

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

I don't consider myself a 'master' of this craft, but hope to be able to pass on what I have learned. As such, here is my build log, which covers the 1:32 scale model of the Bristol M1.c 'Bullet' by 'Special Hobby'.

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# INTRODUCTION

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

Sorted



# AFTER MARKET

## **AFTER MARKET**

### **Figures**

'Copper State Models' RFC mechanic (F32-0027),  
'Kellerkind Miniatures' RFC pilot (54026).

### **Decals**

'Airscale' WW1 instrument dials (AS32 WW1),  
'Aviatic' Linen Weave Effect decal (ATT32236).

### **Seat belts**

'HGW Models' Bristol M1.c (132533)

### **Propeller**

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### **Propeller**

'GasPatch' Vickers Mk.1.

### **Rigging accessories (as required)**

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

### **Sundries (as required)**

'Araldite' two part epoxy adhesive, Paints ('Tamiya' Acrylic, Humbrol Acrylic,  
'Mr. Metal Colour', 'AK Interactive' Primer and micro-filler (Grey AK758, White AK759),  
'AK Interactive' Filters (Wood AK-261), figure paints and filters (Kerosene AK-2039, Oil AK-2019  
and Wash AK-2033), 'Alclad II' Lacquers, 'Alclad' Aqua Gloss 600, 'Mr. Colour' Levelling  
Thinners, 'Vallejo' Model Colour, PVA Adhesive (e.g. 'MicroScale' Micro Krystal Clear),  
'VMS Fleky' Resin CA adhesive (Standard and Thin), 'Bostik' Blue Tack or 'UHU' White Tack,  
'AV' Masilla Plastica (401) putty, 'De-Lux Materials' Perfect Plastic Putty,  
Sanding and/or Polishing sticks from 'Flory Models', 'Humbrol' Maskol,  
'Milliput' two part putty, 'White Spirits', 'MicroScale' MicroSol/MicroSet,  
'Mr. Surfacer 500, 1000, 1200', 'DecoArt Crafters Acrylic' (water based) paints,  
'Artool' Ultra Mask sheets, 'Vallejo' Still Water (26.230), 'VMS' Metal Prep 4K,  
'Mr. Surfacer' primer and filler, 'Hataka' lacquer paints, 'Plastruct' styrene rod,  
'PlusModel' lead wire, 'ANYZ' black braided line (AN001), 'Tamiya' extra thin liquid cement,  
'Plastic Magic' liquid cement, 'Prismacolor' Verithin Argent Metallique 753,  
'Black-It' blackening solution, 'Albion Alloy's' Conneco C-08, 'EZ' stretch line.

### **Weathering mediums (as required)**

'Flory' Clay washes, Flory Pigments, AK Interactive engine washes,  
'Tamiya' Weathering Master (Set C, D and E), 'Derwent' Inktense 24 ink pencils.

### **Display Base**

Etched Plaque (name plate),  
'Inperspective' custom made Acrylic base and cover,  
'Javis' Desert Zone Battle landscape mat (BZ3M),  
'Coastal Kits' 1:32 Scale 'Abandoned Airfield' display mat.

# THE AIRCRAFT

## THE AIRCRAFT

### References:

1. Windsock Date file No.52 - Bristol M.1 (by J.M Bruce).
2. Various online resources.

### The aircraft:

In 1916, while at the British & Colonial Aeroplane Co. Ltd, based at Filton, Bristol, England, Capt. F.S. Barnwell designed a monoplane fighter which was designated the Bristol M.1a. The first prototype flew on the 14th of July 1916 and its speed and overall performance were impressive at that time. At that time the Air Ministry did not favour monoplane designs, due in part to several fatal crashes of monoplane designs in the past. However, one prototype was ordered with four more modified to the M.1b standard, which were fitted with various engines. One of these aircraft was combat tested by some French squadrons. General H. Trenchard, commander of the Royal Flying Corps (RFC) in France refused to accept the aircraft into frontline use, but the commander of the RFC in the Middle East, General W.H.G Salmont accepted three M.1b aircraft for evaluation in that theatre of war. Based on the experiences of the evaluation the final version of this aircraft, the M.1c was put into production under contract No: A.S. 8236. A total of 125 aircraft were built, powered by the Le Rhône 9J rotary engine, although only 32 saw active service. These aircraft operated in the Middle East theatre with No.111 Squadron (Palestine), No.17 and 47 Squadrons (Macedonia), which were to become part of No.150 Squadron in 1918 and with No.72 Squadron (Mesopotamia). There were some victories scored by M.1c fighters operated by No.17 and 150 Squadrons. The bulk of the aircraft were used in the flight training role, both in Egypt and England and some were sent to Chile as compensation for Chilean ships confiscated by the British. Some were even purchased privately by individuals at the cessation of hostilities.

### General specifications:

Length - 20 ft 5in (6.22 m)  
Wingspan - 30 ft 9 in (9.37 m)  
Height - 7 ft 9in (2.36 m)  
Wing area - 145 sq ft (13.5 sq m)  
Empty weight - 900 lb (408 kg)  
Loaded weight - 1,348 lb (611 kg)  
Engine - Le Rhône 9J rotary engine (110hp, 82 kW)  
Propeller - 2 bladed fixed pitch  
Armament - One Vickers .303 machine gun (Type B).

### Performance:

Maximum speed - 130 mph (210 km/h) at sea level  
Service ceiling - 20,000 ft (6.100 m)  
Endurance - 226 miles (364 km)  
Endurance - 1 hr 45 minutes

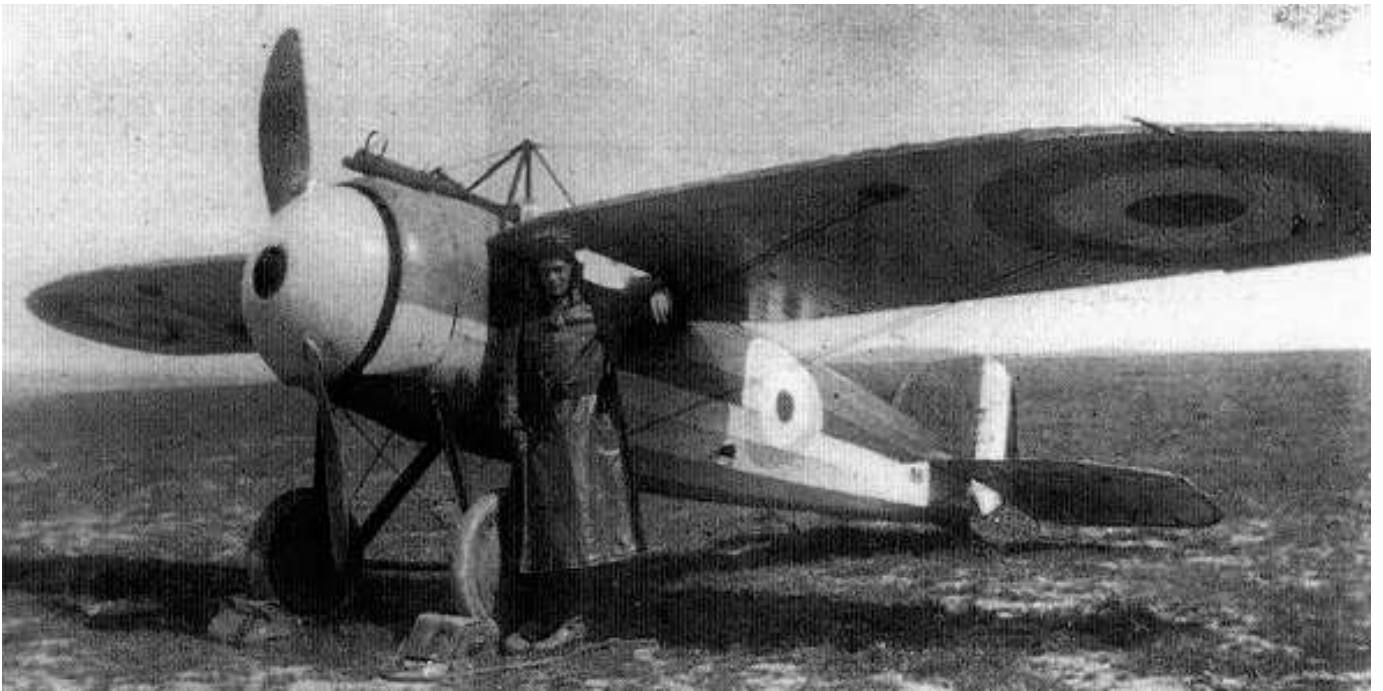
### This model:

The RFC and Royal Naval Air Service merged to form the Royal Air Force on the 1st of April, 1918. On that day No.150 Squadron was formed at Salonika, Greece, with elements from No.17 Squadron and No.47 Squadrons. During WW1 this Squadron was equipped with the Bristol M.1c, Royal Aircraft Factory SE.5a, and Sopwith Camel aircraft.

This particular model build depicts the Bristol M.1c 'Bullet', Serial No. C4907 of No.150 Squadron operating in Macedonia during 1918. This aircraft was flown by Lt. K.B. Moseley, who was credited with the shooting down of an Albatros D.V on the 9th of July, 1918 over the Rupel Pass. This same aircraft was also flown by Lt. J.P. Cavers, who was credited with the shooting down of a LVG on the 1st of September and another LVG on the 2nd of September.



The following photograph shows C4907 at Amberkoj, Macedonia.



The underside of the wings and fuselage were said to be a light blue colour, in order to reduce the absorbed heat reflected from the ground. It is thought the propeller spinner was of the same colour. The colour of the upper surfaces has been depicted as either a red/brown (PC 12) or an olive green (early PC10). The kit instructions and most colour profiles have the PC12 colour, whereas the 'Windsock' Data file No52 colour profile is PC10. As always the definition of colours from early monochrome photographs has always been problematic and the shade differences between PC10 and PC12 are no exception. The 'Windsock' Data file states that it is possible that these aircraft were painted with PC12 when routed through the aircraft depot at Salonika, Greece. However, it was more likely the colour of aircraft operated in Macedonia was PC10, with the possible exception of No.72 Squadron. I decided to use the PC10 colour, based on the 'Windsock' data.

The 'Windsock' Data File N0.52 the same aircraft, but with a different PC colour scheme.



The 'Special Hobby' kit instructions depict two colour schemes, one of which is for C4907.



The following photograph is of another Bristol M1.c, Serial No.C4912 of No.150 Squadron, RAF in July 1918 at Solonika, Greece. This aircraft is noted as also flown by Lt. K.B. Moseley. The colour profile of this aircraft is by Ronnie Barr. Of notice is that this aircraft had the fuselage forward area painted grey.



**PART 1**  
**MODEL**  
**DESCRIPTION**



## PART 1 - MODEL DESCRIPTION

('Special Hobby' - Kit No: HS 32057)

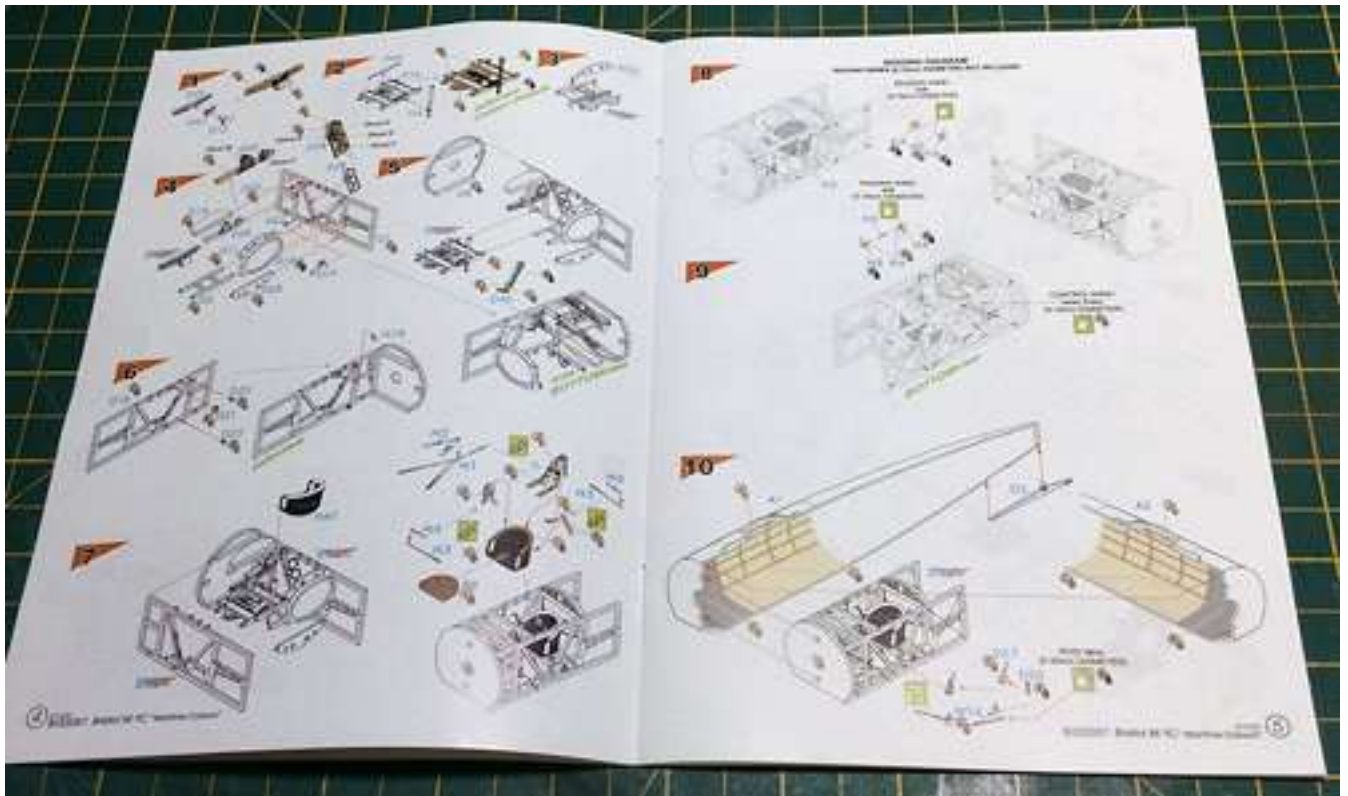
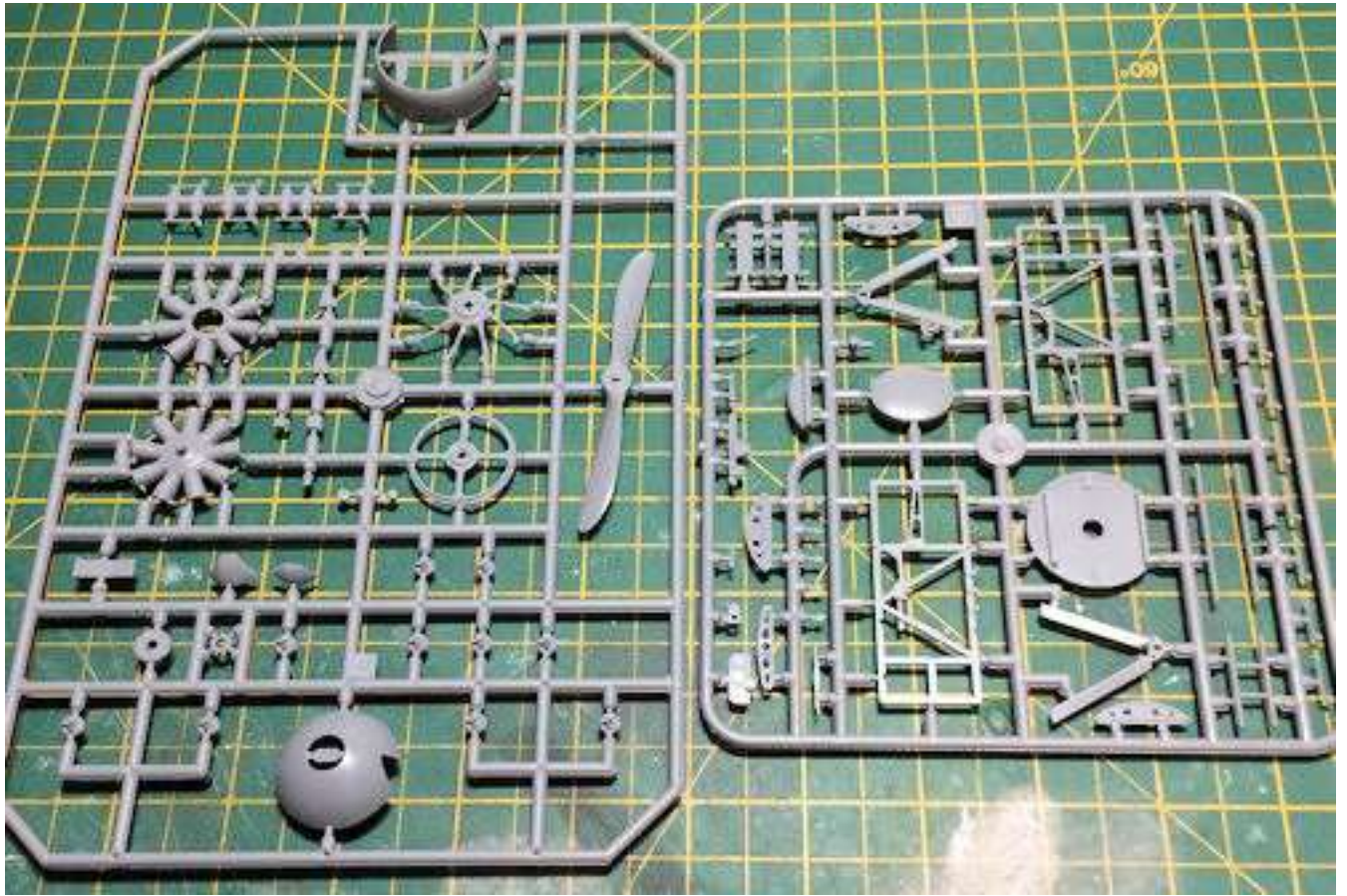
This 1:32nd scale model is manufactured by 'Special Hobby' and is manufactured in a grey coloured styrene. The model parts are supplied on four sprues supplemented by a resin pilot seat, decal sheet, acetate sheet (windscreen and instruments) and a photo-etch detail sheet.

Although this is not a newly moulded kit, the finish of the model parts is surprisingly good, with no obvious surface defects or artifacts and there are very few mould ejector marks, all of which will not be visible on the finished model. Some model parts do have minor 'flash' that will need to be removed but that is only to be expected. Although the main part spues are identified, the individual parts on the sprues are not and cross referencing to pages 2 and 3 of the instructions is necessary to identify parts.

The kit instruction booklet has a title page with aircraft information, followed by nine assembly instruction pages, which include the rigging illustrations. The final two pages shown the colour profiles











PART 2  
WOOD EFFECTS  
(General)

## **PART 2 - WOOD EFFECTS (General)**

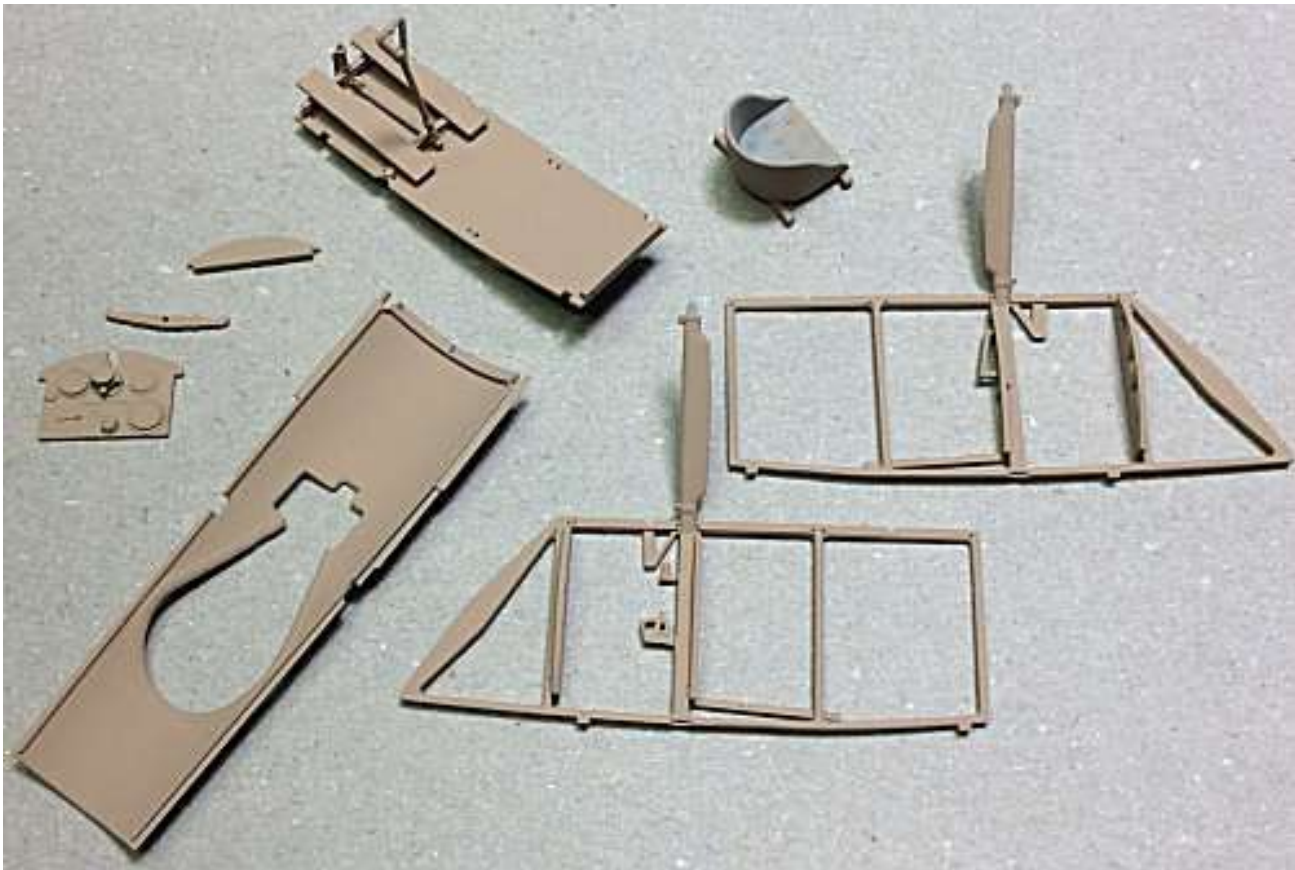
### A basic technique:

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

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

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

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





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

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

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

Once painting is complete, clean the brush in water.

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



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

'Tamiya' have 'Clear' coloured Acrylic paints, which are intended to be mixed with either Flat Clear (XF86), Semi-Gloss Clear (X35) or Clear (X22), to give the required finish but with a tint of the added 'Clear' colour. I use the Clear Yellow (X24) or Clear Orange (X26) to add a varnished tint to the clear coat. If using the 'Tamiya' Clear I add 'Mr. Colour' Levelling Thinners, which does improve airbrushing and avoids pooling. Otherwise I use 'Alclad' Light Sheen (ALC-311).

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

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

Below is an **example** of the applied 'Alclad' lacquer/X24 mix on the propeller.



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

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

**PART 3**  
**WEATHERING**  
**(General)**

### **PART 3 - WEATHERING (General)**

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

#### **Flory Model clay washes:**

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

First I seal the surface with airbrushed 'Alclad' Light Sheen (ALC-311), which dries quickly. A gloss coat tends to stop the clay wash 'gripping' the surface when it is applied and it can run off or just puddle. A matte coat can cause the clay wash to 'grip' too much, making it difficult to remove or even to wash it off completely.

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

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

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

To apply the clay wash is just a matter of brushing all over the surface to be weathered. It doesn't matter really how much is applied as it can be left on for any period, as it is easily removed without any effect on the surface underneath. If you don't achieve your desired effect, you can wash it all off and start again. I use a soft brush, which has been very slightly dampened, to brush off the clay wash. For smearing effects, a very slightly damp brush or absorbent paper should be used, but even then I dab them onto a dry piece of the paper, until it's almost dry. Any wetter and you'll find that you are removing too much of the clay wash. If that happens you would have to re-apply the wash and start again. That said, if you're not happy with the final effect, you can easily remove the clay wash by brushing with a wet brush or even airbrush water over the surface. Dry off the surfaces washed and then re-apply the clay wash and try again until you are satisfied. The technique is to 'damp' brush or wipe over the surface to re-activate the clay wash and at the same time, to smear it over areas that had no clay wash. It'll dry more or less straight away. Then I'll very lightly brush and/or use a piece of damp absorbent paper to remove as much as I want until I get the desired effect. If I remove too much I just reapply clay wash to that area and repeat the removal procedure. Once finished, just run the brush under a tap to rinse out any residual clay pigments. Finally I usually seal the surface with airbrushed 'Alclad' Light Sheen (ALC-311), which will seal in the applied clay wash.

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





**Chipping effects:**

To give the effect of chipped and weathered paint/varnish to metal engine cowls and forward fuselage panels etc, chipping fluids can be used. To achieve this effect, first prime the areas with a suitable primer then airbrush the metallic finish desired. Once dry, a chipping fluid, such as 'AK Interactive' Medium Chipping fluid or 'Vallejo' chipping fluid is airbrushed over the painted areas. An alternative is to use a cheap hair spray. This forms a barrier which will allow the top coat to be chipped off. Finally the required top coat colour is applied.

Once fully dry, moisten the top coat with water, which softens the paint. Then with a cut down (stiff) brush and wood cocktail stick, gently teased off the top coat paint. Take care when doing this as 'too much chipping' can't really be covered up. In that event you would have wet the top coat and remove it all with an old toothbrush or similar and then when dry, re-spray the top coat and try again. Once the desired effect was achieved, I sealed the surfaces with an airbrushed coat of 'Alclad' Light Sheen (ALC-311).



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



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



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



### **Water colour pencils:**

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





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

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

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

A good quality oil paint and thinners are essential to produce a good finish. Some quality oil paints can be too 'gritty' when leached of oil, so I use 'Abteilung 502' oil paints and 'Tamiya' Enamel thinners (X20).





**PART 4**  
**DECALS**  
**(General)**

## PART 4 - DECALS (General)

### Standard decals:

The supplied markings decal sheet and the optional 'lozenge' decals sheets are not 'cookie cut' to the required shapes, but are part of the overall carrier film on the sheet. Therefore you will need to carefully cut the individual decals from the sheet. The decals appear not to be laser

printed, as with for example 'Cartograph' decals, and backing sheet is thicker than standard decal sheets. This makes it difficult to achieve a clean cut around the decals. The decals are not of the best quality, which is to be expected from a 'limited run' kit of this type and given that they have to be carefully cut out from the sheet may make the end result less than favourable.

One alternative to using these decals is, where possible, is to source replacements from commercial retailers or from your 'spares' collection if you have one. This would only apply to the larger 'standard' markings as the smaller and specific model decals are unique and would still need to be used.

A second alternative for the larger markings would be to create masks and airbrush the markings, although this would require specific masks and is not a method advised for the less experienced modeller. Again the small and specific models decals would still need to be used.

**NOTE:** *The following is **applicable only** for decals on a **painted surface**. If decals are to be placed on top of **previously applied decals**, the decal setting solutions may 'eat' into the previous decals. In this case a sealing coat of either 'Alclad' Gloss (ALC-310), 'Alclad' Aqua Gloss (ALC-600), Tamiya' Clear (X22) or 'Johnson' Pledge Floor Care finish should be airbrushed over the first decals, to provide a barrier against the setting solutions.*

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

Airbrush a sealing coat of 'Alclad' Gloss (ALC-310), 'Alclad' Aqua Gloss (ALC-600), 'Tamiya' Clear (X22) or 'Johnson' Pledge Floor Care finish, to provide a smooth surface.

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

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

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

Carefully move the decal into the correct position.

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

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

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

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

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

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

Once the decals have been applied I airbrush a sealing coat of either 'Alclad' Clear Coat Gloss (ALC-310) lacquer), 'Alclad' Aqua Gloss (ALC-600), 'Tamiya' Clear (X22) or 'Johnson' Pledge Floor Care finish over areas of decals where more decals are to be applied.

