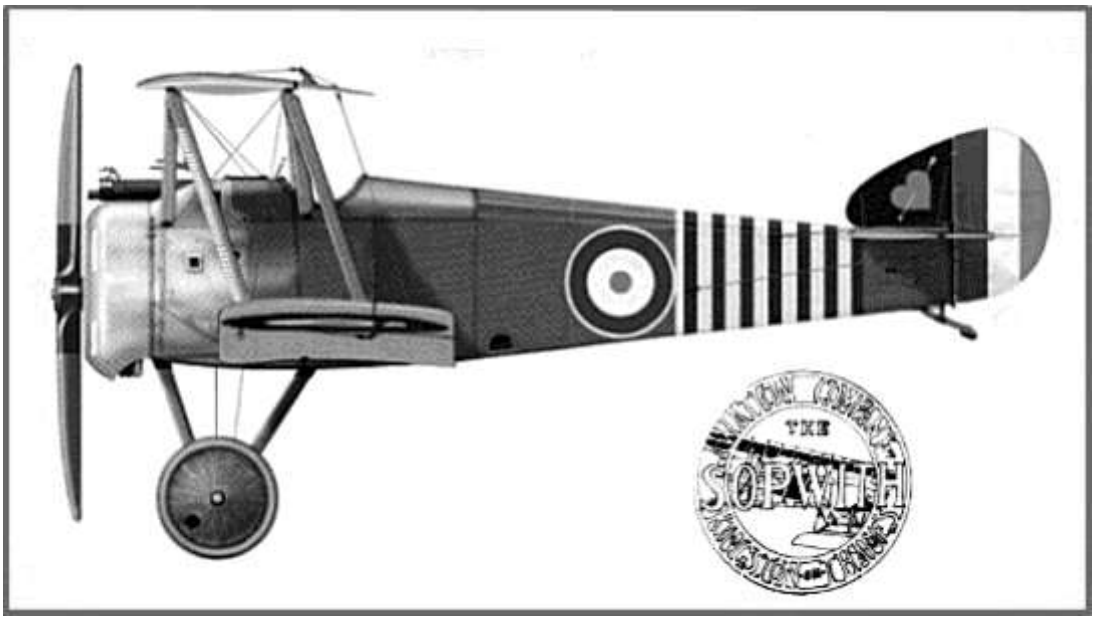


SOPWITH F1 CAMEL

World War One Aircraft Models

I have always held a fascination with early military aircraft. Before I retired I served for 27 years in the Royal Air Force, then a further 20 years as 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, 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 my build log, which covers my build of the 'Wingnut Wings' 1:32 scale model of the Sopwith F1 'Camel' flown by the Canadian ace, William George "Billy" Barker, VC, DSO and Bar, MC and Two Bars.

Mike 'Sandbagger' Norris

sandbaggeruk@sky.com

Completed: January 2019

CONTENTS

INTRODUCTION

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

Sorted

AFTER MARKET

Figures

'Blackdog Models' RFC Fighter Pilot 1914-18 No.1 (F32014),
'Copper State Models' RFC Mechanic (F32-0026).

After Market Parts

'HGW Models' Sopwith Camel seat belts (132590),
'Barracuda Studios' Wicker Seat and cushion (BR32332),
'Proper Plane' Lang type propeller (WP004)'
'Copper State Model' Tools and Cans set (AE32-005),
'JadarHobby Shop' - 1:48 scale WW1 control horns (48087),
'Aber' 1:35th scale photo-etch Hand Tools (35-A68),
'Kellerkind' Ladder and Trestle set (54-061).

Decals

'Aviattic' - Clear Doped Linen (ATT32094),
'Aviattic' PC12 'Light' RFC/RAF (ATT32092).
'Xtradecal' Parallel Stripes (White - XPS2 and Black - XPS1).

Rigging accessories

Various 'Albion Alloy' Micro-tube (Brass or Nickel Silver),
'Steelon' Mono-Filament 0.12mm diameter.
'Stroft GTM' Silicon-PTFE tempered monofil (Blue/Grey 0.08mm diameter),
'RB Motion' 0.51mm Aluminium hexagonal nuts (1279-A).

Sundries

'Araldite' two part epoxy adhesive, Paints ('Tamiya' Acrylic, Humbrol Acrylic, Mr Metal Colour), 'AK Interactive' Primer and micro-filler (Grey AK758) and (White AK759), 'Alclad' Lacquers, Mr. Colour Levelling Thinners, PVA Adhesive, Cyanoacrylate (CA) glue (thin), 'Fleky 5' CA adhesive, Blue or White Tack, Vallejo Plastic Putty, Sanding and/or Polishing sticks from 'Flory Models', 'PlusModel' lead wires, 'Vallejo' Still Water (26.230), 'Masilla Plastica (401) putty, 'Flory' pigments, 'RB Motion' aluminium nut (1279-A), 'Humbrol' Maskol, EZ Line' (White heavy), 'Bostik 'Blutack, 'UHU' White Tack, 'Johnson' Pledge Floor Care finish.

Weathering mediums

'Flory Models' clay washes and pigments, AK Interactive engine washes, 'Tamiya' Weathering Master sets, 'Abteilung 502' oil paints, 'Tamiya' Enamel Thinners (X20).

Display Base

Purpose built Acrylic base and cover, etched plaque (information plate).
'Polak' grass mat - Wild Meadow (4706)

THE MODEL (GENERAL)

('Wingnut Wings' Kit No.32074)

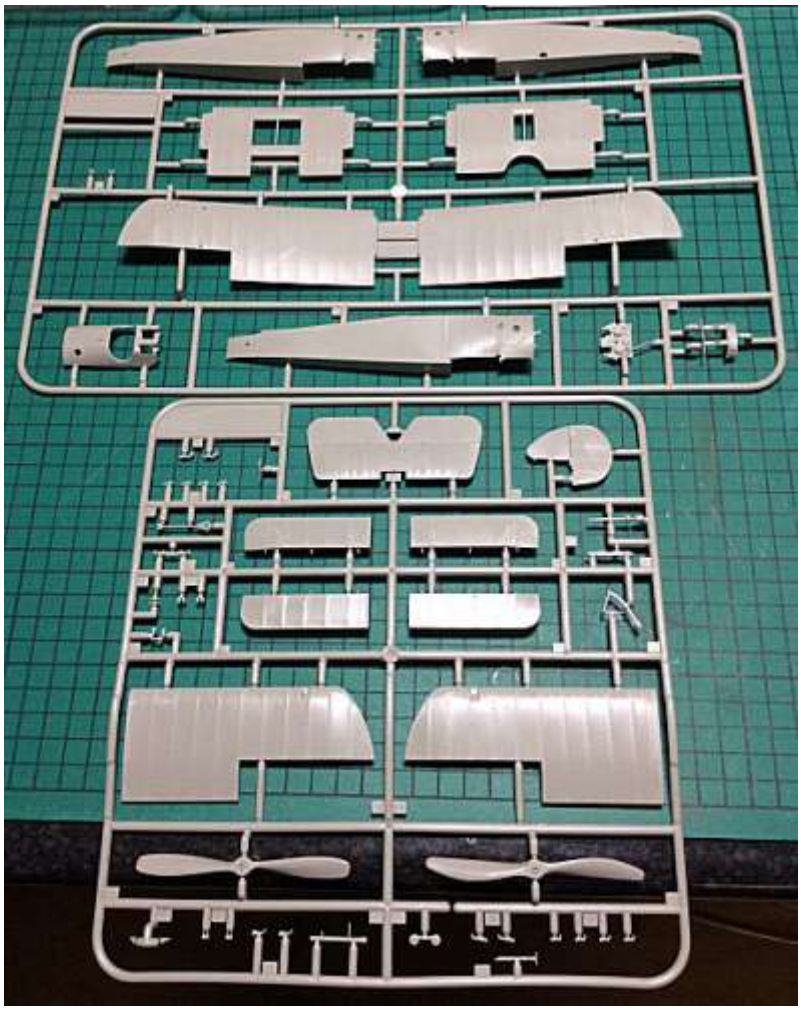
This particular aircraft has been released by 'Wingnut Wings' as four separate kits, three of which depict a different engine version and one of the Naval ship version. That said there are common parts included within each of the kits.

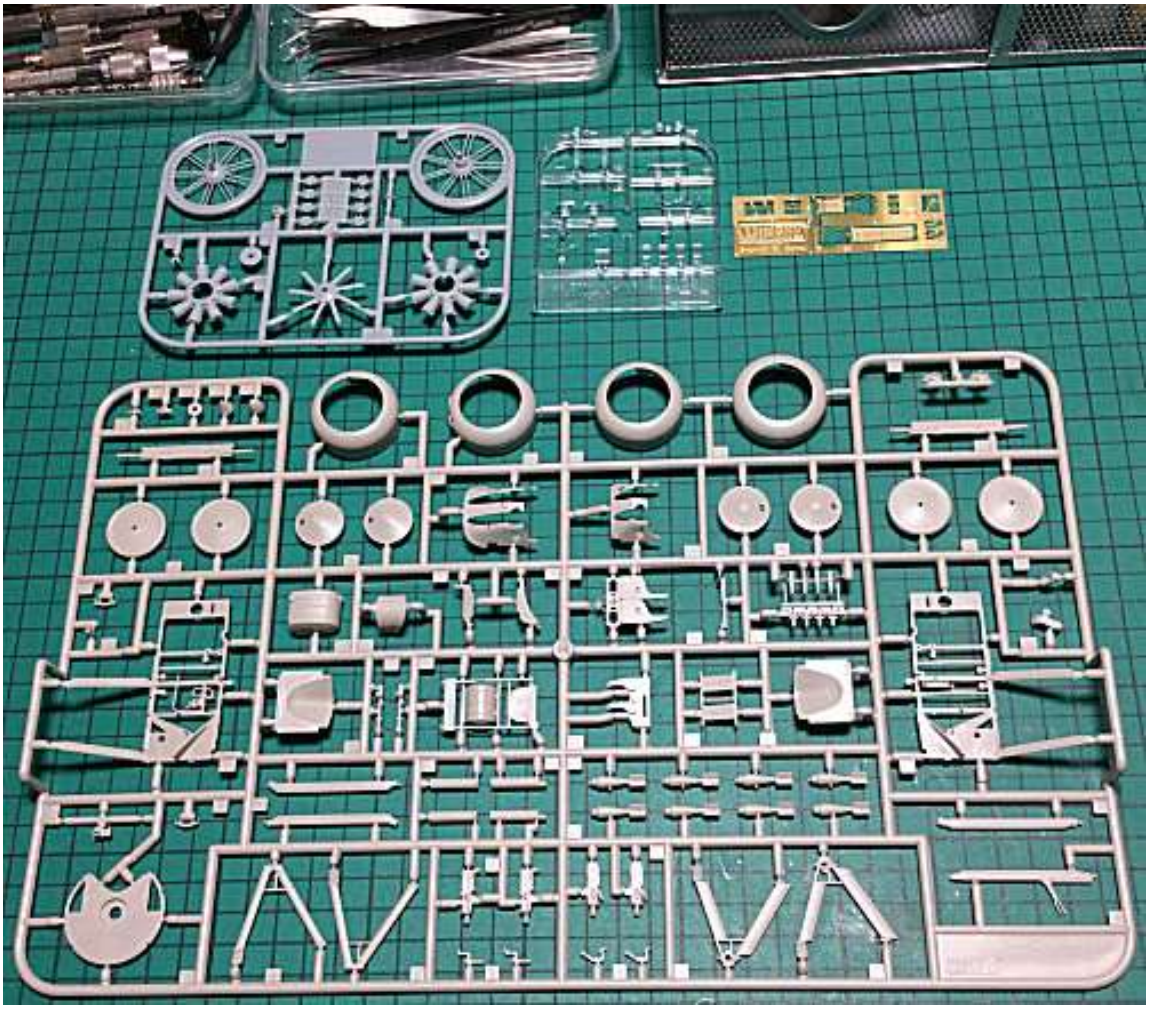
As expected, any model from 'Wingnut Wings' (WNW) is at the top of quality and accuracy. The kit components are not a numerous as many of their kits, which is good if you are building a WNW kit for the first time. The parts are manufactured from traditional 'plastic', not resin. There is minimal mould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

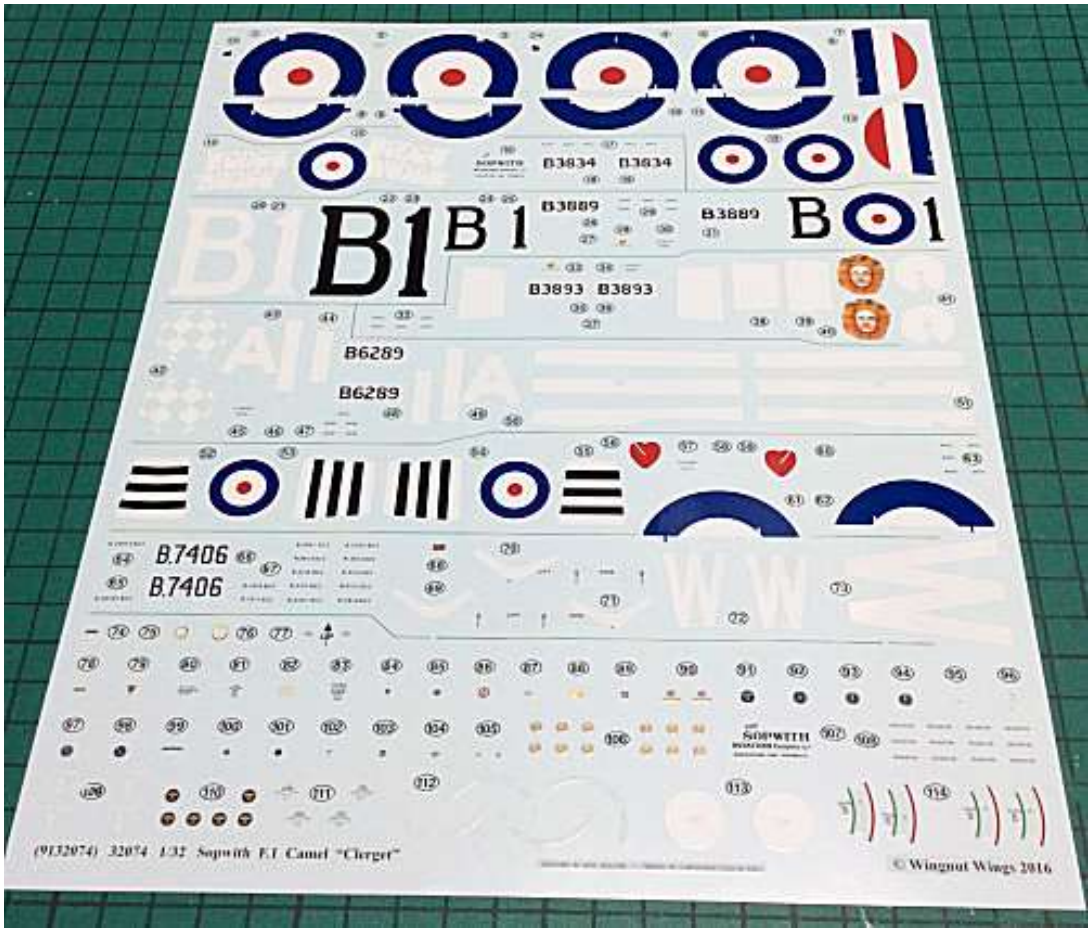
The decal sheets supplied are by 'Cartograf' so should be of the best quality in both colour and registration. However some modellers have experienced problems with the decals supplied in some recent Wingnut releases, but I will only be using some of Barker's personal and national markings.

The instruction manual is in the well known format that WNW produce and has clear and concise instructions, including coloured illustrations and photos for reference. Also the manual has a lot of information on the aircraft including a colour profile of 'Wingnut Wings' interpretation of the earlier of Barker's aircraft colour scheme.

The kit chosen (No.32074) is of the 'Clerget' engine type and does include decals for Barker's earlier markings for 'Camel' B6313. However the fuselage bands can't be used as the later version had thirteen bands, not seven as supplied in the kit. However the arrowed heart decals can be used.







After Market additions

PREFACE

This model represents the Sopwith F1 'Camel', Serial No.B6313, as flown by Major William George 'Billy' Barker, CO of No.139 Squadron, RAF, based at Villaverla, Italy during August 1918.

The pilot:

References:
Osprey Aircraft of the Aces - Sopwith Camel Aces of WW1 by Norman Franks.
Various online resources (e.g. Wikipedia).

William George 'Billy' Barker was born in a log cabin on a farm near the small town of Dauphin, Manitoba in 1894. As a teenager, he was known for his keen eyesight and marksmanship.

Wartime service:

In December 1914, he enlisted in the 1st Canadian Mounted Rifles with whom he served for 8 months as a machine gunner at Ypres, before being accepted in the Royal Flying Corps in April 1916, first as a mechanic then qualifying as a gunner. In August 1916 he received a commission as a second lieutenant, serving as an observer as an observer flying in a B.E.2d two-seater reconnaissance aircraft. He received his first MC doing aerial photography. In July of that year, he recorded his first victory, driving down a German scout aircraft using his observer's gun. At the beginning of 1917, he was sent to flying school for four weeks' instruction to become a pilot. Promoted to flying officer in February 1917, Barker returned to the Western Front again in two-seater reconnaissance aircraft (the B.E.2 and the R.E.8), but this time seated in the front pilot's seat. Three months later, he was promoted to captain and given command of a flight of aircraft (four to six aircraft).
After being wounded in August 1917, he was transferred back to England to become a flight instructor. Hating his new job, he quickly got himself reassigned to active duty in France, though not before getting into trouble doing acrobatics over London. Barker began flying the Sopwith 'Camel', a single seater fighter, armed with twin synchronized machine guns. It proved to be a lethal combination of man and machine. Flying the highly manoeuvrable though temperamental 'Camel', Barker could fully exploit his skills as a marksman. Shortly after his return to France in late October he officially became an ace, downing his fifth German aircraft, a German Albatros D.III fighter. Other "kills" quickly followed. Barker's Sopwith 'Camel', Serial number B6313, was to become the most successful fighter aircraft in British history.

When his squadron was transferred to the Italian Front in late 1917, Barker took aim at the Austrian air force. By April 1918, he had twenty-two victories. He also earned a reputation for taking down observation balloons, a deadly enterprise since the balloons were heavily protected by anti-aircraft guns. In July, he was promoted to major and given command of the No. 139 Squadron. Although the squadron flew the two-seater Bristol F.2b fighter and reconnaissance aircraft (also known as the "Brisfit"), Barker continued to prefer flying his cherished Sopwith 'Camel'. When the Prince of Wales (later Edward VIII) visited the squadron in the summer of 1918, Barker took him aloft in a Brisfit, with the prince occupying the rear observer's seat. Barker flew the prince deep into enemy territory before returning to the Allied lines. Fortunately, although they encountered anti-aircraft fire from the ground, no Austrian aircraft went up to challenge them. By September 1918, he was a highly-decorated ace with at least forty-six victories to his credit. Even more to his credit was the incredible achievement of not losing a single pilot or

Ordered back to England to take command the flight school at Hounslow, Barker's greatest exploit, for which he was to earn the Victory Cross, was yet to come. Arguing that he needed to reacquaint himself with the Western Front to do his job properly, he obtained a ten-day roving commission in France. On 27 October 1918, on the last day of his commission and only two weeks prior to the end of the war, he encountered a German reconnaissance aircraft over the Forêt de Mormal while flying the new Sopwith 7F.1 Snipe. Although Barker managed to down the two-seater craft, he made a rookie mistake and was caught unaware by a German fighter that had sneaked up behind him. He only found out that he was being pursued when his right leg was shattered by a bullet. Despite the pain, Barker managed to circle around the Fokker DVII, and bring it down too.

From there, things only got worse. Somehow during the dog fight with the Fokker, Barker had managed to stumble into an entire "circus" of German fighters. While accounts regarding the number of enemy aircraft vary from 15 to an incredible 60, Barker was vastly outnumbered. In front of thousands of Allied soldiers Barker managed to bring down two more German fighters but not before receiving crippling wounds to his left thigh and left elbow. His Snipe, hit repeatedly, with its fuel tank shot away, crashed behind British lines. Barker, amazingly still alive, was pulled from the wreckage by Scottish troops. On 20 November 1918, he was awarded the Victory Cross for this epic, single-handed battle, and the congratulations of his grateful Sovereign, the Prince of Wales, and Sir Robert Borden, the Canadian Premier.

Post war:

In early 1919, still recovering from his wounds, Barker flew again with the Prince of Wales, taking him on a tour of London by air. Barker needed canes to walk to the aircraft, and flew with his left arm strapped to his breast. Speaking of his flight, the Prince commented: "I have enjoyed it immensely but what a sensation it is when you go over backwards." The RAF promoted Barker to Lieutenant Colonel. On his return to Canada later that year, Barker entered civilian aviation in partnership with Billy Bishop.

Together they operated an air-charter and aircraft maintenance firm located at Armour Heights Air Field in Toronto. In 1921, Barker married Jean Smith, the cousin of Billy Bishop. Their daughter Antoinette was born in 1923.

As was the case with many early civil aviation operations, Bishop-Barker Aeroplanes failed in 1922. Barker then joined the Canadian Airforce (CAF) and was made commanding officer of Camp Borden. Subsequently, he was made acting director of the CAF, and for a time lived in Ottawa. In 1924, with the establishment of the Royal Canadian Air Force, he was sent to England to act as the RCAF's liaison officer with the British Air Ministry. He later studied at the RAF Staff College at Andover and saw service with the RAF in the Middle East.

In 1926, Barker resigned his commission from the RCAF, reportedly because he didn't get along with his commanding officer. For a time, he operated a tobacco farm owned by his father-in-law, Horace B. Smith. This did not go well. In 1927, Conn Smythe, the general manager of the Toronto Maple Leafs (himself a former RAF pilot), made Barker the team's first president.

However civilian life did not come easy to the war hero. Like many veterans, he suffered from post-traumatic stress disorder. For a time, he turned to alcohol to quell his demons. His family life suffered.

In early 1930, things finally looked like they were turning around for him. He had just landed the job of vice president and general manager of the Fairchild Aviation Company of Canada in Montreal. The day of his death, he was in Ottawa to help sell the company's new trainer aircraft, the two-person, Fairchild KR-21B biplane, to the Department of National Defence.
Wednesday, 12 March 1930, was a typical, late winter day in Ottawa. Weather conditions were good, with the wind out of the west, and a high temperature of 7 degrees Celsius. The Fairchild trainer was flown from Montreal to the Rockcliffe aerodrome in the morning by Captain Donald Shaw, the Fairchild Company's test pilot. The trip was uneventful, with the airplane performing as it should. Shortly before 1pm, William Barker, who had travelled to Ottawa by train, decided to take the airplane up for a spin.

He had never flown that model aircraft before but liked to take every opportunity to fly to maintain his competency. Apparently, until he joined the Fairchild Aviation Company two months earlier, he had done little flying since leaving the RCAF in 1926.

Barker seated himself in the real cockpit of the small trainer with registration marking CF-AKR. He warmed up his engine, taxied into the wind, and made a perfect take-off. After circling the airfield, he flew to the north-east across the Ottawa River to the Quebec side. Turning back towards the Rockcliffe aerodrome, something went wrong. One observer, struck by the odd manner in which the airplane was performing, claimed that he had a premonition that something was about to happen. Flying at an altitude of only a couple of hundred feet, the aircraft swerved and then plummeted straight down into the slushy ice of the Ottawa River roughly one hundred yards from the Rockcliffe slip close to the aerodrome. Striking the ice nose first, Barker's aircraft crashed onto its left side. The plane was a tangled wreck. One of the blades of the propeller was sheared off on impact, while the other was broken in two. The engine was jammed back into the fuselage by the force of the crash. Only the rear of the plane and its right wing were left relatively intact. Col. Barker was found still seated in the real cockpit, but he was beyond human help. His body had been crushed on impact, his head smashed against the dashboard of his control panel.
News of the accident flashed through a stunned Capital. Immediately the Department of National Defence established a board of inquiry to examine the cause of the fatal crash. The Board determined that the Fairchild trainer was airworthy before the crash, that weather conditions were good, and that Col. Barker was a "commercial pilot in good standing." Other than these basic facts, Board members had to depend on unreliable eye-witness testimony to draw their conclusions. Their verdict was pilot error. Later, there was speculation that Barker, suffering from depression, may have killed himself. But there is no evidence to support this contention. In many respects, the reasons for the crash remain a mystery.
Col. Barker's body was conveyed by train to the home of his father-in-law at 355 St. Clair Avenue West in Toronto where distinguished guests and friends paid their last respects. On the Saturday afternoon after the accident, his body was brought to Toronto's Mount Pleasant Cemetery and was laid to rest in the Smith family mausoleum. Two thousand servicemen, representing all of the Toronto-area regiments, paraded in his honour. Immediately behind the casket walked family and friends, Ontario Premier Ferguson, Major General McNaughton, and a group of Victory Cross recipients. A warrant officer bore Col. Barker's medals on a cushion. More than 50,000 people lined the route of the funeral cortege down St. Clair Avenue to the cemetery. Overhead a flight of planes flew, each in turn swooping down to shower the procession with rose petals. At the mausoleum, Rev. Canon Broughall, rector of Grace-Church-on-the-Hill, officiated at a short service.

Conclusion:

For decades, there was little way of a public memorial to Lieutenant- Colonel William Barker, V.C., buried as he was in the Smith family's mausoleum. In 2011, his grandchildren righted this wrong. They erected a monument outside of the mausoleum, consisting of a bronze propeller blade rising from a granite base with a bronze picture of Barker and a plaque noting his distinction as 'The most decorated war hero in the history of Canada and the British Empire'. There for the official unveiling of the memorial was Barker's descendants and the Lieutenant Governor of Ontario, David Onley. Overhead, two vintage planes, one of them a Sopwith Snipe, and a CF-18 fighter flew a salute while a bugler sounded *The Last Post*.

During his military service, Barker received the Victoria Cross, the highest awarded throughout the Commonwealth for gallantry in the face of the enemy. He was also awarded the Distinguished Service Order (twice), the Military Cross (three times), the *Croix de Guerre* from France, and the Silver Medal for Military Valour from Italy (twice). He was additionally mentioned in dispatches three times. He was active on the Western Front in France and on the Italian Front.

	DATE	TIME	SQN	AIRCRAFT	OPPONENT	LOCATION
				Observer victories		
	July 16	*N/K*		*BE2d*	*Scout*	*N/K*
				Sopwith Camel victories		
1	20 Oct 17	12.15	28	Camel B6313	Albatros D.III	Roulers
2	26 Oct 17	12.15	28	Camel B6313	Albatros D.V	West of Roulers
3	26 Oct 17	12.20	28	Camel B6313	Albatros D.V	Roulers-Thielt
4	29 Oct 17	12.15	28	Camel B6313	Albatros D.V	Pieve di Soligo
5	3 Dec 17	12.45	28	Camel B6313	Balloon	North East of Conegliano
6	3 Dec 17	12.50	28	Camel B6313	Balloon	North East of Conegliano
7	29 Dec 17	08.45	28	Camel B6313	Balloon	North East of Pieve di Soligo
8	1 Jan 18	1100	28	Camel B6313	Albatros D.V	NW of Vittorio
9	24 Jan 18	1620	28	Camel B6313	Balloon (shared)	East of Conegliano
10	24 Jan 18	1620	28	Camel B6313	Balloon (shared)	East of Conegliano
11	02 Feb 18	1050	28	Camel B6313	Phönix D.I	South West of Conegliano
12	02 Feb 18	1050	28	Camel B6313	C Type	Gera
13	05 Feb 18	1200	28	Camel B6313	Albatros D.III	North West of Oderzo
14	05 Feb 18	1215	28	Camel B6313	C Type	Cornure
15	12 Feb 18	1445	28	Camel B6313	Balloon (shared)	Fossamerlo
16	12 Feb 18	1445	28	Camel B6313	Balloon (shared)	Fossamerlo
17	12 Feb 18	1445	28	Camel B6313	Balloon (shared)	Fossamerlo
18	12 Feb 18	1445	28	Camel B6313	Balloon (shared)	Fossamerlo
19	12 Feb 18	1445	28	Camel B6313	Balloon (shared)	Fossamerlo

	DATE	TIME	SQN	AIRCRAFT	OPPONENT	LOCATION
20	18 Mar 18	1245	28	Camel B6313	Albatros D.III	Villanova
21	19 Mar 18	1245	28	Camel B6313	Albatros D.III	Bassiano
22	19 Mar 18	1250	28	Camel B6313	Albatros D.III	North of Cismon
23	17 Apr 18	1100	66	Camel B6313	Albatros D.III	East of Vittorio
24	08 May 18	1920	66	Camel B6313	C Type	Annone-Cessalto
25	11 May 18	1045	66	Camel B6313	Albatros D.V	Torre di Mosto
26	20 May 18	0800	66	Camel B6313	Albatros D.V	Levico
27	20 May 18	0803	66	Camel B6313	Albatros D.V	Levico
28	21 May 18	0750	66	Camel B6313	Lloyd C	North of Treviso
29	23 May 18	1215	66	Camel B6313	C Type	South of Motta
30	24 May 18	1045	66	Camel B6313	Albatros D.V	Grigno-Val Sugana
31	24 May 18	1050	66	Camel B6313	Albatros D.V	Val Sugana
32	03 June 18	0830	66	Camel B6313	Brandenberg C	Fiume-Feltre
33	09 June 18	1020	66	Camel B6313	Brandenberg D	Levico
34	09 June 18	1025	66	Camel B6313	Brandenberg D	Levico
35	21 June 18	0900	66	Camel B6313	Albatros D.V	Motta
36	25 June 18	0910	66	Camel B6313	Brandenberg D	Susegana
37	13 July 18	0705	66	Camel B6313	Brandenberg D	Conegliano-Godega
38	13 July 18	0708	66	Camel B6313	Albatros D.V	South of Godega aerodrome
39	18 July 18	0805	139	Camel B6313	C Type	South of Gallio
40	18 July 18	0810	139	Camel B6313	C Type	North of Asiago
41	20 July 18	N/K	139	Camel B6313	Albatros D.V	Motta
42	20 July 18	N/K	139	Camel B6313	Albatros D.V	Motta

	DATE	TIME	SQN	AIRCRAFT	OPPONENT	LOCATION
43	23 July 18	N/K	139	Camel B6313	Albatros D.V	Godega aerodrome
44	18 Sept 18	1000	139	Camel B6313	D Type	South of Feltre
45	18 Sept 18	1000	139	Camel B6313	D Type	South of Feltre
46	18 Sept 18	1005	139	Camel B6313	D Type	North of Queroe
				Sopwith Snipe victories		
47	*27 Oct 18*	*0825*	*201*	*Snipe E8102*	*Rumpler C*	*Mormal Woods*
48	*27 Oct 18*	*0830*	*201*	*Snipe*	*Fokker D.VII*	*Mormal Woods*
49	*27 Oct 18*	*08.30*	*201*	*Snipe*	*Fokker D.VII*	*Mormal Woods*
50	*27 Oct 18*	*08.30*	*201*	*Snipe*	*Fokker D.VII*	*Mormal Woods*

THE AIRCRAFT

References:

Osprey Aircraft of the Aces - Sopwith Camel Aces of WW1 by Norman Franks.
Windsock Data File No.26 - Sopwith Camel by J.M Bruce.
Schiffer Military History Book - British Aviation Squadron Markings of WW1 by Les Rogers.
Osprey Publishing - Sopwith Camel vs Fokker Dr.1 by Jon Guttman
Various online resources (e.g. Wikipedia).
'Wingnut Wings' kit instruction manual.

NOTE:

In the Spring of 1918, a flight of Bristol F2b ('Brisfit') fighters arrived in Italy and initially were attached to No.28 Squadron then later to No.34 Squadron, and were known as 'Z' Flight. When a second flight of aircraft joined them, the two flights were combined to form No.139 Squadron. Although the squadron flew the two-seater 'Brisfit' fighter and reconnaissance aircraft, Barker chose to continue to fly his cherished Sopwith 'Camel', Serial No.B6313.

Aircraft development:

Based on extractions from the 'Wingnut Wings' instruction manual:

The Sopwith Aviation Co. developed the 'Camel' in late 1916 in an effort to overcome the single gun handicap suffered by their successful 'Pup' fighter and to improve performance with a more powerful engine. The initial Sopwith F.1 'Camel' prototype was unveiled in late December 1916 and featured a single piece top wing, 2 Vickers Mk.1 machine guns and a 110hp Clerget 9Z engine. Unlike their previous 'Pup' and 'Triplane', the 'Camel' featured a top wing with no dihedral coupled with a high 5 degree dihedral bottom wing which, combined with its concentrated centre of gravity, helped contribute to it's high manoeuvrability, but well deserved reputation as a difficult and frequently dangerous aircraft to fly. Additional prototypes were produced with various improvements including a 3 piece top wing with centre section cut-out and 130hp Clerget 9B engine. Testing by selected operational pilots in early 1917 brought mostly positive reports along with a few recommendations for additional improvements, some of which made their way on to early production aircraft.

The Sopwith F.1 'Camel' went into production in January 1917 and aircraft began equipping Royal Naval Air Service (RNAS) and Royal Flying Corps (RFC) Squadrons in May and June 1917. Initial problems with performance above 10,000ft, mostly attributed to the poor quality of British manufactured 130hp Clerget 9B engines, were troubling and lead to various other engines eventually being used. The RNAS preferred the 150hp AR.1 (Admiralty Rotary 1), later renamed the BR.1 (Bentley Rotary 1), while the RFC preferred the 110hp LeRhone 9J or the improved 140hp Clerget 9Bf when they became available. Many 130hp Clerget 9B engines were upgraded in the field to 140hp 9Bf specifications after a conversion kit was made available in April 1918. The Sopwith Kauper interrupter gear used by Clerget and Bentley powered aircraft proved troublesome but the Constantinesco CC synchronizing gear used by LeRhone powered 'Camel's were relatively trouble free. Other changes included aileron control horn tie wires, re-routing the tailplane control cable exits on the side of the fuselage and a field modified enlarged top wing centre section cut-out which was incorporated on many late production aircraft. After it's initial teething problems the Sopwith 'Camel' proved to be a highly capable fighter and, along with the SE.5a and French SPADs, helped wrest air superiority back from the German Albatros fighters towards the end of 1917.

Around 5,500 ‘Camel’s were built by The Sopwith Aviation Co., Ruston Proctor & Co, Boulton & Paul, Clayton & Shuttleworth, Nieuport & General Aircraft, Hooper & Co, Portholme Aerodrome, Marsh Jones & Crib and British Caudron. A shipboard version with shorter wingspan and a removable rear fuselage was produced for the RNAS as the Sopwith 2F.1 ‘Camel’ from September 1917. A night fighter conversion with 2 Lewis guns mounted on the top wing and the pilot seated further rearwards was known as the Sopwith F.1/3 ‘Comic. A prototype high wing monoplane version was built and test flown and was called the ‘Swallow’, but never went into production. The USAS arranged to equip 5 squadrons with ‘Camel’s, many of which were powered by the 160hp Gnome 9N Monosoupape engine. Other nations to use the ‘Camel’ were Belgium, Latvia, Estonia and Canada. Although rendered obsolete by the arrival of the 230hp Sopwith 7F.1 ‘Snipe’ in late 1918, the ‘Camel’ continued to serve though to the Armistice and was not officially declared obsolete by the RAF until late 1919.

Specifications:

Wingspan - 28’ (8.53 m)
Length - 18’ ¾” (6.02m)
Max Weight - 1,424 lbs (691kg)
Max Speed - 116 mph (186 kph)
Service Ceiling - 20,500 ‘ (6,250 m)
Engine - ‘Clerget’ 9Bf (140hp)
Weapons - Two Vickers Mk.1 synchronized machine guns (calibre 0.303” [7.7mm])
Bomb load (optional) - Max of 100 lbs (45kg).

Barkers ‘Camel’ modifications:

William Barkers Sopwith ‘Camel’, Serial No.B6313, was built by ‘Sopwith Aviation Ltd’ in a batch serial numbered B6201 to B6450 and became the highest scoring ’Camel’ of WW1. It was initially marked with his personal scheme of seven alternate black and white bands, equally spaced, around the rear of the fuselage and on the fin, an arrowed heart, with the arrow head pointing down towards the bottom, rear of the fin. The aircraft was modified by having the forward decking of the cockpit removed for improved visibility. It is this version that is a build option in the ‘Wingnut Wings’ kit.

Later, Barker this aircraft further modified by having extra cooling slots (four in total) cut into the engine cowl and also had the linen covering removed from the rear of the upper wing centre section, again to improve visibility from the cockpit. The personal colour scheme was also changed to increase the number of white bands around the rear of the fuselage. On the fin, the arrowed heart was reversed with the arrow head pointing down towards the bottom, centre of the fin. Throughout its life, B6313 had the external linen surfaces recovered several times.

