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. Although, as most modelers, I got involved in the world of construction kits at an early age, I 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, several people have asked if I would create a 'build log' for future builds.

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 1:32 scale resin model of the Halberstadt D.II by 'Lukgraph'.

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Completed: March 2024

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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

Figures

‘Kellerkind’ German mechanic (54101),
‘Aviattic’ German pilot (ATTRES 031).

Decals

‘Airscale‘ Generic WW1 instruments (AS32 WW1) set,
‘Aviattic’ WW1 German blue linen (ATT32077),
‘Aviattic’ WW1 Linen weave effect (ATT32236).

Propeller

‘Proper Plane’ Niendorf wood propeller (WP056).

Rigging accessories (as required)

‘GasPatch Elite Accessories’ Turnbuckles (1/48 scale),
‘Albion Alloy’s’ Micro-tube or Rod (Brass or Nickel Silver - various diameters),
‘Steelon’ or ‘Stroft GTM’ Mono-Filament (0.08 and 0.12 mm diameter).

Sundries (as required)

Paints (‘Tamiya’ Acrylic, Humbrol Acrylic, ‘Mr. Metal Colour’, ‘AK Interactive’ Paints and Primer/micro-filler (Grey AK758, White AK759), ‘Alclad’ II Lacquers,
‘Hataka’ Orange top, ‘Mig’ A-Stand Aqua Gloss (A.Mig-2503),
‘Mr. Colour’ Levelling Thinners, PVA Adhesive (e.g. ’MicroScale’ Micro Krystal Clear),
‘MicroScale’ MicroSol/MicroSet, ‘VMS Fleky’ CA adhesive (Slow and Thin),
‘UHU’ White Tack, ‘Mr. Surfacer’ 500,or 1000,
‘PlusModel’ lead wire, ‘Modelkasten’ rigging line 0.13mm (0.6),
‘Windsor & Newton’ Griffin Alkyd oil paint, ‘EZ’ black or white line (fine or heavy),
‘MFH’ 0.4mm diameter flexible black tube (P-961),
’Mr. Colour’ Levelling Thinners 400, ‘Mr. Metal’ Primer R.

Weathering mediums (as required)

‘Flory Models’ Clay washes and Pigments, ‘AK Interactive’ (Kerosene AK-2039, Oil AK-2019),
‘Tamiya’ Weathering Master sets.

Display Base

‘Lars op’t Hof Scenery’ pasture Spring grass mat,
‘Inperspective’ custom made Acrylic base and cover,
Information plaque from ‘TLS Engraving Ltd’.

THE AIRCRAFT

THE AIRCRAFT

References:
Centennial Perspective - Halberstadt Aircraft of WW1 Vol 2 (CL.IV-CLS.I and fighters) (by J. Herris).
Halberstadt Fighters-Classics of World War I Aviation, Volume 1 (by Peter M. Grosz).
Online resources.

General:

NOTE: *The following text is based on that from Wikipedia.*

The Halberstadt D.II was a biplane fighter aircraft developed and manufactured by the German aircraft company 'Halberstädter Flugzeugwerke'. The aircraft was accepted for operational service by the *Luftstreitkräfte* (Imperial German Army Air Service) and served throughout the period of Allied air superiority in early 1916. This aircraft was the first biplane fighter to serve in combat for the German Empire, but towards the end of 1916 was gradually superseded in the *Jagdstaffel's* (Jastas) fighter squadrons and other early German fighter units by the more superior Albatros fighters. Even so, small numbers of Halberstadts continued in use well into 1917.

Design:

The Halberstadt D.II was the production version of the experimental D.I. The primary differences between the experimental D.I and production D.II included a substantial effort to lighten the aircraft in order to improve its performance. The D.II also featured staggered wings and the adoption of a more powerful 120 hp Mercedes D.II engine. The side and frontal radiators that had been tried in the D.I were replaced by radiator mounted in the upper wing, similar to the arrangement that was later used by the Albatros D.III and D.V. In comparison with the D.I, the pilot sat higher in his cockpit, to improve his view over the top wing. This required a dorsal turtleback fairing over the rear fuselage, to improve its lines.

The two bay wings were very strongly braced, but the trailing edge was composed of a wooden member, as opposed to the wire or cable common on many of the First World War-era German single-engined aircraft. Photographic evidence indicates that many examples were rigged with washout on the lower wings, which gave the impression of a curved or twisted lower wing trailing edge. In some photos even the upper wings have a similar 'trailing edge droop' on the fixed section inboard of the ailerons.
Lateral control was by ailerons, but the French Morane-style empennage (common not only to Morane's, but also to the Fokker and Pfalz types of the period) was retained. The inevitable result was extreme fore-and-aft sensitivity and poor control harmonization. The D.II was nonetheless considered to be very manoeuvrable in skilled hands. In particular it could reputedly be dived safely at high speed.

A single synchronised IMG 08 'Spandau' machine gun fired through the propeller arc.
If the only performance figures available for the type are accurate, the Halberstadts speed and climb were little better than the wing warping Fokker Eindecker aircraft of the period, but it earned the respect of Allied fighter pilots and was the preferred mount of the pilots of the early Jastas, that was until the Albatros D.I became available. Halberstadts were actually retained, or even returned to service by some pilots during the early weeks of 1917, at a time when the structural difficulties with the Albatros D.III first became apparent.

General specifications:

Length - 23' 11" (7.3m)

Wingspan - 28' 10" (8.8m)

Height - 8' 9" (2.66m)

Empty weight - 1,144 lb (519kg)

Loaded weight - 1,606 lb (728.5kg)

Engine - Mercedes D.II 6-cylinder in-line (water cooled) 120hp (90kW).

Performance:

Maximum speed - 93 mph (150km/h)

Service ceiling - 13,000‘ (4,000m)

Rate of climb - 38 min 30 sec to 16, 000’ (5,000m).

Range - 160 miles (250 km)

Weapons:

1x 7.92mm IMG 08 ‘Spandau’ machine gun.

Aircraft:

The aircraft modelled is the Halberstadt D.II (built by Hannover), Serial No:810/16 Vzfw. Erich Schutlz, the Royal Jagdstaffel 25, operating from Kanatrlarci, Macedonia in early 1917.

Jagdstaffel 25:

Royal Prussian Jagdstaffel 25, commonly abbreviated as Jasta 25, was a ‘hunting group’ (fighter squadron) of the *Luftstreitkräfte*, the air arm of the Imperial German Army during World War I. Jasta 25 was created on the 28th of November 1916 and was mobilized on the 1st of December. It began operations in Macedonia, using Halberstadt D.IIs. It scored its first success on the 10th of December 1916 and suffered the first casualty of the Jasta on the 18th of February 1917. The Jasta continued operations until the end of the war brought about the dissolution of the *Luftstreitkräfte.*

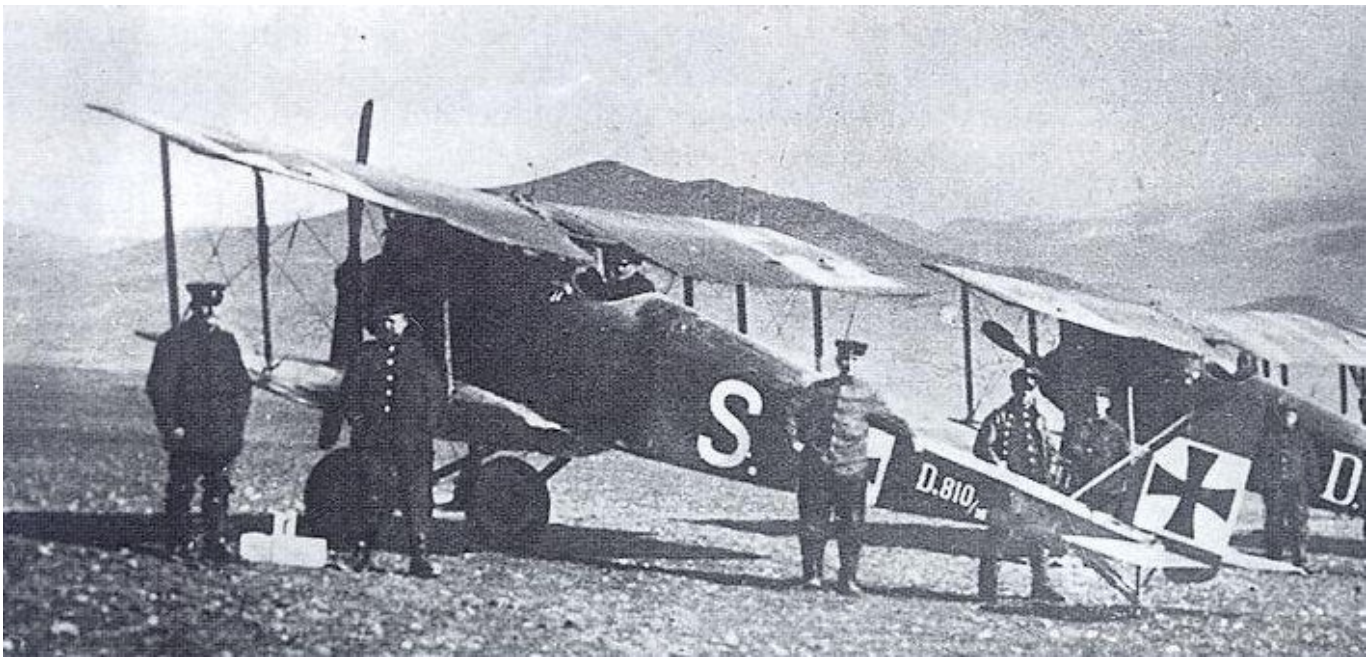
During its combat service in WW1, the Jasta were based at:

Prilep - 28th of November 1916 to the 13th March 1917

Kanatiarci - 13th March 1917 to the 1st of June 1918

Karkova - 1st June 1918 to the 11th of November 1918.

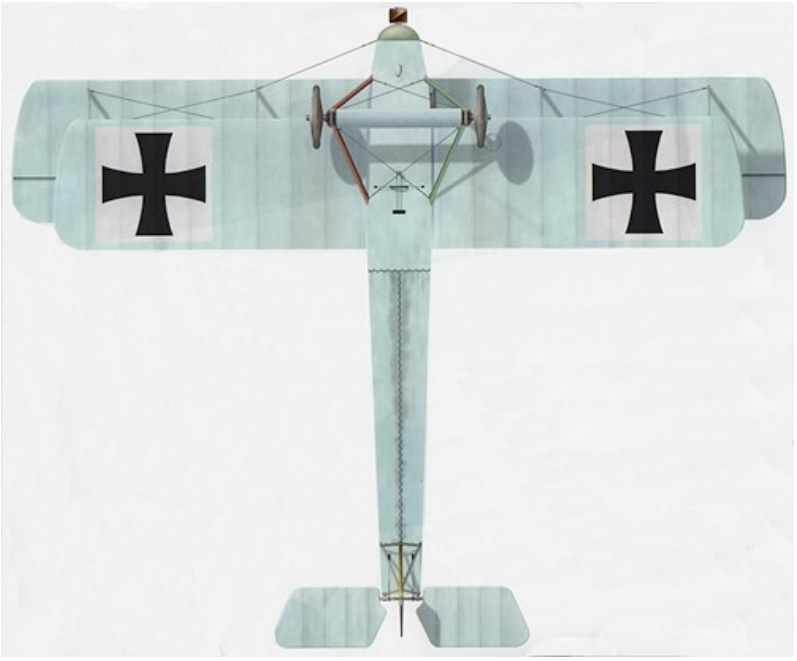
During WW1, Jasta 25 would be credited with 54 aerial victories, of which 46 were enemy aircraft and eight observation balloons. During this time two pilots were killed in action, one pilot killed in a flying accident and two others injured in flying accidents.



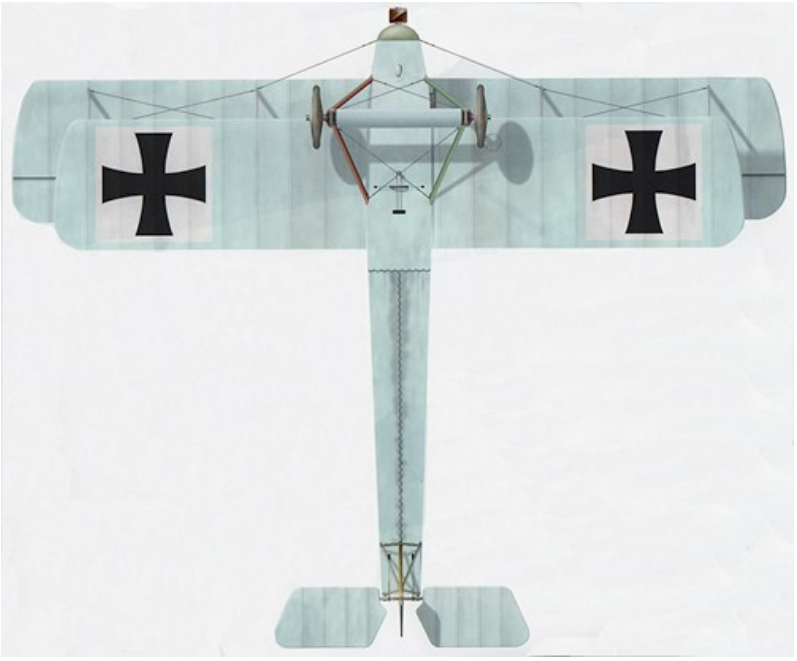
Camouflage scheme:

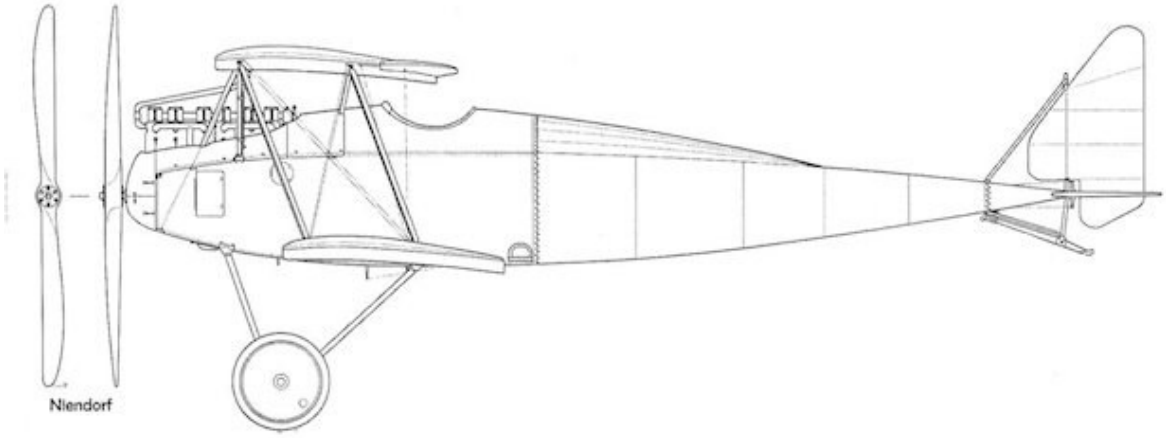
Apart from a few exceptions the Halberstadt fighters were simply camouflaged with green and brown painted upper surfaces with light blue underside surfaces.

Example of upper surface camouflage



Example of upper surface camouflage

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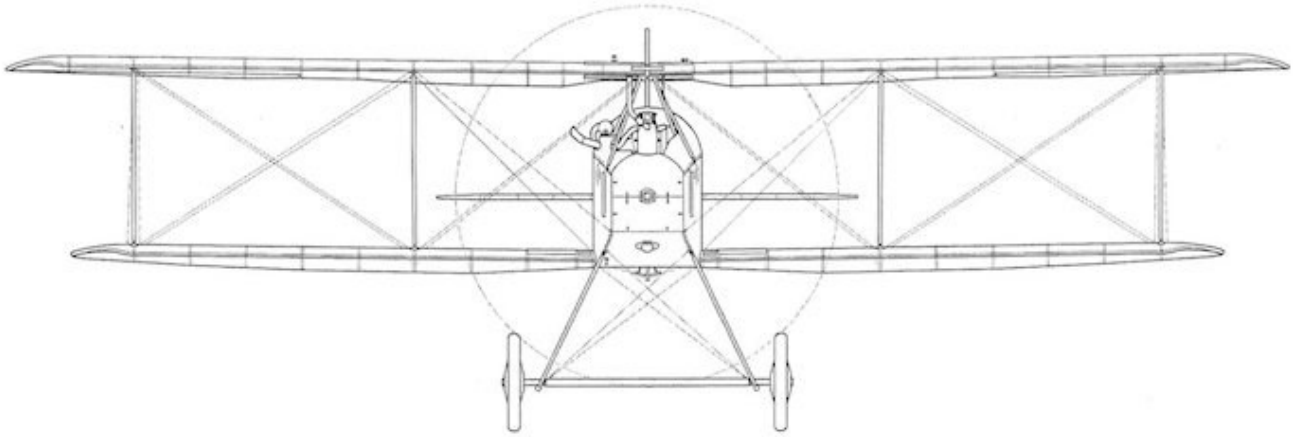
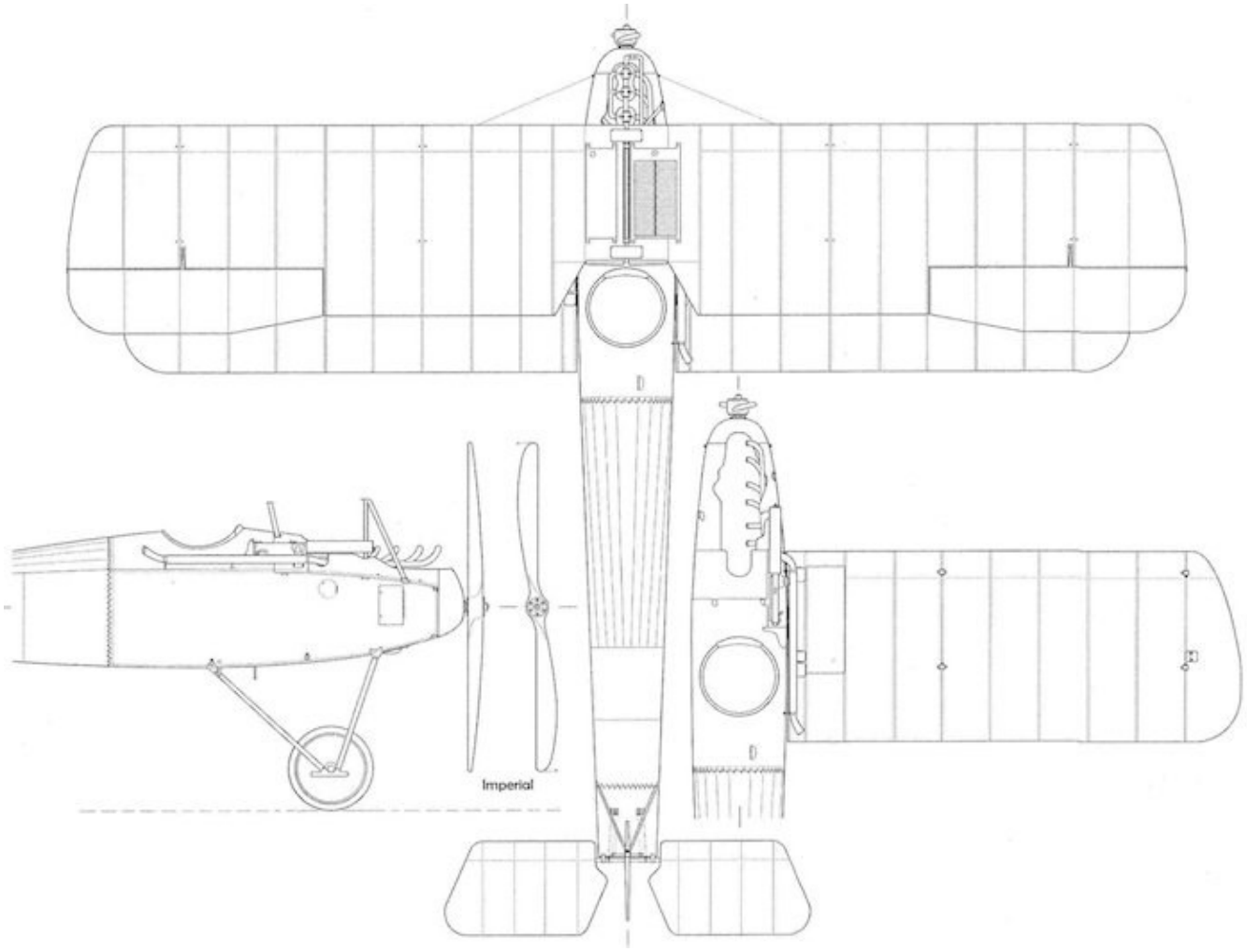
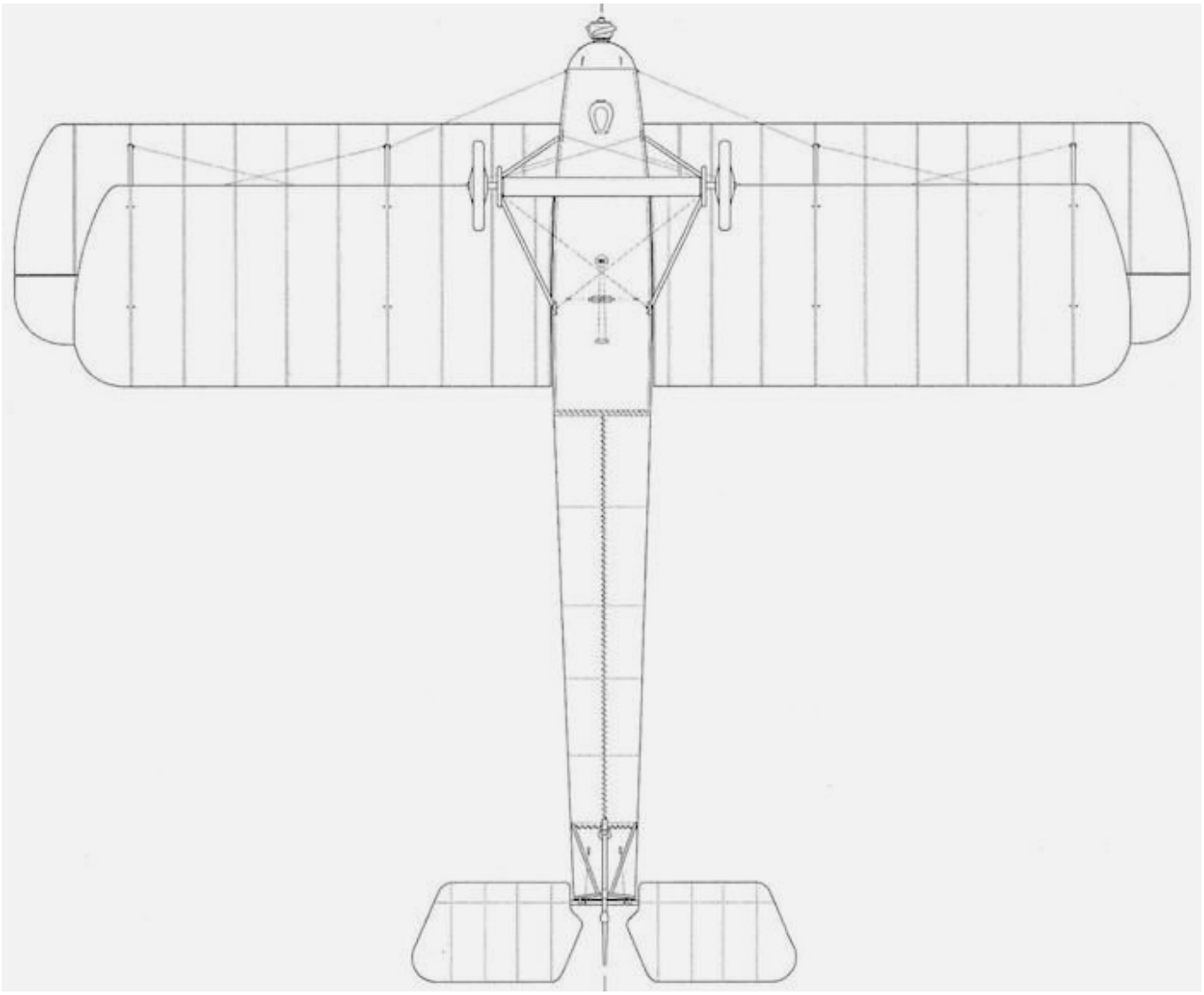
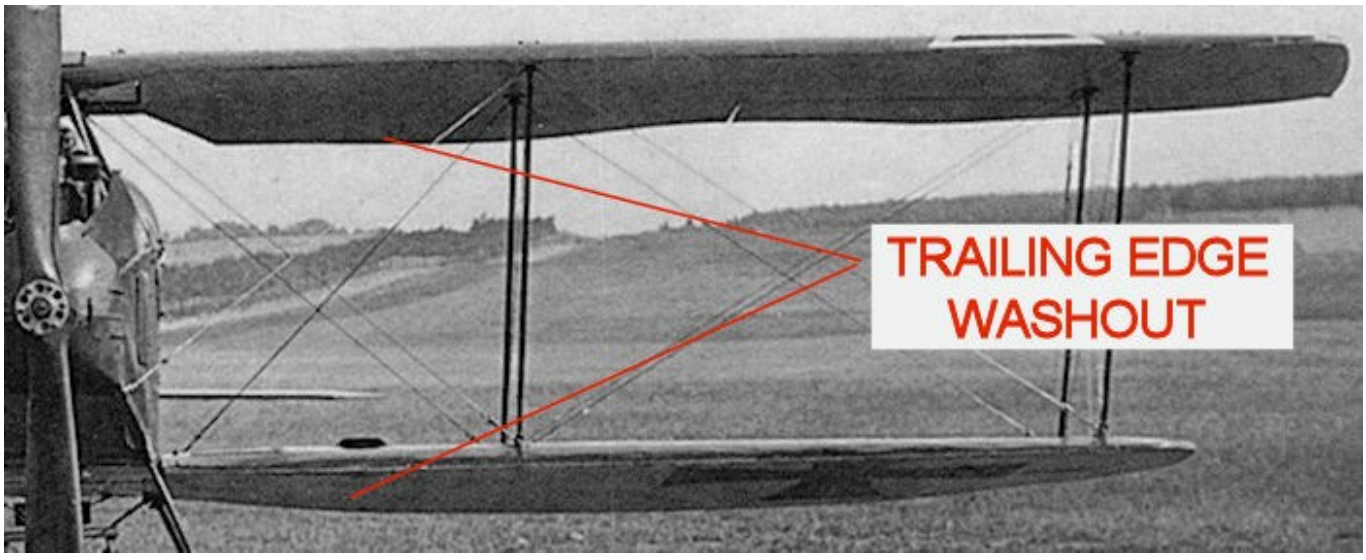



Imperial



Typical wing trailing edge washout



THE PILOT

THE PILOT

References:
Online resources.
NOTE: *The following text is based on that from Wikipedia.*

Erich Schütze is recorded as first serving in the two-seater reconnaissance unit '*Flieger-Abteilung'* (Flyer Detachment) 201. Whilst serving on this unit he and his observer were credited with an aerial victory over a SPAD on the 27th of May 1917 over Craonne, France.
Some time later he was posted to '*Reihenbildzug'* (Special Photographic Unit) No.9, to fly long photo reconnaissance missions. While serving with this unit in Romania, he was credited with destroying an observation balloon Northwest of Păunești on the 7th of September 1917. His next victory was a Sopwith aircraft, Northwest of Brăila, on the 28th of October 1917. He destroyed a second observation balloon on the 20th of November 1917. As recognition of his exploits, he was awarded the Golden Military Merit Cross on the 20th of December 1917. The award was the highest recognition of courage available to an enlisted soldier of the German Empire.
Erich Schütze converted to single seat fighters at the '*Armee-Flug-Park'* (Army Flight Park) No.II. Subsequently he was posted to Macedonia to Royal Jagdstaffel 25 on the 27th of April 1918 and with the rank of *'Vizefeldwebel'* (non-commissioned officer). On the 20th of May 1918, he shot down a Dorand AR North of Monastir in Macedonia for his fifth victory. On the 23rd of August 1918, he claimed his final victory of WW1 by shooting down a SPAD at Sivestrena.
At some point, Schütze was appointed as '*Offizierstellvertreter*' (deputy officer), but it is not know if he was actually commissioned.
In total Erich Schütze had confirmed victories over two observation balloons and four enemy fighters scored over three fronts.
The dates of his birth and death are not recorded.

Victories scored during WW1

	DATE	SQUADRON	AIRCRAFT	ENEMY	LOCATION
1	27th May 1917	Flieger-Abteilung' 201	Not Known	SPAD	Craonne, France
2	7th Sept 1917	Reihenbildzug 9	Not Known	Observation balloon	Păunești, Romania
3	28th Oct 1917	Reihenbildzug 9	Not Known	Sopwith	Brăila, Romania
4	20th Nov 1917	Reihenbildzug 9	Not Known	Observation balloon	Romania
5	20th May 1918	Jasta 25	Halberstadt D.II	Dorand AR	Monastir, Macedonia
6	23rd Aug 1918	Jasta 25	Halberstadt D.II	SPAD	Sivestrena, Macedonia

PART 1
MODEL DESCRIPTION

PART 1 - MODEL DESCRIPTION

('Lukgraph' - Kit No:32-051)

This 1:32nd scale model is manufactured by 'Lukgraph' and is manufactured in grey coloured resin, which initially looks like standard styrene. Other parts, such as the engine, cockpit interior and struts etc are 3D printed. The kit supplies the model parts, decal sheet, photo-etch sheet and the instruction booklet.

The kit instruction booklet has twelve assembly sheets, one rigging sheet and three colour scheme illustration. The supplied decals and colour illustrations cover the three colour schemes and have different aircraft serial numbers for one of the schemes. The instructions seem to be concise. Also, supplied is an acetate sheet for the windscreen.

This model is a new release and with the primary parts cast in resin with internal strengthening metal rods in the upper and lower wings. The resin cast parts are:

Fuselage halves
Upper wing sections
Lower wings
Rudder
Tailplane
Elevators.

As new tool castings there shouldn't be any obvious problems with the resin parts, such as mis-moulds/ short shots, tooling marks, air bubble 'blow holes, heavy resin flash or warping of parts. However, there maybe a few minor areas that will need to be addressed, such as casting marks on some resin parts and reinforcing rods through the wings, which although central, are so close to the surface at the wing tips.

The 3D printed parts are either grey or black in colour and are:

Engine assembly
Engine parts and radiator
Fuselage internal structure
Landing gear
Wing and tail support struts
Propeller
Wheels
Exhaust and engine pipes
Inspection panels and external details
Cockpit parts
Interplane struts.

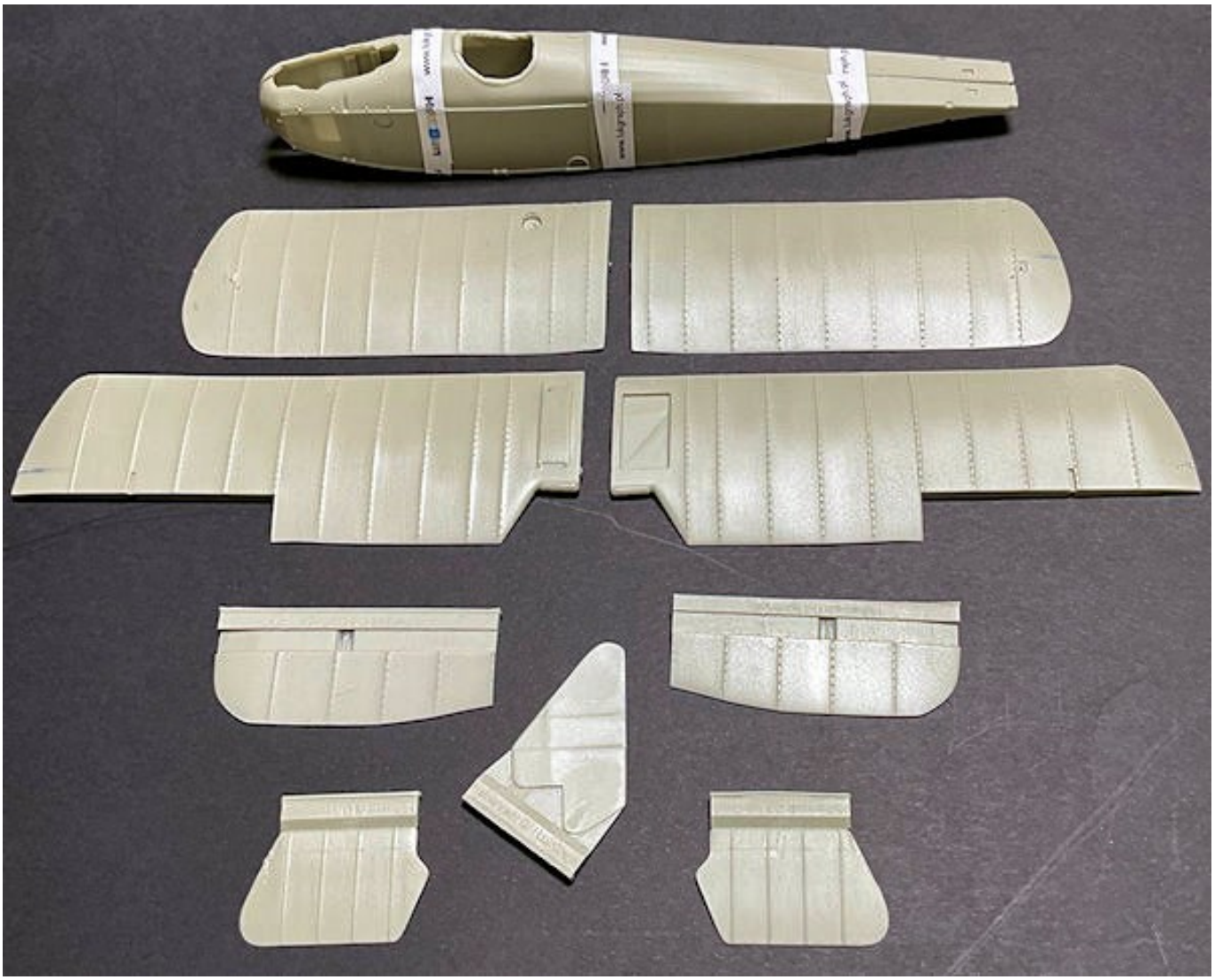
The resin used for the more delicate 3D printed parts is brittle and smaller parts can easily be broken, unless due care is taken when handling those parts. The eight interplane struts have small recesses in each end, which are intended as locations for added metal pins for securing into the resin wings.

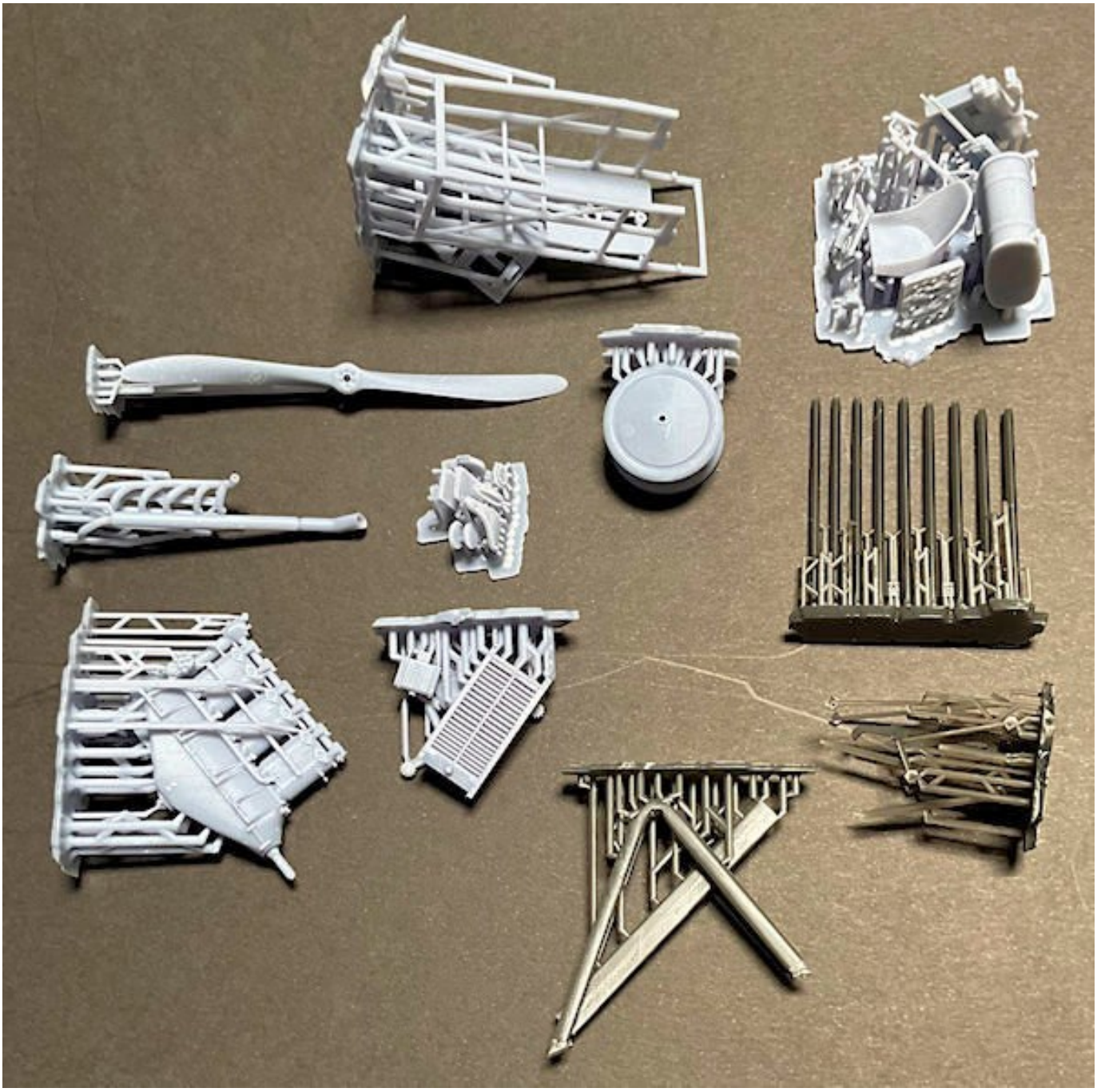
CA adhesive (superglue) must be used to attach and assemble the model parts as normal styrene cement has no effect on resin.

Finally, the decals from 'Lukgraph' can be translucent, meaning the underneath colours on the model may shown through the decals after application. In that case a white decal or paint should be used as a 'blocker' under the decals, to prevent the base colours showing through the decal.

Any after market additions or modifications will be covered in the relevant Part of this build log.


Halberstadt D.II
1:32
www.lukgraph.pl
Halberstadt D.II
1:32
3D PRINTED PARTS





PART 2
WOOD EFFECTS
(General)

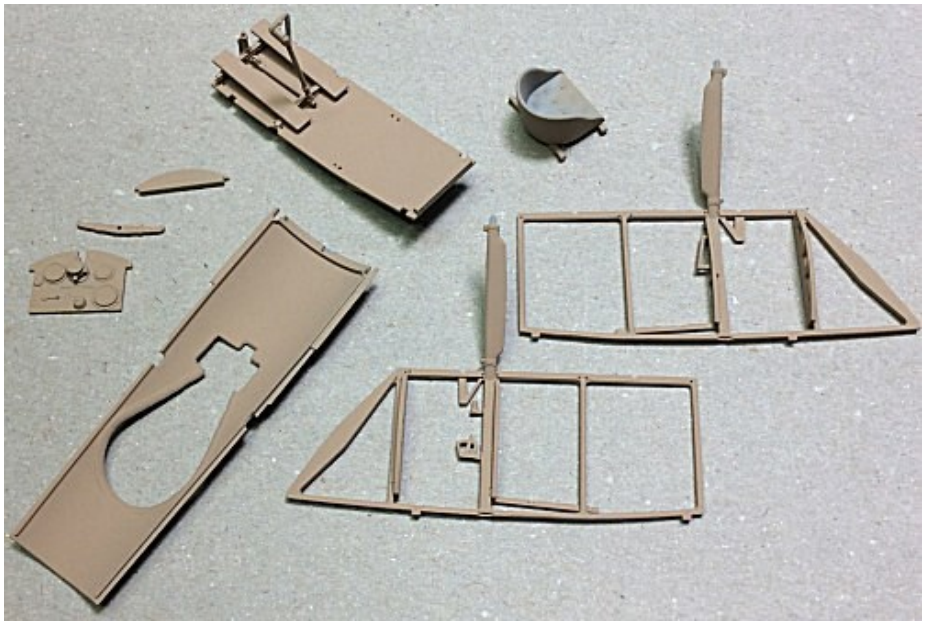
PART 2 - WOOD EFFECTS (General)

A basic technique:

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 'Tamiya' Aerosol Light Grey (Fine) or White (Fine) acrylic primer. Once the primer is dry, you can start applying the wood effect to the applicable cockpit items, such the cockpit framework, decking, seat supports, rudder bar, instrument panel and of course, the wing struts. With practice, this method can also be used on fuselage panels and propellers.

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 Sienna 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 or 'AMMO Mig' enamel odourless thinners (A.Mig-2019), into a suitable dish.

Dip a broad flat oil brush into the thinners 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 of the wood grain, wiping the brush on the sheet of kitchen roll to remove residual oil paint.

Repeat dipping and wiping the brush in the thinners 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.

If desired and once the oil paint is fully dry, airbrush a semi-gloss clear coat, such as 'Alclad' Satin (ALC312-60) 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 'Mr. Colour' Levelling Thinners, which does improve airbrushing and avoids pooling. Otherwise I use 'Alclad' Light Sheen (ALC-311).

Although it's a lacquer, I've found that it will accept 'Tamiya' 'Clear' coloured Acrylics without any separation, which can happen with other paints. The 'Alclad' lacquers dry fast and provide a good sealing layer over the painted surfaces. When using 'Alclad' sealing coats, the golden rule is to allow the various painted surfaces to dry fully before applying 'Alclad' lacquers.

In the following example, I added a few drops of Clear Yellow (X24) into the 'Alclad' Light Sheen (ALC -311) and thoroughly mixed it. Only add small amounts to the 'Alclad' in order to control the amount of tint you desire. I increased my airbrush air pressure to around 20 psi to airbrush the sealing coats over the various cockpit items. The first coat usually dries to a more matte finish, which I assume is due to being sprayed onto the oil paint, rather than onto straight acrylic paint. Once this first coat has dried, I airbrushed several coats of just 'Alclad' Light Sheen (ALC -311), which added not only more sealing coats, but more importantly gave the desired semi-gloss 'varnished' finish I was after.

Below is an **example** of the applied 'Alclad' lacquer/X24 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, prior to fitting them to the model.

PART 3
WEATHERING
(General)

PART 3 - WEATHERING (General)

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. Once dampened, the dried clay is re-activated and the clay wash can be removed or worked as required.
First I seal the surface with airbrushed 'Alclad' Light Sheen (ALC-311), 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 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.

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.
I use a soft brush, which has been very slightly dampened, to brush off the clay wash.
For smearing effects, a very slightly damp brush or absorbent paper should be used, but even then I dab them onto a dry piece of the paper, until it's almost dry. Any wetter and you'll find that you are removing too much of the clay wash. If that happens you would have to re-apply the wash and start again. That said, 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 more or less straight away. Then I'll very lightly brush and/or use a piece of damp absorbent paper to remove as much as I want until I get the desired effect. If I remove too much I just reapply clay wash to that area and repeat the removal procedure. Once finished, just run the brush under a tap to rinse out any residual clay pigments. Finally I usually seal the surface with airbrushed 'Alclad' Light Sheen (ALC-311), which will seal in the applied clay wash.

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 used as-is or mixed to create many colour shades for weathering.

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 teased 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 coat of 'Alclad' Light Sheen (ALC-311).

'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 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 oil, so I use ’Abteilung 502’ oil paints and ‘Tamiya’ Enamel thinners (X20).

PART 4
DECALS
(General)

PART 4 - DECALS (General)

Standard 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, **if used**, may 'eat' into the previous decals. In this case a sealing coat of clear gloss, such as 'Alclad' Aqua Gloss 600, 'Mig' A-Stand Aqua Gloss (A.Mig-2503) or 'Tamiya' Clear (X22) or similar 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 sealing coat of 'Alclad' Aqua Gloss (600), 'Ammo' Aqua Gloss Clear (A.MIG-2503), or 'Tamiya' Clear (X22) to provide a smooth surface.

NOTE: *'MicroSet' solution softens the decal to allow it to conform to the painted surface. 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 softly 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.*

Brush 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 the decals have been applied and are dry I airbrush a final sealing coat of 'Alclad' Light Sheen (ALC -311) or 'Tamiya' Semi-Matt (XF35) over the decals.

'Aviattic' linen effect 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. However, '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, the decals 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 may 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. For this model I chose to use the 'clear' decals, in order to show the linen effect more visibly.

Application:
First airbrush a primer coat of a light colour of white, tan or light grey, such as 'AK Interactive' primer and micro-filler White (AK759) for 'clear backed decal. Grey (AK758) or similar for 'white backed decal on all of the surfaces to have the decals applied.

NOTE: *'Silvering' is caused by air being trapped in the rough surface of the paint, such as on a matte 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 the required base colours to the model surfaces.

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 'Mig' A-Stand Aqua Gloss (A.Mig-2503) or 'Alclad' Aqua Gloss (ALC-600) or similar, which will form a gloss surface for applying the decals.

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 ant 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.

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.

NOTE: *If applying X20A, use sparingly or it may damage the decal.*

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.

