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 model of the Austro-Hungarian Phönix D.I by 'Lukgraph'.

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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 and gaming PC.

AFTER MARKET

AFTER MARKET

Figure

‘Kellerkind’ KuK pilot in leather jacket (54086).

Rigging accessories (as required)

‘GasPatch Elite Accessories’ Turnbuckles (1/48 scale),
‘Albion Alloy’s’ Micro-tube (Brass or Nickel Silver - various diameters),
‘Steelon’ or ‘Stroft GTM’ Mono-Filament (0.08 and 0.12 mm diameter),
‘ModelKasten’ 1.5 (0.2 mm diameter) or 0.6 (0.13 mm diameter) black line.

Propeller

‘Proper Plane’ wood laminated propeller (####).

Decals

‘Airscale’ Instrument dial decals - WW1 generic (AS32 WW1),
‘LF Models’ Austro-Hungarian propeller labels (C3205),
‘Xtradecal’ Parallel White Stripes (XPS2).

Sundries (as required)

Paints (‘Tamiya’ Acrylic, Humbrol Acrylic, ‘Mr. Metal Colour’,
‘AK Interactive’ Primer (Grey AK758, White AK759), ‘Alclad II’ Lacquers,
‘Blacken-It’ solution, ‘Alclad’ Aqua Gloss 600, ‘Mig’ A-Stand Aqua Gloss (A.Mig-2503),
’Mr. Colour’ Levelling Thinners 400, PVA Adhesive (e.g. ’MicroScale’ Micro Krystal Clear),
‘MicroScale’ MicroSol/MicroSet decal solutions, ‘EZ’ White stetch line (Heavy),
‘VMS Fleky’ CA adhesive (Slow and Thin), ‘Revell’ Contacta Professional cement,
‘Mr. Surfacer’ 500/1000/1200, ‘PlusModel’ lead wire, ‘Tamiya’ extra thin liquid cement,
‘White Spirits/Odourless Thinners’, ‘Windsor & Newton’ Griffin Alkyd oil paint,
‘UHU’ White Tack, ’AK Interactive’ Kerosene wash (AK2039), ‘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

‘Polak’ Wild Meadow variation G (4707) grass mat,
‘Inperspective’ custom made Acrylic base and cover,
Information plaque from ‘TLS Engraving Ltd’.

THE AIRCRAFT

THE AIRCRAFT

References:
'JAPO Publications - Phönix D.I-D.II (Jan Zahalka, Mgr. Petr Aharon Tesar, Sigmund Tyrlik)
'Windsock' data file No.31 - Phönix D.I-II (Peter M. Grosz).
Online resources.

General:

NOTE: *The following text is based on that from the 'Lukgraph' instruction booklet.*

The Phönix D.I was the second design developed by the 'Phönix Flugzeug-Werke' and was based on the Hansa-Brandenburg D.I designed aircraft, which being built under license.
The Phönix D.I was a single seater bi-plane and was an improvement over the Hansa-Brandenburg design. It has more efficient designed wings, a more powerful engine and several structural enhancements.
The Phönix D.I aircraft, based on the 20.16 prototype, were particularly notable for 'Sparmann's' design wings with their unique inward inclined outer wing struts. The all-wood airframe, based on the Hansa-Brandenburg D.I design, was covered with plywood panels. The length of the fuselage was Increased by 250 mm rearwards and by 200 mm forwards, due to the anticipated installation of the 200hp water-cooled six-cylinder in-line 'Hiero' engine. The aircraft's armament was two synchronized 8 mm 'Schwarzlose' machine guns, one on each side of the engine, out of pilot's reach.
The prototype was first flown in 1917 and proved to be fast, although difficult to handle. However, due to the urgency of having a fighter, the design was put into production. In an attempt to overcome the aircraft short comings, a D.II version was produced , which had balanced ailerons in the upper wing and a balanced elevator and a more powerful 230hp engine. A later D.III version was produced.
The last of the type was delivered to units on the 4th of November 1918.

General specifications:

Length - (6.75m)
Wingspan (upper) - (9.8m)
Wingspan (lower) - (9.0m)
Height - (2.65m)
Empty weight - lbs (716kg)
Maximum weight - lbs (951kg)
Engine - 'Heiro' six cylinder, water cooled 150kW (200hp)
Propeller - 'Knoller-Jaray'

Performance:

Maximum speed - mph (178 kph)
Service ceiling - 20,000 ft (6,000 m)

Weapons:

Two 'Schwarzlose' M16 (8mm) machine guns.

The aircraft modelled is Phönix D.I, Serial No:J.12 (previously A.110), operated by the Austro-Hungarian 'Kriegsmarine' (Naval) from Abwehrflugstation Zaule, Trieste, 1918.

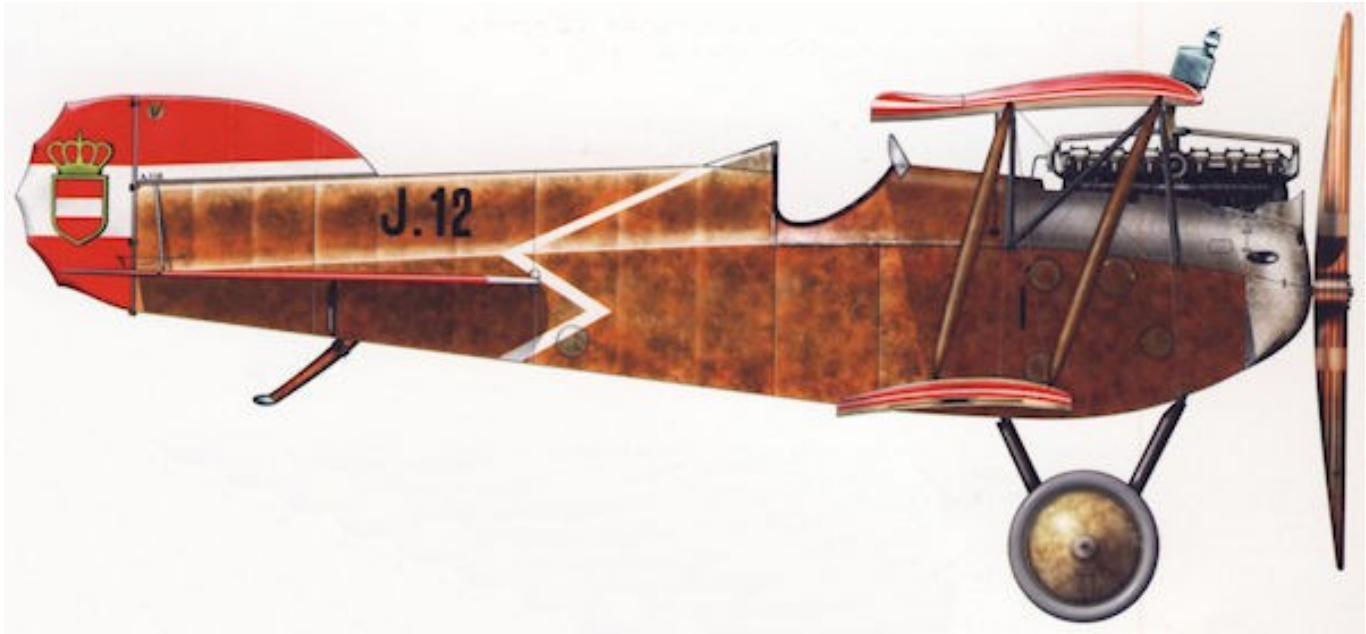
'Kriegsmarine' (KuK)

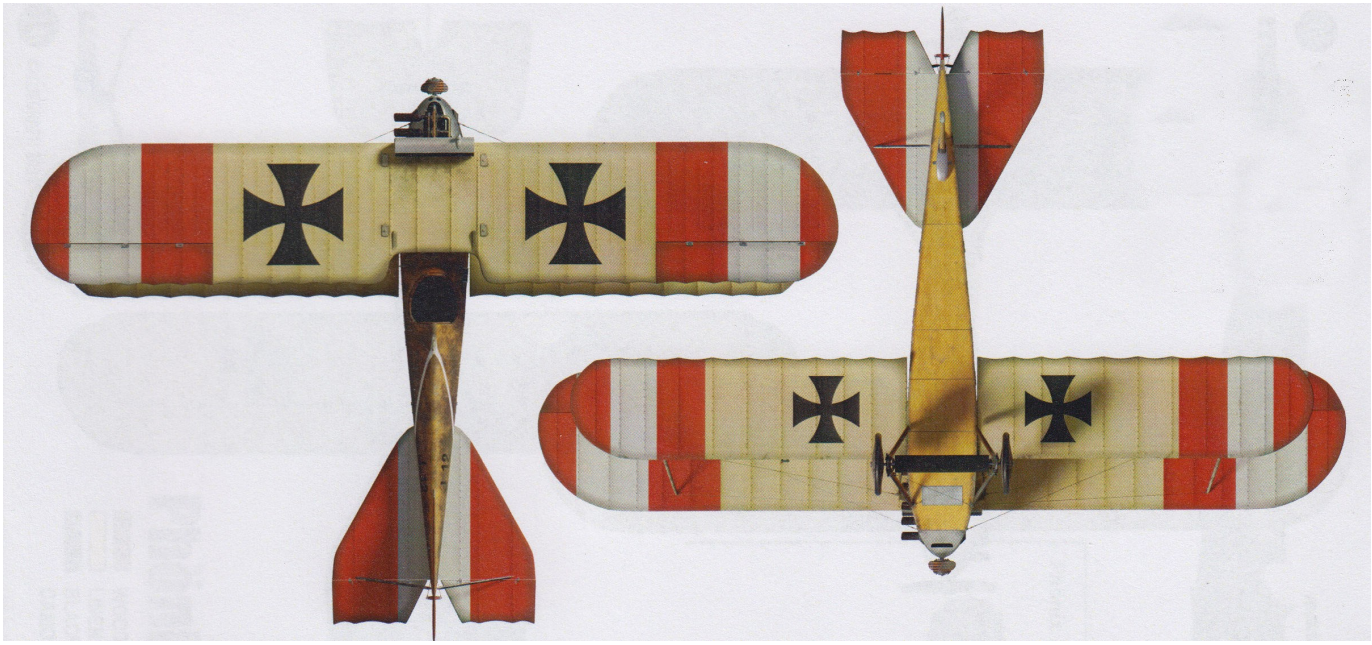
The Austro-Hungarian navy, in addition to operating water borne aircraft (Seeflieger), also operated aircraft designed for land use (Landflieger). Initially, the first land based aircraft in 1916 were the Fokker E.Ill type. However, towards the end of 1916 the Fokker E.III aircraft were replaced with the Hansa-Brandenburg CC flying boats and in 1917 were supplemented with Hansa-Brandenburg W.18 flying boats. Unfortunately these aircraft were not able to climb above 4,000 metres, which was the altitude flown by the Italian bombers that attacked targets along the Adriatic coast. Therefore, it was imperative that a new fighter type was needed and it was decided to use land-based fighters instead.

The newly developed Phönix D.I fighter, initially powered by the ‘Heiro’ six cylinder, water cooled engine of 200hp (later 230hp Hiero engine), was selected as the replacement fighter. These aircraft were to operate from the ‘Abwehrflugstation’ at Altura, the ‘Valbadon’ airfields (near Pola) and the ‘Igalo’ airfield in Boka Kotorska. Additionally the ‘Seeflugstation’ (Triest) had an airfield for land based aircraft at Zaule.
In August 1917 some pilots of the ‘Kriegsmarine’ underwent re-training to the land based Phönix D.I at Wiener Neustadt.
A contract for the first eight aircraft, serial numbers A.97 to A. 104 (later J.I to J.8) was signed on 22nd August 1917 and were assigned to units October and November 1917. The first two aircraft were flown to Altura airfield, near Pola, in early October 1917. However, the ‘Heiro’ 200hp engine was found to lack the power required for its intended operations and the aircraft were sent back and were refitted with the more powerful ‘Heiro’ 230hp engine. These aircraft returned in January 1918. A further twelve Phonix D.I’s, serial numbers A.107 to A.118 (later J.9 to J.20) were ordered in October 1917. The manufacturing company at ‘Stadlau’ was producing the Phönix D.II fighter. It is doubtful that the ‘Kriegsmarine’ ever flew the D.II version and although serial numbers A.114 to A.118 were thought to be D.II aircraft, they were in fact the D.I version, but possibly fitted with higher performance engines.
It is probable that all D.I aircraft of the ‘Kriegsmarine’ were retrofitted with the more powerful 230hp engine. This engine was standard fit for the Phönix D.IIa and an order for 25 aircraft, serial numbers A.156 to A.180 (later J.21 to J.45) was placed on the 8th of June 1918. The D.IIa aircraft were intended for the defence of the coastline near Pola, Triest, Kumhor or Durazzo as well as for use by other units. Delivery of these aircraft was delayed until August, only 10 were eventually delivered.

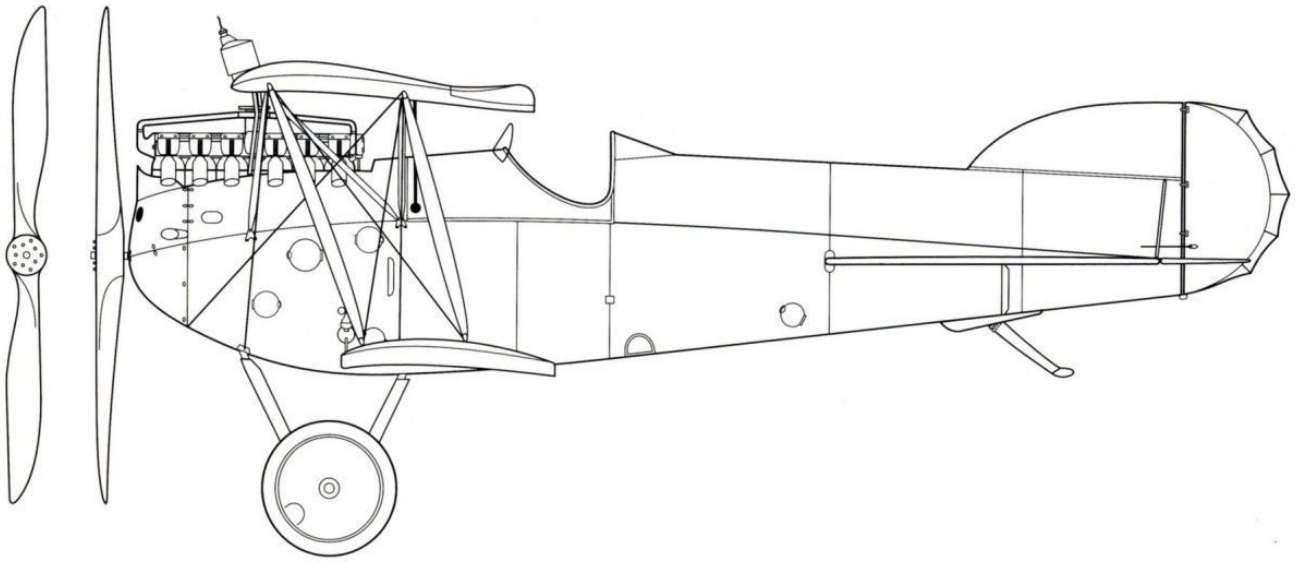
Aircraft J.12 colour scheme:

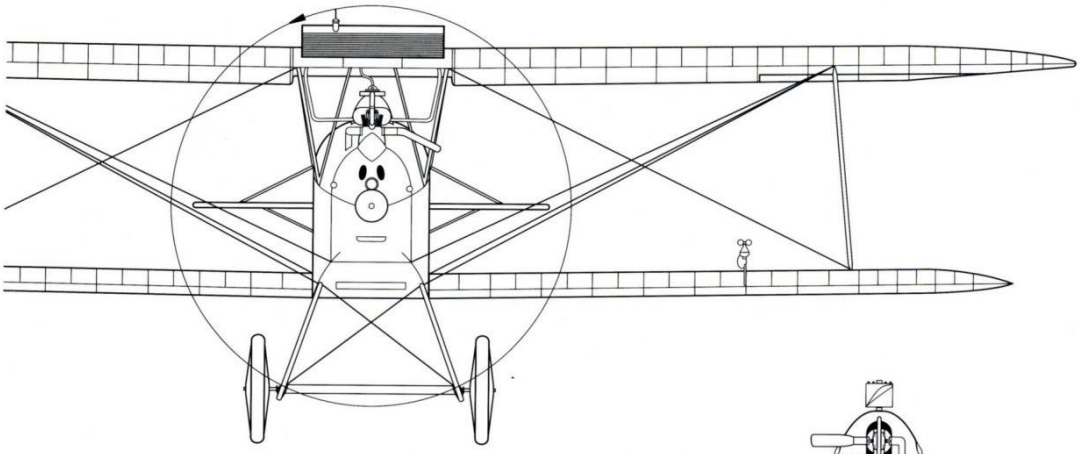
The linen covered wings, ailerons, tailplane, elevator, rudder and fin were treated with Clear Doped Linen (CDL). The sides and top of the plywood covered fuselage and the wheel covers were treated with a covering of mottled green/brown dope, applied either by stippling with a brush or by being applied with a sponge. The plywood underside of the fuselage was clear varnished.
The Phönix DI aircraft of the ‘Kriegsmarine’ had the standard national markings of the ‘Kriegsmarine’, being red-white-red stripes on the tail surfaces and on both top and bottom wing tip surfaces. On the top wing the stripes ran from the wing outer edges to the edge of ailerons. At the middle of the rudder was a red-white-red coat of arms with a golden (yellow) outline and a crown. The black ’Eisernkreuze’ markings on the top and bottom wings had to be positioned further towards the centre-section, so were relatively close to each other. Photographs also reveal that the location of the coat of arms on the rudder varied. There is little information on the national markings of ‘Kriegsmarine’ aircraft.
Few of the ‘Kriegsmarine’ Phönix D.I fighters carried pilot personal markings, Phönix D.I fighter J.12 being one of them, although details of the pilot are not available. This aircraft’s personal marking was a white ’lightning’ marking on the fuselage sides.

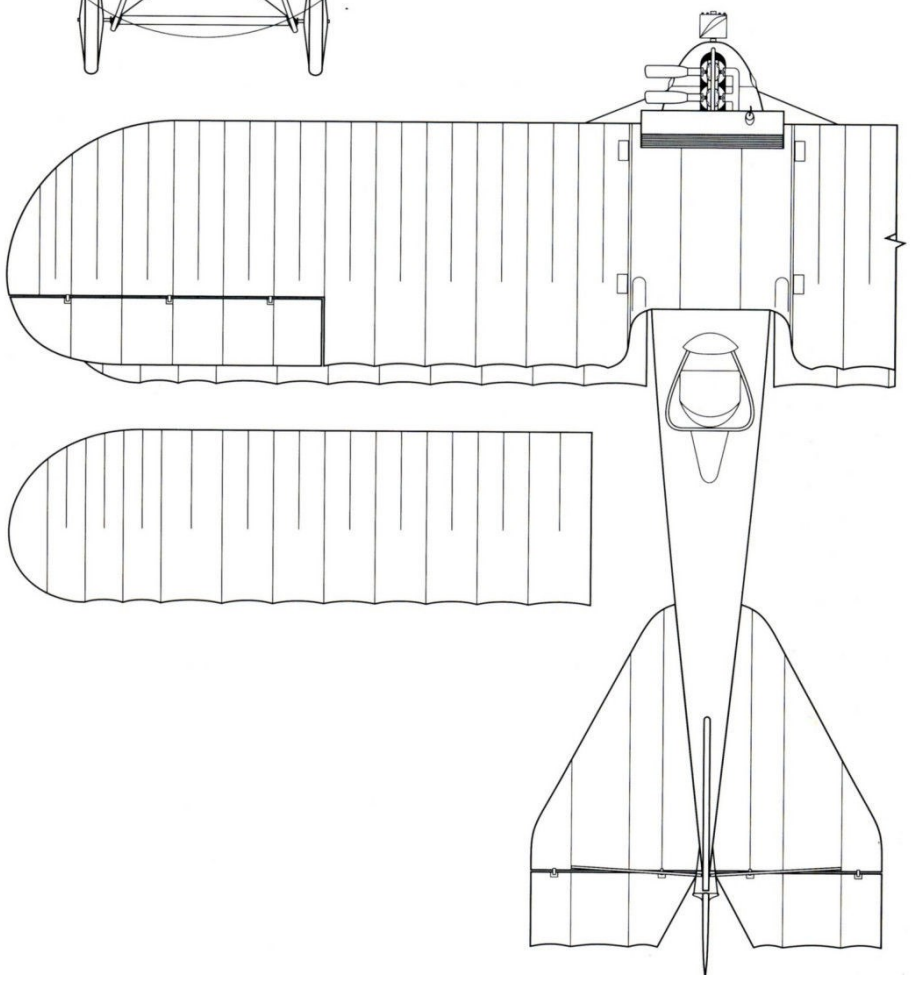





J.12
J.12

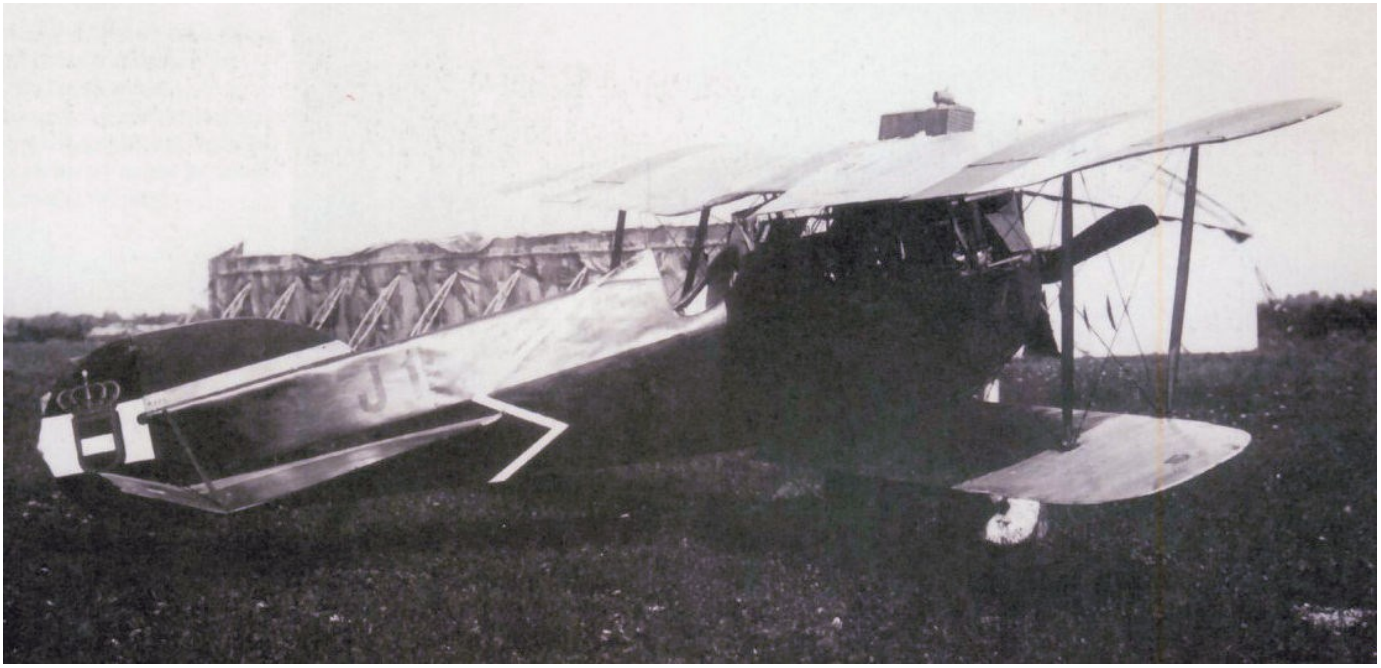


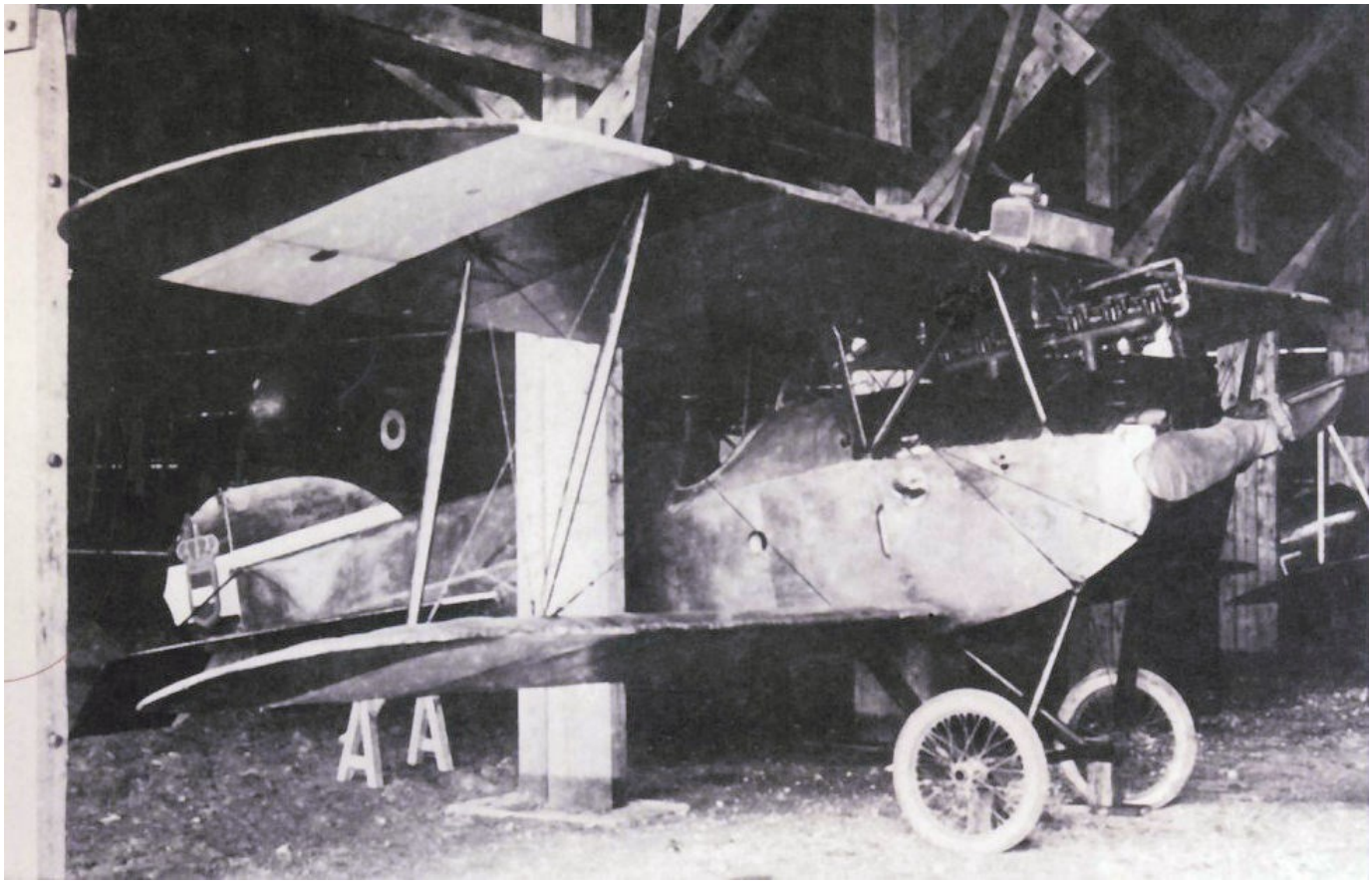


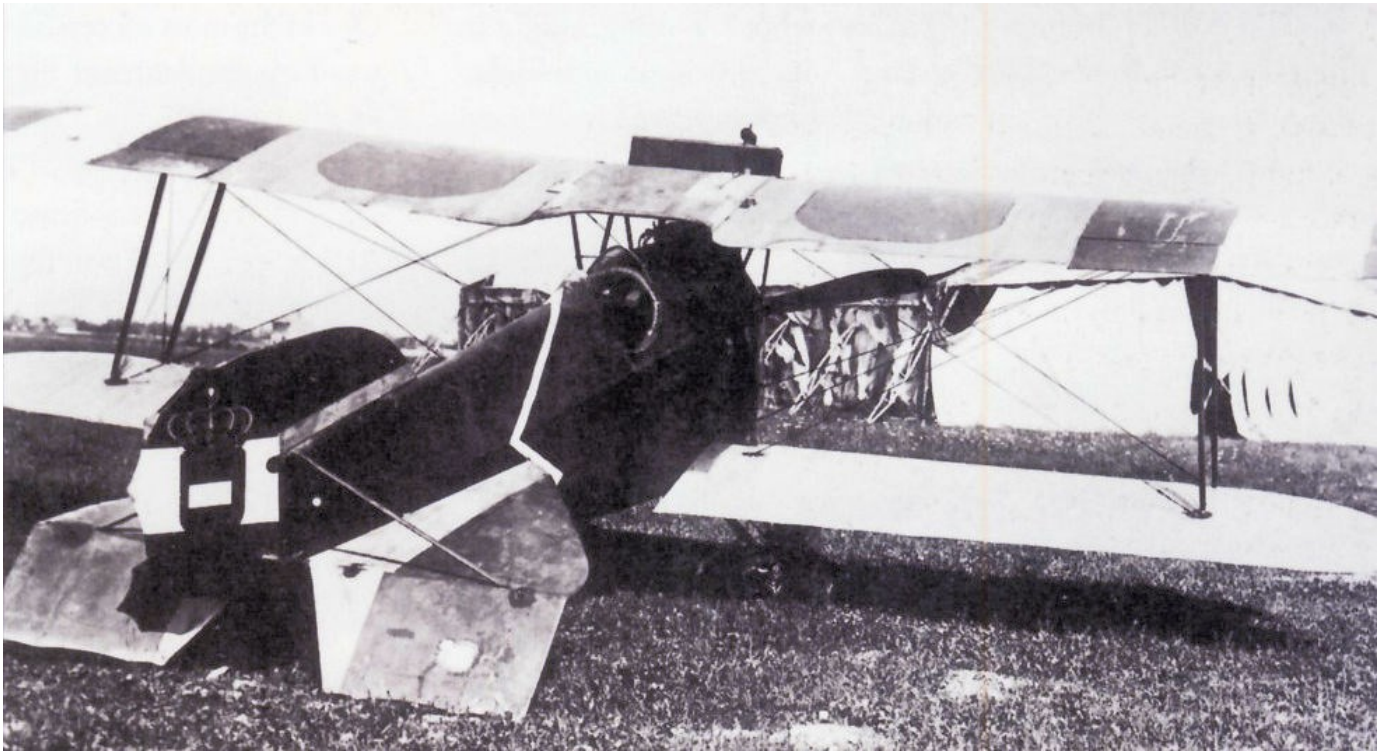


NOTE:

Phönix D.I fighter J.12 was captured by the Italian's on the 19th of July 1918 and subsequently photographed at Maucon airfield. The following photographs were taken when the aircraft was in Italian hands and the wartime black 'Eisernkreuze' markings on the wings had been painted over.



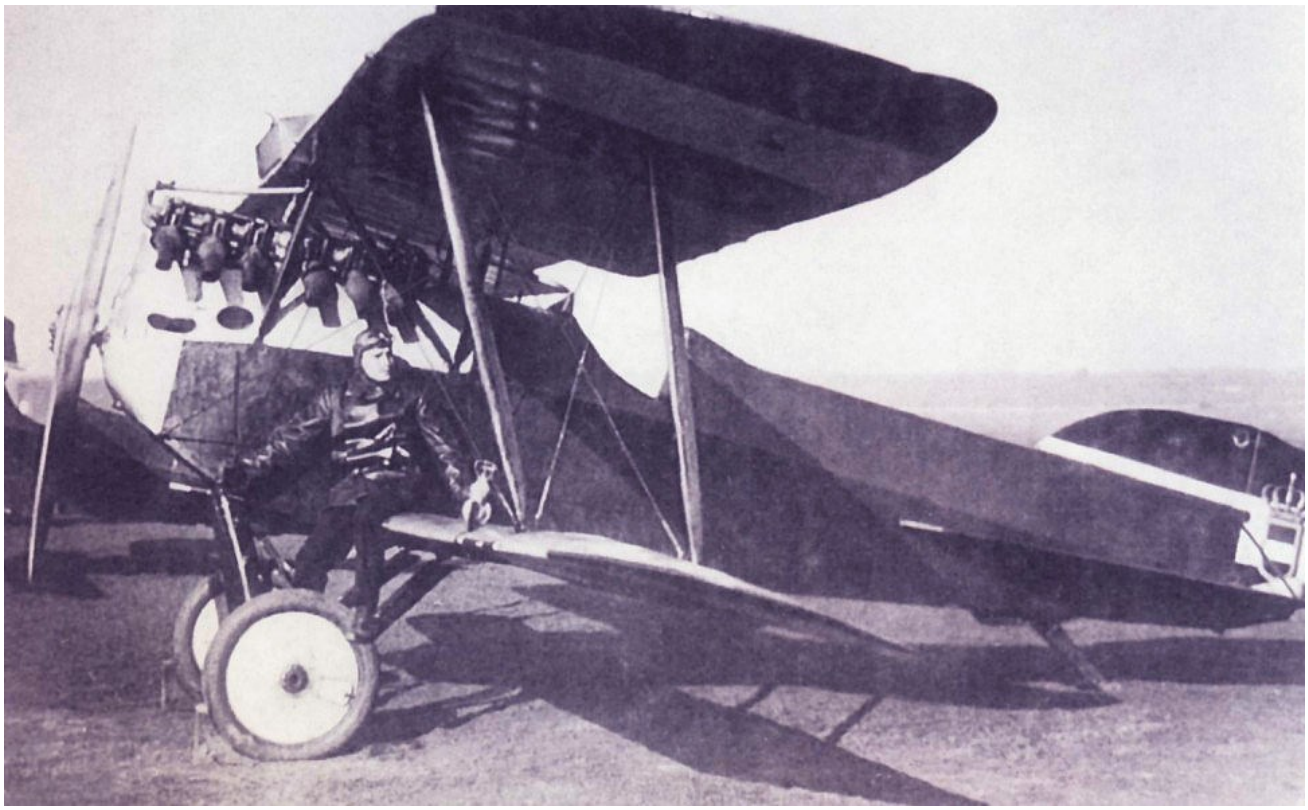




NOTE:

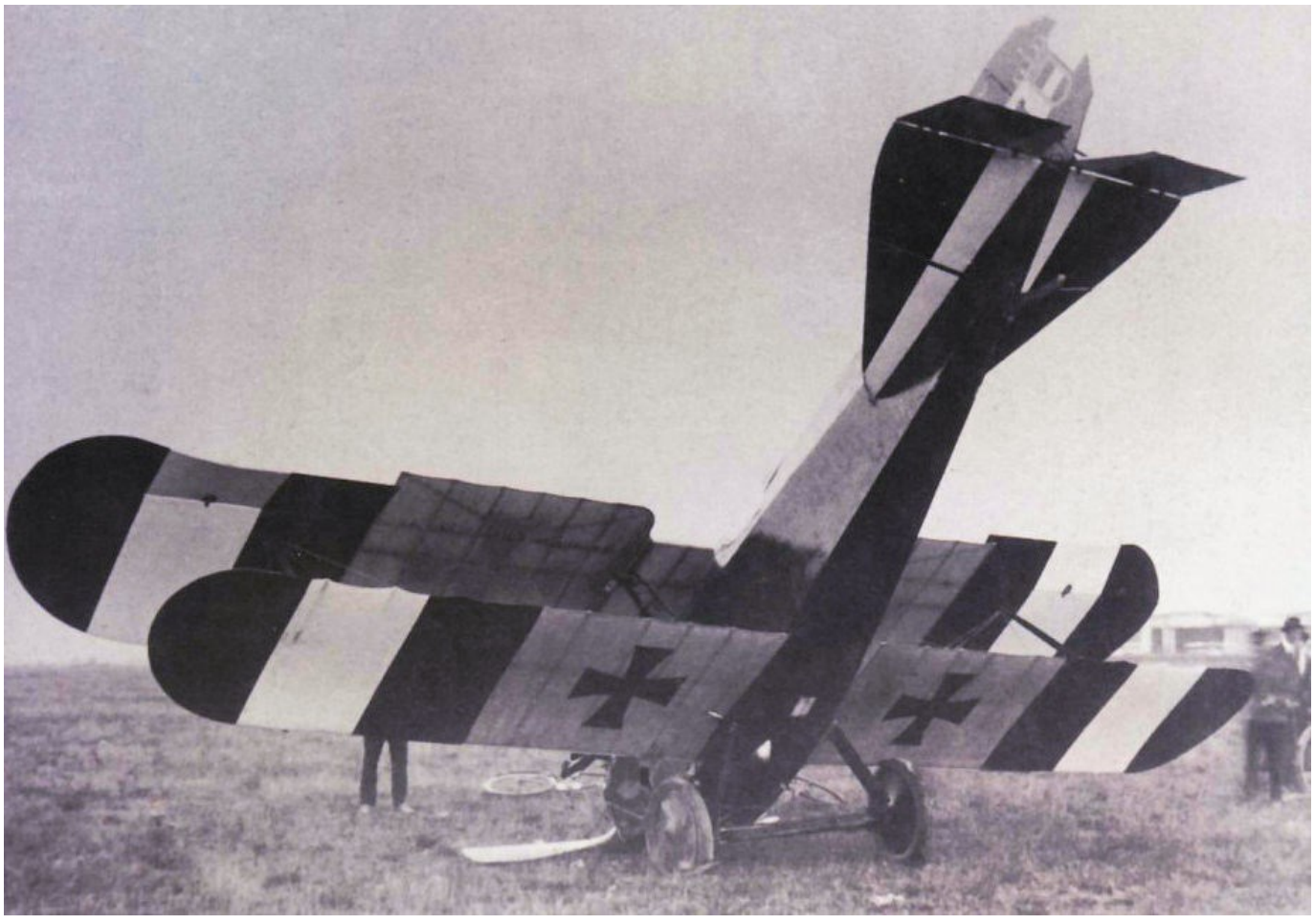
The following photographs are of other Phönix D.I aircraft of the 'Kriegsmarine'.

