
# World War One Aircraft Models

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

I started modeling again a few years ago and now enjoy the challenge of building aircraft of World War One. Since posting photographs of my completed models online, several people have asked if I would create a 'build log' for future builds.

I don't consider myself a 'master' of this craft, but hope to be able to pass on what I have learned. As such, here is my build log, covering the 1:32 scale model of the 'Caproni-Pensuti (AP-1) triplane from 'Mikro-Mir'.

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# INTRODUCTION

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

# AFTER MARKET

## AFTER MARKET

### Figure

'Copper State Models' French seated airman (F32-050).

### Decals

'Airscale' Generic WW1 instrument dial decals (AS32 WW1),
'Aviattic' clear backed Clear Doped Linen 'bleached' (ATT32044).

### Photo-etch

'Airscale' Instrument Bezels (PE32 BEZ)
'PART' 1:48th scale generic control horns (S48-087).

### Rigging accessories (as required)

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

### Sundries (as required)

Paints ('Tamiya' Acrylic, Humbrol Acrylic, 'Mr. Metal Colour', 'MRP' acrylic lacquers,
'AK Interactive' Primer (Grey AK758, White AK759) and various black top paints,
'Alclad II' Lacquers, 'Tamiya' Fine Surface Primer (Grey/White), 'Mig' A-Stand Aqua Gloss (A.Mig-2503),
'Vallejo' Model Colour', 'Mr. Surfacer' 500/1000/1200, 'Mr. Colour' Levelling Thinners 400,
'Mr. Colour' Rapid Thinners, PVA Adhesive (e.g. 'MicroScale' Micro Krystal Clear), 'UHU' White Tack,
'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', 'Windsor & Newton' Griffin Alkyd oil paint,
'EZ' black stretch line (Fine), 'Black-It' solution, 'MFH' 0.4 mm clear flexible tube (P-957),
'VMS' Metal Prep 4K.

### Weathering mediums (as required)

'Flory Models' Clay washes or Pigments, 'AK Interactive' (Kerosene AK-2039, Oil AK-2019),
'Tamiya' Weathering Master (Set C, D and E).

### Display Base

'Model Scene' cut meadow - Spring (F001),
'Inperspective' custom made Acrylic base and cover,
Information plaque from 'TLS Engraving Ltd'.

# THE AIRCRAFT

# THE AIRCRAFT

**This model represent the Italian Caproni-Pensuti (AP-1) civilian triplane of 1918.**

References:

*Online resources.*

Background:

Emilio Pensuti was a test pilot for the Italian company 'Caproni' (Società Per Lo Sviluppo in Italia). During 1918 he designed a small triplane aircraft, which he hoped could be flown by anyone and would become the 'bicycle of the air'.
The Caproni-Pensuti (AP-1) was a small single-engine sports triplane aircraft designed and built at Caproni in Italy just before the end of World War I.
The aircraft was a very compact, low-powered triplane. The single-seat triplane had unswept rectangular wings, each with a full span of only 4 m (13 ft 1 in). These were mounted without stagger, each wing braced to the one below by two pairs of vertical, parallel interplane struts, one pair out beyond mid-span and the other from the fuselage sides. The central wing was attached to the upper fuselage and the other two held well clear of it by the struts. There were ailerons on the upper and lower wings.
The Pensuti had a simple rectangular cross-section fuselage, with the open cockpit at the wing trailing edge. A three cylinder, inverted Y configuration Anzani air-cooled engine of 26 kW (35 hp) in the nose drove a two-blade propeller. The triplane had a fixed undercarriage of wide track, with a single wheel at each end of a single axle with its extremities attached to extensions of the outer interplane struts.
Its cruciform tail had horizontal surfaces mounted on the top of the fuselage; the vertical surface was trapezoidal and extended equally above and below the fuselage. A small tailskid was carried on its lower tip.
Unfortunately, Emilio Pensuti was killed in an unrelated aircraft accident and the maiden flight was delayed. It wasn't until the 10th of February1919 that its first flight took place at Vizzola, piloted by Lt. Lodovico Montegani. The intention of the pilot was only to taxi the machine pending its engine tuning. So, he started with a throttled engine. Halfway down the airfield, because of uneven ground, the machine bounced into the air. Montegani felt from that jump that the triplane had good lift and was well balanced. Then, he gave more throttle, pulled the control column, and found himself flying.
On later test flights, Montegani flew for 30 minutes and even longer. The tiny triplane climbed up to 1000 meters, performed turn, spirals, dives and pull-outs.
From these tests the following data could be taken, maximum and minimum speed 90 and 35 km/h respectively. Take-off and landing runs, 15 meters each, stop included. The engine an old, renewed and proven 35 hp Anzani.

## General characteristics:

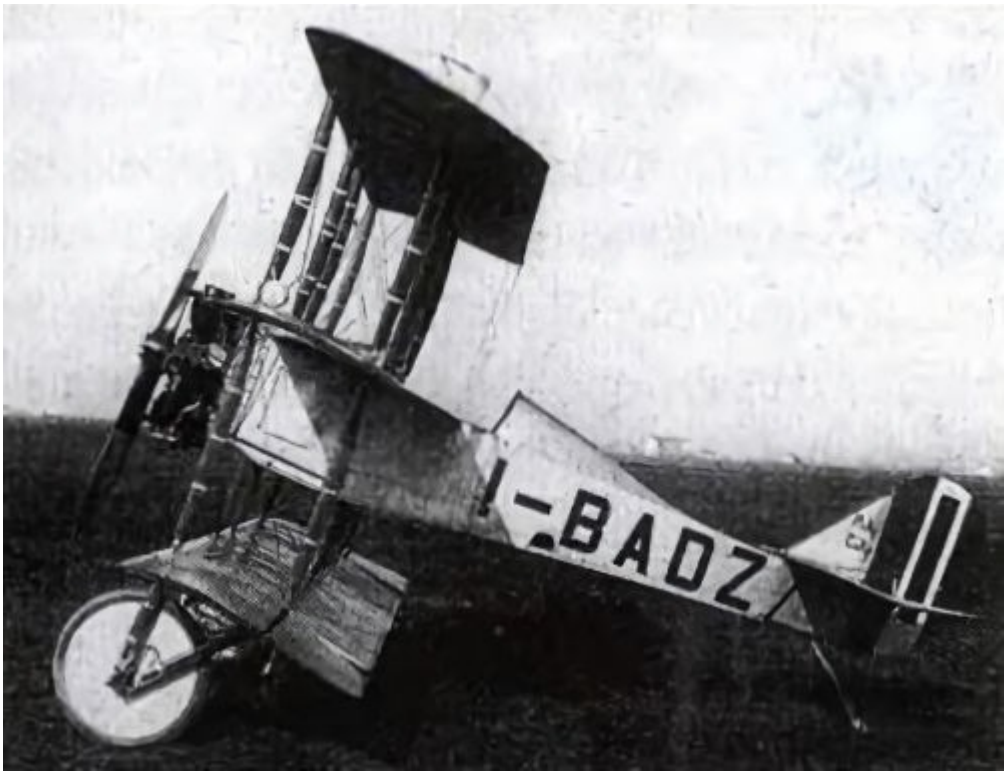
**Crew:** one
**Length:** 3.80 m (12 ft 6 in)
**Wingspan:** 4.0 m (13 ft 1 in) all wings
**Height:** 2.40 m (7 ft 10 in)
**Gross weight:** 230 kg (507 lb) in flight with pilot
**Powerplant:** 1 × Anzani inverted-Y 3-cylinder air-cooled engine, 26 kW (35 hp)
**Propellers:** 2-bladed

## Performance:

**Maximum speed:** 95 km/h (59 mph, 51 kn)
**Stall speed:** 40 km/h (25 mph, 22 kn)
**Rate of climb:** 1.1 m/s (220 ft/min)
**Take-of and landing distances:** 20 m (66 ft).


Kees Kort Collection
PENSUTI
D.T 8½ TRIPLANO PENSUTI

After the war the Pensuti family sold the rights to the aircraft design to the ‘Breda’ company. A second aircraft with a redesigned tail, Anzani 10-cylinder radial engine and other modifications was built at the Breda factory in Milan as the Breda B.1. The aircraft was registered I-BADZ and it gained the second prize at the Italian low-powered aircraft competition held in the summer of 1920 in Milan.



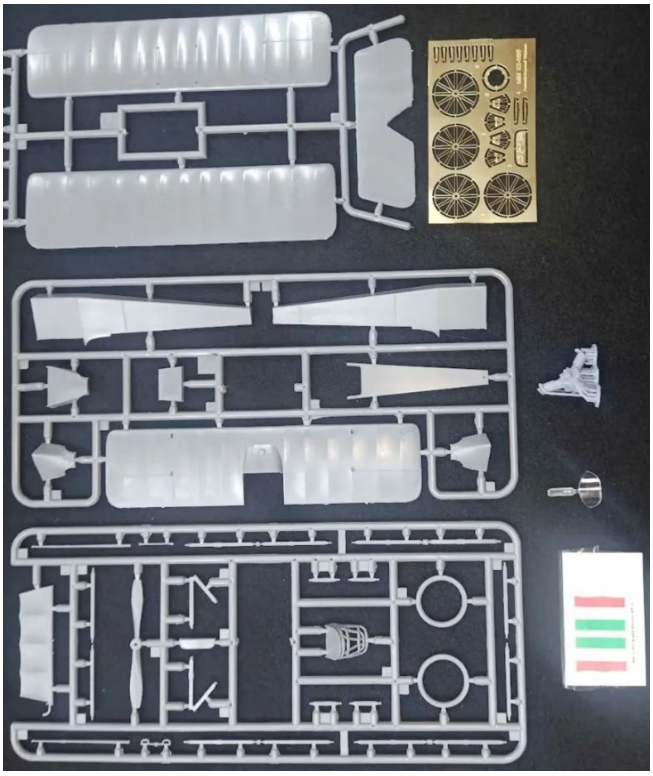
# PART 1
# MODEL DESCRIPTION

## PART 1 - MODEL DESCRIPTION

'Mikro-Mir' - (Kit MM32-005)

This model from 'Mikro-Mir' is a new tool, but having said that, the quality of the parts leaves something to be desired.

The kit parts are supplied in a rather flimsy, stapled together box. The instructions consists of a single, folded sheet with information and a parts call-out on the front page, basic assembly instructions on pages 2, 3 and 4 with a colour profile also on page 4. The injection molded parts are fairly basic with little detail, especially in the cockpit, which has just a seat, control column, rudder bar and instrument panel. The pilots seat is of a design I've not seen before, so I can't vouch for its accuracy. Also most parts have some mold flash and will need cleaning up. The Anzani three cylinder engine is 3D printed. A photo-etch sheet provides parts for the wheels, landing gear, instrument panel, control horns and engine. A clear windscreen is also provided, as is a decal sheet for the rudder.



Inspection of the instructions and parts shows some areas that will need to be addressed during the build:

Some surface imperfections.

Mold flash on parts.

Aileron outline on top surface of centre wing - not required.

Interplane and cabane struts - too flimsy and may need to be replaced.

Landing gear axle long and in two parts - too fragile.

Wings identification not correct in instructions.

No locations for landing gear 'V' struts on underside of lower wing.

No locations for fuselage cabane struts in top surface of centre wing and underside of upper wing.

Locations for outer interplane struts blocked - need opening through.

No locations for upper wing aileron control horns.

Fuel vent pipe required below the fuselage under the cockpit.

# PART 2
# WOOD EFFECTS
# (General)

## PART 2 - WOOD EFFECTS (General)

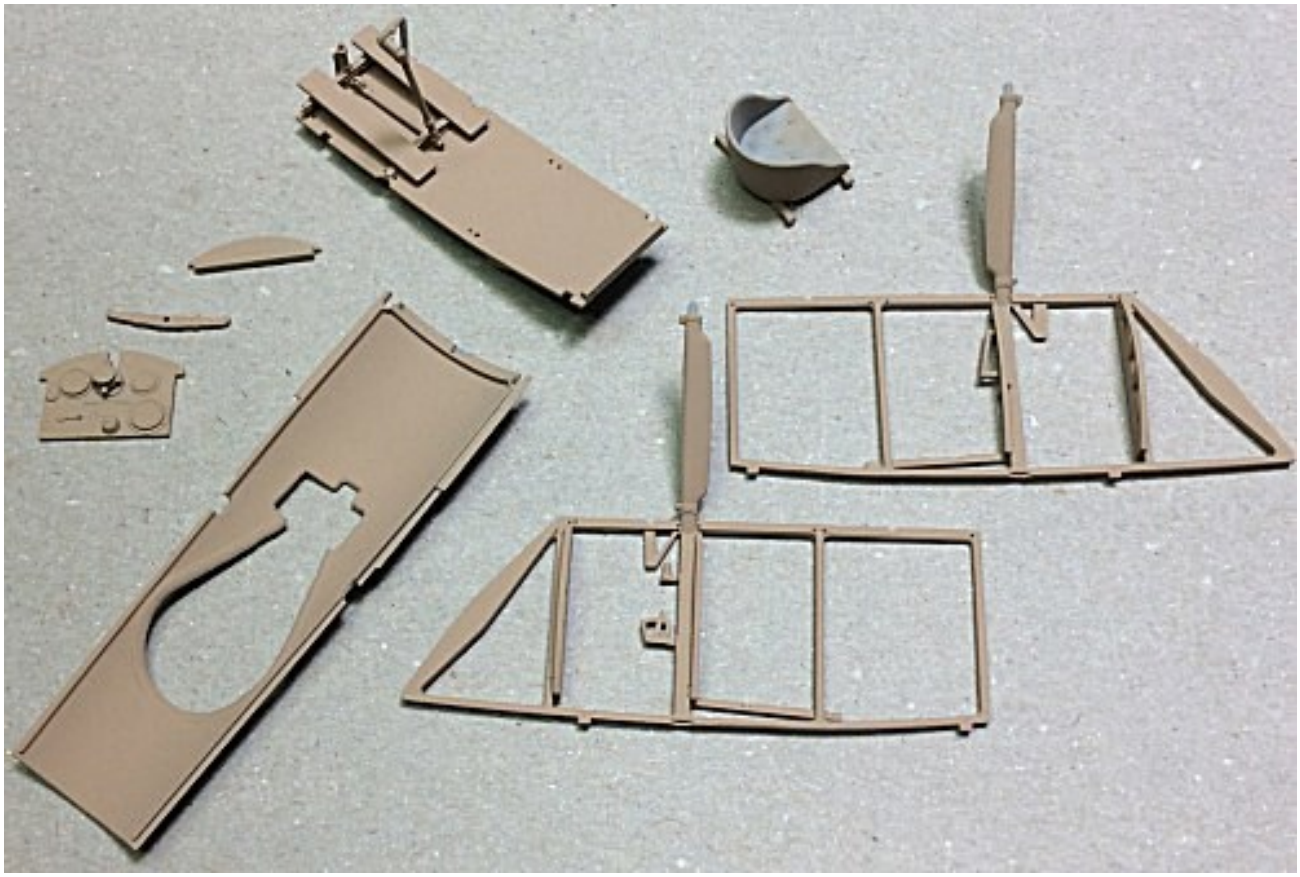
A basic technique:

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

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

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

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



**Wood effect - Method 1:**

DecoArt Crafters Acrylic' paints:

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

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

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

Once painting is complete, clean the brush in water.

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.

**Wood effect - Method 2:**

Windsor & Newton' Griffin (Alkyd) oil paints:

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

Mask off the area as required.

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

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

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

Leave the oil paint to settle for about ten minutes.

Decant a small amount of White Spirits or 'AMMO Mig' enamel odourless thinners (A.Mig-2019), into a suitable dish.

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

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

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

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

If desired and once the oil paint is fully dry, airbrush a semi-gloss clear coat, such as 'Tamiya' Semi-Gloss (X35) or similar to give a varnished look to the finish.

# PART 3
# WEATHERING
# (General)

## PART 3 - WEATHERING (General)

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

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

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

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

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

To apply the clay wash is just a matter of brushing all over the surface to be weathered. It doesn't matter really how much is applied as it can be left on for any period, as it is easily removed without any effect on the surface underneath. If you don't achieve your desired effect, you can wash it all off and start again. I use a soft brush, which has been very slightly dampened, to brush off the clay wash. For smearing effects, a very slightly damp brush or absorbent paper should be used, but even then I dab them onto a dry piece of the paper, until it's almost dry. Any wetter and you'll find that you are removing too much of the clay wash. If that happens you would have to re-apply the wash and start again. That said, if you're not happy with the final effect, you can easily remove the clay wash by brushing with a wet brush or even airbrush water over the surface. Dry off the surfaces washed and then re-apply the clay wash and try again until you are satisfied. The technique is to 'damp' brush or wipe over the surface to re-activate the clay wash and at the same time, to smear it over areas that had no clay wash. It'll dry more or less straight away. Then I'll very lightly brush and/or use a piece of damp absorbent paper to remove as much as I want until I get the desired effect. If I remove too much I just reapply clay wash to that area and repeat the removal procedure. Once finished, just run the brush under a tap to rinse out any residual clay pigments. Finally I usually seal the surface with an airbrushed semi-gloss clear coat, such as '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 semi-gloss clear coat, such as 'Tamiya' Semi-Gloss (X35) or similar.

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


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


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

**Water colour pencils:**

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

**Oil paint:**

A technique used more frequently now is oil paint ‘dot and drag’. Basically an oil paint of the desired colour is placed onto a piece of cardboard, which over a hour or so, soaks out the oil in the paint, leaving a drier pigment. The pigment is ‘dotted’ onto the painted surface where it is required then dragged with a brush previously wetted with ‘Tamiya’ X20 enamel thinners or similar, then wiped virtually dry.

Softly ‘flick’ the brush to drag the pigment in the direction required, which will blend it in a thin layer.

The amount of pigment left showing depends on the effect you require. Always keep the brush wiped clean to avoid a build up of pigment and remoisten and wipe dry often. The more paint you drag, the less pigment is left showing. Blending different coloured pigments can create stains from smoke/ gun blast, rain marks/runs, dirt/dust and oil/fuel stains.

A good quality oil paint and thinners are essential to produce a good finish.

Some oil paints can be too ‘gritty’ once leached of the oil, so I use ‘Abteilung 502’ oil paints thinned with ‘Tamiya’ Enamel thinners (X20).


# PART 4
# DECALS
# (General)

# PART 4 - DECALS

## ‘Standard’ decals:

General:

The kit supplied decals are printed on an inkjet printed and then sealed with two coats of clear sealer. The decals are supplied as two sheets and printed as ’clear backed’ and ‘white backed’.

*‘Clear’ backed decals:*

The decal carrier film is translucent and therefore the colour of the surface under the decal, when applied to the model, will be seen. This type of decal can be used when the surface under the decal has been painted with an appropriate colour, with pre-shading applied or not, as desired. The colour of the base coat will affect the final shade of the applied decal. The sheet does contain duplicate decals, so if unsure, a decal can be applied on a base coated test piece, to check for any colour shift on the applied decal.

*‘White’ backed decals:*

The decal carrier film is coloured white and therefore the colour of the surface under the decal when applied to the model, should not be seen. This type of decal can be used over any base colour. However, if the decal carrier film is slightly translucent, the base colour may affect the final shade of the decal colour. The sheet does contain duplicate decals, so if unsure, a decal can be applied on a base coated test piece, to check for any colour shift on the applied decal.

Application:

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

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

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

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

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

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

Carefully move the decal into the correct position.

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

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

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

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

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

**‘Aviattic’ decals:**

The ‘Aviattic’ decals are different in both production techniques and application to those of the more traditional decal manufacturers. Traditional decals are normally created using processes such as silk screen printing and are pre-shaped for the particular model markings. When placed in warm water they will detach from the backing sheet and can then be slid onto the model surface and when they are correctly positioned, wiped with a semi-dry brush or cotton bud etc, to expel any water from under the decal. Once fully dry, decal softeners, such as ‘MicroSol’ and/or ‘MicroSet’ can be applied, if necessary, to ’weld’ the decal to the model surface. Finally a sealing coat of acrylic or lacquer gloss, semi-matt or flat is applied over the decal, to seal and protect the seal and protect the decal.
The ‘Aviattic’ decals are laser printed onto a very fine carrier film and although this film is thin, the decals are remarkably resilient and somewhat ‘stretchy’ when being applied. This allows them to be more easily moved and positioned before being finally applied. Also with most other decals, I’ve used softeners to help the decals conform to surface irregularities and contours, which is something I’ve found is not really required for ’Aviattic’ decals, due to the nature of the carrier film. In addition, unless the decals has been printed pre-shaped (‘cookie cut’), the decals will need to be cut out from the sheet, so care is required to cut the decals accurately to avoid leaving gaps, especially at the edges, where the white base colour will show. That said, minor gaps may be able to be covered with weathering. For more information, refer to the ‘Aviattic’ instruction sheet supplied with the decals.
Aviattic’ decals are laser printed onto either ‘clear’ or ‘white’ backing, the ‘clear’ being dependent on the base coat you apply and the finished effect you desire. The decals are supplied with very clear instructions on their application, including when to add pre-shading to the base coat, where desired, before you apply the decals.

Application:

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

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

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

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

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

Soak each decal in warm water for approximately 20 seconds.

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

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

Align the decal to the shape of the model part.

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

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

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

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

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

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

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

# PART 5
# RESIN (General)

## PART 5 - RESIN

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

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

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

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

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

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

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

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

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

# PART 6
# RIGGING
# (General)

## PART 6 - RIGGING (General)

References:

*Online resources.*

**General:**

It's important to check where the various rigging attachment points are for this aircraft. Most models have these located on the model, but it's best to carry out research in reference books or research on line before drilling. Some modellers use micro drills manufactured for drilling printed circuit boards etc and these drill bits sometimes have identifying coloured collars fitted to the drill shanks. I have found that care needs to be taken when using these drills, as they are sharp and instead of easing their way into the plastic of the model, they tend to bite in and effectively 'cork screw' their way in, which causes jamming and lots of broken drills. This is not only expensive but can leave broken drill bits in the model, which are virtually impossible to extract. An alternative is to use High Speed Steel (HSS) drill bits, which are cheaper and have less 'bite' when in use, although again, they are very fragile and can very easily be broken.

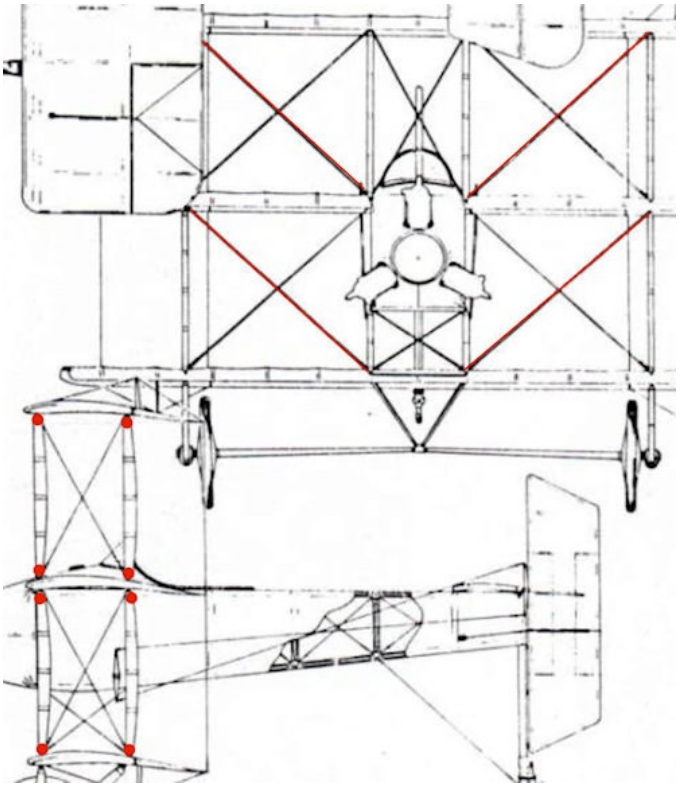
Some modellers drill through the wings etc of the model and rig by pulling through the rigging line/EZ thread etc, gluing in position and then rubbing down the exposed line 'tag' and then re-painting that area. I prefer to drill only part way into the plastic and attach the applicable rigging fixture with CA adhesive.

With your research complete the rigging can be planned for the model in the subsequent Parts of this build log.

For the primary rigging, such as flying and landing wires and cross bracing wires, I used 'Steelon' or 'Stroft GTM' mono-filament (fishing line) of 0.12 mm diameter and for flight controls and 0.08 mm for flight control cables. These are effectively transparent, but airbrushed with a semi-matte clear coat, do give a look of steel and without the need of painting or colouring with a gel pen. The turnbuckles used are either sintered metal or resin and can be obtained from such as 'Gaspatch Models' or 'Proper Plane'.

**NOTE:** *The kit instructions, online photographs and an online rigging diagram differ in how the rigging of this aircraft was fitted. The best information can be seen on the photograph below. Particularly difficult to ascertain is the flight control cables and bracing wires fitted at the tail of the aircraft. Additionally there is no information for inside the cockpit. Therefore, much is based on guesswork and assumption.*

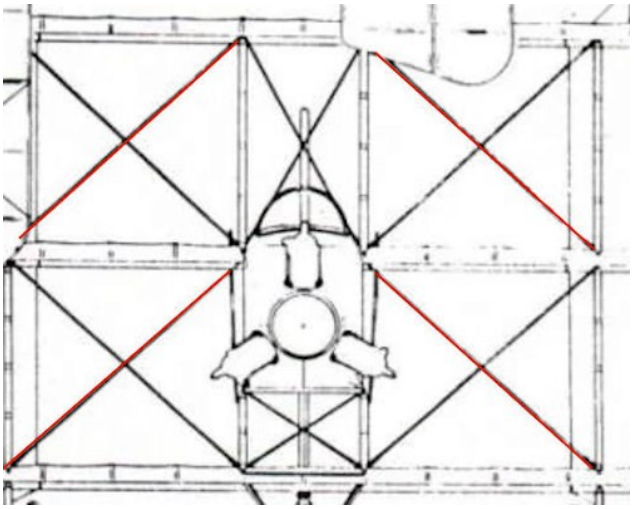
**Structural rigging:**



Flying wires:

Flying wires were fitted between bottom of the front and rear fuselage cabane struts and the top of the outer interplane struts.

Turnbuckles would have been fitted at the lower ends of the wires.

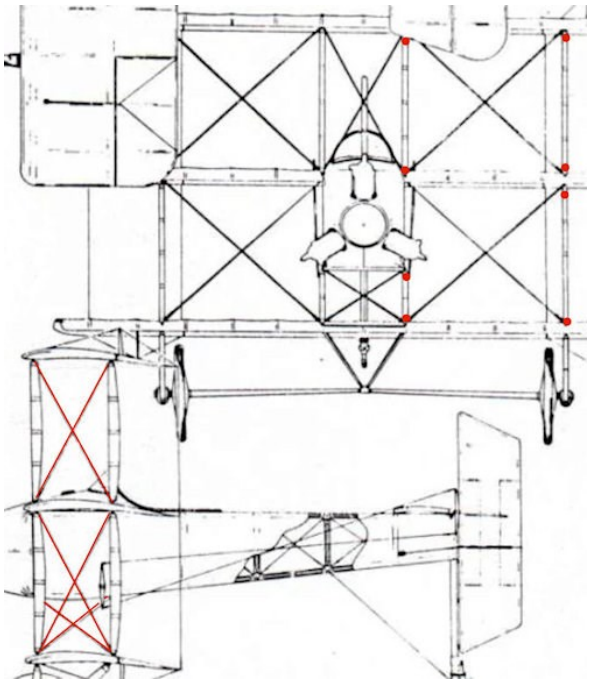


Landing wires:

Landing wires were fitted between top of the front and rear upper fuselage cabane struts and the bottom of the outer interplane struts.

Landing wires were also fitted between underside of the centre wing (below the front and rear upper fuselage cabane struts) and the bottom of the outer interplane struts.

Turnbuckles would have been fitted at the lower ends of the wires.



Incidence wires:

Diagonally crossed incidence wires were fitted between top and bottom of the outer interplane struts.

Diagonally crossed incidence wires were also fitted between top and bottom of the upper and lower fuselage cabane struts.

Turnbuckles would have been fitted at the lower ends of the wires.