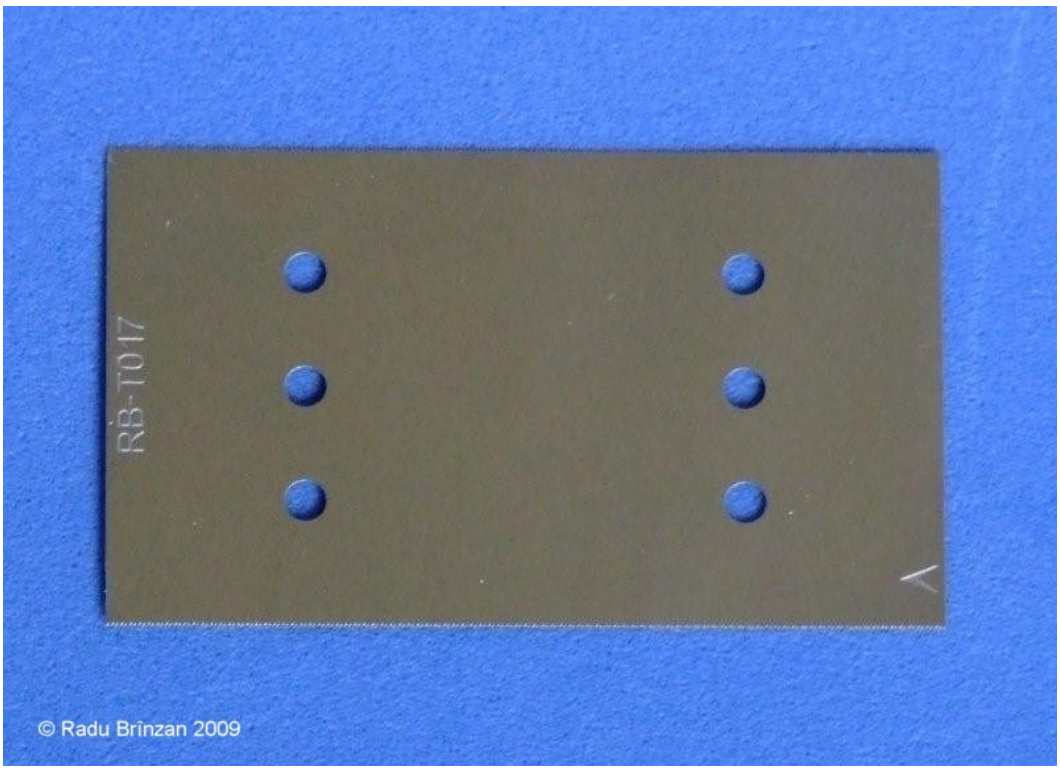
PART 5
RESIN (General)

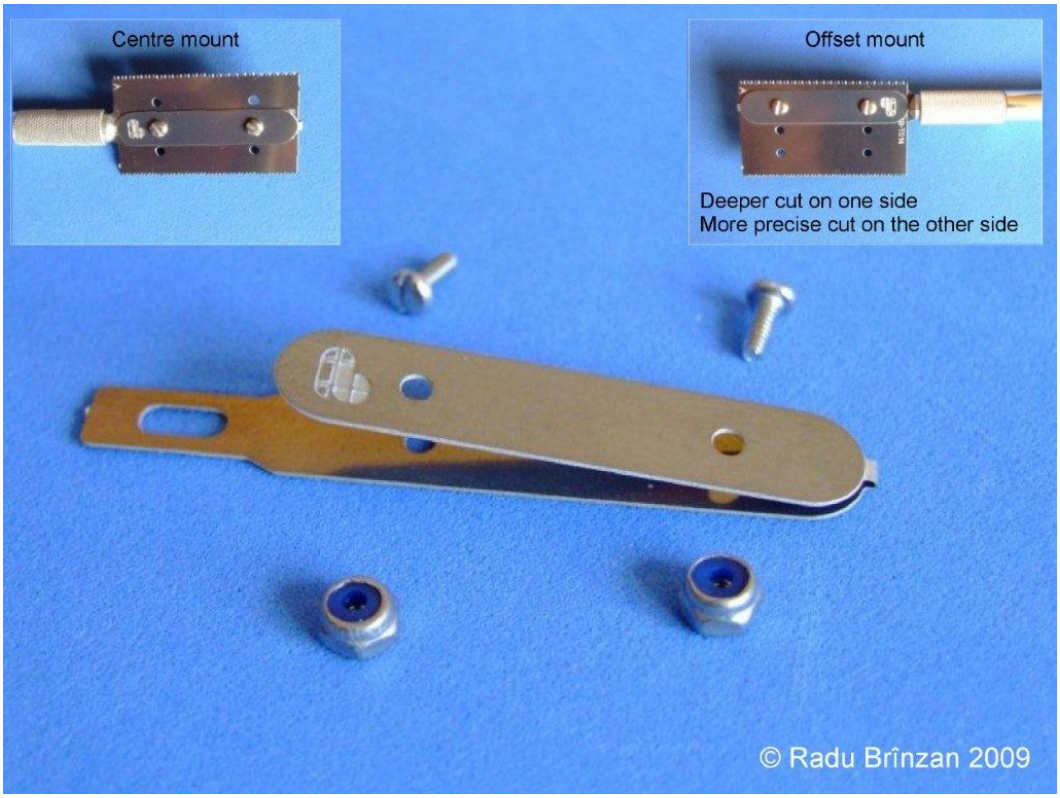
PART 5- RESIN (General)

This model contains aftermarket resin parts, as opposed to the normal plastic used. The reason for creating resin kits is that in years gone by, resin kits were able to produce much finer detail on kit parts than the plastic kit equivalents. Even today, there are many producers of resin kits and particularly after market replacement parts. However, plastic kit manufacturers have come a long way now and kits, such as those from 'Wingnut Wings' and 'Copper State' are equal to, if not better than resin kits. Manufacturers of resin kits these days tend to make kits to order or have 'limited' runs, although aftermarket parts are usually readily available. Working with resin does present different challenges to the modeller, especially if it's the first time of building a resin kit.
The properties of resin differ radically to those of plastic kits. Below I have listed what I have found to be the primary differences for resin kits from plastic kits:

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 thoroughly and leave to dry. Alternatively wipe the parts with isopropyl alcohol (e.g. 'Tamiya' X20A thinners).
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. The best way to remove item is to cut them away with a razor saw, then clean them up afterwards.
3. Once removed from the resin cast, parts will normally 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. Having Superglue 'de-bonder' close by is a good idea.
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 can be 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 difficult and may result in irreparable damage to the parts.

NOTE: *To separate resin parts from the thin moulding backing sheet, use sharp scissors or a scalpel blade. To separate larger parts from the moulding base block, use a fine modellers saw. The saw I use has a double sided and fine 'drag' saw blade and with its holder is available from 'RB Productions'.*





PART 6
RIGGING
(General)

PART 6 - RIGGING (General)

References:
Centennial Perspective - Halberstadt Aircraft of WW1 Vol 2 (CL.IV-CLS.I and fighters) (by J. Herris).
Halberstadt Fighters-Classics of World War I Aviation, Volume 1 (by Peter M. Grosz).
Online resources.

General:
It's important to check where the various rigging attachment points are for this aircraft. 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 etc and these drill bits sometimes have identifying coloured collars fitted to the drill shanks. I have 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.
With your research complete the rigging can be planned for the model in the subsequent Parts of this build log.
For the primary rigging, such as flying and landing wires and cross bracing wires, I used 'Steelon' or 'Stroft GTM' mono-filament (fishing line) of 0.12 mm diameter and for flight controls and 0.08 mm for flight control cables. These are effectively transparent but do give a look of steel, without the need of painting or colouring with a gel pen. The turnbuckles used are either sintered metal or resin and are obtained from such as 'Gaspatch Models' or 'Proper Plane'.

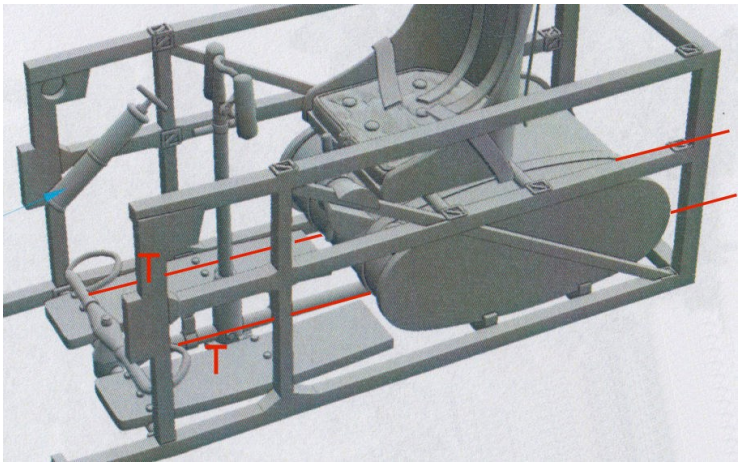
NOTE: *There is very little detailed information for the Halberstadt D.II therefore some speculative guess-work was needed, based on similar aircraft designs, such as the Halberstadt D.V.*

Internal bracing wires:

NOTE: *I could not find any photographs or information regarding any internal fuselage bracing wires in the visible cockpit area. If the kit cockpit detail is accurate then it seems the forward fuselage was covered in plywood, which would have been secured to the internal cockpit side frames. Therefore my assumption is that no internal cockpit bracing wires are required.*

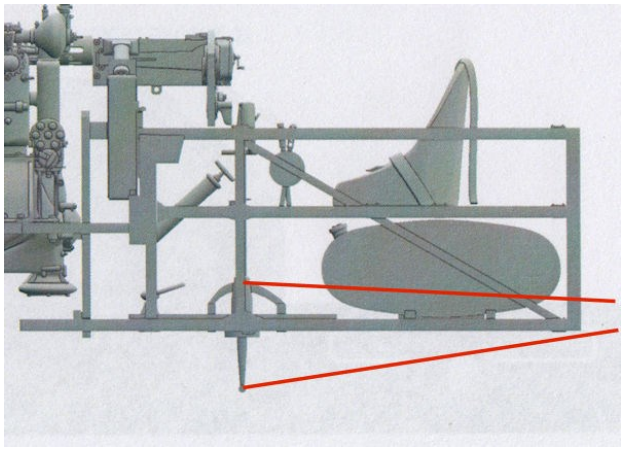
Rudder control cables:

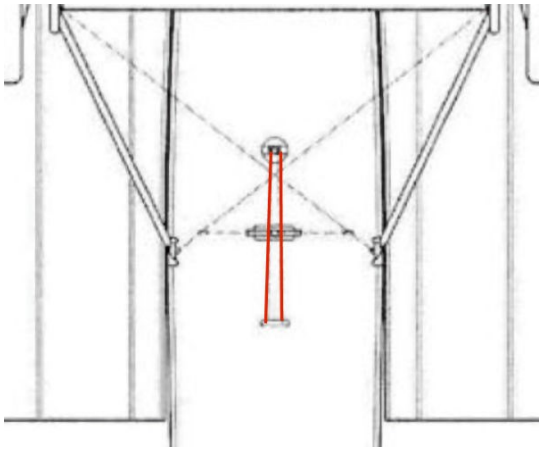
A control cable was attached to each side of the pilots rudder bar (on the rear edge). The cables were routed rearwards and through the top of the fuselage to the rudder control horns, which were located on the vertical torsion bar of the rudder. My assumption is that turnbuckles were fitted in the cables at the pilots rudder bar.

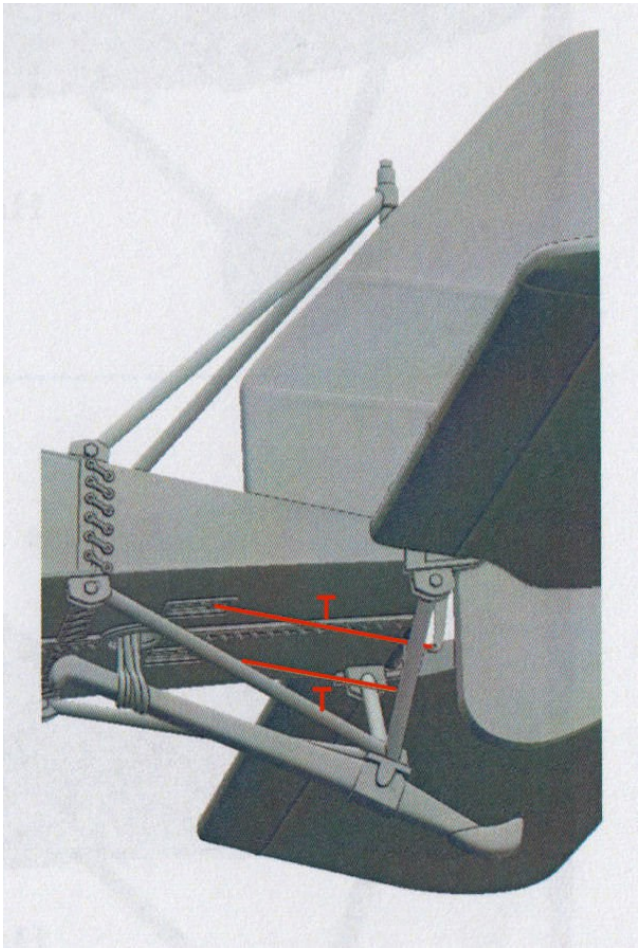


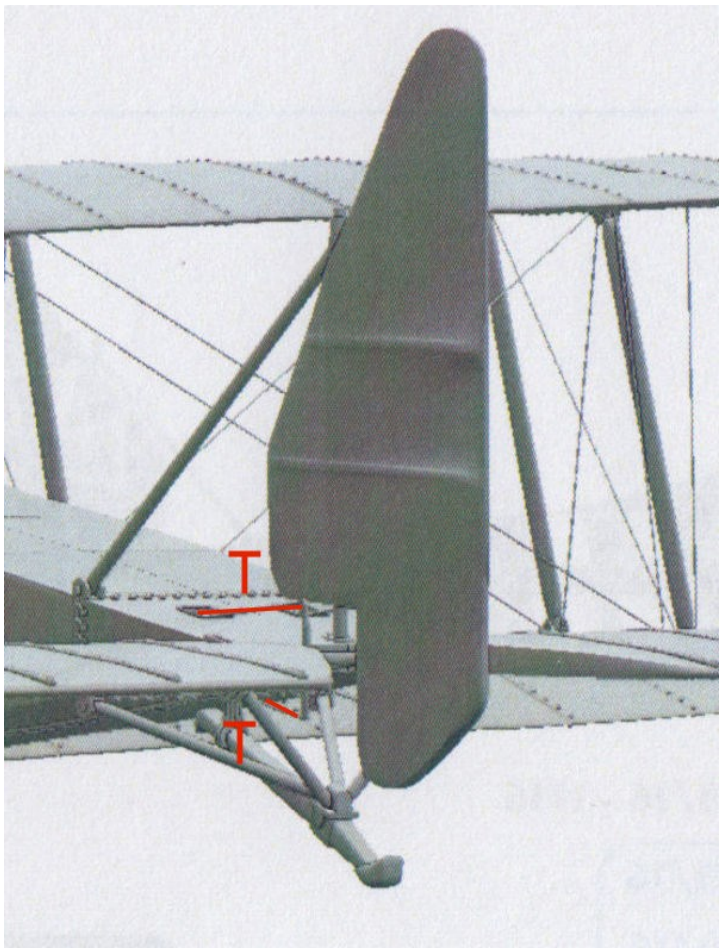
Elevator control cables:

The bottom of the pilots control column protruded through the fuselage, below the cockpit. Control cables were attached to the bottom of the control column and routed rearwards then back into the fuselage. A second pair of cables were attached to the pilots control column towards the base of the column and above the cockpit floor. These cables and the lower cables were routed rearwards and crossed before they exited the fuselage through ports in the top and underside of the fuselage, close to the rudder. The lower cables were attached to the upper control horns on the elevators and the upper cables to the underside control horns on the elevators. Turnbuckles are assumed to have been fitted externally at the control horns.

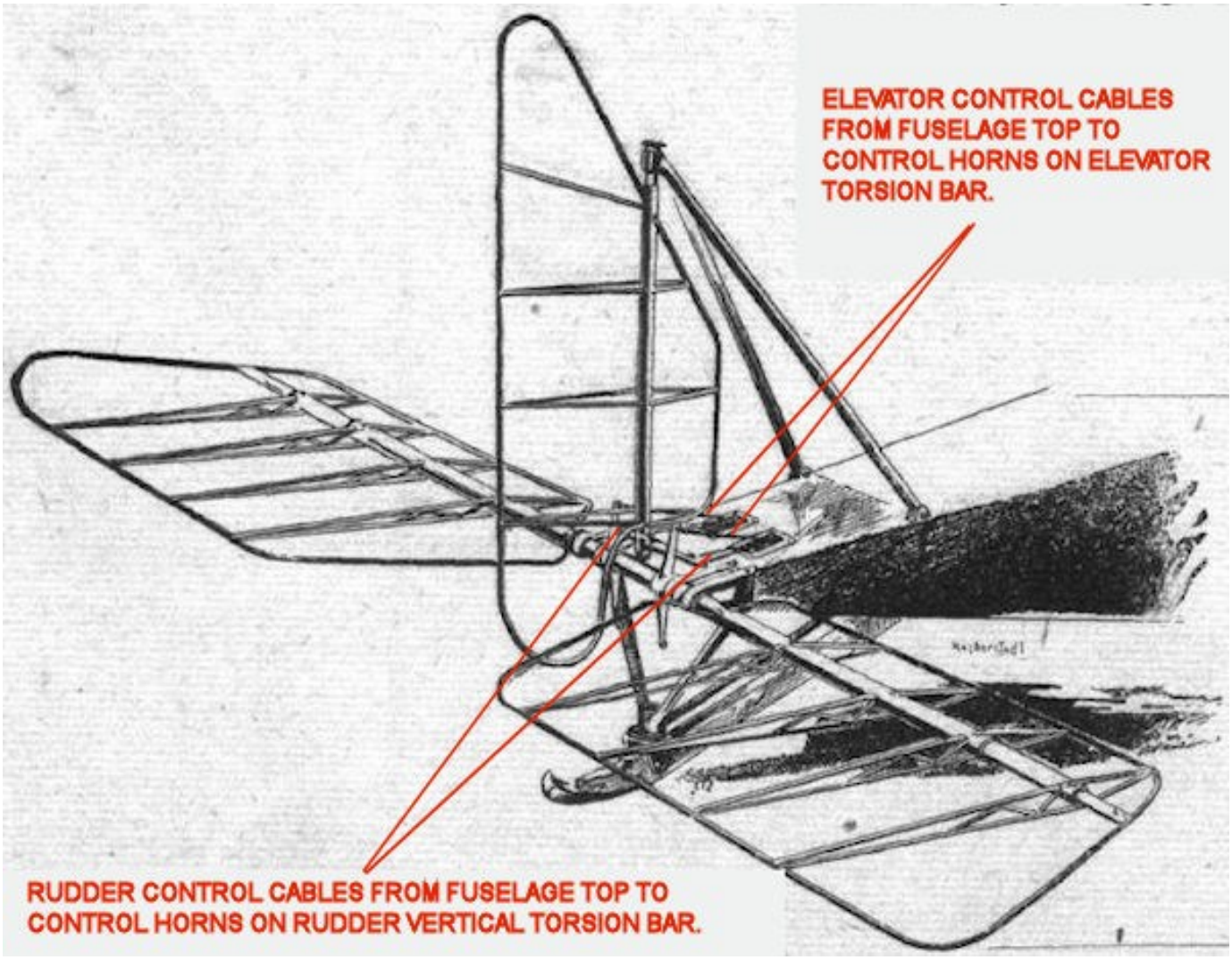






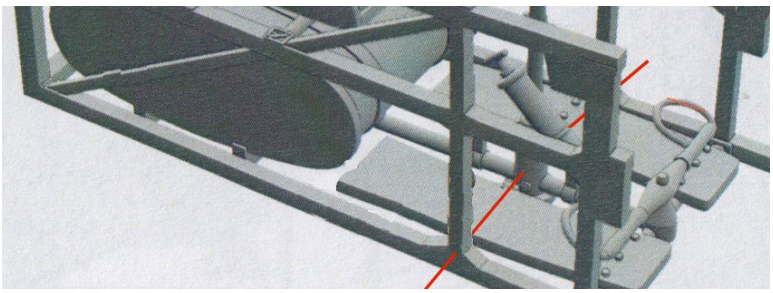


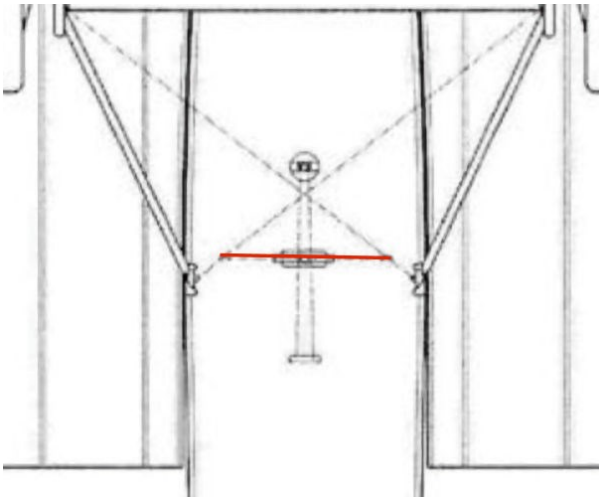
Rudder and Elevator control cables

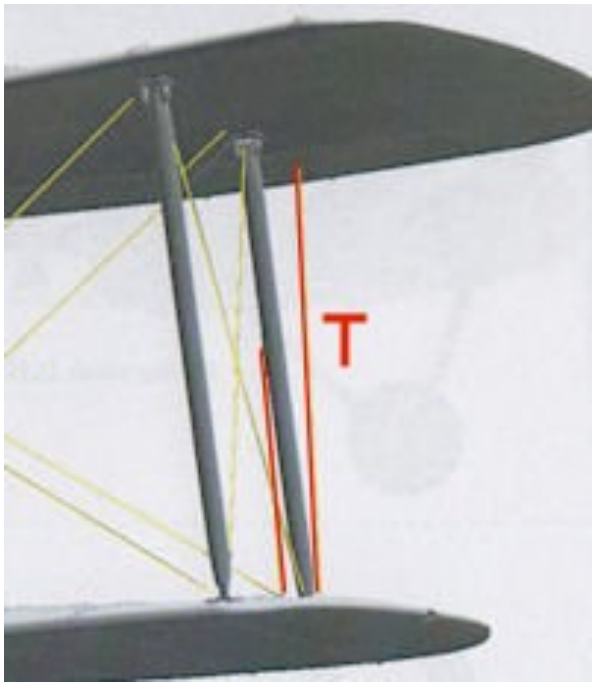


Aileron control cables:

My assumption is that control cables were attached to the control column or its torsion bar and routed outboard through the fuselage sides and into the lower wings. One cable exited the top surface of the lower wings and was routed up and into the underside of the upper wing. A second control cable was routed between the operating levers of the ailerons and downwards into the lower wings. One of the Control cables passed over a ‘bridge’ guide fitted on the underside of the fuselage over the bottom of the protruding pilots control column. Turnbuckles were fitted into the control cables down from the ailerons.



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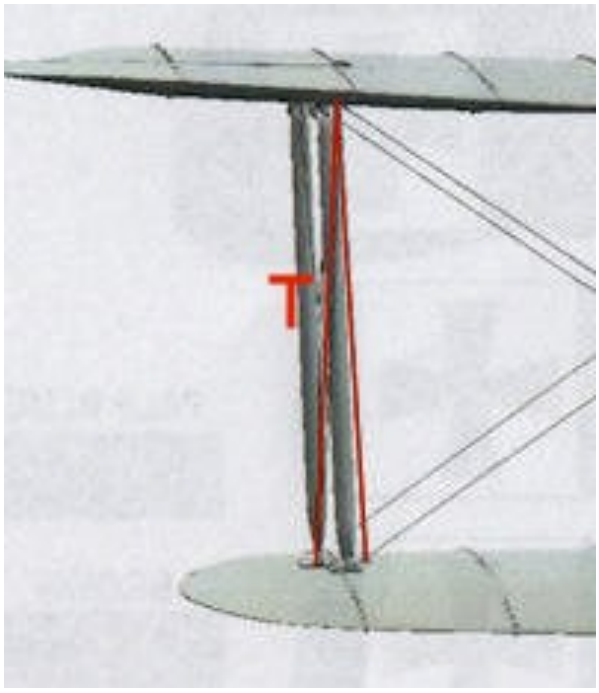
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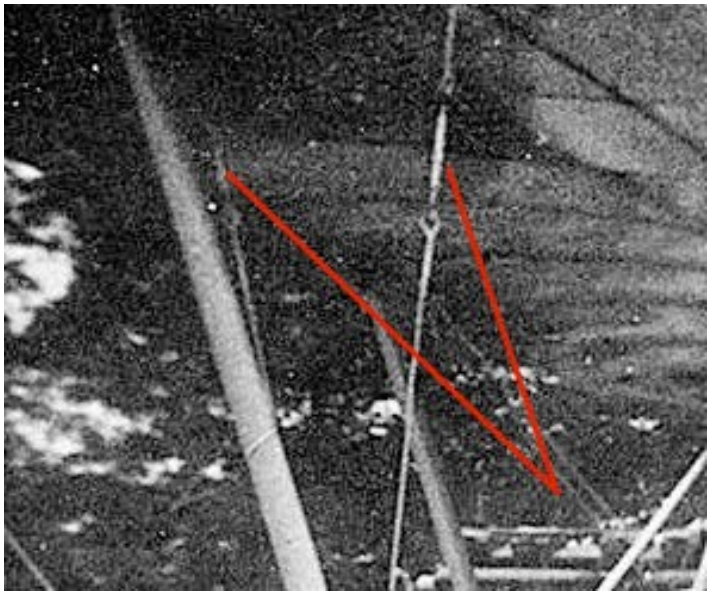

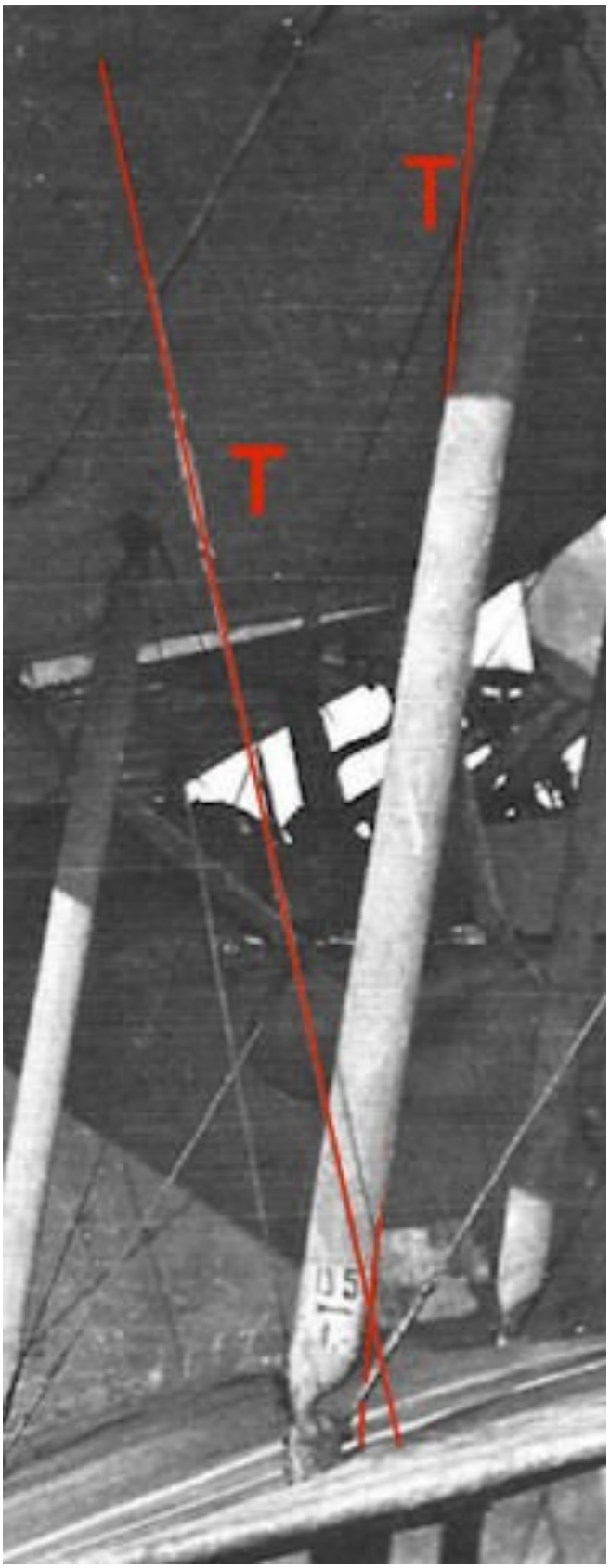
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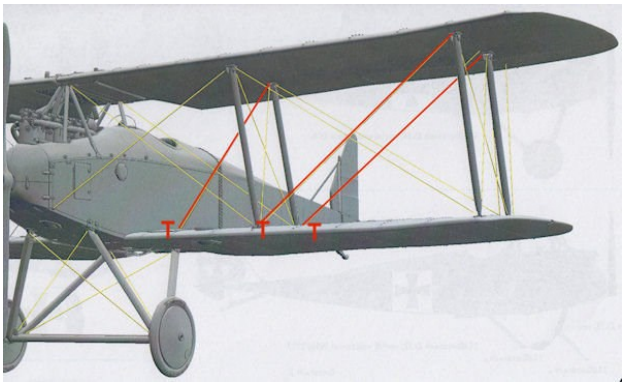
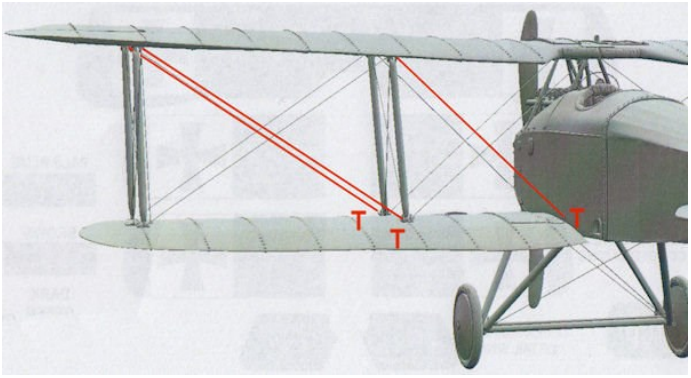
Flying wires:

Flying wires were attached to both sides of the aircraft. One wire was fitted between the fuselage sides and the lower wing roots. Two other flying wires were fitted to the lower wings between the bottom, outboard side of the inner interplane struts and the underside of the upper wing, inboard from the top of the outboard interplane struts. Turnbuckles were fitted in the lower ends of the wires.

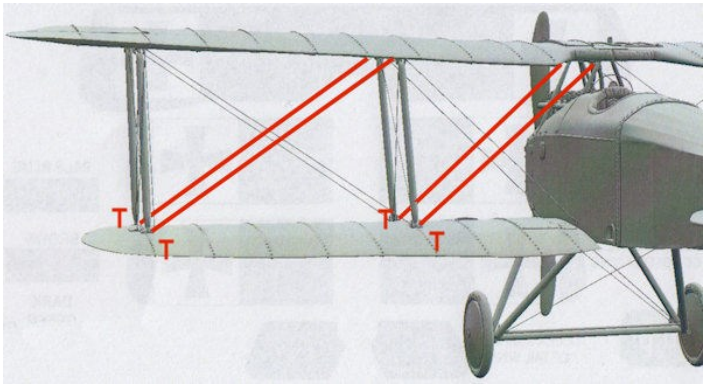


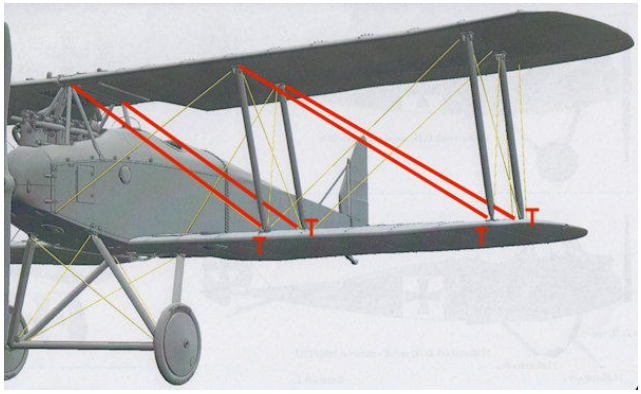


Landing wires:

Landing wires were attached to both sides of the aircraft. Two wires were fitted into the underside of the upper wing, outboard from the tops of the fuselage front and rear cabane struts. These wires were routed down and attached the upper surface of the lower wing, inboard from the bottom of the inner interplane struts.
A second pair of wires were fitted into the underside of the upper wing, outboard from the tops of the inner interplane struts. These wires were routed down and attached the upper surface of the lower wing, inboard from the bottom of the outer interplane struts.

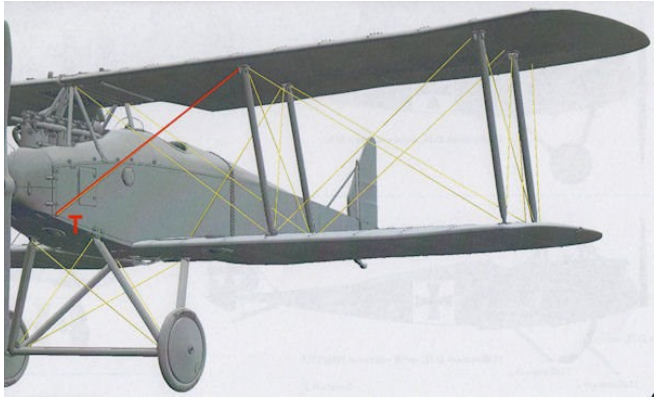
Turnbuckles were fitted in the lower ends of the wires.





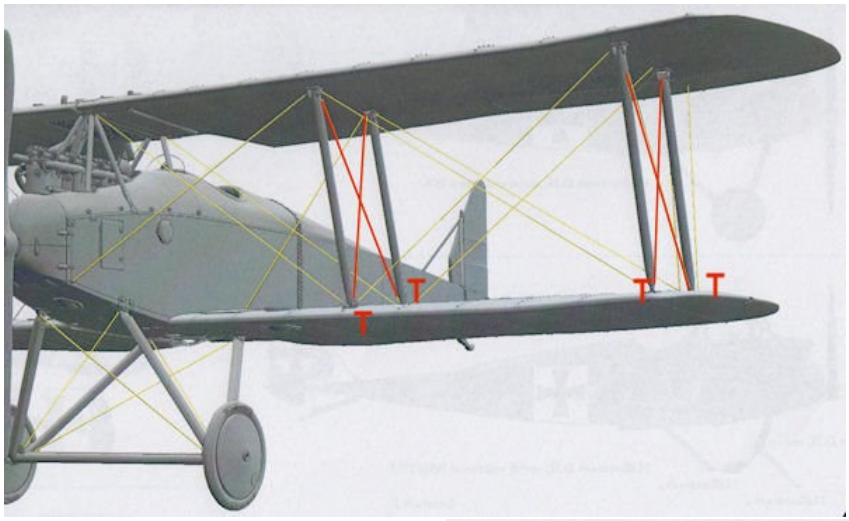
Drag wires:

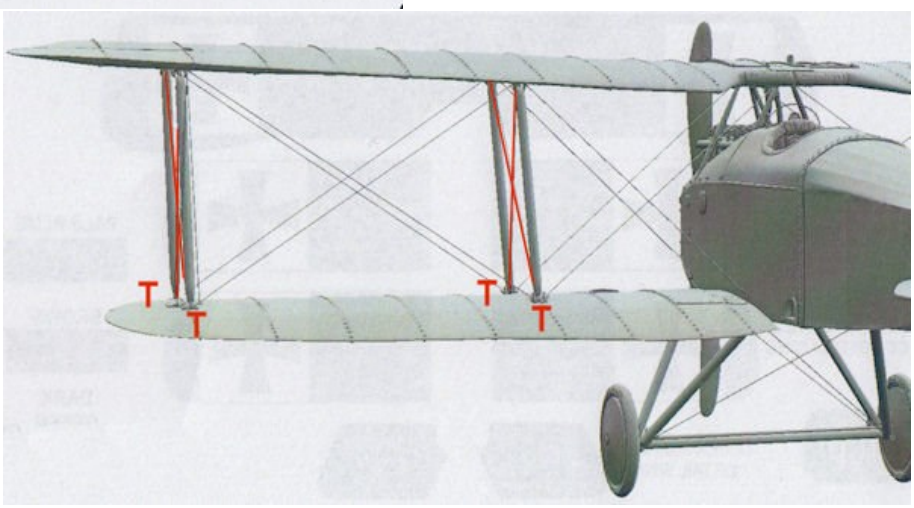
Drag wires were attached to both sides of the aircraft. The wires were attached to the fuselage forward sides at the bottom edge and at the rear of the nose cowl. The wires were routed up and rearwards to the underside of the upper wing at the top of the front inner interplane struts. Turnbuckles were fitted in the lower ends of the wires.



Incidence wires:

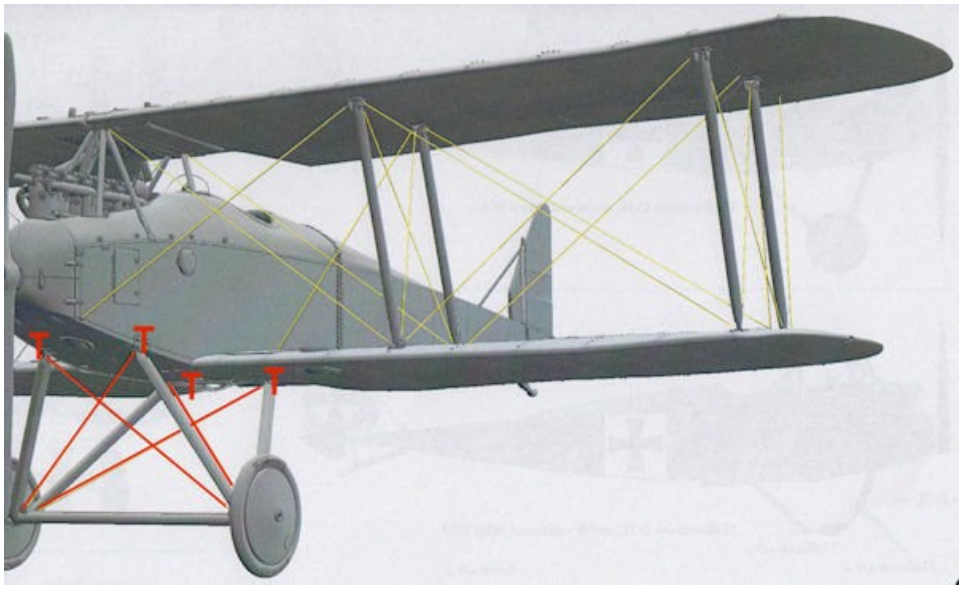
Crossed incidence wires were fitted in the upper surface of the lower wings, between the bottom of the interplane struts and the tops of the opposite interplane struts at the underside of the upper wing. Turnbuckles were fitted in the lower ends of the wires.





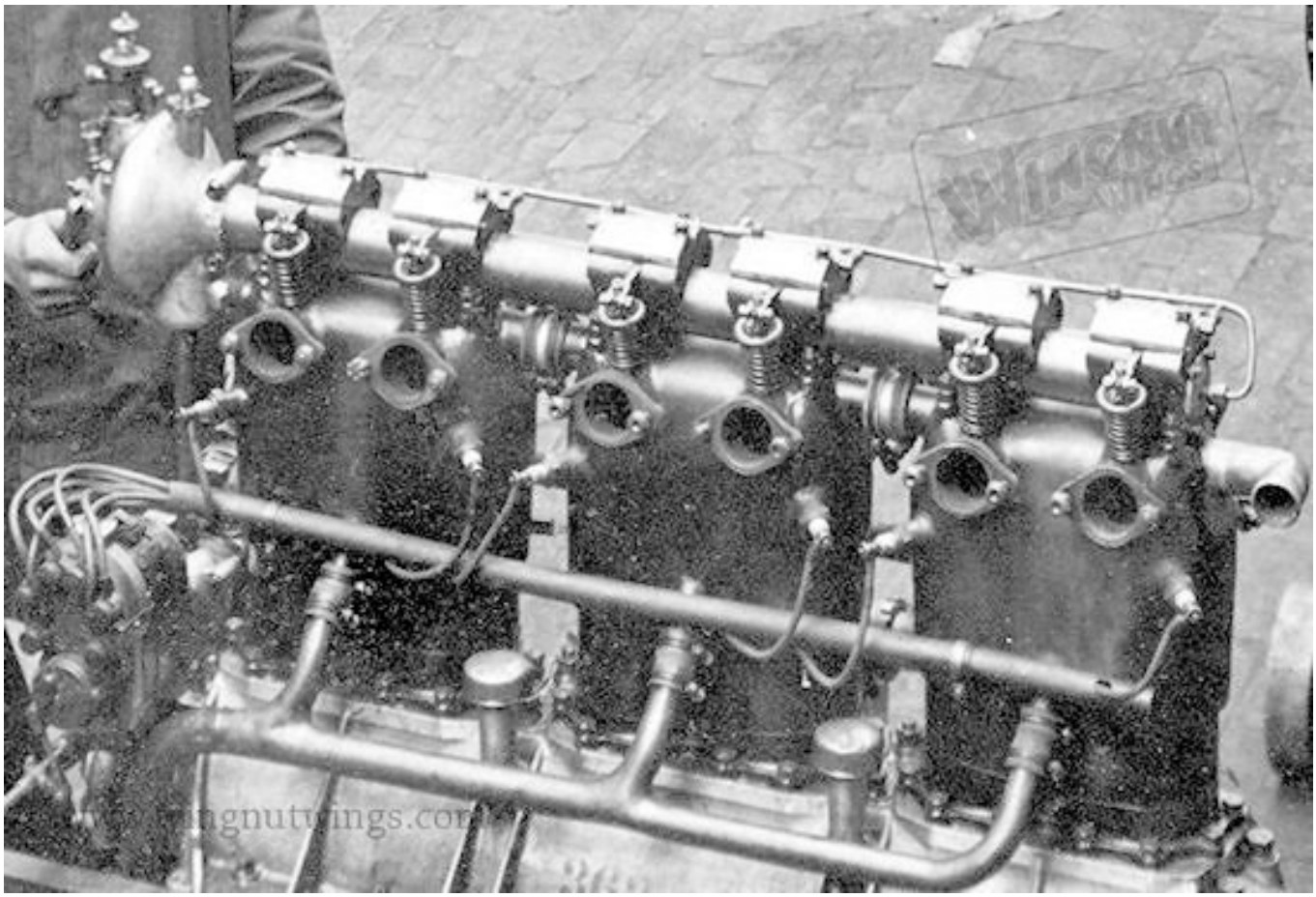
Landing gear bracing wires:

Crossed bracing wires were fitted in the underside of the fuselage at the tops of the front and rear struts. Both pairs of wires were routed down, crossed and attached to the axle fairing ends, inboard from the bottom of the struts. Turnbuckles were fitted in the upper ends of the wires.



PART 7
ENGINE

PART 7 - ENGINE



References:
Online resources.

The Halberstadt D.II aircraft were fitted with the Mercedes D.II six cylinder water cooled inline engine, which developed 120hp (90 kW0. Later marks of the aircraft were fitted with more powerful Argus engines. The engine supplied in the kit is totally 3D printed and to a good surface finish with very little obvious surface striations, that can be associated with 3D printed components. However, ignition leads need to be added.

NOTE: *As this 3D printed engine is resin, assembly must be done using* ***CA adhesive.***
The resin used to print the parts is brittle. Therefore, care is needed when removing the parts from their print supports and when subsequently when handling.

Preparation:

Cut the following 3D printed engine parts from their support trees and carefully sand away any residual 'tree' stubs on the parts:

Engine assembly.
Engine exhaust pipe.
Engine oil tank.
Engine carburettor/inlet manifold.

NOTE: *Each engine cylinder has pre-molded spark plugs. However some were broken away and not all are the same size. Therefore, I chose to replace the spark plugs.*

Cut away all of the spark plugs from the engine cylinders.

Point mark the centre of each spark plug 'witness' mark.

Using the point marks as guides, drill holes of 0.5mm diameter into each engine cylinder, making sure the holes are drilled at the same angle that the original spark plugs were molded. These will be used later in this build to attach tubing to represent the spark plugs.

Painting:

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

Airbrush the parts with 'Tamiya' Gloss Black (X1) or similar.

Brush paint the following parts as detailed:

'Mr. Colour' Stainless Steel (213)

Magneto drive shafts
Valve lever covers
Valve springs
Magneto retaining straps
Water pump.

'Alclad' Duraluminium (ALC-102)

Engine sump and crank-case.

'Mr. Colour' Brass (219)

Engine oil tank
Pipe connection/float chambers at base of carburettor housing
Discs on top of carburettor housing
Caps on two oil filler pipes
Bottom face of Magnetos.

'Mr. Colour' Dark Iron (214)

Overhead camshaft.

'Tamiya' Hull Red (XF9)

Ignition lead support tubes
Outer face of Magnetos
Cylinder gasket faces for the inlet manifold pipes.

'Tamiya' Gunmetal (X10)

Water cooling pipe
Inlet manifolds.

Engine exhaust pipe:

Airbrush the exhaust pipe with 'Alclad' Exhaust Manifold (ALC-123) or similar.

Airbrush the exhaust pipe with a matte (flat) clear coat, such as 'Alclad' Flat (ALC-314) or similar.

Refer to Part 3 (Weathering) of this build log for more information - apply your desired weathering finish to the exhaust pipe (I used 'Flory Models' Dark Dirt or Grey fine clay wash).

Seal the applied weathering with a semi-matte clear coat, such as 'Alclad' Light Sheen (ALC-311) or similar.

Carburettor linkage:

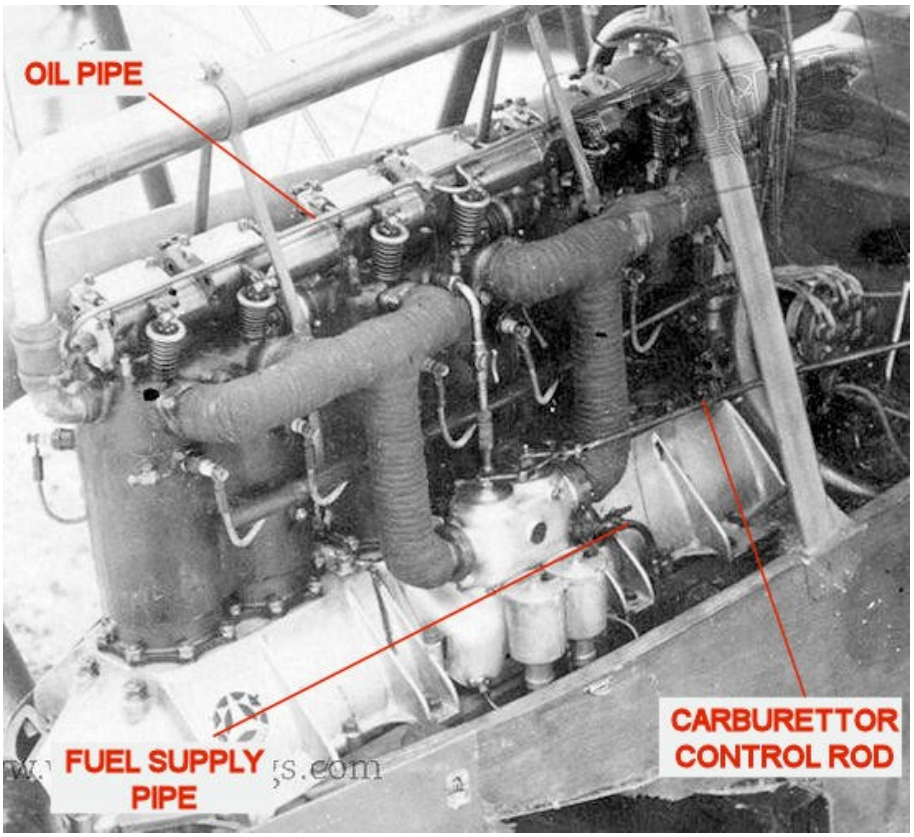
Cut the supplied photo-etch carburettor linkage (16) from the sheet and remove any residual tags from its edges.

Secure the linkage to the top of the carburettor housing, with the cam at the rear of the housing.

Brush paint the linkage with 'Mr. Colour' Stainless Steel (213) or similar.

Modifications:

Typical Mercedes D.II engine



Ignition leads:

Cut twelve short lengths of 0.4 mm diameter Nickel-Silver tube, such as 'Albion Alloy's' NST04 or similar.

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

Cut twelve long lengths of 'Modelkasten' rigging line 0.13mm (0.6).

Using thin CA adhesive, secure a line to the end of each spark plug tube.

Cut the lines such that they can be looped down and under the ignition lead support tubes.

Using thin CA adhesive, secure each line to the underside of their ignition support tube and below their relevant spark plug.

Cut away any residual line from the underside of the ignition support tubes.

Cut twelve long lengths of 'Modelkasten' rigging line 0.13mm (0.6).

Using thin CA adhesive, secure a line to each of the lead connectors on the face of the two magnetos.

Cut the lines such that they can be looped up and to the rear of their ignition support tube.