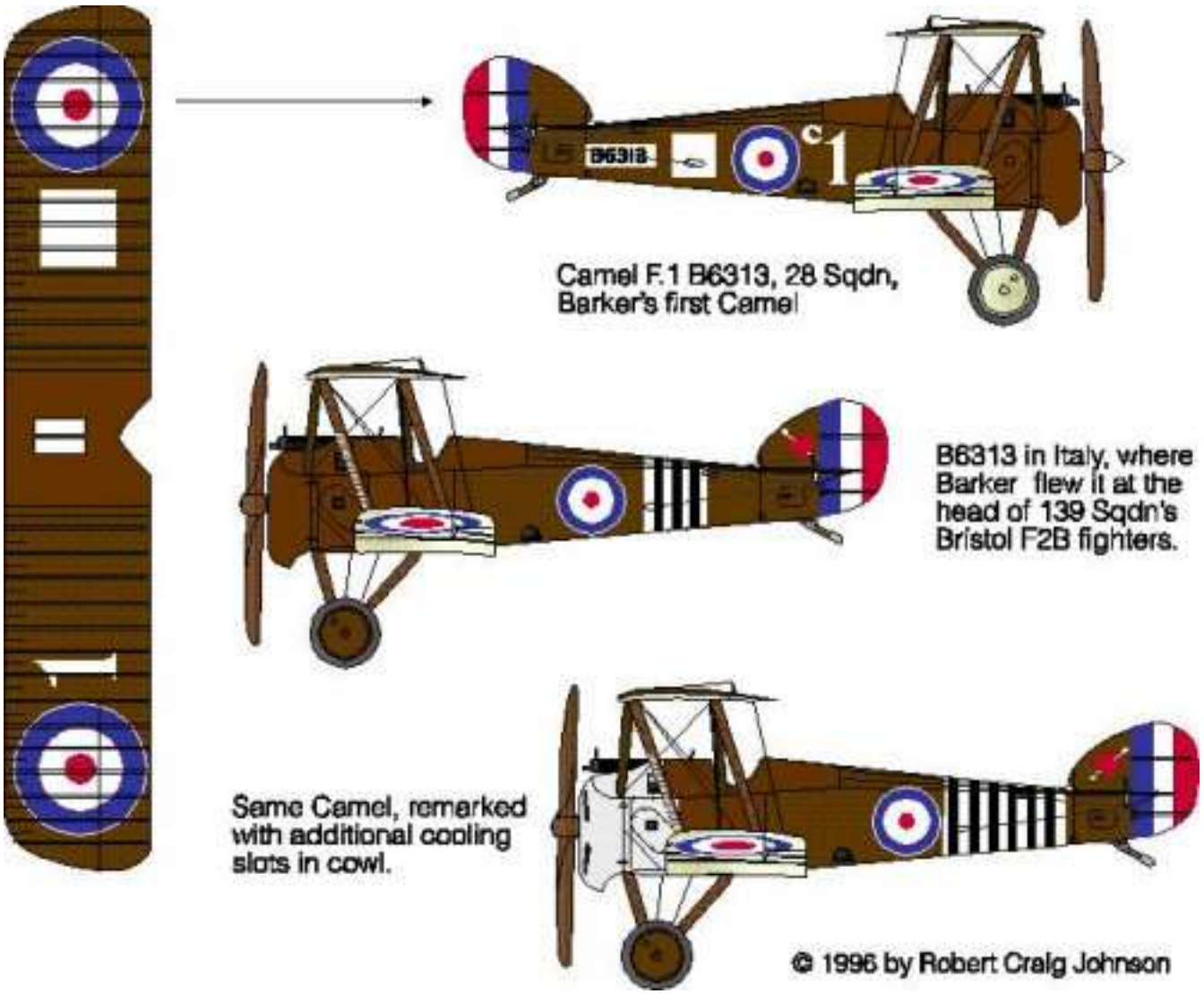
William Barker's Sopwith 'Camel', Serial No.B6313 (**later colour scheme**), Italy 1918

As with most colouring for World War One aircraft, it's debatable as to the exact colours and tints. New aircraft colours would differ from those that have 'seen service' and age and the ambient conditions would have altered these colours. In addition, the chemical mixture of the various dopes changed throughout the war, due to short supplies of some of the ingredients and the particular aircraft manufacturers take on a particular colour specification. Most available colour photographs are of museum aircraft and modern replicas, which may or may not be accurate depictions of the actual colour at the time. In addition, many 'colourised' photographs are created by individuals who's interpretation of colours from monochrome photographs can be open to misinterpretation. Dark and light shades in monochrome photographs are not literally 'black or white'. For instance what looks to be black in colour could have been red or blue.

When researching the colour schemes and finish for this particular aircraft I found that as usual, there are different interpretations available. As an example, depictions of the fin with the arrowed heart motif as being either black or light green, whereas the actual fin of this aircraft on display (see the following photograph) at the RAF Museum in Hendon, London, appears to be either dark PC10 colour or black.

As Sopwith ‘Camels’ were manufactured by 9 different companies and the Sopwith Co. factory drawings designate both Cellon Scheme A (PC10) and (PC12), it is practically impossible to determine which colour a particular aircraft was finished in.
PC10 was made from mixes of yellow ochre, iron oxide and lamp black pigments and could vary between olive drab and chocolate brown depending on the mix and time spent exposed to the elements.
PC12 is slightly less controversial, although previous reports of it being red brown are in error and it was actually a dark chocolate brown.
Long serving aircraft were invariably re-doped and repaired with components salvaged from other aircraft. resulting in them wearing various combinations of doped finish.

The following illustration depicts the supposed representations of ‘Camel’ B6313 colour schemes.



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

PART 1 - THE MODEL

MODIFICATIONS OR CORRECTIONS

Despite this model being produced by 'Wingnut Wings', there are still a few minor changes that can be made to the model to enhance the overall effect.

1A. General preparation:

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

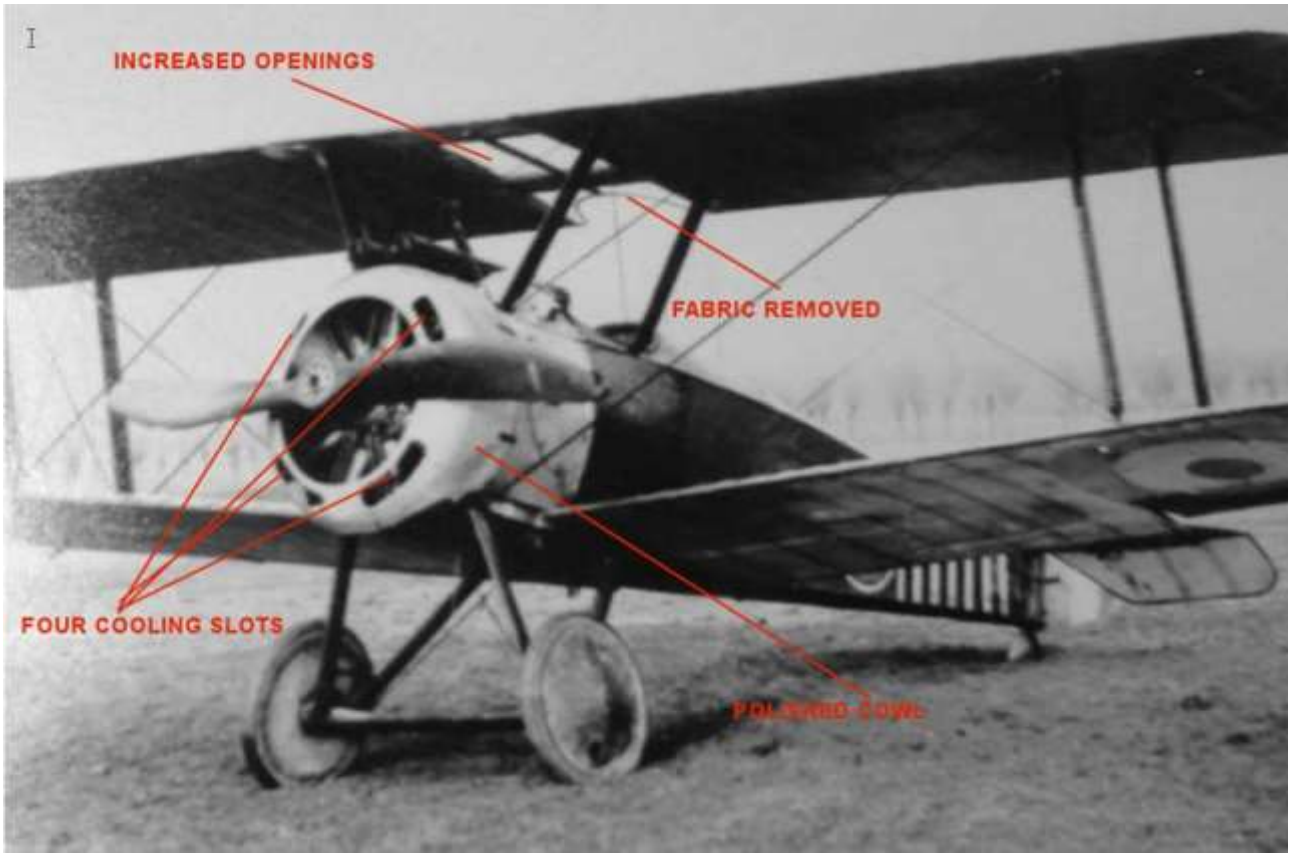
Once the items have been removed from the sprue and prepared, I normally gently wash them in warm, soapy water, to remove any handling 'grease' or mould release agent remaining on the items. I use an old toothbrush to do this. Once dry they can be primed ready for painting. Primer can be applied by brush, airbrush or from aerosol cans. These days I prefer to use 'AK Interactive' Primer and Micro-filler (Grey AK758) or (White AK759). These have good coverage as the base primer for acrylics. Take care when spraying the primer as if you apply too much it will result in 'pooling' or 'runs', which would then need to be removed once the primer has dried. Make sure you spray in a well ventilated area or preferably, if you have one, use an extractor booth.

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

1B. Engine cowl:

The engine cowls for Sopwith 'Camels' had cooling apertures cut through the cowl to aid in cooling, as the exhaust valves on each cylinder head of the engine, when open, vented hot exhaust gases which caused localised overheating of the cowl. Most 'standard' cowls has a single aperture at the lower right of the cowl, close to the bottom cut-out (for clearance from the rotating cylinders of the engine). The engine cowl for Sopwith 'Camels' fitted with the 'Le-Rhone' engine were modified to have apertures added to the lower left of the cowls, as the exhaust valves on that engine opened later than those on the 'Clerget' engine, which caused overheating in that area.

William Barkers Sopwith ‘Came’, Serial No.B6313 (later version) was further modified by having four cooling apertures cut through the engine cowl, as can be seen in the following photograph.



NOTE: *The ‘Wingnut Wings’ kit supplies four types of engine cowls for different versions of the Sopwith ‘Camel’. The kit cowl required is item No.48.*

1. The cowl needs to be supported as the centre line of the slots are scribed. I found the cowl fitted over the lid of a bottle of ‘AK Interactive’ Worn Effects acrylic fluid (AK088). First create a small ‘dimple’ in the centre of the lid.

2. Place the cowl onto the lid.

3. Locate the compass or dividers into the ‘dimple’ on the lid and **lightly** scribe the centre line of the slots around the outside of the cowl. The centre line is approximately 3mm from the inner edge of the cowl.

4. Using a pencil, mark the length of each of the four slots (approximately 10mm) on the scribed centre line. The centre of each slot should be at 45 degrees from the centre of the cowl.

5. Use a sharp point to create drill guides along the centre line of each slot.

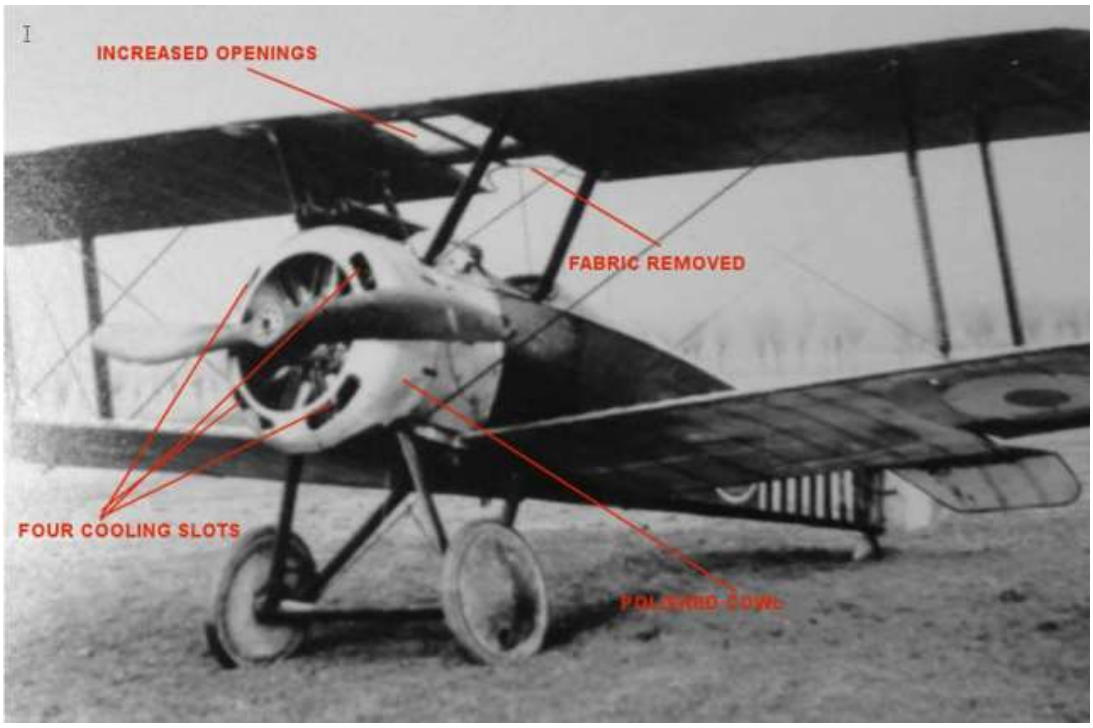
6. Using the drill guides, drill through the cowl with a 1.5mm diameter drill to create the basic slots.

7. Angle the drill across the holes and drill through the holes joins to open up the slots.
8. File, sand or scrape each slot to shape, following the curve of the cowl.

1C. <u>Upper wing centre section:</u>

Sopwith ‘Camels’ had the centre section of the upper wing open, to allow better visibility for the pilots. However, William Barkers aircraft B6313 (later version) was modified further by having the upper wing linen covering removed from behind the centre section cut-out, leaving just the support structure for the linen. In addition the existing centre section cut-out was widened at each side.

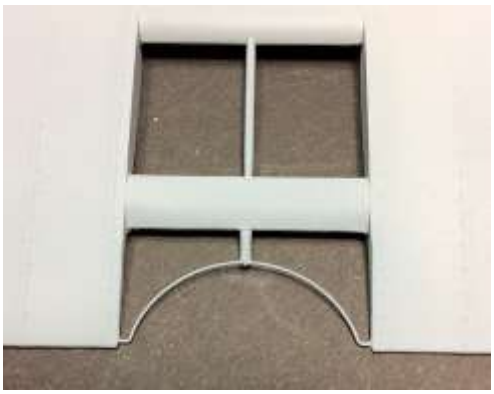
These two wing modifications gave even greater visibility for Barker, as can be seen in the following photograph.



The kit supplies two variations of the upper wing centre section, Parts E4 and E5. The kit instructions show that centre section E4 is not required. However this part does match the modifications on Barkers B6313, so can be used. The only modifications required are as follows:

1. Drill a 0.3mm hole into each corner of the central cut-out.
2. Carefully cut a notch in the top of the centre bar.
3. Cut two lengths of ‘Albion Alloys’ Nickel-Silver 0.1mm rod (NSR01).
4. Locate the two rods diagonally across the centre section cut out, with each end in a hole and crossing in the notch.
5. Secure the rods in the notch using thin CA adhesive.
6. Fill the notch with model putty and once set, carefully sand smooth.
7. The cross member at the rear centre section requires a central anchor ‘stub’ for the linen support hoop. The trailing edge of the rear centre section cross member was sanded flat enough to be able to drill hole in the centre.
8. A 0.3mm diameter hole was drilled into the centre of the trailing edge.
9. A short length of ‘Albion Alloys’ 0.3mm micro-tube (MBT03) was inserted into the hole onto which was slid short lengths of 0.5mm (MBT05), then 0.8mm (MBT08) and finally 1.0mm (MBT10), leaving the last tube standing proud to leave its bore clear for adding the wire hoop ‘anchor’.
10. A hole of 0.4mm was drilled into the inboard edges of the centre section trailing edge.

11. A length of 0.3mm copper wire was bent around a mandrel to form the basic linen support hoop. Each end was bent to fit into the pre-drilled holes in the inboard edges of the centre section trailing edge.
12. A length of 0.2mm copper wire was inserted into the micro-tube previously added to the trailing edge of the cross member and secured in position using thin CA adhesive.
13. The ends of the created wire linen hoop were inserted into the previously drilled holes in the inboard edges of the centre section trailing edge.
14. The added 0.2mm copper wire central 'anchor' was carefully bent around the linen hoop to secure the loop in position.
15. The linen hoop was finally secured in position by applying thin CA adhesive to each end and to the central 'anchor'.

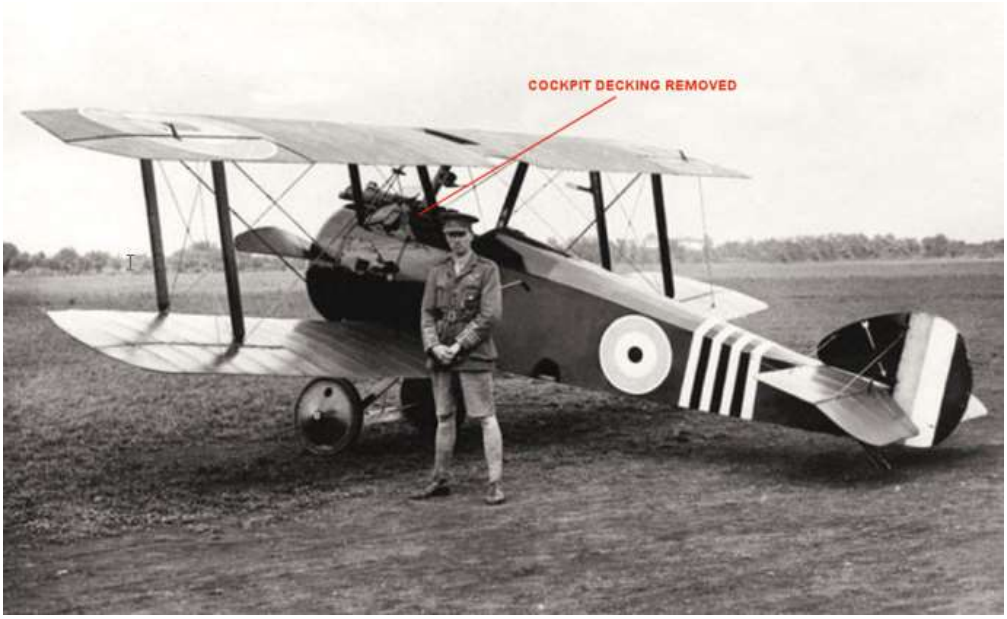


NOTE: The two cross wires (rods) are not shown in this photograph.

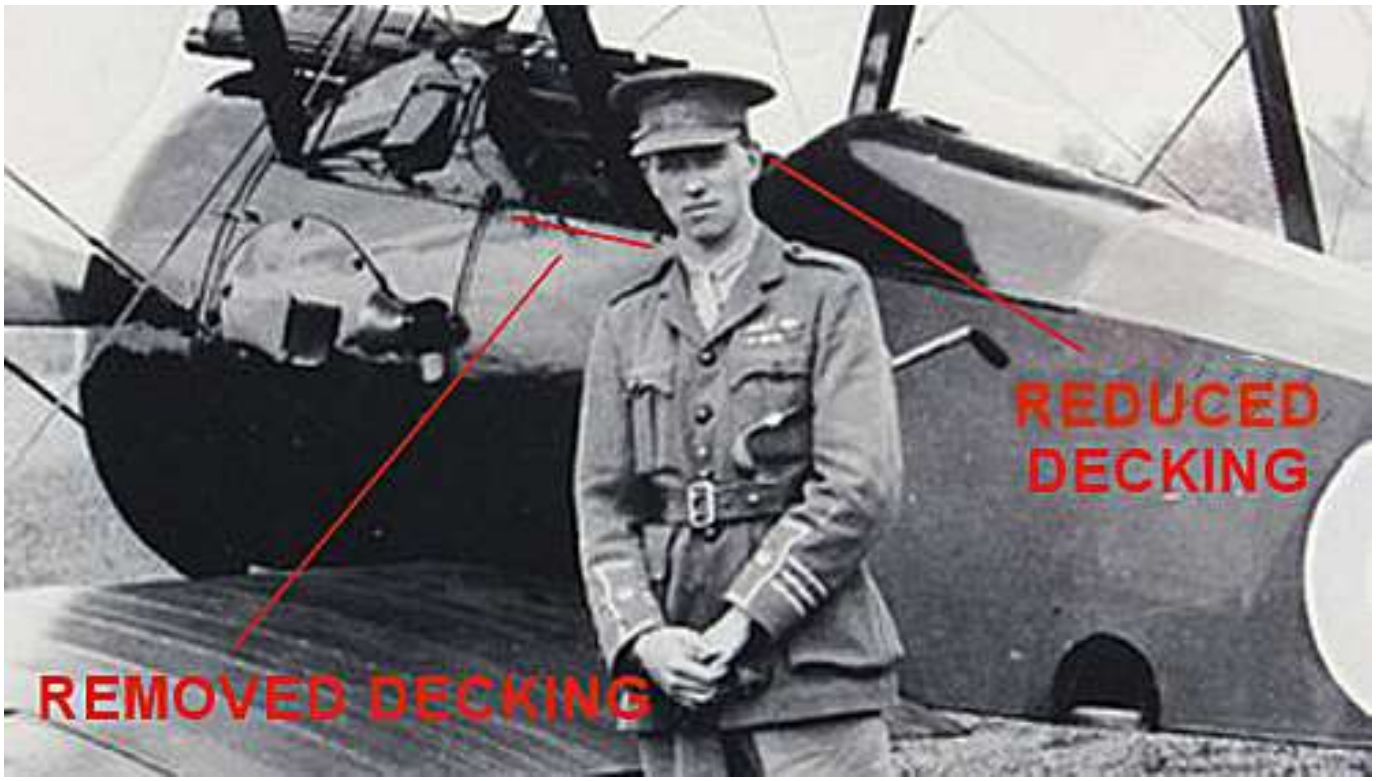
1D. Cockpit Decking:

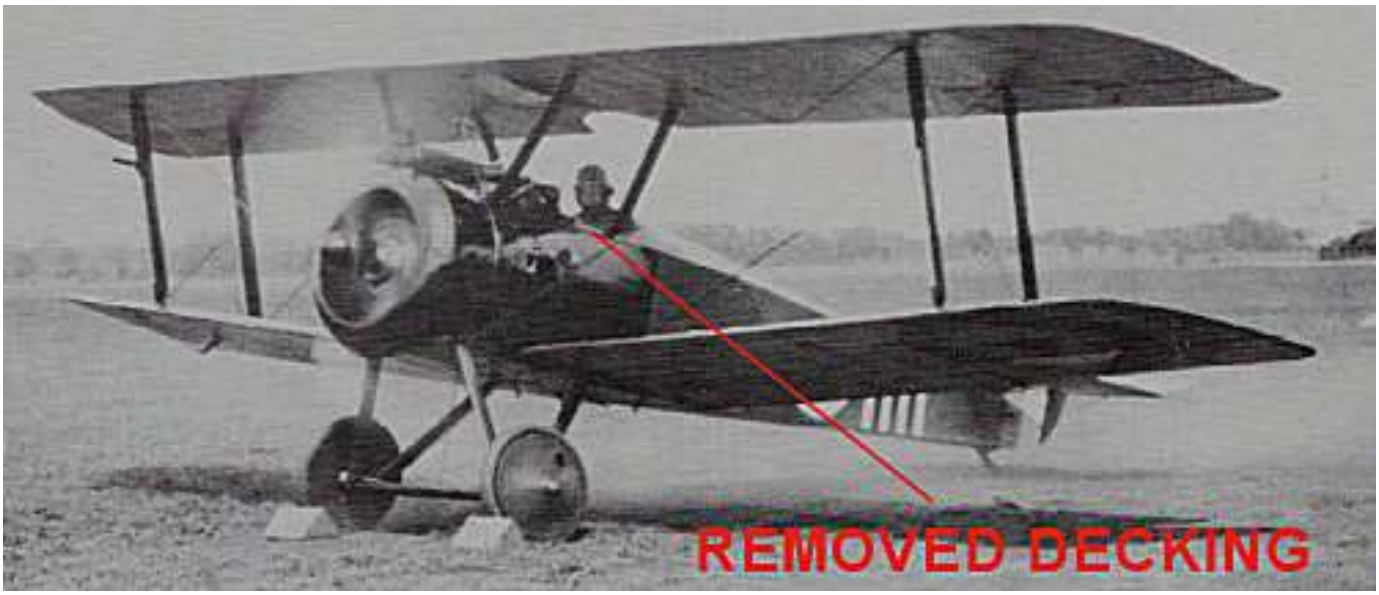
'Field' modifications' to aircraft were quite common and the pilots cockpit decking was modified by certain squadrons or pilots, again to improve visibility and to aid in clearing gun stoppages. Normally the decking was fitted side to side of the fuselage and also between the two Vickers machine guns. Some aircraft had the decking reduced at the right side of the cockpit decking as well as having the decking removed across to the left Vickers machine gun. It appears that William Barkers B6313 was modified further by having the left side of the decking removed.
Fortunately the 'Wingnut Wings' kit covers the earlier B6313 (as can be seen in the following photograph) and makes provision for modifying the cockpit decking.

William Barker with his Sopwith 'Camel', Serial No.B6313 (**earlier colour scheme**), France 1917.



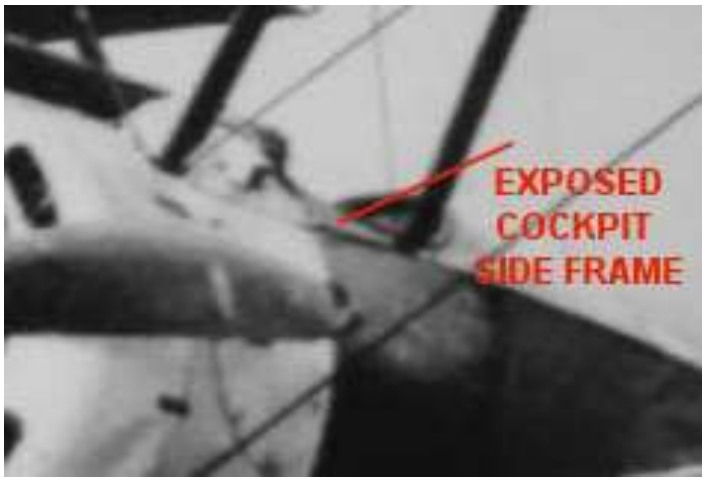
The kit instructions show how to modify the cockpit decking panel (kit part B7) for Barkers ‘Camel’ B6313 (earlier colour scheme), which indicates that that lower portion of the decking, at the left side, needs to be retained. However photographs taken at the time seem to show that the left side of the decking was completely removed, whilst the right side appears to have been Retained, but reduced in size.

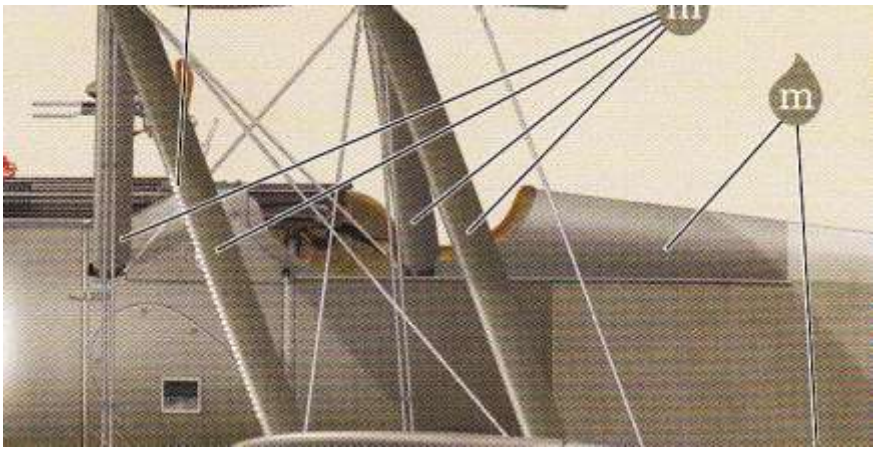




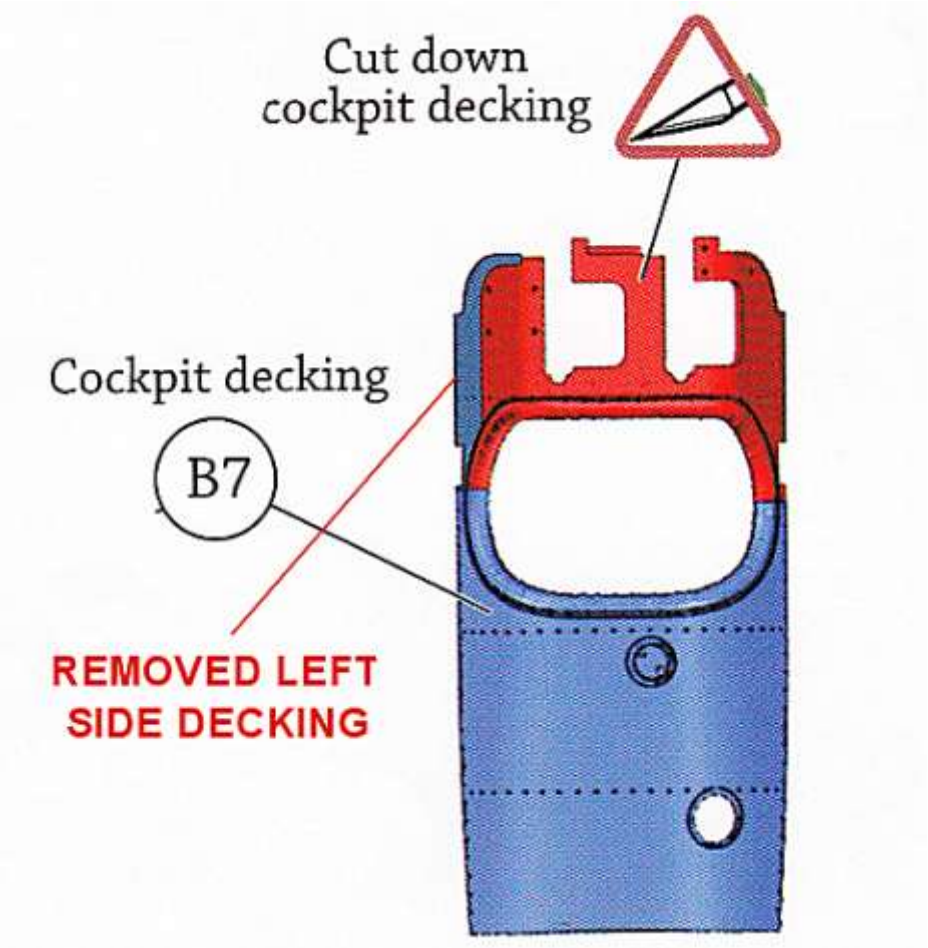
The removed cockpit decking can be easily seen when the above photograph of Barkers B6313 ‘Camel’ (earlier scheme) is compared to a more standard ‘Camel’, as can be seen in the following photograph.

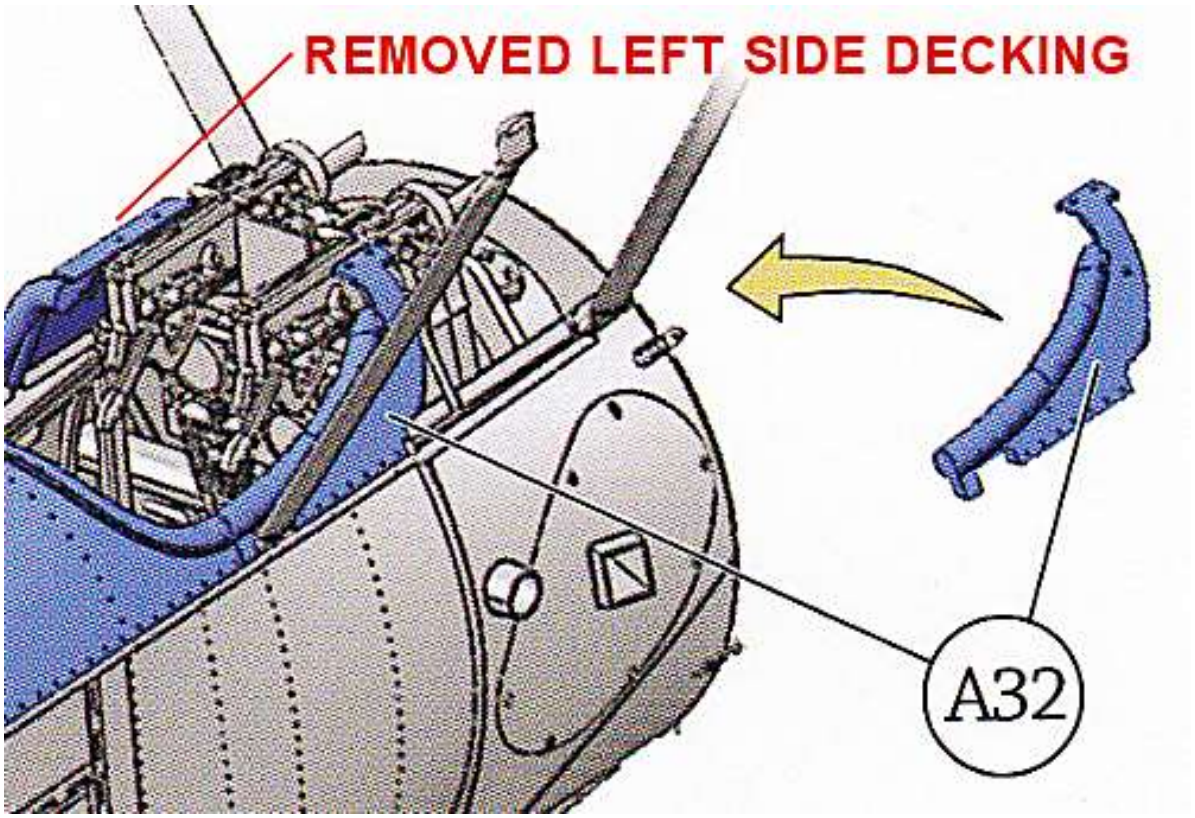
A close up photograph of Barkers later colour schemed ‘Camel’ B6313 shows that the cockpit left side frame is exposed where the decking had been cut away. This exposed frame also appears to be shown in the earlier scheme profile in the ’Wingnut Wings’ instruction manual.





Therefore the forward section of kit part B7 was cut away to be used with reduced right side (kit part A32).





References:

1. Windsock Centenary Special No.5 - Building the Sopwith Camels by Ray Rimell.
2. Windsock Data File No.26 - Sopwith Camel by J.M Bruce..
3. An excellent reference for the Sopwith Camel can be found in the PDF created by 'Bob von Buckles' of 'Bobs Buckles'. This PDF was created from data supplied by James Fahey, based on the 'Clerget' engine Sopwith Camel of 'The Vintage Aviation Ltd', based in New Zealand.

