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 the 1:32 scale model of the Airco DH.2 by 'Wingnut Wings'.

Mike 'Sandbagger' Norris

https://mikesww1aircraftmodels.com
sandbaggeruk@sky.com

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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

Figures

'Kellerkind' French dressing pilot (54/110),
'Blackdog' RFC Mechanic (BDF32020).

Decals

'Aviattic' white backed PC10 'light' (ATT32080),
'Aviattic' clear backed Clear Doped Linen 'bleached' (ATT32044),
'Xtradecal' RAF number/letter decals (32021).

Propeller

'Proper Plane' DH2 wood laminated propeller (WP-021).

Photo-etch

'HGW Models' AMC DH.2 set (132097).

Rigging accessories (as required)

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

Sundries (as required)

Paints ('Tamiya' Acrylic, Humbrol Acrylic, 'Mr. Metal Colour',
'AK Interactive' Primer (Grey AK758, White AK759) and various black top paints,
'AK Interactive' Kerosene (AK2039) and Engine Oil (AK2019) washes, 'Alclad II' Lacquers,
'Tamiya' Fine Surface Primer (Grey/White), 'Mig' A-Stand Aqua Gloss (A.Mig-2503),
'MRP' acrylic lacquers, 'Mr. Surfacer' 500/1000/1200, 'Mr. Colour' 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', 'Windsor & Newton' Griffin Alkyd oil paint, 'VMS' Metal Prep 4K,
'Modelkasten' 0.2 mm diameter black line (1.5), 'Black-It' solution,
'MFH' 0.4 mm diameter flexible black tube (P-961).

Weathering mediums (as required)

'Flory Models' Clay washes or Pigments, 'AK Interactive' (Kerosene AK-2039, Oil AK-2019),
'Tamiya' Weathering Master sets, '502 Abteilung' Smoke (ABT005).

Display Base

'Polak' Wild Meadow - Variation G (4707),
'Inperspective' custom made Acrylic base and cover,
Information plaque from 'TLS Engraving Ltd'.

THE AIRCRAFT

THE AIRCRAFT

References:
‘Osprey aircraft of the aces 88’ - Pusher Aces of World War One (Jon Guttman).
‘Windsock’ Data File No.48 - Airco DH.2 (B.J.Gray).
‘Schiffer Military History Book’ - British Aviation Squadron Markings WW1 (Les Rogers).
‘Online’ - Resources.

The aircraft modelled is the Airco De-Havilland DH.2, Serial No.5966 as flown by Capt. Alan Machin Wilkinson of ‘C’ Flight, No.24 Squadron, Bertangles, August 1916.

NOTE: *The following text is based on that from the ‘Wingnut Wings’ instruction manual and online resources.*

Geoffrey de Havilland:

By the outbreak of the First World War, aeronautical engineer Geoffrey de Havilland was already an experienced aircraft designer, having been responsible for the experimental Royal Aircraft Factory F.E.1, Royal Aircraft Factory F.E.2 and Blériot Scout B.S.1, the B.S.1 being the fastest British aircraft of its day. In June 1914, after working at the Royal Aircraft Factory in Farnborough, he was invited to join Airco as chief designer, where he continued to work on his own designs, the first being the Airco DH.1, which followed a similar formula to that of the F.E.2.
Early air combat over the Western Front indicated the need for a single-seat fighter with a forward-firing machine gun. At this point in time, there was no dominant approach to arming fighters, but a pusher configuration was one answer. As no means of firing forward through the propeller of a tractor aeroplane was yet available to the British, Geoffrey de Havilland designed the DH.2 as a scaled-down, single-seat development of the earlier two-seat DH.1. While it is popularly viewed as a response to the emergence of Germany's Fokker Eindecker monoplane fighters, its development was not specifically targeted at the type, having commenced prior to the arrival of the Fokker Eindecker fighters. Geoffrey de Havilland's designs for Airco aircraft were marked with his initials ‘DH’. His designs for Airco were crucial to the company's success, which provided around a third of the trainers, fighters and bombers used by Britain and the United States during World War I.

Design:

The Airco DH.2 was a compact two-bay pusher biplane fighter aircraft. It had a wooden airframe, which was wire-braced and covered by fabric across most areas, except for the nacelle nose and upper decking. Both the upper and lower wings had ailerons fitted. The upper ailerons were spring-loaded to automatically return to a neutral position when the controls were released. The upper part of the nose of the nacelle was cut away so that a machine gun could be mounted there. Unusually, the windshield was mounted on the machine gun rather than to the airframe. The DH.2 was armed with a single .303 in (7.7 mm) Lewis gun which was mounted on a flexible mount. Early production DH.2’s arrived with an impracticable flexible ‘wobbly’ Lewis gun mount, 2 bladed propeller, bungee or spring type aileron returns and had the 5 gallon emergency fuel tank fixed under the top wing center section. Furthermore, the original gun mounting was criticised for being loose and unstable and it obstructed the control column when elevated. Other identifying features of early production aircraft are the small fairings at the rear of the nacelle, external magazine storage for 4x 47 round magazines for the Lewis machine gun, a single tube pitot head and the rudder control cable pulleys positioned slightly further forward in the nacelle. Like all new aircraft many unofficial and official changes would take place in service. The position of the emergency petrol tank directly above the hot engine was not thought to be ideal so it was moved to various positions on the top wing. Problems with the bottom longerons cracking lead to small inspection flaps being added just above the front undercarriage strut and the capacity of the main petrol tank was increased. Once pilots learned that the best method of achieving a victory was to aim the aircraft rather than the gun, the ‘wobbly’ Lewis gun mount was fixed to fire straight ahead and although this was met with scepticism by higher authorities, until a quick-release clip, devised by Major Lanoe Hawker, was fitted at the Squadron level. Hawker also improved the gunsights and added a ring sight and an ‘aiming off model’ that helped the pilot to ‘lead’ (fire ahead) of a target. The instrument board layout could vary considerably as did, surprisingly, the front cowl.

A 4 bladed propeller developed for another single seat pusher, the FE.8, was introduced in the middle of 1916 and improved performance. The majority of DH.2s were powered by the 100 hp (75 kW) Gnôme Monosoupape nine-cylinder, air-cooled rotary engine, however later models received the similarly configured but much improved 110 hp (82 kW) Le Rhône 9J engine. Some sources state that the Monosoupape was retained in the DH.2 design despite a tendency to shed cylinders midair and a single DH.2 was fitted experimentally with a Le Rhône 9J. In addition to the variety of engines used, the fuel system also differed between individual aircraft. Typically, a gravity-fed fuel tank was used, but it could be located on the upper wing central section, or either above or below the port side upper wing. A total of 453 DH.2s were produced by Airco.

General specifications:

Length - 25' 2 1/2" (7.68m)
Wingspan - 28' 3" (8.61m)
Height - 9' 6 1/2" (2.91m)
Empty weight - 1,356 lb (615 kg)
Maximum weight - 1,441 lb (653.8 kg)
Engine - 100hp Gnome Monosoupape nine cylinder air cooled rotary

Performance:

Maximum speed - 94mph (150kph)
Service ceiling - 14,000ft (4,270m)
Endurance - 2h 45 min

Weapons:

0.303in (707mm) Lewis Mk.II machine gun

Operational service:

After evaluation at Hendon on the 22nd of June 1915, the first DH.2 arrived in France for operational trials with No.5 Squadron (RFC) but was shot down and its pilot killed during early August 1915. This aircraft was recovered and repaired by the Germans. Despite this, the DH.2 was ordered into quantity manufacture. The production aircraft was generally similar to the prototype with the only major alterations being a fuel system and a revised gun mounting arrangement. The first squadron equipped with the DH.2 and the first RFC squadron completely equipped with single-seat fighters, No.24 Squadron (RFC), arrived in France early February 1916. The DH.2 enabled to counter the 'Fokker Scourge' that had given the Germans the advantage during late 1915. It served in fighting and escort duties for almost two years, while numerous pilots became flying aces using the type. The DH.2 was to eventually equip seven fighter squadrons on the Western Front and proved more than a match for the Fokker Eindecker and the first DH.2 victory over an Eindecker may have been on the 2nd of April 1916. DH.2s were heavily involved in the Battle of the Somme with No.24 Squadron engaging in 774 combats and claiming 44 enemy machines. Service training for pilots in the RFC was poor and the DH.2 initially had a high accident rate, supposedly gaining the nickname 'The Spinning Incinerator'. However, as familiarity with the type improved, it was recognised as being manoeuvrable and relatively easy to fly. The limited ammunition supply of the original gun installation proved to be inadequate. Although officially discouraged, pilots experimented with different gun arrangements, including a fixed twin-gun configuration.
The arrival at the front of more powerful German tractor biplane fighters such as the Halberstadt D.II and the Albatros D.I, in late 1916, meant that the DH.2 was being outclassed. However, it remained in first line service until June 1917 in France, until Squadrons such as No.24 and No.32 Squadron (RFC) reequipped with Airco DH.5s or Nieuport 17 fighters. A few remained in service in Macedonia including 'A' Flight of No.47 Squadron, a joint RFC/RNAS fighter squadron and with 'X' Flight, in Palestine until late 1917. By then, it was dangerously obsolete as a fighter. The DH.2 was then used as an advanced trainer and for other secondary tasks, with the last recorded use of a DH.2 being a single example flying at RAF Turnhouse in January 1919.

DH.2 aces:

Distinguished pilots of the DH.2 included Lanoe George Hawker V.C., D.S.O.(seven victories, though none in the DH.2), who was the first commander of No.24 Squadron. Hawker, flying a DH.2, was eventually shot down and killed by Manfred von Richthofen flying an Albatros D.II fighter.
The commander of No.32 Squadron, Lionel Rees was awarded the Victoria Cross after flying the D.H.2 for a solo attack on a formation of ten German two-seaters on the 1st of July 1916, destroying two. James McCudden became an ace in DH.2s and would become the British Empire's fourth-ranking ace of the war. German ace and tactician Oswald Boelcke was killed during a dogfight with No.24 Squadron DH.2s due to a collision with one of his own wingmen. Fourteen aces scored five or more aerial victories using the DH.2 and many also went on to further success in later types. Eight pilots scored all of their victories in the DH-2, including Harry Wood, Sidney Cowan, Hubert Jones, William Curphey, Maxmillian Mare-Montembault, Patrick Anthony Langan-Byrne, Eric Pashley and Selden Long.

The following tabulation shows pilots and their DH.2 victories.

Pilot	victories
Patrick Anthony Langan-Byrne	10
Alan Wilkinson	10
Selden Long	9
Arthur Gerald Knight	8
Eric C. Pashley	8
John Oliver Andrews	7
Sidney Cowan	7
Hubert Jones	7
William Curphey	6
Stanley Cockerell	5
Henry Evans	5
James McCudden	5
Robert Saundby	5
Harry Wood	5

Squadrons that operated the DH.2

No.5 Squadron RFC
No.11 Squadron RFC
No.17 Squadron RFC
No.18 Squadron RFC
No.24 Squadron RFC
No.29 Squadron RFC
No.32 Squadron RFC
No.41 Squadron RFC
No.47 Squadron RFC
No.111 Squadron RFC

Aircraft colour scheme:

Arriving early in the war at a time when camouflage was only just being introduced the DH.2 features many interesting colour scheme possibilities. Early DH.2 appear to have had their nacelles, metal and wood components and struts painted grey, with fabric areas remaining natural Clear Doped Linen (CDL). The desire to camouflage aircraft lead to 'emergency' applications of varnish tinted with liquid or ground pigments, which were quite transparent, although slightly less so for the ground pigment versions, These ranged in colour from approximately FS14097 to 24098 for green and FS3011B to 20122 for the brown (Ian Huntley writing in Scale Models). While offering some protection from prying eyes these dyed varnishes offered no protection from the Sun's harmful rays and a line of opaque Protective Covering (PC) dopes were developed, the most infamous of which, PC10, was slowly introduced from April-May 1916. Prior to the introduction of PC10 it appears that an 'experimental khaki' PC8 colour saw limited use and was, reportedly, a light brown similar to FS10266. Many aircraft exhibit evidence of being camouflaged with tinted green and/or brown varnishes and some may have received a coat of khaki PC8 before PC10 was available in large quantities. All wood and almost all metal parts were painted grey and metal parts which were not grey appear be have initially been finished in black, although many were later overpainted with grey in service.

DH.2 5966:

The colour of the doped linen upper surfaces of DH.2 aircraft operating with No.24 Squadron during 1916 are shown as colour profiles in the following:

‘Wingnut Wings’ kit instruction manual profiles by Ronny Bar

‘Osprey aircraft of the aces 88’ - Pusher Aces of World War One (Jon Guttman)

‘Aircraft colours and markings of the First World War era’ by Bob Pearson

‘Windsock’ Data File No.48 - Airco DH.2 (B.J.Gray).

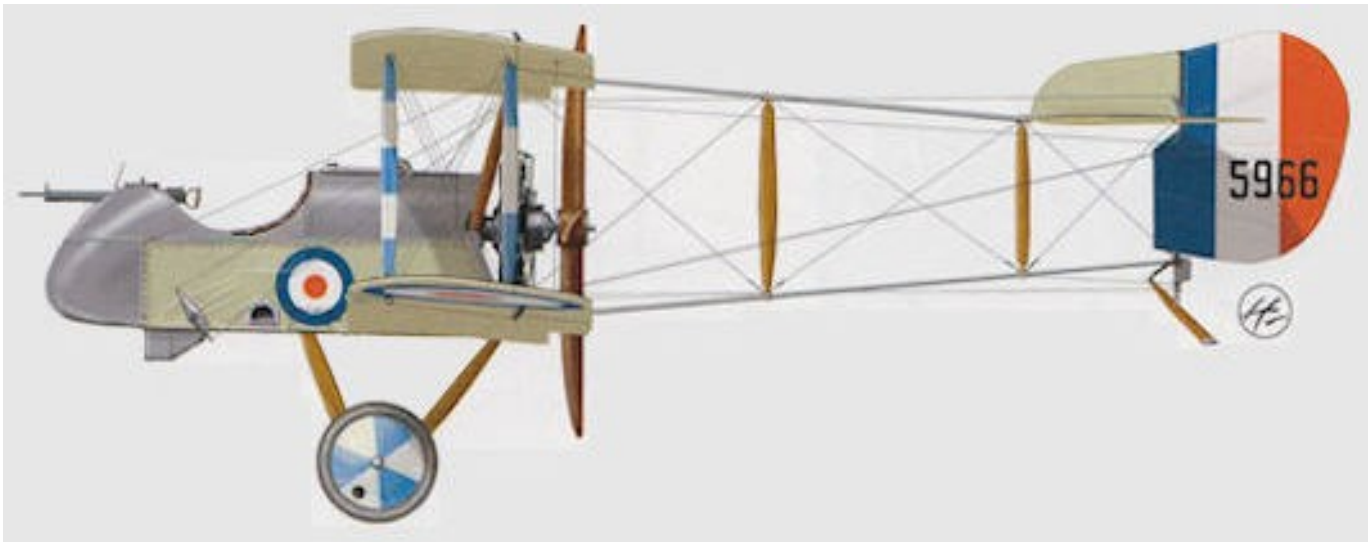
The ‘Osprey’ publication only shows the upper surfaces for a No.24 Squadron DH.2 during 1917 and is shown as the more brown PC10 or PC12 rather than Clear Doped Linen (CDL) or PC8. The other profiles available are only of the aircraft side view, so the upper surfaces are not visible. However, the following text, adapted for No.24 Squadron from the ‘Windsock’ Data File No.48 - Airco DH.2 (B.J.Gray), gives more information on the upper surface colouring:

On arrival in France No.24 Squadron DH2s were in factory finish. In May 1916 instructions were issued from RFC HQ that all nacelles of pusher aircraft were to be painted dull grey. In the same month the RFC began painting the upper surfaces of its aircraft with pigmented dope (PC 10), which varied in colour from chocolate brown to a greenish khaki. By June, all the DH2 squadrons followed suit. The grey nacelles were retained, although later in the year some DH2 nacelles did receive a PC 10 finish. The practice of marking roundels on the fabric sides of the nacelles started in March 1916, and was usually applied in the squadron workshops. The size and location of these roundels varied considerably from aircraft to aircraft. Once established in France, No.24 Squadron divided its flights into colours, with Red for ‘A’ flight; White for ‘B’ flight; and Blue for ‘C’ flight. The DH2s had their fabric wheel covers doped in the appropriate flight colour.

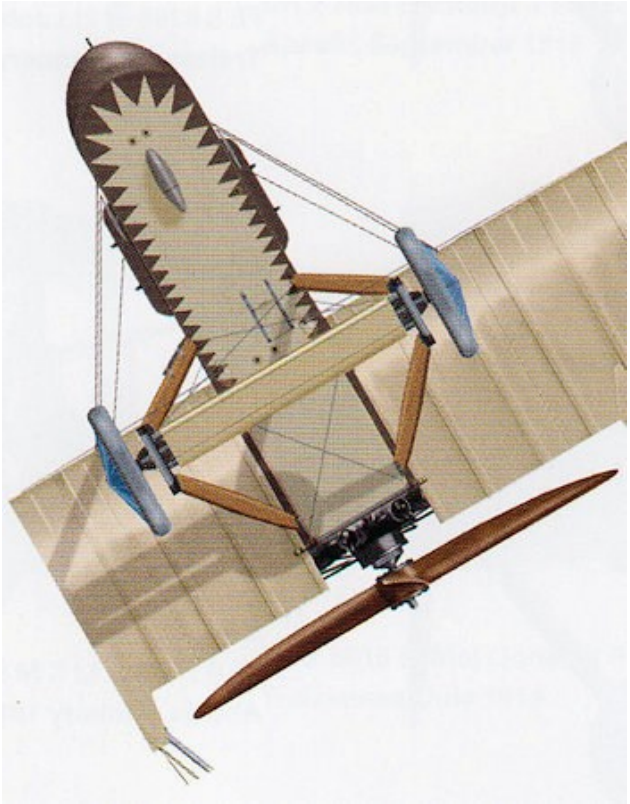
The colour profile for this aircraft is dated as being August 1916 and shows the fin as CDL. However, given the above information, it’s reasonably safe to assume that for this period in 1916 the upper surfaces of the wings, ailerons, tailplanes and elevators were doped with either chocolate brown or greenish khaki PC10.

The ‘Schiffer Military History Book’ - British Aviation Squadron Markings WW1 (Les Rogers) states that No.24 Squadron DH.2 aircraft were fitted with the later four bladed FE.8 type propeller, rather than the earlier two bladed type. Also, the large identity numbers, probably in flight colours, on the nacelle and wings, were not used until 1917. The flight colours for No.24 Squadron DH.2s were red for ‘A’ Flight, white for ‘B’ Flight and blue for ‘C’ Flight. These colours were applied as contrasting bands on the white painted outer interplane struts (never more than two), although originally the wheel covers carried the flight colours. A unique squadron marking was a saw-tooth pattern, created using the grey or PC nacelle colour at the edges of the nacelle underside, which was painted white.

Airco DH.2, 5966 as flown by Capt. Alan Machin Wilkinson of ‘C’ flight, No.24 Squadron during 1916



Example of the saw-tooth underside of the nacelle with PC colour edges



THE PILOT

THE PILOT

References:
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‘Online’ - Resources.

General:

Alan Machin Wilkinson was born on the 21st of November 1891 in Eastbourne, Sussex, the son of a civil engineer. He was educated at Repton School and Oriel College, Oxford, and briefly worked as a school-master in Winchester.

World War 1:

Wilkinson was commissioned as a second lieutenant in the 9th (Cyclist) Battalion, Hampshire Regiment, on the outbreak on the war and was promoted to Lieutenant on 22nd of September 1914. Wilkinson then trained as a pilot and was granted Royal Aero Club Aviator's Certificate No.1398 after soloing a Maurice Farman biplane at the Military School at Farnborough on the 4th of July 1915. He was seconded to the Royal Flying Corp and appointed a Flying Officer on the 8th of September 1915.

Airco DH.2:

Wilkinson was posted to No.24 Squadron (RFC), under the command of Major Lanoe Hawker, flying the Airco DH.2 single-seat fighter and was appointed a flight commander with the temporary rank of Captain on the 22nd of February 1916. He gained his first aerial victories on the 16th of May 1916, driving down two enemy aircraft within half an hour of each other. He accounted for two more on the 17th of June and another the following day, bringing his score to five and making him an 'ace'. He drove down his sixth victim on the 19th of July then another four between the 21st and 31st of August to bring his total to ten, making him the joint-highest scoring pilot in this aircraft, along with Patrick Langan-Byrne. For at least some of the time, Wilkinson had an additional Lewis gun fitted to his aircraft, DH.2 No.5966, known as "Wilkie's Bus", until ordered to remove it.

He was awarded the Distinguished Service Order, which was gazetted on the 20th of October 1916. his citation read:

> Lieutenant (Temporary Captain) Alan Machin Wilkinson, Hampshire Regiment and Royal Flying Corps.
>
> "For conspicuous gallantry and skill. He has shown great dash in attacking enemy machines, and, up to the end of August, he had accounted for five. On one occasion while fighting a hostile machine he was attacked from behind, but out-manoeuvred the enemy and shot him down. Finally he got back, his machine much damaged by machine gun fire."

Wilkinson also received a "mention in despatches" from General Sir Douglas Haig, Commander-in-Chief of the British Armies in France, on the 13th of November 1916. He was posted back to England and served as an instructor at the Central Flying School from the 2nd of December 1916 until the 12th of January 1917, during which time married Miss Lina Shell at St. Barnabas Church, Kensington on the 16th of December 1916.

Bristol F2.b:

He then returned to France to serve in No. 48 Squadron RFC, flying the newly-introduced Bristol F.2a two-seater fighter. Despite heavy British losses during "Bloody April" Wilkinson gained further victories, driving down a fighter on the 5th of April and on the 9th of April 1917 claimed six aircraft, though he was credited with only four. Another victory followed on the 12th, then two on the 13th, and finally his nineteenth and last on 22 April.

This brought him a bar to his Distinguished Service Order which was gazetted on 25 May 1917.
His citation read:

> Lieutenant (Temporary Captain) Alan Machin Wilkinson, DSO, Hampshire Regiment and Royal Flying Corps.

"For great skill and gallantry. He came down to a low altitude and destroyed a hostile scout which was attacking one of our machines, the pilot of which had been wounded, thereby saving it. In one day he shot down and destroyed six hostile machines. He has destroyed eight hostile machines during the past ten days and has displayed exceptional skill and gallantry in leading offensive patrols."

He was awarded the Distinguished Service Order, which was gazetted on 20 October 1916. His citation read:

> Lieutenant (Temporary Captain) Alan Machin Wilkinson, Hampshire Regiment and Royal Flying Corps.
>
> "For conspicuous gallantry and skill. He has shown great dash in attacking enemy machines, and, up to the end of August, he had accounted for five. On one occasion while fighting a hostile machine he was attacked from behind, but out-manoeuvred the enemy and shot him down. Finally he got back, his machine much damaged by machine gun fire."

On the 10th of May 1917 Wilkinson was appointed a squadron commander with the temporary rank of Major and on the 31st of May he was promoted to Captain. He served as the Officer Commanding of No. 23 Squadron (RFC), flying the SPAD S.VII, until the end of August when he was hospitalised with appendicitis. He received his second "mention in despatches" on the 11th of December 1917, but soon afterwards was diagnosed with "neurasthenia" (today considered to be a form of combat stress reaction). He was appointed an acting Lieutenant-Colonel on the 15th of April 1918 and commanded one of the RAF's Schools of Aerial Fighting.

Between wars:

After the war, Wilkinson was transferred to the Royal Air Force (RAF) unemployed list on the 26th of April 1919. He eventually relinquished his commission as a Captain in the Hampshire Regiment on the 30th of September 1921. Wilkinson worked in advertising, eventually becoming a director of the London Press Exchange in 1938.

World War 2:

Wilkinson resumed his military career when granted a commission as a Pilot Officer on probation in the Administrative and Special Duties Branch of the Royal Air Force Volunteer Reserve on the 28th of

February 1939. On the 23rd of July he was confirmed in his appointment and promoted to Flying Officer. He received his third "mention in despatches" on the 17th of March 1941, by which time he was an acting Squadron Leader and served as Officer Commanding RAF West Malling from March to June 1941 and of RAF Martlesham Heath from June 1941 to November 1942. Wilkinson resigned his commission on the 4th of August 1944 and was permitted to retain the rank of Wing Commander.

Wilkinson was credited with nineteen aerial victories. He was one of the few to be twice awarded the DSO and five of those were also holders of the Victoria Cross.

Alan Machin Wilkinson died in Maidstone, Kent in June 1972.

No.	Date/Time	Aircraft/ Serial No.	Opponent	Result	Location	Notes
No. 24 Squadron (RFC) - Airco DH.2						
1	16 May 1916 0700–0730	DH.2 (5966)	AGO G.II	Out of control	Péronne	
2			Fokker E	Out of control		
3	17 June 1916 1825–1900	DH.2 (5966)	Fokker E	Destroyed	Miraumont	
4			Albatros C	Forced to land	Grévillers	
5	18 June 1916 1950	DH.2 (5966)	C Type	Destroyed	South-east of Achiet-le-Grand	
6	19 July 1916 1015	DH.2 (5966)	Fokker E	Out of control	Bapaume – Péronne Road	
7	21 August 1916	DH.2	C Type	Destroyed	Le Sars	Shared with Second Lieutenants Harry Wood and S. J. Sibley.
8	28 August 1916 1840	DH.2 (7880)	Enemy Aircraft	Destroyed	Le Sars - Flers	
9	31 August 1916 1100–1130	DH.2 (7880)	Roland C	Destroyed	Villers	
10			LVG C	Out of control	High Wood	
No. 48 Squadron (RFC) - Bristol F2.b						
11	5 April 1917 1200	Bristol F.2a	Albatros D.III	Out of control	Douai	Observer: Lieutenant Laurence Allen
12	9 April 1917	Bristol F.2a	C	Destroyed	Lens	Observer: Lieutenant Hugh Griffith.
13			Albatros D.III	Out of control		
14			Albatros D.III	Destroyed	Arras	Observer: Lieutenant Laurence Allen. Shared with Captain John Letts and Lieutenant H. G. Collins.
15			Albatros D.III	Out of control		
16	12 April 1917	Bristol F.2a	Albatros D.III	Out of control		Observer: Lieutenant Laurence Allen. Shared with Lieutenant William Winkler & Second Lieutenant Ernest Moore.
17	13 April 1917	Bristol F.2a	Albatros D.III	Destroyed	Vitry-en-Artois	Observer: Lieutenant Laurence Allen. Shared with Lieutenant J. W. Warren & Second Lieutenant Hugh Griffith
18			Albatros D.III	Out of control		
19	22 April 1917	Bristol F.2a	Albatros D.III	Out of control		Observer: Lieutenant Laurence Allen

PART 1
MODEL DESCRIPTION

PART 1 - MODEL DESCRIPTION

('Wingnut Wings' - Kit No:32028)

This kit is from 'Wingnut Wings' and was built using the kit instructions with one correction page issued on the 'Wingnut Wings' web site.

Normally here I would write a basic description of the model, noting any points of interest or flaws. However, there is a good review of a similar kit online. Paste the link below into your internet browser to view the review.

https://archive.aeroscale.net/review/8346/

When researching a particular aircraft, it's quite often found that some changes to the model may be required. These can be modifications to enhance the model to better represent the particular aircraft. Also some squadron aircraft had 'in-the-field' modifications made to improve the aircrafts operational capability. The following are changes that I found that were needed to enhance and reflect the particular aircraft being modelled.

Propeller:

The kit supplies four types of propeller, one of which is the 'Axial' propeller. I chose not to use the kit supplied propeller and to replace it with a 'Proper Plane' Axial wood laminated propeller.

Other:

Other model details will be addressed as and if required, using 'After Market' parts if necessary.

PART 2
WOOD EFFECTS (General)

PART 2 - WOOD EFFECTS (General)

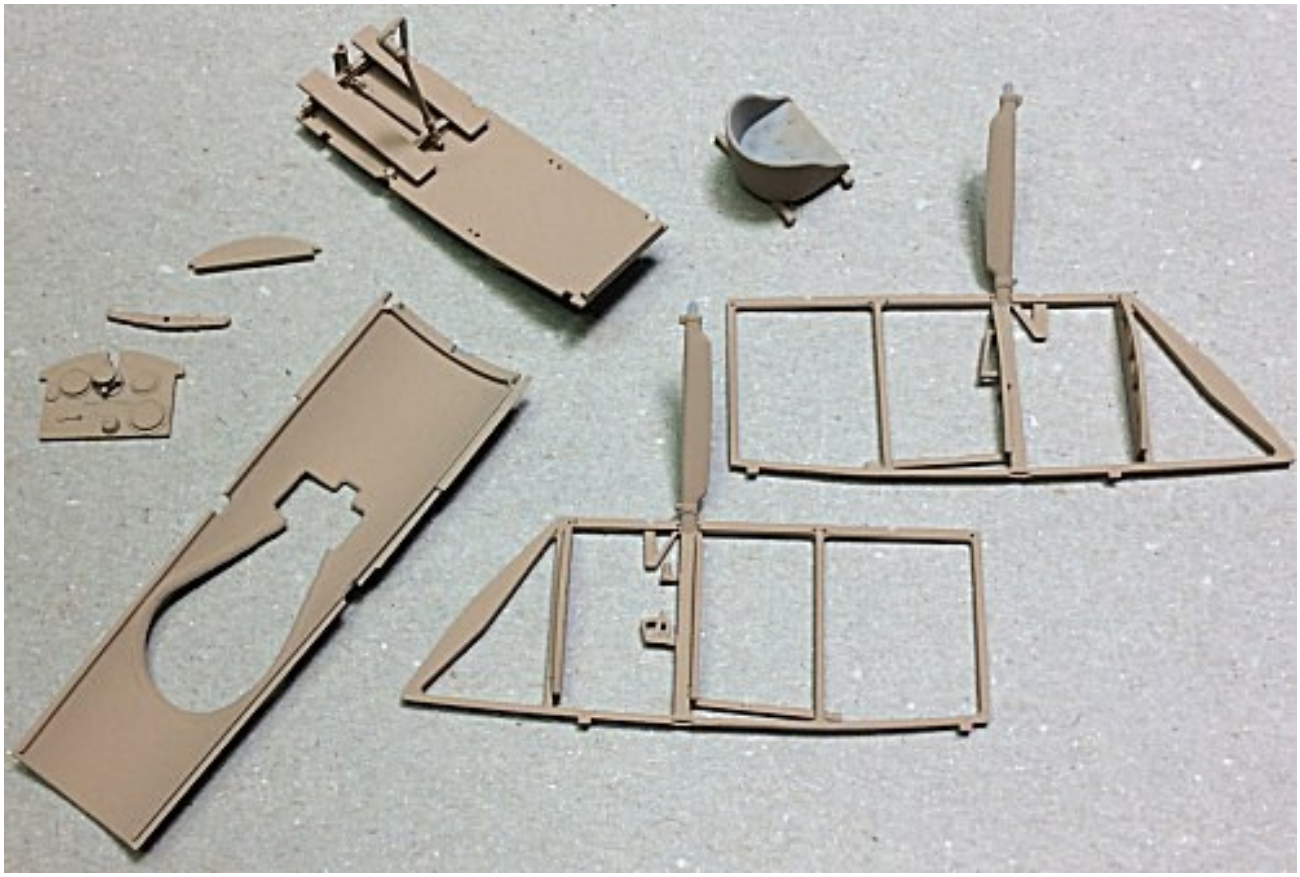
A basic technique:

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

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

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

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



Wood effect - Method 1:

DecoArt Crafters Acrylic' paints:

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

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

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

Once painting is complete, clean the brush in water.

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:

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

Mask off the area as required.

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

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

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

Leave the oil paint to settle for about ten minutes.

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

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

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

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

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

If desired and once the oil paint is fully dry, airbrush a semi-gloss clear coat, such as 'Alclad' Satin (ALC312-60) 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 add 'Mr. Colour' Levelling Thinners, which does improve airbrushing and avoids pooling. Otherwise I use 'Alclad' Light Sheen (ALC-311).

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

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

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

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

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

PART 3
WEATHERING
(General)

PART 3 - WEATHERING (General)

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

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

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

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

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

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

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

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

Chipping effects:

To give the effect of chipped and weathered paint/varnish to metal engine cowls and forward fuselage panels etc, chipping fluids can be used. To achieve this effect, first prime the areas with a suitable primer then airbrush the metallic finish desired. Once dry, a chipping fluid, such as 'AK Interactive' Medium Chipping fluid or 'Vallejo' chipping fluid is airbrushed over the painted areas. An alternative is to use a cheap hair spray. This forms a barrier which will allow the top coat to be chipped off. Finally the required top coat colour is applied.
Once fully dry, moisten the top coat with water, which softens the paint. Then with a cut down (stiff) brush and wood cocktail stick, gently teased off the top coat paint. Take care when doing this as 'too much chipping' can't really be covered up. In that event you would have wet the top coat and remove it all with an old toothbrush or similar and then when dry, re-spray the top coat and try again. Once the desired effect was achieved, I sealed the surfaces with an airbrushed coat of 'Alclad' Light Sheen (ALC-311).

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

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

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

Water colour pencils:

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

Oil paint:

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

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

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

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

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

PART 4
DECALS
(General)

PART 4 - DECALS

‘Standard’ decals:

NOTE: *The following is **applicable only** for decals on a **painted surface**. If decals are to be placed on top of previously applied decals, the decal setting solutions may ’eat’ into the previous decals. In this case a sealing coat of either ‘Alclad’ Aqua Gloss (ALC-600), 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 ‘Alclad’ Aqua Gloss (ALC-600), ‘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 either ‘Alclad’ Light Sheen (ALC-311) lacquer or ‘Tamiya’ Semi Gloss (X35).

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

Once the decals have been applied I airbrush a sealing coat of either ‘Alclad’ Aqua Gloss (ALC-600), ‘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 ‘Alclad’ Light Sheen (ALC -311) or ‘Tamiya’ Semi-Matt (XF35) over the decals.

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

‘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 ’Alclad’ Aqua Gloss (ALC-600) or similar over the painted surface to form a gloss surface for applying the decals.

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

Soak each decal in warm water for approximately 20 seconds.

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

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

Align the decal to the shape of the model part.

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

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

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

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

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

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

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

PART 5
RESIN (General)

PART 5- RESIN (General)

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

When resin kits are cast in their moulds, a release agent is applied to enable the cast resin parts to be more easily removed, which is similar to plastic kit moulding. This release agent can leave a film on the surface of the kit parts, which, if not removed, can prevent paint or adhesives from adhering to the surfaces. The easiest way to remove this film is to carefully and fully wash all of the model parts in warm soapy water, using an old, soft tooth brush, then rinse all of the parts thoroughly and leave to dry. Alternatively wipe the parts with isopropyl alcohol (e.g. 'Tamiya' X20A thinners).

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. The best way to remove item is to cut them away with a razor saw, then clean them up afterwards.

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

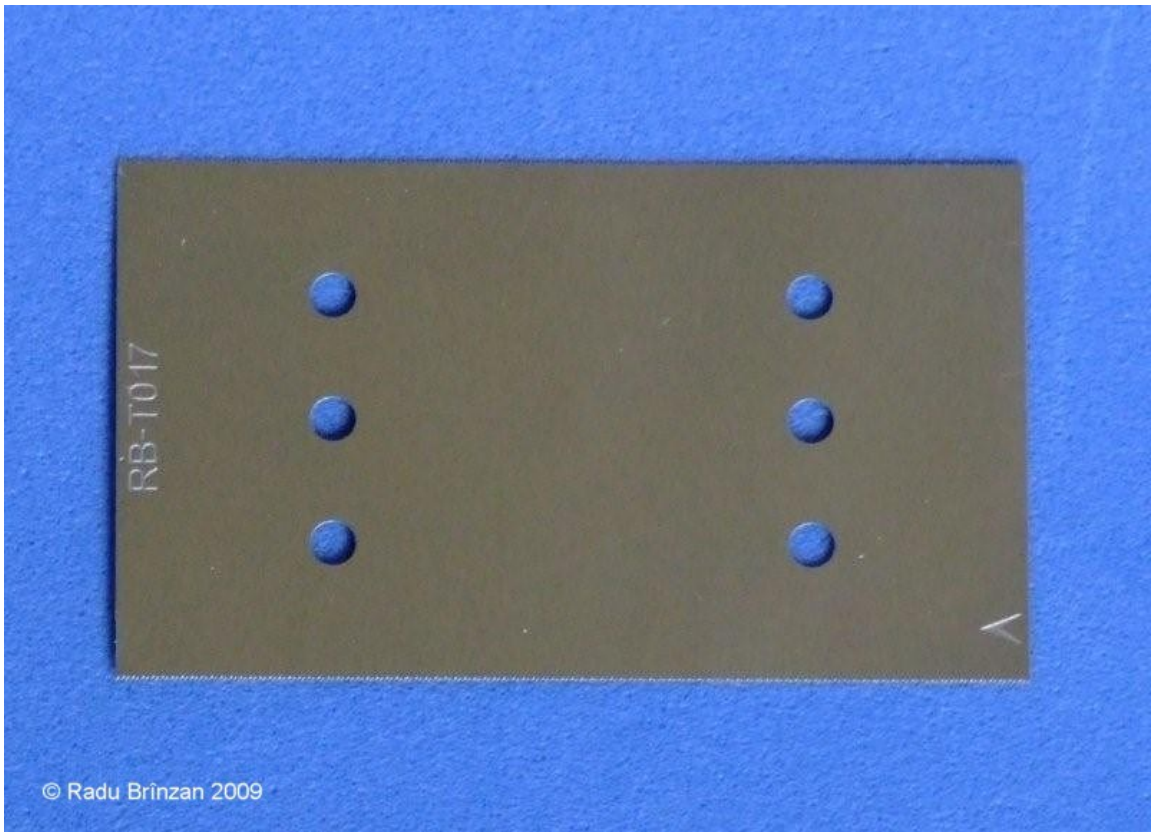
Plastic kits are assembled using solvent adhesives, which melt the surface where it is applied and 'weld' the joint together. Resin however will not react to this type of adhesive and can really only be glued using CA adhesive. This adhesive reacts to moisture in the air and on the surface to be joined.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

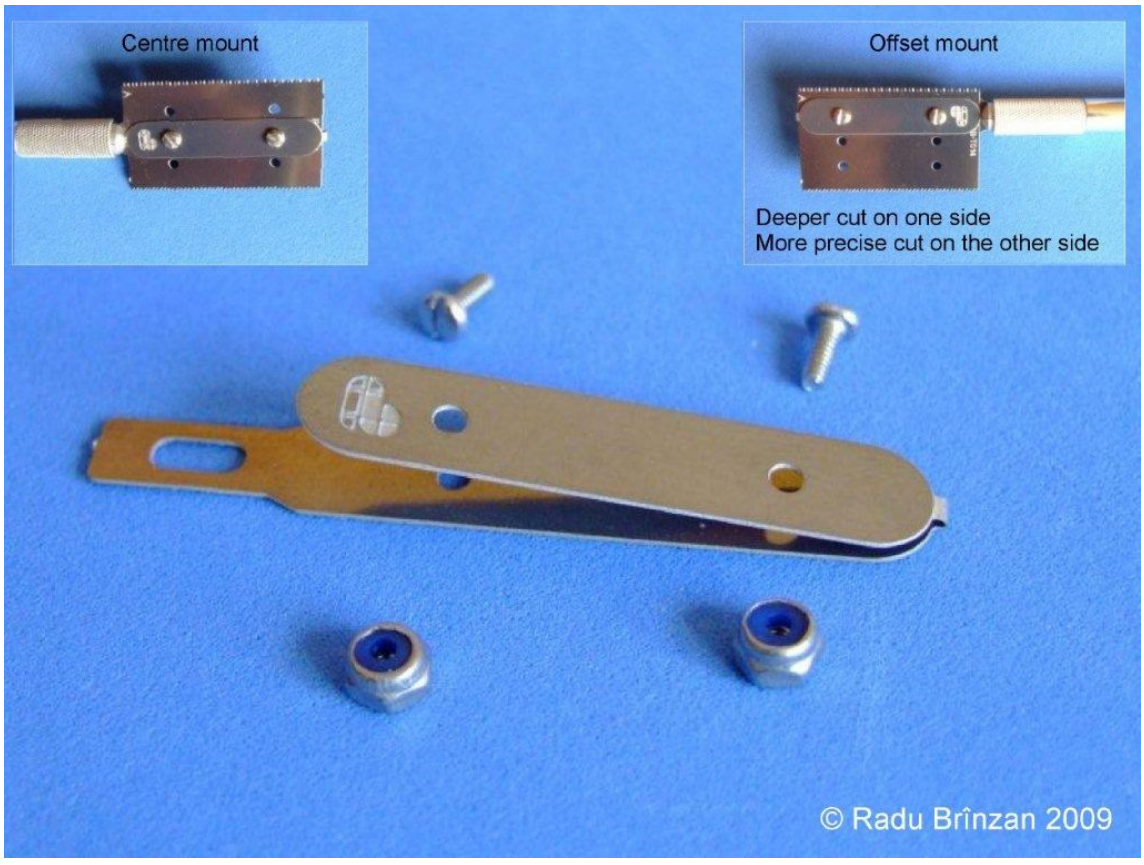
Cutting, sanding and drilling resin will create swarf and more importantly, resin dust. The dust in particular is dangerous, especially if inhaled. Therefore always vacuum the working area, and yourself, regularly. If you have a face mask or filtered respirator and find you can wear it whilst working,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

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

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

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


RB-T017
© Radu Brînzan 2009


Centre mount
Offset mount
Deeper cut on one side
More precise cut on the other side
© Radu Brînzan 2009

PART 6
RIGGING
(General)

PART 6 - RIGGING (General)

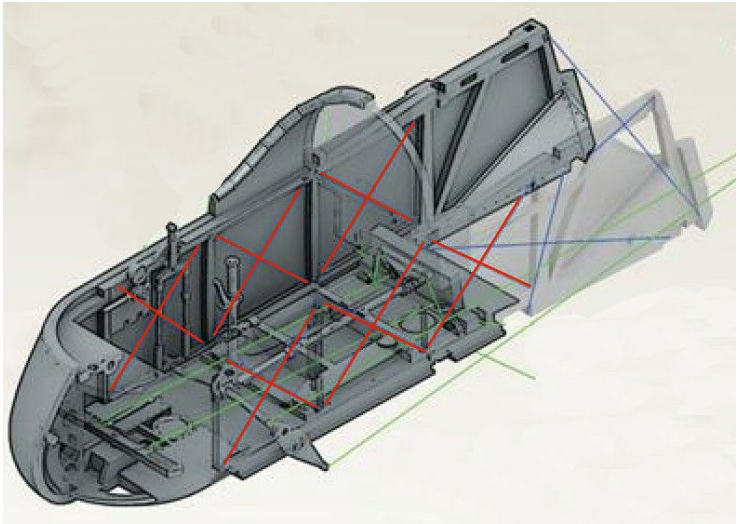
References:
'Osprey aircraft of the aces 88' - Pusher Aces of World War One (Jon Guttman).
'Windsock' Data File No.48 - Airco DH.2 (B.J.Gray).
'Schiffer Military History Book' - British Aviation Squadron Markings WW1 (Les Rogers).
'Online' - Resources.

General:
It's important to check where the various rigging attachment points are for this aircraft. Most models have these located on the model, but it's best to carry out research in reference books or research on line before drilling. Some modellers use micro drills manufactured for drilling printed circuit boards etc and these drill bits sometimes have identifying coloured collars fitted to the drill shanks. I have found that care needs to be taken when using these drills, as they are sharp and instead of easing their way into the plastic of the model, they tend to bite in and effectively 'cork screw' their way in, which causes jamming and lots of broken drills. This is not only expensive but can leave broken drill bits in the model, which are virtually impossible to extract. An alternative is to use High Speed Steel (HSS) drill bits, which are cheaper and have less 'bite' when in use, although again, they are very fragile and can very easily be broken.
Some modellers drill through the wings etc of the model and rig by pulling through the rigging line/EZ thread etc, gluing in position and then rubbing down the exposed line 'tag' and then re-painting that area. I prefer to drill only part way into the plastic and attach the applicable rigging fixture with CA adhesive.
With your research complete the rigging can be planned for the model in the subsequent Parts of this build log.
For the primary rigging, such as flying and landing wires and cross bracing wires, I used 'Steelon' or 'Stroft GTM' mono-filament (fishing line) of 0.12 mm diameter and for flight controls and 0.08 mm for flight control cables. These are effectively transparent but do give a look of steel, without the need of painting or colouring with a gel pen. The turnbuckles used are either sintered metal or resin and can be obtained from such as 'Gaspatch Models' or 'Proper Plane'.

NOTE: *The rigging following illustrations were adapted from those in the instruction manual. Due to the complexity of the rigging on this aircraft, the different types of rigging are detailed under their type Headings. Photographs of DH.2 aircraft show rigging some wires and cables were fitted with turnbuckles, indicating these were* ***wire wound wires.*** *However, some bracing wires were the RAF flat 'streamlined' wires, but the photo-etch wires available are frail and subject to bowing. Therefore I chose to rig those wires with mono-filament and turnbuckles as well.*

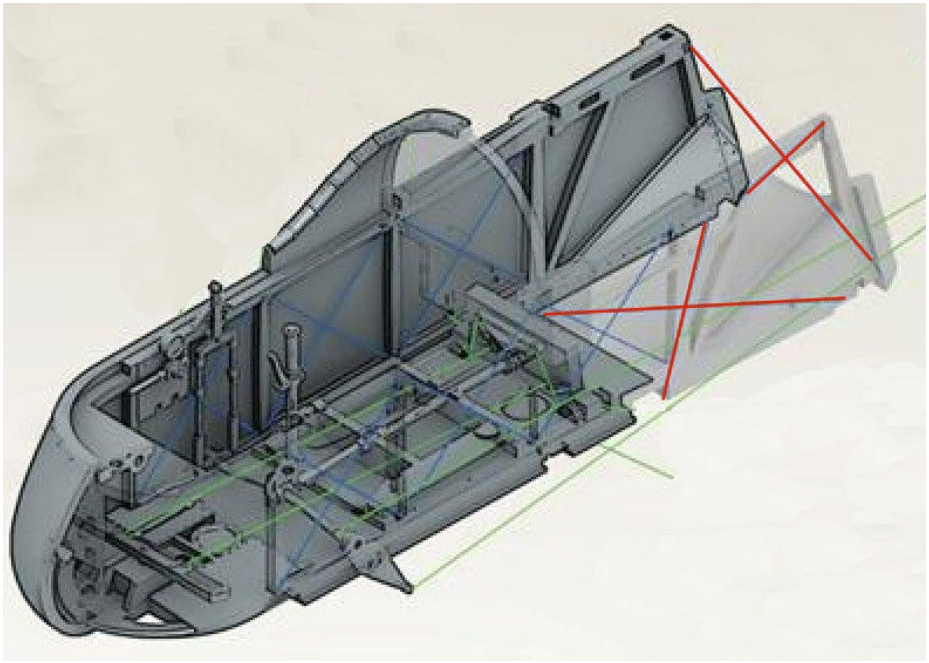
Nacelle bracing wires:

Crossed bracing wires were fitted between the upper and lower corners of the vertical members of the three cockpit side frames. Turnbuckles would have been fitted at one end of the wires.