Using thin CA adhesive, secure the six lines from each magneto to the rear end their ignition support tube.

Brush 'Mr. Colour' Brass (219) or similar the ends of the lines at the twelve spark plug tubes, to represent the lead to plug connectors.

Camshaft oil pipe:

Cut a long length of 0.3mm diameter Nickel-Silver tube, such as 'Albion Alloy's' NST03 or similar.

Bend one end of the tube around a 1.5mm diameter drill shank, to form a semi-circle.

NOTE: *The bent end of the tube should be positioned against the centre pf the front end of engine camshaft.*

Position the tube along the top of the valve gear, on the left side of the engine.

Cut the opposite end of the tube such that it rests over the valve gear and against the housing for the engine de-compression lever.

Using thin CA adhesive, secure the tube in position on the valve gear and the front recess.

Carburettor feed pipe:

NOTE: *The carburettor fuel supply was through a pipe connected to the lower, rear side of the carburettor housing. This pipe is not represented in the kit.*

Cut away the pipe connection stub on the lower, rear side of the carburettor housing.

Drill a hole of 0.5mm diameter into the centre of the connector 'witness' mark and into the carburettor housing. This will be used to connect the fuel supply pipe later in this build.

Propeller shaft:

NOTE: *As the kit supplied propeller is to be replaced with a 'Proper Plane' Niendorf wood version, the fitting of the propeller requires modification to the engine.*

Cut away the pre-molded propeller shaft flush to the front of the engine.

Point mark the centre of the shaft on the engine.

Drill a hole of 1.0mm diameter approximately 10mm into the engine, keeping the drill at 90 degrees to the engine when viewed from above and from the side.

Decals:

Brush a clear gloss coat, such as 'Tamiya' Gloss (X22) or similar, over the forward surface on the engine sump (both sides).

Brush a clear gloss coat, such as 'Tamiya' Gloss (X22) or similar, over the surface on the engine crankcase between the central 'webs' on the right side of the engine.

NOTE: *The kit supplied decals are not 'cookie cut' and therefore need to be manually cut out from their backing sheet.*

Carefully cut out two of the supplied 'Mercedes' engine logo's and one of the rectangular data plates.

Apply the two 'Mercedes' logo's between the two forward crankcase 'webs' on both sides of the engine.

Apply rectangular data plate on the engine crankcase between the central 'webs' on the right side of the engine.

Set the applied decals using 'MicroScale' MicroSol.

Assembly:

Using thin CA adhesive, secure the carburettor housing into its locating slot in the left side of the engine crankcase, with the six intake manifolds onto their locations on the left, top sides of the engine cylinders.

Using thin CA adhesive, secure the exhaust pipe into its locating recesses in the top, right side of the engine cylinders.

Weathering:

Airbrush a semi-matte sealing coat over the engine (e.g. 'Alclad' Light Sheen ALC-311) or simile.

Refer to Part 3 of this build log and weather the engine, as desired, using 'Flory' Dark Dirt clay wash.

Re-apply the semi-matte sealing coat over the engine to seal in the weathering.

Apply 'AK Interactive' Engine Oil (AK-2019), Kerosene (AK-2039) as desired around appropriate areas of the engine, such as along the cam shaft and around the oil tank filler etc.

NOTE: *The following photographs show the engine later in this build. The engine oil tank and other additional details will be fitted later in Part 10 (Fuselage) of this build log.*

PART 8
WEAPON

PART 8 - WEAPON

The early Halberstadt D.I aircraft were fitted with a single 7.92mm IMG 08 ‘Spandau’ machine gun, which was located on the right side of the fuselage decking panel, forward from the cockpit. The kit supplied weapon is 3D printed with a photo-etch cooling jacket and front cover with gun sight.

Preparation:

NOTE: *As the weapon is resin, assembly must be done using **CA adhesive.** The resin used is brittle. Therefore, care is needed when being handled.*

Carefully remove the machine gun from its support trees and sand away any residual tree stubs.

Cut the cooling jacket and front cover with gun sight from the supplied photo-etch sheet.

NOTE: *In the following step, do not remove the three photo-etch tabs from the edge of the cooling jacket.*

File away any residual photo-etch tags from the edges of the parts.

Anneal (soften) the cooling jacket only by passing it along a heat source, such as the flame from a cigarette lighter until the photo-etch changes colour.

Position the centre line of the cooling jacket along the shank of a 2.9mm diameter drill, keeping its edges aligned to the drill.

Roll the cooling jacket around the drill shank to form the circular shape.

Make sure the three edge tabs overlap the opposite edge.

Keeping the two edges together, secure the joint using thin CA adhesive.

Assembly:

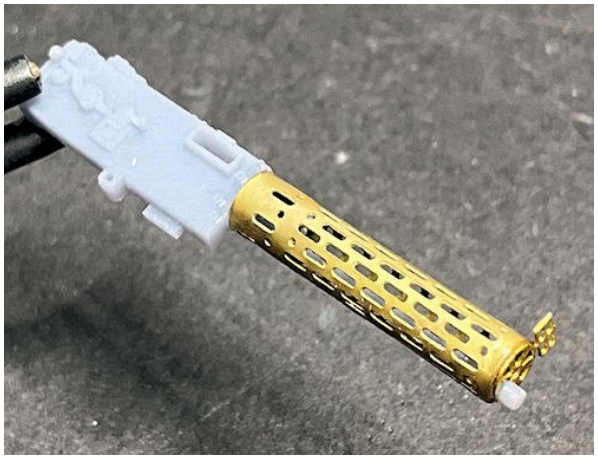
Locate the front cover with gun sight onto the front of the cooling jacket (the rear of the cooling jacket has less perforations). Position with the gun sight opposite the cooling jacket joint.

Secure the front cover onto the front of the cooling jacket using thin CA adhesive.

Slide the cooling jacket over the barrel of the machine gun, locating the barrel through the hole at the bottom of the front cover.

Position the rear edge of the cooling jacket against the front face of the breach block of the machine gun. Make sure the cooling jacket top is a aligned to the top of the breach block and is parallel to the barrel.

Secure the cooling jacket to the breach block and barrel using thin CA adhesive.



Painting:

Airbrush the machine gun with a grey primer, such as ‘AK Interactive’ Grey (AK758) or similar.

Airbrush the machine gun with a gloss black, such as ‘Tamiya’ (X1) or similar.

Airbrush the machine gun with ‘Alclad’ Gun Metal (ALC-120) or similar.

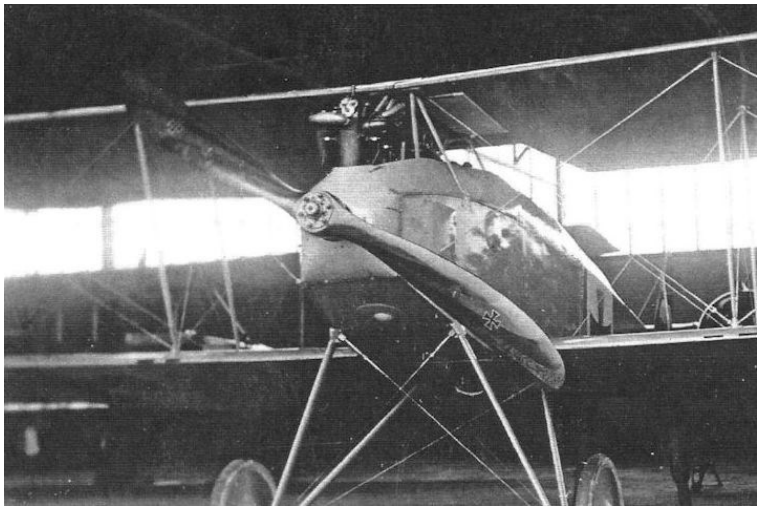
Dry brush the machine gun with ‘Mr. Colour’ Super Iron 2 (SM203) or similar.

PART 9
PROPELLER

PART 9 - PROPELLER

References:
Online resources.

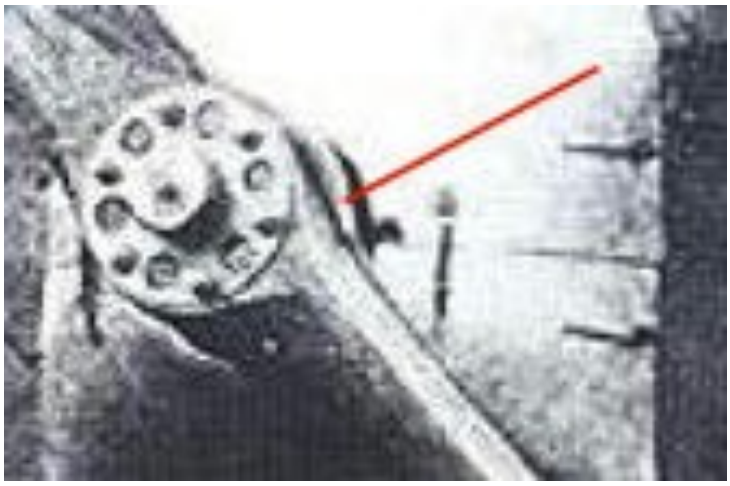
NOTE: *The 3D printed propeller supplied in this kit will not be used, as the twist in each blade is in the wrong direction. As this can't be corrected, a replacement propeller is required. Corrected replacements are available, contact 'Lukgraph'.*
However, I chose to replace the kit supplied propeller with a 'Niendorf' hand made laminated wood propeller from Alexey Belov at 'Proper Plane', which requires modification.



Original incorrect kit supplied propeller

Propeller back and hub plates:

NOTE: *The propeller had a back plate fitted, which is not supplied in the kit.*



From 0.3mm thick plastic card, cut a disc with its diameter slightly larger than the diameter of the central hub of the propeller.

Drill a hole of 1.0mm diameter through the centre of the disc.

Carefully cut the resin front and rear hub plates, supplied with the propeller from 'Proper Plane', from their casting block.

Sand the rear faces of both plates to reduce their thickness to that of the cast plates.

Prime the back and two hub plates with a grey primer, such as 'AK Interactive' Grey (AK758) or similar.

Brush paint the back and two hub plates with 'Mr. Colour' Stainless Steel (213) or similar.

Propeller modification:

NOTE: *The hole in the propeller from 'Proper Plane' needs to be reduced in diameter to allow it to be fitted to the engine. This requires the fitting of different diameter Brass tubes from 'Albion Alloy's'.*

I drilled the hole in the propeller to increase its diameter to 2.5mm. I then cut a short length of 2.5mm diameter tube the same length as the thickness of the propeller hub. I then cut tubes of 1.6mm, 1.4mm and 1.2mm diameter to the same length. The tubes were then slid into each other to create a 2.5mm diameter tube with a 1.0mm diameter internal bore. This tube assembly was inserted into the propeller and secured in position using thin CA adhesive.

Decals:

NOTE: *I chose to use 'Niendorf' propeller decals from my 'spares' (ex-Wingnut Wings decals). Make sure the decals are applied to the front faces of the propeller blades.*

Refer to Part 4 (decals) of this build log - Apply the decals centrally at the outer third of both propeller blades.

Assembly:

Using thin CA adhesive, secure the rear hub plate centrally onto the rear of the propeller hub.

Using thin CA adhesive, secure the front hub plate centrally onto the front of the propeller hub.

Cut a length of 1.0mm diameter Brass rod, such as that from ‘Albion Alloy’s’ or similar.

Using thin CA adhesive, secure the rod fully into the tube assembly from the rear of the propeller hub.

Slide the created back plate disc onto the rod and fully up to the rear hub plate.

Using thin CA adhesive, secure the back plate onto the rod.

Test fit the rod of the propeller assembly into the pre-drilled hole in the front of the engine. If necessary, cut the rod length until the back plate can touch the front of the fuselage.

Airbrush the propeller assembly with a semi-matte clear coat, such as ‘Alclad’ Light Sheen (ALC311) or similar.

Brush ‘AK Interactive’ Kerosene wash (AK3029) over the propeller front hub plate.

NOTE: *The propeller will be fitted to the model once it’s on the display base, as this will allow correct positioning of the mechanic and propeller.*

PART 10
FUSELAGE

PART 10 - THE FUSELAGE

References:
Centennial Perspective - Halberstadt Aircraft of WW1 Vol 2 (CL.IV-CLS.I and fighters) (by J. Herris).
Halberstadt Fighters-Classics of World War I Aviation, Volume 1 (by Peter M. Grosz).
Online resources.

NOTE: *As this model is resin, all assembly of parts must be done using **CA adhesive.** The resin used to 3D print some of the parts is brittle. Therefore, care is needed when removing the parts from their print supports and when subsequently when handling.*

Preparation:

Fuselage halves:

NOTE: *Before assembling and fitting the cockpit it's best to first prepare the fuselage halves.*

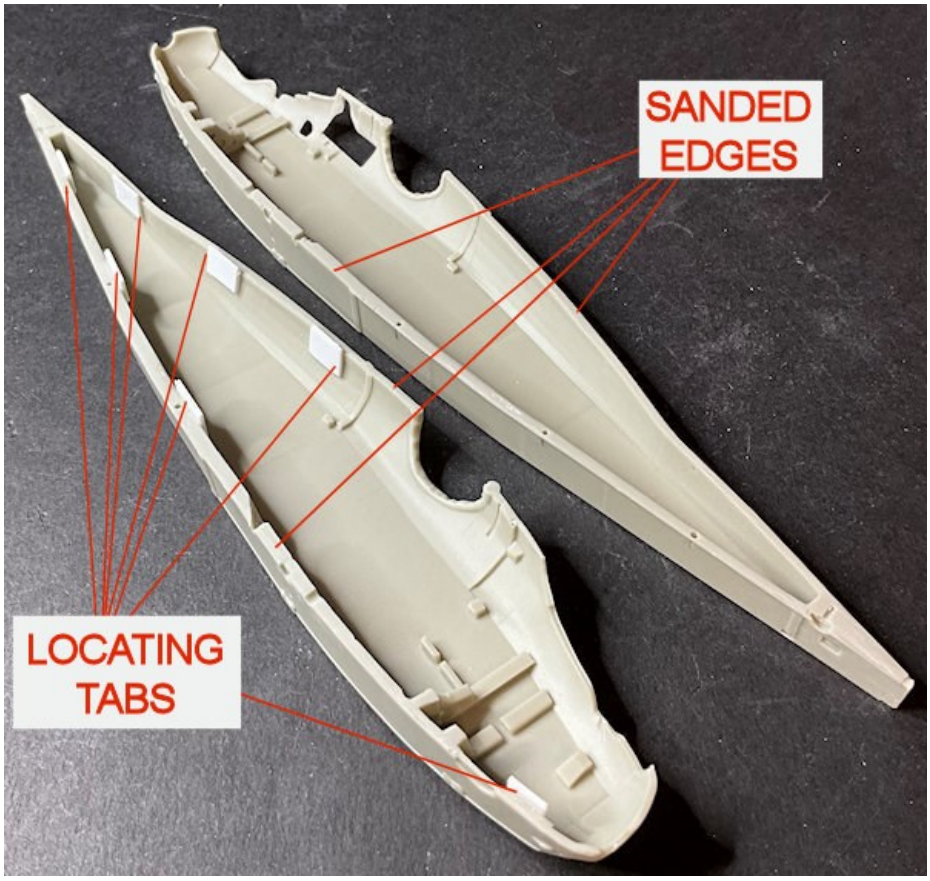
Hold the two fuselage halves together with the molded surface details aligned and check the mating edges for full contact around the fuselage.

NOTE: *During the following step, avoid removing too much material as this will affect the fitting of the cockpit assembly.*

Where necessary file or sand rough or high areas to achieve a full contact between the fuselage halves.

Cut pieces of 1.0mm thick plastic card and secure them in position along the edges of one of the fuselage halves (see following photograph) using thin CA adhesive. These will provide alignment of the fuselage halves when assembled.

Locate the fuselage halves together and make sure the joint has no gaps. If necessary chamfer the edges of the plastic card to allow the halves to locate fully.

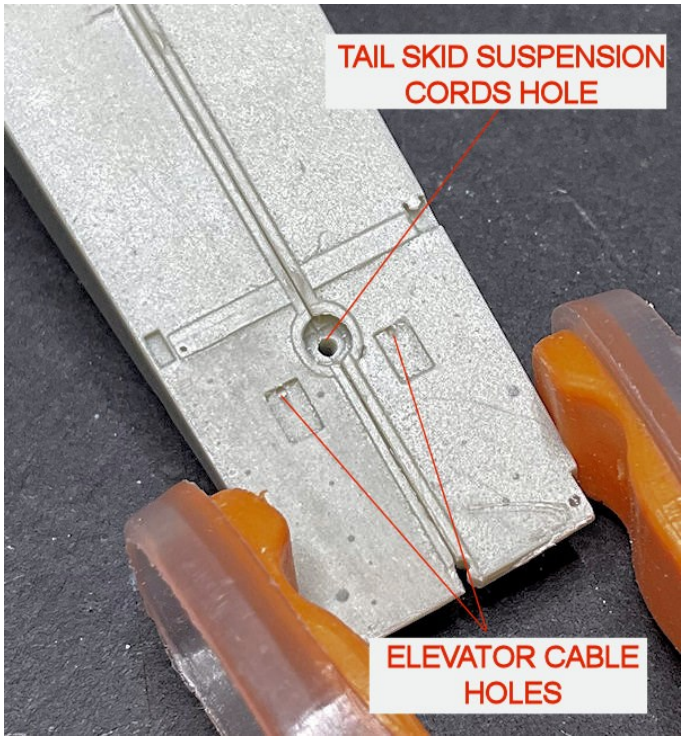


Drill holes of 0.5mm diameter into the recesses in the upper and underside of the fuselage rear. The upper side requires two holes in the forward corners of each recess. The underside recesses require one hole central in the forward edge of the recesses. These holes will be used to rig the rudder and elevator control cables, later in this build.

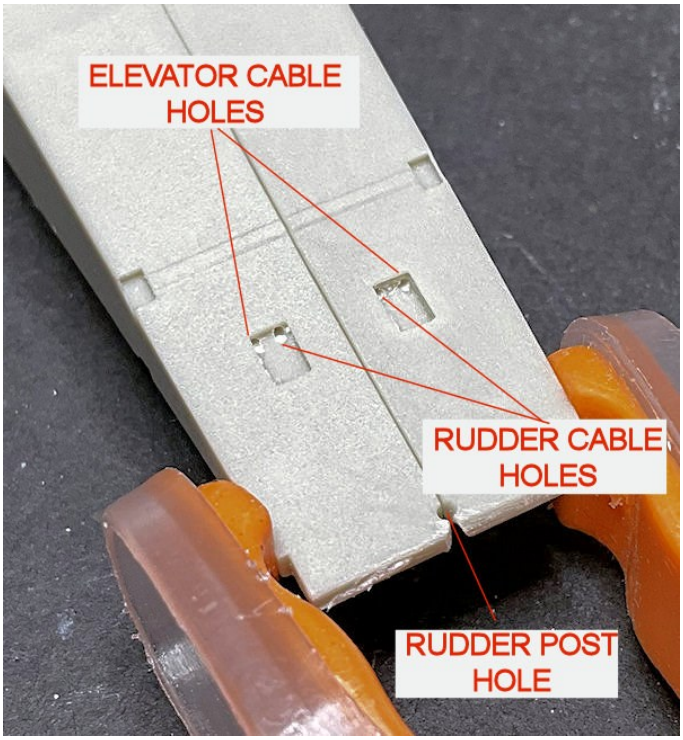
Drill a 0.8mm diameter hole into the centre of the tail skid recess. This will be used to install the tail skid 'bungee' suspension cords, later in this build.

Drill a 0.8mm diameter hole through the rear of the fuselage halves. This will be used to install the rudder post, later in this build.

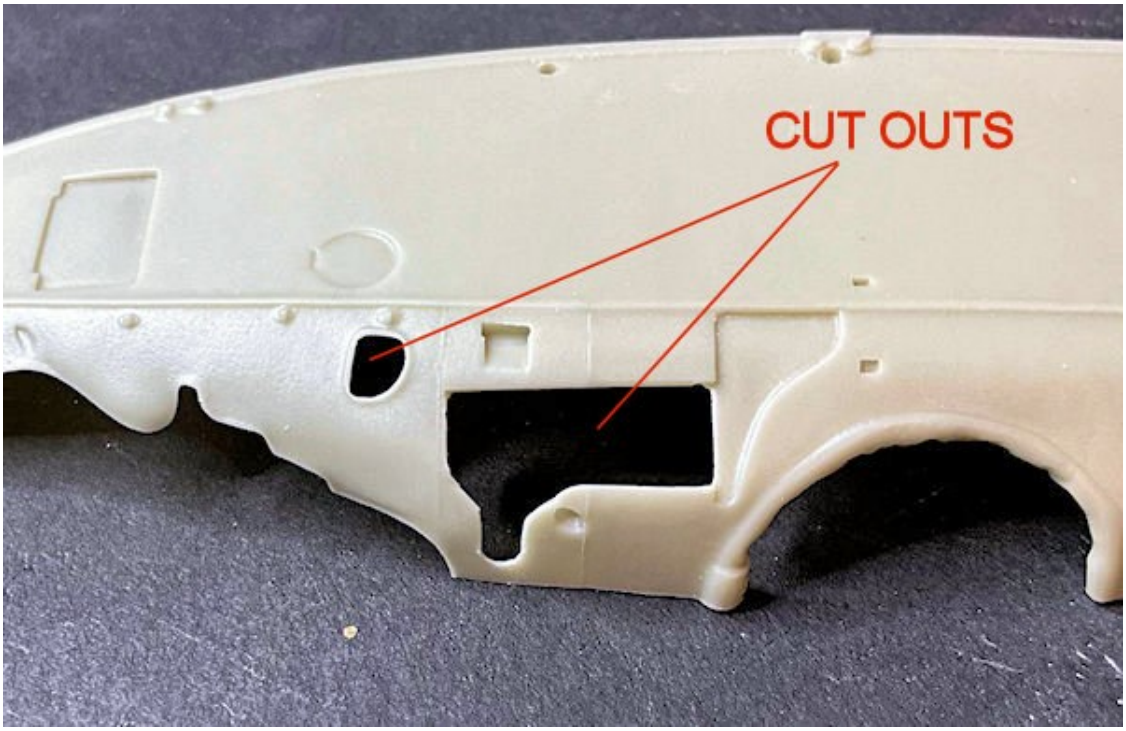
Underside of fuselage



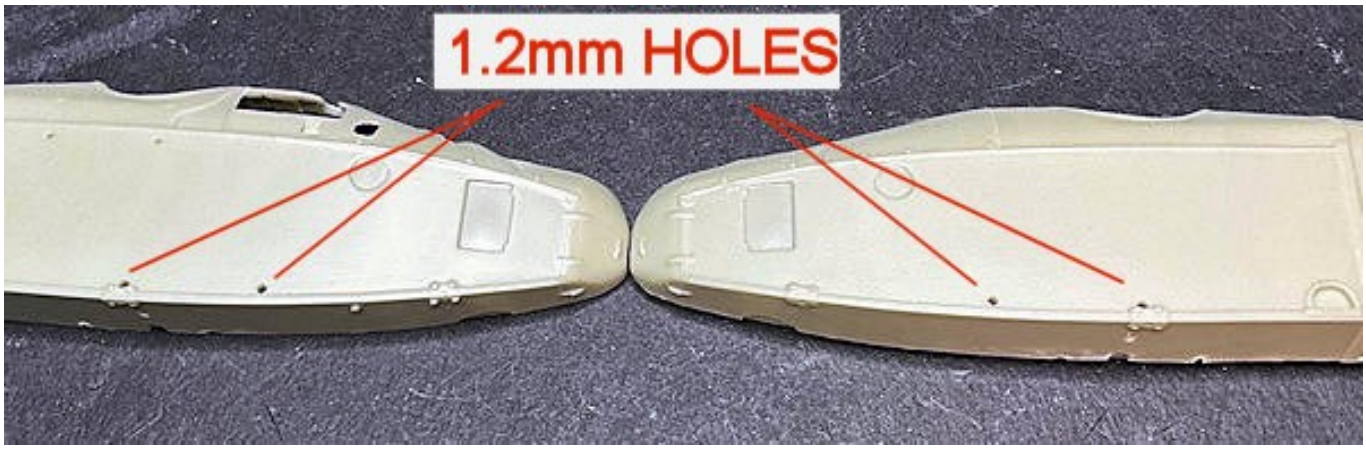
Upper side of fuselage



Cut out the two openings in the right fuselage half and file or scrap away material from the inside of the fuselage to reduce the edges of the openings to a more in-scale thickness.



Drill holes of 1.2mm diameter through the fuselage halves at the pre-molded recesses. These will be used to locate the lower wing support rods, later in this build.



Cockpit frame and fuselage openings:

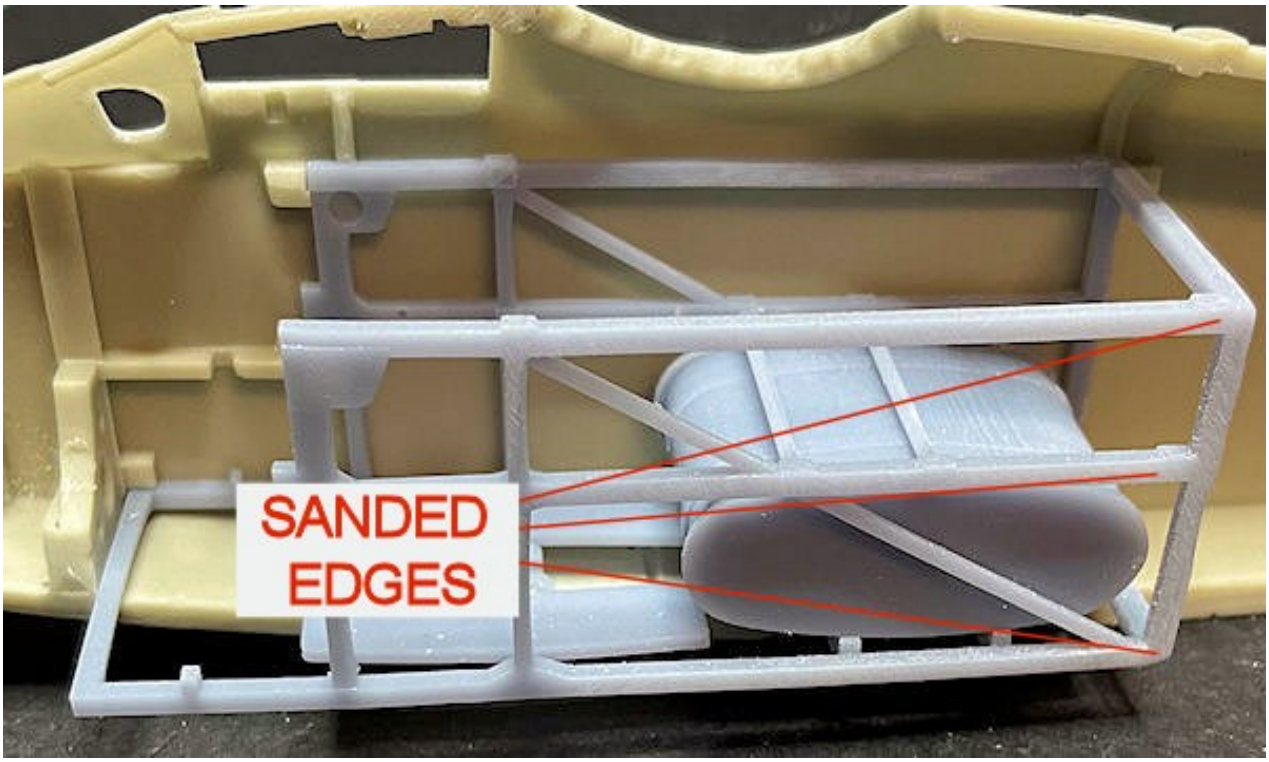
NOTE: *Handle the 3D printed parts with care as the resin used is fragile and can easily be damaged.*

Remove the cockpit frame from its support trees and file or sand away any residual tree stubs from its edges.

Fit the cockpit frame into the right fuselage half. The frame locates into and over its locating stubs.

Locate the left fuselage against the right half, taking care to correctly locate the cockpit frame into its locating stubs in the left fuselage half. Do not force fit the two together or the cockpit frame may be damaged.

If necessary, file or sand away material from the sides of the cockpit frame to reduce the overall width of the frame, allowing the fuselage halves to fully contact each other.



Underside of fuselage:

NOTE: *The underside of the fuselage has a pre-molded opening for the bottom of the pilots control column, when fitted. However, when the cockpit frame is located into the fuselage, the hole in the frame did not align with the pre-molded recess.*

File or sand away the raised detail for the opening on the underside of the fuselage halves.

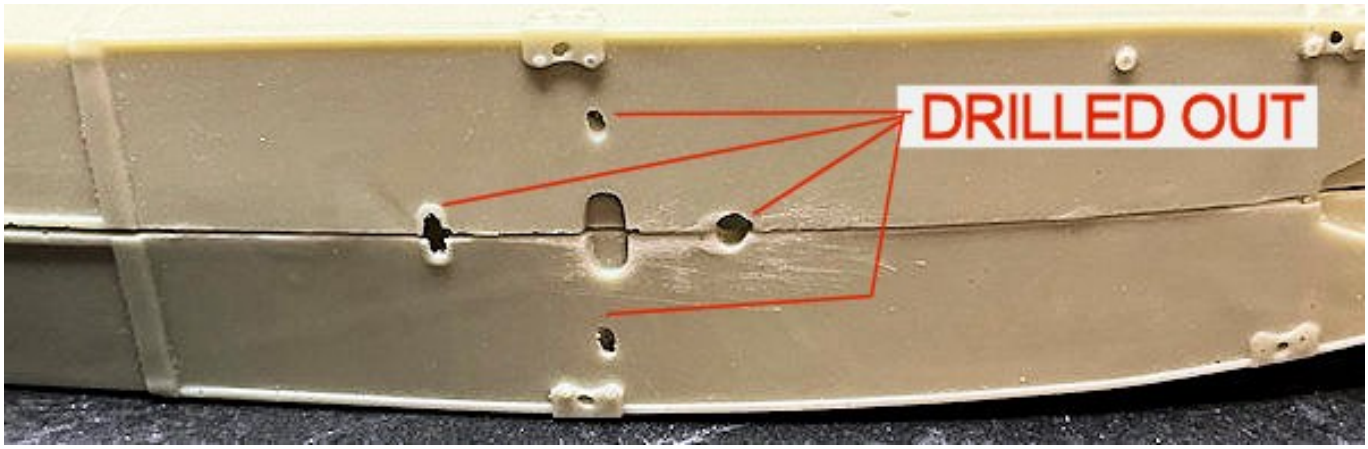
Temporarily join the two fuselage halves together with the cockpit frame fully locate inside. Make sure to fuselage halves are correctly aligned.

Hold the fuselage together and from the cockpit opening, using the hole in the cockpit frame as a guide, drill a hole of 1.8mm diameter through the fuselage. This will be used to fit the protruding column later in this build.

Drill out the rear opening in the fuselage underside, using a 0.8mm diameter drill. Separate the fuselage halves and remove the cockpit frame.

Chamfer rearwards the inside edge of the opening, to allow the elevator control cables, when fitted, to lay at a realistic angle.

Drill a hole of 0.5mm diameter each side of the pre-molded oval recess in the fuselage underside. The holes should be aligned centrally to the oval and midway between its ends and the fuselage sides. These will be used for the aileron control cable, later in this build.



NOTE: *Make sure to identify the various 3D printed parts in the kit instructions. Carefully remove the parts from their support trees and file or sand away any residual tree stubs from the edges of the parts.*

Use CA adhesive to secure the 3D printed parts together.

Secure the engine control levers to the left side of the cockpit frame.

Drill through the locating recesses in the right side of the cockpit frame (for the hand pump), using a 0.7mm diameter drill.

Secure the hand pump into its locating holes on the right side of the cockpit frame.

NOTE: *The locating stubs on the ends of the engine bearer forward support frame are too large to fit into its recesses on the front underside of the engine bearer.*

File or sand away the locating stubs on the ends of the engine bearer forward support frame.

Secure the engine bearer forward support frame vertically onto the forward underside of the engine bearer, using its locating recesses as guides.

Locate the main cockpit frame into the engine bearer and position it against its locating lugs on the underside of the engine bearer.

Secure the main frame vertically onto the engine bearer.

Locate the main frame/engine bearer assembly onto the bottom side members of the cockpit frame with the bottom corners behind (not in front) of its locating lugs and the rear ends of the engine bearer against the front ends of the cockpit side frames.

Secure the main frame/engine bearer to the cockpit frame.

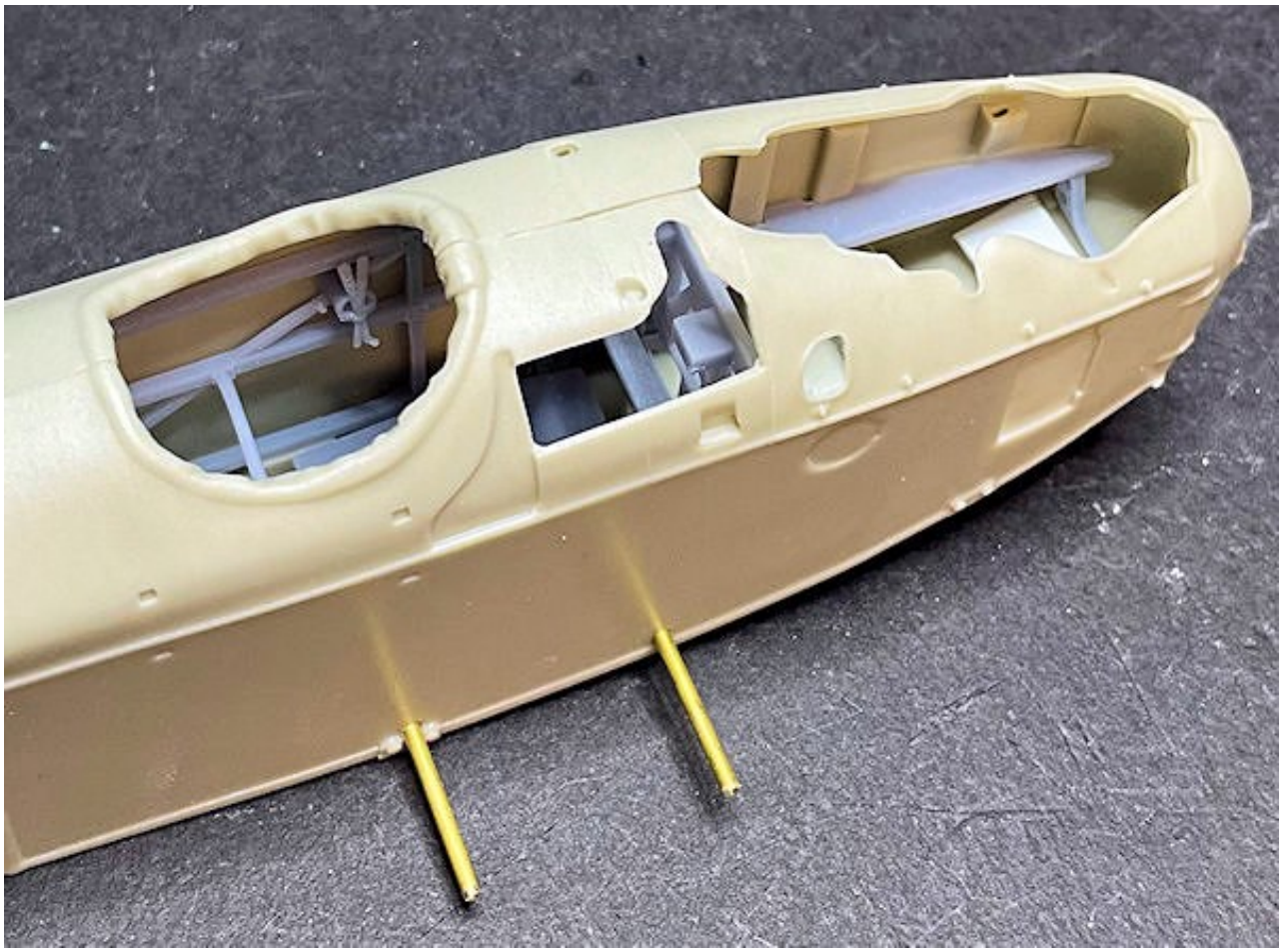
Lower wing support rods:

Cut two lengths of 1.2mm diameter Brass tube, such as 'Albion Alloy's' MBT12 or similar.

Test fit the cockpit assembly into a fuselage half, making sure the assembly fully locates into and on its various locating shoulders in both fuselage halves.

NOTE: *The bottom edges of the fuselage sides have raised molded detail at the rear spar locating holes. These details prevent the lower wing roots from contacting the fuselage.*

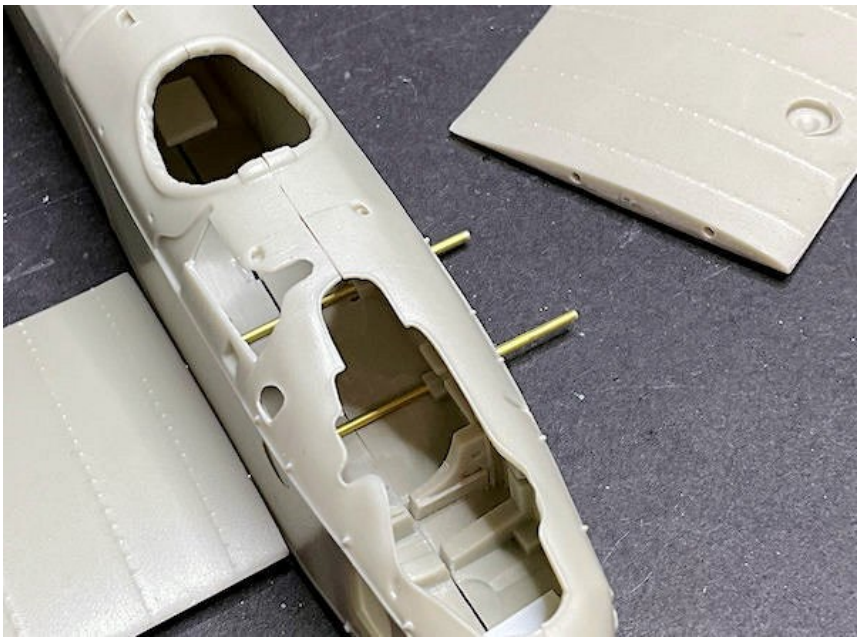
File or sand away the raised detail, from the fuselage outer edges only, around the locating holes for the lower wing rear spar tubes.



Hold the fuselage together and pass the two Brass tubes through the drilled holes in the fuselage sides. If necessary, separate the fuselage halves and scrape away material from the bottom,
inside faces of the fuselage halves where the tubes pass over.

Drill holes of 1.2mm diameter centrally into the lower wing halves, using the pre-molded recesses as guides.

Test fit the lower wings onto their locating tubes and check that the wings contact the fuselage sides.



Assembly:

Instrument panel:

Check the fit of the top edge of the pilots instrument panel into the pre-molded grooves on the upper, inside of the fuselage halves.

If necessary, scrape out the grooves to allow the instrument panel to fully locate into the fuselage halves.

Using CA adhesive, secure the instrument panel centrally into one of the fuselage halves.

Once the adhesive has fully set, test fit the two fuselage halves together and make sure that the instrument panel locates into the other fuselage half without any obstruction.

Preparation (continued):

Pilots seat belts:

Anneal (soften) the four photo-etch seat belts by passing them along a heat source, such as the flame from a cigarette lighter until the photo-etch changes colour.

Carefully remove the pilots seat and its cushion from their 3D printed support trees and sand away any residual tree stubs.

If necessary, sand the outer edge of the seat cushion such that it locates fully into the pilots seat.

Locate the cushion into the seat.

Bend the two shoulder belts over the top of the pilots seat and down onto the seat cushion. The ends of the belts should be positioned midway up the centre of the rear face of the seat.

Remove the belts from the seat an as far as possible without changing their shape.

Remove the seat cushion from the seat.

NOTE: *The two lap belts will be formed over the seat when fitted later in this build.*

Tail skid locations:

NOTE: *The tail skid strut assembly is 3D printed and has rectangular strut tops that locate into recesses in the underside of the fuselage rear and onto the fuselage surface. Handle these struts with care as they are 3D printed and fragile.*

Carefully remove the tail skid strut assembly from its 3D printed support trees and sand away any residual tree stubs.

NOTE: *The supplied photo-etch fittings (7) for the support of the elevator torsion bar should be fitted to the fuselage before check fitting the tail skid assembly.*

Bend each of the two photo-etch parts 7 over and secure the sides together using thin CA adhesive. Make sure the holes and edges of the parts are aligned.

Secure the two parts to the recesses on the rear, outer edges of the fuselage using thin CA adhesive. Make sure the holes in the parts are aligned. Check by passing a length of 0.8mm diameter tube or rod through the two holes. The tube or rod should be parallel to the rear edge of the fuselage.

Check fit the rectangular tops of the two forward struts into their locating recesses in the underside edges of the fuselage rear.

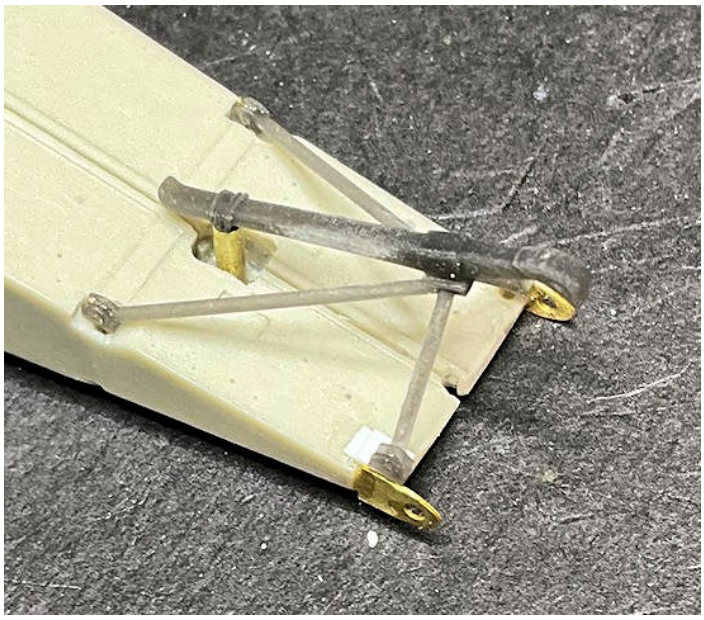
If necessary, lightly sand the rectangular tops and/or increase the size and depth of the location recesses to achieve a full location of the strut tops.

Check that the rectangular tops on the two rear struts fully contact the underside of the fuselage rear and inboard from the fitted photo-etch parts 7 at the fuselage sides.

Check that the centre ’suspension’ can fully locate into its recess in the centre underside of the fuselage rear.

For additional support, I drilled holes of 0.3mm diameter down through the feet of the forward support rods and added Brass rod of the same diameter. Corresponding holes were then drilled into the recesses to locate the added rods.

NOTE: *I broke the centre suspension from the assembly, so replaced it with Brass tube. Also, due to a slight twist in the printed frame, one of the rear support rods would not contact the underside of the fuselage. Therefore, I added plastic card under the foot of the rear support rod.*



Rudder support frame:

NOTE: *The rudder support frame is 3D printed and has rectangular strut 'feet' that locate into recesses in the upper surface of the fuselage rear. Handle these struts with care as they are 3D printed and fragile.*

Carefully remove the rudder support frame from its 3D printed support trees and sand away any residual tree stubs.

Check fit the rectangular 'feet' of the two struts into their locating recesses in the upper, side edges of the fuselage rear.

If necessary, lightly sand the rectangular tops and/or increase the size and depth of the location recesses to achieve a full location of the strut tops.

Check fit the top spigot of the frame into the pre-molded recess in the leading edge of the rudder.

If necessary, use a 1.0mm diameter drill to drill out the recess.

Landing gear:

NOTE: *The landing gear struts are 3D printed and have pre-molded locations in their tops as guides for fitting locating rods to attach the struts into the underside of the fuselage. The rod for the axle locates into a slot in the top surface of the axle fairing. The ends of the axle fairing locate onto small pegs molded on the bottom, inside of the landing gear struts. Handle these struts with care as they are 3D printed and fragile.*

Carefully remove the two landing gear struts, axle fairing and the two wheels from their 3D printed support trees and sand away any residual tree stubs.

NOTE: *The rectangular 'feet' one the ends of the landing gear struts are intended to be pinned into the underside edges of the fuselage. However, the pre-molded bolts at the location points stop the feet of the struts from contacting the fuselage surface. Also, the instructions call for pins of 0.8mm diameter to be used, but holes need to be drilled into the strut feet and 0.8mm diameter may cause the resin material to break away when being drilled. Therefore, smaller holes and pins is advised.*

Temporarily join together the two fuselage halves and retain using masking tape or clamps.

File or sand away the raised bolt details on the location brackets for the landing gear struts, pre-molded on the underside edges of the fuselage.

Point mark the centre of the feet on both struts.

Using the point marks as guides, carefully drill holes 0.4mm diameter as far as possible into the feet, making sure the holes are drilled at 90 degrees to the angled bottom of the feet and when viewed from the side (when the struts are located onto the fuselage).

Cut four short lengths of 0.4mm diameter Brass rod, such as that from 'Albion Alloy's' or similar.

Secure the rods into the pre-drilled holes in the feet of the struts, using thin CA adhesive.

Using the pre-molded recesses in the strut location brackets on the fuselage underside, drill holes of 0.4mm diameter into the fuselage, making sure the holes are drilled at 90 degrees to the fuselage surface when viewed from the front and sides.

NOTE: *The landing gear struts have angled feet and should be located on the correct side of the fuselage, so that the struts angle outwards at the bottom.*

Locate the two landing gear struts into their pre-drilled holes in the fuselage.

Sand the front and rear corners of the ends of the axle fairing, which allows the fairing fully contact the landing gear struts and their locating pegs.

Locate the axle fairing, grooved side facing the fuselage, between the stuts and onto its locating pegs.

Check that the two struts are equally angled from the fuselage and that the axle fairing is horizontal to the fuselage when viewed from the front at 90 degrees to the fuselage when viewed from above or below.

Secure the axle fairing to the landing gear struts using thin Ca adhesive.

Once the adhesive has fully set, carefully remove the landing gear assembly from the fuselage.

NOTE: *The attachment of the struts to the axle is very weak. Therefore I reinforced the attachment by drilling a hole of 0.5mm diameter through the bottom of the 'V' struts and into the ends of the axles fairing. A length of 0.5mm diameter Brass rod was secured in the holes using thin CA adhesive.*

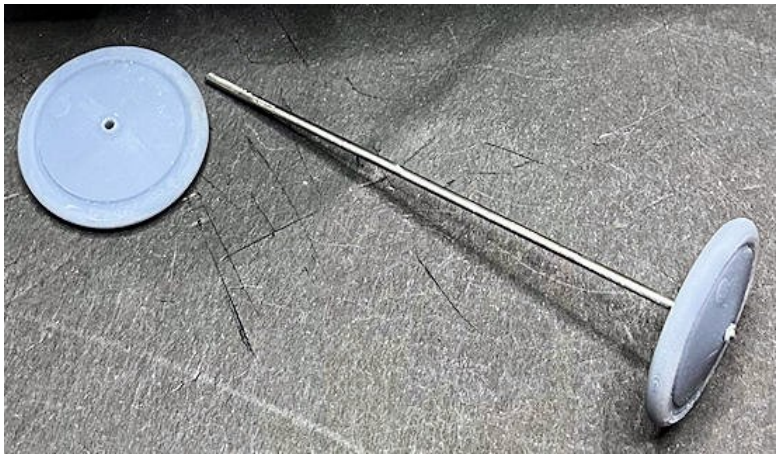
Cut the supplied 1.2mm diameter Steel rod (or Brass tube/rod) to a length of approximately 63mm.

