THE SOPWITH PUP

World War One Aircraft Models

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

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

I don't consider myself a 'master' of this craft, but hope to be able to pass on what I have learned. As such, here is my build log, which covers my build of the 'Wingnut Wings' 1:32 scale model of the Sopwith Pup (RFC).

Mike 'Sandbagger' Norris

sandbaggeruk@sky.com

Completed: February 2018

CONTENTS

INTRODUCTION

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

AFTER MARKET

Pilot Figure

‘Standing RFC Airman’- Copper State Models (F32-041)

Decals

Aviattic (ATT32094) 1:32 scale RFC/RAF Clear Doped Linen
Aviattic (ATT32089) 1:32 scale RFC/RAF PC10 Light

Detailing Sets

‘HGW Models’ - Mask set (632010), Seat Belts (32011) and Photo-Etch set (32010)
JadarHobby Shop - Part No.48087 (1/48)

Rigging accessories

‘GasPatch Elite Accessories’ Turnbuckles 1/48 scale (RAF Late Type)
‘GasPatch Elite Accessories’ Turnbuckles 1/48 scale (one end Type)
Albion Alloy Micro-tube and Rod (Brass or Nickel Silver - various diameters),
‘Model Skills’ pre-cut ‘turnbuckles’, ‘Steelon’ Mono-Filament 0.12 and 0.2 mm diameter,
’RB Motion’ 0.51 mm Aluminium nuts (1279-A).

Sundries

Microscale’s ‘MicroSet/Sol’, Paints (Tamiya Acrylic, Humbrol Acrylic, Mr Metal Colour,
Alclad Lacquers, Mr. Colour Levelling Thinners, PVA Adhesive,
Cyanoacrylate (CA) glue (thin), Blue or White Tack, Vallejo Plastic Putty,
Sanding and/or Polishing sticks from ‘Flory Models’, ‘PlusModel’ lead wires,
‘Vallejo’ Still Water (26.230), ‘Masilla Plastica (401) putty.

Weathering mediums

‘Flory Models’ clay washes and pigments, AK Interactive engine washes,
Tamiya Weathering Master sets.

Display Base

‘Polak’ Grass Mat - Wild Meadow (4706), PVA Adhesive, Sharp sand,
Purpose built Acrylic base and cover, Etched plaque (information plate).

THE MODEL

(WingNut Wings Kit No. 32013)

As expected, any model from WingNut Wings (WNW) is at the top of quality and accuracy. The kit components are not a numerous as many of their kits, which is good if you are building a WNW kit for the first time. The parts are manufactured from traditional 'plastic', not resin. There is minimal mould flash that needs to be removed and also virtually no ejection pin marks that need to be filled and sanded away. All of the main sprues, including the transparencies and photo-etch (PE) parts, are sealed in separate plastic bags, which prevents and sprue damaging another. There are only four main and one transparency sprues for this model. As such it's not the most complicated WW1 aircraft kit out there.

The instruction manual is in the well known format that WNW produce and has clear and concise instructions, including coloured illustrations and photos for reference. There is even a rigging diagram included for those willing to rise to that particular challenge. The manual also has a lot of information on the aircraft and areas where, due to a lack of accurate historical data, the reader is given options to choose from. Colour profiles of the aircraft are provided as are their associated decals, manufactured by 'Cartograf', renown for their quality.

The photograph below shows the ‘After Market’ items for inclusion in the model build.

PREFACE

This model represents the Sopwith Pup, Serial No: A6156 “OS” of No.54 Squadron, RFC, based at Flez, France during April - May of 1917, as flown by Capt. Oliver M Stewart during 1917.

The pilot :

References:
Osprey Aircraft of the Aces 67 by Norman Franks.
Online - ‘Wikipedia’ and the ‘Aerodrome Forum’

Capt. Oliver M ‘Stewpot’ Stewart (MC, AFC) was credited with 5 victories whilst flying Sopwith Pups, three of which were when flying the first, Serial No. A6156. He was born in London, England on the 26th of November 1896. Stewart was commissioned a second lieutenant in the 2/9th Middlesex Regiment (T.F) in October 1914 and transferred to the Royal Flying Corps in1915 and received his Royal Aero Club Aviator's certificate (No.2630) qualifying on a Maurice Farman biplane at military school, Thetford on the 30th of March, 1916. He was first posted for a short period to No.22 Squadron, RFC, after which he moved to No.54 Squadron, in 1917, to fly the Sopwith Pup. Here he was made a flight commander and gained his 5 victories (between the 6th of April and the 25th of September, 1917). He was awarded the MC on the 17th of September 1917. He was then posted back to England and in June 1918, was promoted to Major and given command of the Aeroplane and Armament Experimental Establishment. He received an Air Force Cross for his efforts. He retired from Royal Air Force in 1921, to begin a new career as an aviation journalist. From 1939 through 1962, he was the editor of ‘Aeronautics’ magazine and published books, which included ‘Aerobatics: A Simple Explanation of Aerial Evolutions’, ‘Of Flight and Flyers’ as well as his autobiography ‘Words and Music of a Mechanical Man’. Oliver Stewart died in 1976.

His victories were:
1. Sopwith Pup A6156 - 6th April 1917 - Albatros D.III destroyed over St. Quentin.
2. Sopwith Pup A6156 - 24th May 1917 - Albatros D.III out of control over Premont.
3. Sopwith Pup A6156 - 6th June 1917 - Albatros D.III destroyed south west of Cambrai.
4. Sopwith Pup A6211 - 15th August 1917 - ‘C’ type two seater destroyed south of Middlekerke.
5. Sopwith Pup A6211 - 25th September 1917 - Albatros D.V destroyed north of Middlekerke.

The aircraft:

References:
Osprey Aircraft of the Aces 67 by Norman Franks.
Windsock Data File No.2

Sopwith Pup aircraft were not only built by the Sopwith Aviation Company, but also built by other manufacturers, such as The Whitehead Aircraft Co. Ltd, Beardmore and The Standard Motor Co. Ltd. This particular Sopwith Pup, Serial No.6156, was built by 'Whitehead'. The aircraft served with No.54 Squadron, RFC, based at Flez in France during 1917. In service the aircraft was personalized with the initials 'OS' (Oliver Stewart) and these initials were overlapped to form his monogram. His second Pup was serial No. A6211. In all three different Sopwith Pups carried this monogram, each successive aircraft carried the number sequence after the monogram (e.g. OS III).
NOTE: Two other pilots claimed victories whilst flying A6156, giving the aircraft a total of five kills.

Specifications:
Wingspan - 26' 6"
Height - 9' 5"
Length - 19' 4"
Engines - 80hp Le Rhone 9C, Clerget 7Z, Gnome Lambda OR 100hp Gnome Monosoupape, 110hp Le Rhone 9J
Armament - One fixed Vickers machine gun (for RFC aircraft)
Weight (with 80hp Le Rhone 9C engine) - empty 787lbs, Loaded 1,225lbs
Ceiling (with 80hp Le Rhone 9C engine) **-** Max 17,500'
Endurance (with 80hp Le Rhone 9C engine) - 3 hours
Speed (with 80hp Le Rhone 9C engine) - Max 105mph at 5,000'

The photograph below shows the third Sopwith Pup to carry Capt. Stewart's monogram (Serial No. N/K)

PART 1 - THE MODEL

(Modifications or corrections)

1. General preparation:

Some modellers work the various pieces whilst they are still attached to the main sprue, but I prefer to remove the pieces first so that I can clean they up more easily. However pieces like the cockpit frames are delicate and can easily be damaged when being removed. When parts are cut from the sprues, care should be taken as they can either break or get stressed at the cut point, which causes 'white' stress and/or deforming. For plastic kits, I use fine sprue cutters to cut away the kit part, not too close to the part, then sand off the tag. When I cut resin parts away from their mold blocks, I use a fine cutting saw, which has a more gentle cutting action.
Despite being a WNW kit, there are still some fine moulding lines around items such as the cockpit frames, but they are only slight and are easily removed using a sharp blade or sanding stick. I use a new scalpel blade to gently scrape off the mould lines. Some of the model items like the parts for the cockpit are very small and can easily 'fly off'' when being handled, so take care. Remember to drill any holes needed for rigging or control lines - refer to the relevant pages and diagrams in the kit instruction manual.

Once the items have been removed from the sprue and prepared, they should be gently washed in warm, soapy water, to remove any handling 'grease' or mould release agent remaining on the items. I use an old toothbrush to do this. Once dry they can be primed ready for painting. Primer can be applied by brush, airbrush or from aerosol cans. Although not the cheapest method to prime items, I prefer to use Tamiya's fine surface primer aerosol (light grey). This has a good coverage as the base primer for acrylics. Take care when spraying the primer as if you apply too much it will result in 'pooling' or 'runs', which would then need to be removed once the primer has dried. Make sure you spray in a well ventilated area or preferably, if you have one, use an extractor booth.

To hold items for priming I use self locking tweezers or carefully insert a toothpick into the item or I use a small piece of sticky putty, such as 'Blu Tack' or 'UHU White Tack', on the end of a tooth pick. Once applied the primer dries quickly, one of the main advantages of using acrylic paints rather than enamels or oil paints.

Despite the quality of most kits, even Wingnut Wings kits, there are always things the modeller will want to either correct or modify. For this model there are a few things I decided to work on, before the main build was started. These are detailed in the following pages.

2. Flight control surfaces - animation:

Although the four ailerons are fitted to the wings of the model separately, the elevator is fixed as part of the tailplane. In order to display these flight control surfaces in various positions, they need to be modified.

Ailerons: Fortunately the ailerons and associated wing apertures have pre-molded location points, which can be used to align mounting pins. First I sanded down the location points on each aileron until they were just visible. I then drilled 0.5 mm diameter holes into the ailerons at those location points and also into the wing trailing edges at the corresponding location points. I fitted 0.5 mm diameter Nickel-Silver micro-tube into the aileron holes and secured them with thin CA adhesive. Each aileron was then 'test' fitted into it's wing aperture and bent up or down to the desired angle. Remember that both ailerons should be at the same angle but in the opposite direction on the port to the starboard sides of the wings.

Elevator: The tailplane and elevator is molded in one piece and the join between the two is too thin to animate the elevator using pins. However, using a sharp blade or scrapper, I very lightly scored along the joint on the upper surface, testing each time for the 'bendability' of the elevator joint. Eventually the elevator is able to be bent to a slight downwards angle, as it would have been in the 'relaxed' position.

3. Pilot's step:

The pilot's entry step is solid molded into the port fuselage half. The step on the actual aircraft the step was open and through the fuselage into the cockpit area. Using a small drill I drilled around the inside of the step, following the molded shape. I then carefully cut out the inside material and scrapped clean the internal shape of the step.

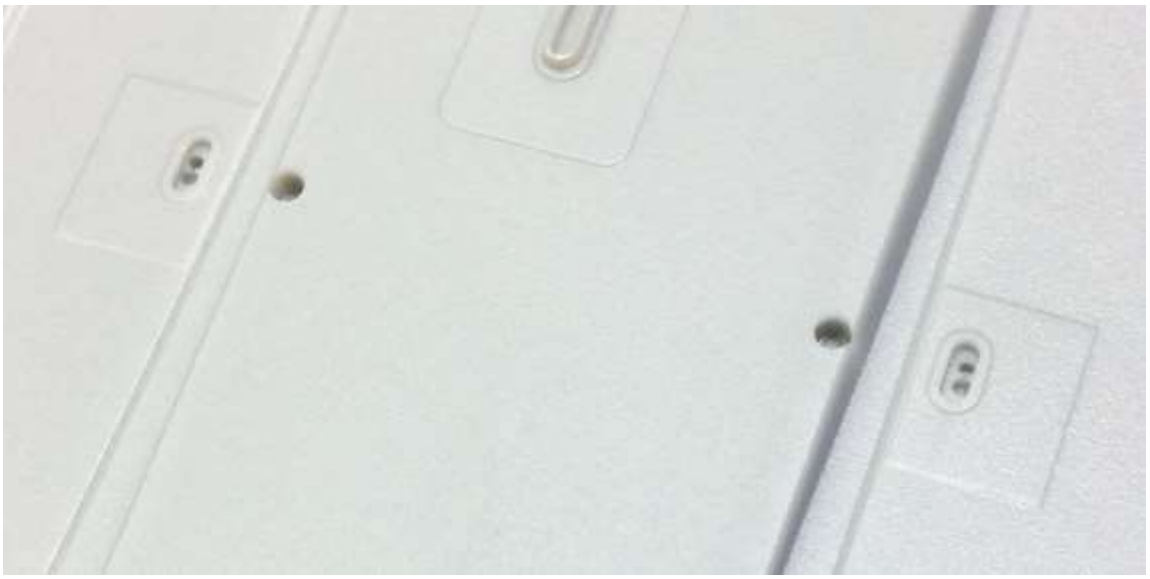
The photo at the left is of the step on the Sopwith Pup, built by 'Vintage Aviator Ltd' of New Zealand.

4. Rigging points:

Most of the various parts of the model that will require rigging already have location points. However some of these (underside of upper wing) need to be drilled out to 0.6 mm diameter, in order to take the 'Gaspatch' RAF late type end fittings that will be used for replicating the attachments for the streamlined flying wires, which were used on this aircraft (Refer to Part 11 of this build log). Rigging holes where just the rigging line will be inserted are 0.3 mm diameter. Check the rigging diagram, as there are some holes that need to be drilled that are not obvious at first glance, such as at the ends of each wing strut and the pairs of hole at the top of the read undercarriage struts and the engine cowl and forward fuselage panel retaining cables (not covered in the kit instructions)..

Through the lower wing into the rear undercarriage struts:

The lower wing of the model has pre-molded entry and exit locations for the twin rigging wires that run from the top of the rear outboard wing support struts, through the lower wing and onto the top of the rear undercarriage strut.



Although separate wires can be attached from the top and underside of the wing to the relevant struts, I chose to pass the wires actually through the wing, as on the actual aircraft. To do this I used the following method for each side of the wing:

1. First I drilled a 0.8mm diameter hole through each location. It is critical that the hole is drilled at the correct angle to align with the two pre-molded locations. Drilling from the lower wing, the drill angle is such that the drill virtually touches the edge of the fuselage, just where the rear location is for the rear undercarriage strut. The hole size is to allow fitting of micro-tube, used as wire guides.

2. A rectangle od 0.2mm thick plastic card was cut into a rectangle to match the pre-molded panel at the wire location on the underside of the wing. This was then glued over the pre-molded panel.

3. A drill of 0.4mm diameter was passed through the hole from the top of the wing and used to drill two holes next to each other through the plastic card panel. A small gap was left between the two holes.

4. Two lengths of 0.4mm diameter micro-tube (Albion Alloys) were cut to a length that left a small portion of each tube sticking proud of both wing surfaces when they were passed through the panel holes.

5. Each tube was located in the panel with a short length sticking proud. CA adhesive was placed on the outside surface of each tube, which were then pushed into the wing, but not flush with the wing surface.

6. A rectangular photo-etch cable ‘patch’ from the set (JadarHobby Shop - Part No.48087 1/48) was located over the protruding tubes on the wing top surface location, then secured in position using thin CA adhesive.

7. Once the adhesive was fully cured, the protruding micro-tubes on both the upper and lower locations were sanded to make them flush with added ‘panel’ and ‘patch’.

8. Finally a 0.2mm diameter drill was passed through each tube to ensure that there was adequate clearance for the rigging wires, when fitted. The locations will be primed, painted and covered with decals later in the build.

The forward fuselage side panels had a retaining strap down the rear edge. I drilled holes of 0.4 mm diameter through the kits ‘groove’, at the top through the fuselage and into bottom through the wing. The left bottom of the rear edge of the engine cowl also had two holes drilled for the engine retaining cable.

5. Cockpit rigging:

Although it can be a challenge to rig the various cockpit control cables, I find it adds a touch of realism to the model, even though most of the controls will not be seen once the fuselage is closed up. The following page shows the cockpit control rigging from the Wingnut Wings instruction manual, as well as the official rigging diagram from ’The Official Technical and Rigging Notes for RFC and RNAS Fighting and Training aeroplanes, 1914- 1918 (Arms and Armour Press - RAF Museum series, Volume 4).

As can be seen from the following diagrams, the primary control cables are:

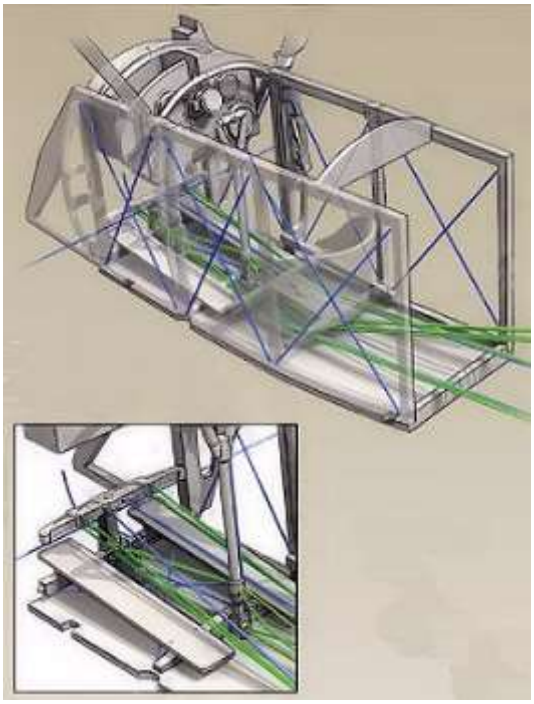
Ailerons - The operating cable is attached to the aileron bell-crank, which is on the end of kit item No.A30, located on the cockpit floor, forward from the rudder bar assembly. The cable runs across the cockpit and through the fuselage into the lower wing. There is a turnbuckle on each cable where attached to the bell-crank.

Rudder - The operating cables are 'doubled' and are attached to the top and bottom and at each side of the rudder bar (kit item No.B16). Turnbuckles were fitted on each cable at the rudder bar. The cables were routed rearwards (to the rudder) and through the floor mounted cable cleats located under and each side of the pilots seat.

Elevator - The elevator was controlled by four cables, which were attached to a collar, located towards the base of the control column.

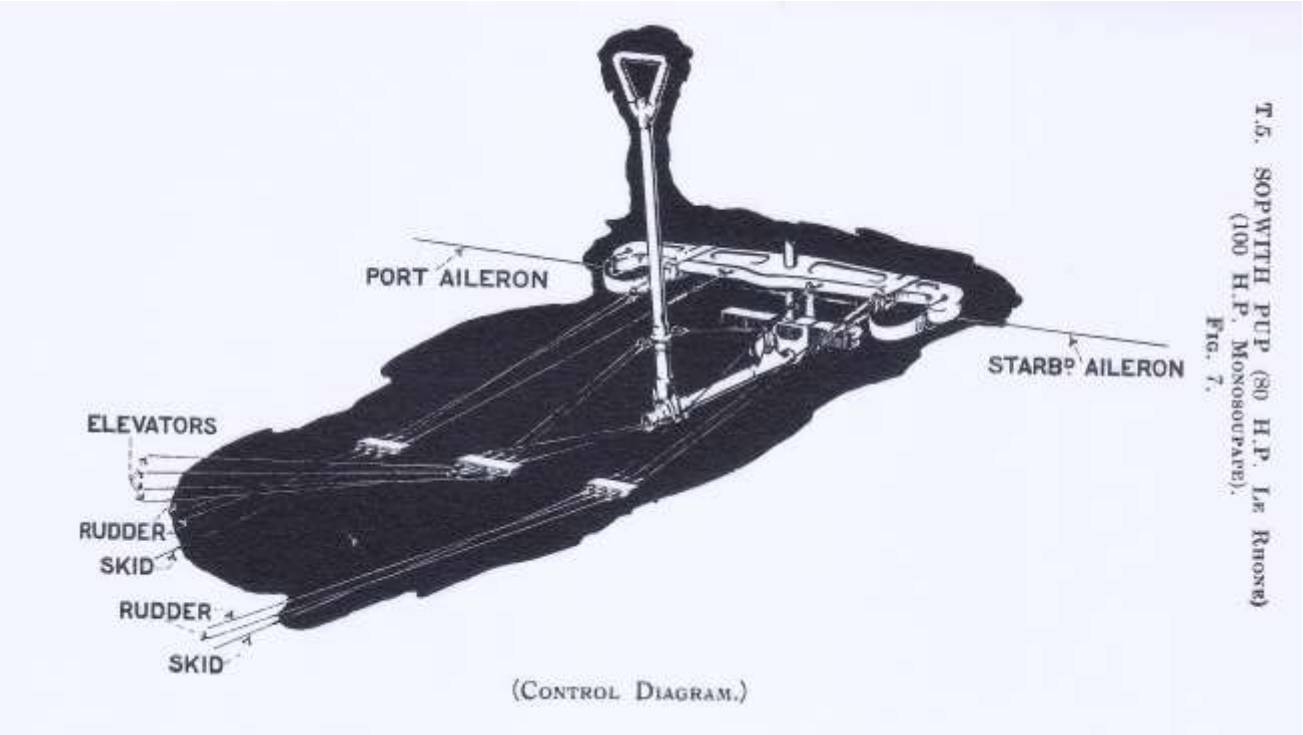
The two cables that raised the elevator (to pitch the aircraft up) were attached to the front of the collar on the control column and were routed forwards and over the pulley on kit item No. A30. They then routed down and through the front of the hollow tube that connected the control column to the aileron bell-crank. They then passed out of the tube (at the base of the control column) and were routed rearwards (to the elevator upper control horns) through floor mounted cable cleats located centrally under the pilots seat.

The two cables that lowered the elevator (to pitch the aircraft down) were attached to the rear of the collar on the control column and were routed rearwards and to the elevator lower control horns, through floor mounted cable cleats located centrally under the pilots seat.



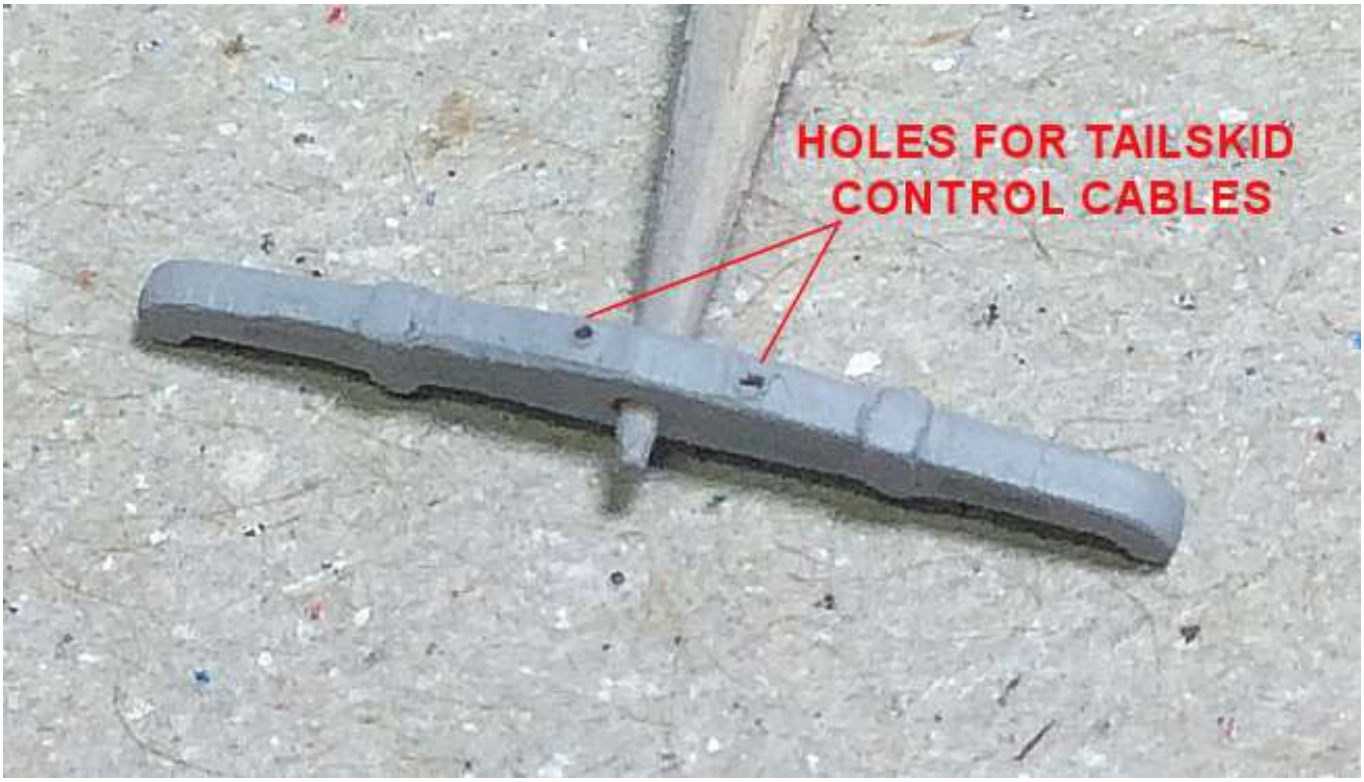
NOTE: Adjustment turnbuckles for the elevator were not located in the cockpit, but further back in the control runs to the elevator.

Tailskid - The aircraft had a steerable tailskid, which was operated by two cables, attached to the rudder bar, midway between the pilots foot rests and the central pillar. Turnbuckles were fitted on each operating cable at the rudder bar. The cables were routed rearwards (to the tailskid) and through the same floor mounted cable cleats used for the rudder cables.



NOTE:
In addition to the control cables in the cockpit, there is also bracing rigging that is fitted on the cockpit side frames and across the cockpit floor partitions (refer to previous diagrams). These will be fitted to the model as part of the build (refer to Part 4 of this build log).