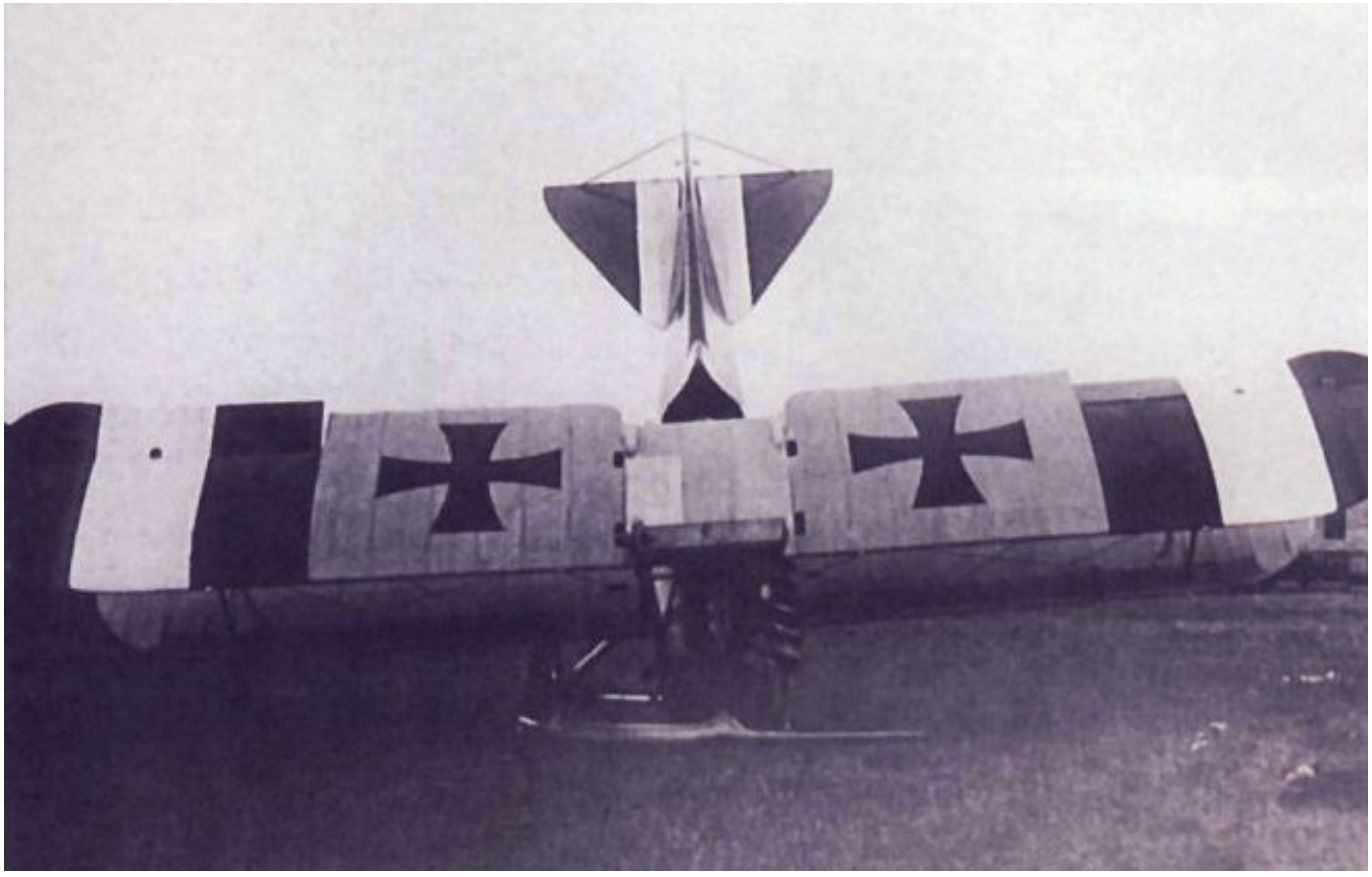
Phönix D.I, Serial A.97

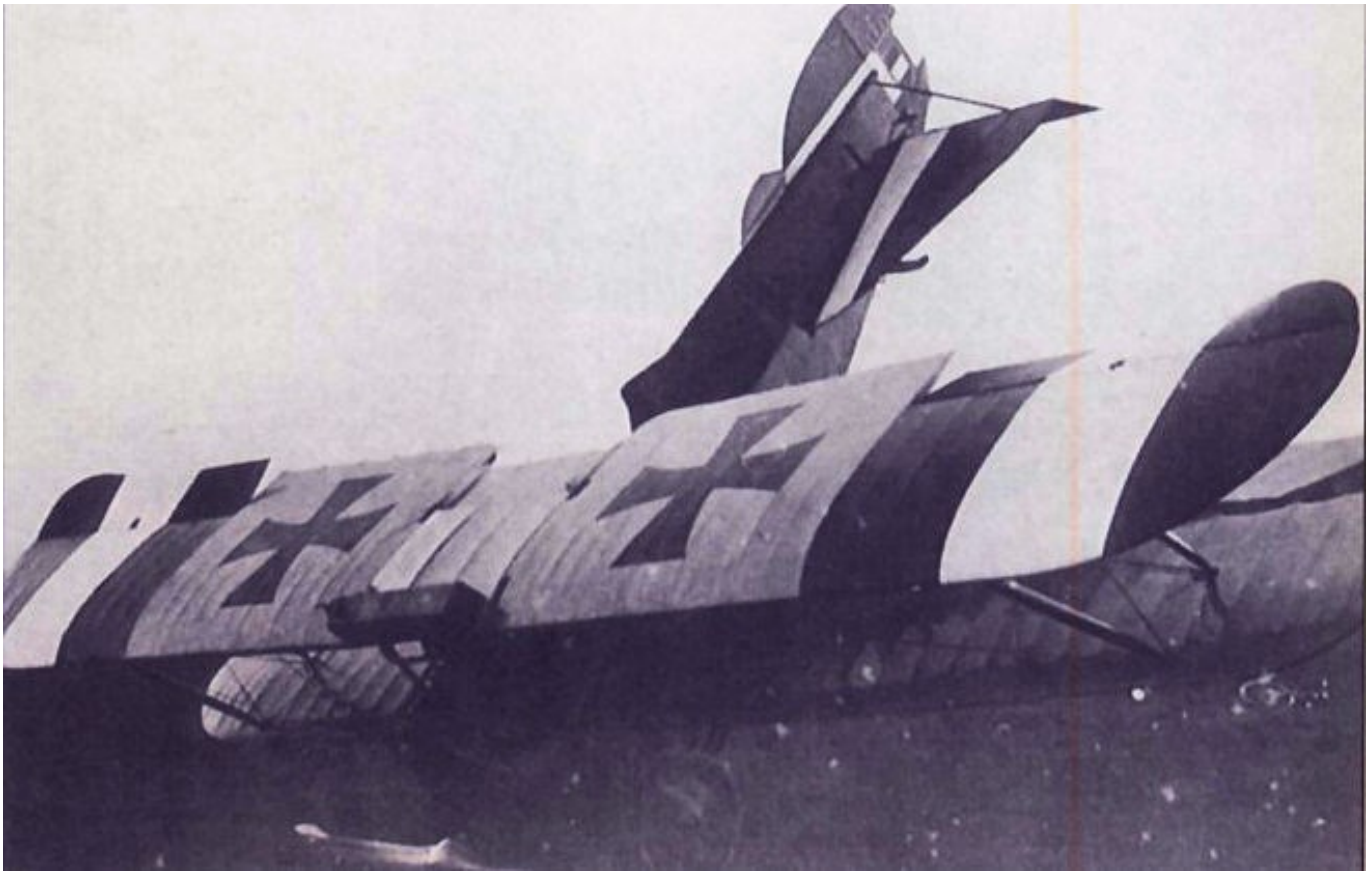


Phönix D.I, Serial A.114

Phönix D.I, Serial A.100







PART 1
MODEL DESCRIPTION

PART 1 - MODEL DESCRIPTION

('Lukgraph' - Kit No:32-057)

NOTE: *This model kit was the initial release, but is now being released as a **fully 3D printed** kit.*

This 1:32nd scale model is manufactured by 'Lukgraph' and has the major components cast in beige coloured resin, which has re-enforcing metal rods in the wings. Other parts, such as the engine, cockpit interior and struts etc are 3D printed. This 'premium' version of the kit supplies the model parts, decal sheets, photo-etch sheet and the instruction booklet.
The kit instruction booklet has seven assembly sheets, three rigging sheets and four colour scheme sheets that cover eight different schemes, as does the supplied decal sheet. The instructions seem to be concise. Also, supplied is an acetate sheet for the windscreen.

This model is a new release along with the D.II version of the aircraft. The resin cast parts are:

Upper wing sections
Lower wings
Rudder
Fin
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:

Fuselage halves
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
Machine guns

The printed parts are of good quality with very little, if any, surface layer lines. The resin used for the more delicate 3D printed parts can be brittle and smaller parts can easily be broken, unless due care is taken when handling those parts. The four interplane struts and landing gear struts are printed hollow so the supplied metal rods can be inserted for additional strength.
CA adhesive (superglue) must be used to attach and assemble the model parts as normal styrene cement has no effect on resin.

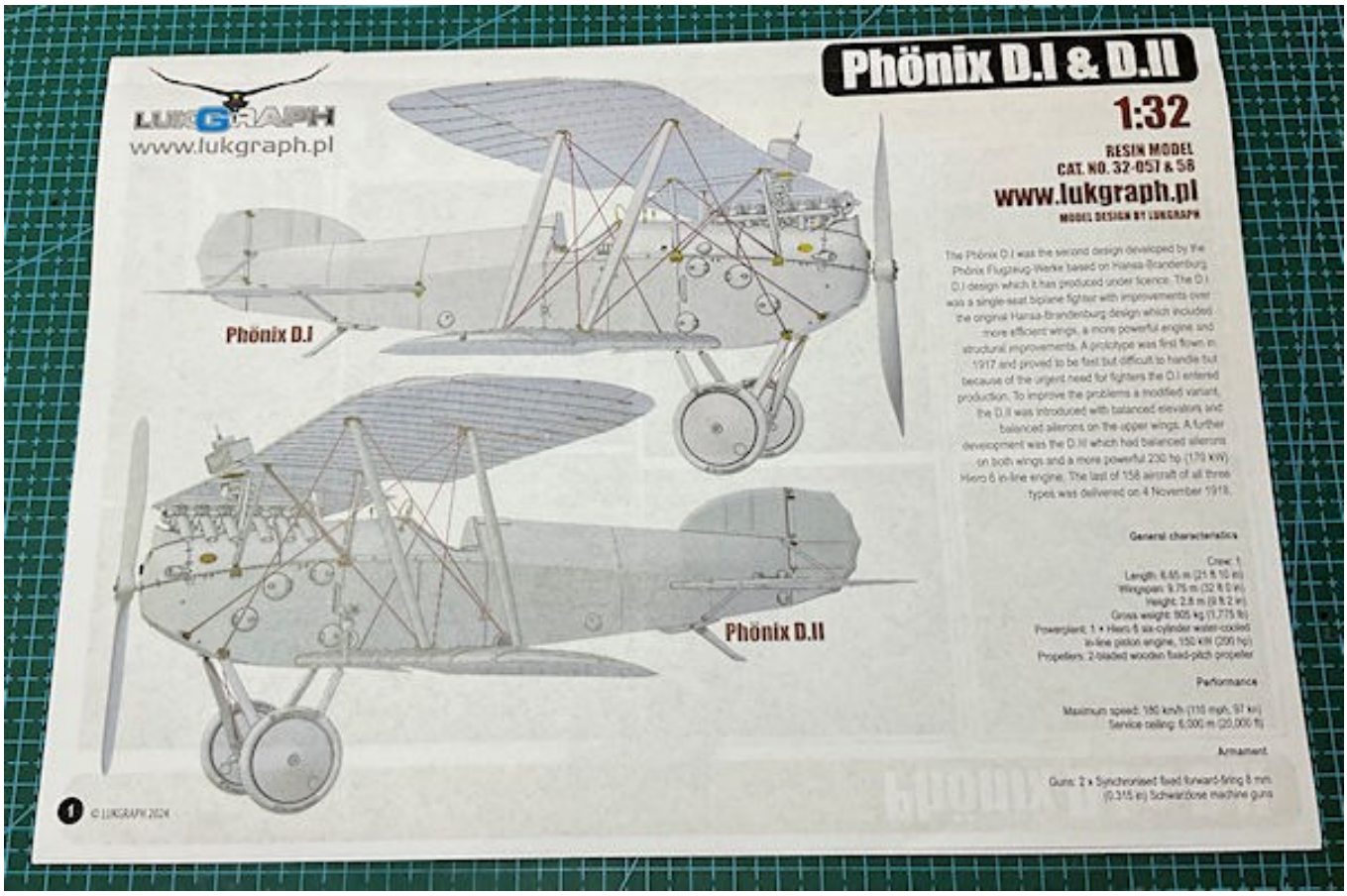
Finally, the decals from 'Lukgraph' are semi-translucent, meaning the underneath colours on the model or previously applied decals will show through the decals after application. Also the decals are not 'cookie cut' and instead are printed as part of the entire carrier film on the decal sheet supplied. Therefore the decals need to be accurately cut out from the sheet in order to limit the amount of carrier film left around the decal.

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


PHÖNIX D.I
LUKGRAPH
1:32


1:32
3D PRINTED PARTS
+ 0,8 mm steel wire
+ 0.5 mm copper wire
Phönix D.I & D.II
Phönix D.I
32-057
Phönix D.II
32-058
3D PRINTED PARTS
CAREFULLY REMOVE THE SUPPORTS (GREY COLOR) BEST WITH A SAW. THE COMPONENTS
ARE HARD BUT FRAGILE. BEFORE PAINTING USE PRIMER. SOME ITEMS MAY REQUIRE
GRINDING VISIBLE LAYERS OF THE 3D PRINT.


J.12
J.12
Phönix D.I


LUKGRAPH
www.lukgraph.pl
Phönix D.I & D.II
1:32
RESIN MODEL
CAT. NO. 32-057 & 58
www.lukgraph.pl
MODEL DESIGN BY LUKGRAPH
Phönix D.I
Phönix D.II
General characteristics
Performance
Armament
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PART 2
WOOD EFFECTS
(General)

PART 2 - WOOD EFFECTS (General)

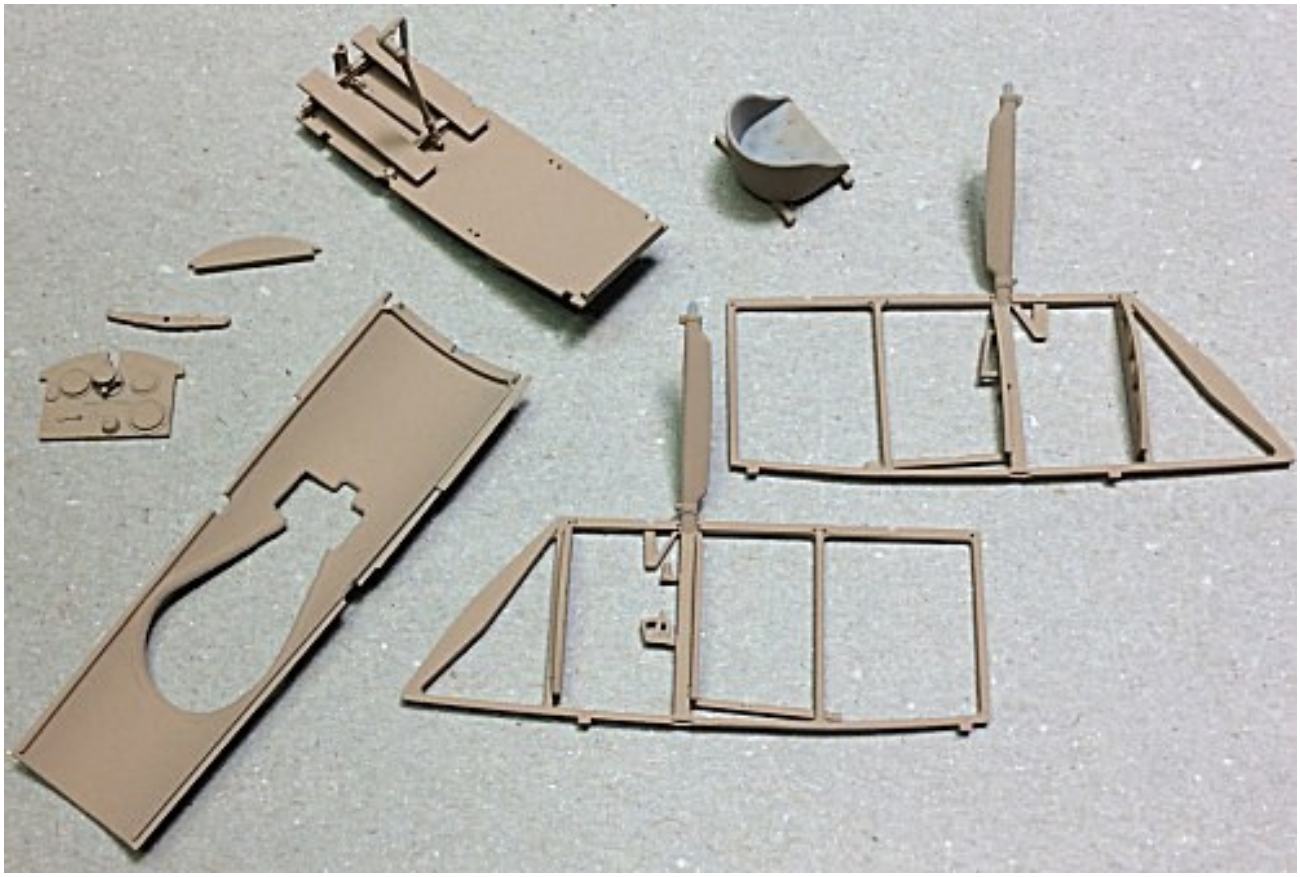
A basic technique:

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 oil paints, which can be enhanced with various washes or filters.

The first thing to do is to ensure the model parts are cleaned, normally with warm water with washing up fluid and something like an old tooth brush. Once cleaned and thoroughly dried, the primer coat can be applied. I use 'AK Interactive' Grey (AK758) or White (AK759) 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 airbrush '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 oil paints can be too ‘gritty’ once leached of the oil, so I use ‘Abteilung 502’ oil paints thinned with ‘Tamiya’ Enamel thinners (X20).

PART 4
DECALS
(General)

PART 4 - DECALS

‘Standard’ type decals:

NOTE: *The following is **applicable only** for decals on a **painted surface**. If decals are to be placed on top of previously applied decals, the decal setting solutions may ’eat’ into the previous decals. In this case a sealing coat of either ‘Alclad’ Aqua Gloss (ALC-600), 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 clear gloss sealing coat, such as ‘Alclad’ Aqua Gloss (ALC-600), ‘Mig’ A-Stand Aqua Gloss (A.Mig-2503), ‘Tamiya’ Clear (X22) or similar to provide a smooth surface.

NOTE: *‘MicroSet’ solution softens the decal to allow it to conform to the painted surface. 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.

Carefully press out any residual water from the decal by either pressing with a tissue or by gently rolling over the decal with a cotton bud.

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

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

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

Once fully dry and set, airbrush a sealing coat over the decal, dependant of your desired finish. I tend to use either ‘Alclad’ Light Sheen (ALC-311) lacquer or ‘Tamiya’ Semi Gloss (X35).

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

Once the decals have been applied I airbrush a sealing coat of either ‘Alclad’ Aqua Gloss (ALC-600), ‘Mig’ A-Stand Aqua Gloss (A.Mig-2503),‘Tamiya’ Clear (X22) or similar over areas of decals where more decals are to be applied.

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.

To ‘knock back’ the sheen for applying weathering effects (refer to Part 3 of this build log), for example ‘Flory’ clay washes or oil paint, I airbrush a sealing coat ‘Alclad’ Light Sheen (ALC-311) mixed with Flat (ALC-314) at a 3 to 2 ratio.

‘Aviattic’ decals:

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

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

Application:

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

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

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

Airbrush at least two light sealing coats of a clear coat such as ’Alclad’ Aqua Gloss (ALC-600), ‘Mig’ A-Stand Aqua Gloss (A.Mig-2503), ‘Tamiya’ Clear (X22) or similar over the painted surface to form a gloss surface for applying the decals.

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

Soak each decal in warm water for approximately 20 seconds.

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

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

Align the decal to the shape of the model part.

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

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

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

Also check that there are no lifted decal edges around the model part.

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

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

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

‘Lukgraph’ decals:

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

Application:

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

PART 5
RESIN (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 /parts kits from plastic (styrene) parts/kits:

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).

Cast or 3D printed 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.

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.

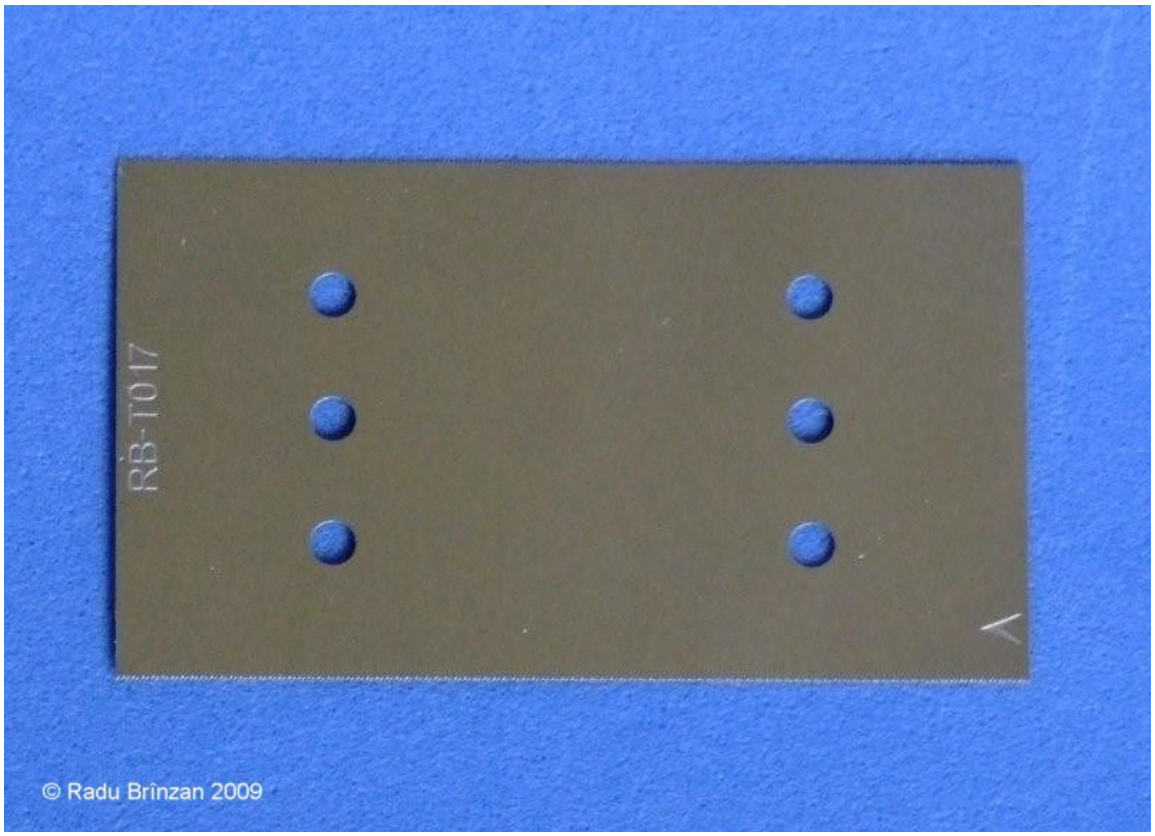
Plastic kits are assembled using solvent adhesives, which melt the surface where it is applied and 'weld' the joint together. Resin however will not react to this type of adhesive and can really only be glued using CA adhesive. This adhesive reacts to moisture in the air and on the surface to be joined. 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.

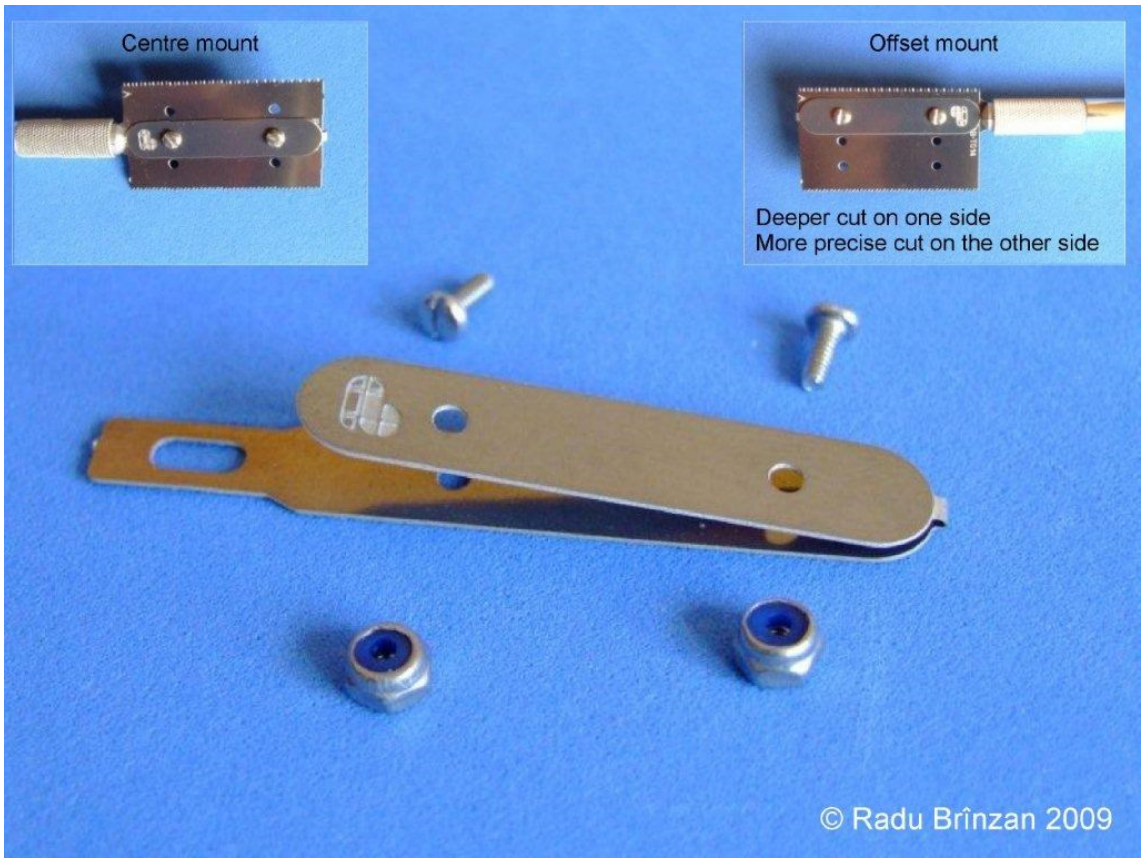
Cutting, sanding and drilling resin will create swarf and more importantly, resin dust. The dust in particular is dangerous, especially if inhaled. Therefore always vacuum the working area, and yourself, regularly. If you have a face mask or filtered respirator and find you can wear it whilst working,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

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.

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

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'.*


RB-T017
© Radu Brînzan 2009


Centre mount
Offset mount
Deeper cut on one side
More precise cut on the other side
© Radu Brînzan 2009

PART 6
RIGGING
(General)

PART 6 - RIGGING (General)

References:
'JAPO Publications - Phönix D.I-D.II (Jan Zahalka, Mgr. Petr Aharon Tesar, Sigmund Tyrlik)
'Windsock' data file No.31 - Phönix D.I-II (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 that can be used are either sintered metal or resin and can be obtained from such as 'Gaspatch Models', 'Proper Plane' or those supplied from 'Lukgraph' as part of this kit.

Internal rigging:

Bracing wires:

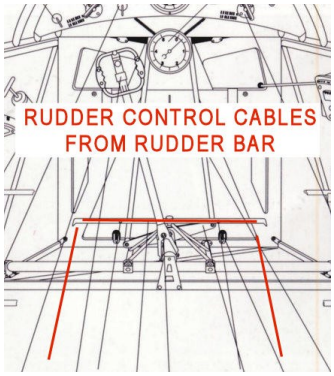
There is very little information or photographs as to what, if any, internal rigging was fitted in these aircraft. Therefore, given that and the restricted view inside the model once completed, I chose not to add any internal bracing wires.

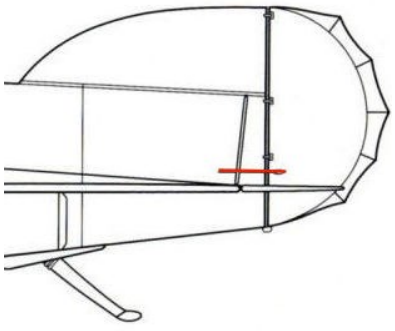
Rudder control cables:

A rudder control cable was attached to each end of the pilots rudder bar in the cockpit. These cables were routed rearwards through the fuselage to exit above the tailplanes and were attached to the rudder control horns on the rudder post.

As the pilot moved the rudder bar left or right, the rudder would move left or right, causing the aircraft to swing (yaw) in the required direction.

Turnbuckles would most likely have been fitted in the control cables at the rudder bar.



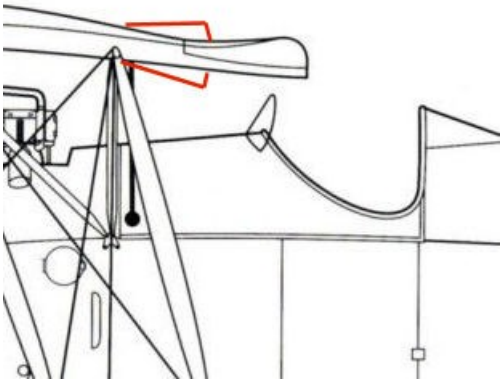


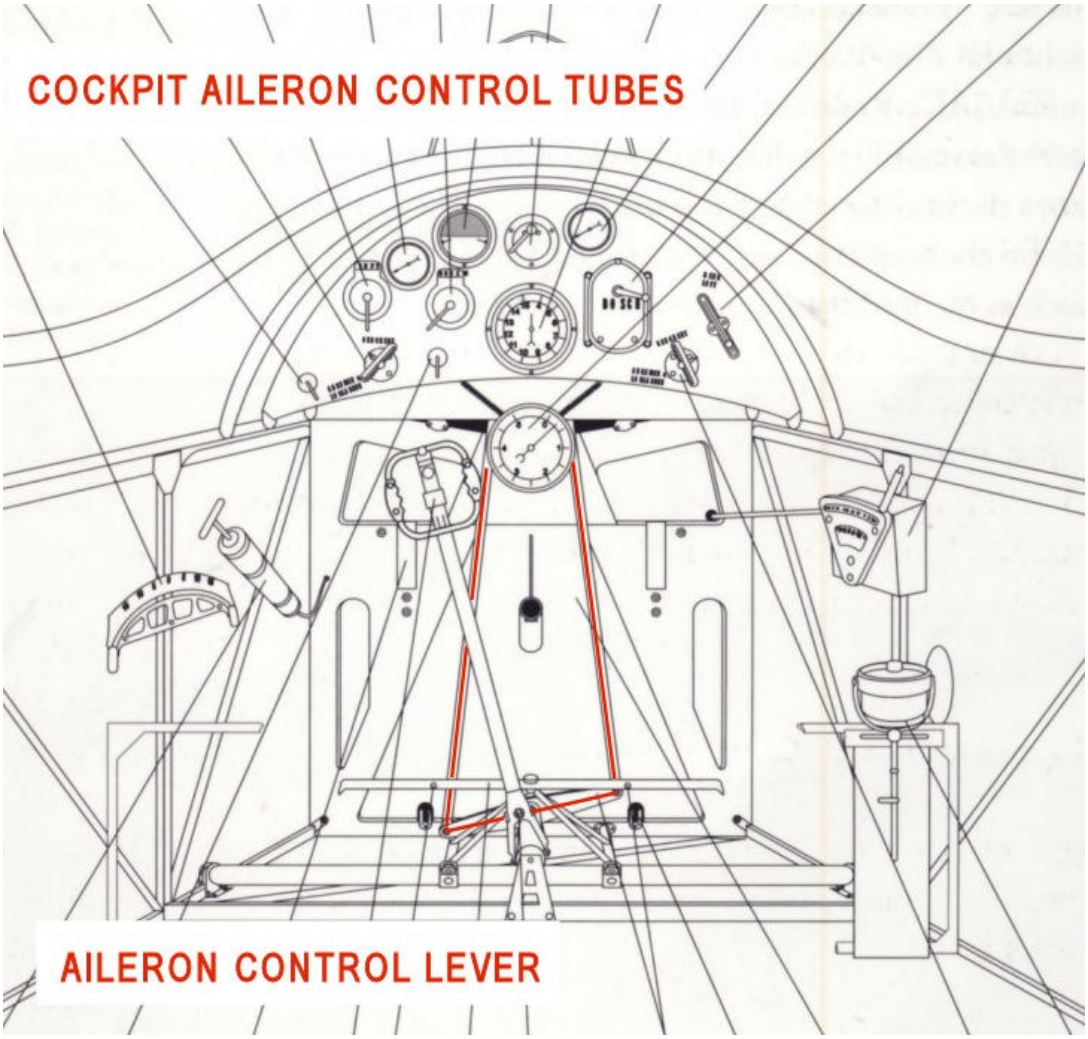
Aileron control cables:

Ailerons were fitted only in the upper wing. An aileron operating lever was attached to the forward end of the control column torsion bar. Control tubes were attached to the ends of the lever and were directed up and out of the cockpit (aligned behind the fuselage rear cabane stuts) and into the underside of the upper wing centre section. Torque tubes in the upper wing were connected to the top ends of the cockpit control tubes and then probably cable to the control horns on the ailerons in the upper wing.

As the pilot moved the control column left or right, the attached torsion bar would rotate left or right, causing the cockpit control tubes to raise on one side and lower on the other. This in turn would rotate the control tubes in the upper wing causing one aileron in the upper wing to lift and the other to lower. This caused the aircraft to turn left or right (roll).

Turnbuckles would most likely have been fitted in the control cables at the aileron control horns.



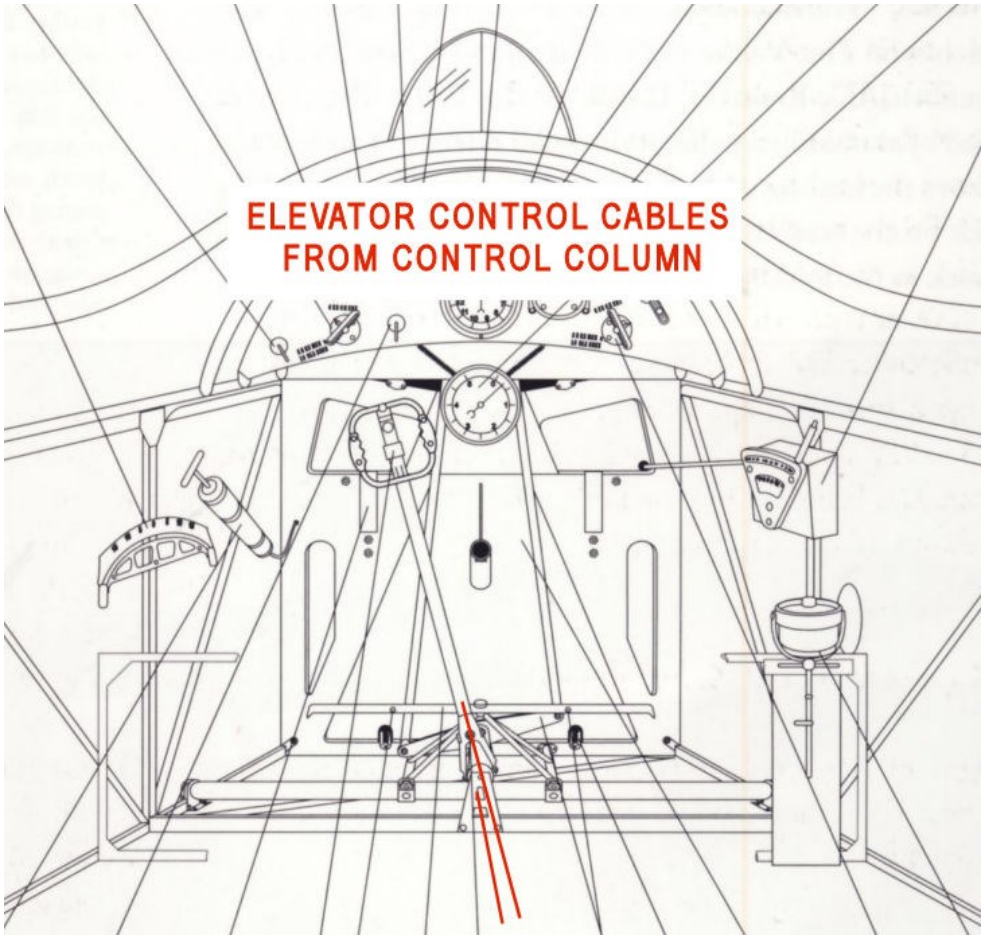


Elevator control cables:

Elevator control cables were most likely fitted to the midway and lower end of the pilots control column. These cables were routed rearwards through the fuselage to be attached within the fuselage rear to the elevator torque tube. There were no externally visible elevator control cables.

As the pilot moved the control column forwards or rearwards, the control cables would rotate the elevator torsion tube, causing the elevator to either lift or lower. This caused the aircraft to climb or dive (pitch).

Turnbuckles would most likely have been fitted in the control cables at the control column.

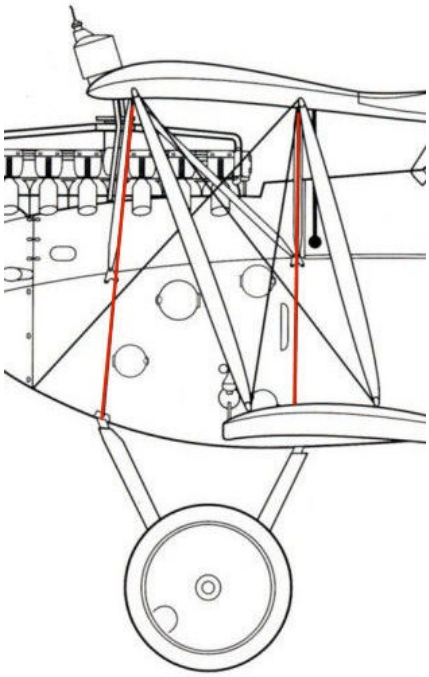


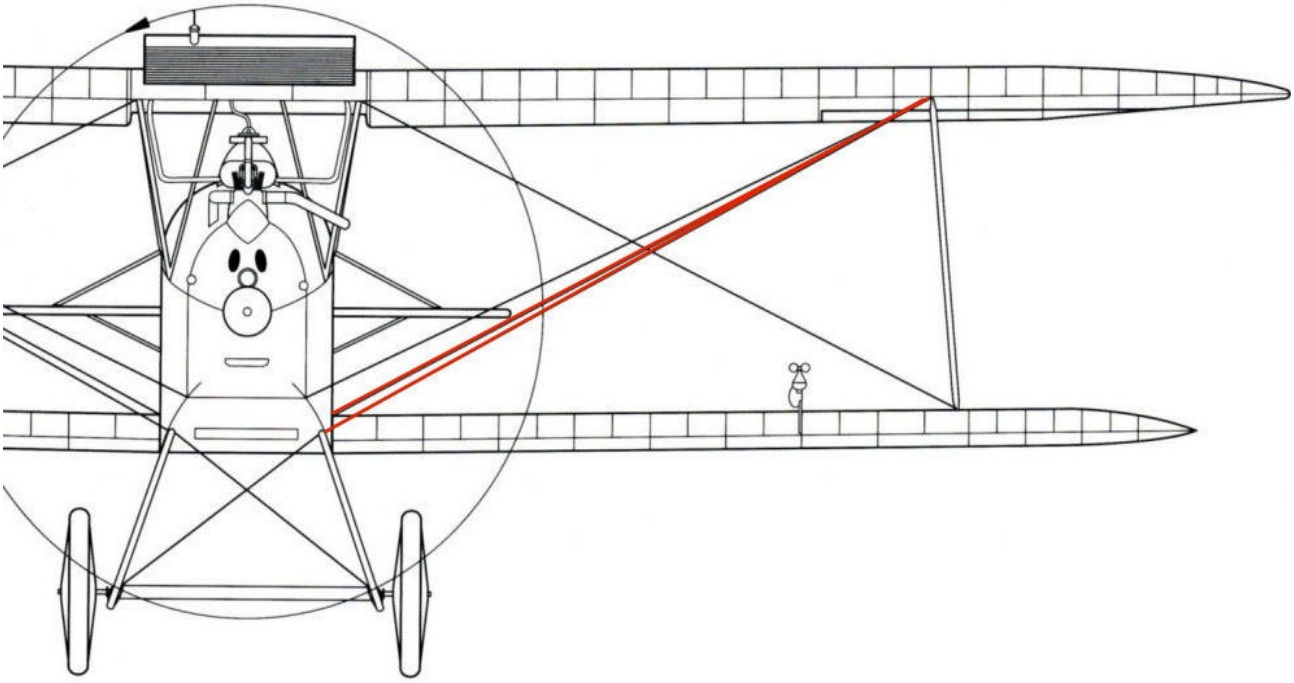
External rigging:

Flying wires:

Two flying wires were fitted, on both sides of the aircraft, between the lower edge of the fuselage and inboard from the top of the interplane struts on the underside of the upper wing. One wire on each side of the aircraft was attached to the fuselage at the root of the lower wing. The second wire was attached at the top of the forward landing gear Attachment point.

Turnbuckles were fitted at the fuselage ends of the wires.

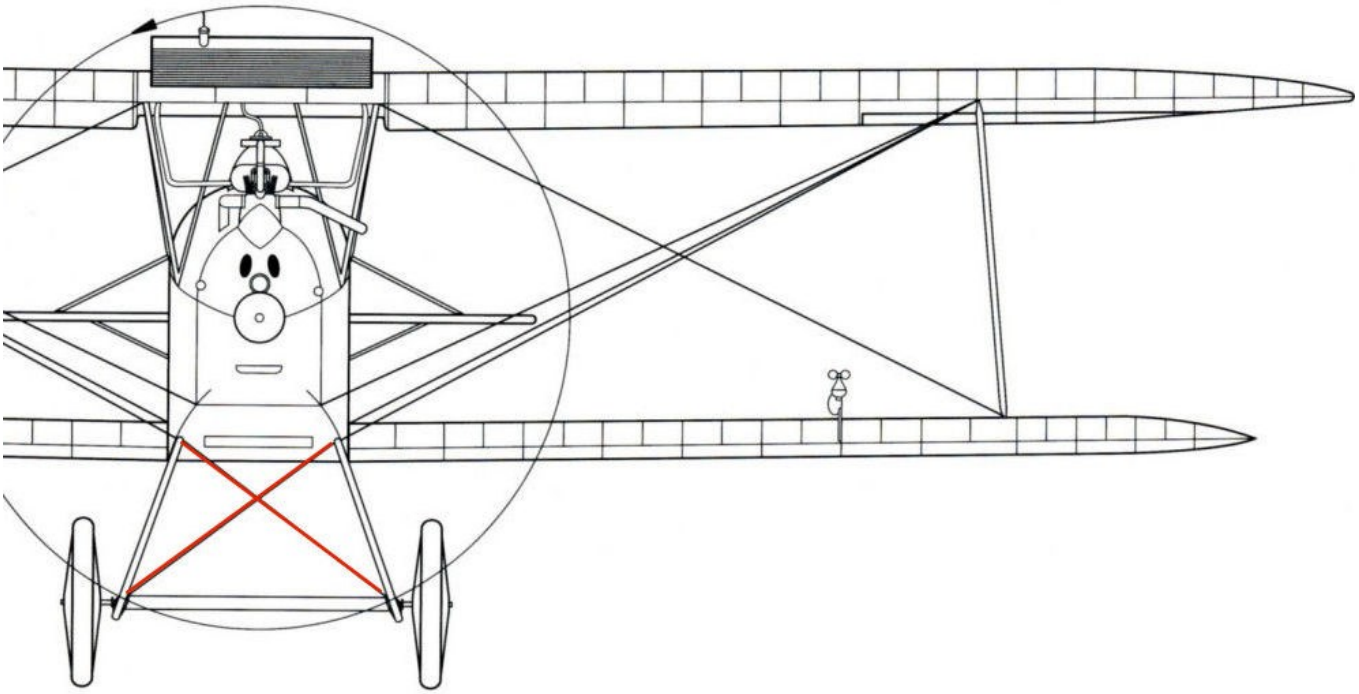




Landing gear bracing wires:

Two diagonally crossed bracing wires were fitted between the top of the forward landing gear struts and the diagonally opposite forward strut.