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

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

### **'Aviatic' linen effect decals:**

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

However, 'Aviatic' 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 'Aviatic' decals, due to the nature of the carrier film. In addition, **the decals are not 'cookie cut'** and therefore they 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. That said, minor gaps may be able to be covered with weathering. For more information, refer to the 'Aviatic' instruction sheet supplied with the decals. 'Aviatic' decals are laser printed onto either 'clear' or 'white' backing, the 'clear' being dependent on the base coat you apply and the finished effect you desire. The decals are supplied with very clear instructions on their application, including when to add pre-shading to the base coat, where desired, before you apply the decals. For this model I chose to use the 'clear' decals, in order to show the linen effect more visibly.

### **Application:**

First airbrush a primer coat of 'AK Interactive' primer and micro-filler (White - AK759) on all of the surfaces to have the decals applied.

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

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

Airbrush at least two light sealing coats of either 'Alclad' Clear Coat Gloss (ALC-310) lacquer, 'Alclad' Aqua Gloss (ALC-600), 'Tamiya' Clear (X22) or 'Johnson' Pledge Floor Care finish (similar to 'Future'), all of which will form a gloss surface for applying the decals.

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

Soak each decal in warm water for approximately 20 seconds.

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

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

Align the decal to the shape of the model part.

Using a broad, soft brush, brush the decal from the centre outwards to remove 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)

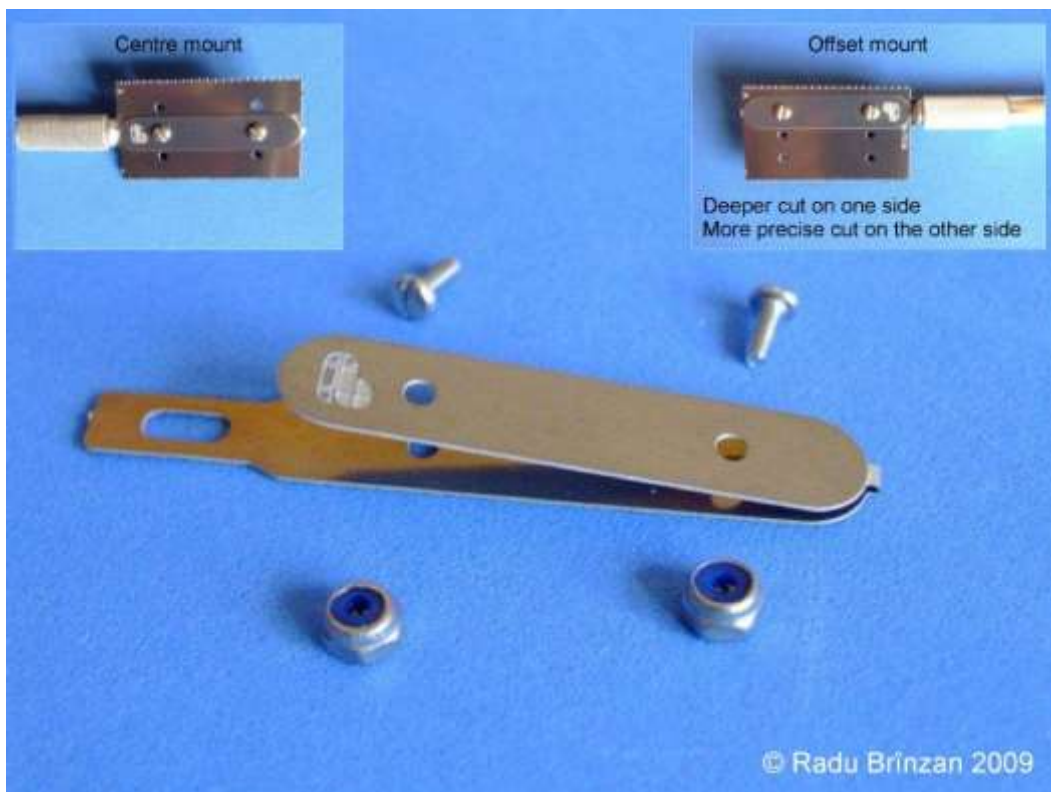
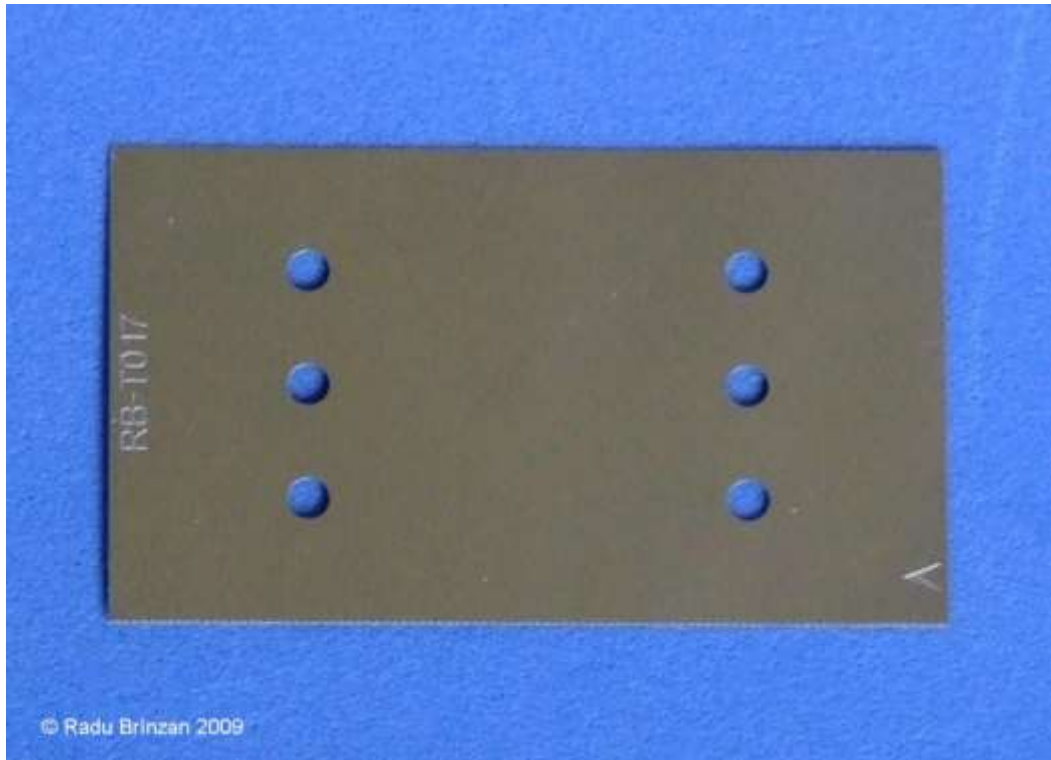
## **PART 5- RESIN (General)**

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

Below I have listed what I have found to be the primary differences for resin kits from plastic kits:

1. When resin kits are cast in their moulds, a release agent is applied to enable the cast resin parts to be more easily removed, which is similar to plastic kit moulding. This release agent can leave a film on the surface of the kit parts, which, if not removed, can prevent paint or adhesives from adhering to the surfaces. The easiest way to remove this film is to carefully and fully wash all of the model parts in warm soapy water, using an old, soft tooth brush, then rinse all of the parts thoroughly and leave to dry. Alternatively wipe the parts with isopropyl alcohol (e.g. 'Tamiya' X20A thinners).
2. Resin, by its nature, is very brittle and can be damaged or broken easily, especially when handling small parts. This is particularly evident when separating the individual items from the resin cast. The best way to remove item is to cut them away with a razor saw, then clean them up afterwards.
3. Once removed from the resin cast, parts will normally have 'resin flash' around or amongst parts, especially small items. This is easily removed with a sharp scalpel blade. Heavier residue can be scraped, filed or sanded away.
4. Plastic kits are assembled using solvent adhesives, which melt the surface where it is applied and 'weld' the joint together. Resin however will not react to this type of adhesive and can really only be glued using CA adhesive. This adhesive reacts to moisture in the air and on the surface to be joined. As most people know, it will also bond skin to whatever it touches, if the skin has CA adhesive on it. Obviously extreme care needs to be exercised when assembling resin kits using CA adhesive.
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 is 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.

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



**PART 6**  
**RIGGING**  
**(General)**



## **PART 6 - RIGGING (General)**

### **General:**

The first thing to check is that you have already drilled out the rigging attachment points. 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 and all necessary holes pre-drilled, the rigging can start. For the primary rigging, such as flying and landing wires and cross bracing wires, I used 'Steelon' mono-filament (fishing line) of 0.12 mm diameter and for flight controls I used 'Stroft' 0.08 mm diameter mono-filament. These are effectively transparent but do give a look of steel, without the need of painting or colouring with a gel pen. The turnbuckles used are either sintered metal or resin and obtained from 'Gaspatch Models'.

**NOTE:** *Aircraft of the Royal Flying Corps (RFC) and Royal Naval Air Service (RNAS) used streamlined rigging wires, know as RAF wires, as opposed to the standard wire wound cables. These RAF wires were solid forged lengths with a right hand thread adjuster at one end and a left hand adjuster at the other, so the wire could easily be tensioned and locked. However, even though there are aftermarket streamlined wires or stretch thread, such as EZ line, but they can be problematic to fit and don't give the model any structural strength. Also, even when viewing a 1:32nd scale model, it would still not be obvious as to whether the model was fitted with streamlined wires or wire wound cables with turnbuckles. For these reasons I rig my models with mono-filament (fishing line), which is easier to work with and does provide structural strength to the finished model.*

### **Elevator control wires**

A lower elevator control wire is routed through both of the fuselage rear sides and connected to lower control horns on the elevator itself. An upper elevator control wire is routed through both sides of rear of the fuselage and connected to upper control horns on the elevator itself. The control wires are attached to the pilot's control column above and below its pivot point. Moving the control column either forwards or rearwards caused the elevator to raise or lower and the aircraft to pitch up or down (climb or dive). The elevator wires had no external turnbuckles as adjustment was carried out inside the cockpit.

### **Rudder control wires**

Two rudder control wires are routed through the top, rear of the fuselage and connect to control horns on each side of the rudder post. The wires were attached to either side of the pilot's rudder bar and moving the rudder bar left or right causes the rudder to turn in that direction, causing the aircraft to yaw left or right. The rudder wires had no external turnbuckles as adjustment was carried out inside the cockpit.

### **Aileron control**

The pilot operated the ailerons on the wings by moving the control column left or right. The aileron control wires were attached to the control column torque bar, which extended forward from the control column. The wires were routed left and right then around pulleys to be routed vertically out of the cockpit and into the internal wing structures. Pulleys routed the wires out to the two wing mounted ailerons, where the wires exited the underside of the wings at the pulley inspection windows. The wires were then routed to the underside control horns. A wire was also connected to the upper aileron control horns and was routed back into the wings upper surface and from there, internally through the wings. To roll to the right the column was moved to the right, which pulled the left wire but released tension on the right wire. The left aileron was pulled down and the interconnecting wire pulled the right aileron up, rolling the aircraft to the right. The opposite rolled the aircraft to the left. The aileron wires had no external turnbuckles as adjustment was carried out inside the cockpit.

### **Landing wires**

Two single landing wires for both wings were attached to a support frame on the fuselage and partly forward from the cockpit. These wires were routed outboard to attachment point on the upper surface of the wings. Turnbuckles were not fitted as these wires were the streamlined type with their own end wire adjusters.

### **Flying wires**

Two pairs of flying wires were attached between the outboard, underside of the wings and the lower half of the fuselage. Turnbuckles were not fitted as these wires were the streamlined type with their own end wire adjusters.

### **Bracing wires**

The bracing wires on this aircraft are as follows:

#### **Fin**

Two runs of bracing wires were used for the fin:

The rear wires were attached between the tail skid rear support and the outboard, underside of the tailplanes. Also from the outboard, upper surface of the tailplanes to the top, rear edge of the fin. Turnbuckles were not fitted as these wires were the streamlined type with their own end wire adjusters.

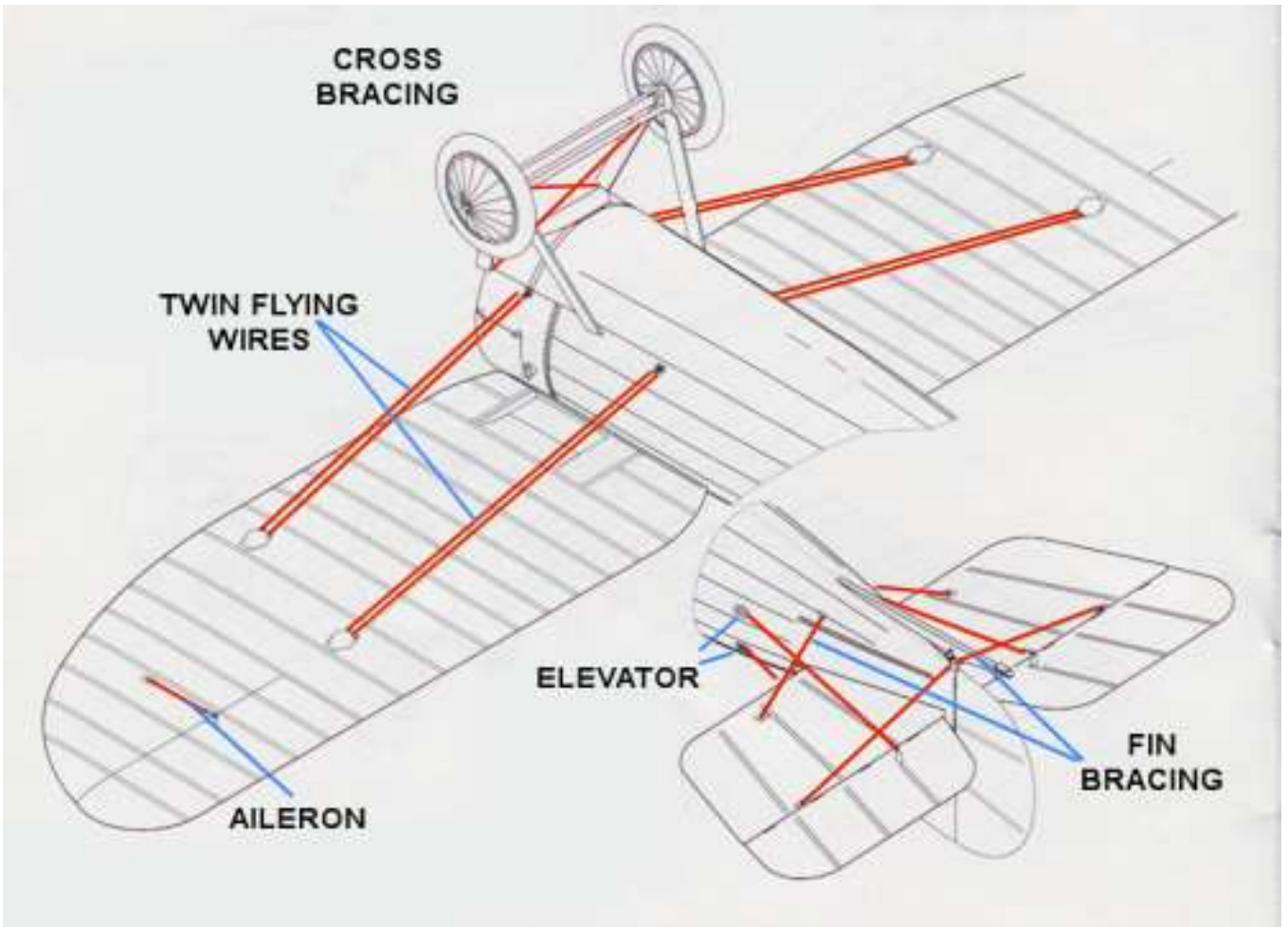
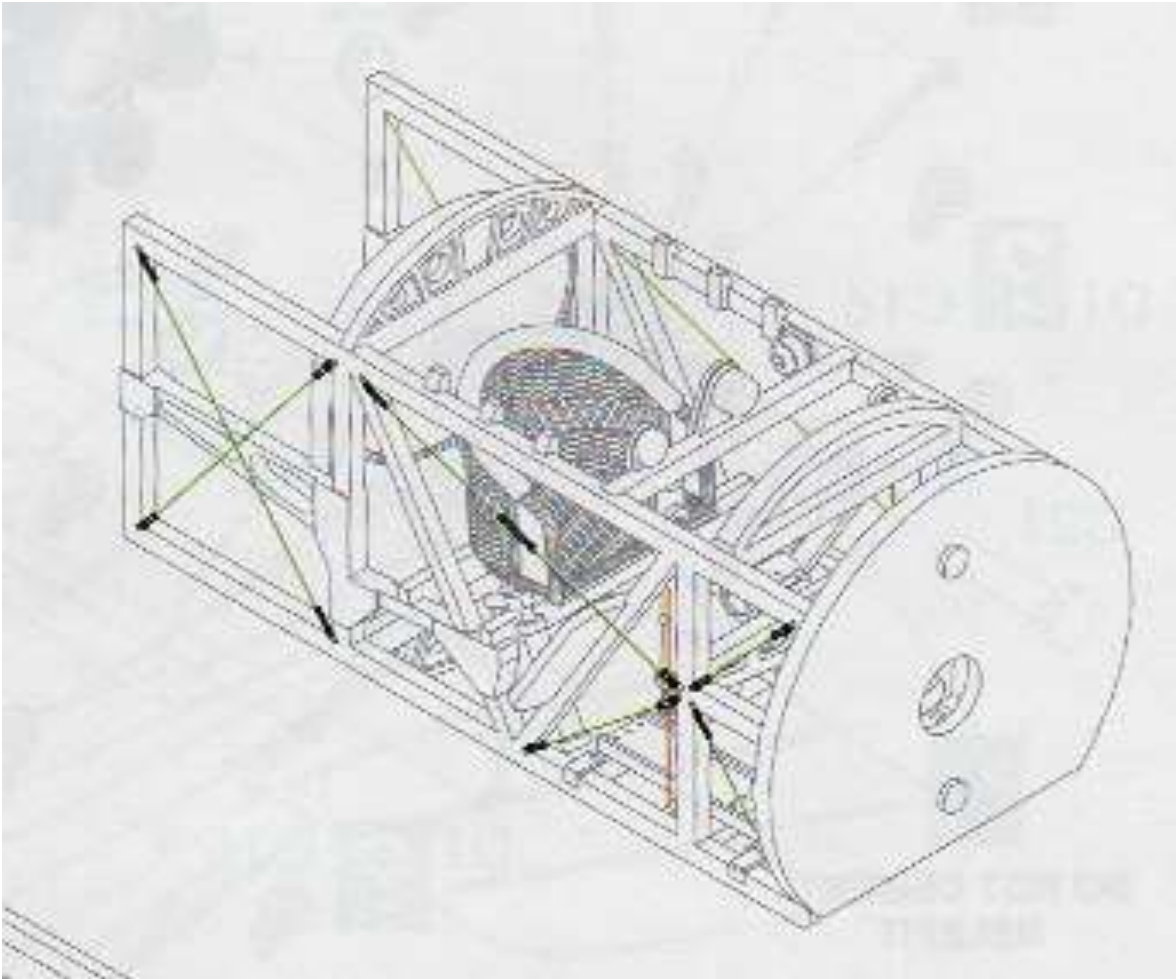
The front wires were attached between the lower, rear of the fuselage and the outboard, underside of the tailplanes. Also from the outboard, upper surface of the tailplanes to the top, front edge of the fin. Turnbuckles were not fitted as these wires were the streamlined type with their own end wire adjusters.

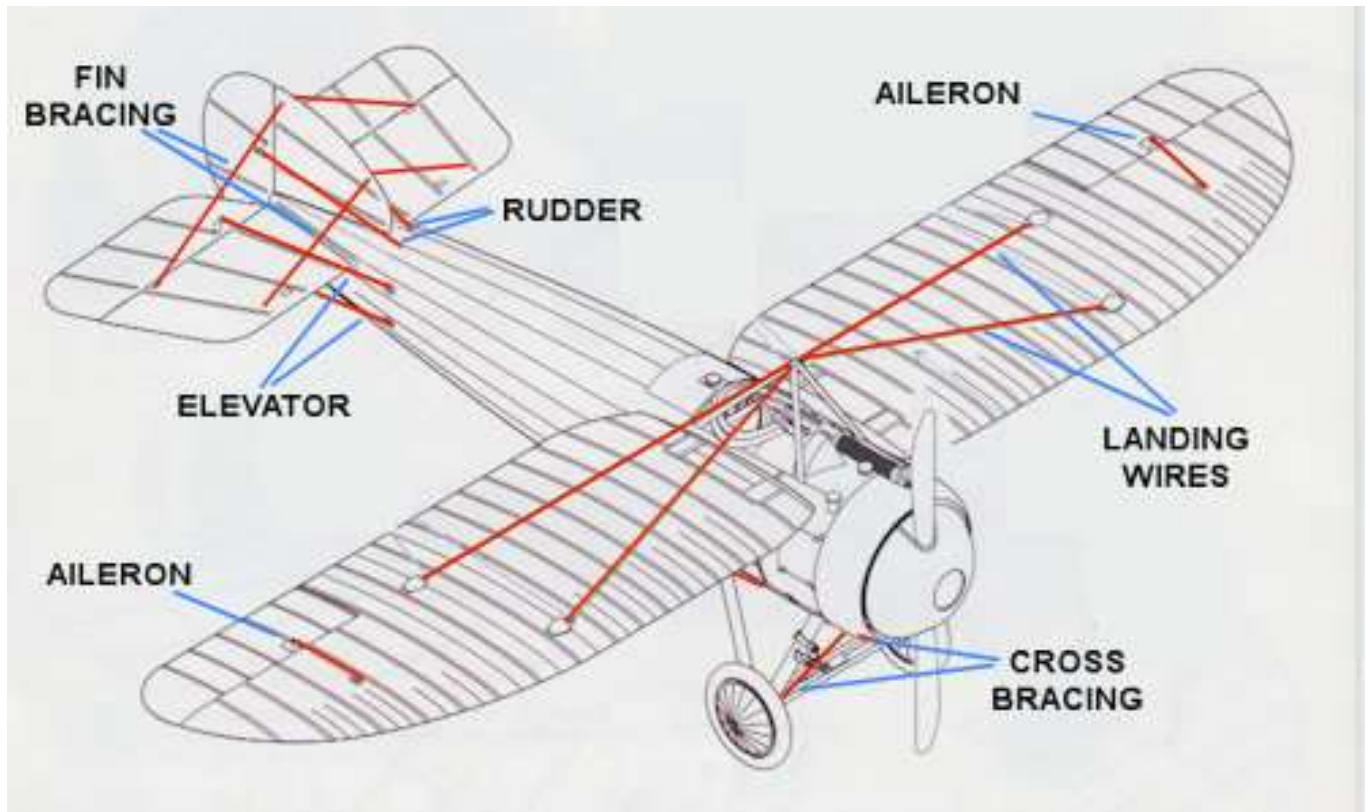
#### **Undercarriage**

Two diagonally crossed wires were attached between the inside of the forward undercarriage struts and the ends of the axle assembly. Turnbuckles were not fitted as these wires were the streamlined type with their own end wire adjusters.

#### **Cockpit frames**

The only visible cockpit bracing in the completed model is the bracing wires on the side frames. The kit illustration show where these bracing lines are located. These are wire wound and therefore had a turnbuckle fitted.





# PART 7

# WEAPON

## PART 7 - WEAPON

The Bristol M1.c appears to have been fitted with a .303 Vickers Mk.1 machine gun. The weapon supplied in the kit supplied will be replaced with that of a 'Gaspatch' resin version, which has much better defined details.



Check fit the 'GasPatch' weapon into the gun trough in the top of the fuselage. The weapon should sit fully into the trough and be parallel with the fuselage.

Drill a hole of 0.8 mm diameter into, but not through, the bottom of the breech block.

Insert a sharpened wood tooth pick into the pre-drilled hole (for holding during painting).

Cut off two pieces of just two bullets from the 'GasPatch' supplied ammunition belt.

Secure the two ammunition pieces into the openings in the breech block.

Check fit the 'GasPatch' weapon into the gun trough in the top of the fuselage.

**NOTE:** *The weapon fitted on this aircraft had a traditional 'ring' gun sight mounted on the forward, front top of the cooling jacket. This ring sight is not supplied with the kit. To represent this gun sight, I used a sight from the photo-etch sheet supplied with a 'Wingnut Wings' Sopwith Camel kit.*

Cut the sight out of the photo-etch sheet and remove any residual tags from the edges.

Secure the ring sight onto the forward, top of the cooling jacket, using a PVA adhesive such as 'MicroScale' Micro Krystal Clear or similar.

Airbrush prime the weapon with a black primer with 'Alclad' Black ALC-305-60 or similar.

Lightly airbrush the weapon with 'Alclad' Steel ALC-112 or similar.

Using 'Tamiya' weathering master Set B (Soot), lightly sponge over the weapon to darken the finish, especially the gun muzzle.

Brush paint the ammunition inlet port in the gun breech blocks with 'Mr. Colour' Brass Copper (215) or similar.

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

Brush paint the ammunition bullets with 'Mr. Colour' Brass (219) or similar.

Secure the weapon in position in the fuselage trough, using CA adhesive.



# PART 8

# PROPELLER



## PART 8 - PROPELLER

The propeller supplied in the kit is of good quality, but I chose to replace it with a hand made, laminated wood propeller from 'ProperPlane'. These are high quality and accurate propellers that are made to represent propellers from the different aircraft that operated during the conflict. Each propeller can be made from different types and colour of wood and each have its specific resin propeller hub and back plate.

The propeller required for this aircraft is of the type fitted to 'Sopwith' aircraft and was made by the 'Lang' company.

The propeller as supplied from 'ProperPlane'.



Remove the Sand or scrape away any residual sprue tags.

Drill out the hole through the propeller and spinner back plate using a 2.1 mm diameter drill. This will allow the propeller and spinner back plate to fit onto the engine propeller shaft.

File or sand away the raised ring in the centre of the front face of the spinner back plate.

Cut a short length of 2.0 mm diameter rod (e.g. 'Albion Alloy's' or similar).

Locate the spinner back plate onto the rod.

Locate the propeller onto the rod.

Test fit the spinner and make sure it is seated fully against the ridge around the back plate and the blades of the propeller engage fully into the recesses in the spinner. If necessary, file or sand away the central area at the rear face of the propeller and/or scrape or file the profile of the spinner cut-outs, until the spinner and propeller fit fully and against the spinner back plate.

Cut away the propeller shaft from the engine and file flat the witness mark.

Mark the centre of the propeller shaft and drill a hole of 2.1 mm diameter into the hollow of the engine interior.

Scrape or sand the inner edges of the propeller cut-outs in the spinner and engine cowl, to reduce then to be more in-scale.

Insert the rod into the pre-drilled hole in the engine.

Locate the spinner support ring onto the rod.

Locate the propeller onto the rod.



Check that the front end of the rod does not extend beyond the recess in the centre, front of the propeller.

Locate the spinner over the propeller and against the back plate.

Hold the engine cowl onto the front of the fuselage.

