World War One Aircraft Models

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

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

I don't consider myself a 'master' of this craft, but hope to be able to pass on what I have learned. As such, here is my build log, which covers a conversion of the 'Wingnut Wings' 1:32 scale model of the Royal Aircraft Factory SE5a (Hisso) to a Viper powered version. This will be displayed alongside a Spitfire Mk.1a as part of a dual build.

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INTRODUCTION

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

AFTER MARKET

AFTER MARKET

Figure

'Copper State Models' British pilot (F32-003).

Decals

'Aviattic' clear backed Clear Doped Linen 'bleached' (ATT32044),
'Xtradecal' Parallel Stripes (White XPS2),
'Xtradecal' RAF numbers/letters (X72157).

Propeller

'Proper Plane' two bladed wood laminated for Viper SE5a (WP-055),
Propeller spinner from 'Roden' SE5a kit (Ro 607).

3D printed parts

'Proper Plane' **test print** of Viper conversion set.

Rigging accessories (as required)

'Gaspatch' 1/48th scale metal Anchor Points,
'Albion Alloy's' Micro tube or rod (Brass or Nickel Silver, various diameters),
'Steelon' or 'Stroft GTM' Mono-Filament (0.08 and 0.12 mm diameter),
'Modelkasten' 0.2 mm diameter black line,
'Proper Plane' fork end resin turnbuckles (RD-019),
'EZ' stretch line (black fine).

Paints (as required)

'Tamiya' Acrylic, Humbrol Acrylic, 'Mr. Metal Color', 'Alclad II' Lacquers,
'AK Interactive' Primer (Grey AK758, White AK759), 'Tamiya' Fine Surface Primer (Grey/White),
'Mig' A-Stand Aqua Gloss (A.Mig-2503), 'MRP' acrylic lacquers,
'Mr. Surfacer' 500/1000/1200/1500, 'Windsor & Newton' Griffin Alkyd oil paint.

Sundries (as required)

'Mr. Color' Levelling Thinners 400, PVA Adhesive (e.g. 'MicroScale' Micro Krystal Clear),
'PlusModel' lead wire, 'MicroScale' MicroSol/MicroSet decal solutions,
'VMS Fleky' CA adhesive (Slow and Thin), 'Revell' Contacta Professional cement,
'Tamiya' extra thin liquid cement, 'Perfect Plastic Putty', 'White Spirits/Odourless Thinners',
'VMS' Metal Prep 4K or 'Mr. Metal' Primer R, 'Araldite' two-part epoxy, 'Black-It' or 'Ammo' (A.MIG-2021),
'MFH' 0.4 mm diameter flexible black tube (P-961), Copper wire various diameters,
'Tamiya' masking sheet and tapes (various widths), 'Prismacolor' Verithin pencils
'Microscale' Krystal Klear, 'UHU' White Tack, 'Tamiya' masking tape (various widths),
'Abteilung 502' Liquid Mask, 'De-Solv-It' Sticky Stuff Remover, 'Frisket' Low Tack Film Matt Roll, Clear.

Weathering mediums (as required)

'Flory Models' Clay washes or Pigments,
'Tamiya' Weathering Master sets,
'Prismacolor' Verithin Argent Métallique pencil (753),
'AK Interactive' Kerosene (AK2039), Engine Oil (AK2019) washes.

Display Base

'Coastal Kits' 200 and 300 mm diameter display roundels.
Information plaques from 'TLS Engraving Ltd'.
'Inperspective' custom made Acrylic cover.
Stained MDF display base hand made.

THE PILOT

THE PILOT

References:
Online resources.
The Sky their Battlefield II - (Trevor Henshaw).
Osprey Publications No.56 Sqn (RFC/RAF) - (Alex Revell).

Early years:

Duncan William Grinnell-Milne was the second son of George Grinnell-Milne (1853–1931), a merchant banker and Maria Caroline Mess (1862–1942), who were married in The Hague in 1882. He was born in Bromley, London on the 6th of August 1896 and was eventually educated at Cheam School and the University of Freiburg.

World War One:

Grinnell-Milne was commissioned as a second lieutenant (on probation) in the 5th Battalion, Rifle Brigade (Prince Consort's Own) on the 13th of December 1913 at the age of 17. At the outbreak of World War I he was considered too young for front-line service, so in an effort to evade this restriction, on the 12th of December 1914 he transferred to the 7th Battalion, Royal Fusiliers (City of London Regiment) where he served with his brother. However, he was soon seconded to the Royal Flying Corps for flying training and on the 17th of August 1915 was granted Royal Aero Club Aviators' Certificate No. 1609 following a flight in a Maurice Farman biplane at the Military Flying School at Shoreham. He was confirmed in his rank of second lieutenant on the 7th of September and two days later was appointed to the rank of Flying Officer. He was then promoted to Lieutenant on the 29th of September 1915 and posted to No.16 Squadron (RFC). On the 28th of November, flying a BE.2c, he claimed his first victory shooting down an Albatros C.I over Sequedin.
However, on the 1st of December, while flying a BE2c on a reconnaissance mission over Valenciennes, the aircraft's engine failed and he was forced to land behind enemy lines near St. Quentin. He and his observer, Capt, CC Strong, burnt the aircraft but were captured. Initially they were reported as missing, but were eventually reported as prisoners of war (POW's) in early January 1916. Grinnell-Milne spent over two years as a POW before he finally escaped in April 1918, making his way from Germany to the Netherlands where he was briefly interned before returning to England.
On the 16th of May he was presented to King George V at Buckingham Palace.

Grinnell-Milne eventually returned to aerial combat with No. 56 Squadron RAF, flying the Royal Aircraft Factory S.E.5a.
On the 3rd of October he destroyed a kite balloon South of Caudry, but flying SE5a Serial No: F5481.
On the 5th of October he another kite balloon South-West of Busigny, again flying F5481.
On the 21st of October he was appointed a flight commander with the rank of acting-captain and celebrated by destroying a Fokker D.VII north of Bousies the same day, flying C1149.
He destroyed and drove down two more Fokker D.VII's over the Mormal Woods on the 29th of October and destroyed his seventh and final victory of the war, another Fokker D.VII on the 3rd of November North-East of Valenciennes. A week later the armistice brought the fighting to an end. On the 17th of December he took command of No. 56 Squadron, remaining with it until it was reduced to cadre status.

Between wars:
In 1919 and 1920, Grinnell-Milne served with No.214 Squadron and No.14 Squadron in Egypt. He was appointed an acting-captain on the 1st of May 1919 and on the 30th of May his award of a bar to his Distinguished Flying Cross (DFC) was gazetted. On the 1st of August he was granted a permanent commission in the Royal Air Force with the rank of Lieutenant. On the 16th of December 1920 he was awarded the Military Cross "in recognition of gallantry in escaping from captivity while a prisoner of war" and on the 1st of January 1921 he was promoted to flight lieutenant. Grinnell-Milne then served as a test pilot at the Royal Aircraft Establishment at Farnborough and in June 1922, took part in the third RAF Aerial Pageant at Hendon, where he and Flight Lieutenant P. W. S. Bulman flew two S.E.5a's in a demonstration of combat tactics against a Airco DH.10 Amiens twin-engined bomber flown by Squadron Leader Roderic M. Hill. On the 14th of April 1923 he was appointed an attaché in the Air Section of the British Delegation in Paris. On the 20th of February 1925 he was posted to No.19 Squadron at RAF Duxford, but on the 14th of April was placed on half-pay and on the 14th of October placed on the retired list at his own request. During his career Grinnell-Milne had flown 60 different aircraft types and had amassed over 2,000 flying hours.
After leaving the RAF he worked as an art dealer in New York and also as an author, based in London, publishing two autobiographical works; An Escaper's Log (1926), detailing his time as a prisoner in Germany and Wind in the Wires (1933) about his flying career, as well as several novels. Later he worked as a broadcaster for the BBC.

World War Two:
He returned to military service prior to World War II, being commissioned as a pilot officer in the Royal Air Force Volunteer Reserve on the 25th of April 1939. On the 17th of June 1940, following Marshal Philippe Pétain's declaration of his intention to seek an armistice, Air-Vice Marshal Arthur Barratt, Air Officer Commanding-in-Chief British Air Forces in France, sent Grinnell-Milne on a mission to deliver letters to the leaders of the French Air Force, stating Britain's determination to continue the fight and encouraging them to do the same in North Africa. Grinnell-Milne was also appointed the British liaison officer to the Commander-in-Chief of the French Air Force Joseph Vuillemin and equipped with portable radio transmitter, call-signs and codes. Grinnell-Milne drove to Bordeaux, then to GHQ French Air Forces at Agen. There Vuillemin regretfully informed him that he had begun the process of transferring men and aircraft to North Africa, but had now received orders to halt all movements. Grinnell-Milne found most of the senior staff officers were either resigned to their fate, obstructive, or openly hostile, though he noted that many of the younger officers and men were eager to leave for England. He left France late on the 18th of June aboard the ship Arethusa. Once back in London he was appointed liaison officer to Free French General Charles de Gaulle, remaining with him for the next four months and taking part in the battles of Dakar and Gabon.

He was promoted to flying officer on the 3rd of August 1941. Grinnell-Milne was invalided out of the RAF (technically he resigned his commission), retaining his rank of flying officer on the 20th of July 1944. Thereafter he rejoined the BBC, remaining there until 1946.

Personal:

Grinnell-Milne was married three times.

In May 1921 he became engaged to Frances Warrington La Lanne, daughter of Mr. and Mrs. Frank Dale La Lanne of Philadelphia and they were married on the 17th of September 1921. Their son, Robin Ian Evelyn Grinnell-Milne, was born on the 13th of January 1925. They divorced in 1927.
He later married Blanca de Undurraga y Sandiford, daughter of Don Julio de Undurraga, which also ended in divorce.
He finally married Pauline Alice Margaret Lemieux, daughter of Dr. Louis-Joseph Lemieux (Canadian Member of Legislative Assembly for Gaspé), on the 26th of May 1932.
During his military career, Grinnell-Milne was credited with six aerial victories during World War One and was awarded the Military Cross (MC) and the Distinguished Flying Cross (DFC) and bar.

Grinnell-Milne died at the age of 77 in Westminster, London in November 1973.

THE AIRCRAFT

THE AIRCRAFT

References:
The Sky their Battlefield II - (Trevor Henshaw).
The SE5 File - (Ray Sturtivant and Gordon Page).
RAF SE5a Windsock Data File Special - (JM Bruce).
RAF SE5 Windsock Data File No.30 - (JM Bruce).
Osprey Publications No.56 Sqn (RFC/RAF) - (Alex Revell).
Wingnut Wings SE5a 'Hisso' - instruction manual kit 32003.

General:

The S.E.5 (Scout Experimental 5) was designed by Henry Folland, John Kenworthy and Major Frank Goodden of the Royal Aircraft Factory in Farnborough. The first of three prototypes flew on the 22nd of November 1916. The first two prototypes were lost in crashes (the first killing the chief test pilot at the Royal Aircraft Factory, Major Frank Goodden, on the 28th of January 1917), due to a weakness in the wing design. The third prototype underwent modification before production commenced
The Royal Aircraft Factory S.E.5 was a conventional tractor biplane fighter aircraft. The fuselage was a wire-braced box girder structure while the wings were furnished with wooden spars and internal ribs. The fuselage was narrower than many contemporary aircraft, which provided the pilot with good all-round visibility. The aircraft had considerable structural strength, which was credited with improving the type's crash worthiness and survivability. It could also withstand high-g manoeuvres and was relatively resistant to battle-damage. Unlike many of its peers, which were highly agile but unforgiving, the S.E.5 was comparatively stable and easy to fly; its stability enabling pilots to more readily fire upon enemies from further away with a greater degree of accuracy. It had a noticeably lower accident rate than comparable aircraft. The exception to its generally stability was an excessive amount of adverse yaw. The yaw could be compensated for by balanced application of the aileron and rudder, whilst adjustment of the elevator trim made it possible to fly in a 'hands off' manner. The S.E.5 was powered by various engines, initially adopting a Hispano-Suiza 8 V8 engine. The Hispano-Suiza engine was advanced for the era, incorporating such features as an aluminium cylinder block with steel liners, dual ignition and forced lubrication that aided cooling; especially compared with contemporary rotary engines, it had the advantage of being easy to operate by most pilots. An expansion tank for the cooling system was integrated into the leading edge of the upper wing's centre section. One of its greatest advantages over the Sopwith Camel was its superior performance at altitude, making it a much better match for the Fokker D.VII when that fighter arrived at the front.
The S.E.5 was armed with a single synchronised .303-inch Vickers machine gun in contrast to the Camel's two, but it also had a wing-mounted Lewis gun fitted on a Foster mounting, which enabled the pilot to fire at an enemy aircraft from below. This armament configuration was much appreciated by the pilots of the first S.E.5 squadrons as the new hydraulic-link 'C-C' synchronising gear for the Vickers machine gun was unreliable at first. The Vickers gun was mounted on the forward left dorsal surface of the fuselage with the breech inside the cockpit, at a slight upwards angle. Typically, spare magazines for the Lewis gun would have been placed within most of the free space in the cockpit including the forward areas, such as the instrumentation panel.
The standard instrument panel included a compass, altimeter, tachometer, oil pressure indicator, airspeed gauge, radiator temperature dial, fuel air pressure indicator, fuel selector and air exchange; these were somewhat difficult to view due to their low-set position in the cockpit. According to 'Dodge' Bailey, Chief Test Pilot of the Shuttleworth Collection, the S.E.5's cockpit was 'the best of the bunch from the era'. It was set amidships, making it difficult to see over the long front fuselage, but otherwise visibility was good.
In total 5,265 S.E.5s were constructed by six manufacturers: Austin Motors (1,650), Air Navigation and Engineering Company (560), Curtiss (1), Martinsyde (258), the Royal Aircraft Factory (200), Vickers (2.164) and Wolseley Motors Limited (431).

In service:

When the 150hp V8 Hispano-Suiza 8Aa powered RAF SE.5 (Royal Aircraft Factory Scout Experimental 5) first appeared over the front lines in early April 1917 with No.56 Squadron (RFC) it was to mixed reactions though it soon proved itself in combat. The large canopy type windshield proved most unpopular and was removed almost immediately at Squadron level.

Later production SE5's incorporated this change, shorter span wings and several lesser alterations. The final few SE5's built in July 1917 were fitted with more powerful 200hp Hispano-Suiza 'Hisso' 8Ab engines, effectively creating the SE.5a standard and it was pretty much in this form that they soldiered on to the end of the Great War 15 months later.
Problems with supply and reliability of the 200hp 'Hisso' engines dogged the SE.5a throughout its service and led to a dizzying array of engines from Hispano-Suiza and Wolseley (mostly improved 'clones' of Hispano-Suiza designs) being installed. The two significant differences were the earlier 'geared' types, where the propeller shaft was driven by a reduction gear off the crankshaft (the propeller had a higher thrust line and rotated counter-clockwise from the pilots perspective) and the later 'direct drive' types (had a lower propeller thrust line and rotated clockwise). As Hispano-Suiza supplied most of the early engines and they were mostly of the geared type, 'Hisso' has become how these early geared engine powered SE.5a have colloquially become known, whether their engines were manufactured by Hispano-Suiza or Wolseley. Eventually the reliable direct drive Wolseley Viper (again an improved clone of a Hispano-Suiza design) was settled on as the preferred engine. Just as SE.5's with geared engines have been identified as 'Hisso' powered, direct drive engined aircraft have become 'Viper' powered, whether they were powered by the Viper or a direct drive Hispano Suiza engine.
A significant feature of the SE.5/SE.5a was the rather large dihedral angle applied to the wings. While this meant that the SE.5a was never going to be as great a dogfighter as its contemporary, the highly agile (and lethal) Sopwith Camel, it provided a stable gun platform and was popular with both novice and experienced airmen alike. This stability also made changing the Lewis gun magazines in flight a slightly less harrowing exercise that it would otherwise have been.
Individual in-service S.E.5s would often receive customisations and user-specified tweaks at the request of their pilots. Popular changes included reducing the dihedral of the wings in order to increase its manoeuvrability and the removal of the head fairing to increase the pilot's visibility to the rear. James McCudden, an ace pilot and former RFC mechanic, was famous for his prolific fine-tuning of his aircraft in order to produce improved performance from it. McCudden was able to increase the top speed by 9 mph and to raise the service ceiling. His adaptions included replacing the standard pistons with high compression versions, shortening the exhaust (saving weight and improving exhaust scavenging) and changes to mixture, ignition and other engine settings as well as fitting a salvaged German propeller spinner (which he himself credited as gaining 3 mph alone).
While there is little controversy about the common colour scheme for the SE.5a, of Protective Covering number 10 (PC10) for the upper surfaces and Clear Doped Linen (CDL) wing lower surfaces, there is a great deal of controversy as to what colour PC10 actually was. Made from mixes of yellow ochre, iron oxide and lamp black pigments it varied between chocolate brown and olive drab, depending on the mix and presumably, time spent exposed to the elements. It appears that early, fresh, PC10 appeared more olive drab (XF62) while later mixes and aircraft exposed to the elements for some time would appear more chocolate brown. Metal cowling panels were left unpainted on the interior and usually painted PC10 on the exterior, though sometimes they were left completely unpainted.

General specifications:
Length: 20 ft 11 in (6.38 m), Wingspan: 26 ft 7 in (8.10 m), Height: 9 ft 6 in (2.90 m)
Wing Area: 244 sq ft (22.7 m2)
Empty Weight: 1,531 lb (6,94.5kg)
Maximum weight - 2,048lb (929kg)

Engine:
200 hp Wolseley 'Viper' V8 engine

Performance:
Maximum Speed: 135 mph at sea level (km/h)
Range: 300 miles (483 km)
Service ceiling: 20,000 ft (6,096m) Endurance: 3 hours

Armament:
Fuselage mounted - 1 x 0.303 in. (7.7 mm) forward-firing Vickers machine gun.
Upper wing mounted - 1x .303 in. (7.7 mm) Lewis gun.
Fuselage mounted - 100lbs (45.4kg) of Cooper bombs.

Royal Aircraft Factory SE5a (Wolseley Viper engine) Serial No: C1149 as flown by Capt. Duncan Grinnell-Milne with No.56 Squadron (RAF) during late 1918.

Duncan William Grinnell-Milne flew three SE5a aircraft and all three were named 'Schweinhund', in reference to 2 years in captivity as a German POW. The most famous of the three was his red painted SE5a, serial number C1149. This aircraft was built by the Royal Aircraft Factory as one of a batch of 100 aircraft (C1051 - C1150) and was powered by the 200hp Wolseley 'Viper' engine. The aircraft was taken to No.2 Issues Section at Fienvillers from No.1 Reception Park at Marquise, France on the 17th of October 1918 and from there onto No.56 Squadron (RAF) on the 21st of October. After the end of hostilities, the aircraft was transferred to No.1 Squadron (RAF) on the 23rd of January 1919. It was sent back to England on the 5th of February 1919 and later, struck off charge.

Colour scheme:

Many resources and models have the whole fuselage of C1149 painted red and the assumption generally is that this was during 1918 when he flew this aircraft with No.56 Squadron (RAF). However, Grinnell-Milne, in his book 'Wind in the Wires' stated that the 'nose' of his aircraft was painted red, so presumably not the whole fuselage. Also, in much later interview, he stated that he was not allowed to have the whole fuselage painted red until after the cessation of hostilities. Possibly he had the nose painted red when he took command of 56 Squadron in France, during December 1918. According to Grinnell-Milne, the fuselage of C1149 was not painted completely red until later and possibly before it returned to England during 1919. The following photograph from the Imperial War Museum archives show the aircraft with the usual aircraft serial number on the fin painted over, as well as the ground handling 'Lift Here' stencils at the lower, rear of the fuselage. Also, the Vickers and Lewis machine guns have been removed. This may suggest this was taken when C1149 was in its post war colour scheme and possibly back in England.
I've chosen not to model this aircraft following the all red fuselage trend for its wartime colour scheme and instead paint the model with just the 'red nose', as stated by Grinnell-Milne. The famed ace Albert Ball flew his SE5a Serial No: A.4850, also with No.56 Squadron (RFC). His aircraft had its nose only painted red and Ball was killed flying this aircraft in 1917. Photographs kindly supplied by Nick Greenall show C1149 in what was its colour scheme I believe during 1918 when possibly Grinnell-Milne chose to use the same colour scheme for C1149 that Ball used on A.4850.
Given there is no definitive answer to the actual colour scheme, I decided to replicate the red nose of Albert Ball's aircraft but with Grinnell-Milne's markings, including the propeller spinner and painted boss of the propeller and 'Schweinhund III' painted only on the left side of the fuselage nose as Grinnell-Milne states in his book that Schweinhund III survived the war.
NOTE: *This aircraft was built by the Royal Aircraft Factory, who positioned the wing roundels further inboard than other manufacturers. Therefore this must be taken into account when applying the wing roundels later in this build log.*

Interpretation of C1149 with the nose only painted red during late 1918.

C1149 presumed to be as painted post WW1.

Grinnell-Milne seated in C1194 ‘Schweinhund’ presumably post WW1 with guns removed.

PART 1
MODEL DESCRIPTION

PART 1 - MODEL DESCRIPTION

('Wingnut Wings' - RAF SE5a (Hisso) (Kit No:32003)

General:

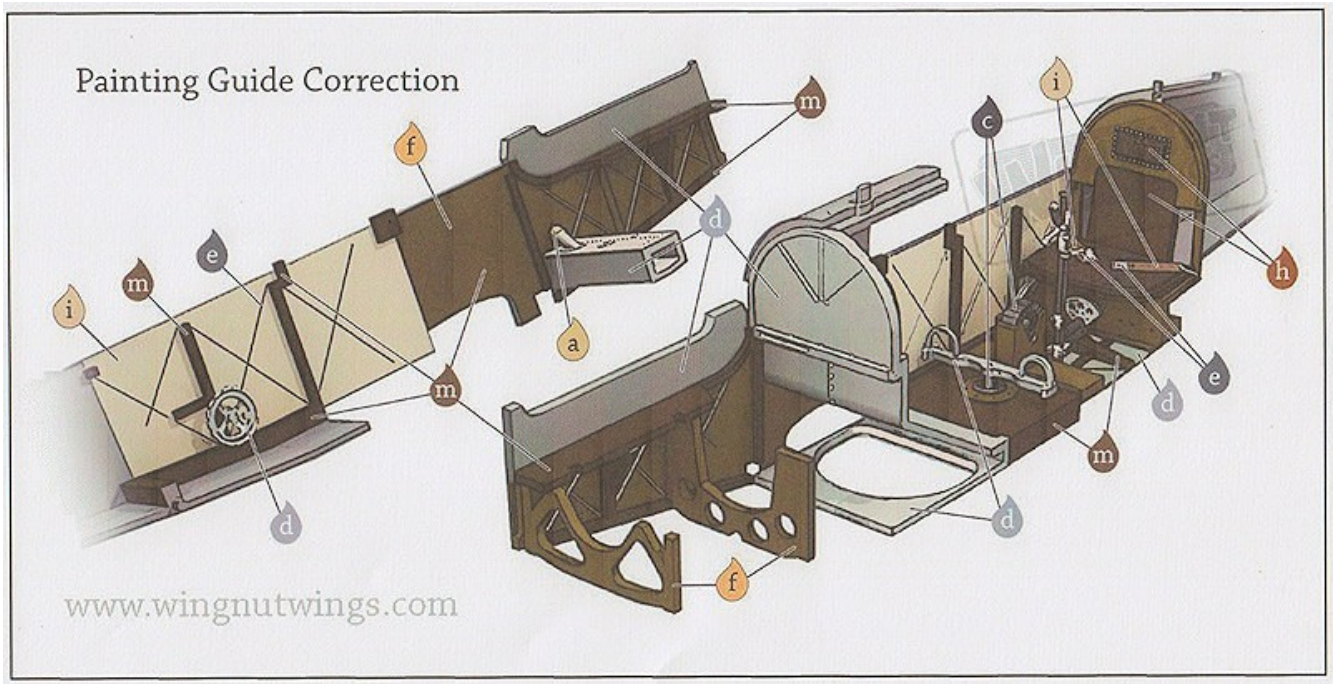
This model will be displayed alongside a Spitfire Mk.1a as part of a dual build.

This kit is from 'Wingnut Wings' and built using the 3D printed conversion set for a Wolseley 'Viper' engine version from Alexey Belov at 'Proper Plane.
The model was built using the kit instructions with reference material and researched illustrations and photographs.
Normally here I would write a basic description of the model, noting any points of interest or flaws. However, there is a good review from Rob Baumgartner on the Hyper-Scale web site. Paste the link below into your internet browser to view the review.

https://www.hyperscale.com/2009/reviews/kits/wingnutwings32003reviewrb_1.htm

Correction sheet:

The 'Wingnut Wings' web site has a correction sheet for the painting of the internal fuselage and cockpit.



3D printed conversion set:

Alexey Belov at ‘Proper Plane’ developed a conversion set to convert the ‘Wingnut Wings’ SE5a (Hisso) model to one which was powered by the Wolseley ‘Viper’ engine, a re-design of the originally fitted Hispano-Suiza’ engine, which proved unreliable.

The 3D printed conversion set used on this model is a test print only. Therefore some modification of the parts may prove necessary. If so, all modifications and a detailed report will be sent to ’Proper Plane’ for improvements to the parts, if required.

The ‘Viper’ conversion set comprises:

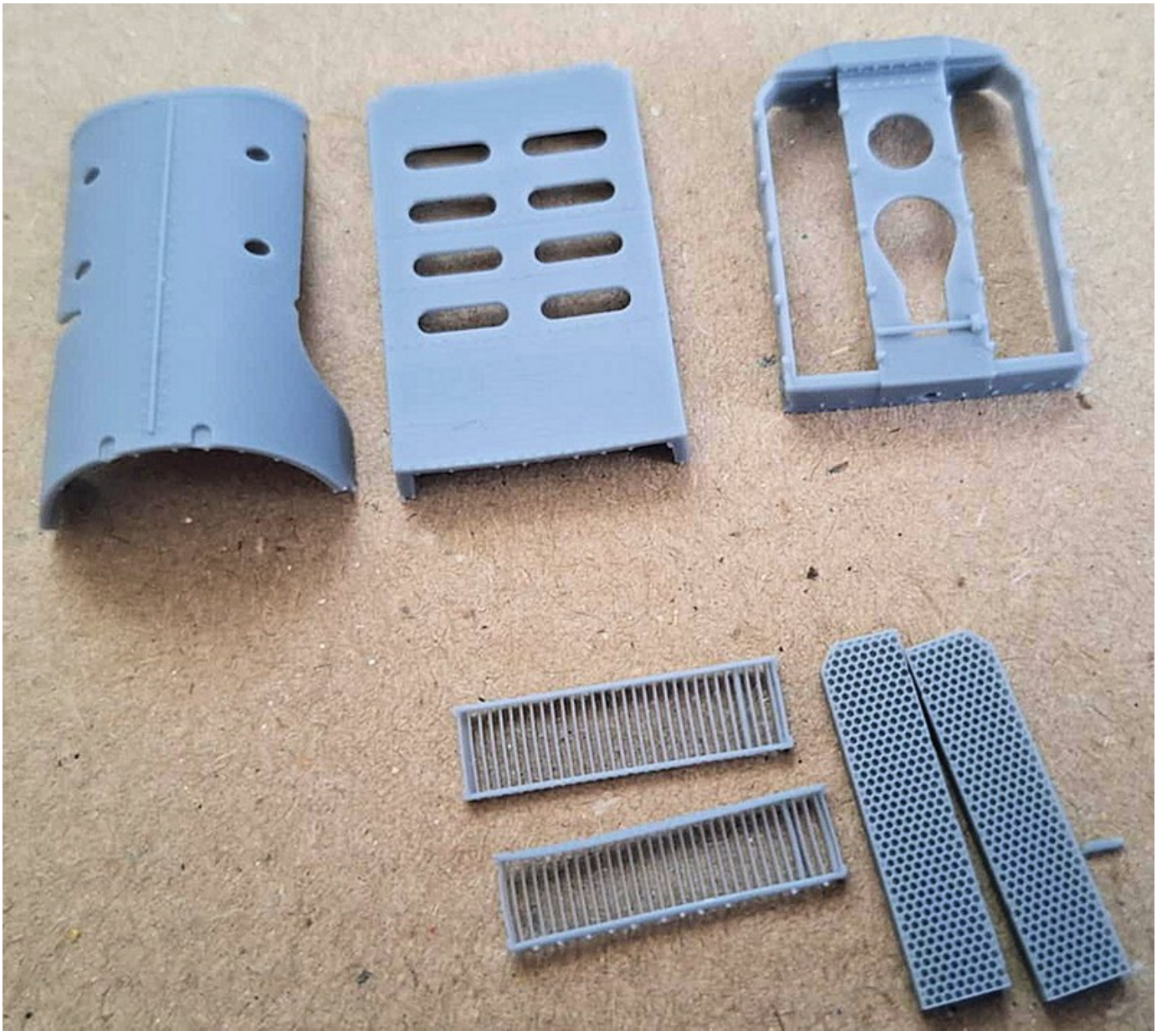
Engine access panel.

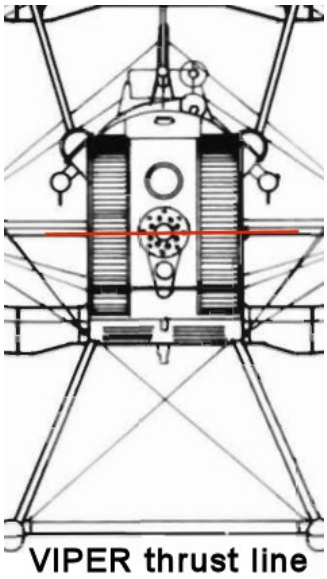
Under fuselage louvred panel.

Radiator frame.

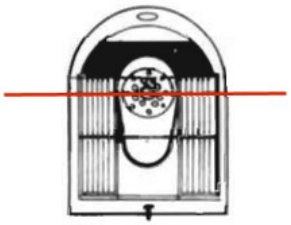
Vertical cooling matrix panels (x 2).

Vertical shutter panels (x 2).

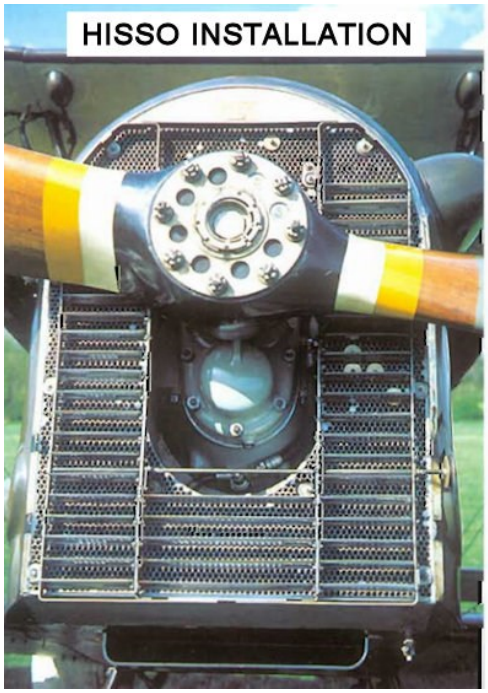


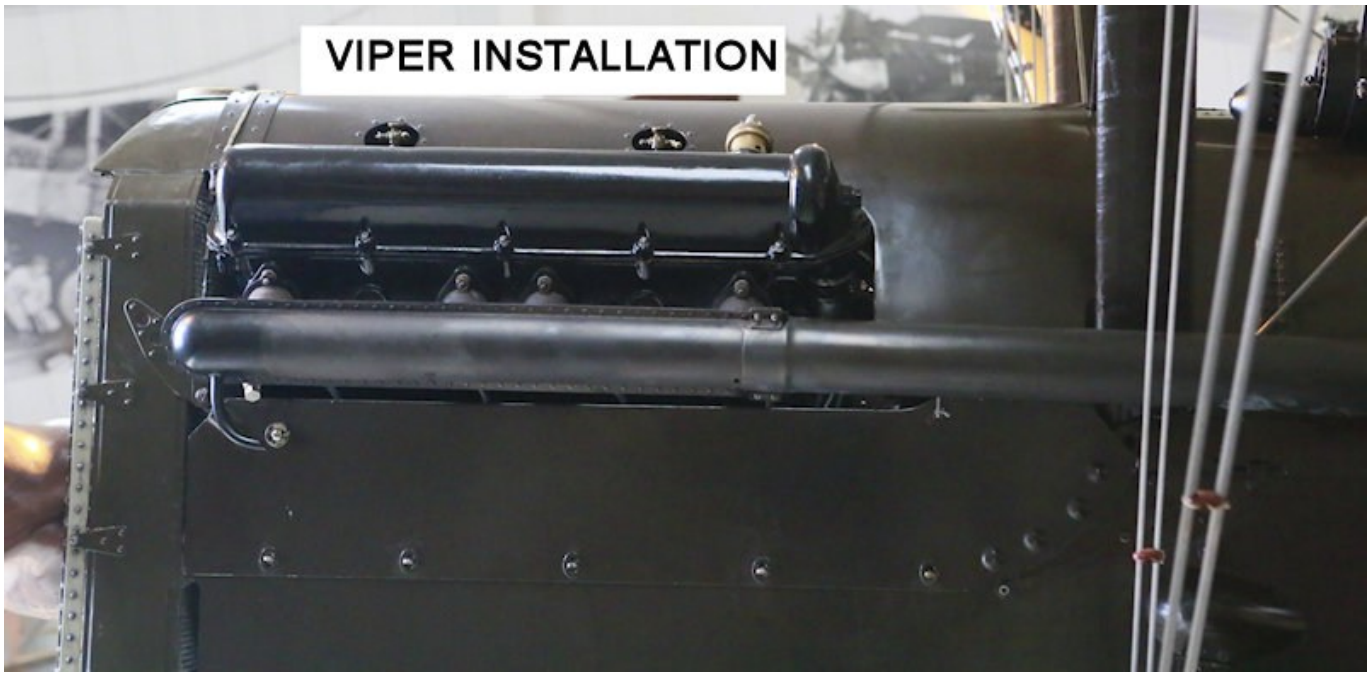


VIPER thrust line



HISSO thrust line






VIPER INSTALLATION


HISSO INSTALLATION
WWW.THEVINTAGEAVIATOR.COM
CONSTRUCTORS OF MILITARY AIRCRAFT

PART 2
WOOD EFFECTS

PART 2 - WOOD EFFECTS

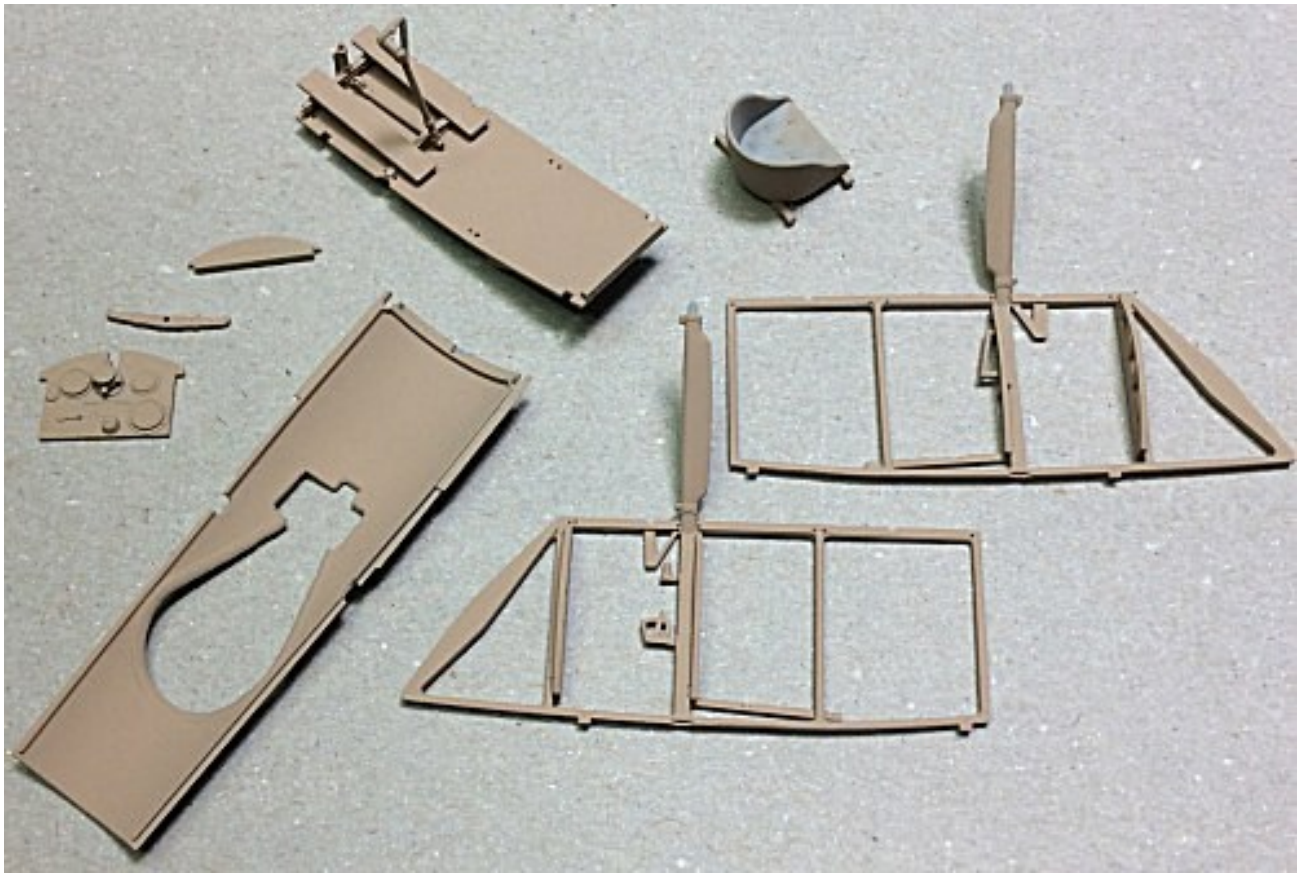
A basic technique:

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

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

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

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



Wood effect - Method 1:

DecoArt Crafters Acrylic' paints:

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

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

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

Once painting is complete, clean the brush in water.

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

Wood effect - Method 2:

Windsor & Newton' Griffin (Alkyd) oil paints:

Mask off the area as required.

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

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

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

Leave the oil paint to settle for about ten minutes.

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

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

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

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

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

If desired and once the oil paint is fully dry, airbrush a semi-gloss clear coat, such as 'Tamiya' Semi-Gloss (X35) or similar, with a few drops of 'Tamiya' Clear Orange (X26) to give a varnished look to the finish.

Surface finish:

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

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

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

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

PART 3
WEATHERING

PART 3 - WEATHERING

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

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

First I seal the surface with an airbrushed semi-gloss clear coat, such as 'Tamiya' Semi-Gloss (X35) or similar. A gloss coat tends to stop the clay wash 'gripping' the surface when it is applied and it can run off or just puddle. A matte coat can cause the clay wash to 'grip' too much, making it difficult to remove or even to wash it off completely.

NOTE 1: The 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 cause the wash to become thick and unusable.

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

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

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

Chipping effects:

To give the effect of chipped and weathered paint/varnish to metal engine cowls and forward fuselage panels etc, chipping fluids can be used. To achieve this effect, first prime the areas with a suitable primer then airbrush the metallic finish desired. Once dry, a chipping fluid, such as 'AK Interactive' Medium Chipping fluid or 'Vallejo' chipping fluid is airbrushed over the painted areas. An alternative is to use a cheap hair spray. This forms a barrier which will allow the top coat to be chipped off. Finally the required top coat colour is applied.
Once fully dry, moisten the top coat with water, which softens the paint. Then with a cut down (stiff) brush and wood cocktail stick, gently teased off the top coat paint. Take care when doing this as 'too much chipping' can't really be covered up. In that event you would have wet the top coat and remove it all with an old toothbrush or similar and then when dry, re-spray the top coat and try again. Once the desired effect was achieved, I sealed the surfaces with an airbrushed coat of 'Tamiya' Semi-Gloss (X35).

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

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

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

Water colour pencils:

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

Oil paint:

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

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

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

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

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

PART 4
DECALS

PART 4 - DECALS

Kit supplied decals:

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

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

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

NOTE: *'MicroSet' solution softens the decal to allow it to conform to the painted surface. 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 '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 'Mig' A-Stand Aqua Gloss (A.Mig-2503), 'Tamiya' Clear (X22) or similar 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 'Tamiya' Semi-Gloss (XF35) over the decals.

To 'knock back' the sheen for applying weathering effects (refer to Part 3 of this build log), for example 'Flory' clay washes or oil paint, I airbrush a sealing coat 'Tamiya' Semi-Gloss (X35).

'Aviattic' decals:

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

The ‘Aviattic’ decals are laser printed onto a very fine carrier film and although this film is thin, the decals are remarkably resilient and somewhat ‘stretchy’ when being applied. This allows them to be more easily moved and positioned before being finally applied. Also with most other decals, I’ve used softeners to help the decals conform to surface irregularities and contours, which is something I’ve found is not really required for ’Aviattic’ decals, due to the nature of the carrier film. In addition, unless the decals has been printed pre-shaped (‘cookie cut’), the decals will need to be cut out from the sheet, so care is required to cut the decals accurately to avoid leaving gaps, especially at the edges, where the white base colour will show. That said, minor gaps may be able to be covered with weathering. For more information, refer to the ‘Aviattic’ instruction sheet supplied with the decals.
Aviattic’ decals are laser printed onto either ‘clear’ or ‘white’ backing, the ‘clear’ being dependent on the base coat you apply and the finished effect you desire. The decals are supplied with very clear instructions on their application, including when to add pre-shading to the base coat, where desired, before you apply the decals.

Application:

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

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

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

Airbrush at least two light sealing coats of a clear coat such as ’‘Mig’ A-Stand Aqua Gloss (A.Mig-2503), ‘Tamiya’ Gloss (X22) or similar over the painted surface to form a gloss surface for applying the decals.

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

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

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

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

Align the decal to the shape of the model part.

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

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

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

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

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

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

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

PART 5
RESIN

PART 5 - RESIN

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

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

The properties of resin differ radically to those of plastic kits. Below I have listed what I have found to be the primary differences for resin or 3D printed kits/parts from plastic (styrene) kits:

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

Cast or 3D printed resin, by its nature, is very brittle and can be damaged or broken easily, especially when handling small parts. This is particularly evident when separating the individual items from the resin cast or from the 3D printed support 'trees'. The best way to remove item is to cut them away with a fine toothed razor saw or single blade cutters, then clean off any residual stubs on the edges of the parts.

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

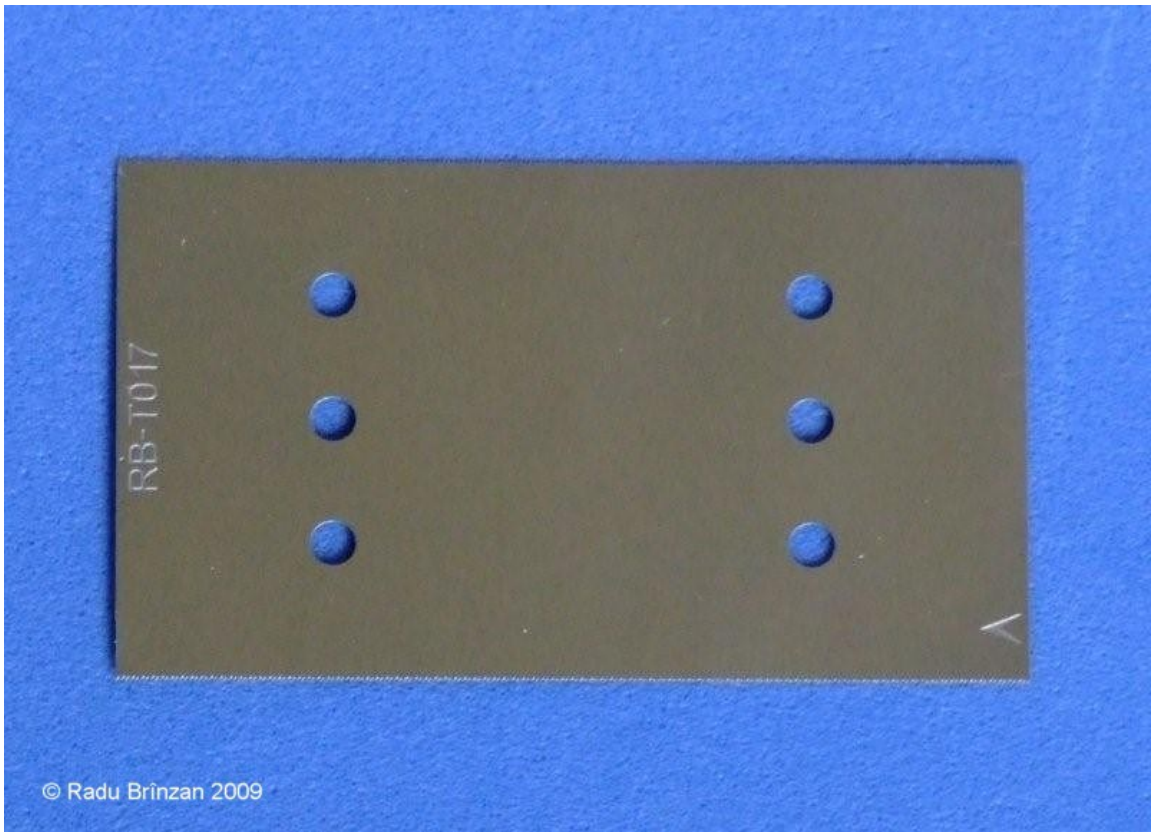
Plastic kits are assembled using solvent adhesives, which melt the surface where it is applied and 'weld' the joint together. Resin cast or 3D prints however will not react to this type of adhesive and can really only be glued using Cyanoacrylate (CA) adhesive. This adhesive reacts to moisture in the air and on the surface to be joined. As most people know, it will also bond skin to whatever it touches, if the skin has CA adhesive on it. Obviously extreme care needs to be exercised when assembling resin kits using CA adhesive. It's always a good idea to have CA release agent available to use if necessary. Good ventilation is also advisable as the fumes from CA adhesive are noticeable and can irritate the eyes and lungs.

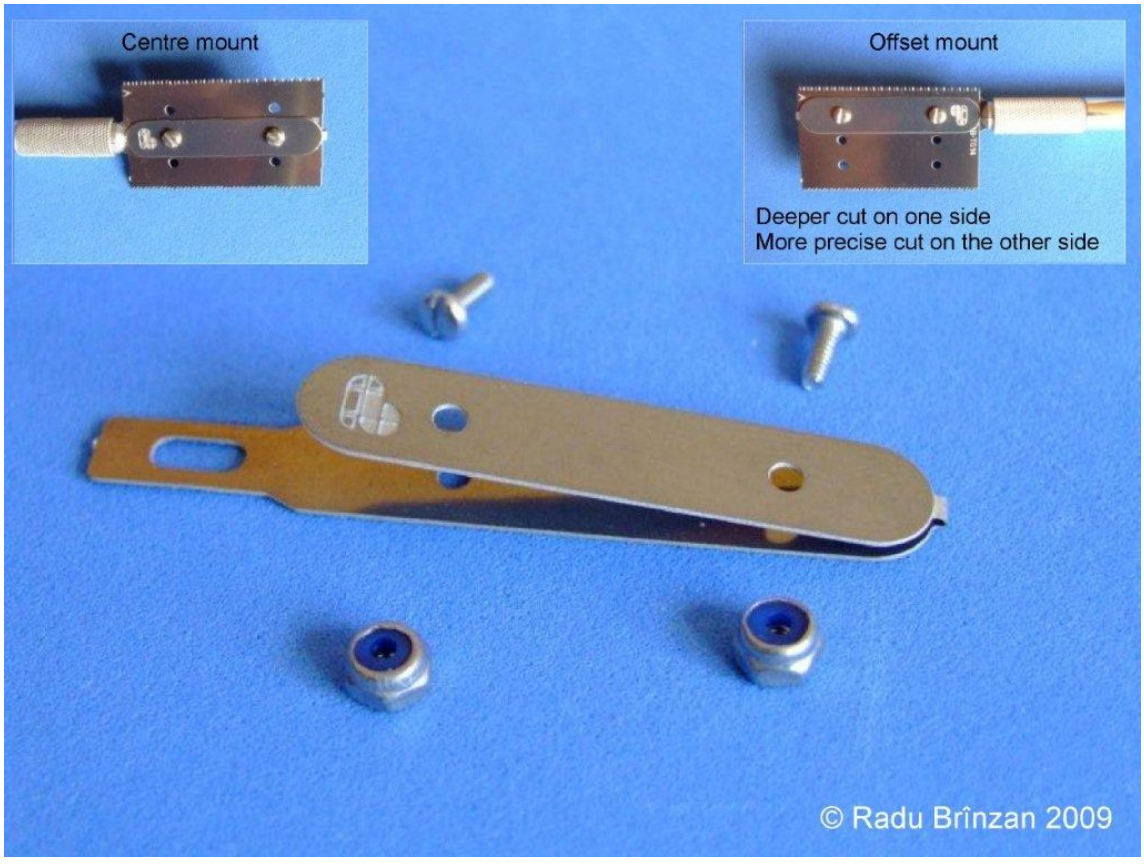
Cutting, sanding and drilling resin will create swarf and more importantly, resin dust. The dust is particular is dangerous, especially if inhaled. Therefore always vacuum the working area and yourself, regularly. If you have a face mask or filtered respirator and find you can wear it whilst working,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

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

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

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





PART 6
RIGGING

PART 6 - RIGGING

References:
The Sky their Battlefield II - (Trevor Henshaw).
The SE5 File - (Ray Sturtivant and Gordon Page).
RAF SE5a Windsock Data File Special - (JM Bruce).
RAF SE5 Windsock Data File No.30 - (JM Bruce).
Wingnut Wings SE5a 'Hisso' - instruction manual kit 32003.

General:

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

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

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

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

Control cables:

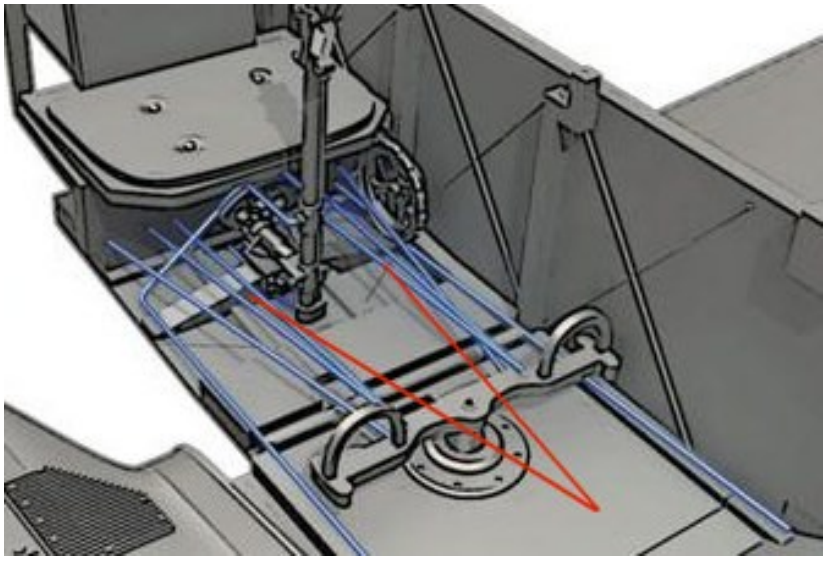
NOTE: *Flight control cables for the SE5a were of the round, wire wound type with turnbuckles for tension adjustment. Illustrations were adapted from the 'Wingnut Wings' kit instruction manual and the photographs of the control cables are from those taken by James Fahey and can be seen on the 'Vintage Aviation Limited (TVAL)' web site: https://jamesfahey.smugmug.com/SE5a and also https://www.thevintageaviator.co.nz/*

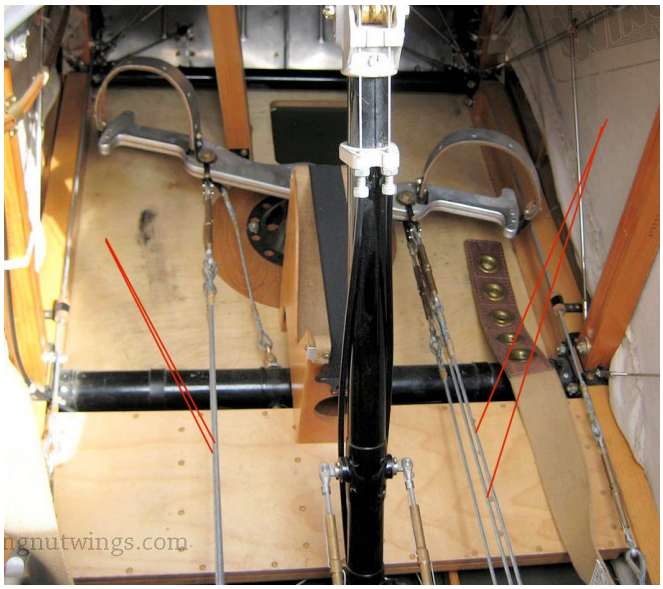
Rudder control cables:

Two pairs of rudder control cables were fitted to the pilots rudder control bar. A pair were connected to the each side of the rudder bar and were routed rearwards through the fuselage to exit through openings in the fuselage rear, close to the base of the fin. The cables were connected to the control horns on each side of the rudder.

Turnbuckles were fitted in the cables at the pilots rudder bar.

As the pilot pushed the rudder bar left or right, the corresponding cables would either tension or slacken, pulling the rudder left or right as appropriate. This caused the aircraft turn left or right (yaw).

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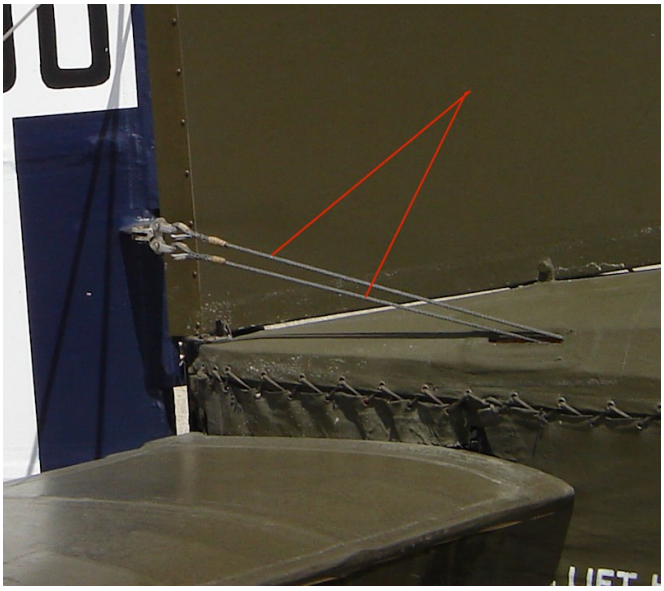
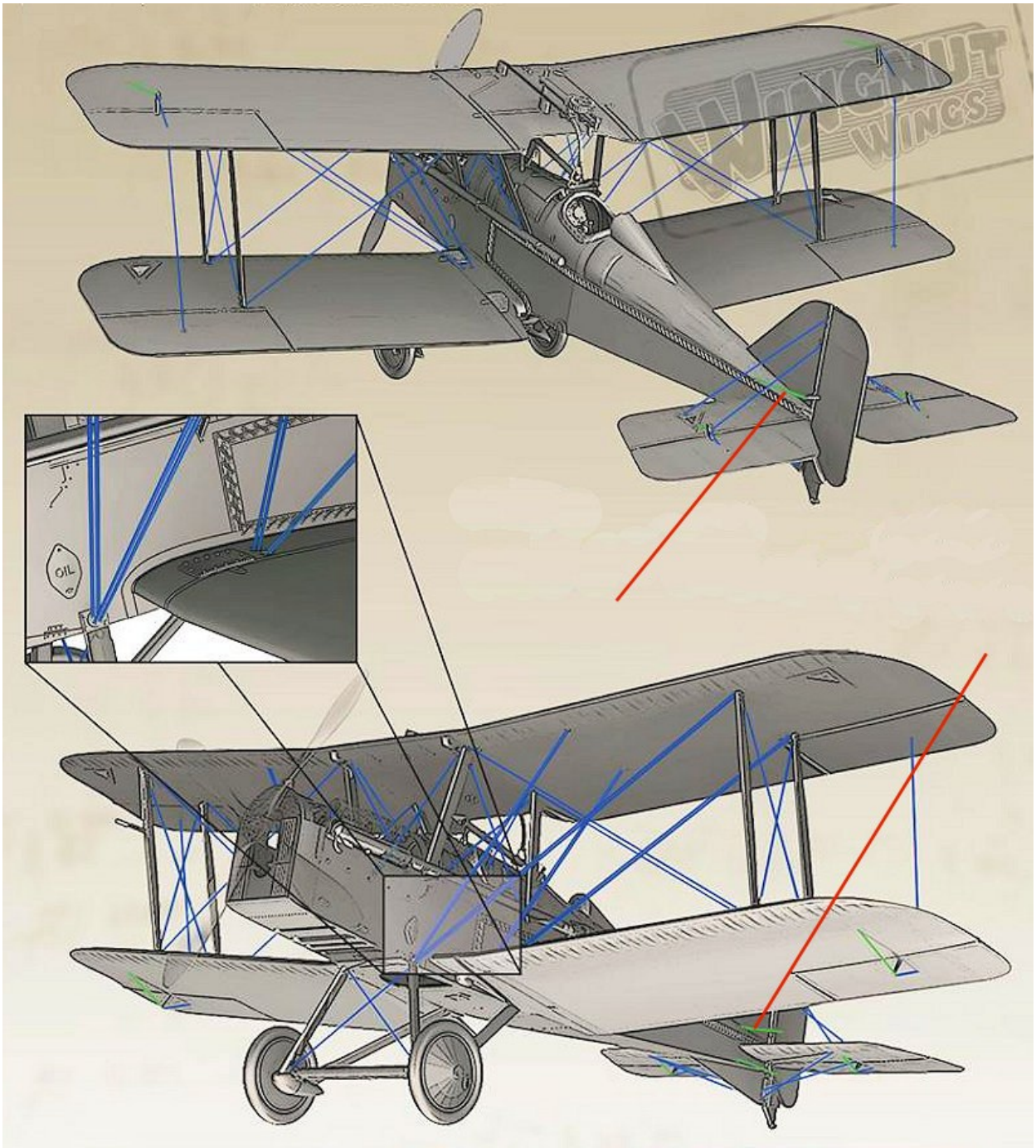
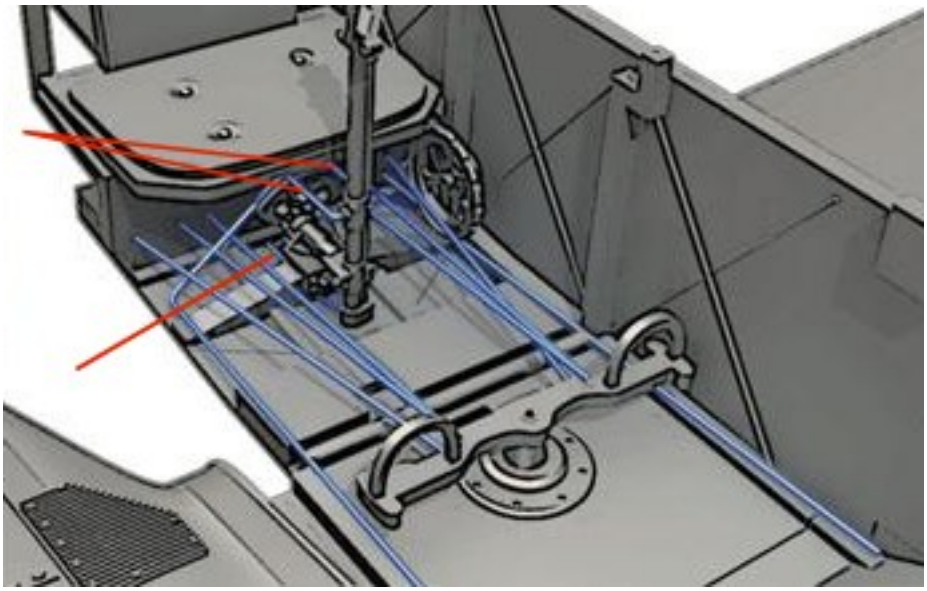
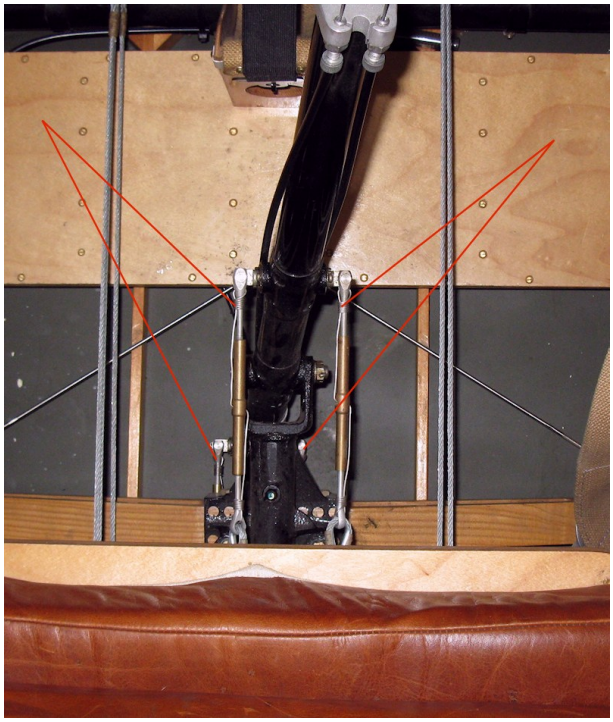


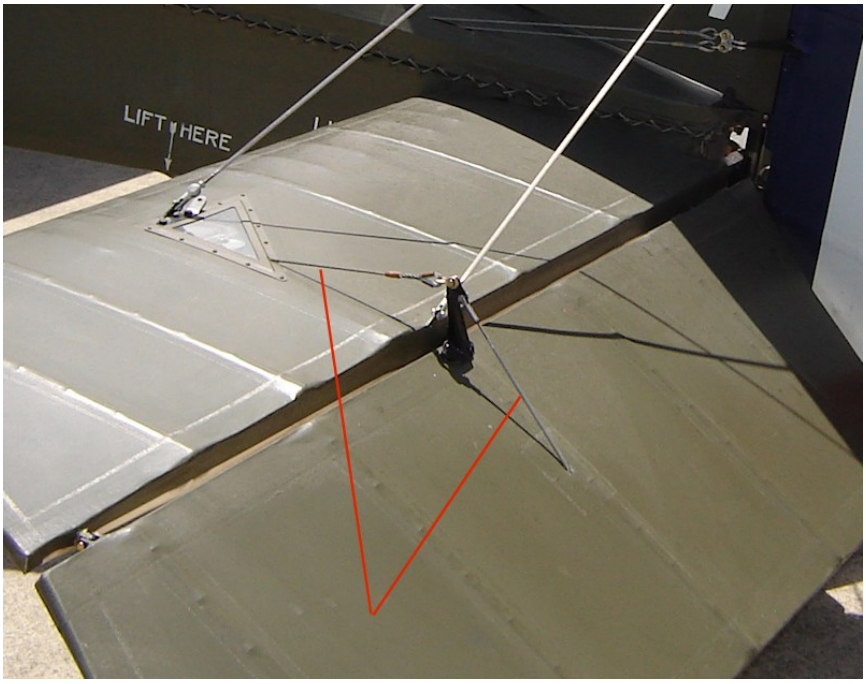

WINGS
OIL

Elevator control cables:

Four pairs of elevator control cables were fitted to the pilots control column. A pair were connected to the each side of the upper and lower sides of the control column and were routed rearwards through the fuselage then around pulleys and outboard internally through the tailplane.
The lower cables from the pilots control column were routed around pulleys (visible through transparent inspection windows) in the tailplane then out to be connected to the top of the elevator upper control horns. A second cable connected to the control horns was routed rearwards and through the elevators to be connected to the top of the elevator underside control horns.
The upper cables from the pilots control column were routed around pulleys in the tailplane and connected to the top of the elevator underside control horns.
Turnbuckles were fitted in the cables at the pilots control column.
As the pilot pulled the control column rearwards, the bottom of the control column would pivot forwards tensioning the lower pairs of control cables. The tension in these cables would pull on the elevator upper control horns, causing the elevators to lift. The upper cables on the control column would slacken as the control column moved rearwards to prevent the cables tension from opposing the movement of the elevators. The effect of the control cables on the elevators was reversed when the pilot pushed the control column forwards, causing the elevators to lower.
Movement of the elevators up or down caused the aircraft to climb or dive (pitch).