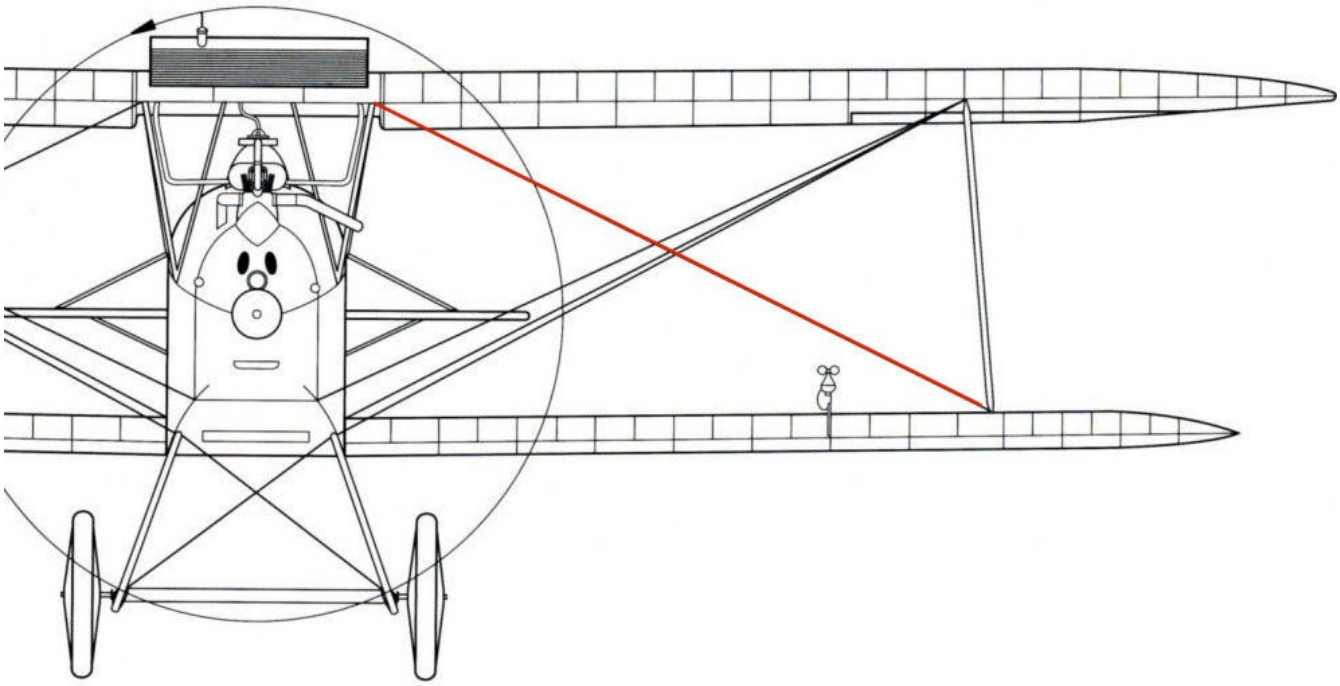
Turnbuckles were fitted in the bracing wires at the top of the forward landing gear struts.



Landing wires:

Two landing wires were fitted, on both sides of the aircraft, between the fuselage cabane struts and the lower wings. One wire on each side of the aircraft was attached between the underside of the upper wing, outboard from the rear cabane struts and inboard from the bottom of the rear interplane strut on the lower wings. The second wire was attached between the underside of the upper wing, outboard from the forward cabane struts and inboard from the bottom of the forward interplane strut on the lower wings.

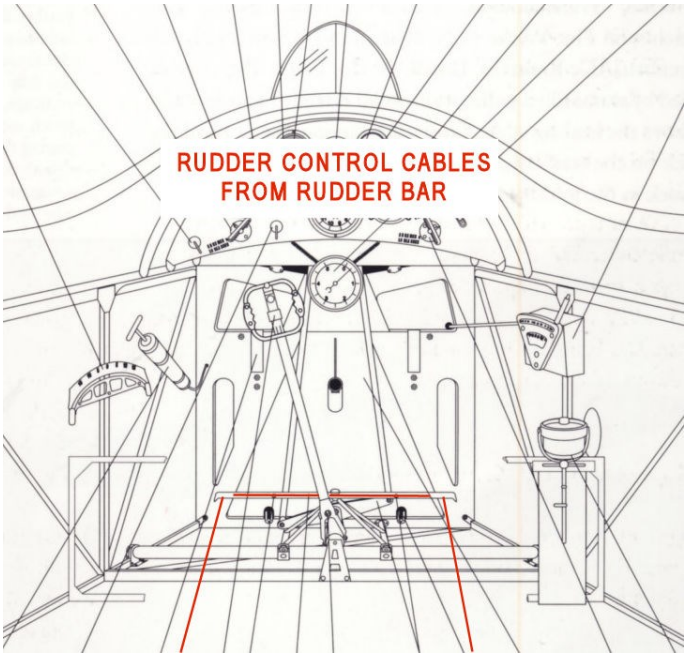
Turnbuckles were fitted at the interplane strut ends of the wires.

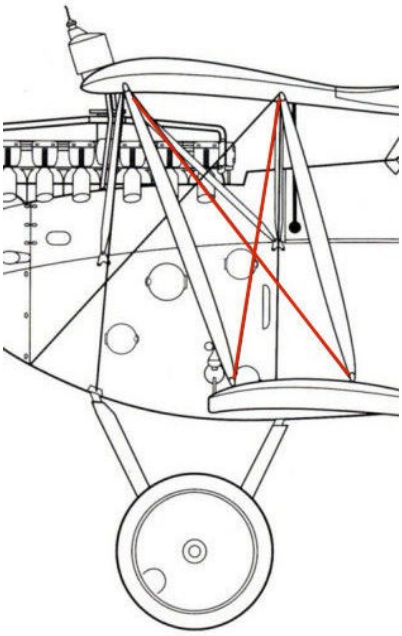


Incidence wires:

Two diagonally crossed incidence wires were fitted between the interplane struts on both sides of the aircraft. One wire was attached between the top of the rear interplane struts on the underside of the upper wings and bottom of the forward interplane struts at the lower wings. The second wire was attached between the top of the forward interplane struts on the underside of the upper wings and bottom of the rear interplane struts at the lower wings.

Turnbuckles were fitted at the lower wing ends of the wires.

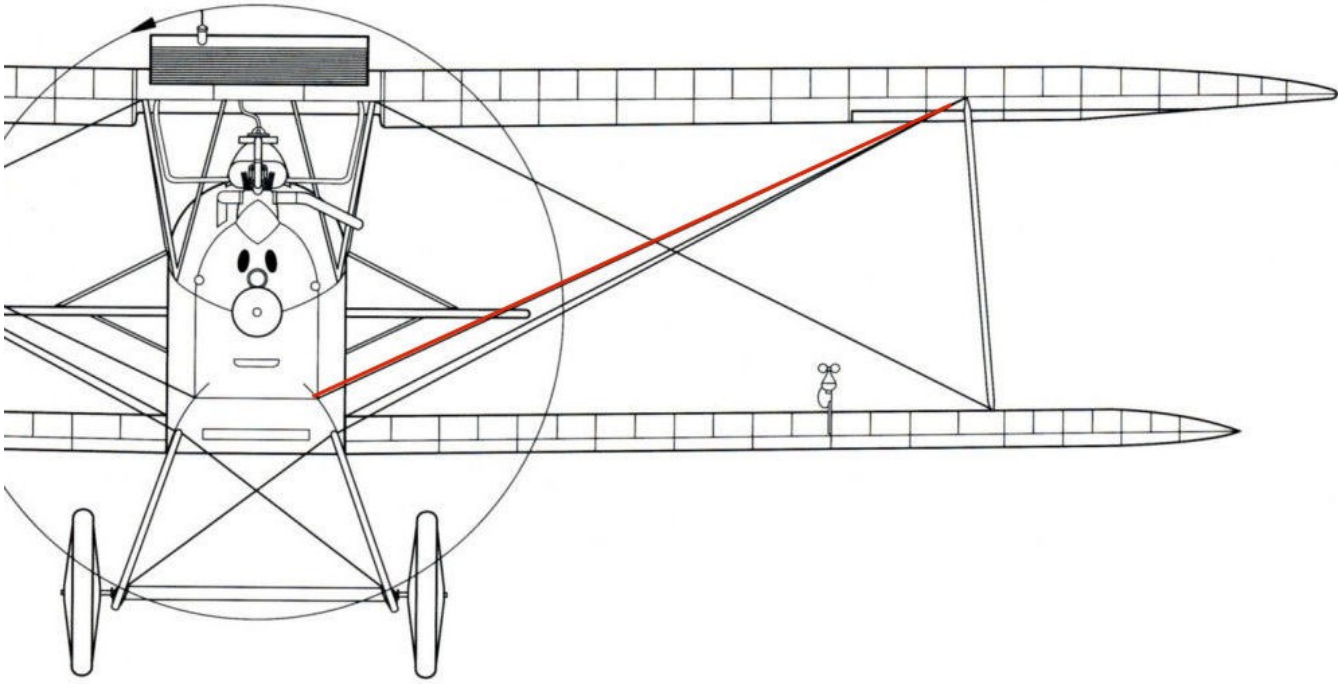


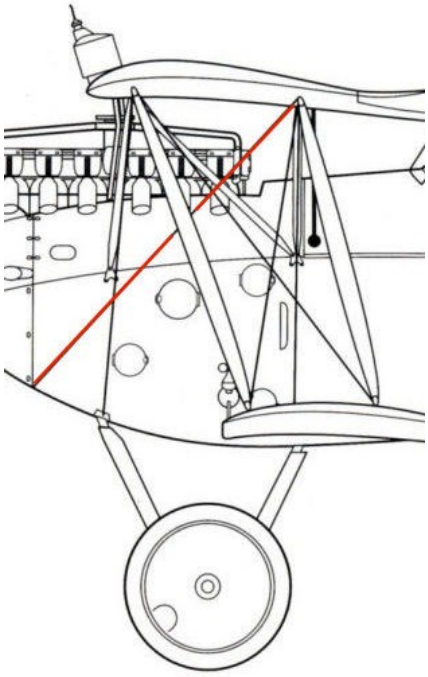


Drag wires:

A single drag wire was fitted to both sides of the aircraft. Each drag wire was attached between the lower edge of the fuselage at the rear of the nose cowl and the top of the rear interplane strut on the underside of the upper wing.

Turnbuckles were fitted at the fuselage ends of the wires.

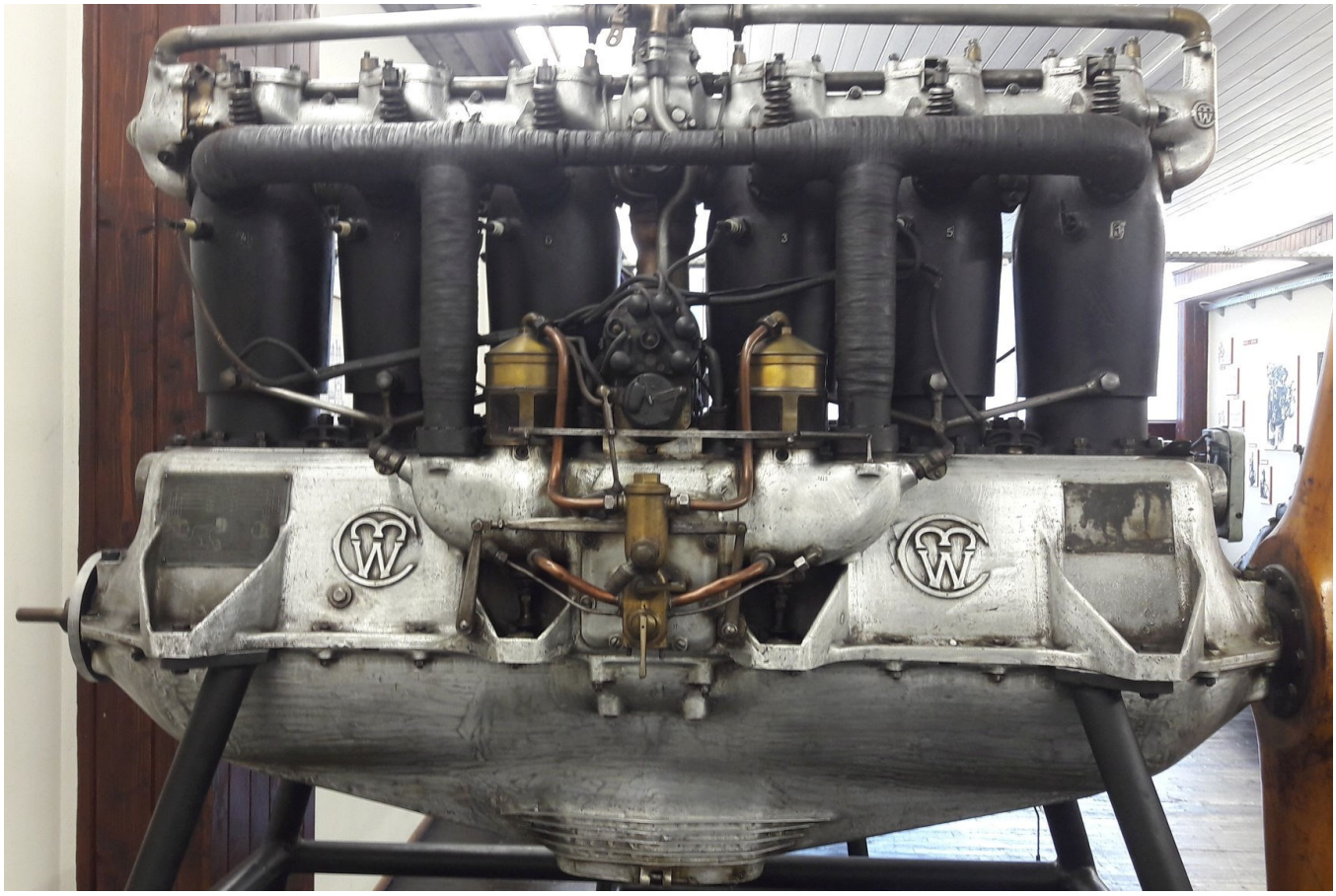


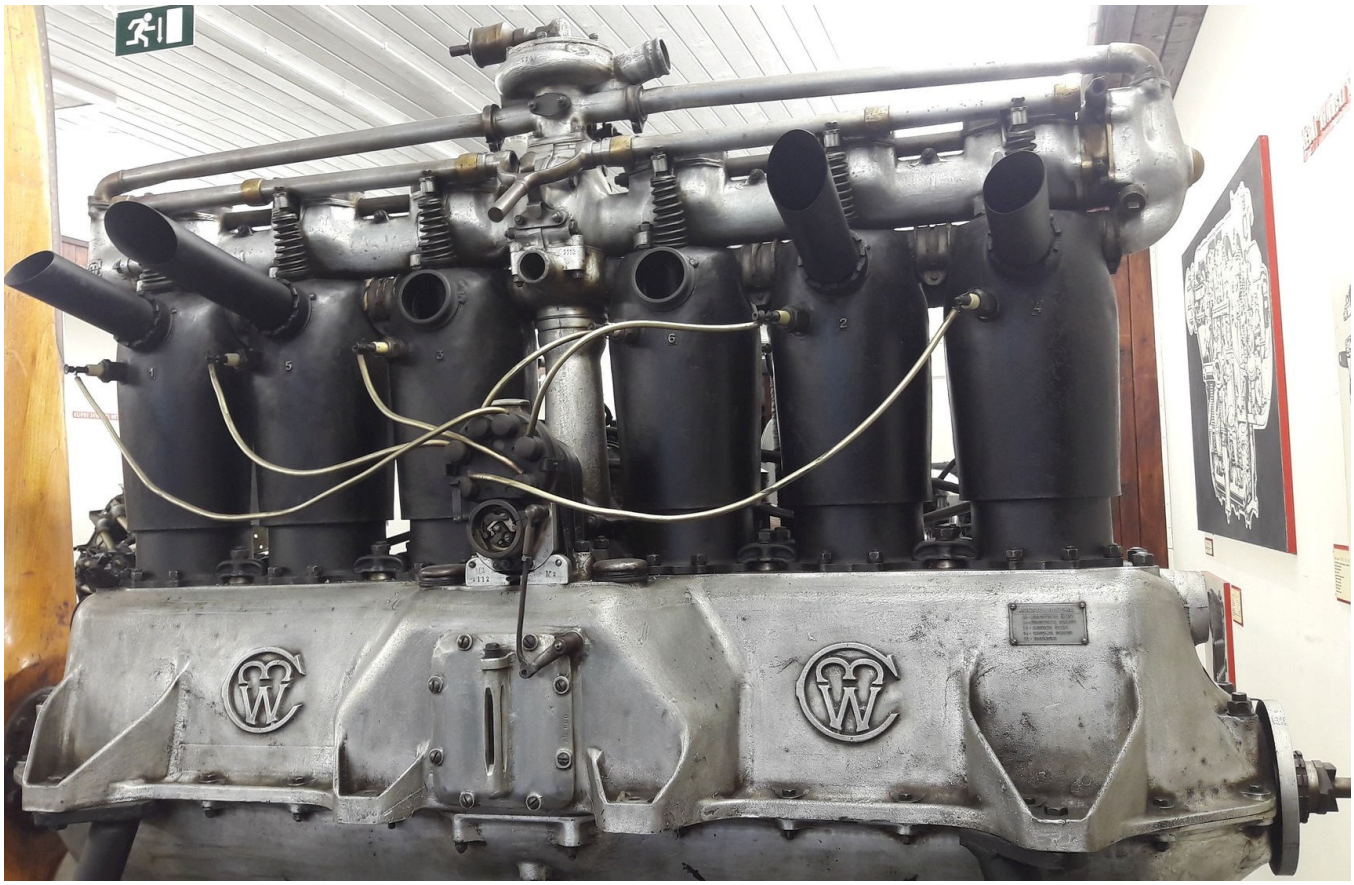


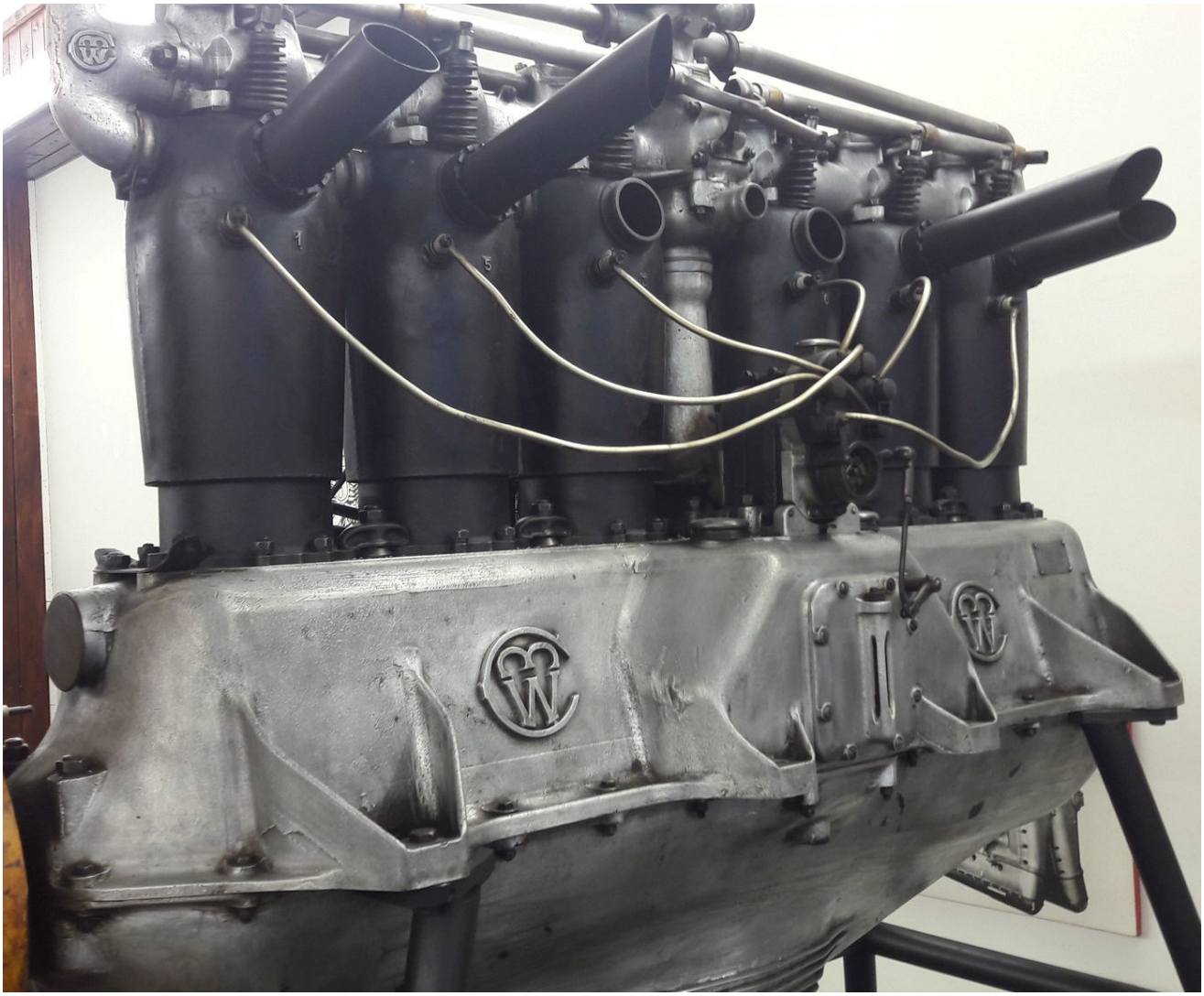
PART 7
ENGINE

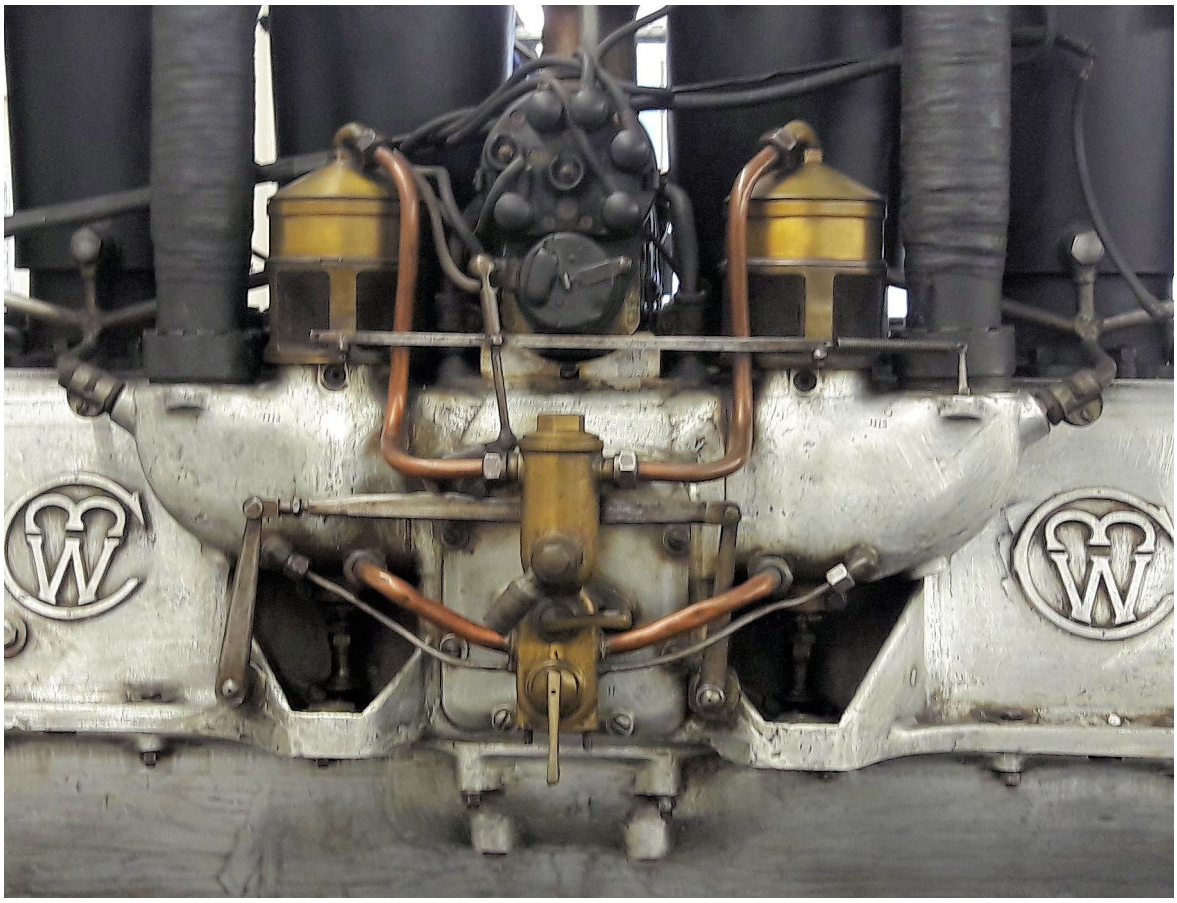
PART 7 - ENGINE

Phönix D.I, Serial No.J.12 of the 'Kriegsmarine' is thought to have been powered by a 'Heiro' six cylinder, water cooled 230hp engine. **However, the kit supplied engine is the 200hp version of the engine. Therefore as no alternative 230hp engine is available, the kit 200hp engine was used.**









Preparation:

NOTE: *When removing the 3D printed engine assembly from its 'support trees',* ***be careful to not cut through what may not be a support tree****. The printed parts are the same colour as their support trees and can be easily mistaken. Refer to the kit instruction illustration for this 3D print to see what is a part and what are support trees.*

Carefully snip or saw through the attaching stubs on the support trees to remove the engine assembly. Take care to not crush or break delicate parts when handling the engine.

File or sand away any residual stubs of the support trees from the engine assembly.

Before continuing, refer to Part 8 (Fuselage) of this build log for test fitting the engine.

Painting:

Airbrush or brush paint the parts as follows:

'Alclad' Steel (ALC-112) or similar - Engine sump and crankcase
'Tamiya' Rubber Black (XF85) - Cylinders on engine assembly and magnetos
'Alclad' Gun Metal (ALC-120) - Inlet manifold

Detail painting:

NOTE: *As some of the lower, side details had to be removed and can't be seen once the engine is installed, not all details were painted.*

Brush paint the following details:

'Mr. Colour' Stainless Steel (213) - Cam shaft housing, camshaft tappet covers, levers and valve springs, coolant pipes and pump
'Mr. Colour' Brass (219) - Carburettor fuel cylinders (x 2)
'Mr. Colour' Copper (215) - Carburettor fuel pipes
'Mr. Colour' Dark Iron (214) - Camshaft top bar
'Tamiya' Hull Red (XF9) - Magnetos faces, gaskets on the exhaust openings and inlet manifold
'Tamiya' Deck Tan (XF55) - Spark plugs

Modifications:

NOTE: *The propeller shaft is too short to allow the propeller to fully locate into the engine (when fitted in the fuselage). The following step will allow the modified 3D printed propeller to fully locate into the engine.*

Using a drill of 1.4 mm diameter, drill deeper into the propeller shaft hole in the front of the engine crank case.

Spark plugs with ignition leads:

Cut twelve lengths of 'ModelKasten' 1.5 (0.2 mm diameter) black line.

Using CA adhesive, secure a line onto each spark plus end.

NOTE: *The following step is necessary so that the ignition leads do not contact the fuselage panels as the engine is fitted.*

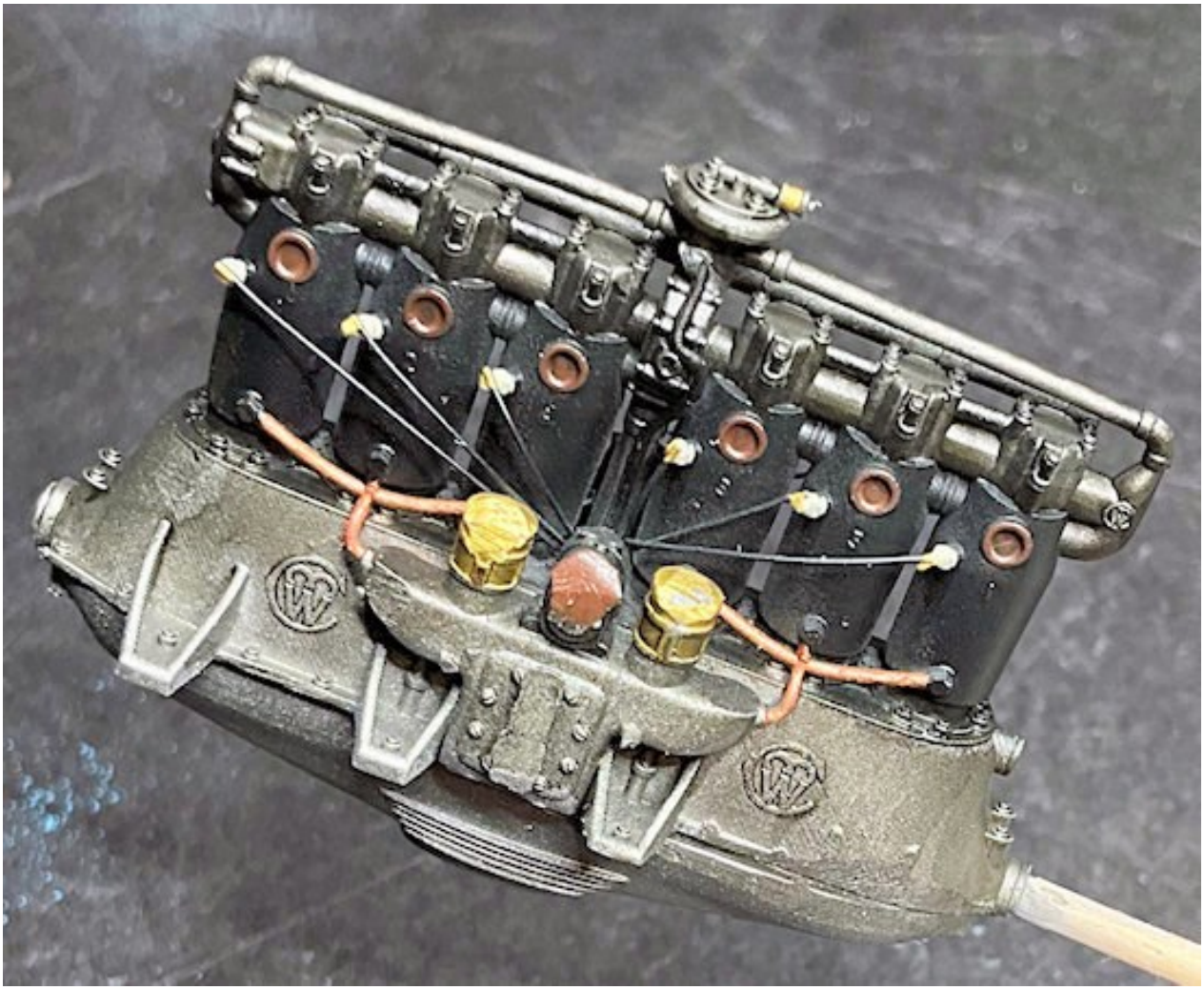
Trim the free end of each line so they lay behind the magneto bodies.

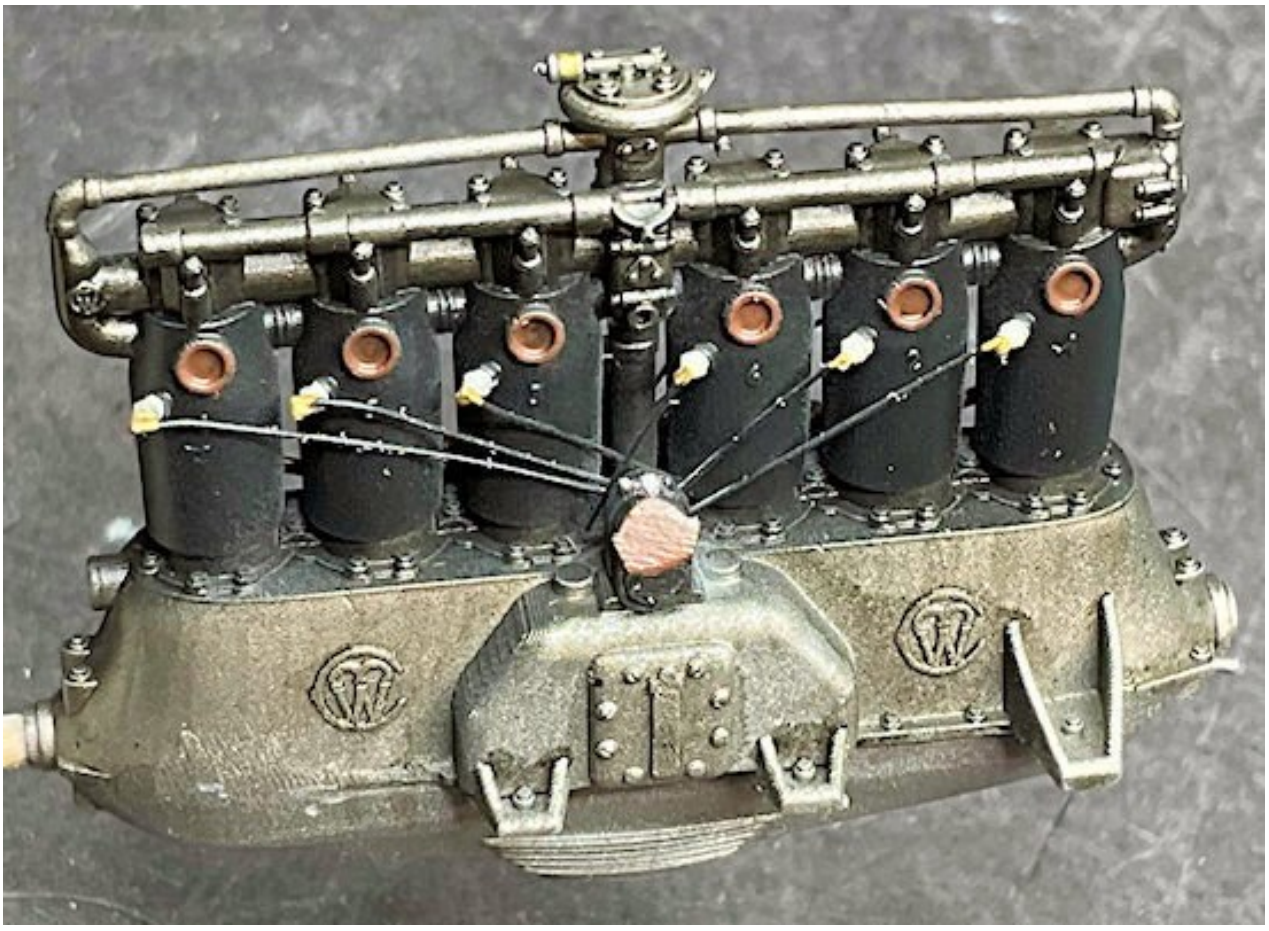
Paint the leads at the spark plugs with 'Mr. Colour' Brass (219) or similar.

Weathering:

Brush, as desired, 'AK Interactive' Kerosene wash (AK2039) over engine details.

The following photographs show the basic engine and where detail has had to be removed.





PART 8
FUSELAGE

PART 8 - FUSELAGE

References:
'JAPO Publications - Phönix D.I-D.II (Jan Zahalka, Mgr. Petr Aharon Tesar, Sigmund Tyrlik)
'Windsock' data file No.31 - Phönix D.I-II (Peter M. Grosz).
Online resources.

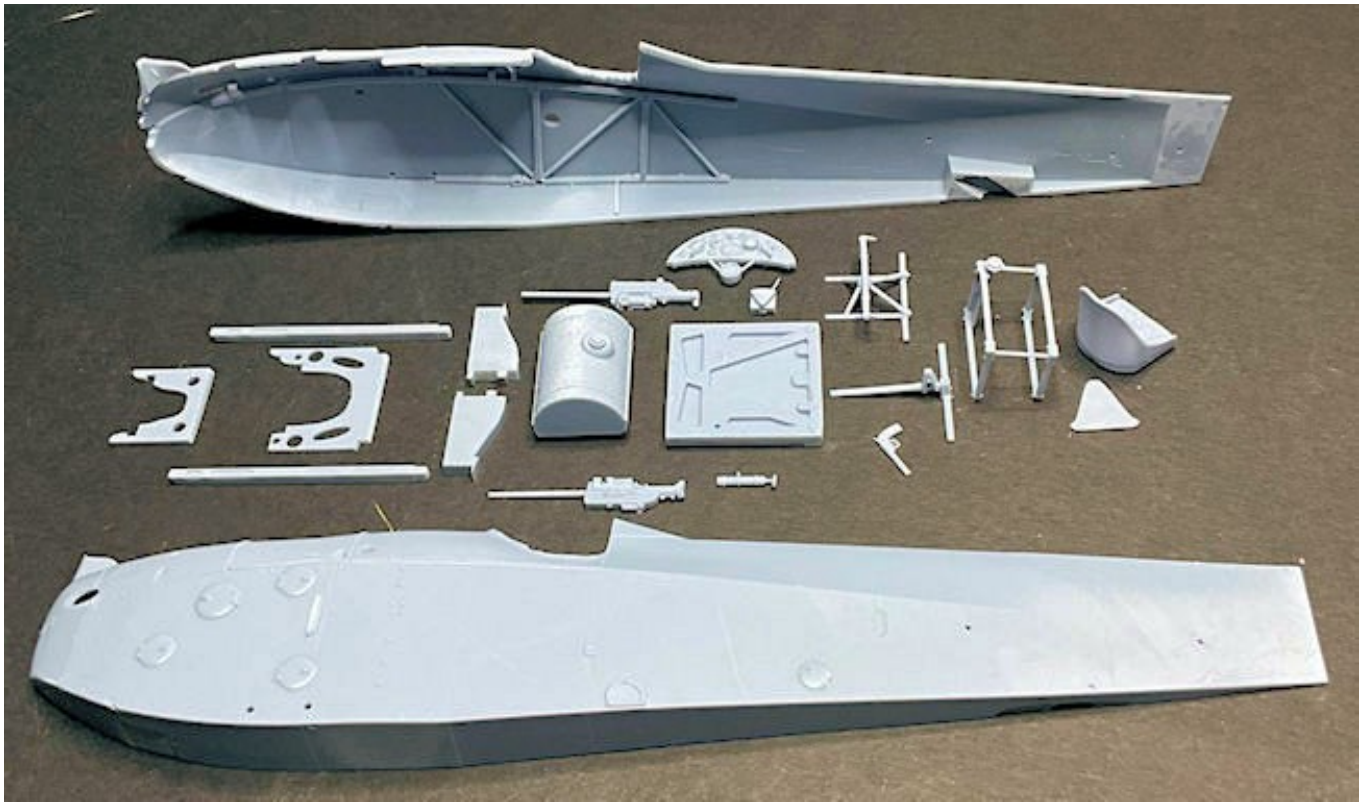
Preparation:

NOTE: *When removing the 3D printed parts from their 'support trees', **be careful to not cut through what may not be a support tree**. The printed parts are the same colour as their support trees and can be easily mistaken. Refer to the kit instruction illustration for the relevant 3D print to see what is a part and what are support trees.*
Handle the parts carefully as some of the parts are frail and easily broken, including the top of the forward fuselage. Also, some parts have very fine printed detail, such as the pilots instrument panel, which can easily be crushed.