Some of the photographs used in this build log were extracted from this PDF, which can be found here:

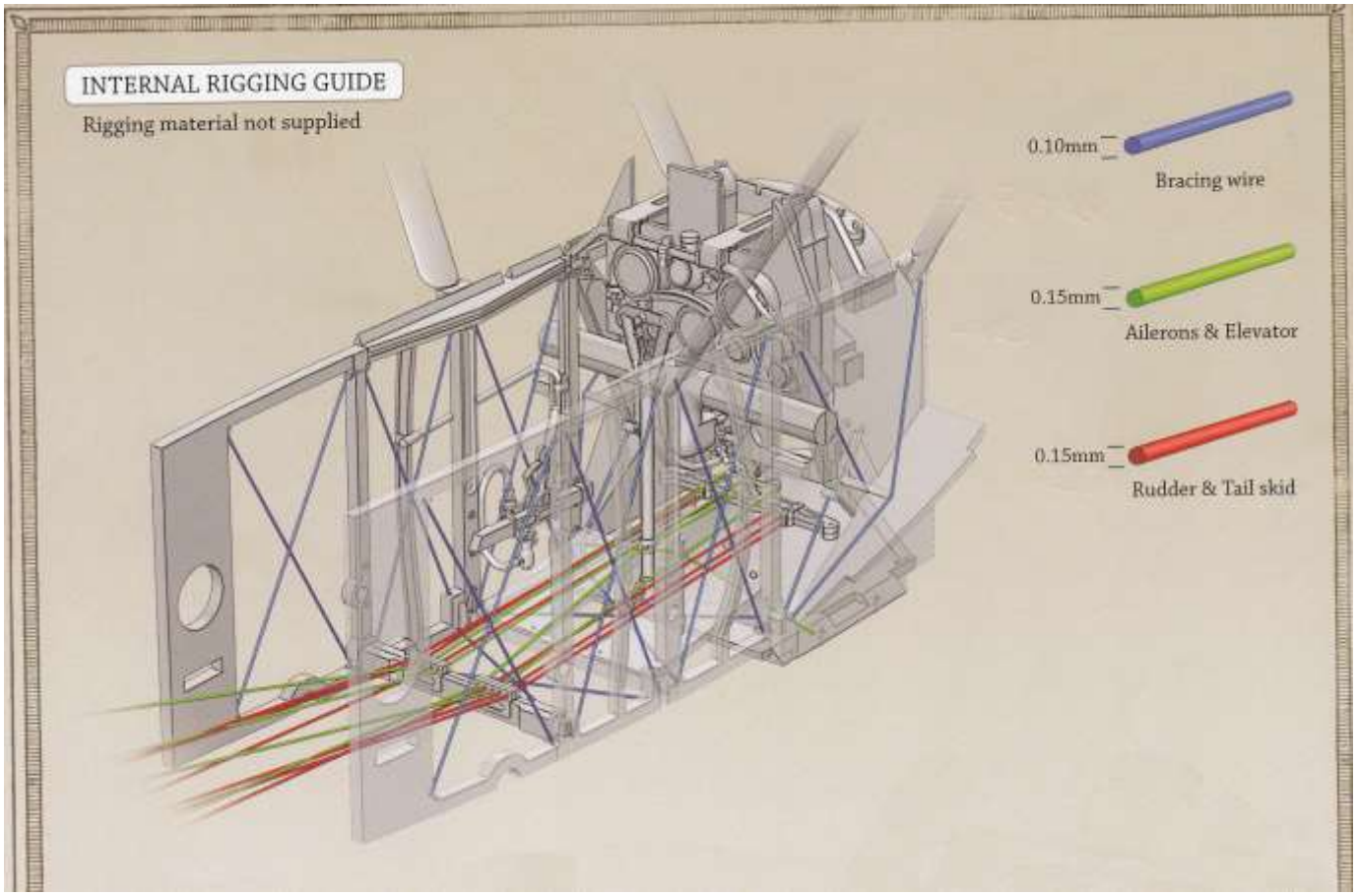
http://bobsbuckles.co.uk/ww1%20docs/Sopwith%20Camel%20Web%20Reference%20.pdf

NOTE: *The adding of this rigging is covered in Part 10 (Internal Detail) of this build log.*

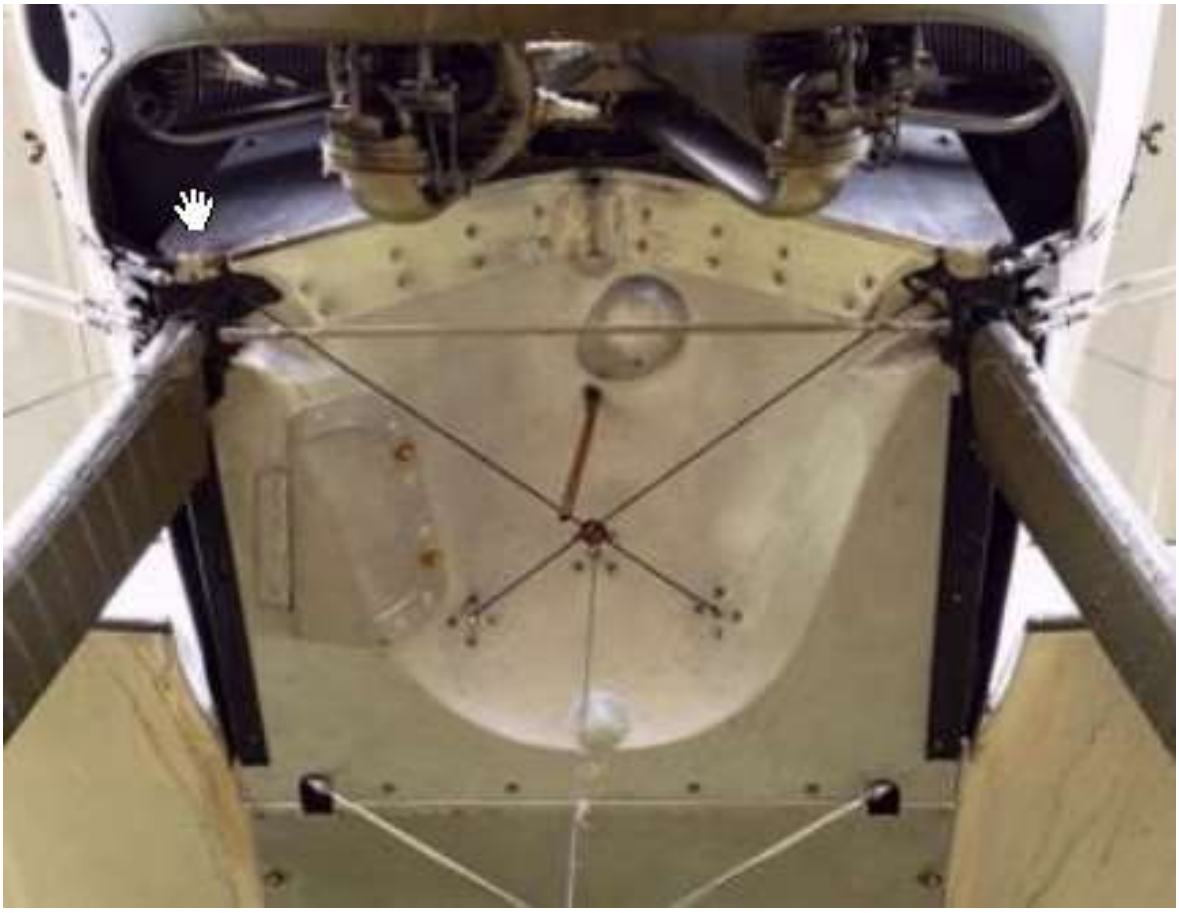
1E. Internal and external fuselage rigging:

The cross bracing for the cockpit side frames is shown in the 'Wingnut Wings' instruction manual, but there are only very small and solid rigging 'stubs' in the corners of the kit supplied side frames. I chose to cut away these small 'stubs' in favour of drilling into the side frame corners to fit the cross bracing.

The cross bracing is shown in 'blue' on the following 'Wingnut Wings' illustration.



There were also bracing wires that were anchored to each side of the forward ‘metal’ under shield panel, inside the cockpit. These wires were routed across and through the panel, where they crossed each outside the panel. The crossed wires outside were attached to the top of the forward undercarriage struts.



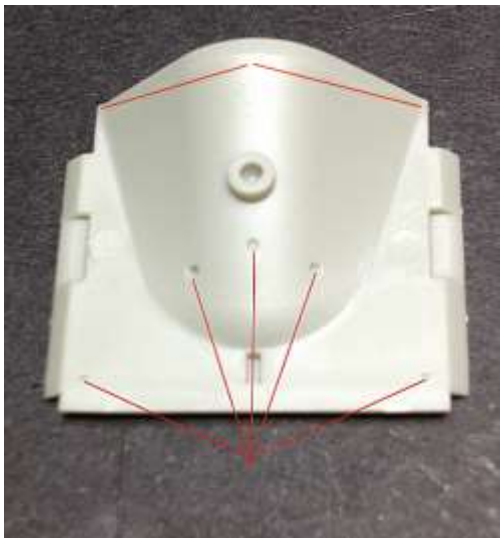
To prepare the model parts for adding the **cross bracing to the cockpit side frames**:

1. Remove the small 'rigging stubs' pre-molded into the corners of the cockpit side frames.

2. At each of the side frame corners, drill through a 0.3mm diameter hole. Check the internal rigging illustration in the 'Wingnut Wings' instruction manual. **NOTE:** *There are also diagonal bracing wires across the floor of the cockpit, although these may not been visible on the finished model.*

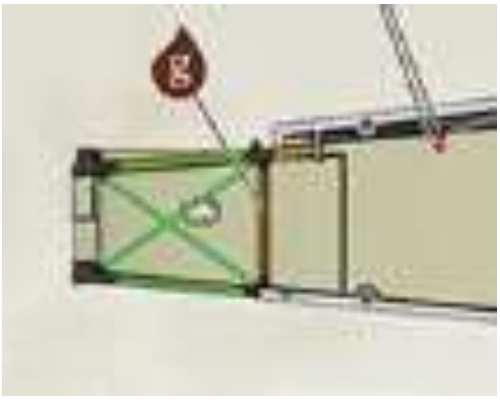
To prepare the model parts for adding the **cross bracing to the forward floor panel**:

Drill through the floor panel (kit item A25), using a 0.3mm diameter drill, at the pre-molded locations, which are the three across the centre rear of the panel and the one in each rear corner of the panel.



There were bracing wires fitted to the fuselage rear, at each side of the tail skid bay. These wires consisted of two crossed wires and two wires inline with the longerons.

'Wingnut Wings' instructions - rigging shown in green.



This bracing was formed by cutting lengths of 'Albion Alloys' 0.1mm Nickel-Silver rod (NSR01) and securing them in place using CA adhesive.

1F. <u>Internal fuselage flight controls:</u>

The 'Wingnut Wings' instruction manual provides a good illustration of the cockpit flight control cables, but the only kit part prepared for rigging is D11, which is the cross member below the fuel tank. The flight control cables required are for the rudder/tail skid, the ailerons and the elevator.

<u>NOTE:</u> *The adding of this rigging is covered in Part 10 (Internal Detail) of this build log.*

<u>Rudder/Tail Skid:</u>

The rudder and steerable tail skid were controlled by cables attached to the rudder bar. The outer pairs of cables were routed from the rudder bar and under the pilots seat and fuel tank then through the cross member (kit item D11) to the rudder control horns. The inner cables were routed in the same way, but were attached to the tail skid steering assembly.

<u>Elevator:</u>

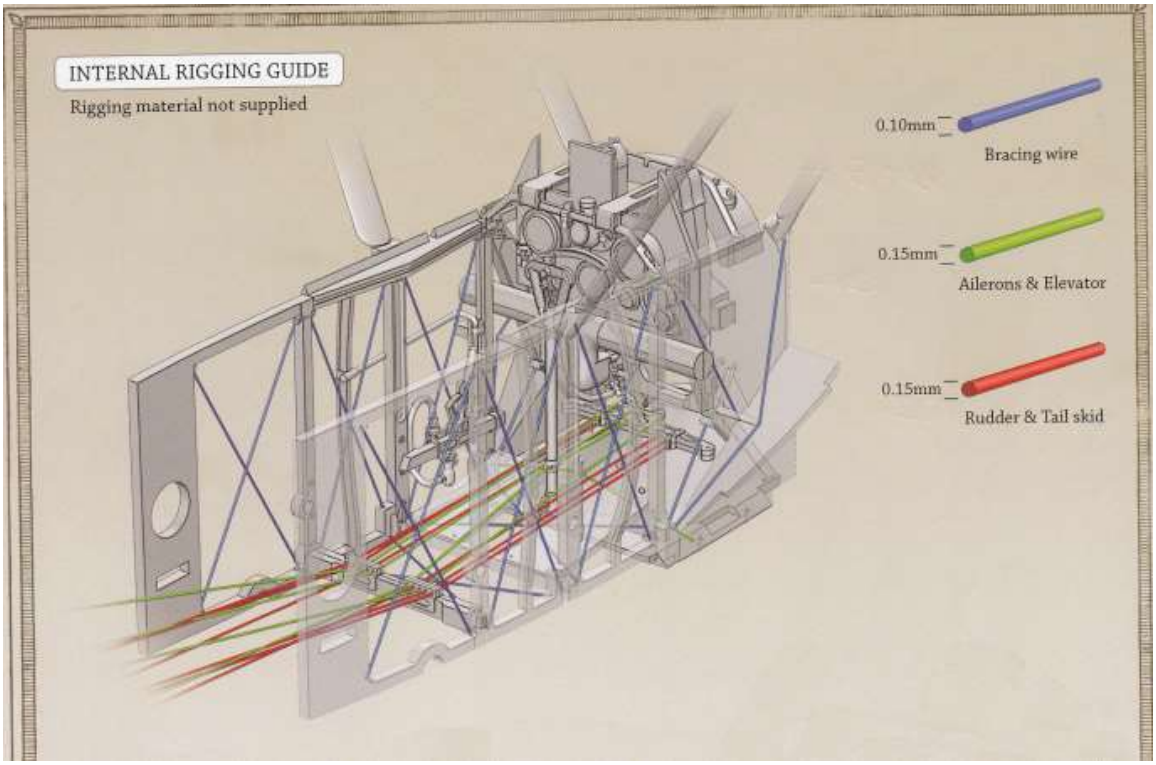
A metal collar was fitted on the pilots control column. This collar was located towards the base of the control column.

Attached to the front of the collar were two cables, which were routed forwards and around two pulleys mounted above the rudder bar. These cables were then routed rearwards under the pilots seat and the fuel tank and passed through a cross member (kit item D11). The cables were routed out of the fuselage and were attached to the upper elevator control horns.

Attached to the rear of the collar were two more cables, which were routed rearwards and under the pilots seat and the fuel tank and passed through a cross member (kit item D11). The cables were routed out of the fuselage and were attached to the lower elevator control horns.

Ailerons:

The control cables for the ailerons were attached to a bell-crank at the forward end of a torque bar, located at the base of the control column. The two cables were routed outboard and through the lower wing structures and along the leading edge of each lower wing. The cables were then routed around pulleys in the leading edge and rearwards, exiting to be attached the aileron control horns on the lower ailerons. The lower and upper ailerons were interconnected by streamlined flying wires. From the top of the upper aileron, the control cables were routed to inside the upper wing structure and forward to pulleys in the wing leading edges. From there the cables passed along the wing leading edge and were joined to form a control cable 'loop'. As one aileron was moved in one direction by moving the control column sideways, the other moved in the opposite direction.

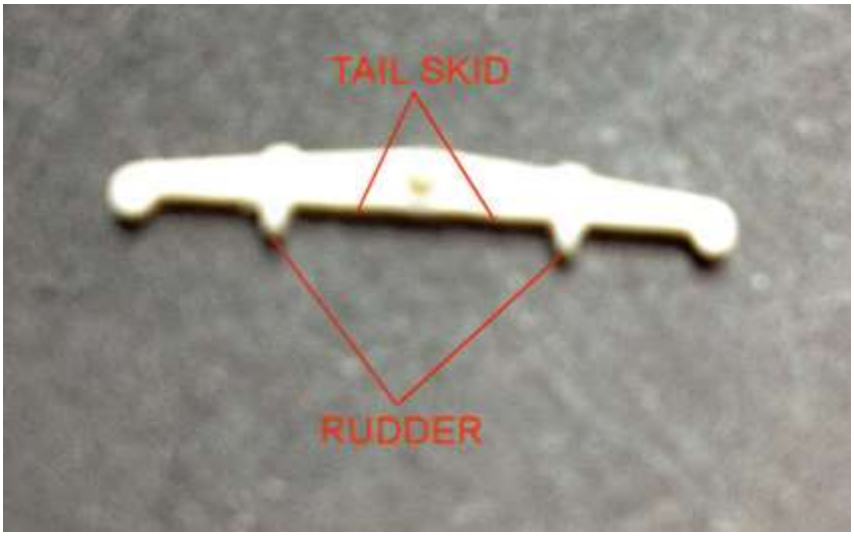


Rudder and Tail Skid:

To prepare the rudder bar for the rudder and tail skid control wires:

1. Drill a 0.4mm diameter hole through the rudder bar (rear to front faces) at the locations shown below. These holes will be used for the tail skid control wires.

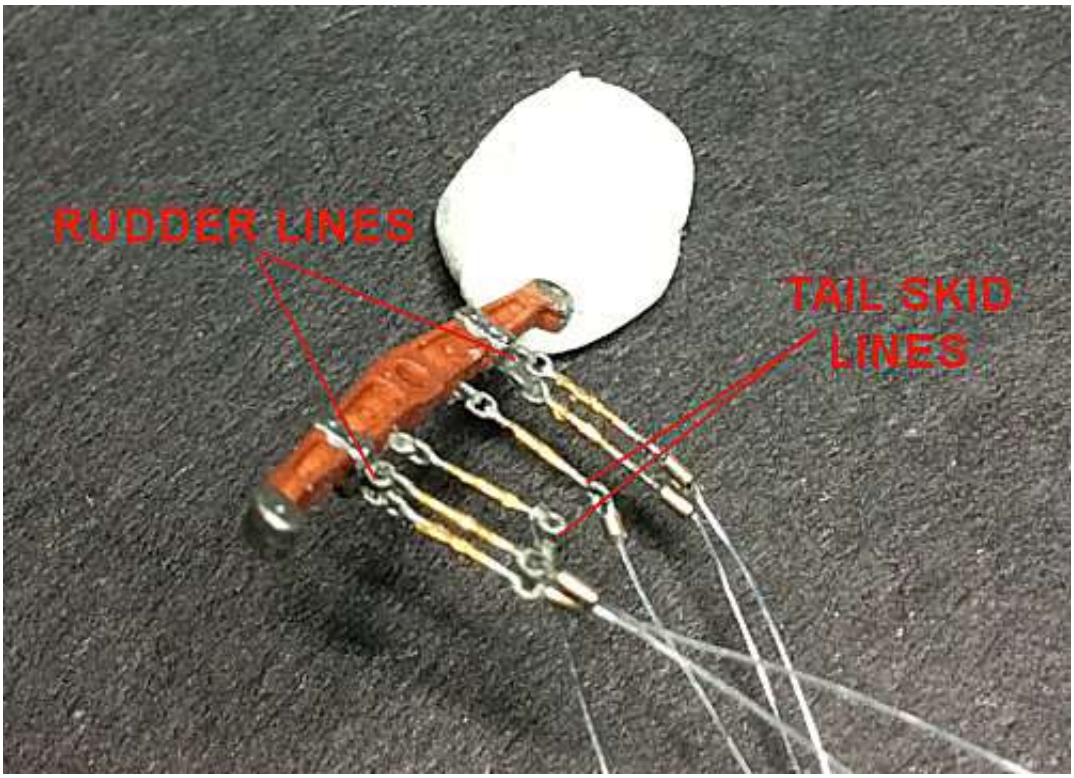
2. At the two locations for the rudder control wires (shown below), carefully cut away the stubs close to the rudder bar.



3. Drill two 0.2mm diameter holes, one above the other, into the rudder bar where the stubs were cut away. Then open up the holes using a 0.4mm drill.

4. Paint the centre section of six ‘GasPatch’ 1:48 scale turnbuckles (Type A) with ‘Mr. Colour Brass (219).

5. Secure each turnbuckle into a hole using thin CA adhesive. The result should be a pair of rudder turnbuckles and a single tail skid turnbuckle at each side of the rudder bar.



Elevator:

On kit part A31 are the two elevator pulleys. Located on the support frame at the bottom of the assembly. To prepare the elevator pulleys for the elevator control wires:

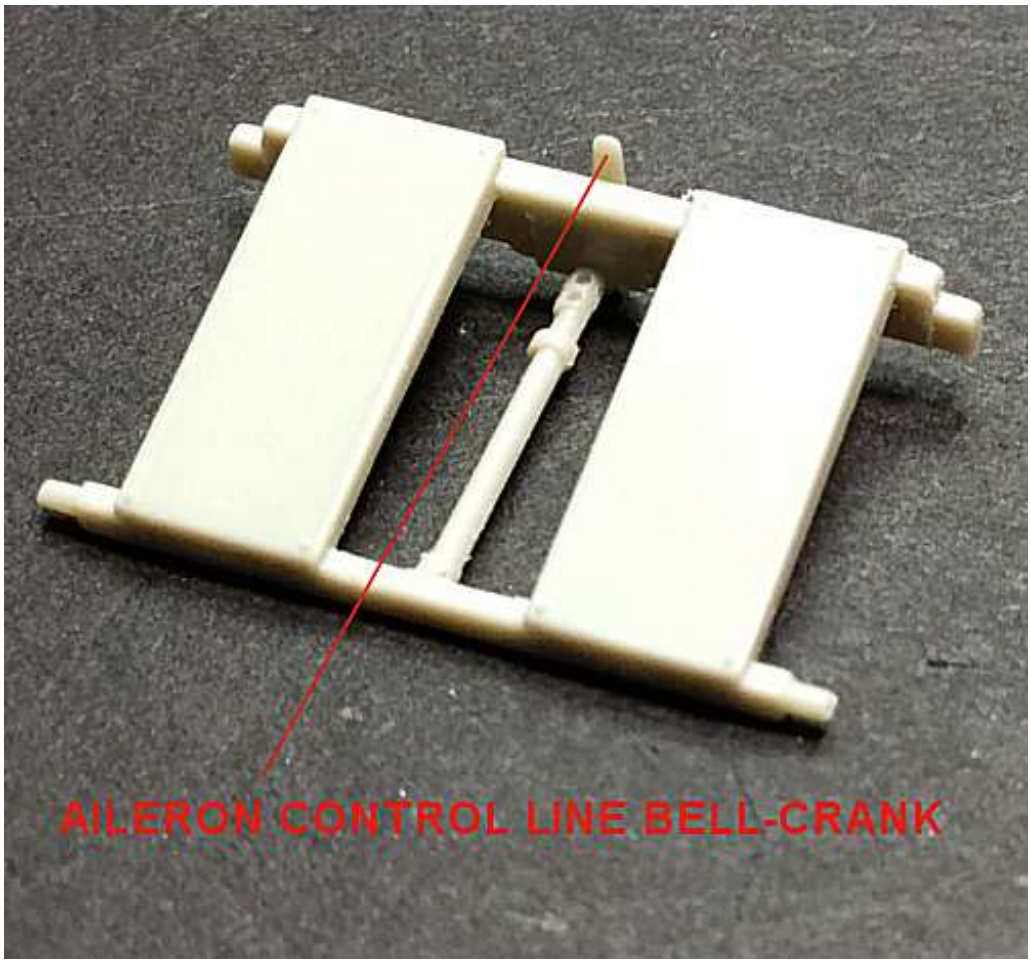
1. At the inside edge of both pulleys, drill through a hole of 0.2mm diameter. These holes will be used to route through the elevator control wires.

2. Pass a long length of 0.12mm diameter ‘Steelon’ mono-filament through one hole, around the rear or the pulleys then back out through the other hole.

3. Secure the line to the rear of the pulleys using thin CA adhesive.

Ailerons:

To represent the control cables for the ailerons, a single line will be attached to the aileron bell-crank on kit item A21. No modification of the kit part will be necessary as the line will just be secured in position with CA adhesive.



1G. Control surface animation:

Anyone viewing the completed model may not have an understanding of how the flight control surfaces operate. Therefore I tend to animate the various surfaces to illustrate that in 'real life' they were able to be moved to control the aircraft.

The ailerons supplied in the kit are separate items, but the rudder/fin and the tailplane/ elevator are molded as solid parts. To animate these control surfaces requires the following:

Ailerons:

The four ailerons are molded with small location 'lugs' that locate into slots molded in the relevant wing locations. Whilst these are sufficient to fit the ailerons to the wings, it does mean that the ailerons would be in the 'null' position, that is in-line with the wing surfaces. This configuration does not allow for the ailerons shown in different positions. In reality the ailerons would probably be in the 'null' position, but I prefer to have them shown 'animated'.

1. Clean up the mold seam line on each aileron and wing location.
2. Above the two inboard pre-molded aileron hinges (not the outer hinge), drill a hole of 0.3mm diameter into the aileron. Make sure the drill is central as the hole is being drilled, otherwise the drill may penetrate the aileron surface.
3. Cut short lengths of 0.3mm diameter micro-tube or rod and secure them into the aileron holes using thin CA adhesive.
4. Drill holes into each wing location for the ailerons using the same size of drill. Make sure the drilled holes will align correctly to those drilled into the ailerons.
5. Test fit (dry) the location pins of each aileron into its correct wing location holes and gently bend the aileron either slightly up or down to the desired positions. Remember that the ailerons on each side of the aircraft much be in the same position.
6. Remove the ailerons for fitting later in the model build.

NOTE: *Less experienced modellers may wish to leave the rudder/fin and the tail plane/ elevator assemblies intact, as supplied in the kit.*

Rudder:

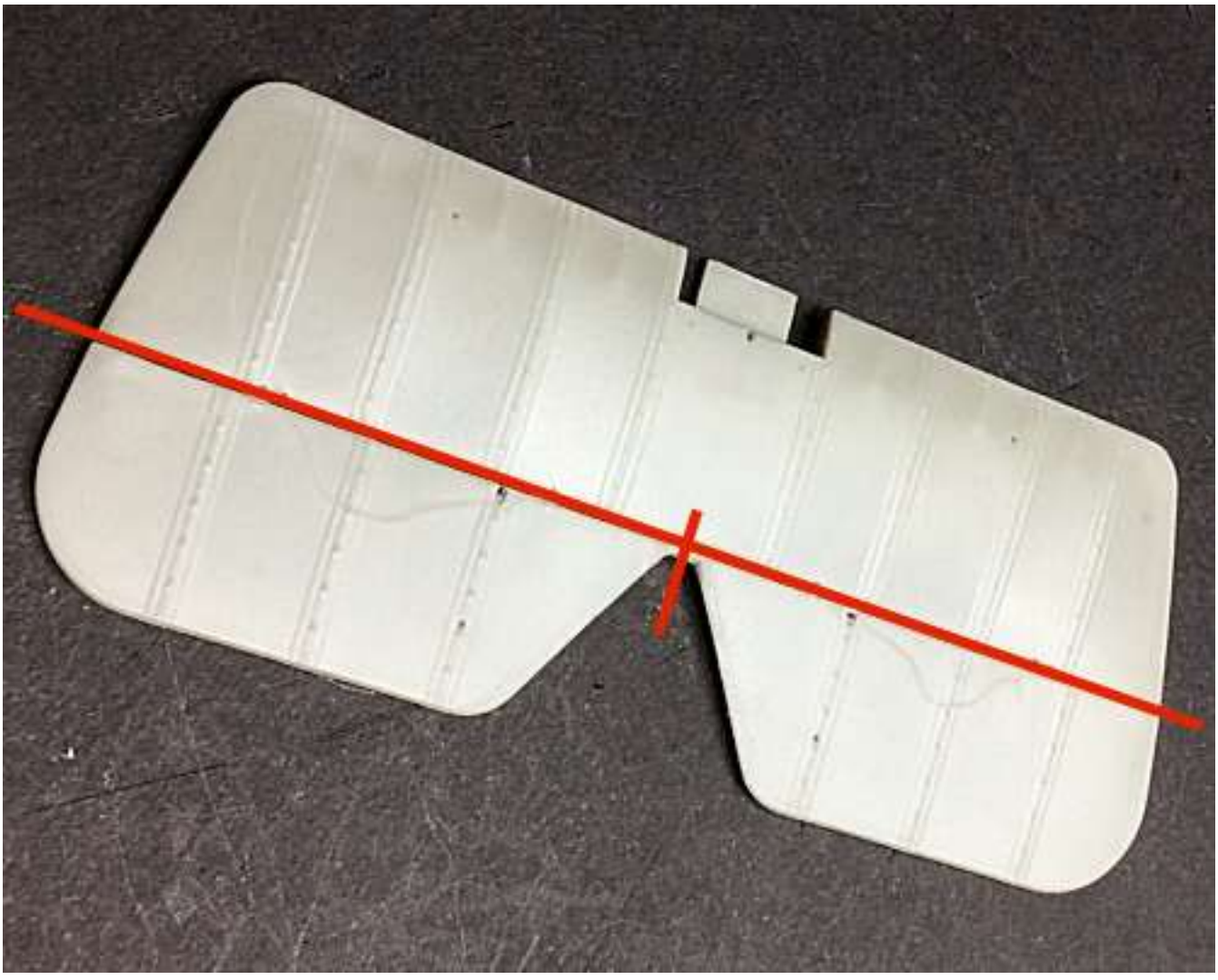
The rudder and fin are molded as a single item, but the joint between the two is open. If the rudder is to be positioned at a slight angle to the fin, it can be achieved by very carefully bending the rudder to one side or the other. Only a slight movement would be sufficient to represent the rudder being off centre. The rudder can also, if required, be removed from the fin by gently flexing it from side to side, which is what I chose to do.

Elevator:

NOTE: *The tailplane and elevator are molded as a single item. If you want to display the elevator in a different position, it needs to be modified.*

Carefully use a sharp scrapper or similar to remove the styrene from between the tail unit and the elevator, until the elevator can be separated.

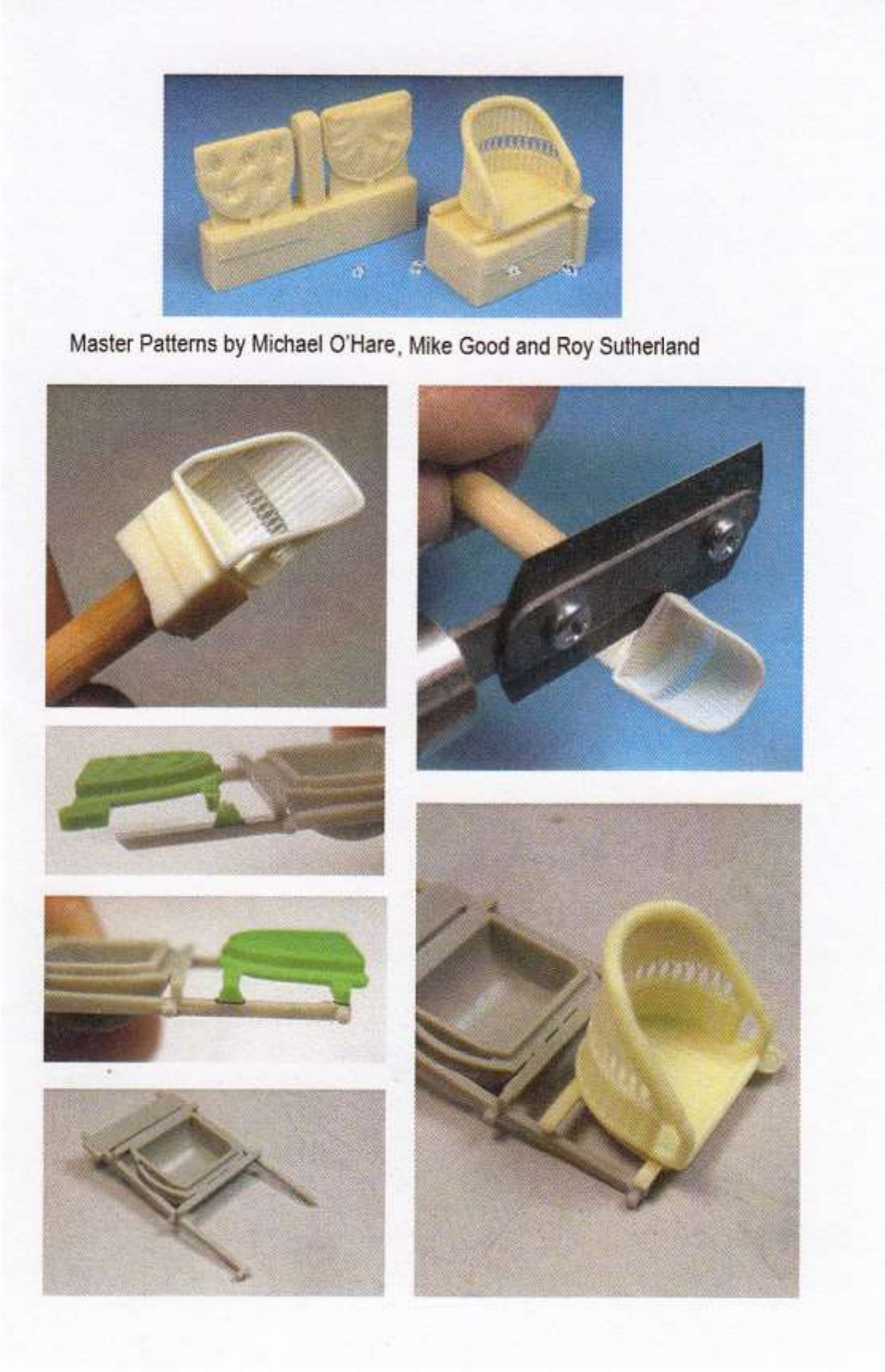
Once separated the tubular join between the two halves is very weak and easily twisted. To allow for easier handling, cut the join in the centre to create two separate elevator halves.



1H. <u>Pilot seat:</u>

For this build I chose to replace the kit supplied seat for the pilot with a resin wicker seat with a ‘Barracuda Cast’ item (Sopwith Camel Wicker Seat with Cushions [BR32332]). This requires modification of the kit part A23 (seat frame with cushion) and discarding the kit part A34 (seat back).

Below are the instructions from ‘Barracuda Cast’ for carrying out this modification.



1I. External rigging points:

Windsock Centenary Special No.5 - Building the Sopwith Camels by Ray Rimell.
Windsock Data File No.26 - Sopwith Camel by J.M Bruce.
An excellent reference for the Sopwith Camel can be found in the PDF created by 'Bob von Buckles' of 'Bobs Buckles'. This PDF was created from data supplied by James Fahey, based on the 'Clerget' engine Sopwith Camel of 'The Vintage Aviation Ltd', based in New Zealand.

The methods of rigging individual wires is covered in Part 11 (Model Construction) of this build log.

1. Refer to the 'Wingnut Wings' instruction manual.
2. Most required rigging points are pre-molded as 'dimples' on the models surfaces.

Some of the photographs used in this build log were extracted from this PDF, which can be found here:

http://bobsbuckles.co.uk/ww1%20docs/Sopwith%20Camel%20Web%20Reference%20.pdf

The Sopwith 'Camel' external rigging for flying wires, landing wires and wing bracing were of the 'streamlined' type, not the standard round type used on earlier RFC aircraft and on aircraft of other Nations. The only external 'round' cables used were the control wires to the ailerons, rudder, elevator and the tail skid. They were also used for the cross bracing under the forward metal cockpit floor and axle fairing.

The 'streamlined' wires can be modelled using the relevant sized flat, photo-etched sets from 'RB Productions'. However, these can be difficult to install and require tiny photo-etch end fittings, which some modellers think are over-sized. More importantly, these wires add no structural strength the a model and apparently can be prone to 'sag' if the ambient temperature changes too much. It's for these reason I choose to use mono-filament (fishing line) for all of the rigging, as it does add structural strength to a model and can be tightened after fitting by apply heat close and along the rigging line. My line of choice is 0.12mm diameter mono-filament by 'Steelon'. When lightly airbrushed with a matt or semi-mat lacquer, it looks close enough to steel to be passable. Besides, to the naked eye it's difficult to tell the difference between the flat photo-etch and the round mono-filament.

Holes need to be provided for routing the rigging wires. Fortunately the supplied kit parts have pre-molded locations for the rigging and controls access points.

Study the rigging illustration and model parts thoroughly to find the various rigging points.

These rigging points need to be drilled at the appropriate angles for the particular rigging. The holes are either drilled through the model part, such as the fuselage points or at the correct angle into the model part, such as the aileron access points in the wings. Of particular note are the wing root points where the dual rigging wires are routed through the wing roots to at he top of the rear undercarriage struts.

To represent the ‘streamlined’ wires on the aircraft, when standard turnbuckles were not used, cut lengths of micro tube are used as the end fittings (Refer to Part 11 (Model Construction - pre-rigging) for how to create rigging end fittings.

Fuselage:
The fuselage has two options for the location of the elevator rigging access points. For this particular aircraft, only the two access point at the top and each side of the fuselage rear are needed. The pre-molded access point lower down the fuselage sides should be sand off. Also two holes need to be drilled through the rear underside of the fuselage for tail skid steering cable access.

Upper wing centre section:
The forward aperture in the upper wing centre section should have a 0.3mm hole drilled into each of the four corners. The rear cut-out requires the same size of hole drilling into the tip of the wing trailing edges (along the wing, not through it). These holes will be used for the support hoop for the removed linen.
On the underside of the upper wing centre section, adjacent to the centre and outboard of the four wing strut locations, drill one 0.5mm hole at an angle to align with the bottom of the lower wings outer struts. Also drill a hole inboard of the forward strut locations.

Tailplane and Elevator:
The tailplane requires four 0.3mm holes to be drilled through for the fin bracing rigging. The elevator halves require a 0.3mm hole to be drilled through for the elevator operating cables.

Fin and Rudder:
The fin requires two 0.3mm holes to be drilled through for the fin bracing rigging. The Rudder requires one 0.3mm hole to be drilled through for the rudder operating cable.

Upper wing halves:
Each upper wing half requires a 0.3mm hole drilling at an angle into the aileron cable access points on the top surface.
On the underside of both upper wing halves, adjacent to the centre and inboard of the two wing strut locations, drill two 0.5mm holes at an angle to align with lower wing roots.

Ailerons:
Each aileron requires a 0.3mm hole drilling through for the ailerons operating cables.

Lower wing:
Each side of the lower wing requires a 0.3mm hole drilling at an angle into the aileron cable access points on the underside surface.
Four 0.5mm holes need to be drilled through the centre section of the lower wing to mount the bomb carrier brackets.
On the top surface of the wing, near the wing roots, is a pre-molded dual rigging point for the rear, twin flying wires. Drill a shallow holes of 1.0 mm diameter into the rigging points (not through the wing). Do the same at the underside rigging points.
On the top surface of the wing, adjacent to the centre and inboard of the four wing strut locations, drill a 0.5mm hole at an angle to align with the top of the fuselage cabane struts.

Undercarriage struts:
The kit item for this particular aircraft are A8 and A9 and each requires a 0.3mm hole drilling through the bottom, forward edge of the strut. These holes will be used for the undercarriage bracing cable. At the top of the forward struts, drill a 0.5mm holes at the rear for locating the rear flying wire from the forward twin flying rigging wires.

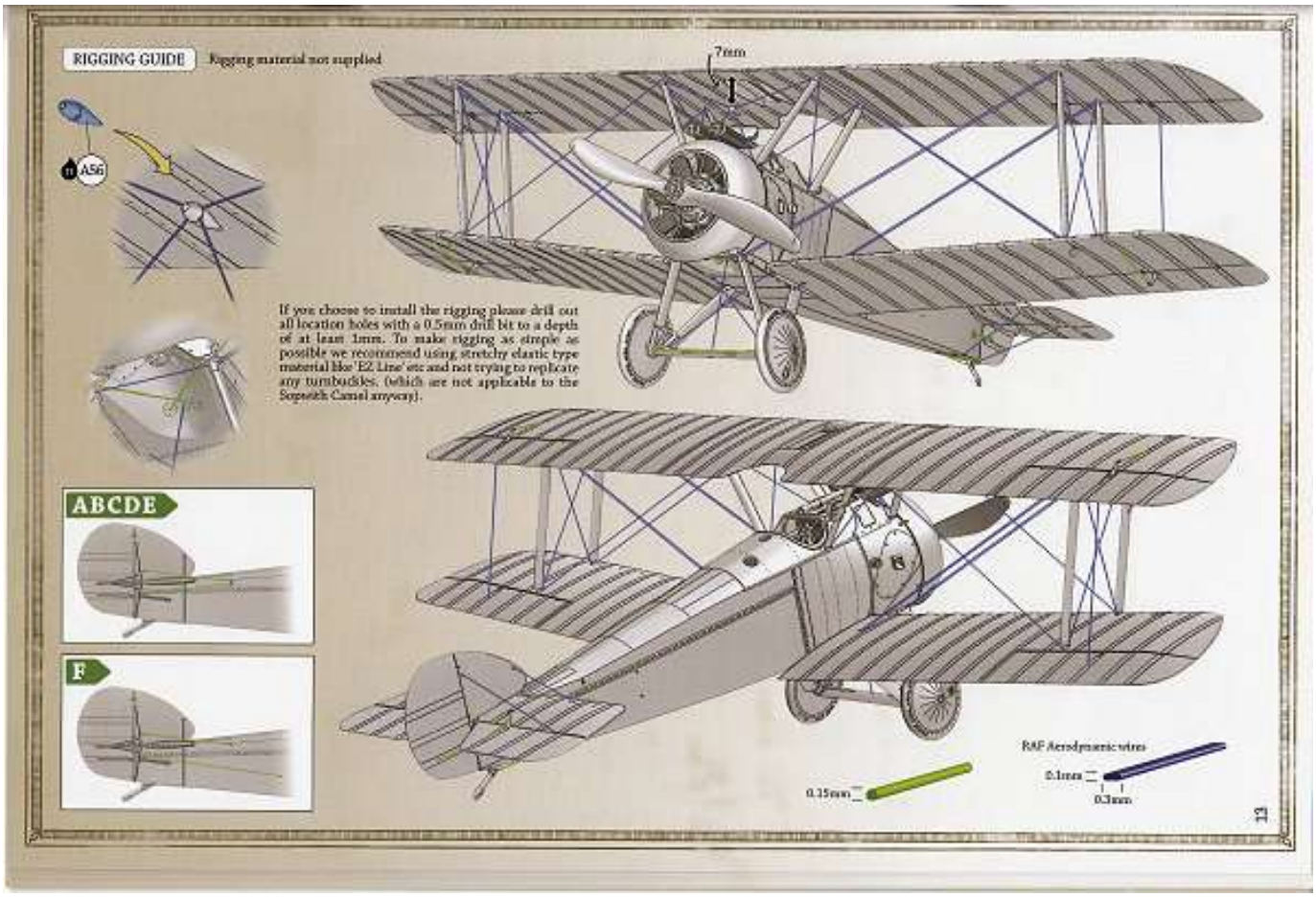
Cockpit side frames:
Each of the four cabane struts have a pre-molded rigging 'ring' at the top and bottom edges. Ensure these are open by carefully check-drilling through, using a 0.2mm drill.