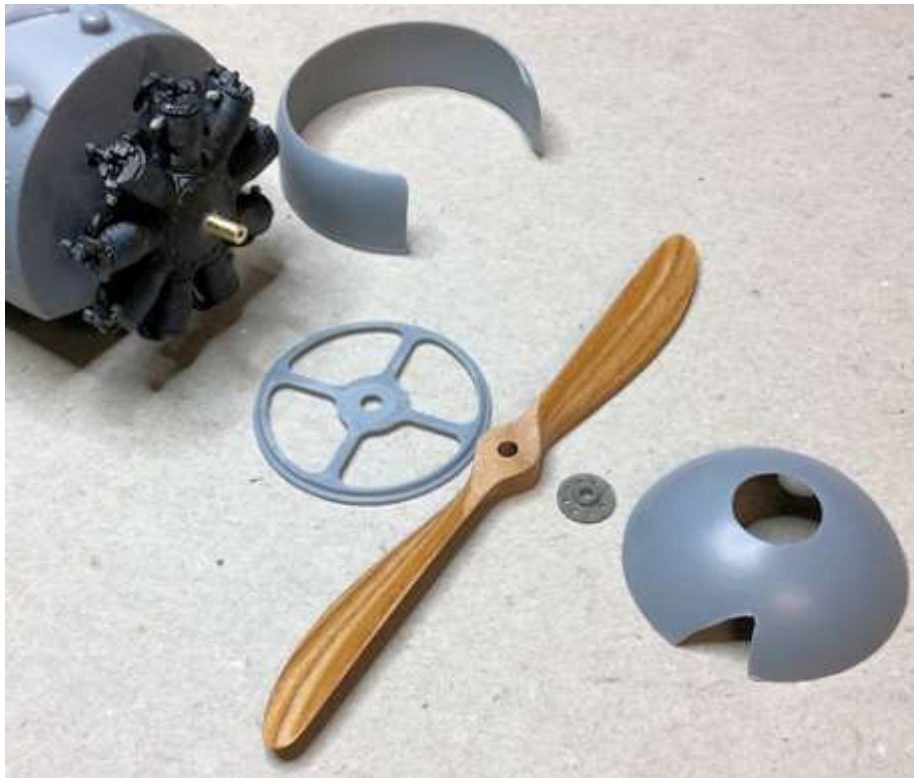
Locate the engine and propeller assembly into the front of the fuselage.

Check that the propeller is clear of the engine cowl and the assembly sits correctly on the fuselage and inside the engine cowl.

Remove and separate the parts.

Carefully cut the 'GasPatch' resin front propeller boss from its mounting block and 'slide' sand the rear face to remove residual resin.

Secure the boss into the recess in the centre, front of the propeller, using CA adhesive.



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

Propeller spinner C1, spinner back plate C18 and blade inserts C14 and C15, inner surface of the engine cowl - front face of the fuselage (engine bulkhead).

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

Centre boss in the propeller - inner surface of the propeller spinner - spinner back plate - inner surface of the engine cowl - front face of the fuselage (engine bulkhead).

Airbrush the outer surfaces of the propeller spinner and blade inserts with 'Tamiya' Light Blue (XF23).

Position the propeller centrally on the spinner back plate.

Secure the propeller to the back plate using CA adhesive.

Slide the spinner back plate/propeller assembly onto a 2.0 mm diameter rod.

Locate the propeller spinner over the propeller and onto the spinner back plate.

Hold the rod to keep the back plate/propeller assembly central in the spinner (view the propeller boss through the hole in the front of the spinner).

Make sure the spinner is fully seated onto the back plate.

Cement the spinner to the back plate.

Check fit the two blade inserts between the rear of the propeller blades and spinner back plate.

If necessary, file or sand the inserts to achieve a good fit.

Cement the inserts in position.

Cut away the two photo-etch 'collars' (17) from the kit supplied sheet.

Secure the 'collars' around the blade cuffs using CA adhesive. Start at one end and glue, then gently bend and form the remainder of the collars around the blades.

Mask off the outer tips of the propeller blades.

Airbrush the propeller tips with 'Tamiya' Light Grey (XF66) or similar.

Remove the masking.



# PART 9

# ENGINE

## PART 9 - ENGINE

The engine supplied in the kit is the Le Rhône 9J rotary engine (110hp). The engine moulding and finish is of good quality although the usual 'flash and seam lines will need to be removed. For some models the engine can be replaced with an aftermarket resin version, usually of better quality and detail. However, there is little point in replacing the kit supplied engine for this model as due to the engine cowl and very large propeller spinner, very little of the engine will be visible on the completed model.



### Preparation:

Following the kit instructions, remove the various engine parts from the sprue. Scrape or sand away any sprue stubs, flash or seam lines on the parts.

### Assembly:

***NOTE:*** *The supplied propeller shaft was moulded slightly mis-aligned and required sanding to fit the engine parts. Also the associated holes in the engine parts required opening up to fit over the propeller shaft.*

Cement the propeller shaft (C21) into the hub (C3). Make sure the rear flange on the shaft contacts the hub.

***NOTE:*** *The ignition slip ring (C4) has nine lugs to represent the attachment points for the nine spark plug ignition leads. As I will add these ignition leads the lugs were removed to allow drilling location holes for the leads.*



Cut away the nine ignition lead lugs from the slip ring (C4).

Drill holes of 0.4 mm diameter through the slip ring where the lugs were located.

Cement the slip ring onto the propeller shaft, making sure it contacts the hub and the three locating 'pips' are facing away from the hub.

Cement the two engine halves (C8 and C13) together, making sure the cylinder seams are aligned.

**NOTE:** *Make sure you remove the residual sprue tabs from the underside of each cylinder head otherwise they will not fully contact the top surface of the cylinder heads.*

Cement the nine cylinder heads (C2) into the tops of the cylinders.

Locate the induction manifold (C19) onto the rear on the engine and check that each manifold contacts the side of the cylinder heads. If necessary scrape or sand the ends on each manifold so they clear the edge of the cylinder head.

Remove the induction manifold.

Airbrush the engine parts with a black primer (e.g. 'Alclad' Black Base (ALC-305-60) or similar).

Airbrush the engine assembly with steel and valve push rods (e.g. 'Alclad' Steel (ALC-112) or similar).

Airbrush the nine induction pipes with exhaust colour (e.g. 'Alclad' Exhaust Manifold (ALC-123) or similar).

Cement the induction manifold onto the rear of the engine, making sure the top of each manifold contacts its cylinder head.

Cut nine lengths of 0.125 mm diameter copper wire (or similar).

Loop each wire over a 0.8 mm diameter drill shank, grip both ends of the wire together then twist the wires to form a 'rope' effect with a drill loop at the end.

**NOTE:** *During the next step, keep the heat source moving along the wires. If you hesitate at one spot the wires will melt.*

Quickly move a flame from a candle or cigarette lighter along the wires to both anneal (soften) and discolour the wires.

Locate the loop on the wires over the spark plugs cut the free ends so they will locate into the pre-drilled holes in the slip ring.

Secure the leads to the spark plugs and the pre-drilled holes in the slip ring using CA adhesive.

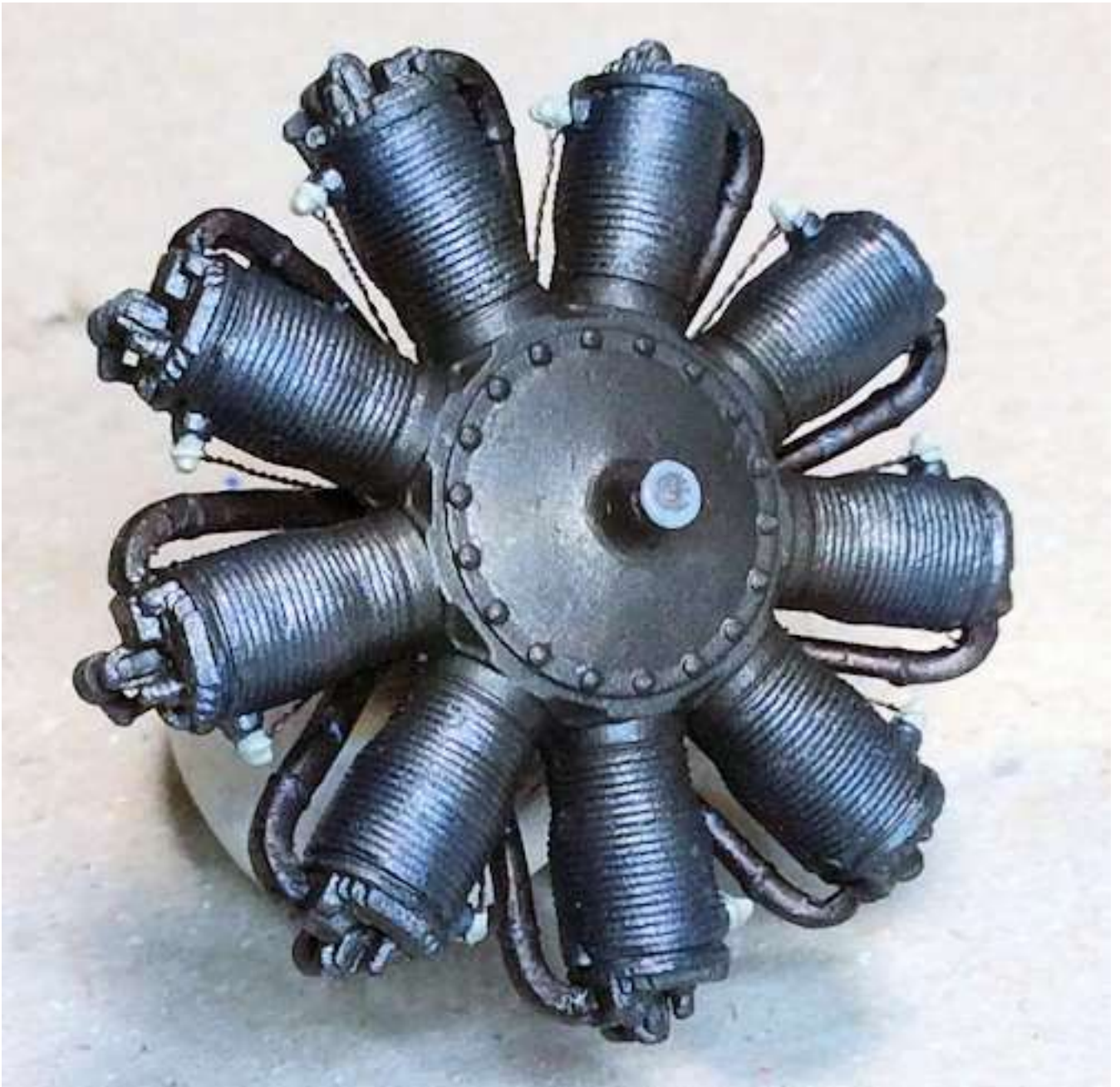
**NOTE:** *The kit supplies two versions of the valve push rods, D1 or C16. The D1 push rods are better detailed.*

Cement each push rod into its location hole at the rear of the engine and the cylinder head. Make sure the 'roller' at the top of each push rod is located flat against the cylinder head (not edge on) and pointing to the left.

Brush paint the spark plug in each cylinder with 'Tamiya' Deck Tan (XF55) or similar.

Sponge 'Tamiya' Weathering Master Set D (Burnt Blue) around the tops of each cylinder.

Brush a light and thinned (with White Spirit) 'AK Interactive' Kerosene (AK-2039) over the engine.



# PART 10

# FUSELAGE



## PART 10 - FUSELAGE

This part of the build log covers the construction of the fuselage, including the cockpit.

**NOTE:** *Unless otherwise stated, follow the 'Special Hobby' instructions for assembly of the parts.*

### Cockpit.

As I was unable to find much information of the internal cockpit detail, apart from a few online photographs. However, the following additional enhancements and corrections can be added:

Rudder control wires.

Elevator control wires.

Aileron control wires.

Cockpit bracing wires.

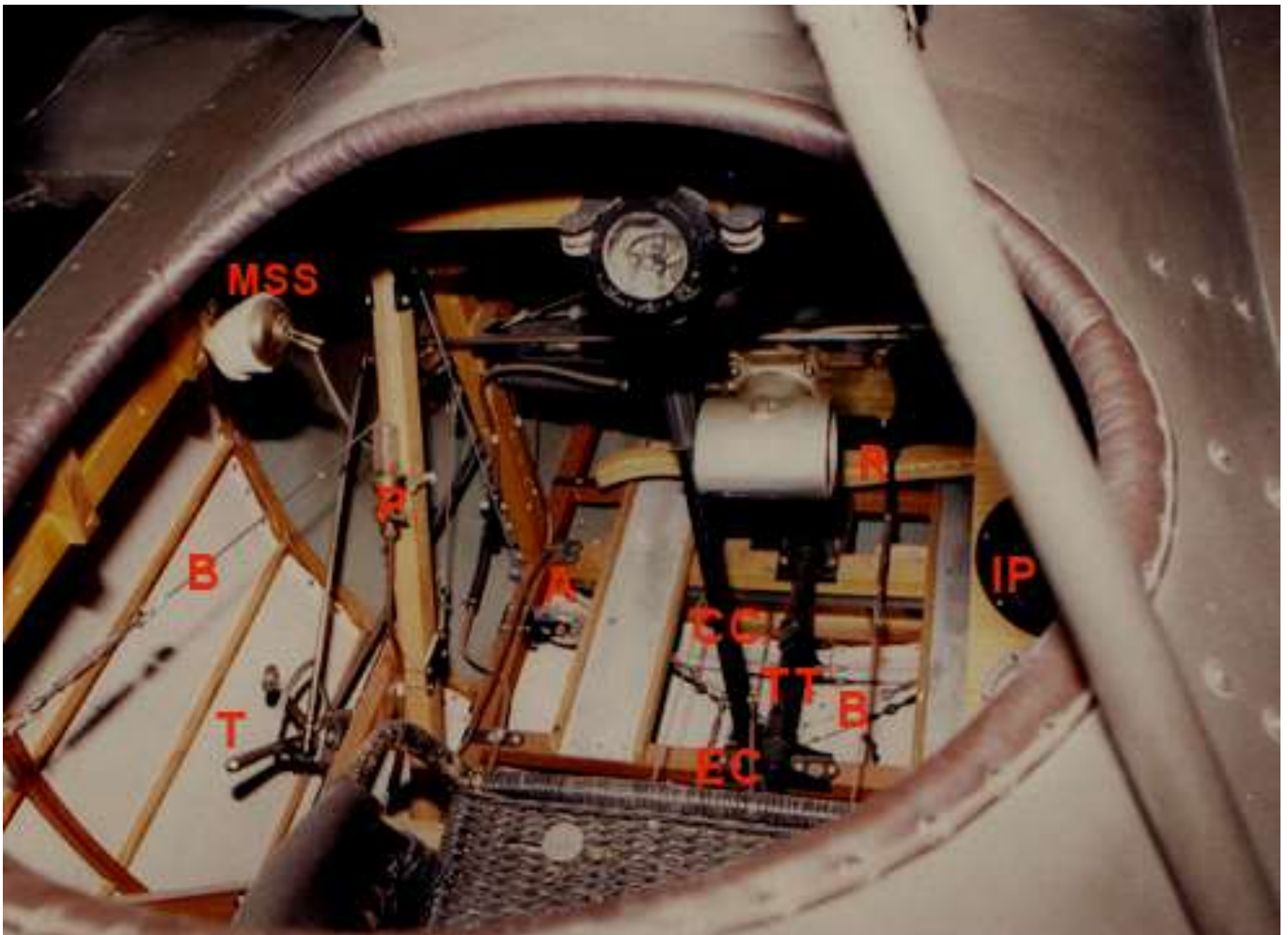
Orientation of right instrument panel.

Cockpit pipe work.

Carburettor air intakes.

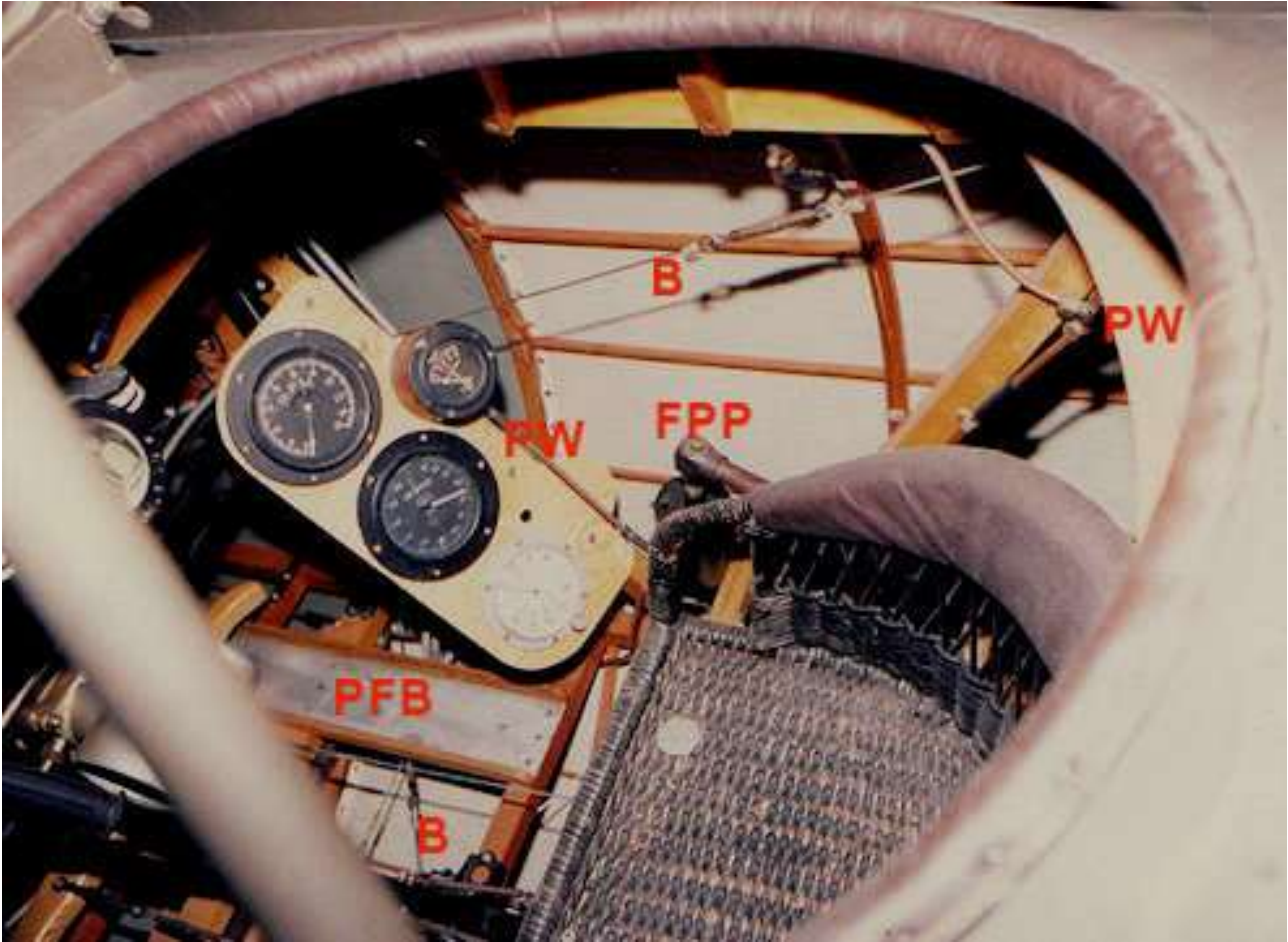
### Key:

MSS - Magneto starter switches P - Oil pulse meter B - Bracing wires T - Throttle  
A - Aileron control CC - Control column TT - Torque tube EC - Elevator control  
R - Rudder control IP - Right instrument panel.



Key:

B - Bracing wires PFB - Pilot's foot boards PW - Pipe work FPP - Fuel pressure pump.



Preparation:

Remove the fuselage halves and all of the cockpit components from their sprues (except the four aileron control line pulleys D22 and D23), including photo-etch parts from the photo-etch sheet.

Remove any residual sprue and photo-etch tabs from the parts, especially the slight mis-aligned mould seam around the cockpit side frames..

Fuselage halves:

**NOTE:** *The engine carburettor air intakes on the forward, sides of the fuselage halves are moulded solid. These require drilling out to represent the actual tube intakes.*

Drill a pilot hole of approximately 1.0 mm through the fuselage at the centre of the carburettor air intakes. Then open up the diameter of the drilled holes using a drill of 2 mm diameter.

On the inside of each fuselage half, scrape away the two mould ejector stubs (at the front of the cockpit frame lines. If not removed they will be visible inside the cockpit once the fuselage assembly is completed.

Using a 0.6 mm diameter drill, chain drill out the three control cable slots at the rear of both of the fuselage halves. If necessary the slots can be smoothed by applying a small amount of liquid cement around the slots.

Cockpit assembly:

Cement together parts D29, D27 and D13. Some reduction in the size of the square 'drive' was necessary to achieve a good fit of the parts.

Cement together part D10 to the underside of D16.

Drill a recess of 1.0 mm diameter into, but not through, the centre of the rudder bar location on D16.

**NOTE:** *The following three steps are to add a strengthening rod to the control column attachment point.*

Drill a hole of 0.3 mm diameter into, but not through, the centre of the control column location point on the rear of D16.

Drill a hole of 0.3 mm diameter through the control column at the location point for attaching to the rear of D16.

Cut a short length of 0.3 mm diameter rod (e.g. 'Albion Alloy's' Nickel-silver rod NSR03 or similar).

Secure the rod into the pre-drilled hole in the control column, using CA adhesive.

**NOTE:** *The following is the order I assembled the cockpit assembly so as to give rigidity during handling.*

Cement frames D7 and D15 onto their locations on D8.

Cement D25 and D11 onto their locations between frames D7 and D15.

Cement D6 on its location points and between frames D7 and D15. The part D6 only fits one way around between the frames.

Cement D20 on its location points and between frames D7 and D15.

Cement D8 between frames D7 and D15.

Cement D21 on its location point on D15.

**NOTE:** *The kit instructions show the orientation of the side instrument panel D28 of the cockpit right side frame. However, the previous cockpit photograph shows this panel fitted the opposite way around.*

Cement D28 onto frame D7.





## Preparation for rigging:

### Control lines:

**NOTE:** *The following steps are required to add bracing and rudder/elevator control lines to the cockpit assembly*

Drill a hole of 0.3 mm diameter through each side of the rudder bar (front to rear) at a point half way between the centre pivot and the curved foot rests.

Secure a 1:48th scale 'Gaspatch' turnbuckle (Type One End) into the pre-drilled holes with the turnbuckles facing rearwards from the rudder bar.

Drill a hole of 0.3 mm diameter through the control column (left side to right side) at the bottom of the control column.

Drill a hole of 0.3 mm diameter through the control column (left side to right side) 4 mm above the attachment point with added rod.

Temporarily pass a length of 'Stroft GTM' 0.08 mm diameter mono-filament through the two pre-drilled holes in the control column.



**NOTE:** *Kit parts D22 (x 2) and D23 (x 2) represent the pulley for guiding the aileron control lines. As can be seen on the previous photograph, the aileron control lines are routed between the pulleys and their attachments to the cockpit side frames.*

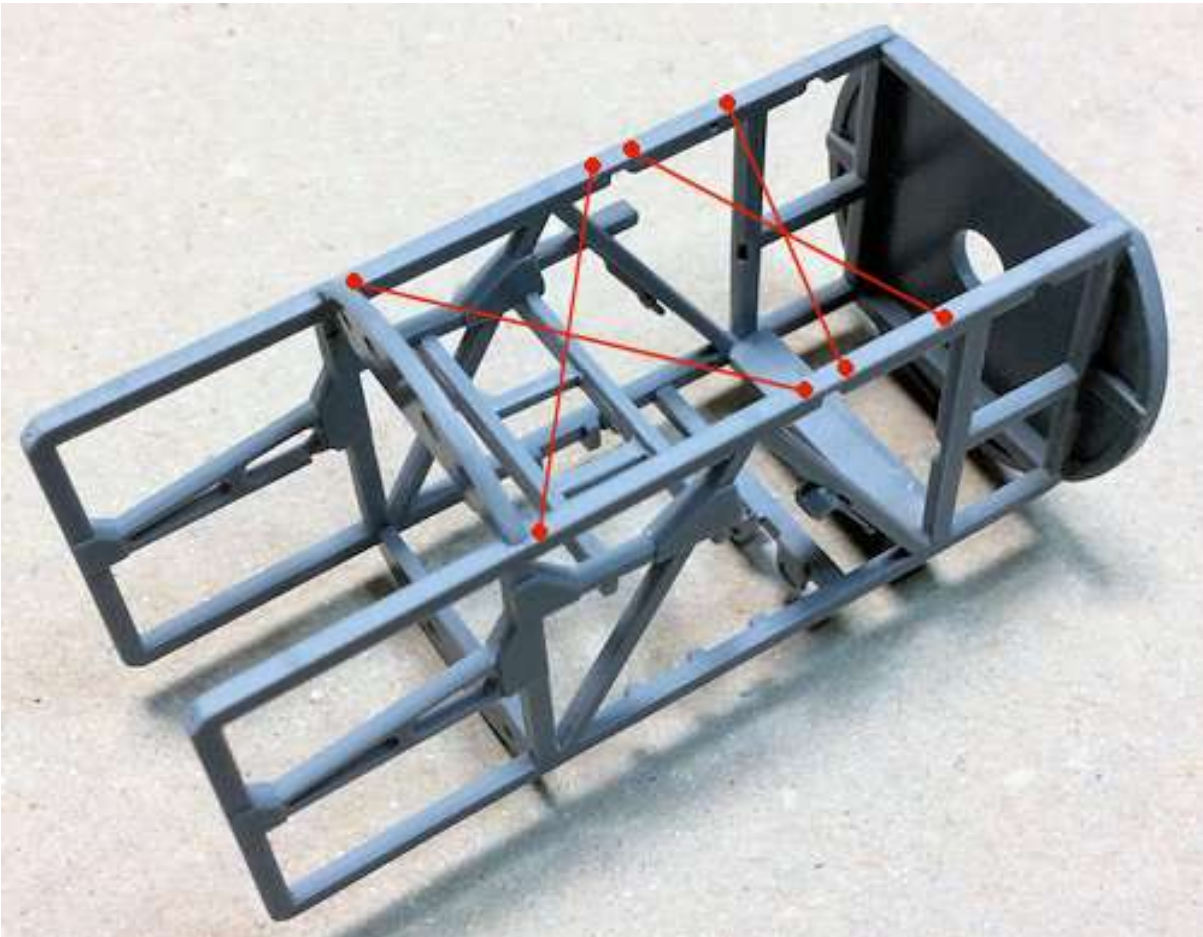
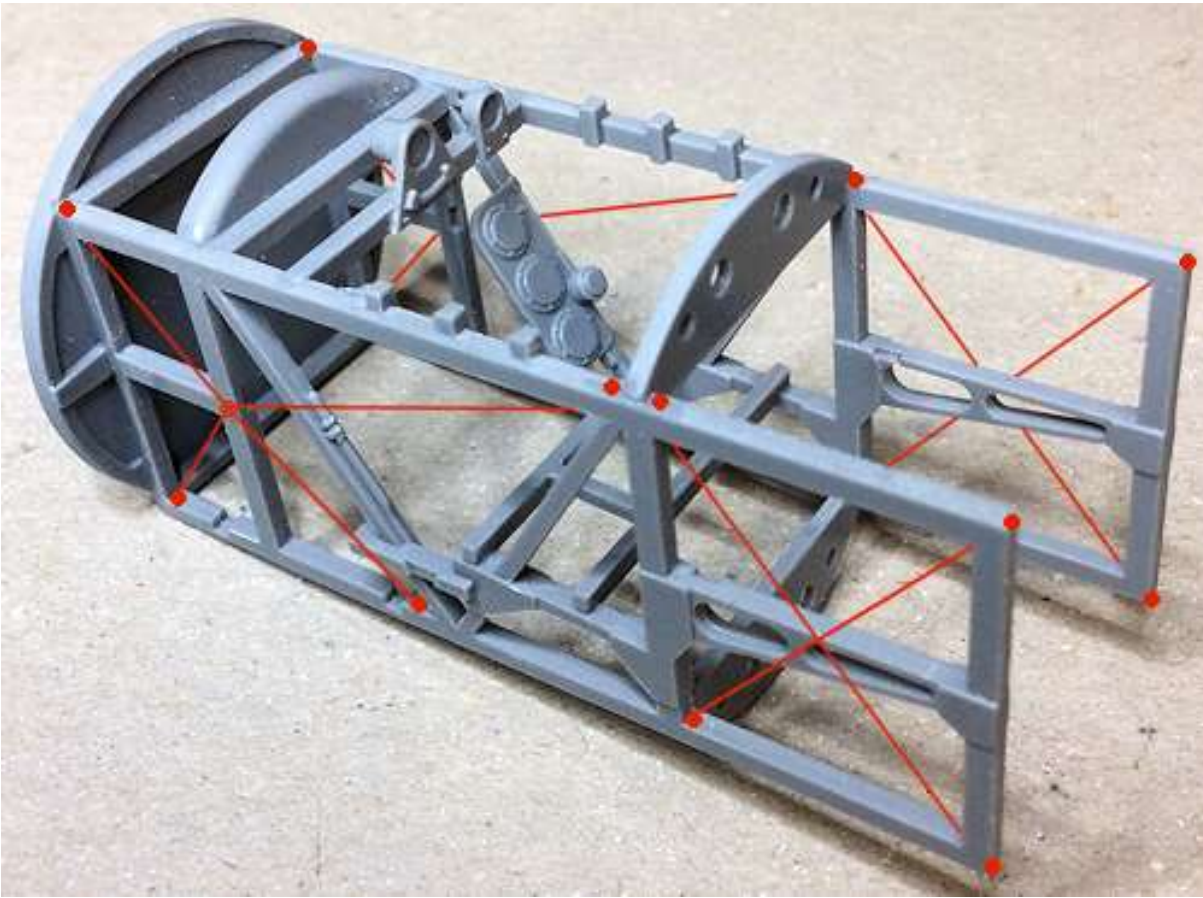
With the aileron control line pulleys D22 and D23 still attached to their sprues (for holding during drilling) drill a hole of 0.2 mm diameter through each pulley at the junction of the pulleys to their attachment lugs, not through the lugs themselves. This will allow routing of the control lines behind each pulley without affecting the cementing of the pulleys to the cockpit side frames.

