



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 modelling again in 2015 and now enjoy the challenge of building aircraft of World War One. Since posting photographs of my completed models online, I've been asked if I would create fully detailed 'build logs' for future builds.

I don't consider myself a 'master' of this hobby, but hope to be able to pass on what I have learned. As such, here is my build log, which covers a model of the 'Wingnut Wings' 1:32 scale kit of a Jeannin 'Stahltaube' ('Steel Dove') of 1914.

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Completed: March 2026

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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 to the 'carpet monster'). 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

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Figures

'Copper State Models' standing German airman (F32-040),
'Copper State Models' Gotha bomber German crew member N.2 (F32-010),
'Copper State Models' German ground crewman N.1 (F32-012).

Propeller

'Proper Plane' wood laminated 'Integral' propeller (WP-064).

Decals:

'Aviatic' German 'Feldgrau' Medium Grey/Green clear backed (ATT32228),
'Aviatic' Clear Doped Linen aged varnished clear backed (ATT32094).

Resin

'ANYZ' cockpit handles (AN030),
'Copper State Models' German 810x125 spoked wheels (A32-040).

Rigging accessories (as required)

'Albion Alloy's' Micro-tube (Brass or Nickel Silver, 0.4 or 0.5 mm diameters),
'Steelon' or 'Stroft GTM' fishing line (0.08 and 0.12 mm diameter),
'Gaspach' 1:48th scale metal turnbuckles (Type C),
'Proper Plane' 3D printed Turnbuckles (RD-005),
'HGW' 1/32nd scale Spoke Eyelets (132129).

Paints (as required)

'Tamiya' Acrylic, Humbrol Acrylic, 'Mr. Metal Color', 'Alclad II' Lacquers,
'AK Interactive' Primer (Grey AK758, White AK759) and figure paints (various),
'Tamiya' Fine Surface Primer (Grey/White), 'Tamiya' Paint Retarder,
'AK Interactive' Acrylic Thinner (AK712), 'Mig' Ammo A-Stand lacquers,
'MRP' acrylic lacquers, 'Windsor & Newton' Griffin Alkyd oil paint, 'Citadel' Colour (various),
'Mr. Surfacer' 500/1000/1200/1500, 'Mr. Finishing Surfacer' 1500.

Sundries (as required)

'Mr. Color' Levelling Thinners 400, PVA Adhesive (e.g. 'MicroScale' Micro Krystal Clear),
'PlusModel' lead wire (various), 'MicroScale' MicroSol/MicroSet decal solutions,
'VMS Fleky' CA adhesive (Slow and Thin), 'Revell' Contacta Professional cement,
'Tamiya' extra thin liquid cement, 'Perfect Plastic Putty', 'White Spirits/Odourless Thinners',
'VMS' Metal Prep 4K or 'Mr. Metal' Primer R, 'Araldite' two-part rapid epoxy, 'Black-It' solution,
'MFH' 0.4 mm diameter flexible black tube (P-961) or clear (P-957), Copper wire various diameters,
'Tamiya' masking sheet and tapes (various widths), 'Prismacolor' Verithin pencils
'Microscale' Krystal Klear, 'UHU' White Tack, 'Tamiya' masking tape (various widths),
'Abteilung 502' Liquid Mask, 'De-Solv-It' Sticky Stuff Remover, 'AK Interactive' Weathering pencils,
'Plastruct' plastic rod (various diameters), 'VMS' Paper Shaper and WFU Modelling Paper.

Weathering mediums (as required)

'AK Interactive' (Kerosene AK-2039, Engine Oil AK-2019),
'Tamiya' Weathering Master sets,
'Flory Models' Clay washes or Pigments.

Display Base

'Model Scene' Spring Meadow (F021),
'Inperspective' custom made acrylic base and cover,
Information plaque from 'TLS Engraving Ltd'.

THE AIRCRAFT

THE AIRCRAFT

References:

'Windsock' data file 104 - The Taube at War (P.M. Grosz).

'Wingnut Wings' - Instruction manual (IM).

Deutsches Technikmuseum, Berlin - Taube A.180/14.

General:

NOTE: *The following text is adapted from the 'Wingnut Wings' instruction manual.*

The delicate bird-like Taube came to epitomize early German aircraft design. Wealthy Austrian industrialist Igo Etrich based his successful Taube design on the stable gliding characteristics of the Zanon (now Alsomitra) *Macrocarpa* seed, as described by Professor Friedrich Ahlborn in his aeronautical research paper published in Germany in 1897. Igo began work in 1900 and was joined by his engineer, Franz Wels in 1903, initially developing models and then manned gliders before moving on to motorized versions. Their Etrich 1 'Sperling' (Sparrow) briefly took to the air in 1909 and was followed in April 1910 by the larger, more powerful, remarkably stable and comparatively safe Etrich II Taube (Dove). Fellow Austrian, Edmund Rumpler was impressed enough by the Etrich II that he obtained a five year exclusive license to build the Taube in Germany. Following further successful demonstrations of a 50hp powered Etrich Taube in October 1910, the Prussian military placed an order with Rumpler for five aircraft. Because the underlying aerodynamic principals of the Taube had been published by Ahlborn in 1897, Etrich was aware that it would be difficult to obtain a patent for his design in Germany and this was confirmed when the patent office rejected his application in September 1911. This essentially made Etrich's design public domain in Germany so that almost anyone with an engine, enough fabric, wire and a few sticks of wood could, legally build and sell their own copy of his Taube. Observing the dizzying array of copycat Taubes being churned out by dozens of his competitors, Rumpler simply refused to pay Etrich any license fees and continued to build the Etrich II Taube, marketed as the 'Rumpler Taube'. Rumpler became the largest supplier of Taubes to the German military. Etrich sued Rumpler in 1912 and numerous court cases continued between the two until 1930.

Ironically, it was the Frenchman, Emil Jeannin (born in Alsace, which had only just been ceded to Germany after the war of 1870-71), who was responsible for one of the next most numerous Taube designs to equip the German military, the Jeannin Stahltaube 1914 'Military Type'. Earlier Jeannin Taubes of 1912-1913 featured a steel tube framed fuselage and tail as opposed to the wood used by most other manufacturers, earning the name Stahltaube (Steel Dove). Later, the 'warping elevator' area of the tail was ribbed with flexible bamboo as were the 'warping aileron' (wing warping) portions of the spruce and ash wings. The fuselage, wings and tail were covered with linen. The engine cowlings were sheet aluminium, while the cabane and undercarriage struts were constructed from steel tube. These early Jeannin designs were distinguished by a propeller guard which curved from the bottom cabane section up to the nose, support girders under the wings, a 100hp Argus 4 cylinder or an 120hp Argus As.II 6 cylinder engine, a radiator mounted under the fuselage and vertically sprung undercarriage struts. The propeller guard and support girders were removed for the 1914 Military Type which also introduced a conventional 'V' strut undercarriage, Hazet radiators on each side of the fuselage and a 6 cylinder 100hp Daimler-Mercedes D.1 or 120hp Argus As.II engine. There was a single seat Jeannin Stahltaube as well as a Kleine (small) version with a shortened fuselage and tail. Relatively conventional ailerons have been noted on a Kleine version as has a 'Scheitelkühler' (brow radiator) mounted above the engine. Emil Jeannin was imprisoned shortly after war was declared, but production of his Stahltaube was continued for the German Army.

Versions of the Taube design were manufactured by Etrich, Rumpler, Aviatik, Halberstadt, Albatros, Gotha, Jeannin, Euler, Deutsche Flugzeug (DFW), Roland, Caspar, Goedecker, Kondor, Rahtjen (later Germania) and Gotha.

Unarmed A type monoplanes such as the Taube designs were used for reconnaissance duties, but shortly after hostilities began, airmen started carrying small bombs and personal firearms. The wider availability of more suitable B type biplane designs later in 1914 and more powerful, armed, C types in 1915 meant that no Jeannin Taubes remained in front line service after the middle of 1915, with surviving aircraft relegated to training units.

The steel tube framework of the Jeannin Stahltaube was painted light grey or grey-green while bare Aluminium cowlings were given a 'turned' finish, a technique employed on some Fokker aircraft. The fabric for almost all Jeannin Stahltaube aircraft was opaque (not translucent) and appears to have been finished in a standard German Army field grey. The single surviving Jeannin Stahltaube was restored in 1986 with a yellow-orange rubberized finish found on similar pre-war designs but it is not known how relevant this is for aircraft in military service. National markings were initially the black 'Eisernkreuz' painted on the field grey fabric. However, difficulty in seeing these markings against the dark fabric is possibly why the white square cross field was introduced in late 1914. At least one Jeannin Stahltaube served long enough to have had its 'Eisernkreuz' repainted with a thin white outline in late 1916.

Specifications:

Wingspan - 13.87m (45ft 6in)

Length - 9.69m (31ft 10in)

Height - 2.97m (9ft 9in)

Empty weight - 705kg (1,554 lb)

Maximum weight - 1035kg (2,280 lb)

Max speed - 120kph (75mph)

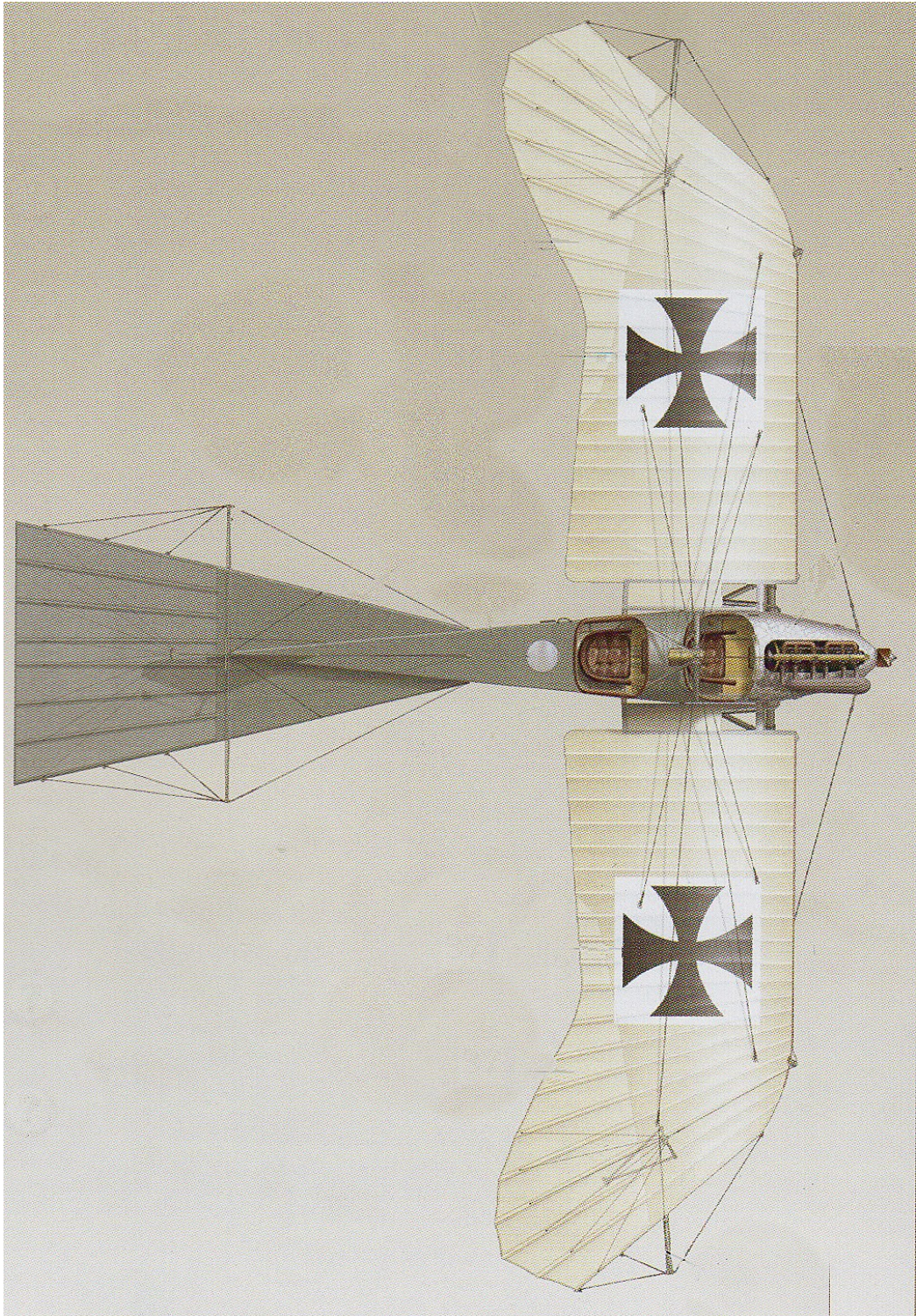
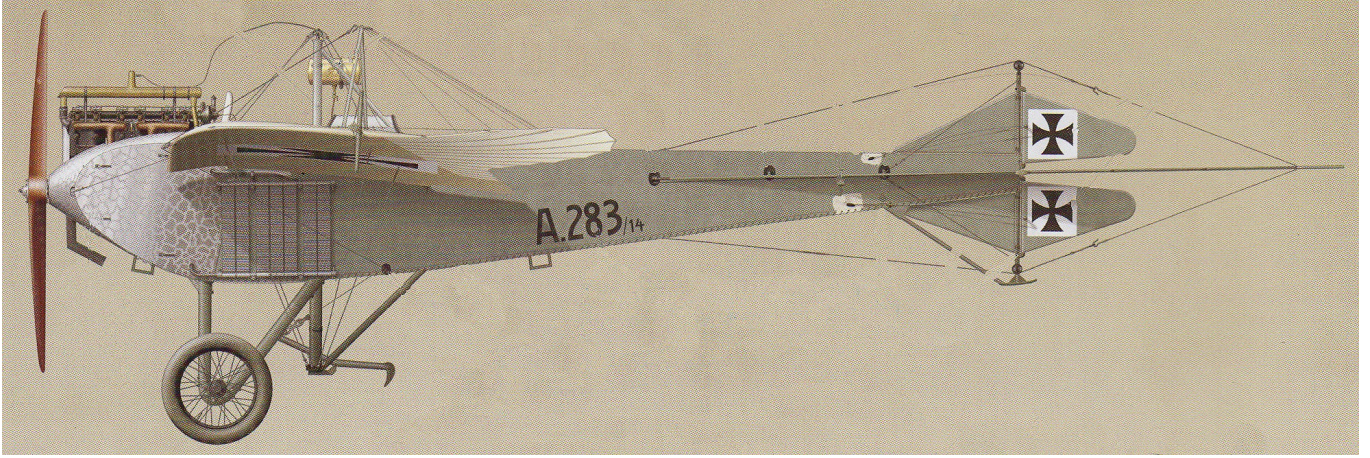
Engines - 100hp Daimler-Mercedes D.1 or Argus AS.II.

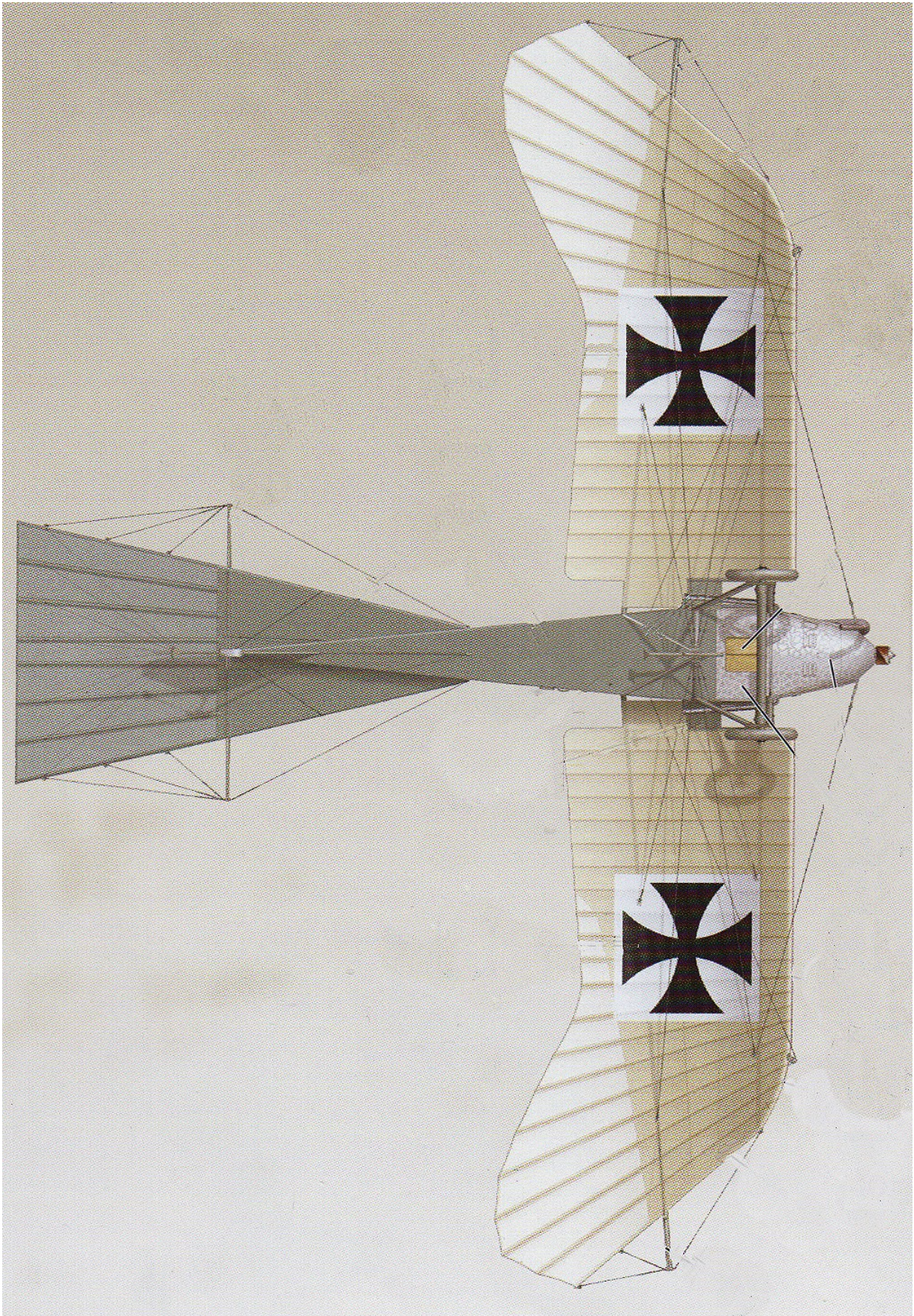
Weapons - Hand held pistols, rifles or bombs.

This model represents Jeannin 'Stahltaube', Serial No: A.283/14 at Aldershof-Johannisthal aerodrome during 1915.

This aircraft was powered by a six cylinder inline Daimler-Mercedes D.1 (100hp) engine. The available photographs of this aircraft suggest they were taken when the aircraft was at Aldershof-Johannisthal, as the thin Aluminium protection strip on the wing leading edges and Clear Doped Linen (CDL) covered wings had not yet been painted in the accepted German Army field grey. Once painted, it seems the linen covering was opaque (not translucent) and little, if any of the internal structure was visible. Note the 'elephant' style engine exhaust, the open viewing port in the wing root, the 'X' shaped opening in the engine cowl and the fitted 'Integral' manufactured propeller.







PART 1
MODEL
DESCRIPTION

PART 1 - MODEL DESCRIPTION

('Wingnut Wings' - Jeannin Stahltaube - Kit No:32058)

General:

Normally I would write a general review of the kit in this part of the build log. However, many reviews have already been published, including this review by Brett Green on 'Hyper Scale'.

His review covers in detail everything the kit has to offer and is worth reading. The link to the review is below.

https://www.hyperscale.com/2017/reviews/kits/wingnutwings32058reviewbg_1.htm



As s usual, after researching the aircraft, some modifications or enhancements may be carried out to make the model more authentic. Where these are embodied into the model, they will be detailed in the relevant 'Modifications' entries throughout this build log.

PART 2

WOOD EFFECTS

PART 2 - WOOD EFFECTS

A basic technique:

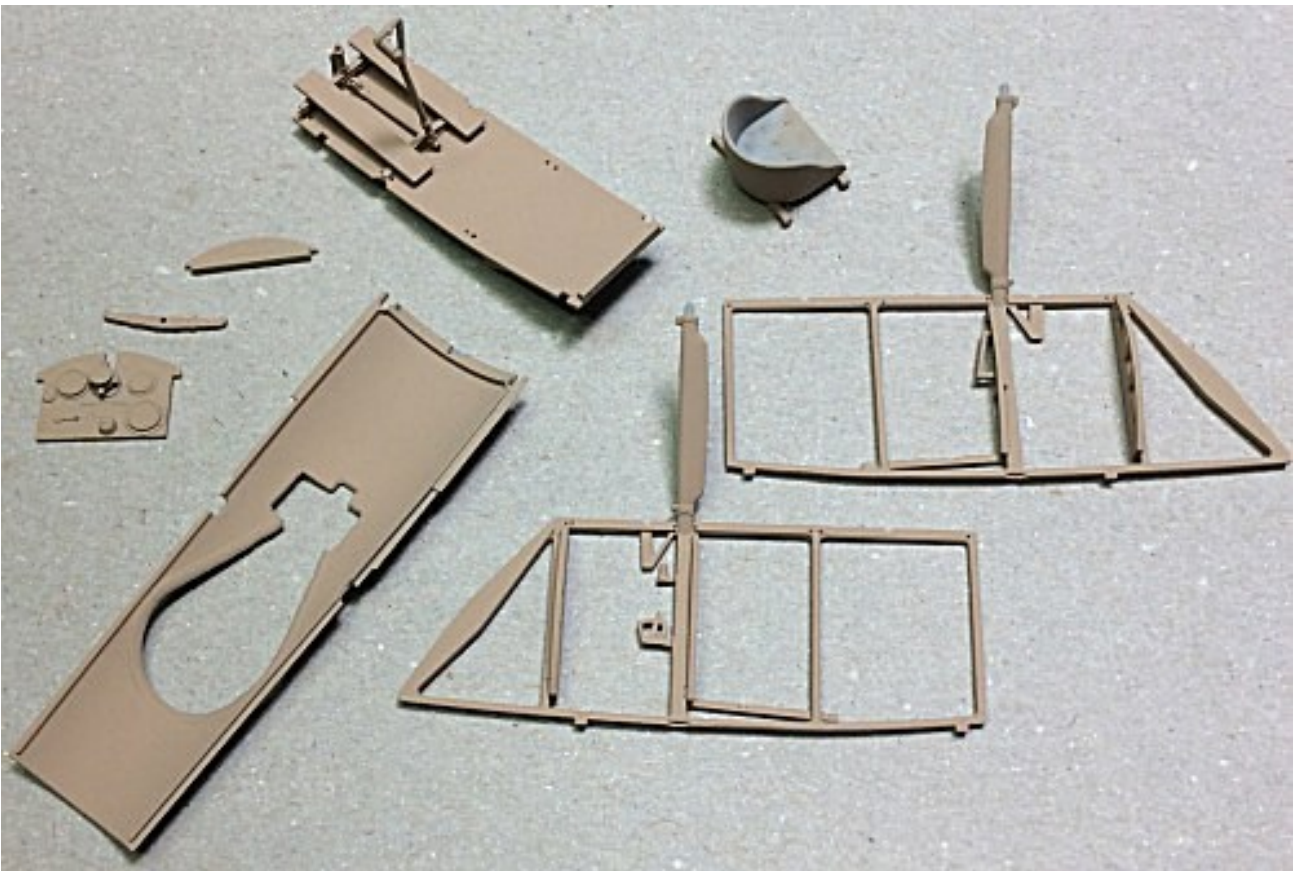
Parts of the model that are supposed to be made of wood can prove to be a challenge to replicate a wood finish to the part. Some aftermarket companies produce accurate wood decals, which can be used to cover larger areas, such as cockpit decking and fuselage panels. However, decals can't easily be used 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. Color' 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 creamier, 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:

Mask off the area as required.

NOTE: *When airbrushing 'Tamiya' acrylic paints, I thin the paints using 'Mr. Color' 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 'Tamiya' Semi-Gloss (X35) or similar, with a few drops of 'Tamiya' Clear Orange (X26) to give a varnished look to the finish.

Surface finish:

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

'Tamiya' have 'Clear' coloured acrylic paints, which are intended to be mixed with either Flat Clear (XF86), Semi-Gloss Clear (X35) or Clear (X22), to give the required finish but with a tint of the added 'Clear' colour. I use the Clear Yellow (X24) or Clear Orange (X26) to add a varnished tint to the clear coat.

If using the 'Tamiya' Clear, I normally add 'Mr. Color' Levelling Thinners, which does improve airbrushing and avoids pooling.



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 clear 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

PART 3 - WEATHERING

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

Flory Model clay washes:

The washes I tend to use are the 'Flory Models' Clay Wash 'Grime' and 'Dark Dirt', which come in various shades and consist of a suspended and very fine clay pigment. They are brushed over the surface to be weathered and dry in around 30 minutes. When dry, use either a piece of good, absorbent kitchen roll or a soft brush to remove as much of the clay wash as you need to achieve the desired effect. 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 an airbrushed semi-gloss clear coat, such as 'Tamiya' Semi-Gloss (X35) or similar. 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 glossier 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 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, dabbing either onto a dry piece of 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 'Tamiya' Semi-Gloss (X35) or similar, 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 'Tamiya' Semi-Gloss (X35).



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



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



Washes: Washes can be applied to either enhance panel lines etc or to add a 'filter' of colour onto a painted surface. They can be purchased ready made from various manufacturers or can be 'homemade' 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 an 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

PART 4 - DECALS

Kit supplied decals:

NOTE: *The following is applicable for decals on painted surfaces. 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 a clear coat of Tamiya' Clear (X22) or similar should be airbrushed over the first applied decals, to provide a barrier against the setting solutions.*

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

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

NOTE: *'MicroSet' solution softens the decal to allow it to conform to the painted surface. Do not attempt to move the decal too much or it may tear.*

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

Remove the decal from its backing sheet after it has released in 'warm' water.

Carefully move the decal into the correct position.

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

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

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

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

To 'knock back' the sheen of the decals and painted surfaces 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 'Tamiya' Semi-Gloss (X35).

'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 (Q-tip) etc, to expel any water from under the decal. Once fully dry, decal softeners, such as 'MicroSol' and/or 'MicroSet' can be applied 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 have 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 one or more sealing coats of a clear gloss coat such as 'Mig' A-Stand Aqua Gloss (A.Mig-2503), 'Tamiya' Gloss (X22) or similar over the painted surface to form a gloss surface for applying the decals.

Soak each decal in warm decal water for **approximately 5 seconds only**, then lay the decal on a non-absorbent surface to allow the decal to separate from its backing sheet.

NOTE: *The surface should be pre-wet with 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.*

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 a cotton bud (Q-tip) 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 lightly apply 'Tamiya' X20A thinners, which will soften and adhere the decal into the hole or opening. Using X20A can also conform decals around curves edges etc.

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

PART 5

RESIN

PART 5 - RESIN

This model contains aftermarket 3D printed parts, as opposed to the normal plastic used.

The reason for resin kit/parts is that in the past, using resin made it possible to produce much finer detail on kit parts than the plastic kit equivalents. Today, there are many producers of resin kits, particularly aftermarket 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 or 3D printed kits may make kits to order or have 'limited' runs, although aftermarket parts are usually readily available. Working with resin or 3D prints does present different challenges to the modeller, especially if it's the first time of building using resin.

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 or 3D printed kits/parts from plastic (styrene) kits:

When resin kits are cast in their moulds or 3D printed, a cast release agent or residual print resin may be present on the surface of the kit/parts. These can prevent paint or adhesives from adhering to the surfaces. The easiest way to remove cast release agent is to carefully and fully wash all of the model parts in warm soapy water, using an old, soft tooth brush, then thoroughly rinse all of the parts and leave to dry. Alternatively wipe the parts with such as 'Tamiya' X20A thinners or with a commercially available Isopropyl Alcohol (90% or higher grade).

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 or from the 3D printed support 'trees'. The best way to remove item is to cut them away with a fine-toothed razor saw or single blade cutters, then clean off any residual stubs on the edges of the parts.

Once parts are removed from resin casts, they may have 'resin flash' around or amongst parts, especially small items. This is easily removed with a sharp scalpel blade. Heavier residue can be scraped, filed or sanded away. Print layer lines may be evident on 3D printed parts, which if possible, should be sanded away.

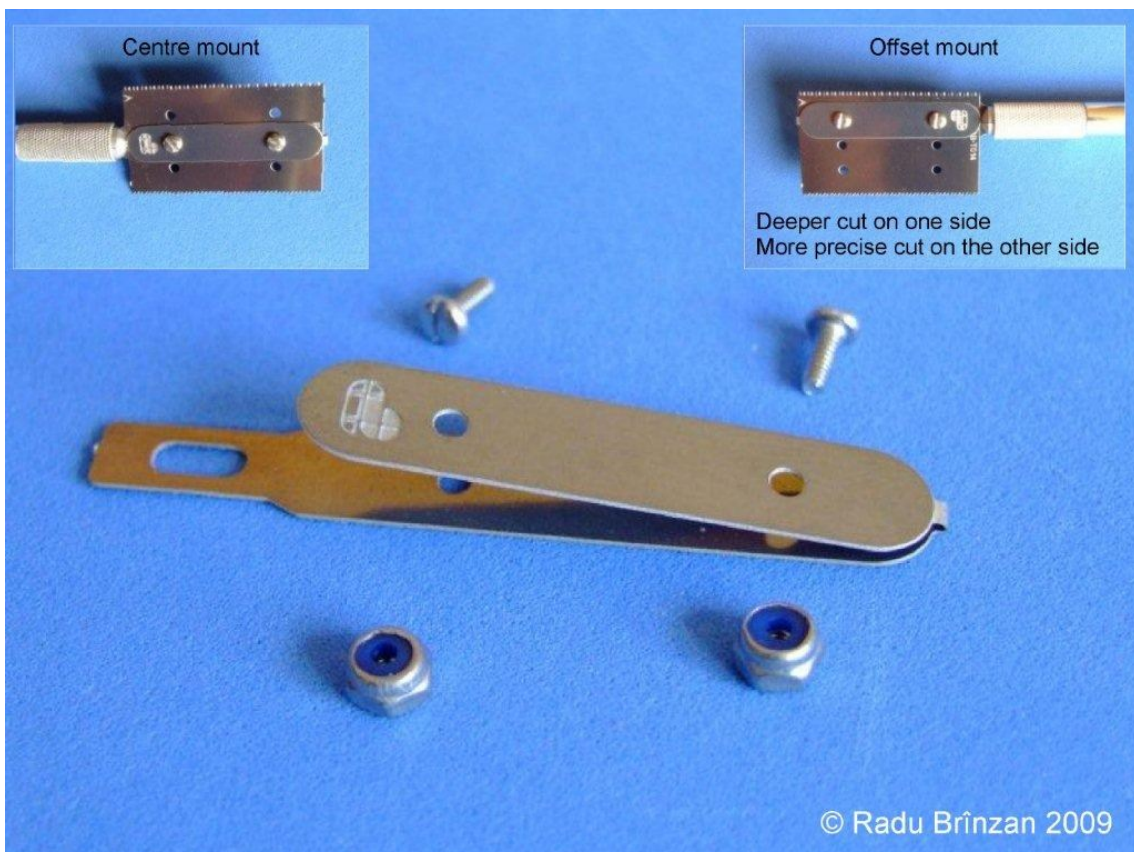
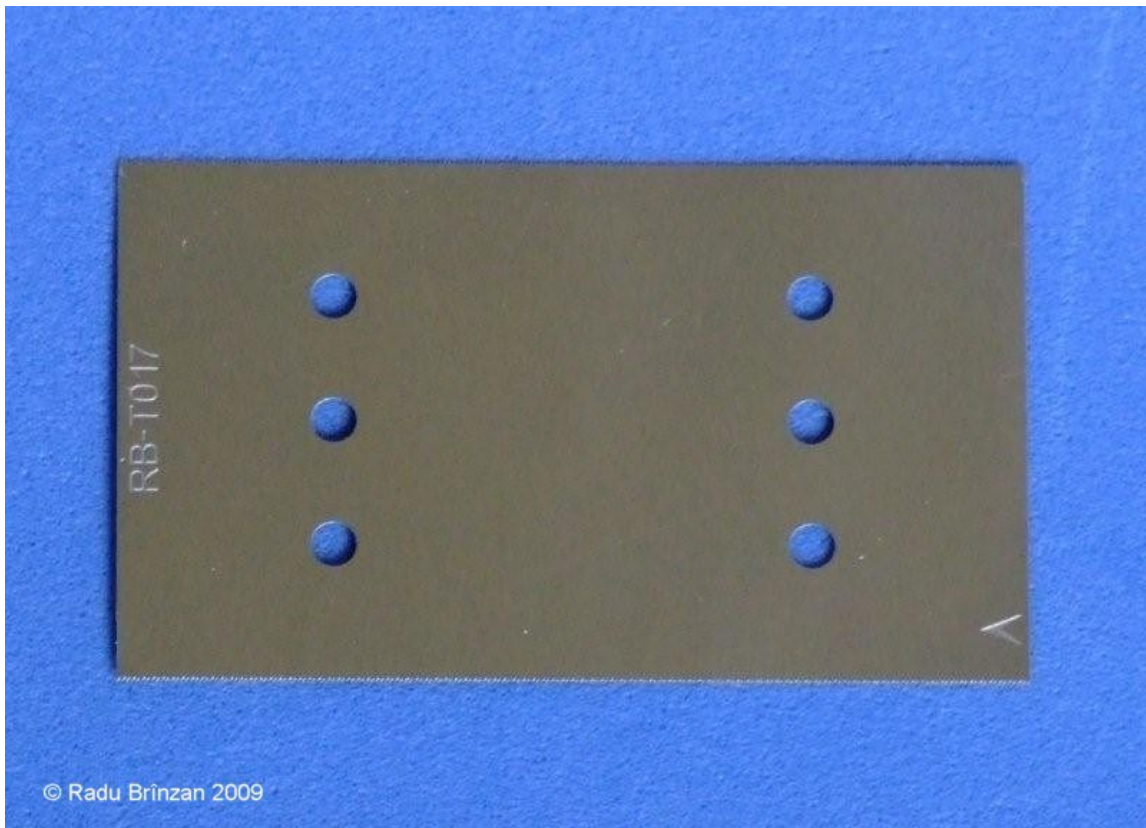
Plastic kits are assembled using solvent adhesives, which melt the surface where it is applied and 'weld' the joint together. Resin cast or 3D prints however will not react to this type of adhesive and can really only be glued using Cyanoacrylate (CA) adhesive. This adhesive reacts to moisture in the 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. It's always a good idea to have CA release agent available to use if necessary. Good ventilation is also advisable as the fumes from CA adhesive are noticeable and can irritate the eyes and lungs.

Cutting, sanding and drilling resin will create swarf and more importantly, resin dust. The dust is 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. Some modellers wet the working surface to trap dust, although this is a messy method. 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 a problem, more so on some cast resin kits/parts. 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 can be 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.

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 modeller saw. The saw I use has a double sided and fine 'drag' saw blade and with its holder, which was available from 'RB Productions'.



PART 6

RIGGING

PART 6 - RIGGING

References:

'Windsock' data file 104 - The Taube at War (P.M. Grosz).

'Wingnut Wings' - Instruction manual.

Deutsches Technikmuseum, Berlin - Taube A.180/14 (Courtesy of Rafael Reckert).

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.

French aircraft used wire-wound rigging, as opposed to the British, who used streamlined solid rigging. Therefore, 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. Any turnbuckles used are either sintered metal or resin and can be obtained from such as 'Gaspach Models' or 'Proper Plane'.

NOTE: *Aircraft of this type were designed prior to the Great War, before the use of conventional flight control surfaces (ailerons, rudder and elevator) became the norm. As such, manoeuvring of the aircraft in-flight was carried out by twisting (warping) of the wings and tail, with basic rudder control.*

Control rigging:

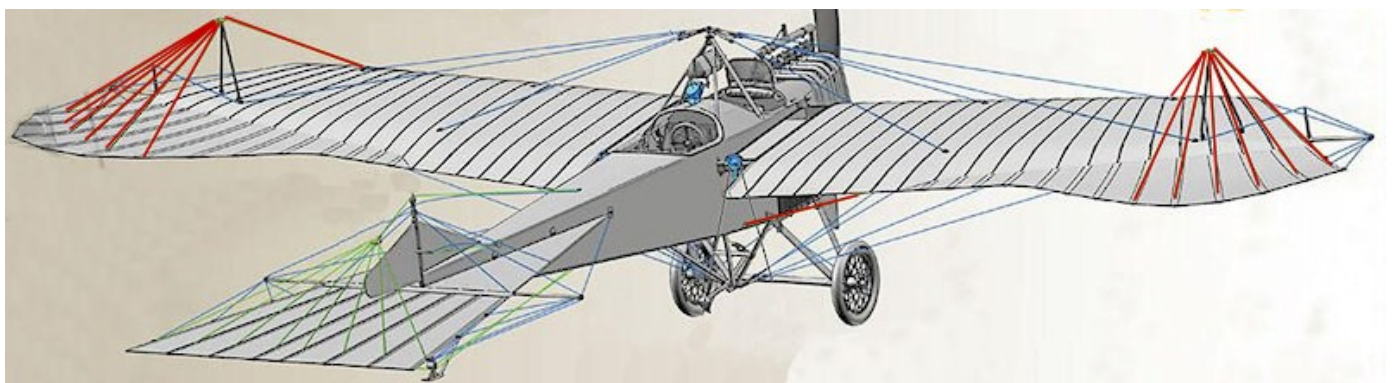
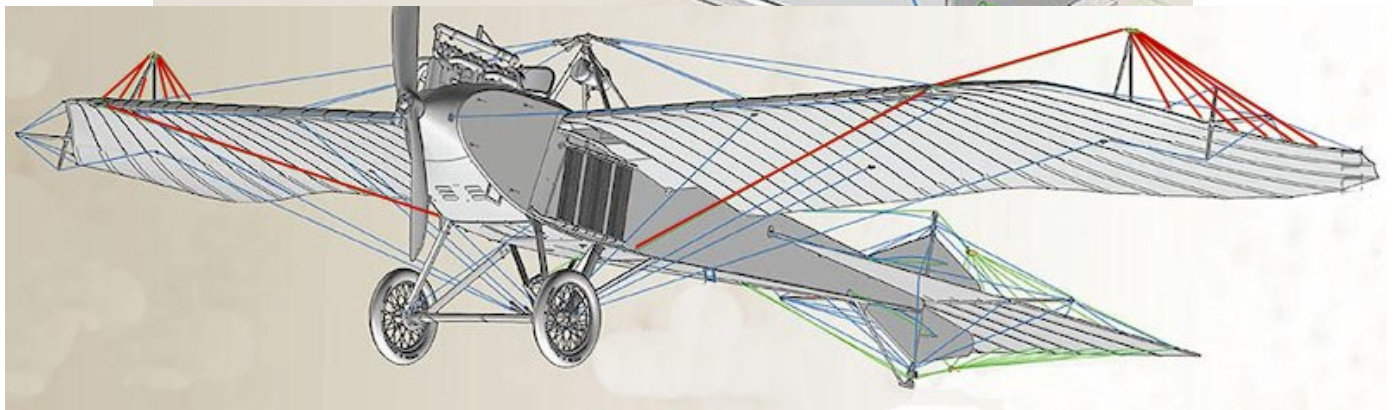
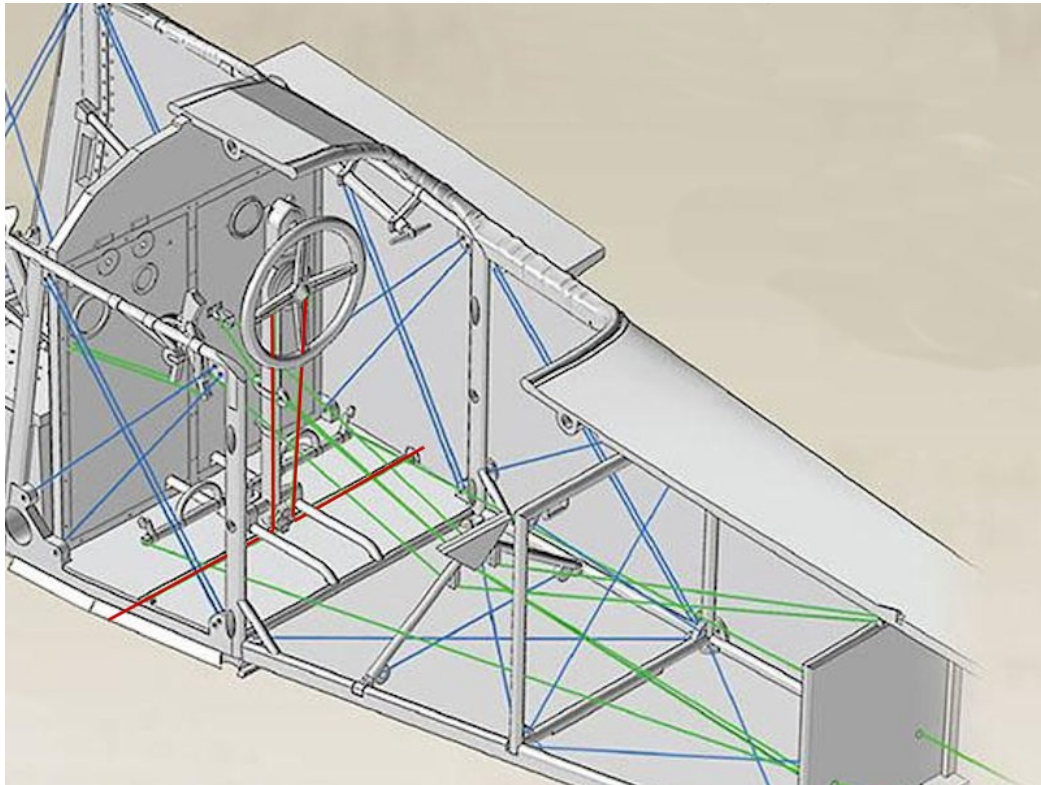
Wing warp control cables:

Control cables were attached to a pulley located in front of the pilot's control (steering) wheel. These cables were routed down and around pulleys at the base of the control column. The left cable was routed right and out of the fuselage. The right cable was routed in the opposite direction (left). The cables were routed across the cockpit floor and out of the fuselage, then diagonally up and out to the leading edge of the wings, where they were turned around a pulley and directed rearwards to the top of the wing warp pylons. A multiple cable plate on the pylons connected six separate cables to the trailing edges of the wings.

As the pilot turned the control wheel left, the right cable to the left wing tensioned and pulled the left wing tip upwards. The left cable to the right wing was relaxed, allowing the internal bamboo cane structure at the wing tip to settle it in its 'neutral' position. This lift of the left wing tip would cause the aircraft to bank (roll) to the left. If the pilot turned the control wheel to the right, the opposite reaction would occur, which caused the aircraft to bank to the right. With the control wheel centralised, the aircraft would remain in level flight.

It's unclear if turnbuckles were fitted to the cables inside the cockpit.

Turnbuckles were fitted in the under wing control cables, approximately one third the way along from the fuselage. It appears that no turnbuckles were fitted in the six trailing edge cables from the wing warp pylons.



Tail warp control cables:

Two separate cables were attached midway down the front of the pilot's control column. The cables were routed forwards and around pulleys on the cockpit bulkhead then rearwards and over cable guides under the pilot's seat support frame. From there they were routed rearwards and up and around a pulley. A single cable from the pulley was routed out of the fuselage top and rearwards to a pulley on the top of the rudder post, then rearwards to a multiple rigging plate. Eight separate cables were attached between the rigging plate and trailing edge of the tail.

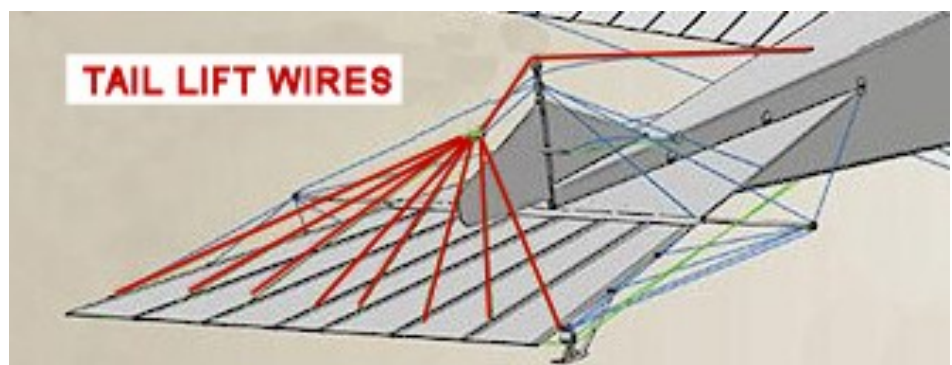
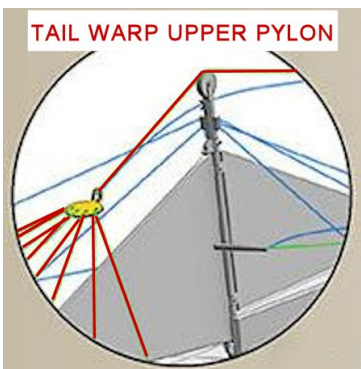
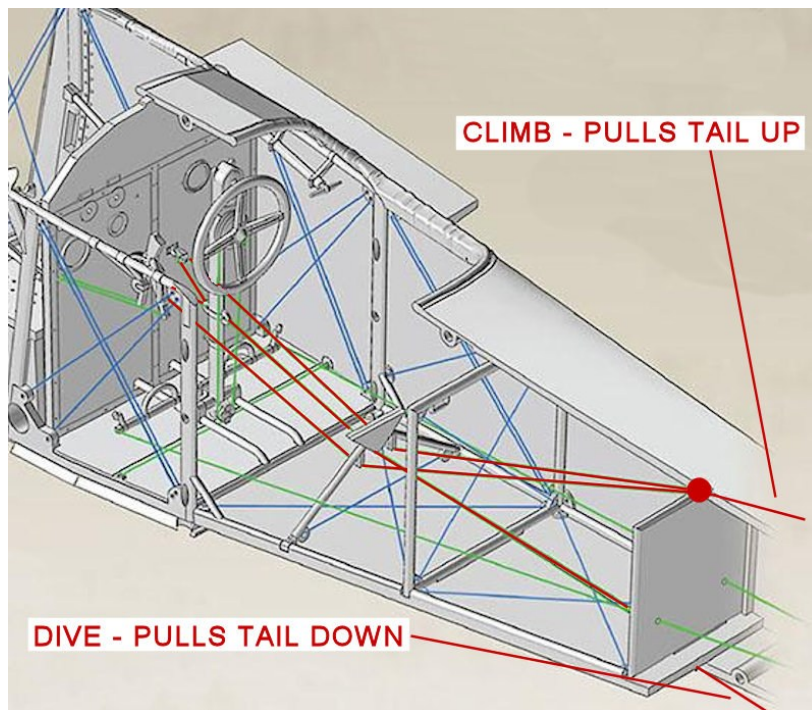
As the pilot pulled back on the control column, the cables would tension and pull the trailing edge of the tail up, causing the aircraft to pitch up (climb). When the control column was centralised, the cables would relax, causing the bamboo cane structure in the tail to settle the tail settle it in its 'neutral' position.