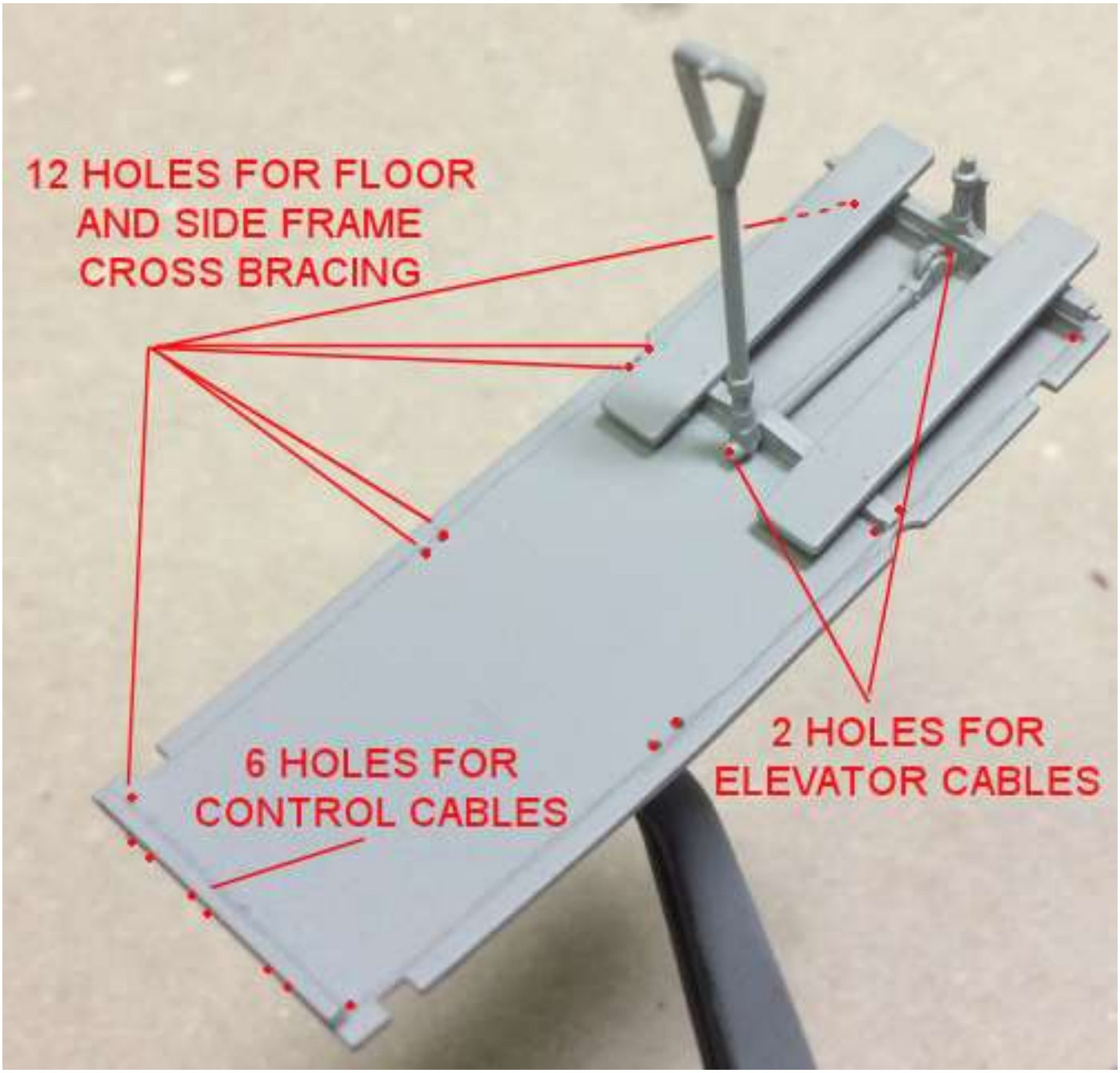
In preparation for installing control rigging to the cockpit, I drilled two 0.3mm diameter holes through the rudder bar to accept the tailskid control cables.



The following describes the holes that were drilled to accept the cockpit control cables for the rudder and elevator, as well as those required to 'anchor' the cross bracing cables for both the cockpit side frames and floor cross bracing cables.

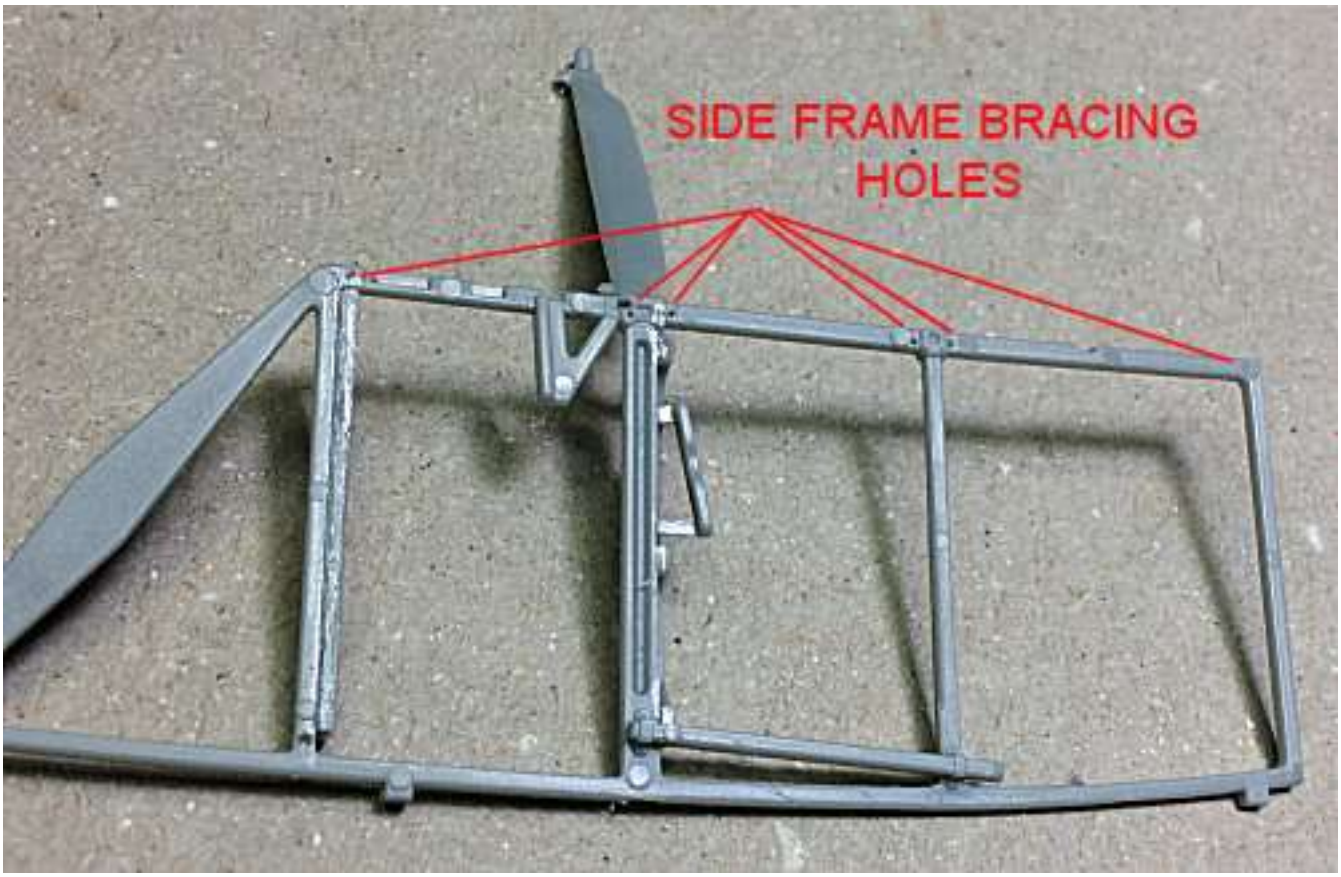
One 0.3mm hole was drilled through the cockpit floor, in front of the elevator pulley. An additional hole was drilled into the end of the control column torque tube (kit item No.A30). These two holes will be used to accept the two control cables running forward from the control column, over the pulley and back through the torque tube (refer to the rigging diagrams on page 13 of this build log).

In addition, 3 pairs of 2 holes were drilled, in rows, through the 'shoulder' at the rear of the cockpit floor and to the to the left, right and centre (refer to rigging diagrams on page 13 of this build log). The centre pair will be used for the control column rear elevator cables and the control column forward elevator cables. The 2 outer pairs will be used for the rudder cables and the tailskid cables.



For the cross bracing on the side frames I used masking tape to temporarily attached the cockpit side frames to the cockpit floor, then using a sharp pencil I outlined the side frames onto the cockpit floor. After taking off the side frames, I drilled holes of 0.3mm diameter from the top of the side frames, diagonally and through, into the top corners of each frame 'bay'. Also I drilled 0.4mm diameter holes through the cockpit floor in the locations needed for the bottom of the side frame cross brace rigging and the floor cross bracings. Doing this would give extra strength to the bracing cables and anyway, the bottom of each cable will be barely visible once the fuselage is closed up.

The holes in the top of each frame 'bay' will be used to attach the 'Gaspatch' turnbuckles for the frame cross bracing cables, the other ends of which will be 'anchored' through the appropriate holes pre-drilled in the cockpit floor.



6. Photo-etch additions:

The photo-etch set from 'HGW Models' (32010) contains some parts that I used on the cockpit area. Following the HGW instructions I fitted the map case, the fuel level indicator and gun magazine cover. The fuel level gauge centre strip was painted with Tamiya Clear Yellow (X24).

7. Additional cockpit detail:

To add more detail to the kit supplied cockpit, I added:

Fuel line: - The right cockpit frame has a fuel level gauge to which I added a fuel line made from Albion Alloy's Nickel-Silver micro-tube (NST03) of 0.3mm diameter.

Throttle control line: - The throttle control line on the left cockpit side frame was made Albion Alloy's Nickel-Silver micro-tube (NST03) of 0.3mm diameter.

Fuel pressure indicator bulb: - On the left frame is a fuel line running to the fuel pressure indicator, which was made from Albion Alloy's brass micro-tube (MBT04) of 0.4mm diameter.

Gun synchro cable: - The gun synchronisation cable, which runs from the control column to the cockpit floor then forwards and up to the gun, was made from 'Plus Models' 0.3mm diameter lead wire.

Rudder bar foot straps: - Two rudder bar foot straps were cut into thin strips from thin lead sheet then painted with Humbrol Leather (62) then secured to the rudder bar using thin CA adhesive.

Hand operated pressure pump: - Some photographs of Sopwith Pups show what appears to be a hand pressure pump, mounted on the top right longeron, close to the instrument panel. I decided to add this (later in this build) by using a spare from my spares box.

8. Wing aileron pulleys:

Moulded into the leading edges of top and lower wings are pulleys, which are part of the aileron control runs. There are 2 in the lower wing and 2 in the top wing. Although quite detailed, I decided to replace them with photo-etch pulley's from the 'HGW Models' photo-etch set (No.32010) for the Sopwith Pup. These are very small and difficult to bend and assemble, but do look better than the kit moulded items. The parts were secured using thin CA adhesive. I carefully removed the kit pulley with a sharp bladed 2mm wide chisel. I assembled the four photo-etch pulleys following the set instructions and using thin CA adhesive.

9. Tie-down rings:

The actual aircraft had two metal ring, each attached to the underside of the lower wing leading edge. These were used to 'tie-down' the aircraft during strong winds etc. Each ring was located just inboard from the outer wing struts and slightly towards the wing trailing edge. To replicate these rings I used 0.3 mm diameter tinned copper wire, which was wrapped around a 0.5 mm diameter drill and twisted to form an 'eyelet'. The tail of the twisted wire was cut away to leave a short length, which will be inserted into ha hole drilled into the wing later in this build.

PART 2 - WOOD EFFECTS (General)

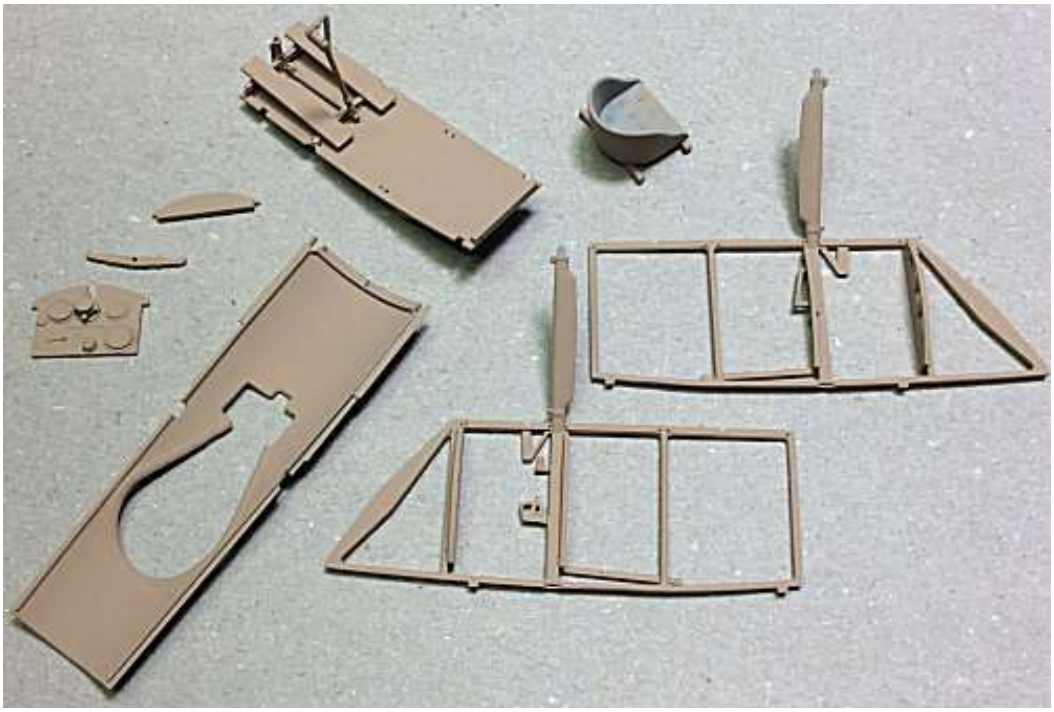
A basic technique:

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

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

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

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



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

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

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

Once painting is complete, clean the brush in water.

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

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. However, I don't use the Tamiya Clear, but instead 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)

Flory Model clay washes: These washes come in various shades and consist of a 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 brush used for oil paint (as the bristles are harder than normal painting brushes) 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 Klear 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 very difficult to remove or even to wash it off completely.

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. The washes I tend to use are Flory Clay Wash 'Grime' and 'Dark Dirt' .

I use a still oil brush to brush off the clay wash, but for smearing effects, an only very slightly damp brush or absorbent paper can be used, but even then I dab them onto a dry piece of the paper. That's how 'damp' it needs to be. 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 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 brush 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 stiff brush and/or use a piece of damp absorbent paper or brush 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 seal the surface with airbrushed Alclad Klear Light Sheen (ALC-311), which will seal in the applied clay wash.

NOTE: Flory washes can be mixed to create other colour blends.

Chipping effects:

I wanted to give the effect of chipped and weathered paint/varnish to the metal engine cowl and forward fuselage panels. To achieve this effect, I first primed the areas with Tamiya Fine Surface primer (Grey) then airbrushed Tamiya Aluminium (XF16). Once dry I airbrushed AK Interactive Medium Chipping fluid (or Vallejo chipping fluid) and when dry, top coated with Tamiya Ocean Grey (XF82). Once fully dry I moistened 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. Be careful 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.

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.

PART 4 - THE COCKPIT

Once the wood effect parts have been completed (method - refer to Part 2 of this build log) and the primed smaller parts have fully dried, you can start to paint these smaller items in the cockpit, brush painting using Tamiya acrylics and 'Mr. Metal Colour' paints. Enamel thinners is needed to clean brushes used with Mr. Metal Colour paint, as Tamiya's X-20A doesn't touch it. This leads me to believe Mr. Metal Colour paint is enamel based, rather than acrylic.

Once an item painted with 'Mr. Metal Colour' paint has fully dried, the surface can be 'burnished' by gently rubbing the surface with a cotton bud, piece of cloth or even your finger. Doing this 'merges' the pigments of the paint to create a realistic metallic sheen.

To paint the various cockpit items, I used Tamiya X18 (Semi-Gloss Black), Wooden Deck Tan (XF78) and 'Mr. Metal Colour' Stainless Steel (MC213), Brass (MC219), Aluminium (MC218) and where required Copper (MC215).

To simulate the fuel in the fuel bulb, located on the right cockpit frame, I used Tamiya a mixture of Tamiya X24 (Clear Yellow), X26 (Clear Orange) and X22 (Clear).

For the pilot's seat I used 'Mr. Metal Colour Stainless Steel (MC213). The seat cushion was painted using Tamiya XF9 (Hull Red) mixed with Humbrol Leather (62) and Alclad Aluminium (ALC101).

Use the normal method of applying the decals to the instrument panel, pressing out any surplus water, using tissue paper or a cotton bud. Once this is done, brush a small amount of 'MicroSet' over the decal surfaces, as this will soften the decals and cause them to 'weld' to the surface. Don't be alarmed if the decals wrinkle at first, as this is the 'MicroSet' taking effect and they will disappear once dry.

To replicate instrument glass, I brushed a small amount of 'Vallejo' Still Water (26.230) onto each of the instrument decals. This dries to a clear finish replicating instrument glass.

.

Assembly:

Photo-etch additions: The photo-etch set from 'HGW Models' (32010) contains some parts that I used on the cockpit area. Following the HGW instructions I fitted the map case, the fuel contents indicator and gun magazine cover (refer to Part 1 of this build log).

With the control column (kit item No.B15), rudder bar base (kit item No.A29) and control column torque tube (kit item No.A30) fitted to the cockpit floor, it's now the best time to rig the various cockpit flight controls, before the cockpit has further items fitted.

NOTE:
If you intend to show the finished aircraft model with ailerons and/or elevator in anything but the neutral position, the control column and aileron bell-crank should be positioned correctly.

All of the control lines and cross-bracing were made using 'Steelon' monofilament (of 0.12mm diameter), 'Gaspatch' 1/48th scale turnbuckles and 'Model Skills' pre-cut turnbuckles (Nickel-Silver 0.4mm diameter).

The kit supplied cockpit frames etc have no pre-moulded tubes, pipes or cables. To replicate these various items, I used 'Albion Alloy's' Brass micro-tube 0.4mm diameter (MBT04) and lead wire of various diameters from 'Plus Model'. These were secured in place using CA adhesive.

Rigging controls:
Ensure you have drilled out all of the internal external rigging attachment points. This will avoid having to try drilling a hole in an inaccessible area once the cockpit build has progressed.
There are various methods for replicating rigging, either by using stretchable threads, such as EZ or Prym, using Monofilament (fishing line), stretched plastic sprue or photo-etched rigging.
My personal preference is monofilament, as it adds strength and rigidity to the finished model, it is easily threaded through micro-tubing, turnbuckles and the small holes drilled into the model. The only real downside is being nylon, it doesn't accept painting easily. Ink paint pens can be used, but if you can obtain a dark and/or silver coloured line, painting shouldn't be necessary.

NOTE: The micro-tubes were cut by rolling a sharp scalpel blade across the tubes. This easily cuts the tube without crushing it or leaving 'burrs', which would stop the rigging line or tube from passing through the holes in the tube.

Elevator controls: There were two pairs of 'twin' cables that operated the elevator from the control column (refer to the rigging diagrams on page 13 of this build log).

1. Two lengths of 'Steelon' 0.12mm diameter mono-filament were cut and one end of both lines were passed down through the 0.3mm diameter hole previously drill in front of the elevator pulley (refer to page 15 of this build log). These ends were secured under the cockpit floor using thin CA adhesive. The two lines were then pulled up and over the pulley, being secured in position on the pulley with thin CA adhesive. Both lines were then looped around each side of the collar on the control column and secured in those positions. The two lines were then passed rearwards and through the two central holes, pre-drilled centrally at the rear of the cockpit floor (refer to page 15 of this build log).

2. Two long lengths of 'Steelon' 0.12mm diameter mono-filament were cut and the ends of both lines were positioned into the pre-drilled hole in the end of the control column torque tube (the control column is mounted on this tube) and secured using thin CA adhesive. The two lines were then passed rearwards and through the two central holes, pre-drilled centrally at the rear of the cockpit floor (refer to page 15 of this build log).

3. The cockpit floor was placed onto 'Blue Tack (on the work surface) and the four lines were held in self clamping tweezers (to pull the lines taut). A strip of 6mm wide Tamiya masking tape was lightly stuck to the work surface and then across all four lines at the rear of the pilots foot rests. This was to pre-tension the lines for when the pilots seat is fitted over them. The four lines were then secured in the two holes at the rear of the cockpit floor, using the thin CA adhesive. Once secure the tags of line sticking proud of the rear of the cockpit floor were trimmed off and masking tape removed. **NOTE:** The lines should be slightly 'slack' once the masking tape has been removed. The lines should tighten once the pilot's seat is fitted later in the build, as it will press down on the slack lines a make them taut.

Rudder Controls: Four short lengths of 'Model Skills' pre-cut 'turnbuckles' (1/48th) were cut. Two long lengths of 'Steelon' 0.12mm diameter mono-filament were cut and each line was positioned in 'nicks' cut at the top and bottom of the rudder bar locations (refer to the rigging diagrams on page 13 of this build log) and secured in position using thin CA adhesive. Each of the cut 0.4mm diameter micro-tubes were slid onto a line and positioned close to the rudder bar and then secured with thin CA adhesive. The left and right pairs of lines were then passed rearwards and through the outboard holes of the pre-drilled holes each side and at the rear of the cockpit floor (refer to page 15 of this build log).

Tailskid controls: Two long lengths of 'Steelon' 0.12mm diameter mono-filament were cut and each was located into the pre-drilled holes in the rudder bar (refer to page 14 of this build log) and secured using thin CA adhesive. Two short lengths of 'Model Skills' pre-cut 'turnbuckles' (1/48th) were cut and slid onto each of the lines and close to the rudder bar. These micro-tubes were then secured in position with thin CA adhesive. The two lines were then passed rearwards and through the two inboard holes of the pre-drilled holes each side and at the rear of the cockpit floor (refer to page 15 of this build log). **The rudder and tail skid control lines were then secured in position using the same method as described in item 3 for the elevator control lines.**

Cockpit floor cross-bracing: To replicate the cross bracing on the cockpit floor (refer to page 13 and 15 of this build log), cables are run from:
1. The rudder bar lower support cross beam to the control column support cross beam
2. The control column support cross beam to the side frame vertical strut.
3. The side frame vertical strut to the rear of the cockpit floor.

The 'anchor' holes for these lines were pre-drilled as 0.3mm diameter holes and will also be used for the side frame bracing lines. Rigging these cables is similar to that for the side frames, except instead of turnbuckles, short, cut lengths of 'Model Skills' pre-cut 'turnbuckles' (1/48th) are used on the lines. A length of 0.12mm 'Steelon' diameter mono-filament was passed through the hole at each side at the front of the cockpit floor. These were secured under the floor using thin CA adhesive. Each line had two tubes slid on and then it was passed down and through the diagonally opposite hole, then passed up and through the adjacent hole. This was repeated until the lines were passed through the holes at the rear of the cockpit floor. Both lines were pulled taut and the various crossed lines adjusted for individual tension, after which the two ends were secured under the cockpit floor using thin CA adhesive.

Side frames cross-bracing: Cross-bracing was fitted to give rigidity to the wooden frame work on the aircraft (refer to page 4 of the Wingnut Wings instruction manual). The cockpit side frames supplied in the kit each have three 'bays that require cross-bracing. Also the forward 'strut' on each frame should be crossed braced, although the struts 'bays' are not complete.
Holes were pre-drilled through the top of each cockpit side frame and through the cockpit floor (refer to page 15 of this build log). Lengths of 'Steelon' 0.12mm diameter mono-filament were cut twice as long as was needed to span across each 'bay'. Each bracing line was created by passing the line through a cut, short length of Albion Alloy's 0.5mm diameter brass micro-tube (MBT05), then passed through the end of the single ended turnbuckle ('Gaspatch Elite Accessories') and back through the tube. The free end of the line can then be pulled through the tube and the tube to be moved up close to, but not touching the turnbuckle. The tube can then be secured in position with thin CA adhesive. The 'Gaspatch' single end turnbuckles are then located into the pre-drilled holes at the top corner of each bay and secured with thin CA adhesive.

Aileron controls: The operating cable is attached to the aileron bell-crank, which is on the end of kit item No.A30, located on the cockpit floor, forward from the rudder bar assembly (refer to page 14 and the two cockpit rigging diagrams on page13 of this build log) . As the kit has no locations points on the fuselage sides to attach the cables and because the mono-filament is not rigid, I used instead Albion Alloy's 0.2mm diameter micro-tube (NSR02) to replicate this control run. The length of the tube needs to be the width of the rudder bar support beam. A short length of Albion Alloy's brass 0.4mm diameter micro-tube was cut and slid onto the 0.2mm tube. The 0.4mm diameter tube was fixed in the centre of the 0.2mm tube and secured using thin CA adhesive. The tube was then positioned centrally onto the aileron bell-crank and parallel to the pilot's foo rests and then secured in that position using the thin CA adhesive.

