World War One Aircraft Models

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

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

I don't consider myself a 'master' of this craft, but hope to be able to pass on what I have learned. As such, here is my build log, covering my build of the 'Planet Models' 1:32 scale resin model of the Port Victoria P.V.7 'Grain Kitten' prototype airship interceptor.

Mike 'Sandbagger' Norris

sandbaggeruk@sky.com

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INTRODUCTION

INTRODUCTION

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

Sorted

AFTER MARKET

AFTER MARKET

Model Kit

'Planet Models' Port Victoria P.V.7 (PLT250).

Figure

'Copper State Models' smoking RFC pilot (F32-042).

Decals

Airscale Dial Decals (Generic World War 1) (AS32 WW1).

Weapons

'Gaspatch' Lewis Mk.II (13-32056).

Pilot's Seat and seat belts

'BarracudaCast' Sopwith Camel wicker (BR32332),
'HGW Models' AMC DH.2 belt set (132511).

Rigging accessories

JadarHobby Shop - Part No.48087 (1/48),
'Albion Alloy' Micro-tube (Brass or Nickel Silver), 'EZ' Fine Black line,
'Stroft GTM' Silicon-PTFE tempered monofil (0.08mm diameter),
'Steelon' Mono-Filament 0.12mm diameter.

Sundries (as required)

'Araldite' two part epoxy adhesive, Paints ('Tamiya' Acrylic, Humbrol Acrylic,
'Mr. Metal Colour', 'AK Interactive' Primer and micro-filler (Grey AK758, White AK759),
'AK Interactive' Filters (Wood AK-261, Kerosene AK-2039, Oil AK-2019 and Wash AK-2033),
'Alclad II' Lacquers, 'Alclad' Aqua Gloss 600, 'Mr. Colour' Levelling Thinners,
'Vallejo' Model Colour, PVA Adhesive (e.g. 'MicroScale' Micro Krystal Clear),
'VMS Fleky' Resin CA adhesive (Standard and Thin), Blue or White Tack,
'Vallejo' Plastic Putty (401),'De-Lux Materials' Perfect Plastic Putty,
Sanding and/or Polishing sticks from 'Flory Models', 'Humbrol' Maskol, 'UHU' White Tack,
'Milliput' two part putty, 'White Spirits', 'MicroScale' MicroSol/MicroSet,
'Mr. Surfacer 500, 1000,1200', 'DecoArt Crafters Acrylic' (water based) oil paints,
'Artool' Ultra Mask sheets, 'Vallejo' Still Water (26.230),
'Mr. Surfacer' primer and filler, 'Hataka' lacquer paints.

Weathering mediums (as required)

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

Display Base

'Model Scene' grass mat (Wetland middle - F011),
Commercially made Acrylic base and cover,
Etched Plaque (name plate).

AIRCRAFT BACKGROUND

AIRCRAFT BACKGROUND

References:

'Planet Models' kit information.
Wikipedia (online resource).

Background:

In an attempt to break the stalemate on the Western Front, the German Imperial Navy started air raids on England, first against military then later civilian targets. The first attack came on the night of 19th January 1915 when the German Zeppelin L3 attacked and bombed Great Yarmouth on the Norfolk coast, resulting in the death of two civilians. That same night another Zeppelin attacked Kings Lynn and two more people died. Public outrage provoked the government to introduce measures to counter the Zeppelin air raids, however anti-aircraft guns proved ineffective, as the airships flew too high and were able to shut down their engines and glide, making detection from the ground extremely difficult. The Admiralty put forward the idea that aircraft, launched from decks on ships or from floating and towed pontoons, could intercept and destroy the airships over the sea, preventing the wreckage falling over land and causing more damage and casualties. The 'disposable' aircraft would then be ditched in the sea.

The Port Victoria P.V.7 'Grain Kitten' was a prototype fighter designed and built by the Port Victoria Marine Experimental Aircraft Depot on the Isle of Grain. The aircraft was a very small and light weight tractor biplane, intended to fulfil the Admiralty requirements and was designed by W.H. Sayers. The wings were of the 'sesquiplane' configuration, the lower wing being much smaller than the upper wing. The wings featured the same high-lift section as used in previous Port Victoria aircraft, and were fitted with ailerons only on the upper wing. It was intended to use a 45 hp (34 kW) geared ABC Gnat two-cylinder air-cooled engine. The armament was a single Lewis gun mounted above the upper wing.

The P.V.7 first flew on 22 June 1917, powered by a 35 hp (26 kW) ungeared Gnat engine, as the intended engine was not available. The official trials took place on the 6th of October 1917 but the P.V.7 proved to be tail heavy in the air and difficult to handle on the ground and the sesquiplane layout and high lift wings were considered not to be suitable for such a small aircraft. In addition, the Gnat engine proved to be extremely unreliable, with test flights being forced to remain within gliding distance of an airfield, in case of engine failure. The P.V.7 was rebuilt with new wings of conventional aerofoil section, a modified tail and a new undercarriage to eliminate some of the problems found in testing. However, the low power and unreliability of the Gnat engine
prevented the P.V.7 being suitable for its intended use, and the P.V.7 was never flown again after it was rebuilt.

In June 1917 the German military stopped using Zeppelins for bombing raids over Britain. Although a tremendous psychological weapon, they had actually caused little damage to the war effort. Of 115 Zeppelins built, 77 had either been shot down or otherwise totally disabled. However air raids did continue, but using aircraft, such as the Gotha.

General characteristics:

Crew: One
Length: 14 ft 11 in (4.55 m)
Upper wingspan: 18 ft 0 in (5.49 m)

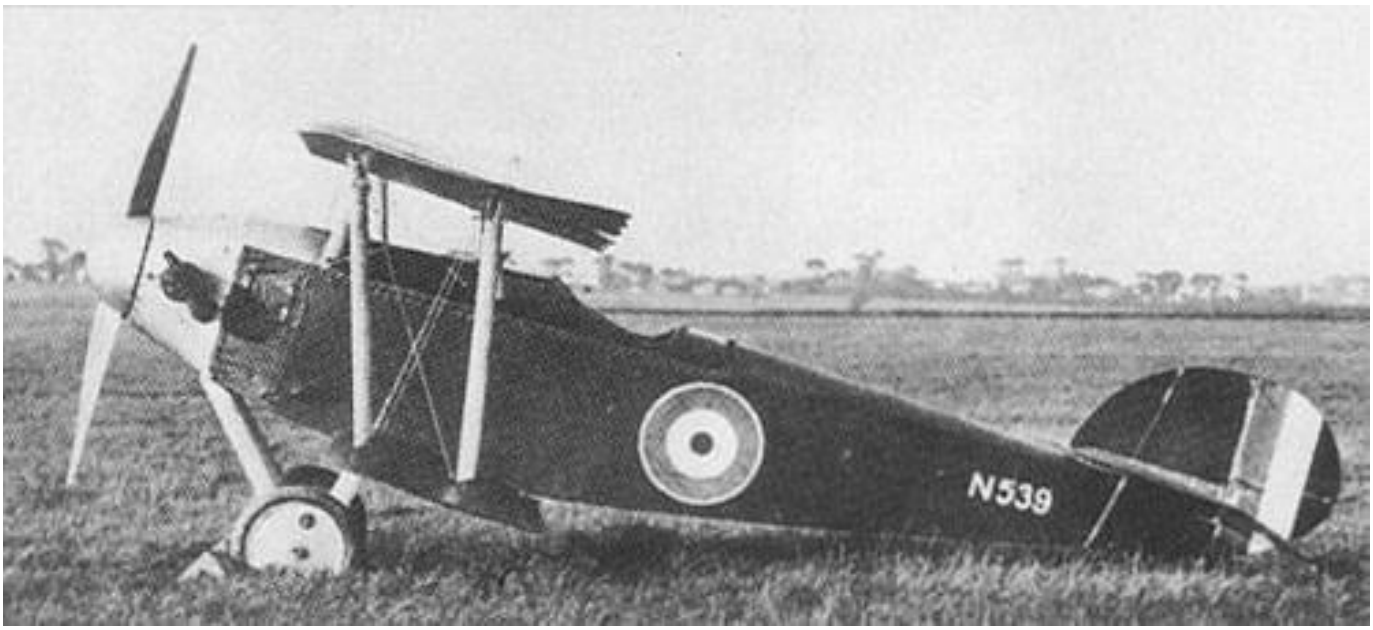
Lower wingspan: 12 ft 7 in (3.84 m)
Height: 5 ft 3 in (1.60 m)
Wing area: 85 sq ft (7.9 m^2)
Empty weight: 284 lb (129 kg)
Gross weight: 491 lb (223 kg)
Engine: ABC 'Gnat' air cooled two-cylinder horizontally-opposed, air cooled piston engine, 35 hp (26 kW)

Performance:

Maximum speed: 85 mph (137 km/h, 74 kn) at 6,500 ft (2,000 m)
Service ceiling: 11,900 ft (3,600 m)
Time to altitude: 22 min to 10,000 ft (3,000 m)

Armament:

A single, fixed Lewis machine gun, located above upper wing.

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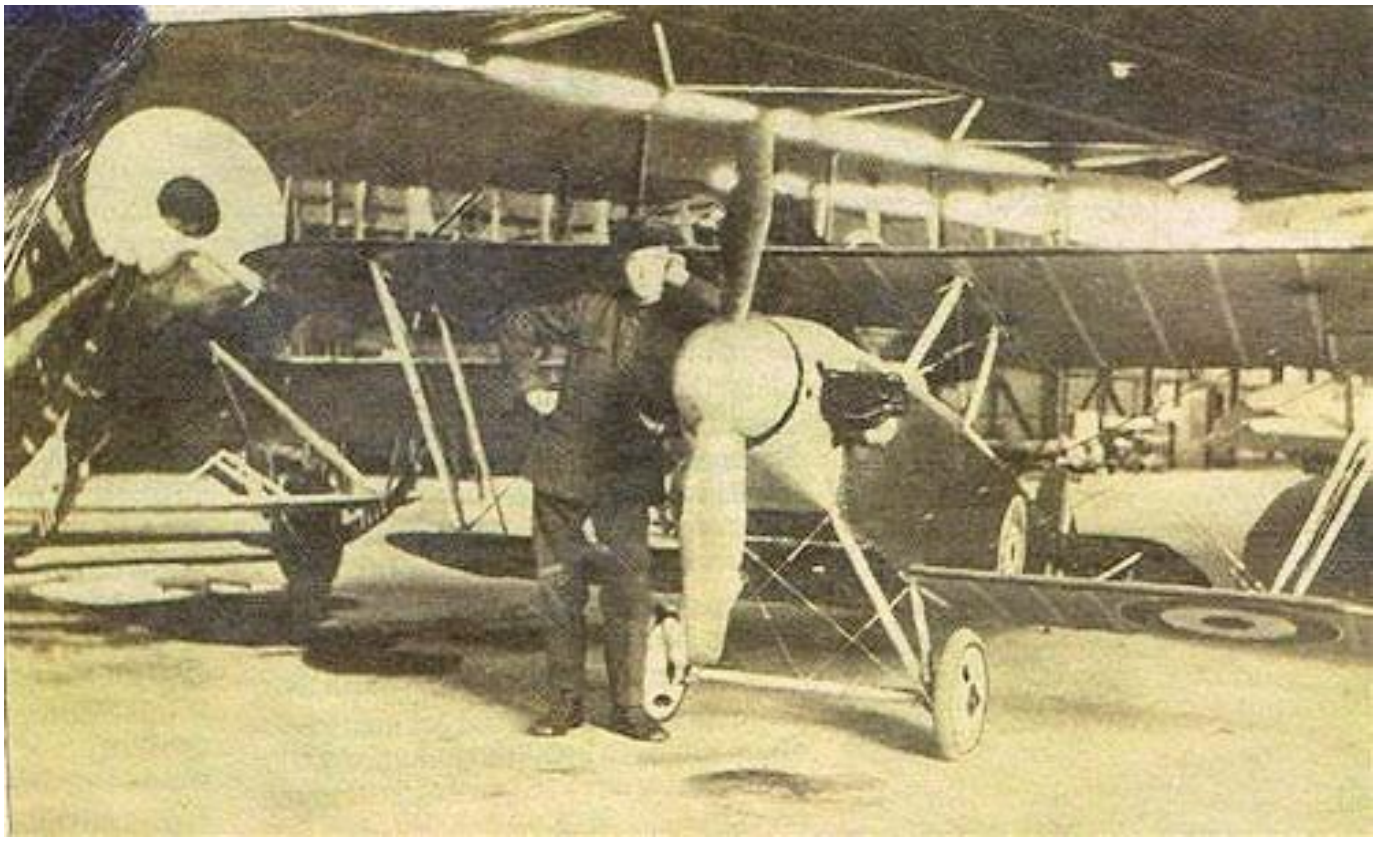
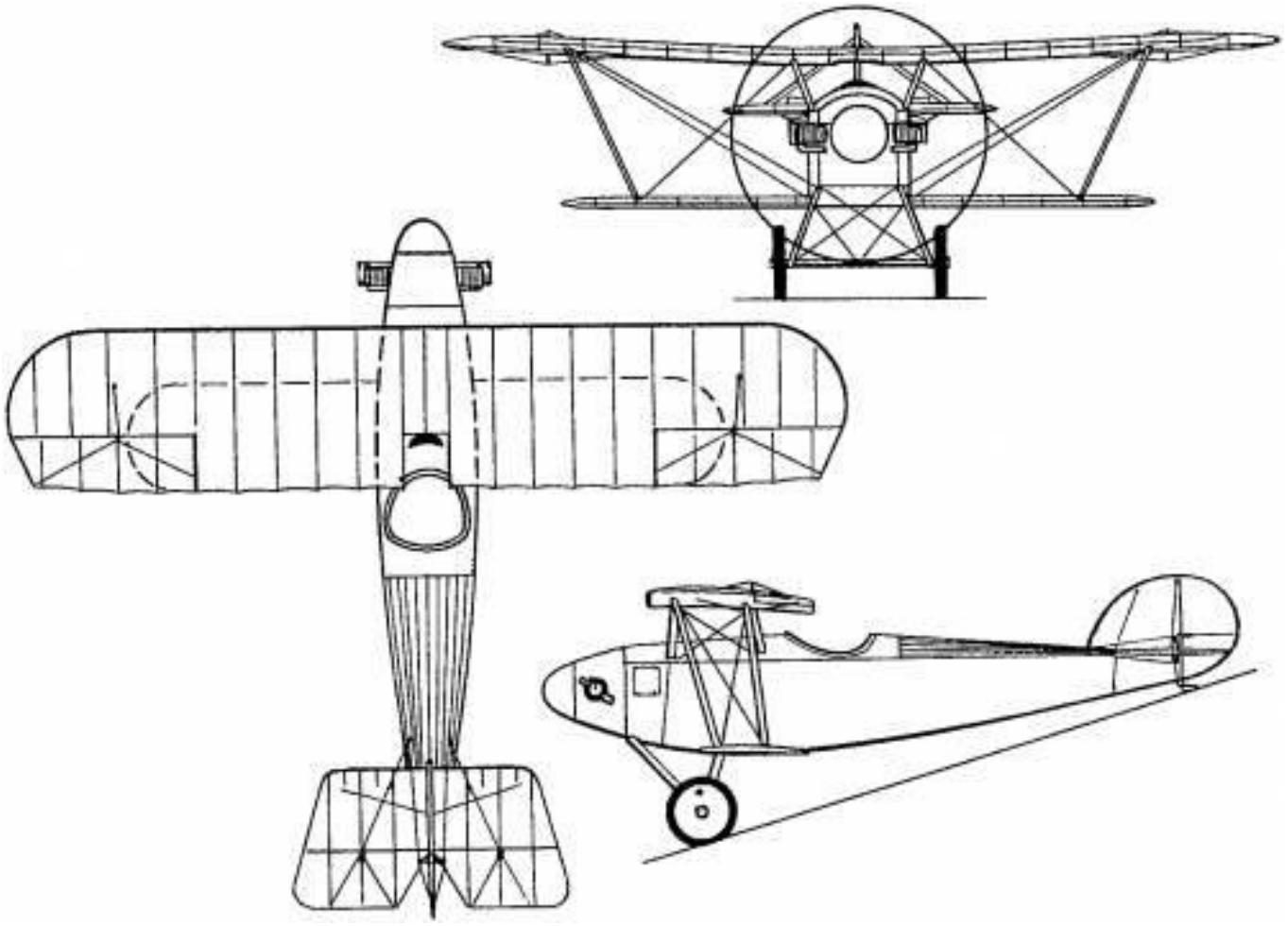




THE MODEL

THE MODEL

'Planet Models' (Kit No: PLT250)

This model depicts the Port Victoria P.V.7 'Grain Kitten' prototype airship interceptor of 1917.

This model kit may prove difficult to some modellers, but those who have experience working on resin models can, with care and attention, be capable of building a good representation of this aircraft.

This model is created entirely from resin, not the 'standard' styrene, so a different approach to building the model must be considered. In many ways resin parts are not as forgiving as styrene. Resin is brittle by comparison and smaller parts are easily damaged. Also CA adhesive must be used to join parts together, as styrene cement has not effect on resin. Some resin kit manufacturers can create parts that are warped, incomplete ('short shots') or covered to one degree or another with air 'blow holes', leaving the surface pock marked. Also resin kits tend not to have the traditional location pins and receiving holes moulded in the parts, for example to join the fuselage halves together. This means additional care is needed to ensure parts are correctly aligned, especially as they are joined using fast setting CA adhesive.

The model parts are packed in sealed plastic covers and the overall quality of the moulded parts is good with no obvious evidence of warping or surface imperfections. However there is a large amount of mould release agent present and the inside of the fuselage halves has resin build up, which will be difficult to remove. Also one of the wing struts had a damaged end.

Great care is needed when working with some of the very small and fragile parts, not only in cutting them away from the base block, but also making sure they are not lost to the 'carpet monster' we so often fall foul of. All parts of the model are moulded onto base blocks or on very thin sheet. Therefore care needs to exercised when cutting these parts away from their bases as parts can easily be damage at this early stage. As is always the case with resin model parts, there is a lot of 'cleaning up' of parts once cut away from their bases, especially with regard to resin 'flash'. In some cases it's best to leave a small amount of resin at joints etc, so the remaining can then be removed once parts are joined. It's too easy to remove all flash only to find there's a gap in the joint as too much was removed.

The kit has a very basic set of instructions and include a colour scheme illustration, which has the only rigging information for the model. The kit has no photo-etch detail, including rigging control horns or seat belts and has no Lewis machine gun. It does however include two thin rods (19) which are not detailed in the kit instructions. The supplied decal sheet has no manufacturer detailed, such as 'Cartograph', so their quality may be less than desired. The kit does supply a pair of acetate windscreens.

As with most kits, there are always areas or details that can be modified or enhanced and some parts that have errors or inaccuracies that need correcting or making from scratch. However, given the lack of information for this one-off prototype, the modeller may be forced to build the model as supplied to create as good a representation as possible of the P.V.7 'Grain Kitten'.

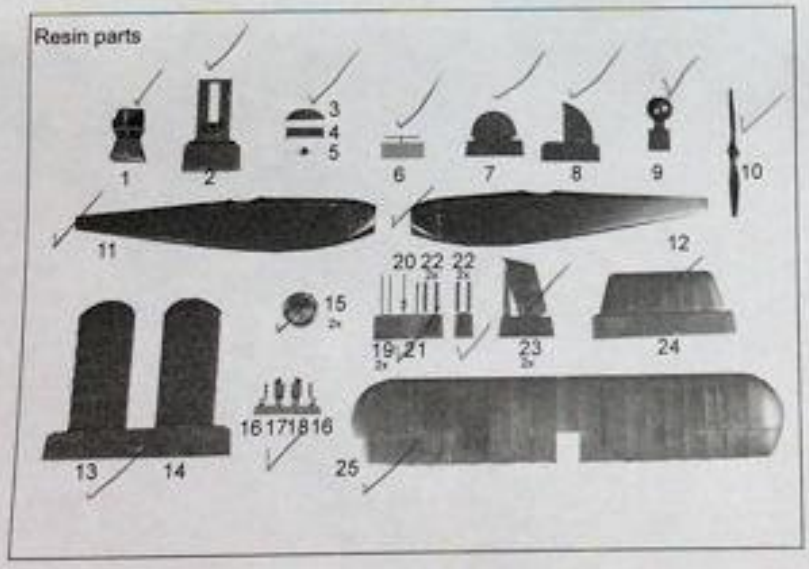

"GRAIN KITTEN"
PLANET models
Port Victoria P.V. 7
"British WWI Airship Interceptor"
N 539
No. 250
1:32
Made in Czech Republic

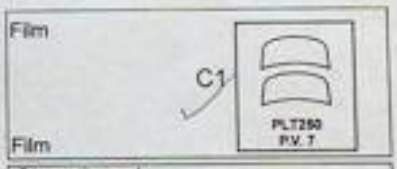
PLT 250
1:32

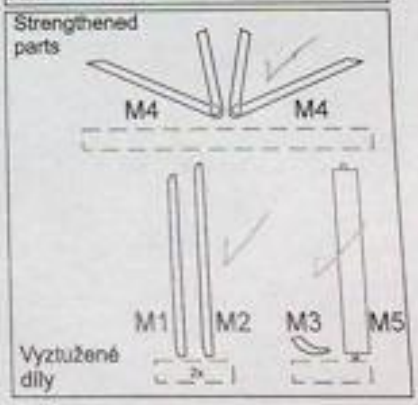
Port Victoria P.V.7

Nálety vzducholodí německého císařského námořnictva, nejprve proti vojenským a později i proti civilním cílům ve Velké Británii způsobily těmář paniku jak mezi civilisty, tak vojáky. Velká Británie horečně hledala způsoby, jak se před nálety bránit. Protiletadlová děla nestačila a tak se hledaly různé techniky, jak ničit vzducholodě pomocí letadel. Britská admiralita chtěla sestřelovat vzducholodě ještě nad mořem, tak aby se zabránilo veškerým škodám. Počítalo se s tím, že letouny budou startovat z plošin na pontonech tažených čluny nebo z krátkých startovních plošin umístěných na dělových věžích bitevních lodí. Aby se množství letounů určených k protivzdušnolodní obraně znásobilo, chtěla Admiralita umístit startovací plošiny i na lehká plavidla. Pro ty však bylo třeba zkonstruovat miniaturní stíhačky. S požadavkem na konstrukci takového stroje se Admiralita obrátila na Royal Naval Air Service Expedimental Construction Depot RNAS umístěný v Port Victoria na ostrově Grain na pobřeží hrabství Kent. Zde do té doby vyrobili několik typů označovaných jménem Port Victoria a zkratkou P.V. a číslem. Všechny tyto stroje byly vodní. Nově konstruovaný P.V.-7 byl prvním pozemním letadlem tamních dílen. Konstruktérem typu byly W. H. Sayers. Navrhl P.V.-7 jako celodřevěný jednoplošník v horním křídle výrazně větším než spodním. Horní křídlo neslo křidélka. Nad křídlem měl být umístěn kulomet Lewis. Ten však stroj pravděpodobně nikdy nenesl. Slabinou se totiž ukázal motor. Původně se počítalo s instalací reduktorové verze dvouválce ABC Gnat o výkonu 45 ks. Ta však nebyla k dispozici, takže do přídě byl umístěn Gnat s přímým náhonem vrtule. Ten dával pouhých 35 ks. K tomu se přidaly potíže s ovladatelností a polohou těžiště. Ty se podařilo úpravami odstranit, ale s motorem byly stále problémy. Často při zkušebních letech pracoval jen na jeden válec. Dne 6. 10.1917 byl P.V.-7, pojmenovaný pro své malé rozměry Grain Kitten, úředně vyzkoušen. Zkoušky ukázaly, že dostup a stoupavost stroje nestačí na boj se vzducholoděmi. Proto jedna z nejmenších stíhaček první světové války zůstala v prototypu.
Rozpětí: 5,49 m, délka: 4,55 m, max. rychlost: 143 km/h, výstup do 3050 m: 10 min. a 50 s., dostup: 3650 m

The air raids of the German Imperial Navy's airships firstly focused on military targets and later on civil targets within Great Britain causing panic to both civilians and soldiers. Great Britain sought for the method how to defend against these air raids. The anti aircraft guns were inadequate and so thought about how to intercept airships with aircraft. British Admiralty wanted to shoot the airships down over the sea to limit damages. It was reckoned that the aircraft could take off from pontoons towed by boats or from short ramps mounted atop the gun turrets of capital battle ships. To multiply the number of the anti airship defense aircraft the Admiralty wanted to place the take off ramps even on small vessels such as forecastles of destroyers. Therefore there was a need for lightweight fighters to be designed. The Admiralty sent this requirement to Royal Navy Air Service Experimental Construction Depot RNAS at Port Victoria on the Isle of Grain off Kent. Several types were built here already and all were designated Port Victoria (abbreviation P.V.) and particular number. All these aircraft were of hydro plane type. The newly designed P.V.-7 was to be the first land plane of this depot. The chief designer was W. H. Sayers. P.V.-7 was designed as an all-wooden, single bay tractor biplane with upper wing significantly larger than the lower one. The ailerons were fitted to the upper wing. The Lewis machine gun was to be mounted atop the upper wing but was most probably never mounted. The weakness was the engine. The original design called for geared 45 Hp two-cylinder ABC Gnat engine. Since the latter was not at hand it was decided to use un-geared Gnat engine providing mere 35 Hp. The aircraft was tail heavy and difficult to handle on the ground. These issues were soon corrected but the engine was extremely unreliable. It often worked on one cylinder only. The official trials took place on October 6, 1917 and P.V.-7 was named Grain Kitten. The trial proved that rate of climb and service ceiling in inadequate for airship interception. Therefore one of the smallest World War 1 fighters remained in prototype stage only.
Wingspan: 5.49 m, Length: 4.55 m, Max. Speed: 143 kmh, Climb to 3,050 m: 10 mins 50 sec, Service Ceiling: 3,650 m.

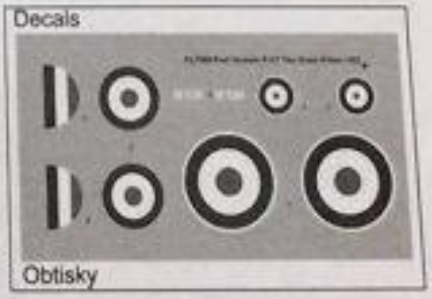






K lepení použijte kyanoakrylátové lepidlo! Díly ohnuté, popř. pokroucené vlivem teplotních změn a stárnutí materiálu mohou být narovnány do požadovaného tvaru pomocí proudu teplé vody nebo vzduchu (fén na vlasy). Kontaktní plochy doporučujeme před lepením odmastit.

For best glueing results use cyanoacrylate glue! Parts slightly distorted and bended owing to temperature changes or due to material ageing can be straightened to requested shapeby hot water or hot air jet. This process can be repeated till result is entirely satisfactory. Before glueing degreasing is recommended.