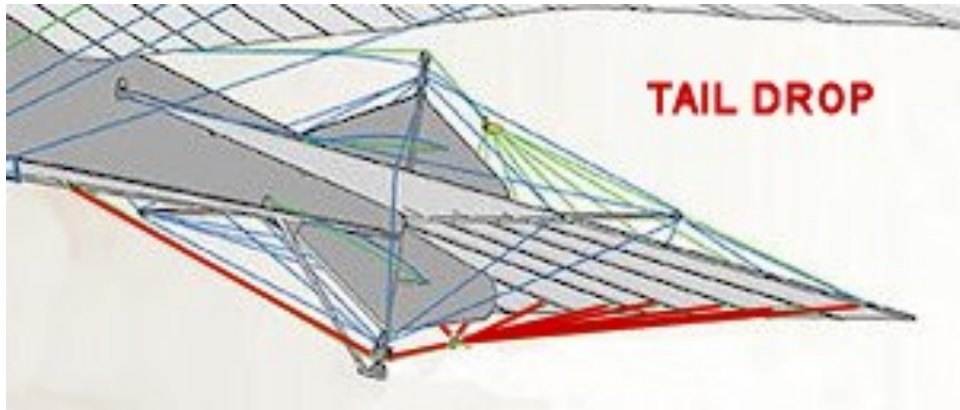
Twin cable was attached midway down the rear of the pilot's control column. The cables were routed rearwards and under a cable guide under the pilot's seat support frame to a pulley. From there a single control cable was routed rearwards and out of the fuselage underside and rearwards to a pulley on the bottom of the rudder post, then rearwards to a rigging plate. Eight separate cables were attached between the rigging plate and underside of the trailing edge of the tail.

As the pilot pushed forwards on the control column, the cables would tension and pull the trailing edge of the tail down, causing the aircraft to pitch down (dive). When the control column was centralised, the cables would relax, causing the bamboo cane structure in the tail to settle the tail settle it in its 'neutral' position.

It's unclear if turnbuckles were fitted to the cable inside the cockpit.

Turnbuckles were fitted in the upper and underside cables midway between the fuselage and the pulleys on the top and bottom of the rudder post. It appears that no turnbuckles were fitted in the eight trailing edge cables from the rudder post.



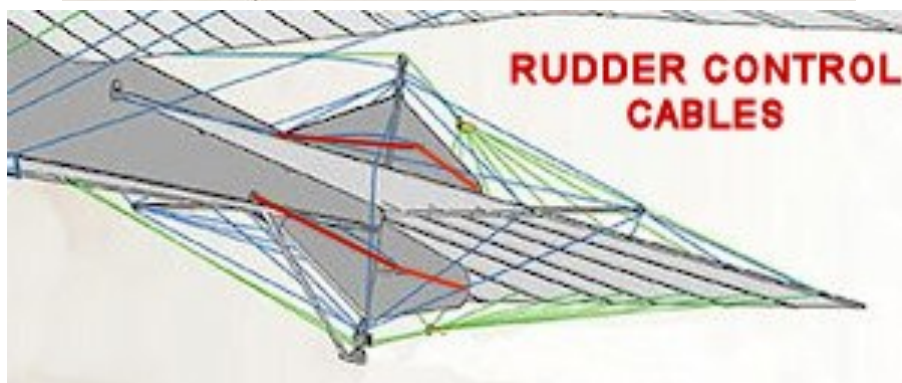
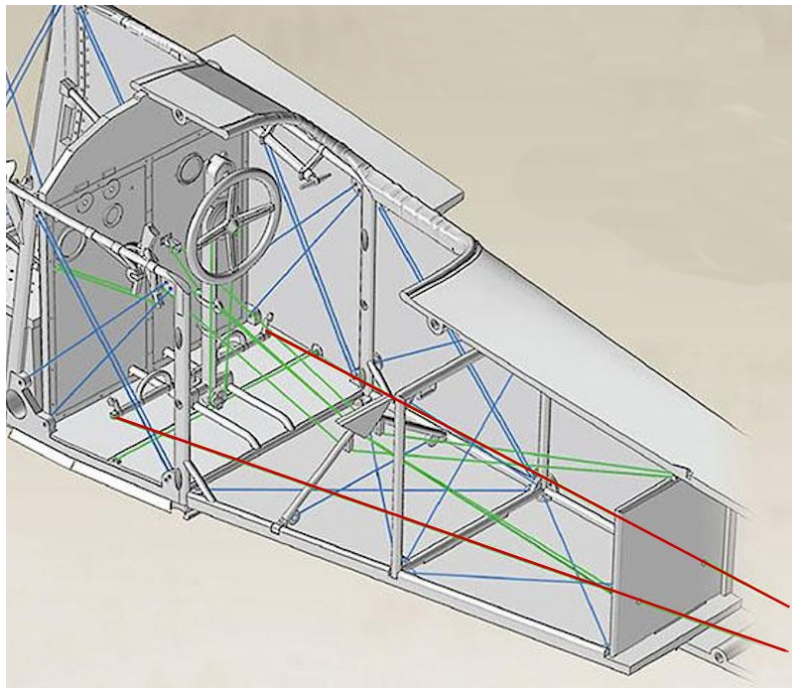


Rudder control cables:

A separate control cable was attached to the ends of the pilot's rudder bar. These cables were routed rearwards and over the pilot's seat support frame then rearwards inside the fuselage. The cables were then attached to two separate cables, which were routed out of the rear sides of the fuselage and over pulleys, then connected to upper and lower king post on both sides of the rudder. A separate cable was routed from the from king posts rearwards and through the rear of the rudders.

As the pilot pushed the rudder bar left, the left cable would tension and the right cable relax. The rudder would then move left and cause the aircraft to yaw (swing) left. If the pilot pushed the rudder bar right the opposite reaction would occur and the aircraft would yaw to the right.

Turnbuckles were not fitted to the cables at the pilot's rudder bar or from the rudder king posts to the rear ends of the rudders, but were fitted in the control cables from the fuselage sides and at the rudder control horns.

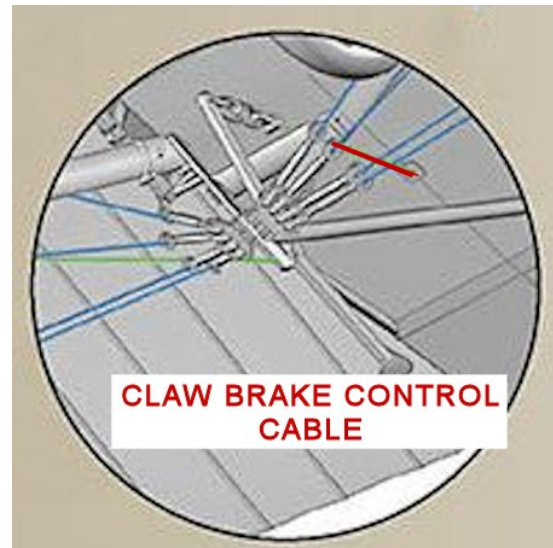


Claw brake control cable:

NOTE: This aircraft, like most of the period, did not have wheel brakes. Instead, a crude 'claw' brake was operated by the pilot on landing. The claw brake dug into the ground, slowing the aircraft.

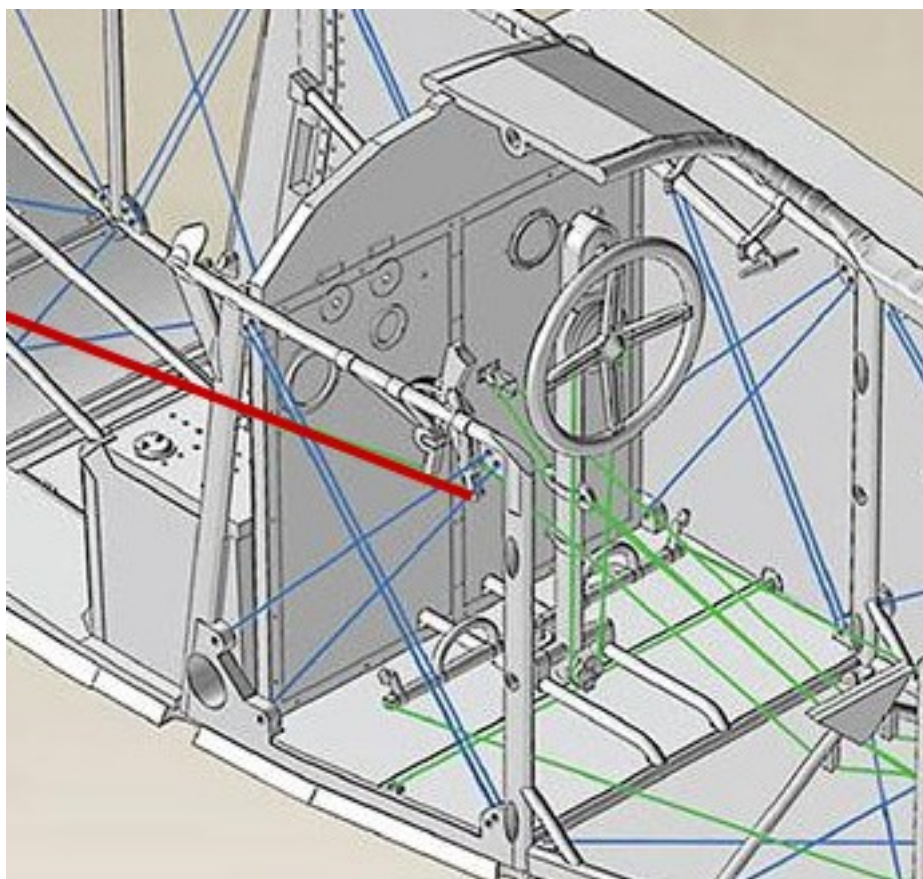
It's unclear as to how the cockpit claw brake control was configured. However, a single cable from the cockpit was routed out of the fuselage underside and forwards to be attached to the top, front of the claw brake.

As the pilot pulled on the cockpit claw control, the cable tensioned and pulled the pivoting claw brake up. This in turn caused the bottom claw of the brake to lower and contact the ground.



Throttle and spark advance control cables:

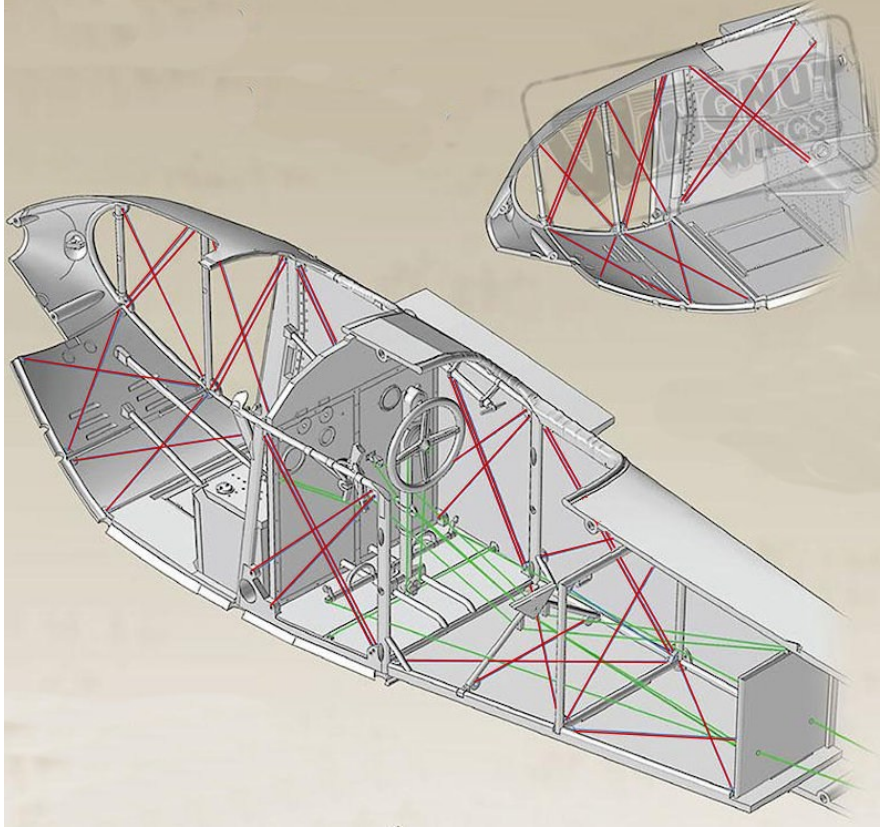
A throttle control cable was attached to the pilot's throttle lever, which was located on the top of the left tubular side frame in the cockpit. The cable was routed forwards past the observers cockpit and into the engine bay. A cable was also connected to the spark advance lever behind the throttle quadrant.



Structural rigging:

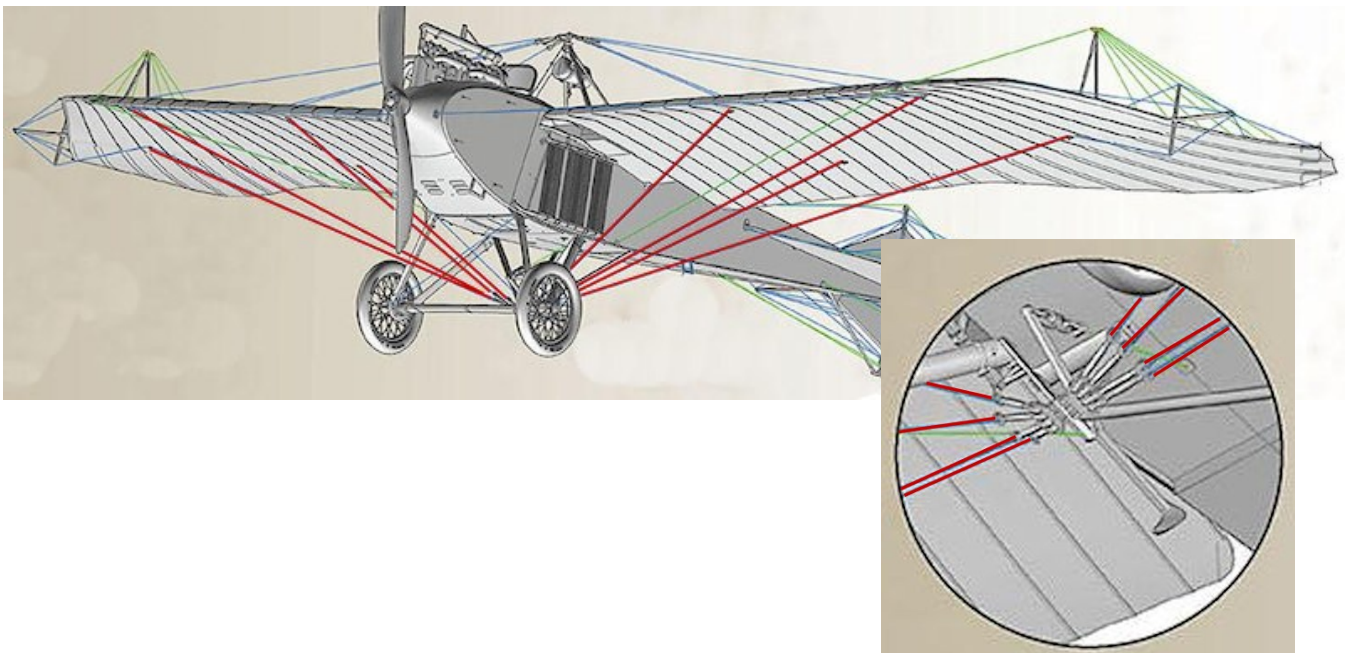
Internal bracing wires:

Refer to the following illustration. Single a double bracing wires were fitted diagonally between the cockpit frame bays along the sides of the engine bay, cockpits and internal rear of the fuselage. Single bracing wires were also fitted diagonally across bottom of the engine bay, cockpit and rear fuselage. Turnbuckles would have been fitted to the wires at accessible locations in the wires, most likely at the tops of the side frame bracing wires.



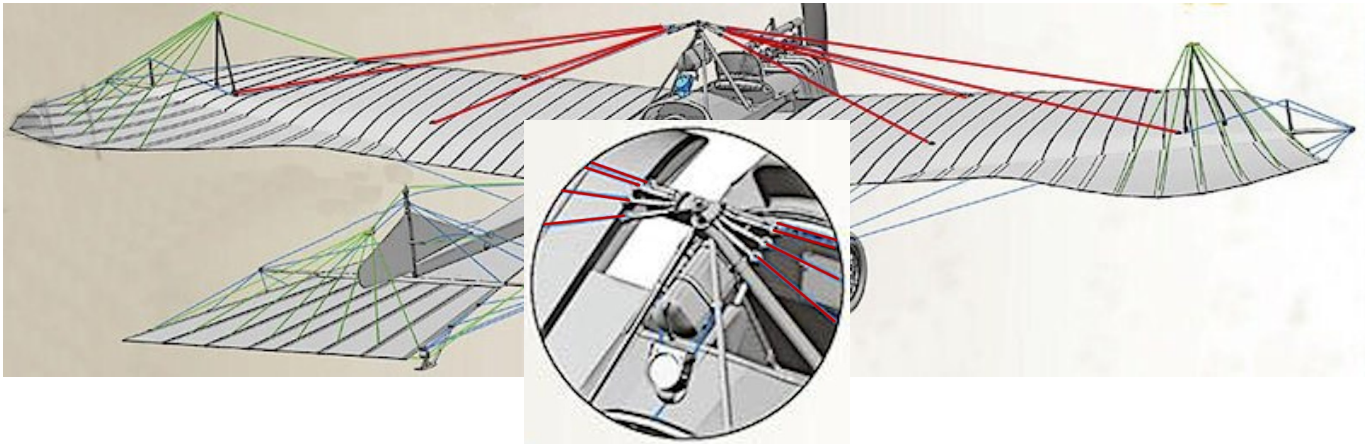
Flying wires:

The purpose of flying wires was to retain the wings during flight. Four single flying wires were fitted under the left and right wings. The cables were attached to turnbuckles on each side of the bottom of the fuselage underside pylon. The wires were routed diagonally up and outboard to locating points on the inner and outer undersides of the wings.



Landing wires:

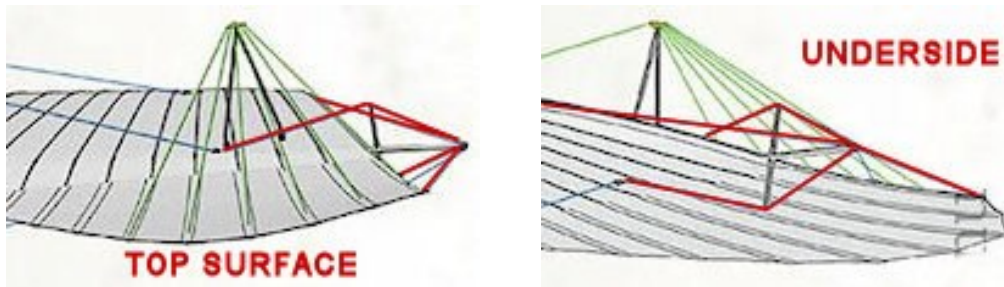
The purpose of landing wires was to retain and support the wings when the aircraft was on the ground. Four single flying wires were fitted over the left and right wings. The cables were attached to turnbuckles on each side of the top of the fuselage upper pylon. The wires were routed diagonally down and outboard to locating points on the inner and outer top surfaces of the wings.



Wing outer bracing wires:

NOTE: The rigging illustrations on IM page 12 appear to be mis-leading, in that they show five bracing wire sections at the left wing tip and six at the right wing tip. As I could not find evidence that to show that this is correct or not, I've chosen to have five bracing wire sections at both wing tips.

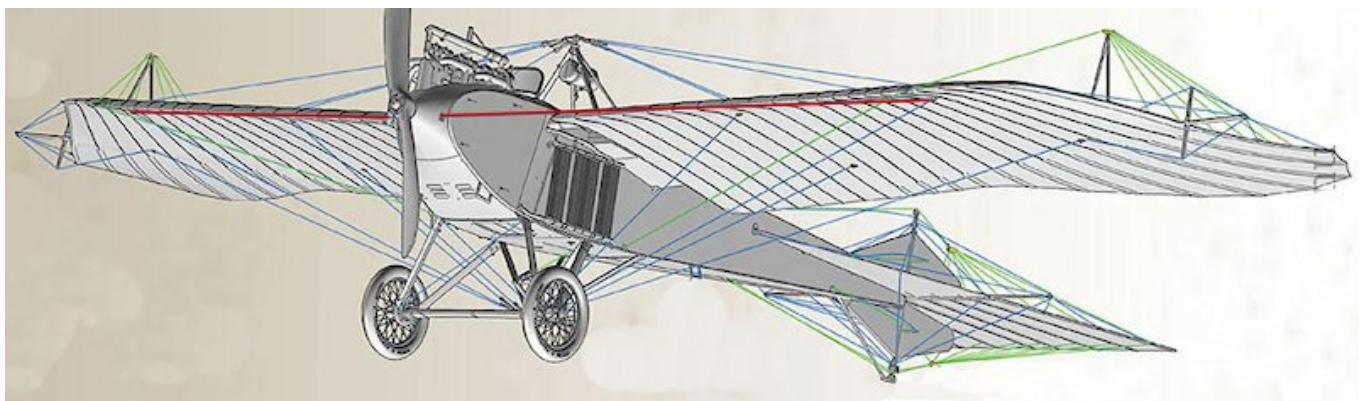
Five wing tip bracing cable sections were fitted to both wings. A wire was attached between the rear, outer flying/landing wire attachment locations above and below the wings. These wires were then routed outboard to the top and bottom of the wing tip vertical pylon and then to the outer end of the horizontal tip pylon. Another wire was attached from the wing tip leading edge rearwards to the outer end of the horizontal tip pylon then rearwards to the outer trailing edge of the wing. Turnbuckles were fitted in each wire between the top/bottom of the wing tip vertical pylons and wing outer edge to the outer end of the wing tip horizontal pylons.



Drag wires:

The purpose of the drag wires was to restrain rearward movement of the wings during flight. A single drag wire was fitted on both sides of the aircraft, between the front, side of the metal engine cowl and the outer, forward flying wire rigging point.

A turnbuckle was fitted in the wires close to engine cowl.



Tail bracing wires:

Single tail bracing wires were **deduplicated** on both sides of the fuselage and tail. The bracing wires were attached as follows:

Fuselage at the front tips of the tail to the ends of the tail horizontal pylons.

Ends of tail horizontal pylon to the rear, outer edges of the tail.

Ends of tail horizontal pylon to the middle, outer edges of the tail.

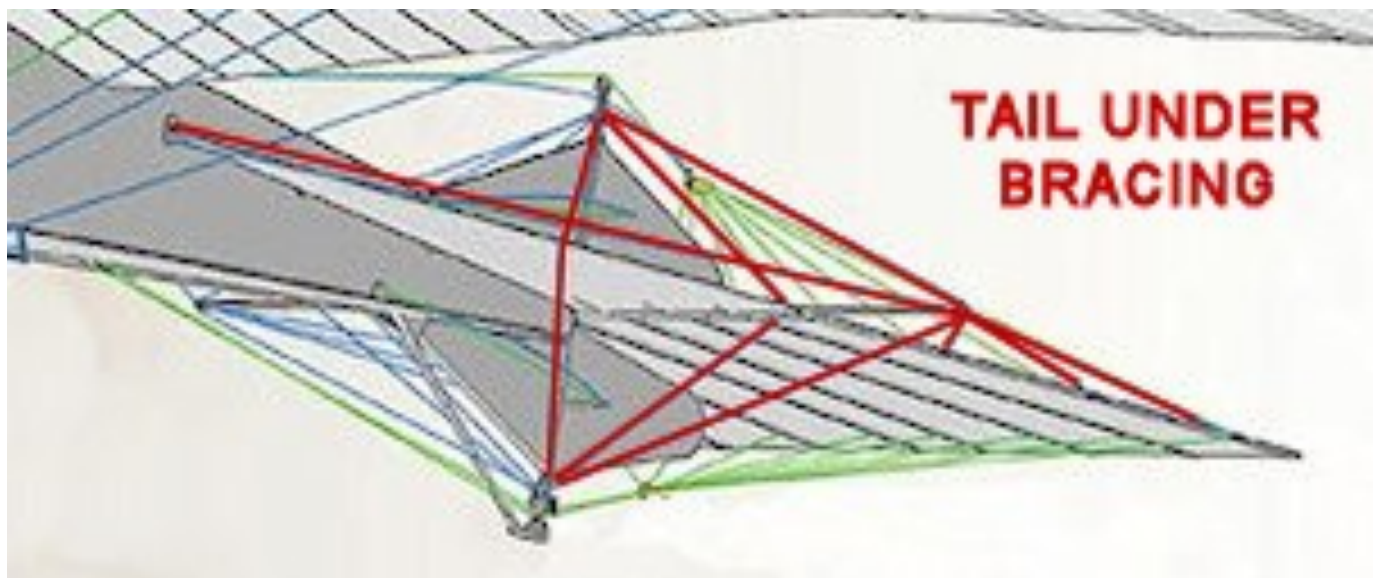
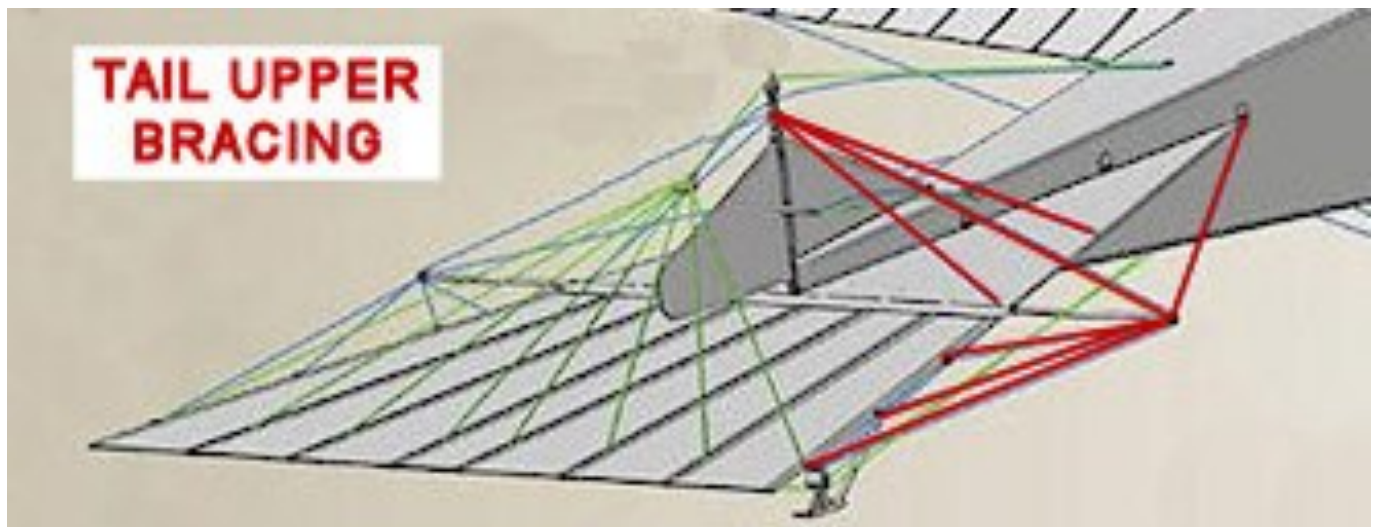
Ends of tail horizontal pylon to the forward, outer edges of the tail.

Ends of the upper and lower rudder posts to the ends of the tail horizontal pylons.

Ends of the upper and lower rudder posts to the outer edges of the tail at the horizontal pylons.

Ends of the upper and lower rudder post to the forward, middle outer edges of the tail.

Turnbuckles were fitted in each wire from the end of the tail horizontal pylons.



Landing gear bracing wires:

Single, diagonally crossed bracing wires were fitted between the inner, tops of the landing gear forward struts and the outer, forward bottom of the landing gear.

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

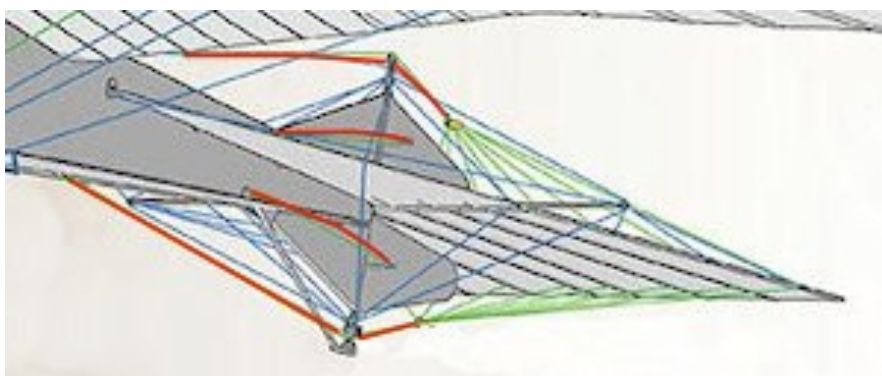
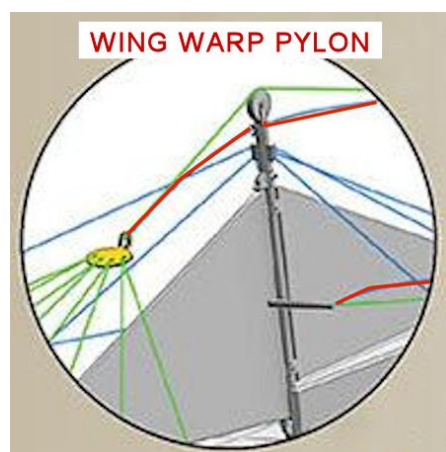
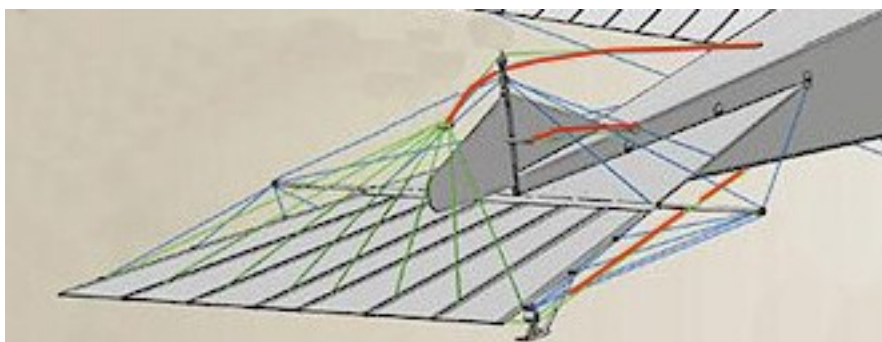


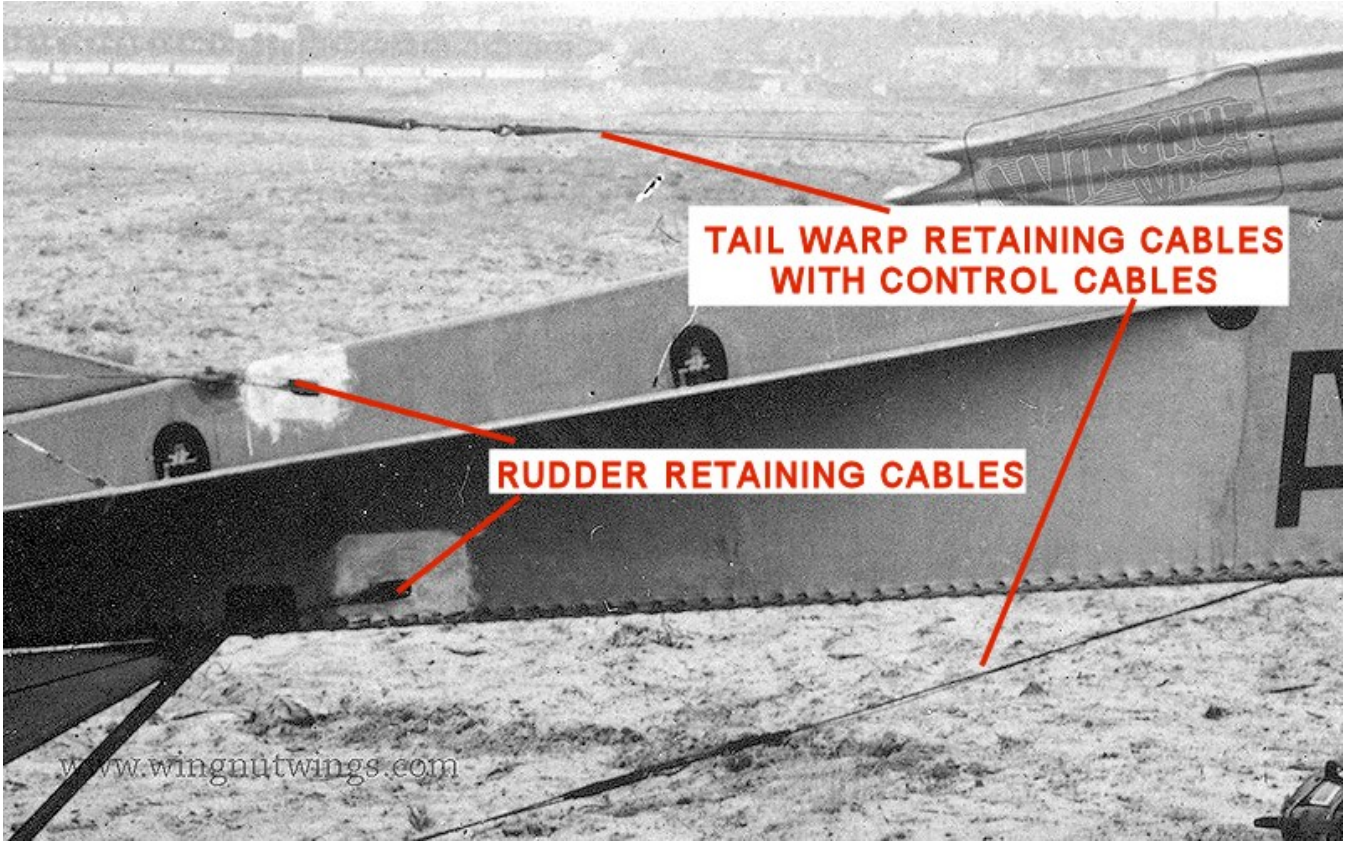
Tail and rudder control restraining cables:

NOTE: The tail warp and rudder control cables has separate restraining cables routed with them, which were presumably to prevent the flimsy tail and rudders from uncontrolled flutter should the control cables be severed, causing loss of control of the aircraft

Restraining cables, presumably tethered inside the fuselage, were routed with the tail warp tail warp control cables, out of the top and underside of the fuselage. The restraining cables were attached to the spreader plate for the eight tail warp wires and were not tensioned so as to avoid preventing the control cables from operating normally.

Restraining cables, presumably tethered inside the fuselage, were also routed out of the fuselage, just forward from the both upper and lower rudder control cables. The restraining cables were routed with the control cables, but separately attached to the rudder control horns. The cables were not tensioned so as to avoid preventing the rudder control cables from operating normally.

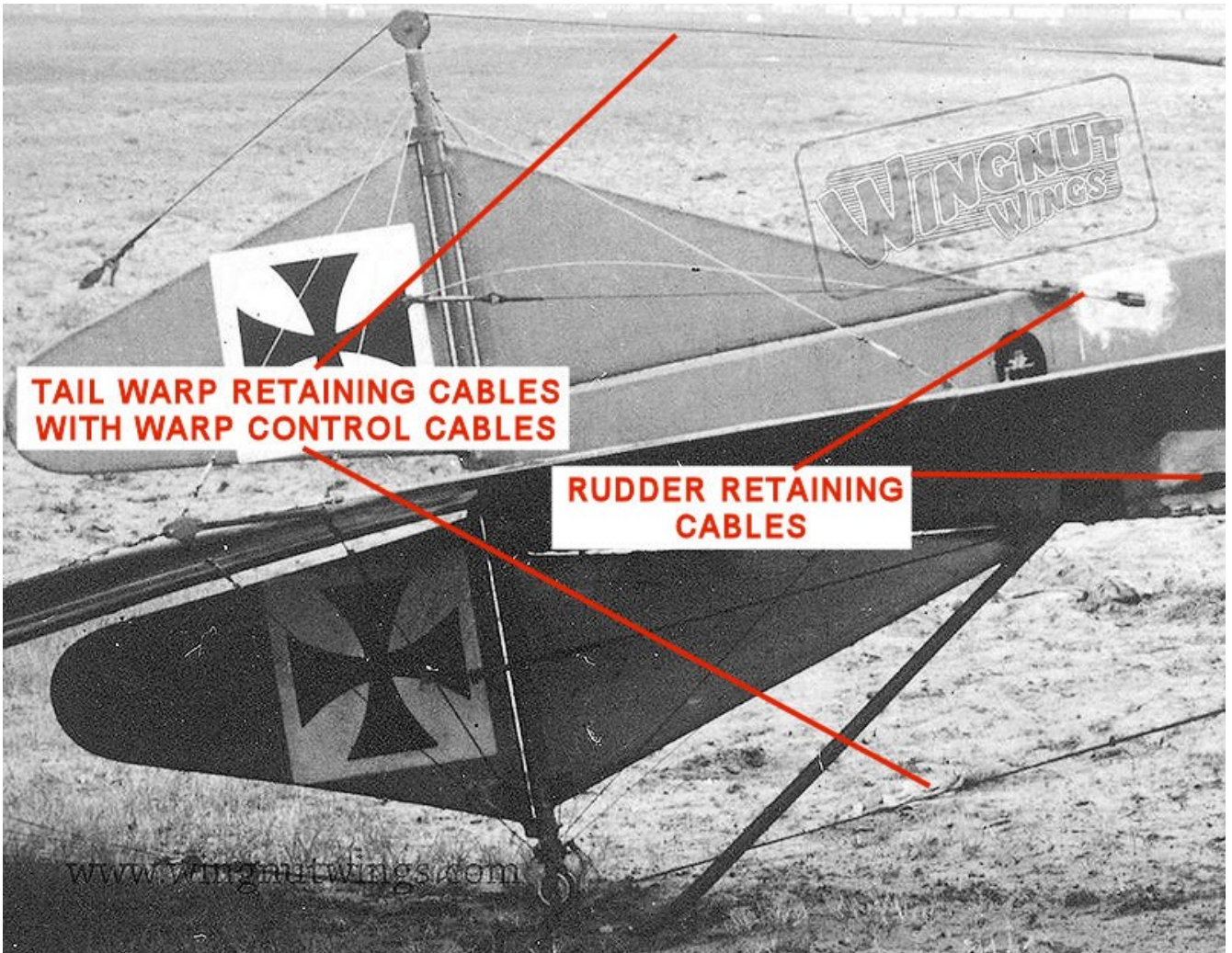




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PART 7

ENGINE

PART 7 - ENGINE

References:

Windsock' data file 104 - The Taube at War (P.M. Grosz).

'Wingnut Wings' - Instruction manual (IM).

Deutsches Technikmuseum, Berlin - Taube A.180/14 (Courtesy of Rafael Reckert).

NOTE: *The aircraft being modelled is shown on Instruction Manual (IM) page 17 (scheme D) and all parts detailed in this build log refer to that particular aircraft.*

*The engine for this particular aircraft is the **100hp Daimler-Mercedes D.1** detailed on IM page 5.*

Wingnut Wings' kit parts are known to be manufactured to tight fitting tolerances. Any primer or paint not removed from the mating surfaces between parts may cause problems when the parts are being assembled.

In general, the assembly of the model parts follows the guidelines detailed in IM page 5.

Preparation:

Remove all of the required parts from mold gates E and A.

Remove any mold seam lines and residual gate tags from the parts.

Assembly:

NOTE: *Make sure all primer, paints and decal are removed from the various mating surfaces of the parts before assembly.*

Cement the relevant parts together and in the following sequence:

Propeller shaft to engine sump.

Engine crankcase to sump.

Cylinder halves.

NOTE: *The follows assembly steps are intended to make alignment of parts accurate and to make painting of parts easier. Otherwise, follow the assembly steps detailed on IM page 5.*

Fully insert the cylinder head into the engine crankcase.

Cement the water pump E6 onto its location on the bottom, rear of the sump.

Cement the coolant pipe E16 into its locating recesses in the right side of the cylinder block.

Make sure the pipe and outlet of the water pump are aligned, but **do not cement them together.**

Fully locate the carburettor/inlet manifold E23 into its locating recess in the engine crankcase.

Make sure the inlet pipes fully locate into their locating holes in the top of the cylinders.

Cement the carburettor/inlet manifold into the crankcase.

Cement the float chambers E7 onto its location on the carburettor body.

Fully locate the magneto drive shaft assembly E12 into its locating recess in the lower, rear of the engine with the top located over the rear end of the camshaft.

Make sure the vertical drive housing is not bowed.

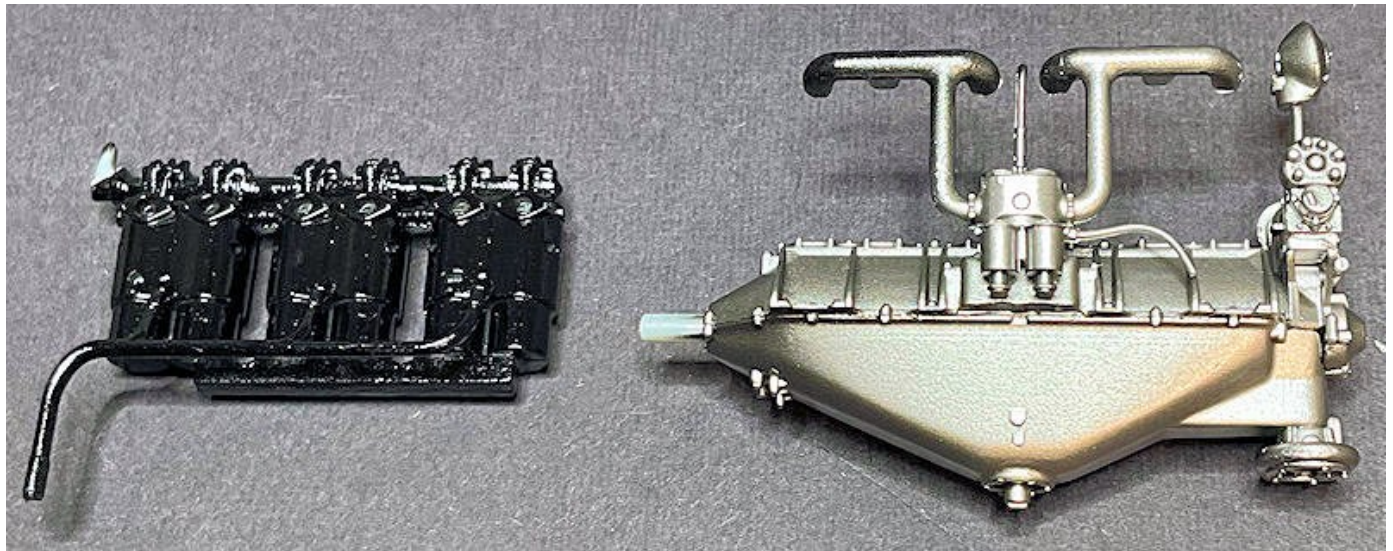
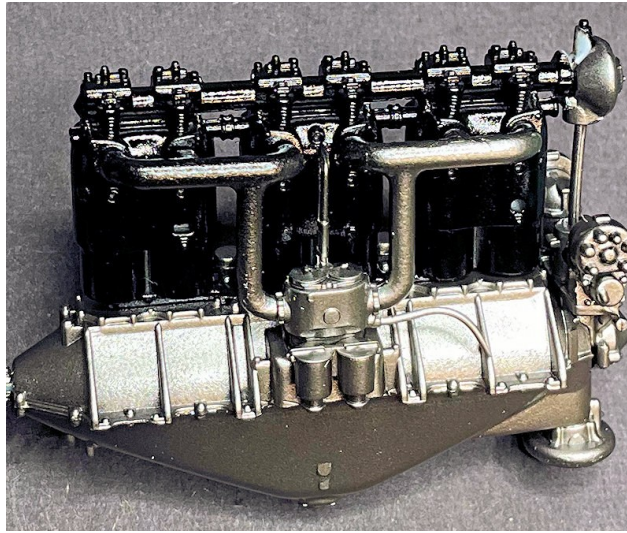
Cement the magneto drive shaft assembly E12 into to engine, but **do not cement the top housing onto the camshaft.**

Once the cemented parts have set, carefully flex the top of the magneto drive assembly away from the camshaft then ease the cylinder block assembly away from the crankcase.

Painting:

Airbrush the cylinder head and crankcase/sump assemblies with 'Tamiya' Gloss Black (X1) or similar.

Airbrush the engine sump with 'Alclad' Steel (ALC112) or similar.



Seal the applied paints with a semi-gloss clear coat, such as 'Tamiya' Semi-Gloss (X35) or similar.

NOTE: Refer to IM page 5 for guidance.

Brush paint the engine parts as follows, using the paints stated or similar:

'Mr. Color' Copper (215) - Carburettor inlet manifolds, coolant pipe.

'Mr. Color' Brass (219) - Carburettor float chambers, body tops, magneto cylinders and filler pipe caps and air valve.

'Mr. Color' Stainless Steel (213) - Camshaft valve springs and tappet covers.

'Tamiya' Semi-Gloss Black (X18) - Magneto body, small pipe from carburettor.

'Tamiya' Hull Red (XF9) - Ignition lead connection face on magnetos, gaskets on exhaust ports.

'Tamiya' Gun Metal (X10) - Camshaft.

Use a cotton bud (Q-tip) to lightly burnish the parts painted with 'Mr. Color Metal' paints.

Modifications:

NOTE: *The engine cylinders have pre-molded locations on both sides for spark plugs. However, no spark lugs are provided in the kit.*

Spark plugs:

Using as guides the pre-molded locations on the cylinders, drill holes of 0.6 mm diameter into both sides of the cylinders.

NOTE: *Nickel-Silver or Brass tube can be chemically blackened by immersion in a solution such as 'Blacken-It' or similar. Rinse in water and dry the blackened tubes to prevent powdering of the surfaces.*
Cut twelve approximately 4 mm long lengths of blackened 0.5 mm diameter tube, such as 'Albion Alloy's' MBT05 or similar.

Cut twelve lengths of 0.2 mm diameter lead wire, such as that from 'PlusModel' or similar.

Using thin CA adhesive, secure a lead wire into each of the tubes.

Using thin CA adhesive, secure a tube into each of the pre-drilled holes in the engine cylinders, leaving approximately 1.5 mm of tube protruding.

Assembly (continued):

NOTE: *Make sure all primer, paints and decal are removed from the various mating surfaces of the parts before assembly. During assembly, make sure the lead wires from the spark plugs are not trapped behind the carburettor inlet manifolds.*

Cement the following:

The cylinder block assembly into its locating slot in the engine crankcase.

The front and rear carburettor inlet manifolds into the front and rear engine cylinders.

The air valve on the rear of the camshaft into its housing from the magnetos drive shaft.

The bottom end of the coolant pipe on to the water pump extension.

Modifications (continued):

NOTE: *The kit supplied ignition lead support tubes (E30) are too small in diameter, so will be replaced.*

Cut two 28 mm long lengths of 0.8 mm diameter Brass tube, such as 'Albion Alloy's' MBT08 or similar.

Brush 'VMS' Metal Prep 4K or 'Mr. Metal' Primer R over the two tubes and allow to fully dry.

Brush paint the two tubes with 'Tamiya' Hull Red (XF9) or similar.

Remove a small amount of paint from both sides of the front and rear engine cylinders where the pre-molded locations are for the original kit supplied ignition lead support tubes.

Remove a small amount of paint from one side of the replacement support tubes at the cylinder pre-molded locations.

Using thin CA adhesive, secure the replacement support tubes to the engine cylinders.

Cut twelve lengths of 0.2 mm diameter lead wire, such as that from 'PlusModel' or similar.

NOTE: *During the following step, not all six wires will fit into the replacement support tubes. Those that can't fit into the tube must be attached to those that do at the tube end.*

Using thin CA adhesive, secure three wires into the rear end of both support tubes.