Refer to Page 3 of the kit instructions and carefully snip or saw through the support trees to remove the various 3D printed fuselage components. Take care to not crush or break delicate parts when handling the components.

Carefully snip or saw through the support trees to separate the two fuselage halves.

Carefully file or sand away any residual support tree stubs from the edges of the parts.

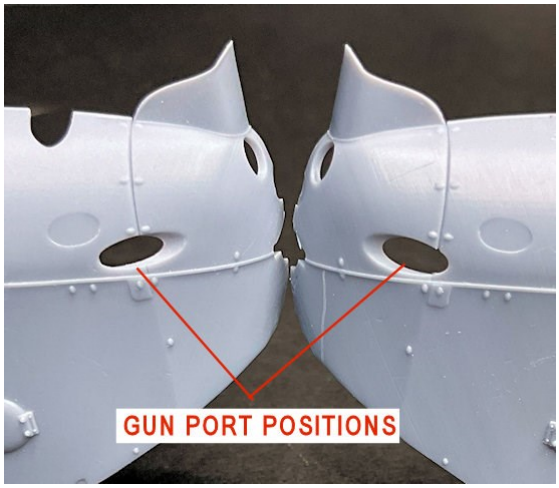


Remove the rudder bar 19 and seat belts 1 and 2 from the kit supplied sheet.

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

NOTE: *The fuselage and its parts have no locating recesses/pegs, apart from those for the rear of the control column cross bar and the support for the aileron operating cross tube. Therefore the parts are simply 'butt' joined.*

The two fuselage halves have the gun ports in different positions, but this may be due to the machine guns being asymmetrically mounted (to avoid engine components).



I found no reason to add the kit supplied fuel tank or the two machine guns, as they are totally hidden by the engine/bearer assembly and fuselage sides once the fuselage is 'closed up'.

Modifications:

Cockpit frames:

NOTE: *For reference, the two frames and the bulkhead are numbered in the following photograph. To modify these parts,* ***each must be test fitted*** *between the fuselage halves before final fitting.*

Cockpit bulkhead (3):

NOTE: *The cockpit bulkhead has no corner cut-outs to clear the fuselage internal side frames. Also the bulkhead is too wide to allow the two fuselage halves to make full contact with each other.*

File a shoulder notch into the top and bottom corners of bulkhead to clear the pre-printed fuselage upper and lower longerons on the fuselage right side and allow the side of the bulkhead to contact the side of the fuselage.

Locate frame 3 onto the inside of the right fuselage half, vertically over the hole for the lower wing rear support rod.

Hold the frame in position using such as 'UHU' White Tack or similar.

Check that the control column support bar and the support structure for the aileron control lever cand be located in their fuselage recesses and still contact the lower rear of frame 3. If necessary, adjust the position of frame 3.

Test locate the left fuselage half and note how much material, if any, needs to be removed from that side of frame 3 to allow the fuselage halves to fully contact each other.

Remove frame 3 from the right fuselage half.

File the left side of frame 3 and the shoulder notches the repeat the above procedure until the fuselage halves to fully contact each other.

Using CA adhesive, secure frame 3 in position in the right fuselage half.

Check again that the fuselage halves to fully contact each other.

Engine middle bearer frame (2):

NOTE: *The engine middle bearer frame is too wide to allow the two fuselage halves to make full contact with each other. This frame has a locating cut-out in the upper longeron of the fuselage left half. No shoulder notches are required to be made.*

Repeat the test fitting procedure, ensuring a slight chamfer is filed onto the bottom edge of the frame to align with the curved bottom of the fuselage.

Using CA adhesive, secure frame 2 in position on the right fuselage half.

Check again that the fuselage halves to fully contact each other.

Engine front bearer frame (1):

NOTE: *The engine front bearer frame is too wide to allow the two fuselage halves to make full contact with each other. Also the tops of the frame seem too high and interfere with fitting the blast shrouds into the gun ports. The top, rear edges of the frame locate against the front of the upper longerons in the fuselage halves.*

Repeat the test fitting procedure, ensuring a slight chamfer is filed onto the bottom edge of the frame to align with the curved bottom of the fuselage.

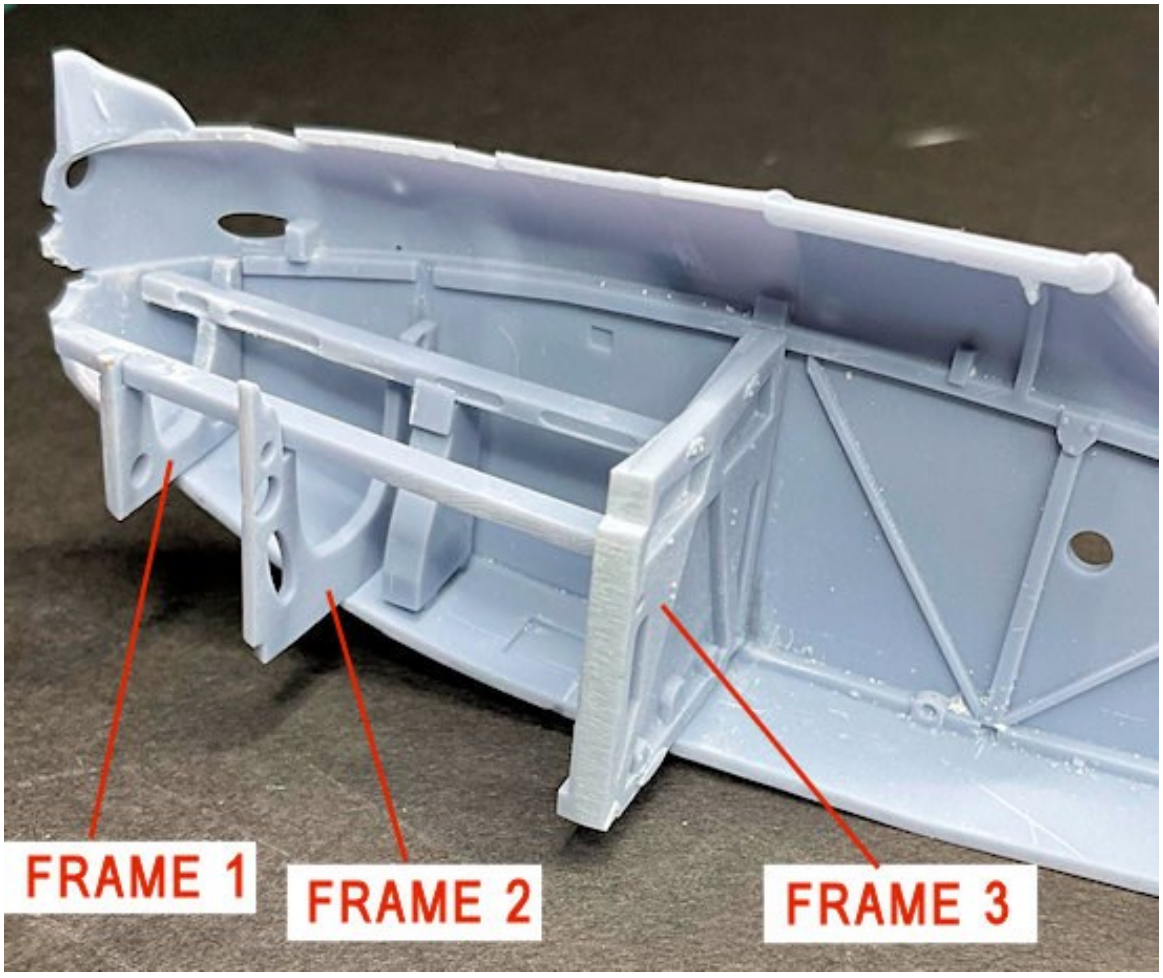
Using CA adhesive, secure frame 1 in position in the right fuselage half.

Check again that the fuselage halves to fully contact each other.

Snip away the tops of the frame to align with the top of the upper longerons.

NOTE: *At this stage it's necessary to fit the two engine bearers, so you can test fit the engine.*

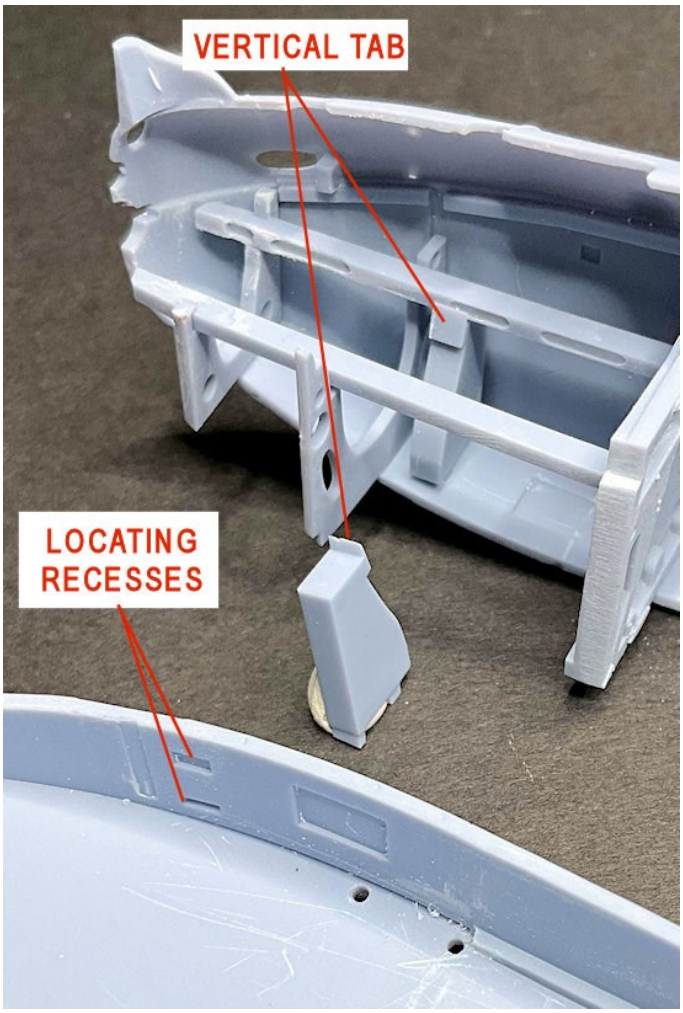
Using CA adhesive, secure the two engine bearers onto the frames and into their locating recesses in the forward face on frame 3.



Engine bearer ‘supports’:

NOTE: *The two ‘supports’ blocks for the engine bearers serve little purpose other than providing extra support under the engine bearers. Also they can’t be seen once the fuselage is ‘closed up. Therefore, you can* ***either*** *not fit them or follow the procedure detailed below.*

The two ‘supports’ blocks for the engine bearers fit into recesses in the bottom of the fuselage with their tops under the engine bearers and their vertical ’tabs’ against the inside edge of the engine bearers. Although the support for the fuselage right half can be fitted, the left can’t. This is because with the support fixed into its recesses in the fuselage left half, the vertical tab on the top of the support will contact the engine left bearer and stop the fuselage halves from being joined. Similarly, the support can’t be secured to the engine left bearer only, as there is no guarantee it will align with its locating recesses in the fuselage left half and in all probability it would be dislodged during closing up of the fuselage halves.



The locating lugs on the bottom of the bearer support blocks are ‘handed’ (angled) to align with the bottom curve of the fuselage halves.

Using CA adhesive, secure the right bearer support block vertically into its locating recesses in the fuselage right half and with its top under the engine right bearer (tab on the inner edge).

Cut away the vertical tab on the left bearer support block.

Using CA adhesive, secure the left right bearer support block vertically into its locating recesses in the fuselage left half.

Test locate the left fuselage half to the right.

Check that the left support block can locate under the engine left bearer and if not, separate the fuselage halves and remove material, as necessary, until the support block locates under the bearer.

Engine:

NOTE: *At this stage, the 3D printed engine can be test fitted. I found that the engine sump was too wide to allow the engine to sit fully on the engine bearers. After adjustments I found that seated engine was tilted slightly up at the front.*

A lot of finely printed detail is on the lower sides of the engine. However, I found that some of this detail prevented locating the engine onto the bearers, as the details were contacting the top edge of the fuselage panels. As that detail can't be seen once the fuselage is 'closed up', I chose to remove detail that Was stopping engine location.

I then located the engine onto the engine bearers in the fuselage right half, to ascertain where material could be removed or packing pieces added to correct the engine tilt.

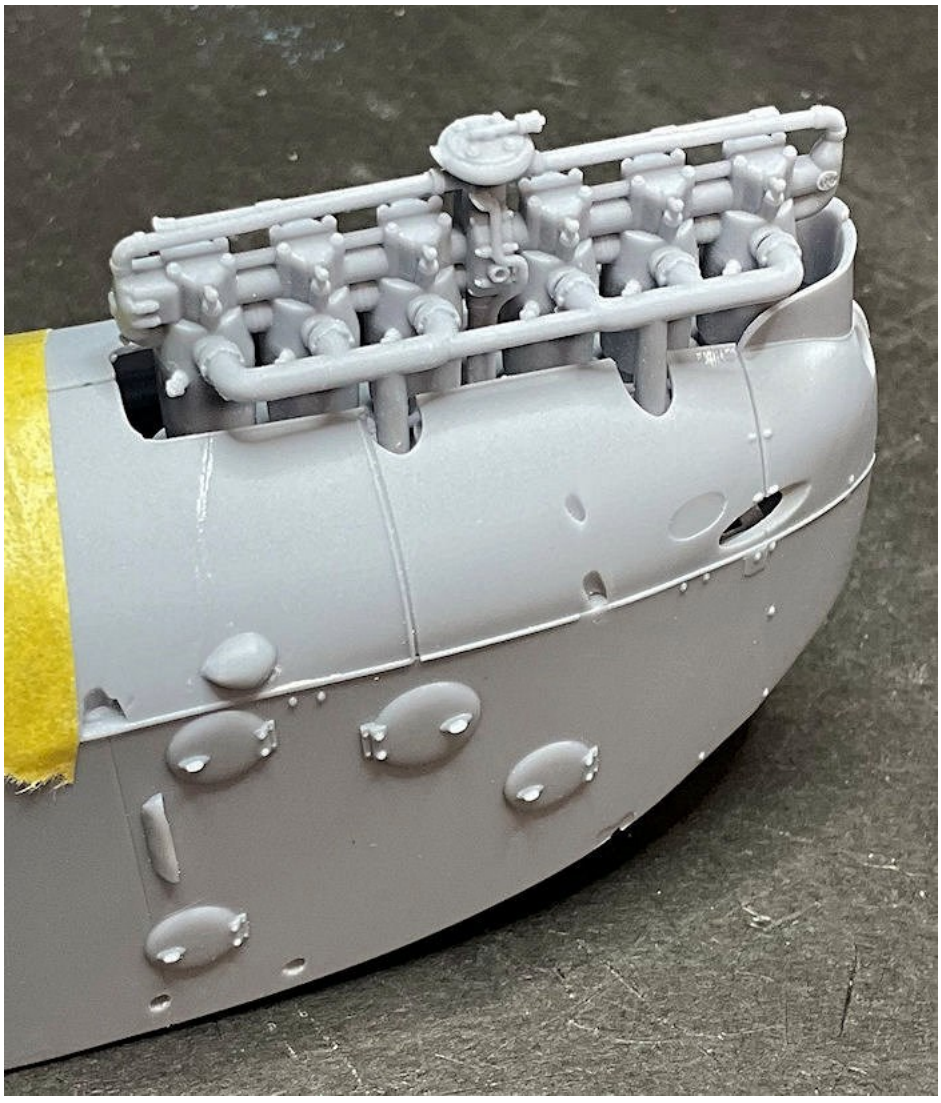
I then chose to remove the front mountings brackets from the engine crankcase at both sides of the engine. This allowed the engine to tip forwards.

I then used thin CA adhesive to secure small squares of plastic card onto the top of the two engine bearers at the location of the engine mounting brackets at the back of the engine crank case.

I continued to locate the engine onto the bearers, checking the engine alignment in the fuselage. I adjusted as necessary until the top of the engine cylinders were parallel to the fuselage and the engine propeller shaft recess at the front of the engine was central in its fuselage opening.

As a final check and with the engine located on the bearers, the fuselage left half was added and checked for full and free contact with the fuselage right half.

The fuselage halves were then separated and the engine removed.



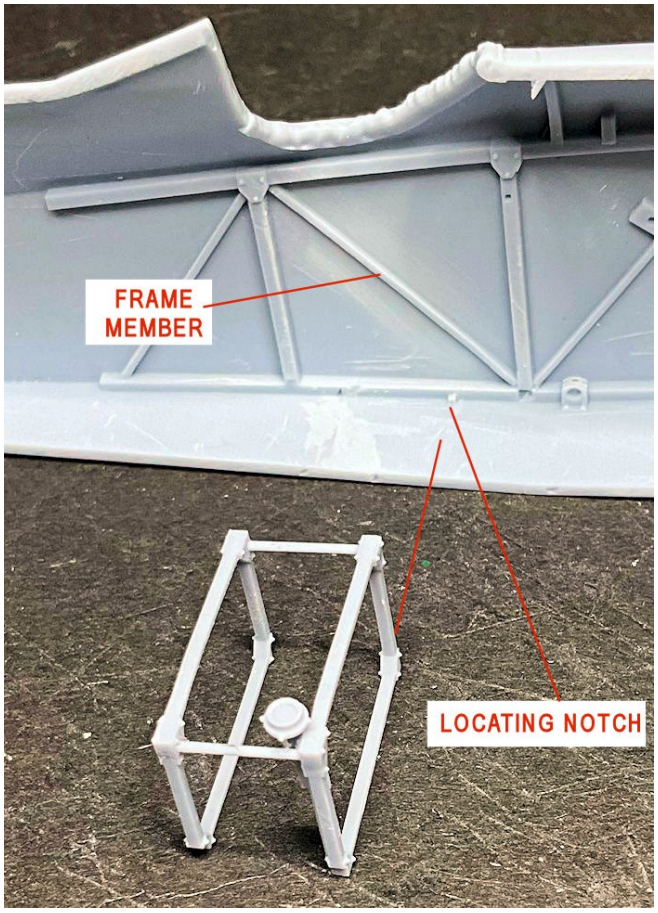
Check fit cockpit parts:

NOTE: *At this stage of the build, it's best to check the fit of the control column, aileron control support and the pilots seat/support frame.*

Pilots seat support frame:

NOTE: *The bottom of the seat support frame rests against the fuselage bottom longeron and in front of the locating notch. When test fitting the seat frame in position between the two fuselage halves, I found that the upper side bars were in contact with the diagonal frame member on the fuselage sides, causing the side bars to bow inwards slightly. As the seat support is fragile, this could break the side bars during assembly of the fuselage.*

Using a sharp curved scalpel blade, I scraped along the diagonal frame member on both fuselage halves, to reduce their depth. I checked to fit of the seat frame until the side bars were no longer bowed.



Control column:

NOTE: *The rear cross bar of the pilots control column locates into its recess in both fuselage halves. The photo-etch aileron control bars lever locates onto the front of the control column torque tube, which passes under the rudder bar support and contacts the lower, centre 'pad' on the cockpit bulkhead.*

Rudder bar support:

NOTE: *The rear cross bar of the rudder bar support locates into its recess in both fuselage halves, forward from the rear cross bar of the pilots control column. The two forward side bars contact the lower edge of the cockpit bulkhead.*

Test fit the control column and rudder bar support into their recesses in the right fuselage half and check that they contact the bottom of the cockpit bulkhead.

Locate the fuselage left side and check that the fuselage halves join fully without any obstruction from the control column or rudder bar support. If necessary, sand the ends of the control column and rudder bar support to prevent any obstruction.

NOTE: The control column stem was accidentally broken and replaced with Brass tube.

Aileron control tubes and openings:

NOTE: *The aileron control tubes between the aileron control bars lever in the cockpit and the underside of the upper wing are not supplied in the kit. Also the openings in the fuselage and underside of the upper wing for these control runs are printed solid and need to be drilled out.*

Use a drill of 1.5 mm diameter to drill through the opening in both fuselage halves. These holes will be modified later in the build (Part 10 Construction).

Aileron control tubes bar:

NOTE: *The kit supplied photo-etch aileron control tubes bar is extremely thin and flexible. There, I chose to replace it.*

Trace the outline of the photo-etch aileron control bars lever onto 0.5 mm thick plastic card.

Cut out the plastic lever and sand the edges to the same as the photo-etch lever.

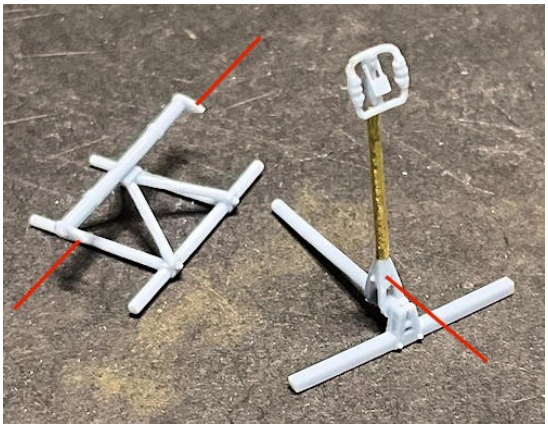
Drill a hole of 1.2 mm diameter through the centre of the plastic lever.

Control rigging holes:

Refer to the following photographs and drill holes of 0.3 mm diameter through:

The rudder control levers on the ends of the rudder bar.

The base of the control column (front to rear).



Painting:

NOTE: *It's necessary to paint the **fuselage internal** parts before assembly of the fuselage. The relevant internal parts are:*

Internal parts shown on Page 3 of the instructions, including the insides surfaces of the fuselage halves (not required - machine guns and fuel tank).

Phönix D.I engine and induction manifold only on page 4 of the instructions (other parts shown fitted/painted later).

Airbrush all of the parts, including the insides of the fuselage halves, with a grey primer, such as 'AK Interactive' Grey (AK758) or similar.

Airbrush or brush paint the parts as follows:

'MRP' Dark Wood (MRP-262' or similar - Fuselage interiors.

'MRP' Ochre Wood (MRP-260' or similar - Seat support frame and rudder bar.

Airbrush the same parts with 'Tamiya' Clear Orange (X26) thinned with 'Mr. Colour' Levelling Thinners 400.

Detail painting:

Brush paint the following details:

'Mr. Colour' Stainless Steel (213) - Inclinometer, trigger pads, speed selector
'Mr. Colour' Brass (219) - Hand pressure pump
'Tamiya' Gun Metal (X10) - Pistol body and barrel
'Tamiya' Hull Red (XF9) - Pump handle, speed selector handle, pistol handle
'Tamiya' Dark Yellow (XF60) - Hand grips on control column
'Tamiya' Grey Green (IJN) (XF76' or similar - Control column, rudder bar support frame, top side bars on seat frame
'Tamiya' Rubber Black (XF85) - Housing for speed selector, compass body (seat frame)

Instrument panel:

'Tamiya' Rubber Black (XF85) - Starter magneto, dial surrounds
'Mr. Colour' Brass (219) - switch/instrument surrounds
'Mr. Colour' Stainless Steel (213) - Altimeter, switch levers
'Tamiya' Clear Gloss (X22) - Instrument and dial faces

Pilots seat:

'Tamiya' Desert Yellow (XF59) - Seat and cushion
Seat - 'AK Interactive' Brown Leather (AK3031) with British Uniform Light (AK3082) lightly brushed.
Cushion - 'AK Interactive' Brown Leather (AK3031) with Black Uniform Base (AK3002).
'Flory Models' Dark Dirt wash - Refer Part 3 (Weathering), brush over the seat cushion to add relief.

Assembly:

Using thin CA adhesive, secure the hand pressure pump onto its locating hole in the fuselage left side.

Using thin CA adhesive, secure the Inclinometer onto its locating hole in the fuselage left side.

Using thin CA adhesive, secure the speed selector onto the vertical frame on the fuselage right side.

Using thin CA adhesive, secure the pilots seat centrally on the seat support frame.

Using thin CA adhesive, secure the pilots seat support frame onto the bottom longeron with its bottom front corner in front of its locating stub.

Using thin CA adhesive, secure the pistol onto the diagonally frame member on the fuselage right side.

Modifications (continued):

Speed select control rod:

Cut a length of 0.4 mm diameter Nickel-Silver rod, such as 'Albion Alloy's' NSR04 or similar.

Using thin CA adhesive, secure rod between the speed select and the cockpit bulk head.

Decals:

NOTE: *I chose to use appropriate decals from the 'Airscale' WW1 Generic set (AS32 WW1) instead of the kit supplied decals.*

Apply appropriate decals from the 'Airscale' WW1 Generic set to the dials and altimeter on the instrument panel and compass on the pilots seat frame.

Assembly (continued):

Pilots instrument panel:

NOTE: *The pilots instrument panel may be too wide to allow the two fuselage halves to make full contact with each other.*

Using CA adhesive, secure instrument panel in position on its shoulder on the right fuselage half.

Locate the fuselage left side onto the right side and check that the fuselage halves can fully contact each other. If not, support the panel and carefully file or sand away the left edge of the panel until the fuselage halves make full contact with each other.

Using thin CA adhesive, secure the engine onto the engine bearers on the fuselage right half, making sure:

The propeller shaft on the front of the engine sump is central in its opening in the nose of the fuselage.

The engine sits horizontal in the fuselage half

The two fuselage halves fully locate against each other.

Rigging:

Aileron control rods:

The aileron control rods between the cockpit and underside of the upper wing will be added later in this build.

Elevator control cables:

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

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

Cut two lengths of 0.4 mm diameter blackened Brass tube, such as ’Albion Alloy’s’ MBT04 or similar.

Pass one line through a tube then through the pre-drilled hole in the base of the pilots control column.

Use thin CA adhesive to secure the line in the control column then the tube onto the line.

Cut away any residual line from the front of the control column.

Pass the second line through the other tube then through the recess in the centre, rear of the control column cross member. Then partially insert the tube into the recess.

Use thin CA adhesive to secure the line and tube in the control column.

Cut away any residual line from the front of the control column cross member.

Rudder control cables:

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

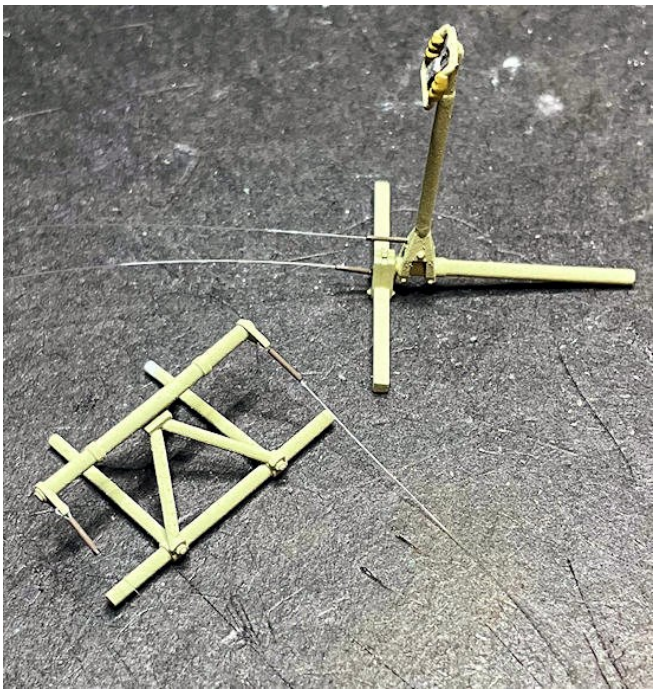
Cut two lengths of 0.4 mm diameter blackened Brass tube, such as ’Albion Alloy’s’ MBT04 or similar.

Pass each line through a tube then through the pre-drilled holes in the levers on the ends of the rudder bar.

Loop the lines back and through the tubes then draw the tubes up to, **but not touching**, the levers.

Use thin CA adhesive to secure the tubes on the lines.

Cut away any residual tag of line at the tubes.



Assembly (continued):

Rudder bar support:

Using CA adhesive, secure the cross member of the rudder bar support into its locating hole in the bottom longeron of the fuselage right side. Make sure the rudder bar support is at 90 degrees to the fuselage half when viewed from above and parallel to the bottom of the fuselage half.

Using CA adhesive, secure the front of the two side bars to the bottom of the cockpit bulkhead.

NOTE: *The use of 'UHU' White Tack (or similar) is to temporarily hold the control lines in position.*

Push a ball of 'UHU' White Tack onto the rear, inside of the fuselage half, keeping it clear of the fuselage edges.

Pass the two rudder bar control lines rearwards under the pilots seat frame.

Gently take up any slack in the lines whilst pressing their ends into the White Tack.

Control column:

NOTE: *During the following step, take care positioning the control column, especially near the altimeter located at the bottom of the pilots instrument panel.*

Locate the control column into the cockpit with its rear cross member in it locating recess and the torque tube under the centre of the rudder bar support.

Slide the aileron control lever (created earlier) onto the front of the torque tube of the control column.

Using CA adhesive, secure the cross member of the control column into its locating recess in the bottom longeron of the fuselage right side. Make sure the control column cross member is at 90 degrees to the fuselage half when viewed from above and parallel to the bottom of the fuselage.

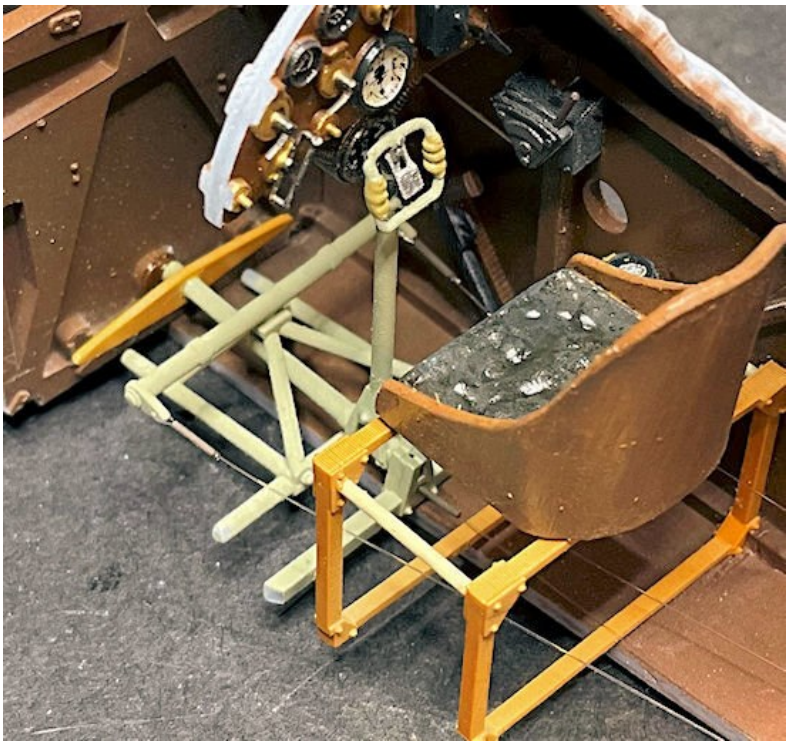
Using CA adhesive, secure the aileron control lever onto the torque tube, making sure the lever is parallel to the bottom of the fuselage half.

Pass the two elevator control lines rearwards under the pilots seat frame.

Gently take up any slack in the lines whilst pressing their ends into the White Tack.

Use CA adhesive to secure the lines (in front of the White Tack) onto the fuselage.

Once the adhesive has set, remove the White Tack.



Seat belts:

Remove the four seat belts from the kit supplied photo-etch sheet.

Remove any photo-etch ‘tags’ from the edges of the parts.

NOTE: *The photo-etch seat belts are thin, so do not really need to be annealed (softened) by applying heat.*

Brush ‘Mr. Metal R’ etch primer onto the parts.

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

Airbrush ‘Tamiya’ Dark Yellow (XF60) or similar over the seat belts.

Brush paint the metal fittings of the belts with ‘Mr. Colour’ Stainless Steel (213) or similar.

NOTE: *The lap seat belts are too long to be attached to the side bars of the seat support.*

Lightly sand the smooth non-detailed face of the longer (shoulder) seat belts at the square end fittings.

Lightly sand the smooth non-detailed face of the shorter (lap) seat belts at the looped end fittings.

Locate the shoulder harness over the top sides of the pilots seat, bending the belts near the belt buckle.

Secure the two belts (square end fittings) in position on the back of the seat using thin CA adhesive.

Secure the front of the two belts in position onto the seat back and onto the seat cushion, using thin CA adhesive.

Secure the two lap belts (looped end fittings) onto the rear of the top corners of the seat frame, using thin CA adhesive.

Twist the belts slightly to angle them towards the sides of the seat.

Bend the straps over the seat sides and onto the seat cushion.

Secure the lap belts onto the seat cushion using thin CA adhesive.

If desired, carefully brush a dark pigment powder over the straps to ‘dirty’ them slightly.

Rigging (continued):

Gun trigger cables:

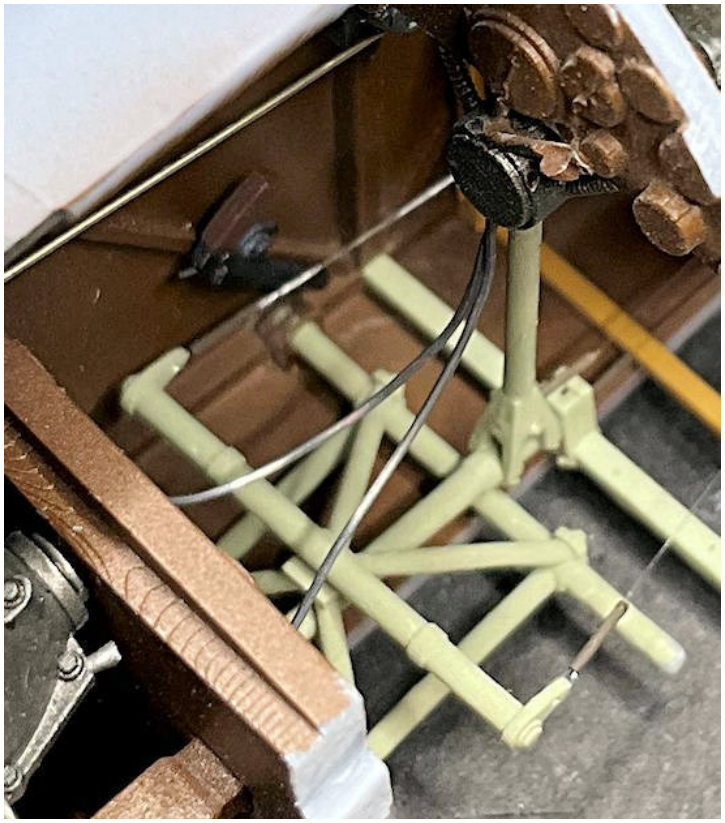
Cut two long lengths of 0.3 mm diameter lead wire, such as that from ‘PlusModel’ or similar.

Bend one end of each wire to 90 degrees.

Use CA adhesive to secure the bent ends into the outer recesses at the top, rear of the cockpit bulkhead.

Trim the length of the two wires so that they can be looped down then up to the rear of the gun triggers on the control column.

Secure the ends of the two wires to the control column using thin CA adhesive.



Assembly (continued):

NOTE: *During the following step, make sure the fuselage halves and internal parts are aligned correctly with no obstructions. If the fuselage halves do not close fully, investigate why and correct.*

Locate the fuselage halves together, making sure the join and align correctly and with no obstruction from the internal parts.

Holding the fuselage halves together, apply thin CA adhesive at points along the fuselage joint to tack the fuselage together.

Once the adhesive has set, apply thin CA adhesive along all of the fuselage joint to secure the two fuselage halves fully together.

Once the adhesive has fully set, file or sand the fuselage joint to blend the joint to the surrounding areas, making sure you don't remove any of the printed surface details.

Cut a length of 1.0 mm diameter rod long enough the pass through the hole in the tail skid, leaving its end slightly proud of the top (fuselage end) and the 'shoe' on the bottom.

Pass the rod through the hole in the tail skid and secure it in position using thin CA adhesive.

Secure the shroud for the tail skid into its recess in the underside, rear of the fuselage.

Insert the tail skid through the shroud and into the fuselage, leaving the printed suspension cord visible at the shroud, then secure it in position using thin CA adhesive.

Using thin CA adhesive, secure the pilots head rest onto the fuselage/fairing at the rear of the cockpit

Using thin CA adhesive, secure the rectangular panel into its recess in the forward, underside of the fuselage.

Using thin CA adhesive, secure the slotted intake into its recess in the forward, underside of the fuselage (under the nose cowl).

Once the adhesive has fully set, file or sand the added details to blend their edges to the surrounding areas, making sure you don't remove any of the printed surface details.

NOTE: *The following steps are necessary to ensure there are no visible gaps in joints or seams on the fuselage.*

Blank off the open cockpit and engine as well as all openings in the fuselage.

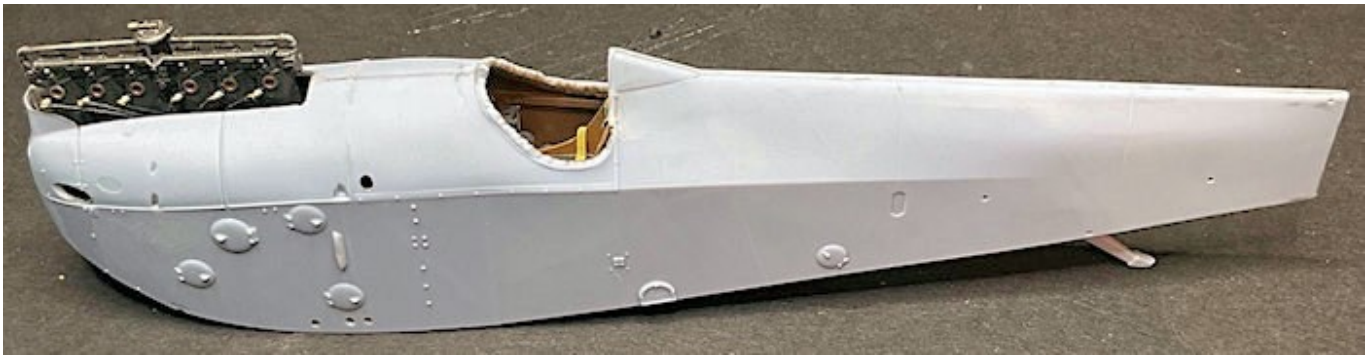
Airbrush the fuselage joints/seams with a grey primer, such as ‘AK Interactive’ Grey (AK758) or similar.

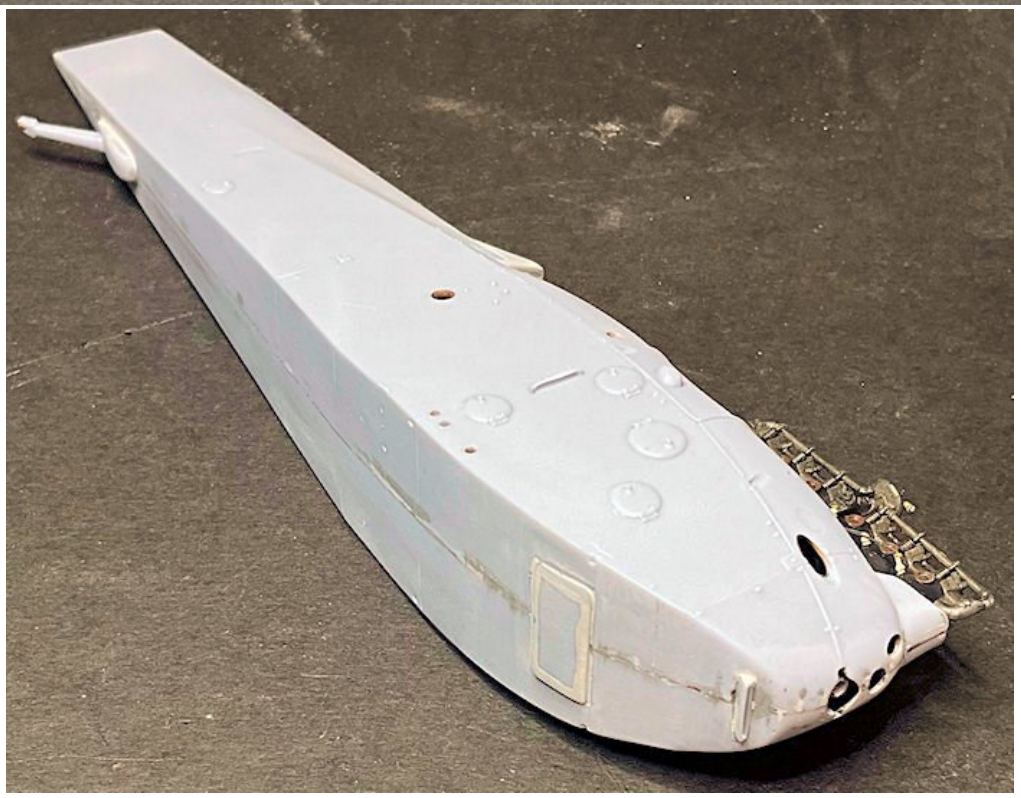
Check the joints/seams for any visible gaps or recesses. If any are found, apply ‘Mr. Colour’ surfacer 500 or 1000 by brush over the joints/seams and allow it to fully set.

