied, if necessary, to ’weld’ the decal to the model surface. Finally a sealing coat of acrylic or lacquer gloss, semi-matt or flat is applied over the decal, to seal and protect the seal and protect the decal.

The ‘Aviattic’ decals are laser printed onto a very fine carrier film and although this film is thin, the decals are remarkably resilient and somewhat ‘stretchy’ when being applied. This allows them to be more easily moved and positioned before being finally applied. Also with most other decals, I’ve used softeners to help the decals conform to surface irregularities and contours, which is something I’ve found is not really required for ’Aviattic’ decals, due to the nature of the carrier film. In addition, unless the decals has been printed pre-shaped (‘cookie cut’), the decals will need to be cut out from the sheet, so care is required to cut the decals accurately to avoid leaving gaps, especially at the edges, where the white base colour will show. That said, minor gaps may be able to be covered with weathering. For more information, refer to the ‘Aviattic’ instruction sheet supplied with the decals. Aviattic’ decals are laser printed onto either ‘clear’ or ‘white’ backing, the ‘clear’ being dependent on the base coat you apply and the finished effect you desire. The decals are supplied with very clear instructions on their application, including when to add pre-shading to the base coat, where desired, before you apply the decals.

Application:

First airbrush the parts to have decals applied with a primer coat of such as 'AK Interactive' White (AK759) or Grey (AK758) or similar light colour for 'clear' backed decals or 'AK Interactive' Grey (AK758) for 'white' backed decals. Appropriate base colours can be applied over the primer coat under 'clear' backed decal.

NOTE: *'Silvering' is caused by air being trapped in the rough surface of the paint, such as on a matte (flat) finish, which after the decal is applied and dries, causes silver sheen patches showing in the decal ('silvering').*

Once dry, check the surfaces for any imperfections, such as trapped dust or raised areas of paint, which will cause 'silvering' under the decals. Any surface imperfections found should be carefully sanded or polished out.

Airbrush at least two light sealing coats of a clear coat such as 'Mig' A-Stand Aqua Gloss (A.Mig-2503), 'Tamiya' Clear (X22) or similar over the painted surface to form a gloss surface for applying the decals.

NOTE: *The decal sheets are supplied as total decal sheets or as 'cookie cut' sheets, where each decal has been printed ready to apply directly onto the model part. Decals created from a solid A4 sheet need to be accurately cut to shape for the model part.*

Cutting decals - total decal sheets:

Always **cut away any white border** around the decal sheet to avoid that accidentally being part of the cut out decal.

Lay the decal sheet **rear surface (not the decal side)** onto the model part surface.

Using a pencil, lightly trace the outline of the part onto the rear surface of the decal sheet. Allow for any curvature across the parts, such as on wings. Also, allow for a slight overlap at the edges of the part.

Carefully cut out the decal shape.

Test fit the decal onto the part to make sure it aligns correctly to the part edges.

NOTE: *The surface must be pre-wet with like warm water with. Care needs to be taken when you slide the decal from the backing sheet and onto the model surface, as the thin decal can fold over on itself.*
Soak each decal in warm water for approximately 20 seconds.

Wet the surface of the model where the decal is to be applied.

Carefully slide the decal onto the wetted surface. Make sure the decal does not fold over on itself.

Align the decal to the shape of the model part.

Using a broad, soft brush, brush the decal from the centre outwards to remove any water from under the decal.

Adhere the decal to the model part surface by either pressure rolling over the decal with cotton buds or, as I do, by wearing lint free cotton gloves and rubbing the decal with your fingers.

Adhere the decal to the model part surface by either pressure rolling over the decal with cotton buds or, as I do, by wearing lint free cotton gloves and rubbing the decal with your fingers.

Check to make sure the decal is in full contact with the surface of the model part and that there are no areas exhibiting 'silvering' (trapped air under the decal). If so, gently prick through the decal and apply water then press out the water to adhere the decal back onto the model part. Also check that there are no lifted decal edges around the model part.

Allow the decal to fully set, preferably overnight. Where decals have been applied to large areas, gentle heating using a hair dryer can accelerate the decal setting time.

Where decals cover location holes or other openings, prick or cut through the decal into the hole or opening then apply 'Tamiya' X20A thinners, which will soften and adhere the decal into the hole or opening. Using X20A can also conform decals around curves edges etc.

Where decals cover location holes or other openings, prick or cut through the decal into the hole or opening then apply ‘Tamiya’ X20A thinners, which will soften and adhere the decal into the hole or opening. Using X20A can also conform decals around curves edges etc.

Protect and seal the decals by airbrushing a sealing coat over the decals. If more decals are to be added onto the applied decals a gloss sealing coat should be used. Otherwise a sealing coat of the desired finish can be applied, which should also be done once all of the required decals have been applied.

‘Lukgraph’ decals:

These decals are semi-translucent and like the ‘Aviattic’ clear backed decals, will show through the base colour of the surface underneath. Also the decals are not ‘cookie cut’ and instead are printed as part of the carrier film on the entire decal sheet supplied. Therefore they need to be accurately cut out from the sheet in order to limit the amount of carrier film left around the decal.

Application:

These decals should treated in the same way as for ‘Aviattic’ clear type decals.

PART 5
RESIN

PART 5 - RESIN

NOTE: *Models can be cast in resin or 3D printed with resin.*

Below I have listed what I have found to be the primary differences for resin parts as opposed to styrene (plastic) injection parts:

1. When resin kits are cast in their moulds, a release agent is applied to enable the cast resin parts to be more easily removed, which is similar to plastic kit moulding. This release agent can leave a film on the surface of the kit parts, which, if not removed, can prevent paint or adhesives from adhering to the surfaces. The easiest way to remove this film is to carefully and fully wash all of the model parts in warm soapy water, using an old, soft tooth brush, then rinse all of the parts of at thoroughly and leave to dry. Alternatively clean the parts with isopropyl alcohol of at least 70% purity, especially on 3D printed parts that have resin residue on their surfaces.

2. Resin, by its nature, is very brittle and can be damaged or broken easily, especially when handling small parts. This is particularly evident when separating the individual items from the resin cast and support trees. The best way to remove item is to cut them away with a razor saw, or a sharp pair of nippers, then carefully remove any residual stubs of resin.

3. Once removed from the resin cast, parts may have 'resin flash' around or amongst parts, especially small items. This is easily removed with a sharp scalpel blade. Heavier residue can be scraped, filed or sanded away.

4. Plastic kits are assembled using solvent adhesives, which melt the surface where it is applied and 'weld' the joint together. Resin however will not react to this type of adhesive and can really only be glued using CA adhesive. This adhesive reacts to moisture in the air and on the surface to be joined. As most people know, it will also bond skin to whatever it touches, if the skin has CA adhesive on it. Obviously extreme care needs to be exercised when assembling resin kits using CA adhesive.

5. Cutting, sanding and drilling resin will create swarf and more importantly, resin dust. The dust in particular is dangerous, especially if inhaled. Therefore always vacuum the working area, and yourself, regularly. If you have a face mask or filtered respirator and find you can wear it whilst working, then do so. Resin can easily be drilled or scraped, but remember how brittle resin when it is being handled.

6. It is not unusual to find imperfections in resin cast parts, such as surface blemishes, small 'blow' holes or ragged edges. This can be common on some resin kits. These imperfections can be rectified by sanding/polishing and/or filling with modelling putty, then sanding/polishing.

7. Generally CA adhesive is supplied as 'instant bond' adhesive, but there are some manufacturers, such as 'VMS Fleky', that supply CA adhesive as standard, thin, slow and specific resin adhesive. Whichever adhesive is used you must ensure parts are correctly positioned and aligned before applying the adhesive. Trying to separate mis-aligned parts once the adhesive sets will prove very difficult and may result in irreparable damage to the parts.

PART 6
ENGINE

PART 6 - ENGINE

NOTE: *The basic engine was prepared earlier in the build log.*

Painting:

NOTE: *As the engine below the exhaust pipes area will not be visible on the completed model, I've only painted the top details of the engine.*

Airbrush the engine with a grey primer, such as 'AK Interactive' Grey (AK758) or similar.

Airbrush the engine cylinders and top detail with 'Tamiya' Semi-gloss black (X18) or similar.

Airbrush the engine sump and crankcase with 'Alclad' Duraluminium (ALC102) or similar.

Where necessary, brush any overspray on the engine cylinders and top detail with 'Tamiya' Semi-gloss black (X18) or similar.

Brush paint the engine detail as follows:

'Tamiya' Bronze (X33) - Valve lever covers, spigot between valve springs.

'Tamiya' Gun Metal (X10) - Cam shaft, end pipe fittings P1 and P3.

'Mr. Metal Colour' Stainless Steel (213) - Vertical central coolant pipe, valve springs.

'AK Interactive' Kerosene wash (AK2039) - Valve springs and camshaft.

'AK Interactive' Engine oil wash (AK2019) - Valve gear cover lates.

Engine exhaust pipes:

Brush the exhaust pipes with **'Mr. Metal Colour' Dark Iron (214).**

Using a cotton bud, lightly buff the painted exhaust pipes to create a metallic sheen.

Dry brush the exit ends of the pipes with **'Tamiya' Rubber Black (XF85)**.

Modifications:

Ignition leads:

NOTE: *There is not enough room between the installed engine cylinders and the engine side access panels to represent both the spark plugs and their ignition leads. Therefore, the ignition leads are fitted after the engine has been painted.*

Using as a guide the spark plug locations in the left side of the engine cylinders, drill a hole of 0.5 mm diameter at approximately a 45 degree angle into, **but not through**, each cylinder.

Drill a hole of 0.5 mm diameter horizontally into, **but not through**, the centre of the bottom of each cylinder. These holes will be used to secure the bottom of the ignition leads.

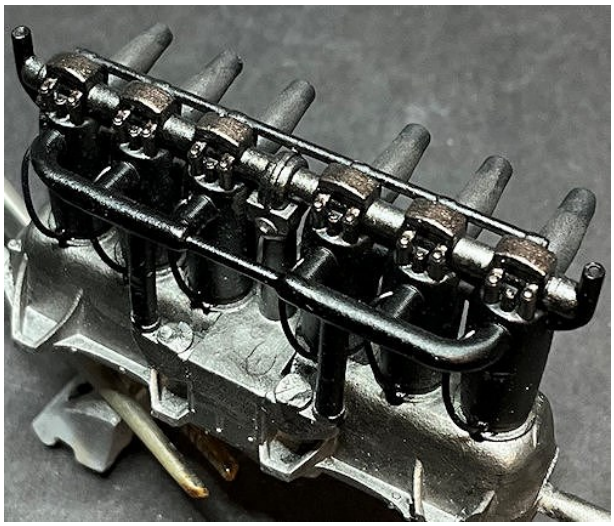
In the right side of the engine cylinders, drill a hole of 0.5 mm diameter at approximately a 45 degree angle horizontally into, **but not through**, each cylinder. The location of the holes should be on the rear half of the cylinders and angled rearwards (refer to previous photographs).

NOTE: *The ignition leads are represented using 'MFH' 0.4 mm diameter flexible black tube (P-961). For ease the leads are attached to the bottom of the engine cylinders as those areas will not be seen on the completed model.*

Cut twelve lengths of the 'MFH' tubing.

Using thin CA adhesive, secure one end of each tube into the pre-drilled holes in the engine cylinders.

Using thin CA adhesive, secure opposite ends of each tube to the pre-drilled holes in the bottom of each engine cylinder.

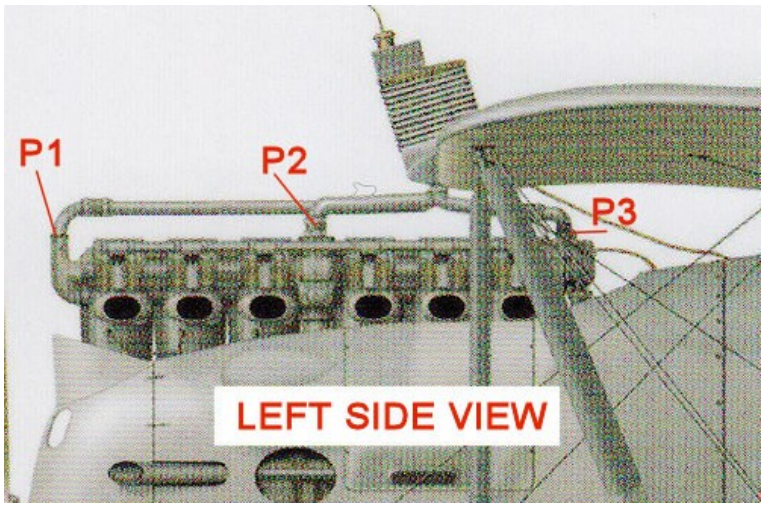


NOTE: *The 3D printed engine does require the addition of the following coolant pipes, which will be visible on the completed model. These will be made and fitted in Part 12 (Construction) of this build log. These pipes can be initially* ***created now or left until*** *the engine and upper wing have been fitted.*

Coolant pipe ***P1*** *from the top, front of the engine to the underside right of the radiator on the upper wing.*

Coolant pipe ***P2*** *from the top, centre of the engine to the underside centre of the radiator on the upper wing.*

Coolant pipe ***P3*** *from the top, rear of the engine to the underside left of the radiator on the upper wing.*



To prepare the engine for the fitting of the coolant pipes, do the following:

Cut away the engine pipe P1 flush with its main body, the carefully drill a hole of 1.0 mm diameter centrally down into the main body, making sure the drill is central to avoid breakthrough.

Cut away the engine pipe P3 flush with its main body, the carefully drill a hole of 1.0 mm diameter centrally down into the main body, making sure the drill is central to avoid breakthrough.

Drill a hole of 0.8 mm diameter centrally into, **but not through**, the outlet block in the centre, right side of the engine, below the overhead camshaft.

PART 7
PROPELLER

PART 7 - PROPELLER

The kit supplied 3D printed propeller is not of good quality as it was mis-shaped, not straight and the pitch of the blades appears to be reversed. Therefore I replaced it with a similar propeller from my 'spares' collection. The propeller tips were re-profiled to represent a 'Sigma' made propeller, a type fitted to this aircraft.

Kit supplied propeller

Replacement propeller (before modification)

Preparation:

The tips and out section of the replacement propeller blades were re-profiled to slightly square them off and remove the erosion plates.

The locating on in the rear of the propeller was drilled out using a 2.0 mm diameter drill, to match the engine propeller shaft.

Painting:

Airbrush the propeller with a grey primer, such as 'AK Interactive' Grey (AK758) or similar.

Airbrush the propeller with 'Tamiya' Dark Yellow (XF60) or similar.

NOTE: *Refer to Part 2 (Wood Effects) of this build log - Method 2.*

Create a wood effect by brushing 'Windsor & Newton' Griffin Alkyd paint (Burnt Umber/Raw Sienna) over the false floor.

Once fully dried, airbrush a semi-matte clear coat, such as 'Tamiya' Gloss (X22) or similar over the propeller blades.

Brush paint the front and rear hubs with 'Mr. Metal Colour' Stainless Steel (213) or similar.

Lightly buff the hubs with a cotton bud to create a metallic sheen.

Decals:

NOTE: *The propeller modelled is of a 'Sigmar' type, which was a subsidiary company of the 'Phönix' company. The only photograph of the 'Sigma' logo on a propeller I found is not defined enough to be able to create an accurate decal. However, it look similar to the 'Jaray' propeller logo. Therefore, I chose to use that decal from the 'LF Models' Austro-Hungarian propeller labels (C3205) set.*

Cut around two 'Jadar' decals as close as possible to the decal edges, as they are printed as part of the overall sheet.

Apply a decal to the propeller blades 3/4 the distance from the propeller hub. Make sure the wings on the decal face towards the propeller tips.

Weathering:

Lightly brush 'AK Interactive' Kerosene wash (AK2039) over the hubs.

To represent tip erosion, lightly sand the tip area of both propeller blades.

Finish:

Airbrush a semi-matte clear coat, such as ‘Tamiya’ Semi-Gloss (X35) or similar over the propeller blades.

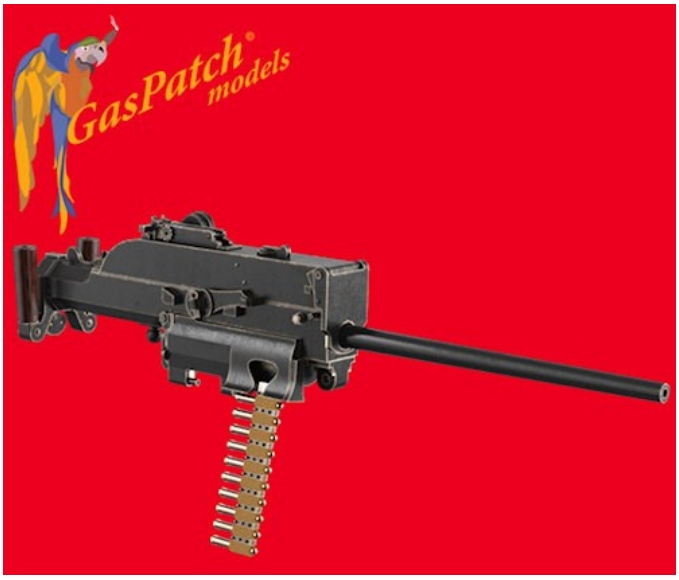
PART 8
WEAPONS

PART 8 - WEAPON

References:

'Windsock' date file No.150 - Phönix C.I (Paolo Varriale).
On-line resources (various).

NOTE: *The observers machine gun supplied in the kit is a Schwarzlose 07-12 with a cooling jacket. However, as well as being somewhat 'over scale' in size, the aircraft was usually armed with an un-jacketed weapon. Therefore, I replaced the weapon with the 'GasPatch' un-jacketed Schwarzlose 07-12 machine gun.*



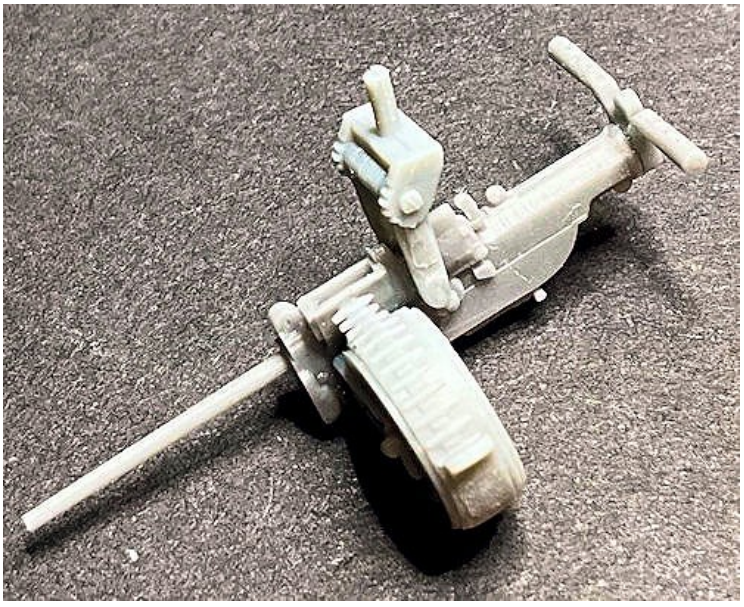
Preparation:

Using thin CA adhesive, secure the gun barrel into its locating hole in the front of the breech block.

Using thin CA adhesive, secure the 'spread' handle assembly into its locating recess in the rear of the breech block.

NOTE: *The Schwarzlose 07-12 machine gun was supplied with ammunition from an ammunition drum, fitted to the right side of the breech block. To represent the ammunition drum, I used a 'Parabellum' machine gun ammunition drum (ex-Wingnut Wings kit) and the gun mount.*

I sanded the surface detail from the right side of the breech block and the mating face of the ammunition drum. The drum was then secured to the right side of the breech block, using thin CA adhesive. The arms of the gun mount were shortened and then secured to the breech block, using thin CA adhesive.



Painting:

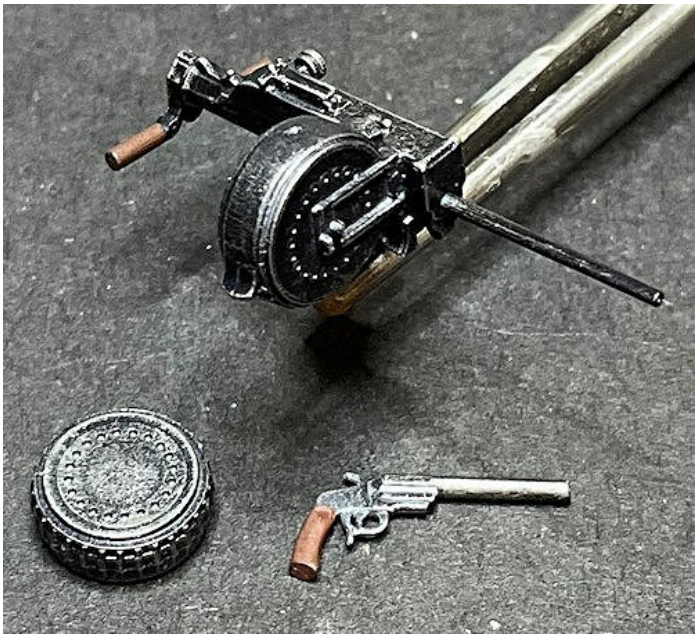
Airbrush the observers machine gun assembly, spare ammunition drum and the flare pistol with a grey primer, such as ‘AK Interactive’ Grey (AK758) or similar.

Airbrush the observers machine gun assembly, spare ammunition drum and the flare pistol with ‘Alclad’ Gunmetal (ALC-120) or similar.

NOTE: *Dry brush by using a domed and soft brush, which has a very light dusting of paint. Dry off paint on the brush on an absorbent paper before dry brushing the part.*

Dry brush the observers machine gun assembly, spare ammunition drum and the flare pistol with ‘Mr. Colour’ Super Iron 2 (203) or similar.

Brush paint the handles of the machine gun and flare pistol with ‘Tamiya’ Hull Red (XF9) or similar.



PART 9
PARTS PREPARATION

PART 9 - PARTS PREPARATION

NOTE: *As this model kit was released by 'KatModel', who are not a mainstream kit company, the kit parts tend to be made of a softer resin and therefore are prone to warp. For this reason and others, some of the kit parts need some work before assembly of the kit can be started.*

Once 3D printed parts are removed from their support trees, make sure and residual stubs are removed and any indentations filled and/or sanded.

Fuselage:

NOTE: *The fuselage halves have no locating pegs or holes to align the two halves together. I found that when the fuselage halves were placed and held together at the tail, the front of the fuselage halves bowed out, leaving a large gap between the front sections. Also, the sides of the fuselage at the front were not vertical, as they should be, but were angled in towards the top edges. This meant the underside of the fuselage at the nose was not horizontal. To correct these anomalies I did the following.*

Cut away the top portion of the three engine 'supports' from both fuselage halves as they serve no real purpose.

Drill holes of 0.8mm diameter through the edges of one of the fuselage sides and the bottom of the rear engine support with the holes spaces as shown in the following photograph.

Hold the fuselage halves together and align to each other and spot drill through the holes into the other fuselage side.

Using the spot marks as guides, drill holes through the other fuselage side.

Cut lengths of 0.8 mm diameter Brass rod, such as that from 'Albion Alloy's' or similar.

Using thin CA adhesive, secure the rods into the pre-drilled holes in one fuselage side. Make sure the rod ends are inside the fuselage half and not protruding.

Locate the other pre-drilled fuselage side fully onto the pinned fuselage side, making sure the two fuselage sides meet.

Mark the ends of the protruding rods at the fuselage side.

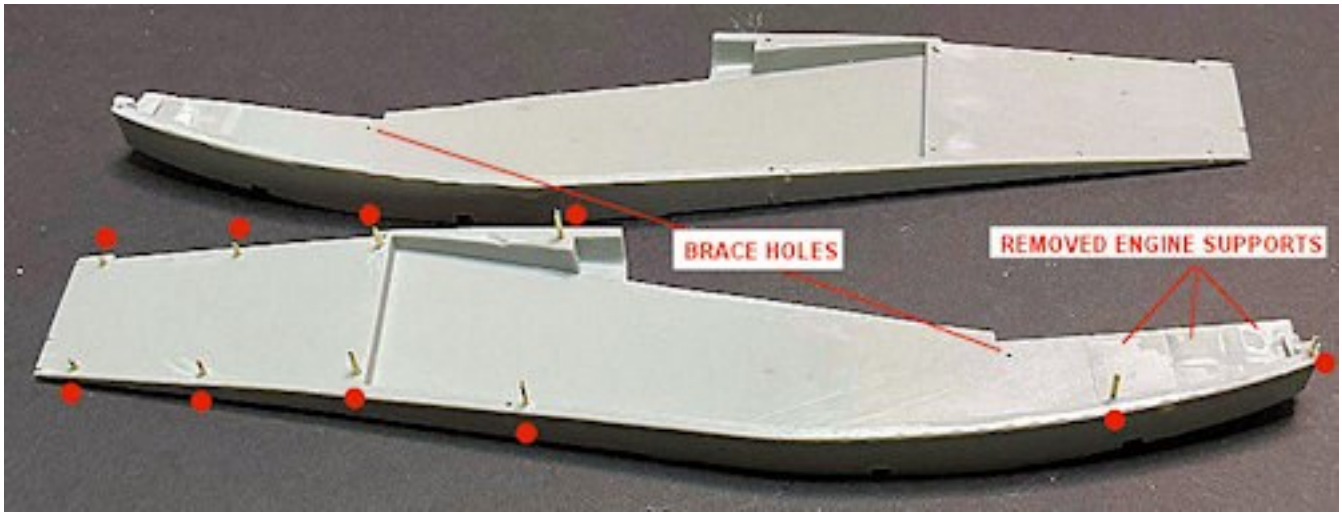
Separate the fuselage halves and cut the rods below the marks made.

Rejoin the fuselage halves and make sure no rods protrude from the fuselage sides.

Separate the fuselage halves and cut the rods below the marks made.

NOTE: *A brace needed to be fitted across the top of the fuselage sides to push them out to force the fuselage sides vertical.*

Drill a hole through both fuselage sides at the location shown in the following photograph.



Rejoin the fuselage halves.

Cut a length of suitable styrene section, such as a piece of kit sprue gate (I used triangular styrene from ‘PlusModel’). The length should be such that when pushed between the fuselage halves at the pre-drilled holes, the fuselage sides are pushed out to be vertical.

Rejoin the fuselage halves and position the styrene ‘brace’ between the pre-drilled holes in the fuselage sides.

Spot drill through the holes in the fuselage halves and into the ends of the styrene brace.

Remove the brace and using the spot drill marks as guides, drill holes into the ends of the brace.

Rejoin the fuselage halves.

Check that the 3D printed lower nose cowl fits correctly onto the front of the fuselage.

Separate the fuselage halves leaving gap between the two halves.

Apply a small amount of thin CA adhesive to each locating rod the fully locate the two fuselage halves together, making sure the halves fully meet and the front sides of the fuselage halves are vertical. Also that the underside of the nose is horizontal.

For additional strength, apply thin CA adhesive along the inside and outside of the joint seams.

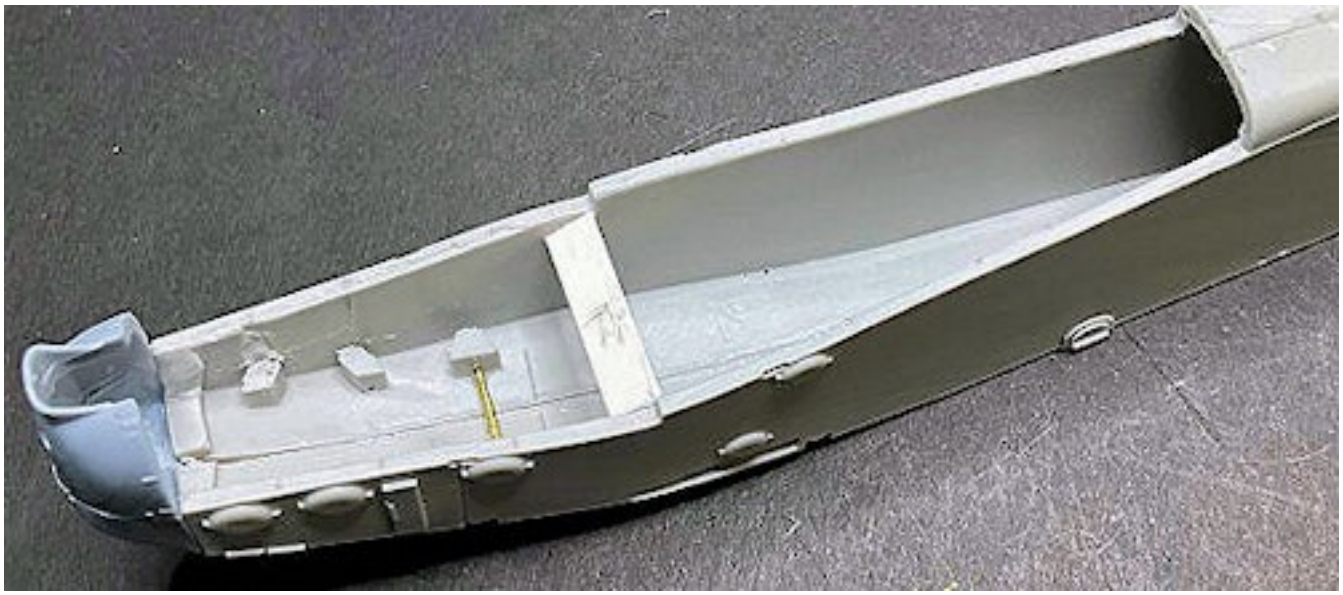
Cut two lengths of 0.8 mm diameter Brass rod, such as that from ‘Albion Alloy’s’ or similar. Make sure the rods do not protrude from the fuselage sides when fully inserted through the fuselage sides and into the ends of the brace.

Locate the created ‘brace’ between the fuselage halves and at the two pre-drilled holes.

Apply thin CA adhesive to the rods then locate the two rods fully through the fuselage sides and into the ends of the brace.

Using thin CA adhesive, secure the lower nose cowl onto the front of the fuselage.

Using thin CA adhesive, secure the upper nose cowl onto the lower nose cowl.



Fill any seam gaps or surfaces holes (alignment rods) with a model putty, such as ‘Perfect Plastic Putty’ or similar. Small gaps can be filled with ‘Mr. Surfacer’ 500.

Once the fillers have fully set, sand the seams to blend them with the surrounding areas. If necessary, re-fill any obvious gaps and re-sand until the seams are filled.

Lower wings:

NOTE: *As designed, the lower wings are intended to be secured in recesses in the fuselage with a thin integral metal rod. This rod has not been trimmed off at the wing root.*

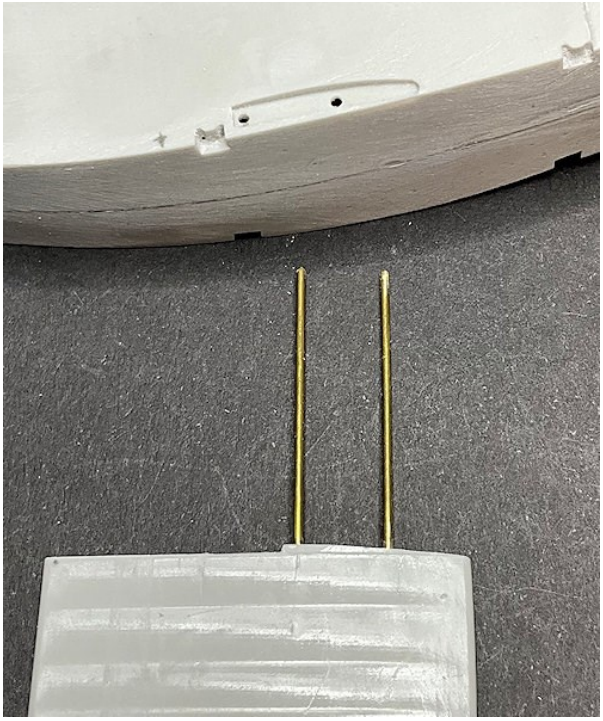
Cut away any protruding integral metal rod in the lower wings at the wing roots.

File or sand any stubs of rod flush to the surrounding wing roots.

Test fit the wings into their recesses in the fuselage lower sides, making sure the wing leading edges are 90 degrees to the fuselage sides. If necessary, file or sand away the locating shoulders at the wing roots to achieve the correct fit.

Drill two holes of 1.0 mm diameter as far as possible into the locating shoulder on both lower wings, making sure the holes are drilled centrally into the wings to avoid 'break through' at the wing surface. Drill holes centrally 8 mm and 18 mm from the wings leading edge.

Cut two lengths of 1.0 mm diameter Brass rod, long enough to be fully inserted into the two lower wings and across the fuselage.



Using thin CA adhesive, secure the two rods into the holes drilled in the right wing.

Drill two holes of 1.0 mm diameter into and through the locating recesses in the fuselage sides for the lower wings. Drill the holes to align with the wing rods. Drill holes centrally 8.0 mm and 18 mm from the recess leading edges.

Locate the rods of the right wing into and through the pre-drilled holes in the fuselage recesses.

Align the left lower wing to the protruding rods and mark their location on the wing.

Drill two holes of 1.0 mm diameter as far as possible into the root of the left lower wing, making sure the holes are drilled centrally into the centre section to avoid 'break through' at the surface.

Locate the left wing onto the protruding rods, making sure both wings are fully located in their fuselage recesses and that both wings are 90 degrees to the fuselage. Also that the two wings are horizontal to the fuselage when viewed from the front.

Check both lower wing for any surface imperfections or warping.

If warping is evident, immerse the wings in hot water or use a hair dryer to make the resin slightly pliable.

Bend the wing to remove the warp and hold in position until the resin cools to regain rigidity.

If any surface imperfections are evident, sand and/or fill them with 'Mr. Surfacer' 500 or similar. Once fully secured, sand flush to blend with the surrounding areas.

Thin the wing trailing edges, by scraping and sanding to give them a more 'in-scale' thickness.

Fuselage external detail:

NOTE: *Fuselage detail (hatch covers) are too thick and some are either not required, missing or are in the wrong position. Also the rudder control cables are molded as part of the fuselage.*

Sand or scrape away the circular hatch covers from both fuselage sides.

Sand or scrape away the pre-molded rudder control cables from both fuselage rear sides.

Sand the areas to blend them with the surrounding fuselage surfaces.

Sand or scrape away the foot steps from both fuselage sides, leaving a witness mark.

Decking panel:

NOTE: *The front edge of the 3D printed decking panel overlaps the shoulder on the fuselage where the engine side panels locate.*

Temporarily locate the engine side access panels onto the fuselage.

Check fit the decking panel to ascertain how much material needs to be removed from the front edge of the panel and if necessary the rear locating edge on the fuselage.

NOTE: *During the following step, make sure the front edge of the decking panel follows the rear edges of the engine side access panels (to avoid any gaps).*

Carefully file or sand away the front edge of the decking panel and if necessary the rear locating edge on the fuselage until the decking panel fits correctly.

NOTE: *Despite pinning the fuselage sides together, there was still a overlap of the fuselage sides to the bottom edges of the cockpit decking panels.*

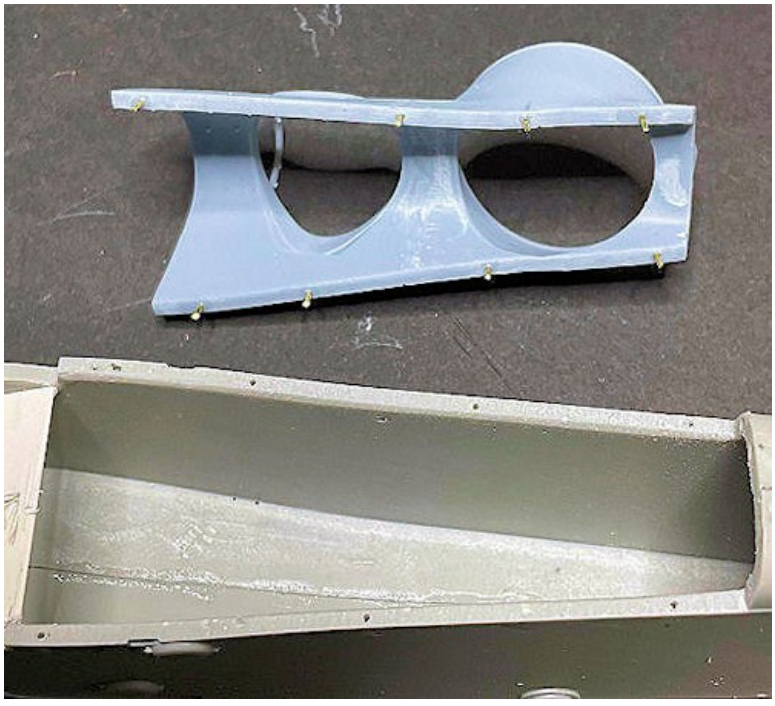
Drill eight holes (four each side) of 0.8mm diameter into the bottom edges of the decking panel as shown in the photograph.

Cut eight lengths of 0.8 mm diameter Brass rod, such as that from ‘Albion Alloy’s’ or similar.

Using thin CA adhesive, secure the rods into the pre-drilled holes in the decking panel.

Hold the decking panel in position over the fuselage and mark the location of the eight rods onto the fuselage sides.

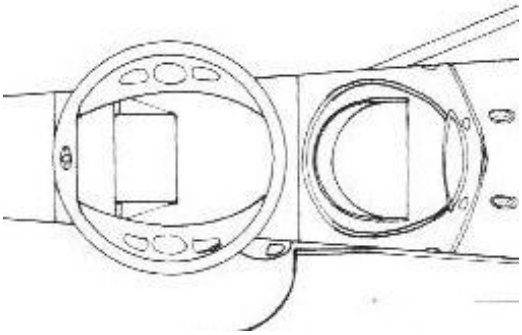
Drill eight holes (four each side) of 0.8mm diameter into the top edges of the fuselage sides.

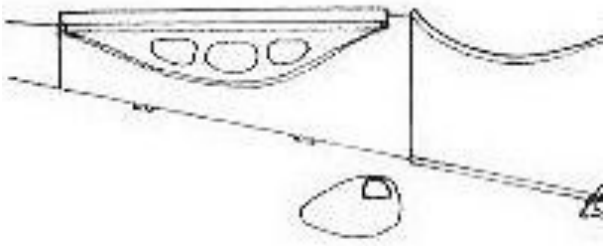


NOTE: *During the following step, if necessary, push the sides of the fuselage to align the rods to the holes.*

Test fit the decking panel onto the fuselage, making sure the panel fully locates onto the fuselage with no obvious gaps.

NOTE: *Later versions of this aircraft has three openings in both sides of the fairing around the decking panel.*



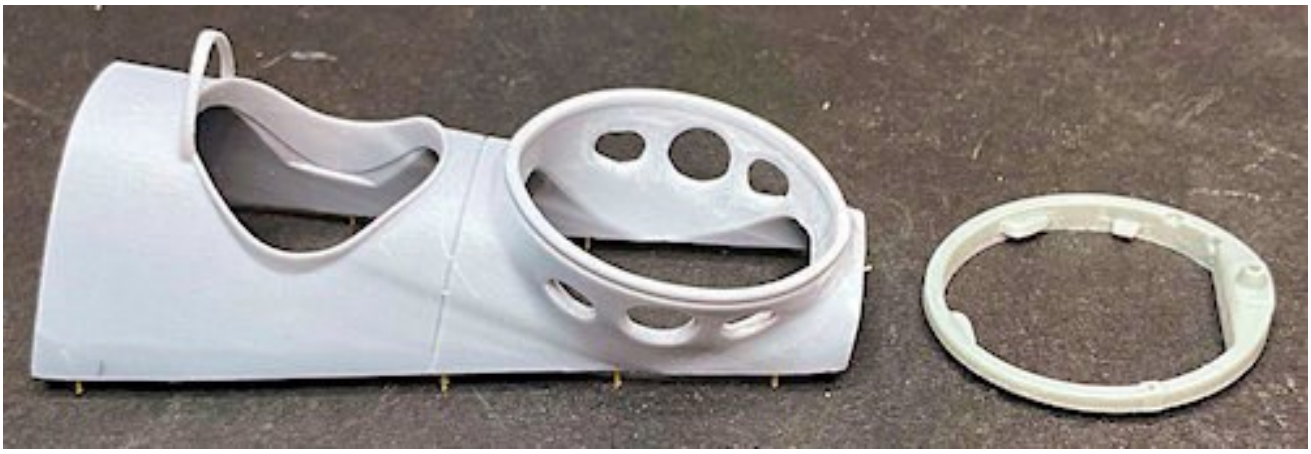


I pencil marked the centre circular and outer slightly oval shapes on the sides of the decking panel, then using a drill of 1.2 mm diameter, drilled through the sides of the panel. Using small needle files (round and half-round) I filed out the shapes of the openings. The inside surface around each opening was slightly thinned by scraping with a curved scalpel blade.

NOTE: *This photo-graph shows the original gun mounting ring before modification.*

NOTE: *The printed decking panel for the observers cockpit includes the machine gun mounting ring. However, as the weapon is to be replaced, the existing gun mounting ring needs to be modified. I chose to add a more correct 'Priesel' mounting ring (ex-Wingnut Wings kit) from my 'spares' collection.*

I sanded and scraped the existing gun mount recess to remove it completely. I also removed the slight shoulder from around the inside, top edge of the opening. This allowed the replacement gun mounting ring to locate into the opening of the decking panel.



Cut away the side extensions on the pilots instrument panel at the bottom ledge of the panel.

File or sand the cut edges to blend them with the remaining shoulder.

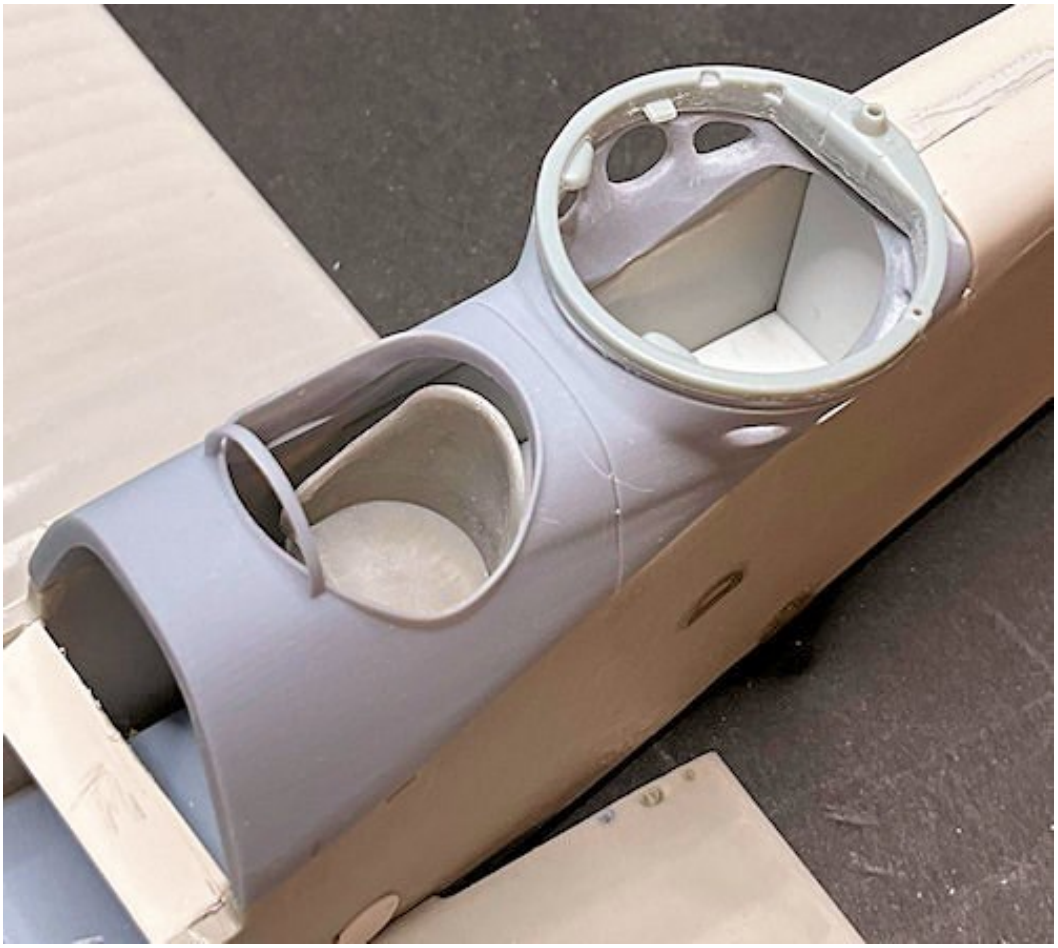
Using CA adhesive, secure the instrument panel vertically into the decking panel and just forward from the pilots cockpit opening.