The cockpit side frames can now be fitted: To add rigidity to the side frames, the completed gun magazine/belt feed (kit item No. A37), the tank (kit item No.A21), the cross beam (kit item No.A31) and the cockpit cross rail (kit item No.A7) should be fitted at the same time. Once these parts have been assembled, short lengths of 'Model Skills' pre-cut 'turnbuckles' (1/48th) are cut and slid onto each side frame bracing line, the ends of which are passed through the appropriate pre-drilled hole in the cockpit floor (as used for the floor cross bracing) and gently pulled to re-move any slack (do not pull too much or the side frame will break).

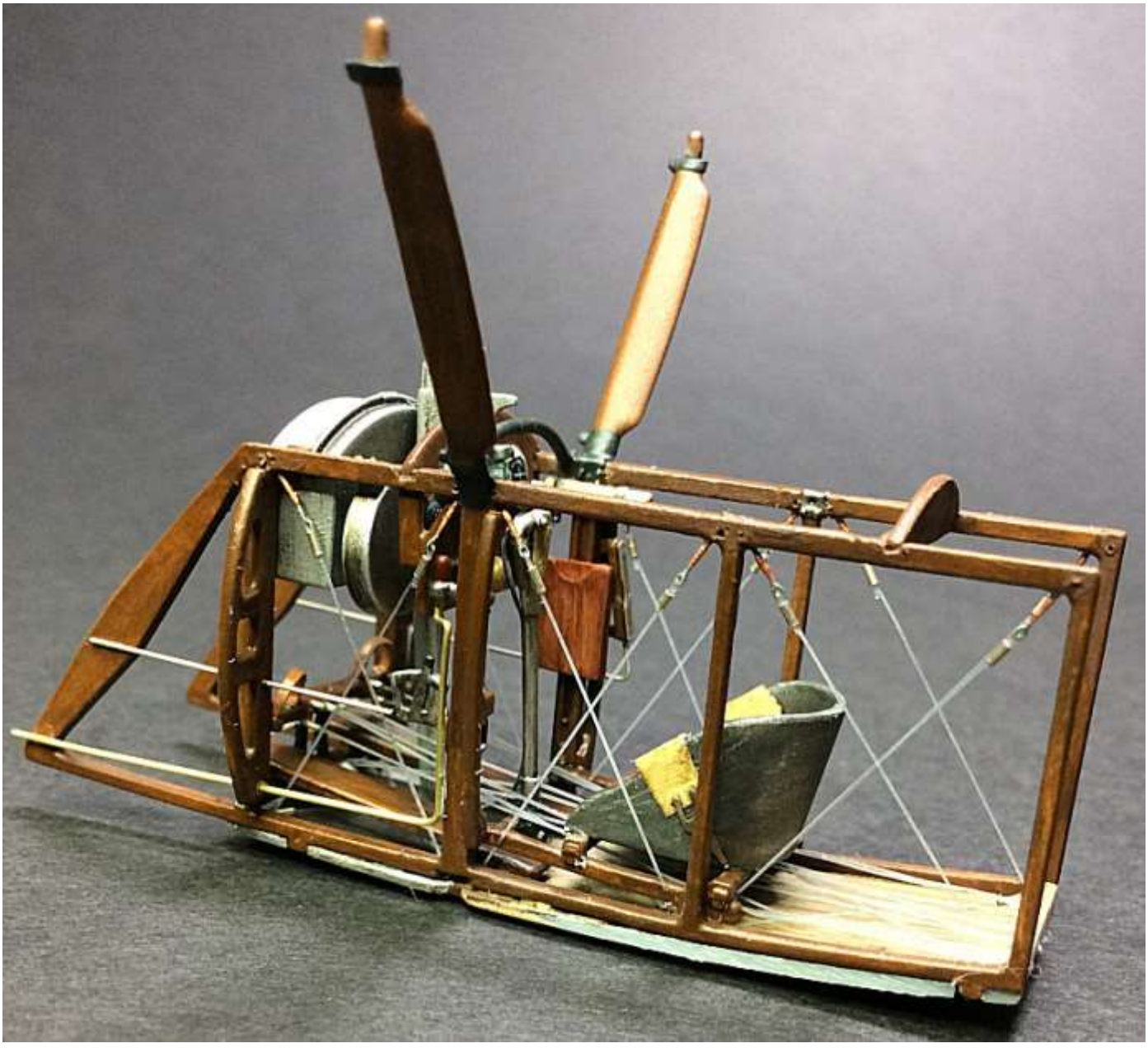
Hand operated pressure pump: It was brush painted with Mr. Metal Colour Brass (MC219) and fixed in position using thin CA adhesive, to the top right longeron and close to the instrument panel.

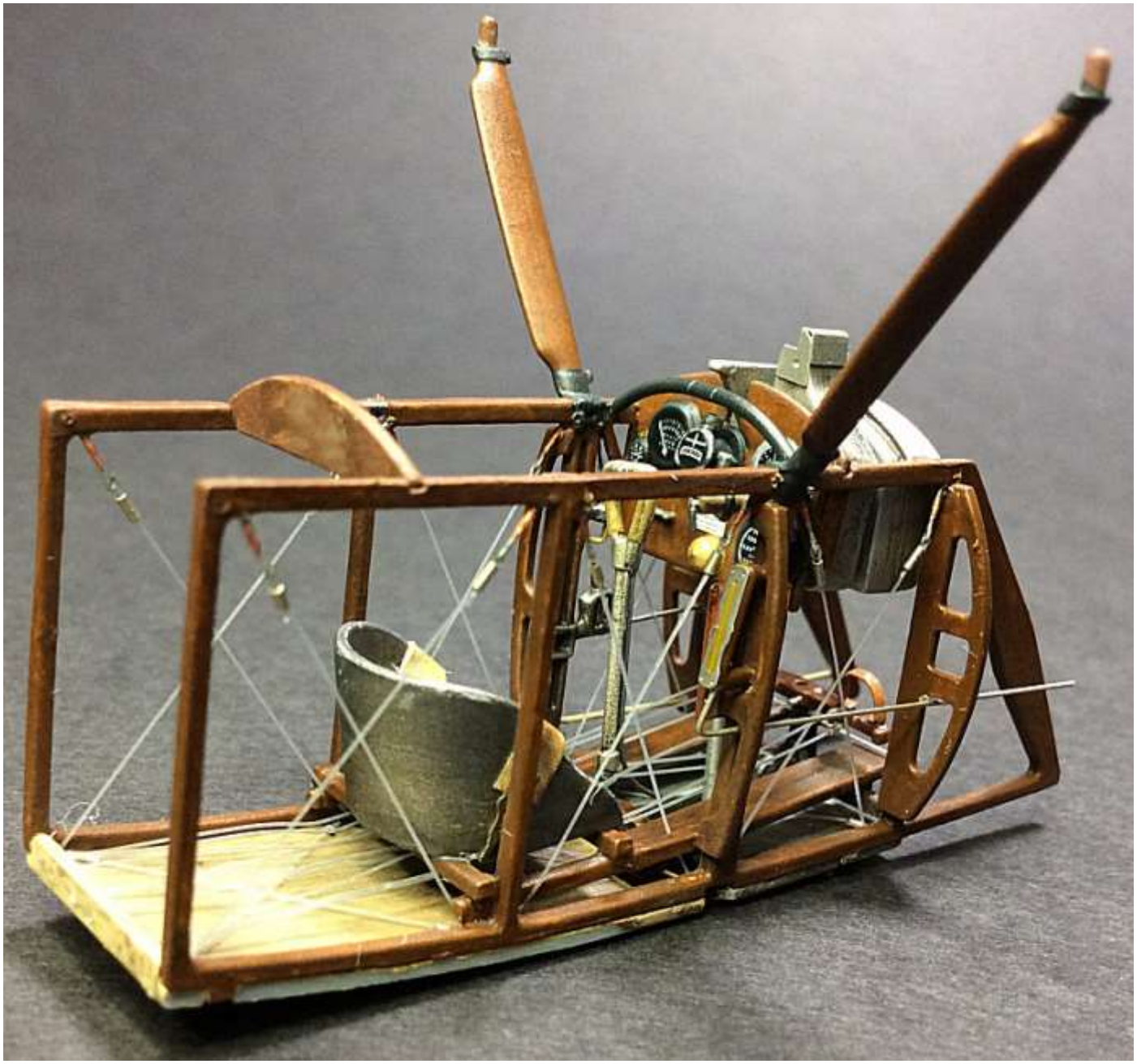
The pilot's seat: This can now be fitted, the mounting frame of which should sit over the control lines for the rudder, tailskid and elevator. For this build I decided to use the 'HGW Models' paper seat restraint straps (32011). This particular set is pre-coloured and although can prove difficult to assemble, does add a more realistic look to the seat belts. The belts were secured them in po-sition on the seat, using thin CA adhesive.

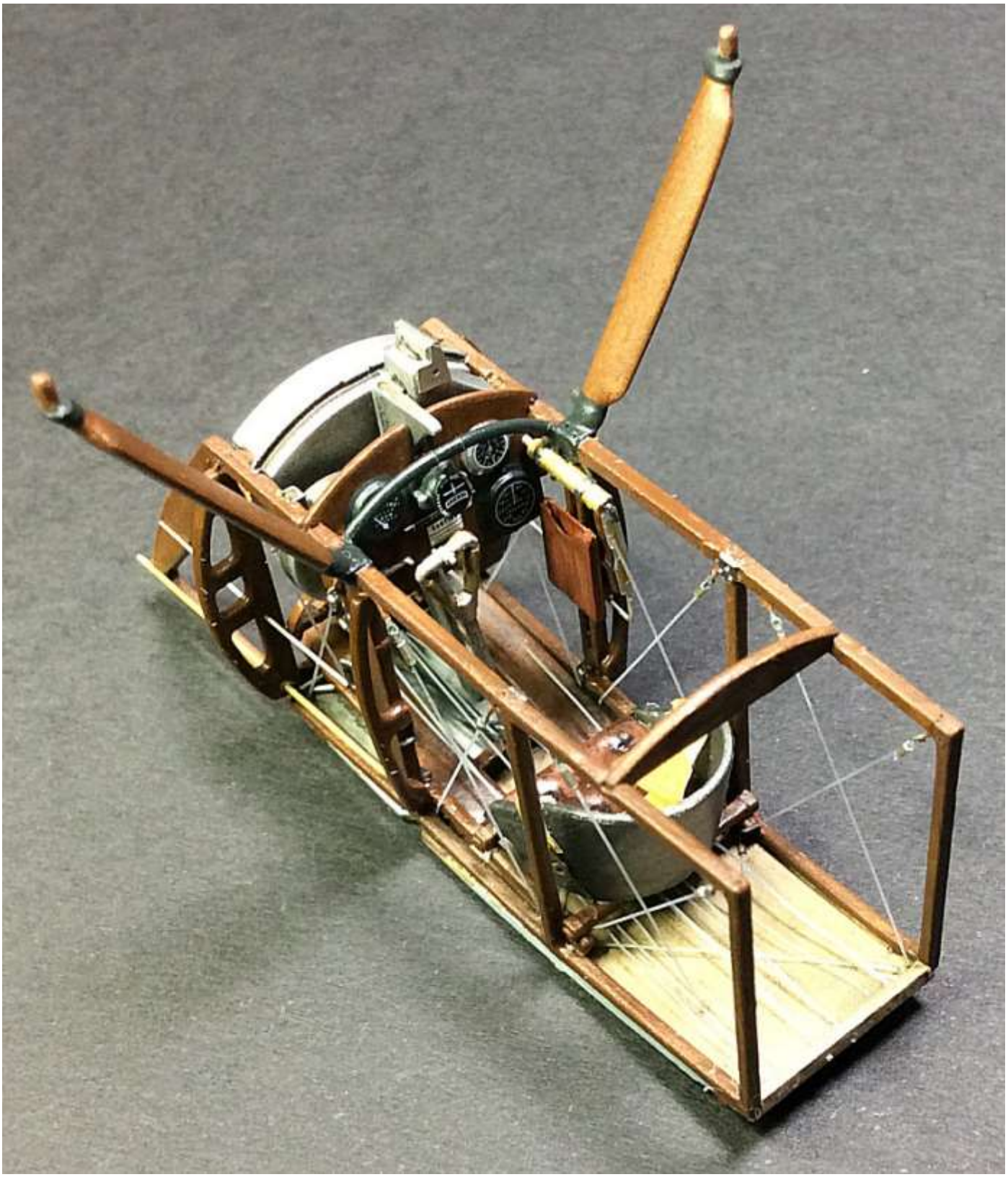
Completion of rigging:
Each of the side frame bracing lines should now be gently pulled taut (through the holes in the cockpit floor) and secured under the cockpit floor using thin CA adhesive. **Do not pull too hard on these lines or you may break or damage the model parts, particular.**

The micro-tube 'turnbuckles' can then be 'toned down' by brush painting with either acrylic metal paints or by applying washes, such as AK Interactive Leaks and Stains.
For this build I used the 'HGW Models' paper seat restraint straps (32011). This particular set is pre-coloured and although can prove difficult to assemble, does add a more realistic look to the seat belts. The belts were secured them in position on the seat, using thin CA adhesive.

A light coat of Alclad Klear Light Sheen (ALC-311) was airbrushed over the complete assembly to give a uniformed finish. This level of detail is up to the individual modeller, as most of it will not be visible once the rest of the cockpit details are added and the two fuselage halves are joined. Even so, I personally like to add the detail - at least I know it's there.







PART 5 - FUSELAGE INTERNALS

1. There are several ‘mold ejector pin’ indentations on both fuselage internal surfaces. Although they are shallow by comparison to some other manufacturers kits, they still need to be removed, otherwise they will show through the paint, especially when applying the ‘Flory’ clay washes when weathering to surfaces. For deeper ejector pin indentations I would normally fill them with a model putty the once dry, scrape/sand them smooth. However as these are shallow, I would sand they out, something I didn’t do as I only noticed them after I’d primed and painted the base colour!!

2. As the cockpit was completed in Part 4 of this build log, now was the time to test ‘dry’ fit the cockpit assembly, to ensure the fuselage halves will close up correctly at that build stage. I found that the three grooves in each fuselage half need to be opened up slightly, to allow the cockpit side frames to locate fully. I also found that the side faces of the wing roots on the lower wing needed to be scrapped to allow the completed cockpit assembly to fully seat down into the wing recess.

3. When the cockpit is fitted into the closed up fuselage, the inboard edges of the wing show either side of the cockpit, adjacent to the cockpit floor. These will need to be painted to match the cockpit, not the lower wing upper surface colour. To mark these areas I temporarily closed up the fuselage haves and position the fuselage onto the lower wing. I then marked lightly, by using a pencil, the outline of the wing, outside the fuselage halves. This will be used as a guide when the wing is painted.

4. The photo-etch set in the kit has the two metal step plates, which need to be fitted, one on each side of the wing and half way between the rigging holes at the wing roots and the trailing edge. I marked where they should be positioned whilst the fuselage was in position. With the fuselage removed the plates were fixed in position using thin CA adhesive.

5. To prevent the three grooves in each fuselage half (for locating the cockpit side frames) from being filled with paint, which will stop the side frames fully fitting in the grooves, I cut thin strips of masking tape, which were located into the grooves.

6. I used Tamiya Fine Grey primer (aerosol) to prime the cockpit area on the lower wing and the internal surfaces of the fuselage halves. Once dry, I brush painted the front of the cockpit floor on the lower wing with Mr. Metal Colour Stainless Steel (MC213). The rest of the internal surfaces were airbrushed with Tamiya Wooden Deck Tan (XF78), mixed with a few drops of the Clear Yellow (X24), to create the colour for Clear Doped Linen (CDL), which makes up the internal fuselage colour. This included the areas at the wing roots previously pencil marked. Once this was fully dry I airbrushed a sealing coat of Alclad Light Sheen (ALC-311) lacquer, to seal the surfaces in preparation for weathering.

NOTE: As with most colouring for World War One aircraft, it’s debatable as to the exact colours and tints. New aircraft colours would differ from those that have ‘seen service’ and age and the ambient conditions would have altered these colours. In addition, the chemical mixture of the various dopes changed throughout the war, due to short supplies of some of the ingredients and the particular aircraft manufacturers take on a particular colour specification. Most colour photographs are of museum aircraft and modern replicas, which may or may not be accurate depictions of the actual colour at the time.

The best we as modellers can achieve is what we, as individuals, consider is ‘accurate’.

7. The cockpit sides of both fuselage halves have a pre-molded ‘lattice’, representing the internal wood bracing typical of the Sopwith Pup, Strutter and Triplane. Painting this lattice work is not really practical, as paint will seep under the masking tape, especially in the corners of the lattice work. Therefore I used a standard brown colouring pencil to colour the lattice work, which gave better control than by painting. I did the same on the internal cross bracing cables at the rear of each fuselage half, but instead used a standard lead pencil. Once again I airbrushed a light Alclad sealing coat over the these areas.

8. ‘Flory’ clay wash (Grime) was then applied to the non-metal surfaces. The metal surfaces were washed with ‘Dark Dirt’. For how to apply ‘Flory’ clay washes, refer to Part 3 of this build log. Once completed, I airbrushed a light Alclad sealing coat over the these areas to seal in the clay wash.

9. I removed the masking tape previously applied into the three grooves in each fuselage half. It’s best to remove the masking tape slowly as having been over spayed with sealing lacquer, the tape may lift off or chip the applied paint around the grooves when being removed.

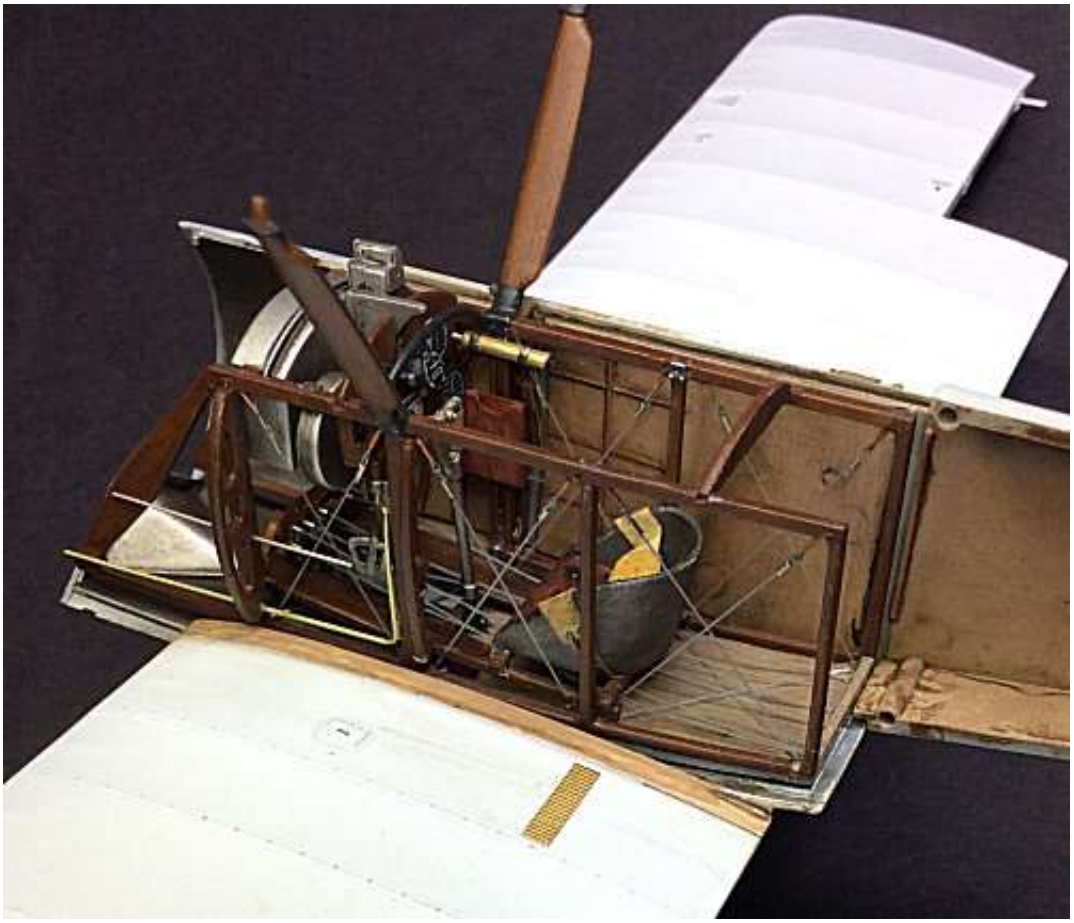
10. To enable the fitting of the tail skid and to ensure the fuselage halves close up fully, it’s best to fit the tail skid into one of the fuselage halves. For this model I used kit Item No.B2 and B11, which I’d already painted.

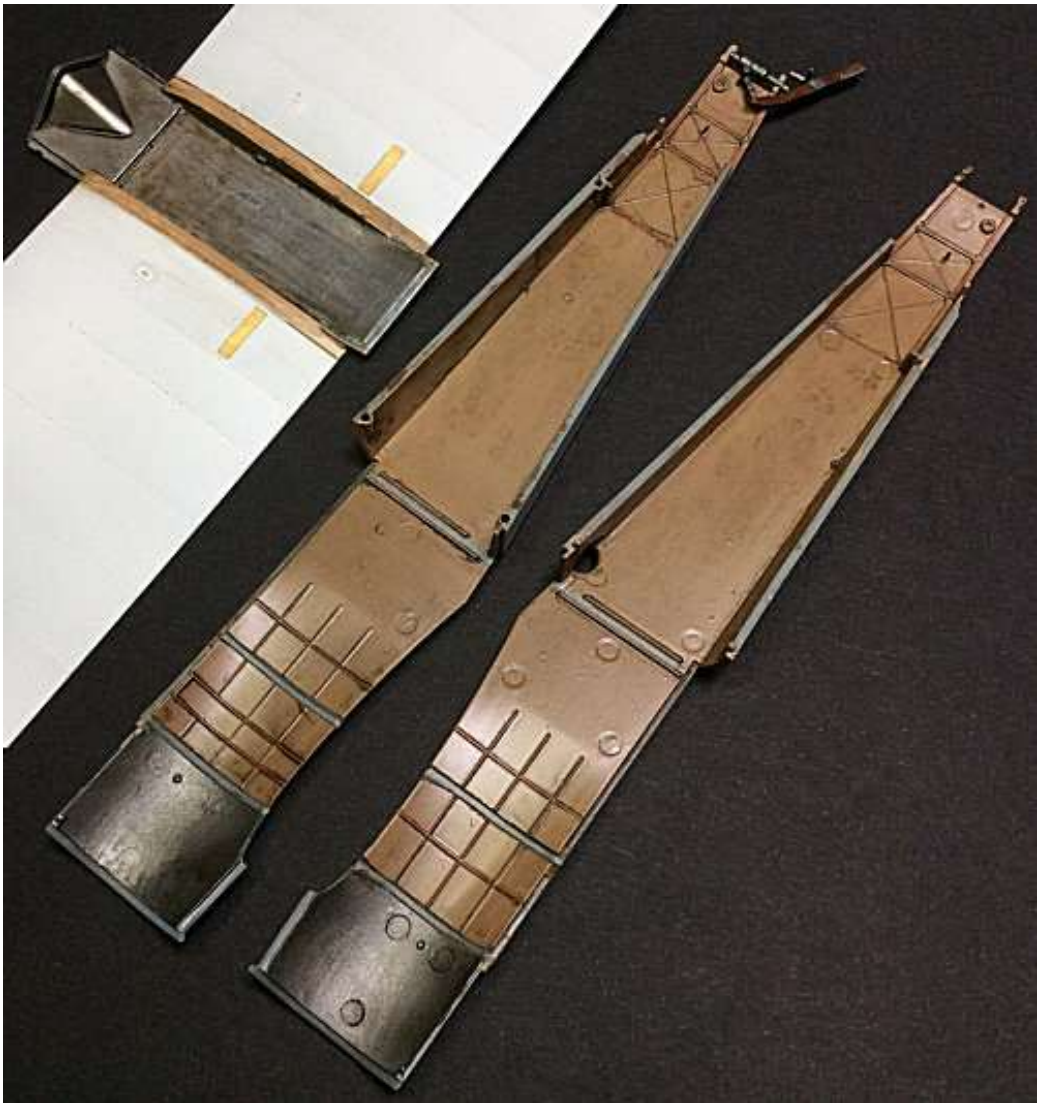
NOTE: Ensure any paint is removed from the location points in the fuselage halves and on items B2 and B11 before you fit these items.

NOTE: Only fit the two items into one of the fuselage halves.

First fit the damper into its location point in one of the fuselage halves and allow the adhesive to dry fully. Then fit the tail skid into its location point in the same fuselage half. Immediately add the opposite fuselage half to close up the fuselage, making sure as you do this that the tail skid is aligned correctly and that it fits into its opposite location point. Leave the fuselage closed up until the adhesive locating the tail skid has fully cured, then remove the other fuselage half. You will now have both tail skid components fixed into a fuselage half, knowing they will align correctly when the fuselage is finally closed up.

On the following page are shots of the finished fuselage halves, including a shot of the cockpit assembly dry fitted in the starboard (right) half. You may notice the ejector pin indentations on the inside of the fuselage surface, which I didn’t notice until it was too late. Unfortunately the weathering clay wash gathers in the indentations and highlights them, a timely reminder to make sure the ejector pin indentations are removed before you start building the model!!





PART 6 - THE ENGINE

As the engine was a rotary, it was relatively straight forward to assemble by following the kit instructions. All of the parts were cleaned of any flash or mold seam lines first. Then the two halves of the engine with the separate cylinder heads was assembled, followed by the engine shaft and its parts.