Remove the aileron pulleys from their sprues and sand away any residual sprue tags.

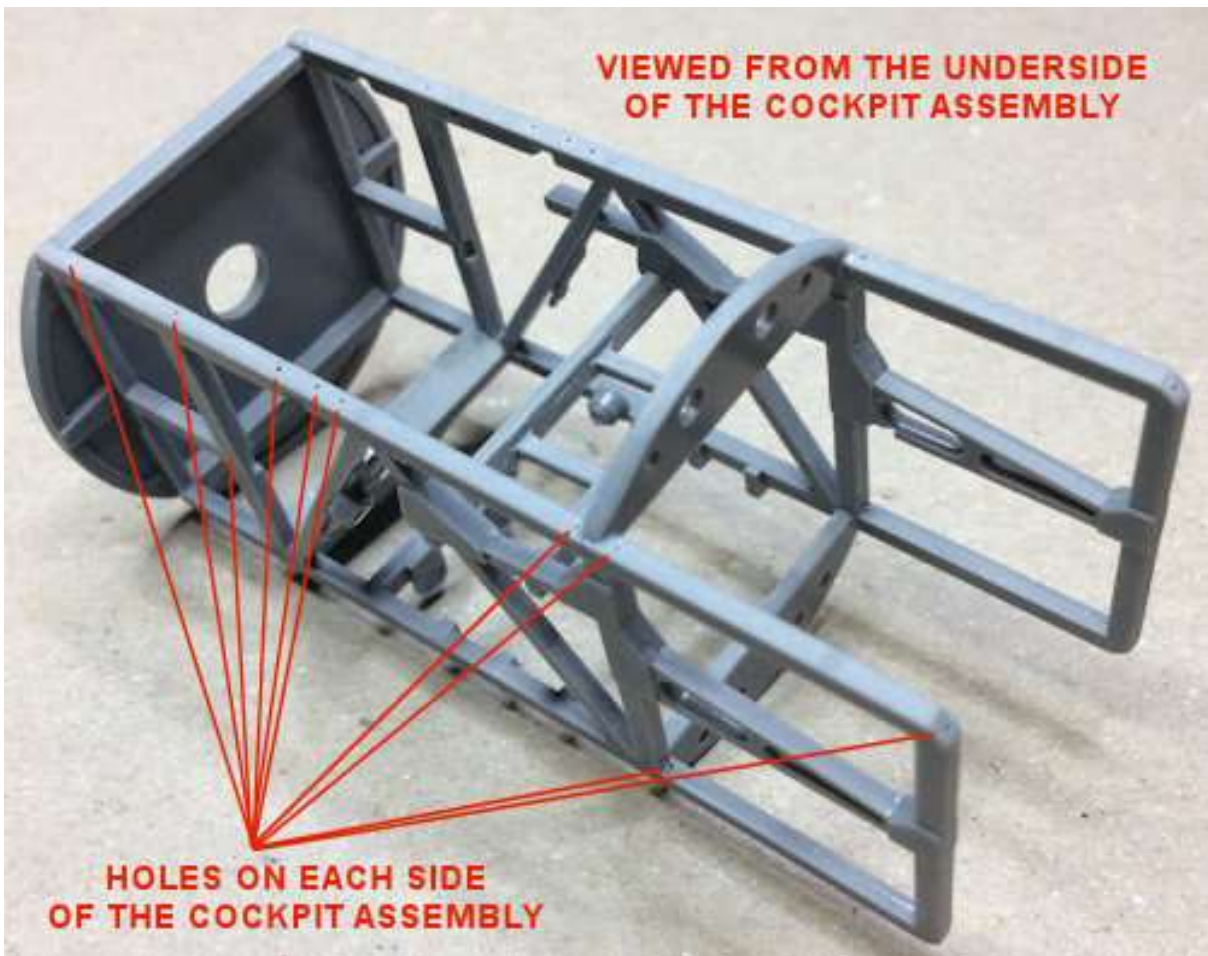
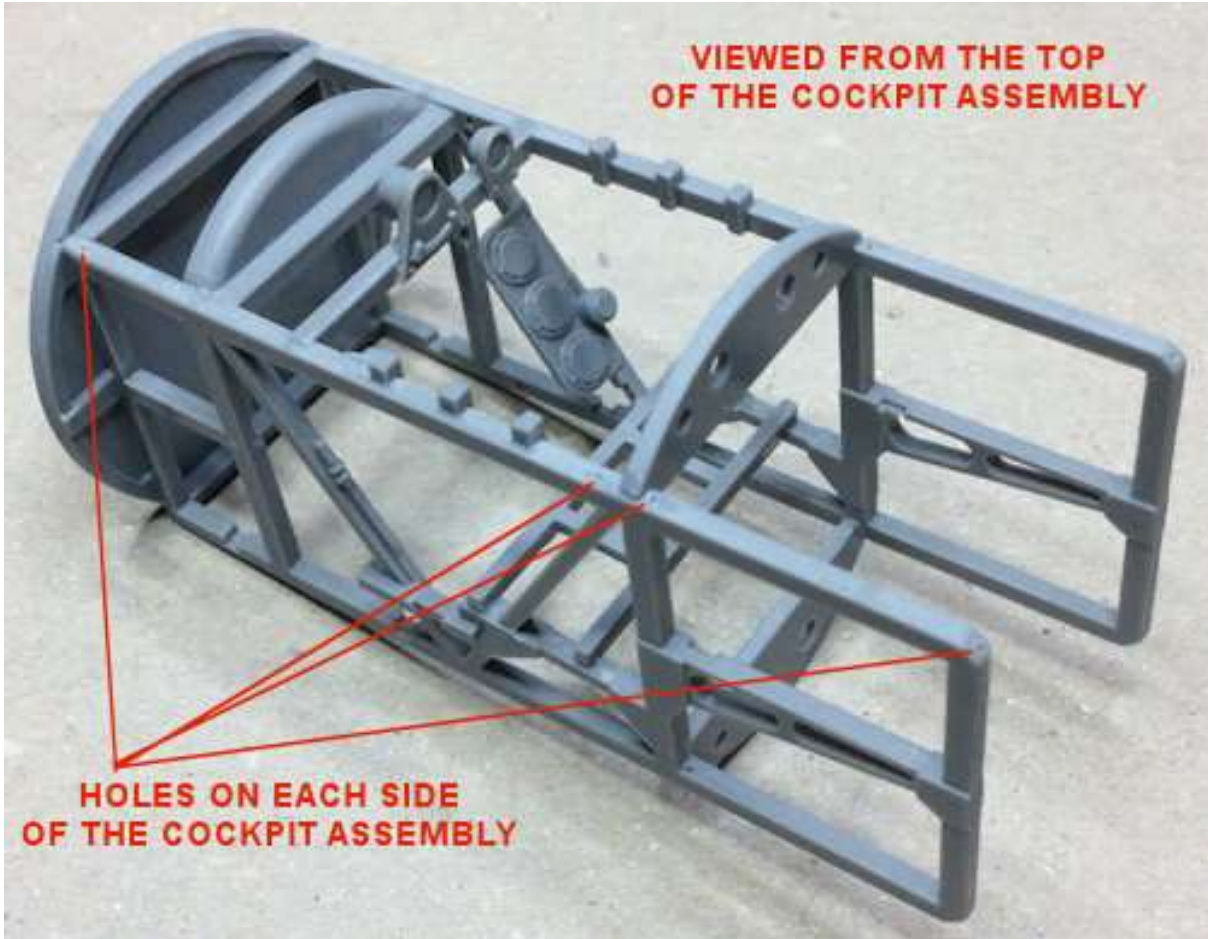


Bracing lines:

Drill holes of 0.3 mm diameter through the cockpit frames at the locations shown in the following photographs.







## Painting:

Airbrush all cockpit parts and the basic assembly with a grey primer, such as 'AK Interactive' Grey AK-758 or similar.

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

Basic cockpit assembly, foot board/frame D16, forward cross member D29, tail skid D3, internal surface of the fuselage halves A1, A2, rudder bar D24 and pilot's seat PUR1.

Brush paint the following parts with 'Tamiya' Neutral Grey (XF53).

Inside of fuselage halves A1 and A2, forward from the pre-moulded frame work.

Airbrush the following parts with 'Alclad' Duraluminium (ALC-120 or similar):

Fuel tank D14, aileron pulleys D22 and D23 and photo-etch parts 14 and 18.

Refer to Part 2 of this build log (Wood effects) - I chose to apply 'DecoArt' Burnt Umber to create the wood effect. Apply the wood effect to the following parts:

Basic cockpit assembly, foot board/frame D16, forward cross member D29, tail skid D3, and the rudder bar D24.

Brush paint or use colour pencils to the colour internal frames of the fuselage halves A1, A2 with wood colour.

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

Control lever D17 and D26, foot boards on D16, instrument surrounds, brackets on D16 and tail skid D3.

Brush paint the following parts with 'Tamiya' White (XF7) or similar:

**NOTE:** *The oil pulse meter is the pre-moulded 'pipe' on the forward diagonal member of cockpit side frame D15. The top of the 'pipe' represents the clear pulse tube, which contains engine oil.*

Pulse meter tube and the curved bank indicator on D20.

Brush paint the following parts with 'Tamiya' Clear Yellow (XF24)

Pulse meter tube

Brush paint the following parts with 'Tamiya' Rubber Black (XF85) or similar:

Control D27, instruments on D20, hand pump D19, Control column D4 and the torque tube in D16.

Brush paint the following parts with 'Mr. Colour' Brass (219) or similar:

Magneto starter switch D21, end caps of hand pump D19.

Brush paint the following parts with 'Tamiya' Hull Red (XF9) or similar:

Handles of the control column D4, control levers D17 and D26 and photo-etch parts PE14 and hand pump D19.

Brush paint the wicker of the pilot's seat with 'AK Interactive' Light Filter for Wood (AK-261).

Brush paint the pilot's seat cushion A6 and seat surround padding with 'Tamiya' Hull Red (XF9) with 'Humbrol' Leather (62) highlights.

## Rudder control lines - pre-rig:

Cut two long lengths of 'Stroft GTM' 0.08 mm diameter mono-filament.

Roll cut two short lengths of 0.4 mm Nickel-Silver tube (e.g. 'Albion Alloy's' NST04 or similar).

Pass a line through a cut tube.

Pass a free end of the line through the eye end of a turnbuckle fitted on the rudder bar.

Pass the line back through the tube.

Move the tube up to, but not touching, the turnbuckle.

Secure the tube to the lines with thin CA adhesive.

Trim away the exposed residual line at the tube.

Brush paint the centre section of the turnbuckle with 'Tamiya' Hull Red (XF9) or similar.

Repeat to rig a line to the other rudder turnbuckle.

#### Elevator control lines - pre-rig:

Cut two long lengths of 'Stroft GTM' 0.08 mm diameter mono-filament.

Roll cut four short lengths of 0.4 mm Nickel-Silver tube (e.g. 'Albion Alloy's' NST04 or similar).

Pass a line through cut tube.

Pass a free end of the line through the pre-drilled hole through the bottom of the control column.

Pass that end of the through cut tube.

Move both tubes up to the rear of the control column (not at the sides) leaving a gap between the tubes and the control column.

Secure the tubes to the line with thin CA adhesive.

Repeat to rig a line to the upper pre-drilled hole in the control column.



#### Aileron control lines - pre-rig:

On the two cockpit side frames D7 and D15, use a 0.9 mm diameter drill to open up the two pre-moulded locations for the aileron pulleys D23.

**NOTE:** *The rectangular stub on the underside of the torque tube on the floor board D16, represents the attachment for the aileron control lines.*

Drill a hole of 0.3 mm diameter across and through the stub on the underside of the torque tube.

Cut a long length of 'Stroft GTM' 0.08 mm diameter mono-filament.

Pass the line through the pre-drilled hole in the stub on the underside of the torque tube.

With equal line at each side of the stub, secure the line to the stub using CA adhesive.

#### Assembly:

**NOTE:** *I chose to replace some of the kit supplied decals with equivalent decals from 'Airscale' WW1 instrument dials (AS32 WW1).*

If necessary, refer to Part 4 (Decals) - Refer to the kit instructions and apply decal A to G to the cockpit assembly.

Cement the fuel tank D14 between frames D7 and D15.

Cement the rudder bar D24 to its location at the front of the floor board D16.

Cement the cross member D29 onto its locations between the cockpit side frames D7 and D15.

Cement the floor board D16 onto its locations between the cockpit side frames D7 and D15.

**NOTE:** *If the ailerons on the wings are to be animated, the control column should be positioned accordingly. If the left aileron is angled up and the right angled down (banking left), the control column should be tilted slightly to the left. The opposite would be for banking right.*

Insert the fitted location rod in the control column into the pre-drilled hole in the rear end of the torque bar on the floor board D16.

Position the control column slightly left or right (for aileron animation) or vertical (for ailerons flat to the wings).

Secure the control column D4 in position, using CA adhesive.

**NOTE:** *Take care when handling the control lines. Use just enough tension to remove slack from the lines. Applying too much tension may break either the rudder bar or the control column.*

#### Rudder control lines:

Route the two rudder control lines rearwards either side of the control column and then under the pilot's seat.

Secure the two lines to the back of the rear cross member D25, using CA adhesive.

#### Elevator control lines:

Route the four elevator control lines from the control column, rearwards under the pilot's seat.

Secure the four lines to the back of the rear cross member D25, using CA adhesive.

#### Aileron control lines:

Pass the free end of a line through the pre-drilled hole in an aileron pulleys D23.

Keeping the line clear, secure the aileron pulley into it's location on the inside, bottom of the cockpit side frame, using CA adhesive.

Pass the free end of the line through the pre-drilled hole in a second aileron pulley D23.

Keeping the line clear, secure the aileron pulley into it's location on the inside, top of the cockpit side frame, using CA adhesive.

Gently pull the line taut and secure it to the top edge of the cockpit side frame, using CA adhesive.

Cut away the excess line at the top of the frame.

Repeat to install the aileron control line to the opposite cockpit side frame.

### Various pipe work:

1. Drill a hole of 0.5 mm diameter into the bottom of the hand pressure pump D19.

Cut a length of 0.4 mm diameter lead wire ('PlusModel) or similar.

Cement the hand pressure pump onto its location on the right cockpit frame D7.

Secure one end of the lead wire into the pre-drill holes in the bottom of the hand pressure pump.

Carefully bend the lead wire to route it up the diagonal frame towards to fuel tank. Pass the wire through the outer hole in the top cross member then onto the rear of the fuel tank.

Secure the wire in position using CA adhesive.

2. Cut a length of 0.4 mm diameter lead wire ('PlusModel) or similar.

Secure one end of the lead wire at the bottom of the oil pulse meter on the cockpit left side frame D15, using CA adhesive.

Route the wire down and forwards, along the bottom of the frame, to the engine bulk head.

Secure the wire in position using CA adhesive.

3. Cut a short length of 0.4 mm diameter lead wire ('PlusModel) or similar.

Position the lead wire between the top of the pre-mould instrument pipe (at the right instrument panel) and the underside of the top frame.

Secure the wire in position using CA adhesive.

4. Cut a length of 0.5 mm diameter lead wire ('PlusModel) or similar.

Using CA adhesive, secure one end of the lead wire between the centre lever block D27 on cross member D29 and the cockpit left side frame.

Route the wire down the frame then forwards to the engine bulk head.

Secure the wire in position using CA adhesive.

### Cross bracing lines:

Use the following procedure to create twelve bracing lines:

Cut twenty four long lengths of 'Stroft' 0.08 mm diameter mono-filament.

Roll cut four short lengths of 0.4 mm diameter Nickel Silver tube ('Albion Alloy's' NST04 or similar).

Pass a line through a cut tube, the through an eye end of a 1:48th scale turnbuckle ('Gaspatch' resin or metal Type C).

Loop the line back and through the tube.

Slide the tube along the lines and up to, but not touching, the turnbuckle eye end.

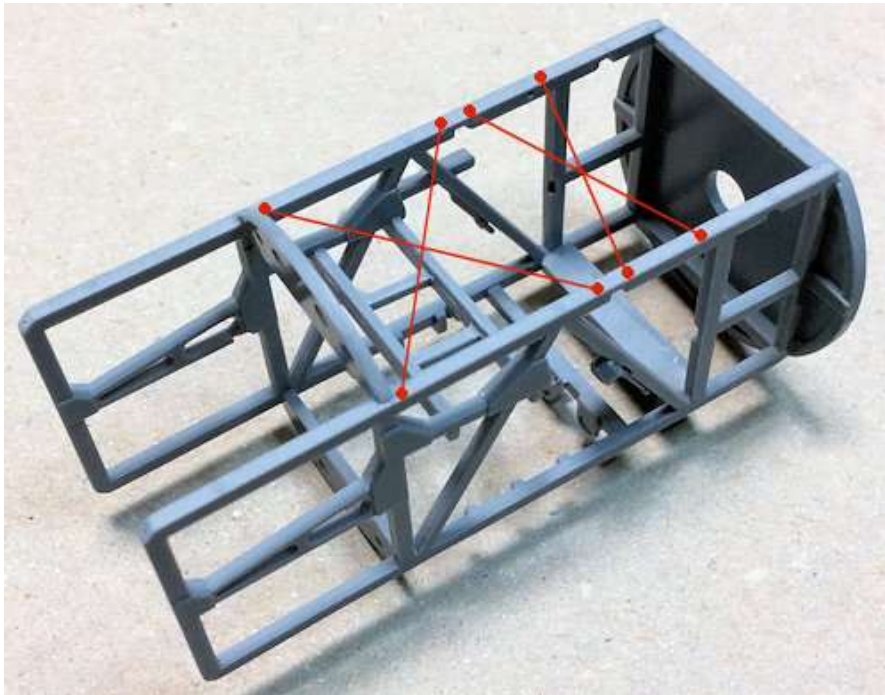
Secure the tube to the lines using CA adhesive.

Cut away the exposed line tag away from the tube.

Repeat to add a line to the opposite end of the turnbuckle.

Brush paint the centre section of each turnbuckle with 'Tamiya' Hull Red (XF9) or similar.





Floor bracing lines:

**NOTE:** Use the above photograph as a guide for rigging the floor bracing lines.

Pass the free end of one of the rigged lines through a floor bracing pre-drilled hole the bottom of a cockpit side frame.

Pass the free end of the other line through the diagonally opposite pre-drilled hole in the bottom of the opposite cockpit side frame.

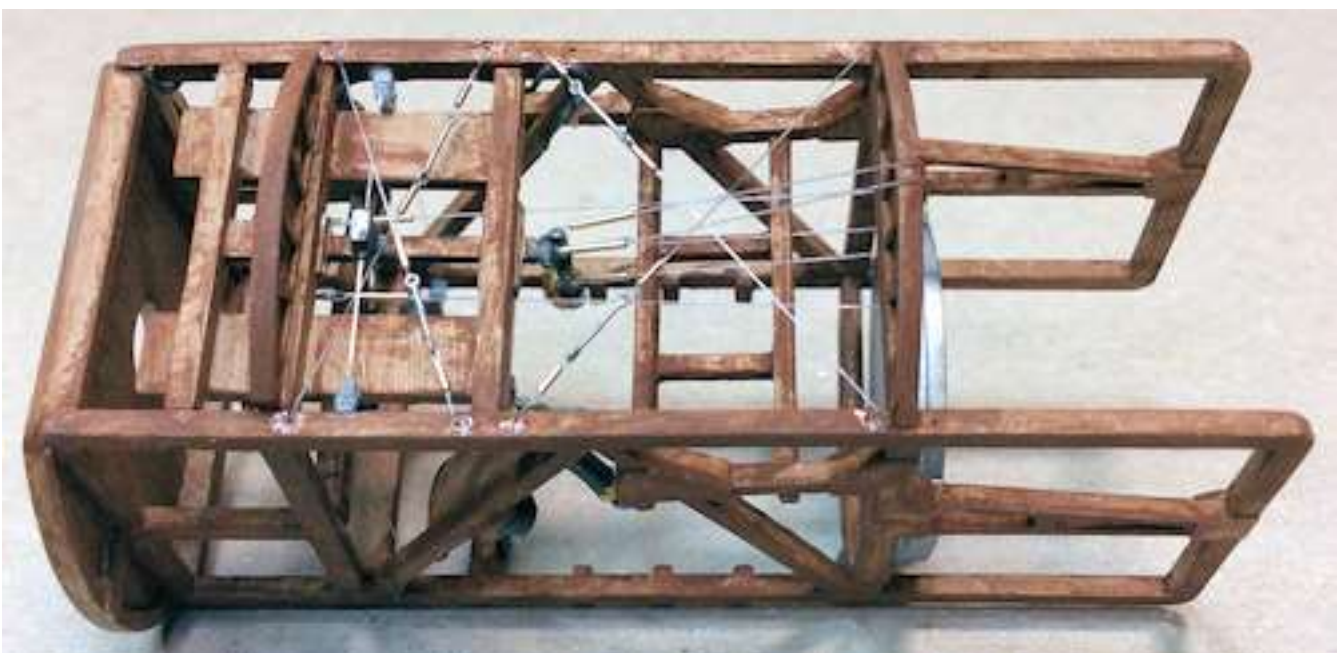
Refer to the following photograph and position the turnbuckle within the cockpit floor frame.

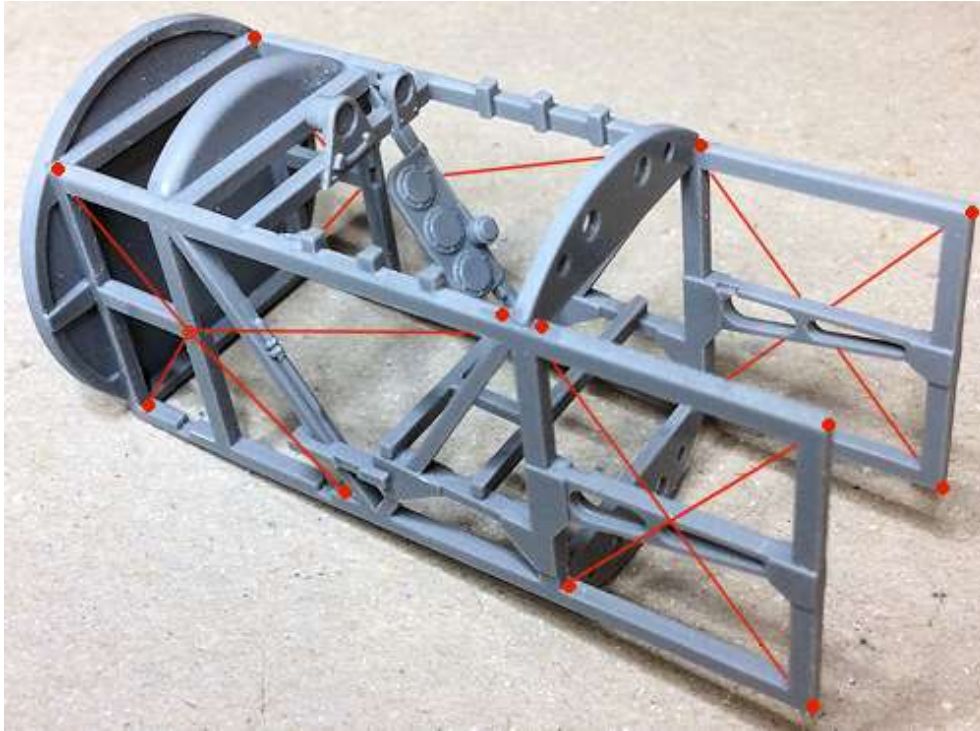
Secure one of the lines into its cockpit side frame, using CA adhesive.

Pull the other line taut and secure it into its cockpit side frame, using CA adhesive.

Cut away the exposed residual line at the exit of the holes.

Repeat the procedure to add the remaining three cross bracing lines to the cockpit floor.



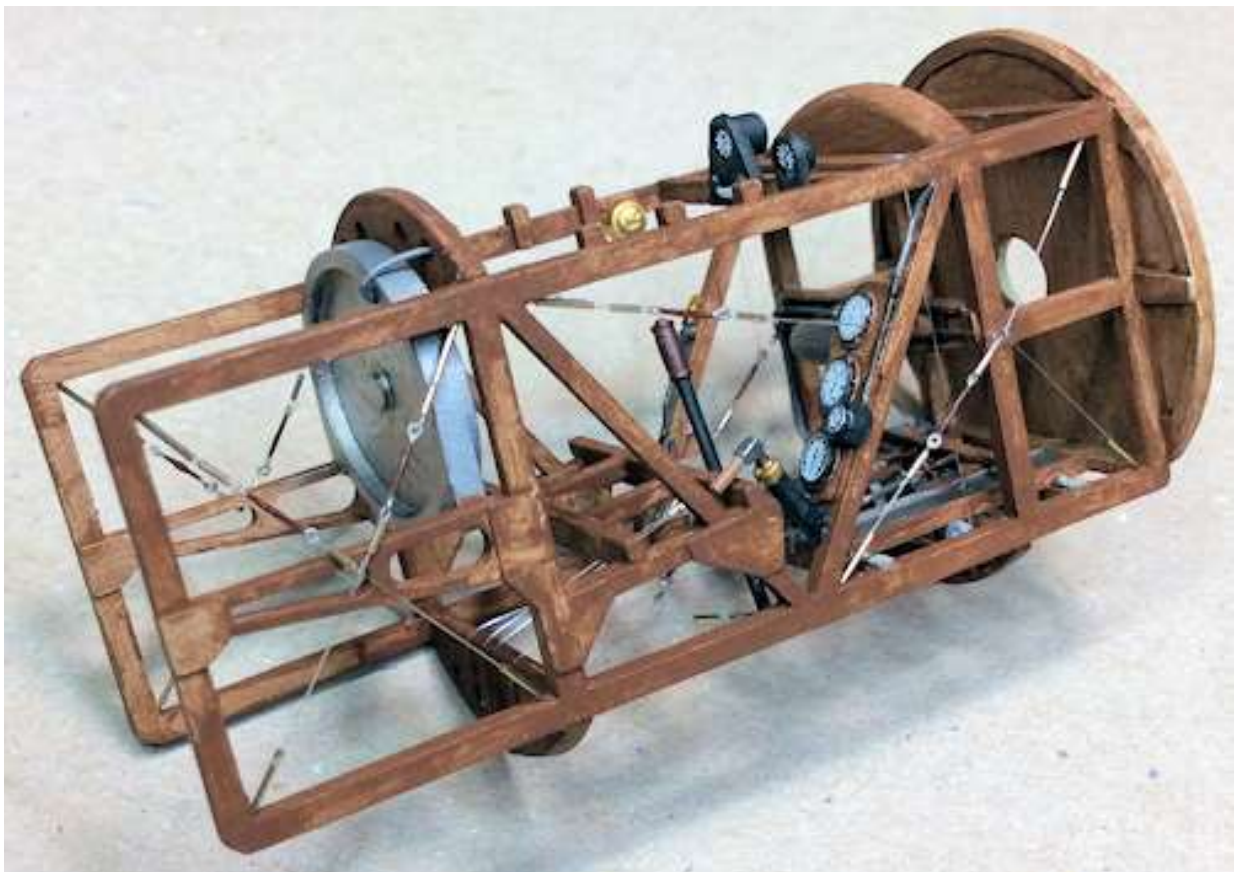


Side framing bracing lines:

**NOTE:** Use the above photograph as a guide for rigging the side frame bracing lines.

Secure a 'GasPatch' 1:48th scale Anchor Point into the pre-drilled hole at the centre of the vertical member of the two cockpit side frames (second back from the engine bulkhead).