Test fit the changes made by:

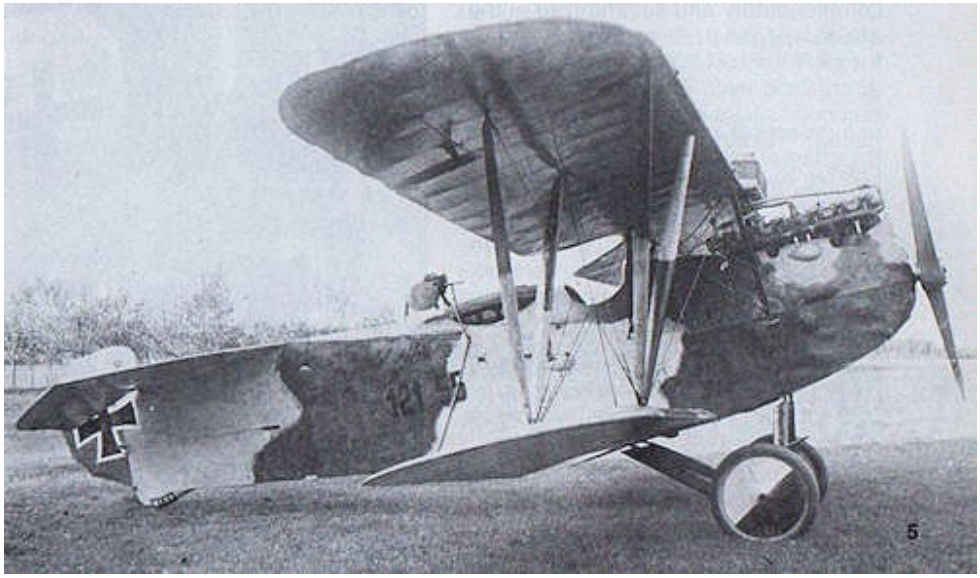
- Locating the cockpit assembly into the fuselage with the front edge against the added floor stop rod.
- Locate the observers rear bulkhead onto the observers floor and into the curved inside top of the fuselage.
- Locate the added gun mounting ring into the observers opening in the decking panel.
- Locate the decking panel fully onto the fuselage sides edges.
- Locate the replacement pilots seat onto the top of the added fuel tank.

Make sure all parts fully locate, align and that there are no obvious gaps.

Remove all of the parts from the fuselage.



NOTE: *The shape of the pilots cockpit opening, when viewed from the sides, is not curved as it was on the actual aircraft. It also had padding around the upper edge.*



The molded rim around he cockpit opening was sanded away.

The profile of the cockpit opening was filed and sanded to a more correct shape.

Then the inner surfaces in the cockpit were sanded to thin them to a more in-scale thickness.

Finally ‘Mr. Surfacer’ 500 was carefully brushed around the rim of the cockpit opening to represent the edge padding.

Engine access panels:

NOTE: *The 3D printed engine access panels were slightly too long to fit between the rear edge of the upper nose cowl and the locating shoulder on the top edges of the fuselage sides.*

Using the 3D printed engine access panels as templates, file back the fuselage locating shoulders such that the two panels fit between the rear edge of the upper nose cowl and the locating shoulder on the top edges of the fuselage sides.

Check that when located the two panels are aligned to each other.

NOTE: *The raised detail on the panels (circular hatch covers, fasteners and panels) are too thick and pronounced.*

Sand or scrape away the circular hatch cover, panel fasteners from both engine access panels. Leave the top ‘teardrop’ access panel intact.

Sand or scrape away the raised panel on the right engine access panel.

Sand or scrape away the raised panel on the left engine access panel to reduce it to a more ‘in-scale’ thickness.

Cockpit assembly:

NOTE: *My research shows that the 3D printed cockpit is totally incorrect and therefore I chose scratch build what I could from the limited information available.*

The following are the anomalies found with the supplied cockpit:

The Austro-Hungarian aircraft were fitted with a pilots steering wheel and associated aileron control cables - not a control column.

The pilots seat is too low in the cockpit was a curved back seat type - not an armchair type.

The observers seat was a fold down seat on the rear bulkhead and facing forward - not an armchair type facing rearwards.

The pilot and observers cockpit were as one - not separated by a solid bulkhead.

The observers cockpit has no detail such as radio gear etc.

The observers machine gun is the wrong type.

From the supplied cockpit, cut away the following parts:

Instrument panel from the centre bulkhead.

Observers seat, leaving the block seat support.

Centre bulkhead level with the pilots cockpit floor.

Pilots seat, leaving the block seat support.

Control column.

Rudder bar.

Sand or file away any reside edges from the cut surfaces.

Check fit the remaining3D printed cockpit floor assembly into the fuselage.

NOTE: *I found that the cockpit assembly needed to be reduced in order for it to fit inside the fuselage.*

Where necessary, remove material from the rear sides of the cockpit floor until it can be slid easily into the fuselage.

With the cockpit floor in the fuselage, slide the floor forwards until its front edge is 4 mm from the rear of the cut away engine support blocks.

Pencil mark the bottom of the fuselage at the front edge of the cockpit floor.

Remove the cockpit assembly.

Using thin CA adhesive, secure a strip of 1.0 mm square plastic rod (or similar) across the fuselage at the front of the marked position (to act as a stop for the cockpit assembly).

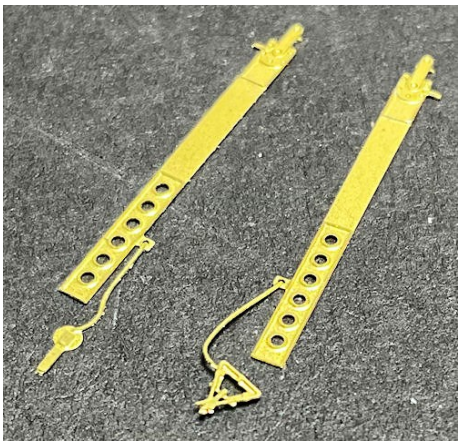
NOTE: *When the cockpit assembly is located into the fuselage, the floor 'block' of the observers cockpit does not extend far enough into the rear of the fuselage. Also, there is no rear cockpit bulkhead supplied in the kit. Therefore, the space left will be seen with the cockpit decking panel fitted.*

The plastic card used needs to be thin enough to be able to flex when the cockpit assembly is inserted into the fuselage.

Cut a piece of 0.4 mm thick plastic card to fit on the raised observer cockpit floor, with its front edge aligned to the remaining pilots cockpit bulkhead and the sides cut tapered so as to fit into the rear of the fuselage.

Once the correct shape is achieved, use CA adhesive to secure the false floor onto the observers cockpit floor.

NOTE: *The pilots seat was mounted onto the top of the fuel tank. The cut away seat was replaced with a suitable seat with resin cushion and photo-etch seat belts from my 'spares' collection.*



Cut two rectangles of 0.8 mm thick plastic card the width of the pilots cockpit floor and 16 mm high (or as required by the seat used).

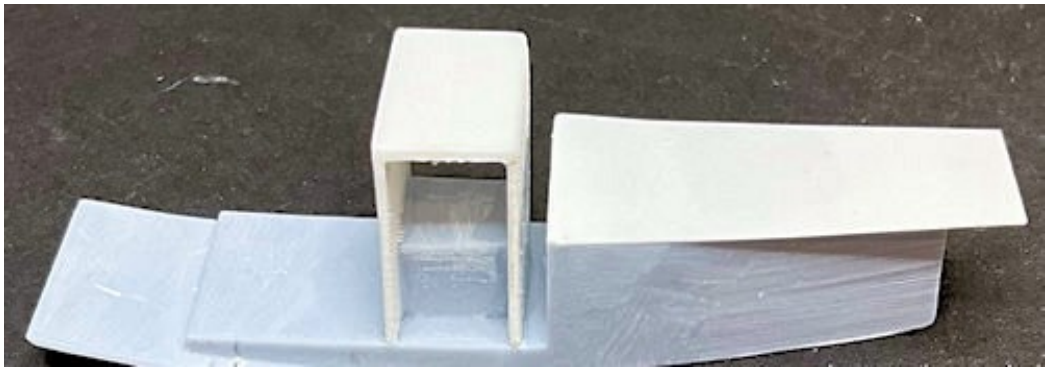
Using CA adhesive, secure the two plastic cards to the front and rear of the pilots seat mounting block, making sure the cards are vertical and aligned to the floor edges.

Cut another card to fit across the top of the two added cards and aligned to their edges.

Using CA adhesive, secure the card on top of the added cards.

If necessary, sand the edges of the three cards to blend them together.

NOTE: *The following is necessary to provide a shoulder for locating the bottom of the observers rear bulkhead.*



Cut a piece of 0.5 mm thick plastic card to fit over the rear half of the observers cockpit floor and aligned to its edges.

Locate the cockpit assembly in the fuselage with its front edge against the added stop rod.

Position the cut plastic card onto the rear half of the observers floor.

Pencil mark across the card vertically below the rear edge of the observers cockpit opening.

Remove the card.

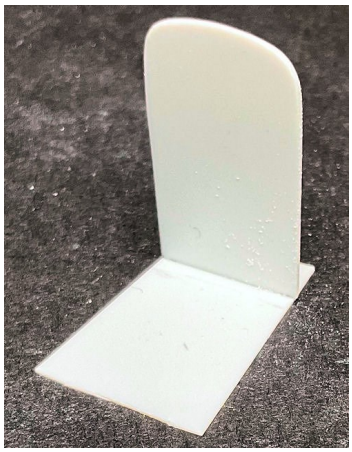
Cut a length of 1.5 mm plastic rod and cement it across the card at the mark made.

Re-fit the card.

Cut a piece of 0.5 mm thick plastic card to fit into the fuselage onto the observers floor at the front of the added floor rod with its top edge into the curved inside of the fuselage.

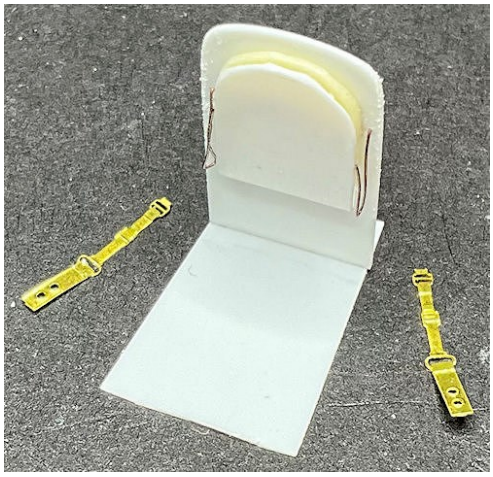
Remove the card floor and bulkhead.

Cement the cut bulkhead vertically against the front edge of the added floor strip with the edges aligned to the edges of the floor card.



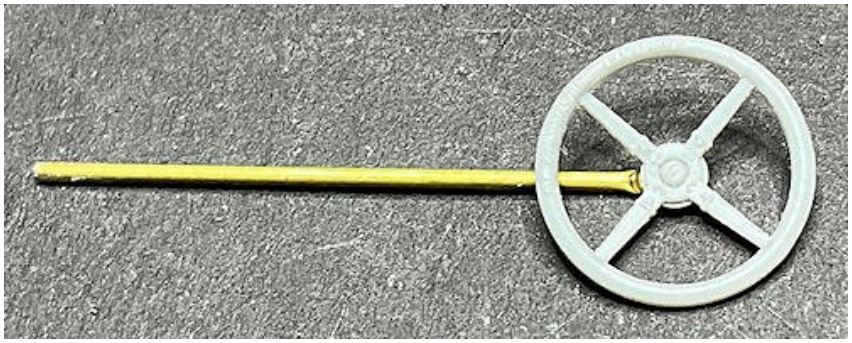
NOTE: *The observers seat was of the drop down type and was fitted in the rear of the observers cockpit, on the rear bulkhead. Photo-etch seat belts were from my 'spares' collection.*

To represent the observers seat, I cut a piece of 0.4 mm thick plastic card to the shape of a 'spare' resin seat cushion, which secured to the seat card using CA adhesive. This was then secured to the rear bulkhead again using CA adhesive. Copper wire of 0.2 mm diameter was used to represent the side stays of the seat and were inserted into 0.3 mm diameter holes drilled through the rear bulked.



NOTE: *The pilots of Phönix built aircraft had a steering wheel rather than a control column.*

A length of 0.8 mm diameter Brass tube, such as 'Albion Alloy's' MBT08 or similar was cut and flattened at one end. That end was secured onto the front of the steering wheel using CA adhesive. A hole of 0.9 mm diameter was drilled centrally into, **but not through**, the cockpit floor so it could be mounted just rearwards from the pilots instrument panel (with the decking panel temporarily fitted on the fuselage).

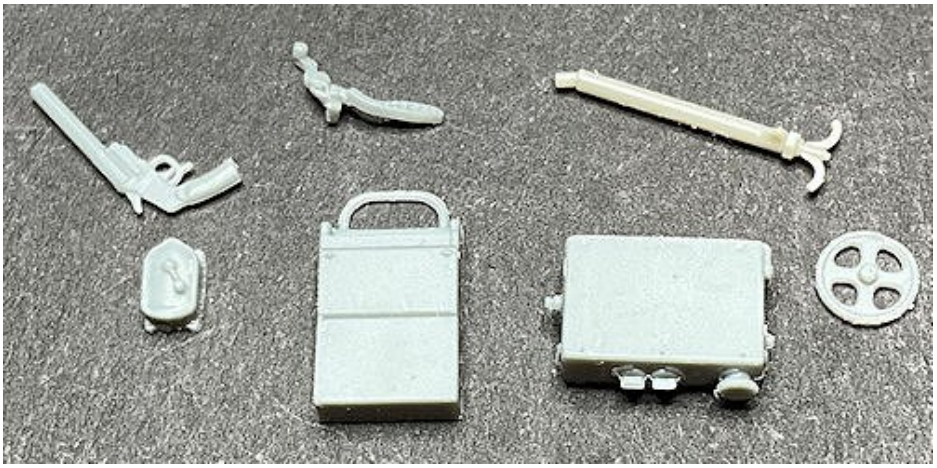


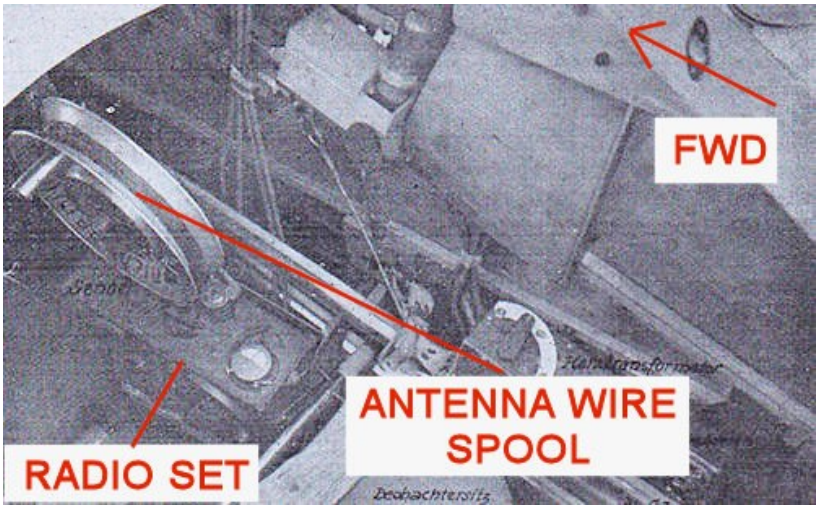
NOTE: *The ends of the rudder bar on the 3D printed cockpit were frayed and split, so needed replacing. The Brass tubing used was from 'Albion Alloy's'*

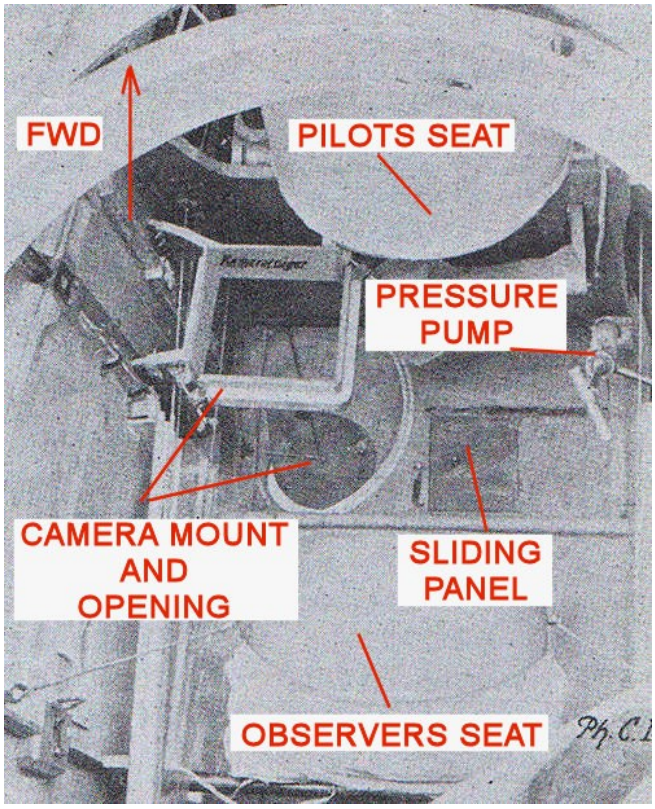
To represent the rudder bar, I first cut a length of 0.8 mm diameter tube, nicked the centre of one side only and drilled a hole of 0.5 mm diameter into that side. A short length of 0.5 mm diameter rod was then secured in the drilled hole using thin CA adhesive. Two short lengths of 'PlusModel' 0.3 mm diameter lead wire were cut and flattened. These were the secured into the holes in the end of the tube and looped over to represent the foot straps. They were secured in and on the tube using thin CA adhesive. .

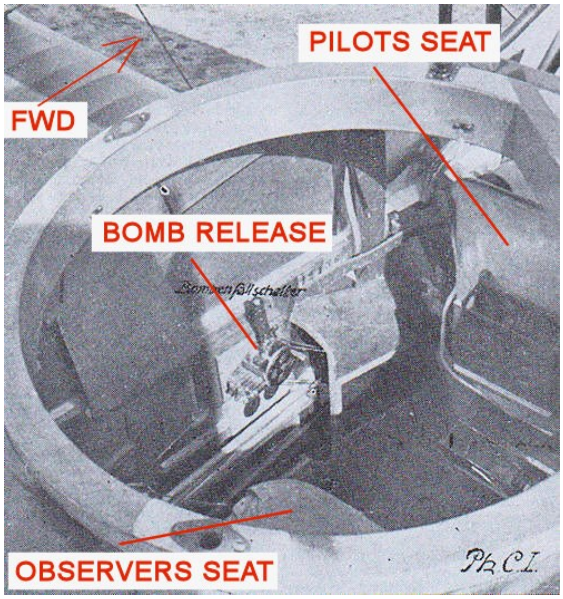
NOTE: *It's not known exactly what equipment was fitted in the cockpits of this particular aircraft, as equipment varied dependent on the role of the aircraft. As this aircraft operated in a reconnaissance squadron, the equipment fitted is basic with some 'poetic license'. The following photographs are those of typical cockpit equipment carried.*

The following parts are from my 'spares' collection from other built kits.









Engine:

Check fit the 3D printed engine in the fuselage with engine side panels held in position and its propeller shaft protruding through the hole in the nose cowl.

NOTE: *I found that the front of the engine crank case and the forward, side support flanges stopped the engine from fully locating forward inside the nose cowl. Also the carburettors on the right side of the engine held away the engine right side panel. These areas were sanded to achieve a better fit of the engine.*

Using a round needle file, file the propeller shaft hole in the top nose cowl slightly down into the lower engine cowl. This allows the engine to sit lower in the fuselage.

Where necessary, remove material from the front of the engine crank case, the forward, side support flanges and the right side carburettors until the engine can be positioned in the fuselage with the engine side panels fully located.

Check fit the engine, making sure the engine is far enough forward and the support flanges are level with the fuselage side edges.

If necessary cut away the propeller shaft and drill a hole of 2.0mm diameter into the engine.

Cut a length of 2.0mm diameter Brass tube, such as that from ’Albion Alloy’s’ or similar.

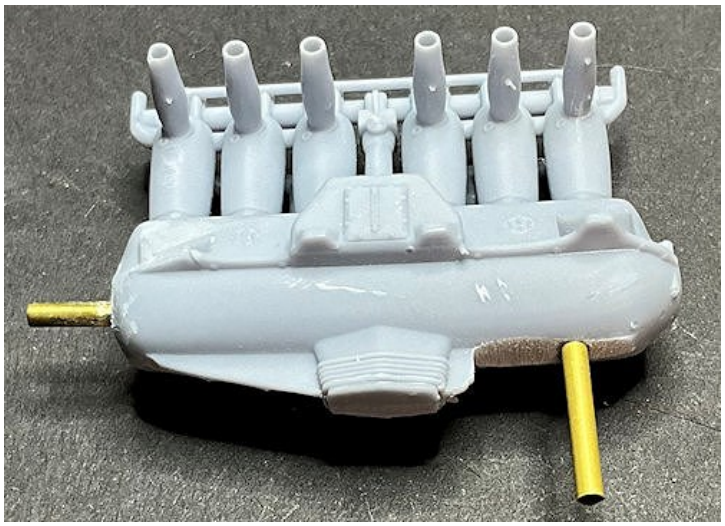
Secure the tube into the pre-drilled hole in the engine.

Drill a hole of 2.0mm diameter into the rear, bottom of the engine sump.

Cut a length of 2.0mm diameter Brass tube, such as that from ’Albion Alloy’s’ or similar.

Cut the length of the tube such that when inserted into the hole and the engine located in the fuselage, the engine is forward and the support flanges are level with the fuselage side edges.

Secure the tube into the pre-drilled hole in the engine.



To give the lower, rear tube more positive support on the floor of the fuselage, I modified a part from my ’spares’ collection by re-shaping the part to fit in front of the added stop for the front of the fuselage floor and filing a slot to allow the part to fit over the Brass tube across the fuselage floor. A hole was drilled into the top of the part for locating the engine tube. The part was then slid onto the tube and the engine located into the fuselage with the added propeller shaft through its hole in the nose cowl. With the engine correctly positioned, a small amount of CA adhesive was applied just at the top of the tube and part. Once set the engine was removed from the fuselage and more CA adhesive applied to fully secure the part to the tube.

Test fit the cockpit assembly, engine and engine access panels to check for any obvious areas that require further attention.

Tailplane and elevator:

Check the assembly for any surface imperfections or warping.

If warping is evident, immerse the assembly in hot water or use a hair dryer to make the print resin slightly pliable.

Bend the assembly to remove the warp and hold in position until the resin cools to regain rigidity.

If any surface imperfections are evident, sand and/or fill them with ‘Mr. Surfacer’ 500 or similar. Once fully cured, sand flush to blend with the surrounding areas.

Thin the leading and trailing edges, by scraping and sanding to give them a more ‘in-scale’ thickness.

Sand or scrape away the rear fairing (not required).

NOTE: *As designed, the tailplane is intended to just be ‘butt’ joined onto the fuselage rear.*

Check that the tailplane sits flush on its fuselage recess. If necessary, file or sand the centre, underside of the tailplane to achieve a flush fit.

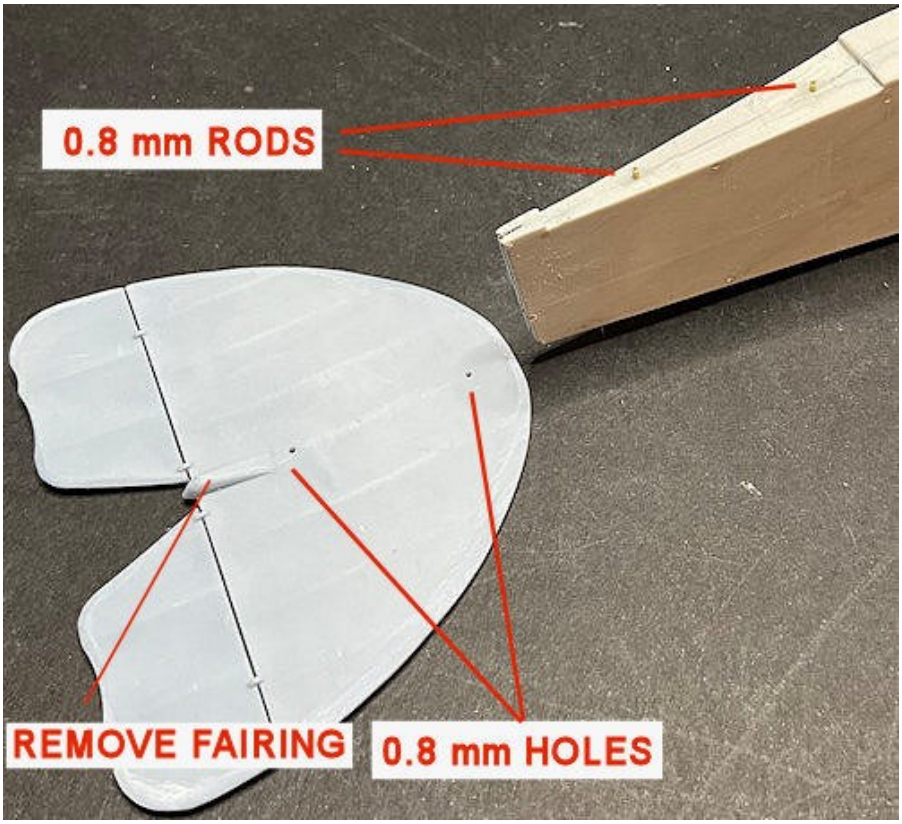
Hold the tailplane on the fuselage recess and drill two holes of 0.8 mm diameter through the centre line of the tailplane and into the fuselage.

Cut two lengths of 0.8 mm diameter Brass rod, such as that from ’Albion Alloy’s’ or similar.

Using thin CA adhesive, secure the rods into the pre-drilled holes in the fuselage recess.

Fit the tailplane onto the rods and the fuselage.

Check if the rods protrude from the top surface of the tailplane. If so, remove the tailplane and file down the rods until they are below the tailplane surface.



Tail skid:

NOTE: *As designed, the tail skid is intended to just be ‘butt’ joined onto the bottom of the fuselage rear.*

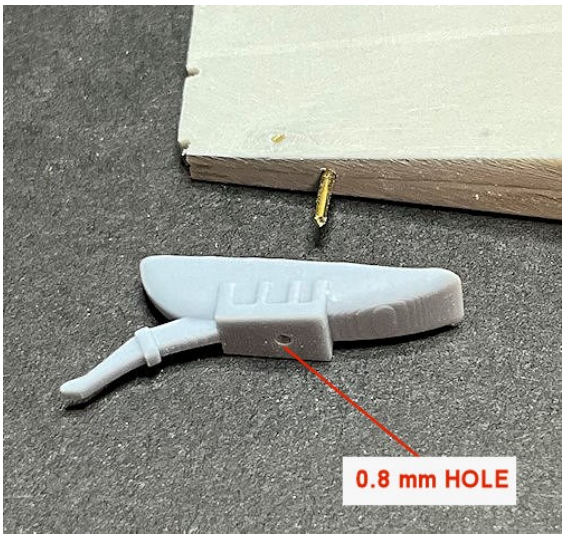
Hold the tail skid in position on the bottom, rear of the fuselage and drill a hole of 0.8 mm diameter through the centre line of the tail skid and into the fuselage.

Cut a length of 0.8 mm diameter Brass rod, such as that from 'Albion Alloy's' or similar.

Using thin CA adhesive, secure the rod into the pre-drilled hole in the fuselage recess.

Check if the rod protrudes from the tail skid, when fitted. If so, remove the tail skid and file down the rod until it is below the tail skid surface.

Using thin CA adhesive, secure the tail skid onto the lower, rear of the fuselage.



Rudder:

Check fit the rudder into its locating recesses in the rear edge of the fuselage. If necessary, carefully file or sand the recesses to achieve a good fit. I filed flats on the front of the rudder hinges to allow the rudder to be closer to the fuselage.

Ailerons:

NOTE: *As designed, the ailerons have molded hinges, but there are no locations for these in the upper wing halves.*

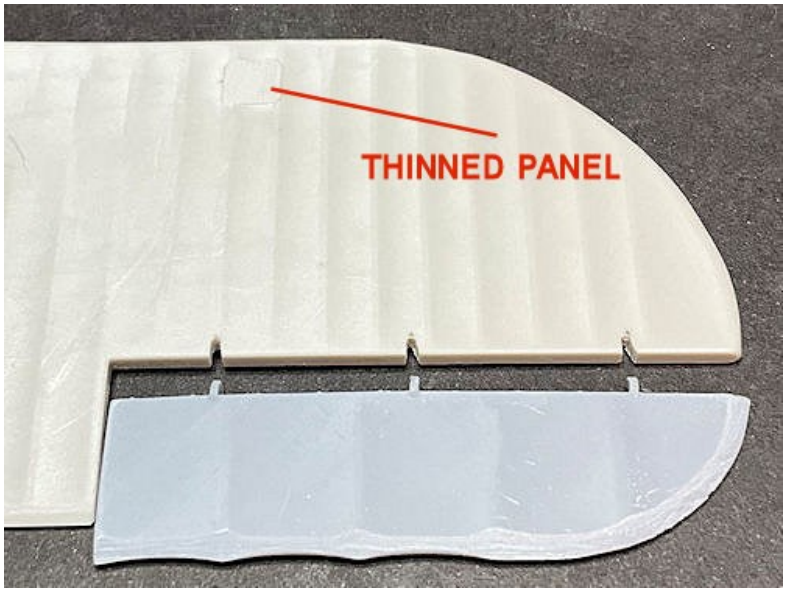
Position each aileron into its location on the upper wing halve.

Pencil mark the position of the aileron hinges onto the trailing edge of the upper wing halves.

Using the cutting edge of a suitable flat needle file, file slots into the trailing edge of the upper wing halves, using the pencil marks as a guide.

Check fit the ailerons to ensure they fully locate against the upper wing halves.

Thin the trailing edges of both ailerons, by scraping and sanding, to give them a more 'in-scale' thickness.



Upper wing:

NOTE: *As designed, the upper wing halves are intended to be secured to the 3D printed upper wing centre section as just 'butt' joints with two locating tabs (aileron cable access panels) at the wing roots. The wings have a thin integral metal rod, which has not been trimmed off at the wing root.*

Cut away any integral metal rod in the upper wing halves at the wing roots.

File or sand any stubs of rod flush to the surrounding wing roots.

Drill two holes of 1.0 mm diameter as far as possible into the roots of both upper lower wing halves, making sure the holes are drilled centrally into the wings to avoid 'break through' at the wing surface. Drill holes centrally 10 mm and 24 mm from the wings leading edge.

Cut four lengths of 1.0 mm diameter Brass rod, long enough to be fully inserted into the upper wings halves and 10 mm into the centre section.

Using thin CA adhesive, secure the rods into the pre-drilled holes drilled in the upper wing halves.

Align the wing halves to the centre section and mark the position of each rod.

Drill two holes of 1.0 mm diameter at least 10 mm into the centre section of the upper wing, making sure the holes are drilled centrally into the centre section to avoid 'break through' at the surface.

NOTE: *I found during the following step that the outer edges of the centre section were not straight and required sanding to align with the roots of the wing halves.*

Locate the upper wing halves into the pre-drilled holes in the centre section, making sure both wings are fully located in the centre section, are aligned over the upper and underside surfaces and that the assembly is aligned straight when viewed from above.

Check the assembly for any surface imperfections or warping.

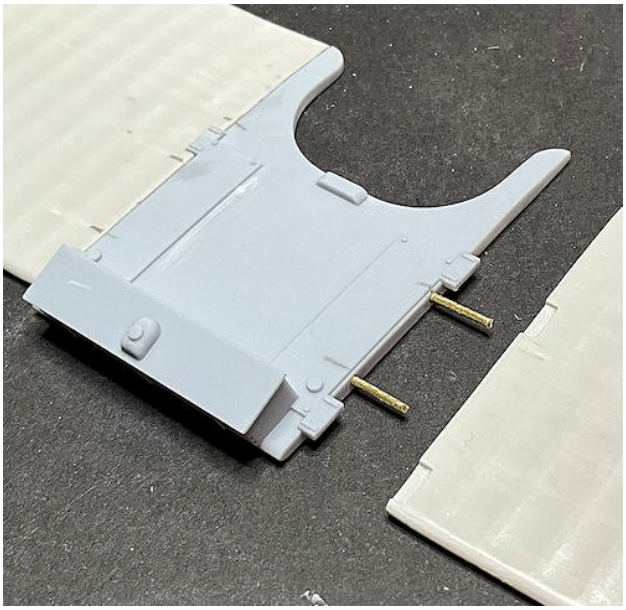
If warping is evident, immerse the relevant part in hot water or use a hair dryer to make the resin slightly pliable.

Bend the part to remove the warp and hold in position until the resin cools to regain rigidity.

NOTE: *Any obvious gaps will be filled during final wing assembly.*

If any surface imperfections are evident, sand and/or fill them with 'Mr. Surfacer' 500 or similar. Once fully secured, sand flush to blend with the surrounding areas.

Thin the wing and centre section trailing edges, by scraping and/or sanding to give them a more 'in-scale' thickness.

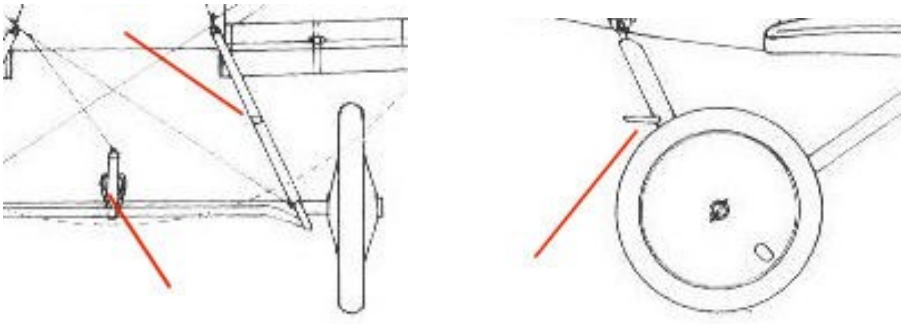


Landing gear:

To give a more positive location for the landing gear wheels, I first cut away the protruding ends of the axle. Then I drilled through the centre of the wheels and the axle using a 2.0 mm diameter drill. I then two lengths of 2.0 mm diameter Brass tube, such as ‘Albion Alloy’s’ MBT20 or similar. The tubes were inserted into the axle holes using thin CA adhesive.

Although the 3D printed wheels supplied in the kit were adequate, they did have pronounced print lines across them. Therefore, **I chose to replace them** with ‘Proper Plane’ Continental 760x100 wheels (RW-002). These are supplied without the wheel front covers, but appropriate covers were used from my ‘spares’ collection. The centres were drilled out to 2.0 mm diameter to fit onto the axle ends.

NOTE: *The landing gear struts and axle fairing are printed over scale and round in section. The actual struts and fairing were aerofoil in section. Also I believe ‘KatModel’ misread the side profile drawings and assumed that the top, front of the claw brake extended beyond the left landing gear wheel. However, the top, front of the claw brake was stub ended and there was a step bar fitted in the front, left landing gear stut, which is what can be seen on the side profile and front view profile illustrations. Therefore, the claw brake needed to be modified and the strut step added (refer to the following illustrations).*



Cut the claw brake away from the axle fairing at its base.

File and sand the landing gear struts and axle fairing to reduce their thickness and to achieve an aerofoil shape.

Cut away the top, front of the claw brake to leave a stub end, then round off the tip by sanding.

Drill a hole of 0.3 mm diameter across and through the tip.

Drill a hole of 0.5 mm diameter vertically through the centre of the claw brake mounting.

Drill a hole of 0.5 mm diameter vertically through the centre of the axle fairing.

Cut a short length of 0.5 mm diameter Brass rod or similar.

Secure the rod into the pre-drilled hole in the axle fairing using thin CA adhesive.

Using thin CA adhesive, secure the claw brake onto the protruding rod in the axle fairing.

Cut a short length of 0.4 mm diameter Brass tube, such as ‘Albion Alloy’s’ (MBT05) or similar.

Drill a hole of 0.4 mm horizontally into the leading edge of the landing gear front, left strut.

Using thin CA adhesive, secure the rod into the pre-drilled hole in the strut.

Flatten the protruding rod using flat nosed pliers or similar

Lower wings (continued):

NOTE: *The lower wings were fitted at this stage of the build in order to test fit the cockpit assembly over the rods of the lower wing that are inside the fuselage.*

Using ‘Araldite’ two-part epoxy adhesive on the support rods and wing roots, the lower wings were fitted and fully located into the fuselage, making sure the wings were 90 degrees to the fuselage when viewed from above and horizontal, when viewed from the front. The exposed rods inside the fuselage were secured to the fuselage floor using CA adhesive.

Cockpit assembly (continued):

NOTE: *The cockpit assembly will rest on the exposed lower wing rods inside the fuselage. This will cause the cockpit assembly to sit high in the fuselage, stopping the decking panel from fully locating onto the fuselage.*

Position the cockpit assembly onto a lower wing with the front edge of the cockpit floor aligned to the added 'stop' strip on bottom surface of the fuselage.

Pencil mark the cockpit assembly with the location of the lower wing support rods inside the fuselage.

Using the pencil marks as guides, file grooves across the underside of the cockpit assembly.

Insert the cockpit assembly into the fuselage as before and check if the assembly sits fully over the rods and against the fuselage bottom.

If necessary, file the grooves more until the correct fit is achieved.

NOTE: *During the following step, I found I had to sand the top of the cockpit bulkhead as it stopped the decking panel from fully locating onto the fuselage.*

With the cockpit assembly located, check fit the decking panel onto the fuselage and make sure it fully locates onto the fuselage.

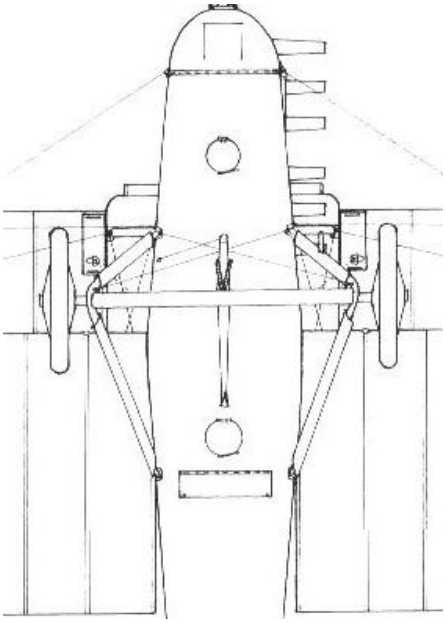
Fuselage underside detail*:*

NOTE: *The underside of the fuselage had:*

Two circular access hatches

A rectangular access panel

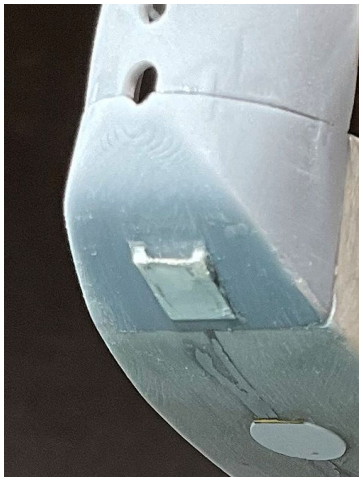
A rectangular air intake under the nose cowl.



To represent the two circular hatch panels, I cut two discs of 6 mm diameter from 0.2 mm thick plastic card. One side of each disc was slightly cut straight to represent the hinge edge. The two discs were secured in position, with their flat edges forwards, onto the underside of the fuselage, using thin CA adhesive. To represent the hinges, I cut short lengths of 0.3 mm diameter Brass rod, such as that from 'Albion Alloy's' or similar and secured them in position along the flat edge of each hatch panel. I drilled a shallow 0.6 mm diameter hole in the rear edge of each panel to represent the panel fasteners.

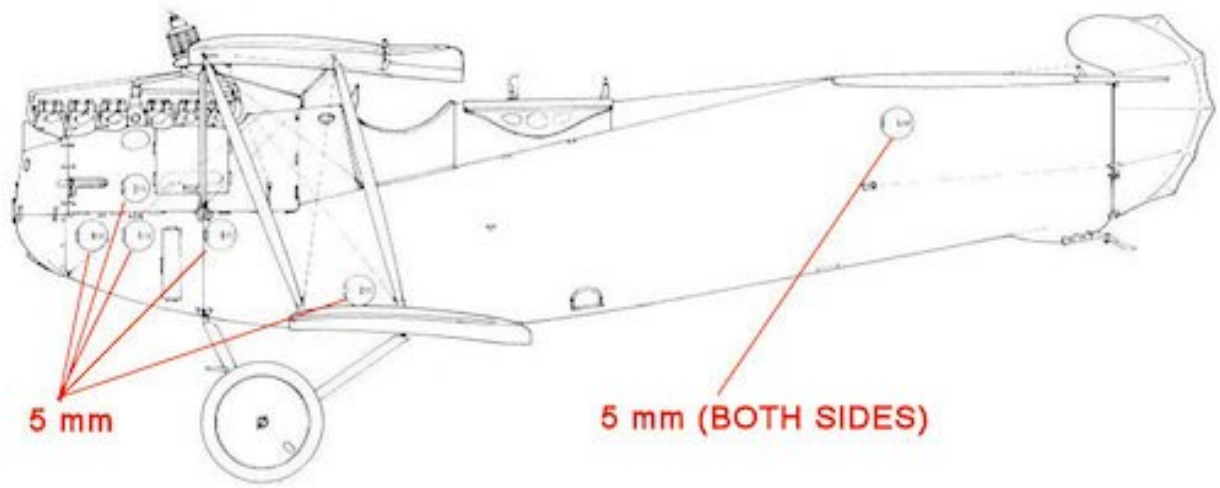
The rectangular access panel was cut from 0.2 mm thick plastic card and secured in position onto the underside of the fuselage, using thin CA adhesive. To represent the hinge, I cut a length of 0.3 mm diameter Brass rod, such as that from 'Albion Alloy's' or similar and secured it in position along the forward edge of the panel. I drilled a shallow 0.6 mm diameter hole in the rear edge at the corners to represent the panel fasteners.