Using thin CA adhesive, secure the remaining three wires onto the wires, already fitted at the rear of the support tubes.

Trim the length of each wire such that they loop down to the six stubs on the face of the magnetos.

Using thin CA adhesive, secure each wire to a stub on the magnetos.

Trim the length of each wire from the spark plugs such that they loop down to the underside of the support tubes.

Using thin CA adhesive, secure each wire to underside of the support tubes.

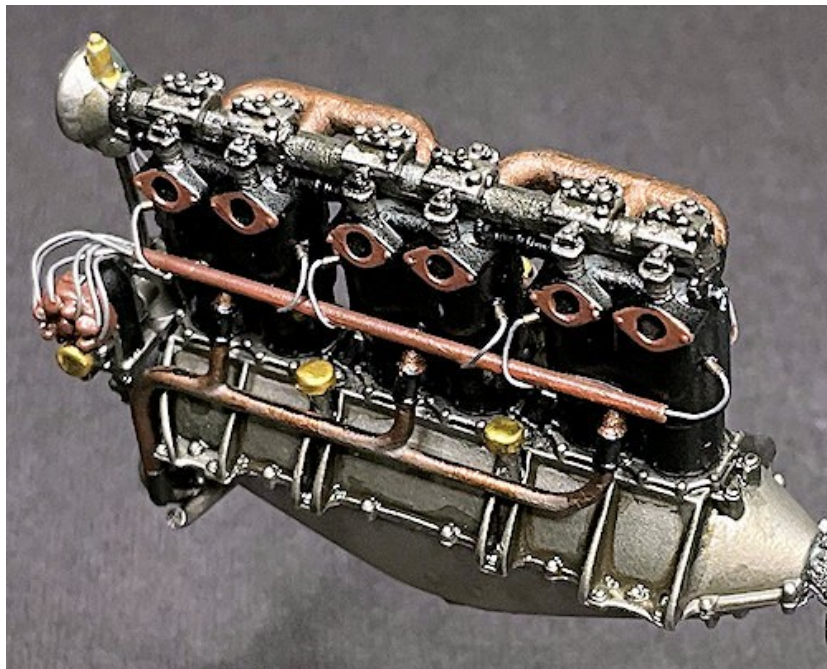
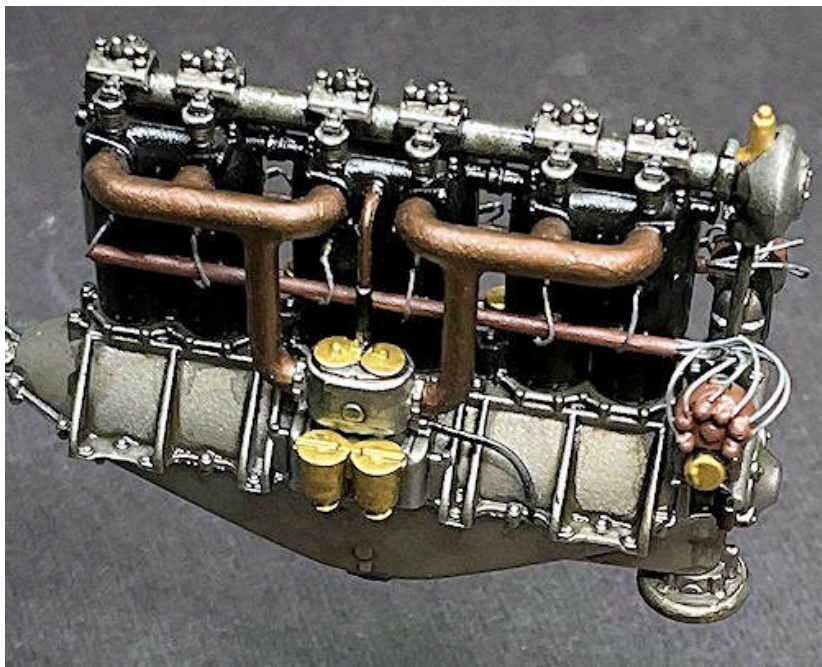
NOTE: Refer to Part 3 (Weathering) of this build log for more information.

Brush 'Flory Models' Dark Dirt wash over the engine crankcase.

Remove the wash to achieve the desired weathering effect.

To seal and protect the applied weathering, airbrush a semi-matte clear coat, such as 'Tamiya' Semi-Gloss (X35) over the applied weathered surfaces.

Brush 'AK Interactive' Kerosene wash (AK) over the valve springs, tappet covers, base of engine cylinders and down the edges of the cast webs on the engine crankcase.



PART 8

PROPELLER

PART 8 - PROPELLER

References:

'Windsock' data file 104 - The Taube at War (P.M. Grosz).

'Wingnut Wings' - Instruction manual (IM).

Deutches Technikumuseum, Berlin - Taube A.180/14.

NOTE: *The aircraft being modelled is shown on IM page 17 (scheme D) and all parts detailed in this build log refer to that particular aircraft.*

The propeller fitted to this aircraft was manufactured by 'Integral'. However, for this model I chose not to use the kit supplied propeller, but use instead a hand made, wood laminated 'Integral' propeller (WP-064) from 'Proper Plane' in Ukraine.

Preparation:

Saw the two propeller hub plates from their base block.

Press the plates onto a flat sanding surface and pull the plates back and forth to reduce their thickness to that of the plates. Check as you sand to make sure the sanding is even and level.

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

NOTE: *The hole in the 'Proper Plane' propeller and the kit engine propeller shaft are not compatible. Therefore, modifications are necessary.*

Cut away the propeller shaft from the fitted engine.

Cur a short length od wooden toothpick or similar to the same thickness as the propeller hub.

Secure the wood plug into the hole in the propeller hub using thin CA adhesive, making sure the plug does not protrude from either side of the hub.

Drill a hole of 1.0 mm diameter centrally into the propeller plug and into the engine at the cut away propeller shaft.

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

NOTE: *Make sure the propeller blades are angled correctly for the front of the propeller (compare to the kit supplied propeller).*

Using thin CA adhesive, secure the front and rear hub plates centrally on the faces of the propeller hub.

Using thin CA adhesive, secure the 1.0 mm diameter rod into the pre-drilled hole in the propeller plug.

Test fit the propeller - Insert the rod into the pre-drilled hole in the engine, making sure the propeller hub is fully against the engine and the propeller is parallel to the wing leading edges when viewed from above and vertical to the fuselage when viewed from the sides.

Decals:

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

Apply the kit supplied decals 29 to the front faces of the propeller blades.

Apply the kit supplied decal 31 to the top of the propeller hub.

Seal the applied decals with a light coat of semi-gloss clear coat, such as 'Tamiya' (X35) or similar.

Weathering:

Brush 'AK Interactive' Kerosene wash (AK2039) over the two propeller hub plates.

If desired, lightly sponge 'Tamiya' Weathering Master set A (Mud or Sand) along the leading edges of the propeller blades.



PART 9

WEAPONS

PART 9 - WEAPONS

References:

Windsock' data file 104 - The Taube at War (P.M. Grosz).

'Wingnut Wings' - Instruction manual (IM).

NOTE: *This aircraft operated in the period before machine guns were fitted to aircraft. As such, the weapons used were limited to hand held pistols, rifle of small bombs, as shown on IM page 11. Including these weapons is a matter of choice by the modeller.*

*I chose **not to add** any of the kit supplied weapons to this model.*

PART 10

WHEELS

PART 10 - WHEELS

References:

'Windsock' data file 104 - The Taube at War (P.M. Grosz).

Deutsches Technikmuseum, Berlin - Taube A.180/14 (Courtesy of Rafael Reckert).

NOTE: *The wheels and photo-etch spokes supplied in the kit were not used. Instead 3D printed 'Copper State Models' German 810x125 spoked wheels (A32-040) were used. As such, the kit supplied axle ends are too large to fit into the wheels and so need to be modified.*

Modification:

NOTE: *To modify the axle ends requires the use of various Brass tubes. The following procedure applies to both ends of the axle.*



Cut away the end of the landing gear axle at the struts.

Drill a hole of 0.6 mm diameter centrally into the axle end approximately 5 mm deep. Make sure the drill is kept central and parallel to the axle.

Cut an 11.5 mm length of 0.6 mm diameter Brass tube, such as 'Albion Alloy's' MBT06 or similar.

Secure the tube fully into the pre-drilled hole using thin CA adhesive, leaving 6.5 mm of rod protruding.

Cut an 6.5 mm length of 1.2 mm diameter Brass tube, such as 'Albion Alloy's' MBT12 or similar.

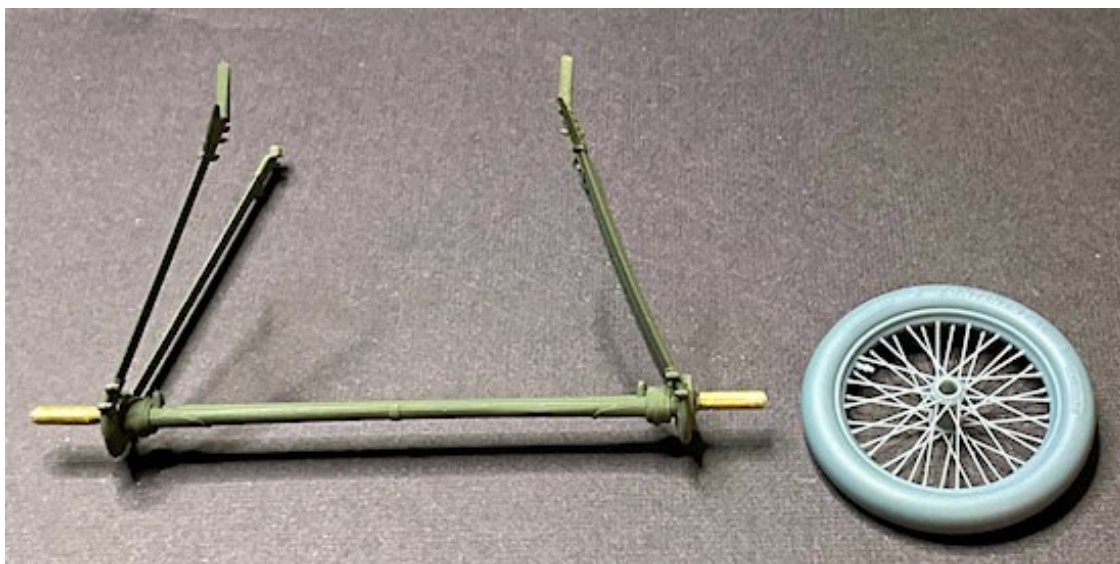
Secure the tube fully onto the previously fitted tube using thin CA adhesive.

Cut an 6.5 mm length of 1.4 mm diameter Brass tube, such as 'Albion Alloy's' MBT14 or similar.

Secure the tube fully onto the previously fitted tube using thin CA adhesive.

Cut an 6.5 mm length of 1.6 mm diameter Brass tube, such as 'Albion Alloy's' MBT16 or similar.

Secure the tube fully onto the previously fitted tube using thin CA adhesive.



NOTE: The 'Copper State Models' wheels are 3D printed and should be handled with care. Any force or twisting of the wheels may cause the spokes to break.

Run a 1.6 mm diameter drill through the hole in the wheel hub to clear any minor resin obstructions.

Test fit the wheels onto the axle ends, making sure the wheels are vertical when viewed from the front and are at 90 degrees to the axle when viewed from above.

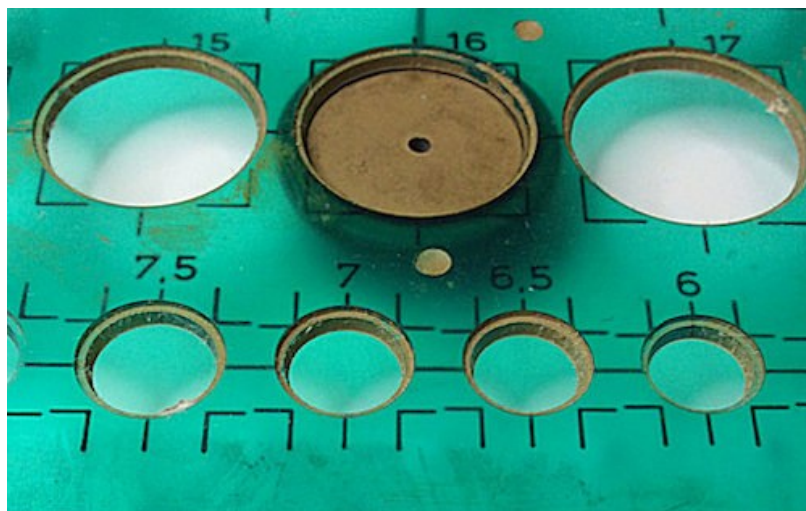
As the wheels need to be painted, do not secure them to the axle ends at this stage of the build.



Painting:

Airbrush the wheels with 'Mr. Surfacer Grey (1500) thinned 50/50% with Self Levelling Thinners (400).

NOTE: To airbrush the wheel spokes and rim without over spraying the surrounding tyres, I used a circle drawing tool (Linex 1217 T). I selected the correct size of hole and positioned the wheel under the hole.



Airbrush the wheel spokes and rims with 'Alclad' Steel (ALC-112) or similar.

Sponge 'Tamiya' Weathering Master set A (Mud) around the tyres to represent dirt.



PART 11

CONSTRUCTION

PART 11 - CONSTRUCTION

References:

'Windsock' data file 104 - The Taube at War (P.M. Grosz).

'Wingnut Wings' - Instruction manual (IM).

Deutsches Technikmuseum, Berlin - Taube A.180/14 (Courtesy of Rafael Reckert).

NOTE: *The aircraft being modelled is shown on page 17 (**scheme D**) and all parts detailed in this build log refer to that particular aircraft.*

*Although the fuselage and wings are large parts, they do have delicate frames or protruding parts that can easily be broken or distorted. The same applies to many other parts of the model, **particularly cockpit frames and protruding pylons on the tail and wings.** To avoid any damage to parts, **take care** throughout the build when handling and assembling parts. 'Wingnut Wings' kit parts are known to be manufactured to tight fitting tolerances. Any primer, paint or decal not removed from the mating surfaces between parts may cause problems when the parts are being assembled.*

In general, the assembly of the model parts follows the guidelines detailed in the applicable pages of the (IM), which are specified in the relevant entries in this build log.

Preparation:

Remove all of the required scheme D fuselage parts from mold gates A and F (IM pages 3 and 7).

Remove any mold seam lines and residual gate tags from the parts.

Assembly:

NOTE: *Make sure all primer, paints and decal are removed from the various mating surfaces of the parts before assembly.*

Cement the floor panels F3 and E6 together.

Cement the pilot's steering wheel A4 to the control column A14.

Cement the throttle quadrant A37 into its support on cockpit frame A17.

Cement the map holder A40 onto the bulkhead A30.

Painting:

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

Inside surfaces of the fuselage halves F1 and F3.

Cockpit floor F3/F6.

Frames A5, A35, A49, A41 and A7.

Fuel tank A22.

Panel A29.

Bulkhead A30.

Pilot's steering wheel/control column A4/A14.

Cockpit side frames A17 and A25.

Rudder pedals and support frame A26 and A18.

Tachometer and fuel filter frame A19.

Starter magneto A2.

Pilot's seat and cushion F2 and A16.

Observers seat F8.

Map holder A40.

Engine bearer A31.

Control pulleys A46.

Engine header tank A42.

Water pipe A43.

Mask off the following areas in preparation for applying metal surfaces (refer to page 4):

- Rear of the forward area of floor panel F3.
- Upper panel area of bulkhead A30.
- Engine bay area, forward inside fuselage right half F7.
- Engine bay area, forward inside fuselage left half F1.

Airbrush the exposed areas with a coat of gloss black, such as 'Tamiya' Gloss Black (X1) or similar.

Airbrush 'Alclad' Duraluminium 9ALC102) or similar over the gloss black painted areas .

Remove all of the applied masking.

Airbrush just over the panel surrounding frames on both sides of panel A29 with a semi-matte black, such as 'Tamiya' Semi-Gloss Black (X18) or similar.

Mask off the black painted panel surrounding frames on both sides of panel A29.

Mask off the metal painted areas on the cockpit forward floor, panel A30 and the fuselage halves F1 and F3.

Airbrush the following with 'Tamiya' Deck Tan (XF55) or similar:

- Cockpit floor F3/F6.
- Inside fuselage halves F1 and F3.
- Top panel on bulkhead A40.
- Panel A29
- Frame A41.
- Observers seat F8.
- Pilot's seat and cushion F2 and A16.

Remove all of the applied masking.

Wood and leather effects:

Example:

NOTE: Refer to Wood effect - Method 2 in Part 2 (Wood Effects) of this build log for more information. The wood effect for this model was created using 'Windsor & Newton' Griffin (Alkyd) oil paints.

Brush a covering coat of 'Windsor & Newton' Griffin Alkyd oil paint over the part.

Leave the oil paint to settle for several minutes.

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

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

Brush the oil paint in the required direction of the wood grain, but keep wiping the brush on the sheet to remove residual oil paint.

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

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

Wood effects:

Mask off the black painted panel surrounding frames on both sides of panel A29.

Mask off the metal painted areas on the cockpit forward floor, panel A30 and the fuselage halves F1 and F3.

Brush 'Windsor & Newton' Griffin Alkyd **Raw Sienna** oil paint over the following parts:

Cockpit floor F3/F6 and bulkhead A40.

Panel A29.

Top panel of bulkhead A30.

Remove residual oil paint to achieve the desired wood effect.

Remove all of the applied masking.

Allow the oil paint to fully dry, usually overnight.

Seal and protect the applied oil paint by airbrushing a semi-matte clear coat, such as 'Tamiya' Semi-Gloss (X35) or similar.

Leather effects:

Brush 'Windsor & Newton' Griffin Alkyd **Vandyke Brown** oil paint over the pilot's seat and the observers seat, but **not over** the seat cushions. Use a brush stippling method to remove residual oil paint and create a worn leather appearance.

Brush 'Windsor & Newton' Griffin Alkyd **Burnt Umber** oil paint over the pilot and observers seat cushions.

Use a brush stippling method, apply 'Windsor & Newton' Griffin Alkyd **Raw Sienna** oil paint over the pilot and observers seat cushions to create a worn leather appearance.

Allow the oil paint to fully dry, usually overnight.

Seal and protect the applied oil paint by airbrushing a semi-matte clear coat, such as 'Tamiya' Semi-Gloss (X35) or similar.

Painting (continued):

Airbrush the following with 'Tamiya' Grey Green (XF76) or similar:

Tubular frames and vertical supports at the metal painted, forward fuselage.

Engine bearer A31.

Fuel tank A22.

Cockpit side frames A17 and A25.

Frames A7, A5, A35, A49.

Rudder bar and support frame A26 and A18.

Tachometer and fuel filter frame A19.

Airbrush the header tank A42 and water pipe A44 with a coat of gloss black, such as 'Tamiya' Gloss Black (X1) or similar.

Airbrush the header tank A42 and water pipe A44 with 'Alclad' Pale Gold (ALC108) or similar.

Mask along the tubular bottom edges of the rear cockpit floor.

Brush paint various details as follows with stated paints or similar:

Pilot's steering wheel - '**Mr. Color**' **Stainless Steel (213)** spokes with '**Tamiya**' **Hull Red (XF9)** rim.

Rudder bar foot restraints - '**AK Interactive**' **Brown Leather (AK3032)**.

Hand pressure pump on side frame A25, filler cap on fuel tank A22 - '**Mr. Metal Color**' **Brass (219)**.

Throttle quadrant and lever, control pulleys A46, starter magneto A2, bottom and sides of map holder A40 and small pipe on top of header tank A42 - '**Tamiya**' **Semi-Gloss Black (X18)**.

Tubular bottom edges of the rear cockpit floor, control column A14 with '**Tamiya**' **Grey Green (XF76)**.

Retaining straps around the header tank A42 - '**Mr. Color**' **Stainless Steel (213)**

Remove the masks along the tubular bottom edges of the rear cockpit floor.

Refer to IM page 3 and brush paint the various details on the pilot's side of panel A29 using the following - 'Tamiya' **Semi-Gloss Black (X18)**, 'Mr. Color' **Stainless Steel (213)**.

Refer to IM page 3 and brush paint the various details on the forward side of panel A29 using the following - 'Tamiya' **Semi-Gloss Black (X18)**, 'Mr. Color' **Stainless Steel (213)**, 'Mr. Color Brass (219).

Assembly (continued):

NOTE: *Make sure all primer, paints and decal are removed from the various mating surfaces of the parts before assembly.*

Cement the pilot's seat cushion A16 onto the seat F2.

Cement the Frame A19 onto the forward side of panel A29.

NOTE: *Make sure the pre-molded holes through the forward side of the pulleys are clear of primer and paint. Use a 0.2 mm diameter drill to clear the holes.*

Cement the two control pulleys A46 into the pilot's side of panel A29.

Cement the starter magneto A2 onto the pilot's side of panel A29.

Decals:

Prepare panel A29, A30 and cockpit left side frame A17 for applying decals by brush painting the areas to have decals with a clear gloss coat, such as 'Tamiya' (X22) or similar.

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

Refer to IM page 3 and apply the following kit supplied decals to panel A29:

23, 38, 48, 49, 50, 51, 52, 53, 55 and 56

Refer to IM page 3 and apply decal 47 to the cockpit left side frame A17.

Seal and protect the applied decals by airbrushing a semi-matte clear coat, such as 'Tamiya' Semi-Gloss (X35) or similar.

Modifications:

Instrument panel A29:

NOTE: *Panel A29 has two selector locations for decals but the kit does not supply the selector handles.*

Select two appropriate size handles from the 'ANYZ' cockpit handles (AN030) set and using thin CA adhesive, secure them into the pre-molded holes in the two selectors.

Brush paint the selector handles with 'Mr. Metal Color' Brass (219) or similar.

Control column and support frame:

NOTE: *The base of the control column is intended to 'clip' between the tubes of the support frame. This is not a strong enough when rigging is fitted. Therefore, I modified the assembly.*

Using as a guide the locating recesses in the base of the control column, drill through the base of the control column using a drill of 0.3 mm diameter.

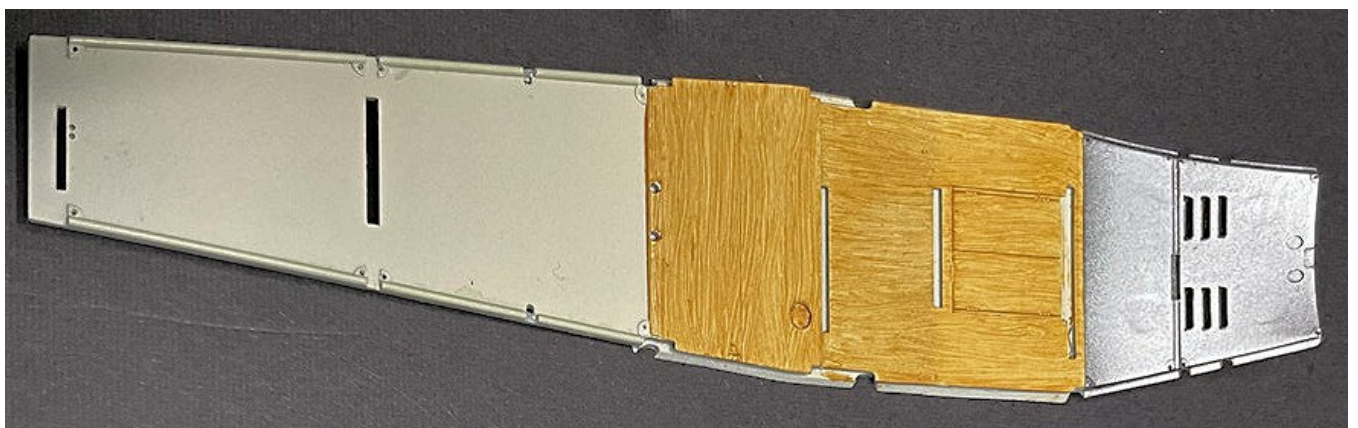
Drill a hole through the locating lugs on the tubes of the support frame, using a drill of 0.3 mm diameter.

Cut a short length of 0.3 mm diameter Brass rod, such as that from 'Albion Alloy's' or similar.

Locate the base of the control column between the lugs on the frame and pass the cut rod through the frame lugs and control column.

NOTE: *The inserted rod and control column will be secured in position on the support frame after pre-rigging the control column is complete.*

Do not secure the rod in position, leaving the control column free to pivot in the support frame.



Internal rigging preparation:

NOTE: *The fuselage kits parts can be rigged and have either pre-molded rigging locations, holes or Recesses. The intention of the rigging recesses is to insert the rigging lines into the recesses and secure in position with an adhesive. However, this can make it difficult to correctly tension the line when using mono-filament as on this model. It is possible using stretch line, such as 'EZ', but I chose to not use that type of line.*

To enable the added rigging lines to be correctly tensioned during installation, I chose to drill through the rigging recesses in the fuselage sides and cockpit floor. Although this creates holes on the outer surfaces, they can easily be filled and blended out after the fuselage assembly is complete.

To prepare the parts for rigging, drill through the pre-molded rigging locations as shown in the following photographs:

In the rigging recesses of the fuselage sides and cockpit floor, drill through the rigging recesses using a 0.3 mm diameter drill.

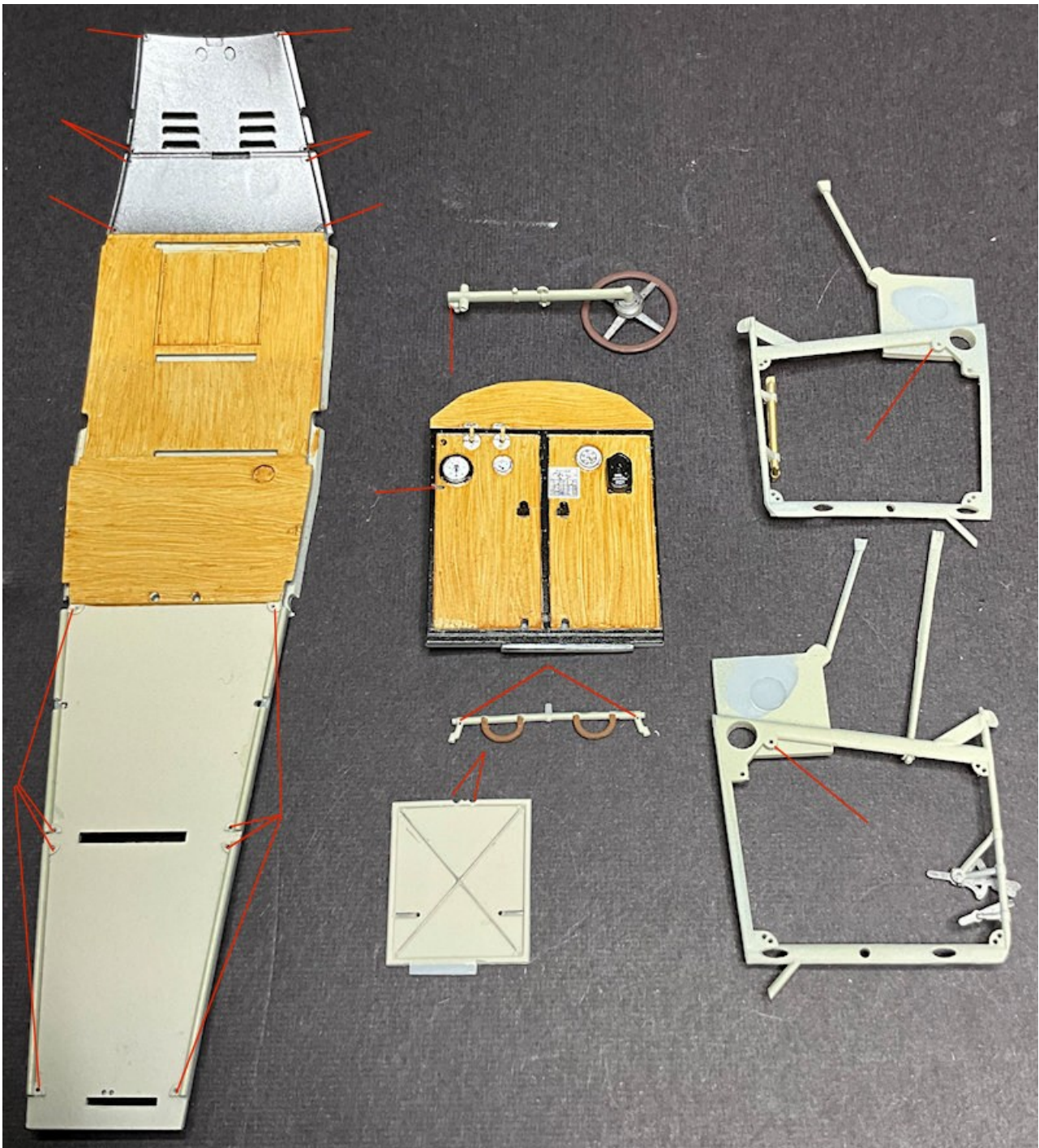
In the corners of the cockpit left and right side frames, drill through the rigging lugs and into the pre-molded rigging hole, using a 0.3 mm diameter drill.

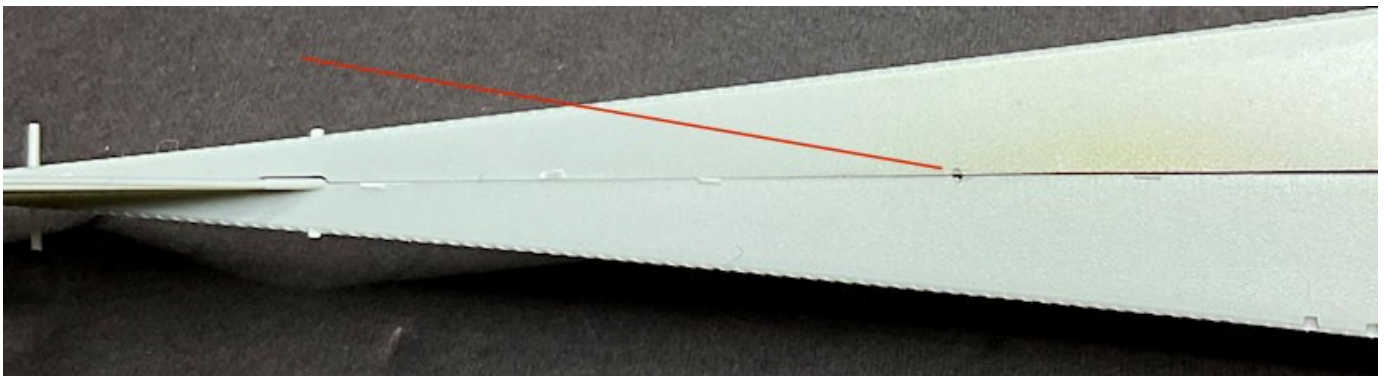
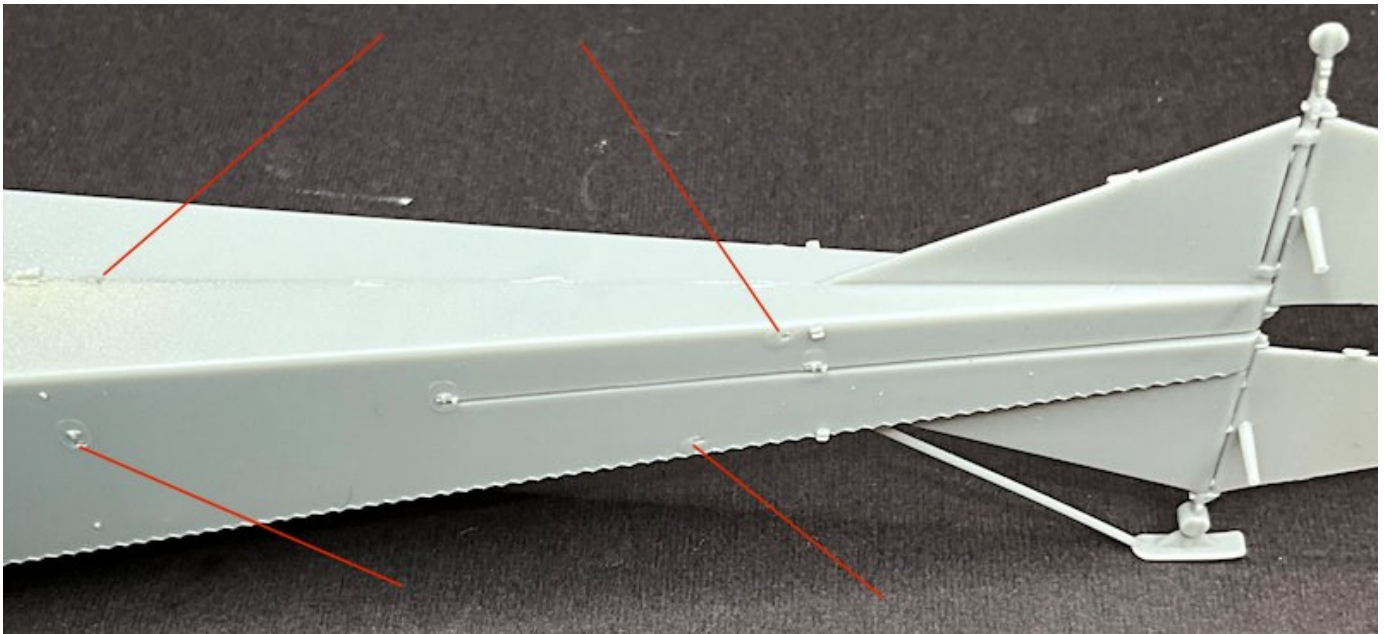
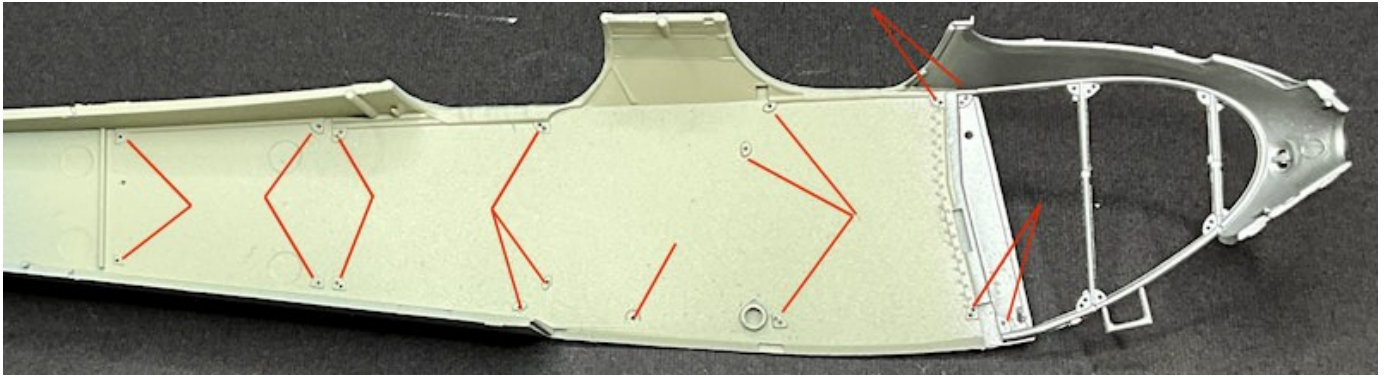
Drill holes across and through the bottom of the control column and through the ends of the rudder bar, using a 0.2 mm diameter drill.

Drill two holes through the pre-molded recess for the throttle control rods, using a 0.2 mm diameter drill.

File two shallow notches (for extra cable clearance) at the pre-molded cable indents on the top edge of panel A41.

Temporarily join the fuselage sides and drill holes of 0.4 mm diameter through the fuselage and angled rearwards towards the tail unit.





Weathering:

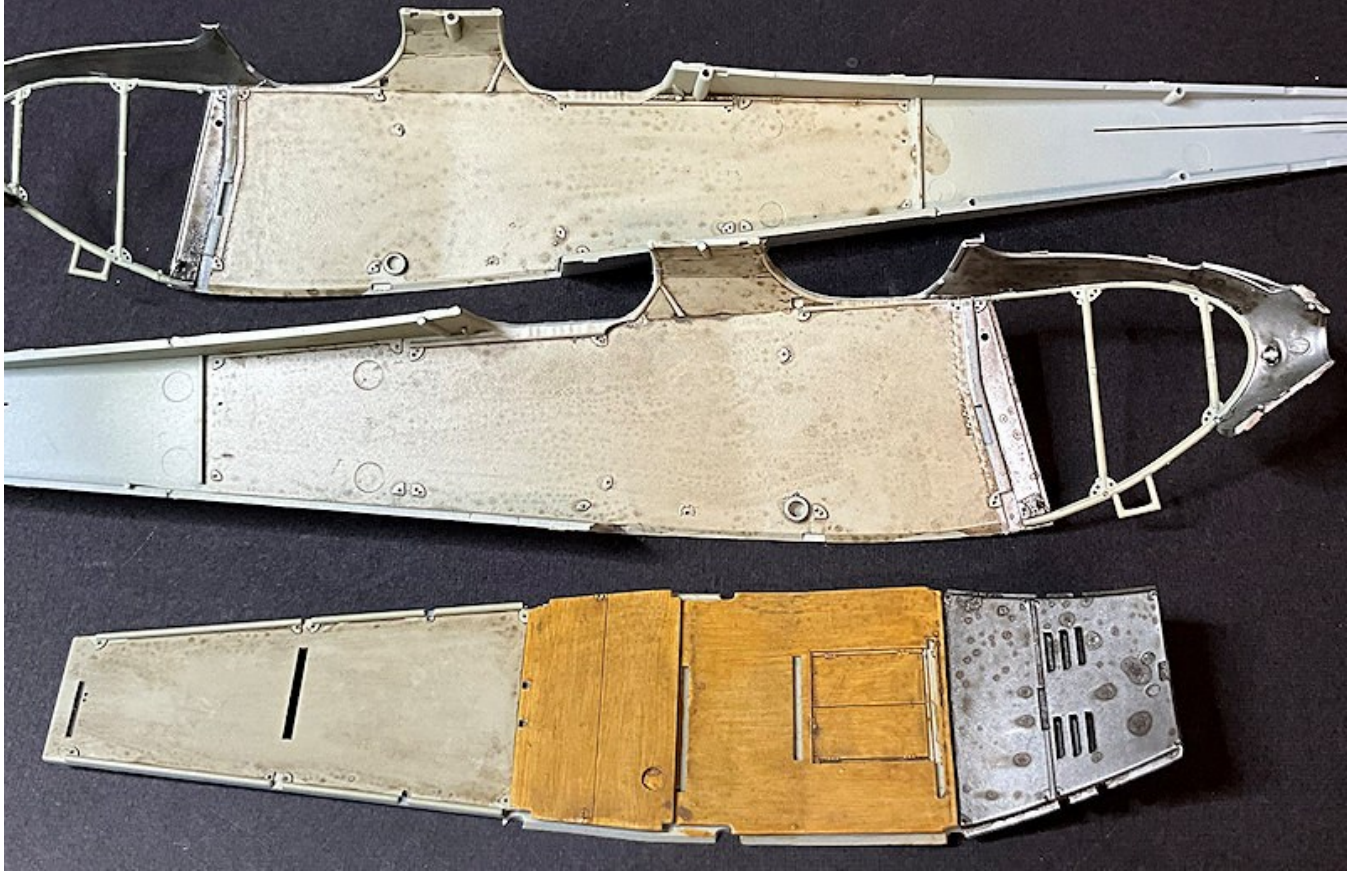
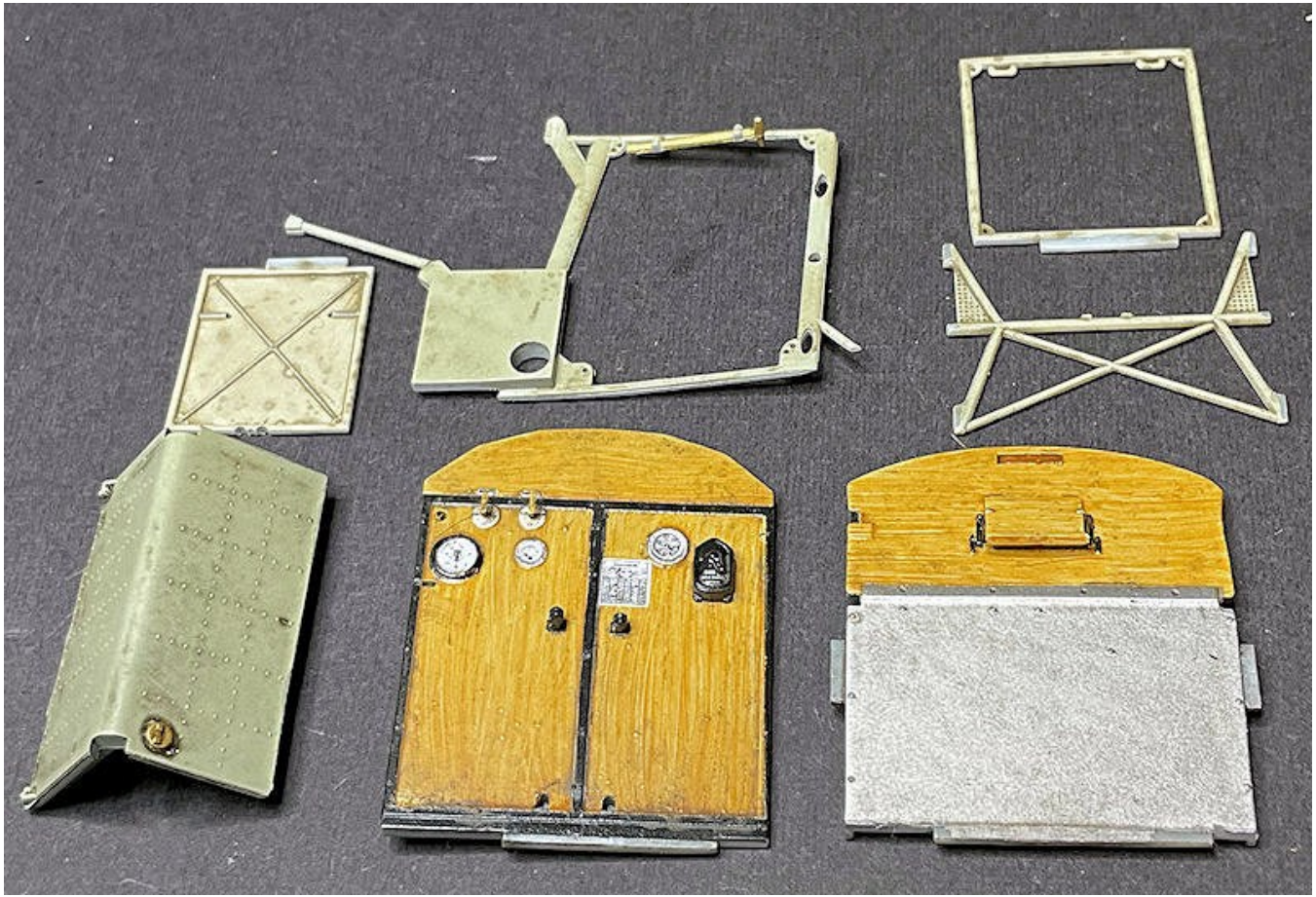
NOTE: Refer to Part 3 (Weathering) of this build log for more information.

Brush 'Flory Models' Grime wash over the insides of the fuselage halves, cockpit floor and internal panels and frames (not the metal painted areas).

Brush 'Flory Models' Dart Dirt wash over the metal painted areas of insides of the fuselage halves, cockpit floor and internal panels.

Remove the wash to achieve the desired weathering effect.

To seal and protect the applied weathering, airbrush a semi-matte clear coat, such as 'Tamiya' Semi-Gloss (X35) over the applied weathered surfaces.



Internal rigging:

Bracing wires:

NOTE: Refer to Part 6 (Rigging) for more information on the fuselage internal and cockpit controls rigging.

The rigging materials used are:

'Stroft GTM' or 'Steelon' 0.12 mm diameter mono-filament (always cut longer than needed).

Blackened 0.4 mm and 0.5 mm diameter Brass or Nickel-Silver tube from 'Albion Alloy's.

Example rigging a bracing wire:

NOTE: Nickel-Silver or Brass tube can be chemically blackened by immersion in a solution such as 'Blacken-It' or similar. Rinse in water and dry the blackened tubes to prevent powdering of the surfaces.

Cut a length of line.

Cut two short lengths of the relevant sized blackened tube.

Pass one end of the line through, from the inside of the fuselage, the pre-drilled rigging hole in the fuselage.

Secure the line in the hole using thin CA adhesive.

Slide the two tubes onto the line.

Pass the free end of the line diagonally across and through the relevant pre-drilled rigging hole in the fuselage.

Keeping the line taut, secure the line in the hole using thin CA adhesive.

Slide each tube up to its rigging hole and secure the tube onto the line.

Cut away any residual end tag of line from the outside of the surface of the part.

Fuselage bracing wires:

NOTE: The following applies to each of the bracing wires, except for the three wires at the rear of the engine bay area. Tubes used are 0.4 mm diameter with 0.12 diameter mono-filament.

Using the previous rigging example, add bracing wires along the inside of the fuselage halves.

Engine bay and fuselage floor bracing wires:

NOTE: Bracing wires are required across the floor area of the engine bay and fuselage, rear of the cockpit floor. Tubes used are 0.4 mm diameter with 0.12 diameter mono-filament.

Using the previous rigging example, add diagonally crossed bracing wires across the floor area of the engine bay and fuselage, rear of the cockpit floor.

Engine bay bracing wires:

NOTE: Only the three bracing wires at the rear of the engine bay area need to be pre-rigged, as access to these rigging locations will be restricted once the fuselage halves are joined together. The remaining engine bay bracing wires will be added after the fuselage halves have been joined together. Tubes used are 0.5 mm diameter with 0.12 diameter mono-filament.

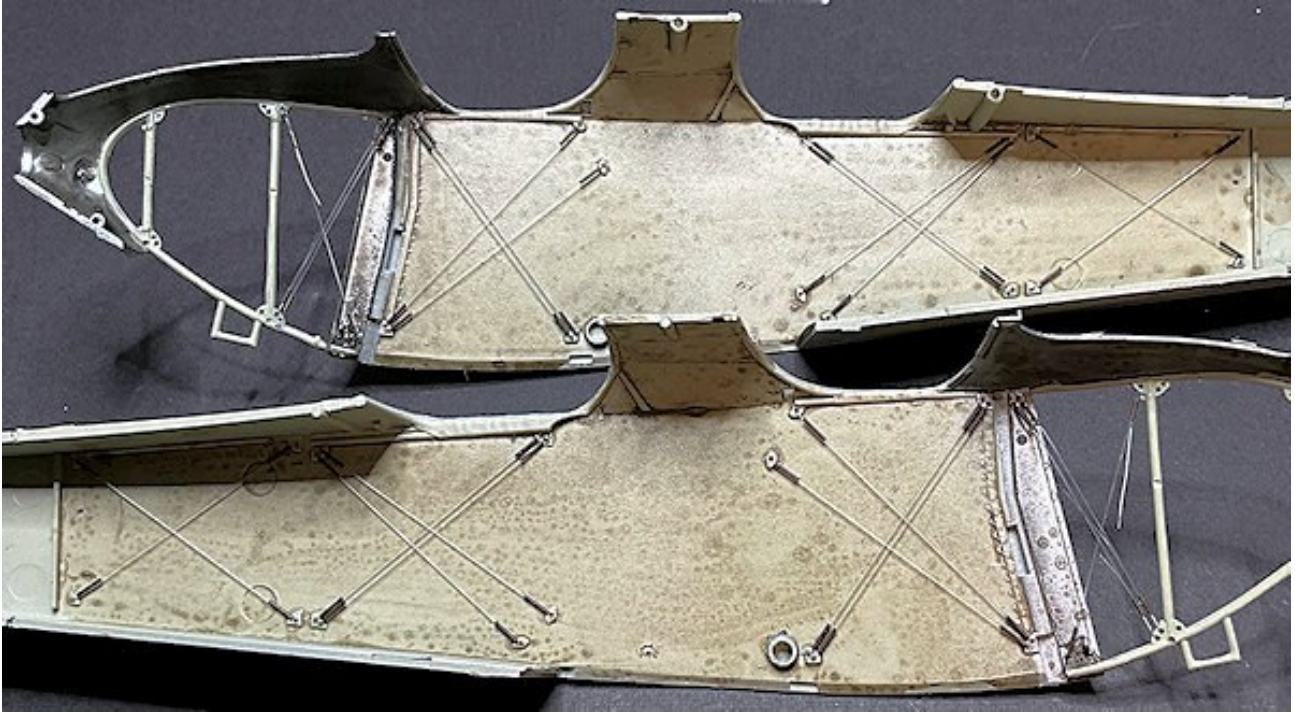
Using the previous rigging example, add the three bracing wires to the rear of the engine bay area on the fuselage halves.