Wing outer struts:
Each of the four outer wing struts have a pre-molded rigging 'ring' at the top and bottom edges. Ensure these are open by carefully check-drilling through, using a 0.2mm drill.

Control horns:
The control horns supplied in the kit are for the elevator (D2 x4), upper ailerons (D24 x2) and lower ailerons (D27 x2). However I found these horns to be somewhat over scale. Instead I chose to use the appropriate photo-etch control horns set from the 'JadarHobby Shop' Part (48087), which are 1/48th scale and more suitable. These photo-etch horns have a rigging hole.

The control horns supplied in the kit for the rudder (A17) and tail skid (D17) were used on the model.

The following illustration is the rigging diagram from the 'Wingnut Wings' instruction manual and shows the rigging and control wires required.



The following photographs show typical examples of rigging on the Sopwith ‘Camel’.

1J. Additional cockpit detail:

References:

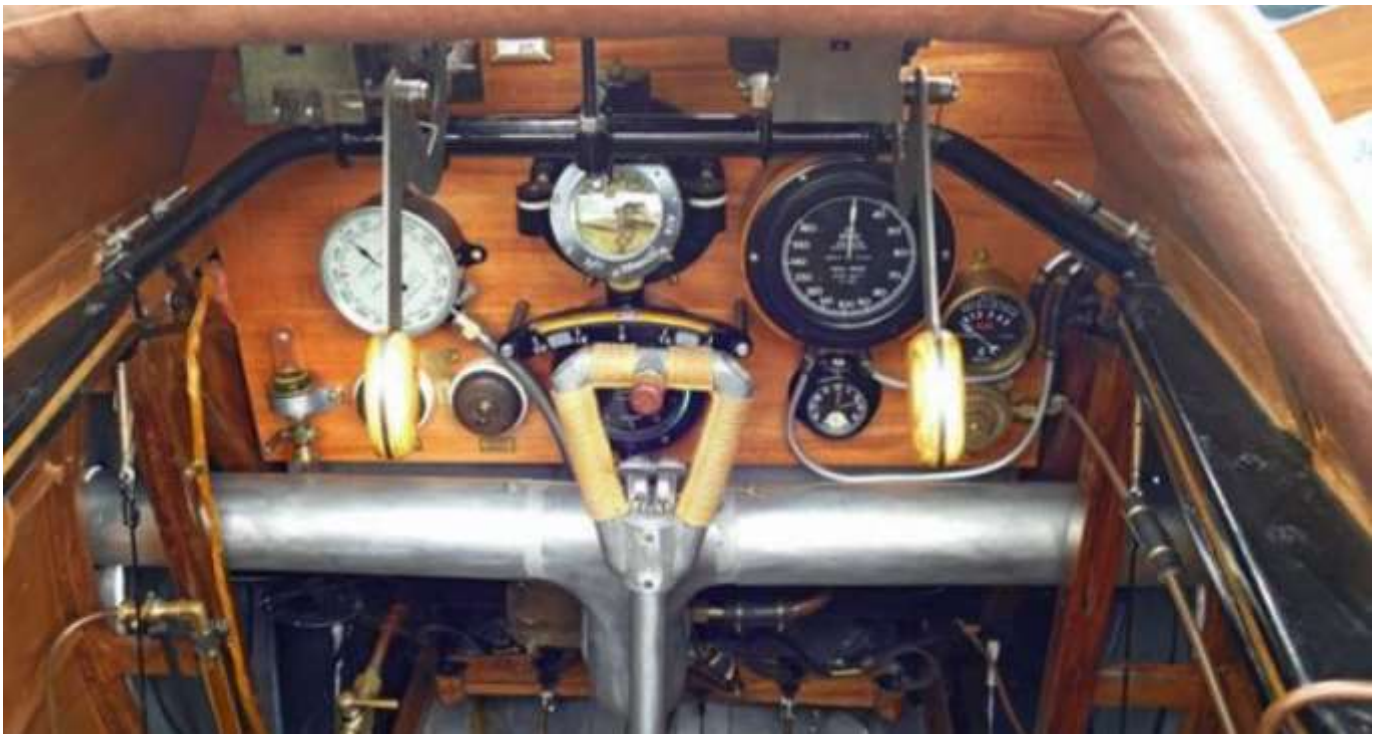
1. Windsock Centenary Special No.5 - Building the Sopwith Camels by Ray Rimell.
2. Windsock Data File No.26 - Sopwith Camel by J.M Bruce.
3. An excellent reference for the Sopwith Camel can be found in the PDF created by 'Bob von Buckles' of 'Bobs Buckles'. This PDF was created from data supplied by James Fahey, based on the 'Clerget' engine Sopwith Camel of 'The Vintage Aviation Ltd', based in New Zealand.

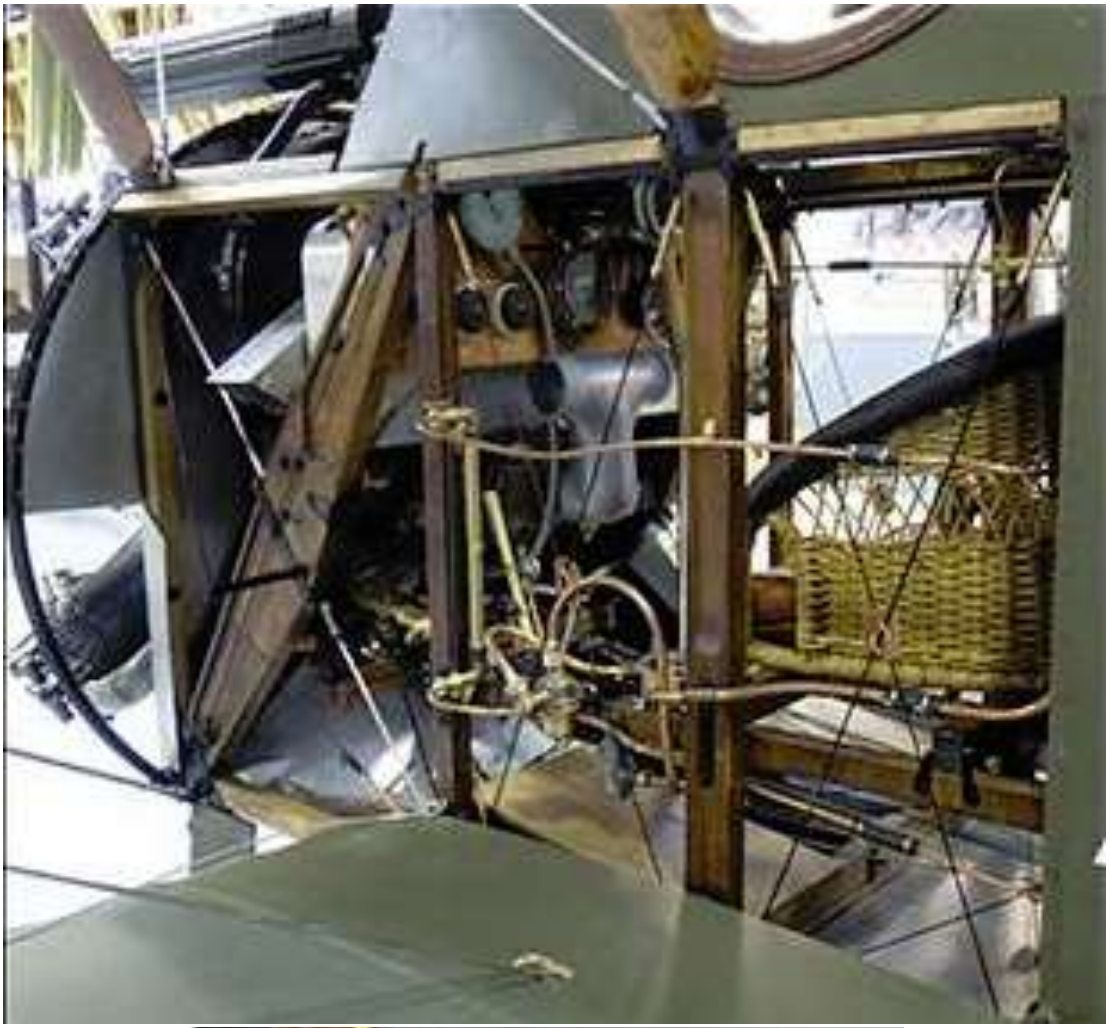
Some of the photographs used in this build log were extracted from this PDF, which can be found here:

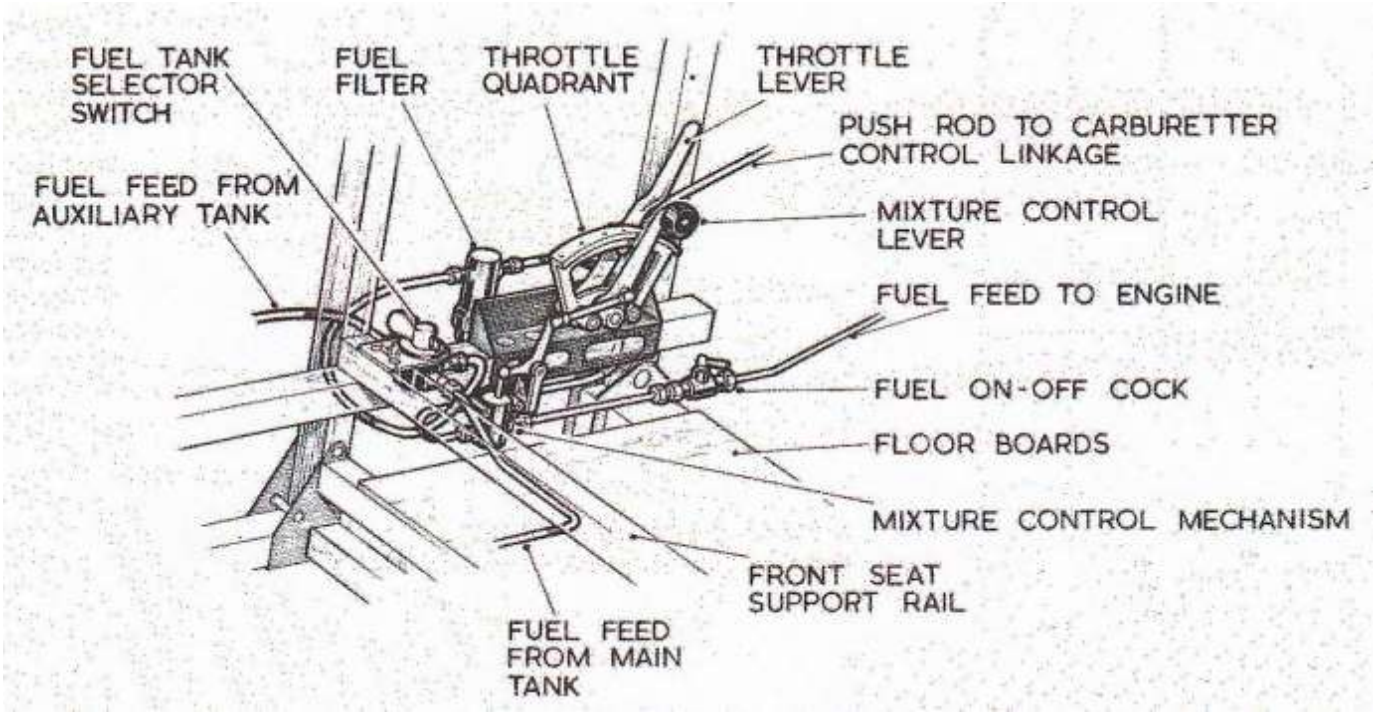
http://bobsbuckles.co.uk/ww1%20docs/Sopwith%20Camel%20Web%20Reference%20.pdf

NOTE: *The adding of additional cockpit detail is covered in Part 10 (Internal Detail) of this build log.*

The cockpit detail supplied in the kit parts is of good quality and extensive, but as always, there can be modifications to enhance this detail even further, despite most of it not being visible once the cockpit is fully enclosed within the fuselage.







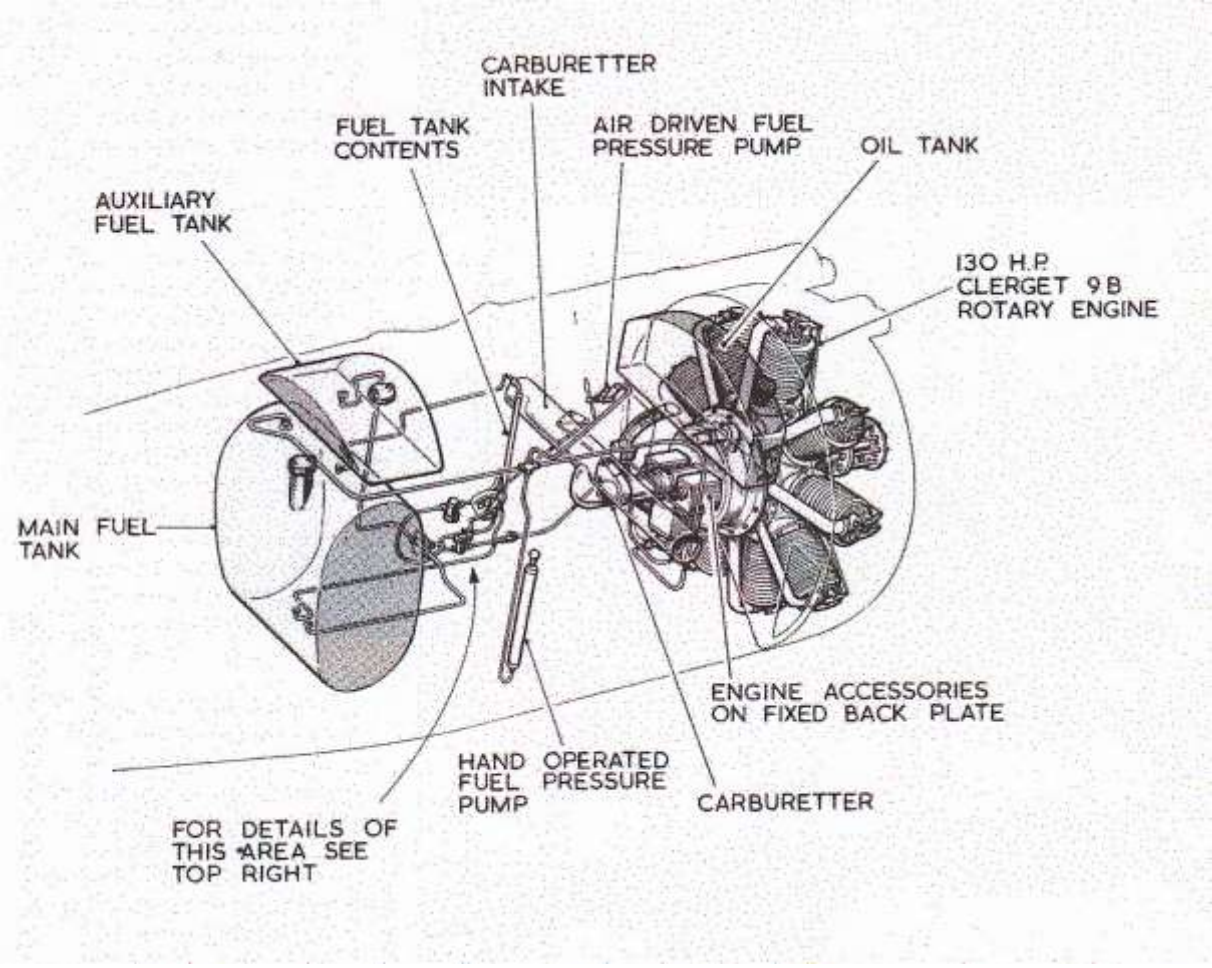
NOTE: *The pre-molded pipe work on the cockpit side frames were removed as being over scale, to be replaced with appropriately sized copper wire.*

Engine fuel control:

The Throttle quadrant was fitted with two selector levers, the throttle lever and the mixture control lever. The levers were connected by control rods and levers to the mixture controller.

Engine fuel supply:

The aircraft was fitted with two fuel tanks, the main tank behind the pilots seat and also an auxiliary fuel tank in the upper inside of the fuselage, situated behind the pilots head. At the lower left of the pilots seat was the fuel tank selector switch, which is represented on the 'Taurus Models' replacement seat. The fuel supply pipes from both the auxiliary fuel tank and the main fuel tank were connected to the fuel tank selector switch. From there a pipe supplied the selected fuel to the fuel filter, located outboard and to the rear of the throttle quadrant. A further pipe connected the fuel supply from the fuel filter to the mixture controller. Lastly, a fuel supply pipe was connected to the front of the mixture controller, located below the throttle assembly, then routed forwards along the left side of the cockpit, through an ON-OFF fuel cock, to the engine carburetor, which was mounted on the fixed back plate of the engine bulk head.



Fuel tank pressurization:

The main fuel tank was pressurized by two methods. The first was by a hand operated pump, located on the cockpit right side frame. In addition, a 'Rotherham' wind driven fuel pressurization pump was mounted externally on the rear of the right, forward cabane strut. A four-way pipe union was located at the top of the cockpit right side frame. The connections to this union were:

1. A pipe routed rearwards to the top of the main fuel tank.
2. A pipe routed vertically down to the pilot operated pressurization pump.
3. A pipe routed up over the padded rim on the cockpit decking and up to the 'Rotherham' wind driven fuel pressurization pump on the cabane strut.
4. A pipe routed forwards and down and across to an area at the base of the engine. The purpose of this pipe is unclear - possibly to a drain pipe under the cockpit forward metal panel.

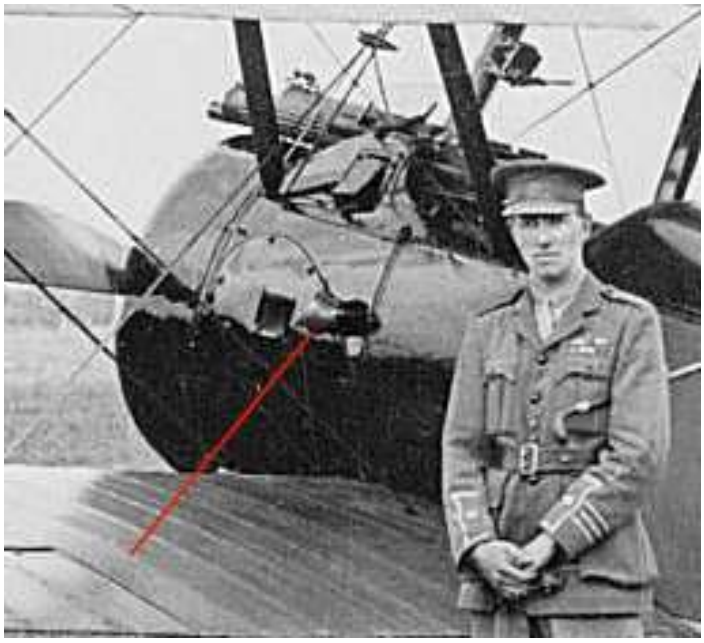
Fuel contents indication:

A pipe was connected to the bottom of the main fuel tank. This pipe was routed forwards along the bottom of the cockpit left side frame and then vertically up the frame strut forward from the throttle assembly. The pipe was connected to a transparent tube on the strut. From the top of the tube, the pipe was routed rearwards and into the top of the main fuel tank. The purpose of the transparent tube was to give the pilot a visible indication of fuel contents in the main fuel tank.

These additions to the cockpit detail, despite many not being visible in the completed model, were created using annealed (softened over a heat source) copper wire, 'PlusModel' lead wires and 'Albion Alloy's' micro-tubes. Refer to Part 10 (Internal Detail) of this build log.

1K. <u>Carburetor intake - field modification:</u>

Sopwith Camels operating in the Italian theatre suffered with lower engine power. This was due to the altitude they were being operated from providing ‘thinner’ (less) air to the engine cylinders. In an attempt to overcome this and to increase the air flow into the two carburetor intakes, a ‘funnel’ was added to the intakes and positioned to face forwards into the airstream. Mesh guards were fitted to the funnel intakes to prevent stones etc from entering the intakes. A photograph of Barkers B6313 with these funnels fitted is shown below. There are photographs of other Italian front Camel’s fitted with this field modification.



<u>NOTE:</u> To replicate these intake ‘funnels’ I used two identical airspeed indicators from my ‘spares’ box. These were approximately the correct size and shape.

1. In the centre of the front face of each indicator I drilled a small pilot hole, taking care not to drill right through the indicator.
2. A larger drill of the same diameter as the indicator face was used to ’open up’ the pilot hole.

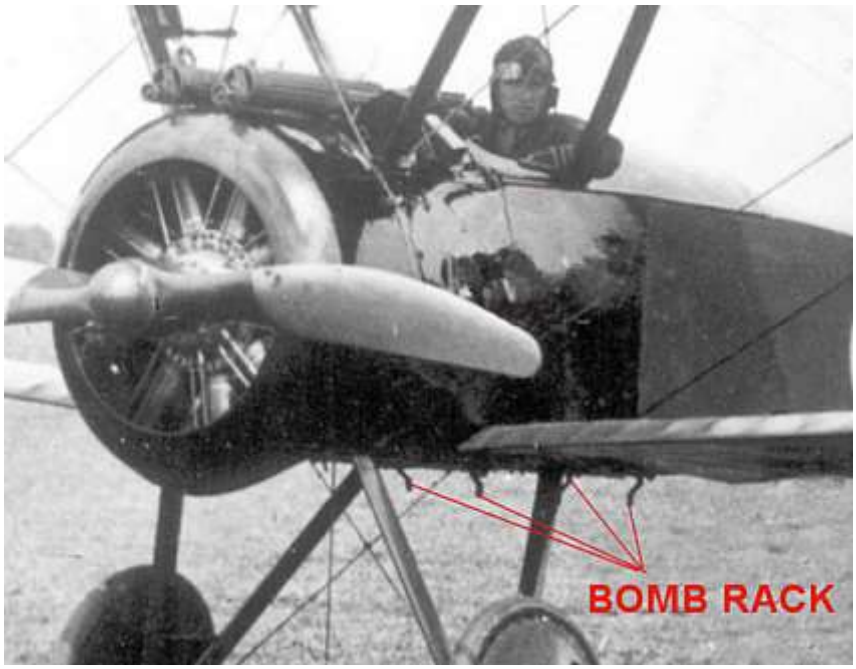
3. A small hole was then drilled, at an angle, into the drilled out face and at an angle towards the round shaped support (intended for the spinning indicator vane).
4. This hole was drilled out using am diameter drill, again taking care not to drill through.
5. The round shaped support was sanded until it was a snug fit into the models carburetor intake tube.
6. The rectangular mounting stem was carefully cut away and the area carefully sanded to conform to shape.
7. Both parts were than primed by airbrushing 'Alclad' Black Base (ALC-305).
8. Once dry, both parts were airbrushed using 'Alclad' Duraluminium (ALC-102).

Both 'funnels will be attached to the model during the final build (Part 10 of this build log).

1L. <u>Bomb rack:</u>

Many Sopwith 'Camels' were fitted with bomb racks for carrying four 'Cooper' bombs. The racks were fitted on the underside centre section of the fuselage. Photographs of Barker's 'Camel' B6313 indicate it to was fitted with a bomb rack at some point, or at least the rack to fuselage attachments. The following photograph of B6313 shows what appear to be the attachment brackets, but without the actual bomb rack itself.

William Barker with his Sopwith 'Camel', Serial No.B6313 (**earlier colour scheme**), France 1917.



As I could not find any references to Barker taking part in ground attack sorties, I chose not to install the bomb rack, but instead cut and bent the four attachment brackets from items in the 'JadarHobby Shop' - 1:48 scale WW1 control horns (48087). These will be fitted later in the build (Part 11 of this build log).

PART 2 - WOOD EFFECTS (General)

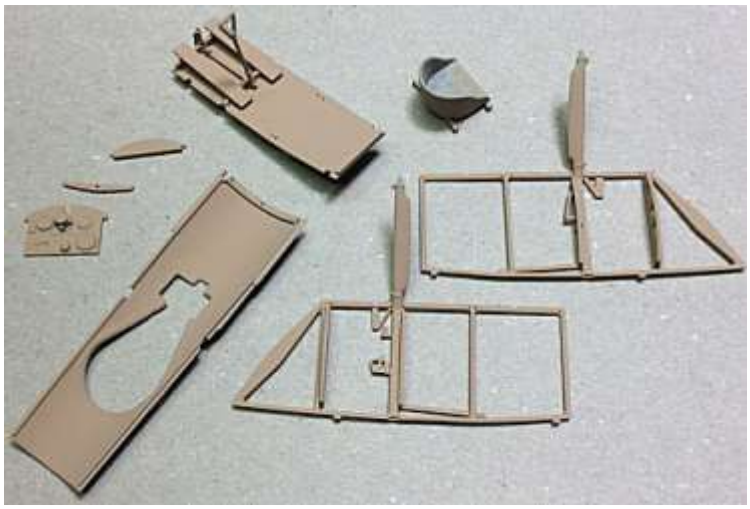
A basic technique:

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

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

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

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



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

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

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

Once painting is complete, clean the brush in water.

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

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

'Tamiya' have 'Clear' coloured Acrylic paints, which are intended to be mixed with either Flat Clear (XF86), Semi-Gloss Clear (X35) or Clear (X22), to give the required finish but with a tint of the added 'Clear' colour. I use the Clear Yellow (X24) or Clear Orange (X26) to add a varnished tint to the clear coat. If using the 'Tamiya' Clear I add 'Mr. Colour' Levelling Thinners, which does improve airbrushing and avoids pooling. Otherwise I use 'Alclad' Light Sheen (ALC-311). Although it's a lacquer, I've found that it will accept 'Tamiya' 'Clear' coloured Acrylics without any separation, which can happen with other paints. The 'Alclad' lacquers dry fast and provide a good sealing layer over the painted surfaces. When using 'Alclad' sealing coats, the golden rule is to allow the various painted surfaces to dry fully before applying 'Alclad' lacquers.

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

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

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

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

PART 3 - WEATHERING (General)

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 bt 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: These washes 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 brush used for oil paint (as the bristles are harder than normal painting brushes) to remove as much of the clay wash as you need to achieve the desired effect. Once dampened, the dried clay is re-activated and the clay wash can be removed or worked as required.

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

To apply the clay wash is just a matter of brushing all over the surface to be weathered. It doesn't matter really how much is applied as it can be left on for any period, as it is easily removed without any effect on the surface underneath. The washes I tend to use are the 'Flory Models' Clay Wash 'Grime' and 'Dark Dirt'.

I use a fairly stiff oil brush to brush off the clay wash, but for smearing effects, an only very slightly damp brush or absorbent paper can be used, but even then I dab them onto a dry piece of the paper. That's how 'damp' it needs to be. Any wetter and you'll find that you are removing too much of the clay wash. If that happens you would have to re-apply the wash and start again.

That said, if you not happy with the final effect, you can easily remove the clay wash by brushing with a wet brush or even airbrush water over the surface. Dry off the surfaces washed and then re-apply the clay wash and try again until you are satisfied.

The technique is to brush over the surface to re-activate the clay wash and at the same time, to smear it over areas that had no clay wash. It'll dry more or less straight away.

Then I'll very lightly stiff brush and/or use a piece of damp absorbent paper or brush to remove as much as I want until I get the desired effect. If I remove too much I just reapply clay wash to that area and repeat the removal procedure.

Once finished, just run the brush under a tap to rinse out any residual clay pigments.

Finally I seal the surface with airbrushed 'Alclad' Klear Light Sheen (ALC-311), which will seal in the applied clay wash.

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

Chipping effects:

I wanted to give the effect of chipped and weathered paint/varnish to the metal engine cowl and forward fuselage panels. To achieve this effect, I first primed the areas with 'Tamiya' Fine Surface primer (Grey) then airbrushed 'Tamiya' Aluminium (XF16). Once dry I airbrushed AK Interactive Medium Chipping fluid (or Vallejo chipping fluid) and when dry, top coated with 'Tamiya' Ocean Grey (XF82). Once fully dry I moistened the top coat with water, which softens the paint. Then with a cut down (stiff) brush and wood cocktail stick, gently teased off the top coat paint. 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.

Oil paint: A technique used more frequently now is oil paint ‘dot and drag’. Basically an oil paint of the desired colour is placed onto a piece of cardboard, which over a hour or so, soaks out the oil in the paint, leaving a drier pigment. The pigment is ‘dotted’ onto the painted surface where it is required then dragged with a brush previously wetted with ‘Tamiya’ X20 enamel thinners then wiped virtually dry.
Softly ‘flick’ the brush to drag the pigment in the direction required, which will blend it in a thin layer.
The amount of pigment left showing depends on the effect you require. Always keep the brush wiped clean to avoid a build up of pigment and remoisten and wipe dry often. The more paint you drag, the less pigment is left showing. Blending different coloured pigments can create stains from smoke/gun blast, rain marks/runs, dirt/dust and oil/fuel stains.

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

PART 4 - RIGGING (General)

The first thing to check is that you have already drilled out the rigging attachment points. Most models have these located on the model, but it's best to carry out research in reference books or research on line before drilling.
Some modellers use micro drills manufactured for drilling printed circuit boards etc and these drill bits sometimes have identifying coloured collars fitted to the drill shanks. I have found that care needs to be taken when using these drills, as they are sharp and instead of easing their way into the plastic of the model, they tend to bite in and effectively 'cork screw' their way in, which causes jamming and lots of broken drills. This is not only expensive but can leave broken drill bits in the model, which are virtually impossible to extract. An alternative is to use High Speed Steel (HSS) drill bits, which are cheaper and have less 'bite' when in use, although again, they are very fragile and can very easily be broken.
Some modellers drill through the wings etc of the model and rig by pulling through the rigging line/EZ thread etc, gluing in position and then rubbing down the exposed line 'tag' and re-painting that area. I prefer to drill only part way into the plastic and attach the applicable rigging fixture with CA adhesive.

With your research complete and all necessary holes pre-drilled (refer to Part 1 of this build log), the rigging can start. For structural strength I use mono-filament (fishing line) of various diameters. These can be semi-transparent but do give a look of steel, without the need of painting or colouring with a gel pen.

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

Rigging and bracing cables fitted to aircraft of this period varied, dependent on the nationality of the aircraft and its individual design. For instance, German aircraft used traditional round, braided cables, whereas later in the war aircraft of the RFC and RAF used solid metal aerodynamic (streamlined) flight rigging and traditional round cables for flight controls. French aircraft used either and sometimes the flight rigging was coloured blue. Finally the methods of actually attaching and adjusting the flight rigging and controls varied. For instance, the attachments for RFC and RAF aerodynamic rigging was different to that for round braided cables, which for adjustment, required turnbuckles. Some German aircraft had attachments with ball end fittings to allow for self alignment of the rigging cables.

The methods for representing this particular aircrafts flight rigging, controls and structural bracing are detailed during the build process in Part 11 of this build log.

PART 5 - DECALS (General)

The personal and national decals supplied in the kit will be used where possible, but for the overall colour and Clear Doped Linen (CDL) surfaces, I chose to use linen effect decals from 'Aviattic' - Clear Doped Linen (ATT32094) and the PC12 'Dark RFC/RAF (ATT32093).
NOTE: *These particular decal sheets are not 'cookie cut' to the required shapes and therefore require you to cut the shapes from the sheets. This is covered in the build (Part 11 of this build log).*

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

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

First I airbrushed a primer coat of 'AK Interactive' Primer and micro-filler (White - AK759) on all of the surfaces to have the decals applied and once dry, the surfaces were checked for any Imperfections, such a trapped dust or raised areas of paint, which will cause 'silvering' under the decals. Any found were carefully polished out. I then airbrushed two light sealing coats of either 'Alclad' Clear Coat Gloss (ALC-310) lacquer), 'Tamiya' Clear (X22) or 'Johnson' Pledge Floor Care finish (similar to 'Future'), which forms a gloss surface for applying the decals. 'Silvering' is caused by air being trapped in the rough surface of the paint, such as on a matte finish, which after the decal is applied and dries, causes the 'silvering'. I the apply the decals following the supplied 'Aviattic' instruction sheet. I pre-wet the model surface with like warm water with a few drops of 'Microscale' MicroSet. 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.

Applying ‘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’ Gloss (ALC-310), ‘Tamiya’ Clear (X22) or ‘Johnson’ Pledge Floor Care finish should be airbrushed over the first decals, to provide a barrier against the setting solutions.*

Applying ‘standard’ water slide decals to a painted surface is different to that for ‘Aviattic’ decals.

1. Ensure the painted surface is smooth and free from any surface imperfections.
2. Airbrush a sealing coat of ’Alclad’ Gloss (ALC-310), ‘Tamiya’ Clear (X22) or ‘Johnson’ Pledge Floor Care finish, to provide a smooth surface.

   NOTE: *‘MicroSet’ solution softens the decal to allow it to conform to the painted surface. Do not attempt to move the decal too much or it may tear.*
3. Wet the area using a light coat of ‘MicroScale’ **MicroSet** solution.
4. Apply the decal after it has soaked in ‘warm’ water enough to start to loosen the decals from its carrier backing.
5. Carefully move the decal into the correct position.
6. 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.*
7. Wet the decal surface with a light coat of ‘MicroScale’ **MicroSol** solution.
8. Leave the solution for several hours to fully dry and set the decal.
9. 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.

For this model the decal sheets had to be cut to match the profiles of the surfaces that required decals. Care is needed to ensure the cut decals are the correct size and shape, otherwise gaps between decals can occur. I trace and cut paper templates or use the kit supplied decals to trace the outline onto the ‘Aviattic’ sheet before cutting out the shape.

Once the decals have been applied I airbrush a sealing coat of either 'Alclad' Clear Coat Gloss (ALC-310) lacquer), 'Tamiya' Clear (X22) or 'Johnson' Pledge Floor Care finish over areas 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 further weather effects ('Flory' clay washes or oil paint), I airbrush a sealing coat 'Alclad' Light Sheen (ALC-311) mixed with Flat (ALC-314) at a 3 to 2 ratio.

PART 6 - WEAPONS

References:
'Vickers Guns' - Windsock Mini Data File No.6 by Harry Woodman

The kit is supplied with two 'Vickers' Mk.1 machine guns fitted with the 'Hyland Type A' cocking handle. The guns have 'tangs' under the breech blocks that located in slots on the top of the gun mountings (B10).

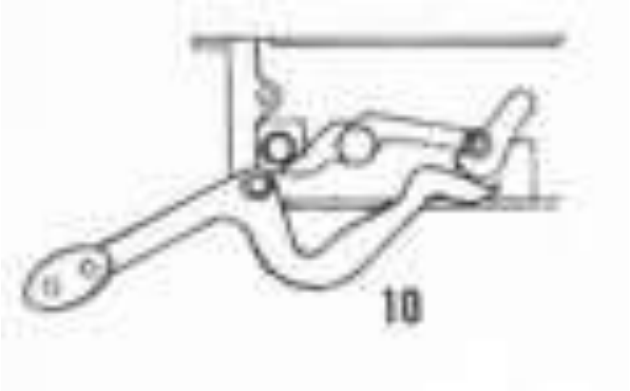
Example of a Hyland Type A cocking handle fitted to the Vickers machine gun on a Sopwith Pup fighter.

1. Cement the pair of cooling jackets halves (A14 and A15) together.

   NOTE: *Take care when drilling the holes as the muzzles are only partly molded onto the cooling jacket halves and can easily be broken off.*
2. Drill a 0.4mm diameter hole into the muzzle of each machine gun, as the muzzles are molded solid.

. **NOTE 1:** *Although the kit instructions show the cooling jackets being fitted to the gun breeches after the top cowling (A40) is fitted, I chose to fully assemble the two guns, as it was easier to paint them assembled, after which they can be fitted at the same time as the top cowling.*
NOTE 2: *For this particular model, the kit supplied photo-etch (PE) end face with Barker's 'Red Devil' emblem (PE6) was used for the right machine gun and PE1 for the left.*
3. Remove the required cooling jacket end faces from the kit supplied photo-etch sheet and cut away any 'sprue tags'.

4. Secure the end faces in position against the cooling jackets using thin CA adhesive.
5. Cement the gun cocking handles (A6) to their locations on the two gun breech blocks.
6. Prime the machine assemblies by airbrushing with ‘Alclad’ Grey Primer and Micro-Filler (ALC-302).
7. Airbrush all of the machine gun parts, except the padding (D23), with a 50/50 mixture of ‘Alclad’ Gunmetal (ALC-120) and Duraluminium (ALC-102).
8. Once dry, dull the metallic look by ‘dry brushing’ the machine gun assemblies with ’Mr. Colour’ Stainless Steel (212).
9. Locate the end faces over the muzzles on the machine guns with the top of the cross bars slightly to the left of top dead centre.