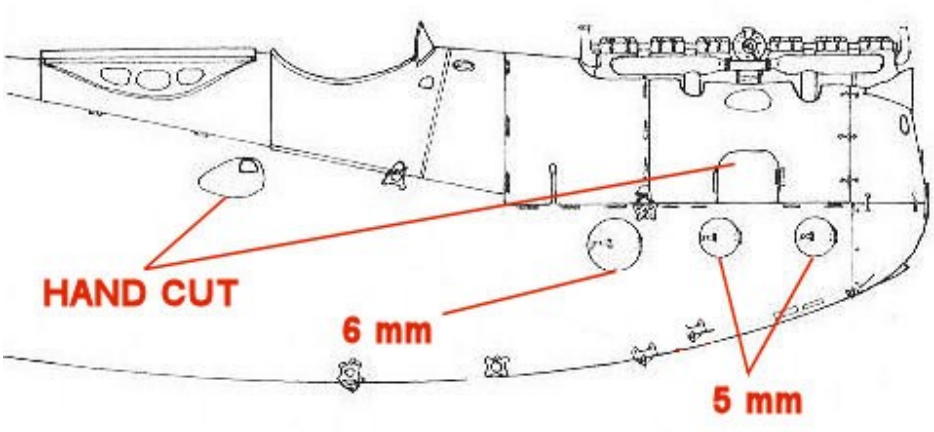
To represent the air intake, I cut a rectangle from 0.1 mm thick plastic card. The panel was secured to the underside of the nose cowl by its **rear edge only**, using thin CA adhesive. Two thin and short strips of 0.3 mm thick plastic card were cut and secured under the front sides of the panel and fuselage, using thin CA adhesive. The adhesive was also applied along the edges to fill any gaps. I then brushed 'Mr. Surfacer 1000 around the edges (not the front) to blend the edges to the surrounding fuselage. Once fully dry, the edges were lightly sanded to remove excess surfacer.



Access hatches:

NOTE: *The previously removed fuselage access hatches need to be added as well as the panel on the engine right access panel.*



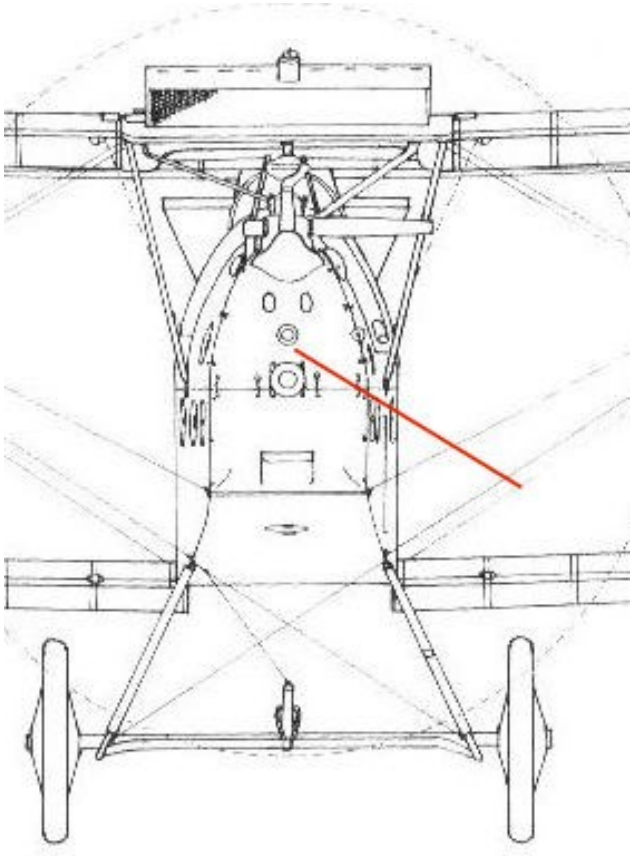


To represent the circular hatch panels, I cut one disc of 6 mm diameter and nine discs of 5mm diameter from 0.2 mm thick plastic card. One side of each disc was slightly cut straight to represent the hinge edge. The discs were secured in position on the fuselage sides and the engine left access panel, with their flat edges forwards, using thin CA adhesive. To represent the hinges, I cut short lengths of 0.3 mm diameter Brass rod, such as that from ‘Albion Alloy’s’ or similar and secured them in position along the flat edge of each hatch panel. I drilled a shallow 0.6 mm diameter hole in the rear edge of each panel to represent the panel fasteners.

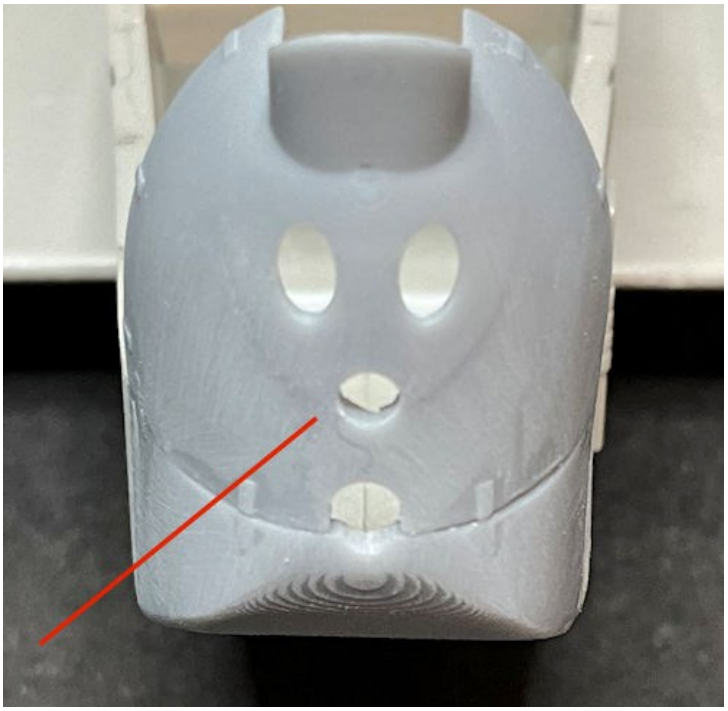
To represent the access panel on the engine right access panel, I cut the panel from 0.2 mm thick plastic card and rounded off the top corners. It was then secured in position on the engine right access panel using thin CA adhesive. To represent the hinge, I cut a length of 0.3 mm diameter Brass rod, such as that from ‘Albion Alloy’s’ or similar and secured it in position down the forward edge of the panel. I drilled a shallow 0.6 mm diameter hole in the top and bottom of the rear edge of the panel to represent the panel fastener.

Opening in nose cowl:

NOTE: *The nose cowl had an additional opening located between the upper two openings and the hole for the propeller shaft.*

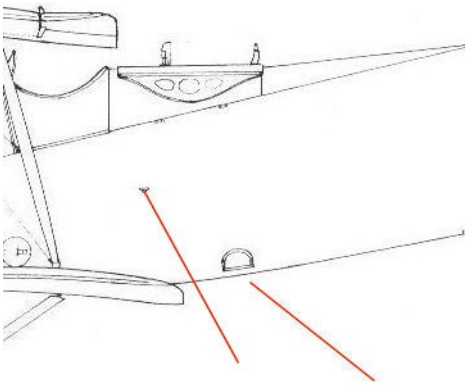


This opening was created by drilling a hole of 2.0 mm diameter centrally through the nose cowl, between the upper two openings and the hole for the propeller shaft.



Foot steps:

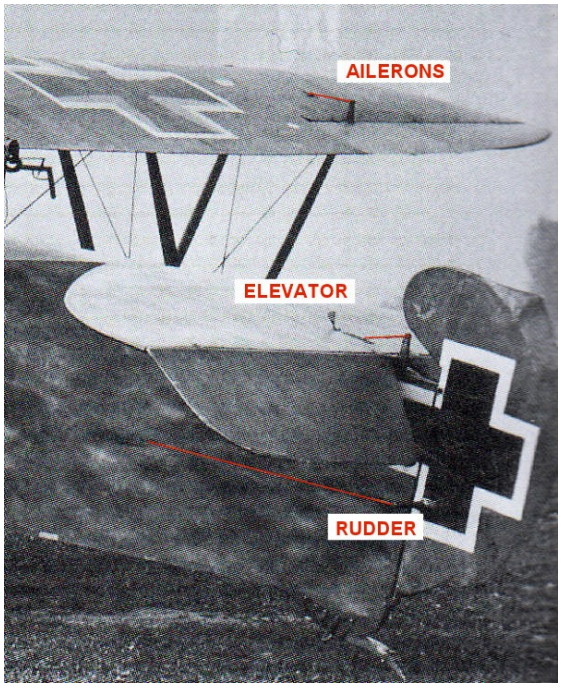
NOTE: *The previously removed foot steps in the bottom edge of the fuselage need to be added. Later aircraft had a second step in the fuselage side to replace the more simple extended foot bar.*



The two steps were photo-etch parts from my 'spares' collection and were secured in position using thin CA adhesive.

Control horns:

NOTE: *Aileron, rudder and elevator control horns need to be added.*



NOTE: *The control horns used were from the 'PART' 1:48th scale controls & turnbuckles (S48-087) set.*

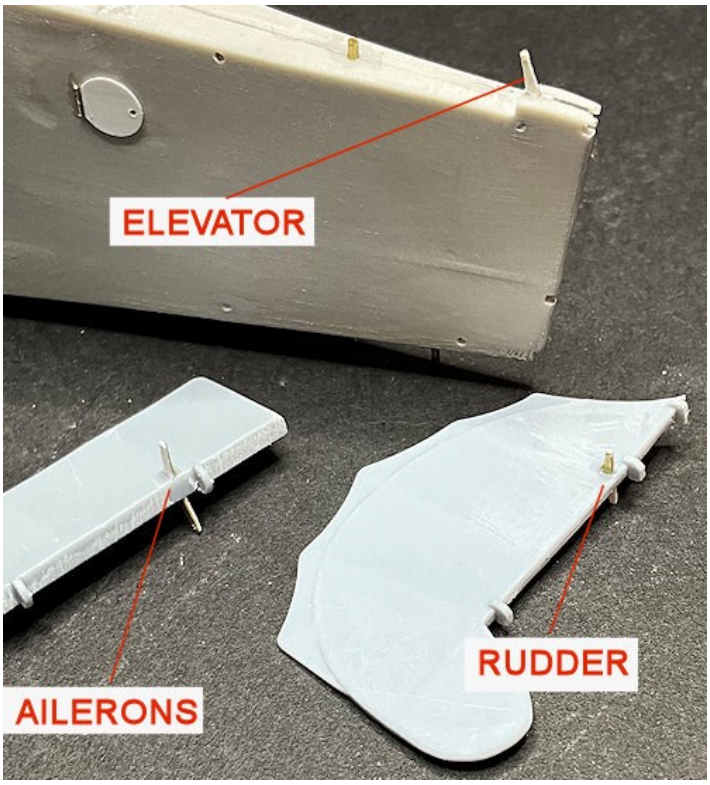
Suitable control horns for the ailerons (x 4), rudder (x 2) and elevator (x 1) were cut from the 'PART' set, making sure to leave the tag on the bottom edges.

Each part was then secured to a piece of 0.2 mm thick plastic card, to increase the thickness of the photo-etch parts and to add more rigidity to them.

The control horns were then cut out of the plastic card and a 0.2 mm diameter drill was used to drill through the rigging hole in the control horns and plastic card backing.

A 0.5 mm diameter hole was drilled through the leading edge of the two ailerons, the ruder and into the top, rear of the fuselage (see photograph for locations).

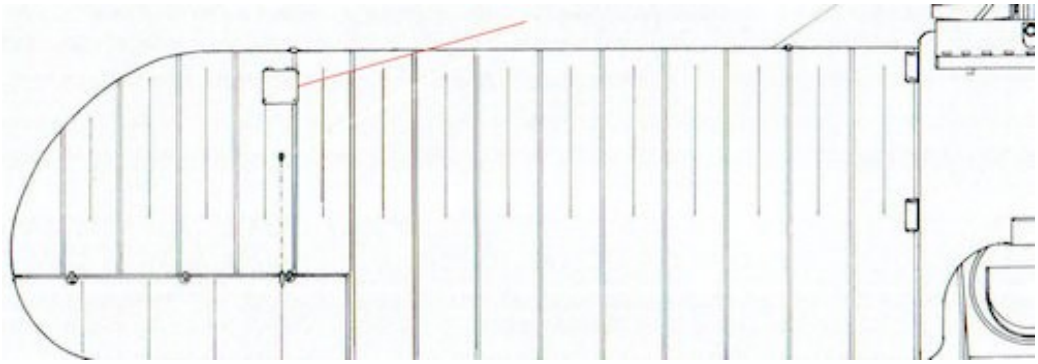
Using thin CA adhesive, each control horn was secured into its pre-drilled hole, making sure the control horns were 90 degrees to the surfaces.



Upper wing (continued):

NOTE: *The surface details on the undersides of the upper wing need to be added, modified or enhanced.*

Cut panels from 0.3 mm thick plastic card the same size as the pre-molded panels on the outer top surface of the upper wings.

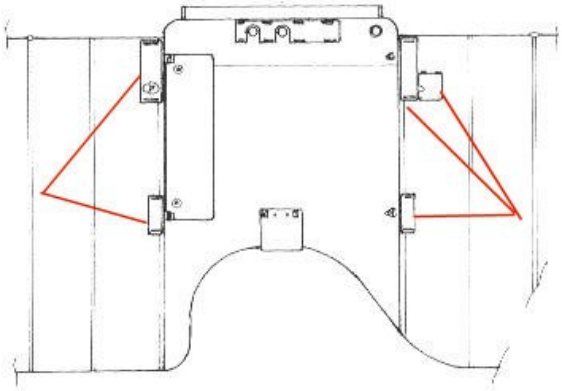


Using thin CA adhesive, secure the cut panels on the underside of the upper wing in the same position as the top surface panels

Cut four panels from 0.3 mm thick plastic card to match the size as the pre-molded panels on the top surface of the upper wings at the wing roots to the centre section.

Cut a panel from 0.3 mm thick plastic card to represent the smaller panel on the underside, left wing.

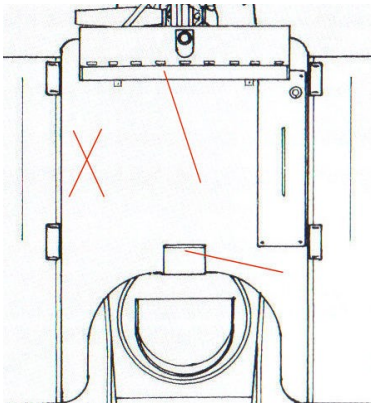
Using thin CA adhesive, secure the cut panels on the underside of the upper wings.



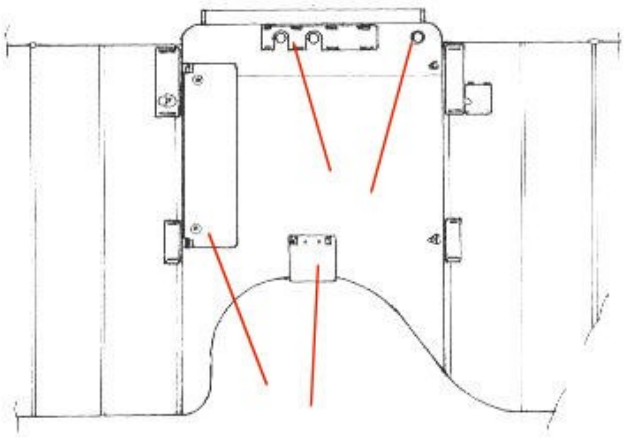
Upper wing centre section:

NOTE: *The surface details on the upper wing centre section (upper and underside surfaces) need to be added, modified or enhanced.*

Top surface



Underside



Top surface:

File or sand away the raised tank panel on the left side of the top surface (not required).

File or sand away the aileron control access panel from the trailing edge of the curved section (as it's over scale). Sand the trailing edge to blend with existing profile.

Cut a strip of 0.3 mm thick plastic card long enough to bend around the trailing edge of the trailing edge.

Using thin CA adhesive, secure the strip centrally onto the top surface of the centre section, around the trailing edge and onto the underside (see following photograph).

Cut a strip of 0.3 mm thick plastic card long enough to span across the rear edge of the top of the radiator.

Using thin CA adhesive, secure the strip across the rear edge of the top of the radiator.

NOTE: *The rear of the radiator is printed as a flat surface, not as a radiator mesh.*

Cut out from 'Plus Model' model mesh (038) the shape of the radiators rear face, including a step cut out over the tank panel on the right side of the radiator.

Underside:

Cut a strip of 0.3 mm thick plastic card the same size as the tank on the top, right of the centre section.

Using thin CA adhesive, secure the strip down the left underside edge of the centre section and aligned to the tank on the top surface.

Cut a strip of 0.3 mm thick plastic card the same size as the radiator base on the top of the centre section.

Using thin CA adhesive, secure the strip across the underside leading edge of the centre section.

Cut a strip of 0.3 mm thick plastic card to represent the access panel for the cooling pipes from the engine.

Using thin CA adhesive, secure the strip centrally along the leading edge of the added plastic card strip.

Upper wing (continued):

Using thin CA adhesive, secure the two upper wing halves onto their added support rods in the upper wing centre section, making sure both wings are fully in contact with the centre section.

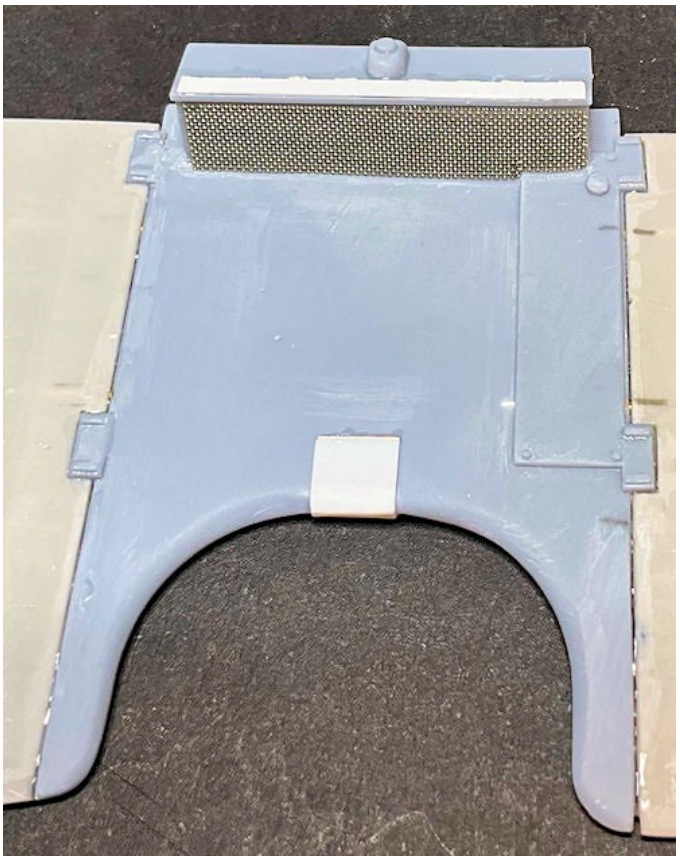
Access panel detail:

NOTE: *The modified or added access panels on the upper wing require hinge and fastener detail adding.*

To represent panel hinges, short lengths of 0.2 mm diameter Nickel-Silver rod (Albion Alloy's NST02) were cut and secured to the front edges of the outboard access panels under the upper wing, the radiator strip and trailing edge panel on the top surface of the centre section of the upper wing.

To represent the panel fasteners, holes of 0.4 mm diameter into the added panels.

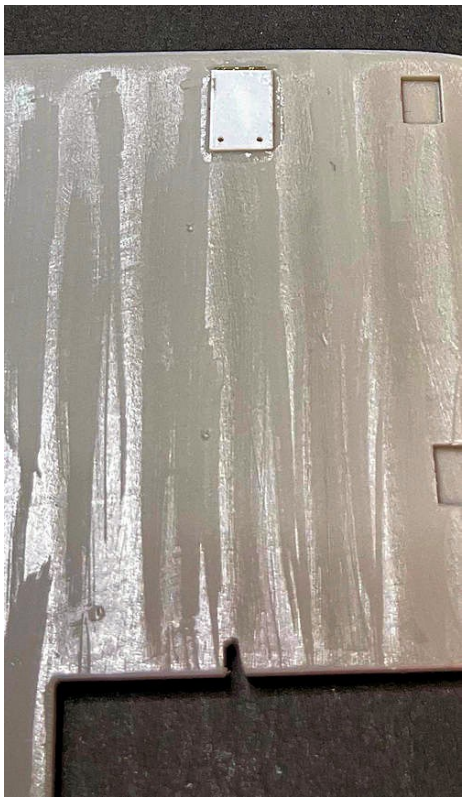
Top surface centre section



Underside centre section

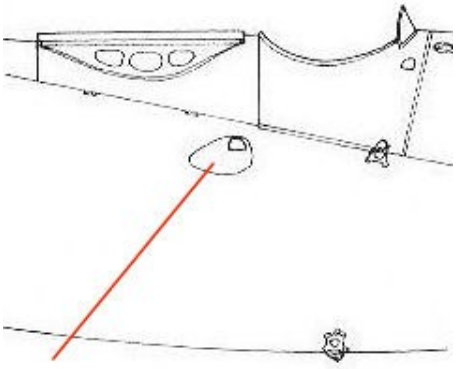
Top surface upper wing

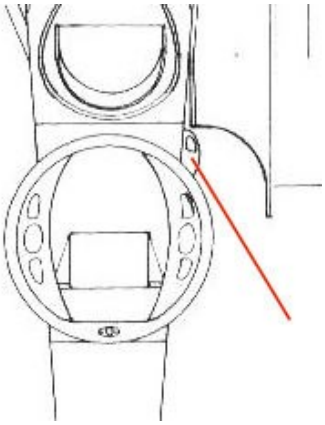
Underside upper wing



Fuselage mounted compass:

NOTE: *These aircraft, from serial No.121-50 onwards, had a compass mounted in a fairing on the right side of the fuselage, being visible by the pilot and the observer.*

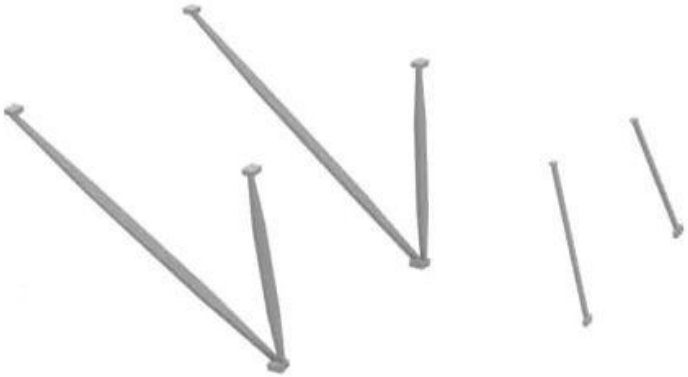


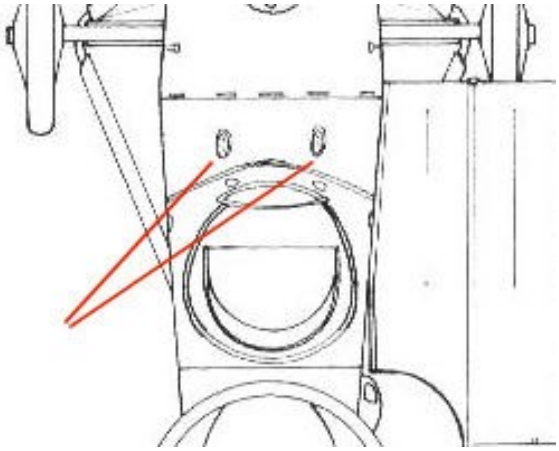


To represent the compass fairing I cut a piece of sprue and shaped in to a curved underside with an outer edge. The top surface was a made flat (to house the compass) and the inner edge was flat and at 90 degrees to the top. The fairing was secured in position on the fuselage right side using thin CA adhesive.

Interplane and cabane struts:

NOTE: *The interplane and cabane struts as supplied in the kit are 3D printed. They have no internal strengthening rods and are therefore weak. In addition some were warped and the cross section of the struts was rectangular, not aerofoil shaped. The side cabane struts were very thin and weak. Also the two rear struts, from the front of the cockpit up to the underside of the upper wing, require adding.*





Interplane struts:

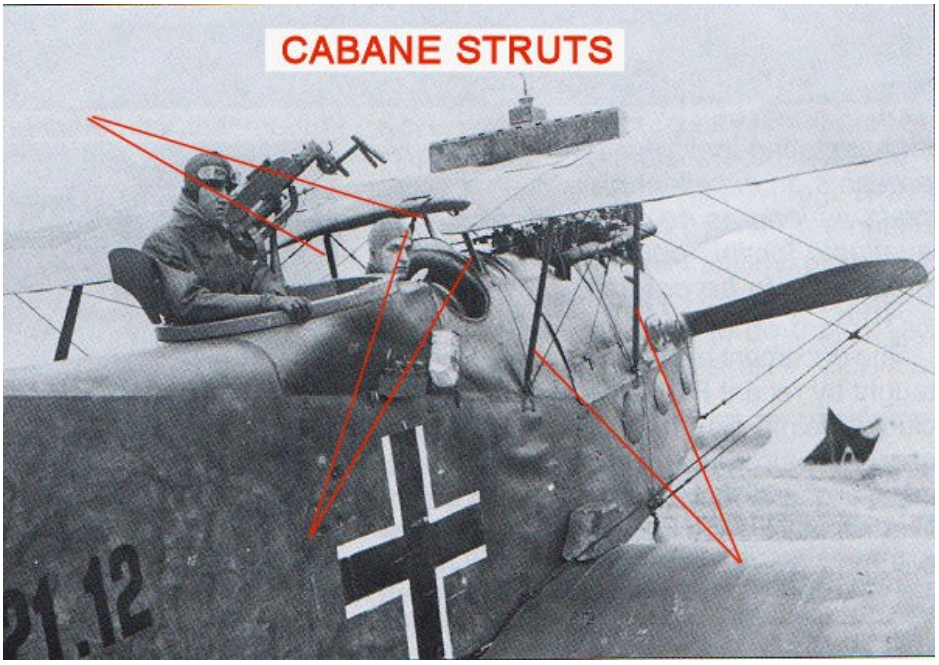
NOTE: *The supplied interplane are rectangular in section, have no internal bracing rods and therefore very weak. Therefore they were discarded to be replaced with stuts created from Brass tube and rod.*

The locating plates at the ends of the interplane struts were cut away for use as fillers in their wing recesses. Using CA adhesive, the plates were secured into their recesses in the underside of the upper wing and top surface of the lower wings. The plates were then sanded to blend them with the surrounding surfaces.

Cabane struts:

NOTE: *The supplied cabane struts are under scale in size and very weak. Therefore they were discarded to be replaced with stuts created from Brass tube and rod. Also, the rear two cabane struts are not supplied and need to be made with the corresponding locations in the fuselage and underside of the upper wing.*

The interplane/cabane struts can only created once the upper wing can be fitted later in this build.

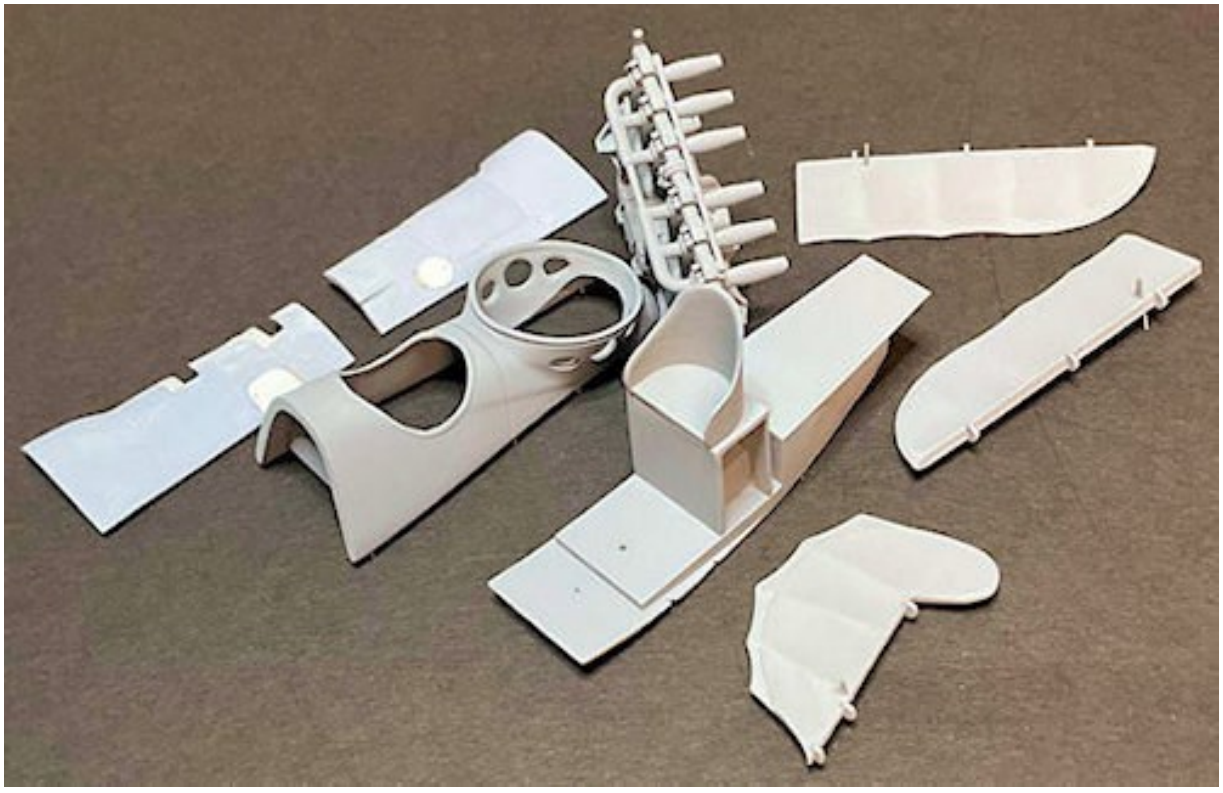


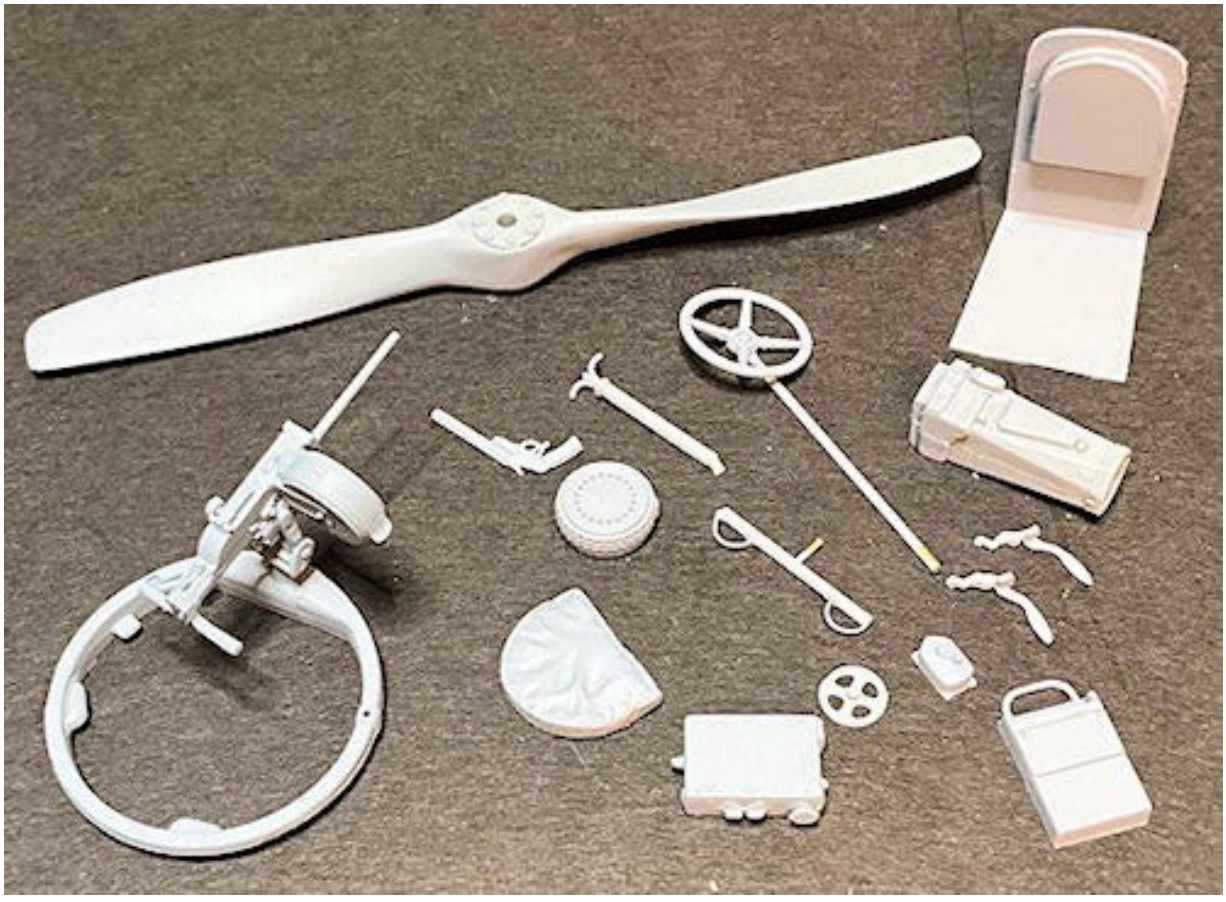
Seam checking:

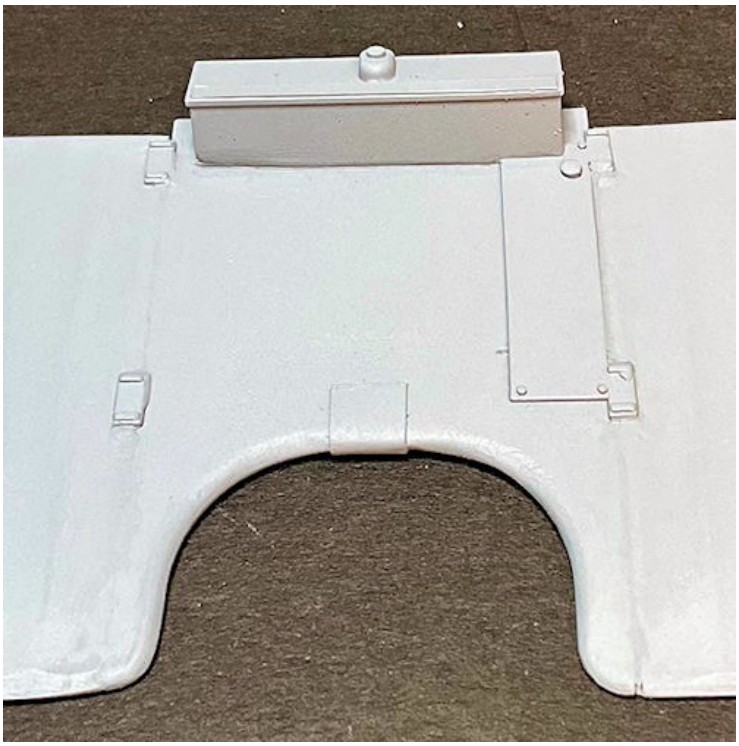
Airbrush all prepared parts and assemblies with a grey primer, such as ‘AK Interactive’ Grey (AK758) or similar.

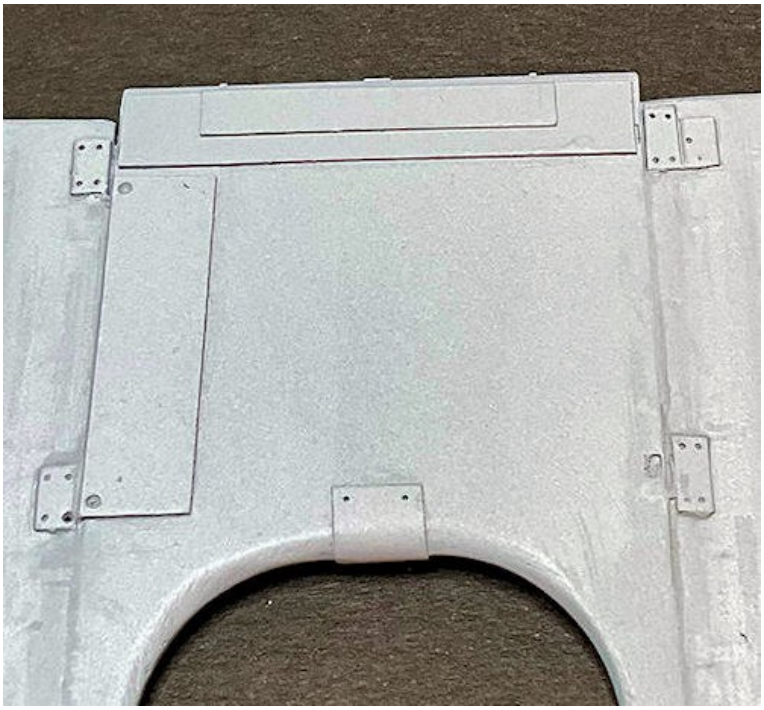
Check all seams, joints and surfaces for evidence of gaps or surface imperfections.

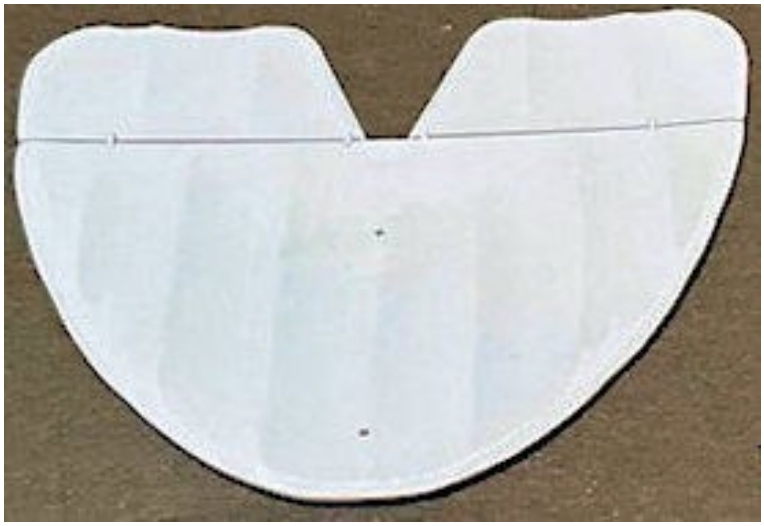
If necessary, sand and/or fill any found then re-prime and re-check until none are visible.

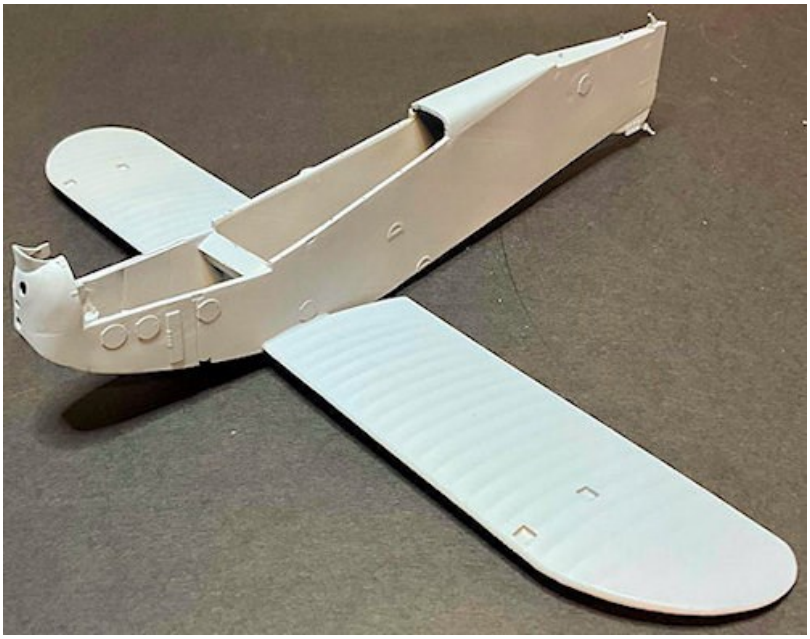


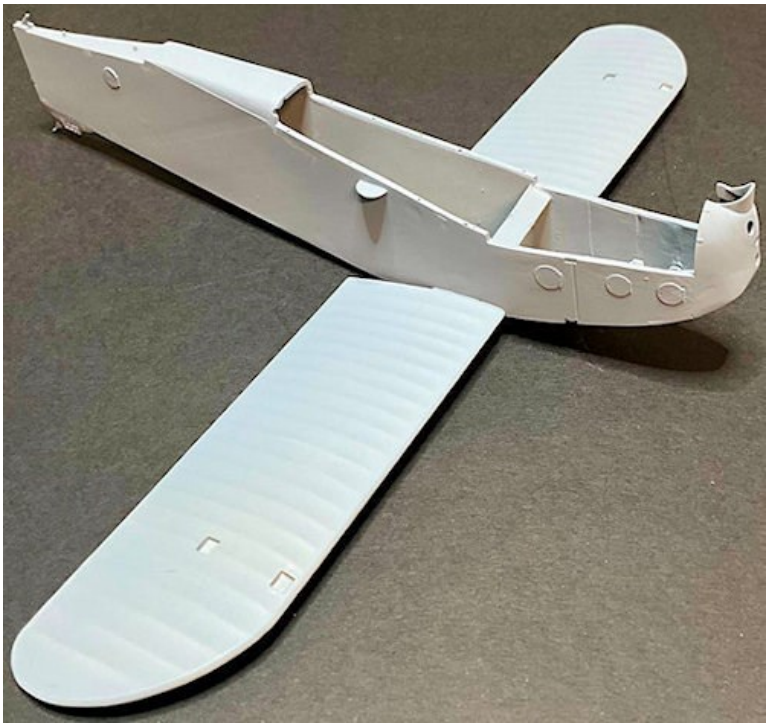












Engine access panels (continued):

NOTE: *When the engine was test fitted into the fuselage and the engine 3D printed side access panels were test fitted, I found the following:*

The bottom edges of the engine side panels were bowed and did not align with the fuselage.

The top, rear edges of the side panels did not meet, leaving a large gap between them.

Removing the bow:

The bowed edges of the side panels were heated using a hair dryer, then when just pliable, reformed to remove the distortion. The panels were test fitted to make sure their bottom edges aligned correctly to the fuselage.

Filling the panel gap:

NOTE: *Although CA adhesive is strong, it is subject to shock loading, which can break the bond of the joint. To avoid this when shaping the added plastic strip, I chose to add support rods.*

I drilled two holes of 0.5 mm diameter centrally into the top, rear edge of the right side panel. I cut two short lengths of 0.5 mm diameter Brass rod (Albion Alloy's) and using thin CA adhesive, secured the into the pre-drilled holes. I cut a strip of 1.0 mm thick plastic card, which was then positioned along the panel edge and the position of the two rods marked centrally on the strip. Using the marks as guides I drilled two holes of 0.5 mm diameter through the strip. The strip was then fitted onto the rods and fully secured to the panel edge using thin CA adhesive. The engine was located into the fuselage and the left side panel was located and held in position with masking tape. The right side panel was then test fitted and the mating face of the plastic strip filed and sanded until the top, rear edges of the two panels were in contact with each other. The top and ends of the plastic strip were also profiled to blend with the surrounding panel surfaces.

PART 10
FUSELAGE

PART 10 - FUSELAGE

References:

'Windsock' date file No.150 - Phönix C.I (Paolo Varriale).
On-line resources (various).

Preparation:

Seat belts:

NOTE: *Annealing photo-etch parts is done by applying heat from a cigarette lighter or similar, along the parts until the photo-etch changes to a grey colour. Avoid melting the parts by keeping the heat source moving over the part. Also avoid heating very small parts as these may easily melt.*

Anneal (soften) the two photo-etch seat belts for the pilot to allow them to be formed over the pilots seat.

Clean off any soot created by the heat source.

Temporarily locate the pilots seat cushion onto the seat.

Locate the two belts against the outer sides of the pilots seat and over the seat edges.

Using a rounded tool, such as a paper burnisher or rounded tooth pick, shape the two belts to hang naturally over the seat.

Brush a metal etch solution, such as 'VMS' Metal Prep 4K or similar over the pilot and observers seat belts in preparation for painting.

Painting:

NOTE: *The fuselage and other parts were primed in the 'Preparation' chapter of this build log.*

Airbrush the inside surfaces of the two engine side access panel with 'Alclad' Duraluminium (ALC102) or similar.