Lightly sand the filled joints/seams to blend them with the surrounding areas.

Re-prime the areas and once dry, check the joints/seams. If necessary, repeat the previous procedure until the joints/seams are no longer visible.

If necessary, use a scriber to care re-instate any panel lines that may have been removed during sanding.





Modifications (continued):

Support holes for lower wings:

NOTE: *The kit supplies 1.2 mm diameter steel rod for use as the supports for the lower wings. However, once the fuselage is joined together, I found that rear rod locating holes on both sides of the fuselage were obstructed by the internal cockpit bulkhead. Therefore, new locating holes needed to be drilled.*

Point mark the fuselage sides 5.5 mm rearwards from the existing front rod locating hole, making sure the marks are aligned centrally to the existing rear locating holes.

Using the point marks as a guide, drill holes of 1.2 mm diameter through the fuselage sides, making sure the holes are drilled at 90 degrees when viewed from above and are horizontal when viewed from the front.

Also, drill through the existing front rod locating holes, as the existing holes are slightly too small for the rod supplied in the kit.

Lay the lower wings against the fuselage sides and point mark the position of the drilled rear locating holes onto the wing roots, making sure the marks are aligned centrally to the existing rear locating hole.

Using the point marks as a guide, drill holes of 1.2 mm diameter as far as possible into the lower wings, making sure the holes are drilled at 90 degrees when viewed from above and are horizontal when viewed from the front.

Also, drill through the existing front rod locating holes, as the existing holes are not deep enough into the wings to provide adequate support (the lower wings are solid resin and heavy).

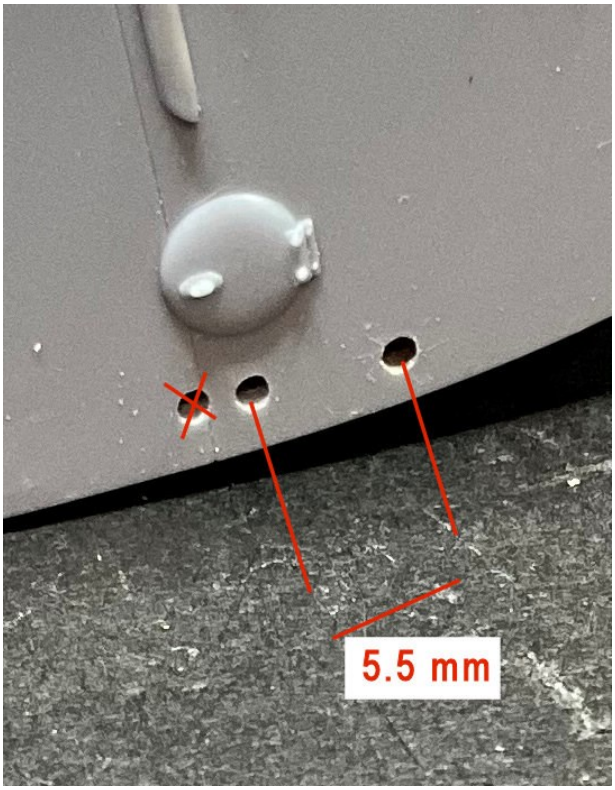
Cut two lengths of the supplied 1.2 mm diameter rod, long enough the be inserted fully into both lower wings and span the width of the fuselage.

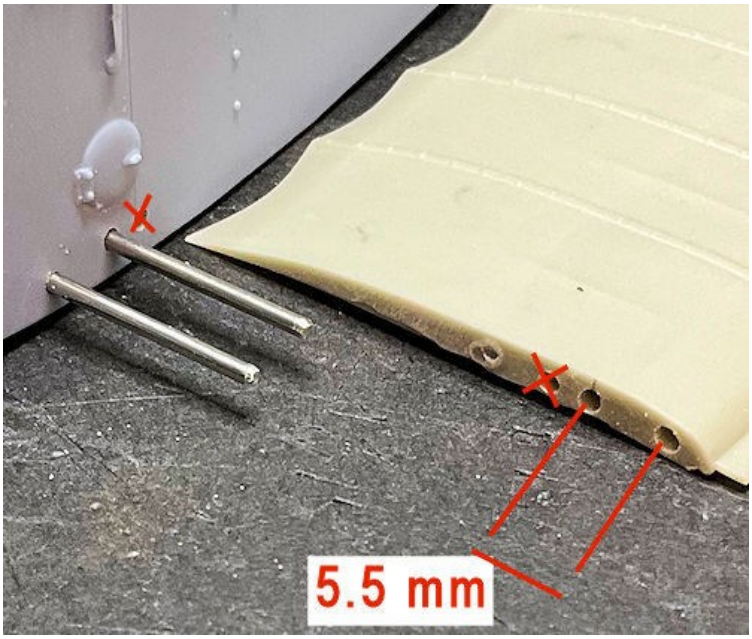
Test fit the rods through the fuselage and into both wings.

Check that the lower wings are at 90 degrees to the fuselage when viewed from above and are horizontal to the fuselage when viewed from the front.

Remove the wings and rods.

Using thin CA adhesive, secure the two rods fully into the drilled holes in one of the lower wings.





Painting (continued):

Blank off the open cockpit and engine as well as all openings in the fuselage.

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

Refer to the following illustration and blank off the fuselage, leaving only the metal panels visible.

Airbrush the exposed panels with a ‘Tamiya’ Gloss Black (X1) or similar.

Airbrush the black painted panels with ’Alclad’ Duraluminium (ALC102) or similar.

Remove the fuselage masking from around the painted panels.

Decals:

Preparation:

NOTE: *The decals in this particular kit supplied by 'Lukgraph' are semi-translucent and therefore any base colour under the decals will show through and affect how the decal appears when applied. For the hand painted brown and beige 'mottled' decal used to cover the fuselage sides and top and the plywood decal for the underside of the fuselage, a base colour of 'Tamiya' Dark Yellow (XF60) or similar is best.*

The decals used are:

'Lukgraph' Phönix D.I Camo-Wood (kit supplied)

*'Lukgraph' Dark plywood 2 (DEC005) (**not** kit supplied).*

Mask off the Duraluminium painted panels and leave all other blanking in fuselage openings in position.

Airbrush 'Tamiya' Dark Yellow (XF60) or similar over the exposed fuselage.

Check the painted surface is smooth and free from any surface artifacts.

Remove all masking and blanking from the fuselage.

Airbrush light coats of a clear gloss, such as 'Mig' A-Stand Aqua Gloss (A.Mig-2503) or 'Alclad' Aqua Gloss 600.

Check the surface is smooth and free from any surface artifacts.

Application:

NOTE: *As the whole fuselage will be covered in decal, it's best the apply the decal in two pieces on each side (one forward, one rear).*

Fuselage left side decal:

Use tracing paper to trace the outline of the whole fuselage side with the top of the tracing along the centre of the fuselage spine.

Cut out the traced template then lay it accurately onto the fuselage side and trim the template as required.

Lay the template onto the back of the ‘Lukgraph’ Camo-Wood decal sheet and trace it’s outline onto the sheet.

Cut the decal shape from the decal sheet.

Lay the decal accurately onto the fuselage side and check it aligns correctly. If necessary, trim the decal as required.

Mark the decal at the vertical panel joint on the fuselage at the rear of the cockpit.

Separate the decal by cutting the decal along the marked panel line.

Forward left decal:

Hold the decal in position and press over the raised fuselage details (access panels etc). This will provide an impression of the surface detail on the decal.

NOTE: *The following step will allow the decal to be applied over the raised detail with less chance of the decal creasing or trapping water/air.*

Using a sharp curved scalpel blade or similar, cross cut through the decal over the impressions of the four fuselage access panels and also along the sides of the cooling louvre.

Refer to Part 4 (Decals) of this build log and apply the fuselage forward decal as for an ’Aviattic’ decal. If ‘MicroScale’ MicroSol or similar decal solutions are not enough to conform the decal over raised or curved detail, you can brush ’Tamiya’ X20A thinners sparingly over the decal. However, do not continue to brush or the decal may melt.

Rear left decal:

Use the same procedure as used for the forward decal, but cut out the pilots foot step before the decal is applied.

Fuselage right side decals:

Use the previous procedure to apply the forward and rear decals to the right side of the fuselage. When applying the fuselage right side decals, make sure that:

- The join of the left and right decals along the spine of the fuselage do not overlap. Otherwise the semi-translucent decals will darken in colour where they overlap.
- There is no gap between the join of the decals, otherwise the base dark yellow colour will be seen.

Underside plywood:

NOTE: *The decals used is the 'Lukgraph' Dark plywood 2 (DEC005) (**not** kit supplied).*

Use the previous procedure to apply the plywood decal along the underside of the fuselage. When tracing then cutting out the decals, make sure that:

- Separate decals are made for each of the pre-printed underside panels, using the visible panel lines as guides.
- Once the front decal under the fuselage nose has been applied, carefully slice around the rectangular panel and remove that part of the decal.
- Trace and cut the rear decal, around the tail skid, as two separate decals (forward and rear).
- The joins between each decal do not overlap. Otherwise the semi-translucent decals will darken in colour where they overlap.
- There is no gap between the join of the decals, otherwise the base dark yellow colour will be seen.

Removing unwanted decal:

NOTE: *Some of the applied decal needs to be removed from some of the fuselage detail, as those details have to be painted.*

Using a sharp, curved scalpel blade or similar, carefully scrape away the decal covering the raised access panel (x 8) and cooling louvres (x 2) on the sides of the fuselage and any excess decal around the cockpit edge padding

If necessary, brush 'Tamiya' X20A thinners **sparingly** around the edges of the raised details to seal the edges of the decal. However, do not continue to brush or the decal may melt.

Painting (continued):

Brush paint the fuselage details as follows:

'AK Interactive' Brown Leather (AK3031) - Cockpit surround padding and pilots head rest.

'Mr. Colour' Stainless Steel (213) - Fuselage round access panels (x 8), underside rectangular panel, cooling louvres (x 2), fuselage side bolt heads, machine gun blast shrouds.

Tail skid:

Refer to Part 2 (Wood Effects) of this build log - Brush paint the tail skid and its fairing with 'Windsor & Newton' Griffin Alkyd paint (Burnt Umber). Brush paint the shoe of the tail skid with 'Mr. Colour' Stainless Steel (213). Brush paint the tail skid suspension cords with 'Tamiya' Buff (XF57) or similar.

Engine inlet manifold:

Refer to Part 3 (Weathering) of this build log - Brush on, let dry then remove 'Flory Models' wash (Rust) to leave a slight residue on the inlet manifold.

Assembly (continued):

Insert the engine inlet manifold into its two openings in the right engine panel then secure it against the engine ports using thin CA adhesive.

Using thin CA adhesive, secure the two machine gun blast shrouds into their openings in the nose of the fuselage.

Decals (continued):

NOTE: *Refer to Part 4 (Decals) of this build log. These decals are semi-translucent and like the 'Aviattic' clear backed decals, will show through the base colour of the surface underneath. If in doubt test a spare decal on the base colour. Also the decals are not 'cookie cut' and instead are printed as part of the carrier film on the entire decal sheet supplied. Therefore they need to be accurately cut out from the sheet in order to limit the amount of carrier film left around the decal.*

Cut out the white lightening and J.12 serial marking decals from the supplied sheet. Cut out the decals as close as possible to the edges of the decals.

Refer to the following illustration and apply the decals to the fuselage.

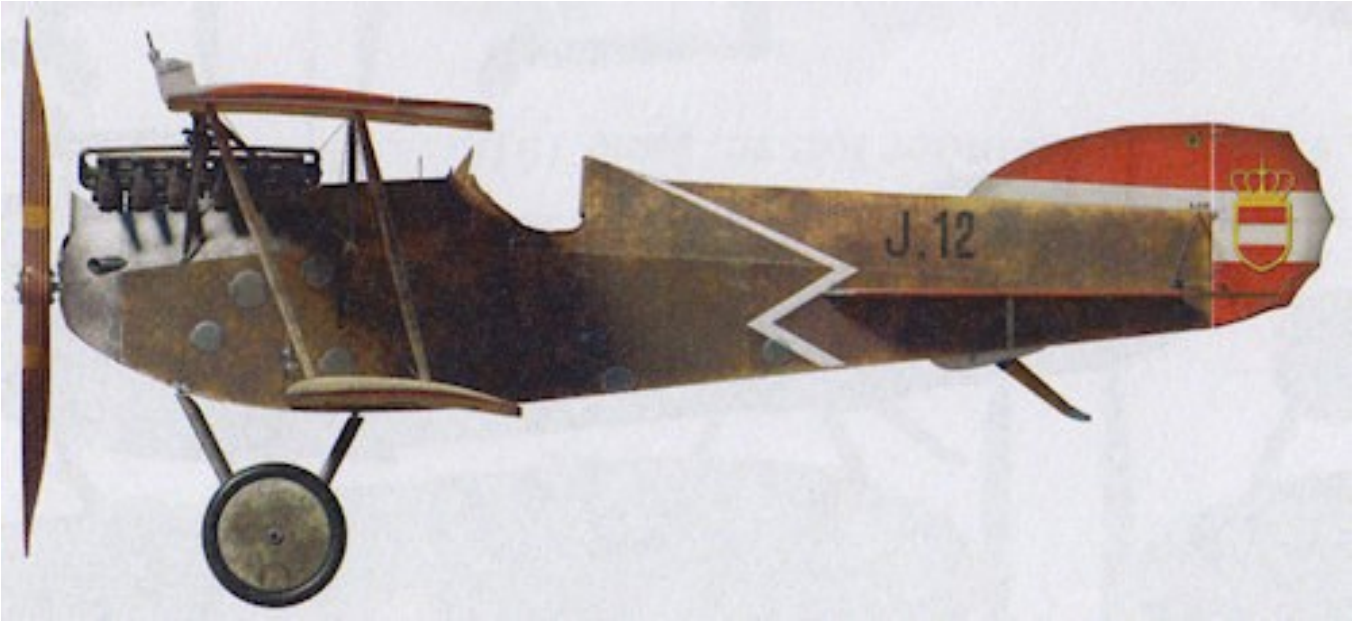


Photo-etch parts:

NOTE: *Refer to pages 7, 8 and 9 of the kit instructions. At this stage of the build, only photo-etch parts 6, 7, 12, 14 and 15 are required.*

Remove photo-etch parts 6, 7, 12, 14 and 15 from the kit supplied sheet.

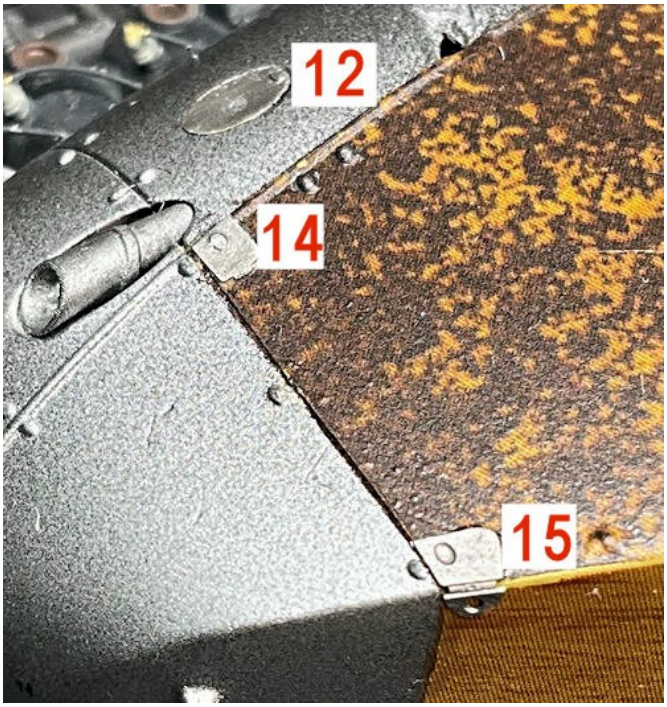
Remove any residual photo-etch tags from the sides of the parts.

Brush ‘Mr. Metal’ Primer R over the visible side of the parts.

Brush ‘Mr. Colour’ Stainless Steel (213) over the visible side of the parts.

NOTE: *Photo-etch parts 6 and 15 need to be bent to fit the model. The molded stub at the photo-etch part 14 needs to be removed to all the part to fully contact the fuselage.*

Using thin CA adhesive, secure the photo-etch parts in their locations on the fuselage.



Weathering:

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

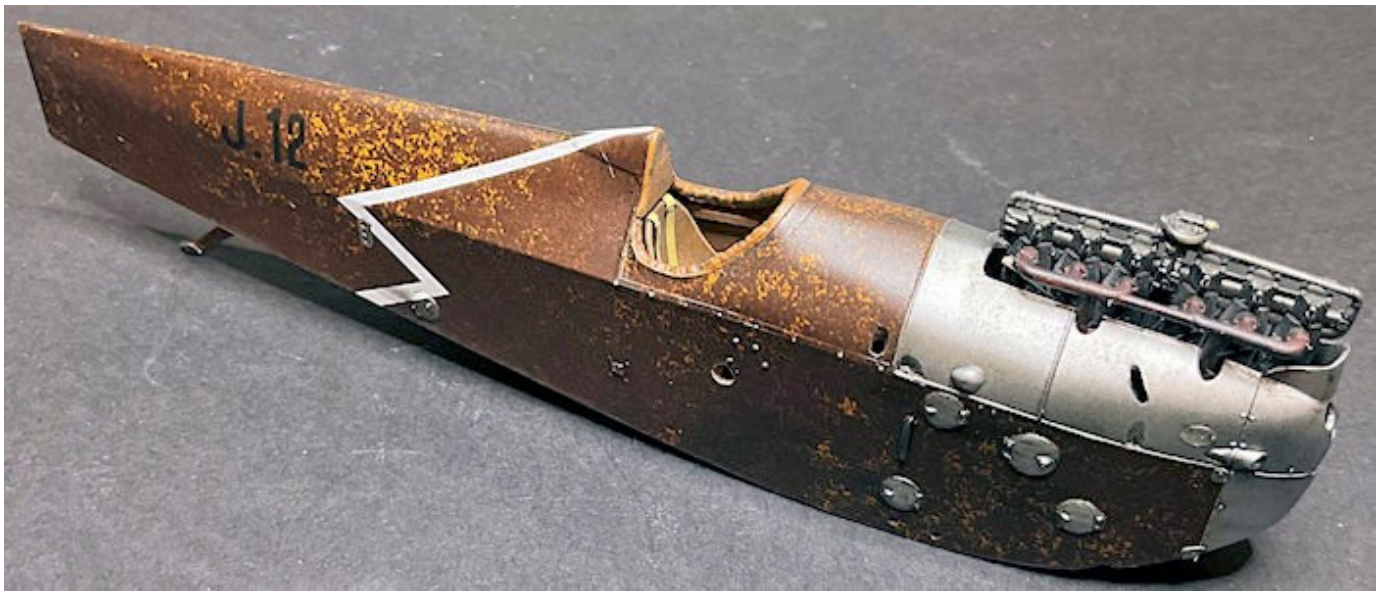
Airbrush a sealing/protection semi-matt clear coat, such as 'Alclad' Light Sheen (ALC311) or similar over the whole fuselage.

Apply 'Flory Models' Dark Dirt clay wash over the fuselage then, once dry, remove the wash to achieve your desired weathering effects.

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

Apply 'Tamiya' Weathering Master (Set B) Soot around the machine gun blast shrouds and behind the fuselage access panels.

Airbrush a sealing semi-matt clear coat, such as 'Alclad' Light Sheen (ALC311) or similar over the whole fuselage.



PART 9
WHEELS

PART 9 - WHEELS

Preparation:

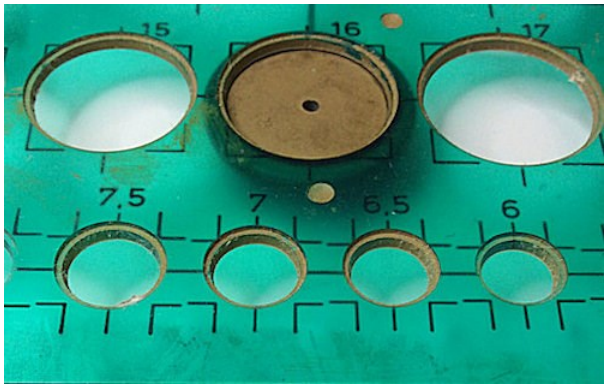
Airbrush the two wheels with a grey primer, such as ‘AK Interactive’ Grey (AK758) or similar.

Airbrush the two wheels with ‘Tamiya; Neutral Grey (XF53) or similar.

NOTE: *The decals in this particular kit supplied by ‘Lukgraph’ are semi-translucent and therefore any base colour under the decals will affect how the decal appears when applied. For the hand painted brown and beige ‘mottled’ decal used for the front and rear wheel covers, a base colour of ’Tamiya’ Dark Yellow (XF60) or similar is best.*

The decals used is the ‘Lukgraph’ Phönix D.I Camo-Wood (kit supplied).

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 front and rear wheel covers with ’Tamiya’ Dark Yellow (XF60) or similar.

Check the painted surface is smooth and free from any surface artifacts.

Airbrush light coats of a clear gloss, such as ‘Mig’ A-Stand Aqua Gloss (A.Mig-2503) or ‘Alclad’ Aqua Gloss 600.

Check the surface is smooth and free from any surface artifacts.

Application:

NOTE: *To create the circular decals for the wheel covers, I used a ‘ThinnerLine Circle Cutter’ and cut the decals from the ‘Lukgraph’ Phönix D.I Camo-Wood decal sheet (kit supplied).*

Test cut circles from a sheet of paper to determine the correct diameter for the decals to fit over the wheel covers without overlapping onto the tyres.

Cut the four decals discs, as required, from the kit supplied decal sheet.

NOTE: *During the next steps, refer to the following photograph for guidance.*

Using a sharp curved scalpel blade or similar, cross cut through the centre of each decal disc, as this will allow the decals to fit more easily over the raised centre hubs on the wheels.

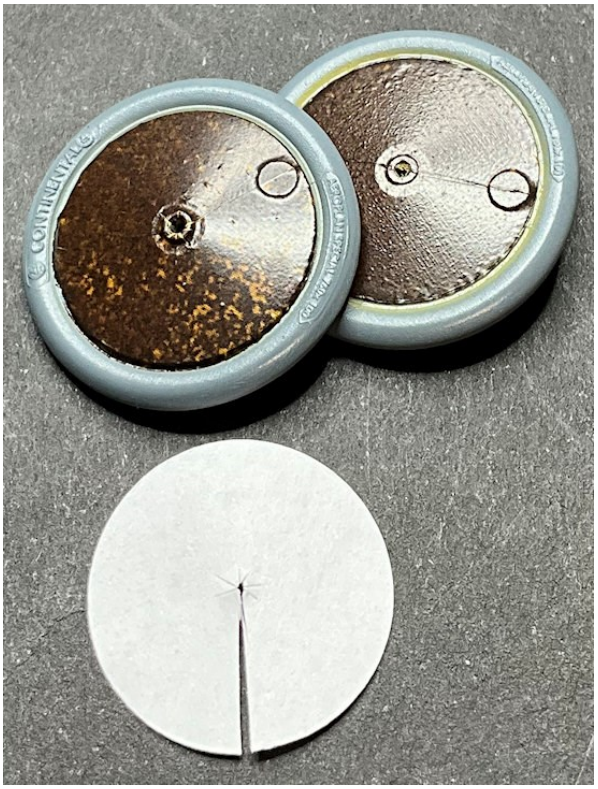
Using a sharp curved scalpel blade or similar, cut a thin wedge of each decal disc, from the centre to the outer edge. This will allow the decal to lay over the convex surface of the wheels.

Refer to Part 4 (Decals) of this build log and apply the decals. Use a damp finger tip to push the two edges of the cut out wedge together.

Weathering:

NOTE: *Refer to Part 3 (Weathering) of this build log. At this stage it’s best to protect the applied decals with a clear coat.*

Airbrush a sealing/protection semi-matt clear coat, such as ‘Alclad’ Light Sheen (ALC311) or similar over the applied wheels.



Apply ’Flory Models’ Dark Dirt clay wash over the wheels then, once dry, remove the wash to achieve your desired weathering effects.

Airbrush a sealing semi-matt clear coat, such as ‘Alclad’ Light Sheen (ALC311) or similar over the wheels.

PART 10
WEAPONS

PART 10 - WEAPONS

The Phönix D.I fighter was armed with two synchronised forward firing ‘Schwarzlose’ 8mm machine guns.

NOTE: ***I chose not to add the kit supplied machine guns, as they are totally hidden by fuselage and engine once the fuselage is ‘closed up’ and therefore can’t be seen.***

PART 11
PROPELLER

PART 11 - PROPELLER

The kit supplies two different propellers, which I believe were manufactured by 'Knoller-Jaray' and 'Sigma'. I chose not to use either for the following reasons:

> *The 'Knoller-Jaray' propeller supplied in the kit is generally correct, but the outer area of the blades needs to be modified. The kit propeller is too rounded at the tips and also needs to be chamfered more towards the tips.*
>
> *The 'Sigma' propeller appears to have been printed reversed, so is not correct for either the Phönix D.I or D.II models. It would be correct for a Phonix D.III aircraft, which 'Lukgraph' do not make.*

Therefore, I chose to fit a hand made, wood laminated propeller, based on the 'Sigma' type, from Alex at 'Proper Plane' in Ukraine.

Preparation:

Carefully cut off the two 'Proper Plane' resin hub plates from their casting block.

Press the plates rear face down on flat sand paper and drag with a finger to remove residual resin down to the thickness of the cast plates.

Brush paint the plates with 'Tamiya' Semi-matte Black (XF18) or similar.

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

Assembly:

Using thin CA adhesive, secure the front hub plate centrally onto the propeller, making sure it is fitted to the front face of the propeller hub.

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

Decals:

NOTE: *The most appropriate manufacturer decals I could find are the 'Jaray-Wein' decals from the 'LF Models' Austro-Hungarian propeller labels (C3205). These decals are printed as part of the complete sheet so need to be carefully cut out.*

Apply the 'Jaray-Wein' decals centrally onto the propeller blades, making sure the decals are applied to the front faces of the blades. The wings on the decals face towards the tips of the propeller.

Modification:

NOTE: *The wood laminated propellers from 'Prop Plane' have no propeller shaft. The kit supplied 3D printed engine has a hole for accepting the shaft of the kit supplied propellers. Therefore, the 'Proper Plane' propeller has to be fitted with a shaft.*

Cut a length of 1.4 mm diameter Brass tube from 'Albion Alloy's' (MBT14) or similar.

Cut a 3.5 mm length of 1.6 mm diameter Brass tube from 'Albion Alloy's' (MBT16) or similar.

Slide the tube onto one end of the 1.4 mm diameter tube and secure it in position using thin CA adhesive.

Cut a 3.5 mm length of 1.8 mm diameter Brass tube from 'Albion Alloy's' (MBT18) or similar.

Slide the tube onto the 1.6 mm diameter tube and secure it in position using thin CA adhesive.

Cut a 3.5 mm length of 2.0 mm diameter Brass tube from 'Albion Alloy's' (MBT20) or similar.

Slide the tube onto the 1.8 mm diameter tube and secure it in position using thin CA adhesive.

Insert thicker CA adhesive or similar through the hole in the rear hub plate and into the propeller hub.

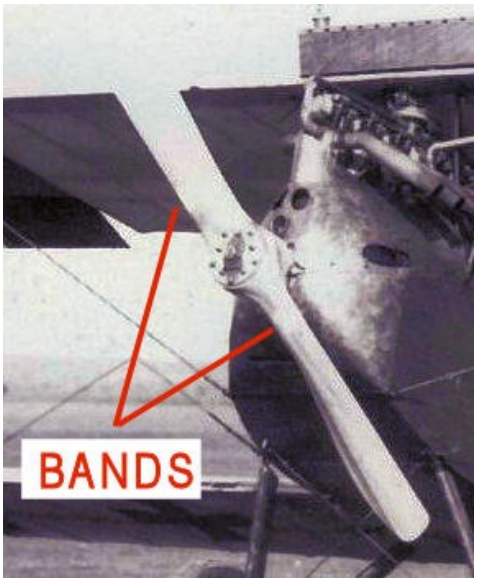
NOTE: *During the following step, make sure the created propeller shaft is at 90 degrees to the propeller, when viewed from various angles.*

Insert the 2.0 mm diameter tube through the hole in the rear hub plate and into the propeller hub until it contacts the rear face of the front hub plate.

Painting:

Brush ‘AK Interactive’ Kerosene wash (AK2039) over the front and rear hub plates on the propeller.

NOTE: *Many of the aircraft propellers had linen strips wrapped around the blades and aligned to the muzzles of the two machine guns. The was presumably done to more clearly see if fired ammunition had struck either of the blades. Also, the wrappings may have helped prevent from the wood splintering, if damaged.*



Locate the propeller into the hole in the engine and rotate it such that each blade is positioned in front of a machine gun muzzle at the front, sides of the fuselage.

Note the central location on the propeller blades at the muzzle of the machine gun.

The bands were created using cut lengths of the 4 mm wide White decal stripes from the ‘Xtradecal’ Parallel White Stripes (XPS2) set.

Seal and protect the applied decals by airbrushing the propeller with a semi-matt clear coat, such as ‘Alclad’ Light Sheen (ALC311) or similar.

Weathering:

If desired, lightly brush ‘Tamiya’ Weathering Master Set A (Mud) along the leading edges of the propeller blades.

PART 12
CONSTRUCTION

PART 12 - CONSTRUCTION

References:
'JAPO Publications - Phönix D.I-D.II (Jan Zahalka, Mgr. Petr Aharon Tesar, Sigmund Tyrlik)
'Windsock' data file No.31 - Phönix D.I-II (Peter M. Grosz).
Online resources.

Preparation:

NOTE: *When removing the 3D printed parts from their 'support trees', **be careful to not cut through what may not be a support tree**. The printed parts are the same colour as their support trees and can be easily mistaken. Refer to the kit instruction illustration for the relevant 3D print to see what is a part and what are support trees.*

Carefully snip or saw through the attaching stubs on the support trees to remove any required 3D printed components. Take care to not crush or break delicate parts when handling the components.

File or sand away any residual stubs of the support trees from the components.

NOTE: *The following parts are cast resin, not 3D printed. From this point of the build and onwards, refer to Part 5 (Resin) of this build log for **information and health precautions** when working with resin parts.*

Using a sharp scrapper or a saw. Carefully cut away the resin casting blocks from the following parts:

Upper wing halves
Lower wing halves
Tailplane (left and right)
Elevator
Fin
Rudder.

Carefully scrape, file or sand away any residual cast block resin from the edges of the parts.

Modifications:

NOTE: *When the upper and lower wing halves were laid on a flat surface and viewed from their leading edges (front), I found that the wings varied noticeably in thickness.*

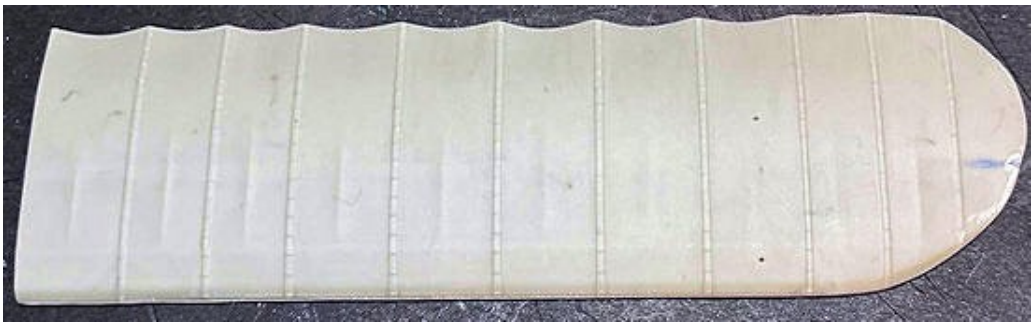
The upper left wing half is thicker than the upper right wing half

The lower right is thicker than the lower left wing

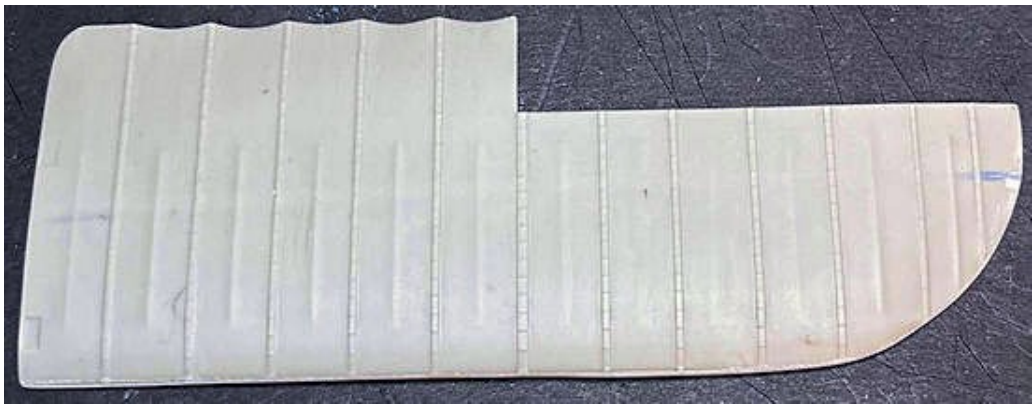
Given how pronounced the different thickness of the wings was, I decided the only option was to remove, as necessary, all of the surface detail then re-profile the wings. Once the profile was corrected, the surface detail for the ribs and tapes were to be re-instated.

In addition, the stitching molded on the wing rib tapes is quite pronounced and I think overscale. Whilst painting over these details would lessen that effect, applying decals over them may cause problems. Any raised detail under decals can trap air, causing silvering and can also prevent the decal from fully adhering to the model surface. Both can lead to the decal lifting or breaking away during subsequent handling etc. As I intend to decal the surfaces, I chose to remove resin detail from the wings.

Original lower wing ribs and tapes



Original upper wing ribs and tapes



The leading edge underside of the upper left wing was scraped and sanded to remove the excess thickness of cast resin to match the thickness of the upper right wing.

The leading edge underside of the lower right wing was scraped and sanded to remove the excess thickness of cast resin to match the thickness of the lower left wing.

The stitching on the rib tapes was sanded away and each rib tape scrapped carefully to reduce their thickness, leaving an slight impression of rib tapes.

To re-instate sanded away rib tapes to the undersides of the wings, I cut thin strips of 0.1 mm thick plastic card, whish were secured to where the tapes were missing, using thin CA adhesive.

Once the adhesive had fully set, I carefully sanded away the added strips to blend them as close as possible to the original molded tapes.

Preparation (continued):

Upper wing support rods:

NOTE: *The 1.2 mm diameter Steel rod used is supplied in the kit.*

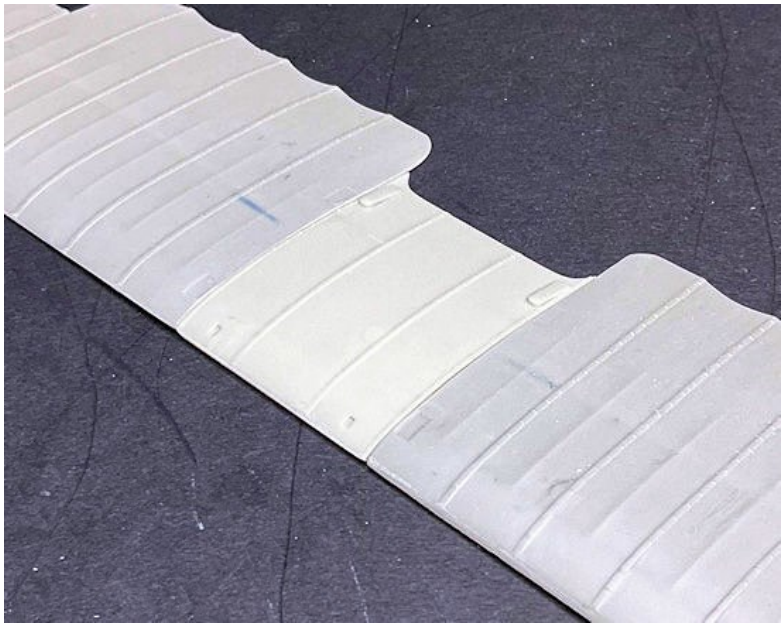
Using the pre-molded recesses in the outer faces of the centre section of the upper wing, drill holes of 1.2 mm diameter at least 10 mm into the centre section. Make sure the holes are drilled at 90 degrees to the edges and horizontal when viewed from the front.

Using the pre-molded recesses in the wing root faces of the outer wings, drill holes of 1.2 mm diameter at least 10 mm into the wing halves. Make sure the holes are drilled at 90 degrees to the edges and horizontal when viewed from the front.

Cut four lengths of the 1.2 mm diameter Steel rod, long enough to fully insert into the drilled holes in the upper wing halves and wing centre section.

Using thin CA adhesive, secure the four rods fully into the drilled holes in the wing centre section.

Check fit the outer wings to the centre section, making sure the wings and centre section are aligned to each other and horizontal.



Aileron support rods:

NOTE: *The two ailerons have upward 'wash out' at their outer ends and are profiled to match their wing half. Make sure the ailerons are fitted to the correct wing half.*

Using a suitable needle file, file away the resin between the three pre-molded aileron hinges on the two ailerons.

Point mark the centre of the recessed hinge points.

Using the point marks as a guide, drill holes of 0.4 mm diameter into the leading edge of the two ailerons. Make sure the holes are drilled at 90 degrees to the edges and horizontal when viewed from the side.

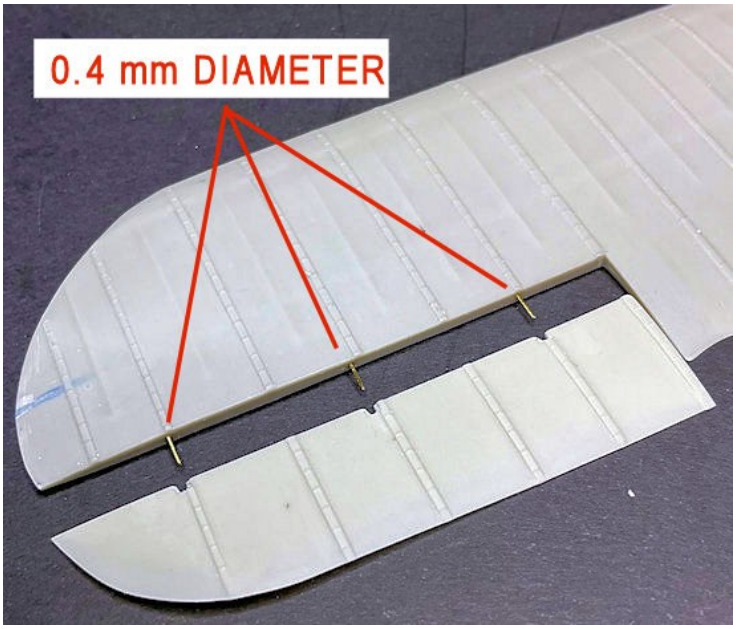
Cut six short lengths of 0.4 mm diameter Brass rod, such as that from 'Albion Alloy's' or similar.

Using thin CA adhesive, secure the rods into the drilled holes in the ailerons.

Lay the ailerons against the openings in their upper wing halves and mark the position of the fitted rods onto the upper wing halves.

Using the point marks as a guide, drill holes of 0.4 mm diameter into the trailing edge of the upper wing halves.

Check fit the ailerons to their upper wing half, making sure they are aligned to the wing trailing edges.



Tailplane support rods:

NOTE: *The tailplane locating holes in the fuselage rear are larger than can be drilled into the tailplane inboard faces.*

Using the recesses in the inboard face of the two tailplanes as guides, drill holes of 0.5 mm diameter into the tailplanes. Make sure the holes are drilled at the same angle as the tailplane/fuselage join and are horizontal when viewed from the front.

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

Using thin CA adhesive, secure the rods into the drilled holes in the tailplanes.