Slide a tube on to the lines.

Pass the free ends of the lines diagonally across and through the relevant pre-molded rigging location.

Loop the lines back and through the tubes.

Hold the free end of the lines and slide the tubes up to the rigging location, but leave the **lines and tubes loose**.



Cockpit side frames bay bracing wires:

NOTE: *The following is applicable to the four bracing wires on cockpit side frames A17 and A25. Tubes used are 0.4 mm and 0.5 mm diameter with 0.12 diameter mono-filament. Nickel-Silver or Brass tube can be chemically blackened by immersion in a solution such as 'Blacken-It' or similar. Rinse in water and dry the blackened tubes to prevent powdering of the surfaces.*

Cut four long lengths of line.

Cut four short lengths of 0.4 mm diameter blackened tube.

Cut four short lengths of 0.5 mm diameter blackened tube.

Using thin CA adhesive, secure the end of one line into the pre-drilled hole in the side of the bottom, forward rigging location (outer side of the fuel tank side panel).

Pass the remaining three lines through the bottom rigging locations (from the inner side of the frame) and using thin CA adhesive, secure the lines in the holes.

Slide a 0.4 tube on to each line followed by a 0.5 mm tube.

Pass the four lines diagonally up and across (from the inner side of the frame) then through their relevant top rigging locations .

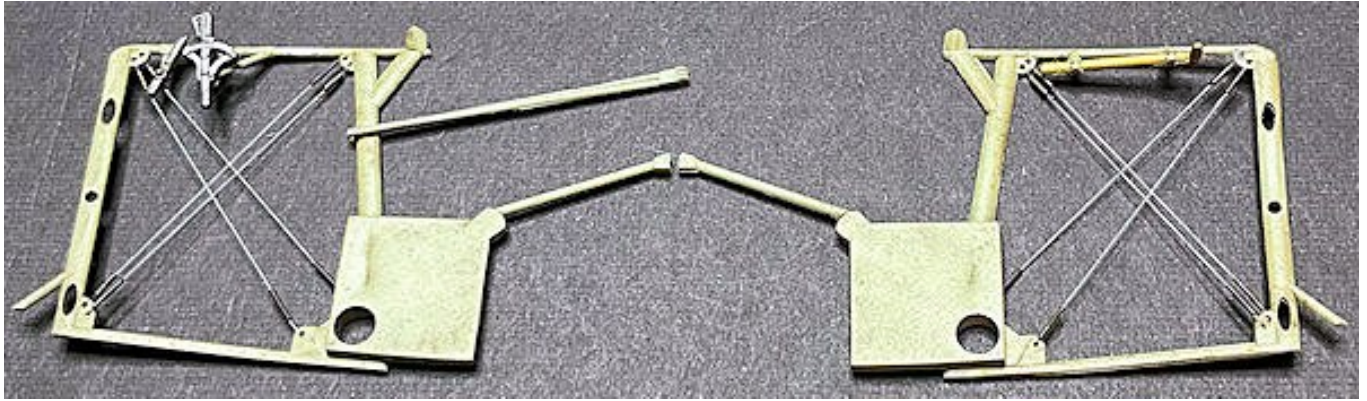
Loop the lines back and through the 0.5 mm tubes.

NOTE: *During the following steps, do not tension the lines too much as the cockpit frames may distort or break.*

Hold the free end of the lines and keeping the lines taut, slide the 0.5 mm tubes up to the top rigging locations.

Using thin CA adhesive, secure the lines in the tubes.

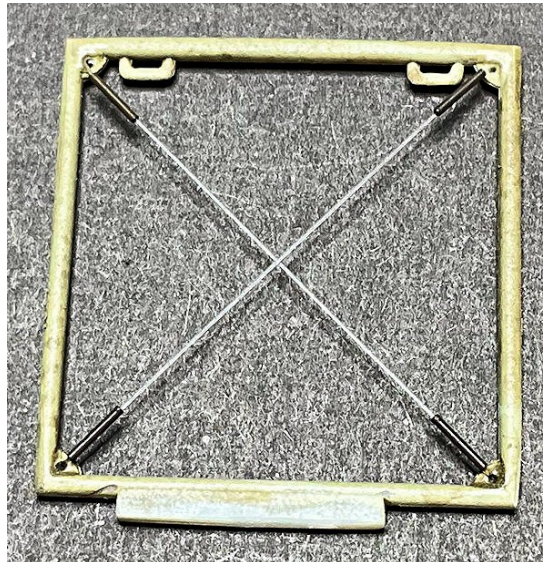
Cut way any residual end tag of line at the tube end furthest from the rigging location.



Fuselage frame A49 bracing wires:

NOTE: Tubes used are 0.4 mm diameter with 0.12 diameter mono-filament.

Using the previous rigging example, add diagonally crossed bracing wires to fuselage frame A47.



Internal control cables:

NOTE: Refer to Part 6 (Rigging) for more information on the fuselage internal and cockpit rigging. At this stage of the build the control cable rigging for the **rudder** can be pre-rigged. The rigging materials used are:

'Stroft GTM' or 'Steelon' 0.08 diameter mono-filament (always cut longer than needed).

Blackened 0.4 diameter Brass or Nickel-Silver tube from 'Albion Alloy's.

Nickel-Silver or Brass tube can be chemically blackened by immersion in a solution such as 'Blacken-It' or similar. Rinse in water and dry the blackened tubes to prevent powdering of the surfaces.

Rudder control cables:

Cut two long lengths of line.

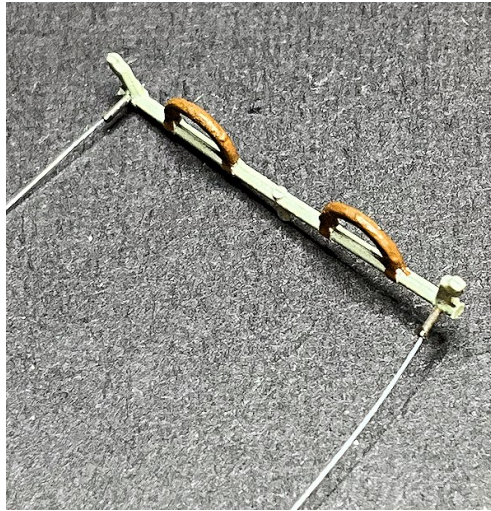
Cut two short lengths of 0.4 mm diameter blackened tube.

Pass one end of each line through the pre-drilled holes in the outer ends of the pilot's rudder bar.

Secure the lines in the rudder bar using thin CA adhesive.

Slide a tube on to each line and up to the rudder bar.

Secure the tubes on to the lines using thin CA adhesive.



Assembly (continued):

NOTE: *At this stage of the build and to make pre-rigging of the wing and tail warp control cables easier, some cockpit parts can be fitted. Make sure all primer and paint is removed from the mating surfaces of the various parts. During assembly, check the fitted part into a fuselage half, to ensure alignments are correct.*

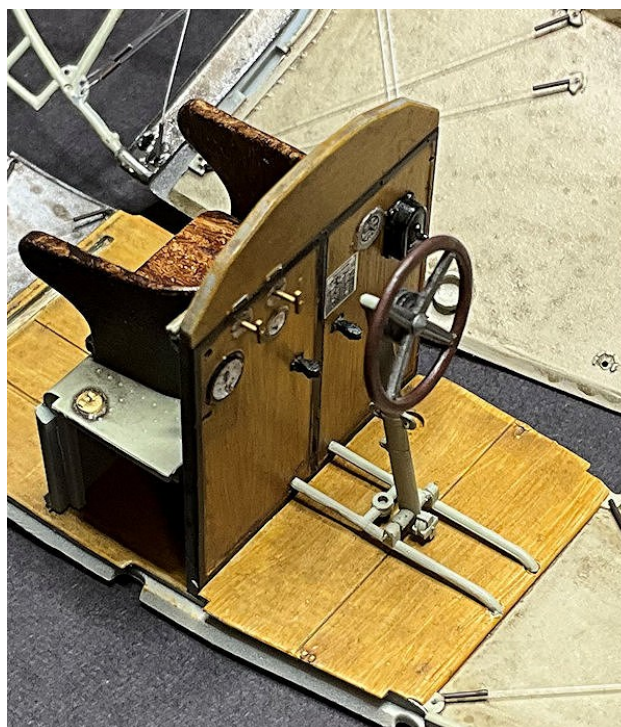
Cement the pilot's instrument panel A29 into its locating slot on the cockpit floor.

Cement the fuel tank A22 into its locating slot in the cockpit floor and its rear locating lug in to the opening between the vertical tubes on A29.

Cement the observers seat F8 onto the fuel tank with its locating lug, on the bottom, rear of the seat, between the vertical tubes on A29.

Cement the support frame A18 with the control column A14 into its locating recesses in the bottom rear of panel A29 and the rear edge of the cockpit floor.

Cement the rear panel A41 into its locating slot in the rear of the cockpit/fuselage floor.



Internal rigging (continued):

NOTE: Refer to Part 6 (Rigging) for more information on the fuselage internal and cockpit rigging. At this stage of the build the control cable rigging for the **wing warp** and **tail warp** can be pre-rigged. The rigging materials used are:

'Stroft GTM' or 'Steelon' 0.08 diameter mono-filament (always cut longer than needed).

Blackened 0.4 diameter Brass or Nickel-Silver tube from 'Albion Alloy's.

Nickel-Silver or Brass tube can be chemically blackened by immersion in solutions such as 'Blacken-It' or similar. Rinse in water and dry the blackened tubes to prevent powdering of the surfaces.

The control column was modified earlier and should not have been secured in position yet so it is free to pivot in the support frame.

Wing warp control cables:

Cut two long lengths of line.

Using thin CA adhesive, secure one end of a line to the left and around the forward groove in the pulley in front of the pilot's steering wheel.

Using thin CA adhesive, secure one end of the second line to the right and around the rear groove in the pulley in front of the pilot's steering wheel.

Pass the left line down to the right side of the pulley at the bottom of the control column.

Pass the line through the pre-drilled hole across the pulley and out to the right side of the cockpit floor.

Repeat the procedure to the right line, but passing it out to the left side of the cockpit floor.

Drill a hole of 0.3 mm diameter down through the pre-molded cable points on the outer edges of the cockpit floor.

Pass the free ends of the lines through their relevant drilled holes in the cockpit floor, but **do not secure** them in the holes yet.

NOTE: During the following steps, do not apply too much tension to the lines, otherwise the control column may be distorted or detached.

Position the control column vertically to the cockpit floor and secure it to the support frame using thin CA adhesive.

Pull on the two lines at the edges of the cockpit floor to tension them and then secure them in the holes using thin CA adhesive.

Cut away any residual end tag of line at the underside of the holes.

Tail warp control cables :

Cut a length of line the twice the approximate length of the fuselage/cockpit floor.

Cut two short lengths of 0.4 mm diameter blackened tube.

Pass the line through the pre-molded rigging point on the front edge of the control column with an equal length of line at each side.

Slide a tube on to both ends of the line.

Pass the left line through, from the inner side, the pre-drilled hole across the left pulley in the pilot's instrument panel.

Pass the right line through, from the inner side, the pre-drilled hole across the right pulley in the pilot's instrument panel.

Keeping the two tubes just clear of the rigging point on the control column, secure them to the lines using thin CA adhesive.

Support the control column and gently pull on each of the lines from the pulleys, to remove the slackness in the lines between the control column and the pulleys.

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

Cut a long length of line.

Cut a short length of 0.4 mm diameter blackened tube.

Slide the tube on to the line.

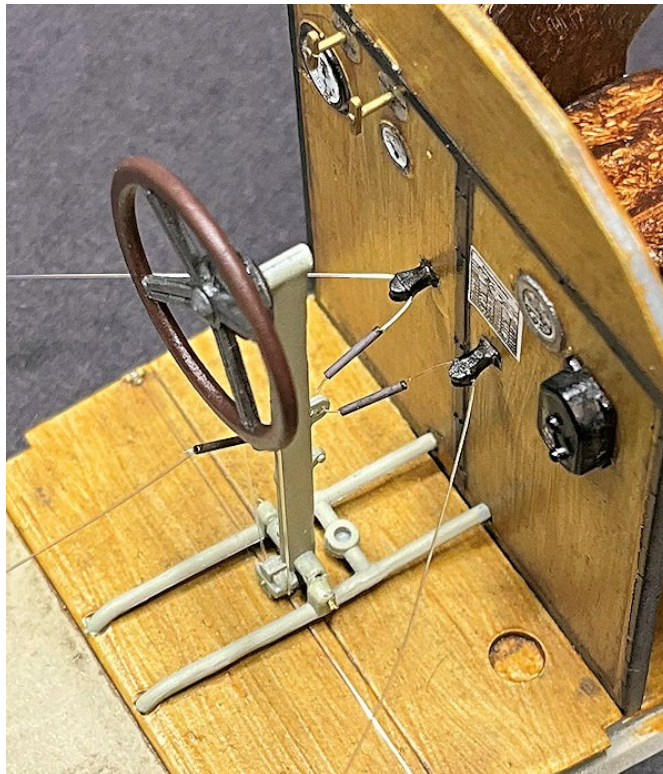
Pass the line through the pre-molded rigging point on the rear edge of the control column.

Loop the line back and through the tube.

Slide the tube close to the rigging point.

Using thin CA adhesive, secure the tube to the lines.

Cut away any residual end tag of line at the tube end furthest from the rigging point.



Assembly (continued):

NOTE: *Make sure all primer, paints and decal are removed from the various mating surfaces of the parts before assembly. Also, make sure the pre-rigged control lines are kept clear of any joints or cement. During assembly, check the fitted part into a fuselage half, to ensure alignments are correct.*

Cement the rudder bar into its locating recess in the support frame A18 (on the cockpit floor).

Cement panel A30 into its locating slot in the cockpit floor.

Cement the two cockpit side frames A17 and A25 into the sides of the fuel tank and bottom edges of the cockpit floor. The forward projections locate into cut-outs in the top, sides of panel A30.

Cement frame A7 into its locating openings in the rear uprights of the cockpit side frames.

Cement the pilot's seat into its support frame locating holes in the side edges of the cockpit floor. The front, underside of the seat is cemented on to top, centre of frame A7.

Cement frame A49 into its locating slot in the fuselage floor.

Cement the engine bearer A31 into its locating slot in the forward face of panel A30.

Cement the two forward frames A5 and A35 into their locating recesses in the forward, metal panels of the fuselage floor. Cement the tops of the frames into their locating holes in the undersides of the engine bearer.

Internal rigging (continued):

NOTE: Refer to Part 6 (Rigging) for more information on the fuselage internal and cockpit rigging. At this stage of the build the control cable rigging for the **tail warp** and the **rudder** can be final rigged. Do not apply too much tension when securing the lines to the rear frame A41 as this may deflect that frame or stress the control column and pulleys on the pilot's instrument panel.

Tail warp control cables:

Pass the free ends of the two lines from the pulleys, on the instrument panel, rearwards through the upper section of the pilot's front seat support frame under the pilot's seat.

Pass the lines rearwards through the side sections of frame A49 and over the two notches made in the top edge of the rear frame A41.

Keeping the lines taut, locate them over the two cable guides on the pilot's rear seat support frame under the pilot's seat.

Keeping the lines taut, secure them to the seat guides and frame notches and rear of frame A41, using thin CA adhesive.

Drill a hole of 0.3 mm diameter through the centre, bottom edge of the rear frame A41.

Pass the free end of the line, from the rear of the pilot's control column, rearwards and through the upper section of the pilot's front seat support frame under the pilot's seat.

Pass the line rearwards through the bottom section of frame A49 then through the pre-drilled hole in the rear frame A41.

Keeping the line taut, locate it over the central cable guide on the pilot's rear seat support frame under the pilot's seat.

Keeping the line taut, secure it to the seat guide and the rear of frame A41, using thin CA adhesive.

Rudder control cables:

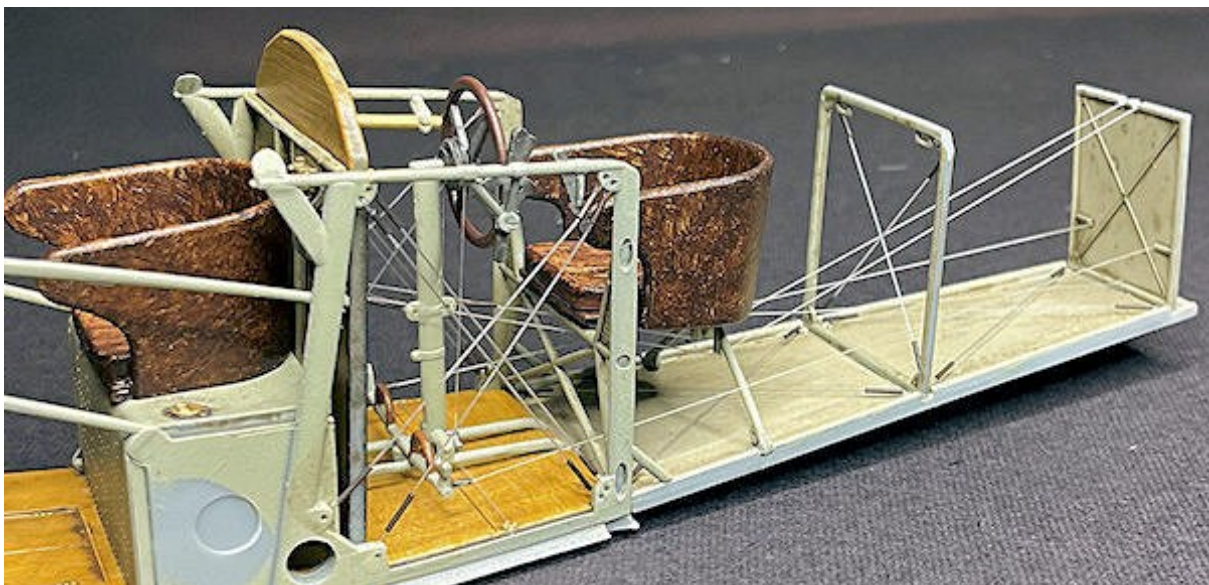
Pass the free ends of the two lines from the ends of the pilot's rudder bar pulleys rearwards through the outer sections of the pilot's front seat support frame under the pilot's seat.

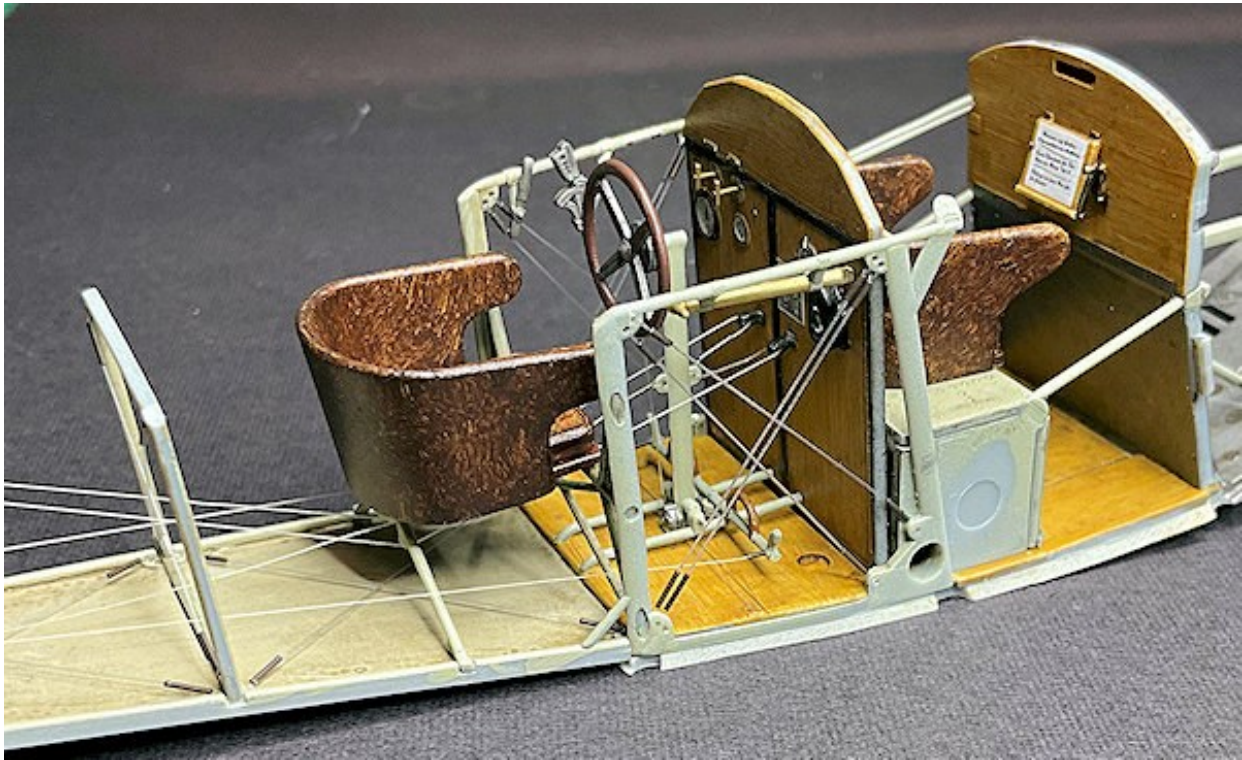
Pass the lines rearwards and over the pilot's rear seat support frame then through the outer sections of frame A49.

Pass the lines through the two pre-molded holes in the rear frame A41.

NOTE: Do not apply too much tension when securing the lines to the rear frame A41 as this may deflect that frame or bend/break the rudder bar.

Keeping the lines taut, secure them to the rear of frame A41, using thin CA adhesive.





To remove the surface sheen on the added rigging lines, airbrush the lines with a semi-matte clear coat, such as 'Tamiya' Semi-Gloss (X35) or similar.

Seat lap belts:

NOTE: *The lap belts for the pilot and observer are supplied as photo-etch parts. The pilot's lap belts are parts P1/P2 and the observers parts P3/P4.*

Cut the lap belts from the kit supplied photo-etch sheet.

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

Using a low heat source (e.g. cigarette lighter or candle flame) 'wave' each belt over the flame and watch for the part to discolour. **Do not linger** over the flame or the photo-etch may **distort or even melt**. Doing this anneals the photo-etch, making it easier to bend. Wipe off any soot from the belts.

NOTE: *During the following step, the belts should be formed to a natural relaxed state, not rigid. Refer to the IM page 7 for guidance.*

Bend and form the pilot's two lap belts (P1/P2) to lay over the pilot's seat with the ends of the straps able to be attached to the support struts on the cockpit side frames.

Carefully remove the belts and without altering their formed shapes.

Bend and form the observers two lap belts (P3/P4) to lay over the observers seat with the ends of the straps able to attach to the brackets at the top of fuselage frame A49.

Carefully remove the belts and without altering their formed shapes.

Brush 'VMS' Metal Prep 4K or 'Mr. Metal' Primer R over the four lap belts.

Brush paint the lap straps with 'Tamiya' Dark Yellow (XF60) or similar.

Brush paint the metal fitting on each belt with 'Mr. Metal Color' Stainless Steel (213) or similar.

Remove any paint/metal prep from the underside of the belts where they will be adhered to the seats and support struts and brackets.

Using thin CA adhesive, secure the lap belts in position for the pilot and observers seats.

Brush 'Tamiya' Flat (XF86) mixed with a few drops of Smoke (X19) over the belts to create a grubby effect.



Assembly (continued):

NOTE: *Make sure all primer, paints and decal are removed from the various mating surfaces of the parts before assembly. The engine was prepared in Part 7 (Engine) of this build log.*

Check fit the cockpit assembly between the joined fuselage halves before final assembly, to ensure the alignment of the parts is correct and the fuselage halves fully join together.

Check that all fuselage/cockpit rigging, except for the loose bracing wires at the sides of the engine bay, is intact and not detached.

Locate the prepared engine onto the engine bearers, making sure the edges of the engine crankcase fully contact the bearers.

Cement the engine to the engine bearers.

Cement the rear support frame A44 for the header tank into its locating recesses in the forward, outer edges of the bulkhead.

Cement the header tank A42 into its locating hole in the top of the front engine cylinder and the top of the added support frame.

Fully locate the cockpit assembly into the fuselage right half, making sure that:

The two rear frames A47 and A42 locate in the recesses between the rigging points on the fuselage half.

The hole in the lower, outer side of cockpit side frame A25 fits over the round locator on the side of the fuselage half.

The rectangular locator on the outer edge of the bulkhead A40 fits into its recess in the side of the fuselage half.

Apply cement to the following:

Rear corners of the rear frames A47 and A42.

Rectangular locator on the outer edge of the bulkhead A40.

Between the underside of the cockpit floor and fuselage floor.

Locate the top of drains pipes A43 into the hole in the underside of the engine water pump, with the bottom of the two pipes against the bottom corners of the bulkhead.

Cement the drains pipe to the water pump and bulkhead.

Modifications (continued):

NOTE: *The kit does not supply any of the fuel pipes from the pilot's or observers cockpit to the engine. This modification is a representation only of the fuel pipes and is not necessarily accurate.*

Fuel pipes:

Cut a length of 'MFH' 0.4 mm diameter flexible black tube (P-961).

Using thin CA adhesive, secure the tube along the bottom, left edge of the observers cockpit floor, between the left side of the fuel tank to the bottom left corner of the bulkhead.

Cut a long length of 0.5 mm diameter lead wire from 'PlusModel' or similar.

Using thin CA adhesive, secure the wire to the forward, bottom left corner of the bulkhead, then up along the diagonal rib of the bulkhead then forward along the underside of the engine bearer.

Curve the free end of the wire up and attach it to the bottom of the carburetors rear float chamber.

Cut a short length of 0.5 mm diameter lead wire from 'PlusModel' or similar.

Using thin CA adhesive, secure the wire between the previously fitted wire and the bottom of the carburetors forward float chamber.



Engine control rods:

NOTE: *The kit does not supply any of the engine control rods from the pilot's cockpit to the engine. This modification is a representation only of the engine controls and is not necessarily accurate.*

Drill two holes of 0.4 mm diameter vertically aligned, through the left side of the bulkhead and below the attachment of the header tank support frame.

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

Pass one tube through each of the two pre-drilled holes in the bulkhead

Pass the tubes rearwards and around the outside edge of the pilot's instrument panel.

Spark advance control rod:

Bend the bottom at the side of the panel, so its end can contact the bottom, outer edge of the spark advance lever.

Keeping the tube horizontal through the observers cockpit, use thin CA adhesive to secure the tube:

In the hole in the bulkhead.

At the edge of the pilot's instrument panel.

At the bottom, outer edge of the spark advance lever.

Bend the tube at the bulkhead inwards the forwards to contact the centre of the Brass painted cylinder on the magneto.

Keeping the tube in position, use thin CA adhesive to secure the tube to the centre of the Brass painted cylinder on the magneto.

Throttle control rod:

Bend the top tube at the side of the panel, so its end can contact the bottom, outer edge of the throttle lever.

Keeping the tube horizontal through the observers cockpit, secure the tube:

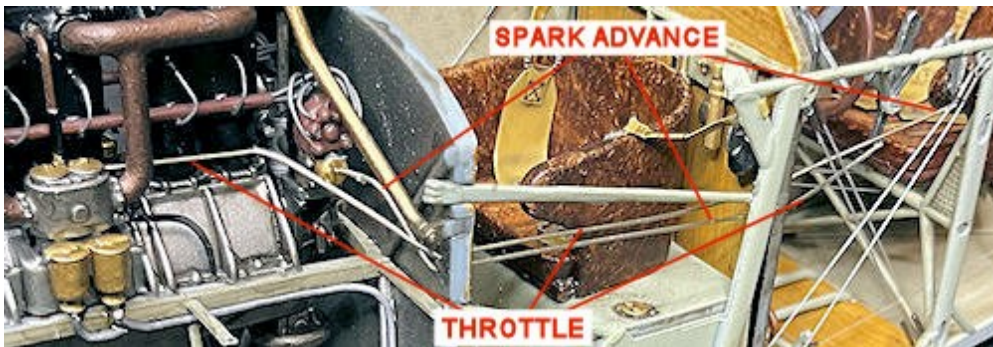
In the hole in the bulkhead.

At the edge of the pilot's instrument panel.

At the bottom, outer edge of the throttle lever.

Bend the tube at the bulkhead inwards towards the rear engine cylinder, then forwards behind the rear intake manifold to the top, rear of the carburettor housing.

Keeping the tube in position, use thin CA adhesive to secure the tube to the top, rear of the carburettor housing.

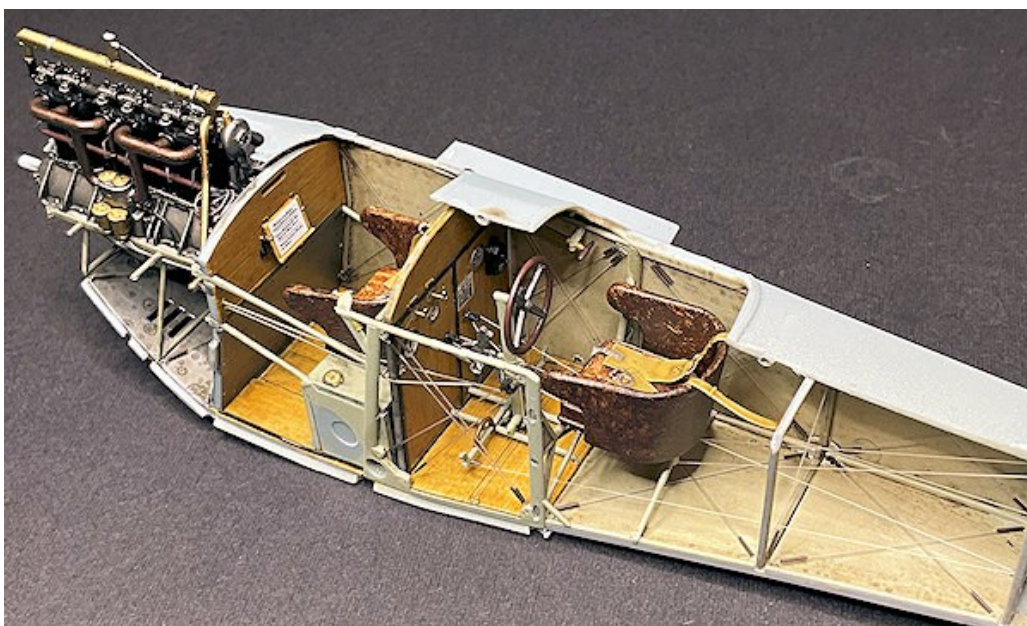


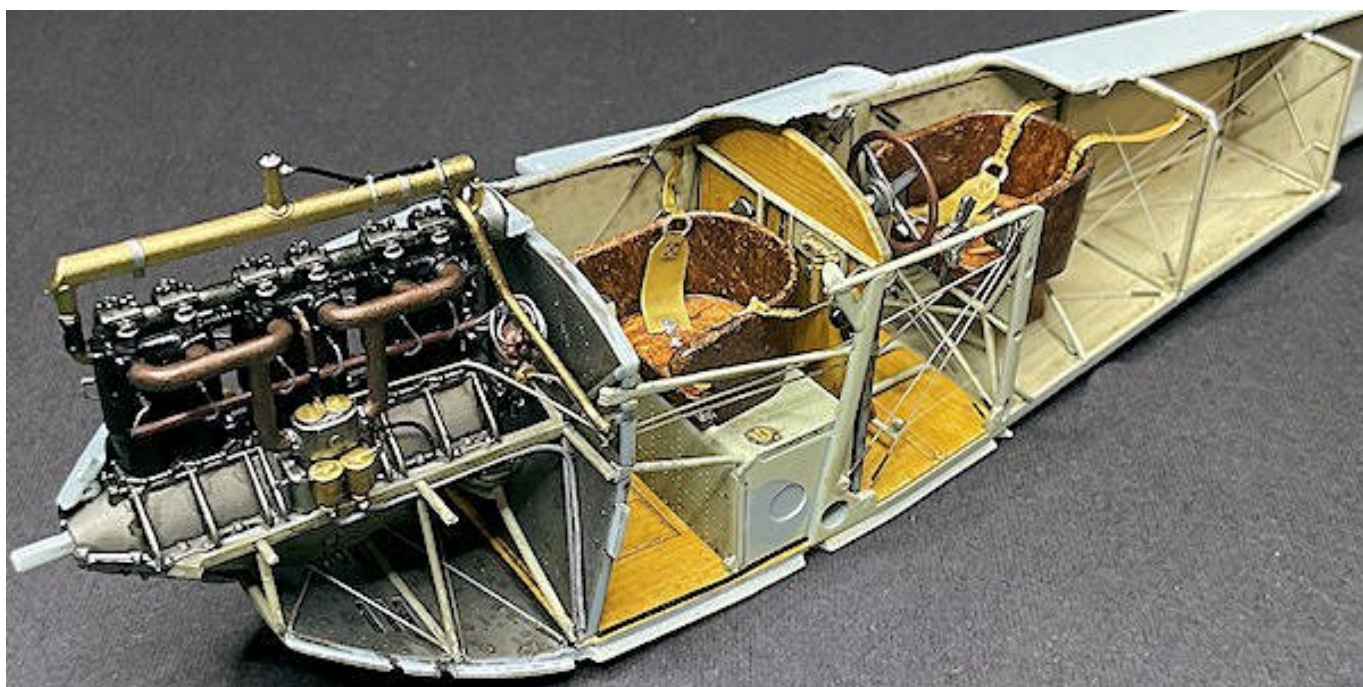
Assembly (continued):

NOTE: *Make sure all primer, paints and decal are removed from the various mating surfaces of the parts before assembly.*

Check fit the cockpit assembly between the joined fuselage halves before final assembly, to ensure the alignment of the parts is correct and the fuselage halves fully join together.

Check that all fuselage/cockpit rigging, except for the loose bracing wires at the sides of the engine bay, is intact and not detached.





Join together the two fuselage halves.

Note: *When securing the two fuselage halves together, I found it easier to work from the fuselage rear forwards.*

Cement along the upper and underside fuselage joint rear of the pilot's cockpit, including along the upper and underside fins.

If necessary, clamp or tape together the rear of the two fuselage halves.

Make sure that:

The locating hole in the cockpit left side frame has fully located over the cylindrical locator on the left side of the fuselage.

The rectangular locator on the left side of the bulkhead has fully located into its slot in the left half of the fuselage.

The fuselage top joint between the cockpits is fully closed.

The fuselage tabs at the front of the observers cockpit are correctly overlapping.

The upper and underside joints at the front (nose) of the fuselage are fully closed.

Cement all upper and underside joints forward from the pilot's cockpit.

If necessary, clamp or tape together the cemented fuselage halves.

Once the cemented joints have fully set, remove all clamps and tape from the fuselage assembly.

Sand away any residual tags of line, protruding from the fuselage internal rigging, from the outer surfaces of the fuselage.

Sand along or across all of the cemented joints to blend them with the surrounding surfaces, taking care to not sand away any surface details. If any small gaps are present after sanding, fill the gaps with putty, such as 'Perfect Plastic Putty' or brush 'Mr. Surfacer' 500 or 1000, allow to set then re-sand.

To check if any 'ghost' seams are present, fully mask off the engine and all openings on the fuselage and airbrush a surface primer, such as 'Mr. Finishing Surfacer' 1500 along the seams, which will show any seams that still need to be rectified.



Internal rigging (continued):

NOTE: Refer to Part 6 (Rigging) for more information on the fuselage internal and cockpit rigging. The fuselage engine bay side bracing wires were left loose earlier in this build, due to the flexibility of the side struts of the forward fuselage. However, as the fuselage halves have now been joined and the engine bay area is more rigid, the wires can now be final rigged.

During the following steps, do not tension the lines too much as the cockpit frames may distort or break.

Pre-rigged lines:

Carefully pull on the free end of the already pre-rigged lines and keeping the lines taut, slide the 0.5 mm tubes up to the rigging locations.

Using thin CA adhesive, secure the lines in the tubes.

Cut way any residual end tag of line at the tube end furthest from the rigging location.

Remaining rigging:

NOTE: The following applies to the three forward bracing wires in both engine bay sides. Tubes used are blackened 0.5 mm diameter with 0.12 diameter mono-filament. Nickel-Silver or Brass tube can be chemically blackened by immersion in a solution such as 'Blacken-It' or similar. Rinse in water and dry the blackened tubes to prevent powdering of the surfaces.

Cut two short lengths of 0.5 mm diameter blackened tube.

Cut a length of 0.12 mm diameter mono-filament.

Pass the line through a pre-molded rigging location.

Slide a tube on to the line.

Loop the line back and through the tube.

Slide the tube up to the rigging location and secure it to the lines using thin CA adhesive.

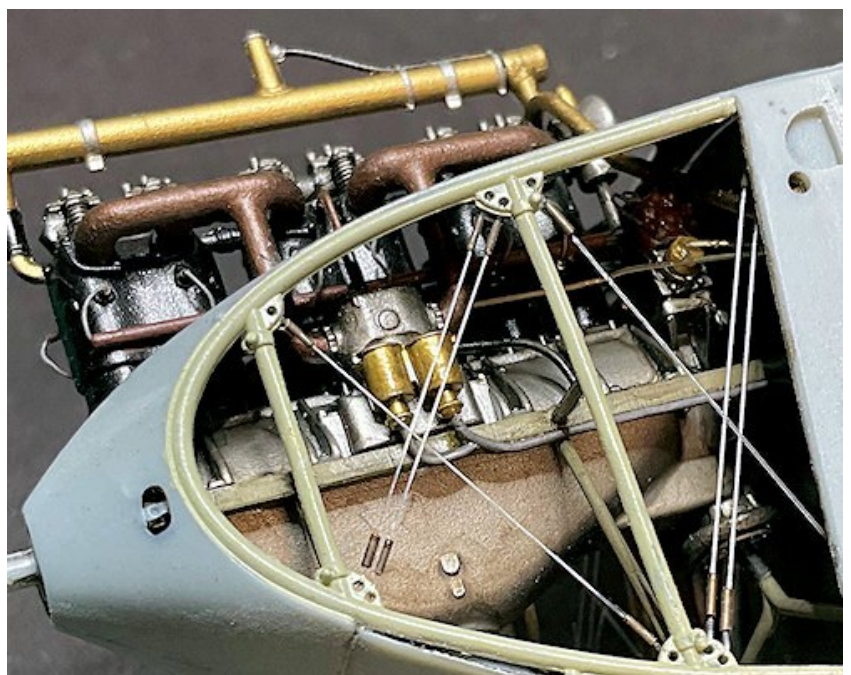
Slide a tube on to the line.

Pass the line diagonally across then through the relevant rigging location.

Loop the line back and through the tube.

Keeping the line taut, slide the tube up to the rigging location and secure it to the lines using thin CA adhesive.

Cut away any residual end tag of line at the tub ends furthest from the rigging locations.



Preparation (continued):

Remove, as required, all of the remaining parts required for scheme D from mold gates A, B, C, D and photo-etch sheet P (IM pages 4 to 8).

Remove any mold seam lines and residual gate and photo-etch tags from the parts.

External rigging preparation:

NOTE: *Refer to Part 6 (Rigging) for more information on the external structural and control rigging. Some of the required rigging points are pre-molded in the kit parts.*

Wing warp control cables:

Using as guides the six pre-molded recesses in outer, trailing edges of both wings, drill holes through the wings using a 0.4 mm diameter drill.

Tail warp control cables:

NOTE: *The top pylon on the tail broke off during handling. Therefore, I drilled the pylon and the fin pylon and pinned the fin pylon using 0.3 mm diameter Brass rod from 'Albion Alloy's'. This will allow the pylon to be fitted on to the fin pylon when required.*

Drill a hole of 0.3 mm diameter through the bottom of the pulley on the underside tail warp pylon. Drill the hole centrally and from the rear to the front of the pulley.

Using as guides the six pre-molded recesses in the rear of the tail bamboo ribs, drill holes through the tail using a 0.4 mm diameter drill. Also through the tail outer edges at the rear bracing wire anchor point.

Rudder control cables:

Using as guides the pre-molded rudder cable rigging locations on the upper and lower sides of the fuselage rear, drill holes of 0.3 mm diameter through the fuselage sides at angled rearwards towards the upper and lower rudder king-posts.

Drill a hole vertically through the end of the four rudder king-posts and through the rear end of the rudders, using a 0.3 mm diameter.

Claw brake control cable:

Using as a guide the claw brake pre-molded cable location, which is in the centre of the fuselage underside between the landing gear strut recesses, drill a hole of 0.3 mm diameter into, **but not through**, the fuselage.

Flying wires:

Using as guides the four pre-molded rigging points in both wings, drill holes through the wings using a 0.4 mm diameter drill.

NOTE: *As the turnbuckles molded on the flying wires anchor A51 seem over sized, I chose to replace them with more in-scale resin versions.*

Cut away the eight pre-molded turnbuckles of part A51.

File or sand away the residual flat turnbuckle ends from the top and underside of both sides of the anchor.

Landing wires:

NOTE: *The rigging locations on both wings are the holes already drilled for the flying wires. As the turnbuckles molded on the landing wires anchor A50 seem over sized, I chose to replace them with more in-scale resin versions.*

Cut away the eight pre-molded turnbuckles of part A50.

File or sand away the residual flat turnbuckle ends from the top and underside of both sides of the anchor.

Wing outer bracing wires:

Using as a guide, in both wings, the pre-molded bracing wire rigging point (just outboard from the outer, rear rigging point for the flying/landing wires), drill holes through the wings using a 0.4 mm diameter drill.

Drill a hole horizontally of 0.3 mm diameter through the ends of the upper and lower vertical pylons at the outer ends of both wings.

Drag wires:

Drill a hole of 0.3 mm diameter through the pre-molded rigging point in the sides of the fuselage nose cone.

Drill a hole of 0.3 mm diameter into, **but not through**, the underside of the wings at the forward, outer flying wire rigging point.

Tail bracing wires:

NOTE: *The two pylons at the sides of the tail were replaced earlier in this build.*

Drill a hole of 0.3 mm diameter through the two side shoulders on the upper pylon of the fin.

Using the pre-molded recesses as guides, drill holes of 0.3 mm diameter as follows:

Both fuselage sides (1 both sides) at the forward tip of the tailplane.

Through the rigging lug at the bottom of the lower rudder.

Through the tailplane (2 both sides), midway along the tailplane edge.

Through the tailplane (1 both sides) at the base of the tailplane horizontal pylons.

Landing gear bracing wires:

Using as guides the pre-molded recesses in the top and bottom of the landing gear forward struts, drill holes of 0.4 mm diameter through the struts.

Tail restraining cables:

NOTE: *The restraining cable for the upper and underside tail warp control cables will use the same rigging points as the control cables.*

Rudder restraining cables:

NOTE: *The restraining cable for the upper and underside rudder control cables will use the same rigging points as the control cables.*

Modifications (continued):

NOTE: *Refer to IM page 7 for guidance. This particular aircraft had a crossed opening in the metal panel on the underside of the nose. Now that the fuselage has been assembled, this opening can be added, using the photo-etch template (P8) supplied in the kit.*



Place the photo-etch template P8 onto the underside of the nose panel with the side 'nicks' aligned to the fuselage joint seam. Point mark the centre of the five template holes on to the fuselage.

Remove the template.

NOTE: *During the following steps, take care to no damage the underside of the engine sump.*

Using the centre hole point mark as a guide, drill through the fuselage using a 2.0 mm diameter drill.

Using the four outer hole point marks as a guides, drill through the fuselage using a 1.0 mm diameter drill.

Carefully cut out the plastic from between the drilled holes then refine the edges to form the cross shape.