Airbrush the forward, inside surfaces of the fuselage (engine bay area) with 'Alclad' Duraluminium (ALC102) or similar.

Airbrush the following with 'Tamiya' Desert Yellow (XF59) or similar:

Inside surfaces of the fuselage (not the engine bay area).
Inside surfaces of the decking panel.
Observers mounting ring for the machine gun.
Constructed cockpit assembly.
Constructed observers cockpit (floor/rear bulkhead and seat).
Pilots seat cushion.

Wood effect:

NOTE: *Refer to Part 2 (Wood Effects) of this build log - Method 2.*

Create a wood effect by brushing 'Windsor & Newton' Griffin Alkyd paint (Burnt Umber) over the following surfaces:

Inside surfaces of the fuselage (not the engine bay area).
Inside surfaces of the decking panel.
Observers mounting ring for the machine gun.
Constructed cockpit assembly.
Constructed observers cockpit (floor/rear bulkhead and seat).

Detail painting:

NOTE: *The cockpit equipment consists of suitable parts from my 'spares' collection from previously built kits.*

Painting:

Airbrush the parts with a grey primer, such as 'AK Interactive' Grey (AK758) or similar:

Control column/steering wheel
Rudder par
Starter magneto
Lever
Container
Radio
Hand pump
Aerial spool
Camera.

Brush paint the parts as follows:

'Tamiya' Grey/Green (IJN) (XF76) - Radio, hand pump, rudder bar, control column, steering wheel spokes, metal fitting on observers machine gun mounting ring.

'Tamiya' Grey (IJN) (XF75) - Camera.

'Tamiya' Semi-Gloss Black (X18) - Container, starter magneto.

'Mr. Metal Colour' Stainless Steel (213) - Lever, aerial spool, created fuel tank under pilots seat, hand pump handle, camera details, centre of steering wheel, radio control dial, switch on starter magneto, vertical bar on instrument panel.

Mr. Metal Colour' Brass (219) - Neck of hand pump stem, instrument panel dial surrounds.

'Tamiya' White (XF2) - Radio control dial.

'Tamiya' Red (XF7) - Radio control dial.

'Tamiya' Clear Yellow (X24) - Vertical bar on instrument panel (3/4 up from bottom)

'AK Interactive' Brown Leather (AK3031) - Pilots seat, observers seat cushion, rudder bar foot straps.

'AK Interactive' Brown Leather (AK3031) - Pilots seat cushion with **'AK Interactive' British Uniform Light (AK3082)** highlights.

NOTE: *Dry brush by using a domed and soft brush, which has a very light dusting of paint. Dry off paint on the brush on an absorbent paper before dry brushing the part.*

Dry brush the over the black painted container with 'Mr. Colour' Super Iron 2 (203) or similar.

Seat belts:

Brush 'VMS' Metal Prep 4K over the four photo-etch seat belts.

Brush paint 'Tamiya' Dark Yellow (XF60) over the four photo-etch seat belts.

Brush paint the metal fittings on the four seat belts with 'Mr. Metal Colour' Stainless Steel (213).

Decals:

NOTE: *As the kit does not supply any decals and there is no information as to what instruments etc were fitted to this aircraft, I have added generic cockpit instruments and equipment decals.*

I applied instrument decals from the 'Airscale' generic WW1 dial (AS32 WW1) set and equipment decals from my 'spares' collection. Instrument faces were brushed with 'Tamiya' Clear Gloss (X22) to represent glass lenses.

Construction:

Secure the pilots seat cushion onto the seat, using thin CA adhesive.

Secure the pilots seat straps onto the seat sides and cushion, using thin CA adhesive.

Secure the rudder bar into its pre-drilled hole in the cockpit floor, using thin CA adhesive.

Locate the two copper wire seat supports into their pre-drilled holes in the upper, sides of the observers rear bulkhead and secure in position using thin CA adhesive.

Route the wires down the loop up to the sides of the observers seat.

Secure in position using thin CA adhesive.

Secure the observers seat belts onto the sides of the observers rear bulkhead, using thin CA adhesive.

For extra adhesion apply ‘Araldite’ two part epoxy adhesive (50/50 mix) onto the cockpit floor area of the fuselage and fully locate the cockpit assembly into the fuselage with the floor front edge against the added stop bar in the fuselage.

Modifications:

False floor:

NOTE: *As the 3D printed cockpit has been heavily modified with the pilots seat being raised, its existing floor is too low for a pilot to be able to reach the rudder bar and the created control column for the steering wheel would be to long. Therefore a false floor is can now be created for the pilots cockpit.*

Using thin CA adhesive, a length of 1.0 mm plastic rod ('PlusModel) was secured to the front of the created fuel tank under the pilots seat, to act as a rest for the rear edge of the false floor. The rod was positioned horizontally across the tank and at a realistic distance down from the pilots seat.

To support the false floor, I used a suitable sized rectangular kit part from my 'spares' collection and sanded its height so when located on the cockpit floor, its top aligned with the top of the added support rod on the fuel tank. The part was then secured centrally onto the cockpit floor, using thin CA adhesive.

I cut a piece of 0.8 mm thick plastic card and shaped it so it fitted inside the fuselage with its rear edge resting on he rod attached to the front of the created fuel tank under the pilots seat. The sides were shaped to fit against the tapered sides of the inside of the fuselage. A disc of the plastic card was cut to represent the mounting for the rudder bar and cemented onto the top front of the false floor. Holes were drilled through the false floor and centre of the rudder mounting to mount the rudder bar and control column/steering wheel. Drill a hole of 0.3 mm diameter through the false floor each side of the hole drilled for the control column (for the aileron control cables).

The false floor was airbrushed with 'AK Interactive' Grey (AK758) primer then airbrushed with 'Tamiya' Dark Yellow (F60).

NOTE: *Refer to Part 2 (Wood Effects) of this build log - Method 2.*

Create a wood effect by brushing 'Windsor & Newton' Griffin Alkyd paint (Burnt Umber) over the false floor.

The false floor was then secured in position inside the fuselage by applying CA adhesive to the top of the added support rod and the floor support.

Windscreen:

NOTE: *The printed windscreen frame on the fuselage decking panel is weak and was snapped off. Therefore, a replacement windscreen was required.*

I replaced the windscreen frame with a suitable complete windscreen from my 'spares' collection (ex-Wingnut Wings kit).

Construction (continued):

NOTE: *It's not known exactly what equipment was fitted in the cockpits of this particular aircraft, as equipment varied dependent on the role of the aircraft. As this aircraft operated in a reconnaissance squadron, the equipment I've fitted is generic and located with some 'poetic license'.*

Observers cockpit:

NOTE: *The following three steps are required to represent the supports for the camera and to make sure the top of the camera clears the inside of the fuselage decking panel.*

Cut two lengths of 0.8 mm plastic rod (PlusModel) with their height just below the forward, left side of the observers cockpit.

Using thin CA adhesive, secure the rods vertically to the forward, left side of the observers cockpit and approximately 2.5 mm apart.

Brush paint the two rods with 'Tamiya' Grey/Green (IJN) (XF78) or similar.

NOTE: *The following three steps add a mounting tube for the observers flare pistol.*

Cut a 3.0 mm length of 1.2 mm diameter Brass tube, such as 'Albion Alloy's' MBT12 or similar.

Using thin CA adhesive, secure the tube onto the barrel of the flare pistol and against the ammunition chamber.

Brush paint the tube with 'Tamiya' Semi-Gloss Black (X18) or similar.

NOTE: *Refer to the following photographs for the location of the parts in the observers cockpit.*

Using thin CA adhesive, secure in position the camera to its support rods and the container and flare pistol to the inside, left of the observers cockpit.

Using thin CA adhesive, secure in position the radio set, aerial spool and ammunition drum to the inside, right of the observers cockpit.

Pilots cockpit:

NOTE: *Refer to the following photographs for the location of the parts on the inside of the pilots cockpit.*

Using thin CA adhesive, secure starter magneto onto the inside, left of the fuselage decking panel and rearwards from the instrument panel.

Cut a length of 0.4 mm diameter lead wire ('PlusModel') and using thin CVA adhesive, secure one end to the bottom of the starter magneto.

Curve the wire forwards and under the instrument pane and secure in position using thin CA adhesive. Cut away any excess wire at the front edge of the decking panel.

NOTE: *The following two steps are to represent the engine throttle control.*

Using thin CA adhesive, secure the lever to the inside, left of the pilots cockpit and within realistic reach of the pilot.

Cut a length of 0.4 mm diameter Nickel-Silver rod, such as that from 'Albion Alloy's' and using thin CA adhesive, secure it at the base of the lever and horizontally forwards.

Using thin CA adhesive, secure the hand pump to the inside, right side of the fuselage and angled up under the instrument panel.

Rudder control cables:

Using thin CA adhesive, secure the rudder bar into its pre-drilled locating hole in the false floor.

Cut two lengths of 0.4 mm diameter Nickel-Silver rod, such as that from 'Albion Alloy's', long enough to rest on the rudder bar and the cockpit floor at the bottom of the fuel tank.

Secure the two rods to the rudder bar and floor using thin CA adhesive, making sure the rods are parallel to each other and are centrally aligned to the fuselage.

Aileron control cables:

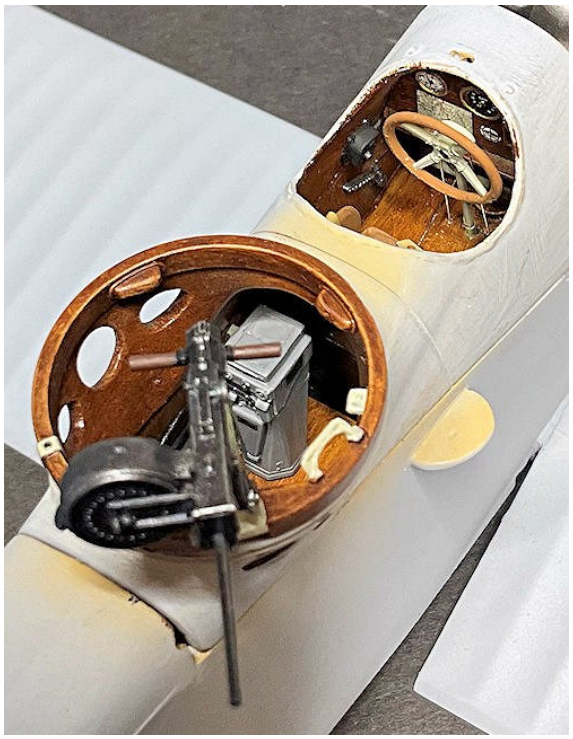
NOTE: *There is no information readily available detailing how the aileron control cables were fitted inside the pilots cockpit and to the steering wheel. Therefore, the following is a representation only.*

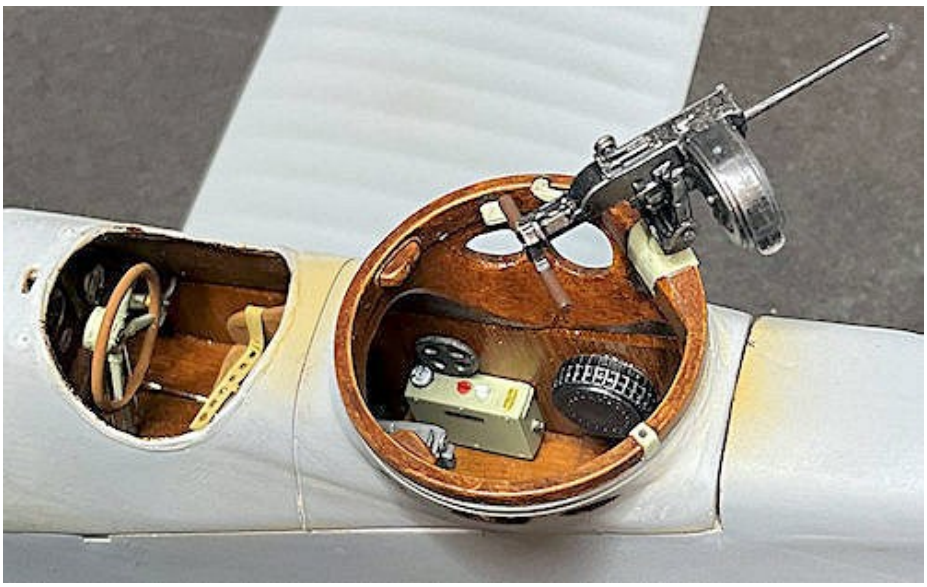
Using thin CA adhesive, secure the control column/steering wheel into its pre-drilled locating hole in the false floor.

Cut two lengths of 0.4 mm diameter Nickel-Silver rod, such as that from 'Albion Alloy's', long enough to rest on their tops each side of the front, centre of the steering wheel with the bottom ends into the pre-drilled holes in the false floor (each side of the control column).

Secure the two rods to the steering wheel and floor using thin CA adhesive.

The following photographs show the cockpits with the decking panel and observers machine gun temporarily fitted.





Internal surface finish:

NOTE: *Refer to Part 3 (Weathering) of this build log for more information.*

To provide a good base for applying weathering, airbrush a semi-matte clear coat, such as ‘Tamiya’ Semi-Gloss (X35) or similar over the following surfaces:

Inside of the fuselage

Inside the decking panel

Inside of the engine side access panels.

Brush apply ‘Flory Models’ Clay washes over the surfaces, allow to dry then remove to achieve your desired weathered effects. I chose to use the ’Flory Models’ Dark Dirt wash.

To seal the weathered surfaces, airbrush a light coat of semi-matte clear coat, such as ‘Tamiya’ Semi-Gloss (X35) or similar.

Brush a clear gloss coat, such as ’Tamiya’ Clear (X22) or similar onto the dial/faces of the various instruments to re-create the glass lens finish.

Construction (continued):

Align the added locating rods in the fuselage decking panel to the pre-drilled holes in the fuselage.

Using CA adhesive, secure the fuselage decking panel fully onto the fuselage.

Sand away any residual adhesive from the external joint between the decking panel and fuselage.

If necessary, fill any seam gaps with a model putty, such as ‘Perfect Plastic Putty’ or similar. Small gaps can be filled with ‘Mr. Surfacer’ 500.

Once the fillers have fully set, sand the seams to blend them with the surrounding areas.

Airbrush along the seam joint with a grey primer, such as ‘AK Interactive’ Grey (AK758) or similar. This will show if any gaps still exist.

If necessary, sand and/or fill any found then re-prime and re-check until none are visible.

PART 11
RIGGING

PART 11 - RIGGING

References:

'Windsock' date file No.150 - Phönix C.I (Paolo Varriale).
On-line resources (various).

General:

Before any assembly, painting or application of decals, you should check that rigging attachment points are drilled out (later in this build). Most models have these located on the model, but it's best to carry out research in reference books or research on line before drilling. Some modellers use micro drills manufactured for drilling printed circuit boards and these drill bits sometimes have identifying coloured collars fitted to the drill shanks to denote the drill diameters. I've found that care needs to be taken when using these drills, as they are sharp and instead of easing their way into the plastic of the model, they tend to bite in and effectively 'cork screw' their way in, which causes jamming and lots of broken drills. This is not only expensive but can leave broken drill bits in the model, which are virtually impossible to extract. An alternative is to use High Speed Steel (HSS) drill bits, which are cheaper and have less 'bite' when in use, although again, they are very fragile and can very easily be broken. Some modellers drill through the wings etc of the model and rig by pulling through the rigging line/EZ thread etc, gluing in position and then rubbing down the exposed line 'tag' and then re-painting that area. I prefer to drill only part way into the plastic and attach the applicable rigging fixture with CA adhesive, using mono-filament (fishing line) as the rigging wires.

Required rigging:

Typically the structural rigging and flight control cables were the standard wire wound cable.

External rigging:

Cabane strut bracing
Rear and forward flying wires
Rear and forward landing wires
Incidence wires between interplane struts
Landing gear cross bracing and claw brake
Drag wires
Rudder, elevator and aileron control cables.

Internal rigging:

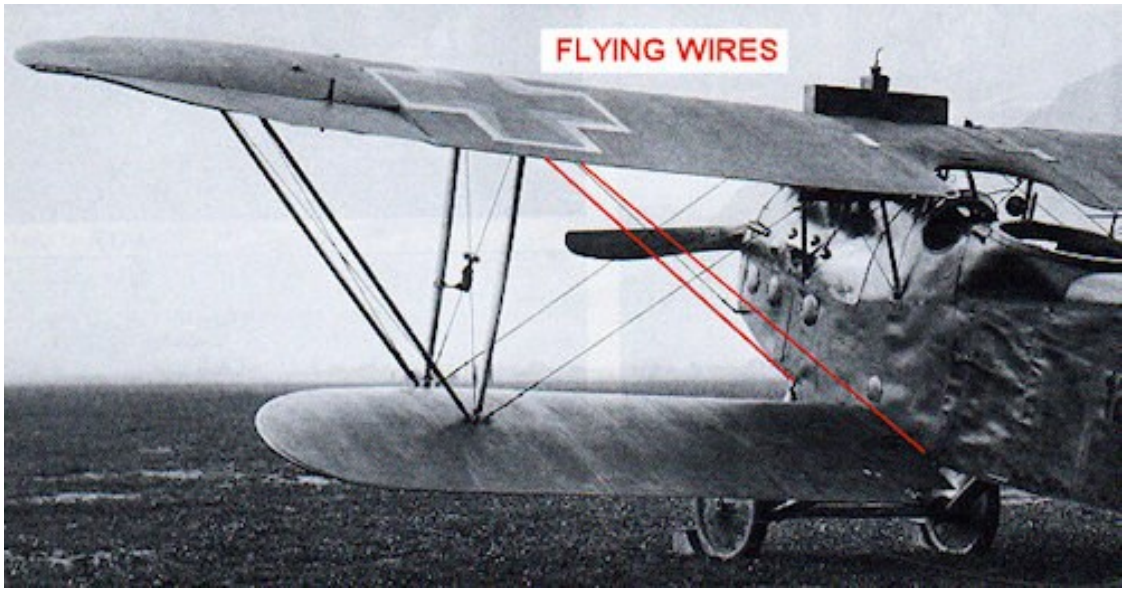
Cockpit frames crossed braced. As the fuselage was clad in plywood it's probable that very little, if any, wire bracing was fitted.
Rudder, elevator and aileron control cables.

Cabane strut bracing:

Crossed bracing wires were fitted diagonally between the bottom and top of the front and rear fuselage cabane struts, on both sides of the aircraft. Turnbuckles were fitted at the top ends of the wires.

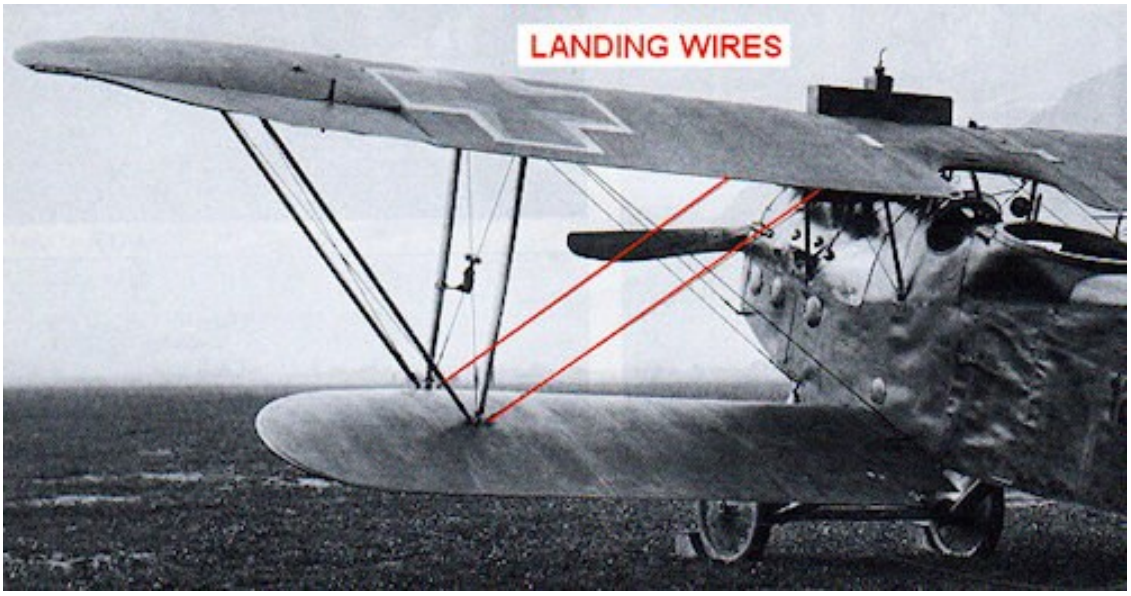
Rear and forward flying wires:

Two single flying wires were fitted to both sides of the aircraft.
The forward flying wires were fitted between the top of the landing gear front struts and the underside of the upper wing, inboard from the top of the front inner interplane struts. A turnbuckle was fitted at the landing gear strut end of the wire.
The rear flying wires were fitted between the lower wing root (above the landing gear rear struts) and the underside of the upper wing, inboard from the top of the rear inner interplane struts. A turnbuckle was fitted at the wing root end of the wire.



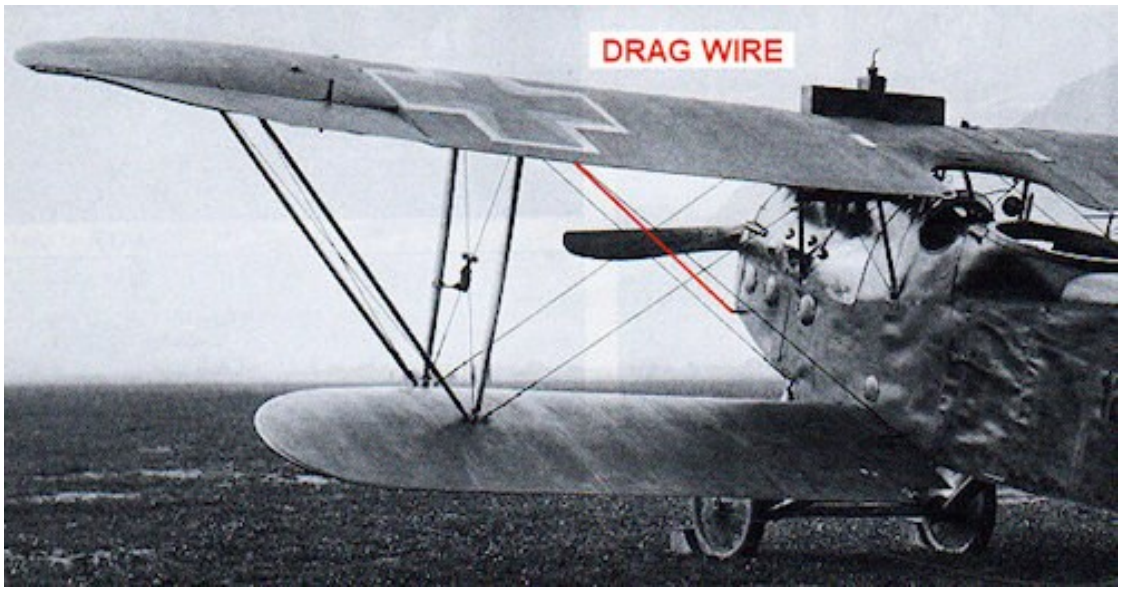
Rear and forward landing wires:

Two single landing wires were fitted to both sides of the aircraft.
The forward landing wires were fitted between the top surface of the lower wing, inboard from the bottom of the front inner interplane struts and the underside of the upper wing, outboard from the top of the front fuselage cabane struts. A turnbuckle was fitted at the lower wing end of the wire.
The rear landing wires were fitted between the top surface of the lower wing, inboard from the bottom of the rear inner interplane struts and the underside of the upper wing, outboard from the top of the rear fuselage cabane struts. A turnbuckle was fitted at the lower wing end of the wire.



Drag wires:

Single drag wires were fitted to both sides of the aircraft. The wires were fitted between the lower, rear edge of the fuselage nose cowl and the underside of the upper wing, inboard from the top of the rear, inner interplane struts. Turnbuckles were fitted in the wires at the fuselage nose cowl end of the wires.



Rudder, elevator and aileron control cables:

Rudder control cables:

A rudder control cable was fitted from the both ends of the cockpit rudder bar and were routed through the fuselage. The cables exited the sides of the rear fuselage, midway down the fuselage sides and rear from the leading edge of the tailplane. The cables were attached to both ends of the rudder control horn with a turnbuckle.
As the pilot moved the rudder bar left or right, the control cables would move the rudder accordingly, which caused the tail of the aircraft to move left or right (yaw).

Elevator control cables:

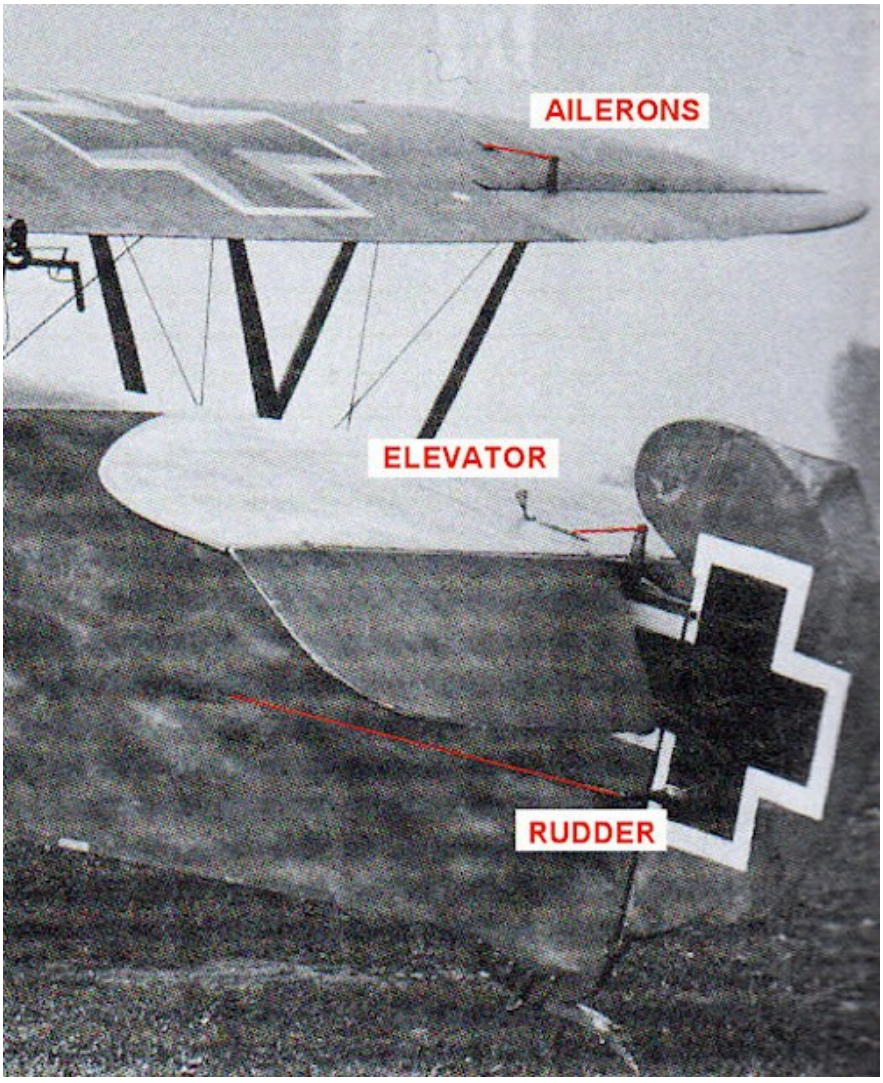
It seems that the elevator upper and lower control cables attached to the pilots control column were routed rearwards through the fuselage and up to the tailplane. Only the upper control cable was visible and it exited through a slot in the tailplane and connected to the top of the elevator control horn. The lower cable was most likely connected to the bottom of the elevator control horn within the rear of the fuselage. Turnbuckles were most likely fitted to the control cables at the cockpit ends of the wires.
As the pilot pulled back or pushed forwards on the control wheel, the cables would move the elevator up or down, causing the aircraft to climb or dive (pitch).

Aileron control:

NOTE: *It's not clear exactly how the control cable for the ailerons were routed inside the cockpit, but would have been routed around a pulley system from the pilots steering wheel.*

Aileron control cables were connected to the pilots steering wheel and its movement was transmitted by the control cables up and out of the fuselage sides at the bottom of the decking panel. These cables were routed up and out through a slotted opening at the rear of the engine side access panels and up into the underside of the upper wing. The cable movement was passed outboard through the upper wing then out to the ailerons. Ailerons were fitted to the upper wing only and their control cables exited the upper wing and were connected to the top and underside ends of the aileron control horns. It's unclear as to where any turnbuckles were
fitted.
As the pilot As the control steering wheel was turned left or right, the control cables would move one aileron up and the other aileron down, causing the aircraft to turn left or right (bank).

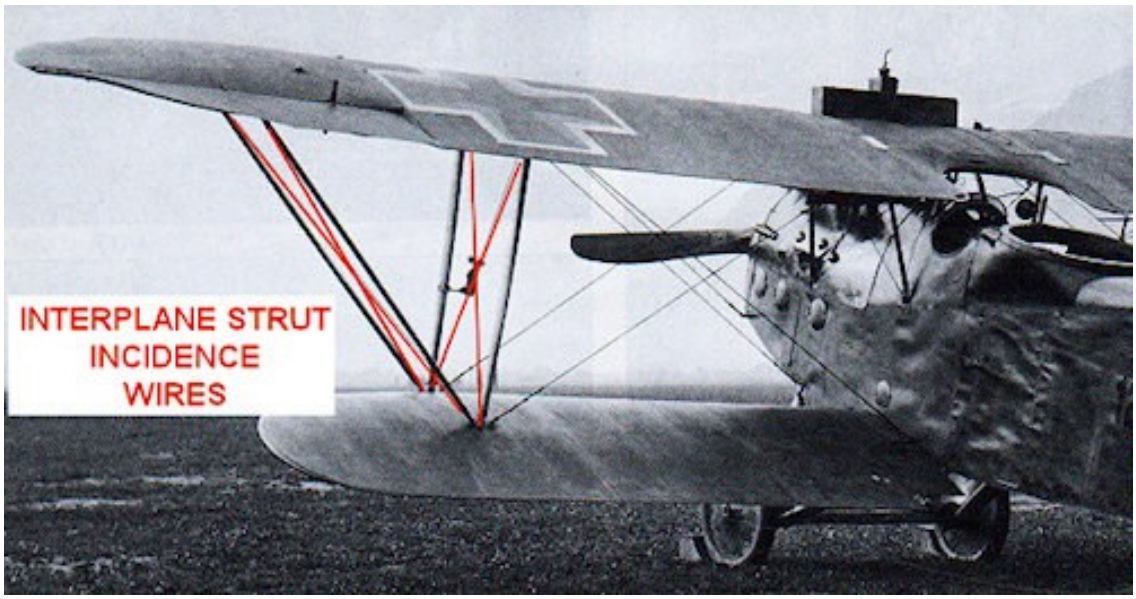

AILERON CONTROL CABLE


AILERONS
ELEVATOR
RUDDER

Incidence wires between interplane struts:

NOTE: *This aircraft was fitted with two pairs of interplane struts on both sides of the aircraft. The inner struts were fitted vertically between the lower and upper wings.*
The outer interplane struts were fitted at the bottom of the inner struts and angled outward to the underside of the upper wing.

Both pairs of interplane struts had diagonally crossed incidence wires fitted. The wires were fitted between the top surface of the lower wings at the bottom of the struts and the underside of the upper wing, at the top of the struts.
Turnbuckles were fitted in each bracing wire at the lower wing ends of the wires.



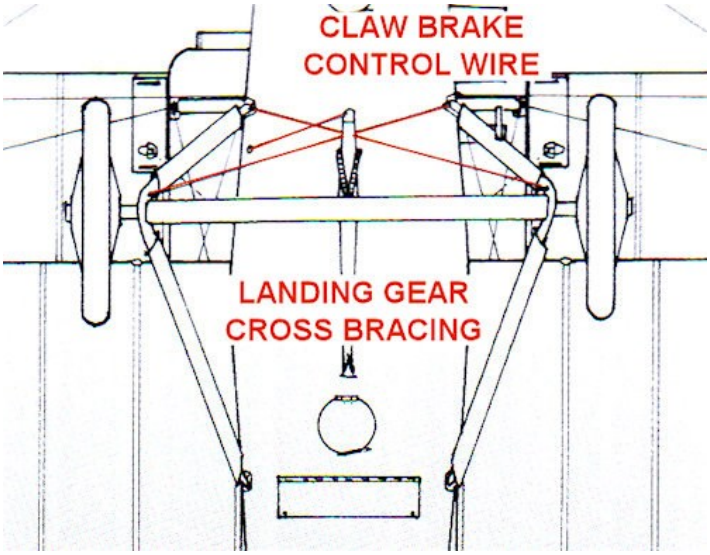
Landing gear cross bracing and claw brake:

Bracing wires:

Diagonally crossed bracing wires were fitted between the bottom of the landing gear front struts and the underside of the fuselage, inboard from the top of the front struts. Turnbuckles were fitted in the bracing wires at the tops of the wires.

Claw brake control cable:

The pilots control cable for operating the claw brake (fitted centrally on the axle) was connected between the top, front of the claw brake and an opening at the underside edge of the fuselage, to the rear of the landing gear front, right strut.



PART 12
CONSTRUCTION

PART 12 - CONSTRUCTION

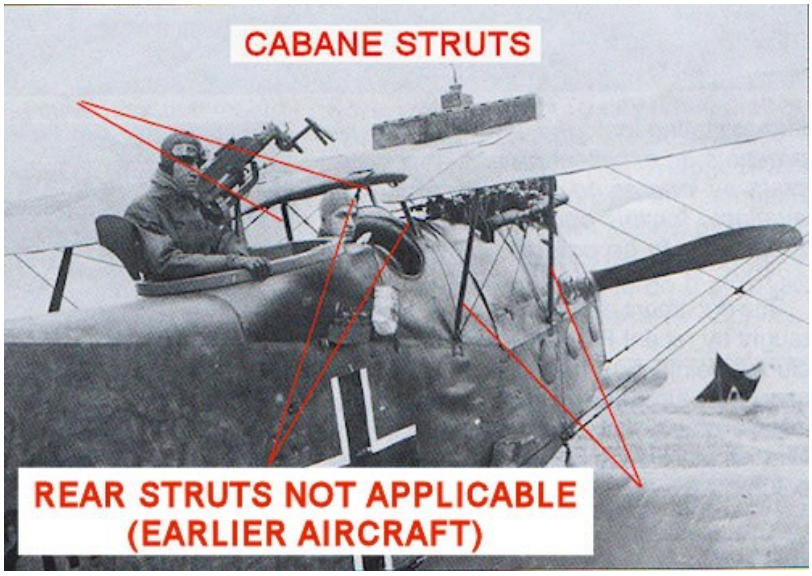
References:

'Windsock' date file No.150 - Phönix C.I (Paolo Varriale).
On-line resources (various).

Modifications:

Cabane side strut support rods:

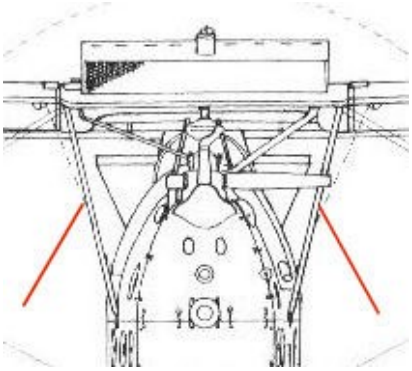
NOTE: *The supplied 3D printed cabane struts are both very thin, weak and not long enough so they were discarded. The cabane struts were made using Brass tube and rod from 'Albion Alloy's'.*

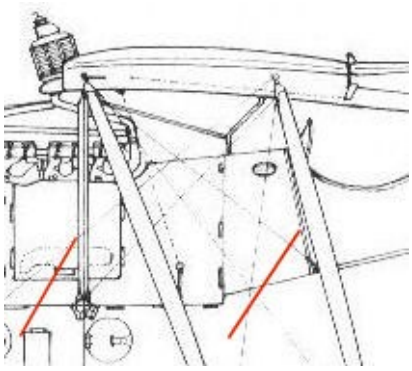


Drill a hole of 0.5 mm diameter horizontally through the four shallow stut locations recesses in the top edges of the fuselage sides.

Cut two long lengths of 0.5 mm diameter Brass rod, such as that from 'Albion Alloy's' or similar.

NOTE: *Refer to the following illustrations for the angle of the cabane side struts.*





Bend one end of each rod such that when they are inserted into the forward pre-drilled holes in the sides of the fuselage, the outward angle of the stuts is approximately as shown on the previous illustration.

Lay the upper wing on a flat surface with its underside uppermost.

Insert a rod into the forward pre-drilled holes in the sides of the fuselage and hold in position using masking tape or 'UHU' White Tack or similar. The rods should be vertical.

NOTE: *Make sure the upper wing is correctly positioned with regard to the wing trailing edge over the fuselage decking panel and the distance away from the fuselage (refer to the previous illustration).*

Hold the upper wing over the fuselage in the correct position and note how much needs to be cut from the top of the rods to allow the rod tops to be inserted into the underside of the upper wing.

Reduce the height of the rod tops as required.

NOTE: *In the following step, make sure the upper wing is positioned centrally over the fuselage when viewed from the front.*

Refer to the previous illustrations and hold the upper wing over the fuselage in the correct position and mark the location of the rod tops.

Using the marks as guides, drill holes of 0.5 mm diameter (at the same angle as the struts) into, **but not through**, the underside of the upper wing.

Check that the upper wing locates onto the tops of the struts and that the wing is positioned correctly, centrally over the fuselage and parallel to the lower wings.

NOTE: *The two rear side struts are angled forwards at their tops.*

Repeat the previous procedure to create and test fit the two rear side struts.

Cabane side struts:

Cut four lengths of 1.1 mm diameter Brass tube, such as 'Albion Alloy's' MBT11 or similar. The length of the tubes should be slightly longer than the straight support rods (when fitted).

NOTE: *To form a aerofoil cross section to the stuts, I used the 'Strutter' tool from 'Albion Alloy's' which unfortunately is no longer available. This tool is essentially a pair of vice jaws that can tilt when compressed.*

A Brass rod of 0.5 mm diameter was passed through each tube and inserted into the 'Strutter' and then compressed. The tubes were then removed from the 'Strutter' and the Brass rod removed.

File or sand a slight chamfer on one side at one end of each tube (for fuselage clearance).

Sand around the non-chamfered side of each tube to form a slight curve.

Slide the tubes over each support rod with the bent ends facing away from the chamfered/curved end and central on the tubes. Note how much tube needs to be removed at the top end of each tube to leave 1.5 mm approximately of rod protruding.

Cut, file or sand away the top of each tube as required.

Slide each tube over its support rod with the bent end facing away from the chamfered/curved end and central on the tube.

Secure the support rods in the tubes. For additional strength I soft soldered the rods in the tubes, but otherwise CA adhesive can be used.

Fitting:

NOTE: *During the following steps, I used pieces of sponge packing to support the upper wing and rear of the fuselage, in order to achieve their correct positions and full location of the cabane struts.*

Lay the upper wing on a flat surface with its underside uppermost.

If necessary, cut away the end of the bends in the rear struts enough to prevent rod showing inside the pilots cockpit.

NOTE: *During the following step, refer to the previous illustrations.*

Wing the upper wing located and adequately supported, check that the upper wing is:

Centrally over the fuselage (when viewed from the front).

Parallel to the lower wings (when viewed from the front and above).

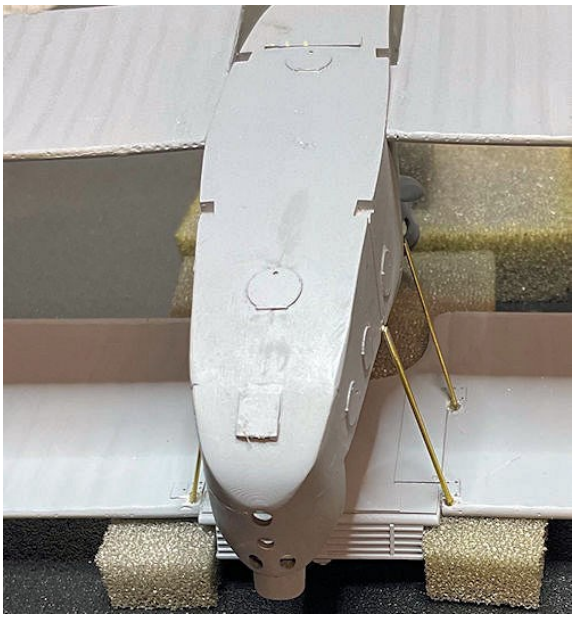
Aligned with the lower wings (when viewed from the side).

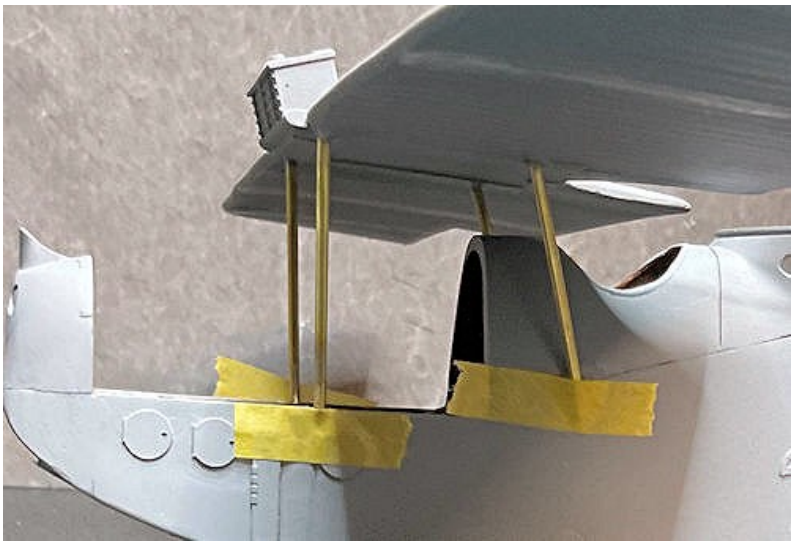
The wing trailing edge correctly positioned over the fuselage decking panel (when viewed from the side).

The wing is the correct distance away from the top of the fuselage (when viewed from the side).

Using CA adhesive, secure the tops of the cabane struts into their locating holes in the underside of the upper wing. **Do not** secure their opposite ends into the fuselage as this will be done later in this build, when the upper wing is final fitted.

For extra adhesion at the upper wing, apply a small amount of two-part epoxy adhesive, such as 'Araldite', smoothly around the strut to wing joints.





Interplane 'V' struts:

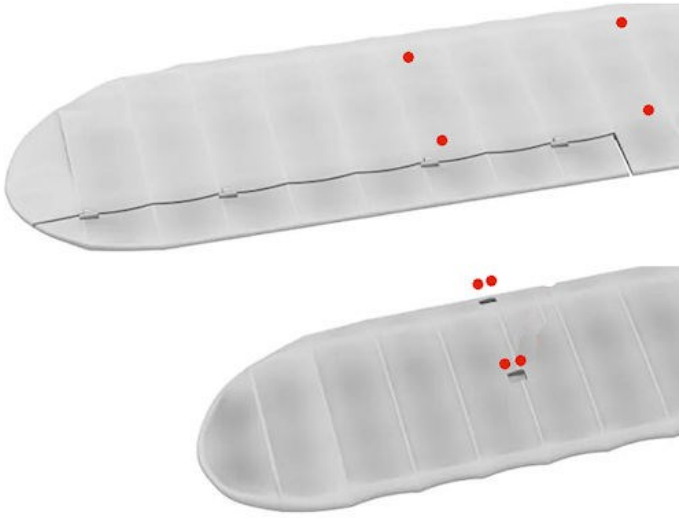
NOTE: *The Brass tubing and rod used were from 'Albion Alloy's'. The struts were formed into an aerofoil cross section using the metal 'Strutter' vice jaws from 'Albion Alloy's (no longer available). At this stage of the build,* ***handle the assembly with care*** *to avoid the upper wing from moving out of alignment.*

Temporarily fit the upper wing onto the fuselage by fully locating the rods in the bottom of the side cabane struts into their pre-drilled locating holes in the fuselage sides. Hold the stuts into the fuselage using strips of masking tape.