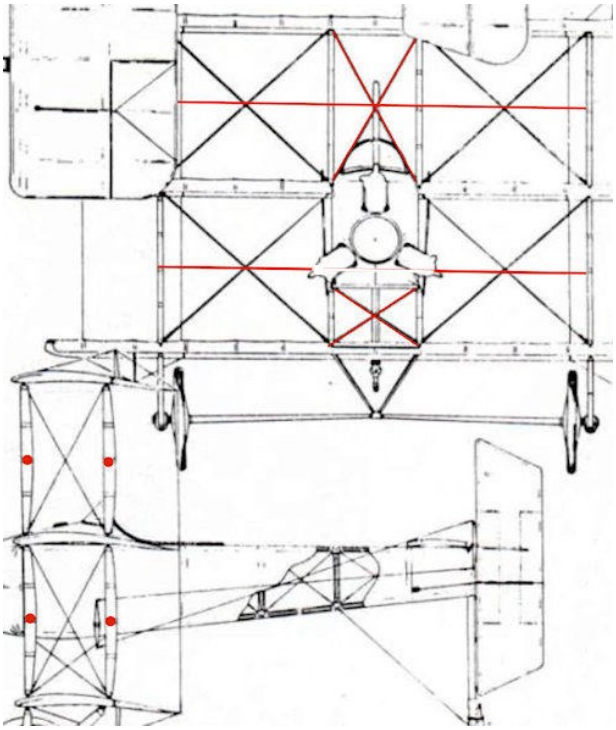
Bracing wires:

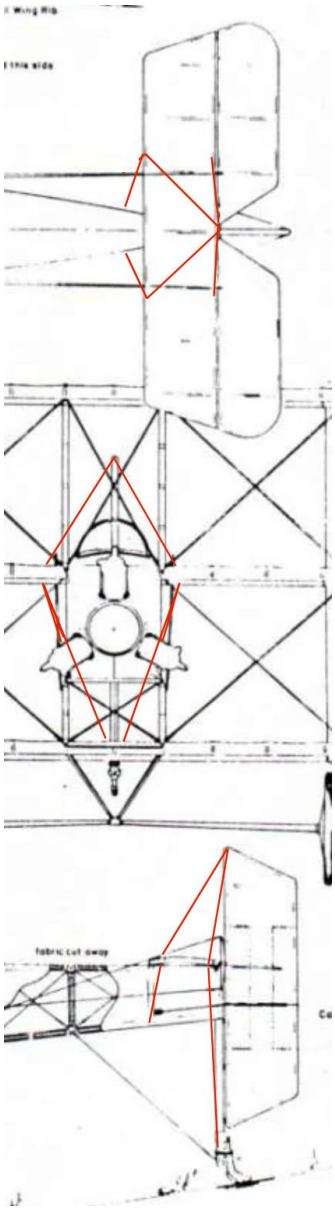
A horizontal bracing wire was fitted across the upper and centre wings. The wire was routed between the outer, forward interplane struts and across the fuselage, forward upper cabane struts and was positioned midway up the struts. A second horizontal bracing wire was fitted across the same, but rear struts.

Horizontal bracing wires were similarly fitted to the interplane struts of the centre and lower wings, but were routed into the sides of the fuselage.

Diagonally crossed bracing wires were fitted between top and bottom of the front and rear underside fuselage cabane struts and only between top and bottom of the front upper fuselage cabane struts.

Turnbuckles would have been fitted at the lower end of the cabane bracing wires and at the fuselage sides.





Fin bracing wires:

Fin bracing wires were fitted on both sides if the tail unit, between the bottom edge of the fuselage rear and up through the leading edge of the tailplanes to the top of the rudder post.

Also, bracing wires were fitted on both sides if the tail unit, between the bottom of the rudder posy and up through the trailing edge of the tailplanes to the top of the rudder post.

Turnbuckles would have been fitted at the tailplane ends of the wires.

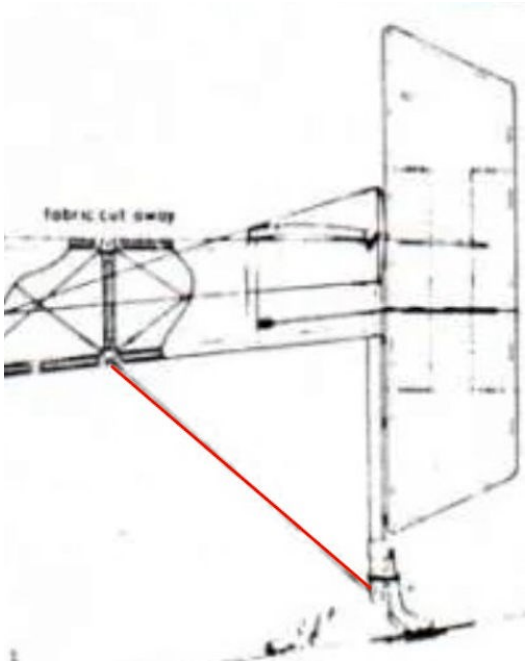
Rudder/tail skid control cables:

**NOTE:** *The later Pensuti 2 version had a more conventional tail unit and its rudder control cables were routed from the fuselage, rear sides to control horns fitted in the rudder.*

It seems that the two rudder control cables were routed between the underside, rear of the fuselage and the bottom of the rudder post, at the tail skid. This would enable the pilot to operate the rudder inflight and also to steer the aircraft, using the tail skid, when on the ground. Therefore, a double ended control horn was most likely fitted to the bottom of the rudder post.

Turnbuckles were fitted in the control cables below the fuselage rear.

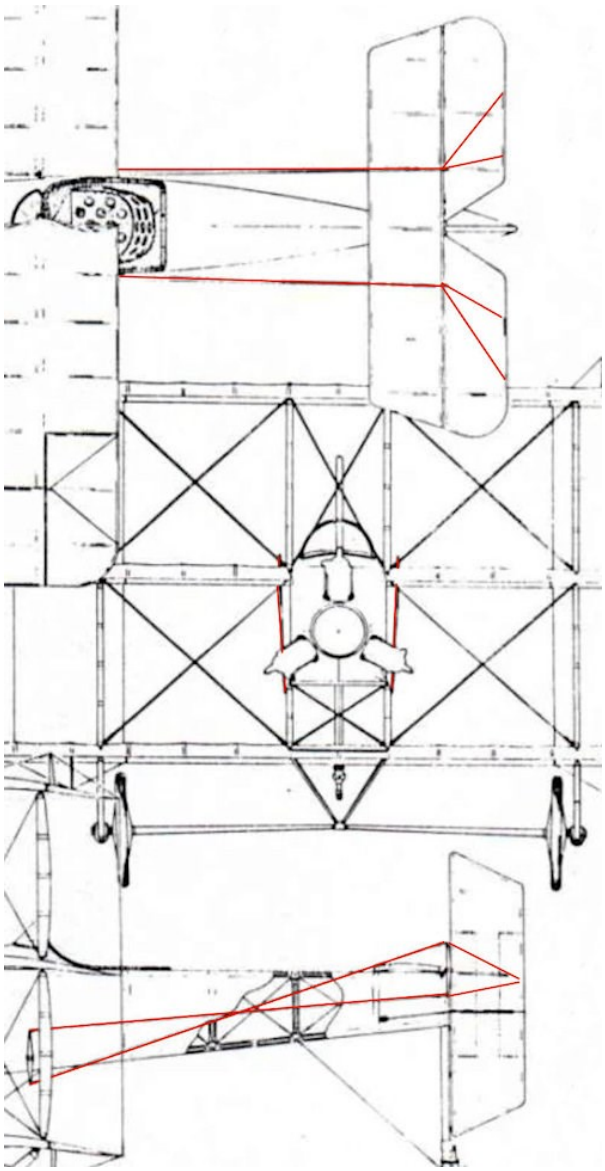
As the pilot moved the rudder bar left or right, the rudder and tail skid would be moved move left or right, causing the aircraft to swing (yaw) in the required direction.




Elevator control cables:

Elevator control cables were attached to the ends of external control levers, which were attached to the cross bar of the pilots control column. The external cables were routed rearwards and crossed to be attached to the ends of the upper and underside control horns on the elevator. Two separate wires were attached to the ends of the upper and the underside control horns and routed rearwards and through the trailing edges of the elevator. Turnbuckles were fitted to the cables at the external elevator control levers.

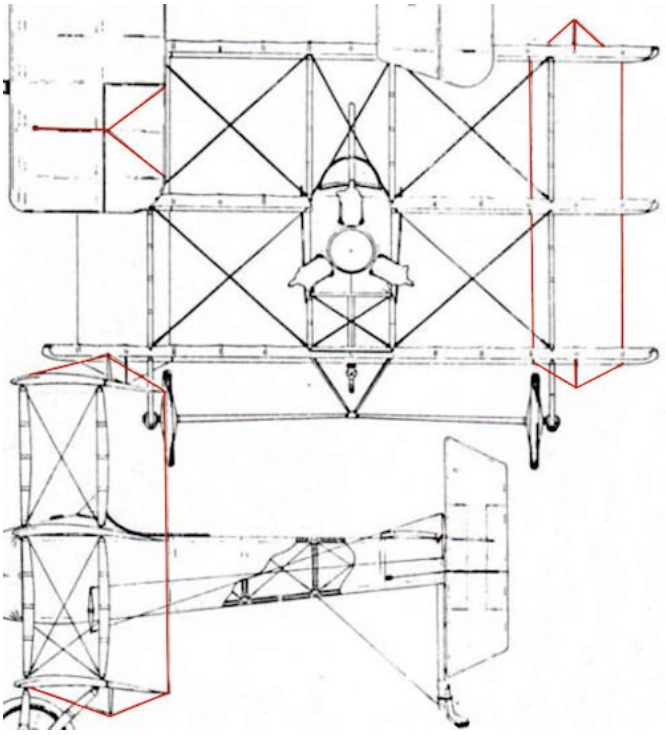
As the pilot moved the control column forwards or rearwards, the cross bar would turn the elevator control levers, causing the cables to either lift or lower the elevator. This caused the aircraft to climb or dive (pitch).



Aileron control cables:

**NOTE:** *It's not known how the cockpit aileron control cables were routed out to the ailerons.*

Aileron control cables from the top surface of the upper wing were routed rearwards and attached to the ends of the upper aileron control horns. Two cables from the control horns were routed rearwards and through the trailing edge of the upper aileron, then down through the trailing edges of the centre and lower wings. The cables were then attached to the ends of the control horns on the underside of the lower wing ailerons. A cable attached to the end of those control horns was routed forwards and into the underside of the lower wings.



Turnbuckles would most likely have been fitted in the control cables at the forward, wing sides of the aileron control horns.

As the pilot moved the control column left or right, the cables caused one aileron in the upper wings to lift and the other to lower. This caused the aircraft to turn left or right (roll).

# PART 7
# PROPELLER

## PART 7 - PROPELLER

Preparation:

Remove the propeller from its mold gate.

Sand away any residual gate stubs, mold flash or seams.

Painting:

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

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

*Wood effect:*

**NOTE:** *Refer to Part 2 (Wood Effects) of this build log for detail of applying wood effects using the ‘Windsor & Newton’ Griffin Alkyd oil paints.*

Apply the wood effect to the propeller by brushing with ‘Windsor & Newton’ Griffin Alkyd Burnt Umber oil paint.

Once fully dry, carefully brush paint the propeller hub plates with ‘Mr. Colour’ stainless Steel (213) or similar.

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

Lightly brush ‘AK Interactive’ Kerosene wash onto the painted propeller hub plates.

# PART 8
# PREPARATION

## PART 8 - PREPARATION

References:

*Online resources.*

**NOTE:** *Due to the various changes required to better reflect the actual aircraft, modifications to model parts are necessary before construction of the model can begin. Remove the model parts required from their mold gates and file or sand away any gate stubs mold flash or seam lines from their edges.*

Fuselage:

**NOTE:** *The fuselage halves have no locating recesses or pegs. To give a more positive joint, plastic card tabs were added.*

Cut three rectangular strips of 0.8 mm thick plastic card.

Cement two of the strips half way across the internal rear, bottom of a fuselage half and rear of the cockpit.

Cement the remaining strip half way across the internal forward, bottom of the fuselage half just behind the vertical front edge.

Apply cement to the underside of the three strips then locate the other fuselage half onto the strips, making sure the underside and rear of the two fuselage halves are aligned.

Apply cement internally along the bottom fuselage seam and at the rear edge joint.

Cement the top, rear fuselage panel onto the fuselage, making sure the molded recess at the rear end is on the top and the front ‘legs’ are fully forward. Also that the panel sides are aligned to the fuselage sides.

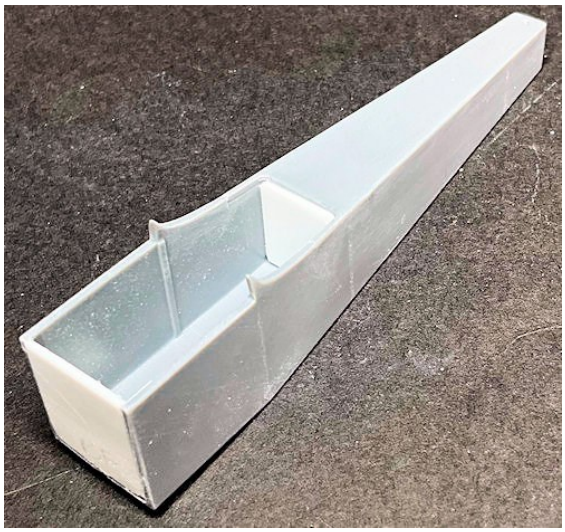
**NOTE:** *The fuselage has no internal bulkhead behind the pilots seat or behind the engine.*

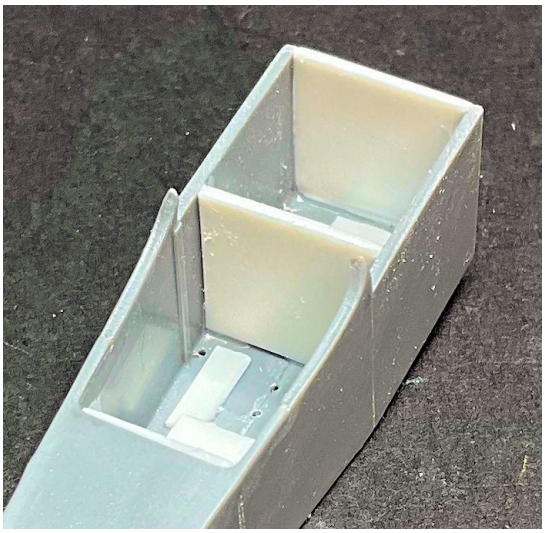
Cut three rectangles of 0.8 mm thick plastic card.

File or sand one rectangle to fit into the rear of the cockpit, against the slight shoulders molded in the fuselage sides and top.

File or sand one rectangle to fit into the cockpit forward from the pre-molded vertical members.

File or sand the remaining rectangle to fit into the front of the fuselage and flush with the vertical front edges.





Once the adhesive has fully set, sand the fuselage joint seams at the sides of the top panel and at the underside joint to blend then with the surrounding surfaces.

Cockpit:

**NOTE:** *The cockpit area inside the fuselage has no detail, except for the pilots seat, rudder bar and control column. The seat needs to be raised slightly.*

I cut a square of 1.0 mm thick plastic card smaller than the seat base. This was cemented onto the fuselage floor to raise the seat slightly. A smaller piece of 0.8 mm thick plastic card was cut and cemented on the front of the previous card to tilt the seat slightly rearwards.

Two strips of 0.8 mm thick plastic card were cut and cemented onto the fuselage floor to represent the pilots foot boards.

A hole of 0.8 mm diameter was drilled into, **but not through**, the fuselage floor to locate the control column.

Centre wing:

Cement the bare instrument panel into its opening at the centre, rear of the centre wing. Make sure the panel is flush with the edges of the wing opening.

Once the adhesive has fully set, sand the instrument panel to blend it with the edges of the wing opening.

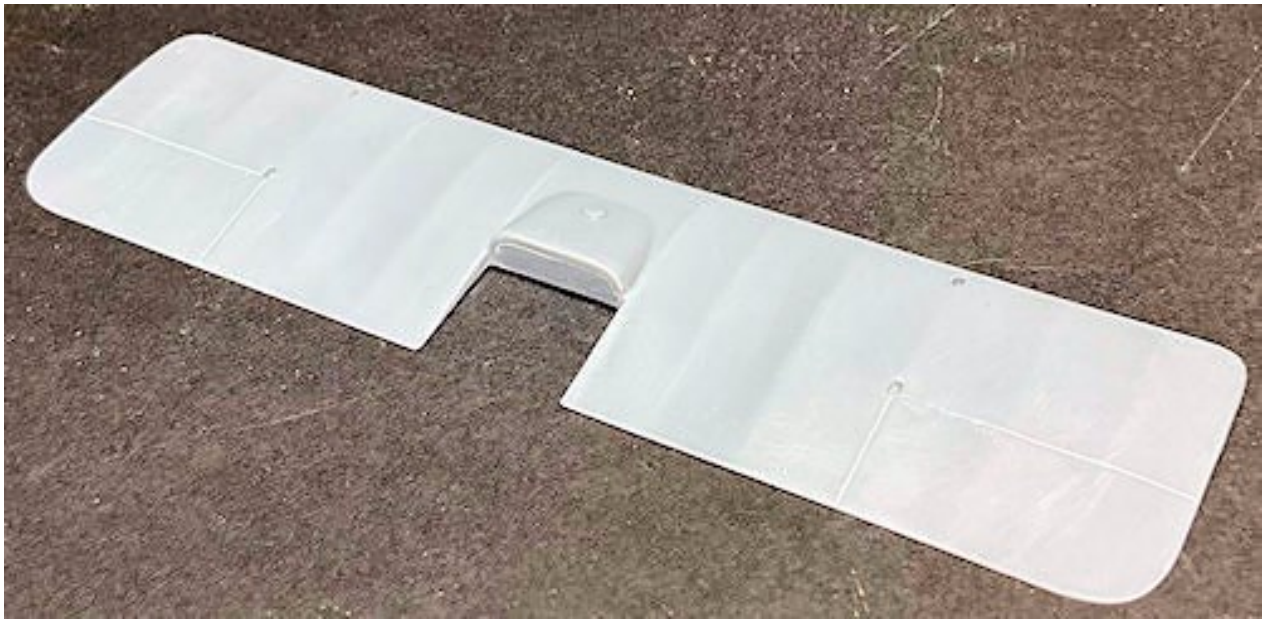
If necessary, brush several layers of ‘Mr. Surfacer’ 500 along the joint seam, then sand to blend with the surrounding surfaces.

Once fully set, sand away the residual surfacer flush with the surrounding surfaces

**NOTE:** *The pre-molded outlines of the ailerons on the upper surface are incorrect not required.*

Brush several layers of ‘Mr. Surfacer’ 500 along the pre-molded aileron outlines.

Once fully set, sand away the residual surfacer to leave the aileron outlines flush with the surrounding surfaces.



Pilots seat:

**NOTE:** *The pilots seat has mold flash along the edges of the seat separations on the rear of the seat.*

Carefully scrape away as much of the mold flash as possible from the edges of the seat separations on the seat back.

Smooth the edges by applying cement along the seams.

I added a resin seat cushion from my 'spares' collection. The cushion was sanded at the edges to fit into the pilots seat.

Photo-etch lap belts were added from my 'spares' collection. These were heat softened (annealed) over a naked flame then bent to fit over the sides of the seat.

Interplane struts:

**NOTE:** *I felt that the interplane struts required replacing and the wings modified for the following reasons:*

*The upper and lower wings have shallow recesses only to locate the interplane struts.*

*The centre wing has blocked locations, stopping the interplane struts passing through.*

*The four kit supplied interplane struts are too long and therefore weak and are rectangular in cross section (not aerofoil).*

Cut four lengths of 1.1 mm diameter Brass tube, such as 'Albion Alloy's' MBT11 or similar. The length of the tubes should be the same as a kit supplied interplane strut, but less the location pegs at both ends.

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

A Brass rod of 0.5 mm diameter, such as 'Albion Alloy's' MBT05, was passed through each tube and inserted into the 'Strutter' and then compressed.

The tubes were then removed from the 'Strutter' and the Brass rod removed.

Four lengths of 0.5 mm Brass rod were cut to a length 6 mm longer than the tubes.

The rods were inserted into the tubes with 3.0 mm protruding at each end.

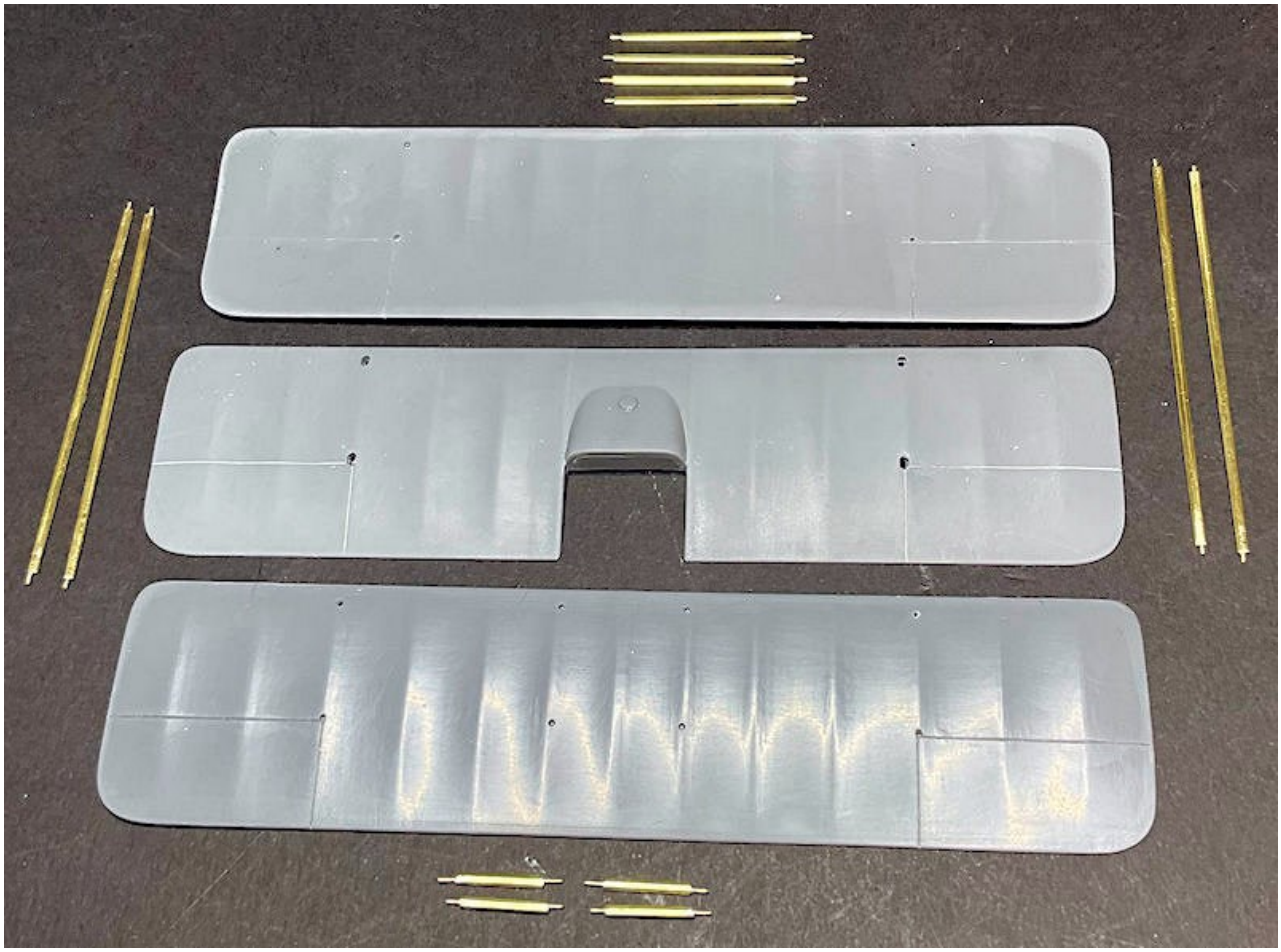
The rods were soft soldered in the tubes, after which residual solder was filed and sanded away.

Using as guides the shallow, pre-molded recesses for the interplane struts in the top surface of the lower wing, I drilled locating holes of 0.6 mm diameter into, **but not through**, the lower wing.

Using as guides the shallow, pre-molded recesses for the interplane struts in the underside of the upper wing, I drilled locating holes of 0.6 mm diameter into, **but not through**, the upper wing.

Trim the length of the protruding rods to make sure the struts fully locate against the wing surfaces.

Using as guides the pre-molded recesses for the interplane struts in the top surface of the centre wing, I drilled holes of 0.7 mm diameter the wing at each end on the recesses. The drill was then tilted to drill out the remaining plastic, creating 'pass through' slots for the created 219 interplane struts.



Cabane struts:

**NOTE:** *I felt that the cabane struts required replacing and the wings and fuselage modified for the following reasons:*

*The four fuselage upper cabane struts are rectangular in cross section (not aerofoil).*

*The four fuselage lower cabane struts are rectangular in cross section (not aerofoil).*

*The top surface of the centre wing has no locating recesses for the fuselage four upper cabane struts.*

*The underside of the upper wing has no locating recesses for the fuselage four upper cabane struts.*

*The locations in the top surface of the lower wing for the lower four cabane struts are wider than the fuselage width.*

The previous procedure was used to create Brass struts to replace (previous photograph):

The four lower cabane struts between the fuselage and lower wing.

The four upper cabane struts between the fuselage and upper wing.

*Lower cabane struts:*

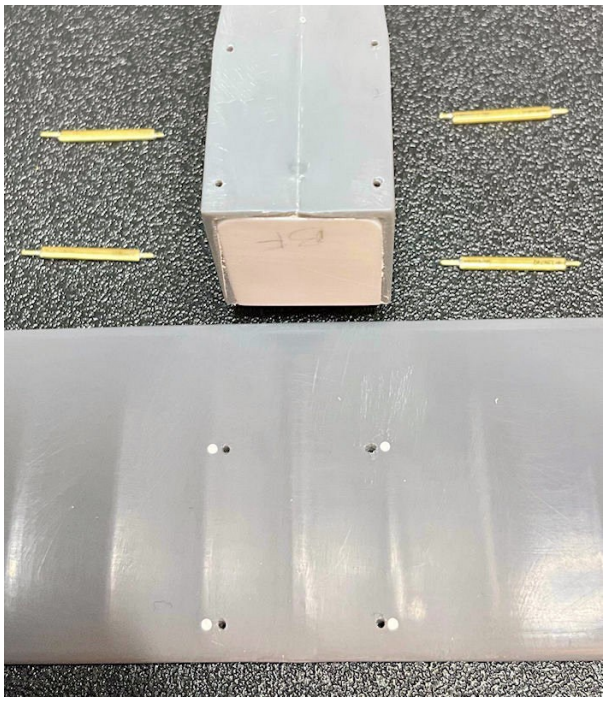
The four locating recesses in the centre, top surface of the lower wing, were filled with 'Perfect Plastic Putty' and when set, sanded to blend with the surrounding surfaces.

A 0.6 mm diameter drill was used to drill four locating holes through the lower wing (underside to be used to locate the axle centre support frame). The holes were drilled approximately 1.0 mm inboard from the original and now filled locating holes.

The fuselage was positioned onto the lower wing and centred between the original filled locating holes, with the fuselage front edge aligned over the wing leading edge.

Holding the fuselage and wing together, a 0.6 mm diameter drill was used to ’spot’ drill through the holes in the lower wing and onto the underside of the fuselage.

With the lower wing removed and using the ‘spot’ guides, the holes were drilled through the underside of the fuselage.