Once assembled I primed all of the engine components with a 'lightly' airbrushed coat of Alclad Grey Primer and Filler (ALC-302). When priming finely detailed parts, such as the engine cylinder cooling fans, don't apply too much primer or it will start to fill in the fine detail. The various parts were the painted with the following:

Engine assembly - Airbrushed - Alclad Gunmetal (ALC-120) - Once dry the crankcase was brush painted with Mr. Metal Colour Iron (MC212) and when fully dry, buffed with a cotton bud to enhance the metallic sheen. The crankcase was lightly brush with the silver colour from the Tamiya Weathering Master Set C. The spark plugs with brush painted with Tamiya Dark Yellow (XF60).

Manifold - Airbrushed - Alclad Exhaust Manifold (ALC-123) - Once dry the crankcase was brush painted with Mr. Metal Colour Iron (MC212) and when dry, buffed with a cotton bud to enhance the metallic sheen. The manifold pipes had the Burnt Blue and the Burnt Red colours from the Tamiya Weathering Master Set D applied by sponge. This was to give the impression of heat discolouration to parts of the manifold pipes. Finally I applied Mr. Metal Colour Copper (MC215), thinned with enamel thinners.

Engine mounting shaft: Assemble the engine shaft (kit items No.E2, 5, 7 and 8). For this model the propeller will be static, so I applied adhesive to the shaft locking ring. The forward (exposed) part of the shaft only was brush painted using Mr. Metal Colour Stainless Steel (MC213).

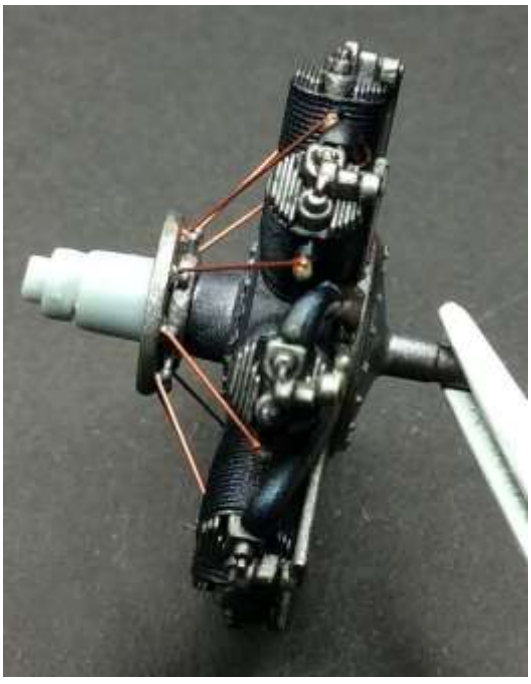
Valve operating rods, cylinder heads and engine shaft assembly - These were brush painted using Mr. Metal Colour Stainless Steel (MC213). The bases of the push rods were brush painted with Mr. Metal Colour Brass (MC219). Once fully dry, the painted surfaces were lightly buffed with cotton buds to create the metallic finish required.

The manifold and valve operating rods assemblies were then attached to the engine assembly. I found a slight misalignment at the tops of the manifold pipes to the cylinder heads. I filled these with PVA (white glue), although an alternative for fillings small gaps is with liquid plastic, which is off cuts of thin plastic sheet dissolved in Tamiya extra thin adhesive, although any similar plastic adhesive would do. These can be used to fill small gaps on the model, in preference to using a putty filler.

The whole engine was then given a wash of AK Interactive 'Leaks and Stains' (AK 2033) and once this had dried, highlights were added around the assembly using the Silver colour from the Tamiya Weathering Master Set E.

Ignition leads: The kit item E2 is the ignition lead ring and has small spurs for connecting each ignition lead to its spark plug in the cylinder head. To add ignition leads I cut lengths of 0.2 mm Nickel-Silver micro-tube (Albion Alloys - NSR02), which were attached to each spark plug and its relevant spur on kit item E2, using thin CA adhesive. Once dry, the tubes were brush painted with Mr. Metal Colour Copper (MC215).

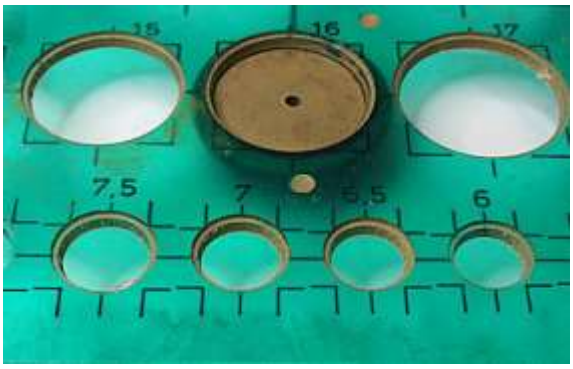
Once the engine is fixed to the forward fuselage bulkhead and the engine cowl is installed, very little of the engine detail, particularly the ignition wires, will be seen. Hey Ho - that's modelling.



PART 7 - WHEELS

The assembly of the two wheels is straight forward. In the kit are two ‘clip over’ locking discs (B4), which are used to secure the wheels onto the axle and allow them to rotate. I didn't use these as the intention is to have the model static on a display base.
The wheel and front covers were primed with Tamiya Fine Grey (aerosol) primer and once dry, were airbrushed with Tamiya White (X2), which will act as the base coat for applying ‘Aviattic’ linen decals. Then they were given a sealing coat of Alclad Gloss (ALC-310) as a base for the decals.

NOTE: To airbrush the internal face 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.



The internal surfaces of the wheel were airbrushed with Tamiya Deck Tan (XF 55) and when dry, the pre-molded spokes were highlighted with a standard lead pencil.

The wheel front and rear covers were airbrushed with Tamiya White (X2) and when dry had decal pre -shading airbrushed around the rims, using a mix of thinned Tamiya NATO Black (XF69) and Olive Drab (XF62). Once dry the wheels were airbrushed with a sealing coat of thinned Tamiya Clear (X22), in preparation for the application of decals.

I used a ‘ThinnerLine Circle Cutter’ to create circular masks (from masking sheet) for the wheel rear covers and positioned them on the wheels.

The tyres were then airbrushed with Tamiya Royal Light Grey (XF80) and the masks removed.

I then used the circle cutter to cut out a paper circle of the same size and drilled a hole in the centre large enough to clear the centre boss on the wheel outer cover. I then cut out a section of the disc then test fitted it over the wheel outer cover. Through trial and error I managed to create a paper template that fitted over the wheel outer cover with the cut out section joining.

I then used the circle cutter to cut out the two decal discs for the outer covers from the PC10 linen decal sheet - Aviattic' Light PC10 (ATT32089) and did the same for the inner covers, but used instead the CDL linen decal sheet - 'Aviattic' CDL (ATT32094).
Using the paper template I drilled the centre hole and cut out the section on both PC10 decal discs.
The two PC10 and two CDL discs were applied following the 'Aviattic' instructions (refer to Part 10 of this build log).
NOTE: The 'Aviattic' decals are quite strong and flexible enough to be able to push and position the decals prior to final fitting.
The wheel cover has an access hole for the valve inside the wheel. This is covered by the decal, so will need to be carefully punctured and pushed against the side of the hole. 'Micro-Sol' was applied to aid in forming the decal in the hole and around the wheel centre boss.

The kit supplied decals for the tyre manufacturer were added around the edge of the tyres and over the raised wording moulded in the tyre itself. **NOTE:** Ensure these decals are applied over the pre-molded wording, which I failed to do on some of the sides (see tyres shot)!!

The wheel parts were then sealed with Alclad Light Sheen (ALC-311).

The wheels were then weathered with brushed AK Interactive 'Kerosene' around the tyre rims. The tyres and wheel covers were weathered, using a small piece of sponge, with the colours Mud from the Tamiya Weathering Maser Set A and Soot colour from Set B.

Finally, a 1.0 mm diameter hole was drilled through the middle of the tyre and towards the centre of the wheel. A short length of 0.8 mm diameter paper clip wire will secured in the holes when mounting the model on its display base later in this build log.

The wheels with the front covers 'test fitted.

PART 8 - WEAPONS

The weapon fitted to this particular Sopwith Pup was a Vickers machine gun, fitted with a Hyland Type E loading handle and a padded windscreen.

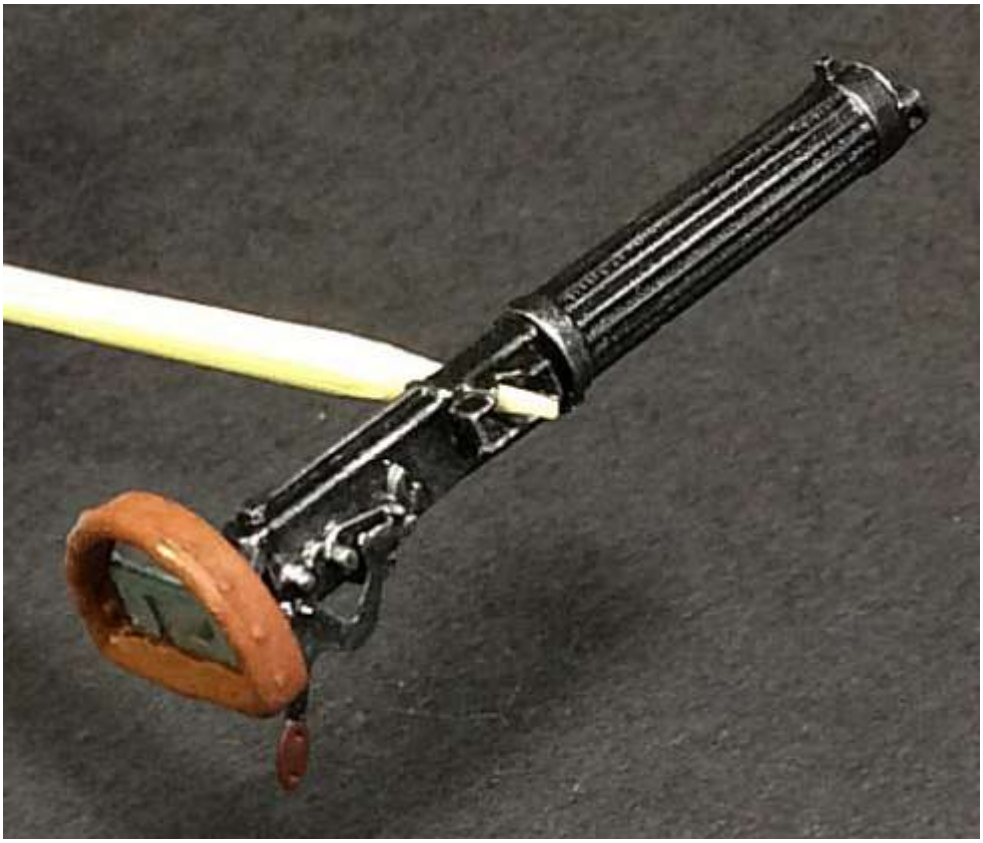
The kit supplied parts consist of the machine gun, windscreen and a photo-etch loading handle.

The parts were removed from their sprues and cleaned of any molding seams or flash.

The photo-etch Hyland loading handle (kit item No.P2) and kit item No.P1 were attached to the gun using thin CA adhesive.

The Vickers machine gun was then given a coat of Tamiya Fine grey aerosol primer and when dry, airbrushed with Alclad Gun Metal lacquer (ALC-120). Once this was dry and to give a metallic sheen to the gun, I lightly 'dry' brushed Mr. Metal Colour Stainless Steel (MC213) over the gun. Then finally I burnished the guns with the Gun Metal colour from the Tamiya Weathering Master (Set C).

The padded surround on the windscreen was brush painted using Humbrol Leather (62) with a small amount of Tamiya Hull Red (XF9), then a light coat of thinned Tamiya Semi-Gloss Clear (X35). The support frame was painted with Tamiya Ocean Grey 2 RAF (XF82).



PART 9 - PROPELLER

The kit supplied propeller can be primed and either hand or airbrushed, to achieve the laminated wood effect, is desired. To do this effectively can be difficult and a bad propeller can ruin the look of an otherwise good model.

To replicate this particular propeller I used the ‘wood effects’ method detail in Part 2 of this build log.

The painting phase was completed (using Tamiya Dark Yellow (XF60) as the base coat) and after it was fully dry, an airbrushed sealing coat of Alclad Light Sheen (ALC311) was applied.

Once dry the two manufacturers decals were added to the blades and dried, after which ’Micro-Sol’ was sparingly applied to weld the decals onto the surface. When dry a final sealing coat of Alclad Light Sheen (ALC311) was airbrushed over the propeller.

Once dry, I applied the sand colour from the Tamiya Weathering Master Set A. This was applied along the propeller leading edges (front and rear) and to the propeller tips, using a piece of fine sponge. Also I rubbed lightly along each blade using the soot colour from the Tamiya Weathering Master Set B. This gives a faint impression of the darker laminated wood.

PART 10 - DECALS

The decals supplied in the kit are for the individual aircraft markings, but obviously do not cover the paint schemes used. Consequently I have chosen to use decals from 'Aviattic', and CDL (ATT32045) for the underside rib tapes.

Aviattic decals:

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

However, 'Aviattic' decals are laser printed onto a very fine carrier film and although this film is thin, the decals are remarkably resilient and somewhat 'stretchy' when being applied. This allows them to be more easily moved and positioned before being finally applied. Also with most other decals, I've used softeners to help the decals conform to surface irregularities and contours, which is something I've found is not really required for 'Aviattic' decals, due to the nature of the carrier film. In addition, the decals need to be cut out from the sheet, so care is required to cut the decals accurately to avoid leaving gaps, especially at the edges, where the white base colour will show. That said, minor gaps may be able to be covered with weathering. For more information, refer to the 'Aviattic' instruction sheet supplied with the decals.

Aviattic' decals are laser printed onto either 'clear' or 'white' backing, the 'clear' being dependent on the base coat you apply and the finished effect you desire. The decals are supplied with very clear instructions on their application, including when to add pre-shading to the base coat, where desired, before you apply the decals. For this model I chose to use the 'clear' decals, in order to show the linen effect more visibly.

First I airbrushed a base coat of Tamiya white (XF2) on the surfaces to have the decals applied and once dry, checked and polished any imperfections (to avoid 'silvering' under the decals) then airbrushed a sealing coat of Alclad Clear Coat Gloss (ALC-310) lacquer, if felt necessary, to form a glossier surface for applying the decals. 'Silvering' is caused by air being trapped in the rough surface of the paint, such as a matte finish, which after the decal is applied and dries, causes the 'silvering'. The decals were then applied following the supplied 'Aviattic' instruction sheet. In this instance the decal sheets had to be cut to match the profiles of the surfaces that required decals. Care is needed to ensure the cut decals are the correct size and shape, otherwise gaps between decals can occur.

NOTE: As an alternative, to aid in decal adhesion, you can mix with the water a small amount of PVA adhesive (white glue) and also apply this on the surface of the model. Another method is to apply 'Future' acrylic floor polish (UK - Pledge Floor Care Finish) to the model surface. Always ensure all solutions under the decals are removed using tissue, cotton buds etc.

Once the decals have been applied I airbrush a sealing coat of Alclad Clear Coat Gloss (ALC-310) Lacquer over areas where more decals are to be applied, such as the 'Pheon' external markings for this model. Once applied and dry I airbrush a final sealing coat of Alclad Light Sheen (ALC-311) mixed 50-50 with Flat (ALC-314) over the decals.

PART 11 - RIGGING (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 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 structural strength I used 'Steelon' mono-filament (fishing line) of various diameters. This is effectively transparent but does give a look of steel, without the need of painting or colouring with a gel pen.
Typically for many British aircraft, the Sopwith Pup had two types of rigging. Cables were used for some flying controls and internal bracing and RAF streamlined (flat) rigging was used, primarily for wing and undercarriage bracing. Even at a scale of 1:32, it's difficult to see with the naked eye, any difference between flat or round rigging, or in fact the different sizes used on the actual aircraft. Due to this, and as a representation only of the rigging, I only use various diameter mono-filaments.
To represent the flat wire attachments to the aircraft I used 0.4 mm Nickel Silver tube (Albion Alloys). This was cut to appropriate lengths by rolling a shielded razor blade across the tube whilst applying light pressure. This will easily cut the tube without leaving burrs or blocking the cut end of the tube, which stop the rigging from passing through.

NOTE: As you work your way through the rigging it is always good to check the rigging attachment points for any damaged paint. This can be rectified before continuing with the rigging, just in case access will be limited once all of the rigging is completed.

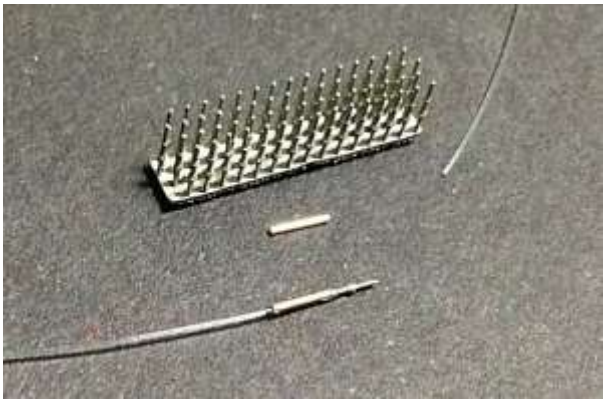
Flight controls cables:
A long length of 0.12 mm diameter 'Steelon' line is inserted into its pre-drilled rigging point and secured with thin CA adhesive. An Albion Alloy's micro-tube of either Brass (MBT05) or Nickel-Silver (NST05) is slid onto the line and then the free end of the line was passed through the associated flight control horn and looped back to the free tube. Using two pairs of tweezers, the free end of the line is inserted into the tube and pushed through until the line could be gripped from the other side. Then holding the tube with one pair of tweezers, the free end on the line is gently pulled to tighten the line and cause the free tube to slide up against the control horn etc. Hold the tube in position and apply thin CA adhesive to secure the line and tube in position. Once dry the exposed free end of the line can be cut away, as close to the control horn as possible, using a shielded razor blade.

This method can be used for attaching control cables from rigging holes to control horns etc, and when using after market turnbuckles. For turnbuckles fitted part way along a control cable, the lines and micro-tubes would attach to both ends of the turnbuckle. Where a single end turnbuckle is used, such as directly from the model part, the line and micro-tube would only be attached to the 'loop' end, as the other end of the turnbuckle would be attached to the model part.

Streamlined rigging wires:

Method 1: - A long length of appropriate 'Steelon' 0.12mm diameter line is inserted into 0.4mm diameter tube (Albion Alloys - Brass or Nickel-Silver) and secured with CA adhesive. An aluminium nut from 'RB Motion' (1279-A) is slid onto the line. The tube is then inserted into a pre-drilled 0.5 mm diameter hole (rigging point) with the nut slid up against the tube, secured with CA adhesive. Another nut and tube are slid onto the line and the free end of the line cut enough to allow the line, under slight tension, to enter the opposite rigging location hole. Keeping the rigging line in tension, the tube and nut are then secured in the location hole, as before.

Method 2: - A length of 0.4 mm diameter tube (Albion Alloys - Brass [MBT04] or Nickel-Silver [NST04]) is slid onto the shank of a 'Gaspatch' 1:48th scale RAF Later Type fitting and the a length of 'Steelon' 0.2 mm diameter line is inserted into the other end of the tube, which is then secured with thin CA adhesive. An aluminium nut from 'RB Motion' (1279-A) is slid onto the line and secured at the tube. The 'Gaspatch' fitting is then inserted and secured into the relevant 0.6 mm diameter pre-drilled hole (the flat shank of the 'Gaspatch fitting'). Another nut and tube are slid onto the line, the end of which is inserted through the 0.3 mm diameter pre-drilled hole for the opposite end of the rigging line. The free end of the line is pulled taut and then the line is secured in position with thin CA adhesive, followed by the tube and nut. The 'tag' of rigging line can then be cut away.

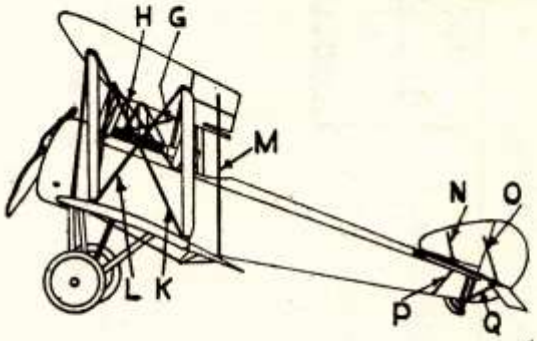


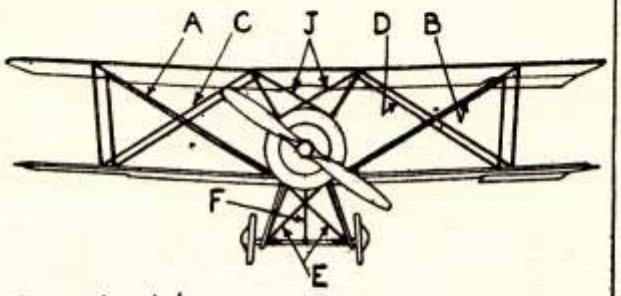
NOTE: These rigging methods may result in the line being slightly 'slack' and not tensioned enough. This can be resolved by applying heat close to and along the length of the line, which causes the mono-filament line to shrink and then tighten. Heat can be applied from a small soldering iron or similar, but obviously great care is needed, especially to avoid melting the line or touching and damaging the model parts.

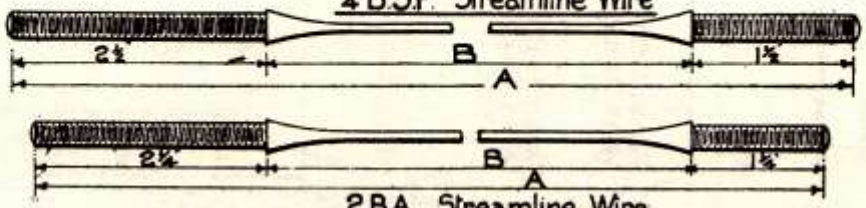
Finally the exposed micro-tubes are 'toned down' by applying either a light coat of 'Mr. Metal Colour' Dark Iron (214) or by applying an 'AK Interactive' wash, such as their Leaks and Stains wash.

On the following page is the official rigging chart for the Sopwith Pup and shows the two sizes of streamlined rigging wires used and where they are fitted. The flight control cables were different, being of the traditional round, multi-strand cable type. If required, this chart can be used to vary the diameter of line used in the various positions, in order to replicate the different streamlined wire sizes.
Reference: British Military Aircraft of World War One - The Official Technical and Rigging Notes for RFC and RNAS Fighting and Training aeroplanes, 1914-1918 (Arms and Armour Press - RAF Museum series, Volume 4).

RAF-WIRE LENGTHS.







2.B.A. Streamline Wire.

Index Letter on Machine	Description	N° Off	Size	Admiralty Lengths	Sopwith Lengths A	Sopwith Lengths B	Remarks
A	Front Flying Wires	4	¼ B.S.F.		9'-2¾"	8'-10¾"	
B	Rear Flying Wires	4	-		9'-2¾"	8-10¾"	
C	Front Landing Wire	2	-		7'-8¾"	7'-4¾"	
D	Rear Landing Wire	2	-		7'-8¾"	7'-4¾"	
E	Undercarriage Cross Bracing Wire	2	-		3'-9"	3'-5"	
F	Undercarriage Centre Wire	1	-	2'-5"	2'-8"	2'-4"	
G	Centre Section Side Bracing (Short)	2	2 BA	3'-4¼"	3'-6¾"	3'-3¼"	
H	Centre Section Side Bracing (Long)	2	-	3'-4¾"	3'-7¼"	3'-3¾"	
J	Front Centre Section Cross Bracing	2	-	3'-4¼"	3'-6¾"	3'-3¼"	
K	Incidence Wire (Long)	2	-	5-8"	5'-10½"	5'-7"	
L	Incidence Wire (Short)	2	-	3'-11¼"	4'-1¾"	3'-10¼"	
M	Aileron Connecting Wires	2	-	4'-3"	4'-5½"	4'-2"	
N	Tail Plane Bracing Wire (Top Front)	2	-	2'-9½"	3'-0"	2'-8½"	
O	Tail Plane Bracing Wire (Top Rear)	2	-	2-11"	3'-1½"	2'-10"	
P	Tail Plane Bracing Wire (Bottom Front)	2	-	2'-4¾"	2'-7¼"	2'-3¾"	
Q	Tail Plane Bracing Wire (Bottom Rear)	2	-	2'-10"	3'-0½"	2'-9"	

T.5. SOPWITH PUP.
(80 H.P. Le Rhone).
(100 H.P. Monosoupape).

PART 12 - CONSTRUCTION

My basic sequence of construction is as follows, which may not follow the kit instructions.

PART 1 - THE MODEL -Modifications or Corrections:

PART 2 - WOOD EFFECTS

PART 3 - WEATHERING (General)

PART 4 - THE COCKPIT

PART 5 - FUSELAGE INTERNALS

PART 6 - ENGINE

PART 7 - WHEELS

PART 8 - WEAPONS

PART 9 - PROPELLER

PART 12 - CONSTRUCTION (with **PART 10** DECALS & **PART 11** RIGGING)

PART 13 - FIGURES

PART 14 - DISPLAY BASE

CONSTRUCTION

1. Do Part 1 first, so that you can carry out any required modifications or corrections you want to incorporate into the model.
2. Do Parts 2 through 5, in preparation for closing up the fuselage.
3. Do Parts 6 through 9 in preparation for later in the build.
4. Read Parts 10 and 11 for information.
5. Ensure the three grooves in each fuselage half (for locating the cockpit assembly side frames) are clear of any paint or sealing coats. Also clean paint from the outer edges of the three side frame ribs on each frame.
6. Apply adhesive to the three grooves in the fuselage half that has the tail skid fitted and then locate the cockpit assembly into the grooves.
7. Apply adhesive into the three grooves in the other fuselage half, including in the tail skid location and then close up the fuselage, ensuring the tail skid and the cockpit assembly are located correctly.
8. Use elastic bands around the fuselage to hold the two halves together and then between the bands, apply adhesive along the fuselage joints. Leave the assembly to fully dry.