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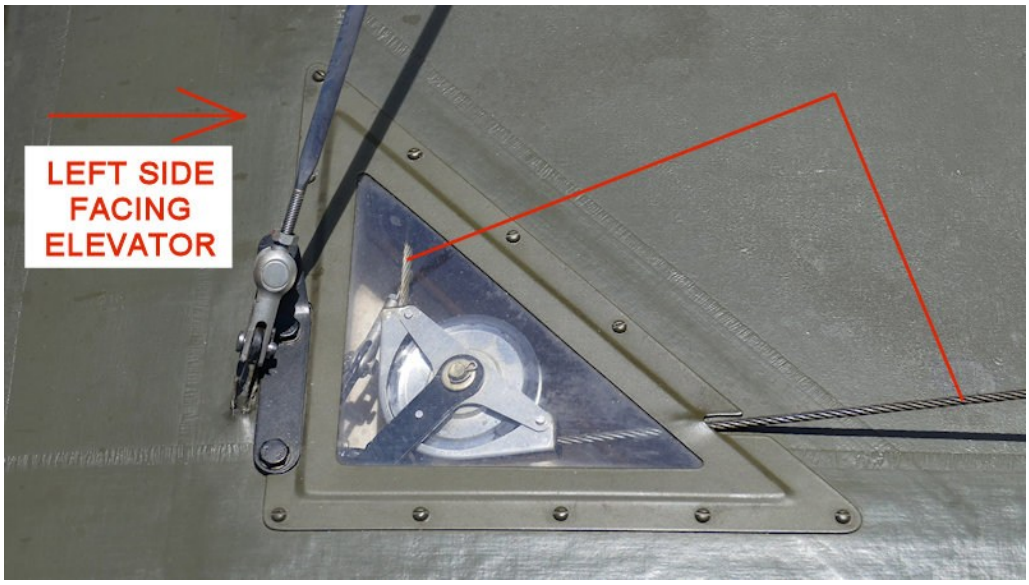
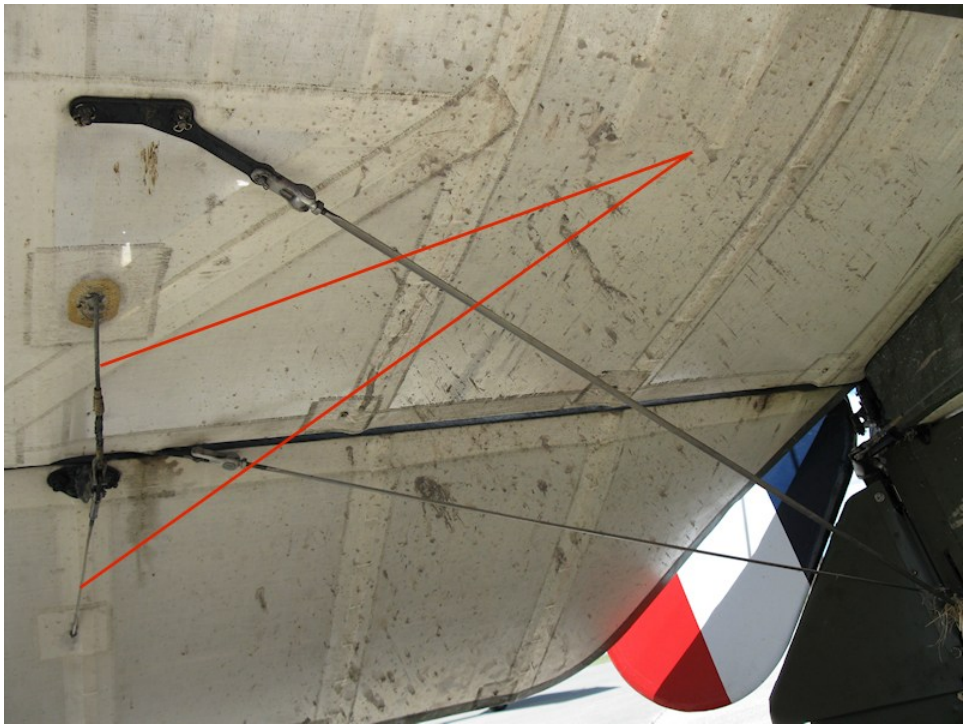
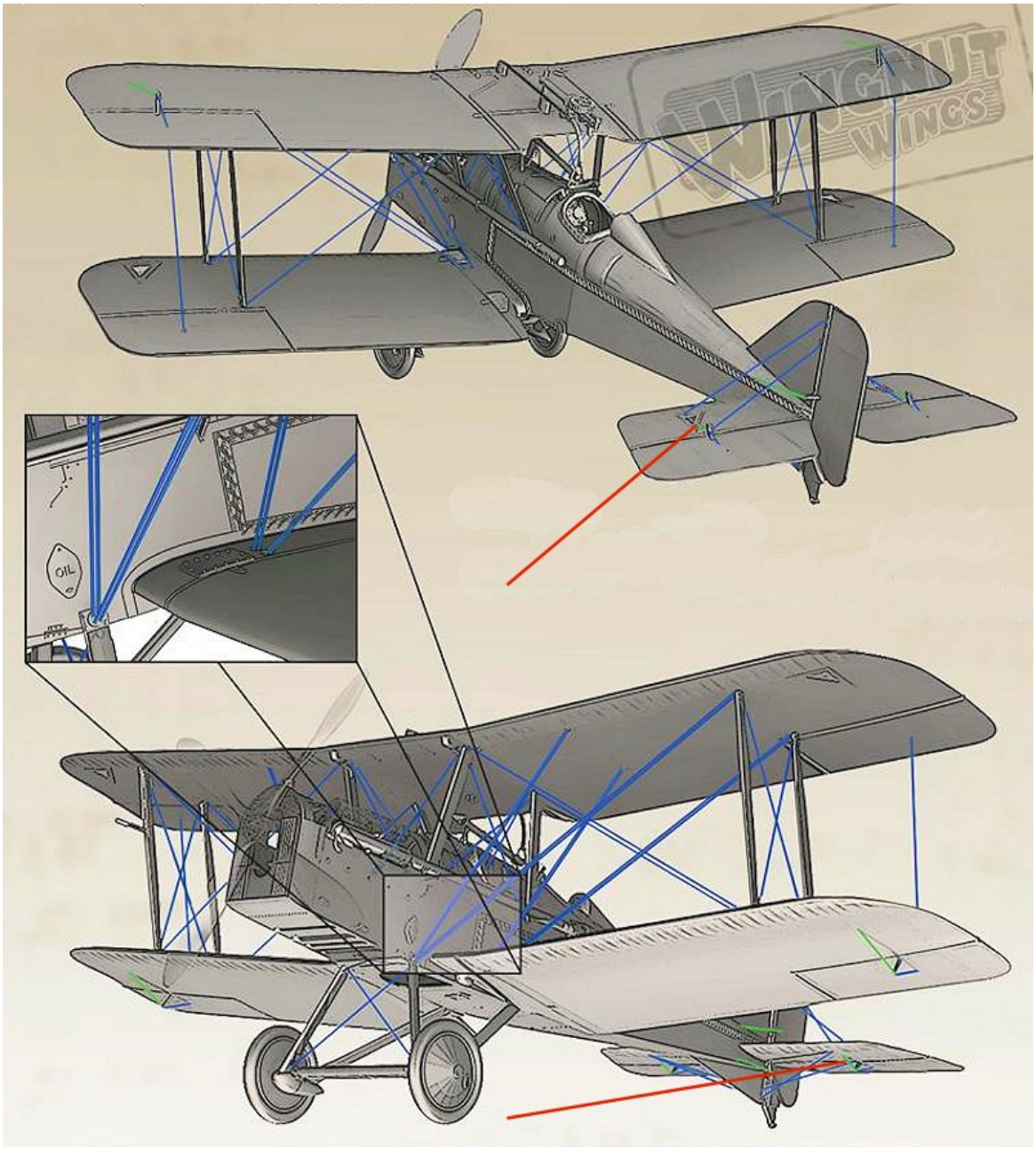
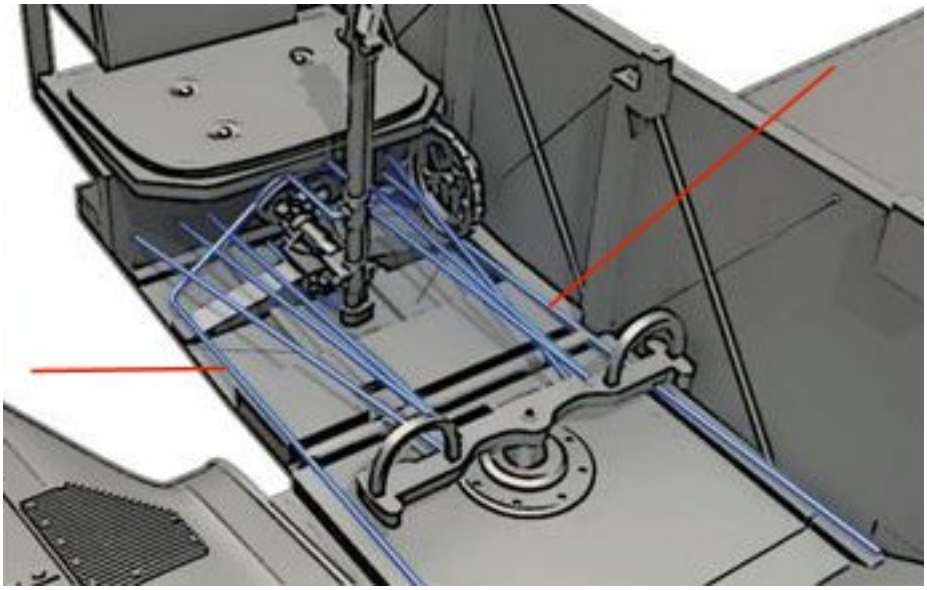

LEFT SIDE
FACING
ELEVATOR

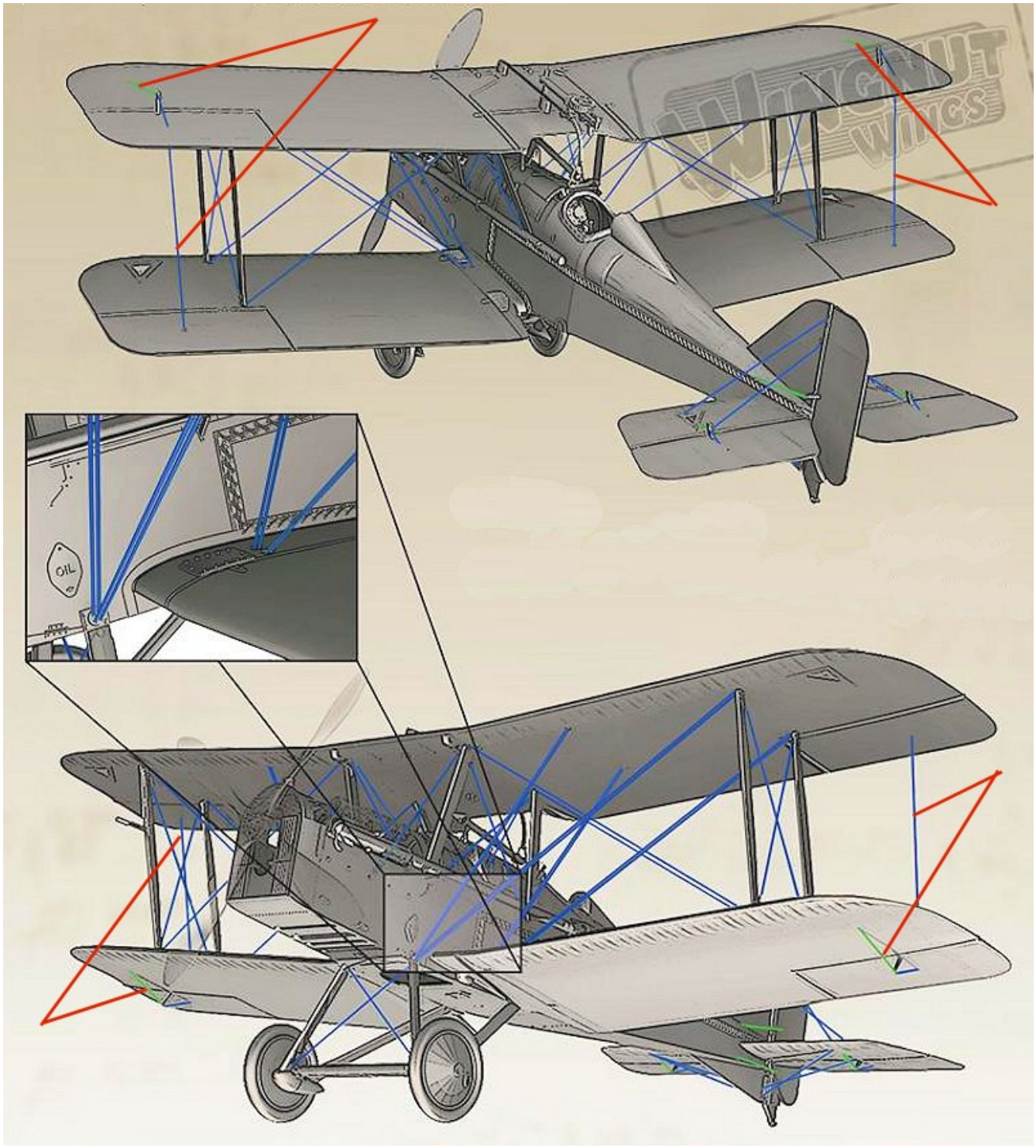




Aileron control cables:

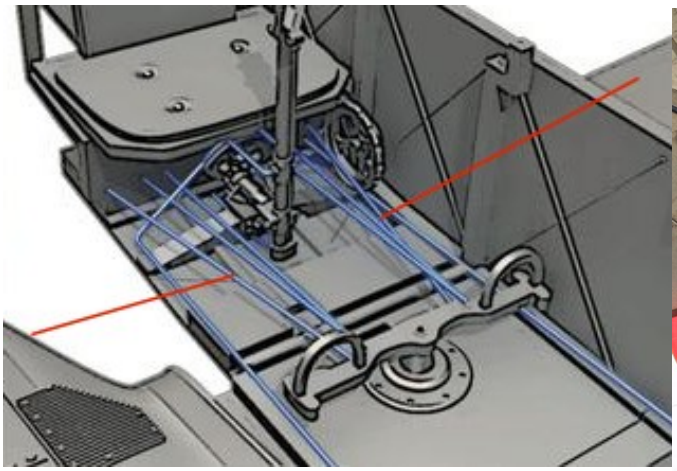
A torque bar was fixed to the lower section of the pilots control column. The bar was routed rearwards under the pilots seat to a bell-crank fitted at the rear end of the bar. It seems that the aileron control cable was routed over the bell-crank and outboard and around pulleys at the cockpit sides. The cable at each side of the cockpit was routed forwards and around pulleys and outboard through the internal structure of the lower wings. The cable was routed around pulleys (visible through transparent inspection windows) in the lower wings then out from the underside of the wings to be connected to the top of the aileron lower control horns. A second cable connected to the control horns was routed rearwards and through the aileron, then vertically up and through the upper ailerons to the top of the upper aileron control horns. The cable was then routed forwards and into the upper wing then around pulleys (visible through transparent inspection windows) and across the internal structure of the upper wing, completing the control cable loop.
Turnbuckles were fitted in the control cable forward from the cable pulleys at the pilots seat. They were also fitted in the control cable attachment to the forward top of the four aileron control horns.
As the pilot moved the control column left or right, the corresponding side of the control cable would tension and the other side relax, causing the ailerons on one side of the aircraft to lift and the other to drop. This caused the aircraft to bank left or right (roll).



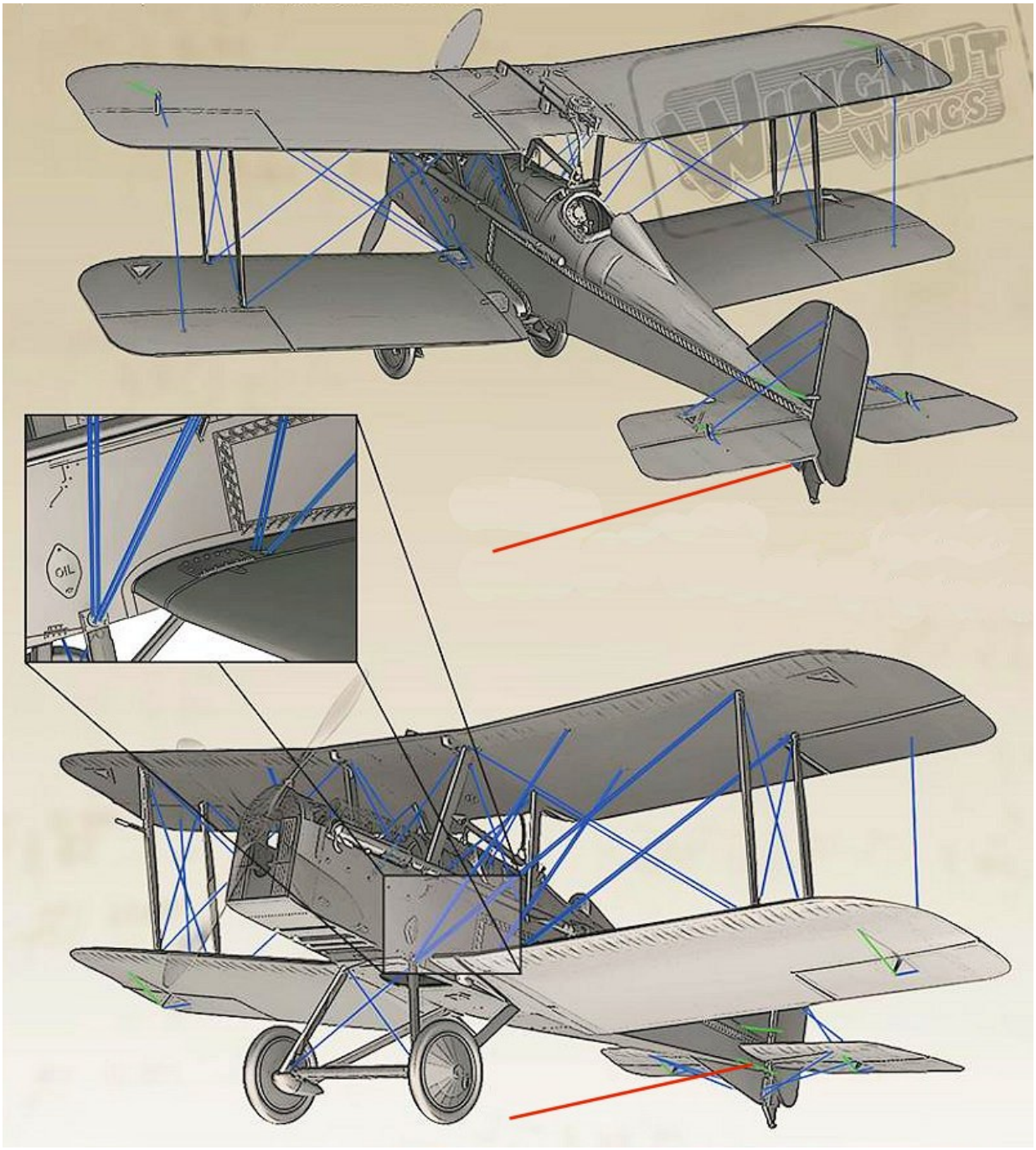


Tail skid control cables:

A tail skid control cable was to both sides of the pilots rudder control bar. The cables were routed rearwards through the fuselage to exit through openings in the fuselage lower rear, below the tailplane. The cables were connected to the control horns on each side of the top of the moveable tail skid. Turnbuckles were fitted in the cables at the pilots rudder bar.
As the pilot pushed the rudder bar left or right, the corresponding cables would either tension or slacken, pulling the tail skid left or right. The moving tail skid assisted the pilot to steer the aircraft on the ground, causing the rear of the aircraft to turn left or right.




LIFT HERE

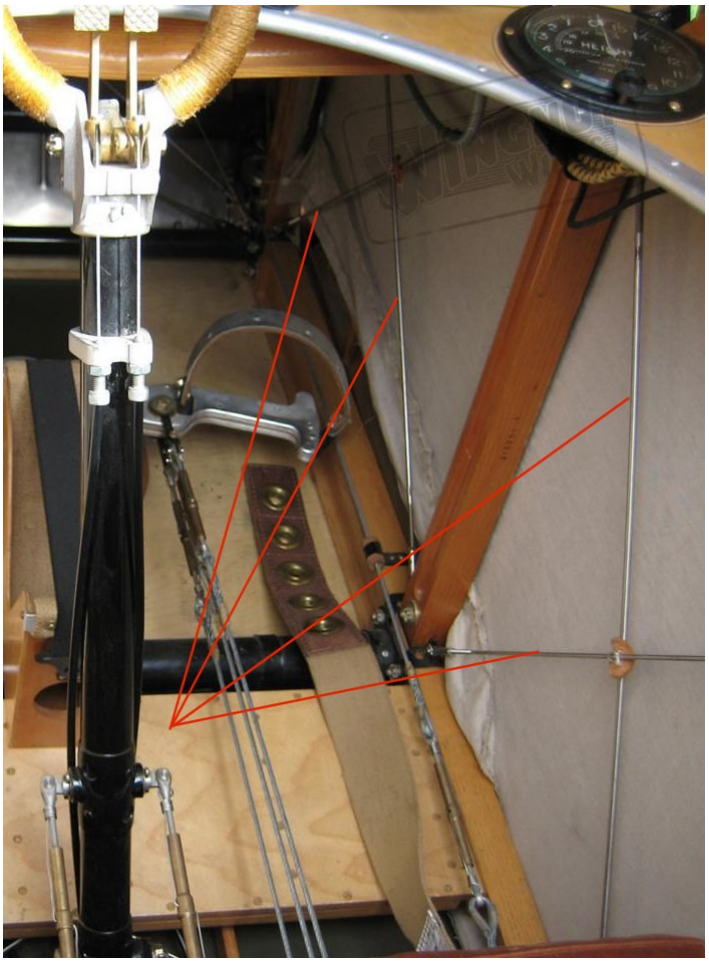


Internal bracing wires:

NOTE: *Bracing wires for the SE5a were of the streamlined, forged type (RAF wires), with end adjusters for tension adjustment. Illustrations were adapted from the 'Wingnut Wings' kit instruction manual and the photographs of the control cables are from those taken by James Fahey and can be seen on the 'Vintage Aviation Limited (TVAL)' web site: https://jamesfahey.smugmug.com/SE5a and also from the web site https://ww.thevintageaviator.co.nz/*

The aircraft had internal bracing wires diagonally crossed between all of the fuselage side frames, between the frames across the bottom of the fuselage and across the top and bottoms of the fuselage frames rear of the cockpit. However, the only bracing wires that can be seen on the finished model are those bracing wires diagonally crossed between the three fuselage side frames in the cockpit. As such only those wires will be added to the model.

Bracing wires were fitted diagonally crossed between the top and bottom corners of the cockpit side frames. These were streamlined wires were fitted with end fittings, so had no turnbuckles.

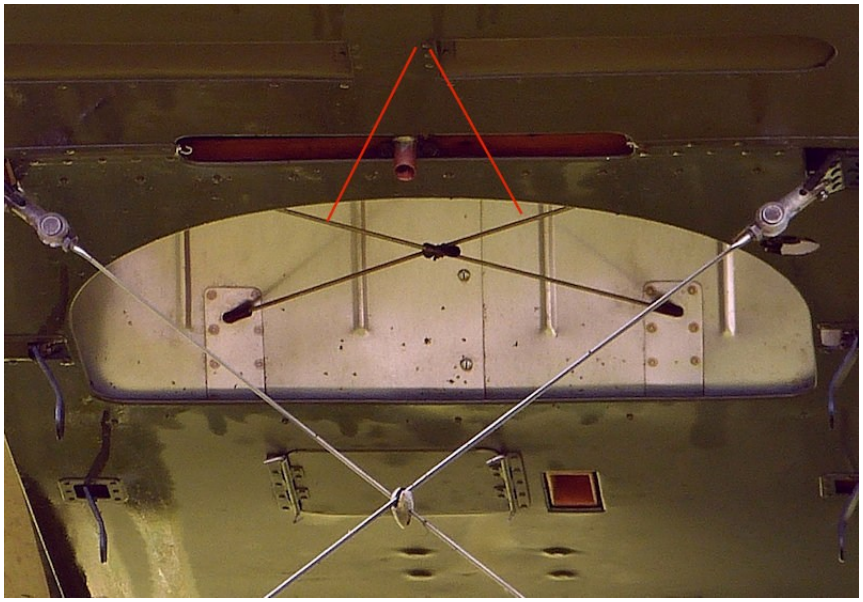


External bracing wires:

NOTE: *Bracing wires for the SE5a were of the streamlined, forged type (RAF wires), with end adjusters for tension adjustment. Illustrations were adapted from the 'Wingnut Wings' kit instruction manual and the photographs of the control cables are from those taken by James Fahey and can be seen on the 'Vintage Aviation Limited (TVAL)' web site: https://jamesfahey.smugmug.com/SE5a and also from the web site https://ww.thevintageaviator.co.nz/*

Fuselage underside:

The open bay in the underside of the fuselage, above the landing gear struts, has diagonally crossed bracing wires fitted inside the fuselage opening. These were streamlined wires were fitted with end fittings, so had no turnbuckles.



Cabane struts:

A total of eight bracing wires were fitted at the fuselage cabane struts.

Two single bracing wires were fitted between the underside of the upper wing, inboard from the top of the forward fuselage cabane struts and fuselage decking panel, forward from the cockpit.

Two more single bracing wires were fitted between the underside of the upper wing, inboard from the top of the rear fuselage cabane struts and the sides of the fuselage decking panel, forward from the cockpit.

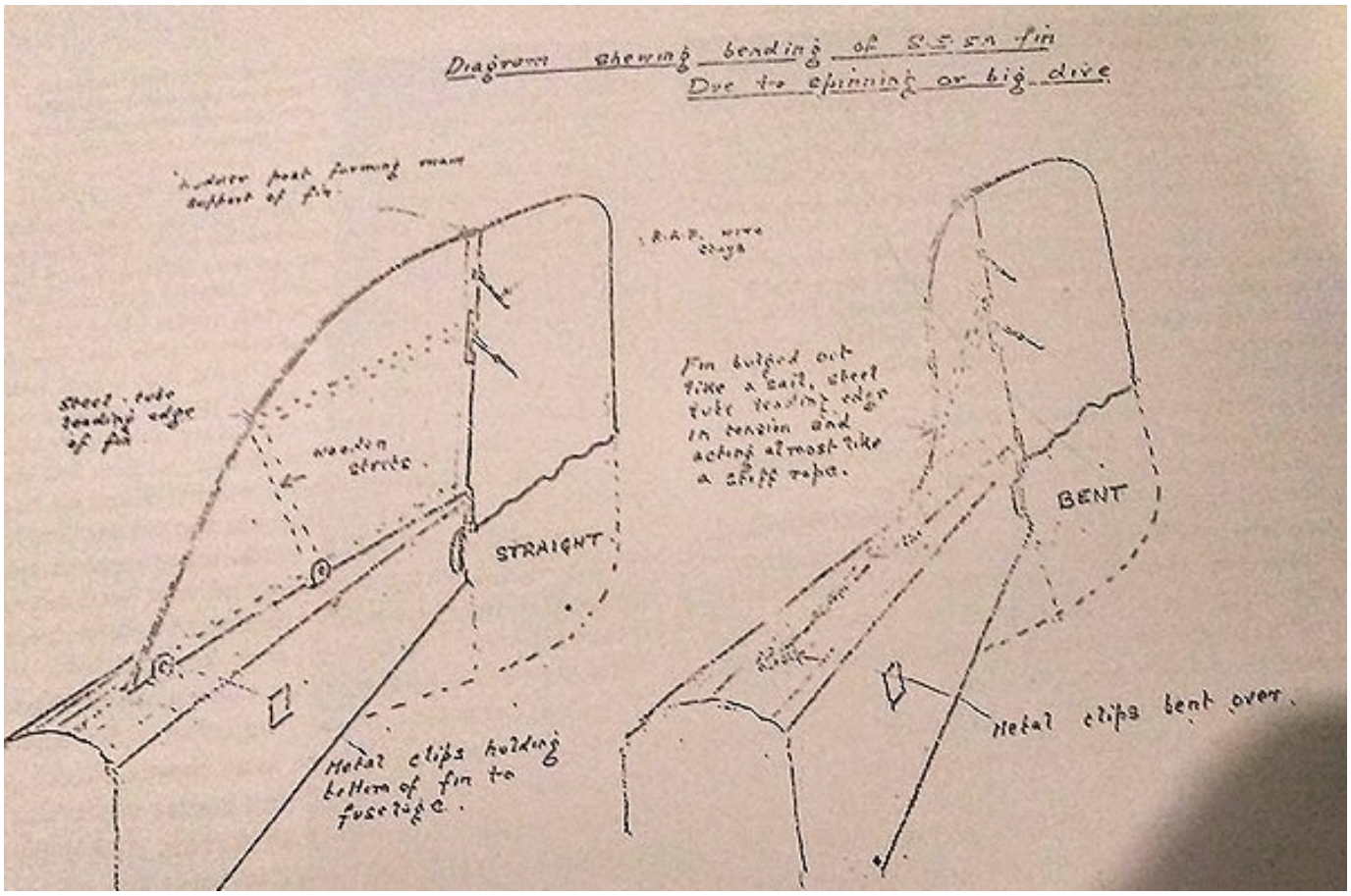
Two diagonally crossed wires were fitted between the top of the forward and rear fuselage cabane struts and the opposite bottom ends of the struts.

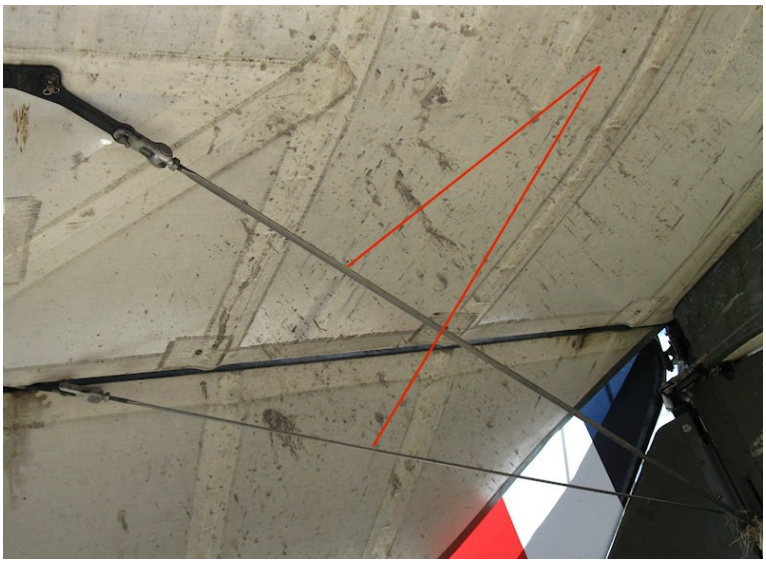
These were streamlined wires were fitted with end fittings, so had no turnbuckles.

Fin to tailplane :

Two bracing wires were fitted between the top of the trailing edge of the fin and forward from the aileron inspection windows in the tailplane.
Two more bracing wires were fitted between further down the trailing edge of the fin and the trailing edges of the tailplane.
Similar pairs of wires were also fitted between the underside of the tailplanes and the trailing edge of the tail skid keel, with the forward bracing wire attached to the bottom location in the tail skid keel.
No.56 Squadron eliminated tail/fin twist by adding an extra bracing wire between the fin leading edge and the inspection panel on the tailplane. These were streamlined wires with fitted with end fittings, so had no turnbuckles.

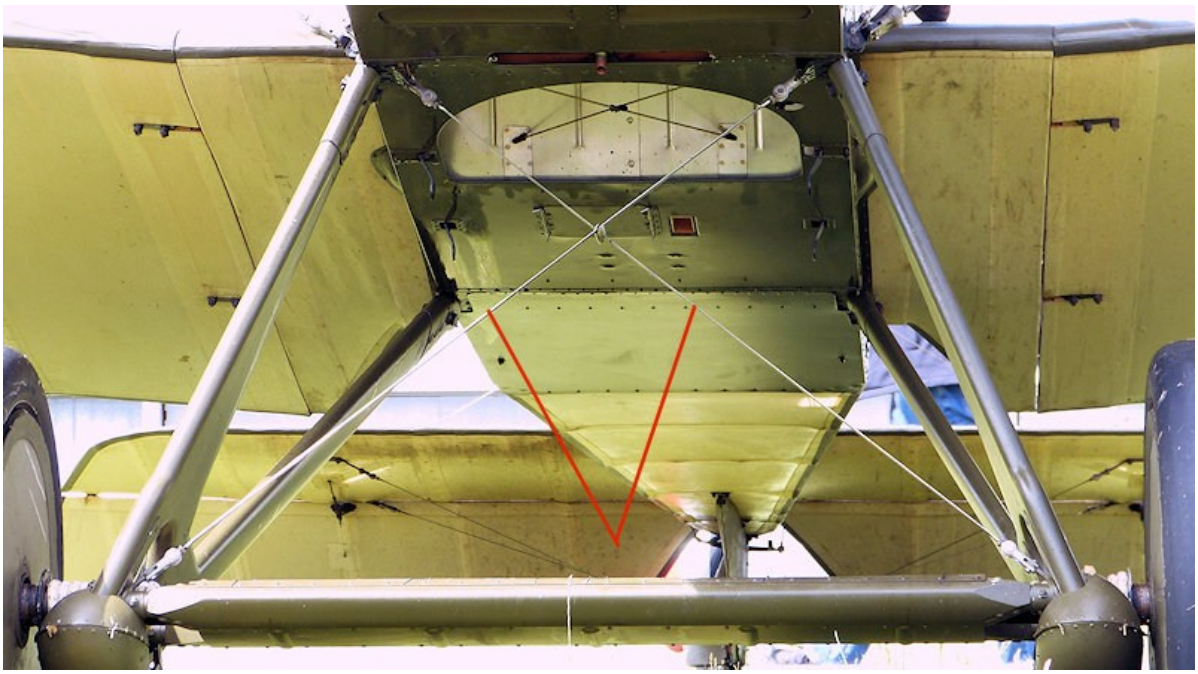
Extract from ‘High in the Empty Blue’ showing fin bowing during a spin or dive





Landing gear:

Two diagonally crossed bracing wires were fitted between the underside of the fuselage, inboard from the top of the landing gear forward struts and the forward, outer ends of the axle fairing. These were streamlined wires were fitted with end fittings, so had no turnbuckles.

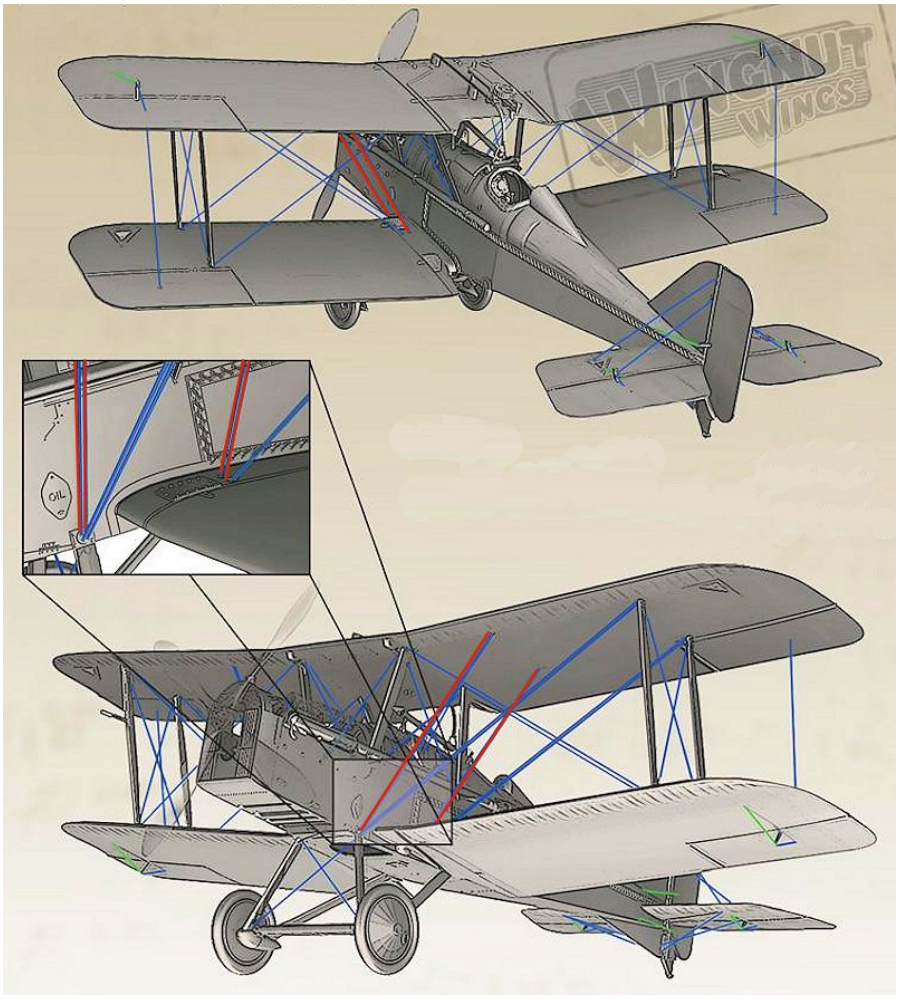


Structural wires:

NOTE: *Structural wires for the SE5a were of the streamlined, forged type (RAF wires), with end adjusters for tension adjustment. Illustrations were adapted from the 'Wingnut Wings' kit instruction manual and the photographs of the control cables are from those taken by James Fahey and can be seen on the 'Vintage Aviation Limited (TVAL)' web site: https://jamesfahey.smugmug.com/SE5a and also from the web site https://ww.thevintageaviator.co.nz/*

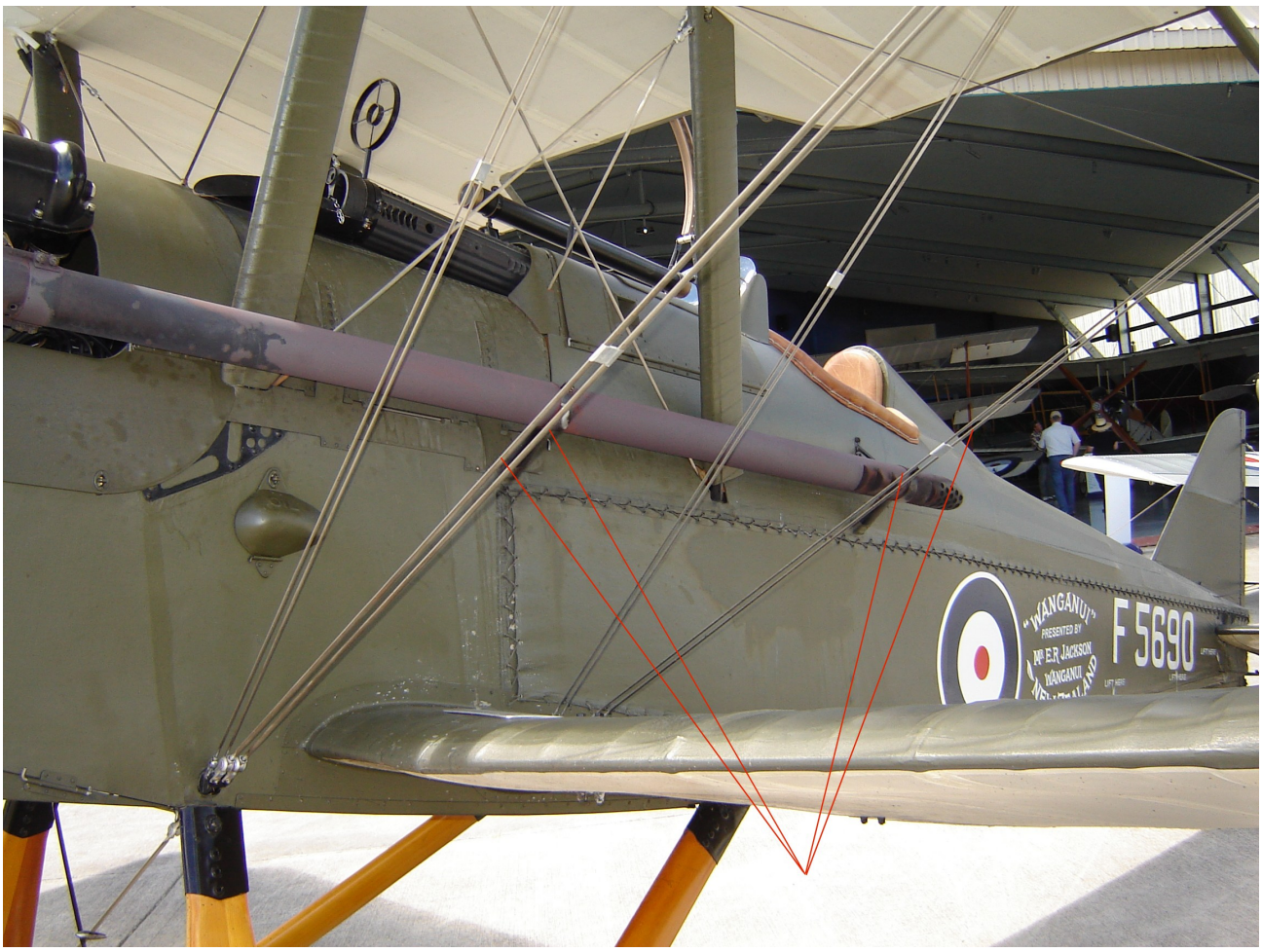
Auxiliary flying wires:

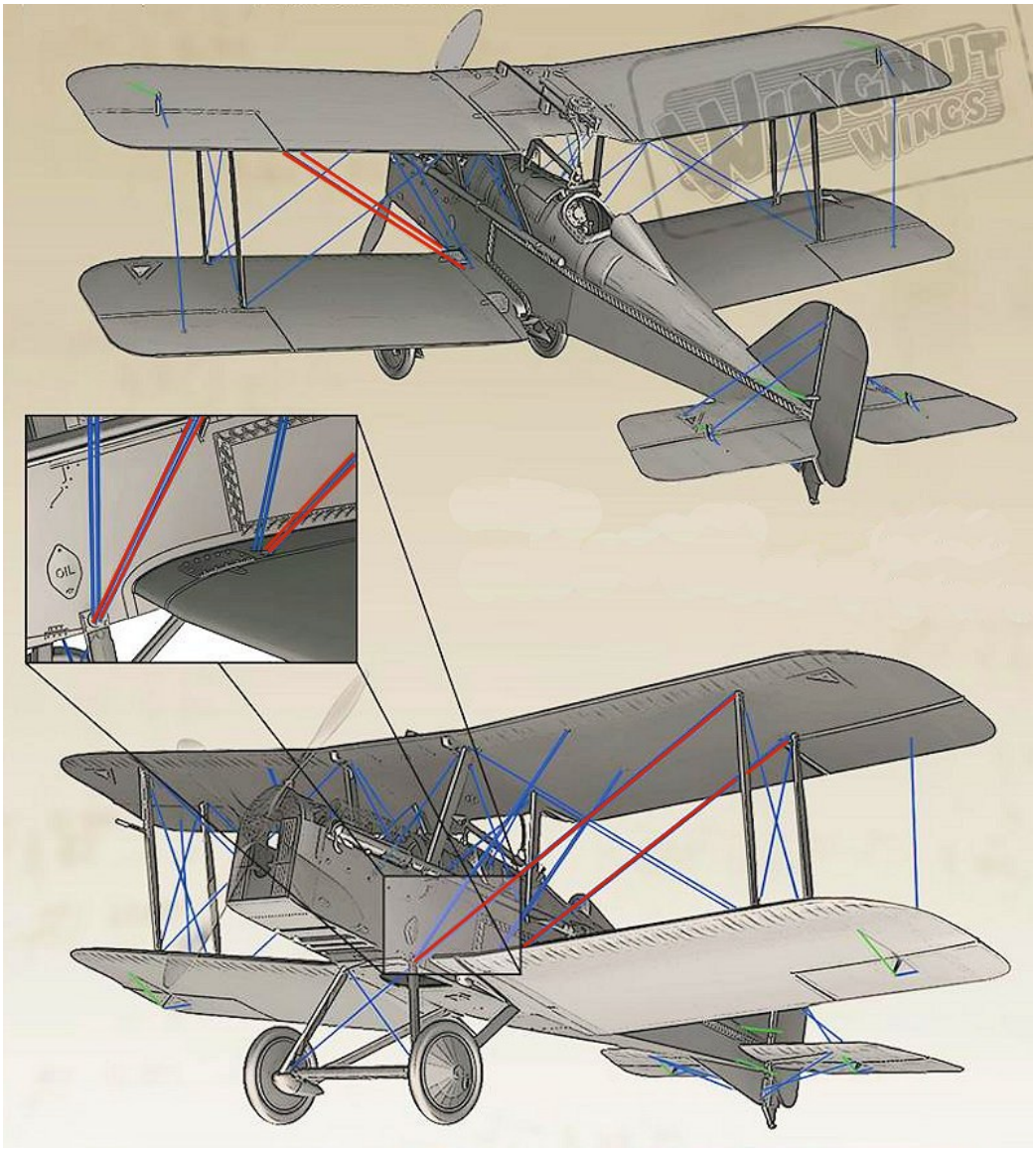
A pair of auxiliary flying wires were fitted between the top fitting on the landing gear forward struts and the underside of the upper wing, between the forward fuselage cabane and the interplane struts. A second pair of auxiliary flying wires were fitted between a recess in the lower wing root and the underside of the upper wing, between the rear fuselage cabane and the interplane struts.
These were streamlined wires fitted with end fittings, so had no turnbuckles.



Primary flying wires:

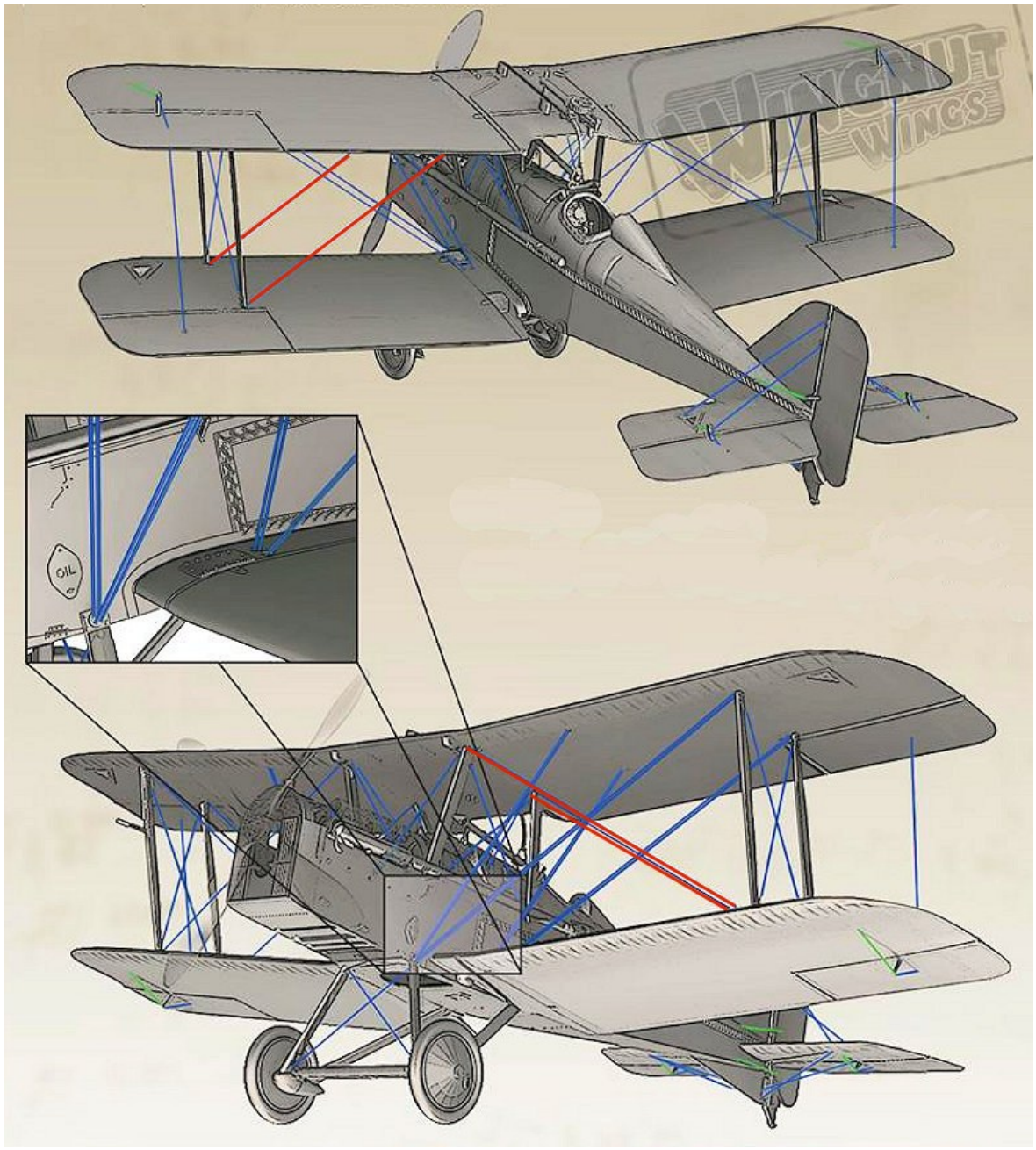
A pair of primary flying wires were fitted between the top fitting on the landing gear forward struts and the underside of the upper wing inboard from the forward interplane struts. A second pair of primary flying wires were fitted between a recess in the lower wing root and the underside of the upper wing inboard from the rear interplane struts.
These were streamlined wires fitted with end fittings, so had no turnbuckles.





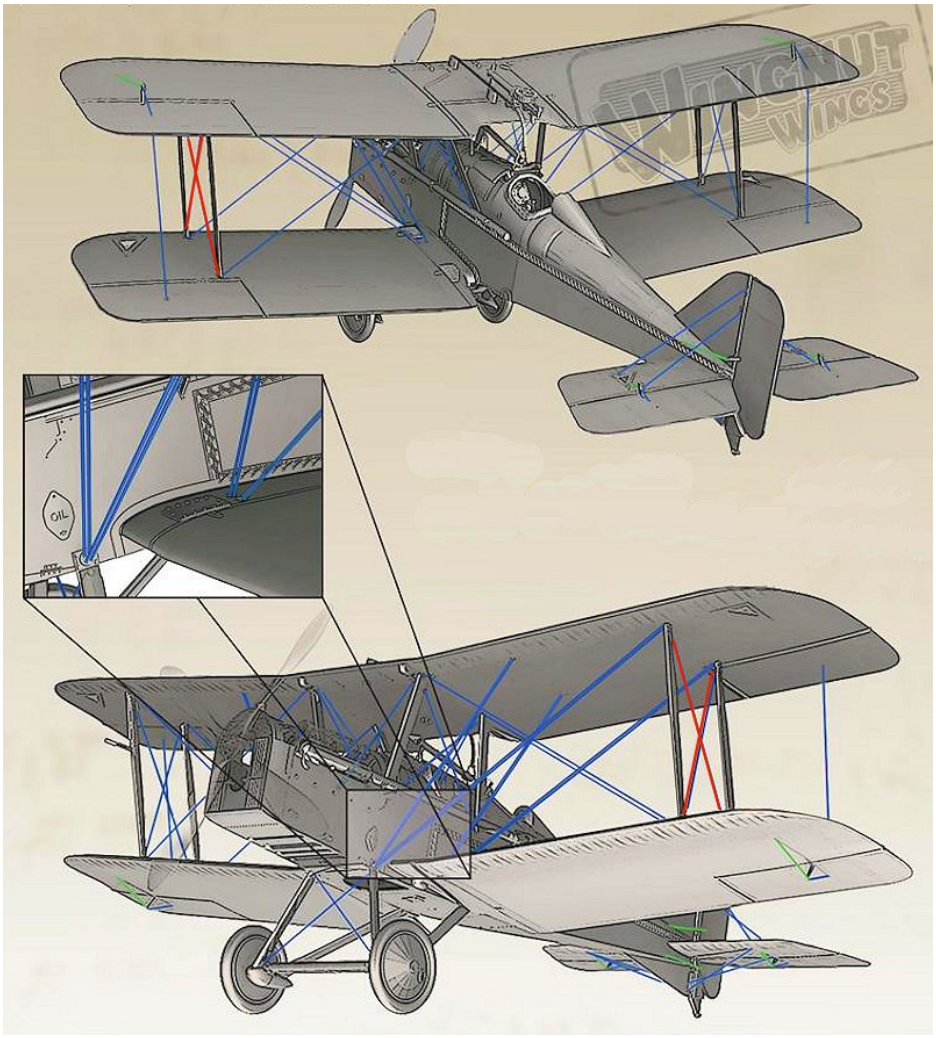
Landing wires:

A pair of landing wires were fitted between the underside of the upper wing, outboard from the top of the forward fuselage cabane struts and the top surface of the lower wings, inboard from the bottom of the forward interplane struts. A second pair of landing wires were fitted between the underside of the upper wing, outboard from the top of the rear fuselage cabane struts and the top surface of the lower wings, inboard from the bottom of the rear interplane struts.
These were streamlined wires were fitted with end fittings, so had no turnbuckles.



Incidence wires:

Diagonally crossed incidence wires were fitted between the underside of the upper wing, at the tops of the interplane struts and the top surface of the lower wings at the bottom of the interplane struts.
These were streamlined wires were fitted with end fittings, so had no turnbuckles.