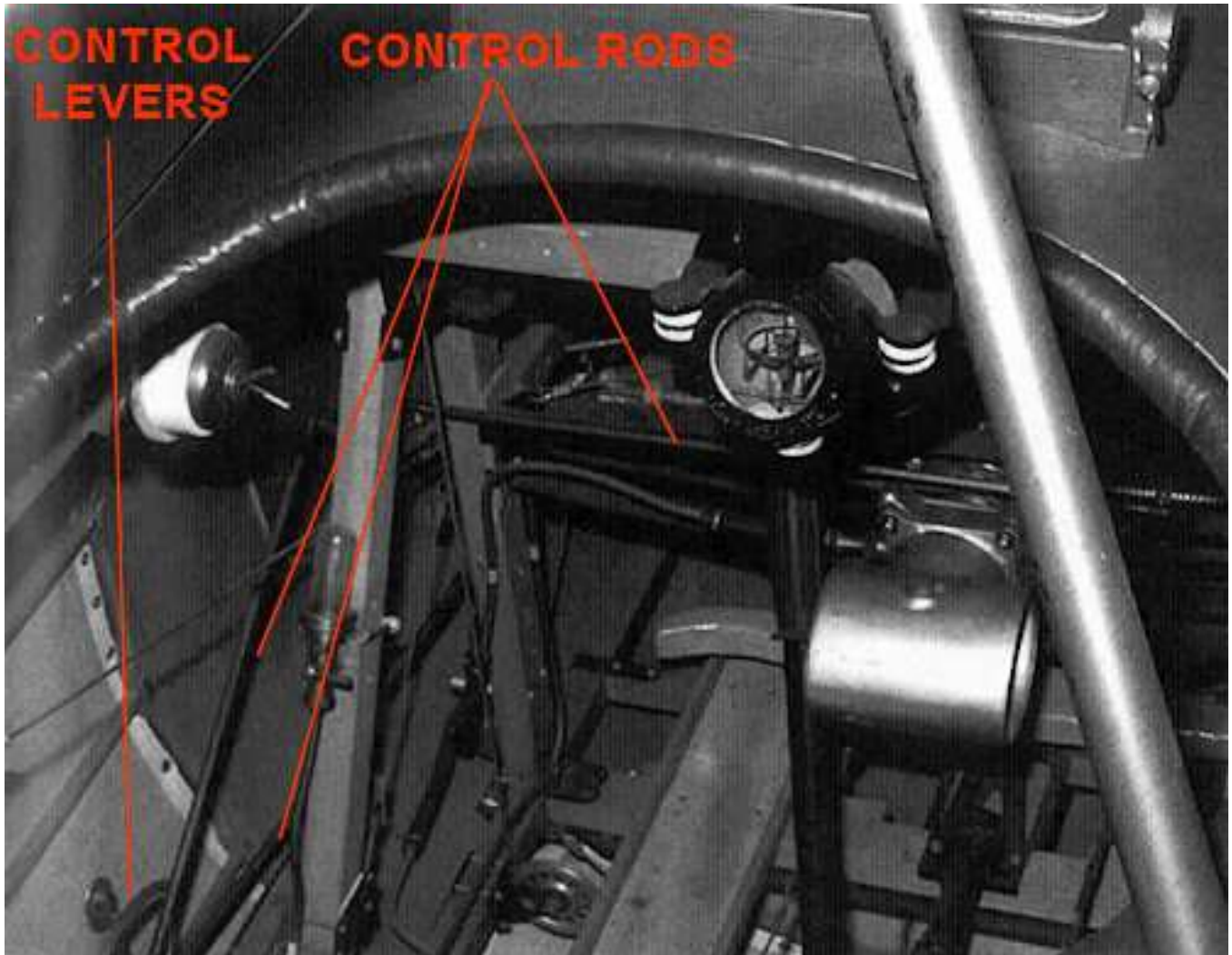
Use the same procedure as used to rig the bracing lines to the floor . The only exception is that the two crossed bracing lines at the front of the cockpit side frames pass through the pre-installed anchor points.





## Engine controls:

**NOTE:** The kit instructions show optional engine controls, photo-etch part PE14 or a combination of parts D17 and D26. The following photograph shows the control levers and rods. A control rod is attached to one control lever and is routed up at an angle and forwards to the left side of the cross member D20, where it is probably connected to a bell crank lever. From there the rod is routed across D20 to the right side of the cockpit. A control rod is also attached to the second control lever and is routed forwards along the left side of the cockpit. What the levers control and to what they are connected is not clear.



*I chose to use the photo-etch part PE14 with part D17.*

Remove photo-etch PE14 from the sheet and remove any residual tags from the edges.

Secure PE14 to D17 using CA adhesive. The photo-etch PE14 should be secured to the flat side (without the pre-moulded 'pip' of D17 with its lever facing rearwards.

Cement D17 into its location recess on the outer face of the bottom of the cockpit side frame D15, with the pre-moulded 'pip' above the frame and facing into the cockpit.

Roll cut a long length of 0.4 mm diameter Nickel-Silver tube (e.g. 'Albion Alloy's' NST04 or similar).

**NOTE:** The engine control rods were painted black. The tube used can either be painted black (e.g. 'Tamiya' Rubber Black XF85 or similar) or dipped in a blackening solution, such as 'Blacken-It or similar).

Paint or treat the tube to colour it black.

Roll cut a length of the tube such that it will fit between the control lever block and the rear of the engine bulk head.

Secure the tube in position using CA adhesive.

Roll cut a long length of the tube and bend it to 90 degrees.

Trim each end of the tube such that it will fit between the D17 control lever and left along cross member D20 to the centre lever box.

Secure the tube in position using CA adhesive.

Roll cut a length of the tube.

Trim the tube such that it will fit between the right side of the D17 control lever and along cross member D20 to the cockpit right side frame (D7).

Secure the tube in position using CA adhesive.

#### Magneto switches:

**NOTE:** *The magneto switches supplied in the kit are photo-etch parts PE18 , which I think are not to scale. Therefore I chose to replace them with tube.*

Mark then drill two holes of 0.3 mm diameter into the magnet switch D21.

Roll cut two short lengths of 0.2 mm diameter Nickel-Silver tube (e.g. 'Albion Alloy's' NST03 or similar).

Secure the two tubes into the pre-drilled holes in the magneto switch.

#### Pilot's seat:

**NOTE:** *The seat harness supplied in the kit is photo-etch and does not represent the types of harnesses used at that time. In fact it looks identical to the 'Eduard' set for the WW2 Fairy 'Swordfish. Therefore I chose to use instead laser cut textile belts from 'HGW Models'.*

Secure the pilot's seat cushion A6 onto the seat PUR1 using CA adhesive.

Secure the pilot's seat in position on the support frame D6, using CA adhesive. The seat should be slightly forward from the front support cross member.

#### Weathering:

Refer to Part 3 (Weathering) - Apply 'Flory Models' Dark Dirt clay wash to the inside of the fuselage halves, pilot's seat and cushion and the fuel tank.

Apply 'Flory Models' Grime clay wash to the pilot's foot boards.

Remove the wash to achieve the desired effect.

**NOTE:** *Sealing the painted cockpit assembly will protect the painted surfaces and applied weathering.*

Airbrush seal the cockpit assembly and the inside surfaces of the two fuselage halves with a semi-matte sealer (e.g. 'Alclad' Light Sheen ALC-311 or similar).

#### Seat belts:

**NOTE:** *For this model use only the seat belt parts 1, 3, 2 and 5 with photo-etch parts 1.*

Following the included instructions, assemble the pilot's seat belts ('HGW Models' 132533). Use thin CA adhesive to join the belt parts together (not the photo-etch parts).

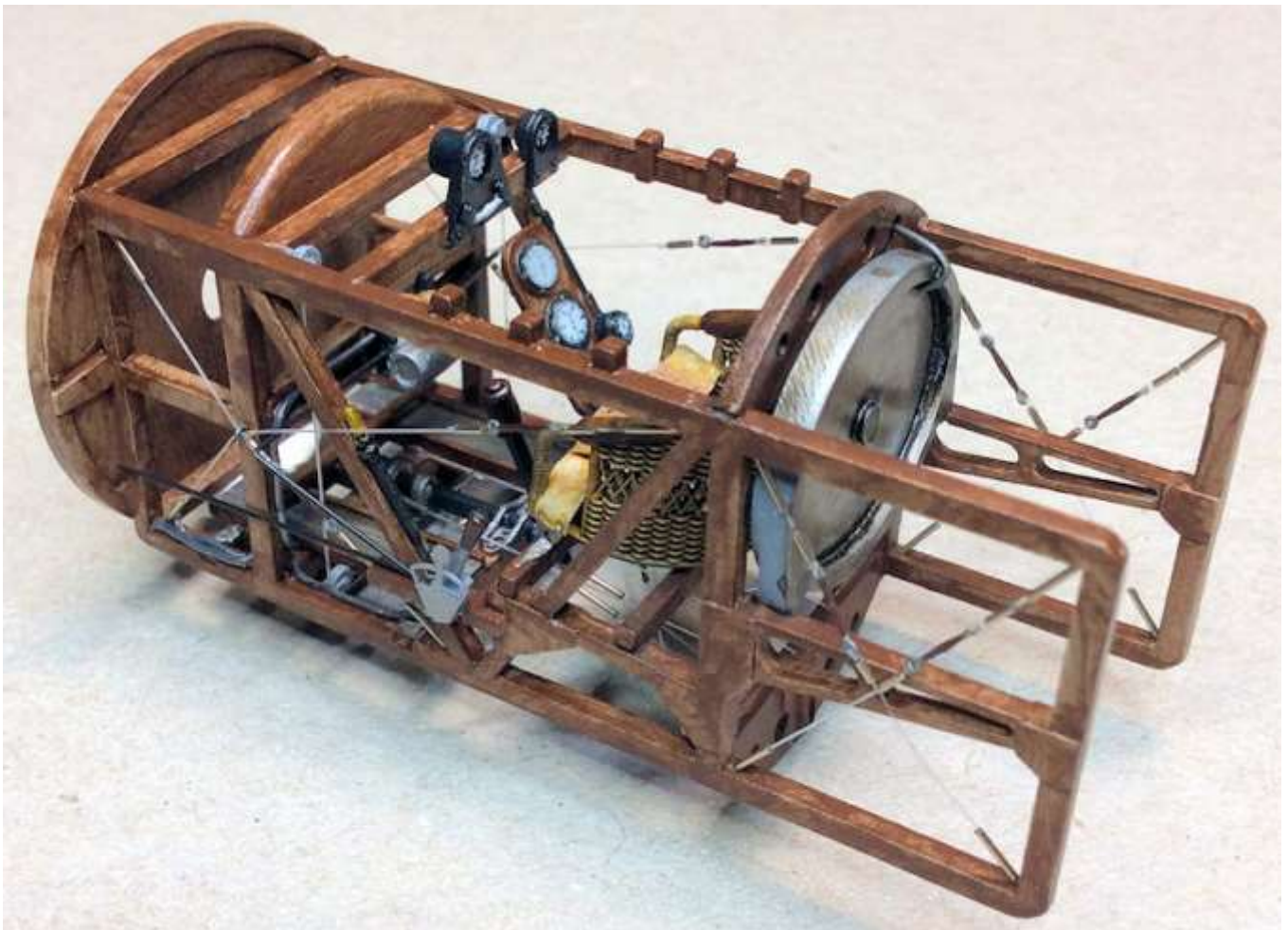
Trim the edges of parts 1 and 2 so they can fit through the gap under the arms of the pilot's seat. Bend the attachment end of the photo-etch parts 1 to an angle of 90 degrees, so they will sit onto the seat front support cross member.

Position each belt through the gaps under the arm of the pilot's seat and secure the attachment to the seat support front cross member, using CA adhesive.

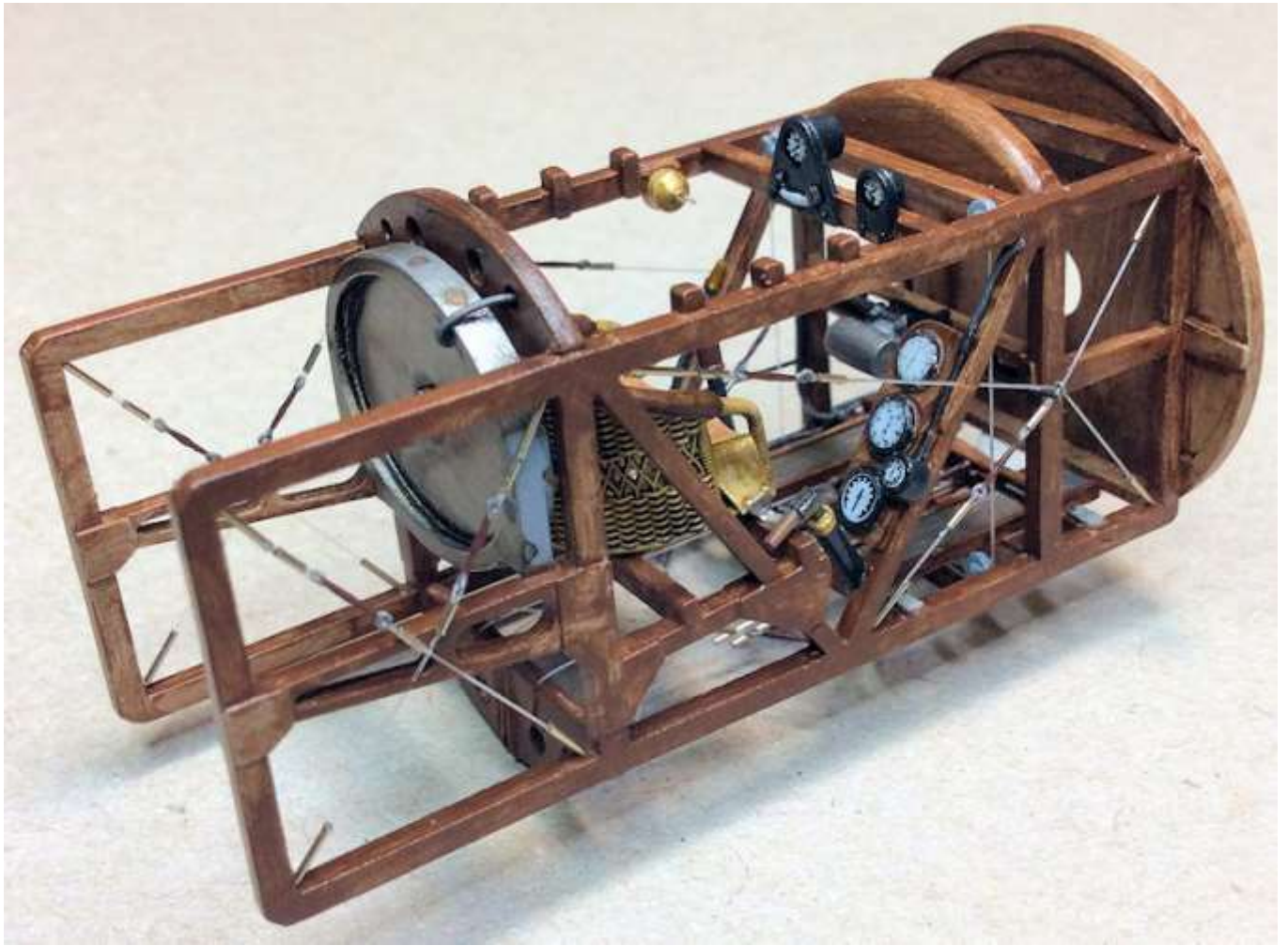
Position the two belts, as desired, onto the seat cushion and secure in position using CA adhesive.

Instrument faces:

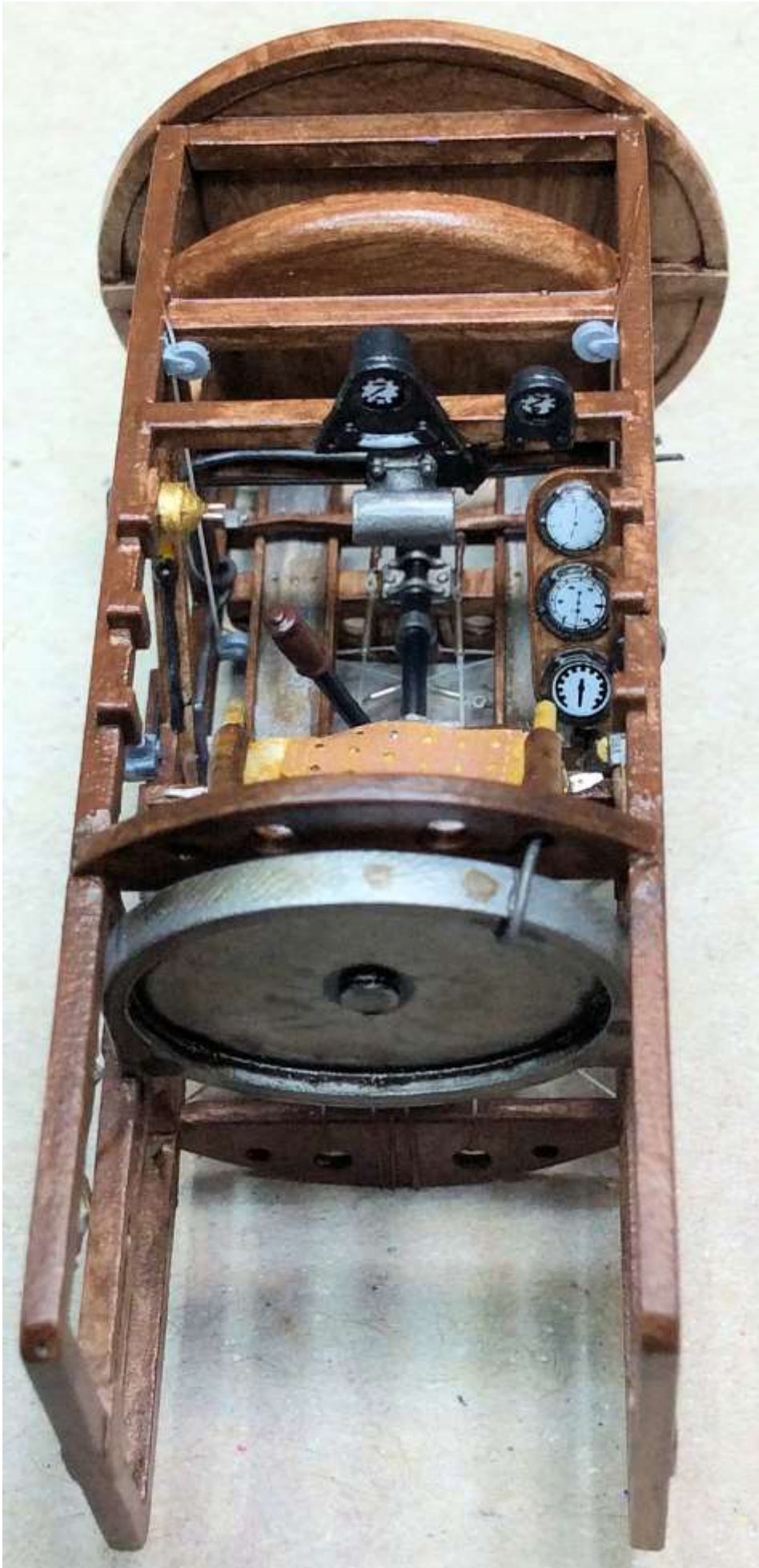
Brush a clear gloss coat, such as 'Tamiya' Clear X22 or similar, onto the faces of the instruments, to represent glass.













Assembly (cont'd):

Make sure the fuselage mating surfaces are cleaned of any primer or paint.

Position the cockpit assembly into the left fuselage half, making sure the two locating stubs on the front of the engine bulk head are fully located in the front of the fuselage.

Hold the cockpit assembly in place and cement the engine bulk head to the inside of the front of the fuselage.

Locate the right fuselage half against the left fuselage half/cockpit assembly and once correctly aligned (there are no locating pins/holes), cement the fuselage halves together.

Once the cement has fully cured and set, carefully sand along the fuselage joint seams to blend the to the surround areas.



# PART 11

# CONSTRUCTION



## **PART 11 - CONSTRUCTION**

Remove the two wings, fin, rudder, tailplanes and elevators from the kit sprue and sand away any residual sprue tags and mould flash.

**NOTE:** *The aileron for the wings and the rudder and elevators are supplied to be 'butt' glued in place. However, this means the joints will be weak and the parts easily broken away. Also, if as for this model, the flight control surfaces are to be animated, the kit method of attachment will not allow this to be achieved. Therefore I chose to attach the flight control surfaces with tubes.*

Sand away the pre-moulded attachment lugs for the ailerons on the two wings, ailerons, tailplanes, elevators, fin and rudder.

### **Wings:**

Drill holes of 0.7 mm diameter into the trailing edge of each wing at the aileron openings. The holes should be drilled centrally at the wings and from the wing tip inboard - outboard rib tape, third rib tape in and fifth rib tape in.

Dip a length of 0.6 mm diameter Nickel-Silver tube (e.g. 'Albion Alloy's NST06 or similar) into 'Blacken-It' solution, to create a blackened finish on the tube.

Roll cut six short lengths of the tube.

Secure the tubes into the pre-drilled holes in the wings, using CA adhesive.

Position the ailerons against their relative wing and mark the location of the three tubes onto the leading edge of the ailerons.

Drill holes of 0.7 mm diameter centrally into the leading edge of the ailerons.

Locate each aileron onto its locating tubes and push it against the wing trailing edge.

**NOTE:** *If, as with this model, the ailerons are to be animated, they should be angled to correspond with the position of the control column.*

*If the control column was fitted vertical in the cockpit, both ailerons should be aligned with the wings.*

*If the control column was fitted tilted to the left in the cockpit, the left aileron should be angled slightly up and the right aileron angled slightly down and at the same angle.*

*If the control column was fitted tilted to the right in the cockpit, the left aileron should be angled slightly down and the right aileron angled slightly up and at the same angle.*

With each aileron fully located onto the wings, bend the aileron in the required direction and angle (if the ailerons are to be animated).

Remove both ailerons from the wings.

**NOTE:** *The actual aircraft had drains openings at the underside of the wings and ailerons, at the trailing edges. These are not represented on the kit wings.*

Drill recesses of 0.7 mm diameter into, but not through, the trailing edges of both wings and ailerons. Each 'recess' should be at the trailing edge and just outboard of each rib tape.



### Elevators:

Drill holes of 0.5 mm diameter into the trailing edge of each tailplane. The holes should be drilled centrally at the tailplanes and from the tailplane tips inboard - outboard rib tape and third rib tape in.

Dip a length of 0.6 mm diameter Nickel-Silver tube (e.g. 'Albion Alloy's NST06 or similar) into 'Blacken-It' solution, to create a blackened finish on the tube.

Roll cut four short lengths of the tube.

Secure the tubes into the pre-drilled holes in the tailplanes, using CA adhesive.

Position the elevators against their relative tailplane and mark the location of the two tubes onto the leading edge of the elevators.

Drill holes of 0.5 mm diameter centrally into the leading edge of the elevators.

Locate each elevator onto its locating tubes and push it against the tailplane trailing edges.

**NOTE:** *If, as with this model, the elevators are to be animated, they should be angled to correspond with the position of the control column.*

*If the control column was fitted vertical in the cockpit, both elevators should be aligned with the tailplanes.*

*If the control column was fitted tilted forwards in the cockpit, the two elevators should be angled slightly down and at the same angle.*

With each elevator fully located onto the tailplanes, bend the elevators down slightly and at the same angle.

Remove both elevators from the tailplanes.



#### Rudder:

Drill holes of 0.4 mm diameter centrally into the trailing edge of the fin.

Dip a length of 0.3 mm diameter Nickel-Silver tube (e.g. 'Albion Alloy's NST03 or similar) into 'Blacken-It' solution, to create a blackened finish on the tube.

Roll cut two short lengths of the tube.

Secure the tubes into the pre-drilled holes in the fin, using CA adhesive.

Position the rudder against the fin and mark the location of the two tubes onto the leading edge of the rudder.

Drill holes of 0.4 mm diameter centrally into the leading edge of the rudder.

Check the fit of the rudder by locating the rudder onto its locating tubes and push it against the fin trailing edges.

Remove the rudder from the fin.



### Rigging preparation:

**NOTE:** The kit supplied control horns for the ailerons, elevators and rudder are photo-etch. The control surfaces do not have any support for these control horns and just 'butt' joining them to the control surfaces is too weak, meaning they will easily be broken off when the rigging is fitted. The control surfaces need to be modified to provide a better joint.

Holes need to be drilled to provide attachment points for the flying, landing and bracing lines.

### Wings:

Drill a hole of 0.5 mm diameter through each wing at the front of the pre-moulded aileron line entry points.

Drill two holes side by side of 0.4 mm diameter (centres 1 mm apart) into the two anchor point 'bulges' on the underside surface of each wing. Drill one hole into, but not through the wing (underside flying wire). Drill the second hole through the wing (second underside flying wire and upper landing wire).

Remove the four kit supplied photo-etch parts PE6 from the sheet. Remove any residual photo-etch tags, but **leave the two photo-etch tags at the base of the control horns intact** (flying wires).

Drill a hole of 0.5 mm diameter into, but not through, each aileron just to the rear of the leading edge and at the location shown on the following photo-graphs.

Lay a photo-etch PE6 control horn onto the wing surface and align the front 'tag' to the pre-drilled recess.

Mark the location of the other 'tag'.

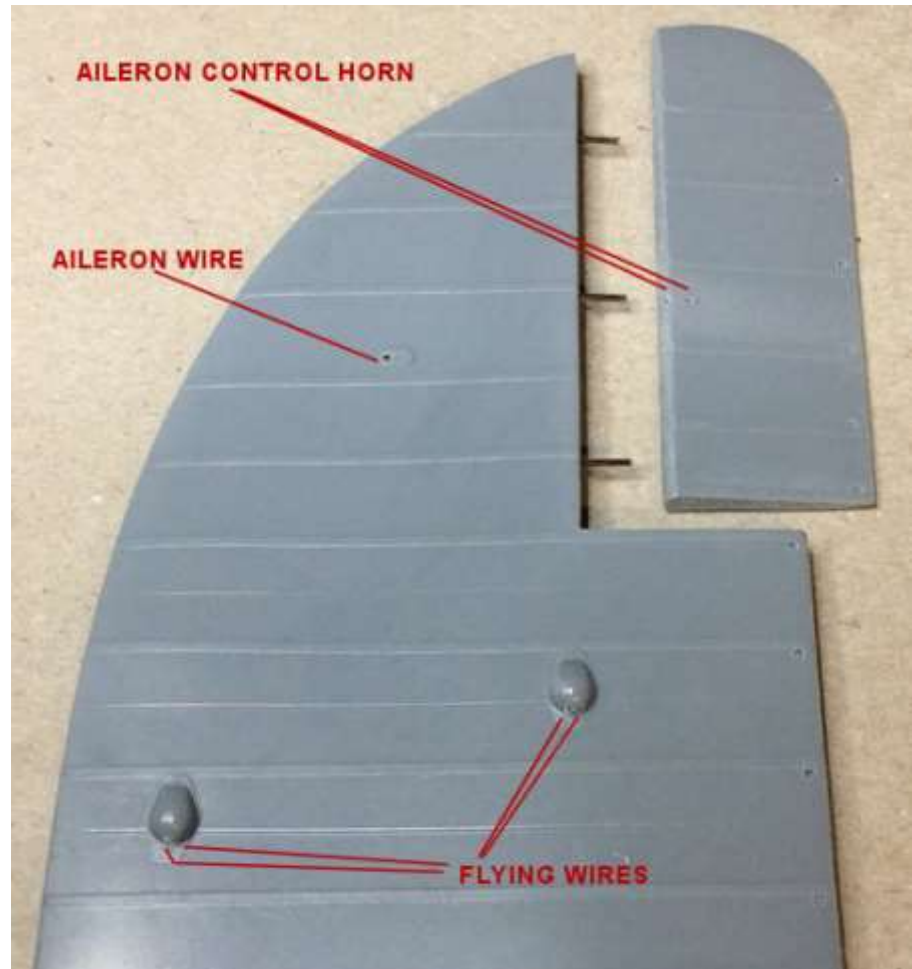
Drill a hole of 0.5 mm diameter through each aileron at the marked location.