NOTE: When applying adhesive along seam joints, such as the fuselage, always give the adhesive time to fully cure, as sometimes, after its fully cured, the adhesive can cause the plastic to 'sink' along the seam joints, leaving small depressions. Checking for this is best done once a primer coat has been applied, as this will show any such problems, which can then be rectified using filler and sanding.

9 If necessary, fill any seam joint or adhesive sink marks with an appropriate model putty. I use 'Masilla Plastica ' (401), but any good putty will OK. Allow the putty to fully cure then sand flush to the model surface. Check and if it looks good, re-prime the sanded areas and when dry, check again. Repeat this procedure as necessary until you achieve a good joint.

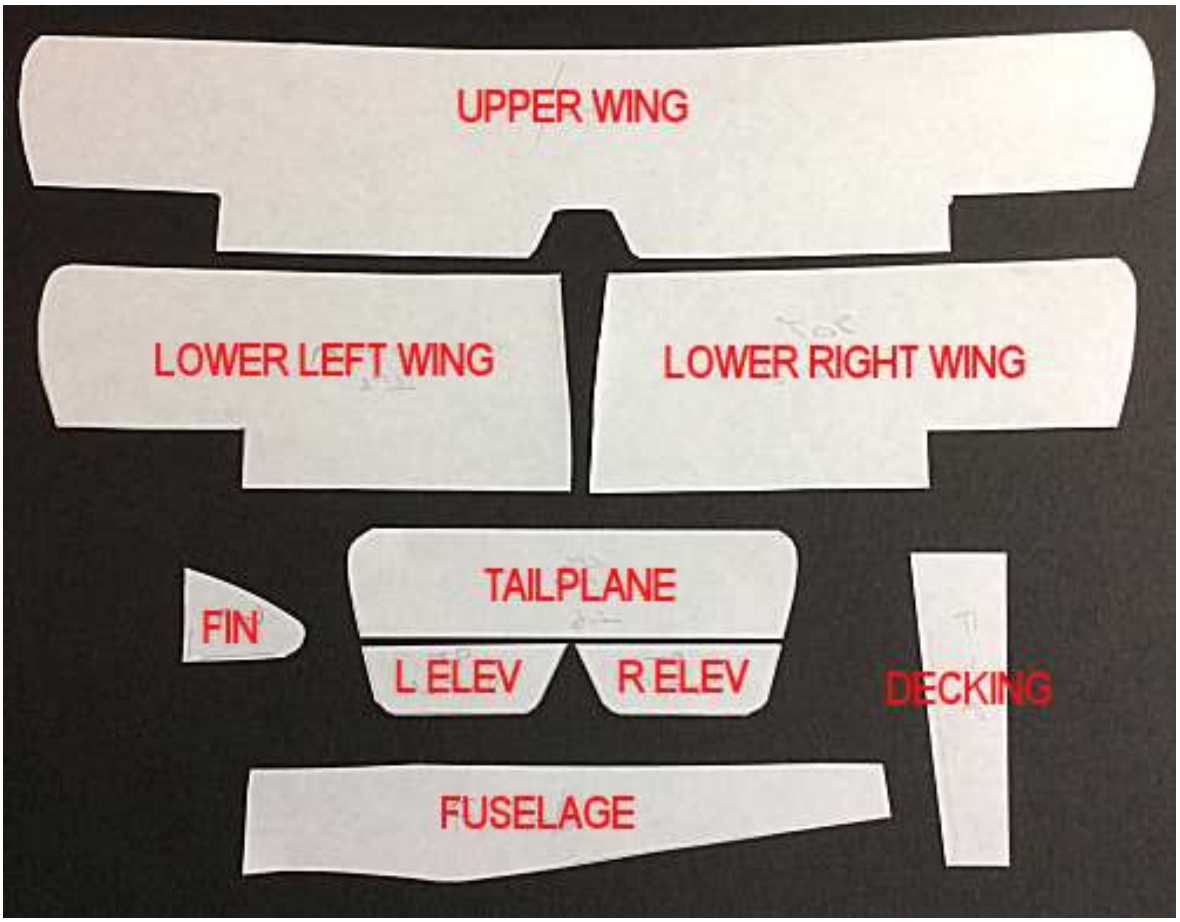
10. Fit the two forward side panels (for this model, kit item No.A23 and A24).

11. **Decal preparation:** As stated before, the 'Aviattic' PC10 and CDL linen decals are not 'cookie cut' (pre-shaped), but are supplied as sheets. Therefore care is required to ensure the decals are cut out accurately to fit the various areas of the model.

Using the two wings, axle fairing, four ailerons and the tailplane as guides, trace the out lines of each onto paper, ensuring to leave a slight overlap and that each paper template matches the allotted surface. Mark each template so you can recognise which template fits on which surface.

The fuselage sides, top and underside can't be 'templated' in the same way, but only by trial and error cutting until you achieve the correctly shaped templates.

Below are the paper templates for the upper PC10 surfaces.

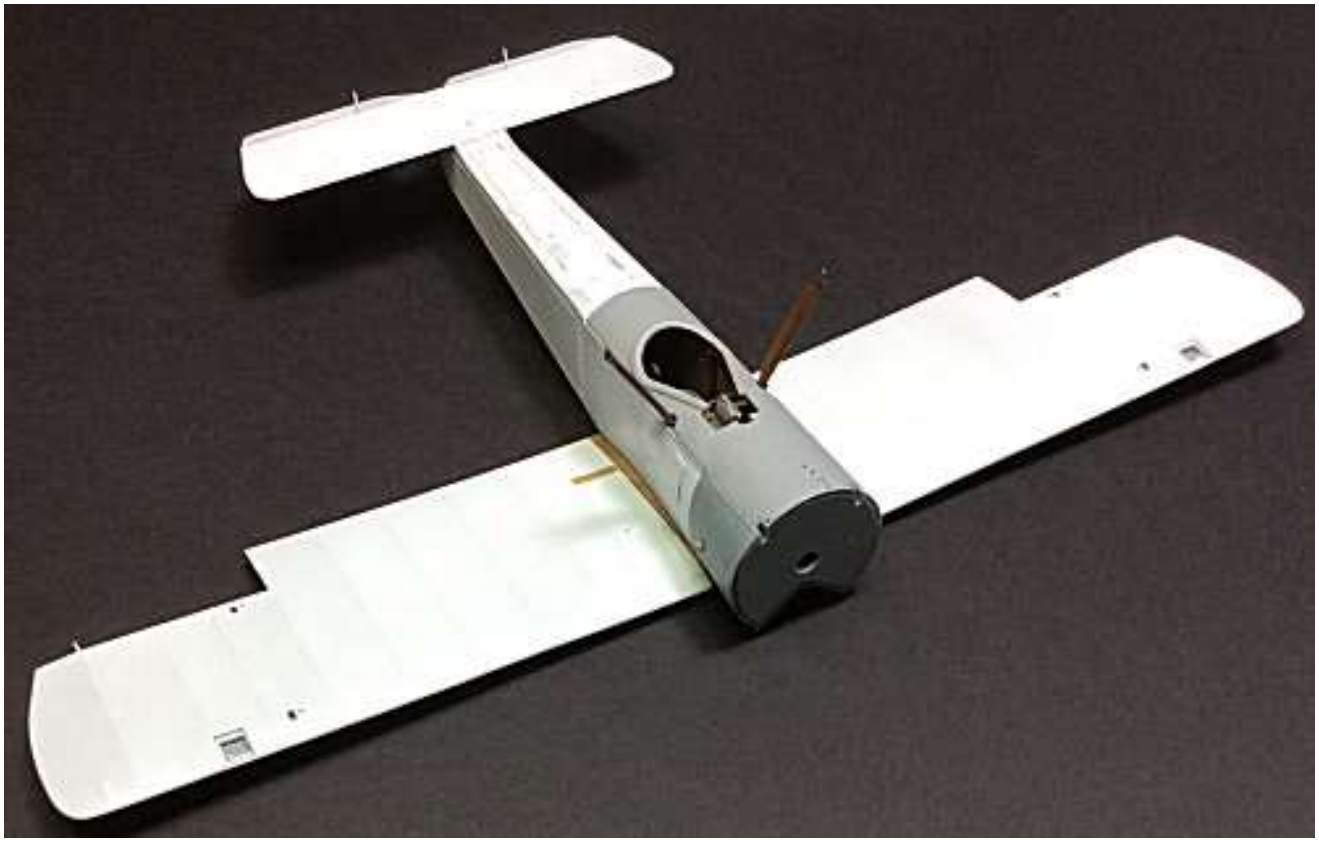


Using the paper templates, **‘lightly’** outline them onto the relevant ’Aviattic’ decal sheet. Make sure you don’t apply too much pressure when marking out the decals, as even a pencil can tear through the decal surface if too much pressure is applied. **NOTE:** Make sure you cut out the decals using the correct side of the template or you will end up with a ’mirrored’ decal (opposite way round).

Using sharp scissors or a scalpel blade, carefully cut out each decal. Make sure there is a clean cut through the decal as several cuts can cause slight ‘fraying’ at the cut edge, which can pull fine strips of the decal away when removed.

Retain the cut decals for application to the model later in the build.

12. Fit the tailplane - don’t fit the elevator control horns as these are fitted after applying the decals).
13. Fit the forward fuselage top decking. The underside of the decking was painted with wood effect (refer to Part 2 of this build log).
14. The internal surface of the bulkhead and shaft were brush painted with Mr. Metal Colour Stainless Steel (MC213).
15. Fit the engine bulkhead to the front of the fuselage. Ensure that the bulkhead is flush with the fuselage edges.
16. Fit the lower wing - don’t fit the aileron control horns as these are fitted after applying the decals).



17. I found after fitting the lower wing that there was a small gap at the wing roots, between the wing and fuselage sides. I filled this gap using ’Masilla Plastica ’ (401) putty and smoothed the join before it had time to set.

18. Once the putty had fully dried I masked the cockpit area then airbrushed Tamiya White (X2) over the model as a decal base coat.

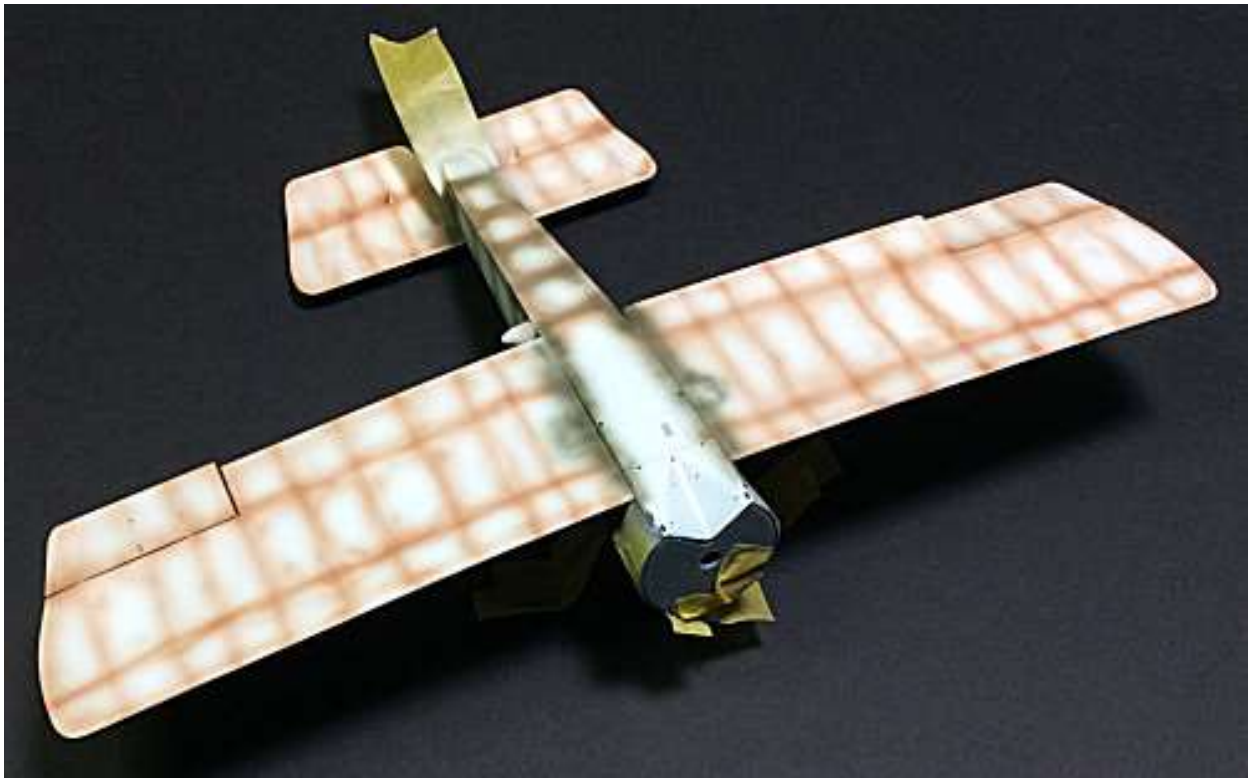
19. The next step was to pre-shade the external surfaces - temporarily fit the ailerons to both wings.

20. I mixed thinned Tamiya NATO Black (XF69) and Olive Drab (XF62) and then airbrush some representations of the pre-shading onto a spare piece of plastic card, to check the colour and intensity. Once satisfied I then I then cut a small ‘test’ strip of the relevant ‘Aviattic’ decal and applied it temporarily onto the appropriate pre-shaded surface. I could then check the pre-shading colour was correct through the decal.

    NOTE: If the colour of the pre-shading does not look correct through the decal, mix a slightly different shade of paint and overspray the pre-shading, then check again until you are happy with the results. If the pre-shading colour is too strong, airbrush a light and thinned ‘misting’ coat of Tamiya White (X2) over the pre-shading, in order to ‘knock it back’ to reduce the intensity.

21. The upper surfaces were then pre-shaded to highlight the structural formers, stringers and longerons of the fuselage, wings, tailplane and fin. These lines will show through the semi-transparent ‘Aviattic’ Light PC10 decals.

22. The pre-shading for the underside CDL surfaces was done using a thinned mixture of Tamiya Wooden Deck Tan (XF78) and NATO Brown (XF68). Remember that the under side pre-shading will include the front and rear wing spars, which were not normally visible through the PC colours applied to the upper surfaces.



23. The model was then given an airbrushed sealing coat of Tamiya Clear (X22) - normally I use Alclad Gloss (ALC-310), prior to applying the decals, but instead used the Tamiya product as it tends to dry and set quicker than Alclad.

24. Once the sealing coat has dried fully, remove the temporarily fitted ailerons from both wings.

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

    Make sure the model surface for each decal to be applied is clean and smooth.

    NOTE: Apply the upper surface (PC10) decals first.

    Make sure the model surface is clean and smooth, otherwise particles on the surface will cause 'silvering' (trapped air) under the decals when dry.

    Wet the model surface with clean water.

    Soak the decal in warm water for around 30 seconds or long enough to be able to move the decal on its backing sheet.

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

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

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

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

The four roundel decals for the upper wing are designed to wrap over the wing aileron trailing and leading edges. The decals are marked with dotted lines to show the wrap line. Make these decals are firmed down at these areas of the decal.

Use a needle to carefully prick through the decal on any areas where air is trapped and can't easily be removed, such as wing strut location holes, aileron pulley apertures and around raised detail, such as the applied photo-etch pilot steps on the lower wing.

Apply 'MicroSol' around these areas and the edges, as well as across the entire surface of the decal.

Allow these decals to fully set.

Once the upper surface decals have fully set and dried, the underside CDL decals can be applied using the same method.

Once fully set, airbrush a sealing coat of Alclad Light Sheen (ALC-311) over the decals and allow to fully dry.

NOTE: Even when applied and sealed, the decals can easily be damaged if handled roughly or scraped with a sharp edge. Once decals have been applied, I use either lint free or surgical rubber gloves when handling those surfaces.

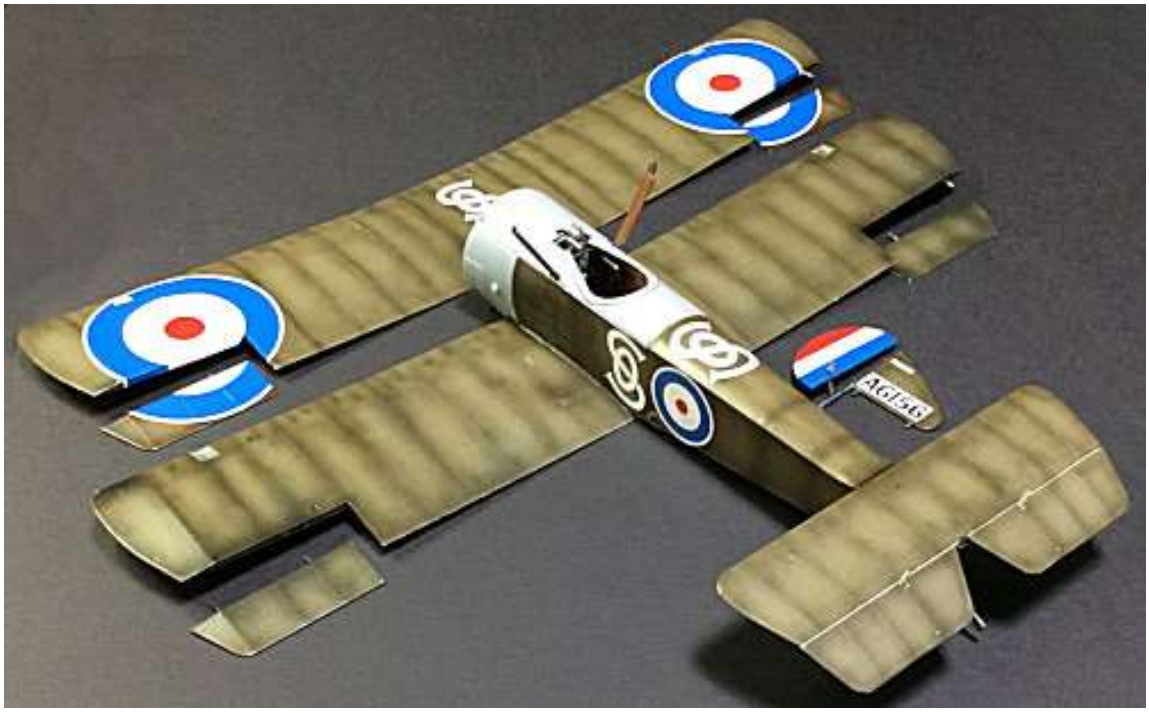
26. Using a sharp and shielded razor blade, carefully cut away the decal ‘skin’ covering the four aileron pulley apertures on the wing leading edges, to expose the pulley locations.

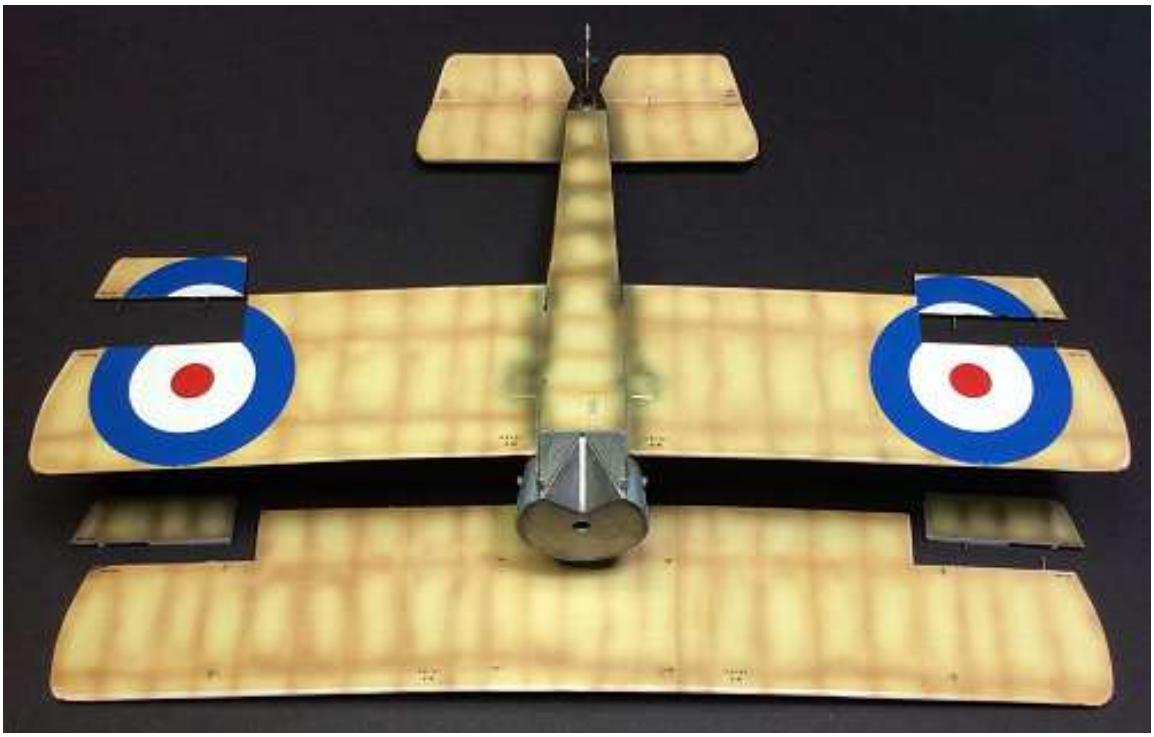
27. Airbrush a light sealing coat of gloss, such as Alclad Gloss (ALC-310), over the areas of the model that will have the kit supplied decals applied.

28. Once the gloss coat has fully dried, apply the kit supplied decals in the normal way.

29. Apply ’MicroSol’ over the applied decals. **NOTE:** The decals will ‘wrinkle’ as the solvent does its job, however this is normal and the decal will smooth out once the solvent has dried. Never be tempted to try smoothing these wrinkles as this will damage the softened decal.

30. Once the kit supplied decals were dry, I sealed them with Alclad Light Sheen (ALC-311).





31. The following were brush painted with Mr. Metal Colour Stainless Steel (MC213) and buffed when dry: - Inside of the engine cowl, forward underside panels on the fuselage, the rounds ejector chute under the fuselage, the carburettor intake pipes and the two pilot steps on the lower wing.

32. The cockpit top forward decking was brush painted with Tamiya Neutral Grey (XF53) and the engine cowl airbrushed with the same.

33. The cockpit surround padding and the four aileron pulley apertures in the wings were brush painted with Humbrol Leather (62) mixed with a few drops of Tamiya Hull Red XF9).

34. The fuel/oil cap were brush painted with Mr. Metal Colour Brass (MC219).

35. Attach the four ailerons to their relevant locations and secure them in position using thin CA adhesive around the micro-tube pins previously fitted in Part 1 of this build. Remember to position the ailerons correctly if you fitted the control column off centre (one side of the ailerons up and the other side down). If the control column was fitted centred then all of the ailerons will be in-line with the wings.

36. Secure the engine into the bulkhead by inserting the engine shaft into the bulkhead hole. If the engine is to be static it will need to be glued in position.

37. Fit the engine cowl over the engine and glue it onto the fuselage bulkhead.

38. The model was then airbrushed with a 50-50 mix of Alclad Light Sheen (ALC-311) and Flat (ALC-314), thinned with Alclad Airbrush Cleaner (ALC-307). This will give the correct surface finish for applying the ‘Flory’ clay weathering wash.

39. ‘Flory’ Dark Dirt clay wash was applied over the upper surfaces of the model and the Grime clay wash on the undersides.

40. Once fully dry, the washes were removed as required to achieve the desired effect (refer to Part 3 of this build log).

41. The clay wash was then sealed by airbrushing with a 50-50 mix of Alclad Light Sheen (ALC-311) and Flat (ALC-314), thinned with Alclad Airbrush Cleaner (ALC-307).