10. Brush paint the gun padding (D23) with ‘Humbrol’ Leather (62).
11. Cement the gun padding (D23) to their location on the rear of the gun breech blocks.
12. Brush paint Barker’s ‘Red Devil’ emblem (if used) with ‘Tamiya’ Flat Red (XF7).
13. Brush paint the ammunition inlet port in the gun breech blocks with a 50/50 mix of ‘Mr. Colour’ Brass (219) and Copper (215) to create a Phosphor Bronze colour.
14. Brush paint the return spring on the left of each breech block with ‘Mr. Colour’ Stainless Steel (213).
15. Dry brush the gun muzzle area with ‘Tamiya’ Rubber Black (XF85).
16. Brush paint the wood hand grips on the two cocking handles with ‘Tamiya’ Hull Red (XF9).
17. Apply a wash of ‘AK Interactive’ Kerosene (AK 2039) thinned with White Spirit.

PART 7 - PROPELLER

The kit supplies two different propellers for this model. Although these propellers are of good molded quality, I chose instead to use a hand made and laminated wood propeller instead. The propeller used is a 'Proper Plane' - Lang type propeller (WP004).

The basic propeller created by 'Proper Plane'

The propeller fitted to Barker's B6313 was of this type, but had two main differences:

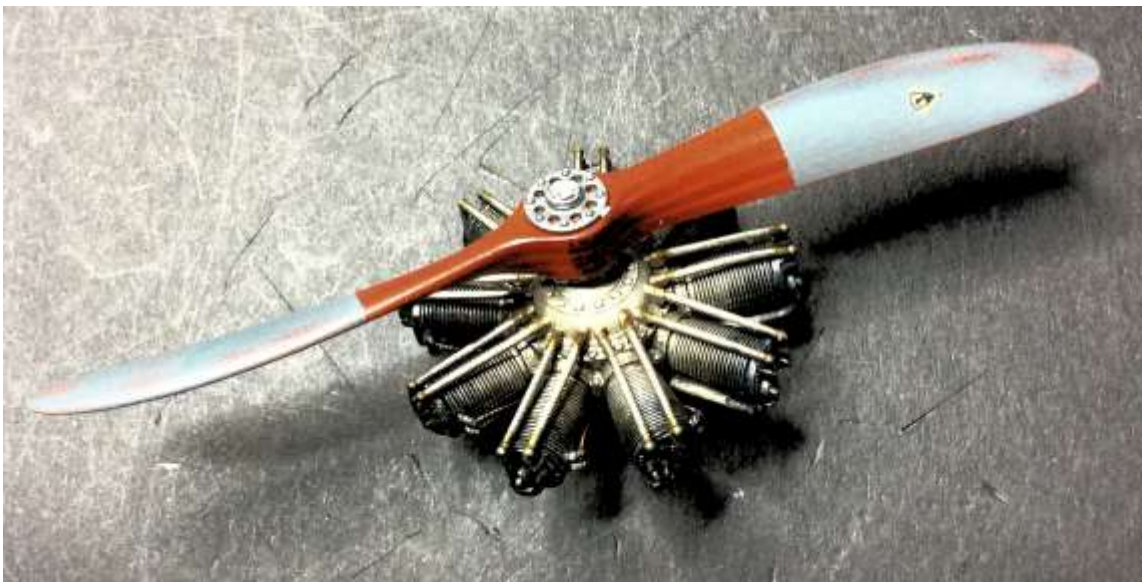
A. The exposed wood was finished in a rich brown varnish.
B. The outer half of each blade was protected with a painted grey surface.

NOTE: *The earlier version of B6313 had a red conical spinner covering the front retaining plate - this was not fitted to the later version of B6313 (this model).*

To represent the differences:

1. Make sure the wooden propeller is perfectly smooth and lightly sand if necessary.
2. Airbrush light coats of 'Tamiya' Clear Orange (X26) mixed with a small amount of 'Tamiya' Hull Red (XF9), thinned with 'Tamiya' X20A thinners, to obtain the darker varnished look of the wood.
3. Once totally dry, mask off the outer half of each blade and airbrush with 'Tamiya' Grey (XF82).
4. When fully dry, lightly polish the leading and trailing edges, the tips and along to main faces, to allow the wood underneath to show through as paint wear.

5. Once dry, either polish the propeller hub and grey paint OR airbrush a sealing coat - use either 'Alclad' Clear Coat Gloss (ALC-310) lacquer, 'Tamiya' Clear (X22) with added 'Mr. Colour' levelling thinners or 'Johnson' Pledge Floor Care finish (similar to 'Future'). This will provide a good surface for applying the decals.
6. Apply the kit supplied propeller decals (79 and 83).
   NOTE: *The resin propeller bosses supplied with the 'Proper Plane' propeller have central holes that are smaller than the engine propeller shaft. Carefully scrape away the surface of the shaft until the propeller and bosses can slide onto the shaft*.
7. Once cut off, sanded to the correct thickness, brush paint the two propeller bosses with 'Mr. Colour' Stainless Steel (213).
8. Position the bosses onto the hub of the propeller (boss with retaining nut fits to the front of the hub) and secure them using thin CA adhesive.
9. Finally, seal the propeller by airbrushing with 'Alclad' Semi-Matt (ALC-312).



PART 8 - ENGINE

The following steps detail the building of the engine prior to it being installed to the fuselage.

The 'Clerget' 9Bf (140hp) rotary engine supplied in the kit is of good quality and detail, but there are other companies that produce highly detailed styrene and resin model engines, such as those from 'Roden', 'Taurus Models', 'Ultra Cast' and 'vector Resin'. However as with most model aircraft having a rotary engine, the engine cowl once installed covers 90% of the engine and much of it can't actually been seen.

The 'Clerget' engine supplied in the kit is of good quality and detail and given the lack of visibility once fitted to the model, I chose to it in preference to an after market engine. In addition using the kit engine saves any extra expense that is not really warranted.

All of the kit parts needed to build the engine are contained on a single sprue (E). Building the engine is straight forward following the 'Wingnut Wings' instruction manual.

This part of the build log covers the addition of ignition wires and the painting of the engine.

1. Assemble the engine cylinder block E6, E8 with the cylinder heads E3.
2. Assemble the induction pipe assembly E1, propeller shaft E4 and slip ring/retainer E5/E7.
3. Prime all parts using 'AK Interactive' Primer and micro-filler (AK758).
4. Airbrush the cylinder block assembly using 'Tamiya' Metallic Grey (XF56).
5. Airbrush the push rod assembly using 'Tamiya' Chrome Silver (X11).
6. Airbrush the propeller shaft, slip ring/retaining ring and induction pipes assembly using 'Tamiya' Flat Aluminium (XF16).
7. Brush paint the 18 spark plugs using 'Tamiya' Flat White (XF2) mixed with a drop of Buff (XF57).

   NOTE: *There are location stubs in the front and rear of the engine and on the induction pipes and push rod assembles. These are intended to align the assemblies when they are fitted. However when assembled there is a slight misalignment for both assemblies to the engine cylinder heads. To remedy this, cut away the location stubs from the inside of the engine, which then allows correct alignment of the parts.*
8. Assemble the complete engine.
9. Apply an engine wash of 'AK Interactive' Engine Wash (AK2033).
10. Airbrush the engine with a light coat of 'Alclad' Semi-Matt (ALC-312) lacquer.
11. Apply the decal data plate (kit decal 78) to the push rod housing.
12. Apply lightly by sponge 'Tamiya' Weathering Master (Set D - Burnt Blue) to the induction pipes at the cylinder heads.
13. Apply lightly by sponge 'Tamiya' Weathering Master (Set B - Soot) to the cylinder heads at the opposite side to the induction pipes (the exhaust valve).

14. Apply an engine wash of ‘AK Interactive’ Engine Oil (AK2019) to each end of the engine push rods.

    NOTE: *In the following steps, the orientation of the nine pairs of ignition leads, which are attached to the spark plugs and slip ring on the propeller shaft at the rear of the engine. The leads are attached to the slip ring at the centre of the relevant cylinder.*

15. Using a 0.6mm diameter drill as a mandrel and 0.125mm diameter copper wire (or similar), loop the wire over the shank of the drill.

16. Twist the wire until you have a tight spiral of wire with a 0.6mm loop at the end.

17. Create nine such ‘ignition leads’.

    NOTE: *The non-looped end of each of the following ’ignition leads’ need to be positioned between the rear of the engine crankcase and the engine locating disc (fits into the engine bulkhead (kit part A10) and slightly to **left** of the centre of the cylinder (viewed from the rear).*

18. Cut the nine lengths, at the non-looped end, long enough to be located onto the rear spark plug of each cylinder with the other end between the rear of the engine crankcase and the engine locating disc.

19. Locate the loop of each ‘ignition lead’ over the rear spark plugs, position the other ends then secure in position by applying CA adhesive to the loop on the spark plug.

    NOTE: *The non-looped end of each of the following ’ignition leads’ need to be positioned between the rear of the engine crankcase and the engine locating disc (fits into the engine bulkhead (kit part A10) and slightly to **right** of the centre of the cylinder (viewed from the rear).*

20. Repeat steps 15 to 19 above to fit ‘ignition leads’ to the forward spark plugs of each of the cylinders.

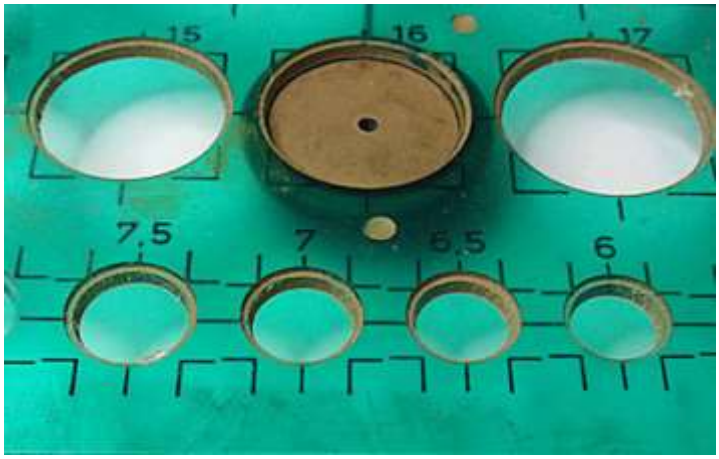
21. Apply ‘AK Interactive’ Engine Wash (AK2033) along each ‘ignition lead’ in order to ‘knock back’ the shine of the copper wire.

PART 9 - WHEELS

The assembly of the two wheels is straight forward. In the kit are two ‘clip over’ locking discs (D13), which are used to secure the wheels onto the axle and allow them to rotate. I didn't use these as the intention is to have the model static on a display base.

First, the tyres were brush painted using ‘Tamiya’ Rubber Black (XF85).

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



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

The faces of the wheel front and rear covers were primed with ‘AK Interactive’ Primer and Micro-filler (White - 769), which will act as the base coat for applying ‘Aviattic’ linen decals.

They were then given a sealing coat - use either ‘Alclad’ Clear Coat Gloss (ALC-310) lacquer, ‘Tamiya’ Clear (X22) with added ‘Mr. Colour’ levelling thinners or ‘Johnson’ Pledge Floor Care finish (similar to ‘Future’), all of which will give a gloss surface for applying the decals.

NOTE: *I used a ‘ThinnerLine Circle Cutter’ to create circular decals (from the ‘Aviattic PC and CDL sheets) for the wheel covers.*

Using the cutter I cut out two decals for the rear wheel covers (from the CDL sheet) and two decals for the front covers (PC sheet).

NOTE: *The front wheel covers are slightly conical in shape. The decals need to be cut slightly larger in diameter than required then a section cut out. This will allow the decal to be applied to the conical surface with the cut sides butting against each other.*

NOTE: *The 'Aviattic' decals are quite strong and flexible enough to be able to push and position the decals prior to final fitting.*

The two PC and CDL decal discs were then applied to the wheels following the 'Aviattic' instructions (refer to Part 11 of this build log).

The front wheel covers have an access hole for the valve inside the wheel. To force the decal to conform to the access hole, first carefully puncture through the decal into the access hole, then carefully apply 'Micro-Sol' to aid in conforming the decal in the hole. The same can be done to the axle hole in the wheel rear covers.

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

NOTE: *Ensure the tyre decals (112) are applied over the pre-molded wording on the tyres.*

The kit supplied decals for the tyre manufacturer (decals 112) were added around the edge of the tyres and over the raised wording moulded in the tyre itself.

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

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

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

The wheels with the front covers 'test fitted.

PART 10 - INTERNAL DETAIL

This Part 5 of the build log will cover the painting and assembly of the entire internal fuselage components, including any modifications or corrections to enhance the models interior and to add more authentic detail.

NOTE 1: *Follow the basic WNW kit instruction manual for assembly.*
NOTE 2: *Ensure any modifications or corrections for cockpit items have been carried out as detailed in Part 1 (Modifications or Corrections) of this build log.*
NOTE 3: *The 'Aldis' gun sight (kit part D25) was not fitted to Barkers B6313 so is not required for this model.*
NOTE 4: *Unless otherwise stated, all painting was carried out using an airbrush.*
CAUTION: *Take great care when handling the cockpit side frames (A19 and A26), before and after the cockpit is assembled. The two cabane struts on each side frame are molded as part of the frame. These struts can be easily knocked, which may cause them to be weakened at the base or to snap off completely. For similar reasons, also protect the installed tail skid by a sponge pad masking taped to under the rear fuselage.*

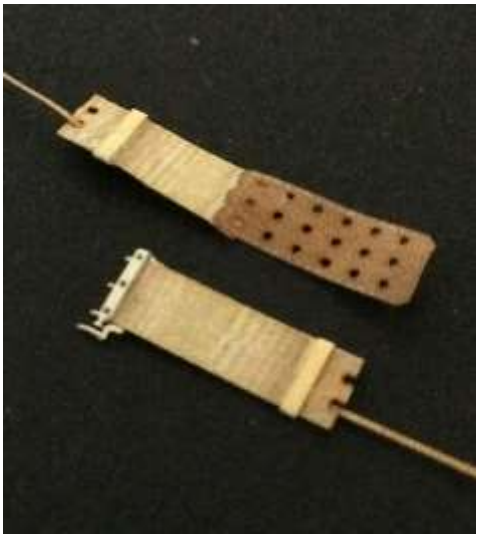
Preparation and Partial Assembly:

1. Using 'AK Interactive' Primer and Micro-filler (Grey-AK758), airbrush prime the required parts. In addition, prime the replacement resin seat and cushion from 'Taurus Models', the centre section of the lower wing (B6), the rear face of the front engine plate (A10), inside the two fuselage halves (B1 and B2) and the tail skid (D17).
   NOTE: *The 'Wingnut Wings' instruction manual indicates that the wooden components for the internal fuselage and cabane struts are either 'light' or 'dark' wood. When applying the wood effects, choose suitable oil paints to reflect the different colours of wood parts. For example Burnt Umber for darker wood and Burnt Sienna for lighter wood.*
2. Apply wood effects (refer to Part 2 Wood Effects of this build log) to the following parts:
   Dark or Light wood:
   Instrument panel (B9)
   Fuselage (B1 and B2) cockpit side panels (refer to page 6 of the 'Wingnut Wings' instruction manual)
   Dark wood:
   Cockpit side frames with cabane struts (A19 and A26)
   Seat and fuel tank frame (A23)
   Fuselage (B1 and B2) fuselage tail bay upright (refer to page 6 of the 'Wingnut Wings' instruction manual)
   Light wood:
   Tail skid (D17)
   Cross member (D11)
   Floor boards (A21)
   Inside of the cockpit decking (B7)
   Rudder bar (D7)
   Decking side panel (inside surface) A32)
   Lower wing (B6) centre, rear section

3. Paint the following parts with ‘Alclad’ Gloss Black Base (ALC-305) and when dry, with Duraluminium (ALC-102):
   - Magazines and engine back plate (A31)
   - Carburetor air pipe (A18)
   - Undershield - cockpit side (A25)
   - Fuel tank (A35)
   - Top cowling - inside surface (A40)
   - Fuselage (B1 and B2) forward panels (refer to page 6 of the ‘Wingnut Wings’ instruction manual)
   - Lower wing (B6) centre, forward section
   - Oil tank/gun mounts assembly (B10) -oil tank ‘Tamiya’ Grey (XF82)
   - Top cowling panel (A40)

4. Brush paint the compass and inclinometer (D12) with ‘Tamiya’ Rubber Black (XF85).
5. Paint the inside the fuselage halves (B1 and B2) rear of the wood effect panels with ‘Tamiya’ Deck Tan (XF55).
6. Paint pilots seat (’Taurus Models’ replacement) with ‘Tamiya’ Deck Tan XF55). When dry brush over ‘AK Interactive’ Light Wood filter (AK261).
7. Paint the pilots seat cushion (’Taurus Models’ replacement) with ‘Tamiya’ Hull Red with ‘Humbrol’ Leather (62) highlights.
8. For cockpit details and following the ‘Wingnut Wings’ instruction manual, brush paint instrument surrounds ‘Tamiya’ Rubber Black (XF85) and brass items using ’Mr. Colour’ Brass (219), including the fuel and oil tank caps.
9. Brush paint using ‘Mr. Colour’ Stainless Steel (213);
   - The vertical surface (front of the auxiliary fuel tank) inside the cockpit decking panel (B7).
   - The base of the main fuel tank (A23) with ‘Mr. Colour’ Stainless Steel (213).
   - The pilots control column and tube at the base.
   - Any metal fittings.

   Airbrush the instrument panel (B9) with a gloss sealing - use either ‘Alclad’ Clear Coat Gloss (ALC-310) lacquer, ‘Tamiya’ Clear (X22) with added ‘Mr. Colour’ levelling thinners or ‘Johnson’ Pledge Floor Care finish (similar to ‘Future’), which will give a gloss surface for applying the decals.
11. Apply the required decals to the instrument panel.
12. Assemble the parts (A31/22, D12, A18) to the instrument panel (B9).
13. Seal the instrument panel assembly and all of the other painted cockpit parts by airbrushing with either ‘Alclad Light Sheen (ALC-311) lacquer or ‘Tamiya’ Semi Gloss Clear (X35) with added ‘Mr. Colour’ levelling thinners.
14. Using the instructions supplied with the ‘HGW Models’ Sopwith Camel seat belts set (132590), assemble the seat belts with the ‘loop’ straps option. Attach each belt loop to only one side of its seat belt (refer to the following photograph).

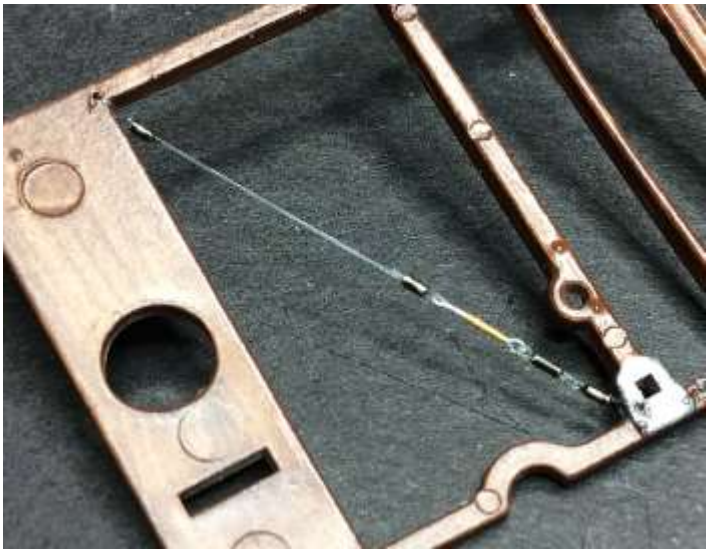


Internal rigging - Bracing wires:

For information refer to Part 1E of this build log.

15. At this stage and before the cockpit complete is assembled, the bracing wires should be installed.
16. Ensure the pre-drilled rigging holes in cockpit parts A31 (pulleys), A19 and A26 (side frames), D7 (rudder bar) and D11 (cross member) are clear of any paint or sealing coat.
17. 'Roll' cut a short length of 'Albion Alloys' 0.5mm diameter tube (MBT05). Cut a length of 0.12mm 'Steelon' mono-filament line and pass one end through the tube and the eye end of a 'GasPatch' 1:48 scale turnbuckle (Type C). Pass the end of the line back through the tube then holding both lines, slide the tube up and close to (not touching) the turn buckle eye end. Make sure the looped line is free to move in the turnbuckle eye end. Secure the tube to the line using thin CA adhesive. Separate the two lines where they exit the tube and cut away the free end close to the tube.
18. Repeat to the other end of the turnbuckle so you end up with a line attached to both ends of the turnbuckle.
    NOTE: *During the next steps ensure the turnbuckle is positioned closer to the bottom corner of the cockpit side frame.*
19. 'Roll' cut a short length of 'Albion Alloys' 0.5mm diameter tube (MBT05). Pass the line through the tube then through the pre-drilled 0.3mm hole in one corner of the cockpit side frame. Pass the end of the line back through the tube then holding both lines, slide the tube up and close to the corner of the side frame. Secure the tube to the line using thin CA adhesive. Separate the two lines where they exit the tube and cut away the free end close to the tube.
20. Repeat to the other end of the line so you end up with a bracing line attached to opposite corners of the formers in the cockpit side frame.
21. Repeat the process to create crossed bracing wires in the three 'bays' of the cockpit side frames.
22. Apply 'AK Interactive' Kerosene' filter (AK 2039) to the brass tubes to 'knock back' the shine of the metal.

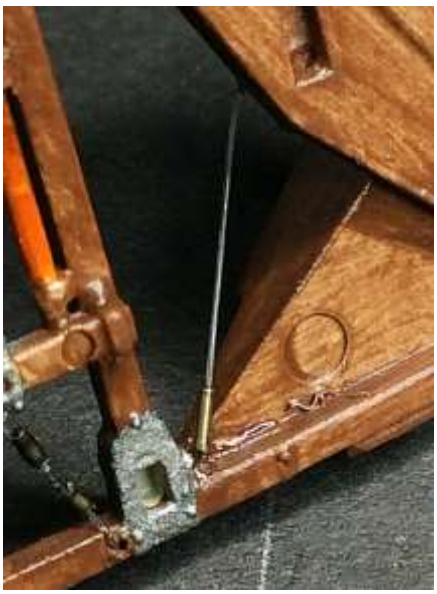
23. Brush paint the centre of the turnbuckles using ‘Mr. Colour’ Brass (219).
24. Repeat these procedures to rig the remaining lines to the cockpit side frames, following the rigging diagram in the ‘Wingnut Wings’ instruction manual.



Example of a single cross bracing wire between cockpit side frame formers.

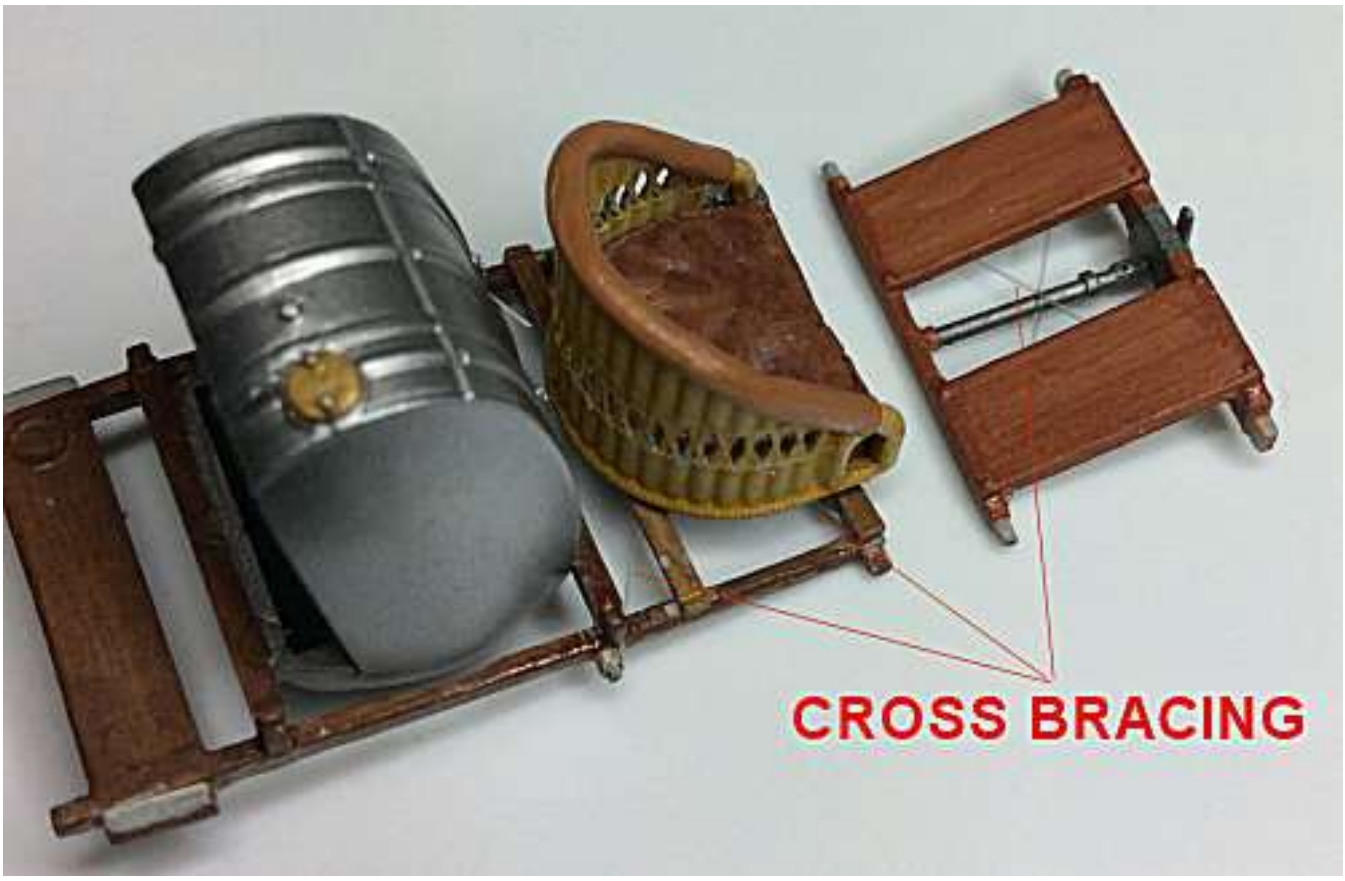
There was a bracing wire attached to the bottom corner of the forward vertical former. This wire was routed up and attached to a stub on the forward outboard face of the cockpit side frames. From there it was routed up to attach to the base of the forward cabane strut.

25. Drill a 0.2mm diameter hole through the bottom corner of the forward vertical former.
26. Pass a length of 0.12mm ‘Steelon’ mono-filament line through the hole securing it in position using thin CA adhesive.
27. Trim away the line on the outboard side of the cockpit side frame.
28. Cut a short length of ‘Albion Alloys’ 0.4mm Nickel-Silver tube (NST04) and slide it onto the line.
29. Drill a 0.2mm diameter hole through the end of the stub on the forward outboard face of the cockpit side frame.
30. Pass the end of the line through the hole in the stub.
31. Drill a 0.2mm diameter hole through the cockpit side frame, at the bottom of the forward cabane strut.
32. Pass the end of the line through the hole.
33. Pull the line taut and secure it in position using thin CA adhesive.
34. Trim away the line on the inboard side of the cockpit side frame.
35. Slide the tube down against the corner of the vertical former and Pull the line taut and secure it in position using thin CA adhesive.
36. Apply ‘AK Interactive’ Kerosene’ filter (AK 2039) to the brass tubes to ‘knock back’ the shine of the metal.
37 Brush paint the centre of the turnbuckles using ‘Mr. Colour’ Brass (219).
38. Repeat this procedure to other cockpit side frame.



There were cross bracing wires fitted under the pilot's seat frame (A23) and the foot boards (A21). To represent theses wires:

39. Drill a 0.2mm diameter hole through the outer ends of the two cross members of the frame under the pilot's foot boards (A21).
40. Drill a 0.2mm diameter hole through the outer ends of the forward cross member of the frame under the main fuel tank (A23).
41. Drill a 0.2mm diameter hole through the forward ends of the side members of the frame (A23).
42. Pass a lengths of 0.12mm 'Steelon' mono-filament line through the holes to form crossed wires.
43. Secure one end of each line using thin CA adhesive.
44. Pull each line taut and secure the other end using thin CA adhesive.



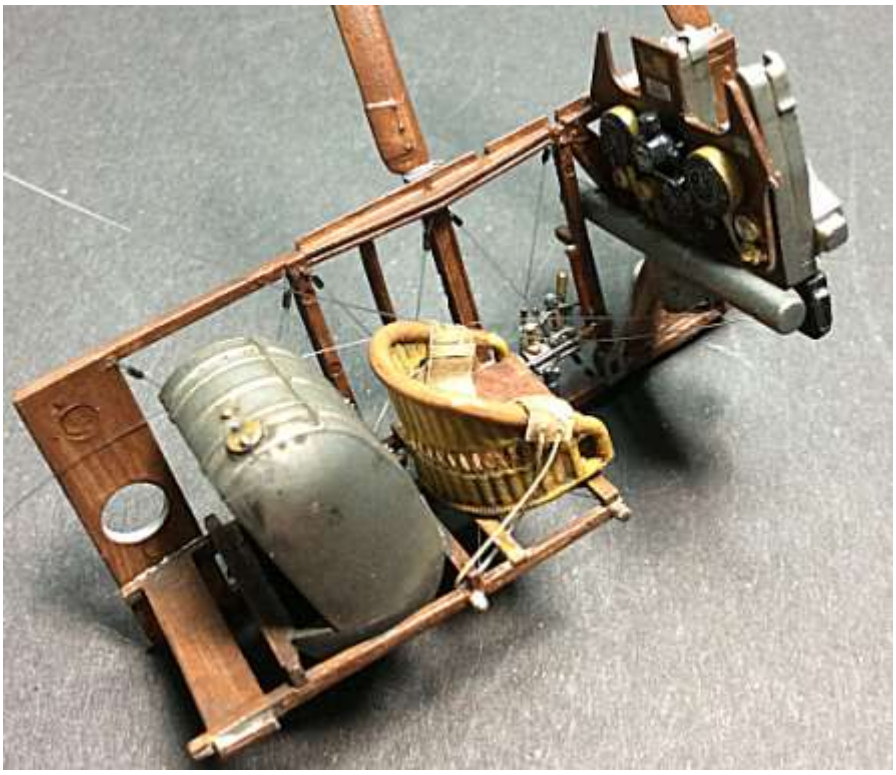
45. Seat belts - The ‘HGW Models’ Sopwith Camel seat belts (132590) were partly assembled previously, The ‘loop’ straps must be looped under the rear cross member of the pilots seat and the forward cross member of the main fuel tank frame (A23).
46. Attach the end of each ‘loop’ strap to its seat belt using CA adhesive.
47. Position the seat belts as required as secure them in position on the pilots seat using CA adhesive.

NOTE: *The weathering is applied at this stage before the bracing rigging is fitted to the cockpit forward metal panel.*

48. Refer to Part 3 (weathering) of this build log and using the ‘Flory’ Dark Dirt clay wash, weather the following:
    - Inside surfaces of the fuselage halves
    - Lower wing centre section
    - Magazines and back engine plate (A22, A31 - behind instrument panel assembly)
    - Carburetor air induction pipe (A18 - instrument panel assembly)
    - Floor boards (A21)
    - Undershield (A25)
    - Main fuel tank (A35) and pilots seat
    - Inside surface of:
        - Decking panel (B7) and right side (A32)
        - Top cowling (A40)
        - Front engine plate (A10)
        - Oil tank, gun mounts (B10)
49. Apply ‘AK Interactive’ Kerosene filter (AK2039) around the filler cap of the main fuel tank (A35).

NOTE 1: *The following partial assembly steps allow access to the cockpit side frame for adding extra pipe detail before final assembly of the cockpit.*
NOTE 2: *Test (dry) fit the various parts and make sure all connection joints are free from primer and paint, to ensure an easy fit of the parts. If necessary, sand butting edges of the cockpit side frames etc where they contact the fuselage halves. When assembled the parts should be able to be removed easily from the fuselage halves.*
NOTE 3: *Do not apply too much cement to the joints in steps 50 and 51, or seepage of cement may come into contact the left fuselage half and bond the two together.*

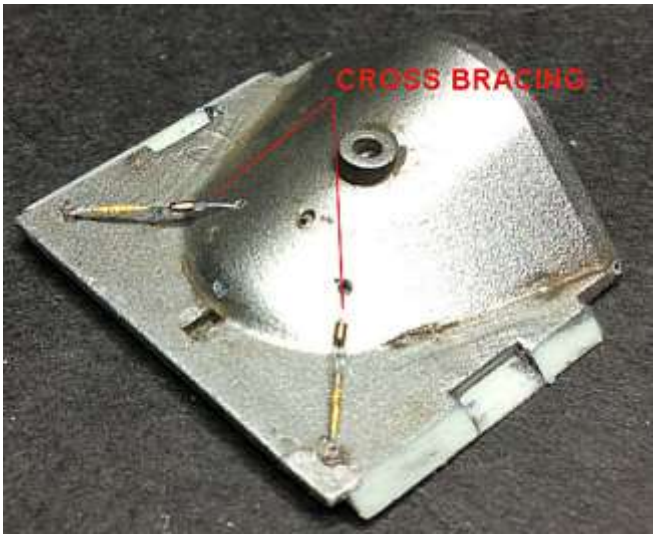
50. Cement the pilots seat and main fuel tank assembly into its locations on the left cockpit side frame.
51. Cement the instrument panel assembly into its locations on the left cockpit side frame.
52. Dry fit the right cockpit side frame onto it locations on the pilots seat and main fuel tank assembly and the instrument panel assembly. **Do not cement.**
53. Locate the assembly onto the left fuselage half.
54. Position the right fuselage half to the left fuselage half, making sure it is correctly located.
55. Allow the cemented joints on the left fuselage half set completely.
56. Carefully separate the two fuselage halves and remove the cockpit assembly.
57. Carefully removed the right cockpit side frame to leave just the left side frame with the attached parts.

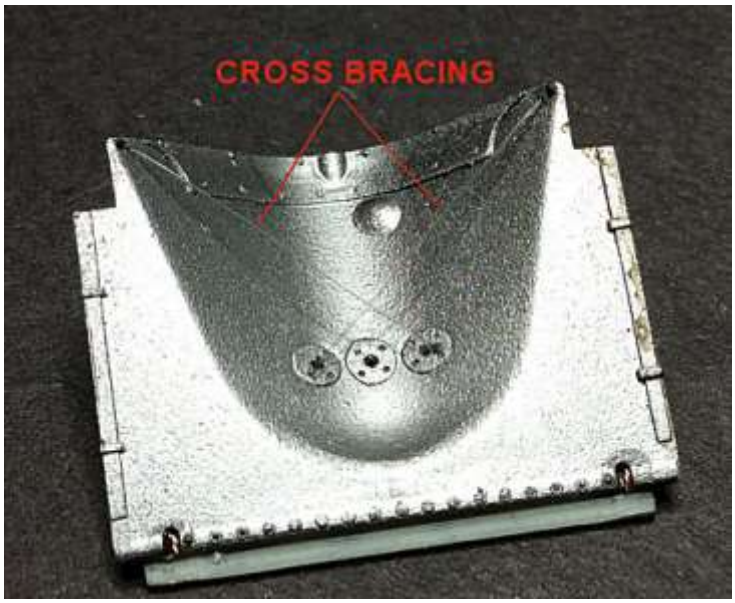


Whilst the cemented assembly is setting, the forward ‘metal’ under shield panel cross bracing wires can be added as follows:

58. Cut two lengths of 0.12mm diameter ‘Steelon’ mono-filament.
59. Cut two lengths of 0.125mm diameter copper wire.
60. Cut two short lengths of ‘Albion Alloys’ 0.5mm micro-tube (MBT05).

61. Pass a copper wire through the eye end of a ‘GasPatch’ turnbuckle (Type C) and twist the two ends to form an spiral ‘anchor’ loop at the turnbuckle. Repeat for a second turnbuckle.
62. Slide a tube onto the line then pass one end of the line through the other eye end of the turnbuckle and loop it back and through the tube. Slide the tube up and close to the turnbuckle. Repeat for the second turnbuckle.
63. Secure the tubes in position using thin CA adhesive.
64. Cut away the line tag close to the tube.
65. Insert the copper wires into the pre-drilled holes at the rear corners of the panels inner face.
66. Bend the copper wire tails over the rear edge step on the panel.
67. Pass the ends of the lines through the pre-drilled holes on their side of the central ‘hump’ of the panel.
68. From the outside face of the panel, cross the lines and pass the ends through the pre-drilled holes in the corners at the front edge of the panel.
69. Secure the copper wires into the panel using thin CA adhesive, then cut away the exposed wire flush with the edge of the rear step on the panel.
70. Pull the two lines taut and secure them at the panel front corner holes using thin CA adhesive.
71. Apply ‘AK Interactive’ Kerosene filter (AK2039) to the two tubes to knock back the metal shine.
72. Brush paint the centre section of the two turnbuckles using ’Mr. Colour’ Brass (219).