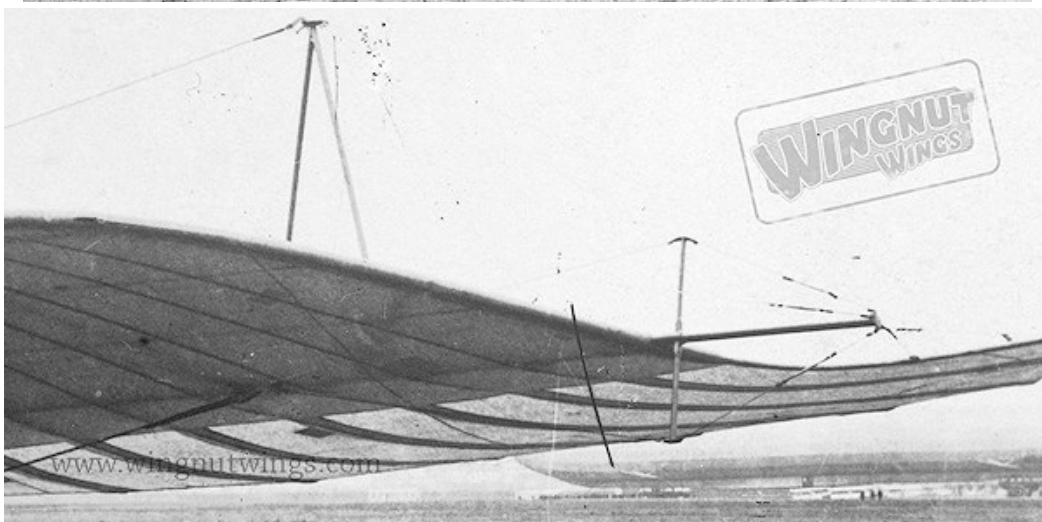
NOTE: *I made my cut-out too large, so covered it with a correct cross, cut from 0.2 mm thick plastic card. This was cemented to the fuselage and the edges brushed with 'Mr. Surfacer' 500. Once set the surfacer was sand over to blend the fuselage and plastic card together.*

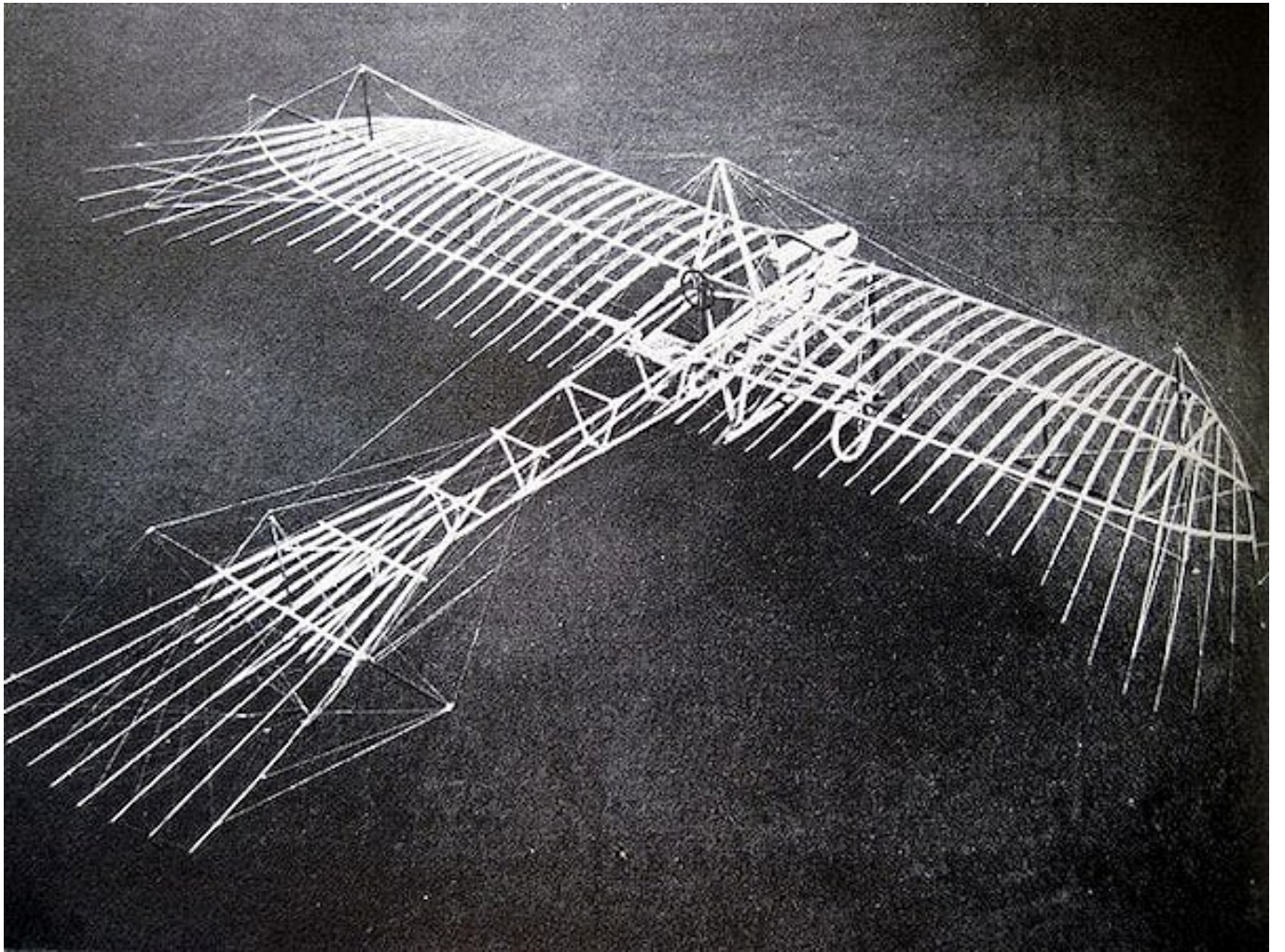


internal structures:

NOTE: *This particular aircraft had Clear Doped Linen (CDL) covering over the wings. The fuselage and tail had 'Feldgrau' Medium Grey/Green dope applied. The wings, being only CDL, would have allowed light to penetrate through the doped linen and reveal the internal structures of the wings as faded darker structures ('ghost' structures), especially when viewed from the underside. The 'Feldgrau' Medium Grey/Green doped surfaces, being darker, would have tended to block more of the light penetration and so show less of the internal structures.*

Painting and pre-shading of the internal structures on the top and undersides of the wings, fuselage and tail surfaces will therefore differ in intensity.





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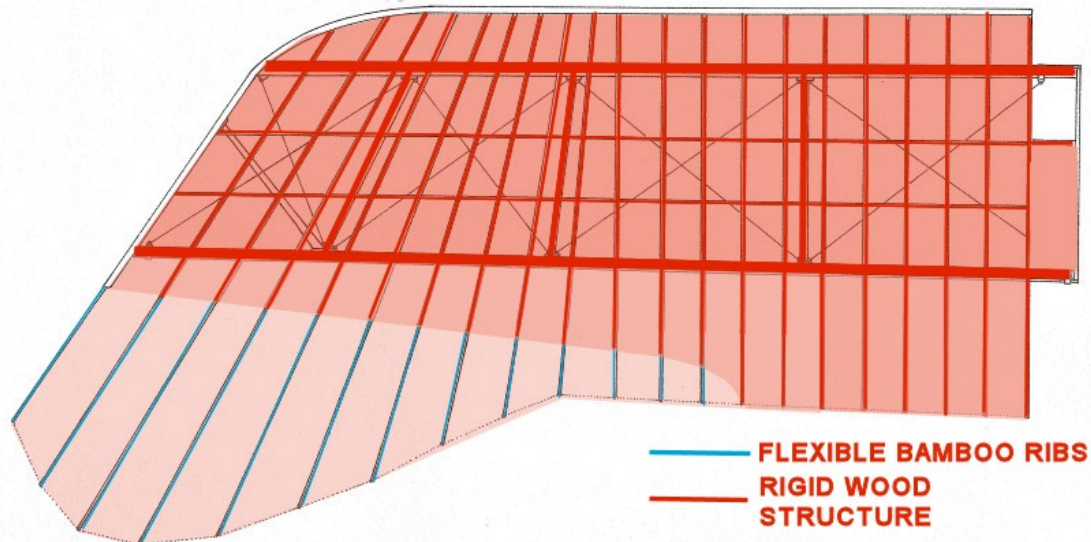
Painting (continued):

Wings:

NOTE: The following illustration shows the darker coloured area on the wings, which is where the internal structure would be less apparent than on the lighter coloured area on the outer, trailing edges of the wings (wing warp area). This is due to the much thinner wing warp area allowing more light penetration through the CDL covering. The same internal structures are visible on both sides of the wings.

During the following steps, make sure the painted surfaces are smooth and free from any surface artifacts, such as dust, fluff, hair etc, otherwise silvering of the decals may occur after application.

NOTE: The rear two spars of the model wings are not parallel to the front spars (as illustrated). The rear spar is angled forwards from the fuselage. I assume therefore, both rear spars on the two wings are angled slightly forwards to the outer edge of the wings.



NOTE: The panel area at the wing roots will be painted later in this build.

Airbrush both wings with a grey primer, such as 'AK Interactive' Grey (AK758) or 'Mr. Surfacer Grey (1500) thinned 50/50% with Self Levelling Thinners (400) or similar.

Airbrush both wings with 'MRP' Clear Doped Linen (MRP-256) or similar.

Front and rear primary wing spars:

NOTE: The following steps apply to both sides of both wings.

Apply two strips of masking tape, 1.5 mm apart and parallel to the wing leading edge. The strips should start at both sides of the front spar at the wing roots and be positioned across the two forward rigging point on the wings to the wing tips.

Repeat the procedure to add the wing primary rear spars. The strips should start at both sides of the rear spar at the wing roots and be angled across the two rear rigging point on the wings to the wing tips.

Airbrush 'MRP' Khaki Green 3/G3 (MRP-333) or similar between the two sets of masking strips. **Do not** apply the paint to heavily.

Remove the strips of masking tape.

Front and rear intermediate wing spars:

NOTE: The following steps apply to both sides of both wings.

Apply two strips of masking tape, 1.0 mm apart and parallel to the painted primary front wing spar. The strips should start at both sides of the rear member of the wing root opening and be positioned across the wings out to the wing tips.

Repeat the procedure to add the wing intermediate rear spars. The strips should be positioned parallel to the painted primary rear spar and start approximately 14 mm from the rear edge of the wing root then across the two rear rigging points on the wing tips to the wing tips.

Airbrush 'MRP' Khaki Green 3/G3 (MRP-333) or similar between the two sets of masking strips. **Do not** apply the paint to heavily.

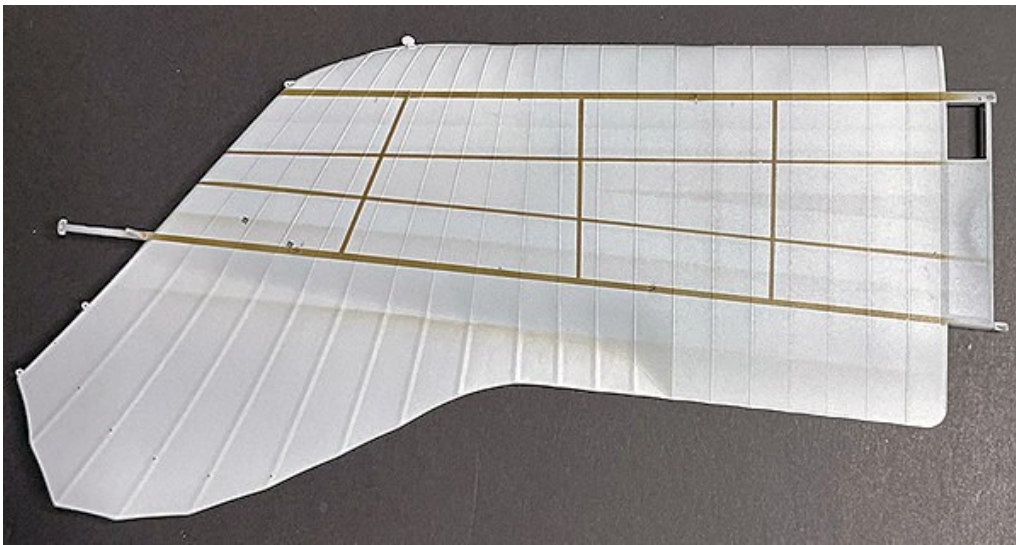
Remove the strips of masking tape.

Repeat the procedure to add the three wing interconnecting spars between the primary front and rear spars. The strips should be positioned parallel to their adjacent wing ribs at wing roots and be centrally between the 6th, 11th and 17th wing ribs from the edge of the wing roots.

Airbrush 'MRP' Khaki Green 3/G3 (MRP-333) or similar between the three sets of masking strips. **Do not** apply the paint to heavily.

Remove the strips of masking tape.

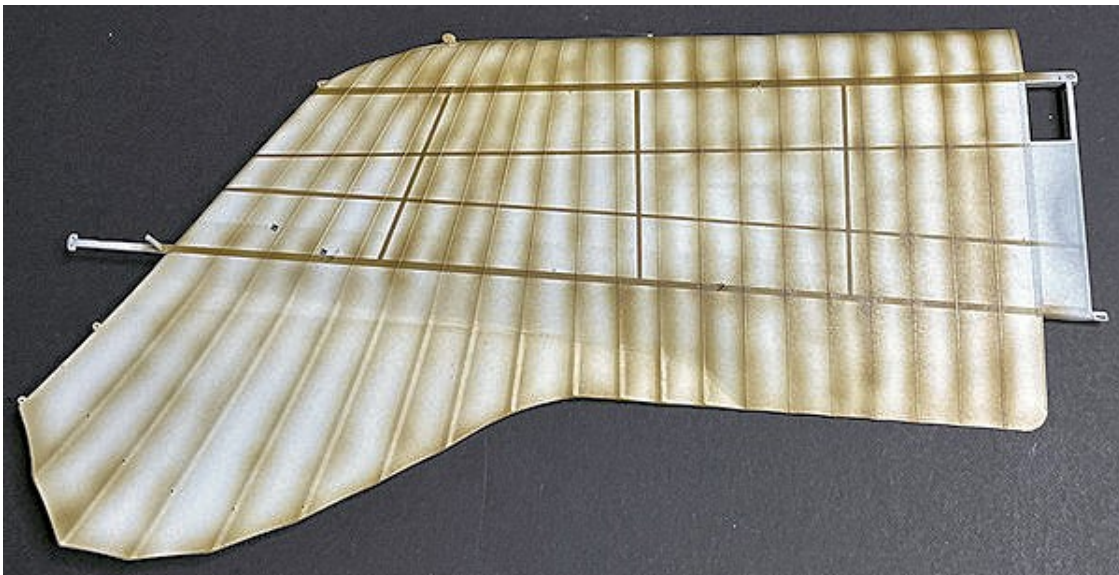
NOTE: *The wing spars shown in the following photograph should be lighter than shown and should be similar to the rib pre-shading shown in the next photograph.*



Wing ribs and bamboo extensions:

NOTE: *The following steps apply to both sides of both wings.*

Carefully airbrush, from leading to trailing edges of the wings, 'MRP' Khaki Green 3/G3 (MRP-333) or similar along the length of each of the pre-molded wing ribs and the bamboo extensions.



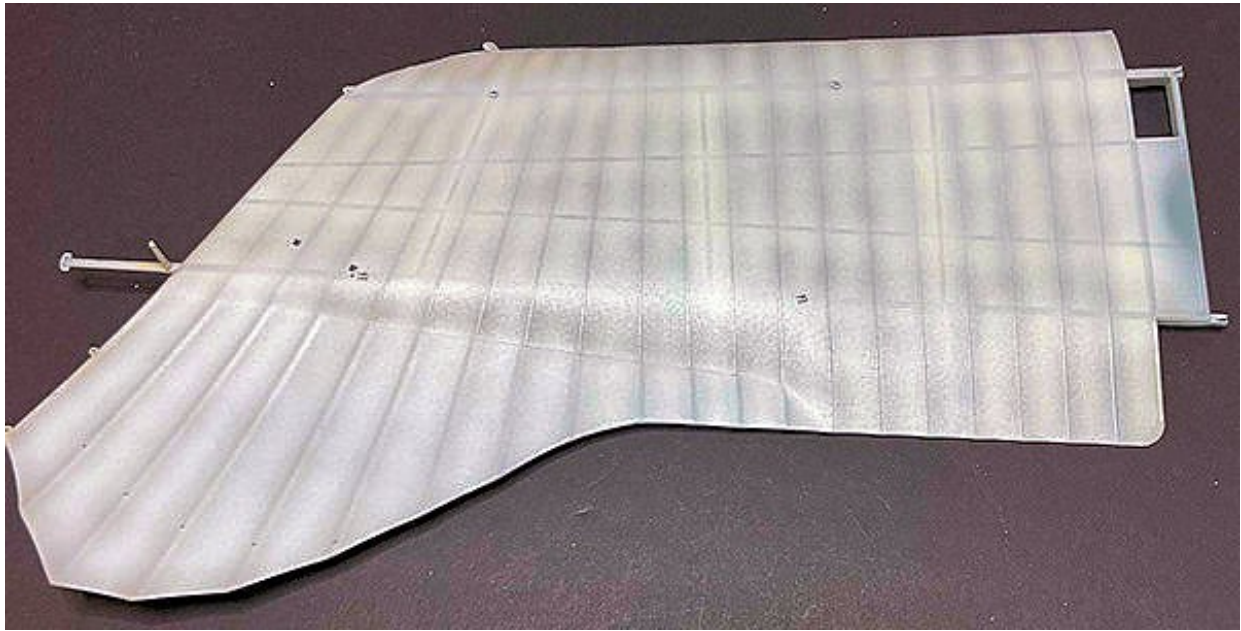
Finish:

NOTE: During the following step, apply a light coat and allow it to dry, then check the effect. If necessary, further light coats of paint can be applied and checked until the desired effect is achieved.

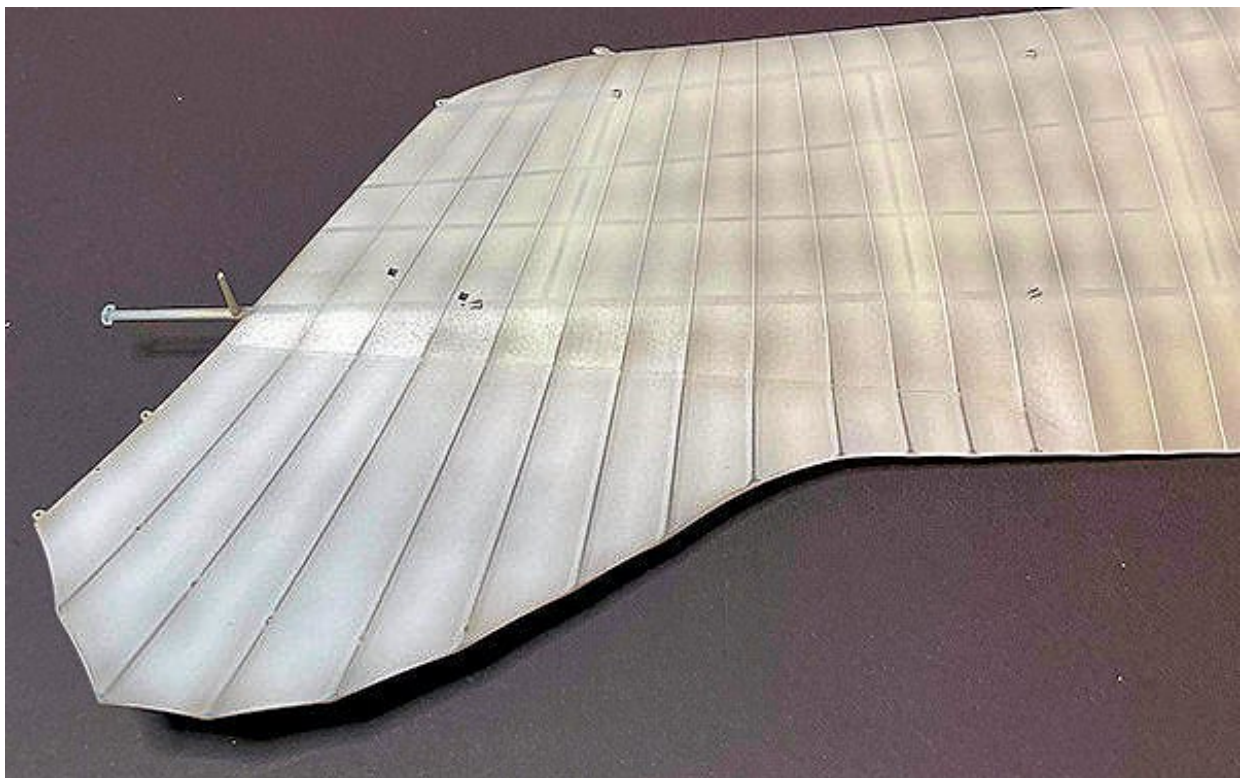
Lightly airbrush over the wings with 'MRP' Clear Doped Linen (MRP-256) to fade the Khaki Green painted internal structures and blend them with the surrounding CDL painted surface. The intention is to leave the Khaki Green as a faint shadow of the internal structure.

NOTE: During the following step, refer to the lighter shaded area on the previous illustration.

To lighten the wing warp outer, trailing edge areas of the wings, airbrush 'MRP' White (MRP-004) or similar between the bamboo extensions.



To highlight the bamboo extensions in the wing warp area, I lightly sanded across the area using 'Tamiya' Sanding Cloth 3000 to remove the paint from the raised ribs and expose the darker plastic below.



Wing decal check:

NOTE: *The following procedure is intended to check the effect of applied decals over the painted and pre-shaded wings. During the following steps, make sure the painted surface is smooth and free from any surface artifacts, such as dust, fluff, hair etc, which can cause silvering of the decals after application.*

If necessary lightly sand/polish off any surface artifacts to create a smooth painted surface.

Airbrush the wing with a clear gloss coat (several coats if necessary), such as 'Mig' A-Stand Aqua Gloss (A.Mig-2503), 'Tamiya 'Gloss (X22) or similar.

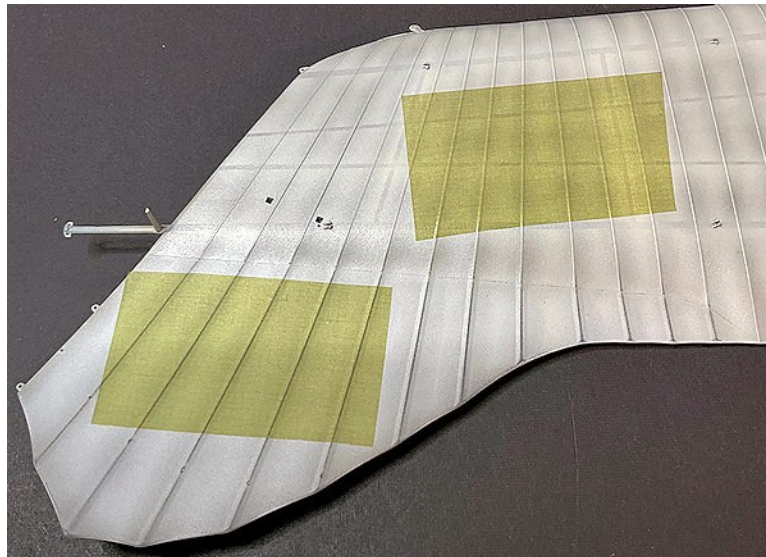
Cut test pieces of the 'Aviatic' Clear Doped Linen (CDL) aged varnished clear backed (ATT32094) decal.

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

Apply the decal test pieces over areas of pre-shading on the wings.

Check the effect of the decal over the pre-shaded painted surfaces. If the Khaki Green pre-shading appears to be too dark and obvious, lightly re-spray 'MRP' Clear Doped Linen (MRP-256) or similar over the wings then repeat the gloss coat and decal application until the desired, faded effect is achieved.

Peel off the decal test pieces.



Painting (continued):

Fuselage:

NOTE: *Use as guides the red line and shaded illustration that follows. The shaded and coloured areas on the fuselage show where the internal structure would be less apparent due to having had 'Feldgrau' Medium Grey/Green dope applied over the CDL covering.*

During the following steps, make sure the painted surfaces are smooth and free from any surface artifacts, such as dust, fluff, hair etc, otherwise silvering of the decals may occur after application.

Do not apply paint over the metal panels and cowl at the front of the fuselage. These will be painted later in this build.

Mask off all fuselage openings including the engine area and cockpits.

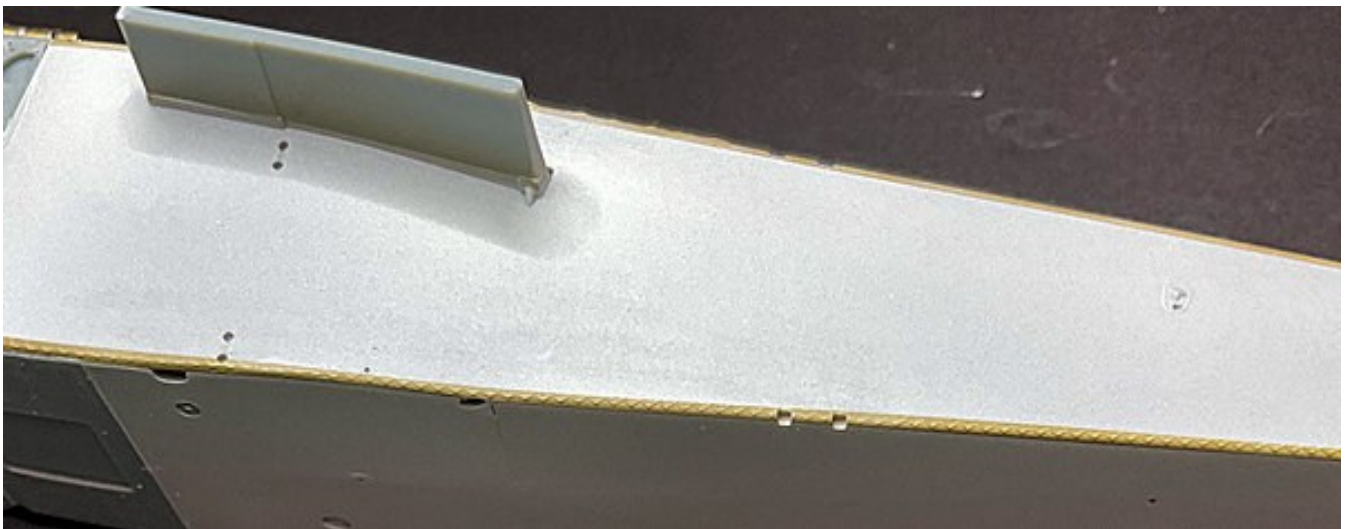
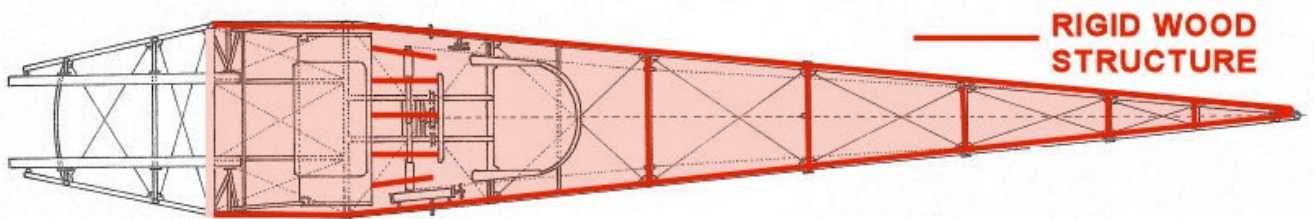
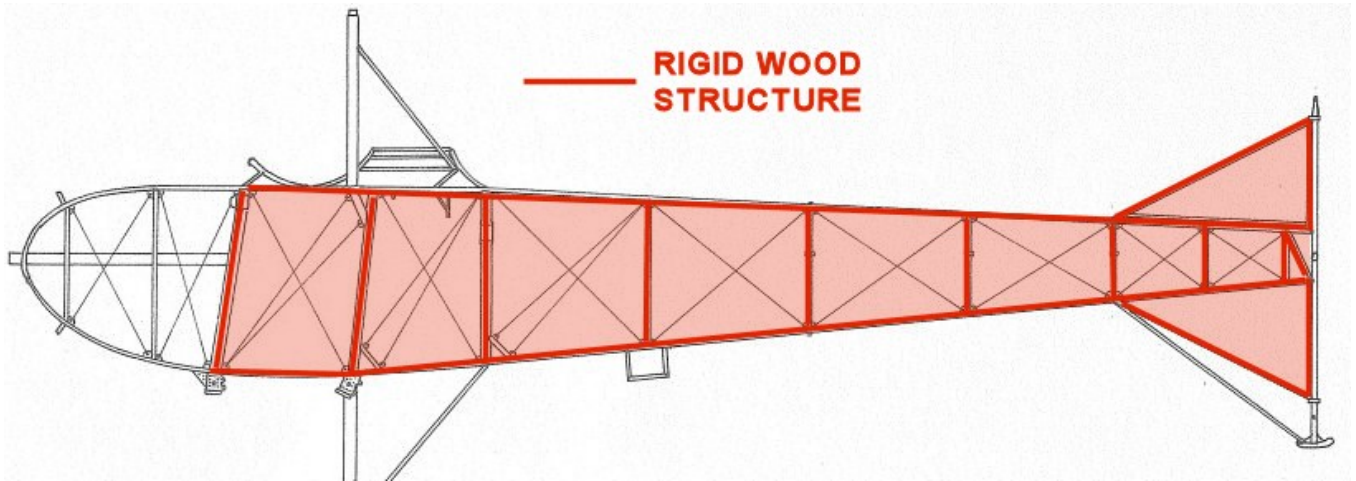
Airbrush the fuselage with a grey primer, such as 'AK Interactive' Grey (AK758) or 'Mr. Surfacer Grey (1500) thinned 50/50% with Self Levelling Thinners (400) or similar.

Airbrush the fuselage with 'MRP' Clear Doped Linen (MRP-256) or similar.

Mask off the fuselage leaving approximately 1.0 mm of the upper and lower fuselage longerons exposed on the sides, top and underside of the fuselage.

Airbrush along the exposed fuselage longerons with 'MRP' Khaki Green 3/G3 (MRP-333) or similar.

Remove the masking, leaving only the engine and all openings masked.



Mask off the fuselage leaving only the sides of the fuselage frames exposed. The frame sides should be approximately 1.0 mm wide around the sides, top and underside of the fuselage.

Airbrush along the exposed sides of the fuselage frames with 'MRP' Khaki Green 3/G3 (MRP-333) or similar.

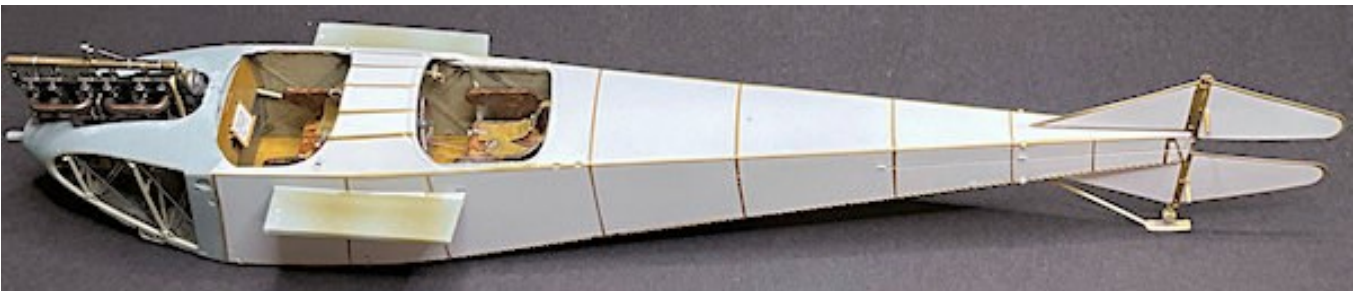
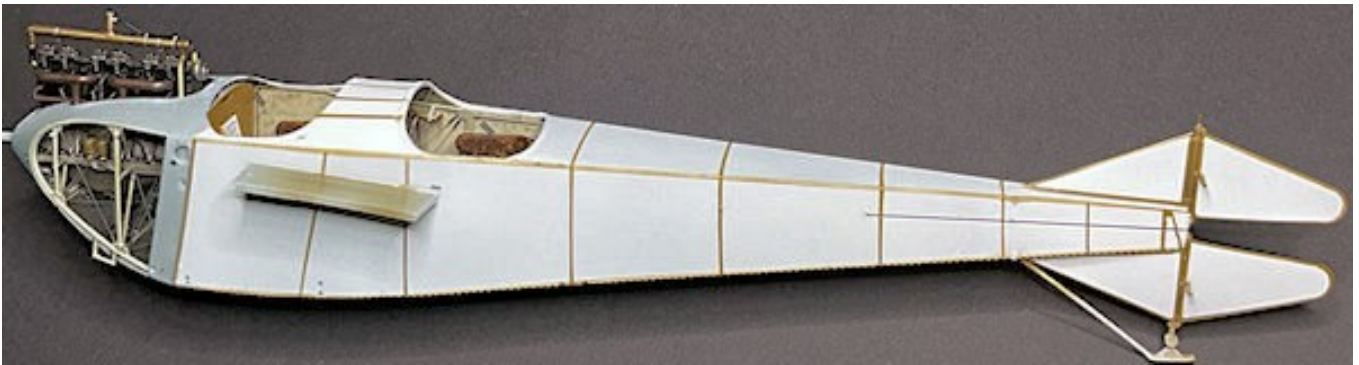
Remove all masking, leaving only the engine and all openings masked.

Mask off the fuselage upper decking panel between the two cockpits, leaving only the five ribs exposed. The ribs should be approximately 1.0 mm wide.

Mask off both sides of the upper and lower fins and rudders, leaving only the edges exposed. The edges should be approximately 1.0 mm wide.

Airbrush along the exposed ribs on the decking panel and the edges of the fins and rudders with 'MRP' Khaki Green 3/G3 (MRP-333) or similar.

Remove all masking, leaving only the engine and all openings masked.

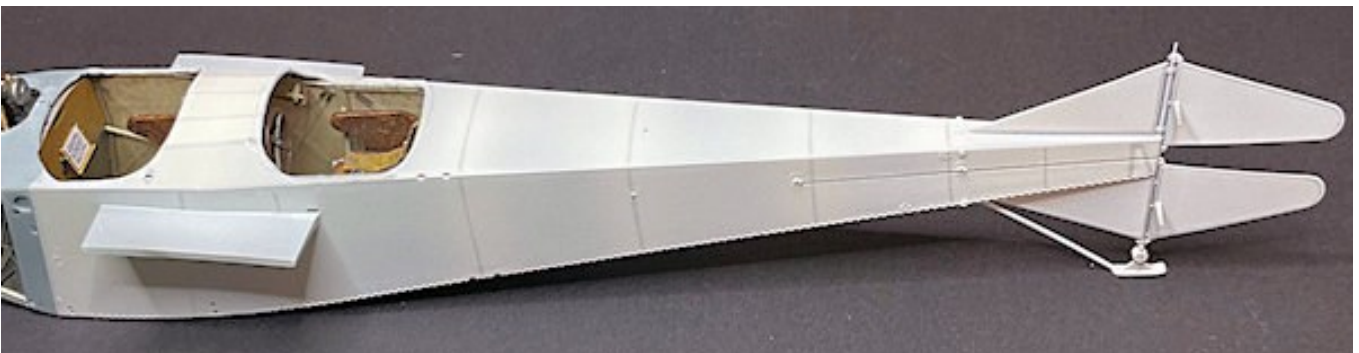


Finish:

NOTE: During the following step, apply a light coat and allow it to dry, then check the effect. If necessary, further light coats of paint can be applied and checked until the desired effect is achieved.

Lightly airbrush 'MRP' Clear Doped Linen (MRP-256) over the fuselage to fade the Khaki Green painted internal longerons and frame sides and blend them with the surrounding CDL painted surface. The intention is to leave the Khaki Green as a faint shadow of the internal structure.

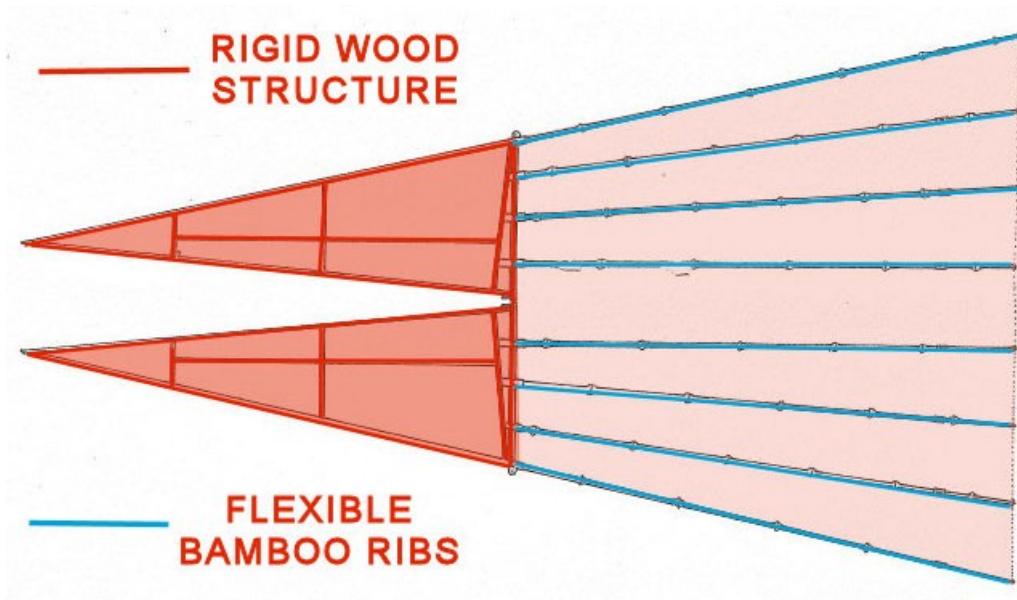
Remove the remaining masking from the engine and all fuselage openings.



Tail unit:

NOTE: The following illustration shows the darker coloured area on the tail unit, which is where the internal structure would be less apparent due to having had 'Feldgrau' Medium Grey/Green dope applied. The lighter coloured area on the tail shows the thinner tail section which allowed more light penetration through the 'Feldgrau' Medium Grey/Green doped covering. The same internal structures are visible on both sides of the tail.

During the following steps, make sure the painted surfaces are smooth and free from any surface artifacts, such as dust, fluff, hair etc, otherwise silvering of the decals may occur after application.



Airbrush the tail unit with a grey primer, such as 'AK Interactive' Grey (AK758) or 'Mr. Surfacer Grey (1500) thinned 50/50% with Self Levelling Thinners (400) or similar.

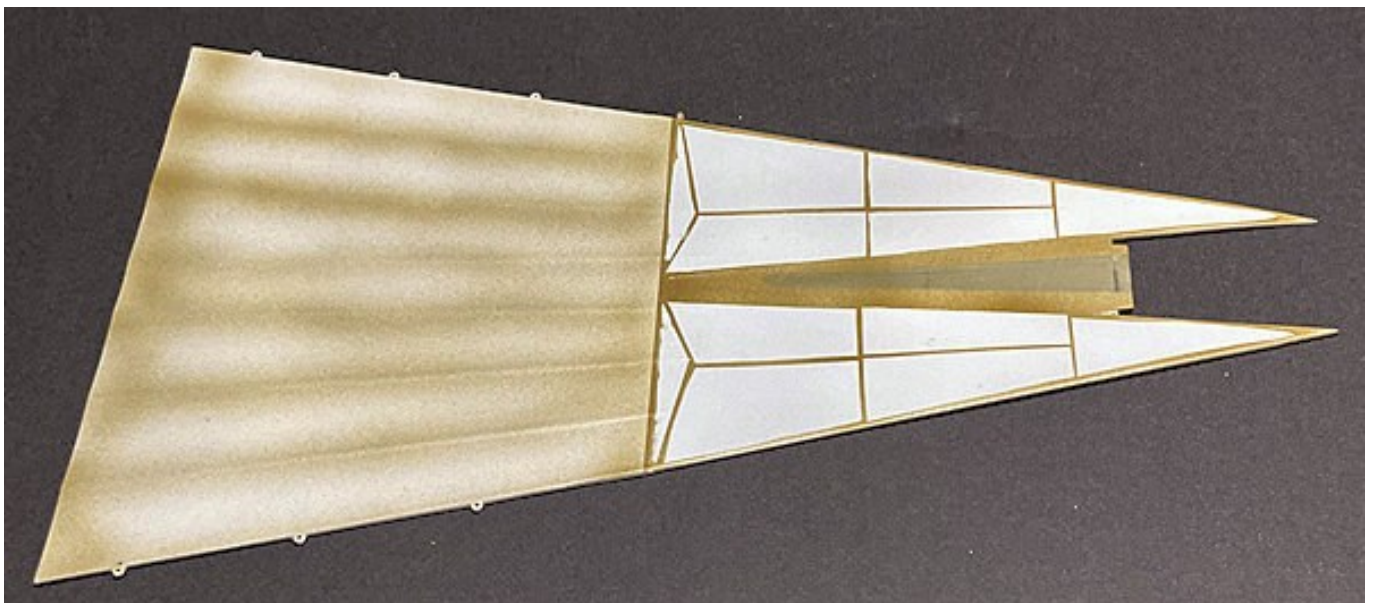
Airbrush the tail unit with 'MRP' Clear Doped Linen (MRP-256) or similar.

Mask off both sides of the forward area of the tail unit, leaving only the internal structures exposed. The internal structures should be approximately 1.0 mm wide.

Airbrush along the exposed internal structures with 'MRP' Khaki Green 3/G3 (MRP-333) or similar.

Remove all masking.

Airbrush along the bamboo extensions on the tail warp area with 'MRP' Khaki Green 3/G3 (MRP-333) or similar.



Finish:

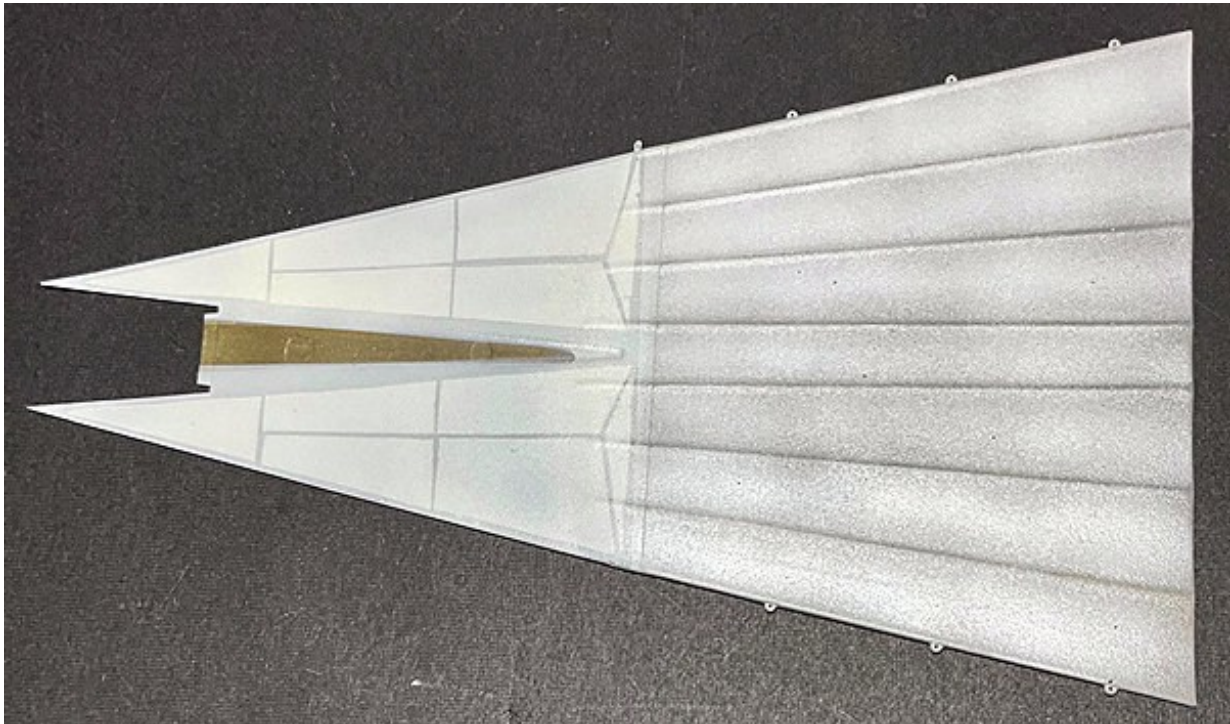
NOTE: *During the following step, apply a light coat and allow it to dry, then check the effect. If necessary, further light coats of paint can be applied and checked until the desired effect is achieved.*

Lightly airbrush 'MRP' Clear Doped Linen (MRP-256) over the tail unit to fade the Khaki Green painted internal structure and bamboo extensions to blend them with the surrounding CDL painted surface. The intention is to leave the Khaki Green as a faint shadow of the internal structures.

To highlight the bamboo extensions in the tail warp area, I lightly sanded across the area using 'Tamiya' Sanding Cloth 3000 to remove the paint from the raised ribs and expose the darker plastic below.

NOTE: *During the following step, refer to the lighter shaded area on the previous illustration.*

To lighten the tail warp area, airbrush 'MRP' White (MRP-004) or similar between the bamboo extensions.



Fuselage and tail unit decal check:

NOTE: *The following procedure is intended to check the effect of applied decals over the painted and pre-shaded fuselage. During the following steps, make sure the painted surface is smooth and free from any surface artifacts, such as dust, fluff, hair etc, which can cause silvering of the decals after application.*

If necessary lightly sand/polish off any surface artifacts to create a smooth painted surface.

Airbrush the wing with a clear gloss coat (several coats if necessary), such as 'Mig' A-Stand Aqua Gloss (A.Mig-2503), 'Tamiya' Gloss (X22) or similar.

Cut test pieces of the 'Aviatic' German 'Feldgrau' Medium Grey/Green clear backed (ATT32228) decal.

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

Apply the decal test pieces over areas of pre-shading on the fuselage and tail unit.

Check the effect of the decal over the pre-shaded painted surfaces. If the Khaki Green pre-shading appears to be too dark and obvious, lightly re-spray 'MRP' Clear Doped Linen (MRP-256) or similar over the fuselage then repeat the gloss coat and decal application until the desired, faded effect is achieved.

Peel off the decal test pieces.

Tail pylon replacement:

NOTE: *As referred to previously, the various pylons at the edges of the wings, tail and fins are particularly fragile and can easily be broken during handling. I managed to break one of the tail side pylons and so decided to replace both pylons. The following steps describe the replacement of these pylons.*

Cut away the side pylon from the tail.

Cut away the end bracket from the pylon.

Drill a hole of 0.4 mm diameter through the end bracket.

Drill a hole of 0.4 mm diameter centrally into the side of the tail at the removed pylon location.

Cut a length of 0.8 mm diameter Brass tube from 'Albion Alloy's (MBT2M) the same length as the removed pylon.

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

Pass the rod through the pre-drilled hole in the end bracket with 2 mm of rod protruding from the outer end of the bracket.

Secure the bracket on the rod using thin CA adhesive.

Pass the free end of the rod through the tube so the bracket is against the end of the tube.

Secure the rod in the tube using thin CA adhesive.

Trim the length of the protruding rod so it can be fully inserted in the pre-drilled hole in the side of the tail.

Remove a double end turnbuckle from the photo-etch PART control horn and turnbuckle set (S48-087).

Drill a hole of 0.4 mm diameter through the centre of the turnbuckle.

Fully locate the turnbuckle onto the protruding rod at the outer end of the bracket.

Bend the turnbuckle sides so the locate against the angled extensions on the bracket.

NOTE: *The two replacement pylons will be fitted in the tail later in this build.*



Decals (continued):

'Aviatic' decals:

NOTES: Refer to Part 4 (Decals) of this build log for more information. The decals used are from 'Aviatic' and are the German 'Feldgrau' Medium Grey/Green clear backed (ATT32228) and the Clear Doped Linen (CDL) aged varnished clear backed (ATT32094).

The 'Aviatic' linen decals are unlike normal screen printed decals, in that when being applied, have the ability to be handled with slightly less care than normal and they have the ability to stretch slightly, which standard decals do not. That said, if you handle them too roughly, damage can occur.

Make sure the model surface for each decal to be applied is clean and smooth or particles on the surface may cause 'silvering' (trapped air) under the decals when dry.

These 'Aviatic' CDL decals being used are not 'cookie' cut to the shapes required. Therefore the decals must be hand cut to shape.

Example of applying 'Aviatic' decals:

NOTE: The following example applies to surfaces that can be traced around, such as wings and fuselage flat side panels. However, for surfaces which **can't be traced easily**, a paper template can be cut and checked against the model surface, then used to trace the outline on the decal sheet.

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

Lay the part with surface to have decal down onto the rear (blank) side of the decal sheet.

NOTE: During the following step, do not press too hard when tracing the outline as this may mark the decal side of the sheet.

Using a pencil, lightly trace the outline of the part onto the rear of the decal, allowing for any curvature of the part, such as wings.

Carefully cut out the decal shape.

Check that the decal fits correctly over the surface of the part.

NOTE: To aid in adhesion, you can mix a small amount of PVA (white glue) into the decal water.

Wet the model surface with clean water.

Soak the decal in the warm decal water long enough to be able to move the decal on its backing sheet.

Carefully lift the decal on its backing sheet from the water. Make sure the decal does not fold over on itself, as it will be difficult to separate a fold once out of the water.

Carefully slide the decal off one end of the backing paper and position the decal end onto the wing and holding that end, slide out the backing paper.

Using large, flat brush or cotton buds, start to smooth out the decal at one end, removing any water from underneath and smoothing the decal onto the surface. Continue this along the length of the decal, taking care not to grip the decal surfaces with your fingers, as this will cause ripples in the decal.

Once the decal is smoothed down onto the model surface, apply pressure along the decal with soft and dry tissue paper or by finger pressure whilst wearing lint free cotton gloves. This will expel any remaining water and press the decal on to the model surface. Check over the decal to make sure there are no tears or folds, which need to be rectified before the decal sets.

NOTES: If the decal covers locating holes, slots or other openings, prick through the decal over holes or slice the decal over openings, then brush either 'MicroScale' MicroSol' or **sparingly** 'Tamiya' X20A thinners into the holes or around the openings. This will soften and conform the decal.

If the decal needs to be conformed around curved edges etc, brush **sparingly** 'Tamiya' X20A thinners across the decal edge. This will soften and conform the decal.