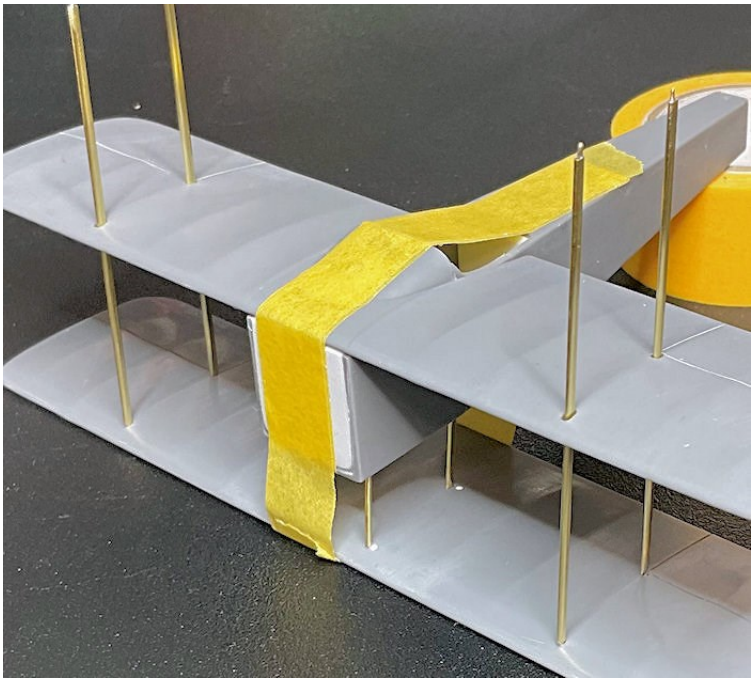


The centre wing was held in position on the fuselage using masking tape.

**NOTE:** *During the following step, use long strips of masking tape to hold the lower wing and struts temporarily to the fuselage.*

The four fuselage lower cabane struts were fitted into their fuselage and lower wing locating holes.

To check that all struts were aligned and vertical, the four interplane struts were test fitted through the centre wing and into their locating holes in the lower wing.



Remove all masking tape and remove the lower wing, centre wing and all struts.

Upper cabane struts:

A light pencil line was drawn across the top surface of the centre wing, between the centres of the created front and rear openings for the interplane struts.

Point marks were made in the wing where the drawn front line crossed the pre-molded rib tape lines.

Point marks were made in the wing, just outboard from where the drawn rear line met the rear edges of the fairing covering the instrument panel.

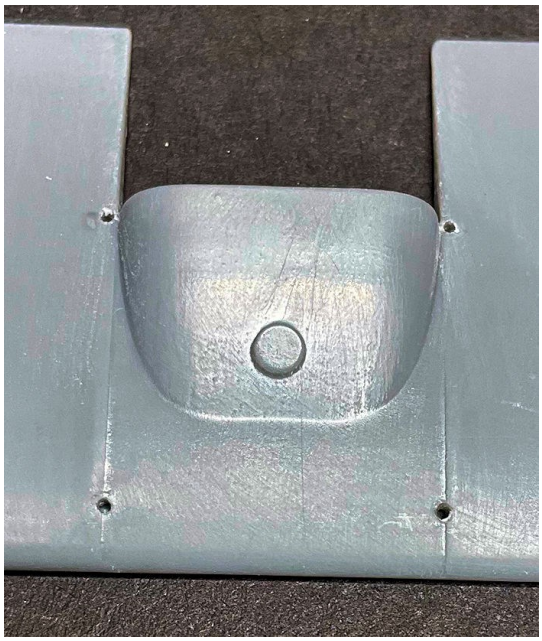
Using the point marks as guides, a 0.6 mm diameter drill was used to drill four locating holes into, **but not through**, the centre wing.

A light pencil line was drawn across the underside surface of the upper wing, between the centres of pre-drilled locating holes for the interplane struts.

Point marks were made in the wing where the drawn lines crossed the pre-molded rib tape lines.

Using the point marks as guides, a 0.6 mm diameter drill was used to drill four locating holes into, **but not through**, the upper wing.

Trim the length of the protruding rods in the created fuselage upper cabane struts to make sure the struts fully locate against the upper and centre wing surfaces.



Hold the centre wing onto the fuselage using masking tape.

**NOTE:** *During the following step, I used 'UHU' White Tack or similar to temporarily hold the struts into the centre wing.*

Locate and retain the four created upper cabane struts into their pre-drilled locating holes in the centre wing.

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

Invert the fuselage/wing assembly and locate the struts into their pre-drilled locating holes in the underside of the upper wing.

**NOTE:** *To hold the assembly I secured the front of the fuselage to a vertical surface using a piece of 'UHU' White Tack.*

With the upper and centre wing aligned to each other, the four cabane struts were checked to make sure they were aligned to each other and vertical when viewed from the side and rear.


Remove the assembly and remove the upper wing and the struts and centre wing from the fuselage.

Landing gear:

**NOTE:** *The kit supplied landing gear is basic, with two plastic bars (to be joined together) for the axle, two tyres, two 'V' struts and four photo-etch suspension plates and spoked wheels rims. I chose to replace the weak plastic supplied axle halves.*

Remove the plastic parts from their mold gates and the photo-etch parts from the supplied sheet.

Remove any residual mold gate and photo-etch tags from the edges of the parts.

*Landing gear struts:*

Using thin CA adhesive, secure the photo-etch suspension plates to both lower ends of the landing gear struts, making sure to keep the axle holes aligned.

As there are no locating recesses for the struts on the underside of the lower wing, drill four locating recesses into, **but not through**, the underside of the wing. Using the struts as guides, drill the recesses 5 mm back from the wing leading edge and inline with the aileron inboard edges.

Temporarily hold the struts into their locating recesses using 'UHU' White Tack or similar, keeping the struts vertical on the wing.

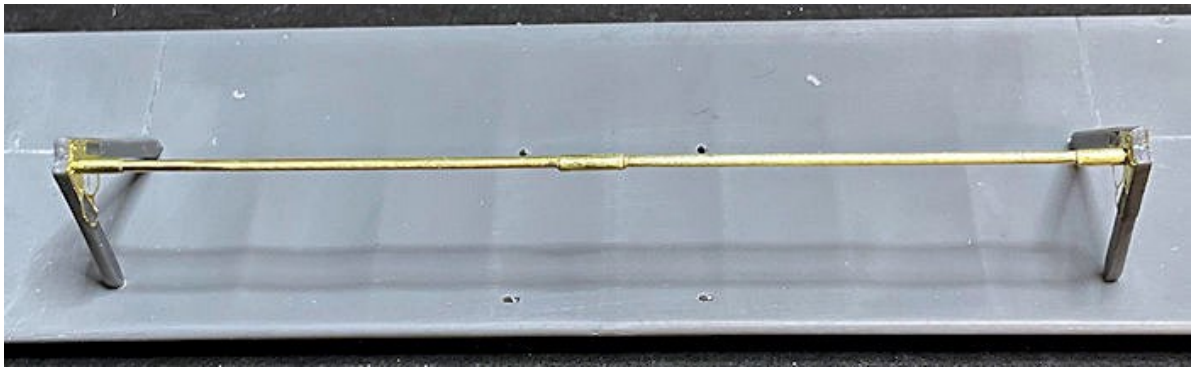
*Axle:*

Cut a long length of 0.8 mm diameter Brass rod, such as that from 'Albion Alloy's' or similar. The length of the rod should be such that when inserted into the landing gear struts, the ends are flush with the outer face of the struts.

Cut two short and one slightly longer lengths of 1.1 mm diameter Brass tube, such as 'Albion Alloy's MBT11.

Slide the tubes onto the axle rod.

Using thin CA adhesive, secure the longer tube in the centre of the rod and the shorter tubes at the rod ends, leaving rod protruding to fit through the landing gear struts.



Test fit the axle into the landing gear struts then remove the axle.

*Wheels:*

**NOTE:** *The supplied photo-etch spoked rims are slightly to large in diameter to fit into the shouldered recesses around both sides of the tyres.*

Using a sharp and curved blade, scrape around the inside edge of both sides of each tyre until the photo-etch rims can be laid into the wheels and be flush with the wheel outer edges.

Position a rim on one side of each tyre, keeping the rim central in the tyre.

Using thin CA adhesive, secure the outer edge of the rims to the tyres, keeping the rims central on the tyres.

To add additional support to the rim centres, cut a disc of 1.0 mm thick plastic card to the same diameter of the centre ‘hubs’.

Drill a hole of 1.2 mm diameter through the centre of the discs.

Secure the discs to the centre hubs using thin CA adhesive, keeping the axle holes aligned.

Once the adhesive has set, repeat the procedure to secure the remaining rims to the other side of the tyres, making sure to keep the axle holes and pairs of spokes aligned.

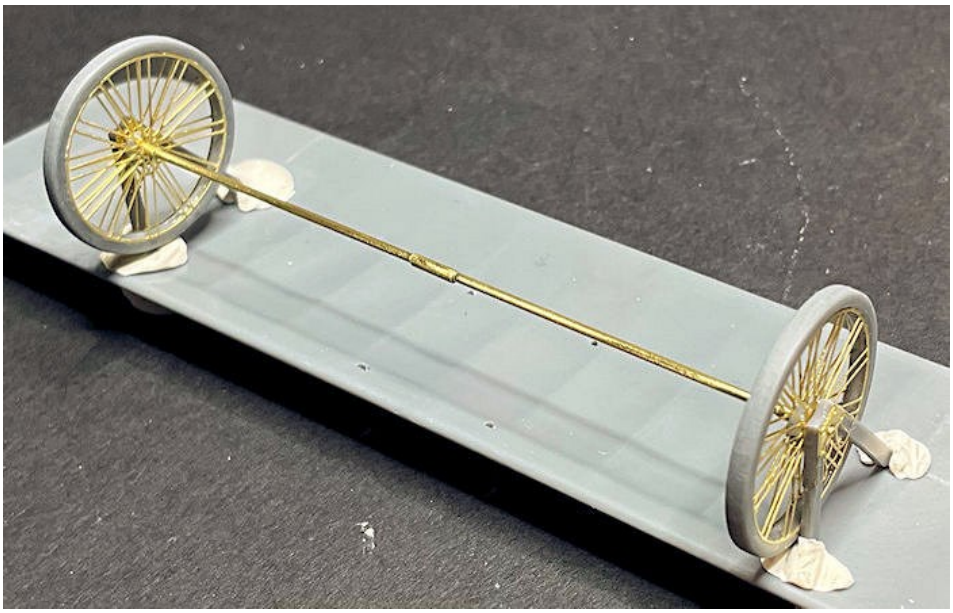
Apply thin CA adhesive into the tyre space between the two rims on both wheels. This will add additional strength to the bond of the rims.

Use a 1.2 mm diameter drill to carefully drill through the axle holes to clear any adhesive.

Slide the wheels onto the axel ends.

Test fit the wheels by temporarily refitting the axle into the landing gear struts.

Then slide the wheels to the ends of the axle (over the added 1.1 mm diameter tubes) and against the landing gear struts.



*Axle support frame:*

**NOTE:** *The kit instructions expect the support frame to be created from stretched sprue, which would not be easily achieved and anyway would be very weak.*

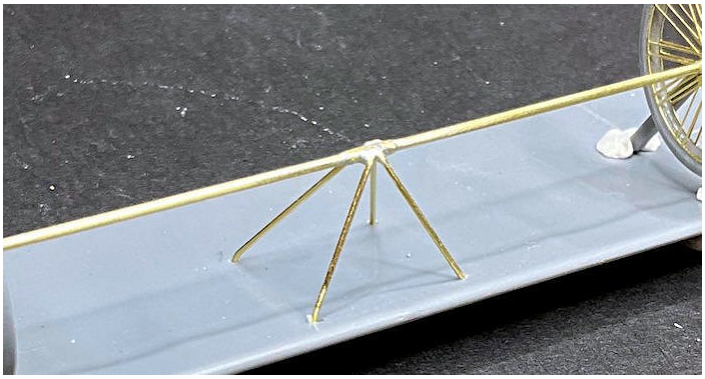
Cut four lengths of 0.5 mm diameter Brass rod, such as that from ‘Albion Alloy’s’ or similar.

Insert one end of each rod into the drilled through holes on the underside of the lower wing (lower cabane strut holes).

Trim the length of the rods to lay against the added central tube on the axle rod.

**NOTE:** *During the following step, I chose to soft solder the rods to the tube. However, thin CA adhesive can be used, although that would be a less strong bond and could cause rods to break away if stressed.*

Secure the rods to the central tube.



Remove the wheels, axle assembly and landing gear struts from the underside of the lower wing.

Aileron animation:

**NOTE:** *The following is necessary only if the four ailerons are to be animated.*

Using a sharp scriber, separate the four ailerons from the upper and lower wings by scribing along and through the pre-molded outlines of the ailerons.

File or sand smooth the cut edges of the ailerons and wings.

Point mark two locations centrally in the leading edge face of each aileron.

Using the point marks as guides, drill holes of 0.4 mm diameter centrally into the leading edge face of each aileron.

Cut eight short length of 0.5 mm diameter Brass tube, such as that from ‘Albion Alloy’s’ or similar. The rods should be long enough to be fully inserted into the pre-drilled holes with enough protruding to fit into the wings.

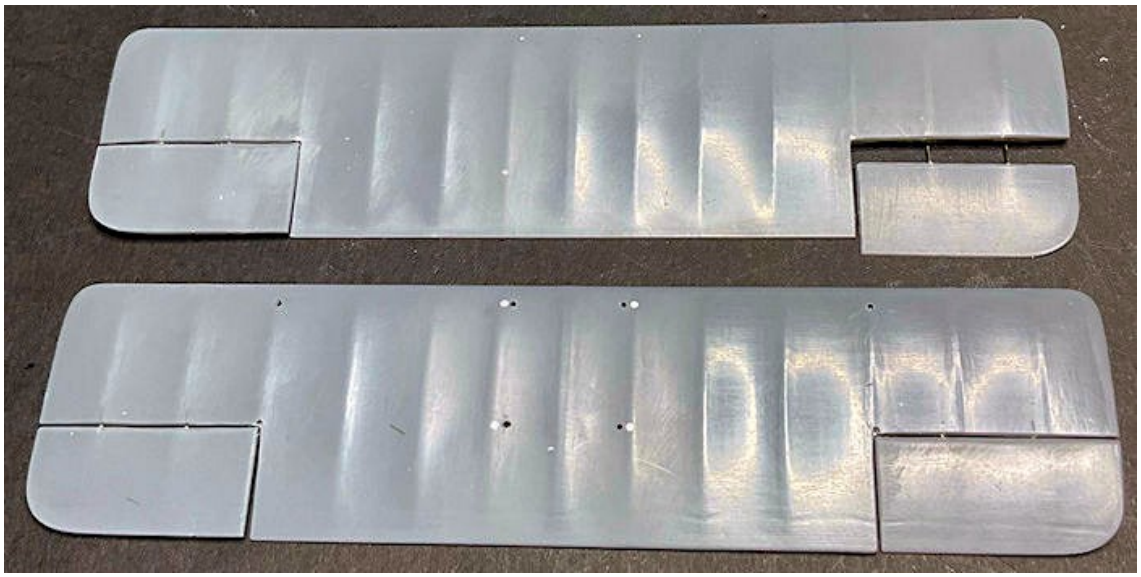
Lay each aileron against its wing opening and pencil mark the position of the rods on the wing.

Using the pencil marks as guides, drill holes of 0.4 mm diameter centrally into the trailing edge face of each wing aileron location.

Fully locate each aileron into its wing location.

**NOTE:** *The ailerons on one side of the wings should be angled slightly up and on the side of the wings, slightly down. The pairs of ailerons should be at the same angle.*

Carefully flex each aileron to bend the locating rods and achieve the desired angles.

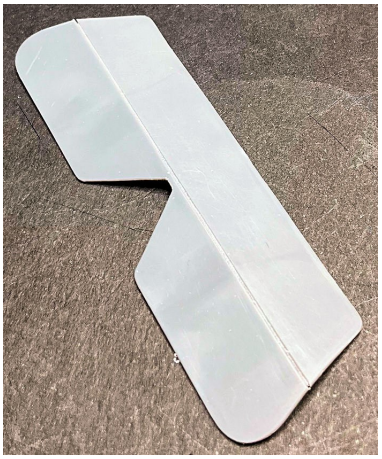


Elevator animation:

**NOTE:** *The following is necessary only if the elevator is to be animated.*

Using a sharp scriber, scribe along, **but not** through, the pre-molded line between the tailplane and the elevator.

Carefully flex the elevator down to the desired angle.



Engine test fit:

**NOTE:** *Although it's a tight fit, the engine can be fitted into its recesses in the fitted engine cowl panels.*

Cement the three engine cowl panels together and to the front of the fuselage. The flatter panel is located on the underside.

Once the cement has fully set, sand the joints between the three engine cowl panels to blend them with each other and the fuselage.

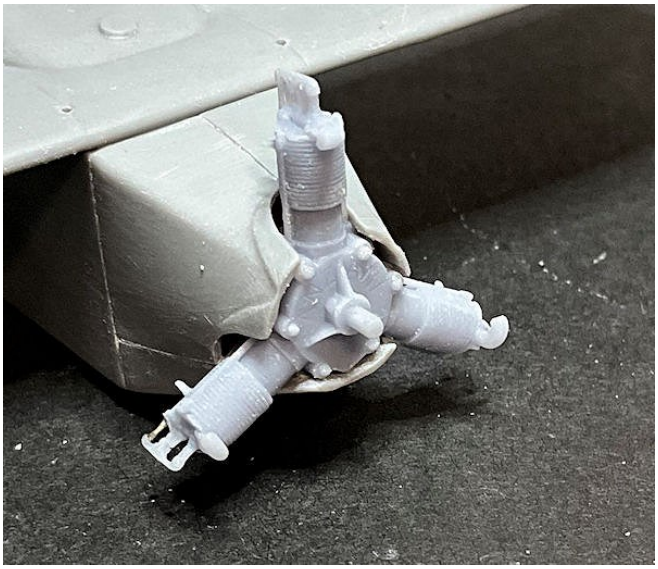
Carefully remove the 3D printed engine from its support tees and remove any residual support stubs.

If resin print residue is apparent, wash the engine in Isopropyl Alcohol of 90% or more strength, then evaporate the alcohol using warm air (hair dryer or similar).

**NOTE:** *Some plastic removal from the engine cowl panels may be required to allow the engine to be inserted.*

Test fit the engine through the opening in the front of the engine cowl panels and into the cylinder recesses in the panels.

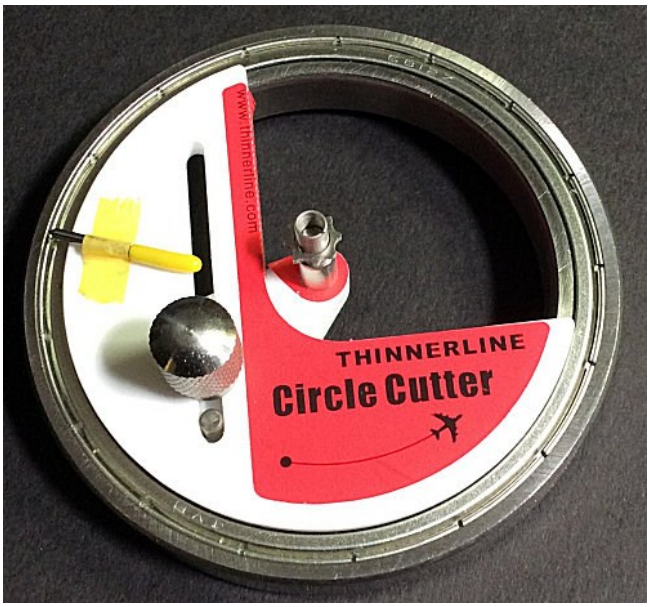
If necessary, use a half round needle file to remove plastic from the central curve in the ends of the three cowl panels. Also, again if necessary, slightly file away the front edges of the cylinder recesses. Both will help easier insertion of the engine into the cowl panels.



Cowl retaining ring:

**NOTE:** *Supplied in the kit is a photo-etch retaining ring for securing together the fronts of the engine cowl panels. However, I found that the diameter of the ring was smaller than the edges of the cowl panels. Rather than sand down the panels to match to the ring, I chose to create a replacement ring from plastic card.*

*To cut accurate circles, I used a 'ThinnerLine Circle Cutter', although other types are available. The cutter was pushed against an engineers square, to keep the centre of the ring aligned.*




Using the circle cutter, cut out a disc from paper. The disc should be approximately the same internal diameter as that of the photo-etch part.

Check the hole cut against the temporarily fitted engine and if necessary, increase the diameter of the cutter setting and repeat, until the correct diameter is achieved.

Note the diameter setting on the cutter.

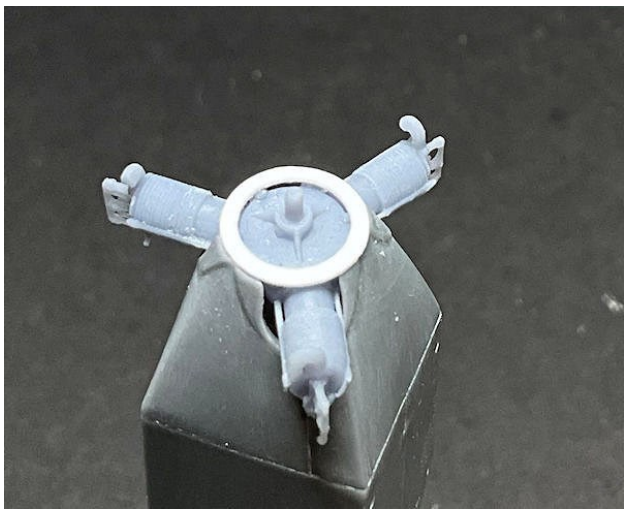
Using the circle cutter, cut out a disc from paper. The disc should be the diameter necessary to align with the edges of the three cowl panels.

Check the hole cut against the temporarily fitted engine and if necessary, increase the diameter of the cutter setting and repeat, until the correct diameter is achieved.

Note the diameter setting on the cutter.

Firmly tape an engineers square or similar onto a sheet of 0.5 mm thick plastic card.

Position the circle cutter firmly against the two edges of the engineers square, then draw a pencil line around the rest of the outside edge to create an alignment mark.



Set the cutter to the diameter of the first, inner disc.

Hold the cutter against the square and check it is aligned to the pencil line.

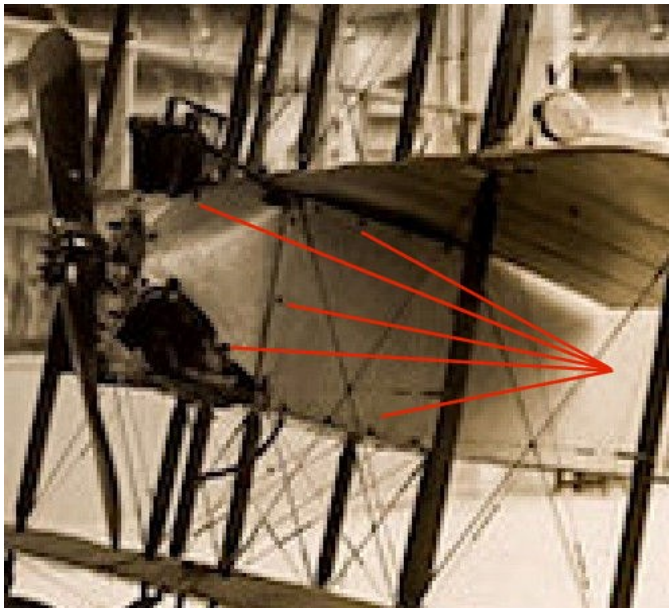
Cut the disc from the sheet and discard.

Now repeat the procedure, but with the cutter set to the second, larger diameter.

The resultant ring should have the centre hole aligned to the outer edge of the ring.

Panel fasteners:

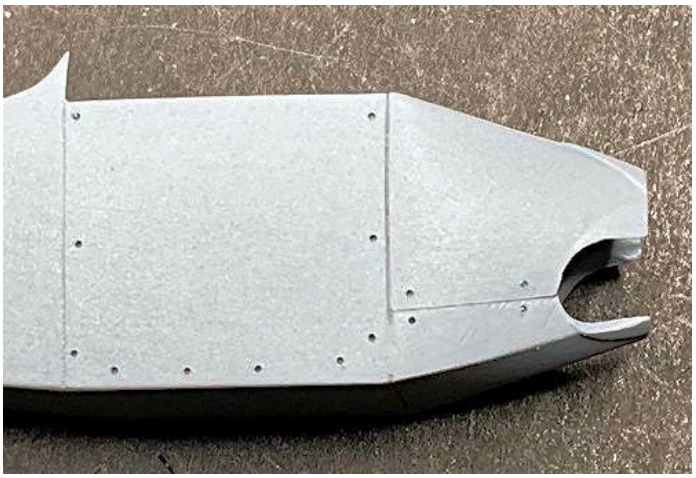
**NOTE:** *The three engine cowl panels and the fuselage forward panels were metal and were attached to each other and the fuselage with fasteners.*

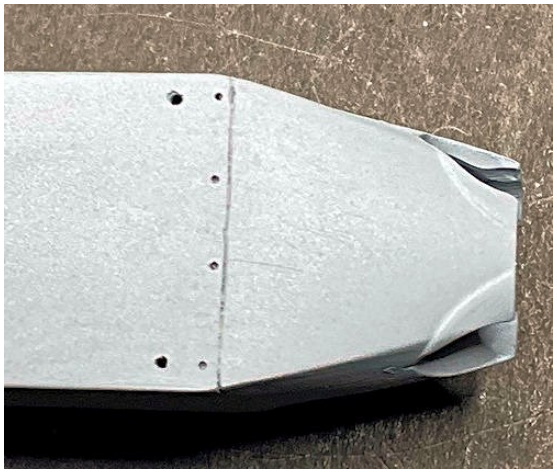


Lightly point mark the locations of two fasteners into the cowl panels each side of the panel joints.

Lightly point mark the locations of fasteners into each side of the fuselage sides and underside.

Using the point marks as guides, drill holes of 0.4 mm diameter into, **but not through**, the cowl panels and fuselage sides and underside.





# PART 9
# FUSELAGE

## PART 9 - FUSELAGE

References:

*Online resources.*

**Painting:**

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

Mask off the fuselage at the rear edges of the front panels.

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

Airbrush the exposed panels with 'Alclad' Duraluminium (ALC102) or similar.

Remove the masking.

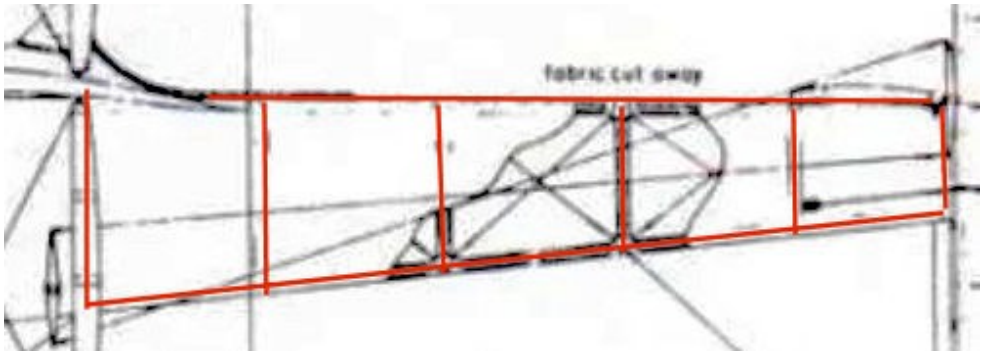
Brush paint the cockpit inside faces of the fuselage sides with 'Tamiya' Deck Tan (XF55) or similar.

Brush paint the cockpit floor and bulkheads with 'Tamiya' Dark Yellow (XF60) or similar.

Using 'Mr. Colour' Stainless Steel (213) or similar, brush paint the inside of the fuselage metal side and underside panels in the cockpit. The panels are painted forward from the vertical side members.

Mask off the fuselage side and underside metal panels.

Using 'MRP' Clear Doped Linen (MRP-256) or similar, lightly airbrush cockpit and fuselage.




Using thin strips of masking tape, mask off the externally painted fuselage where the internal frames and longerons are located.

Airbrush the outside faces of the cockpit and fuselage with 'Tamiya' Deck Tan (XF55) or similar.

Remove the masking.

To fade back the fuselage rib tapes and blend them with the surrounding surfaces, **lightly** airbrush the fuselage with 'Tamiya' Deck Tan (XF55) or similar.

Remove the masking from fuselage side and underside metal panels.