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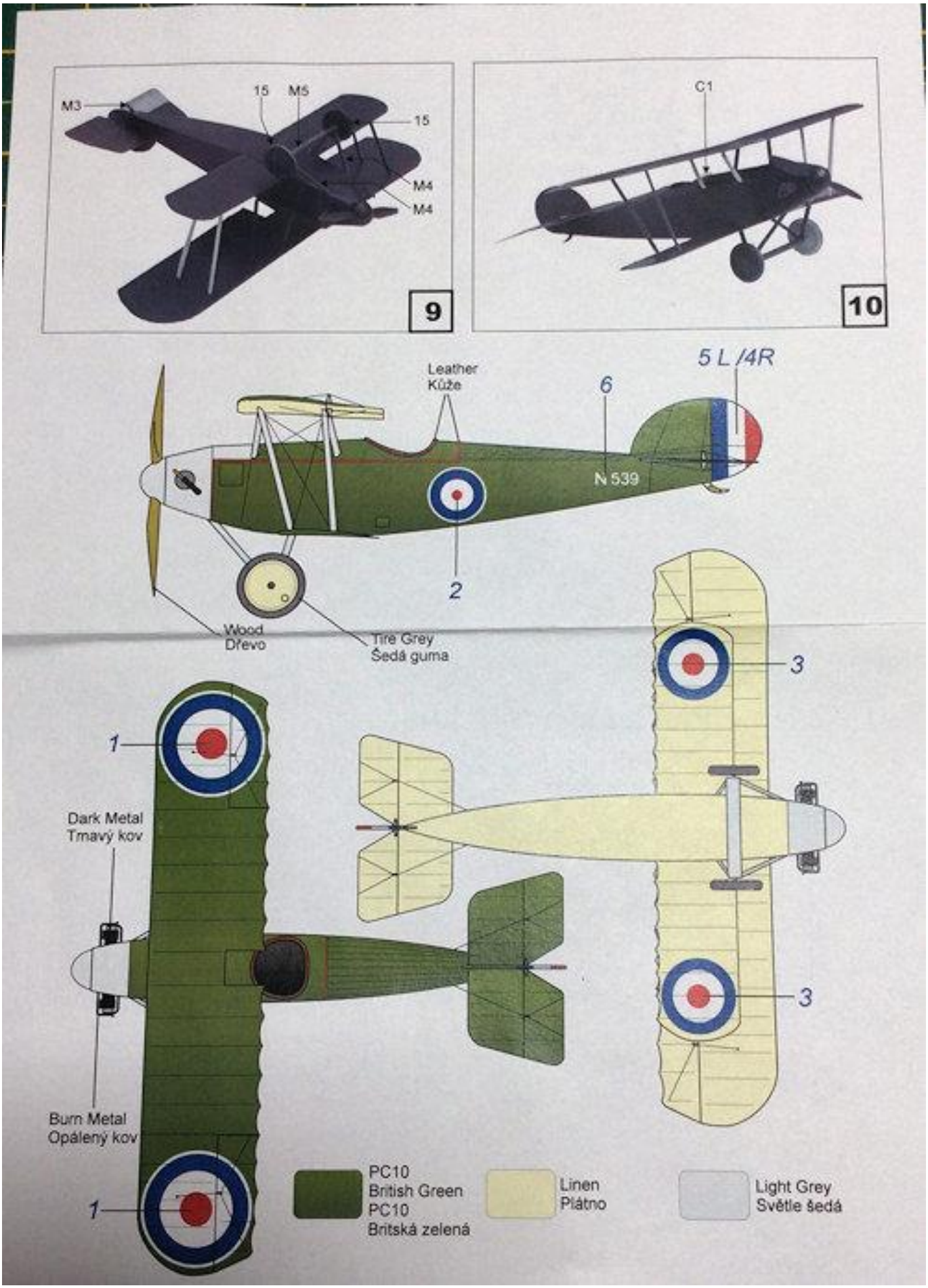
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PART 1

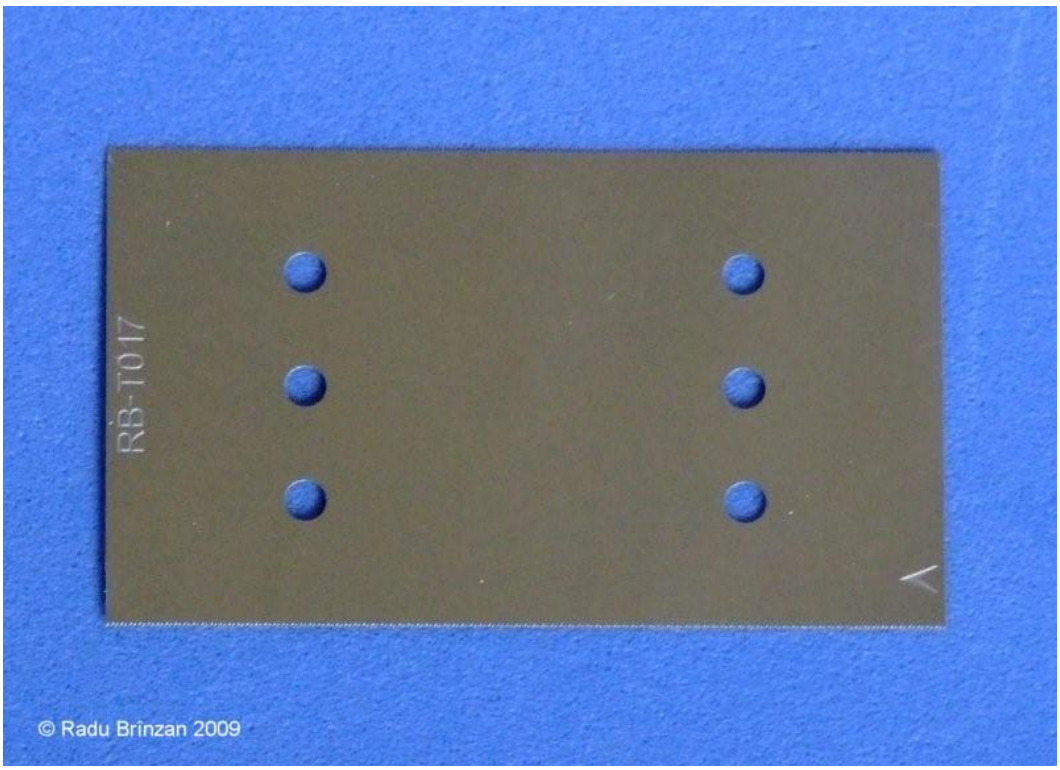
WORKING WITH RESIN (General)

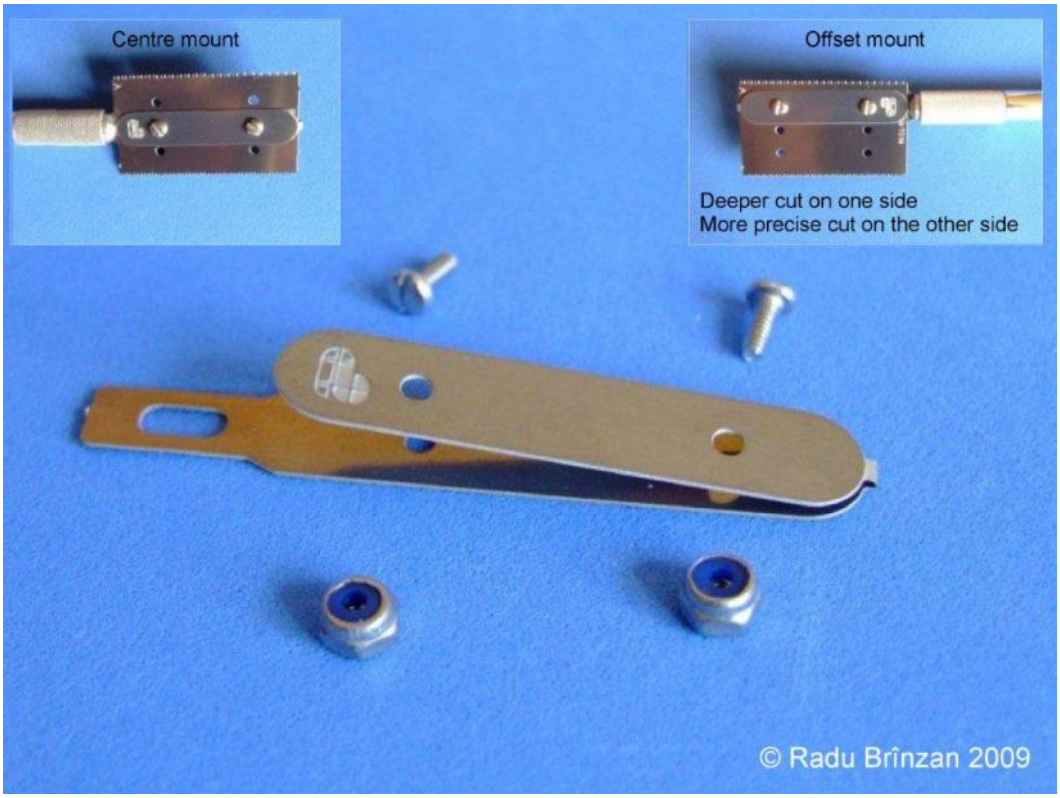
PART 1- WORKING WITH RESIN

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

1. When resin kits are cast in their moulds, a release agent is applied to enable the cast resin parts to be more easily removed, which is similar to plastic kit moulding. This release agent can leave a film on the surface of the kit parts, which, if not removed, can prevent paint or adhesives from adhering to the surfaces. The easiest way to remove this film is to carefully and fully wash all of the model parts in warm soapy water, using an old, soft tooth brush, then rinse all of the parts thoroughly and leave to dry. Alternatively wipe the parts with isopropyl alcohol (e.g. 'Tamiya' X20A thinners).
2. Resin, by its nature, is very brittle and can be damaged or broken easily, especially when handling small parts. This is particularly evident when separating the individual items from the resin cast. The best way to remove item is to cut them away with a razor saw, then clean them up afterwards.
3. Once removed from the resin cast, parts will normally have 'resin flash' around or amongst parts, especially small items. This is easily removed with a sharp scalpel blade. Heavier residue can be scraped, filed or sanded away.
4. Plastic kits are assembled using solvent adhesives, which melt the surface where it is applied and 'weld' the joint together. Resin however will not react to this type of adhesive and can really only be glued using CA adhesive. This adhesive reacts to moisture in the air and on the surface to be joined. As most people know, it will also bond skin to whatever it touches, if the skin has CA adhesive on it. Obviously extreme care needs to be exercised when assembling resin kits using CA adhesive.
5. Cutting, sanding and drilling resin will create swarf and more importantly, resin dust. The dust in particular is dangerous, especially if inhaled. Therefore always vacuum the working area, and yourself, regularly. If you have a face mask or filtered respirator and find you can wear it whilst working, then do so. Resin can easily be drilled or scraped, but remember how brittle resin is when it is being handled.
6. It is not unusual to find imperfections in resin cast parts, such as surface blemishes, small 'blow' holes or ragged edges. This can be common on some resin kits. These imperfections can be rectified by sanding/polishing and/or filling with modelling putty, then sanding/polishing.
7. Generally CA adhesive is supplied as 'instant bond' adhesive, but there are some manufacturers, such as 'VMS Fleky', that supply CA adhesive as standard, thin, slow and specific resin adhesive. Whichever adhesive is used you must ensure parts are correctly positioned and aligned before applying the adhesive. Trying to separate mis-aligned parts once the adhesive sets will prove very difficult and may result in irreparable damage to the parts.

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





PART 2

WOOD EFFECTS (General)

PART 2 - WOOD EFFECTS (General)

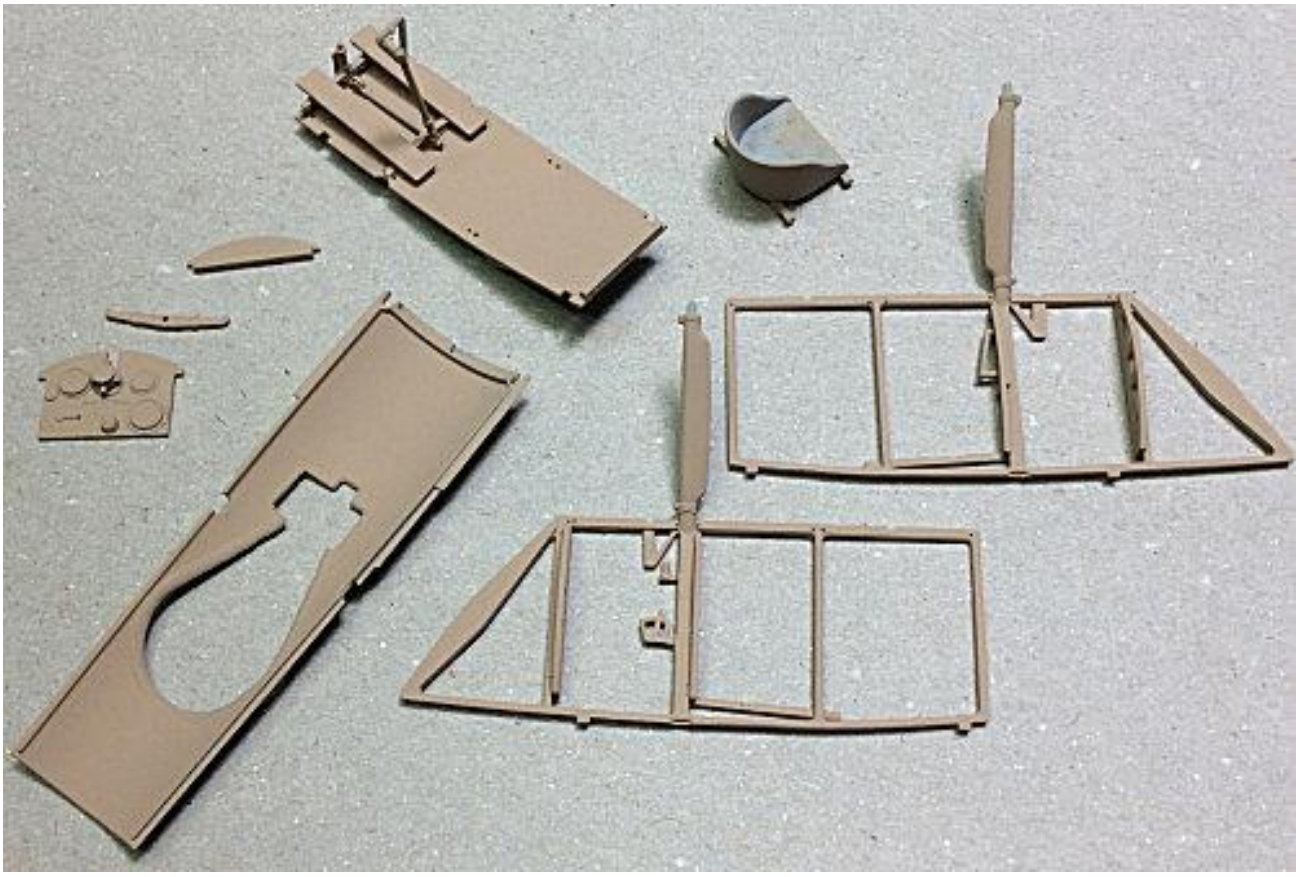
A basic technique:

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

The first thing to do is to ensure the model parts are cleaned, normally with warm water with washing up fluid and something like an old tooth brush. Once cleaned and thoroughly dried, the primer coat can be applied, for example 'AK Interactive' Grey (AK-758) primer and micro-filler. Once the primer is dry apply the base colour, after which you can start applying the wood effect to the applicable parts, such as fuselage panels, cockpit items, decking panels and wing struts. With practice, this method can also be used on fuselage panels and propellers.

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. After priming, apply a suitable base colour. For most wood effects, use 'Tamiya' Deck Tan (XF55), Wooden Deck Tan (XF78) or Dark Yellow (XF60), suitably thinned with 'Tamiya' Thinners (X20A). The colour used affects the colour of wood effect applied, so experiment before hand to ascertain the effect you require. 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, you can 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.

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

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

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

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

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

PART 3

WEATHERING
(General)

PART 3 - WEATHERING (General)

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

Flory Model clay washes:

The washes I tend to use are the 'Flory Models' Clay Wash 'Grime' and 'Dark Dirt', which come in various shades and consist of a suspended and very fine clay pigment. They are brushed over the surface to be weathered and dry in around 30 minutes. When dry, use either a piece of good, absorbent kitchen roll or a soft brush to remove as much of the clay wash as you need to achieve the desired effect. Once dampened, the dried clay is re-activated and the clay wash can be removed or worked as required. First I seal the surface with airbrushed 'Alclad' Light Sheen (ALC -311) or Semi-Matte (ALC-312), which dries quickly. A gloss coat tends to stop the clay wash 'gripping' the surface when it is applied and it can run off or just puddle. A matte coat can cause the clay wash to 'grip' too much, making it difficult to remove or even to wash it off completely.

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

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

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

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

NOTE 5: *If the wash 'beads' on the surface instead of spreading evenly, add a few drops of washing up liquid to the wash, which will break the surface tension of the wash, allowing it to spread.*

NOTE 6: *When the wash is finally sealed it will darken slightly. As the weathering effect is intended to be subtle, it's best to remove more than you think is necessary before sealing. Sealed weathering can't be removed. Additional wash can be applied onto the sealed weathering, as required, and sealed again.*

To apply the clay wash is just a matter of brushing all over the surface to be weathered. It doesn't matter really how much is applied as it can be left on for any period, as it is easily removed without any effect on the surface underneath. If you don't achieve your desired effect, you can wash it all off and start again. I use a soft brush, which has been very slightly dampened, to brush off the clay wash. For smearing effects, a very slightly damp brush or absorbent paper should be used, but even then I dab them onto a dry piece of the paper, until it's almost dry. Any wetter and you'll find that you are removing too much of the clay wash. If that happens you would have to re-apply the wash and start again. That said, if you're not happy with the final effect, you can easily remove the clay wash by brushing with a wet brush or even airbrush water over the surface.

Dry off the surfaces washed and then re-apply the clay wash and try again until you are satisfied. The technique is to 'damp' brush or wipe over the surface to re-activate the clay wash and at the same time, to smear it over areas that had no clay wash. It'll dry more or less straight away. Then I'll very lightly brush and/or use a piece of damp absorbent paper to remove as much as I want until I get the desired effect. If I remove too much I just reapply clay wash to that area and repeat the removal procedure. Once finished, just run the brush under a tap to rinse out any residual clay pigments. Finally I usually seal the surface with airbrushed 'Alclad' Light Sheen (ALC-311) or Semi-Matte (ALC-312), which will seal in the applied clay wash.

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. Take care when doing this as 'too much chipping' can't really be covered up. In that event you would have wet the top coat and remove it all with an old toothbrush or similar and then when dry, re-spray the top coat and try again. Once the desired effect was achieved, I sealed the surfaces with an airbrushed coat of 'Alclad' Light Sheen (ALC-311) or Semi-Matte (ALC-312).

'Tamiya' Weathering Master sets:

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

Pigments:

Pigments, such as those produced by 'Flory Models' or 'Humbrol' are effectively very fine 'dusts', which can be applied to a model to re-create dust, dirt, stains etc. They can be applied by dry brushing or brushed and fixed with solutions, applied sparingly, such as White Sprit or 'Tamiya' X20a thinners.

Washes:

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

Water colour pencils:

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

Oil paint:

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

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

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

Another good product are the oil brushers, produced by ‘Ammo’ by Mig Jemenez. These are made with modellers specifically in mind. The oil paint is applied from the brush then blended using their odourless thinners. The oil brushers are supplied as specific colouring sets or individually.

PART 4

DECALS

(General)

PART 4 - DECALS (General)

Standard decals:

The supplied markings decal sheet and the optional 'lozenge' decals sheets are not 'cookie cut' to the required shapes, but are part of the overall carrier film on the sheet. Therefore you will need to carefully cut the individual decals from the sheet. The decals appear not to be laser printed, as with for example 'Cartograph' decals, and backing sheet is thicker than standard decal sheets. This makes it difficult to achieve a clean cut around the decals. The decals are not of the best quality, which is to be expected from a 'limited run' kit of this type and given that they have to be carefully cut out from the sheet may make the end result less than favourable.

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

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

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

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

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

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

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

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

Carefully move the decal into the correct position.

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

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

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

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

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

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

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

Once the decals have been applied and are dry I airbrush a final sealing coat of panel (’Alclad’ Light Sheen ALC-311, ‘Tamiya’ Semi-Gloss X35 or similar) over the decals.

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

PART 5

RIGGING DETAILS

PART 5 - RIGGING DETAILS

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 use mono-filament (fishing line) of various diameters. These can be semi-transparent but do give a look of steel, without the need of painting or colouring with a gel pen.

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.*

Rigging and bracing cables fitted to aircraft of this period varied, dependent on the nationality of the aircraft and its individual design. For instance, German and RFC aircraft used traditional round, braided cables, whereas later in the war aircraft of the RFC and RAF used solid metal aerodynamic (streamlined) flight rigging and traditional round cables for flight controls. French aircraft used either and sometimes the flight rigging was coloured blue. Finally the methods of actually attaching and adjusting the flight rigging and controls varied. For instance, the method for attaching RFC and RAF aerodynamic rigging was different to that for round braided cables, which for adjustment, required turnbuckles. Some German aircraft had attachments with ball end fittings to allow for self alignment of the rigging cables.
The RFC and RAF 'streamlined' wires can be modelled using the relevant sized flat, photo-etched sets from 'RB Productions'. However, these can be difficult to install and require tiny photo-etch end fittings, which some modellers think are over-sized. More importantly, these wires add no structural strength the a model and apparently can be prone to 'sag' if the ambient temperature changes too much. It's for these reason I choose to use mono-filament (fishing line) for all of the rigging, as it does add structural strength to a model and can be tightened after fitting by apply heat close and along the rigging line. My line of choice is mono-filament with 0.12 mm diameter by 'Steelon' for General rigging and 0.08 mm 'Stroft' for control lines. When lightly airbrushed with a matt or semi-mat lacquer, it looks close enough to steel to be passable. Besides, to the naked eye it's difficult to tell the difference between the flat photo-etch and the round mono-filament.
Holes need to be provided for fitting the rigging wires, so study the rigging illustration, model parts and reference material thoroughly to find the various rigging points.

Flight controls:

Rudder:

The rudder control wires from the pilot's rudder bar in the cockpit were routed rearwards inside the fuselage then exited from each side of the fuselage, forward from the fin. Each control line was routed above the tail plane and connected to the rudder control horn at each side of the rudder. A second control line was attached to the control horns and was routed through the rear of the rudder to inter-connect the two control horns. Moving the rudder bar in the cockpit left or right would pull on the rudder control horn, moving the rudder left or right, causing the aircraft to turn (yaw) in the required direction.

Elevator:

The elevator control wires from the pilot's control column in the cockpit were routed rearwards inside the fuselage then doubled to exit from each side of the fuselage, forward from the fin. The top control wires were routed above the tail plane and connected to the upper elevator control horn at each side of the leading edge of the elevator. A second control line was attached to the control horns and was routed to two positions at the trailing edge of each elevator to form a 'Y' shaped control line. These control wires passed through the elevator to the underside control horn, then back into the fuselage. Moving the control column in the cockpit forwards or rearwards would move the elevator up or down, causing the aircraft to dive or climb (pitch) the aircraft.

Ailerons:

The aileron control wires from the pilot's control column in the cockpit were routed up and out through the sides of the fuselage and up into the underside of the upper wing, where they were routed internally outboard to the trailing edge ailerons on the wing. Control wires exited the top of the upper wing and were connected to the aileron upper control horns. A second control line was attached to the control horns and was routed to two positions at the trailing edge of each aileron to form a 'Y' shaped control line. These control wires passed through the ailerons to the under-side control horn, then back into the wing. Moving the control column in the cockpit left or right would move the ailerons up or down (in opposition to each other) to cause the aircraft to turn (roll) left or right.

Bracing:

Bracing wires were fitted to strengthen the structure of the aircraft in flight (flying wires) and when on the ground (landing wires). They were also fitted to give rigidity to the fin and undercarriage. Bracing wires were fitted:

Support struts from the bottom rear of the fuselage up to the leading edge of the tail plane. From the top of the tail plane, rigging wires through the top of the fin to the opposite side.

From the bottom rear of the fuselage at the tail skid, through the trailing edge of the tail plane, through the top rear of the fin and across to the trailing edge of the opposite side of the tail plane and back to the bottom of the fuselage.

Two wires were cross braced between the two outer wing support struts on each side of the aircraft.

Two wires were cross braced between the two cabane support struts on each side of the fuselage and two wires crossed between the forward cabane struts.

Two wires were cross braced between the top of the two rear support struts for the undercarriage and the centre of the wheel axle fairing.

Two wires were cross braced between the top of the two front support struts for the undercarriage and the outboard ends of the wheel axle fairing.

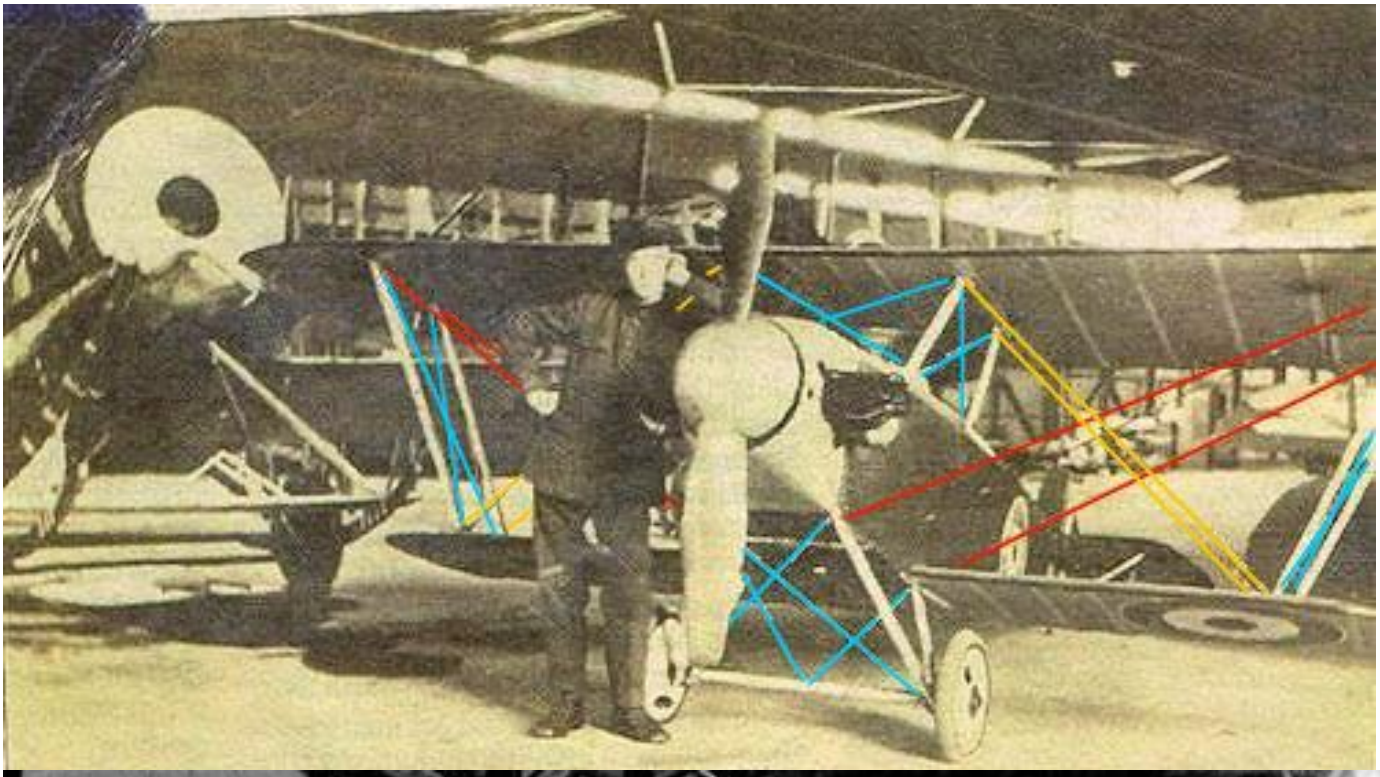
At each side of the aircraft, single flying wires were connected between the top of the forward wing support strut and the bottom edge of the fuselage, at the top of the front undercarriage strut.

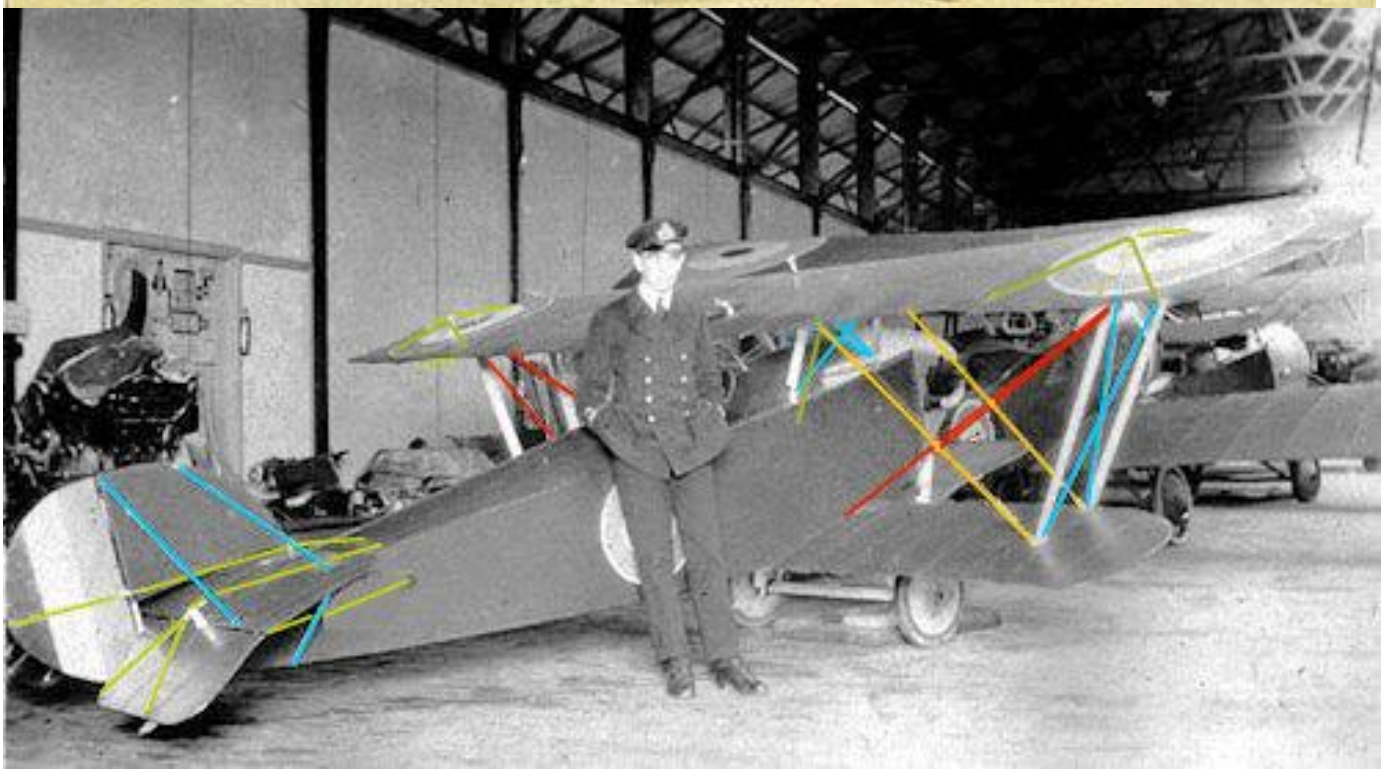
At each side of the aircraft, single flying wires were connected between the top of the rear wing support strut and the lower wing root at the fuselage, inline with the rear undercarriage struts.