RAF-WIRE LENGTHS

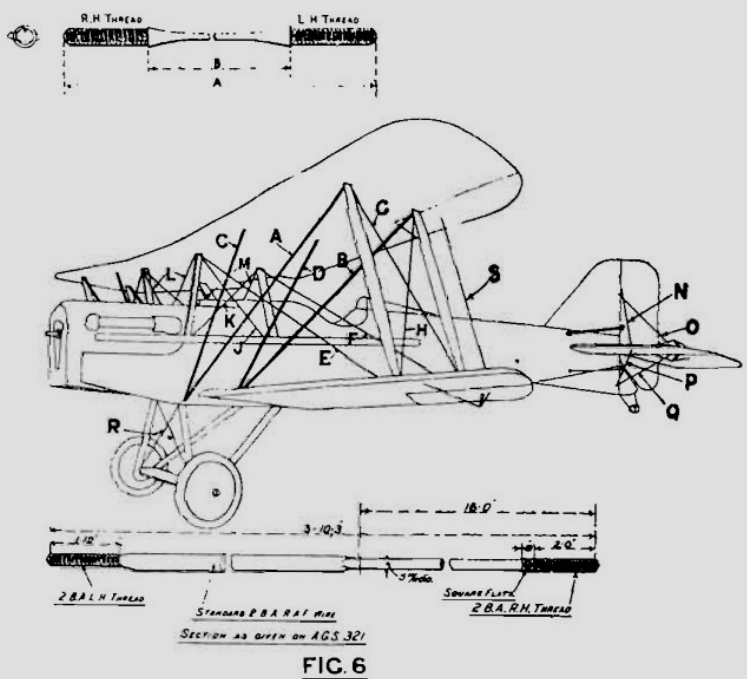
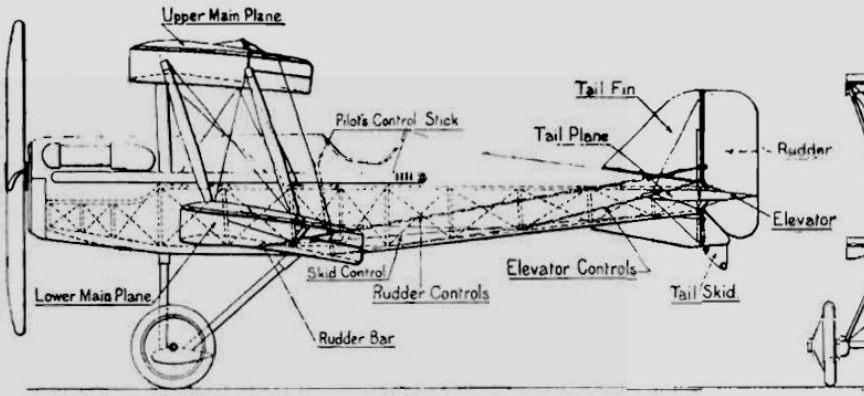


FIG. 6

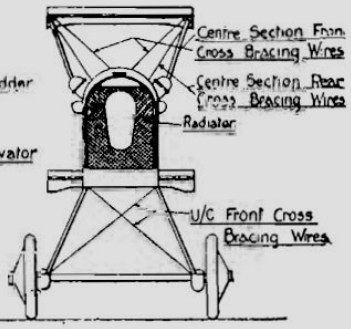
REF.	DESCRIPTION	No Off	A	B	SIZE	REMARKS
A	Front Flying Wire	4	9-2·6	8-10·2	4 BSF	
B	Rear	4	8-8·0	8-4·0	2 BA	
C	Front Auxiliary Flying Wire	4	5-10·6	5-7·4	4 "	
D	Rear	4	5-4·4	5-1·2	4 "	
E	Front Landing Wire	2	8-0"	7-8·1"	2 "	
F	Rear	2	8-0·25	7-8·35	2 "	
G	Incidence Wire (long)	2	4-11·70	4-8"	2 "	
H	" (short)	2	3-4·80	3-1·8	2 "	
J	Centre Section Side Bracing (long)	2	4-2·15	3-10·8	2 "	
K	Centre Section Side Bracing (Short)	2	3-2·9	3-0"	2 "	
L	Front Centre Section Cross Bracing	2				See Fig 6
M	Rear Centre Section Cross Bracing	2	5-0·25	4-8·9	2 B.A.	
N	Tail Plane Bracing Top Front	2	3'-10·35	3'-6·25	2 "	
O	Tail Plane Bracing Top Rear	2	3'-3·1	2'-11·2	2 "	
P	Tail Plane Bracing Bottom Front	2	2'-11·7	2'-8·2	2 "	
Q	Tail Plane Bracing Bottom Rear	2	2'-8·25	2'-4·4	2 "	
R	U/C Front Cross Bracing	2	3'-6"	3'-2·7	4 BSF	
S	Aileron Connecting Wires	2	4'-9·1	4'-5·9	4 BA	

FIG. 1.



SIDE ELEVATION

FIG. 2



FRONT ELEVATION
(LESS MAIN PLANES)

FLYING POSITION.

The Machine is in Flying Position when the Engine Bearers are level longitudinally and the Front and Rear Spar Tubes are level transversely.

TRUING UP THE FUSELAGE.

Support the Fuselage so that the Rear Spar Tube is level transversely, and the Engine Bearers level longitudinally as far as possible. By means of Side Bracing Wires, between Front and Rear Spar Tubes, adjust until the tubes are parallel and level. Mark the mid points of all Cross Struts top and bottom. Insert a steel Tube to fit without play into the Finpost. Stretch a centre line below the Fuselage from the mid point of the Rear Spar Tube to the axis of the Finpost. True up the Bottom Cross Bracing Wires until the mid points of all Bottom Cross Struts are in line with the bottom stretched centre line. Proceed in a similar manner for the Top of Fuselage. Mark points on Side Struts at equal vertical distances - 5" is a convenient distance - below the top face of the Top Longerons. Adjust the Side Bracing Wires on one Side until all marked points on Side Struts on that side are in line. Check by levelling from marked point to marked point on adjacent Side Struts using a long straightedge for this purpose and working from front to rear. Proceed in exactly the same way for the other side. Check for there being no wind in the Fuselage as follows:- Place a straightedge transversely across the Top Longerons above the Front Spar Tube. Place another straightedge transversely across the Top Longerons at any other point about 2½ from Strut Sockets. The upper edge of the second straightedge at each point checked should be in line with the upper edge of the first straightedge. Finally tension the Internal Cross Bracing Wires making corresponding diagonals equal at each section. A line dropped from the mid point of a Top Cross Strut should strike the mid point of the corresponding Bottom Cross Strut.

TRUING UP THE UNDERCARRIAGE.

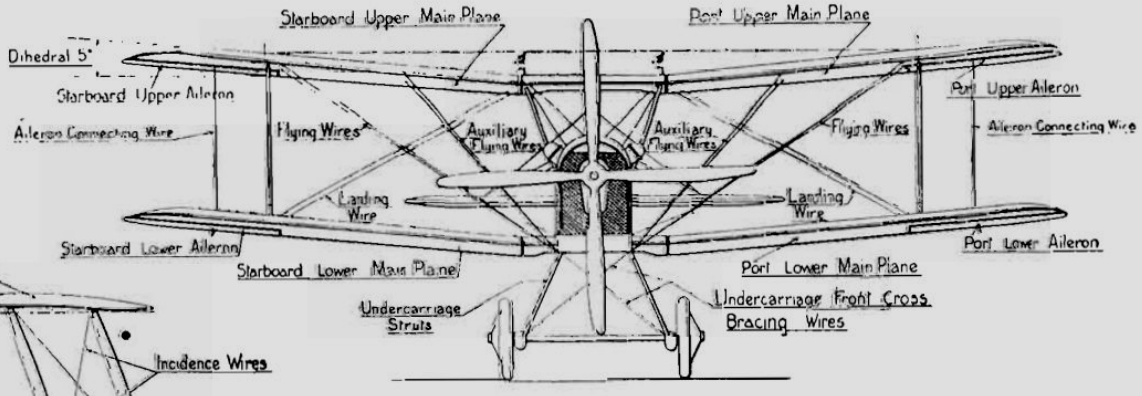
Adjust Front Cross Bracing Wires making corresponding diagonals equal and check by trammel.

TRUING UP THE CENTRE SECTION.

The Upper Centre Section Plane should be symmetrical about the vertical centre line of Machine. Adjust by Front and Rear Cross Bracing Wires. Drop plumb lines from the lateral extremities of the Front Spar. The Stagger should be 18". Adjust by Side Cross Bracing Wires and check by measuring the horizontal fore and aft distance between the plumb lines dropped from the lateral extremities of the Front Spar and the corresponding points on the lateral extremities of the Bottom Front Spar Tube.

4 Sheets
Sheet 1.

FIG. 3



FRONT ELEVATION

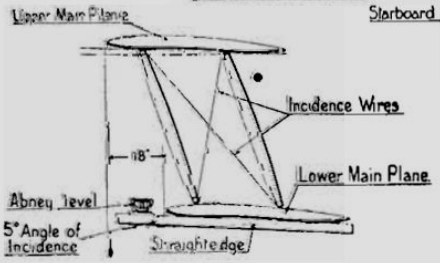


FIG. 4

TRUING UP THE MAIN PLANES

4 Sheets
Sheet 2.

DIHEDRAL.

The Dihedral is 5° for both Upper and Lower Main Planes. Adjust by Front Landing Wires and check by Abney level and straightedge along the Front Spars.

STAGGER.

The Stagger is 18" throughout. Adjust by Incidence or Stagger Wires and check by measuring the horizontal fore and aft distance between the Leading Edge of Lower Main Planes and plumb lines dropped from the Leading Edge of Upper Main Planes. This distance should be 18".

INCIDENCE.

The Incidence is 5° throughout for both Upper and Lower Main Planes. Adjust by Incidence Wires and Rear Landing and Flying Wires and check by Abney level and straightedge placing the latter from Leading Edge to Trailing Edge at Ribs.

Check for Main Planes being square with Machine by taking measurements from Top and Bottom Sockets of Front Outer Struts to Rudder Post and Propeller Boss. Corresponding measurements should be the same on both sides.

AILERONS.

With Pilot's Control Stick central the Ailerons should droop ¾"

FIG. 5

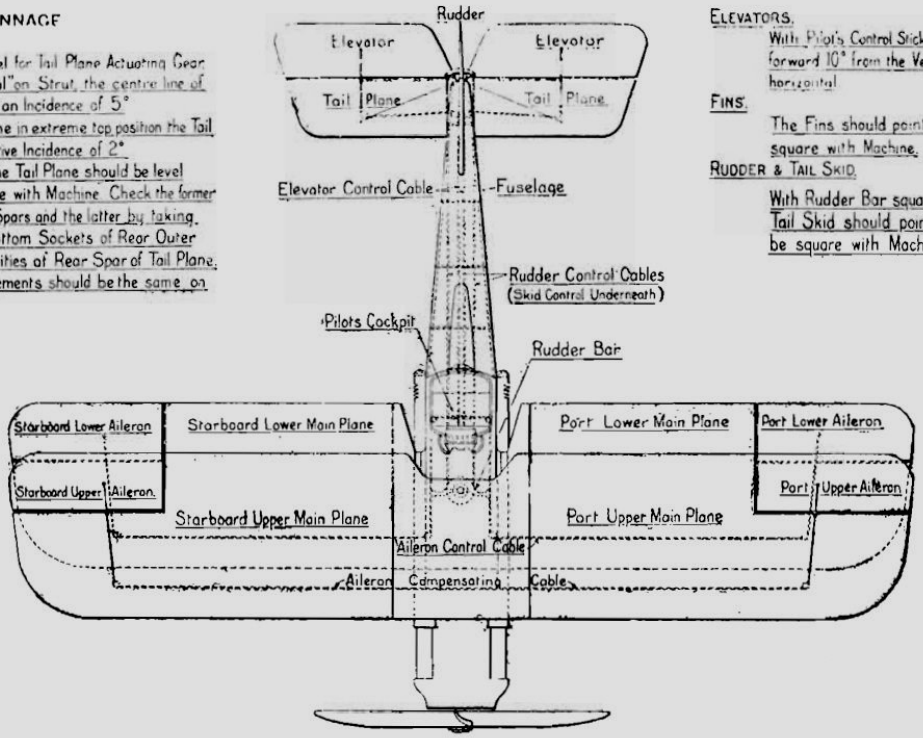
EMPENNAGE

TAIL PLANE.

With Knob of Hand Wheel for Tail Plane Actuating Gear opposite the word "Normal" on Strut, the centre line of Tail Plane should be at an Incidence of 5°.

With Rear End of Tail Plane in extreme top position the Tail Plane should have a negative Incidence of 2°.

The Tail Plane should be level transversely and square with Machine. Check the former by spirit level over the Spars and the latter by taking measurements from Bottom Sockets of Rear Outer Struts to lateral extremities of Rear Spar of Tail Plane. Corresponding measurements should be the same on both sides.



ELEVATORS.

With Pilot's Control Stick neutral transversely but leaning forward 10° from the Vertical the Elevators should be horizontal

FINS.

The Fins should point directly fore and aft and be square with Machine.

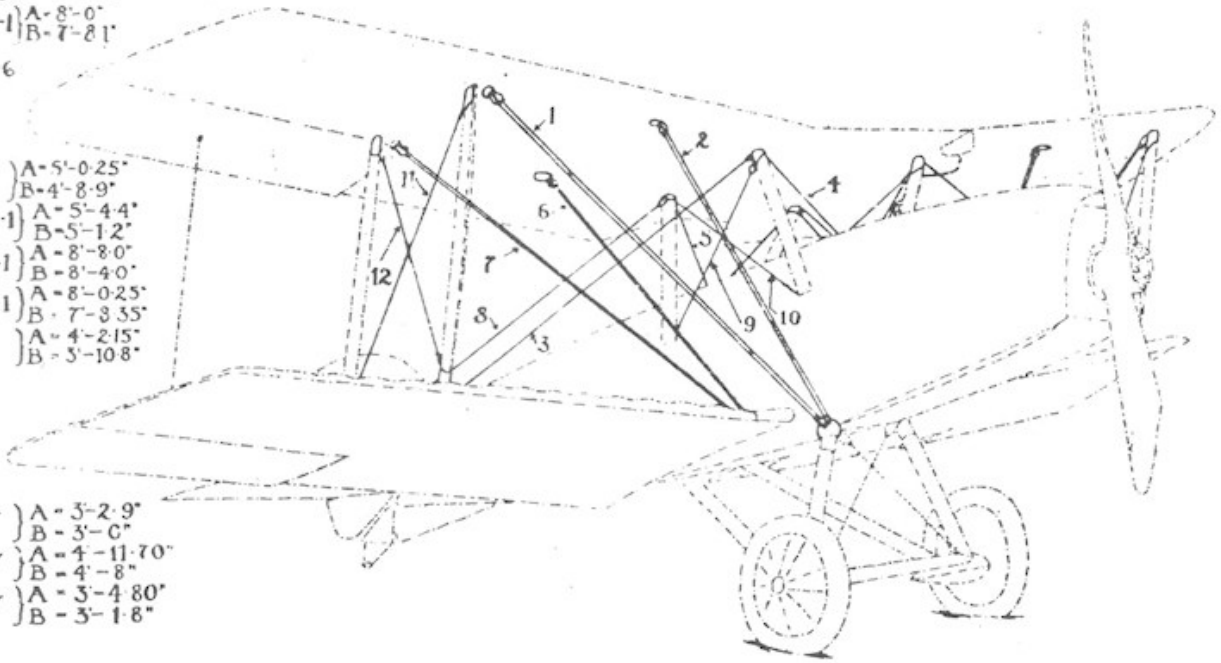
RUDDER & TAIL SKID.

With Rudder Bar square in Fuselage the Rudder and Tail Skid should point directly fore and aft and be square with Machine.

4 Sheets. Sheet 3.

PLATE 1139

1-AGS.348 A-9'-2·6" B-8'-10·2"
2-AGS.346 A-5'-10·6" B-5'-7·4"
3-AGS.347-1 A-8'-0" B-7'-8·1"
4-A 10276-6



5-AGS.347 A-5'-0·25" B-4'-8·9"
6-AGS.346-1 A-5'-4·4" B-5'-1·2"
7-AGS.347-1 A-8'-8·0" B-8'-4·0"
8-AGS.347-1 A-8'-0·25" B-7'-8·35"
9-AGS.347 A-4'-2·15" B-3'-10·8"
10-AGS.347 A-3'-2·9" B-3'-6"
11-AGS.347 A-4'-11·70" B-4'-8"
12-AGS.347 A-3'-4·80" B-3'-1·8"

ARRANGEMENT OF STREAMLINE WIRES

PART 7
ENGINE

PART 7 - ENGINE

References:
The SE5 File - (Ray Sturtivant and Gordon Page).
RAF SE5a Windsock Data File Special - (JM Bruce).

NOTE: *The Wolseley Viper engine was a modified and improved version of the Hispano-Suiza (Hisso) 8. The Wolseley Viper was a direct-drive 200 hp engine, whereas the original Hispano-Suiza 8 had some issues, particularly with its geared drive. Wolseley addressed these issues and also increased the compression ratio in their Viper engine.*

The original 'Hisso' was a 150hp engine, later upgraded to 200hp with a geared reduction drive, which proved troublesome. Wolseley modified the 'Hisso' engine, known as the 'Viper' engine, which had improved reliability and an increased compression ratio of 5.3.1. It was designed with a propeller direct drive instead of the geared drive of the 'Hisso' engine.

Although the two engine design were similar, modifications were necessary to the SE5a to allow the 'Viper' engine to be installed. The external differences were primarily:

The propeller on its drive shaft was lower than the 'Hisso' versions, due to the lack of the geared reduction drive on the engine.

Modified engine upper access panel.

Modified under fuselage louvred panel.

Different radiator.

The following modifications are necessary on the 'Wingnut Wings' supplied 'Hisso' engine to allow the fitting of the 'Viper' conversion set. 'Roden' supply a SE5a model kit which has the 'Viper' engine and also supply the engine as a separate kit. However, that engine is larger than the 'Wingnut Wings' Hisso' and therefore it's better to convert the kit supplied engine.

The engine is to displayed enclosed within the fuselage. Therefore some parts will not be required as they will not be visible on the completed model or may interfere with the fit of the modified engine.

Preparation:

Cement the two halves of the engine sump (E3 and E8) together.

Cement the two halves of the engine crankcase (E10 and E13) together.

Cement the crankcase assembly onto the sump assembly.

Using a fine saw, carefully cut away the propeller geared drive from the front of the engine.

File or sand flat the cut surfaces on the front of the engine assembly and the removed gear drive.

Cement the geared drive onto the front of the engine, but upside down, so that the propeller shaft is at the bottom.

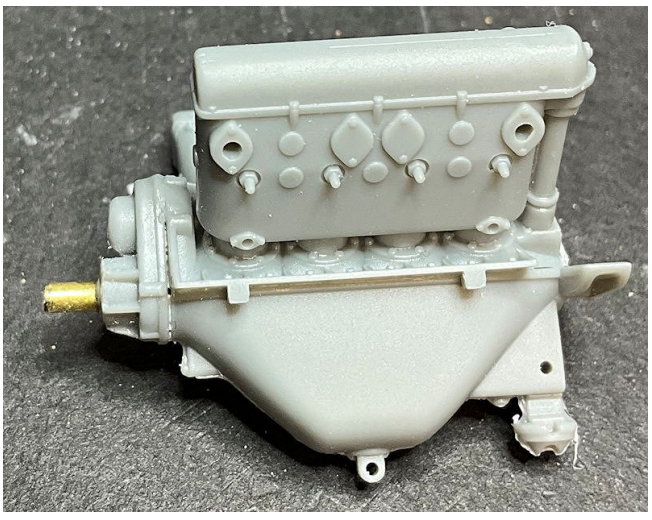
Cut away the propeller shaft from the geared drive housing.

Point mark the centre of the original propeller shaft on the geared drive housing.

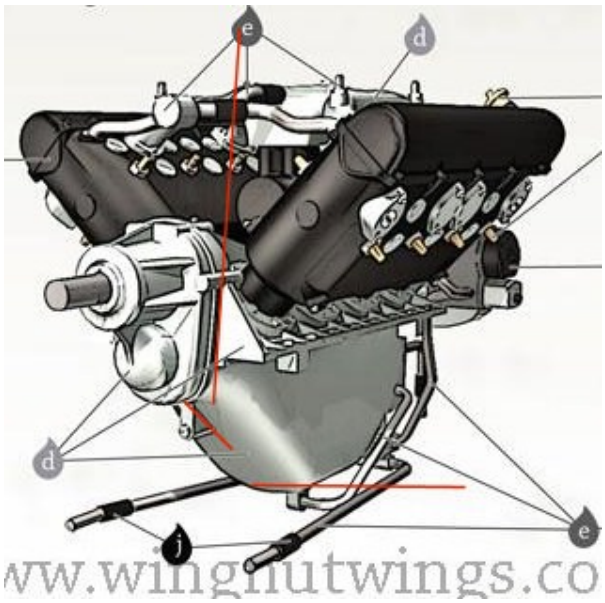
Using the point mark as a guide, drill a hole of 1.8 mm diameter into the geared drive housing.

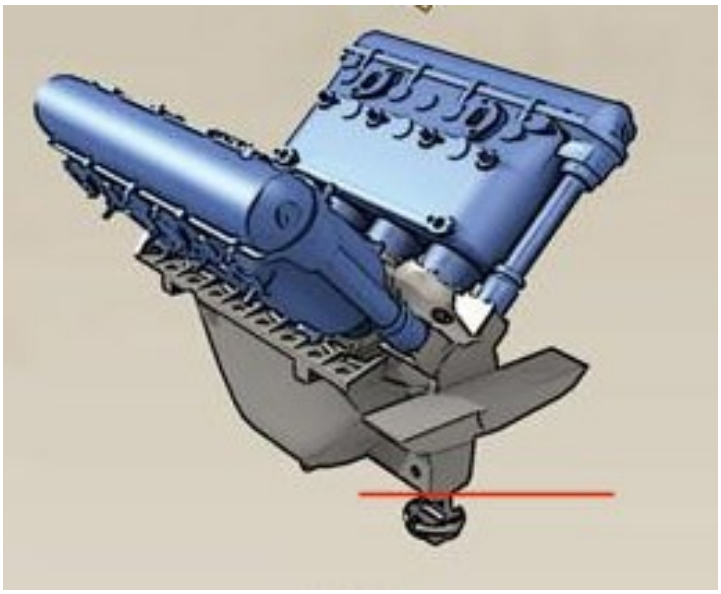
Cut a length of 1.8 mm diameter Brass tube, such as 'Albion Alloy's' MBT18 or similar, such that when fully inserted into the pre-drilled hole, approximately 5 mm of tube is left protruding.

Using thin CA adhesive, secure the tube fully into the pre-drilled hole.



Cut away the oil pump from the bottom rear of the sump, the bottom pipe connection and the triangular pipe connection at the bottom front of the sump.





To allow the engine to be positioned more forwards on the engine bearers and not be obstructed by the radiator housing:

File away the pre-molded ‘bulge’ below the propeller shaft.

File away the reinforcing webs around the propeller shaft housing.

Cut away the four locating stubs on the underside of the sides of the crankcase.

Cut two strips of 0.4 mm thick plastic card wide enough to allow approximately 2 mm to protrude from the sides of the crankcase.

Using thin CA adhesive, secure them to the underside of the sides of the crankcase. This will allow the engine to be position forwards and more easily on the fuselage engine bearers.

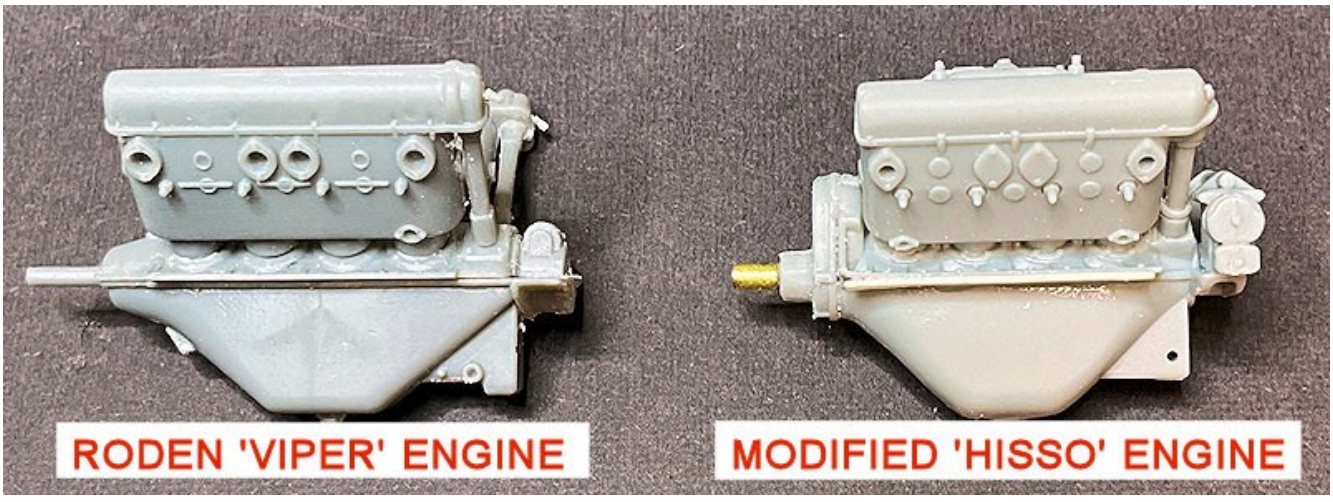
Cement the magneto (x2) assembly (E6) onto its locating shoulder at the rear of the engine.

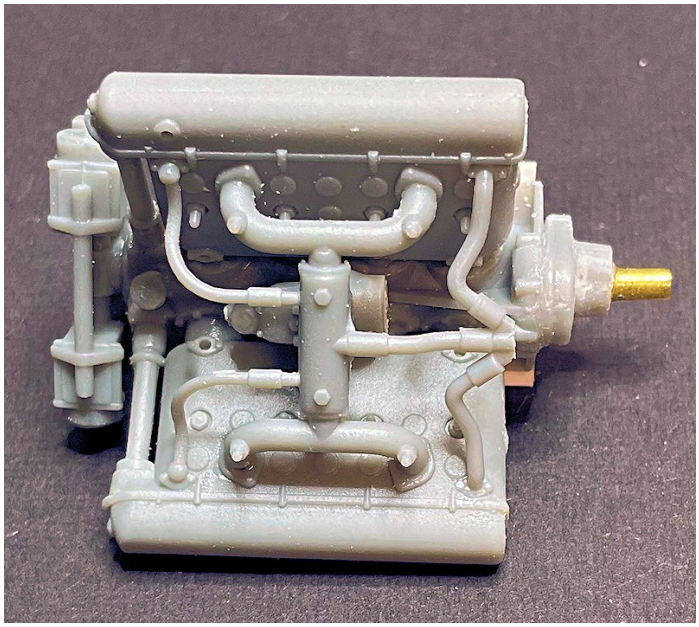
Drill a hole of 2.5 mm diameter centrally into the face of the carburettor air intake (E15).

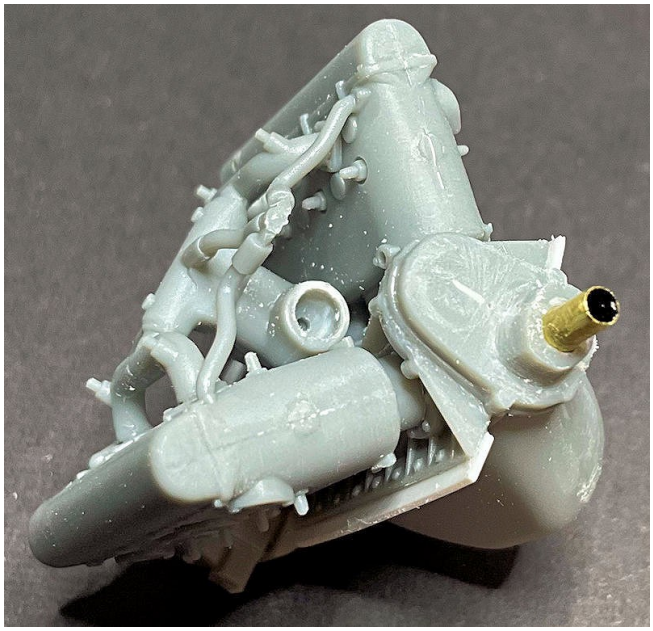
Cement the carburettor air intake (E15) into its locating recess in the centre, underside of the induction manifold (E2).

Cement the induction manifold (E2) into its locating recesses on the top, inner sides of the cylinder banks.

Cement the four pipes of the induction manifold (E2) onto their locating faces on top, inner sides of the cylinder banks.







NOTE: *Before continuing with the engine build, go to Part 10 (Fuselage) for test fitting of the modified engine.*

Painting:

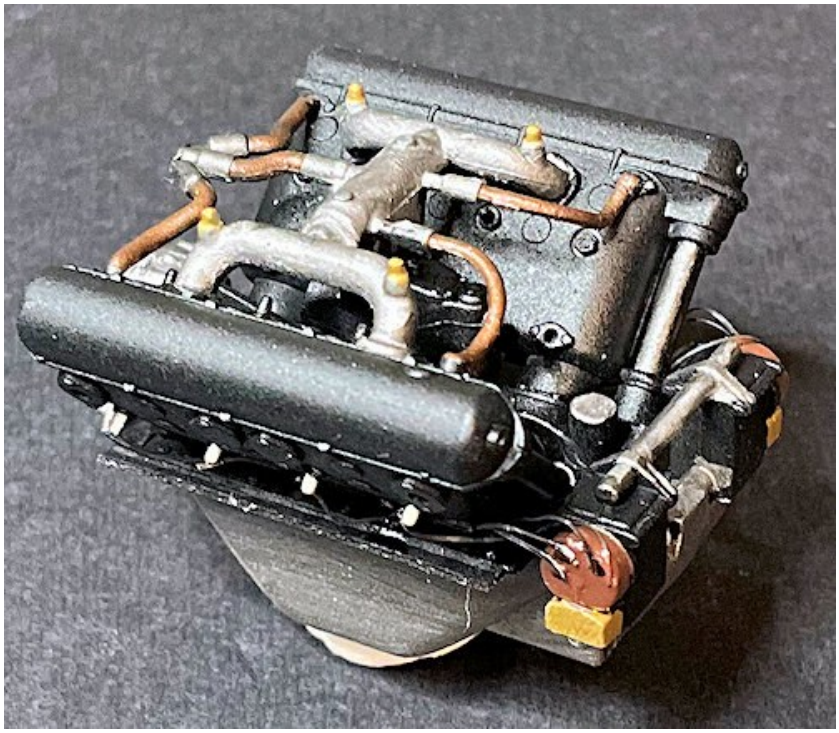
NOTE: *Most of the engine will not be visible in the completed model as the engine top access panel will be fitted. As such the engine was painted, basically following page 13 (step 15) in the 'Wingnut Wings' instruction manual. Supplied engine pipes E1, A59 and E16 were not used as they will not be visible.*

Modifications:

Spark plug leads:

Basic spark plug ignition leads were made by cutting lengths of 'EZ' stretch line (Fine) and using thin CA adhesive, securing the ends to the tops of the spark plugs then threading the other ends to the magneto cover plates.

NOTE: *This is a basically painted/detailed engine, as most of it will not be seen on the completed model.*



Engine exhaust pipes:

NOTE: *The two engine exhaust pipes (A1, A2) are molded with solid exhaust louvres and holes at their rear ends. To improve accuracy of the exhaust pipes, I chose to 'open up' the louvres and holes.*

Point mark the exhaust pipes at the centres of the holes and vents.

Using the point marks as guides, drill holes into, **but not through**, the rear of the exhaust pipes, using a 0.5 mm diameter drill.

Using the point marks as guides, drill holes at an angle into, **but not through**, the vents of the exhaust pipes, using a 0.6 mm diameter drill.

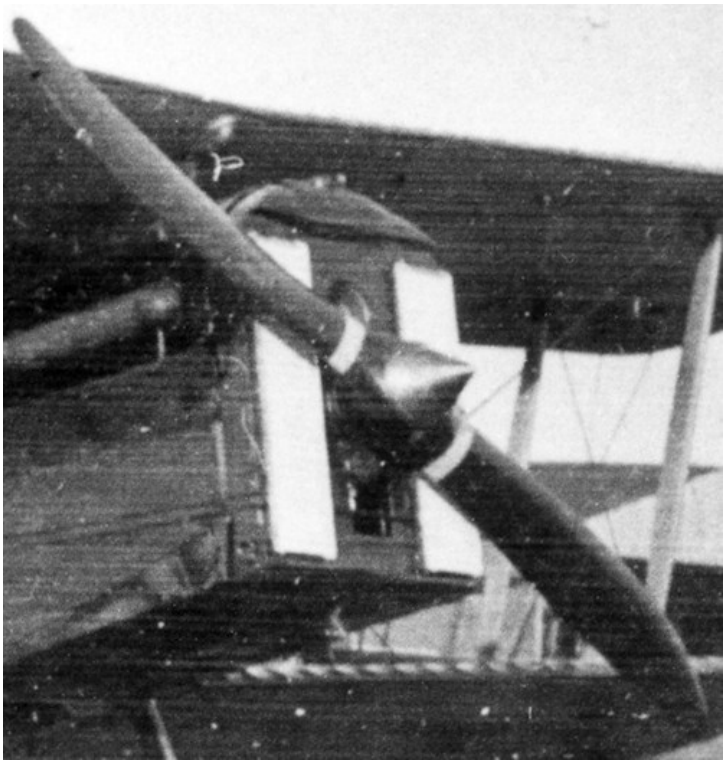
Carefully chamfer the sides of the vent holes to create louvered edges.

PART 8
PROPELLER

PART 8 - PROPELLER

References:
The SE5 File - (Ray Sturtivant and Gordon Page).
RAF SE5a Windsock Data File Special - (JM Bruce).
Osprey Publications No.56 Sqn (RFC/RAF) - (Alex Revell).

NOTE:
The kit supplied propeller was not used and replaced with a 'Proper Plane' wood laminated propeller (WP-055) for the SE5a fighter with the Wolseley 'Viper' engine fitted. The propeller spinner was taken from the 'Roden' SE5a kit (Ro 607).



Painting:

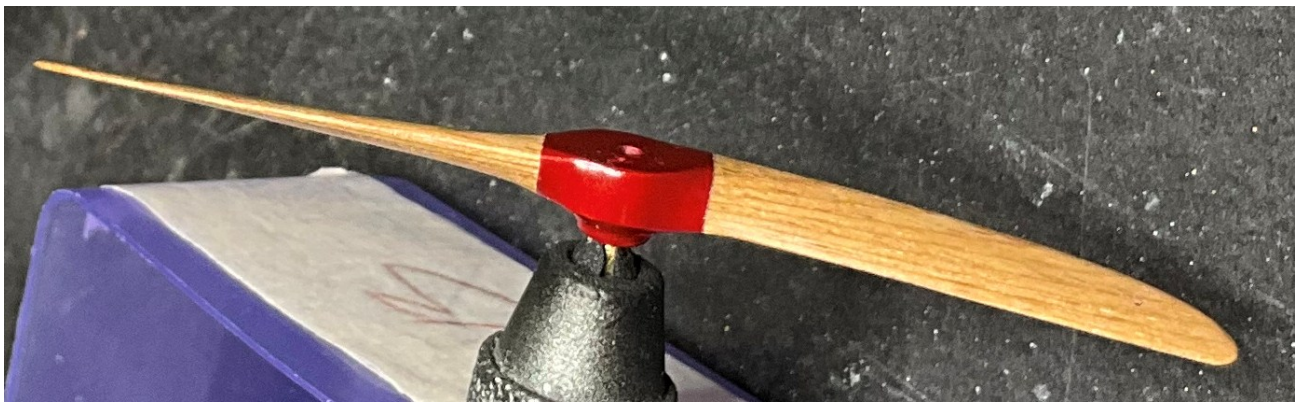
Propeller:

Mask off the propeller blades to leave its central boss exposed to the outer edge of the white bands.

Airbrush the exposed central boss of the propeller and the propeller spinner from the 'Roden' kit with a black primer, such as 'Mr. Surfacer' 1500 or similar.

Airbrush the exposed central boss of the propeller with a mix of 'Tamiya' Red (XF7) with Rubber Black (XF85) to a ratio of approximately 60/40%.

Remove the masking.



Spinner:

Airbrush the propeller spinner with a gloss black, such as ‘Tamiya’ Gloss Black (X1) or similar.

Airbrush the spinner with ’Alclad’ Steel (ALC-112) or similar.

Decals:

Cut two lengths of size 7 ‘Xtradecal’ Parallel Stripes (White XPS2) long enough to be applied around the propeller blades at the outer edges of the painted central boss.

Apply the decal stripes around the propeller blades, making sure the ends join at the rear edge or the rear of the blades (so can’t be seen from the front of the propeller).

Assembly:

Using thin CA adhesive, secure the propeller spinner centrally onto the front of the propeller boss.

Finish:

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

Using ‘Tamiya’ Weathering Master set A (Mud), lightly sponge along the leading edge of the propeller blades.

PART 9
WEAPONS

PART 9 - WEAPONS

References:
The SE5 File - (Ray Sturtivant and Gordon Page).
RAF SE5a Windsock Data File Special - (JM Bruce).

NOTE: *The Wolseley Viper SE5a was armed with a fuselage Vickers machine gun and an upper wing mounted Lewis machine gun.*

Vickers machine gun:

Preparation:

Remove the Vickers machine gun (A67) from its mold gate.

Clean away any mold seam lines and residual gate tags from the machine gun.

Remove the gun site (P4), cocking lever (P5) and jacket plate (P7) from the kit supplied photo-etch sheet.

Cut away any residual tags from the edges of the parts.

Assembly:

Using thin CA adhesive, secure the cocking lever in position on the rear, right side of the weapons breach block.

Using thin CA adhesive, secure the jacket plate to the front of the cooling jacket of the machine gun.

NOTE: *The gun site is intended to be folded around the cooling jacket of the machine gun. However, this is not easy to achieve. Therefore, I chose to replace the retaining strap with a masking tape strip.*

Cut away the retaining strap from the gun sight.

Drill a hole of 0.4 mm diameter into the top of the cooling jacket and aligned to the molded fore-sight.

Using thin CA adhesive, secure the 'leg' of the gun sight into the hole, making sure the sight is at 90 degrees to the cooling jacket and centrally aligned to the molded fore-site.

Cut a thin strip of 'Tamiya' or similar masking tape.

Secure the strip onto the cooling jacket and at the base of the gun sight.

Wrap the strip around the cooling jacket and against the opposite base side of the gun sight and cut.

Use a wood tooth pick or similar to press the tape into the grooves around the cooling jacket.

Painting:

Airbrush the machine gun with a black primer, such as 'Mr. Surfacer 1500 or similar.

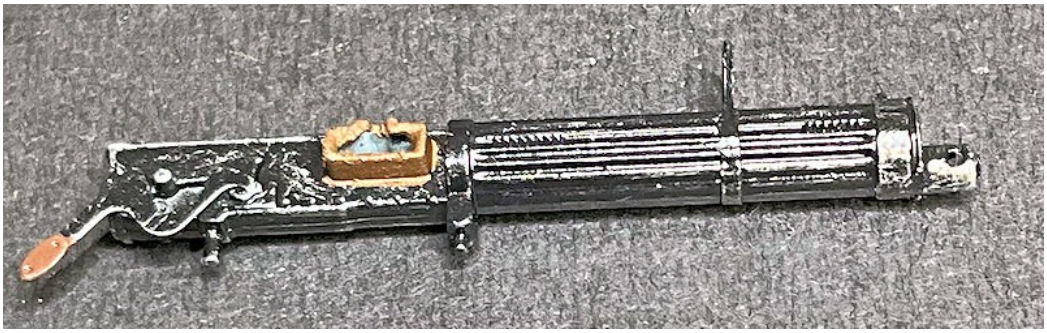
Airbrush the machine gun with 'Alclad' Gun Metal (ALC120) or similar.

NOTE: *Dry brush by using a domed and soft brush, which has been dipped in the paint. Dab the brush on an absorbent paper to remove the liquid paint, leaving paint pigment on the brush.*

Dry brush the machine gun with 'Mr. Color' Super Iron 2 (203) or similar, to create a worn surface.

Brush paint the handle of the cocking lever with 'Tamiya' Hull Red (XF9) or similar.

Brush paint the ammunition intake with 'Mr. Color' Bronze (215) or similar.



Lewis machine gun:

NOTE: *The Lewis machine gun will be fitted to it's mounting rail later in this build.*

Preparation:

Remove the Lewis machine gun , ammunition drum and mounting rail (A67) from its mold gate.

Clean away any mold seam lines and residual gate tags from the machine gun.

Painting:

Airbrush the Lewis machine gun and ammunition drum (A18, A22) with 'Tamiya' Gloss Black (X1) or similar.

Airbrush the Lewis machine gun and ammunition drum with 'Alclad' Gun Metal (ALC120) or similar.

NOTE: *Dry brush by using a domed and soft brush, which has been dipped in the paint. Dab the brush on an absorbent paper to remove the liquid paint, leaving paint pigment on the brush.*

Dry brush the machine gun and ammunition drum with 'Mr. Color' Super Iron 2 (203) or similar, to create a worn surface.

Airbrush the following with a mix of 'MRP' Acrylic Lacquer Khaki Green No.3/63 (MRP-333), Dark Green (MRP-110) and Dark Wood (MRP-262) to a ratio of approximately 40/40/20%.

Brush paint the curved rail of the mounting rail with 'Mr. Metal Color' Brass (219) or similar.

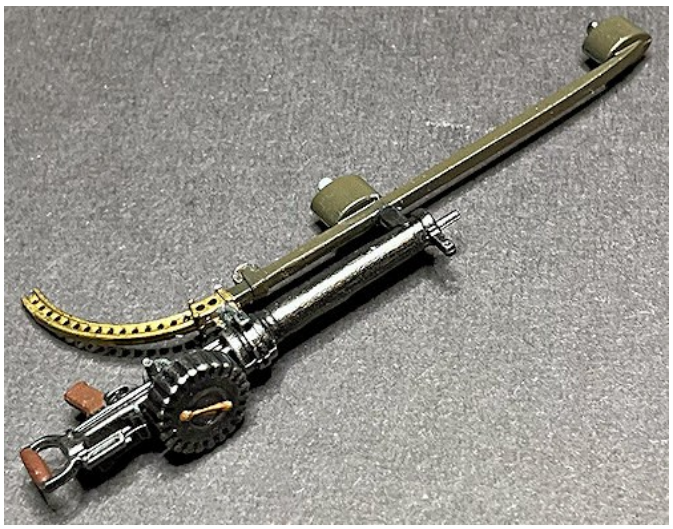
Brush paint the hand grips of the Lewis machine gun with 'Tamiya' Hull Red (XF9) or similar.

Brush the grip on the ammunition drum with 'AK Interactive' Brown Leather (AK3031) or similar.

Assembly:

Cement the ammunition drum onto its locating peg on the machine gun, making sure it's horizontal to the machine gun.

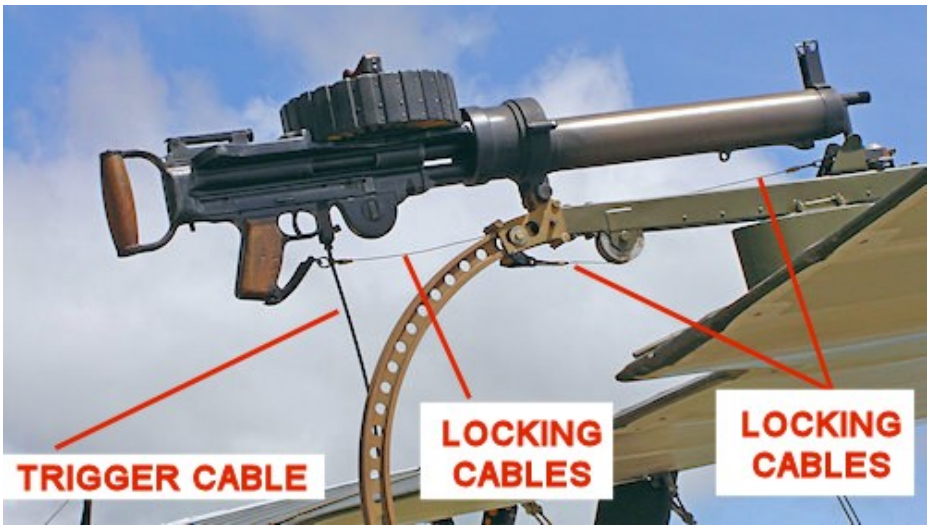
Cement the machine gun onto its locating forward shoulder and rear recesses on the mounting rail. Make sure it's aligned vertically on the mounting rail.



Modifications:

Gun control cables:

NOTE: *The wing mounted Lewis machine gun fired by a cable attached to the trigger and was operated from the trigger on the pilots control column. The weapon was manually pulled along and down to the cockpit by the pilot compressing the locking lever to release the weapon for reloading or firing upwards. When pushed back up into position, the locking mechanism held the weapon in place. The Vickers machine gun was fired by operating the gun button on the top of the pilots control column.*



Cut three long lengths of ‘EZ’ stretch line (black fine).

Drill a hole of 0.3 mm diameter centrally through the forward gun mount.

Pass a length on the ‘EZ’ line through the hole to the bottom of the hand grip.

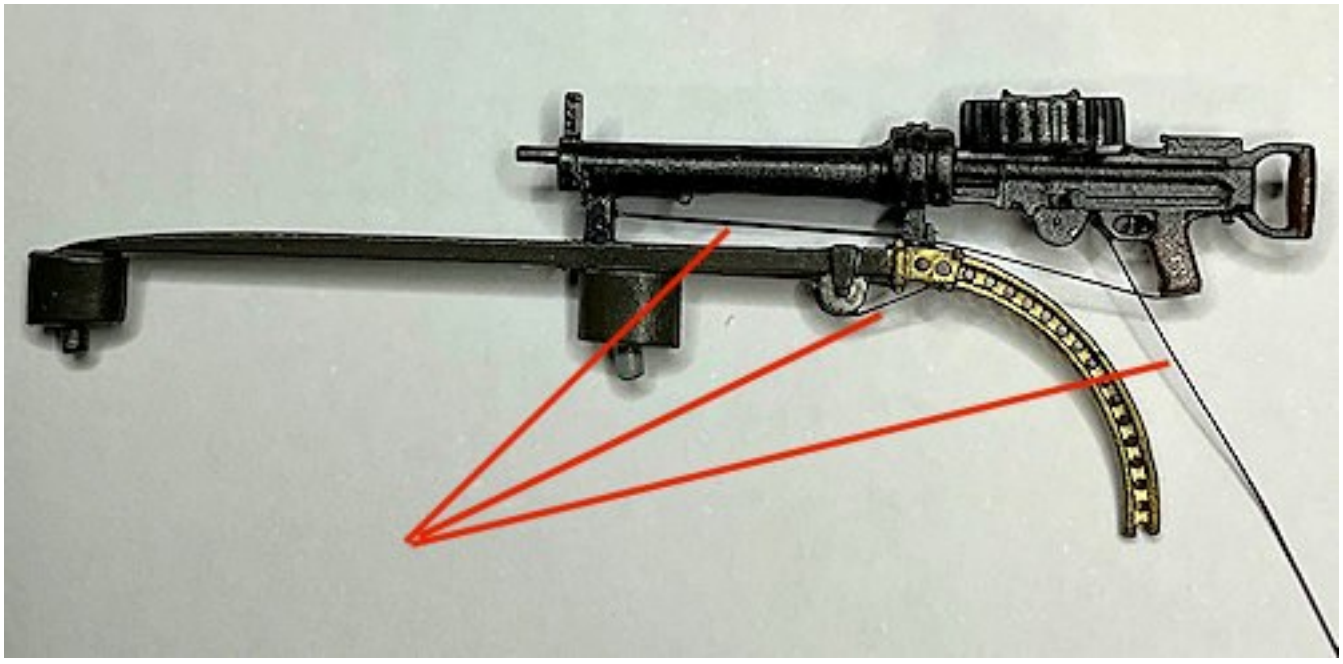
Using thin CA adhesive, secure the line to the bottom of the hand grip.

Tension the line and using thin CA adhesive, secure the line into the pre-drilled hole in the forward gun mount.

Cut away any residual line at the front of the gun mount and bottom, rear of the hand grip.

Using thin CA adhesive, secure one end of the second line to the front edge of the trigger guard.

Using thin CA adhesive, secure the third line around the pulley and on to the underside of the gun rail.



PART 10
CONSTRUCTION

PART 10 - CONSTRUCTION

References:
Online resources.
The SE5 File - (Ray Sturtivant and Gordon Page).
RAF SE5a Windsock Data File Special - (JM Bruce).
RAF SE5 Windsock Data File No.30 - (JM Bruce).
Osprey Publications No.56 Sqn (RFC/RAF) - (Alex Revell).
Wingnut Wings SE5a 'Hisso' - Instruction manual (Kit No: 32003).

Preparation:

General:

NOTE: *The aircraft being modelled is A 'Viper' powered aircraft, Serial No: C1194. The kit is a Hispano-Suiza (Hisso)' model and does not have specific parts/decals for the 'Viper' version. Therefore I chose to follow kit scheme 'C' for any kit parts used, as that scheme serial number C'1057 is closest to C.1194.*

Remove the following parts from their mold gates:

Lower wing (B3).
Pilots seat (A32).
Seat cushion (A35).
Cockpit floor panel (A40).
Flare pistol case (A3).
Control column (A66).
Aileron control quadrant (A17).
Lewis ammunition drum case (A9).
Fuselage halves (D6 and D8).
Fuselage panels (A68, A72 and D9).
Rear gun sight (A20).
Vent louvre (photo-etch P6).
Bulkhead (A45).
Engine support frames (A36 and A47).
Trim wheel (A74).
Oil tank (A10, A58 and A73).
Instrument board (A46).
Instrument panel (A25).
Compass (A14).
Grease pump (A41).
Bulkhead (A38).
Rudder bar (A6).
NOTE: *The ammunition container is mis-identified as part D57.*
Ammunition container (A57).

Cut away the gate sprue from the opening in the lower wing.

NOTE: *The following step is required as the aircraft model being built did not have the head rest fitted.*

Cut away the two locating pegs for the pilots head rest fairing, from the top of the fuselage right half (D6).

File, scrape or sand away any residual 'gate' tags from the edges of the parts.

Test fit each part to make sure the parts fully locate and align correctly.

Cement the fuel tank halves (A10, A58) together.

Cement the filler spout (A73) into its locating recess in the top of the fuel tank assembly.

Cement the pilots seat (A32) onto the cockpit floor panel (A40).

Cement the seat cushion (A35) onto the pilots seat.

Cement the flare pistol case (5) onto the cockpit floor panel.

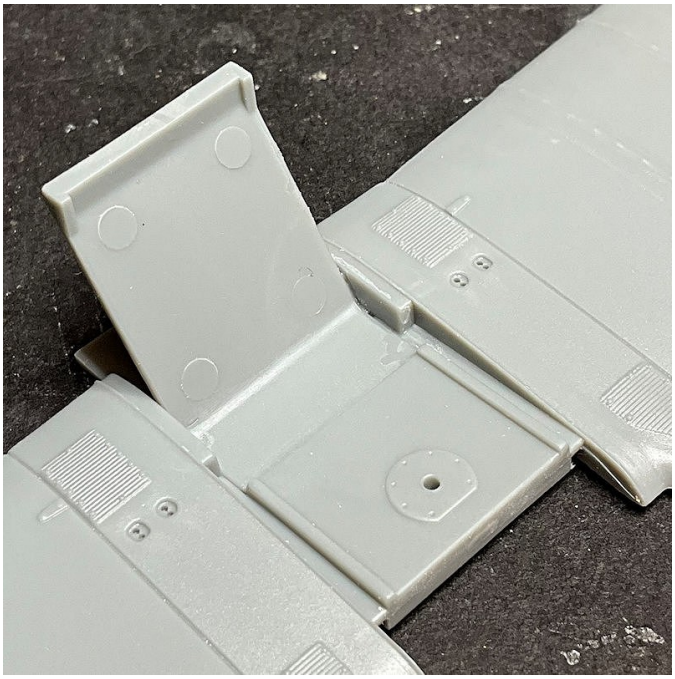
Cement the instrument panel (A25) onto the instrument board (A46).

Cement the Lewis ammunition drum case (A9) onto the instrument panel.

Cement the bulkhead (A38) in position on the centre section of the lower wing.

Cement the rear gun sight (A20) into its locating hole in fuselage panel (A68).

Bend the ends of the photo-etch louvre (P6) the using thin CA adhesive, secure the louvre in position in its recess on the fuselage panel (A68).



Temporarily join the two fuselage halves together using masking tape over the fuselage rear seam joints.

NOTE: *During the following steps, **cement the parts** to the inside of the **fuselage right half only**. This will ensure correct alignment with the fuselage left half when assembled.*

Locate fully the bulkhead (A45) into position in the fuselage then cement it in position.

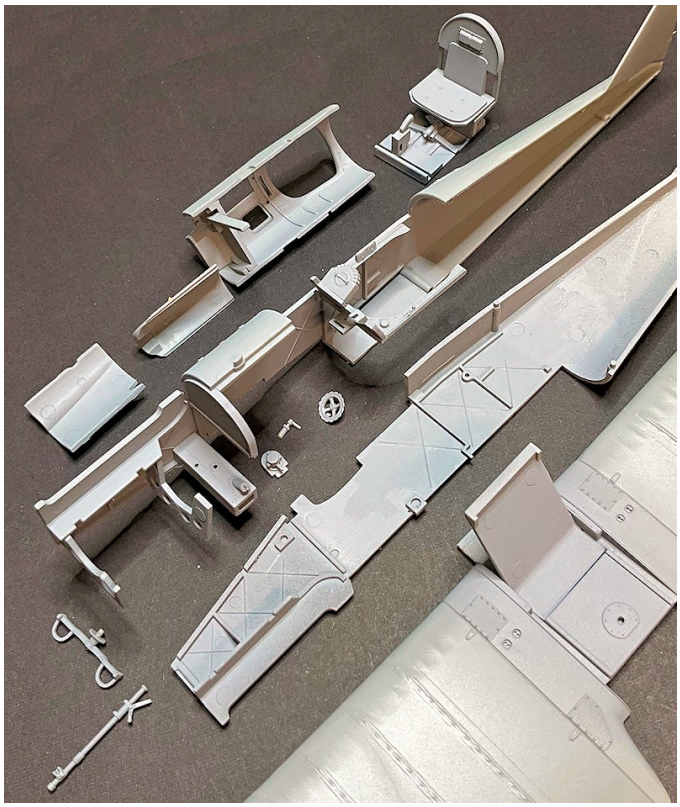
Locate fully the rear engine support frame (A36) into position in the fuselage then cement it in position.

Locate fully the forward engine support frame (A47) into position in the fuselage then cement it in position.

Locate fully the instrument board/panel onto it locaters then cement it in position.

Locate fully the oil tank assembly onto its locater in the fuselage left side, then cement it in position.

Once the cemented parts are fully set, separate the fuselage halves.



Pre-rigging:

Using the pre-molded recesses as guides, drill five lightening holes of 0.8 mm diameter through the aileron control quadrant (A17).

Cement the aileron control quadrant in position on the cross member of the cockpit floor panel.

NOTE: *The following step is required for when control line rigging is added in the cockpit.*

Using the pre-molded recesses as guides, drill six holes of 0.5 mm diameter through the bottom, front of the pilots seat.

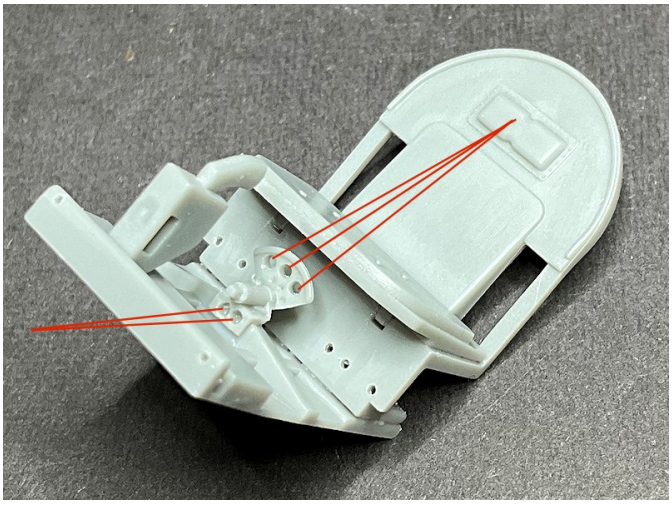
Point mark the top, outer ends of the cross member at the front of the cockpit floor panel.

Using the point marks as guides, drill two holes of 0.5 mm diameter through the cross member.

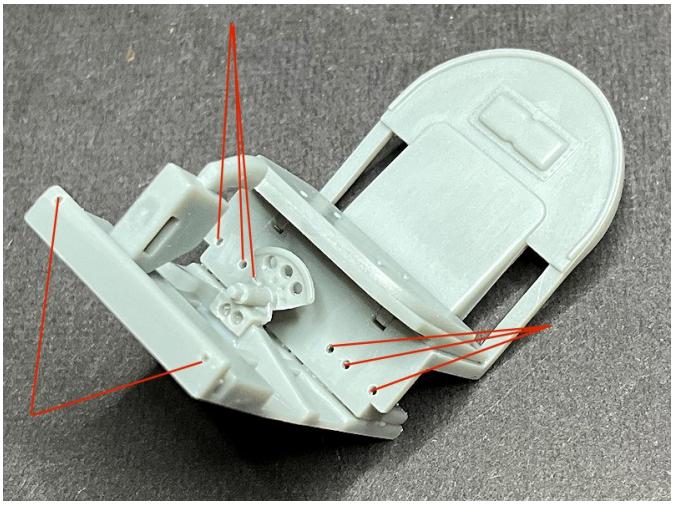
Drill a hole of 0.3 mm diameter into, **but not through**, the corners of the metal panel of the cockpit floor in the lower wing and through the rudder bar (see following photograph).

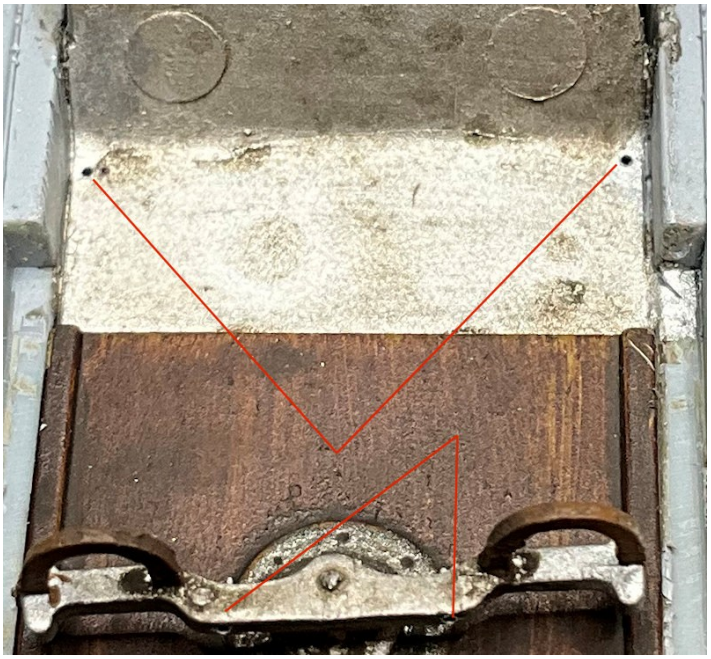
Drill a hole of 0.3 mm diameter side to side through the control column for the upper elevator control Cables, refer to Part 6 (Rigging) of this build log.

Lightening holes



Rigging holes





NOTE: *The following are required if the flight control surfaces are to positioned rather than aligned, as intended in the kit.*

Elevators:

Remove the three hinge stubs from the leading edge of both elevators, leaving a witness mark for drilling.

Point mark the centres of the witness marks.

Using the point marks as guides, drill holes of 0.5 mm diameter into the leading edge of both elevators, making sure the drill is kept central and at 90 degrees to the leading edges.

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

Using thin CA adhesive, secure a rod into each of the pre-drilled holes.

Point mark the centres of the pre-molded hinge stubs on the trailing edge of the tailplane.