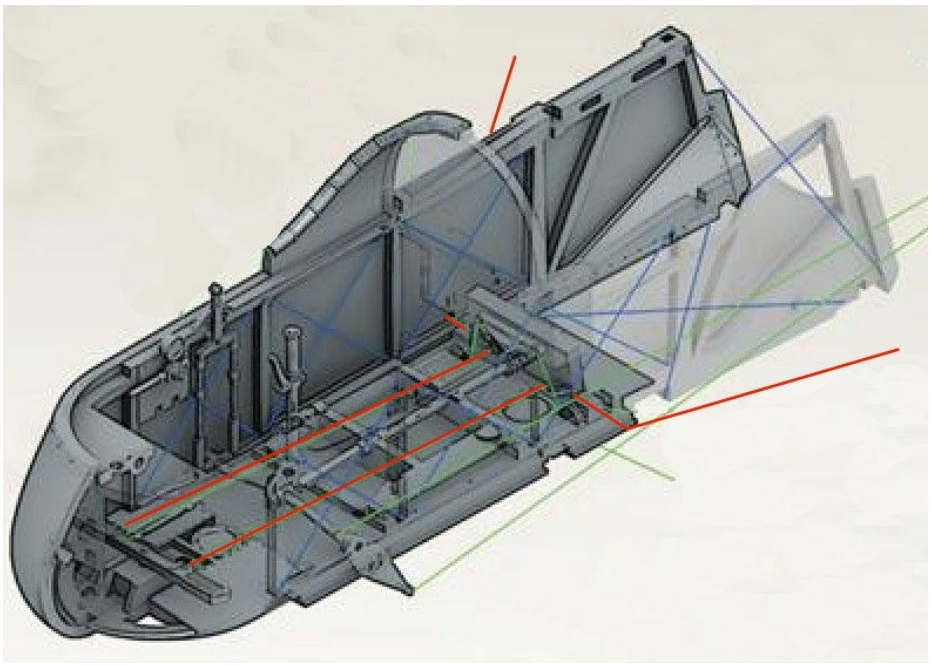
Crossed bracing wires were fitted across the rear of the nacelle, between the upper corners of the nacelle side frames, behind the engine and the outer ends of the lower wing exposed rear spar. Turnbuckles were fitted at the lower ends of the wires.

Crossed bracing wires were fitted across the rear floor of the nacelle, between the lower corners of the nacelle side frames. Turnbuckles were fitted at the rear ends of the wires.

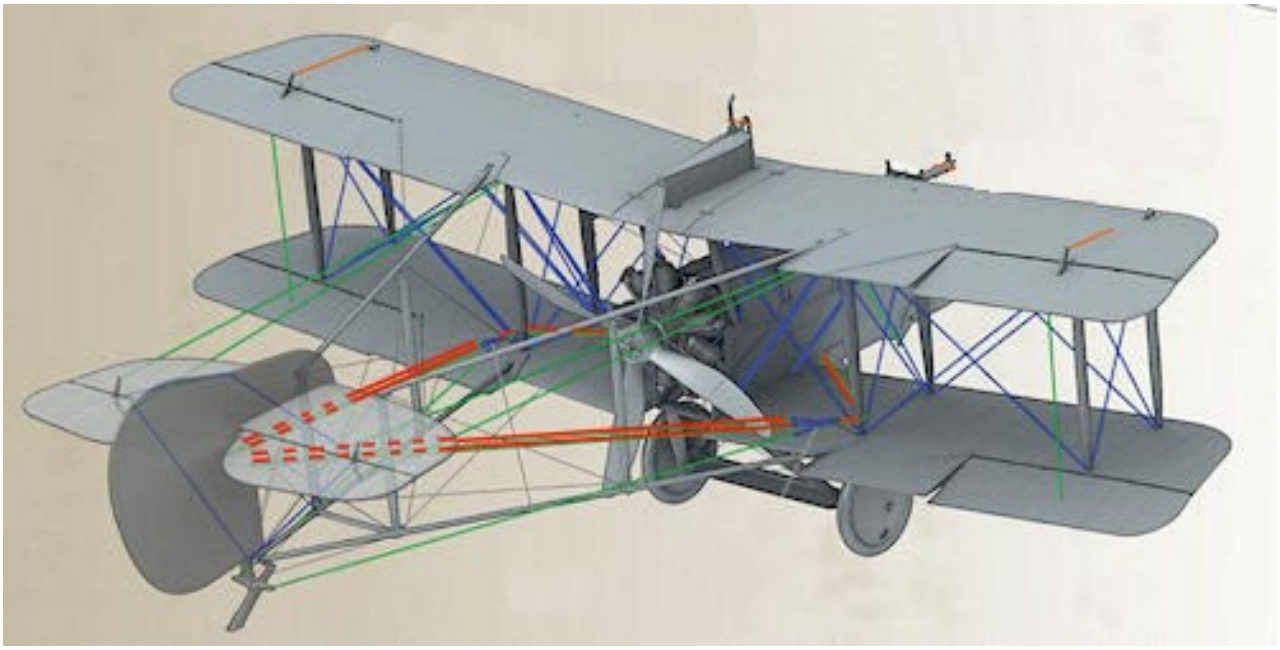


Rudder control cables:

Twin cables were attached to both ends of the pilots rudder bar. These cables were routed rearwards and under the pilots seat then 90 turned degrees by pulleys to exit the bottom edges of the nacelle.
Turnbuckles were most likely fitted at the rudder bar end of the cables.

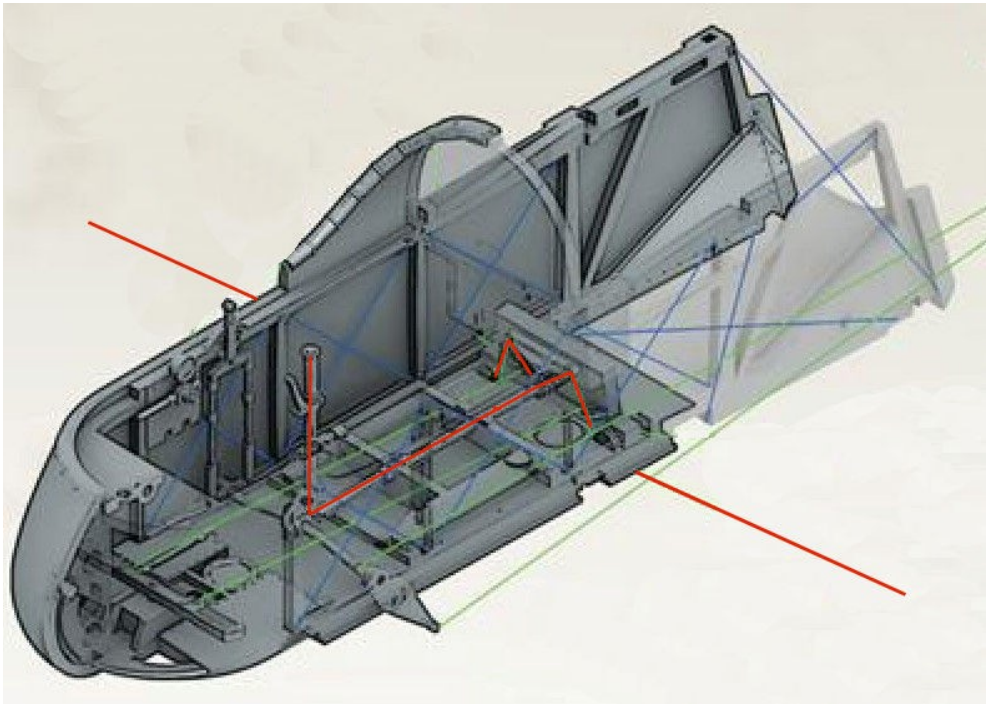


The cables from the nacelle sides were routed rearwards and around a pully at the bottom of the inboard, rear interplane struts. The cables were attached to a three way turnbuckle, the upper two of which were attached to cables that were routed rearwards and were attached to the rudder control horns on both sides of the rudder.
As the pilot moved the rudder bar left or right, one set of control cables were tensioned and the other Relaxed, causing the rudder to move left or right. This caused the aircraft to swing left or right (yaw).

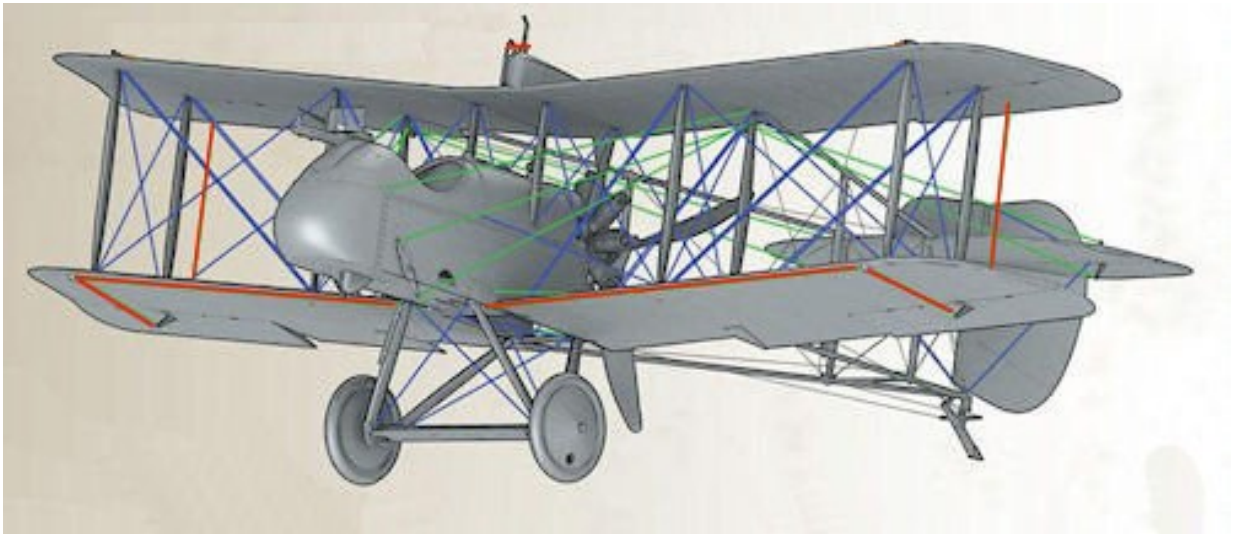


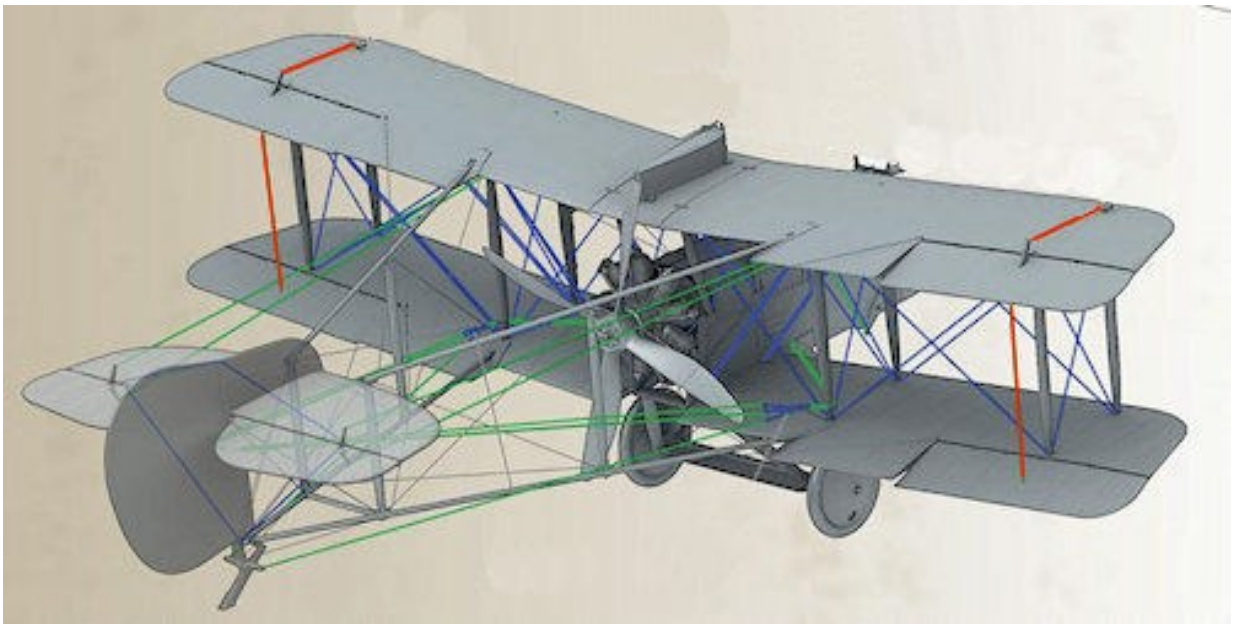
Aileron control cables:

A torque tube was attached the bottom, rear of the pilots control column and was routed rearwards to under the pilots seat. A double bell-crank lever was fitted to the rear end of the torque tube. Aileron control cables were attached to the ends of the two bell-crank levers and routed down, around control pulleys and out through the nacelle floor at the leading edges of the lower wings.



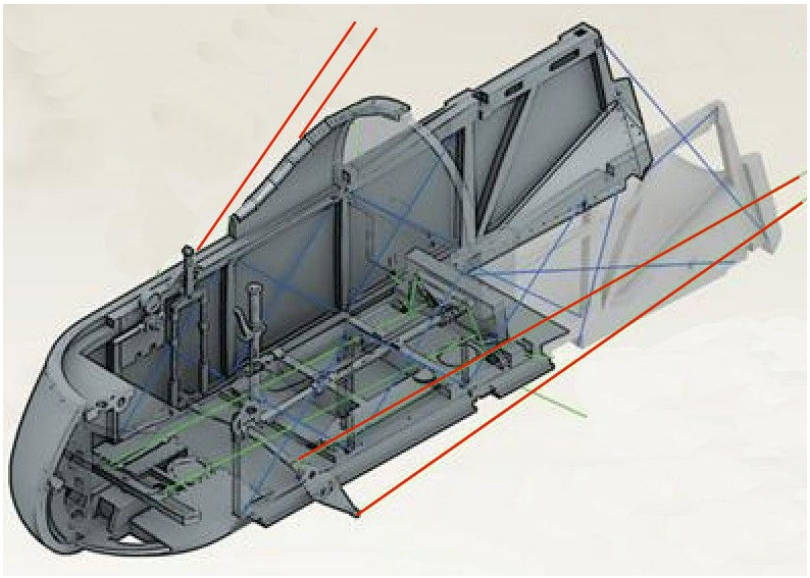
The control cables were routed outboard through fairleads at the lower wings leading edges and then around faired pulleys and rearwards, where they were attached the ends of the underside aileron control horns. A separate cable was attached between the lower aileron and was routed up between the wings to the underside of the upper wing aileron. A sprung loaded control cable was attached to the upper aileron control horns and was routed forwards and attached to the front spar of the wing.
As the pilot moved the control column left or right, the attached torsion tube rotated and moved the double ended bell-crank levers, causing one of the attached control cables to tension and the other to relax. This caused the ailerons on one side of the wings to move up and the other side to move down. The movement of the ailerons caused the aircraft to tilt left or right (roll). The rubber sprung loaded upper ailerons returned the control column to the neutral (central) position.



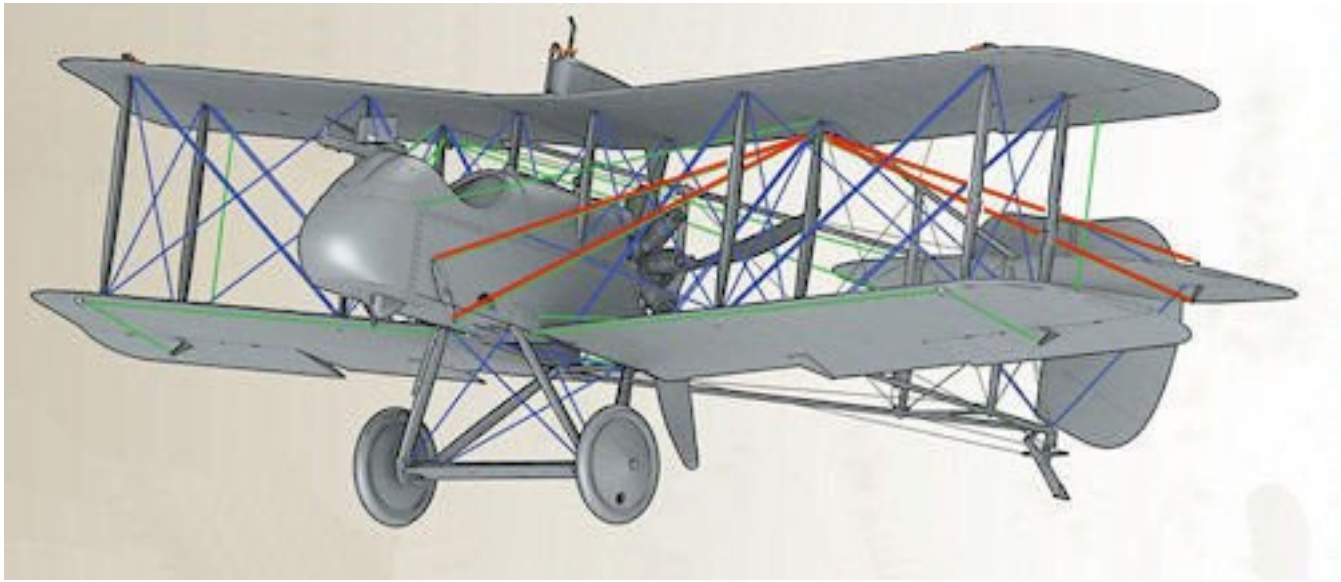


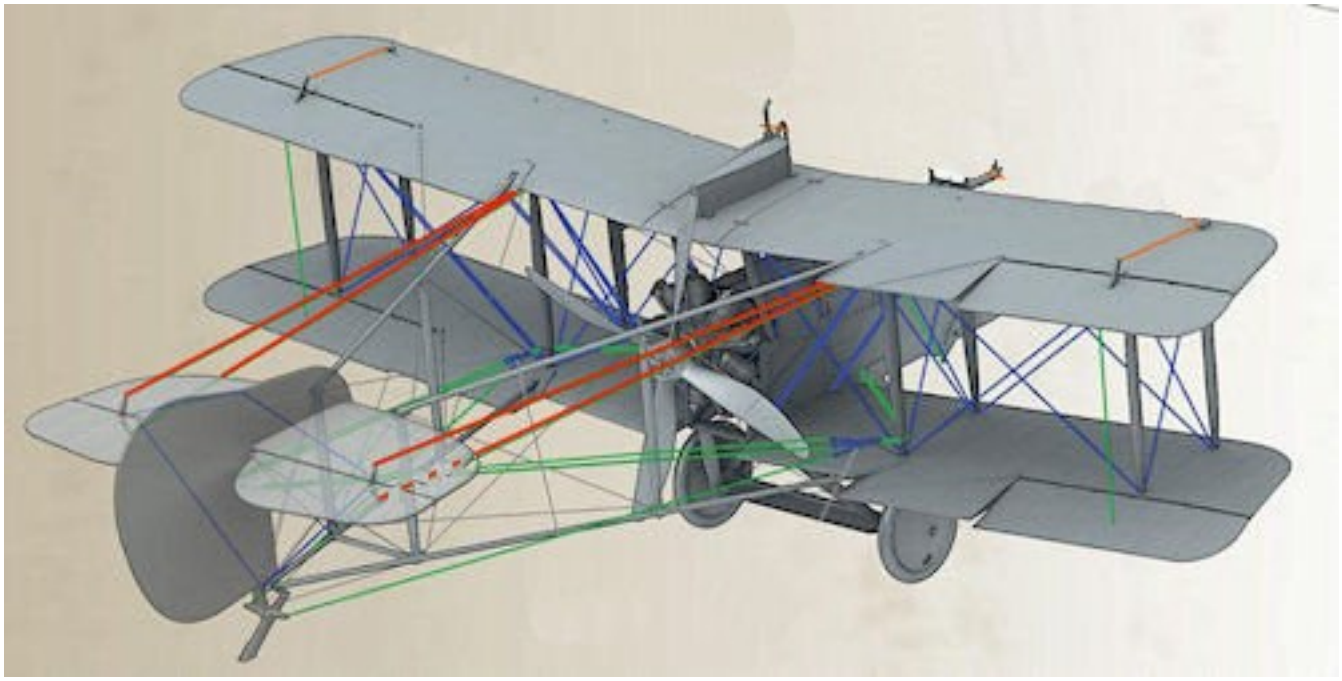
Elevator control cables:

The bottom of the pilots control column rotated a torsion tube that spanned across the nacelle floor and out through the sides of the nacelle. Double ended control levers were fitted to the protruding ends of the torque tube. An elevator control cable was attached to both ends of the control levers. Turnbuckles were fitted in the cables at the control levers.



The two cables attached the ends of the control horns were routed up and around a pulley at the top of the inboard, rear interplane struts. From there the cables were routed rearward and attached to the upper and underside ends of the elevator control horns.
As the pilot moved the control column forward or rearward, the attached torque tube across the floor of the nacelle rotated, causing the external control levers to rotate forwards or rearwards. This caused the Same pair of control cables on both sides of the nacelle to either tension or relax, moving the elevator up or down. This caused the aircraft to either climb or dive (pitch).

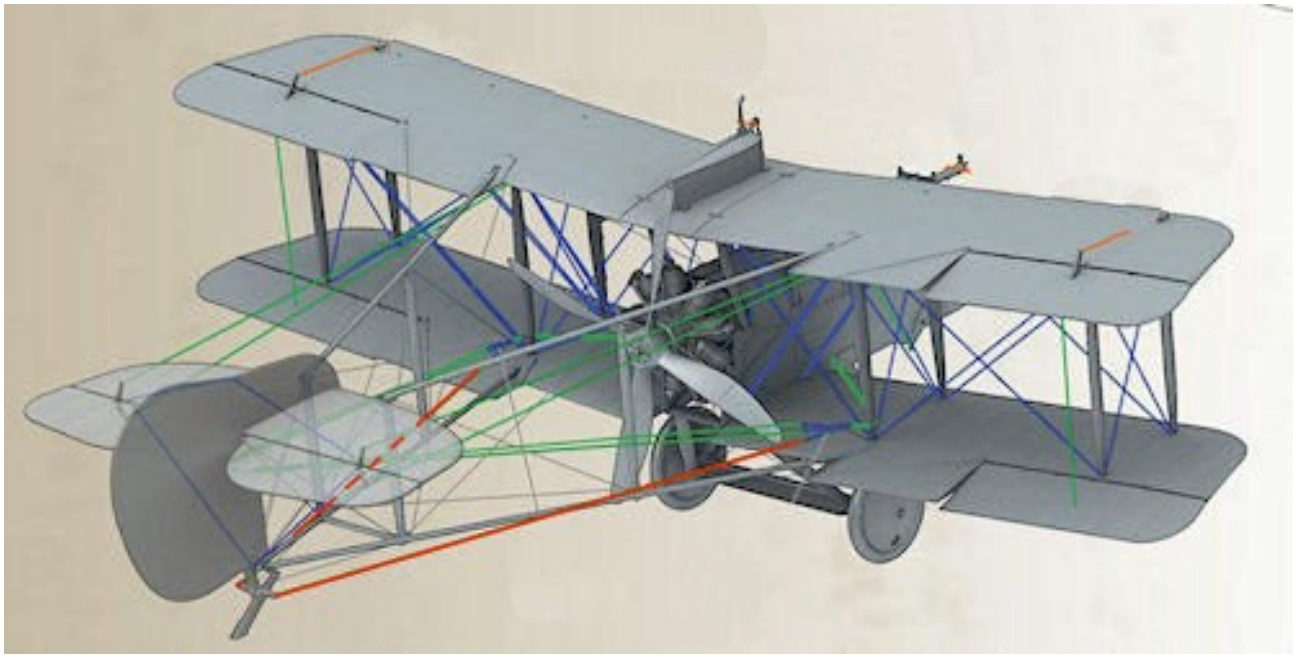




Tail skid control cables:

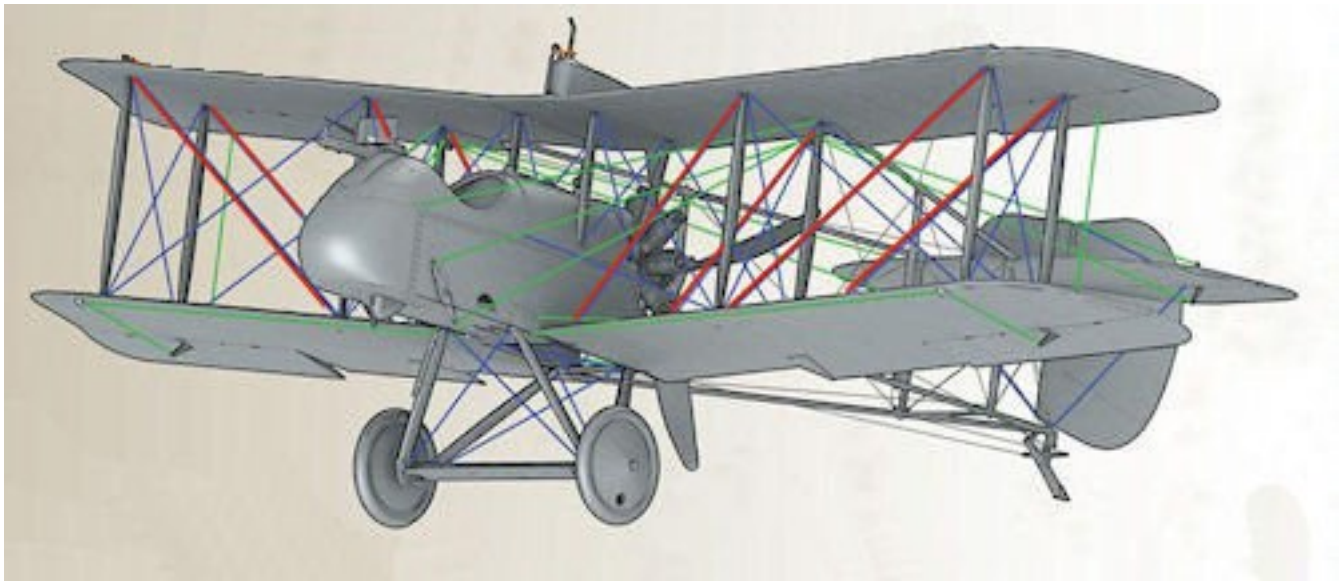
NOTE: *The tail skid was able to move in unison with the rudder, which allowed the aircraft to be steered when on the ground.*

The lower turnbuckle on the three way turnbuckle (rudder control) is for the control of the tail skid. Cables were attached to these turnbuckles and routed rearwards to the ends of the tail skid control horn.
As the pilot moved the rudder bar and therefore the rudder, the tail skid would move in unison, steering the aircraft when on the ground.



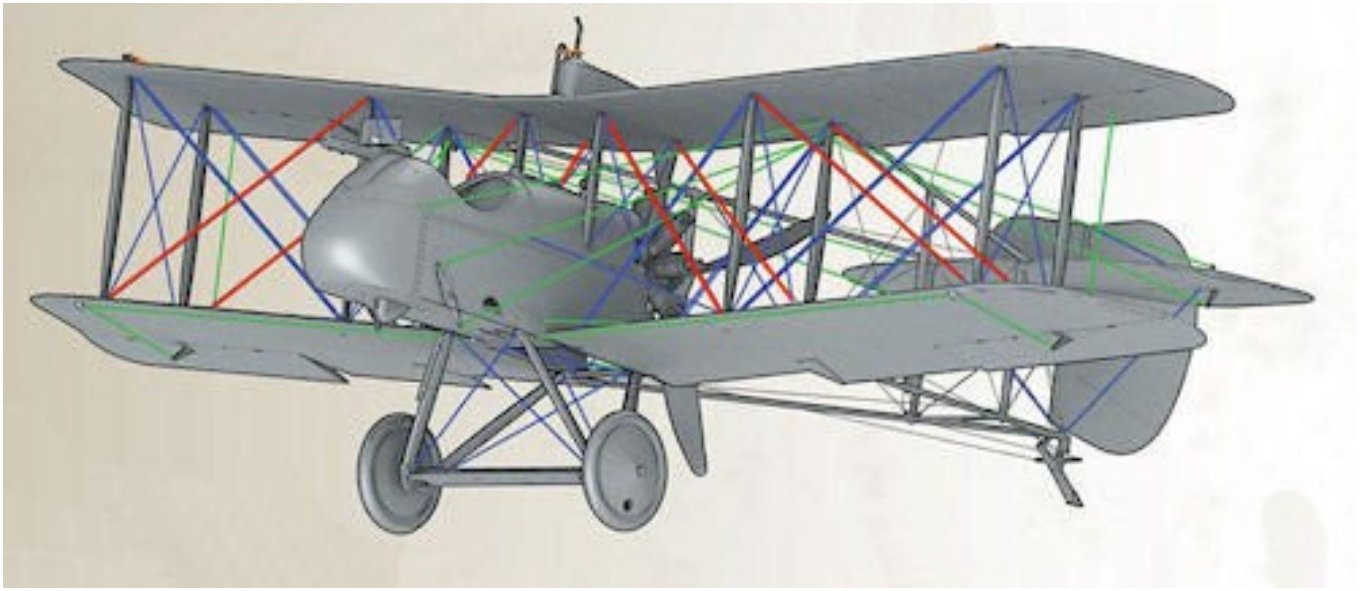
Flying wires:

Two pairs of twin flying wires were fitted at the bottom edge of the nacelle sides and were routed diagonally up and attached to the underside of the upper wing, inboard from the top of the inner interplane struts.
Similarly, pairs of twin flying wires were fitted to the top surface of the lower wings, outboard from the inner interplane struts and were routed diagonally up and attached to the underside of the upper wing, inboard from the top of the outer interplane struts.
Turnbuckles were fitted to each wire at the nacelle and lower wing ends of the wires.



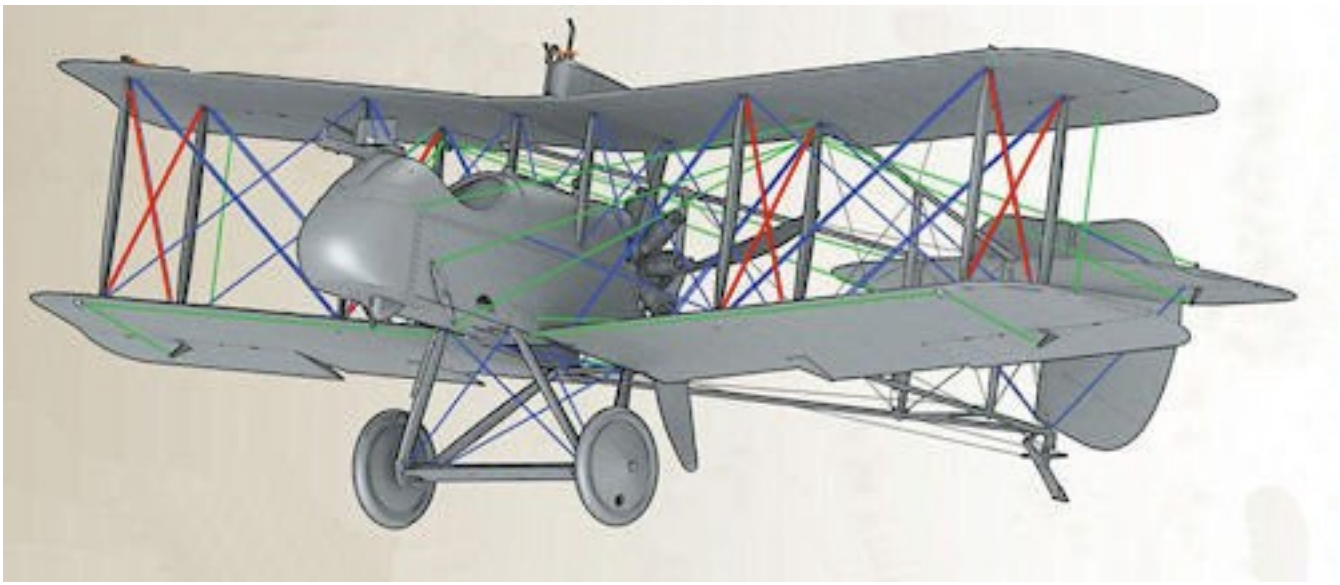
Landing wires:

Single landing wires were fitted at the underside of the upper wing, outboard from the top of the nacelle cabane struts and were routed diagonally down and attached to the top surface of the lower wings, inboard from the inner interplane struts.
Similarly, landing wires were fitted at the underside of the upper wing, outboard from the top of the inner interplane struts and were routed diagonally down and attached to the top surface of the lower wings, inboard from the outer interplane struts.
Turnbuckles were fitted to the lower end of each wire.



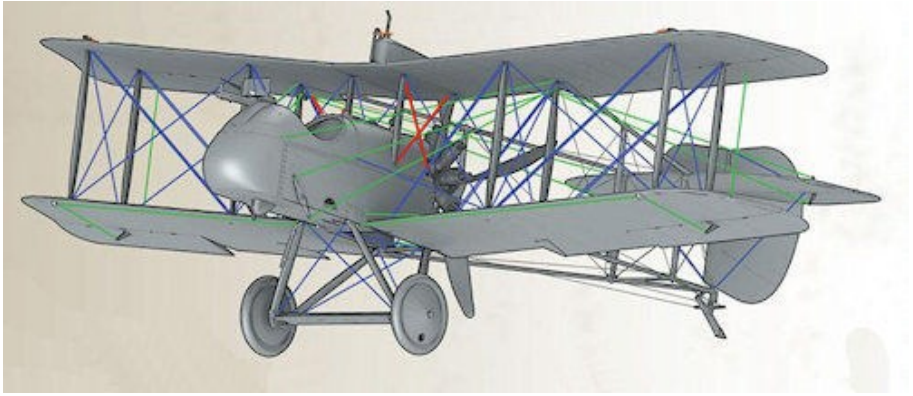
Incidence wires:

Crossed incidence wires were fitted between the inner and outer interplane struts. The wires were attached to the underside of the upper wing and the top surface of the lower wings. Turnbuckles were fitted at the lower end of each wire.



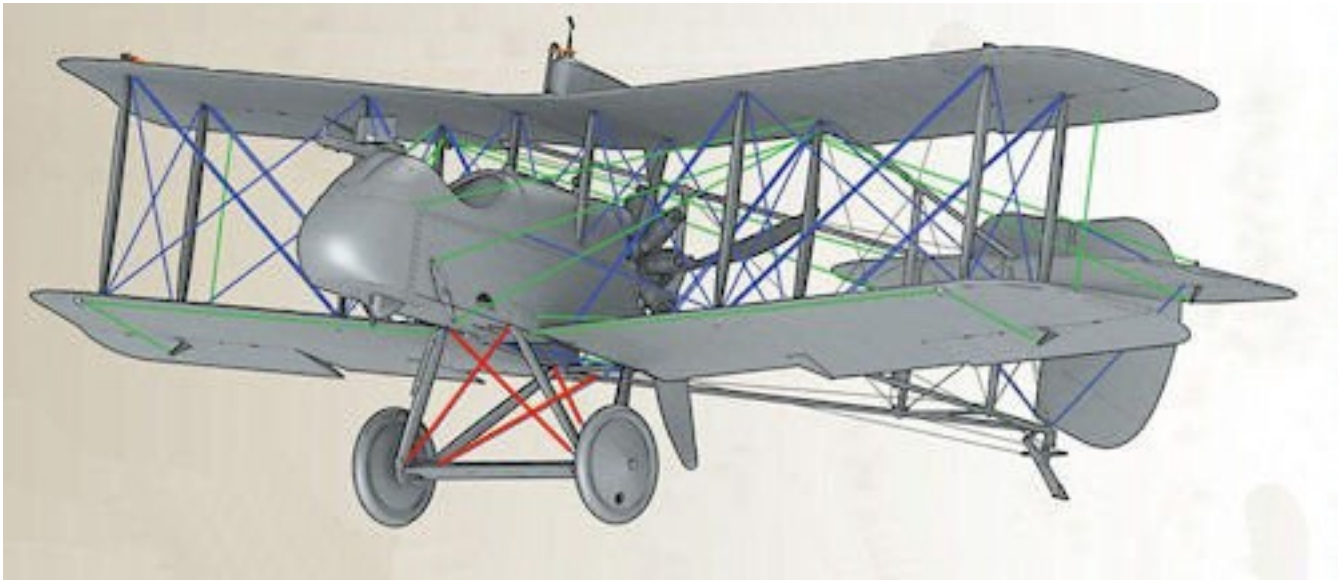
Cabane strut bracing wires:

Crossed bracing wires were fitted between the front and rear nacelle cabane struts. The wires were attached to the underside of the upper wing and the sides of the nacelle at the bottom of the struts. Turnbuckles were fitted at the lower end of each wire.



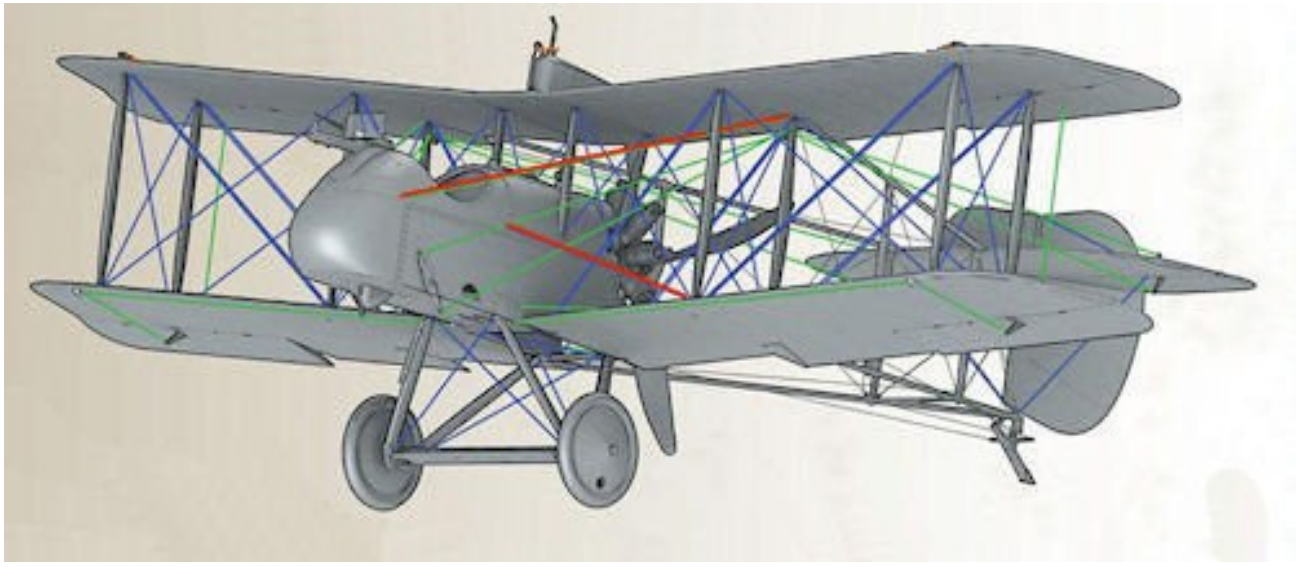
Landing gear bracing wires:

A pair of crossed landing gear bracing wires were fitted between the underside of the nacelle, inboard from the top of the landing gear forward struts and the bottom of the landing gear forward struts.
A second pair of crossed landing gear bracing wires were fitted between the underside of the nacelle, inboard from the top of the landing gear rear struts and the bottom of the landing gear rear struts.
Turnbuckles were fitted to each wire at the lower end.



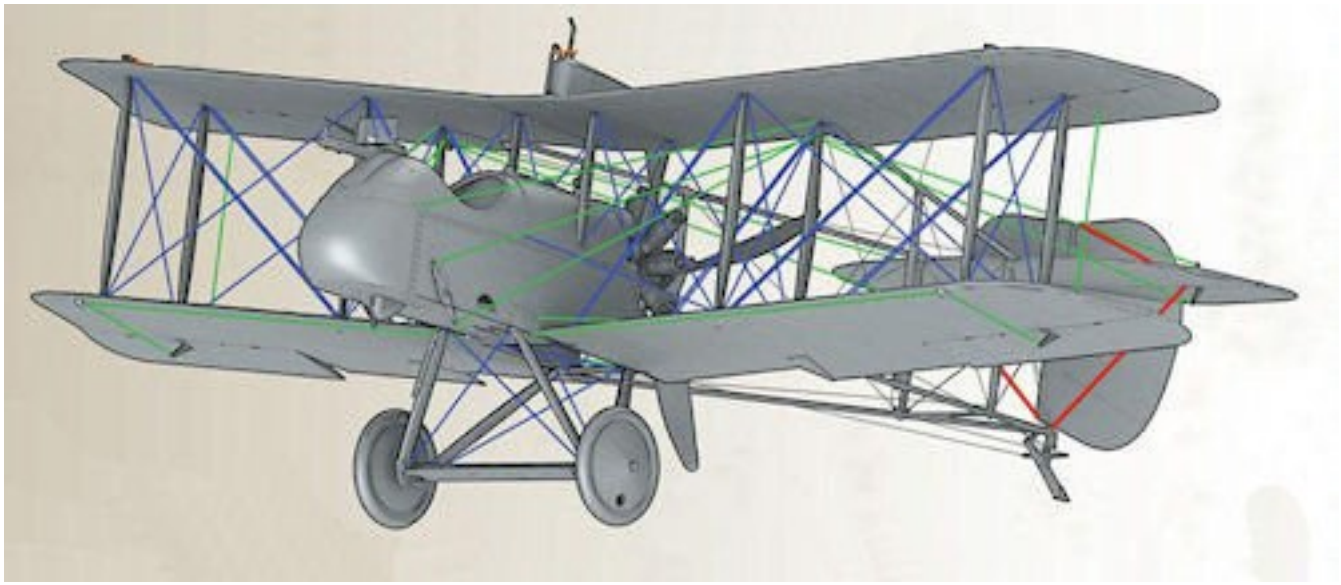
Drag wires:

Single drag wires were fitted to the sides of the nacelle, above the top, forward corner of the linen side panel. The wires were routed up and rearwards to the underside of the upper wing at the top of the rear, inner interplane struts.
Similarly, single drag wires were fitted to the sides of the nacelle, below the rear of the cockpit. The wires were routed down to the top surface of the lower wing, inboard from the bottom of the forward, inner struts.
Turnbuckles were fitted to each wire at the nacelle ends.



Tailplane bracing wires:

Four single bracing wires were fitted between the top of the fin trailing edge, the trailing edges of the tailplanes and the bottom of the rudder post.
Turnbuckles were fitted to each upper wire at the tailplane ends.
Turnbuckles were fitted to each lower wire at the rudder post ends.

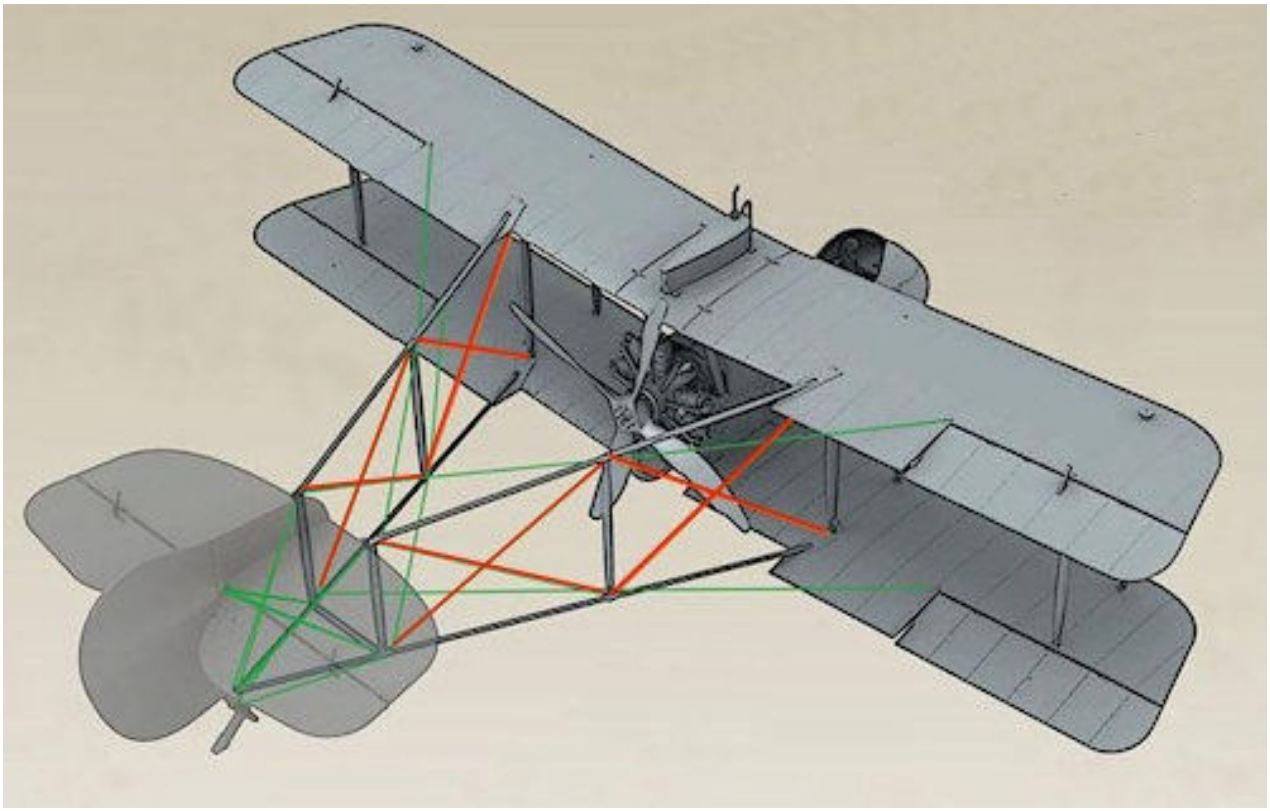


Tail boom bracing wires:

NOTE: *The bracing of the tail booms is complex. Therefore, their description is separated into the various wires.*

Side frames:

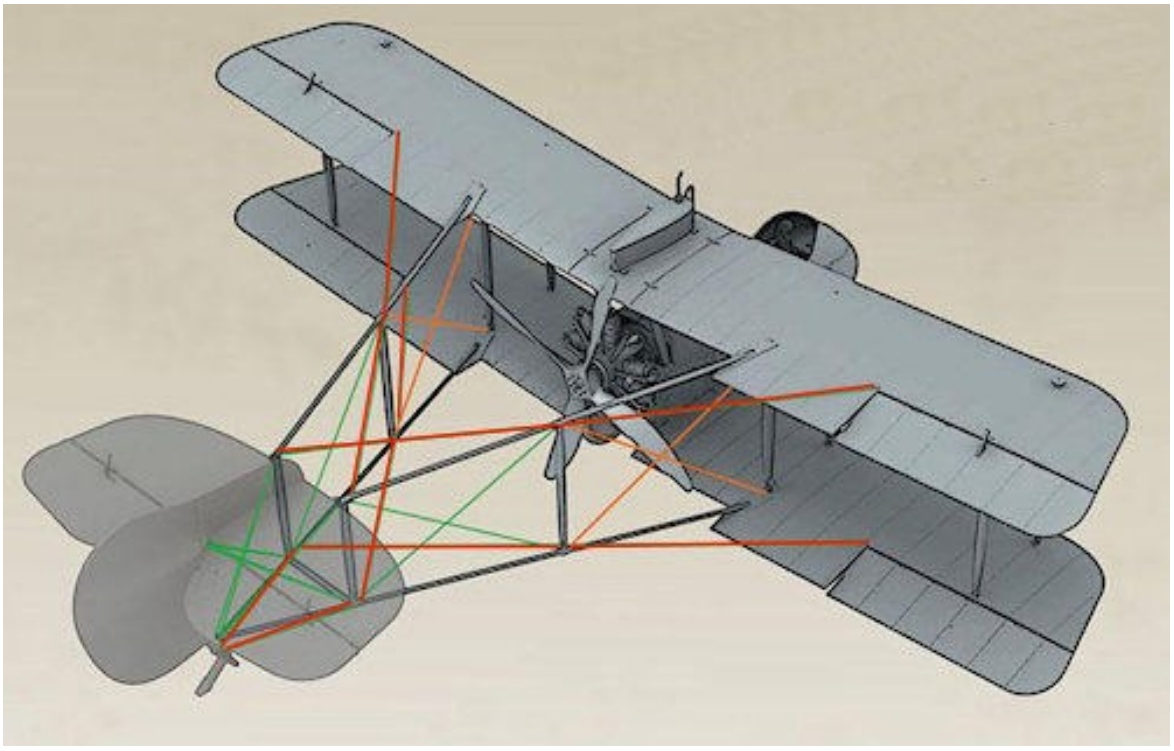
The tail boom side bays were fitted with crossed bracing wires. The wires were attached to the bottom of the vertical struts and were routed diagonally up to the top of the adjacent struts.
Turnbuckles were fitted at the lower ends of the wires.