Check that the two 'tags' on the control horn fit into the pre-drilled recess and hole with the base of the control horn in contact with the surface of the aileron.

Wing and aileron upper surfaces.



Wing and aileron underside surfaces.



### Fuselage:

Drill a hole of 0.4 mm diameter through the rear of the fuselage and at the lower corner at the tail skid location recess (rear tailplane bracing wire).

Drill a hole of 0.4 mm diameter through the rear of the fuselage and at the lower pre-moulded recess (forward tailplane bracing wire).

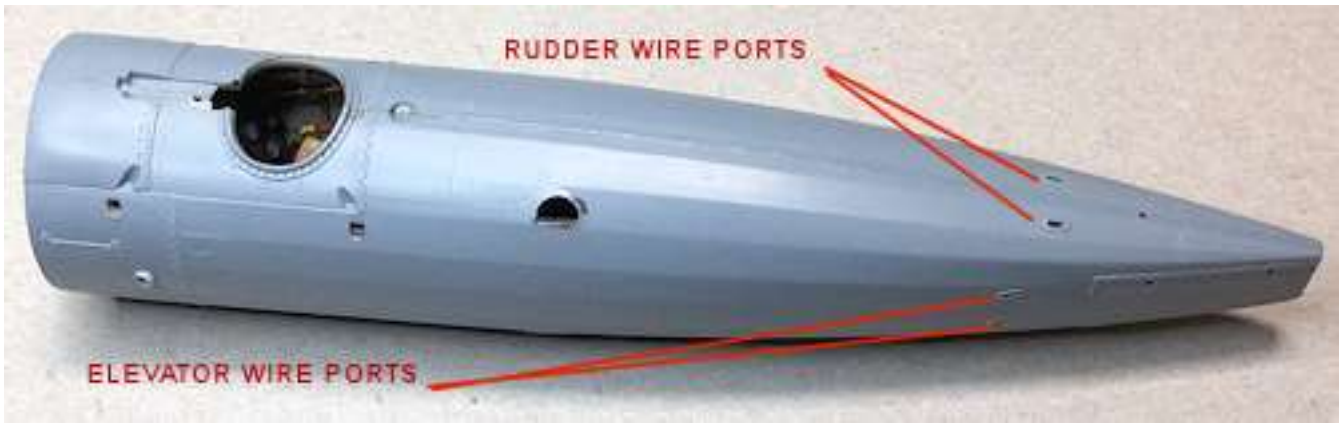
Chain drill a row of holes of 0.6 mm diameter through the rear of the fuselage at the pre-moulded ports for the rudder and elevator control wires. Angle drill across the pre-drilled holes to create a slot.

Drill two holes (side by side) of 0.4 mm diameter into the two pre-moulded anchor points at both sides of the fuselage (flying wires).

Drill a hole of 0.4 mm diameter through the fuselage inboard from the pre-mould location for the front undercarriage struts (undercarriage bracing).







Undercarriage struts:

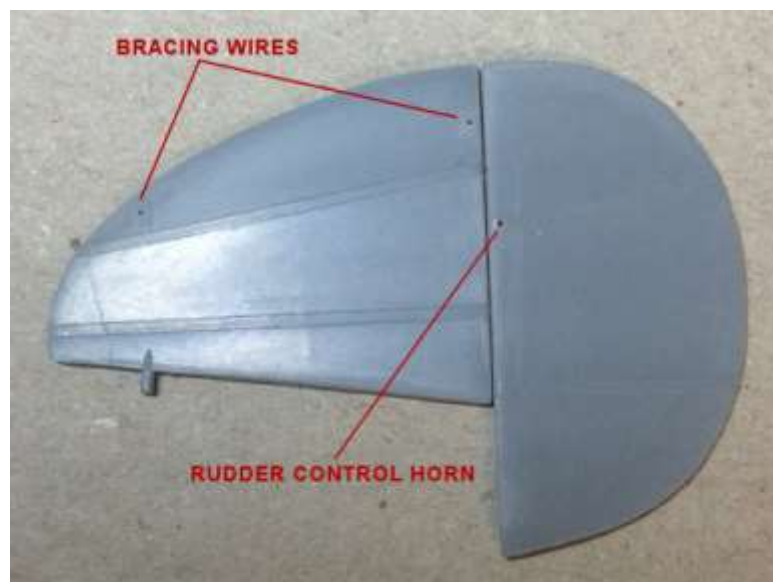
Drill a hole of 0.4 mm diameter through each undercarriage front strut, above the pre-moulded recess for the front axle rod.



Fin and rudder:

Drill a hole of 0.5 mm diameter through the rudder, close to its leading edge, as shown on the following photograph (rudder control horns).

Drill two holes of 0.3 mm diameter through the upper edge of the fin, as shown on the following photograph (bracing wires).



### Tailplanes and elevators:

Drill a hole of 0.5 mm diameter through each elevator, as shown on the following photograph (elevator control horns).

Drill two holes of 0.3 mm diameter through each tailplane, as shown on the following photograph (bracing wires).



### Weapon fit:

**NOTE:** *The kit supplied Vickers machine gun is to be replaced with the 'GasPatch' Vickers Mk.1 version. This requires slight modification to the weapon recess in the fuselage.*

Using a sharp modellers chisel, carefully remove the front of the weapon recess (in front of the cockpit), until the 'GasPatch' machine gun can rest in the recess on its forward mounting lugs with the bottom of its cooling jacket resting on the fuselage. The rear of the weapons breech block should be just forward from the cockpit cut-out.

### Windscreen:

Cut out windscreen B from the kit supplied acetate sheet, leaving a strip at the top for holding it.

Remove the photo-etch windscreen mounting (PE9).

Brush paint PE9 with 'Mr. Colour' Stainless Steel (213 or similar).

Fold PE9 together.

Brush paint the back plate of the crash pad C12 with 'Tamiya' Red Brown (XF64) or similar.

Brush paint the padding of the crash pad C12 with 'Tamiya' Hull red (XF9) with highlights of 'Humbrol' Leather (62).

Apply a small amount of PVA adhesive (e.g. 'Microscale' Krystal Clear or similar) to the inner surfaces of PE9.

Slide the folded PE9 over the blacked out area of the windscreen acetate and leave until the adhesive has set.

Apply a small amount of PVA adhesive (e.g. 'Microscale' Krystal Clear or similar) to the back of the crash pad C12 and position it at the bottom of one side of PE12 and leave to allow the adhesive to set.

Cut away the extra holding strip at the top of the acetate windscreen.

#### Ammunition ejector chute:

**NOTE:** *The kit supplied ammunition ejector chute C11 is moulded as a solid piece, when in fact the chute should be hollow, to allow spent cartridges from the machine gun to be ejected clear of the aircraft.*

Before removing the ejector chute from its sprue, use a 0.4 mm diameter drill and drill into the inside of C11 to represent the hollow ejector chute.

Remove C11 from its sprue and sand away any residual sprue tags.

Cement the ejector chute C11 onto its pre-mould location on the forward, left side of the fuselage.

#### Ammunition guards:

Remove the ammunition guards C6 and C7 from their sprue.

Sand away any residual sprue tags.

Scrape away the inside surfaces at the top (weapon end) of the guards, to reduce their thickness to be more in-scale.

Temporarily locate the 'GasPatch' machine gun into its recess in the fuselage.

Hold the weapon in position and position the right guard (C6) onto the fuselage and just touching the right side of the weapon, covering the ammunition feed slot in the breech block.

Cement the guard in position.

Repeat to fit guard C7 to the left side of the weapon.

Remove the weapon.

Use a modelling putty (e.g. 'Perfect Plastic Putty' or similar) to fill the gap between the bottom, rear edges of the two guards.

#### Remaining parts:

**NOTE:** *The following kit parts will either not be required or will be replaced:*

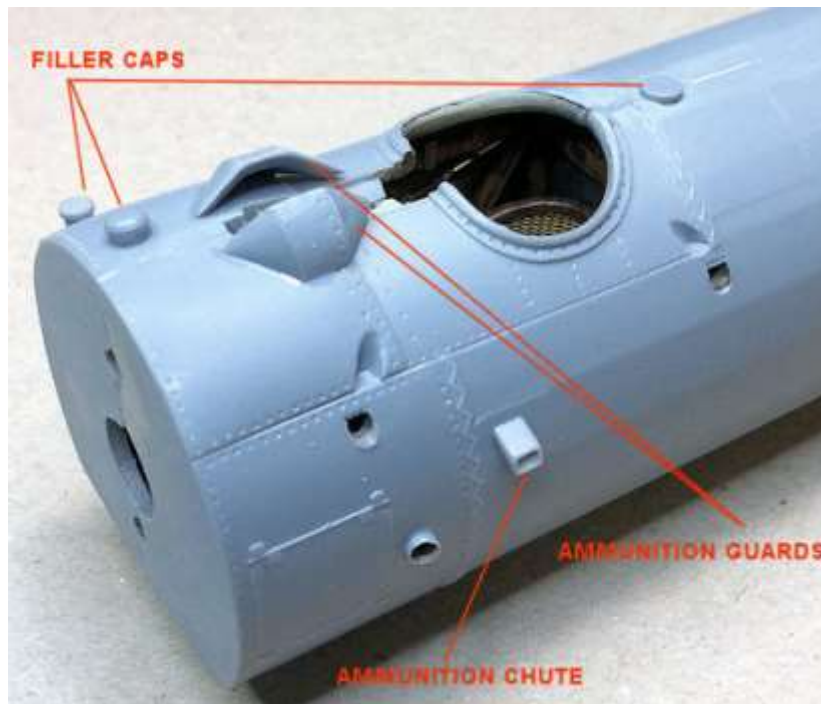
*Axle rods D5 (x 2), blanking plate C5, machine gun A5 and rigging supports A12 (x 2).*

Remove the following parts from their sprue and sand away any residual sprue tags or mould 'flash':

*Wheels A13 (x 2), wheel covers A10 (x 2), axle D2, undercarriage struts D9 and D12, filler caps C9, C10 and C17 and the resin pump propeller PUR 2.*

#### Filler caps:

Cement filler caps C9, C10 and C17 into their locations on the forward, top of the fuselage.



Undercarriage assembly:

**NOTE:** *The kit supplied undercarriage struts have pre-mould location 'pips' at the top of the struts, intended to locate into the dimples in the lower part of the fuselage. However, the struts are moulded such that they can't be fitted into the fuselage at the correct angle and also leave a gap on the outer edge. Therefore I chose to replace the method of attaching the struts to the fuselage and the axle torsion bars, which are weal styrene rods.*

File away the top of the struts to remove the location 'pips' and to chamfer the struts to better conform to the shape of the fuselage.

Drill a hole of 0.5 mm diameter down into the top of each strut.

Roll cut four lengths of 0.4 mm diameter rod (e.g. 'Albion Alloy's' MBR04 or similar).

Secure the rods into the pre-drilled holes in the struts using CA adhesive.

Drill a hole of 0.5 mm diameter into the fuselage at the strut location recesses.

Bend the exposed rods at the angle required to fit them into their pre-drilled holes, with the struts angled out at the bottom.

Locate the axle into the bottom location holes in the two struts. Make sure the struts are the correct way around (wind driver pump of the right struts facing forwards).

Locate the rods in the struts fully into their pre-drilled holes in the fuselage. Check that the struts are equally spaced each side of the fuselage centre line and that the axle is horizontal with the fuselage central.

Cement the axle to the two struts.

Cut two lengths of 1.0 mm diameter rod (e.g. Albion Alloy's' or similar).

File the ends of both rods to the length required to locate into their location recesses on the inside, bottom of the struts. Chamfer the rod ends slightly to align with the angle of the struts.

Locate each rod into the undercarriage struts and secure in position using CA adhesive.

Once the cement and CA adhesive have fully set, gently prise the tops of the struts out of their location holes in the fuselage.



**NOTE:** The basic suspension on this aircraft was 'bungee' cord, which was wrapped around the outer ends of the axle. In addition there was a wire 'hoop' fitted around the outer torsion bars of the main axle.



Bungee cord:

Using 'EZ' heavy line (white), wrap the line across the base of the undercarriage struts and around the main axle, securing it in position using CA adhesive.

Wire hoops:

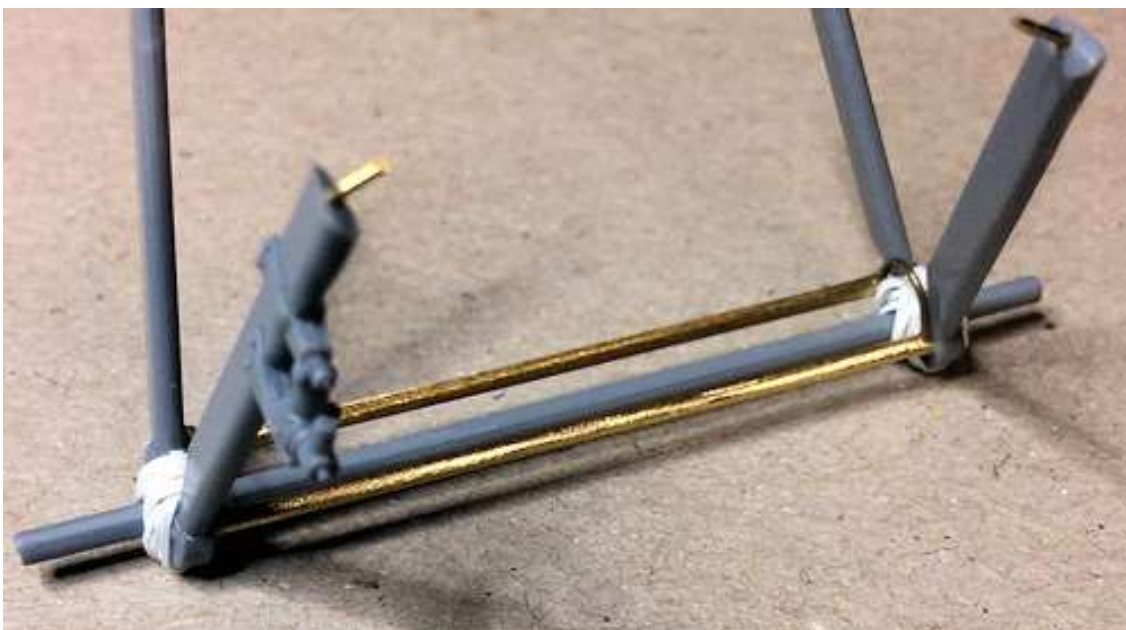
Heat anneal a length of 0.4 mm diameter rod (e.g. 'Albion Alloy's or similar), using the flame from a candle or cigarette lighter.

Bend the rod around a circular former to create a semi-circle.

Cut the half hoop from the rod and cut the two ends so that the half hoop spans the two torsion bars at either side of the main axle.

Secure the half hoop in position over the main axle and onto the two torsion bars.

Repeat to add a half hoop to the other end of the axle.



### Wing support struts:

**NOTE:** *The wing support struts are formed by two inverted and joined 'V' struts. The kit supplied struts A12 may not be strong enough to support the weight of the wings when rigged, as the wing to fuselage location stubs are not very large. Therefore I chose to replace them with struts made of metal tubes.*



### Strut aerofoils:

The struts are created using the 'Strutter' from Model Skills ('Albion Alloy's'). The 'Strutter' is a pair of hardened steel jaws, one of which has two steel pins, the other has location holes for the pins. These are used in a normal medium sized bench vice. A length of tube, with an appropriate solid rod inserted is positioned across the two pins of the 'Strutter' and the vice jaws are then tightened, which tips the 'Strutter' jaws to crush the brass tube around the inserted rod. Unless the tube is heavily crushed, the rod should be able to be removed. Once all struts have been created they can be joined together, if required, using soft solder or CA adhesive, including inserted locating rods, which are used to attach the struts to the model. In this way the wing is supported by brass struts with solid rod attachments, which is more sturdy than the kits supplied plastic or resin struts.



**NOTE:** To create the four wing support struts, use the kit parts as a guide to the required length and shape of the ends.

Roll cut four lengths of 0.9 mm Tube (e.g. 'Albion Alloy's MBT09 or similar) to longer than the legs of the kit struts A12.

Slide each tube onto a long length of 0.5 mm diameter rod (e.g. 'Albion Alloy's' MBR05 or similar).

Using the 'Strutter' tool, create four aerofoil sections.

Remove the 0.5 mm rod from the aerofoil sections.

Locate the un-chamfered ends of the four tubes onto an 'Albion Alloy's' Conneco C-08 cross piece.

Secure the tubes to the cross piece by either soft soldering or by using CA adhesive (soft soldering is stronger).

Bend a pair of tubes to the same 'V' profile as the kit A12 struts.

Bend the other pair of tubes the same to form the four legged support strut assembly.

Cut the ends of the tubes to just longer than the A12 struts.

File the ends of each tube at an angle to fit to their location recesses in the fuselage.

Drill a hole of 0.5 mm diameter into the centre of the four strut location recesses in the fuselage.

Roll cut four short lengths of 0.4 mm diameter rod ('e.g. 'Albion Alloy's or similar) and insert them into the open ends of the tubes, leaving 4 mm protruding from each end.

Secure each rod into its aerofoil section. I used soft solder to join the tubes, but CA adhesive can be used as an alternative.

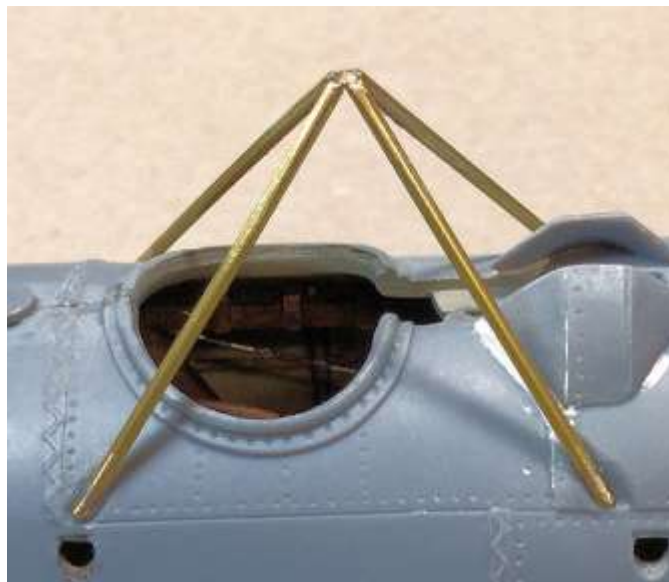
File or sand clean the soldered or glued ends of the struts to remove residual solder or adhesive.

Bend the protruding rods to the angle required to allow the strut assembly to fully locate into the pre-drilled holes in the fuselage.

Test fit the strut assembly onto the fuselage.

Check that the top joint of the assembly is over the front edge of the cockpit opening and that it is central over the fuselage when viewed from the front.

Secure the strut assembly into the fuselage using CA adhesive.







Painting the underside surfaces blue:

Make sure all component parts are clean, smooth and free of any surface imperfections.

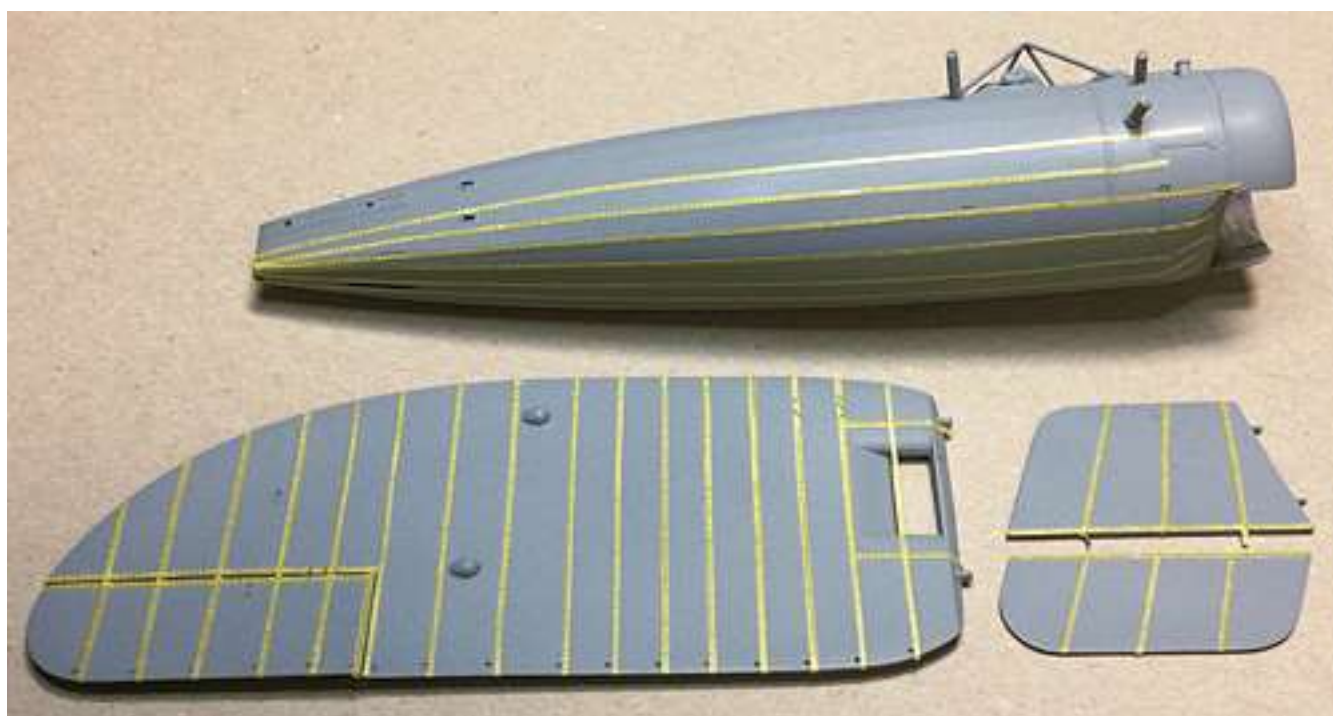
Block off or mask any openings in the fuselage - cockpit, pilot steps, carburettor air intakes, engine mounting hole, strut locations etc.

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

Fuselage, wings, ailerons, elevators, tailplanes, fin and rudder.

**NOTE:** *The internal wing ribs and fuselage longerons would normally be tight against the doped linen covering. As the undersides of this aircraft are blue in colour, the contact area of the ribs and longerons would be lighter shade than the surrounding colour and either side of the contact areas would be slightly darker.*

Cut strips of 1.0 mm wide masking tape and position them over the wing rib tapes on the underside of the wings and along the lower longerons of the fuselage (refer to following photograph).





Using an airbrush, pre-shade either side of the masking tapes with 'Tamiya' Smoke (XF19) or similar. The pre-shading should not be applied too heavily as over spraying it with the blue colour enough to blend it back may also cover other detail.



Airbrush 'Tamiya' Light Blue (XF23) or similar over the pre-shaded surfaces and the propeller spinner. The paint should be applied in thin coats enough to fade back the pre-shading, but leave enough visible for a further final coat.



Remove all of the masking strips.

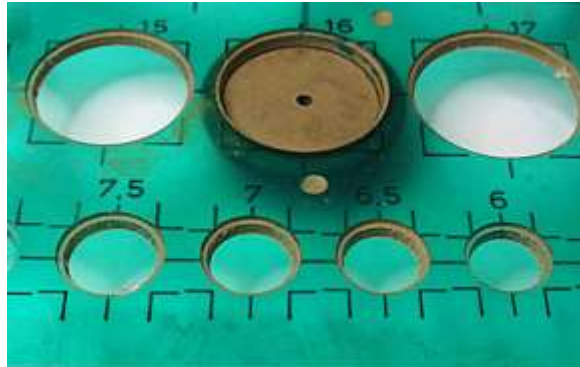
Airbrush 'Tamiya' Light Blue (XF23) or similar over the pre-shaded surfaces and the propeller spinner. The paint should be applied as a very light 'misting' coat, enough to blend the tape stripes without totally covering them, so the lines show as a lighter blue.



## Wheels:

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

### Example only



Airbrush the tyres of the two wheels with a grey primer, such as 'AK Interactive' Grey AK-758 or similar.

**NOTE:** The paint used to represent the early PC10 green colour is 'Hataka' lacquer Dark Olive Green (C301), thinned to approximately a 50/50 ration with 'Mr. Colour' Levelling Thinners 400.

Airbrush over the outer face of the two wheels and the two outer wheel covers.

Use a pencil lead to colour the inflation valve in each wheel.

Cement the outer wheel covers onto the wheels.

Airbrush the tyres with a gloss sealing coat (e.g. 'Alclad' Aqua Gloss ALC-600 or similar).

## Painting the upper surfaces PC10:



**NOTE:** The following upper surfaces require painting with the PC10 colour:

*Fuselage, wings, tailplanes, elevators, fin and including the struts of the undercarriage assembly.*

Mask off the pre-painted fuselage blue colour, remembering the angle up to the leading edge of the tailplanes.

**NOTE:** *Cut thin strips of masking tape to mask around the edges, the fill in the rest of the blue area with masking tape or similar.*

Mask off the outer edges of the underside pre-painted blue colour on the wings, ailerons, tailplanes and elevators, to leave narrow band at the outer edges.

Block or mask off (from the pre-painted undersides) the wing root openings (I used 'UHU White Tack).