*Wood effect:*

**NOTE:** *Refer to Part 2 (Wood Effects) of this build log for detail of applying wood effects using the 'Windsor & Newton' Griffin Alkyd oil paints.*

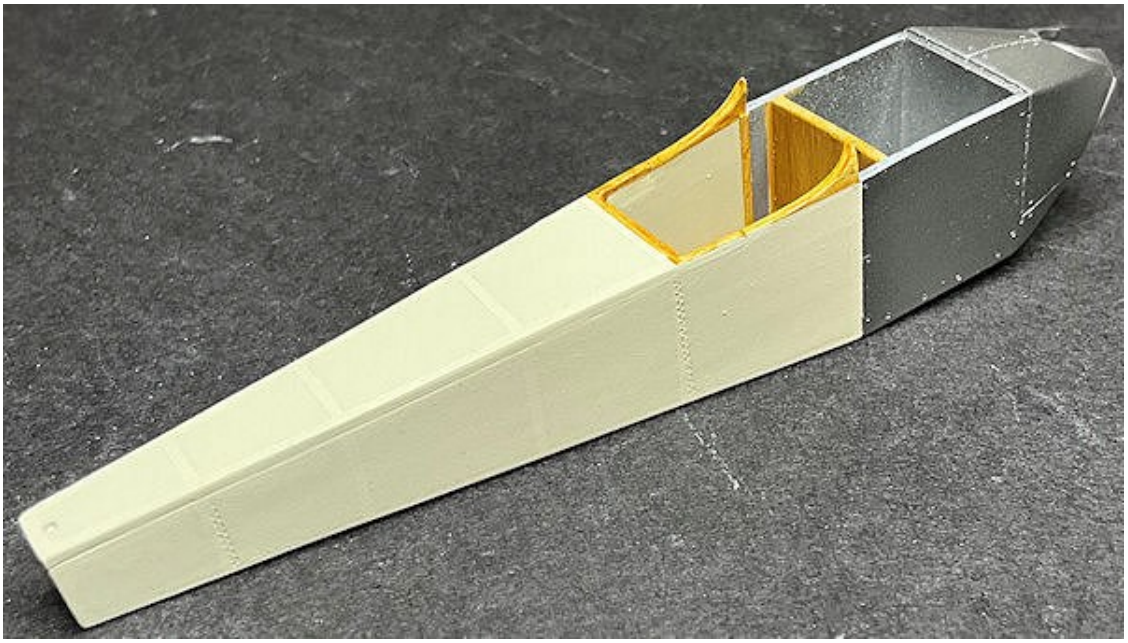
Apply the wood effect to the following parts, brushing with 'Windsor & Newton' Griffin Alkyd Raw Sienna oil paint:

Front and rear bulkheads.

Cockpit floor.

Forward vertical members.

Inside and outside of the top side members.



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

Pilots seat and cushion.

Rudder bar and control column.

Lap belts.

Airbrush only the pilots seat and cushion with ‘Tamiya’ Dark Yellow (XF60) or similar.

*Pilots seat:*

Apply the wood effect to the pilots seat by brushing with ‘Windsor & Newton’ Griffin Alkyd Raw Sienna oil paint.

*Pilots seat cushion:*

Apply a leather effect to the pilots seat cushion by brushing with ‘Windsor & Newton’ Griffin Alkyd Burnt Umber oil paint. Removing the paint across the seat will give the look of worn leather as the dark yellow base colour will show through.

*Pilots lap straps:*

Brush paint the pilots lap straps with ‘Tamiya’ Desert Yellow (XF59) or similar.

*Rudder bar:*

Brush paint the rudder bar with ‘Tamiya’ Rubber Black (XF85) or similar.

Brush paint the foot straps on the rudder bar with ‘Humbrol’ Matt (62) or similar.

*Control Column:*

Brush paint the control column with ‘Tamiya’ Rubber Black (XF85) or similar.

Brush paint the top hand grip with ‘Tamiya’ Hull Red (XF9) or similar.

**Internal bracing wires:**

Cut four short lengths of 0.4 mm diameter Brass tube, such as ‘Albion Alloy’s’ MBT04 or similar.

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

Blacken the tubes to reduce their metallic sheen.

**NOTE:** *Always **cut the length of required line much longer than needed** to span between its attachment points. This allows for easier attachment of both ends of the line.*

Cut four lengths of ’EZ’ black stretch line (Fine).

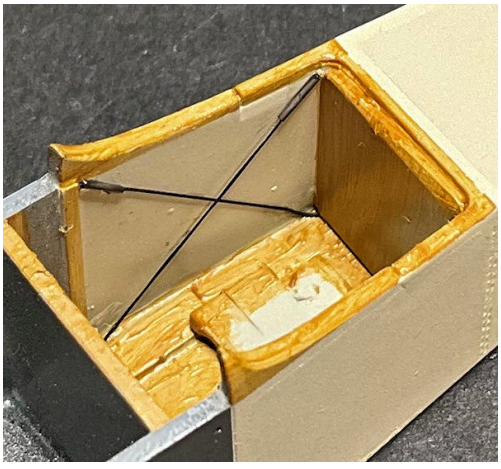
Pass each line through a tube then secure the line in the tube at the tube end, using thin CA adhesive.

Cut away any protruding line at the tube ends.

Using thin CA adhesive, secure a tube diagonally onto the top corners of the cockpit sides. The tubes should be angled to align with the diagonally opposite bottom corners in the cockpit.

Apply a small amount of thin CA adhesive into the bottom corners and keeping each line taut, secure in position.

Cut away any excess line at the cockpit bottom corners.



**Rudder control cables:**

Cement the rudder bar into its locating hole in the cockpit floor or across the added pilots foot boards.

Prepare two tubed lines as previously detailed.

Using thin CA adhesive, secure the tubes onto the pilots foot boards and against the ends of the rudder bar.

Apply a small amount of thin CA adhesive into the bottom rear of the cockpit and keeping each line taut, secure in position.

Cut away any excess line at the bottom rear of the cockpit

**Construction:**

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

Using thin CA adhesive, secure the two lap straps onto the sides of the pilots seat, over the edges and onto the seat cushion.

Apply cement to the underside of the pilots seat the carefully locate the seat into the cockpit and onto the cockpit floor.

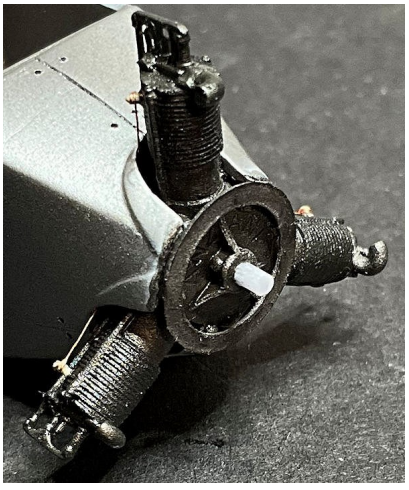
Cement the control column into its locating hole in the cockpit floor.

Ease the engine through the opening in the front of the engine cowl panels.

Using thin CA adhesive, if necessary, to secure the engine in the engine cowl panels.

Clean away and paint from the contact areas of the front edges of the cowl panels and the created cowl ring.

Cement the created cowl ring over the engine crankcase and onto the front edges of the cowl panels.



**Decals:**

To avoid overspray, mask off the painted metal panels on the fuselage.

Airbrush the external sides of the fuselage with one or more coats of clear gloss, such as ‘Mig’ A-Stand Aqua Gloss (A.Mig-2503) or ‘Tamiya’ Gloss (X22) or similar.

Remove the masking.

**NOTES:** *The decals used are the 'Aviattic' clear backed Clear Doped Linen 'bleached' (ATT32044). Refer to Part 4 (Decals) of this build log for more information.*

*The 'Aviattic' 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 'Aviattic' CDL decals being used are not 'cookie' cut to the shapes required. Therefore the decals must be hand cut to shape.*

Example of applying 'Aviattic' decals:

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 'Aviattic' decals:

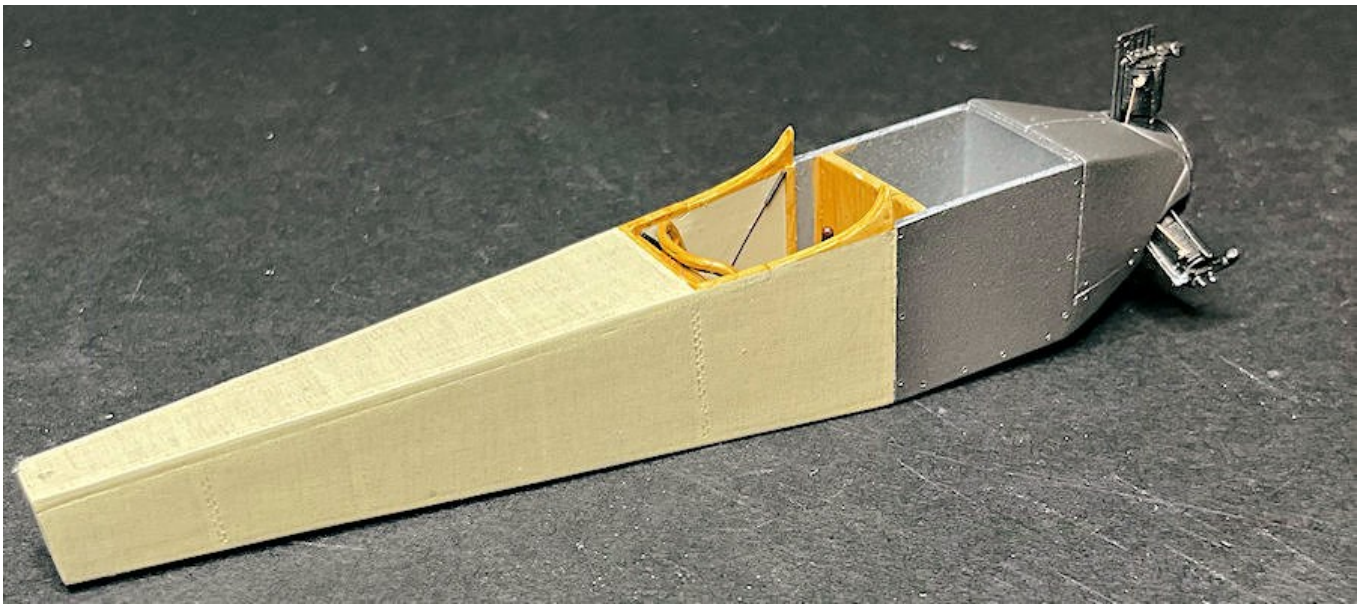
Using the previous example, cut and apply the CDL decals. Its easier to apply the decals in the following order:

Fuselage sides.

Fuselage top surface.

Fuselage underside.

Once the decals have fully set, airbrush the fuselage outside and cockpit with ‘Mr. Colour’ Rapid Thinners to provide a semi-matte finish and seal.



# PART 10
# ENGINE

## PART 10 - ENGINE

References:

*Online resources.*

**NOTE:** *The engine fitted to this version on the aircraft was an Anzani inverted 'Y', 3-cylinder air-cooled engine, 26 kW (35 hp).*

**Painting:**

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

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

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

Engine crankcase.
Base of the cylinders.
Cylinder tops.
Created cowl ring.

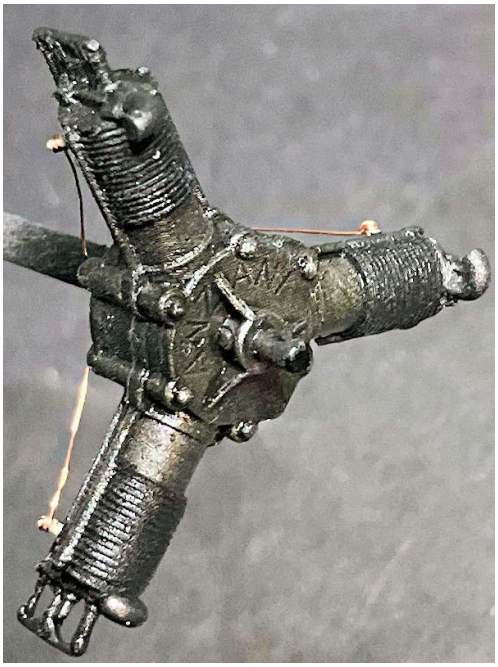
Brush paint the cylinder spark plugs with 'Tamiya' Buff (XF57) or similar.

Lightly brush 'AK Interactive' Kerosene (AK-2039) over the steel painted surfaces of the engine.

**Modifications:**

*Cowl ring:*

**NOTE:** *The kit supplied a photo-etch cowl ring, intended to fit over the front edges of the three engine cowl panels. However, it was found to be too large a diameter and will be replaced later in this build.*



*Ignition leads:*

**NOTE:** *The actual connection of the ignition leads to the spark plugs is unclear. Therefore, these were represented only.*

To represent the ignition leads to the spark plugs, I drilled a hole of 0.3 mm diameter into the rear of the engine crankcase and below the spark plugs. A length of 0.125 mm diameter copper wire was secured in each hole, using thin CA adhesive. The free end of each wire was pulled up and around its spark plug several times, then secured in position using thin CA adhesive. Any excess wire was cut away at the spark plug.

# PART 11
# CONSTRUCTION

## PART 11 - CONSTRUCTION

References:

*Online resources.*

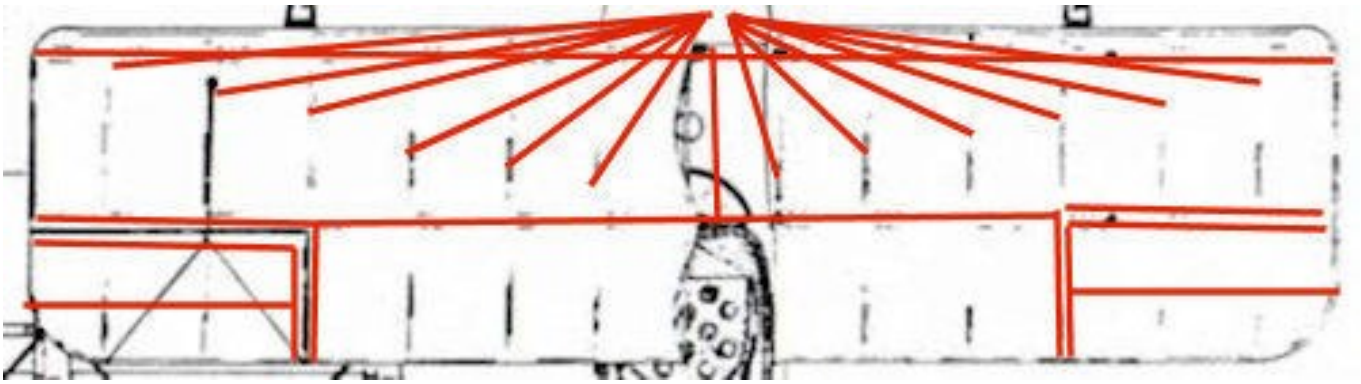
**Painting:**

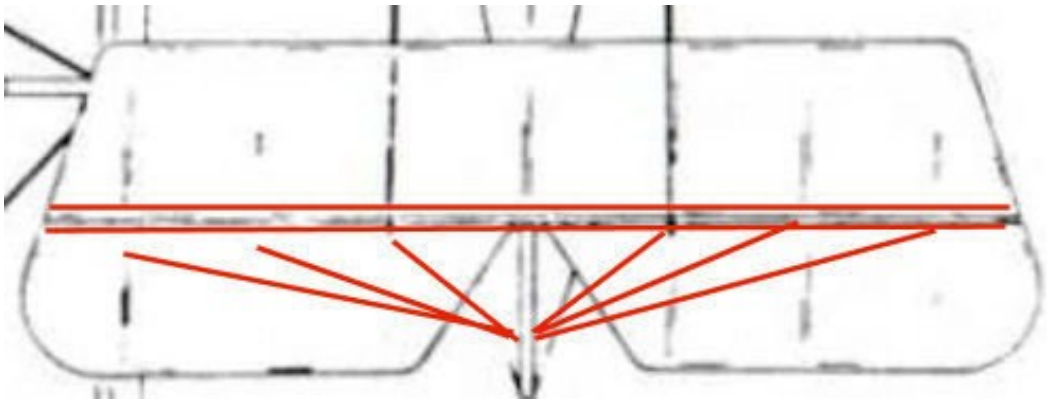
Flight surfaces:

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

Upper, centre and lower wings.
Upper and lower ailerons.
Tailplane/elevator.
Rudder.
All interplane and cabane struts.
Landing gear axle assembly.
Wheel assemblies.
Landing gear struts.

Airbrush the three wings, ailerons, tailplane/elevator with ‘MRP’ Clear Doped Linen (MRP-256) or similar.





**NOTE**: *Refer to the previous illustrations.*

Using thin strips of masking tape, mask off both sides of the following:

The molded ribs of the three wings, ailerons and the tailplane/elevator.
Aileron leading edge and centre/side members.
Aileron trailing edge and side members in the upper and lower wings.

Using wider strips of masking tape, mask off both sides of the following:

Across the front and rear spars of the three wings.
Across the tailplane/elevator joint.

Airbrush the three wings, ailerons, tailplane/elevator with ‘Tamiya’ Deck Tan (XF55) or similar.

Remove the masking.

To fade back the rib tapes and blend them with the surrounding surfaces, **lightly** airbrush the three wings, ailerons and the tailplane/elevator with ‘Tamiya’ Deck Tan (XF55) or similar.

**Decals:**

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

*The kit supplied photo-etch panel was not used. Instead, generic decals were used from the ‘Airscale’ Generic WW1 instrument dial decals (AS32 WW1), with appropriate sized photo-etch instrument bezels from the ‘Airscale’ Instrument Bezels (PE32 BEZ) set.*

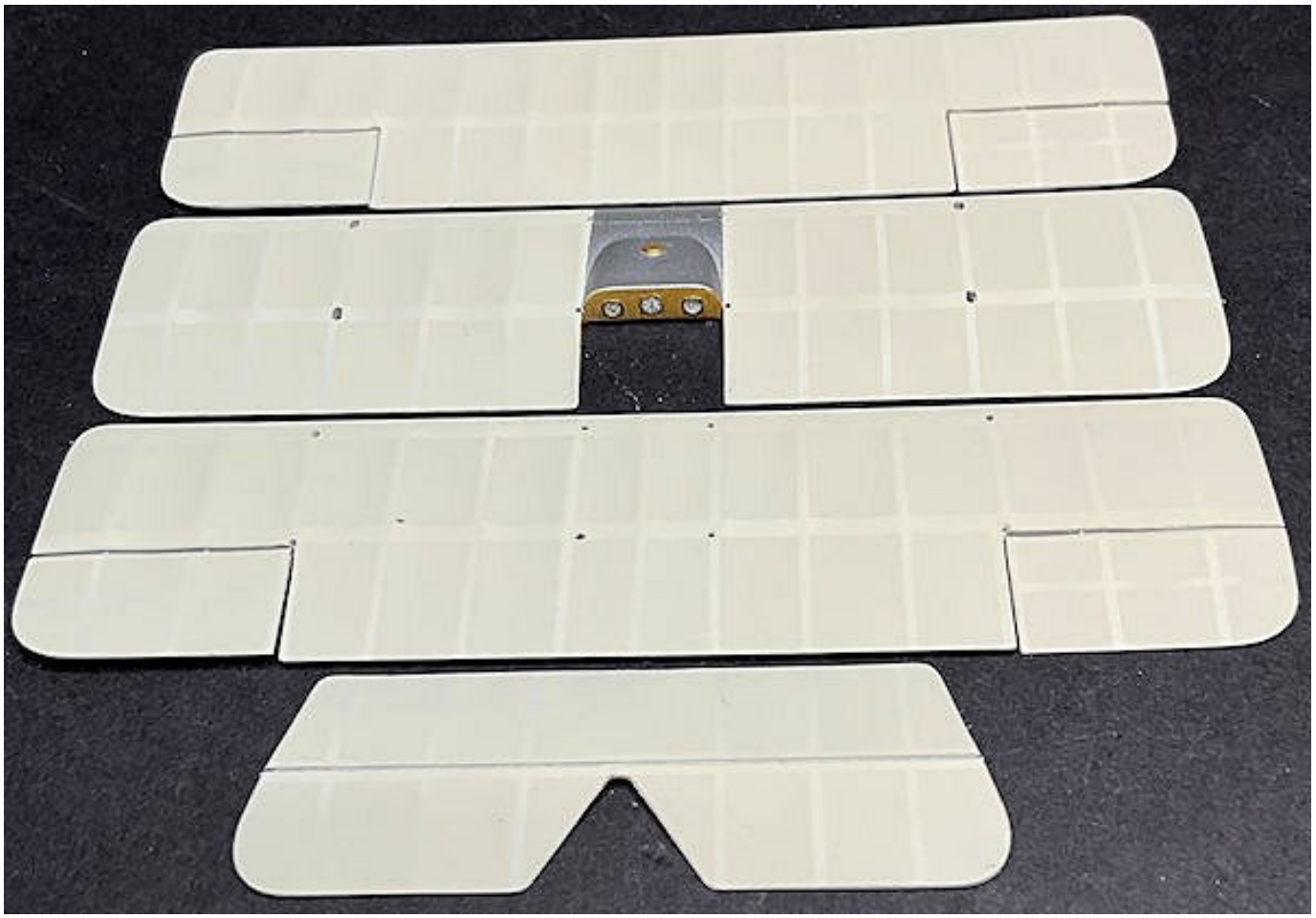
*The decal used for the internal and external surfaces was the ‘Aviattic’ clear backed Clear Doped Linen ’bleached’ (ATT32044).*

*Instruments:*

Select three generic instrument faces from the ‘Airscale’ set and apply them to the pilots instrument panel on the centre wing.

Select three generic instrument bezels of the appropriate size from the ‘Airscale’ photo-etch set.

Position each bezel over its applied decal and secure in position by applying a gloss clear coat, such as ‘Tamiya’ Gloss (X22) or similar, over the decal. This will seep under the bezel and once dry will hold the bezel in position and give the instrument a ‘glass’ effect.



*Rudder:*

Airbrush the rudder with ‘MRP’ Clear Doped Linen (MRP-256) or similar.

**NOTE:** *Refer to Part 4 (Decals) of this build log as the kit supplied decals were used for the rudder.*

Mask off across the central area of the sides of the rudder, below the upper and lower molded ribs.

Apply the kit supplied rudder decals centrally on the rudder sides, between the upper and lower ribs.

Once the decals have fully set and if necessary, brush paint red, such as ‘Tamiya’ Red (XF7) or similar, to fill in any exposed rudder between the red of the two decals.

Seal the applied decals with a clear coat, such as ‘Tamiya’ Semi-Gloss (X35) or similar.

Once fully dry, lightly apply masking to cover the applied decals. ‘Post-It’ notes can be used as the adhesive on the edges is very low tack as less likely to lift the decal when removed.

Using thin strips of masking tape, mask off along the molded upper and lower ribs.

Airbrush the exposed upper and lower ends of the rudder with ‘Tamiya’ Deck Tan (XF55) or similar.

To fade back the rib tapes and blend them with the surrounding surfaces, **lightly** airbrush the exposed upper and lower ends of the rudder with ‘Tamiya’ Deck Tan (XF55) or similar.

To avoid damaging the applied decals, carefully remove the masking.

**Detail painting:**

*Base colour:*

Airbrush the following with ‘Tamiya’ Dark Yellow (XF60) or similar.

Four interplane struts.
Four upper cabane struts.
Four lower cabane struts.
Two landing ‘V’ gear struts.

*Struts:*

**NOTE:** *Refer to Part 2 (Wood Effects) of this build log for detail of applying wood effects using the ‘Windsor & Newton’ Griffin Alkyd oil paints. The following step applies to:*

*Four interplane struts.*
*Four upper cabane struts.*
*Four lower cabane struts.*
*Two landing ‘V’ gear struts.*

Apply the wood effect to the struts by brushing with ‘Windsor & Newton’ Griffin Alkyd Burnt Sienna oil paint.

Seal the painted applied wood effect on the struts by airbrushing with a semi-matt clear coat, such as ‘Tamiya’ Semi-Gloss (X35) or similar.

Brush paint the metal fittings at the bottom of the landing gear ‘V’ struts with ‘Mr. Colour’ Dark Iron (214).

Once fully dry, lightly buff the paint with a soft cotton bud or similar to create the metallic sheen.

*Landing gear axle:*

**NOTE:** *Due to the heavier pigments in 'Mr. Metal Colour' paint, it's best to thin the paint with 'Mr. Colour' Levelling Thinner 400 to approximately 50/50% ration.*

Airbrush the landing gear axle assembly with 'Mr. Metal Colour' Dark Iron (214).

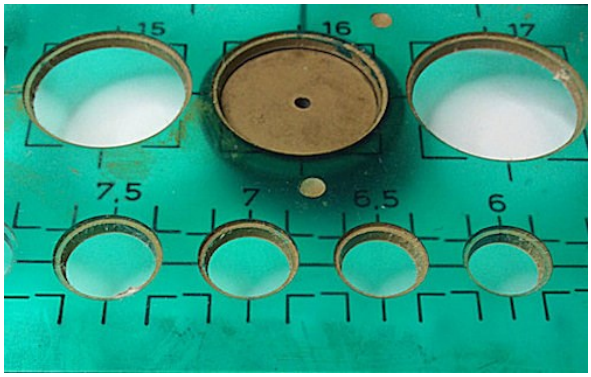
Once fully dry, lightly buff the paint with a soft cotton bud or similar to create the metallic sheen.

*Wheels:*

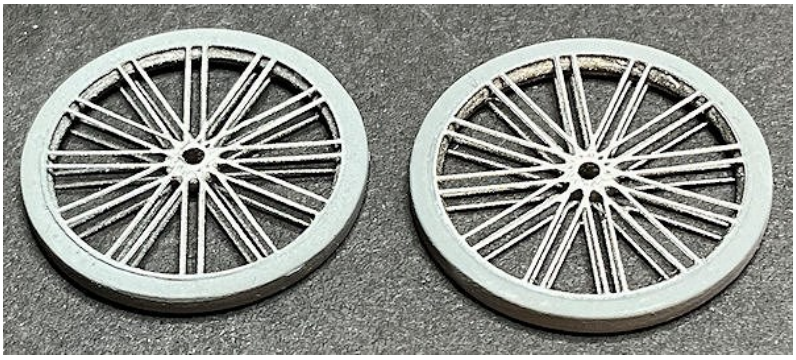
Airbrush the tyres of the wheels with 'Tamiya' IJN Grey (XF75).

**NOTE:** *To airbrush the inboard rims and spokes of the wheels 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 face under the hole.*

Example



Airbrush light coats of ‘Alclad’ Steel (ALC112) or similar over the exposed rims and spokes of the wheels. wheels.



**Decals (continued):**

**NOTE:** *Refer to Part 4 (Decals) of this build log for more information. The decal used is the ‘Aviattic’ clear backed Clear Doped Linen ’bleached’ (ATT32044).*

Airbrush the both sides of the following with one or more coats of clear gloss, such as ‘Mig’ A-Stand Aqua Gloss (A.Mig-2503) or ‘Tamiya’ Gloss (X22) or similar:

Upper wing.

Centre wing (not the centre metal panel area).

Lower wing.

Ailerons (x 4).

Tailplane/elevator.

Rudder.