File and sand the ends of the rods to allow the to be easily inserted in the pre-molded holes in the two wheels.

Locate a wheel onto each end of the steel rod with the shouldered side of the axle hole facing outboard).

Locate the axle (rod) onto the groove in the upper surface of the axle fairing, making sure the inner faces of the wheels are clear of the bottoms of the landing gear struts.

Remove the axle and wheels for fitting later in the build.



Painting:

Airbrush all of the fuselage internal components, as follows, with a grey primer, such as 'AK Interactive' Grey (AK758) or similar:

Resin parts:

Internal surfaces of the fuselage halves (with fitted instrument panel)

3D printed parts:

Assembled cockpit frame

Fuel tank

Pilots seat

Seat cushion

Ammunition container

Rudder bar

Control column

Four photo-etch seat belts

Machine gun assembly.

Airbrush the following:

'Tamiya' Gloss Black (X1) or similar:

Fuel tank.

Ammunition container.

Control column.

Machine gun assembly.

'**Tamiya' Dark Yellow (XF60) or similar:**

Mask off the painted rear section of each fuselage half and leave in place until later.

The exposed forward section of each fuselage half, including the fitted instrument panel.

Assembled cockpit frame.

Pilots seat.

Seat cushion.

Rudder bar.

Four photo-etch seat belts.

‘Alclad’ Steel (ALC-112) or similar:

Fuel tank.

Ammunition container.

Control column.

‘**Tamiya’ Desert Yellow (XF59) or similar:**

Ammunition belt in container.

Brush paint the following:

Paint the internal surfaces of the fuselage halves (with fitted instrument panel) as follows:

Mask off the forward section of each fuselage half at the rear of the cockpit frame, when fitted.

Airbrush the rear section of the fuselage with ‘Tamiya’ Deck Tan (XF55) or similar.

Remove the masking.

Light wood effect:

The exposed *forward section of each fuselage half* require a lighter coloured wood effect. I used Windsor & Newton’ Griffin (Alkyd) Raw Sienna oil paint:

Brush a covering coat of the oil paint over the surfaces.

Leave the oil paint to settle for several minutes.

Decant a small amount of White Spirits or Odourless thinners into a suitable dish.

Dip a flat oil brush into the thinners then wipe the brush on a sheet of kitchen roll (which should not deposit any fibres in the oil paint) to remove most of the thinners.

Brush the applied oil paint in the required direction of the wood grain (front to rear). Keep wiping the brush on the sheet to remove residual oil paint.

Repeat dipping and wiping the brush in the thinners and brushing the oil paint until the desired density and effect is achieved.

Leave the oil paint to fully dry. It should be touch dry in an hour or so and fully dry within 12 hours.

Dark wood effect:

The *assembled cockpit frame* requires a darker coloured wood effect. I used Windsor & Newton’ Griffin (Alkyd) Burnt Sienna oil paint:

Use the previous method to create the darker wood grain effect on the parts.

Leave the oil paint to fully dry. It should be touch dry in an hour or so and fully dry within 12 hours.

The *pilots rudder bar* requires a darker coloured wood effect. I used Windsor & Newton’ Griffin (Alkyd) Burnt Umber oil paint:

Use the previous method to create the darker wood grain effect on the parts.

Leave the oil paint to fully dry. It should be touch dry in an hour or so and fully dry within 12 hours.

Leather effect:

The *pilots seat and seat cushion* require a leather effect. I used Windsor & Newton’ Griffin (Alkyd) Burnt Umber and Raw Sienna oil paint:

Brush a covering coat of the Burnt Umber oil paint over the surfaces.

Leave the oil paint to settle for several minutes.

‘Stipple’ a small amount of the Raw Sienna oil paint into the applied Raw Umber to create a ‘flecked’ leather effect.

Leave the oil paint to fully dry. It should be touch dry in an hour or so and fully dry within 12 hours.

Brush paint the following details:

'Tamiya' Desert Yellow (XF59) or similar:

Ammunition belt in container.

'**Tamiya' Red (X7) or similar:**

Gun trigger pad on control column.

'Alclad' Steel (ALC-112) or similar:

Metal engine panels inside the forward fuselage halves.
Metal fittings on the pilots four seat belts.
Throttle and spark advance levers on left side of cockpit frame.
Foot retainers on the pilots rudder bar.
Handle stem of hand pump of right side of cockpit frame.
Two instruments on pilots instrument panel.
Two switch levers on pilots instrument panel.

'**Tamiya' Green Grey IJN (XF76) or similar:**

Metal fittings on cockpit frame.

'**Tamiya' Hull Red (XF9) or similar:**

Hand grips on throttle and spark advance levers on left side of cockpit frame.
Handle stem of hand pump of right side of cockpit frame.
Hand grips on the control column.

'Mr. Colour' Brass (219) or similar:

Filler cap on fuel tank.
Body of hand pump on right side of cockpit frame.
Ammunition rounds in the ammunition container.
Starter switch on pilots instrument panel.

'**Tamiya' Rubber Black (XF85) or similar:**

Recess in throttle/spark advance lever mounting.
Starter magneto on pilots instrument panel.

Use a pencil to create a metallic finish on the securing bolts on the pilots foot boards.

Preparation (continued):

Test fit cockpit with engine:

Locate the engine onto the engine bearers of the cockpit frame assembly.

Locate the cockpit frame with engine into a fuselage half.

Locate the opposite fuselage half.

Make sure the two fuselage halves close fully without any obvious obstructions from the cockpit frame and engine. Once satisfied, separate the fuselage halves and engine from the engine bearers.

NOTE: *I found the there were areas of the engine and cockpit frame that prevented the fuselage halves from fully closing. Therefore, you may need to do some or all of the following:*

Remove primer and paint from the contact areas of the fuselage halves where the cockpit frame locates.

Remove primer and paint from the contact areas of the cockpit frame where it locates into the two fuselage halves.

Remove primer and paint from the outer surfaces of the cockpit frame.

Cut away the centre section of the forward, lower frame under the engine bearers of the cockpit frame (not visible anyway).

File away the flange and bolts along the sides of the engine at the propeller reduction gear housing.

File away the oil pump housing on the bottom of the engine sump (not visible anyway).

Thinned the inside of the fuselage halves around the opening for the propeller shaft opening.

Thinned the inside edges of the fuselage halves along the openings of the engine cover panels.

Modifications:

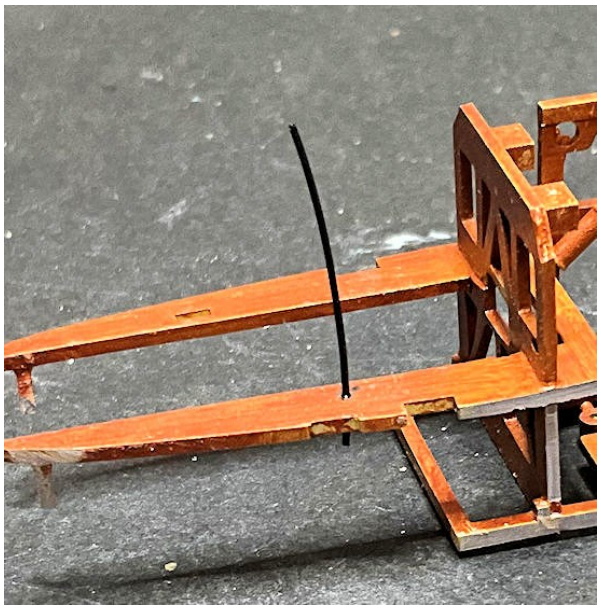
Carburettor fuel supply pipe:

NOTE: *The hole to attach the fuel supply pipe to the carburettor housing was drilled earlier in the build log (Part 7 - Engine).*

Drill a hole of 0.5mm diameter down through the left engine bearer, as shown in the following photograph.

Cut a length of 'MFH' Black tube (P-961).

Secure one end of the tube into the pre-drilled hole, using thin CA adhesive. The pipe will be attached to the carburettor housing later in this build log.



Carburettor/Spark advance control rods:

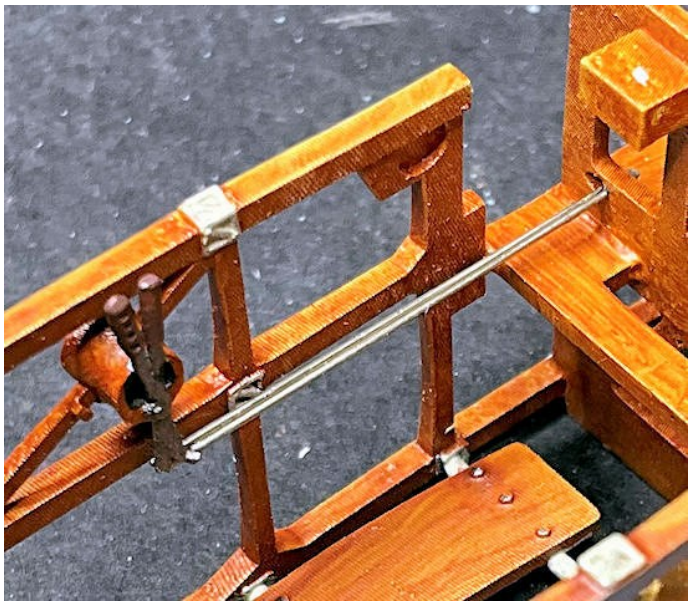
Cut two lengths of 0.3mm diameter Nickel-Silver tube, such as that from 'Albion Alloy's' (NST03) or similar.

Pass the tubes through the opening in the left side of the cockpit forward frame.

Using thin CA adhesive, secure one end of the tubes to the throttle and spark advance levers.

Using thin CA adhesive, secure the tubes in the frame opening.

Carefully snip away the protruding tubes at the front face of the cockpit forward frame.



Decals:

Brush a clear gloss coat, such as 'Tamiya' Gloss (X22) or similar, over the two instruments on the pilots instrument panel and the cockpit right side of the ammunition container.

NOTE: *The kit supplied decals are not 'cookie cut' and therefore need to be manually cut out from their backing sheet. I chose to not use decals 1 and 3 and instead used appropriate decals from the 'Airscale' Generic WW1 instruments (AS32 WW1) set.*

Apply appropriate decals to the two instrument faces on the pilots instrument panel.

Cut out one of the kit supplied rectangular data plate decals and apply it to the cockpit right side of the ammunition container.

Set the applied decals using 'MicroScale' MicroSol.

Assembly (continued):

Using thin CA adhesive, secure the pilots seat cushion into the pilots seat.

Using thin CA adhesive, secure the two photo-etch shoulder belts onto the centre, rear of the pilots seat with the belt ends onto the seat cushion.

Using thin CA adhesive, secure the ring ends of the two photo-etch lap belts around the rear support cross member for the pilots seat with the belts over the edges of the seat and onto the seat cushion.

Using thin CA adhesive, secure the ammunition container onto its two locating lugs on the cockpit forward frame.

Secure the engine assembly onto the engine bearers of the cockpit frame assembly, using a slow (thicker) CA adhesive.

Locate (without adhesive) the cockpit assembly with engine into its locations in the left fuselage.

Locate the right fuselage half to the left, making sure the cockpit frame assembly fully locates into its locations and the two fuselage halves are fully in contact with each other.

Make sure the engine is seated fully on the engine bearers and is central in the fuselage.

Leave the assembly to allow the CA adhesive to fully set and secure the engine.

Once the adhesive has set, carefully separate the fuselage halves and remove the cockpit frame and engine assembly.

Modifications (continued):

Carburettor fuel supply pipe:

Cut the previously fitted fuel supply tube such that it can be inserted into the pre-drilled hole in the rear side of the carburettor housing.

Using thin CA adhesive, secure the tube into the hole in the carburettor housing.

Throttle control rod:

Cut a long length of 0.3mm diameter Nickel-Silver tube, such as 'Albion Alloy's' NST03 or similar.

Bend one end of the tube such that it will locate on the top of the carburettor housing at the fitted photo-etch throttle linkage.

Cut the other end of the tube to allow it to rest on opening in the cockpit forward frame (where the two control rods were previously fitted from the cockpit.

Using thin CA adhesive, secure the tube onto the top of the carburettor housing and at the frame opening.

Assembly (continued):

Using thin CA adhesive, secure the oil tank into its locating slot on the right side of the engine bearers.

Weathering:

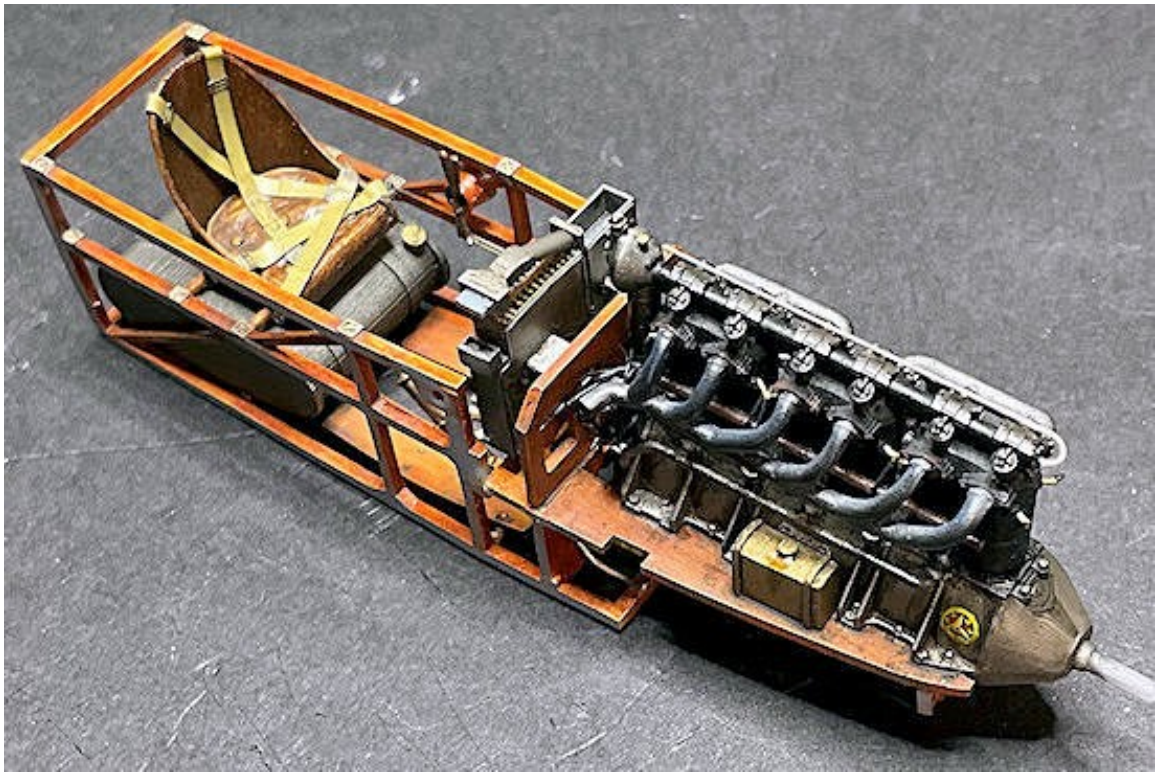
Airbrush the following with a semi-matte clear coat, such as ‘Alclad’ Light Sheen (ALC-311) or similar:

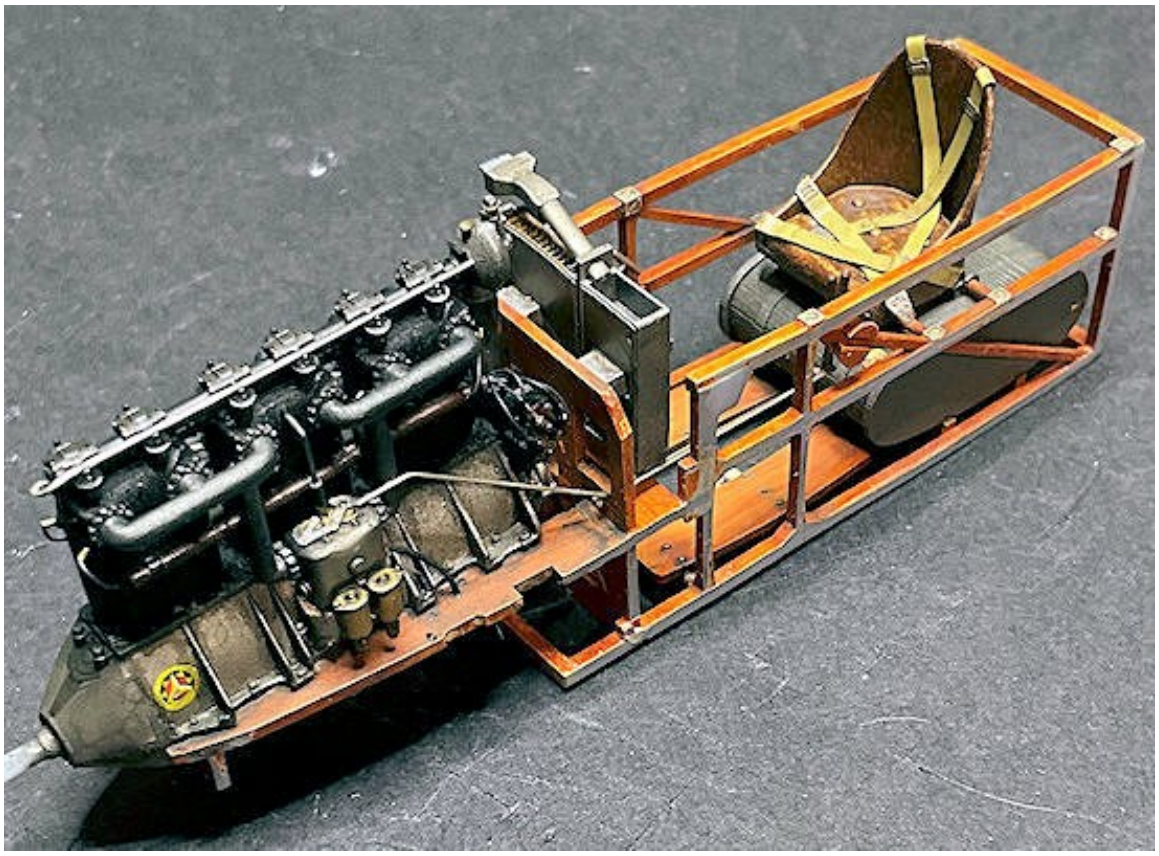
Inside surfaces of both fuselage halves.

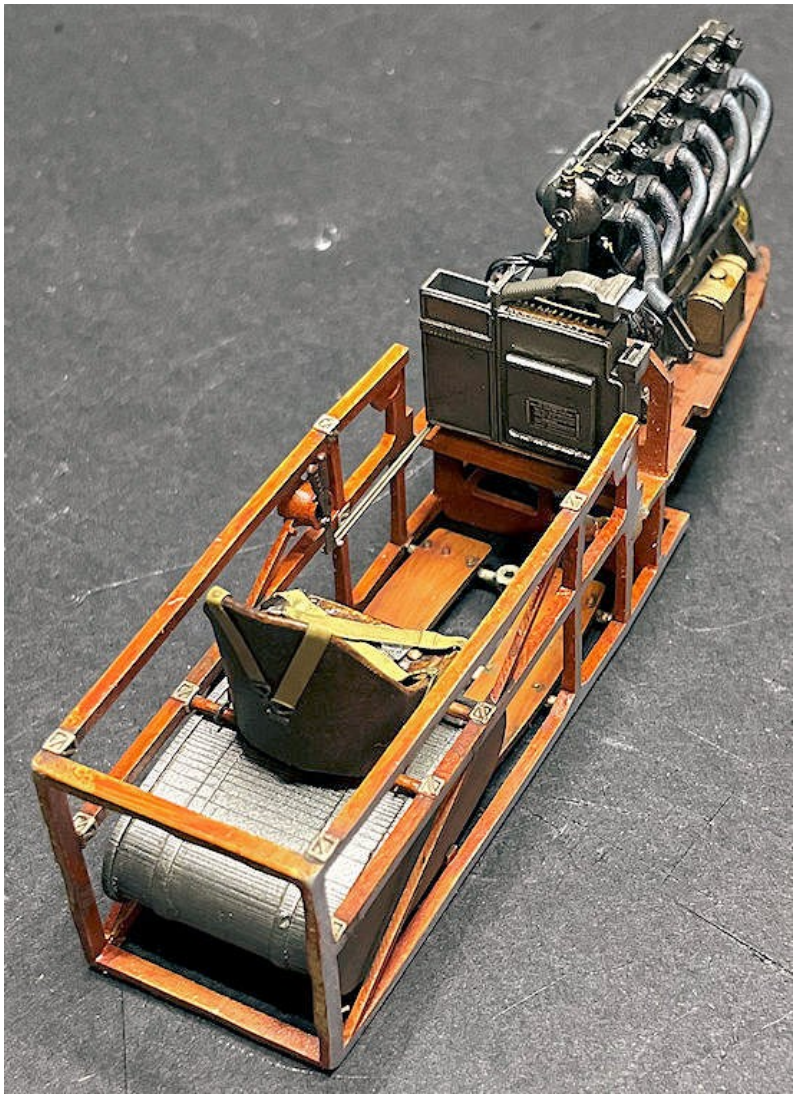
Cockpit assembly with fitted engine.

Refer to Part 3 of this build log and weather the engine and cockpit details, as desired, using ‘Flory’ Dark Dirt clay wash.

Apply ’AK Interactive’ Engine Oil (AK-2019), Kerosene (AK-2039) or Engine Wash (AK-2033) as desired around appropriate areas of the engine (e.g. AK-2019 along the cam shaft).







Modifications (continued):

NOTE: *The rigging line used for the cockpit is 'EZ' black line (Fine), as this will be more visible than mono-filament.*

Rudder control cables:

Cut a long length of 'EZ' line and pass it through a blackened 0.5mm diameter Brass tube.

Loop the line and back through the tube to form a loop.

Pass the loop over the rudder bar foot restraints and across to the pre-molded shoulder on the rudder bar.

Pull the end of the line tighten the loop around the rudder bar and move the tube up to the rudder bar.

Secure the line in the tube using thin CA adhesive.

Cut away the residual 'tail' of line.

Repeat to add a line to the opposite side of the rudder bar.

Secure the rudder bar into its locating recess between the front of the pilots foot boards.

Pass the two lines rearwards and under the cross members of the cockpit frame, under the fuel tank.

Pull the end of the lines to slightly tighten them.

Secure the lines to the underside of the rear cross member of the cockpit frame, using thin CA adhesive.

Cut away the residual 'tail' of line at the cross member.

Elevator control cables:

Drill a hole of 0.3mm diameter across and through the control column at the two protruding lugs of the sides of the control column, above the curved member.

Cut a long length of 'EZ' line and pass it through a blackened 0.5mm diameter Brass tube.

Pass the line through the pre-drilled hole in the control column.

Pass the opposite end of the line through a blackened 0.5mm diameter Brass tube.

Position the line such that it has equal line at both sides of the control column.

Move the two tubes up to the control column.

Secure the line in the tubes using thin CA adhesive.

Drill a hole of 0.3mm diameter across and through the 'ball' at the bottom of the control column. This will be used later in this build to attach the elevator external control cables.

Aileron control cables:

Drill a hole of 0.3mm diameter through the top of the upright support mounting at the rear of the curved member at the base of the control column.

Cut a long length of 'EZ' line and pass it through a blackened 0.5mm diameter Brass tube.

Pass the line through the pre-drilled hole in the rear support.

Pass the opposite end of the line through a blackened 0.5mm diameter Brass tube.

Position the line such that it has equal line at both sides of the rear support.

Move the two tubes up to the rear support.

Secure the line in the tubes using thin CA adhesive.

Assembly (continued):

NOTE: *During the following steps, make sure the lines are kept clear of any applied adhesive.*

Lower the control column down into the cockpit, passing the rear of the torque tube under the fuel tank and the bottom section of the control column down and through its locating hole between the pilots foot boards.

Make sure the control column is vertical in the cockpit with the front of the torque tube contacting the base of the rudder bar mounting. The rear end of the torque tube should be in contact with the underside of the fuel tank, forward from the frame cross member.

Secure the control column in position, using CA adhesive.

Modifications (continued):

Elevator control cables:

Pass the two lines rearwards and under the cross members of the cockpit frame, under the fuel tank.

Pull the end of the lines to slightly tighten them.

Secure the lines to the underside of the rear cross member of the cockpit frame, using thin CA adhesive.

Cut away the residual 'tail' of lines at the cross member.

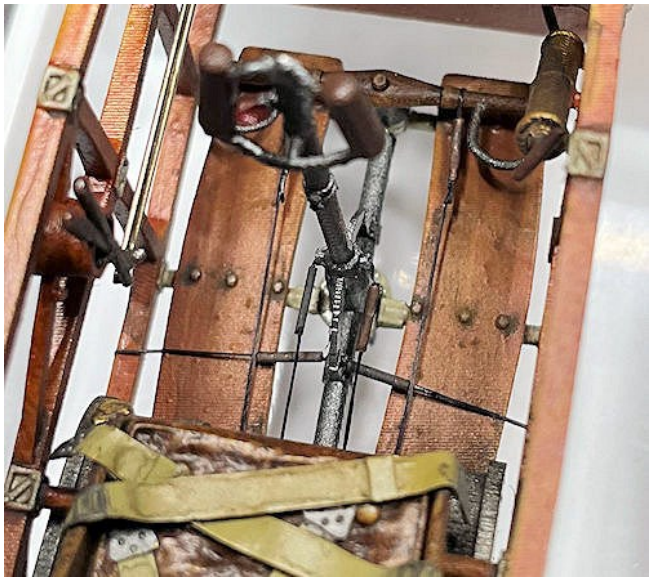
Aileron control cables:

Pass the two lines out under the rudder control cables and over the pilots foot boards and to the bottom side members of the cockpit frame.

Pull the end of the lines to slightly tighten them.

Secure the lines to the outer edge of the cockpit bottom frame members, using thin CA adhesive.

Cut away the residual 'tail' of lines at the outer edge of the frame members.



Gun trigger cable:

Cut a long length of ‘PlusModel’ 0.mm diameter lead wire.

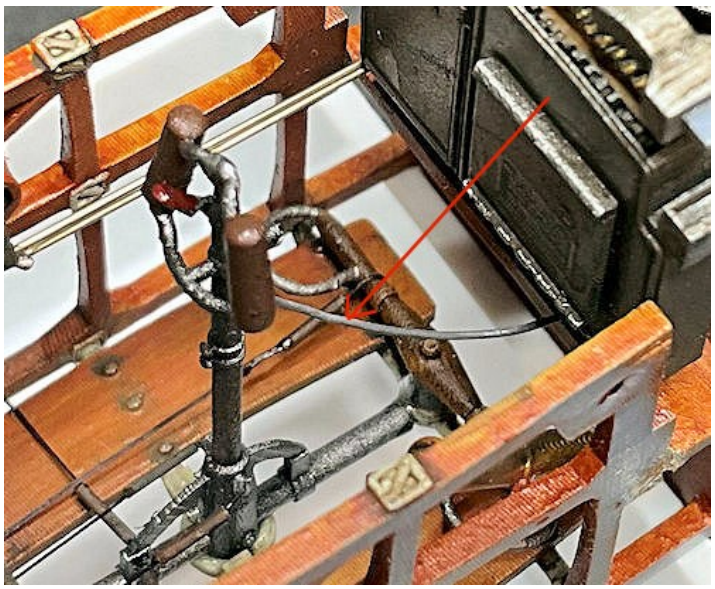
Bend one end of the wire o fit under the protruding stem on the top, front of the control column.

Pass the wire down into the cockpit and, using CA adhesive, secure the bent end of the wire onto the underside of protruding stem on the top, front of the control column.

Carefully loop the wire up and between the rear of the ammunition container and the cockpit forward frame.

Secure the wire to the rear, right side of the ammunition container, using thin CA adhesive.

Cut away any residual wire at the top of the ammunition container.



Assembly (continued):

NOTE: *During the following step, make sure the bottom of the control column passes through its opening in the underside of the fuselage halves.*

Locate the cockpit assembly fully into the right fuselage half, making sure the ammunition feed chute passes through the opening in the fuselage.

Locate the left fuselage half, making sure the cockpit assembly locates without obstructions and the fuselage halves are in full contact with each other.

Slightly open the mating edges around the fuselage halves.

Apply CA adhesive to the fitted plastic card locating tabs then fully close the fuselage halves, making sure the edges around the two halves are correctly aligned. If necessary, clamp or tape the fuselage together until the adhesive has fully set.

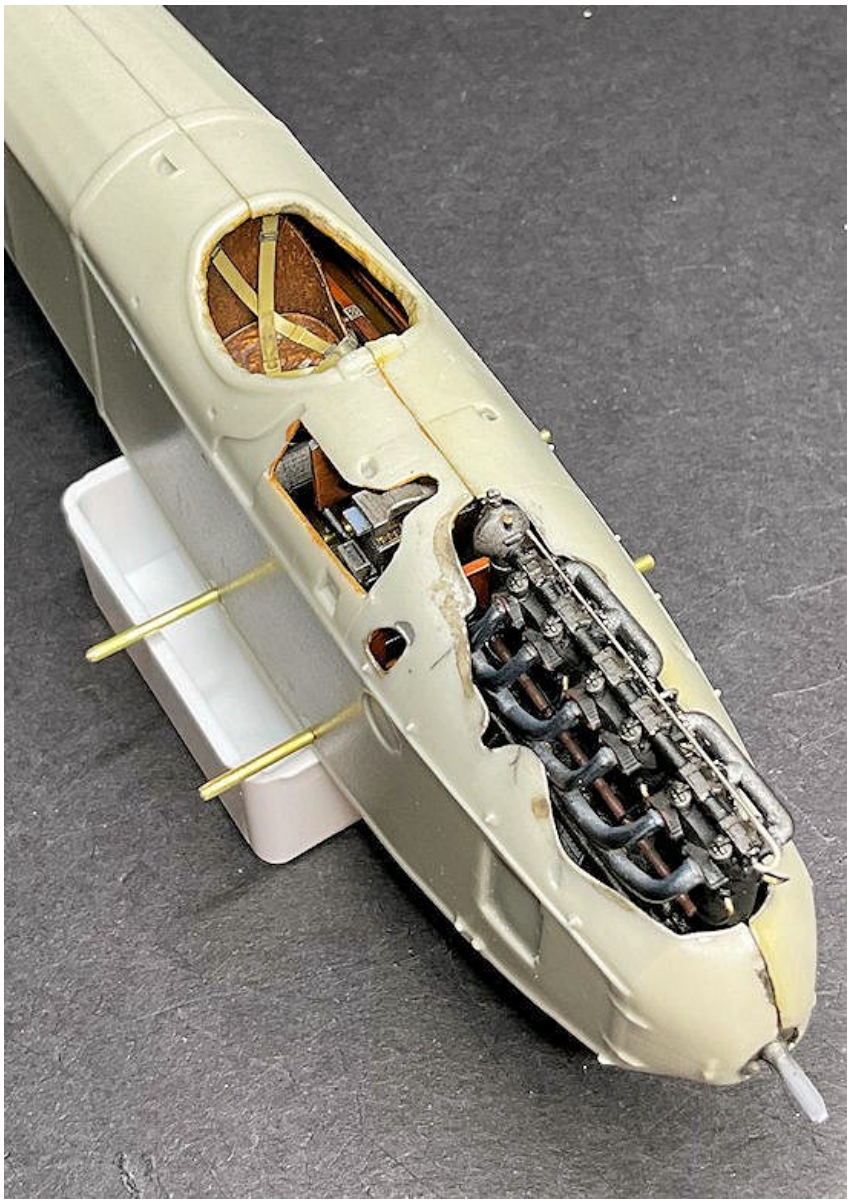
If used, remove any clamps or tape from the fuselage.

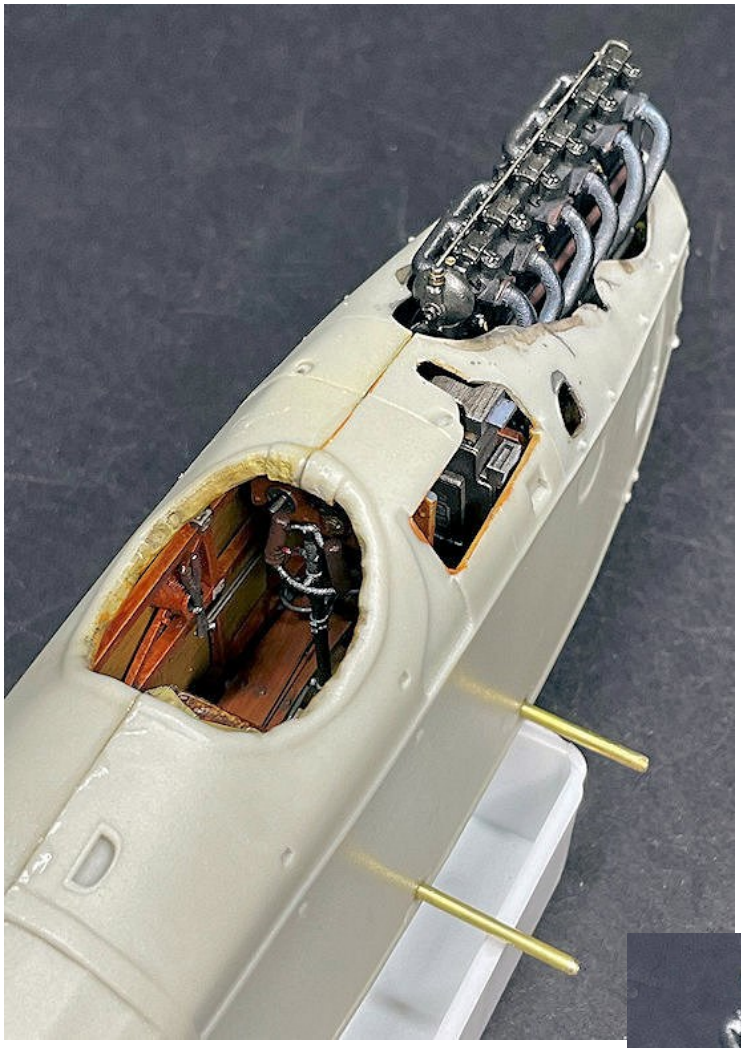
Apply thin CA adhesive along the joint between the fuselage halves and leave to allow the adhesive to set.

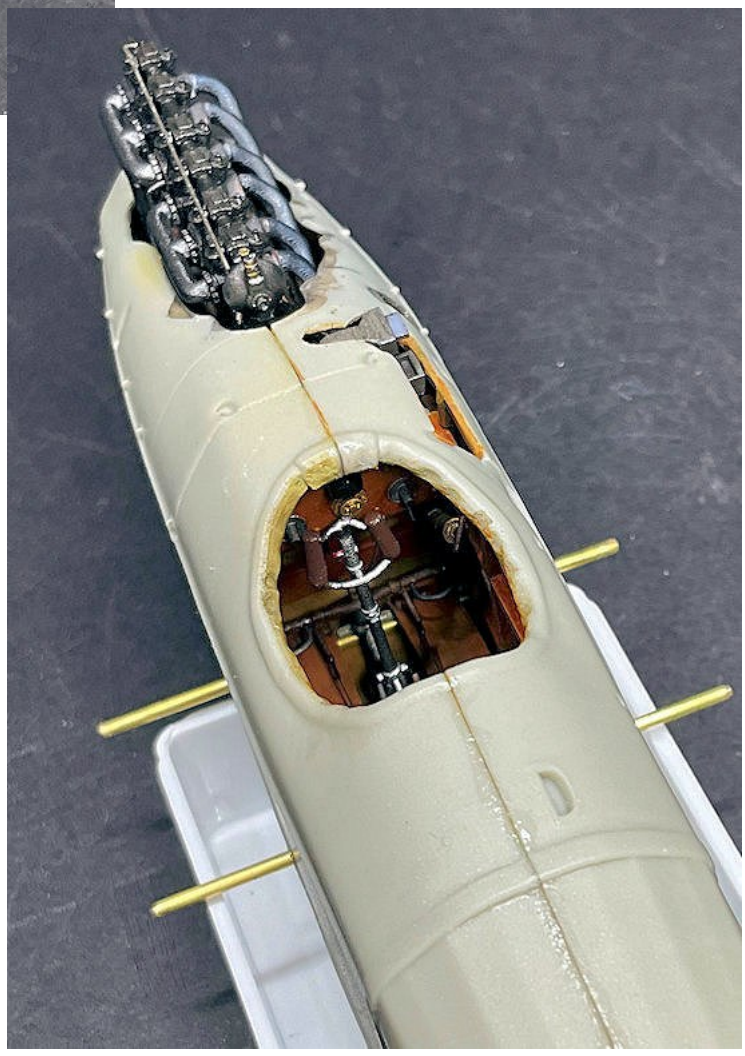
Slide the two prepared Brass rods, for supporting the lower wigs, through the pre-drilled holes in the bottom edges of the fuselage sides, making sure they protrude the same distance from both sides of the fuselage.

Secure the rods in the fuselage using thin CA adhesive.

CAUTION: *The bottom of the control column protrudes from the underside of the fuselage. From this stage of the build onwards,* ***protect the control column from being broken,*** *by taking care when handling the model until the landing gear is fitted. The control column can be protected until then by temporarily taping pieces of sponge to the underside of the fuselage, either side of the control column or resting the fuselage on a hollow container.*







Preparation (continued):

Fuselage seam joint:

NOTE: *The various 'strips' around the fuselage, representing the stitching of the linen covering, are pre-molded and raised. These are intended as the base for applying the kit supplied photo-etch stitching strips. However, the combination of the pre-molded and photo-etch stitching will produced an overly thick representation of the stitching. Therefore, I chose to remove the pre-molded strips and use just the photo-etch strips.*

Sand across the seam joint around the fuselage to blend the two surfaces together and remove any residual adhesive.

Scrape or sand away the pre-molded stitching strips from the sides, top and underside of the fuselage.

Check the fuselage seam joint for any visible gaps or depressions. If necessary, fill the gaps by brushing 'Mr. Hobby' Mr. Surfacer 500 or 1000 along the affected seams and allow to fully cure. Then sand away the surface residual surfacer to blend the seams into the surrounding surfaces.

To check the fuselage seams, blank off the open cockpit, engine area and the machine gun openings in the fuselage.

Airbrush a grey primer, such as 'AK Interactive' Grey (AK758) or similar over the fuselage seams.

Check the fuselage seam joint for any visible gaps or depressions. If necessary, apply more surfacer and repeat the sanding and priming of the fuselage seams until no gaps or depressions are visible.

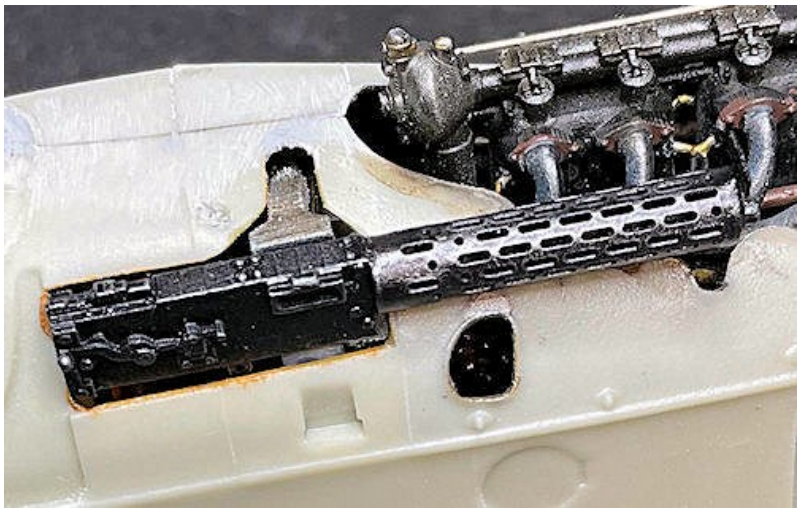
Remove all masking from the fuselage.

Machine gun:

NOTE: *The kit supplied machine gun is intended to locate into the lug on the end of the ammunition container feed chute and recess in the side of the ammunition container. However, I found it was easier to remove the locating lug on the underside of the guns breech block as it's not really necessary. The gun can be located onto the lug of the feed chute only.*

File away the locating lug on the underside of the machine gun breech block.

Test fit the machine gun onto the lug on the end of the ammunition feed chute.



Printed panels:

NOTE: *The kit supplied 3D printed fuselage panels are too thick and therefore stand proud of the fuselage surface, even though the fuselage locations have pre-molded recesses.*

Remove the following 3D printed parts from their tree supports and sand or file away any residual tree stubs from their edges:

Two rectangular and two round access panels.

Fuselage machine gun opening - rear panel.

Fuselage forward, underside cover.

Fuselage underside aileron cable guide palate.

Carefully scrape or sand the rear, mating surface of each part and test fit into their associated locating Recesses in the fuselage. Continue until each part (except the aileron cable guide plate) locates fully into its recess and is close to flush with the fuselage surface

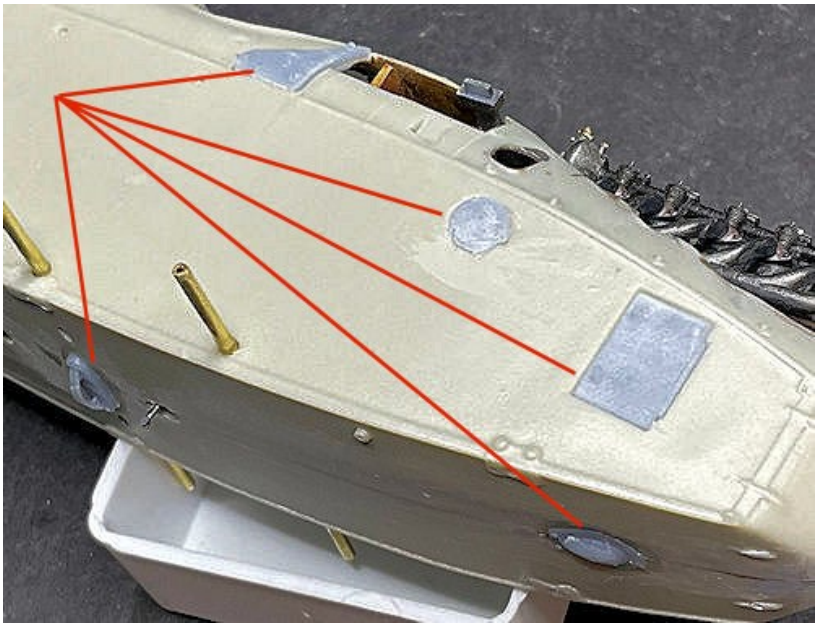


Photo-etch parts:

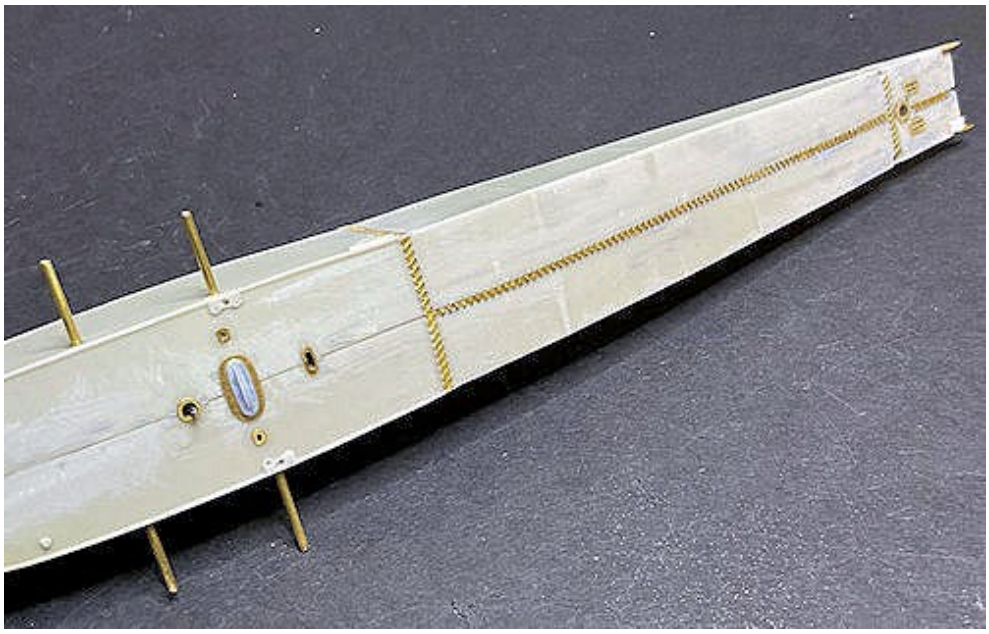
NOTE: *Some of the kit supplied photo-etch parts can be fitted to the fuselage at this stage and will be painted later in this build log. Parts 10, 11 x2, 18 and 18a will not be used. Parts 17 will be fitted later in this build log.*

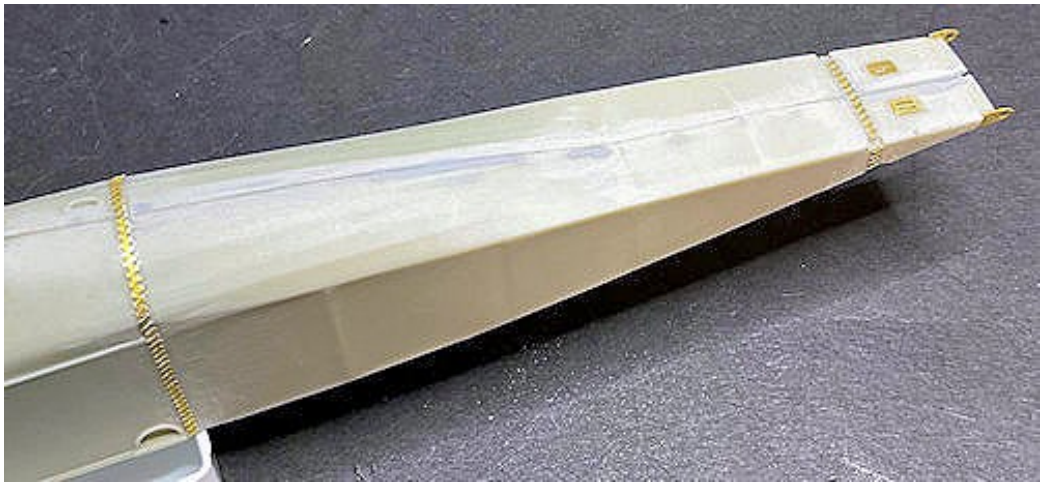
Cut out the following photo-etch parts from their kit supplied sheet and remove any residual tags from their edges:

5, 6, 9, 12, 13, 14 and 15x2.

Refer to pages 7 and 8 of the kit instructions for parts locations.

Using thin CA adhesive, secure the photo-etch parts to the fuselage, cutting the stitching strips to length as required.