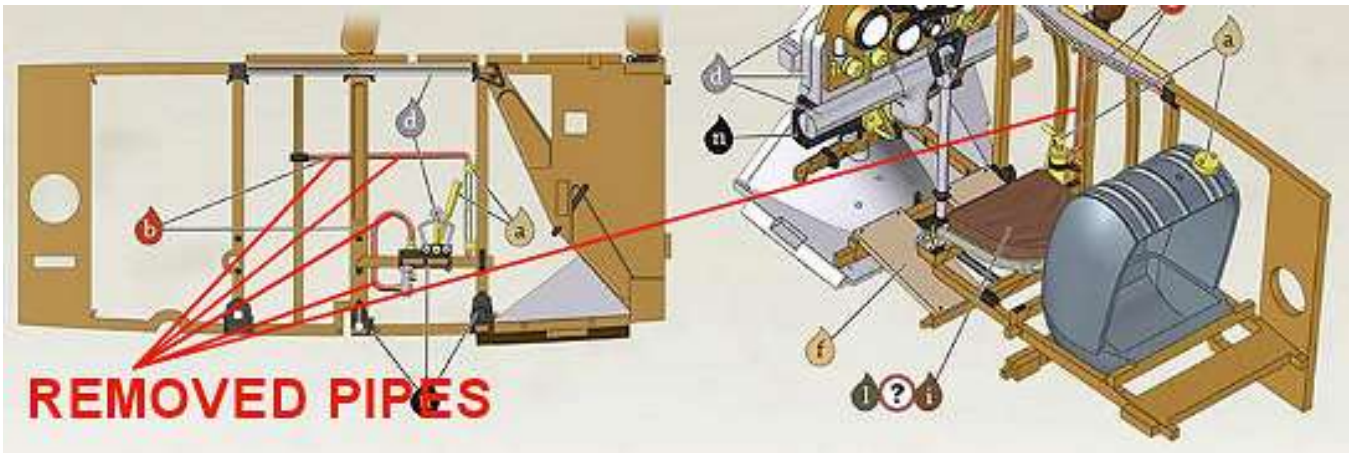


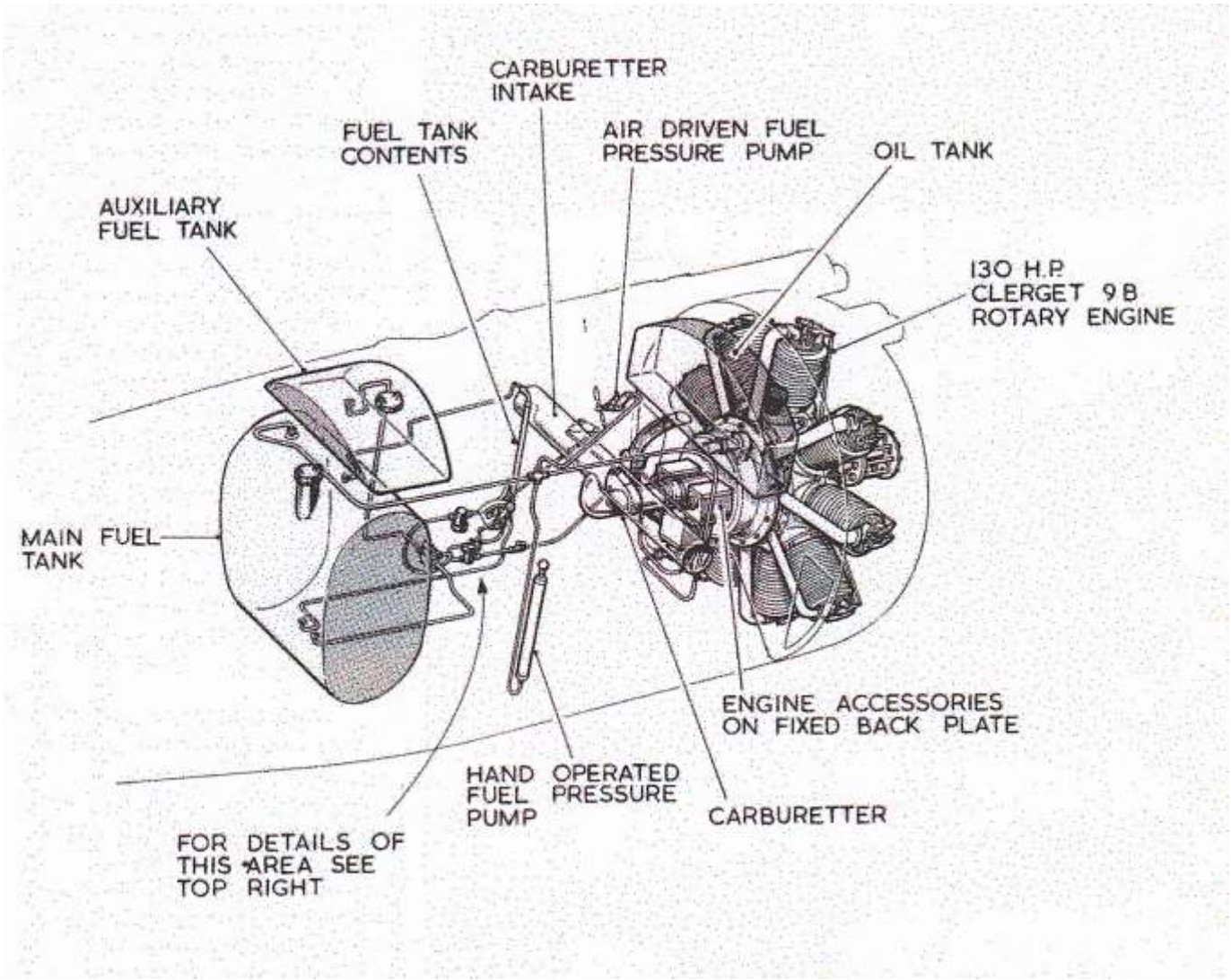


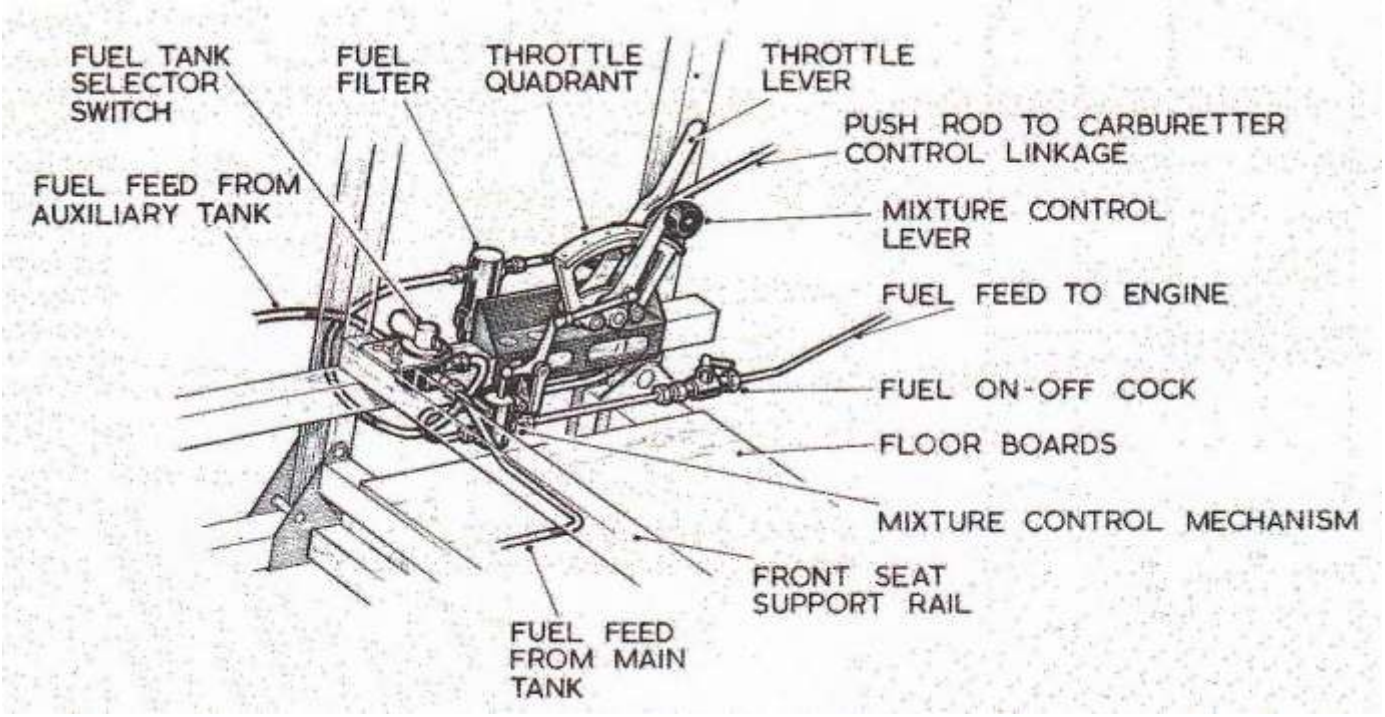
With the left cockpit side frame exposed, but with the main fuel tank, pilots seat and instrument panel fitted, it and the separate right cockpit side frame can now have the additional pipe detail added.

NOTE: *The existing pipes on the side frames appear to be over scale so therefore will be replaced with suitable copper wire. For information refer to Part 1J of this build log.*

73. On the cockpit side frames, cut away the pre-molded pipes as highlighted below. Refer to the following illustrations for the various pipes and throttle controls required.







Left cockpit side frame

NOTE: *Before use, prepare the copper wire by annealing (heating over a flame). This not only softens the copper wire but also removes any surface treatment, so dulling the metal finish.*

74. Fuel filter - The pre-molded fuel filter was replaced with one created from brass micro-tube and located where the pipe was cut away at the rear of the throttle quadrant. It was made by cutting a short length of 'Albion Alloys' 0.8mm diameter micro-tube (MTB08) and a short length of 0.4mm tube (MBT04). One tube was slid inside the other and secured using thin CA adhesive. Both end were then 'roll' cut to length. A hole of 0.4mm diameter was drilled into the location of the cut pipe and the 'filter' inserted and secured using thin CA adhesive.
75. Pipe - fuel filter to fuel mixture controller - The pipe was routed from the forward face of the fuel filter towards the vertical former, then looped around and back behind the throttle quadrant, down forward to the fuel mixture controller. A hole of 0.3mm diameter was drilled into the rear face of the fuel mixture controller and the forward face of the fuel filter, both at the cut away pipe locations. A length of copper wire (0.2mm diameter) was cut and annealed, then bent to the correct shape, after which it positioned behind the throttle quadrant with the ends located in the pre-drilled holes. The pipe was secured in the holes using 'Flexy 5' CA adhesive.
76. Pipe - Fuel filter to fuel selector switch - The pipe was routed from the rear face of the fuel filter back to the vertical former, next the to front of the pilots seat. From there the pipe was routed down the forward face of the former then under the longeron and inboard and up to the selector switch. A length of annealed copper wire (0.2mm diameter) was cut then bent to the correct shape and once correctly positioned, was secured in place using 'Flexy 5' CA adhesive.

77. Pipe - Fuel selector switch to auxiliary fuel tank - The pipe was routed outboard from the fuel selector switch then rearwards to the base of the rear vertical former. From there the pipe was routed vertically up the former then rearwards and up behind the location for the representation (on decking panel B7) of the auxiliary fuel tank. A length of annealed copper wire (0.375mm diameter) was cut then bent to the correct shape and once correctly positioned, was secured in place using 'Flexy 5' CA adhesive.
NOTE: *During the following step, make sure that when fitted, the cross member (D11) will clear the installed pipe.*

78. Pipe - Fuel selector switch to main fuel tank - The pipe was routed from centrally below the main fuel tank forwards to in front of the forward cross member supporting the pilots seat, then outboard to the right side of the fuel selector switch. A hole of 0.4mm was drilled into the bottom of the main fuel tank. A length of annealed copper wire (0.375mm diameter) was cut then bent to the correct shape and once correctly positioned, was secured in place using 'Flexy 5' CA adhesive.

79. Pipe - Fuel contents from main fuel tank (bottom) to contents indicator tube - The pipe was routed from the bottom, the left side of the main fuel tank and outboard then forwards, below the lower longeron to forward of the throttle quadrant. From there it was routed up to connect to the base of the fuel contents indicator tube. A hole of 0.4mm was drilled into the bottom of the main fuel tank. A length of annealed copper wire (0.375mm) was cut then then bent to the correct shape and once correctly positioned, was secured in place using 'Flexy 5' CA adhesive.

80. Pipe - Fuel contents from main fuel tank (top) to contents indicator tube - The pipe was routed from the top, centre of the main fuel tank and outboard then forwards, across and behind the three vertical formers to the top of the fuel contents indicator tube. A hole of 0.4mm was drilled into the top front of the main fuel tank. A length of annealed copper wire (0.375mm) was cut and bent to the correct shape. The section of the wire, between the last two formers, was cut out and added between the formers (to avoid fouling on the inside of the fuselage). The wires were correctly positioned and secured in place using 'Flexy 5' CA adhesive.

81. Pipe - Engine fuel supply from the mixture controller to the engine - The pipe was routed from the fuel mixture controller forwards to just past the throttle quadrant. There the pipe was connected to a fuel shut-off valve and from there was routed slightly upwards towards the engine carburetor, located on the engine accessories back plate. A hole of 0.4mm was drilled into the forward face of the fuel mixture controller.

    1. Cut a short length of 'Albion Alloys' 0.7mm diameter tube (MBT07) and slightly longer 0.5mm tube (MBT05).
    2. Slide the smaller tube into the larger, centralize the outer tube and secure them with thin CA adhesive.
    3. Cut a length of 0.2mm annealed copper tube and pass it through the micro-tube.
    4. Cut one end of the copper wire so that the micro-tube is just forward from the throttle mounting.
    5. Bend the other end of the copper wire to pass up through the left hand aperture under the instrument panel.
    6. Secure the ends of the copper pipe and the micro-tube using thin CA adhesive.
    7. Cut a very short length of 'Albion Alloys' 0.2mm Nickel-Silver rod (NSR02) and secure it in position across the top of the micro-tube (lever for shut-off cock).

82. Cement the cross member (D11) into its location, which is below the main fuel tank, on the cockpit side frame.

83. Cement the pre-rigged rudder bar (D7) to its location on the Undershield (A25).

NOTE: *During the next step, remember to position the control column to suit the position of the elevator and ailerons, if they are to be animated. If not the control column should be vertical and central to the torsion bar.*

84. Cement the pilots control column (D6) to the torsion bar on the floor boards (A21).

NOTE: *During the next step, refer to the rigging diagram in the 'Wingnut Wings' instruction manual.*

85. Elevator control cables: - Cut a long length of 0.12mm diameter 'Steelon' mono-filament and pass it through one of the pre-drilled holes at the elevator pulleys, at the bottom of the instrument panel assembly. Pass the ends of the line through the relevant holes in the cross member (D11). Secure one end to the underside of the rear cross member on the seat and fuel tank mounting frame (A23) using CA adhesive. Pull the line around the pulley and secure with CA adhesive. Finally, pull the free end of the line taut and secure it to the rear cross member on the seat and fuel tank mounting frame (A23) using CA adhesive. Repeat for the other elevator pulley and lines. Cut away the four ends of lines flush the rear of he cross member.

86. Engine fuel control linkage - The throttle quadrant was fitted with two selector levers, the throttle lever and the mixture control lever. The mixture control lever was connected to the fuel mixture controller by a rod and bell-crank. The throttle lever was connected forwards to the carburetor linkage by a rod. To represent these control linkages:

    1. Cut two very short lengths of 'Albion Alloys' 0.2mm Nickel-Silver rod (NSR02).

    2. Position one rod vertically from the centre, top of the fuel mixture controller and secure with thin CA adhesive.

    3. Position the other rod horizontally and rearwards from the pivot point of the mixture control lever and secure with thin CA adhesive.

    4. Cut out the shape of the bell-crank from 0.2mm thick plastic card.

    5. Secure the bell-crank in position on the throttle assembly and between the ends of the two rods and using thin CA adhesive.

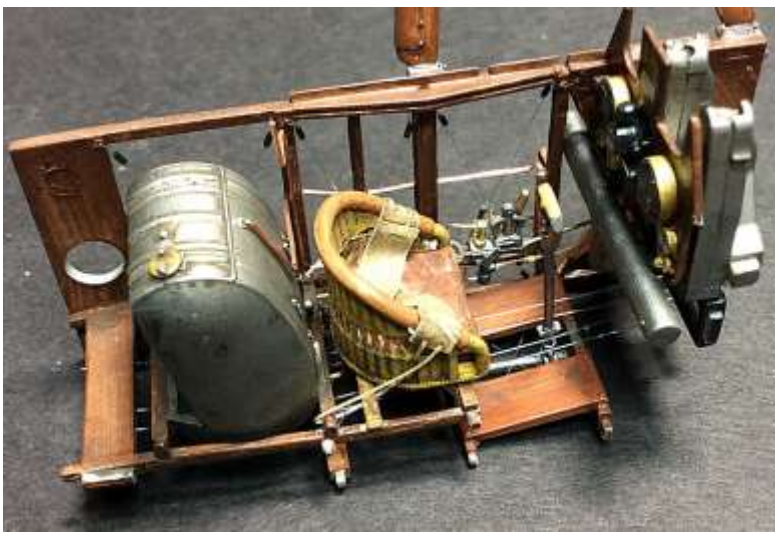
    6. Brush paint the bell-crank with 'Mr. Colour' Stainless Steel (213).

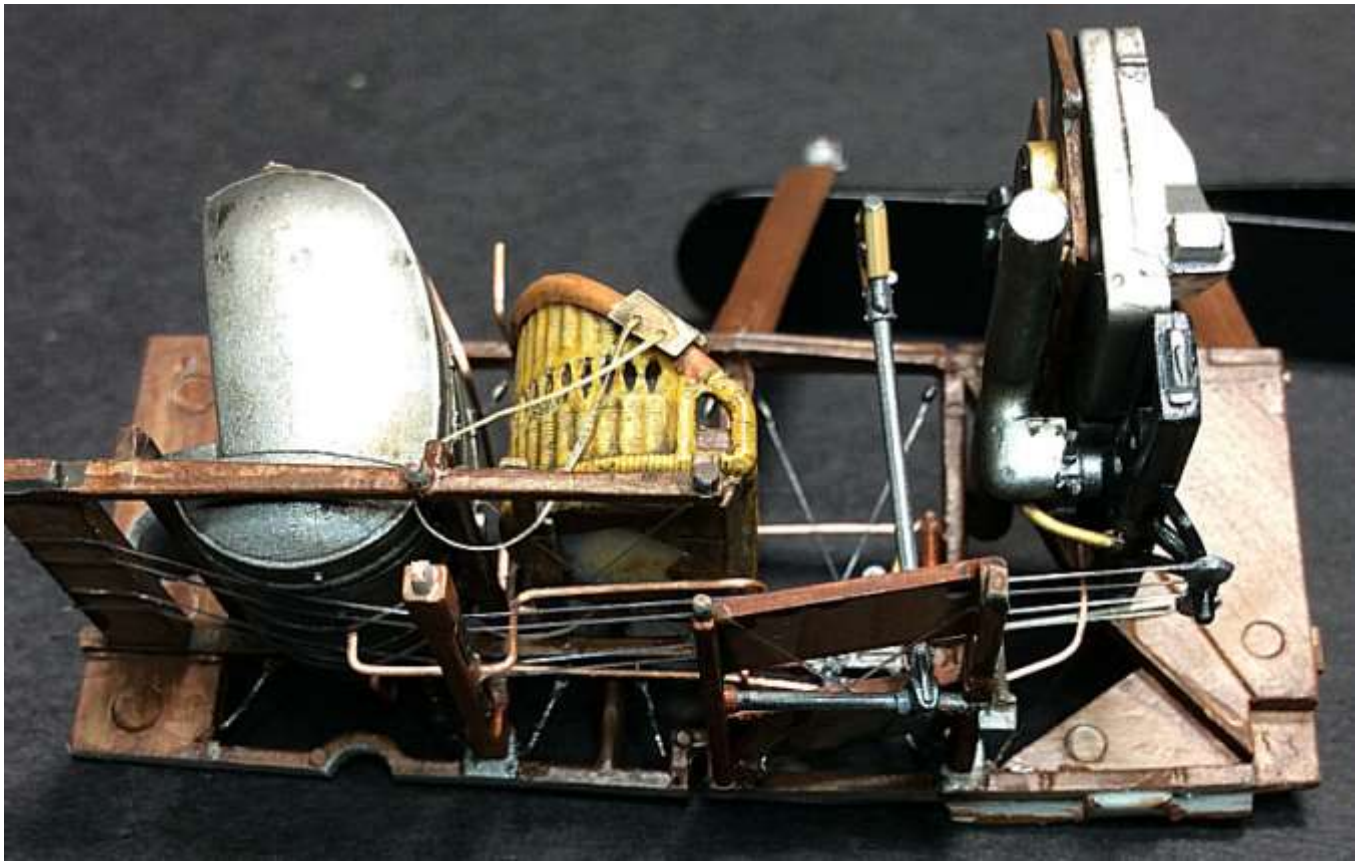
    7. Cut a length of 'Albion Alloys' 0.4mm Nickel-Silver micro-tube and position it against the base of the throttle quadrant and against the cockpit side frame, under the left side of the instrument panel assembly. Secure in position using thin CA adhesive.

87. Aileron control cables - The aileron control cables were attached to a lever at the front of the control column torsion bar (A21) and were routed outboard.

1. Drill a 0.3mm diameter hole through the end of the aileron lever at the front of the control column torsion bar.
2. 'Roll' cut a short length of 'Albion Alloys' 0.5mm diameter tube (MBT05). Cut a length of 0.12mm 'Steelon' mono-filament line and pass one end through the tube and the eye end of a 'GasPatch' 1:48 scale turnbuckle (Type C) then back through the tube. Holding both lines, slide the tube up and close to (not touching) the turn buckle eye end. Make sure the looped line is free to move in the turnbuckle eye end and secure the tube to the line using thin CA adhesive. Separate the two lines where they exit the tube and cut away the free end close to the tube.
3. Repeat this procedure to create a second line on the aileron lever.
4. Drill a 0.3mm diameter hole, from front to back, through the outer ends of the front cross member on the floor boards (A21).
5. Cut a length of 0.125mm copper wire and pass it through the hole in the aileron lever and back over the top of the lever.
6. Slide the 'open' eye ends of both turnbuckles onto the copper wire then twist the wire to hold the turnbuckles against the aileron lever. Cut away excess copper wire.
7. Pass the free end of each aileron line outboard and through the pre-drilled holes, pull the line taut and secure to the cross member using thin CA adhesive.
8. Cut away the line flush with the rear face of the cross member.
9. Apply 'AK Interactive' Kerosene filter (AK2039) to the two tubes to knock back the metal shine.
10. Brush paint the centre section of the two turnbuckles using 'Mr. Colour' Brass (219).
11. Blend-in the copper wire to the aileron lever by brush painting it using 'Mr. Colour' Stainless Steel (213).

88. Pass the top of the pilots control column, fitted to the floor boards (A21), up through the two centre elevator control lines, then locate the floor boards into the two location points in the cockpit left side frame. Dry fit the right cockpit side frame to the assembly to assists in alignment. Cement the floor boards to the cockpit left side frame.





89. Elevator control cable to control column - The elevator control cables were two cables and each control cable was routed from the elevator, through the fuselage to its pulley above the pilots rudder bar, around the pulley and rearwards. The cables were then attached to the pilots control column. From there the cables were routed rearwards and then back to the elevator. Therefore the one cable adjacent to each side of the control column needs to be attached.
    1. Apply a small amount of CA adhesive to one side of the control column opposite the control cable.
    2. Using tweezers each side of the cable, push that cable against the control column onto the adhesive and hold to allow the adhesive to set.
    3. Repeat this procedure to attach the other cable to the control column.

90. Oil tank and gun mounting
    1. Dry fit the cockpit right side panel onto the left side assembly.
    2. Dry fit the assembly between the fuselage halves, making sure the assembly is correctly located on the rear circular locators and into the slots in the forward side panels. Temporarily hold the fuselage together using elastic bands or modelling clamps.
    3. Locate the oil tank and gun mounting assembly (B10) onto the cockpit assembly and cement in position to the cockpit left side frame **only**. The two vertical locators slide into the two slots in the rear of the instrument panel.
    4. *Leave the fuselage assembled for fitting the under shield in the next step.*

91. Under shield with rudder bar - The under shield (A25) can now be fitted prior to rigging the rudder and tail skid control cables.
    1. From under the fuselage, carefully pass the pre-rigged rudder and tail skid control cables up through and out of the cockpit.
    2. Place the under shield in position - the under shield has recessed locators each side and the attached rudder bar has a hole in the centre top that locates onto a stub below the instrument panel elevator pulleys. Also a recess in the rear top of the underside panel locates onto a stub, located below the aileron lever on the floor boards.
    3. Cement the left side of the under shield to the cockpit left side frame **only** and to the floor boards and rudder locators. Leave the assembly to set.
    4. Carefully separate the fuselage halves and remove the cockpit assembly.
    5. Carefully remove the cockpit right side frame from the assembly.
    6. Refer to the rigging illustration in the 'Wingnut Wings' instruction manual and thread each rudder and tail skid cables through the relevant holes in the cross member (D11) below the main fuel tank.
    7. Gently pull each line taut and secure to the underside of the rear cross member of the main fuel tank/pilot seat frame (A23).

92. Machine gun trigger cables - The machine guns were fired by the pilot pressing trigger pads located at the top of the control column. These trigger pads were connected by operating cables attached to the left, rear side of the breech blocks of each machine gun. The cables were clipped to the instrument panel each side of the altimeter located centrally at the bottom of the instrument panel. To represent these operating cables:
    1. Cut two lengths of 'PlusModel' 0.3mm diameter lead wire secure to the forward face of the trigger pad, using thin CA adhesive.
    2. Loop each line down then back up to the altimeter.
    3. Attach the left cable to the left side of the altimeter and the right cable to the right side, using thin CA adhesive.
    4. Loop the left cable up to outside rear of the left gun mounting and secure with thin CA adhesive. Repeat for the right cable.

93. Engine 'blip' switch - The rotary engine, once started, rotated at a constant speed. To enable the pilot to reduce engine rotating speed for landing etc, a 'blip' switch was fitted to the top of the pilots control column. When momentarily pressed, this switch temporarily cut fuel supply to the engine thereby slowing its rotating speed. When released, the engine with hot spark plugs, would run back up to its operating rotational speed. The term 'blip' was due to the sound the engine made as it was cut then powered back up again. Loop a length of PlusModel' 0.2mm diameter lead wire from the back of the 'blip' button on the control column to carburetor block at the lower left f the carburetor air induction pipe. Secure in position using CA adhesive.

94. **Right cockpit side frame** - The only modifications required to the cockpit right side frame is the fitting of copper wire to represent the fuel tank pressurization pipes (refer to Part 1J - Additional cockpit detail). The four pipes were connected to a union located on the cockpit right side frame. The pipes required are:

One pipe routed rearwards from the union to the top of the main fuel tank.
One pipe routed vertically down from the union to the pilot operated pressurization pump.
One pipe routed up from the union and cockpit decking towards the oil tank ('Rotherham' wind driven fuel pressurization pump on the cabane strut).
One pipe routed forwards from the union and down and across to an area at the base of the engine. The purpose of this pipe is unclear - possibly to a drain pipe in the under shield.

    1. Cut two short lengths of 'Albion Alloy's' 0.6mm diameter micro-tube (MBT06) and one length slightly longer.
    2. Cut four lengths of 0.28mm diameter copper wire, one longer than the other three.
    3. Slide the longer copper wire through the longer tube, position the tube centrally and secure in position using thin CA adhesive.
    4. Slide each of the short tubes onto the ends of the shorter copper wires and secure in position using thin CA adhesive.
       NOTE: *One pipe routed vertically down from the union to the pilot operated pressurization pump.*
    5. Shape one of the remaining wires so that the micro-tube end rests centrally against and under the micro-tube of the already installed wire. The wire should route down the vertical former and loop back up to the bottom of the fuel pressure pump. Secure in position using CA adhesive.

6. ***Locate the cockpit right side frame onto its locations on the cockpit assembly and cement in position.***

One pipe routed rearwards from the union to the top of the main fuel tank.

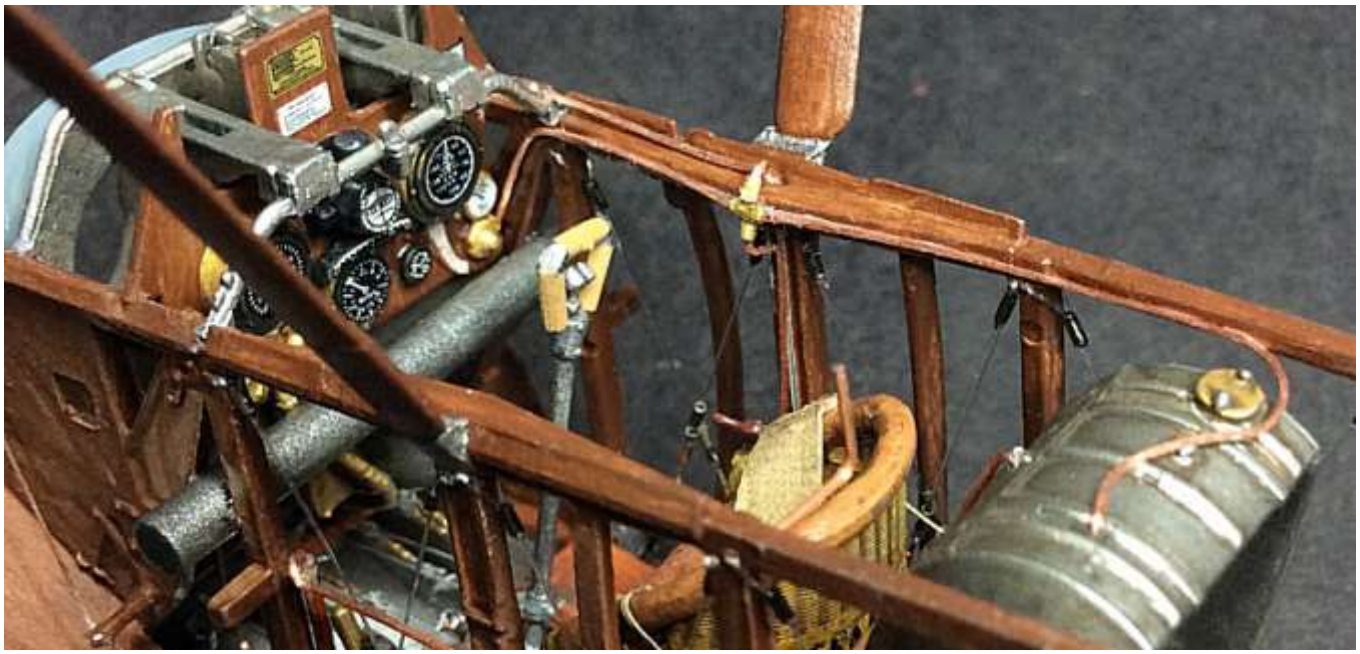
7. Drill a 0.4mm diameter hole into the top left of the main fuel tank.
8. Using the longer wire/tube, position the wire so that the micro-tube is on the inside edge of the cockpit right side frame, opposite the rear cabane strut.
9. Shape the rear wire so that it is routed rearwards along the side frame, then across the top of the main fuel tank. Cut then bend the wire and insert it into the pre-drilled hole. Secure the wire in position against the side frame using CA adhesive.

One pipe routed forwards from the union and down and across to an area at the base of the engine. The purpose of this pipe is unclear - possibly to a drain pipe in the under shield.

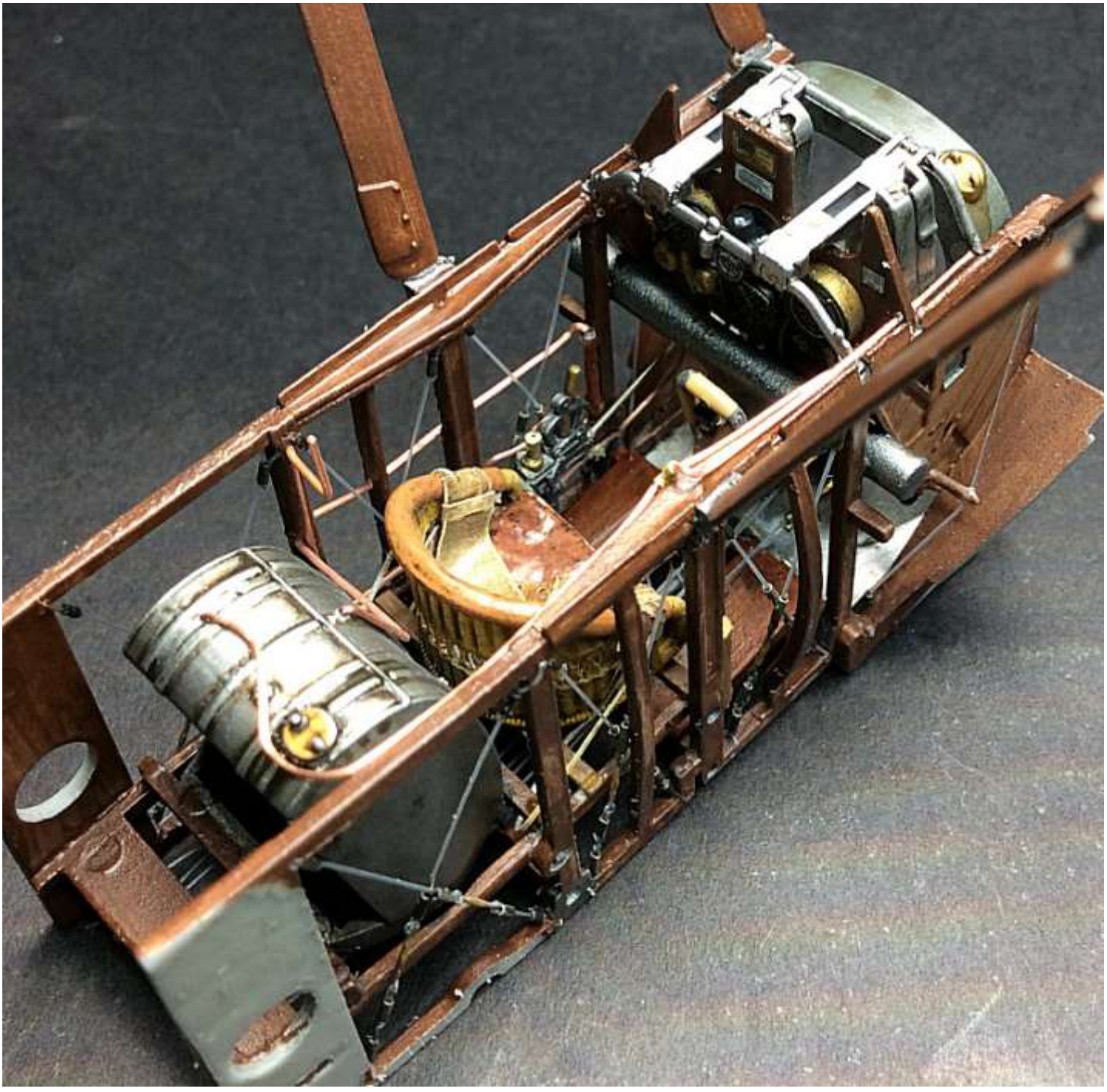
10. Shape the other end of the wire/tube so that it routes forwards along the side frame the down to the bottom of the instrument panel. Secure the wire in position against the side frame using CA adhesive.

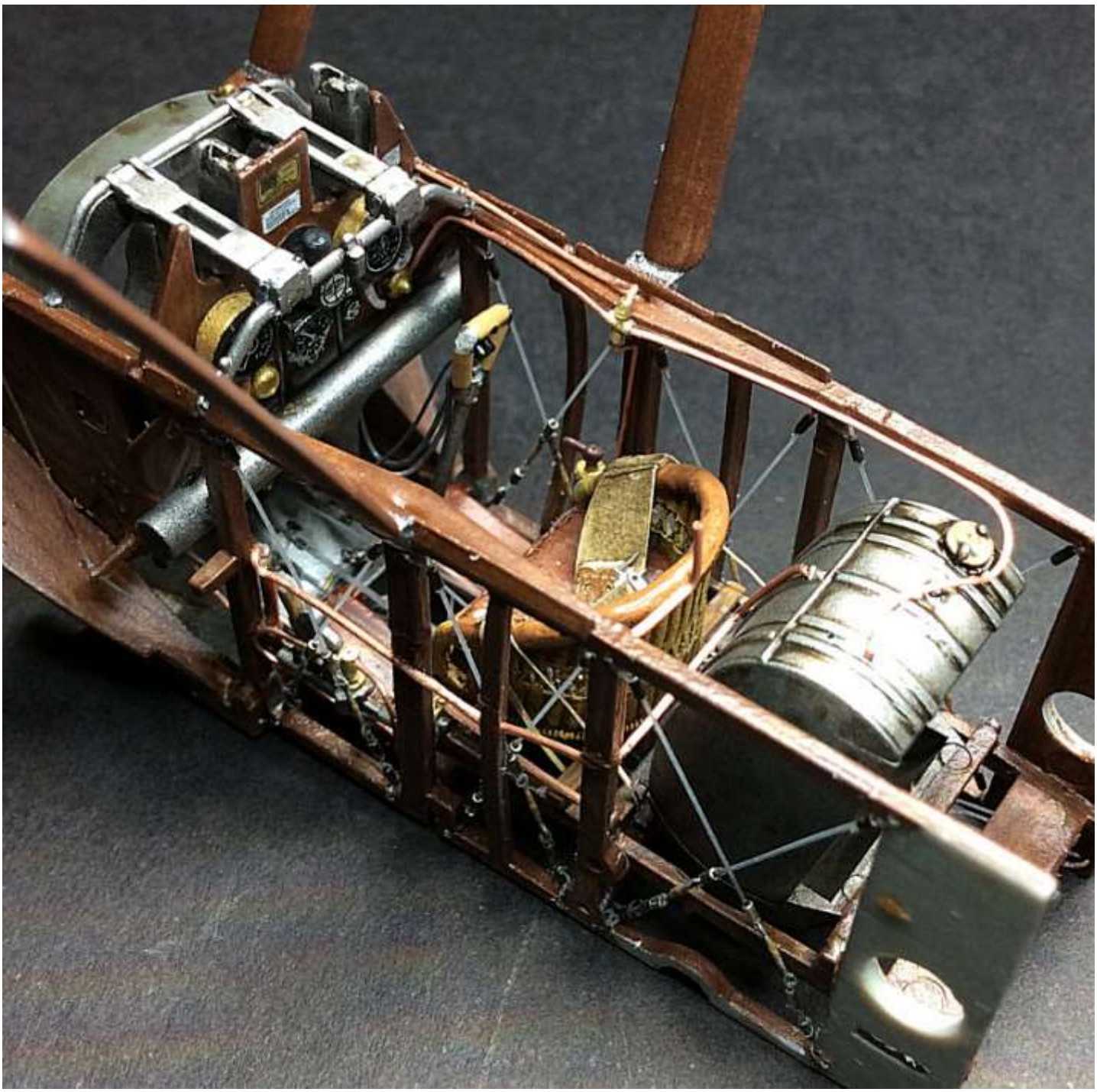
One pipe routed up from the union and cockpit decking towards the oil tank ('Rotherham' wind driven fuel pressurization pump on the cabane strut).