At each side of the aircraft, single landing wires were connected between the top of the forward fuselage cabane wing support strut and the bottom of the forward wing support strut.

At each side of the aircraft, single landing wires were connected between the top of the rear fuselage cabane wing support strut and the bottom of the rear wing support strut.

Key: Red = Flying wires Orange = Landing wires Blue = Cross bracing Green = Flight control.





PART 6

PROPELLER

PART 6 - PROPELLER

NOTE: *Whilst working with the resin parts of this model:*

Assembly of all parts is carried out using CA adhesive.

Handle with care as the parts have been moulded very thin and are fragile and easily damaged.

Wash all parts in warm water with washing liquid added, to remove resin mould release agent.

Cut the parts away from their mould bases or sheet.

Remove all mould 'flash' , stubs and seams from the parts.

When working with resin, dust or particles are harmful if they are inhaled or ingested.

NOTE: *Normally I would replace kit propellers with aftermarket items, as these are made from laminated wood and more realistic. However the propeller for this aircraft is unique and therefore I decided to use the kit item.*

Remove any resin flash and seam lines from the propeller.

Check for any surface imperfections and fill/sand as required.

Prime the propeller with a white primer (e.g. 'AK Interactive' White (AK-759) or similar).

Airbrush the propeller with 'Tamiya' Deck Tan (XF55) or similar.

If necessary, lightly sand the painted surfaces to create a smooth surface.

Refer to Part 2 (Wood Effects) and using a piece of sponge, apply 'DecoArt Crafters Acrylic (water based) oil paint (Burnt Umber).

Airbrush a light semi-matte sealing coat (e.g. 'Alclad' Semi-Matte (ALC-312) or similar, mixed with 'Tamiya' Clear Orange (X26) at a 2:1 ratio. If necessary airbrush further light coats until the required sheen finish is achieved.

PART 7
WEAPONS

PART 7 - WEAPONS

NOTE: *Whilst working with the resin parts of this model:*

Assembly of all parts is carried out using CA adhesive.

Handle with care as the parts have been moulded very thin and are fragile and easily damaged.

Wash all parts in warm water with washing liquid added, to remove resin mould release agent.

Cut the parts away from their mould bases or sheet.

Remove all mould 'flash' , stubs and seams from the parts.

When working with resin, dust or particles are harmful if they are inhaled or ingested.

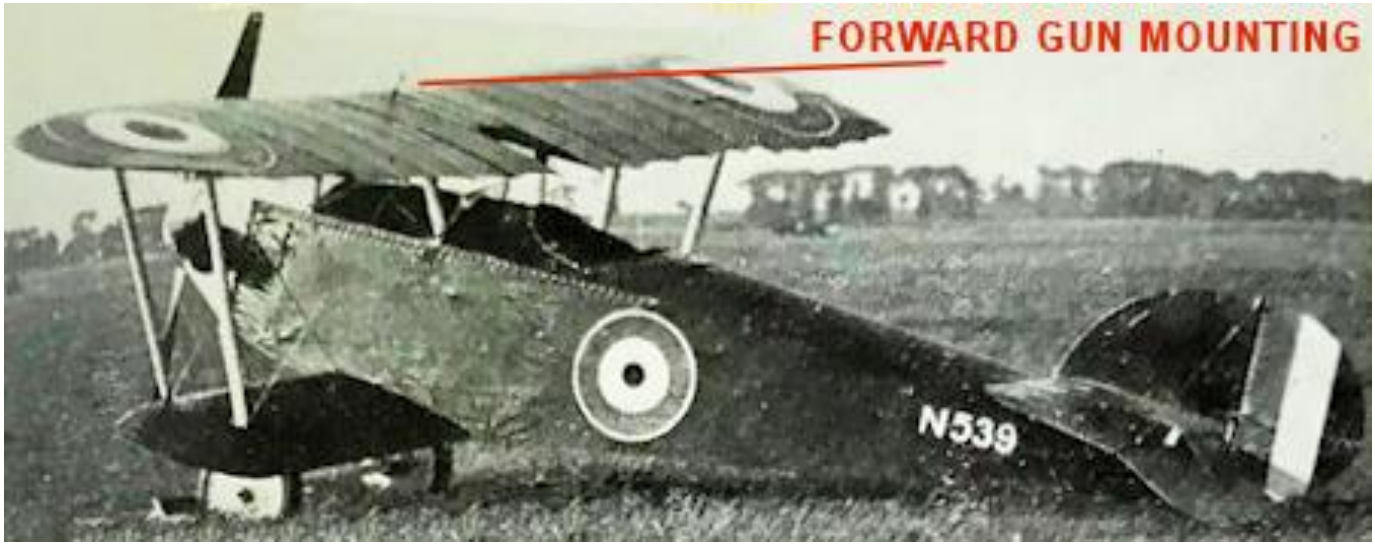
The only weapon intended to be fitted to this aircraft was a Lewis machine gun, fitted over the centre cut-out of the upper wing. However there are no photographs or details of a weapon fitted to the PV.7 and the kit does not supply any weapons for this model. The only comparison I could find were photographs of a Lewis machine gun fitted on the Port Victoria PV.8, the 'Eastchurch Kitten' (Ser No.540). Later aircraft that carried over wing Lewis guns, such as the SE5, had the gun mounted on a curved rail, which allowed the pilot to swing the gun down in order to replace the ammunition drum. There was no need for this on the PV.7 as the pilot could easily reach the Lewis gun, so the weapon was mounted in a fixed position on the wing.

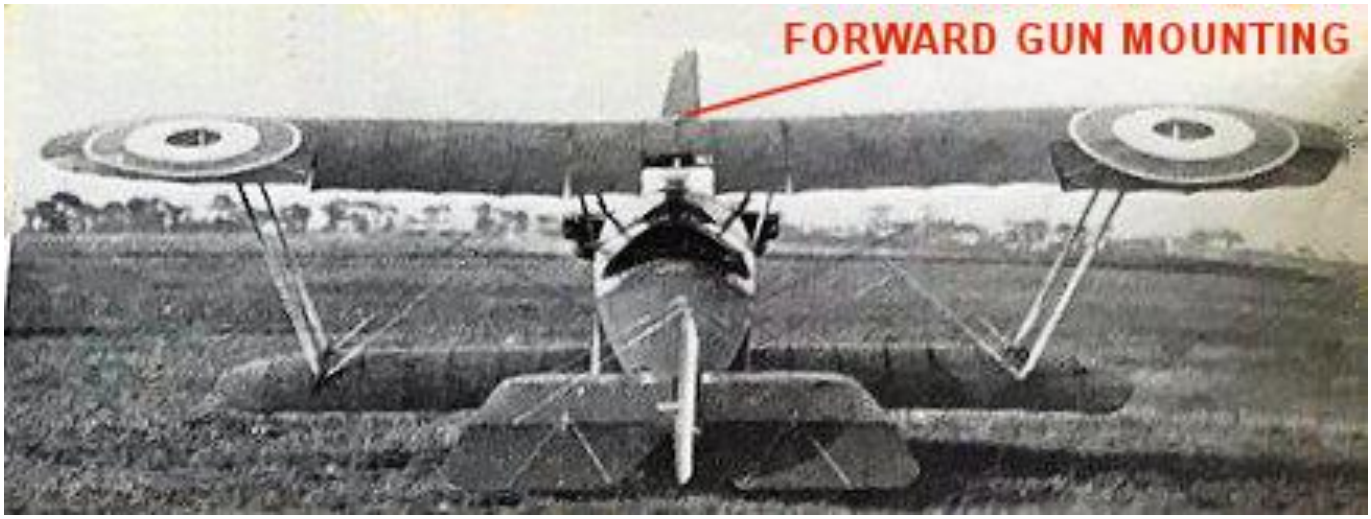
The Port Victoria PV.8 'Eastchurch Kitten'

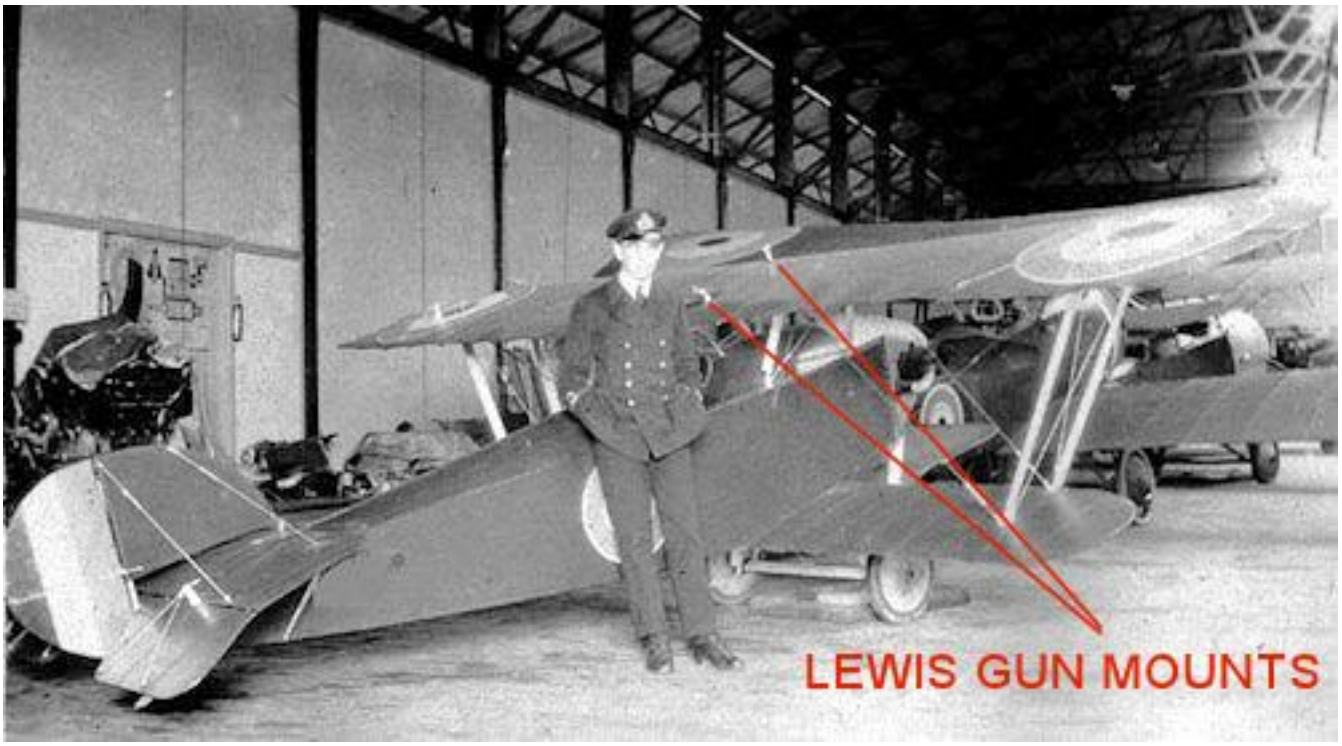
The Lewis machine gun fitted to the PV.8 was offset to the right, presumably to allow easier access to the cockpit for the pilot.

However as can be seen on the following photographs of the PV.7, what appears to be the front mounting for a Lewis machine gun is located on the centre line of the wing.

The Port Victoria PV.7 ‘Grain Kitten’







Therefore I decided to fit an aftermarket gun. In this instance it was the Lewis Mk.II (13-32056) from 'Gaspatch', who have a range of various resin WW1 weapons, all of which have well defined and accurate detail. The addition of the machine gun, based on that of the PV.8, also required making an appropriate mounting.

Drill a location hole of 0.9 mm diameter into, but not through, the top surface of the upper wing. The hole should be central to the wing cut-out and 2 mm from the trailing edge.

NOTE: *A gun swivel mount, from my spare 'Wingnut Wings' parts, was used*.

Reduce the length of the locating shaft of the swivel mount so when inserted into the pre-drilled hole in the wing, the bottom of the 'U' bracket is touching the wing.

Drill a hole of 0.5 mm diameter through the centre of the two lugs on the swivel mount.

NOTE: *The cartridge collection pouch supplied with the 'Gaspatch' machine gun is not required for this model build*.

Carefully scrape flat both sides of the gun mounting pivot point on the 'Gaspatch' machine gun.

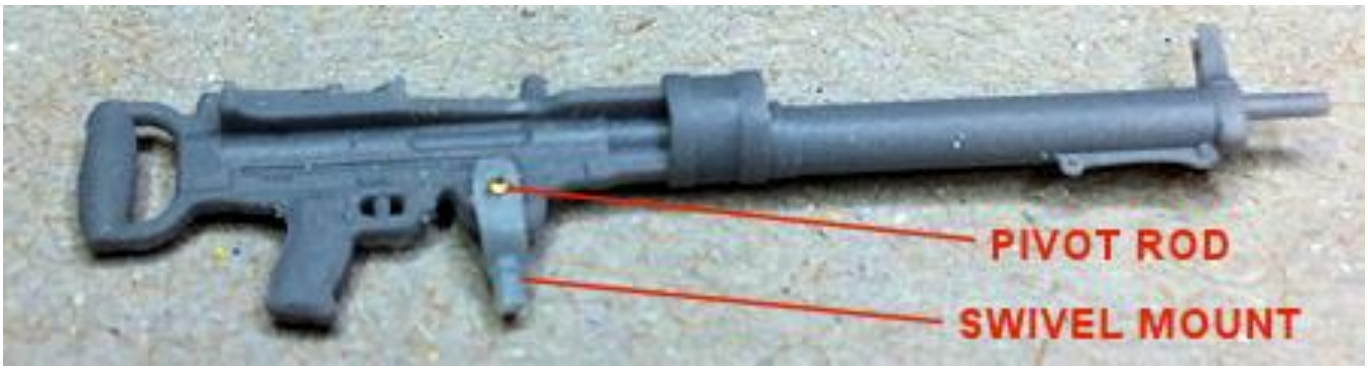
Drill a hole of 0.5 mm diameter through the centre of the gun mounting pivot point.

Cut a short length of 0.4 mm diameter tube (e.g. ‘Albion Alloy’s’ MBT04 or similar).

Position the swivel mount onto the gun mounting pivot point, then pass the tube through the pre-drilled holes. The swivel mount should be free to move.

Carefully apply thin CA adhesive to the outer ends of the tube to secure it to the swivel mount only, not the gun.

Carefully sand away and tube ends protruding from the swivel mount.



NOTE: *Due to the angle of attack for the fitted upper wing, the front of the mounted machine gun should be pointing down slightly, towards the wing surface. If the machine gun was to be mounted parallel to the wing surface, it would mean that when in flight, the gun would be angled too much in an upward direction.*

Locate the gun assembly onto the upper wing making sure the gun is vertical on the wing, aligned with the centreline of the wing and slightly down at the front.

Mark the wing for the centre of the cooling jacket of the gun, directly under the mounting ring for the front gun sight.

Remove the gun assembly.

At the mark, drill a hole of 0.5 mm diameter into, but not through, the wing and angled slightly forwards.

Cut a length of 0.5 mm diameter tube (e.g. ‘Albion Alloy’s’ MBT05 or similar).

Insert the tube into the pre-drilled hole in the upper wing.

Re-locate and position the gun assembly onto the upper wing.

Adjust the length of the tube until the gun assembly sits at the correct angle and the mounting ring for the front gun sight rests on the top of the tube.

Remove the gun assembly.

Secure the front support tube into the wing using thin CA adhesive.

Using flat pliers, flatten the exposed tube so that it will be inline with the mounted machine gun.

Painting:

NOTE: *The paints used are:*

'Alclad II' - Black Base primer (ALC-305).

'Alclad II' - Steel (ALC-112).

'Tamiya' Hull Red (XF9).

Check the ‘Gaspatch’ Lewis machine gun and ammunition drum for any imperfections, seams lines and dust etc and clean as necessary.

Airbrush a light coat of ‘Alclad’ Black base primer (ALC-305) or similar over the gun and ammunition drum.

Airbrush a light dusting coat ‘Alclad’ Steel (ALC-112) or similar over the gun and ammunition drum.

Secure the ammunition drum to the top of the machine gun, using CA adhesive.

Brush paint the strap handle of the ammunition drum with ‘Humbrol’ Leather (62) or similar.

Brush paint the two hand grips on the machine gun - ‘Tamiya’ Hull Red (XF9) mixed with a small amount of ‘Humbrol’ Leather (62) - or similar mix.

PART 8

ENGINE WITH MODIFICATIONS

PART 8 - ENGINE WITH MODIFICATIONS

NOTE: *Whilst working with the resin parts of this model:*

Assembly of all parts is carried out using CA adhesive.

Handle with care as the parts have been moulded very thin and are fragile and easily damaged.

Wash all parts in warm water with washing liquid added, to remove resin mould release agent.

Cut the parts away from their mould bases or sheet.

Remove all mould 'flash' , stubs and seams from the parts.

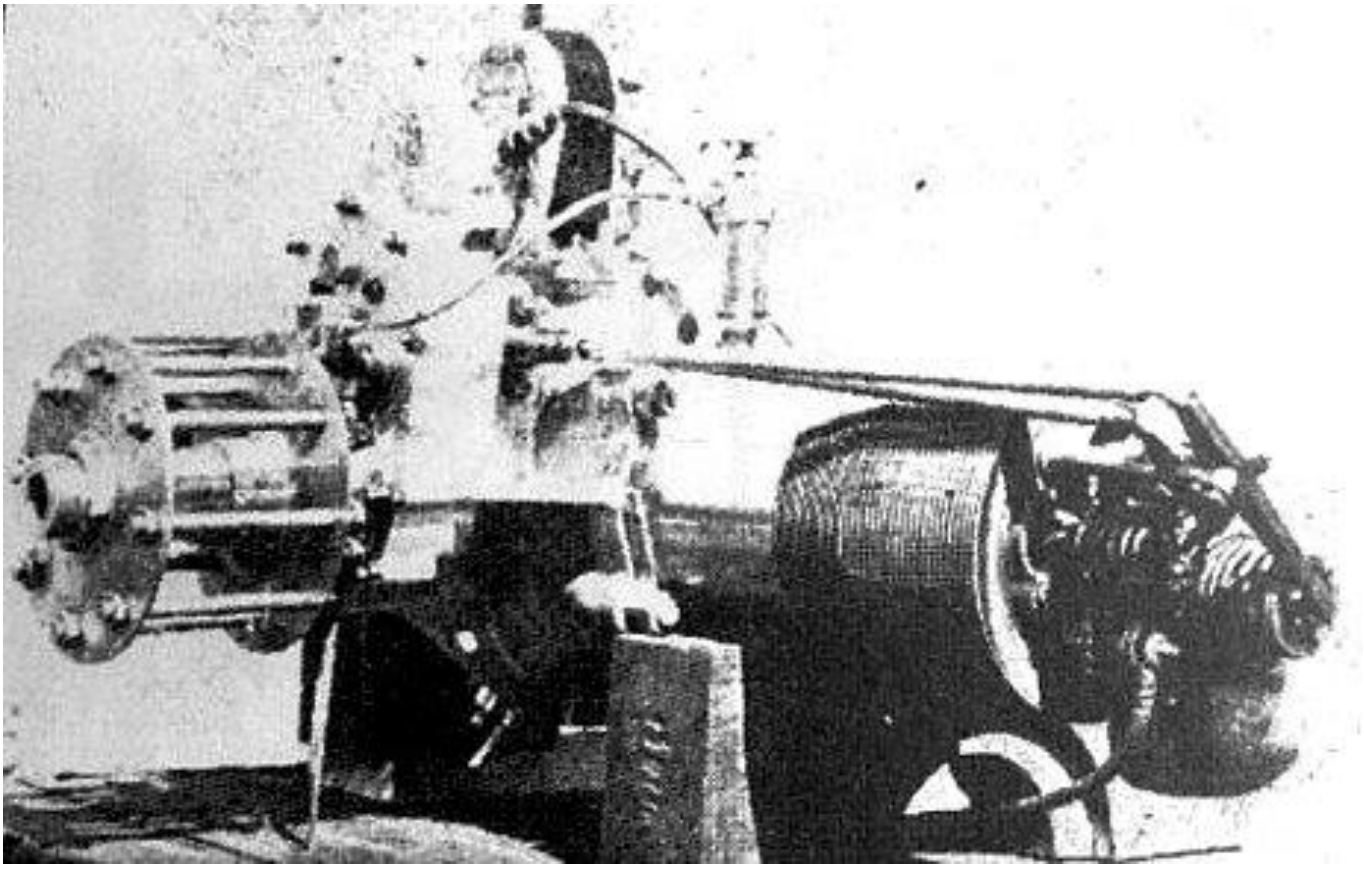
When working with resin, dust or particles are harmful if they are inhaled or ingested.

The 'All British Engine Company, Ltd' of London, later renamed 'ABC Motors Ltd' was formed in 1912 Ronald Charteris with Granville Bradshaw as the chief designer. The Company developed both the motorcycle and aircraft engines.
The 'Gnat' was a horizontally opposed, two cylinder engine with single ignition and was produced in both geared and direct drive versions. Only 17 engines of this1916 design were built.

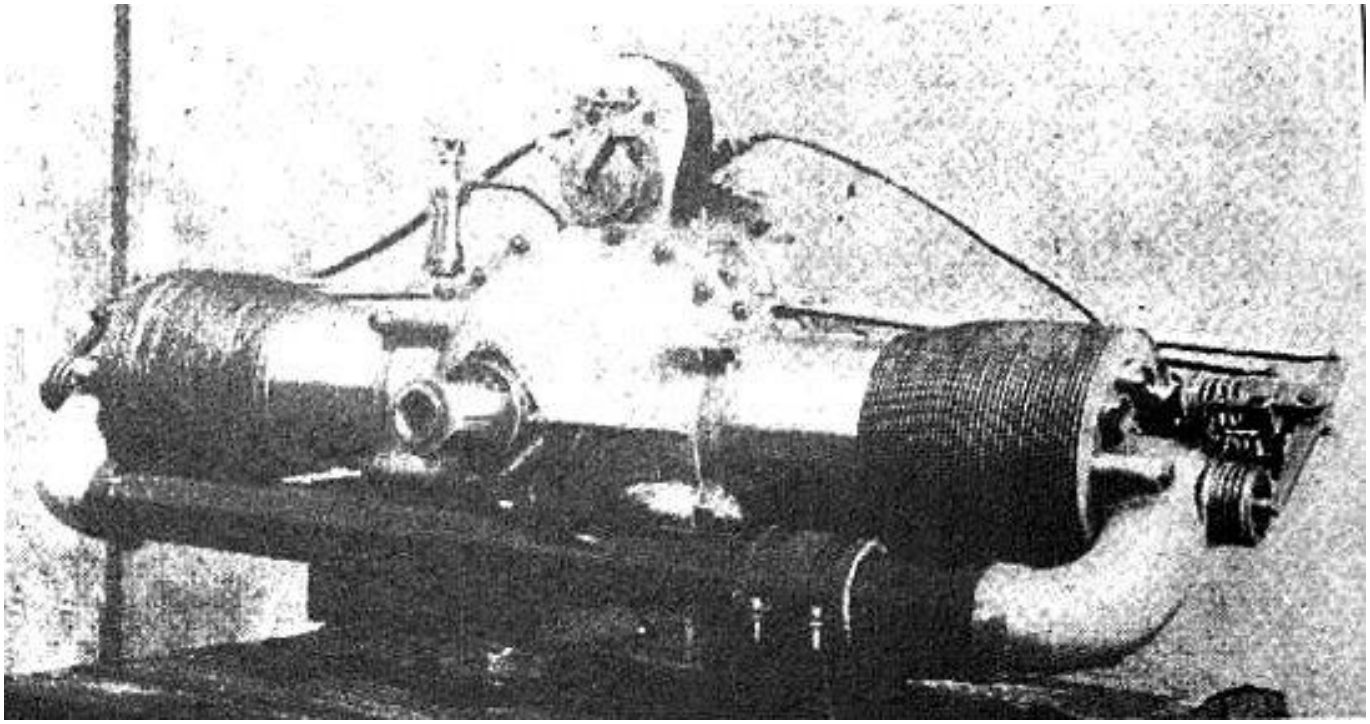
Specifications:

Type - horizontally opposed two cylinder, air cooled.
Power - 35hp (26kW) at 1800 RPM.
Weight - 115 lb (52 kg).
Cylinder Bore - 4.3 inches (110mm).
Cylinder Stroke - 4.7 inches (120mm).
Displacement - 139 cu inches (2.3 litres).

Typical ABC 'Gnat' engine (front view)

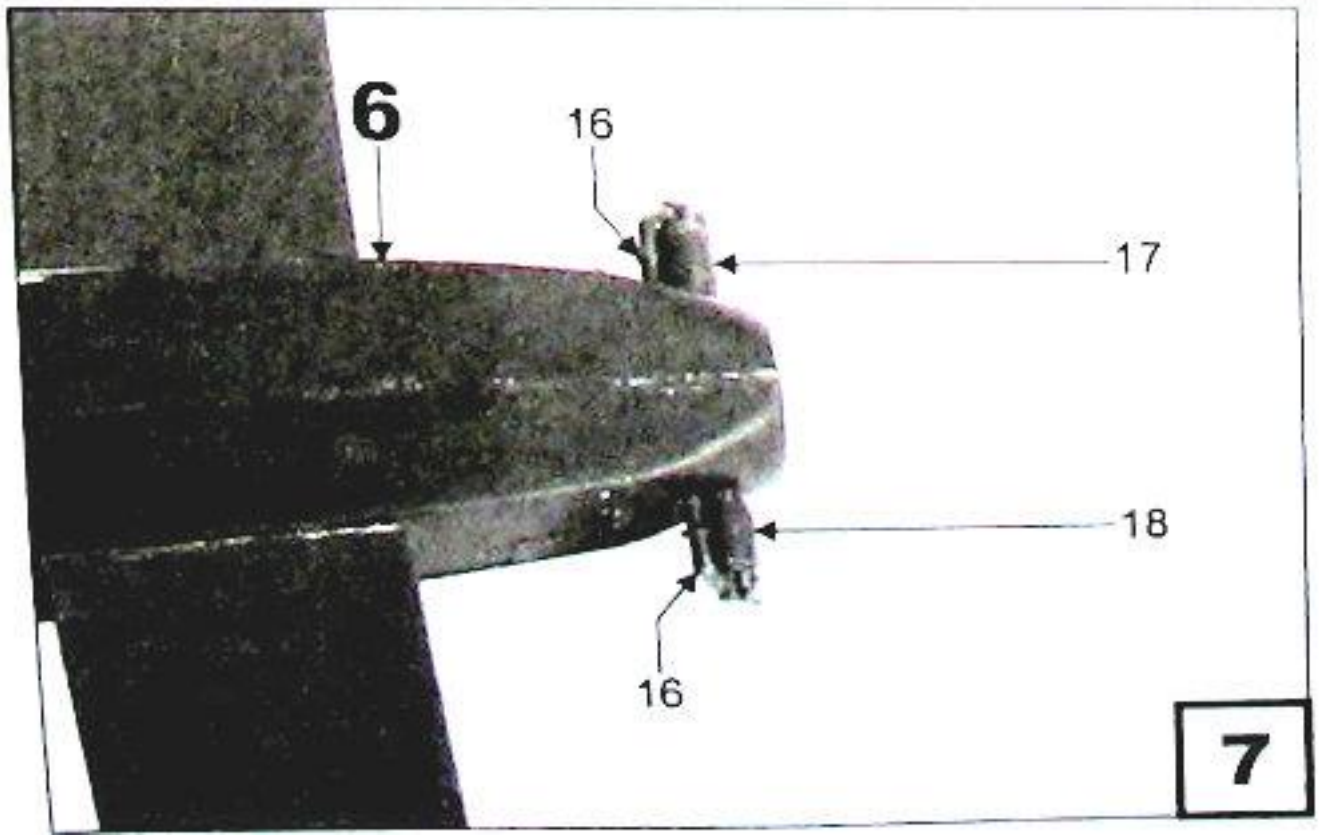


Typical ABC ‘Gnat’ engine (rear view)



The engine supplied in the kit consist of just four parts, the two cylinder assemblies (17 and 18) and what are assumed to be the two fuel induction pipes (16). The size of the parts and the fact that there is little, if any, information for the design and construction of this engine, means that the engine as such must be built as supplied in the kit.