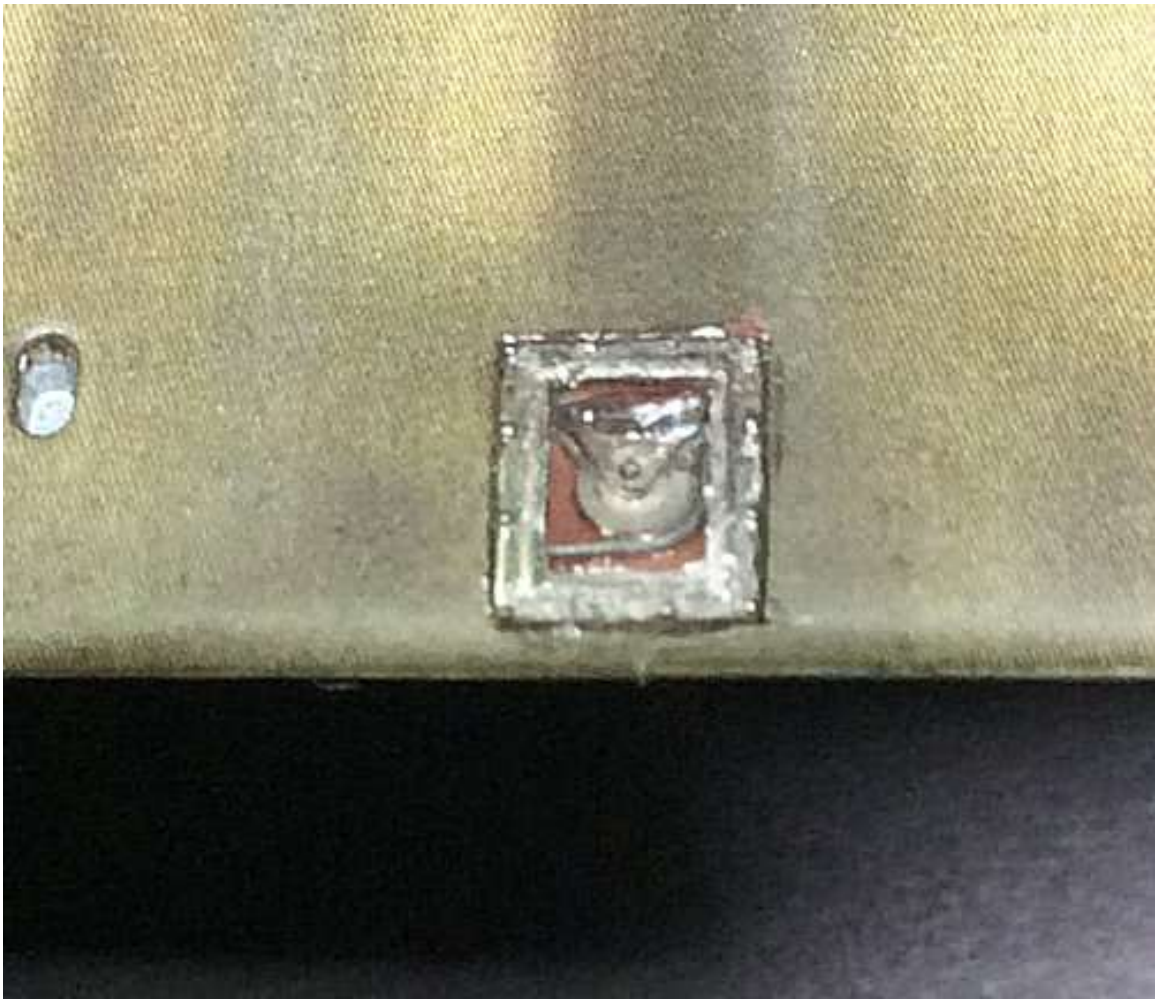
42. Oil staining was applied using ‘AK Interactive’ Engine Oil wash (AK2019) (refer to Part 3 of this build log).

43. Extra weathering was applied as required using the following (refer to Part 3 of this build log):
Mud colour from the Tamiya Weathering Master Set A
Green colour from the Tamiya Weathering Master Set E
Oil Stain colour from the Tamiya Weathering Master Set D.

44. The applied decals will have covered the pre-drilled holes for the rigging points as well as those for any other required openings, such as those required for the wing struts, pilot's step and various control lines. Carefully pass the drills used through each rigging location to re-open them and make sure any other apertures are clear of decal. If necessary, apply 'Micro-Sol' in these to soften and conform the edges of the decals.

45. The four previously assembled photo-etch aileron pulleys were located into the upper and lower wing leading edge apertures using thin CA adhesive. The aileron control cables were simulated by adding short lengths of 0.2 mm diameter lead wire by PlusModel.

46. The kit supplies transparent 'windows' for the aileron pulley locations and these windows can be delicate if you press on them during fitting. I carefully sanded the edges of each one to ensure an easy fit into the apertures. These were then secured in position with 'Formula 560' canopy glue, although standard PVA adhesive will do just as well. I then masked off the windows with the HGW masks in set No.632010 and then brush painted the edges of each window Mr. Metal Colour Stainless Steel (MC213).



47. The undercarriage was assembled using the kit instructions, except that as the wheels were to be static, they were glued onto the axle.
NOTE: Ensure the previously drilled holes (refer to Part 7 of this build log) are positioned such that when the model support pins are inserted, they will be vertical when inserted in the display base.
NOTE: The assembly was temporarily dry fitted into the fuselage and the parts glued and left to set. Once set the assembly was removed.
The colours I used to paint the parts of the undercarriage parts were as follows:
1. Undercarriage struts - Thinned mix of Tamiya Olive Drab (XF62) and NATO Black (XF69).
2. Axle - Mr. Metal Colour Stainless Steel (MC213).
3. Bungee suspension - Tamiya Dark Yellow (XF60).
4. End plates - Tamiya NATO Black (XF69).

48. 'Flory' Dark Dirt clay wash was applied over the undercarriage assembly and when dry, removed as required to achieve the desired effect.

49. The undercarriage assembly was then airbrushed with a 50-50 mix of Alclad Light Sheen (ALC-311) and Flat (ALC-314), thinned with Alclad Airbrush Cleaner (ALC-307).

50. The two kit supplied decals were applied.

51. The undercarriage assembly was then airbrushed with a 50-50 mix of Alclad Light Sheen (ALC-311) and Flat (ALC-314), thinned with Alclad Airbrush Cleaner (ALC-307).

NOTE: Ensure the previously drilled rigging location holes, which are at the top of the rear undercarriage struts, are clear.

52. The undercarriage assembly was fitted to the fuselage (without the wheels).

53. The fin was fitted to the rear of the fuselage.

54. Brush paint the rudder, aileron and elevator control horns using Tamiya NATO Black (XF69). Once dry ensure all of the rigging holes (0.3 mm diameter) in the horns are open and clear of paint.

55. **Rigging:** Before starting to rig the flying controls, there are two sets of cables that need to be fitted whilst there is still adequate access.

Fuselage side panel - retaining cable: Each forward side panel on the fuselage sides had a retaining cable secured down its rear edge. Two holes on each fuselage side should have already been drilled for a 'GasPatch Elite Accessories Turnbuckles 1/48 scale (one end type). The ends of two turnbuckles without the 'loop' were carefully bent to approximately a right angle (90 degrees). A length of 0.12 mm diameter 'Steelon' line was passed through each turnbuckle then looped back through a short length of Albion Alloys 0.5 mm brass tube (MBT05). The tube was pulled up against the turnbuckle and secured with thin CA adhesive and the lines 'tag' cut away. Each turnbuckle was inserted into the pre-drilled hole at the top of the fuselage side panels and secured. The line was then cut to allow the line to enter the pre-drilled holes in the lower wing then secured in position, whilst holding the line taut.

Engine cowl - retaining cable: The rear of the engine cowl had a retaining cable secured around its rear edge. Two holes in the cowl at the forward undercarriage strut) should have already been drilled for a ‘GasPatch Elite Accessories Turnbuckles 1/48 scale (one end type). The ends of two turnbuckles without the ‘loop’ were carefully bent to approximately a right angle (90 degrees). A length of 0.12 mm diameter ’Steelon’ line was passed through one turnbuckle then looped back through a short length of Albion Alloys 0.5 mm brass tube (MBT05). The tube was pulled up against the turnbuckle and secured with thin CA adhesive and the lines ‘tag’ cut away. This was repeated on the other end of the line, but the tube and turnbuckle were NOT secured on the line. This turnbuckle was then inserted into the other pre-drilled hole in the engine cowl and secured. The line ‘’tag’ was gently pulled to tighten the line around the engine cowl. The tube was pushed up against the turnbuckle and secured in position, whilst holding the line taut. Lastly the excess line ‘tag’ was cut away.

Control Rigging: The next stage is to rig the model. This is done in three stages.

NOTE 1: The rigging material (line) used is 'Steelon' mono-filament (0.12 and 0.2 mm diameter).
NOTE 2: The adhesive used throughout to secure rigging is thin CA adhesive.
NOTE 3: Refer to page 13 of the kit instruction manual and Part 11 of this build log.
NOTE 4: The only exposed 'traditional' turnbuckles on this aircraft are on the rear of the engine cowl and fuselage side panels.
NOTE 5: The **Stage 2** rigging is done with the **top wing not fitted** to the model.
NOTE 6: The 'RB Motion' nuts used are very small and liable to end up in the bowels of the dreaded 'carpet monster'. Therefore always use a long enough length of line to be able to lay the end on your work surface and guide the nuts onto the lines.

STAGE 1 - Rigging the tail and undercarriage

Rudder: The rudder is operated by twin cables attached to the left and right control horns, which are located towards the bottom of the rudder. These cables are routed through an aperture in the sides of the rear fuselage. **Secure the rudder control horn B3 into the slot on the rudder**. I cut two lengths of 0.12 mm line long enough to run from the fuselage to the horns and back. I passed one line through the hole in a control horn and then slid on each end a short length of Albion Alloy's 0.5 mm Nickel-Silver micro-tube (NST04). These were then slid up to the control horn and once the line was pulled taut, secured to each other. **Position the rudder onto the fin and rear fuselage and secure.** The two free ends of the line were inserted into the fuselage aperture and holding the lines taut, secured in position. Repeat for the other side.

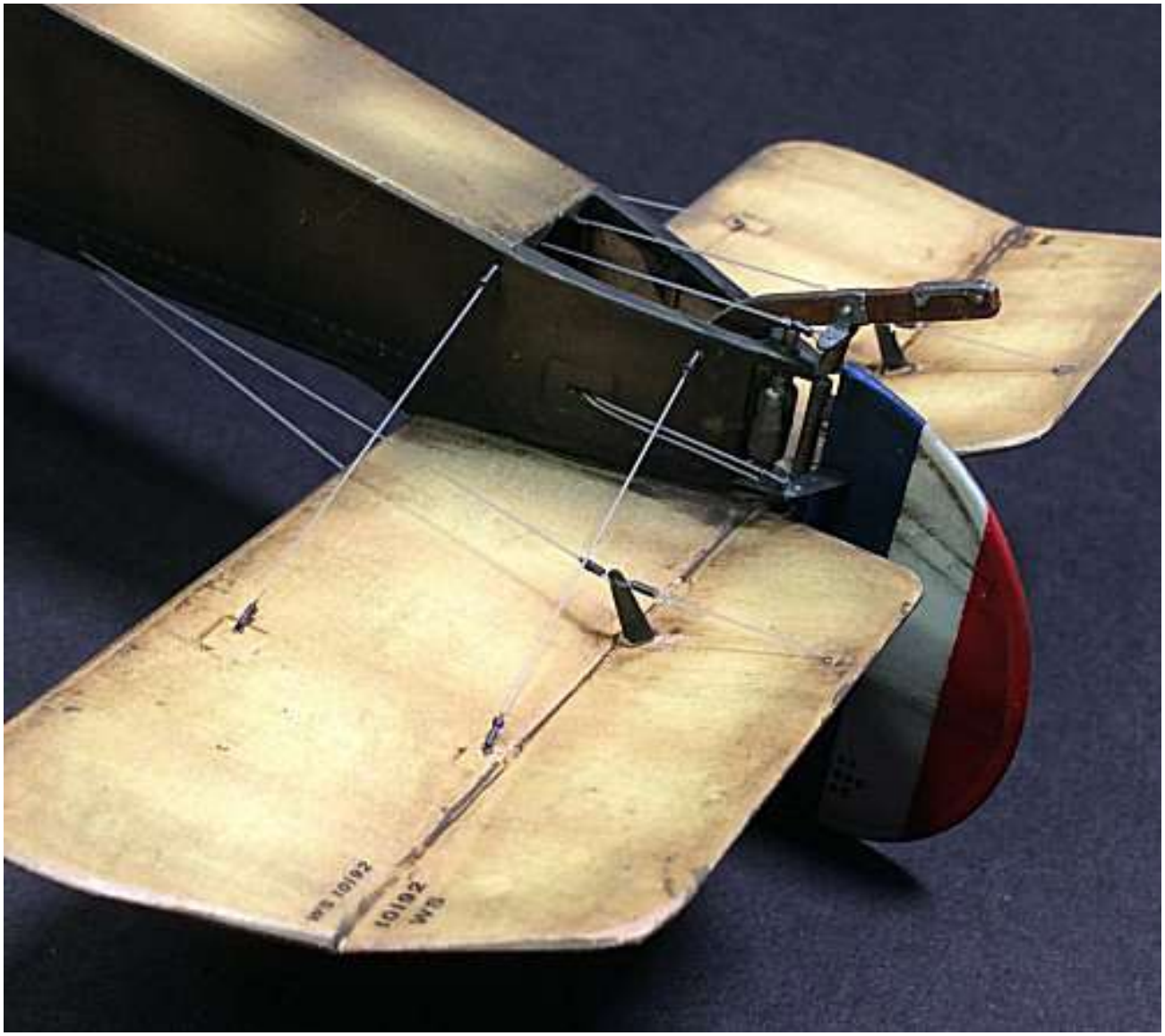
Tailskid: The tailskid was controlled by a single cable attached to each side of its control horn. I cut two lengths of 0.12 mm line. I then passed one line through the hole in one side of the control horn and then slid on a short length of Albion Alloy's 0.5 mm Brass micro-tube (MBT05). I looped the line from the control horn back through the tube and whilst pulling the line taut, slid the tube up to the control horn and secured it in position on the line. The excess 'tag' of line was cut away using a shielded razor blade. The free end of the line was inserted up into the rear fuselage opening and secured in position. Repeat for the other side.

Elevator: The elevator was controlled by a cable on each side of the elevator. Each cable was routed from an upper aperture, located at the upper longeron of the fuselage, then to the upper control horn and from there back and through the trailing edge of the elevator. From here each cable ran forwards to the lower control horn and onwards the fuselage lower aperture. To do this requires three separate lines. The first from the fuselage upper aperture to the control horn. The second from the upper control horn, via the elevator to the lower control horn. The third from the lower control horn to the fuselage lower aperture. **Secure the elevator control horns B12 into the slots on the elevator.** The two 0.12 mm lines from the fuselage to control horns were passed through the relevant hole in the control horns and then had a short length of Albion Alloy's 0.5 mm Brass micro-tube (MBT05) slid on. The lines were looped the control horn back through the tubes and whilst pulling the line taut, the tubes were slid up to the control horn and secured in position on the line. The third 0.12 mm line was passed through the hole at one end of the control horns and looped back through a slid on tube and secured in the same way. The free end on this line was passed through the elevator and attached to the other control horns the same way. Excess 'tags' of lines were cut away using a shielded razor blade. The free ends of the four lines were secured into the relevant apertures on the rear fuselage.

Tailplane: RAF aerodynamic wires spanned across the tailplane and through the fin, ending at the lower rear of the fuselage. The end fixing of each wire was adjustable and secured with a lock nut. Two suitable lengths of 0.12 mm line were cut.

Forward bracing cable: - At the bottom of the fuselage a 0.3 mm diameter hole should have been drilled. One end of a line was secured into the hole on left side of the fuselage then two short lengths of Albion Alloy's 0.4 mm Nickel-Silver micro-tube (NST04), with two aluminium nuts from 'RB Motion' (1279-A), were slid onto the line. This line was then passed through the forward hole in the tailplane and again, two tubes and nuts were slid onto the line. The line was then passed over the forward fin location, pulled taut and secured in position. The same process was used routing the line through the right side of the tailplane and when pulled taut, was secured in position into the opposite fuselage hole. With the line secure, each tube and its nut were slid up to the end of it line and then secured in position.

Rear bracing cable: - The same process was used for the rear bracing cable, with the exception that the line passes through the fin top rear edge. Also the line needs to be secured in 0.3 mm holes drilled through the bottom rear end of the fuselage.

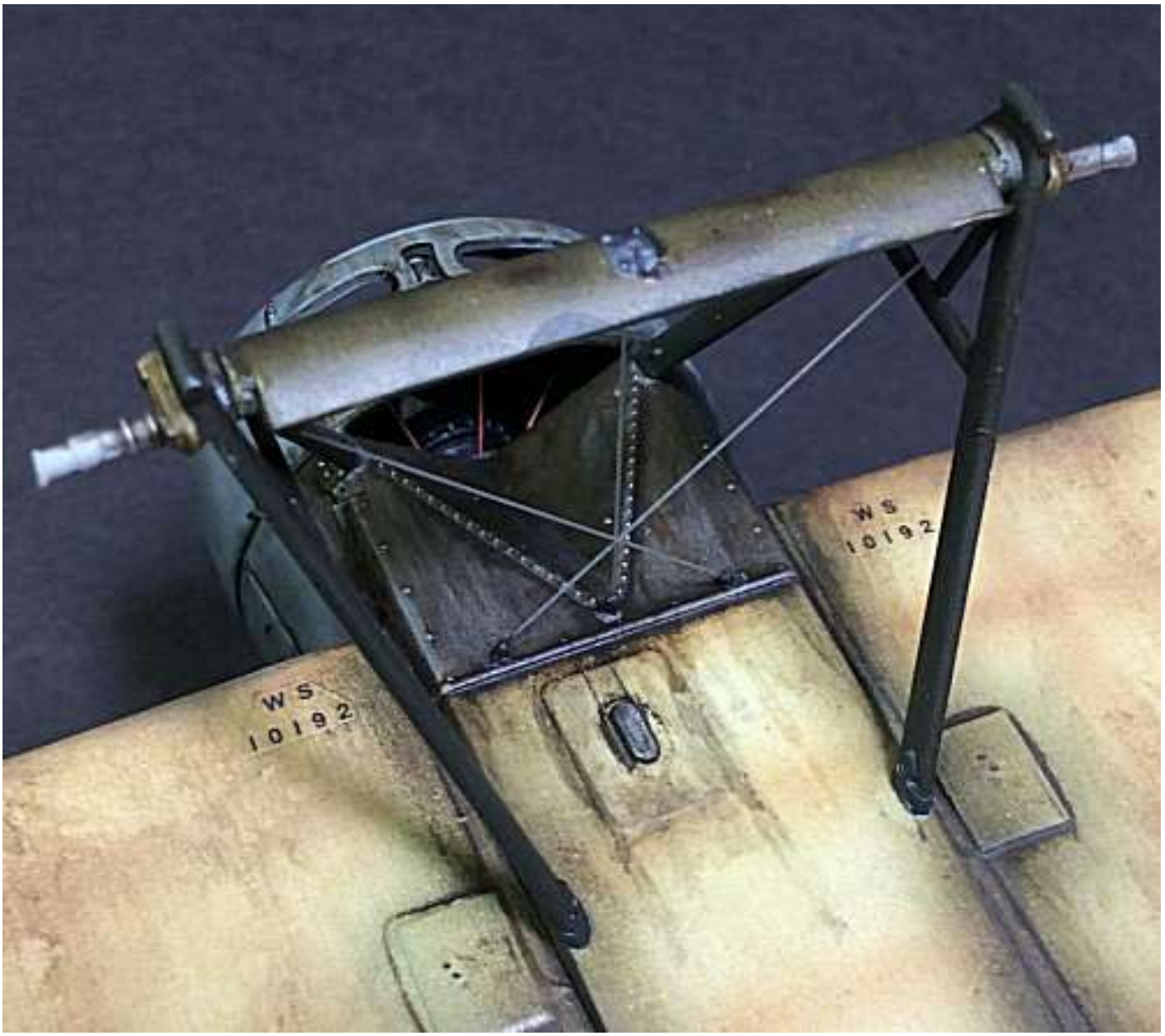


<u>Undercarriage cross bracing:</u> The undercarriage was braced with three RAF aerodynamic wires, two that crossed and one centrally through the centre of the axle fairing. Three 0.5 mm diameter holes should have been drilled into the bottom of the fuselage. The two outside holes should be angled across and towards to where the outside of the axle would be on the opposite side. Three 0.3 mm diameter holes need to have been drilled in the axle fairing, one centrally and close to the rear of the axle and one at each end of the axle fairing as close as possible to the base of the struts.

A short length of Albion Alloy's 0.4 mm Nickel-Silver micro-tube (NST04) was secured onto the end of the three 0.12 mm lines. The tubes were inserted into the three pre-drilled holes in the bottom of the fuselage and secured in position.

Two aluminium nuts from 'RB Motion' (1279-A) and another tube were slid onto each of the three lines then the line free ends were passed through the holes in the axle fairing (central to centre and the outers crossed). Each line was pulled taut and the line secured in the axle fairing. The excess tags on the secured lines were cut away. The three sliding tubes and their nuts were moved up to the axle fairing and then secured in position.

<u>NOTE:</u> It is advisable to leave rigging the ailerons until the end on the build, as they are easily damaged when handling the model (refer to STAGE 3 rigging in Part 12 of this build log).



Glue the previously assembled Vickers machine gun onto it mounting.

Test fit each wing support and cabane strut into its location in the underside of the upper wing. This will ensure the struts will enter fully and will be seated correctly.

Glue the four wing outer support struts into their locations in the lower wing and the two forward cabane struts into their fuselage locations. Make sure the outer strut with the twin pitot tubes is fitted as the forward strut on the right wing.

‘**Dry fit’** the top wing onto the support and cabane struts. Make sure the wing is seated fully onto the struts.
NOTE: Do not secure the upper wing in position at this stage.

Allow the glued struts in the lower wing and fuselage to set fully.

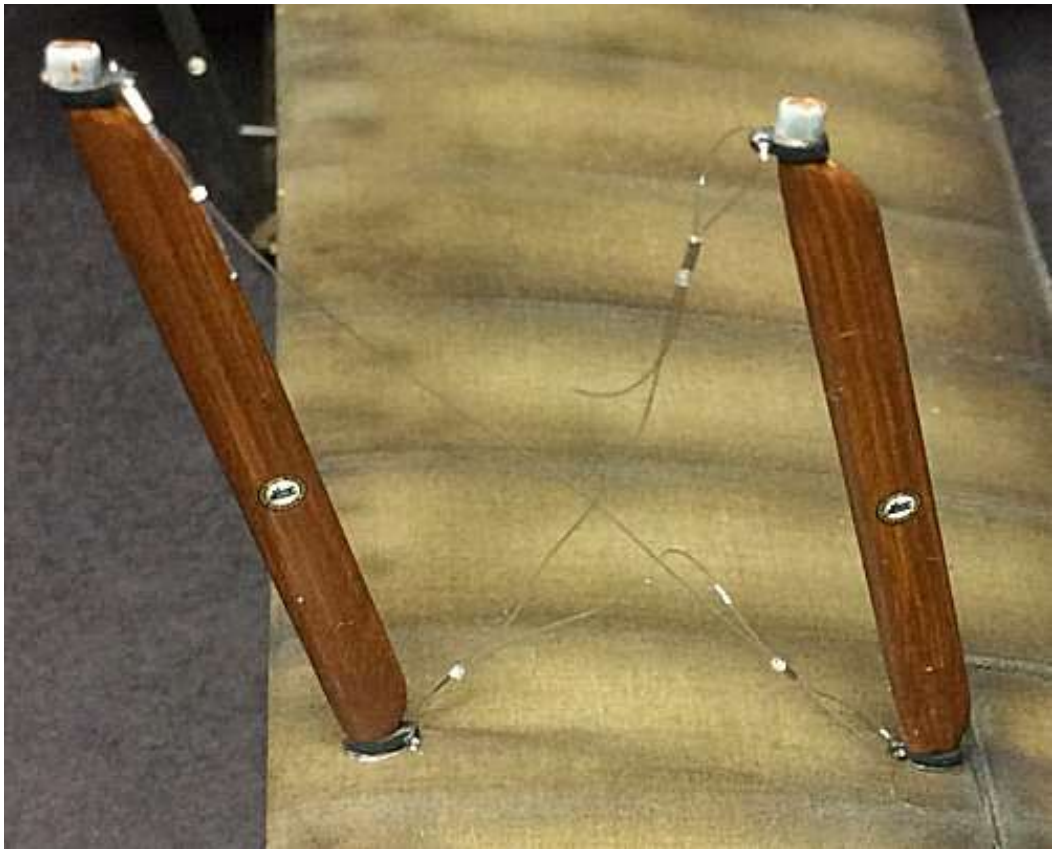
Remove the upper wing from the support struts.

STAGE 2 - Pre-rigging the wings.
The following rigging is done ***before*** the top wing is fitted.

Front to rear cabane struts - cross bracing wires: Two RAF aerodynamic bracing wires were attached to the top and bottom end fittings of the front and rear cabane struts on both sides of the fuselage. These wires crossed at each side. The end fittings of each strut should have been pre-drilled with of 0.3 mm diameter drill. One end of the four cut 0.12 mm diameter lines was looped through the strut upper holes then a short length of Albion Alloy's 0.5 mm Brass micro-tube (MBT05) was slid onto the lines. The lines were then routed back through the tubes, which were then slid up to the end fittings. An aluminium nut from 'RB' Motion' (1279-A) was slid onto each line and over the end of the exposed line, then against its tube. An 'RB Motion' nut was then slid onto the free ends of these lines, followed by another micro-tube then the lines were looped through the lower strut holes and back through the micro-tube and through the nut. ***Leave the lines slack and do not tighten or secure the ends of the line at this stage*** **(**tightening the lines without the top wing fitted will deflect the top of the struts, causing misalignment with the top wing locations). Cut and shorten the exposed ends of the lines from the micro-tubes, leaving enough to pull the lines tight later in the build.
NOTE: Method 2 for rigging can't be used for these struts due to the thin strut design.

Outer struts - crossed incidence wires: Two RAF aerodynamic incidence wires were attached to the top and bottom end fittings of the outer wing struts on both sides of the model. These wires crossed at each side. The end fittings of each strut should have been pre-drilled with of 0.3 mm diameter drill. Pre-rig these crossed lines using the same method as above for the front to rear cabane struts.
NOTE: Again, method 2 for rigging can't be used for these struts due to the thin strut design.

Pre-rigged incidence wires on the outer struts



Front cross bracing wires: Two RAF aerodynamic bracing wires were attached close to the forward cabane strut attachments on the underside of the upper wing and then across to the forward edge of the fuselage top decking. These wires crossed. The wing locations and front decking locations should have been pre-drilled with a 0.6 mm diameter drill, which were angled approximately to the run of the finally fitted wires. Using Method 2 (refer to Part 11 of this build log), attach each line into the pre-drilled holes in the top wing (inboard of the two forward cabane strut locations.
NOTE: Make sure the 'Gaspatch' fitting does not enter into the holes for the cabane struts, otherwise the struts will not be able to be seated fully into the wing.