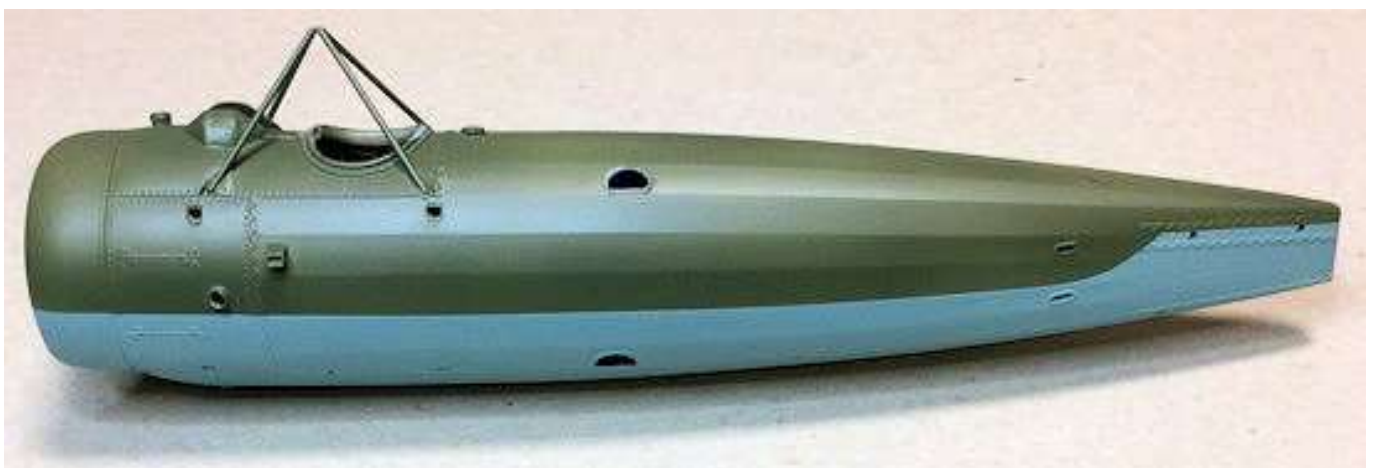
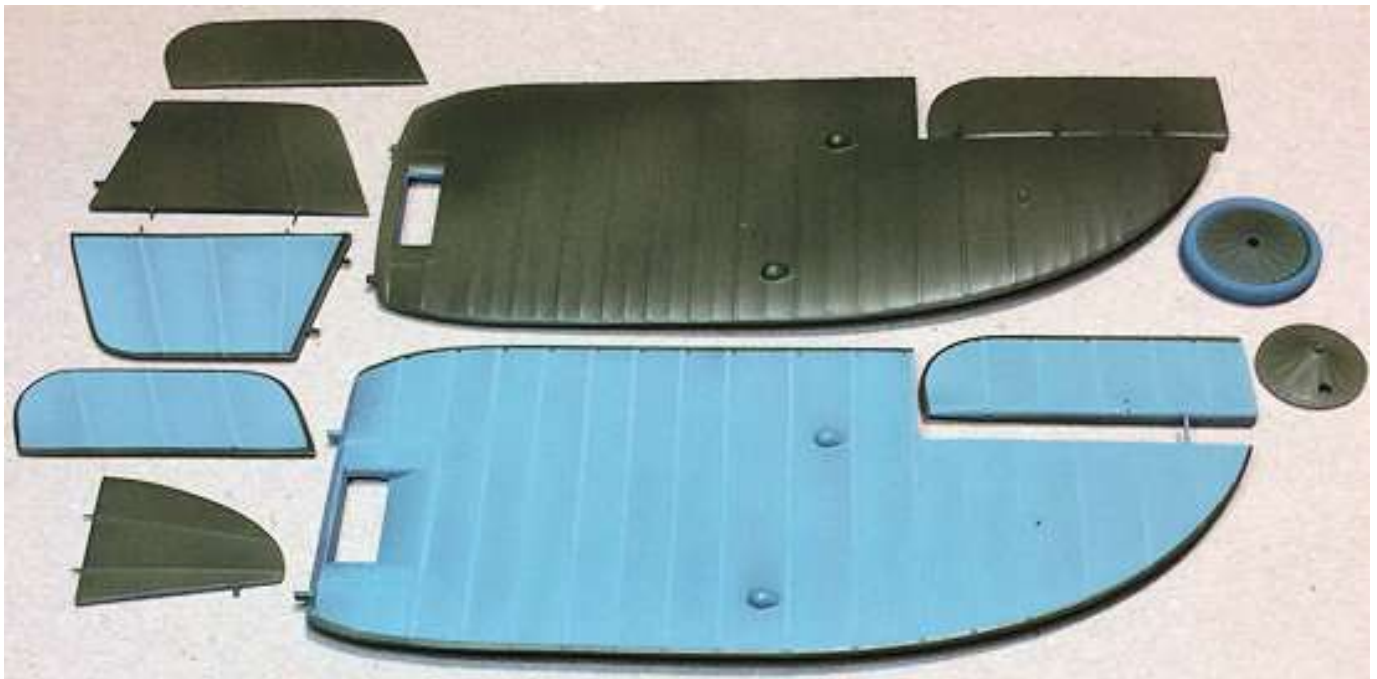
**NOTE:** *The paint used to represent the early PC10 green colour is 'Hataka' lacquer Dark Olive Green (C301), thinned to approximately a 50/50 ration with 'Mr. Colour' Levelling Thinners 400. Initially, airbrush a very light 'misting' coat to seal the edges of the masking tape and to form a bonding layer of paint for the final coat. Once dry airbrush a covering coat of paint.*

Airbrush the underside outer edges of the wings, ailerons, tailplanes and elevators. Spray away from the masking tape, not directly into it.

Airbrush the upper surfaces of the fuselage, wings, tailplanes, elevators and fin.

Airbrush the struts of the undercarriage assembly.

Remove all of the masking.





### Detail painting:

Brush paint the following parts:

#### Fuselage:

'Tamiya' Rubber Black (XF85) or similar - Inside the carburettor air intakes, inside the ammunition ejector chute, front two filler caps, two pilot's foot steps, bottom of gun trough.

**NOTE:** *Sharpen a wood tooth pick to apply paint into the studs in the cockpit surround padding.*

'Mr. Colour' Brass (219) or similar - filler cap to rear of cockpit, studs in cockpit surround padding.

'Tamiya' Hull Red (XF9) with 'Humbrol' Leather (62) highlights or similar - cockpit surround padding.

#### Undercarriage assembly:

'Tamiya' Rubber Black (XF85) or similar - main axle, two axle torque bars, two axle hoops, support bracket for pressure pump.

'Mr. Colour' Brass (219) or similar - body of pressure pump.

'Tamiya' Buff (XF57) or similar - bungee suspension cords.

#### Wheels:

'Tamiya' Rubber Black (XF85) or similar - protruding main axle ends.





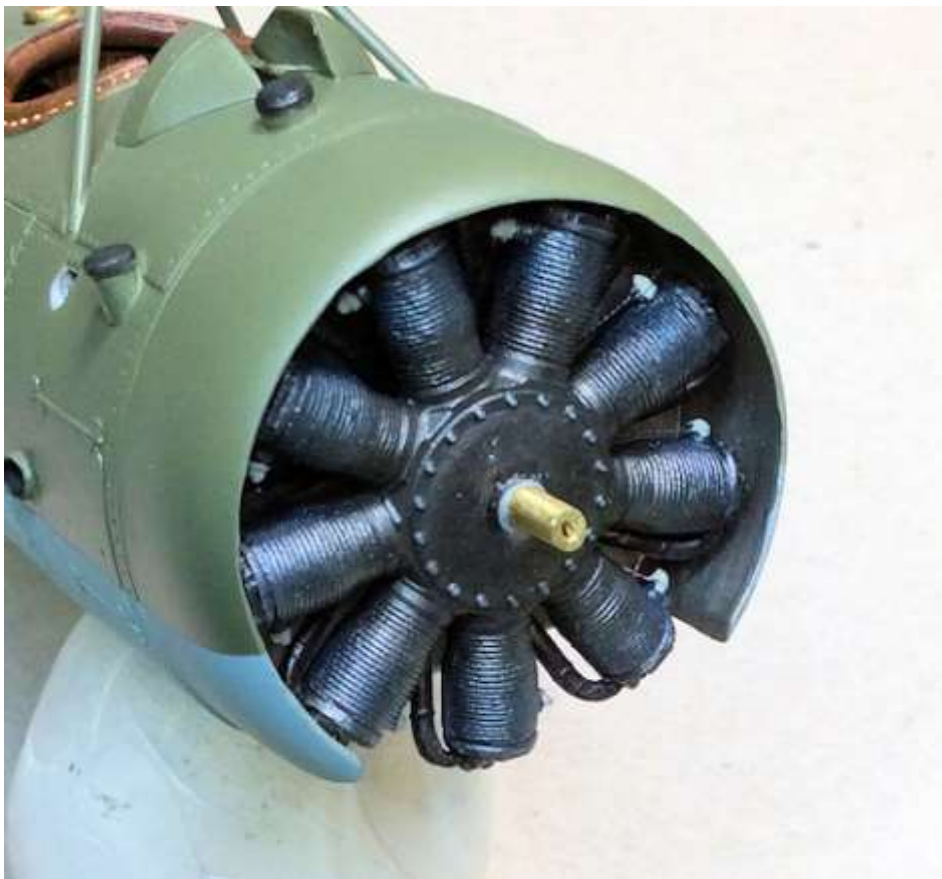


Engine fit:

Locate the engine into its recess in the fuselage bulkhead, inside the engine cowl.

Make sure the engine propeller shaft is central in the engine cowl and is parallel to the fuselage centre line, when viewed from the side and above or below.

Apply cement to secure the engine into the fuselage bulkhead.



## Decals:

**WARNING:** *Unlike most WW1 aircraft, the fuselage for this aircraft is round in section and also tapers towards the rear. This means that applying decals to the fuselage is more of a challenge as large decals can't be applied as they will fold and crease towards the rear of the fuselage. Therefore separate strips of decal need to be applied and aligned around the fuselage. As such, application of these decals can be time consuming and involve a lot of trial and error to achieve an aligned and natural linen look. **If you feel you do not have the patience or skills to apply the decals well, I suggest you do not decal the model, but instead leave the surfaces as painted.***

## Fuselage.

**NOTE:** *The linen weave effect decal used is from 'Aviatic' - Linen Weave Effect (ATT32236). Refer to Part 4 (Decals) of this build log for more information.*

Make sure all parts to be sealed with a gloss coat are smooth and free from any surface imperfections.

Airbrush the following parts with a gloss sealing coat of 'Alclad' Aqua Gloss ALC-600 or similar:

Wings (both sides), fuselage, tailplanes (both sides), fin (both sides), rudder (both sides), elevators (both sides) and ailerons (both sides).

Check that all parts sealed are still free from any surface imperfections. If necessary, lightly sand the surface and re-apply the sealing coat until a good surface is achieved.

**NOTE:** *When cutting out the paper templates, make sure only the 'linen' covered surfaces of the fuselage are made. Do not include the metal panel areas on the fuselage forward areas.*

Starting at one side of the fuselage, cut out a paper template so that its top edge aligns with the colour join between the PC10 and blue underside. The template should only span two or three fuselage longerons and its bottom edge aligned with that longeron.

Using a pencil, trace the outline onto the back of the 'Aviatic' linen 'weave' decal sheet (ATT32236). Make sure the template is traced the correct way around otherwise you will end up with a reversed decal.

Carefully cut out the decal shape from the sheet.

Check and if necessary, adjust the decal to achieve the correct shape.

Apply the decal to the fuselage.

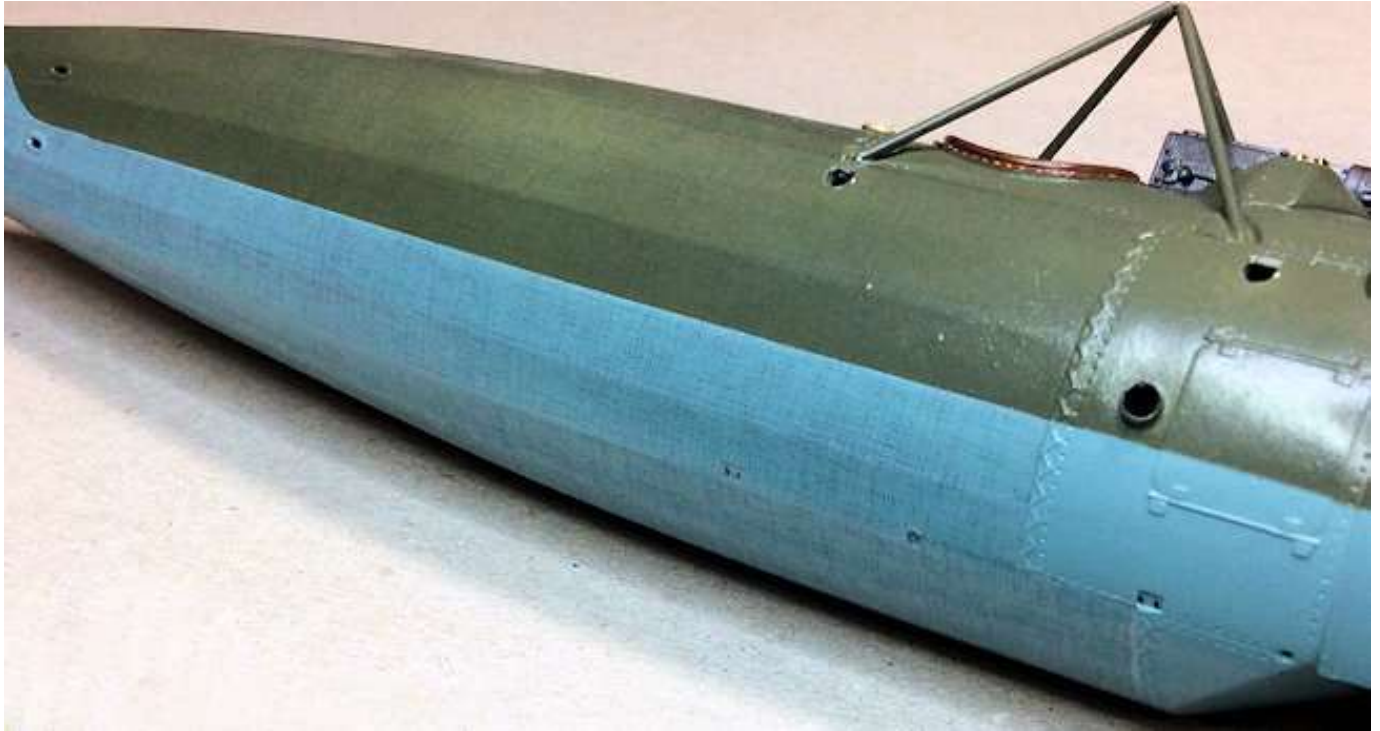
Using the same procedure, cut and apply decals to complete the linen effect over the fuselage.

**NOTE:** *During the following step, apply the cement very sparingly - lightly dampened brush.*

Once all of the fuselage decals have been applied, use the tip of a sharp scalpel blade to pierce and cut through the decal areas that cover rigging holes, pilot foot steps etc. Then apply liquid cement, such as 'Tamiya' Extra Thin or similar, *very sparingly* around the edges of the pierced decal. This will melt the decal allowing it to conform and weld to the contours of the model.

## Tail skid - fit:

Cement the tail skid into its location hole and recess on the underside, rear of the fuselage.



#### Wings surfaces:

**NOTE:** *When tracing the outline of the wings, mark the areas for the rigging 'bulges'. Use the tip of a scalpel blade to cut sections into the bulge areas so that the decal will locate over them when applied.*

Using a pencil, trace the outline of a wing onto the back of the 'Aviatic' linen 'weave' decal sheet (ATT32236).

Carefully cut out the decal shape from the sheet.

Check and if necessary, adjust the decal to achieve the correct shape.

Apply the decal to the wing.

**NOTE:** *When tracing the remaining sides of the wings, make sure the template is traced the correct way around otherwise you will end up with a reversed decal.*

Use the same template to create the decals for the remaining sides of the wings.

Apply the decals to the wings.



### Flight control surfaces:

Use the same procedure to apply the weave effect linen decals to both sides of the ailerons, fin, tailplanes and elevators.



### Markings (kit decals):

**NOTE:** Take care when handling the decals supplied in the kit as they are fragile and easy torn or chipped. Refer to the kit instructions for decal positioning.

Apply the two roundels to the fuselage.

Apply the two 'lift here' decals to the rear of the fuselage.

Apply the two serial numbers to the fin.

Apply the national stripes to the rudder.

Apply the 'Bristol' decals to the rudder.

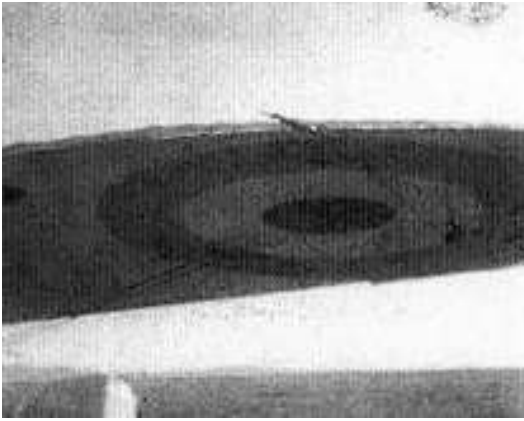
Apply the tyre manufacturers lettering decals to both sides of the tyres (in the same position).

### Wing roundels - underside surface.

**NOTE 1:** The large roundels for the wings are printed as one piece. However they also need to span onto the ailerons.

**NOTE 2:** Although the roundels on the fuselage and upper surfaces of the wings had the latter style of roundel, with the narrow white outer ring, the roundels on the underside of the wings did not. This was probably due to the fact that the white outer ring would not show against the light blue wing colour.





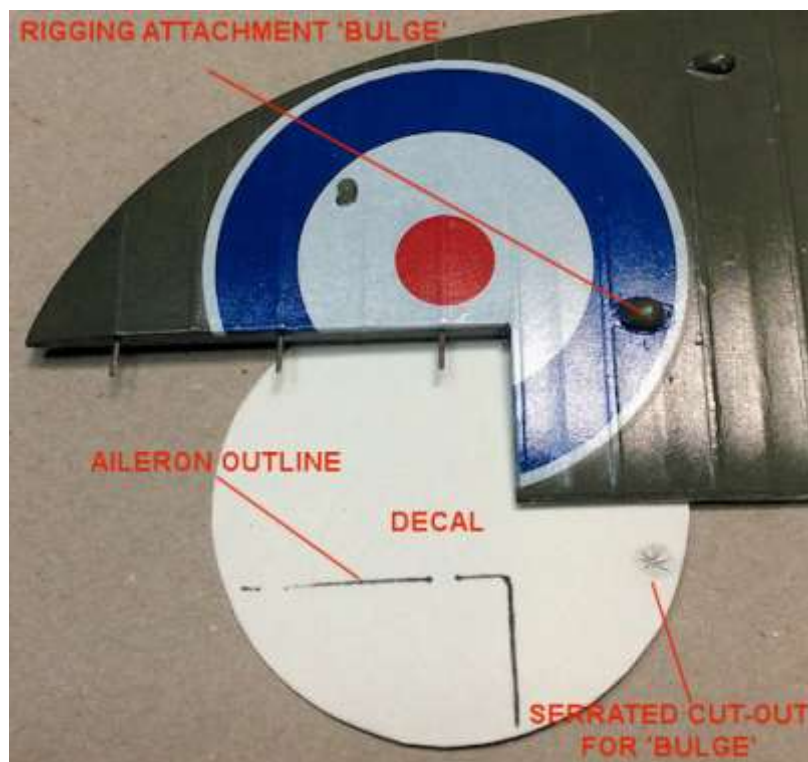
Carefully cut away the narrow white outer ring from the two underside roundels.

Use the tip of a scalpel blade to cut sections into the cut-out in the roundel for the bulge area, so that the decal will locate over the bulge when applied.

Locate the roundel decal onto the underside of the wing with the serrated cut-out fully over the bulge.

Turn the wing over and holding the decal in place, mark the open area for the aileron.

NOTE: Upper roundel already applied



Remove the decal and cut out the marked area to create the main wing roundel and the portion of the roundel for the aileron.

Apply the wing roundel to the underside surface of the wing.

Locate the aileron fully onto its mounting rods.

Apply the aileron portion of the roundel, aligning it to the wing roundel.

Remove the aileron.

Repeat this procedure to apply the roundel to the underside of the opposite wing.

### Wing roundels - upper surface.

Repeat this procedure to apply the roundels to the upper surface of the wing and ailerons.

### Roundel overlap.

**NOTE:** Usually the applied roundels would continue around the leading edge of the wing ailerons and the trailing edge of the wings. However, the kit supplied decals do not allow for this.

Brush paint these areas with 'Tamiya' Flat Blue (XF8), Flat Red (XF7) and Flat White (XF2) or similar.



### Control horns - fitting:

Make sure the pre-drilled holes for the control horns in the ailerons, rudder and elevators, are clear of paint and decal. If necessary run a 0.5 mm diameter drill through the holes.

Secure the four photo-etch aileron control horns into their pre-drilled holes in the two ailerons, using CA adhesive.

Secure the two photo-etch rudder control horns into their pre-drilled holes in the rudder, using CA adhesive.

Secure the four photo-etch elevator control horns into their pre-drilled holes in the two elevators, using CA adhesive.

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



Weathering:

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

Airbrush the model parts with a semi-matte coat (e.g. 'Alclad' Light Sheen ALC-311 or Semi-Matte (312) or 'Tamiya' Semi-clear X35 or similar).

**NOTE:** As this aircraft operated in the Middle East theatre, I chose the 'Grime' wash to add weathering.

Refer to Part 3 (Weathering) of this build log for more information - Apply 'Flory Models' Weathering clay wash (Grime) over the model parts.



Remove the weathering wash to achieve the desired finish.

Seal the applied weathering by airbrushing the surfaces with a semi-matte coat (e.g. 'Alclad' Light Sheen ALC-311 or Semi-Matte (312) or 'Tamiya' Semi-clear X35 or similar).

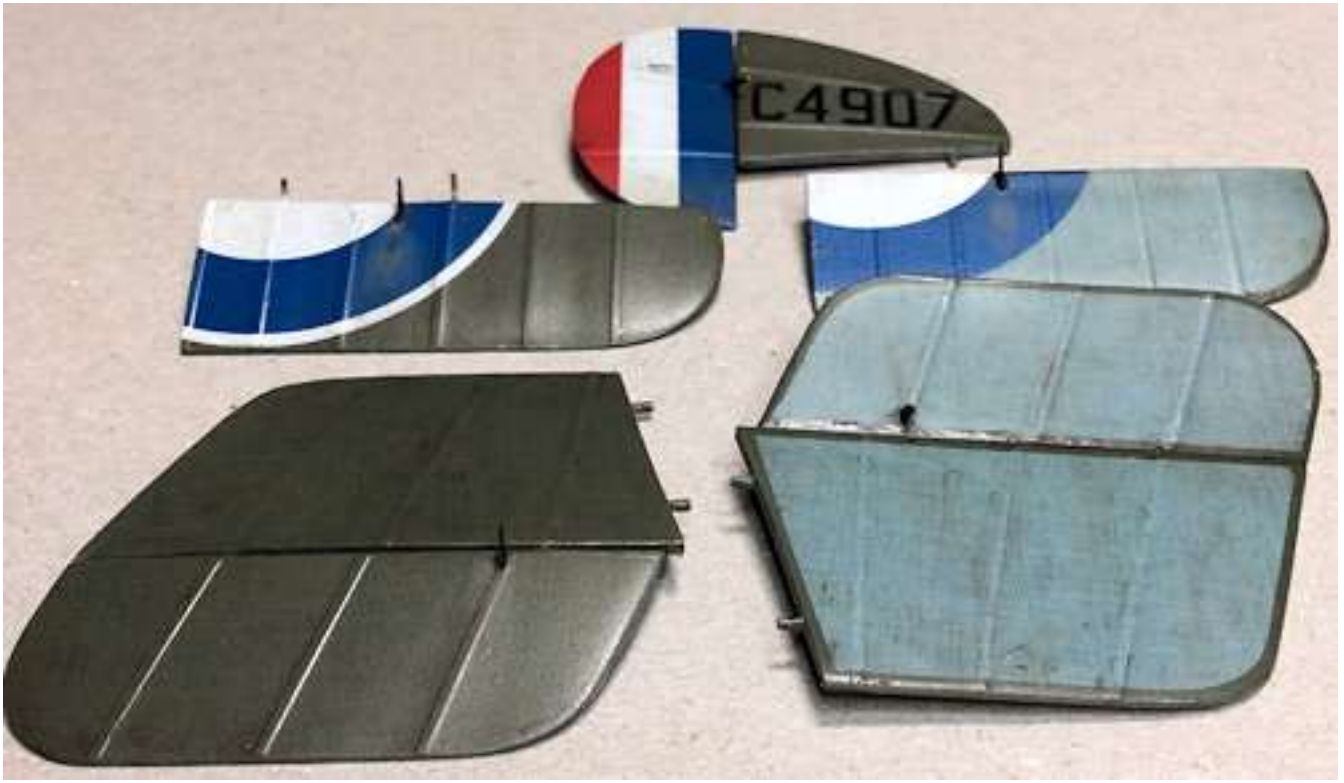
If desired, add extra weathering by sponging on 'Tamiya' Weathering Master Set C (Gunmetal), Set D (Oil Stain) and Set A (Mud and Sand) as required.

For adding fuel and oil stains under the engine and from the three filler caps, use enamel wash 'AK Interactive' Kerosene (AK2039) and Engine Oil (AK2019).









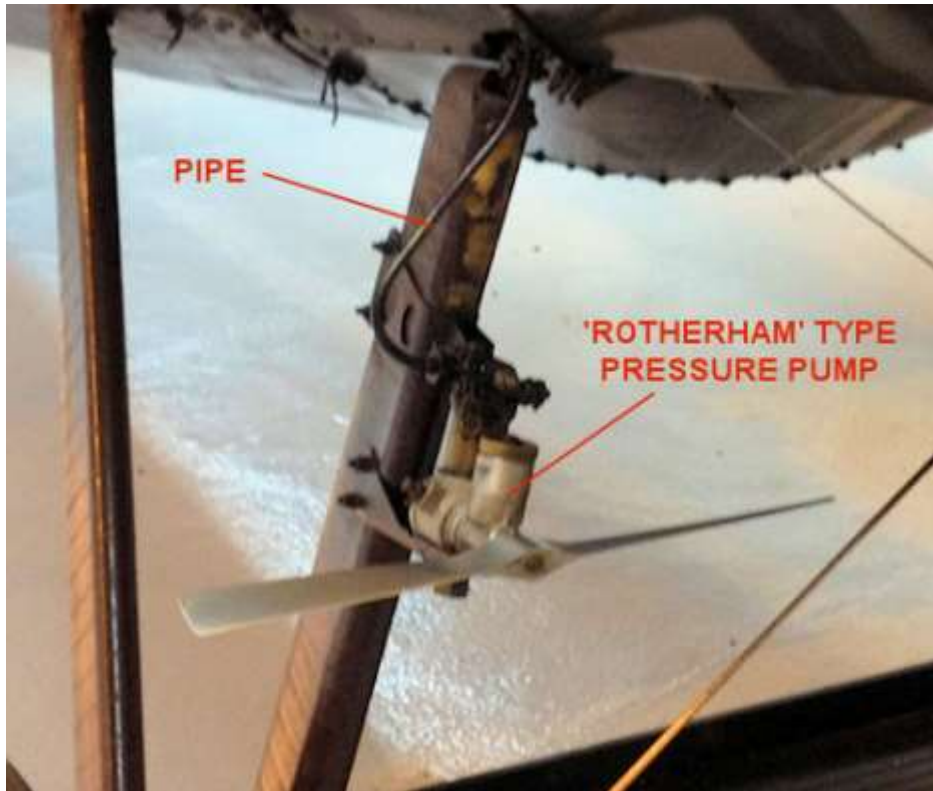
### Undercarriage - fit:

Make sure the four pre-drilled holes in the fuselage for locating the undercarriage strut rods are free from paint and decal.

Make sure all of the location rods in the ends of the undercarriage struts are free from paint.

Secure the undercarriage assembly to the fuselage, using CA adhesive.

**NOTE:** *This aircraft was fitted with a wind driven 'Rotherham' type pressure pump.*



Cut a length of 0.4 mm diameter lead wire, such as 'PlusModels' or similar.

Secure the wire in position using CA adhesive.

### Pre-rigging:

**NOTE:** *Before assembly of the model continues it's best to pre-rig the model parts, as doing this at the pre-assembly stage is easier and parts are less liable to be damaged.*

Make sure all of the pre-drilled holes in the fuselage, wings, fin, rudder and the tailplanes are free from paint and decal.

Make sure all of the holes in the ends of the control horns for the ailerons, rudder and elevators are free from paint. If necessary use a 0.2 mm diameter drill to clear the paint from the holes.

Secure the rudder to the fin location rods, using CA adhesive.

Secure the two elevators to their tailplanes rods, using CA adhesive.

Dip 0.4 mm diameter Nickel-Silver tube (e.g. 'Albion Alloy's' NST04 or similar) in a blackening solution, such as 'Black-It'. This will turn the tubes black in colour and to a more neutral colour, rather than the bright metal finish.

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

## **Flight controls.**

### **Rudder.**

Cut two long lengths of 0.8 mm diameter mono-filament (e.g. 'Stroft GTM or similar).

Slide a blackened 0.4 mm diameter tube onto the lines.

Pass the lines through the holes in the end of the rudder control horns.

Loop the free end of the lines from the control horns back through the tubes.

Slide the tubes up to, but not touching, the control horns.

Secure the tubes to the lines using thin CA adhesive.

Cut away the residual tag of line at the tubes.

### **Elevators.**

**NOTE:** *The lines added to the elevator should be long enough to route from the elevator control horns, forward and through the slots in the side of the fuselage, then through the fuselage to exit from the opposite slots and back to the other elevator control horns.*

Add a line to both control horns **only** on one elevator, using the same procedure used for the rudder.