Once fully dry and set, trim any excess decal from edges using a sharp blade, such as a shielded razor blade.

Application 'Aviatic' decals:

NOTE: Refer to Part 4 (Decals) and/or the previous example of this build log for more information. This aircraft would normally have had German 'Feldgrau' Medium Grey/Green dope applied over the fuselage, wings and tail. However, when photographed at the time, it appears the wings only were still in their factory applied Clear Doped Linen (CDL) finish.

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

Using the previous 'Aviatic' example as a guide, cut and apply CDL decals to the upper and underside surfaces of the two wings. Due to the size of the wings, it's easier to cut and inner and outer decal for each side of the wings, making sure to align the join between the two decals to avoid the base colour showing.

Using the previous 'Aviatic' example as a guide, cut and apply the German 'Feldgrau' decals. Due to the protruding wing locating shoulders on the fuselage sides, it's easier to cut two decals for the sides of the fuselage with the join above and below the shoulders and along a pre-shaded fuselage frame. Make sure to align the join between the two decals to avoid the base colour showing.

Apply the separately cut decals in the following order, making sure their edges do not overlap, as this will double the decal and show much darker than the surrounding areas:

Fuselage sides (two decals).

Fuselage underside (one decal).

Fuselage top (one decal).

Fuselage top decking panel (two decals joined along centre).

Fins and rudders (one each side).

Upper surface and underside of the tail unit (two decals joined between the outer pylons).

Kit supplied decals:

NOTE: Refer to Part 4 (Decals) of this build log for more information and to the IM page 17 for the location of the various decals. The kit supplied decals used for this model are as follows:

Wings - decals 34 (x 2) and 37 (x 2).

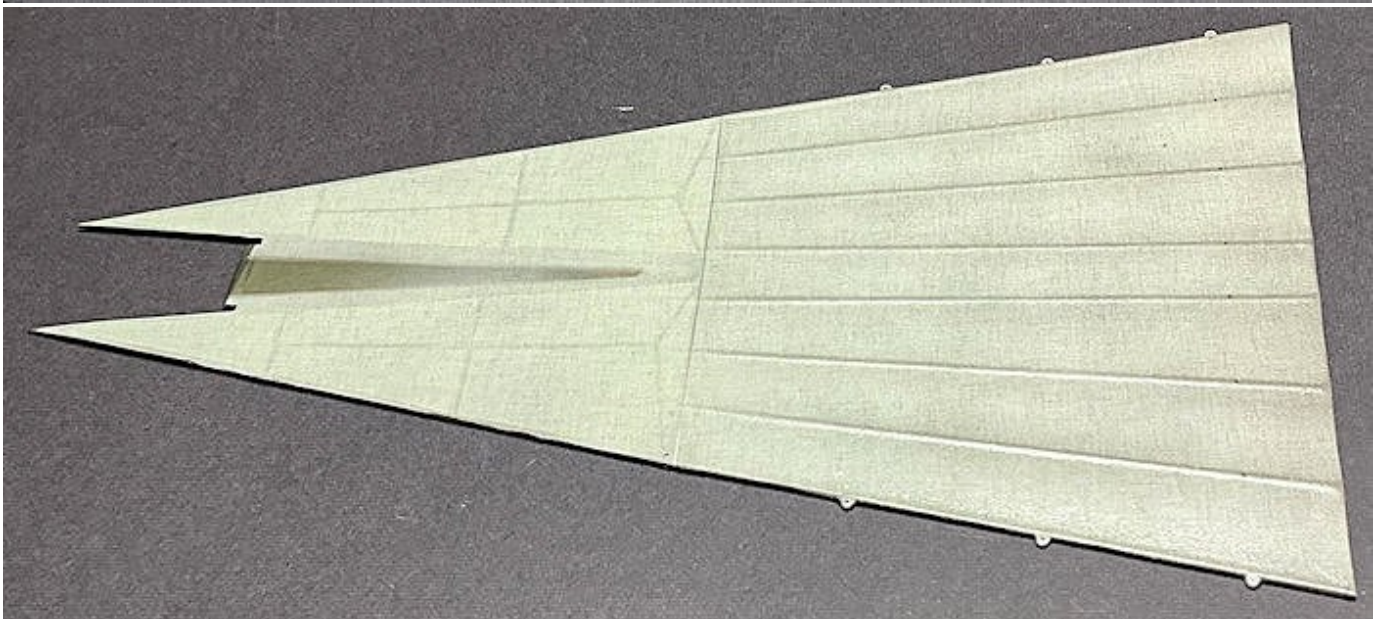
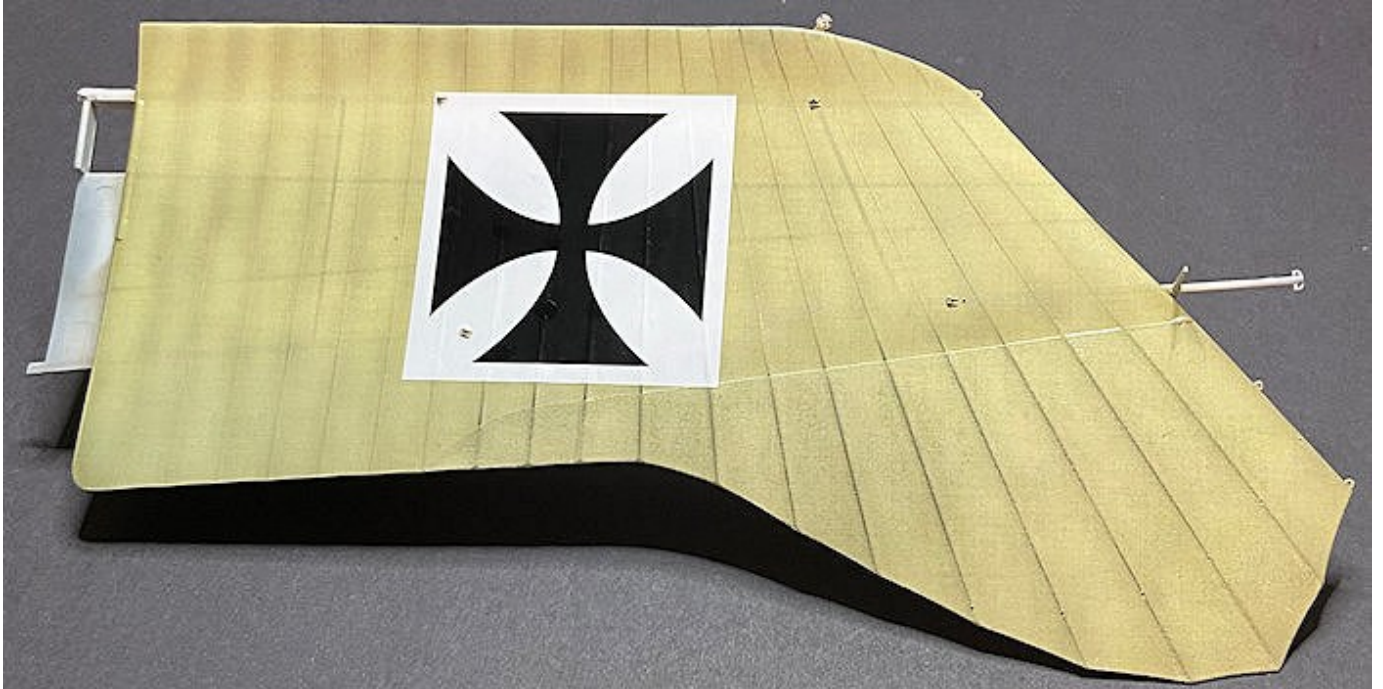
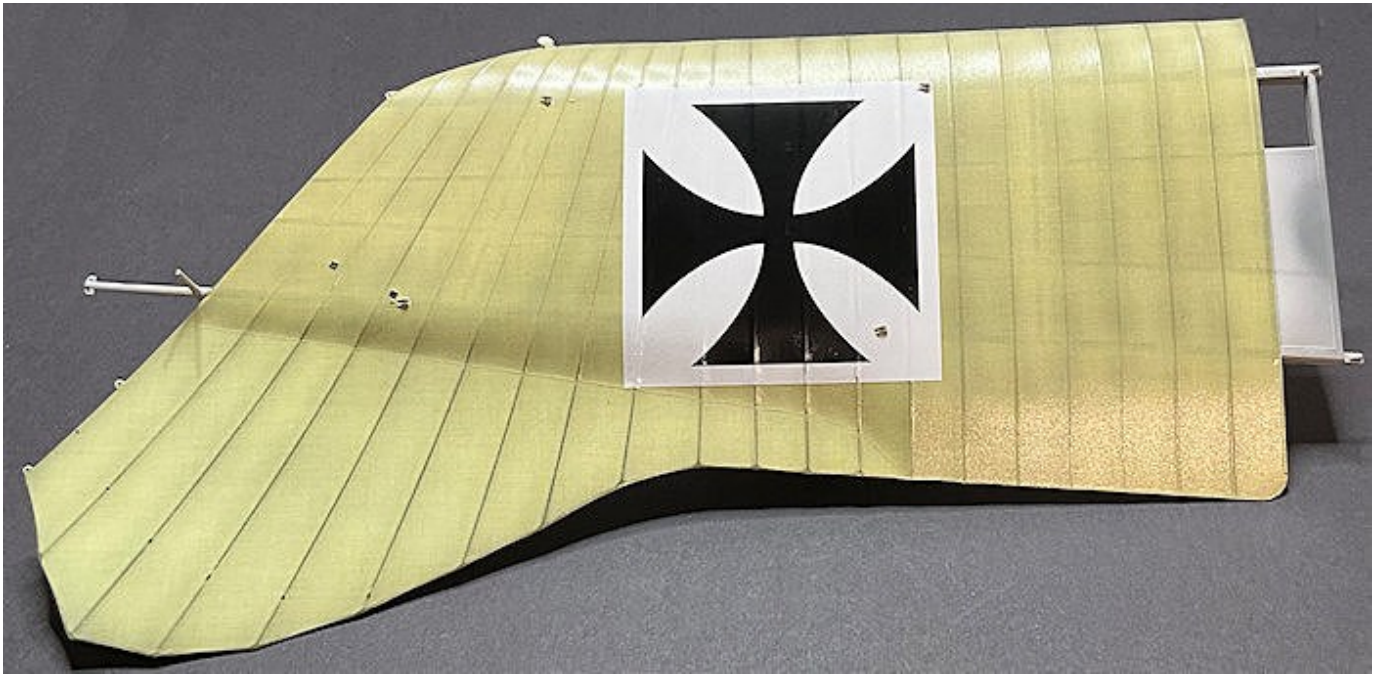
Fuselage - decals 4, 5, 11 (x 2), 12, 13, 16 (x 2), 17 (x 2), 18 (x 2).

Rudders - 2 (x 4).

Finish:

To seal and protect all of the applied decals and to prepare them for the weathering stage, airbrush over the decals with a semi-gloss clear coat, such as 'Tamiya' Semi-Gloss (X35) or similar.





Painting (continued):

NOTE: *Decals 30 (x 2), 35 (x 2), 36 (x 2), 39 (x 2), 40 (x 2) and 41 (x 2) represent the metal surround stripes at the wing roots. However, I chose to not use them and instead airbrush those stripes.*

Wing root panel areas:

Mask off the wing top surfaces/undersides and the fuselage around the wing root panel areas, including the metal strips around the panels.

Airbrush the wing root areas with a grey primer, such as 'AK Interactive' Grey (AK758) or 'Mr. Surfacer Grey (1500) thinned 50/50% with Self Levelling Thinners (400) or similar.

Airbrush the wing root areas with 'Tamiya' Buff (XF57) or similar.

Remove all masking.

NOTE: *Refer to Wood effect - Method 2 in Part 2 (Wood Effects) of this build log for more information. The colour illustrations in the IM show the wing roots being apparently covered with linen. However, I think it more likely those panels were painted or varnished wood, otherwise the linen would have been easily damaged by the constant foot fall. Therefore, the wood effect for this model was created using 'Windsor & Newton' Griffin (Alkyd) oil paints.*

Brush 'Windsor & Newton' Griffin Alkyd **Raw Sienna** oil paint over the wing root areas, but not the metal strips around the panel and on the front wing spar.

Remove residual oil paint to achieve the desired wood effect.

Allow the oil paint to fully dry, usually overnight.

Seal and protect the applied oil paint by airbrushing a semi-matte clear coat, such as 'Tamiya' Semi-Gloss (X35) or similar.

NOTE: *Refer to scheme E on IM page 19 for positions of the metal stripes on the wing roots - decals 30 (x 2), 35 (x 2), 36 (x 2), 39 (x 2).*

Mask off or carefully brush paint over the metal strips around the wing root panels panel and on the front wing spar, using 'Mr. Metal Color' Stainless Steel (213) or similar.

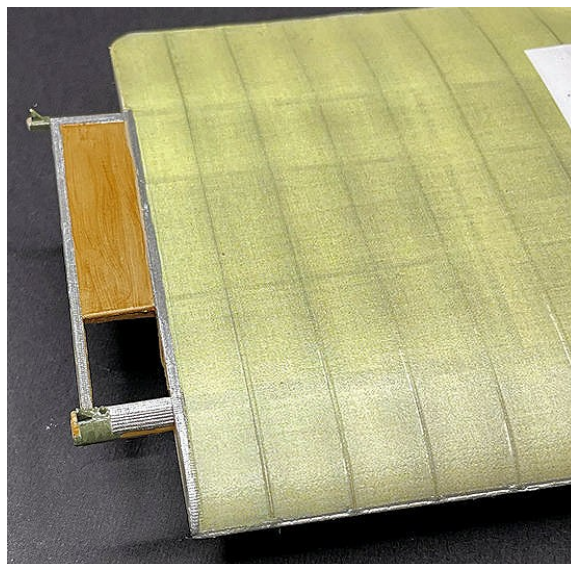
Wings leading edges:

NOTE: *Refer to scheme E on IM page 19 for positions of the metal stripes on the wing leading edges - decals 40 (x 2) and 41 (x 2).*

Mask off the wing leading edges to leave and parallel strip of approximately 1.5 mm wide along the centre of the wing leading edges.

Airbrush the exposed wing leading edges with using 'Mr. Metal Color' Stainless Steel (213) or similar.

Remove all masking.



Assembly (continued):

Cement the fuel contents tube C2 into the rear of the gravity fuel tank half A12.

Cement the gravity fuel tank halves A11 and A12 together.

Cut away the upper locating stub from the rear of the cylinder front cover A47 (IM page 10).

NOTE: *During the following step check the fit and alignment of the landing gear to the fuselage locating recesses.*

Cement the landing gear struts A8 and A9 to the axle A48 (IM page 10).

NOTE: *During the following step check the fit and alignment of the bottom cabane struts to the fuselage locating recesses.*

Cement the claw brake A6 to the bottom cabane strut A15 (IM page 11).

Cement the bottom cabane struts A3 to struts A15 (IM page 11).

Painting (continued):

Brush paint the pulleys on the top/bottom of the rudder post and on the outer, leading edges of the wings with 'Mr. Color' Stainless Steel (213) or similar.

Using 'Tamiya' Field Grey (XF65) or similar, brush paint the following:

- Front/rear metal fittings on the wing root spars.
- Three rigging points on the outer wing and tail edges.
- Pulley support bracket on the outer, leading edge of the wings.
- Fuselage rudder posts, tail pylons and tail skid structure.
- Underside rear brackets on the wing roots.

Airbrush the following parts with a grey primer, such as 'AK Interactive' Grey (AK758) or 'Mr. Surfacer Grey (1500) thinned 50/50% with Self Levelling Thinners (400) or similar:

- Observers crash padding A33.
- Observers two grab handles A45.
- Access hatch A34.
- Top cabane struts.
- Gravity fuel tank (mask off the fuel contents tube first).
- Top cabane struts.
- Bottom cabane struts.
- Landing gear assembly.
- Fuselage foot step A36 and grab handle A1.
- Two 'Hazel' radiators A23 and A32.
- Two wing upper pylons A10.
- Modified top and bottom cabane strut turnbuckles A50 and A51.

Airbrush the following with 'Tamiya' Grey Green (XF76) or similar:

- Top cabane struts, observers two cockpit grab handles, fuselage foot step and grab handle.

Airbrush the following with 'Tamiya' Field Grey (XF65) or similar:

- Landing gear assembly.
- Bottom cabane strut assembly and two wing upper pylons.
- Replacement tail outer pylons.
- Top and bottom cabane strut turnbuckles

Airbrush the following with a gloss black, such as 'Tamiya' Gloss Black (X1) or similar:

Access hatch.

Gravity fuel tank.

Two 'Hazet' radiators.

Airbrush the gravity fuel tank with 'Alclad' Pale Gold (ALC108) or similar.

Brush paint the two straps around the gravity fuel tank with 'Mr. Metal Color' Stainless Steel (213) or similar.

Remove the masking from the fuel contents tube.

Brush paint the top and bottom tube connections with 'Mr. Metal Color' Brass (219) or similar.

Brush paint the exposed fuel contents tube with 'Tamiya' Clear Yellow (X24).

Airbrush the following with 'Alclad' Duraluminium (ALC102) or similar:

The two 'Hazet' radiators.

Cylinder front cover.

Brush the shoe of the claw brake with 'Mr. Metal Color' Stainless Steel (213) or similar.

Dry brush the metal fittings on the landing gear, lower cabane strut assemblies and gravity fuel tank with 'Mr. Metal Color' Stainless Steel (213) or similar.

Brush the landing gear 'bungee' suspension cords and claw brake tension cords with 'Tamiya' Buff (XF57) or similar.

Brush 'AK Interactive' Kerosene wash (AK2039) over the matrix sections of the 'Hazet' radiators and around the landing gear 'bungee' suspension and claw brake tension cords.

Leather effects:

NOTE: *The cockpit leather surrounds and the observers head padding was usually filled with horse hair and was either rolled then stitched or nailed to the cockpits.*

Airbrush the observers crash padding with 'Tamiya' Dark Yellow (XF60) or similar.

Brush paint the cockpits surround padding with 'Tamiya' Dark Yellow (XF60) or similar.

Brush 'Windsor & Newton' Griffin Alkyd **Burnt Umber** oil paint over the cockpits surround padding and the observers head padding.

Leave the oil paint to fully dry.

Using a brush lightly stroke 'Windsor & Newton' Griffin Alkyd **Raw Sienna** oil paint over the cockpits surround padding and observers crash padding to create a look of worn leather.

Leave the oil paint to fully dry.

Once the oil paint is fully dry, airbrush a semi-matte clear coat, such as 'Tamiya' Semi-Gloss (X35) or similar over the paddings.

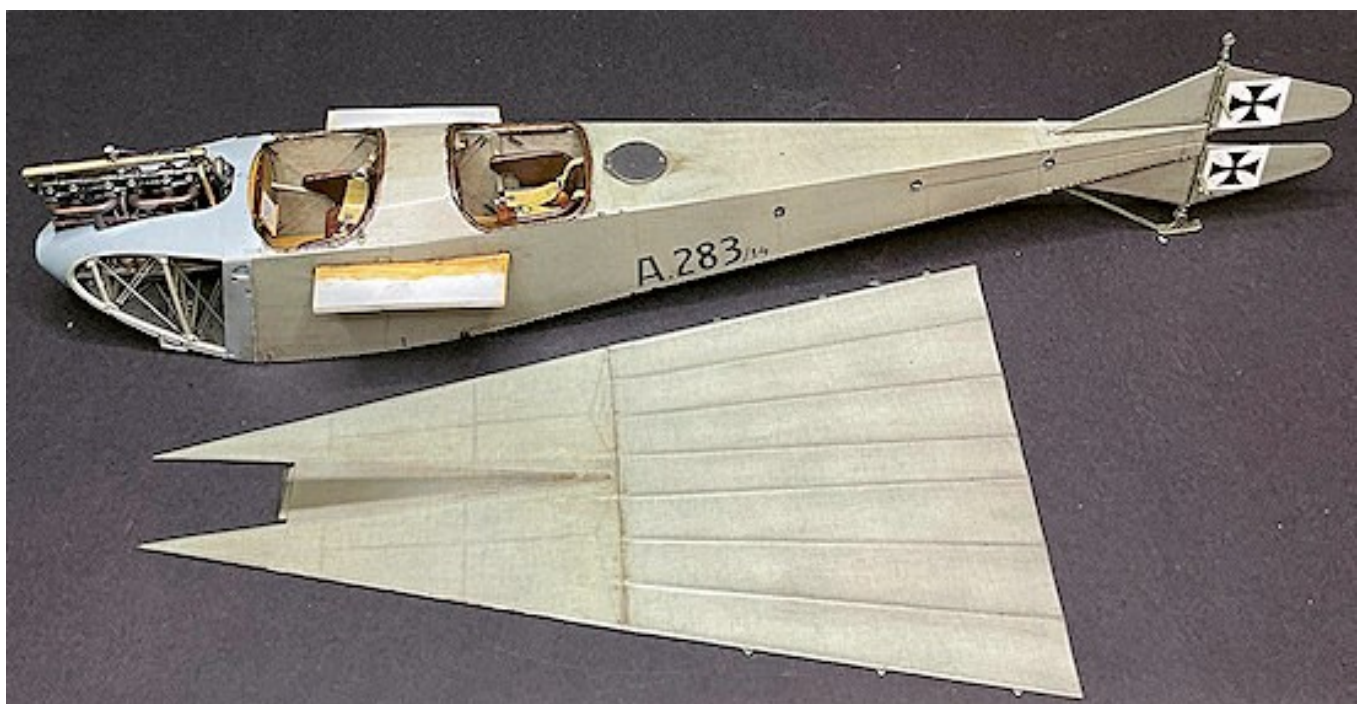
Weathering (continued):

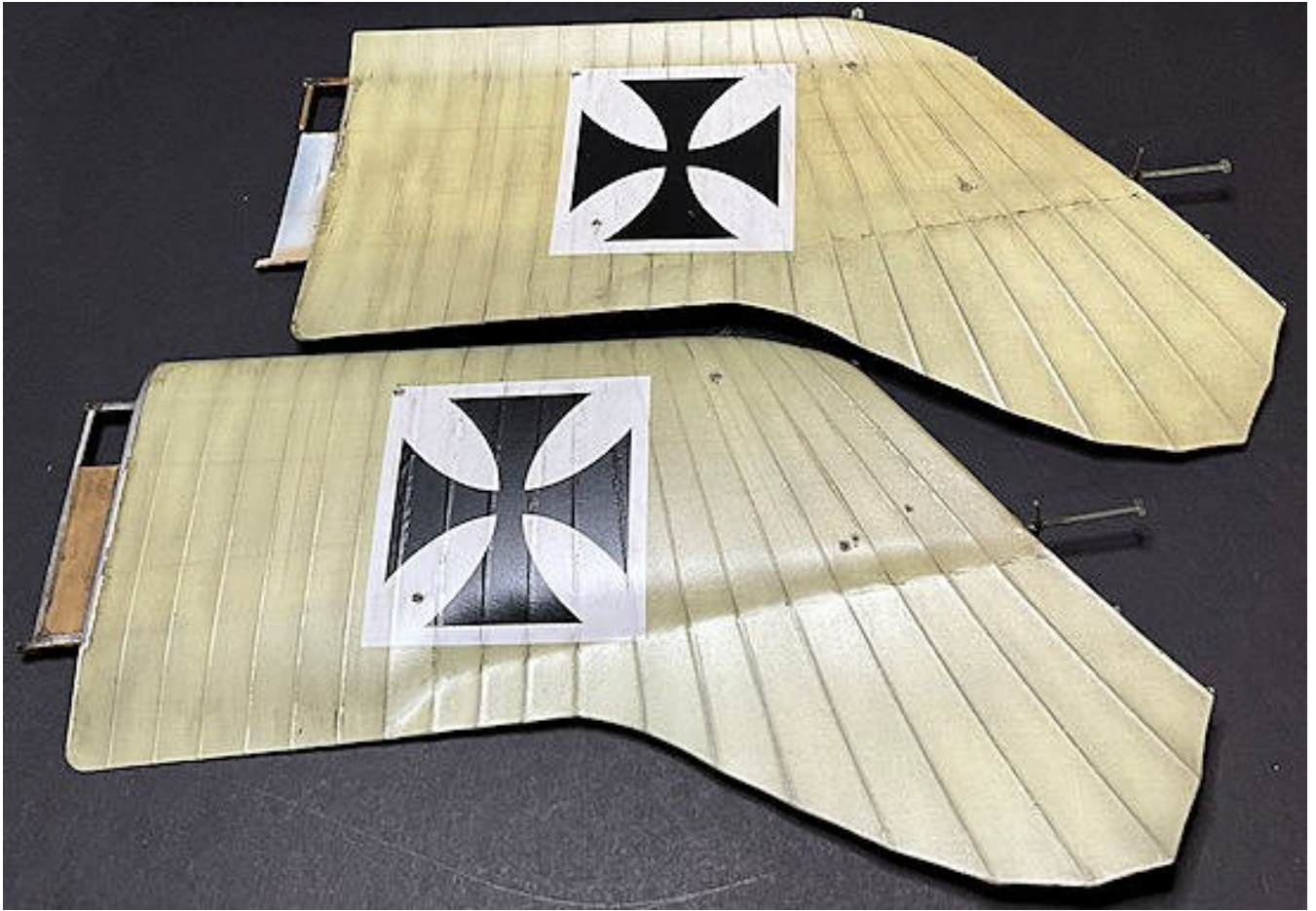
NOTE: *Refer to Part 3 (Weathering) of this build log for more information.*

I brushed 'Flory Models' Dark Dirt wash over the fuselage (not the forward unpainted metal panel areas), the tail unit and both wings.

I removed the wash to achieve the desired weathering effect.

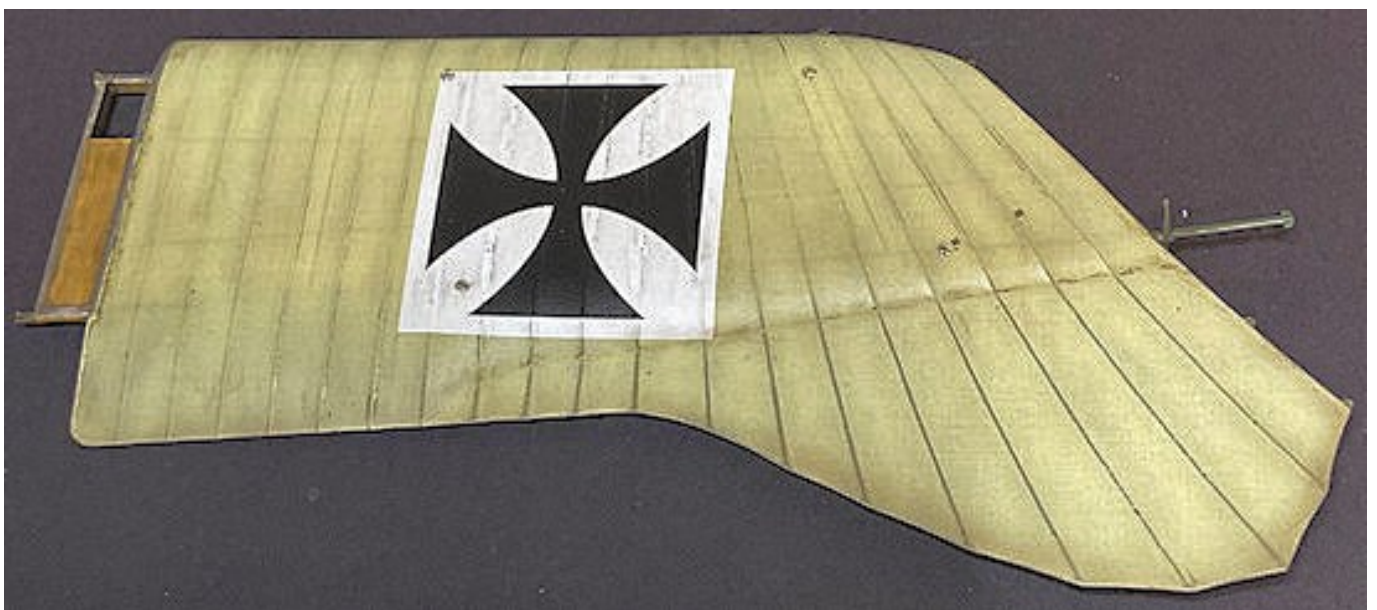
To seal and protect the applied weathering, I airbrushed a semi-matte clear coat, such as 'Tamiya' Semi-Gloss (X35) over the applied weathered surfaces.





I sponged 'Tamiya' Weathering Master set A (Mud) along the edges on the fuselage, wings, tail, lower fin and rudder and the ribs between the two cockpits.

I sponged 'Tamiya' Weathering Master set D (Oil Stain) at the forward, lower corners of the fuselage.

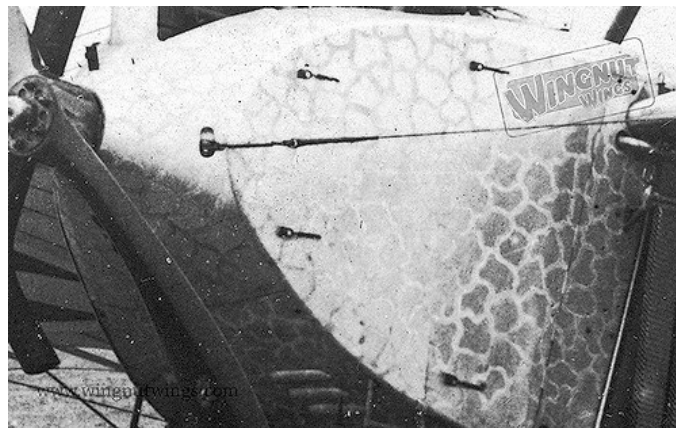




Painting (continued):

'Turned' finish on metal panels:

NOTE: The metal panels around the front of the fuselage were given a 'turned' (buffed/polished) type of finish.



The 'hints and tips' pages on the 'Wingnut Wings' web site suggest painting fine lines of 'Tamiya' Flat Aluminium (X16) onto a base coat of 'Tamiya' Chrome Silver (X11).

JEANNIN STAHLTAUBE COWLING 'SCALES' HINTS & TIPS

<p style="text-align: right;">(000642-34)</p>	<p style="text-align: right;">(Zdenko Bugan)</p>
<p>1. Cowling scales on Jeannin Stahltaube 283/14. Note how they flip from light to dark depending the lighting.</p>	<p>2. Use a brush or airbrush to paint cowlings with Tamiya X-11 Chrome Silver ENAMEL</p>
<p style="text-align: right;">(Zdenko Bugan)</p>	<p style="text-align: right;">(Zdenko Bugan)</p>
<p>3. Thin the Tamiya XF-16 Flat Aluminium ENAMEL paint so it can be brushed on in fine lines.</p>	<p>4. Completed cowling scales on built model of Jeannin Stahltaube 283/14. Note how they flip from light to dark depending the lighting.</p>

www.wingnutwings.com

The patterned surface could be applied by brush or cut masks etc. However, I found the easier method was to use masking fluid.

Mask off the fuselage, engine and left side engine access panel opening, leaving just the forward metal panels exposed.

Airbrush the following with a gloss black, such as 'Tamiya' Gloss Black (X1) or similar:

- Cylinder front cover A47.
- Left side engine access panel A20.
- Right side engine access panel A21.
- Exposed fuselage forward metal panels.

Airbrush the inside surface of the engine access panels A20 and A21 with 'Mr. Colour' Super Metallic 2 (Super Iron 2 - SM203).

If desired, weather the inside face of the panel A20 and A21. I used 'Flory Models' Dark Dirt wash (refer to Part 3 (Weathering) of the build log for more information).

Make sure the mating surfaces of the right engine access panel A21 and fuselage tubular frame are clear of paint/primer.

Cement the right engine access panel A21 onto the fuselage.

Airbrush the following with 'Mr. Colour' Super Metallic 2 (Super Iron 2 - SM203):

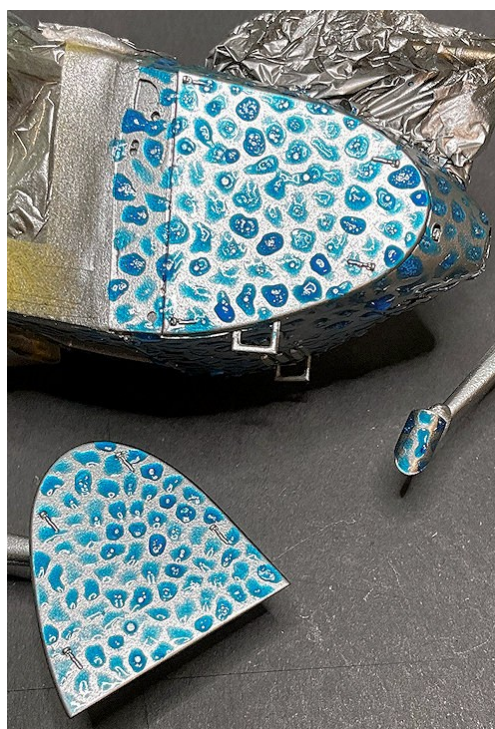
- Cylinder front cover A47.
- Outer surface of left side engine access panel A20.
- Exposed fuselage forward metal panels.

NOTE: *The masking fluid used is 'Abteilung 502' Liquid Mask (ABT115). Build up of masking fluid on the brush can be removed by agitating the brush in 'De-Solv-It' Sticky Stuff Remover then drying on tissue paper.*

When apply the masking fluid, make sure each patch is separated from the adjacent patches. Otherwise patches will merge and the effect of the polished outlines around patches will be lost.

Using a fine brush, carefully 'paint' the various patches onto the exposed fuselage panels and the outer surface of panel A20. Clean the brush regularly during application.

Allow the applied masking fluid to dry.



Airbrush 'Mr. Colour' Super Metallic 2 (Super Chrome Silver 2 - SM206) over the masked fuselage panels and panel A20.

Once the applied paint had dried, gently rub over the painted surfaces to remove all masking fluid patches from the fuselage and panel A20.

Remove all general masking from the fuselage.

Airbrush over the painted surfaces with a semi-gloss clear coat, such as 'Tamiya' Semi-Gloss (X35) or similar.

If desired, weather the painted metal surfaces. I used 'Flory Models' Dark Dirt wash (refer to Part 3 (Weathering) of the build log for more information).

Mask off the rectangular panel on the underside of the fuselage metal panel.

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

NOTE: Refer to Wood effect - Method 2 in Part 2 (Wood Effects) of this build log for more information. The wood effect for this model was created using 'Windsor & Newton' Griffin (Alkyd) oil paints.

Brush 'Windsor & Newton' Griffin Alkyd **Raw Sienna** oil paint over the exposed panel.

Remove residual oil paint to achieve the desired wood effect.

Allow the oil paint to fully dry, usually overnight.



Seal and protect the applied oil paint by airbrushing a semi-matte clear coat, such as 'Tamiya' Semi-Gloss (X35) or similar.

Sponge 'Tamiya' Weathering Master set D (Oil Stain) from the rear of the louvres on the underside panel.

Assembly (continued):

Cement the front cylinder cover A47 onto its location on the engine front cylinder.

Cement the observers crash padding A33 into its locating recess in the forward cockpit panel.

Cement the two observers grab handles A45 to the inner edge of the forward cockpit.

Cement the two 'Hazel' radiators A23/A32 into their locating recesses in the fuselage sides.

Cement the gravity fuel tank onto its locating pegs on the top left cabane strut A38.

Cement the top right cabane strut A39 to the gravity fuel tank and left strut.

NOTE: *Cement will not adhere parts onto a decal surface.*

Use thin CA adhesive to secure the access hatch A34 in position on the top of the fuselage rear.

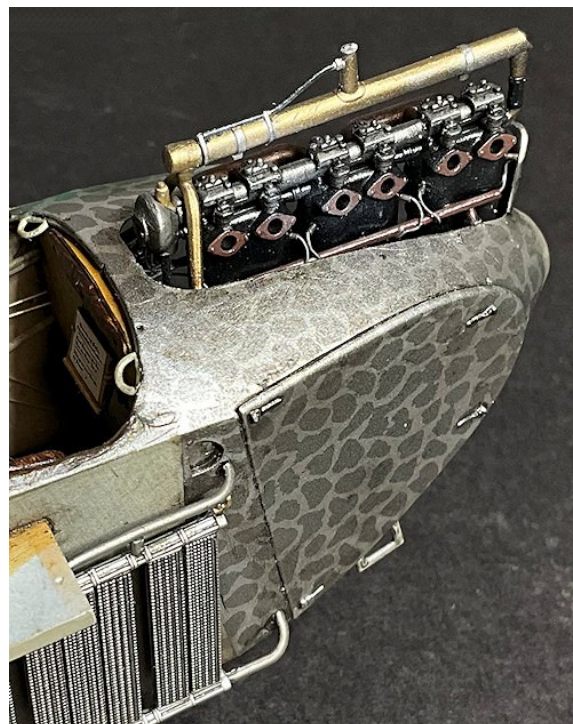
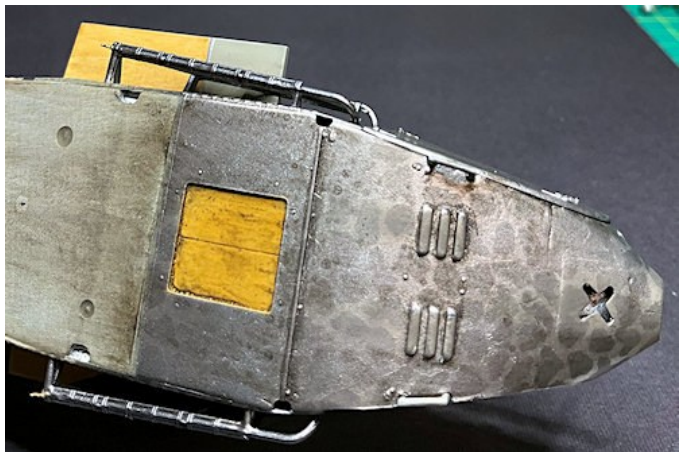
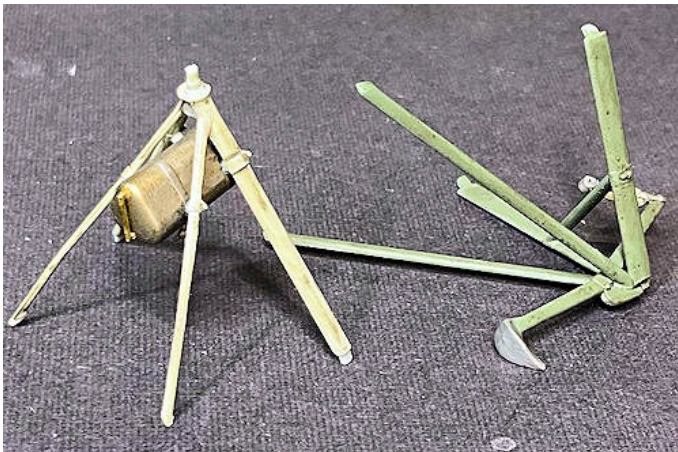
Painting (continued):

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

Brush 'Flory Models' Dark Dirt wash over the painted metal panels and the top and bottom cabane strut assemblies.

Remove the wash to achieve the desired weathering effect.

To seal and protect the applied weathering, airbrush a semi-matte clear coat, such as 'Tamiya' Semi-Gloss (X35) over the applied weathered surfaces.



Modifications (continued):

NOTE: *The turnbuckle mounting A50 for the top cabane strut assembly was modified earlier in the build log so that separate, more in-scale turnbuckles could be fitted.*

The turnbuckles used are the 'Gaspatch' 1:48th scale metal turnbuckles (Type C).

Top cabane strut turnbuckle mounting:

Drill a hole of 0.3 mm diameter vertically and centrally down through the turnbuckle mounting spigot on the top cabane strut assembly.

Drill a hole of 0.3 mm diameter vertically through the centre of the modified turnbuckle mounting A50.

Cut a length of 0.3 mm diameter Brass rod, such as that from 'Albion Alloy's or similar.

Secure the rod into the pre-drilled hole in the mounting spigot on the top cabane strut assembly.

Locate the turnbuckle mounting fully onto the added rod then trim off any protruding rod at the top of the mounting.

Remove the mounting from the rod.

Drill four equally spaced holes of 0.3 mm diameter vertically through the outer edges of the turnbuckle mounting.

Prepare eight 'Gaspatch' 1:48th scale metal turnbuckles (Type C):

Remove them from their casting base.

If necessary, use a 0.2 mm diameter drill to clear the turnbuckles 'eye' ends of any residual metal.

Brush paint the centre barrel of each turnbuckle with 'Mr. Metal Color' Copper (215) or Brass (219).

Cut eight lengths of 0.08 mm diameter mono-filament, such as 'Stroft GTM' or 'Steelon'.

Pass a line through one of the 'eye' ends of a turnbuckle.

Pass both ends of the line down through a pre-drilled hole in an outer edge of the mounting.

Repeat the procedure to add the remaining three turnbuckles to the edge of the mounting.

Keep all of the lines taut and then secure the lines to the underside of the mounting, using thin CA adhesive.

Cut away any residual line from the underside of the mounting.

Repeat the procedure to add the four turnbuckles to the opposite edge of the mounting.

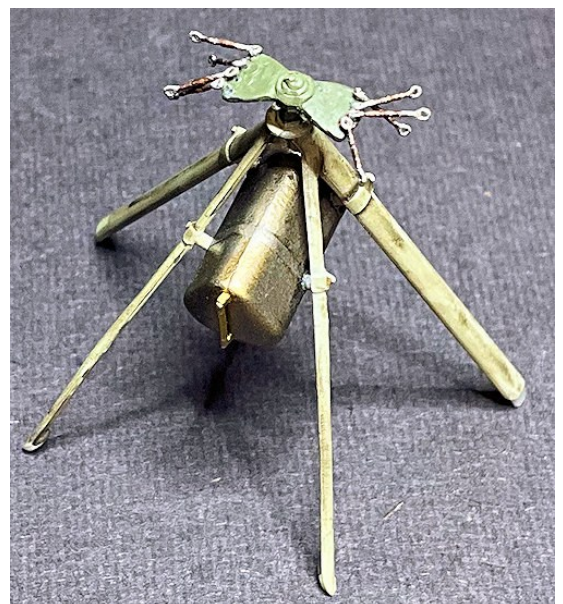
Locate the mounting onto the fitted rod in the top cabane strut assembly.

Apply thin CA adhesive to the base of the rod than fully locate the mounting down onto the turnbuckle mounting spigot. Make sure that the:

Turnbuckle mounting is at 90 degrees across the strut assembly.

Turnbuckle mounting horizontal when viewed from the front.

The turnbuckles are secure but free to move on the mounting.



Bottom cabane strut turnbuckle mounting:

NOTE: *The turnbuckle mounting A51 for the bottom cabane strut assembly was modified earlier in the build log.*

To add eight turnbuckles to the bottom turnbuckle mounting, repeat the same procedure used for adding turnbuckles to the top turnbuckle mounting.

Make sure that the turnbuckles are secure but free to move on the mounting:

Cement the bottom turnbuckle mounting onto its location on the base of the bottom cabane strut assembly. Make sure that the:

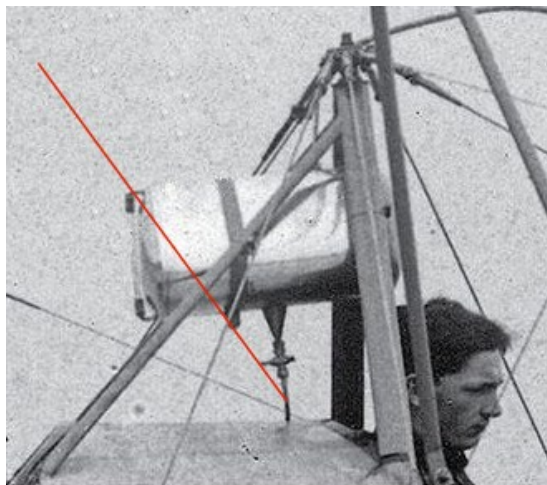
Turnbuckle mounting is at 90 degrees across the strut assembly.

Turnbuckle mounting horizontal when viewed from the front.



Gravity fuel tank pipe:

NOTE: *The gravity fuel tank supplied fuel to the main tank in the fuselage through an interconnected pipe.*



Drill a hole of 0.3 mm diameter vertically and centrally up into the pipe connection under the gravity fuel tank.

Cut a short length of 0.2 mm diameter Brass rod, such as that from 'Albion Alloy's' or similar.

Cut a length of 'MFH' 0.4 mm diameter flexible black tube (P-961).

Using thin CA adhesive, secure the rod into the pre-drilled hole on the tank pipe connection, leaving approximately 2 mm protruding.

Using thin CA adhesive, secure the black tube fully onto the protruding rod.

Position the top cabane assembly into its locating recesses on the fuselage.

Point mark the location for the tube entry into the fuselage between the two cockpits.

Using the point mark as a guide, drill a hole of 0.7 mm diameter through the fuselage.



Assembly (continued):

NOTE: *Make sure all primer and paint are removed from the mating surfaces of the parts.*

Cement the top cabane strut assembly into its locating recesses in the top of the fuselage.

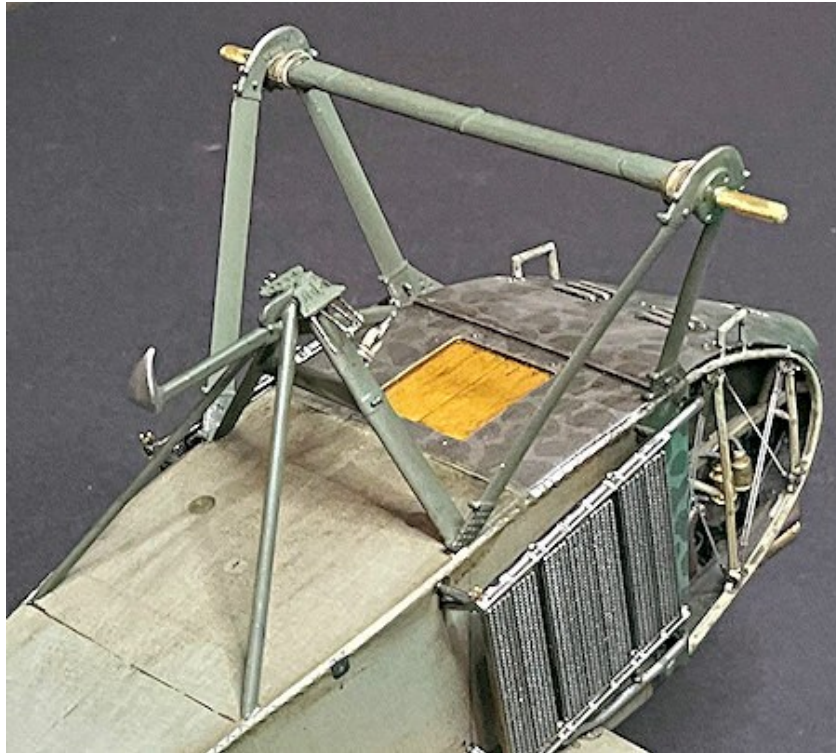
Trim the length of the tube from the gravity fuel tank so it can be inserted into the pre-drilled hole in the fuselage.

Insert the tube into the pre-drilled hole.



Cement the landing gear assembly into its four locating recesses in the underside of the fuselage.

Cement the bottom cabane strut assembly into its locating recesses at the inner edge of the landing gear rear struts and fuselage edges.



External rigging:

NOTE: Refer to Part 6 (Rigging) for more information on the external rigging.

The rigging materials used are:

'Stroft GTM' or 'Steelon' 0.08 mm diameter mono-filament line (always cut longer than needed).

Blackened 0.4 mm diameter Brass or Nickel-Silver tube from 'Albion Alloy's.