Wings to tail boom bracing:

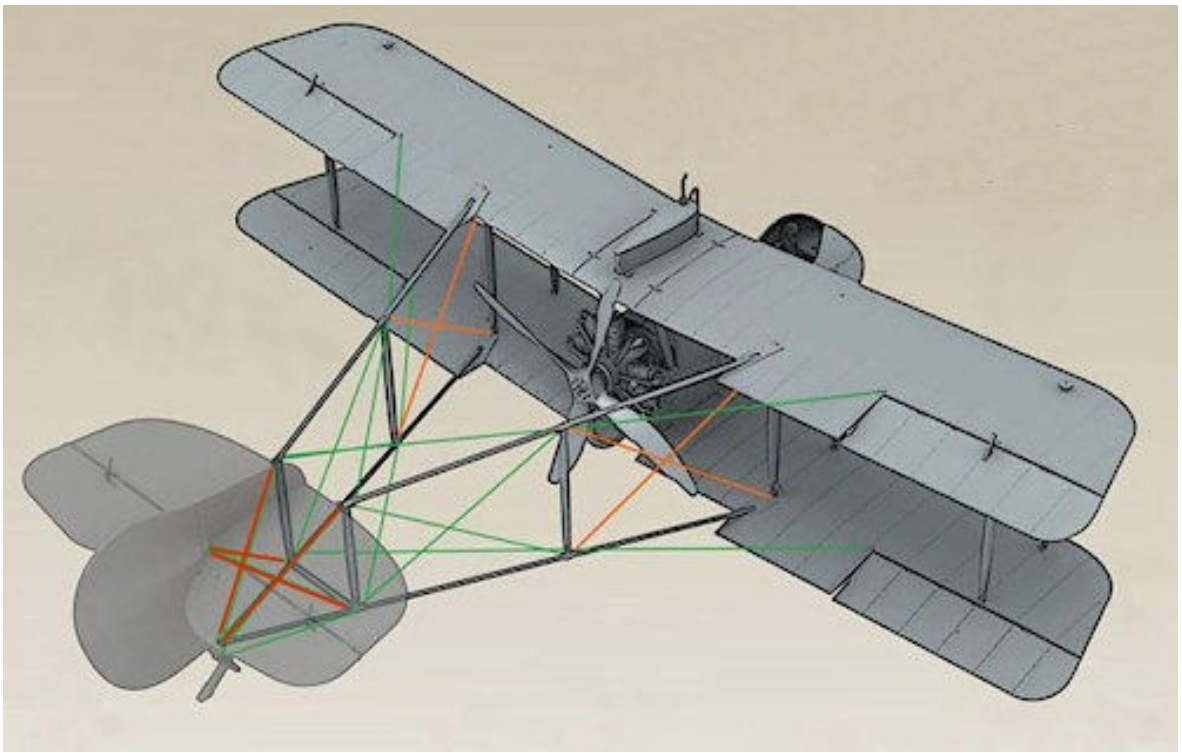
Tail boom bracing wires were fitted to the top surface of the upper wing, close to the inboard corners of the ailerons. The wires were routed rearwards and across to the upper tail booms at the top of the forward vertical struts. The wires were then routed rearwards and across to the top of the rear vertical struts. Turnbuckles were fitted to the wires each side of the forward vertical struts.

Tail boom bracing wires were fitted to the top surface of the lower wings, close to the inboard corners of the ailerons. The wires were routed rearwards and across to the lower tail booms at the bottom of the forward vertical struts. The wires were then routed rearwards and across to the bottom of the rear vertical struts then rearwards to the bottom of the rudder post. Turnbuckles were fitted to the wires each side of the forward vertical struts.



Tail booms to rudder post bracing:

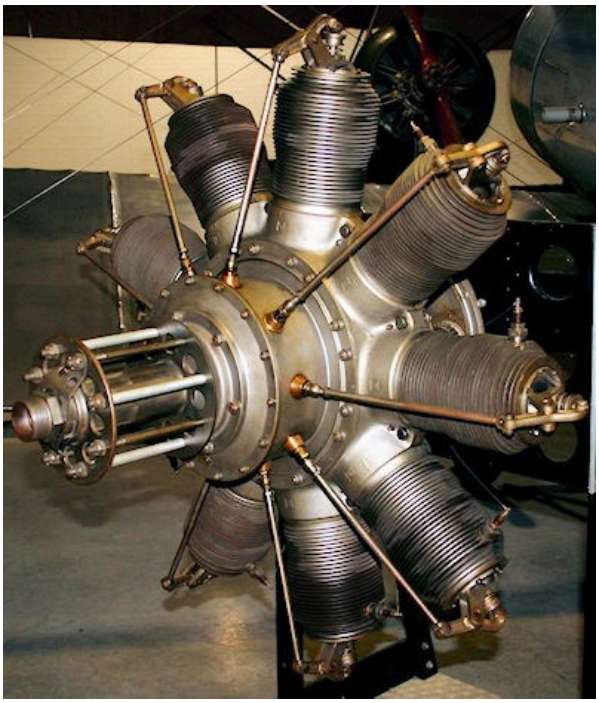
Upper bracing wires were fitted to the tops of the tail boom rear vertical struts. The wires were routed rearwards and down to the bottom of the rudder post.
Turnbuckles were fitted to the wires at the top of the vertical struts.
Lower bracing wires were fitted to the bottom of the tail boom rear vertical struts. The wires were routed rearwards and up to the top of the rudder post.
Turnbuckles were fitted to the wires at the bottom of the vertical struts.



PART 7
ENGINE

PART 7 - ENGINE

The Airco DH.2 was fitted with the Gnome Monosoupape 100 hp, nine cylinder and air cooled rotary engine.



NOTE: *The assembly of the engine follows page 5 of the kit instruction manual. There is a part E6 which is not mentioned in the instructions, so I did not use it. Also, as the engine will be fixed in position, I did not use the retaining collar E2.*

Preparation:

Remove the engine parts from the mold gate.

Remove any residual sprue tags from the edges of the parts.

Cut away the spark plugs from the rear of the cylinders (not required).

Assembly:

Assemble the engine following the instructions on page 5 of the kit instruction manual.

Painting:

Airbrush the engine assembly with a light coat of black primer, such as 'Tamiya' Gloss Black (X1) or similar.

Airbrush the engine assembly with light coat of 'Alclad' Steel (ALC-112) or similar.

Decal:

Apply decal 51 onto the engine case.

Painting (continued):

Brush 'AK Interactive' Kerosene (AK-2039) wash around the engine assembly.

Brush 'AK Interactive' Engine Oil (AK-2019) along the push rods.

Lightly sponge 'Tamiya' Weathering Master Set D (Burnt Blue) around the cylinder heads.

Brush paint the bottom guides on each push rod with 'Mr. Colour' Brass (219) or similar.

Brush paint the slip rig with 'Tamiya' Hull Red (XF9) or similar.

Brush paint the spark plugs with 'Tamiya' Deck Tan (XF55) or similar.

Modifications:

NOTE: *The ignition leads for each cylinder were attached between the relevant stub on the slip ring to the cylinder spark plug.*

Drill a hole of 0.2 mm diameter through a stub on the slip ring.

Drill a hole of 0.2 mm diameter through the associated spark plug on the engine cylinder.

Cut a long length of 0.125 mm diameter copper wire.

Hole the wire against a 0.4 mm diameter former, such as a drill.

Twist the wire around the former four times.

Pass one end of the wire through the pre-drilled hole in the slip ring.

Pass the other end of the wire through the pre-drilled hole in the spark plug.

Pull the wire at the spark plug to move the coil in the wire closer.

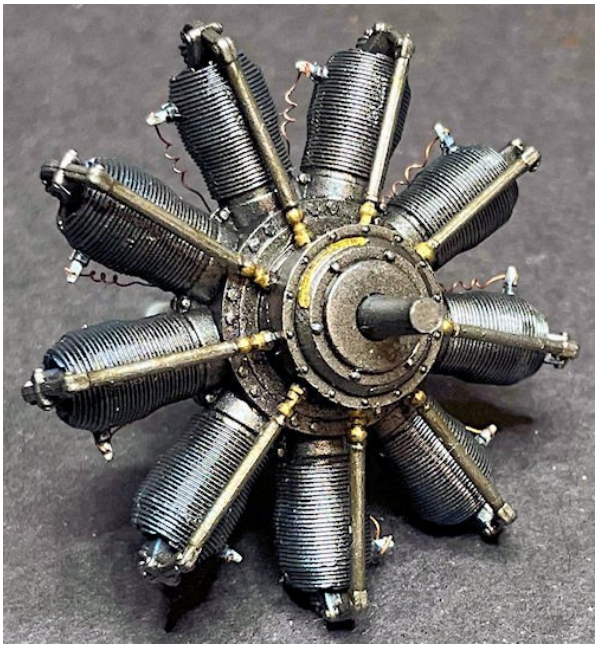
Bend the end of the wire over the spark plug and secure it in position using thin CA adhesive.

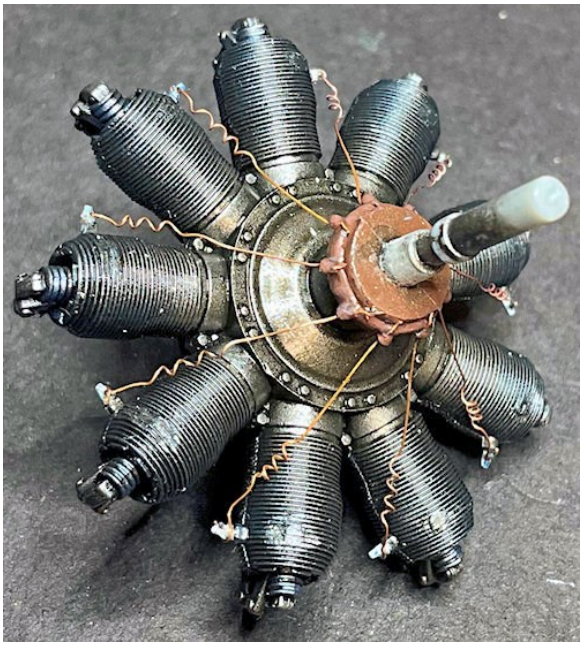
Pull the wire at the slip ring to remove any bow in the wire.

Bend the end of the wire over the rear edge of the slip ring and secure it in position using thin CA adhesive.

Cut away any end tags of wire at the spark plug and slip ring.

Repeat the procedure to add the remaining eight ignition wires.





PART 8
PROPELLER

PART 8 - PROPELLER

References:
'Windsock' Data File No.48 - Airco DH.2 (B.J.Gray).
'Schiffer Military History Book' - British Aviation Squadron Markings WW1 (Les Rogers).

NOTE:
The kit supplied propellers were not used and replaced with a 'Proper Plane' DH2 wood laminated propeller (WP-021).

Preparation:

Carefully cut off the two 'Proper Plane' resin hub plates from their casting block.

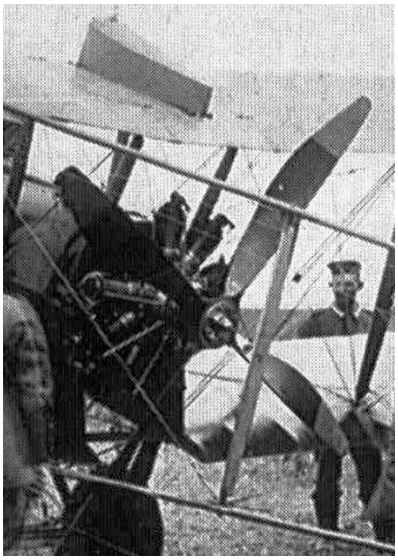
Press the plates rear face down on flat sand paper and drag with a finger to remove residual resin down to the thickness of the cast plates.

Painting:

Airbrush the plates with 'Tamiya' Semi-matte Black (XF18) or similar.

Airbrush the plates with 'Mr. Colour' Stainless Steel (213) or similar.

NOTE: *The DH.2 was fitted with either a two or for bladed propeller. The four bladed propeller fitted to the DH.2 was the 'Darracq' T7928 type that had been already fitted to the FE.8 fighter. Some had metal plates fitted to the blade leading edge tips to protect against damage or erosion. Others had the tips wrapped in doped linen for the same reasons. I chose to represent the linen wrapping type.*



With reference to the previous photograph, mask off the four propeller blades leaving the linen wrap areas exposed.

Airbrush light coats of 'MRP' acrylic lacquer Clear Doped Linen (MRP-256) or similar over the exposed blade tips.

Remove the masking.

Assembly:

Using thin CA adhesive, secure the front hub plate centrally onto the propeller, making sure it is fitted to the front face of the propeller hub.

Using thin CA adhesive, secure the rear hub plate centrally onto the back face of the propeller hub.

NOTE: *The hole in the propeller is larger the engine propeller shaft.*

Cut a short length of 2.0 mm diameter Brass tube, such as 'Albion Alloy's' MBT20.

Sand the engine propeller shaft to fit inside the tube.

Secure the tube on the propeller shaft using thin CA adhesive.

Using a 2.0 mm diameter drill, open up the hole in the centre of the rear hub plate.

Check fit the propeller on the engine propeller shaft.

Propeller rear view

Decals:

NOTE: *The decals used are the kit supplied decals 48. It seems from the FE.8 propeller photograph below that the 'Darracq' company logo was applied to only one propeller blade (not on all four blades).*

Apply a decal 48 to one of the propeller blades, with the centre shield on the decal facing the straight leading edge of the propeller.

Weathering:

Brush ‘AK Interactive’ Kerosene was (AK2039) over the front and rear hub plates.

Airbrush the propeller with a semi-matte clear coat, such as ‘Alclad’ Light Sheen (ALC311) or similar.

Lightly sponge ‘Tamiya’ Weathering Master Oil Stain (Set D) over the leading edges of the linen wing tips.

PART 9
NACELLE

PART 9 - NACELLE

References:
'Osprey aircraft of the aces 88' - Pusher Aces of World War One (Jon Guttman).
'Windsock' Data File No.48 - Airco DH.2 (B.J.Gray).
'Schiffer Military History Book' - British Aviation Squadron Markings WW1 (Les Rogers).
'Online' - Resources.

NOTE: *The particular aircraft being modelled is based on the **scheme B** on page 15 of the instruction manual. Some model parts supplied in the kit are generic. However, there are specific parts applicable to the different schemes. During construction, make sure the correct specific parts (**B**) are used, as indicated by the green coloured flags in the instruction manual. **Disregard any parts** flagged as being specific to schemes **A, C, D or E**. My sequence of assembly may not follow the kit instructions. The relevant instructions pages are noted as necessary.*

Preparation:

General:

Remove all of the relevant nacelle parts detailed on pages 3, 4 and 5 in the instruction manual from their mold gates, **except** the photo-etch seat belts P10 and P12.

Remove any residual gate tags from the edges of the parts.

Cut away the residual gate tags only from the between the two vertical members on nacelle side frame A17, as indicated on page 3 of the instruction manual.

Cut away the residual gate tags from only the top and pipes on nacelle side frame A18, as indicated on page 3 of the instruction manual.

Cut away gate support from across the seat support frame A6, as indicated on page 3 of the instruction manual.

Drill the two 1.0 mm diameter holes (Lewis ammunition drum containers) through both nacelle sides A42 and A43, as indicated on page 4 of the instruction manual.

Drill a 0.8 mm diameter hole (control cable outlet) through both nacelle sides, as indicated on page 4 of the instruction manual.

Scrape or sand away the ejector pin marks from the inner surface of both nacelles, as these may be seen on the finished model.

Assembly:

NOTE: *Make sure all primer and paints are removed from the mating surfaces of the parts.*

Page 3 - Cement the control column parts A25, A40 and A13 together onto the seat support A6.

Page 3 - Cement the oil and petrol tank parts A48 and A49 together.

Page 3 - Cement the instrument panel parts A2, A4 and A32 together.

NOTE: *The following **two** steps should be carried out together to ensure the side frames align correctly. The nacelle side frames can be flexed to allow fitting of nacelle floor assembly later in the build.*

Page 3 - Cement the two nacelle side frames A17 and A18 together at their forward location.

Page 3 - Cement the instrument panel assembly onto and against the front of the side frame assembly.

Modifications:

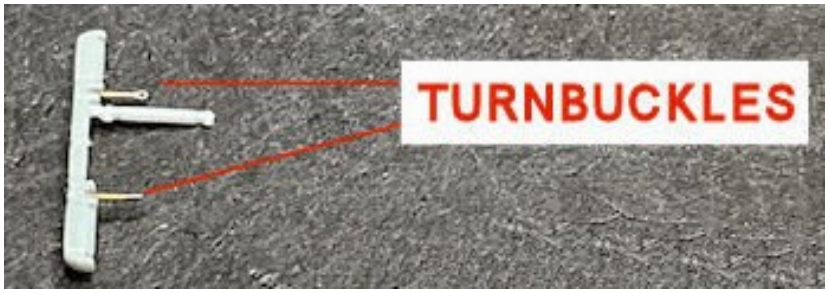
NOTE: *If rigging of control cables is to be carried, it's best to drill the necessary holes into the relevant parts before rigging and assembling the parts. Refer to Part 6 (rigging) of this build log for information.*

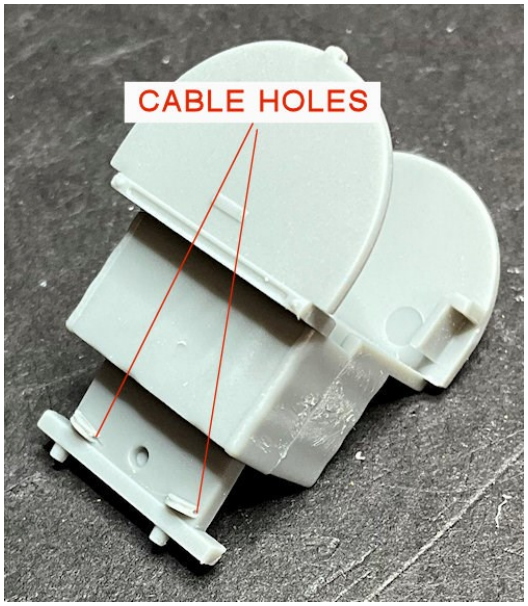
Rudder:

Drill a hole of 0.3 mm diameter sideways through the base of the two cable pulleys on the bottom of the oil tank frame.

Drill a hole of 0.3 mm diameter, rear to front, through the pilots rudder bar at the pre-molded cable points.

Using thin CA adhesive, secure a ‘GasPatch’ 1/48th scale turnbuckle (One Ended type) into each of the pre-drilled holes in the rudder bar, making sure they are fitted facing rearwards.



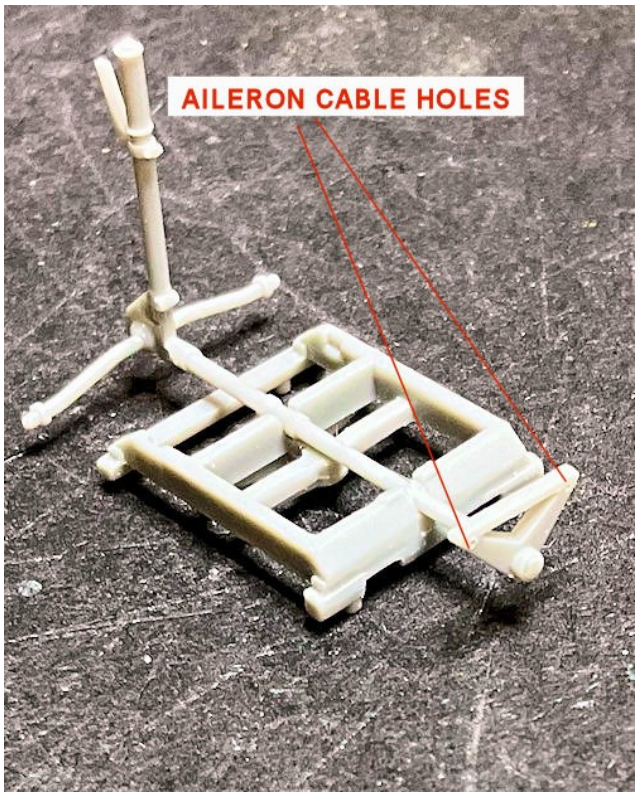


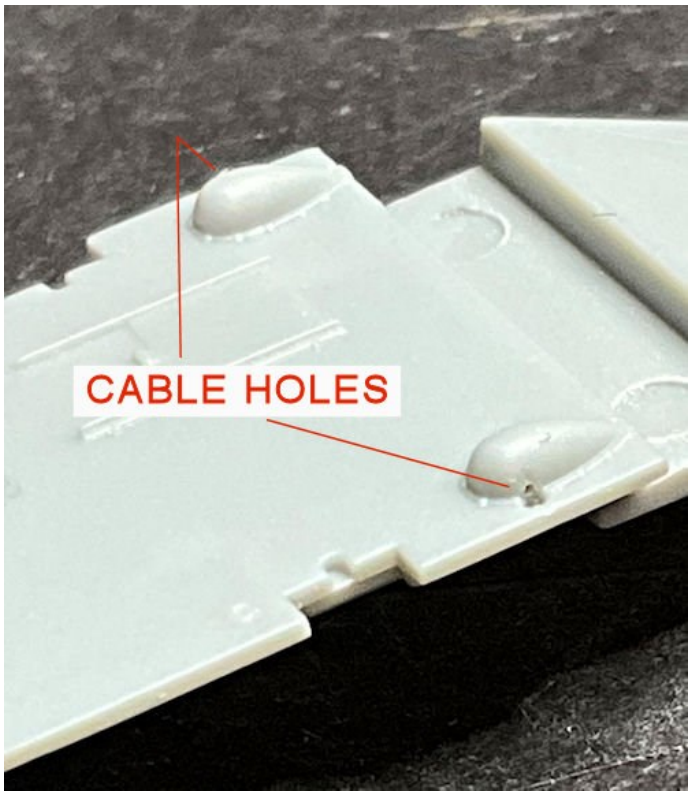
Ailerons:

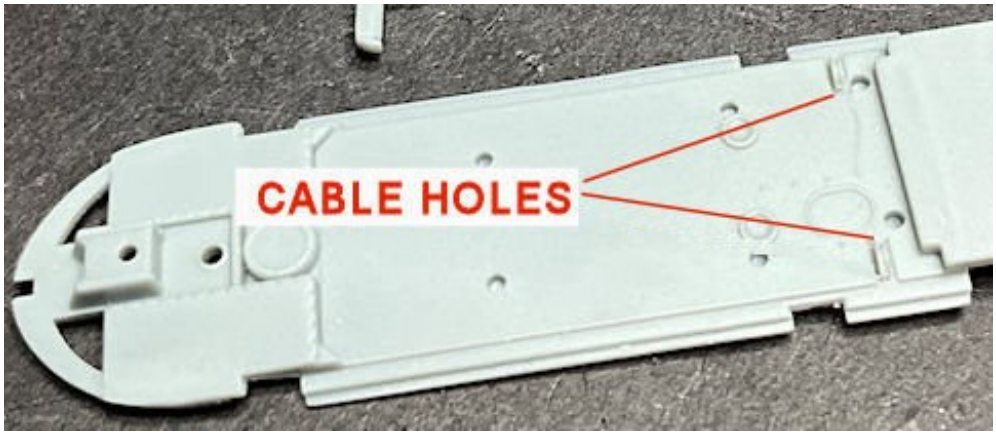
Drill a hole of 0.3 mm diameter, rear to front, through the ends of the aileron bell-crank levers.

Drill a hole of 0.3 mm diameter sideways through the base of the two cable pulleys on the nacelle floor.

Drill a hole of 0.3 mm diameter sideways into, **but not through**, the pulley fairings under nacelle floor.







Painting:

General:

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

Page 4 - Mask off the inside front area and upper arch of the nacelle halves.

Page 3 - Mask off the metal ’drip tray’ on the rear of the nacelle floor.

Airbrush ‘Tamiya’ Wooden Deck Tan (XF78) or similar over the following parts:

- Inside of the nacelle halves
- Nacelle floor
- Nacelle side frame assembly
- Pilots seat
- Seat cushion
- Rudder bar.

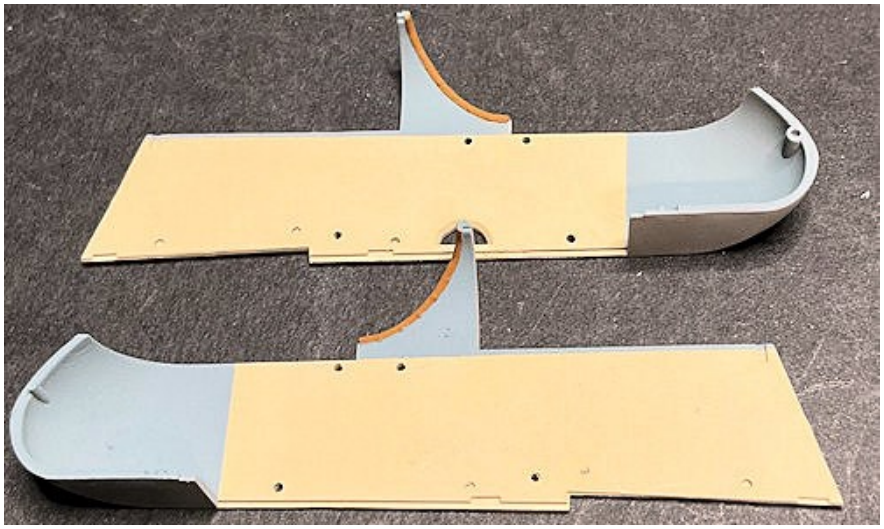
Remove the applied masking.

Page 4 - Mask off the painted insides of the nacelle halves.

Airbrush ‘Tamiya’ Light Grey (XF66) or similar over the following parts:

- Front area and upper arch of the nacelle halves.
- Oil/fuel tank assembly (not the bottom - oil tank)
- Seat support assembly
- Inside of the engine cowl (page 5)
- Inside the front cowl (page 5).
- Engine bearer aft (page 5).

Remove the applied masking.



Wood effect:

NOTE: *Refer to Part 2 (Wood Effects) of this build log - Method 2.*

Create a wood effect by brushing 'Windsor & Newton' Griffin Alkyd paint (Raw Sienna) over the following parts:

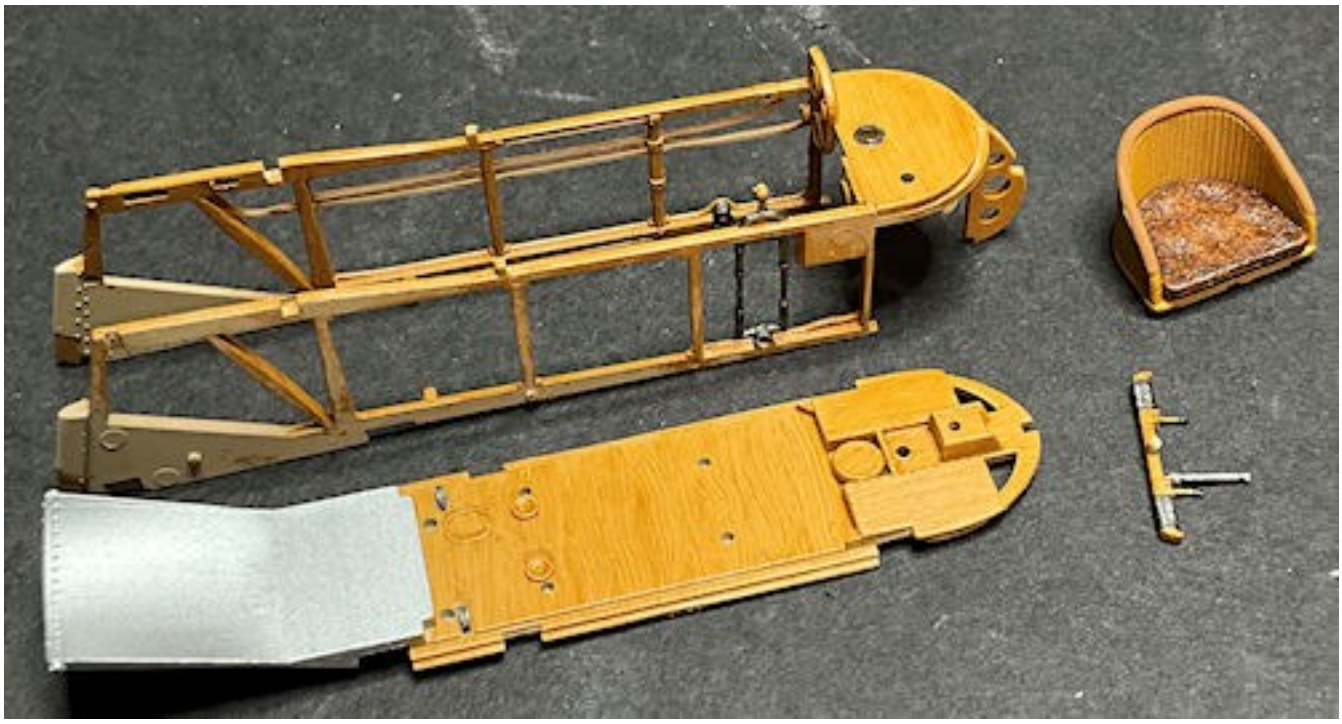
Nacelle side frames assembly

Painted nacelle floor

Rudder bar.

Create a wicker effect by brushing 'Windsor & Newton' Griffin Alkyd paint (Yellow Ochre) over the pilots seat.

Create a leather effect by brushing 'Windsor & Newton' Griffin Alkyd paint (Burnt Umber) over the pilots seat cushion, then stipple Raw Sienna on the cushion to represent wear.



Detail painting:

Refer to pages 3 and 4 of kit instructions. Brush paint or airbrush the detail parts as follows:

'Mr. Colour' Aluminium (218) or similar - Oil tank face, engine drip tray (rear of nacelle floor)

'Tamiya' Semi-Gloss Black (X18) or similar - Elevator control tube (bottom of control column), instrument panels (dial bezels), compass body (nacelle floor.

'Tamiya' Rubber Black (XF85) or similar - Petrol tank

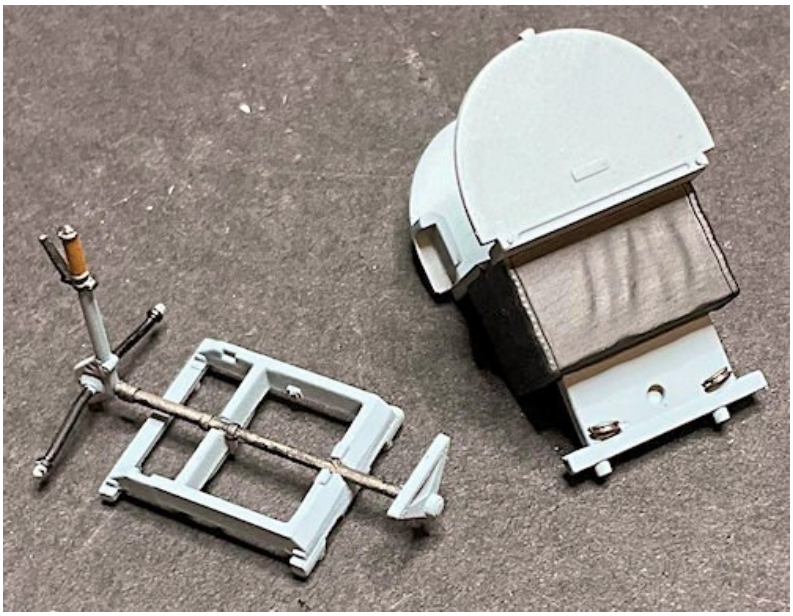
'Mr. Colour' Brass (219) or similar - Pulsometers (C5) (not the glass bowls), instrument (A45), switch and instrument bezel (A4), hand air pump (A60).

'Mr. Colour' Copper (215) and Dark Iron (214) or similar - Air inlet pipe (A59), pipes on left nacelle frame, pipe at the bottom of right and left nacelle frame.

'Mr. Colour' Stainless Steel (213) or similar - Trigger lever (control column), elevator adjusting lever and springs (nacelle right frame), part A46 (nacelle left frame), rudder/aileron control cable pulleys (rear nacelle), foot grips (rudder bar), control column aileron torque tube, covers on rear of nacelle frames, gun mounting ring on flat gum support panel, support straps around hand air pump.

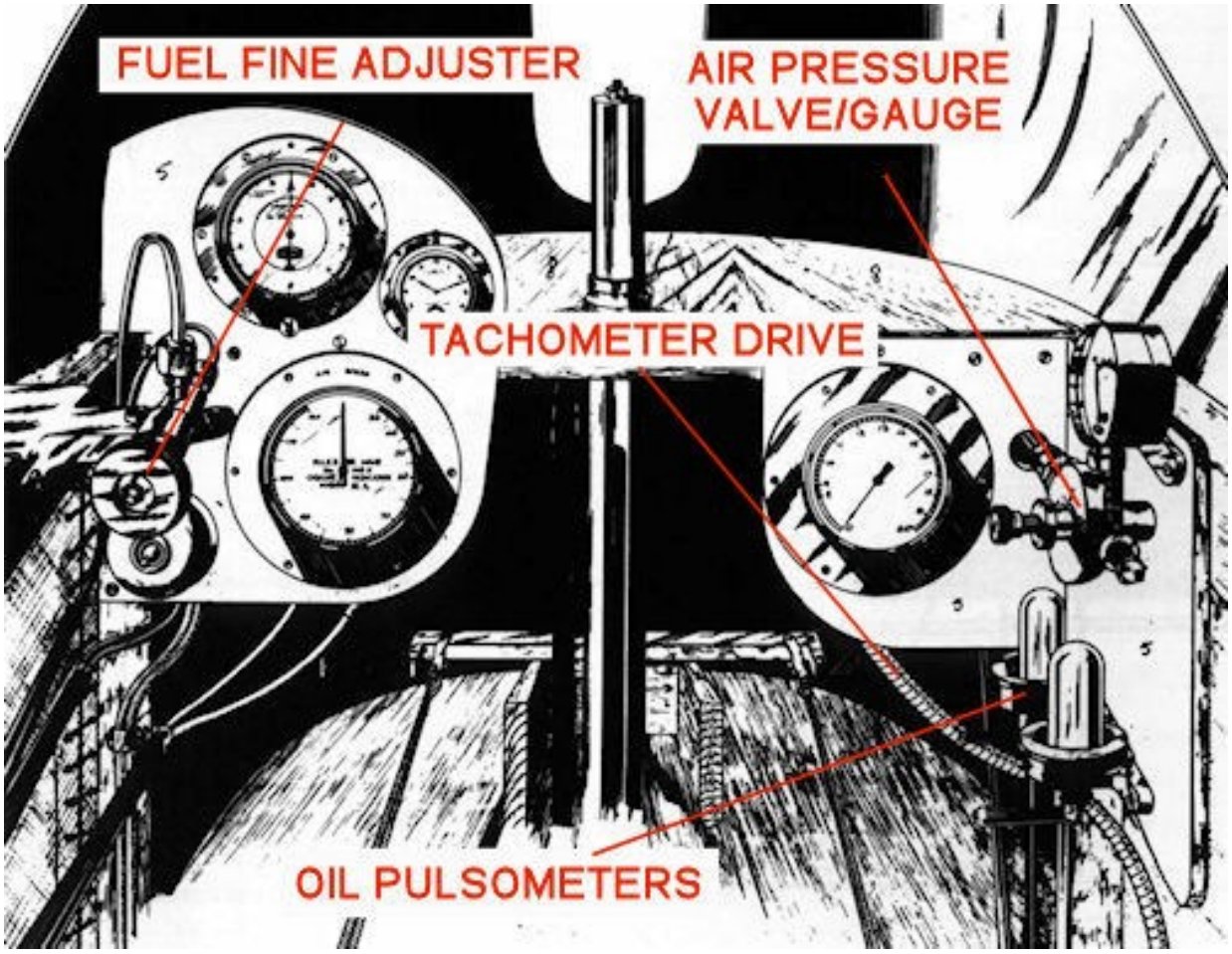
'AK Interactive' Brown Leather (AK3031' or similar - Padding around pilots seat, inside only of the padding around the nacelle arch, control column hand grip.

'Tamiya' Hull Red (XF9) or similar - Handle on hand air pump and elevator adjusting lever.



Modifications (continued):

NOTE: *The following details the adding of various pipes to the cockpit.*

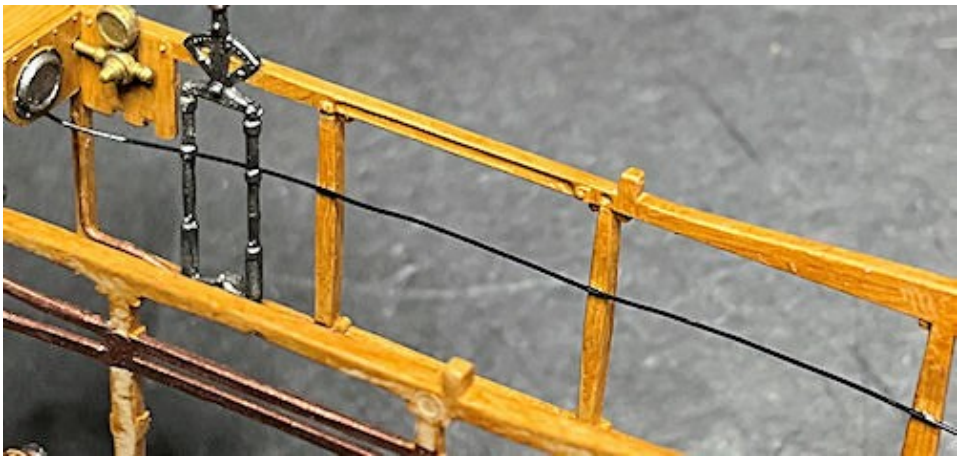


Fine fuel adjuster:

To add two pipes to the fine fuel adjuster, I drilled two holes of 0.3 mm diameter, one into the top and a second into the front connector. Into the holes I secured a length of 0.2 mm diameter copper wire, using thin CA adhesive. The fuel adjuster was the cemented into its locating hole at the top, front of the nacelle left frame. The two wires were then looped over then under the left instrument panel and secure behind the panel using thin CA adhesive.

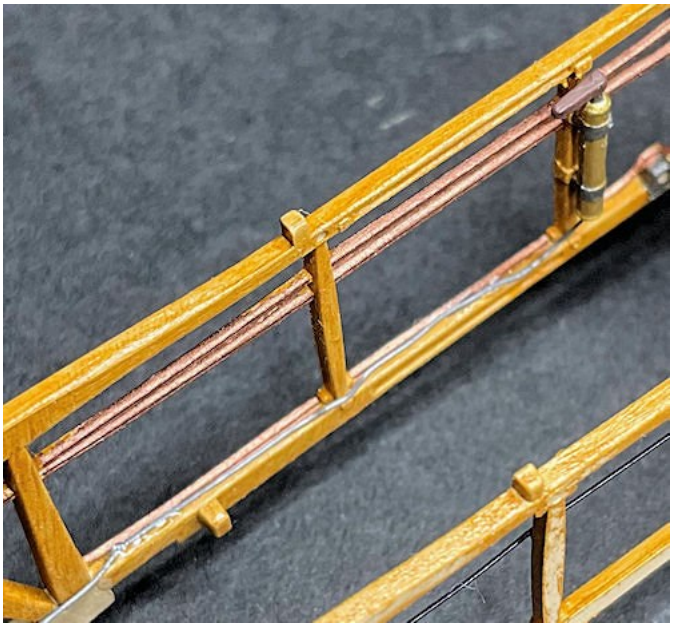
Tachometer drive:

To represent the drive from the Tachometer, I cut a long length of ‘Modelkasten’ 0.2 mm diameter black line (1.5). This was secured behind the Tachometer on the right instrument panel, using thin CA adhesive. The line was then routed rearwards behind the springs of the elevator adjusting lever and along the vertical members of the nacelle right frame. The line was secured in position using thin CA adhesive.



Air pressure pump:

To represent the pipe from the air pressure pump, I first cut away the pipe molded on the bottom end of the pump. A hole of 0.5 mm diameter was drilled up into the centre of the pump, using the witness mark from the cut away pipe as a guide. A long length of 0.4 mm diameter ‘PlusModel’ lead wire was cut and secured into the pre-drilled hole using thin CA adhesive. The pump was then cemented into its locating holes in the vertical member of the nacelle left frame. The lead wire was then curved rearwards and routed along the bottom of the nacelle frame and secured in position using thin CA adhesive.



Oil pulsometers:

NOTE: *At this stage of the build, the infamous 'carpet monster' claimed the kit Pulsometer. Therefore, I needed to scratch a replacement.*

I cut two short lengths of 0.5 mm diameter plastic rod and lightly sanded one end of the rods to form a dome. The rods were then bent to 90 degrees. The bends in the rods were brush primed with a grey primer, leaving the domed tops clear of primer. The bends were then painted with 'Mr. Colour' Brass (219). The clear domed tops of the rods were brushed with 'Tamiya' Clear Yellow (X24) to represent the oil filled glass bulbs. Finally the two rods were secured in the original locating slots in the nacelle right frame using thin CA adhesive, making sure the rods were slightly clear of the panel and vertical.

Decals:

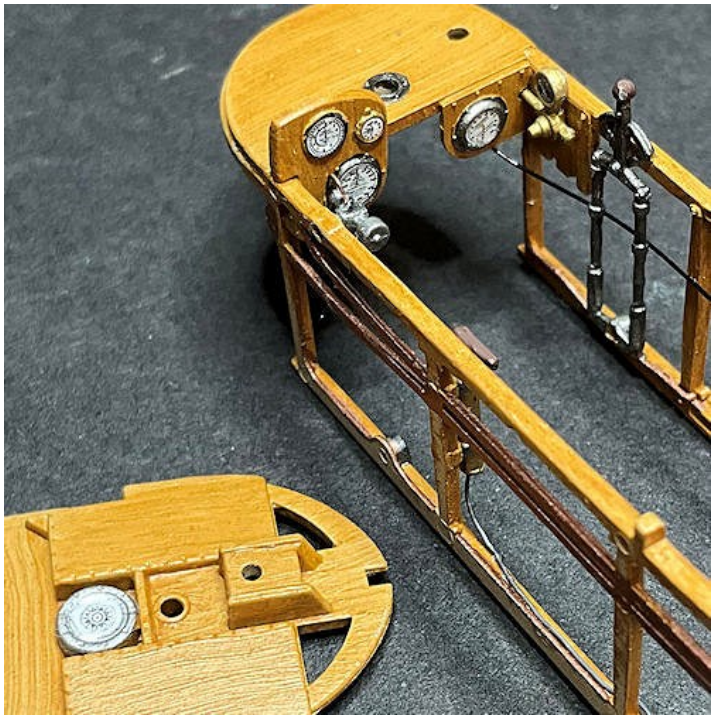
Page 3 - Apply decal 54 to the lower, front face of the oil tank face.

Page 3 - Apply decal 59 to the instrument A45 on the nacelle right frame.

Page 3 - Apply decal 60 to the compass on the nacelle floor.

Page 3 - Apply decals 55, 56, 57 and 58 to the instrument panels.

Once the decals have fully set, brush 'Tamiya' Clear Gloss (X22) or similar over the decals, to represent instrument glass.



Assembly (continued):

Cement the pilots seat cushion onto the pilots seat.

Cement the pilots seat onto the seat support frame.

Cement the seat/frame assembly into its locating holes in the nacelle floor.

Rigging control cables:

NOTE: *The materials for rigging control cables are 'Albion Alloy's' Nickel-Silver tube (NST04) and 'Steelon' or 'Stroft' 0.08 mm diameter mono-filament.*

Aileron control cables:

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

Cut a short length of blackened 'Albion Alloys' Nickel-Silver 0.4 mm (NST04) diameter tube.

Cut a length of 0.08 mm diameter mono-filament.

Pass a tube onto the line.

Pass the line through the pre-drilled hole in the end of one of the aileron bell-crank levers.

Loop the line back and through the tube.

Slide the tube up to, **but not touching**, the lever.

Using thin CA adhesive, secure the lines in the tube.

Cut away any residual tag of line at the tube end, leaving the fitted line free to move in the lever.

Repeat the procedure to add a line to the other aileron bell-crank lever.

Pass the free ends of the lines down and through the pre-drilled holes through the aileron cable pulleys on the nacelle floor.