As before, make sure the upper wing is aligned correctly with the fuselage and lower wings.

NOTE: *The lower wings are solid resin cast with no internal support rods. Therefore the wings may droop down at their tips. When creating the interplane 'V' struts, this must be taken into account, so that when final fitted the lower wings will be better aligned.*

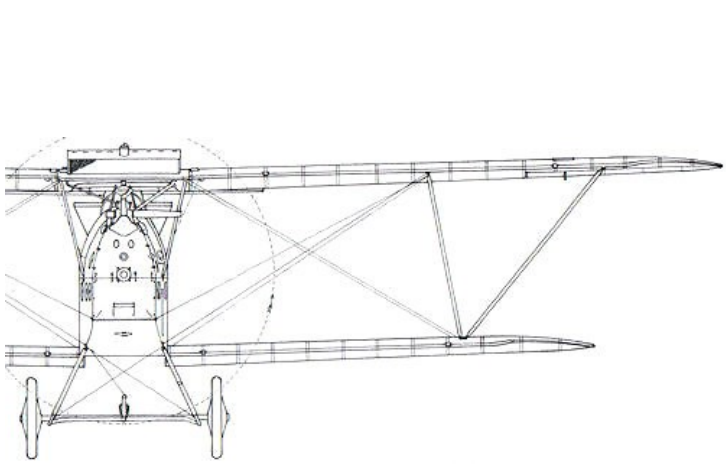
Point mark the locations of each interplane strut on the 3D printed strut 'pads' previously fitted into the strut recesses on the underside of the upper wing and top surface of the lower wings. Leave a slight space between the point marks where two struts are to be fitted to the same 'pad'.

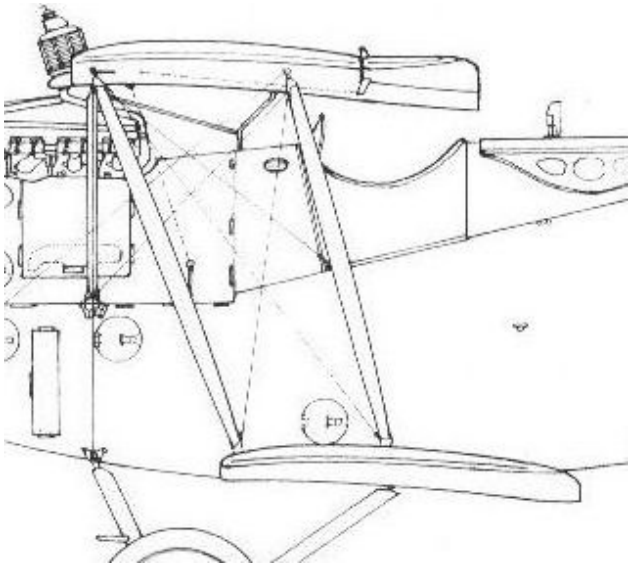


Using the point marks as guides, drill holes of 0.5 mm diameter vertically through the upper and lower wings.

Example strut:

NOTE: *Refer to the following illustrations for the angle of the various interplane struts.*





Cut a long length of 0.5 mm diameter Brass rod, such as that from 'Albion Alloy's' or similar.

Trim the length of the rod such that it spans between the two locating holes for the ends of the particular strut, leaving enough rod to bend at each end for locating into the wings.

Cut a length of 1.4 mm diameter Brass tube, such as 'Albion Alloy's' MBT14 or similar. The length of the tube should be such that it spans between the two locating holes for the ends of the particular strut (when fitted).

NOTE: *To form a aerofoil cross section to the stuts, I used the 'Strutter' tool from 'Albion Alloy's' which unfortunately is no longer available. This tool is essentially a pair of vice jaws that can tilt when compressed.*

Pass a Brass rod of 0.5 mm diameter through the tube and inserted it into the 'Strutter' and then Compress to form an aerofoil cross section. Then remove the tube from the 'Strutter' and remove the Brass rod.

File or sand a slight chamfer on opposite sides at the ends of the tube (for clearing the wing surfaces).

Sand around the non-chamfered sides of the tube ends to form a slight curve.

Slide the tube over the cut support rod, leave 1.5 mm approximately of rod protruding at both ends of the tube.

Secure the support rods in the tubes. For additional strength I soft soldered the rods in the tubes, but otherwise CA adhesive can be used.

Bend the protruding rods such that the strut can be located fully into its locating holes in the wings.

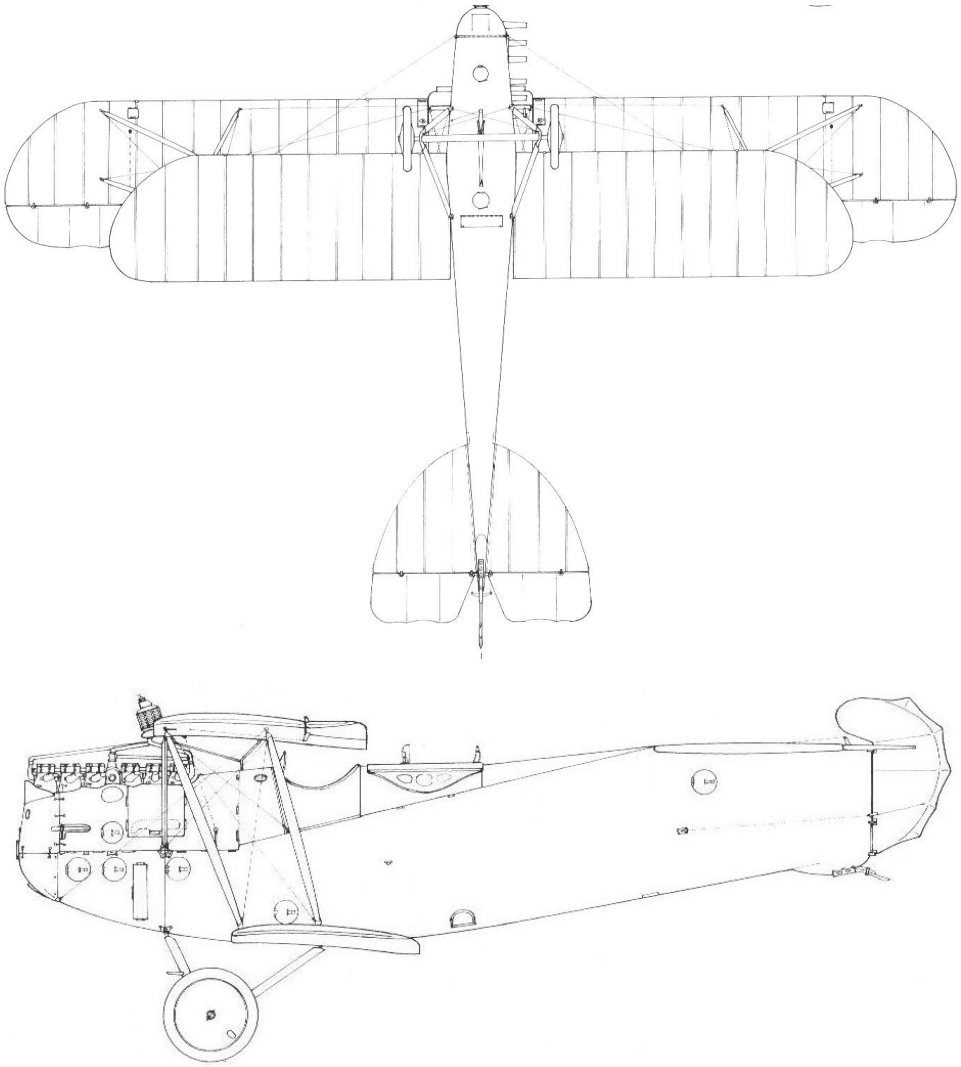
Make sure the strut is fully located in the wings and the thin cross section of the strut is visible when viewed from the front.

Interplane struts:

NOTE: *When fitting the struts, the resin wings can flex. Therefore, use long strips of masking tape to hold the upper and lower wings together on the fitted struts. Also I used sponge pads with masking tape to protect the top surface of the upper wing and elevator control horn.*

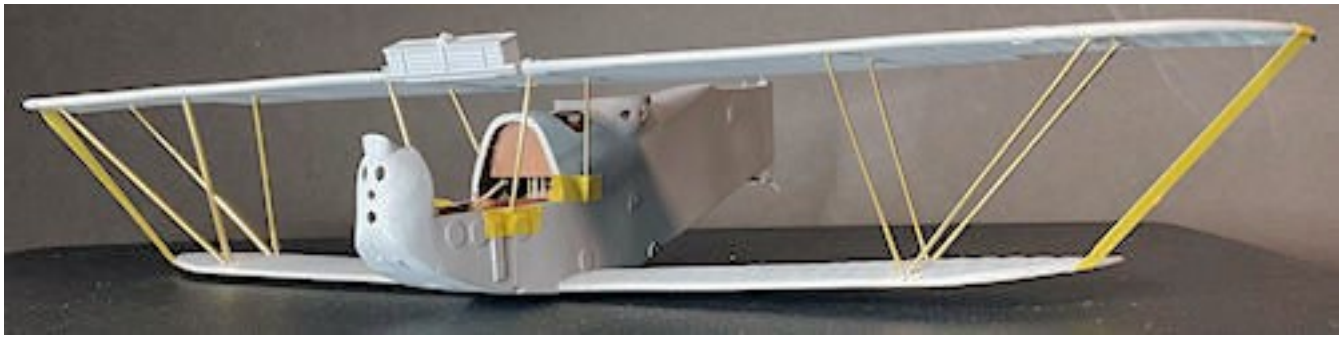
Using the above example, create all eight interplane struts

Check that the upper and lower wing are parallel to each other and are aligned when viewed from above and the sides.



Apply thin CA adhesive to the struts to upper wing joints only, as the lower strut joints will be secured into the lower wings later in this build.

For extra adhesion at the upper wing, apply a small amount of two-part epoxy adhesive, such as ‘Araldite’, smoothly around the strut to wing joints.



Once the adhesive has fully set, carefully remove the upper wing, with its cabane and interplane struts attached, from the fuselage and lower wings.

Fill the exposed strut location holes on the underside of the lower wings and top surface of the upper wing with ‘Perfect Plastic Putty’ or similar.

Once set, sand to blend to the surrounding surfaces.

Airbrush any sanded areas with a grey primer, such as ‘AK Interactive’ Grey (AK758) or similar.

Check for evidence of the filled locating holes still being visible.

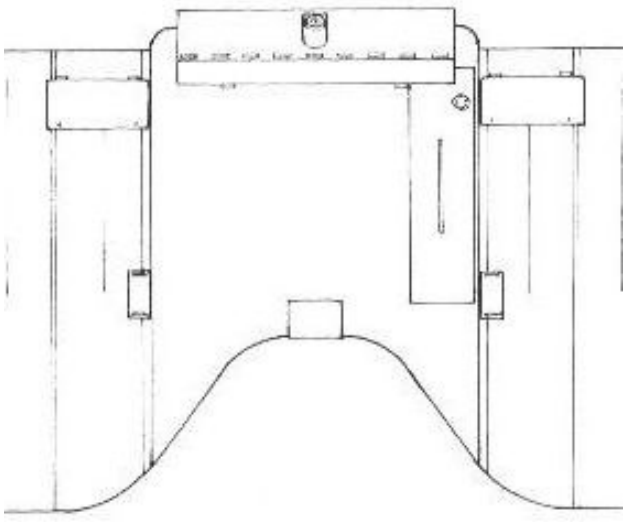
If necessary, sand and/or fill any found then re-prime and re-check until none are visible.

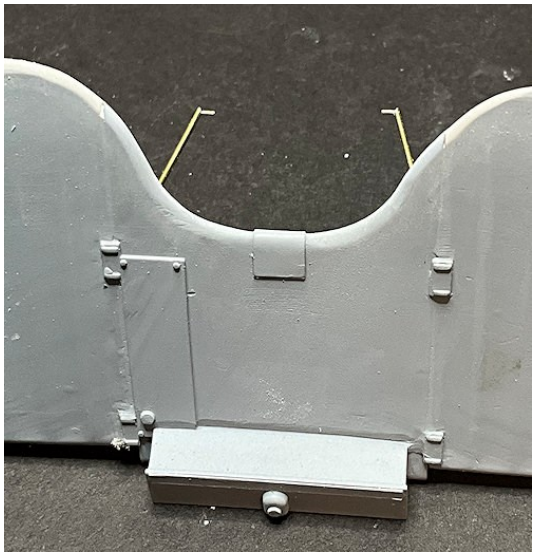
Brush a metal etch solution, such as ’VMS’ Metal Prep 4K or similar over the struts in preparation for painting.

Upper wing cut out:

NOTE: *On later production aircraft the centre section cut out above the pilots cockpit was increased by tapering out the outer edges.*

To re-profile the centre section cut out above the pilots cockpit, I first cut away the trailing edge corners of the upper wing, then filed the profile shape as shown in the illustration above. Finally, I filed and sanded the trailing edges to thin them and to create a curved edge.

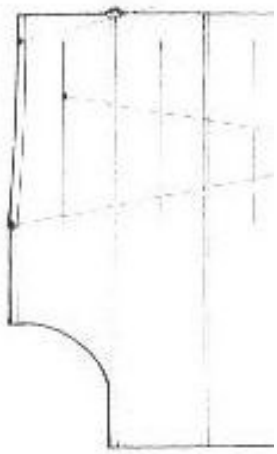




Lower wing cut outs:

NOTE: *On later production aircraft the trailing edges of the lower wing roots were cut out to give the pilot a better downwards view.*

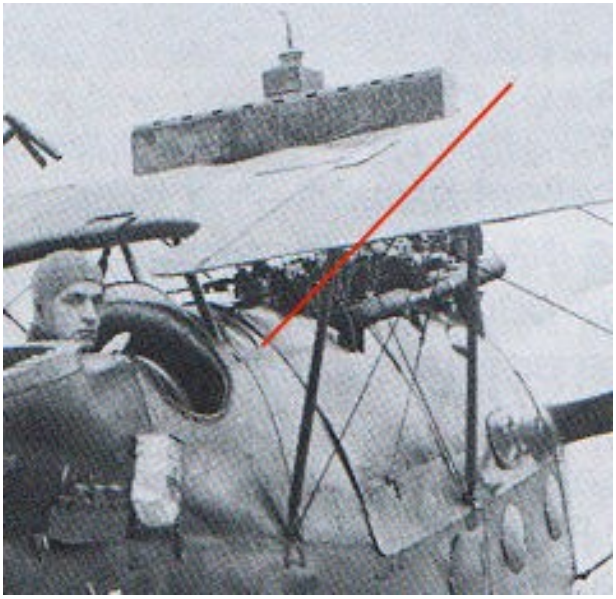
To re-profile the lower wing roots, I first cut through the trailing edge of the lower wings along the molded rib tape. I then chain drilled through the wings to form the curved edge to the fuselage. The created cut outs were then filed to the shape as shown in the illustration above. Finally, I filed and sanded the trailing edges to thin them and to create a curved edge.



Window ports:

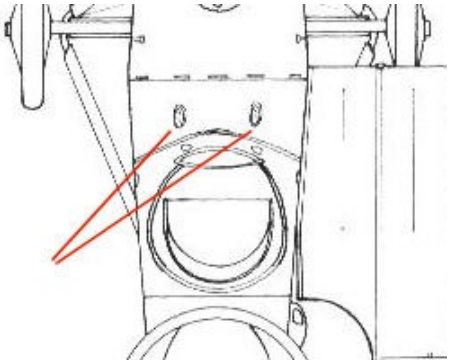
NOTE: *A circular clear window port was located each side of the fuselage top, forward from the pilots windscreen. I believe these were to allow daylight into the cockpit to aid the pilot in seeing the instrument panel. On later production models, it seems the two rear fuselage cabane struts were removed and the openings blanked off.*

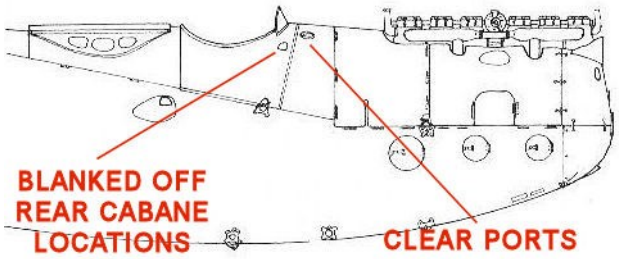
Early production aircraft photograph

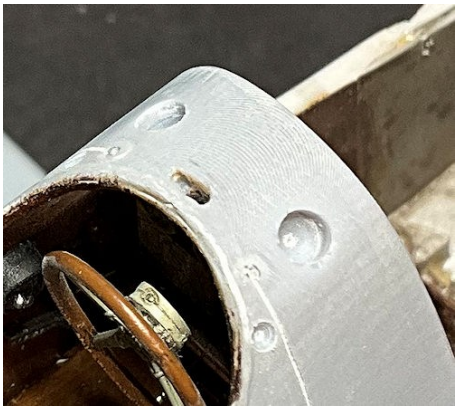


To represent the clear window recesses I point marked then drilled into, **but not through**, the fuselage decking panel using a 2.0 mm diameter drill. These recesses will be filled with clear resin later in this build.

To represent the blanked off cabane strut locations, I point marked then drilled into, **but not through**, the fuselage decking panel using a 1.2 mm diameter drill.







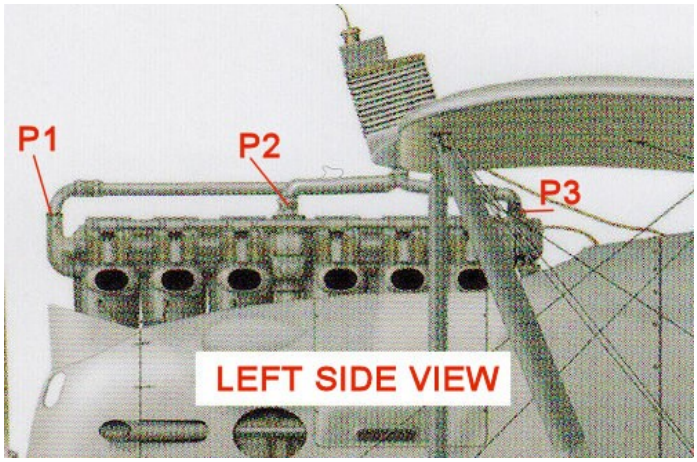
<u>Engine to radiator pipes:</u>

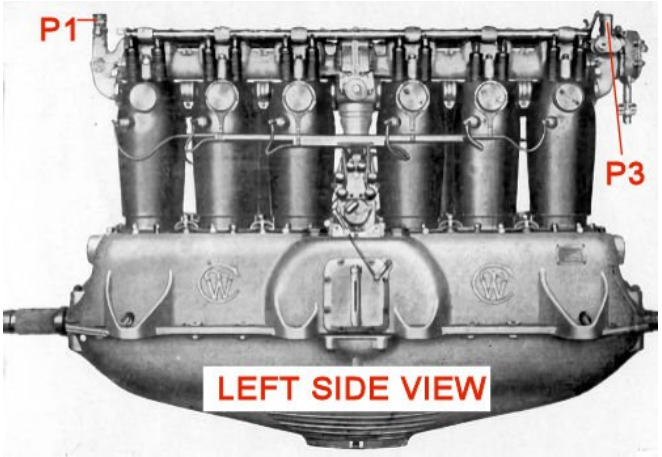
<u>NOTE:</u> *The 3D printed engine does require the addition of the following coolant pipes, which will be Are not supplied with the kit and will visible on the completed model.*

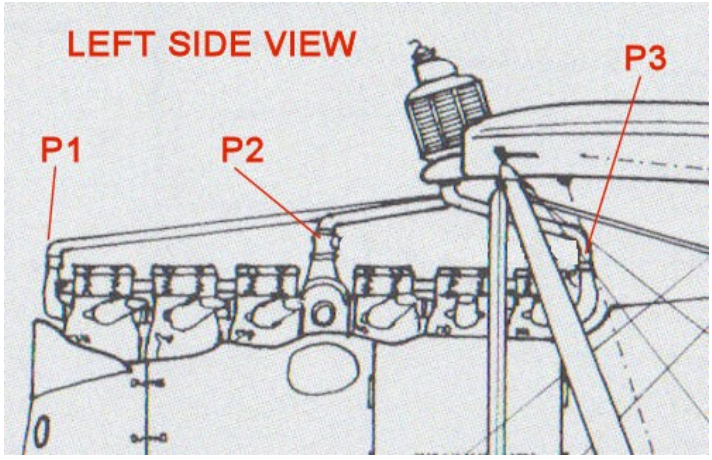
*Coolant pipe **P1** from the top, front of the engine to the underside right of the radiator on the upper wing.*

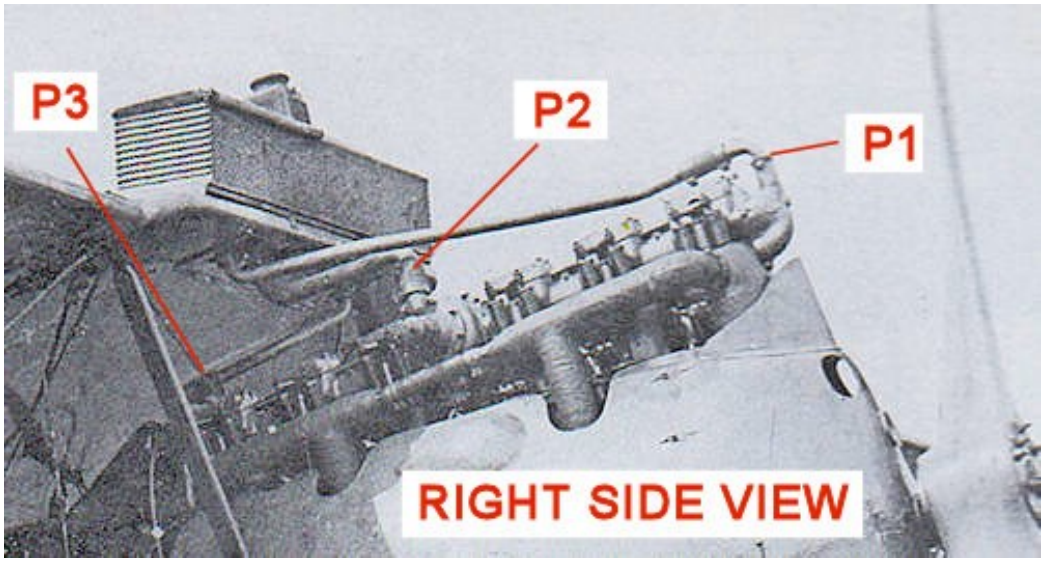
*Coolant pipe **P2** from the top, centre of the engine to the underside centre of the radiator on the upper wing.*

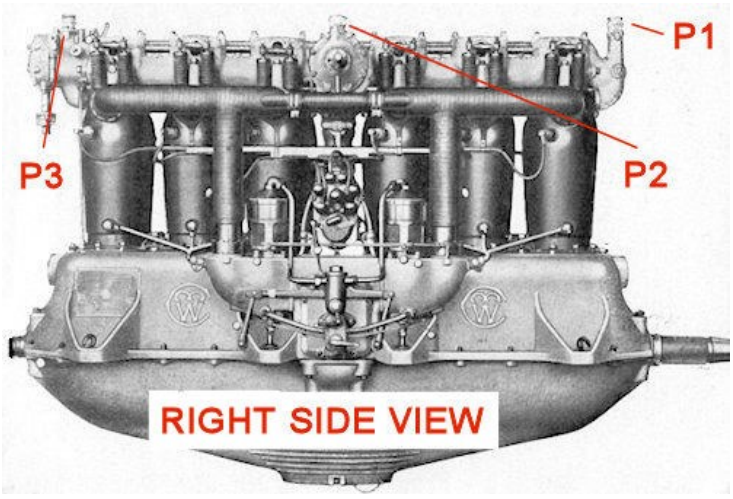
*Coolant pipe **P3** from the top, rear of the engine to the underside left of the radiator on the upper wing.*

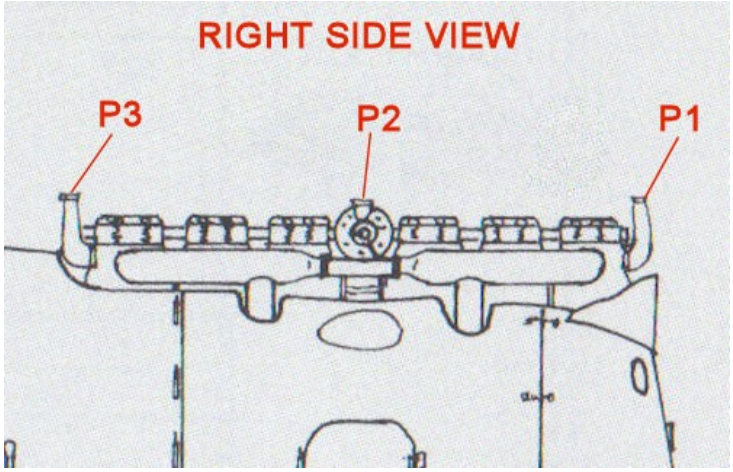





LEFT SIDE VIEW
P3
P1
P2


P3
P2
P1
RIGHT SIDE VIEW


P1
P3
P2
RIGHT SIDE VIEW


RIGHT SIDE VIEW
P3
P2
P1

NOTE: *The upper wing ends of the pipes and their length need to be formed for attaching to the underside of the upper wing.* ***The forming of the pipes and the position can only be done with the upper wing positioned on it struts.*** *Refer to the previous photographs and illustrations for the three coolant pipes. These pipes were made using Brass Tube and rod from 'Albion Alloy's'. Use the engine assembly to determine how the pipes should be formed.*

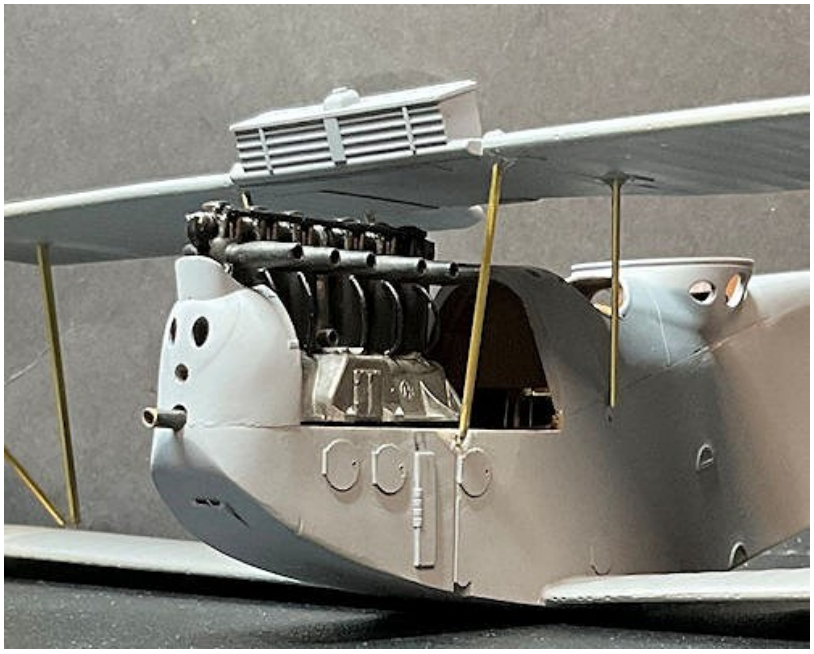
0.8 mm diameter Brass rod.

1.0 mm diameter Brass tube (MBT10).

1.2 mm diameter Brass tube (MBT12).

Locate the engine into the fuselage engine bay, making sure the engine is fully forward, central in the bay and the propeller shaft through its hole in the nose cowl.

Fit the upper wing with its struts onto the fuselage and lower wing as before, holding the wings in position using strips of masking tape.



Coolant pipe P2:

Cut a 50 mm length of 0.8 mm diameter rod and a short length of 1.0 mm diameter tube.

NOTE: *Annealing (softening) the Brass rod is done by applying heat from a cigarette lighter or similar, along the rod until it changes to a grey colour.*

Anneal the rod.

Bend one end of rod around a round former to create a 90 degree bend.

Locate the bent end of the rod into the its pre-drilled hole in the right side of the engine, centrally below the camshaft.

Note where the next rearward bend should be made in the rod. When bent the rod should be at the level of the engine camshaft.

Bend the rod around a round former to create a 90 degree rearward facing bend.

Slide the 1.0 mm diameter tube over the rod.

Offer the pipe up to the engine and locate its forward bent end into the pre-drilled hole in the centre, right side of the engine, below the camshaft. Make sure the pipe is aligned to the camshaft (when viewed from the side) and aligned along the top of the engine (when viewed from above).

Note where the rod needs to be bent vertically, including trimming the length of the rod, such that its end is will be in contact with the underside of the radiator in the upper wing.

Bend the rod around a round former to create a 90 degree vertical bend.

Using thin CA adhesive, secure the 1.0 mm diameter tube on to the rod, midway between the bends along the rod. This represents a pipe hose connector.

Locate the pipe into its locating hole in the right side of the engine and check that the top rear end of the pipe rests against the underside of the radiator.

Coolant pipe P1:

Cut a 50 mm length of 0.8 mm diameter rod and a short length of 1.0 mm diameter tube.

NOTE: *Annealing (softening) the Brass rod is done by applying heat from a cigarette lighter or similar, along the rod until it changes to a grey colour.*

Anneal the rod.

Bend one end of rod around a round former to create a 90 degree bend.

Slide the 1.0 mm diameter tube over the rod and up to the bent end.

Using thin CA adhesive, secure the tube to the rod. This represent a pipe hose connector.

Locate the bent end of the rod into the its pre-drilled hole in the top, front of the engine.

With pipe P2 temporarily located in position, note where the rod needs to bent outwards to avoid pipe P2.

Bend the rod slightly outwards as required to avoid pipe P2. Then bend the rear section of the rod at a slight upward angle towards the underside of the upper wing.

Note where the rod needs to be bent vertically, including trimming the length of the rod, such that its end is will be in contact with the underside of the radiator in the upper wing and to the left of pipe P2 (when viewed from the front).

Bend the rod around a round former to create a 90 degree vertical bend.

Locate the pipe into its locating hole in the top, front of the engine and check that the top rear end of the pipe rests against the underside of the radiator in the upper wing and to the left of pipe P2 (when viewed from the front).

Coolant pipe P3:

Use the same procedure for creating pipe P1 to create pipe P3, with the exceptions that:

When fitted, the pipe should be angled forwards between the top, rear of the engine and the right, underside of the radiator (when viewed from the front).

The pipe should be straight, apart from the bent ends.

Carefully remove the upper wing and engine from the fuselage.

Finish:

Clean the surface of the pipes using a sanding sponge or similar.

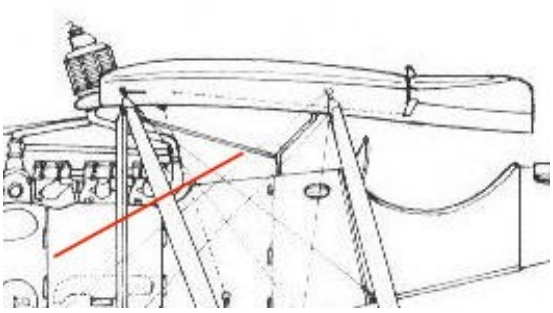
Immerse the pipes in ‘Black-It’ solution or similar to etch the surfaces of the Brass and blacken it.

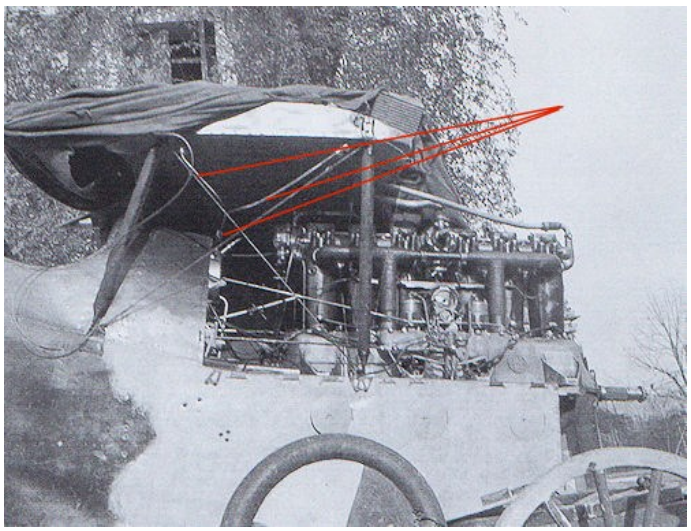
Wipe off any residual solution from the pipes.

NOTE: *The three pipes can only be final fitted once the upper wing has been fitted, later in this build.*

Under wing fuel transfer pipe:

NOTE: *Two fuel transfer pipes were fitted between the underside of the auxiliary fuel tank, located in the upper wing (on the right side of the wing centre section) and into the fuselage decking panel forward from the pilots cockpit. The fuel was supplied to the main fuel tank under the pilots seat.*





Two pipe recesses for locating the created pipes need to be made in the underside of the upper wing as well as the recess in the right side of the fuselage decking panel.

Drill a hole of 0.6 mm diameter into, **but not through**, the underside of the upper wing centre section at the front and rear outboard edge corners of the auxiliary fuel tank.

Drill a hole of 0.6 mm diameter through the top of the fuselage decking panel, off set to the right side and close to the edge of the engine bay.

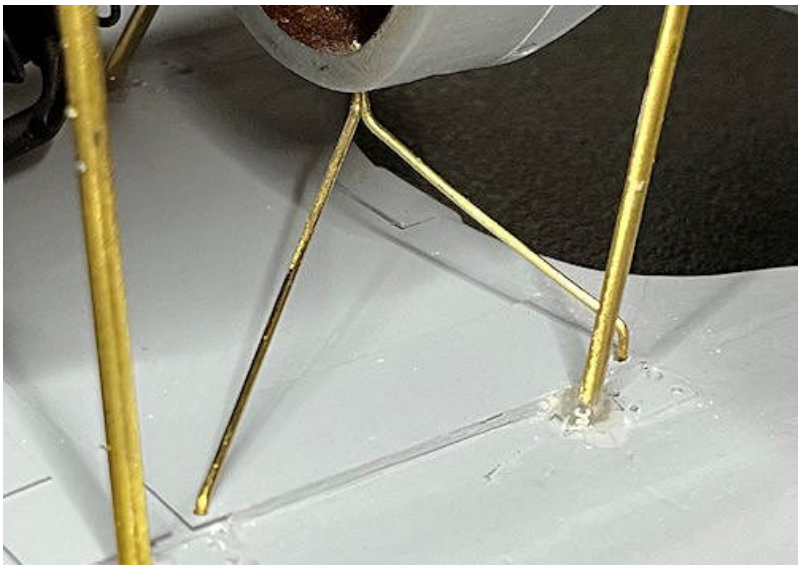
Cut two long lengths of 0.5 mm diameter Brass rod, such as that from 'Albion Alloy's' or similar.

Bend the ends of one rod such that the rod can be inserted fully into the pre-drilled hole in the decking panel and the pre-drilled recess in the rear outboard edge corner of the auxiliary fuel tank.

Bend the ends of the second rod such that the rod rest against the rod in the decking panel and the pre-drilled recess in the front outboard edge corner of the auxiliary fuel tank.

NOTE: *The two pipes can only be final fitted once the upper wing has been fitted, later in this build.*

The following photograph shows the pipes located in the underside of the upper wing



Painting:

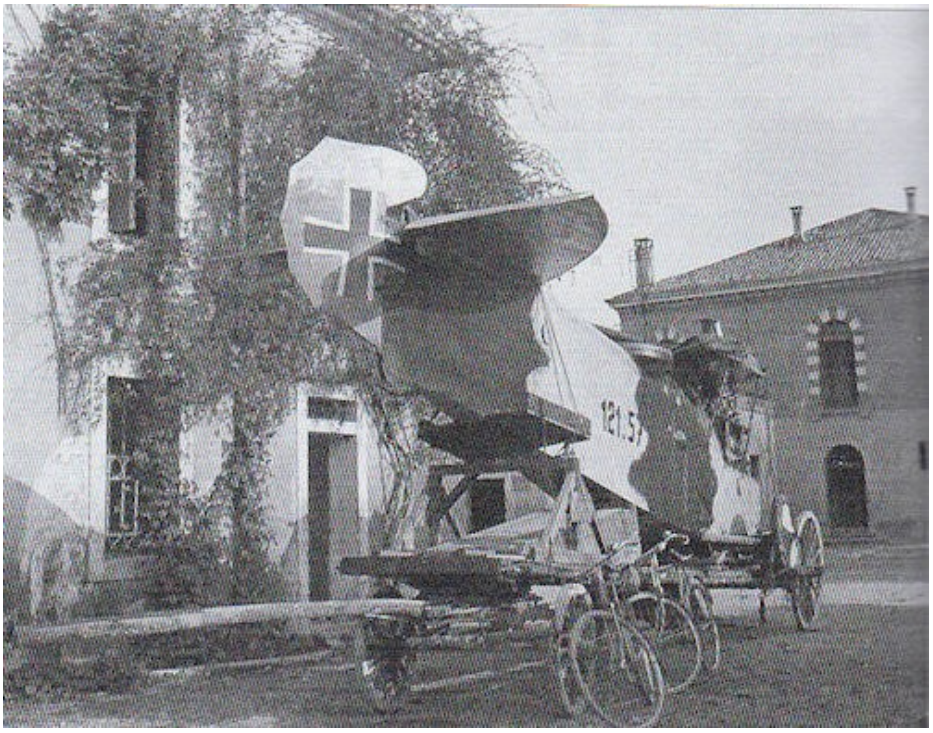
NOTE: *The Austro-Hungarian used different schemes for their aircraft camouflage.*

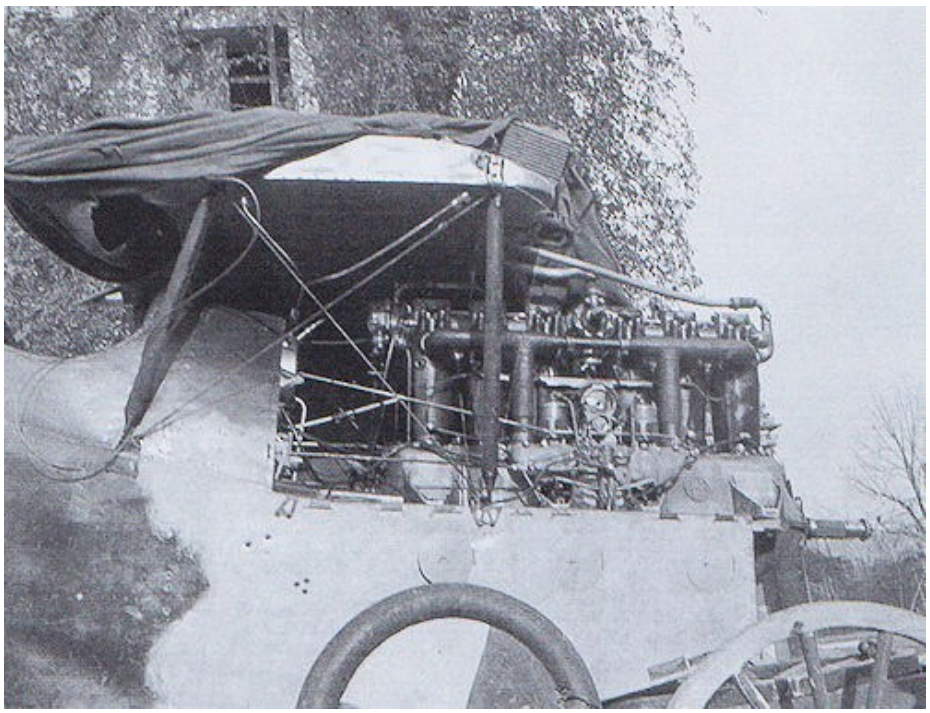
Camouflage scheme:

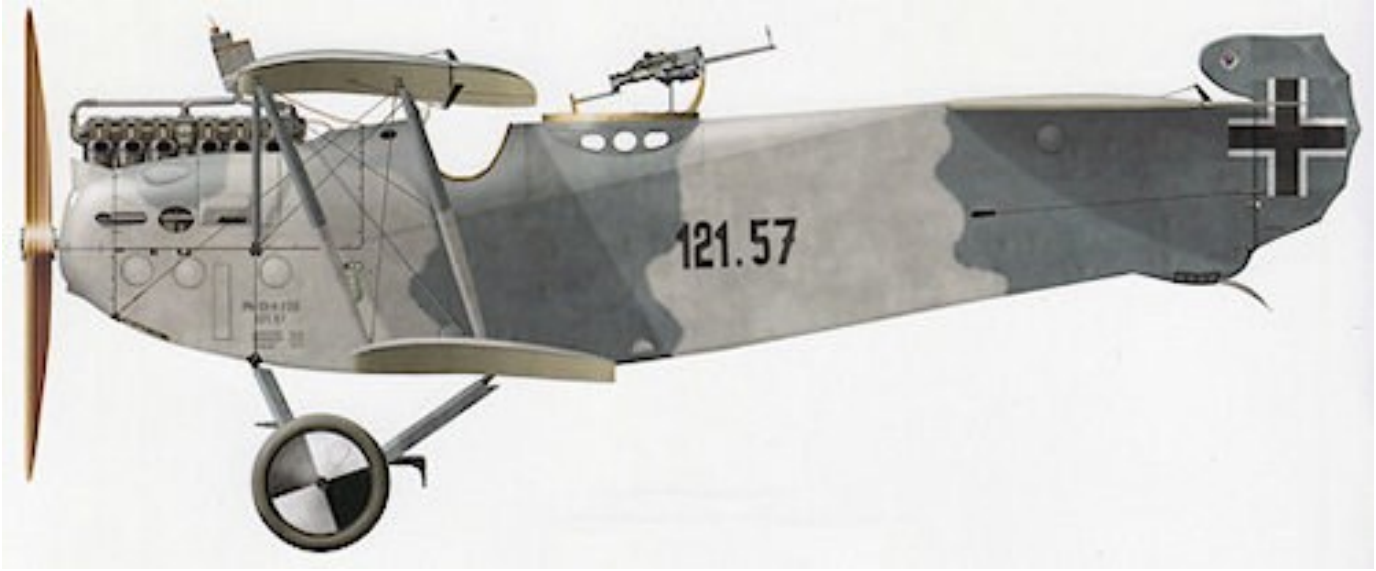
This particular aircraft (121.57) had the 'wolkenartige Schattierung ('Cloud-like-shading') scheme of light and dark grey. This was applied to the upper surfaces of the wings, ailerons, tail plane, elevator, rudder and the top and side surfaces of the fuselage. Photographs of 121.57 shows how the paints were applied with a rags, as the paint edges are not sharply defined. The general shapes of the applied dark grey paint appears to be a similar both sides of the fuselage. As there seems to be no photographs or information as to how the camouflage scheme was applied on the wings and tail unit, I've based it on that of the 'Lloyd' built 49.03, which was used by the Russian 3rd Red Air Flight during 1919.