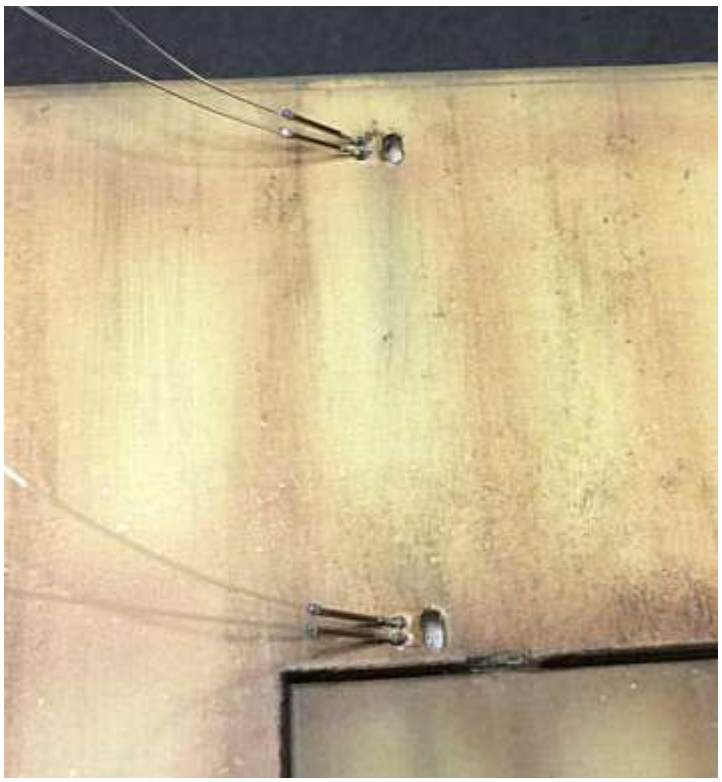
Forward (twin) flying wires: The forward flying wires consist of twin wires, which were attached to the top of each forward undercarriage strut and the underside of the top wing, adjacent to the top wing forward outer support struts. Two 0.6 mm diameter holes should have been pre-drilled into the wing locations and two 0.3 mm diameter holes in the undercarriage struts, at an angle that will give a straight run between the attachment points. Using Method 2 (refer to Part 11 of this build log), attach each line into the pre-drilled holes in the top wing.

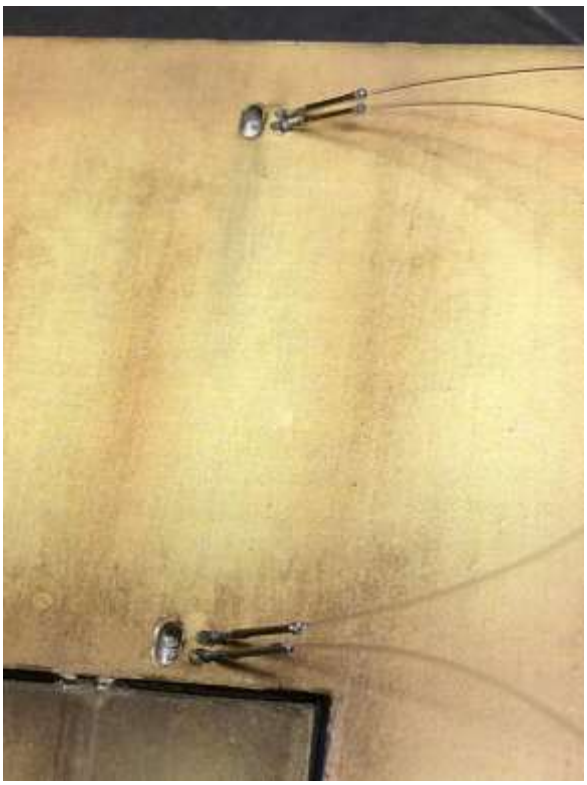
Rear (twin) flying wires: The procedure used for the forward (twin) flying wires is used for the rear flying wire, but at the top wing rear outer support struts.

Forward landing wires: A single RAF aerodynamic wire was attached between the top and bottom wings, adjacent to the top of the forward cabane strut and bottom of the wing outer forward support strut. Using Method 2 (refer to Part 11 of this build log), attach each line into the pre-drilled holes in the top wing.

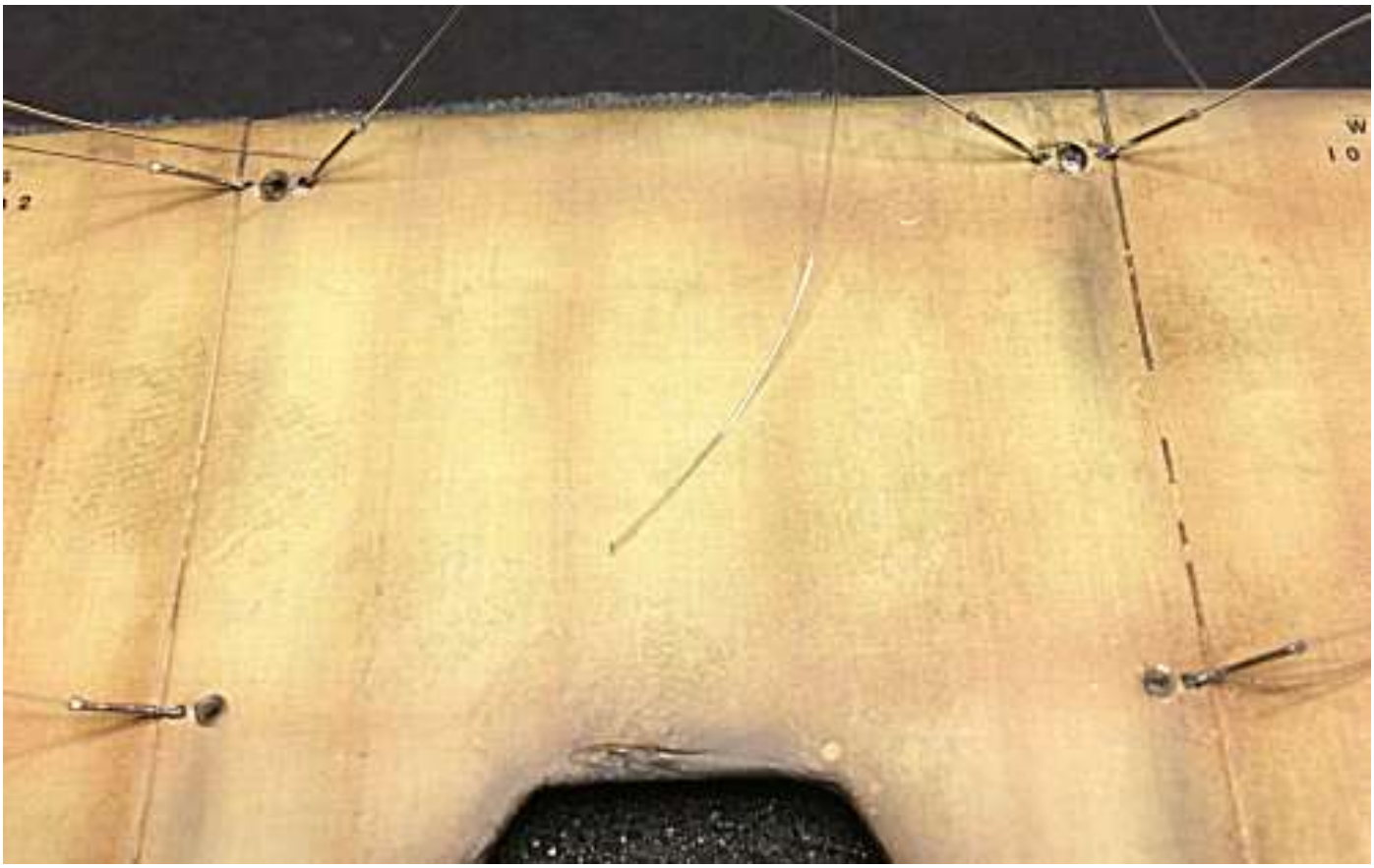
Rear landing wires: A single RAF aerodynamic wire was attached between the top and bottom wings, adjacent to the top of the rear cabane struts and bottom of the wing rear forward support strut. Using Method 2 (refer to Part 11 of this build log), attach each line into the pre-drilled holes in the top wing

Top wing underside - front and rear twin flying wires.

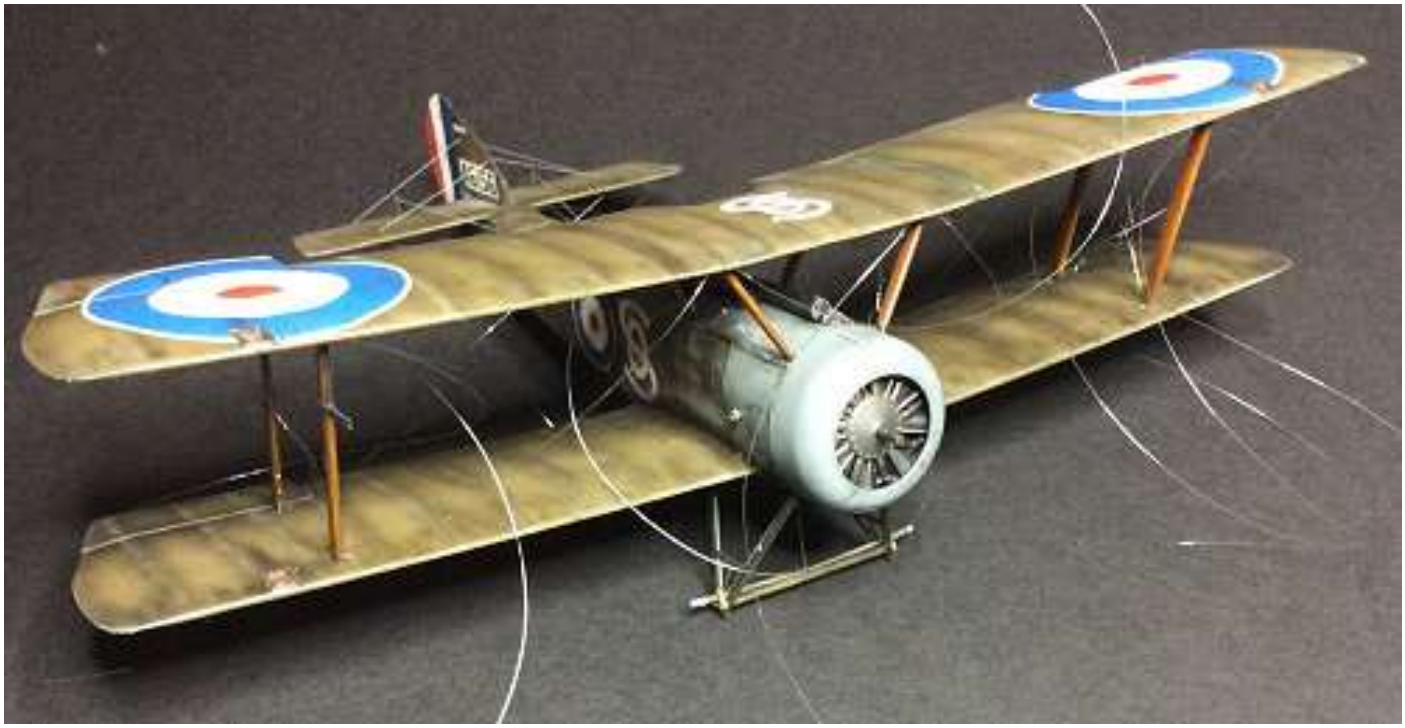




Top wing - Front/Rear single landing wires and front cross-bracing wires



Glue the upper wing in position on the wing and cabane support struts.
NOTE: Make sure the wing is seated fully onto the struts and that any previously installed rigging is not trapped or affected by the glue at the upper wing strut joints.



STAGE 3 - Final rigging.
The final rigging can be completed now that the top wing is fitted.

Front to rear cabane struts - cross bracing wires: The rigging has already been fitted to the front and rear cabane struts, but was left slack. With the top wing now fitted, these lines can be tightened and secured. At the top of each strut, hold the two lines from the micro-tube and slide the tube and nut up against the strut and secure with thin CA adhesive. Now at the bottom of each strut, carefully pull on the exposed 'tail' of the line to tighten the line between the struts. If necessary slide the tube away from the strut until the line is tight then move it and the nut up against the strut and secure. Cut away the 'tail' of the lines as close as possible to the micro-tubes.

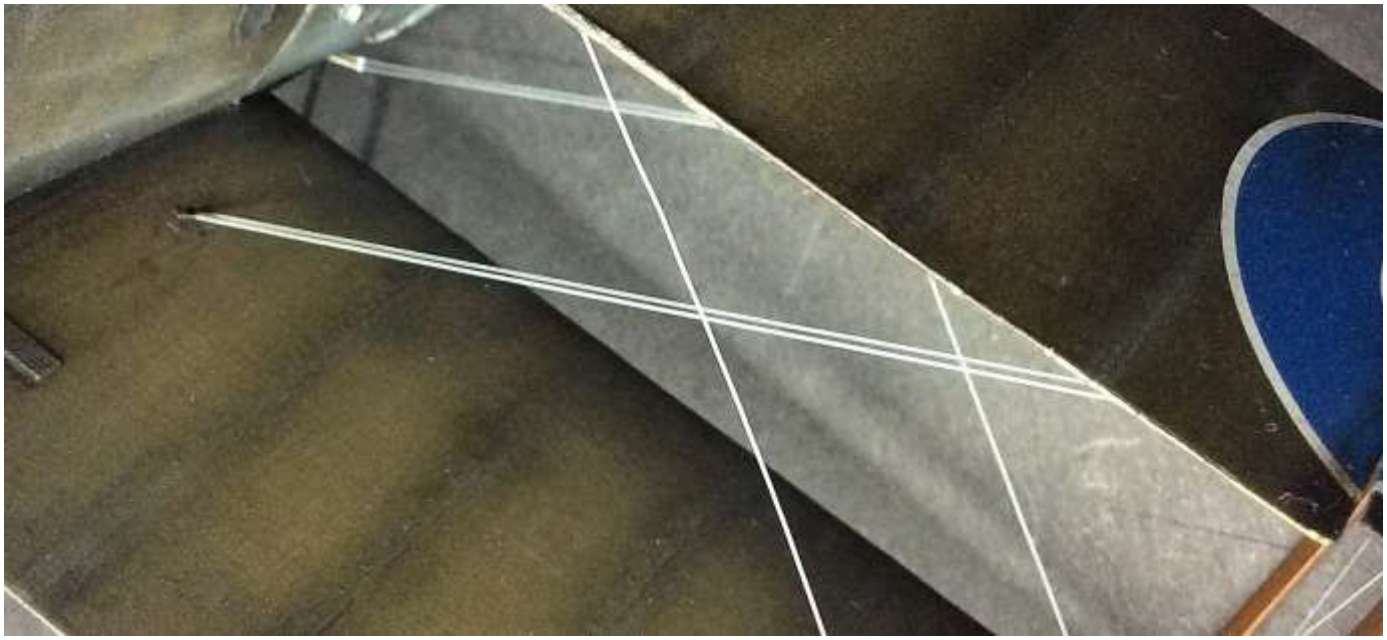
Outer strut - crossed incidence wires: The rigging has already been fitted to the tops of the wing outer support struts. Carry out the same procedure on these lines as for the front and rear cabane struts (above).

Outer strut incidence wires

Front cabane strut - cross bracing wires: The rigging has already been fitted to the underside of the top wing. Each line was inserted into its pre-drilled hole in the fuselage top decking. Hold the line held in tension, then secure in position.

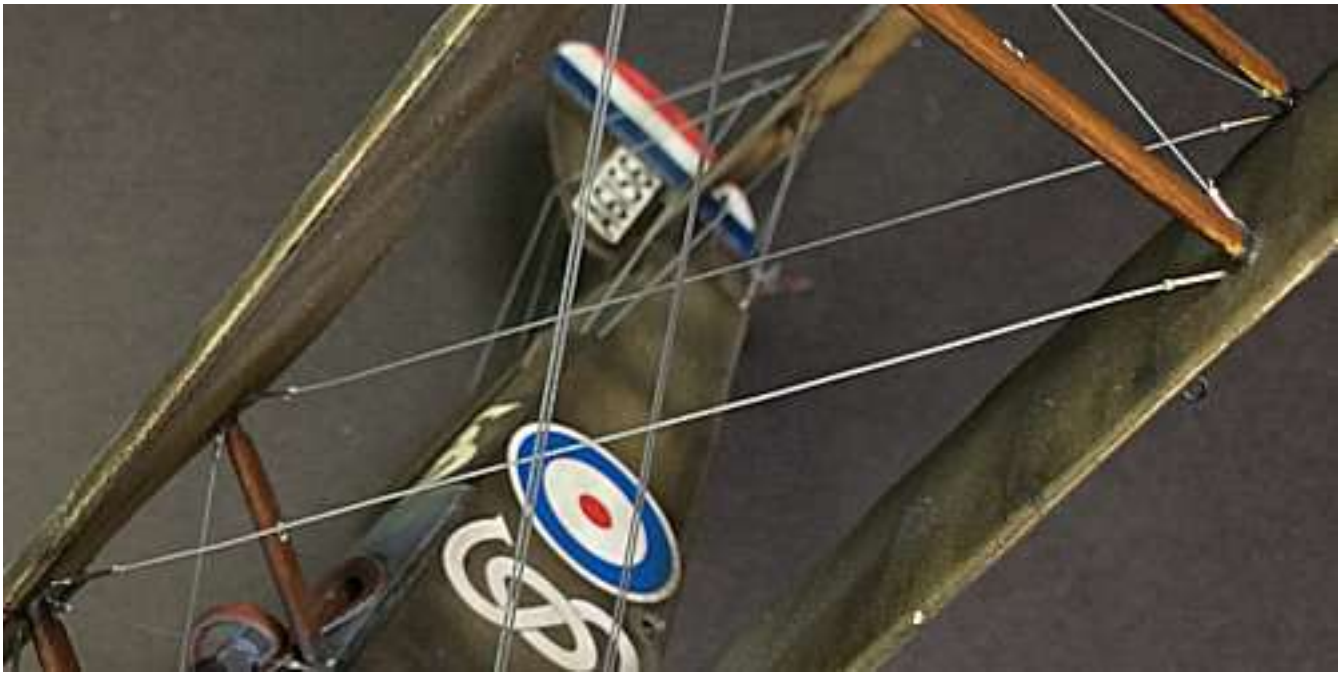
Forward (twin) flying wires: The rigging lines have already been fitted to the underside of the upper wing. An aluminium nut from 'RB Motion' (1279-A) was slid onto each line, followed by a short length of Albion Alloy's 0.4 mm Nickel-Silver micro-tube (NST04). The lines were then inserted through the pre-drilled 0.3 mm diameter holes in the forward undercarriage support strut. The lines were then pulled taut and secured in the holes using thin CA adhesive. The tubes and nuts were then slid up to the undercarriage struts and secured in position. The 'tags' of the rigging line was then cut away.

Rear (twin) flying wires: The rigging lines have already been fitted to the underside of the upper wing. At each side, the lines were passed through the pre-fitted micro-tubes in the lower wing. Under the wing an aluminium nut from 'RB Motion' (1279-A) was slid onto each line, followed by a short length of Albion Alloy's 0.4 mm Nickel-Silver micro-tube (NST04). The lines were then passed through the pre-drilled holes at the top of the rear undercarriage support strut. The lines were pulled taut and secured in position using thin CA adhesive. The tubes and nuts were then slid up to the undercarriage strut and secured in position. The 'tags' of the rigging line was then cut away.

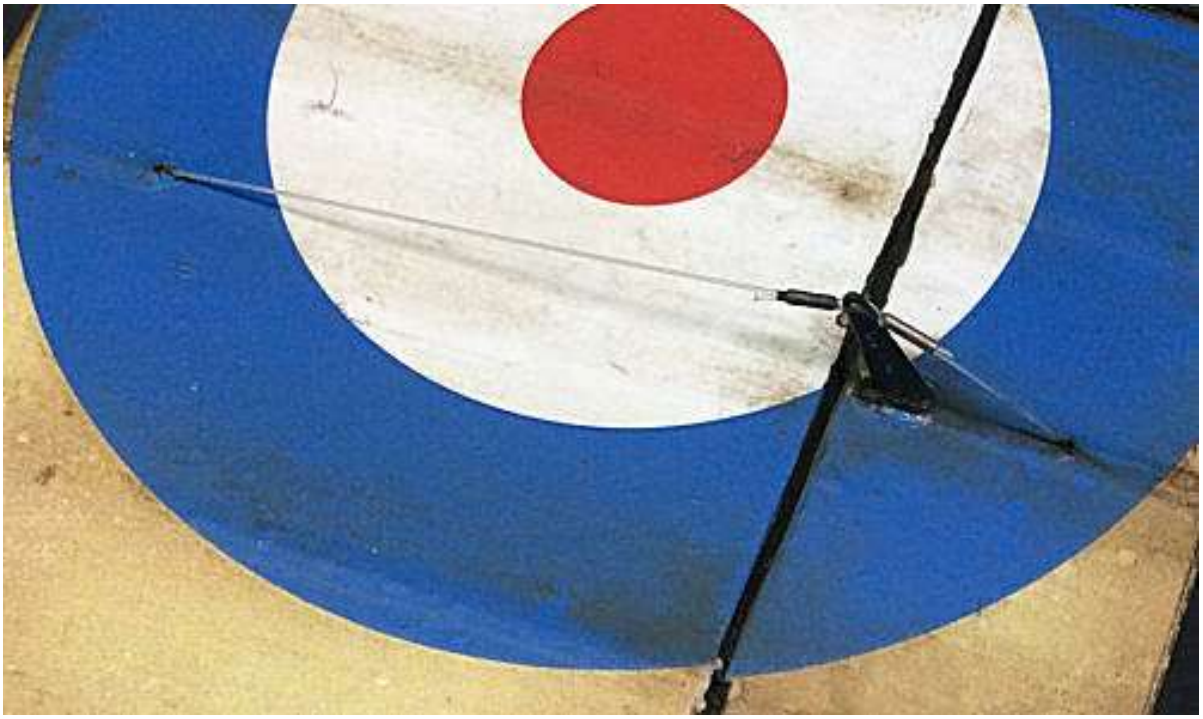


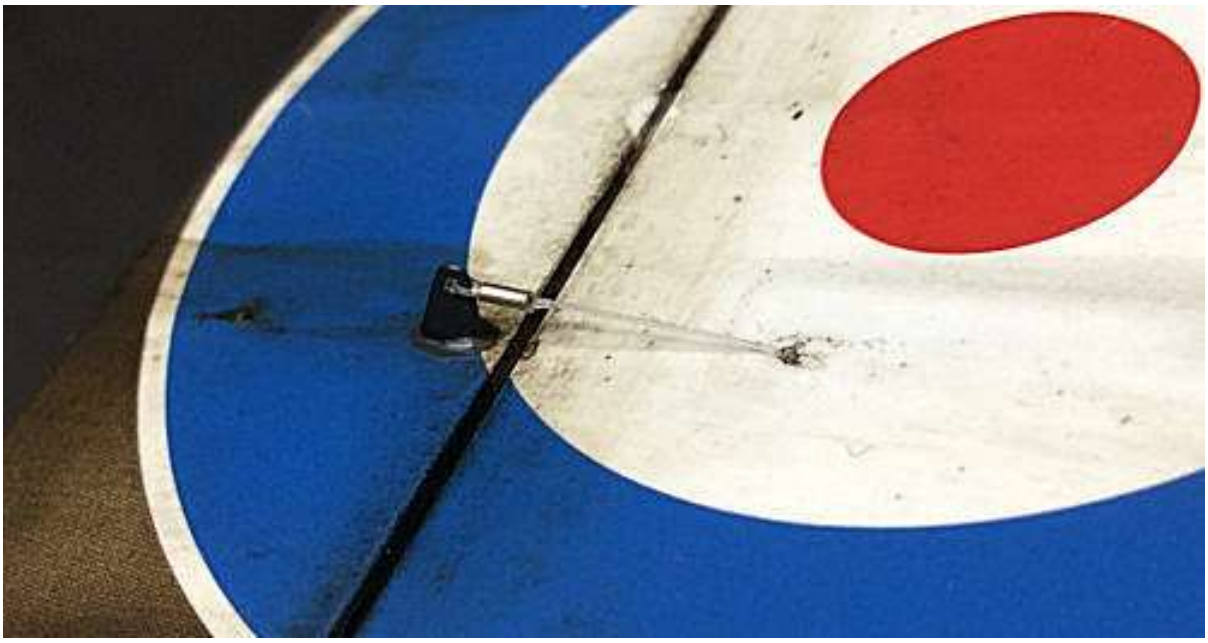
Rear landing wires: The rear landing wires have already been attached to the underside of the upper wing. Using Method 2 (refer to Part 11 of this build log), pass the free end of the rigging line through the 0.3 mm diameter hole pre-drilled through the lower wing, adjacent to the wing rear support strut. The lines were then pulled taut and secured in the holes using thin CA adhesive. The tubes and nuts were then slid up to the undercarriage struts and secured in position. The 'tags' of the rigging line was then cut away.

Forward landing wires: The forward landing wires have already been attached to the underside of the upper wing. They are fitted to the lower wing using the same procedure as for the rear landing wires, except they are attached adjacent to the wing forward support struts.