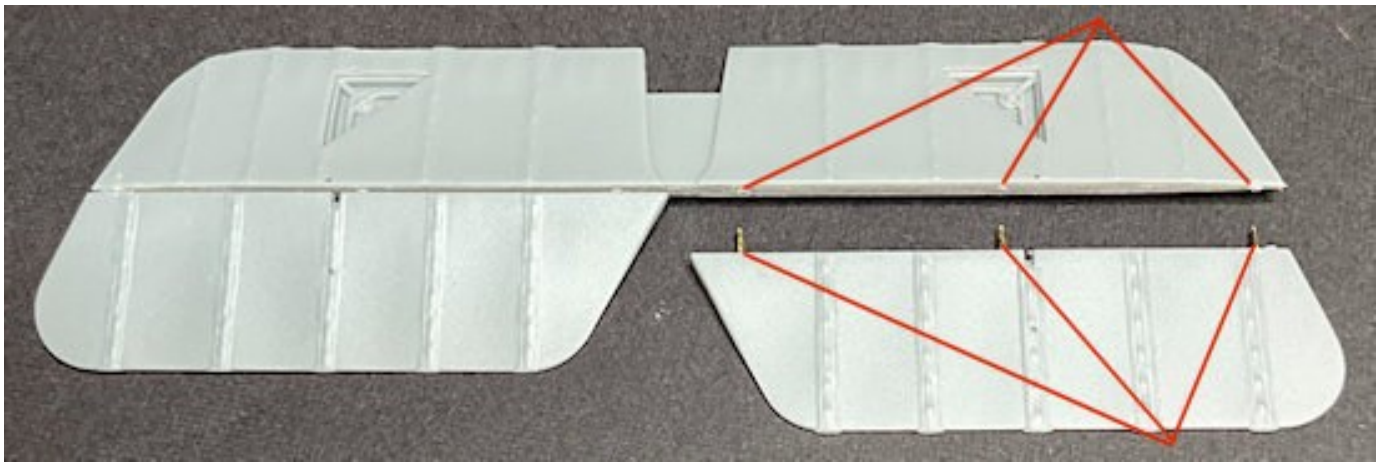
Using the point marks as guides, drill holes of 0.5 mm diameter into the trailing edge of the tailplane, making sure the drill is kept central and at 90 degrees to the leading edges.

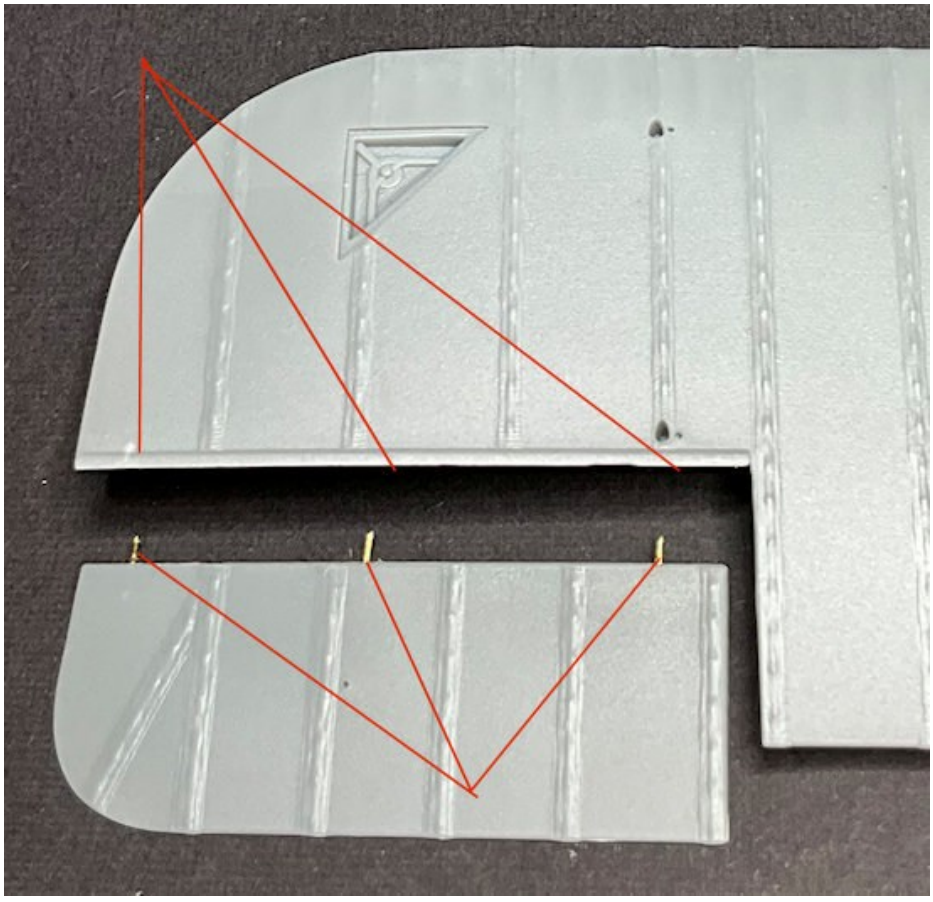
Locate fully the two elevators into the tailplane holes and carefully bend each slightly downwards.

Remove the two elevators.

Upper wing ailerons:

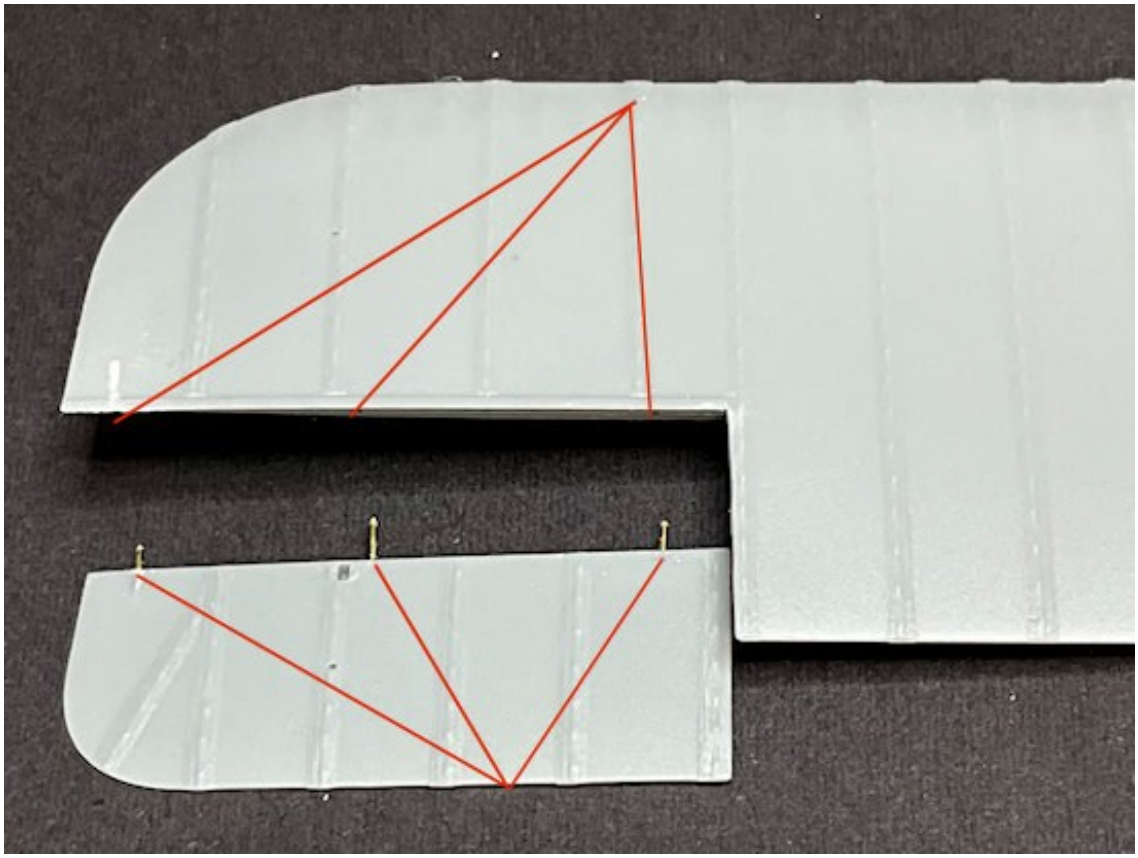
Repeat the procedure to modify the upper wing ailerons, but due to the thinness at the outer end of the ailerons, drill and rod that location using a 0.3 mm drill and rod.





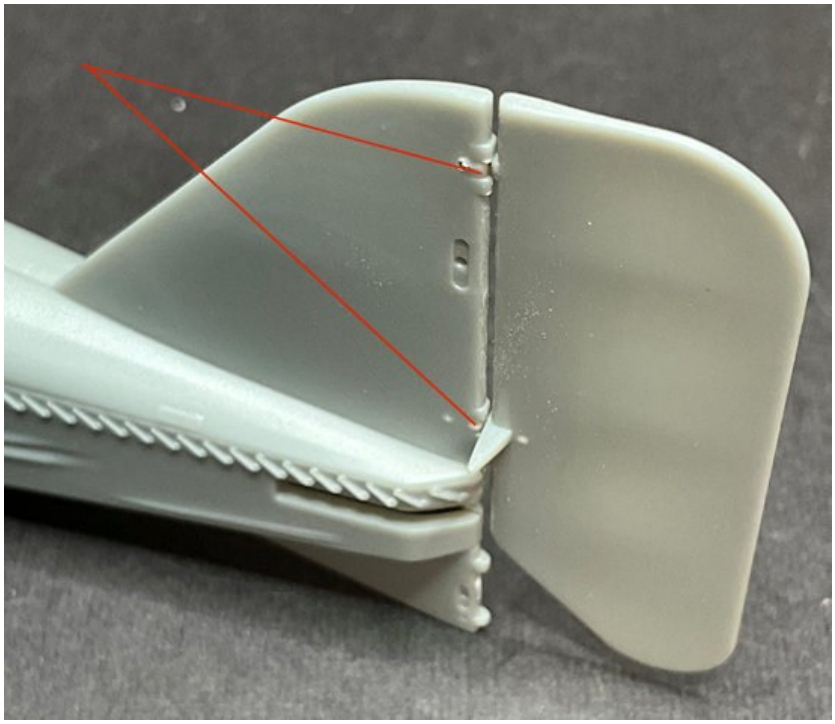
Lower wing ailerons:

Repeat the procedure to modify the lower wing ailerons.



Rudder:

Repeat the procedure to modify the rudder, but due to the thinness of the rudder leading edge, drill and rod the two hinge locations using a 0.3 mm drill and rod.



Painting:

Airbrush the following with a grey primer, such as ‘Mr. Surfacer’ Grey 1500 or similar:

Centre section assembly of the lower wing.
Internal surfaces of the fuselage left half.
Internal surfaces of the fuselage right half assembly.
Internal surfaces of the fuselage panels (A68, A72).
Internal surfaces of the fuselage panel assembly (D9).
Pilots seat/floor panel assembly.
Rudder bar.
Control column.
Trim wheel.
Grease pump.
Compass.

Airbrush the three linen panels (with cross bracing wires) with ‘MRP’ Clear Doped Linen (MRP-256) or similar.

Mask off the following areas:

The three painted linen panels and the top area of the engine bay on the fuselage left half.
The three painted linen panels, the metal bulkhead, the top area of the engine bay and the oil tank on the right fuselage half.
The ammunition container on panel D9.
The metal bulkhead on the centre section of the lower wing.

Airbrush the exposed areas of the exposed areas and the pilots seat/floor assembly with ‘Tamiya’ Dark Yellow (XF60) or similar.

Wood effect:

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

Use the chosen method to apply light wood effect finish to the following areas. I followed Method 2 using Windsor & Newton’ Griffin (Alkyd) **Raw Sienna** oil paint:

The two engine support frames.

Side panels forward from linen painted panels on fuselage left and right halves.

Pilots seat support frame.

Cockpit floor and case for Lewis ammunition drum.

Use the chosen method to apply dark wood effect finish to the following areas. I followed Method 2 using Windsor & Newton' Griffin (Alkyd) **Burnt Umber** oil paint:

Cockpit floor on centre section of lower wing.

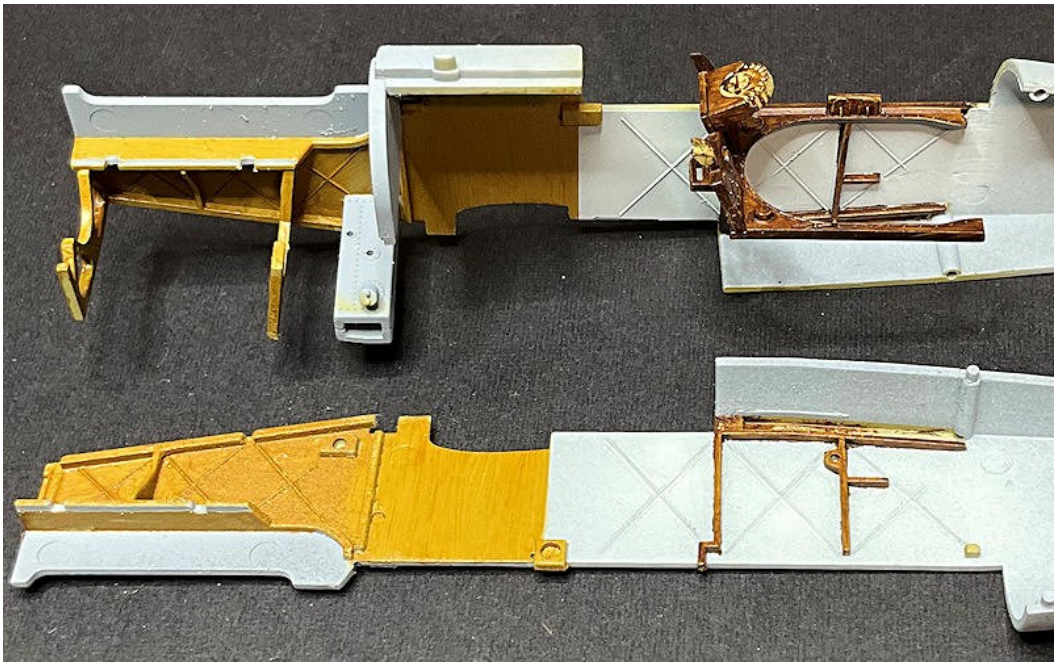
Floor cross members forward from pilots seat.

Instrument board and panel.

Side frames on linen painted panels.

Cockpit floor for the rudder bar.

Once the oil painted wood effects have dried, carefully remove all applied masking.



‘Viper’ installation conversion:

NOTE: ***At this stage*** *of the fuselage build,* ***refer to Part 7 (Engine)*** *for modifications to convert the ‘Hisso’ engine installation to that of the Wolseley ‘Viper’ engine. Once the engine modifications are carried out, continue this build of the fuselage.*

Clear away any residual primer/paint from the mating surfaces of the cockpit assemblies/parts and the fuselage halves.

Dry fit the pilots seat assembly into the fuselage right half.

Join the two fuselage halves and hold them together using masking tape. Make sure the pilots seat assembly, oil tank and the two engine support frames locate correctly to the fuselage left half.

Locate fuselage decking panel (A72) onto the fuselage left half and hold in position using masking tape.

Locate fuselage cockpit panel (D9) onto the fuselage and hold in position using masking tape.

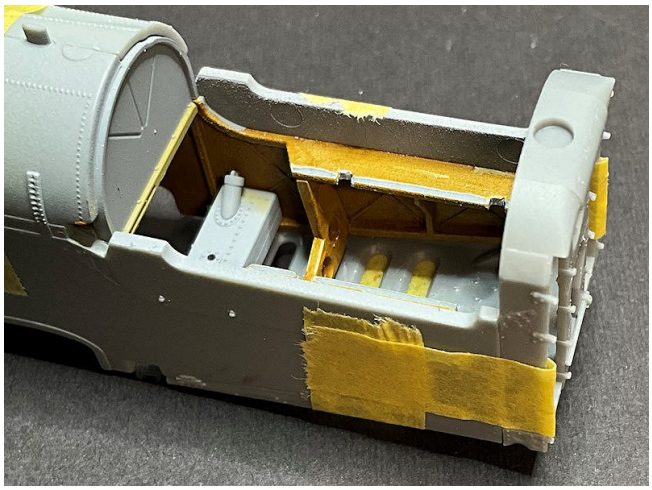
NOTE: *Make sure all residual stubs, from the 3D printed support trees for the conversion set parts, are removed.*

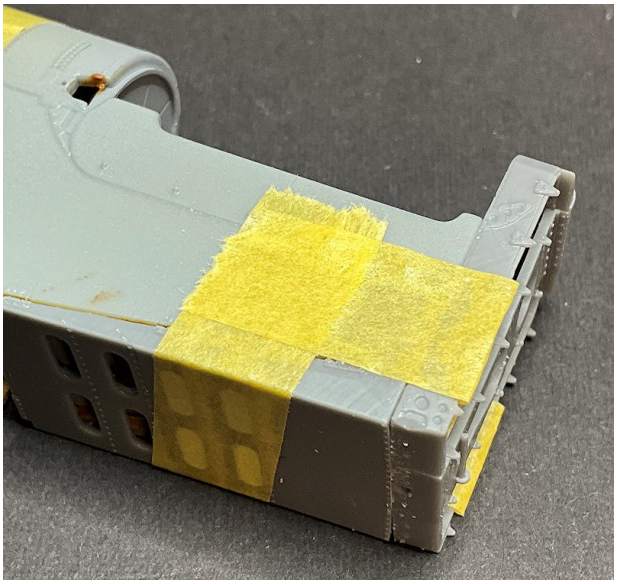
Fully locate the 3D printed underside louvered panel onto the forward, underside of the fuselage and hold in position using masking tape.

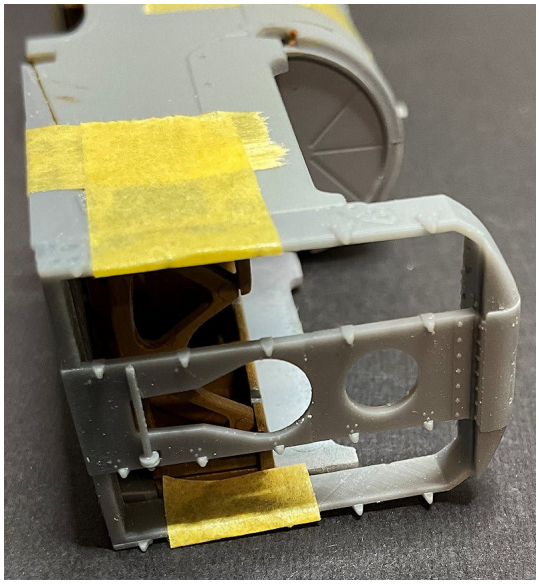
Cut the radiator filler from the top of the ‘Wingnut Wings’ radiator inner housing (A37) and using thin CA adhesive, secure it into the recess in the top of the 3D printed radiator housing.

Fully locate the 3D printed radiator housing onto the front of the fuselage and hold in position using masking tape.

Make sure the edges of the 3D printed parts are aligned correctly to the fuselage edges.

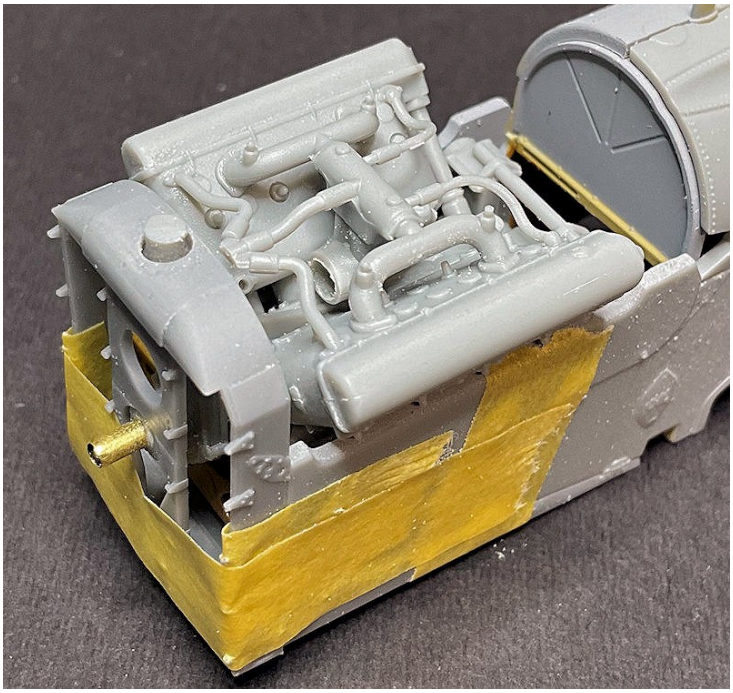






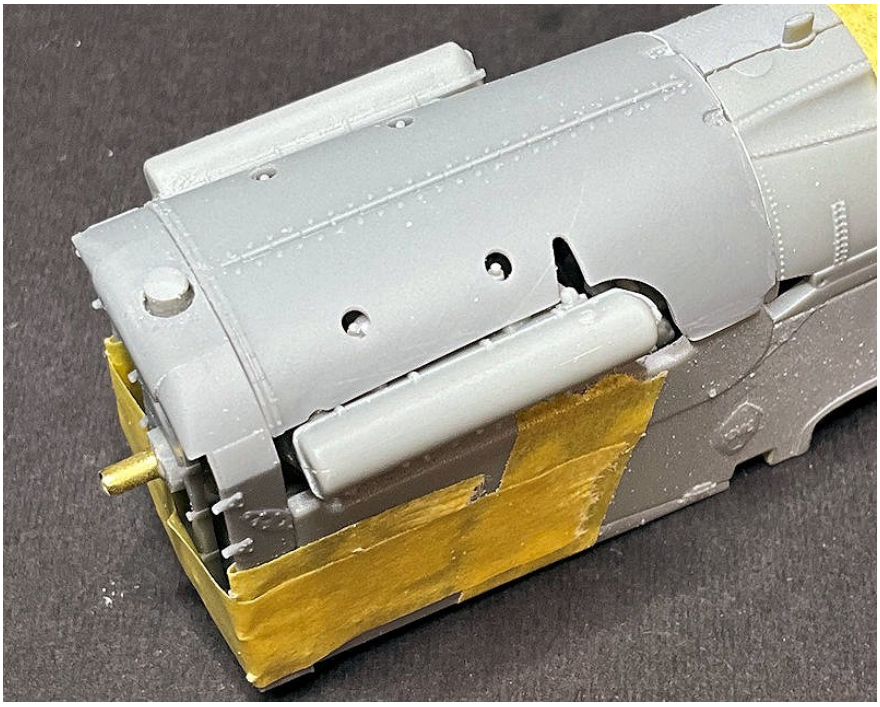
Locate and position the modified engine, refer to Part 7 (Engine), onto the engine bearers in the fuselage.

Make sure the engine is central between the fuselage sides and the propeller shaft protrudes through the opening in the radiator housing.



Test fit the 3D printed top panel over the engine and between the rear of the radiator housing and front of the fuselage panels.

I found that the front edge of the panel had no support at the top, rear edge of the radiator housing. Therefore, I secured, using thin CA adhesive, a thin strip of plastic rod across the top, rear of the radiator housing, such that when located, the front edge of the top panel rested on the strip and the panel was aligned to the radiator top. When the panel is located, the four holes in the panel should align with the four ‘fuel primers’ on the engine induction manifolds.



Remove the top panel and engine then remove all masking tape and dis-assemble the fuselage and parts.

NOTE: *The two 3D printed radiator shutters are very fragile, so must be handled with care.*

Carefully cut the two radiator shutters and cooling matrix from their support tress.

Remove all residual support tree stubs from the edges of the shutters and matrix.

Using thin CA adhesive, secure the two matrix into their openings in the radiator housing, making sure the front surface of the matrix are flush to the front surface of the radiator housing.

NOTE: *The following is to represent the radiator drain valve.*

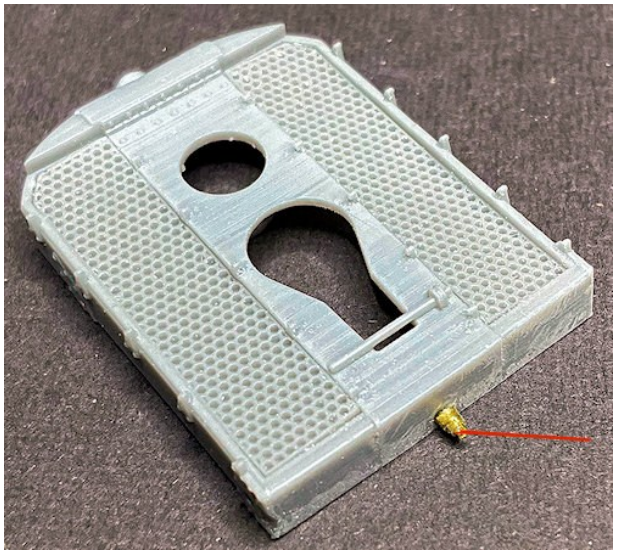
Drill through the recess in the bottom of the radiator housing using a 1.2 mm diameter drill.

Cut short lengths of Brass tube, such as that from 'Albion Alloy's' or similar, of 1.2 mm, 0.9 mm and 0.5 mm diameter.

Using thin CA adhesive, secure the 1.2 mm diameter tube into the pre-drilled hole, leaving 1.0 mm protruding.

Using thin CA adhesive, secure the 0.9 mm diameter tube into the fitted tube, leaving 0.5 mm protruding.

Using thin CA adhesive, secure the 0.5 mm diameter tube into the fitted tube, leaving 0.5 mm protruding.



Test fit the two radiator shutters onto the front of the radiator and between the attachment lugs on both sides of the cooling matrix. The shutters should lay flush over the matrix and between the attachment lugs. I found the inner edges of the attachment lugs and sides of the shutters need to be file/sanded to achieve the correct fit. Once achieved, removed the shutters.

Painting (continued):

Brush paint the following with ‘Mr. Color’ Stainless Steel (213) or similar:

Bulkhead and forward panel on centre section of the lower wing.

Oil tank , upper bulkhead and top of engine bay side panel on fuselage right half.

Top of engine bay side panel on fuselage left half.

Inside surface of 3D printed top engine panel.

Inside surface of fuselage gun panel (A45).

Throttle control levers on left side of the instrument board (A46).

Control column (A66).

Trim wheel (A74), Rudder bar (A6).

Ammunition container (A57) on fuselage decking panel (D9).

Floor boards around cross members on seat floor (A40).

Two instrument faces on instrument panel and inner edge of instrument board (refer page 4 of instructions).
Brush paint the two panels on instrument board (refer page 4 of instructions) and top of control column hand grip with ‘Mr. Color’ Brass (219) or similar.

Brush paint the following with ‘Tamiya’ Gun Metal (X10) or similar:

Lewis ammunition drum on the instrument panel.

Mounting plate for the rudder bar on centre section of the lower wing.

Leather effect:

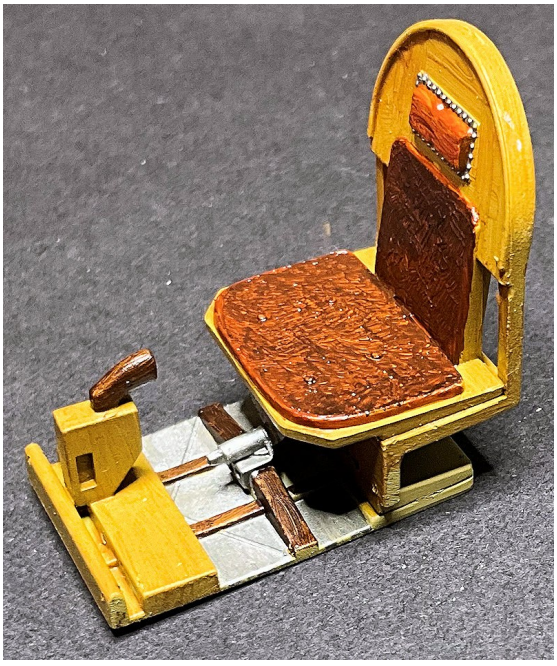
NOTE: *Refer to Part 2 (Wood Effects) of this build log for more information.*

Use the chosen method to apply a leather effect to the following areas. I followed Method 2 using Windsor & Newton’ Griffin (Alkyd) **Burnt Sienna** and **Burnt Umber** oil paint:

Seat cushion and seat back on the pilots seat. I applied the Burnt Sienna first, then stippled on Burnt Umber.

Head rest on the seat back of the pilots seat. I applied the Burnt Sienna.

Hand grip of the flare pistol. I applied the Burnt Umber.



Brush paint the foot straps on the rudder bar and control column hand grip with ‘AK Interactive’ Brown Leather (AK3031) or similar.

Brush paint the following with ‘Tamiya’ Semi-Gloss Black (X18) or similar:

Compass (A14).

Instrument faces on instrument panel (refer page 4 of instructions).

Vickers gun mount on instrument panel.

Airbrush the two 3D printed shutters, radiator housing assembly, inside surfaces of fuselage panels (A68, and 3D printed engine cover panel) with a grey primer, such as ‘Mr. Surfacer’ Grey 1500 or similar.

Airbrush the two 3D printed shutters with ‘Alclad’ Duraluminium (ALC102) or similar.

Decals:

Apply the various cockpit decals by following page 4 of the ‘Wingnut Wings’ instruction manual.

Assembly:

Cement the rudder bar into its locating hole in the centre section of the lower wing.

Cement the trim wheel into its locating hole in the fuselage left half.

Cement the compass into its locating slot in the forward, centre of the instrument panel.

Cement the control column onto its locating stub and the seat floor (forward from the pilots seat).

Photo-etch lap straps:

Remove the two lap straps (P1, P3) and buckle (P2) from the kit supplied photo-etch sheet.

Remove and residual tags from the edges of the parts.

NOTE: *Annealing - Using a low heat source (e.g. cigarette lighter or candle flame), ‘wave’ the parts over the flame several times and watch for the parts to discolour.* ***Keep the flame moving*** *or the parts may* ***melt****. Doing this anneals the parts, making them easier to bend. Wipe off any soot from the parts.*

Anneal the two lap straps and buckle.

Secure the buckle (P2) onto it’s locating patch on seat belt (P1), then bend the retaining tang over towards the belt.

Bend the retaining fittings on the outer ends of the belts such that the belts can be positioned on the pilots seat as desired.

Brush ‘Mr. Metal’ Primer R or similar etch primer over the parts.

Airbrush the two lap straps with ‘Tamiya’ Desert Yellow (XF59) or similar.

Brush paint the metal fittings on the two lap straps with ‘Mr. Color’ Stainless Steel (213) or similar.

Using thin CA adhesive, secure the two lap straps onto the pilots seat.

Weathering:

Airbrush a semi-matte clear coat, such as ‘Tamiya’ (X35) or similar over the following:

Internal surfaces of the fuselage halves.

Pilots seat/floor assembly.

Inside surfaces of fuselage panels (A72, A57) and 3D printed engine panel/ underside louvered panel).

NOTE: *Refer to Part 3 (Weathering) - For general internal weathering I chose to use the ‘Flory Models’ Dark Dirt and the Grime fine clay washes.*

Brush ‘Flory Models’ Dart Dirt/Grime fine clay washes, as desired, to the following parts:

Internal surfaces of the fuselage halves.

Cockpit/bulkhead in centre section of lower wing.

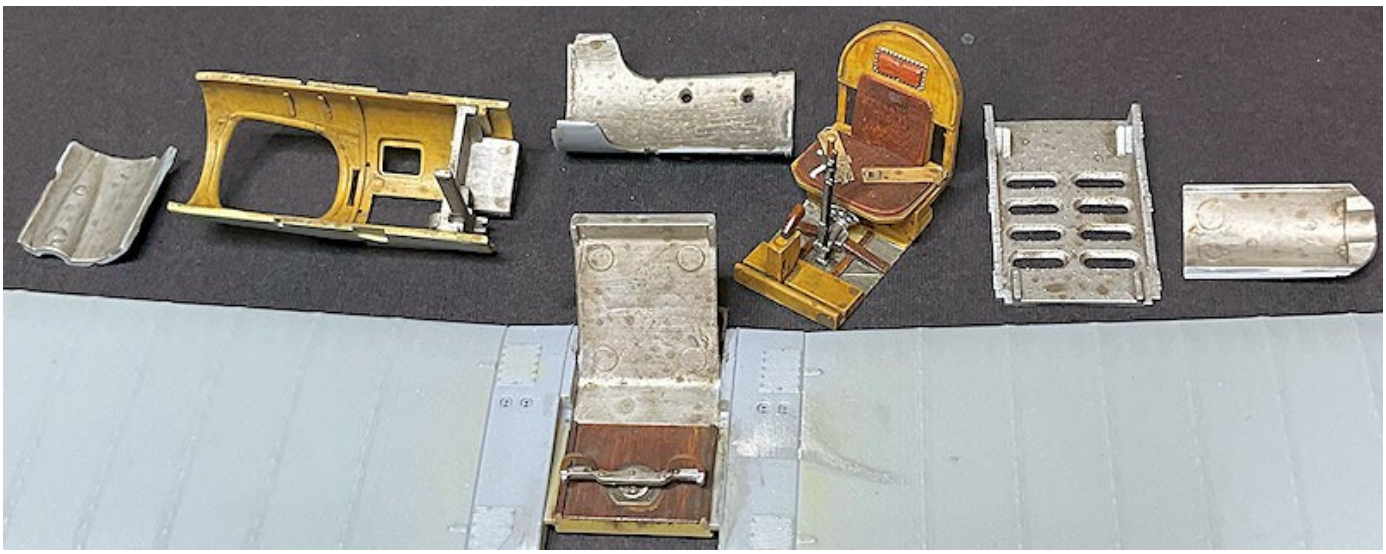
Pilots seat/floor assembly.

Inside surfaces of fuselage panels (A72, A57) and 3D printed engine panel/ underside louvered panel).

Remove the wash as needed to achieve the desired effect.

Instrument lenses:

To achieve a gloss lens finish on the cockpit instrument decals, either brush a clear gloss such as 'Tamiya' (X22) or apply UV clear resin over the decals. I used UV clear resin.



Assembly (continued):

Make sure all mating surfaces of all parts are clear od primer, paint or oil paint. 'Wingnut Wings' kit parts are designed to tight tolerances, so mating surfaces must be clean.

Final test fit parts to make sure they can be fully located.

Using a PVA glue, such as 'Microscale' Krystal Klear or similar, secure the clear transparency (C9) into its opening in decking panel (D9).

NOTE: *For the following step **only**, I used 'Revell' Contacta Professional cement, which is thicker and slower setting cement, so allows parts to be positioned more easily.*

Cement the base of the pilots seat/floor assembly in position on the floor of the fuselage right half.

Fully locate the fuselage left half to the right half, making sure the pilots seat assembly and the right side of the instrument board are aligned correctly to their locating surfaces in the fuselage right half.

Apply cement between the underside of the right side of the instrument board and fuselage half.

Once the cemented joints have fully set, remove the fuselage left half from the fuselage right half.

Control cable rigging:

NOTE: *Refer to Part 6 (Rigging) of this build log for more information. At this stage of the build, it's best to pre-rig the rudder, elevator and aileron control cables before further assembly of the fuselage. The rigging materials used are:*

Tube - Blackened 0.4 mm diameter Brass tube, such as 'Albion Alloy's' MBT04 or similar.

Line - 0.08 mm diameter mono-filament, such as 'Steelon' or 'Stroft GTM' or similar.

Nickel-Silver or Brass tube can be chemically blackened by immersion in solutions such as 'Black-It' or 'Ammo' (A.MIG-2021) or similar then rinse and dry the blackened tubes to prevent powdering of the surfaces.

Elevator upper control cables:

Cut a long length of 0.08 mm diameter mono-filament, such as that from 'Steelon' or 'Stroft GTM.

Cut two short length of blackened 0.4 mm diameter Brass tube, such as 'Albion Alloy's' MBT04 or similar.

Using thin CA adhesive, secure one end of the line to the front, underside of the pilots seat support and 3 mm from the centre.

Slide a tube onto the line.

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

Slide the second onto the free end of the line.

Keeping the line taut, use thin CA adhesive to secure the line to the front, underside of the pilots seat support and 3 mm from the centre.

Slide the two tubes up to the control column and secure to the lines using thin CA adhesive.

Outer aileron control cables:

Cut two long lengths of 0.08 mm diameter mono-filament, such as that from 'Steelon' or 'Stroft GTM.

Pass a line through the two outer pre-drilled holes in the underside of the pilots seat.

Pass the lines forwards to the pre-drilled holes in the forward metal panel of the cockpit floor.

Using thin CA adhesive, secure the lines into the two pre-drilled holes in the corners of the cockpit forward metal floor. Do not secure the lines in the pilot seat holes yet.

Tail skid control cables:

Cut two long lengths of 0.08 mm diameter mono-filament, such as that from 'Steelon' or 'Stroft GTM.

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

Pass the lines through the two outer pre-drilled holes in the underside of the pilots seat.

Pass the lines forwards to the pre-drilled holes in the rudder bar.

Slide a tube onto each of the lines.

Pass the lines through the rudder holes, but do not secure in place yet.

Keeping the outer aileron control lines taut, apply thin CA adhesive (at the rear of the pilots seat) to secure the aileron and tail skid lines at both sides of the seat.

Rudder control cables:

Cut four long lengths of 0.08 mm diameter mono-filament, such as that from ‘Steelon’ or ‘Stroft GTM.

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

Pass each line through the two inner pre-drilled holes in the underside of the pilots seat.

Apply thin CA adhesive (at the rear of the pilots seat) to secure the rudder control lines at both sides of the seat.

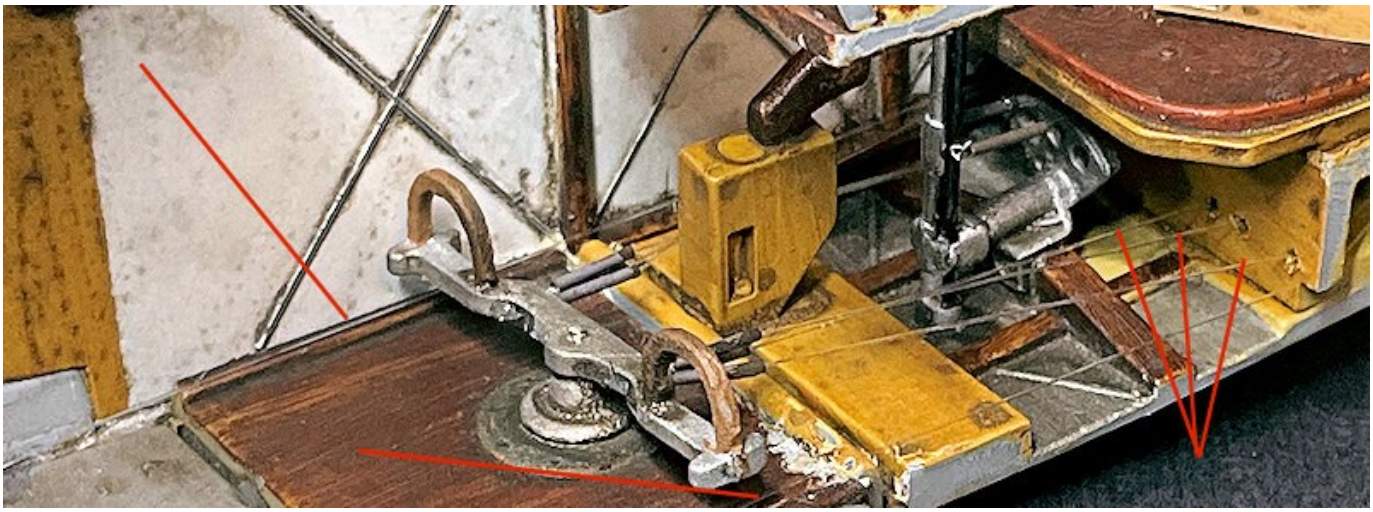
Slide a tube onto each of the lines.

Pass the lines at each side through the pre-drilled holes in the rudder bar.

Keeping the lines taut, apply thin CA adhesive to the front on the rudder bar to secure the lines in position.

Slide each tube up to the rudder bar and secure to the lines using thin CA adhesive.

Once the adhesive has fully set, carefully cut away the protruding lines at the front of the rudder bar.



Assembly (continued):

NOTE: *The following steps require the fuselage left half to be eased over the left wing and into position against the fuselage.*

Carefully ease the fuselage left half over the left wing and into its locations on the fuselage. Make sure the fuselage halves, instrument board, oil tank and the two engine support frames fully locate into their locations.

Once the correct fit is achieved, ease the fuselage halves rear of the cockpit slightly apart, apply cement along the joint then fully join the fuselage halves.

Apply cement along the base of the fin to fuselage joint.

Make sure the oil tank and engine support frames are fully locate then cement in position.

NOTE: *In the following step, tip the decking panel forward edge into the fuselage, then push it forward and down at the rear to engage it fully onto the fuselage.*

Cement decking panel (D9) in position onto the fuselage and over the cockpit.

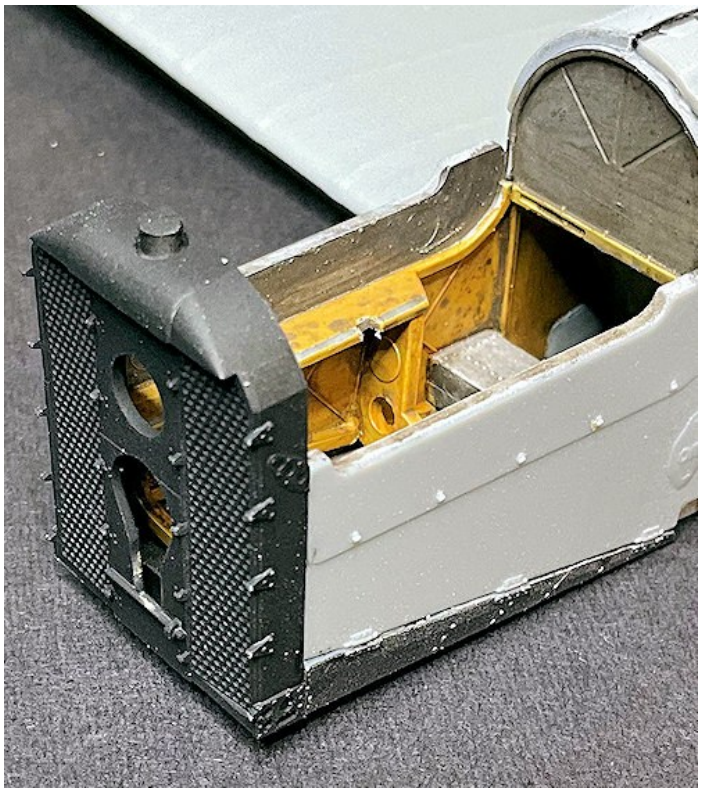
Cement fuselage panel (A72) in position onto the fuselage.

Pass the radiator coolant pipe (E17) through the holes in the bottom of the rear engine support frame and locate the front ends of the pipe onto the lower, rear of the front engine support frame.

Cement the pipe to both engine support frames.

Using thin CA adhesive, secure the 3D printed underside louvred panel in position on the forward, underside of the fuselage. Make sure the front and side edges are aligned to the fuselage.

Using thin CA adhesive, secure the 3D printed radiator housing to the front of the fuselage. Make sure the bottom and side edges are aligned to the fuselage and underside panel.



Test fit the converted engine onto the engine bearers by tipping the front of the engine down then through the opening in the radiator housing. Then lower the rear of the engine onto the engine bearers.

Test fit the 3D printed top engine panel between the top of the fuselage and top, rear edge of the od the radiator housing. Make sure that:

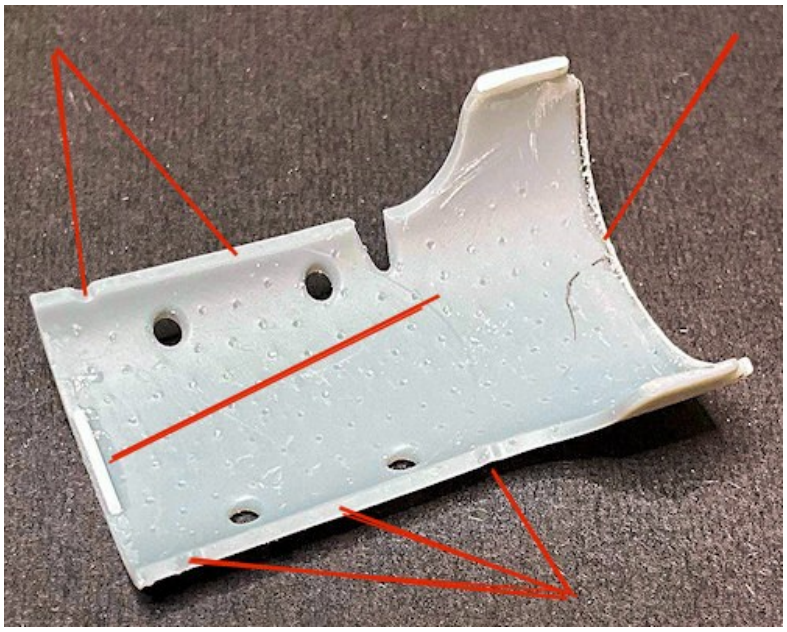
The engine is positioned on the bearers such that the four fuel primers on the to of the engine intake manifolds are central in the panel holes.

The lower, rear edges of the panel locate onto the fuselage sides.

The front of the panel is flush with the top of the radiator housing.

NOTE: *Bear in mind this conversion set is **a trial set** and not the final version.*

I found that the rear edge of the top panel needed sanding to allow the panel fitted correctly between the radiator and fuselage. Also, the cut-outs in the panel above the engine cylinder banks seemed too close to the cylinder heads and the gap between the engine cylinders and panel edges reduced towards the front of the panel. Therefore, I sanded the edges to increase the gap slightly and make the edges parallel to the cylinder heads. This also required the three indents in the edges needed to be re-instated with a round needle file.

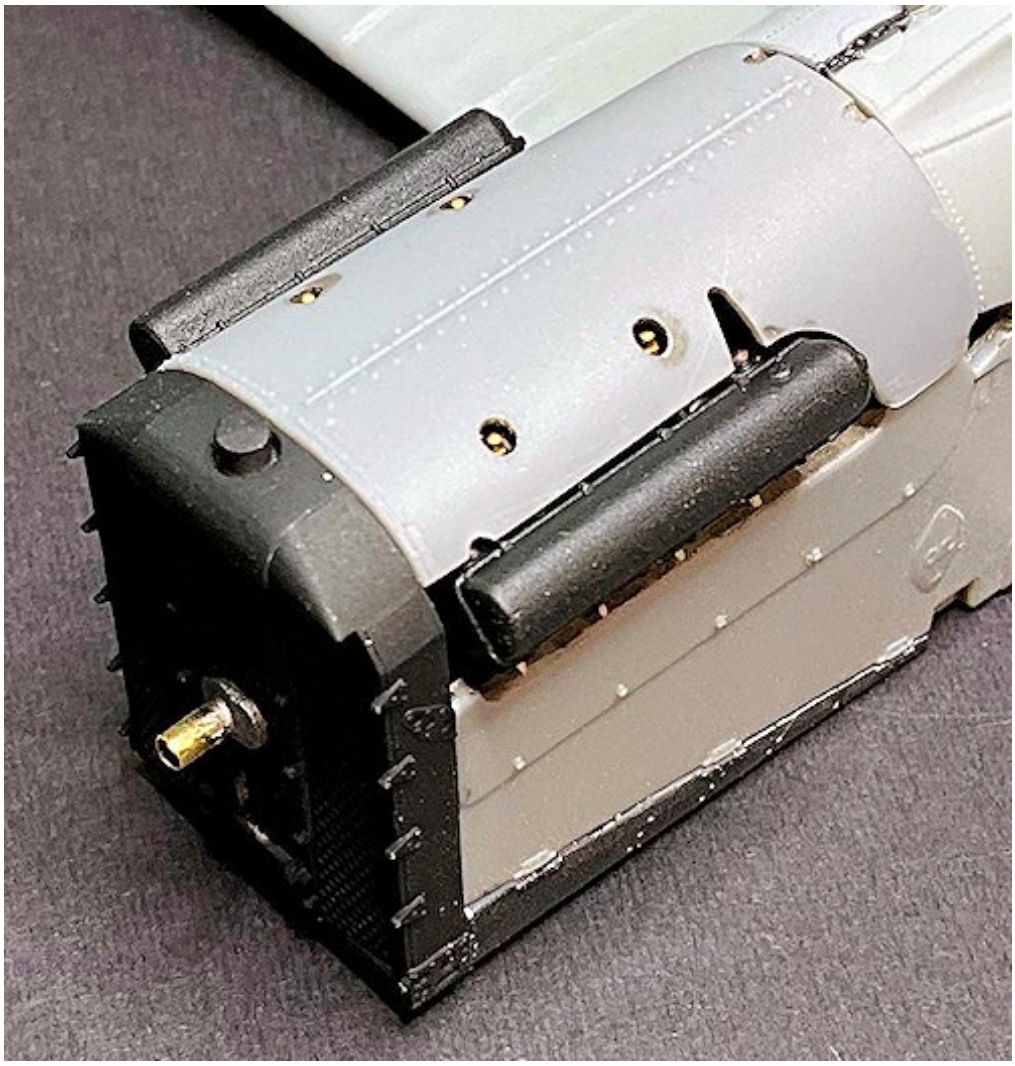


With the engine correctly positioned, test fit the two engine exhaust pipes (A1, A2). Make sure that:

The fit into the engine exhaust ports.

The exhaust pipe rear supports (A70, A71) will align correctly to their locating points on the fuselage sides.

Remove the exhaust pipes, top panel and engine from the fuselage.



Cement aileron infill (D3) onto the left lower wing and (D2) onto the right lower wing.

Cement aileron infill (D12) onto the left aileron of the upper wing and (D13) onto the right aileron.

Cement vent pipe (A49) the underside of the upper wing at the forward, left of the centre section.

Cement vent pipe (A43) the underside of the upper wing at the forward, right of the centre section.

Cement pipe (A42) the upper surface of the upper wing at the forward, left of the centre section.

Cement pipe (A44) the upper surface of the upper wing at the forward, right of the centre section.

Painting (continued):

Preparation:

Mask off the following using masking tape, 'UHU' white Tack and pieces of sponge:

Inner and outer surfaces of the fitted transparent window (C9) using liquid masking solution, such as that from 'Humbrol' or similar.

Radiator openings at the rear, inside face of the radiator.

Open louvres on the inner surface of the underside panel, inside the fuselage.

'D' opening rear of underside panel.

Open cockpit.

Underside of windscreen locating slot/Aldis gun sight holes.

Temporary fitting of panels:

Apply 'UHU' White Tack to the top of the Vickers gun mounting inside the fuselage, the push and final fuselage panel A68 fully into location in the fuselage.

Apply rolled 'worms' of white tack around the edges of the open engine bay.

Apply white tack inside the engine bay .

Fully locate the engine top cover panel over the open engine bay and onto the white tack 'worms'.

Airbrush the following with a grey primer, such as 'Mr. Surfacer' Grey 1500 or similar.

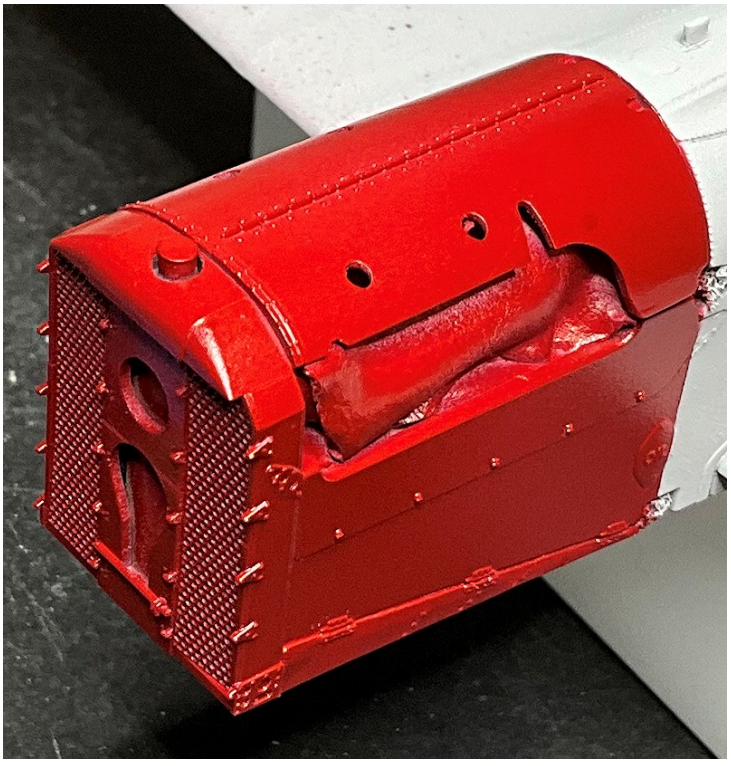
Upper wing.

Fuselage/lower wings.

Upper and lower wing ailerons.

Tailplane.

Elevator.



Make sure the primed surfaces are smooth and free of any surface imperfections.

Mask off around the forward fuselage (nose) following the rear edge of the engine bay.

Also mask off the lower wings at the wing roots.

Airbrush the exposed nose of the fuselage with a mix of 'Tamiya' Red (XF7) with Rubber Black (XF85) to a ratio of approximately 60/40%.

Remove the engine top cover panel

Remove all masking, 'UHU' white tack and sponge from the painted nose of the fuselage and from around the lower wing roots, but leave the remaining fuselage masking in position.

Mask off the red painted nose of the fuselage.

Airbrush the undersides of the following with ‘MRP’ Clear Doped Linen (MRP-256) or similar:

Fuselage/lower wings.

Upper wing.

Upper and lower ailerons.

Tailplane.

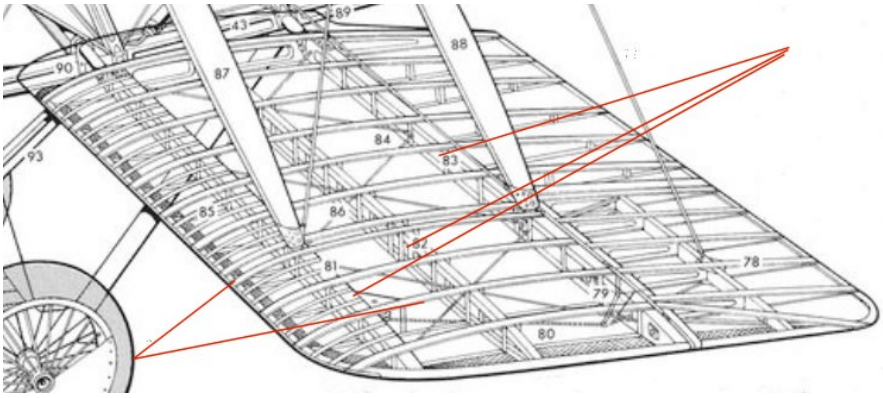
Elevator.

NOTE: *The aircraft flight surfaces were covered with doped linen and for this aircraft, this covering was overpainted on the upper surfaces, but left as Clear Doped Linen (CDL) on the underside surfaces. As such, daylight was less able to penetrate through the painted upper surfaces and this meant the internal structures were less visible from the underside. The internal structures however would have been slightly visible as ‘ghost’ outlines through the linen and would have been slightly blurred, not sharply defined. Therefore, internal structures need to be created by masking and painting. However, some guesswork is necessary, due to a lack of structural information.*

Mask off the wing ribs (front to rear) on the **underside** of lower wings, using 1.0 mm wide strips of masking tape.

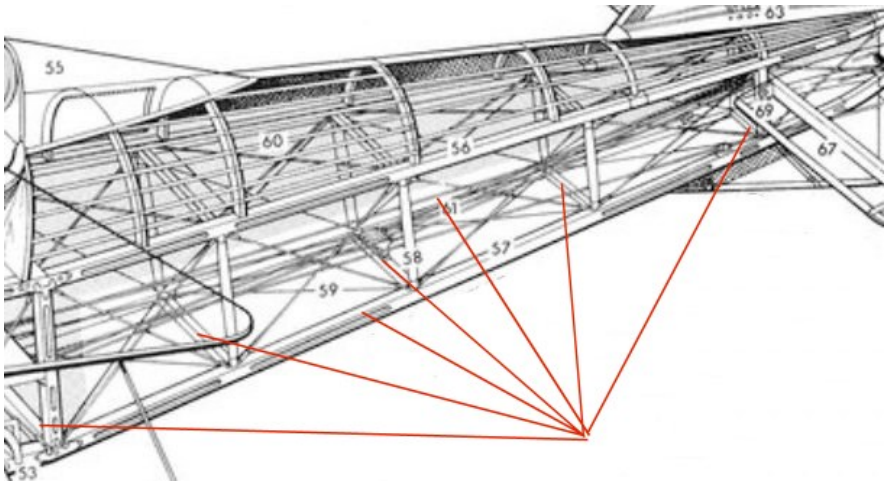
Mask off the front and rear wing spars (wing roots to tips) on the **underside** of lower wings, using 2.0 mm wide strips of masking tape.

Mask off the middle wing spar (wing roots to tips) on the **underside** of lower wings, using 1.0 mm wide strips of masking tape.



Mask off the bottom of the cross members on the **underside** of the fuselage frames using 1.0 mm wide strips of masking tape.

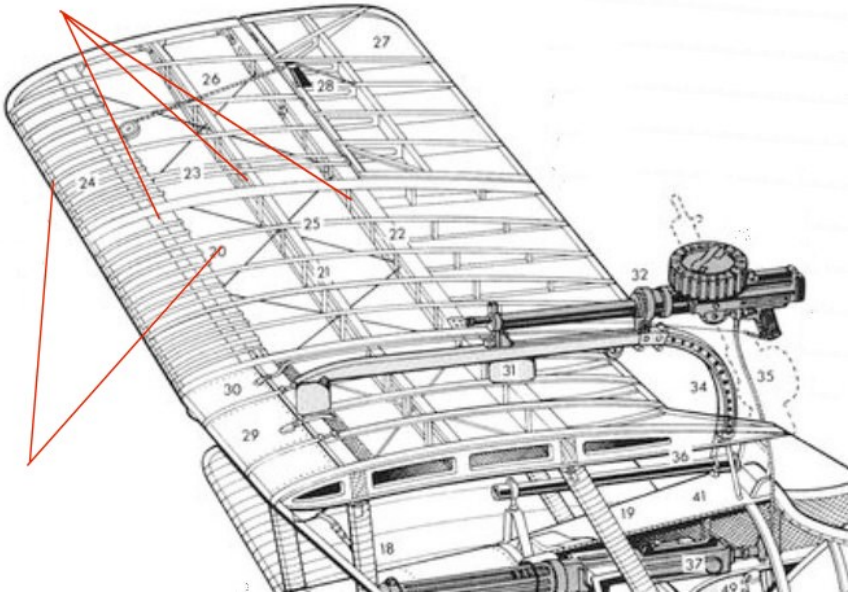
Mask off the longerons along the bottom outer edges at the **underside** of the fuselage, using 2.0 mm wide strips of masking tape.



Mask off the wing ribs (front to rear) on the **underside** of upper wing, using 1.0 mm wide strips of masking tape.