Undersides:

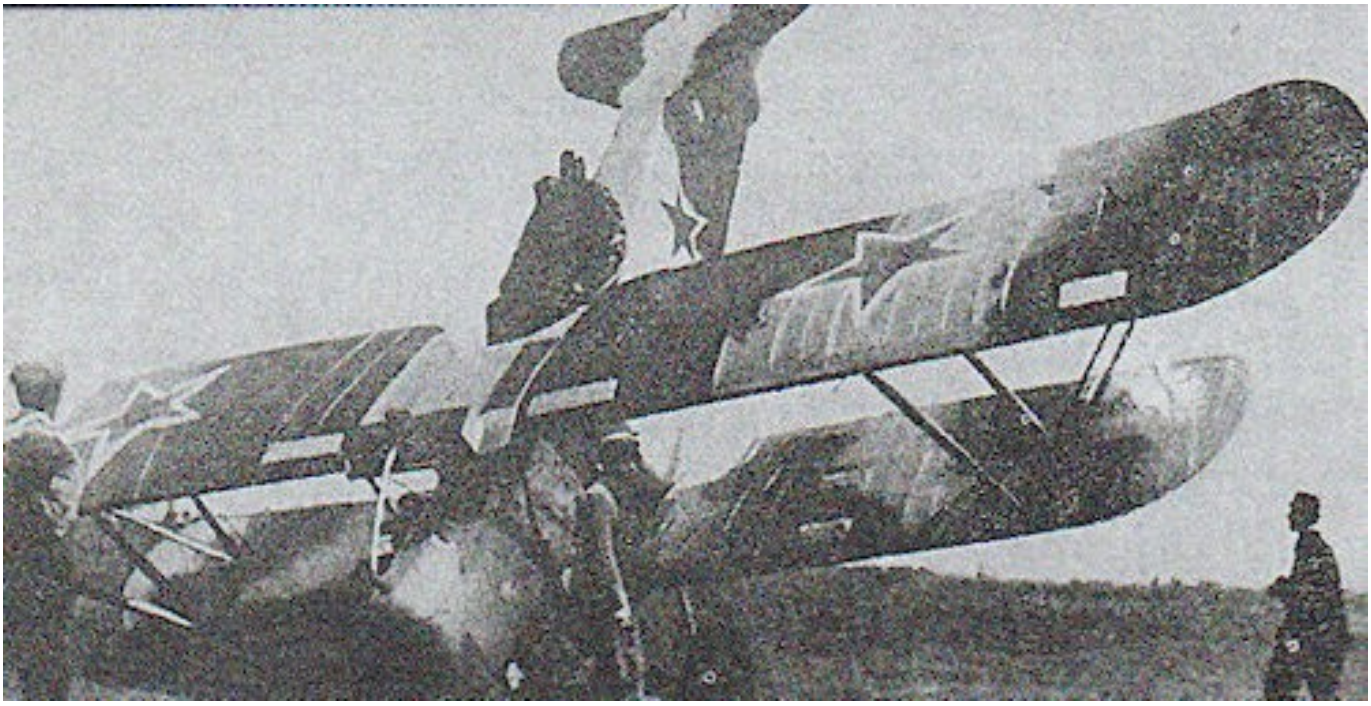
The undersides of the wings, ailerons, tail plane and elevator were not painted, but had clear dope applied , generally known as Clear Doped Linen (CDL). It's most likely the plywood underside of the fuselage was not painted, but instead had a clear coating applied over the plywood surfaces.







Upper surfaces camouflage scheme ('Lloyd built 49.03)



Using pieces of sponge or masking tape etc, blank off the following:

Pilots cockpit opening.
Observers cockpit opening, including inside the added openings on each side.
Inside of the openings in the nose cowl.
Across the fuselage rear of the engine bay.
Across the open engine bay.
Rear of the nose cowl.

The two engine side access panels were also temporarily held in position using masking tape inside.

Airbrush any modified or re-worked areas (without primer) on the prepared parts with a grey primer, such as 'AK Interactive' Grey (AK758) or similar.

Check all seams, joints and surfaces for evidence of gaps or surface imperfections.

If necessary, sand and/or fill any found then re-prime and re-check until none are visible.

Underside decal base colour:

NOTE: *The underside surfaces of the upper wing and ailerons, lower wings, tailplane and the elevator will have the 'Aviattic' WW1 CDL (aged varnish) (ATT32094) decal applied. The underside of the fuselage, which was varnished plywood will have the 'Lukgraph' Dark Plywood (DEC005) applied. These decals are 'clear' backed and therefore the most appropriate base colour under the decals is white. Also, the decals are not 'cookie cut' to align with the model parts and therefore, each decal required needs to be accurately cut out from the decal sheets.*

The 'Tamiya' paints used were thinned using 'Mr. Colour Levelling Thinner 400 to approximately 60/40%. This helps to better control the airbrushed paint and drying time.

After each application of paint, check for any imperfections, such as paint imperfections, trapped dust, fluff, hair etc. If any are found, lightly sand the area clear then re-paint until a good paint finish is achieved.

To prevent overspray on the fuselage sides and nose cowl, mask off those surfaces.

Airbrush 'Tamiya' White (XF2) or similar over the undersides of the following:

Upper wing.
Upper wing ailerons.
Lower wings.
Tailplane.
Elevator.
Fuselage.

Camouflaged surfaces:

NOTE: *The grey paints were applied with rags, as the line between the grey is not precise, but rather patchy. This can be seen on the previous close-up photograph of the fuselage of 121.57.*

However, to avoid problems with airbrush over spray, I chose to mask the grey patterns rather than free hand airbrush them. The paints used are:

'Tamiya' Medium Sea Grey 2 (RAF) (XF83).
'Tamiya' Ocean Grey 2 (RAF) (XF82).

Using 'Tamiya' Medium Sea Grey 2 (RAF) (XF83), airbrush the light grey colour onto the following:

Top surface of the upper wing.
Top surface of the lower wings.
Top surface of the tailplane and elevator.
Fuselage sides and top surfaces.

NOTE: *Only the light grey painted surfaces need to be masked in order to create the dark grey patterns. Refer to the previous illustration and photographs for the guidance on the colour scheme.*

Using 1.0 mm wide strips of 'Tamiya' masking tape, mask the outlines of the various dark grey shapes on the various parts.

Using 2.0 mm wide strips of 'Tamiya' masking tape, mask around the previously applied masking tape in order to increase their width.

Mask off the remaining light grey areas of the parts using a combination of pieces/strips of 6.0 and 18.0 mm wide 'Tamiya' masking tape.

Using 'Tamiya' Ocean Grey 2 (RAF) (XF82), airbrush the dark grey patterns onto the following:

Top surface of the upper wing.
Top surface of the lower wings.
Top surface of the tailplane and elevator.

Rudder.

Fuselage sides and top surfaces.

Landing gear strut/axle assembly.

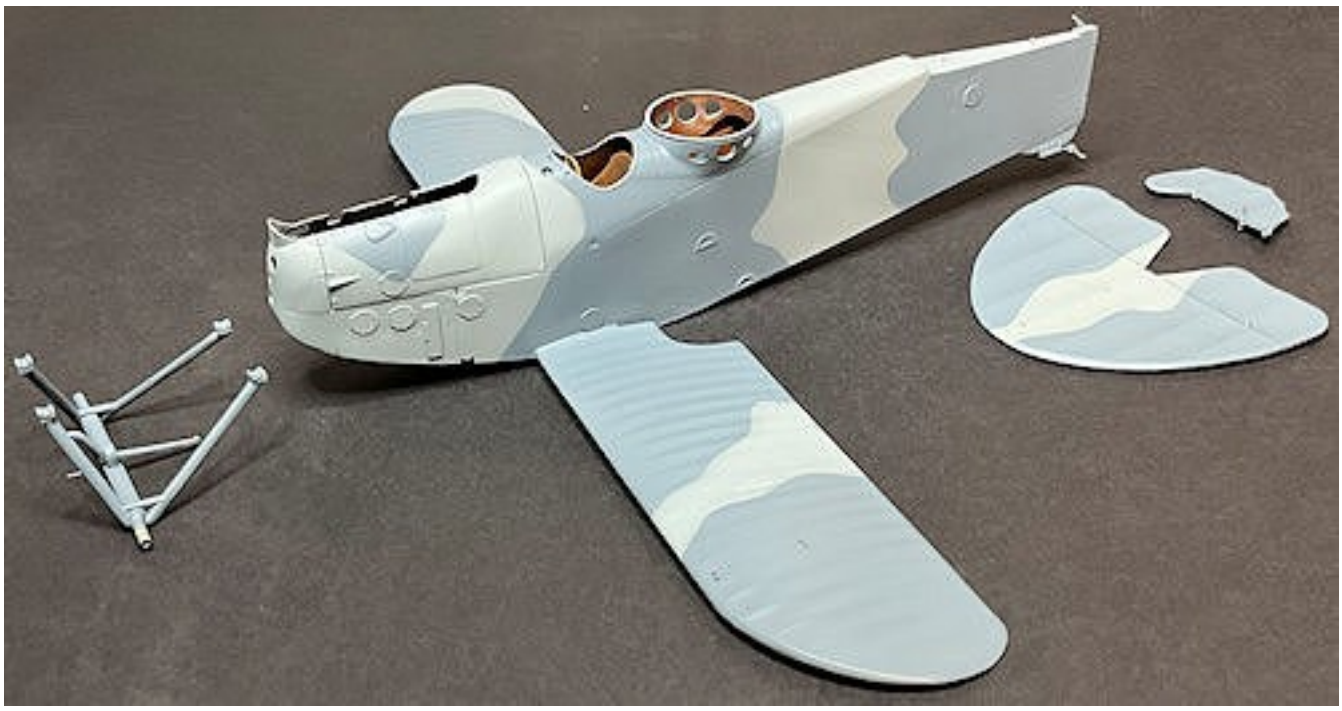
Remove all masking applied to the parts and the previously masked cockpits and engine bay.

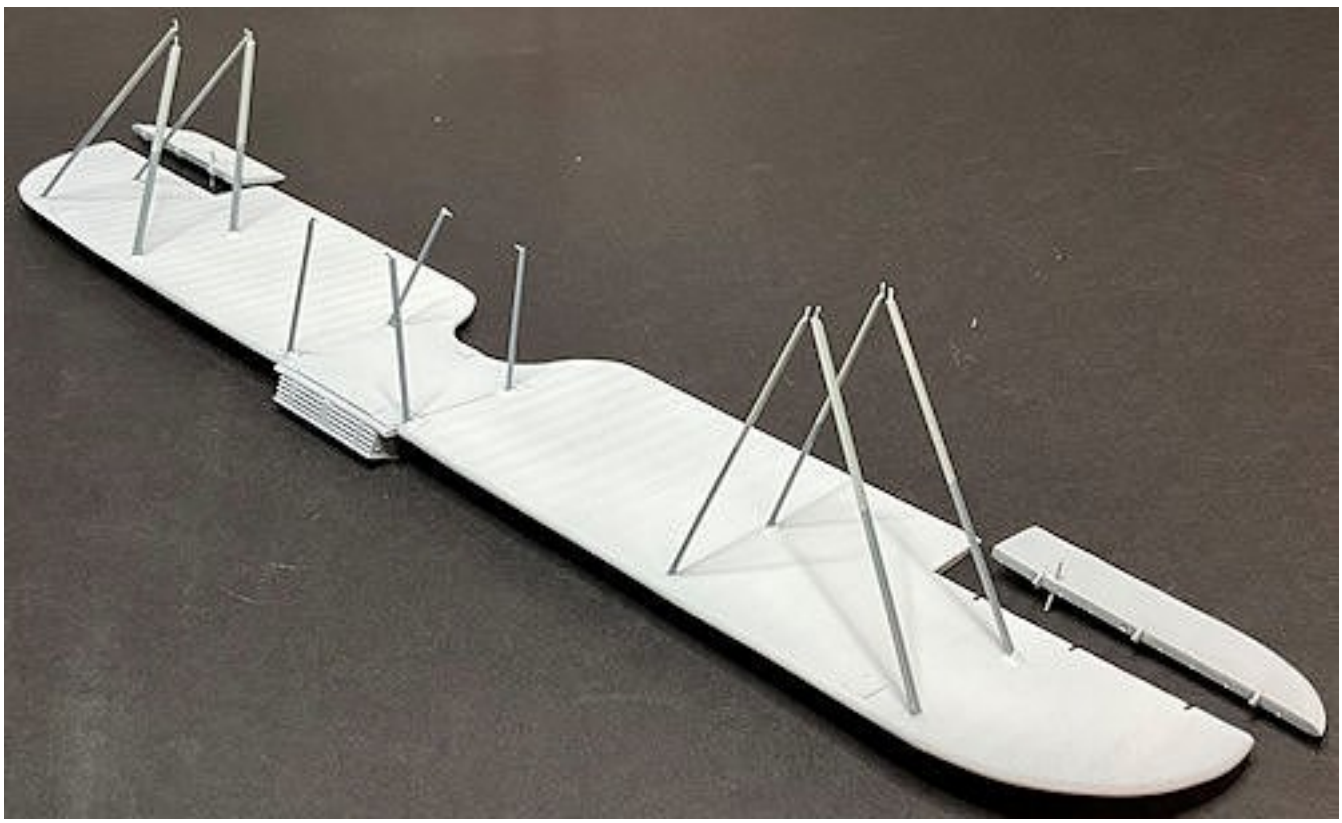
Camouflaged wing struts:

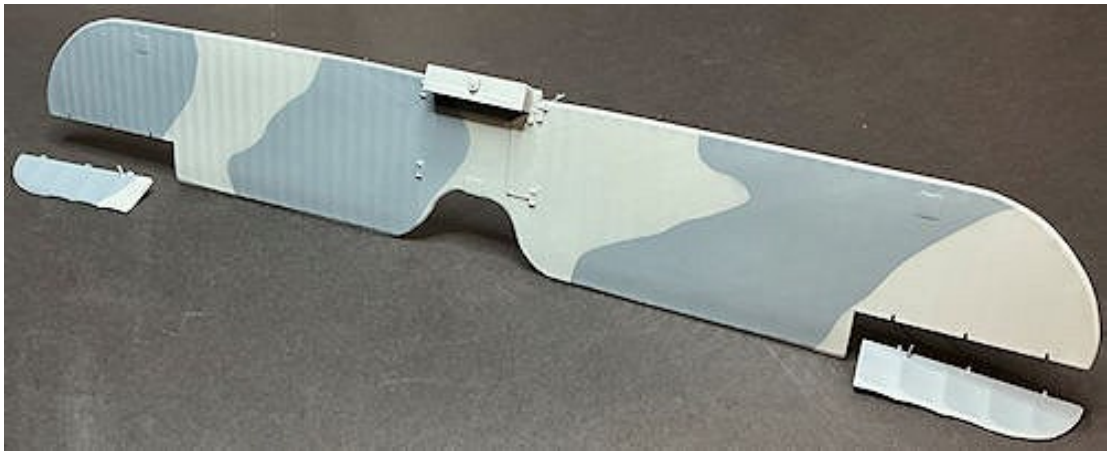
NOTE: *Refer to the previous illustration and photographs for the guidance.*

Brush paint the fuselage cabane struts and the top half of each of the interplane struts with ‘Tamiya’ Ocean Grey 2 (RAF) (XF82).

Brush paint the bottom half of each of the interplane struts with ‘Tamiya’ Medium Sea Grey 2 (RAF) (XF83).







Surface finish:

Make sure the painted surfaces, especially the white undersides, are as smooth as possible. If necessary, light sand or buff the surfaces to remove any roughness in the paint finish.

NOTE: *The following step will protect the painted surfaces and also provide a good surface for applying decal later in the build.*

Airbrush the painted surfaces with a clear gloss coat, such as 'Mig' A-Stand Aqua Gloss (A.Mig-2503), 'Tamiya' Gloss (x22) or similar.

Decals:

Undersides:

NOTE: *The decal used for the underside surfaces is the **'Aviattic' WW1 CDL (aged varnish) (ATT32094)** type. This decal type is 'clear' backed (transparent) and not pre-shaped ('cookie cut') to fit this model and therefore, the decals will need to be cut out to shape from the sheet. Care is required to cut the decals accurately to avoid leaving gaps, especially at the edges, where the white base colour will show. Always **cut away any white border** around the decal sheet to avoid that accidentally being part of the cut-out decal.*

***Refer to Part 4 (Decals)** of this build log for guidance for the application of 'Aviattic' decals.*

Lower wings:

Cut out and apply a decal to the underside surface of both lower wings. The decal should cover the entire wing surface up to the fuselage. Allow for a slight overlap at the edges of the part

Tail plane/elevator:

Cut out and apply a decal to the underside surfaces of the tail plane and the elevator. Allow for a slight overlap at the edges of the part. Once the decal starts to dry on the part, gently run a sharp blade along the gap between the trailing edge of the tail plane and leading edge of the elevator, to separate the decals.

Ailerons:

Cut out and apply decals to the underside surfaces of the two ailerons. Allow for a slight overlap at the edges of the part and cut a small slot to allow the decals to fit around the fitted control horns.

Upper wing:

NOTE: *Application of the decal to the underside of the upper wing is more complicated as the interplane and fuselage cabane struts are already fitted. It's best to cut various separate decals to fit on the wing and around the base of the struts, including any raised adhesive that is present.*

For each decal, first cut a paper template to achieve a good fit to the wing and around the struts. I used a suitable hole punch to remove paper from around the bases of the struts. The decals should cover the wing surface but not cover the wing centre section, which is solid, not linen covered. Allow for a slight overlap at the edges of the wing.

Using the paper templates, cut out and apply each decal to the underside surface of the upper wing. The decals should cover the wing surface and allow for a slight overlap at the edges of the part.

Once the decals have started to dry, cut around the edges of the raised aileron control access panels and remove the decal from the panels. Also slice through the decal covering the aileron hinge slots.

Decals can be conformed over raised detail and into pre-drilled holes, slots and around edges using 'MicroScale' MicroSol decal solution. If necessary, 'Tamiya' Acrylic thinner (X20A) applied sparingly can be used to conform decal, but using too much can melt the decal.

Once the decals have fully set, check around the edges and if necessary, carefully remove any excess decal by lightly sanding.

Seal and protect the decals by airbrushing a light coat of clear semi-gloss coat, such as 'Tamiya' Semi-Gloss (x35) or similar.

Fuselage:

NOTE: *The decal used for the underside of the fuselage is the **'Lukgraph' Dark Plywood (DEC005)** type. This decal type is 'clear' backed (transparent) and not pre-shaped ('cookie cut') to fit this model and therefore needs to be treated the same as for the 'Aviattic' decal. Always **cut away any white border** around the decal sheet to avoid that accidentally being part of the cut out decal.*

***Refer to Part 4 (Decals)** of this build log for guidance for the application of 'Lukgraph' decals.*

First cut a paper template to achieve a good fit to the underside of the fuselage, making sure the template aligns to the edges of the fuselage and stops at the joint of the nose cowl and front of the mounting of the tail skid.

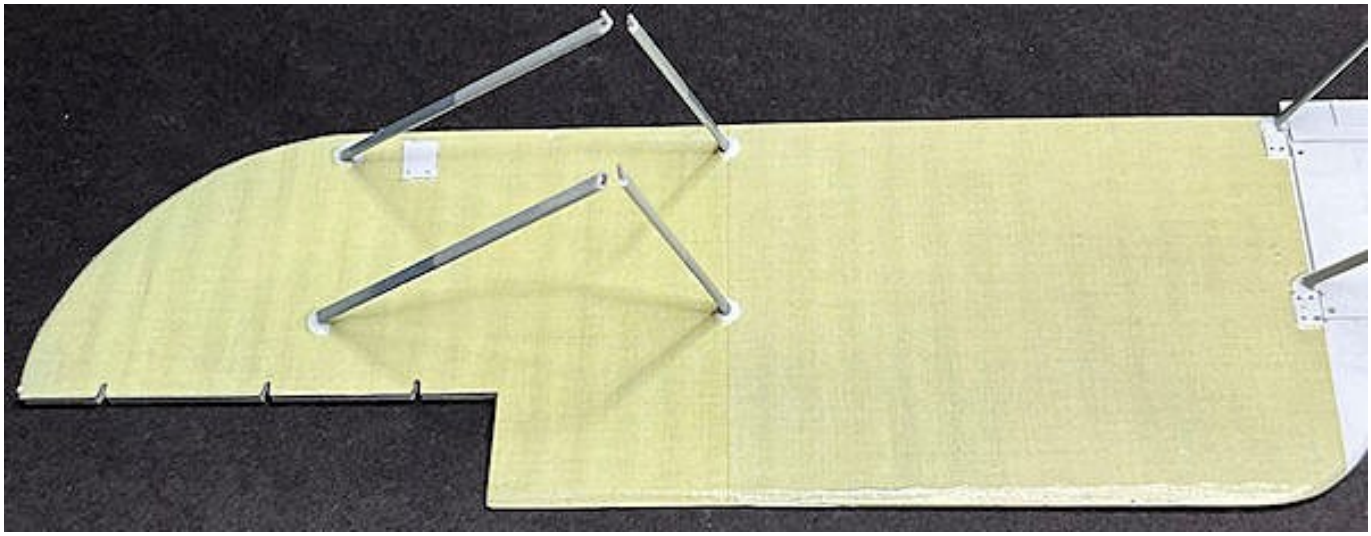
Using the paper template, cut out and apply the decal to the underside of the fuselage.

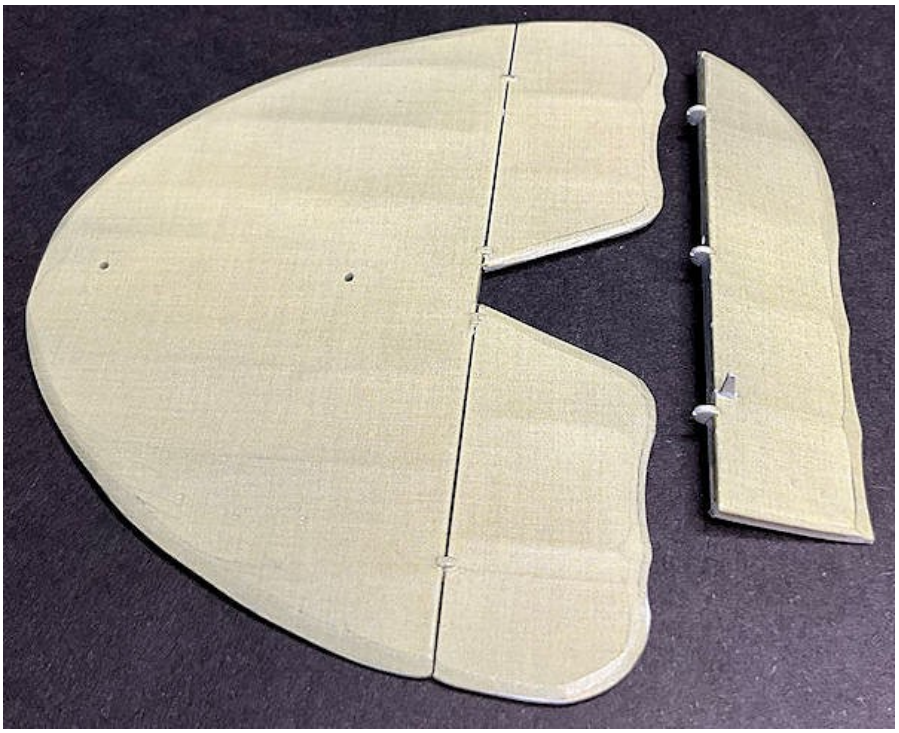
Once the decal has started to dry, cut around the edges of the raised panels and remove the decal from the panels.

Decals can be conformed over raised detail and into pre-drilled holes, slots and around edges using 'MicroScale' MicroSol decal solution. If necessary, 'Tamiya' Acrylic thinner (X20A) applied sparingly can be used to conform decal, but using too much can melt the decal.

Once the decals have fully set, check around the edges and if necessary, carefully remove any excess decal by lightly sanding.

Seal and protect the decals by airbrushing a light coat of clear semi-gloss coat, such as 'Tamiya' Semi-Gloss (x35) or similar.





Top surfaces:

NOTE: *The decal used for the top surfaces is the **'Aviattic' Linen Weave Effect (ATT32236)** type. This decal type is 'clear' backed (transparent) and not pre-shaped ('cookie cut') to fit this model and therefore, the decals will need to be cut out to shape from the sheet. Care is required to cut the decals accurately to avoid leaving gaps, especially at the edges, where the white base colour will show. Always **cut away any white border** around the decal sheet to avoid that accidentally being part of the cut out decal.*

***Refer to Part 4 (Decals)** of this build log for guidance for the application of 'Aviattic' decals.*

Lower wings:

Cut out and apply a decal to the top surface of both lower wings. The decal should cover the entire wing surface up to the fuselage. Allow for a slight overlap at the edges of the part.

Tail plane/elevator:

Cut out and apply a decal to the top surface of the tail plane and the elevator. Allow for a slight overlap at the edges of the part. Once the decal starts to dry on the part, gently run a sharp blade along the gap between the trailing edge of the tail plane and leading edge of the elevator, to separate the decals.

Ailerons:

Cut out and apply decals to the top surface surfaces of the two ailerons. Allow for a slight overlap at the edges of the part and cut a small slot to allow the decals to fit around the fitted control horns.

Upper wing:

Cut out and apply decals to the top surface of the upper wing. The decals should cover the wing surface but not cover the wing centre section, which is solid, not linen covered. Allow for a slight overlap at the edges of the part.

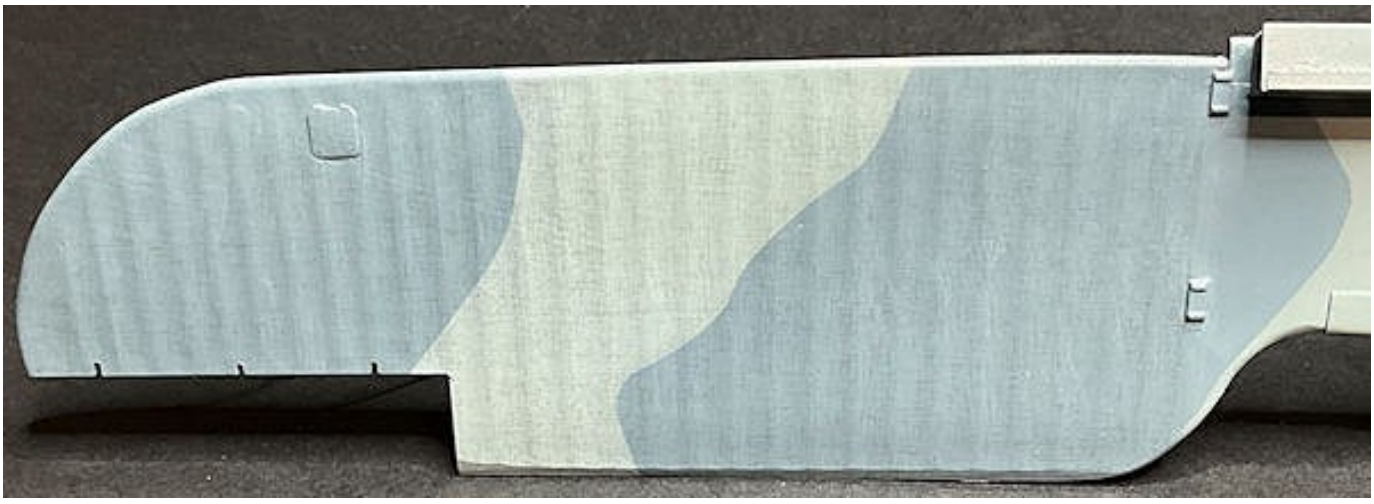
Rudder:

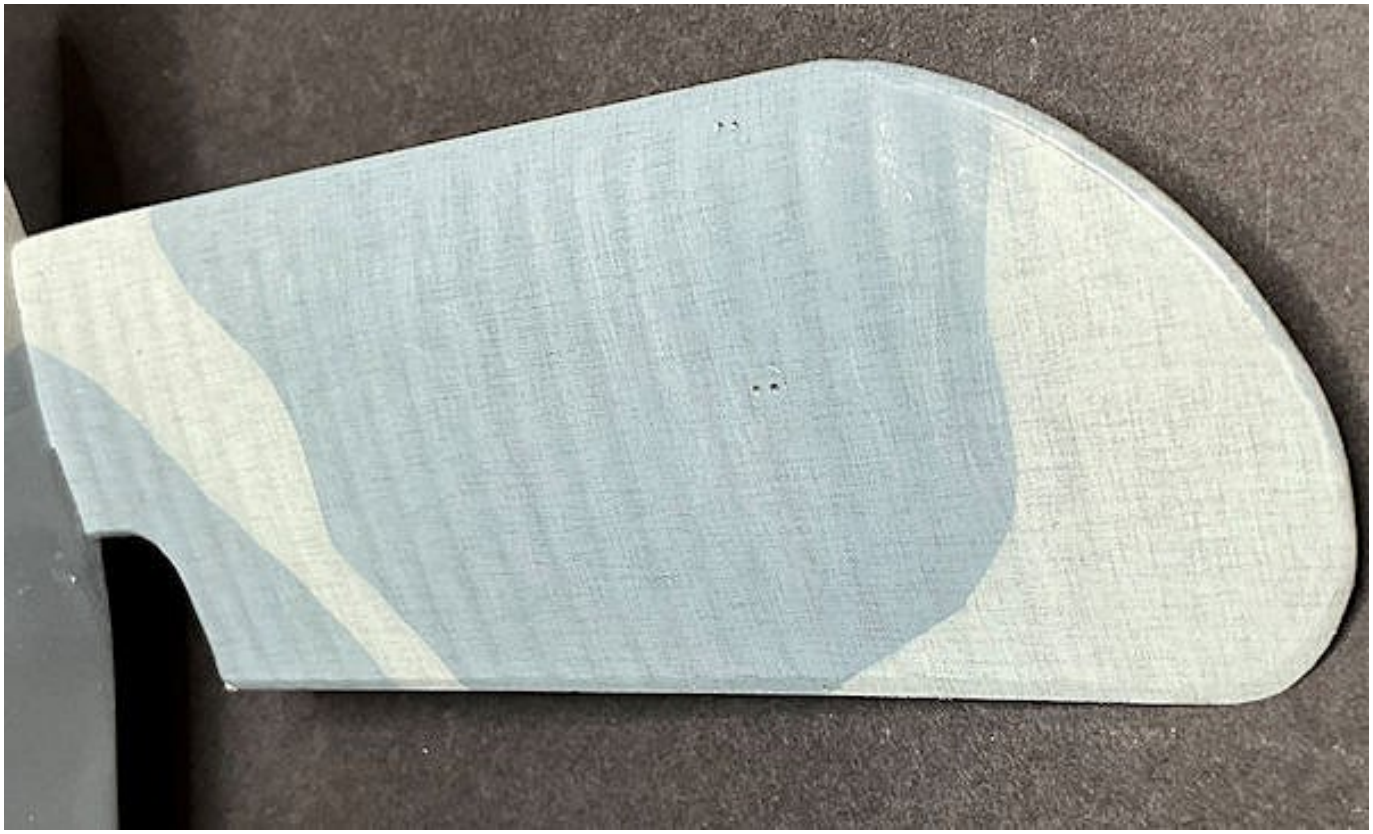
Cut out and apply decals to both sides of the rudder and cut a small slot to allow the decals to fit around the fitted control horns.

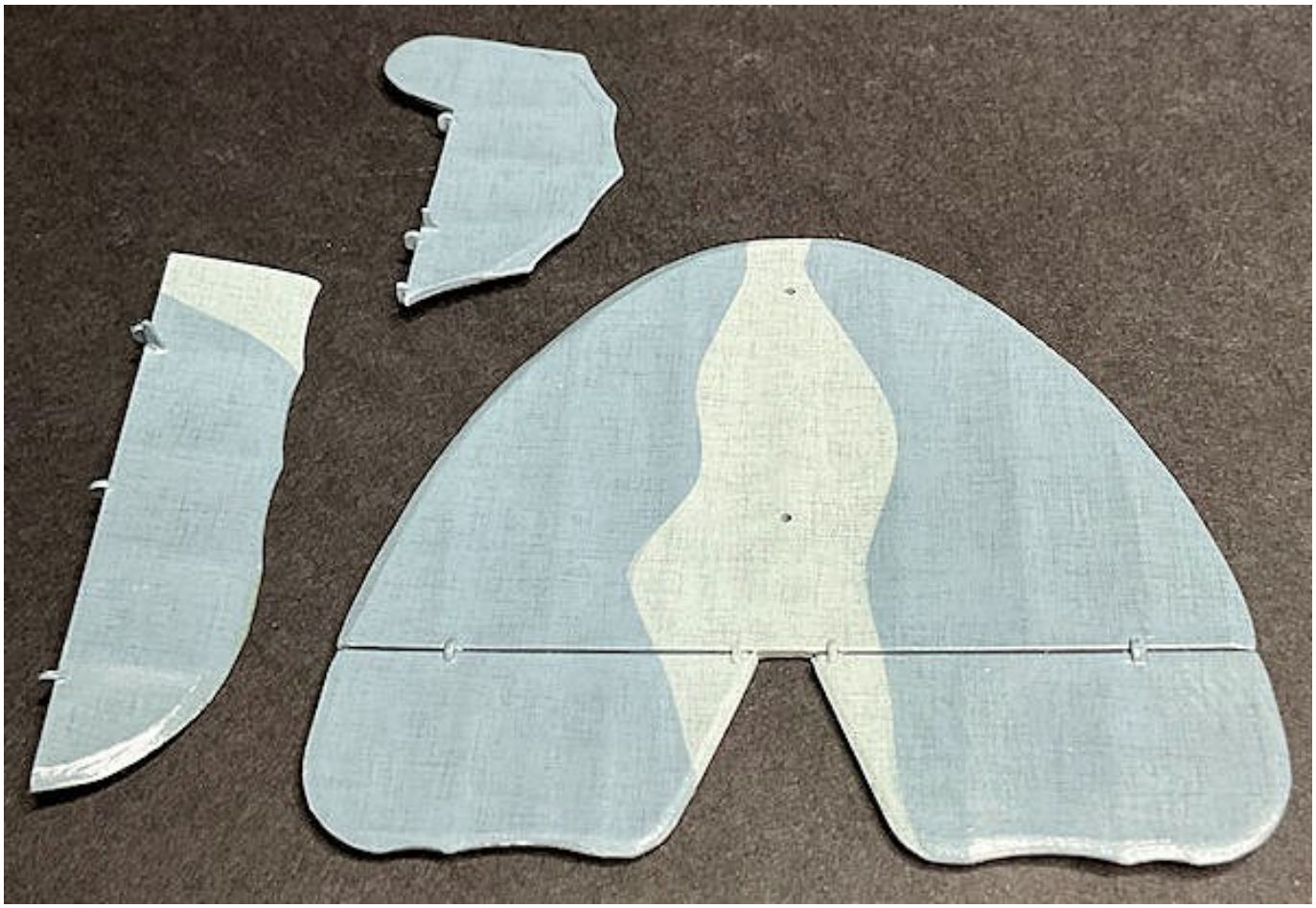
Decals can be conformed over raised detail and into pre-drilled holes, slots and around edges using 'MicroScale' MicroSol decal solution. If necessary, 'Tamiya' Acrylic thinner (X20A) applied sparingly can be used to conform decal, but using too much can melt the decal.

Once the decals have fully set, check around the edges and if necessary, carefully remove any excess decal by lightly sanding.

Seal and protect the decals by airbrushing a light coat of clear semi-gloss coat, such as 'Tamiya' Semi-Gloss (x35) or similar.







Aircraft marking decals:

NOTE: *The photographs of 121.57 and colour profile show that this aircraft had the later 'Balkenkreuz', straight-armed cross markings. The requirement to change to this type of marking was introduced during 1918, to replace the earlier 'Eisernekrueze' iron crosses. However, not all aircraft markings had been changed before the Armistice. This particular aircraft had the 'Balkenkreuz' markings applied to either side of the rudder, the top surface of the upper wing and undersides of the lower wings. Unusually, there were no such markings on the sides of the fuselage, which had just the serial number and data legend (on the left front of the fuselage). The 'Phönix' company logo was located on the forward, top of the rudder sides.*

The photographs of 121.57 with the 'Balkenkreuz' markings on were taken late in WW1 following a flying accident. Earlier, aircraft would have had the 'Cross Pattée' (Iron Cross) markings as shown on 121.27, 121.36 and 121.55. ***I chose to apply those markings rather than the later 'Balkenkreuz' markings****.*

It should be noted that the markings on the upper wing and rudder had white borders. The markings on the lower wings were black only, with no border.

Phönix serial No. 121.27

Phönix serial No. 121.36

Phönix serial No. 121.55

The kit as supplied does not have any decals at all.

The following decals were from my decal ‘spares’ collection from other built models:

‘Balkenkreuz’ markings.

Fuselage data plates.

Interplane strut serial numbers.

Rudder cable outlet surrounds (fuselage).

External compass.

The following decals were printed:

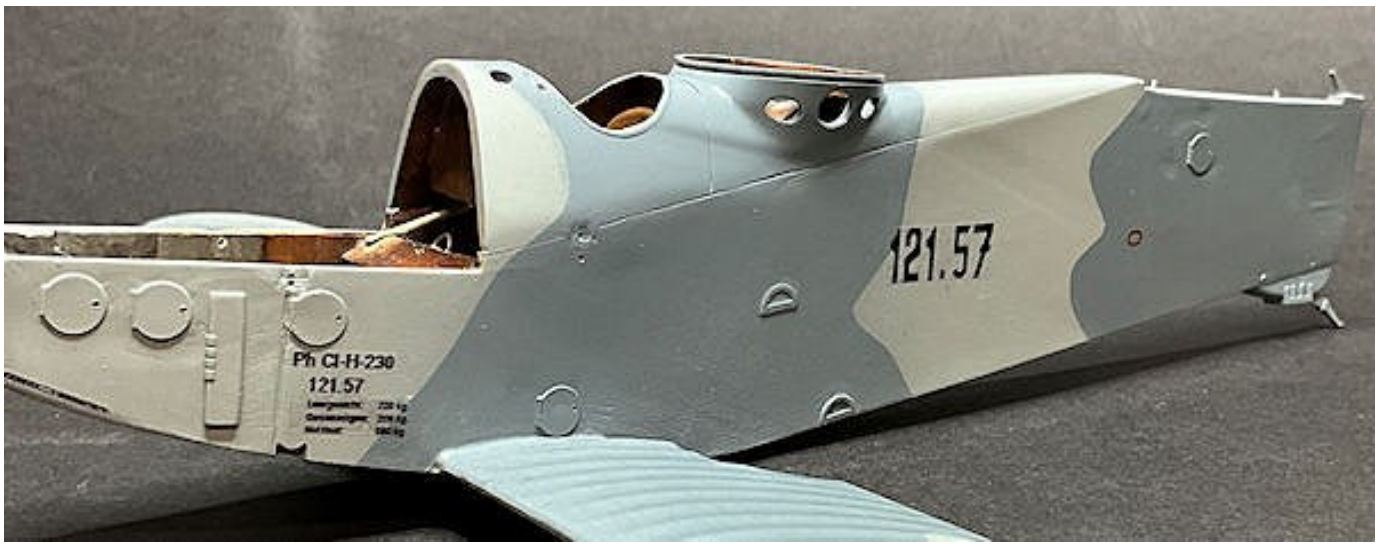
Fuselage serial numbers.

Fuselage data legend.

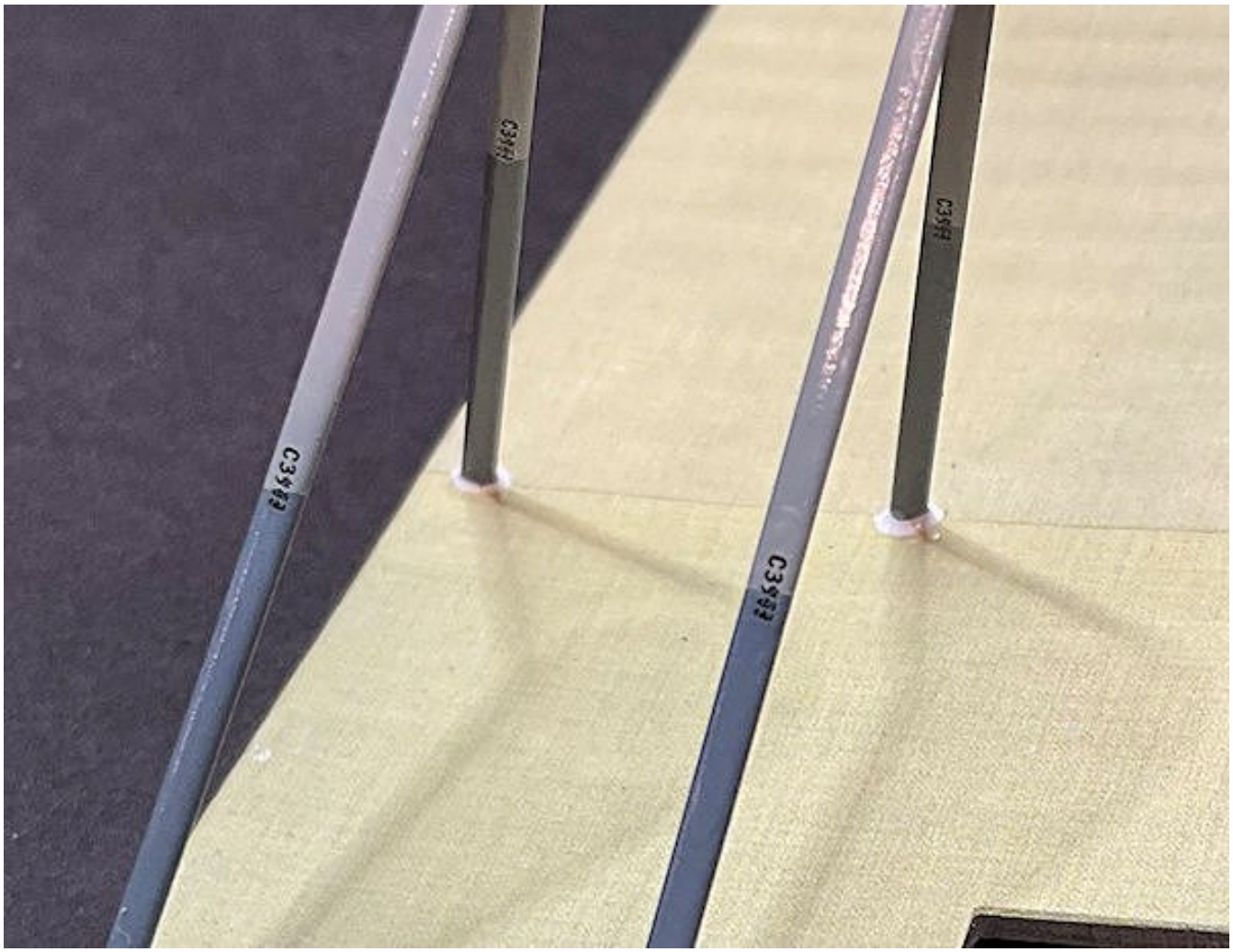
‘Phönix’ company logo (rudder).

These decals were sourced from online resources and the colour profile. These were copied then prepared in ‘Paint Shop Pro’ software and printed on ‘MDP’ clear decal paper (laser decal paper), using my Canon LBP631Cw laser printer, which means the decals do not require sealing before use, as would be the case if created on an inkjet printer. The decals were then cut out from the sheet and applied to the model.

The decals were sealed and protect by airbrushing over them with a light coat of clear semi-gloss coat, such as ‘Tamiya’ Semi-Gloss (x35) or similar.




121.57



Construction:

Engine:

NOTE: *As the mounting of the engine has been modified, I used 'Araldite' two part epoxy adhesive to secure the engine in the fuselage. This adhesive was applied using a wood tooth pick. Take care when applying as it can 'string' and set on the model surfaces.*

Mix the adhesive and apply it inside the fuselage where the mounting block locates and also add a small amount around the hole for the propeller shaft inside the nose cowl.