Nickel-Silver or Brass tube can be chemically blackened by immersion in a solution such as 'Blacken-It' or similar. Rinse in water and dry the blackened tubes to prevent powdering of the surfaces.

Claw brake:

Cut a long length of line.

Cut a short length of blackened tube.

Secure one end of the line into the pre-drilled hole in the underside of the fuselage, using thin CA adhesive.

Slide the tube onto the line.

Pass the line through the hole in the rear end of the 'bungee' cords on the claw brake.

Loop the line back through the tube.

Slide the tube up to, **but not touching**, the 'bungee' cords.

Keeping the line taut, secure the lines in the tube using thin CA adhesive.

Cut away any residual protruding line at the tube end furthest from the 'bungee' cords.



NOTE: Refer to Part 6 (Rigging) for more information on the external rigging.

The rigging materials used are:

'Stroft GTM' or 'Steelon' 0.08 mm diameter mono-filament line (always cut longer than needed).

Blackened 0.4 mm diameter Brass or Nickel-Silver tube from 'Albion Alloy's.

'Proper Plane' Turnbuckles (RD-018).

Landing gear bracing wires:

Cut a long length of line.

Cut two short lengths of blackened tube.

Brush paint the centre barrel of the turnbuckle with 'Mr. Metal Color' Copper (215) or Brass (219).

Pass the line through a tube then through the 'eye' end of the turnbuckle.

Loop the line back through the tube.

Slide the tube up to, **but not touching**, the turnbuckle.

Secure the lines in the tube with thin CA adhesive, applied to the tube end furthest from the turnbuckle.

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

Secure the 'leg' of the turnbuckle into the pre-drilled hole in the inner, top of a landing gear forward strut.

Cut away any protruding 'leg' of the turnbuckle at the outer edge of the landing gear strut.

Slide the second tube onto the line.

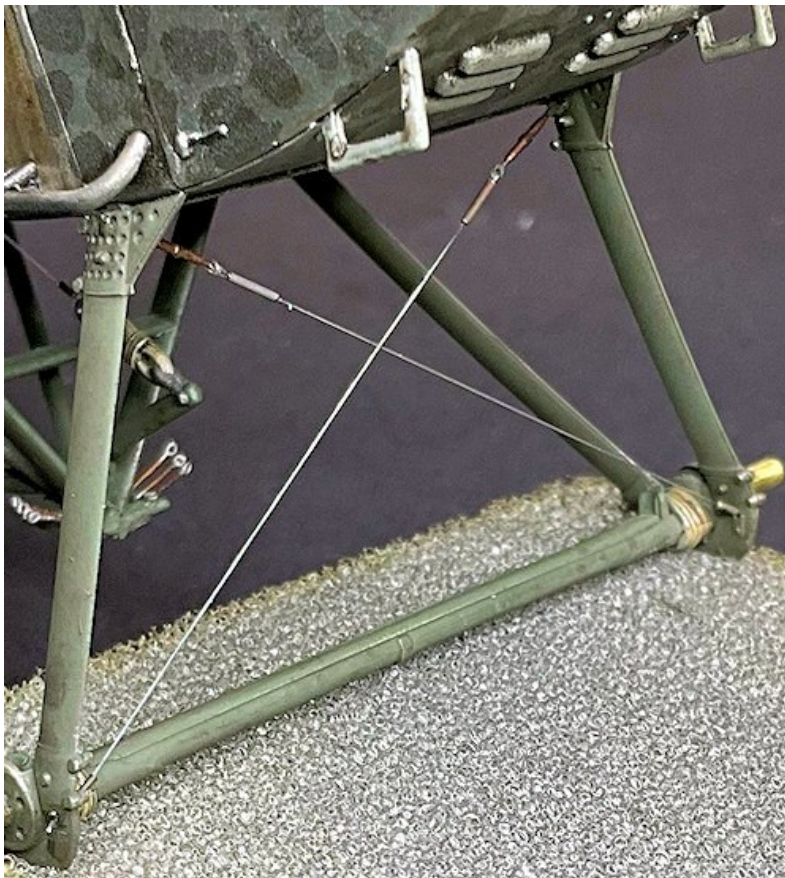
Pass the line through the pre-drilled hole in the bottom of the opposite landing gear forward strut.

Keeping the line taut, secure the line in the strut using thin CA adhesive.

Secure the tube to the line using thin CA adhesive.

Cut away any residual protruding line at the outer edge of the landing gear strut.

Repeat the procedure to add the opposite bracing wire to the landing gear.



NOTE: The 'eyelets' used are the 'HGW' 1/32nd scale Spoke Eyelets (132129).

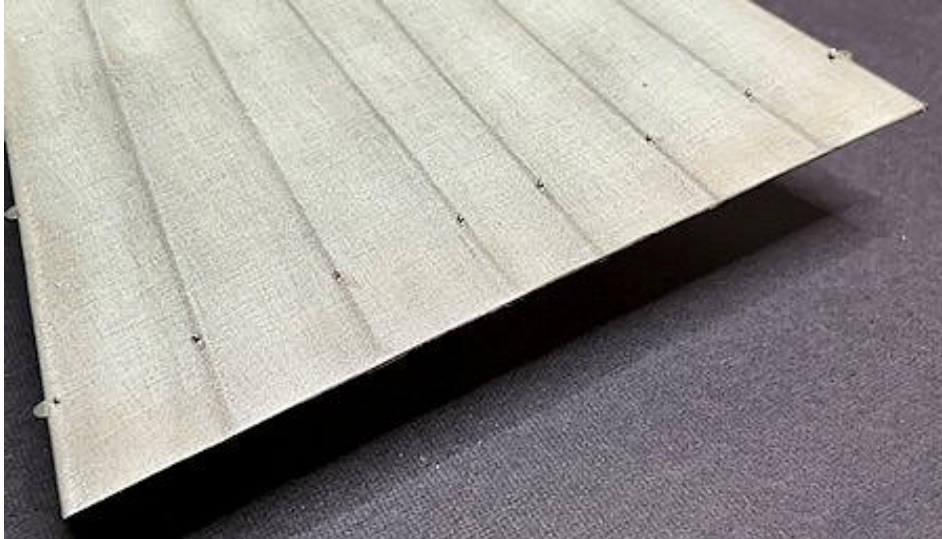
Remove sixteen (16) 'eyelets' from the supplied photo-etch sheet.

Make sure the eight (8) pre-drilled rigging holes across the tail are clear of paint and decal.

Cut back the 'legs' of the 'eyelets' to shorten them so they don't protrude from the tail when inserted into the pre-drilled rigging holes.

Using thin CA adhesive, secure an 'eyelet' into each of the eight tail rigging holes and from the top and undersides.

Check the holes in the 'eyelets' are clear of adhesive.



Remove twelve (12) 'eyelets' from the supplied photo-etch sheet.

Make sure the six pre-drilled rigging holes in the outer, trailing edges of both wings tail are clear of paint and decal.

Cut back the 'legs' of the 'eyelets' to shorten them so they don't protrude from the wings when inserted into the pre-drilled rigging holes.

NOTE: The 'eyelets' for both wings only need to be inserted into the rigging holes from the top surface of the wings (not the undersides).

Using thin CA adhesive, secure an 'eyelet' into each of the six (6) rigging holes in both wings.

Check the holes in the 'eyelets' are clear of adhesive.



Assembly (continued):

NOTE: *Make sure any paint and decal is removed from the mating surfaces of the parts.*

Test fit the tail into its locating slot in the fuselage rear, making sure it is located fully forwards in the fuselage.

Remove the tail from the fuselage.

Apply cement along the fuselage locating slot in the fuselage.

Insert and fully locate the tail into the fuselage, clamping the top and bottom of the fuselage rear together.

To reinforce the joint, apply thin CA adhesive along the top and bottom of the tail to fuselage joints.

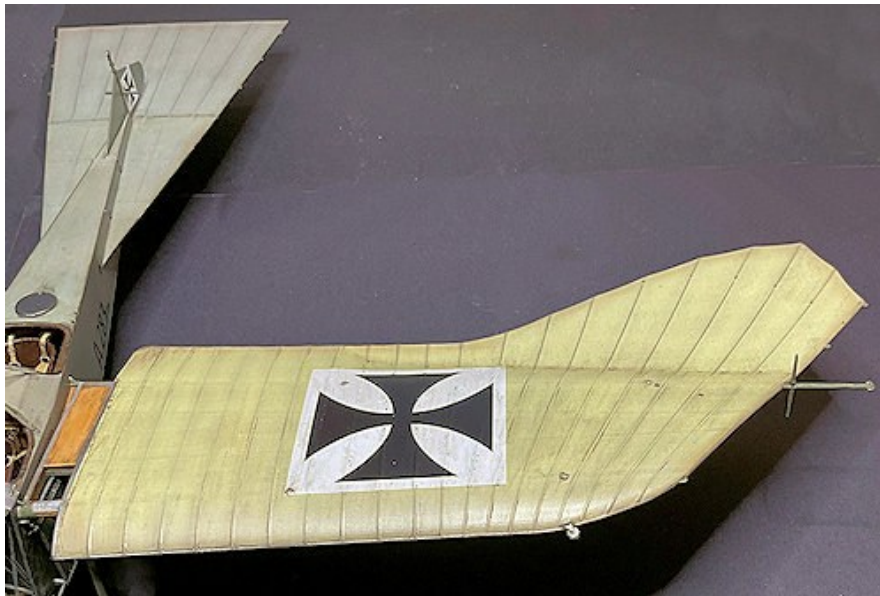
Once the adhesives have fully set, remove any clamps from the fuselage.

If necessary, airbrush a semi-gloss clear coat, such as 'Tamiya' Semi-Gloss (X35) or similar along the joints to remove and shine from the adhesives.

Test fit the two wings onto their fuselage locating 'shoulders' and their front/rear spars into their locating recesses in the fuselage. Make sure any paint is removed from the mating surfaces to achieve a full fit of the wings.

NOTE: *Due to the size and weight of the wings, I used 'Revell' Contacta Professional cement to secure the wings in position.*

Cement the two wings onto their fuselage locating 'shoulders' and into their front/rear spar locating recesses in the fuselage.



Rigging - final tensioning:

Invariably after rigging has been completed, some wires may be slack. This can be remedied by careful application of heat along the line.

WARNING: *Care needs to be taken when using this method to tension line, as using a heat source is required.*

NOTE: *Take care not to linger at one area of a line with the heat source as this will melt the mono-filament causing the line to break. Also take care not to touch any part of the model or any other rigging, as this will also cause damage through melting.*

Carefully move a suitable heat source (I use a small electrical soldering iron) close to and along the slack line, keeping the heat source always moving. You will see the line tension as the applied heat takes effect, shrinking the line.

External rigging (continued):

NOTE: *If the wings are fully rigged first, it will be more difficult to rig the tail unit as the various wing pylons and rigging could be damaged when inverting the model to rig the tail. Therefore, it's best to **rig the tail unit first** then rig the wings.*

Tail warp control:

Upper control and restraining cables:

NOTE: *Refer to Part 6 (Rigging) for more information on the external rigging.*

The rigging materials used are:

'Stroft GTM' or 'Steelon' 0.08 and 0.12 mm diameter mono-filament line (always cut longer than needed).

Blackened 0.4 and 0.5 mm diameter Brass or Nickel-Silver tube from 'Albion Alloy's.

'Proper Plane' 3D printed turnbuckle (RD-005).

The following procedure applies to all eight of the tail warp control cables.

Cut a short length of blackened 0.4 mm diameter tube.

Cut a long length of 0.08 mm diameter line (tail warp cables).

Brush paint the centre barrel of each turnbuckle with 'Mr. Metal Color' Copper (215) or Brass (219).

Remove a rigging plate (P6) from the kit supplied photo-etch sheet.

Pass a pylon line through a 0.4 mm diameter tube then through a rigging hole in the rear edge of the rigging plate.

Loop the line back and through the tube.

Slide the tube up to, **but not touching**, the rigging plate.

Repeat the procedure to attach a second line to the **same hole** in the rigging plate.

Secure the lines in the tubes with thin CA adhesive.

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

Repeat the procedure to attach the remaining three pairs of lines to the rigging plate.

Cut two short lengths of blackened 0.5 mm diameter tube.

Cut two long lengths of 0.12 mm diameter line.

Pass a line through a 0.5 mm diameter tube then through an 'eye' end of the turnbuckle.

Loop the line back and through the tube.

Slide the tube up to, **but not touching**, the turnbuckle.

Secure the lines in the tube with thin CA adhesive, applied to the tube end furthest from the turnbuckle.

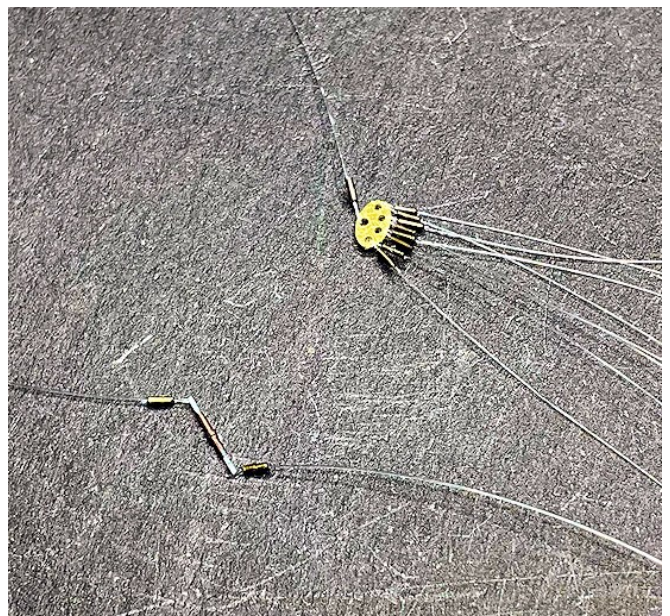
Cut away any residual end tag of line at the tube end.

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

Pass the free end of one of the lines through a 0.5 mm diameter tube then through the forward rigging hole in the rigging plate.

Loop the line back and through the tube.

Slide the tube up to, **but not touching**, the turnbuckle, leaving the **loop of line loose** (secured when fitting to the model).



Insert the end of one of the restraining cable and the free end of the turnbuckle cable into the pre-drilled hole in the top of the fuselage, rear of the pilot's cockpit.

Secure the lines in the hole using thin CA adhesive.

Pass both lines rearwards and over the top of the pulley on the top of the rudder post keeping the turnbuckle approximately midway between the fuselage and bottom, front of the upper fin.

Keeping the lines taut, secure the lines on the pulley using thin CA adhesive.

Move the non-secured tube on the line to the front of the rigging plate to allow the plate to be position mid-way over the upper rudder.

Slide the tube up to, **but not touching**, the rigging plate.

Secure the lines in the tube using thin CA adhesive.

NOTE: *The following steps apply to all eight tail warp control lines.*

Pass each line through a 0.4 mm diameter tube then through its relevant rigging anchor across the tail.

Loop the lines back and through the tubes.

NOTE: *Avoid applying too much tension in each of the lines, otherwise the strain may distort or break away the pulley and rudder post.*

Slide the tubes up to, **but not touching**, the rigging anchors.

Keeping each line taut, secure the lines in the tubes with thin CA adhesive.

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

Pass the free end of the restraining line through a 0.5 mm diameter blacked tube, then through the forward rigging hole in the rigging plate.

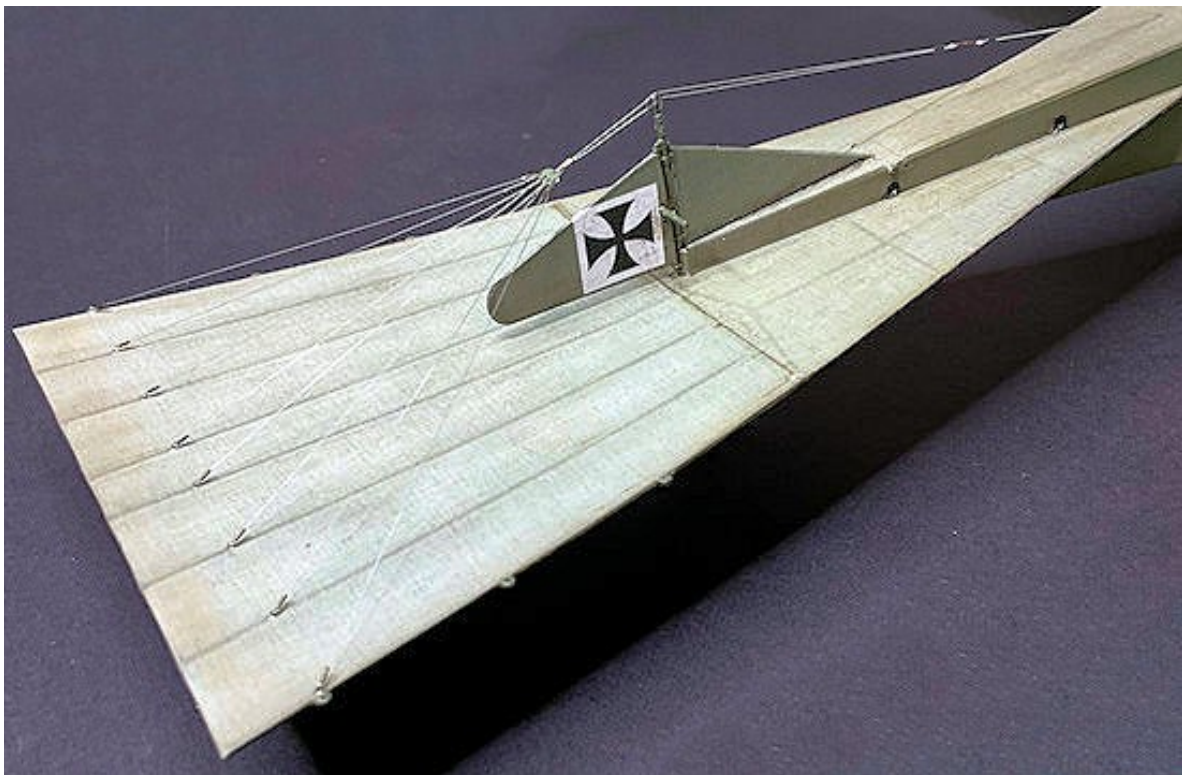
Loop the line back and through the tube.

Slide the tube up to, **but not touching**, the rigging plate.

Keeping the line taut, secure the line in the tube with thin CA adhesive.

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

Brush paint the rigging plate with 'Tamiya' Field Grey (XF65).



Underside control and restraining cables:

NOTE: Refer to Part 6 (Rigging) for more information on the external rigging.

The rigging materials used are:

'Stroft GTM' or 'Steelon' 0.08 and 0.12 mm diameter mono-filament line (always cut longer than needed).

Blackened 0.4 and 0.5 mm diameter Brass or Nickel-Silver tube from 'Albion Alloy's.

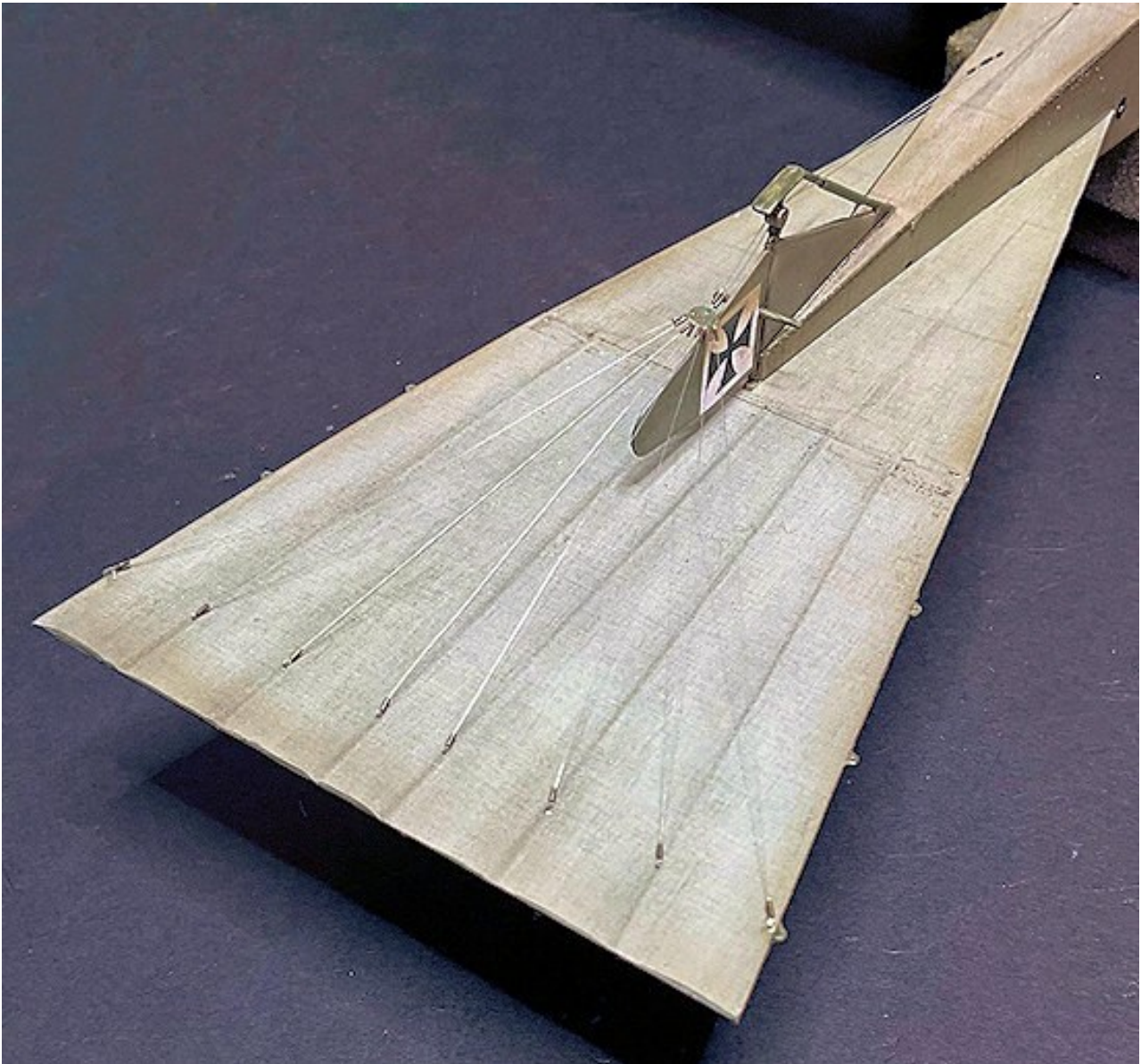
'Proper Plane' 3D printed turnbuckle (RD-005).

The following procedure applies to all eight of the tail warp control cables.

Repeat the same procedure used for the upper lines assembly, but with the following exception:

Create the two lines with the turnbuckle, but do not attach to the rigging plate. This will be done when fitting to the model.

During assembly, pass the free ends of the restraining and turnbuckle control lines through the pre-drilled hole the control pulley on the bottom of the rudder post. Then attach both to the rigging plate.



Rudder control and restraining cables:

NOTE: Refer to Part 6 (Rigging) for more information on the external rigging.

The rigging materials used are:

'Stroft GTM' or 'Steelon' 0.08 mm diameter mono-filament line (always cut longer than needed).

Blackened 0.4 mm diameter Brass or Nickel-Silver tube from 'Albion Alloy's.

'Proper Plane' 3D printed Turnbuckles (RD-005).

The following procedure applies to both sides of the upper and underside rudder cables.

Cut three short lengths of blackened 0.4 mm diameter tube.

Cut three long lengths of 0.08 mm diameter line.

Brush paint the centre barrel of the turnbuckle with 'Mr. Metal Color' Copper (215) or Brass (219).

Pass a line through a 0.4 mm diameter tube then through an 'eye' end of the turnbuckle.

Loop the line back and through the tube.

Slide the tube up to, **but not touching**, the turnbuckle.

Secure the lines in the tube with thin CA adhesive, applied to the tube end furthest from the turnbuckle.

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

Cut that line to approximately 15 mm length.

Repeat the procedure to attach the second line to the other 'eye' end of the turnbuckle, but leave **the loop of line loose**.

Pass the third line through a 0.4 mm diameter tube, leaving approximately 15 mm protruding.

Secure the tube in position on the line using thin CA adhesive.

Pass the short lengths of the two lines through the pre-drilled hole in the end of the rudder horizontal Pylon, leaving the tubes just clear of the pylon.

Secure the lines in the hole using thin CA adhesive.

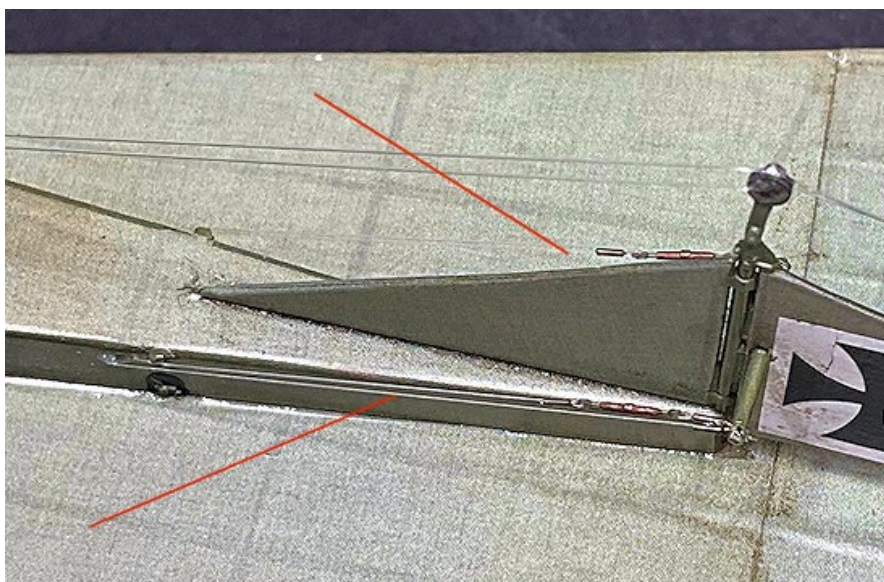
Insert the opposite end of the two lines into the relevant pre-drilled hole rigging hole in the fuselage.

Keeping the non-turnbuckle line taut, secure both lines in the hole using thin CA adhesive.

Pull the line at the loose turnbuckle and slide the tube up to, **but not touching**, the turnbuckle.

Keeping the line taut, secure lines in the tube using thin CA adhesive.

Cut away any residual end tag of line at the tube end and from the rudder pylon.



Tail bracing wires:

NOTE: Refer to Part 6 (Rigging) for more information on the external rigging.

The rigging materials used are:

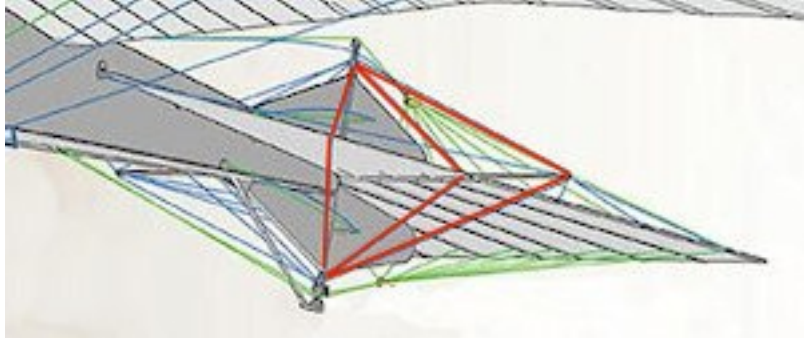
'Stroft GTM' or 'Steelon' 0.08 mm diameter mono-filament line (always cut longer than needed).

Blackened 0.4 mm diameter Brass or Nickel-Silver tube from 'Albion Alloy's.

'Proper Plane' 3D printed Turnbuckles (RD-005).

The two pylons at the sides of the tail were replaced earlier in this build.

Preparation:



NOTE: Cut short lengths of blackened tubes as described during the rigging of the upper and underside bracing wires.

Brush paint the centre barrel of twelve (12) turnbuckles with 'Mr. Metal Color' Copper (215) or Brass (219).

Cut six (6) long lengths of line.

Pass three lines through the two pre-drilled holes in the shoulders on the top of the rudder post.

Slide a tube onto each line.

Loop each line back and through its tube.

Slide the tubes up to, **but not touching**, the rudder post.

Using thin CA adhesive, secure each tube to its lines.

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

Pass each line through a tube then through an 'eye' end of a turnbuckle.

Loop the lines back and through the tubes.

Slide the tubes up to, **but not touching**, the turnbuckles, leaving the **loops of line loose**.

Cut three (3) extra long lengths of line.

Pass the lines through the pre-drilled hole in the rigging lug at the bottom of the underside rudder, making sure the same amount of line is from both sides of the rigging lug.

Slide a tube onto each line.

Slide the tubes up to, **but not touching**, the rigging lug.

Using thin CA adhesive, secure each tube to its lines.

Pass each line through a tube then through an 'eye' end of a turnbuckle.

Loop the lines back and through the tubes.

Slide the tubes up to, **but not touching**, the turnbuckles, leaving the **loops of line loose**.

Upper and underside bracing wires:

Cut four (4) long lengths of line.

Pass a line through each of the two pre-drilled holes on the edge of both sides of the tailplane.

Slide two tubes onto the four lines protruding above the tailplane.

Pass each line through the 'eye' end of two of the turnbuckle fitted lines from the top rudder post.

Loop each line back and through its tube.

Slide the tubes up to, **but not touching**, the turnbuckles, leaving the **loops of line loose**.

NOTE: *When the aircraft is on its back, make sure suitable packing is used to keep the various pylons clear of the work surface. I used pieces of sponge, avoiding installed rigging.*

Lay the aircraft onto its back to access the underside of the tail.

Repeat the previous steps to attach the four underside protruding lines to their turnbuckle line, leaving the **loops of line loose**.

NOTE: *For positioning the turnbuckles, refer to the following photograph.*

Move the turnbuckles on the four lines closer to the underside edges of the tailplane.

Slide the tubes from the rigging lug down to, **but not touching**, the turnbuckles.

Using thin CA adhesive, secure each tube to its lines.

Cut away any residual end tags of line at the tubes.

Turn the model over to access the top of the tailplane.

Repeat the previous steps to attach the four lines from the top of the rudder post to their turnbuckle lines.

Lay the aircraft onto its back to access the underside of the tail.

Slide the tubes from the four protruding lines up to, **but not touching**, their turnbuckles.

Using thin CA adhesive, secure each tube to its lines.

Cut away any residual end tags of line at the tubes.

Turn the model over to access the top of the tailplane.

Keeping the four lines at the tailplane edges taut, slide tubes up to, **but not touching**, the turnbuckles and secure the lines using thin CA adhesive.

Cut away any residual end tags of line at the tubes.

Slide the loose tubes on both sides of the tailplane edges onto the tailplane and secure in position using thin CA adhesive.

Slide the loose tubes on both sides of the top rudder post up to the rudder post and secure in position using thin CA adhesive.

Slide the loose tubes on both sides of the underside rigging lug up to the rigging lug and secure in position using thin CA adhesive.

Outer pylon bracing wire:

Pass each of the top and underside outer pylon lines through a tube then through an 'eye' end of a turnbuckle.

Loop the lines back and through the tubes.

Slide the tubes up to, **but not touching**, the turnbuckles, leaving the **loops of line loose**.

NOTE: *My replacement pylons have rigging holes for these bracing wires. The kit supplied pylons do not.*

Cut four (4) long lengths of line.

Pass a line through the top and bottom rigging holes in the photo-etch rigging plate on the end of the pylons.

Slide a tube onto both lines.

Loop each line back and through its tube.

Slide the tubes up to, **but not touching**, the ends of the outer pylons.

Using thin CA adhesive, secure each tube to its lines.

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

Slide a tube onto the two lines above the tailplane.

Pass each line through the 'eye' end of its turnbuckle bracing line.

Loop each line back and through its tube.

Slide the tubes up to, **but not touching**, the turnbuckles, leaving the **loops of line loose**.

NOTE: *When the aircraft is on its back, make sure suitable packing is used to keep the various pylons clear of the work surface. I used pieces of sponge, avoiding installed rigging.*

Lay the aircraft onto its back to access the underside of the tail.

Repeat the previous steps to attach the two underside lines to their turnbuckle lines.

NOTE: *For positioning the turnbuckles, refer to the following photograph.*

Move the turnbuckles on the two lines closer towards the end of the outer pylons.

Slide the tubes from the rigging plate side up to, **but not touching**, the turnbuckles.

Using thin CA adhesive, secure each tube to its lines.

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

Slide the loose tubes down to the outer pylon.

Using thin CA adhesive, secure each tube to its lines.

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

Turn the aircraft over.

Move the turnbuckles on the two lines closer towards the end of the outer pylons.

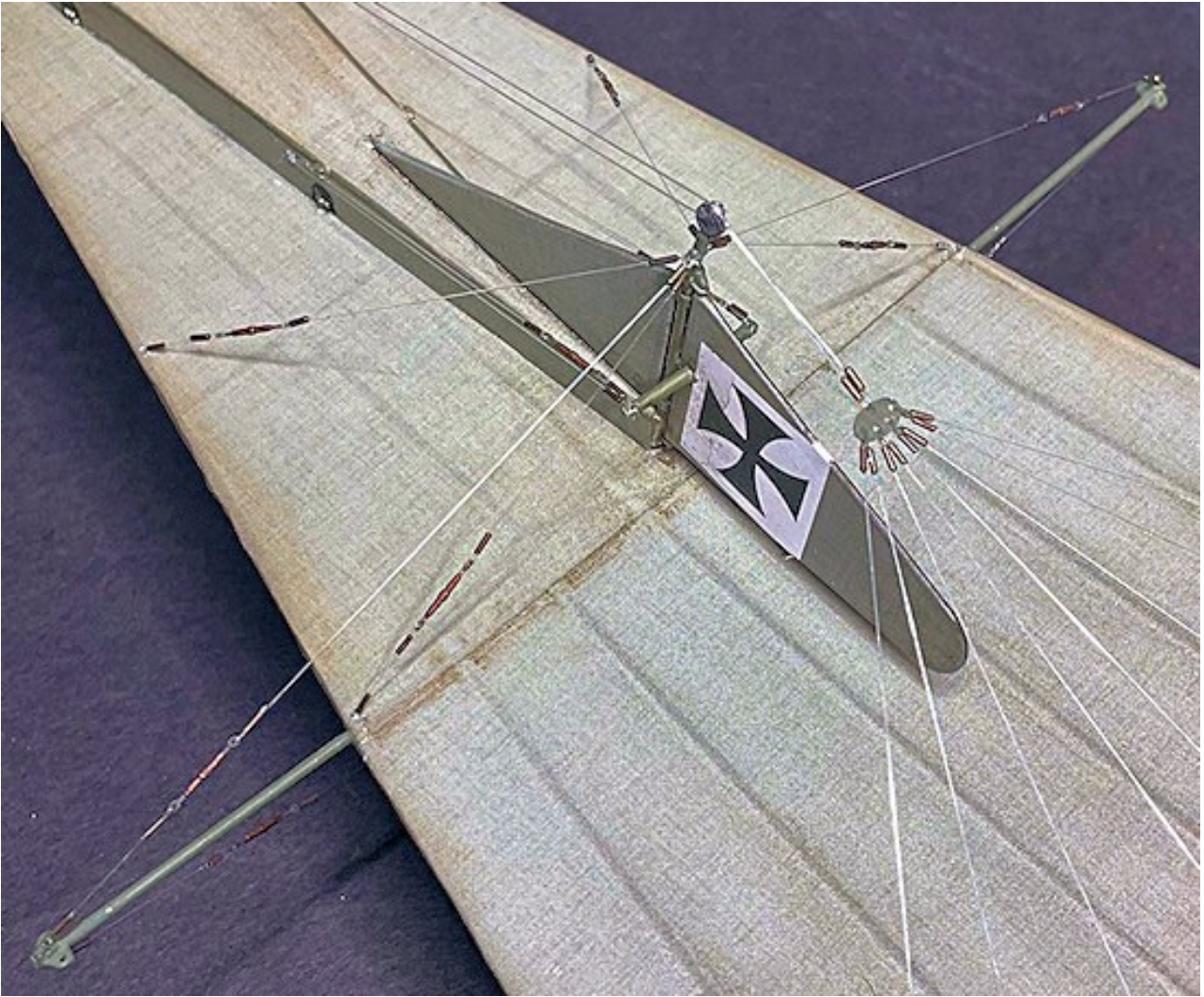
Slide the tubes from the rudder post up to, **but not touching**, the turnbuckles.

Using thin CA adhesive, secure each tube to its lines.

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

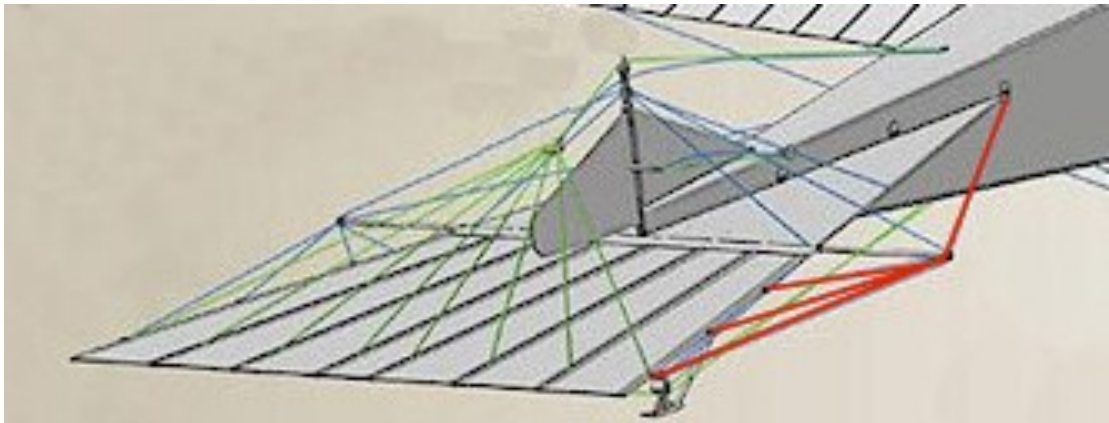
Keeping the pylon lines taut, slide tubes up to, **but not touching**, the turnbuckles and secure the lines using thin CA adhesive.

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



Forward edge bracing wires:

NOTE: The following steps apply to both sides of the tail.



Brush paint the centre barrel of a turnbuckle with 'Mr. Metal Color' Copper (215) or Brass (219).

Cut two (2) long lengths of line.

Slide a tube onto a line then pass the line through an 'eye' end of the turnbuckle.

Loop the line back and through the tube.

Slide the tube up to, **but not touching**, the turnbuckle.

Using thin CA adhesive, secure the tube to its lines.

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

Repeat the procedure to attach a line to the opposite end of the turnbuckle.

Insert the line into the pre-drilled hole in the side of the fuselage at the forward end of the tailplane.

Position the turnbuckle closer towards the end of the outer pylon.

Secure the line in the fuselage using thin CA adhesive.

Slide a tube onto the pylon end of the line then pass the line through the rigging hole in the outer pylon.

Loop the line back and through the tube.

Keeping the line taut, slide the tube up to, **but not touching**, the end of the pylon.

Using thin CA adhesive, secure the tube to its lines.

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

Rear edge bracing wires:

NOTE: *The following steps apply to both sides of the tail.*

Brush paint the centre barrel of a turnbuckle with 'Mr. Metal Color' Copper (215) or Brass (219).

Cut two (2) long lengths of line.

Slide a tube onto a line then pass the line through an 'eye' end of the turnbuckle.

Loop the line back and through the tube.

Slide the tube up to, **but not touching**, the turnbuckle.

Using thin CA adhesive, secure the tube to its lines.

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

Repeat the procedure to attach a line to the opposite end of the turnbuckle.

Slide a tube onto a line then pass the line through the rear rigging hole in the outer pylon.

Loop the line back and through the tube.

Slide the tube up to, **but not touching**, the end of the pylon, leaving the **loop of line loose**.

Repeat the previous steps to attach the line to its relevant rigging lug on the rear edge of the tail.

Move the turnbuckle closer to the end of the outer pylon.

Slide the outer tube up to, **but not touching**, the end of the pylon.

Using thin CA adhesive, secure the tube to its lines.

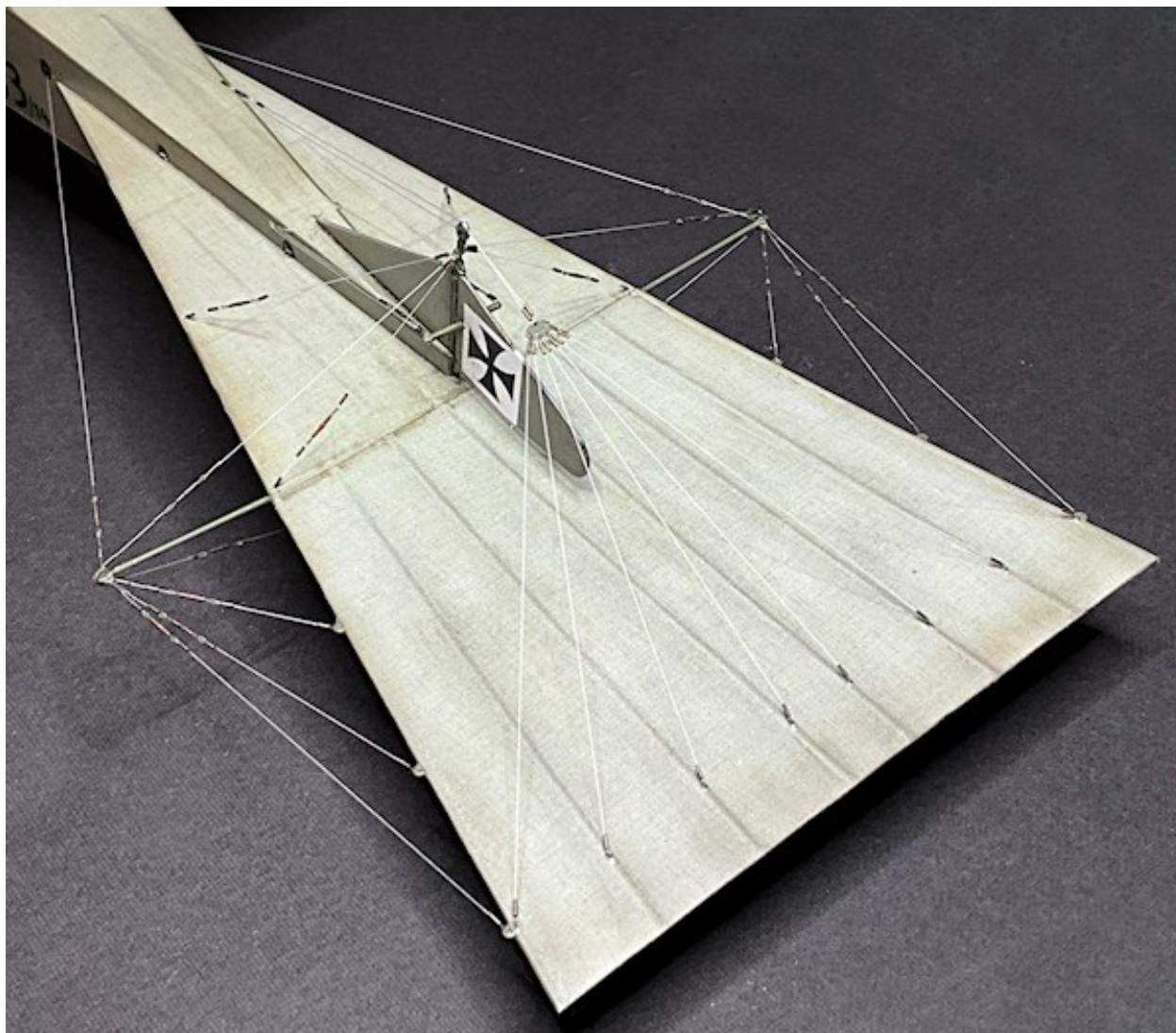
Cut away any residual end tags of line at the tube.

Keeping the line taut, slide the inner tube up to its rigging log on the rear edge of the tail.

Using thin CA adhesive, secure the tube to its lines.

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

Repeat the previous steps to attach the two remaining bracing lines to their rigging lugs on the rear edge of the tail.



Flying/Landing wires:

NOTE: Refer to Part 6 (Rigging) for more information on the external rigging.

The rigging materials used are:

'Stroft GTM' or 'Steelon' 0.12 mm diameter mono-filament line (always cut longer than needed).

Blackened 0.4 and 0.5 mm diameter Brass or Nickel-Silver tube from 'Albion Alloy's.

The following procedure applies to each of the four flying (underside) and landing (top side) wires for both wings.

Cut a very long length of line.

Cut two short lengths of blackened 0.4 mm diameter tube.

Cut two short lengths of blackened 0.5 mm diameter tube.

Make sure the four pre-drilled rigging holes in both wings are clear of paint and decal.

NOTE: The wires are rigged as follows:

The two inner turnbuckles on the top and bottom cabane strut assemblies are rigged to the two outer pre-drilled holes in the wings.

The two outer turnbuckles on the top and bottom cabane strut assemblies are rigged to the two inner pre-drilled holes in the wings.

Pass the line through a 0.5 mm diameter tube then through the 'eye' end of the turnbuckle on the top cabane strut assembly.

Loop the line back through the tube.

Slide the tube up to, **but not touching**, the turnbuckle.

Secure the lines in the tube with thin CA adhesive, applied to the tube end furthest from the turnbuckle.

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

Pass the line through a 0.4 mm diameter tube then down through the relevant pre-drilled hole in the wing.

Pass the line through a 0.4 mm diameter tube then a 0.5 mm diameter tube.

Pass the line through the 'eye' end of the turnbuckle on the bottom cabane strut assembly.

Loop the line back through the 0.5 mm diameter tube.

Slide the tube up to, **but not touching**, the turnbuckle.

NOTE: *During the following step, support the outer end of the wing to prevent the wing from being flexed down.*

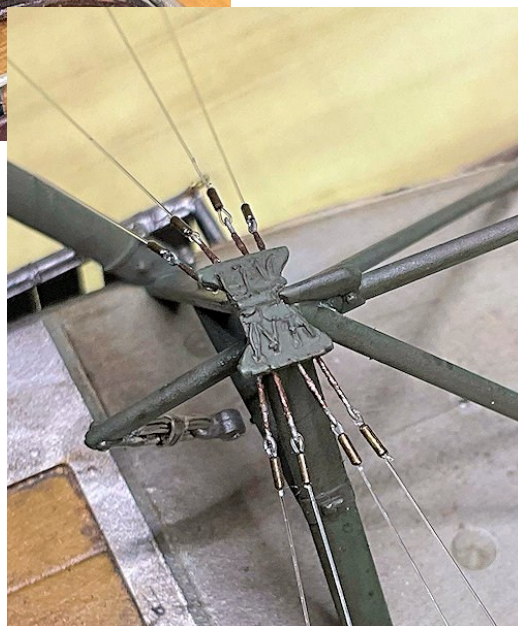
Gently pull on the line from the underside of the wing and keeping the line taut secure the line into the pre-drilled hole in the wing by applying thin CA adhesive at the top side of the wing.

Keeping the underside line taut, slide the 0.5 mm diameter tube up to, **but not touching**, the turnbuckle.

Secure the lines in the tube with thin CA adhesive, applied to the tube end furthest from the turnbuckle.

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

Slide the upper and underside 0.4 mm diameter tubes up to the rigging points on the wings and secure them to the lines using thin CA adhesive.



Drag wires:

NOTE: Refer to Part 6 (Rigging) for more information on the external rigging.