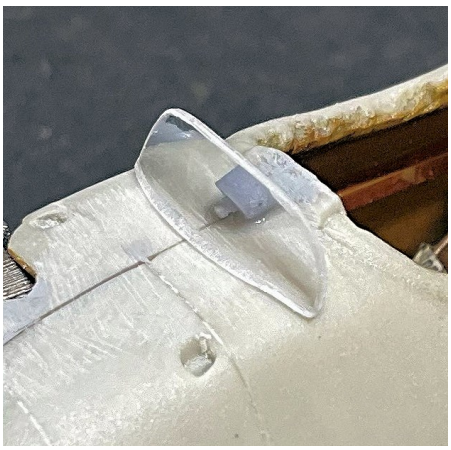




Windscreen:

NOTE: *The windscreen supplied in the kit consists of two photo-etch parts (18 and 18a) and an acetate sheet. I chose to replace these parts with a spare windscreen from another model kit. This was re-profiled to fit onto the fuselage.*

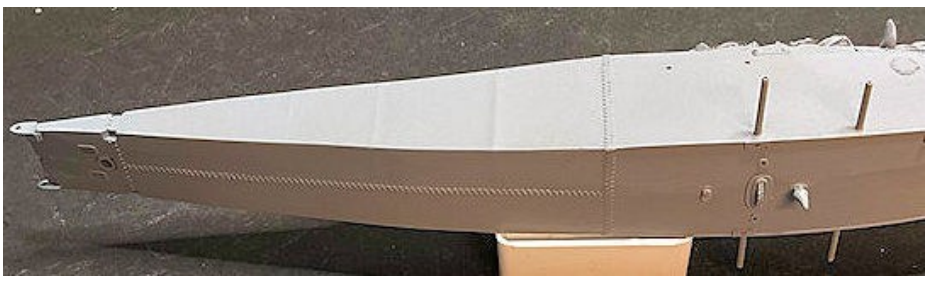
Using CA adhesive, secure the 3D printed instrument to the top, centre of the fuselage, just forward from the cockpit padding. This should be fitted now so the windscreen can be profiled correctly to fit across the fuselage and at the correct angle rearwards.



Painting (continued):

Blank off the open cockpit, engine area and the machine gun openings in the fuselage.

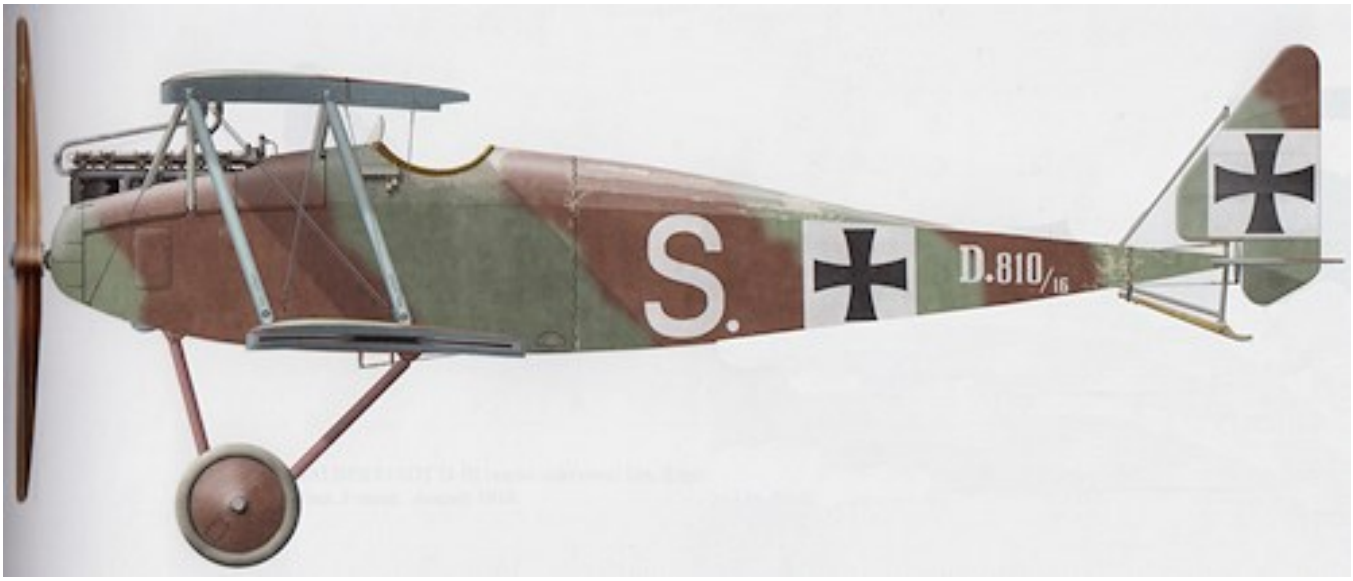
Airbrush a grey primer, such as ’AK Interactive’ Grey (AK758) or similar over the fuselage.



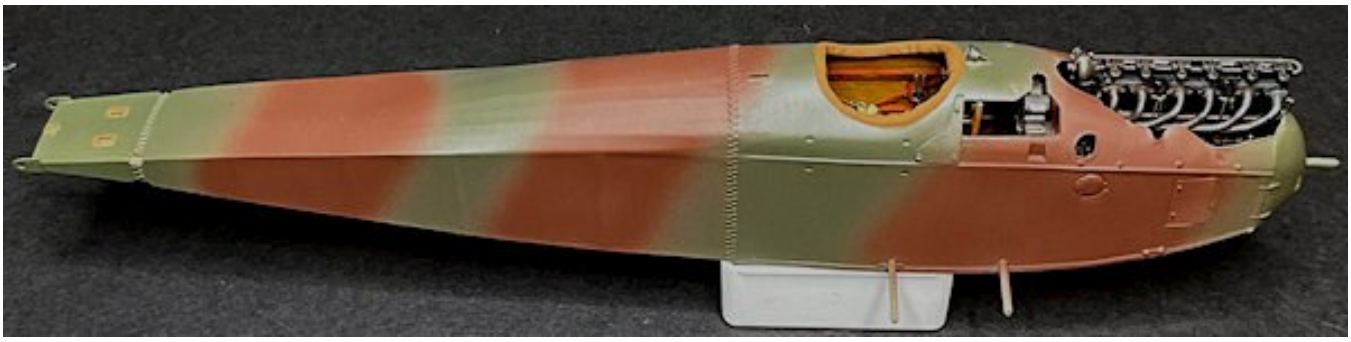
NOTE: *Use the following illustrations as a guide for painting the green and brown camouflage patterns.*

Airbrush ‘Hataka’ (Orange top range) Dark Olive Green (C301) or similar, around the sides and top surface of the fuselage.

Airbrush ‘Hataka’ (Orange top range) Brun Foncé (C079) or similar, around the sides and top surface of the fuselage. Once dry, airbrush a light coat of ‘Tamiya’ NATO Brown (XF68) over the Brun Foncé colour.



Brush paint ‘AK Interactive’ Brown Leather (AK3031) or similar around the cockpit padding and rudder/ elevator control cable exit ports on the top and underside of the fuselage rear.



Decals:

To prepare the surfaces for applying the decals, airbrush a clear gloss coat, such as ‘Mig’ A-Stand Aqua Gloss (A.Mig-2503) or ‘Alclad’ Aqua Gloss 600 over the areas of the fuselage that required decals, which are:

Fuselage sides, top and underside from the fuselage stitching rearwards

Face of the fuselage mounted instrument.

NOTE: *The ‘Aviattic’ decals are not ‘cookie cut’ and therefore need to be cut out from their backing sheet. The individual decals need to be cut a close the their edges as possible to avoid carrier film at their edges. Also, I chose to an appropriate decal from the ‘Airscale‘ Generic WW1 instruments (AS32 WW1) set for the fuselage mounted instrument, rather than the kit supplied decal.*

Refer to Part 4 (Decals) of this build log for more information.

The ‘Aviattic’ decals used are the ‘Aviattic’ WW1 German blue linen (ATT32077) and the WW1 Linen weave effect (ATT32236).

To prepare the surfaces for applying the decals, airbrush a clear gloss coat, such as ‘Mig’ A-Stand Aqua Gloss (A.Mig-2503) or ‘Alclad’ Aqua Gloss 600 over the areas of the fuselage that required decals, which are:

Fuselage sides, top and underside from the fuselage stitching rearwards

Face of the fuselage mounted instrument.

Fuselage sides and top:

Cut out a paper template that covers one side of the fuselage, from the vertical fuselage stitching to the fuselage rear.

Check that the template aligns correctly to the edges of the fuselage side.

Lay the template onto the rear surface of the ‘Aviattic’ WW1 Linen weave effect (ATT32236) decal sheet.

Trace the template outline onto the decal sheet.

Carefully cut out the decal shape from the sheet.

Refer to Part 4 (Decals) of this build log and apply the decal to the fuselage side, making sure the edges of the decal are aligned to the fuselage edges.

Repeat the procedure to apply a decal to the opposite fuselage side.

Repeat the procedure to apply a decal to the fuselage top.

Fuselage underside:

Cut out a paper template that covers the underside of the fuselage, from the horizontal fuselage stitching to the fuselage rear.

Check that the template aligns correctly to the edges of the fuselage side.

Lay the template onto the rear surface of the ‘Aviattic’ WW1 German blue linen (ATT32077) decal sheet.

Trace the template outline onto the decal sheet.

Carefully cut out the decal shape from the sheet.

Refer to Part 4 (Decals) of this build log and apply the decal to the fuselage side, making sure the edges of the decal are aligned to the fuselage edges.

Kit supplied decals:

NOTE: *The decals supplied in the kit are not ‘cookie cut’ and therefore need to be cut out from the backing sheet. The individual decals need to be cut a close the their edges as possible to avoid carrier film at their edges. Also, I chose to an appropriate decal from the ‘Airscale‘ Generic WW1 instruments (AS32 WW1) set for the fuselage mounted instrument, rather than the kit supplied decal.*

The kit supplied decals required are:

Two fuselage side crosses (smaller)

Two fuselage serial numbers D.810/16.

Refer to Part 4 (Decals) of this build log and apply the kit supplied decals to the fuselage and the fuselage mounted instrument.

Painting (Continued):

Mask off and airbrush the following area with a mix of ‘Tamiya’ Light Blue (XF23), Medium Blue (XF18) and Flat Blue (XF8) in a ration of 70%/20% and 10% to approximate the colour of the underside decal colour:

Underside of the forward fuselage.

Brush paint the following with ‘Tamiya’ Grey Green (IJN) (XF76):

Aileron control cable guide on the fuselage underside

Landing gear attachment brackets (x4) on the fuselage underside.

Brush paint the following with ‘AK Interactive’ Brown Leather (AK3031):

Aileron control cable outlets (x2) on the fuselage underside

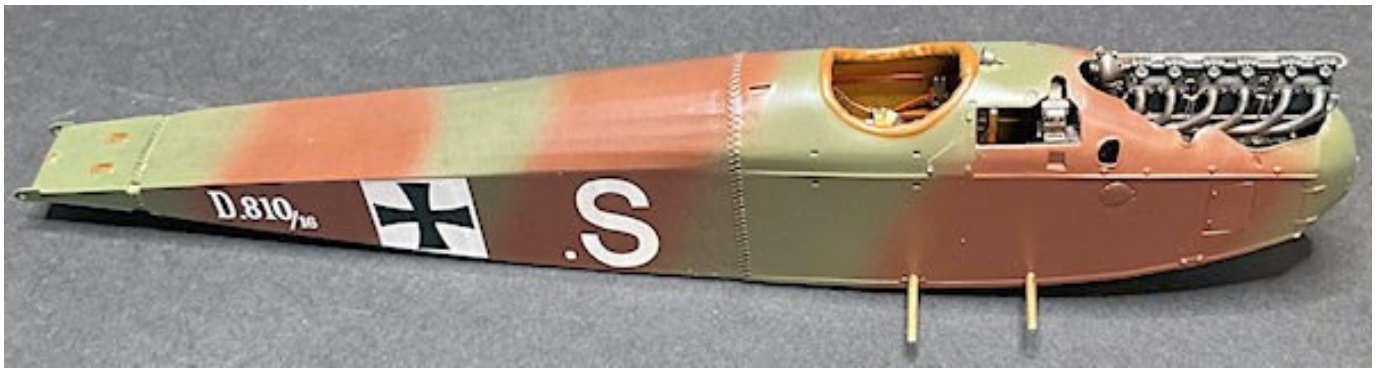
Elevator control cable outlets (x2) on the fuselage underside

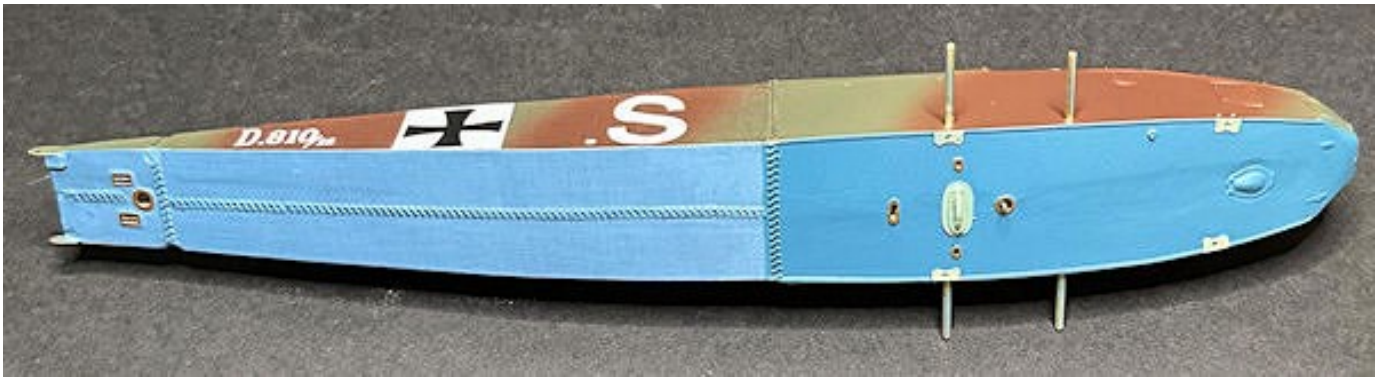
Tail skid suspension outlets (x2) outlet on the fuselage, rear underside

Rudder/elevator (x2) outlet on the fuselage, rear underside.

Sealing:

Once the decals have fully set, seal and protect them by airbrushing a semi-matte clear coat, such as ‘Alclad’ Light Sheen (ALC-311) or similar over the applied decals. This coat will also provide a base for subsequent weathering.





Weathering:

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

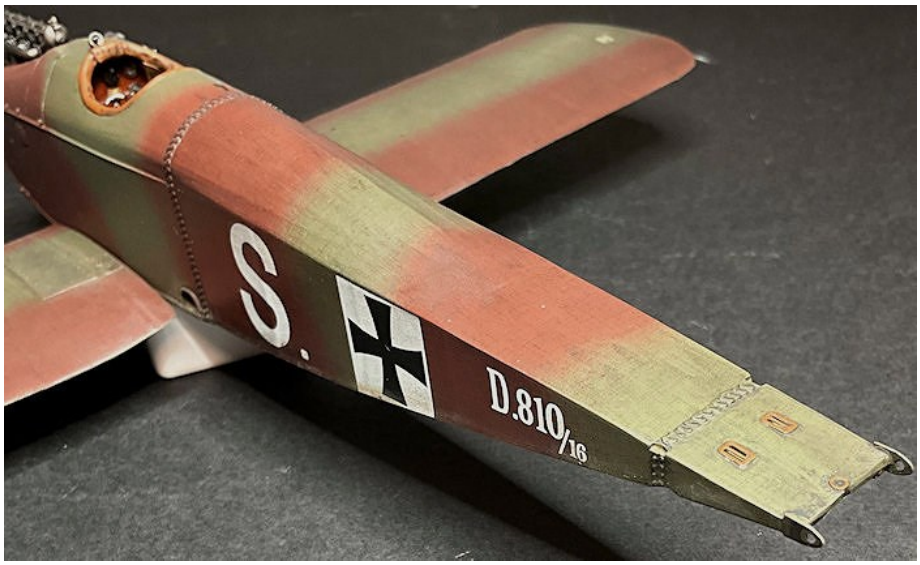
Brush ‘Flory Models’ fine clay wash (Dark Dirt) over the fuselage surfaces and leave to fully dry.

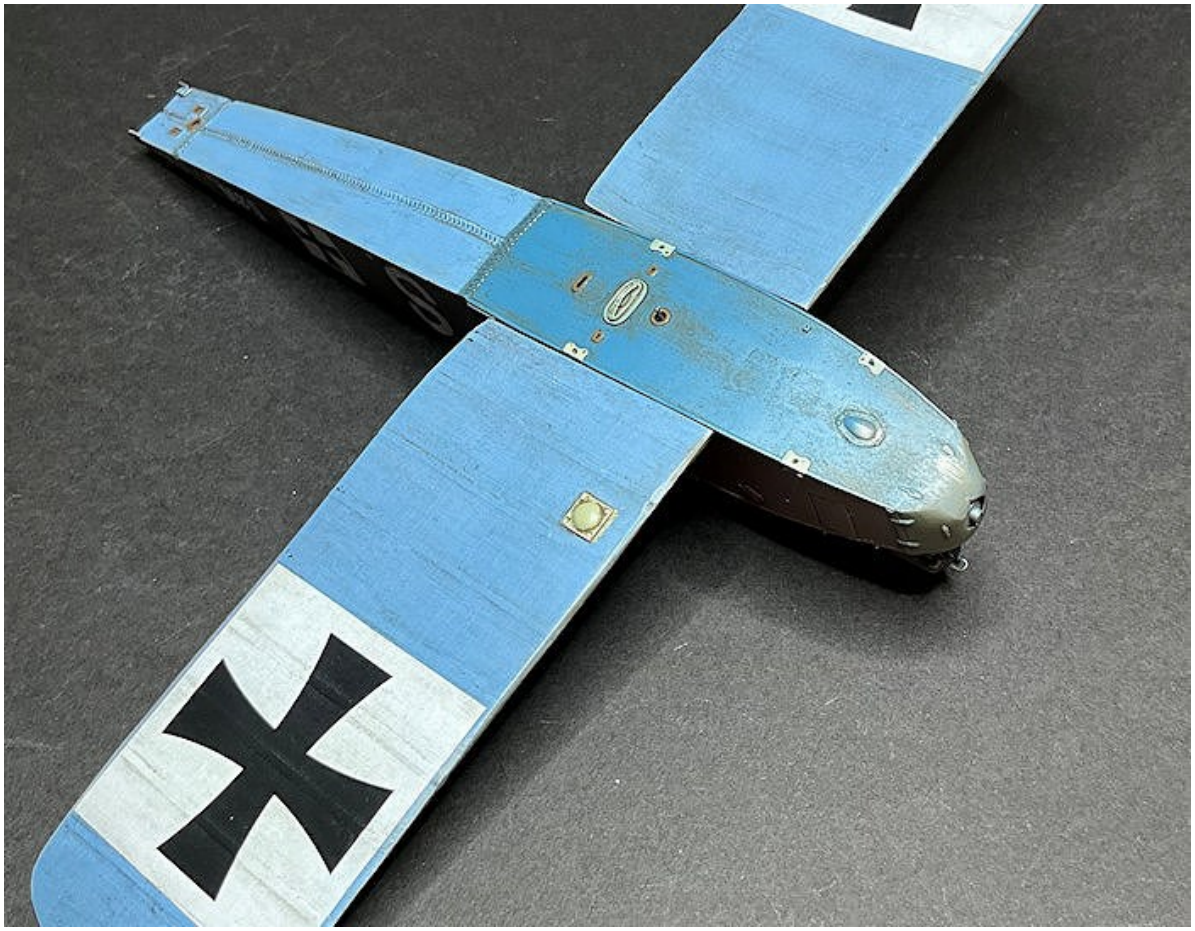
Once dry, remove the wash to achieve the desired weathered effect.

Seal and protect the applied weathering by airbrushing a semi-matte clear coat, such as ‘Alclad’ Light Sheen (ALC-311) or similar over the fuselage.

Lightly dry brush ’Mr. Colour’ Super Metallic 2 (Super Iron 2 - SM 203) on the edges of the metal panels at the forward fuselage and around the nose cowl.

Sponge ’Tamiya’ Weathering Master (Set D Oil Stain) under the nose cowl and (Set A Mud) along the lower edges of the fuselage, rearwards from the vertical stitching.





Assembly (continued):

Pass the rod secured into one of the elevators through the added photo-etch supports on the rear of the fuselage.

Cut the two photo-etch elevator control horns (4) from the kit supplied sheet and remove any residual photo-etch tags from their edges.

Slide the two control horns onto the elevator rod, with the curve of the horns facing forwards.

Pass the end of the rod through the opposite support on the rear of the fuselage.

Fully locate the remaining elevator onto the rod, making sure it aligns with the other elevator and that both elevators are against their supports.

Using thin CA adhesive, secure that elevator to the rod.

For additional strength, use thin CA adhesive between the inner edge of the elevators and the fuselage supports.

Position the two control horns on the rod and aligned with the outer slots of the control cable outlets on the top and underside of the fuselage rear. The horns should also be at 90 degrees to the surface of both of the elevators.

Painting (continued):

Brush paint the elevator torsion bar and control horns with ‘Tamiya’ Grey Green (IJN) (XF76) or similar.

Airbrush the external exhaust pipe with a grey primer, such as ‘AK Interactive’ Grey (AK758) or similar.

Airbrush the external exhaust pipe with a black gloss base, such as ‘Tamiya’ Gloss Black Base (X1) or similar.

Airbrush the pipe with ’Alclad’ Exhaust Manifold (ALC-123) or similar.

Airbrush the pipe with a matte (flat) clear coat, such as ‘Alclad’ Flat (ALC-314) or similar.

Refer to Part 3 (Weathering) of this build log for more information - apply your desired weathering finish to the exhaust pipe (I used ‘Flory Models’ Grey fine clay wash).

Seal the applied weathering with a semi-matte clear coat, such as ‘Alclad’ Flat (ALC-314) or similar.

Lightly sponge ‘Tamiya’ Weather Master Set B (Soot) around the end opening of the exhaust pipe.

Carefully brush around the edges of the windscreen, using ‘Tamiya’ Grey Green IJN (XF76) or similar.

Airbrush the feed chute with a grey primer, such as ‘AK Interactive’ Grey (AK758) or similar.

Airbrush the feed chute with a black gloss base, such as ‘Tamiya’ Gloss Black Base (X1) or similar.

Airbrush the feed chute with ’Alclad’ Steel ALC-112) or similar.

Brush paint the ammunition rounds with ‘Mr. Colour’ Copper (215) or similar:

Brush paint the ammunition belt with ‘Tamiya’ Desert Yellow (XF59) or similar.

Assembly (continued):

Windscreen:

Secure the windscreen onto the top of the fuselage, just forward from the instrument in the front of the cockpit.

Machine gun:

Test fit the prepared machine gun into it opening in the fuselage and onto the end of the protruding ammunition chute on the ammunition container in the cockpit.

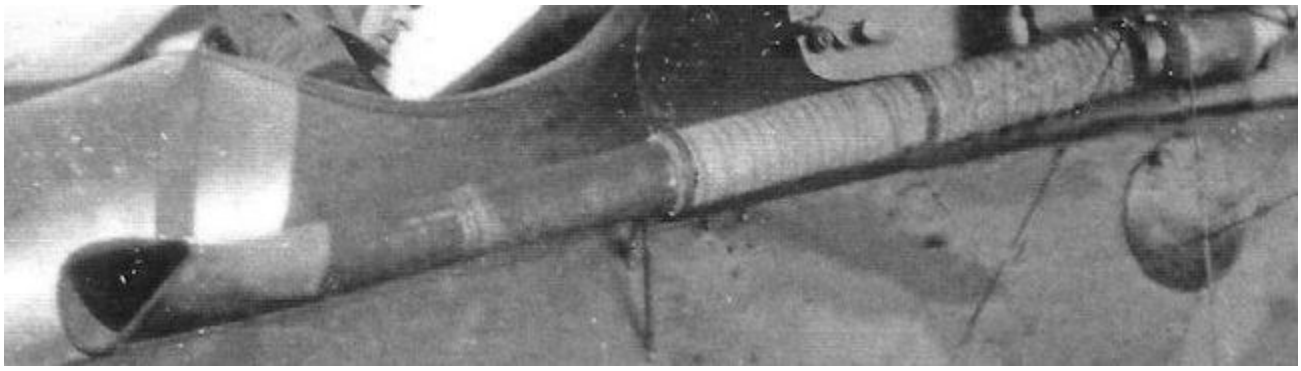
Secure the machine gun in position using thin CA adhesive.

Ammunition feed chute:

Secure the ammunition feed chute into the outer port of the machine gun and the fuselage recess.

External exhaust pipe and supports:

NOTE: *The kit supplied photo-etch supports for the external exhaust pipe do not accurately represent the actual supports. Therefore, I chose to not use the photo-etch parts (19) and instead crate supports from flattened tubing. Also, the centre portion of the exhaust pipe was lagged, as can be seen in the following photograph.*



Drill holes of 0.6mm diameter through the fuselage right side in the centre of the four support recesses.

Cut four lengths of 0.5mm Aluminium tube, such as ’Albion Alloy’s’ (MAT05) or similar to form the support straps.

Use flat nosed pliers to flatten the tube, leaving a short length at one end of the tube round.

Using thin CA adhesive, secure the rounded end of the tubes into the pre-drilled holes in the fuselage, making sure the flattened tube is horizontal when viewed from the side of the fuselage.

Cut long strips of 1.0mm wide plumbers PTFE tape.

Wrap the tapes around the larger diameter centre portion of the external exhaust pipe.

Seal the tape onto the exhaust pipe by airbrushing with matte clear coat, such as ‘Alclad’ Flat (ALC-314) or similar.

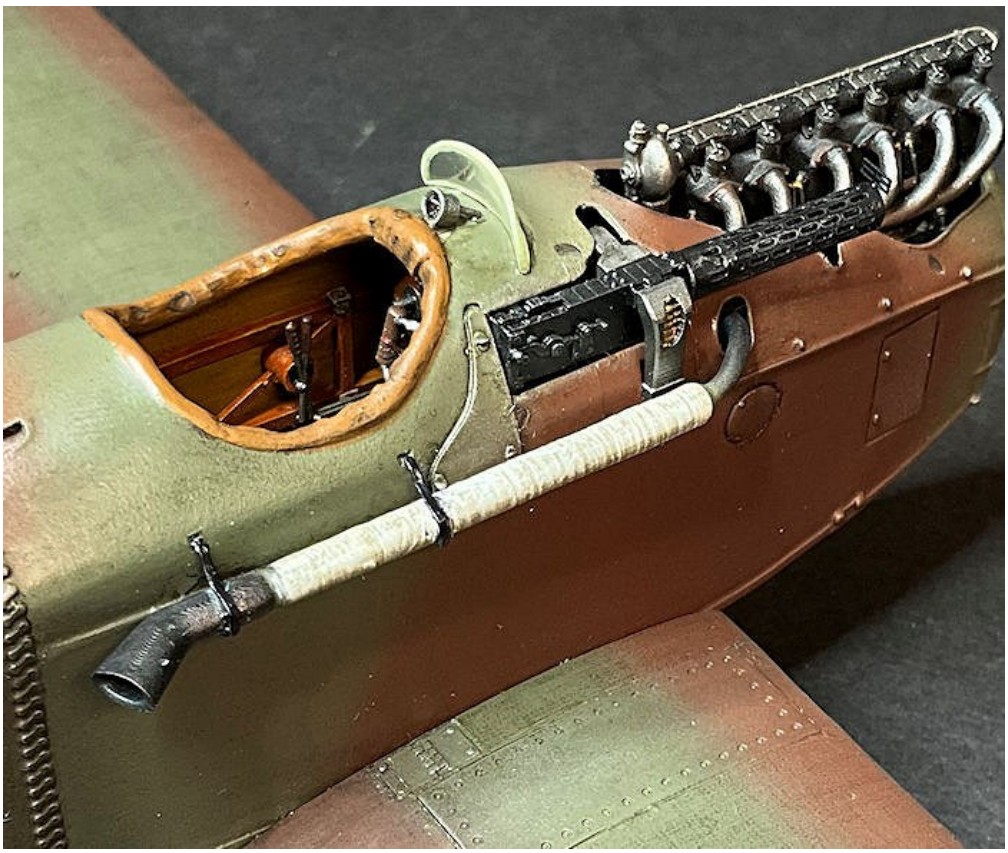
Weather the tape by sponging with ‘Tamiya’ Weathering Master Set D (Oil Stain).

Secure the locating stub on the front (engine) end of the external exhaust pipe into the locating hole in the engine exhaust pipe, making sure the pipe lays between the four fitted supports.

Cut and bend the fitted flattened straps such that they conform and overlap slightly around the exhaust pipe.

Secure the straps together at their overlap using thin CA adhesive.

Brush paint the support straps with ‘Tamiya’ Rubber Black (XF85).



PART 11
CONSTRUCTION

PART 11 - CONSTRUCTION

References:
Centennial Perspective - Halberstadt Aircraft of WW1 Vol 2 (CL.IV-CLS.I and fighters) (by J. Herris).
Halberstadt Fighters-Classics of World War I Aviation, Volume 1 (by Peter M. Grosz).
Online resources.

NOTE: *As this model is resin, all assembly of parts must be done using **CA adhesive.** The resin used to 3D print some of the parts is brittle. Therefore, care is needed when removing the parts from their print supports and subsequently when handling.*

Preparation:

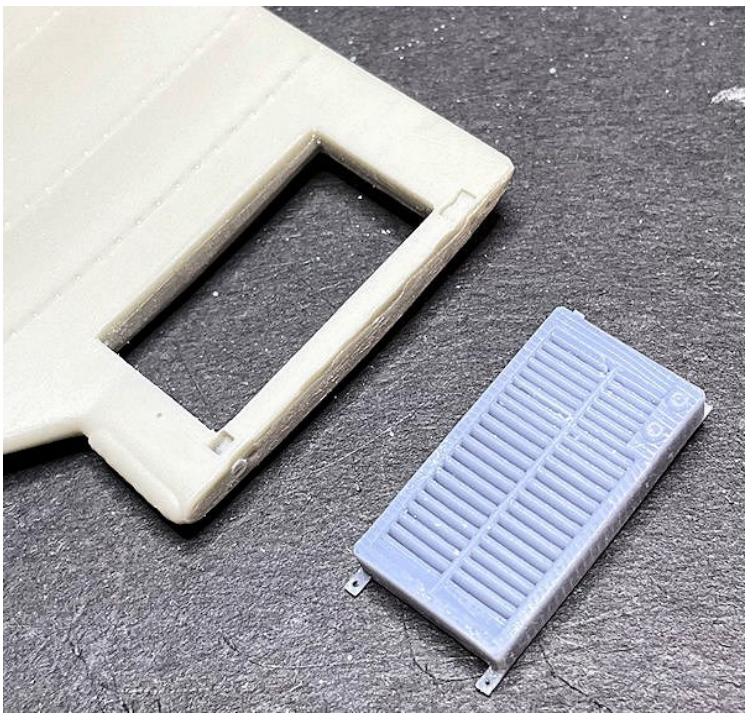
Upper wing radiator:

Remove the radiator from its support trees and file or sand away any residual tree stubs from its edges.

Drill holes of 1.0mm diameter around and through the inner edges of the radiator recess in the right upper wing.

Cut through the holes to remove the recess from the wing.

File the inner edges of the opening until the radiator can be fully inserted into the wing.



Wings:

Cut the two ailerons, elevators and rudder from their resin casting blocks and file or sand away any roughness or residue resin from their edges.

Cut out the channel in the upper wing, used to locate the aileron operating lever.

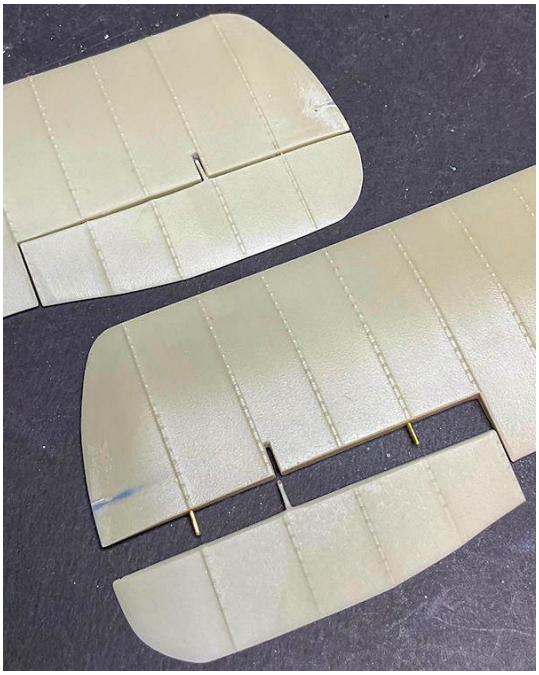
Drill holes of 0.8mm diameter centrally into the trailing ailerons edge in the upper wing halves. The holes should be drilled at the first and fourth rib tapes in from the wing tip.

Drill holes of 0.8mm diameter centrally into the leading edges of the ailerons at the same positions as the holes in the upper wing halves.

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

Secure the rods fully into their drilled holes in the upper wing halves.

Test fit the two ailerons onto their locating rods and id desired, slightly bend one aileron up and the other down, or leave them aligned to the upper wings.



NOTE: *The wings supplied in the kit are cast in resin and have internal metal reinforcing rods to prevent warping of the wings. Comparing the wing shapes and detail to reference material shows that some aspects of the wings require changing to make them closer to that of the actual wings.*

The wing ribs tapes are too heavily cast.

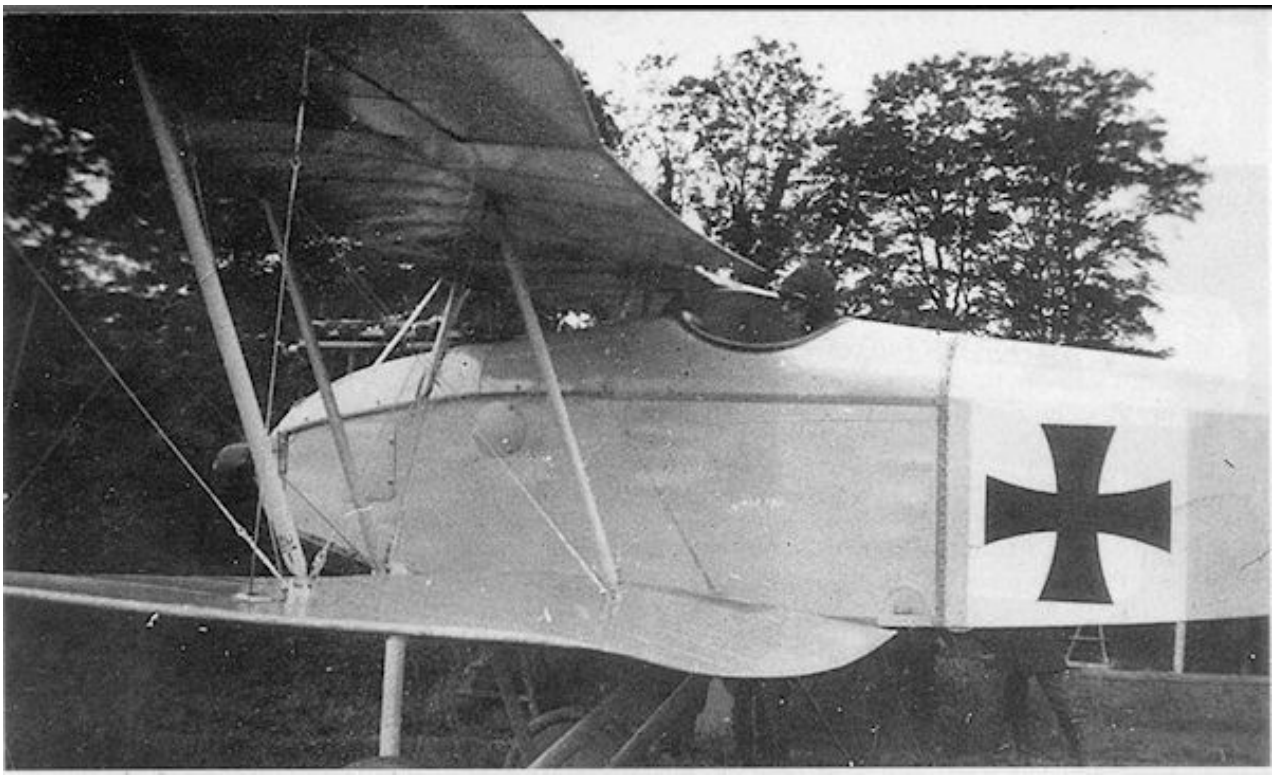
The wing trailing edges do not reflect enough the 'washout' droop at the inboard sections of the wings.

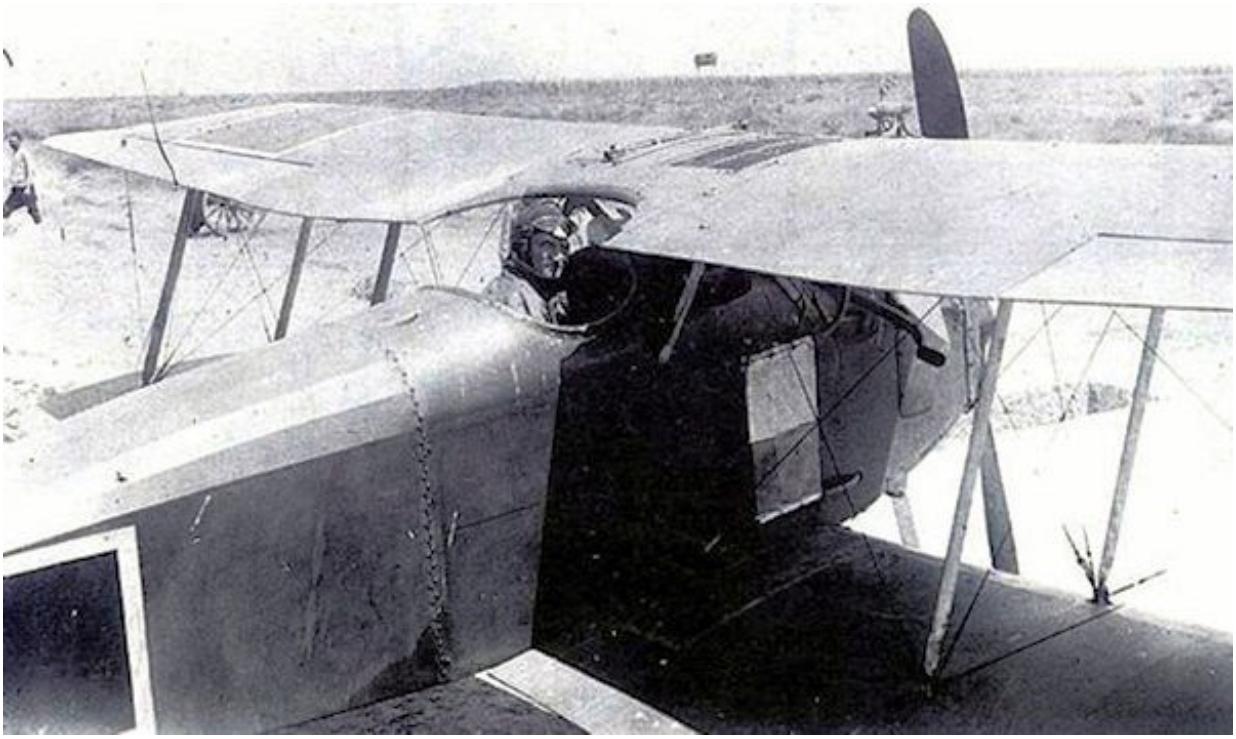
The leading edges of the upper wing halves are of different thickness.

The top surface of the wings appear to be too 'bulged' around the central area.

The upper wings have a degree of warp.

Examples of wing trailing edge 'washout' and lack of visible rib tapes





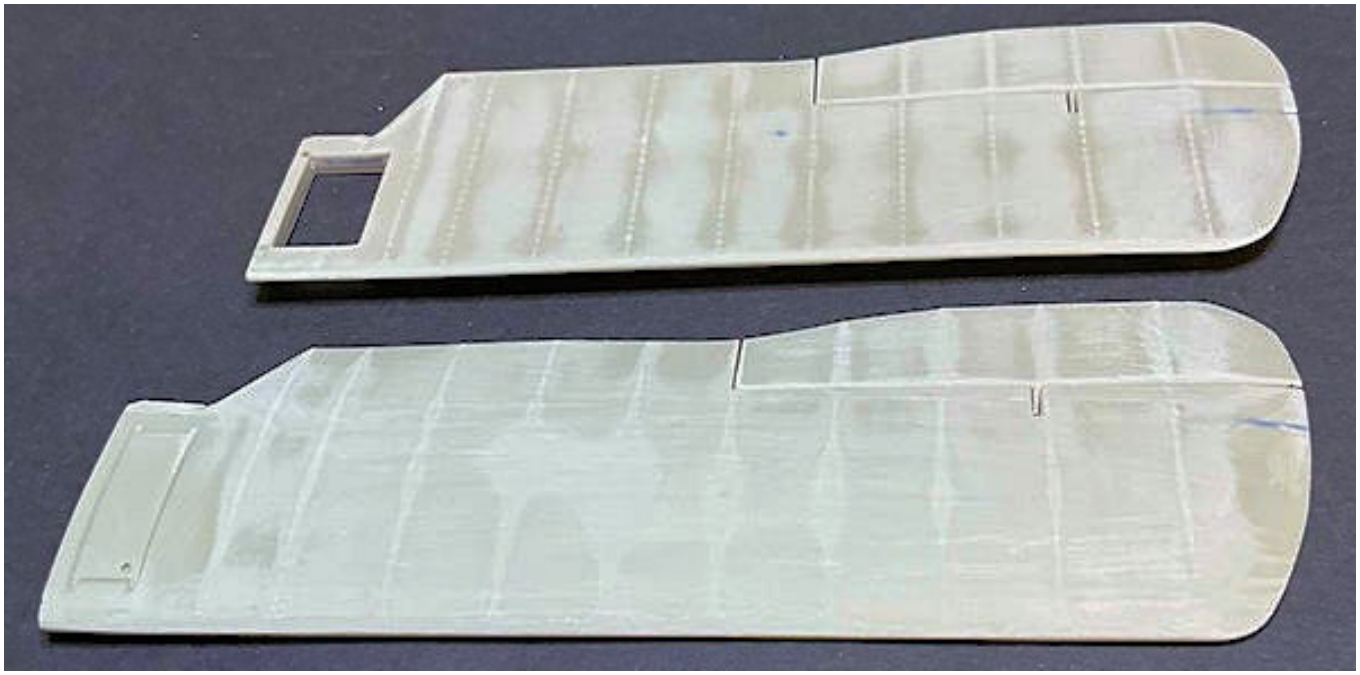
Wing ‘washout’ at trailing edges

Kit wings

Upper wing halves:

The wing halves were immersed in hot water to make the pliable. They were then straightened out, while still hot, with my hands to remove any warping or twist. I also pressed down on the inboard trailing edges of the wings to create a slight ‘washout’ (droop). Once they had cooled down, I scraped then sanded to top surfaces to remove the ‘bulging’ across the wing and also the leading edges to reduce their thickness. Finally I sanded smooth the molded rib tapes on the both sides of the wing halves and their ailerons, leaving just a witness mark where the rib tapes had been located.

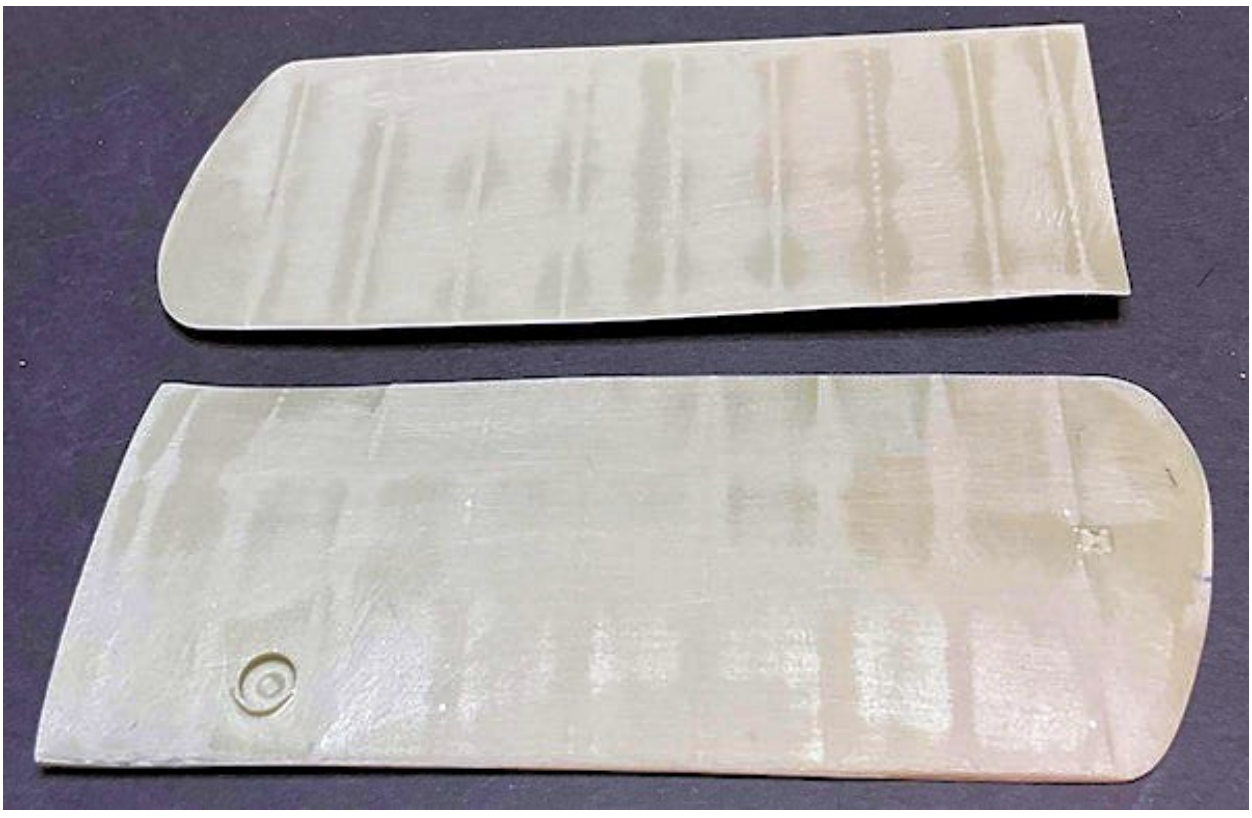
Upper wings



Lower wing halves:

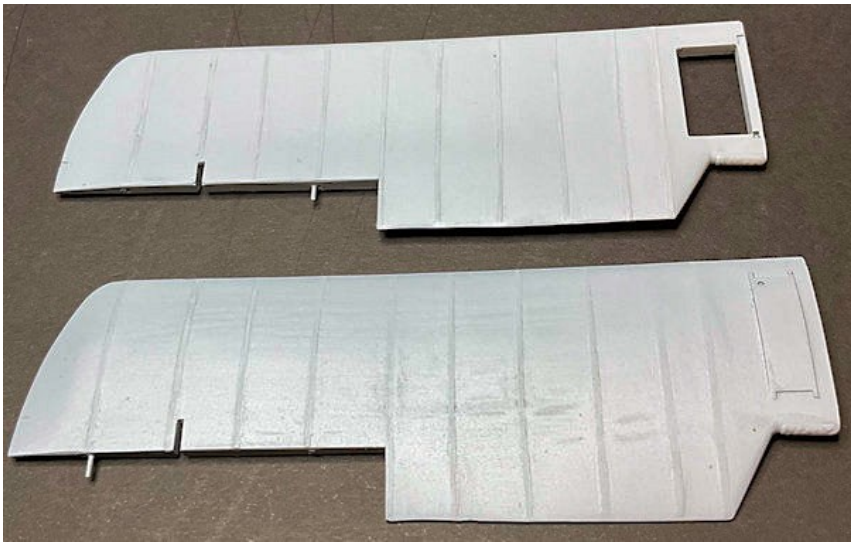
The wing halves were immersed in hot water to make the pliable. They were then straightened out, while still hot, with my hands to remove any warping or twist. I also pressed down on the inboard trailing edges of the wings to create a slight ‘washout’ (droop). Once they had cooled down, I scraped then sanded to top surfaces to remove the ‘bulging’ across the wing and also the leading edges to reduce their thickness. Finally I sanded smooth the molded rib tapes on the both sides of the wing halves, leaving just a witness mark where the rib tapes had been located.