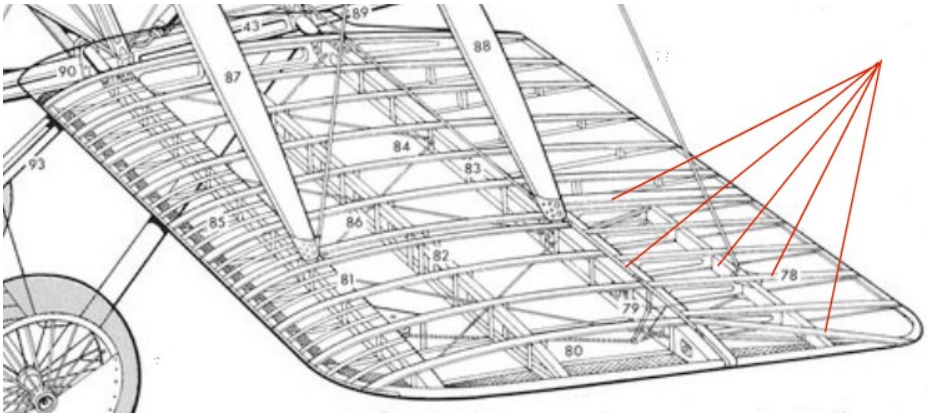
Mask off the front and rear wing spars (wing roots to tips) on the **underside** of upper wing, using 2.0 mm wide strips of masking tape.

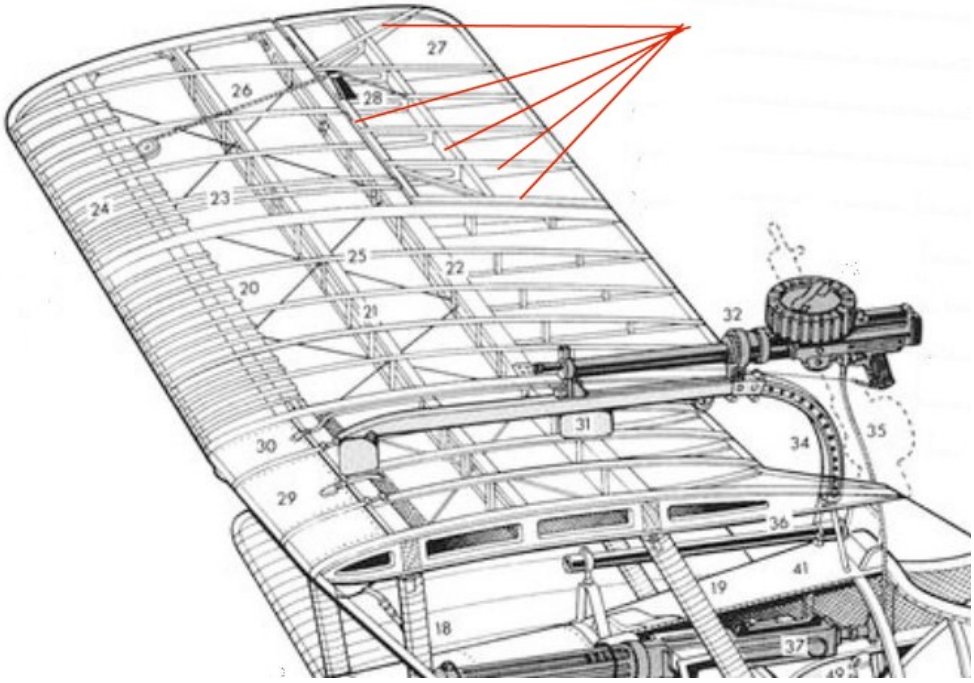
Mask off the middle wing spar (wing roots to tips) on the **underside** of upper wing, using 1.0 mm wide strips of masking tape.



Mask off the wing ribs (front to rear) on the **underside** of upper and lower ailerons, using 1.0 mm wide strips of masking tape.

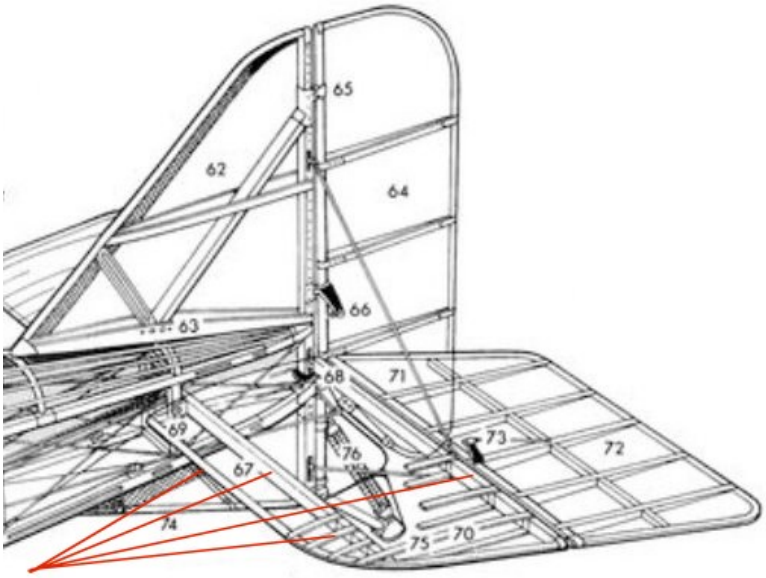
Mask off the front and mid spars on the **underside** of upper and lower ailerons, using 1.0 mm wide strips of masking tape.





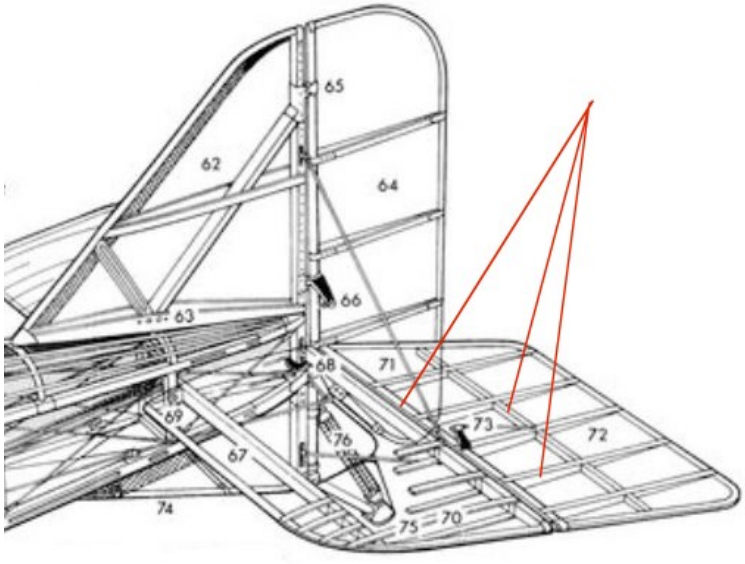
Mask off the wing ribs (front to rear) on the **underside** of tailplane, using 1.0 mm wide strips of masking tape.

Mask off the front, mid and rear spars on the **underside** of tailplane, using 1.0 mm wide strips of masking tape.



Mask off the wing ribs (front to rear) on the **underside** of elevator, using 1.0 mm wide strips of masking tape.

Mask off the front and mid spars on the **underside** of elevator, using 1.0 mm wide strips of masking tape.

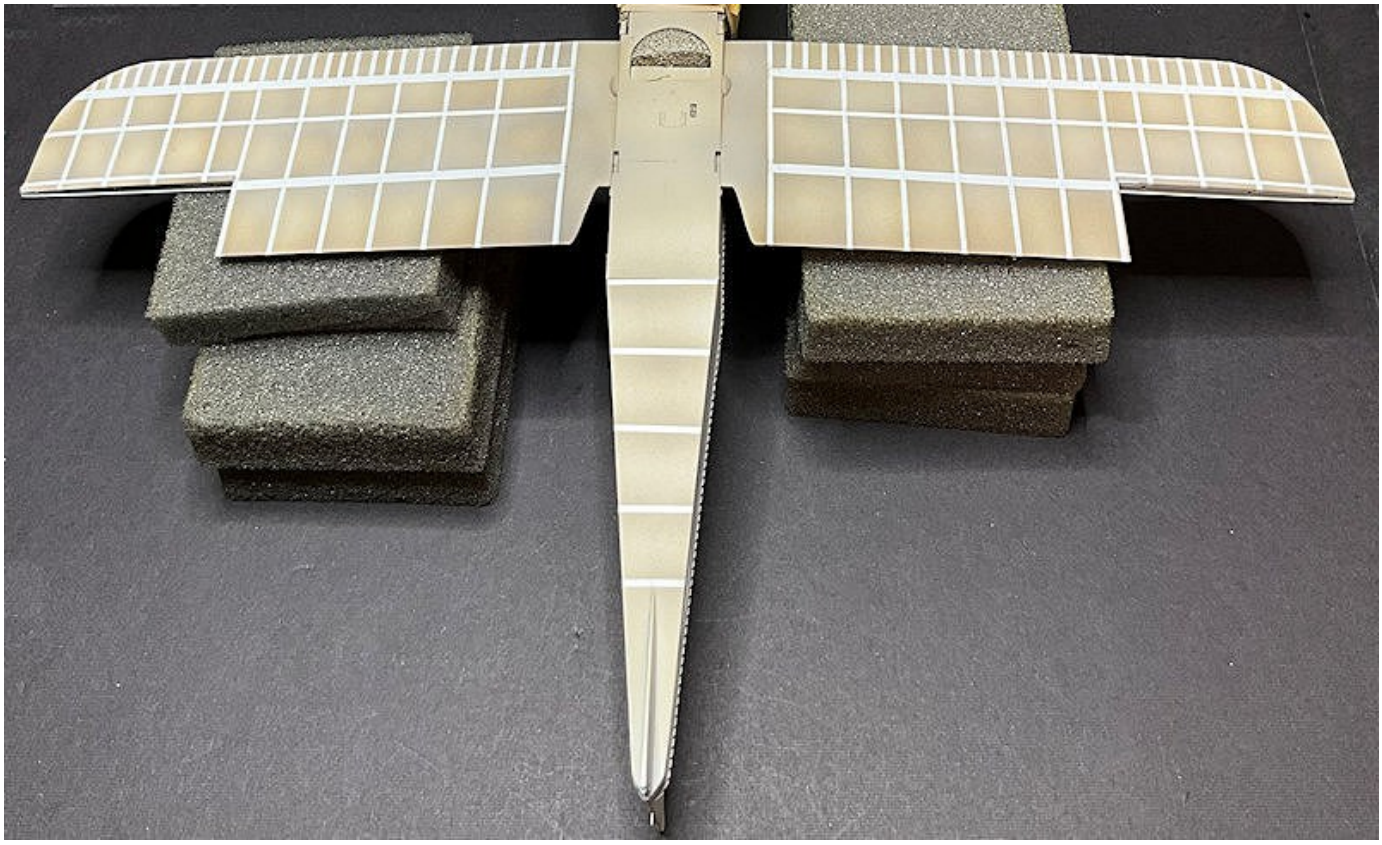


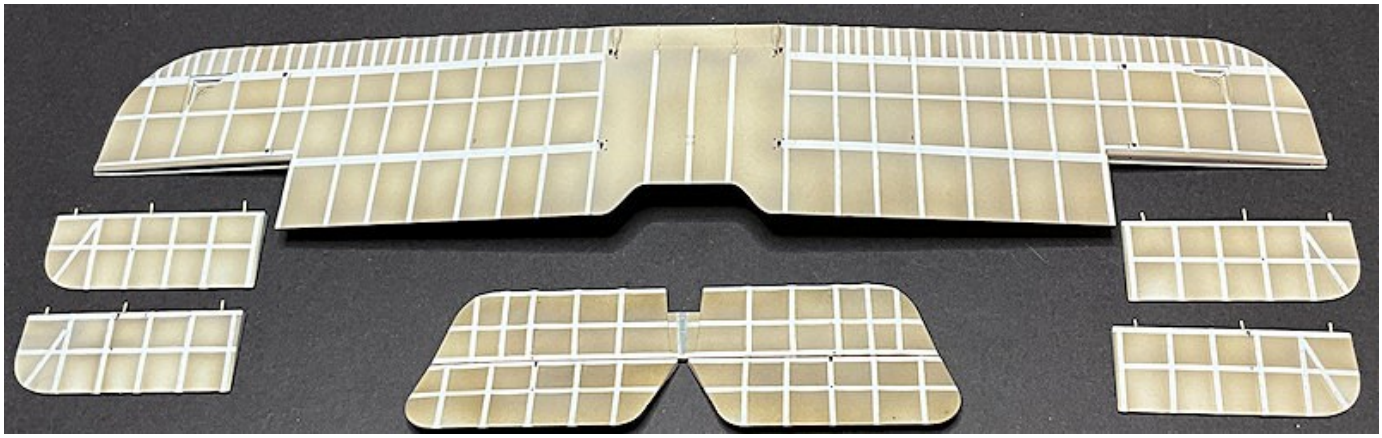
Airbrush along the edges of the masking strips with ‘MRP’ Khaki Green 3/63 (MRP-333) or similar, to create shadow effects each side of the strips.

NOTE: *During the following step, the intention is to partially cover (‘knock back’) the painted Khaki Green with the Deck Tan top coat. Do not airbrush too much covering as a second coat of Deck Tan will be required when the masking strips are removed.*

Lightly airbrush over the masked/painted surfaces with ’Tamiya’ Deck Tan (XF55) or similar to lightly cover the surface, but only lightly fade the exposed Khaki Green paint.

Remove all of the strips of masking tape, to reveal the lighter painted structures.





Lightly airbrush over the painted surfaces with ’Tamiya’ Deck Tan (XF55) or similar to cover the surfaces and further blend the lighter, previously masked lines.

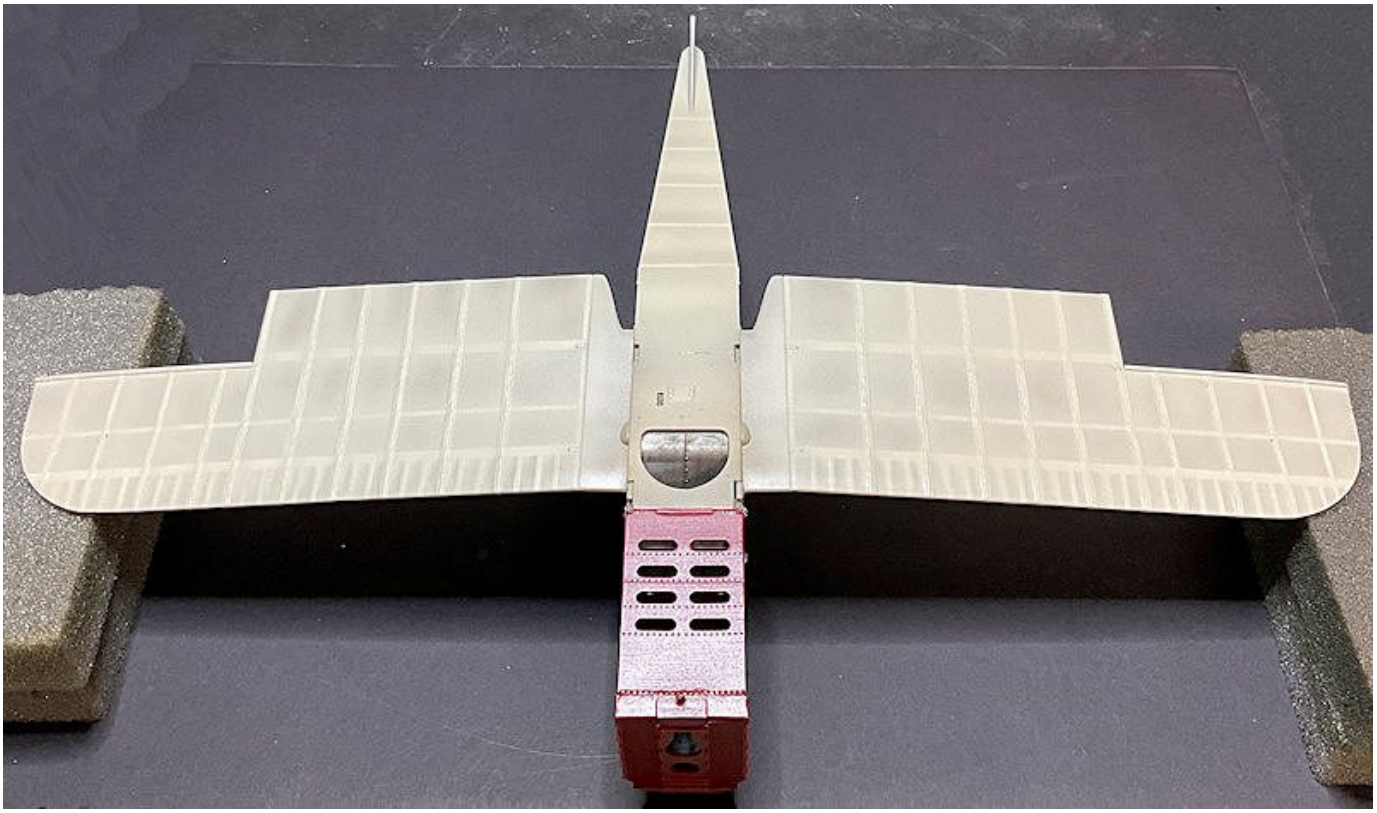
NOTE: *The painted surfaces must be smooth and free of any surface imperfections, roughness and dust in order to prevent decal ‘silvering’ when decals are applied. Silvering occurs when air is trapped under applied decals and shows as ‘silvering’ through the dried decal.*

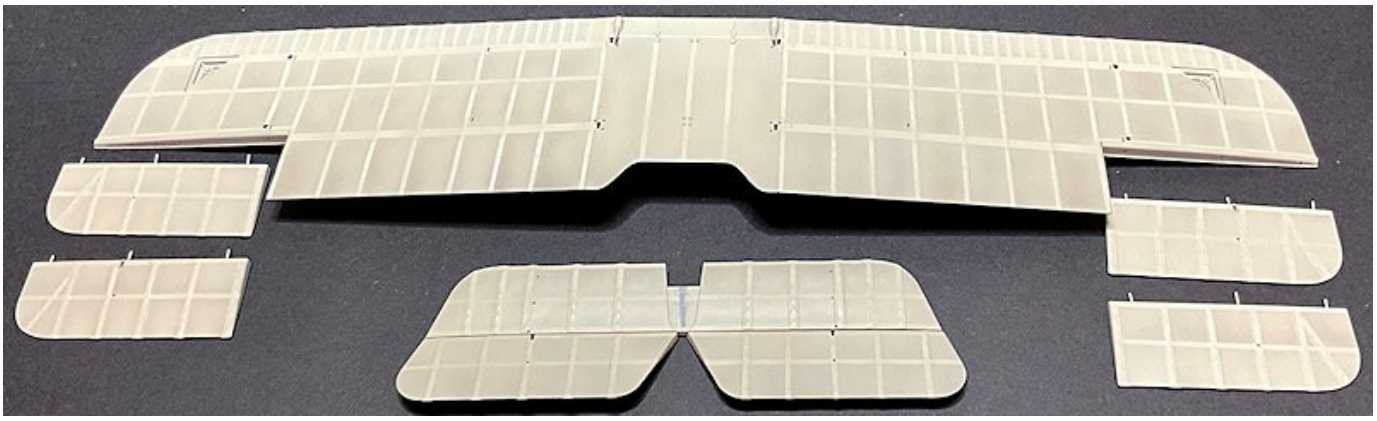
If necessary, to prepare the surfaces, rub the painted surfaces with a lint free or microfibre cloth to smooth out the surfaces.

NOTE: *A clear semi-gloss coat is applied to seal and protect the painted surfaces.*

Airbrush a semi-gloss clear coat, such as ‘Tamiya’ Semi-Gloss (X35) or similar over the undersides of the painted surfaces.

Remove all masking, ‘UHU’ white tach and sponge from the model, except where applied over the cockpit opening, windscreen/Aldis gun sight, transparent window and strut locations. That masking is necessary during the painting of the upper surfaces.





NOTE: *The ‘Protective Covering’ (PC) coloured dope applied to the upper surfaces was also wrapped over the edges and slightly onto the underside, forming a lip on the underside surfaces.*

Mask off the **undersides** of the following, leaving approximately 1.5 to 2 mm exposed around the outer edges:

Upper wing.
Lower wings.
Fuselage
Upper and lower ailerons.
Tailplane.
Elevators.

Mask off the red painted nose of the fuselage.

NOTE: *The following paint mix is intended to represent 'Protective Covering' (PC) 10 dope, which produced a green/brown colour, although the exact shade is still a point of contention.*

Airbrush the upper surfaces and underside edges with a mix of 'MRP' Acrylic Lacquer Khaki Green No.3/63 (MRP-333), Dark Green (MRP-110) and Dark Wood (MRP-262) to a ratio of approximately 40/40/20%. This will give a brown base colour.

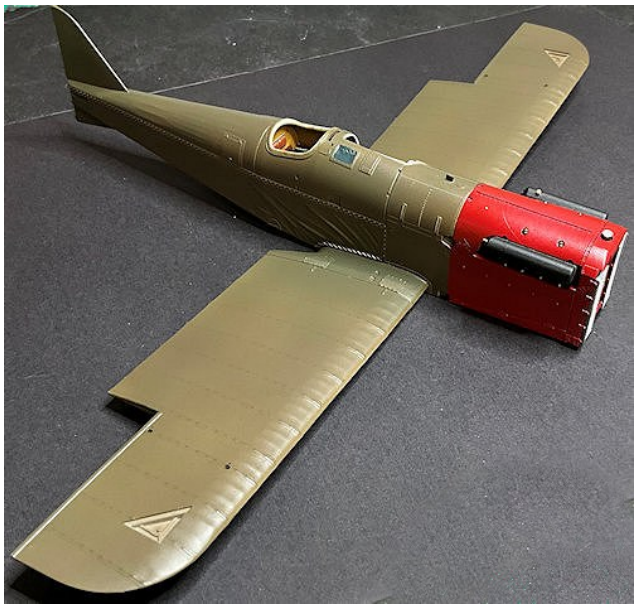
Airbrush a **light coat** over the upper surfaces with 'MRP' Acrylic Lacquer Dark Green (MRP-110) to create the green tinted PC10 doped finish.

Remove fuselage panel A68 panel.

Remove all remaining masking tape, 'UHU' white tack and sponge from all painted parts, including the fuselage/lower wing assembly.

Using a wood tooth pick or similar, remove the liquid masking from the inner and outer surfaces of the fitted transparent window (C9).

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



Brush paint the two radiator cooling matrix with ‘Tamiya’ Rubber Black’ (XF85) or similar.

Brush paint the following with ‘Mr. Color’ Stainless steel (213) or similar:

Radiator cap/filler.
Four step plates on the lower wings.
Operating rod (for radiator shutters) on the radiator housing.

Assembly (continued):

Test fit the landing gear axle/fairing into its locating recesses and holes in the landing gear struts.

Test fit the landing gear struts into their locating recesses in the underside edges of the fuselage.

Cement the landing gear axle/fairing into its locating recesses and holes in the landing gear struts.

Before the cement sets, test fit the landing gear assembly into the fuselage.

Once the cement has fully set, remove the landing gear assembly from the fuselage.

Using thin CA adhesive, secure the two radiator shutters between their locating lugs at the front of the radiator cooling matrix. Make sure the operating rod towards the bottom of the shutters are aligned to the rod on the radiator housing.

NOTE: *Before fitting the engine into the fuselage, test fit the engine and the 3D printed top access panel and make sure the four fuel priming cups on the engine are centrally position in their access holes in the panel. Also, make sure the exhaust pipes align with the engine ports and the support brackets on the fuselage sides (refer to my later correction on page 103).*

Cement the engine onto the two engine bearers, making sure it’s correctly positioned under the top access panel.

Using thin CA adhesive, secure the top access panel onto the fuselage front edge and sides and the top, rear of the radiator.

Painting (continued):

Airbrush all remaining parts with a grey primer, such as 'Mr. Surfacer' Grey 1500 or similar:

Airbrush the following with 'Tamiya' NATO Black (XF69) or similar:

Aldis gun sight (A69) and supports (A7, A8).

Exhaust pipe supports (A70, A71).

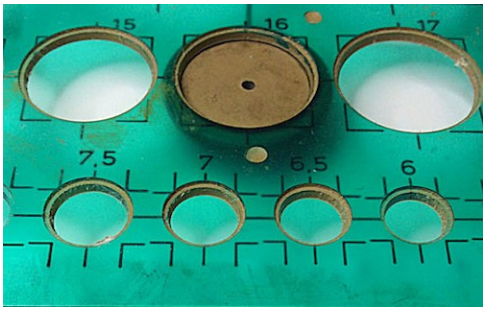
Aileron control horns (A29).

Elevator control horns (A21).

Tyres around wheels (A6).

Airbrush the following with a mix of 'MRP' Acrylic Lacquer Khaki Green No.3/63 (MRP-333), Dark Green (MRP-110) and Dark Wood (MRP-262) to a ratio of approximately 40/40/20%.

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



Outside of the wheel covers on the wheels.

Landing gear assembly.

Airbrush a **light coat** over the painted wheel covers and landing gear assembly with 'MRP' Acrylic Lacquer Dark Green (MRP-110) to create the green tinted PC10 doped finish.

Airbrush the following with a mix 'Tamiya' White (XF2) and Deck Tan (XF55) at approximately 90/10%. To take away the intensity of the white:

Outer wheel covers (A26).

Rudder (A11).

Airbrush both exhaust pipes (A1, A2) with 'Tamiya' Gloss Black (X1) or similar.

Airbrush the two exhaust pipes with a matte clear coat, such as 'Tamiya' (X86) or similar.

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

I first applied the exhaust pipes with 'Flory Models' Rust fine clay wash.

That wash was carefully removed to leave light traces on the exhaust pipes.

The pipes were then sealed with another light coat of the matte clear coat.

I then applied 'Flory Models' Grey fine clay wash.

That wash was carefully removed to leave light traces on the exhaust pipes.

I then lightly sponged 'Tamiya' Weather Master Set B (Soot) around the outlets of the exhaust pipes.

Airbrush the interplane struts (A23, A24, A50 and A51) with ‘Tamiya’ Desert Yellow (XF59) or similar.

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

Brush ‘Windsor & Newton’ Griffin Alkyd **Raw Sienna** oil paint over the four interplane struts.

Remove residual oil paint to achieve the desired wood effect.

Brush paint the following with ‘Tamiya’ Semi-Gloss Black (X18) or similar:

Interplane strut end fittings.

Pitot Static pipes and brackets on interplane strut (A24).

Gun sight (A20) on fuselage panel (A68).

Tailskid control horn on tailskid (A48).

Main and auxiliary axle inboard ends on the landing gear.

Brush paint the metal plates at the win roots and rubber connectors in the pipes on the upper wing ‘Tamiya’ Flat Black (XF1) or similar.

Brush paint the following with ‘Tamiya’ Deck Tan (XF55) or similar:

Inside ‘floors’ of the aileron inspection triangles in the underside of the upper wing, top surface of the lower wings and the tailplane.

‘Bungee’ cord suspension on both ends of the landing gear axle.

Brush paint with ‘Tamiya’ Red Brown (XF64) or similar the frames inside the aileron inspection triangles in the underside of the upper wing, top surface of the lower wings and the tailplane.

Brush paint with ‘Mr. Metal Color’ Stainless Steel (213) or similar the control cables and pulleys inside the aileron inspection triangles in the underside of the upper wing, top surface of the lower wings and the tailplane.

NOTE: *The transparent centres of the windows over the aileron control pulleys must be masked before painting. Also, slight differences in the shade of the painted edges is required as they were made of metal, not linen.*

Using masking tape, cut eight triangles with 4.5 mm long sides from the 90 degree angles.

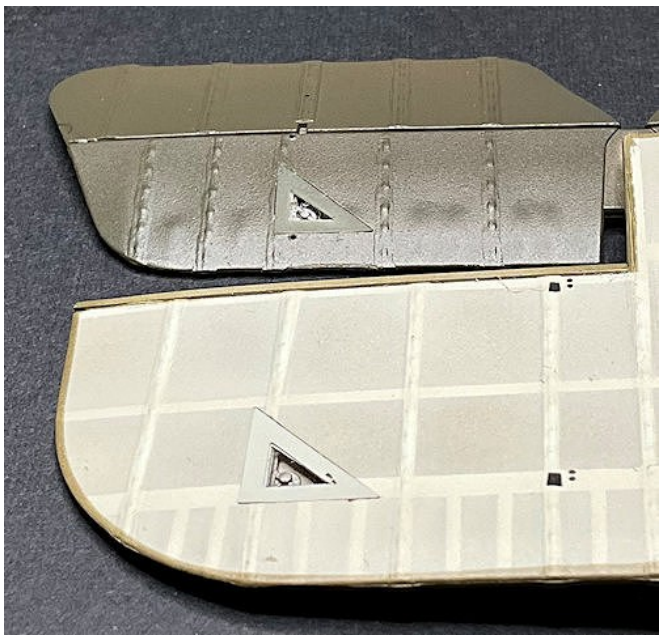
Apply the masks to the centre sections on both sides of the wings transparencies C1, C2, C3 and C4.

Airbrush over the exposed edges of the four transparencies with ‘MRP’ Acrylic Lacquer Dark Green (MRP-110).

Repeat the above procedure on the tailplane transparencies C5 and C6.

Remove the masks.

Using a PVA adhesive, such as ‘Microscale’ Krystal Klear or similar, apply small drops into the corners of the relevant aileron inspection openings and secure the transparencies in position.



Mask of the windscreen on transparency C8.

Airbrush over the exposed edges with ‘MRP’ Acrylic Lacquer Dark Green (MRP-110).

Remove the masking.

Using a PVA adhesive, such as ‘Microscale’ Krystal Klear or similar, apply the adhesive along the locating slot in front of the cockpit for the windscreen.

Secure the windscreen fully into the fuselage locating slot.

Brush paint the cockpit surround padding with ‘AK Interactive’ Brown Leather (AK3031) or similar.

Modifications (continued):

Cabane strut wrapping:

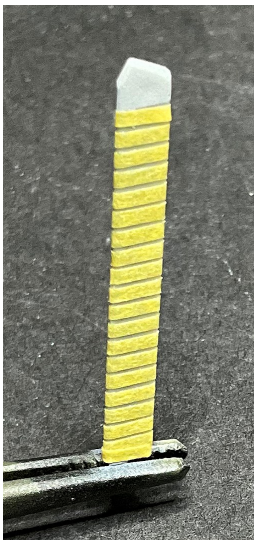
NOTE: *The four cabane struts between the fuselage and upper wing were wrapped with thin linen strips, which were painted with the same PC10 coloured dope used for the rest of the upper surfaces of the aircraft.*

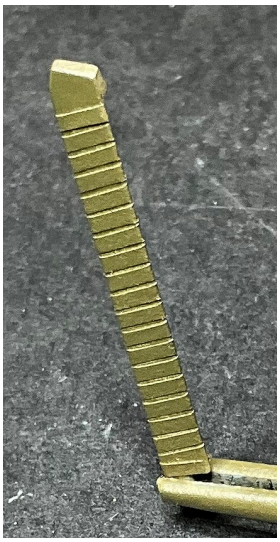
To represent the linen wrapping around the four fuselage cabane struts, I used ‘Tamiya’ 1.0 mm wide masking tape. This was wrapped around each strut aligned to the fuselage end fittings. I left a slight gap between the wraps, otherwise when painted the wrapping would merge together and look as though the struts were just painted, not linen wrapped.

Lightly airbrush the wrapped struts with a grey primer, such as ‘Mr. Surfacer’ 1500 or similar. Do not apply the primer to heavily or the gaps between the wraps will be filled.

Airbrush the struts with a mix of ‘MRP’ Acrylic Lacquer Khaki Green No.3/63 (MRP-333) and Dark Green (MRP-110) to a ratio of approximately 60/40%.

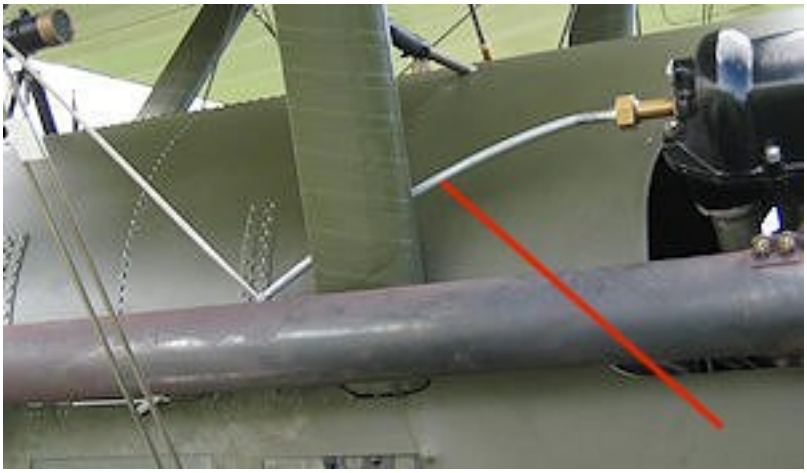
Airbrush a **light coat** over the struts with ‘MRP’ Acrylic Lacquer Dark Green (MRP-110) to create the green tinted PC10 doped finish.



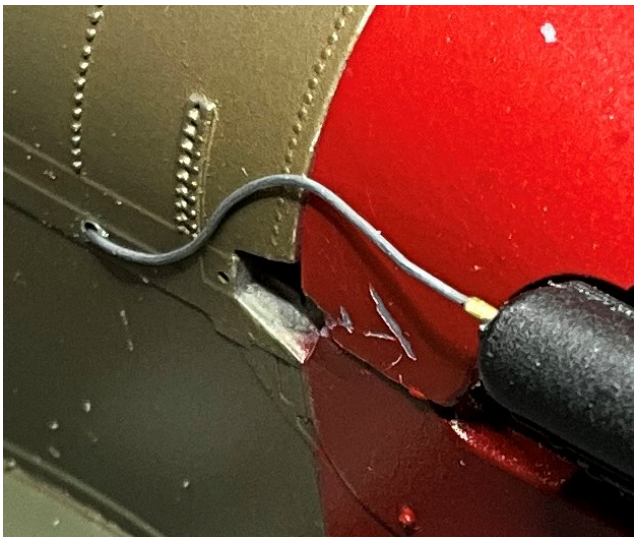


Tachometer drive:

NOTE: *The rear of an engine cam shaft cover had the Tachometer drive attached. On the 'Shuttleworth Collection' Viper powered SE5a the drive was routed rearwards from the right cam shaft cover and down into the fuselage at the bottom of the fuselage rear, right cabane strut.*

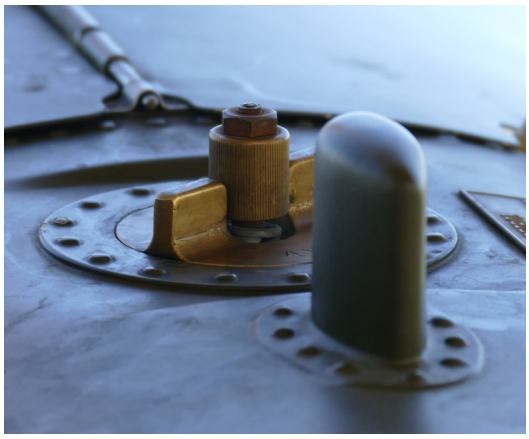


To represent the drive connection I drilled a hole of 0.5 mm diameter into the rear end of the cam shaft cover and inserted a short length of 0.5 mm diameter Brass tube ('Albion Alloy's' MBT05). A hole of 0.5 mm diameter was drilled into the fuselage side aligned to the bottom edge of the engine access panel and rear of the forward, right cabane strut.
A 'PlusModel' 0.3 mm diameter lead wire was cut to represent the drive cable. With the forward, right cabane strut temporarily fitted into its locating recess, the wire was inserted into the tube and fuselage hole around the lower, rear of the strut and secured at both ends with thin CA adhesive.



Fuel tank cap:

NOTE: *The filler cap for the main fuel tank, located on the centre of the decking panel (forward from the cockpit) is not represented on the kit model.*

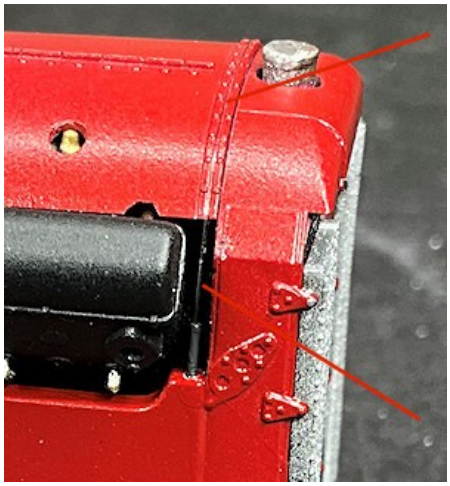


To represent the filler cap, I drilled a hole into the centre of the flat, pre-molded cap in the top of the fuselage. I then cut a short length of 0.8 mm diameter rod, such as that from 'Albion Alloy's' or similar. I also cut two short lengths of 0.3 mm diameter Brass rod. Using thin CA adhesive I secured the 0.8 mm diameter rod into the pre-drilled hole then secured the two shorter rods each side of the rod. Once the adhesive had fully set, I carefully brush painted the cap with 'Mr. Metal Color' Brass (219).

Panel strap:

NOTE: *The top access panel over the engine was retained in position at its front edge by a retaining strap that was attached to the fuselage sides.*

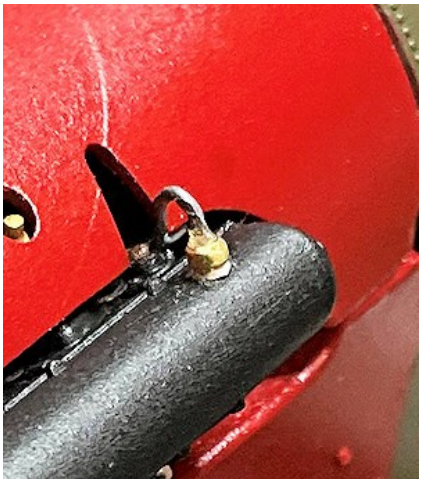
To represent the retaining strap I first cut two short lengths of 0.4 mm Diameter Brass tube, such as 'Albion Alloy's' MBT04 or similar. I then cut a long length of 0.12 mm diameter mono-filament, such as that from 'Steelon' or 'Stroft GTM'. I frilled a hole of 0.5 mm diameter vertically into the top, forward edge of the nose side panels. One end of the line was secured into a tube using thin CA adhesive then the tube was secured into one of the pre-drilled holes. The line was then laid over the front edge of the top panel and down to the top edge of the fuselage side Panel and cut at that point. The second tube was slid onto the line then inserted into the remaining pre-drilled hole. The tube was secured in position using thin CA adhesive then holding the line taut over the panel, it was secured into the tube. Finally both tubes were brush painted with 'Tamiya' Rubber Black (XF85).



Air pump pipe:

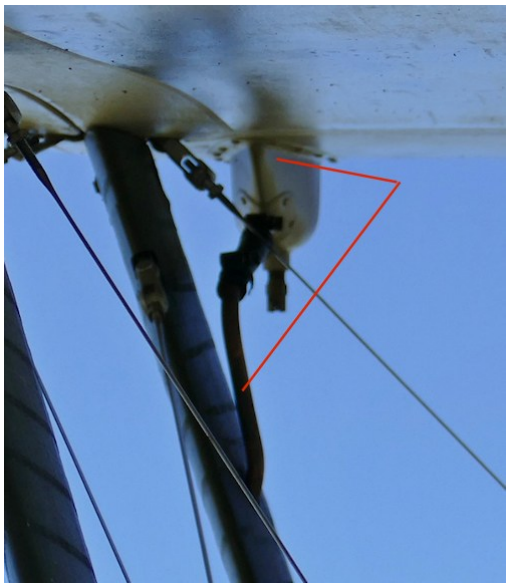
NOTE: *A pipe was connected to the centre, top of the air pump and was routed over and under the engine covering panel.*

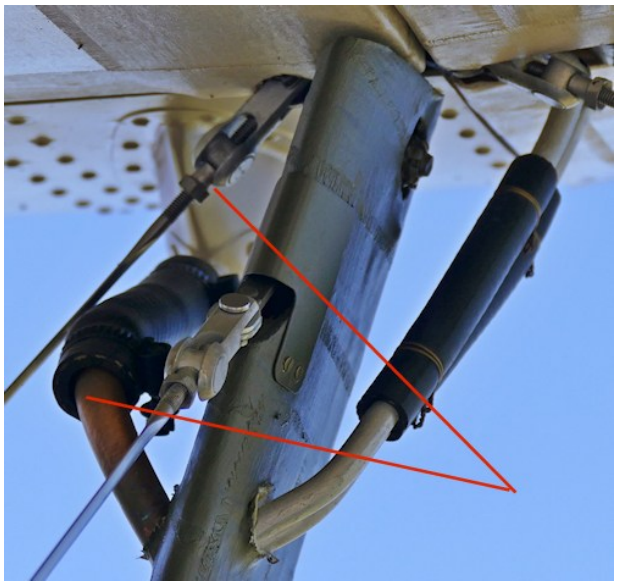
To represent the pipe for the air pump I cut a short length of 'PlusModel' 0.4 mm diameter lead wire and bent it to shape, then secured it to the centre of he air pump and the bottom, inner edge of the 3D printed engine access panel.



Auxiliary tank pipes:

NOTE: *The auxiliary fuel tank in the upper wing supplied fuel to the main fuel tank through two pipes attached to collectors on the underside of the upper wing. The pipe on the right side was routed down the right cabane strut then through a pipe across into the fuselage. The pipe on the left side was routed down the strut and into the fuselage at the bottom of the strut.*

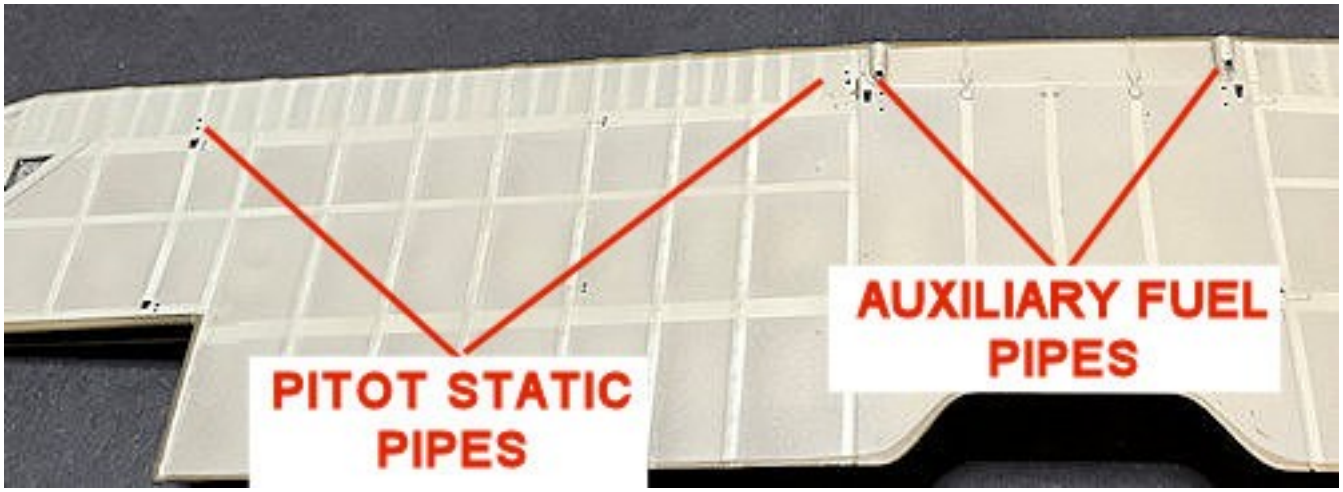




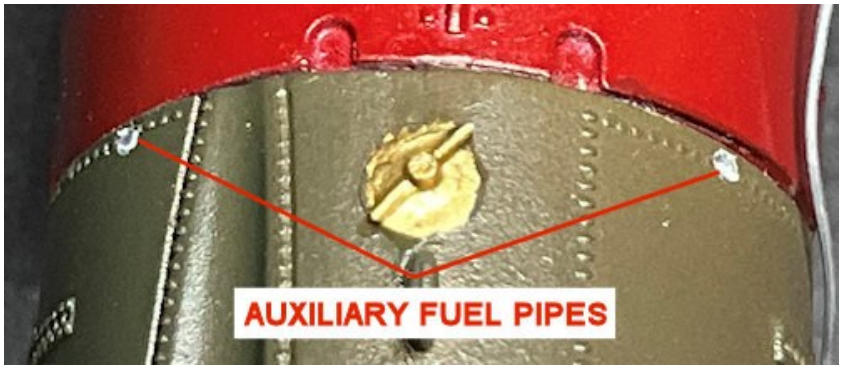
NOTE: *In the following step the tubing used is 'MFH' 0.4 mm diameter flexible black tube (P-961).*

Cut away the two pre-molded fuel pipes from the ends of the two fuel collector tanks on the underside, leading edge of the upper wing centre section.

Using the witness marks as guides, drill a hole of 0.5 mm diameter into the fuel collector tanks. These will be used to locate the auxiliary fuel pipes from the inboard, tops of the forward cabane struts.



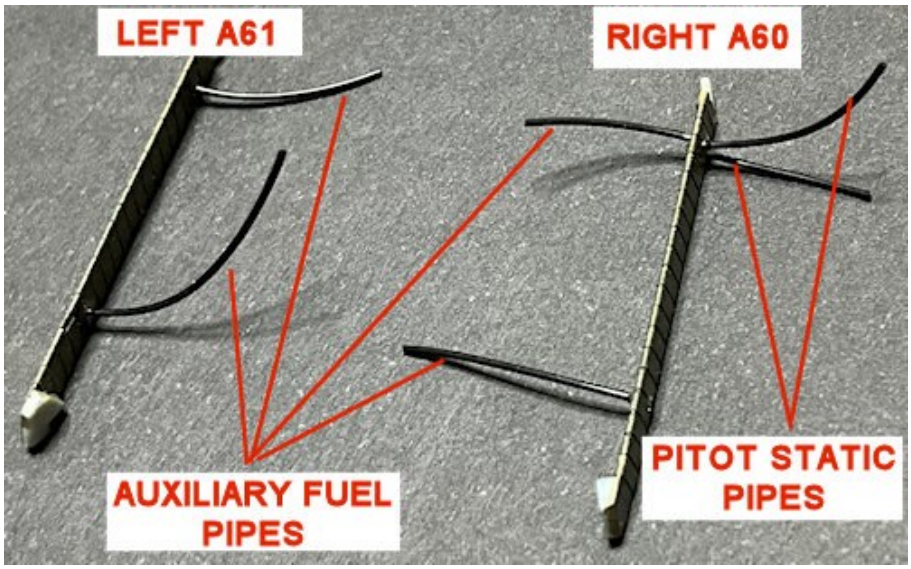
Drill a hole of 0.5 mm diameter into both sides of the fuselage panel (as shown). These will be used to locate the auxiliary fuel pipes from the inner, bottoms of the forward fuselage cabane struts.



Drill two recesses of 0.5 mm diameter into, **but not through**, the top and bottom inboard surfaces of the fuselage forward cabane struts A60 (right) and A61 (left), as shown in the following photograph.

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

Using thin CA adhesive, secure a pipe into each of the four recesses.



Pitot pipes:

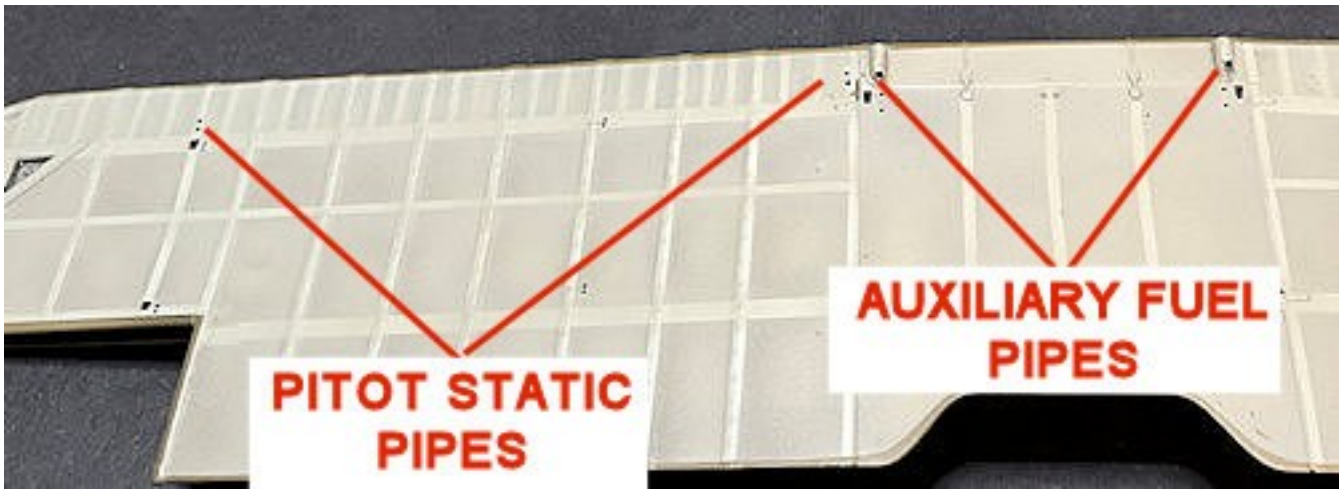
NOTE: *The two pitot static pipes are mounted on the forward, right interplane strut. The pipes were routed up into the upper wing and then out and down the forward, right fuselage cabane strut into the fuselage.*

Cut away the pre-molded pitot static pipes from the top, front of the right, forward interplane strut (A24).

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

Using thin CA adhesive, secure the two pipes next to each other onto the removed pipes area of the strut.

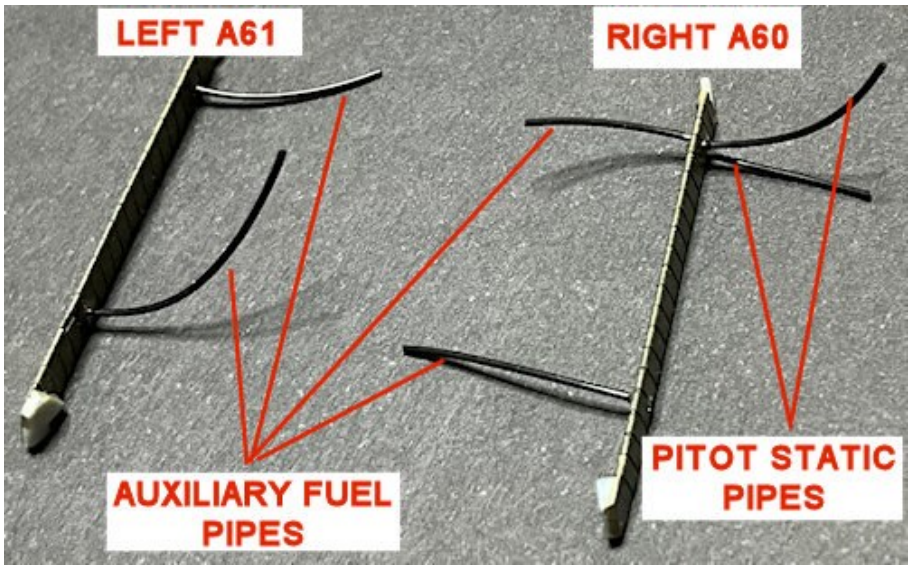
Drill two holes of 0.5 mm diameter into, **but not through**, the right underside leading edge of the upper wing and forward from the right, forward interplane strut and also outboard from the auxiliary fuel collector tank. These will be used to locate the pitot static pipes from the interplane strut and fuselage cabane strut.



Drill two recesses of 0.5 mm diameter into, **but not through**, the outboard, top of the fuselage forward cabane struts A60 (right), as shown in the following photograph.

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

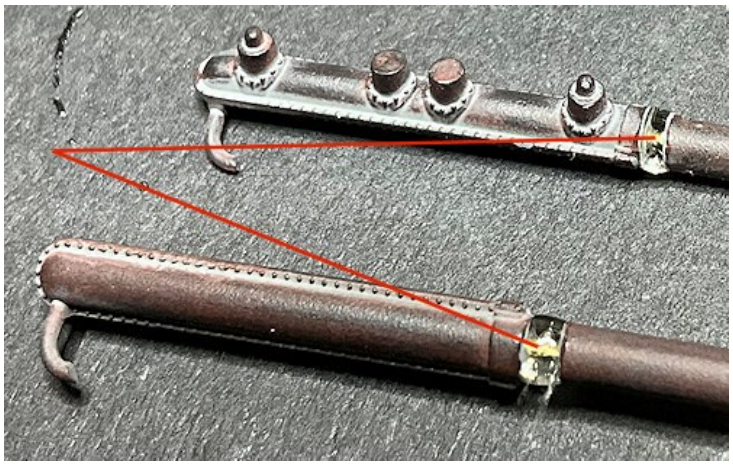
Using thin CA adhesive, secure a pipe into each of the two recesses.



Engine exhaust pipes:

NOTE: *When I fitted the engine into the fuselage, I did not account for alignment of the exhaust pipe support brackets to their locating recesses in the fuselage sides. Consequently the brackets were slightly too far forwards from their locating recesses. Therefore, I had to modify the two exhaust pipes to move back and align the brackets to their locating holes/recesses in the fuselage sides.*

To correct the exhaust pipes I first cemented the rear exhaust support brackets (A70, A71) into their locating slits in the rear, inboard side of the exhaust pipes, making sure they were located the correct way in the pipes. I then cut through the exhaust pipes at the rear edge of the main manifolds. A hole of 0.5 mm diameter was drilled centrally into both cut ends of each exhaust pipe. A short length of 0.5 mm diameter Brass rod, such as that from 'Albion Alloy's' or similar was secured into the pre-drilled holes in the main manifolds using thin CA adhesive. The exhaust pipes were then located onto the exposed rods and the assemblies positioned into the locating holes in the engine cylinder heads. The pipes were moved/twisted until the support brackets aligned to their locating hole/recesses in the fuselage sides. Thin CA adhesive was then applied to secure the pipes to the exposed rods. Once the adhesive had fully set, I applied UV setting clear resin to fill the gaps in the pipes and to further secure them together.



The resin infill was then carefully filed/sanded to blend with the surrounding surfaces of the exhaust pipes, then primed and painted, as before, to blend the joints with the exhaust pipes.

Decals (continued):

'Aviattic decals:

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

The 'Aviattic' linen decals are unlike normal screen printed decals, in that when being applied, have the ability to be handled with slightly less care than normal and they have the ability to stretch slightly, which standard decals do not. That said, if you handle them too roughly, damage can occur.
Make sure the model surface for each decal to be applied is clean and smooth or irregularities/particles on the surface may cause 'silvering' (trapped air) under the decals when dry.
These 'Aviattic' CDL decals being used are not 'cookie' cut to the shapes required. Therefore the decals must be hand cut to shape.

Surface finish:

NOTE: *The painted surfaces must be smooth and free of any surface imperfections, roughness and dust in order to prevent decal 'silvering', which is where air is trapped under the applied decal and shows as silvering through the dried decal.*

A clear gloss coat can be applied to seal and protect the painted surfaces and to provide a good base for decals. For example, the clear gloss coating used can be 'Mig' A-Stand Aqua Gloss (A.Mig-2503) or 'Tamiya' Clear Gloss (X22). If using 'Tamiya' (X22), I thin it with 'Mr. Hobby' Rapid Thinners, as this makes it easier to airbrush and also tends to give a more sheen finish than the standard 400 Levelling thinners.

Example of applying 'Aviattic' decals:

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

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

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

Carefully cut out the decal shape.

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

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

Wet the model surface with the warm decal water.

Dip the decal in the warm decal water for **approximately 5 seconds only**, then remove a lay on a clean, non-absorbent surface just long enough to be able to move the decal on its backing sheet.

Carefully slide the decal off one end of the backing paper and position the decal end onto the surface and holding that end, slide out the backing paper, making sure the decal does not fold over on itself, as it will be difficult to separate a fold over decal.

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

Once the decal is smoothed down onto the model surface, apply pressure along the decal with soft and dry tissue paper or by finger pressure whilst wearing lint free cotton gloves. This will expel any remaining water and press the decal on to the model surface.

Check over the decal to make sure there are no tears or folds, which need to be rectified before the decal sets.

Paper templates:

Some surfaces of models that require covering with a decal can be problematic due to their shape. In this case, cut out a paper template to check against the models surface and once happy, use that template to trace out the shape on the blank, rear of the actual decal sheet.

Preparation:

If necessary, to provide a good decal surface, rub the painted surfaces with a lint free or microfibre cloth to smooth out the surfaces.

If necessary airbrush several light coats of a clear gloss over the surfaces of the model parts that are to have decal applied.

Make sure the both sides of the following parts are smooth and free from any surface imperfections, roughness and dust:

Upper wing and ailerons.

Lower wings and ailerons.

Tailplane.

Elevators.

Wheel inner covers.

Wheel outer covers.

Upper surfaces:

Upper wing:

NOTE: *Due to the size of the upper wing, it's best to apply the 'Aviattic' decals in separate sections. I cut two separate decals for the wing outer sections.*

Using the previous example as a guide, cut out the two separate decals.

Apply the decals to the outer sections (not the centre section) of the upper wing.

Lower wings:

Repeat the procedure to apply decals to the lower wing.

Once the decals start to set, use a sharp blade to carefully cut around the triangular aileron inspection windows and metal foot plates and remove the decal from those areas.

Tailplane:

Repeat the procedure to apply decal across the top surface of the tailplane.

Once the decals start to set, use a sharp blade to carefully cut around the triangular aileron inspection windows and remove the decal from those areas.

Elevators:

Repeat the procedure to apply decal across the top surfaces of the elevators.

Ailerons:

Repeat the procedure to apply decal across the top surface of the four ailerons.

Underside surfaces:

Repeat the previous procedures to apply decal to the undersides of the upper and lower wings, tailplane, elevators and the four ailerons. On the undersides of the lower wings, once the decals start to set, use a sharp blade to carefully cut around the triangular aileron inspection windows and remove the decal from those areas.

Fuselage:

NOTE: *Not all of the fuselage should have decal applied. The fuselage forward and decking panels were painted with dope, but were not linen covered.*

Fuselage sides:

NOTE: *Due to the pre-molded linen 'folds' in the fuselage sides, care must be taken to ensure the applied decal is fully against the surfaces in and between the linen 'folds', otherwise 'silvering' may occur when the decal dries and sets.*

Cut a paper template to fit over the fuselage sides below the horizontal and behind the vertical stitching rows.

Check the template covers the areas fully.

Use the template as a guide to trace the outline of the fuselage left and right side decals on the blank, rear of the decal sheet.

Accurately cut out the decal shapes.

Apply the decals to the fuselage sides, making sure the decals are aligned at the 'stitching' rows and to the bottom edges of the fuselage. Make sure the decals are fully against the surfaces in and between the linen 'folds'

Fuselage top surface:

NOTE: *The top of the fuselage that requires a decal is from the rear of the cockpit to the rear end of the fuselage and also down each side to the tops of the horizontal 'stitching' rows. The decal also requires a cut-out for around the base of the fin.*

Cut a paper template to fit over the fuselage top and sides.

Check the template covers the area fully.

Use the template as a guide to trace the outline of the decal on the blank, rear of the decal sheet.

Accurately cut out the decal shape.

Apply the decal to the fuselage top/sides, making sure the decal is aligned at the horizontal 'stitching' rows. Make sure the decal is fully against the surface.

Once the decal on the right side of the fuselage starts to set, use a sharp blade to carefully cut around the square access panel near the cockpit and remove the decal from that area.

Fuselage underside:

NOTE: *The fuselage underside decal required is from the rearmost panel line below the cockpit to the rear end of the fuselage. The decal requires a cut-out for around the tail skid.*

Cut a paper template to fit over the fuselage underside.

Check the template covers the area fully.

Use the template as a guide to trace the outline of the decal on the blank, rear of the decal sheet.

Accurately cut out the decal shape.