Keeping the lines taut, secure them in the pulleys using thin CA adhesive.

Cut away any residual line at the edge of the nacelle floor.

Pre-rig the rudder control cables:

NOTE: *The following steps are to pre-rig the rudder bar before fitting to the nacelle and final rigging the lines.*

Cut two long lengths of mono-filament.

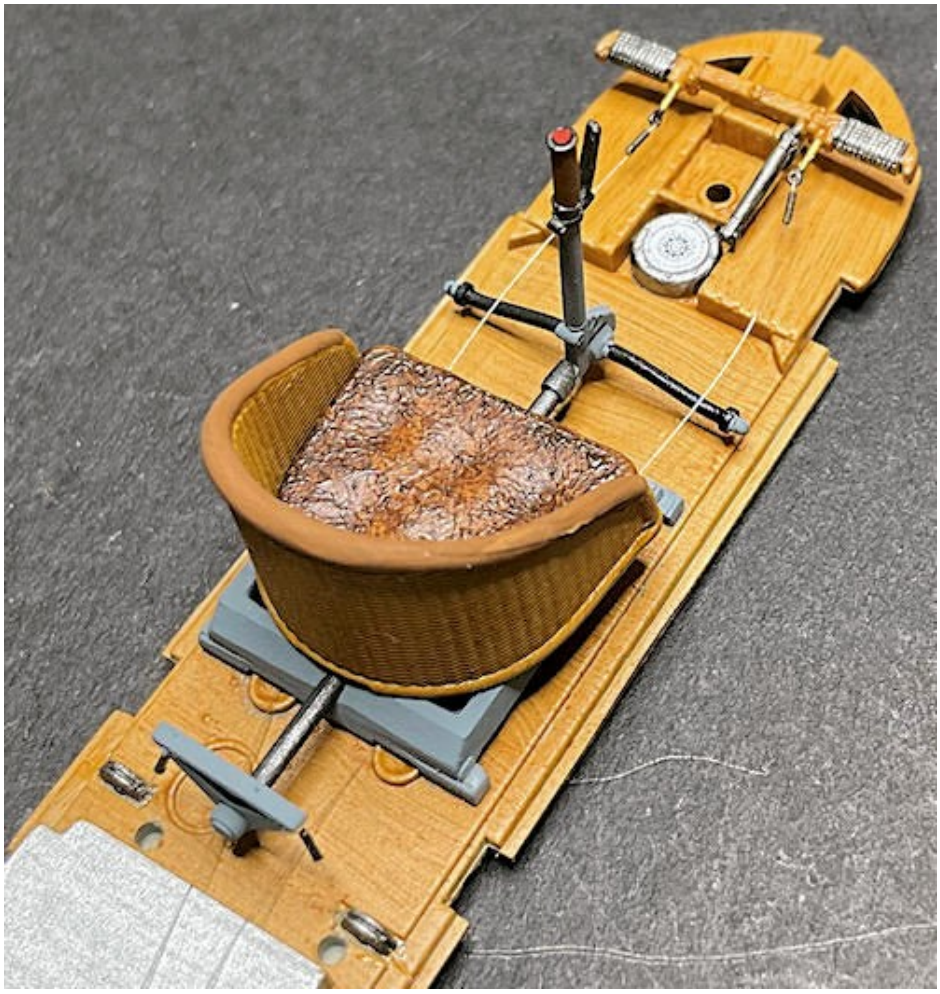
Repeat the previous procedure to attach a line to ‘eyes’ of the two turnbuckles fitted in the rudder bar.

Assembly (continued):

NOTE: *The following steps are to fit the rudder bar before final rigging the lines.*

Cement the pilots rudder bar into its locating hole at the front of the nacelle floor.

Pass the two rudder control lines rearwards, under the pilots seat and through the slots in the rear seat support cross member.



Carefully locate and cement the nacelle floor assembly between the nacelle sides, making sure that:

- The tabs on the front ends of the side frames locates fully under the nacelle floor
- The outer ends of the elevator torque tube (across the nacelle floor) locates fully into its locating holes in the side frames
- The bottom edges of the side frames locate fully onto their shoulders on the nacelle floor
- The engine drip tray locates fully into its locating holes in the rear of the sides frames.

Move the two rudder control lines forwards to clear where the oil/fuel tank assembly locates.

Locate and cement the oil/fuel tank assembly into its locating holes on the nacelle floor and its recesses in the top of the side frames.

Cement the forward engine support frame into its locating recesses in the top, inner sides of the side frames (behind the oil/fuel tank assembly).

Cement the rear engine support frame into its locating recesses in the top, inner rear sides of the side frames.

Pass the free end of the two rudder control lines outboard through the pre-drilled holes in the rudder pulleys on the forward, lower face of the oil/fuel tank assembly.

Keeping the lines taut, secure them onto the top edges of the bottom nacelle side frame members.

Cut away residual line flush with the outer edge of the side frames.

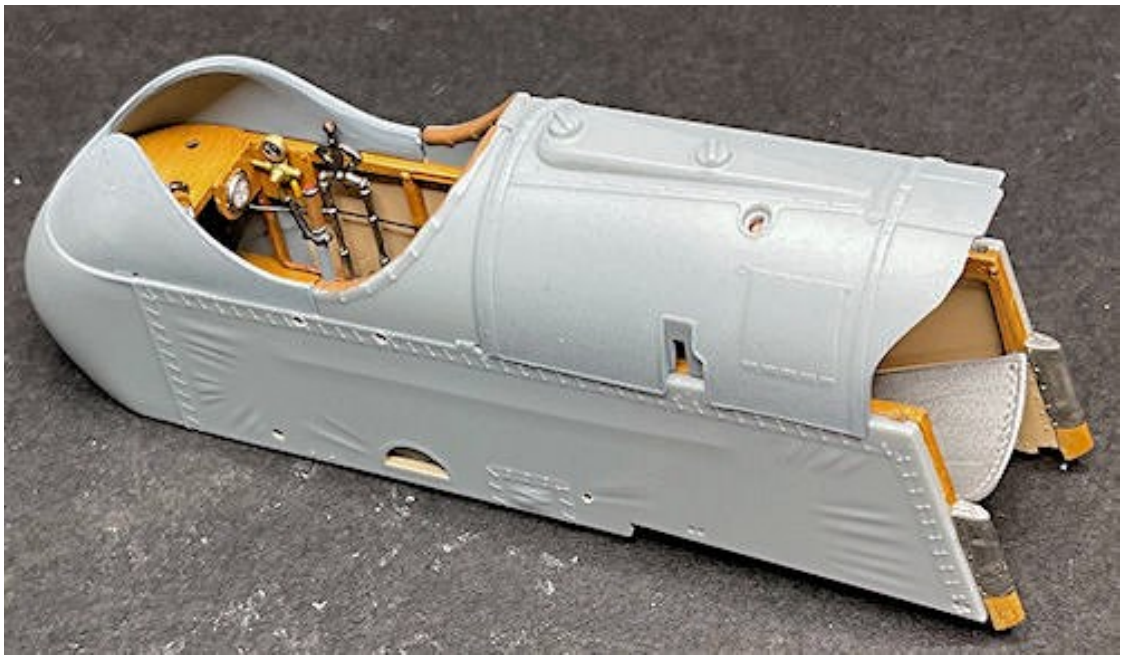
Clean paint and primer from the mating surfaces and locating stubs/holes on the nacelle assembly and nacelle halves.

Test fit the two nacelle halves onto the assembly, making sure the join together fully.

Clean paint and primer from the mating surfaces and locating surfaces on the nose upper cowl and nacelle rear cover.

Test fit the nose upper cowl and nacelle rear cover, making sure they locate fully.

Remove the nose upper cowl and nacelle rear cover.



Nacelle bracing wires:

NOTE: *Refer to Part 6 (Rigging) for more information.*

Side bracing wires:

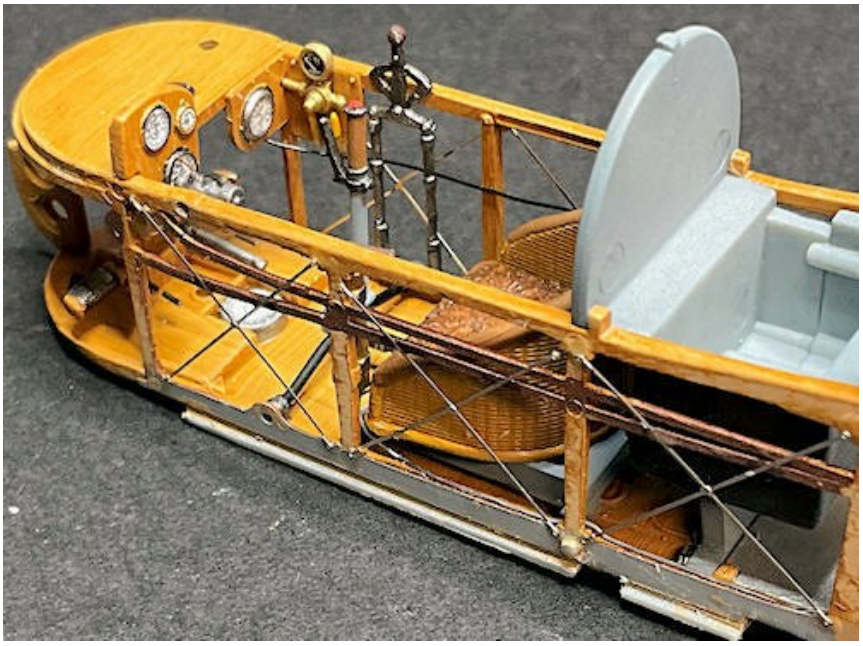
NOTE: *The side bracing wires used were from the 'HGW Models' AMC DH.2 set (132097).*

Cut the four number 5 crossed bracing wires from the 'HGW' photo-etch set.

Using thin CA adhesive, secure the bracing wires onto the outside of the first two bays in the nacelle side frames.

Cut the two number 6 crossed bracing wires from the 'HGW' photo-etch set.

Using thin CA adhesive, secure the bracing wires onto the outside of the rear bays in the nacelle side frames.



Engine bay bracing wires:

Lower bracing wires:

NOTE: *The lower rigging is 0.08 mm diameter 'Steelon' mono-filament. The rigging Anchor Points used are the 'GasPatch Elite Accessories' 1/48 scale metal Anchor Points, which are snapped in their centres to provide two Anchor Points.*

Cut a long length of line.

Cut a short length of blackened tube.

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

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

Secure the lines in the tube using thin CA adhesive.

Cut away the residual tag of line.

Drill a hole of 0.3 mm diameter through the bottom of the rear vertical members on the nacelle side frames.

Using thin CA adhesive, secure the Anchor Points of the pre-rigged lines into the pre-drilled holes.

Drill a hole of 0.3 mm diameter through the bottom of the rearmost (angled) member on the nacelle side frames. Drill the holes just above the engine drip tray.

Using thin CA adhesive, secure an Anchor Point into the pre-drilled holes in the rearmost (angled) side frame members.

Using the previous procedure attach the free ends of the lines (crossed) onto the fitted Anchor Points, but leaving the line loose in the Anchor Points..

Keeping the lines taut, slide the tubes up to, **but not touching**, the 'eye' of the Anchor Points.

Secure the lines in the tube using thin CA adhesive.

Cut away the residual tag of line.

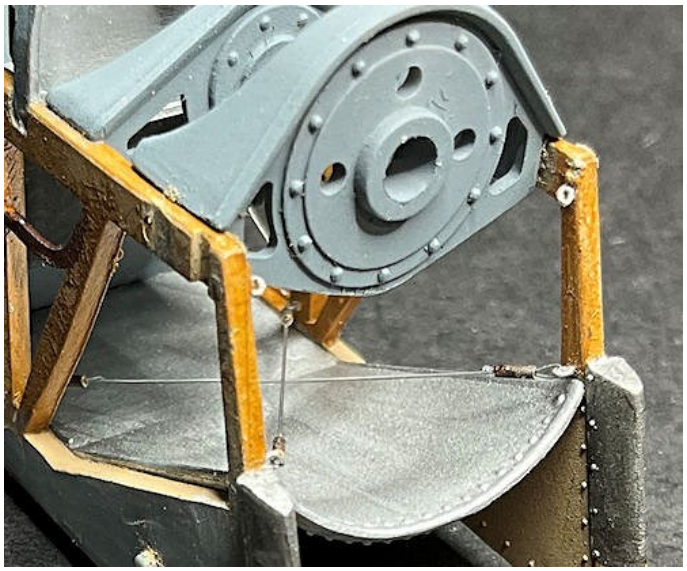
File away any protruding tang of the Anchor Points at the outer faces of the Nacelle side frames.

Rear bracing wires:

NOTE: *The engine bay rear bracing wires between the upper corners of the nacelle side frames (behind the engine) and the outer ends of the lower wing exposed rear spar, can't be rigged until the lower wing is attached to the nacelle assembly. Therefore, only the upper anchor points can be added at this stage of the build.*

Drill a hole of 0.3 mm diameter through the top corner of the rearmost (angled) member on the nacelle side frames.

Using thin CA adhesive, secure an Anchor Point into the pre-drilled holes in the rearmost (angled) side frame members.



Seat belts:

Preparation:

Remove the two lap belts from the kit supplied photo-etch sheet.

Remove any photo-etch ‘tags’ from the edges of the parts.

NOTE: *Annealing photo-etch parts is done by applying heat from a cigarette lighter or similar, along the parts until the photo-etch changes to a grey colour. Avoid melting the parts by keeping the heat source moving over the part. Also avoid heating very small parts as these may easily melt.*

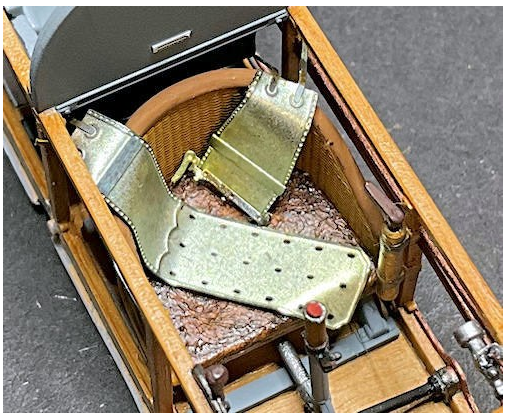
Anneal (soften) the parts to allow them to be formed over the pilots seat.

Clean off any soot created by the heat source.

Forming:

Locate the two retaining straps of the belts over the seat top and each side of the vertical members of the nacelle side frames.

Using a rounded tool, such as a paper burnisher or rounded tooth pick, shape the two belts to hang naturally over the seat.



Painting:

Brush ‘Mr. Metal’ R etch primer onto the two lap belts.

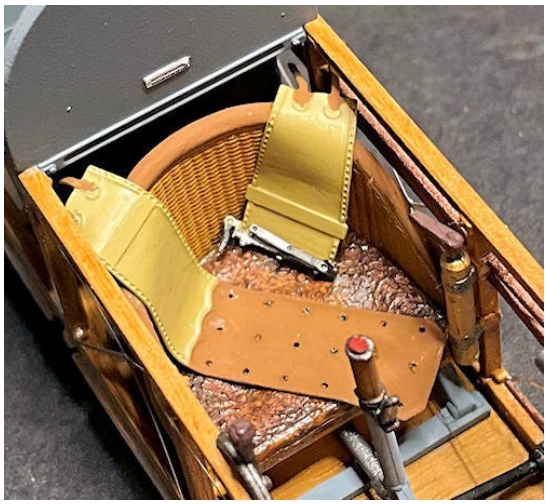
Brush paint the laps belts (not the perforated section of the longer belt) with ‘Tamiya’ Dark Yellow (XF60) or similar.

Brush paint the perforated section of the longer belt with ‘AK Interactive’ Brown Leather (AK3031) or similar.

Brush paint the end metal fittings with ‘Mr Colour’ Stainless Steel (213) or similar.

Fitting:

Locate the two lap belts, as when they were formed, over the pilots seat and secure in position on the seat, using thin CA adhesive.



Weathering:

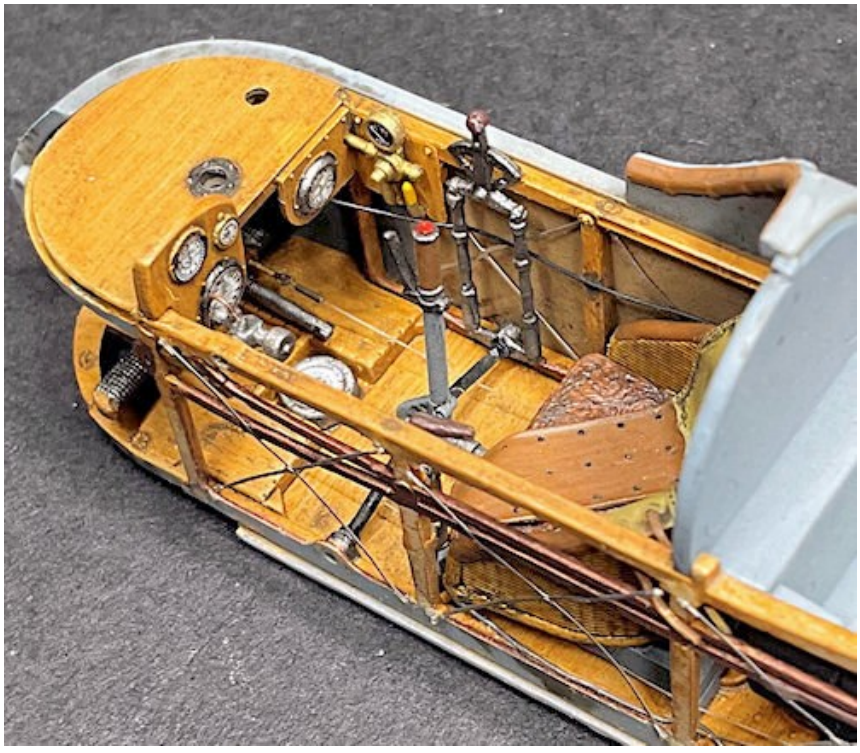
NOTE: *Refer to Part 3 (Weathering) of this build log for more information.*

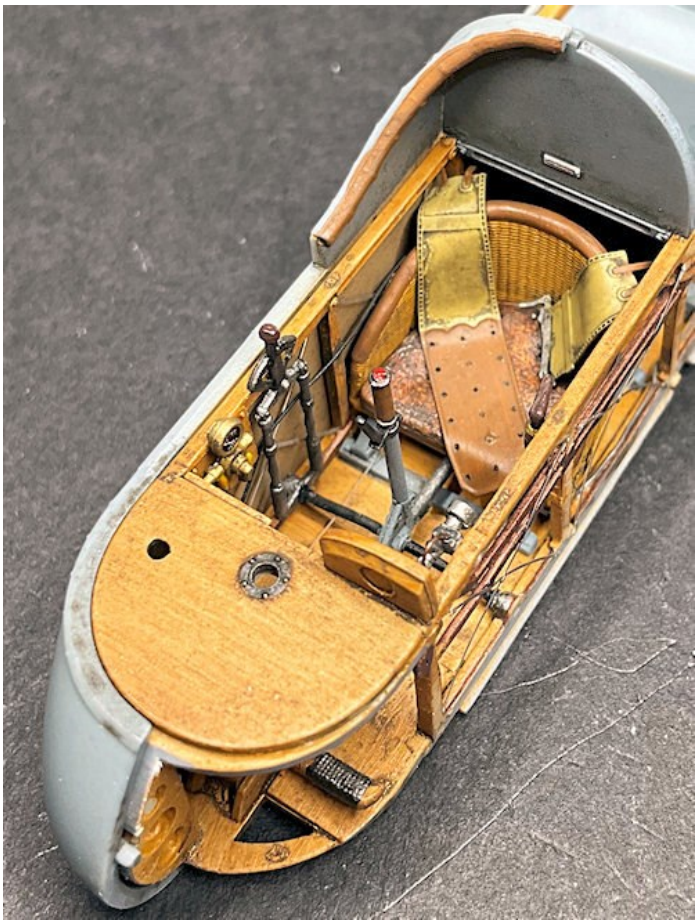
To provide a good base for applying weathering, airbrush a semi-matte clear coat, such as 'Alclad' Light Sheen (ALC311) or similar over the following:

Nacelle assembly
Painted inside of nose upper cowl
Painted inside of nacelle rear cover
Painted inside of the nacelle halves.

Brush apply 'Flory Models' Clay washes to achieve your desired weathered effects. I chose to use the Dark Dirt wash.

Brush a clear gloss coat, such as 'Tamiya' Clear (X22) or similar onto the dial/faces of the various instruments.





Assembly (continued):

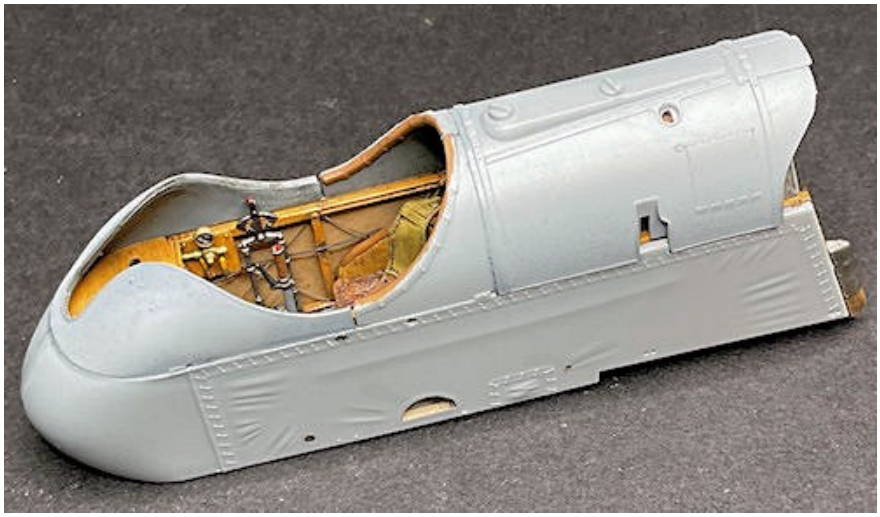
Make sure all mating surfaces and locating stubs/holes are clear of any paint and primer.

Cement the nacelle assembly into the nacelle right half.

Cement the nacelle left half onto the nacelle assembly and nacelle right half.

Cement the nacelle rear cover onto its locating recesses in the top, rear of the nacelle side frames.

Cement the upper nose cowl onto the front of the nacelle assembly.



Sand the outer seam joints to blend the surfaces together.

If necessary, fill any gaps with a filler, such as 'Perfect Plastic Putty' or smaller gaps with 'Mr. Surfacer' 500 or similar and when fully set, sand to blend with the surrounding area.

Modifications (continued);

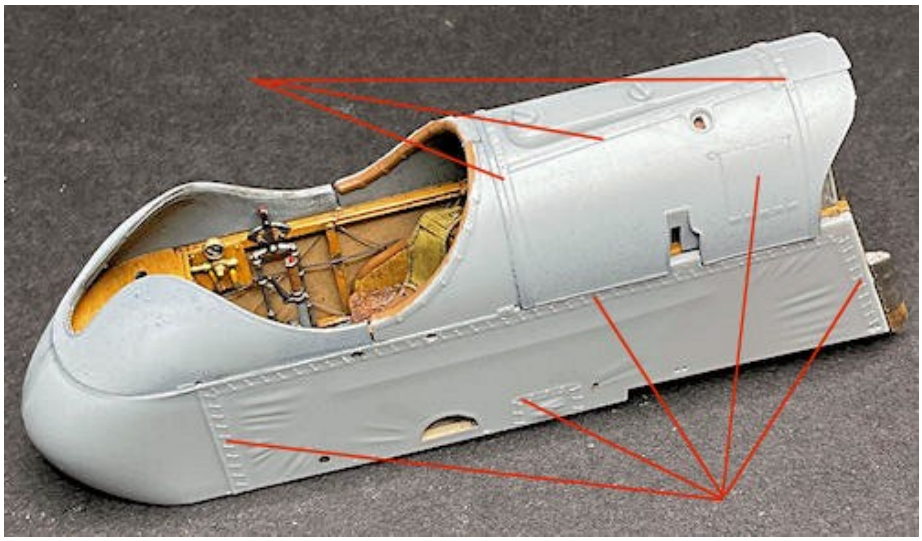
Sand or scrape away the late production hatch detail from the upper, rear of the left side of the nacelle rear cover (refer to page 7 of the instruction manual).

Stitching:

NOTE: *The pre-molded side linen stitching on the nacelle looks rather 'flat'. Therefore I chose to replace the stitching with the parts from the 'HGW Models' AMC DH.2 set (132097).*

Carefully scrape or sand away all of the pre-molded stitching on the sides of the nacelle and from the nacelle rear cover.

Carefully scrape or sand away the two retaining belts from the nacelle rear cover.



NOTE: ***Do not fit*** *the two retaining straps to the nacelle rear cover, as these will need to be fitted after painting. Also,* ***do not fit*** *the wide vertical stitching strip to the left side of the nacelle (it was only on the right side).*

Cut the required stitching parts from their photo-etch sheet.

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

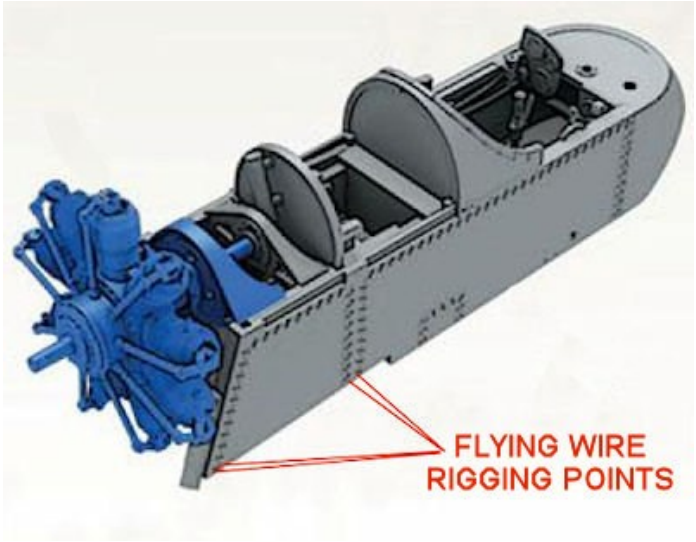
NOTE: *Follow the instructions detailed on sheet 2/3 in the 'HGW Models' AMC DH.2 set (132097) for fitting the various stitching parts. When fitting the straight part to the top, left of the nacelle rear cover, make sure to leave enough space for fitting the front retaining strap.*

Using thin CA adhesive, secure the various stitching parts to the nacelle.

Once the adhesive has fully set check along the edges of the parts to make sure the parts are fully secured to the nacelle.

Carefully scrape away any residual adhesive at the edges of the parts, using a sharp and curved scalpel blade or similar.

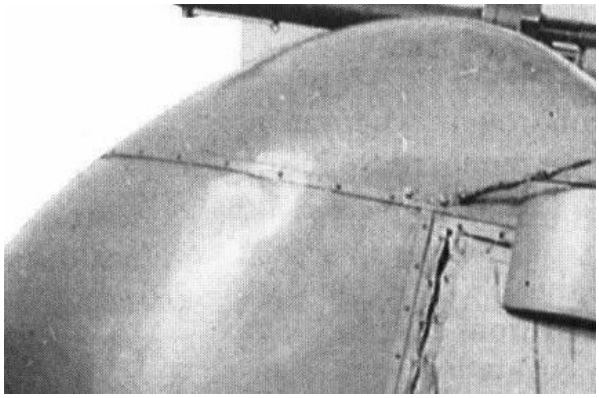
NOTE: *Refer to the following illustration. Some of the photo-etch parts cover the pre-molded flying wire rigging points on both sides of the nacelle and these need to be reinstated.*



Drill pairs of flying wire rigging holes of 0.3 mm diameter through the applied photo-etch stitching. The distance between the holes should be as close as possible to the original (same as landing wires points on the lower wing).

Nose strip:

NOTE: *The join between the nose and the nose upper cowl was covered with a strip.*



Cut a thin strip of 0.2 mm thick plastic card and cement it around the nacelle nose, covering the joint.

Once the cement has fully set, lightly sand the strip to blend it with the surrounding surfaces.

Retaining straps:

NOTE: *The two pre-molded retaining straps on the nacelle rear cover look rather 'flat'. Therefore I chose to replace the straps.*

Cut the two retaining strap buckled ends **only from the** photo-etch parts 7 on the 'HGW Models' AMC DH.2 set (132097) set.

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

Lightly sand the back surface of the straps to provide a key for adhesive.

Brush 'VMS' Metal Prep 4K over the detailed side of the straps.

Airbrush the two buckled straps with 'AK Interactive' Brown Leather (AK3031) or similar.

Brush paint the buckles of the straps with 'Mr. Colour' Stainless Steel (213) or similar.

Cut two long strips of 0.2 mm thick plastic card to the same width of the buckled straps.

Airbrush **one side only** of both strips with a grey primer, such as 'AK Interactive' Grey (AK758) or similar.

Airbrush the primed sides of the two straps with 'AK Interactive' Brown Leather (AK3031) or similar.

Painting (continued):

Mask off the open cockpit, the open engine bay area and the painted inside of the nacelle side frames, under the engine drip tray.

Mask or plug all other openings on the nacelle.

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

Check the nacelle for any surface imperfections or gaps and if necessary sand/fill and reprime.

Ask off the nacelle linen side panels.

Airbrush the exposed nacelle with 'Tamiya' Light Grey (XF66) or similar.

Remove the masking from the nacelle side panels.

Mask off the light grey painted areas of the nacelle, making sure the applied stitching is masked half way across the stitching.

Airbrush the linen side panels and exposed stitching with 'Tamiya' Deck Tan (XF55) or similar.

Remove all masking and plugs from openings.

Prime then brush paint the air inlet pipe (A41) with ‘Tamiya’ Rubber Black (XF85) or similar.

Brush paint the pilots foot step with ‘Mr. Colour’ Stainless Steel (213) or similar.

Brush paint the underside of the engine drip tray with ‘Mr. Colour’ Stainless Steel (213) or similar.

Brush paint the oil and fuel filler caps with ‘Mr. Colour’ Brass (219) or similar.

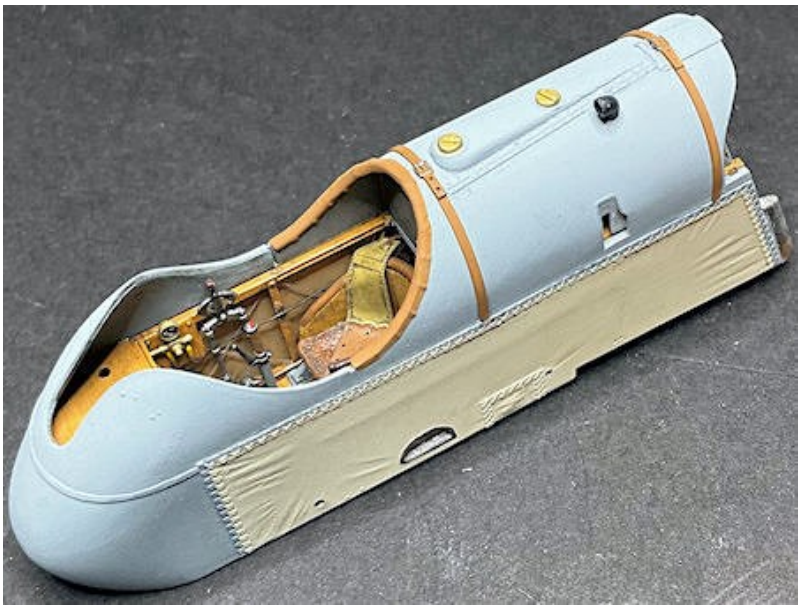
Brush paint the cockpit surround padding with ‘AK Interactive’ Brown Leather (AK3031) or similar.

Assembly (continued):

Cement the air inlet pipe (A41) into its locating recess in the top of the nacelle rear cover.

Cement the two prepared retaining straps over the nacelle rear cover and at the original locations.

Using thin CA adhesive, secure the two prepared photo-etch buckled straps onto the top, centre of the retaining straps, making sure the contact points are clear of paint and primer.



Decals:

Airbrush the sides and underside of the nacelle with one or two gloss clear coats, such as ‘Mig’ A-Stand Aqua Gloss (A.Mig-2503) or similar.

Apply the kit supplied roundels (25) onto the sides of the nacelle.

To reduce the possibility of ‘silvering’ (trapped air under the decal) under decal 15, cut away the transparent decal carrier film from around the edges of the decal.

To allow the decal to conform over the two raised fairings at the rear of the nacelle underside, cross cut the transparent carrier film in the two fairing openings on decal 15.

Apply the kit supplied decal (15) to the underside of the nacelle.

Modifications (continued):

Underside sliding panel:

NOTE: *The pre-molded sliding panel on the underside of the nacelle looks rather 'flat'. Therefore I chose to replace the panel with the part 21 from the 'HGW Models' AMC DH.2 set (132097).*

Sand or scrape away the sliding panel detail on the underside of the nacelle.

Cut the sliding panel photo-etch part 21 from the 'HGW Models' AMC DH.2 set (132097) set.

Remove any residual photo-etch tags from the edges of the part.

Lightly sand the back surface of the panel to provide a key for adhesive.

Brush 'VMS' Metal Prep 4K over the detailed side of the panel.

Airbrush the detailed side of the panel with a grey primer, such as 'AK Interactive' Grey (AK758) or similar.

Airbrush the panel with 'Tamiya' White (XF2) or similar.

Assembly (continued):

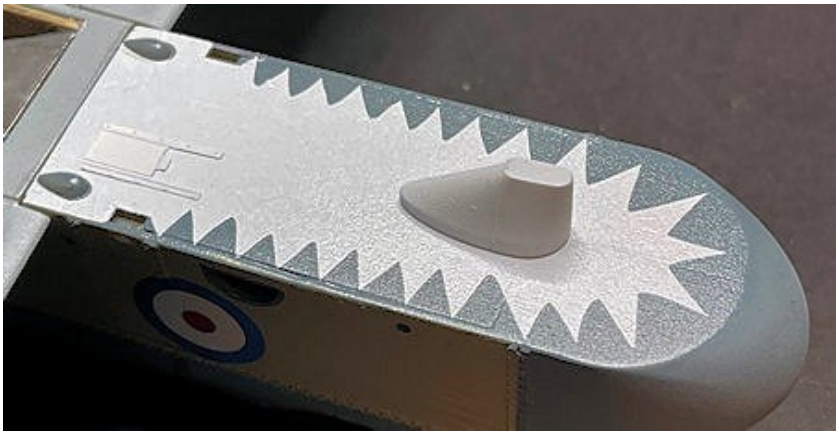
Cement the kit part A12 into its locating hole in the compass fairing A7.

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

Airbrush the compass fairing assembly with 'Tamiya' White (XF7) or similar.

Cement the compass fairing into its locating recess in the underside of the nacelle.

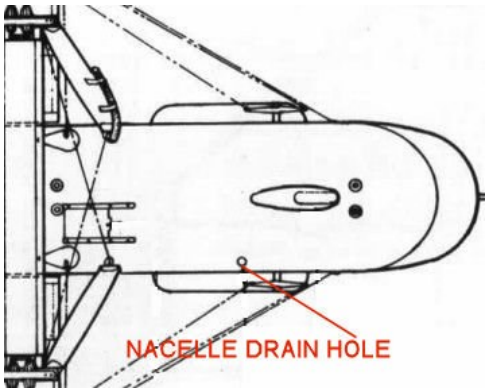
Using thin CA adhesive, secure the prepared photo-etch sliding panel at the original location on the underside of the nacelle.



Modifications (continued):

Nacelle underside drain hole:

NOTE: *A single drain hole was located left midway edge of the nacelle underside.*



Drill a hole of 0.8 mm diameter into the left edge of the underside of the nacelle.

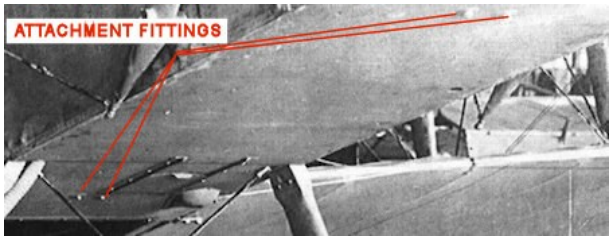
Brush paint inside the hole with 'Tamiya' Rubber Black (XF85) or similar

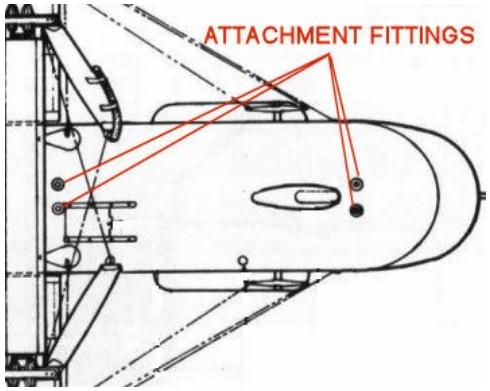
Nacelle underside attachment fittings:

NOTE: *The underside of the nacelle a two pairs of attachment fittings (presumably bolts) fitted centrally, with one pair behind the sliding panel and the other pair forward from the compass fairing.*

Cut or punch out four discs of 1.5 mm diameter from 0.1 mm thick plastic card.

Lightly cement the four discs onto the underside of the nacelle.





PART 10
WEAPONS

PART 10 - WEAPONS

Ammunition containers:

Remove the ammunition containers A54 and A55 from their sprue gate and remove any residual sprue tags from their edges.

Modification:

NOTE: *At Part 9 (Nacelle) stage of this build, when test fitting the ammunition containers, I found that:*

The replacement photo-etch nacelle stitching used covered the pre-drilled locating holes for the ammunition containers.

The photo-etch stitching stands proud of the nacelle sides and does not allow the containers to fit flush against the sides of the nacelle.

The kit supplied roundels needed to be applied further forward on the nacelle sides, otherwise they would have overlapped the larger photo-etch stitching around the inspection patch. This meant the containers needed to be located further forward on the nacelle sides to avoid overlapping the roundels.

To avoid the top of the roundels the height of the containers was above the edge of the cockpit opening.

When located the ammunition drums were much thinner than their locating compartments.

In order to overcome these problems, I needed to:

Cut away the two locating stubs from the containers (no longer required)

Reduced the height of the containers (to avoid being above the cockpit opening)

Reduced the width of the ammunition containers to move them closer to the nacelle sides and provide a closer fit for the ammunition drums.

Painting:

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

Airbrush the containers with 'Tamiya' Wooden Deck Tan (XF78) or similar.

NOTE: *Refer to Part 2 (Wood Effects) of this build log - Method 2.*

Create a wood effect by brushing 'Windsor & Newton' Griffin Alkyd paint (Raw Sienna) over the containers.

Fitting:

NOTE: *During the following step, make sure the containers are level and if possible, do not cover the roundels. Also that the tops of the containers are not above the edge of the cockpit opening.*

Using thin CA adhesive, secure the containers onto the nacelle sides below the photo-etch stitching.

Ammunition drums:

Remove five of the ammunition drums D18 from their sprue gate and remove any residual sprue tags from their edges.

Painting:

Airbrush the ammunition drums with a black primer, such as 'Tamiya' Gloss Black (X1) or similar.

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

Airbrush with 'Alclad' Gunmetal (ALC120) or similar.

NOTE: *Dry brush by using a domed and soft brush, which has a very light dusting of paint. Dry off paint on the brush on an absorbent paper before dry brushing the part.*

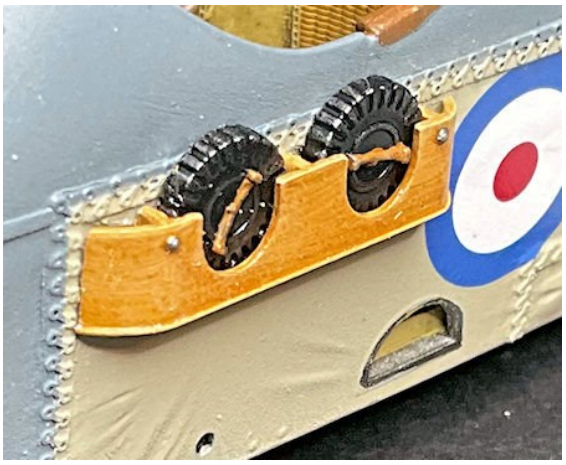
Dry brush with 'Mr. Colour' Super Iron 2 (203) or similar.

Brush paint the grab straps on the ammunition drums with ‘AK Interactive’ Brown Leather (AK3031) or similar.

Brush paint the ammunition rounds in the ammunition drums with ‘Mr. Colour’ Brass (219) or similar.

Fitting:

Cement two ammunition drums into both containers, making sure the leather grab straps are facing outboard.



Empty rounds catch bag:

Remove the empty rounds catch bag A62 its sprue gate and remove any residual sprue tags from its edges.

Painting:

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

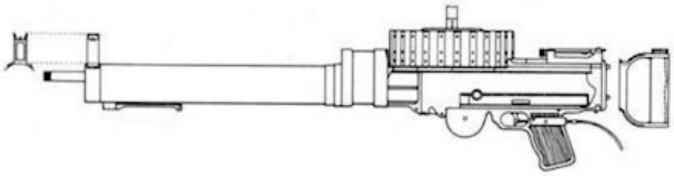
Airbrush with ‘Tamiya’ Deck Tan (XF55) or similar.

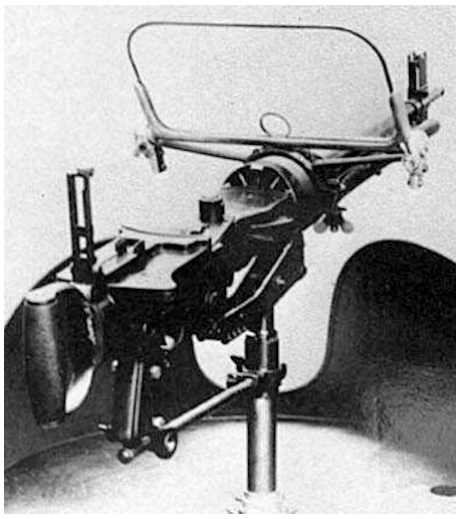
Brush paint the metal connector at the machine gun end (top) with ’Mr. Colour’ Stainless Steel (213) or similar.

Lewis machine gun Mk.II:

NOTE: *Page 12 of the instruction manual shows the ‘adjuster handle’ (A44) on the mounting of the Lewis machine gun. This handle is not molded on the mounting part, presumably because if it was, the mounting could not be passed through the mounting hole in the cockpit forward panel. Therefore, if used, the part A44 needs to be fitted after the Lewis machine gun has been finally fitted into the nacelle later in the build. I chose not to use this part as it can’t easily be seen if fitted.*

Also the instructions state to fit the photo-etch ring sight (P6). However, some resources shows a widened solid foresight was fitted. Therefore I chose not to use the P6 part.





Preparation:

Remove the Lewis machine gun and mounting A10 from its sprue gate and remove any residual sprue tags from its edges.

Remove the ‘Triplex’ windscreen C1 its sprue gate and remove any residual sprue tags from its edges.

Painting:

Airbrush with ‘Tamiya’ Gloss Black (X1) or similar.

Airbrush with ’Alclad’ Gunmetal (ALC120) or similar.

NOTE: *Dry brush by using a domed and soft brush, which has a very light dusting of paint. Dry off paint on the brush on an absorbent paper before dry brushing the part.*

Dry brush with ‘Mr. Colour’ Super Iron 2 (203) or similar.

Brush paint the handle with ‘Tamiya’ Hull Red (XF9) or similar.

Brush paint the rear handle grip with ‘AK Interactive’ Brown Leather (AK) or similar.

Brush paint the support frame of the windscreen with ’Tamiya’ Rubber Black (XF85) or similar.

Assembly:

Cement the windscreen into it locating slot on the machine gun, making sure it’s fitted angled rearwards.

Cement the empty rounds catch bag onto the right side of the machine gun.

Cement an ammunition drum onto its location on the top of the machine gun.

NOTE: *The photograph below shows the Lewis machine gun test fitted only.*
To prevent possible damage, the Lewis machine gun assembly will be fitted later in this build.

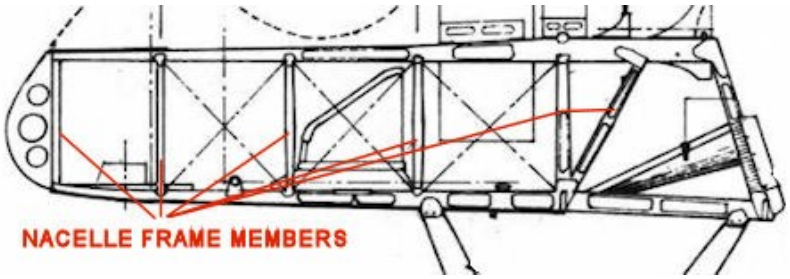
PART 11
NACELLE WEATHERING

PART 11 - NACELLE WEATHERING

Weathering:

To provide a good base for applying weathering, airbrush a semi-matte clear coat, such as 'Alclad' Light Sheen (ALC311) or similar over the nacelle assembly.

NOTE: *The nacelle side members usually stood out under the linen side covering.*



Using the above illustration as a guide, apply 1.0 mm wide masking tape strips up the sides of the nacelle.

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

Brush apply 'Flory Models' Clay washes over the nacelle outer surfaces and details. I chose to use the Dark Dirt wash.

NOTE: *Dry brush by using a domed and soft brush, which has a very light dusting of paint. Dry off paint on the brush on an absorbent paper before dry brushing the part.*

Once the wash has fully dried, remove the masking tapes.

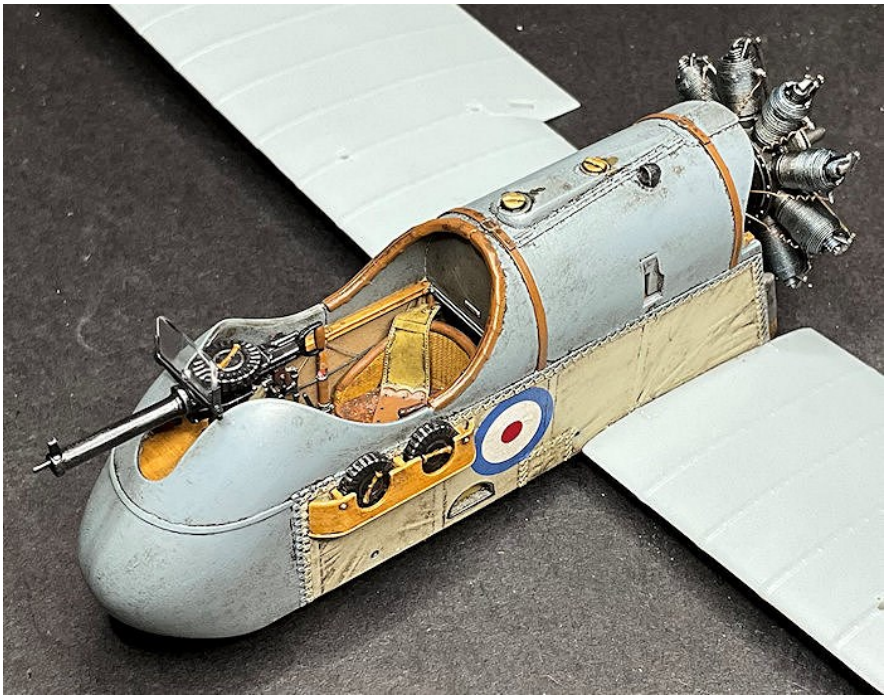
Remove the wash to achieve your desired weathered effects.