Secure the engine assembly in position in the fuselage, making sure it is correctly aligned. Before the adhesive sets, test fit the engine side panels to make sure they and the engine fit correctly.

Tailplane:

Scape away the decal and paint from the centre line on the underside of the tailplane and its mating surface on the fuselage.

Using the same adhesive or CA adhesive, secure the tailplane onto its locating rods added in the top, rear of the fuselage. Make sure the tailplane is fully located on the fuselage and is horizontal when viewed from the front and rear.

Engine side access panels:

Using the same adhesive or CA adhesive, secure the two engine sides panels onto the fuselage and over the engine. Make sure the panel edges align to the fuselage sides and top and that the two panels meet at the top. If necessary, use masking tape strips to temporarily hold the panels in position, taking care not to allow the tape to come into contact with any adhesive.

Any steps or mis-alignment of the panels on the fuselage or where they meet at their tops, can be rectified by sanding to align the edges. Mask off the engine and surrounding surfaces, then airbrush re-prime and re-paint the relevant areas.

Observers gun mounting ring:

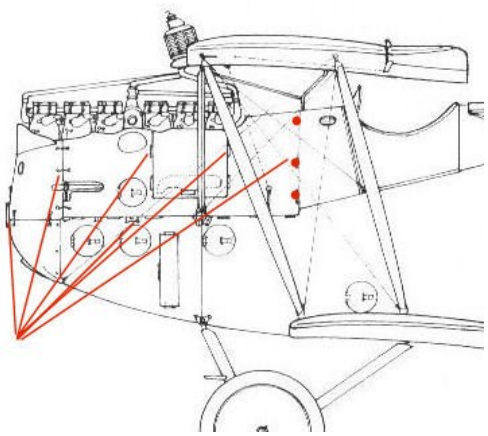
NOTE: *In the following step, the observers gun mounting ring should be located such that machine gun, when fitted into its mounting, will be at the rear or right side of the fuselage.*

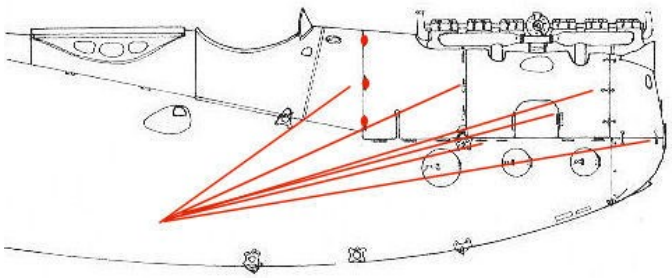
Fully locate the observers gun mounting ring into the opening in the observers cockpit and secure in position using thin CA adhesive.

Modifications (continued):

Panel fasteners:

NOTE: *Due to previous sanding around the front of the fuselage and the two engine side access panels, the original panel fasteners were removed so need to be added. The illustration indicates that panel fasteners were 'latch' types. However, I believe it's more likely that the fasteners along the rear edge of the panels to the front edge of the fuselage decking panel were circular fasteners.*





At the fasteners marked as red circles, drill holes of 0.5 mm diameter into, **but not through**, the rear edges of the two engine side panels.

Cut short and narrow strips of 0.2 mm thick plastic card to represent the remaining 'latch' type fasteners.

Using thin CA adhesive and the illustrations as guides, secure strips:

Each side of the panel on the left side panel.

Each side of the panel on the right side panel.

Along the rear edge of the middle panel on the right side panel.

Along the bottom edge of both panels.

Between the nose cowl and both side panels.

Painting (continued):

NOTE: *During the following step, the masking tape is applied onto the decal surfaces. Therefore, apply the masking tape lightly otherwise it may pull up the decal when removed.*

Carefully mask off the underside of the upper wing close to and at the edges of the centre section.

Airbrush the centre section with 'Tamiya' Medium Sea Grey 2 (RAF) (XF83).

Carefully remove the masking tape.

Detail painting:

NOTE: *To give a better surface for the following detail brush painting, airbrush the previously glossed areas with a semi-matte clear coat, such as 'Tamiya' Semi-Gloss (x35).*

Brush paint the various surface details as follows:

Access panels on upper wing underside - 'Tamiya' Medium Sea Grey 2 (RAF) (XF83).

Around base of interplane struts (upper wing) -'Tamiya' Ocean Grey 2 (RAF) (XF82).

Access panels on the underside of the fuselage - 'Tamiya' Medium Sea Grey 2 (RAF) (XF83).

Access panels on upper wing top surface -'Tamiya' Ocean Grey 2 (RAF) (XF82).

Radiator - Ocean Grey 2 (RAF) (XF82), 'Mr. Colour' Brass (219) cap.

Added fuselage panel fasteners - 'Tamiya' Medium Sea Grey 2 (RAF) (XF83) or Ocean Grey 2 (RAF) (XF82) as applicable.

Tail skid - Mounting block 'Tamiya' NATO Brown (XF68), skid 'Tamiya' Desert Yellow (XF59), metal fittings 'Mr. Colour' Stainless Steel (213).

Crew step surrounds - 'Mr. Colour' Stainless Steel (213).

Pilots cockpit surround padding - 'AK Interactive' Brown Leather (AK3031).

Aileron and rudder control horns - 'Tamiya' Rubber Black (XF85).

Pilots windscreen surround frame - 'Tamiya' Medium Sea Grey 2 (RAF) (XF83) or Ocean Grey 2 (RAF) (XF82) as applicable.

Construction (continued):

Using thin CA adhesive, secure the previously created metal mesh in position on the rear of the radiator on the upper wing.

Cut a short length of 0.4 mm diameter Brass rod, such as that from 'Albion Alloy's.

Bent the rod to 90 degrees.

Drill a hole of 0.5 mm diameter centrally down into the radiator filler cap.

Using thin CA adhesive, secure the rod into the pre-drilled hole, making sure the bent end faces forwards.

Weathering:

NOTE: *Refer to Part 3 (Weathering) of this build log. At this stage it's easier to apply weathering to the model parts before further assembly of the model.*

Airbrush a light sealing/protection semi-matt clear coat, such as 'Tamiya' Semi-Gloss (X35) or similar over the upper wing, fuselage, lower wings, tailplane, ailerons, rudder and landing gear. .

Apply your weathering effects medium of all surfaces of the parts. I used 'Flory Models' Dark Dirt clay wash then, once dry, removed the wash to achieve the desired effects.

Seal the applied weathering by airbrushing a light semi-matt clear coat, such as 'Tamiya' Semi-Gloss (X35) or similar over the parts.

Brush the radiator rear mesh with 'AK Interactive' Kerosene wash (AK2039).

Apply 'Tamiya' Weathering Master (Set A) Mud along the bottom edges of the fuselage.

Apply 'Tamiya' Weathering Master (Set D) Oil Stain behind the radiator and under fuselage access panel.

Use a 'Prismacolour' Verithin Metallic Silver pencil (753) to add worn paint effects on the hinges and lock fasteners of access panels.

Create mud splatter from the landing gear wheels on the underside of the lower wings, by 'flicking' 'Flory Models' Grime wash from a brush. Once dry, any unwanted Grime can be removed with a damp brush.

Construction (continued):

Pilots windscreen:

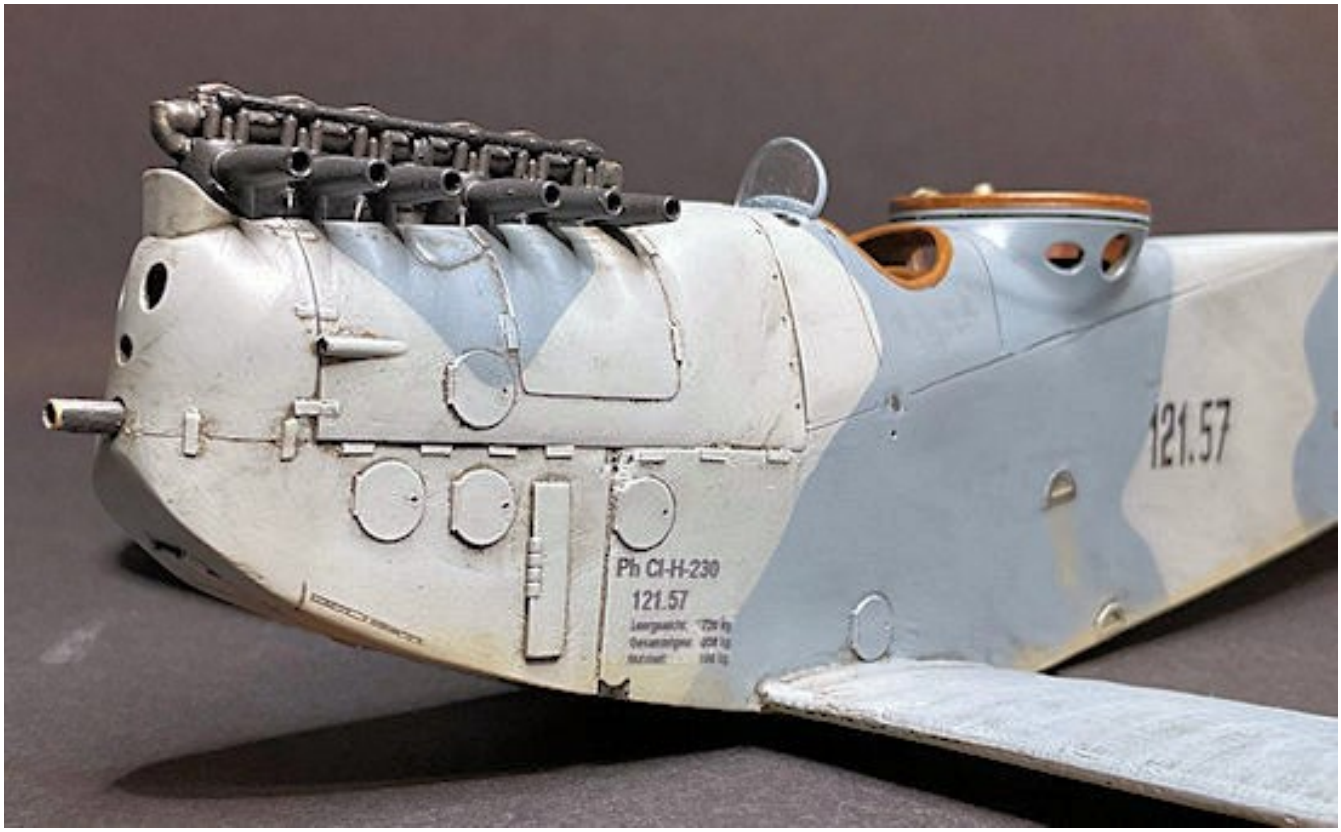
NOTE: *The pilots windscreen is fitted at this stage as it avoided it being contaminated with the previous airbrushed clear coats.*

Using PVA adhesive (white glue) secure the pilots windscreen in position on the fuselage decking panel.

Decking panel windows:

Carefully fill the pre-drilled recess at each side of the pilots windscreen with a clear resin and allow it to fully set. If available, use a Ultra-Violet (UV) light source to set the resin quicker.

The following photographs show the model parts at this stage of the build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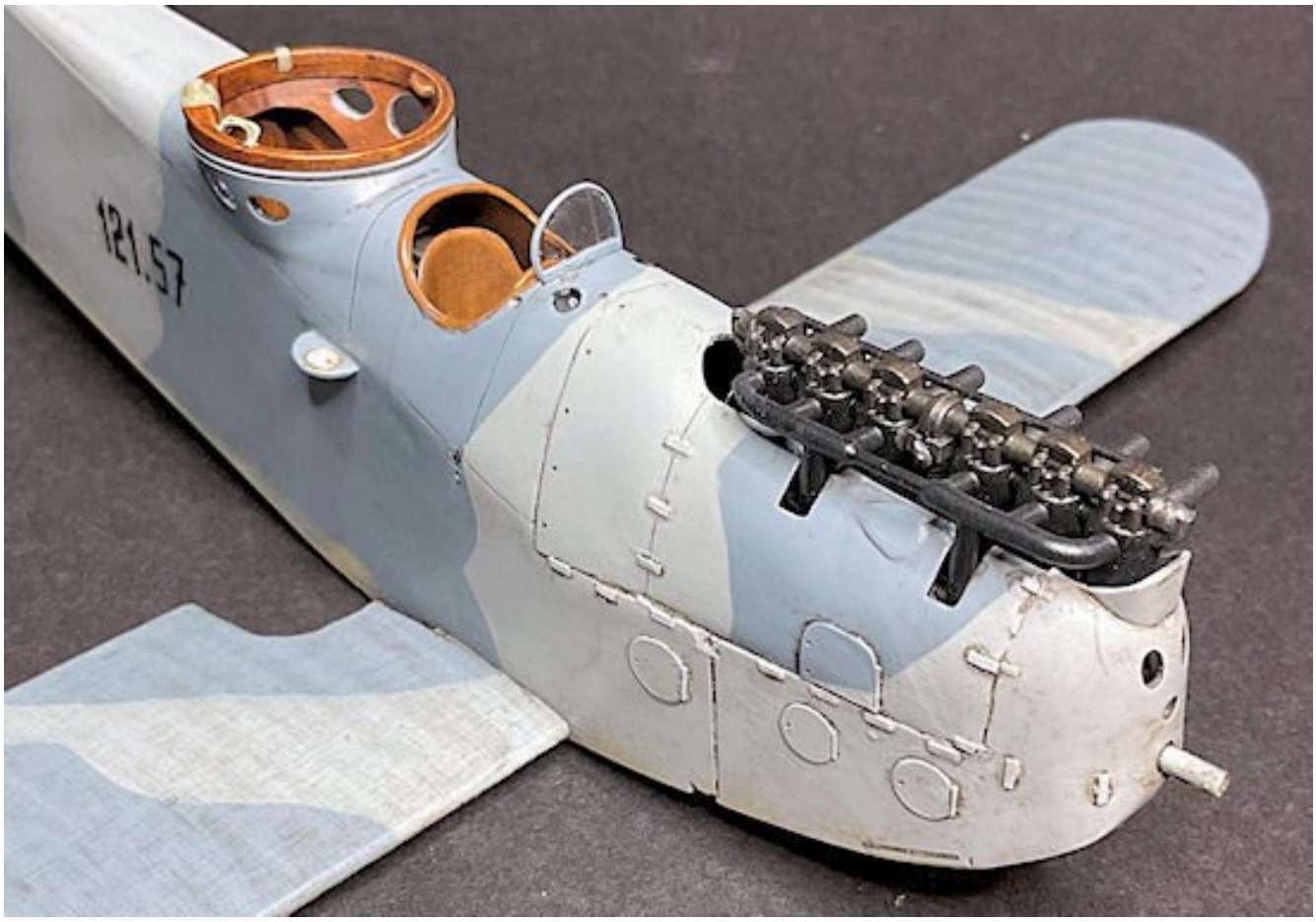
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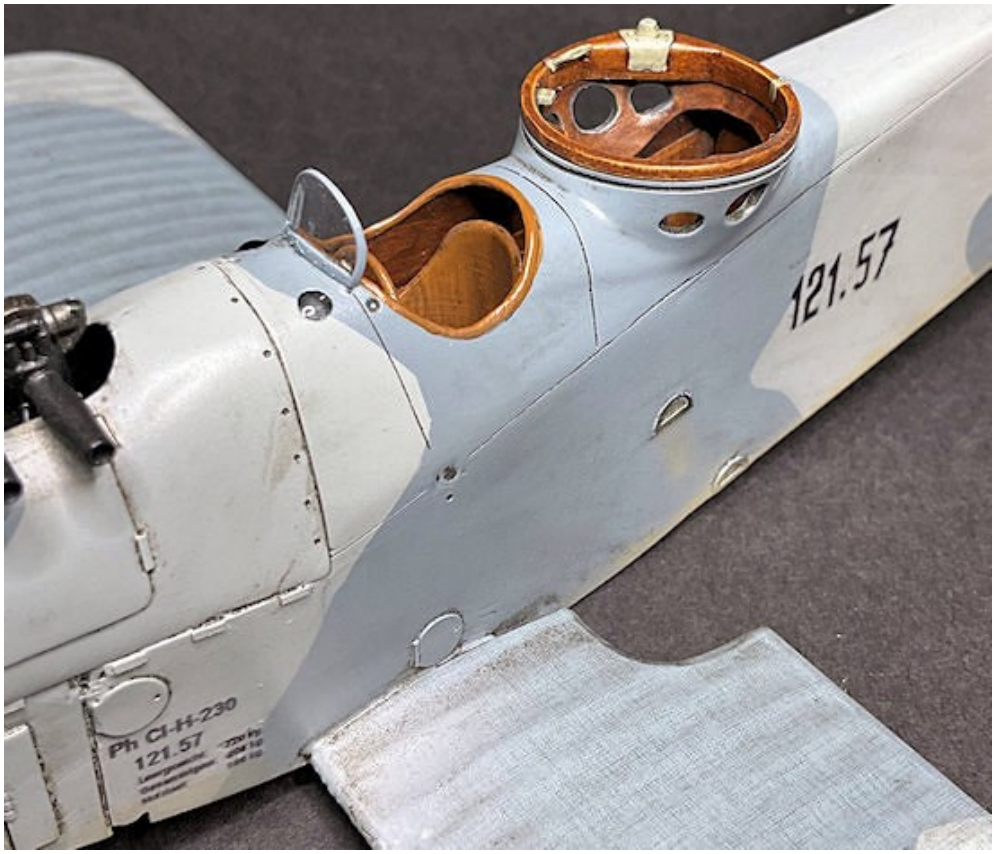
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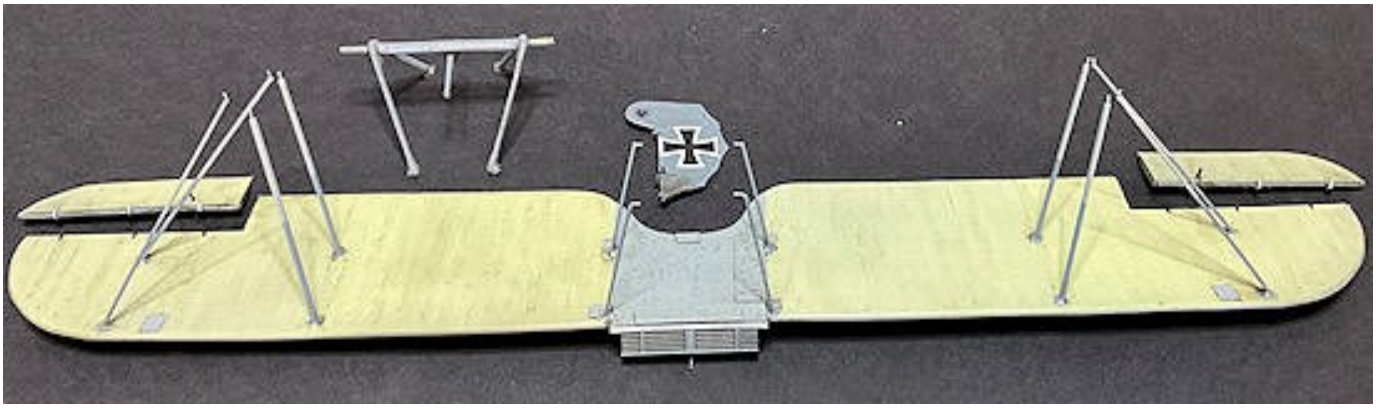
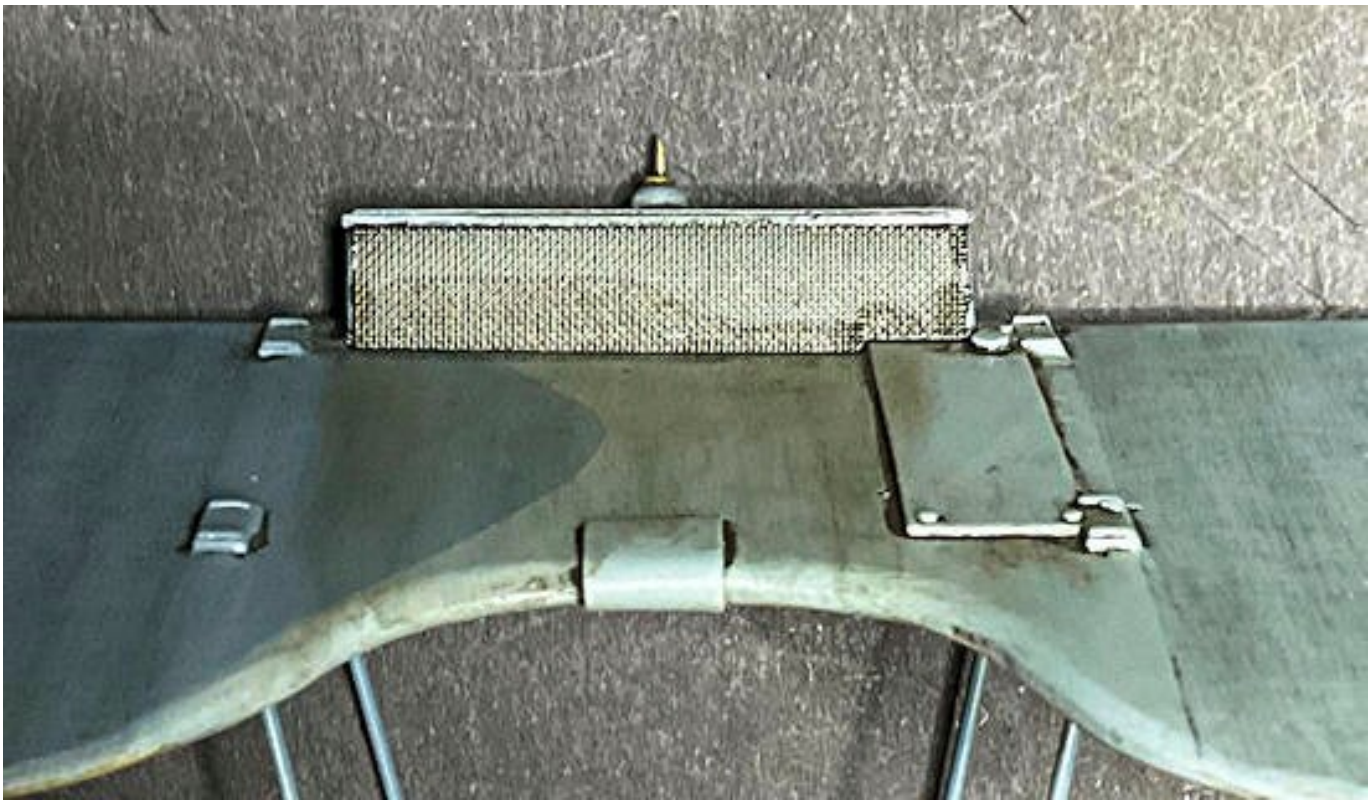
121.57





Modifications (continued):

Landing gear suspension:

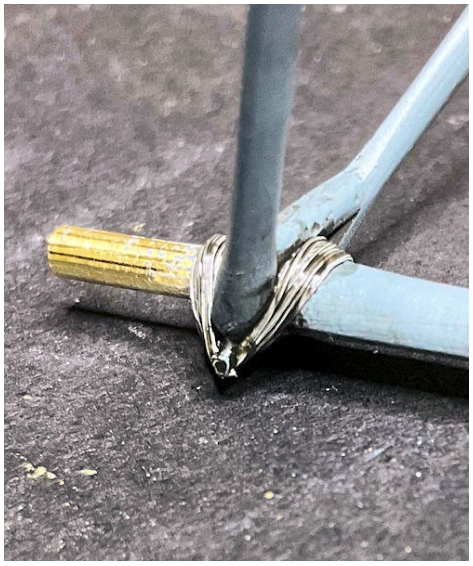
NOTE: *Photographs of these aircraft I have seen do not show clearly the type of suspension for the landing gear. However, an original photograph of the prototype aircraft shows traditional 'bungee' type suspension cord, wrapped over the axle and around bars fitted into the leading and trailing edges at the bottom of the landing gear struts.*

To represent the wrapping bars in the landing gear struts, I drilled holes of 0.5 mm diameter into the bottom leading and trailing edges of the landing gear struts. The holes were drilled at a slight upward angle.

I cut short lengths of 0.5 mm diameter Brass rod, such as that from 'Albion Alloy's, and secured them into the pre-drilled holes in the struts.

'EZ' stretch white line (Heavy) was then wrapped around the added bars and over the axle several times and secured in place using thin CA adhesive.

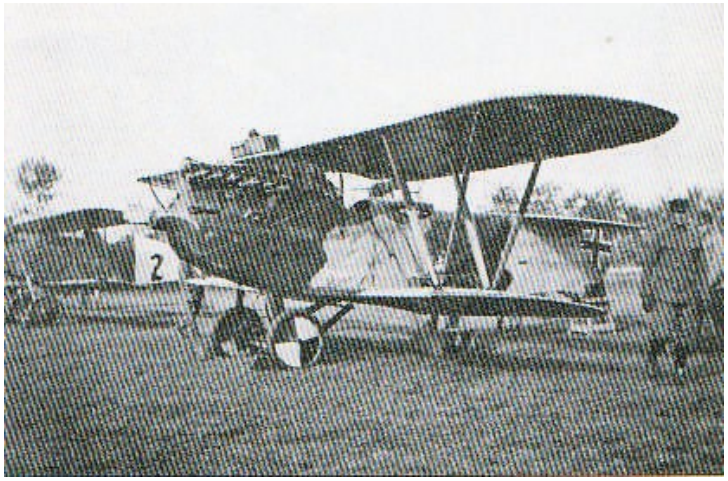
AK Interactive' Kerosene (AK2039) wash was then brushed over the lines to weather them.



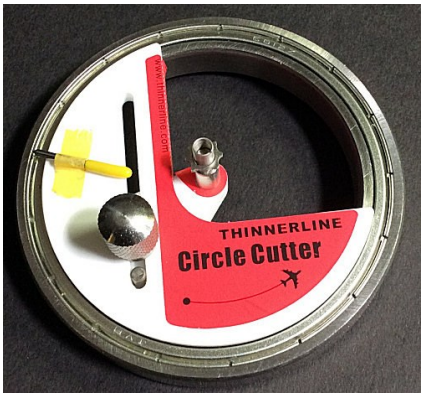
Painting (continued):

Landing gear wheels:

NOTE: *The wheel outer covers on Flik 57/Rb (Reihenbildaufklarerkompagnie photo reconnaissance unit specializing in serial photography), were painted as quartered black and white.*



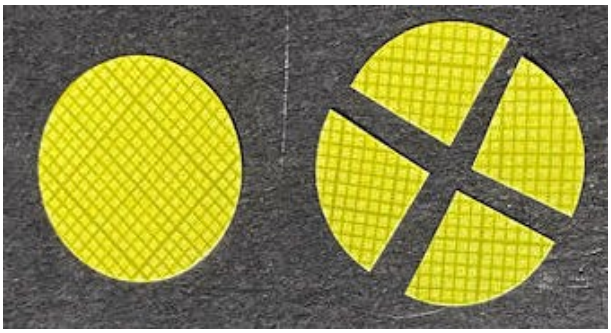
NOTE: *To cut accurate circles, I used a 'ThinnerLine Circle Cutter', although other types are available.*



Using the circle cutter, cut out a disc from paper to cover the front wheel covers on the wheels, until the correct size is achieved.

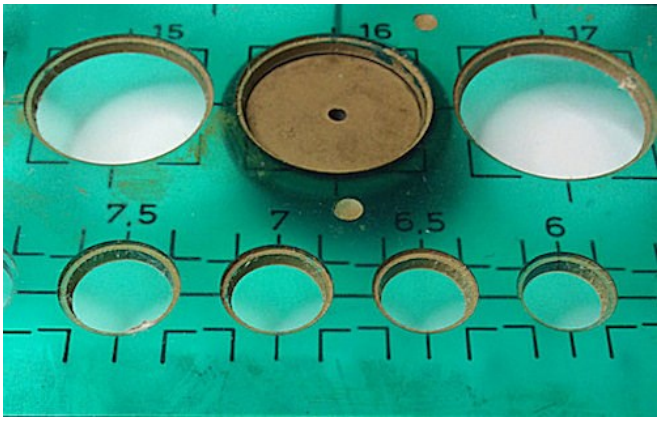
Using the settings on the circle cutter, cut from 'Tamiya' masking sheet or similar, a front cover disc.

Cut the masking disc into quarters, to allow masking when painting the outer wheel covers.



Airbrush the tyres on the wheels with ‘Tamiya’ Neutral Grey (XF53) or similar.

NOTE: *To airbrush the internal faces of the wheels without over spraying the surrounding tyres, I use a circle drawing tool (Linex 1217 T). I selected the correct size of hole and position the wheel face under the hole.*



Using the ‘Linex’ to cover the tyres, airbrush the front and rear wheel covers with ‘Tamiya’ White (XF2) or similar.

Apply the quartered masks onto the front wheel covers and opposite each other (point to point).

Using the ‘Linex’ to cover the tyres, airbrush the exposed white quarters on the front wheel covers with ‘Tamiya’ Rubber Black (XF85) or similar.

Remove the quartered masks.

Decals (continued):

Rear wheel covers:

Using the circle cutter, cut out a disc template from paper to cover the rear wheel covers on the wheels, until the correct size is achieved (allowing for any curved surface of the covers).

Point mark the centre of the template discs.

Using the mark as a guide, drill a hole through the template disc of 2.5 mm diameter, to allow the template to fit over the axle ends.

NOTE: *The paper template will not fully conform over the wheel cover as it will be stiffer than decal. However, it should fit enough to gauge if the cut decal will fit correctly.*

Test fit the template, as far as possible, over the wheel rear covers making sure the disc edges are at the tyre edges and the edges of the cut slot meet.

Using the settings on the circle cutter, cut from ‘Aviattic’ WW1 CDL (aged varnish) (ATT32094) decal sheet, two rear covers.

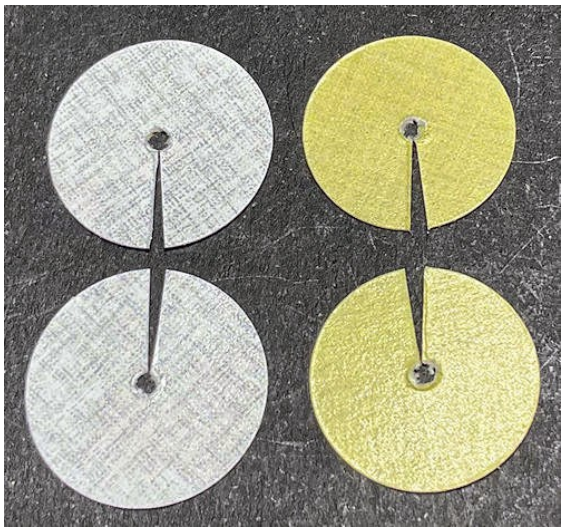
Point mark the centres of the two decal discs.

Using the marks as a guide, drill a hole through the decal discs of 2.5 mm diameter, to allow the decals to fit over the axle ends.

If necessary, cut a narrow ‘V’ slot from the centre of the two decal discs for the rear covers, to allow the decal to conform over the curved shape of the covers.

Front wheel covers:

Using the same procedure, create two front cover decals, but from ‘Aviattic’ Linen Weave effect (ATT32236) decal sheet.



Application:

***Refer to Part 4 (Decals)** of this build log for guidance for the application of ’Aviattic’ decals.*

Apply the cut ‘Aviattic’ WW1 CDL (aged varnish) (ATT32094) decals to the wheel rear covers.

Apply the cut ‘Aviattic’ Linen Weave effect (ATT32236) decals to the wheel front covers.

The following photograph shows the wheels test fitted

Weathering:

NOTE: *Refer to Part 3 (Weathering) of this build log for information.*

Brush apply ‘Flory Models’ Clay washes over the wheels and landing gear struts, allow to dry then remove to achieve your desired weathered effects. I chose to use the ’Flory Models’ Grime wash.

Using the ‘Linex’ to cover the tyres, airbrush a semi-gloss clear coat, such ‘Tamiya’ Semi-Gloss (x35) or similar over the wheel covers.

If desired, sponge ‘Tamiya’ Weathering Master Set (Mud) around the tyres.

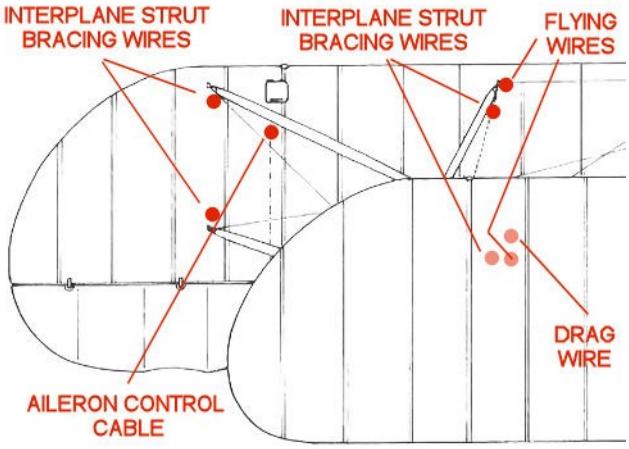
Rigging preparation:

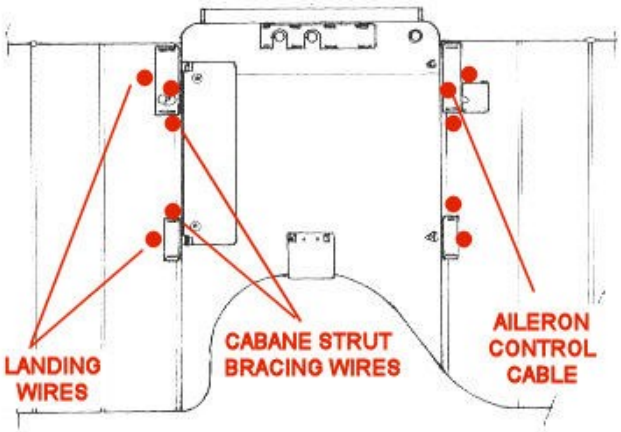
NOTE: *Refer to Part 11 (Rigging) of this build log for rigging information.*

Upper wing underside:

Drill holes of 0.4 mm diameter into, **but not through**, the underside of the upper wing, as shown on the following illustration. Aileron control cable holes in outer wing sections are 0.3 mm diameter.

NOTE: *The holes should be drilled at the approximate angles that will align the control cable and rigging lines (when fitted) to their opposite end locations.*





Upper wing top surface:

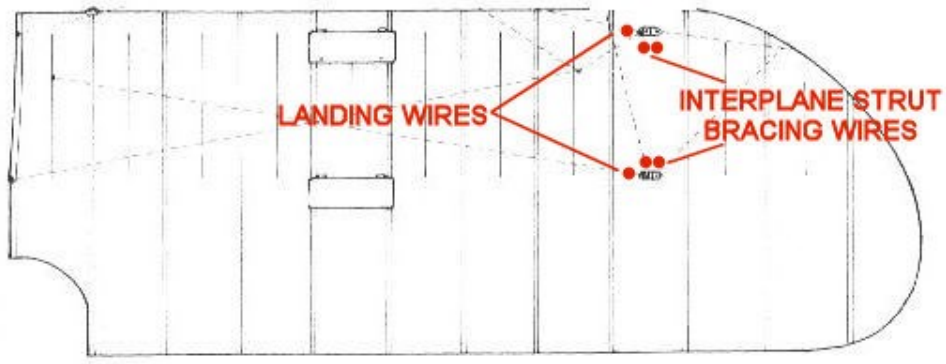
Drill holes of 0.3 mm diameter into, **but not through**, the top surface of the upper wing, as shown on the following illustration.

NOTE: *The holes should be drilled at the approximate angles that will align the control cables (when fitted) to their opposite end locations.*

Lower wings top surfaces:

Drill holes of 0.4 mm diameter into, **but not through**, the top surfaces of the lower wings, as shown on the following illustration.

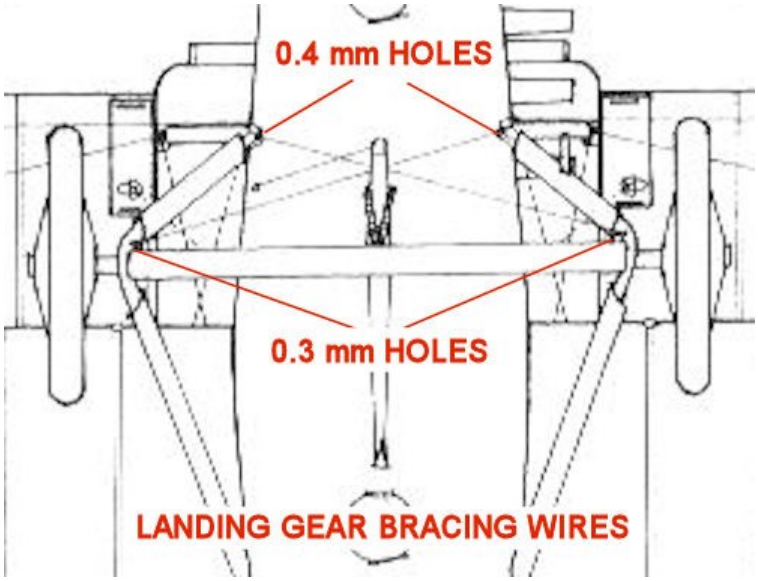
NOTE: *The holes should be drilled at the approximate angles that will align the rigging lines (when fitted) to their opposite end locations.*



Fuselage underside and landing gear:

Drill holes of 0.3 and 0.4 mm diameter into the underside of the fuselage, as shown on the following illustration.

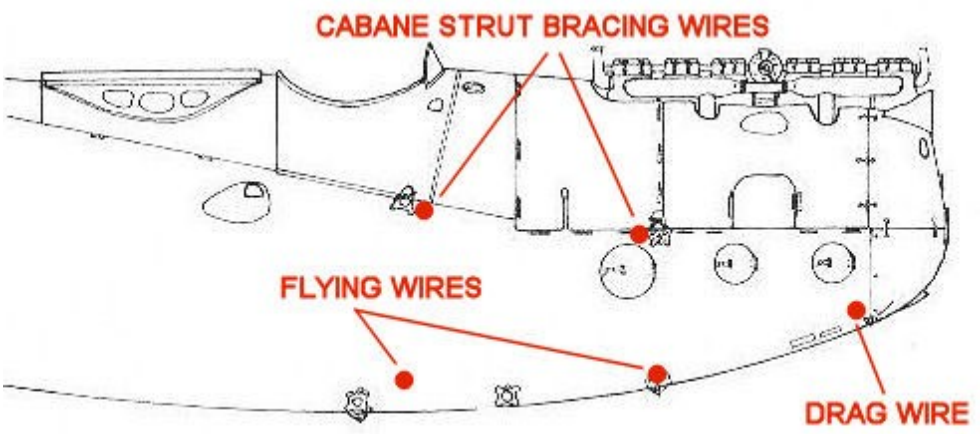
NOTE: *The holes should be drilled at the approximate angles that will align the rigging lines (when fitted) to their opposite end locations.*



Fuselage:

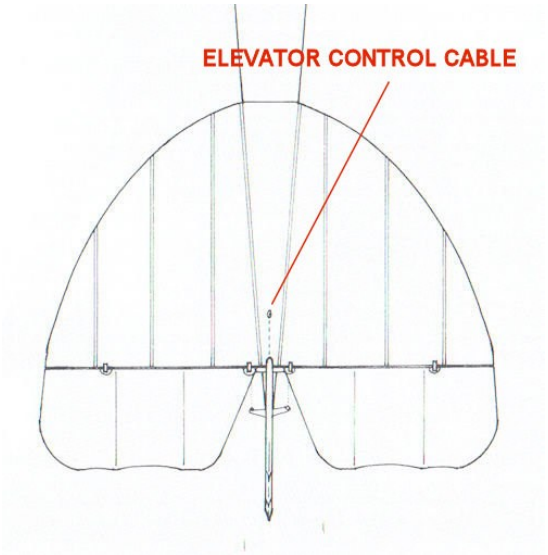
Drill holes of 0.3 mm diameter into the sides of the fuselage, as shown on the following illustration.

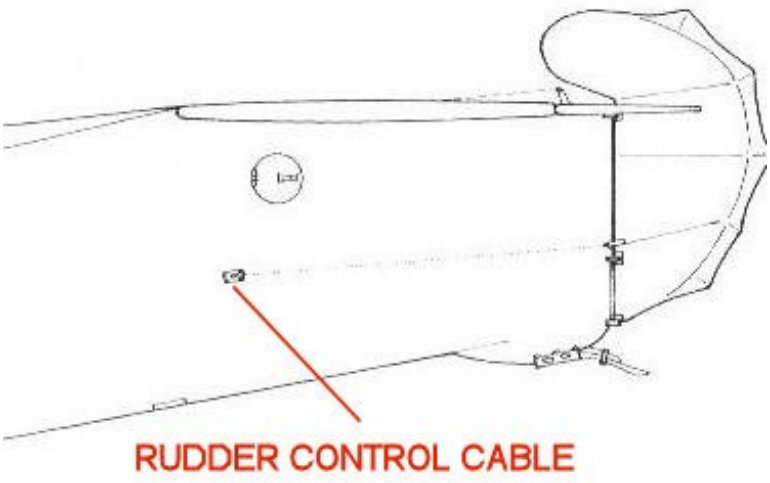
NOTE: *The holes should be drilled at the approximate angles that will align the rigging lines (when fitted) to their opposite end locations.*



NOTE: *To 'chain' drill a slot, drill several holes inline, then angle the drill to drill out any material remaining between the holes.*

Chain drill slots for the elevator and rudder control cables, using a 0.7 mm diameter drill, as shown in the following illustrations.





Pre-rigging:

NOTE: *At this stage of the build it's best to pre-rig the model parts as this makes it easier to final rig the assembled model. The **'structural'** pre-rigging uses the following materials:*

'Albion Alloy's' 0.5 mm diameter Brass (MBT05) or Nickel-Silver micro-tube (NST05) or similar.

'Steelon' or 'Stroft GTM' 0.12 mm diameter mono-filament (fishing line).

'Gaspatch' 1/48th scale metal Anchor Points.

Anchor points:

Check that the 'eye' end of each Anchor Point is clear of metal deposits. If necessary, carefully drill out the eye end using a 0.2 mm diameter drill.

NOTE: *Refer to the previous illustrations for the pre-drilled hole locations.*

Using thin CA adhesive, secure an Anchor Point into each of the following pre-drilled holes. The 'eye' ends of the Anchor Points should parallel (inline) with the fuselage.

Fuselage sides - cabane strut bracing wires.

Upper wing underside - rear and forward flying wires.

Upper wing underside - rear and forward landing wires.

Upper wing underside - drag wires.

Upper wing underside - aileron control cable (above fuselage).

Upper wing underside - interplane struts bracing wires.

Check the eye end is clear of adhesive. If necessary, carefully clear any adhesive using a 0.2 mm diameter drill.

Attaching structural rigging lines:

NOTE: *For **each of the Anchor Points** fitted, use the following procedure to add a longer than necessary, structural pre-rigged line.*

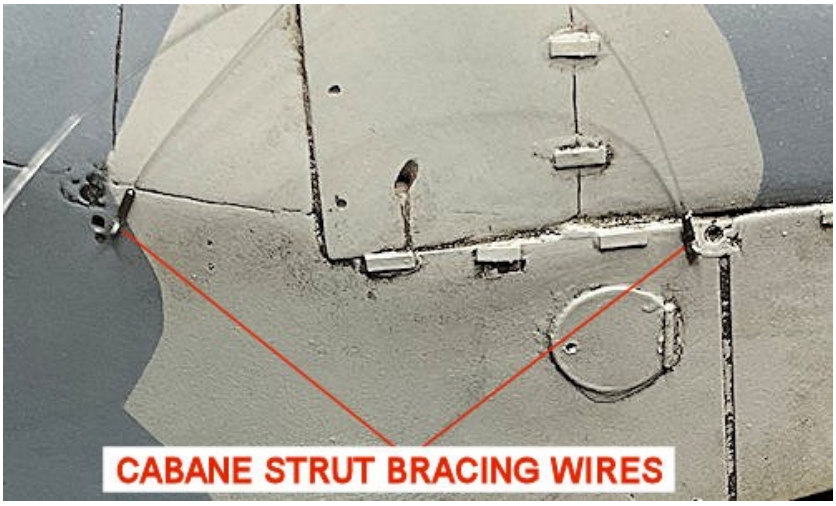
Cut a short length of 0.5 mm diameter tube.