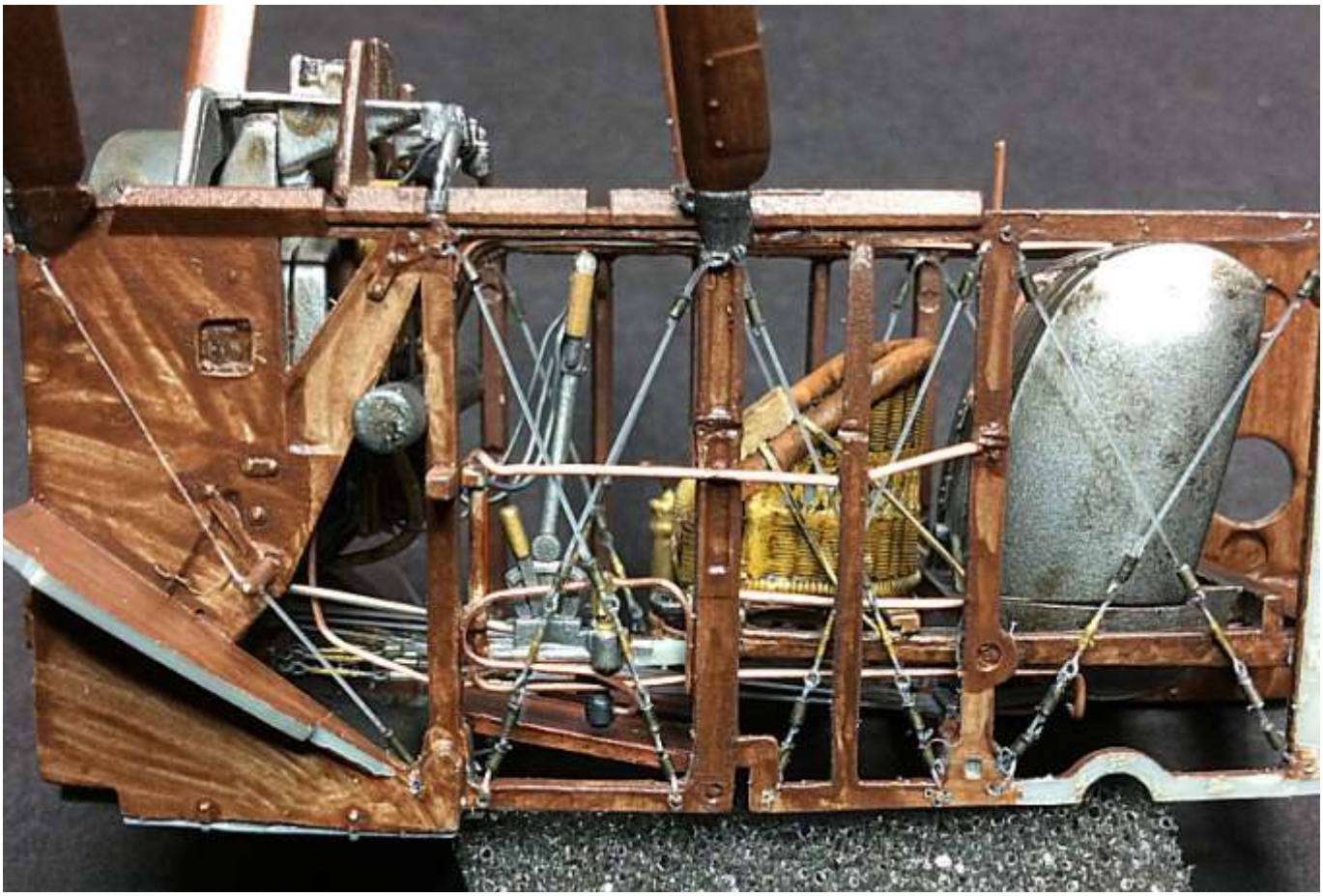
11. Drill a hole 0.5mm diameter hole through the lower edge of the instrument panel where it's attached to the cockpit right side frame.
12. Using one of the remaining wire/tubes, shape the wire so that the end micro-tube rests against the micro-tube of the already installed wire/tube and the wire routes outboard to the edge of the side frame. Pass the end of the wire forwards and through the pre-drilled hole in the instrument panel. Cut the forward end of the wire so it is behind the oil tank. Secure the micro-tube and forward wire in position using CA adhesive.

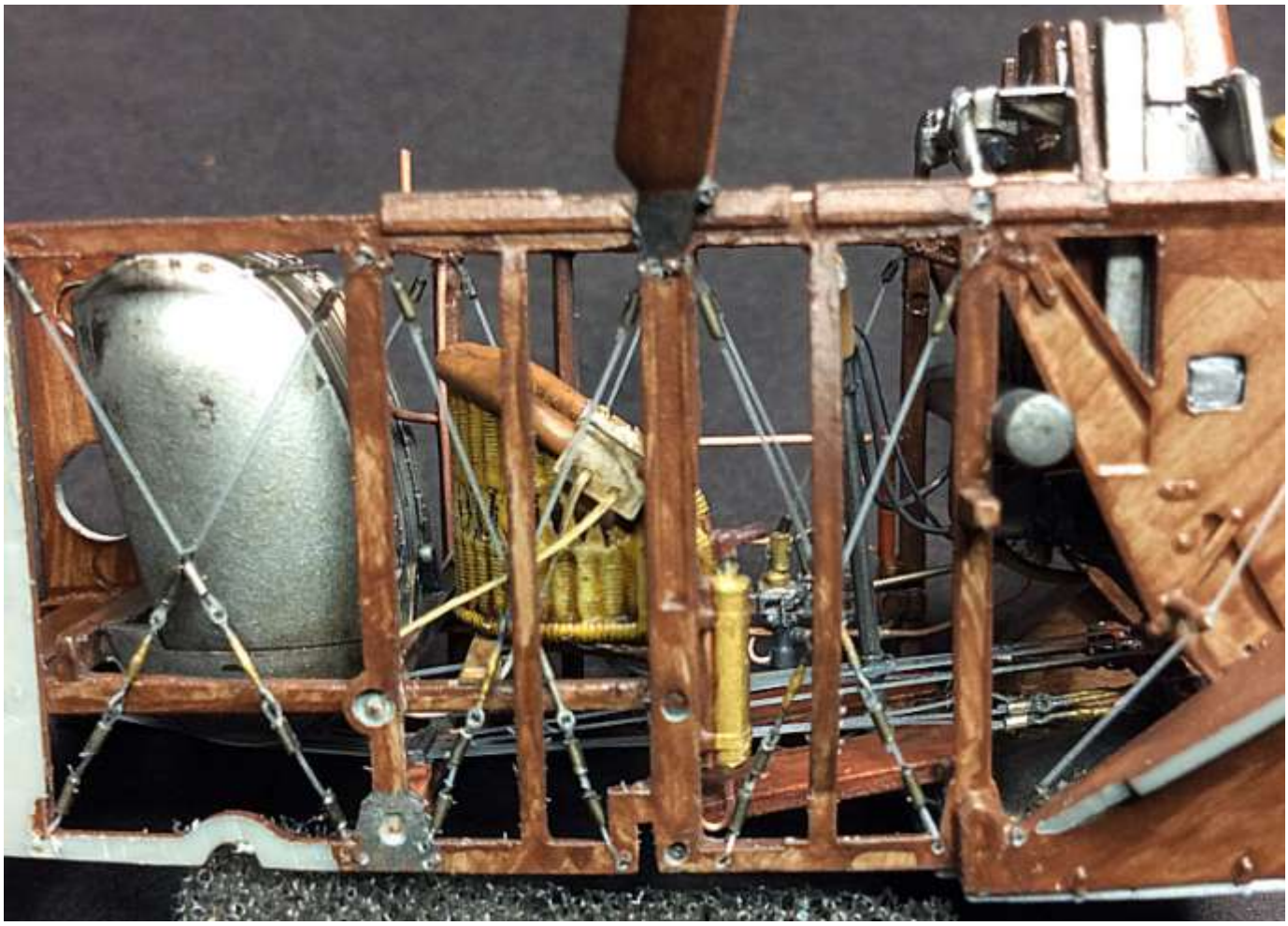


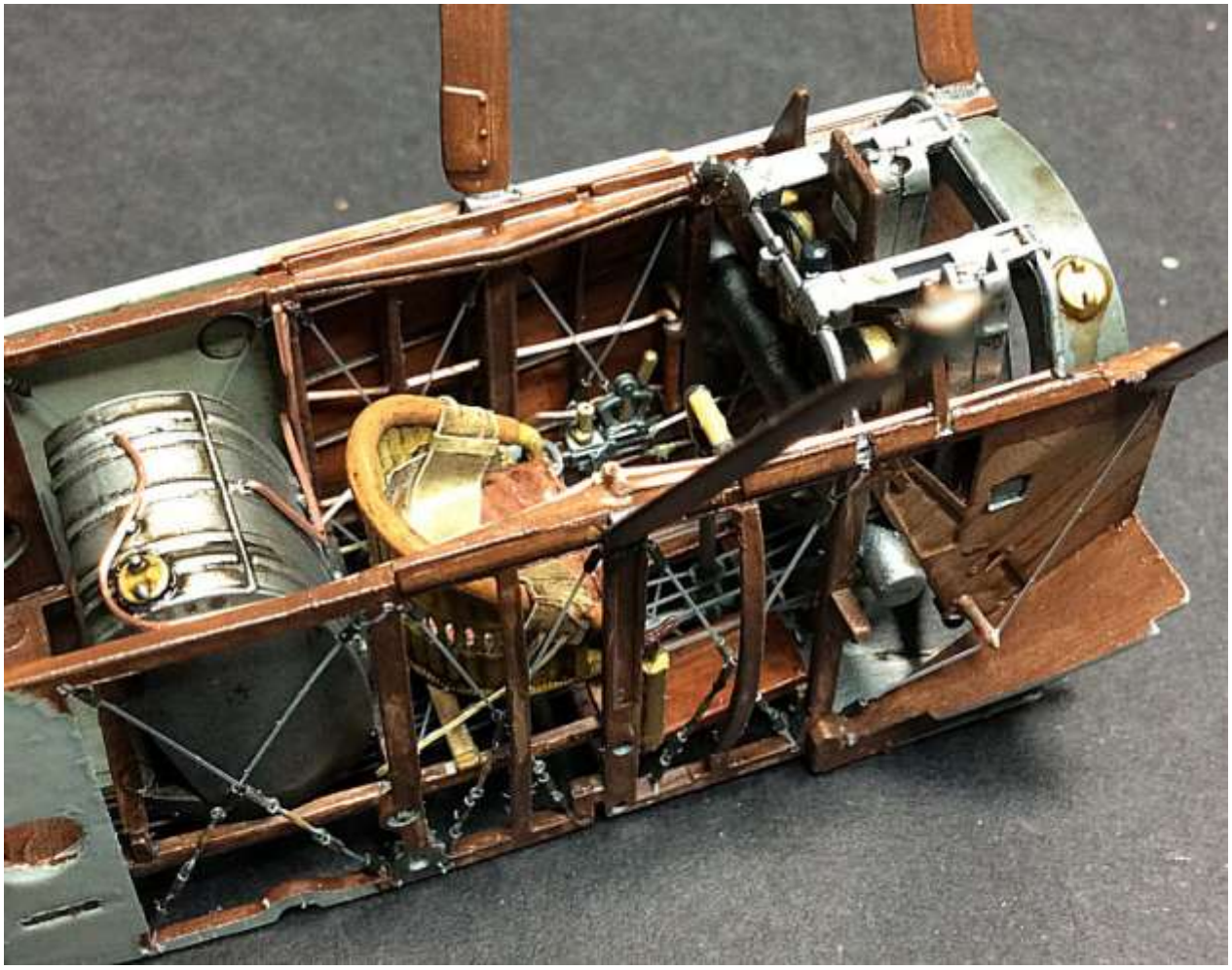
95. With the cockpit assembly completed, airbrush a light coat of 'Alclad' Light Sheen (ALC-311) over the entire assembly.

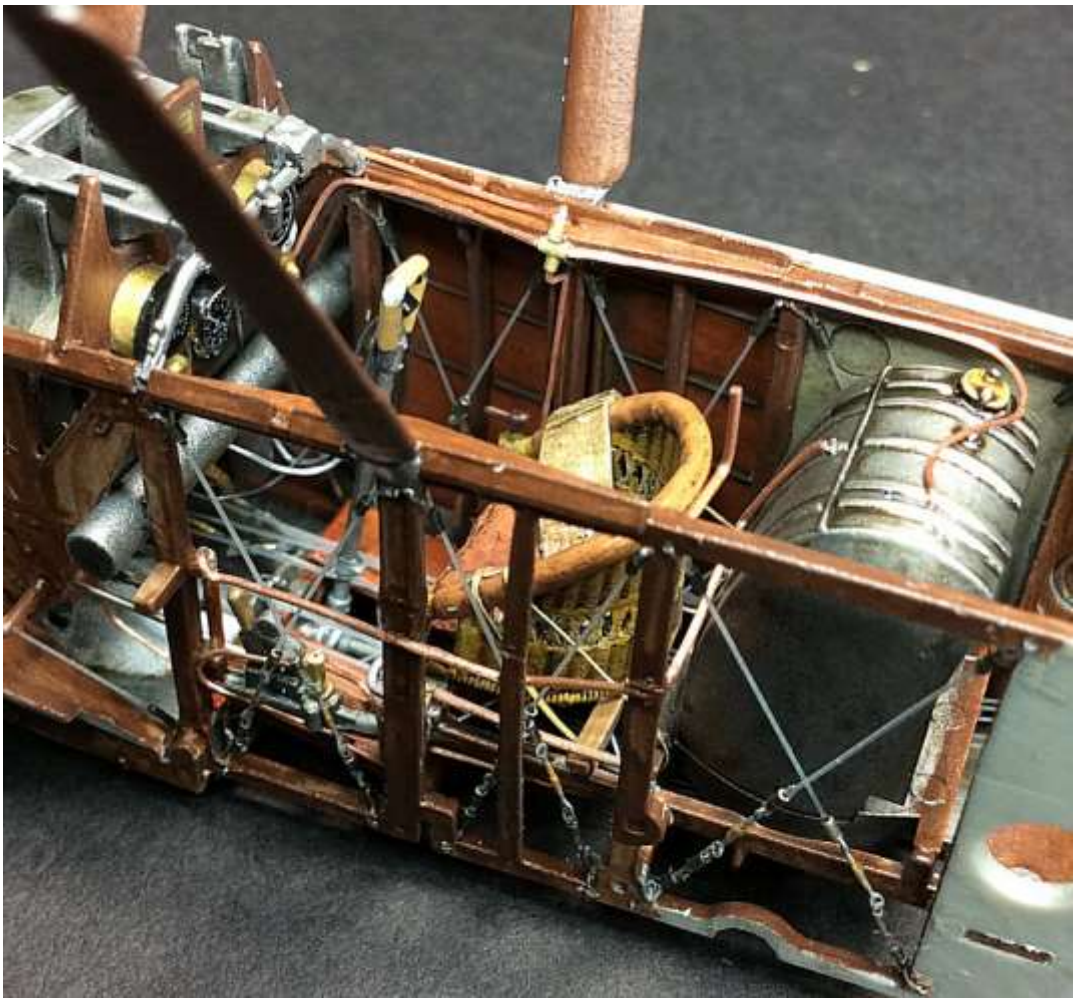


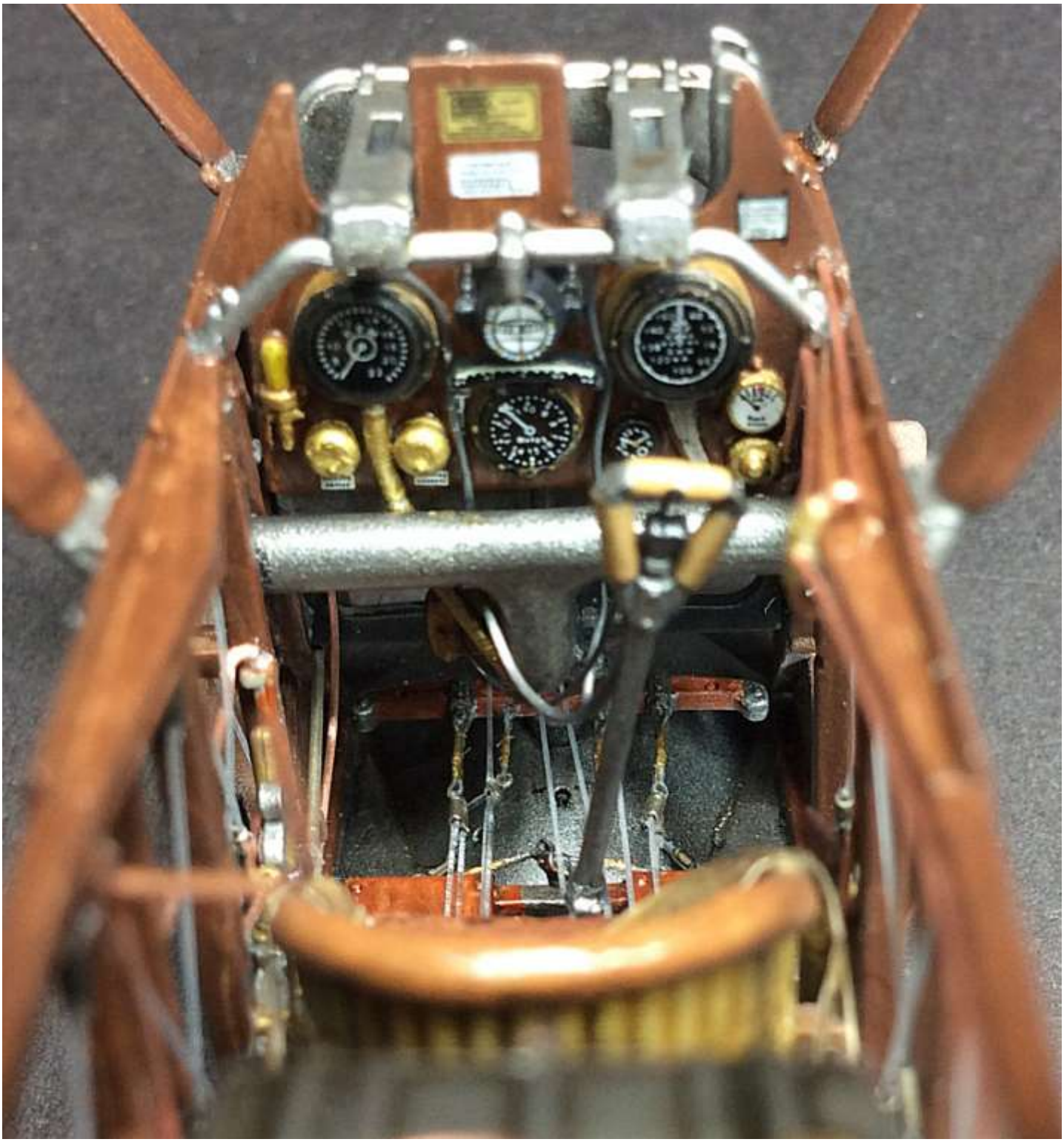


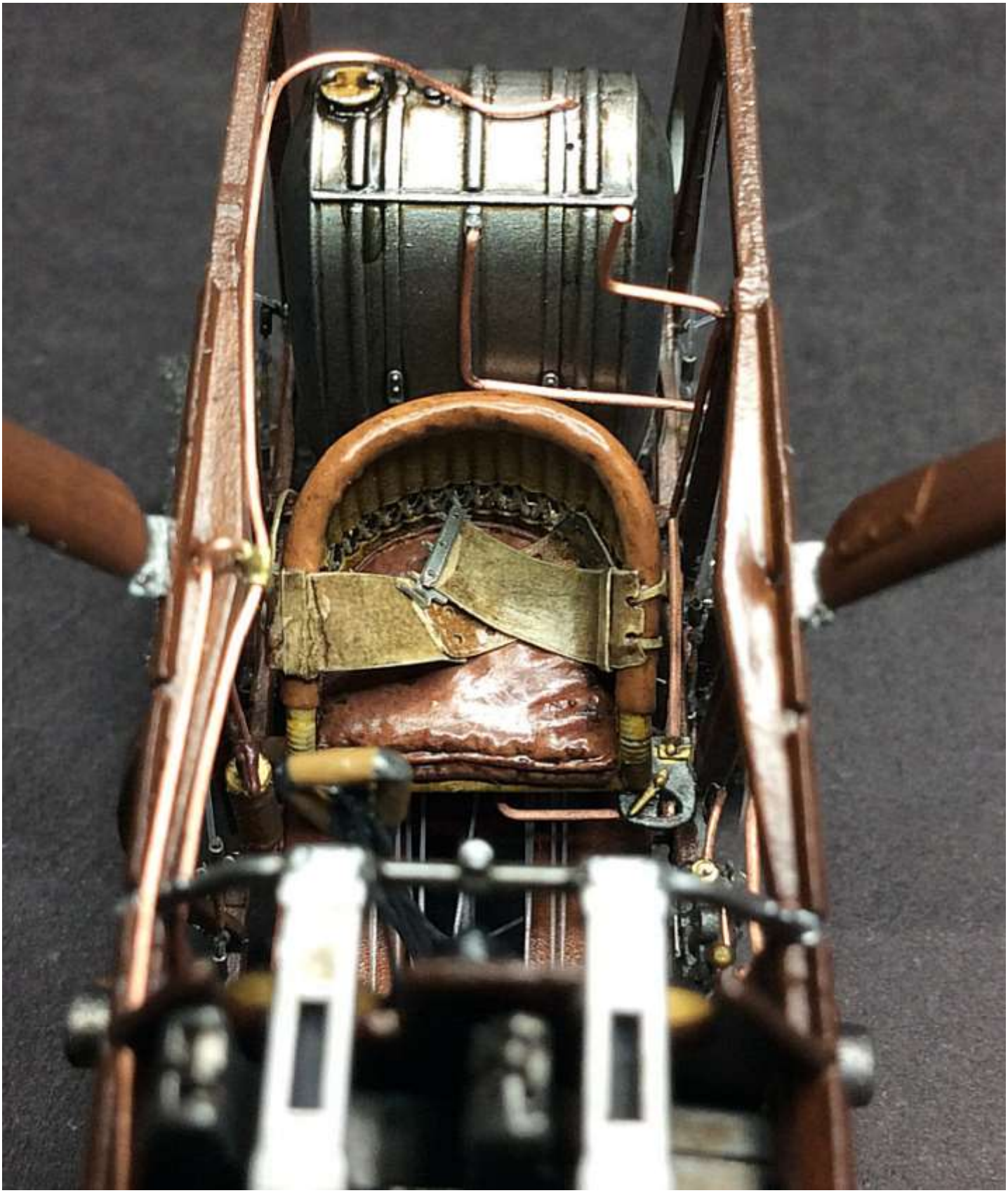


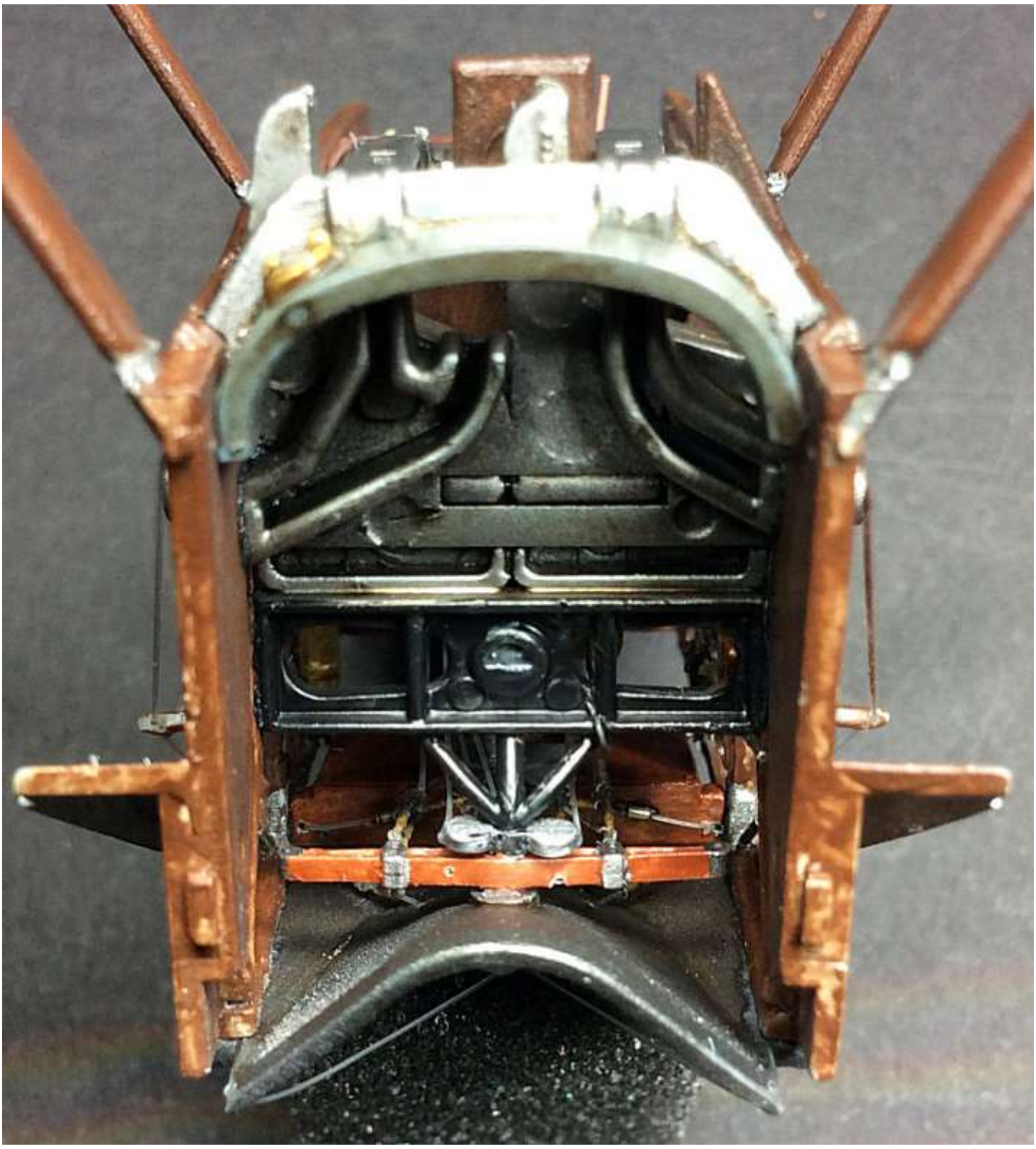












PART 11 - MODEL CONSTRUCTION

NOTE: At this stage in the assembly of the model, ensure that all of the modifications (Part 1 of this build log) have been completed. Also that the cockpit assembly to the fuselage has been completed (Part 5 of this build log).

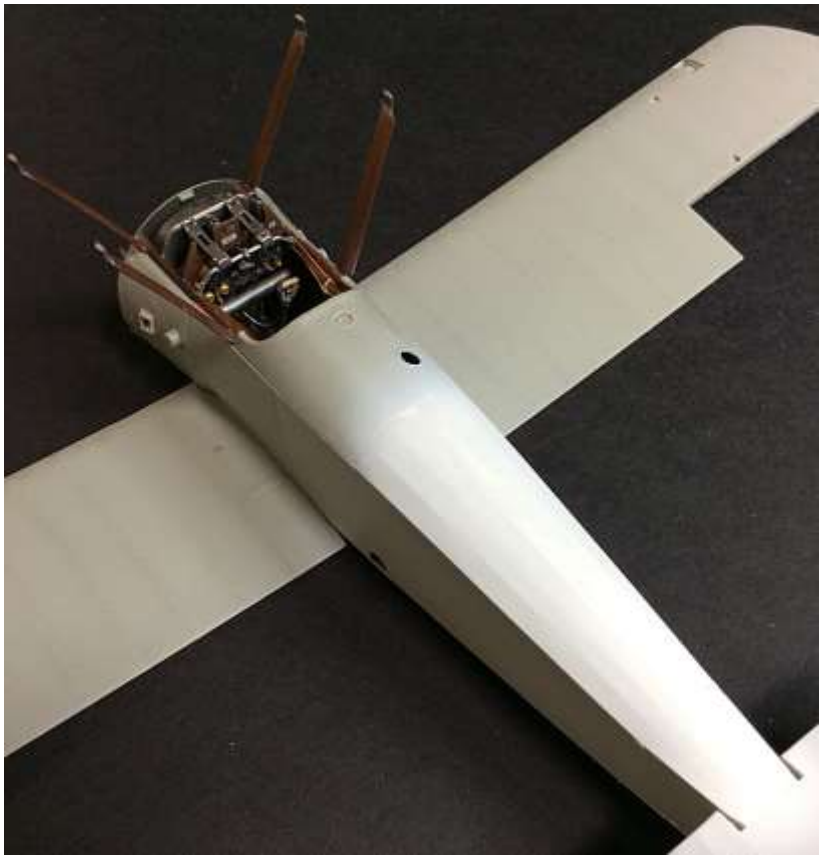
CAUTION: *Take great care when handling the cockpit side frames (A19 and A26), before and after the cockpit is assembled. The two cabane struts on each side frame are molded as part of the frame. These struts can be easily knocked, which may cause them to be weakened at the base or to snap off completely. For similar reasons, also protect the installed tail skid by a sponge pad masking taped to under the rear fuselage.*

Fuselage assembly and lower wing:

1. Ensure all mating surfaces and locators on the fuselage halves and the cockpit assembly are free from primer and paint.
2. Test (dry) fit the cockpit assembly into the fuselage halves. Ensure all joints and locators engage and are fully in contact.
3. Apply cement to the left cockpit side frame around the round locator and vertically up and down and also into the recess in the left fuselage forward panel.
4. Locate the cockpit assembly into the left fuselage half and ensure it is fully in contact.
5. Apply cement to the right cockpit side frame around the round locator and vertically up and down and also into the recess in the right fuselage forward panel.
6. Locate the right fuselage half onto the cockpit assembly and left fuselage half. Ensure the cockpit side frames are fully located and in contact with the fuselage halves and that the fuselage forward panel recesses are engaged with the locators on the cockpit assembly.
7. Using modelling clamps and/or elastic bands, hold the assembly together, making sure the fuselage seams are fully in contact.
8. Apply liquid cement along the fuselage seams.
9. Leave the assembly clamped to allow the applied cement to fully set.
10. Once the applied cement has set, remove all clamps and/or elastic bands.
11. Test (dry) fit the engine front plate (A10) to the forward fuselage. Ensure all of the mating surfaces and locators on the fuselage and engine front plate are free from primer and paint.
12. Apply liquid cement to secure the engine front plate to the fuselage.
13. Test (dry) fit the modified cockpit decking panel (B7) to the fuselage. Ensure all the mating surfaces and locators on the fuselage and decking panel are free from primer and paint. Ensure the vertical portion of the added copper wire fuel supply pipe from the auxiliary fuel tank is located behind the tank panel in the decking panel.
14. Apply liquid cement to secure the decking panel the fuselage.
15. Test (dry) fit the lower wing (B6) to the fuselage. Ensure all of the mating surfaces and locators on the fuselage and wing are free from primer and paint.
16. If necessary, scrape or sand mating surfaces on the fuselage or wing, to ensure a good fit.
17. Apply liquid cement to secure the wing to the fuselage.

18. Cement the tailplane to the fuselage.

19. Check the assembled fuselage for any open seams or gaps. If found, fill with such as 'Deluxe Materials' Perfect Plastic Putty, which is water based and easily spread. Once set, sand away any excess putty and recheck to see if further treatment is required. Once you are happy with the results, airbrush a grey primer over the seams, which when dry, will show up areas that require further attention.



20. Ensure the rigging attachment holes at the base of each of the four cabane struts at the cockpit sides are free from paint. There are two rigging points at the front strut base and one at the rear strut base.

Machine guns - fitting:

21. Test fit the modified top cowling panel (B7) and ensure it positions correctly around the forward cabane struts, lays correctly on the cockpit side frames and front face contacts the engine front plate (bulkhead).

    NOTE: *If Barker's 'Red Devil' emblem is being used, that machine gun should be fitted in at right side with a standard gun at the left side.*

22. Rest the two machine guns under the gun cut-outs in the top cowling panel, then carefully position the panel with the gun breech blocks in contact with the gun mountings. Ensure both guns are correctly aligned and the top cowling panel is fully seated onto the fuselage.

23. Once the panel and guns are fully and correctly positioned, cement the panel to engine the front panel joint and to the left and right side joints. Hold in position until the cement takes effect.

24. With both guns seated onto the gun mountings and correctly positioned, apply cement between the gun breech blocks and the mountings.

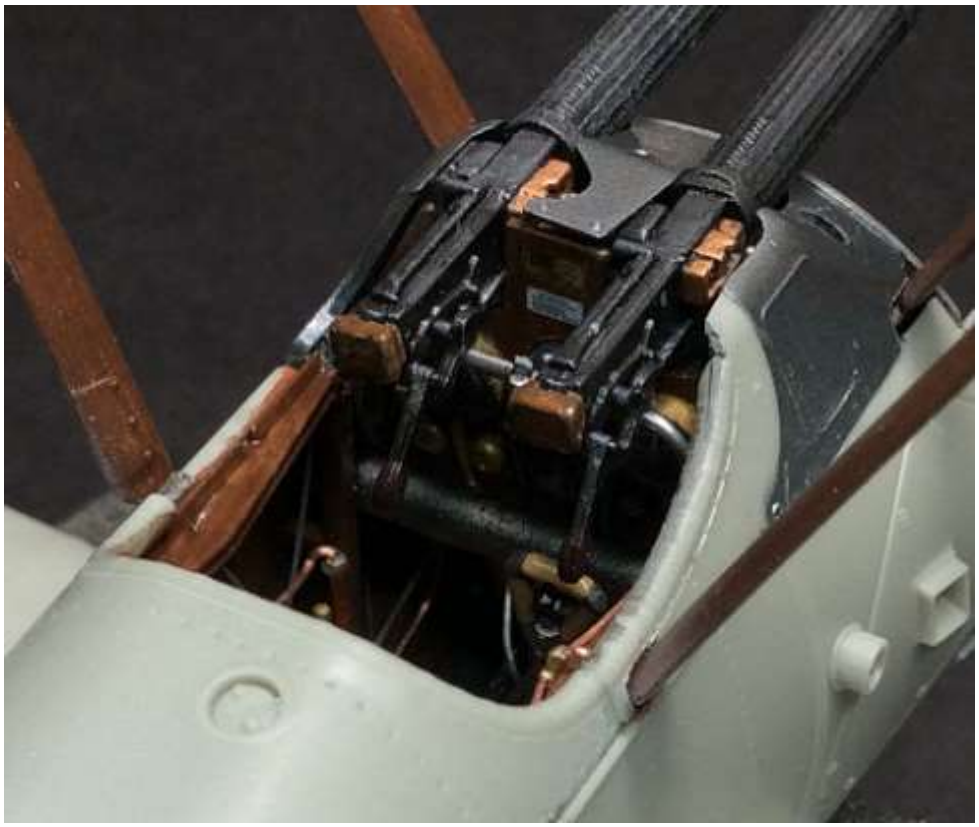
NOTE: *The right decking panel (A25) fits around the right rear cabane strut and against the rear edge of the top cowling panel. To suit Barker's B6313 'Camel' and to obtain a better fit, some changes were necessary.*

25. At the top of the right side decking panel is a rectangular area, which needs to be cut away so that its edge aligns with the edge of the fitted top cowling panel.

26. At the forward inner edge of the right side decking panel is a 'lug', intended to fit inside the top cowling panel. As the top cowling panel is already fitted, this 'lug' is not necessary, so was removed.

27. Test fit the right decking panel (A25) and adjust as necessary to obtain a good fit.

28. Cement the right side decking panel (A25) in position.



Priming and pre-shading:

On this model, the external surfaces of the fuselage, wings and tail panels, including flight control surfaces model will be covered with ‘Aviattic’ linen effect decals, which require a white base coat in order to show the linen effect to its best. Other areas will be painted.

29. Ensure the surfaces of all model parts are smooth and free from surface defects, dust etc.

30. Cement the two outer wings to the top wing centre section.

31. Mask off the following fuselage areas:
    Open cockpit, machine guns and forward top cowling.
    The four cabane struts.
    Fuselage forward side cowling panels.
    Under shield and under fuselage panel.
    Fuselage side panels and cockpit decking.
    All openings that could allow overspray to enter the inside of the fuselage.

32. Airbrush ‘AK Interactive’ Primer and Micro-filler (White AK759) over the following model parts:
    Exposed fuselage areas.
    Outer faces of the wheel covers.
    Top and bottom surfaces of the upper wing assembly.
    Top and bottom surfaces of the lower wings.
    Top and bottom surfaces of the tailplane and elevator halves.
    Top and bottom surfaces of the four ailerons.

33. Ensure the primed surfaces are smooth and free from surface defects, dust etc and if necessary, sand smooth and re-prime as required.

34. Remove all masking from the fuselage.

35. Mask off all areas of the fuselage and lower wings, to leave exposed just the forward side cowling panels, fuselage side panels, under fuselage panel and cockpit decking.

36. Airbrush ‘AK Interactive’ Primer and Micro-filler (Grey AK758) over the exposed fuselage panels and all remaining and separate model parts.

37. Ensure the primed surfaces are smooth and free from surface defects, dust etc and if necessary, sand smooth and re-prime as required.

38. Remove all masking from the fuselage.

39. Mask off all areas of the fuselage and lower wings, to leave just the forward side cowling panels exposed.

40. Airbrush ‘Alclad’ Gloss Black Base (ALC-305) over the forward cowling side panels.

41. Ensure the primed surfaces are smooth and free from surface defects, dust etc and if necessary, sand smooth and re-prime as required.