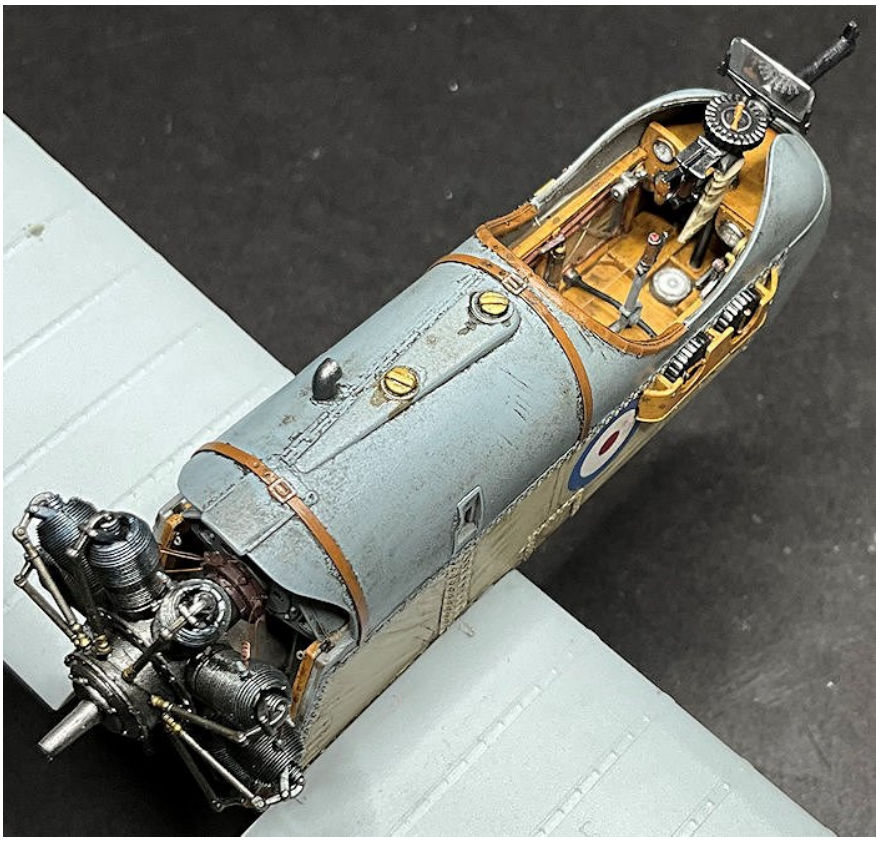
To seal and protect the applied weathering, airbrush a light coat of semi-matte clear coat, such as 'Alclad' Light Sheen (ALC311) or similar over the nacelle assembly.

Lightly dry brush the leading edges of the underside sliding panel and the leading edges of the air intake on the nacelle rear cover with 'Mr. Colour' Super Iron 2 (203) or similar.

Lightly brush 'AK Interactive' Kerosene (AK2039) around the fuel filler cap (front cap on nacelle rear cover).

Lightly brush 'AK Interactive' Engine Oil (AK2019) around the oil filler cap (rear cap on nacelle rear cover).





PART 12
CONSTRUCTION

PART 12 - CONSTRUCTION

References:
'Osprey aircraft of the aces 88' - Pusher Aces of World War One (Jon Guttman).
'Windsock' Data File No.48 - Airco DH.2 (B.J.Gray).
'Schiffer Military History Book' - British Aviation Squadron Markings WW1 (Les Rogers).
'Online' - Resources.

NOTE: *The particular aircraft being modelled is based on the **scheme B** on page 15 of the instruction manual. Some model parts supplied in the kit are generic. However, there are specific parts applicable to the different schemes. During construction, make sure the correct specific parts (**B**) are used, as indicated by the green coloured flags in the instruction manual. **Disregard any parts** flagged as being specific to schemes **A, C, D or E**.*

My sequence of assembly may not follow the kit instructions. The relevant instructions pages are noted as necessary.

Preparation:

Once the various required kit parts are removed from their gates, remove any residual gate tags from the edges of the parts.

Page 8 - Cut away the fuel tank locating stubs on the top surface (left side) and underside of the upper wing (not required).

Assembly:

Page 7 - Cement the lower wing fully into its locating recesses in the underside of the nacelle.

Page 9 - Cement the landing gear assembly (A20, A21 and B10) together.

Page 7 - Cement the control cable pulleys (D14 and D13) into their locating recesses in the rear, inboard interplane struts B2 (right) and B3 (left).

Modifications:

Gravity fuel tank:

NOTE: *The fuel pipe A63 supplied with the kit is molded solid. Therefore, I chose to replace the pipe with Brass tube.*

Page 8 - Cement the fuel tank parts A30, A31 and A39 together.

Cut away the top pipe from the pipe A63.

Cement the remaining pipe into its locating hole in the assembled fuel tank.

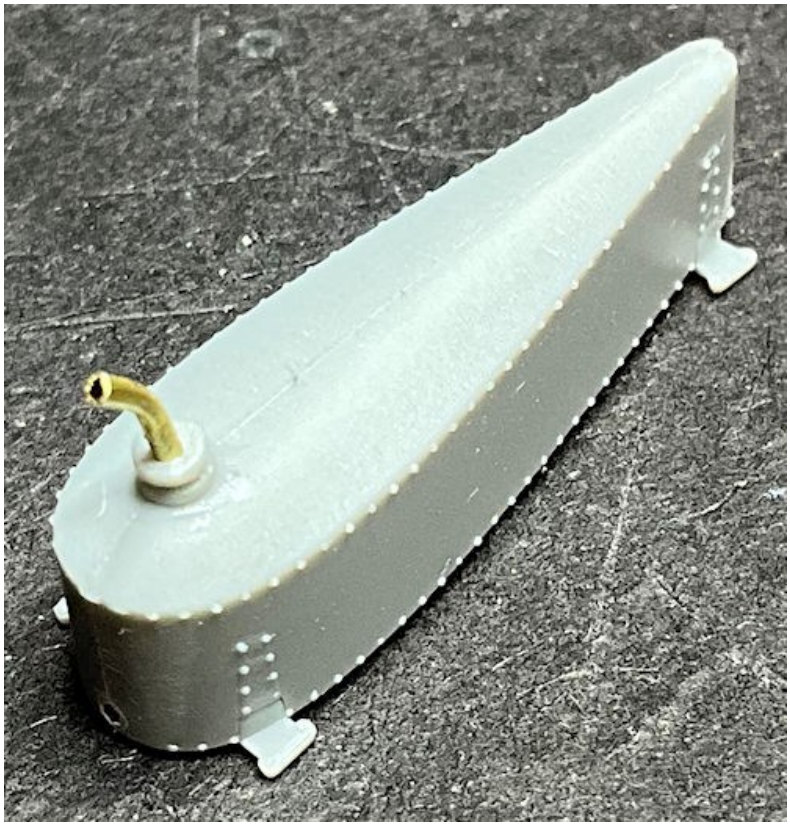
Drill a hole of 0.8 mm diameter centrally down into the fitted pipe.

Cut a length of 0.8 mm diameter Brass tube, such as 'Albion Alloy's' MBT02.

Bend one end to the same angle as the original kit pipe.

Trim the length of each end of the tube to match the original kit pipe.

Using thin CA adhesive, secure the tube into the pre-drilled hole, making sure the bent end faces forwards on the fuel tank.



Attaching ailerons and elevators:

NOTE: *The ailerons and elevators are intended to be just cemented onto the upper wing and tailplane hinge points. However, to create a more robust attachment I chose to add support rods to these parts.*

Cut away the centre stubs in each hinge recess on the leading edges of the four ailerons.

Cut away the hinge stubs on the leading edges of the two elevators.

NOTE: *Only the outer hinges on the ailerons will have rods fitted, as the centre hinge is too close to the locating recesses for the rear interplane struts.*

Point mark the centres of the two outer removed stubs on the ailerons and all three on the elevators.

Using the point marks as guides, drill a holes of 0.5 mm diameter centrally into the ailerons and 0.3 mm diameter in the elevators.

Point mark the centres of the aileron and elevator hinges on the trailing edges of the wings and tailplane.

Using the point marks as guides, drill a holes of 0.5 mm diameter centrally into the wings and 0.3 mm diameter in the tailplane.

Cut short lengths of 0.5 mm and 0.3 mm diameter Brass rod, such as ‘Albion Alloy’s’ MBT05 and MBT03. Cut the rods long enough to be fitted into the pre-drilled holes in the ailerons and elevators, with enough protruding to enable fitting into the pre-drilled holes in the wings and tailplane.

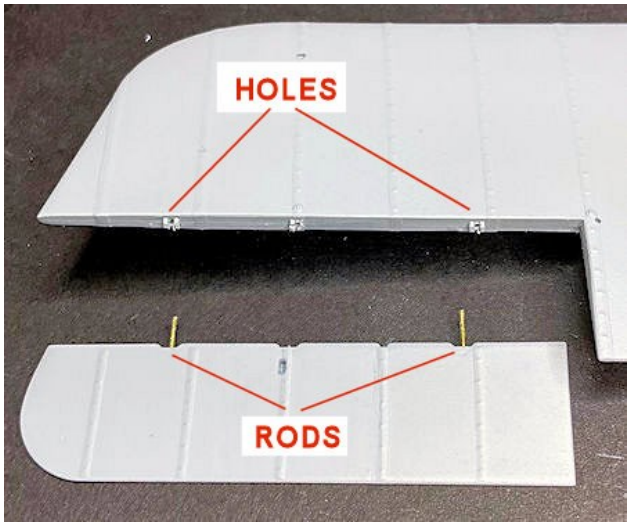
Remove the elevators from the tailplane.

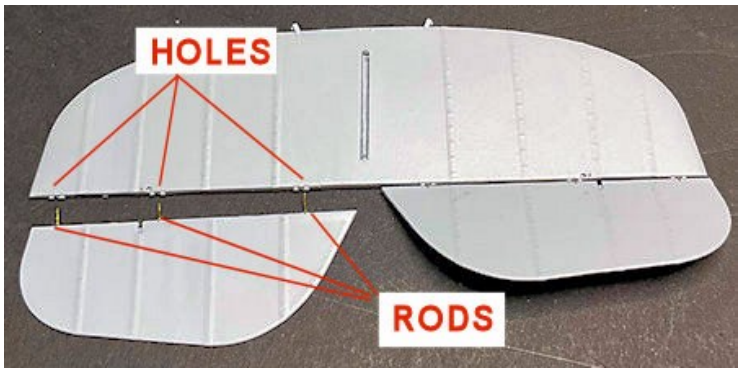
Using thin CA adhesive, secure the rods into each of the pre-drilled holes in the ailerons and elevators.

Fit the ailerons into the upper and lower wings, making sure they fully locate. If desired, bend the ailerons on one side of the wings slightly up and the opposite side down by the same amount.

Remove the ailerons from the wings.

Fit the elevators into the tailplane, making sure they fully locate. If desired, bend the elevators slightly down and by the same amount.





Painting:

Preparation:

Airbrush the following with a light grey primer, such as 'Tamiya' Fine Surface Primer (Grey) aerosol or similar.

Upper wing and ailerons
Lower wing
Tailplane
Elevators
Fin/rudder.

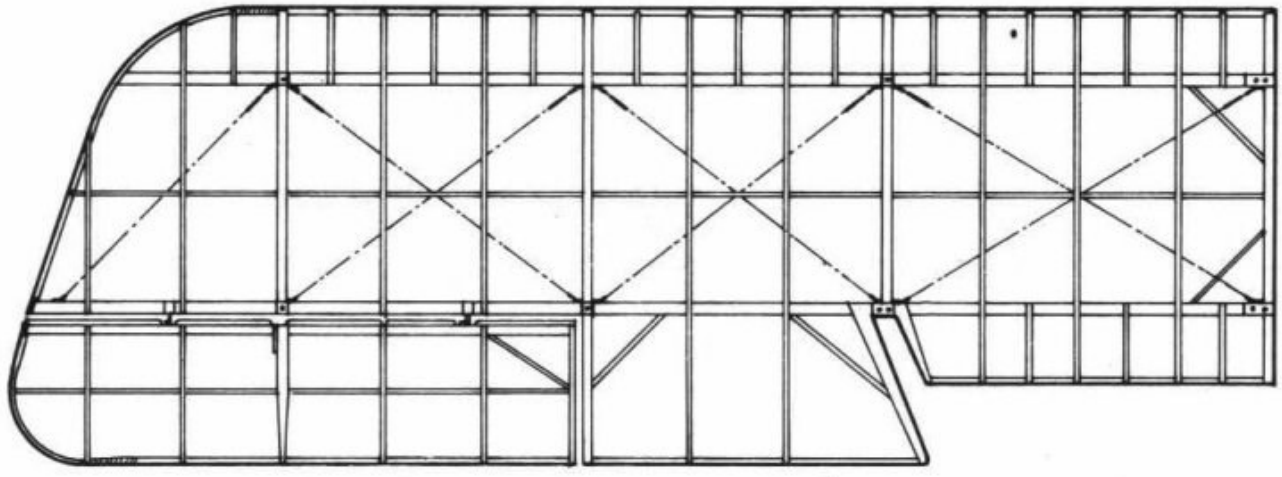
Internal structure:

NOTE: *The internal structure of the wings and ailerons, tailplane and elevator, fin and rudder would have been visible through the linen covering on aircraft that were just doped with Clear Doped Linen (CDL). However, if the upper surfaces, as in this case, were colour doped, the light penetration from above would have been reduced. Therefore, from the undersides, the internal structure would not have been so prominent as with the wings only clear doped.*

Wings and ailerons:

NOTE: *The internal structure of the upper and lower wings and ailerons was identical and consisted of:*

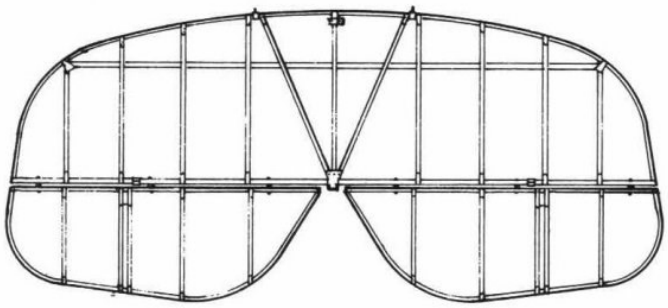
Forward spar, Rear spar, Primary wing ribs, Secondary leading and trailing edge ribs, Corner bracing members, Crossed bracing wires.



Tailplane and elevator:

NOTE: *The internal structure of the tailplane and elevator consisted of:*

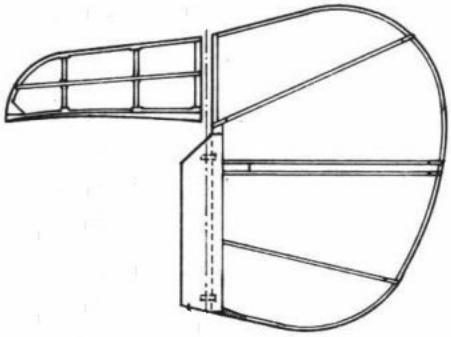
Forward spar, Rear spar,
Primary ribs, Centre bracing members.



Rudder and fin:

NOTE: *The internal structure of the rudder and fin consisted of:*

Fin centre spar, Fin vertical members,
Rudder radial members.



Underside of wings:

NOTE: *The following steps are intended to create a faded effect of the wings internal structures. Before applying paint to the model parts, it's best to test the effects with decal also applied.*

Effects test:

Using a piece of plastic card, airbrush the card with a light grey primer, such as 'Tamiya' Fine Surface Primer (Grey) aerosol or similar.

Airbrush with 'MRP' acrylic lacquer Dark Wood (MRP-262).

Cut thin strips of masking tape and apply onto the Dark Wood paint.

Airbrush light coats of 'MRP' acrylic lacquer Clear Doped Linen (MRP-256) over the card until the exposed dark wood colour is covered.

Remove the masking strips.

Airbrush successive light coats of 'MRP' acrylic lacquer Clear Doped Linen (MRP-256) over the card until the exposed dark wood internal structures **starts to be faded back** (not covered).

Cut a piece of the 'Aviattic' clear backed Clear Doped Linen 'bleached' (ATT32044) decal and apply it over the painted card.

Check the effect of the faded internal structure under the decal. If necessary, remove the decal, airbrush Clear Doped Linen (MRP-256) as required until under decal, the desired effect is achieved.

Painting:

Mask of the underside of the lower wing from the edges of the centre section.

Airbrush ‘Tamiya’ Light Grey (XF66) or similar over the centre section.

Remove the masking.

Mask of the painted underside centre section of the lower wing.

Airbrush ‘MRP’ acrylic lacquer Dark Wood (MRP-262) over the undersides of the following:

Upper wing
Lower wings.
Ailerons
Tailplane
Elevators.

Using the previous illustrations as a guide, cut strips of masking tape to create the internal structures on the undersides of the parts.

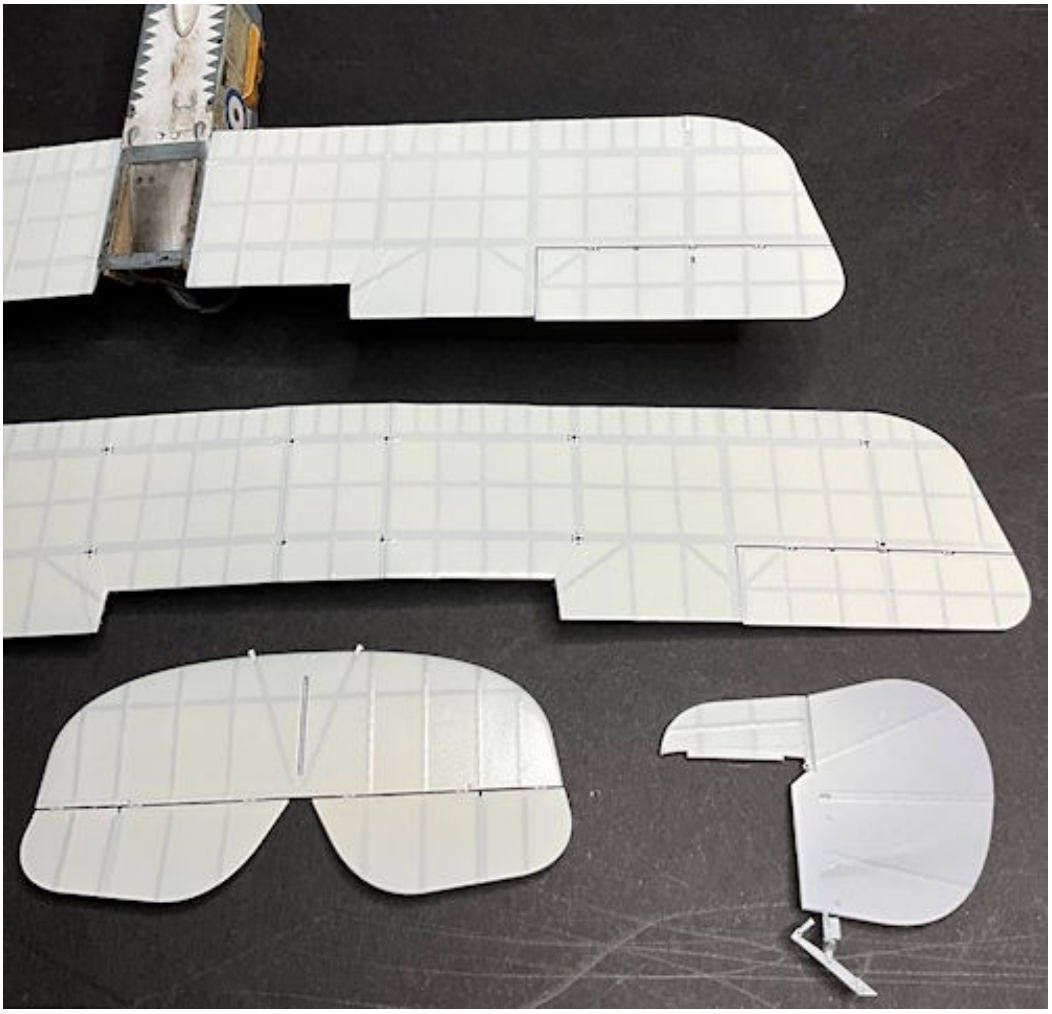
Airbrush light coats of ‘MRP’ acrylic lacquer Clear Doped Linen (MRP-256) over the undersides of the parts, until the exposed Dark Wood colour is covered.

Remove the masking strips.

If necessary, lightly sand over the exposed Dark Wood internal structures to remove any slight spray edges.

Airbrush successive light coats of ‘MRP’ acrylic lacquer Clear Doped Linen (MRP-256) over the painted surfaces until the Dark Wood internal structures are faded back (not covered) to the desired level.

Remove the masking from the underside centre section of the lower wing.



Check the painted surfaces for any imperfections (dust, hair etc) and if necessary, lightly sand to remove.

Decals:

General:

NOTES: *The decals used are the 'Aviattic' 'Aviattic' White backed PC10 'light' (ATT32080) and the Clear backed Clear Doped Linen 'bleached (ATT32044). Refer to Part 4 (Decals) of this build log for more information.*

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

Make sure the model surface for each decal to be applied is clean and smooth or particles on the surface may cause 'silvering' (trapped air) under the decals when dry.

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

Example of applying 'Aviattic' decals:

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

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

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

Carefully cut out the decal shape.

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

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

Wet the model surface with clean water.

Soak the decal in the warm decal water long enough to be able to move the decal on its backing sheet.

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

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

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

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

NOTES: *If the decal covers locating holes, slots or other openings, prick through the decal over holes or slice the decal over openings, then brush either 'MicroScale' MicroSol' or* ***sparingly*** *'Tamiya' X20A thinners into the holes or around the openings. This will soften and conform the decal.*

If the decal needs to be conformed around curved edges etc, brush ***sparingly*** *'Tamiya' X20A thinners across the decal edge. This will soften and conform the decal.*

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

Application ‘Aviattic’ decals:

Using the previous example, cut and apply CDL decals to the **undersides** of the parts as follows:

Underside surfaces of the upper wing, lower wings, ailerons, tailplane, elevators and both sides of the fin. For the upper wing, cut two outer sections and the centre section as separate decals, as this makes them easier to apply the decals, rather than one large decal.

Using the previous example, cut and apply the PC10 decals to the top surfaces of the parts as follows:

Top surfaces of the upper wing, lower wings, ailerons, tailplane and elevators. For the upper wing, cut two outer sections and the centre section as separate decals, as this makes them easier to apply the decals, rather than one large decal.

Application ‘kit’ decals:

NOTE: *Use the colour profile B on page 15 of the kit instructions for placement of the kit supplied decals.*

Upper wing - decals 1, 2, 3 and 4.

Underside lower wings - decals 5, 6, 7 and 8. Decals 45 at leading edge (refer to profile E on page 19 of the kit instructions).

Rudder - decals 13 and 14.

Fin and rudder - decals 45 and 47 (refer to profile E on page 19 of the kit instructions).

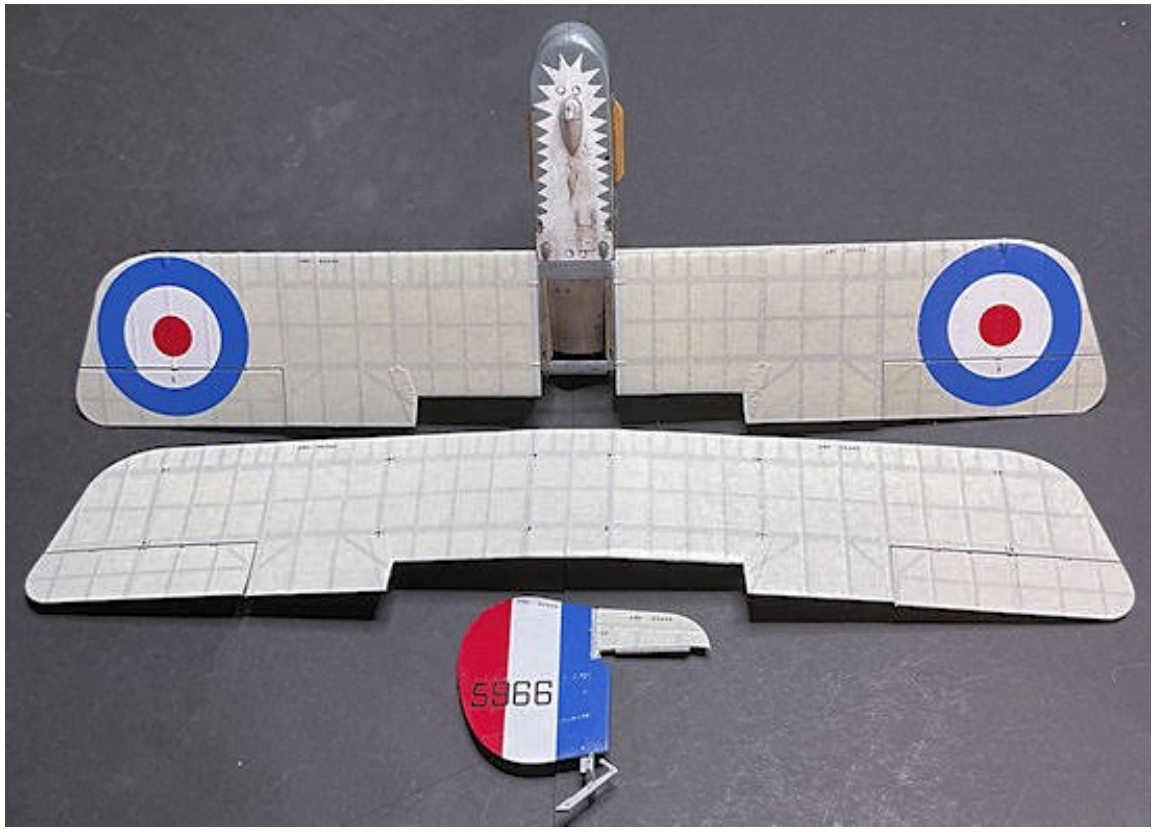
Left side of nacelle - decal 46 (refer to profile E on page 19 of the kit instructions).

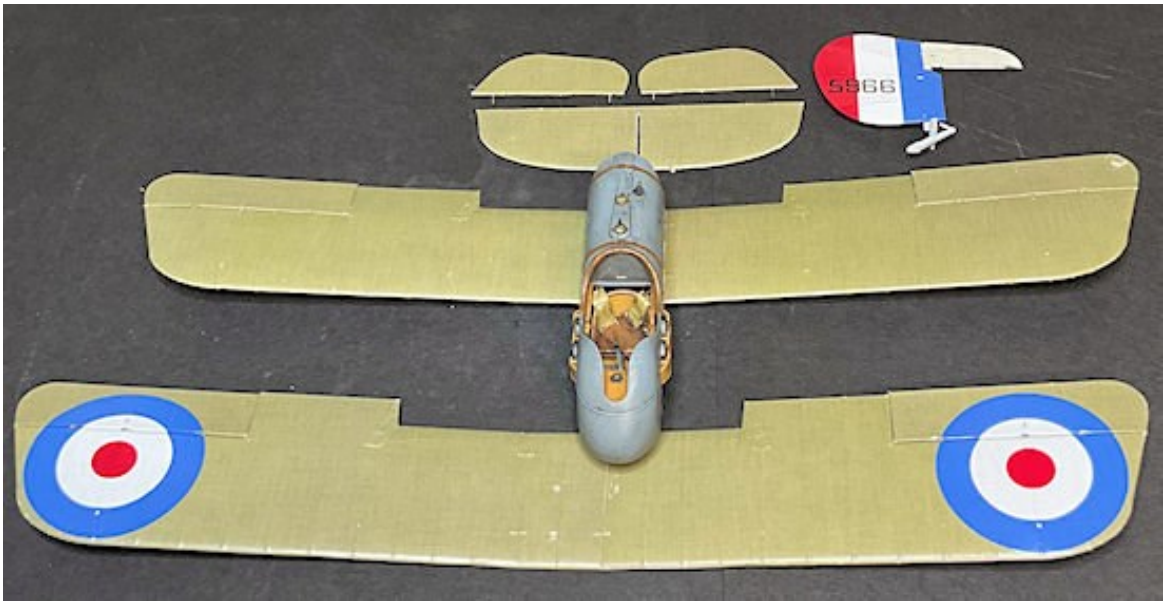
Underside of tailplane and elevator - decals 45 (refer to profile E on page 19 of the kit instructions).

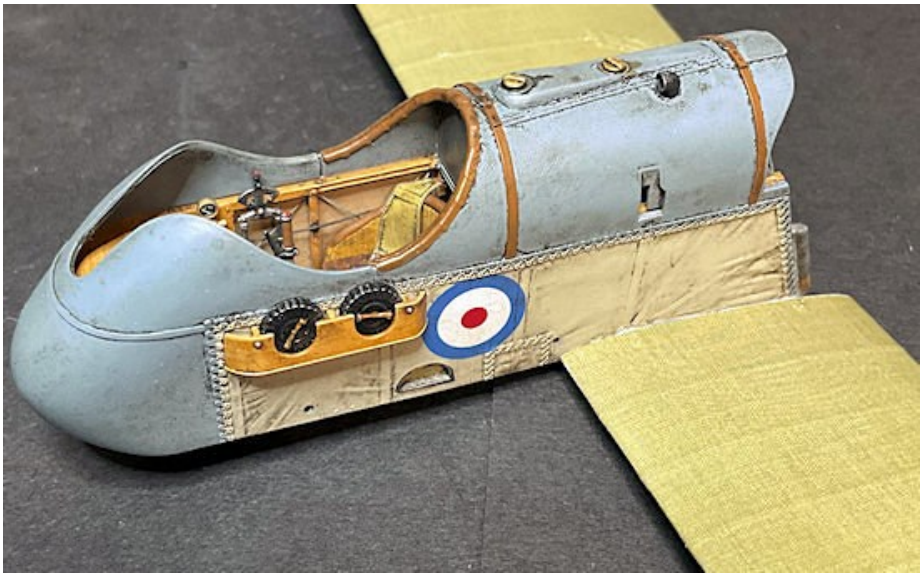
Rudder serial 5966 - not in the kit decals, made from ‘Xtradecal’ RAF numbers/letters (32021).

NOTE: *The following step is to seal and protect, from subsequent handling, the applied decals.*

To seal and protect from subsequent handling the applied decals, airbrush them with a semi-matte clear coat, such as ‘Alclad’ Light Sheen (ALC311) or similar.







Painting (continued):

Airbrush the following with a grey primer, such as 'Tamiya' Fine Surface Primer (Grey) aerosol or similar.

Landing gear assembly
Interplane struts (D1 x4, B2, B16, B3, B17)
Cabane struts (B11, B12, B13, B14)
Tail booms (A15 and A22)
Boom cross strut A57
Wheels (D9)
Gravity fuel tank assembly (for upper wing).

Airbrush the following with 'Tamiya' Light Grey (XF66) or similar:

Landing gear assembly
Interplane struts (B2, B16, B3, B17)
Cabane struts (B11, B12, B13, B14)
Tail booms (A15 and A22)
Boom cross strut A57
Wheels (D9)
Gravity fuel tank assembly (for upper wing).

Airbrush the wheel outer covers (D10) with a white primer, such as 'Tamiya' Fine Surface Primer (White) aerosol or similar.

Detail painting:

Tail skid:

Brush paint the wood tailskid with 'Tamiya' Dark Yellow (XF60) or similar

NOTE: *Refer to Part 2 (Wood Effects) of this build log - Method 2.*

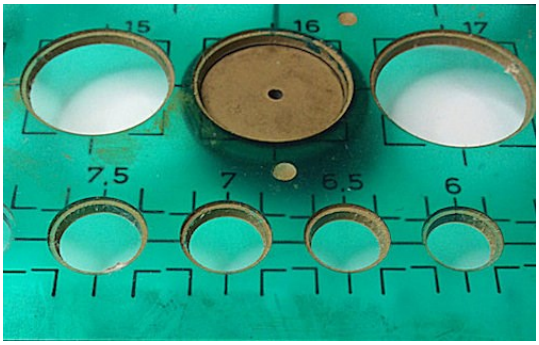
Create a wood effect by brushing 'Windsor & Newton' Griffin Alkyd paint (Raw Sienna) over the tailskid.

Brush paint the tail skid post and shoe with 'Tamiya' Semi-Gloss Black (X18) or similar:

Brush paint the tail skid support block with 'Tamiya' Light Grey (XF66) or similar.

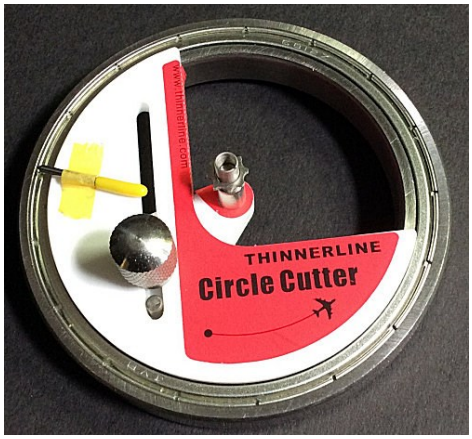
Wheels:

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



Airbrush light coats of 'MRP' acrylic lacquer Clear Doped Linen (MRP-256) or similar over the exposed inboard face of the wheels.

NOTE: *The outer covers for the wheels (A10) were painted with six equally spaced segments, alternating between white and blue (three of each). To create the segments I used masks and to cut circles, I used a 'Thinnerline' circle cutter.*



Using suitable masking tape or film, cut a circular mask of 18 mm diameter.

Using a compass or dividers around the edge of the mask, mark the mask to divide it into six equally spaced segments.

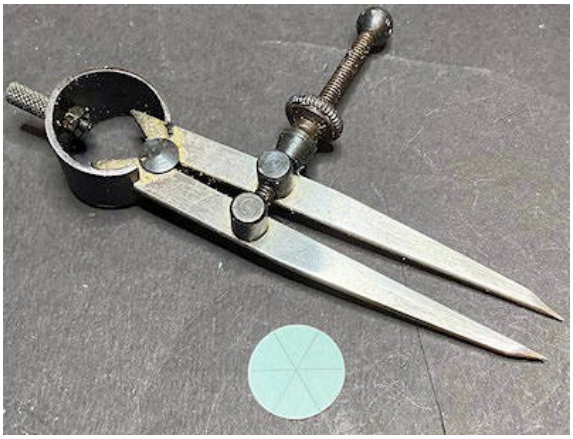
Using a pencil and the marks around the edge of the mask as guides, draw across the mask to join opposite marks.

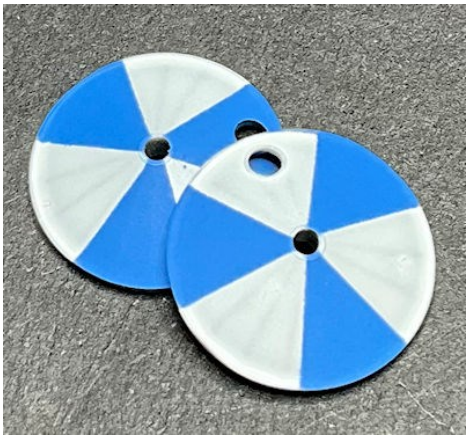
Cut across the pencil lines to separate the mask into six segments.

Apply three mask segments onto each outer cover, making sure the segments are equally spaced.

Airbrush the three exposed segments of each outer cover with a mix of ‘Tamiya’ Flat Blue (XF8) and White (XF2) or similar, to a ratio of 70/30%.

Remove the three masks from both outer covers.





Wings:

Either cut away the decal covering the tail boom cover plates on the trailing edge (top and underside) of the upper and lower wings OR mask around them.

Brush paint the wings top surface cover plates with ‘Tamiya’ Olive Drab (XF62) and White (XF2) to approximate the PC10 decal colour.

Brush paint the wings underside cover plates with ‘Tamiya’ Light Grey (XF66) or similar.

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

Wing attachment plates (top and underside)

Interplane strut mounting plates on the upper and lower wings.

Tail booms:

Brush paint the strut attachment fittings on the tail booms with ‘Tamiya’ Semi-Gloss Black (X18) or similar.

Landing gear:

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

Brush paint the ‘bungee’ suspension cords with ‘Tamiya’ Buff (XF57) or similar.

Outer interplane struts:

Airbrush the interplane struts (D1x4) with a mix of ‘Tamiya’ Flat Blue (XF8) and White (XF2) or similar, to a ratio of 70/30%.

NOTE: *The kit supplied decals can be used. I chose to paint the white segments.*

Refer to page 15 of the kit instructions and mask off the blue sections (red in the instructions) of the struts.

Airbrush the exposed sections of the struts with ‘Tamiya’ White (XF2) with a small amount of Buff (XF57) to ’knock back’ the white.

Remove the masking from the four struts.

Decals (continued):

Airbrush the following with a gloss clear coat, such as ‘Mig’ A-Stand Aqua Gloss (A.Mig-2503) or similar:

Interplane struts (B2, B16, B3, B17)

Cabane struts (B11, B12, B13, B14)

Vertical struts on tail booms (A15 and A22)

Wheels.

NOTE: *Refer to page 15 of the kit instructions for placement of decals. Decals 27 and 28 not used.*

Apply kit decals 44 centrally on both sides of:

Interplane struts (B2, B16, B3, B17)
Cabane struts (B11, B12, B13, B14)
Vertical struts on tail booms (A15 and A22).

Cut two discs of the 'Aviattic' clear backed Clear Doped Linen 'bleached' (ATT32044) and apply to the inboard faces of the two wheels.

Apply the kit decals 16 around the raised lettering of the tyres (both sides).

Weathering:

To provide a good base for applying weathering, airbrush a semi-matte clear coat, such as 'Alclad' Light Sheen (ALC311) or for more 'grip and effect Flat (ALC314):

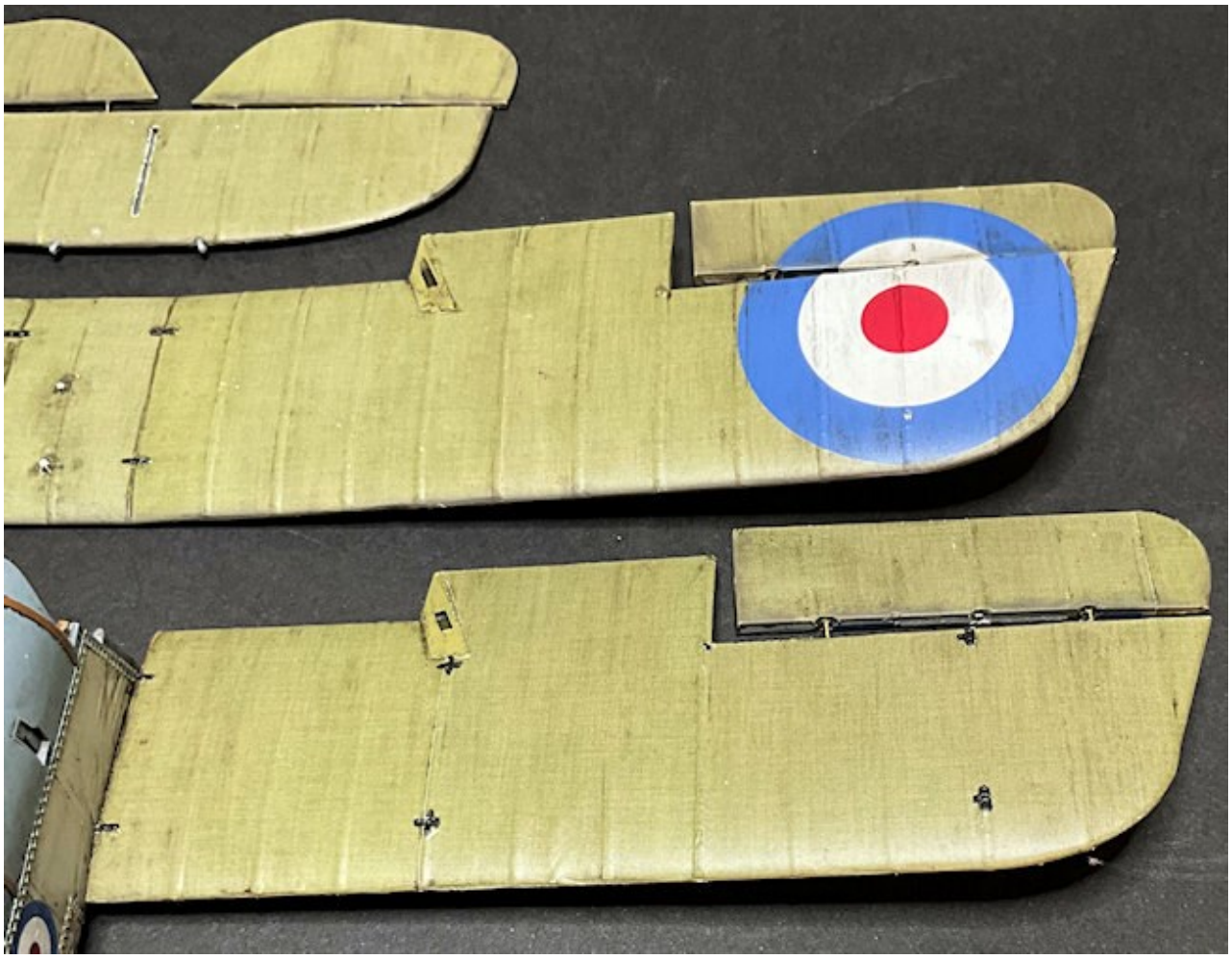
Upper and lower wings
Tailplane
Ailerons
Elevators
Landing gear
Wheels
Interplane struts
Cabane struts.

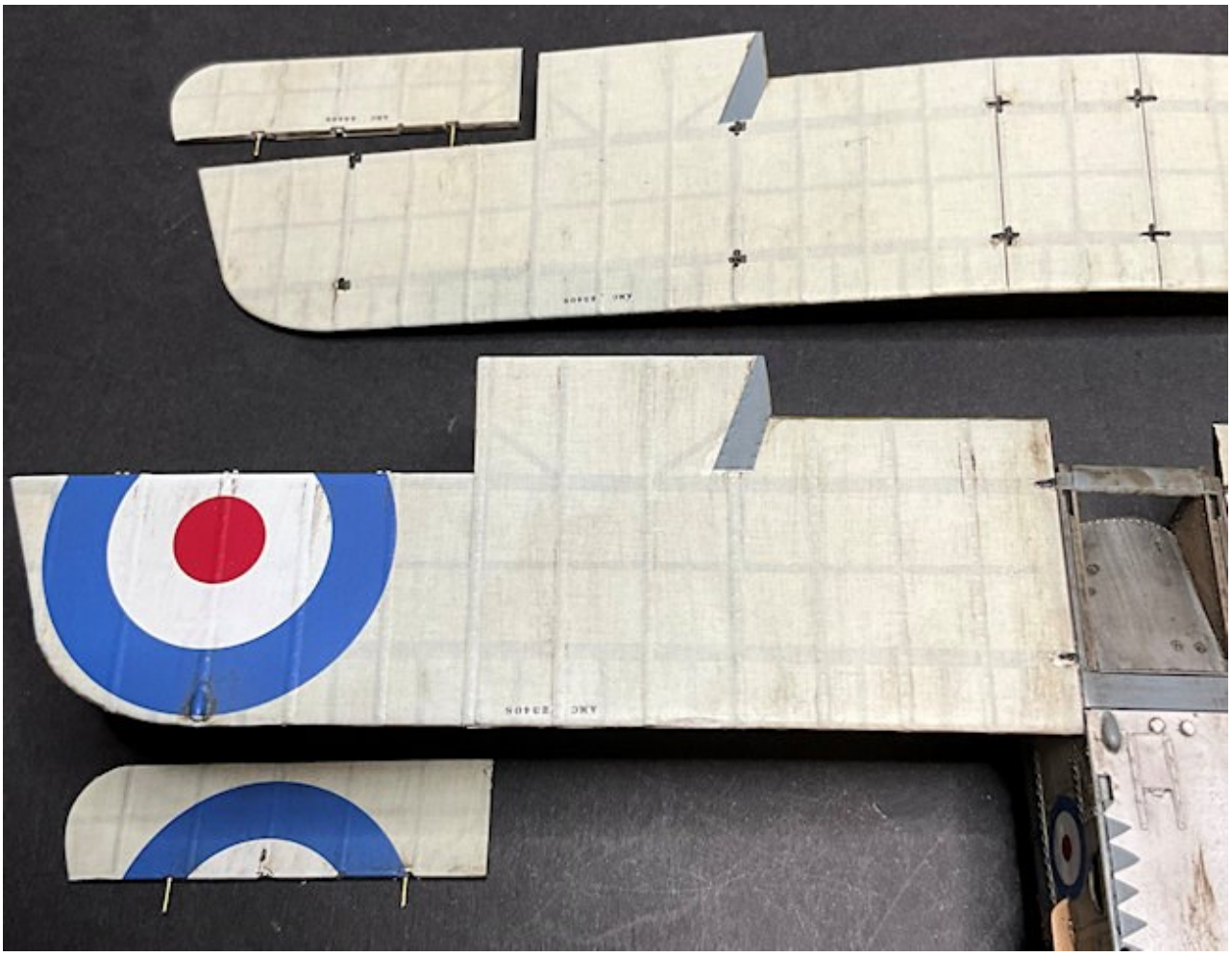
NOTE: *Refer to Part 3 (Weathering) of this build log for more information.*

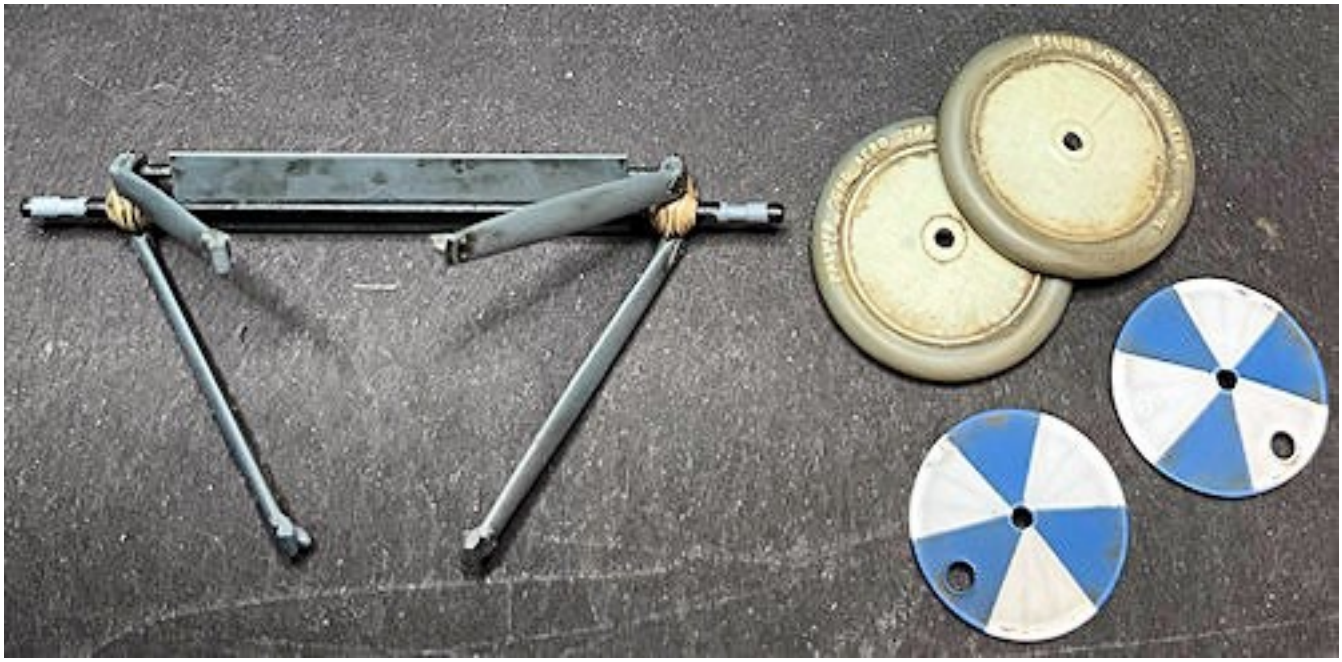
Brush apply 'Flory Models' Clay washes to achieve your desired weathered effects. I chose to use the Dark Dirt wash on the top surfaces and Grime on the underside surfaces.