Lower wings



Restoring rib tapes:

To restore the sanded off rib tapes on the upper and lower wings, I cut 1.0mm wide strips of 0.2mm thick plastic card. Using thin CA adhesive, the strips were secured to the wing surfaces along the witness marks of the removed rib tapes. Once the adhesive had fully set, the strips were carefully scrapped and sanded to reduce their thickness and to blend them closer to the wing surfaces. The wings were then airbrushed with a grey primer, such as ‘AK Interactive’ Grey (AK758) or similar. This will show where the applied rib tapes require more sanding to blend them with the wing surfaces. Repeat this priming and sanding, if necessary to achieve the desired effect.



Joining upper wings halves:

Using the pre-molded recesses in the forward end of both wing roots, drill holes of 1.0mm diameter centrally into the wing halves. Make sure to drill the holes at 90 degrees to the wings when viewed from the front and from above.

Cut two lengths of 1.0mm diameter Brass rod, such as that from ’Albion Alloy’s’ or similar.

Secure one rod into the pre-drilled hole in one wing half.

Locate the rod into the hole in the other wing half and push the wing halves fully together.

Pencil mark across the tops of the wing halves at the trailing edge, rear of the internal metal reinforcing rod (ends are visible in the wing roots).

Separate the wing halves and point mark the centre of the wing roots at the pencil marks.

Using the point marks as guides, drill holes of 1.0mm diameter centrally into the wing halves. Make sure to drill the holes at 90 degrees to the wings when viewed from the front and from above.

Cut two lengths of 1.0mm diameter Brass rod, such as that from 'Albion Alloy's' or similar.

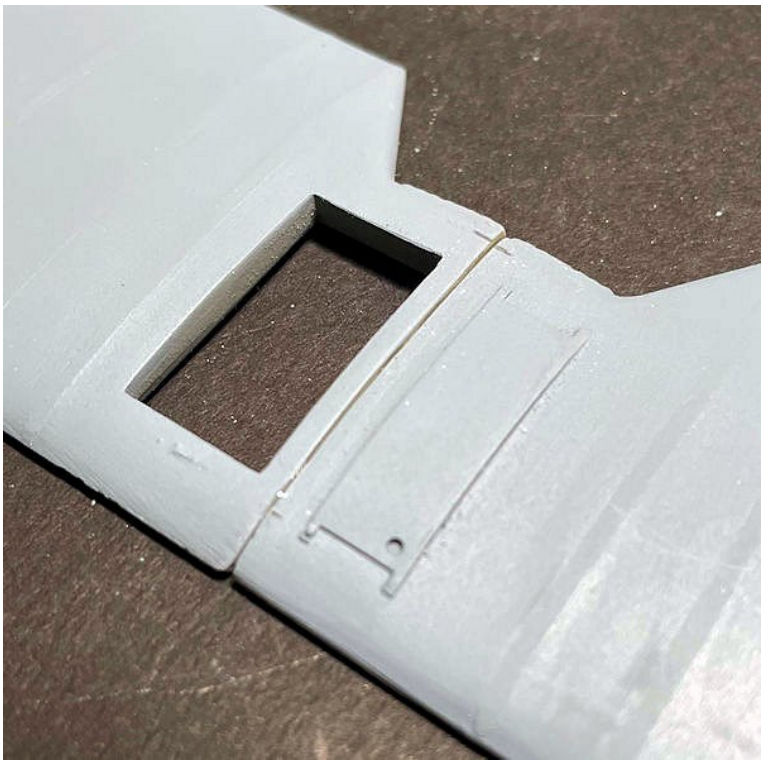
Secure one rod into the pre-drilled hole in the wing half that already has its forward rod fitted.

Locate the two rods into their holes in the other wing half and push the wing halves fully together.

Check that when joined the assembly is flat across the two wing halves and with not obvious mis-alignment where the wings join.

Slightly separate the wings and apply CA adhesive between the wings roots.

Push the wing halves fully together and allow the adhesive to fully set.



Fill the gap along the joint with a modelling putty or 'Mr. Surfacer' 500 then, once fully set, sand to blend the joint with the surrounding surfaces.

Cabane strut locations:

NOTE: *The fuselage to upper wing cabane struts are 3D printed and have rectangular tops that locate into recesses in the underside of the upper wing, each side of the centre joint. Handle these struts with care as they are 3D printed and fragile.*

Carefully remove the two forward 'V' struts and two rear cabane struts from their 3D printed support trees and sand away any residual tree stubs.

Check fit the rectangular tops of the two 'V' struts into their locating recesses in the underside of the upper wing, each side of the wing joint and to the rear of the wing leading edge.

If necessary, lightly sand the rectangular tops and/or increase the size and depth of the wing recesses to achieve a full location of the strut tops.

Check fit the rectangular tops of the two rear struts into their locating recesses in the underside of the upper wing, each side of the wing joint and forward from the wing trailing edge.

If necessary, lightly sand the rectangular tops and/or increase the size and depth of the wing recesses to achieve a full location of the strut tops.

Interplane strut locations:

NOTE: *The eight interplane struts are 3D printed and have pre-molded locating holes in each end, to be used for attaching 0.8mm diameter rods for attaching the struts into the upper and lower wings. Handle these struts with care as they are 3D printed and fragile.*

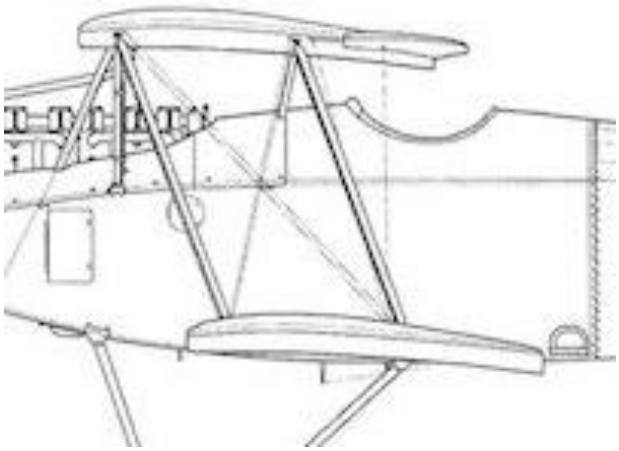
Carefully remove the five (one is a spare) struts A, the two struts B and the two struts C from their 3D printed support trees and sand away any residual tree stubs.

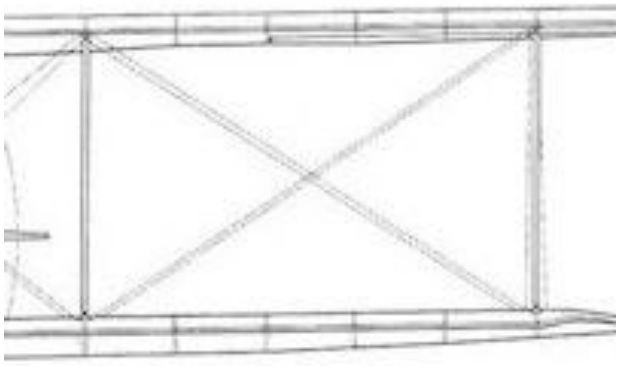
Cut sixteen short lengths of 0.8mm diameter Brass rod, such as that from 'Albion Alloy's or similar.

Using thin CA adhesive, secure a rod into the pre-molded holes in each end of all of the struts, making sure the rods are aligned to the struts when viewed from the front and side of the struts.

Using as guides the pre-molded recesses in the top surface of the lower wing halves, drill holes of 0.8mm diameter into, **but not through**, the lower wing halves. The holes should be drilled at an angle leaning forwards up to the strut locating recesses in the underside of the upper wing.

Using as guides the pre-molded recesses in the underside surface of the upper wing, drill holes of 0.8mm diameter into, **but not through**, the upper wing. The holes should be drilled at an angle leaning rearwards down to the strut locating recesses in the top surface of the lower wing halves.





Elevators:

The pre-molded rib tapes on the elevators were only slightly raised, so were carefully scrapped to reduce their thickness.

Holes of 0.8mm diameter were drilled centrally into the inner edges of the elevators at the pre-molded recesses.

A length of 0.8mm diameter Brass tube, such as 'Albion Alloy's' MBT08 or similar, was cut to represent the elevator torsion bar. The length of the tube should be such that when the elevators are fully located to the ends of the tube, the elevator inner edges are close to the fuselage sides.

Using thin CA adhesive, secure the rod fully into one of the elevators.

Rudder:

Remove the rudder from its 3D tree supports and sand away any residual print tags from its edges.

Drill hole of 0.8mm diameter centrally up into bottom edge of the rudder at the pre-molded recess.

A short length of 0.8mm diameter Brass tube, such as 'Albion Alloy's' MBT08 or similar, was cut and secured into the hole, using thin CA adhesive. This represents the rudder post.

NOTE: *The kit does not supply the control horn for the rudder.*

I cut a basic control horn shape from 0.4mm thick plastic card and drilled a hole of 0.2mm diameter through each end and a hole of 0.9mm diameter through the centre. This was then secured onto the fitted rudder post in the rudder with the horn against the bottom edge of the rudder.

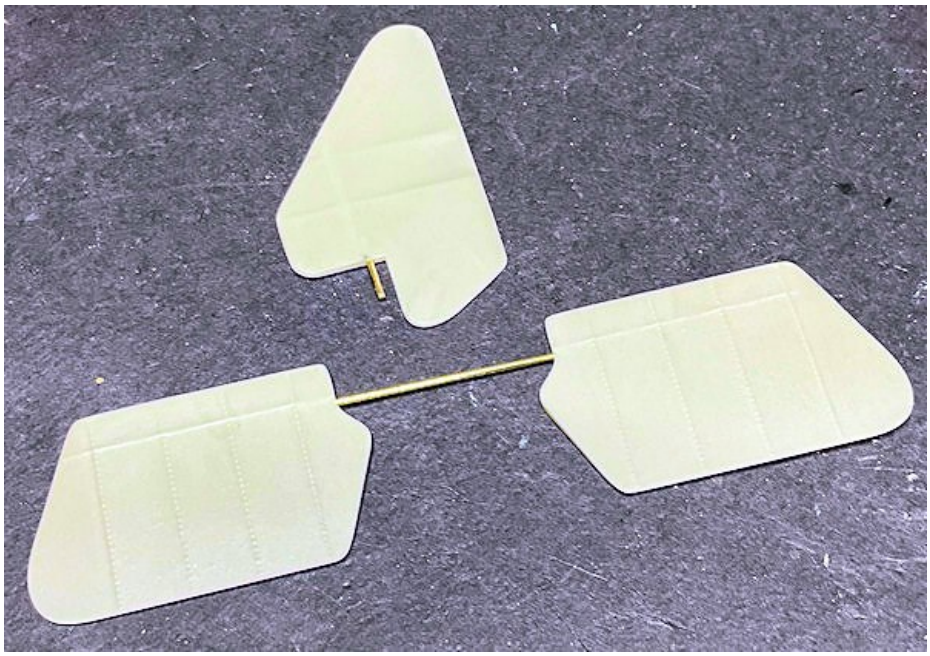


Photo-etch parts:

NOTE: *The kit supplied photo-etch parts can be fitted to the upper and lower wings at this stage and will be painted later in this build log. Rigging anchor parts 25 will not be used.*

Cut out the following photo-etch parts from their kit supplied sheet and remove any residual tags from their edges:

20 x2, 21 x2, 22 x2, 23 x3, 24, 26 x4,

Refer to pages 11 and 12 of the kit instructions for parts locations.

NOTE: *The kit instructions indicate that there are two plate 21 on both lower wing halves. This is incorrect - plates 22 are at the rear and plates 21 are at the front. The three 'leaves' of each pair of plates should be joined.*

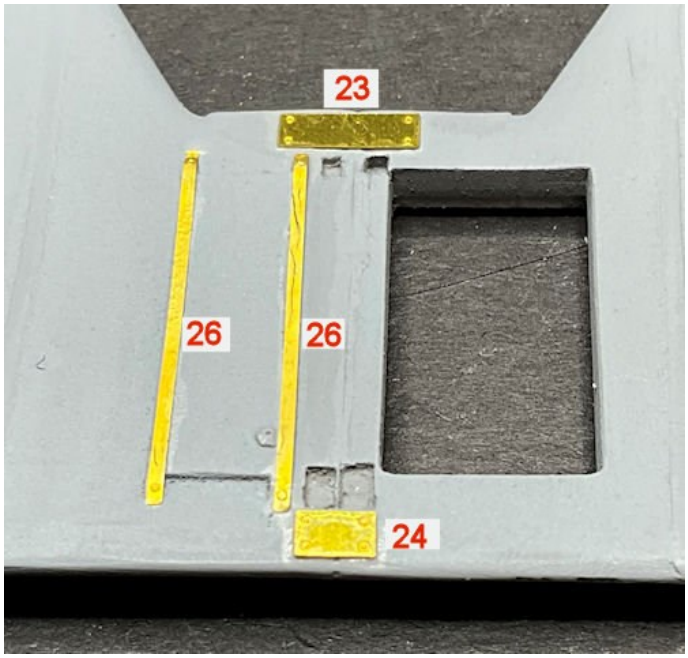
Using thin CA adhesive, secure the photo-etch parts to the upper and lower wings.

Remove the 3D printed compass and the filler cap for the upper wing tank from their support trees and remove any residual tree stubs from their edges.

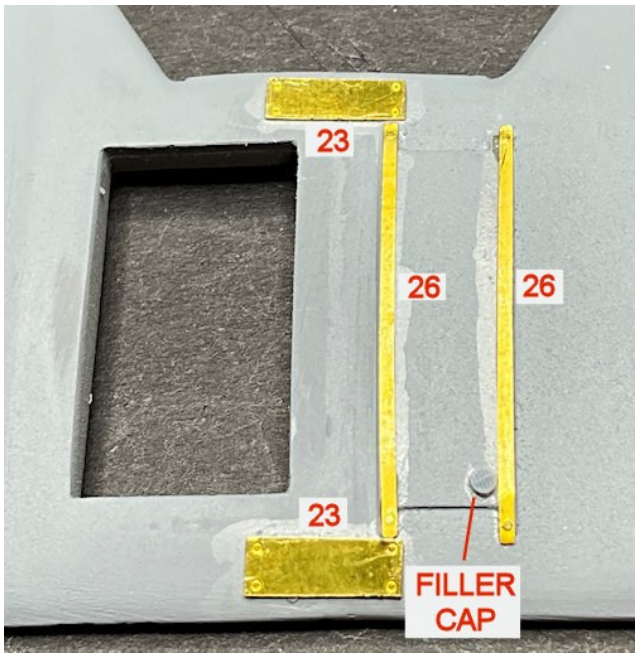
Using thin CA adhesive, secure the compass into its recess in the left lower wing.

Using thin CA adhesive, secure the filler cap into its recess in the upper wing tank.

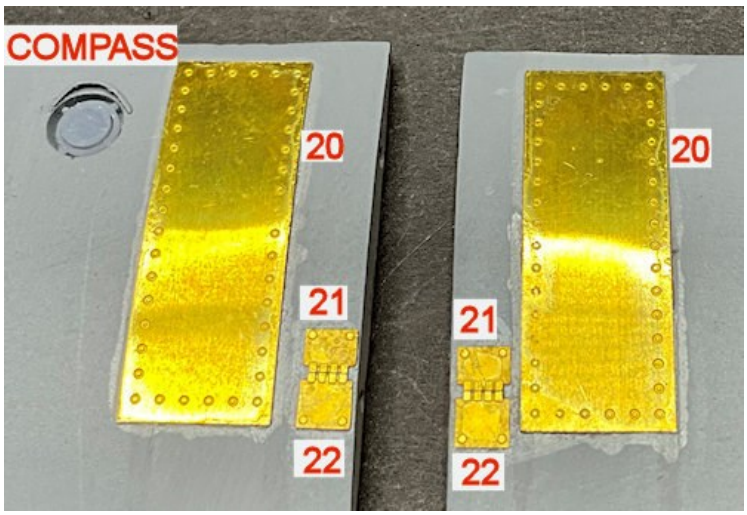
Upper wing - underside



Upper wing - top



Lower wing halves



Once the CA adhesive has fully set, any residual adhesive around the edges of the photo-etch parts can be removed by sanding along the edges with a sanding sponge.

Painting:

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

Landing gear wheels (x2)
Elevators (x2)
Rudder
Landing gear struts/axle assembly
Tail skid assembly

Fuselage cabane struts (x4)
Rudder support
Upper wing
Lower wing halves (x2)
Interplane struts (x8)
Radiator
Radiator pipes (x2).

Airbrush or brush paint ‘Tamiya’ Grey Green (IJN) (X76) or similar over the following:

Tail skid assembly
Fuselage cabane struts (x4)
Rudder support
Interplane struts (x8)
Elevator torsion bar and control horns
Rudder control horn.

NOTE: *Use the following illustrations as a guide for painting the green and brown camouflage patterns. Note that the paints appear to have been airbrushed, not hard line brush painted.*

Airbrush ‘Hataka’ (Orange top range) Dark Olive Green (C301) or similar, across the top surfaces of the upper and lower wings and elevators and the sides of the rudder. Also the landing gear right struts and top, right of the axle fairing.

Airbrush ‘Hataka’ (Orange top range) Brun Foncé (C079) or similar, across the top surfaces of the upper and lower wings and elevators, the sides of the rudder. Also the landing gear left struts and top, left of the axle fairing. Once dry, airbrush a light coat of ‘Tamiya’ NATO Brown (XF68) over the Brun Foncé colour.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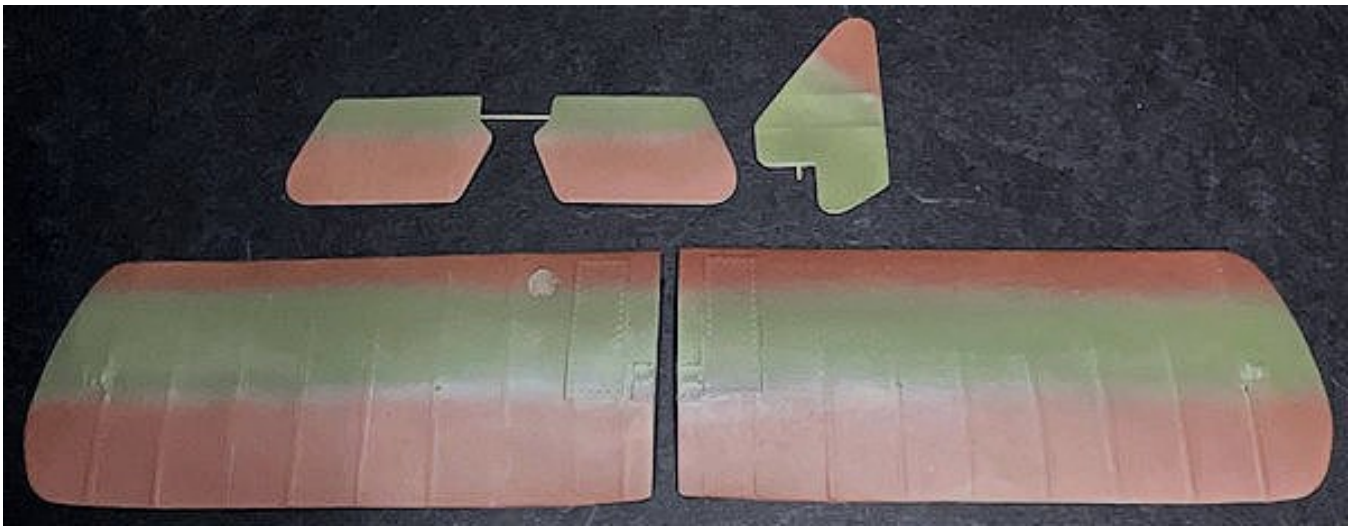
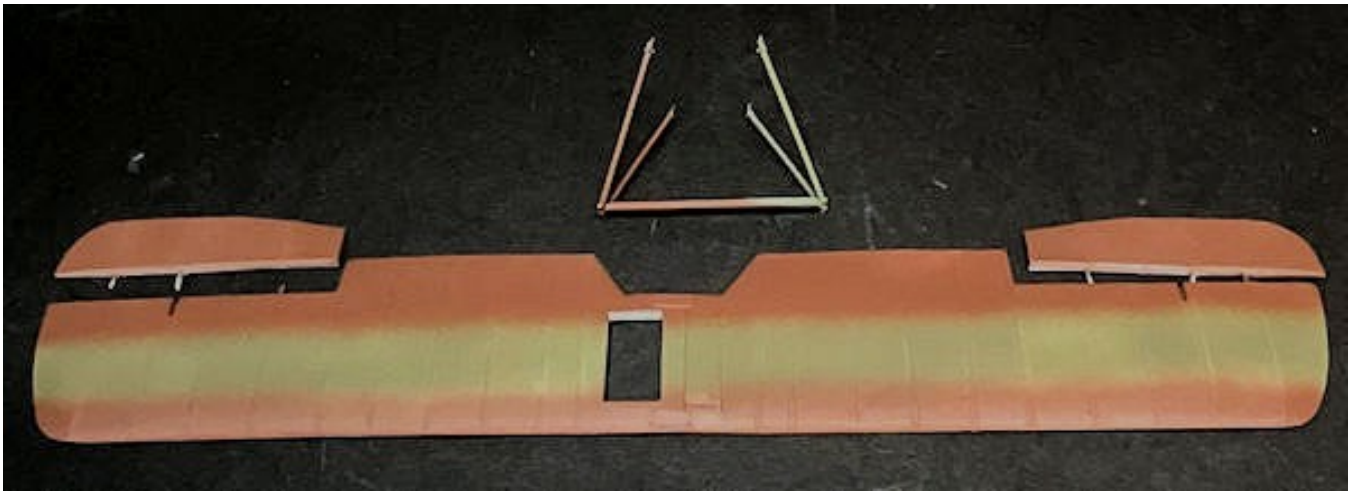




Decals:

‘Aviattic’ decals:

NOTE: *The ‘Aviattic’ decals are not ‘cookie cut’ and therefore need to be cut out from their backing sheet. The individual decals need to be cut a close the their edges as possible to avoid carrier film at their edges.*

Refer to Part 4 (Decals) of this build log for more information.

The ‘Aviattic’ decals used are the ‘Aviattic’ WW1 German blue linen (ATT32077) and the WW1 Linen weave effect (ATT32236).

To prepare the surfaces for applying the decals, airbrush a clear gloss coat, such as ‘Mig’ A-Stand Aqua Gloss (A.Mig-2503) or ‘Alclad’ Aqua Gloss 600 over the areas of the fuselage that required decals, which are:

Both sides of the upper wing
Both sides of the lower wing halves
Both sides of the two ailerons
Both sides of the rudder
Both sides of the two elevators.

For each area to have decals, cut out a paper template that covers the area.

Check that the template aligns correctly to the edges of the area.

Lay the template onto the rear surface of the ‘Aviattic’ WW1 Linen weave effect (ATT32236) decal sheet.

Trace the template outline onto the decal sheet.

Carefully cut out the decal shape from the sheet.

Refer to Part 4 (Decals) of this build log and apply the decal to the area, making sure the edges of the decal are aligned to edges of the area.

Kit supplied decals:

NOTE: *The decals supplied in the kit are not 'cookie cut' and therefore need to be cut out from the backing sheet. The individual decals need to be cut a close the their edges as possible to avoid carrier film at their edges. Also, I chose an appropriate decal from the 'Airscale' Generic WW1 instruments (AS32 WW1) set for the fuselage mounted instrument and compass in the lower, left wing, rather than using the kit supplied decals.*

The kit supplied decals required are:

Two upper wing crosses (top)

Two lower wing crosses (underside)

Two rudder crosses (replaced with decals from my 'spares')

Eight interplane strut serial numbers

Eight interplane strut logos.

Other decals:

Compass face and fuselage mounted instrument.

NOTE: *The upper wing crosses need to be cut across the gap between the wing and the ailerons. Also it's not clear whether the centre section of the upper wing was linen covered. There, I chose not to cover that area with the linen decal.*

Refer to Part 4 (Decals) of this build log and apply the kit supplied decals to the wings and interplane struts. I also added the Halberstadt company logo decal to the top sides of the rudder, which was common for German aircraft.

Sealing:

Once the decals have fully set, seal and protect them by airbrushing a semi-matte clear coat, such as 'Alclad' Light Sheen (ALC-311) or similar over the applied decals. This coat will also provide a base for subsequent weathering.

Painting (Continued):

Mask off and airbrush the underside centre section of the upper wing with a mix of 'Tamiya' Light Blue (XF23), Medium Blue (XF18) and Flat Blue (XF8) in a ration of 70%/20% and 10% to approximate the colour of the underside decal colour.

Brush paint the underside of the compass housing under the lower left wing and the control levers on the two upper wing ailerons with 'Tamiya' Grey Green (IJN) (XF76).

Brush paint around the ring of the compass on the left lower wing with 'Tamiya' Rubber Black (XF85) or similar.

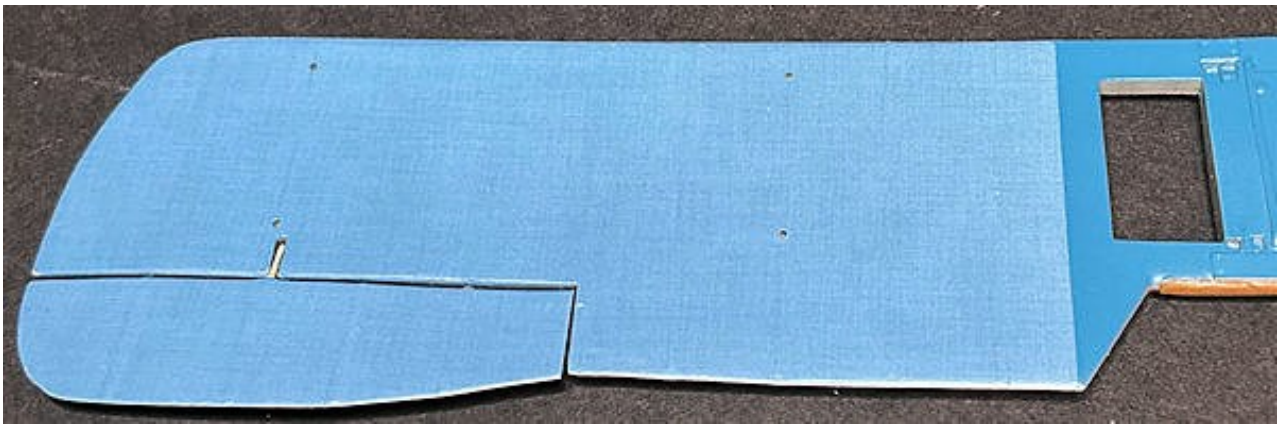
Brush paint the aileron control cable access panels on the top, outer surface of the lower wings with 'Tamiya' Grey Green (IJN) (XF76).

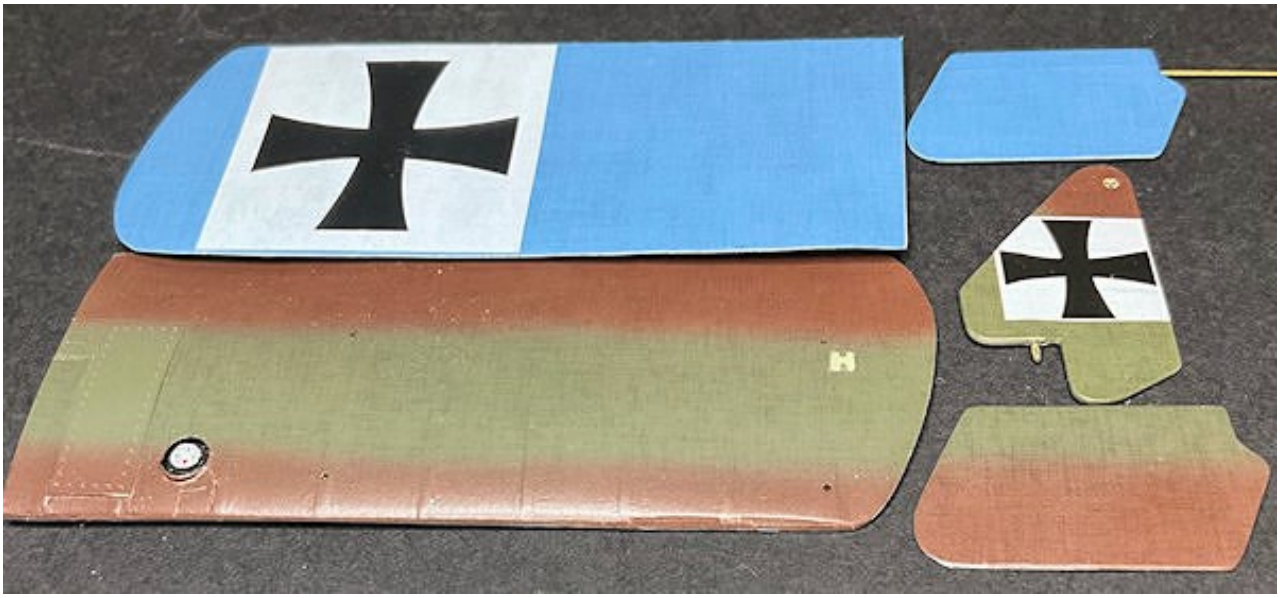
Brush paint the head protection padding around the centre section trailing edge on the upper wing with 'AK Interactive' Brown Leather (AK3031).

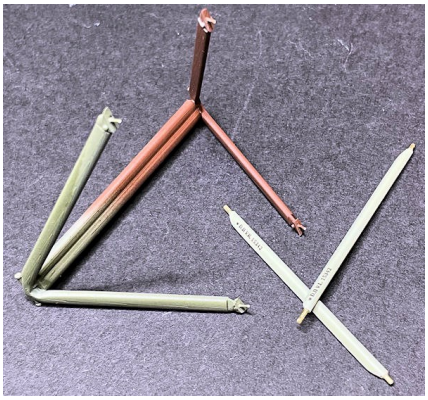
Brush paint the tail skid with 'Tamiya' Flat Brown (XF10) or similar.

Brush paint the 'shoe' of the tail skid with 'Mr. Colour' Stainless Steel (213) or similar.

Brush paint the tail skid 'bungee' suspension cords with 'Tamiya' Deck Tan (XF55) or similar.







Weathering:

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

Brush ‘Flory Models’ fine clay wash (Dark Dirt) over the following surfaces and leave to fully dry:

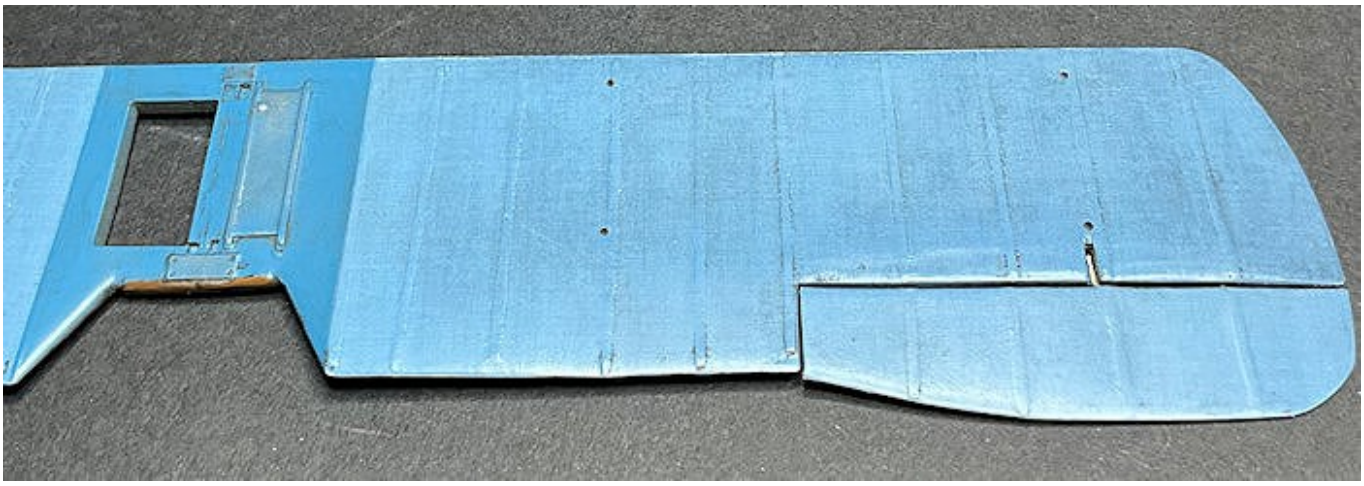
Upper wing and ailerons (both sides)
Lower wing halves (both sides)
Rudder (both sides)
Elevators (Both sides)
Landing gear strut assembly.

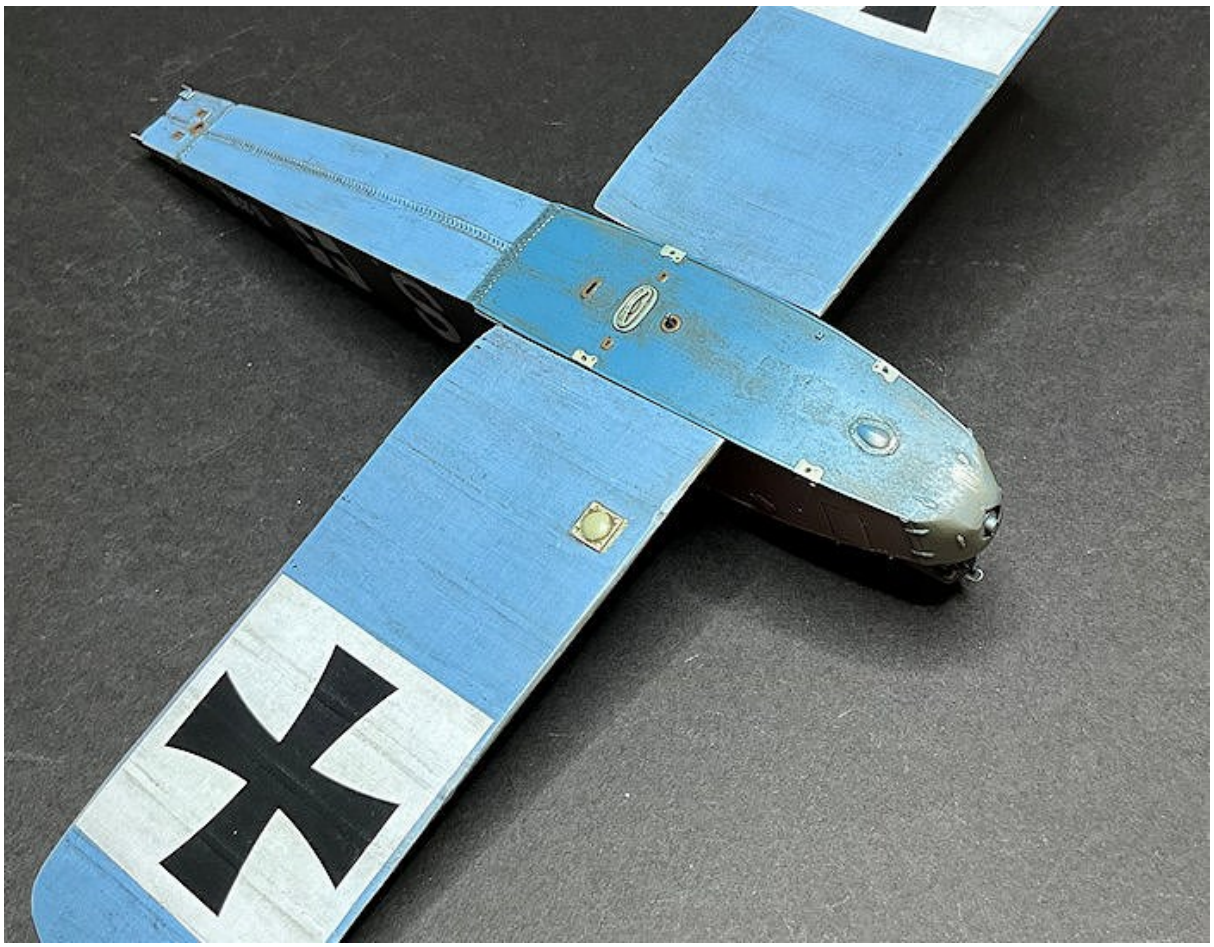
Once dry, remove the wash to achieve the desired weathered effect.

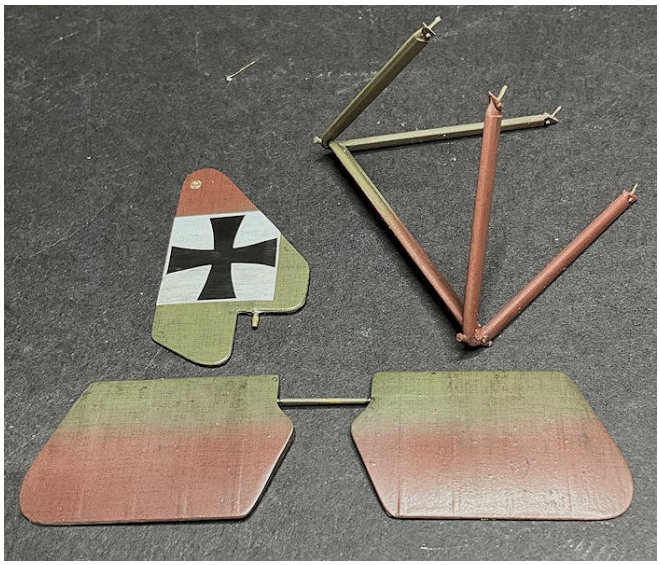
Seal and protect the applied weathering by airbrushing a semi-matte clear coat, such as ‘Alclad’ Light Sheen (ALC-311) or similar over the surfaces.

Lightly dry brush ’Mr. Colour’ Super Metallic 2 (Super Iron 2 - SM 203) on the edges of the metal panels and fuel tank on the upper wing and lower wing halves.

Sponge ’Tamiya’ Weathering Master (Set A Mud) along the leading edges of the upper wing and lower wing halves.





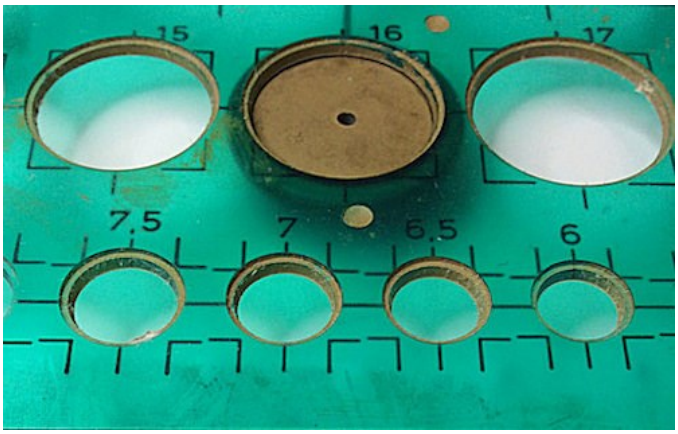


Painting (Continued):

Brush ‘Tamiya’ Clear Gloss (X22) over the face of the two cockpit instruments, the fuselage mounted instrument and the compass on the lower left wing.

Brush ’Microscale’ Micro Kristal Clear onto the face of the compass to form a slightly raised and clear ’dome’.

NOTE: *The ‘Aviattic’ Linen Weave effect decal (ATT32236) is produced as ‘clear’ backed, meaning the applied base coat colours will show through the decals after they have been applied. To airbrush the internal face of the wheels without over spraying the surrounding grey coloured 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.*



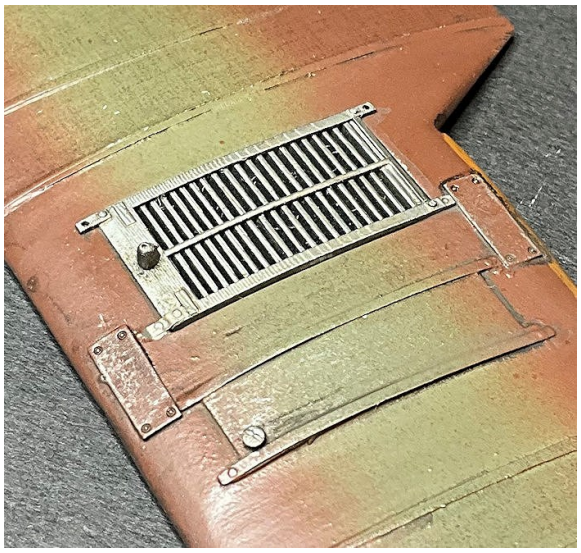
Airbrush the inner and outer faces of the two landing gear wheels with ‘Tamiya’ NATO Brown (XF68) or similar.

Airbrush the already primed upper wing radiator with ‘Tamiya’ Gloss Black (X1) or similar.

Airbrush the radiator with ‘Alclad’ Steel (ALC-112) or similar.

Assembly (continued):

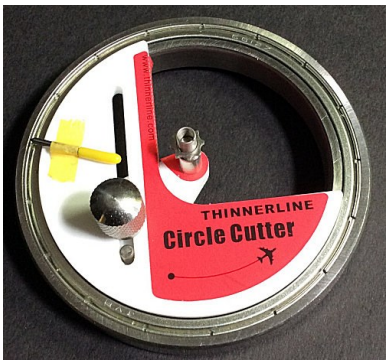
Using thin CA adhesive, secure the prepared radiator fully into its opening in the upper wing.



Decals (continued):

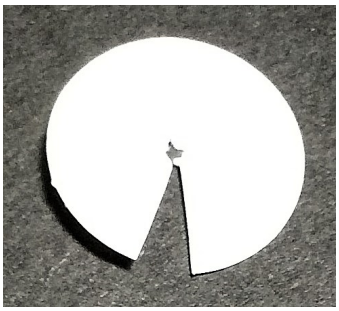
Wheels:

NOTE: *The decals used for the wheel covers are cut from the linen effect sheet - ‘Aviattic’ Linen Weave effect (ATT32236). To cut these circular decals I used a ‘Thinnerline’ circle cutter.*



Using the cutter I cut out two decals for the rear wheel covers and two decals for the front covers.

NOTE: *The front wheel covers are slightly conical in shape. The decals need to be cut slightly larger in diameter than required then a section cut out. This will allow the decal to be applied to the conical surface with the cut sides butting against each other.*



NOTE: *The 'Aviattic' decals are quite strong and flexible enough to be able to push and position the decals prior to final fitting.*

Apply the four decal discs to the wheels.

Airbrush the wheels with a matte (flat) clear coat, such as 'Alclad' Flat (ALC-314) or similar.

Refer to Part 3 (Weathering) of this build log for more information - apply your desired weathering finish to the wheels (I used 'Flory Models' Grime fine clay wash).

Seal the wash by airbrushing the wheels with a matte (flat) clear coat, such as 'Alclad' Flat (ALC-314) or similar.

Assembly (continued):

Landing gear axle and wheels:

NOTE: *It seems the axle was mounted centrally across the top of the axle fairing with 'bungee' type suspension cords wrapped around the cord supports and axle ends.*

Locate the two wheels onto 1.2mm diameter steel rod (axle) supplied in the kit.

Place the axle onto the pre-moulded groove in the top of the axle fairing.

Position the wheels on the axle such that they are approximately 2mm away from the bottom, outer edge of the landing gear struts.

If necessary, cut the axle rod to remove any excess rod length.

Secure the wheels to the ends of the axle rod using thin CA adhesive. Make sure the wheels are fitted with the protruding boss at the wheel centre facing outboard.

Place the axle onto the pre-moulded groove in the top of the axle fairing and hold in position.

Drill holes of 0.6mm diameter through the axle fairing, on each side of the axle and 13mm in from the ends of the fairing.

Bend two lengths of 0.5mm diameter Nickel-Silver tube around a 1.2mm diameter rod to form two semi-circular hoops.

Trim the length of the hoop legs such that they do not protrude from under the axle fairing when inserted over the axle and through the pre-drilled holes.

Brush paint the axle with 'Tamiya' Rubber Black (XF85) or similar.

Position the axle into the groove in the top of the axle fairing and fully locate the two hoops over the axle and into the fairing.

Secure the axle and hoops to the fairing using thin CA adhesive.

Cut a long length of 'EZ' white line (heavy).

Secure one end of the line under the bottom of a landing gear 'V' strut, using thin CA adhesive.

Route the line up and across the end of the axle fairing then down the outside at the opposite end of the fairing. Repeat on the underside to return to the start.

Continue routing the line until sufficient has been applied.

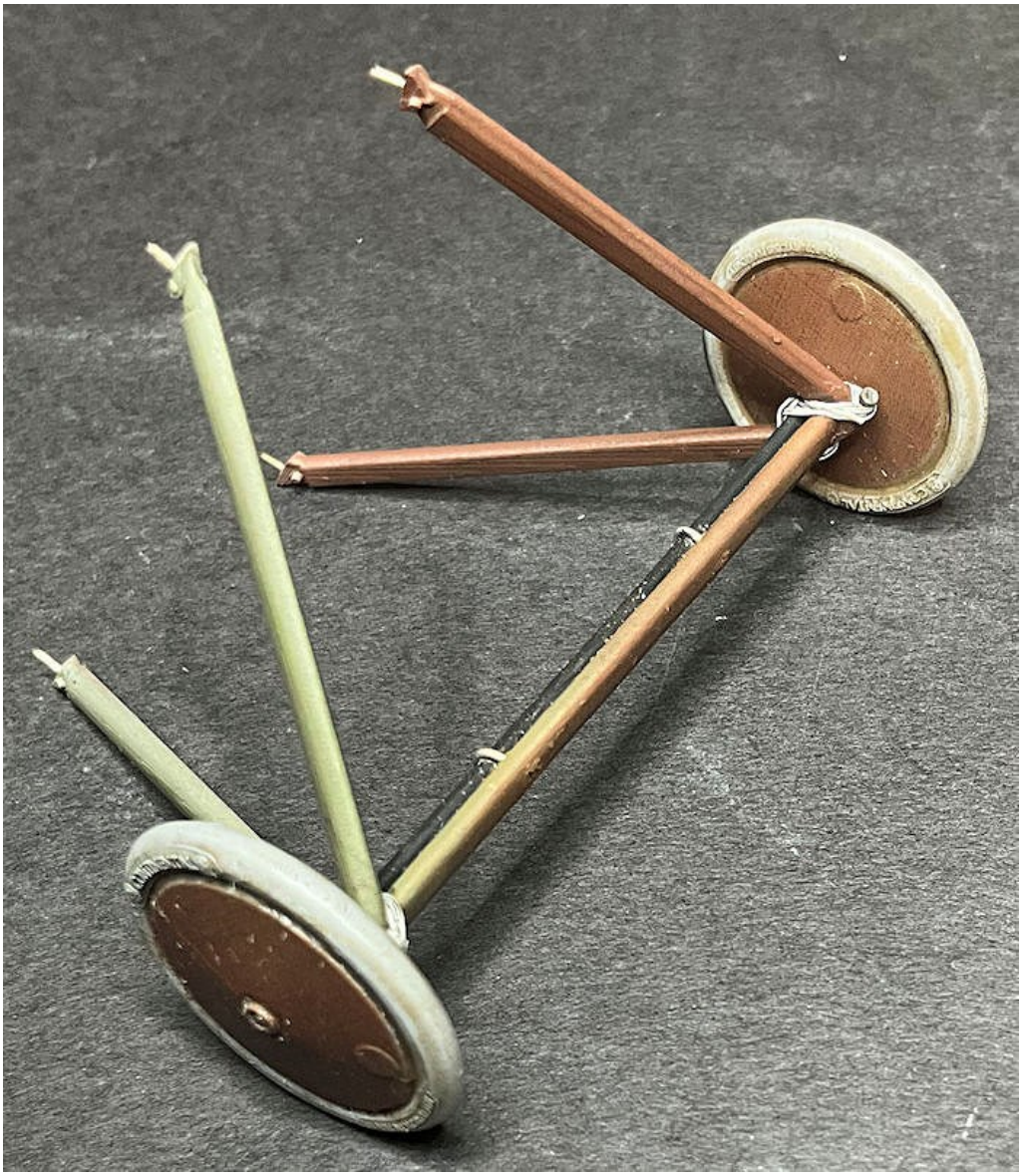
Secure the line to the underside of the strut using thin CA adhesive.