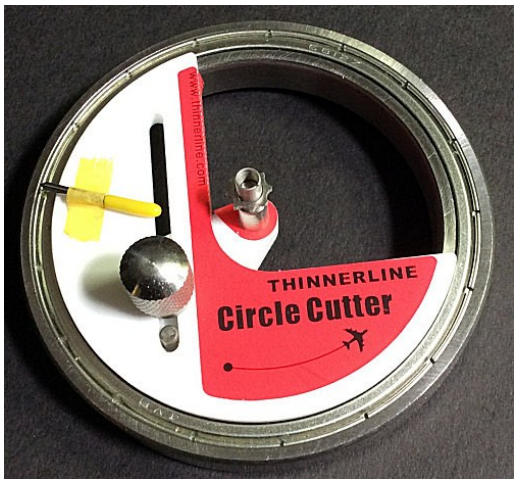
Apply the decal to the fuselage underside, making sure the decal is aligned at the edges of the fuselage and to the panel line. Make sure the decal is fully against the surface.

Fin:

Repeat the previous procedures to apply decal to both sides of the fin.

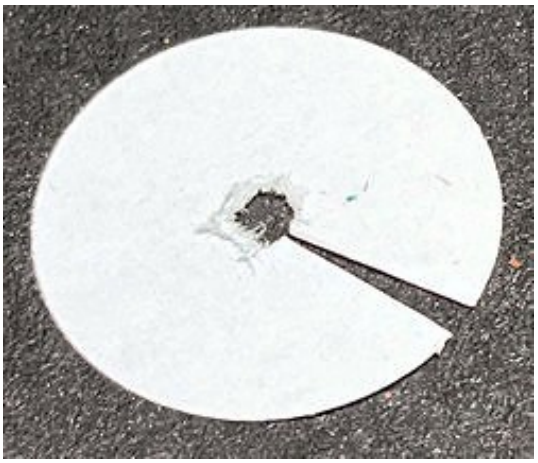
Wheel covers:

NOTE: *To cut these circular decals I used a 'Thinnerline' circle cutter. Other circle cutters are available, such as that from 'DSPIAE'.*



Outer wheel covers:

NOTE: *Due to the conical shape of the outer wheel covers, the decals need to have a narrow cut-out to allow the decals to conform to the covers without distortion.*

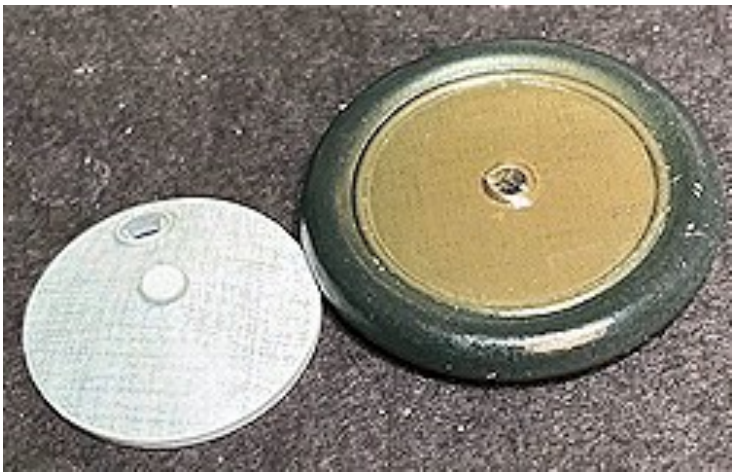


Use the circle cutter to cut a circular template from paper until the template is of the correct diameter to fit into the rear wheel cover.

Cut a shallow triangle through one side of the template and test fit the template onto the outer wheel covers. Make sure the template reaches the edges of the cover and the edges of the cut-out join without any overlap.

Cut two circular decals from the decal sheet.

Use a 2.5 mm diameter drill to drill through the centre of decals (to fit over the centre wheel hub).



Apply the decals to the wheel covers.

Inner wheel covers:

Use the circle cutter to cut a circular template from paper until the template is of the correct diameter to fit into the rear wheel cover.

Cut two circular decals from the decal sheet.

Apply the decals to the wheel covers.

Sealing decal edges:

NOTE: *If the decal covers locating holes, slots or other openings, wait until the decal is fully dry and set then prick through the decal over holes or slice the decal over openings, then brush either 'MicroScale' MicroSol' or* ***sparingly*** *'Tamiya' X20A thinners into the holes or around the openings. This will soften and conform the decal. If the decal needs to be conformed around curved edges etc, brush* ***sparingly*** *'Tamiya' X20A thinners across the decal edge. This will soften and conform the decal. Any excessive overhang of decal at edges can be removed by trimming using a sharp blade, such as a shielded razor blade or carefully sanding the edges, taking care to avoid damaging the painted surfaces.*

Assembly (continued:

Cement the Vickers machine gun fully into its locating slots in the cockpit gun mountings.

Cement the fuselage panel A68 over the Vickers machine gun and onto its locating edges on the fuselage opening.

Cement the two supports (A7, A8) onto the Aldis gun sight (A69).

Cement the Aldis gun sight assembly into the locating holes on the fuselage decking panel.

Cement the tail skid (A48) against its locating face on the rear of the tail skid fairing.

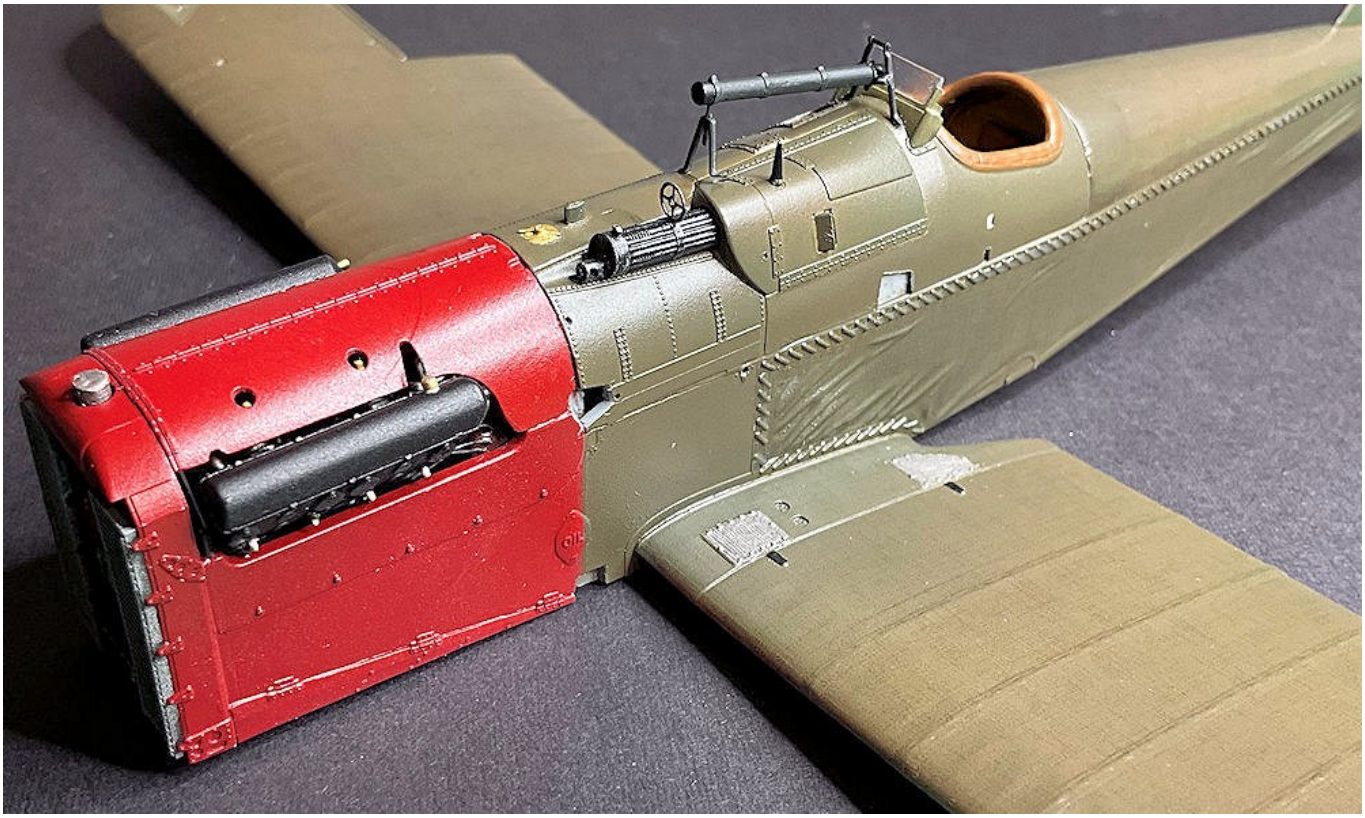
Painting (continued):

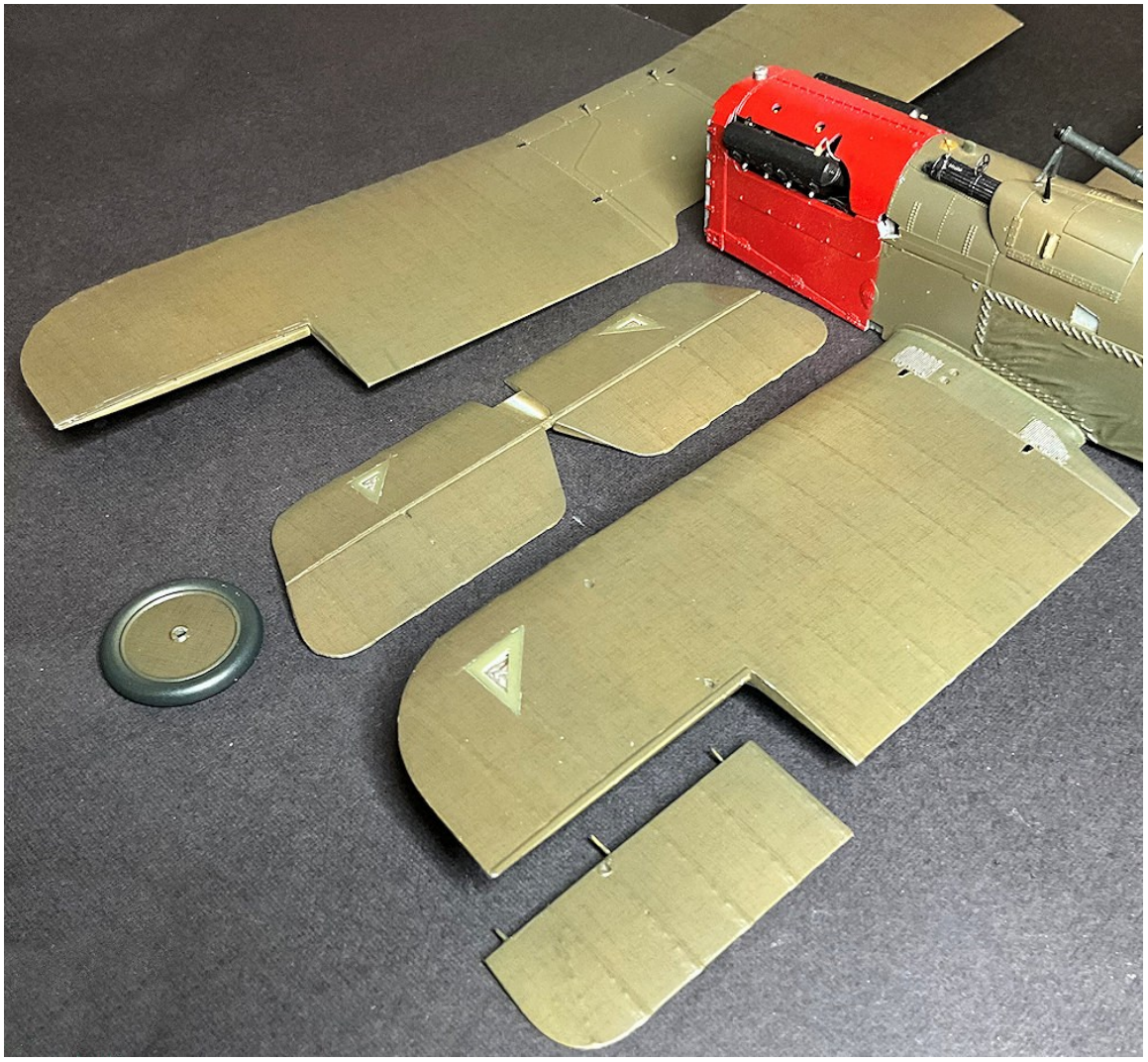
NOTE: *'Abteilung 502' Liquid Mask can be cleaned from a brush by agitating in 'De-Solv-It' Sticky Stuff Remover*.

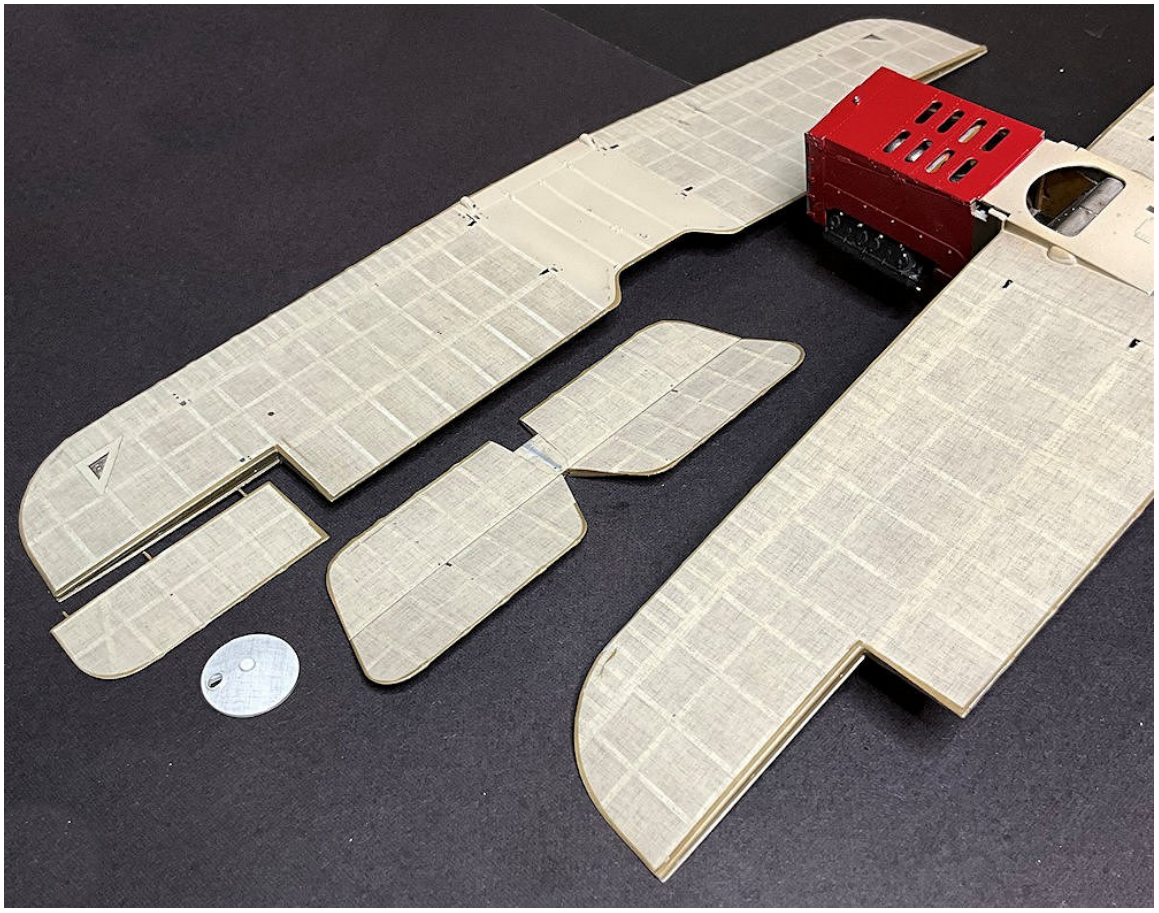
Protect the clear transparencies (windscreen, fuselage cockpit window and all six wing/tailplane aileron inspection windows), with a mask, such as 'Abteilung 502' Liquid Mask or similar.

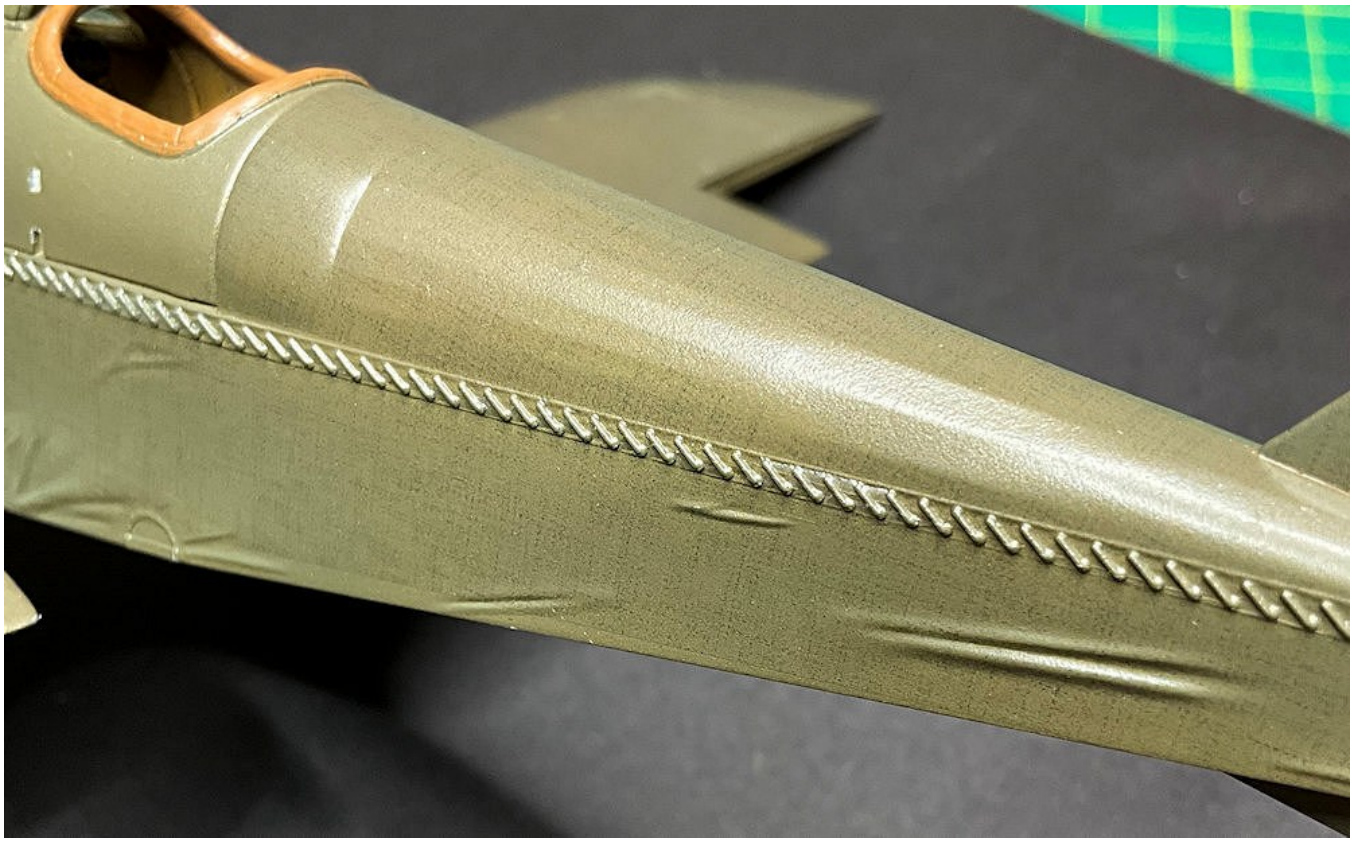
Airbrush a light layer of semi-matte clear coat, such as 'Tamiya' Semi-Gloss (X35) or similar, over all of the model and non-fitted parts (except the two exhaust pipes). This will seal applied decals and provide a good surface for applying weathering.

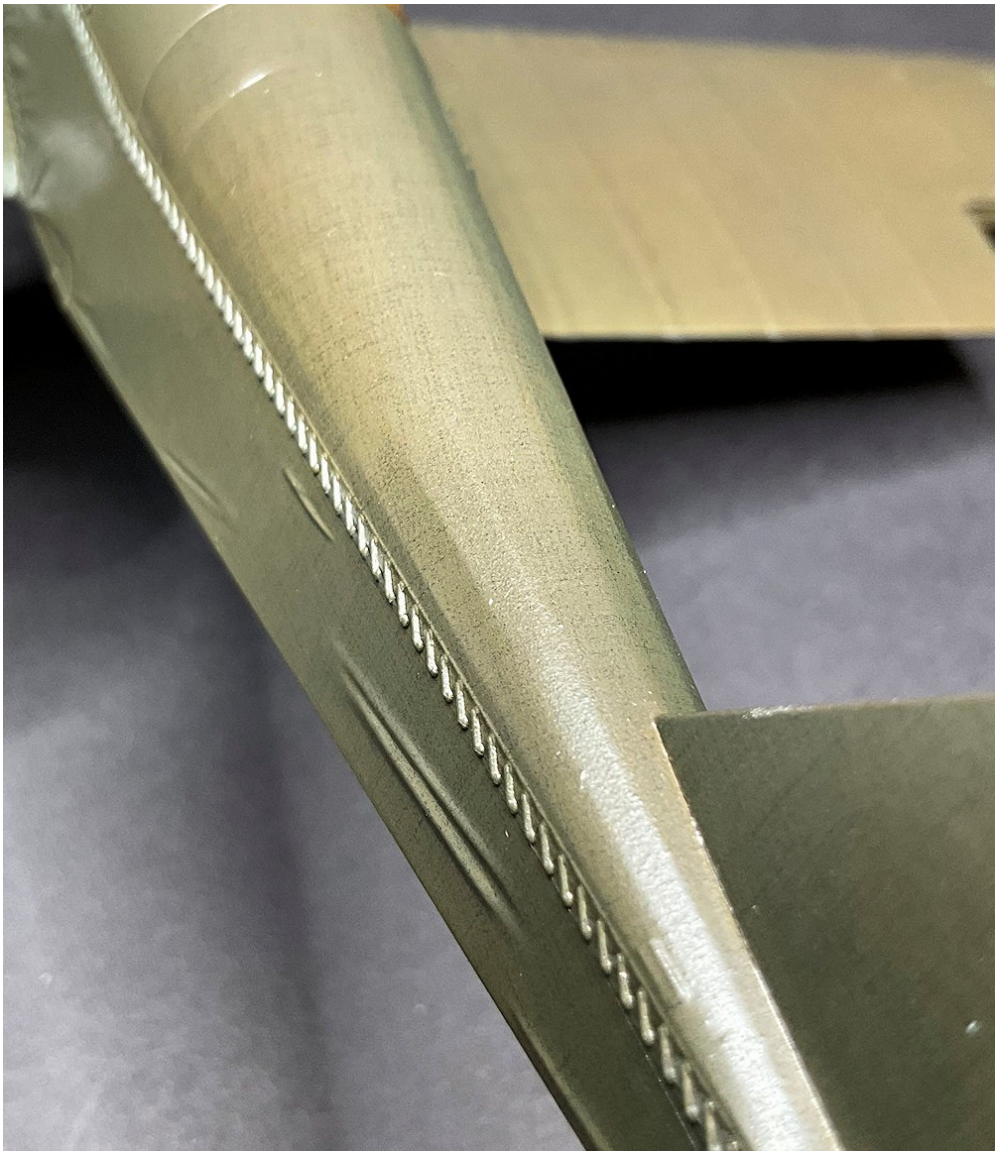
Use a wood toothpick to detach and remove the applied liquid mask from the transparencies on the upper and lower wings and tailplane.











Markings:

NOTE: *I chose to airbrush some of the various markings using specific masks made by Mark Beckwith at **'Making History Masks'** (https://making-history.ca/), with the remaining marks as decals supplied with the kit.*

The decal guide supplied in the 'Roden' kit of this aircraft shows the following:

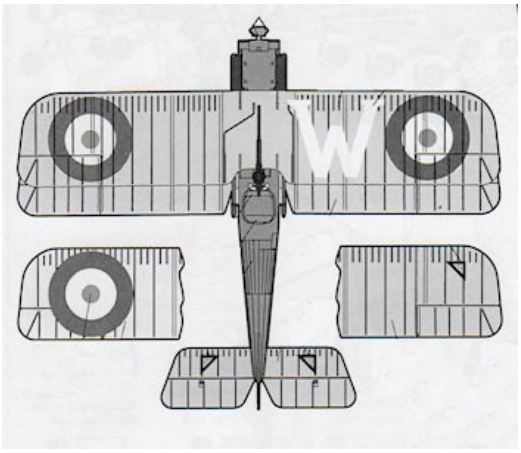
'Schweinhund' marking on the lower, front side of the fuselage. This marking was only on the left side of the fuselage.

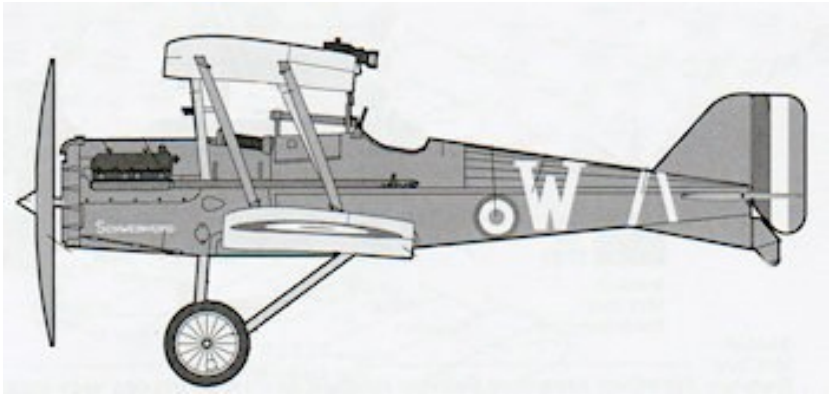
Two white angled stripes on both sides of the rear of the fuselage. This was the No.56 Squadron (RAF) marking in late 1918.

Large letter 'W' in white on both sides of the fuselage.

Larger letter 'W' in white on the top surface of the upper wing (right side).

RAF roundels on both sides of the fuselage, top surface of the upper wing and underside of the lower wings.





However, this aircraft was built by the Royal Aircraft Factory (RAF), who positioned the wing roundels further inboard than other manufacturers. This can be seen on photographs of other RAF built SE5a aircraft of No.56 Squadron, based on photographs in the following references:

The SE5 File - (Ray Sturtivant and Gordon Page).
British Aviation Squadron Markings of WW1 - (Les Rogers).

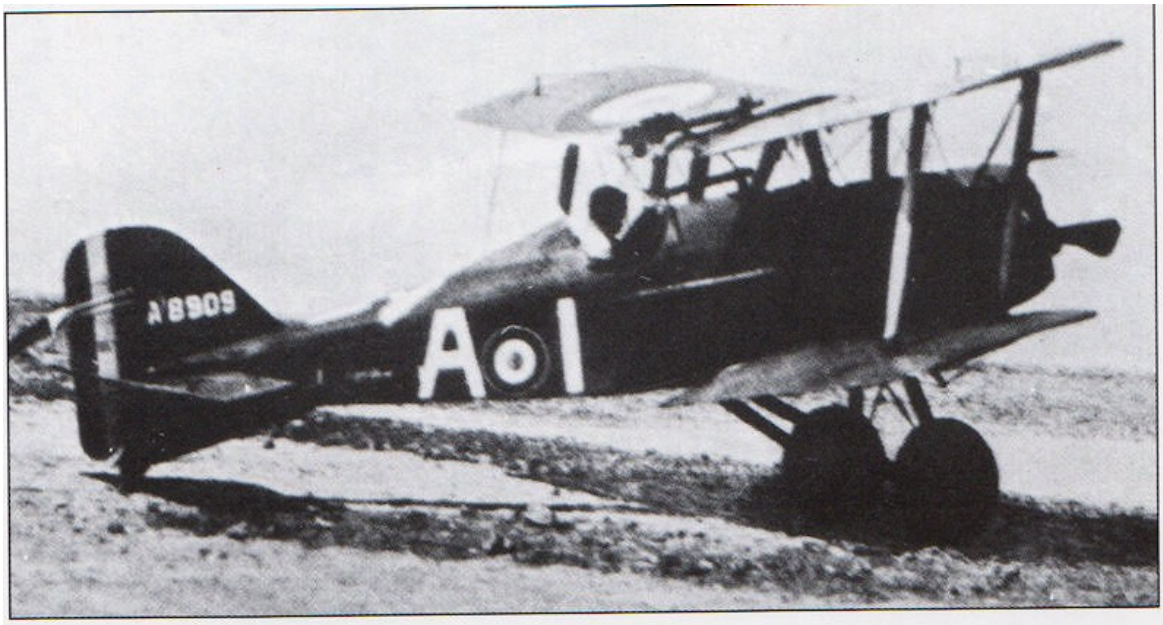
Serial No: A4853 'C2' of Lt. DS Wilkinson.

Serial No: A8909 'A1' of Capt. PB Prothero.

Serial No: A8913 'B2' of Lt. Muspratt.

Serial No: B4863 'G' of Capt. JB McCudden.

S.E.5 A'4853 "C2" of Lt. D.S. Wilkinson.



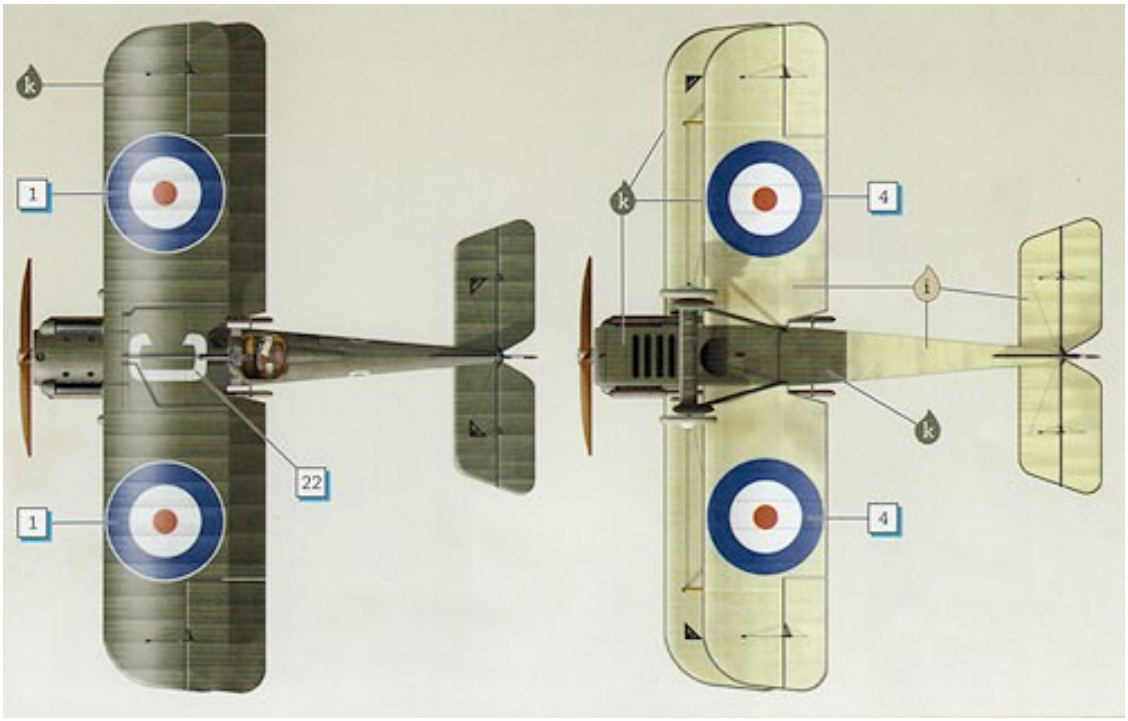
S.E.5 A'8909 "A1" of Capt. P.B. Prothero.

S.E.5 A'8913 "B2." Sgt. Vousden with Lt. Muspratt's S.E.5.

S.E.5a B'4863 "G." Capt. J.B. McCudden's S.E.5a.

As the only photographs of C1149 do not show clearly where wing roundels were positioned, I chose to ignore the 'Roden' decal guide and place the roundels as shown on the kit supplied profile 'C' of Serial No: C1057 of No.24 Squadron (refer to the following colour profile), also an RAF built aircraft.

This means that the white 'W' on the upper wing can't be positioned as shown on the 'Roden' decal guide. However, as can be seen on the kit supplied profile of C1057, its identification letter 'C' on the upper wing is on the centre section. Therefore, I chose to position the white 'W' onto the centre section.



Some Squadron's had the identification letters also applied usually to the underside of the lower right wing and in black. There is one photograph of an RAF built SE5a of No.56 Squadron that carries the identification letter 'R' on the underside of the lower, right wing and outboard (partly over the aileron) of the roundel.

Admittedly, it may not be the case that all No.56 Squadron aircraft carried an identification letter on the underside of the lower wing. However, as I'm altering the positions of the wing roundels and the upper wing 'W', I decided I may as well add a black 'W' to the lower, right wing.

Finally, it seems the serial number C.1149 was displayed on both sides of the rudder and was coloured black/white. The wheel tyres were marked with the 'Palmer Cord' manufacturers specification.

NOTE: *To paint the wing and fuselage roundels using the 'Making History Masks' requires repeated application and removal of the various parts of the mask. As this could have caused the applied 'Aviattic' Weave Linen effect decals to the model surfaces to lift off the surfaces. Therefore, I chose to only use the masks for the various 'W' and the serial numbers on the rudder. All of the remaining markings were made using the kit supplied decals.*

Temporarily fit the aileron to the lower, right wing.

Position the large 'W' mask centrally on the underside of the lower, right wing, with the mask overlapping onto the aileron.

Airbrush 'MRP' Black (MRP-255) or similar over the mask.

Carefully remove the mask from the wing.

Remove the aileron from the wing.

Position the mask onto the top surface of the upper wing and centrally onto the centre section.

Airbrush 'MRP' White (MRP-004) or similar over the mask.

Carefully remove the mask from the wing.

Position the smaller 'W' mask onto the side of the fuselage.

Airbrush 'MRP' White (MRP-004) or similar over the mask.

Carefully remove the mask from the fuselage.

Repeat the procedure on the other side of the fuselage.

NOTE: *Refer to Part 4 (Decals) of this build log. The fuselage roundels were cut from the kit supplied decals.*

Apply the roundels (without the outer white ring) to the underside of the lower wings.

Apply the roundels to the top surface of the upper wing.

Apply the fuselage roundels to both sides of the fuselage.

Apply the three 'Lift Here' decals to both sides of the fuselage.

Cut four strips (No.5) from the 'Xtradecal' Parallel Stripes (White XPS2) set.

Apply two strips to both sides of the fuselage rear (Squadron marking).

Apply the rudder stripes to the sides of the rudder.

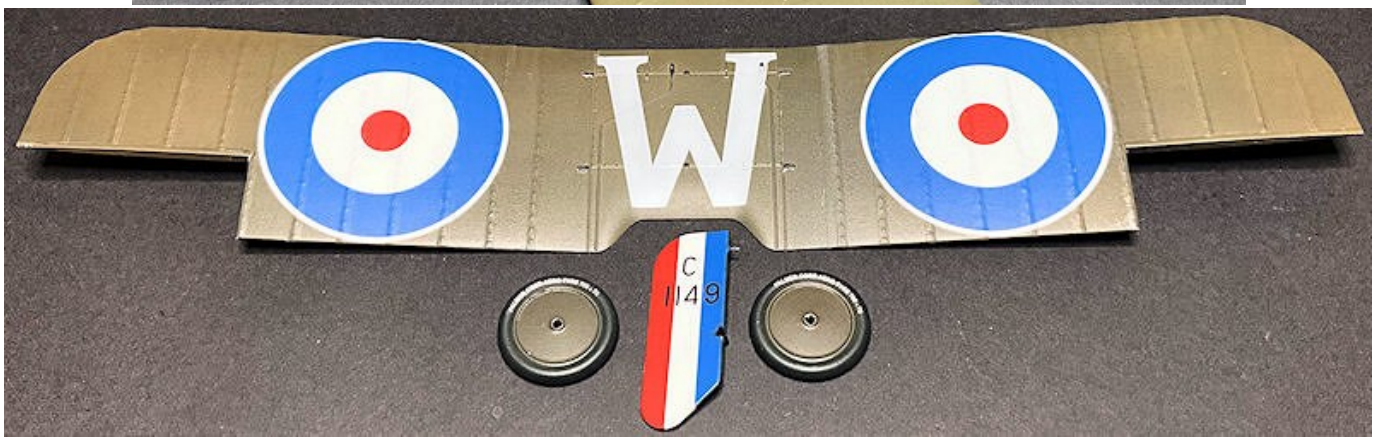
Apply the ‘Palmer Cord’ manufacturer decals to both sides of the wheel tyres.

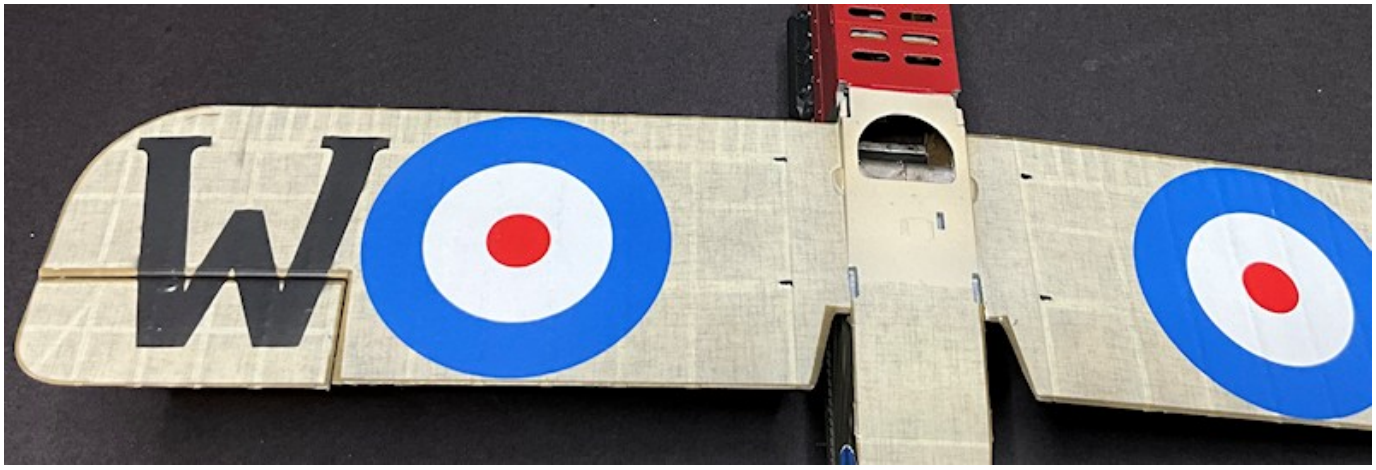
NOTE: *The aircraft serials C1149 on the rudder were made from ‘Xtradecal’ RAF numbers/letters (72157).*

Cut out the C1149 letter and numbers from the ‘Xtradecal’ sheet, making sure to cut as close as possible to the edges of the letter/numbers.

Apply the C1149 serial to both sides of the rudder.

To seal and protect the applied decals and markings and provide a good surface for applying weathering, airbrush the model with a semi-matte clear coat, such as ‘Tamiya’ Semi-Gloss (X35) or similar.





Weathering (continued):

General:

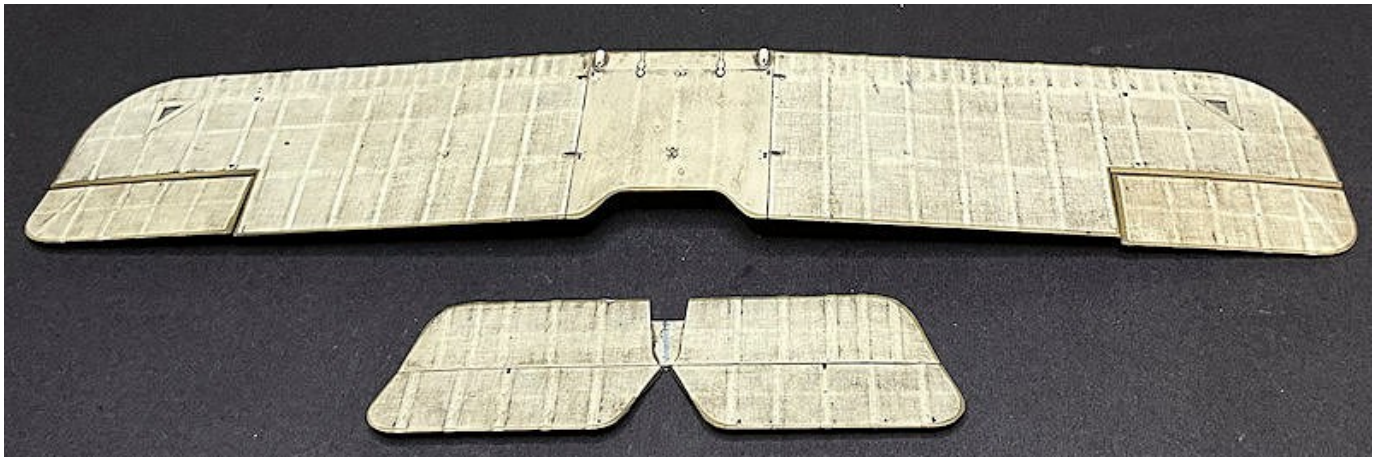
NOTE: *Refer to Part 3 (Weathering) - For general weathering I chose to use the 'Flory Models' Dark Dirt fine clay wash.*

Brush 'Flory Models' Dark Dirt wash over the following:

Fuselage/lower wings assembly.
Upper wing.
Tailplane/elevator.
Rudder.
Four ailerons.
Landing gear assembly.
Wheels.

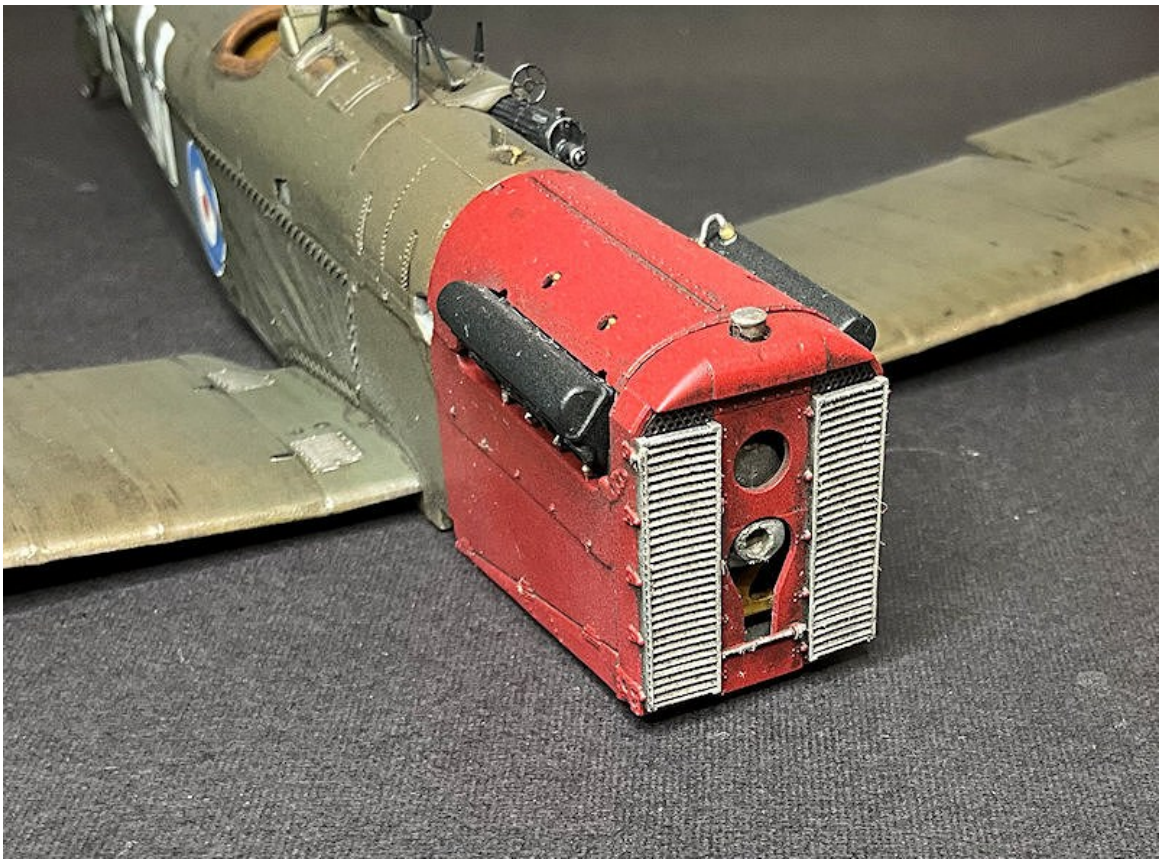
Remove the wash, as desired, from the parts to achieve your desired weathered effect.

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




M


W



Mud splatter:

NOTE: *Refer to Part 3 (Weathering) - For mud splatter effect I chose to use the 'Flory Models' Grime fine clay wash.*

Wet a brush with the 'Flory' Grime wash and gently flick it over a wood tooth pick to create splatter on the undersides of the lower wings above and to the rear of the landing gear wheels, when fitted.

Remove the wash, as necessary, to create a natural spread of splatter (spreading wider towards the trailing edges of the lower wings.

Using 'Tamiya' Weathering Master set A (Mud), lightly sponge:

Along the bottom edges of the fuselage and nose.

Around the wheel tyres.

Around the inboard/outboard wheel covers.

Landing gear axle fairing and bottom of the struts.

Lower, rear edge of the rudder.

Over the four metal tread plates at the roots of the lower wings.

Using 'Tamiya' Weathering Master set A (Light Sand), lightly sponge along the fuselage stitching.

Using 'Tamiya' Weathering Master set D (Oil Stain), lightly sponge rearwards from the panel lines on the top, centre section of the upper wing.

Using 'Tamiya' Weathering Master set B (Soot), lightly sponge the gun trough, just forward of the pilots Vickers machine gun.

Fluid stains:

Lightly brush 'AK Interactive' Kerosene (AK2039) wash around the fuel tank and radiator filler caps on the forward, top of the fuselage.

Lightly brush 'AK Interactive' Engine Oil (AK2019) wash at the rear of the louvered openings in the forward, underside panel of the fuselage.

Metal paint wear/chipping:

NOTE: *Dry brush by using a domed and soft brush, which has been dipped in the paint. Dab the brush on an absorbent paper to remove the liquid paint, leaving paint pigment on the brush.*

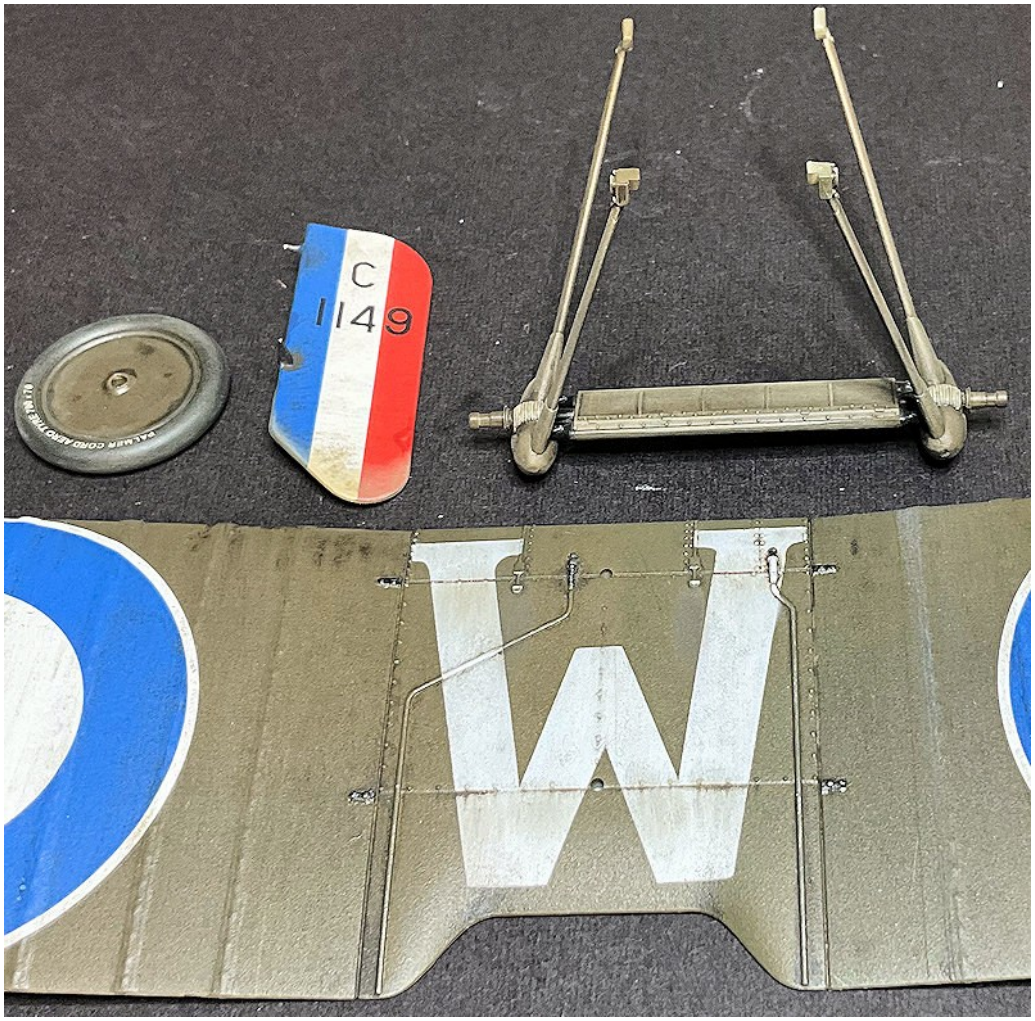
Using ‘Mr. Color’ Super Iron 2 (203) or similar, dry brush the following to create a worn/chipped effect:

Metal fittings on the top and underside of the upper wing centre section.

Around or along the metal fittings, panel edges, hinges/fasteners on the fuselage.

Additional chips can be created using a Prismacolor’ Verithin Argent Métallique pencil (753).


SCHWEINHUND


C
1149

Rigging locating holes:

NOTE: ***Refer to Part 6 (Rigging) of this build log for more information****. At this stage of the build, it's best to drill the various locating points for the rigging, before further assembly and pre-rigging of the model.*

Cabane strut bracing wires:

NOTE: *Refer to the following photographs for hole locations.*

Fuselage left side - Drill holes of 0.3 mm diameter through the recess in the top, left rear of the engine cover panel and cover panel over the Vickers machine gun.

Fuselage right side - Drill holes of 0.3 mm diameter through the recess in the top, right rear of the engine cover panel and the forward edge of the fuselage decking panel.

Forward cabane struts - Drill holes of 0.3 mm diameter through the top and bottom of the trailing edges of the struts.

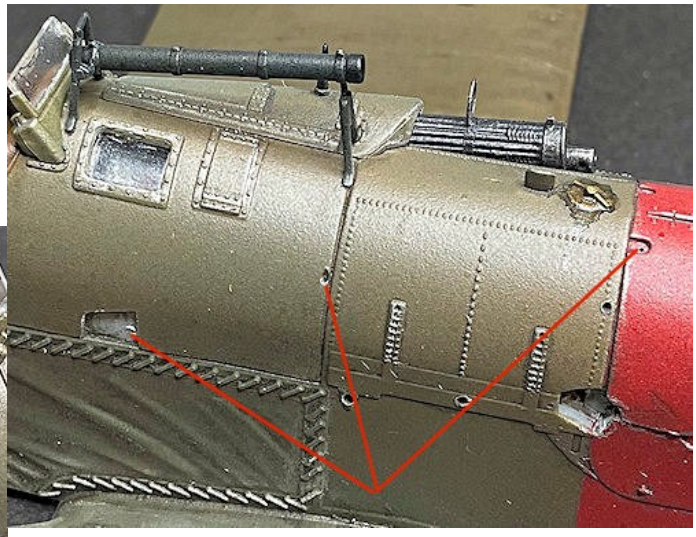
Rear cabane struts - Drill holes of 0.3 mm diameter through the top and bottom of the leading edges of the struts.

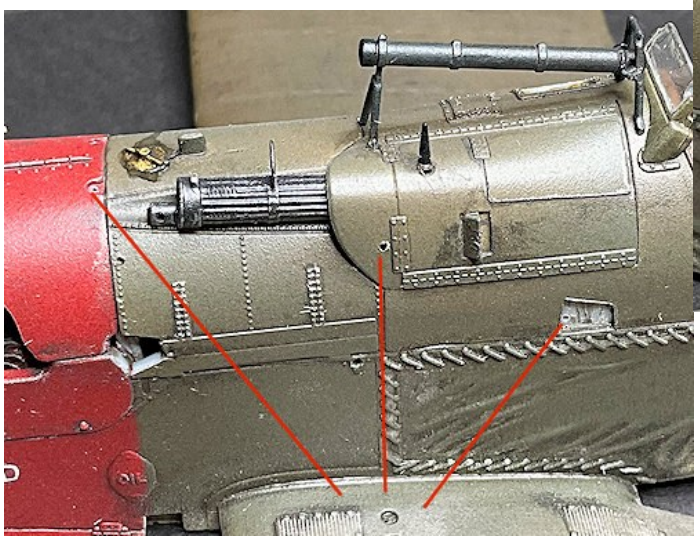
Using the pre-molded divots as guides, drill a hole of 0.3 mm diameter into, **but not through**, the underside of the upper wing centre section. Drill only the two forward and the two rear holes.

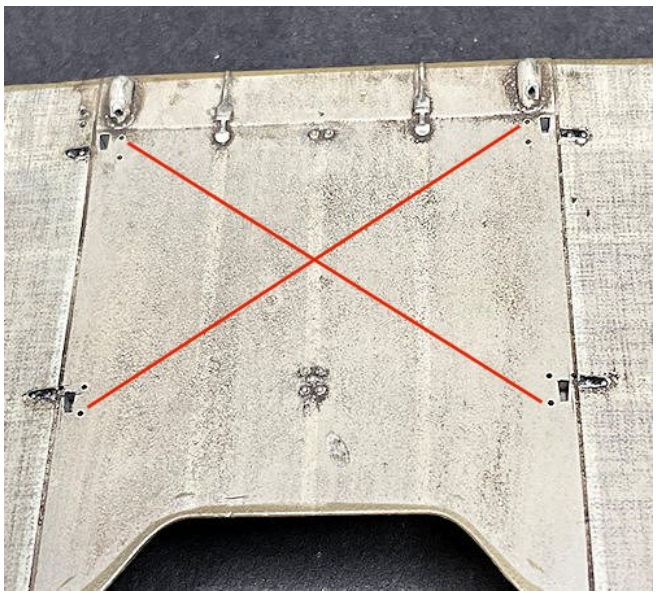
NOTE: *Before fitting the Anchor Points, check that the 'eye' end is clear and 0.12mm diameter mono-filament can pass through the hole. If not, carefully drill out the hole using a 0.2 mm diameter drill.*

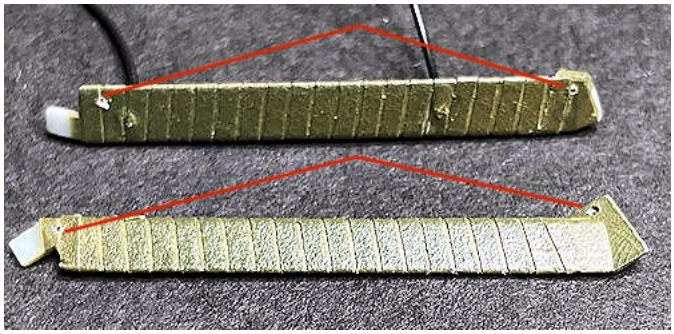
Using thin CA adhesive, secure a 'Gaspatch' 1:48th scale metal Anchor Point fully into the pre-drilled holes.

Once the adhesive has set, check that the Anchor Points are secure in the wing and that the 'eye' ends are clear of adhesive. If not, carefully clear out the hole using a 0.2 mm diameter drill.



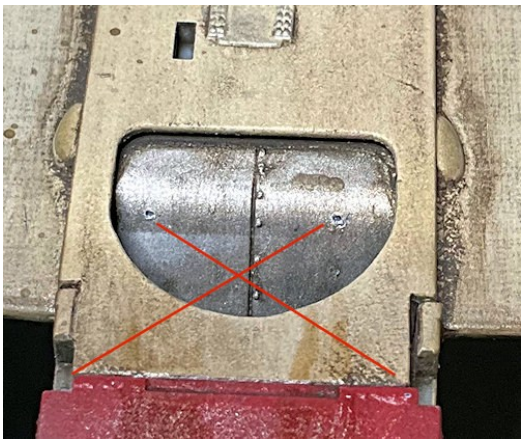






Fuselage internal bracing wires:

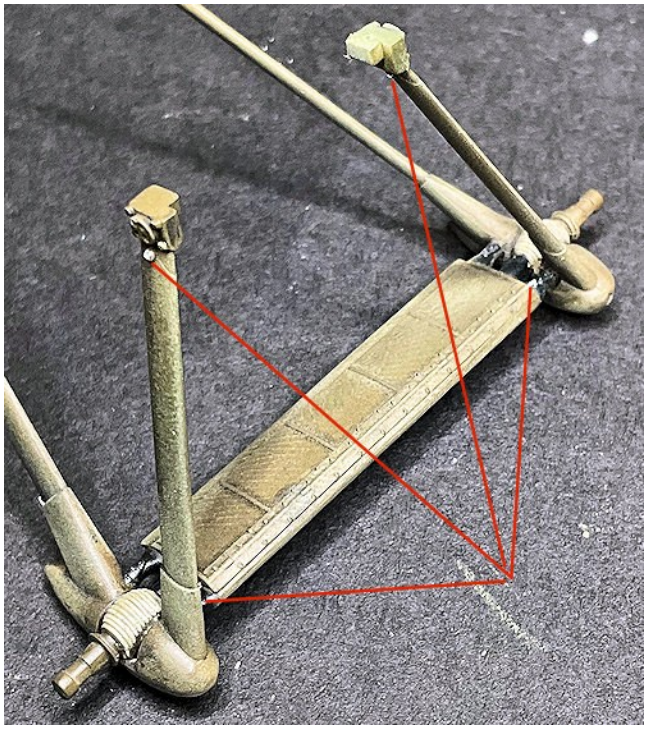
Drill holes of 0.3 mm diameter into the bottom outer edges of the fuel tank and aligned diagonally to the locating openings for the forward landing gear struts. The holes will be used to locate the crossed bracing wires across to the tops of the landing gear struts.



Landing gear bracing wires:

Drill holes of 0.3 mm diameter through the tops of the landing gear forward struts, using the pre-molded lugs as guides.

Drill holes of 0.3 mm diameter vertically through the front bars of the landing gear, close to the ends of the axle fairing.