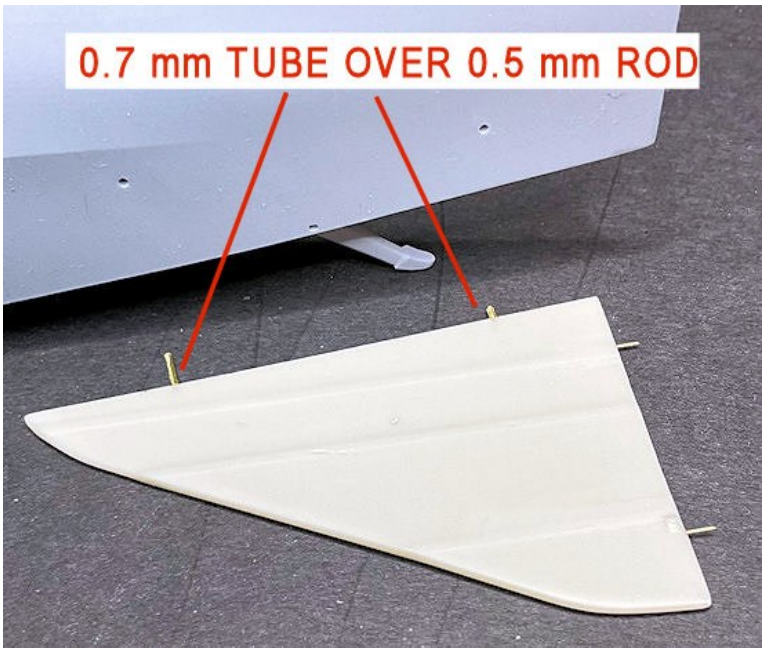
Cut four short lengths of 0.7 mm diameter Brass tube, such as that from 'Albion Alloy's' MBT07 or similar.

Using thin CA adhesive, secure the tubes onto the fitted rods (to increase their diameter).

NOTE: *The rear tailplane locating hole in the fuselage is not very deep.*

Snip the length of the tailplane rear locating tube/rods to allow them the be fully inserted into their locating holes in the fuselage rear.

Check fit the two tailplanes into their fuselage locating holes, making sure they are aligned to the fuselage sides and horizontal when viewed from the front/rear.



Elevator support rods:

Using a suitable needle file, file away the resin between the two pre-molded hinges on the two elevators.

Point mark the centre of the recessed hinge points.

Using the point marks as a guide, drill holes of 0.3 mm diameter into the leading edge of the two elevators. Make sure the holes are drilled at 90 degrees to the edges and horizontal when viewed from the side.

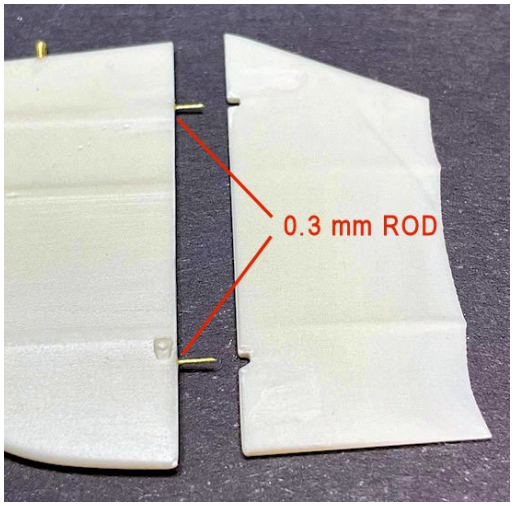
Cut four short lengths of 0.3 mm diameter Brass rod, such as that from ‘Albion Alloy’s’ or similar.

Using thin CA adhesive, secure the rods into the drilled holes in the elevators.

Lay the elevators against the trailing edges of their tailplane and mark the position of the fitted rods onto the tailplanes.

Using the point marks as a guide, drill holes of 0.3 mm diameter into the trailing edges of the tailplanes.

Check fit the elevators to their tailplanes, making sure they are aligned to the tailplane trailing edges.



Fin support rods:

Position the fin onto the top, rear of the fuselage with its rear, vertical edge aligned to the rear end of the fuselage.

Mark two support rod positions on the bottom edge of the fin and on the top of the fuselage.

Using the marks as a guide, drill holes of 0.3 mm diameter centrally into the bottom edge of the fin and into the top of the fuselage. Make sure the holes are drilled at 90 degrees to the edge of the fuselage and fin and are vertical when viewed from the front/rear.

Cut two short lengths of 0.3 mm diameter Brass rod, such as that from ‘Albion Alloy’s’ or similar.

Using thin CA adhesive, secure the rods into the drilled holes in the fin.

Check fit the fin onto the fuselage, making sure it’s aligned to the fuselage top surface, is central on the fuselage and is vertical when viewed from the front/rear.

Rudder support rods:

With the fin temporarily fitted, position the rudder (the correct way up) against the rear of the fin and the fuselage. Make sure the top of the rudder is aligned to the top of the fin.

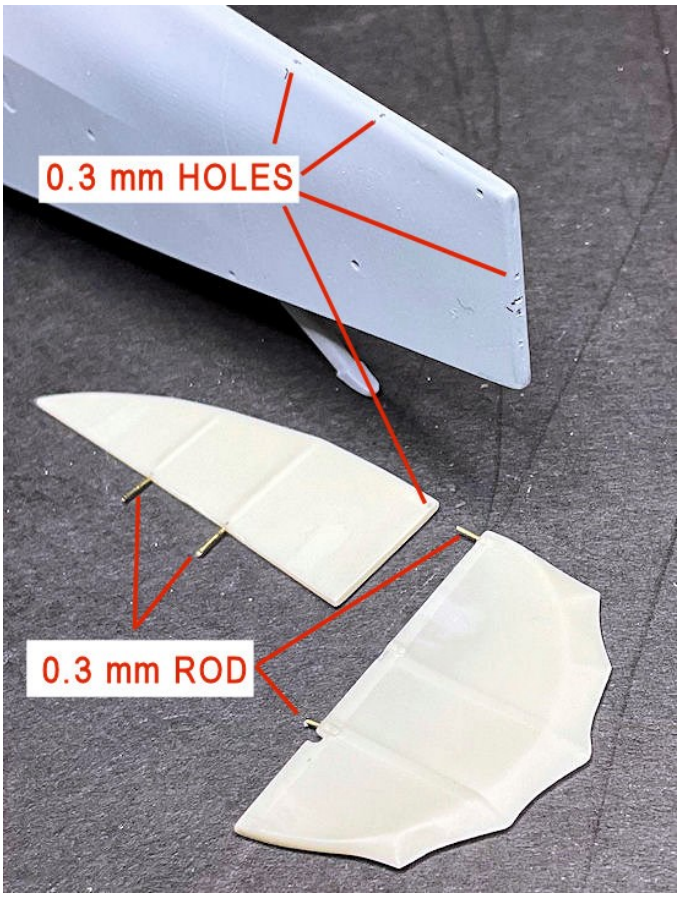
Mark the position of the top hinge of the rudder onto the fin and the rudder lower hinge onto the fuselage rear.

Using the marks as a guide, drill holes of 0.3 mm diameter centrally into the top of the rudder and the rear edge of the fuselage. Make sure the holes are drilled at 90 degrees to the edges when viewed from the side and from above.

Cut two short lengths of 0.3 mm diameter Brass rod, such as that from ‘Albion Alloy’s’ or similar.

Using thin CA adhesive, secure the rods into the drilled holes in the rudder.

Check fit the rudder to the rear edges of the fin and fuselage, making sure the rudder is aligned and against both.



Landing gear support struts:

NOTE: *The kit supplies Steel rod of 0.8 mm diameter for supporting the various struts. However, the rod holes in the landing gear axle and struts are larger 1.0 mm diameter. To give maximum support, I chose to not use the kit supplied rod and instead use 1.0 mm diameter Brass rod from ‘Albion Alloy’s’.*

Cut a length of rod long enough to pass through the axle and with the wheels located. The ends of the rod should be flush with the outer face of the wheels.

Using thin CA adhesive, secure the rod into the axle.

Cut four lengths of rod long enough to pass through the landing gear struts and be flush to the bottom of the struts with enough protruding at the top of the struts to insert into the fuselage locating holes.

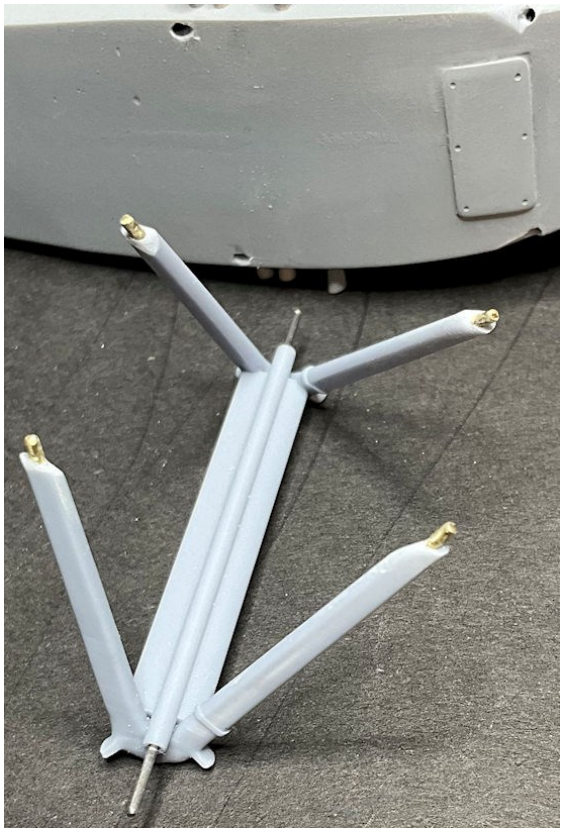
Using thin CA adhesive, secure the rod into the axle.

NOTE: *The locating holes in the fuselage need to be drilled at the correct angle to align with the strut support rods. Drill carefully into the 3D printed fuselage as the locating holes are close to the fuselage edges and may break away material.*

Using as guides the four strut locating recesses in the fuselage underside, drill holes of 0.8 mm diameter at the correct angle into the fuselage.

Carefully drill out the holes to 1.0 mm diameter.

Test fit the landing assembly into the fuselage. If necessary, remove material from the top of the struts and/or fuselage edges to ensure the struts fully contact the fuselage.



Tailplane support struts:

NOTE: *The support struts for the tailplane have location points on the trailing edge of the tailplanes and the fuselage. However the struts themselves have none. Therefore, I chose to add support rods to provide a more positive location.*

Using the fuselage strut locating points as guides, drill a hole of 0.4 mm diameter through the fuselage.

Temporarily fit the two tailplanes into the fuselage sides. And make sure they remain horizontal when viewed from the front/rear.

Upper struts:

Chamfer the ends of the two upper struts such that they locate fully against their locating points on the fuselage and upper surface of the tailplanes.

Carefully drill a hole of 0.4 mm diameter centrally into the chamfered ends of the two upper struts.

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

Using thin CA adhesive, secure the rods into the holes in the struts ends.

Bend the rods to the angles required to locate in the holes in the fuselage and tailplane.

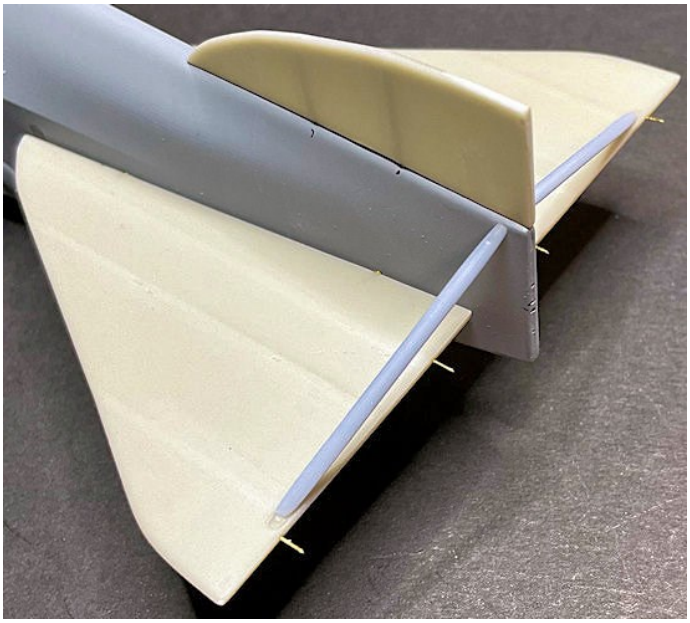
Trim the rods such that they locate in the holes but not protrude at the other side.

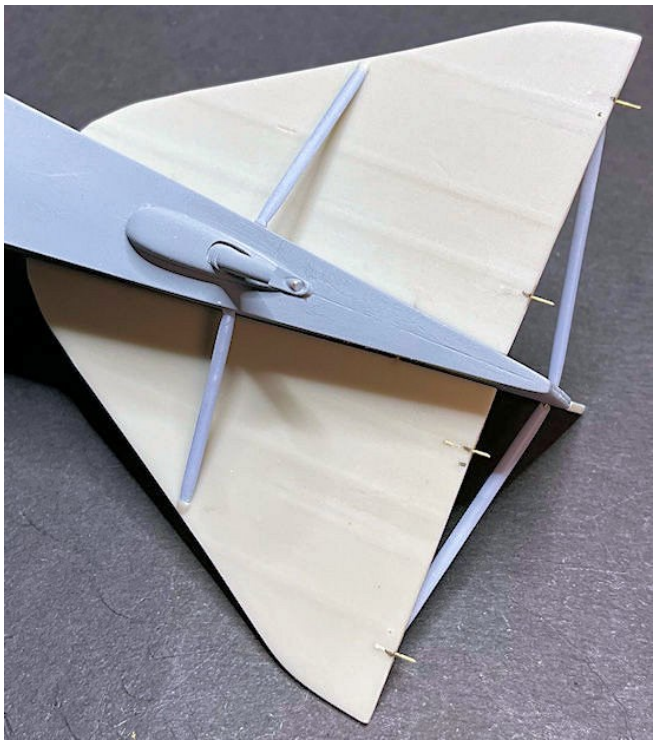
Lower struts:

Chamfer the ends of the two lower struts such that they locate fully against their locating points on the fuselage and underside surface of the tailplanes.

Test fit:

Locate all four struts in position between the tailplanes and the fuselage, making sure the tailplanes are horizontal when viewed from the front/rear.





Cabane support rods:

NOTE: *The fuselage cabane support struts have location recesses in the fuselage and locating holes in the outer edges of the upper wing centre section. The ends of the 3D printed cabane 'Z' struts have locating 'dimples' in their ends, but not actual holes. Therefore, I chose to add support rods to provide a more positive location.*

Using a drill of 0.4 mm, drill out the four strut locating holes in the outer edges of the upper wing centre section.

Using a drill of 0.4 mm, drill support rod holes into the strut locating recesses in the fuselage and at the angle of the cabane struts (when fitted).

Using a drill of 0.4 mm, carefully drill rod locating holes into the end of each cabane strut (x 8).

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

Using thin CA adhesive, secure a rod into each of the eight drilled holes in the ends of the cabane struts.

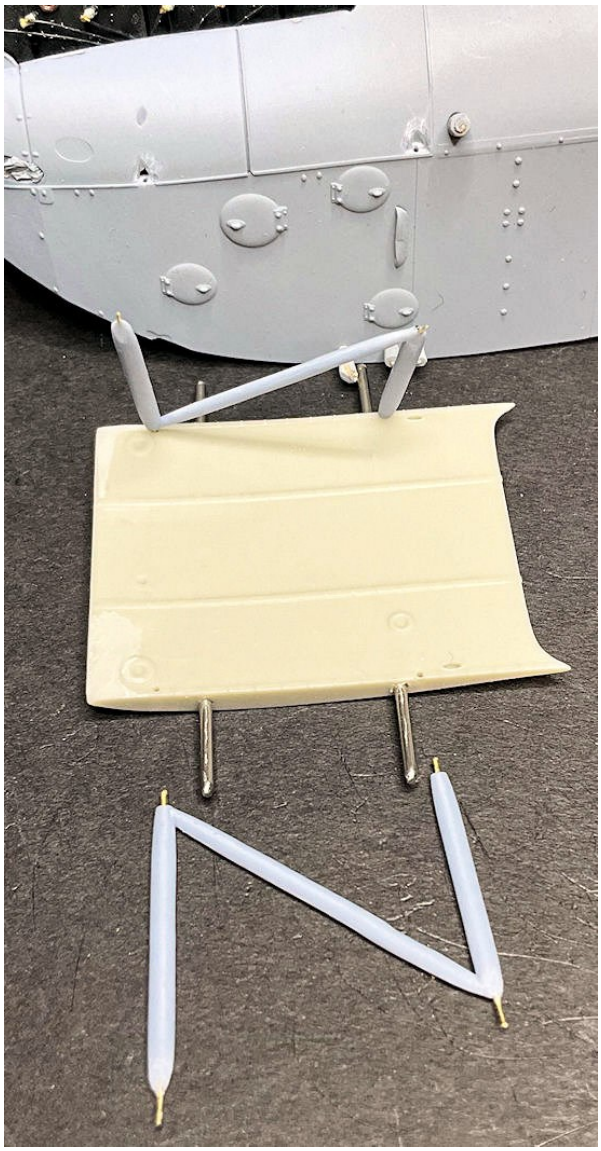
Test fit the cabane struts into their locating holes in the fuselage side recesses, making sure the struts are fitted the correct way (refer to the instructions). Where necessary:

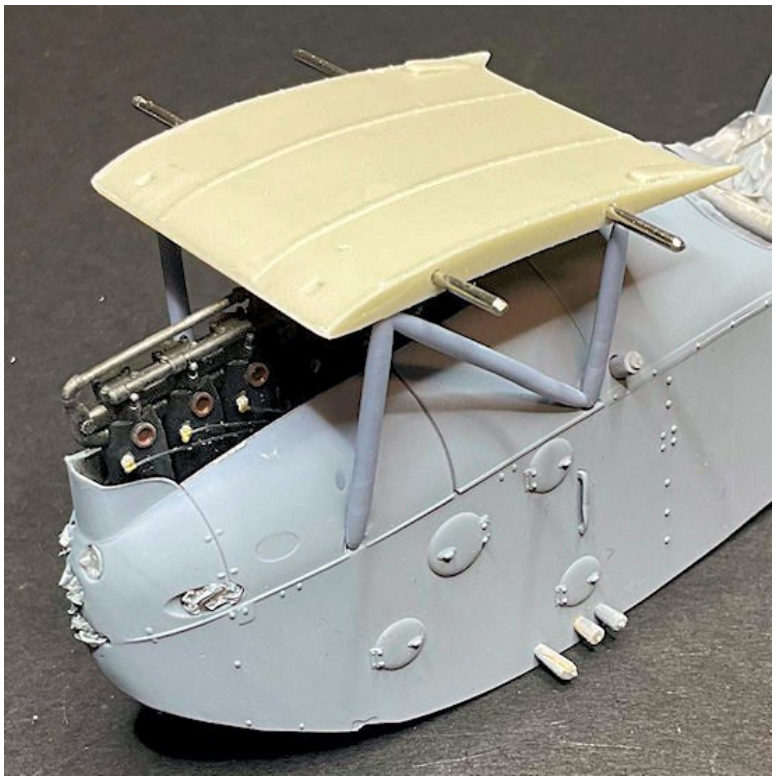
- Carefully remove material from around the recesses to allow the struts to fully locate fully.
- If necessary, remove material from the bottom, rear of the struts to allow the struts to fully locate.
- Bend the bottom locating rods to set the cabane struts at approximately the correct angle (when viewed from the front).

Locate the upper wing centre section onto the tops of the cabane struts. Where necessary:

- Bend the top locating rods to allow the centre section to fully locate on the cabane struts, making sure the centre section is horizontal when viewed from the front and is at 90 degrees to the fuselage when viewed from above.

Leave the centre section temporarily fitted on the cabane struts. This is best done before preparing and test fitting the four interplane struts.





Interplane strut support rods:

NOTE: *The kit supplies Steel rod of 0.8 mm diameter for supporting the various struts. However, the rod holes in the interplane struts are larger, being 1.0 mm diameter. To give maximum support, I chose to not use the kit supplied rod and instead use 1.0 mm diameter Brass rod from 'Albion Alloy's'.*

If necessary, use a 1.0 mm diameter drill to drill through and 3D print blockages in the internal bores of the four interplane struts. **Take care** when drilling as the material is resin and may break away at the ends.

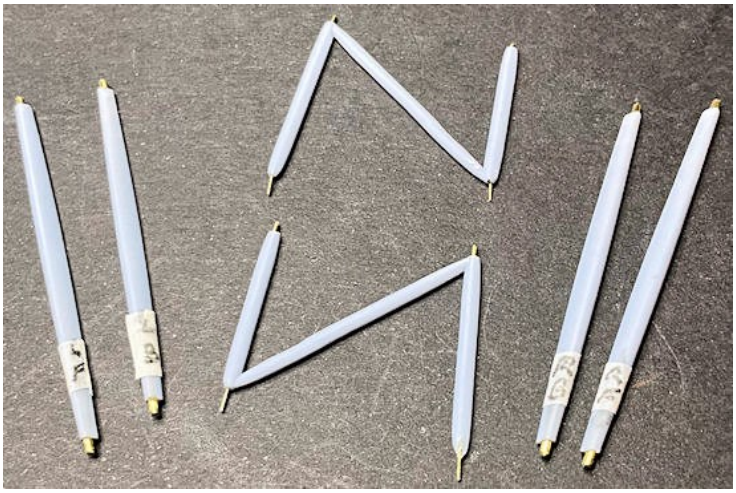
Cut four lengths of 1.0 mm diameter Brass rod, such as that from 'Albion Alloy's' or similar, long enough the pass through the four struts with approximately 3.0 mm protruding from each end.

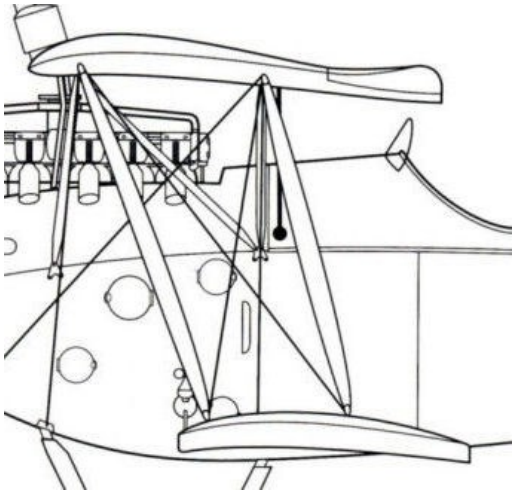
Pass the rods through the struts and secure them in the struts using thin CA adhesive.

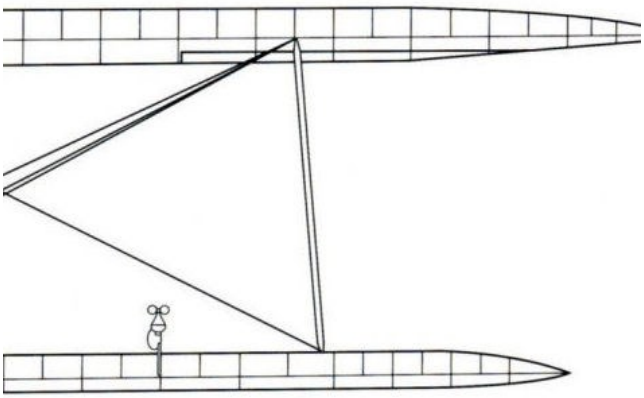
Using a drill of 1.0 mm diameter, drill into, **but not through**, the strut location holes in the underside of the upper wing halves and the top surface of the two lower wings. Make sure the holes are drilled at the approximate angles, as the struts tilt forward and inward from the lower to the upper wings.

NOTE: *Some material may need to be removed from the ends of the struts to allow them to angle inwards and forwards in the wings. The longer struts are the forward interplane struts, the shorter the rear struts. Make sure the forward struts match in height and also the rear struts match in height.*

Test fit each struts into its locating hole in its lower wing half, tilting the strut to the required angle. If necessary, remove just enough material from the end of the struts to allow the struts to be tilted correctly. Mark each strut at the bottom with its wing position (for future fitting reference).







Temporarily fit the lower wing to the fuselage.

Fully locate the two fuselage cabane struts into their locating holes and hold them in position by applying ‘UHU’ White Tack or similar to the strut bottoms and the fuselage.

Temporarily fit the upper wing halves to the wing centre section.

Fully locate the four interplane struts into their positions in the lower wing halves and hold them in position by applying ‘UHU’ White Tack or similar to the strut bottoms and the wings.

Lay the upper wing on a flat surface with its top surface down.

Invert the fuselage/lower wing assembly and lower it carefully onto the upper wing, carefully guiding the cabane strut locating rods into their locating holes in the outer edges of the upper wing centre section.

Hold the cabane struts in position and cate the tops of the four interplane struts into their locating holes in the underside of the upper wing.

Hold the wings together using elastic bands over both wings.

Check that:

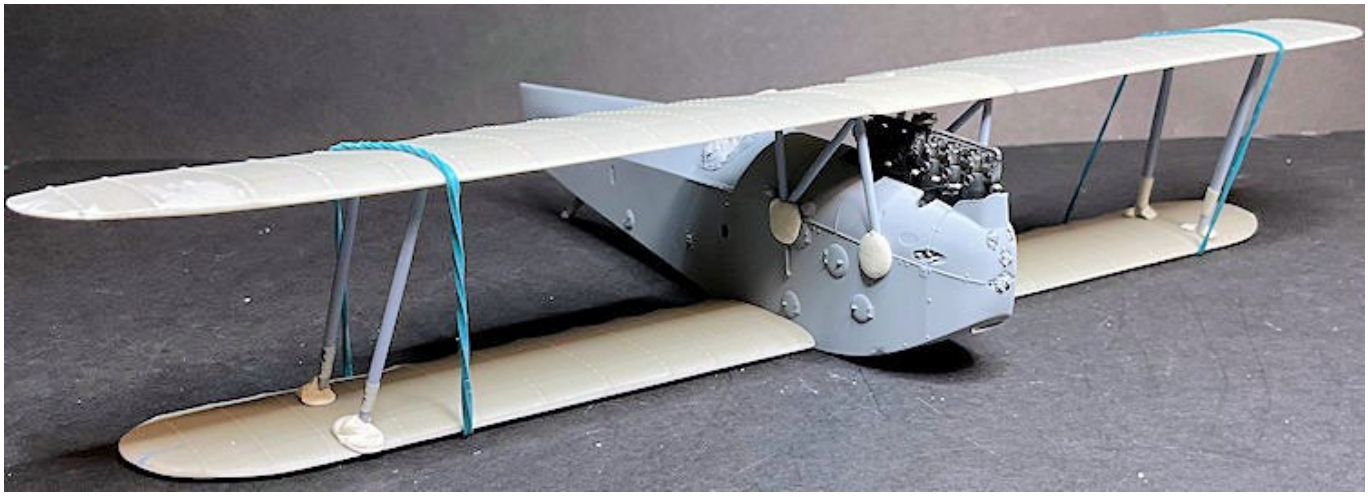
All struts are fully located in both wings

The wings are parallel with each other when viewed from the front

The wings are at 90 degrees to the fuselage when viewed from above

The wings are parallel with each other when viewed from the above

The struts are not bowed or distorted (under pressure).



Remove the retaining elastic bands and carefully lift the upper wing assembly from the struts.

Remove the 'UHU' White Tack or similar from the interplane and cabane struts and remove the struts.

Remove the lower wing halves from the fuselage.

Wing-engine tubes:

NOTE: *The aircraft had two support struts between the engine side panels and the underside of the centre section of the upper wing. Although the kit instructions show these parts, there is no reference to the part or fitting them. Also these struts pass through the engine side panel and not just 'sit' on them. As such I chose to make them from tube.*

Using the location recesses on the side panels as guides, I drilled through the panels using a 1.0 mm diameter drill. The drill was then tilted back and inwards to gradually drill out an angled slot.

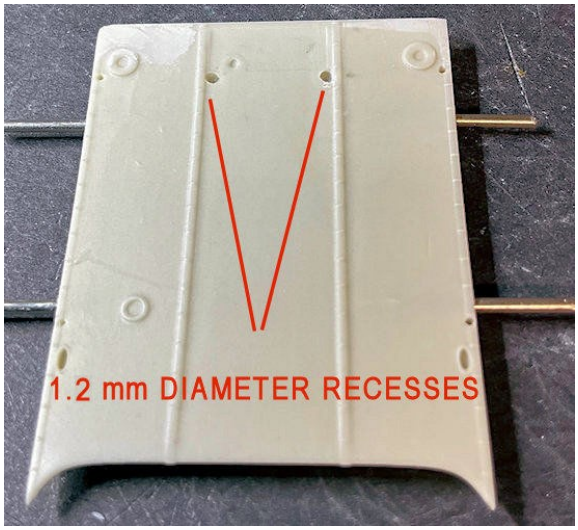
Using a drill of 1.2 mm diameter, drill recesses into, **but not through**, the underside of the centre section for the upper wing. The recesses should be just inboard from the rib tapes and aligned just to the rear of the pre-molded rings.

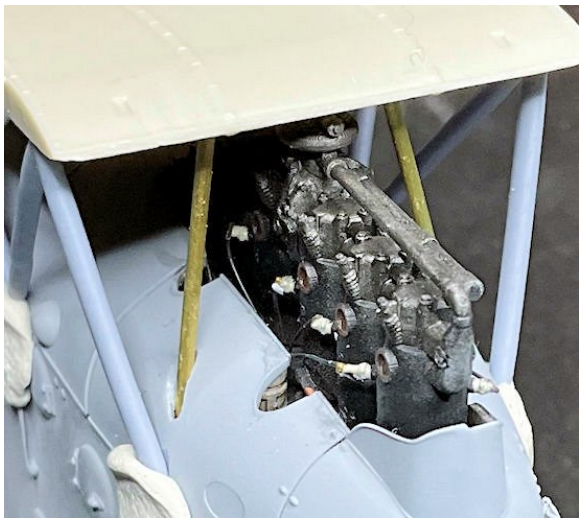
Temporarily fit the two cabane struts into their locating holes and hold them in position by applying 'UHU' White Tack or similar to the strut bottoms and the fuselage.

Locate the centre section of the upper wing onto the cabane strut rods.

Cut two lengths of 1.0 mm diameter Brass tube, such as 'Albion Alloy's MBT10 or similar. The length of the tubes should be enough to insert into the slots in the panels and into the recesses in the underside of the wing centre section. If necessary, adjust the slots until the tubes can be fitted easily and without lifting or moving the wing centre section off-centre.

Remove the tubes, wing centre section, cabane struts and 'UHU' White Tack.





Aileron control tubes:

NOTE: *An aileron operating lever was attached to the forward end of the control column torsion bar. Control tubes were attached to the ends of the lever and were directed up and out of the cockpit (aligned behind the fuselage rear cabane stuts) and into the underside of the upper wing centre section.*

Drill two holes of 1.0 mm diameter into, **but not through**, the underside of the centre section. The holes should be drilled into the pre-molded locations and slightly angled inwards and rearwards.

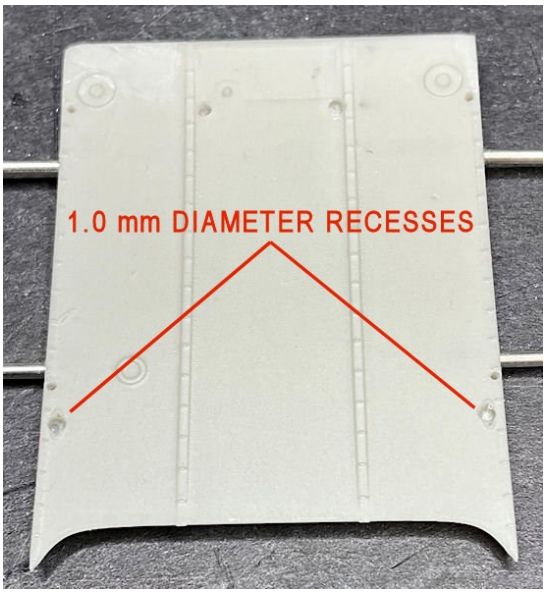
Using a sharp, straight edge blade or round needle file, chamfer the top edge of the control tube holes, previously drilled through the sides of the fuselage decking panel.

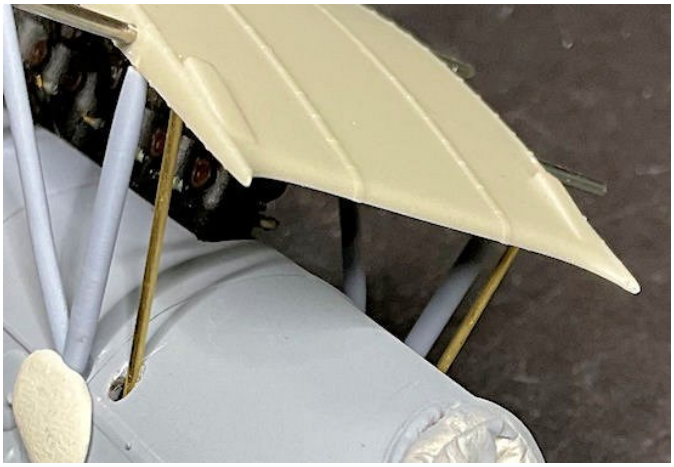
Temporarily fit the two cabane struts into their locating holes and hold them in position by applying 'UHU' White Tack or similar to the strut bottoms and the fuselage.

Locate the centre section of the upper wing onto the cabane strut rods.

Cut two lengths of 0.8 mm diameter Brass tube, such as 'Albion Alloy's MBT08 or similar. The length of the tubes should be enough to insert into the slots in the decking panel and into the recesses in the underside of the wing centre section. If necessary, adjust the slots until the tubes can be fitted easily and without lifting or moving the wing centre section off-centre.

Remove the tubes, wing centre section, cabane struts and 'UHU' White Tack.





Painting:

NOTE: *The decals in this particular kit supplied by 'Lukgraph' are semi-translucent and therefore any base colour under the decals will affect how the decal appears when applied. For the Clear Doped Linen (CDL) covering of the wings, a base colour of white is best.*

Flight surfaces:

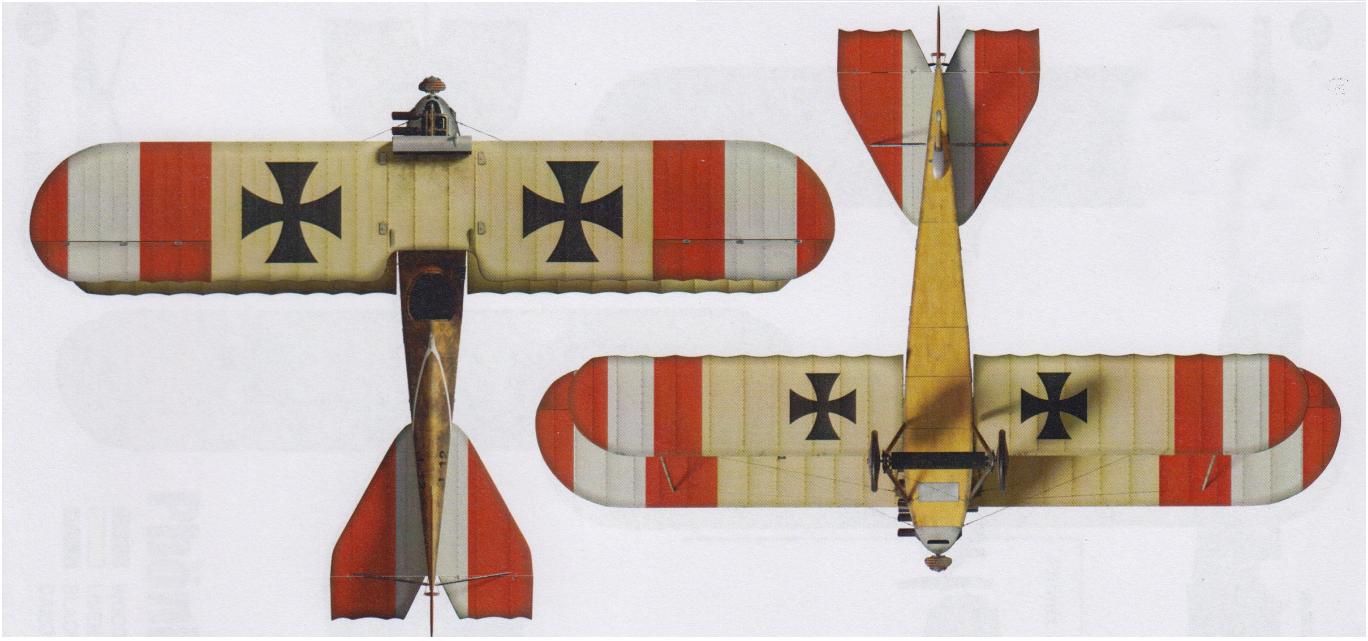
Airbrush the following flight surfaces with a white primer, such as 'AK Interactive' White (AK759) or similar:

- Upper wing
- Lower wings
- Tailplanes (x 2)
- Ailerons (x 2)
- Elevators (x 2)
- Fin
- Rudder.

Where necessary, lightly sand the painted surfaces to remove any surface artifacts to achieve as smooth a surface as possible.

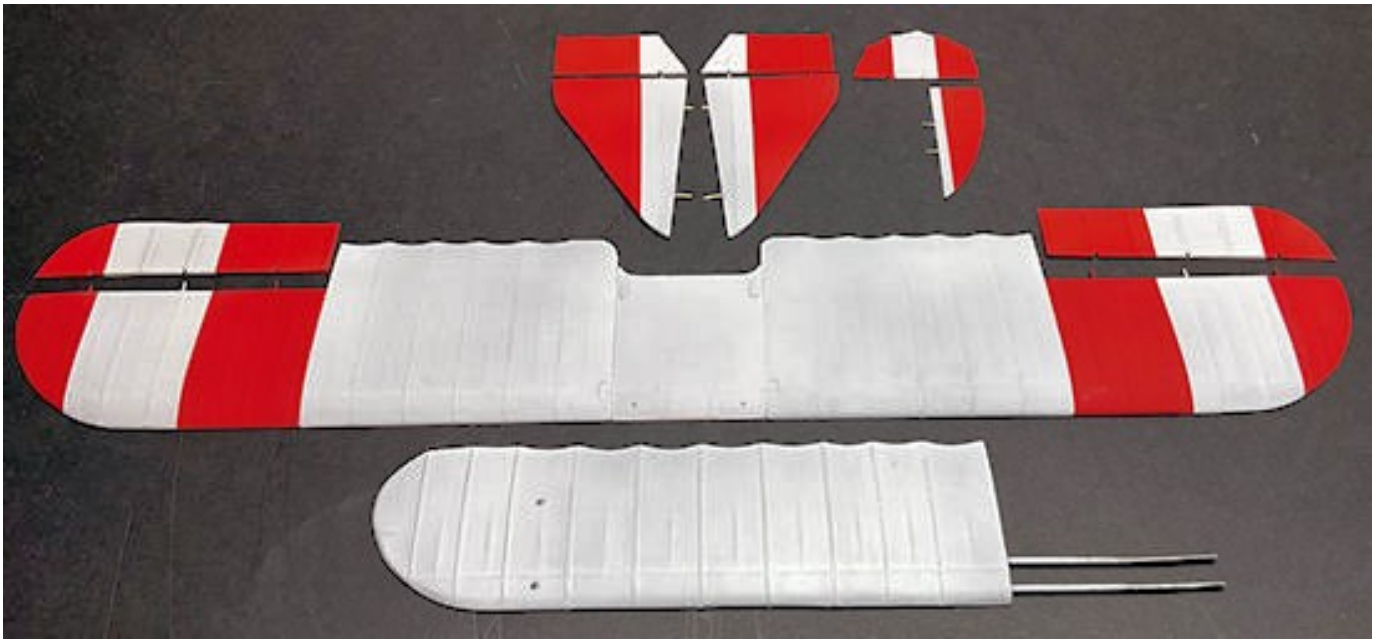
Refer to the following illustrations. Mask off all white areas of the:

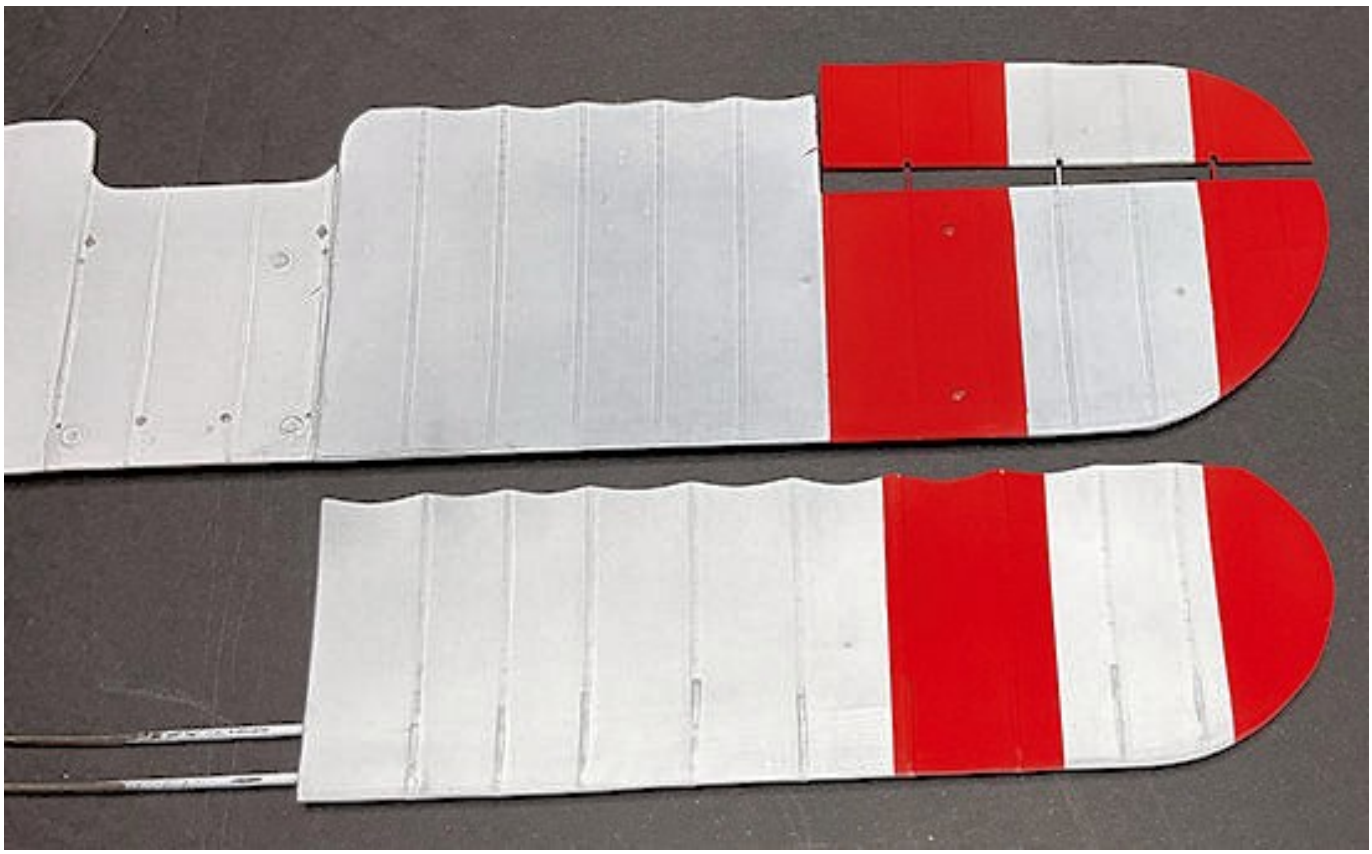
- Upper wing
- Lower wings
- Tailplanes (x 2)
- Ailerons (x 2)
- Elevators (x 2)
- Fin
- Rudder.