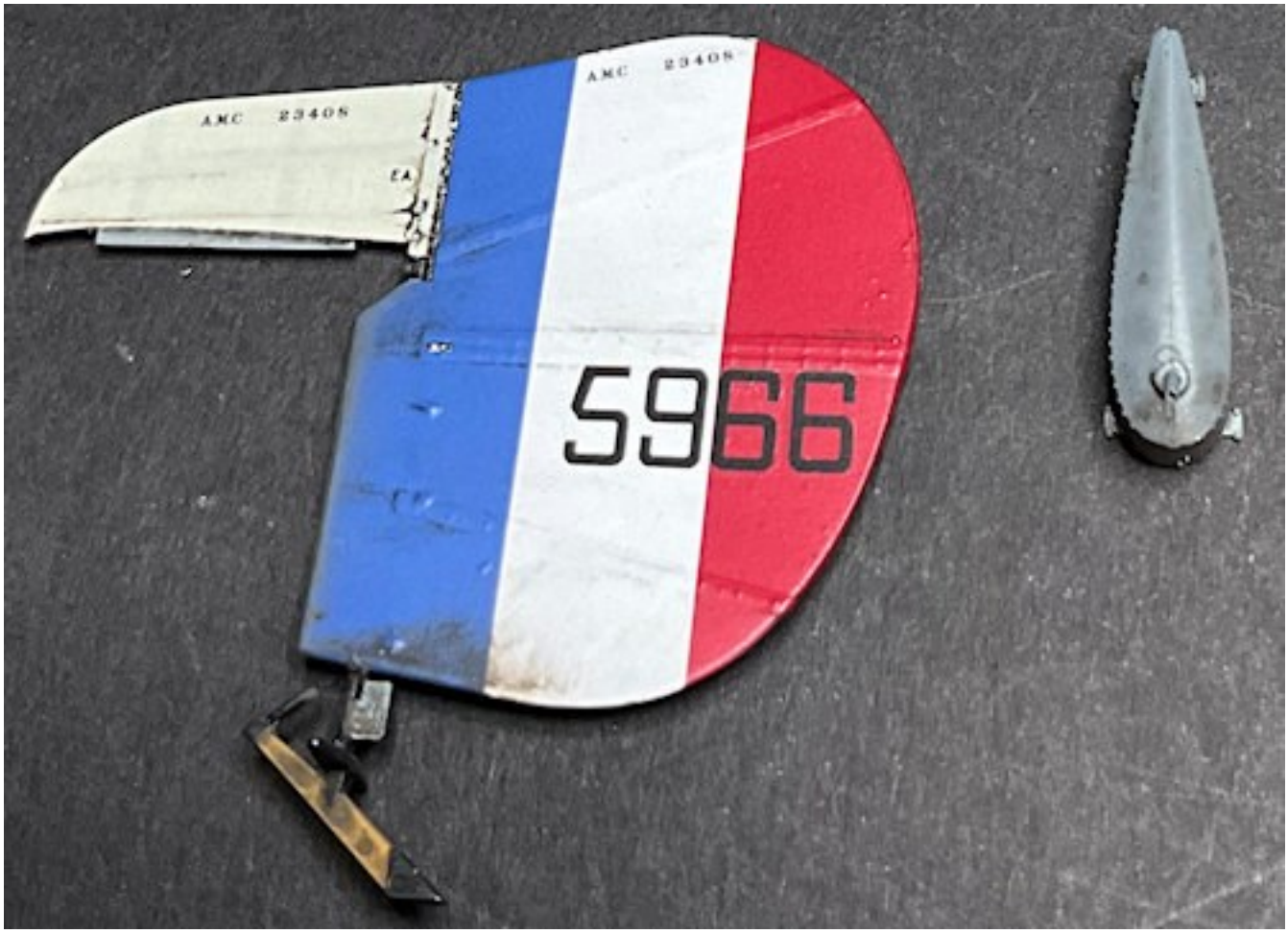
Lightly sponge 'Tamiya' Weathering Master set A (Mud) around the tyres of the wheels.

Lightly sponge 'Tamiya' Weathering Master set D (Oil Stain) along leading edges of flight surfaces.









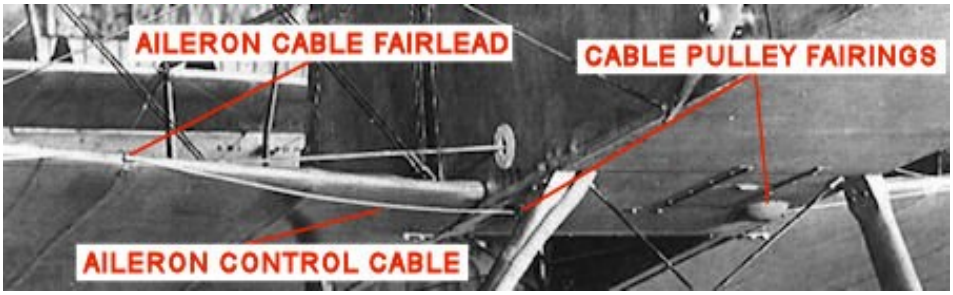
NOTE: *The following step is to seal and protect, from subsequent handling, the applied weathering.*

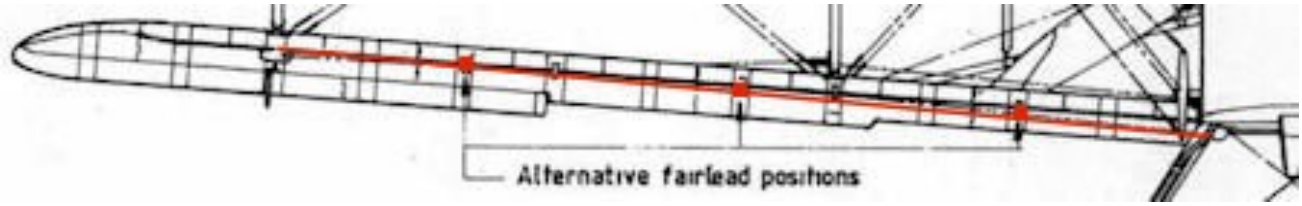
To seal and protect from subsequent handling the applied weathering, airbrush the weathered surfaces (not the wheels) with a semi-matte clear coat, such as ‘Alclad’ Light Sheen (ALC311) or similar.

Modifications (continued):

Aileron fairleads lower wing:

NOTE: *The aileron control cables exited the nacelle from their pulley fairings and were retained at the leading edge of each lower wing by either two or three cable fairleads, before being turned rearwards around the outer pulleys. I chose to fit three fairleads to both lower wings after the wing decals were applied.*





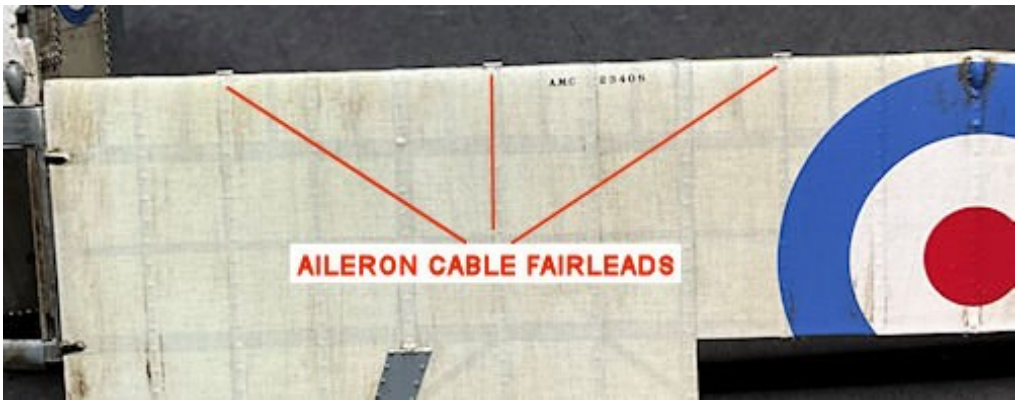
Cut six short lengths of 0.4 mm diameter Nickel-Silver tube, such as 'Albion Alloy's' NST04 or similar.

Run a 0.2 mm diameter drill through the tubes to remove any burring from the internal bores.

Carefully scrap away the wing decal at the three fairlead location on the leading edge of both lower wings.

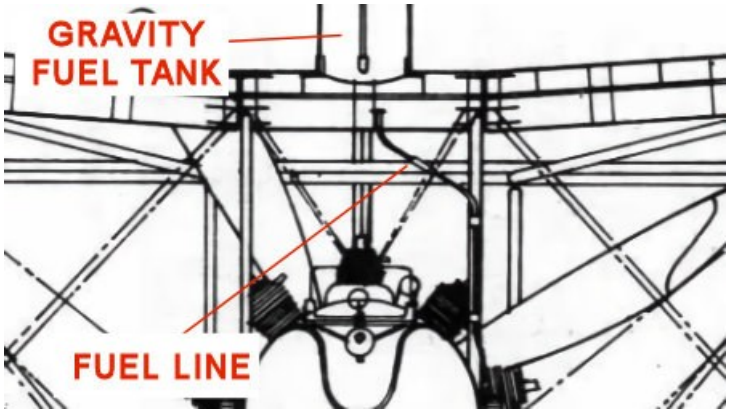
NOTE: *In the following step, make sure no adhesive gets into the bore of the tubes.*

Using thin CA adhesive, secure a tube to each of the locations on the leading edges of both wings.



Gravity fuel tank line:

NOTE: *The fuel line from the upper wing gravity tank is not supplied in the kit, so needs to be created.*



Temporarily locate the gravity fuel tank onto its locating stubs on the upper wing.

Point mark the underside of the upper wing under the front, right of the fuel tank.

Using the point mark as a guide, drill a hole of 0.8 mm diameter into, **but not through**, the underside of the upper wing.

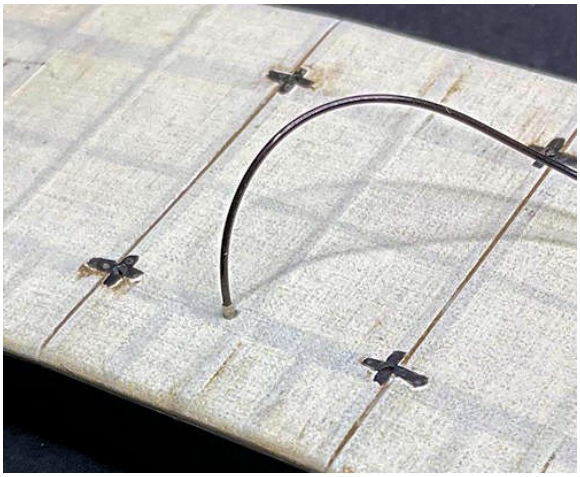
Cut a short length of 0.7 mm diameter Nickel-Silver tube, such as 'Albion Alloy's' NST07 or similar.

Using thin CA adhesive, secure the tube into the pre-drilled hole in the upper wing.

If necessary run a 0.5 mm diameter drill into the tube to clear any adhesive.

NOTE: *The 'MFH' flexible tube will be finally fitted later in the build.*

Cut a long length of 'MFH' 0.4 mm diameter flexible black tube (P-961) and check it fully locates into the tube.



Painting (continued):

Airbrush the following control horns with a grey primer, such as 'Tamiya' Fine Surface Primer (Grey) aerosol or similar:

Lower ailerons D6 x 2
Upper aileron D12 x 2
Rudder D16 x 2
Elevators D7 x 2.

Airbrush the control horns with 'Tamiya' Wooden Deck Tan (XF78) or similar.

Airbrush the rubber aileron control runs on D12 with 'Tamiya' Rubber Black (XF85) or similar.

Rigging preparation:

NOTE: *Refer to Part 6 (Rigging) for more information. Before continuing further with the build, it's best to prepare the rigging points.*

Control horns:

Drill a hole of 0.2 mm diameter through the ends of the following control horns:

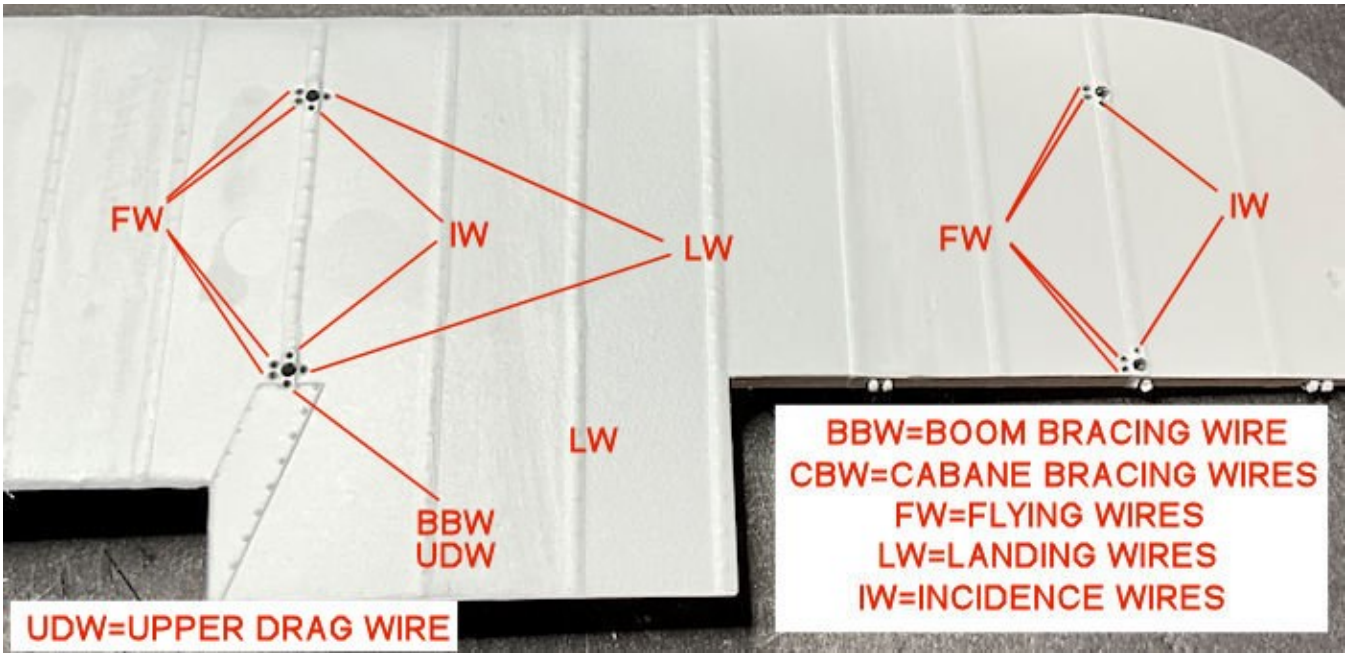
Lower ailerons D6 x 2
Rudder D16 x 2
Elevators D7 x 2
Tail skid (bottom of rudder post).

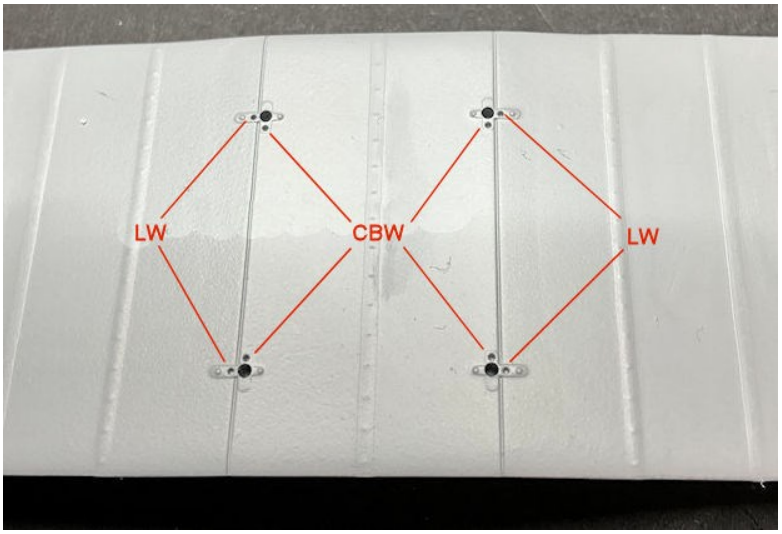
Aileron pulleys:

Drill a hole of 0.2 mm diameter through the strut side of the aileron control pulleys D14, fitted on the out-board top of the rear inboard interplane struts.

Upper wing underside:

NOTE: *The following photographs are of the underside of the upper wing, showing the pre-molded rigging points around the strut locations.*





NOTE: *The Anchor Points used are the metal versions of the 'GasPatch Elite Accessories' Anchor Points (1/48 scale). Each are snapped at the centre to create two Anchor Points.*

Prepare approximately **fifty** 'Gaspatch' 1/48th scale metal Anchor Points. Check that the 'eye' ends are clear of metal.

At each of the pre-molded rigging points on the underside of the upper wing, drill into **but not through** the wing, using a 0.3 mm diameter drill.

Using thin CA adhesive, secure the 'leg' of an Anchor Point into each of the pre-drilled holes in the underside of the upper wing. Make sure the Anchor Points will not obstruct the struts when fitted.

Once secured in position and if necessary, run a 0.2 mm diameter drill through the 'eye' of any Anchor Points contaminated with adhesive.

Upper wing top surface:

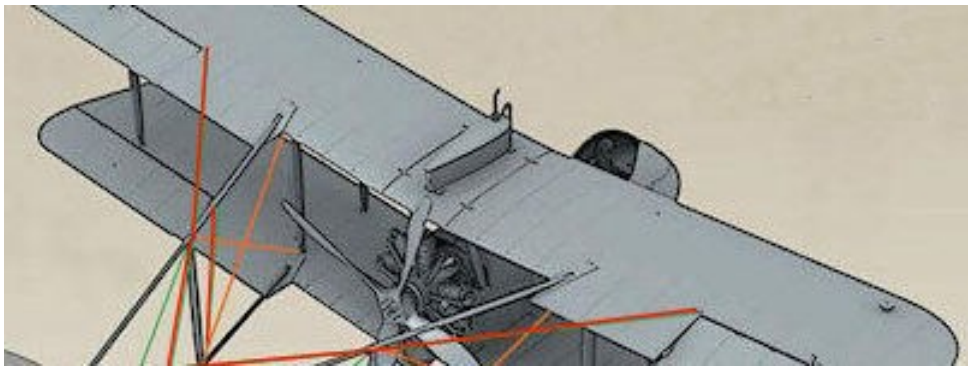
NOTE: *The boom bracing wires will be fitted later in the build.*

Prepare 'Gaspatch' anchor points as required.

At the pre-molded rigging point on the corner of the upper wing ailerons on the top surface of the upper wing, drill into **but not through** the wing, using a 0.3 mm diameter drill.

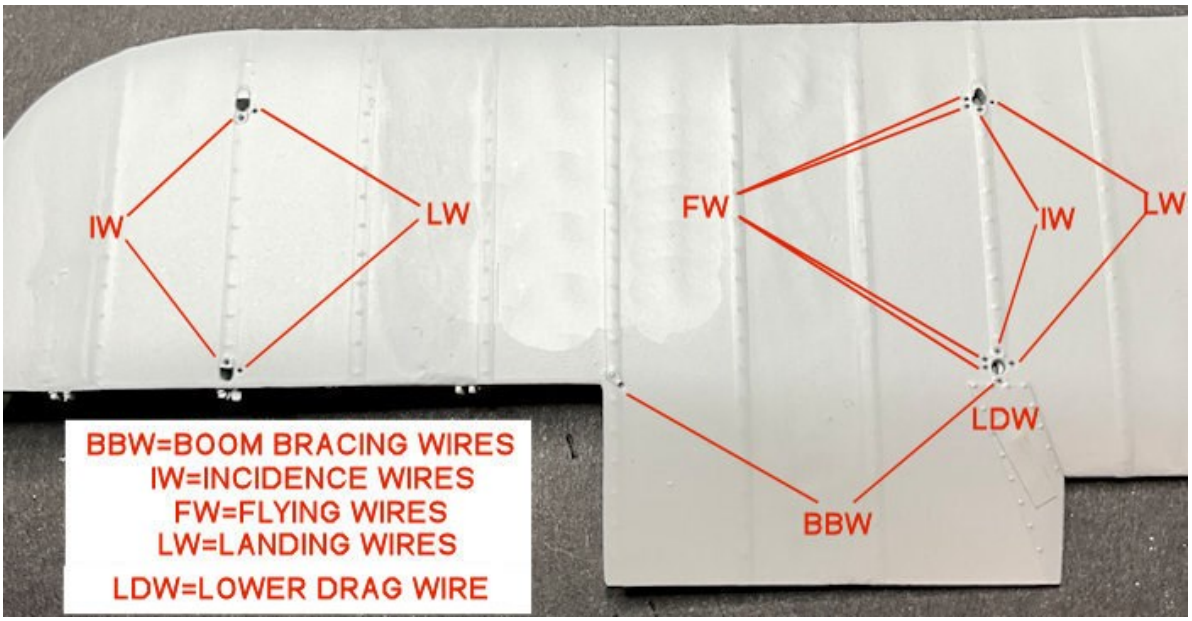
Using thin CA adhesive, secure the 'leg' of an Anchor Point into both pre-drilled holes.

Once secured in position run a 0.2 mm diameter drill through the 'eye' of the Anchor Points to clear any contamination from adhesive.



Lower wings top surface:

NOTE: *The following photographs are of the top surface of the lower wings, showing the pre-molded rigging points around the strut locations.*



Temporarily fit the interplane struts into their locating holes in the lower wings.

NOTE: *During the following step, make sure the holes are drilled at the approximate angles to align with the opposite end location for the particular line. Temporarily fitting the interplane and cabane struts will help approximate the angles required.*

Use as guides the pre-molded locations and drill holes of 0.3 mm diameter into, **but not through,** the lower wings.

NOTE: *The following steps are for routing the lower boom bracing and lower drag wires later in the build.*

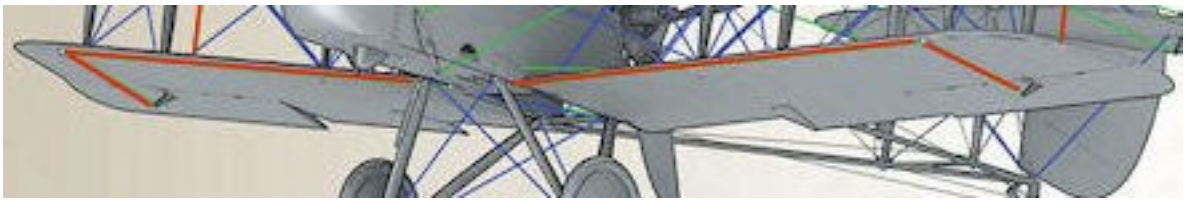
Prepare four ‘Gaspatch’ anchor points.

Using thin CA adhesive, secure the ’leg’ of an Anchor Points into the **BBW** and **LDW** pre-drilled holes. Make sure the Anchor Points will not obstruct the struts when fitted.

Once secured in position run a 0.2 mm diameter drill through the ’eye’ of the Anchor Points if they are contaminated with adhesive.

Lower wings underside:

NOTE: *The following steps are for routing the aileron control cables later in the build.*

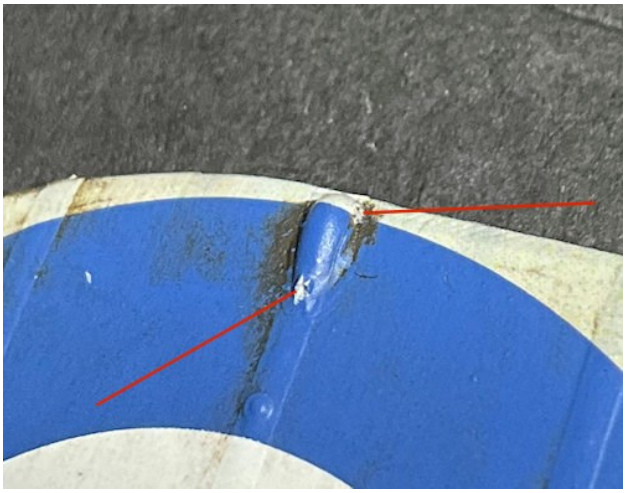


Point mark the centre rear of the aileron pulley fairing on the underside of both lower wings.

Using the point marks as guides, drill holes of 0.2 mm diameter into, **but not through**, the pulley fairing.

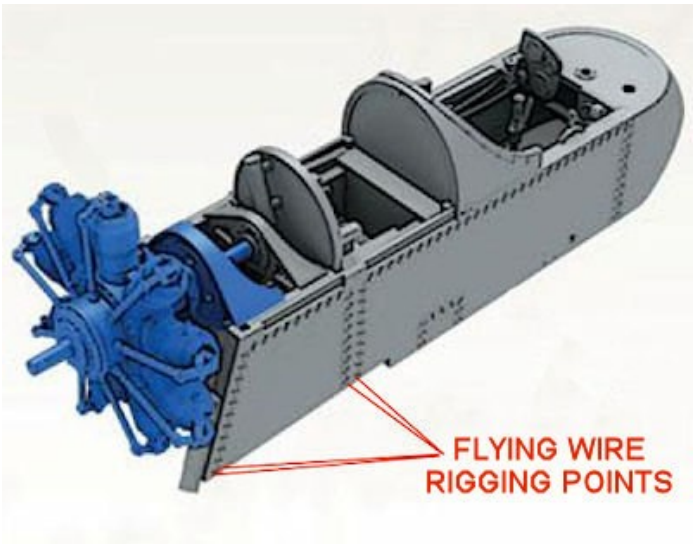
Point mark the inboard front the aileron pulley fairing on the underside of both lower wings.

Using the point marks as guides, drill holes of 0.2 mm diameter into, **but not through**, the pulley fairing.

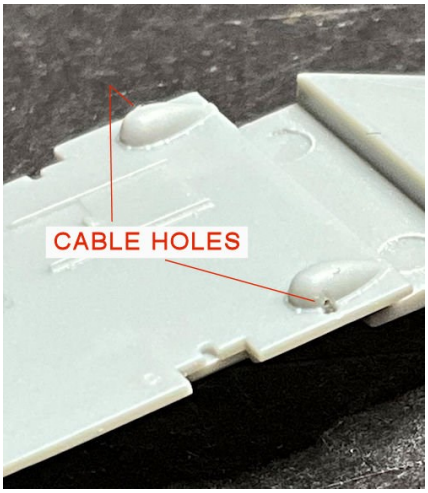


Nacelle:

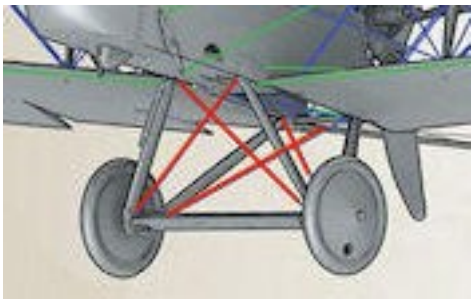
To clear any paint, run a drill of 0.3 mm diameter through the pre-drilled flying wire holes in the nacelle.



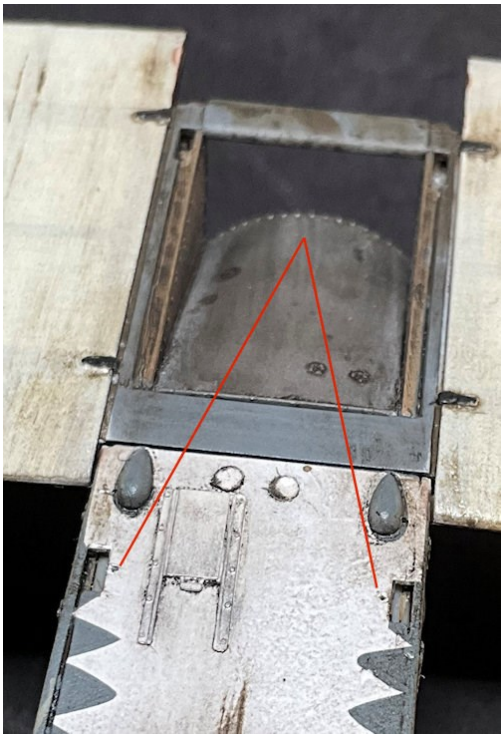
To clear any paint, run a drill of 0.3 mm diameter through the pre-drilled aileron cable holes in the underside of the nacelle.



NOTE: *The following steps are for rigging the cross bracing wires on the landing gear later in the build.*



Drill a hole of 0.3 mm diameter into the underside of the nacelle, inboard from the locating recesses for the landing gear front struts.



Prepare two ‘Gaspatch’ Anchor Points.

Using thin CA adhesive, secure the ’leg’ of an Anchor Point into each of the pre-drilled holes in the underside of the nacelle.

Once secured in position run a 0.2 mm diameter drill through the ’eye’ of the Anchor Points if they are contaminated with adhesive.

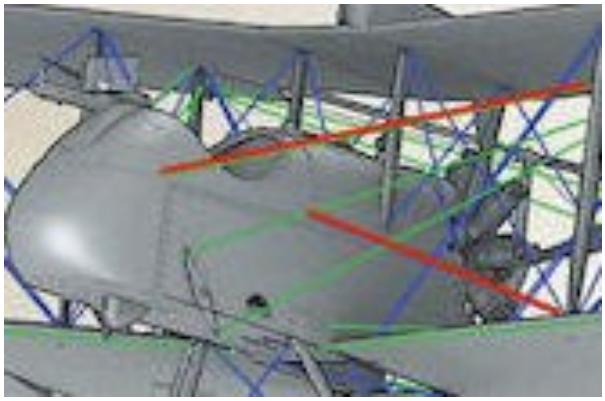
NOTE: *The following steps are for fitting the combined upper and lower drag and boom bracing wires later in the build.*

Refer to the following illustration and drill two holes of 0.3 mm diameter through both sides of the nacelle.

Prepare four ‘Gaspatch’ anchor points.

Using thin CA adhesive, secure the ’leg’ of an Anchor Point into each of the pre-drilled holes.

Once secured in position run a 0.2 mm diameter drill through the ’eye’ of the Anchor Points if they are contaminated with adhesive.



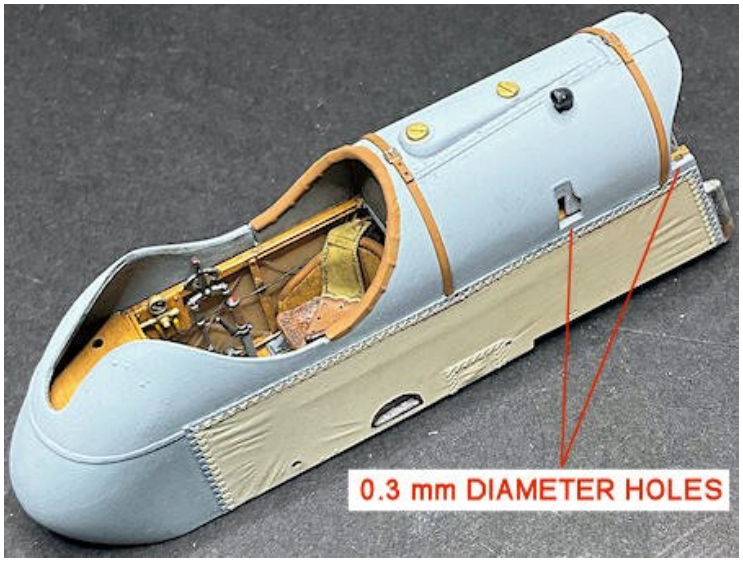
NOTE: *The following steps are for fitting the cabane strut bracing wires later in the build.*

Refer to the following illustration and drill two holes of 0.3 mm diameter through both sides of the nacelle rear cover.

Prepare four ‘Gaspatch’ anchor points.

Using thin CA adhesive, secure the ’leg’ of an Anchor Point into each of the pre-drilled holes. Make sure the Anchor Points will not obstruct the struts when fitted.

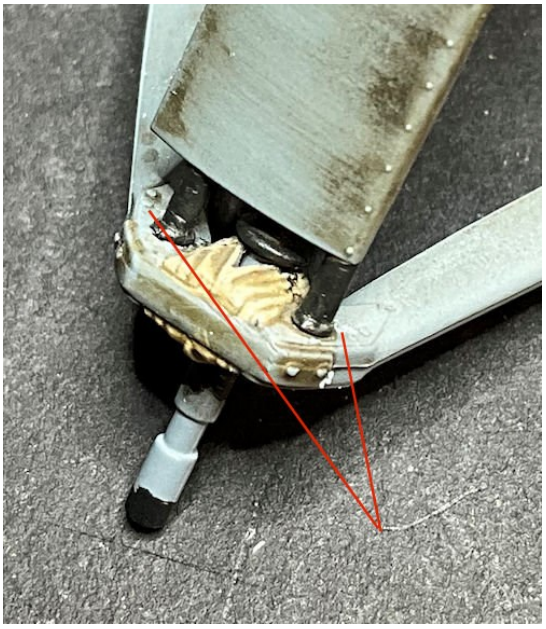
Once secured in position run a 0.2 mm diameter drill through the ’eye’ of the Anchor Points if they are contaminated with adhesive.

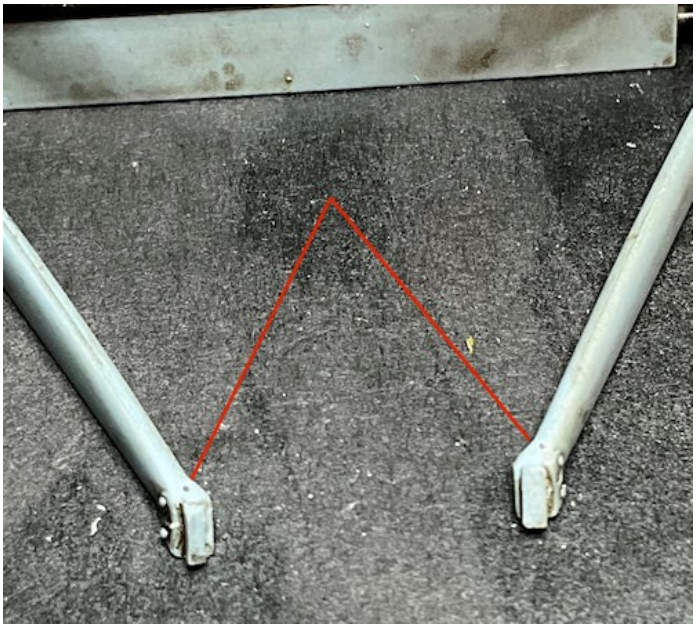


Landing gear:

Drill a hole of 0.3 mm diameter into the bottom of the landing struts on both sides of the axle assembly. struts.

Drill a hole of 0.3 mm diameter into the forward, top of the landing gear rear struts.





Prepare two ‘Gaspatch’ anchor points.

Using thin CA adhesive, secure the ’leg’ of an Anchor Point into each of the pre-drilled holes in the landing gear rear struts.

Once secured in position run a 0.2 mm diameter drill through the ’eye’ of the Anchor Points if they are contaminated with adhesive.

Ailerons:

NOTE: *The following steps are for fitting the between wings aileron control wires later in the build.*

For the two lower ailerons, use as guides the pre-molded locations and drill holes of 0.3 mm diameter into, **but not through,** the top surface of the lower ailerons (for adding turnbuckles later in the build).

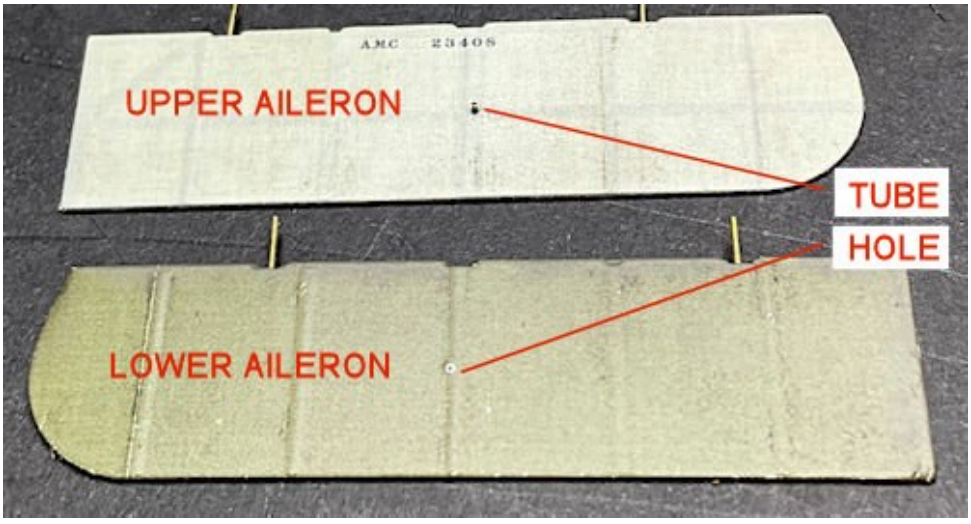
For the two upper ailerons, use as guides the pre-molded locations and drill holes of 0.4 mm diameter into, **but not through,** the underside of the upper ailerons.

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

Cut two short lengths of blackened ‘Albion Alloys’ Nickel-Silver 0.4 mm (NST04) diameter tube.

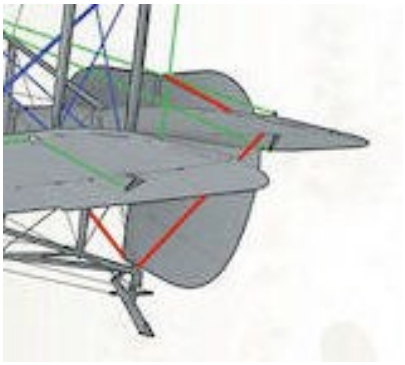
Using thin CA adhesive, secure the tubes into the pre-drilled holes in the upper ailerons (for adding rigging later in the build).

Once secured in position run a 0.2 mm diameter drill into the tubes if they are contaminated with adhesive.



Tailplane:

NOTE: *The following steps are for fitting the tailplane bracing wires later in the build.*



Using the pre-molded recesses at the top and bottom rear of the fin as a guide, drill holes of 0.3 mm diameter through the fin.

Drill a hole of 0.3 mm diameter through the trailing edge of the tailplane, just outboard from the middle hinge location.

Drill a hole of 0.3 mm diameter into, **but not through**, the rudder post just above the small protruding stub on both sides at the bottom of the rudder post, making sure the holes are drilled angled to align with the holes in the tailplane trailing edges.

Drill a hole of 0.2 mm diameter into the small protruding stub on both sides at the bottom of the rudder post, just above the tail skid control horns,

Tail booms:

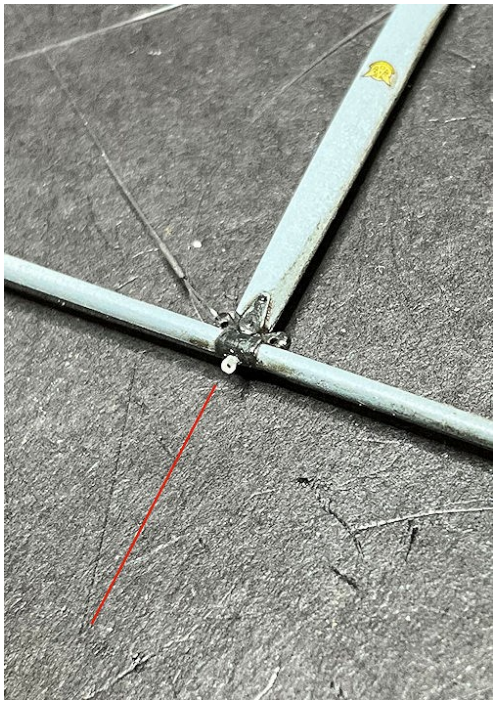
NOTE: *The following steps are for fitting the tail boom bracing wires from the wings, to be rigged later in the build. Anchor Points are used to avoid drilled through the frail tail booms.*

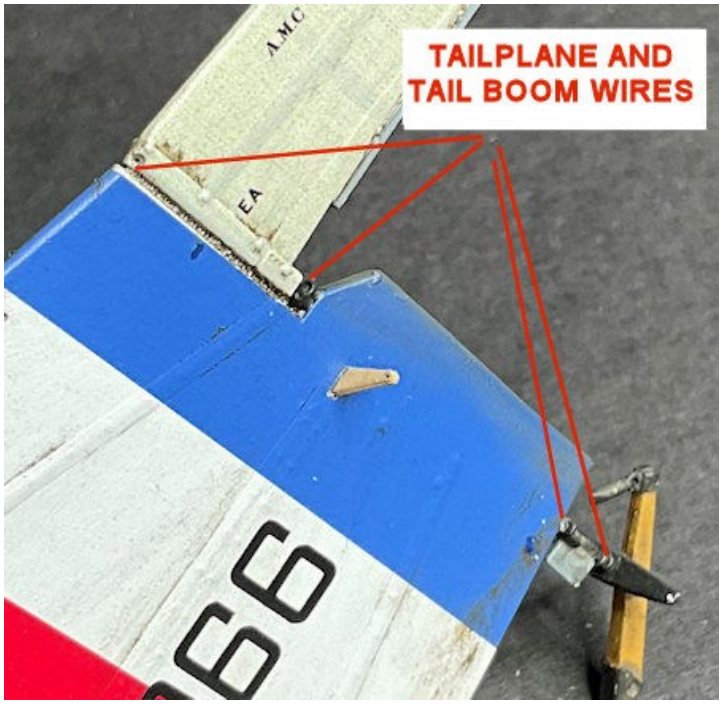
File or sand away the studs at the top and bottom of the vertical struts on both tail booms.

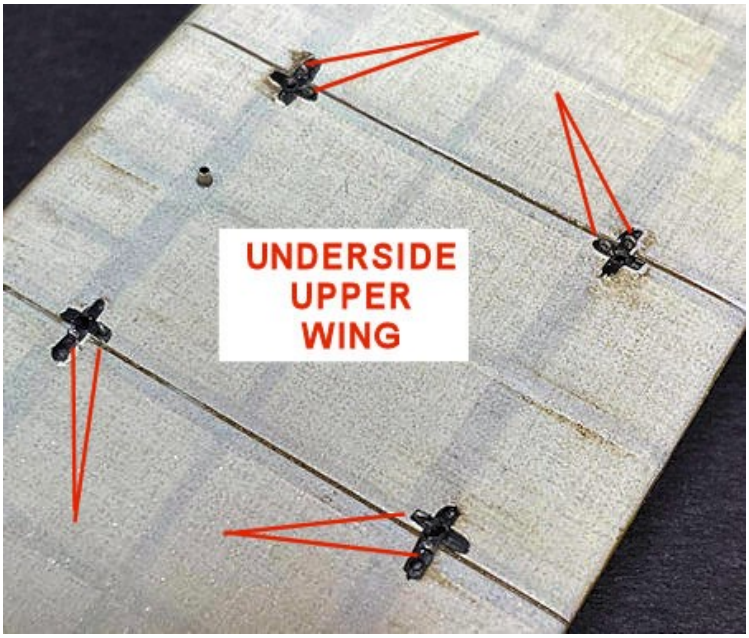
Using the witness marks as guides, drill holes of 0.3 mm diameter into the tail bools.

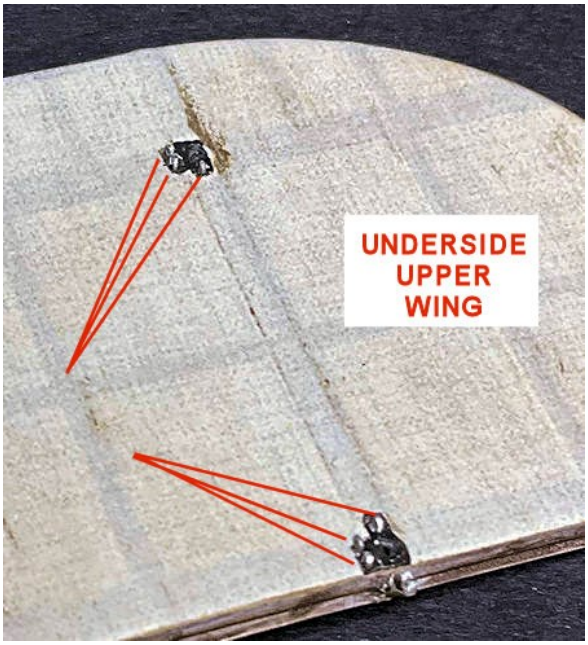
Using thin CA adhesive, secure an Anchor Point into each of the drilled holes, making sure they are slightly angled to align with the bracing wires, when fitted.