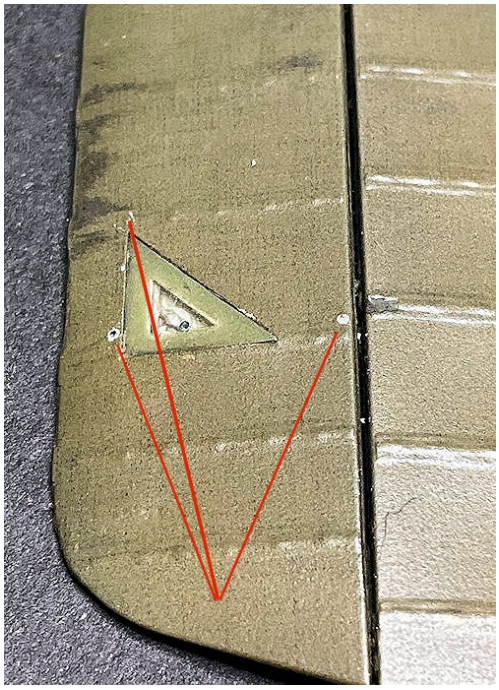
Fin/tailplane bracing wires:

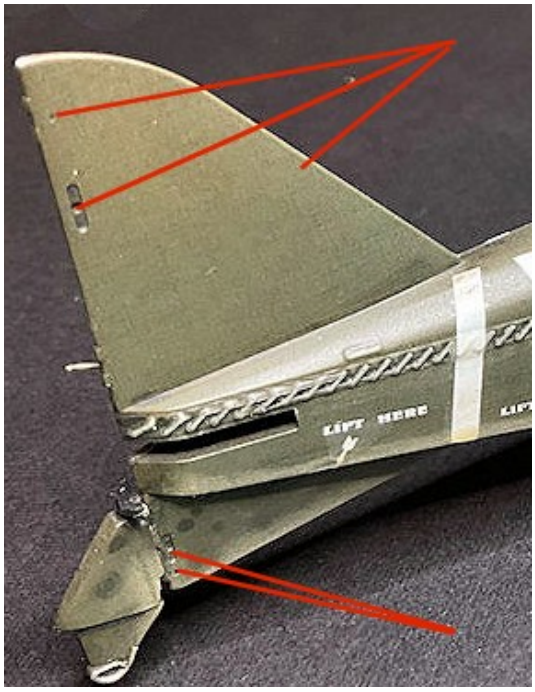
Using the pre-molded divots as guides, drill holes of 0.4 mm diameter vertically through the tailplanes just forward from the aileron inspection windows and at the trailing edges of the tailplanes.

Using the pre-molded divots as guides, drill two holes of 0.4 mm diameter horizontally through the trailing the edge of the fin.

Using the pre-molded divots as guides, drill two holes of 0.4 mm diameter horizontally through the trailing the edge of the tail skid keel.

For the additional bracing wire added by No.56 Squadron, drill holes of 0.4 mm diameter midway down the leading edge of the fin and through the tailplane inboard from the inspection window.

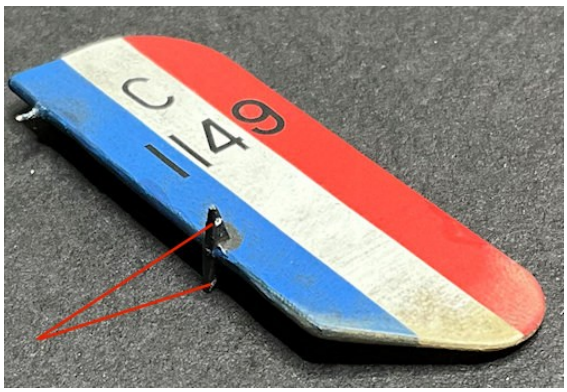




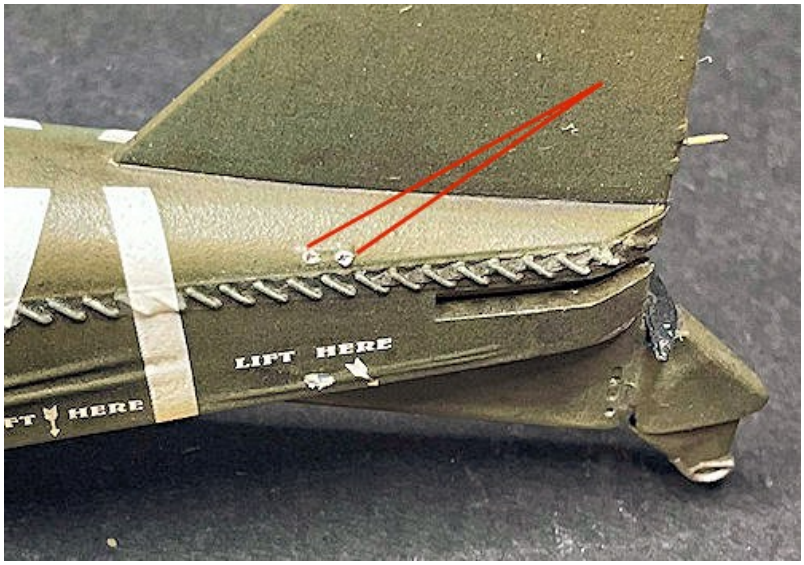
Rudder control cables:

Cement the rudder control horn fully into its locating recess in the leading edge of the rudder.

Drill a hole of 0.2 mm diameter vertically through both ends of the rudder control horn.



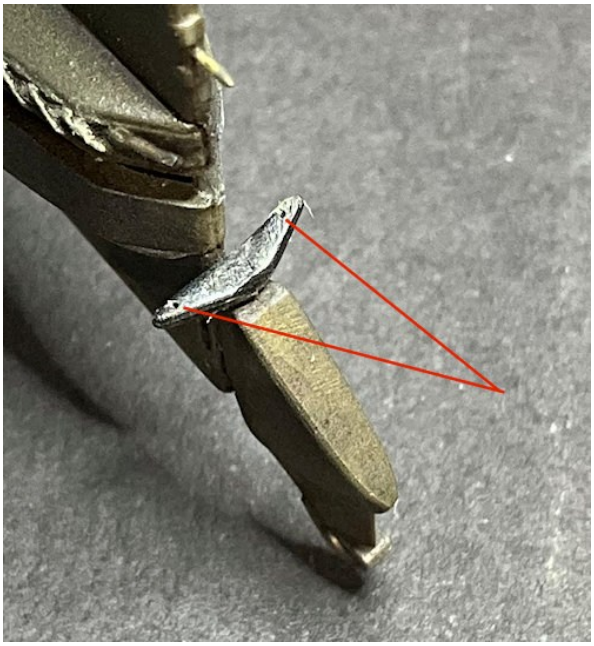
At each end of the pre-molded rectangle, on the top rear of the fuselage alongside the base of the fin, drill a hole of 0.4 mm diameter through the fuselage and angled back towards the rudder control horns (when rudder fitted).

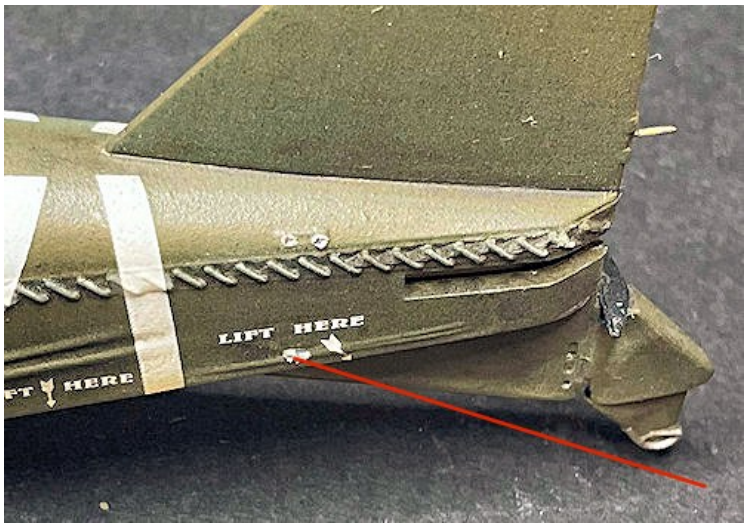


Tailskid control cables:

Drill a hole of 0.2 mm diameter vertically through both ends of the tail skid control horn.

At the bottom edge of the fuselage rear sides and below the pre-drilled rudder control cable holes, drill a hole of 0.4 mm diameter through the fuselage and angled back towards the tail skid control horns.

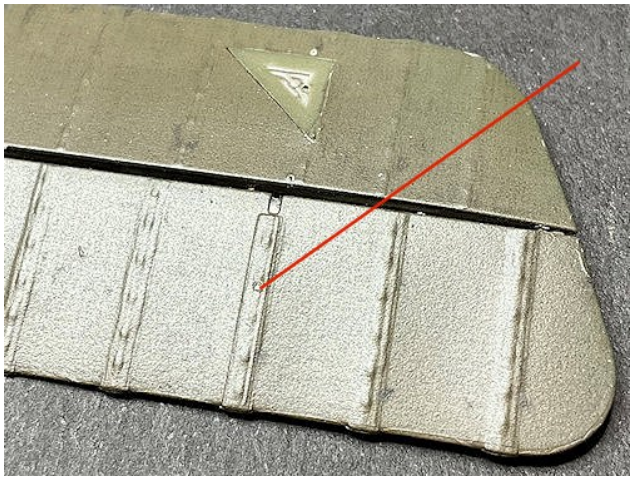




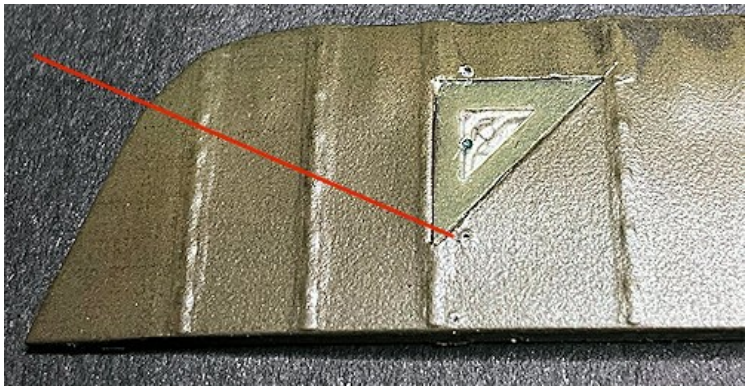
Elevator control cables:

NOTE: *The elevator control horns do not require rigging holes as the control lines will be looped around the end of the control horns.*

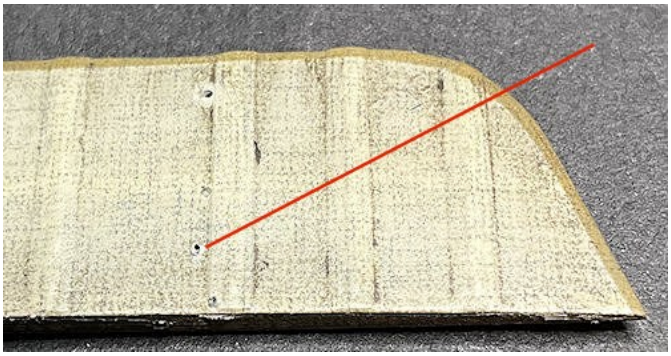
Using the pre-molded divots as a guide, drill a hole of 0.4 mm diameter through both elevators.



Drill a hole of 0.4 mm diameter through the tailplane at the rear, inboard side of the inspection window.

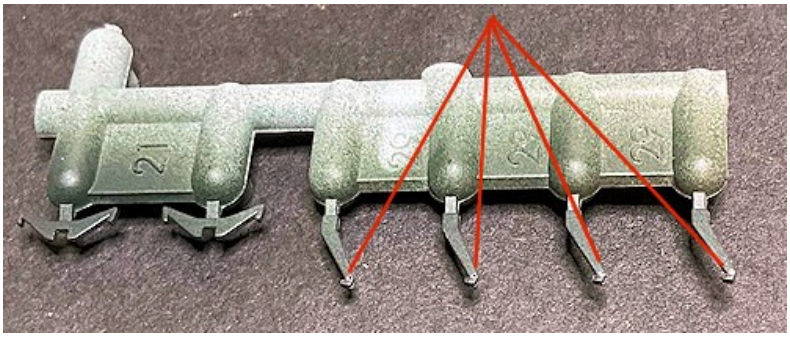


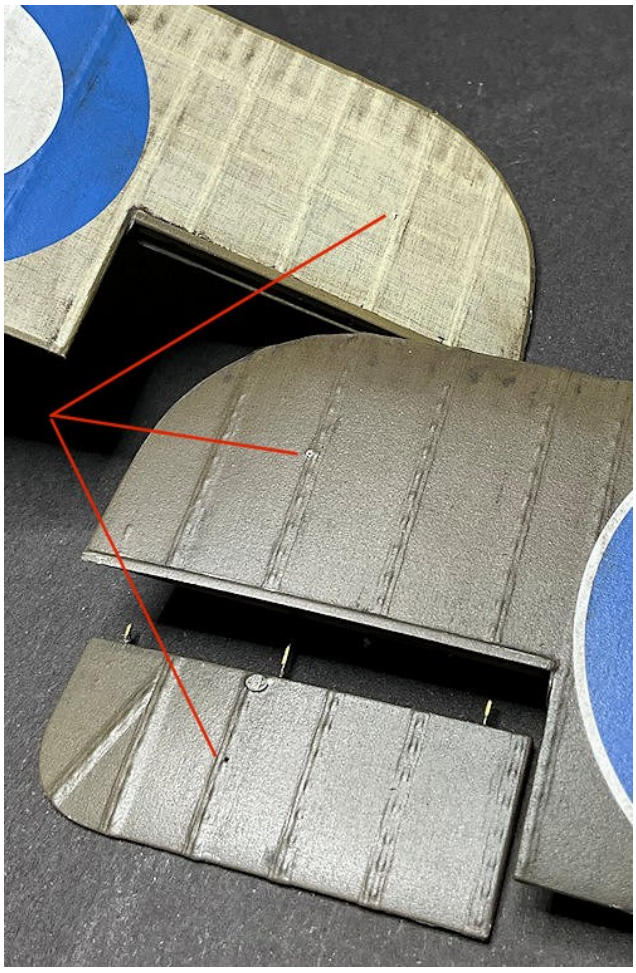
Drill a hole of 0.3 mm diameter into, **but not through**, the underside surface of the tailplane and at the same position as previously drilled on the top surface and angled back towards the bottom end of the elevator control horns (when elevator fitted).



Aileron control cables:

Using the pre-molded divots as guides, drill holes of 0.2 mm diameter through the ends of the four aileron control horns.





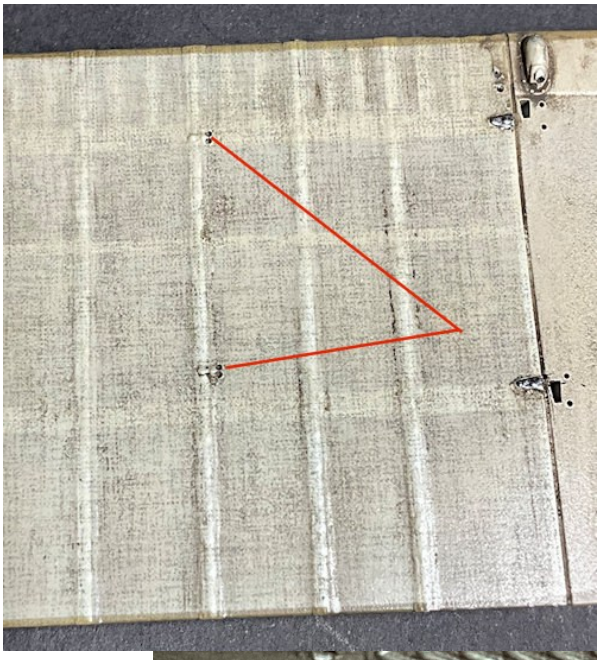
Using the pre-molded divots as a guide, drill a hole of 0.4 mm diameter through each of the four ailerons.

Using the pre-molded divots as a guide, drill holes of 0.3 mm diameter through upper wing.

Using the pre-molded divots as a guide, drill holes of 0.3 mm diameter through lower wings.

Auxiliary flying wires:

NOTE: *Temporarily fit the landing gear assembly into the fuselage and interplane struts into the lower wings. Then fit the upper wing onto the struts to ascertain the angle to be drilled between the landing gear/ lower wings the auxiliary flying wire locating points in the underside of the upper wing.*

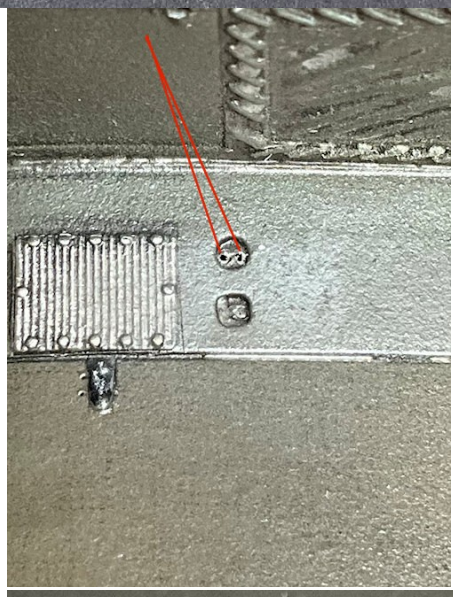


Using the pre-molded divots as guides, drill two pairs of holes of 0.3 mm diameter into, **but not through**, in the underside of the upper wing.

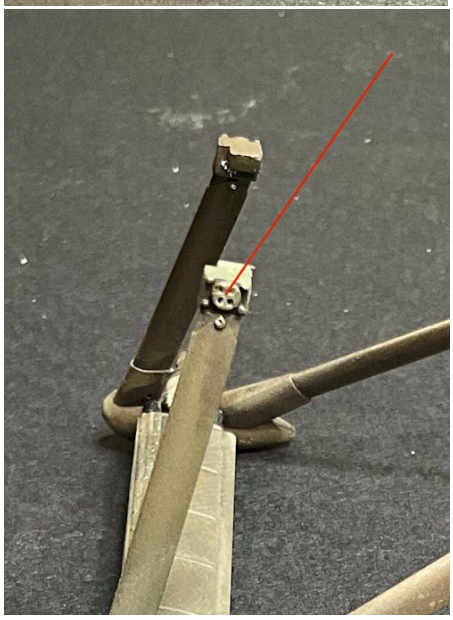
NOTE: *Before fitting the Anchor Points, check that the 'eye' end is clear and 0.12mm diameter mono-filament can pass through the hole. If not, carefully drill out the hole using a 0.2 mm diameter drill.*

Using thin CA adhesive, secure a 'Gaspatch' 1:48th scale metal Anchor Point fully into the eight pre-drilled holes.

Once the adhesive has set, check that the Anchor Points are secure in the wing and that the 'eye' ends are clear of adhesive. If not, carefully clear out the holes using a 0.2 mm diameter drill.



Using the pre-molded divots as a guide, drill holes of 0.3 mm diameter into, **but not through**, the lower wings at the inboard recesses and angled to their locating point in the underside of the upper wing (when wing is fitted).

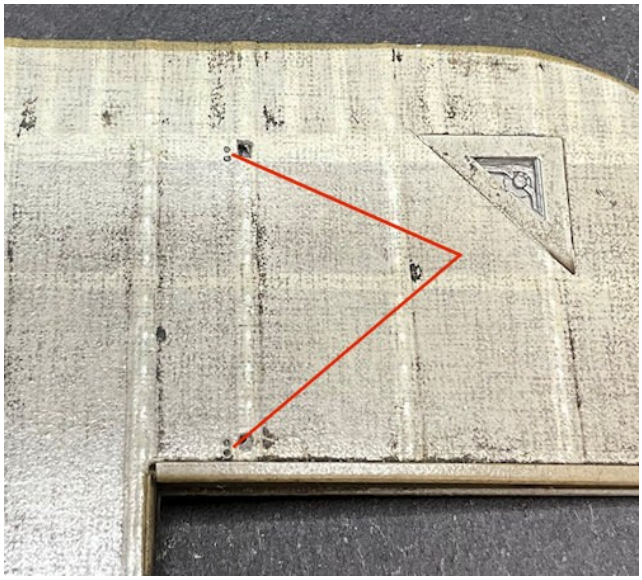


Using the top two pre-molded divots as a guide, drill holes of 0.3 mm diameter through the top fitting of the landing gear forward struts and angled to their locating point in the underside of the upper wing (when wing is fitted).

Primary flying wires:

NOTE: *Temporarily fit the landing gear assembly into the fuselage and interplane struts into the lower wings to ascertain the angle to be drilled between the landing gear/lower wings and top of the interplane struts.*

Using the pre-molded divots as guides, drill two pairs of holes of 0.3 mm diameter into, **but not through**, in the underside of the upper wing.

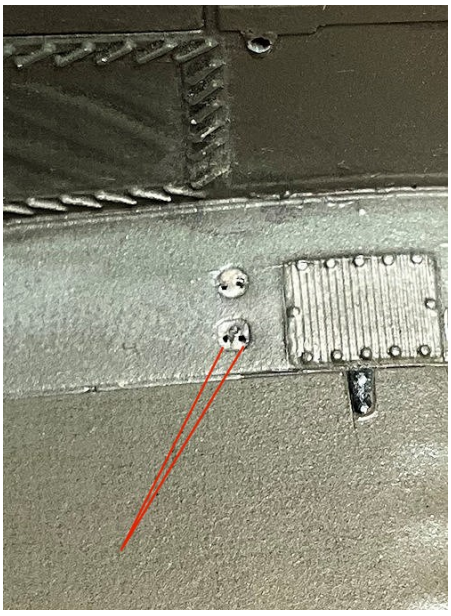


NOTE: *Before fitting the Anchor Points, check that the 'eye' end is clear and 0.12mm diameter mono-filament can pass through the hole. If not, carefully drill out the hole using a 0.2 mm diameter drill.*

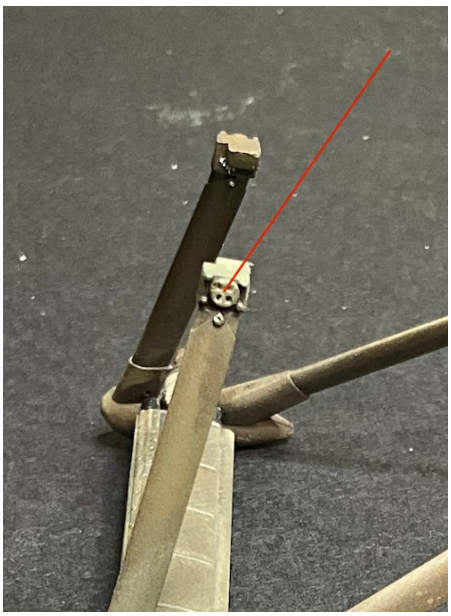
Using thin CA adhesive, secure a 'Gaspatch' 1:48th scale metal Anchor Point fully into the eight pre-drilled holes.

Once the adhesive has set, check that the Anchor Points are secure in the wing and that the 'eye' ends are clear of adhesive. If not, carefully clear out the hole using a 0.2 mm diameter drill.

Using the pre-molded divots as a guide, drill holes of 0.3 mm diameter into, **but not through**, the lower wings at the outboard recesses and angled to their locating point in the underside of the upper wing (when wing is fitted).

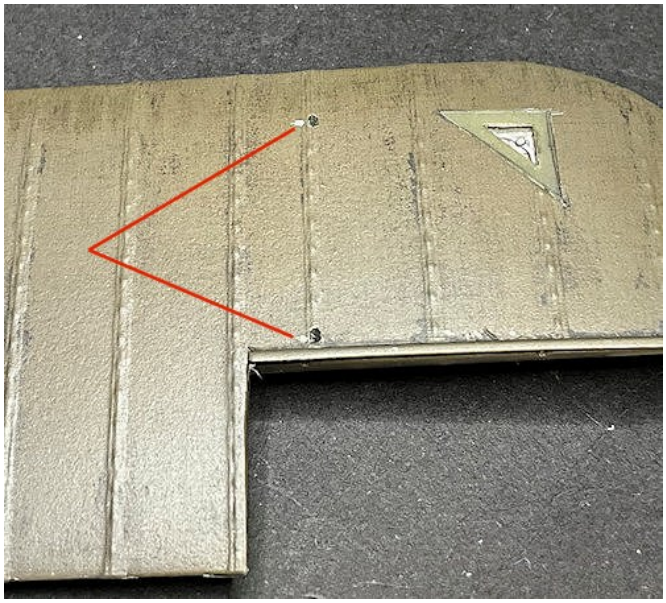


Using the bottom two pre-molded divots as a guide, drill holes of 0.3 mm diameter through the top fitting of the landing gear forward struts and angled to their locating point in the underside of the upper wing (when wing is fitted).

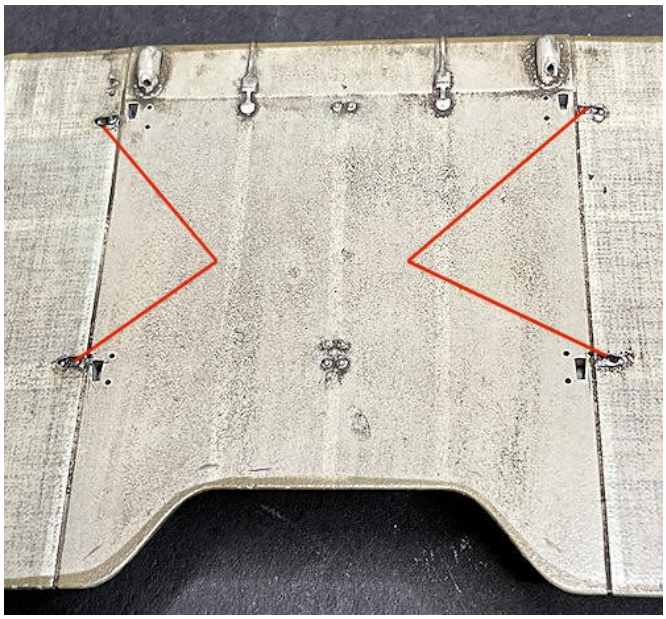


Landing wires:

NOTE: *Temporarily fit the fuselage cabane struts into the fuselage to ascertain the angle to be drilled between the top of the struts and the lower wings.*



Using the pre-molded divots as guides, drill two pairs of holes of 0.3 mm diameter vertically through the top surface of the lower wings.



Using the pre-molded divots as guides, drill four holes of 0.3 mm diameter into, **but not through**, in the underside of the upper wing at the wing brackets.

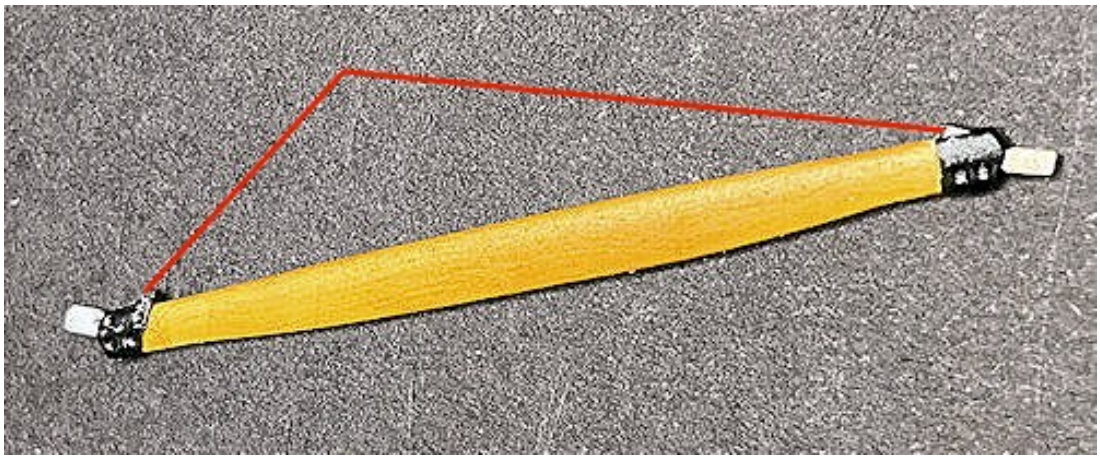
NOTE: *Before fitting the Anchor Points, check that the 'eye' ends are clear and 0.12mm diameter mono-filament can pass through the holes. If not, carefully drill out the holes using a 0.2 mm diameter drill.*

Using thin CA adhesive, secure a 'Gaspatch' 1:48th scale metal Anchor Point fully into the four pre-drilled holes.

Once the adhesive has set, check that the Anchor Points are secure in the wing and that the 'eye' ends are clear of adhesive. If not, carefully clear out the holes using a 0.2 mm diameter drill.

Incidence wires:

Drill holes of 0.2 mm diameter through the wire attachment lugs at each end of the four interplane struts.



Assembly (continued):

NOTE: *Make sure all paint and decal is removed from and mating surfaces before assembly.*

Cement the landing gear assembly fully into its four strut locating recesses in the fuselage.

Locate the two wheels onto the ends of the landing gear axle.

Fit the wheel retainers (A12) fully over their axle shoulders to hold the wheels onto the axle.

Cement the retainers to the wheels and axle, making sure the wheels are vertical when viewed from the front and aligned the to fuselage when viewed from above.

Cement the wheel outer covers fully into the wheels.

Cement the four aileron control horns ((A29) fully into their locating recesses in the leading edges of the four ailerons.

Cement the two elevator control horns (A21) fully into their locating recesses in the leading edges of the elevator.

Cement the tailplane fully into its locating slot in the rear of the fuselage.

Using thin CA adhesive, secure the two elevator fully into it pre-drilled locating holes in the trailing edge of the tailplane.

Rigging - final tensioning:

NOTE*:* *When completing lines of rigging (final rigging) using mono-filament and usually during the final rigging stage, some lines may be slightly slack. This can be remedied by the careful application of heat along the line.*
Where many rigged lines are required, it's best to tighten any slack completed lines as you add them, as trying to tighten a line amidst others may cause damage to the other lines.
Take care not to linger at one area of a line with the heat source as this will melt the mono-filament causing the line to break.
Also take care not to touch any part of the model or any other rigging, as this will also cause damage through melting.

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

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

Final rigging:

NOTE: *Nickel-Silver or Brass tube can be chemically blackened by immersion in solutions such as 'Black-It' or 'Ammo' (A.MIG-2021) or similar then rinse and dry the blackened tubes to prevent powdering of the surfaces.*

Landing gear bracing wires:

NOTE: *Refer to Part 6 (Rigging) of this build log for more information. The rigging materials used are:*

'Albion Alloy's' Micro-tube Brass (MBT04) or Nickel-Silver NST04) of 0.4 mm diameter.
'Steelon' or 'Stroft GTM' Mono-Filament line of 0.12 mm diameter.

Cut four short lengths of blackened tube.

Cut two long lengths of line.

Pass the lines through the pre-drilled holes in the top of the landing gear forward struts, making sure the end of the lines can reach past the opposite end of the landing gear axle.

Using thin CA adhesive, secure the lines in the landing gear struts.

Slide two tubes onto each line then pass the free end of the lines down through the pre-drilled hole in the opposite ends of the axle.

Keeping the lines taut and the tubes clear of the axle, secure the lines in the axle using thin CA adhesive.

Cut away and residual line from e struts and axle ends.

Slide the tubes up to the struts and axle ends and secure on the lines using thin CA adhesive.

Fuselage internal bracing wires:

NOTE: *Refer to Part 6 (Rigging) of this build log for more information. The rigging materials used are:*

'Albion Alloy's' Micro-tube Brass (MBT04) or Nickel-Silver NST04) of 0.4 mm diameter.
'Albion Alloy's' 0.2 mm diameter Nickel-Silver rod (NSR02) or similar.

Cut two short lengths of blackened .

Cut two lengths of Nickel-Silver rod.

Trim the length of the rods such that they can be inserted into the pre-drilled holes in the lower edge of the fuel tank in the underside of the fuselage and positioned diagonally crossed towards the tops of the landing gear forward struts.

Slide a tube onto each rod and position the tubes 1.0 mm from the rod ends.

Secure the tubes to the rods using thin CA adhesive.

Insert the rods (at the tube ends) into the pre-drilled holes in the lower edge of the fuel tank and positioned diagonally crossed towards the tops of the tops of the landing gear forward struts.

Secure the rods in the fuel tank using thin CA adhesive.

Tailplane/Fin bracing wires.

NOTE: *Refer to Part 6 (Rigging) of this build log for more information. The rigging materials used are:*

'Albion Alloy's' Micro-tube Brass (MBT04) or Nickel-Silver NST04) of 0.4 mm diameter.
'Steelon' or 'Stroft GTM' Mono-Filament line of 0.12 mm diameter.

Cut twenty short lengths of blackened tube.

Cut three long lengths of line.

Pass one line through the pre-drilled hole towards the top of the fin trailing edge.

Slide two tubes onto both lines.

Pass the free end of the lines down through the pre-drilled holes in the leading edge of the tailplanes.

Lay the model on its back.

Slide two tubes onto both lines.

Pass the free end of the lines across and through the pre-drilled hole towards the bottom of the trailing edge of the tail skid keel.

Pull the free end of the lines taut (I use self-gripping tweezers) and make sure the tubes are clear of the pre-drilled holes.

Using thin CA adhesive, secure the lines in the hole in the tail skid keel.

Slide the tubes up to the tail skid keel and underside of the tailplane.

Secure the tubes to the lines using thin CA adhesive.

Turn the model over.

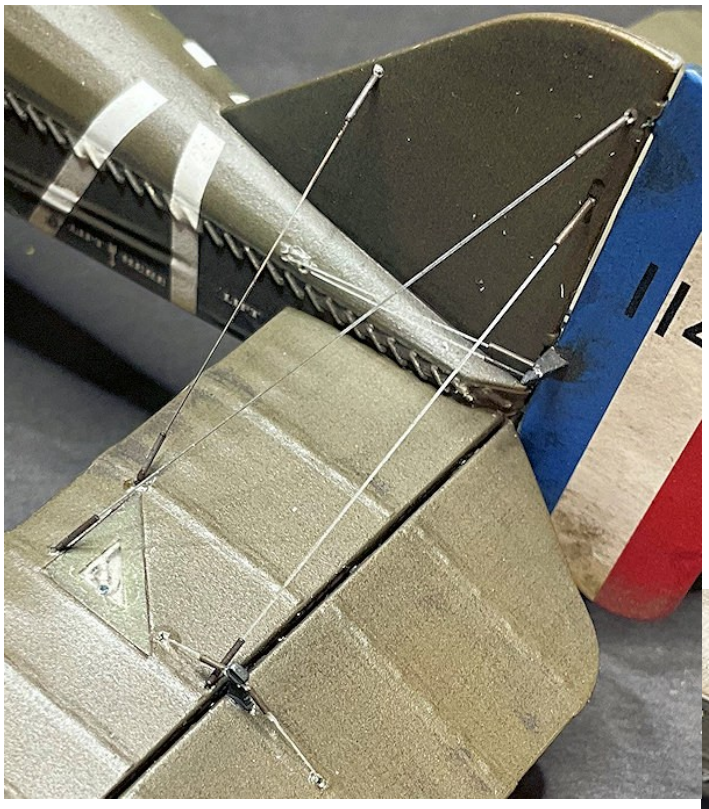
Slide the tubes up to the fin and top surface of the tailplane.

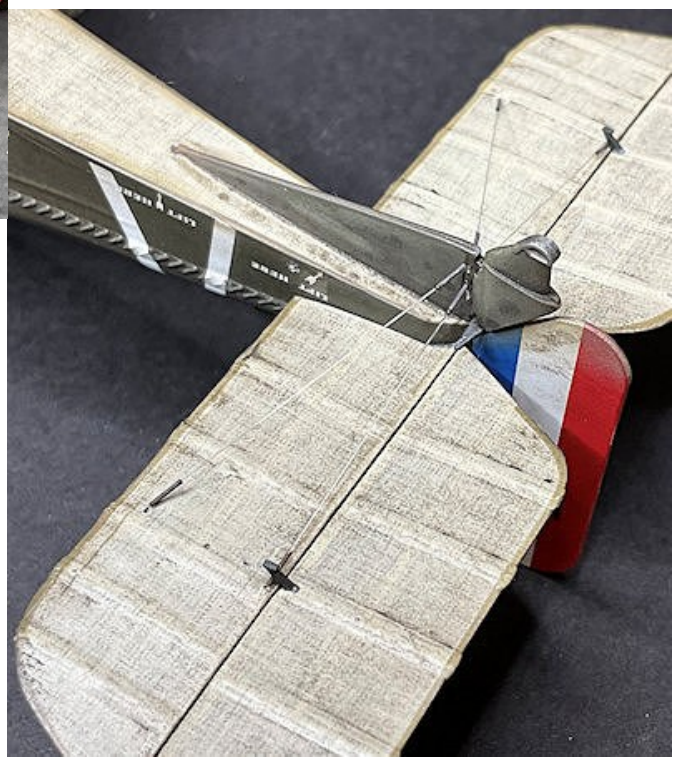
Secure the tubes to the lines using thin CA adhesive.

Carefully cut away any residual line at the tail skid keel.

Repeat the procedure using the pre-drilled holes in the tailplane trailing edge and upper hole in the trailing edge of the tail skid.

Repeat the procedure to add the No.56 Squadron additional bracing wire between the top of the tailplane, inboard from the inspection window and the leading edge of the fin. Cut away residual line under the tailplane.





Tail skid control cables.

NOTE: *Refer to Part 6 (Rigging) of this build log for more information. The rigging materials used are:*

'Albion Alloy's' Micro-tube Brass (MBT04) or Nickel-Silver NST04) of 0.4 mm diameter.
'Steelon' or 'Stroft GTM' Mono-Filament line of 0.08 mm diameter.

Cut two short lengths of blackened tube.

Cut two long lengths of line.

Pass a line into the pre-drilled lower hole in one side of the fuselage rear.

Using thin CA adhesive, secure the line in the hole.

Slide a tube onto the line.

Pass the line through the pre-drilled hole on that side of the tail skid control horn.

Loop the line back and through the tube.

Keeping the line taut, slide the tube up to the control horn.

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

Cut away any residual line at the tube.

Repeat the process for the control cable on the other side of the fuselage.

Rudder control cables.

Cut four short lengths of 0.4 mm diameter blackened 'Albion Alloy's' Micro-tube Brass (MBT04) or Nickel-Silver (NST04) or similar.

Cut two long lengths of line.

Pass a line into the pre-drilled **forward** hole in the upper side of the fuselage rear.

Using thin CA adhesive, secure the line in the hole.

Slide a tube onto the line.

Pass the line through down through the pre-drilled hole on that side of the rudder control horn.

Slide a tube onto the line.

Pass the line into the pre-drilled **rear** hole in the upper side of the fuselage rear.

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

Repeat the process for the rudder control cables on the other side of the fuselage.

Elevator control cables.

Cut eight short lengths of 0.4 mm diameter blackened 'Albion Alloy's' Micro-tube Brass (MBT04) or Nickel-Silver (NST04) or similar.

Cut four long lengths of line.

Slide a tube onto a line.

Loop the line back and through the tube to form a loop.

Pass the loop of line over the top of an elevator control horn.

Hold both lines taut and facing rearwards, then slide the tube up to the control horn.

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

Pass the free end of the line back and down through the pre-drilled hole in the elevator.

Turn the model over.

Slide a tube onto the line.

Loop the line back and through the tube to form a loop.

Pass the loop of line over the top of the other end of the elevator control horn.

Pull on the free end of the line to keep it taut then slide the tube up to the control horn.

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

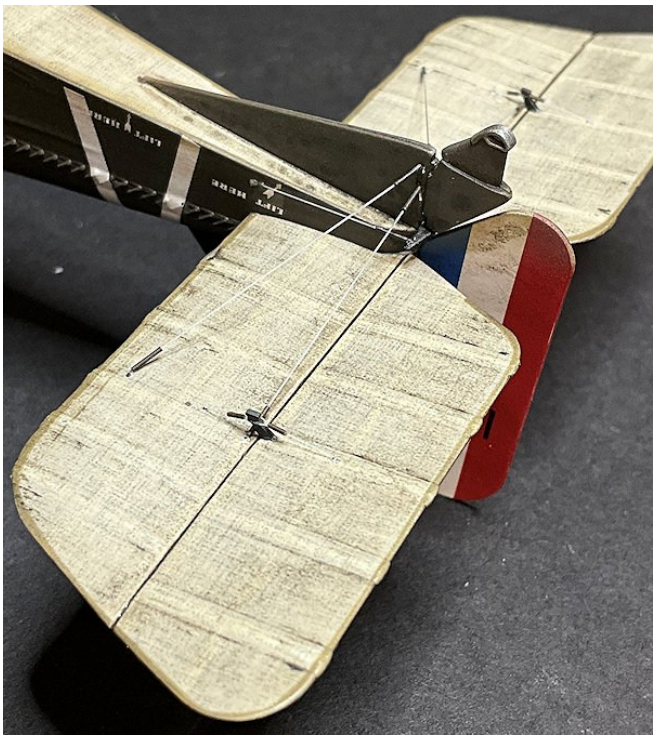
Cut away any residual line at the tube ends.

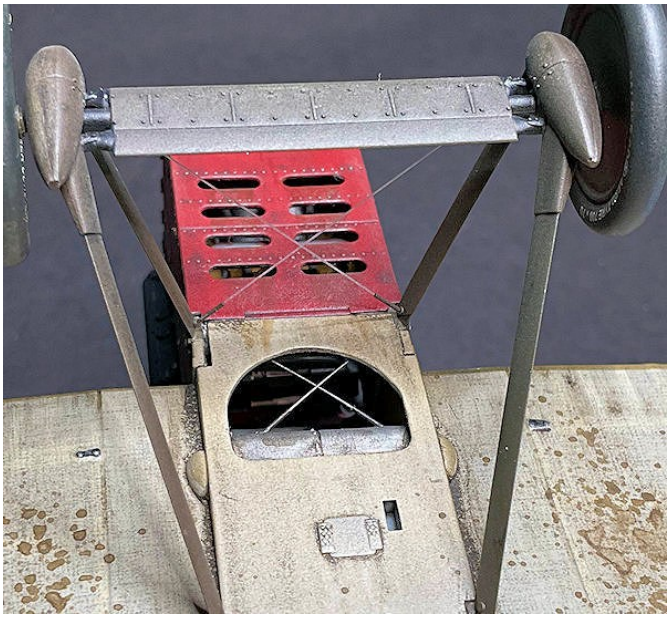
Repeat the process to add a second control line from the control horn and through the pre-drilled hole in the tailplane at the inspection window.

Repeat the process to add the elevator control lines to the other side of the tailplane and elevator.

Surface finish:

To reduce the sheen of the mono-filament, lightly airbrush the applied rigging with a semi-gloss clear coat, such as ‘Tamiya’ Semi-Gloss (X35) or similar.





Pre-rigging (continued):

Primary and Auxiliary flying wires:

NOTE: *Refer to Part 6 (Rigging) of this build log for more information. The rigging line used is 'Steelon' or 'Stroft GTM' Mono-Filament line of 0.12 mm diameter.*

Cut sixteen long lengths of line.

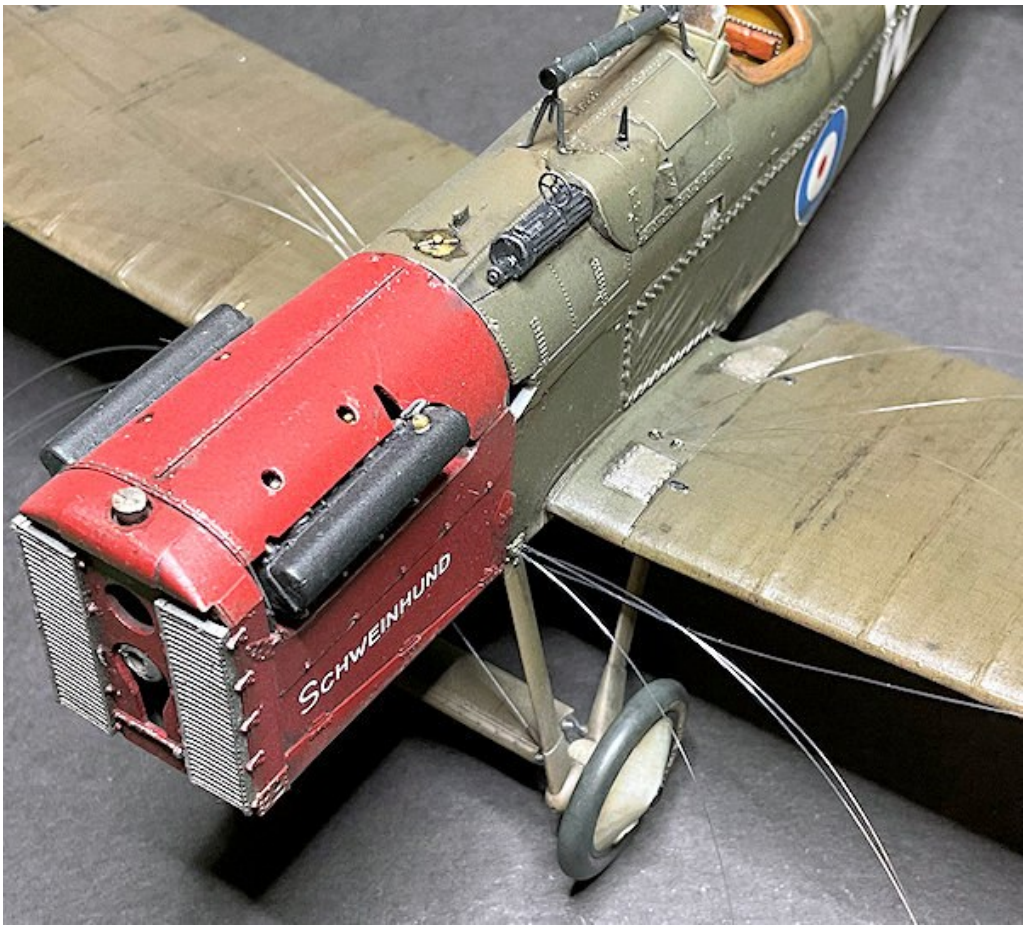
Insert a line fully into each of the four pre-drilled holes in the top of the landing gear forward struts on one side of the fuselage.

Secure the lines in the holes using thin CA adhesive.

Insert a line fully into each of the four pre-drilled holes in the rigging recesses in the top surface of the lower wings at the wing roots.

Secure the lines in the holes using thin CA adhesive.

Repeat the procedure to add the remaining eight lines to the other side of the fuselage and lower wing.



Fuselage cabane strut bracing wires:

Refer to Part 6 (Rigging) of this build log for more information. The rigging materials used are:

'Albion Alloy's' Micro-tube Brass (MBT04) or Nickel-Silver NST04) of 0.4 mm diameter.
'Albion Alloy's' Micro-tube Brass (MBT05) or Nickel-Silver NST054) of 0.5 mm diameter.
'Steelon' or 'Stroft GTM' Mono-Filament line of 0.12 mm diameter.

Cut eight short lengths of blackened **0.4 mm** diameter tube.

Cut four long lengths of line.

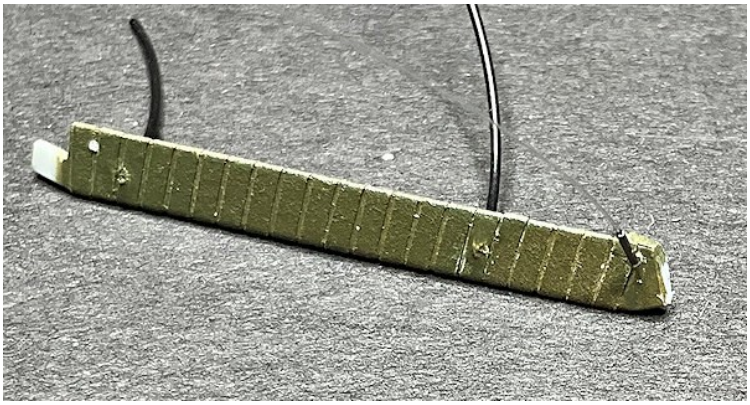
Pass a line (from the outer surface) through the pre-drilled holes at the bottom of the four fuselage cabane struts.

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

Slide a tube on the free end of each of the lines.

Move the tubes close to, **but not touching**, the edges of the cabane struts.

Using thin CA adhesive, secure the tubes on to the lines.



NOTE: *During the following steps, make sure the cabane struts are correctly matched for the two sides of the fuselage.*

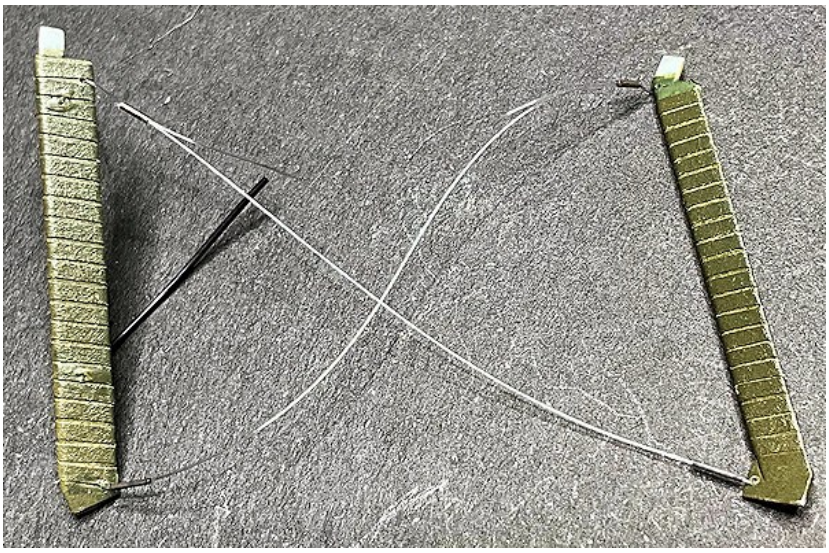
Slide a tube on the free end of each of the lines.

Pass the lines diagonally up to the pre-drilled holes in the adjacent strut.

Loop the lines back and through the tubes.

NOTE: *During the following step, leave the lines longer than needed for when the struts are fitted to the fuselage. The lines will be final rigged after the struts have been fitted.*

Move the tubes close to, **but not touching**, the edges of the cabane struts.



Cut four short lengths of blackened **0.5 mm** diameter tube.

Cut four long lengths of line.

Pass a line through the ‘eye’ end of each of the four pre-fitted Anchor Points for the cabane strut cross bracing wires (in the underside of the upper wing centre section).

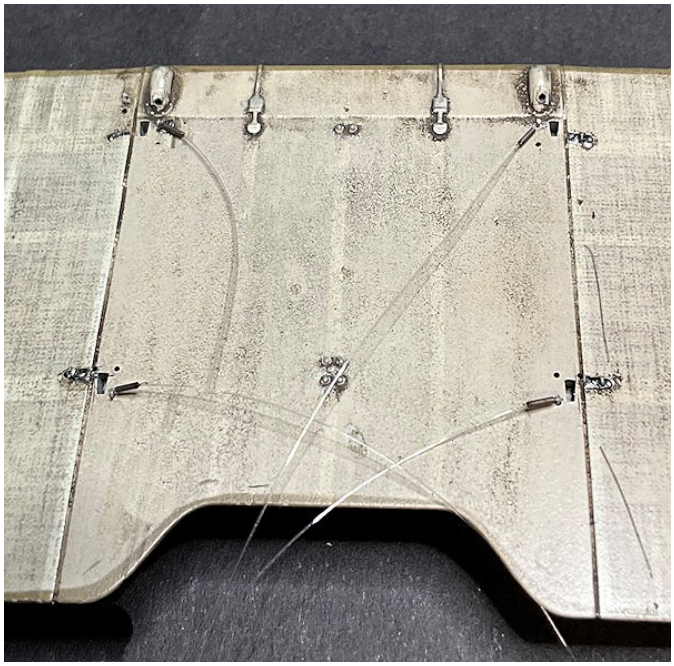
Slide a tube on to each line.

Loop the lines back and through the tubes.

Move the tube up to, **but not touching**, the Anchor Points.

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

Cut away any residual line at the tube ends.



Incidence wires:

Refer to Part 6 (Rigging) of this build log for more information. The rigging materials used are:

> *'Albion Alloy's' Micro-tube Brass (MBT05) or Nickel-Silver NST05) of 0.5 mm diameter.*
> *'Steelon' or 'Stroft GTM' Mono-Filament line of 0.12 mm diameter.*

Cut eight short lengths of blackened tube.

Cut four long lengths of line.

Pass a line (from the outer surface) through the pre-drilled hole at the bottom of a cabane strut.

Slide a tube on the free end of the line.

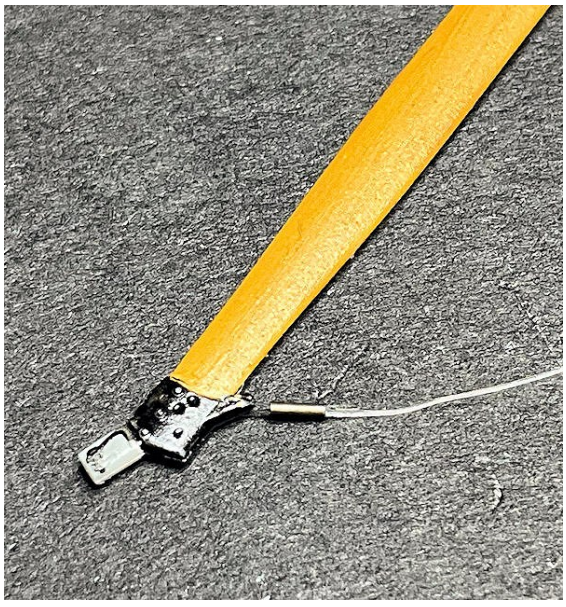
Loop the line back and through the tube.

Move the tube close to, **but not touching**, the edge of the cabane strut.

Using thin CA adhesive, secure the tube on to the line.

Cut away any residual line at the tube end.

Repeat the procedure to add lines to the remaining three cabane struts.



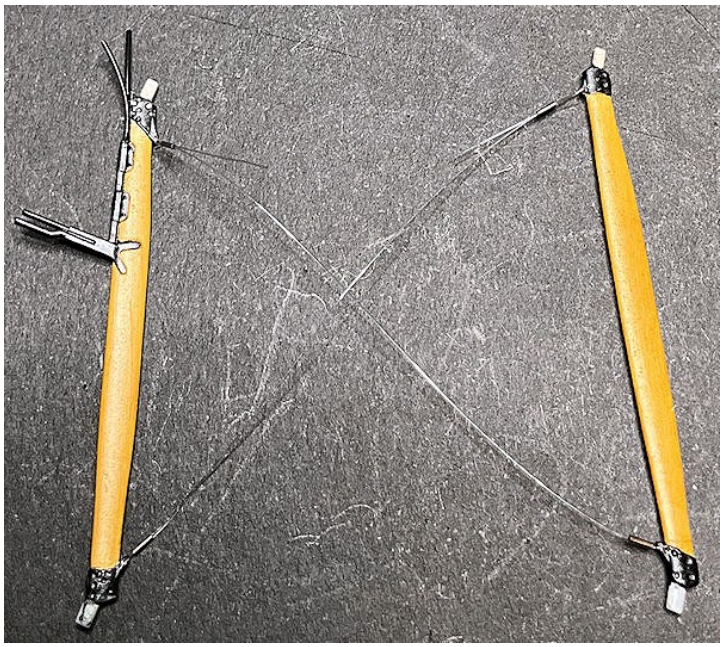
NOTE: *During the following steps, make sure the interplane struts are correctly matched for the two lower wings.*

Slide a tube on the free end of each of the lines.

Pass the lines diagonally up to the pre-drilled holes in the adjacent strut.

Loop the lines back and through the tubes.

NOTE: *During the following step, leave the lines longer than needed for when the struts are fitted to the lower wings. The lines will be final rigged after the struts have been fitted.*



Move the tubes close to, **but not touching**, the edges of the cabane struts.

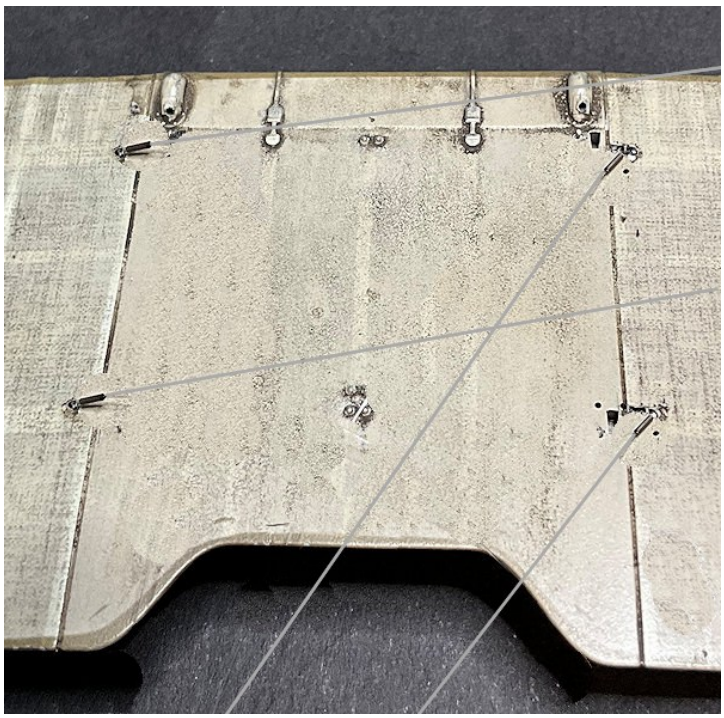
Landing wires:

NOTE: *Refer to Part 6 (Rigging) of this build log for more information. The rigging materials used are:*

'Albion Alloy's' Micro-tube Brass (MBT05) or Nickel-Silver NST05) of 0.5 mm diameter.
'Steelon' or 'Stroft GTM' Mono-Filament line of 0.12 mm diameter.

Cut four short lengths of blackened **0.5 mm** diameter tube.

Cut four long lengths of line.



Pass a line through the 'eye' end of each of the four pre-fitted Anchor Points for the landing wires (in the underside of the upper wing, outboard from the centre section).

Slide a tube on to each line.

Loop the lines back and through the tubes.

Move the tube up to, **but not touching**, the Anchor Points.

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

Cut away any residual line at the tube ends.

Assembly (continued):

NOTE: *Make sure all strut and fuel pipe locating holes/recesses and struts ends are clear of paint or decal.*

Cement the four cabane struts into their locating recesses in the fuselage, making sure the bracing wires are crossed.

Cement the interplane struts into their locating recesses in the lower wings, making sure the bracing wires are crossed.

Cement the upper wing fully onto the cabane and interplane struts. If necessary, elastic bands can be used to temporarily hold together the wings until the cement has fully set.

Rigging - final tensioning:

NOTE*:* *When completing lines of rigging (final rigging) using mono-filament and usually during the final rigging stage, some lines may be slightly slack. This can be remedied by the careful application of heat along the line.*
Where many rigged lines are required, it's best to tighten any slack completed lines as you add them, as trying to tighten a line amidst others may cause damage to the other lines.
Take care not to linger at one area of a line with the heat source as this will melt the mono-filament causing the line to break.
Also take care not to touch any part of the model or any other rigging, as this will also cause damage through melting.

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

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

Final rigging (continued):

NOTE: *Nickel-Silver or Brass tube can be chemically blackened by immersion in solutions such as 'Black-It' or 'Ammo' (A.MIG-2021) or similar then rinse and dry the blackened tubes to prevent powdering of the surfaces. The* ***following rigging sequence is best*** *for easier access to the various rigged lines.*

Incidence wires:

NOTE: *Refer to Part 6 (Rigging) of this build log for more information. The crossed incidence wires are already fitted to the interplane struts.*

For each of the four incidence wires, pull on the free end of the line and keeping the line taut, slide the free tube up to the strut.

Using thin CA adhesive, secure the line in the tube.

Cut away any residual line at the tube end.