The only possible addition would be the single ignition lead and spark plug on each cylinder and valve push rods.



NOTE: *The paints used are:*

'Alclad II' - Black base primer (ALC-305).

'Alclad II' - Steel (ALC-112).

Alclad II' - Exhaust Manifold (ALC-123).

Alclad II' - Copper (ALC-110).

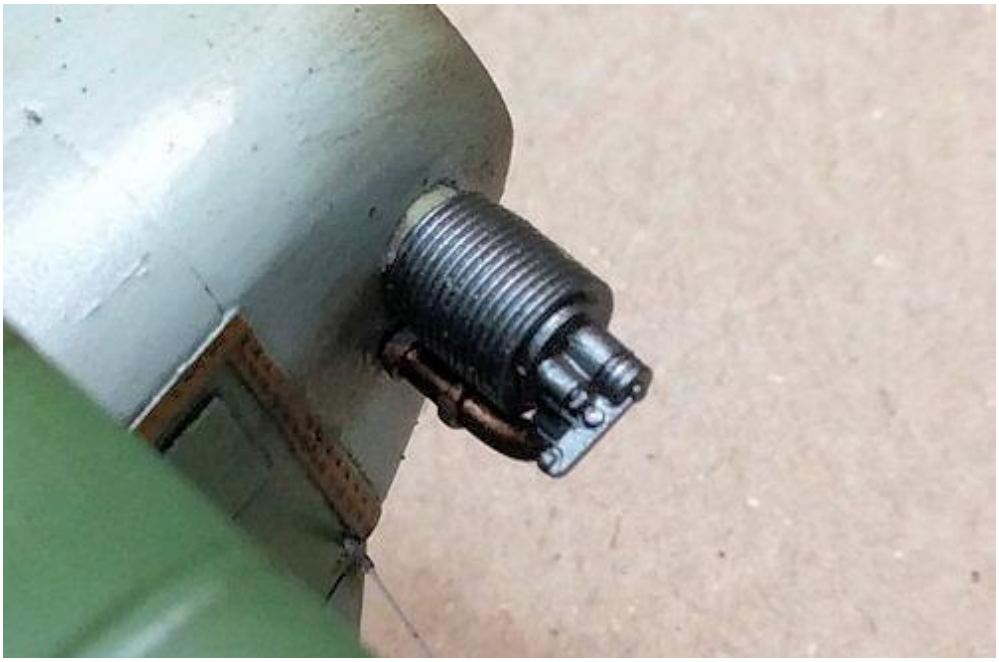
Check the engine parts are free from any imperfections, seams lines and dust etc and clean as necessary.

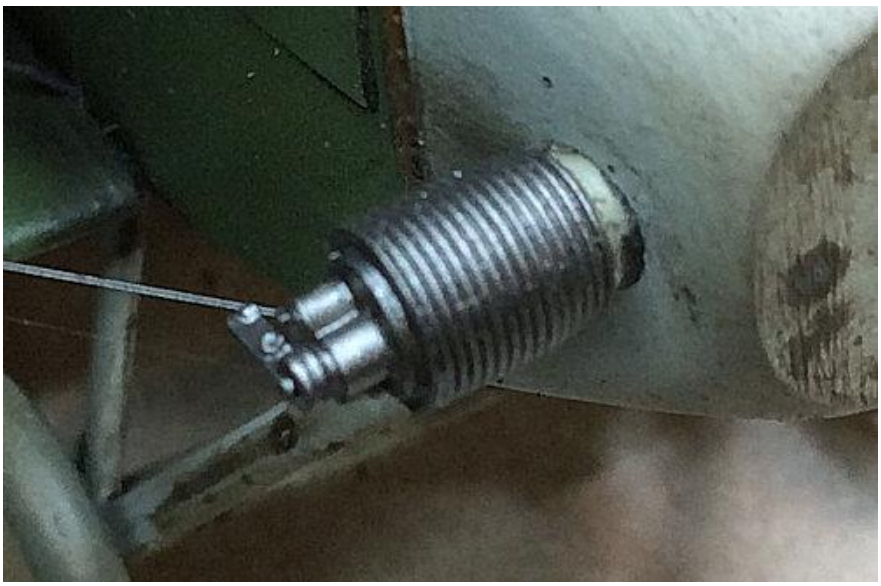
Airbrush a light coat of 'Alclad' Black base primer (ALC-305) or similar over the two cylinders and induction pipes.

Airbrush a light dusting coat 'Alclad' Steel (ALC-112) or similar over the two cylinders.

Airbrush a light coat of 'Alclad' Exhaust Manifold (ALC-123) and Copper (ALC-110) mixed 50/50 (or similar) over the two induction pipes.

NOTE: *The engine cylinders and induction pipes must be fitted to the fuselage (refer to Part 10 - Construction with Modifications) before the modifications of adding spark plugs leads and valve pushrods can be added.*





PART 9

PREPARATION WITH MODIFICATIONS

PART 9 - PREPARATION WITH MODIFICATIONS

NOTE: *Whilst working with the resin parts of this model:*

Assembly of all parts is carried out using CA adhesive.

Handle with care as the parts have been moulded very thin and are fragile and easily damaged. ***Especially when the fuselage is assembled as any undue pressure on the sides can break the seam joint.***

Wash all parts in warm water with washing liquid added, to remove resin mould release agent.

Cut the parts away from their mould bases or sheet.

Remove all mould 'flash' , stubs and seams from the parts.

When working with resin, dust or particles are harmful if they are inhaled or ingested.

Example of mould residue and 'flash'

Undercarriage:

NOTE: *The undercarriage axle fairing supplied in the kit is moulded with the axle. However the axle fairing is too wide and needs to be modified. This requires cutting off the existing axle ends.*

Cut both axle ends off the axle fairing.

Cut the fairing length to 26 mm.

Drill a hole of 0.5 mm diameter and approximately 5 mm deep centrally into each end of the axle fairing, between the leading edge and the centre of the axle fairing.

Drill a 0.5 mm diameter hole through the centre and at each end of the axle fairing.

NOTE: *The bottom surface of the axle fairing is flatter than the curved top surface.*

File a slight chamfer on the ends of the axle fairing from the pre-drilled holes up towards the top surface.

Cut two lengths of 0.5 mm diameter rod (e.g. 'Albion Alloy's MBR05 or similar).

Secure the rods into the pre-drilled holes in the axle fairing, using thin CA adhesive.

NOTE: *The undercarriage should be fitted with the longer strut forwards and the shorter strut rearwards.*

Hold a kit undercarriage strut in position on one side of the fuselage underside, with the locating pin of the forward strut just to the rear of the moulded stitching line and the strut flush to the fuselage side. Mark the location of the pin.

At the pin mark, drill a hole of 0.6 mm diameter through the bottom of the fuselage.

Repeat to drill a hole through the bottom of the fuselage at the opposite side.

Hold the kit undercarriage struts in position on the fuselage underside, with the locating pins of the forward struts in their pre-drilled hole.

Make sure the two struts are parallel to each other and mark the position of their locating pins for the rear struts.

Remove the struts and at the pin marks, drill a hole of 0.6 mm diameter through the bottom of the fuselage.

NOTE: *The undercarriage assembly will be fitted to the model later in this build.*

Test fit the two undercarriage struts with the axle fairing.

Wheels:

Drill a 0.5 mm diameter hole through the centre of each wheel to accept the added tube stub axles on the in the axle fairing. Do not fit the wheels at this stage of the build.

Ailerons:

NOTE 1: *The two ailerons on the upper wing are moulded into the resin wing. If the ailerons are to be animated, they will need to be cut from the wing and modified.*

NOTE 2: *Refer to Part 5 (Rigging details) for rigging information.*

Using the pre-moulded lines in the upper wing (25), carefully cut out the two ailerons. I use a scrapper to scrape out the lines and cut, if necessary, using a fine saw.

Sand the wing openings smooth and flat.

Sand the leading edge of both removed ailerons to form a curved edge on both sides.

Centre mark three equally spaced points into the trailing edge of the two wing aileron cut-outs.

Using the points as a guide, drill six holes of 0.5 mm diameter into the wing approximately 5 mm deep.

Cut six lengths of 0.5 mm diameter tube (e.g. 'Albion Alloy's' MBT05 or similar) approximately 8mm in length.

Insert a tube into each drilled hole and secure in position.

Lay the two removed ailerons against the tubes in their respective locations and mark the position of each tube onto the leading edge of the ailerons.

Drill the marked holes into the leading edges of the two ailerons, making sure the holes are central and approximately 5mm deep.

Test fit the two ailerons and check they are fully located and aligned with the wing surfaces.

Remove the ailerons for fitting later in this build.

Select four appropriate control horns from the JadarHobby Shop - Part No.48087 (1/48) photo-etch set.

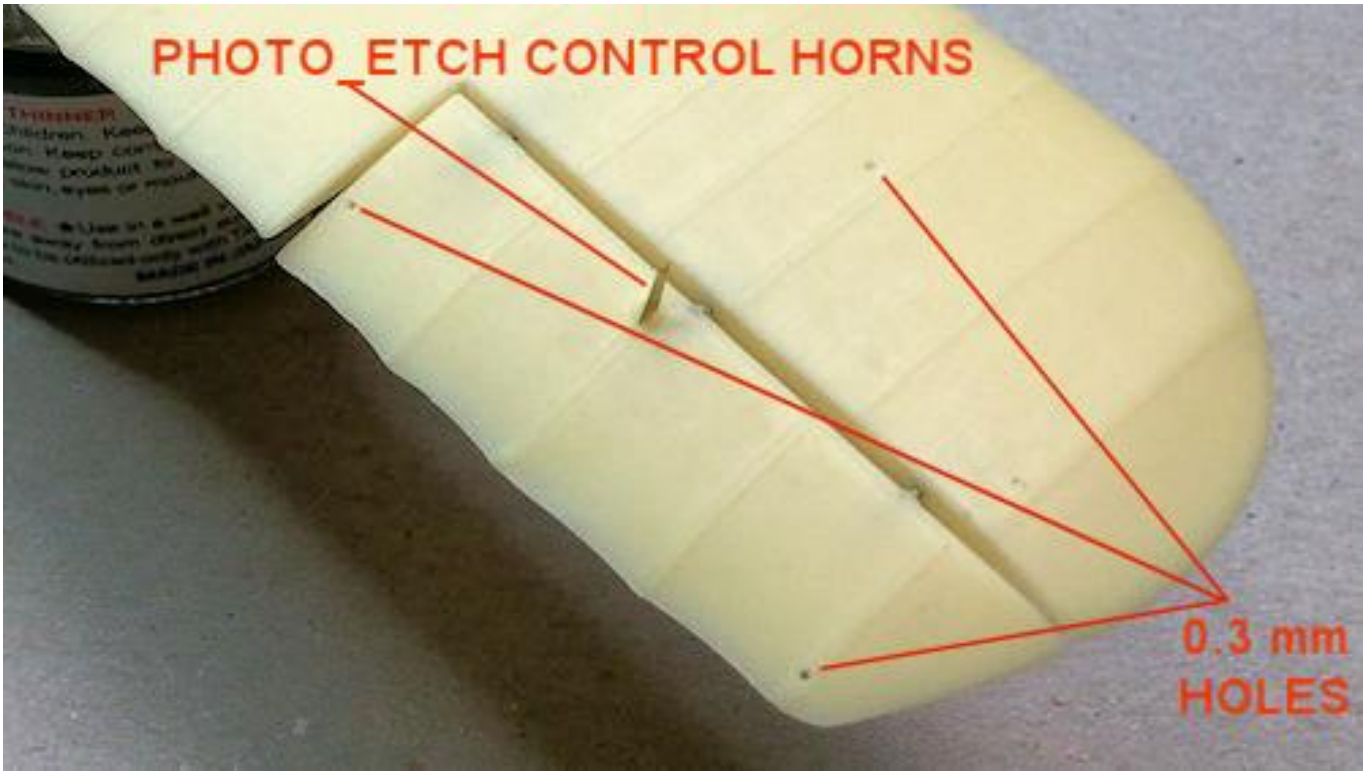
Using a sharp modelling chisel, press a slit indent into both sides of each aileron at the control horn locations.

In the centre of the indents, drill a 0.3 mm diameter hole through the aileron.

Insert the tang and bottom of a photo-etch control horn into a hole and slit and secure in position using CA adhesive.

Repeat to fit the control horn in the other side of the aileron.

Drill rigging location holes through the ailerons and wing at the locations shown, using a 0.3 mm diameter drill.



Remove both ailerons from the wing, for fitting later in this build.

Fin and rudder:

NOTE 1: *The supplied resin fin and rudder are intended to be secured to the top centre of the tail plane and rear of the fin respectively, by just being glued as 'butt' joints, which are not really strong enough joints. Therefore the fin and rudder need to be pinned to the tail plane and fin.*

NOTE 2: *Refer to Part 5 (Rigging details) for rigging information.*

Carefully sand the bottom edge of the fin (8) so it's profile matches the centre rib tape of the curved upper surface of the tail plane (12) (curved surface).

Drill two holes of 0.3 mm diameter into the bottom edge of the fin.

Cut two short lengths of 0.3 mm diameter rod and secure them into the drilled holes.

Lay the fin against the top, centre rib tape of the tail plane and mark the position of the two rods in the fin.

Drill two holes of 0.4 mm diameter through the tail plane at the marked positions.

File or sand away the two 'hinge' lugs on the leading edge of the rudder.

NOTE: *The bottom pin to attach the rudder to the fin and rudder post must be added father up, at the bottom of the fin. This is necessary as the exposed rudder post is too weak to be drilled and will break.*

Drill two holes of 0.3 mm diameter into the leading edge of the rudder (7).

Cut two short lengths of 0.3 mm diameter rod and secure them into the drilled holes.

Lay the rudder against the rear edge of the fin/rudder post, and mark the position of the two rods in the rudder.

Drill two holes of 0.4 mm diameter into the fin rear edge at the marked positions.

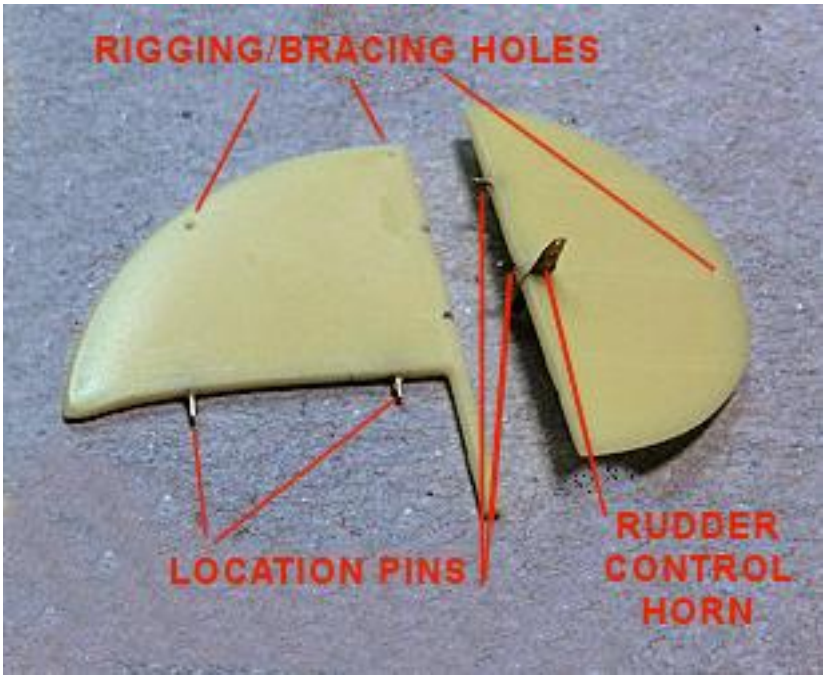
Drill a hole of 0.5 mm diameter in the rear edge of the rudder (for rigging).

Using a fine modelling saw, cut a slot into the leading edge of the rudder.

Insert an appropriate photo-etch control horn at each side of the rudder and secure in position.

Drill two bracing wire holes of 0.5 mm diameter through the fin just inside the curved edge.

Drill a rigging hole of 0.5 mm diameter through the rear edge of he rudder.



Elevators:

NOTE: *Refer to Part 5 (Rigging details) for rigging information.*

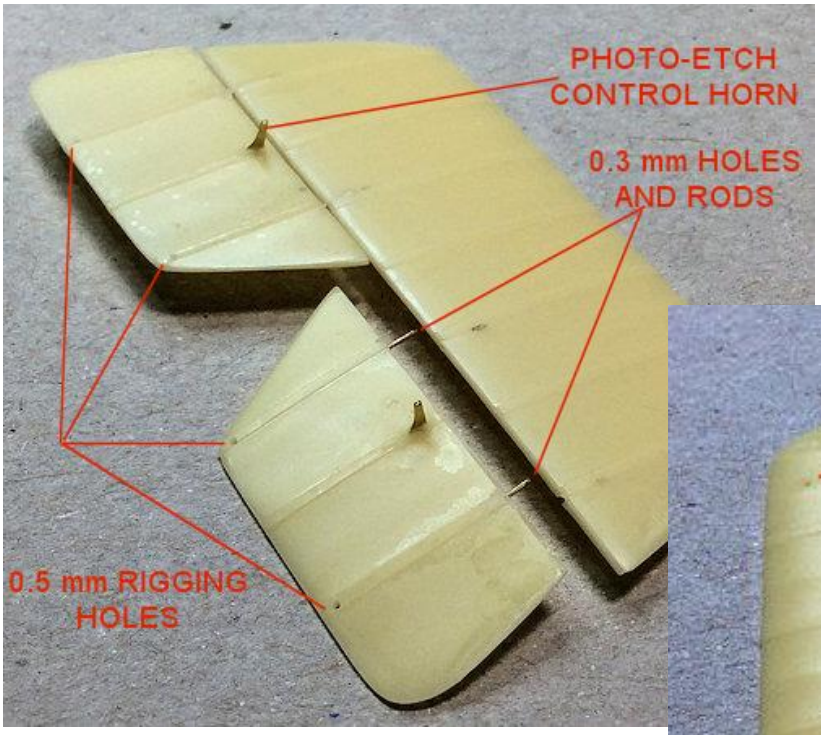
The elevators (23) were modified using the same procedure used to modify the ailerons, with the following exceptions:

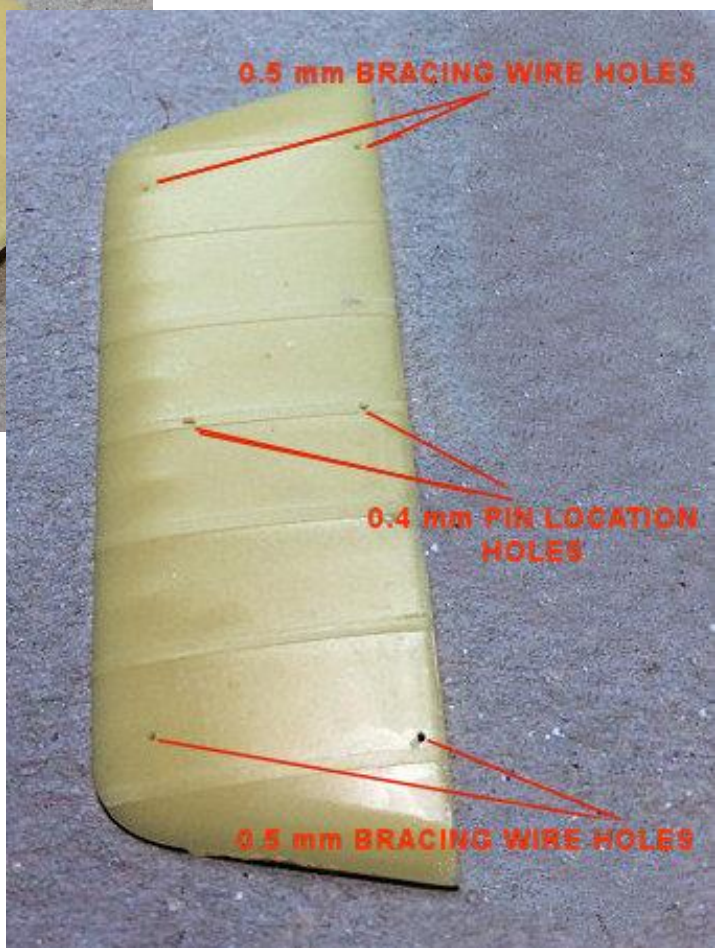
The drilled holes for locating the control horns were 0.5 mm diameter.

The holes and rod used to attach the elevators were 0.3 mm diameter.

Drill four rigging holes of 0.5 mm diameter through the trailing edge of the tail plane.

Drill four bracing wire holes of 0.5 mm diameter through the tail plane.





Tail plane bracing:

Drill a 0.5 mm diameter hole into the fuselage (both sides) at the bottom rear edge, adjacent to the tail skid.

Wing rigging and bracing:

NOTE 1: *Refer to Part 5 (Rigging details) for wing rigging and bracing information.*

NOTE 2: *Anchor points for the various rigging and bracing wires will be added after painting of the model assemblies is completed.*

Pre-rigging location holes:

Now that the model construction has progressed to this stage, the remaining location holes for the rigging and cross bracing can be added. This consist of drilling holes into the model so that anchor points can be added.

NOTE: *Refer to Part 5 (Rigging details) for information on the various rigging and cross bracing anchor points.*

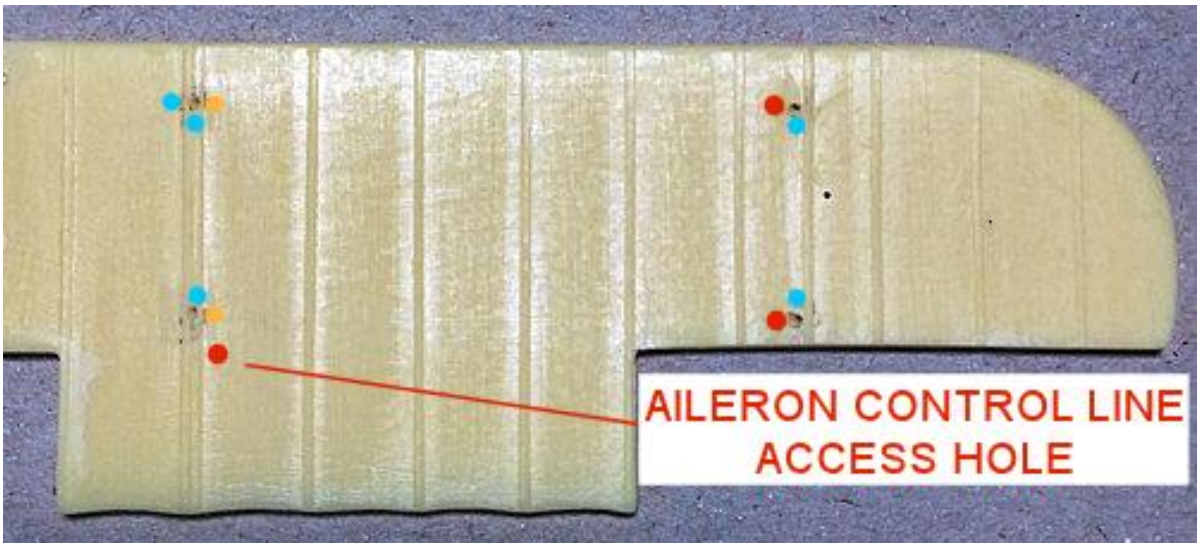
Underside of the upper wing:

Drill ten bracing location holes (blue) into, but not through, the underside of the upper wing. The holes should be 0.5 mm diameter and angled such that the wires, when fitted, will be straight between the relevant anchor points.

Drill four rigging holes (red) into, but not through, the underside of the upper wing. The holes should be 0.5 mm diameter and angled such that the wires, when fitted, will be straight between the relevant anchor points.

Drill four rigging holes (orange) into, but not through, the underside of the upper wing. The holes should be 0.5 mm diameter and angled such that the wires, when fitted, will be straight between the relevant anchor points.

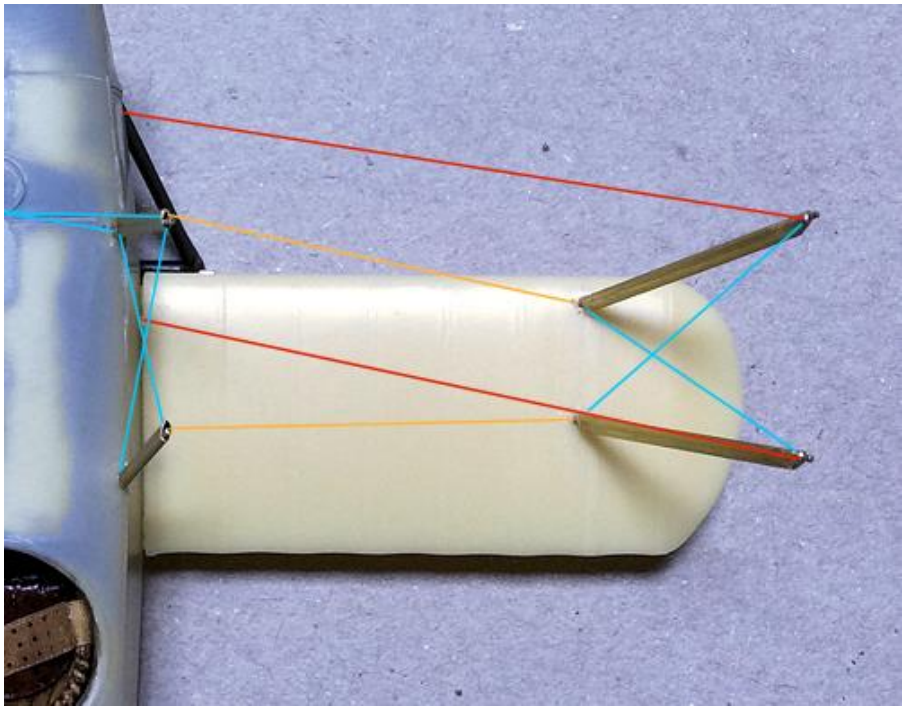
Drill two control line holes (red) into the underside of the upper wing for the aileron control wires. The holes should be 0.5 mm diameter and angled such that the aileron control wires from wing, when fitted, will be straight between the wing and the fuselage drilled holes.



Topside of the lower wings:

Drill two holes (blue) into, but not through, the topside of the lower wings. The holes should be 0.5 mm diameter and angled such that the wires, when fitted, will be straight between the relevant anchor points.

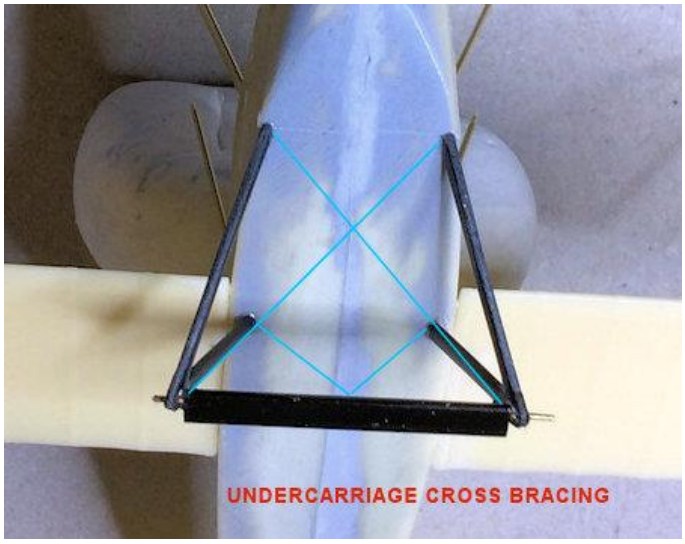
Drill two holes (orange) into, but not through, the topside of the lower wings. The holes should be 0.5 mm diameter and angled such that the wires, when fitted, will be straight between the relevant anchor points.



Undercarriage bracing:

Drill four bracing lone holes (blue) into the underside of the fuselage. The holes should be 0.5 mm diameter and angled such that the wires, when fitted, will be straight between the relevant anchor points.