**NOTES:** *The decals used are the ‘Aviattic’ clear backed Clear Doped Linen ’bleached’ (ATT32044). Refer to Part 4 (Decals) of this build log for more information.*

*The ‘Aviattic’ 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 ‘Aviattic’ CDL decals being used are not ‘cookie’ cut to the shapes required. Therefore the decals must be hand cut to shape.*

Example of applying ‘Aviattic’ decals:

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.*

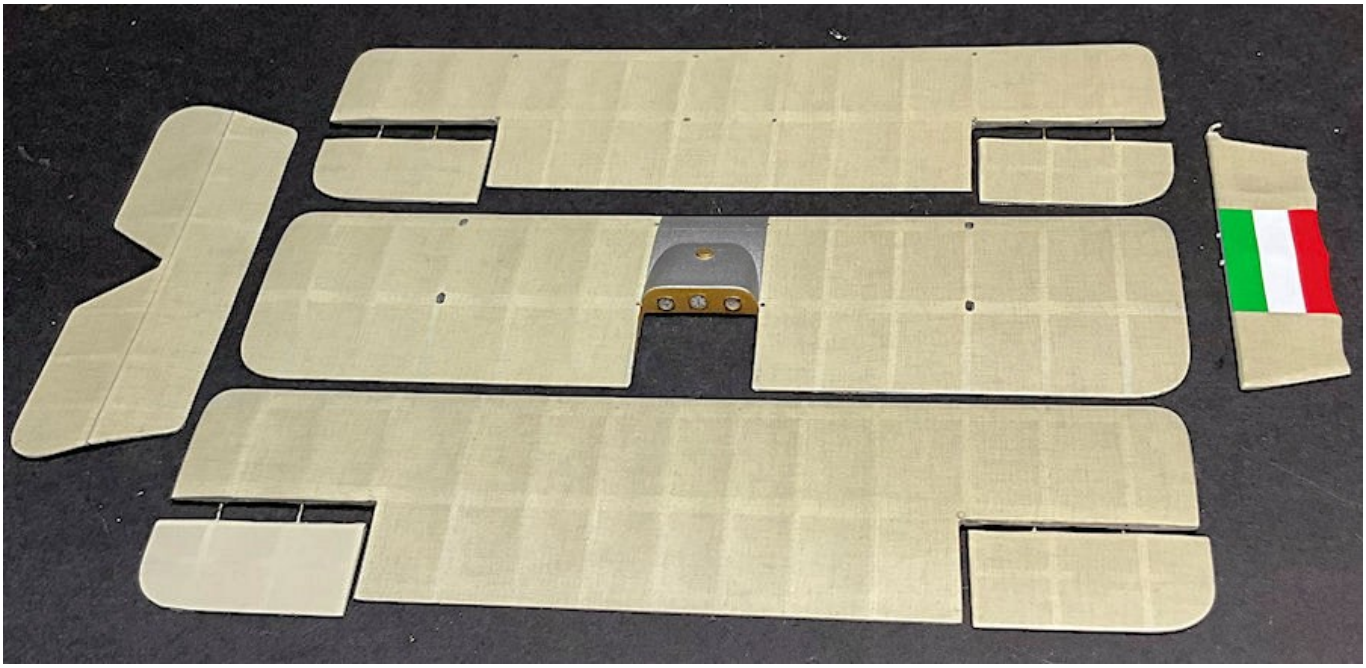
*Once fully dry and set, trim any excess decal from edges using a sharp blade, such as a shielded razor blade.*

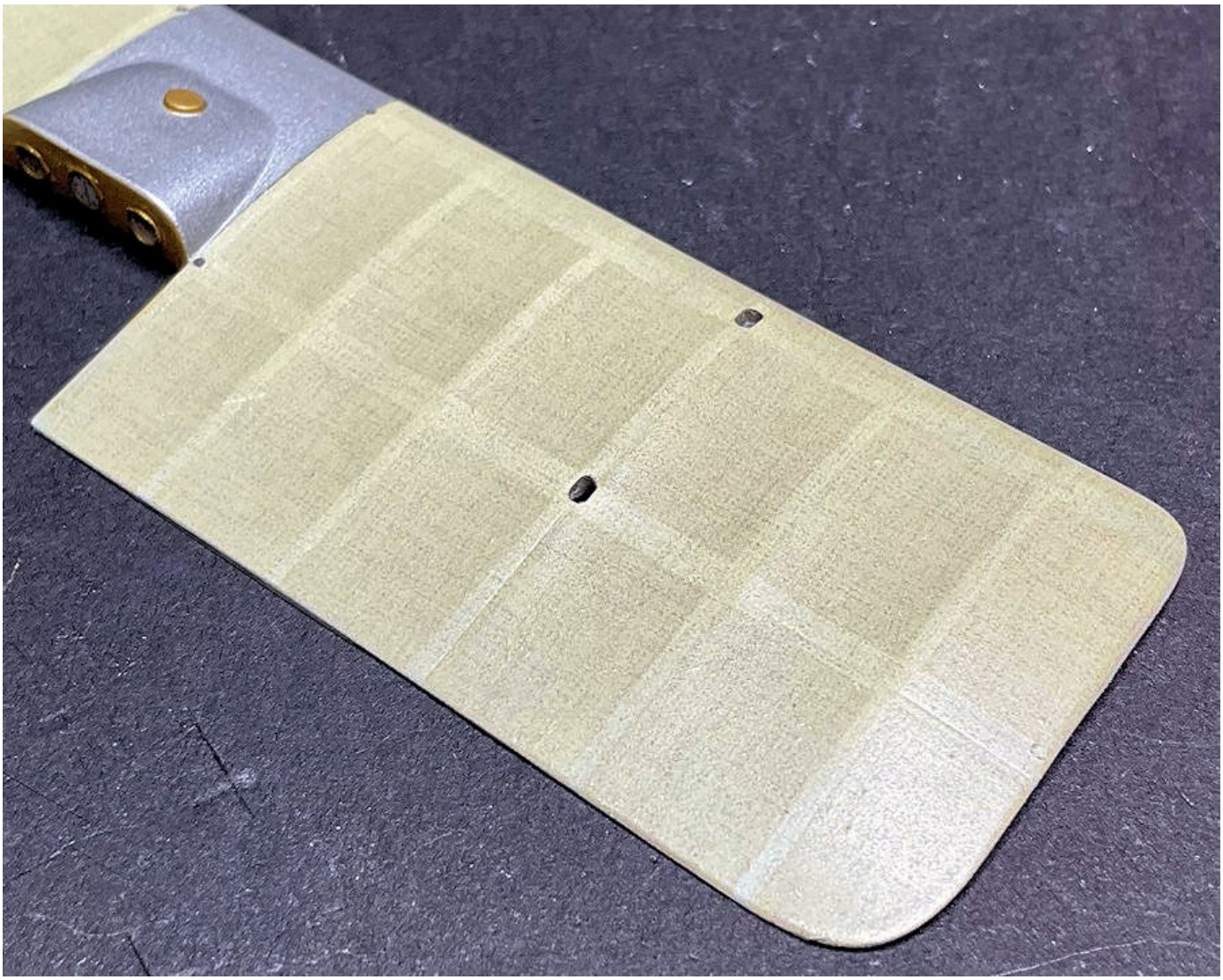
Application 'Aviattic' decals:

Using the previous example, cut and apply the CDL decals to the following:

Upper wing.
Centre wing (not the centre metal panel area).
Lower wing.
Ailerons (x 4).
Tailplane/elevator.
Rudder (not the tri-colour decal).

Once the decals have fully set, airbrush the fuselage outside and cockpit with 'Mr. Colour' Rapid Thinners to provide a semi-matte finish and seal.





**Construction:**

**NOTE:** *The following step is to prevent the oil paint on the four interplane struts being chipped during fitting through their slots in the centre wing.*

Carefully test fit the painted interplane struts through the pre-cut locating slots in the centre wing. The struts must easily slide through the slots without scraping against the wing and damaging their paint.

If necessary, carefully file out the slots to allow the struts to pass through.

Make sure all paint and primer is removed from the locating rods at the ends of all of the struts and their locating recesses in the wings and fuselage.

'PART' 1:48th scale generic control horns (S48-087).

Control horn attachments:

**NOTE:** *Only the underside of the lower ailerons have locating recesses for their control horns. The upper ailerons and the elevator have no locating recesses, which they require.*

To locate the control horns in the leading edges of the ailerons and elevator, I drilled slots into, **but not through**, each aileron of 0.5 mm width to locate the control horns.

Control horns:

**NOTE:** *The kit supplied control horns and levers are thin photo-etch and are liable to bend and distort. Therefore, I chose to replace them with more sturdier control horns and levers.*

*Elevator control levers:*

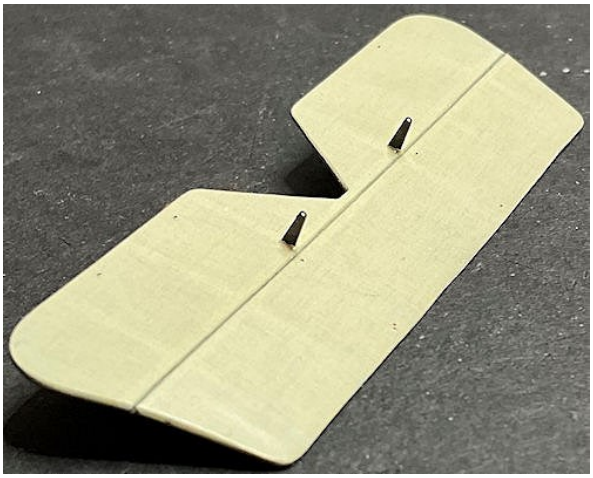
**NOTE:** *The elevator control levers that are located on the outside of the fuselage at the bottom of the cockpit and would have been attached to the ends of an operating bar attached to the pilots control column.*

To represent the elevator control levers, I cut and shaped levers from 0.8 mm thick plastic card. Each end of the levers were drilled through using a drill of 0.2 mm diameter and the centres drilled 0.5 mm diameter (for fitting the control bars). Two short lengths of 0.4 mm diameter tube, such as 'Albion Alloy's' Nickel-Silver (NST04) or similar were cut and secured vertically into the centre drilled holes. The horns will be painted with 'Tamiya' Rubber Black (XF85) or similar, once pre-rigged and fitted.

A hole of 0.5 mm diameter was drilled through the fuselage sides at the bottom edges and aligned to the rear of the fitted pilots control column. The control horns will be fitted once pre-rigged later in this build log.

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

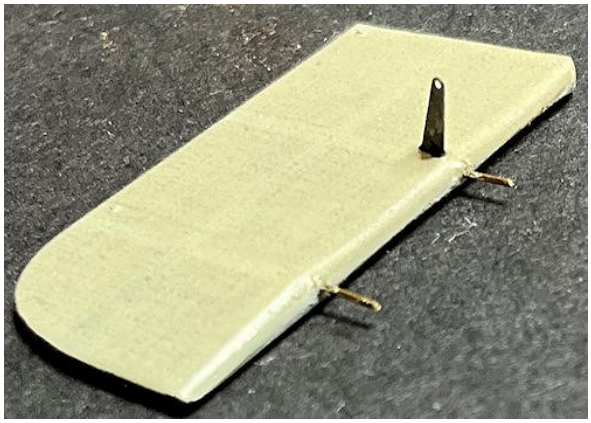
To represent the elevator operating bar in the cockpit, a length of 0.4 mm diameter tube, such as 'Albion Alloy's' Nickel-Silver (NST04) or similar was cut and blackened by immersion in 'Black-it'. It was then secured across the cockpit floor and against the rear of the pilots control column, using thin CA adhesive.



To represent the elevator control horns, I used four appropriate horns from the 'PART' 1:48th scale generic control horns (S48-087) set. The horns were blackened by immersion in 'Black-it' then fitted using thin CA adhesive.

*Aileron control horns:*

To represent the aileron control horns, I used four appropriate horns from the 'PART' 1:48th scale generic control horns (S48-087) set. The horns were blackened by immersion in 'Black-it' then fitted using thin CA adhesive.



*Rudder/tail skid control horn:*

**NOTE:** *The rudder and tail skid control horn was located at the base of the rudder post.*

To represent the rudder control horns, I cut and shaped a double ended control horn from 0.8 mm thick plastic card. Each end of the control horn were drilled through using a drill of 0.2 mm diameter. The horn was then cemented to the rear, bottom of the rudder post. The horn will be painted with 'Tamiya' Rubber Black (XF85) or similar, once pre-rigged and fitted.

**Pre-rigging:**

**NOTE:** *Refer to Part 6 (Rigging) of this build log for rigging information. Due to the amount of the rigging required and the small size of the model, it's best to pre-rig the various lines before assembly of the model is started.*

*Locating holes:*

**NOTE:** *To provide locating holes for the turnbuckles and anchor points used to rig the model,* ***holes of 0.4 mm diameter*** *need to be drilled into,* ***but not through****, the various model parts. The holes, where necessary, should be drilled at the approximate angle between the eventual ends of the rigged line, to make sure the line and turnbuckles are aligned (straight). As a rough guide:*

> *60 degree angle - Incidence wires between the interplane struts, the fuselage upper cabane side struts and the forward, upper fuselage cabane struts.*

*45 degree angle - Flying wires, landing wires and lower fuselage cabane struts.*

*As required - Fin bracing wires, rudder/elevator/aileron control cables.*

*One end of most rigging lines requires an anchor point fitting to retain the line at the opposite end to the turnbuckle. After drilling the locating holes, fit an anchor point into the holes noted in the photographs.*

*The anchor points are 'GasPatch Elite Accessories' metal Anchor Points (1/48 scale). Check that the 'eye' ends are clear of any metal filling before fitting. The anchor points should be fitted using CA adhesive, making sure no adhesive contaminates the 'eye' of the anchor point. If so, after fitting, carefully drill out the 'eye', using a 0.2 mm diameter drill.*

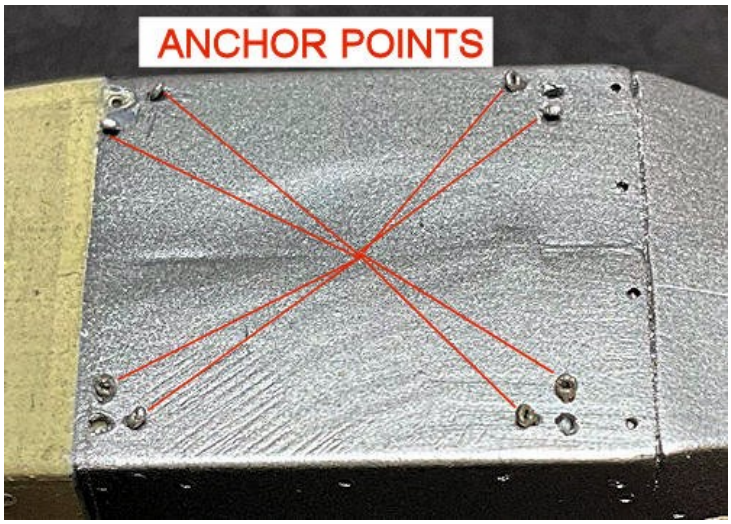
Using the following photographs as guides, drill all necessary rigging location holes.

Using thin CA, secure Anchor Points into pre-drilled holes as follows:

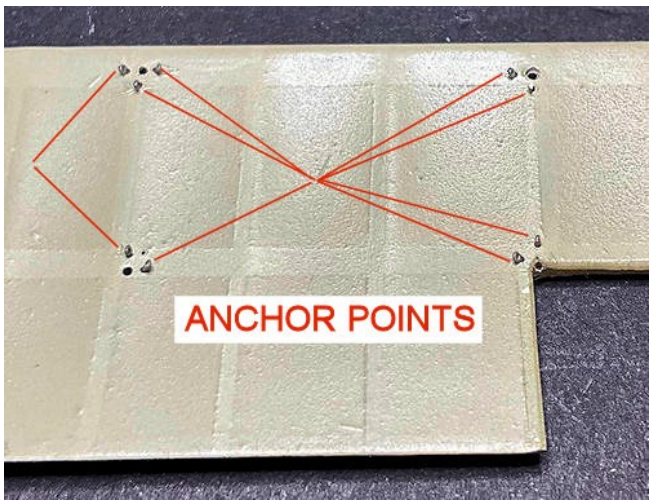
All holes in the underside of the fuselage.

All holes in the underside of the upper wing.

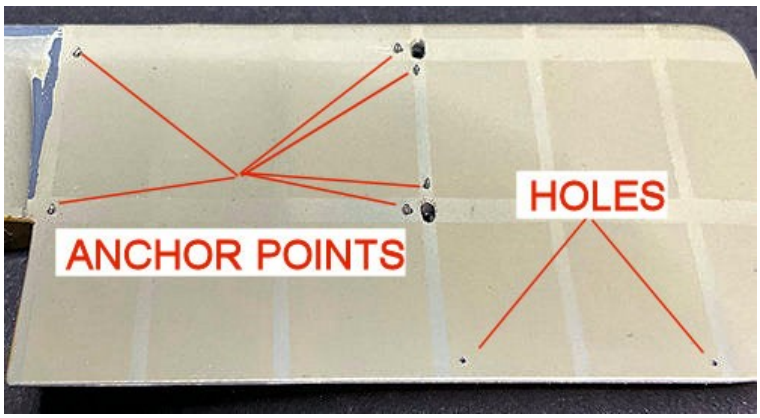
All holes in the underside of the centre wing.



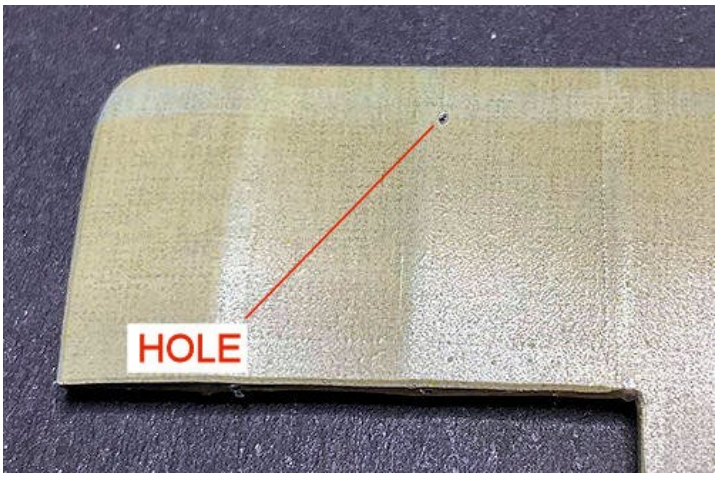

Underside of fuselage




Underside of upper wing (both sides)




Underside of centre wing (both sides)

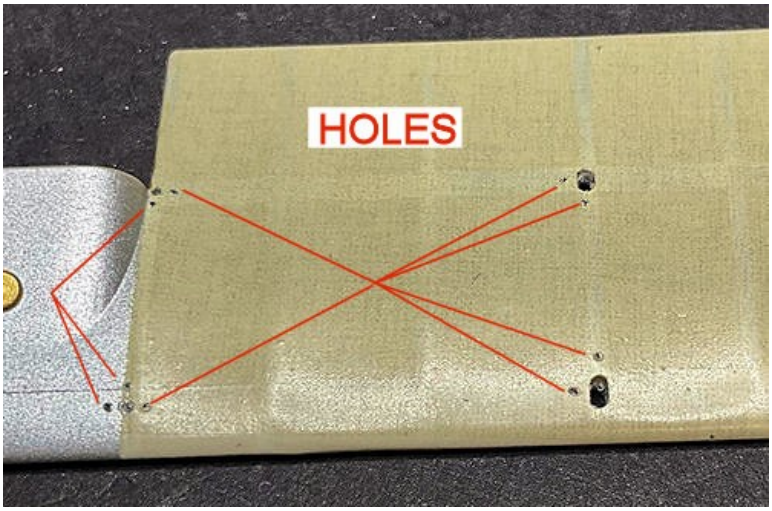


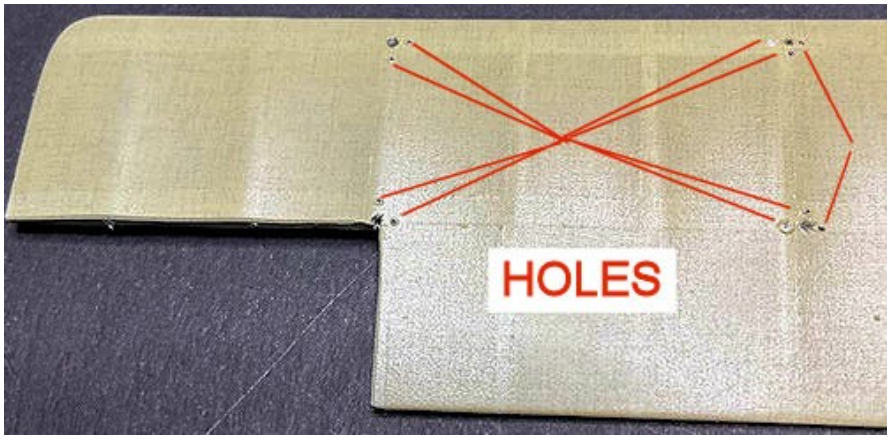

Upper wing top surface (both sides)

and

Lower wing underside (both sides)

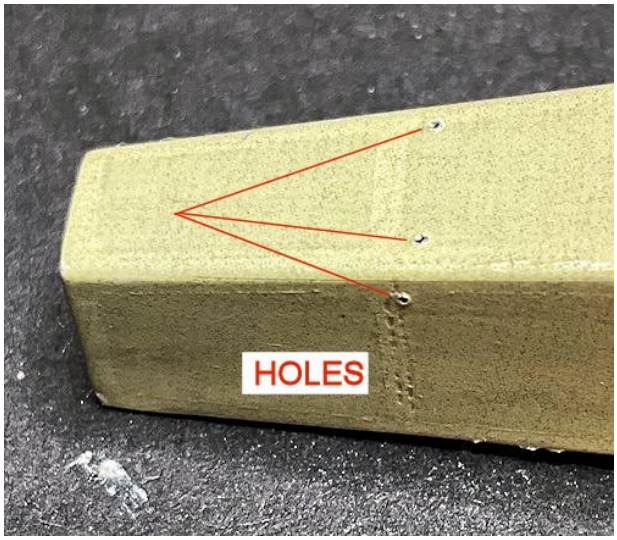
Centre wing top surface (both sides)

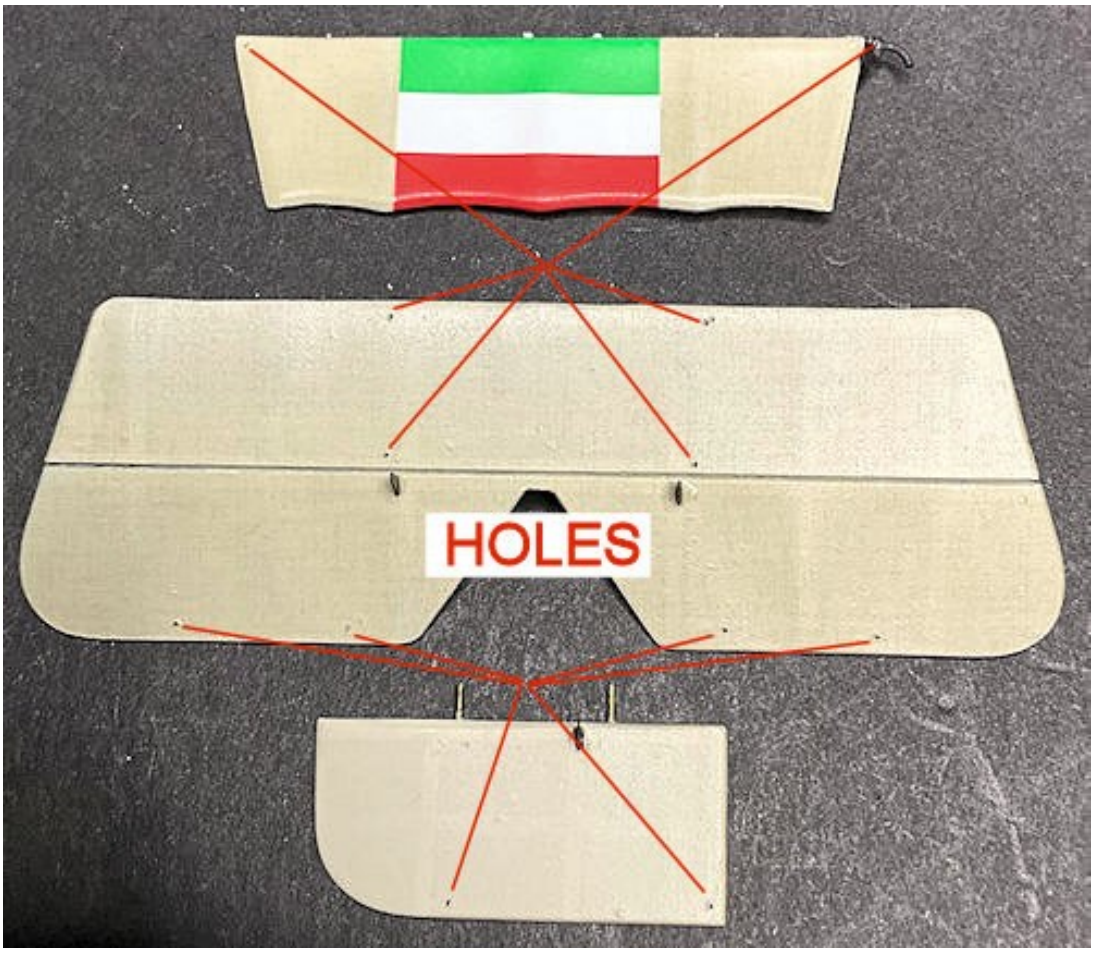



Lower wing top surface (both sides)

Fuselage rear (both sides)






Rudder, tailplane/elevator and all four ailerons

Pre-rigging lines:

**NOTE:** *Normally I would use blackened Brass or Nickel-Silver tube for rigging. However, on such a small model with so much rigging, the effect would be too much. Therefore, the pre-rigging uses the following materials:*

*'MFH' 0.4 mm clear flexible tube (P-957).*

*'Steelon' or 'Stroft GTM' 0.08 mm diameter mono-filament (fishing line).*

*Refer to the model parts and always **cut the length of required line much longer than needed** to span between its attachment points. This allows for easier attachment of turnbuckles and attachment during the final rigging stage.*

*For **each of the Anchor Points and control horns** fitted, use the following procedure to add a line.*

Cut a short length of 0.4 mm diameter tube.

Cut a longer length than required of 0.08 mm diameter line.

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

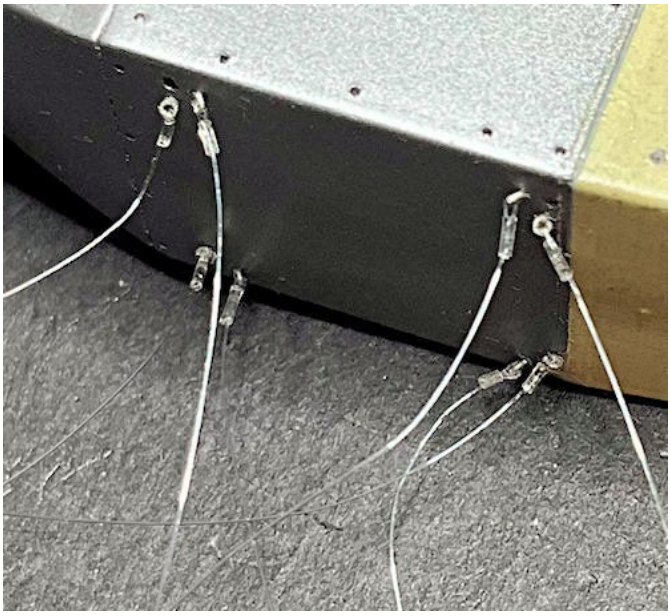
Loop the line back and through the tube.

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

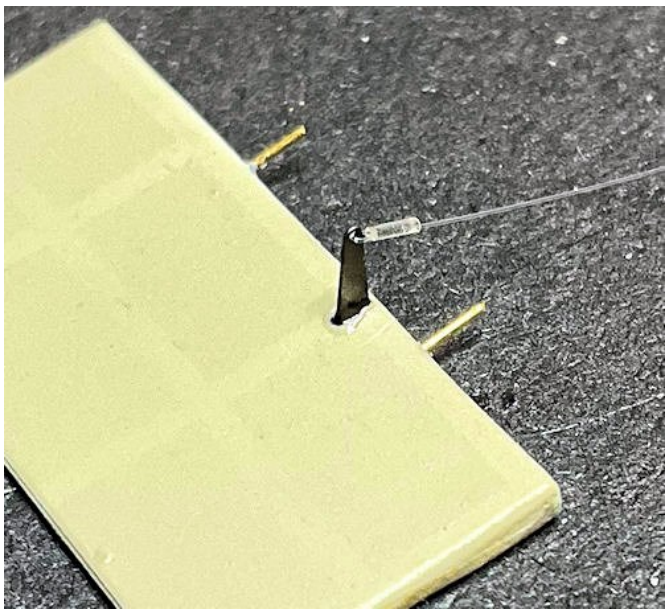
Using thin CA adhesive, secure the lines in the tube end away from the Anchor Point.