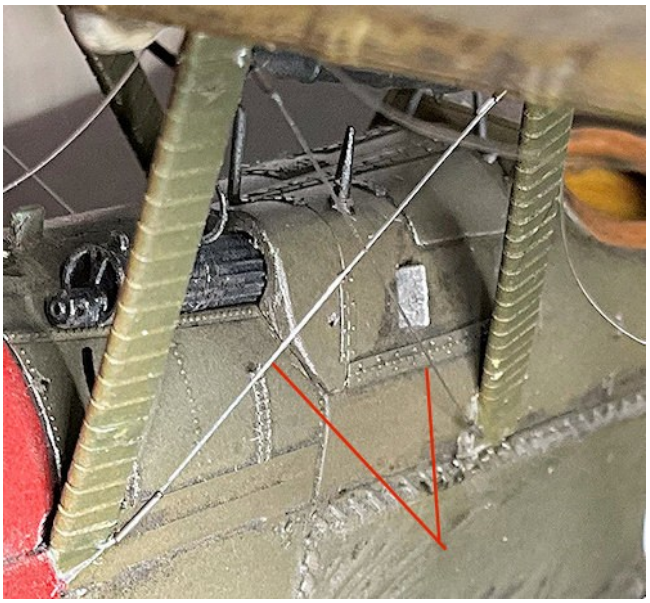
Cabane strut bracing wires:

NOTE: *Refer to Part 6 (Rigging) of this build log for more information. The crossed bracing wires are already fitted to the cabane struts.*

For each of the four incidence wires, pull on the free end of the line and keeping the line taut, slide the free tube up to the strut.

Using thin CA adhesive, secure the line in the tube.

Cut away any residual line at the tube end.



Pass the free end of the pre-rigged left, rear bracing wire down and into the pre-drilled hole in the panel covering the Vickers machine gun. Trim the length of the line such that it can be inserted into the hole by approximately 5 mm.

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

Pass the free end of the pre-rigged right, rear bracing wire down and into the pre-drilled hole in the fuselage left side panel. Trim the length of the line such that it can be inserted into the hole by approximately 5 mm.

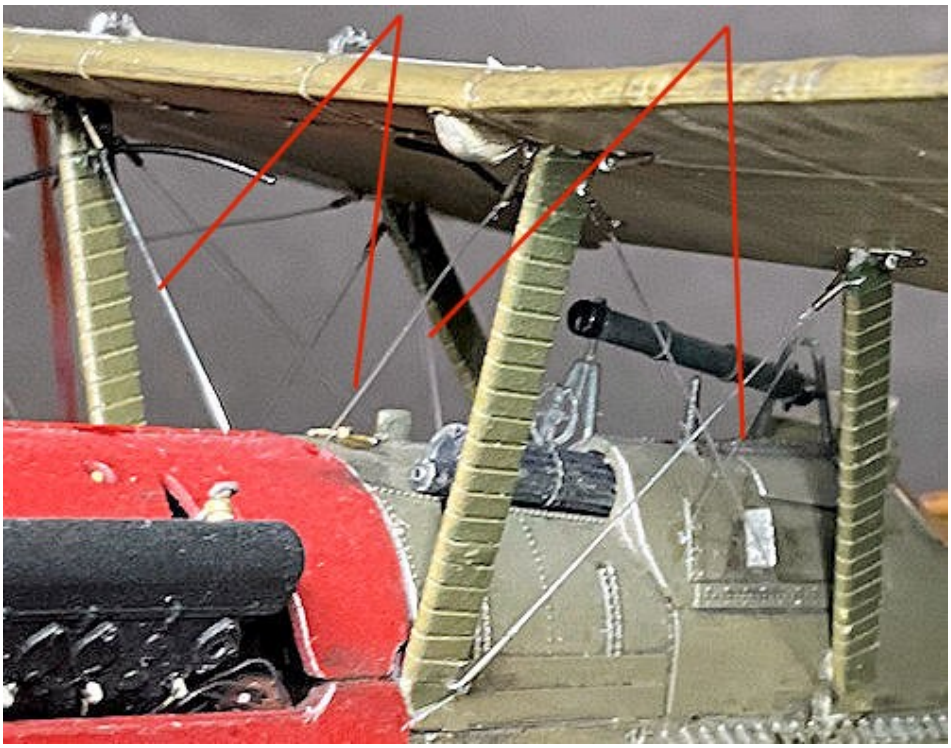
Keeping the line taut, secure it in the hole using thin CA adhesive.

Pass the free end of the pre-rigged left, forward bracing wire down and into the pre-drilled hole in the top left, rear edge of the engine access panel. Trim the length of the line such that it can be inserted into the hole by approximately 5 mm.

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

Pass the free end of the pre-rigged right, forward bracing wire down and into the pre-drilled hole in the top right, rear edge of the engine access panel. Trim the length of the line such that it can be inserted into the hole by approximately 5 mm.

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



Rear auxiliary flying wires:

NOTE: *Refer to Part 6 (Rigging) of this build log for more information. The* ***rear auxiliary flying wires*** *are already fitted to the lower wings. The rigging materials used are 'Albion Alloy's' Micro-tube Brass (MBT05) or Nickel-Silver NST05) of 0.5 mm diameter. The following procedure applies to each of the four rear auxiliary flying wires.*

Cut two short lengths of blackened tubes.

Slide the two tubes on to an auxiliary flying wire.

Pass the free end of the line up and through its previously fitted Anchor Point in the underside of the upper wing.

Loop the line back and through the tube.

Keeping the line taut, slide the tube up to, **but not touching**, the Anchor Point.

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

Cut away any residual line at the tube end.

Repeat the procedure for the remaining three rear auxiliary fly wires.

Rear primary flying wires:

NOTE: *Refer to Part 6 (Rigging) of this build log for more information. The* ***rear primary flying*** *wires are already fitted to the lower wings. The rigging materials used are 'Albion Alloy's' Micro-tube Brass (MBT05) or Nickel-Silver NST05) of 0.5 mm diameter. The following procedure applies to each of the four rear auxiliary flying wires.*

Repeat the previous procedure to final rig each of the rear primary flying wires to their respective Anchor points in the underside of the upper wing, inboard from the top of the interplane struts.

Rear landing wires:

NOTE: *Refer to Part 6 (Rigging) of this build log for more information. The **rear landing** wires are already fitted to the underside of the upper wing. The rigging materials used are 'Albion Alloy's' Micro-tube Brass (MBT05) or Nickel-Silver NST05) of 0.5 mm diameter. The following procedure applies to both of the rear landing wires.*

Cut two short lengths of blackened tubes.

Slide a tube on to a rear landing wire.

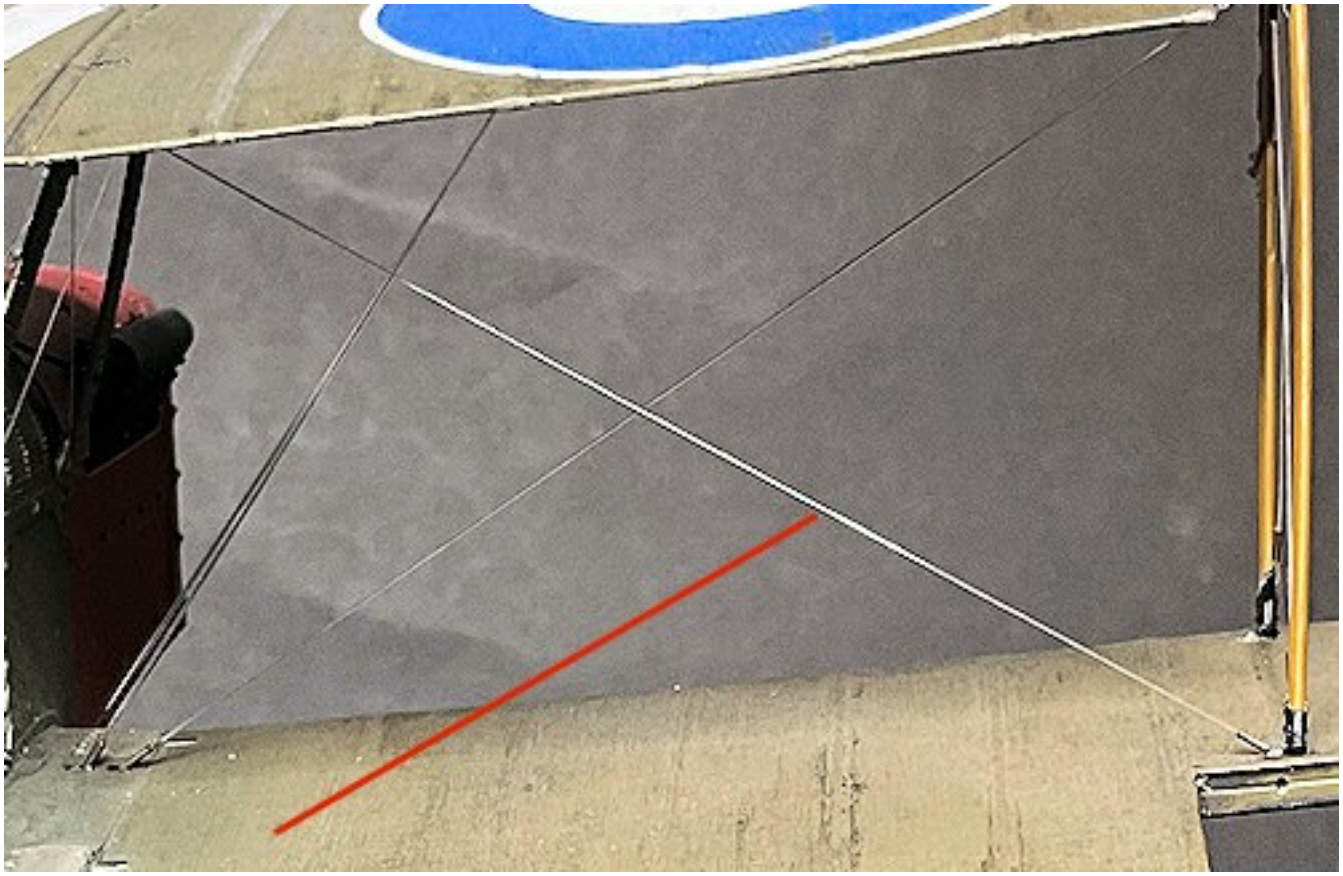
Pass the free end of the rear landing wire down and through the pre-drilled hole in the lower wing, inboard from the bottom of the rear interplane strut.

Keeping the line taut, secure it into the pre-drilled hole using thin CA adhesive.

Slide the tube down to the lower wing.

Secure the tube to the line using thin CA adhesive.

Cut away any residual line at the underside of the lower wing.



Forward auxiliary flying wires:

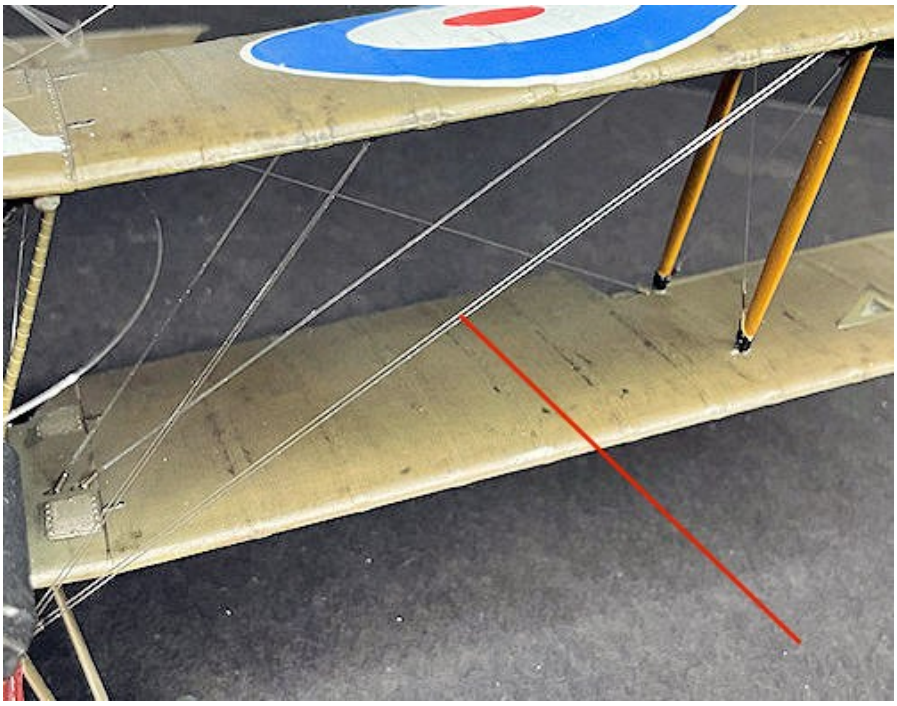
NOTE: *Refer to Part 6 (Rigging) of this build log for more information. The **forward auxiliary flying wires** are already fitted to the top of the landing gear forward struts. The rigging materials used are 'Albion Alloy's' Micro-tube Brass (MBT05) or Nickel-Silver NST05) of 0.5 mm diameter. The following procedure applies to each of the four forward auxiliary flying wires.*

Follow the same procedure as detailed previously for final rigging the rear auxiliary flying wires. Rig the two wires at the top of the landing gear forward struts to their fitted Anchor Points in the underside of the upper wing.

Forward flying wires:

NOTE: *Refer to Part 6 (Rigging) of this build log for more information. The* ***forward flying wires*** *are already fitted to the lower points on the top of the landing gear forward struts. The rigging materials used are 'Albion Alloy's' Micro-tube Brass (MBT05) or Nickel-Silver NST05) of 0.5 mm diameter. The following procedure applies to each of the four forward flying wires.*

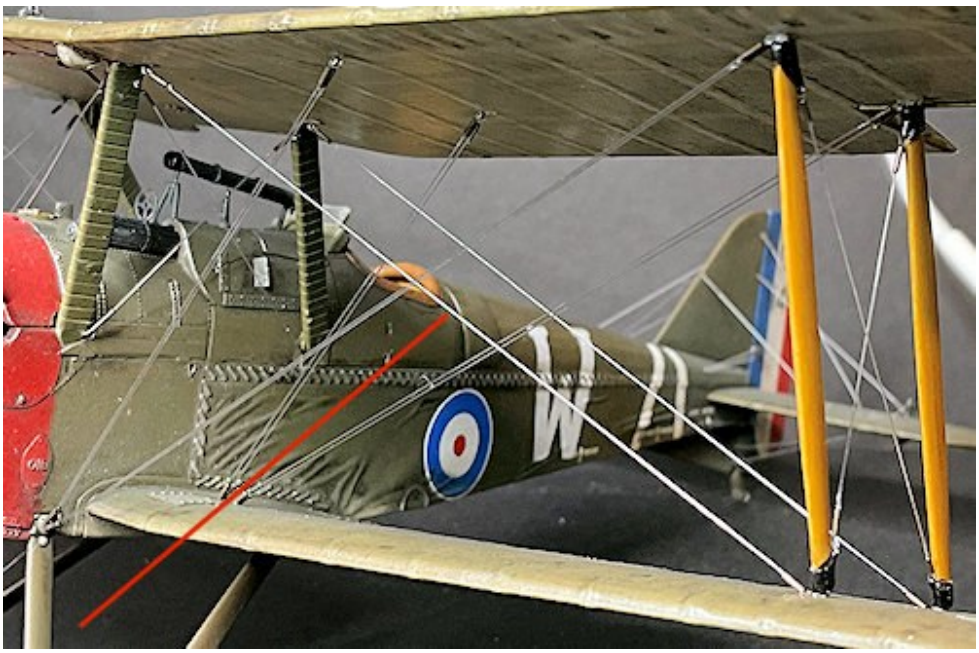
Follow the same procedure as detailed previously for final rigging the forward auxiliary flying wires, adding two tubes to each line. Rig the two wires at the lower points on the top of the landing gear forward struts to their fitted Anchor Points in the underside of the upper wing, inboard from the top of the interplane struts.



Forward landing wires:

NOTE: *Refer to Part 6 (Rigging) of this build log for more information. The **forward landing** wires are already fitted to the underside of the upper wing. The rigging materials used are 'Albion Alloy's' Micro-tube Brass (MBT05) or Nickel-Silver NST05) of 0.5 mm diameter. The following procedure applies to both of the forward landing wires.*

Follow the same procedure as detailed previously for final rigging the rear landing wires. Rig the two wires from the underside of the upper wing, outboard from the top of the forward cabane struts to their pre-drilled holes through the lower wings, inboard from the bottom of the forward interplane struts.



Aileron control cables:

NOTE: *Refer to Part 6 (Rigging) of this build log for more information. The ailerons and control cables can now be fitted as the upper wing has been fitted including all other rigging. The rigging materials used are:*

'Albion Alloy's' Micro-tube Brass (MBT04) or Nickel-Silver NST04) of 0.4 mm diameter.
'Steelon' or 'Stroft GTM' Mono-Filament line of 0.08 mm diameter.
'Proper Plane' fork end resin turnbuckles (RD-019).

The following procedure applies to both sides of the aircraft.

Cut four short lengths of blackened tube.

Cut three long lengths of line.

Cut the centre from the fork end of two turnbuckles, such that they fit over the top of the aileron control horns.

Using thin CA adhesive, secure the ailerons into their pre-drilled holes in the trailing edge of the upper and lower wings.

Pass one long line through the pre-drilled hole in the top of an aileron control horn.

Slide a tube on to the line.

Loop the line back and through the tube.

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

Secure the tube to the line using thin CA adhesive.

Pass the free end of the line rearwards and through the pre-drilled hole in the aileron.

Pass the line between the wings and through the pre-drilled hole in the opposite aileron.

Slide a tube on to the line.

Pass the line through the pre-drilled hole in the top of the aileron control horn.

Loop the line back and through the tube.

Keeping the line taut, slide the tube up to, **but not touching**, the control horn.

Secure the tube to the line using thin CA adhesive.

Cut away any residual line at the tube ends.

Pass one long line through the ‘eye’ end of each of the two turnbuckles.

Slide a tube on to the line.

Loop the line back and through the tube.

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

Secure the tube to the line using thin CA adhesive.

Cut away any residual line at the tube ends.

Pass the free end of the lines through the pre-drilled holes from the top surface of the upper wing and underside of the lower wing.

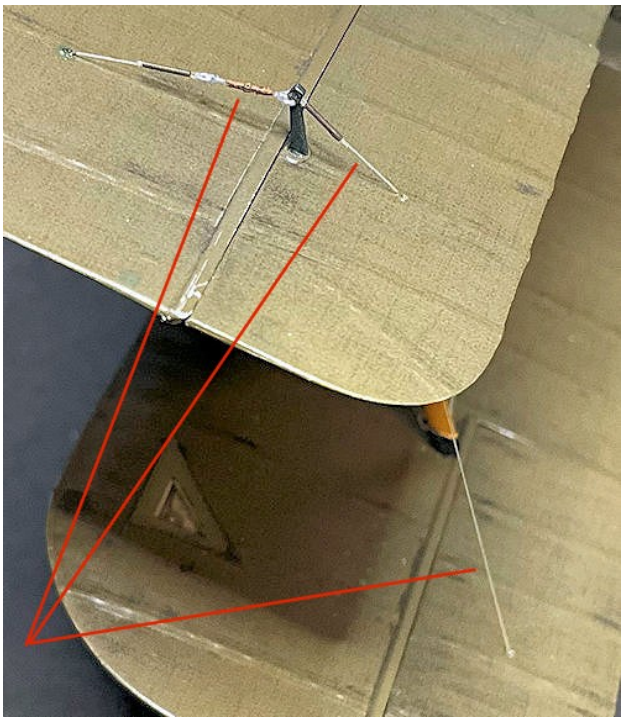
Using thin CA adhesive, secure the fork end of the turnbuckles over the top of the aileron control horns.

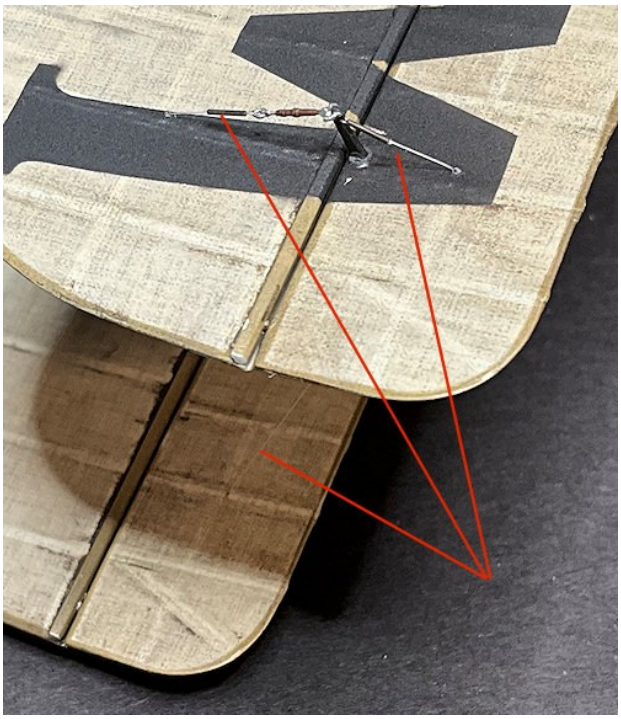
Keeping the lines taut, secure the lines in the pre-drilled holes in the wings, using thin CA adhesive.

Cut away any residual line at the surface of the wings.

Brush paint the centre barrel of the turnbuckles with ’Mr. Color’ Copper (215).

Brush paint the ends of the turnbuckles with ’Mr. Color’ Stainless Steel (213).





Assembly (continued):

Auxiliary fuel and pitot static pipes:

Trim the length of the two pre-fitted auxiliary fuel pipes in the inner surface of the forward cabane struts, such that they can be fully inserted into the pre-drilled holes in the fuselage sides.

Fully insert the pipes into the holes and if necessary, secure in place using thin CA adhesive.

Trim the length of the two pre-fitted fuel pipes in the top, inner surface of the forward cabane struts such that they can be fully inserted into the pre-drilled holes in the collector tanks on the underside of the upper wing leading edge.

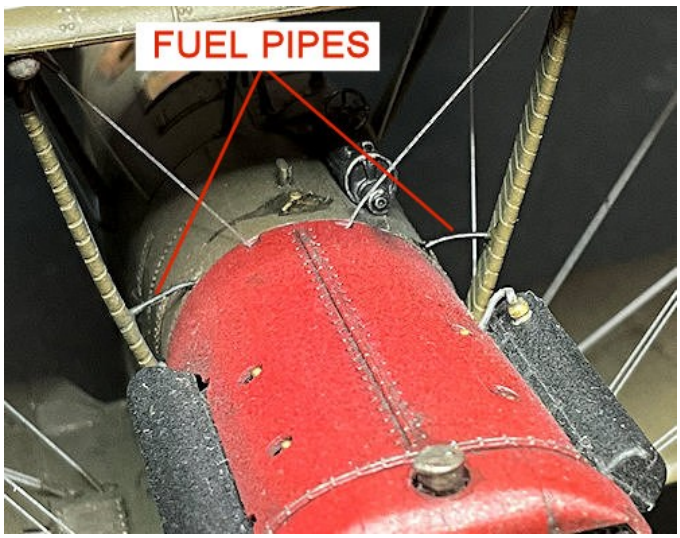
Fully insert the pipes into the holes and if necessary, secure in place using thin CA adhesive.

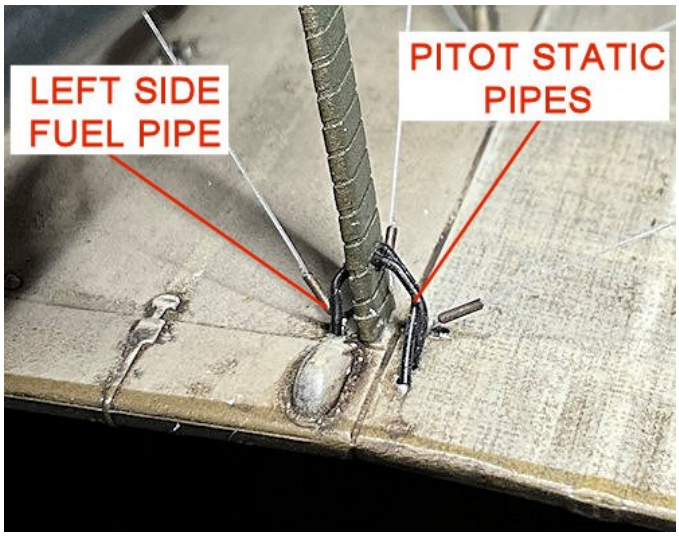
Trim the length of the two pre-fitted pitot static pipes on the forward, right interplane strut such that they can be fully inserted into the pre-drilled holes in the underside of the upper wing, forward from the strut.

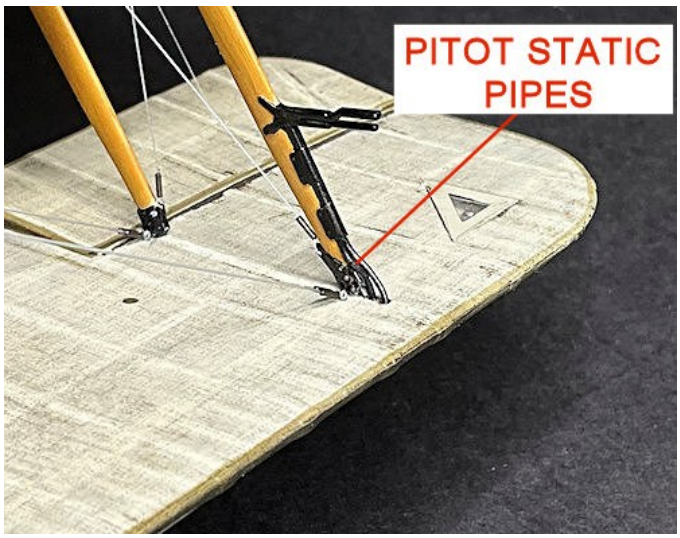
Fully insert the pipes into the holes and if necessary, secure in place using thin CA adhesive.

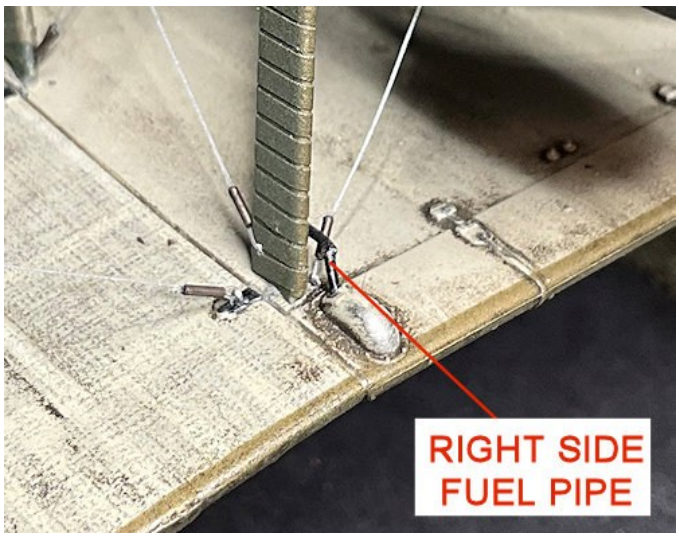
Trim the length of the two pre-fitted pitot static pipes on the outer surface of the forward, right cabane strut such that they can be fully inserted into the pre-drilled holes in the underside of the upper wing.

Fully insert the pipes into the holes and if necessary, secure in place using thin CA adhesive.









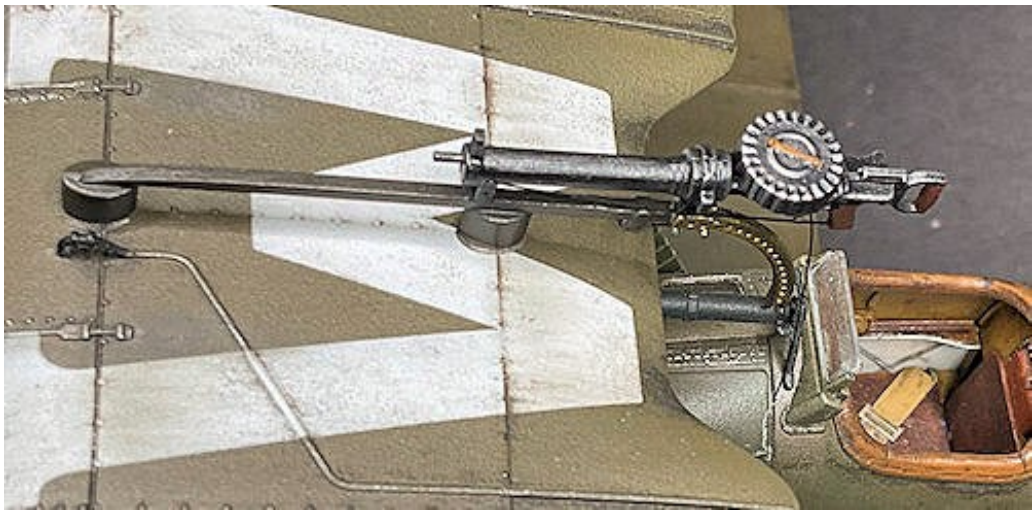
Lewis machine gun:

Cement the Lewis machine gun assembly into its two locating holes in the top surface of the upper wing centre section.

Drill a hole of 0.3 mm diameter through the fuselage, forward and to the left of the cockpit (Lewis machine gun trigger cable).

Trim the length of gun trigger cable such that it can be inserted down through the pre-drilled hole and into the cockpit.

Pass the line down and through the pre-drilled hole.



Engine exhaust pipes:

Cement the left and right engine exhaust pipes into their locating holes in the engine cylinder heads and their mounting bracket recesses in the fuselage sides.

Propeller:

Using CA adhesive on the propeller shaft, secure the propeller fully into the predrilled hole in the front of the engine.

PART 11
FIGURE

PART 11 - FIGURE

Th figure used with this model is the 'Copper State Models' British pilot (F32-003). The figure is supplied as a complete body, two arms and the head.

Preparation:

Cut and sand away the casting bases on the bottom of the feet and arms.

Cut a length of 0.5 mm and 0.8 mm diameter Brass rod, such as that from 'Albion Alloy's' or similar.

Drill a hole of 0.8 mm diameter vertically up into the left leg, making sure to keep the drill central to avoid drilling through the side of the leg.

Drill a hole of 0.6 mm diameter vertically up into the neck of the head.

Using thin CA adhesive secure the 0.8 mm rod fully into the pre-drilled hole in the leg. This will be used for painting the figure and for mounting the figure into the display base.

Using thin CA adhesive secure the 0.5 mm rod fully into the pre-drilled hole in the head. This will be used for painting the figure before fitting it to the body.

Painting:

Airbrush the figure and head with a grey primer, such as 'Mr. Surfacer' Grey 1500 or similar.

NOTE: *When brush painting with 'Tamiya' acrylics, I add a small amount of thinner or retarder in order to keep the paint fluid, otherwise I find it doesn't brush well onto the primed surface. The shadows and the highlights were brushed on while the base coats were still wet, which allows blending the paint, rather than ending up with stark contrasts.*

Brush paint the figure and head as follows:

Trousers - 'Tamiya' Khaki Drab (XF51) with Olive Green (XF58) blended highlights.

Jacket - 'AK Interactive' Brown Leather (AK3031), British Uniform (AK3081) shadows.
Finish 'Tamiya' Semi-Matte clear coat (X35) or similar.

Flight cap - 'AK Interactive' British Uniform (AK3081).
Finish 'Tamiya' Semi-Matte clear coat (X35) or similar.

Boots/Gloves - 'AK Interactive' Brown Leather (AK3031).
Finish 'Tamiya' Semi-Matte clear coat (X35) or similar.

Fur lining (boots, gloves, cap) - 'Tamiya' Deck Tan (XF55).

Goggle lenses, buttons, buckles - 'Mr. Metal Colour' Stainless Steel (213).
Goggle Lens surrounds - 'Tamiya' Rubber Black (XF85).

NOTE: *'Citadel Colour' can be thinned using water on a wet palette, which is basically water moistened tissue.*

Flesh - 'Citadel Colour' Bugmans Glow (base), Cadian Flesh Tone (flesh), Kislev Flesh (highlight).

Assembly:

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

Using thin CA adhesive secure the two arms fully into their locating recesses in the body of the figure.

Weathering:

Lightly sponge 'Tamiya' Weathering Master Set A (Mud) over the shoes.

Lightly sponge 'Tamiya' Weathering Master Set D (Oil Stain) over the pockets and elbows of the flying coat.

PART 12
DISPLAY BASE

PART 12 - DISPLAY BASE

This model will be displayed alongside a Spitfire Mk.1a as part of a dual build.

The cover for the display case in made from clear acrylic sheet of 3mm thickness. This cover was purpose built by Paul Moss of 'Inperspextive', who has a retail outlet on Ebay.

www.inperspextive.com

The base plinth was cut from 9 mm thick MDF board and the shoulder around the edge was routed for locating the clear cover. Three coats of a semi-gloss black wood varnish was applied to the plinth.

The two roundel base displays are made from 3mm plastic board by 'Coastal Kits'.

https://coastalkits.co.uk/

The information plaques were engraved by 'TLS Engraving Ltd'.

https://theengravingshop.co.uk/

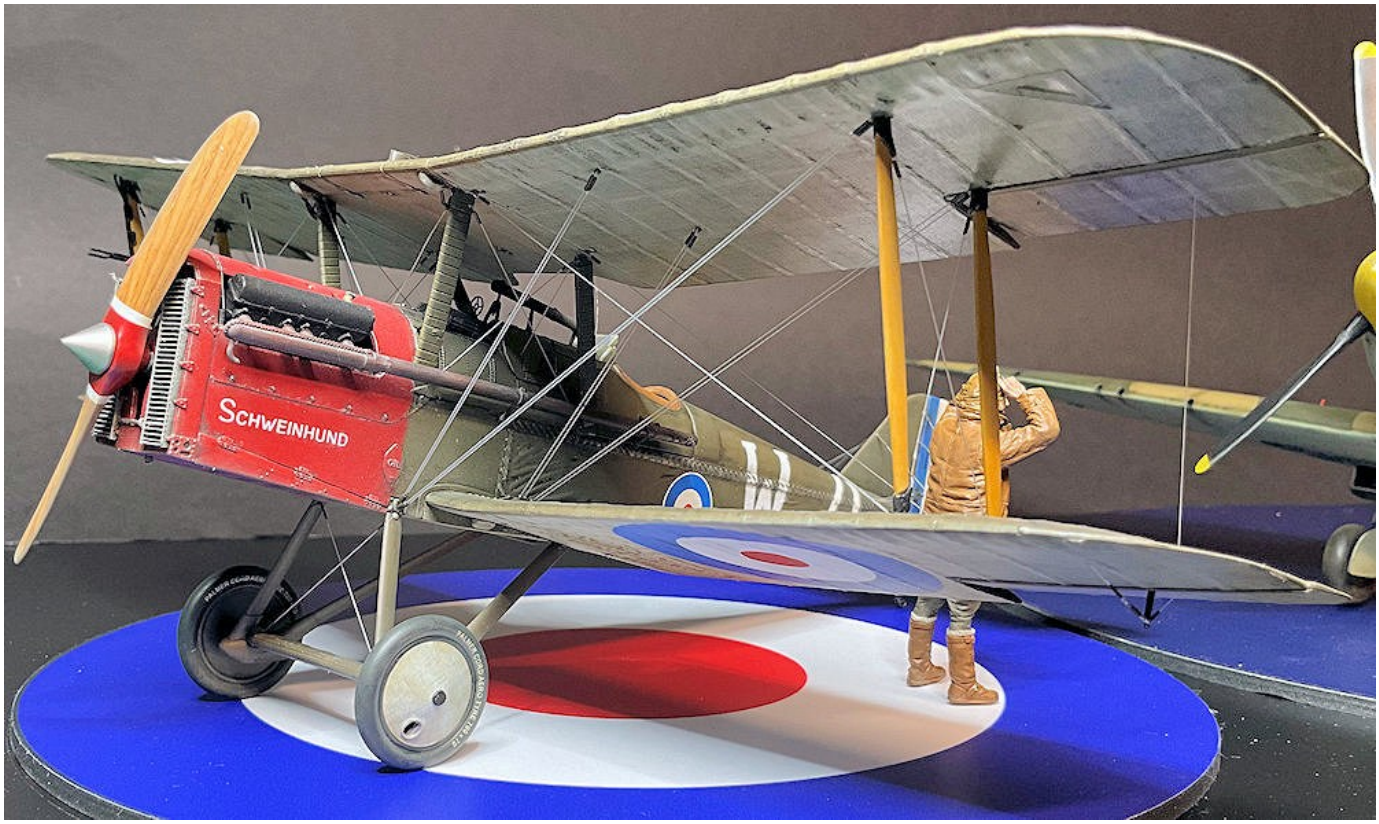
The aircraft were not fixed to the display base, but left as 'free standing'. Although this may not be as secure as fixing the models to the display base, it does mean the models will not be subjected to shock loading when being moved around, as they might be if fixed on the display.

The roundels are 200 mm diameter for the SE5a and 300 mm for the Spitfire. These were positioned on the plinth with the models and checked to ensure the acrylic cover was clear of the models when placed onto the plinth. The position of the roundels was noted and the cover and models removed. The roundels were then secured to the plinth in the noted positions, using 'Bostik' contact adhesive.

With the models positioned on the roundels, the figures positioned on the roundels in their final positions and the location of the locating rods in the legs marked on the roundels. A hole of 1.0 mm was drilled vertically through the roundels into the plinth. PVA or thin CA adhesive was then applied to the rods of the figures, which were then fully inserted into the drilled holes. Light pressure was applied to the figures to ensure they were fully located into the base.

The acrylic stands for the information plaques were scuffed with sand paper on the bottom surfaces. The model information plaques were then position on the plinth and their outlines lightly marked on the plinth. Inside the marked areas were scuffed to provide a good bonding surface. The contact adhesive was applied to the scuffed surfaces and the plaques, which were then positioned within their outlines on the plinth. The display title plaque was similarly applied centrally on the plinth. Once the adhesives had fully set, the information plaques were secured onto their stands, using the self-adhesive tape on the rear face of the plaques.

PART 13
COMPLETED MODEL PHOTOGRAPHS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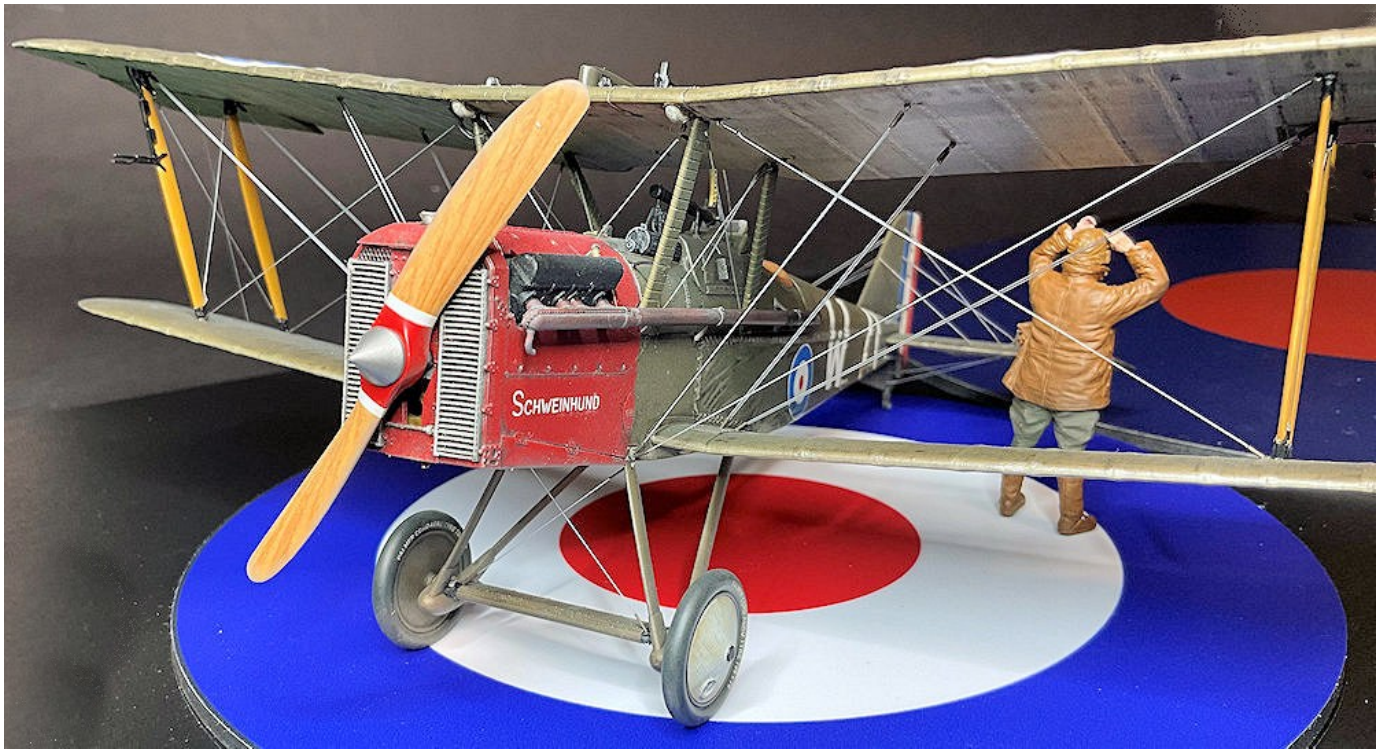
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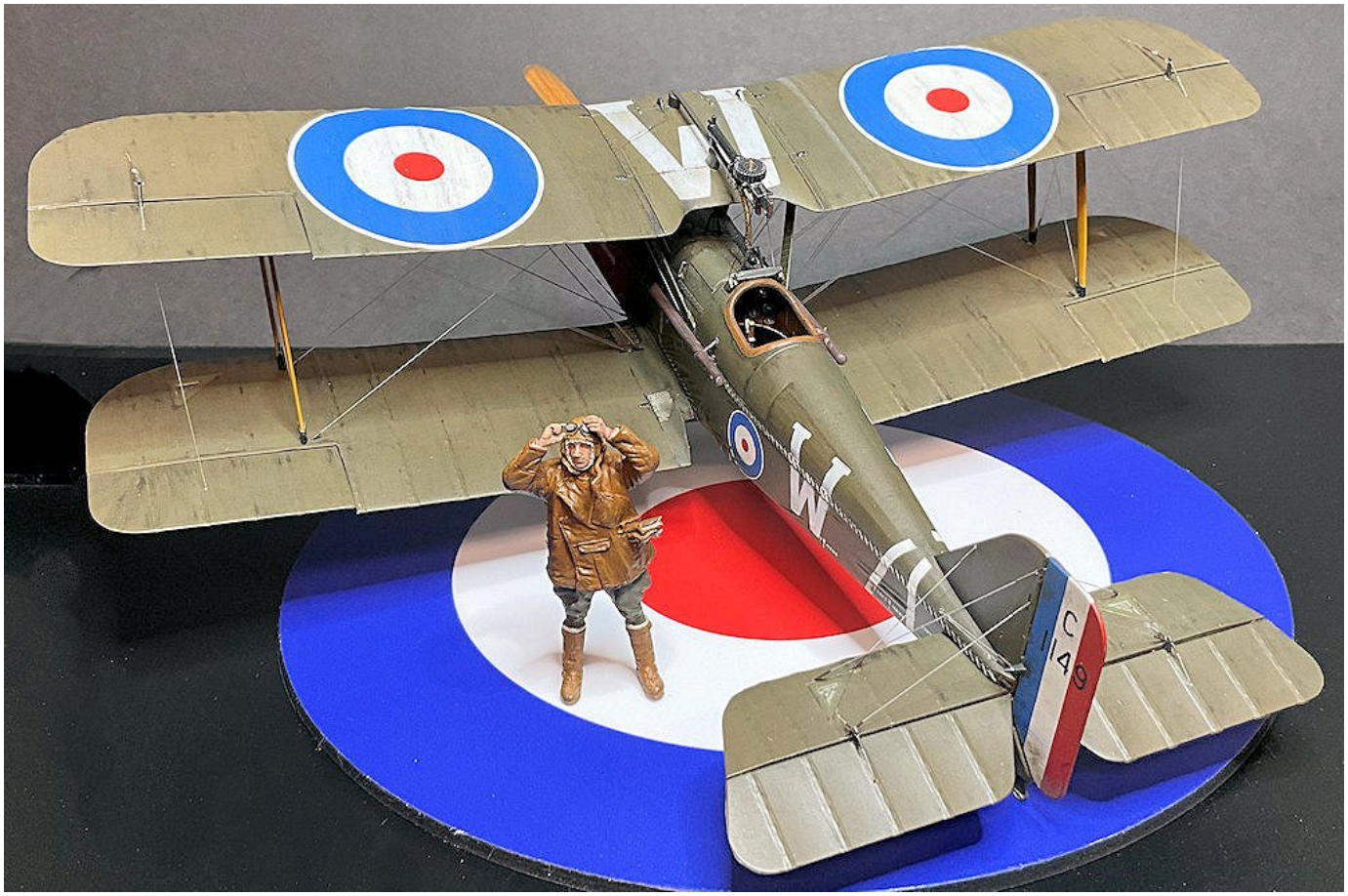

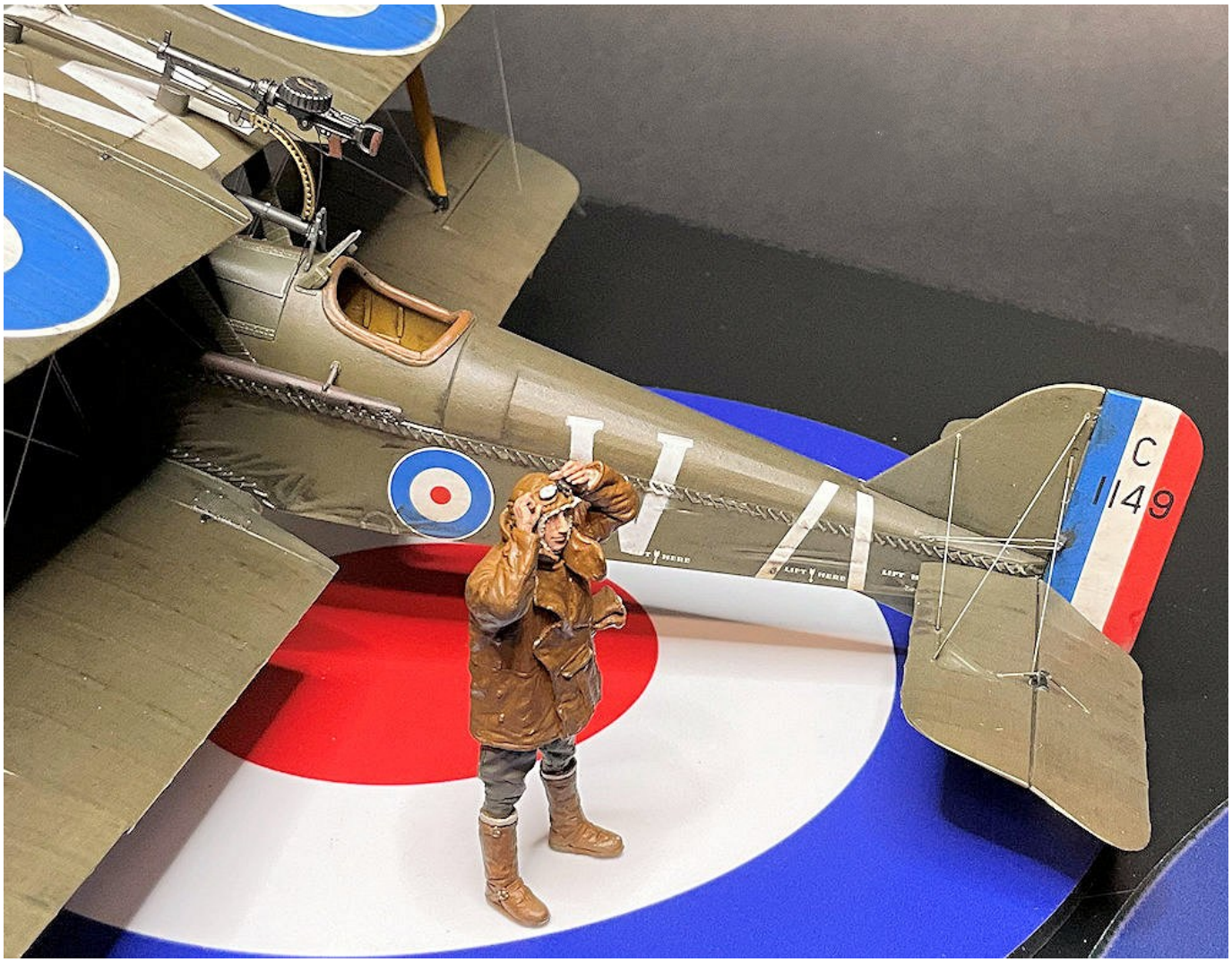
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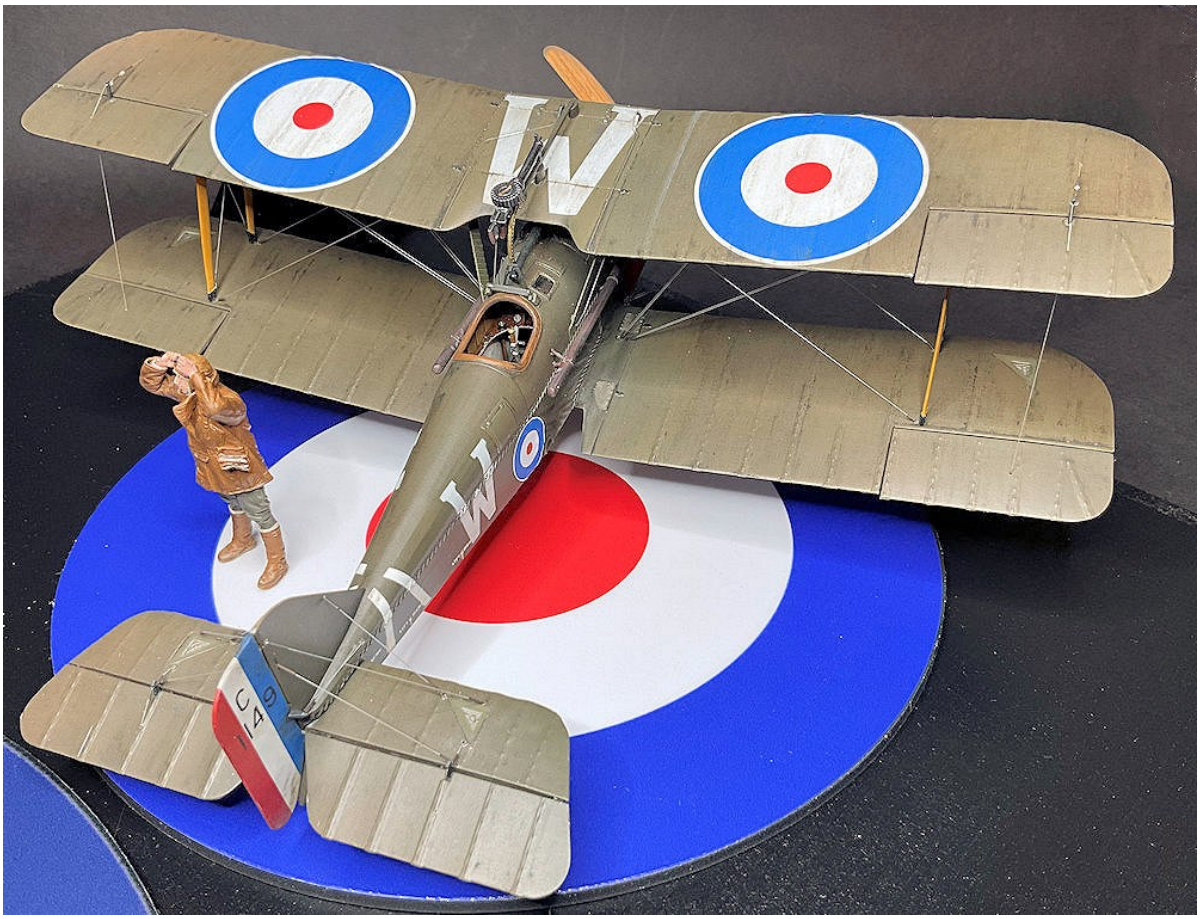


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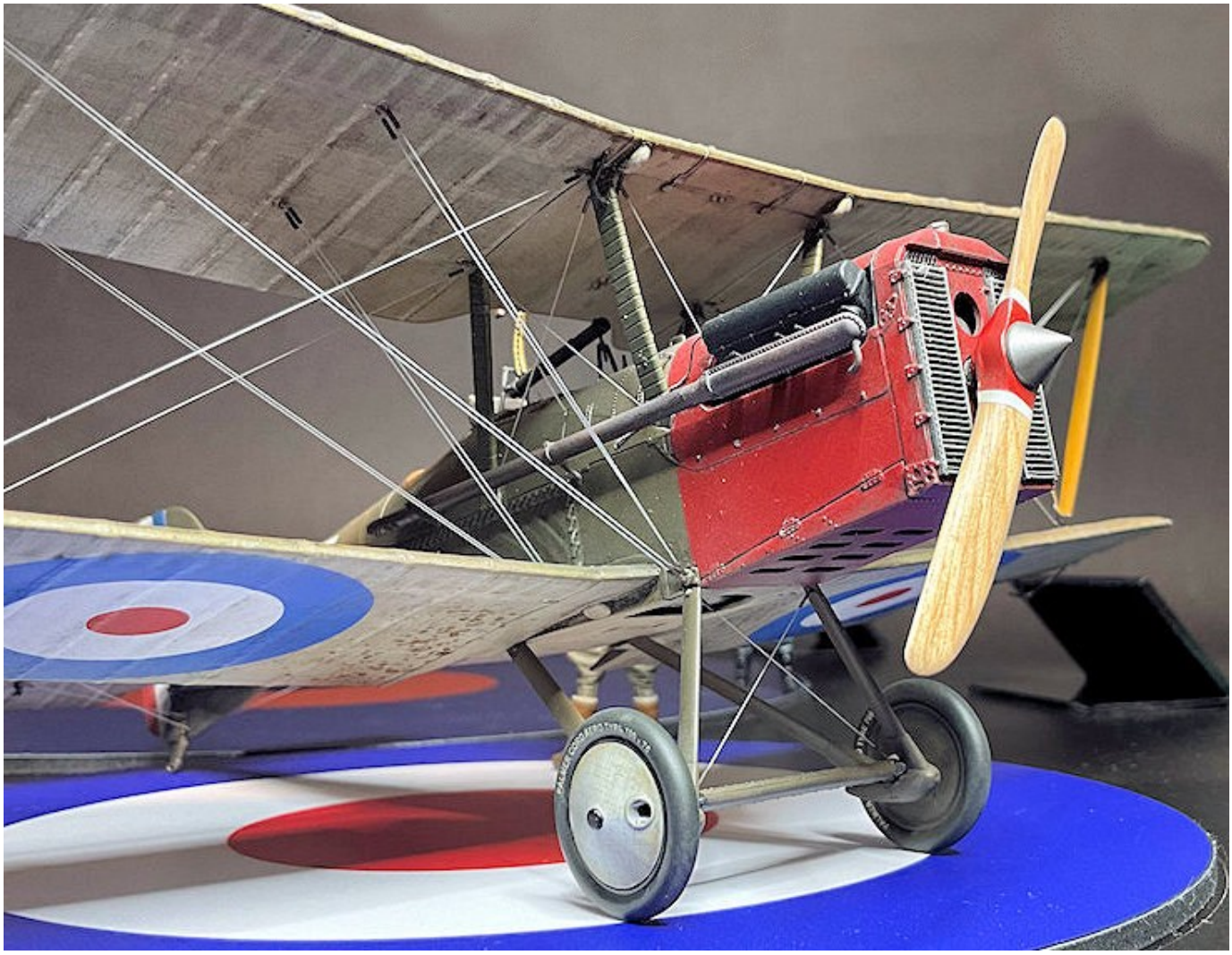


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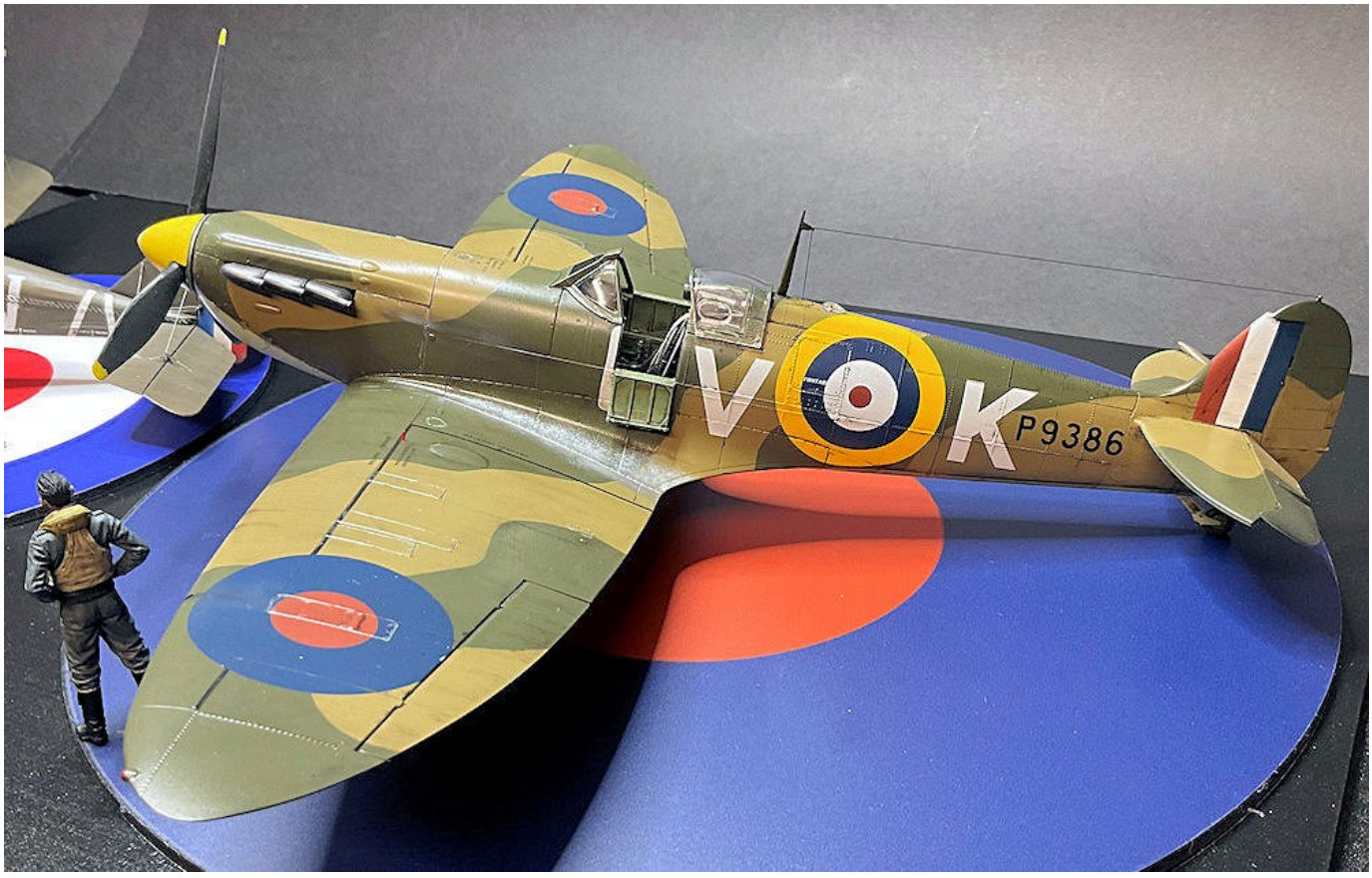
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