Drill one bracing lone hole (blue) through the centre of the undercarriage axle fairing. The hole should be 0.5 mm diameter



Fuselage:

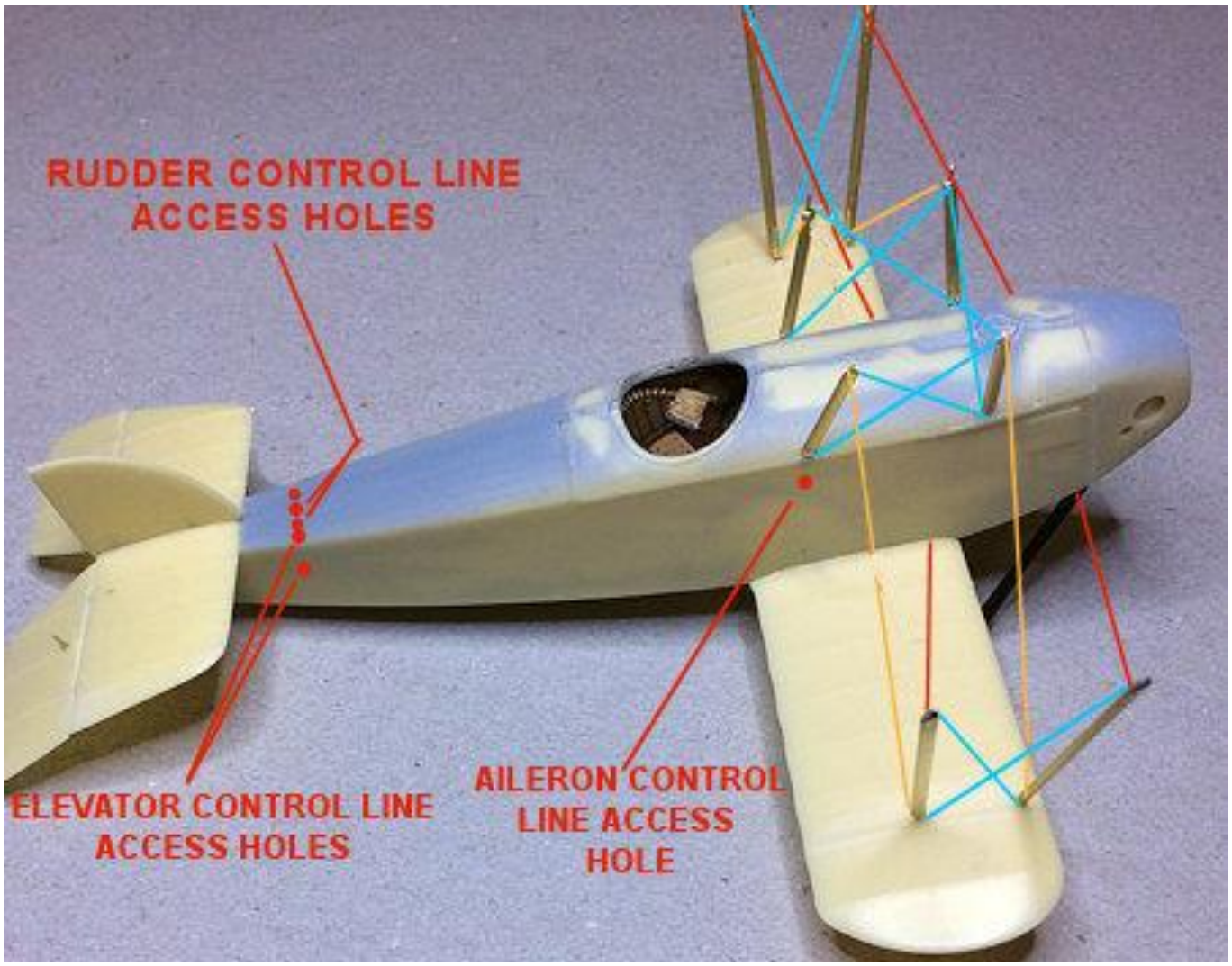
Drill two holes (blue) into each side of the fuselage top decking. One hole to the rear of the forward cabane strut. One hole forward of the base of the rear cabane strut. The holes should be 0.5 mm diameter and angled such that the wires, when fitted, will be straight between the relevant anchor points.

Drill two holes (red) into each side of the fuselage. One midway along the wing roots of the lower wings and one at the top of the forward undercarriage struts. The holes should be 0.5 mm diameter and angled such that the wires, when fitted, will be straight between the relevant anchor points.

Drill four holes (red) into the top, rear of the fuselage. The two inner holes should be inline with the rudder control horns and approximately 6 mm forward from the fin. The outer two holes are for the elevator control wires. The holes should be 0.5 mm diameter and angled such that the rudder and elevator control wires, when fitted, will be straight between the rudder and elevator control horns and the drilled holes.

Drill a hole (red) into each side of the fuselage for the elevator lower control wires. The holes should be 0.5 mm diameter and angled such that the elevator control wires, when fitted, will be straight between the elevator underside control horns and the drilled holes.

Drill a hole (red) into the sides of the fuselage for the aileron control wires. The holes should be 0.5 mm diameter and angled such that the aileron control wires from the sides of the fuselage, when fitted, will be straight between the fuselage and the holes in the underside of the upper wing.



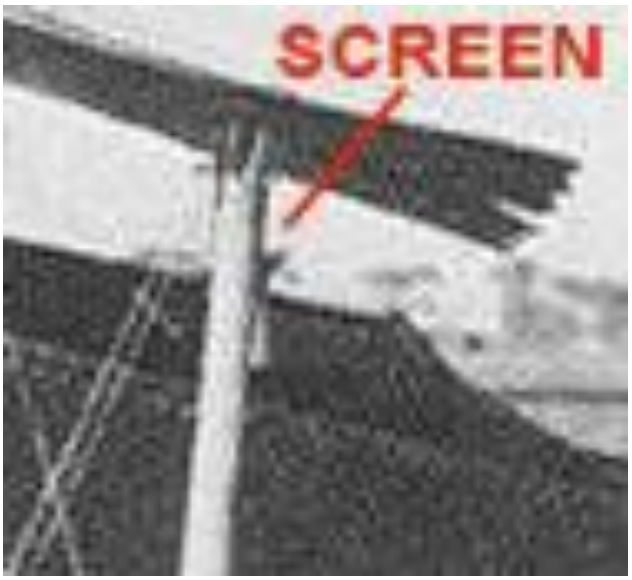
Windscreen:

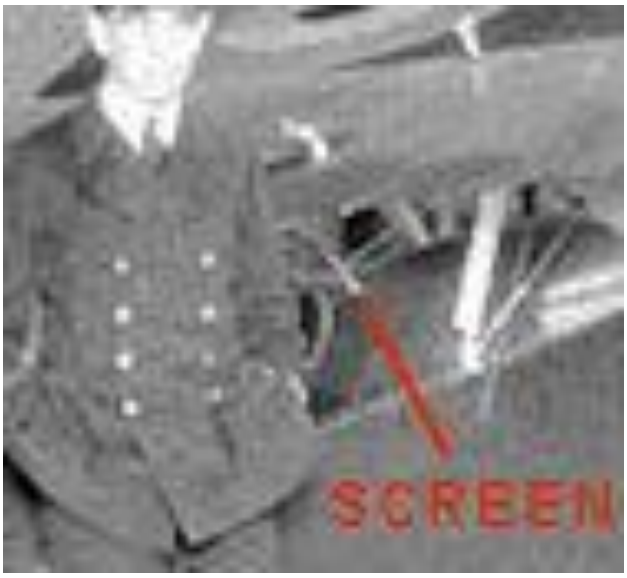
The Port Victoria PV.7 ‘Grain Kitten’, like the PV.8 ‘Eastchurch Kitten’, no longer exist. However a full sized working replica of the PV.8 does exist at the Yorkshire Air Museum, near the city of York in the United Kingdom. This replica shows just how small these aircraft designs were and how cramped the pilot’s could be in such a small cockpit.

PV.8 ‘Eastchurch Kitten’ replica.

An actual PV.8 prototype airborne.

Even though the pilot's were sat in the cockpit with most of their upper torso exposed to the elements, it appears that a windscreen was still fitted forward from the cockpit. Exactly how much protection this gave the pilot's is debatable!! The following photographs show the windscreen as fitted to the PV.7 'Grain Kitten'.





The 'windscreen' as such, provided in the kit consists of just a thin, outlined acetate sheet, which is virtually unusable. Therefore I replaced it with an approximately shaped windscreen from my 'spares' box.

Using the kit supplied acetate windscreen as a template, file and sand the shape of the windscreen. Make sure the curved profile on the base of the windscreen fully contacts the surface at the top of the fuselage, between the two rear cabane struts.

Sand then polish the top curves edge of the windscreen.

Brush paint the both sides of the bottom edge and slightly up each side of the windscreen, using 'Mr. Colour' Stainless Steel (213) or similar.

PART 10

COCKPIT WITH MODIFICATIONS

PART 10 - COCKPIT WITH MODIFICATIONS

NOTE 1: *Whilst working with the resin parts of this model:*

All assembly of all parts is carried out using CA adhesive.

Handle with care as the parts have been moulded very thin and are fragile and easily damaged.

Wash all parts in warm water with washing liquid added, to remove resin mould release agent.

Cut the parts away from their mould bases or sheet.

Remove all mould 'flash' , stubs and seams from the parts.

When working with resin, dust or particles are harmful if they are inhaled or ingested.

NOTE 2: *The basic resin pilot's seat supplied in the kit was replaced by the 'BarracudaCast' Sopwith Camel wicker (BR32332) seat.*

Remove clean up the following parts from their moulding blocks:
'BarracudaCast' pilot's seat, cockpit floor (2), instrument panel (3), cross member (4), throttle quadrant (5), rudder bar (6), fuselage halves (11 and 12), control column (21) and torsion bar (20).

Secure the control column (21) to the torsion bar (22).

Secure the cross member (4) to the underside of the cockpit floor (2).

Secure the rudder bar/torsion bar assembly to the cockpit floor assembly (torsion bar locates in holes).

Secure the rudder bar (6) to the cockpit floor location.

NOTE: *The following step is necessary to increase the height of the replacement seat.*

Secure a piece of 1.0 mm thick plastic card onto the underneath of the pilot's seat.

Prime the parts, including the inner surfaces of the fuselage halves, with a grey primer (e.g. 'AK Interactive' Grey AK-758 or similar).

Airbrush the inner surfaces of the fuselage halves, cockpit floor assembly and the instrument panel with 'Tamiya' Deck Tan (XF55).

Airbrush the pilot's seat with 'Tamiya' Wooden Deck Tan (XF78).

Brush paint the control column and torsion bar using 'Tamiya' Rubber Black (XF85).

Brush paint the throttle quadrant (5) using 'Mr. Colour' Stainless Steel (213).

Brush paint the control column and throttle lever hand grips with 'Tamiya' Hull Red (XF9).

Brush paint the instrument panel switch and the with on the inside of the right fuselage half, using 'Mr. Colour' Brass (219).

Brush 'AK Interactive' light wood filter (AK261) over the pilot's seat.

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

Secure the throttle quadrant onto its location in the left fuselage half.

Secure the seat cushion onto the pilot's seat.

Airbrush a semi-matte coat over the cockpit floor assembly, pilot's seat, inside the fuselage halves and the instrument panel ('Alclad' Light Sheen ALC-311, 'Tamiya' Semi-Gloss X35 or similar).

Brush a gloss sealer (‘Tamiya’ Gloss (X22 or similar) onto the two instruments and the vertical bar on the instrument panel.

Select appropriate decals from the ‘Airscale’ Dial Decals (Generic World War 1) (AS32 WW1) set and apply them to the two instruments and the vertical bar on the instrument panel. I also added a placard type decal next to the throttle quadrant and the switch on the cockpit halves (‘poetic licence’).

NOTE: *Refer to Part 2 (Wood effects) of this build log for more information.*

Apply ‘DecoArt’ Crafters Acrylic oil paint (Burnt Umber) over the cockpit floor assembly, the cockpit frames on the inside of both fuselage halves and the instrument panel.

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

Apply ‘Flory Model’ Dark Dirt fine clay wash over the over the cockpit floor assembly, the cockpit frames on the inside of both fuselage halves, the pilot’s seat and the instrument panel.

Airbrush a semi-matte coat over the cockpit floor assembly, inside the fuselage halves, the pilot’s seat and the instrument panel (’Alclad’ Light Sheen (311), ‘Tamiya’ Semi-Gloss (x35) or similar).

Cut a length of 0.2 mm Nickel-Silver rod (e.g. ‘Albion Alloy’s’ NSR02 or similar).

Secure the rod in position inside the left fuselage half, between the throttle quadrant and forward fuselage.

Cut two lengths of 0.2 mm Nickel-Silver rod (e.g. ‘Albion Alloy’s’ NSR02 or similar).

Cut two short lengths of 0.5 mm Aluminium tube (e.g. ‘Albion Alloy’s’ MAT05 or similar).

Secure the 0.5 mm tubes onto the end of the 0.2 mm rods.

Secure the 0.5 mm tubes onto the rudder bar and the 0.2 mm rods against the sides of the location cylinder for the original pilot’s seat.

Cut a length of ‘PlusModel’ 0.2 mm diameter lead wire.

Secure the lead wire in position inside the right fuselage half, between the switch and the forward fuselage.

Seat belts:
The kit does not supply the pilot’s seat belts, therefore I have chosen to use the ‘HGW Models’ AMC DH.2 belt set (132511) as being the most appropriate.

NOTE: *When assembling the seat straps, use CA adhesive. To avoid the adhesive soaking through the seat belts and sticking to the working surface, assemble the belts on a shiny surface, such as tile. When holding down the belt joints to allow the adhesive to set, keep the belt moving over the shiny surface, which should stop the adhesive sticking the belt to the working surface.*

Following the included instruction card, assemble the seat belts (‘HGW Models’ AMC DH.2 belt set (132511). The choice for the type of anchoring of the seat belts can be either the metal fittings or the loop straps.

Brush over the assembled seat belts with ’AK Interactive’ Filters (Wood AK-261) thinned with White Spirits to give a dirtier appearance to the belts.

Secure the two seat belts to the outside bottom edge of the pilot’s seat and up and over the seat sides onto the seat cushion.

Secure the cockpit floor assembly into the left fuselage half, with the bottom edges of the two cross members aligned with the front and rear vertical side frame members.

Secure the pilot's seat onto the location cylinder for the original pilot's seat. Before the adhesive sets, locate the right fuselage half and make sure the pilot's seat is central between the fuselage halves.

Remove the right fuselage half.

NOTE: *In the following step, if the end of the instrument panel has to be 'worked', the same should be done to the opposite end of the panel.*

Test fit the instrument panel into the left fuselage half. The centre of the middle instrument dial should be in-line with the edge of the fuselage. If not, file or sand away the end of the panel that butts up against the cockpit side frame until the panel is correctly aligned.

Secure the instrument panel in position in the left fuselage half.

NOTE: *The fuselage halves are moulded thin as are therefore flexible, but also fragile and easily damaged if too much pressure is applied when joining them. During the following step take care to align the fuselage halves as accurately as possible, as there are no locating stubs or holes provided.*

Apply CA adhesive to the one fuselage half, but along the mating face at the top of the fuselage and forward from the cockpit.

Position the two fuselage halves together aligning the mating faces where the CA adhesive was applied. Hold in position until the adhesive has set.

Insert the point of a toothpick or similar, at the top rear of the fuselage join. This will open up the mating faces to allow adhesive to be applied.

Apply CA adhesive into the length of the open join.

Position the two fuselage halves together aligning the mating faces where the CA adhesive was applied. Hold in position until the adhesive has set.

Repeat this procedure for the fuselage bottom joint, first at the forward half of the joint then once the CA adhesive has set, the remainder of the joint.

Finally, apply CA adhesive down the fuselage front and rear seams.

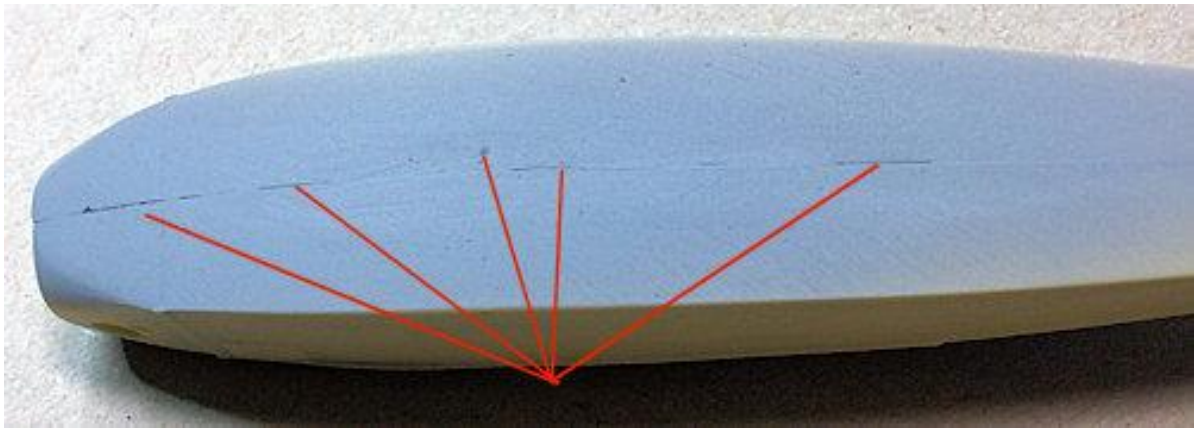
NOTE: *The fuselage halves are moulded thin and therefore fragile and easily damaged. During the next step take care not to apply too much pressure when handling the fuselage and also not to file or sand through the resin.*

Carefully file or sand along the seam of the fuselage joint, to remove residual CA adhesive and to blend the two halves of the seam. Take care not to remove any surface detail, such as surface stitching and panels. Make sure the final finish is smooth and free from any imperfections, as this will help when applying decals later in this build.

Mask off the cockpit opening to protect the cockpit detail.

Airbrush prime the fuselage with a grey primer (e.g. 'AK Interactive' Grey AK-758 or similar).

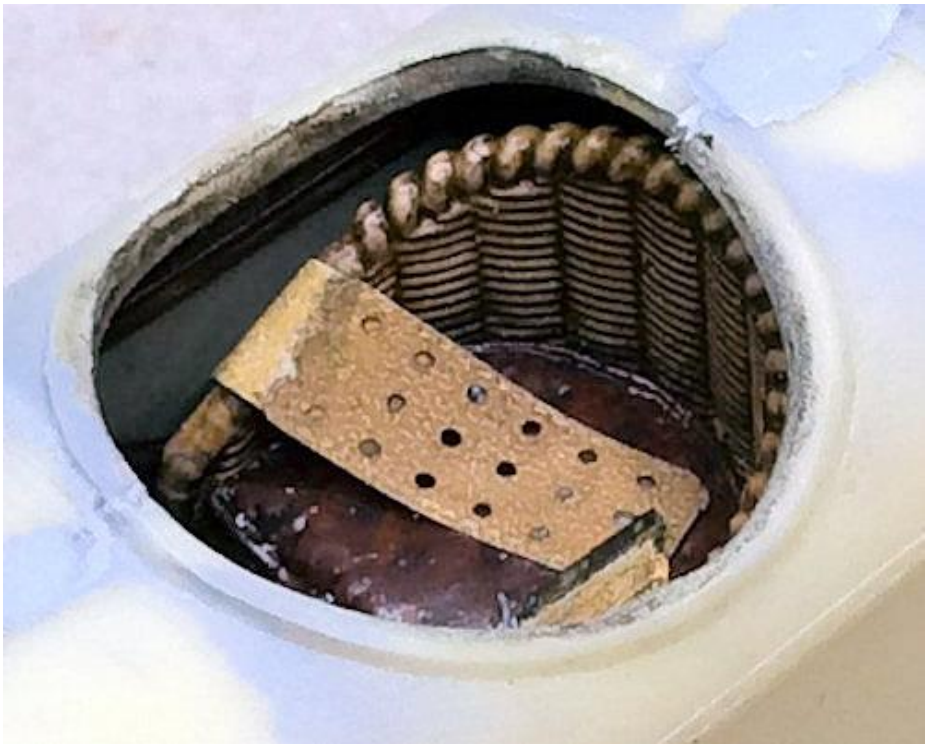
Check the fuselage seam joint for any seam openings or 'steps'. Also look for any other surface imperfections.

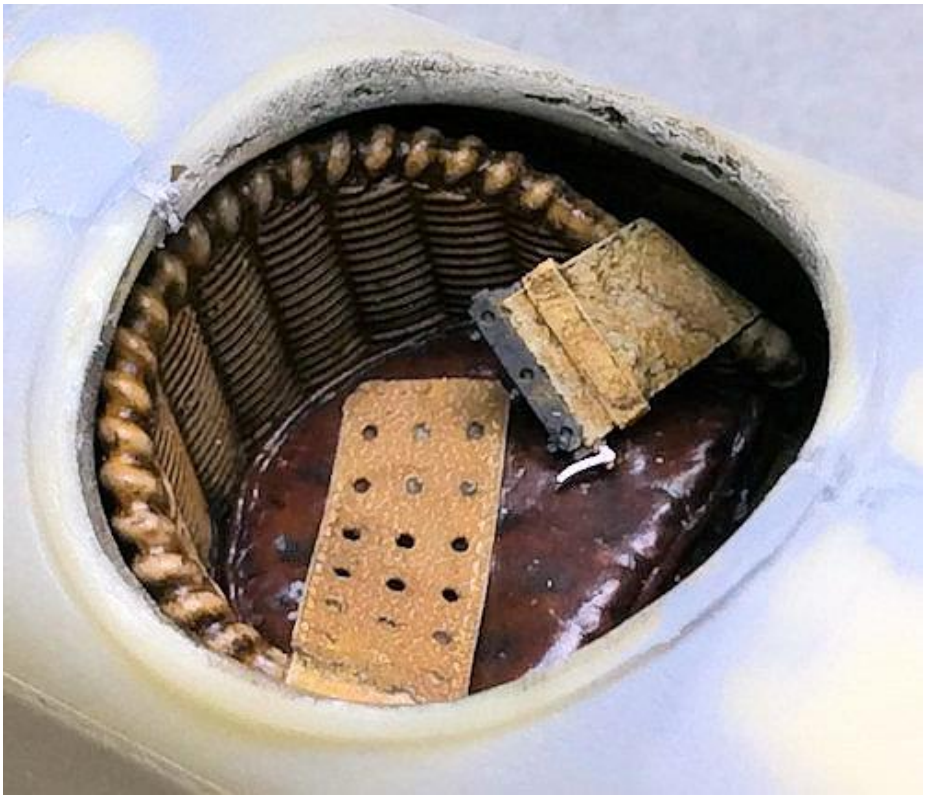


NOTE: *Due to how thin the walls of the fuselage are and that they may have already needed to be sanded, it is not advisable to sand further. If seam gaps of surface imperfections are visible, a better option is to coat these with a good surface 'primer and filler', such as 'Mr. Surfacer', which is supplied in various filling capacities, such as 500, 1000 or 1200. The lower the number the thicker the filling capacity. The primer is lacquer based, so can if necessary be thinned with 'Mr. Colour' self levelling thinners.*

If necessary, apply a light coat of 'Mr. Surfacer' 500 over any gaps or surface imperfections.

Allow the primer to dry then using a cotton bud dampened with 'Mr. Colour' self levelling thinners, gently wipe across, not along, the filled areas. The thinners should re-activate the primer and remove any excess, leaving the gaps or imperfections flush with the surrounding surface.





PART 11
CONSTRUCTION WITH MODIFICATIONS

PART 11 - CONSTRUCTION WITH MODIFICATIONS

NOTE: *Whilst working with the resin parts of this model:*

Assembly of all parts is carried out using CA adhesive.

Handle with care as the parts have been moulded very thin and are fragile and easily damaged.

Wash all parts in warm water with washing liquid added, to remove resin mould release agent.

Cut the parts away from their mould bases or sheet.

Remove all mould 'flash' , stubs and seams from the parts.

When working with resin, dust or particles are harmful if they are inhaled or ingested.

Lower wing halves:

NOTE 1: *The two lower wing halves need to pinned to the fuselage sides for additional strength, as the intended method for the kit is just to 'butt' join the wings to the fuselage, which is not a strong enough joint.*

NOTE 2: *On each side of the fuselage, at the bottom edge, is a pre-moulded indent. The purpose of these indents are not detailed in the kit instructions, but are assumed to be a location for pinning the wings to the fuselage.*

On each lower wing half, mark a central point 9 mm and 17 mm rearwards from the wing leading edges.

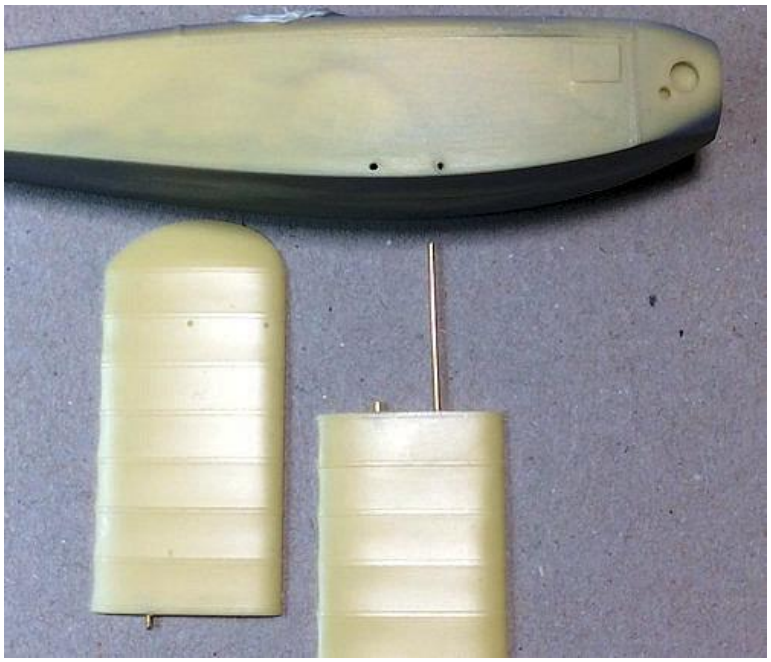
At the centre point marks, drill holes of 0.8 mm diameter and approximately 4 mm deep, horizontally into the wings, making sure to drill the hole carefully so as not to break through the wing surfaces.

At the indent on each side of the fuselage, mark a centre point 8 mm rearwards from the centre of the indents.

At the indents and previously marked positions, drill holes of 0.8 mm diameter through to the inside of the fuselage.

Cut three lengths of 0.8 mm diameter rod (e.g. 'Albion Alloy's' or similar). Two lengths of approximately 6 mm and one length 28 mm.

Secure the short lengths of rod into the rear holes drilled into the lower wings.



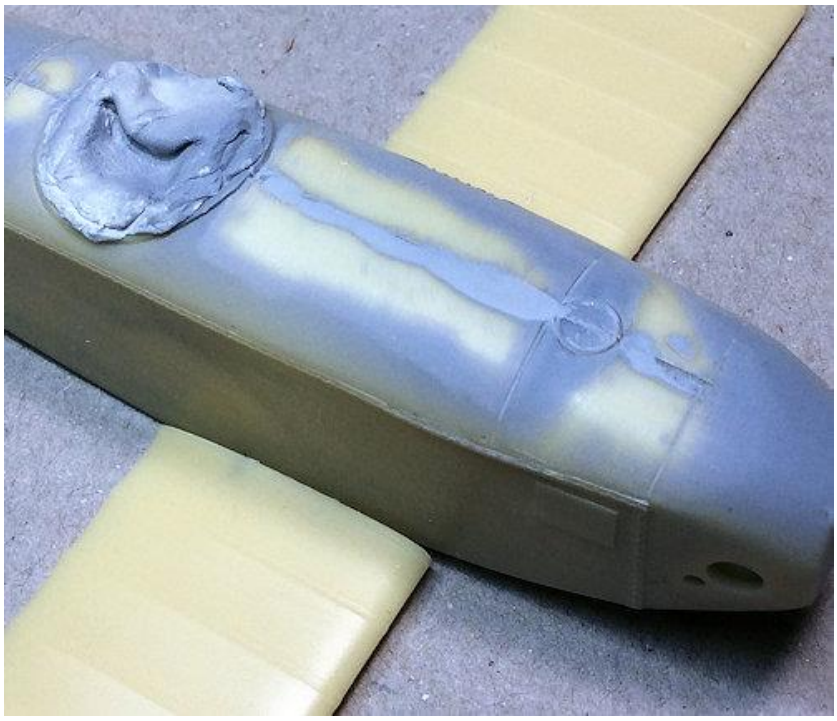
Pass the secured long rod in the wing through the forward holes drilled through the fuselage so it protrudes through the hole in the opposite side of the fuselage.

Test fit each wing to the fuselage and check the wings are aligned and at 90 degrees to the fuselage when viewed from above and horizontal when viewed from the front.

Remove the wings.