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

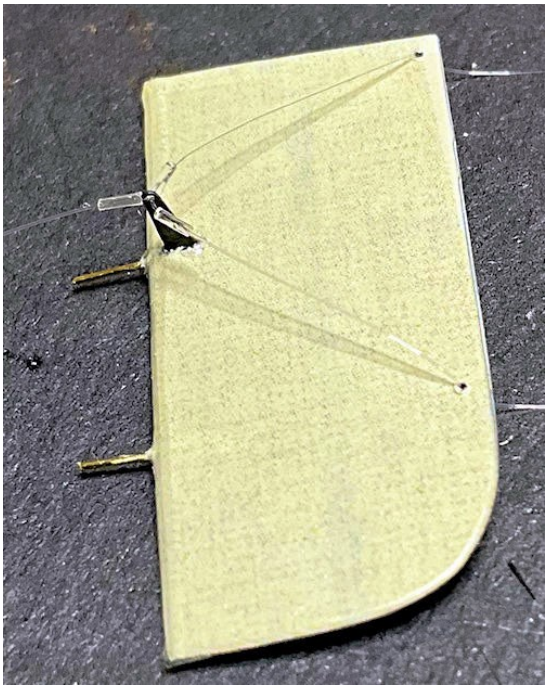
**Refer to the following photographs for any particular information.**



Underside of fuselage



Lower ailerons underside



Upper ailerons top surface

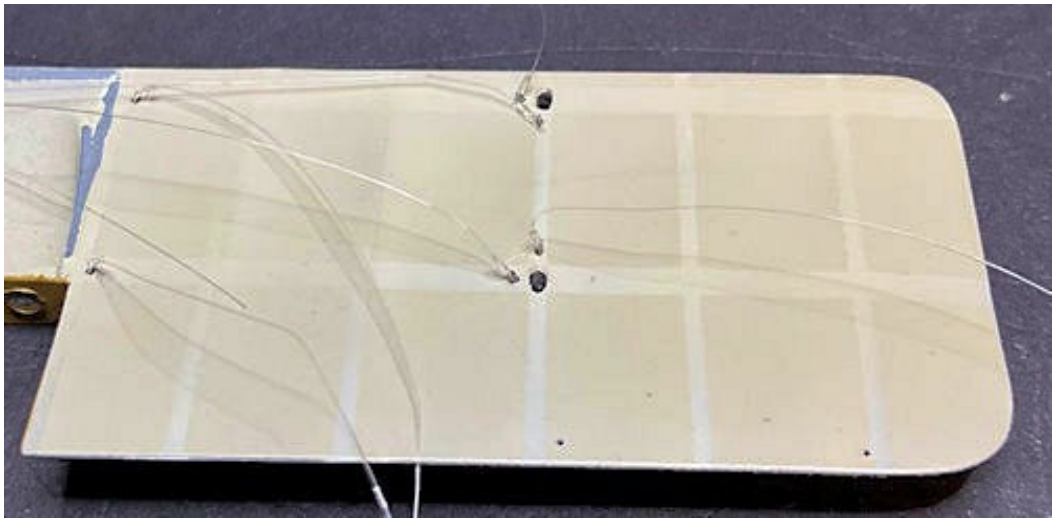
Elevator rear wires

**NOTE:** *The two rear lines on the upper aileron control horns are one long line, each length of which need to be long enough to span from the control horns on the upper wing ailerons to the control horns on the lower wing ailerons*.

Cut the length of line and pass it through the hole in the end of the control horn. Slide a short length of tube onto both ends of the line and up to, but not touching, the control horn. Pass the free ends of the lines through the pre-drilled holes in the trailing edge of the elevator. Keeping both lines equal in length and taut, secure the tubes on the line at the control horns, using thin CA adhesive.

**NOTE:** *The two rear lines on the top and the underside rear of the elevator (both sides) are each one long line, each length of which need to be long enough to span from the control horns on the top of the elevator, through the holes in its trailing edge to the control horns on the underside of the elevator.*

Use the same procedure as for the ailerons, but at the underside control horns, pass both lines with added tubes, through the hole in the control horn. Keeping both lines equal in length and taut, secure the tubes on the line at the control horns, using thin CA adhesive.



Underside of centre wing

**NOTE:** *Pre-rig both sides of the wing underside, except the trailing edge holes, which should be left clear.*

Underside of upper wing

**Construction (continued):**

Make sure all paint is removed from the mating faces and cement the centre wing onto its location on the fuselage.

Make sure all paint is removed from the protruding rods at both ends of all of the struts and their locating holes in the upper, centre and lower wings and the fuselage.

Use thin strips of masking tape to temporarily hold the various pre-rigged lines to the wings and fuselage and away from the strut locating holes and slots for the interplane struts.

**NOTE:** *The various struts need to be aligned to the wings during the following steps and also need to be secured in position using CA adhesive. As such, it's best to use a slower, thicker setting adhesive, such as that from the 'VMS Fleky' range or similar.*

*Handle all of the oil painted struts with care as the paint can be easily chipped.*

*Lower fuselage cabane struts:*

Apply a small amount of CA adhesive onto the protruding locating rods at one end of the four, shorter fuselage cabane struts.

Fully locate the four struts into their pre-drilled locating holes on the underside of the fuselage, making sure they are vertical in the fuselage when viewed from the front and sides.

Allow a few minutes for the adhesive to ‘grab’ the struts in the fuselage.

Apply a small amount of CA adhesive onto the opposite protruding locating rods at the ends of the four struts.

Carefully locate the four struts into their pre-drilled locating holes in the top surface of the lower wing.

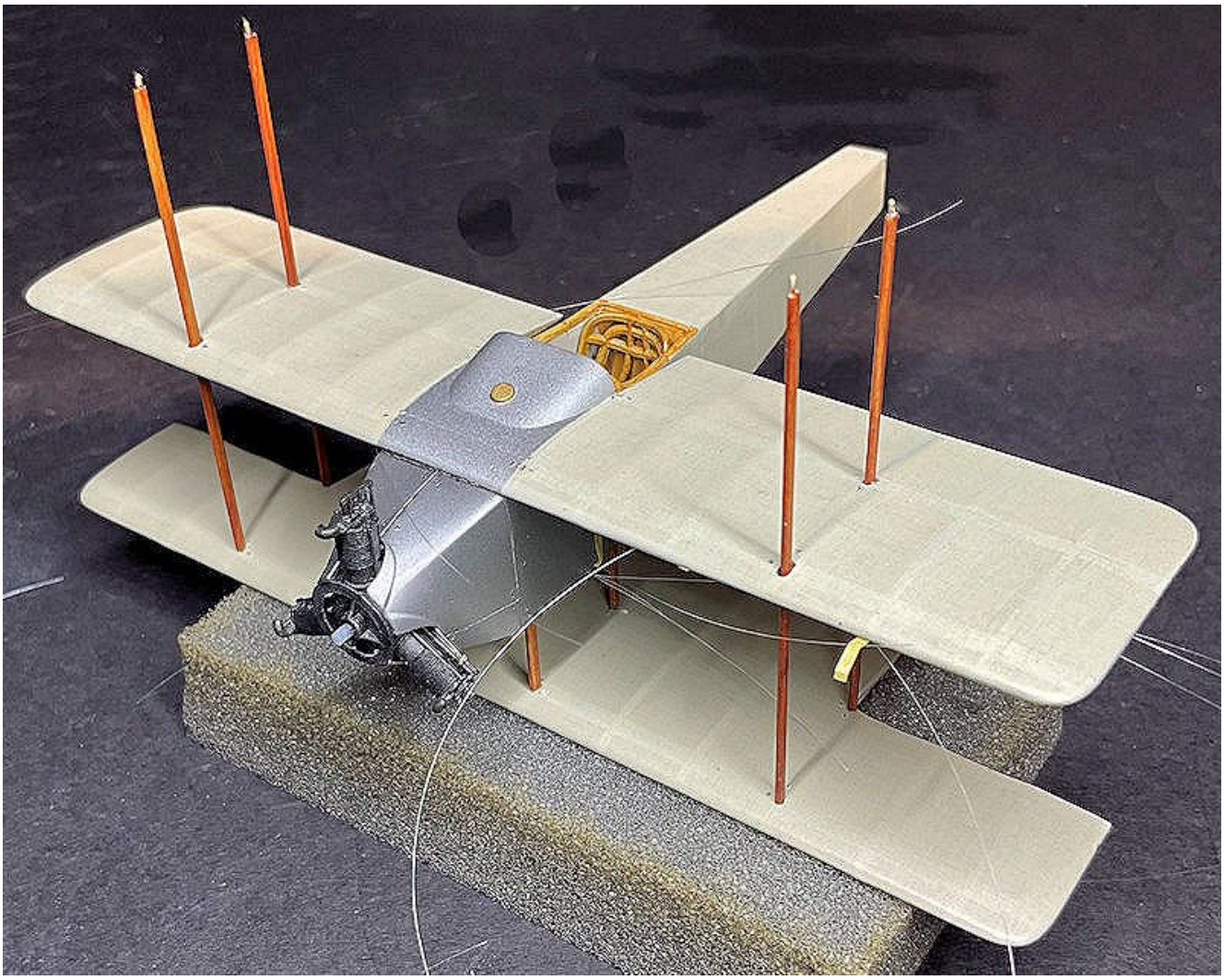
Before the adhesive sets, check that the four cabane struts are vertical between the wings when viewed from the front and sides. Also that the centre and lower wings are aligned and parallel to each other when viewed from the front and sides.

*Interplane struts:*

Carefully slide the four interplane struts through their locating slots in the centre wing.

Apply a small amount of CA adhesive onto the protruding locating rods at the lower wing ends of the four interplane struts.

Fully locate the four struts into their pre-drilled locating holes on the top surface of the lower wing, making sure they are vertical in the wings when viewed from the front and sides.



*Upper fuselage cabane struts:*

**NOTE:** *Before fitting the upper wing onto the fuselage upper cabane struts and the interplane struts, some test fitting of the wing is necessary to ensure a correct fit.*

Temporarily locate the four fuselage upper cabane struts into their pre-drilled locating holes in the decking panel of the fuselage.

Carefully locate the upper wing fully onto the four fuselage upper cabane struts and wing interplane struts.

Check that the four cabane struts are vertical between the wings when viewed from the front and sides. Also that the upper wing is aligned to the centre and lower wings and that the three wings are parallel to each other when viewed from the front and sides.

Apply a small amount of CA adhesive onto the protruding locating rods at one end of the four, fuselage upper cabane struts.

Fully locate the four struts into their pre-drilled locating holes in the decking panel of the fuselage, making sure they are vertical in the fuselage when viewed from the front and sides.

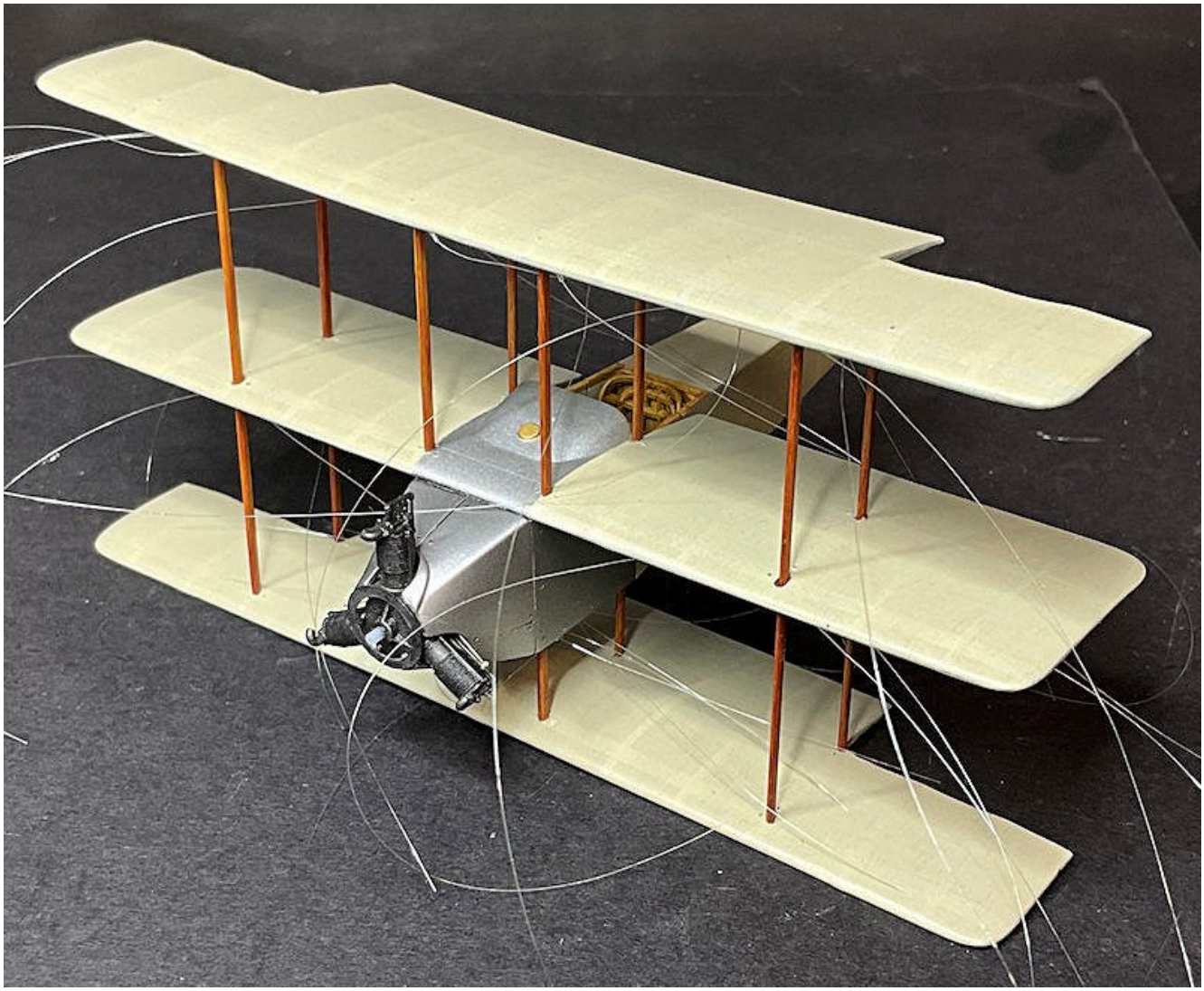
Allow a few minutes for the adhesive to ‘grab’ the struts in the fuselage.

Apply a small amount of CA adhesive onto the opposite protruding locating rods at the ends of the four struts and the rods at the tops of the four interplane struts.

Carefully locate the upper wing fully onto the four fuselage upper cabane struts and wing interplane struts.

Before the adhesive sets, check that the four cabane struts are vertical between the wings when viewed from the front and sides. Also that the upper wing is aligned to the centre and lower wings and that the three wings are parallel to each other when viewed from the front and sides.

Once he adhesive has fully set, remove the masking tape strips holding the various pre-rigged lines.



**Final rigging:**

*Example rigging:*

**NOTE:** *The tubing used is MFH' 0.4 mm clear flexible tube (P-957).*

*For **each of the turnbuckles**, use the following procedure to add a line.*

Cut a short length of 0.4 mm diameter tube.

Pass a pre-rigged line through the tube, then through the 'eye' end of a Type A turnbuckle.

Loop the line back and through the tube.

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

Leave the line loose in the turnbuckle.

Apply thin CA adhesive to the 'leg' of the turnbuckle and fully insert it into its pre-drilled locating hole on the model part. Make sure the angle of the fitted turnbuckle aligns to the opposite end of the rigging line.

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

Secure the tube to the lines using thin CA adhesive.

Cut away any residual line at the tube end.

*Rigging the wings*:

**NOTE:** *Refer to Part 6 (Rigging) of this build log for more information. The turnbuckles used for rigging the wings are the metal 'Gaspatch' 1:48th scale (One End type). Check that the 'eye' ends are clear of any metal filling before fitting. If necessary, carefully drill out the 'eye', using a 0.2 mm diameter drill.*

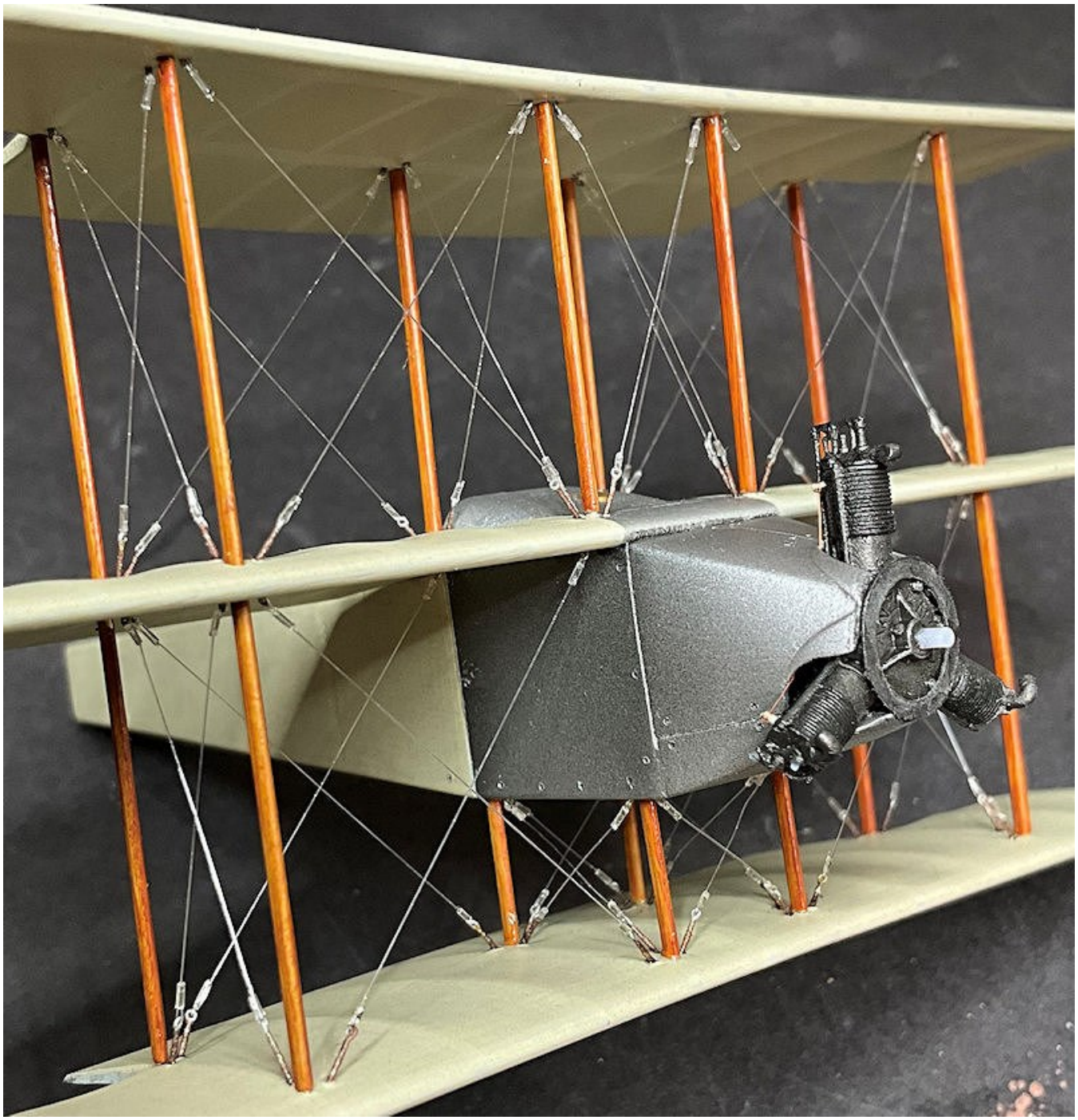
Prepare thirty eight (38) 'Gaspatch' 1/48th scale metal Turnbuckles (One Ended type).

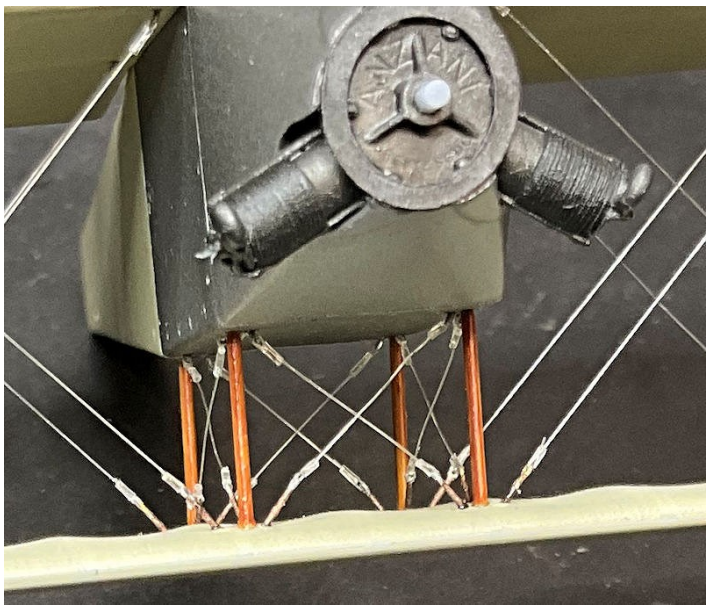
Brush paint their centre barrels with 'Mr. Colour' Copper (215) mixed with Dark Iron (214) or similar to a ratio of approximately 60/40%.

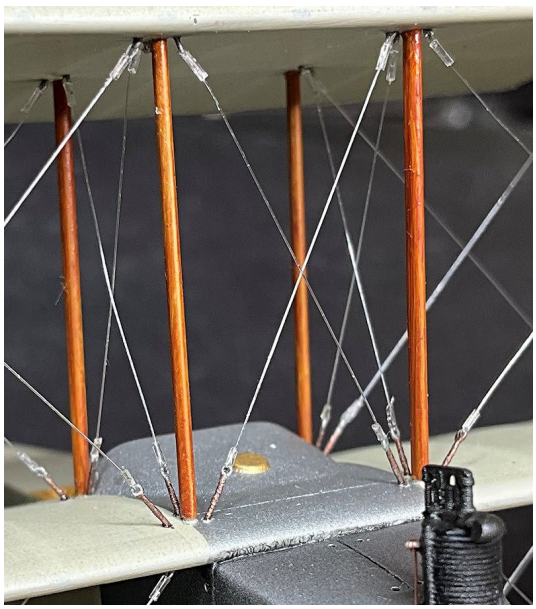

*With so much rigging on such a small model, it's easier for access to rig the model in the following order:*

*Fuselage lower cabane struts - incidence and bracing wires).*
*Fuselage upper cabane struts - incidence and bracing wires).*
*Landing wires.*
*Flying wires.*
*Interplane incidence wires.*
*Horizontal bracing wires.*

*The following photographs show the various rigged lines.*







*Lower horizontal bracing wires:*

**NOTE:** *Refer to Part 6 (Rigging) of this build log for more information. Now that the wings are fitted, the rigging locating holes needed in the fuselage sides can be made for attaching the lower, horizontal bracing wires. The turnbuckles used are the metal 'Gaspatch' 1:48th scale (Type A). Check that the 'eye' ends are clear of any metal filling before fitting. If necessary, carefully drill out the 'eye', using a 0.2 mm diameter drill.*


Prepare four (4) 'Gaspatch' 1/48th scale metal Turnbuckles (One Ended type).

Brush paint their centre barrels with 'Mr. Colour' Copper (215) mixed with Dark Iron (214) or similar to a ratio of approximately 60/40%.

Using the previous example, attach long lengths of line to the 'eye' end of the turnbuckles.

Drill two holes of 0.4 mm diameter through each side of the fuselage. The holes should be aligned to the crossed front and rear flying and landing wires and be horizontal when viewed from the front.

Secure the turnbuckles into the holes, using thin CA adhesive.

Hold the lines horizontal and taut across the crossed flying and landing wires and using thin CA adhesive, secure the lines to the front and rear edges of the forward and rear interplane struts.

Once the adhesive has fully set, cut away residual line at the outer edge of the interplane struts.

*Upper horizontal bracing wires:*

**NOTE:** *Refer to Part 6 (Rigging) of this build log for more information. Now that the wings are fitted, the upper, horizontal bracing wire can be fitted. The turnbuckles used are the metal 'Gaspatch' 1:48th scale (Type C). Check that the 'eye' ends are clear of any metal filling before fitting. If necessary, carefully drill out the 'eye', using a 0.2 mm diameter drill.*


Prepare a 'Gaspatch' 1/48th scale metal turnbuckles (Type C).

Brush paint the centre barrel with 'Mr. Colour' Copper (215) mixed with Dark Iron (214) or similar to a ratio of approximately 60/40%.

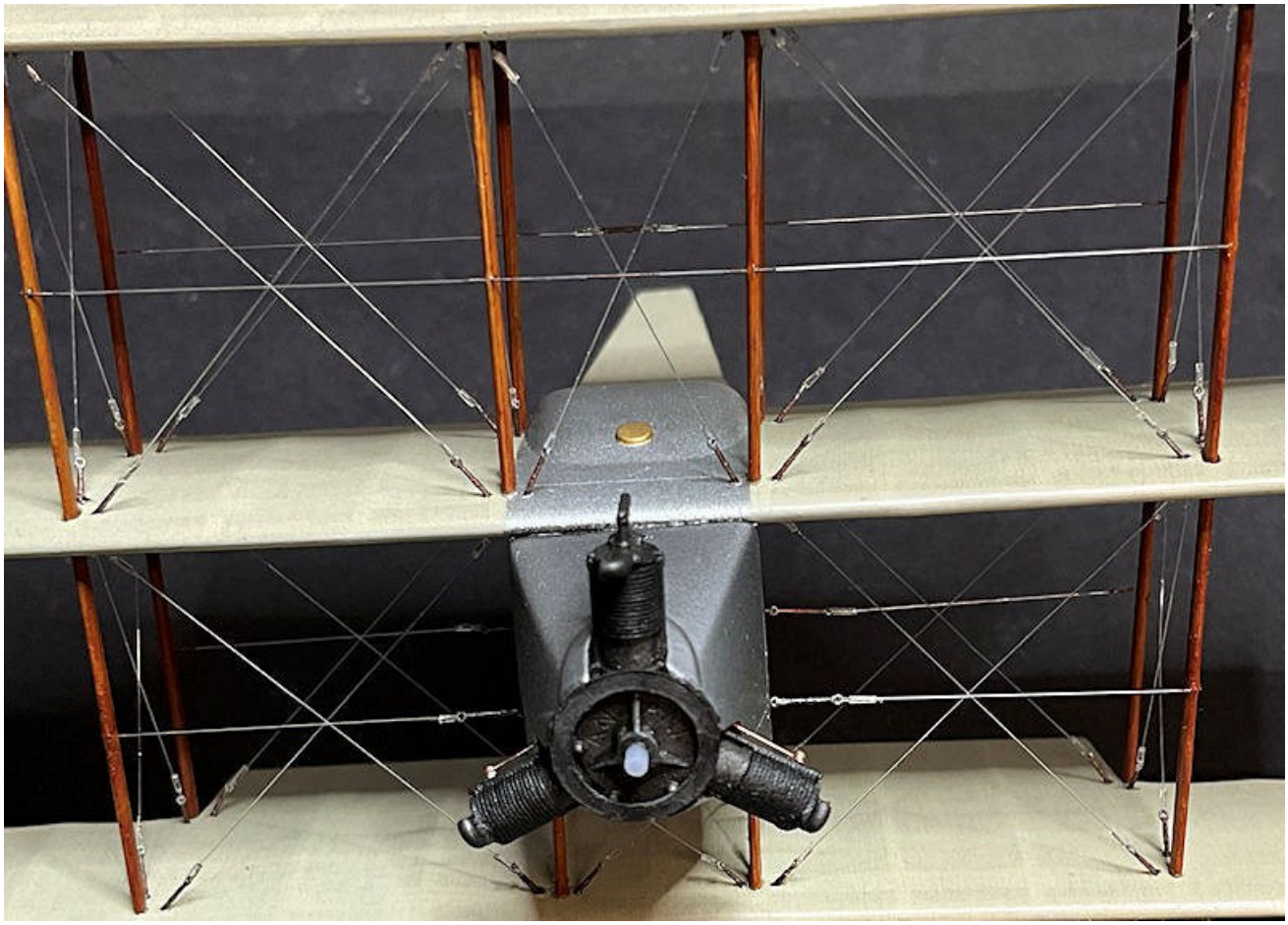
Using the previous example, attach a long length of line to both 'eye' ends of the turnbuckle.