### **Ailerons.**

Add a line to **one** aileron control horn on both ailerons, using the same procedure used for the rudder.

## **Bracing wires.**

### **Undercarriage.**

Cut two long lengths of 0.12 mm diameter mono-filament (e.g. 'Steelon' or similar).

Using thin CA adhesive, secure a line into the pre-drilled holes in the underside of the fuselage, inboard from the forward undercarriage struts.

### **Tailplane to fin.**

Cut two long lengths of 0.12 mm diameter mono-filament (e.g. 'Steelon or similar).

Pass one line through the pre-drilled hole at the bottom of the fuselage, above the tail skid mounting.

Centralize the line to the fuselage.

Secure the line in the fuselage using thin CA adhesive.

Using thin CA adhesive, secure the remaining line into one of the pre-drilled holes forward from the already installed line.

## **Flying wires.**

**NOTE:** *Each wing is moulded as a single, solid piece and have very short and stubby attachment lugs to the fuselage location holes. As such the wings will not hold their position while the cement dries and may 'sag' if not supported. To help support the wing in its correct position, a front and a rear rigged flying wire will be attached to the fuselage then routed through the wing and onto the over cockpit support frame. From there the lines will route out and through the opposite wing to be attached the opposite side of the fuselage. The four remaining flying wires will just be attached between the fuselage and underside of each wing.*

Cut six long lengths (see NOTE above) of 0.12 mm diameter mono-filament (e.g. 'Steelon' or similar).

Using thin CA adhesive, secure four of the lines into the pairs of pre-drilled holes on one side of the underside of the fuselage.

Using thin CA adhesive, secure the remaining two lines into just one of the pre-drilled holes in each pair on the opposite side of the underside of the fuselage.

### **Landing wires.**

The four landing wires will be represented by the flying wires routed above and across the wings.

### **Assembly:**

**NOTE:** *When attaching the flight control surfaces, make sure the pre-rigged lines are kept clear of joints and adhesive.*

Cement the rudder and fin assembly onto the top, rear of the fuselage. Make sure it is vertical and centred to the fuselage.

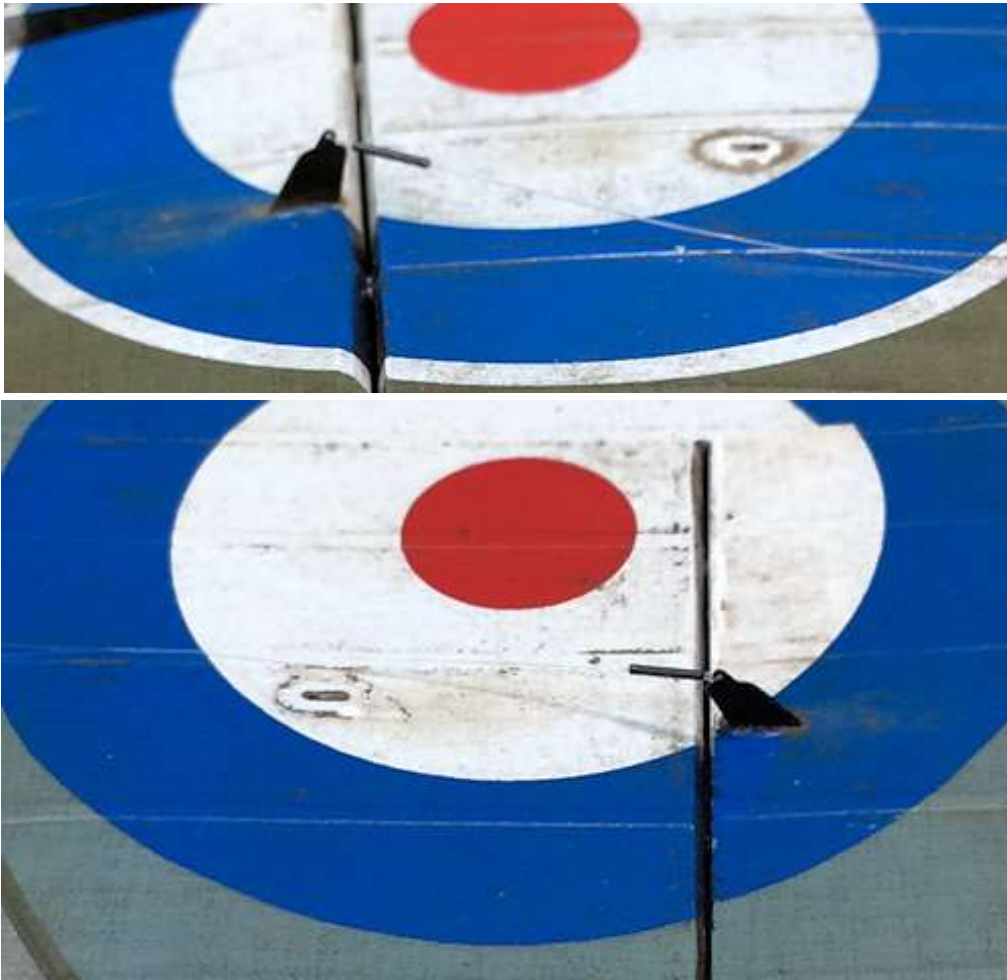
Cement the two tailplane and elevator assemblies into their location holes in the sides of the fuselage. Make sure both are horizontal to the fuselage.

Using CA adhesive, secure the two wing ailerons with their locating rods, to the wings.









#### Aileron control - rigging:

Pass the free end of the fitted control line, from the control horn and through the pre-drilled hole in the wing.

Slide a blackened 0.4 mm diameter tube onto the line.

Pass the free end of the line through the remaining control horn.

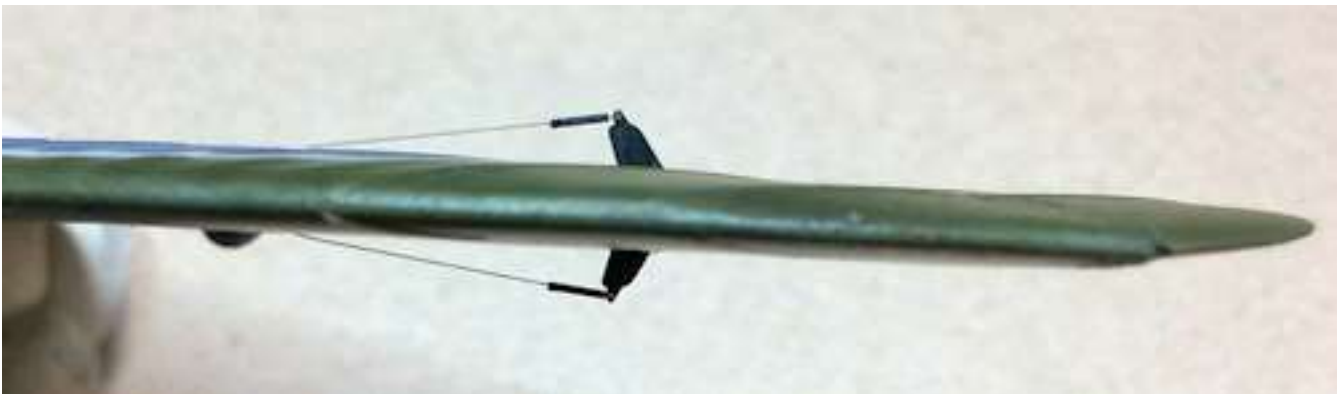
Loop the free end of the line from the control horn back through the tube.

Slide the tube up to, but not touching, the control horn.

Secure the tube to the lines using thin CA adhesive.

Cut away the residual tag of line at the tube.

Repeat this procedure to add a line to the other aileron.



### Elevator control - rigging:

Pass the free end of the fitted control line from the underside control horn and through the lower side slot in the fuselage.

Pass the line through the fuselage to exit from the opposite lower slot.

Slide a blackened 0.4 mm diameter tube onto the line.

Pass the free end of the line through the remaining underside control horn.

Loop the free end of the line from the control horn back through the tube.

Slide the tube up to, but not touching, the control horn.

Secure the tube to the lines using thin CA adhesive.

Cut away the residual tag of line at the tube.

Repeat this procedure to complete the control line from the upper control horn to the other elevator.

### Rudder control - rigging:

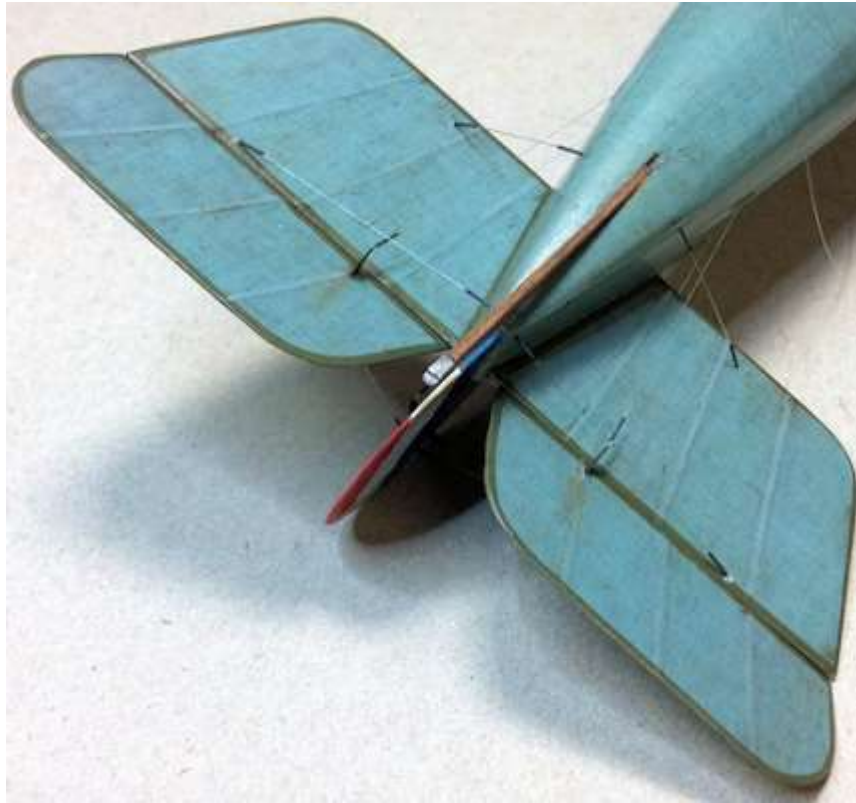
Pass the free end of a fitted control line from the control horn and into the rudder slot on that side of the upper fuselage.

Keeping the line taut, secure it in position using CA adhesive.

Repeat to complete the opposite rudder control line.







Undercarriage cross bracing:

Pass one of the fitted lines through two blackened 0.4 mm diameter tubes.

Pass the free end of the line through the pre-drilled hole at the base of the opposite forward strut.

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

Slide the tubes to each end of the line and secure in position using CA adhesive.

Cut away the residual tag of line at the strut.

Repeat this procedure to complete the opposite bracing wire.



Wheels - fit:

Cement the two wheels to the ends of the axle.



## Wings - fitting:

**NOTE:** *The following procedure helps to support the wing by using the two flying wires as well as the wing to fuselage locations.*

Make sure the four pre-drilled rigging holes in each wing are free from paint and decal.

Make sure the wings fit fully into their locations in the fuselage and are fully against the fuselage sides. If not, file, scrape or sand the locating lugs on the wings until the correct fit is achieved.

Stand the fuselage on its undercarriage.

Slide two blackened 0.4 mm diameter tubes onto the forward lines of the two pairs of lines that were secured into the bottom (in my case the **right side**) of the fuselage.

Pass the free ends of the two lines up and through the pre-drilled holes in the wings.

Slide two blackened 0.4 mm diameter tubes onto the lines.

Loop both lines over the top of the over cockpit support frame, then back under and over the top again to the opposite side of the aircraft.

Apply cement into the two wing location holes in the fuselage.

Locate the wing fully into its location holes in the fuselage.

Support the wing so that there is approximately 2-3 degrees of dihedral angle (wing tip raised).

Pull the two lines taut around the top of the support frame and apply weight to the ends to keep the lines taut (I used self locking tweezers).

Apply thin CA adhesive to the lines to secure them to the top of the support frame.

Apply thin CA adhesive to secure the lines in the wings pre-drilled holes they pass through.

Slide the bottom blackened tubes on the lines above the wing down to the wing and secure in position using thin CA adhesive.

Slide the top blackened tubes on the lines above the wing up to the support frame and secure in position using thin CA adhesive.

Leave the model supported to allow the adhesives to fully set.

**NOTE:** *If, once the adhesives have set, there is still movement of the wings at the fuselage joint, reinforce the joint by applying thin CA adhesive into the joint from the underside of the wing.*



Turn the model onto its back with the wing tip in contact with the work surface.

Slide the bottom blackened tubes on the lines under the wing down to the wing and secure in position using thin CA adhesive.

Slide the top blackened tubes on the lines under the wing up to the fuselage and secure in position using thin CA adhesive.

**NOTE:** *With the wing secured to the fuselage and additionally support by the rigging lines, the opposite wing can be fitted.*

Stand the fuselage on its undercarriage with fitted wing supported.

Slide two blackened 0.4 mm diameter tubes onto the two lines secured to the support frame.

Pass the free ends of the two lines down and through the pre-drilled holes in the wings.

Apply cement into the two wing location holes in the fuselage.

Locate the wing fully into its location holes in the fuselage.

Support the wing so that there is approximately 2-3 degrees of dihedral angle (wing tip raised).

Pull the two lines taut and apply weight to the ends to keep the lines taut (I used self locking tweezers).

Apply thin CA adhesive to secure the lines in the wings pre-drilled holes they pass through.

Slide the bottom blackened tubes on the lines above the wing down to the wing and secure in position using thin CA adhesive.

Slide the top blackened tubes on the lines above the wing up to the support frame and secure in position using thin CA adhesive.

Leave the model supported to allow the adhesives to fully set.

**NOTE:** *If, once the adhesives have set, there is still movement of the wings at the fuselage joint, reinforce the joint by applying thin CA adhesive into the joint from the underside of the wing.*



Turn the model onto its back with the wing tip in contact with the work surface.

Trim the free end of the two lines such that under slight tension, they can be inserted into their pre-drilled location holes in the fuselage.

Slide two blackened 0.4 mm diameter tubes onto the two lines.

Secure the ends of the two lines into their respective location hole, using thin CA adhesive.

Slide the bottom blackened tubes on the lines under the wing down to the wing and secure in position using thin CA adhesive.

Slide the top blackened tubes on the lines under the wing up to the fuselage and secure in position using thin CA adhesive.

#### Remaining lines.

**NOTE:** *At this stage in the rigging, there should be two unattached flying lines at each side of the fuselage. The following applies to all four lines.*

Trim the free end of the lines such that under slight tension, they can be inserted into their pre-drilled location holes in the fuselage.

Slide two blackened 0.4 mm diameter tubes onto the lines.

Secure the ends of the lines into their respective location hole, using thin CA adhesive.

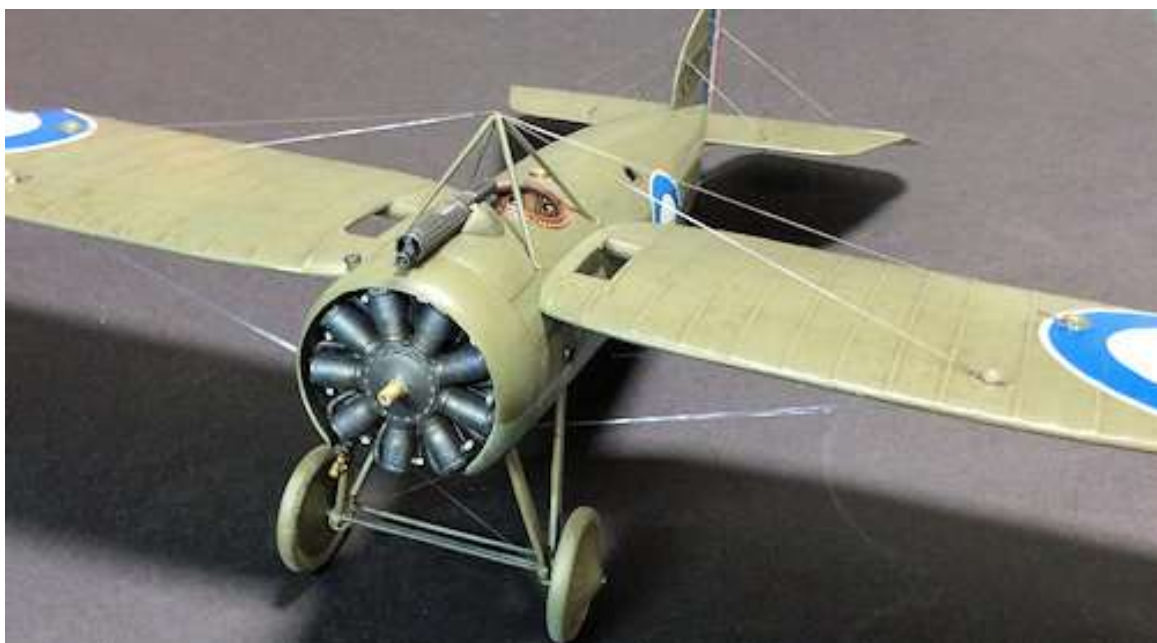
Slide the bottom blackened tubes on the lines under the wing down to the wing and secure in position using thin CA adhesive.

Slide the top blackened tubes on the lines under the wing up to the fuselage and secure in position using thin CA adhesive.

#### Tightening lines:

**NOTE:** *If there is slackness in any rigging line, it can be removed, within reason, by apply a heat source along the line. During the next step, keep the heat source moving along the lines and not too close, otherwise the line will melt. Also avoid touching any part of the model to prevent it being heat damaged.*

Apply a heat source, such as that from a small electrical soldering iron, close to and along the line that is slack. This will shrink the line and tighten it. Applying heat to remove too much line slackness can deform the line, requiring it to be replaced.







Airbrush a light, misting coat of a semi-matte, such as 'Alclad' Light Sheen (ALC-311) or similar, over the rigging on the model. This will slightly dull the sheen of the mono-filament to give it a more natural finish.

Propeller - wind driven pump:

Remove the resin propeller from its moulding block.

Carefully remove any flash from the edges.

Brush paint the propeller with a wood effect, such as 'DecoArt' Burnt Sienna or similar.

Secure the propeller onto the wind driven pressure pump (right, front undercarriage strut), using CA adhesive.

Windscreen:

Secure the windscreen assembly to the rear of the breech block on the machine gun, using a PVA adhesive, such as 'MicroScale' Micro Krystal Clear or similar.

Propeller:

**NOTE:** *The figure of the mechanic is intended to be turning the propeller to prime the engine. As such the propeller on the aircraft can't be fixed in position until the figure is placed on the display.*



# PART 12

# FIGURES

## **PART 12 - FIGURES**

The figures I chose to use are the 'Copper State Models' RFC mechanic (F32-0027) and the 'Kellerkind Miniatures' RFC pilot (54026).

### **Assembly:**

#### **Mechanic:**

**NOTE:** *The figure of the mechanic is intended to be turning the propeller to prime the engine. As such the propeller on the aircraft can't be fixed in position until the figure is placed on the display.*

Cut away the moulding blocks from the feet, arms and head of the figure.

Remove any flash and seam lines from the pilot's body parts.

Test fit the arms and head into the body.

Secure the arms and heads onto the body, using CA adhesive.

Drill a hole of 0.9 mm diameter up into the pilot's left leg.

Cut a length of 0.8 mm diameter rod (I used a standard metal paper clip).

Secure the rod into the pre-drilled hole in the pilot's left leg, using CA adhesive. This provides a means of holding the figure whilst it is painted and also of locating the figure onto the final display base.

#### **Pilot:**

**NOTE:** *I chose to scrape away the moustache from the pilot's face and replace the scarf, which I thought did not look realistic and too stiff.*

Remove any flash and seam lines from the pilot's body parts.

Reduce the thickness of the soles on the pilot's flying boots.

Secure the joined arms to the torso using CA adhesive.

Secure the head into the torso using CA adhesive.

Mix a small amount of 'Milliput' two part putty (50/50 ratio).

Add 'Milliput' to the existing scarf knot and across the left shoulder. Wetting the putty helps in applying.

Leave the putty to fully cure and set hard.

Drill a hole of 0.9 mm diameter up into the pilot's left leg.

Cut a length of 0.8 mm diameter rod (I used a standard metal paper clip).

Secure the rod into the pre-drilled hole in the pilot's left leg, using CA adhesive. This provides a means of holding the figure whilst it is painted and also of locating the figure onto the final display base.

### **Painting:**

Airbrush both figures with a grey primer, such as 'AK Interactive Grey AK758 or similar.

#### **Mechanic:**

Overalls - 'Tamiya' Dark Yellow (XF60) with Wooden Deck Tan (XT78) highlights. Refer to Part 3 (Weathering) for more information - apply 'Flory Models' Grime wash over the overalls and once dry, remove as required to add 'dirty' highlights.

Cap - 'Tamiya' Flat Earth (XF52) with Khaki Drab (XF51) highlights.

Shoes - 'Tamiya' Red Brown (XF64).

Flesh - 'AK Interactive' Light Flesh (3012), Faded White (3029) and 'Model Colour' Base Skintone (70.815).

Shirt cuff and socks - 'Ak Interactive' British Uniform (AK3081).

Hair - 'Ak Interactive' British Uniform (AK3081).

Eyes - 'Tamiya' Semi-Gloss Black (X18).

Buttons/Metal fittings - 'Mr. Colour' Stainless Steel (212), Brass (219).

To apply various stains or dirt on the figure, lightly sponge 'Tamiya' Weathering Master Set D (Oil Stain) and Set A (Mud and Sand).





### **Pilot:**

Flying boots, helmet and palms of gloves - 'Tamiya' Red Brown (XF64) with 'Humbrol' Leather (62) highlights.

Flight coat - 'Humbrol' Leather (62) with Flat Earth (XF52) highlights.

Collar - 'Tamiya' White (X2) with Buff (XF57) highlights.

Shoes - 'Tamiya' Red Brown (XF64).

Trousers - 'Ak Interactive' British Uniform (AK3081).

Flesh - 'AK Interactive' Light Flesh (3012), Faded White (3029) and 'Model Colour' Base Skintone (70.815).

Pocket maps - 'AK Interactive' Faded White (AK3029).

Fur lining goggles, gloves and boots - 'Tamiya' Red Brown (XF64) Buff (XF57) and White (X2) highlights.

Goggles - 'Tamiya' Clear Yellow (X24).

Scarf - 'Tamiya' Dark Green (XF61).

Metal fittings - 'Mr. Colour' Stainless Steel (213).

Brush a light coat of Semi-Matte (e.g. 'Tamiya' Semi Gloss X35 or similar) over the flying helmet, boots and flight coat.

To apply various stains or dirt on the figure, lightly sponge 'Tamiya' Weathering Master Set D (Oil Stain) and Set A (Mud and Sand).







# PART 13

# DISPLAY BASE

## **PART 13 - DISPLAY BASE**

The display case is 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.inperspective.com](http://www.inperspective.com).

For this display I chose to use the 'Javis' Desert Zone Battle landscape (BZ3M) sheet.

The self-adhesive backed information plaque was custom made by the online 'Custom Engraving Shop'.

### **Preparation:**

**NOTE:** *As the 'Javis' mat is not very thick, I decided to fix it onto a spare piece of a 'Coastal Kits' 1:32 Scale display mat.*

Cut the required shape for the mat from the 'Coastal Kits' mat.

Trace the outline of the cut mat onto the back of the selected area of the 'Javis' desert sheet.

Cut out the shape from the 'Javis' sheet.

Scuff the surface of the cut mat with a rough sandpaper, to provide a good key surface for the adhesive.

Apply PVA adhesive (white glue) to the roughened surface of the cut mat.

Position the cut 'Javis' shape onto the adhesive surface of the mat.

Make sure the 'Javis' shape is aligned correctly on the mat.

Add even weight over the 'Javis' mat to ensure it is fully in contact with the adhesive and mat. I placed 'Tamiya' paint jars all over the sheet, especially around the edges. I then placed heavy books onto the jars to press them down.

Leave the PVA adhesive to fully dry and set.

Remove the weights.

Scuff the underside surface of the mat with a rough sandpaper, to provide a good key surface for the adhesive when securing to the display base..

### **Display - assembly:**

**NOTE:** *During this stage, make sure the model is positioned on the base of the display case such that it clears the display cover when placed onto the base.*

Place the mat onto a sheet of paper and trace its outline onto the paper.

Cut out and discard the shape of the mat from the paper.

Place the paper template onto the display base in the required position for the mat.

Using a soft marker, trace the outline of the mat onto the display base.

Remove the paper template and scuff inside the mat outline using a coarse grit sand paper, in order to give a key for the adhesive.

Blow away any residual acrylic dust from the display base.

**NOTE:** *During the next step, do not apply too much adhesive, otherwise when pressure is applied over the mat, excess adhesive may be pressed out from the edges of the mat, spoiling the finish at the mat edges.*



Apply a contact adhesive, such as 'Bostik', inside the prepared area on the display base and the underside of the mat.

Allow the adhesive to set tacky.

Position the mat onto the adhesive area on the display base.

Add even weight over the 'Javis' mat to ensure it is fully in contact with the adhesive on the display base. I placed 'Tamiya' paint jars all over the sheet, especially around the edges. I then placed heavy books onto the jars to press them down.

Leave the PVA adhesive to fully dry and set.

Remove the weights.

**NOTE:** *As the display mat is raised and had a black edge, I chose to 'blend' the edge of the mat to the black acrylic display base using fine sand.*

Using a suitably sized brush, apply a seam of PVA adhesive around the edge of the mat and onto the display base.

Once dry, apply more PVA adhesive and while it is still wet, sprinkle fine sand onto the adhesive.

Allow the adhesive and sand mix to fully set.

**NOTE:** *Between applications of adhesive and sand, do not brush away residual sand from the acrylic display base, or it will scratch the surface. Instead turn the display base upside down to allow the residual sand to fall away, then just blow the surface to remove any remaining sand.*

Repeat application of PVA adhesive and sand to gradually build up the edge until the mat and display base merge without any obvious steps or gaps.

Model positioning:

**NOTE:** *The figure of the mechanic is intended to be turning the propeller to prime the engine. As such the propeller on the aircraft can't be fixed in position until the figure is placed on the display.*

Place the aircraft model in its final position on the mat.

Position the pilot figure in the desired location on the mat and mark the location of the leg support rod onto the mat.

Temporarily fit the propeller assembly onto the engine.

Position the mechanic figure in the desired location on the mat in front of the propeller.

Position the mechanic figure and the propeller until the mechanics right hand is in contact the edge of the propeller.

Mark the location of the mechanics leg support rod onto the mat.

Using the figure rod marks as guides, drill 0.8 mm diameter holes through the mat and into, but not through, the display base.

Snip the rod in the figures to the required length for inserting into the display.

Secure the figures into the pre-drilled hole in the display base, using CA adhesive or PVA (White Glue) applied to the support rod.

Relocate the aircraft and position the propeller so the mechanics right hand is in contact with the propeller. Note the position of the propeller on the aircraft.

Secure the propeller to the engine shaft.

To prevent damage, remove the model of the aircraft.

Information plaque:

A matching acrylic piano black plaque stand was positioned to the left, front corner of the display base (just in from the edges of the shoulder for locating the transparent acrylic cover.

The area on the underside of the stand and its contact area on the display base were scuffed using a coarse grit sand paper, in order to give a key for the adhesive.

A thin coat of contact adhesive was then applied to both scuffed areas and once the adhesive started to set, the stand was carefully position onto the display bae and pressed down to make full contact.

The self-adhesive backed information plaque was the positioned onto the stand and pressed to make full contact.

**NOTE: *The aircraft model is not secured to the display base as this can cause shock damage to the model if the display is transported to shows etc. For that the aircraft model would be packed separately for transporting.***

**PART 14**  
**COMPLETED**  
**MODEL**  
**PHOTOGRAPHS**



















**END**