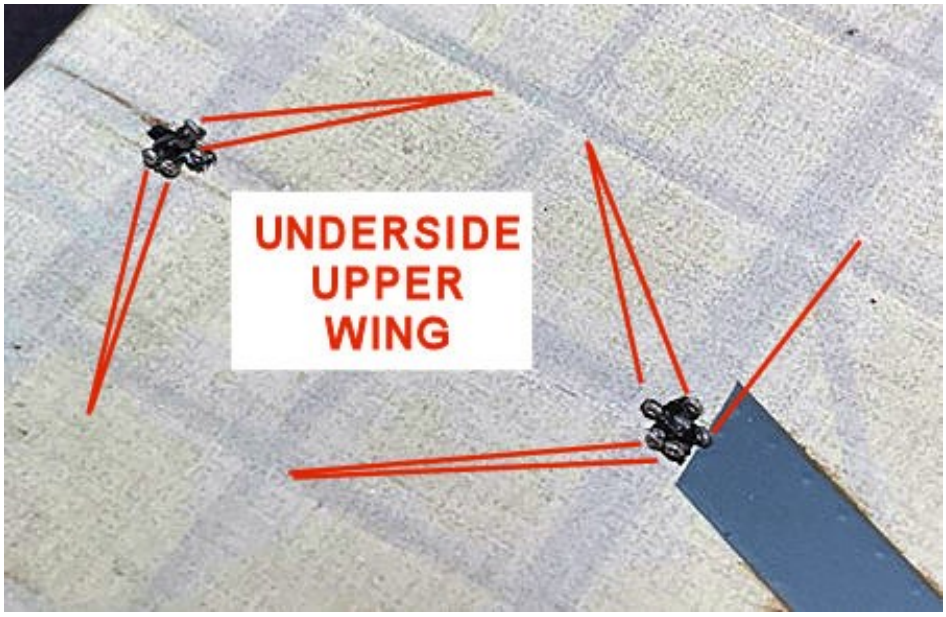
The following photographs show the fitted Anchor Points and drilled holes.

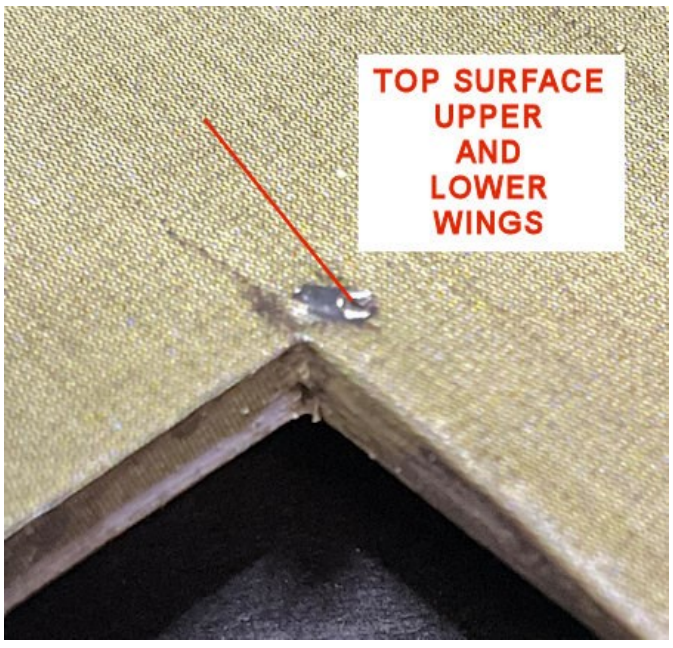


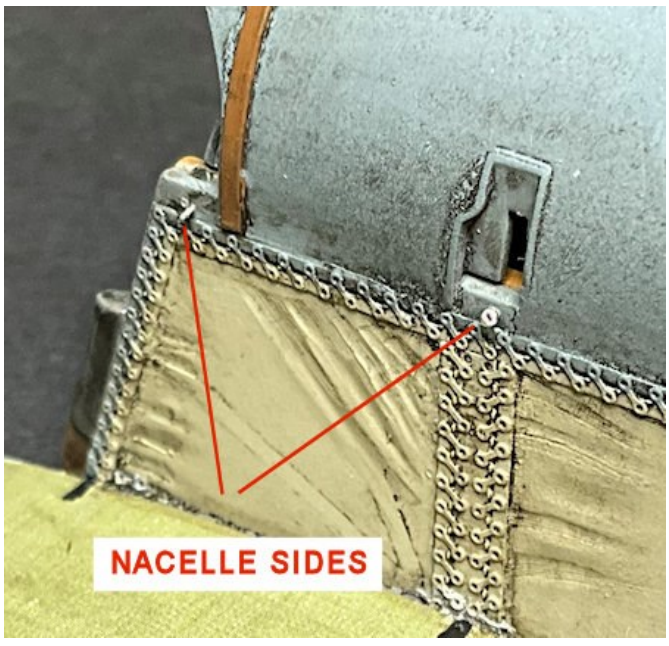


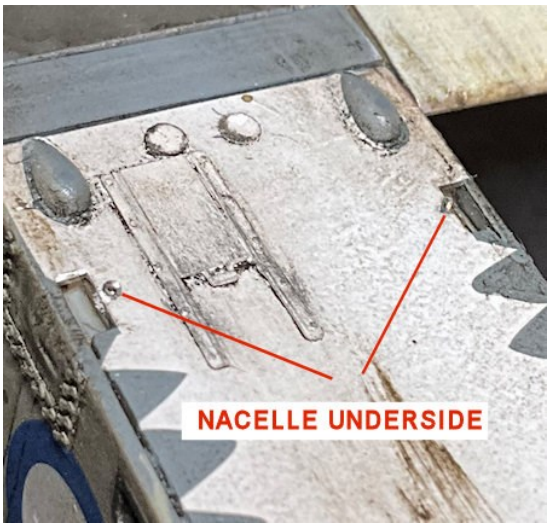

UNDERSIDE
UPPER
WING

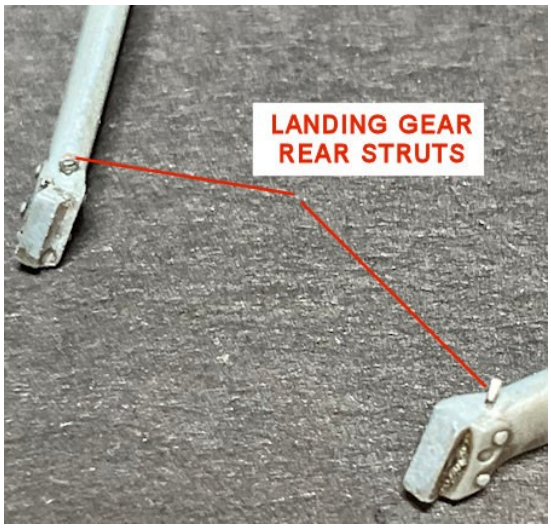

UNDERSIDE
UPPER
WING

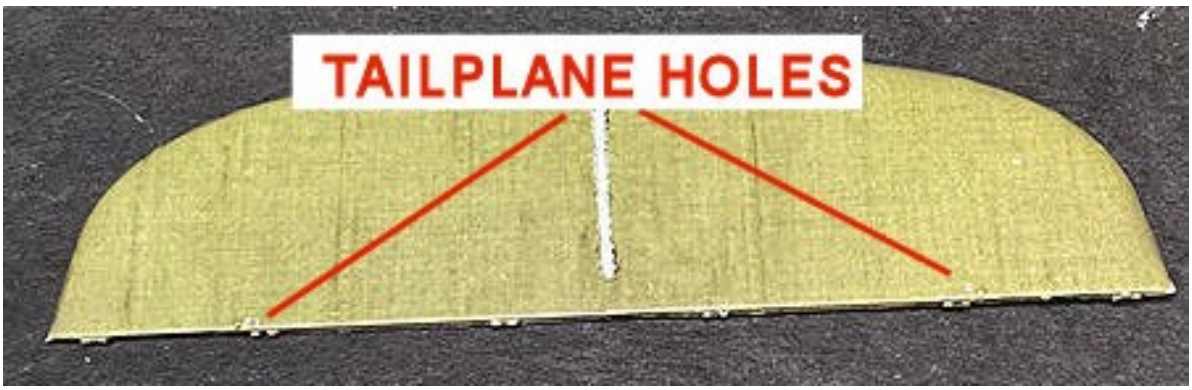

UNDERSIDE
UPPER
WING


TOP SURFACE
UPPER
AND
LOWER
WINGS


NACELLE SIDES







Assembly (continued):

Cement the following control horns into their locating recesses of the relevant flight surfaces:

Lower ailerons D6 x 2
Rudder D16 x 2
Elevators D7 x 2.

Pre-rigging:

NOTE: *Refer to Part 6 (Rigging) for more information. Before continuing further with the build, it's best to pre-rig the model parts as much as possible. This particular aircraft had rubber cord return ailerons (D12) on the upper wing.*

Pre-rig example:

If necessary, carefully run a 0.2 mm diameter drill through the 'eye' end of the Anchor Point to remove any obstruction.

Cut a short length of 0.5 mm diameter Nickel-Silver tube, such as that supplied from 'Albion Alloy's (NST05) or Brass tube (MBT05) similar.

Deburr the tube by running a 0.3mm diameter drill through the tube.

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

Blacken the tube to reduce its metallic sheen.

NOTE: *Always **cut the length of line much longer than needed** to span between its attachment points. This allows for easier connecting during the final rigging stage.*

Cut a long length of 0.12 mm diameter mono-filament (fishing line), such as that from 'Steelon'.

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

Loop the line back and through the tube.

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

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

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

Check that the line is free to move in the Anchor Point (to allow for alignment of the line during the final rigging stage of the build).

Upper wing underside:

NOTE: *Refer to the previous preparation photographs and **example** of pre-rigging a line.*

Add a pre-rigged line to each of the fitted Anchor Points **(except the BBW and UDW)** fitted in the underside of the upper wing.

Nacelle underside:

Use the same procedure to add a line to the two Anchor Points on the underside of the nacelle.

Landing gear:

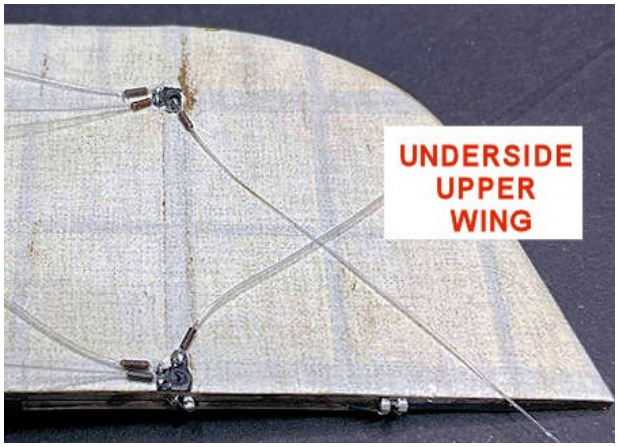
Use the same procedure to add a line to the two Anchor Points on the rear struts of the landing gear.

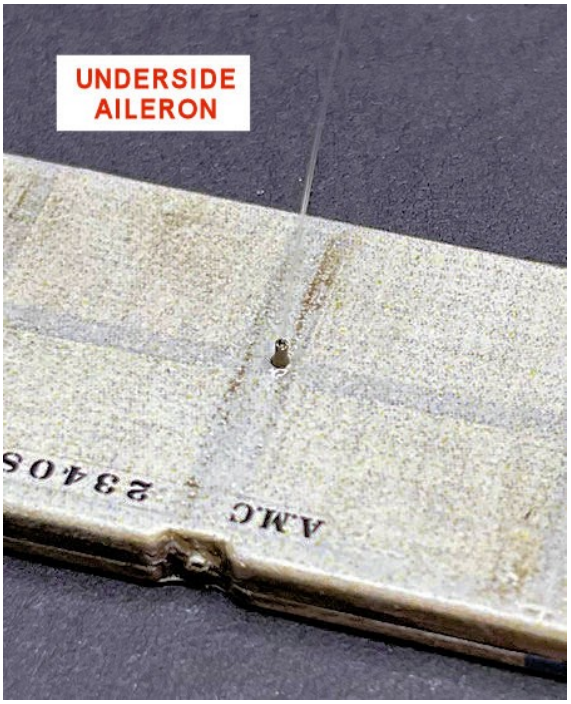
Ailerons:

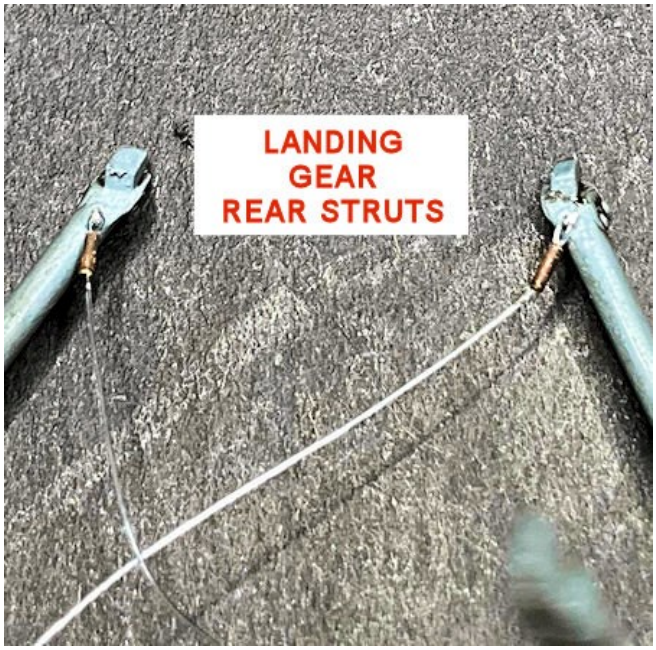
Cut two long lengths of 0.08 mm diameter mono-filament, such as ‘Steelon’ or ‘Stroft GTM’.

Using thin CA adhesive, secure a line into the tube previously fitted into the undersides of the upper wing ailerons.

The following photographs show the pre-rigged lines fitted.







Assembly (continued):

NOTE: *Refer to page 7 of the kit instructions for strut locations.*

Make sure all strut end and strut locating recesses and holes in the wings and nacelle are clear of paint.

Test fit the nacelle cabane struts and the interplane struts into the location recesses in the nacelle and upper and lower wings. Make sure the struts fully locate.

Cement the four nacelle cabane struts into their locating recesses in the nacelle.

NOTE: *During the following step make sure:*

> *The tops of the eight interplane struts align to the tops of the nacelle cabane struts when viewed from the lower wing tips.*
>
> *All struts are vertical when viewed from the front.*

Cement the eight interplane struts into their locating recesses in the lower wings.

Leave the struts to fully set in the nacelle and lower wings.

Make sure the pre-drilled rigging holes in the top surface of the lower wings are clear of any adhesive used to secure the interplane struts into the wings. If necessary, use a 0.3 mm diameter drill to clear the holes.

Using thin strips of masking tape, hold the various pre-rigged lines on the underside of the upper wing clear of the locating holes for the nacelle cabane and wing interplane struts.

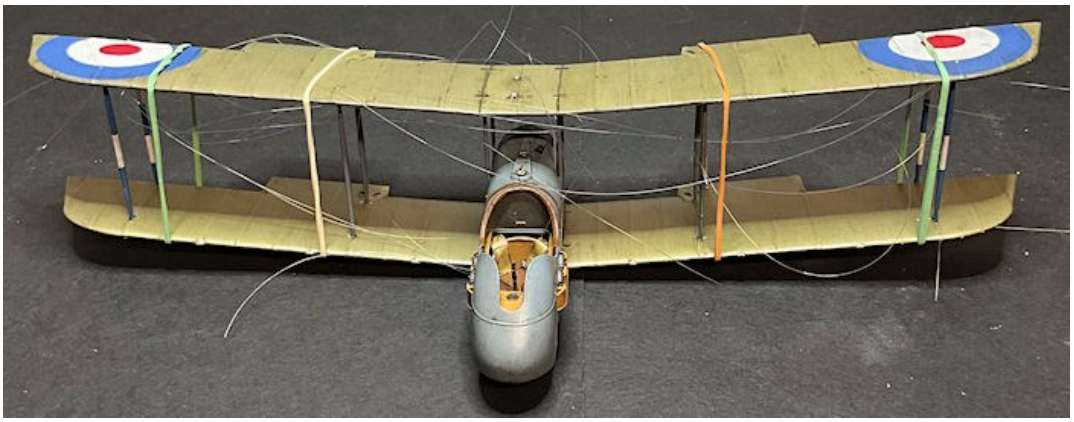
Carefully locate the upper wing onto the nacelle and interplane struts, making sure the upper wing locates fully onto the struts.

NOTE: *During the following step, the upper wing can be held in position using elastic bands over the upper and lower wings.*

Cement the nacelle and interplane struts into the upper wing.

Remove the masking tapes from the lines.

Leave the struts to fully set in the upper wing.



Final rigging:

Rigging - final tensioning:

Invariably during final rigging using mono-filament, some lines may be slack. This can be remedied by careful application of heat along the line.

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

NOTE: *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.*

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 and tightening the line.

NOTE: *Refer to Part 6 (Rigging) for more information.*
The turnbuckles used are the 'GasPatch Elite Accessories' 1/48 scale Turnbuckles (One Ended type).
Approximately fifty turnbuckles will be required.

Prepare the turnbuckles, including painting the centre barrels with 'Mr. Colour' Brass (219) or similar.

One Ended turnbuckle rigging example:

If necessary, carefully run a 0.2 mm diameter drill through the ‘eye’ end of the turnbuckles to remove any obstruction.

Cut a short length of 0.5 mm diameter Nickel-Silver tube, such as that supplied from ‘Albion Alloy’s (NST05) or Brass tube (MBT05) or similar.

Deburr the tube by running a 0.3mm diameter drill through the tube.

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

Blacken the tube to reduce its metallic sheen.

Pass the pre-rigged line through the tube, then through the ‘eye’ end of the turnbuckle.

Loop the line back and through the tube.

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

NOTE: *The loop of line through the turnbuckle should be left loose to allow for alignment of the line during the final rigging stage of the build.*

Check that the line is free to move in the turnbuckle.

Using thin CA adhesive, secure the leg of the turnbuckle into its relevant pre-drilled hole in the model, making sure the turnbuckle is aligned to its other end Anchor Point.

Keeping the line taut, slide the tube up to, **but not touching**, the ‘eye’ end of the turnbuckle.

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

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

Photo-etch turnbuckles:

NOTE: *The kit supplies photo-etch turnbuckles (P1 and P2) for the rudder and tail skid control cables. However, being photo-etch they are flat and not very realistic.*

Remove photo-etch parts P1 and P2 from their sheet and cut away any tags from their edges.

Brush the parts with ‘VMS’ Metal Prep 4K or similar to prepare the parts for painting.

Brush the central ‘barrels’ of the individual turnbuckles with several layers of ‘Mr. Surfacer’ 100 to ‘bulk out’ them and reduce their flatness.

Brush paint the barrels with ‘Mr. Colour’ Brass (219) or similar.

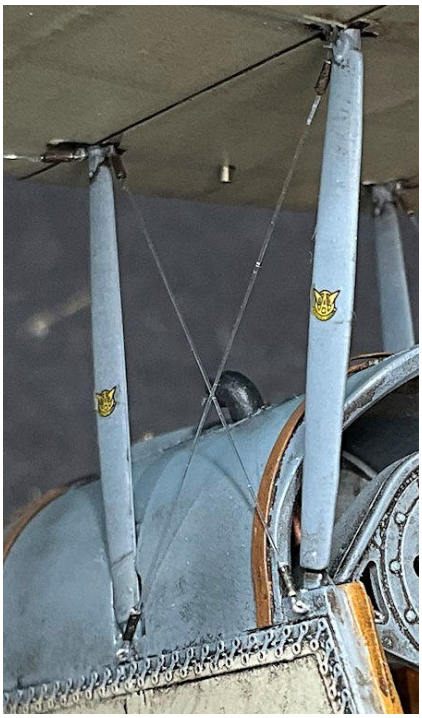
Brush paint the ‘eye’ ends of the turnbuckles and their centre plate barrels with ‘Mr. Colour’ Stainless Steel (213) or similar.

Final rigging:

NOTE: *Due to the complex rigging for this aircraft, it’s best to rig the aircraft in the easiest order, as follows.*

Cabane strut bracing wires:

For each of the four pre-rigged cabane strut bracing wires (attached to the underside of the upper wing), attached the lines diagonally down and onto the Anchor Points fitted in the sides of the nacelle. Attach the lines with just a tube (not a turnbuckle), using the previous procedure to attach pre-rigged lines to the underside of the upper wing.



Incidence wires:

NOTE: *Rig the incidence wires for the inboard interplane struts first, followed by the outboard wires.*

For the four pre-rigged inboard incidence wires (attached to the underside of the upper wing), attached the lines diagonally down and onto the Anchor Points fitted between the interplane struts on the lower wings. Attach the lines with a turnbuckle, using the previous turnbuckle rigging example.

Repeat the procedure for the four pre-rigged outboard incidence wires.

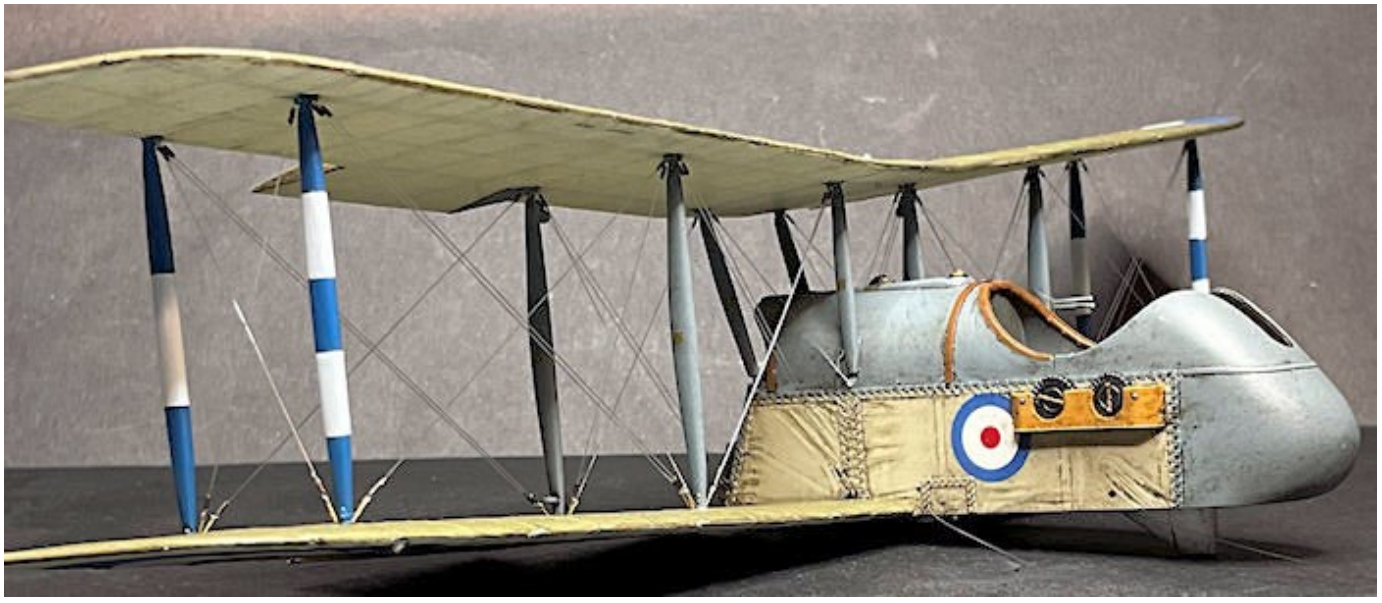
Flying wires:

For each pair of the eight pairs of pre-rigged flying wires (attached to the underside of the upper wing), attached the lines diagonally down and into their pre-drilled holes in the bottom edge of the nacelle and lower wings. Attach the lines with a turnbuckle, using the previous turnbuckle rigging example.

Landing wires:

For each of the eight single pre-rigged landing wires (attached to the underside of the upper wing), attached the lines diagonally down and into their pre-drilled holes in the lower wings. Attach the lines with a turnbuckle, using the previous turnbuckle rigging example.

The following photograph shows the wires fitted for the cabane and interplane struts and the twin flying and single landing wires.



Tail boom bracing wires:

NOTE: *Due to how frail the tail booms are, it's best to rig them as much as possible before fitting them to the wings. I chose for simplicity to represent turnbuckles with tube, instead of turnbuckles.*

Tube rigging:

NOTE: *The following procedure apples to the two central bays on both tail booms.*

Cut two short lengths of 0.4 mm diameter Nickel-Silver or Brass tube, such as that supplied from 'Albion Alloy's (NST05) or Brass tube (MBT05) or similar.

Deburr the tube by running a 0.2mm diameter drill through the tube.

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

Blacken the tube to reduce its metallic sheen.

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

Pass the line through a tube, then through the pre-molded 'eye' loop in a corner of a tail boom bay.

Loop the line back and through the tube.

Slide the tube up to, **but not touching**, the 'eye' loop.

NOTE: *The loop of line through the turnbuckle should be left loose to allow for alignment of the line during the final rigging stage of the build.*

Check that the line is free to move in the 'eye' loop.

Using thin CA adhesive, secure the lines in the tube end.

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

Repeat to attach the line to the diagonally opposite 'eye' loop in the tail boom bay, but leave the line loose and do not fix in position yet. This will be done after the fin/rudder assembly has been fitted to the booms.

NOTE: *The following procedure apples to the two wires at the wings end of the both tail booms.*

Cut a long length of 0.08 mm diameter mono-filament, such as that from 'Steelon' or 'Stroft GTM'. The line needs to be longer than needed to span from the tail boom (when fitted) to the Anchor Points fitted in the wings, behind the inboard, rear interplane strut then forward to the front of the nacelle.

Use the previous procedure to attach a line to the upper and lower 'eye' loops at the front of the tail booms.

NOTE: *The following procedure apples to the two tailplane wires at the rear of the both tail booms.*

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

Use the previous procedure to attach a line to the upper and lower 'eye' loops at the rear of the tail booms.

Assembly (continued):

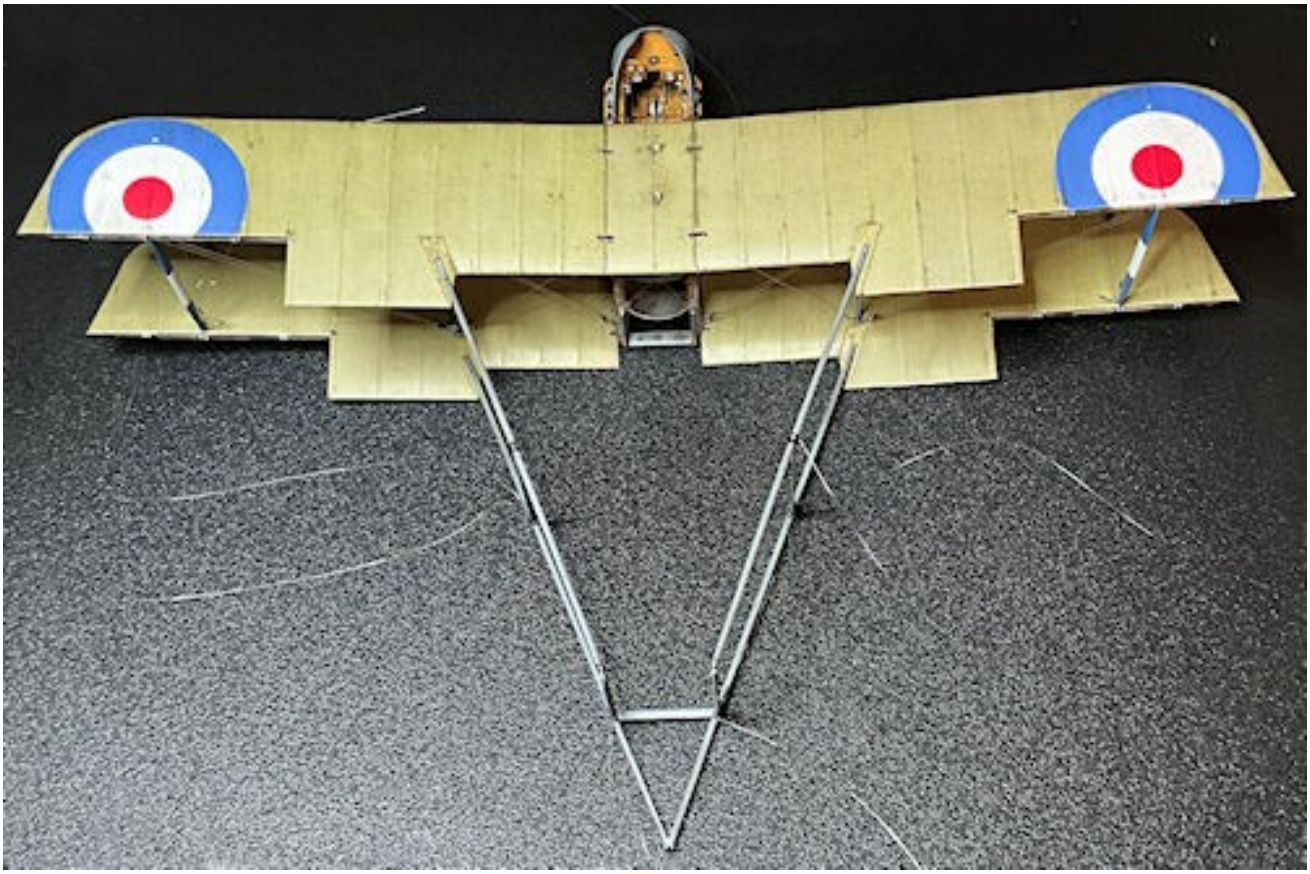
Make sure the wing locating recesses for the tail booms and the tail boom locating tabs are clear of paint.

NOTE: *The tail boom bottom locating tabs do not fit flush with the surface of the lower wings, but sit raised slightly at their rear ends. If the booms are pressed hard into their lower wing recesses, it will cause the bottom of the tail booms to bow.*

Cement the two tail booms into their locating recesses in the upper and lower wings.

Cement the tail boom cross member (A57) into its locating holes on the inside, rear of the tail booms.

Cement together the bottom rear ends of the two tail booms.



Final rigging (continued):

NOTE: *The tail booms are fragile and therefore flexible. When rigging the tail booms do not over tighten the rigging lines, as this may flex and distort the tail booms.*

Lower boom bracing wires:

Cut two short lengths of 0.4 mm diameter Nickel-Silver or Brass tube, such as that supplied from 'Albion Alloy's (NST05) or Brass tube (MBT05) or similar.

Deburr the tubes by running a 0.2mm diameter drill through the tube.

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

Blacken the tubes to reduce the metallic sheen.

Pass the left lower pre-rigged line from the left tail boom through a tube, then through the Anchor Point fitted in the left lower wing at the rear of the inboard rear interplane strut.

Pass the line forwards over the wing.

Loosely fit the line to the second tube and a 'Gaspatch' 1/48th scale turnbuckle (One Ended) as previously described for the various wires between the wings. Leave the loop of line loose in the 'eye end' of the turnbuckle.

Using thin CA adhesive, secure the leg of the turnbuckle into its pre-drilled hole at the middle of the nacelle side, making sure the turnbuckle is aligned to the Anchor Point in the lower wing.

Pull on the free end of line from the to keep the line taut and slide the tube up to, **but not touching**, the ‘eye’ end of the turnbuckle.

Secure the lines in the tube using thin CA adhesive.

Cut away the residual line at the tube end.

Repeat the procedure to the right lower pre-rigged line from the right tail boom.

Upper boom bracing wires:

Cut two short lengths of 0.4 mm diameter Nickel-Silver or Brass tube, such as that supplied from ‘Albion Alloy’s (NST05) or Brass tube (MBT05) or similar.

Deburr the tubes by running a 0.2mm diameter drill through the tube.

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

Blacken the tubes to reduce its metallic sheen.

Pass the left upper pre-rigged line from the left tail boom through a tube, then through the Anchor Point fitted in the underside of the upper wing, at the rear of the inboard rear interplane strut.

Pass the line forwards under the wing.

Loosely fit the line to the second tube and a ‘Gaspatch’ 1/48th scale turnbuckle (One Ended) as previously described for the various wires between the wings. Leave the loop of line loose in the ‘eye end’ of the turnbuckle.

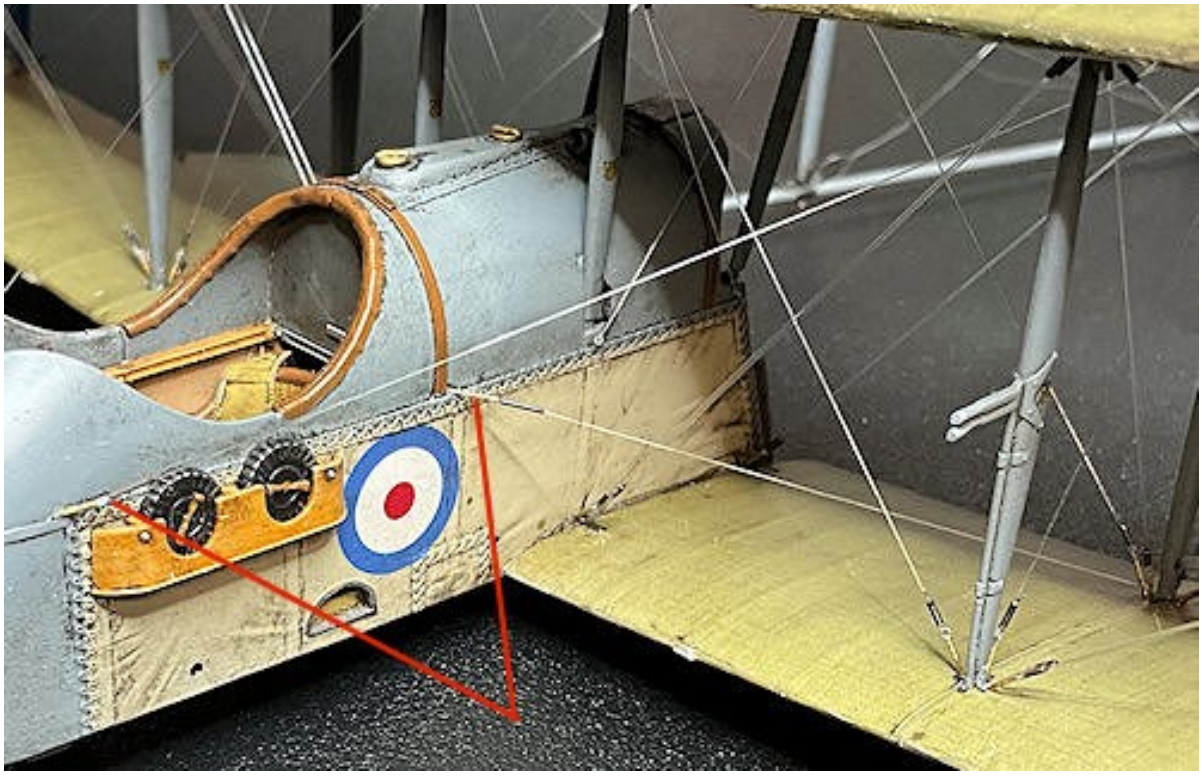
Using thin CA adhesive, secure the leg of the turnbuckle into its pre-drilled hole at the forward nacelle side, making sure the turnbuckle is aligned to the Anchor Point in the upper wing.

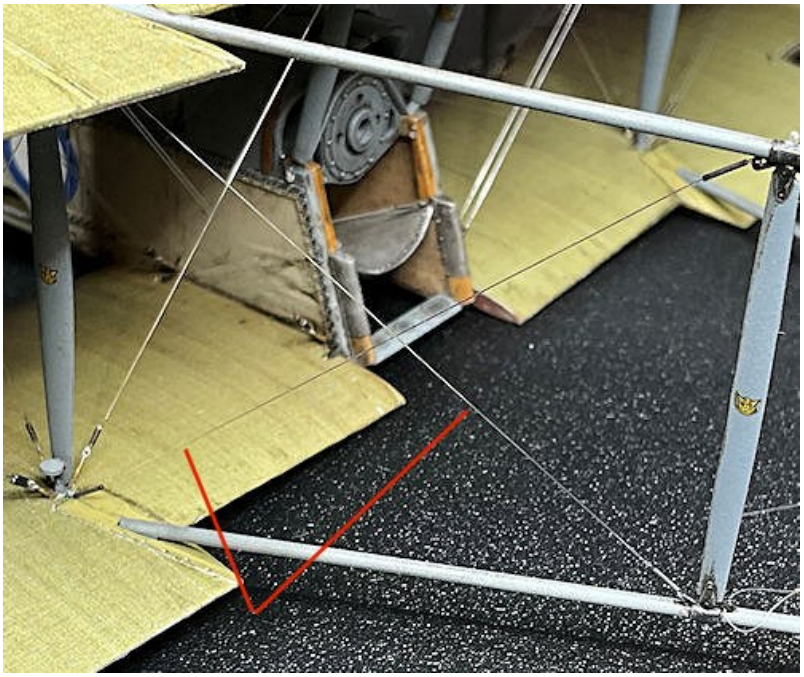
Pull on the free end of line from the to keep the line taut and slide the tube up to, **but not touching**, the ‘eye’ end of the turnbuckle.

Secure the lines in the tube using thin CA adhesive.

Cut away the residual line at the tube end.

Repeat the procedure to the right upper pre-rigged line from the right tail boom.





Assembly (continued):

NOTE: *Make sure mating faces are clear of paint*.

Fin/rudder assembly:

Cement the fin/rudder into its locating recess on the top of the tailplane, making sure the fin/rudder is at 90 degrees to the tailplane.

Cement the fin/rudder assembly onto the tail booms:

The extended lugs on the leading edge of the tailplane locate inside the lugs on the top ends of the tail booms.

The joined bottom of the tail booms has a cut-out, which locates against the rudder post under the rudder.

Landing gear:

Cement the landing gear struts into their recesses in the underside of the nacelle.

Final rigging (continued):

Tailplane bracing wires:

Cut eight short lengths of 0.4 mm diameter Nickel-Silver or Brass tube, such as that supplied from 'Albion Alloy's (NST05) or Brass tube (MBT05) or similar.

Deburr the tubes by running a 0.2mm diameter drill through the tube.

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

Blacken the tube to reduce its metallic sheen.

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

Fit one end of the line to a tube and a 'Gaspatch' 1/48th scale turnbuckle (One Ended) as previously described for the various wires between the wings.

Using thin CA adhesive, secure the leg of the turnbuckle into a pre-drilled hole in the small protruding stub on one side at the bottom of the rudder post.

Pass the free end of the line through a second tube.

Pass the line up and through the pre-drilled hole in the trailing edge of the tailplane.

Pass the free end of the line through two tubes.

Pass the line up and through the pre-drilled hole in the top, trailing edge of the fin.

Pass the free end of the line through two tubes.

Pass the line down and through the pre-drilled hole in the trailing edge of that tailplane.

Pass the free end of the line through two tubes and a ‘Gaspatch’ 1/48th scale turnbuckle (One Ended).

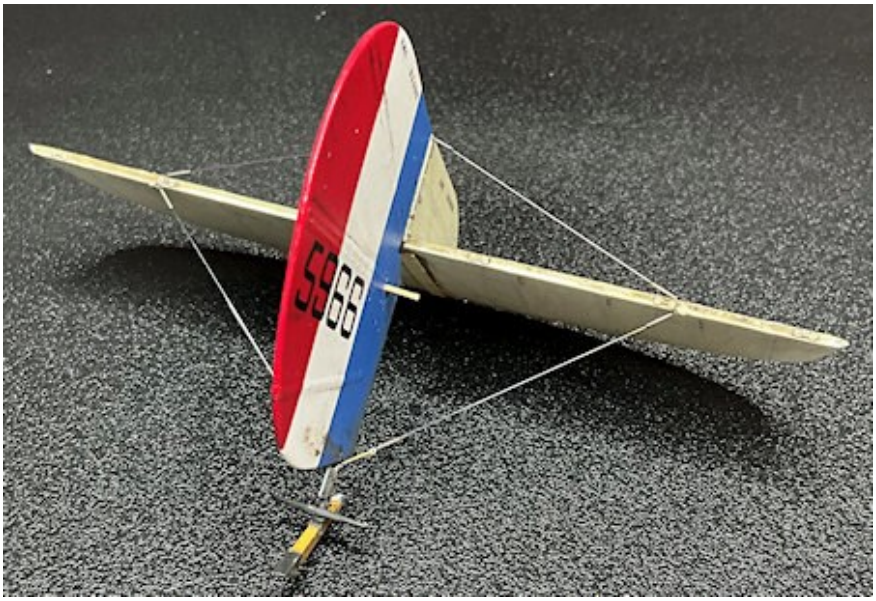
Loosely fit the line to the turnbuckle, as previously described for the various wires between the wings. leaving the loop of line loose in the ‘eye end’ of the turnbuckle.

Using thin CA adhesive, secure the leg of the turnbuckle into its pre-drilled hole in the small protruding stub on that side at the bottom of the rudder post.

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

Secure the lines in the tube using thin CA adhesive.

Cut away the residual line at the tube end.



Tail boom bracing wires:

NOTE: *The bracing wires in the central bay of the tail booms were left loose at one end until the fin/rudder assembly was fitted. These can now be tightened and secured. The following steps apply to the four loose bracing wires.*

Slide the tube up to, **but not touching**, the ‘eye’ loop.

Check that the line is free to move in the ‘eye’ loop.

Pull gently on the free end of the line to keep the line taut and using thin CA adhesive, secure the lines in the tube end.

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

Tail booms to rudder post bracing:

Cut two short lengths of 0.4 mm diameter Nickel-Silver or Brass tube, such as that supplied from ‘Albion Alloy’s (NST05) or Brass tube (MBT05) or similar.

Deburr the tubes by running a 0.2mm diameter drill through the tube.

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

Blacken the tube to reduce its metallic sheen.

Slide a tube onto both of the pre-rigged bracing lines at the top, rear of the two tail booms.

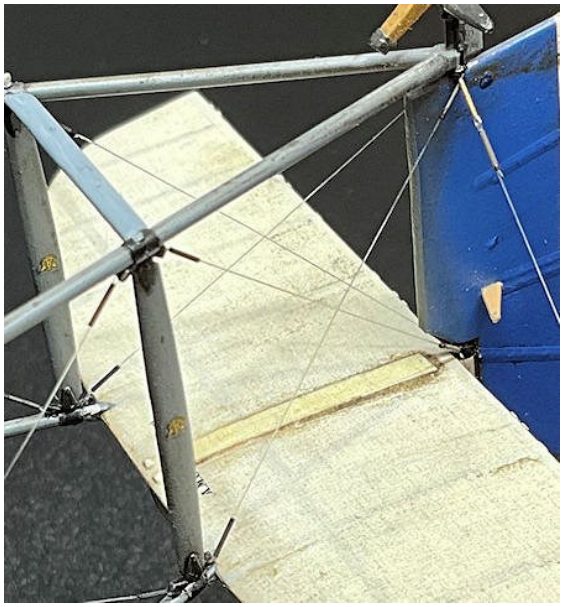
Pass the free ends of the lines down and around to the opposite side of the rudder post, directly under the rudder.

Keeping the lines taut, secure them to the rudder post using thin CA adhesive.

Move the tubes down to the rudder post and using thin CA adhesive, secure the tubes onto the lines.

Repeat the procedure to attach the pre-rigged bracing lines at the bottom of the two tail booms, but pass the line up and through the pre-drilled hole at the bottom, rear of the fin.

Cut away residual line at the rudder post and bottom rear of the fin.



Landing gear bracing wires:

Cut four short lengths of 0.4 mm diameter Nickel-Silver or Brass tube, such as that supplied from 'Albion Alloy's (NST05) or Brass tube (MBT05) or similar.

Deburr the tubes by running a 0.2mm diameter drill through the tube.

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

Blacken the tube to reduce its metallic sheen.

NOTE: *The following steps apply to the four pre-rigged bracing wires for the landing gear.*

Fit one end of a rear bracing line to a tube and a 'Gaspatch' 1/48th scale turnbuckle (One Ended) as previously described for the various wires between the wings, but leave the loop through the turnbuckle loose.

Using thin CA adhesive, secure the leg of the turnbuckle into the pre-drilled hole in the pre-drilled hole in the diagonally opposite landing gear rear strut, making sure the turnbuckle is aligned to the other end Anchor Point.

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

Secure the lines in the tube using thin CA adhesive.

Cut away the residual line at the tube end.

Repeat the procedure for the other rear bracing line.

Repeat the procedure for the two forward bracing wires of the landing gear, fitting the turnbuckles in their pre-drilled holes in the bottom of the landing gear front struts.

Rudder and tail skid control cables:

NOTE: *The kit supplied photo-etch turnbuckles (P1 and P2) were prepared earlier in this build log.*

The following steps apply to ***two of the three*** *turnbuckles on P1 and P2.*

Cut a short length of 0.4 mm diameter Nickel-Silver or Brass tube, such as that supplied from 'Albion Alloy's (NST05) or Brass tube (MBT05) or similar.

Deburr the tube by running a 0.2mm diameter drill through the tube.

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

Blacken the tube to reduce its metallic sheen.

NOTE: *The length of the lines need to be:*

> *For the bottom of the three rear turnbuckles - longer than that required to span between the trailing edge of the lower wings to the tail skid.*
>
> *For the middle of the three rear turnbuckles - longer than that required to span between the trailing edge of the lower wings to the rudder control horns the back to the lower wing.*

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

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

Loop the line back and through the tube.

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

Check that the line is free to move in the 'eye' of the turnbuckle.

Using thin CA adhesive, secure the lines in the tube end.

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

NOTE; *The following steps apply to the* ***two*** *front turnbuckles on P1 and P2.*

Cut a short length of 0.4 mm and blacken, as before.

NOTE: *For the line required - longer than that required to span between the trailing edge of the lower wing and around the pulley at the bottom, outer edge of the inboard, rear interplane strut then to the side of the nacelle.*

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

Align the 'eye' ends of the two turnbuckles then attach the line with tube, as before.

Pass the single line around the pulley at the bottom, outer edge of the inboard, rear interplane strut then across to the side of the nacelle.

Keep the line in contact with the rim of the pulley and secure it in position using thin CA adhesive.

Cut the line such that the line can be, while taut, inserted into the control cables hole in the middle, bottom edge of the nacelle side.

Cut a short length of 0.4 mm and blacken, as before.

Using thin CA adhesive, secure the tube on the end of the line.

Keeping the line taut, use thin CA adhesive to secure the tube in the control cables hole in the bottom, middle edge of the nacelle.

Repeat the procedure to the opposite turnbuckle.

Cut four short lengths of 0.4 mm diameter Nickel-Silver or Brass tube, such as that supplied from 'Albion Alloy's (NST05) or Brass tube (MBT05) or similar.

Deburr the tubes by running a 0.2mm diameter drill through the tube.

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

Blacken the tubes to reduce the metallic sheen.

Slide a tube onto the bottom of the three turnbuckle lines.

Pass that line through the pre-drilled hole in the tail skid control horn, then back through the tube.

Slide a tube onto the middle of the three turnbuckle lines.

Pass that line through the pre-drilled hole in the rudder control horn, then back through the tube.

Slide a tube onto the free end of the middle line.

Pass that line through the 'eye' end of the top turnbuckle then back through the tube.

Pull the two front turnbuckle lines to move the turnbuckles closer to the trailing edge of the lower wing.