Cut away any residual line.

Repeat the procedure to add line to the opposite end of the axle.

Brush ’AK Interactive’ Kerosene wash (AK2039) over the applied lines.

Airbrush the applied lines with a semi-matte clear coat, such as ’Alclad’ Light Sheen (ALC-311) or similar.



Pre-rigging:

NOTE: *At this stage of the build and before the upper wing, rudder and elevators are fitted, it’s best to pre-rig the various rigging and control lines to the parts.*

Turnbuckles types:

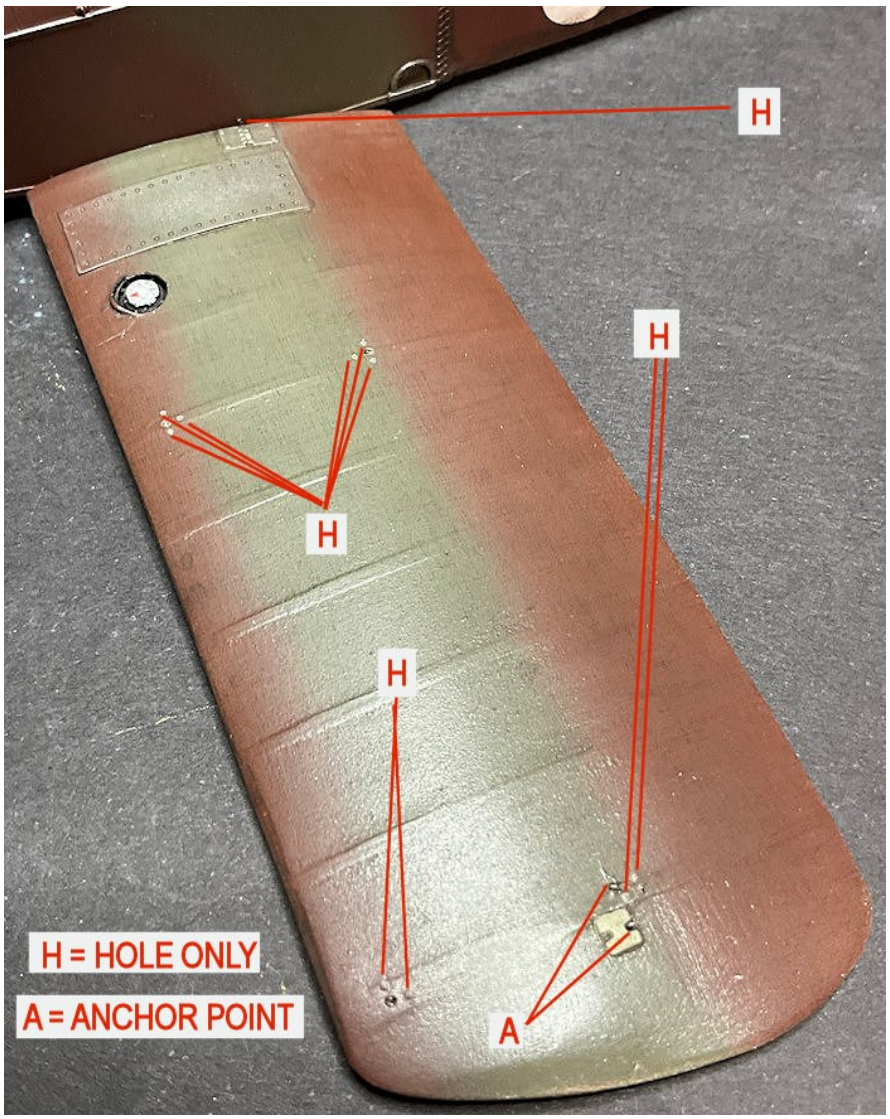
The rigging is attached to the underside of the upper wing using ’Gaspatch’ 1:48th scale metal Anchor points. These are supplied double ended and need to be snapped at the centre of the shanks to separate each into two separate Anchor Points.

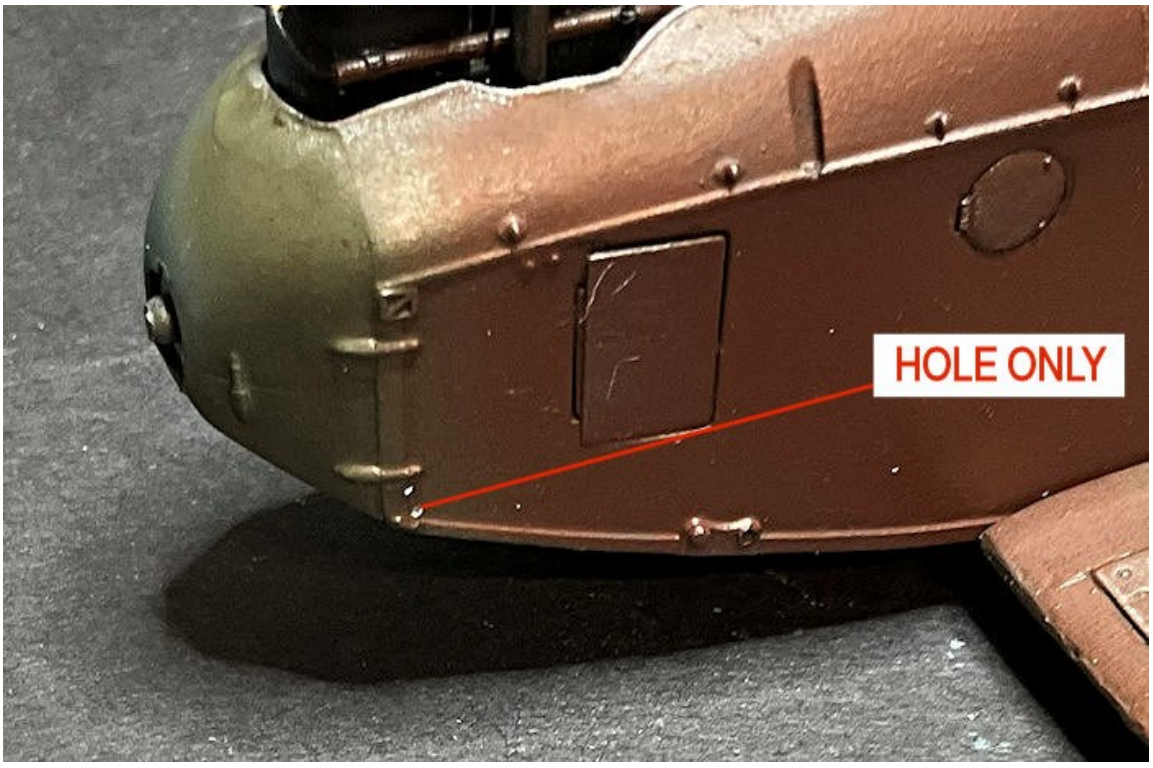
The control lines for the elevators use ’Gaspatch’ 1:48th scale metal Type C turnbuckles.

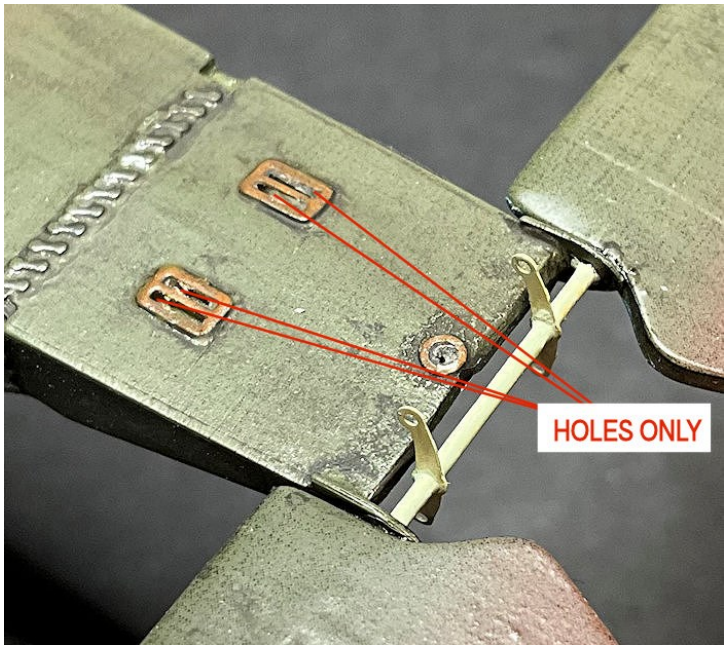
Preparation:

Refer to the following photographs and drill holes of 0.4mm diameter into, **but not through**, the model parts. These will be used to attach the various rigging and control lines to the model.

Refer to Part 6 (Rigging) of this build log - ‘Holes only’ should be drilled at the approximate angles to align the fitted rigging line to its opposite end location.







Refer to Part 6 (Rigging) of this build log - ‘Holes only’ should be drilled at the approximate angles to align the fitted rigging line to its opposite end location.

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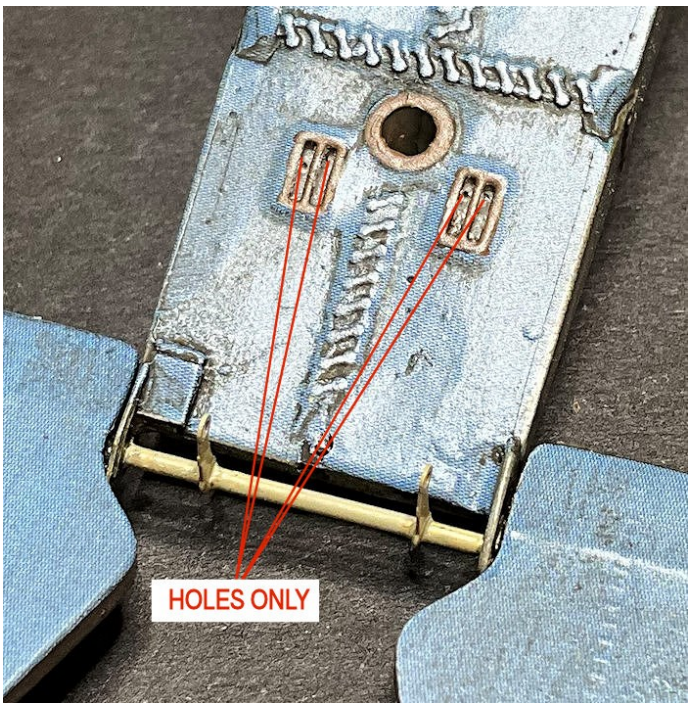
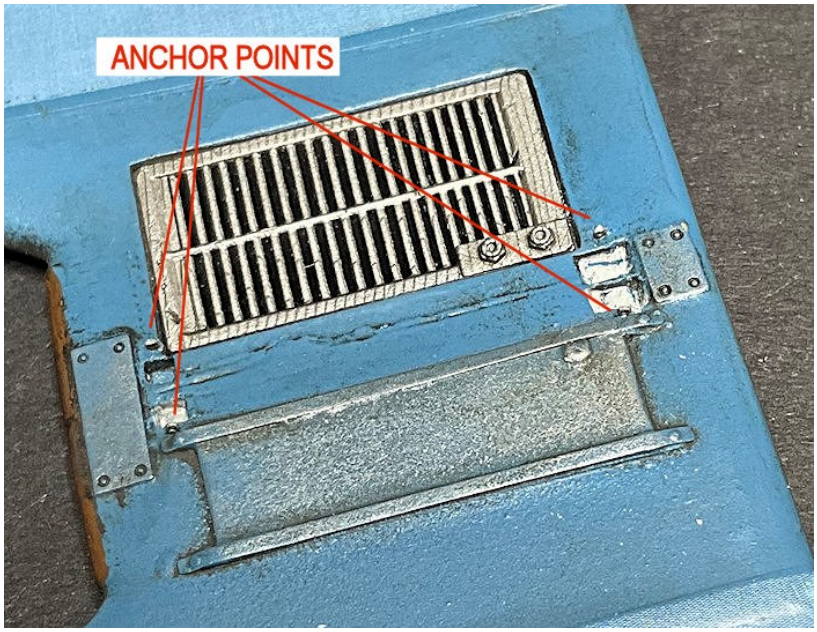
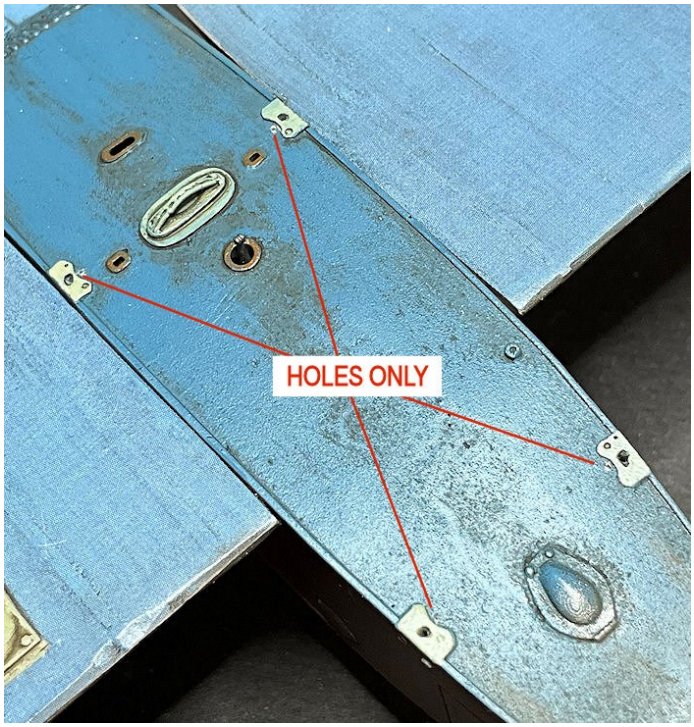
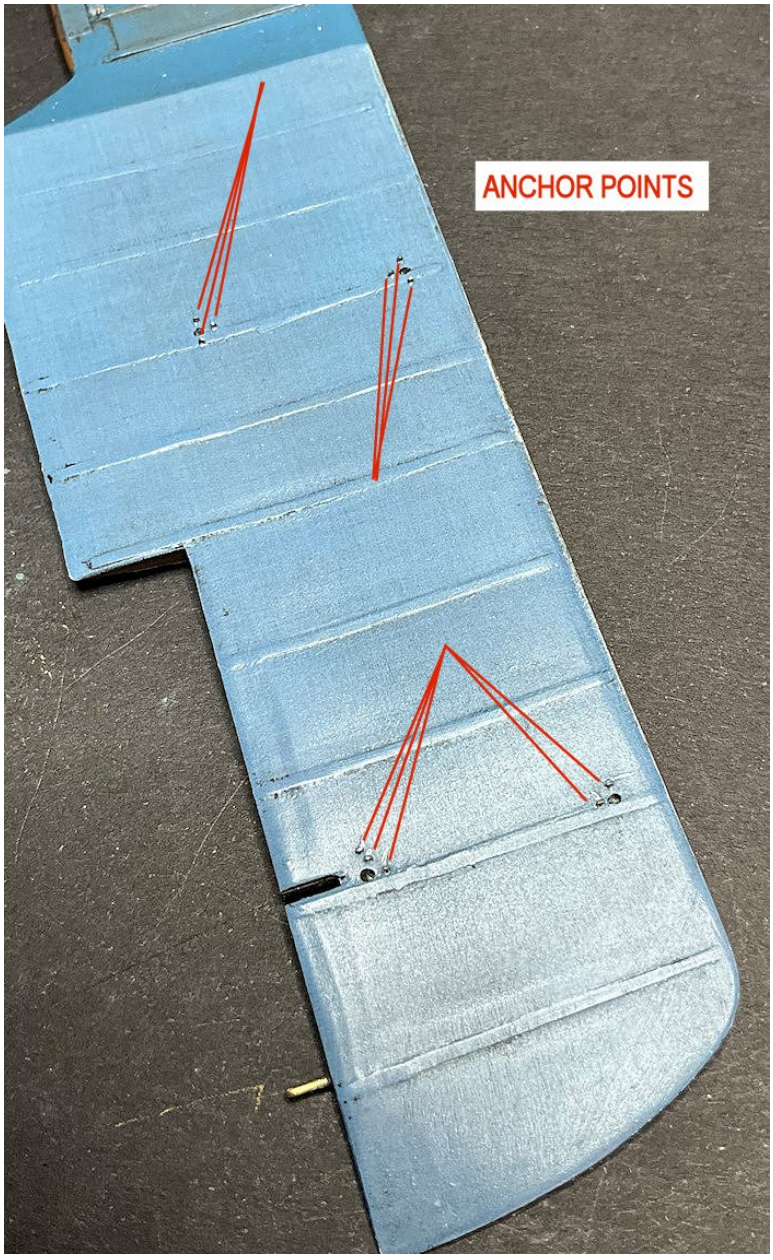
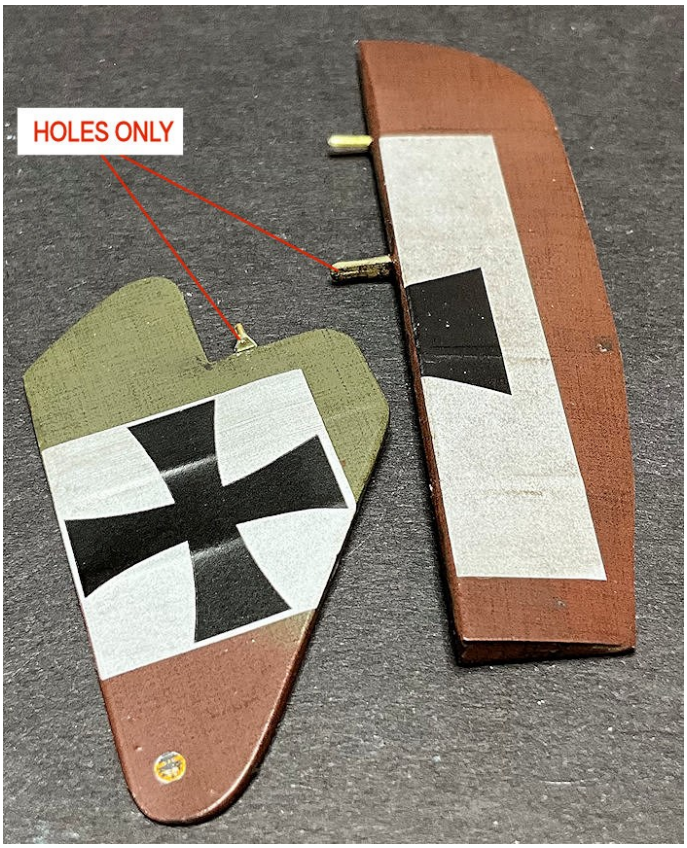






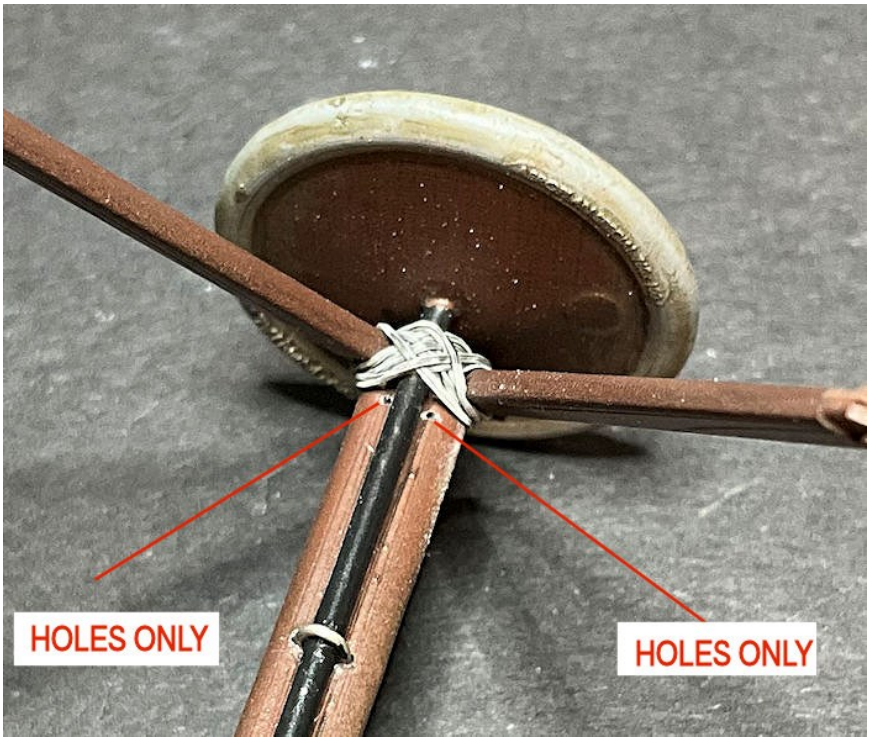
Refer to Part 6 (Rigging) of this build log - ‘Holes only’ should be drilled at the approximate angles to align the fitted rigging line to its opposite end location.





Drill holes through both sides of the model parts.

Drill holes through both sides of the model parts.



Upper wing pre-rigging:

NOTE: *For **each of the Anchor Points** fitted in the underside of the upper wing, use the following procedure to add a long, pre-rigged line.*

If necessary, carefully run a 0.2mm diameter drill through the ‘eye’ end of the Anchor points to remove any build up of metal.

NOTE: *Brass tube can be chemically blackened by immersion in solutions such as ‘Blacken-It’ or similar.*

Cut a short length of blackened tube 0.5mm diameter Brass tube, such as that supplied from ‘Albion Alloys’ (MBT05) or similar.

Deburr the tube by running a 0.3mm diameter drill through the tube.

NOTE: *Always **cut the length of line much longer than needed** to span between its attachment points. This allows for easier connecting during the final rigging stage.*

Cut a long length of 0.12mm diameter mono-filament (fishing line), such as ‘Stroft GTM’ or ‘Steelon’.

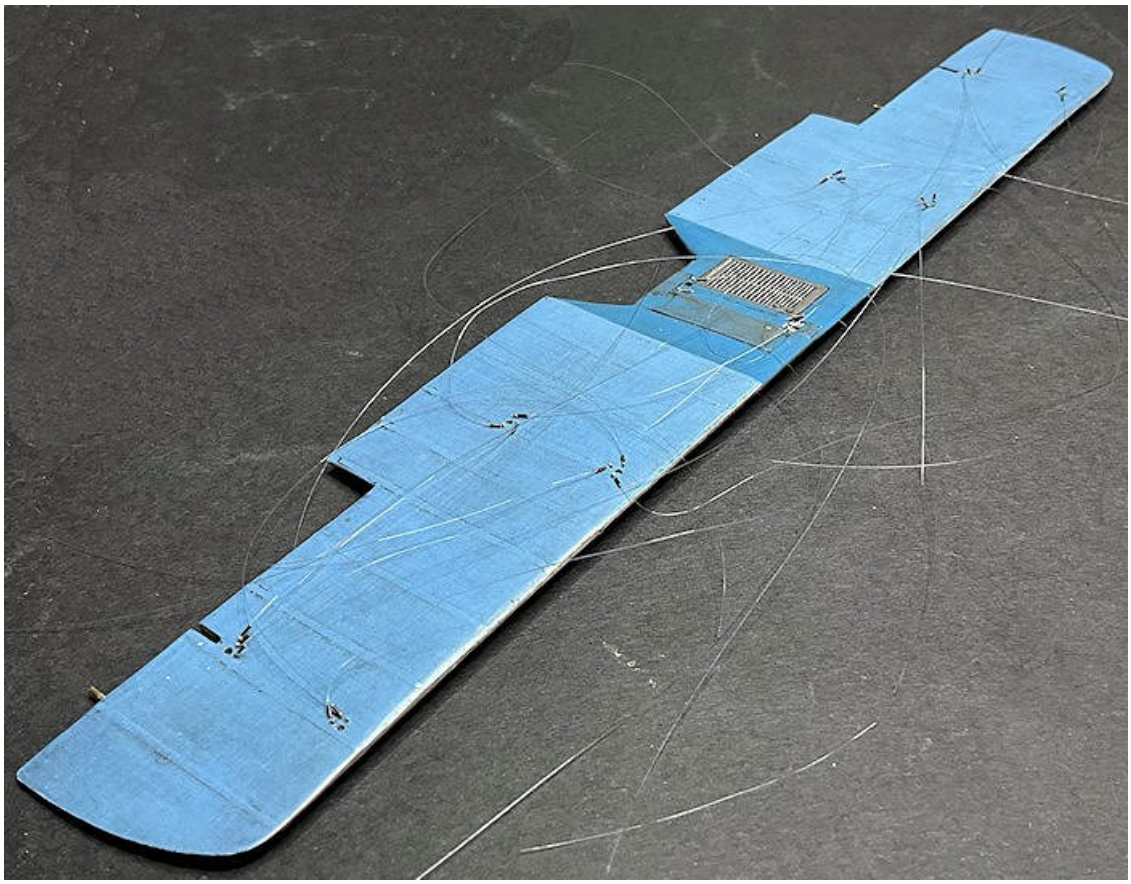
Pass the line through the tube, then trough the ‘eye’ end of an Anchor Point.

Pass the line back and through the tube.

Slide the tube up to, **but not touching**, the ‘eye’ end of the Anchor Point.

Secure the lines to the tube end away from the Anchor Point, using thin CA adhesive.

Cut away any residual tag of line at the tube end.



Elevator rigging:

NOTE: *The elevator is rigged using 0.08mm diameter, such as ‘Steelon’ or ‘Stroft GTM’ and 0.4mm blackened Brass tube, such as ‘Albion Alloy’s’ MBT04 or similar. Deburr cut tubes using a 0.2mm diameter drill*

Using the previous procedure, attach a rigging line to both ends of a ’Gaspatch’ 1:48th scale metal Type C turnbuckle.

Using one of the attached lines, use the same procedure to attach the line to a rigging hole in the end of an elevator control horn, but not securing the line in position.

Pull on the end tag of line to draw the tubes and turnbuckle together and close to the elevator control horn.

Secure the lines at the join between the tubes using thin CA adhesive.

Cut away any residual tag of line.

Cut the forward line such that with the rigged line in tension, the line end can be inserted into the pre-drilled hole in the fuselage inside the outer slot of the added cable outlet cover.

Secure the end of the line into the pre-drilled hole, keeping the rigged line in tension, using thin CA adhesive.

Brush paint the centre barrel of the turnbuckle with ‘Mr. Colour’ Iron (212) or similar.

Repeat the procedure to add rigged lines to the remaining upper and underside elevator control horns.

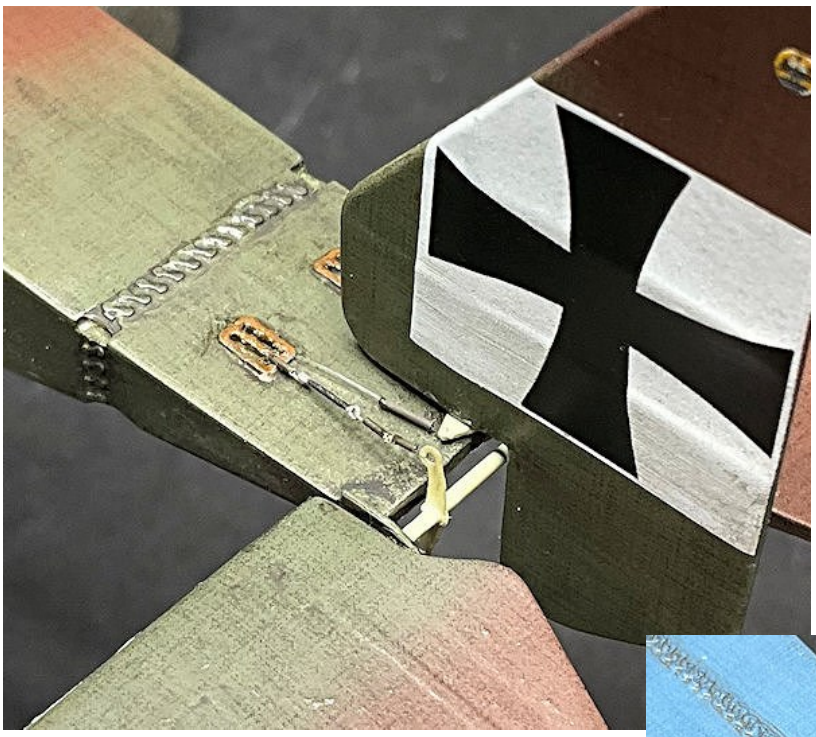
Rudder rigging:

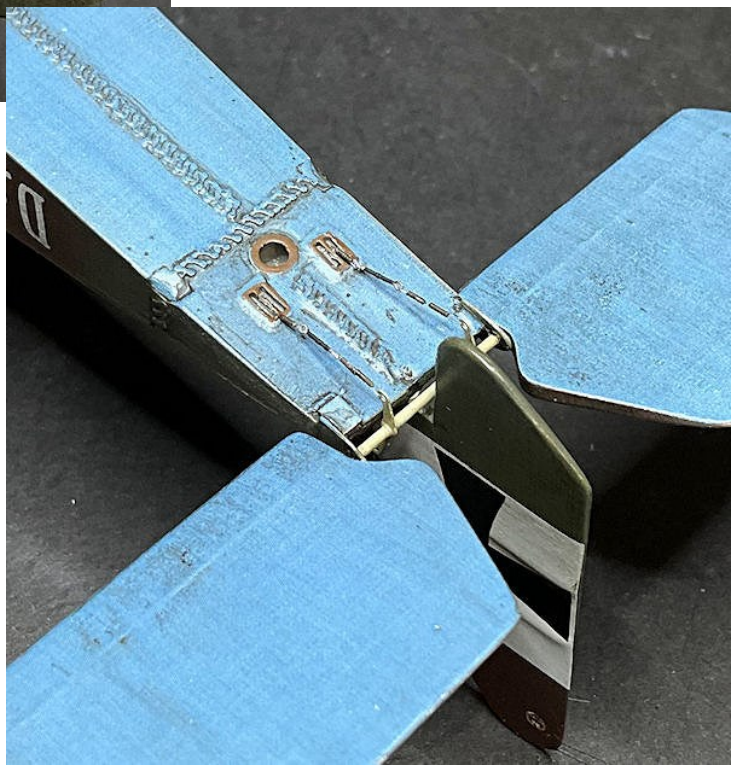
Repeat the procedure (without turnbuckles) to add a control line to the pre-drilled holes in the ends of the added rudder control horn on the rudder post.

Keeping the two lines above the fuselage, secure the rudder post into its locating hole in the top, rear of the fuselage.

Cut the forward ends of the two lines such that with the rigged lines in tension, the line ends can be inserted into the pre-drilled hole in the fuselage inside the inner slot of the added cable outlet cover.

Secure the end of the lines into their pre-drilled hole, keeping the rigged line in tension, using thin CA adhesive.





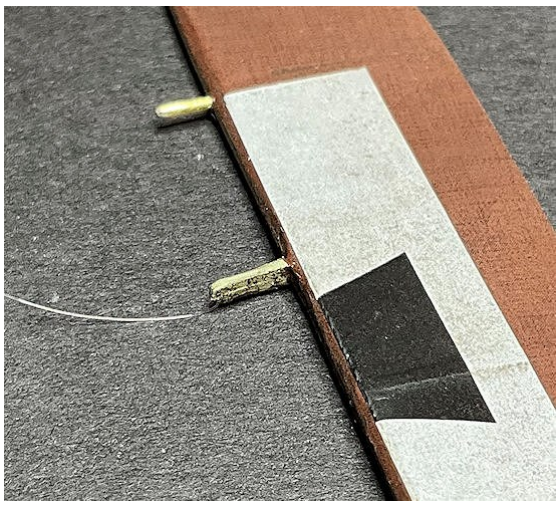
Ailerons pre-rigging:

Cut two long lengths of 0.08mm diameter mono-filament, such as ‘Steelon’ or ‘Stroft GTM’.

Pass the one end of the lines through the pre-molded holes in the end of the aileron control levers

Secure the lines in the holes and down a side of the control levers, using thin CA adhesive.

Cut away any residual line at the control levers.



Painting (continued):

Separate twenty eight ’Gaspatch’ 1:48th scale metal One-Ended turnbuckles from the casting base.

Separate four ’Gaspatch’ 1:48th scale metal turnbuckles (Type C).

Brush paint the centre barrel of the turnbuckles with ‘Mr. Colour’ Iron (212) or similar.

Assembly (continued):

Upper wing fit:

NOTE: *From this stage of the build onwards, make sure no stress in placed on the eight interplane struts, especially at the ends. The fitted locating rods do not penetrate far enough into the ends of 3D printed struts. As such, any pressure will cause the struts to break, leaving the locating rod into the wing.*

Refer to the model drawings on pages 11 and 13 of the kit instructions for the angle of the struts when they are fitted.

Struts A are the two outer struts on both sides.

Struts B are the two forward, inner struts.

Struts C are the two rear, inner struts.

I chose to first fit the upper wing without the fuselage cabane struts, as aligning them correctly to their fuselage recesses and inside the engine cowls would be difficult when fitting the upper wing and the interplane struts. The cabane struts will be fitted once the upper wing is installed.

Before finally fitting the interplane struts into the lower wings, make sure to check the forward tilt angle of the struts to the upper wing is correct with the fuselage forward cabane struts temporarily attached (masking tape) to the fuselage. This is necessary to ensure the cabane struts can be located correctly when the upper wing is fitted (refer to the follow ‘Fuselage cabane struts).

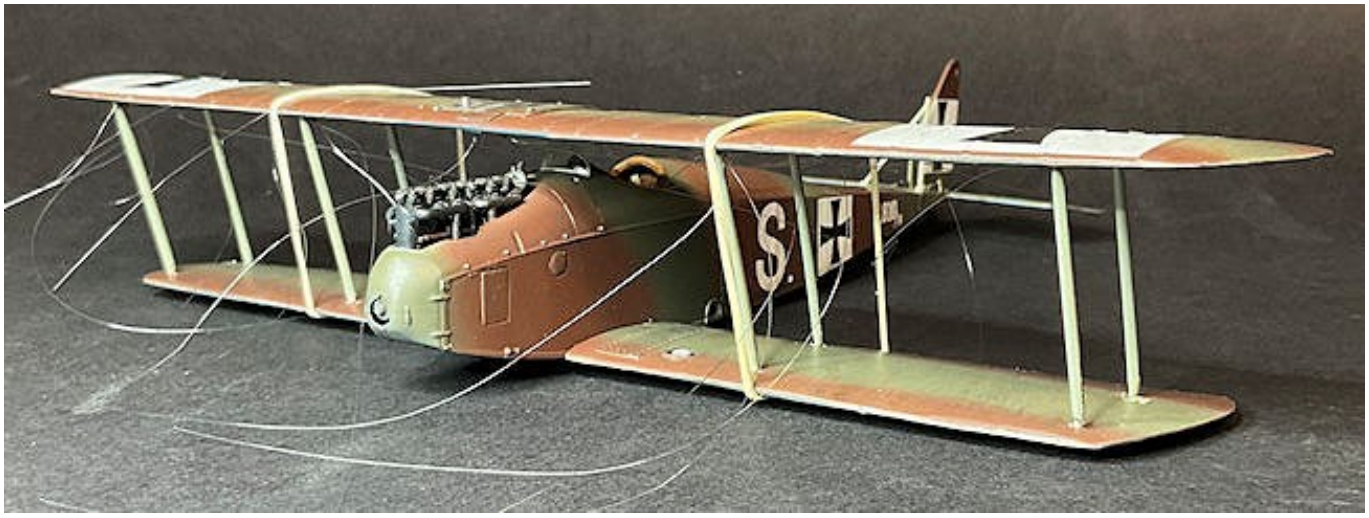
With reference to the drawings, secure the forward, outer struts A into their pre-drilled locating holes in the lower wings, using CA adhesive. Note the struts should be vertical when viewed from the front/rear and with their tops angled forwards such that the struts pass through the circular access panels of the fuselage sides, when viewed from the side.

Secure the forward, inner struts B into their pre-drilled locating holes in the lower wings, using CA adhesive. Make sure the struts are vertical when viewed from the front/rear and are angle forwards to align with fitted Struts A, when viewed from the side.

Secure the rear, outer struts A into their pre-drilled locating holes in the lower wings, using CA adhesive. Make sure the struts are vertical when viewed from the front/rear and are angle forwards to align with fitted forward struts A, when viewed from the side. The struts A tops should be the same distance apart as they are at their bases.

Secure the rear, inner struts C into their pre-drilled locating holes in the lower wings, using CA adhesive. Make sure the struts are vertical when viewed from the front/rear and are angle forwards to align with fitted forward struts B, when viewed from the side. The struts B and C tops should be the same distance apart as they are at their bases.

Clear any CA adhesive that may have contaminated the pre-drilled rigging holes around the fitted struts in the lower wings by running a drill of 0.4mm diameter into the holes.



Using thin CA adhesive, secure prepared rudder support frame into its locating recesses in the top, leading edge of the rudder and the recesses in the top, rear sides of the fuselage.

Fuselage cabane struts:

NOTE: ***I fitted the eight interplane struts with their tilt angle to far rearwards***. *Consequently, when the upper wing was fitted it was to far rearwards and the fuselage cabane struts did not align correctly with their locating recesses in the upper wing and fuselage. Therefore, to align them correctly I had to create individual Brass struts to replace the kit supplied cabane struts. Incidentally, these will also be stronger and more easily located in position. If the interplane struts are correctly angled forwards, when the upper wing is fitted the kit supplied cabane struts should align correctly and should be secured in position with CA adhesive.*

Several lengths of 0.9mm diameter Brass tube from ‘Albion Alloy’s’ (MBT09) were cut and 0.4mm diameter Brass rod (MBR04) inserted through the tubes.

The tubes were then formed into an aerofoil shape using the ’Strutter’ vice jaws from ’Albion Alloy’s’ (no longer available).

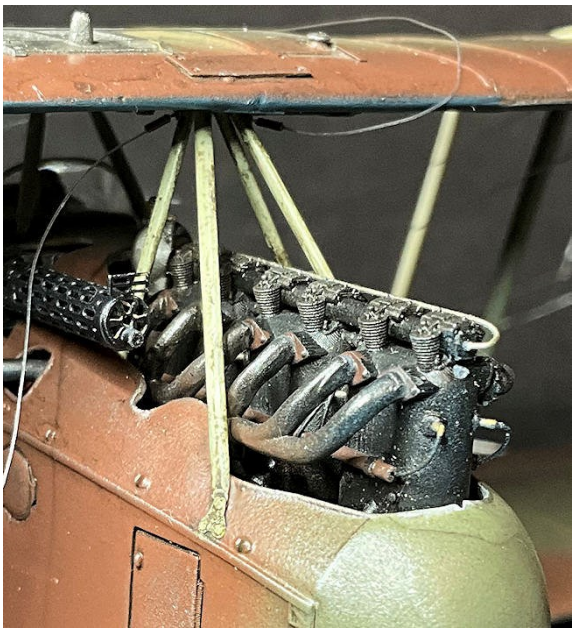
The rods were removed and the tubes brushed with ’Mr. Metal’ Primer R.

Two tubes were cut to the correct length for fitting the two rear struts and four individual tubes cut to form the two front ’V’ struts.

Once primed with ’AK Interactive’ Grey primer (AK758) they were airbrushed with ’Tamiya; Grey Green (IJN) (XF78).

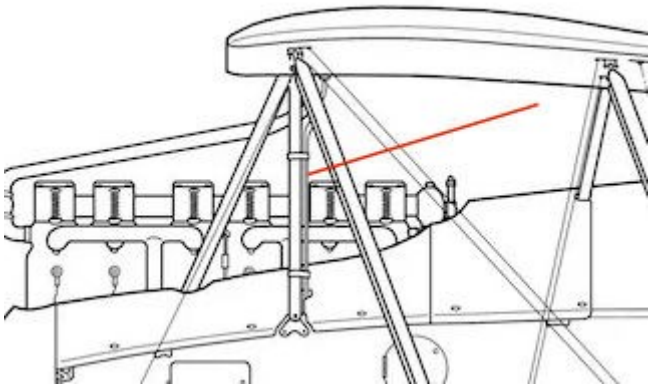
The rear struts were then secured in position into their recesses in the underside of the upper wing and fuselage side recesses, using CA adhesive.

The forward struts were then secured in position into their recesses in the underside of the upper wing, fuselage side recesses and inside the engine cowls, using CA adhesive.

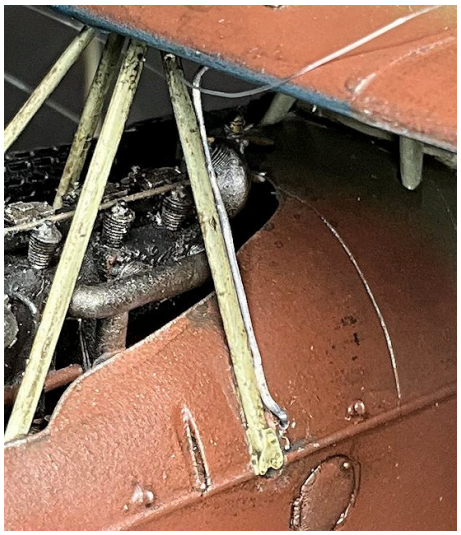


Strut pipe:

NOTE: *A pipe, from the upper wing auxiliary fuel tank, was attached to the rear of the left forward fuselage cabane strut.*



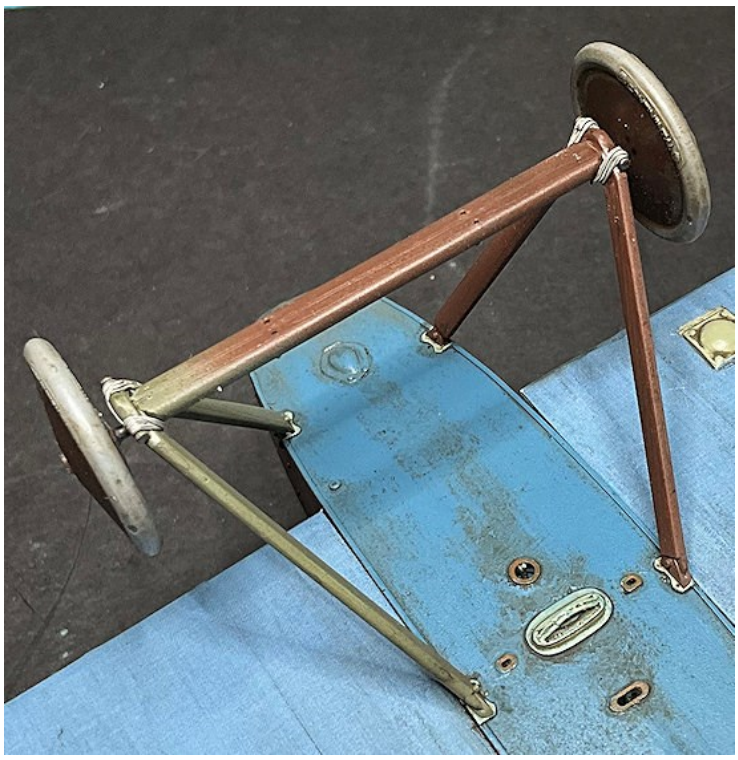
To represent the pipe I cut a long length of 0.4mm diameter lead wire from 'PlusModel'. I then drill a hole of 0.6mm diameter into, **but not through,** the underside of the upper wing in the raised 'dome' on the forward end of the auxiliary fuel tank. A second hole was drilled into the left side of the fuselage just to the rear of the bottom of the forward, rear cabane strut. One end of the lead wire was secured into the wing hole using CA adhesive. Once the adhesive set, the wire was curved across to the rear of the strut then down to the bottom and back into the hole in the fuselage. CA adhesive was applied to secure the wire in position on the strut.



Landing gear:

Make sure any primer or paint is removed from the added locating pins in the tops of the landing gear struts and from the mating faces on the surface of the underside of the fuselage.

Locate the landing struts into their locating holes in the underside of the fuselage and secure in position using thin CA adhesive.



Tail skid assembly:

Make sure any primer or paint is removed from the added locating pins in the tops of the forward struts of the tail skid and from the mating recesses and mating surfaces on the underside rear of the fuselage.

Locate the forward struts of the tail skid into their locating holes and recesses on the underside, rear of the fuselage.

Locate the rear tail skid struts onto their locations on the underside, rear of the fuselage.

Secure the tail skid in position on the fuselage using thin CA adhesive.

Engine to upper wing coolant pipes:

NOTE: *As the upper wing was fitted too far rearwards, the kit supplied coolant pipes, between the engine and radiator on the underside of the upper wing will no longer fit. Therefore, these pipes needed to be modified.*

Rear pipe:

The top connection to the underside of the upper wing was carefully recessed in its centre, using drills of 0.6mm up to 1.4mm diameter. This was done to allow the pipe to locate over the pre-molded connector the upper wing.

The bottom of the pipe was carefully cut away until the pipe could be located fully onto its connector on the underside of the upper wing and its bottom inside the rear of the right engine cowl.

Forward pipe:

The top connection to the underside of the upper wing was carefully recessed in its centre, using drills of 0.6mm up to 1.4mm diameter. This was done to allow the pipe to locate over the pre-molded connector the upper wing.

The pipe separated by cutting through the centre of the short and straight section of the pipe towards the engine end.

A length of 1.6mm diameter Brass tube from ‘Albion Alloy’s (MBT16) was cut and secured onto the cut end of the forward section of the pipe, using thin CA adhesive.

The longer, rear section of the pipe was located into the open end of the Brass tube and the pipe assembly test located onto its connector on the underside of the upper wing and the top, front of the forward engine cylinder.

The rear section of the pipe was removed and the length of the open end of the Brass tube was filed away, as necessary, to until the pipe assembly was able to fully contact the upper wing and front of the forward engine cylinder.

NOTE: *During the next step, make sure the rear section of the pipe is positioned in the tube correctly to ensure the two ends of the pipe align with the upper wing connector and engine cylinder.*

The rear section of the pipe was secured to the Brass pipe using thin CA adhesive.

Painting:

Airbrush the two pipes with a gloss black, such as ‘Tamiya’ Black (X1) or similar.

Airbrush the two pipes with ‘Alclad’ Gun Metal (ALC-120) or similar.