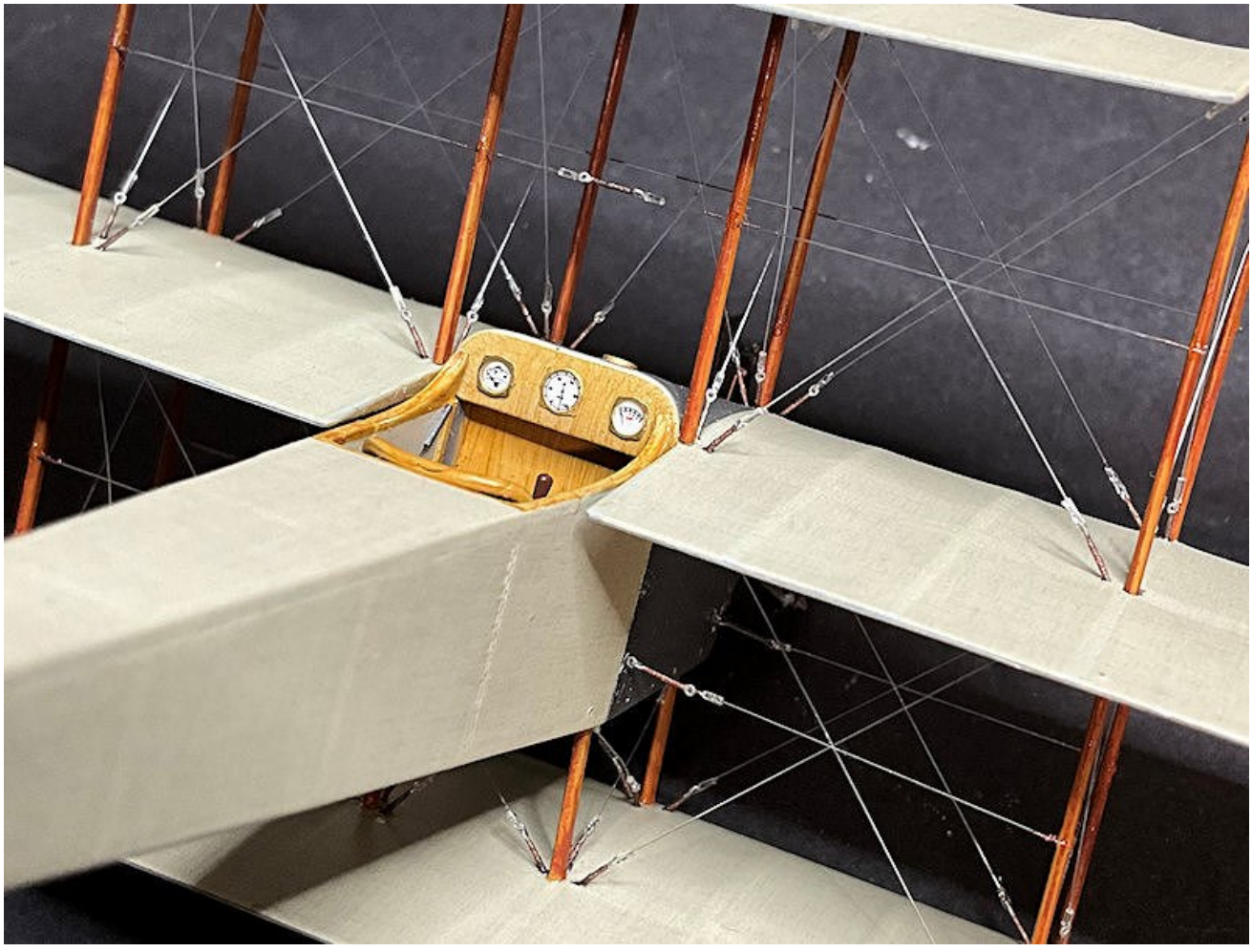
Hold the line horizontal and taut and across the crossed rear flying and landing wires and with the turnbuckle centred between the fuselage rear, upper cabane struts.

Using thin CA adhesive, secure the lines to the rear edge of the rear interplane struts.

Once the adhesive has fully set, cut away residual line at the outer edge of the interplane struts.

Repeat the procedure, but with a single long length of line (without a turnbuckle) across the forward interplane and fuselage forward cabane struts, securing the line to all four struts.





*Ailerons and control cables:*

**NOTE:** *Refer to Part 6 (Rigging) of this build log for more information. Now that the wings are fitted, the ailerons and their control cables, which were pre-rigged earlier in this build log, can be fitted.*

Fully locate the upper ailerons onto the locating holes pre-drilled in the trailing edge of the upper wing.

Fully locate the lower ailerons onto the locating holes pre-drilled in the trailing edge of the lower wings.

Apply thin CA adhesive to the aileron rods then fully locate the ailerons against the wings.

Trim the length of the single lines attached to the front of the control horns such that they can be fully inserted into the pre-drilled holes in the top surface of the upper wing and underside of the lower wings.

Keep the lines taut, apply thin CA adhesive to secure the lines in their locating holes.

Pass the two lines at the rear of the aileron control horns rearwards and down through the pre-drilled holes in the aileron trailing edge.

Then pass the lines down through the pre-drilled holes in the trailing edge of the centre wing and through the holes in the lower wing ailerons.

Turn the model over.

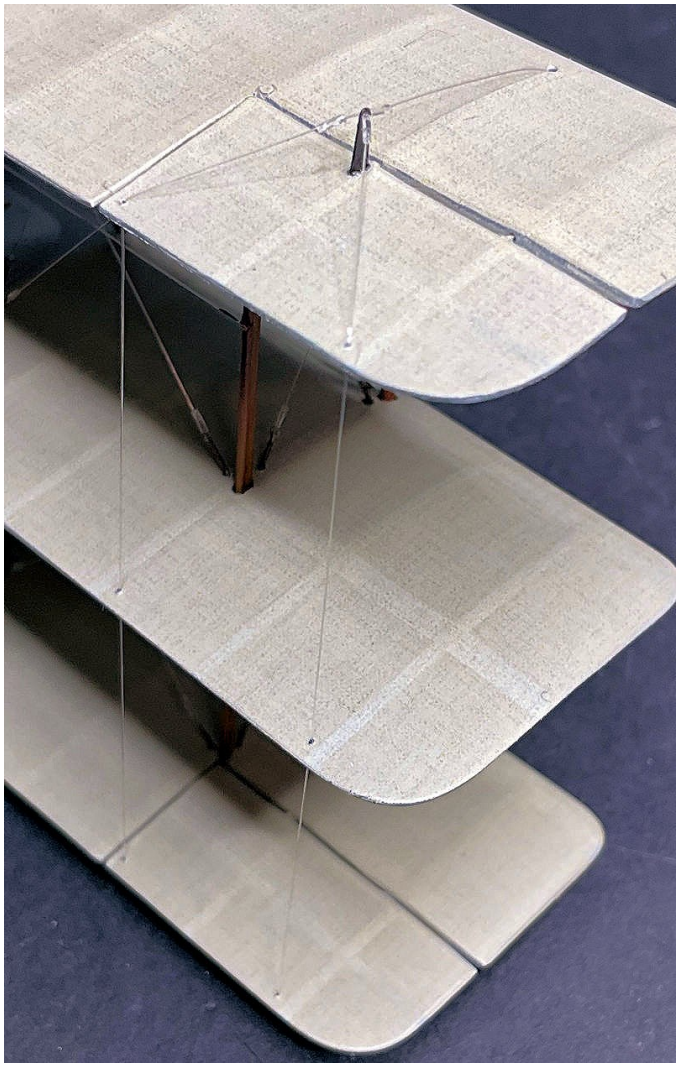
Cut four short lengths of tube and slide one onto each of the four aileron lines.

Pass the free ends of the lines through the hole in the end of the lower wing ailerons.

Slide the tubes up to the control horns.

Keeping the lines taut, apply thin CA adhesive to secure the lines to the control horns.

Cut away residual line close to the control horns.



**Construction (continued)*:***

Make sure all decal and paint is removed from the mating faces of the underside of the tailplane and top of the fuselage rear.

Cement the tailplane onto the rear of the fuselage. Make sure the trailing edge at the centre of the tailplane is aligned to the rear edge of the fuselage. Also that the tailplane is centred on the fuselage and parallel to the wings.

Make sure all paint is removed from the mating faces at the rear end of the fuselage and leading edge of the rudder.

Cement the rudder into its locating recesses in the rear end of the fuselage, making sure the rudder is vertical on the fuselage.

**Final rigging (continued):**

**NOTE:** *Refer to Part 6 (Rigging) of this build log for more information.*

*Forward fin bracing wires:*

Cut eight short lengths of tube and one long length of line.

Using thin CA adhesive, secure one end of the line into the pre-drilled hole on the rear, lower edge of the fuselage.

Slide two tubes onto the line then pass the line up and through the pre-drilled hole in the tailplane leading edge.

Slide two tubes onto the line then pass the line up and through the pre-drilled hole in the top front of the rudder.

Slide two tubes onto the line then pass the line down and through the pre-drilled hole in the tailplane opposite leading edge.

Keeping the line taut, apply thin CA adhesive to secure the line in the rudder and tailplane.

Slide the tubes to the ends of the lines and secure on the lines using thin CA adhesive.

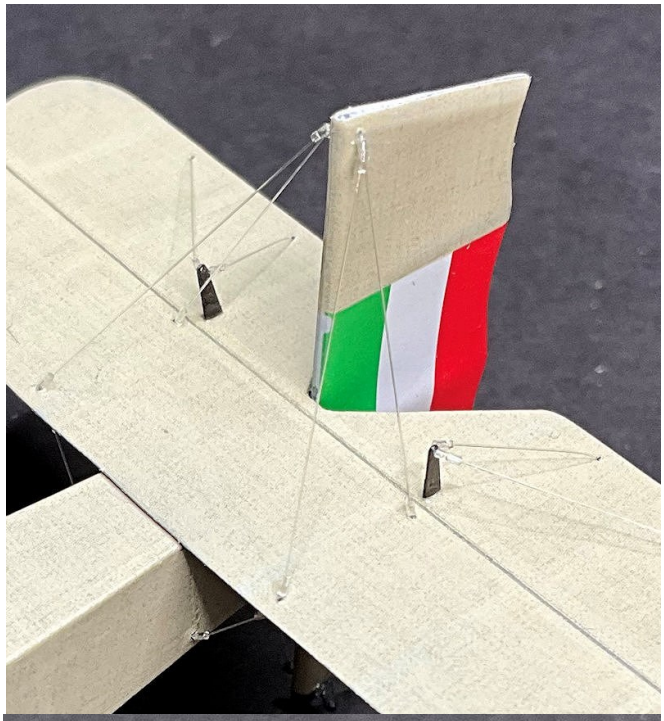
Trim the free end of the line to allow it to be fully inserted into the pre-drilled hole on the rear, lower edge on that side of the fuselage.

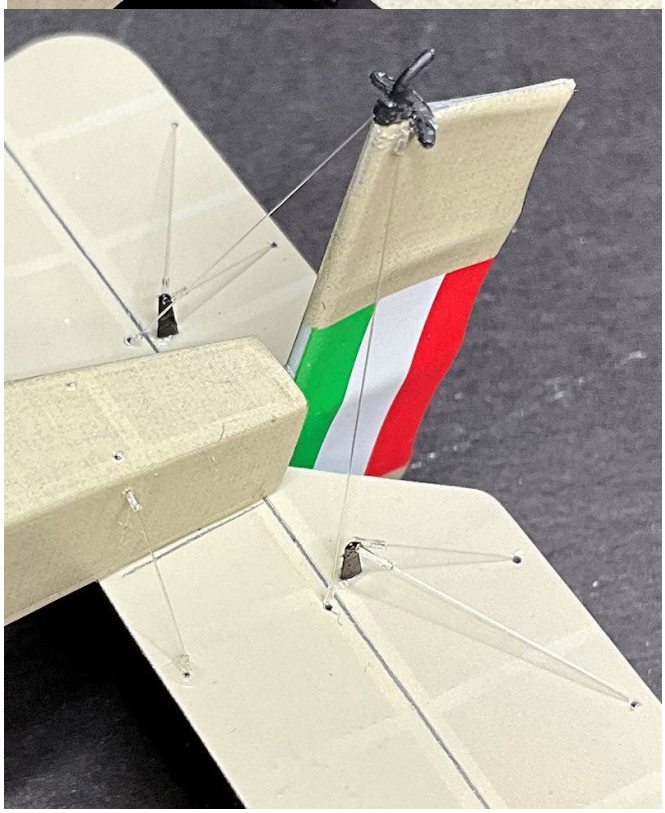
Slide two tubes onto the line then pass the line fully into the pre-drilled hole and secure in position using thin CA adhesive.

Slide the remaining two tubes to the ends of that line and secure using thin CA adhesive.

*Rear fin bracing wires:*

Follow the previous procedure, but routing the line through the pre-drilled holes in the trailing edge of the tailplane and securing the ends of the line through the pre-drilled hole in the bottom of the rudder post.





*Rudder/tail skid control cables :*

**NOTE:** *Refer to Part 6 (Rigging) of this build log for more information. The turnbuckles used are the metal 'Gaspatch' 1:48th scale (Type C).*

Prepare two 'Gaspatch' 1/48th scale metal turnbuckles (Type C).

Brush paint the centre barrel with 'Mr. Colour' Copper (215) mixed with Dark Iron (214) or similar to a ratio of approximately 60/40%.

Using the previous example, attach a long length of line to both 'eye' ends of the turnbuckles.

Trim one line of the two turnbuckles to allow them to be fully inserted into the pre-drilled hole in the rear, underside of the fuselage.

Using thin CA adhesive, secure the trimmed lines into the pre-drilled hole in the rear, underside of the fuselage.

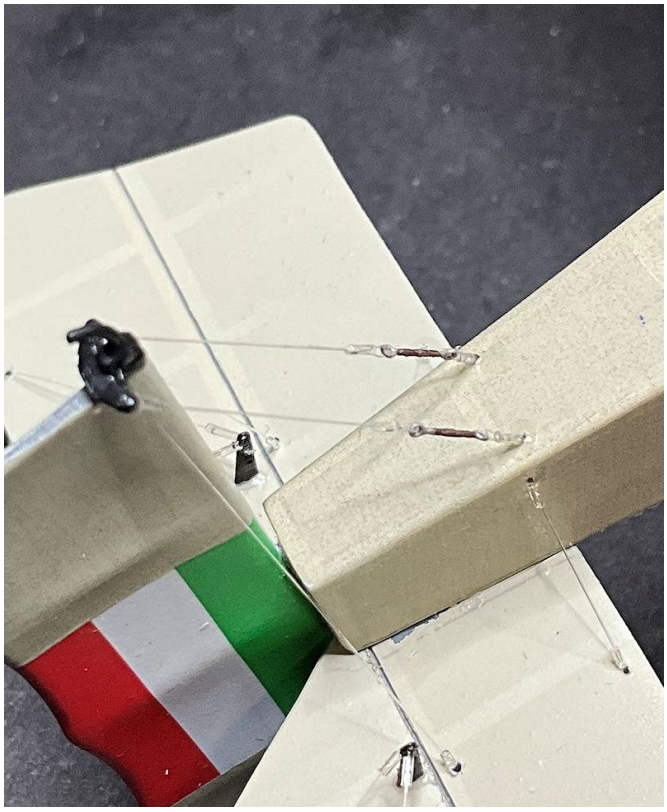
Cut two short lengths of tube.

Slide a tube onto the free lines of the turnbuckles.

Pass the free end of each line through the pre-drilled holes in the added rudder control horn at the bottom of the rudder post.

Keeping the lines taut, apply thin CA adhesive to secure the lines in the rudder control horns.

Cut away residual line at the control horns.



*Elevator cables :*

**NOTE:** *Refer to Part 6 (Rigging) of this build log for more information. The turnbuckles used are the metal 'Gaspatch' 1:48th scale (Type C).*

Cut four short lengths of 0.2 mm diameter rod, such as that from Albion Alloy's' or similar.

Secure the rods into the pre-drilled holes at the ends of the created elevator control levers, leaving 0.5 mm protruding from the outer side of the levers (for mounting the turnbuckles).

Cut away the remaining tube at the other side of the levers.

Prepare four ‘Gaspatch’ 1/48th scale metal turnbuckles (Type C).

Brush paint the centre barrels with ‘Mr. Colour’ Copper (215) mixed with Dark Iron (214) or similar to a ratio of approximately 60/40%.

Using the previous example, attach a long length of line to one ‘eye’ end of each turnbuckle.

**NOTE:** *If the elevators are not aligned to the tailplane but are angled down, the elevator control levers should be angled slightly forwards at their tops.*

Using thin CA adhesive, secure the attached rods of the elevator control levers into their pre-drilled holes in the fuselage sides, making sure both levers are angled the same.

Using thin CA adhesive, secure the empty ‘eye’ ends of the turnbuckles onto the protruding rods on the control levers.

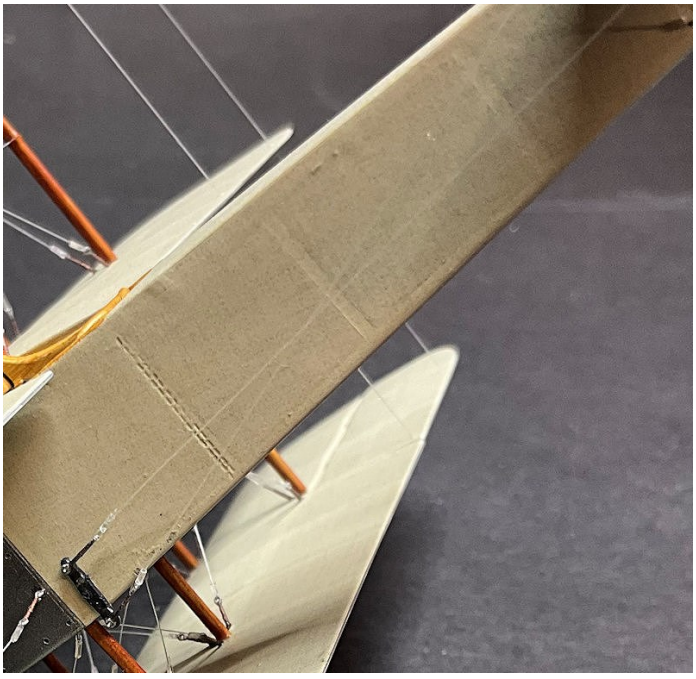
Pass the upper control lines rearwards to the elevator underside control horns.

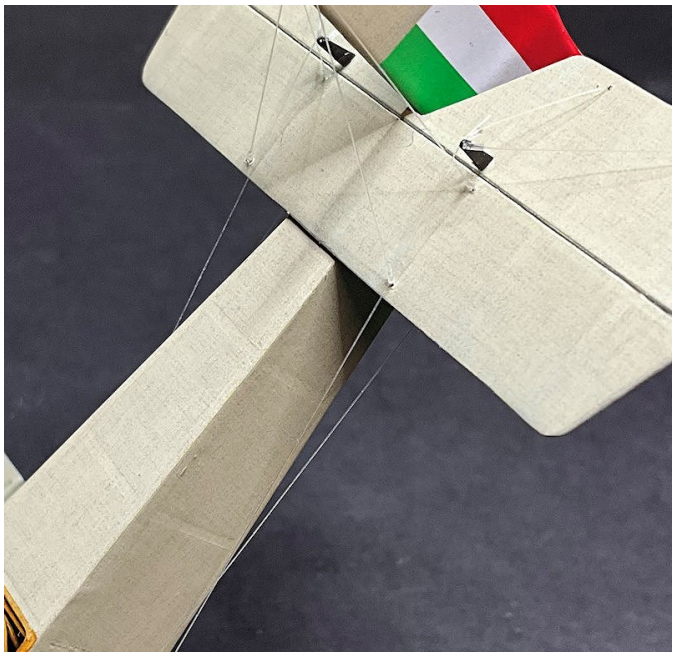
Secure the lines to the top of the control horns using thin CA adhesive.

Pass the lower control lines rearwards to the elevator upper control horns.

Secure the lines to the top of the control horns using thin CA adhesive.

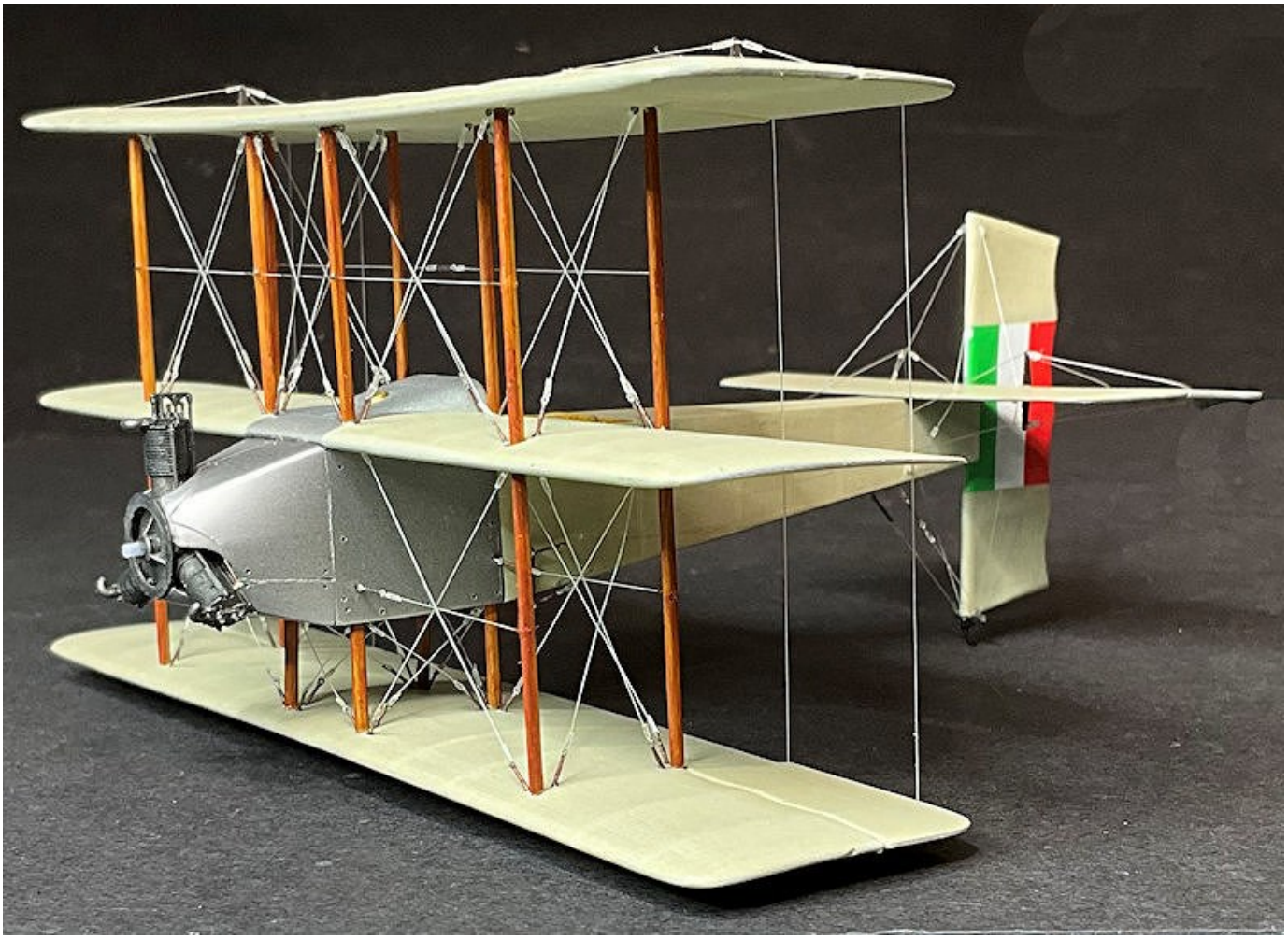
Cut away residual line at the control horns.

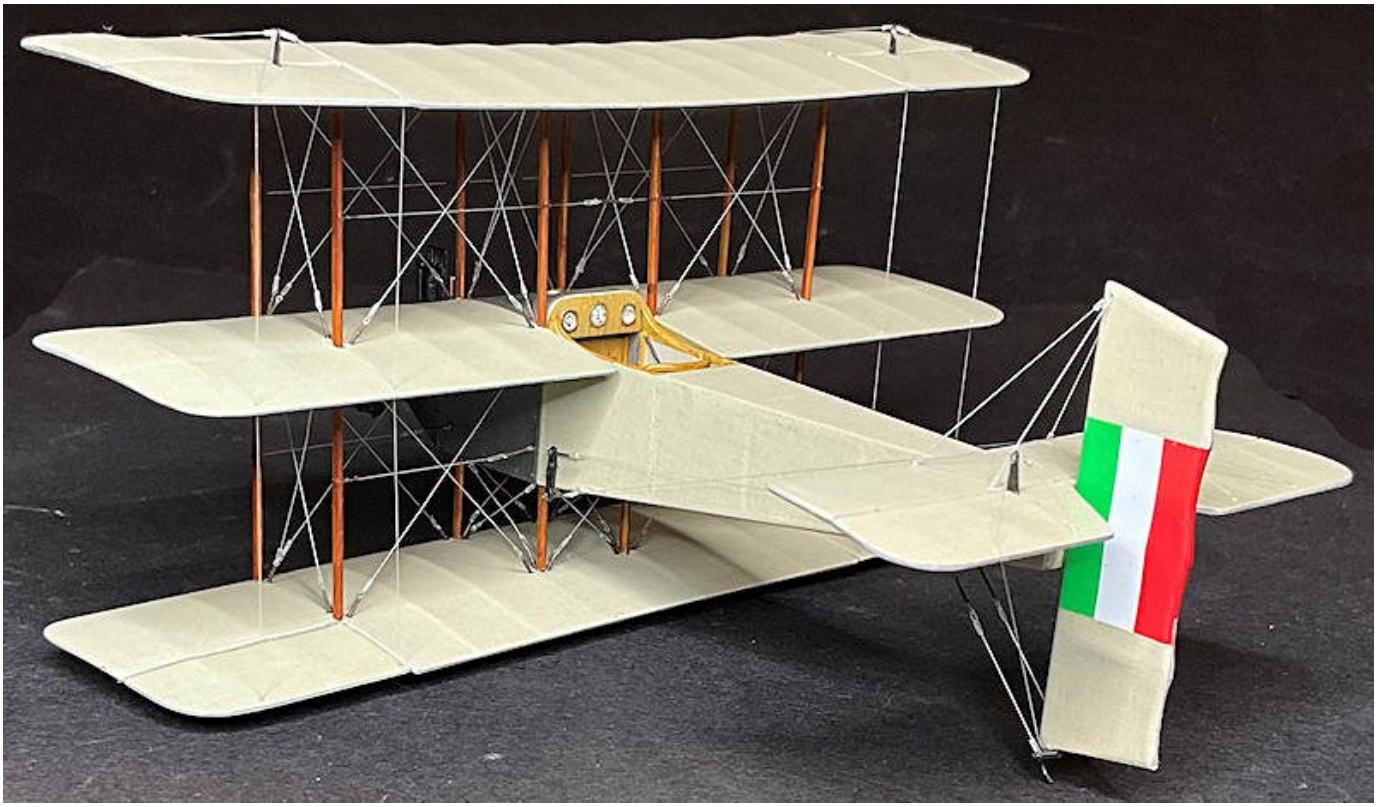




*Finish:*

Airbrush a light semi-matte clear coat, such as ‘Tamiya’ Semi-Gloss (X35) or similar, over all of the rigging. This will reduce the sheen of the mono-filament.





**Construction (continued)**:

Landing gear:

**NOTE:** *The landing wheels, struts and axle assembly were prepared earlier in the build log.*

Cement one of the landing gear struts into its locating holes on the underside of the lower wing. Make sure the strut is fully located and is vertical on the wing when viewed from the front.

Slide a wheel onto that end of the axle assembly.