Apply thin CA adhesive to secure the two front turnbuckle wires in the pulley hole.

Pull the free end of the tail skid line to tighten it and move the tube up to, **but not touching**, the control horn.

Apply thin CA adhesive to secure the lines in the tube.

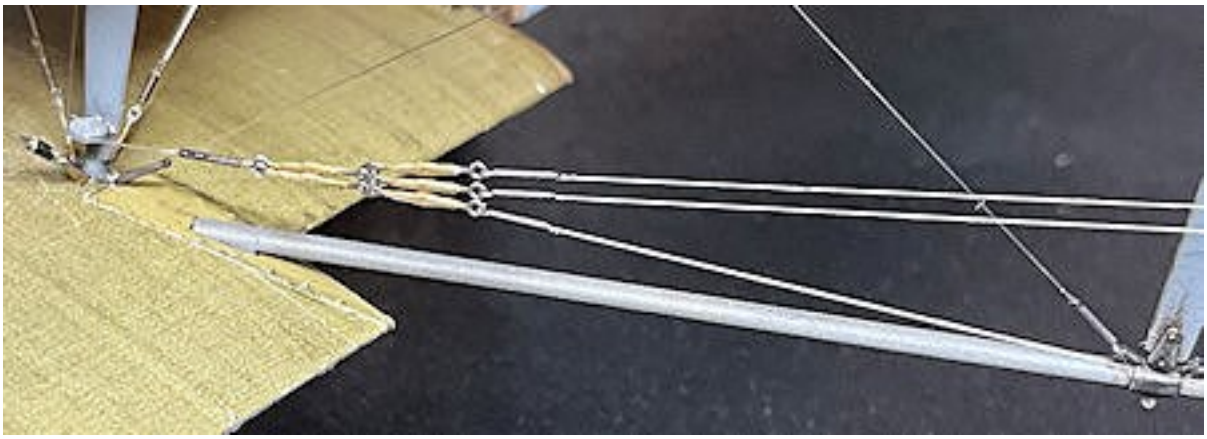
Cut away residual line at the tube end.

Pull the free end of the rudder control line at the top of the three turnbuckles to tighten both lines and move the tube up to, **but not touching**, the turnbuckle.

Apply thin CA adhesive to secure the lines in the tube.

Cut away residual line at the tube end.

Repeat the procedure to rig the opposite turnbuckles and control cables.



Elevator control cables:

NOTE: *The following steps apply to both ends of the two elevator control levers (D5). The turnbuckles used are the 'GasPatch Elite Accessories' 1/48 scale Turnbuckles (Type C), of which four will be required.*

Prepare the turnbuckles, including painting the centre barrels with 'Mr. Colour' Brass (219) or similar.

Cut a short length of 0.4 mm diameter Nickel-Silver or Brass tube, such as that supplied from 'Albion Alloy's (NST05) or Brass tube (MBT05) or similar.

Deburr the tube by running a 0.2mm diameter drill through the tube.

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

Blacken the tube to reduce its metallic sheen.

Drill a hole of 0.2 mm diameter through the centre of one end of the elevator control lever D5 (refer to the following photograph).

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

Pass the line through the tube, then through an ‘eye’ end of the turnbuckle.

Loop the line back and through the tube.

Pass both lines through the pre-drilled hole in the end of the control lever.

Pull the two lines to move the tube and turnbuckle up to the control lever.

Using thin CA adhesive, secure the lines in the control lever.

Cut away any residual tags of line at the control lever.

Repeat the procedure at the other end of the control lever.

Using thin CA adhesive, locate and secure the two elevators onto the trailing edge of the tailplane, with the elevators aligned to the tailplane.

NOTE: *The following steps apply to both control levers.*

Cut a short length of 0.4 mm diameter Nickel-Silver or Brass tube, such as that supplied from ‘Albion Alloy’s (NST05) or Brass tube (MBT05) or similar.

Deburr the tube by running a 0.2mm diameter drill through the tube.

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

Blacken the tube to reduce its metallic sheen.

NOTE: *The length of the elevator control lines should span from the front of the nacelle then up to the control pulley (D14) on the top, inboard side of the rear, inboard interplane strut and from there to the elevators (when fitted).*

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

Pass the line through the tube, then through the free ‘eye’ end of the fitted turnbuckle.

Loop the line back and through the tube.

Slide the tube up to, **but not touching**, the ‘eye’ of the turnbuckle.

Check that the line is free to move in the ‘eye’ of the turnbuckle.

Using thin CA adhesive, secure the lines in the tube end.

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

Cement the two control levers into their locating holes in the sides of the nacelle. I fitted the control levers in the vertical (elevators neutral) position.

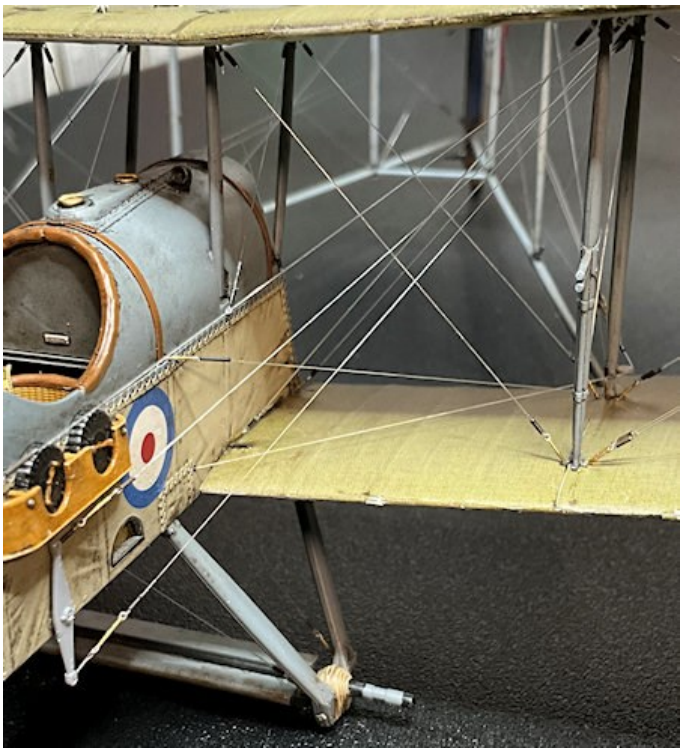
Pass the free ends of the lines diagonally up and through the pre-drilled hole in the control pulley (D14).

Pull the lines through and make sure they are separate and not twisted together.

Cut two short lengths of 0.4 mm diameter Nickel-Silver or Brass tube, such as that supplied from 'Albion Alloy's (NST05) or Brass tube (MBT05) or similar and blacken as before.

Attach the lines, as before, to the upper and underside control horns on the elevator, making sure to keep the lines taut.

Repeat the procedure to attach the opposite elevator control cables.



Wing to tail boom bracing wires:

NOTE: *The following steps apply to both upper and lower wing to tail boom bracing wires.*

Cut five short lengths of 0.4 mm diameter Nickel-Silver or Brass tube, such as that supplied from 'Albion Alloy's (NST05) or Brass tube (MBT05) or similar and blacken as before.

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

Prepare a 'Gaspatch' 1/48th scale Type C turnbuckle, including painting the centre barrel with 'Mr. Colour' Brass (219) or similar.

Attach a line, as before, to each end of the turnbuckle.

Pass one line through the Anchor Point fitted previously at the top, forward vertical strut of the tail boom.

Slide two tubes onto that line.

Pass that line through the Anchor Point fitted previously at the top, rear vertical strut of the opposite tail boom.

Loop the line back and through the tube.

Slide a tube onto the other line.

Pass that line through the Anchor Point fitted previously on the top surface of the upper wing at the corner of the aileron cut-out.

Loop the line back and through the tube.

Pull the free end of the rear line to move the turnbuckle line against the opposite tail boom.

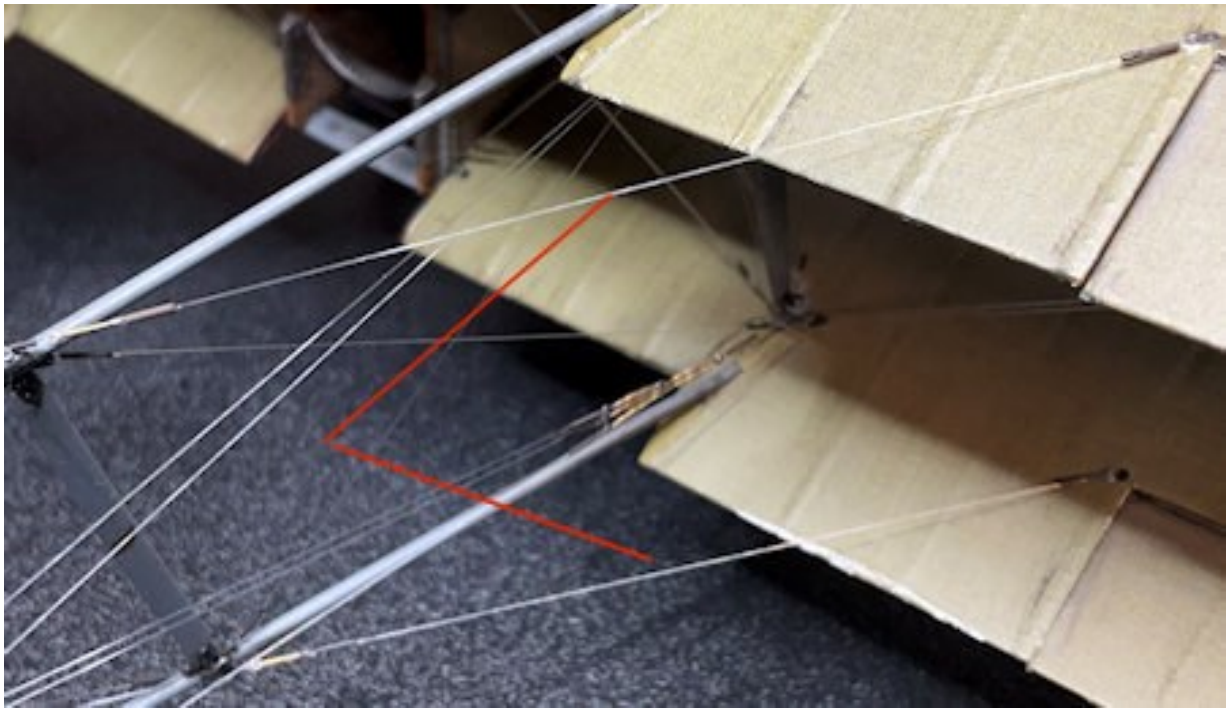
Keeping the line taut, secure the lines in the tube, using thin CA adhesive.

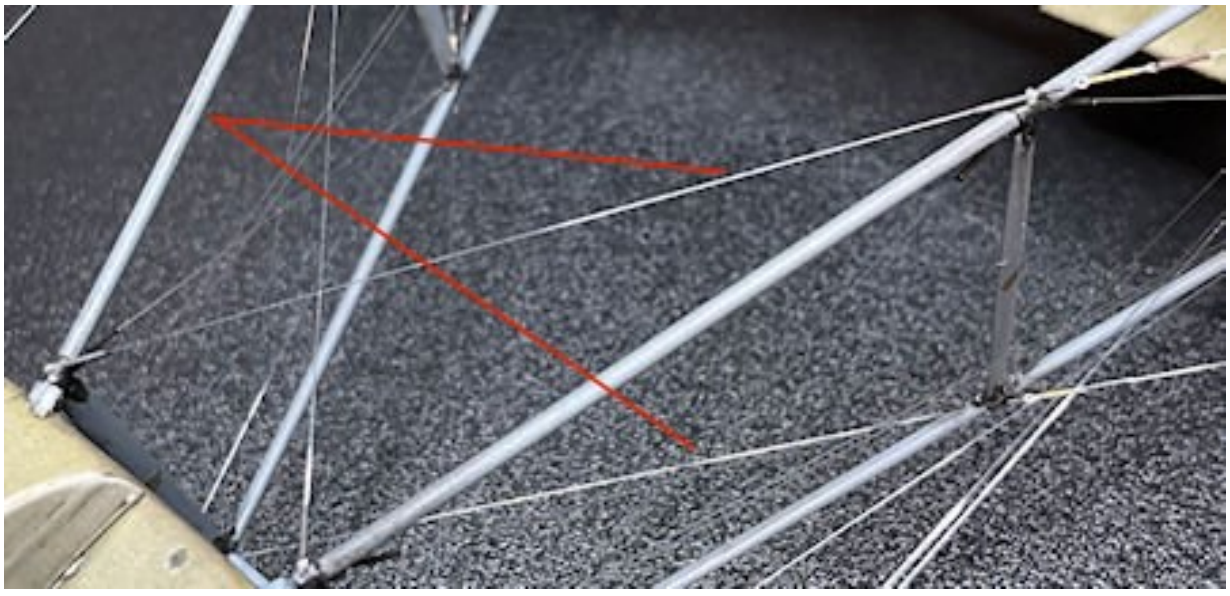
Pull the free end of the upper wing line and move the tube up to the wing Anchor Point.

Keeping the line taut, secure the lines in the tube, using thin CA adhesive.

Cut away residual line at the ends of the tubes.

Repeat the procedure to add the remaining upper and both lower bracing lines.





Aileron control cables:

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

Pass the lines through the aileron fairlead tubes fitted to the leading edge of the lower wings.

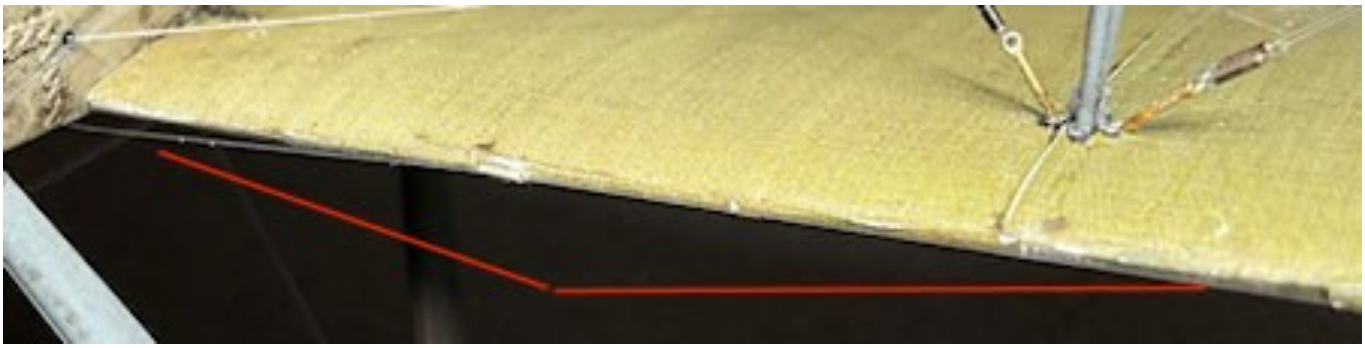
Using thin CA adhesive, secure the end of the lines into the pre-drilled holes in the side of the aileron pulley fairings on the underside of the nacelle.

Cut the other end of the lines such that when inserted into the pre-drilled hole in the aileron pulley fairings on the underside of the lower wings, the line is taut.

Using thin CA adhesive, secure the end of the lines into the pre-drilled holes in the aileron pulley fairings on the underside of the lower wings.

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

Using thin CA adhesive, secure the end of the lines into the pre-drilled holes in the rear of the aileron pulley fairings on the underside of the lower wings.



Apply thin CA adhesive to the fitted locating rods in the aileron leading edges.

Fully locate the four ailerons into their pre-drilled holes in the upper wing, keeping the ailerons aligned to the wings.

Cut two short lengths of 0.4 mm diameter Nickel-Silver or Brass tube, such as that supplied from ‘Albion Alloy’s (NST05) or Brass tube (MBT05) or similar and blacken as before.

Fit the end of the pre-rigged upper aileron lines to a tube and a ‘Gaspatch’ 1/48th scale turnbuckle (One Ended) as previously described for the various wires between the wings, but leave the loop through the turnbuckle loose.

Using thin CA adhesive, secure the leg of the turnbuckles into the pre-drilled holes in the top surface of the lower ailerons, with the turnbuckles aligned to the other en of the lines.

Pull the free end of the lines to move the tube up to, **but not** touching, the ‘eye’ end of the turnbuckle.

Keeping the line taut, secure the lines in the tube, using thin CA adhesive.

Cut away residual line at the ends of the tubes.

Cut four short lengths of 0.4 mm diameter Nickel-Silver or Brass tube, such as that supplied from 'Albion Alloy's (NST05) or Brass tube (MBT05) or similar and blacken as before.

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

Pass the lines through a tube and a 'Gaspatch' 1/48th scale turnbuckle (Type C) as previously described, but leave the protruding line loose in the tube.

Pass the ends of the lines through the pre-drilled hole in the end of the aileron control horn on the underside of the lower ailerons. Pass the line through from opposite sides of the control horn.

Pull the ends of the lines to move the tube up to, **but not toughing**, the control horn.

Using thin CA adhesive, secure the lines in the control horn.

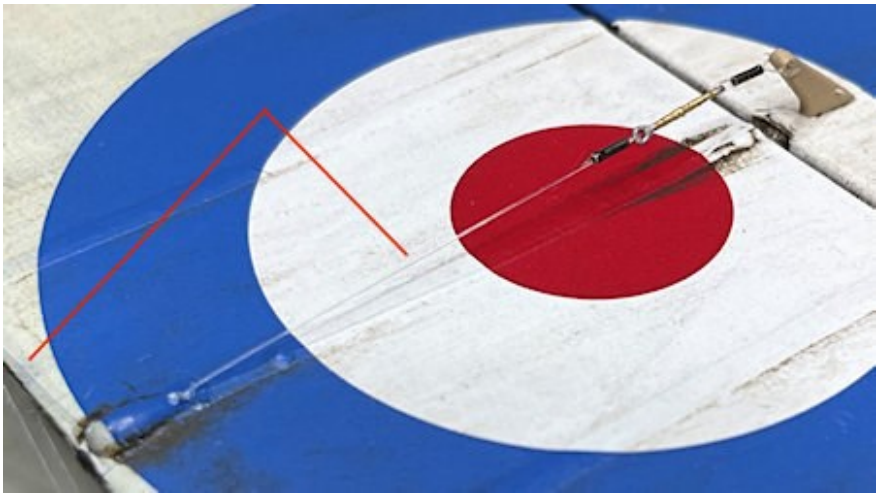
Cut away residual line at the sides of the control horn.

Pass the lines from the aileron pulley fairings through a tube and a 'Gaspatch' 1/48th scale turnbuckle (Type C) as previously described, but leave the line loose in the turnbuckle.

Pull the free end of the lines to tighten the line and move the tube up to, **but not toughing**, the 'eye' end of the turnbuckle.

Using thin CA adhesive, secure the lines in the tube.

Cut away residual line at the tube end.



Modifications (continued):

Gravity fuel tank line:

NOTE: *The locating tube for the fuel line, from the upper wing gravity tank, was fitted into the underside of the upper wing earlier in this build. Also a length of 'MFH' flexible tube was cut.*

Insert one end of the 'MFH' 0.4 mm diameter flexible black tube (P-961) into the fitted tube and secure using thin CA adhesive.

Using thin CA adhesive, secure the tube down the front edge of the left, forward cabane strut.

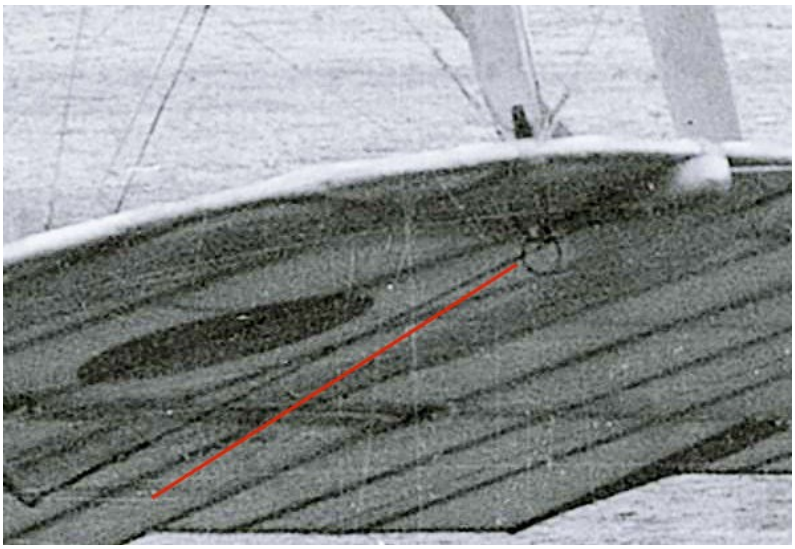
Cut the end of the tube so it can be inserted into the recess behind the bottom of the strut.

Using thin CA adhesive, secure the tube into the recess behind the bottom of the strut.

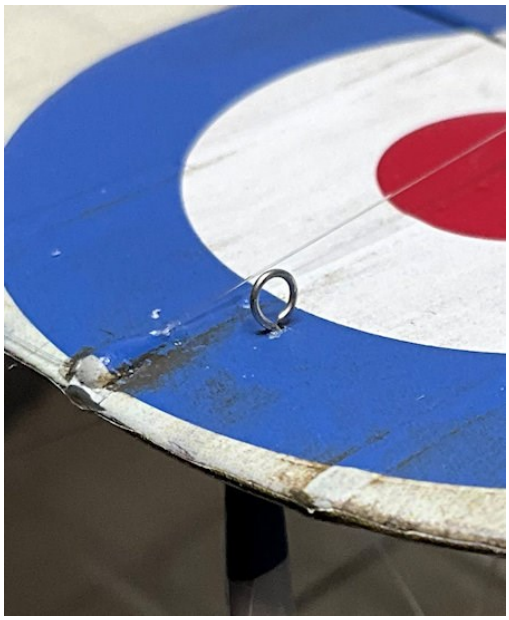
Brush paint two retaining straps around the tube, using 'Tamiya' Light Grey (XF66).

Lower wing tie down rings:

NOTE: *Tethering down rings were fitted to the underside of the lower wings.*



To represent the tethering rings, I bent a length of 0.3 mm diameter 'tinned' copper wire around a 1.4 mm diameter drill shank, to form a spring. I then cut away two rings and bent one end to a 90 degrees. A hole of 0.4 mm diameter was drilled into, **but not through**, the underside of the lower wings, outboard from the aileron pulley fairings. The 'leg' of the rings was secured in the holes using CA adhesive, with the rings parallel to the nacelle.



Assembly (continued):

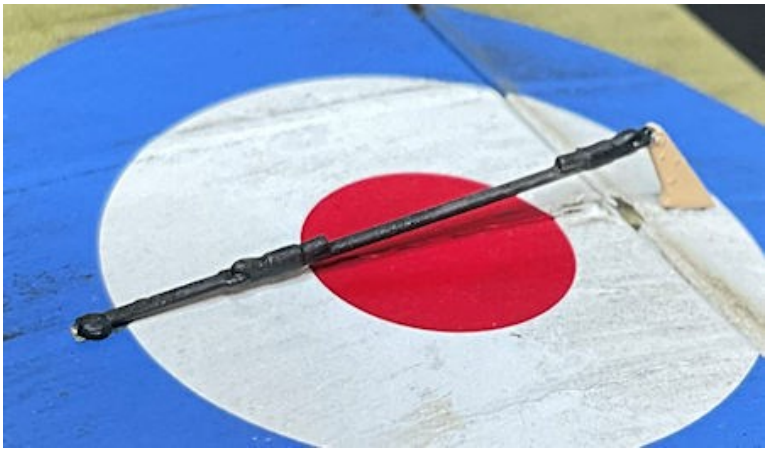
Locate the wheels onto the axle ends of the landing gear, inboard from the axle recess.

Locate the wheel retainers (D17) onto the axle recesses. If the wheels are to be fixed in position, cement the wheels and retainers to the axle.

Locate the wheel outer cover into the wheels, making sure the hole/cut-out at the edge is positioned over the valve/spokes in the wheel.

Cement the wheel covers to the wheels.

Cement the upper aileron control horn and rubber return (D12) into the recess in the upper ailerons and the pre-molded location towards the wing leading edge.

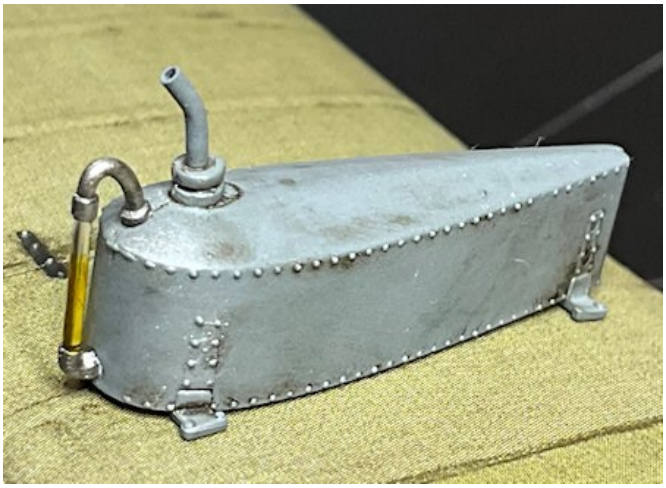


Cement the gravity fuel tank sight glass (C3) into its locating hole at the bottom, front of the fuel tank.

Brush paint the top and lower sections of the sight glass with ‘Mr. Colour’ Stainless Steel (213) or similar.

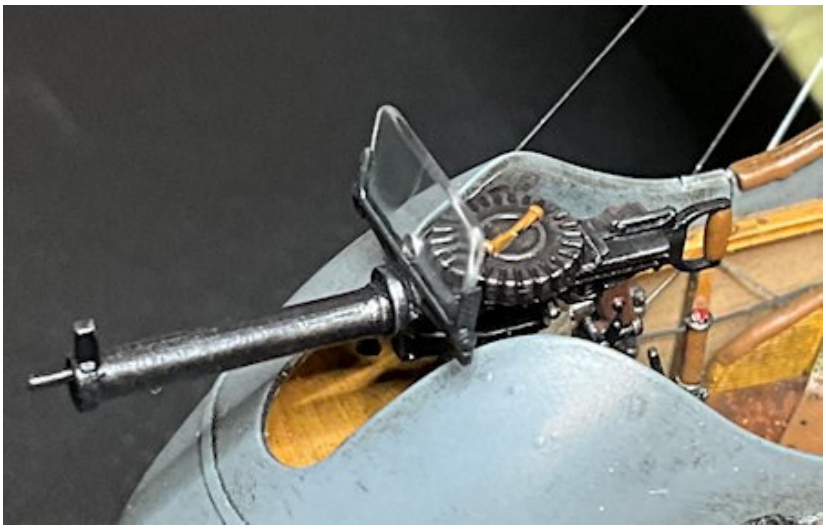
Brush paint the centre ‘sight glass’ section with ‘Tamiya’ Clear Yellow (X24) or similar.

Cement the gravity fuel tank onto it’s locating pegs on the centre section of the upper wing.

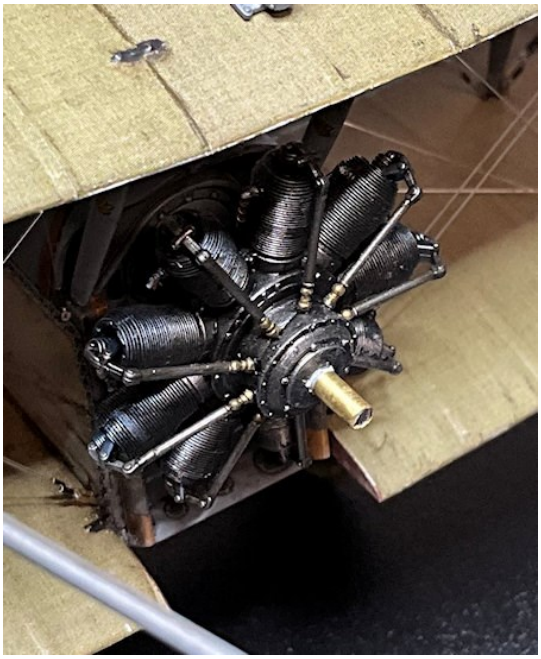


Locate the ‘Lewis’ machine gun assembly through tits locating hole in the nacelle forward panel.

Apply cement to the bottom of the mounting tube then insert it into its locating hole in the nacelle floor, making sure the weapon is aligned centrally in the nacelle.



Apply cement to the mounting shaft of the engine assembly and insert the engine fully inti its locating holes in the engine bay frames.



Using CA adhesive, secure the propeller onto the engine shaft and in the desired position.

Rigging finish:

To dull down the applied rigging, airbrush the rigging with a semi-matte clear coat, such as ‘Alclad’ Light Sheen (ALC311) or similar.

PART 13
FIGURES

PART 13 - FIGURES

The figures I chose to use are the 'Kellerkind' French dressing pilot (54/110) and the 'Blackdog' RFC Mechanic (BDF32020).

Pilot:

Preparation:

NOTE: *Refer to Part 5 (Resin) of this build log. The figure is supplied as figure, right arm and separate gloves and boots. I chose not to use the separate boots.*

Cut away the figure, arm and gloves from their casting blocks.

File or sand away residual casting resin or mold seam lines from the figure.

NOTE: *The figure, being French, has rank badges on the left arm. These were scrapped off and creases added to align with those on the arm.*

Check that there are no surface imperfections and if necessary, fill and/or sand to restore the surface finish.

Carefully drill a hole of 0.8mm diameter centrally up into one of the legs.

Cut a long length of 0.8mm diameter Brass rod, such as that from 'Albion Alloy's' or similar.

Using CA adhesive, secure the rod into the pre-drilled hole in the leg. This will be used to hold the figure when painting and mounting the figure to the display base.

Assembly:

NOTE: *The gloves are separate to the figure.*

Using CA adhesive, secure the right arm into its locating recess on the body.

Painting:

NOTE: *The figure was painted using 'AK Interactive' and 'Tamiya' acrylic paints. Thin the 'AK' paints with their acrylic thinners (AK712). 'Citadel' paints were used for flesh painting.*

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

Brush paint the figure as follows:

Flight overalls - 'AK Interactive' British Uniform Light (AK3082) with British Uniform (AK3081) as shadows. Buttons 'Mr. Colour' Stainless Steel (213) or similar.

Overall lining - 'Tamiya' Deck Tan (XF55) with light brushing of 'AK Interactive' Engine Oil (AK2019) wash.

Jacket - 'Tamiya' Olive Green (XF58) mixed with Flat Earth (XF52) to 60/40%. Buttons 'Mr. Colour' Brass (219) or similar.

Shoes - 'Tamiya' Red Brown (XF64) or similar.

Gloves - 'Humbrol' Leather (62) base with 'Tamiya' Hull Red (XF9) highlights or similar.

Head Balaclava - 'Tamiya' Rubber Black (XF85) or preferred colour.

Belt - 'AK Interactive' Brown Leather (AK3081) or similar.

Goggles - 'Humbrol' Leather (62) or similar. Lenses Stainless Steel (213) or similar. Overpaint lenses with 'Tamiya' Clear Yellow (X24).

NOTE: *The following painting technique for flesh applies to all of the figures. These are water based and can be thinned as required using water, which is also used to clean the brushes. It's easier to use a 'wet palette' when applying these paints as this keeps the paint from drying and allows mixing of paints as required. A basic wet palette can be a water proof plastic lid with dampened kitchen roll paper laid inside. The paints are then dripped onto the damp paper and applied from there.*

The paints used for the flesh of the figures are from the ‘Citadel’ colour range:

Base coat - ’Bugmans Glow’.

Flesh tone - ‘Cadian Flesh Tone’.

Flesh highlights - ‘Kislev Flesh’.

Brush ‘Bugmans Glow’ over the exposed head and hands of the figure and allow to dry.

Brush ‘Cadian Flesh Tone’ lightly over the painted head and hands of the figure and allow to dry. Do not apply the paint such that it completely covers the previous coat, as subtle shadows are necessary around such as the ears, eyes, nose and chin etc.

Brush ‘Kislev Flesh’ very lightly over the painted head and hands of the figure and allow to dry. This application is very light and intended to highlight areas such as the eye brows, ears, bridge of the nose and jaw line etc.

Using a needle point, apply ‘Tamiya’ Rubber Black (XF85) or similar to create the eye pupils.

Weathering:

Lightly sponge ’Tamiya’ Weathering Master set A (mud) over the shoes.

Lightly sponge ’Tamiya’ Weathering Master set D (oil stain) around the elbows, pockets and seat of the overalls.

Mechanic:

Preparation:

NOTE: *Refer to Part 5 (Resin) of this build log. I replaced the head of the figure with one from my 'spares' collection as the forage cap on the kit part was shaped too large. Also I cut away the tool from the left hand and did not use the spanner.*

Cut away the parts from their casting blocks.

File or sand away residual casting resin or mold seam lines from the parts.

Check that there are no surface imperfections and if necessary, fill and/or sand to restore the surface finish.

Cut three lengths of 0.8 mm diameter Brass rod, such as that from 'Albion Alloy's' or similar.

Carefully drill a hole of 0.8 mm diameter centrally up into one of the legs, making sure the drill is kept central to avoid it breaking through the leg.

Carefully drill a hole of 0.8 mm diameter centrally into, **but not through**, the left arm and into its location on the body.

Carefully drill a hole of 0.8 mm diameter centrally up into, **but not through**, the neck of the head and into its location on the body.

Using CA adhesive, secure the rods into the pre-drilled holes in the leg, head and left arm.

Test fit the left arm into its body locating hole and if necessary, bend the rod to achieve a full fit of the arm against the body and hand recess.

Cut a short length of 0.5 mm diameter Brass rod, such as that from 'Albion Alloy's' or similar.

Carefully drill a hole of 0.5 mm diameter centrally into, **but not through**, the wrist of the right hand and into its location in the right arm.

Using CA adhesive, secure the rod into the pre-drilled hole in the hand.

Test fit the right hand and head into their locating holes in the right arm and body. If necessary, bend the rods to achieve a natural fit between the head and hand.

Leave the head in position and using thin CA adhesive, secure the hand into the arm.

Remove the head without disturbing the right hand.

Painting:

NOTE: *The figure was painted using 'AK Interactive' and 'Tamiya' acrylic paints. Thin the 'AK' paints with their acrylic thinners (AK712). The head is painted separately and will be fitted once painting is complete. 'Citadel' paints were used for flesh painting.*

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

Brush paint the figure as follows:

> **Overalls and forage cap** - 'AK Interactive' British Uniform (AK3081) with British Uniform Light (AK3082) as shadows.
>
> **Shoes** - 'Tamiya' Red Brown (XF64) or similar.
>
> **Forage cap badge, belt buckle, buttons** - 'Mr. Colour' Brass (219) or similar.
>
> **Flesh and features** - Repeat the painting procedure used for the pilot figure. Brush paint the hair, moustache, eyebrows with 'Tamiya' Flat Earth (XF52) or choice of colour.

Assembly:

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

Weathering:

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

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 overalls.

PART 14
DISPLAY BASE

PART 14 - DISPLAY BASE

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

The grass mat used was the 'Polak' Wild Meadow - Variation G (4707).

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

Grass mat:

The grass mat was cut to the desired shape. The clear plastic backing was removed from the grass mat, which was then positioned on the base. The mat was laid onto the display base and positioned to ensure the model would clear the display top when located. A soft, silver coloured pencil was used to lightly trace the outline of the mat on the display base. PVA adhesive was then applied to the backing (underside) of the mat, which was then laid back onto the base, aligned to the pencil outline and gently pushed down to make proper contact. The grass mat was covered with a sheet of kitchen 'Cling Film' or paper and several heavy books were then stacked onto the covering to press the grass mat fully in contact with the display base. The books and covering were removed after two hours, when the edges of the grass mat were checked for contact (apply PVA adhesive if not). The grass tufts were gently brushed to remove any flatness.

Aircraft model:

The aircraft was not fixed to the display base, but left as 'free standing'. Although this may not be as secure as fixing the model to the display base, it does mean the model will not be subjected to shock loading when being moved around, as it might be if fixed on the display. The grass mat was scrapped through where the tyres of the wheels and the tail skid were located. This allows the model to be located into, not onto, the grass mat.

The figures:

The figures were positioned on the base in their final positions and the locating rod in the legs of the figures were marked on the grass mat. Holes of 1.0 mm were drilled through the grass mat and into (not through) the display base. PVA or CA adhesive was then applied to the rods of the figures, which were then located fully into their drilled holes. Light pressure was applied to the figures, until the adhesive had set, to ensure they were fully located and vertical in the base.

The information plaque:

The acrylic stand for the information plaque was scuffed with sand paper on its bottom surface. It was then position in the left corner of the display base and its outline lightly scored with a pointed scriber. The area inside the scribed outline was scuffed with sand paper. An adhesive, such as a contact or two-part epoxy adhesive was applied to the scuffed surfaces and the stand positioned onto the scribed outline on the display base. Once the adhesive had fully set, the information plaque was secured onto the stand, using the self-adhesive tape on the rear face of the plaque.

PART 15
COMPLETED MODEL PHOTOGRAPHS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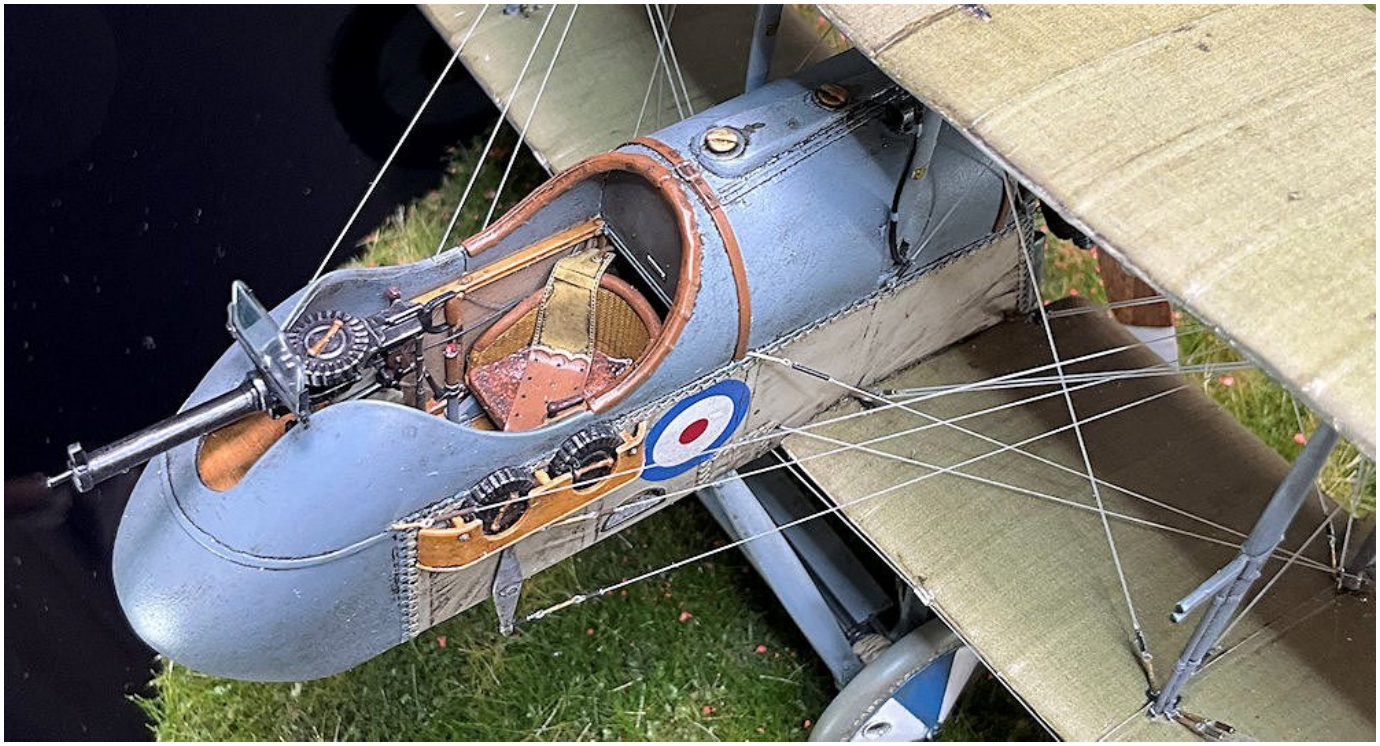

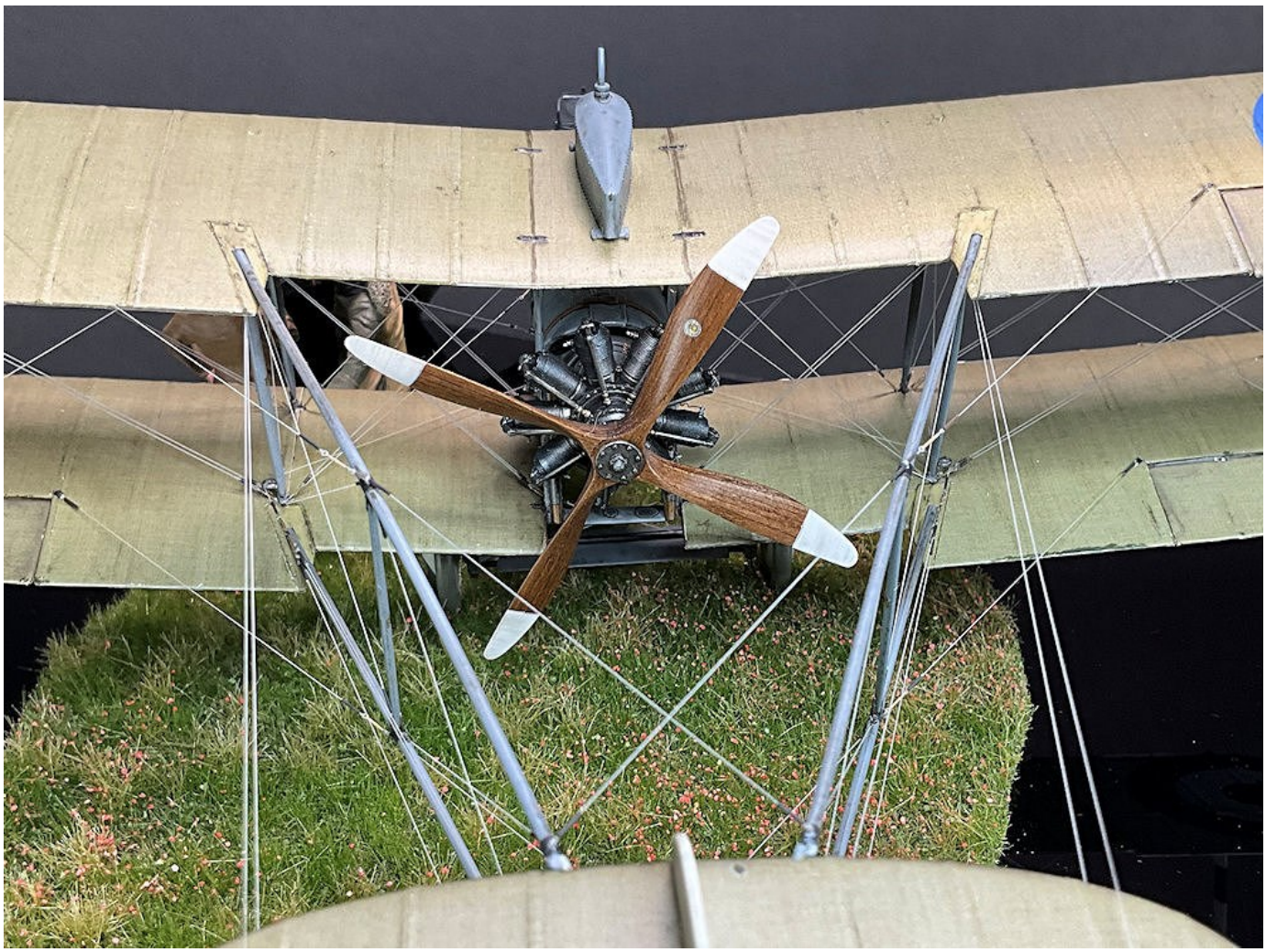

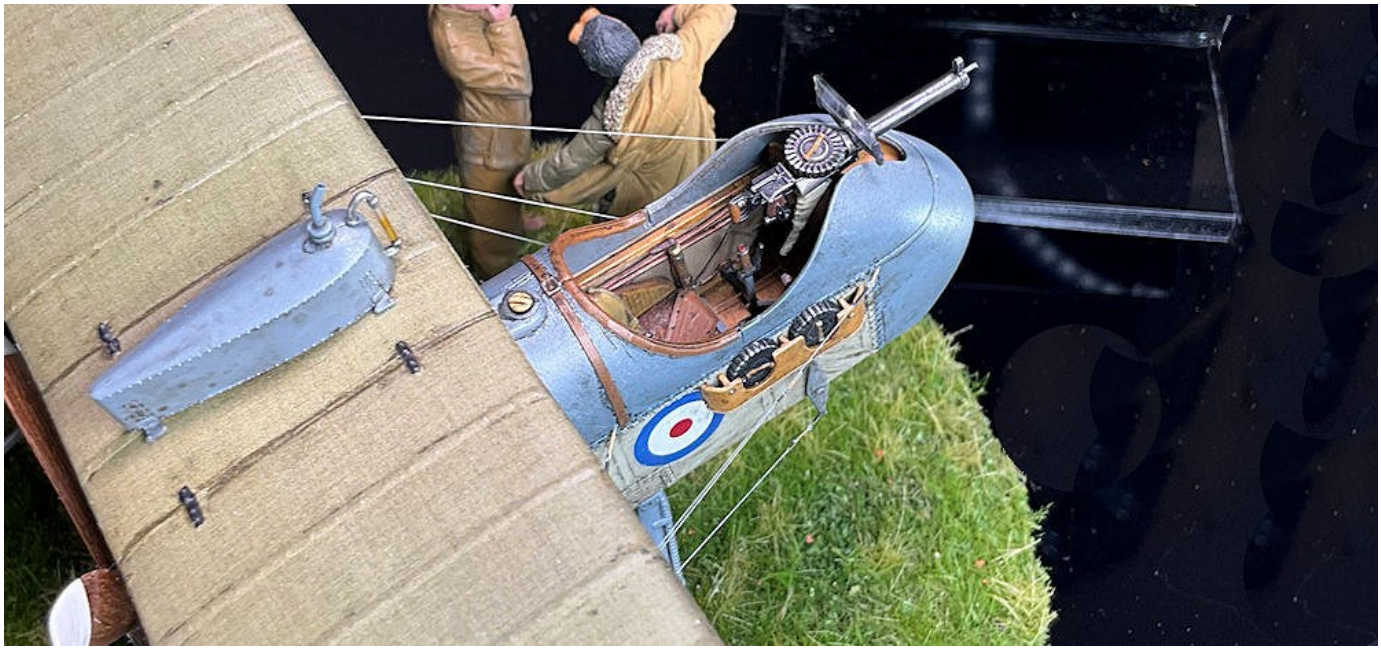

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