Deburr the tube ends by running a 0.3mm diameter drill through the tube.

NOTE: *Nickel-Silver or Brass tube can be chemically blackened by immersion in solutions such as 'Blacken-It' or similar.*

Blacken the tube to reduce its metallic sheen.

NOTE: *Refer to the model parts and always **cut the length of required line much longer than needed** to span between its attachment points. This allows for easier attachment of turnbuckles and attachment during the final rigging stage.*



Cut a length of 0.12 mm diameter mono-filament, such as that from 'Steelon' or 'Stroft GTM'.

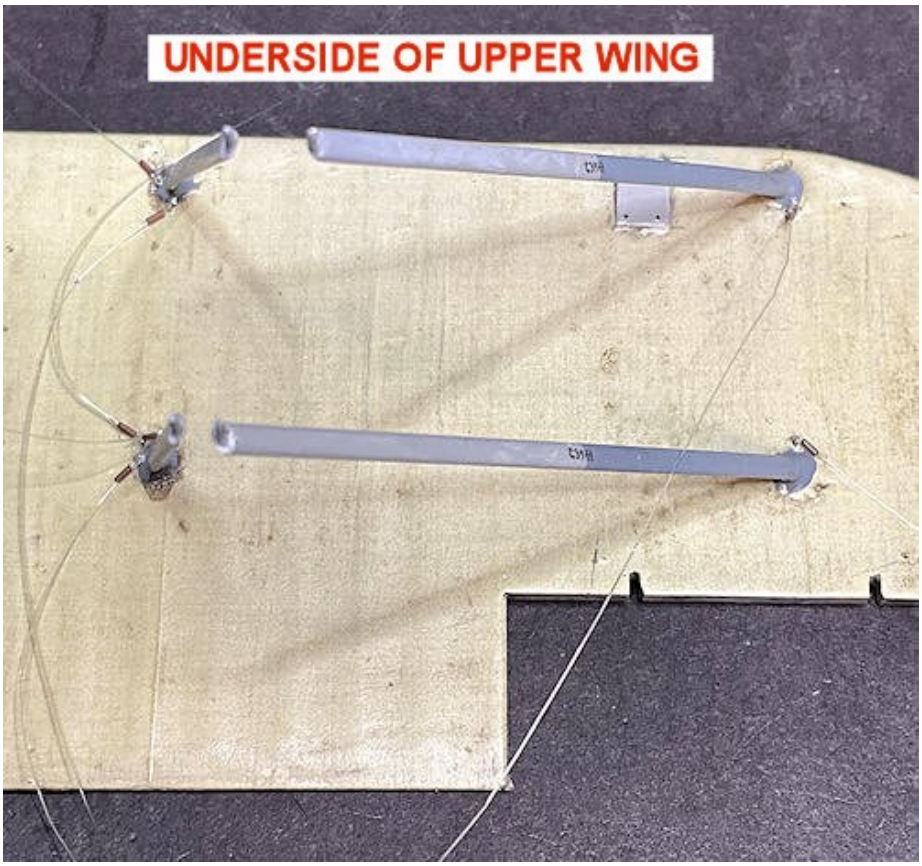
Pass the line through the tube, then through the 'eye' end of the Anchor Point.

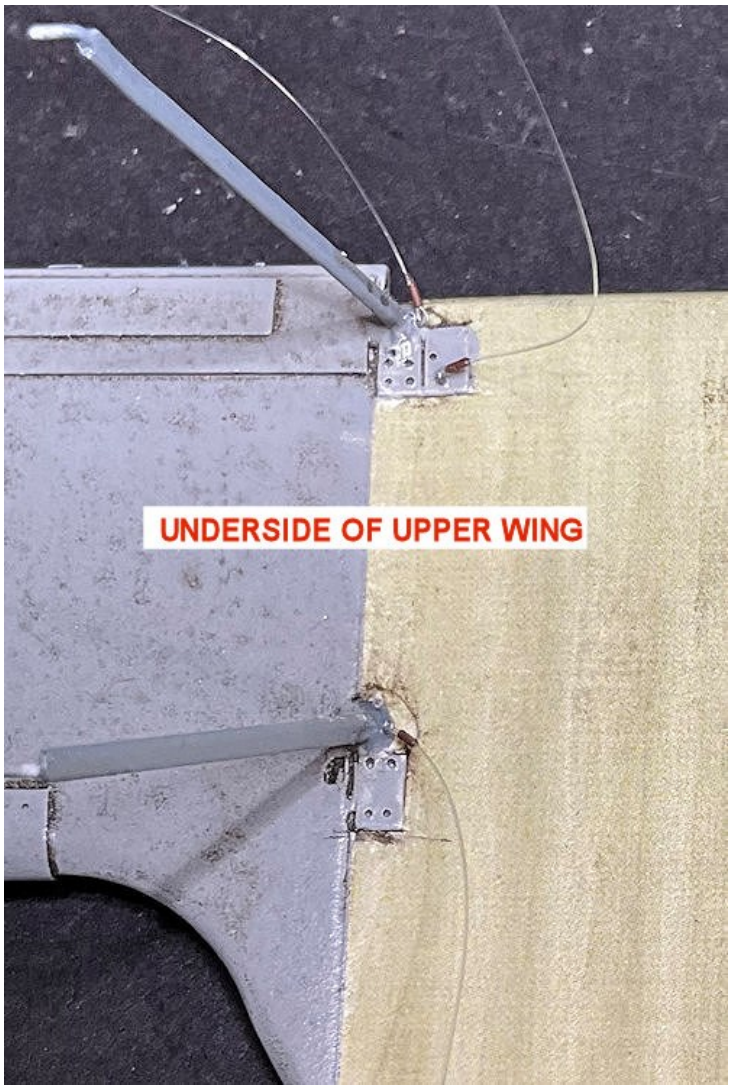
Loop the line back and through the tube.

Slide the tube up to, **but not touching**, the 'eye' end of the Anchor Point.

Using thin CA adhesive, secure the lines in the tube end away from the Anchor Point.

Cut away any residual tag of line at the tube end.

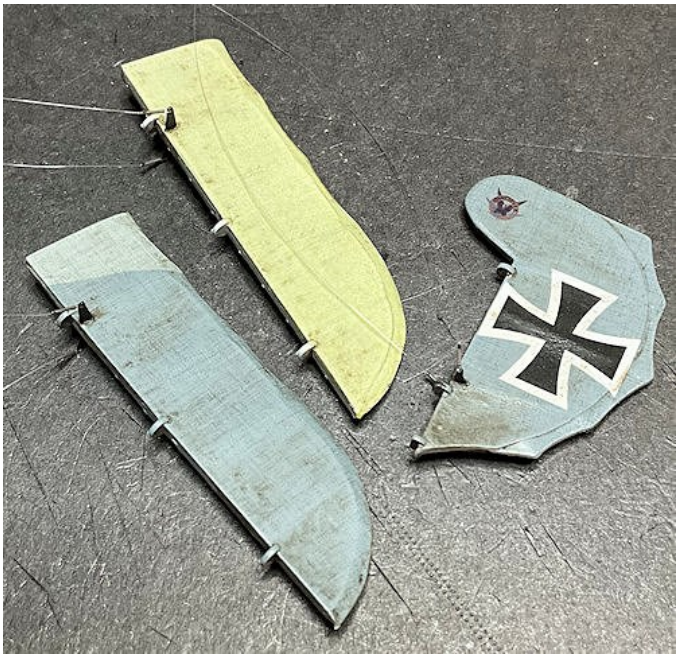

UNDERSIDE OF UPPER WING

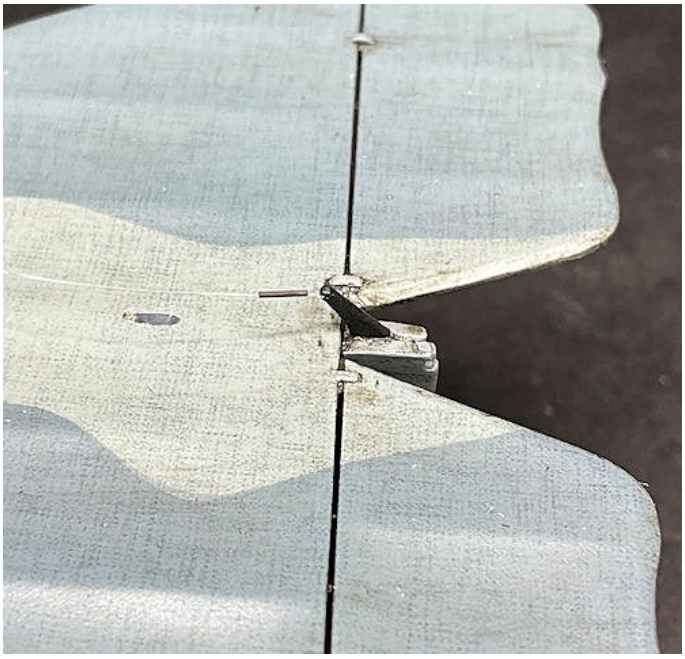

UNDERSIDE OF UPPER WING

Attaching control cables:

NOTE: *During the following step, use 0.4 mm diameter 'Albion Alloy's' Brass (MBT04) or Nickel-Silver micro-tube (NST04) or similar and 'Stroft GTM' 0.08 mm diameter mono-filament.*

Using the previous procedure, attach control lines to the pre-drilled holes in the end of the control horn fitted for the elevator and both sides of the control horns fitted to the rudder and both ailerons.





Construction (continued):

Landing gear:

Make sure all paint and weathering is removed from the tops of the landing gear struts and their locating recesses in the bottom edges of the fuselage.

Secure the landing gear fully onto the fuselage, using CA adhesive.

Upper wing:

NOTE: *When fitting the upper wing, the interplane struts **should not** be secured into their locating holes until the wings have been fully rigged. If they are secured into the lower wings with CA adhesive before rigging is completed, the rigging locating holes in the lower wings (close to the strut locating holes) will be contaminated with adhesive and can't easily be drilled out.*

Make sure the locating rods in the lower wing ends of the interplane struts are free of paint. If necessary, carefully scrape away any paint residue.

Make sure the locating holes in the lower wings for the interplane struts are free of paint. If necessary, drill out (without drilling through the wings) any paint residue with a 0.5 mm diameter drill.

Make sure the locating holes in the fuselage sides for the cabane struts are free of paint. If necessary, drill out (without drilling through the wings) any paint residue with a 0.5 mm diameter drill.

NOTE: *In the following step, apply the masking tape strips **lightly** onto the upper wing, to avoid lifting or damaging the applied decal on the wing surface.*

Keep the pre-rigged lines on the upper wing clear of the struts locations on the lower wings by using thin strips of masking tape to hold the lines on the underside or top surface of the upper wing.

NOTE: *Although the interplane and cabane struts are made from Brass tube and rod, they can still be damage if mishandled. During the following step, take care to not bend or dislodge the cabane and interplane struts.*

Position the upper wing over the fuselage/lower wings and carefully lower it over the fuselage, making sure the four cabane struts are as clear of the fuselage sides as possible.

Fully locate the cabane strut locating rods into their pre-drilled holes in the fuselage sides.

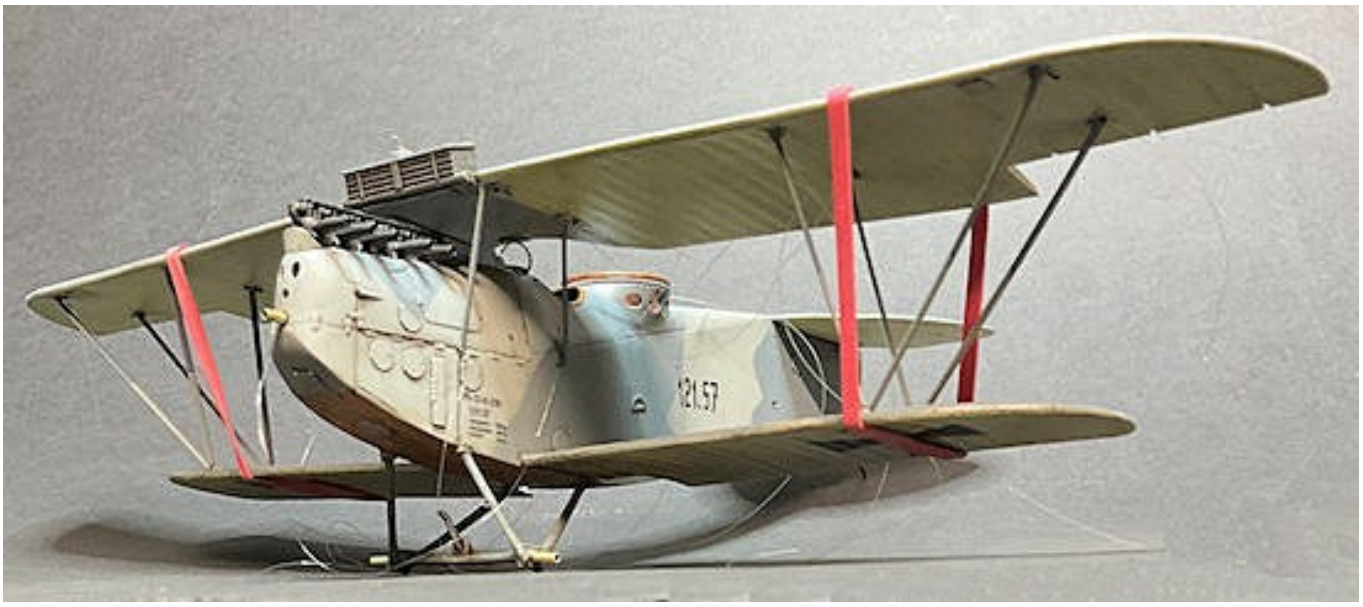
Fully locate the interplane struts into their pre-drilled locating holes in the **left or right** lower wing.

To keep the interplane struts fully located, hold the upper and lower wings on that side together using elastic bands.

Fully locate the interplane struts into their pre-drilled locating holes in the opposite lower wing.

To keep the interplane struts fully located, hold the upper and lower wings on that side together using elastic bands.

Remove the masking strips to release the pre-rigged lines.



Final rigging:

NOTE:

The final rigging stage uses the uses the following materials:

'Albion Alloy's' 0.5 mm diameter Brass (MBT05) or Nickel-Silver micro-tube (NST05) or similar.

'Gaspatch' 1/48th scale metal Turnbuckles (Type A).

The located interplane struts will be secured in the lower wings after the final rigging is completed.

NOTE: *Refer to Part 11 (Rigging) of this build log for rigging information and to the previous illustrations for the pre-drilled hole locations. For* ***each of the Type A turnbuckles*** *fitted, use the following procedure.*

Prepare a 'Gaspatch' 1/48th scale metal Turnbuckles (Type A) and brush paint its centre barrel with 'Mr. Colour' Copper (215) mixed with Dark Iron (214) or similar to a ratio of approximately 60/40%.

Cut a short length of 0.5 mm diameter tube.

Deburr the tube ends by running a 0.3mm diameter drill through the tube.

NOTE: *Nickel-Silver or Brass tube can be chemically blackened by immersion in solutions such as 'Blacken-It' or similar.*

Blacken the tube to reduce its metallic sheen.

Pass a pre-rigged line through the tube, then through the 'eye' end of the Type A turnbuckle.

Loop the line back and through the tube.

Fully locate the ‘leg’ of the turnbuckle into the relevant pre-drilled hole for that pre-rigged line.

Make sure the turnbuckle is aligned to the opposite end Anchor Point. If the turnbuckle is slightly misaligned, it can be carefully bent to align. However, too much and it can snap, leaving the ‘leg’ of the turnbuckle still secured in the model and drilling a new location hole would be extremely difficult.

Using thin CA adhesive, secure the turnbuckle in its locating hole.

Gently pull the tag end of the line at the tube to tighten the line.

Keeping the line taut, slide the tube up to, **but not touching**, the ‘eye’ end of the turnbuckle.

Using thin CA adhesive, secure the lines in the tube end away from the Anchor Point.

Cut away any residual tag of line at the tube end.

Structural rigging:

NOTE: *The easiest order to final rig the lines is as follows.*

Fuselage sides - cabane strut bracing wires.
Fuselage sides - aileron control cables.
Inner interplane struts bracing wires.
Outer interplane struts bracing wires.
Rear and forward landing wires.
Rear and forward flying wires.
Fuselage drag wires.

Rigging - tensioning:

Invariably during rigging using mono-filament, some completed lines may be slack. This can be remedied by careful application of heat along the line, but preferably only once all rigging has been completed. Only then will you be able to see which lines require additional tensioning.

NOTE: *Take care not to linger at one area of a line with the heat source as this will melt the mono-filament causing the line to break. Also take care not to touch any part of the model or any other rigging, as this will also cause damage through melting. Applying too much heat for too long can cause the mono-filament to lose its ability to remain tensioned.*

WARNING: *Care needs to be taken when using this method to tension line, as using a heat source is required.*

Carefully move a suitable heat source (I use a small electrical soldering iron) close to and along the slack line, keeping the heat source always moving. As the applied heat takes effect the line will shrink slightly and tension.

Landing gear bracing wires:

Cut two short lengths of 0.5 mm diameter tube.

Blacken the tubes to reduce their metallic sheen.

Using the previous procedure, attach the Type A turnbuckle on a pre-rigged line into the pre-drilled hole in the top of a landing gear forward strut, using thin CA adhesive.

Pass the free end of the line through the second tube, then diagonally down to the bottom of the opposite landing gear strut.

Pass the line through the pre-drilled hole in the bottom of that landing gear strut.

Slide the tube up to that strut and keeping the line taut, secure the line in the hole and the tube to the line, using thin CA adhesive.

Repeat the procedure to create the diagonally opposite landing gear bracing line.

Construction (continued):

Using CA adhesive, secure the two upper wing ailerons into their locations (hinge slots), making sure the are aligned to the upper wing.

Using CA adhesive, secure the rudder centrally into its locations (hinge slots), making sure it is aligned to the centre of the fuselage.

Using CA adhesive, secure the two wheels to the axle ends, making sure the wheels are parallel to the fuselage, when viewed from above and vertical when viewed from the front.

Final rigging (continued):

Claw brake control cable:

Cut a short length of 0.5 mm diameter tube.

Blacken the tube to reduce their metallic sheen.

Cut a length of 0.12 mm diameter mono-filament, such as that from 'Steelon' or 'Stroft GTM'.

Pass the line through the tube, then through the pre-drilled hole through the top, front of the claw brake.

Loop the line back and through the tube.

Slide the tube up to, **but not touching**, the claw brake.

Using thin CA adhesive, secure the lines in the tube end away from the claw brake.

Cut away any residual tag of line at the tube end.

Pass the free end of the line up to the pre-drilled hole in the fuselage underside, inboard from the left, rear landing gear strut.

Trim excess line from the end to allow the line, when kept taut, to be fully inserted into the hole.

Keeping the line taut, secure the line in the hole using thin CA adhesive.

Rudder control cables:

Pass the free ends of the pre-rigged rudder control cables forwards and into the previously create slots in the fuselage sides.

Keeping the lines taut, secure the lines in the slots using thin CA adhesive.

Elevator control cable:

Pass the free end of the pre-rigged elevator control cable forwards and into the previously create slot in the top of the tailplane.

Keeping the line taut, secure the line in the slot using thin CA adhesive.

Ailerons control cables:

Pass the free end of a pre-rigged aileron control cable forwards and into the pre-drilled hole in the upper wing surface.

Trim excess line from the end to allow the line, when kept taut, to be fully inserted into the hole.

Keeping the line taut, secure the line in the hole using thin CA adhesive.

Repeat the procedure for the remaining three aileron control cables.

Finish:

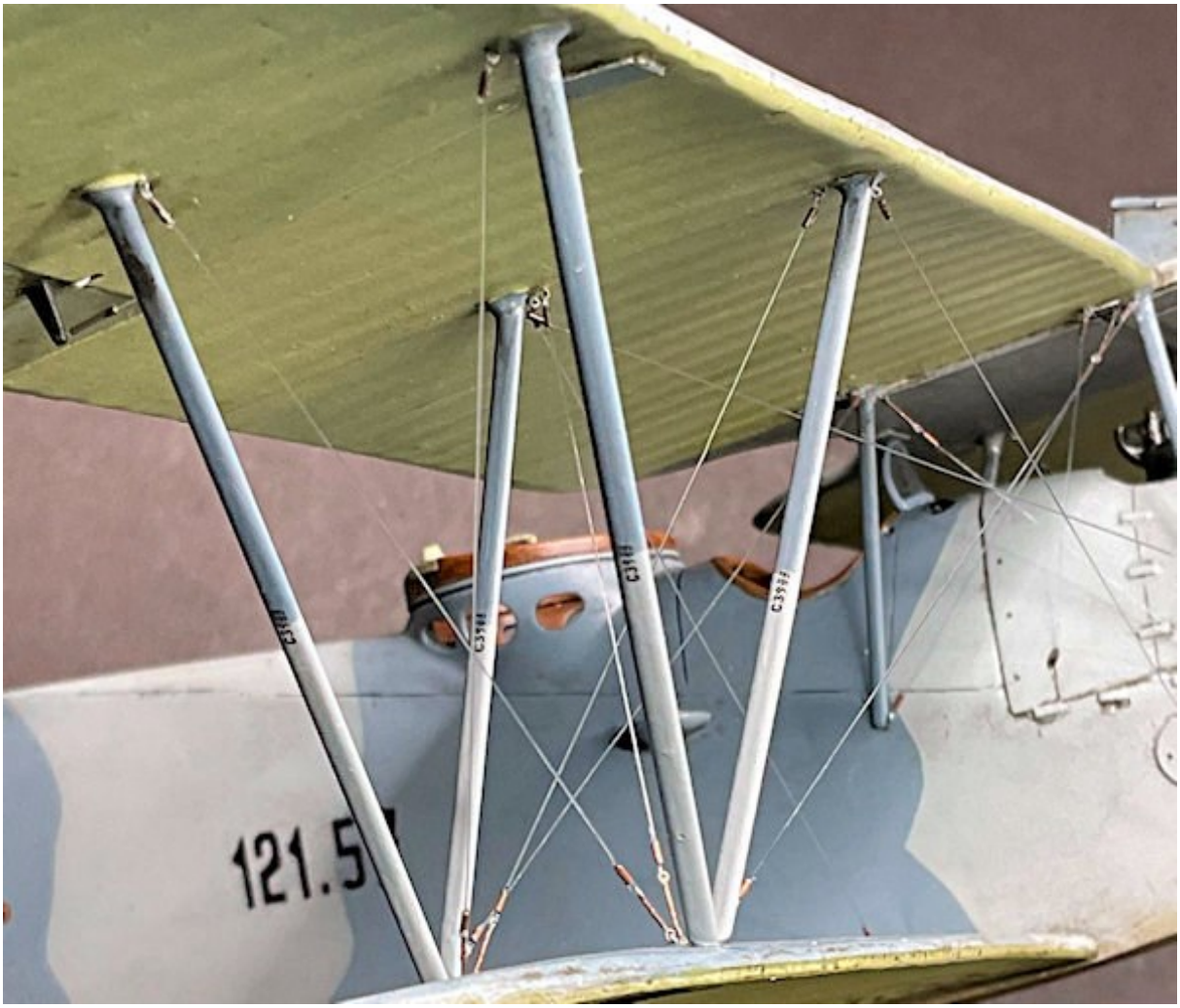
NOTE: *During the following step, temporarily mask off the pilots windscreen and the two added daylight windows in the decking panel.*

To reduce the glare of the rigging mono-filament, lightly airbrush a semi-gloss clear coat, such 'Tamiya' Semi-Gloss (x35) or similar over the rigging and control lines.

The following photographs show the various rigging wires and cables.


121.57


121.57



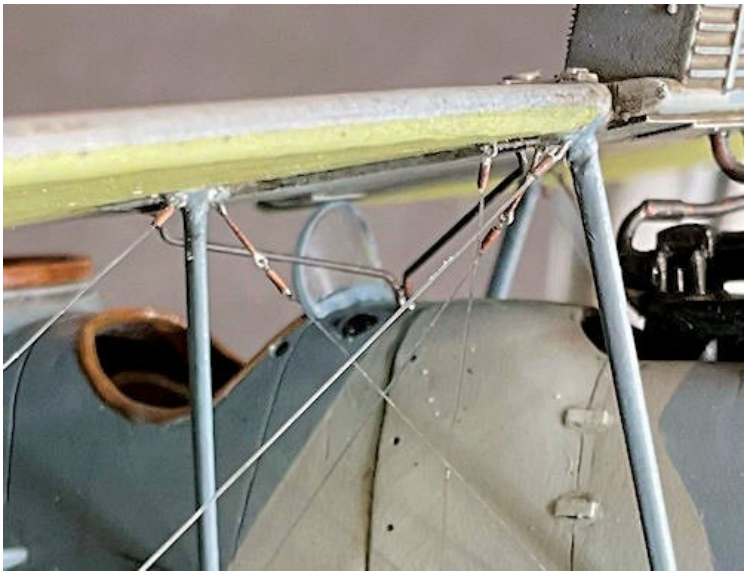
Construction (continued):

NOTE: *The three engine to under wing radiator pipes and the two fuel transfer pipes were created earlier in this Part of the build log.*

Fuel transfer pipes:

Using thin CA adhesive, secure the top end of the rear pipe into the pre-drilled hole in the rear corner of the auxiliary fuel tank on the underside of the upper wing centre section (right side). The bottom end of the pipe should be secured into the offset hole in the fuselage decking panel (forward from the pilots windscreen).

Using thin CA adhesive, secure the top end of the forward pipe into the pre-drilled hole in the forward corner of the auxiliary fuel tank on the underside of the upper wing centre section (right side). The bottom end of the pipe should be secured against the bottom of the rear pipe and the decking panel surface.



NOTE: *During the following steps, some adjustment to the pipes may be necessary to enable them to fit into their pre-drilled locating holes in the engine and rest against the radiator on the underside of the upper wing centre section.*

Radiator pipe P3:

Using CA adhesive, fully locate the bottom end of pipe P3 into its pre-drilled locating recess in the top, rear of the engine.

Before the adhesive sets, position the top end of the pipe against the right end (when viewed from the front) of the radiator housing on the underside of the upper wing centre section.

Apply CA adhesive to secure the top end of the pipe onto the radiator housing.

Radiator pipe P2:

Using CA adhesive, fully locate the front end of pipe P2 into its pre-drilled locating recess in the top, centre right side of the engine.

Before the adhesive sets, position the top end of the pipe against the radiator housing on the underside of the upper wing centre section. The pipe should be parallel with the engine (when viewed from above) and horizontal (when viewed from the side).

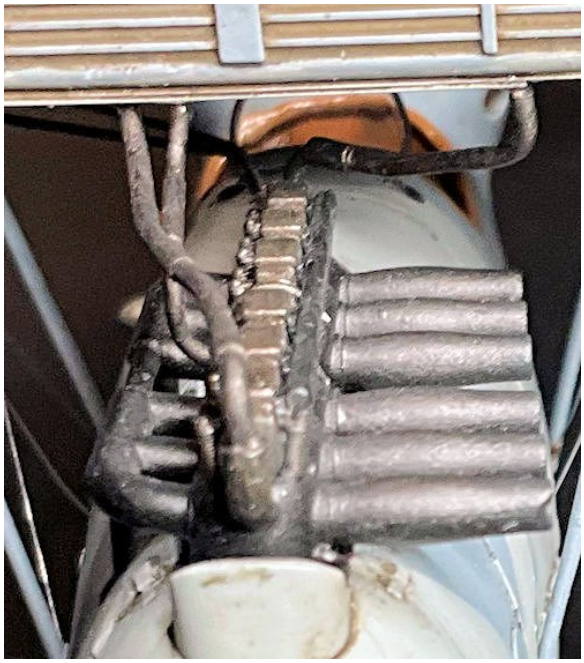
Apply CA adhesive to secure the top end of the pipe onto the radiator housing.

Radiator pipe P1:

Using CA adhesive, fully locate the front end of pipe P1 into its pre-drilled locating recess in the top, front of the engine.

Before the adhesive sets, position the top end of the pipe against the radiator housing on the underside of the upper wing centre section. The pipe should be parallel with pipe P2 when viewed from above and from the side).

Apply CA adhesive to secure the top end of the pipe onto the radiator housing.



Finish:

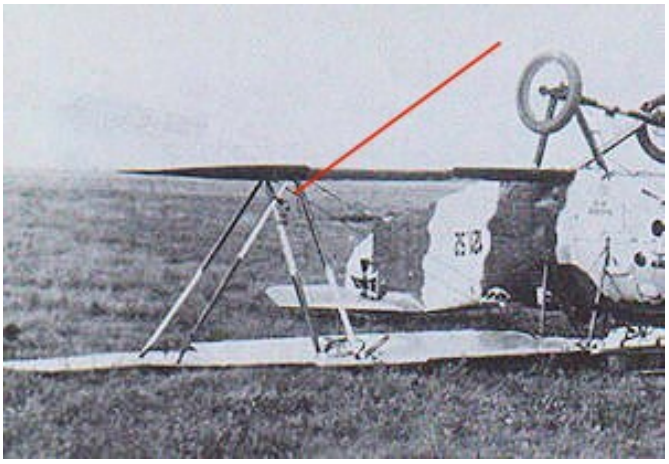
Brush paint the all pipes with ‘Mr. Colour’ Dark Iron (214) or similar.

Anemometer:

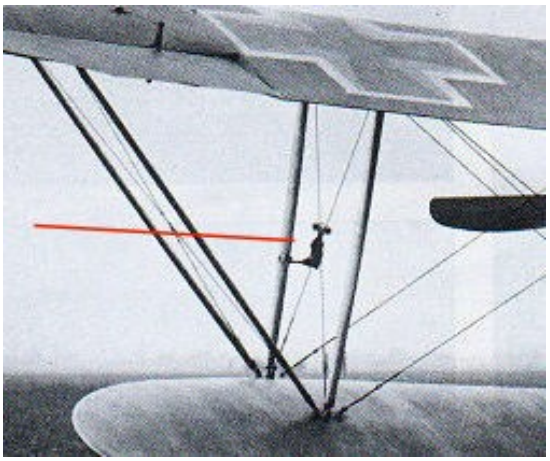
NOTE: *An Anemometer (airspeed indicator) was fitted to the interplane struts to be visible by the pilot. The method of mounting and the interplane stut used varied between aircraft. I chose to mount the Anemometer directly onto the outer interplane strut, as drilling a support bar into the created Brass reinforced struts was not really feasible.*

The instrument used was the ‘Proper Plane’ Morell Anemometer (RD-008). The decal used was from the ‘Airscale’ generic WW1 dial (AS32 WW1) set.

Chosen mounting



Alternative mounting



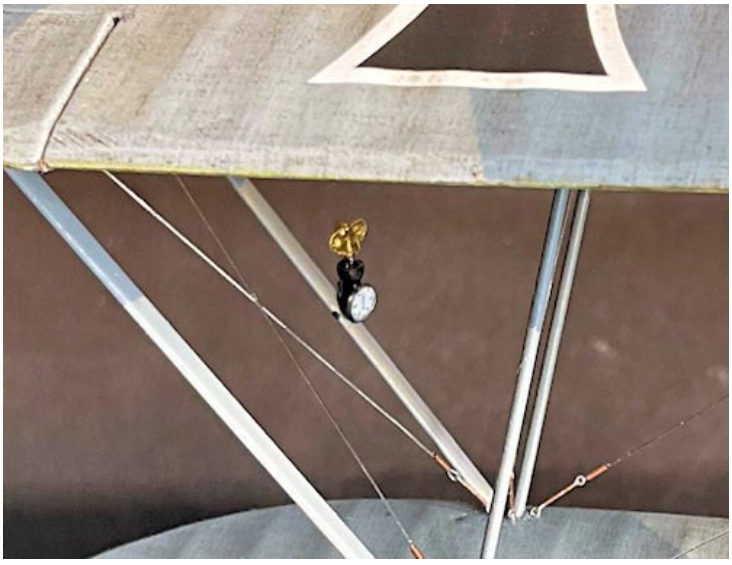
Brush paint the body of the Anemometer with ‘Tamiya’ Semi-Gloss Black (X18) or similar.

Brush paint the spinner assembly of the Anemometer with ‘Mr. Colour’ Brass (219) or similar.

Apply an appropriate decal to the face of the Anemometer.

Using thin CA adhesive, secure the Anemometer to the inboard side of the forward, outer interplane strut and facing towards the pilots cockpit.

To represent the retaining strap, brush paint a thin line around the interplane strut behind the Anemometer, using ‘Tamiya’ Semi-Gloss Black (X18) or similar.



Wireless aerial weight:

To represent the weight on the end of the trailing aerial wire (when deployed), I used a small, cylindrical and hollow piece from my ‘kit spares’ and secured it onto the underside of the fuselage below the wireless set in the observers cockpit, using thin CA adhesive.

The weight was brush painted using ‘Tamiya’ Ocean Grey 2 (RAF) (XF62).

Observers flare rack:

NOTE: *The flare rack used was a spare from a previous model build.*

Airbrush the rack with a grey primer, such as 'AK Interactive' Grey (AK758) or similar.

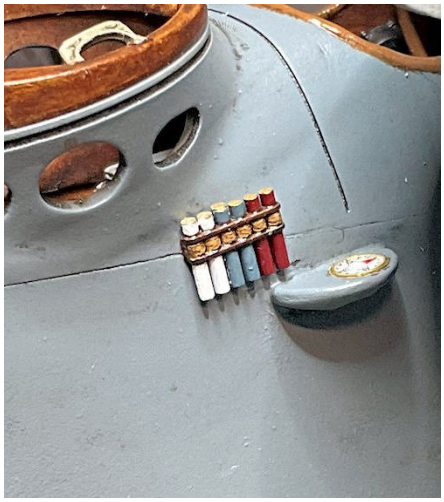
Brush paint the support rack with 'Tamiya' Desert Yellow (XF59) with NATO Brown (XF68) wooden edges.

Brush paint the flares with 'Tamiya' White (XF2), Medium Blue (XF18) and Red (X7) mixed with Rubber Black (XF85) to darken.

Brush paint the firing caps on the flare tops with 'Mr. Colour' Brass (219).

Lightly brush 'AK Interactive' Kerosene wash (AK2039) between the flares.

Using thin CA adhesive, secure the flare rack to the right side of the fuselage,



Pilots gun sight:

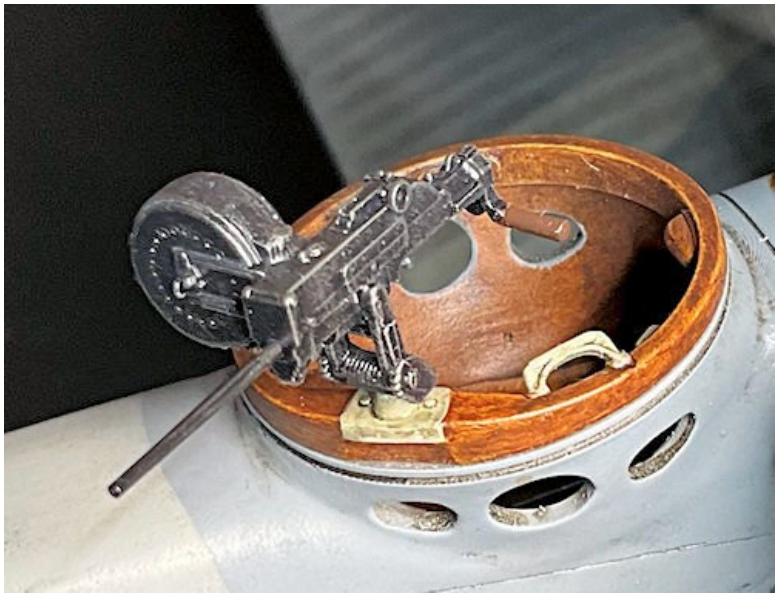
The pilot had a machine gun that was located inside the engine bay, to the left of the engine and fired out through a fairing at the left side of the nose cowl. I assume the pilot had some sort of aiming sight fitted to the forward decking panel, forward from the cockpit. However, as I could not find any photographs or drawings of a gun sight, I **chose not to fit** one to the model rather than fit an inaccurate gun sight.

Propeller:

Using CA adhesive, secure the propeller, in the desired position, onto the engine propeller shaft.

Observers machine gun:

Using thin CA adhesive, secure the observers machine gun, in the desired position, into its mounting hole in the gun mounting ring.



PART 13
FIGURE

PART 13 - FIGURE

The figure I chose to use with this model is the 'Kellerkind Miniaturen' German mechanic (54/101).

NOTE: *Refer to Part 5 (Resin) of this build log. The figure from 'Kellerkind Miniaturen' is supplied as a main body with two separate arms.*

Preparation:

Cut away the figure parts from their casting blocks.

File or sand away residual casting resin or mold seam lines from the figure.

Check that there are no surface imperfections and if necessary, fill and/or sand to restore the surface finish.

Carefully drill a hole of 0.8mm diameter centrally up into one of the legs of the figure.

Cut a long length of 0.8mm diameter Brass rod, such as that from 'Albion Alloy's' or similar.

Using CA adhesive, secure the rod into the pre-drilled hole in the leg. This will be used to hold the figure when painting and mounting the figure to the display base.

Assembly:

Using CA adhesive, secure the two arms into their locating recesses on the body of the 'Kellerkind Miniaturen' mechanic figure.

Modifications:

NOTE: *As this figure is of a German mechanic, some changes were made to make the figure more 'generic' and if he was working on the aircrafts forward fuselage.*

I carved and sanded away the field cap to give the head a clean shaven appearance.

I cut away the shoulder epaulettes.

I cut away the oil can held in the figures right hand.

I cut away the 'flashes' on the exposed jacket collar.

I used a photo-etch Screw Driver from the 'Aber' hand tools (35-A68) set. This tool consists of the screw driver with a second handle that is secured in position using thin CA adhesive. This tool will be fitted into the right hand of the figure once painted.

Painting:

NOTE: *The figure is painted using paints by 'AK Interactive', 'Mr. Colour' and 'Citadel' paints. Thin the 'AK' paints with their acrylic thinners (AK712).*

Airbrush the figure with a grey primer, such as 'AK Interactive' Grey (AK758) or similar.

Brush paint the figure as follows:

Boots - 'AK Interactive' Brown Leather (AK3031), highlights British Uniform (AK3081).

Trousers/jacket - 'AK Interactive' German uniform light (AK3092), highlights German Uniform Base (AK3091).

Pocket rag - 'AK Interactive' Faded White (AK3029), weathered with 'kerosene wash (AK2039).

Jerkin - 'AK Interactive' Brown Leather (AK3031), highlights British Uniform (AK3081). Brush coat with a semi-matte clear coat, such as 'Tamiya' Semi-Gloss (X35) or similar.

Shirt collar and cuffs - 'AK Interactive' Faded White (AK3029).

Buttons - 'Mr. Colour' Stainless Steel (213).

Flesh painting:

NOTE: *The following is a painting technique for flesh. The 'Citadel' paints used are water based and can be thinned as required using water, which is also used to clean the brushes. It's easier to use a 'wet palette' when applying these paints as this keeps the paint from drying and allows mixing of paints as required. A basic wet palette can be a water proof plastic lid with dampened kitchen roll paper laid inside. The paints are then dripped onto the damp paper and applied from there.*

The paints used for the flesh of the figures are from the 'Citadel' colour range:

Base coat - 'Bugmans Glow'.

Flesh tone - 'Cadian Flesh Tone'.

Flesh highlights - 'Kislev Flesh'.

Brush 'Bugmans Glow' over the exposed head and hands of the figure and allow to dry.

Brush 'Cadian Flesh Tone' lightly over the painted head and hands of the figure and allow to dry. Do not apply the paint such that it completely covers the previous coat, as subtle shadows are necessary around such as the ears, eyes, nose and chin etc.

Brush 'Kislev Flesh' very lightly over the painted head and hands of the figure and allow to dry. This application is very light and intended to highlight areas such as the eye brows, ears, bridge of the nose and jaw line etc.

Using a needle point, apply 'Tamiya' Rubber Black (XF85) or similar to create the eye pupils.

Weathering:

Lightly sponge 'Tamiya' Weathering Master set A (mud) over the shoes.

Lightly sponge 'Tamiya' Weathering Master set D (oil stain) around the elbows, pockets and seat of the overalls. Also lightly around the sides and back of the head to represent bald hair.

PART 14
DISPLAY BASE

PART 14 - DISPLAY BASE

The display case is made from two sheets of 3mm thick Piano Black Acrylic sheet cemented together with a transparent top fabricated from 3mm thick Clear Acrylic sheet. This was custom made for me by Paul Moss at 'Inperspextive' (Ebay). The name plaque was also made by an on-line retailer 'The Engraving Shop'.

The grass mat was cut to shape from a sheet of 'Lars op't Hof Scenery' grass mat (Summer pasture with weeds LH10.66).

The cut mat was then positioned on the base and the model and figure test placed to achieve the best effect and to make sure the transparent cover of the case would be able to be located without touching the model. The model and figure were then removed with the grass mat left in position on the display base. The edges of the grass mat were then carefully lifted and a soft marker pen was used to mark the outline of the grass mat, but approximately 5mm inside the mat edge. The grass mat was then removed and the area of the display base inside the marks was scuffed using a coarse grit sand paper, in order to give a key for the adhesive.

The back of the grass mat was lightly spayed with water to dampen the surface prior to be glued on the display base.

NOTE: *When applying the adhesive, make sure it is not applied too thickly and close to the edges of the finally positioned grass mat. Otherwise the adhesive may be squeezed out from under the grass mat once weight is applied to hold down the mat during setting of the adhesive.*

A coat of PVA adhesive (white glue) was applied to the scuffed area on the display base and to the back of the grass mat. The grass mat was then laid onto the PVA adhesive and positioned correctly. Light pressure was applied to ensure the mat was in contact with the adhesive.

Finally an acrylic plaque stand was positioned to the left, front corner of the display base (just in from the edges of the shoulder for locating the transparent acrylic cover. The area on the underside of the stand and its contact are on the display base were scuffed using a coarse grit sand paper, in order to give a key for the adhesive. A thin coat of contact adhesive was then applied to both scuffed areas and once the adhesive started to set, the stand was carefully position onto the display bae and pressed down to make full contact. The self-adhesive backed information plaque was the positioned onto the stand and pressed to make full contact.

The model and figure were then positioned on the base in their final positions and the support pin for the pilot figure marked into the grass mat. A hole of 1.0mm diameter was then drilled through the grass mat and into, but not through, the base. The hole was cleared of residual acrylic to ensure the pin in the figure would fully locate. The figure was then test fitted and where necessary, the support pin for the figure was snipped to the required length to fully locate into the display base.

NOTE: *The aircraft model is not secured to the display base as this can cause shock damage to the model if the display is transported to shows etc. For that the aircraft model would be packed separately for transporting.*

Thin CA adhesive or PVA adhesive was then applied to the support pin of the pilot figure, which was then located, in the desired position, into the pre-drilled location hole. The mechanic figure was secured in position standing on the wheel, using thin CA adhesive. The aircraft itself, being light in weight, will tend to sit on top of the grass on the mat, rather than seat fully down, as would a real aircraft. Therefore the location of the aircraft wheels and tail skid were marked onto the grass mat and those areas scrapped through the mat to create slight and unobstructed troughs, into which the aircraft could be located.

PART 15
COMPLETED MODEL PHOTOGRAPHS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END