Airbrush the exposed white areas with ‘Tamiya’ Flat Red (XF7) mixed with Rubber Black (XF85) to a ration of approximately 80/20%.

Once the paint has dried, remove all of the masking.





Decals:

Refer to Part 4 (Decals) of this build log. The decal used is the ‘Lukgraph’ Phönix Linen Clear Doped Linen (DEC010) (kit supplied). These decals are semi-translucent and like the ‘Aviattic’ clear backed decals, will show through the base colour of the surface underneath. If in doubt test a spare decal on the base colour. Also the decals are not ‘cookie cut’ and instead are printed as part of the carrier film on the entire decal sheet supplied. Therefore they need to be accurately cut out from the sheet in order to limit the amount of carrier film left around the decal.

Airbrush light coats of a clear gloss, such as 'Mig' A-Stand Aqua Gloss (A.Mig-2503) or 'Alclad' Aqua Gloss 600. I applied three separate coats of the clear coat.

Between each coat of clear coat, check the surfaces are smooth and free from any surface artifacts. If necessary, lightly sand away any artifacts, without sanding through the white base coat.

Upper wing:

NOTE: *Only the exposed central white areas of the upper wing (top surface and underside) need to have decal applied, as the outer red/white/red sections were painted over. As the upper wing surface is quite large, I chose to create three separate decals for the top and underside surfaces.*

Lay one side of the upper wing onto the back of the decal sheet, holding the decal sheet against the wing surface.

Trace the outline on the wing onto the decal sheet, marking where the joints of the wing outer and centre section are located.

Using the trace as a guide, cut out the decal then cut across the joint marks to create the three separate decals.

Test fit each decal and if necessary, trim each decal to fit and align to the wing edges and to each other.

NOTE: *During the following step, make sure the applied decals do not overlap each other as overlapping decals will shown as a darker colour.*

Refer to Part 4 (Decals) of this build log and apply the three decals.

Repeat the procedure to cut and apply the three decals to the other side of the upper wing. Make sure the decals do not overlap each other or the edges of the decals previously applied to the other side of the wing.

Lower wings:

NOTE: *Only the top surface of the lower wings and their central undersides need to have decal applied, as the underside outer red/white/red sections were painted over. As the lower wings are smaller than the upper wing, single decals can be cut and applied to both sides of the lower wings.*

Repeat the previous procedure to cut and apply the single decals to both sides of the lower wings. Make sure the decals do not overlap each other or the edges of the decals previously applied to the other side of the wings.

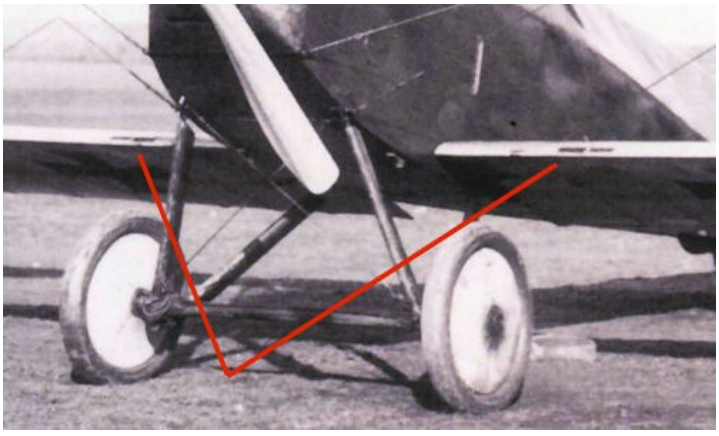
Other markings:

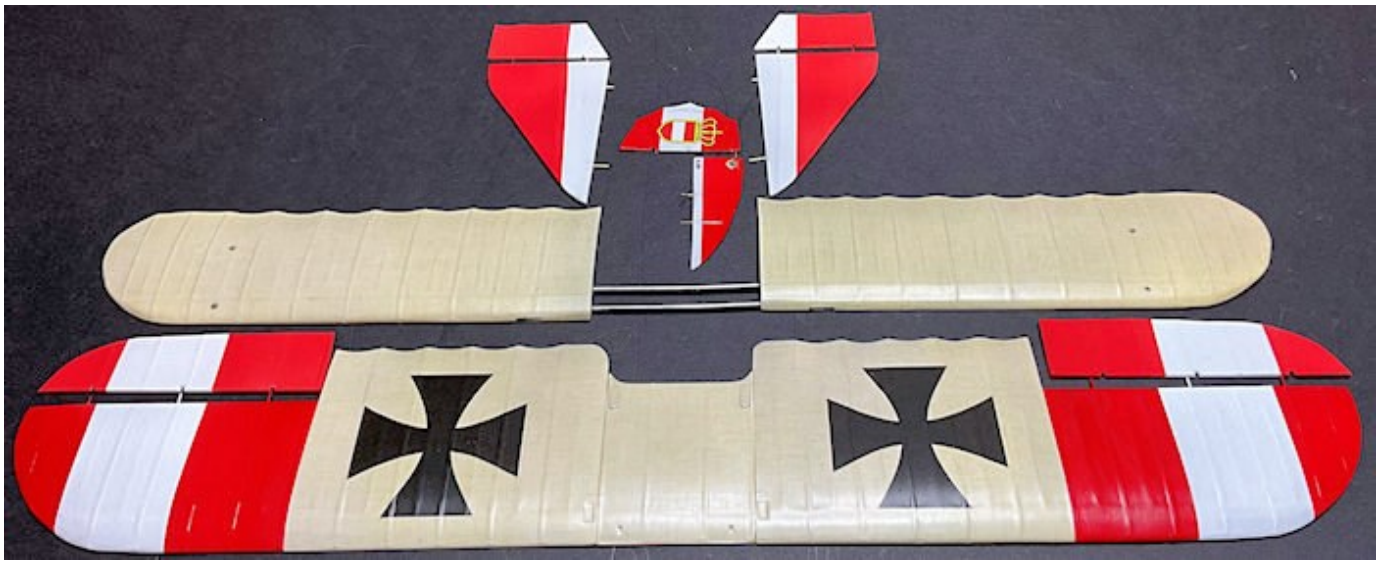
Refer to the previous illustration on this aircraft and apply the individual decals as follows:

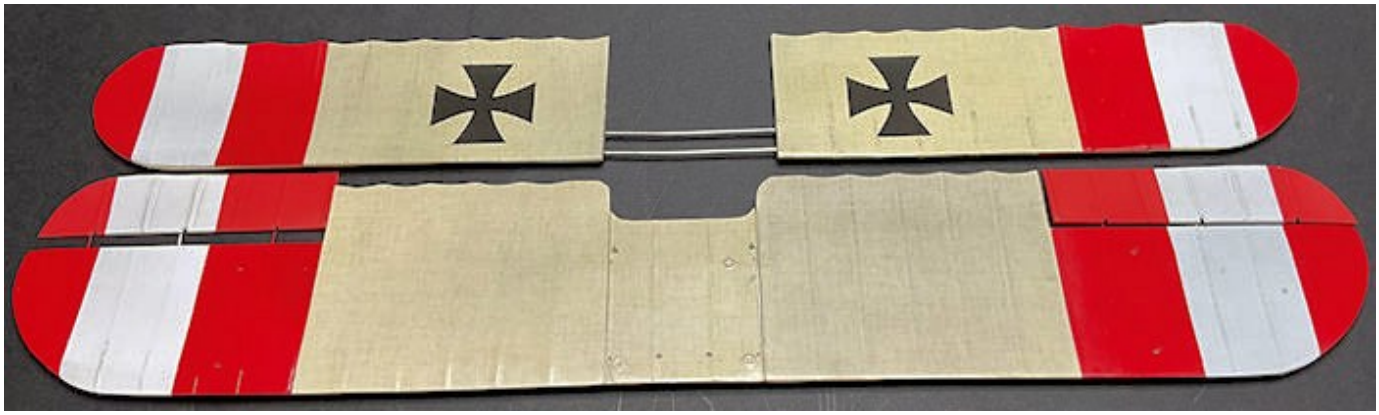
Large crosses to the top surface of the upper wing
Small crosses to the underside of the lower wings
Crest to each side of the rudder
Small serial number to bottom, rear (both sides) of the fin
Phönix company logo to top, rear (both sides) of the fin.

NOTE: *Refer to the opposite photograph. Thin, rectangular data plates were fitted to the leading edge of the lower wings. These decal markings are not supplied in the kit.*

I applied appropriate decals from my decal 'spares' collection.







Weathering:

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

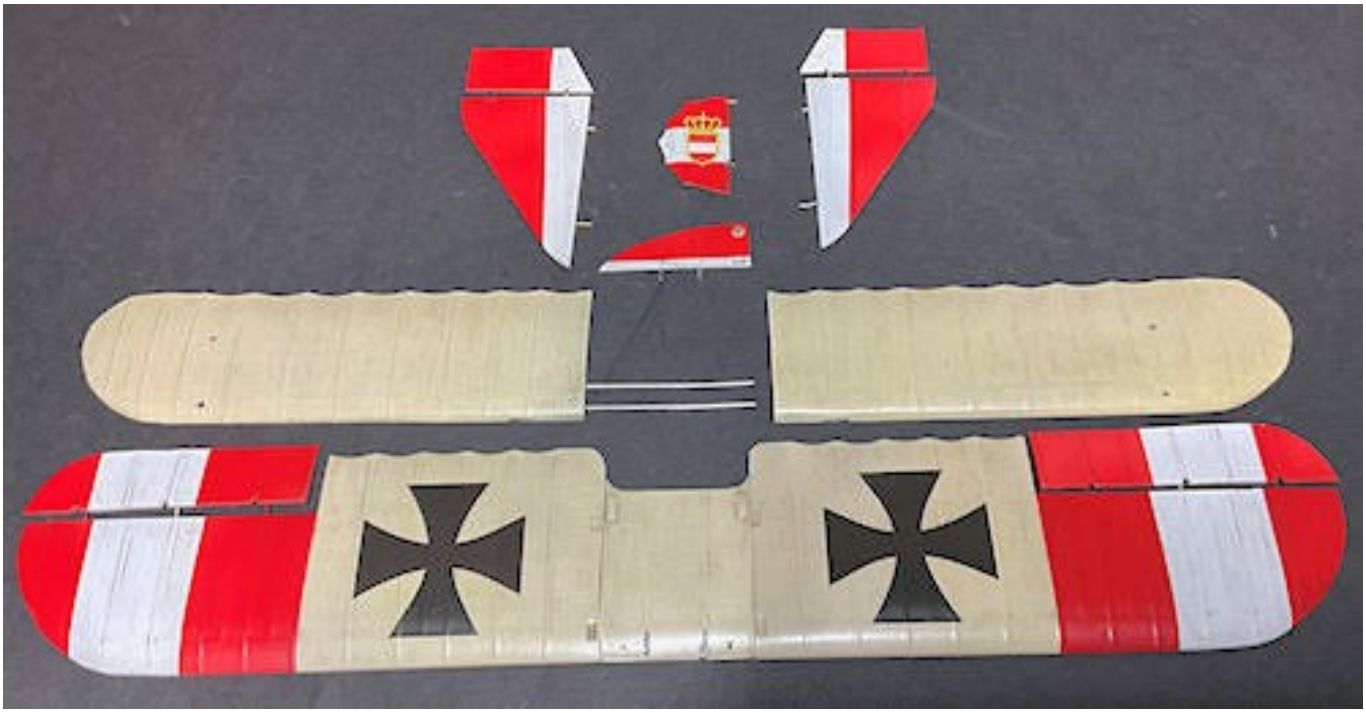
Once the applied decals have fully dried and set, airbrush a sealing/protection semi-matt clear coat, such as 'Alclad' Light Sheen (ALC311) or similar over the.

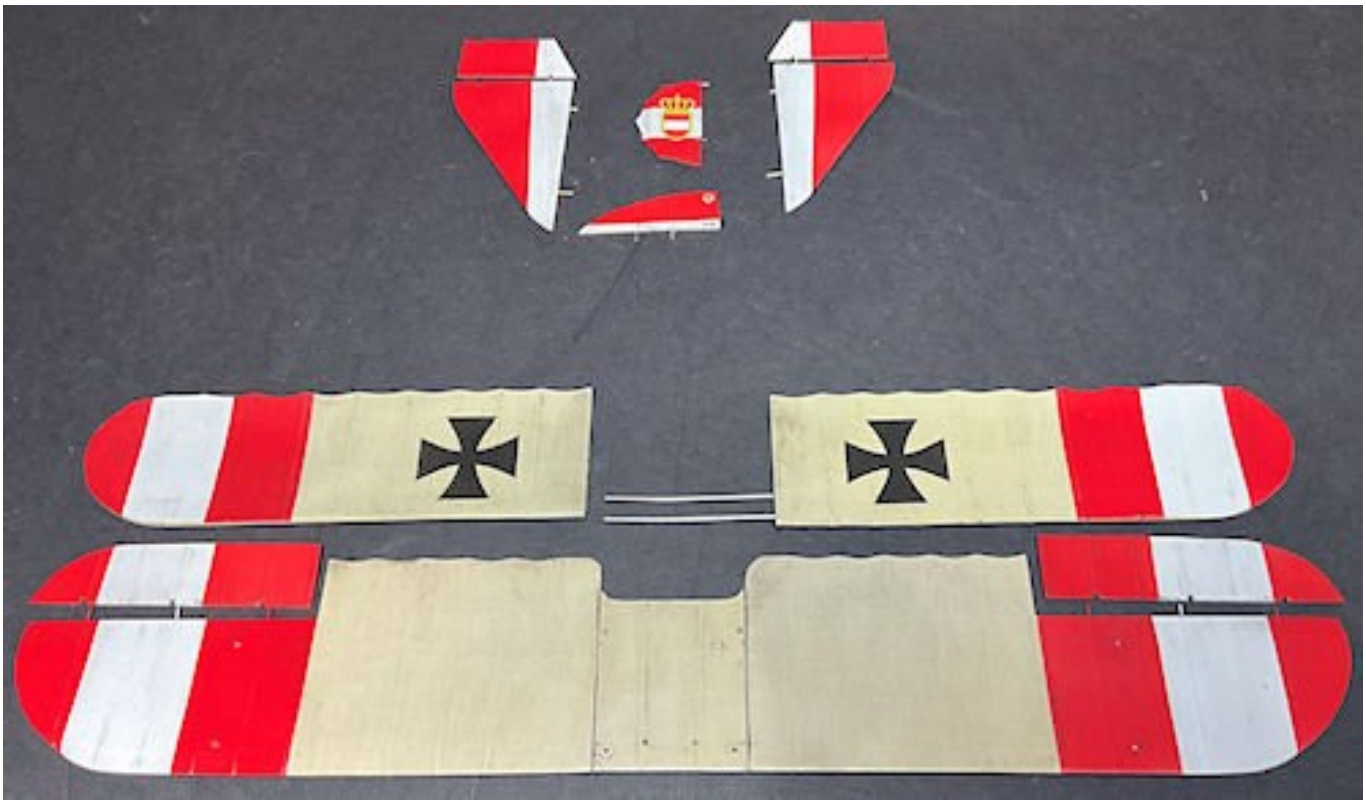
Upper wing - Lower wings - Tailplanes (x 2) - Ailerons (x 2) - Elevators (x 2) - Fin - Rudder.

Apply 'Flory Models' Dark Dirt clay wash over the flight surfaces

Once dry, remove the wash to achieve your desired weathering effects.

Airbrush a sealing semi-matt clear coat, such as ‘Alclad’ Light Sheen (ALC311) or similar over all of the weathered surfaces.





Assembly (continued):

Radiator:

NOTE: *The 3D printed radiator has a flat bottom, which will not conform to the curve of the upper wing.*

File or scrape a shallow curve across the centre of the radiator bottom.

Regularly check the fit of the radiator onto the upper wing and adjust until it conforms to the curve of the wing.

Painting (continued):

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

Interplane struts (x 4)

Fuselage cabane 'Z' struts (x 2)

Tailplane support struts (x 4)

Radiator

Radiator auxiliary support struts (x 2)

Aileron control tubes (x 2)

Landing gear assembly

Radiator

Engine exhaust pipes (x 6)

Engine to radiator pipes (x 3)

Flare rack

Rear view mirror

Anemometer instrument

Photo-etch parts sheet.

Airbrush or brush paint the above parts with the following colours or similar:

'Tamiya' Rubber Black (XF85) - Interplane struts, fuselage cabane 'Z' struts, landing gear assembly, tailplane support struts, radiator auxiliary support struts, support for rear view mirror, Anemometer body, aileron control tubes, end connectors on engine to radiator pipes.

'Alclad' Steel (ALC112) - Radiator, rear view mirror (not the support), aileron tube covers (upper wing), engine to radiator pipes.

'Alclad' Pale Gold (ALC108) - Anemometer cups.

'AK Interactive' Kerosene wash (AK2039) - Radiator cooling matrix (both sides).

'Tamiya' Clear Yellow (X24) - Rear view mirror lens.

Engine exhaust pipes:

Airbrush the exhaust pipes with **'Alclad' Exhaust Manifold (ALC-123)**.

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

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**).

Paint the locking rings with **'Tamiya' Gun Metal (X10)**.

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

Dry brush the exit ends of the pipes with **'Tamiya' Flat Black (XF1)**.

Flare rack:

'Tamiya' Red Brown (XF64) - rack

'Tamiya' Red (XF7), White (XF2) - flares

'Mr. Colour' Brass (219) - flare caps.

Photo-etch parts (cut from kit supplied sheet and residual tags removed from edges) :

'Alclad' Steel (ALC112)

Upper wing - radiator plate 13, cabane strut cover plates 11, aileron hinges 3

Fuselage - cabane strut plates10 and 17

Elevator - hinges 3, cable and ports 5 (cut away the 'cable' and drill a 0.5 mm diameter hole in the centre square recess)

Rudder - hinges 3

Radiator panel - 13

Hinge plates (Rudder, Ailerons, Elevators) - 3

Landing gear strut plates - 16

Cabane strut plates - 10

'Tamiya' Rubber Black (XF85) - rudder control horns 4

Airbrush all parts with a protective semi-matt clear coat, such as 'Alclad' Light Sheen (ALC311) or similar.

Rigging preparation:

NOTE: *Refer to Part 6 (Rigging) of this build log for rigging information. Locating holes for each rigging point must be drilled at the relevant location on the model.*

Temporary fit of parts:

NOTE: *The following steps are necessary to gauge what angle the rigging points holes will need to be drilled so that the fitted One-Ended turnbuckles align to the finally fitted rigging line. Temporarily fit the parts as required.*

Temporarily fit the lower wings to the fuselage.

Temporarily fit the interplane struts into the lower wings.

Temporarily fit the fuselage 'Z' cabane struts into the fuselage.

Temporarily fit the landing gear assembly into the fuselage.

Upper wing:

Drill holes of 0.3 mm diameter into, **but not through**, the underside of the upper wing, as follows:

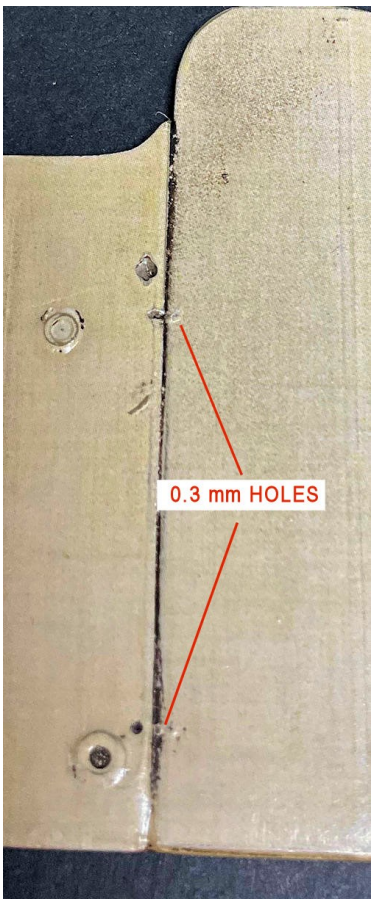
Rear of the forward interplane strut locating hole

Forward from the rear interplane strut locating hole

Inboard from the forward interplane strut locating hole

Inboard from the rear interplane strut locating hole

Between the holes drilled at the rear interplane strut locating hole.



Lower wings:

Using the fitted parts as an angle guide for the rigging lines, drill holes of 0.3 mm diameter into the top surface of the lower wings, as follows:

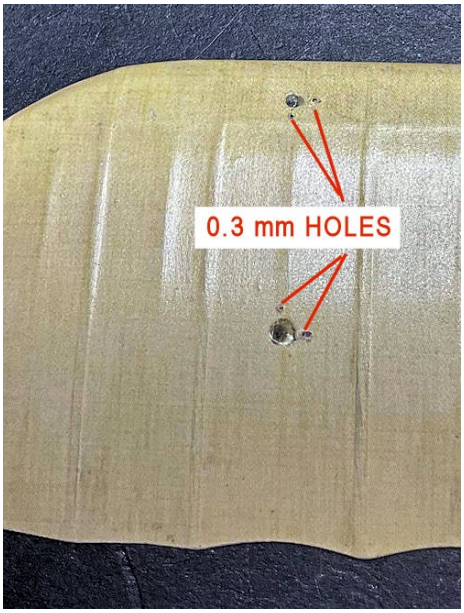
Drill holes of 0.3 mm diameter into, **but not through**, the underside of the upper wing, as follows:

Rear of the forward interplane strut locating hole

Forward from the rear interplane strut locating hole

Inboard from the forward interplane strut locating hole

Inboard from the rear interplane strut locating hole.



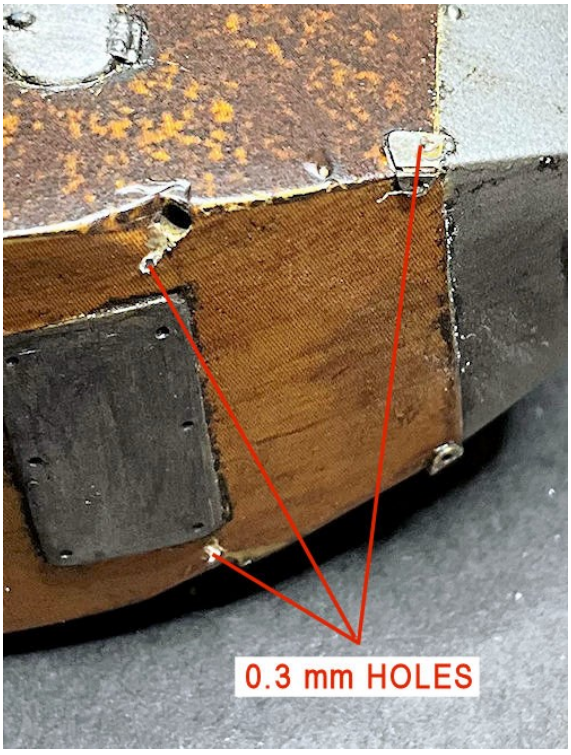
Fuselage:

Using the fitted parts as an angle guide for the rigging lines, drill holes of 0.3 mm diameter into the fuselage, as follows:

Underside of the fuselage, inboard from the two locating holes for the landing gear front struts.

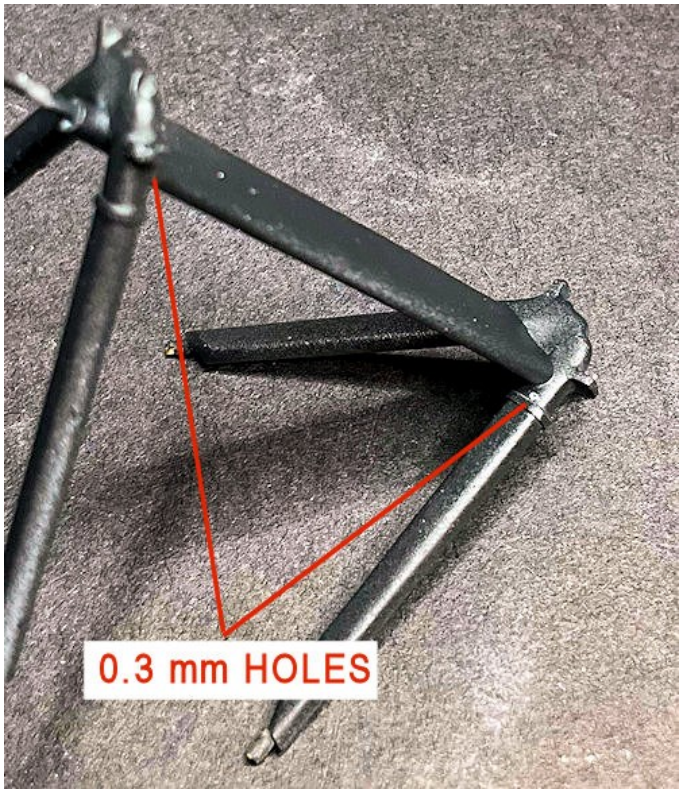
Through the fitted photo-etch brackets (15) at the bottom, forward edge of the fuselage sides.

Fuselage lower sides, above the locating holes for the landing gear struts.



Landing gear assembly:

Using the fitted parts as an angle guide for the rigging lines, drill holes of 0.3 mm diameter into the bottom, forward edge of the landing gear front struts.



Remove temporary fitted parts:

Remove the temporarily fitted landing gear assembly, interplane struts, fuselage 'Z' cabane struts and the lower wings.

Rudder:

NOTE: *The following steps are to allow rigging line to be used for the rudder control cables, instead of the 'flat' control line originally on the photo-etch parts 5.*

Using as a guide the small pin point mark at the lower, leading edge of the rudder, drill a hole of 0.4 mm diameter through the rudder.

Insert the location 'tags' of the photo-etch control horns (4) into the drilled hole in the rudder. Insert the control horns from both sides of the rudder with the 'tags' overlapping each other.

Using thin CA adhesive, secure the control horns into the drilled hole and against the sides of the rudder, making sure the horns are at 90 degrees to the rudder sides and aligned to each other.

NOTE: *The following steps are necessary to accurately position the outlets for the rudder control cables in the rear, sides of the fuselage. Temporarily fit the parts as required.*

Temporarily fit the two tailplanes to the rear, sides of the fuselage.

NOTE: *The rudder 'cable' on the photo-etch parts (5) should already have been cut off earlier in this build log.*

Drill a hole of 0.5 mm diameter through the centre recess of the photo-etch outlets (5).

Position an outlet on one side of the fuselage, just above the top surface of the tailplanes and with its centre over the tailplane trailing edges.

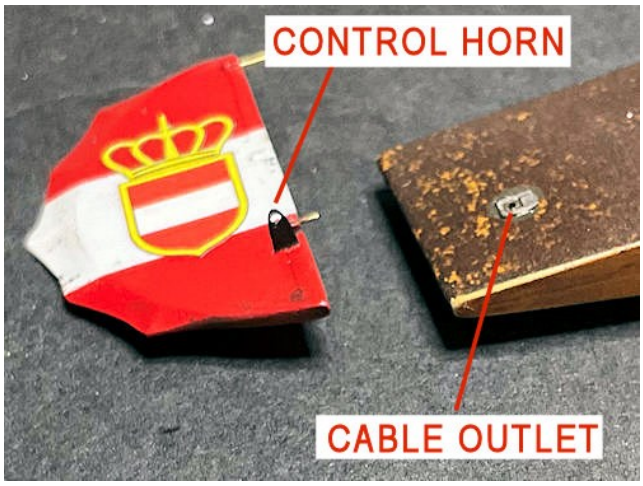
Point mark through the drilled hole in the outlet onto the fuselage side.

Remove the outlet and tailplanes from the fuselage.

Using the point mark as a guide, drill a hole of 0.5 mm diameter completely through the fuselage, making sure the hole is drilled at 90 degrees to the fuselage when viewed from above and behind.

Using thin CA adhesive, secure the photo-etch outlets to the fuselage sides, making sure their holes are aligned to the holes in the fuselage.

If necessary carefully drill out any residual adhesive in the outlets and fuselage.



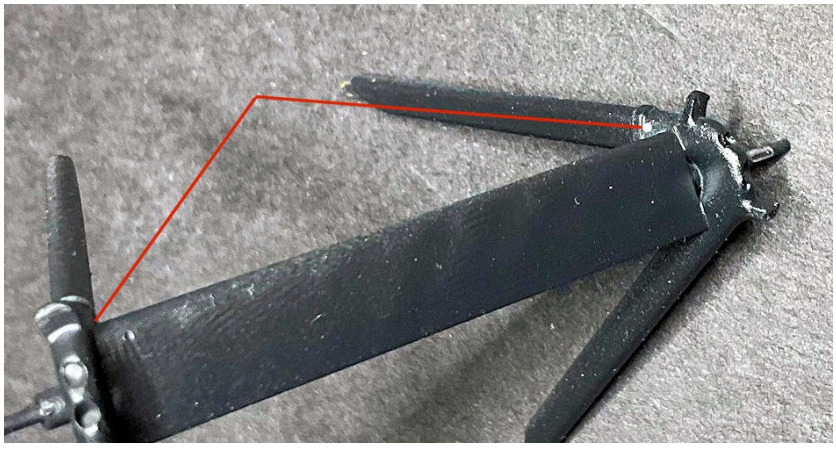
Rigging Anchor Points:

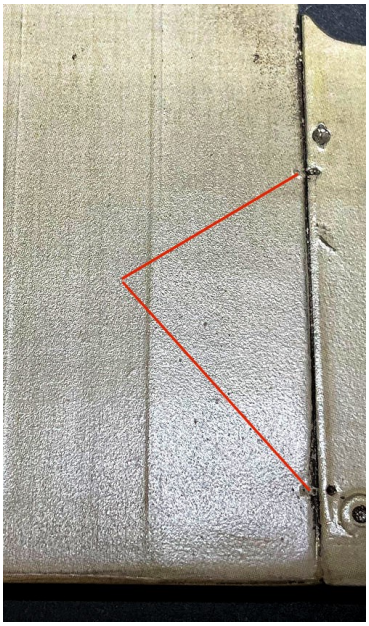
NOTE: ***The rigging anchor plates supplied as photo-etch parts (8 and 9) in the kit are not used****. Instead, the rigging Anchor Points used are the 'GasPatch Elite Accessories' 1/48 scale metal Anchor Points, which are snapped in their centres to provide two Anchor Points.*

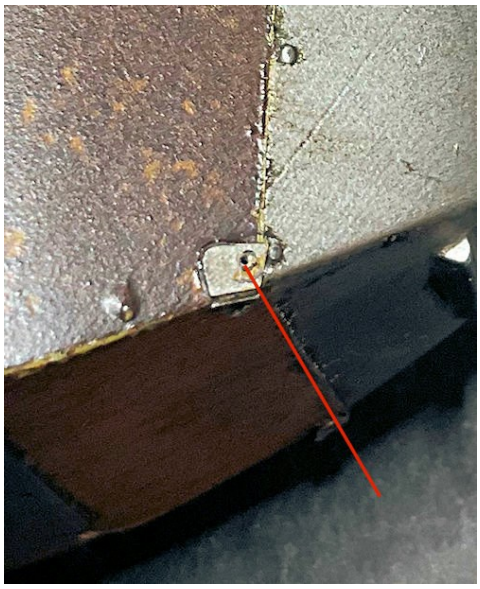
Using thin CA adhesive, secure the 'leg' of an Anchor Point into **each of the following** pre-drilled holes. Make sure the Anchor Points are fitted so that the 'eye' of the Anchor Points will be parallel with fuselage.

Once secured in position and if necessary, run a 0.2 mm diameter drill through the 'eye' of and Anchor Points contaminated with adhesive.

Landing gear







Pre-rigging:

NOTE: *At this stage of the build it's best to pre-rig the model parts as this makes it easier to final rig the assembled model. The pre-rigging uses the following:*

'Albion Alloy's' 0.5 mm diameter Nickel-Silver micro-tube (NST05)

'Steelon' mono-filament (0.12 mm diameter).

Underside of upper wing:

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

If necessary, carefully run a 0.2 mm diameter drill through the 'eye' end of the Anchor Point to remove any obstruction.

Cut a short length of 0.5 mm diameter Nickel-Silver tube, such as that supplied from 'Albion Alloy's (NST05) or similar.

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

NOTE: *Nickel-Silver tube can be chemically blackened by immersion in solutions such as 'Blacken-It' or similar.*

Blacken the tube to reduce its metallic sheen.

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 0.12 mm diameter mono-filament (fishing line), such as that from 'Steelon'.

Pass the line through the tube, then trough the 'eye' end of the Anchor Point.

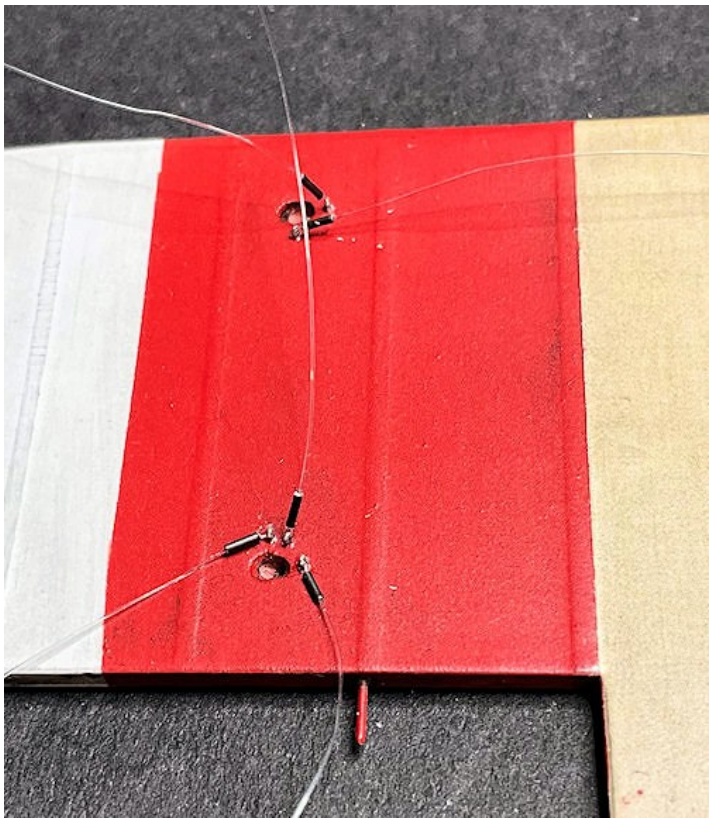
Loop the line back and through the tube.

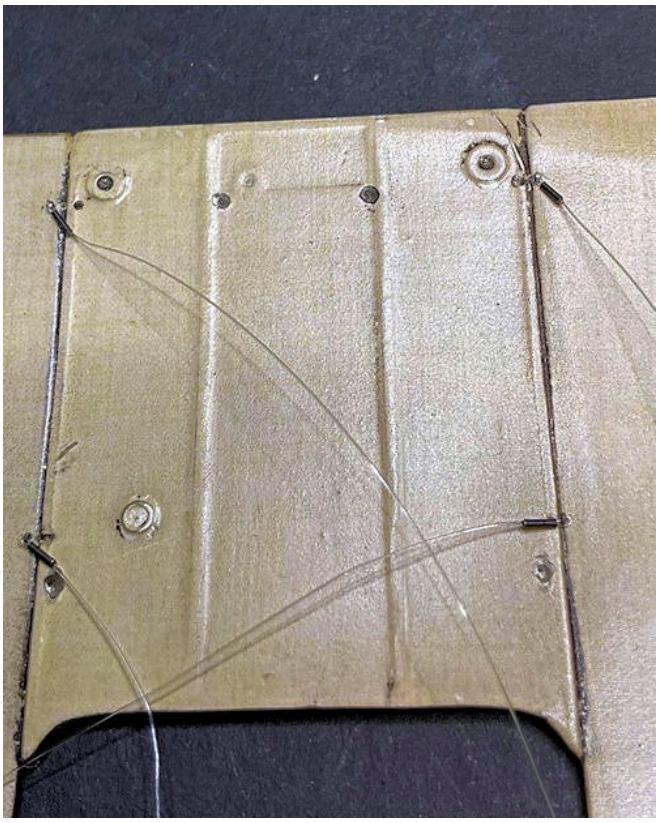
Slide the tube up to, **but not touching**, the 'eye' end of the Anchor Point.

Using thin CA adhesive, secure the lines in the tube end away from the Anchor Point.

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

Underside of upper wing



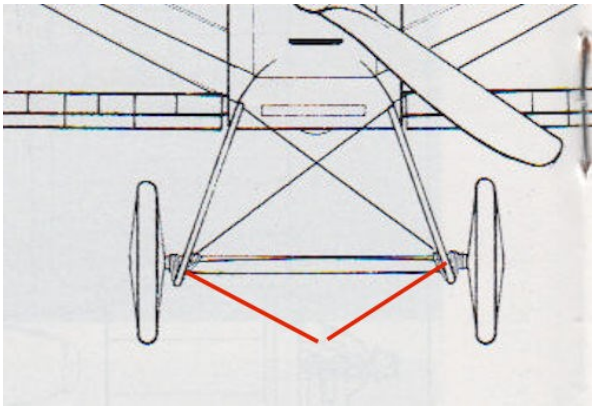


Rudder:

Use the same procedure to pre-rig a control line to a control horn **one side only** of the rudder.

Modifications (continued):

NOTE: *Axle suspension was provided by 'bungee' type cord, which was wrapped around the axle at both sides of the landing gear struts.*



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

Using thin CA adhesive, secure one end of the line against the outer, bottom side the landing gear rear strut.

Pass the line up and across the end of the axle between the struts then down and around the protruding ‘ledge’ on the front strut.

Pass the line up and across the outer end of the axle between the struts then down and around the protruding ‘ledge’ on the rear strut.

Continue routing the line until sufficient has been applied.

Using thin CA adhesive, secure the end of the line to the underside of a ‘ledge’.

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.

Assembly (continued):

Windscreen:

Carefully cut out a windscreen from the kit supplied acetate sheet. Cut around and slightly outside of the printed outline.

Remove the photo-etch windscreen frame (20) from the kit supplied sheet.

Remove and residual tags from the part edges.

Lightly sand the rear face (smooth side) of the frame.

Lay the acetate screen onto the sanded side of the frame and check it aligns to the frame edges.

With the acetate screen in position on the frame, carefully apply small amounts of thin CA adhesive to the edge of the screen/frame. Lightly press the screen edges to spread the adhesive around the join between the screen and frame.