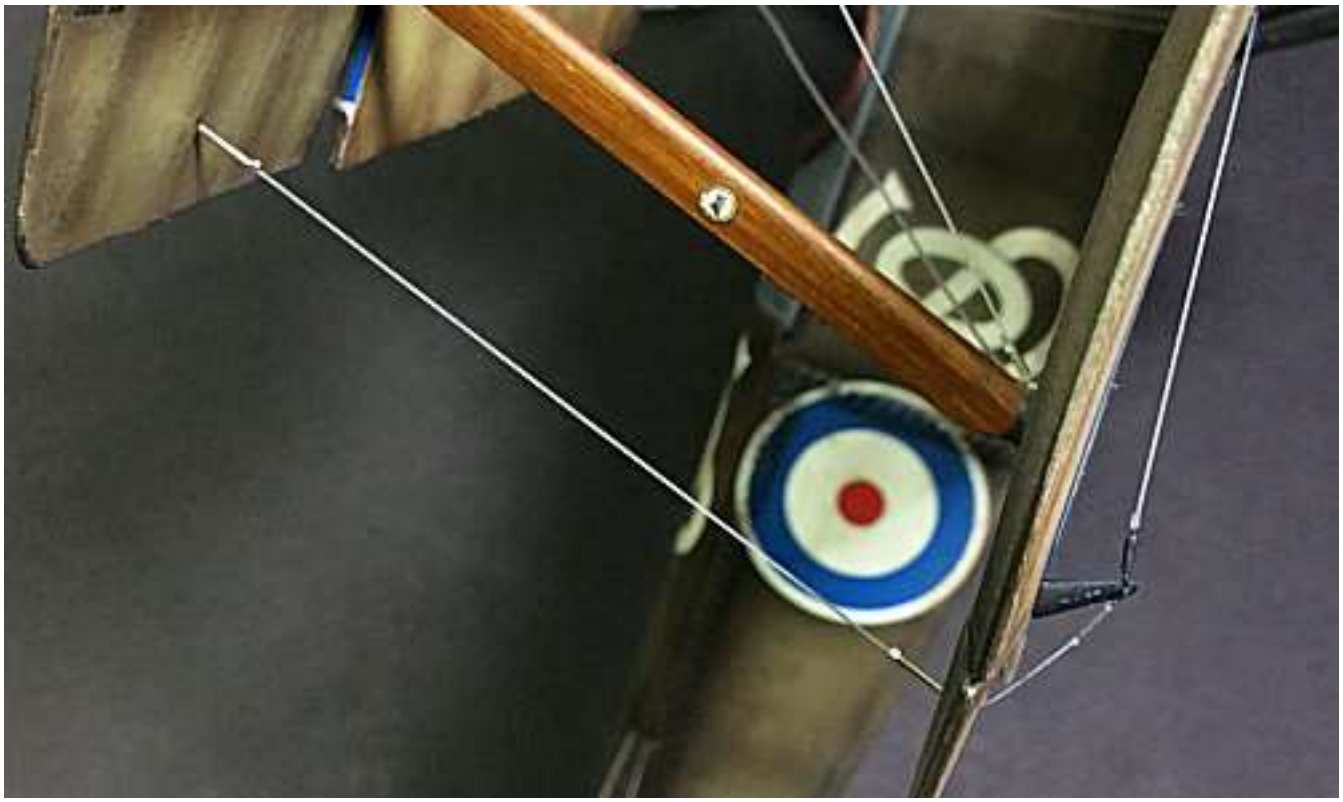


Aileron control cables: The ailerons were controlled by both cables and RAF aerodynamic wires. Control cables were routed from the top surface of the upper wing to the control horn and from the underside of the lower wing to that control horn and onto the lower aileron. A RAF aerodynamic wire connected the two ailerons. Both wings and both ailerons should have pre-drilled 0.3 mm diameter holes for this rigging. **Secure the aileron control horns into their slots on the ailerons. Remember the horns A8 are to be fitted under the lower wing ailerons and B14 above the upper wing ailerons.**
A short length of Albion Alloy's 0.5 mm Brass micro-tube (MBT05) was slid onto a length of 0.12 mm line which was looped through an upper control horn and back through the tube. The same was done at the lower control horn. All lines in turn were '*gently'* pulled taut and their tubes secured in position against the control horns. Excess line tags were cut away. The free ends of the lines were inserted into the pre-drilled holes in the wing surfaces and secured in position. This process was repeated for the opposite side aileron control cable.





Aileron connecting wire: A single RAF aerodynamic wire was connected between the underside of the upper wing aileron and through the lower wing aileron onto the aileron control horn. A long 0.12 mm diameter line was cut and one end secured into the pre-drilled hole in the underside of the upper aileron. A short length of 0.4 mm diameter brass micro-tube (Albion Alloys s MBT04) was slid onto the line, followed two 'RB Motion' nuts (1279-A) and another tube. The line was then passed through the pre-drilled hole in the bottom aileron. A short length of 0.5 mm micro-tube (MBT05) was slid onto the line, which was passed through the control hon and looped beck through the tube. The line was then 'gently' pulled taut and the 0.5 mm tube positioned against the control horn and secured with thin CA adhesive. At the inter-wing aileron line, each tube and nut was slid to its end of the line and against its aileron and secured in position.
NOTE: Ensure you do not pull too hard on the line as the ailerons and/or control horns may move or break away from the model.



Once the rigging is completed, there will probably be some lines that are slack. Slack lines can be tightened by applying heat from a soldering iron or similar, close to and along the length of the line, which will cause the mono-filament to shrink and tighten. Make sure you do not get too close to the line of linger in one area, as this will cause the line to break. Also be careful you do not get too close to or touch the model, as this will melt the plastic.

The micro-tubes on the rigging can be 'knocked back' by brush painting with the colour of your choice or by weathering with for example 'AK Interactive' Leaks and Stains wash.

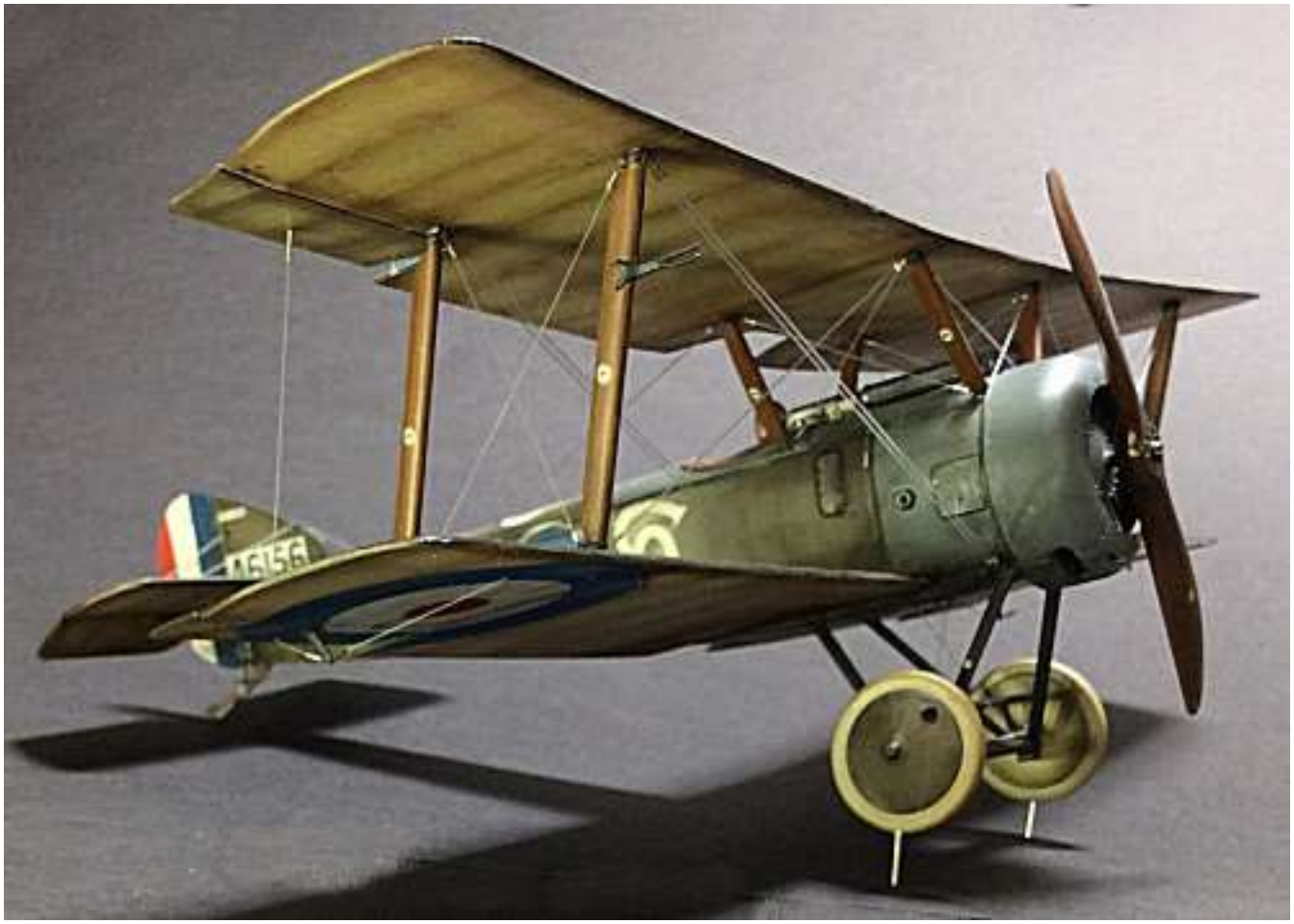
Airbrush the rigging with a light, misting coat of a 50-50 mix of Alclad Light Sheen (ALC-311) and Flat (ALC-314), thinned with Alclad Airbrush Cleaner (ALC-307). This will take off the shine of the mono-filament.

56. Secure the prepared propeller to the engine prop shaft.
NOTE: If you plan to have a figure near or at the propeller, make sure the propeller is positioned to suit the figure.

57. Wheel pins - Cut two straight lengths of 0.8 mm diameter from a standard paper clip. Bend one end to the angle required so the when on the axle, the wheel is angled correctly and the protruding part of the pin is vertical to the model. Test this until you are satisfied, then secure the pins into the wheels using thin CA adhesive.
NOTE: Don't push the 0.8 mm diameter pins too far into the wheels, otherwise they may cross the centre of the wheels, stopping the axle penetrating fully into the wheels.

58. Fit the wheels to the axle, making sure the wheels are angled correctly and the metal pins in each wheel will be vertical when the aircraft is 'sat' on the display base.
NOTE: When the wheels are fitted to the model, they should be angled in at the top and out at the bottom, which is the normal position for the wheels when the aircraft is on the ground (weight on condition) and the axle ends are pushed upwards against the bungee suspension cords. Only when the aircraft was in flight would the wheels hang vertically on the 'relaxed' axle.

59. Once the display base is completed (refer to Part 14 of this build log), the finished model



and figure are positioned as required. Holes of 1.0 mm diameter holes are drilled into the base (but not through it), to locate the mountings pins fitted in the two wheels and the pin fitted into the leg of the figure. The model can then be secured into the base by applying PVA adhesive to the mounting pins as it is finally located into the base.

PART 13 - FIGURE

The figure I chose to use is the 'Standing RFC Airman'- Copper State Models (F32-041). This is a four part figure, with the main body, the two arms and the head and only needed a few small seams and flash to be removed from the parts. I then washed the parts in warm soapy water using an old toothbrush. This was to get rid of any residual release agent from the figure. Ensure the figure is fully dry before continuing. I felt the outstretched arm looked a little long when compared to the rest of the figure. Therefore I cut the gauntlet away from the arm the filed the remaining arm back a little. Once satisfied I drilled a 1.0 mm hole in both and pinned them together with thin CA adhesive. Once fully dry the figure was primed using Tamiya Fine Grey primer. The figure was then brush painted as follows:

NOTE: When brush painting with Tamiya acrylics, I always add a small amount of Tamiya X20A thinners, in order to keep the paint fluid. Otherwise I find it doesn't brush well onto the primed surface. A good alternative thinners is Mr. Colour Levelling Thinner.

1. Shoes: - Tamiya NATO Brown (XF68) dry brushed with Dark Yellow (XF60).

2. Puttees: - Tamiya Dark Yellow (XF60) dry brushed with NATO Brown (XF68).

3. Trousers: - Tamiya Olive Drab (XF62) mixed with NATO Black (XF69).

4. Flying Jacket: - Humbrol Leather (62) mixed with Tamiya NATO Brown (XF69).

5. Cross belts: - Tamiya Red Brown (XF64).

6. Gauntlets: - Tamiya NATO Brown (XF68) dry brushed with Dark Yellow (XF60).

7. Cap: - Tamiya Olive Drab (XF62) mixed with NATO Black (XF69), Black (XF18).

8. Flesh: - Model Colour Basic Skin Tone (70.815), Beige Red (70.804) and Burnt Red (70.814).

9. Badges and buckles—Mr. Metal Colour Brass (MC219).

10. Scarf - Tamiya White (X2) with Deck Tan (XF78).

Darker highlights were applied with base colours mixed with small amounts of Tamiya NATO Black (XF69). Also AK Interactive Engine Wash (AK-2033) was used on the puttee's, shoes and scarf. Tamiya Master Weathering Set A (Mud) was weathered onto the shoes and Set B (Soot) on the edges of the coat.
Finally an airbrushed coat of 50/50 mixed Alclad Flat (ALC-314) and Light Sheen (ALC211) lacquer was applied to seal the figure.

PART 14 - DISPLAY BASE

The display case is made from 6mm thick Piano Black Acrylic sheet and the transparent top is fabricated from 3mm thick Clear Acrylic sheet. This was made for me by an on-line manufacturer. The name plaque was also made by an on-line retailer and was attached to an angled mount, which was secured to the display base with a contact adhesive.

The model and pilot figure were positioned on the base in their final positions and the pin locations were marked on the base. Three 1.0 mm holes were drilled into the base to correspond to the paper clip pins in the two wheels and the one in the leg of the pilot figure. Three lengths of paper clip were cut and temporarily located into the three holes.

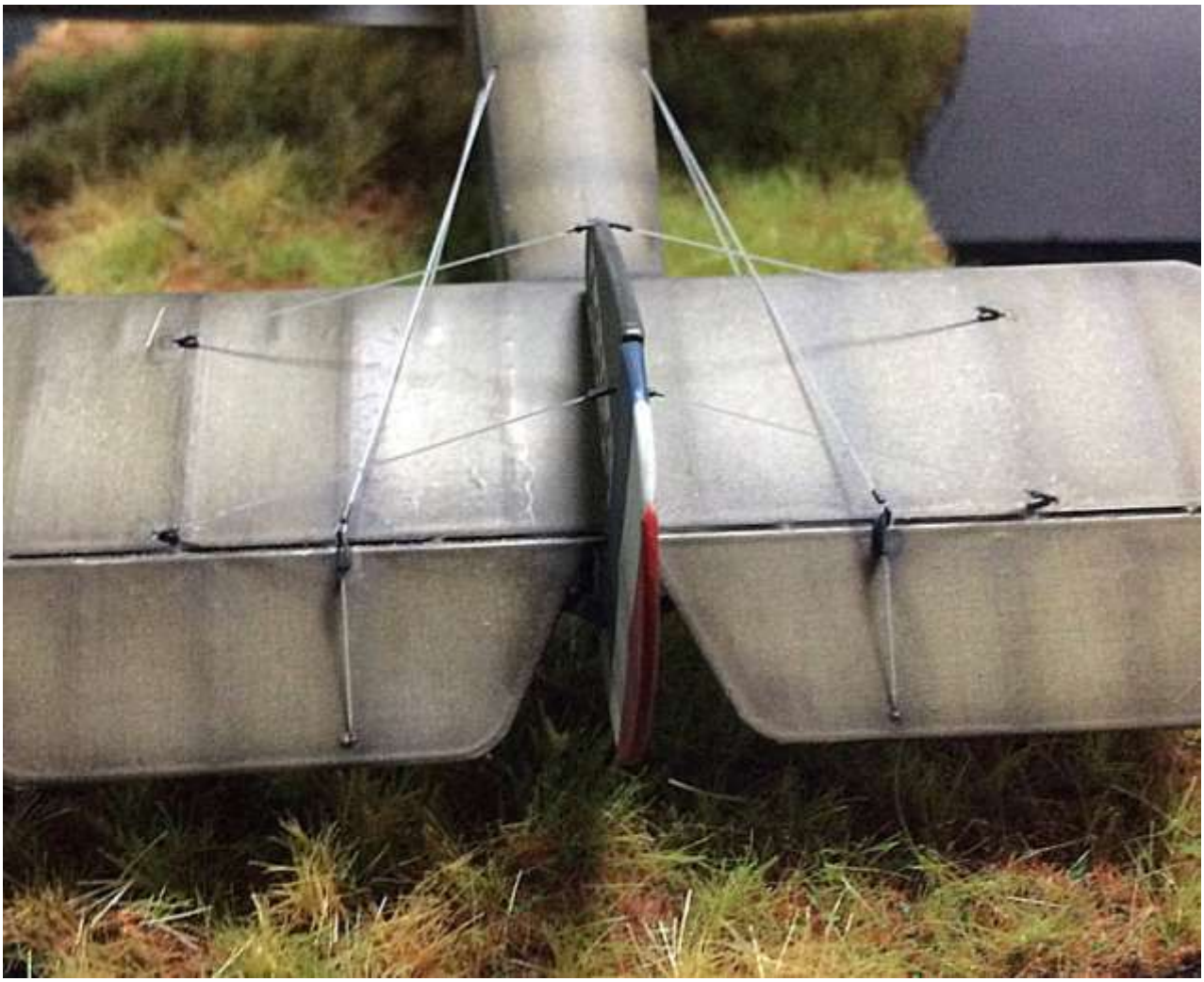
The grass mat was cut to shape from a sheet of 'Polak' Wild Meadow (4706). The clear plastic backing was removed from the grass mat, which was then positioned on the base and with the three pins protruding through the mat. The mat was lifted at the end closest to the two protruding wheel pins. PVA adhesive was applied to the underside of the mat, which was then laid back onto the base and gently pushed down to make proper contact. The same technique was then used for the remainder of the grass mat, working in stages, from the two wheel pins to the opposite end of the mat.

Once the PVA adhesive had fully set, the three temporary paper clip pins were removed and the three holes 'cleared out' with a 1.0 mm drill to ensure the model pins would fully seat into the holes. PVA adhesive was then applied to the two wheel pins and the model was carefully seated into the two previously drilled holes. Light pressure was applied to the wheels and rear fuselage to ensure the model 'sat' naturally on the grass mat. The same was applied to the pilot figure.

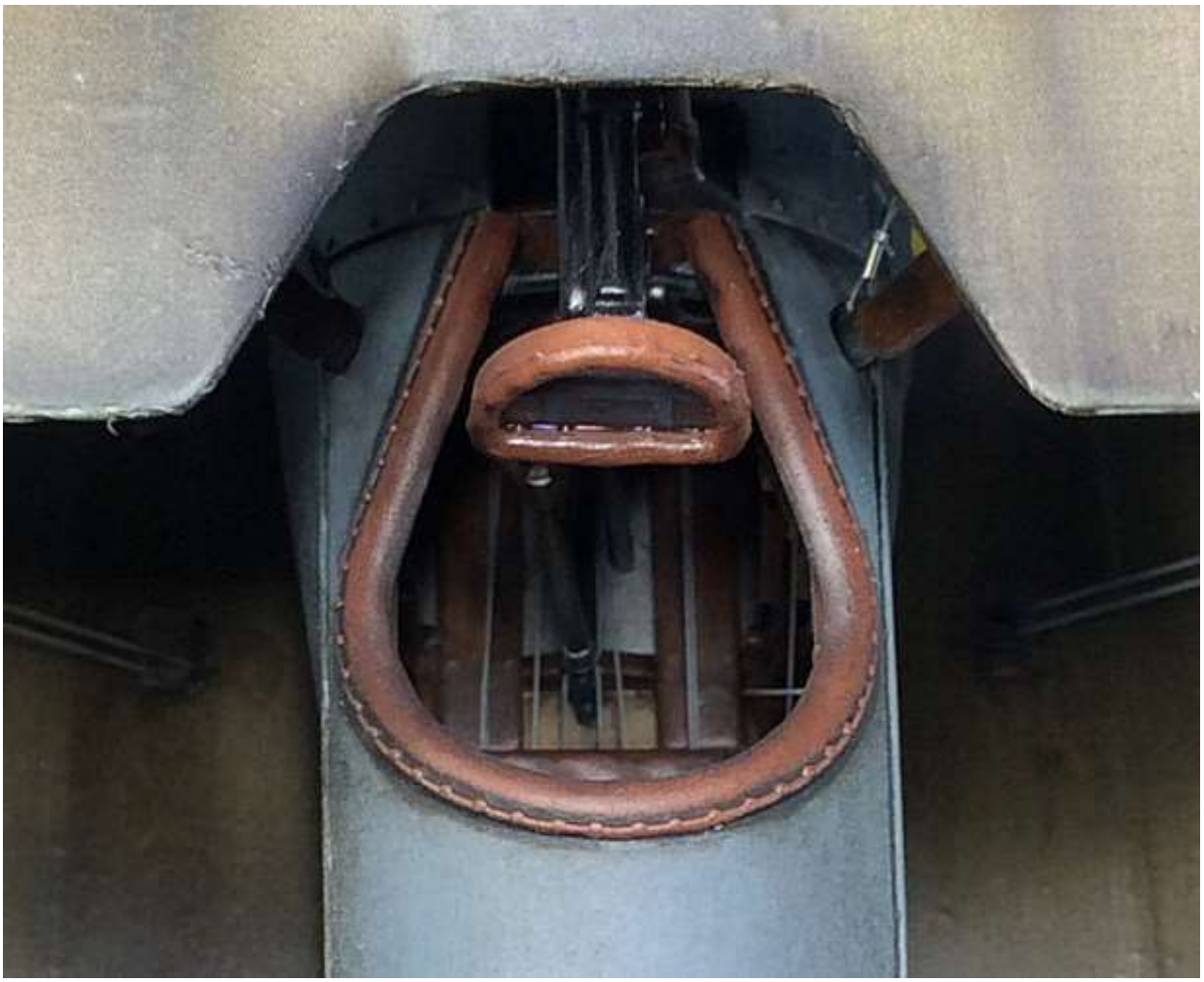
COMPLETED MODEL PHOTOGRAPHS

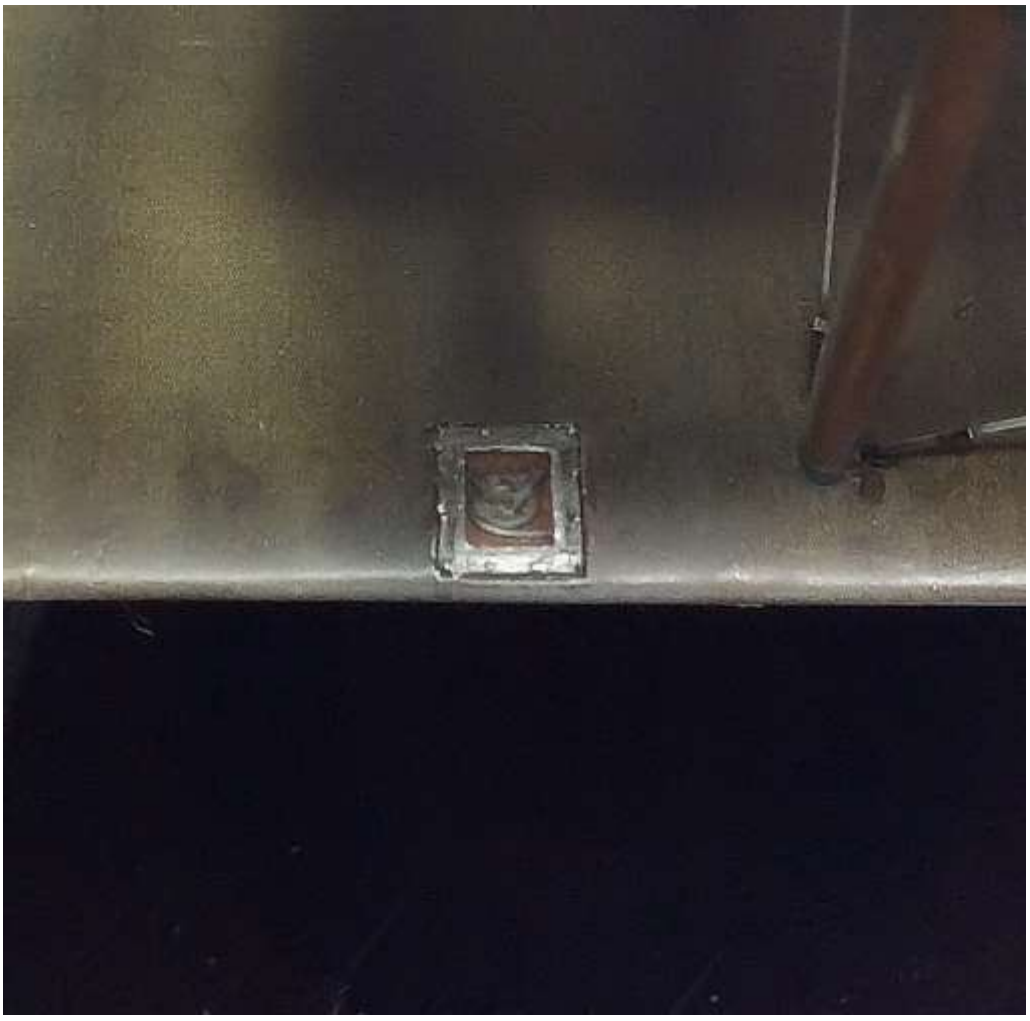

A6156


A6156




A6156





END