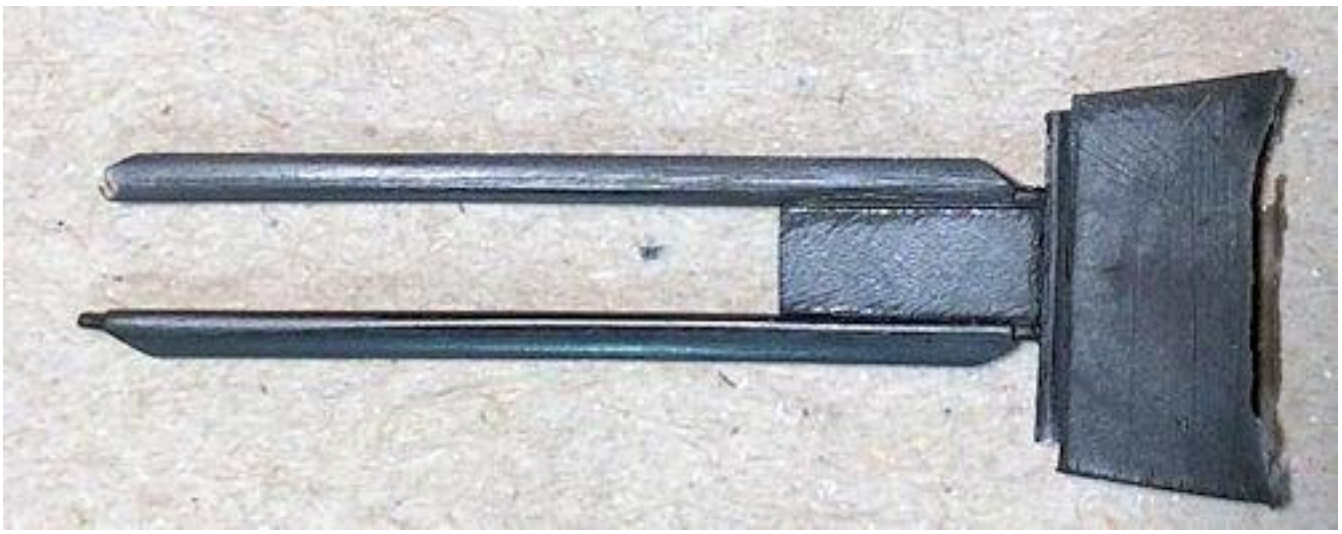
Secure the long rod through the forward holes drilled into the fuselage, using CA adhesive. Make sure the rod protrudes equally from both sides of the fuselage.

Apply CA adhesive along the wing root of each lower wing and secure in position onto the fuselage sides on the support rods.



Wing struts:

The four resin wing support struts M1 and M2) are supplied in the kit, but one on the struts had damage to one end. Although the wings are solid resin, they are small and therefore light and had the kit struts been intact, I would have used them. However, given one of the struts was missing its end locating pin I decided to replace all four struts with micro-tube with internal support rods.



Strut aerofoils:

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

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

Roll cut four lengths of 1.2 mm diameter tube (e.g. ‘Albion Alloy’s’ MBT12 or similar). The lengths of the cut tubes should be slightly longer than the kit supplied struts.

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

Using the ‘Strutter’ tool, create four aerofoil sections.

Remove the 0.5 mm rod from the aerofoil sections.

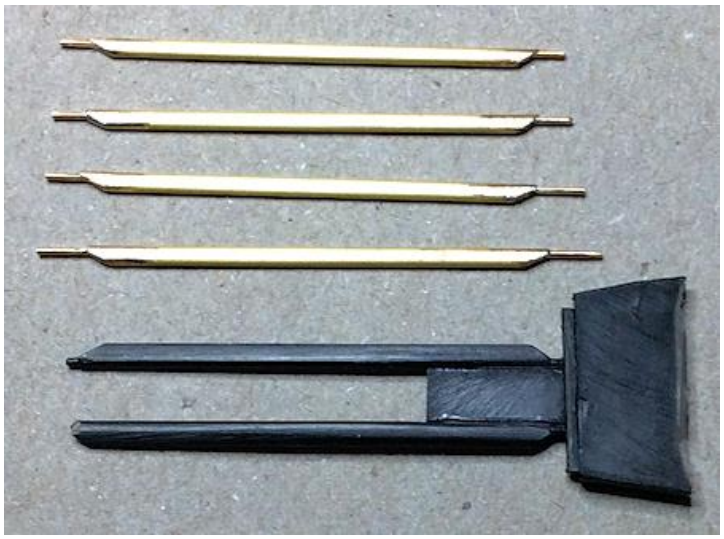
File the ends of each aerofoil section to match those of the kit supplied struts.

File the ends of one side of each aerofoil section at an angle to match those on the kit supplied struts.

Insert a cut 0.5 mm diameter rod into the aerofoil section and trim the length of the rods to leave 1mm protruding from each end.

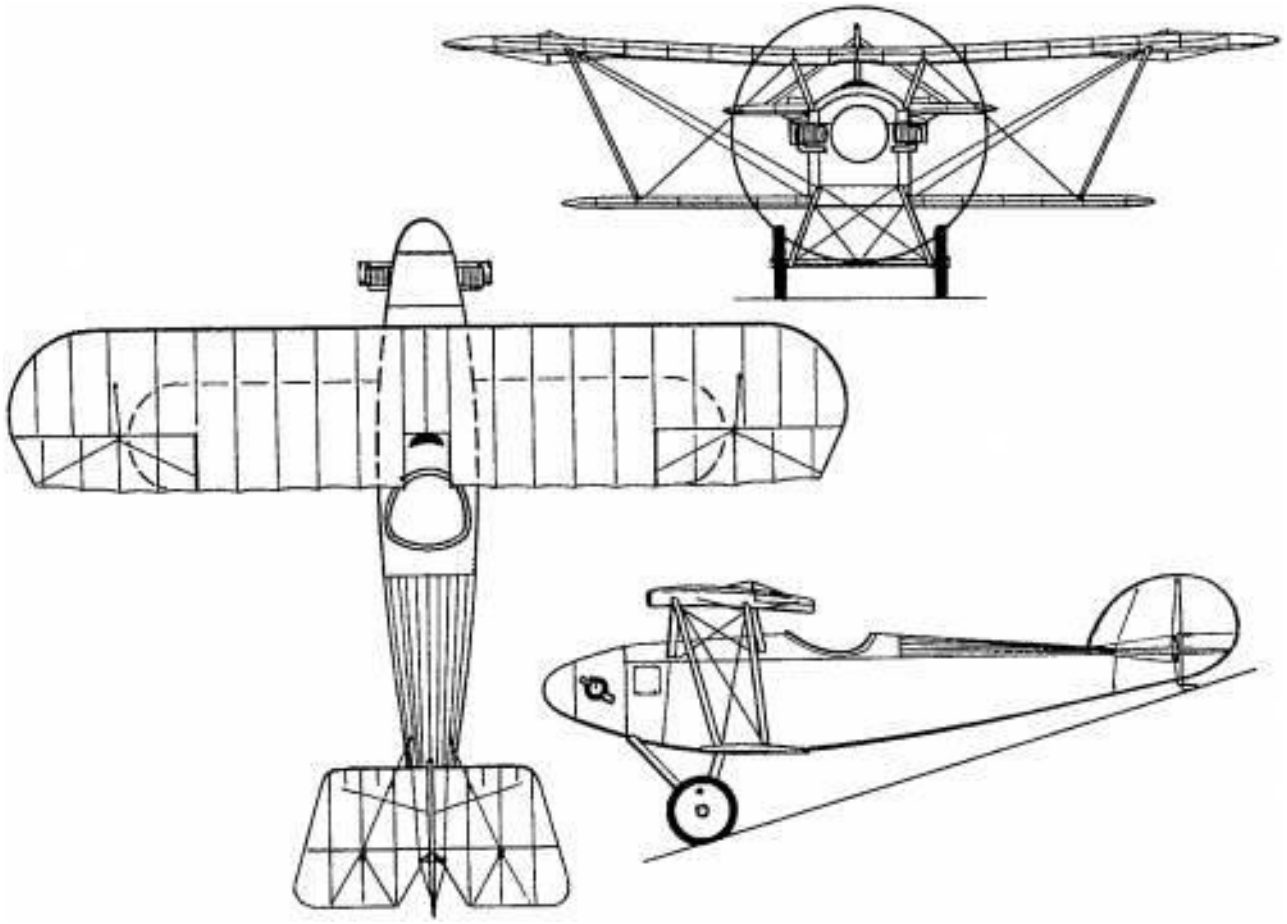
Secure each rod into its aerofoil section. I used soft solder to join the tubes, but CA adhesive can be used as an alternative.

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



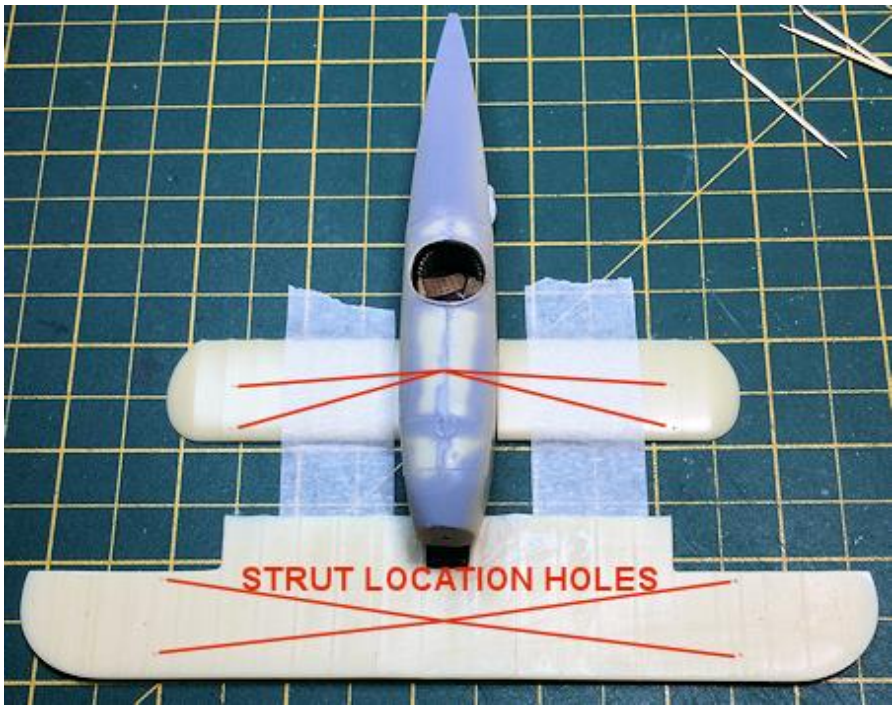
Wing struts - test fitting:

Refer to the following 3-view illustration and using a drill of 0.5 mm diameter, drill strut location holes at the approximate angles into the pre-moulded ‘dimples’ on the upper surface of the two lower wings and the underside of the upper wing. Make sure you don’t drill through the wings.



NOTE: *Once each strut has been adjusted for its particular location between the wings, make sure you note each strut for those locations. Otherwise it may cause wing fittings issues when the struts are finally fitted.*

For each strut, cut and file/sand the end locating rods, if required, so the strut will locate fully into its location holes in the upper and lower wings.



Locate the rods of the lower wings through and into the pre-drilled holes in the fuselage to fit the lower wings.

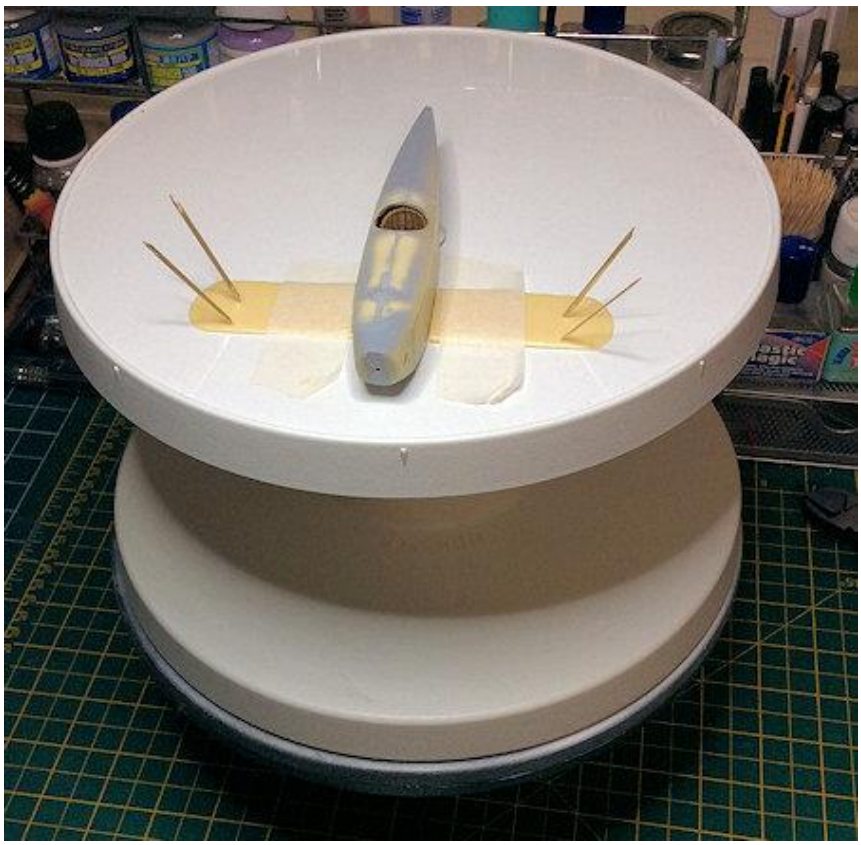
NOTE: *When test fitting the struts it's best to raise your working area so that you can work under the upper wing more easily. I used a cake makers adjustable turntable.*

Lay the assembly flat onto the work surface and support the bottom rear of the fuselage.

Apply masking tape over the wings to hold the assembly to the work surface. Make sure the wings are at 90 degrees to the fuselage and the fuselage is not tilted to one side or the other.

Insert each wing strut, with the chamfered edges rearwards, into its location holes in the underside of the upper wing. Use PVA adhesive to temporarily hold the struts into the upper wing.

This photograph is only to show the elevated working position achieved by the use of a cake makers adjustable turntable.



Allow the PVA adhesive to start to set. The PVA adhesive will not form a permanent joint.

Carefully locate the bottom of the upper wing struts into the four locating holes in the bottom wings, making sure the strut locating rods are fully seated into all of the location holes in the wings.

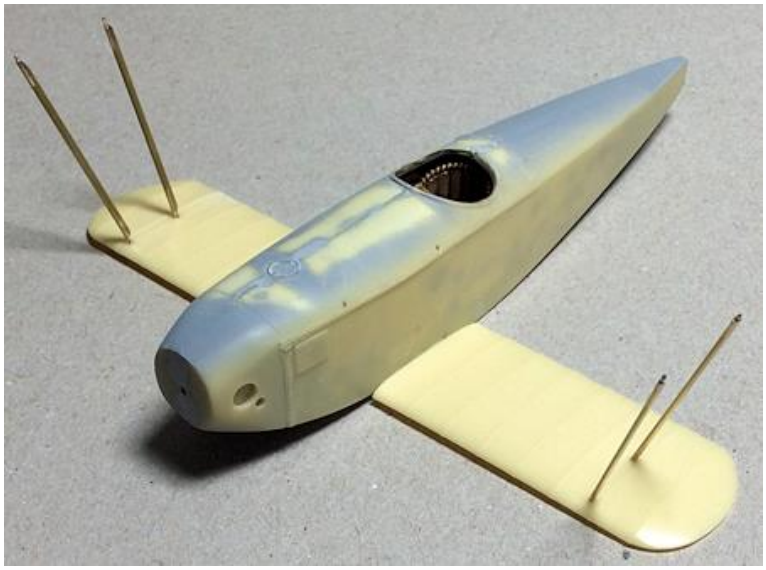
Check that the two wings are angled correctly when viewed from the sides and aligned when viewed from above. Support the upper wing where necessary to achieve correct alignment.

Apply thin CA adhesive around the strut to lower wing locations and leave to fully set.

Turn the model over onto its back and using a scalpel blade, gently lift off the PVA adhesive from the strut to upper wing locations. The adhesive should just slide up the struts.

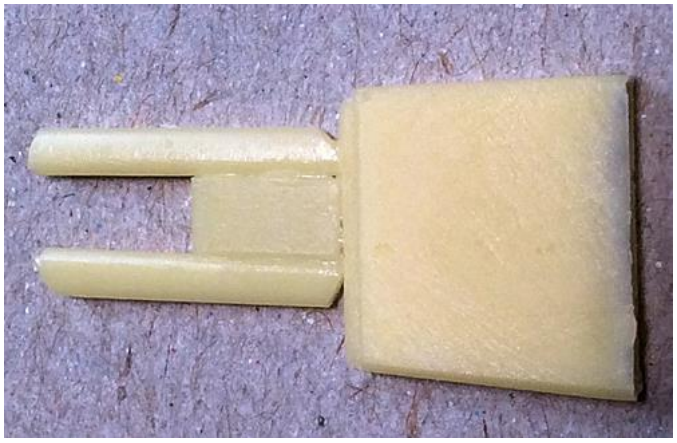
Carefully remove the upper wing, leaving the four wing struts in the lower wings.

If necessary, carefully remove residual PVA adhesive from the ends of the struts.



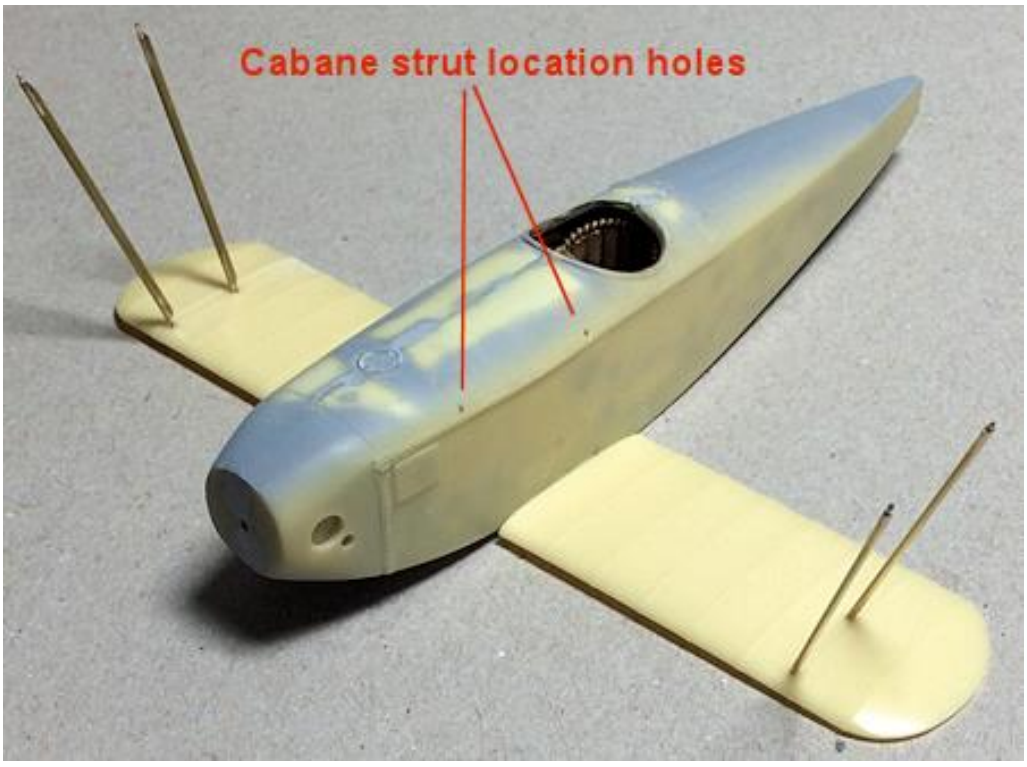
Cabane struts:

The four resin cabane struts (kit part 22) seem to have been moulded without end locating pins, despite there being very faint location ‘dimples’ on the underside of the upper wing and on the top edges of the fuselage, where presumably the struts are supposed to locate. As there is no way to locate the struts into the ‘dimples’, I decided to replace all four struts using micro-tube with internal support rods.



NOTE: *Refer to the previous 3-view illustration for the approximate drilling angles for the four cabane struts.*

At the four strut location ‘dimples’ on the fuselage, drill a holes of 0.7 mm diameter through the fuselage. *Drill through carefully for the two rear locations as the drill will enter the cockpit area*.



On the underside of the upper wing and the top sides of the fuselage, use a 0.6 mm diameter drill to rill out the pre-moulded strut location ‘dimples’ to create the locating holes. Make sure you drill to the approximate angles for each strut (front to rear, inboard to outboard).

Temporarily ring mark the eight strut location holes in the upper wing, to help locate them when test fitting the wing.

NOTE: *The length of the forward rods should be long enough so that when inserted into the forward pre-drilled holes in the fuselage, the rods can be moved up into the wing location hole, but if accidently dropped, will not fall inside the fuselage.*

Forward rods - Cut two 35 mm lengths of 0.5 mm diameter rod (e.g. 'Albion Alloy's' MBR05 or similar).

Rear rods - Cut two 20 mm lengths of 0.5 mm diameter rod (e.g. 'Albion Alloy's' MBR05 or similar).

Insert one of the 35 mm rods into a pre-drilled forward hole in the fuselage.

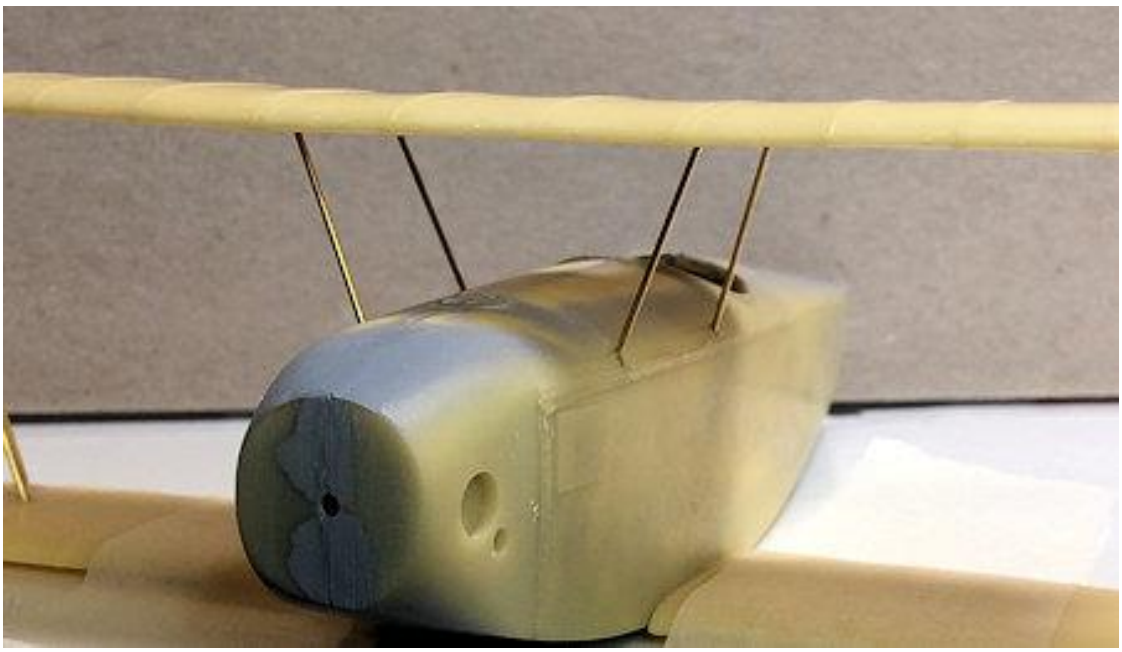
NOTE: *Repeated test fitting of the upper wing will be required until it can be located fully onto the four wing support struts and the forward support rod for the cabane strut.*

Test fit then remove the upper wing, adjusting the length of the cabane strut support rod, as required, until the wing can be fully located on all four struts and the support rod. This may require 'angle drilling' the location hole to allow the support rod to align with its location hole in the wing.

Leave the upper wing in position and apply thin CA adhesive to where the cabane support rod passes through the fuselage location hole. Allow the adhesive to fully set.

Repeat the procedure to fit the other forward cabane support rod.

Repeat the procedure to fit the two rear cabane support rods, using the 20 mm long rods.



Roll cut two lengths of 1.2 mm diameter tube (e.g. ‘Albion Alloy’s’ MBT12 or similar). The lengths of the cut tubes should be longer than the exposed support rods for the forward cabane struts.

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

Using the ‘Strutter’ tool, create four aerofoil sections.

Remove the 0.5 mm rod from the aerofoil sections.

File or sand the ends of each aerofoil section so that when slid onto their support rods, they will sit correctly against the upper wing and fuselage.

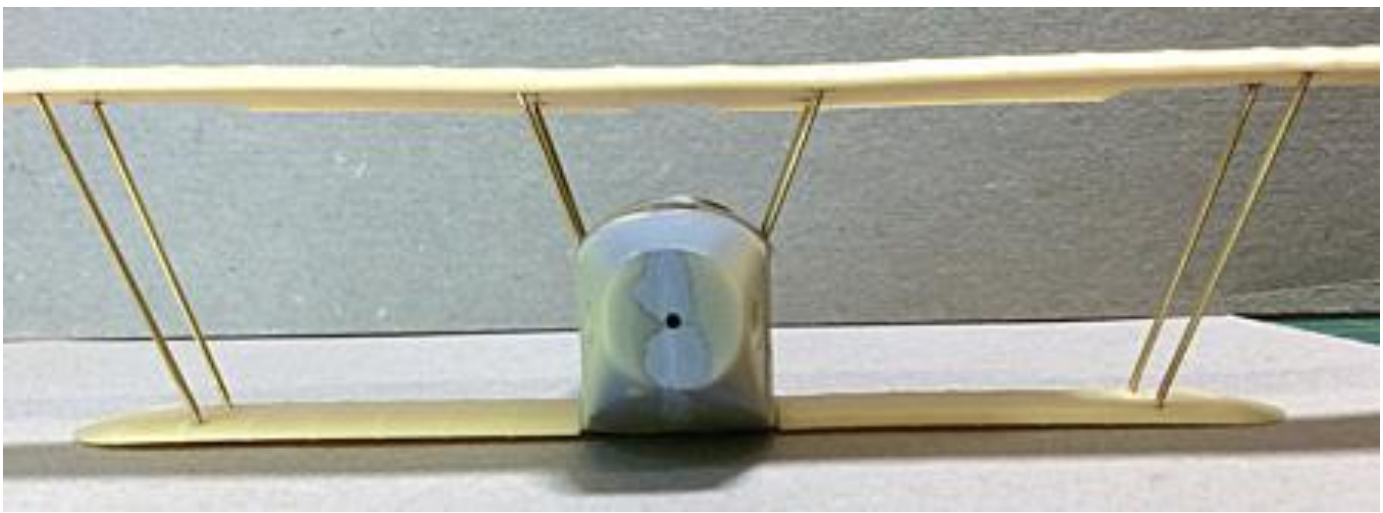
Remove the aerofoil section and file the ends of one side of each aerofoil section at an angle to match those on the kit supplied struts.

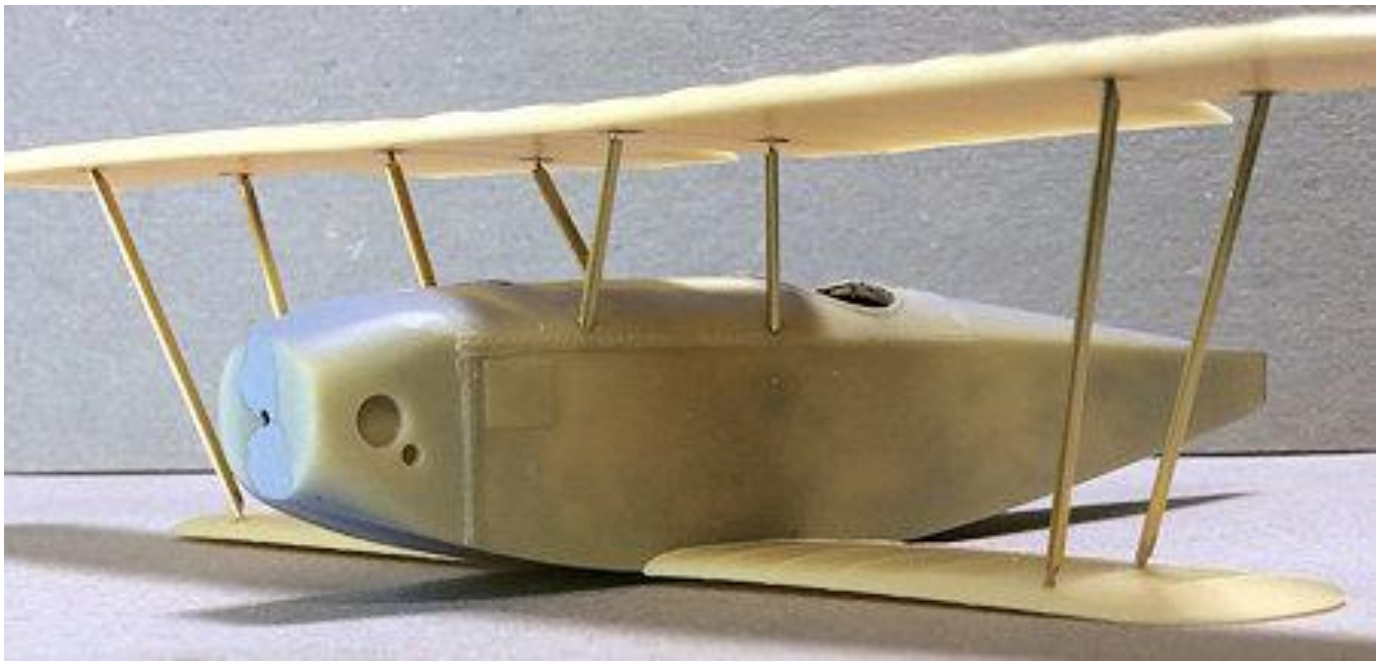
Refit the aerofoil sections onto their support rods with the filed angled edges rearwards.