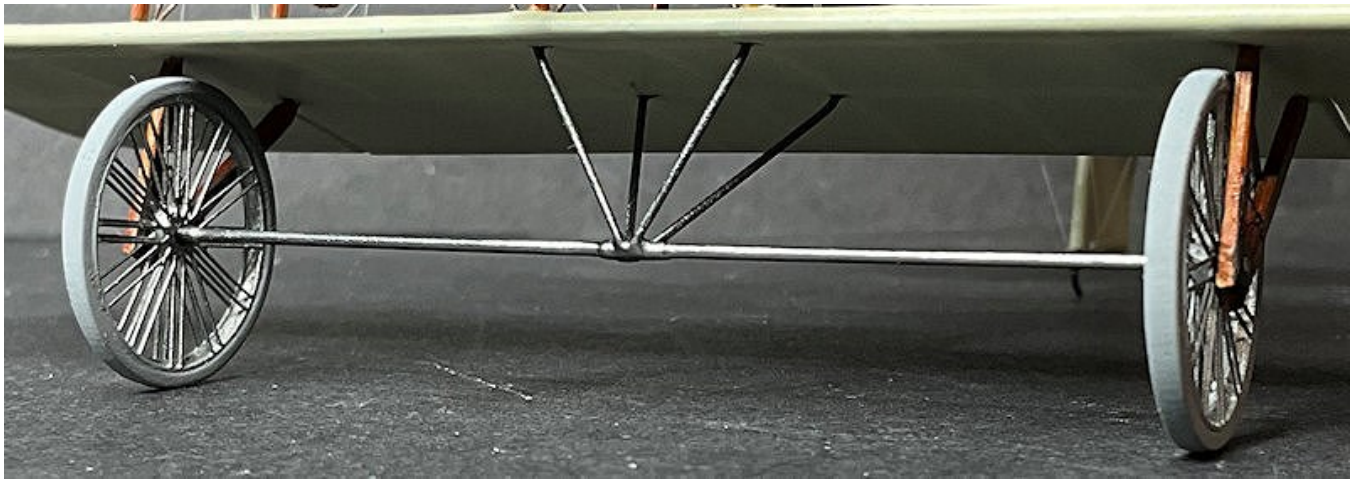
Locate that end of the axle into its locating hole in the landing gear strut.

Fully locate the four legs of the axle support frame into their pre-drilled locating holes in the underside of the wing and secure in place using thin CA adhesive.

Slide the remaining wheel onto the free end of the axle.

Locate the remaining landing gear strut onto that end of the axle then fully locate and cement the strut into its locating holes on the underside of the lower wing. Make sure the strut is fully located and is vertical on the wing when viewed from the front.

Slide the wheels up to the landing gear struts and secure on the axle using thin CA adhesive.



Windscreen:

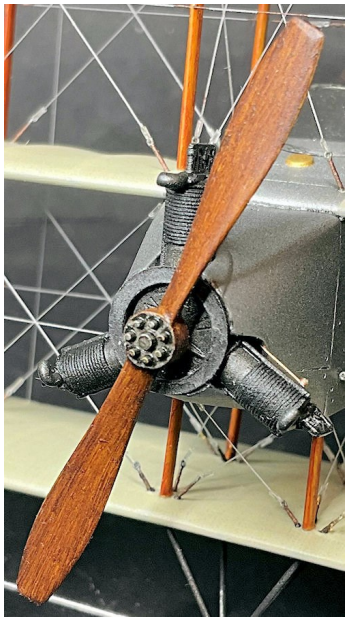
Cut away the molding gate from the edge of the windscreen and carefully sand the residue away.

Brush paint the edges of the windscreen with ‘Mr. Colour’ Stainless Steel (213) or similar.

Using a PVA adhesive, such as ’MicroScale’ Micro Krystal Clear or similar, secure the windscreen onto the decal panel at the front edge of the cockpit opening.

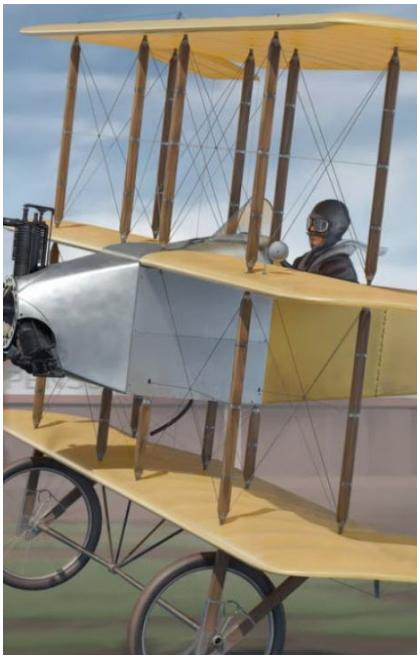
Propeller:

Cement the propeller is the desired position onto the engine propeller shaft. If necessary, a thicker slow setting CA adhesive can be used.



Strut linen wraps:

**NOTE:** *It was usual during this period to wrap linen strips around aircraft struts to help prevent splintering of the wood due to stresses.*



To represent these linen wrappings, I brush painted 'AK Interactive' Faded white (AK3029) around the interplane and fuselage cabane struts.

Brush 'Tamiya' Smoke (X19) over the painted linen wraps to reduce the brightness of the white colour.

Weathering:

**NOTE:** *This aircraft was a civilian design and therefore not subjected to the heavy weathering associated with military aircraft.*

Refer to Part 3 (Weathering) of this build log. To highlight the panel fasteners on the engine cowl panels, I applied 'Flory Models' Dark Dirt fine clay wash.

# PART 12
# FIGURE

## PART 12 - FIGURE

The figure I chose to use is the 'Copper State Models' French seated airman (F32-050).

The figure is seated and drinking coffee. It comprises the body/right leg, left leg, two arms, head and hat. Also supplied is a table with legs, a chair and a walking cane.

**Figure:**

**NOTE:** *Refer to Part 5 (resin) of this build log for information. As the figure is intended to represent a civilian, I did not use the supplied French cap.*

Preparation:

Remove any casting tabs from the edges of the figure parts and sand away any residue or seams lines.

Scape away the rank markings on the cuffs of the jacket and collar.

Assembly:

**NOTE:** *Some parts of the figure are not fitted initially as some filling may be required to the body joints and also it makes painting detail easier. As the figure is resin, CA adhesive must be used.*

Using thin CA adhesive, secure the left leg to the figure body.

Using thin CA adhesive, secure the right arm into the figure body.

Fill any gaps in joints with a modelling putty, such as 'Perfect Plastic Putty' or similar and once fully set, sand the filler to blend with the surrounding surfaces.

Painting:

Airbrush the figure assembly, left arm and head with a grey primer, such as 'AK Interactive' Grey (AK758) or similar.

Brush paint the figure as follows:

**'AK Interactive' Brown Leather (AK3031)** - Leg covers, belt, jacket creases.

**'AK Interactive' British Uniform Light (AK3081)** - Jacket.

**'Tamiya' FLM Grey (XF22)** - Trousers.

**'Tamiya' IJN Grey (XF75)** - Trouser creases.

**'Tamiya' Linoleum Deck Brown (XF79)** - Shoes.

**'Tamiya' Rubber Black (XF85)** - Shoe soles.

**'Mr. Colour' Brass (219)** - Jacket buttons.

**'Mr. Colour' Stainless Steel (213)** - Buckles on leg covers.

**'Vallejo' Model Colour basic skin tone (70.815 and light flesh 70.928)** - Flesh.

**'Tamiya' Rubber Black (XF85)** - Hair.

**'Citadel' Bugmans Glow** - Lips.

**'Tamiya' Deck Tan (XF55)** - Cup and saucer.

**'Tamiya' Flat Earth (XF52) and Clear Orange (X26)** - Coffee in cup.

Brush paint the jacket, leg covers and shoes with **'Tamiya' Semi-Gloss (X35)**.

Brush paint the trousers with **'Tamiya' Flat (X86)**.

Assembly (continued):

Using thin CA adhesive, secure the head into the body of the figure.

**Accessories:**

**NOTE:** *The map case used was from my 'spares' collection.*

Preparation:

Remove any casting tabs from the edges of the table parts, chair, walking cane and map case, then sand away any residue or seams lines.

*Assembly:*

Using thin CA adhesive, secure the table top to the table stand.

Priming:

Airbrush the table assembly, chair, walking cane and map case with a grey primer, such as 'AK Interactive' Grey (AK758) or similar.

Painting:

Airbrush the table assembly, chair and walking cane with 'Tamiya' Dark Yellow (XF60) or similar.

**NOTE:** *Refer to **Method 2 in Part 2 (Wood Effects)** of this build log for more information*

*Table:*

Apply your chosen wood effect. I chose to use Windsor & Newton' Griffin (Alkyd) Burnt Sienna oil paint.

*Chair:*

Apply your chosen wood effect. I chose to use Windsor & Newton' Griffin (Alkyd) Raw Sienna oil paint.

*Walking cane:*

Apply your chosen wood effect. I chose to use Windsor & Newton' Griffin (Alkyd) Raw Sienna oil paint.

*Map case:* **'AK Interactive' Brown Leather (AK3031)**, buttons **'Mr. Colour' Brass (219)**, finish **'Tamiya' Semi-Gloss (X35)**.

# PART 13
# DISPLAY BASE

# PART 13 - DISPLAY BASE

The display case in made from piano black and clear acrylic sheet of 3mm thickness. The base shoulder, for locating the clear cover, is a second thickness on top of the base plate. This case was purpose built by Paul Moss, who has a retail outlet on Ebay - www.inperspextive.com

The grass mat used was the 'Model Scene' cut meadow - Spring (F001).

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

## Grass mat:

The grass mat was cut to the desired shape. The mat was laid onto the display base and positioned to ensure the model would clear the display top when located. A soft pencil was used to lightly trace the outline of the mat on the display base. PVA adhesive was then applied to the backing of the mat, which was then laid back onto the base, aligned to the pencil outline and gently pushed down to make proper contact. The grass mat was covered with a sheet of 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 were gently brushed to remove any flatness.

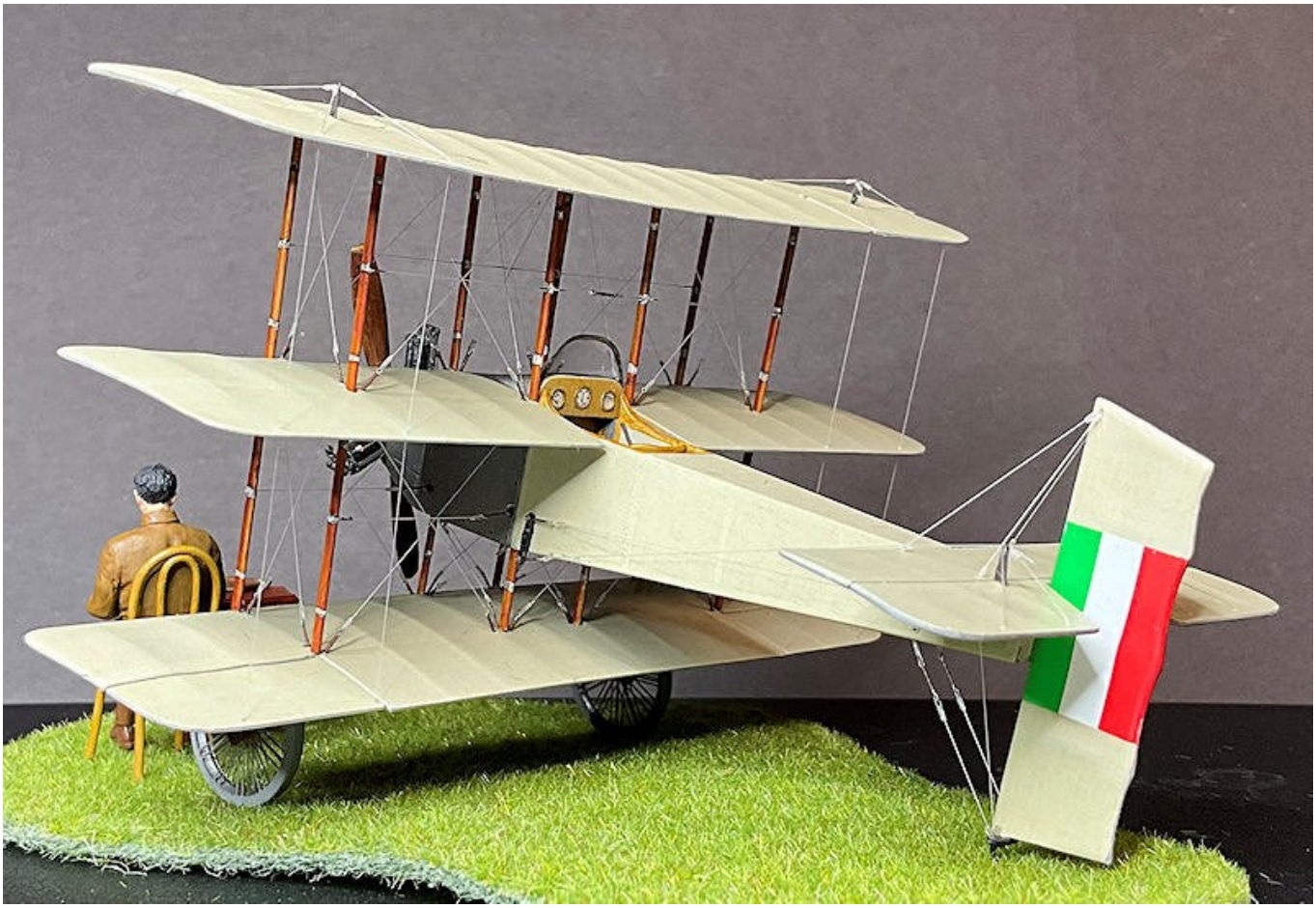
## Aircraft model:

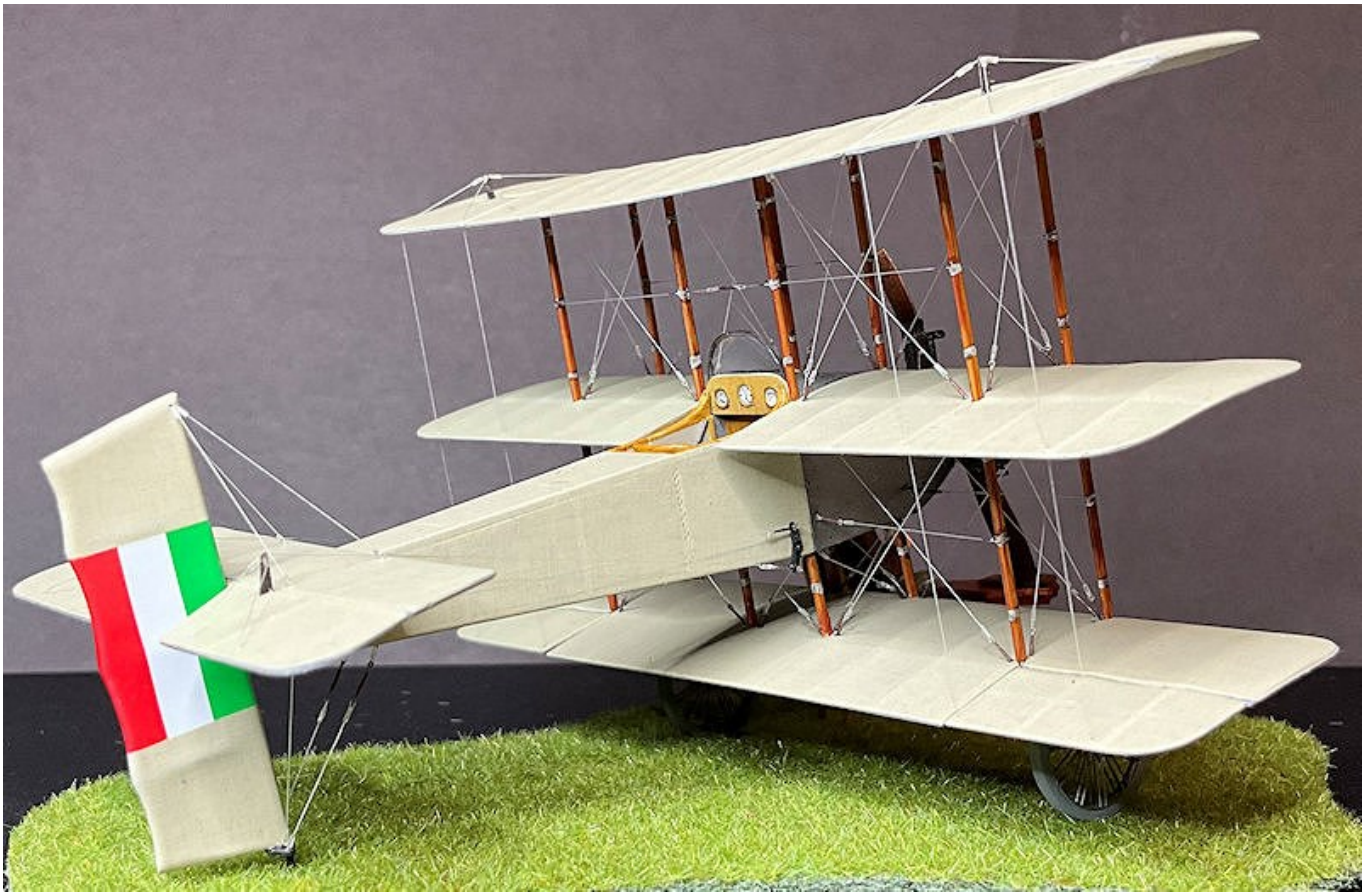
The aircraft was not fixed to the display base, but left as 'free standing'. Although this may not be as secure as fixing the model to the display base, it does mean the model will not be subjected to shock loading when being moved around, as it might be if fixed on the display. However, the location of the wheels and tail skid were scored through the grass mat to give the model a more firmer location.

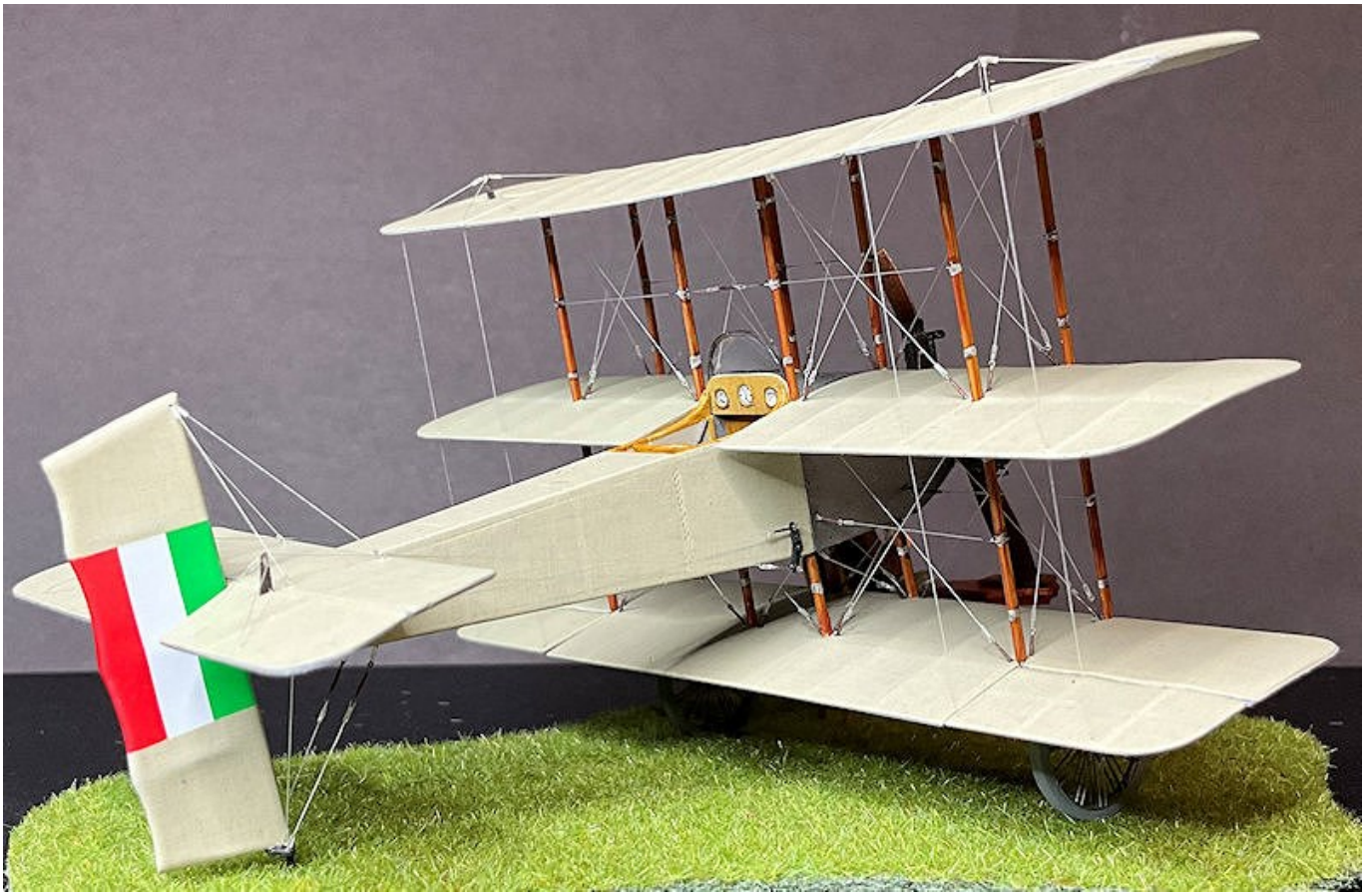
## The figure with accessories:

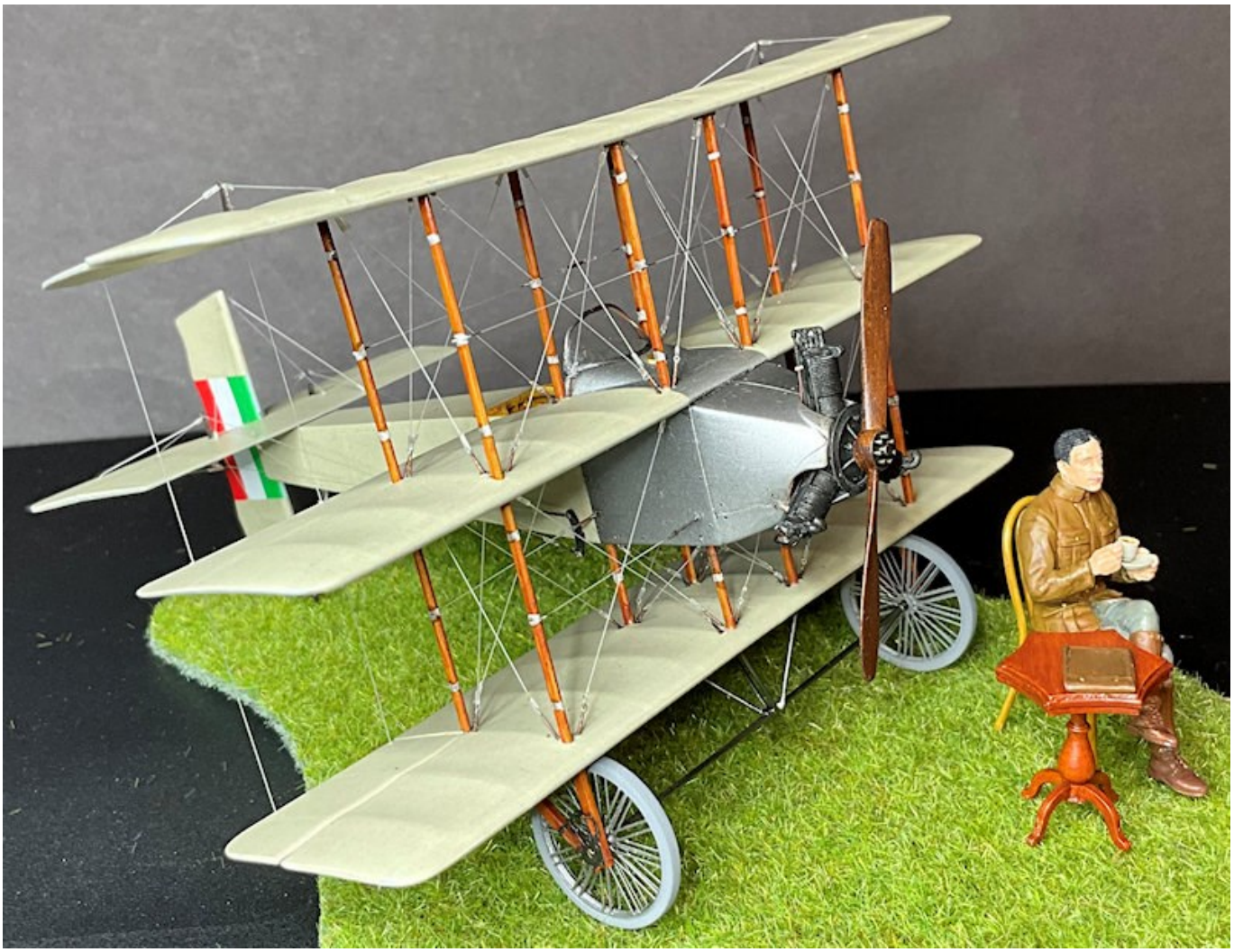
The figure with accessories were positioned on the base in their final positions and the locations marked on the grass mat. The locations were then scored through the grass mat and onto the base. PVA or thin CA adhesive was then applied to secure the figure with accessories and light pressure was applied to ensure they were fully located onto the base.

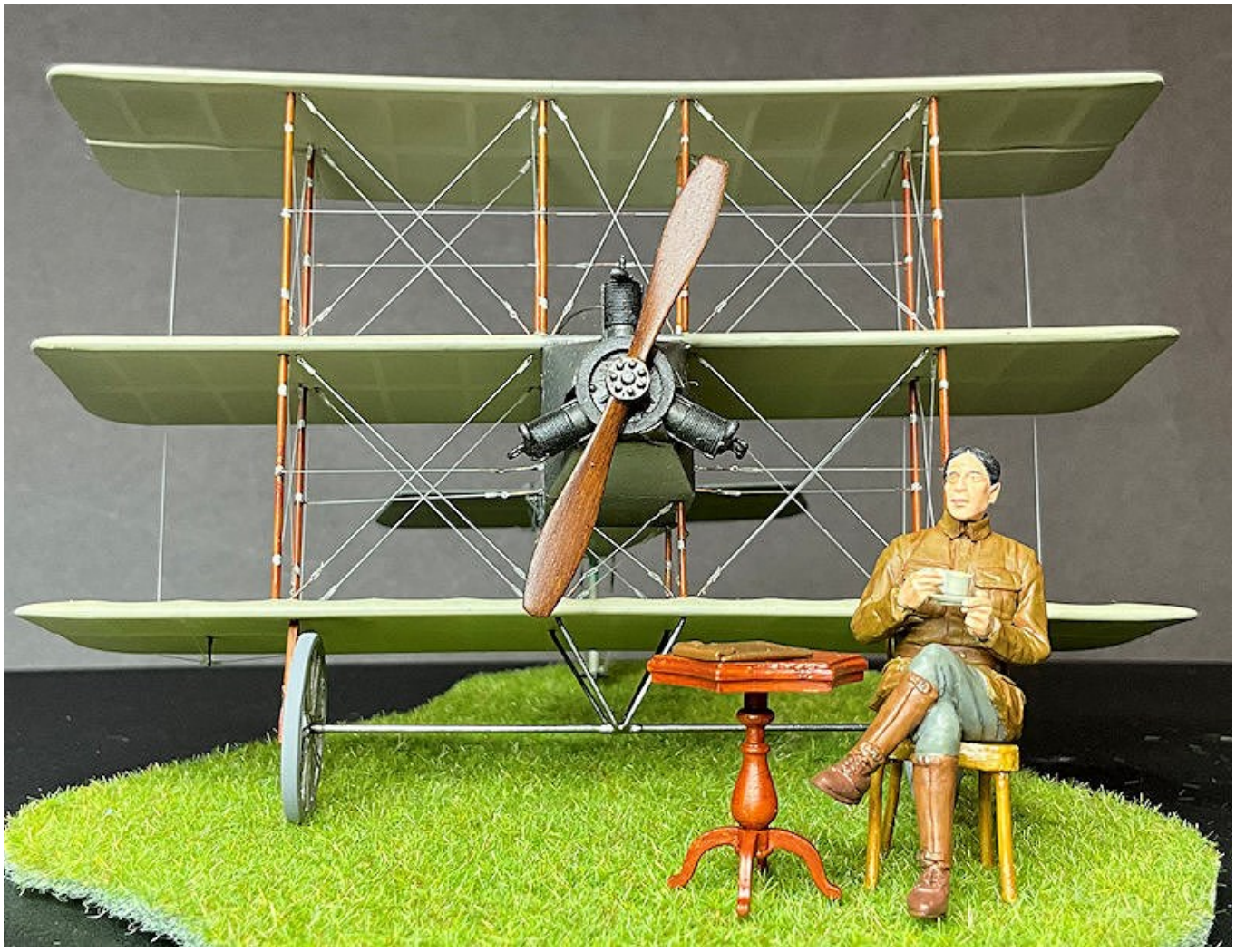
# PART 14
# COMPLETED MODEL PHOTOGRAPHS











**END**