The rigging materials used are:

'Stroft GTM' or 'Steelon' 0.12 mm diameter mono-filament line (always cut longer than needed).

Blackened 0.4 mm and 0.5 mm diameter Brass or Nickel-Silver tube from 'Albion Alloy's.

'Gaspatch' 1:48th scale metal turnbuckles (Type C).

The following procedure applies to both drag wires.

Cut two long lengths of line.

Prepare a 'Gaspatch' 1:48th scale metal turnbuckle (Type C):

Remove the turnbuckle from its casting base.

If necessary, use a 0.2 mm diameter drill to clear the turnbuckles 'eye' ends of any residual metal.

Brush paint the centre barrel of the turnbuckle with 'Mr. Metal Color' Copper (215) or Brass (219).

Pass a line through a 0.5 mm diameter tube then through the 'eye' end of a turnbuckle.

Loop the line back and through the tube.

Slide the tube up to, **but not touching**, the turnbuckle.

Secure the lines in the tube with thin CA adhesive, applied to the tube end furthest from the turnbuckle.

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

Cut the line to leave 15 mm of line length.

Insert the free end of the line into the pre-drilled hole in the rigging point on the fuselage nose, leaving approximately 8 mm protruding.

Secure the line in the hole with thin CA adhesive

Attach the second line to the opposite end of the turnbuckle, but do not secure it.

Pass the line through a 0.5 mm diameter tube then through a 0.4 mm diameter tube.

Using thin CA adhesive, secure the line in the pre-drilled hole in the underside of the wing at the forward, outer rigging point for the flying wire.

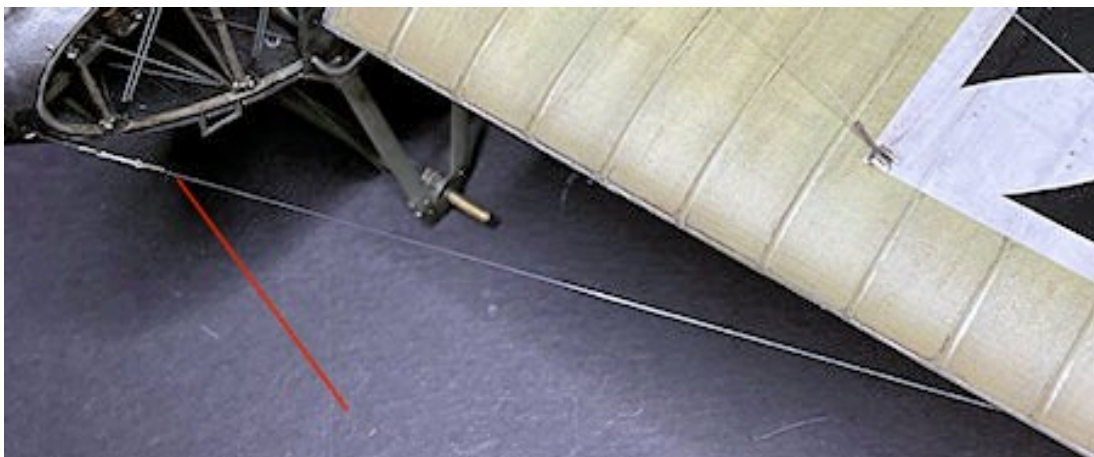
Keeping the line taut, slide the 0.5 mm diameter tube up to, **but not touching**, the turnbuckle.

Secure the lines in the tube with thin CA adhesive, applied to the tube end furthest from the turnbuckle.

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

Slide the 0.4 mm diameter tube up to the wing rigging point.

Secure the tube on the line using thin CA adhesive.



Assembly (continued):

NOTE: *Make sure any paint and decal is removed from the mating surfaces of the parts.*

Cement the over wing pylons (A10) into their locating recesses in the top surface of the wings.

External rigging (continued):

Wing warp control cables:

NOTE: *Refer to Part 6 (Rigging) for more information on the external rigging.*

The rigging materials used are:

'Stroft GTM' or 'Steelon' 0.08 mm diameter mono-filament line (always cut longer than needed).

Blackened 0.4 mm diameter Brass or Nickel-Silver tube from 'Albion Alloy's'.

The following procedure applies to both wings.

Cut six (6) short lengths of blackened tube.

Cut six (6) long lengths of line (wing warp pylon cables).

Remove a rigging plate (P11) from the kit supplied photo-etch sheet.

Pass a pylon line through a 0.4 mm diameter tube then through a rigging hole in the rear edge of the rigging plate.

Loop the line back and through the tube.

Slide the tube up to, **but not touching**, the rigging plate.

Secure the lines in the tube with thin CA adhesive.

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

Repeat the procedure to attach the remaining five pylon cables to the rigging plate.



NOTE: *Refer to Part 6 (Rigging) for more information on the external rigging.*

The rigging materials used are:

'Stroft GTM' or 'Steelon' 0.12 mm diameter mono-filament line (always cut longer than needed).

Blackened 0.5 mm diameter Brass or Nickel-Silver tube from 'Albion Alloy's'.

'Gaspatch' 1:48th scale metal turnbuckles (Type C).

The following procedure applies to both wings.

Cut nine (9) short lengths of blackened tube.

Cut two very long lengths of line.

Prepare a 'Gaspatch' 1:48th scale metal turnbuckle (Type C):

Remove the turnbuckle from its casting base.

If necessary, use a 0.2 mm diameter drill to clear the turnbuckles 'eye' ends of any residual metal.

Brush paint the centre barrel of the turnbuckle with 'Mr. Metal Color' Copper (215) or Brass (219).

Pass a line through a 0.5 mm diameter tube then through an 'eye' end of the turnbuckle.

Loop the line back and through the tube.

Slide the tube up to, **but not touching**, the turnbuckle.

Secure the lines in the tube with thin CA adhesive, applied to the tube end furthest from the turnbuckle.

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

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

Make sure the pre-drilled rigging hole at the bottom edge of the fuselage is clear of any paint and decal.

Trim the length of one of the lines to approximately 65 mm.

Using thin CA adhesive, secure the end of that line fully into the pre-drilled rigging hole at the bottom edge of the fuselage.

Pass the other line between the underside flying wires and around the control pulley on the outer leading edge of the wing.

Keeping the line taut, secure the line around the pulley using thin CA adhesive.

NOTE: *The following is necessary to have the rigging plate angled to align more naturally with the rigging lines.*

Bend the forward side of the rigging plate (between the two single holes) to approximately 60 degrees.

Pass the free end of the line through a 0.5 mm diameter tube then through an forward rigging hole in the rigging plate.

Loop the line back and through the tube, leaving the **loop of line loose**.

Brush paint the rigging plate with 'Tamiya' Field Grey (XF65).

Using thin CA adhesive, secure the rigging plate to the sub on the top of the wing pylon.

NOTE: *The following applies to all six of the pylon to wing warp control cables. Do not apply too much tension in the six wing warp lines to avoid bending or breaking the wing pylon.*

Slide a tube onto the outer wing warp line from the fitted rigging plate.

Pass the free end of the line through the fitted outer rigging anchor at the wing trailing edge, then loop the line back through the tube.

Slide the tube up to, **but not touching**, the rigging anchor.

Repeat the procedure to the inner wing warp line.

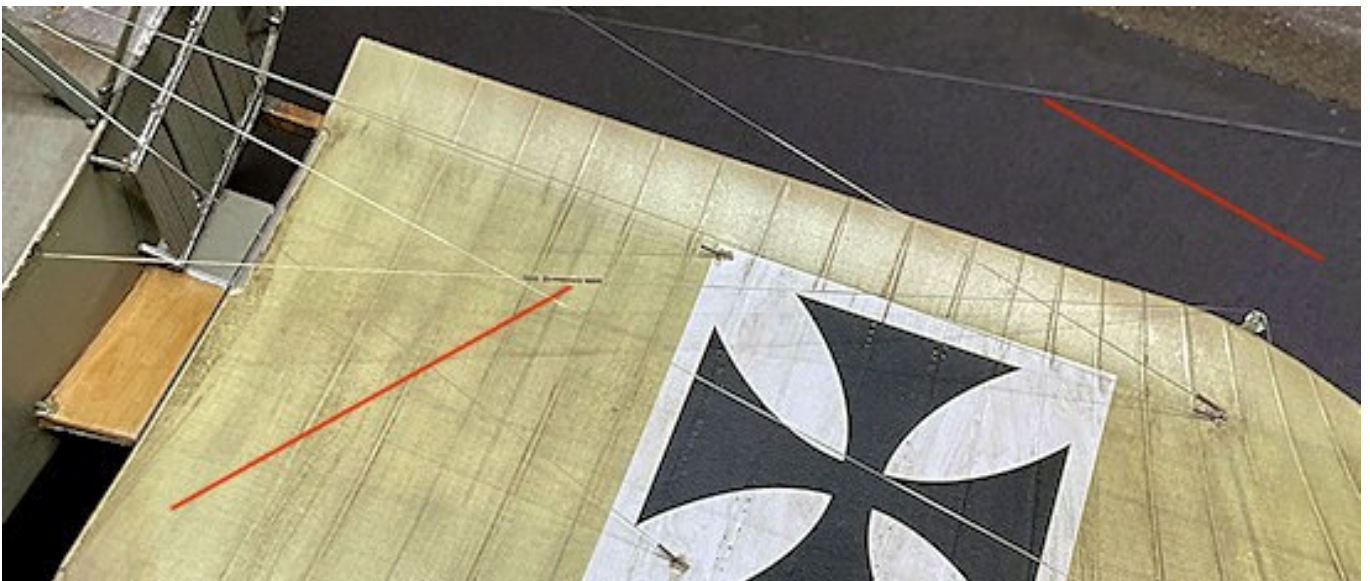
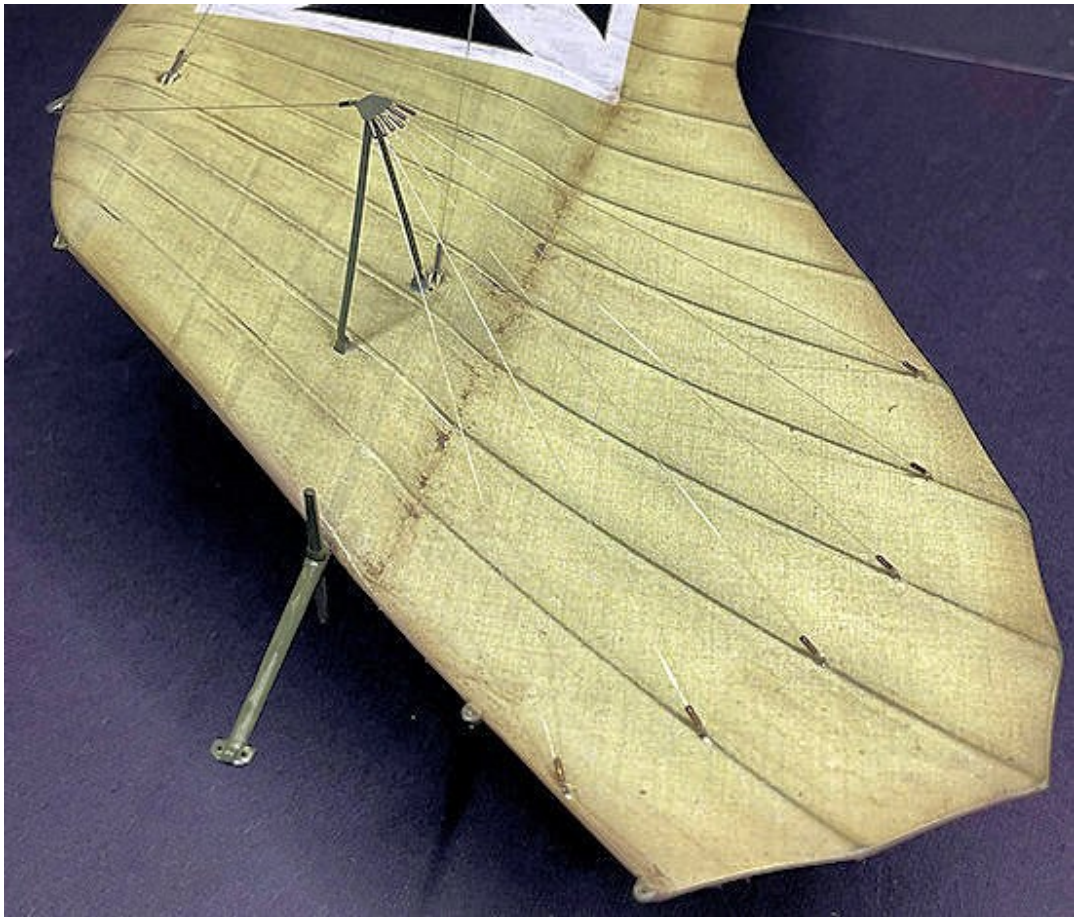
Keeping both lines taut, secure the lines in the tubes using thin CA adhesive.

Repeat the procedure to the four remaining warp lines.

Slide the tube on the line attached to the front of the rigging plate up to, **but not touching**, the rigging plate.

Keeping the line taut, secure the lines in the tube using thin CA adhesive.

Cut away any residual end tags of line at the seven (7) tube ends.



Wing outer bracing wires:

NOTE: Refer to Part 6 (Rigging) for more information on the external rigging.

The rigging materials used are:

'Stroft GTM' or 'Steelon' 0.08 mm diameter mono-filament line (always cut longer than needed).

Blackened 0.5 mm diameter Brass or Nickel-Silver tube from 'Albion Alloy's'.

'Proper Plane' 3D printed Turnbuckles (RD-005).

The following procedure applies to both wings.

Vertical pylon bracing wires:

Prepare two (2) 'Proper Plane' 3D printed Turnbuckles (RD-005) and brush paint the centre barrel of the turnbuckles with 'Mr. Metal Color' Copper (215) or Brass (219).

Cut three long lengths of line.

Cut six (6) short lengths of tube.

Pass a line through a 0.5 mm diameter tube then through an 'eye' end of the first turnbuckle.

Loop the line back and through the tube.

Slide the tube up to, **but not touching**, the turnbuckle.

Secure the lines in the tube with thin CA adhesive, applied to the tube end furthest from the turnbuckle.

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

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

Pass the third line through a 0.5 mm diameter tube then through an 'eye' end of the second turnbuckle.

Loop the line back and through the tube.

Slide the tube up to, **but not touching**, the turnbuckle.

Secure the lines in the tube with thin CA adhesive, applied to the tube end furthest from the turnbuckle.

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

Pass the free end of a line from the first turnbuckle through a 0.5 mm diameter tube then through the free 'eye' end of the second turnbuckle.

Loop the line back and through the tube.

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

Pass the two free ends of turnbuckle line through the pre-drilled hole in the ends of the top and bottom wing top vertical pylons.

Slide a tube onto both lines.

Pass the top line down through the pre-drilled hole in the wing at the rear landing wire rigging point.

Pass the underside line up through the pre-drilled hole in the wing at the rear flying wire rigging point.

Locate the line between the two turnbuckles over the centre of the end of the wing tip horizontal pylon.

Position the two turnbuckles midway between the top/bottom ends of the wing tip vertical pylons and the end of the horizontal pylon.

Using thin CA adhesive, secure the two lines in the vertical pylons.

Keeping the two lines through the wing taut, secure them in the wing using thin CA adhesive.

Cut away any residual end tags of line at the wing surfaces.

Slide the tube down to the wing surface and secure them to the lines using thin CA adhesive.

Slide the tube at the horizontal pylon (not yet secured in position) up to, **but not touching**, the turnbuckle.

Keeping the line taut, secure the lines in the tube using thin CA adhesive.

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

Secure the line over the end of the horizontal pylon, using thin CA adhesive.

Horizontal pylon bracing wires:

The rigging materials used are:

'Stroft GTM' or 'Steelon' 0.08 mm diameter mono-filament line (always cut longer than needed).

Blackened 0.5 mm diameter Brass or Nickel-Silver tube from 'Albion Alloy's.

'Proper Plane' 3D printed Turnbuckles (RD-005).

The following procedure applies to the three bracing wires on both wings.

Prepare a 'Proper Plane' 3D printed Turnbuckles (RD-005) and brush paint the centre barrel of the turnbuckle with 'Mr. Metal Color' Copper (215) or Brass (219).

Cut two long lengths of line.

Cut four (4) short lengths of tube.

Pass a line through a 0.5 mm diameter tube then through an 'eye' end of the turnbuckle.

Loop the line back and through the tube.

Slide the tube up to, **but not touching**, the turnbuckle.

Secure the lines in the tube with thin CA adhesive, applied to the tube end furthest from the turnbuckle.

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

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

Pass the free end of a line through a 0.5 mm diameter tube then through one of the three pre-molded rigging anchors on the outer edge of the wing.

Loop the line back and through the tube.

Slide the tube up to, **but not touching**, the rigging anchor, leaving the **loop of line loose**.

Repeat the procedure to attach the other line to the relevant rigging hole in end of the wing tip horizontal pylon.

Position the turnbuckle towards the end of the wing tip horizontal pylon.

Slide the tubes up to, **but not touching**, the wing rigging anchor and end of the wing tip horizontal pylon.

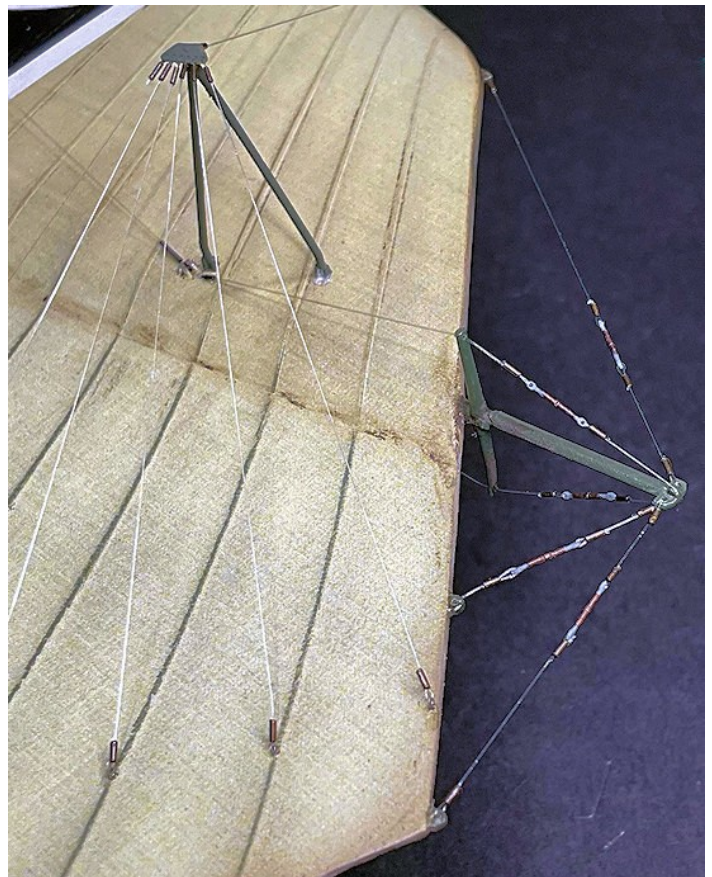
Secure the lines in the tubes using thin CA adhesive.

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

Slide the tubes up to, **but not touching**, the 'eye' ends of the turnbuckle.

Keeping the lines taut, secure the lines in the tubes using thin CA adhesive.

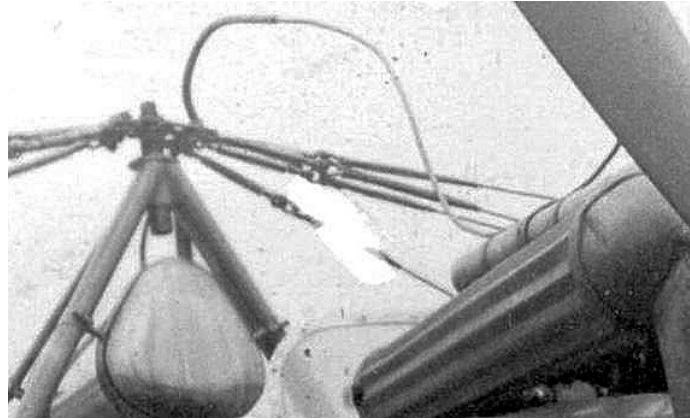
Cut away any residual end tag of line at the tube ends.



Modifications (continued):

Vent pipe:

NOTE: *The coolant header tank above the engine had a vent pipe fitted. Only the forward portion of the pipe is represented on the kit engine. The pipe from the engine connects to a slightly larger bore pipe the end of which appears to have been attached to the top of the upper cabane strut assembly.*



Cut a length of 'MFH' 0.4 mm diameter flexible black tube (P-961).

NOTE: *The 'MFH' tubing does not adhere well enough using CA adhesive. Therefore, I used 'Araldite' two-part rapid epoxy instead.*

Mix a small amount of 'Araldite' two-part rapid epoxy 50/50%.

Apply the adhesive to the top, rear of the coolant header tank above the engine and at the back of the pre-molded vent pipe.

Position one end of the 'MFH' tube onto the adhesive and contacting the end of the pre-molded pipe.

Once the adhesive has fully set, cut the length of the tube such that it loops up to and just past the top, left side of the rigging plate on the top of the upper cabane strut assembly.

Apply a small amount of mixed adhesive to the top, left side of the rigging plate on the top of the upper cabane strut assembly.

Position the end of the tube onto the adhesive with the end just over the rear edge of the rigging plate.



Assembly (continued):

Wheels:

Locate each wheel partially onto its axle.
Apply CA adhesive onto the exposed axles.
Fully locate the wheels onto their axles.

Fuselage foot and hand grab:

Cement the fuselage foot step A31 and hand grab A1 into their locating recesses in the bottom and upper edges of the left side of the fuselage.



Engine exhaust pipe:

NOTE: *The assembly and painting of the engine exhaust pipe was left until now to ensure the pipe was correctly aligned when fitted.*

Cement exhaust collector halves E18 and E19 together.

Carefully remove any mold seam lines from the assembled halves and the exhaust down pipe A13.

Temporarily locate the exhaust collector into its locating holes in the upper, right side of the engine cylinders.

Locate the exhaust drop pipe onto the front of the collector and angle it slightly in towards the fuselage.

Cement the drop pipe to the collector.

Remove the assembly from the engine.

Airbrush the assembly with a gloss black, such as 'Tamiya (X1) or similar.

Airbrush the assembly with 'Mig' Ammo A-Stand Burnt Iron (A-Mig 2320) lacquer or similar.

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

Brush 'Flory Models' Rust wash around the collector at the rear of the drop pipe and around the collectors rear end.

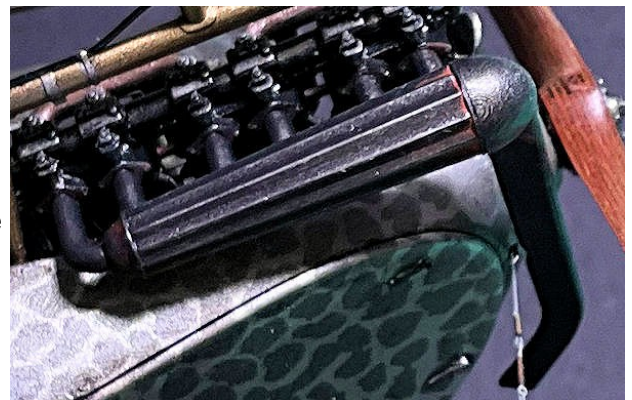
Remove the wash to achieve the desired weathering effect.

To seal and protect the applied weathering, airbrush a semi-matte clear coat, such as 'Tamiya' Semi-Gloss (X35) over the applied weathered surfaces.

Lightly sponge 'Tamiya' Weathering Master set B (Soot) around the exit port at the bottom of the drop pipe.

NOTE: *Dry brush by using a domed and soft brush, which has been dipped in the paint. Dab the brush on an absorbent paper to remove the liquid paint, leaving paint pigment on the brush.*

Dry brush the collector and leading edge of the drop pipe with 'Mr. Color' Super Iron 2 (203) or similar, to create a worn metal.



Windscreen:

Drill a hole of 1.0 mm diameter vertically through the decking panel locating points in front of the forward cockpit.

Brush paint the outer frame (both sides) of the kit windscreen C1.

Lightly sponge 'Tamiya' Weathering Master set D (Oil Stain) around the top corners and sides on the front face of the windscreen.

Cement the windscreen 'legs' fully into the two pre-drilled holes in the decking panel.



Propeller:

Apply CA or two part epoxy resin adhesive, into the pre-drilled locating hole in the engine or around the added propeller shaft.

Insert the propeller shaft into the pre-drilled hole in the engine, making sure the propeller hub is fully against the engine and the propeller is parallel to the wing leading edges when viewed from above and vertical to the fuselage when viewed from the sides.



PART 12

FIGURES

PART 12 - FIGURES

NOTE: Refer to Part 5 (Resin) of this build log when working with resin parts.

The figures I chose to use with this model are:

- 'Copper State Models' standing German airman (F32-040),
- 'Copper State Models' Gotha bomber German crew member N.2 (F32-010),
- 'Copper State Models' German ground crewman N.1 (F32-012).

German ground crewman (F32-012):

NOTE: This figure is supplied as a body, left and right arms and a head. Some shortening or reducing of the locating stubs on the arms and head may be required to achieve a flush fit of the parts into the body.

Preparation:

Cut away any mold base blocks from the parts and sand or file off any residual mold block to blend with the surrounding surfaces.

Drill a hole of 0.8 mm diameter up into the left leg of the body, making sure to keep the drill central to avoid breaking through the sides of the leg.

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

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

Using thin CA adhesive, secure the left and right arms into their socket locations in the body of the figure.

Using thin CA adhesive, secure the head into the body.

If necessary, fill any obvious gaps with a modelling putty, such as 'Perfect Plastic Putty' or similar, then sand or file to blend with the surrounding surfaces.

Sand or scrape away any mold seam lines or surface artifacts.

Painting:

Airbrush the figure with a grey primer, such as 'AK Interactive' Grey (AK758) or 'Mr. Surfacer Grey (1500) thinned 50/50% with Self Levelling Thinners (400) or similar.

Brush paint the figure as follows:

Trousers/Jacket - 'AK Interactive' WW1 German Uniform Light (AK3092) with blended shadows of WW1 German Uniform Base (AK3091).

Buttons - 'Mr. Metal Color' Stainless Steel (213).

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

Cap - 'AK Interactive' WW1 German Uniform Light (AK3092), band Red Emblem (AK3126).

Flesh and features:

NOTE: The following painting technique for flesh applies to all of the figures. The paints used are water based and can be thinned as required using water, which is also used to clean the brushes. It's easier to use a 'wet palette' when applying these paints as this keeps the paint from drying and allows mixing of paints as required. A basic wet palette can be a water proof plastic lid with dampened kitchen roll paper laid inside. The paints are then dripped onto the damp paper and applied from there.

The paints used for the flesh of the figures are from the '**Citadel**' colour range:

Base coat - 'Bugmans Glow'.

Shading - 'Reikland Flesh Shade'.

Flesh tone - 'Cadian Flesh Tone'.

Flesh highlights - 'Kislev Flesh'.

Brush 'Bugmans Glow' over the exposed head and hands of the figure and allow to dry.

Brush thinned 'Reikland Flesh Shade' over the painted head and hands of the figure and allow to dry.

Brush thinned 'Cadian Flesh Tone' over the painted head and hands of the figure and allow to dry. Do not apply the paint such that it completely covers the previous coats, as subtle shadows are necessary around such as the ears, eyes, nose and chin etc.

Brush thinned 'Kislev Flesh' over the painted head and hands of the figure and allow to dry. This should be applied very lightly and is intended to highlight areas such as the eye brows, ears, bridge of the nose and jaw line etc.

Instead of painting the eye pupils, press a needle point or similar into the centre of the eyes to create the pupils.

Brush paint the hair/moustache/eyebrows with your desired colour.

Weathering:

Lightly sponge 'Tamiya' Weathering Master set A (mud) over the shoes.

Lightly sponge 'Tamiya' Weathering Master set D (oil stain) around the elbows and pockets of the jacket.

Lightly brush, as desired, 'Flory Models' Dark Dirt wash along jacket and shoulder epaulettes.



Wood crate:

NOTE: This figure is intended to be stood on a ladder. However, I wanted the figure on the ground and by the engine. Therefore, a suitably sized resin wood crate from my 'spares box' was used as a foot rest.

German crew member (F32-010):

NOTE: *This figure is supplied as a body, left and right arms and a head. Some shortening or reducing of the locating stubs on the arms and head may be required to achieve a flush fit of the parts into the body.*

Preparation:

Cut away any mold base blocks from the parts and sand or file off any residual mold block to blend with the surrounding surfaces.

Drill a hole of 0.8 mm diameter up into the right leg of the body, making sure to keep the drill central to avoid breaking through the sides of the leg.

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

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

Using thin CA adhesive, secure the left and right arms into their socket locations in the body of the figure.

Using thin CA adhesive, secure the head into the body.

If necessary, fill any obvious gaps with a modelling putty, such as 'Perfect Plastic Putty' or similar, then sand or file to blend with the surrounding surfaces.

Sand or scrape away any mold seam lines or surface artifacts.

Painting:

Airbrush the figure with a grey primer, such as 'AK Interactive' Grey (AK758) or 'Mr. Surfacer Grey (1500) thinned 50/50% with Self Levelling Thinners (400) or similar.

Brush paint the figure as follows:

Trousers - 'AK Interactive' WW1 German Uniform Light (AK3092) with blended shadows of WW1 German Uniform Base (AK3091).

Flight jacket - 'AK Interactive' Brown Leather (AK3031), mixed with Black Uniform Base (AK3002) for crease shadows.

Leg gaiters, Helmet and Gloves - 'AK Interactive' Brown Leather (AK3031), mixed with Black Uniform Base (AK3002).

Helmet cheek and goggle straps - 'AK Interactive' Brown Leather (AK3031).

Goggle lenses - 'Mr. Metal Color' Stainless Steel (213) then 'Tamiya' Clear Orange (X26) lenses.

Shoes - 'Tamiya' Hul Red (XF9).

Scarf - 'AK Interactive' French Uniform Base (AK3101).

Buttons - 'Mr. Metal Colour' Stainless Steel (213).

Flight jacket, leg gaiters, helmet, gloves and shoes - Overpaint with 'Tamiya' Semi-Matte clear coat (X35).

Flesh and features - As previously described.

Weathering:

Lightly sponge 'Tamiya' Weathering Master set A (mud) over the shoes.

Lightly sponge 'Tamiya' Weathering Master set D (oil stain) around the elbows and pockets of the jacket.

Lightly brush, as desired, 'Flory Models' Dark Dirt wash on the scarf, seams on the leg gaiters, helmet and cheek straps, gloves.



German standing airman (F32-040):

NOTE: *This figure is supplied as a body, left and right arms, two optional heads, right and left jacket fronts and two scarf sides. Some shortening or reducing of the locating stubs on the arms and head may be required to achieve a flush fit of the parts into the body.*

Preparation:

NOTE: *The bottom edges of the two jacket fronts need to be cut away to align their bottoms with the bottom of the jacket on the body.*

Cut away any mold base blocks from the parts and sand or file off any residual mold block to blend with the surrounding surfaces.

Drill a hole of 0.8 mm diameter up into either the right or left leg of the body, making sure to keep the drill central to avoid breaking through the sides of the leg.

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

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

Using thin CA adhesive, secure the left and right arms into their socket locations in the body of the figure.

Using thin CA adhesive, secure the two jacket fronts in position onto the body.

Using thin CA adhesive, secure the two sides of the scarf onto the body.

Using thin CA adhesive, secure one of the two supplied heads into the body.

If necessary, fill any obvious gaps with a modelling putty, such as 'Perfect Plastic Putty' or similar, then sand or file to blend with the surrounding surfaces.

Sand or scrape away any mold seam lines or surface artifacts.

Painting:

Airbrush the figure with a grey primer, such as 'AK Interactive' Grey (AK758) or 'Mr. Surfacer Grey (1500) thinned 50/50% with Self Levelling Thinners (400) or similar.

Brush paint the figure as follows:

Trousers/Jacket - 'AK Interactive' WW1 German Uniform Light (AK3092) with blended shadows of WW1 German Uniform Base (AK3091).

Flight jacket - 'AK Interactive' Brown Leather (AK3031), mixed with Black Uniform Base (AK3002) for crease shadows.

Gaiters and Helmet - 'AK Interactive' Brown Leather (AK3031), mixed with Black Uniform Base (AK3002).

Helmet cheek straps - 'AK Interactive' Brown Leather (AK3031).

Shoes - 'Tamiya' Black (X18).

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

Buttons - 'Mr. Metal Colour' Stainless Steel (213).

Map board - 'Tamiya' Deck Brown (XF79).

Flight jacket, leg gaiters, helmet, shoes - Overpaint with 'Tamiya' Semi-Matte clear coat (X35).

Flesh and features - As previously described.

Weathering:

Lightly sponge 'Tamiya' Weathering Master set A (mud) over the shoes.

Lightly sponge 'Tamiya' Weathering Master set D (oil stain) around the elbows and pockets of the jacket.

Lightly brush, as desired, 'Flory Models' Dark Dirt wash on the scarf, seams on the leg gaiters, helmet and cheek straps.



PART 13

DISPLAY BASE

PART 13 - DISPLAY BASE

The display case is made from piano black and clear acrylic sheet of 3mm thickness. The shoulder around the plinth is for locating the clear cover and 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.inperspective.com

The grass mat used was the 'Model Scene' Spring Meadow (F021).

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

Grass mat:

The grass mat was cut to the desired shape to locate the model on. The mat was then laid onto the display base and positioned to ensure the display top, when located, would clear the model. A soft silver leaded pencil was used to lightly trace the outline of the mat on the display base. Inside the marked area was scuffed using sand paper, to provide a grip surface for the adhesive. PVA (white glue) adhesive was then applied to the scuffed area and the grass mat was then laid back onto the base and aligned to the pencil outline, then gently pushed down to make proper contact. The grass mat was covered with a sheet of paper and several heavy books were then stacked onto the paper, to press the grass mat fully in contact with the display base. The books and paper were removed after several hours, when the edges of the grass mat were checked for contact (apply more PVA adhesive if not). The grass was then gently brushed to remove any flatness and loose strands.

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 base. However, the location of the wheels and tail skids were scored through the grass mat to give the model a more positive location.

Figures and accessories:

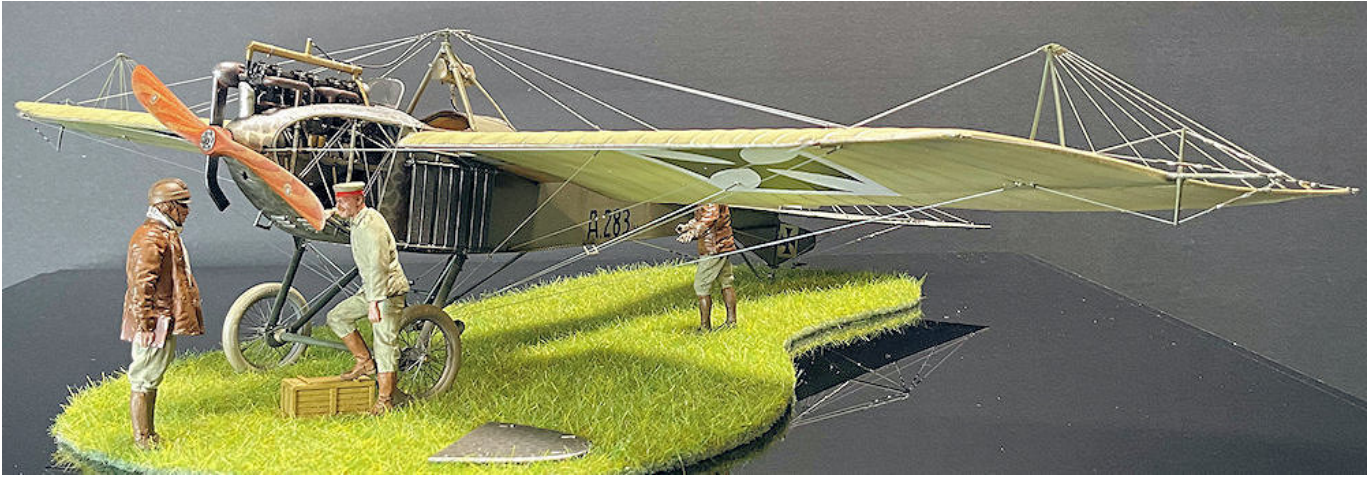
With the model positioned on the grass mat, the figures and crate were positioned on the base in their final positions and the locations of the locating rods in the legs of the figures were marked on the grass mat. The location of the crate was marked on the mat.

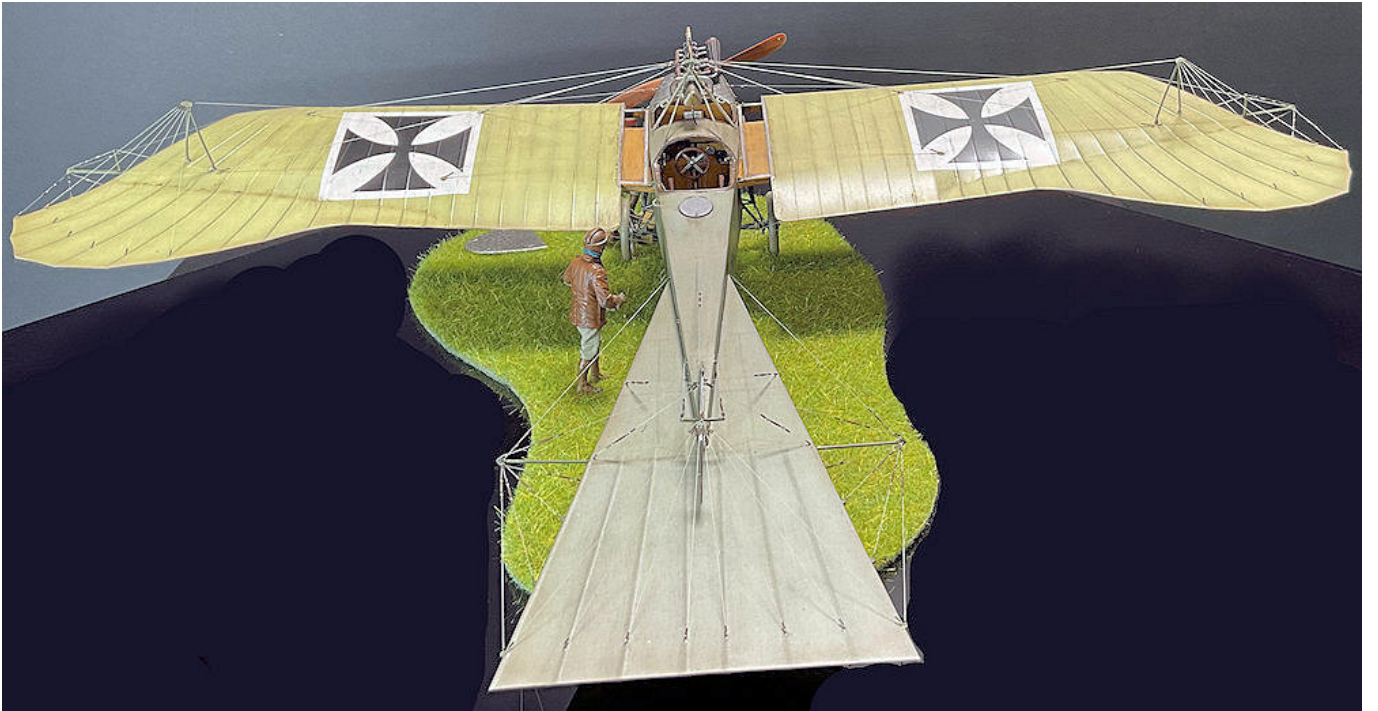
At each rod marking, a hole of 1.0 mm was drilled through the grass mat and into (not through) the base plinth. The location of the crate was cut through the grass mat to the display base and the crate was then secured in the cut-out using CA adhesive. PVA or thin CA adhesive was then applied to the rods of the figures, which were then carefully fully located into their drilled holes in the display base. Light pressure was applied to the figure to ensure it was fully located into the base.

Information plaque:

The acrylic stand for the information plaque was scuffed with sand paper on its bottom surface. It was then positioned in the left corner of the display base and its outline lightly scored with a pointed scribe. 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.

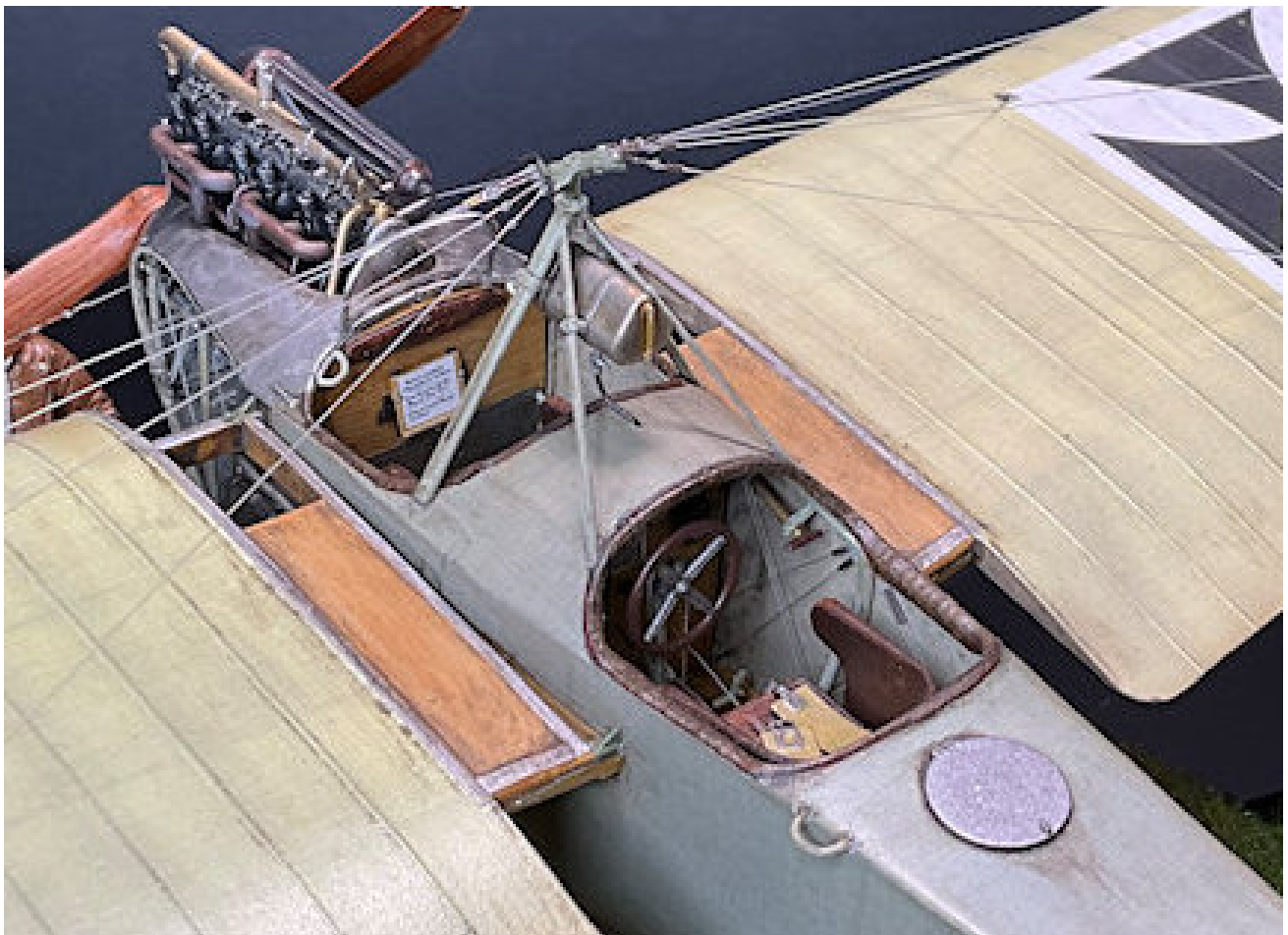
PART 14
COMPLETED
MODEL
PHOTOGRAPHS

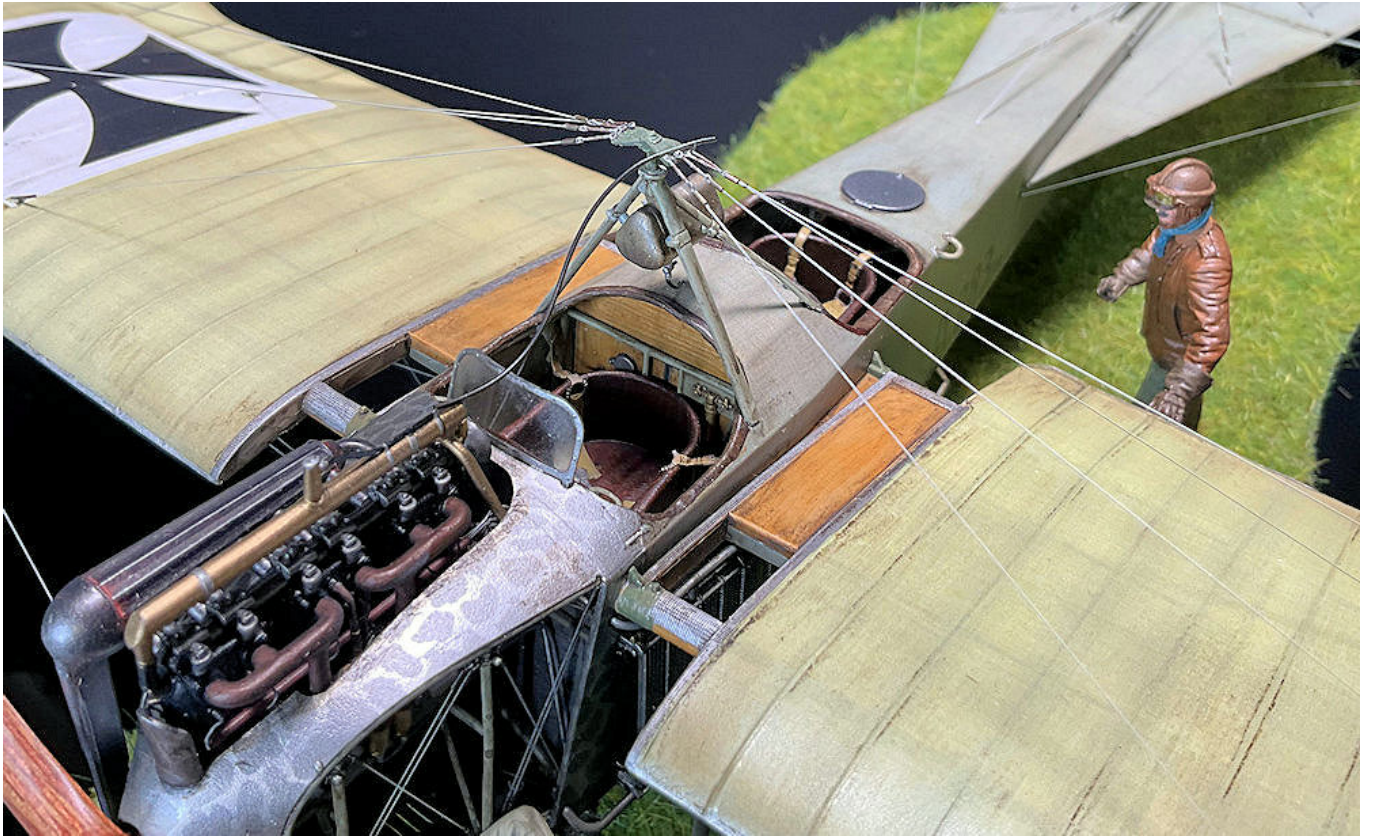












END