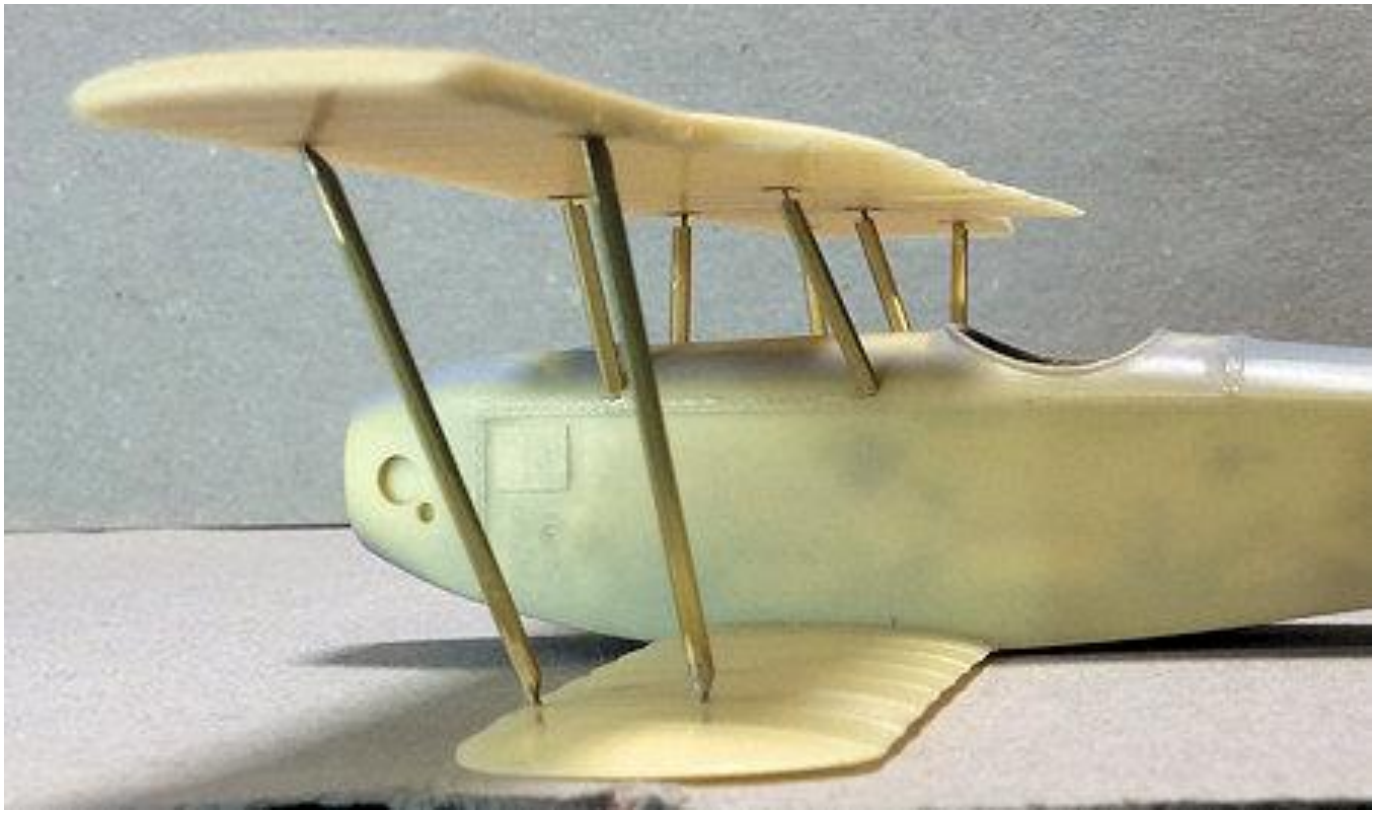
Test fit the upper wing and make sure the wing is fully located on all four wing support struts and the two forward cabane strut assemblies.

Apply thin CA adhesive to where the cabane aerofoil sections sit against the fuselage. Allow the adhesive to fully set.

Remove the upper wing.







Undercarriage - fitting:

NOTE: *The undercarriage struts, when fitted, should be angled outboard at the bottoms by approximately 20 degrees. Also use two part epoxy adhesive (e.g. 'Araldite Rapid' or similar) as CA adhesive seems to have little effect on the material used to mould the struts.*

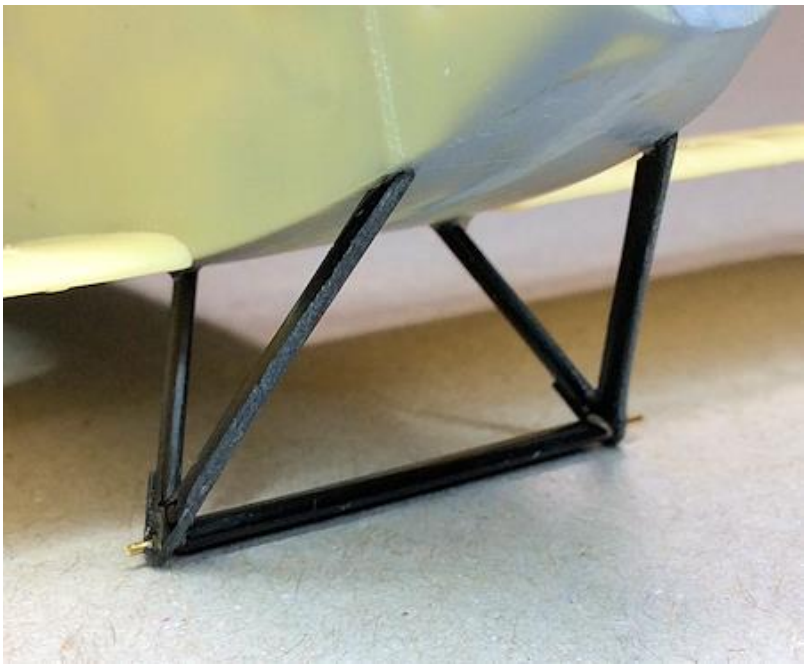
Secure the two undercarriage struts in position, angled outboard at the bottoms, on the underside of the fuselage.

Once the adhesive starts to set, gently prise apart and fit the undercarriage fairing assembly with the added stub axles through the holes in the struts. Make sure the flatter side of the fairing is underneath.

Close the struts to the axle fairing and apply two part epoxy adhesive to the strut/axle locations.

Stand the model on the undercarriage, which will set the axle fairing to the correct angle.

Make sure the undercarriage assembly struts are aligned, the assembly is level with the lower wings and is symmetrical to the fuselage.



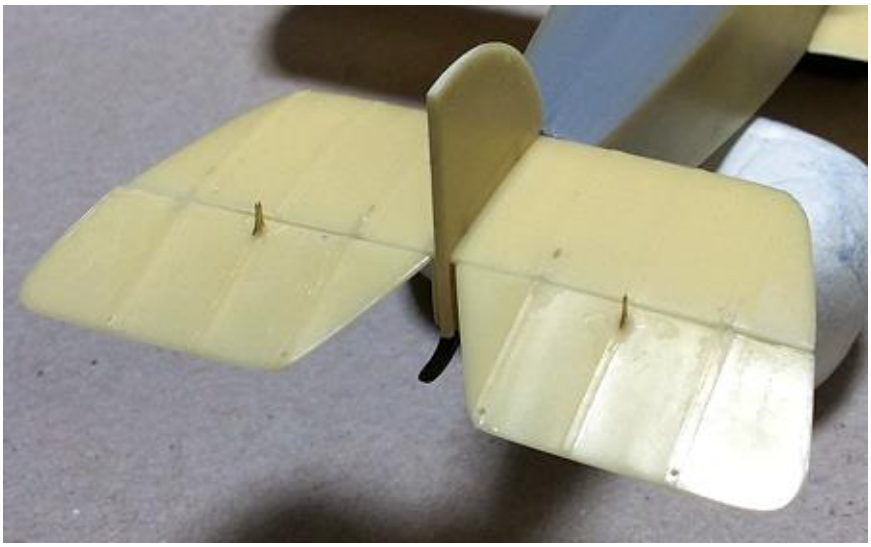
Tail unit assembly - fitting:

Secure the two elevators to the trailing edge of the tail plane, using CA adhesive.

If desired, carefully bend the two elevators down slightly and make sure they are aligned.

Secure the fin into the tail plane using CA adhesive. Make sure the fin is fully located onto the tail plane and is at 90 degrees.

Secure the tail plane/fin assembly onto the recess at the top, rear of the fuselage, using CA adhesive. Add adhesive down the rear edge of the fuselage to secure the ’rudder post’ against the fuselage rear edge.



Tail skid - fitting:

Secure the tail skid into its location hole in the bottom, rear of the fuselage, using CA adhesive. If necessary use two part epoxy adhesive.

Painting:

NOTE: *The paints used are:*

'Hataka' lacquer paint - Jaune Sahara (C121).

'Hataka' lacquer paint - Medium Green 42 (C019).

'Hataka' lacquer paint - Light Green (C020 -RLM83).

'AK Interactive' White primer and micro-filler (AK-759).

'Tamiya' Royal Light Grey (XF80), Hull Red (XF9), Buff (XF57), Deck Tan (XF55)

'Humbrol' Leather (62).

Check all parts and assemblies for any imperfections, seams lines and dust etc and clean as necessary.

Mask off the open cockpit and propeller shaft hole in the fuselage.

Airbrush 'AK Interactive' white primer and micro-filler (AK-759) or similar over the following parts:

Fuselage assembly.

Upper wing.

Two ailerons

Two wheels

Propeller and spinner.

Clear Doped Linen (CDL):

Check the painted surfaces for and imperfections, such as hair, dust or a rough to touch finish. If found, lightly sand or polish the surface until it's smooth and blemish free. If necessary, re-prime and check.

Airbrush 'Hataka' Jaune Sahara or similar over the undersides of the upper/lower wings, ailerons, fuselage, tail plane, elevators and both sides of the wheels.

Allow the painted surfaces to fully cure (preferably overnight).

Cut thin strips of masking tape and cover the pre-moulded rib tapes on the undersides of the upper and lower wings, tail plane and elevators. Also apply across the underside of the fuselage (see following photograph).

Cut thin strips of masking tape (two slightly wider than the other two strips) and position them across the undersides of the upper and lower wings to represent the front (the wider) and rear wing spars.

Airbrush 'Tamiya' Deck Tan or similar over the previously painted surfaces.

Remove the strips of masking tape.

Airbrush lightly 'Tamiya' Buff or similar over the previously painted surfaces to lighten the colour.

Allow the painted surfaces to fully cure (preferably overnight).

If the visible rib tapes and spars appear too bright, lightly airbrush 'Tamiya' Buff or similar over the previously painted surfaces. The paint should be applied as a **light, dusting coat**, so that it blends the lighter rib tapes and wing spars to the rest of the surface, but without totally covering the colour of the rib tapes and spars. Once dry the ribs tapes and spars should show slightly lighter than the surrounding colour.

Using a very fine sander, lightly sand between the visible wing ribs tapes and spars, tail plane/ elevator/aileron rib tapes and the ribs on the underside of the fuselage. to start to expose the darker Deck Tan colour underneath. This should create the illusion of darker Clear Doped Linen (CDL) between the lighter wing ribs tapes and spars.

Protective Covering (PC10):

NOTE: *Always airbrush down onto the surfaces to avoid over spray onto the previously painted underside surfaces.*

To prevent over spray, mask off the previously painted CDL surfaces, especially under the tail plane and the elevators.

Mix 'Hataka' Light Green with 'Hataka' Medium Green at approximately 2:1 ratio or similar mix to create the PC 10 green.

Airbrush over the top surfaces of the upper/lower wings, the tail plane/elevators, the fin and the top and sides of the fuselage.

Allow the painted surfaces to fully cure (preferably overnight).

Undercarriage and wing struts - paint:

Brush paint the eight wing struts and the undercarriage struts and axle fairing, using 'Tamiya' Royal Light Grey (XF80) or similar.

Forward fuselage - paint:

Mask off the forward area of the fuselage (refer to the kit colour guide) and airbrush that area and the propeller spinner with 'Tamiya' Royal Light Grey (XF80) or similar.

Remove the masking.

Fuselage stitching - paint:

Carefully brush paint the stitching with 'Humbrol' Leather (62).

Along the forward, top edge of the fuselage sides.

Over the fuselage top to the rear of the cockpit.

Vertically down the fuselage at the rear of the forward engine panels.

Cockpit surround padding - paint:

Carefully brush paint the cockpit surround padding with 'Humbrol' Leather (62).

Dry brush highlights of 'Tamiya' Hull Red (XF9).

Remove the masking from the open cockpit and propeller shaft hole in the fuselage.

Rudder - paint:

Mask off the rudder to leave just the area for the forward blue stripe.

Airbrush that area with 'Tamiya' Flat Blue (XF8) or similar.

Remove the masking.

Once fully dry, mask off the rudder to leave just the area for the rear red stripe.

Airbrush that area with 'Tamiya' Flat Red (XF7) or similar.

Remove the masking.

Wheel tyres - paint:

Mask off the wheel cover on both sides of the wheels.

Brush paint the tyres with ‘Tamiya’ RLM Grey (XF22).

Remove the masking.

Tail skid - paint:

Brush paint with ‘Tamiya’ Royal Light Grey (XF80) or similar.

Metal parts - paint:

Brush paint the access cap in the forward, top of the fuselage and the centre band around the tail skid, using ‘Mr. Colour’ Stainless Steel (213).

Decals:

NOTE 1: *Most of the kit supplied decals have carrier film at the edges, which can show once the decals are applied. Therefore I replaced all of the roundels with suitable decals from my ‘spares’. However I did use the white serial number N 539.*

NOTE 2: *The resin fuselage in particularly thin, so do not apply excessive pressure when you apply the decals, otherwise the fuselage could be damaged and/or the seam joint could crack open.*

Prepare the areas to have decals applied by airbrush a gloss sealing coat (e.g. ’Alclad’ Aqua Gloss (ALC-600) or similar).

Apply appropriate replacement decals (or use the kit decals):

Roundels - top surface of upper wing.

Roundels - underside of lower wings.

Roundels - sides of the fuselage.

Serial number N 539 - the rear sides of the fuselage.

Pre-weathering - sealing coat:

To protect the painted and decal surfaces for weathering, airbrush a semi-matte sealing coat (panel (’Alclad’ Light Sheen ALC-311, ‘Tamiya’ Semi-Gloss X35 or similar) over the painted surfaces.

Weathering:

NOTE: *This protype aircraft was not extensively flown, due in the main to the regular failures of the engine. So much so that flights were taken with the airfield in sight so that if the engine failed, the pilot could glide back to land. As such the aircraft would probably not have been heavily weathered.*

Refer to Part 3 (Weathering) and apply ‘Flory’ clay wash (Dart Dirt) over all painted surfaces.

Remove the clay wash as required to achieve a slightly weathered look.

Protect the applied weathering by airbrushing the semi-matte sealing coat panel (’Alclad’ Light Sheen ALC-311, ‘Tamiya’ Semi-Gloss X35 or similar) over the treated surfaces.

Pre-rigging:

Wings:

NOTE 1: *Aircraft of the Royal Flying Corps (RFC) primarily used aerodynamic rigging 'wires'. These were drop forged to an aerofoil cross section, but had round, threaded ends. The threads were opposite direction on the opposite ends of the 'wires', to enable the 'wire' tension to be adjusted. The 'wires' were locked with lock-nuts at each end attachment fitting.*

Although there are aftermarket end fittings available from 'Gaspatch' Elite Models, these require the use of round rigging material, such as wire or mono-filament and the diameter of the hole through each fitting is less than 0.2 mm in diameter. The fitting require the rigging line to be passed through the fitting then glued into a hole drilled in the model. This may leave the glued line weak and prone to be easily pulled out. Therefore for this model I decided to use micro-tube to represent the end fittings, as the glued tubes will adhere more strongly to the model.

NOTE 2: *Refer to Part 5 (Rigging details) and Part 9 (Preparation with modifications) for rigging information. The following steps concern only the Flying/Landing wires and wing strut cross bracing wires, a total of 16 wires.*

Cut 18 long lengths of 0.12 mm diameter line ('Steelon' mono-filament or similar).

Cut 18 lengths of 0.4 mm diameter tube, approximately 5 mm long (e.g. 'Albion Alloy's NST04 or similar).

Slide a tube onto the end of each line and secure in position using thin CA adhesive.

Trim away any protruding line at the end of the tube.

NOTE: *During the next step, use the fitted wing struts on the model lower wings as a guide for fitting the rigging wires at the correct angles.*

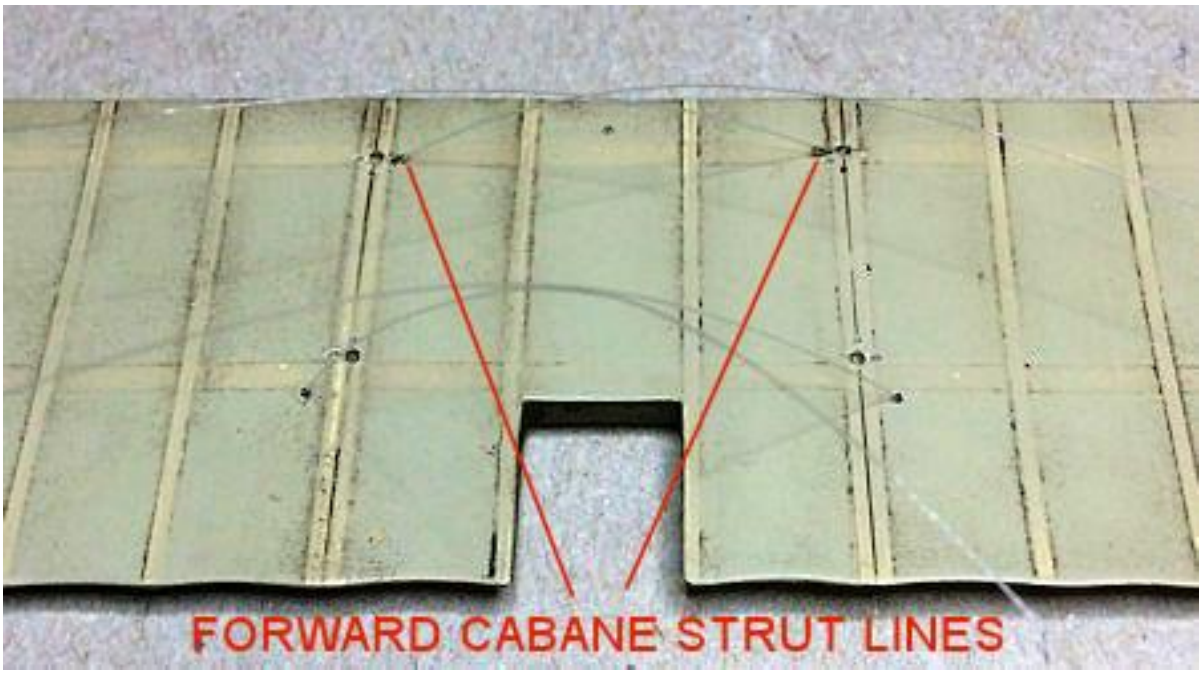
Locate each of the tubes for the 4 cabane strut, side cross bracing wires, at the correct angles, into their pre-drilled holes in the fuselage. Secure the tubes in position using thin CA adhesive.

Locate each of the tubes for the 4 wing outer support strut cross bracing wires, at the correct angles, into their pre-drilled holes in the lower wings. Secure the tubes in position using thin CA adhesive.

Locate each of the tubes for the 4 flying wires, at the correct angles, into their pre-drilled holes in the wing root of the lower wings and the lower, forward fuselage. Secure the tubes in position using thin CA adhesive.

Locate each of the tubes for the 4 landing wires, at the correct angles, into their pre-drilled holes in the lower wings. Secure the tubes in position using thin CA adhesive.

Locate each of the tubes for the 2 cross bracing wires for between the forward cabane struts, at the correct angles, into their pre-drilled holes in the underside of the upper wing. Secure the tubes in position using thin CA adhesive.



Cut 2 long lengths of 0.12 mm diameter line ('Steelon' mono-filament or similar).

Cut 2 lengths of 0.4 mm diameter tube, approximately 3 mm long (e.g. 'Albion Alloy's NST04 or similar).

Slide a tube onto the end of each line and secure in position using thin CA adhesive.

Trim away any protruding line at the end of the tube.

NOTE: *When inserted into their pre-drilled holes, the tubes should be flush with or just below the wing surface.*

Locate each of the tubes for the 2 aileron control wires into their pre-drilled holes in the underside of the upper wing. Secure the tubes in position using thin CA adhesive.

Undercarriage:

NOTE: *Refer to Part 5 (Rigging details) and Part 9 (Preparation with modifications) for rigging information. The following steps concern only the undercarriage cross bracing wires, a total of 4 wires.*

Cut 4 long lengths of 0.12 mm diameter line ('Steelon' mono-filament or similar).

Cut 4 lengths of 0.4 mm diameter tube, approximately 5 mm long (e.g. 'Albion Alloy's NST04 or similar).

Slide a tube onto the end of each line and secure in position using thin CA adhesive.

Trim away any protruding line at the end of the tube.

NOTE: *During the next step, use the fitted undercarriage struts on the model lower wings as a guide for fitting the rigging wires at the correct angles.*

Locate each of the tubes for the 2 rear undercarriage strut cross bracing wires, at the correct angles, into their pre-drilled holes in the fuselage. Secure the tubes in position using thin CA adhesive.

Locate each of the tubes for the 2 forward undercarriage strut cross bracing wires, at the correct angles, into their pre-drilled holes in the fuselage. Secure the tubes in position using thin CA adhesive.

Ailerons:

NOTE: *For each of the two ailerons, use the following procedure. Refer to Part 5 (Rigging details) and Part 9 (Preparation with modifications) for rigging information.*

Cut a long length of 0.08 mm diameter line ('Stroft GTM' Silicon-PTFE tempered monofil or similar).

Cut 4 lengths of 0.4 mm diameter tube, approximately 4 mm long (e.g. 'Albion Alloy's NST04 or similar).

Pass the line through the hole in the end of one of the aileron control horns.

Slide a tube onto both sides of the line.

Pass one end of the line through the pre-drilled hole in the aileron trailing edge, on that side of the control horn.

Pass the other end of the line through the opposite pre-drilled hole in the aileron trailing edge.

From the other side of the aileron, slide a tube onto each line.

Pass the free end of one line through the hole in the control horn on that side of the aileron.

Pass the line through the tube on the opposite side.

Carefully pull the two lines taut and hold in tension to tighten the line.

Slide each tube up to its control horn and secure in position using thin CA adhesive.

Carefully cut away the two protruding excess line ends at the joining tube.

If necessary, tighten slack lines (refer to page 89).

Brush paint the tubes with ‘Mr. Colour’ Iron (212) or similar.

Once the rigging of the wings is complete, lightly airbrush a semi-matte coating panel (’Alclad’ Light Sheen ALC-311, ‘Tamiya’ Semi-Gloss X35 or similar) over all rigging lines. This will give a better look to the mono-filament rigging lines.

Elevators:

Repeat the previous procedure to rig each side of the fitted elevators.

Rudder:

Cut a long length of 0.08 mm diameter line (‘Stroft GTM’ Silicon-PTFE tempered monofil or similar).

Cut 2 lengths of 0.4 mm diameter tube, approximately 4 mm long (e.g. ‘Albion Alloy’s NST04 or similar).

Pass the line through the pre-drilled hole in the trailing edge of the rudder.

Slide a tube onto both sides of the line.

Pass one end of the line through the hole in the rudder control horn on that side of the rudder.

Pass the other end of the line through the hole in the opposite rudder control horn.

Pass the free end of each line back through the tube on that line.

Slide one tube up to its rudder control horn and secure in position using thin CA adhesive.

Slide the other tube up to its rudder control horn and keeping the line taut, secure in position using thin CA adhesive.

Carefully cut away the two protruding excess line ends at the two tubes.

If necessary, tighten slack lines (refer to page 89).

Brush paint the tubes with ‘Mr. Colour’ Iron (212) or similar.

Once the rigging of the wings is complete, lightly airbrush a semi-matte coating panel (’Alclad’ Light Sheen ALC-311, ‘Tamiya’ Semi-Gloss X35 or similar) over all rigging lines. This will give a better look to the mono-filament rigging lines.

Final rigging:

Wings:

NOTE: *To make it easier for access to the rigging, it’s best to rig the wings in the following order:*

Cross bracing - front fuselage cabane struts (x2).

Cross bracing - between the front and rear cabane struts (x4).

Rear flying and landing wires (x4).

Front flying and landing wires (x4).

Aileron control wires - fuselage sides to upper wing (x2).

Cross bracing - between the wing outer support struts (x4).

Tightening wires:

WARNING: *During final rigging, when using heat to tighten wires, it's important not to get too close to the line and to keep the heat source moving along the line without stopping in one area or touching the line or model parts, otherwise the model parts will be damaged or the line will melt and break. As the heat is applied, watch the line start to tighten and stop as soon as the slack in the line is removed.*

If any installed line is slack, it can be tightened by applying heat along the length the line, using for example an electricians soldering iron. The heat causes the mono-filament to shrink and tighten the line.

Cross bracing - front fuselage cabane struts:

NOTE: *For each of the two cross bracing wires, use the following procedure.*

Cut a length of 0.4 mm diameter tube, approximately 4 mm long (e.g. 'Albion Alloy's NST04 or similar).

Slide the tube onto the line.

Hold the free end of the line taut against the bottom, forward side of the diagonally opposite cabane strut.

Keeping the tube clear, apply CA adhesive to the line to secure it against and around the base of the strut.

Slide the tube to the end of the line and secure in position using thin CA adhesive.

NOTE: *Although more difficult, it is best to paint the metal tubes after they have been fitted, as a painted surface will not adhere to the model as well as metal.*

Brush paint the tubes with 'Mr. Colour' Iron (212) or similar.

Cross bracing - between the front and rear cabane struts:

NOTE: *For each of the four cross bracing wires, use the following procedure.*

Hold the free end of the line taut against its diagonally opposite pre-drilled location hole in the underside of the upper wing.

Carefully cut the line so that when held taut, the end of the line is inside the pre-drilled hole.

Cut a length of 0.4 mm diameter tube, approximately 4 mm long (e.g. 'Albion Alloy's NST04 or similar).

Slide the tube onto the line.

Apply thin CA adhesive either onto the free end of the line or into the pre-drilled hole.

Locate the free end of the line into the pre-drilled hole and hold the line as taut as possible until the adhesive sets.

Slide the tube to the end of the line and secure in position using thin CA adhesive.

NOTE: *Although more difficult, it is best to paint the metal tubes after they have been fitted, as a painted surface will not adhere to the model as well as metal.*

Brush paint the tubes with 'Mr. Colour' Iron (212) or similar.

Rear flying and landing wires.

NOTE: *For each of the two rear flying wires and two landing wires, use the following procedure.*

Hold the free end of the line taut against its diagonally opposite pre-drilled location hole in the underside of the upper wing (landing wires) and lower wing root (flying wires).

Carefully cut the line so that when held taut, the end of the line is inside the pre-drilled hole.

Cut a length of 0.4 mm diameter tube, approximately 4 mm long (e.g. 'Albion Alloy's NST04 or similar).

Slide the tube onto the line.

Apply thin CA adhesive either onto the free end of the line or into the pre-drilled hole.

Locate the free end of the line into the pre-drilled hole and hold the line as taut as possible until the adhesive sets.

Slide the tube to the end of the line and secure in position using thin CA adhesive.

NOTE: *Although more difficult, it is best to paint the metal tubes after they have been fitted, as a painted surface will not adhere to the model as well as metal.*

Brush paint the tubes with 'Mr. Colour' Iron (212) or similar.

Front flying and landing wires.

NOTE: *For each of the two front flying wires and two landing wires, use the following procedure.*

Hold the free end of the line taut against its diagonally opposite pre-drilled location hole in the underside of the upper wing (landing wires) and lower, forward fuselage (flying wires).