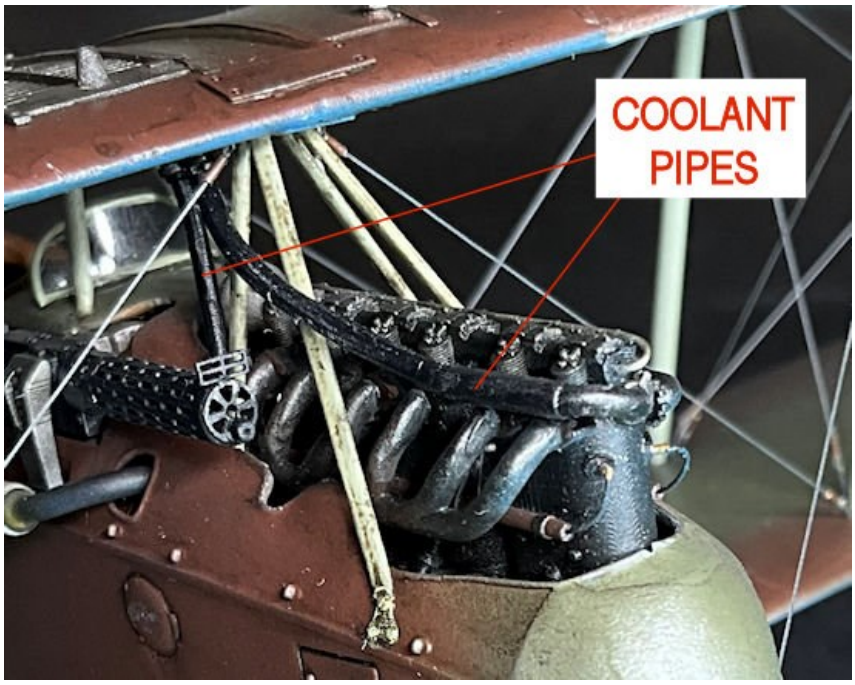
Brush paint the top fittings (upper wing ends) with ‘Tamiya’ Rubber Black (XF85) or similar.

Brush paint the clamp rings around the top fittings (upper wing ends) with ‘Mr. Colour’ Stainless Steel (213) or similar.

Assembly (continued):

Using CA adhesive, secure the rear pipe in position on the underwing rear connector in inside the right engine cowl.

Using CA adhesive, secure the forward pipe in position on the underwing front connector and onto the top, front of the forward engine cylinder.



Final rigging:

Turnbuckle types:

NOTE: The rigging is attached to the top surface of the lower wings and fuselage using 'Gaspatch' 1:48th scale metal One-Ended turnbuckles.

The control lines for the ailerons use 'Gaspatch' 1:48th scale metal Type C turnbuckles.

Example for One Ended turnbuckles:

NOTE: *Refer to the previous Pre-Rigging section of this chapter and Part 6 (Rigging) of this build log for rigging attachment locations. Brass tube can be chemically blackened by immersion in solutions such as 'Blacken-It' or similar.*

Cut a short length of blackened tube 0.5mm diameter Brass tube, such as that supplied from 'Albion Alloys' (MBT05) or similar.

Deburr the tube by running a 0.3mm diameter drill through the tube.

Pass the pre-rigged line through the tube, then trough the 'eye' end of a prepared 'Gaspatch' 1:48th scale turnbuckle (One Ended Type).

Pass the line back and through the tube, leaving the loop of line through the 'eye' end loose.

Secure the tang of the turnbuckle into its relevant pre-drilled hole and secure in position using thin CA adhesive.

Pull on the free end of the line at the tube to slide the tube up to, **but not touching**, the 'eye' end of the fitted turnbuckle.

Keeping the line taut, secure the lines to the tube end away from the turnbuckle, using thin CA adhesive.

Cut away any residual tag of line at the tube end.

Example for Type C aileron turnbuckles:

NOTE: *Refer to the previous Pre-Rigging section of this chapter and Part 6 (Rigging) of this build log for rigging attachment locations. Brass tube can be chemically blackened by immersion in solutions such as 'Blacken-It' or similar.*

Cut a short length of blackened tube 0.4mm diameter Brass tube, such as that supplied from 'Albion Alloys' (MBT04) or similar.

Deburr the tube by running a 0.2mm diameter drill through the tube.

Pass the pre-rigged aileron control line through the tube, then trough the 'eye' end of a prepared 'Gaspatch' 1:48th scale turnbuckle (Type C).

Pass the line back and through the tube.

Slide the tube up to, **but not touching**, the 'eye' end of the turnbuckle, leaving the loop of line through the 'eye' end loose.

Using the previous procedure, attach a rigging line to the opposite end of the turnbuckle.

NOTE: *The following steps should be carried out only when the ends of the rigged line are secured in the relevant model parts*

Secure the lines to the tube ends away from the turnbuckle, using thin CA adhesive.

Cut away any residual tags of line at the tube ends.

NOTE: *The following sequence for final rigging is best to allow access to the various rigging lines.*

Interplane cross bracing wires:

For each of the pre-rigged eight bracing wires between the interplane struts, carry out the previous example for rigging a 'Gaspatch' One-Ended turnbuckle, attaching each line from the underside of the upper wing to its diagonally opposite pre-drilled locating hole on the lower wings.

Landing wires:

For each of the pre-rigged eight landing wires between the underside of the upper wing and top surface of the lower wings, carry out the previous example for rigging a 'Gaspatch' One-Ended turnbuckle, attaching each line from the underside of the upper wing to its diagonally opposite pre-drilled locating hole on the lower wings.

Flying wires:

The six flying wires consist of the two outer wires (both sides of the aircraft) between the underside of the upper wing and top surface of the lower wings and fuselage lower edge at the lower wing root.
For each of the pre-rigged wires, carry out the previous example for rigging a 'Gaspatch' One-Ended turnbuckle, attaching each pre-rigged line from the underside of the upper wing to its diagonally opposite pre-drilled locating hole on the lower wings and in the fuselage side.

Drag wires:

For the two pre-rigged drag wires, carry out the previous example for rigging a 'Gaspatch' One-Ended turnbuckle, attaching each line from the underside of the upper wing to the lower front of the fuselage.

Aileron control cables:

NOTE: *The tube used is 0.4mm diameter and the line 0.08mm mono-filament.*

1. For each of the two pre-rigged aileron control cables on the underside of the upper wing, carry out the previous example for rigging a 'Gaspatch' Type C turnbuckle, leaving the loop of line loose.

Use the same procedure to attach a line the Anchor Point previously fitted in the lower wings, inboard from the outer, rear interplane struts.

Use the previous example for rigging a 'Gaspatch' Type C turnbuckle, attach the line to the free 'eye' end of the Type C turnbuckles, leaving the loop of line loose.

Pull on the end tags of each of the two lines to position the turnbuckle 2/3 of the distance up between the lower and upper wings, with the tubes close to, **but not touching**, the turnbuckle.

Secure the lines to the tubes using thin CA adhesive then cut away any residual tags of line.

2. Locate the two pre-rigged Ailerons onto their locating rods in the upper wing and secure them in position using thin CA adhesive.

Use the previous procedure, rig a control cable between each aileron and the Anchor Points fitted in the lower wing, outboard from outer, rear interplane struts. The Type C turnbuckle should be positioned at the approximate position of the previously fitted turnbuckle in the adjacent aileron control line.

Fuselage underside - elevator control cables:

NOTE: *The tube used is 0.4mm diameter and the line 0.08mm mono-filament.*

Cut a long length of line.

Pass the line through the hole in the protruding base of the control column at the underside of the fuselage.

Slide a tube onto the line and close to the base of the control column.

Using thin CA adhesive secure the tubes to the line.

Pass both line rearwards and through the aileron control cable 'curved' guide.

Pass the ends of the lines into the opening in the underside of the fuselage.

Keeping the lines taut, secure them at each side of the opening using thin CA adhesive.

Fuselage underside - aileron control cable:

NOTE: *The tube used is 0.4mm diameter and the line 0.08mm mono-filament.*

Cut a long length of line.

Pass the line into one of the openings in the underside of the fuselage, at the side of the 'curved' aileron cable guide.

Secure the line in the opening using thin CA adhesive.

Keeping the line taut, secure it across the curved guide using thin CA adhesive.

Pass the other end of the line into the opposite opening in the underside of the fuselage, at the other side of the ’curved’ aileron cable guide.

Secure the line in the opening using thin CA adhesive.

Landing gear cross bracing wires:

NOTE: *The tube used is 0.4mm diameter and the line 0.12mm mono-filament.*

Cut four long lengths of line.

For each of the lines carry out the previous example for rigging a ’Gaspatch’ One-Ended turnbuckle.

Using thin CA adhesive, secure the four turnbuckles into the pre-drilled hole in the underside of the fuselage, inboard from the landing gear struts.

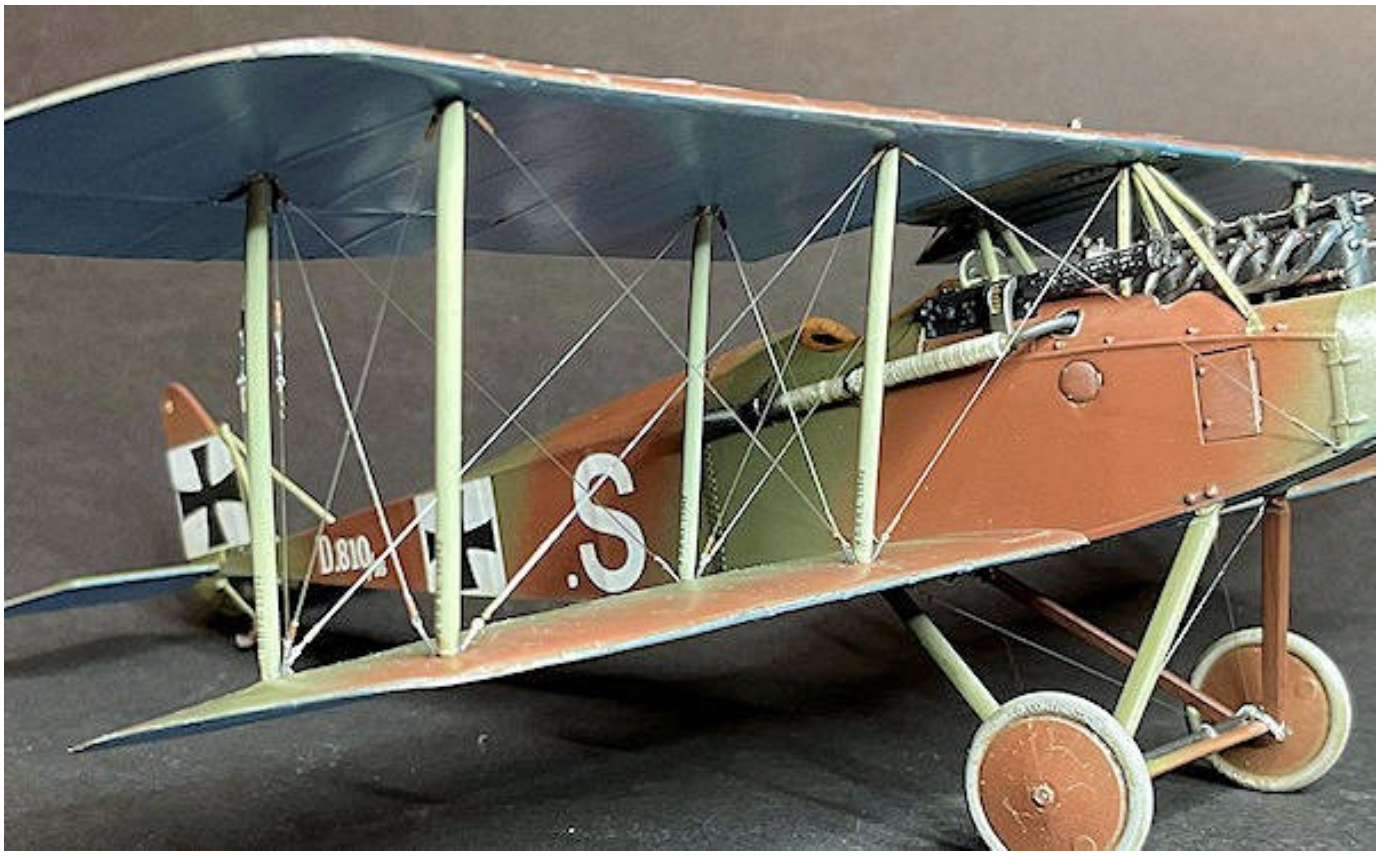
Pass the ends of the two landing gear rear strut lines diagonally down and to their pre-drilled holes in the ends of the axle fairing, at the rear of the axle.

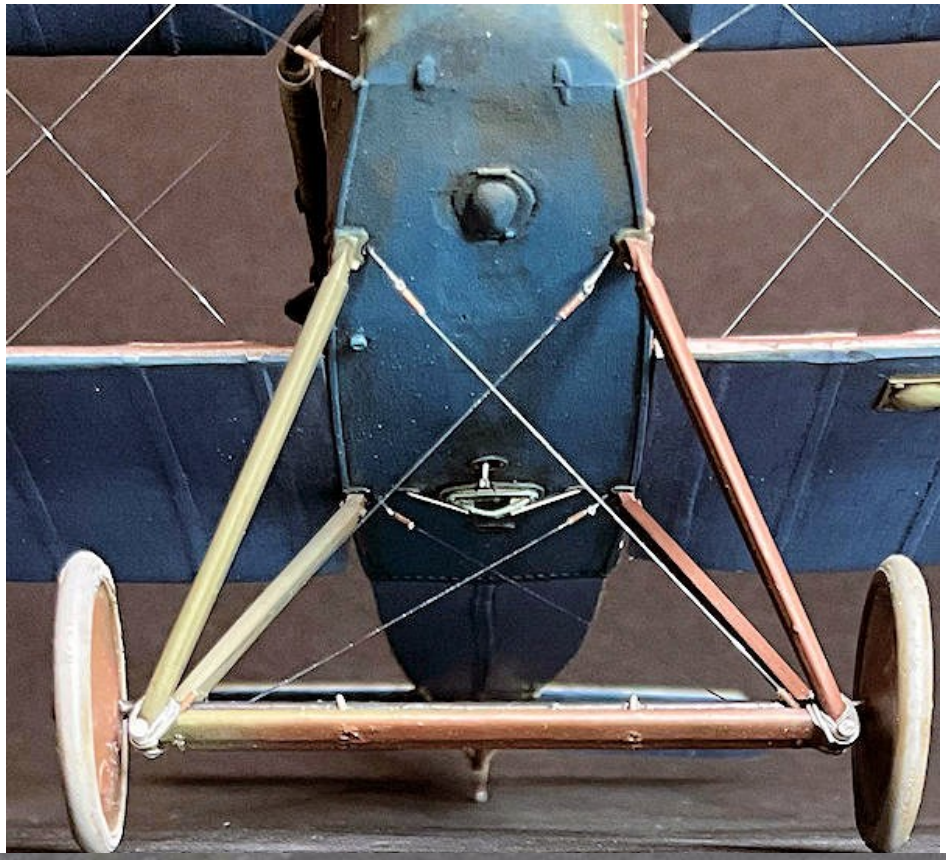
Pass each line through a tube then down through the holes in the axle fairing.

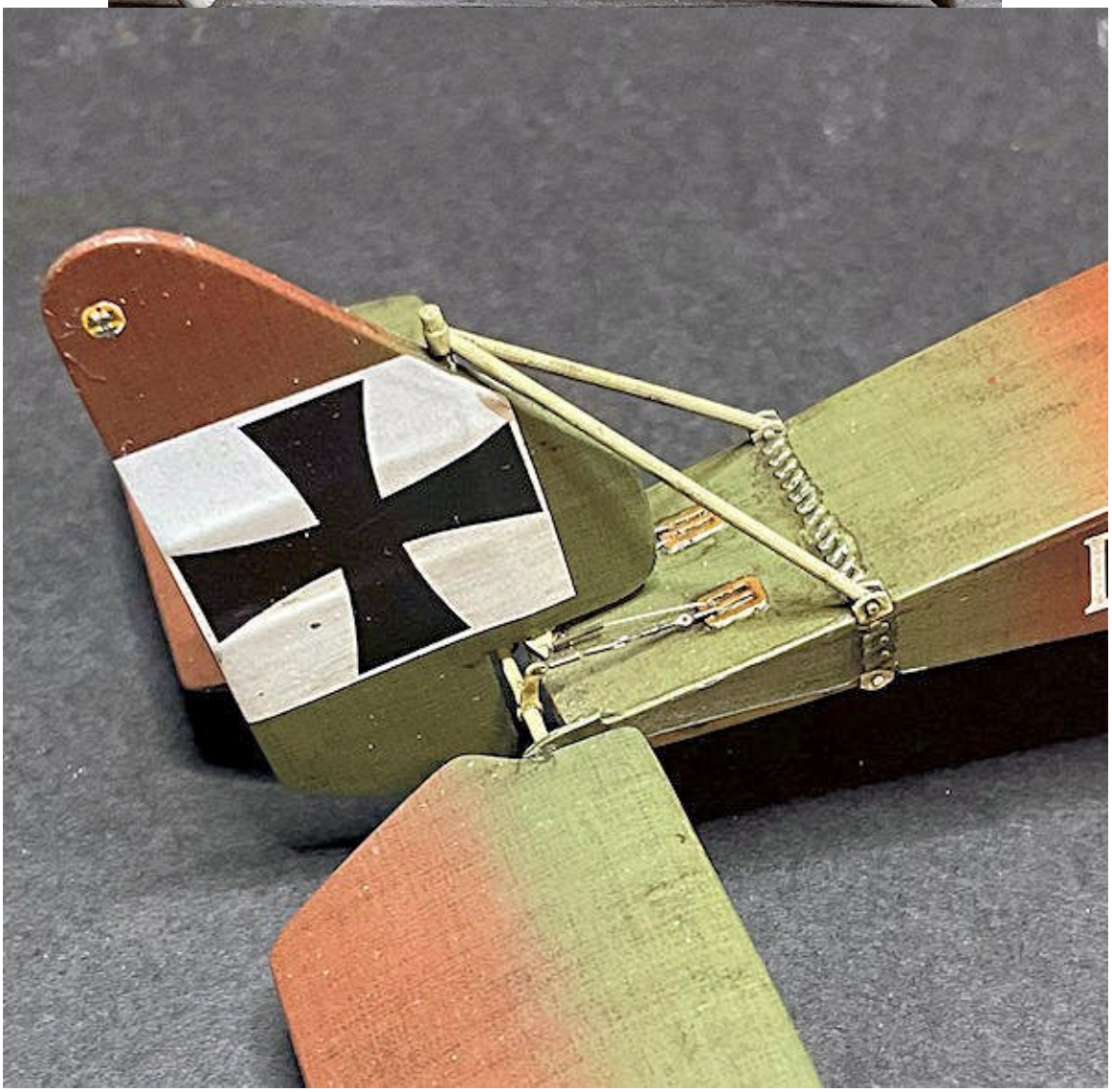
Keeping the lines taut, secure them in the axle fairing using thin CA adhesive.

Cut away any residual tag of line from under the axle fairing.

Repeat the procedure to attach the two landing gear front strut lines, passing the lines through their pre-drilled holes in the ends of the axle fairing, forward from the axle.







Weathering (continued):

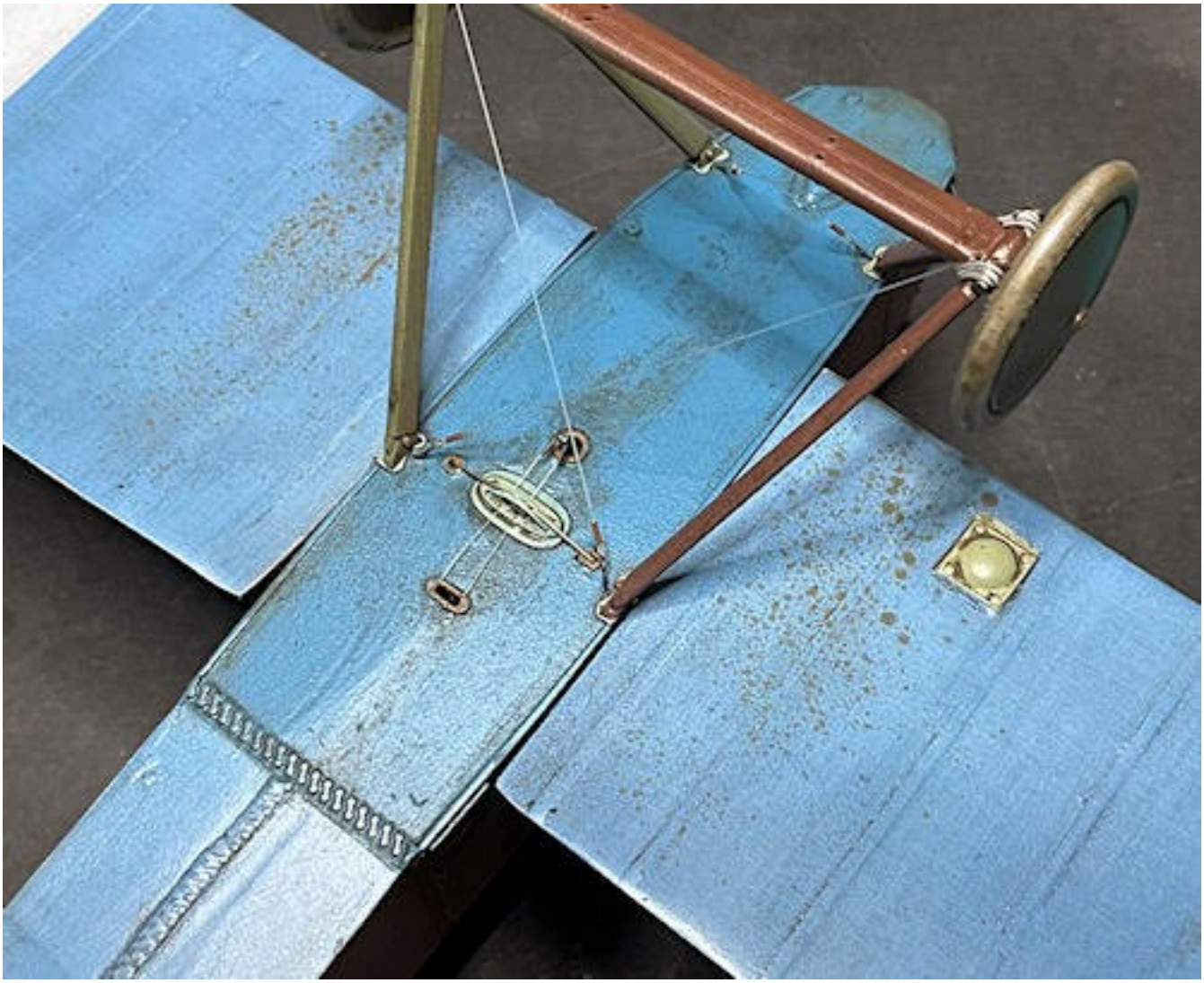
NOTE: *Refer to Part 3 (Weathering) of this build log for more information.*

Brush ‘Flory Models’ fine clay wash (Dark Dirt) over the lower wing roots and adjacent wing surface and leave to fully dry.

Brush ‘Flory Models’ fine clay wash (Grime) over the wheels on the landing gear.

Using a short hair brush, flick ‘Flory Models’ fine clay wash (Grime) onto the underside of the lower wings to represent dirt/mud spray from the landing gear wheels.

Once dry, remove the wash to achieve the desired weathered effect.



Propeller:

The propeller will be fitted once the model is on the display base as this will allow correct positioning of the propeller with the mechanic.

PART 12
FIGURES

PART 12 - FIGURES

The figures I chose to use are the 'Kellerkind' German mechanic (54101), the 'Aviattic' German pilot (ATTRES 031). The step ladder is from the 'Black dog' ladder set (F32064).

NOTE: *The figures are made of resin - refer to Part 5 (Resin) of this build log.*

Pilot:

Preparation:

Remove the figure from its moulding block.

File or sand away residual mounting block resin from the bottom of the feet.

Check that there are no surface imperfections and if necessary, fill and/or sand to restore the surface finish.

NOTE: *As the head on the figure looked too small and out of scale, I replaced it with a more suitably sized head from my 'spares'.*

Drill a hole of 0.8mm diameter centrally up into one of the legs.

Cut a 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. This will be used to hold the figure while being painted and to mount the figure onto the display base.

Painting:

NOTE: *The figure was painted using 'AK Interactive' and 'Tamiya' acrylic paints. Thin the 'AK' paints with their acrylic thinners (AK712).*

Airbrush the figure parts with a grey primer, such as 'AK Interactive' Grey (AK-758) or similar.

Gaiters - 'AK Interactive' British Uniform (AK3081). 'Mr. Colour' Stainless Steel (213) buckles.

Shoes - 'Tamiya' Rubber Black (XF85).

Jacket/Trousers - 'AK Interactive' German Uniform Light (AK3092) mixed with German Uniform Base (AK3091) to 50/50%. 'Tamiya' Red (XF7) piping, Rubber Black (XF85) Iron Cross. 'Mr. Colour' Stainless Steel (213) pendent.

Flight Jacket - 'AK Interactive' Brown Leather (AK3031) with dry brushed British Uniform (AK3081). 'Mr. Colour' Stainless Steel (213) cuff buttons. Fur edge 'AK Interactive' Faded White (AK3029) dry brushed with British Uniform (AK3081).

Scarf - 'AK Interactive' Faded White (AK3029).

Helmet - 'AK Interactive' Brown Leather (AK3031) mixed with German Uniform Base (AK3091) to 50/50%.

Flesh - 'Citadel Colour' Cadian Flesh Tone with Kislev Flesh highlights. Moustache 'AK Interactive' German Uniform Shadow (AK3093). Lips 'AK Interactive' Shadow Flesh (AK3014).

Finish:

Brush the flight jacket, helmet and gaiters/shoes with a semi-matte clear coat, such as 'Tamiya' Semi-Gloss (X35) or similar.

Weathering:

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

Brush 'Flory Models' fine clay wash (Dark Dirt) over the trousers, jackets, helmet and various creases and leave to fully dry.

Once dry, remove the wash to achieve the desired weathered effect.

Lightly sponge ‘Tamiya’ Weathering Master Set A (Mud) over the shoes.

Lightly sponge ‘Tamiya’ Weathering Master Set D (Oil Stain) over the pockets and elbows of the flight jacket.

Mechanic:

NOTE: *The ‘Kellerkind’ German mechanic (54101) set contains two figures, one intended to be priming the engine cylinders of a rotary engine and the other holding the propeller. The figure used for this model is that of the mechanic holding the propeller.*

Preparation:

Remove the figure and arms from their moulding block.

File or sand away residual mounting block resin from the parts.

Check that there are no surface imperfections and if necessary, fill and/or sand to restore the surface finish.

Drill a hole of 0.8mm diameter centrally up into one of the legs.

Cut a 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. This will be used to hold the figure while being painted and to mount the figure onto the display base.

Using CA adhesive, secure the two arms into their sockets in the body of the figure.

Painting:

NOTE: *The figure was painted using ‘AK Interactive’ and ‘Tamiya’ acrylic paints. Thin the ‘AK’ paints with their acrylic thinners (AK712).*

Airbrush the figure parts with a grey primer, such as ‘AK Interactive’ Grey (AK-758) or similar.

Boots: ‘AK Interactive’ Brown Leather (AK3031).

Trousers and Jacket: Airbrush with ‘Tamiya’ Rubber Black (XF85) or similar. Buttons ‘Mr. Colour’ Stainless Steel (213).

Field cap: ‘AK Interactive’ German Uniform Light (AK3092), ‘Tamiya’ Red XF7), Rubber Black (XF85) and white (XF2).

Flesh - ‘Citadel Colour’ Cadian Flesh Tone with Kislev Flesh highlights. Moustache ‘AK Interactive’ German Uniform Shadow (AK3093). Lips ‘AK Interactive’ Light Flesh (AK3012).

Hair/Moustache: ‘AK Interactive’ British Uniform Light (AK3082).

Weathering:

Airbrush the figure with a matte clear coat, such as ‘Alclad’ Flat (ALC311) or similar.

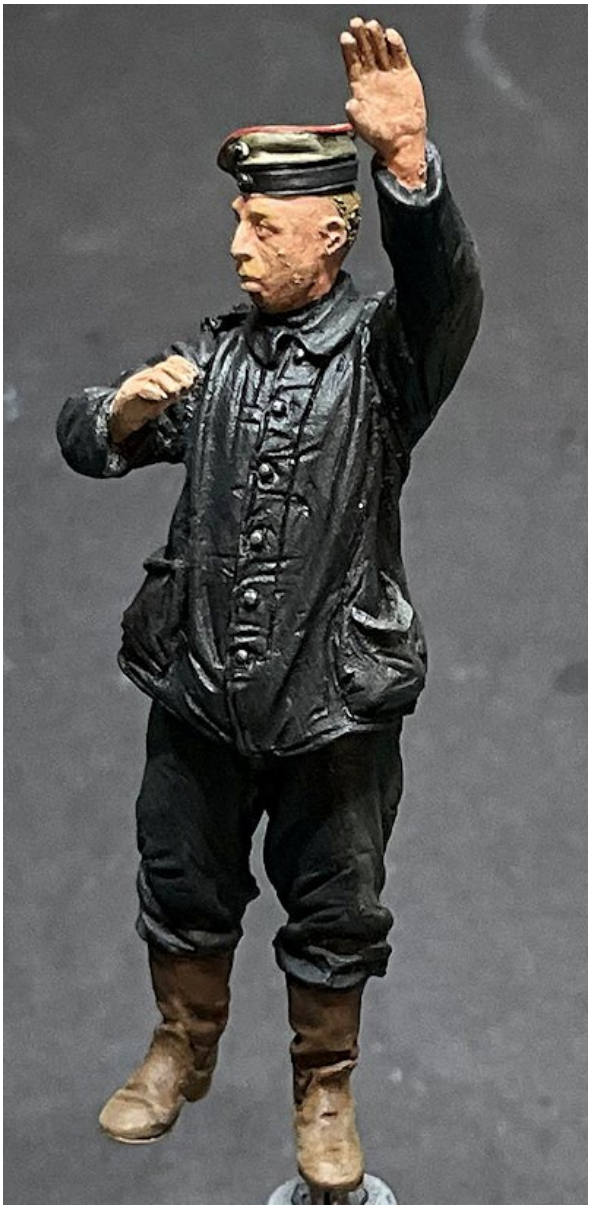
NOTE: *Refer to Part 3 (Weathering) of this build log for more information.*

Brush ‘Flory Models’ fine clay wash (Dark Dirt) over the boots and leave to fully dry.

Once dry, remove the wash to achieve the desired weathered effect.

Lightly sponge ‘Tamiya’ Weathering Master Set A (Mud) over the boots.

Lightly sponge ‘Tamiya’ Weathering Master Set D (Oil Stain) over the pockets and elbows of the jacket and sides of trousers.



PART 13
DISPLAY BASE

PART 13 - DISPLAY BASE

The display case in made from piano black and clear acrylic sheet of 3mm thickness. The base shoulder, for locating the clear cover, is a second thickness on top of the base plate. This case was purpose built by Paul Moss, who has a retail outlet on Ebay - www.inperspextive.com
The grass mat used was the 'Lars op't Hof Scenery' pasture Spring grass mat.
The information plaque was engraved by 'TLS Engraving Ltd'.

Grass mat:

The grass mat was cut to the desired shape and then positioned on the base. The mat was laid onto the display base and positioned to ensure the model would clear the display top when located. The outline of the mat was lightly traced (silver pencil) on the display base. PVA adhesive was then applied to the backing (underside) of the mat, which was then laid back onto the base, aligned to the pencil outline and gently pushed down to make proper contact. The grass mat was covered with a sheet of A4 sized paper and several heavy books were then laid onto the paper, to press the grass mat fully in contact with the display base. The books and paper were removed after two hours, when the edges of the grass mat were checked for contact (apply PVA adhesive if not). The grass tufts were gently brushed to remove any flatness.

Aircraft model:

The aircraft was not fixed to the display base, but left as 'free standing'. Although this may not be as secure as fixing the model to the display base, it does mean the model will not be subjected to shock loading when being moved around, as it might be if fixed on the display. However, the grass mat was scored through where the bottom of the wheels were to be positioned. This allowed the model to 'seat' into the mat without being fixed on position.

The figures:

Mechanic figure:

The prepared propeller was located into the front of the engine so that the mechanic figure could be correctly positioned. The mechanic figure was positioned to the propeller and the location of the pin in the leg of the figure was marked on the grass mat. A hole of 1.0 mm was then drilled through the grass mat and into (not through) the display base. PVA adhesive, which is not fast setting, was then applied to the propeller shaft and then the propeller was located fully into the engine. PVA adhesive was then applied to the pin of the figure, which was then carefully seated into the drilled hole in the display base. Light pressure was applied to the figure to ensure it was fully located in the base and the position of the propeller adjusted as necessary. Both the propeller and figure were left to allow the PVA adhesive to fully set.

Pilot figure:

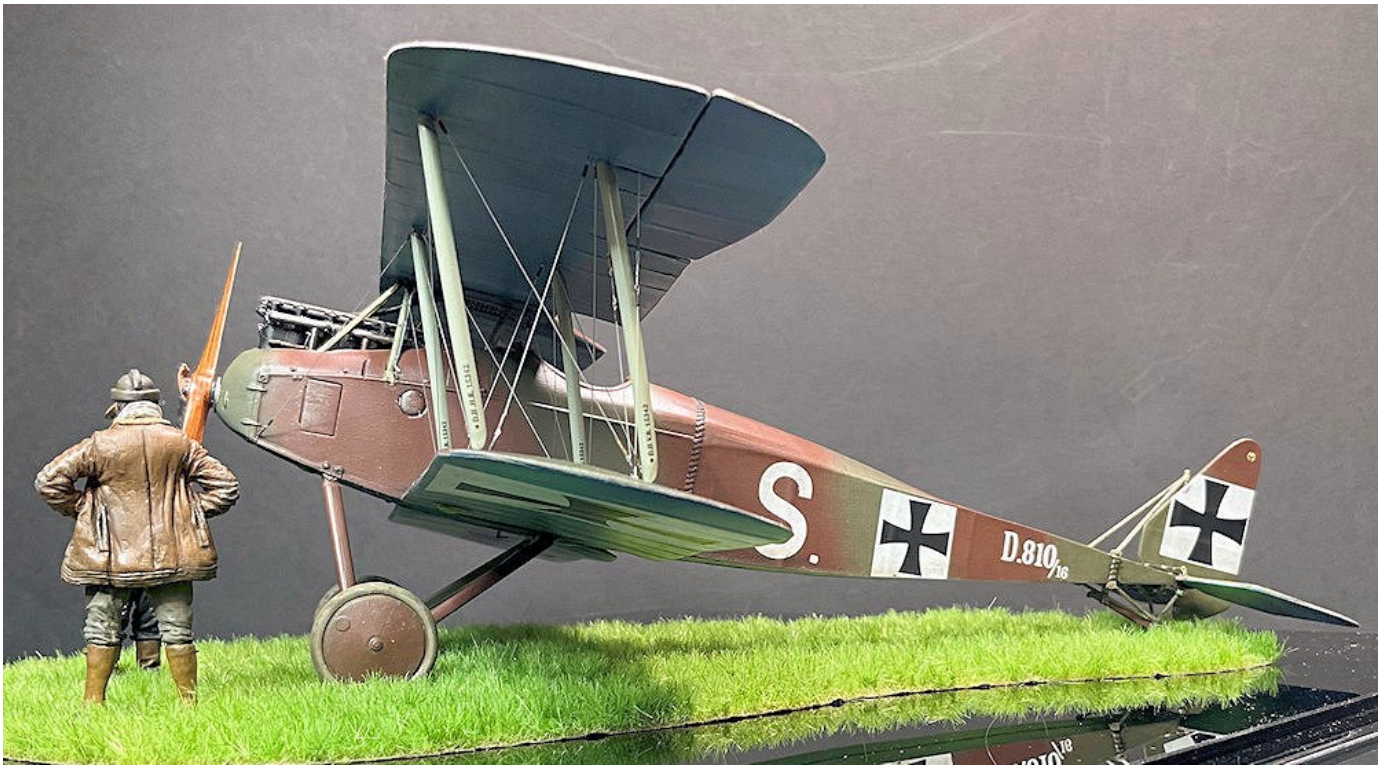
The pilot fire was positioned and then fixed to the display base using the same procedure as for the mechanic figure.

Information Plaque:

The angled acrylic plaque stand was positioned at the front, left corner of the display base and its outline marked on the base. The base surface and the underside of the stand were sanded to provide a good key for the adhesive. The stand was then fixed to the display base using two-part epoxy adhesive ('Araldite').

The information plaque has double sided tape on its rear surface. The protective paper was removed and the plaque located centrally onto the stand.

PART 14
COMPLETED MODEL PHOTOGRAPHS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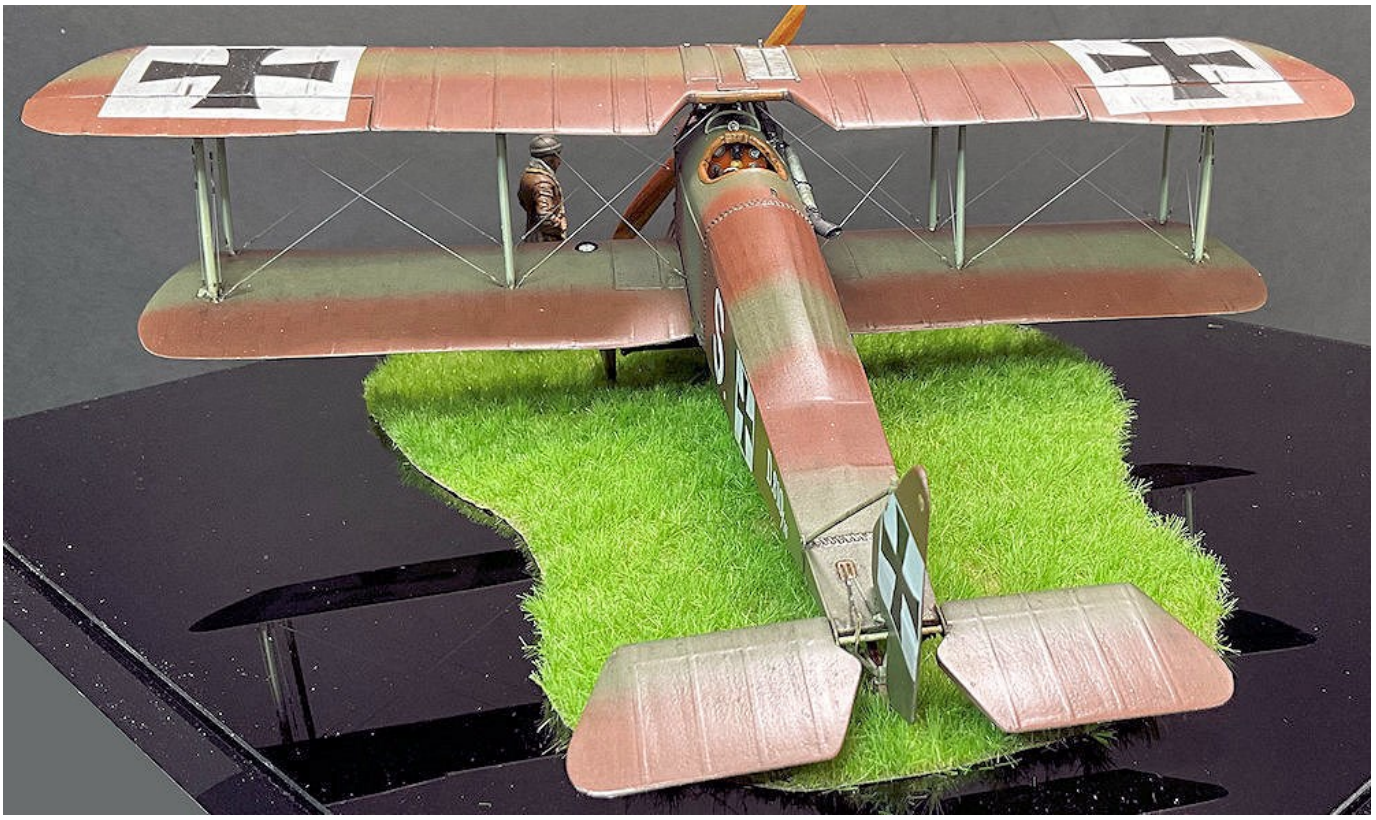


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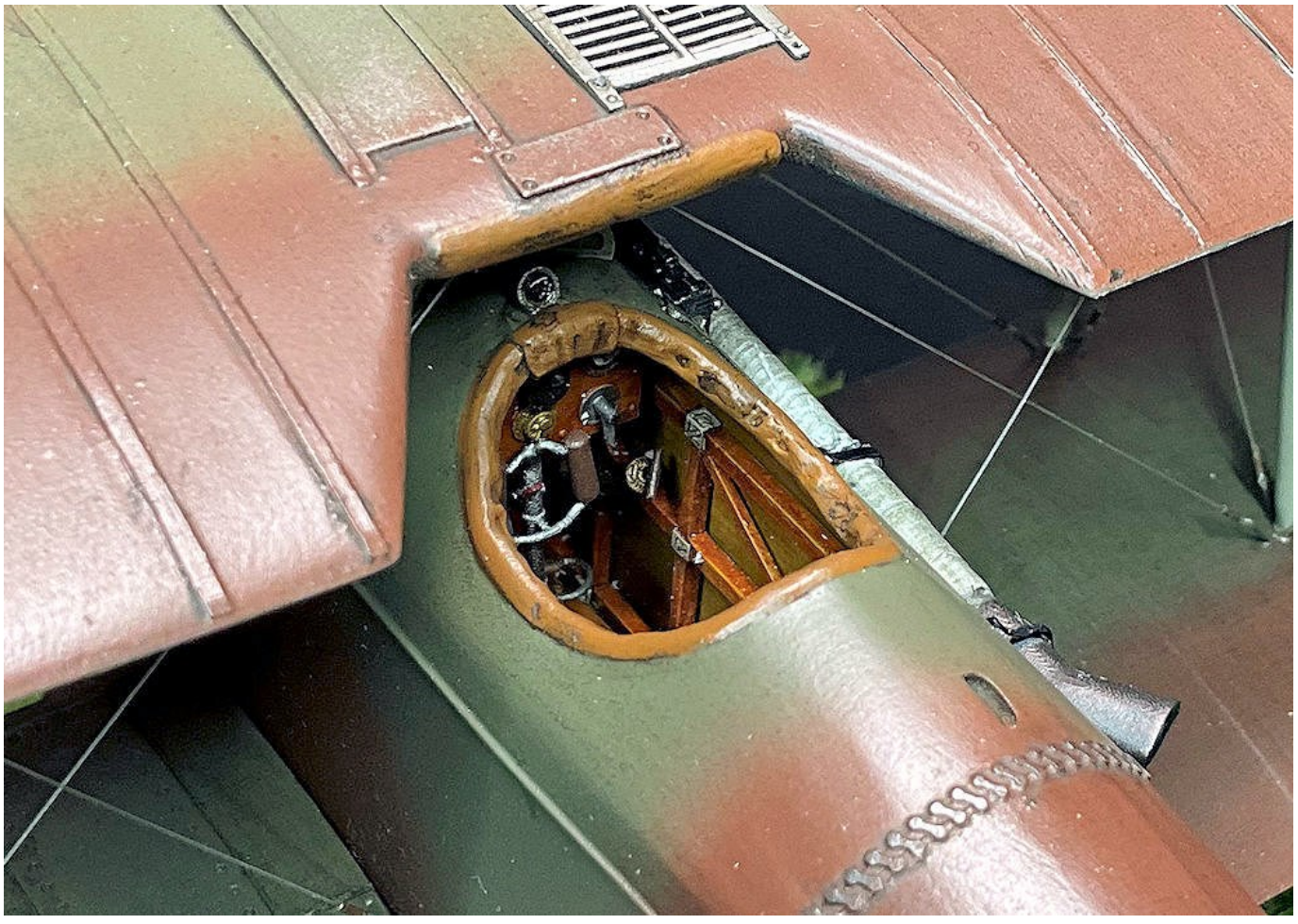

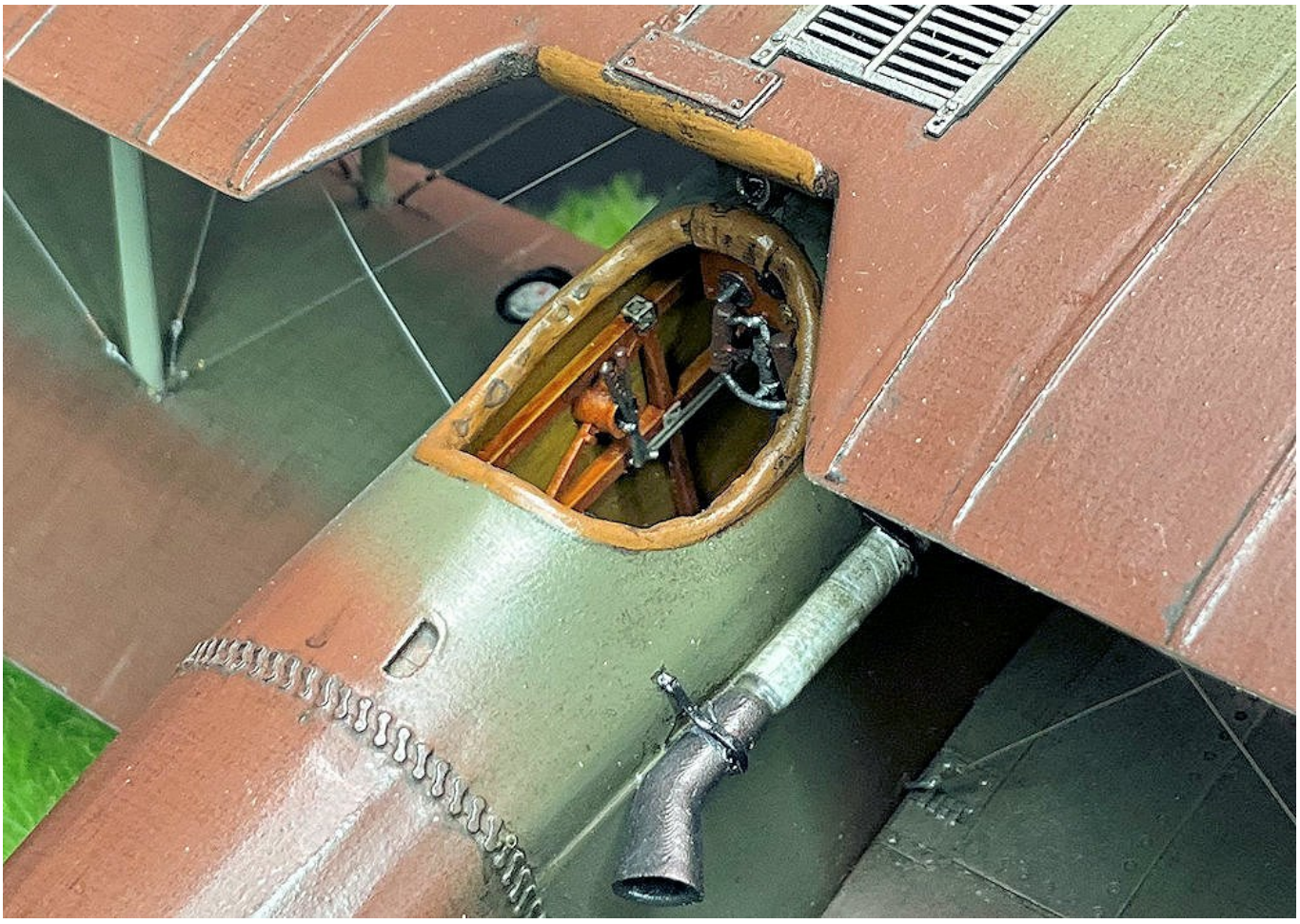

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