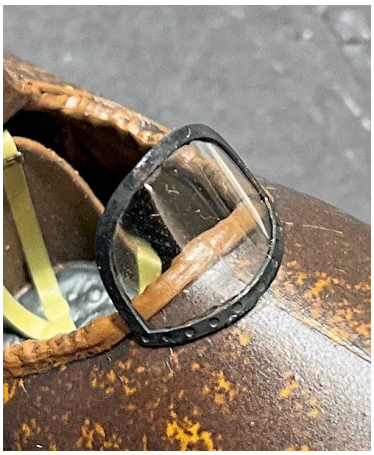
Once the adhesive has set, lay the assembly, acetate side down, over a round former of 5 mm diameter.

Hold the assembly centrally on the former and bend both sides down and around the former, to form a curve.

Check the windscreen locates fully over the fuselage decking panel forward from the cockpit. A guide line is visible on the fuselage for positioning the windscreen.

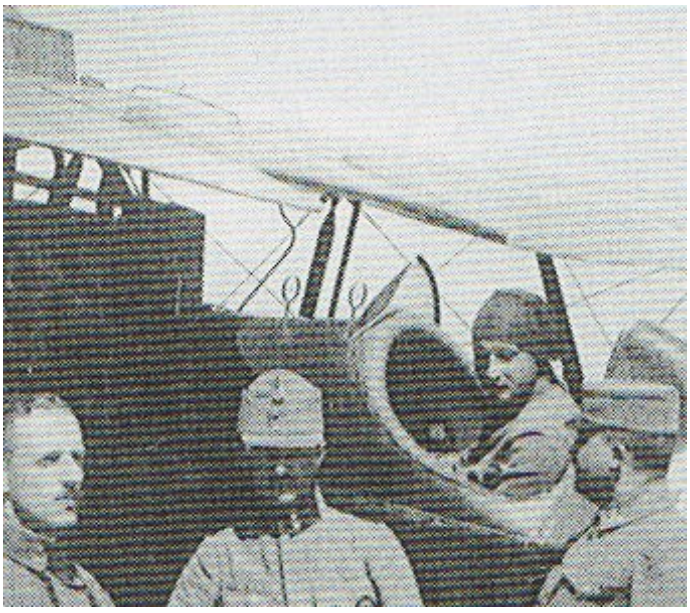
Carefully brush 'Tamiya' Rubber Black (XF85) or similar around the frame front edges and the acetate covering the rear edge of the frame.

Secure the windscreen in position on the fuselage using PVA (white glue) thinly applied along the bottom edge of the windscreen



Gun sights:

NOTE: *Twin gun sights of the ring type were fitted to some aircraft, although some had a single gun sight. It unclear how many gun sights were fitted to this particular aircraft. Therefore I chose to fit the two photo-etch gun sites, as supplied in the kit.*



Remove the photo-etch gun sights (17) from the kit supplied sheet.

Remove and residual tags from the part edges.

NOTE: *Photo-etch can be chemically blackened by immersion in solutions such as 'Blacken-It' or similar.*

Blacken the two gun sights.

Refer to the following photograph and drill two holes of 0.4 mm diameter vertically into the fuselage decking panel. The holes should equal distance from the centre of the fuselage, just outside the outer edges of the windscreen and .

Using CA adhesive, secure the two gun sights into their holes in the fuselage. Make sure the gun sights are:

Vertical in the fuselage when viewed from the front/rear and the side.

At 90 degrees to the fuselage centre line when viewed from above.

Aligned to each other.

Cabane strut plates:

Using CA adhesive, secure the photo-etch cabane strut plates (11) onto their recesses outboard from the centre section on the top surface of the upper wing.

Radiator panel:

Using CA adhesive, secure the photo-etch radiator panel (13) into its shallow recess in the forward, underside of the upper wing centre section.

Lower wings:

Insert the fitted locating rods in the lower wing into and through the holes in the fuselage. Pass the ends of the rods through the holes in the other side of the fuselage, leaving a gap between the fuselage and lower wing root.

Apply thin CA adhesive to the contact face of the wing root and the rods.

Push the wing fully against the fuselage, making sure the leading edge of the wing is at 90 degrees to the fuselage centre line. I checked this by laying the assembly onto the grid marked on my cutting mat.

Locate the opposite lower wing onto the protruding support rods, leaving a gap between the fuselage and lower wing root.

Apply thin CA adhesive to the contact face of the wing root and the rods.

Push the wing fully against the fuselage, making sure the leading edge of the wing is at 90 degrees to the fuselage centre line.

Cabane struts:

Using CA adhesive, secure the locating rods added to the two cabane ‘Z’ struts into their locating rod holes previously drilled into the strut recesses in the fuselage. Make sure the cabane struts are fully located into their fuselage recesses.

Upper wing:

NOTE: *The following step is necessary to prevent the pre-rigged lines on the underside of the upper wing from being contaminated with adhesive.*

Use thin strips of masking tape to hold the pre-rigged lines onto the upper wing and away from the cabane and interplane strut locating holes.

Lay the upper wing top surface down.

Locate the four top locating rods in the cabane struts into their locating holes pre-drilled in the underside of the upper wing.

Apply a small amount of thin CA adhesive to secure the struts into the upper wing.

Turn the aircraft over and lay it on the lower wings.

NOTE: *The longer interplane struts are the front struts.*

Fully locate a front interplane strut into its locating hole pre-drilled into a lower wing.

Fully locate a the top of the strut into its locating hole pre-drilled into the underside of the upper wing.

NOTE: *If necessary, use an elastic band around the lower and upper wings to keep the strut fully located.*

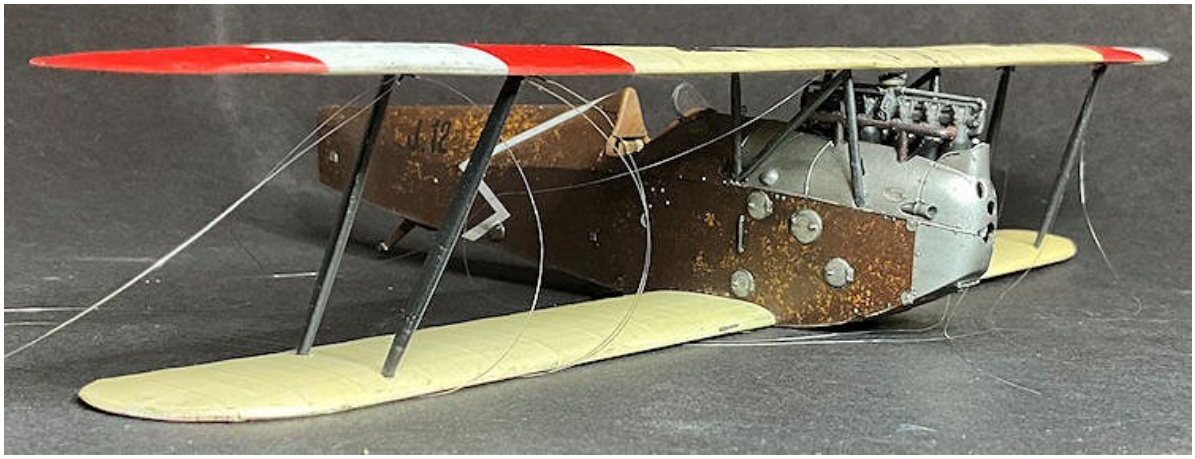
Apply a small amount of thin CA adhesive to secure the strut into both wings.

Repeat the procedure to fit the front interplane strut into the opposite wings.

Repeat the procedure to fit the shorter, rear interplane struts into their locating holes pre-drilled in the upper and lower wings.

Remove the masking tapes to release the pre-rigged lines from the upper wing.

Check that the upper and lower wings are aligned when viewed from above and from the sides.



Final rigging - wings:

NOTE: *The final rigging uses the following:*

'GasPatch Elite Accessories' 1/48 scale metal turnbuckles (One-Ended)

'Albion Alloy's' 0.5 mm diameter Nickel-Silver micro-tube (NST05)

One-Ended

Example for One Ended turnbuckles:

NOTE: *The following example applies to all of the pre-rigged lines between to upper and lower wings,* ***except the drag wires****, which will be final rigged differently with Type C turnbuckles.*

Clear any residual decal, paint or adhesive from the pre-drilled rigging holes by running a 0.3mm diameter drill in the holes.

Cut a short length of 0.5mm diameter Nickel-Silver tube, such as that supplied from 'Albion Alloy's (NST05) or similar.

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

NOTE: *Nickel-Silver tube can be chemically blackened by immersion in solutions such as 'Blacken-It' or similar.*

Blacken the tube.

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

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

Using thin CA adhesive, secure the tang of the turnbuckle into its relevant pre-drilled hole, making sure the turnbuckle is aligned to the opposite end (Anchor Point) of the line.

Pull on the free end of the line at the tube to tighten the line, then 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.

Wings - final rigging:

Refer to Part 6 (Rigging) of this build log - Using the example above, final rig the lines between the upper and lower wings and in the following order:

Rear flying wires (both sides) - Landing wires (both sides) - Front flying wires (both sides) - Incidence wires between interplane struts (both sides).

Final rigging - drag wires:

NOTE: *The final rigging of the drag wires uses the following:*

'GasPatch Elite Accessories' 1/48 scale metal turnbuckles (Type C)

'Albion Alloy's' 0.5 mm diameter Nickel-Silver micro-tube (NST05)

Type C

Example for Type C turnbuckles:

NOTE: *Type C turnbuckles are fitted inline, with a line attached to both ends of the turnbuckle. Refer to the rigging of Anchor Points earlier in this build log.*

A line is attached, for example, to an Anchor Point on the fuselage and a second line to an Anchor Point on a wing.

Clear any residual decal, paint or adhesive from the pre-drilled rigging holes by running a 0.3mm diameter drill in the holes.

Cut a short length of 0.5mm diameter Nickel-Silver tube, such as that supplied from 'Albion Alloy's (NST05) or similar.

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

NOTE: *Nickel-Silver tube can be chemically blackened by immersion in solutions such as 'Blacken-It' or similar.*

Blacken the tube.

Pass one of the lines through the tube, then through the 'eye' end of a 'Gaspatch' 1:48th scale turnbuckle (Type C).

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

Repeat the procedure to attach the second line to the other end of the turnbuckle.

Pull on the free ends of the two lines to position the turnbuckle in the line, then slide the tubes up to, **but not touching**, the 'eye' ends of the turnbuckle.

Keeping the lines taut, 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.

Drag wires - final rigging:

Refer to Part 6 (Rigging) of this build log - Using the example above, final rig the two drag wires between the fuselage sides and the upper wing.

Assembly (continued):

Landing gear:

Make sure the four fuselage locating holes for the landing gear struts are clear of paint and decal.

Make sure the four locating rods in the landing gear struts are clear of paint.

Using thin CA adhesive, secure the landing gear into its fuselage locating holes.

Final rigging - landing gear:

NOTE: *The final rigging uses the following:*

'GasPatch Elite Accessories' 1/48 scale metal turnbuckles (One Ended)

'Albion Alloy's' 0.5 mm diameter Nickel-Silver micro-tube (NST05)

Using the previous example for rigging a One-Ended turnbuckle, attach a line to two turnbuckles.

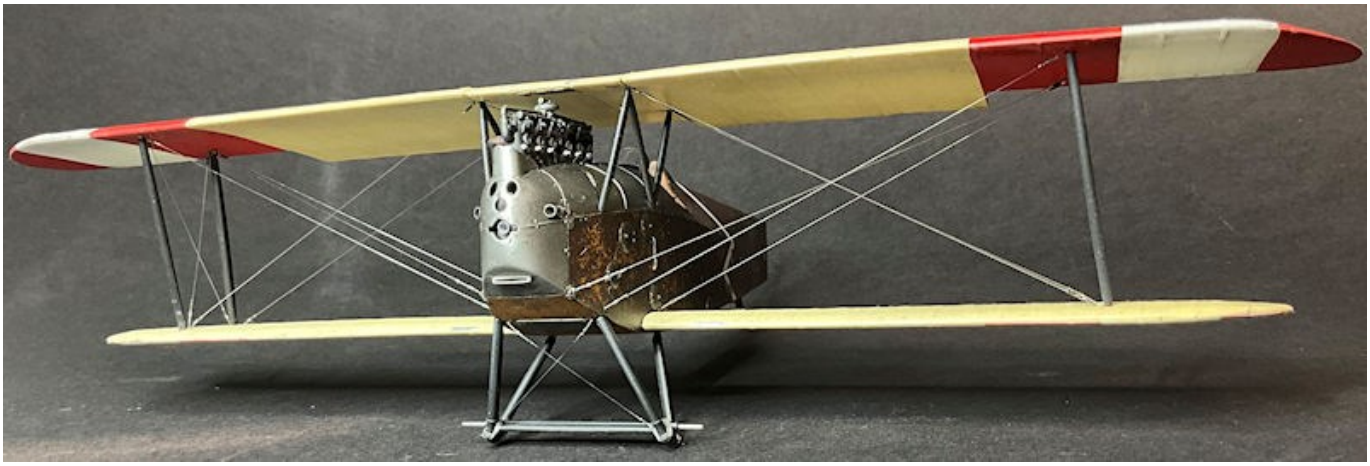
Using thin CA adhesive, secure the tang of the turnbuckles into the pre-drilled holes in the underside of the fuselage, inboard from the landing gear front struts. Make sure the turnbuckles are aligned diagonally across and down to the previously fitted Anchor Points at the front, bottom of the landing gear struts.

Using the previous example for rigging an Anchor Point, attach the free ends of the two lines to the diagonally opposite Anchor Points on the landing gear struts.

Pull on the free ends of the lines then slide the tubes up to, **but not touching**, the 'eye' end of the fitted Anchor Points.

Keeping the lines taut, secure the lines to the tube ends away from the Anchor Points, using thin CA adhesive.

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



Assembly (continued):

Engine cooling pipes:

NOTE: *During construction of the fuselage, I had to modify the internal frames in order to allow the fuselage halves to fully join. This ultimately led to the fitted engine being slightly out of position in the fuselage, which meant the coolant pipe from the water pump on the top of the engine did not locate into its recess in the panel on the underside of the upper wing. Therefore, I did not use the kit supplied pipe and instead created a pipe from 0.8 mm diameter lead wire from 'PlusModel', bent to shape then, using thin CA adhesive, secured it in position between the engine water pump and the underside of the upper wing. It was then brush painted with 'Mr. Colour' Stainless Steel (213) and 'AK Interactive' Kerosene wash (AK2039).*

Radiator auxiliary support struts:

Slide the radiator auxiliary support struts (created earlier in the build) into the holes cut into the engine side panels.

Insert the top end of the struts into the pre-drilled recesses in the underside of the upper wing, outboard from the added panel.

Secure the struts in the engine panels and underside of the upper wing using thin CA adhesive.

Engine side coolant pipes:

NOTE: *Due to the same reason the previous coolant pipe did not fit, I found that the kit supplied coolant pipes between the engine sides and upper wing also did not fit correctly. Therefore, I did not use the kit supplied pipe and again created pipes from 0.8 mm diameter lead wire from 'PlusModel'. These were bent to shape then, using thin CA adhesive, secured in position against the sides of the engine (below the water pump), the front of the fuselage cabane struts and the recesses in the underside of the upper wing. They were brush painted with 'Mr. Colour' Stainless Steel (213) and 'AK Interactive' Kerosene wash (AK2039).*

Aileron control tubes:

Slide the aileron control tubes (created earlier in the build) into the holes cut into the fuselage decking panel, forward from the cockpit.

Insert the top end of the tubes into the pre-drilled recesses in the underside of the upper wing, rear of the tops of the rear fuselage cabane struts.

Secure the tubes in the fuselage and underside of the upper wing using thin CA adhesive.

Engine exhaust pipes:

NOTE: *Three exhaust pipes are fitted between the cabane struts and three forward from the cabane struts.*

Using thin CA adhesive, secure the six engine exhaust pipes onto their ports on the upper, left side of the engine.

Radiator:

Using thin CA adhesive, secure the radiator onto the leading edge of the upper wing centre section.

Tailplanes:

NOTE: *During the following step, make sure the tailplanes are fitted with their support strut locations on the top surface trailing edges.*

Using thin CA adhesive, secure the two tailplanes into their pre-drilled locating holes in the fuselage, rear sides, making sure the tailplanes are 90 degrees to the fuselage when viewed from the front/rear.

Using thin CA adhesive, secure the upper and lower support struts for the tailplanes in position.

Fin:

Using thin CA adhesive, secure the fin into its pre-drilled locating holes in the top, rear of the fuselage, making sure the fin is vertical on the fuselage when viewed from the front/rear.

Rudder:

Using thin CA adhesive, secure the rudder into its pre-drilled locating holes in the top, rear of the fin and rear edge of the fuselage, making sure the rudder is vertical on the fuselage when viewed from the front/ rear.

Ailerons:

Using thin CA adhesive, secure the two ailerons to their support rods in the trailing edge of the upper wing.

Final rigging - rudder:

NOTE: *One side of the rudder has already been pre-rigged earlier in this build log.*

Pass the pre-rigged line through the hole pre-drilled in the fuselage side (photo-etch control port), across the fuselage and out through the hole in the other side of the fuselage.

Cut a short length of 0.5mm diameter Nickel-Silver tube, such as that supplied from 'Albion Alloy's (NST05) or similar.

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

NOTE: *Nickel-Silver tube can be chemically blackened by immersion in solutions such as 'Blacken-It' or similar.*

Blacken the tube.

Pass the line through the tube, then through the 'eye' end of the rudder control horn.

Loop the line back and through the tube.

Pull on the free end of the line then slide the tube up to, **but not touching**, the 'eye' end of the control horn.

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

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

Assembly (continued):

Elevators:

NOTE: *During the following step the elevators can be angled slightly down by gently bending the support rods during fitting.*

Using thin CA adhesive, secure the elevators into their pre-drilled locating holes in the rear edge of the tailplanes.

Photo-etch brackets and hinge covers:

Using thin CA adhesive, secure the pre-painted photo-etch brackets (10) to the bottom of the fuselage cabane struts.

Using thin CA adhesive, secure the pre-painted photo-etch brackets (16) to the top of the landing gear forward struts.

Using thin CA adhesive, secure the pre-painted photo-etch hinge covers (3) over the following:

Both ailerons (both sides) (12 total)

Rudder (both sides) (6 total)

Elevators (both sides) (8 total).

Pilots rear view mirror:

Using thin CA adhesive, secure the pilots rear view mirror onto the fuselage decking panel, to the left and slightly forward from the edge of the windscreen.

Anemometer:

Brush paint the instrument face with a clear gloss coat, such as 'Tamiya' Clear Gloss (X22) or similar.

Apply an appropriate decal from the 'Airscale' Instrument dial decals - WW1 generic (AS32 WW1) to the instrument face.

Brush paint the applied decal with a clear gloss coat, such as 'Tamiya' Clear Gloss (X22) or similar.

Drill a hole of 0.8 mm diameter into the leading edge of the left lower wing, two and a half wing rib tapes inboard from the forward interplane strut.

Using thin CA adhesive, secure the Anemometer at the leading edge of the left lower wing and two wing rib tapes inboard from the forward interplane strut.

Flare rack:

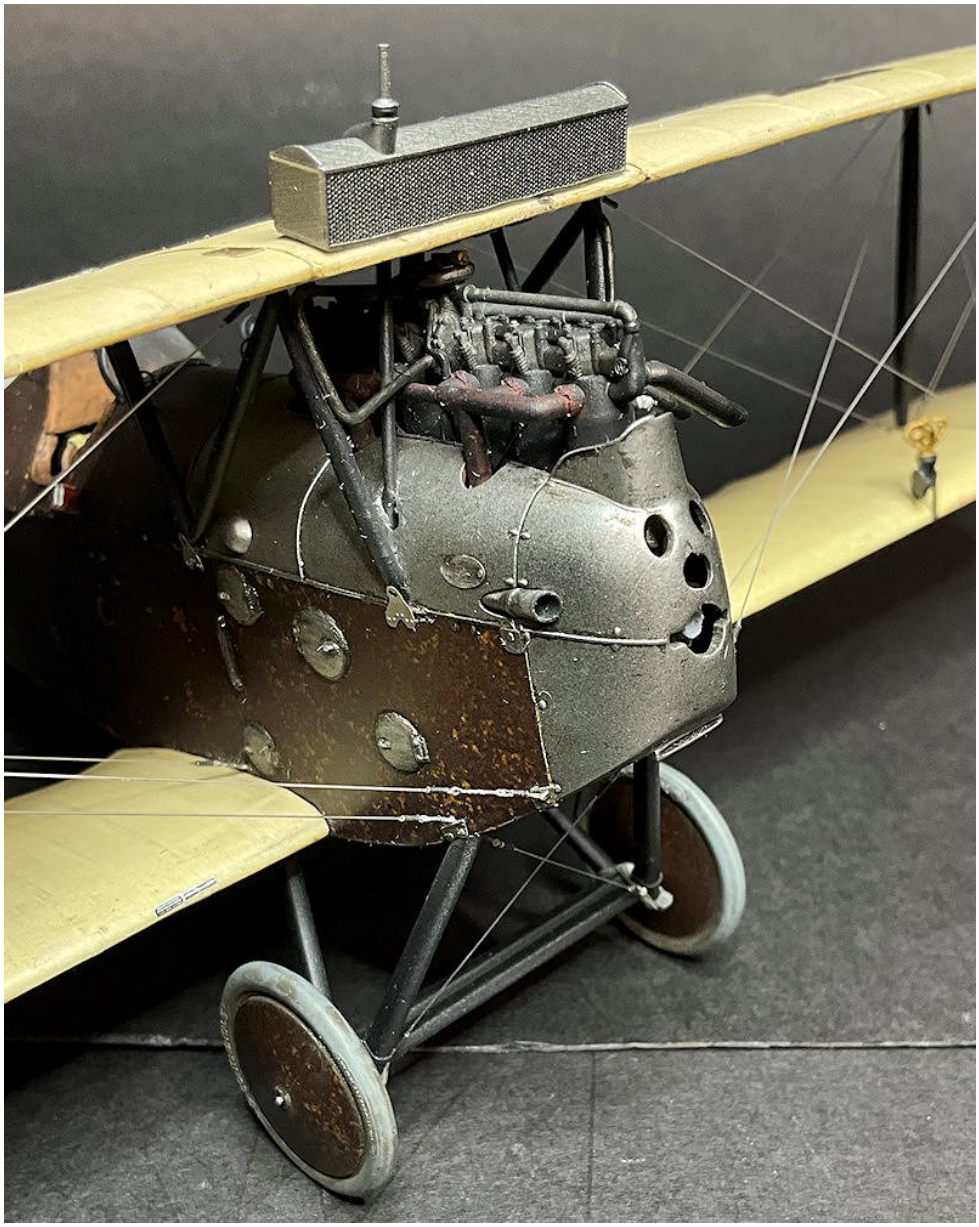
Using thin CA adhesive, secure the flare rack onto the fuselage at the right side of the cockpit.

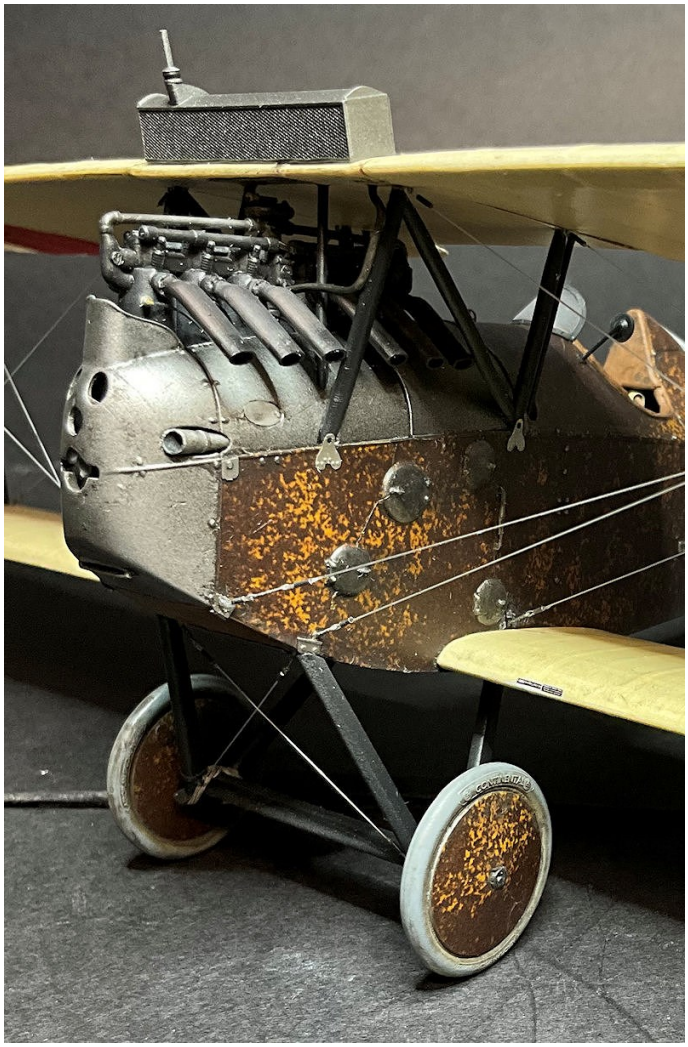
Wheels:

Using thin CA adhesive, secure the wheels to the ends of the steel axle, making sure the wheels are vertical when viewed from the front and parallel when viewed from above/below.

The following photographs show most of the parts added, including the:

Engine coolant pipes
Exhaust pipes
Radiator auxiliary support struts
Upper wing detail
Aileron control tubes
Gun sights
Tailplanes and elevators
Fin and rudder
Upper wing ailerons
Photo-etch brackets and hinge covers
Pilots rear view mirror
Lower wing Anemometer
Wheels.



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A.110

Surface finish:

NOTE: *The following step is intended to give a final protective clear coat over the model and to dull the sheen on the mono-filament rigging lines.*

Cover the acetate windscreen to protect it from over spray.

Airbrush a light coat of semi-matte clear coat, such as ‘Alclad’ Light Sheen (ALC311) or similar over the model and it’s rigging lines.

Remove the windscreen covering.

Weathering:

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

Brush on, let dry then remove ’Flory Models’ wash (Dark Dirt) to leave a slight stain:

Behind the upper wing mounted radiator

Behind all of the flight surface hinges

Behind the interplane struts.

Lightly wet a brush with ’Flory Models’ wash (Grime) then flick the brush over a round rod or tooth pick to create spatter on the undersides of the lower wings, behind the wheels.

Brush on, let dry then remove ’Flory Models’ wash (Grime) to leave a slight stain:

Around the pilots foot step (left side of fuselage)

On the trailing edge at the wing root of the lower, left wing.

Lightly sponge ‘Tamiya’ Weathering Master set A (mud):

Along the leading edges of the upper and lower wings (top and underside)

Around the wheel tyres.

Propeller:

Using CA adhesive, secure the propeller into the propeller shaft hole in the engine front.

PART 13
FIGURE

PART 13 - FIGURE

The figure I chose to use is the 'Kellerkind' KuK pilot in leather jacket (54086).

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

Preparation:

Remove the figure and left arm their moulding blocks.

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.

Assembly:

Using CA adhesive, secure the left arm onto the figure.

Painting:

NOTE: *The figure was painted using 'AK Interactive' and 'Tamiya' acrylic paints. Slightly 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.

Brush paint the figure as follows:

Shoes - 'Tamiya' Semi-gloss Black (X18).

Flying coat - Base colour - 'AK Interactive' Brown Leather (AK3031), highlights - 'AK Interactive' British Uniform (AK3081), airbrush with a semi-matte clear coat, such as 'Alclad' Light Sheen ALC311) or similar. Buttons 'Mr. Colour' Dark Iron (214). Lining 'Tamiya' White XF2) with Desert Yellow (XF59) highlights.

Jacket/Trousers/Puttees - 'Tamiya' Dark Sea Grey (XF54) with Light Grey (XF66) highlights. Jacket collar 'Tamiya' Red (X7) with 10% Rubber Black (XF85) to darken. 'Mr. Colour' Brass (219) collar studs.

Gloves - 'AK Interactive' Brown Leather (AK3031).

Scarf - 'Tamiya' Medium Blue (XF18).

Flesh - 'Citadel Colour' Cadian Flesh Tone with Kislev Flesh highlights. Lips Bugmans Glow.

Hair - 'Tamiya' Rubber Black (XF85) with dry brushed Neutral Grey (XF53) highlights.

Finishes - Clothes 'Tamiya' Flat Clear (XF86), Leather sheen 'Tamiya' Semi-Gloss Clear (XF35).

Weathering:

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 flying coat.

Refer Part 3 (Weathering) of this build log - brush 'Flory Models' Dark Dirt clay wash over the jacket, trousers and puttees to add dirt/ grime.

PART 14
DISPLAY BASE

PART 14 - 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 'Polak' Wild Meadow variation G (4707) grass mat.

The information plaque was engraved by 'TLS Engraving Ltd'.

Grass mat:

The grass mat was cut to the desired shape. The clear plastic backing was removed from the grass mat, which was 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. A soft, silver coloured pencil was used to lightly trace the outline of the mat 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 kitchen 'Cling Film' or paper and several heavy books were then stacked onto the covering to press the grass mat fully in contact with the display base. The books and covering 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. The grass mat was scrapped through where the tyres of the wheels and the tail skid were located. This allows the model to be located into, not onto, the grass mat.

The figure:

The figure was positioned on the base in its final position 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 drilled through the grass mat and into (not through) the display base. PVA or CA adhesive was then applied to the pin of the figure, which was then located fully into the drilled hole. Light pressure was applied to the figure, until the adhesive had set, to ensure it was fully located and vertical in the base.

The information plaque:

The acrylic stand for the information plaque was scuffed with sand paper on its bottom surface. It was then position in the left corner of the display base and its outline lightly scored with a pointed scriber. The area inside the scribed outline was scuffed with sand paper. An adhesive, such as a contact or two-part epoxy adhesive was applied to the scuffed surfaces and the stand positioned onto the scribed outline on the display base.

Once the adhesive had fully set, the information plaque was secured onto the stand, using the self-adhesive tape on the rear face of the plaque.

PART 15
COMPLETED MODEL PHOTOGRAPHS


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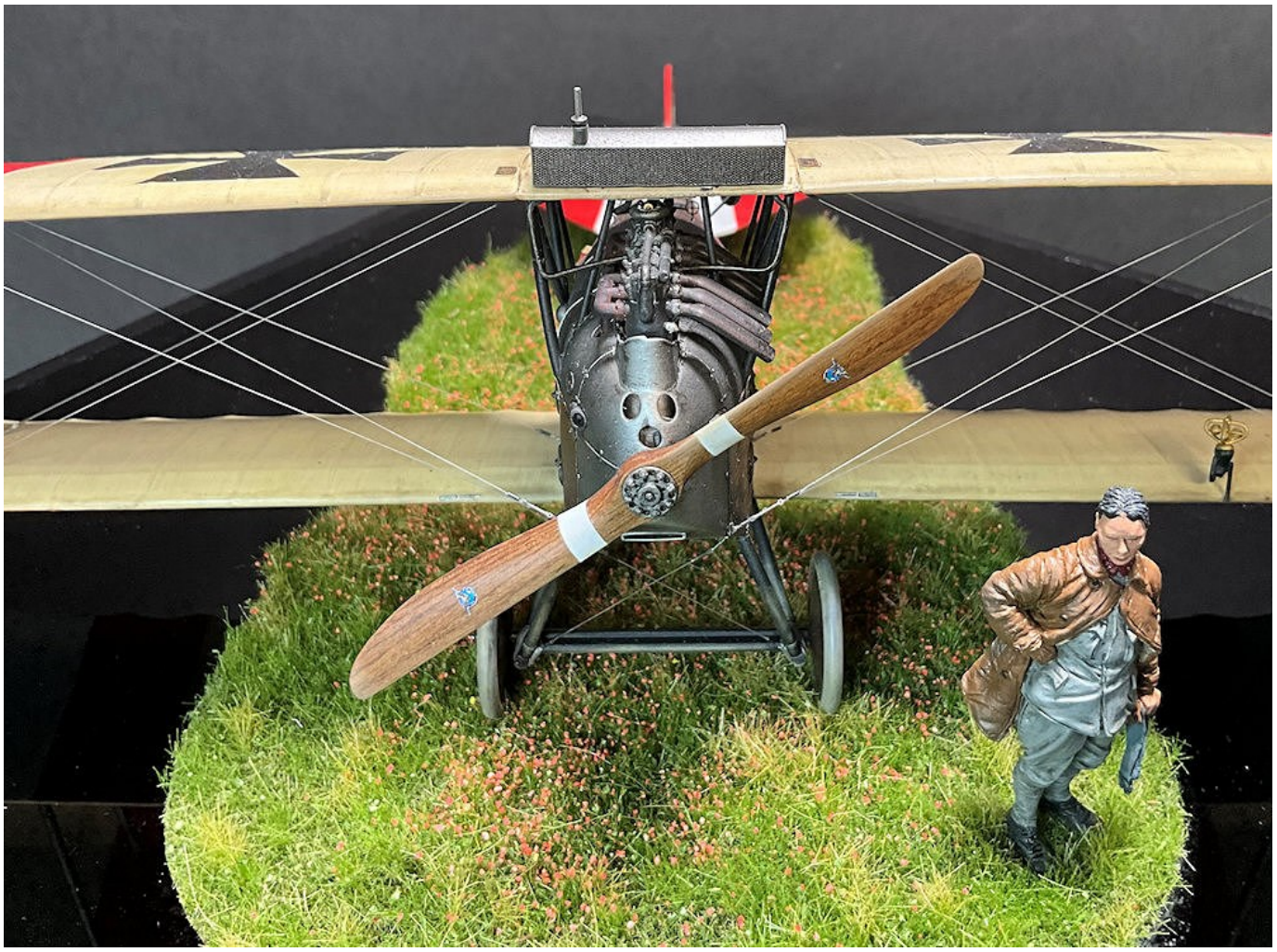

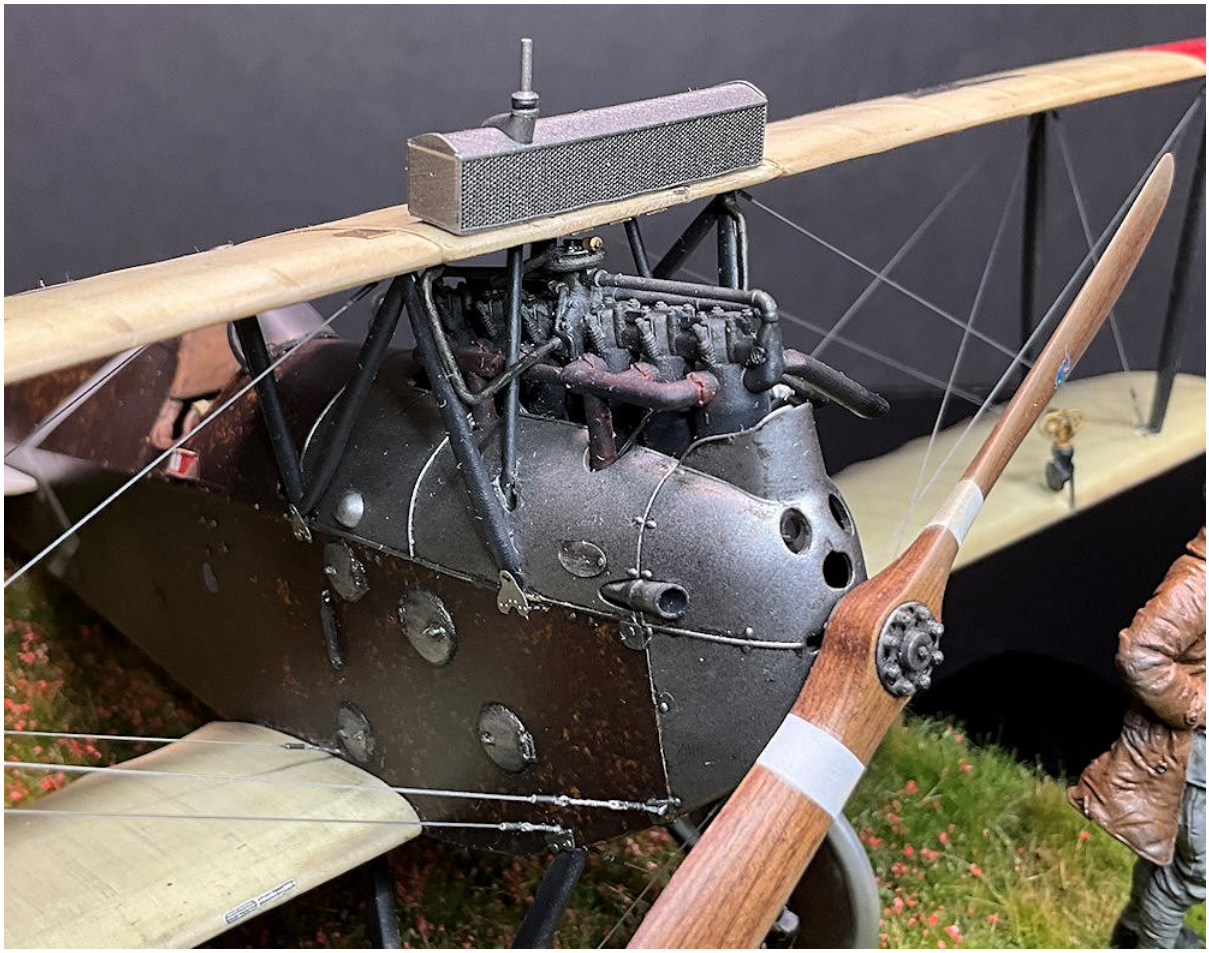

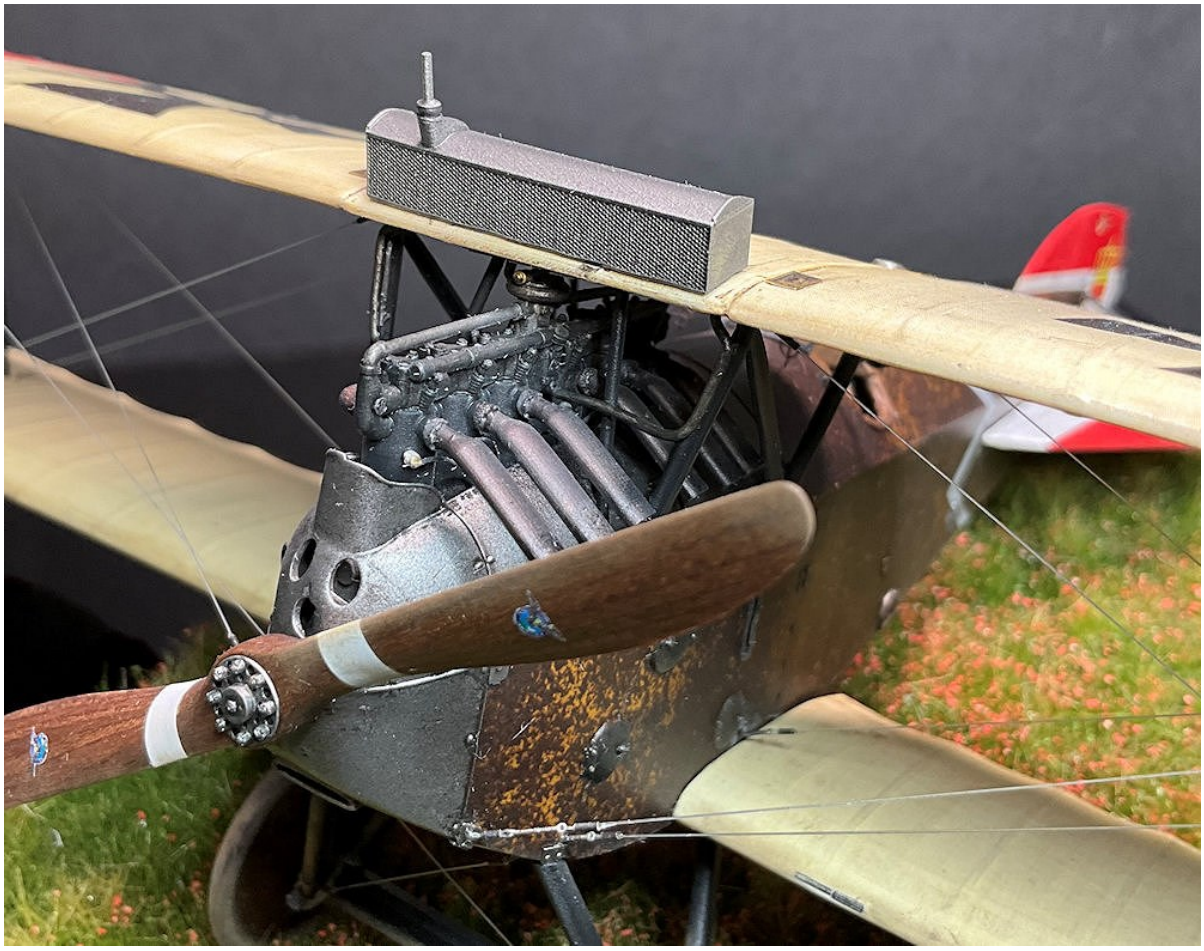

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