Carefully cut the line so that when held taut, the end of the line is inside the pre-drilled hole.

Cut a length of 0.4 mm diameter tube, approximately 4 mm long (e.g. 'Albion Alloy's NST04 or similar).

Slide the tube onto the line.

Apply thin CA adhesive either onto the free end of the line or into the pre-drilled hole.

Locate the free end of the line into the pre-drilled hole and hold the line as taut as possible until the adhesive sets.

Slide the tube to the end of the line and secure in position using thin CA adhesive.

NOTE: *Although more difficult, it is best to paint the metal tubes after they have been fitted, as a painted surface will not adhere to the model as well as metal.*

Brush paint the tubes with 'Mr. Colour' Iron (212) or similar.

Aileron control:

NOTE: *For each of the two aileron control wires (fuselage sides to wing), use the following procedure.*

Hold the free end of the aileron control line taut against its pre-drilled location hole in the side of the fuselage.

Carefully cut the line so that when held taut, the end of the line is inside the pre-drilled hole.

Apply thin CA adhesive either onto the free end of the line or into the pre-drilled hole.

Locate the free end of the line into the pre-drilled hole and hold the line as taut as possible until the adhesive sets.

Cross bracing - between the wing outer support struts:

NOTE: *For each of the four cross bracing wires, use the following procedure.*

Hold the free end of the line taut against its diagonally opposite pre-drilled location hole in the underside of the upper wing.

Carefully cut the line so that when held taut, the end of the line is inside the pre-drilled hole.

Cut a length of 0.4 mm diameter tube, approximately 4 mm long (e.g. 'Albion Alloy's NST04 or similar).

Slide the tube onto the line.

Apply thin CA adhesive either onto the free end of the line or into the pre-drilled hole.

Locate the free end of the line into the pre-drilled hole and hold the line as taut as possible until the adhesive sets.

Slide the tube to the end of the line and secure in position using thin CA adhesive.

NOTE: *Although more difficult, it is best to paint the metal tubes after they have been fitted, as a painted surface will not adhere to the model as well as metal.*

Brush paint the tubes with 'Mr. Colour' Iron (212) or similar.

Undercarriage:

Front cross bracing wires:

NOTE: *For each of the front undercarriage cross bracing wires, use the following procedure.*

Cut a length of 0.4 mm diameter tube, approximately 5 mm long (e.g. 'Albion Alloy's NST04 or similar).

Slide the tube onto the line.

Pass the free end of the line through its diagonally opposite pre-drilled location hole in the end of the axle fairing.

Keeping the line taut, apply CA adhesive to secure the line in the hole. **Keep the tube away from the adhesive.**

Slide the tube to the end of the line and secure in position using thin CA adhesive.

NOTE: *Although more difficult, it is best to paint the metal tubes after they have been fitted, as a painted surface will not adhere to the model as well as metal.*

Brush paint the tubes with 'Mr. Colour' Iron (212) or similar.

Rear cross bracing wires:

Pass the free ends of both wires through the pre-drilled hole in the centre of the axle fairing.

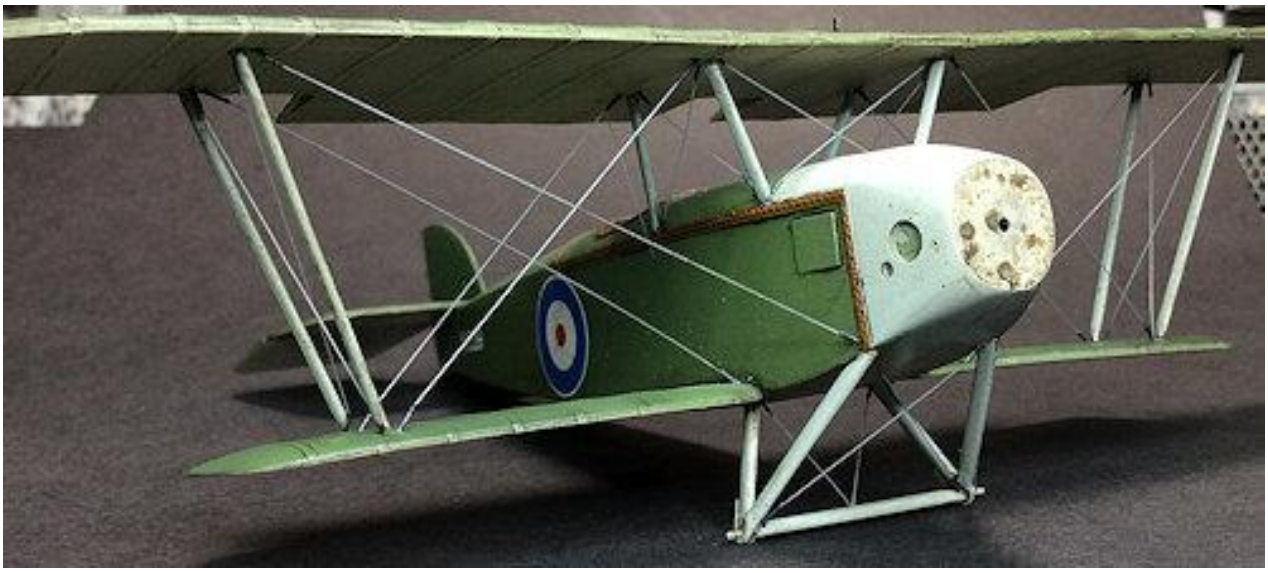
Keeping both lines taut, apply CA adhesive to secure the lines in the hole.

NOTE: *Although more difficult, it is best to paint the metal tubes after they have been fitted, as a painted surface will not adhere to the model as well as metal.*

Brush paint the tubes with 'Mr. Colour' Iron (212) or similar.

Highlighting:

Once the rigging of the wings is complete, lightly airbrush a semi-matte coating panel ('Alclad' Light Sheen ALC-311, 'Tamiya' Semi-Gloss X35 or similar) over all rigging lines. This will give a better look to the mono-filament rigging lines.



Wheels - fit:

Apply CA adhesive to the fitted tube stub axles in the ends of the axle fairing and secure the two wheels in position.

Ailerons - fit/final rig:

NOTE: *For each of the two ailerons, use the following procedure. Refer to Part 5 (Rigging details) and Part 9 (Preparation with modifications) for rigging information.*

Make sure the pre-drilled holes in the upper wing trailing edge are clear of paint etc.

Make sure the fitted location pins in the aileron leading edges are clear of paint etc.

Locate each aileron into the wing and secure in position using thin CA adhesive. If desired, angle slightly the ailerons and in opposition.

Cut a long length of 0.08 mm diameter line (‘Stroft GTM’ Silicon-PTFE tempered monofil or similar).

Cut two lengths of 0.4 mm diameter tube, approximately 4 mm long (e.g. ‘Albion Alloy’s NST04 or similar).

Insert one end of the line through the pre-drilled hole in the top surface of the upper wing.

Slide a tube onto one end of the line.

Pass that end of the line under then over the aileron control horn on that side of the wing (or if possible, through the hole in the end of the control horn).

Pass the free end of each line back through the tube on that line.

Slide one tube up to its aileron control horn and secure in position using thin CA adhesive.

Repeat on the other side of the wing and keeping the line taut.

Carefully cut away the two protruding excess line ends at the two tubes.

If necessary, tighten slack lines (refer to page 87).

Brush paint the tubes with ‘Mr. Colour’ Iron (212) or similar.

Once the rigging of the ailerons is complete, lightly airbrush a semi-matte coating panel (’Alclad’ Light Sheen ALC-311, ‘Tamiya’ Semi-Gloss X35 or similar) over all rigging lines. This will give a better look to the mono-filament rigging lines.

Rudder - fit/final rig:

Make sure the pre-drilled holes in the trailing edge of the fin are clear of paint etc.

Make sure the fitted location pins in the rudder leading edge are clear of paint etc.

Locate the rudder onto the fin and secure in position using thin CA adhesive.

Cut two long lengths of 0.08 mm diameter line (‘Stroft GTM’ Silicon-PTFE tempered monofil or similar).

Cut two lengths of 0.4 mm diameter tube, approximately 4 mm long (e.g. ‘Albion Alloy’s NST04 or similar).

Insert one end of each line into the pre-drilled inboard holes in the top, rear of the fuselage.

Secure the two lines in the holes using thin CA adhesive.

Slide a tube onto one the free end of each line.

Pass the end of each line under then over their rudder control horn on the rudder (or if possible, through the hole in the end of the control horn).

Pass the free end of each line back through the tube on that line.

Slide one tube up to its aileron control horn and keeping the line taut, secure in position using thin CA adhesive.

Carefully cut away the two protruding excess line ends at the two tubes.

If necessary, tighten slack lines (refer to page 87).

Brush paint the tubes with ‘Mr. Colour’ Iron (212) or similar.

Once the rigging of the rudder is complete, lightly airbrush a semi-matte coating panel (’Alclad’ Light Sheen ALC-311, ‘Tamiya’ Semi-Gloss X35 or similar) over all rigging lines. This will give a better look to the mono-filament rigging lines.

Elevators - fit/final rig:

Cut four long lengths of 0.08 mm diameter line (‘Stroft GTM’ Silicon-PTFE tempered monofil or similar).

Cut four lengths of 0.4 mm diameter tube, approximately 4 mm long (e.g. ‘Albion Alloy’s NST04 or similar).

Insert one end of two lines into the pre-drilled outboard holes in the top, rear of the fuselage.

Insert one end of two lines into the pre-drilled on the rear, sides of the fuselage.

Secure the four lines in the holes using thin CA adhesive.

NOTE: *Carry out the following steps on the four elevator control lines.*

Slide a tube onto one the free end of each line.

Pass the end of a line under then over its elevator control horn (or if possible, through the hole in the end of the control horn).

Pass the free end of each line back through the tube on that line.

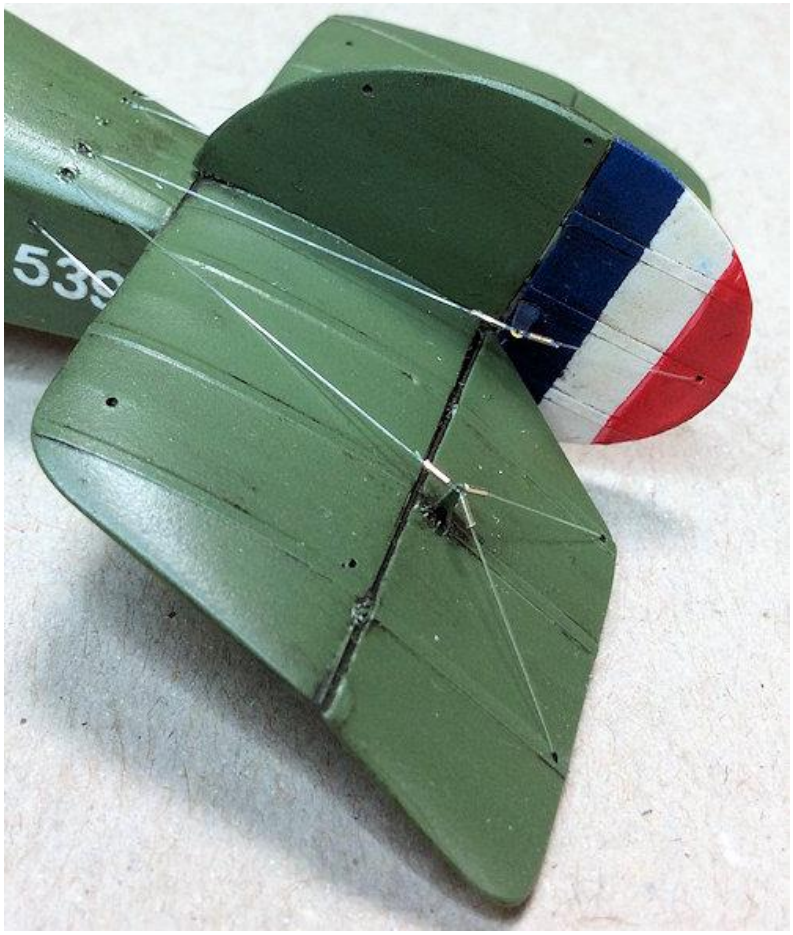
Slide the tube up to its elevator control horn and keeping the line taut, secure in position using thin CA adhesive.

Carefully cut away the protruding excess line end at the tube.

If necessary, tighten slack lines (refer to page 87).

Brush paint the tube with ‘Mr. Colour’ Iron (212) or similar.

Once the rigging of the elevator is complete, lightly airbrush a semi-matte coating panel (’Alclad’ Light Sheen ALC-311, ‘Tamiya’ Semi-Gloss X35 or similar) over all rigging lines. This will give a better look to the mono-filament rigging lines.



Tail plane bracing:

NOTE: *Refer to Part 5 (Rigging details) and Part 9 (Preparation with modifications) for rigging information. The following steps concern only the tail plane cross bracing wires, a total of 2 wires.*

Cut a long length of 0.12 mm diameter line ('Steelon' mono-filament or similar).

Cut 2 lengths of 0.4 mm diameter tube, approximately 4 mm long (e.g. 'Albion Alloy's NST04 or similar).

Cut 2 lengths of 0.4 mm diameter tube, approximately 2 mm long (e.g. 'Albion Alloy's NST04 or similar).

Front bracing wire:

Insert a free end of one of the lines into a pre-drilled hole in the leading edge of the tail plane.

Secure the line in the hole using CA adhesive.

Slide two tubes onto the line (long tube followed by short tube).

Pass the free end of the line through the forward pre-drilled hole at the top of the fin.

Slide two tubes onto the line (short tube followed by long tube).

Pass the free end of the line through the opposite pre-drilled hole in the leading edge of the tail plane.

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

From the underside of the tail plane, trim away protruding excess line.

Slide the long tubes to the tail plane upper surface and the short tubes to the fin sides and secure them in position using thin CA adhesive.

Rear bracing wire:

Cut a long length of 0.12 mm diameter line (‘Steelon’ mono-filament or similar).

Cut 6 lengths of 0.4 mm diameter tube, approximately 4 mm long (e.g. ‘Albion Alloy’s NST04 or similar).

Cut 6 lengths of 0.4 mm diameter tube, approximately 2 mm long (e.g. ‘Albion Alloy’s NST04 or similar).

Insert a free end of the line into a pre-drilled hole at the lower, rear of the fuselage.

Secure the line in the hole using CA adhesive.

Slide two tubes onto the line (short tube followed by long tube).

Pass the free end of the line up and through the rear pre-drilled hole in the trailing edge of the tail plane.

Slide two tubes onto the line (long tube followed by short tube).

Pass the free end of the line up and through the rear pre-drilled hole at the top of the fin.

Slide two tubes onto the line (short tube followed by long tube).

Pass the free end of the line down and through the opposite rear pre-drilled hole at trailing edge of the tail plane.

Slide two tubes onto the line (long tube followed by short tube).

Cut the free end of the line so that it can be fully inserted into the pre-drilled hole on that side of the fuselage.

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

Slide tubes up to the tail plane upper and underside surfaces and the fin sides and secure them in position using thin CA adhesive.

Brush paint the tubes with ‘Mr. Colour’ Iron (212) or similar.

Once the rigging of the rudder is complete, lightly airbrush a semi-matte coating panel (’Alclad’ Light Sheen ALC-311, ‘Tamiya’ Semi-Gloss X35 or similar) over all rigging lines. This will give a better look to the mono-filament rigging lines.

Forward bracing struts:

NOTE 1: *The two tail plane support struts are create using the same technique as used to create the wing struts (refer to page 70).*

NOTE 2: *When creating the support struts, not that they align with the associated bracing wire above the tail plane.*

Roll cut two lengths of 0.5 mm diameter Aluminium tube (e.g. ‘Albion Alloy’s’ MAT05 or similar).

The lengths of the cut tubes should be slightly longer than the distance between the underside of the tail plane at the bracing wire hole and inline at the bottom edge of the fuselage.

Slide each tube onto a long length of 0.2 mm diameter rod (e.g. ‘Albion Alloy’s’ NSR02 or similar).

Using the ‘Strutter’ tool, create two aerofoil sections.

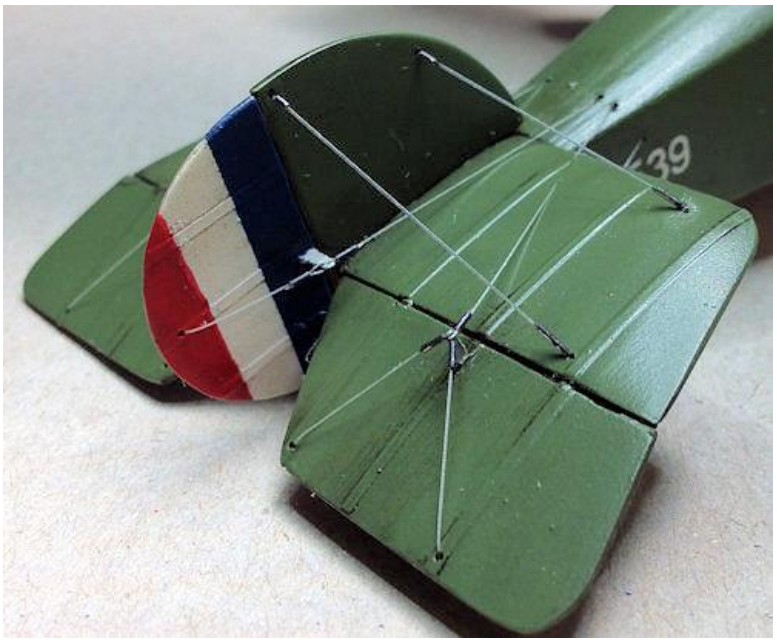
Remove the 0.2 mm rod from the aerofoil sections.

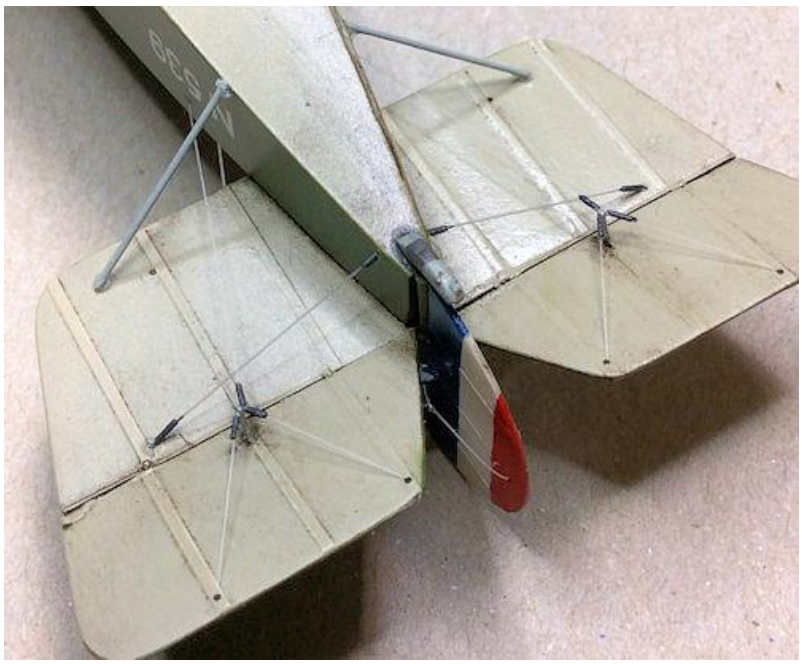
File the ends of each aerofoil section to match the angles required to fit the struts between the underside of the tail plane (leading edge) and the bottom edge of the fuselage (adjacent to the tail skid).

Locate each aerofoil section in position between the fuselage and underside of the tail plane.

Make sure the sections are correctly positioned and secure in place using CA adhesive.

Prime then paint the two aerofoil sections with ‘Tamiya’ Royal Light Grey (XF80) or similar.





Final weathering:

If desired, final weathering touches can be added. For example:

Refer to Part 3 (Weathering):

Apply ‘Flory Models’ Dark Dirt clay wash to areas around panels, strut attaching points etc.

Apply ‘Tamiya’ Master Weathering Set A (Mud) along the lower fuselage edges and as wheel spray on the undersides of the lower wings.

Apply ‘Tamiya’ Master Weathering Set D (Oil Stain) to the rear of the engine cylinders.

Machine gun:

NOTE: *Lewis machine guns fitted on the upper wings of fighters would normally be mounted on a ‘pull down’ rack, such as on the SE5a aircraft. This enabled the pilot to replace the ammunition drum. Therefore an unlock and pull down cable was required in addition to a trigger cable from the cockpit. However this aircraft was so small the pilot could easily reach the ammunition drum from the cockpit and was also able to fire the weapon using the normal gun trigger. Therefore the weapon was rigidly fixed on the upper wing and had no operating cables as such.*

Locate the added swivel gun mounting into the pre-drilled hole at the rear of the upper wing centre section. Make sure the cooling jacket rests on the added forward support in the wing and that the weapon is positioned centrally on the wing and not tilted to one side or the other.

Secure the Lewis machine gun in position, using CA adhesive.

Engine - fit:

Test fit the two cylinders and their induction pipes into their fuselage location recesses. Make sure the cylinders are at 90 degrees to the fuselage, when viewed from above and the front and the induction pipes are parallel to their cylinders. If necessary, adjust as required to achieve the correct fit.

Locate the two cylinders into their fuselage recesses, making sure the small square lug on the cylinder heads align with the fuselage recesses for the induction pipes. Secure with CA adhesive.

Locate the two induction pipes into their fuselage recesses, making sure the top of the pipes contacts the small square lugs on the cylinder heads. Secure with CA adhesive.

NOTE: *The following steps apply to both cylinders.*

Drill two holes of 0.4 mm diameter into the fuselage at the base of the cylinder. When viewed from the top of the cylinder, the holes should be aligned with the end of the valve lever and the small lug above the lever.

Cut two lengths of 0.3 mm diameter Nickel-Silver tube ('Albion Alloy's NST03 or similar).

Cut one tube so it will locate into the pre-drilled hole under the valve lever with the outer end just under the bottom end of the lever.

Bend one end of the remaining tube to 90 degrees then flatted the bent end with flat nosed pliers.

Cut the opposite end of the tube so that will locate into the remaining pre-drilled hole with the bent end resting on top of the cylinder lug.

Secure both tubes in position using CA adhesive.

Cut a length of 0.3 mm diameter lead wire ('PlusModel' or similar).

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

Drill a hole of 0.4 mm diameter into the fuselage at the base of the cylinder (centrally at the bottom of the cylinder when viewed from the side).

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

Secure one of the wire into the pre-drilled hole in the fuselage, using CA adhesive.

Bend the free end of the wire over the top of the spark plug and trim away excess wire.

Secure the wire to the top of the spark plug using CA adhesive.

Propeller and spinner:

NOTE: *Refer to the previous photographs to ensure the propeller is fitted the correct way around into the spinner.*

Check fit the propeller into the spinner. Make sure the propeller locates fully into the spinner and is clear of the spinner rear edge. If necessary carefully file or sand away the spinner cut-outs and/or reduce the length of the locating stub to achieve the correct fit.

Secure the propeller into the spinner using CA adhesive.

Secure the propeller/spinner assembly, at the desired angle, onto the front of the fuselage, using CA adhesive.

Wind screen:

Apply a thin bead of ’MicroScale’ Micro Krystal Clear (PVA adhesive) to the bottom edge of the wind screen.

Position the wind screen onto the top of the fuselage, centrally between the two rear cabane struts and leaning slightly rearwards at the top.

PART 12

FIGURE

PART 12 - FIGURE

The figure chosen to compliment this model is the 'Copper State Models' smoking RFC pilot (F32-042). The figure kit consists of just the body, two arms and the head

NOTE: *Whilst working with the resin parts of this model:*

Assembly of all parts is carried out using CA adhesive.

Handle with care as the parts have been moulded very thin and are fragile and easily damaged.

Wash all parts in warm water with washing liquid added, to remove resin mould release agent.

Cut the parts away from their mould bases or sheet.

Remove all mould 'flash' , stubs and seams from the parts.

When working with resin, dust or particles are harmful if they are inhaled or ingested.

Preparation:

Before assembly, cut the four parts away from their moulding blocks.

Remove imperfections and seam lines by scraping with a sharp scalpel blade.

Wash the figure parts in warm water with washing up liquid added and then thoroughly dry the parts. This will remove any residual 'release agent' used during casting of the figures, which if not removed, may cause problems when applying paint to the figure.

Check the figure for any surface imperfections, such as small 'blown holes', mis-moulding etc and fill and sand accordingly to repair the surface.

Assemble and prime:

Assemble the figure using CA adhesive.

NOTE: *The following steps are necessary to hold the figure for painting (in a pin vice or similar) and to finally fix the figure onto the model display base.*

Drill a hole of 0.9 mm diameter approximately 10 mm through the underside of a shoe and up into that leg. Make sure the hole is drilled as centrally as possible into the leg, to avoid the drill breaking through the side of the leg.

Cut a length of paper clip wire (0.8 mm diameter) of approximately 20 mm length and secure it into the drilled hole, using CA adhesive.

Painting:

NOTE: *When brush painting with Tamiya acrylics, the paint will dry quicker than needed, so adding thinners or retarder helps slow the paint drying time. Use either:*

'Tamiya' acrylic retarder.

'Mr. Colour' Self Levelling thinners (which contains a retarder).

'AK Interactive' acrylic thinners (AK712).

'Tamiya' X20A thinners (if retarder solutions are not available).

Airbrush a grey primer over the figure (e.g. 'AK Interactive' Grey AK-758 or similar).

Brush paint the figure as follows:

1. Boots: - 'Tamiya' Flat Brown (XF10).
2. Flying Jacket: - 'AK Interactive' Brown Leather (AK3031) with highlights of British Uniform Light (AK3082), 'Tamiya' Flat Brown (XF10).
3. Flying helmet: - 'Humbrol' Leather (62) with highlights of 'Tamiya' Hull Red (XF9).
4. Airbrush a light coat of semi-matte over the following (e.g. 'Alclad' Semi-Matte ALC-312 or similar) - Flying jacket, helmet and boots.
5. Goggles: - 'Mr. Colour' Stainless Steel (213) then coat of 'Tamia' Clear Yellow (X24).
6. Buttons and Buckles: - Mr. Metal Colour Brass (MC219).
7. Flesh: - 'Model Colour' Basic Skin Tone (70.815), Beige Red (70.804) and Burnt Red (70.814) -'AK Interactive' Faded White (AK3029), 'Tamiya' Rubber Black (XF85).
8. Trousers: - 'AK Interactive' French Uniform (AK3103) with highlights of 'Model Colour' Black (70.950).
9. Cigarette: - 'Tamiya' Deck Tan (XF55).
10. Weathering: - Lightly sponge 'Tamiya' Master Weathering Set A (Mud) onto the boots and Set B (Soot) on the edges of the flying jacket and back of the elbows on the sleeves.

PART 13

DISPLAY BASE

PART 13 - DISPLAY BASE

The display case is made from sheets of 3 mm thick piano black Acrylic sheet, cut and cemented together to form a 'shouldered step' for seating the transparent top, which is fabricated from 3 mm thick clear Acrylic sheet. This was made to measure for this model by an on-line manufacturer, who also made the angled plaque mount, which was secured to the display base with a contact adhesive.

The brass (brushed silver) plaques were also made by an online manufacturer and were secured to the angled mount with contact adhesive.

The grass mat used is the 'Model Scene' grass mat (Wetland middle F011).

Grass mat:

Cut the grass mat to the desired shape.

Lay the mat onto the display base and position to ensure the model will clear the display top when located.

Use a soft pencil to lightly trace the outline of the mat on the display base.

Remove the mat and lightly spray the underside of the mat with water and leave for a minute, to soften the backing of the mat.

NOTE: *During the next step, do not apply too much PVA adhesive and keep it clear of the outer edges of the outline. Applying too much adhesive may cause it to ooze out from the edges of the mat when the mat is loaded for drying.*

Apply PVA adhesive (white glue) to the inside of the traced outline on the display base.

Position the mat onto the base, aligned to the pencil outline and gently pushed down to make proper contact.

Cover the mat with a sheet of kitchen 'Cling Film'.

Stack several 'heavy' books onto the covered mat, to hold it down onto the display base.

After several hours, remove the books and cling film.

Model and figure:

The aircraft was not fixed to the display base, but left as 'free standing'. This avoids any shock loading damage that may occur to the model when being transported or move around in the display case.

Cut away the support pin in the leg of the pilot, leaving approximately 6 mm exposed.

Locate the figure in its final position on the base.

Mark the location of the support pin in the leg of the pilot.

Drill a hole of 1.0 mm diameter through the grass mat and into (not through) the display base.

Apply PVA adhesive to the pin of the figure and locate it into the pre-drilled hole in the display base.

Apply light pressure to the figure to ensure it is fully located in the base. Make sure the figure is stood correctly and not leaning in any direction.

PART 14

COMPLETED MODEL PHOTOS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END