42. Airbrush ‘Alclad’ Duraluminium (ALC-102) over the forward cowling side panels.

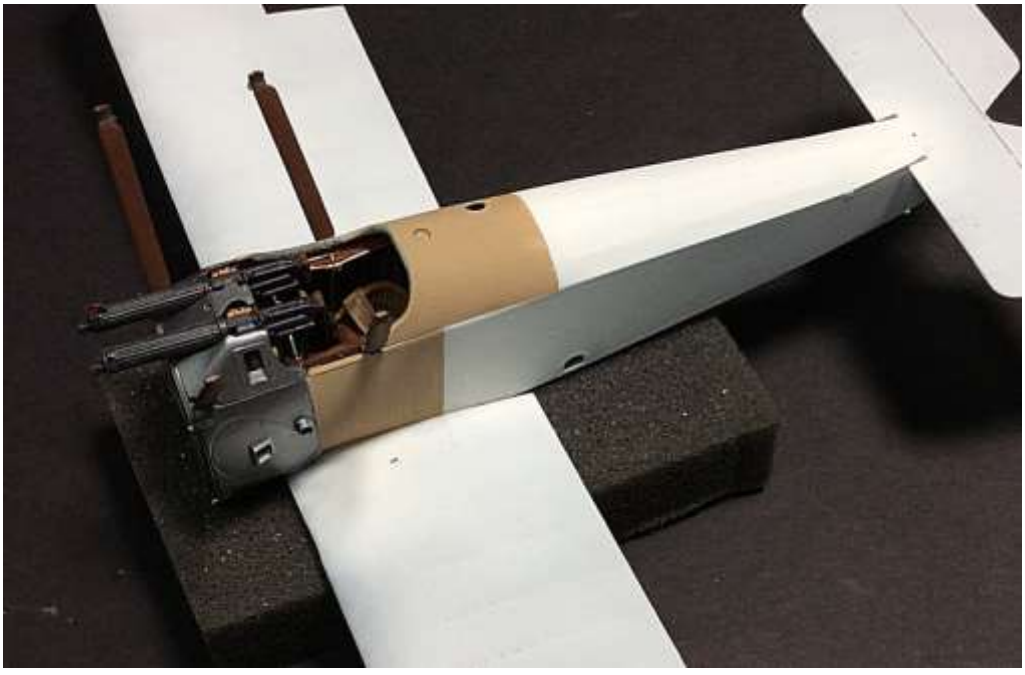
43. Mask off all areas of the fuselage and lower wings, to leave just the cockpit decking panel and side wood panels exposed.

44. Airbrush the cockpit decking panel and fuselage side with ‘Tamiya’ Wooden Deck Tan (XF78)

45. Remove all masking from the fuselage.

46. Ensure all painted surfaces are smooth and free from any imperfections, such as trapped dust etc and residue from the masking materials used.

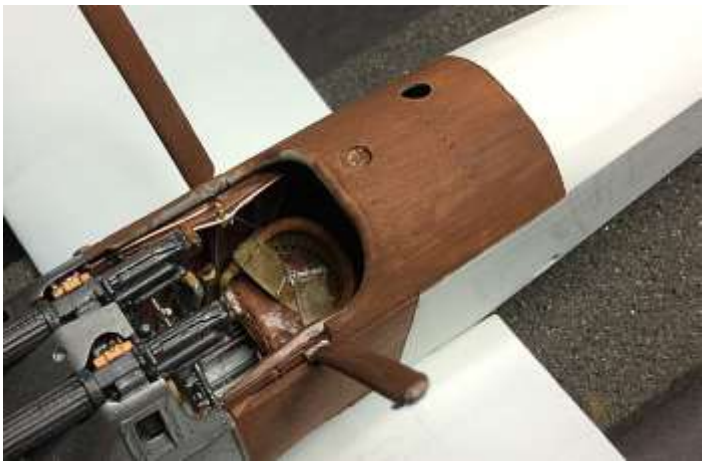
47. Mask off all areas of the fuselage and lower wings, to leave just the cockpit decking panel and side wood panels exposed.



48. Apply the desired wood effect (refer to Part 2 of this build log - Wood Effects).

49. Remove all masking.

50. Ensure all painted surfaces are smooth and free from any imperfections, such as trapped dust etc and residue from the masking materials used.



51. Brush paint the fuel tank cap and surrounds using ‘Mr. Colour’ Brass (219).

52. Brush paint the cockpit surround padding using a mix of ‘Humbrol’ Leather (62) and ‘Tamiya’ Hull Red (XF9).

Wood effect parts:

53. Assemble the undercarriage (A8, A9, A44, A45 and A46).

54. Airbrush ‘Tamiya’ Wooden Deck Tan (XF78) to the following parts:
    Inside faces of the wheels and wheel covers.
    Undercarriage assembly.
    The four wing struts.

55. Apply wood effects (refer to Part 2 Wood Effects of this build log) to the following parts:
    Dark wood:
    Undercarriage assembly.
    The four wings struts.

Assembly continued:

56. Brush paint the undercarriage ‘bungee’ suspension brackets (A45, A46), the strut end fittings (A8, A9), axle and cross bar supports and the under fuselage panel between the under shield and rear undercarriage struts using ‘Mr. Colour’ Stainless Steel (213).

57. Brush paint the four engine cowl securing ‘straps’ using ‘Tamiya’ Rubber Black (XF85).

58. Airbrush ‘Alclad’ Gloss Black Base (ALC-305) over the following parts and once dry, top coat with ‘Alclad’ Duraluminium (ALC-102):
    ‘Rotherham’ pressure pump (D14 and photo-etch 7).
    Empty link chute (A36).
    Tie down rings (B3).
    Engine cowl (modified) (A48).

59. Engine cowl finish:

The Sopwith 'Camel' aircraft were built by other manufacturers other than the Sopwith Company Ltd themselves. The surface of unpainted engine cowls on Sopwith built aircraft were 'burnished' in a small circular pattern. Other manufacturers did not apply this finish. Barker's B6313 went through several paint finish schemes, including having the engine cowl and side panels varnished, however the scheme depicted on this model had exposed cowl and panels. I think it's likely that by the time B6313 was serving in Italy, the engine cowl and side panels would have had the previous finishes polished out, leaving a bare metal surface. *For this reason I've chosen not to replicate the original 'burnished' effect*. However if a 'burnished' effect is desired it can be replicated as follows:

NOTE: *The engine cowl and side panels have previously been primed and airbrushed with 'Alclad' Duraluminium (ALC-102).*

Using thinned 'Tamiya' Chrome Silver (X11) or similar colour and a fine brush, apply small 'dots' of paint around the engine cowl and side panels, maintaining a regular pattern. Allow the paint to fully dry, then using a cotton bud, gently rub the painted surface to 'knock back' the painted dots.

Modern example of a 'burnished' engine cowl.

Assembly continued:

60. Brush paint the following parts using 'Mr. Colour' Stainless Steel (213):
    - Front engine plate (A10).
    - Undercarriage axle.
    - Undercarriage 'bungee' anchors (A45 and A46).
61. Cement the empty link chute (A36) into the left side of the top cowling.
62. Cement the 'Rotherham' pressure pump (D14) to the rear edge of the forward, right cabane strut.
63. Using CA adhesive, attach the two brackets (photo-etch 7) to the other side of the pump.
64. Temporarily fit the four ailerons into the pre-drilled holes in the four aileron locations in both wings.

Pre-shading:
Applying pre-shading to model surfaces on a white base coat will allow the shading to show through the applied 'Aviattic' linen effect decals, which unlike post-shading, will not cover the linen effect of the decals. Pre-shading can be used to show the internal wing spars and ribs and also staining or shadows along wing ribs and trailing edges etc. Normally pre-shading is most effective on Clear Doped Linen (CDL) surfaces, as coloured doped surfaces (e.g. PC 10 or PC12) were too dark to show structure through.

Pre-shading test for decals - Using a thinned mixture of 'Mr. Colour' Smoke Grey' (101) and 'Alclad' airbrush cleaners (ALC-307), airbrush some representation of the pre-shading onto a spare piece of plastic card, to check the colour and intensity. Then cut a small 'test' strip of the 'Aviattic' CDL decal and apply it onto the pre-shaded surface. Check the pre-shading colour has the desired effect through the decal. Remember that the under side pre-shading should not include the front and rear wing spars, which were not normally visible through the PC colours applied to the upper surfaces.

NOTE: *If the colours of the pre-shading do not look correct through the decal, mix a slightly different shade of paint and overspray the pre-shading, then check again until you are happy with the results. If the pre-shading colour is too strong, airbrush a light and thinned 'misting' coat of 'AK interactive' Primer and micro-filler (White - 759) over the pre-shading, in order to 'knock it back' to reduce the intensity.*

65. The upper PC12 surfaces were then pre-shaded to highlight the structural formers of the fuselage and the ribs of the wings, ailerons, tailplane and elevator halves. Also any areas of stain or shadow were airbrushed. This pre-shadowing will show through the semi-transparent 'Aviattic' PC12 decals.
66. The underside CDL surfaces were then pre-shaded to highlight the structural formers of the fuselage and the ribs of the wings, ailerons, tailplane and elevator halves. Also any areas of stain or shadow were airbrushed. This pre-shadowing will show through the semi-transparent 'Aviattic' CDL decals.
67. The model was then given an airbrushed sealing coat - use either 'Alclad' Clear Coat Gloss (ALC-310) lacquer, 'Tamiya' Clear (X22) with added 'Mr. Colour' levelling thinners or 'Johnson' Pledge Floor Care finish (similar to 'Future'), all of which will give a gloss surface for applying the decals.
68. Once the sealing coat has dried fully, remove the temporarily fitted ailerons from both wings.

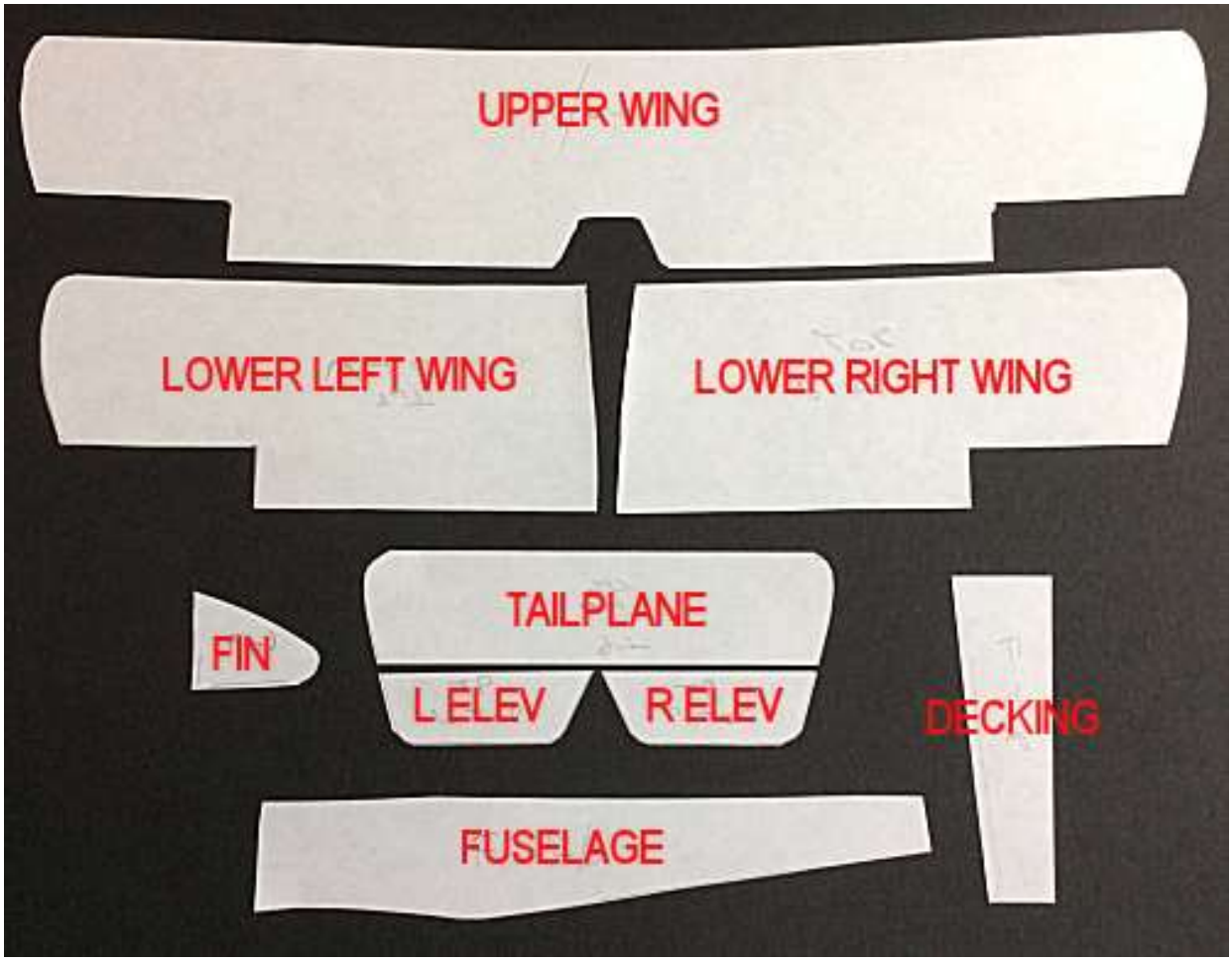
Decal templates:

The ‘Aviattic’ PC12 and CDL linen decals are not ‘cookie cut’ (pre-shaped), but are supplied as A4 sheets. Therefore care is required to ensure the decals are cut out accurately to fit the various areas of the model.

69. Using the wings, four ailerons, tailplane, elevator halves and wheel covers as guides, trace the outlines of each onto paper, ensuring to leave a slight overlap and that each paper template matches the relevant surface. Mark each template so you can recognise which template fits on which surface.

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

Below is an example of paper templates for a Sopwith ‘Pup’.



71. Using the paper templates, **‘lightly’** outline them onto the relevant ’Aviattic’ decal sheet. Make sure you don’t apply too much pressure when marking out the decals, as even a pencil can tear through the decal surface if too much pressure is applied.

NOTE 1: *Make sure you cut out the decals using the correct side of the template or you will end up with a ’mirrored’ decal (opposite way round).*

NOTE 2: *Due to the width of the upper wing, it is advisable to apply three separately cut decals - one for the centre section and one each for the outer wing sections.*

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

'Aviattic' decal application:

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

NOTE: *Apply the upper surface (PC12) decals first - edge overlap of the underside CDL decals over the upper surface PC12 decals is less obvious than if the decals are applied the other way around.*

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

74. Wet the model surface with clean water.

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

76. 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.

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

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

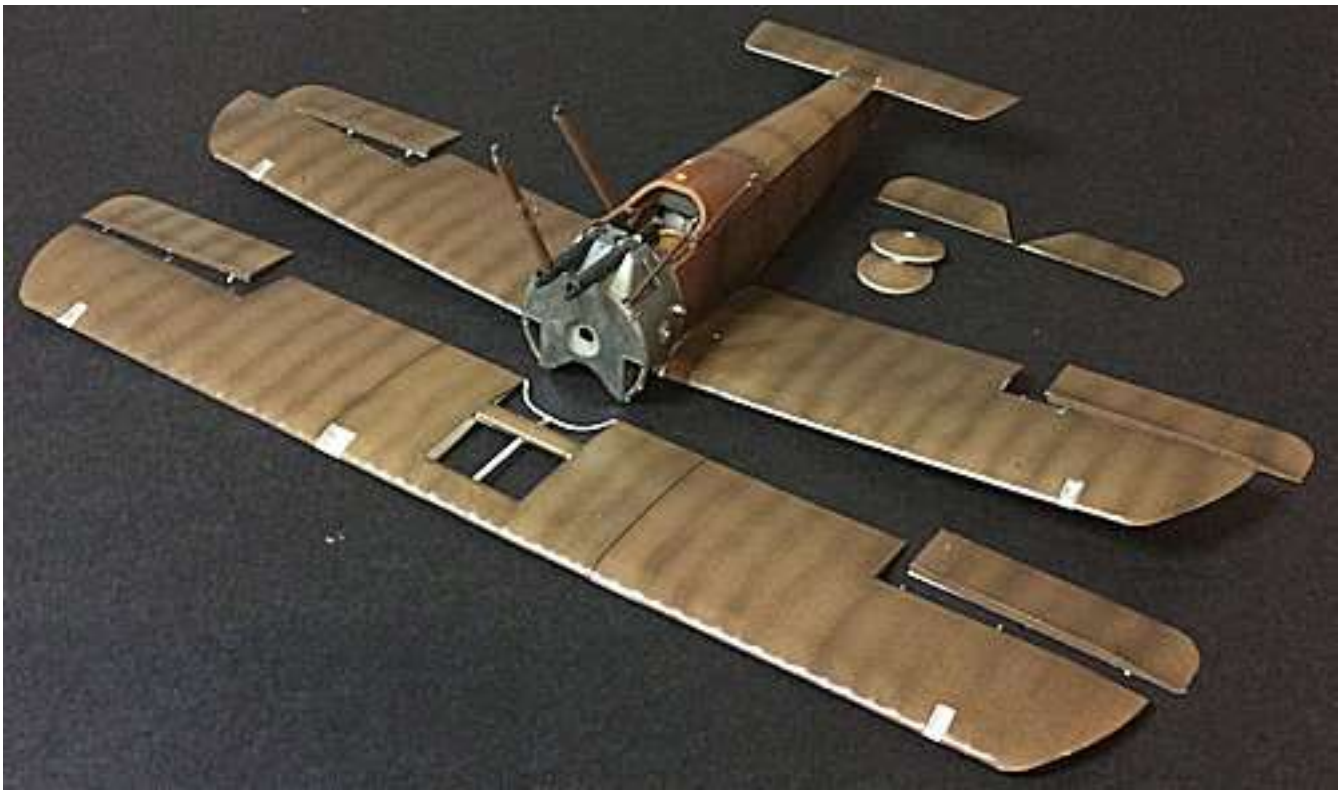
79. Once the decal is smoothed down onto the model surface, apply pressure along the decal with soft and dry tissue paper. This will expel any remaining water and press the decal on to the model surface. Check over the decal to make sure there are no tears or folds, which need to be rectified before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

80. Use a needle to carefully prick through the decal on any areas where air is trapped and can't easily be removed, such as wing strut location holes, aileron pulley apertures etc.

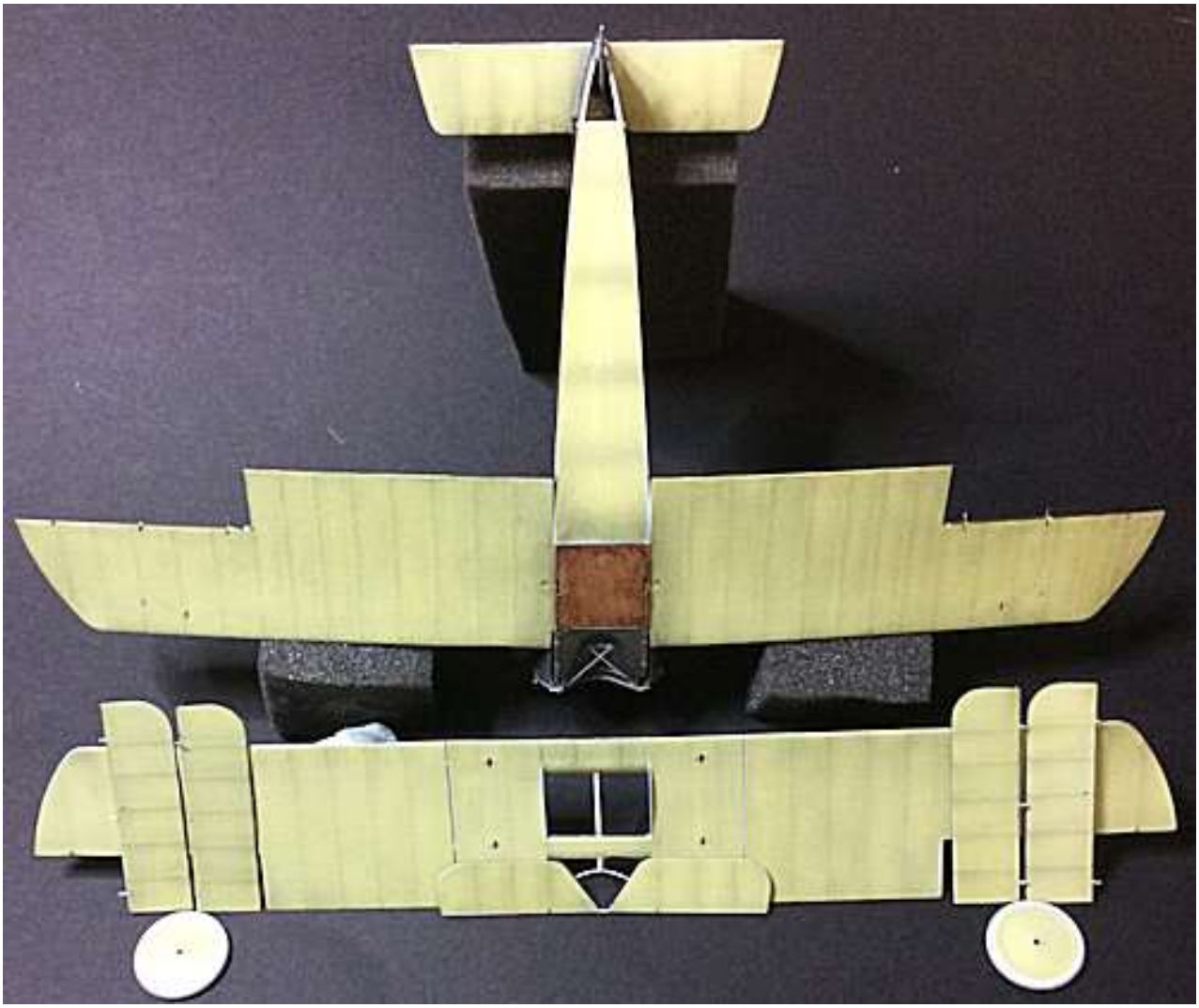
81. Once the decals have set and if necessary, apply 'MicroSol' or 'Tamiya' X20A thinners around any lifted edges of the decals. The thinners can also be used sparingly to 'seat down' areas of the decal that show evidence of 'silvering' (trapped air under the decal).

82. Allow these decals to fully set.

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



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



NOTE: *Before sealing the applied decals, the aileron control pulleys on both wings and the upper wing centre section wood will need to be painted.*

84. Brush paint the five aileron pulley apertures using ‘Tamiya’ Wooden Deck Tan (XF78).

85. Apply the desired wood effect (refer to Part 2 of this build log) to the five apertures.

86. Brush paint the four aileron pulleys and support using ‘Mr. Colour’ Iron (212).

87. Brush paint the exposed aileron control wires (pre-molded in the five apertures) using ‘Mr. Colour’ Stainless Steel (213).

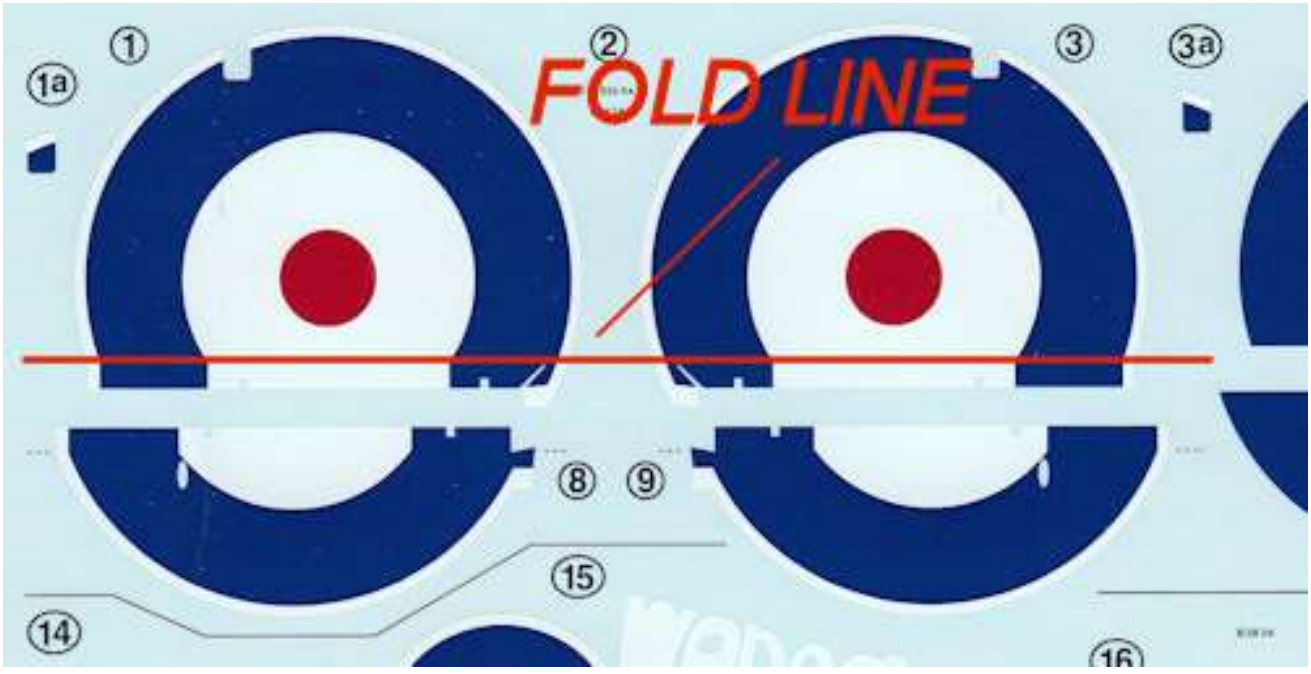
88. Airbrush the rudder with ‘AK Interactive’ Primer and Micro-filler (White-769).

89. Airbrush the fin using a mix of ‘Tamiya’ Rubber Black (XF85) and Green (XF13) to create the dark green colour of the fin (refer page 18).

90. Cut away the Red and Blue decal markings from the kit supplied decals (7 and13).

91. Where kit supplied’ extra decals are required, airbrush over the areas with sealing coat of gloss - use either ‘Alclad’ Clear Coat Gloss (ALC-310) lacquer, ‘Tamiya’ Clear (X22) with added ‘Mr. Colour’ levelling thinners or ‘Johnson’ Pledge Floor Care finish (similar to ‘Future’), which will give a gloss surface for applying the decals onto the applied ‘Aviattic’ decals.

NOTE : *The wing roundel decals are designed to wrap over the wing aileron trailing and aileron leading edges. The decals are marked with dotted lines to show the wrap line. For some reason and unlike other decals supplied by ‘Cartograf’ for Wingnut Wings kits, these particular decals are very prone to cracking or flaking when being applied. For this reason I chose to cut the decals along the marked ‘fold lines’. The wrap over part of the decal was discarded in favour of painting the colours where the decal would have been applied.*



NOTE: *Do not apply the fuselage roundels at this stage.*

92. Once the gloss sealing coat has fully dried, apply any required kit supplied decals in the normal way.

NOTE: *The rudder is primed in white so that the kit supplied decals can be cut, to apply just the red and blue markings.*

93. Apply the cut Red and Blue decals onto the white base colour on the rudder.

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

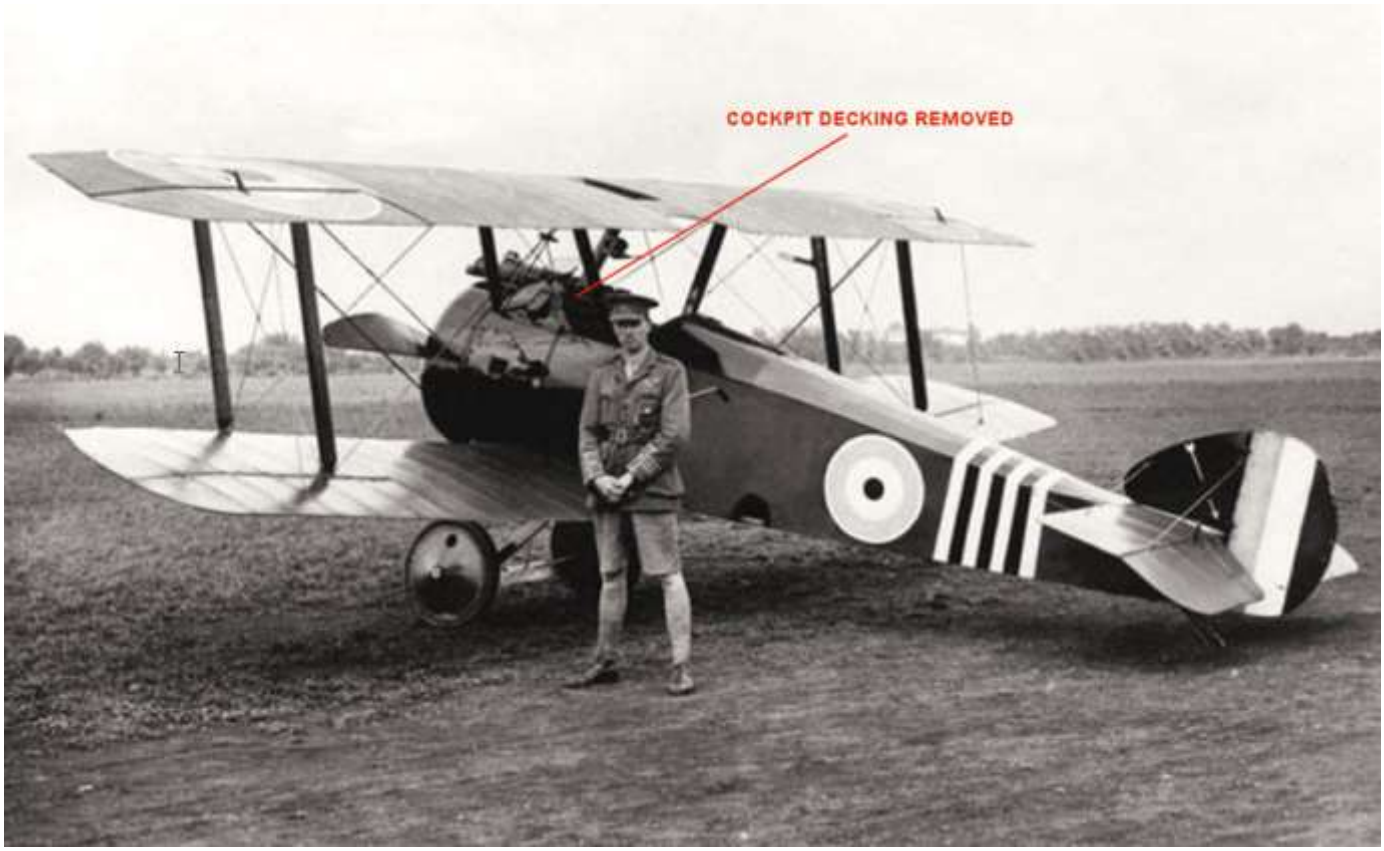
94. Apply 'MicroSol' over the kit applied decals and also around the edges then allow the solvent to dry and conform the decals to the surfaces.

95. Once set and dry, brush paint the Red, White and Blue colours to match the decals:
Rear faces of the four wing aileron apertures - 'Tamiya' Flat Blue (XF8), White (X7).
Leading edge faces of the four ailerons - 'Tamiya' Flat Blue (XF8), White (X7).
Exposed edges around rudder (if required - 'Tamiya' Flat Blue (XF8), White (X7) and Red (X7).

Fuselage bands:

At the time represented by this model, Barker was Commanding Officer of No.139 Squadron, serving in Italy. The Squadrons aircraft were the Bristol FE2b 'Brisfit', a two seater fighter. The squadron markings varied for individual aircraft, but were initially two parallel white bands and in some cases with black between. In time the number of bands increased with some aircraft having four, ten, twelve or thirteen bands applied.
Barker chose to fly B6313 whilst with No.139 Squadron and the fuselage bands were increased, possibly inline with markings on other aircraft in the squadron.
It seems clear that the earlier scheme for B6313 was alternate white (4) and black (3) bands, as can be discerned from the following photograph.

William Barker's Sopwith 'Camel', Serial No.B6313 (**earlier colour scheme**), 1917



As can be seen in the following photograph, the later version scheme had seven white bands around the fuselage. The colour between the white bands is a matter of debate, even to this day.

William Barker's Sopwith 'Camel', Serial No.B6313 (**later colour scheme**), Italy 1918

Barker returned to England and after badgering the authorities, was allowed to return to France, attached for two weeks to No.201 Squadron operating Sopwith Camels. The aircraft Barker chose to fly was a Sopwith Snipe (Serial No.E8102). Barker seems to preferred fuselage bands as his personal markings, as this aircraft (see following photograph) was marked with banding similar to that on B6313, despite No.201 squadron markings being a single white band.

This fuselage of Barkers Snipe is now in the Canadian War Museum. Although time has taken its toll on the linen colouring of the fuselage, it is still clear to see that black was not used between the applied white bands around the fuselage.

Discerning the colours of WW1 aircraft from the monochrome photographs taken at the time is at best, very difficult. When looking at the photographs and comparing the subtle tonal changes on the fuselage banding of Barkers Sopwith Camel B6313 (later scheme) and his Sopwith Snipe (E8102 with no black banding), it is difficult to decide whether the banding between the white bands on B6313 are black or left as the applied PC dope colour.
Given that most kit manufacturers and therefore modellers have opted for alternate white and black stripes, I decided to apply this colouring.

The fuselage banding decals (white/black) supplied with the Wingnut Wings kit are for the earlier colour scheme, which had less bands. Therefore for this model, the bands needed to be created either by painting or by using decals. As the fuselage is already covered in 'Aviattic' linen effect decals, which are of a glossy, non-absorbent material, I chose to use decals, namely 'Xtradecal' Parallel Stripes (White-XPS2 and Black -XPS1).

> **NOTE 1:** *The decal stripes used from the 'Xtradecal' sheets are the 2mm wide stripes. Only the most forward stripe (white) and is thinner in width.*
> **NOTE 2:** *Accurate positioning of the decal stripes is essential. Any misalignment will be obvious. Make sure the applied stripes are vertical on the sides and aligned when viewed from the fuselage underside. Do not apply the decal to the underside of the fuselage as these will applied later.*
> **NOTE 3:** *You may find that applying a single length of decal stripe around the fuselage causes the decal to wrinkle on the fuselage top. If this does occur, try carefully slicing the decal in the centre and/or sides, which will allow you to position the decal and reduce wrinkling.*
> **NOTE 4:** *When apply consecutive decal stripes, make sure the rear edge of each applied decal stripe touches the forward edge of the previously applied stripe.*

96. Start at the rear of the fuselage just forward from the front of the tailplane.
97. Cut a length of black decal stripe and apply it to the fuselage side, over the top and down the opposite side.
98. Apply 'MicroSol' over the applied decal then allow the solvent to dry and conform the decal to the surfaces.
99. Carry out the same procedure and apply a white decal stripe to the fuselage.
100. Continue to apply decal stripes along the fuselage, alternating between black and white stripes, until thirteen stripes have been applied, the last of which should be black in colour.
    NOTE: *Photographs of this marking scheme show that the most forward stripe was white in colour and thinner than the other stripes.*
101. From the 'Xtradecal' white decal sheet, cut a length of thinner stripe.
102. Apply the white against the most forward black stripe.
103. Cut and apply black and white stripes to the underside of the fuselage, such that they match the widths and align with the ends of the existing decals.
104. Apply the kit supplied fuselage roundels forward of the fuselage stripes.
105. Apply the kit supplied arrowed hearts to the sides of the fin. Make sure the arrow heads are pointing towards the bottom, centre of the fin and the flights towards the top rear.
106. Apply 'MicroSol' over the applied decals then allow the solvent to dry and conform the decal to the surfaces.

107. Airbrush over all decaled surfaces ('Aviattic', kit supplied and extra), undercarriage assembly, wheels and rudder/fin with a sealing coat - use either 'Alclad' Light Sheen (ALC-311) lacquer, 'Tamiya' Semi-Gloss (X35) with added 'Mr. Colour' levelling thinners.

WARNING: ***Once applied and sealed, decals can still be damaged if handled incorrectly:***
1. Too much handling, especially around edges, can cause the decals to crack/chip.
2. Finger marks can be imprinted on the surface of decals, if the sealing coat has not fully cured.
3. Removal from decaled surfaces of masking tape (even when de-tacked), masking putty, 'BlueTack' or 'WhiteTak' can lift the decal from the model surface, causing air 'silvering' or possibly tear away the decal.
NOTE: *To limit damage to decals through handling, I wear either surgical gloves of lint free cotton gloves when handling decaled surfaces*.

108. Brush paint the replacement photo-etch control horns for the ailerons and elevator halves, and also the four bomb rack attachment brackets using 'Tamiya' Rubber Black (XF85).

109. Ensure the holes in the rudder and photo-etch control horns are clear of paint - run an appropriate size drill through them if blocked.

Weathering:

At this stage, before final assembly of the remaining parts, it's best to apply weathering to the exposed model surfaces.

NOTE: *During the following step, do not apply the wash inside the aileron pulley apertures in both wings.*

110. Apply 'Flory Models' clay wash (Dart Dirt) over the model surfaces, including the undercarriage, wheels, engine cowl and control surfaces. Allow the wash to fully dry. (Refer to Part 3 of this build log).

111. Remove the wash, as desired, to achieve the desired weathered finish.

112. Apply ‘Flory Models’ clay wash (Grime) along the bottom edges of the fuselage, wheel cover edges and tyres, bottom of the rudder and centre underside of the elevator halves

113. Remove the wash, as desired, to achieve the desired dirt effect along the edges.

114. Airbrush over all treated surfaces with a sealing coat, using the same sealer as used to seal the applied decals.

115. Apply by sponge ‘Tamiya’ Weathering Master (Set D - Oil Stain) as desired, along edges and to the rear of wing struts and wing trailing edges, to create dirt and streaking effects.

116. Apply ‘AK Interactive’ Kerosene (AK 2039) and/or Engine Oil (AK 2019) as desired to the leading edge of the engine under tray (forward fuselage) and from the rear edge of the engine cowl and forward fuselage side panels.

117. Cement the engine assembly into its location recess on the engine bulkhead.

NOTE: *In the next step, make sure the four cowl retaining straps on the front of the fuselage are located into the four cut-outs in the engine cowl.*

118. Cement the engine cowl over the engine and onto the front of the fuselage.

119. To represent the air pipe from the ‘Rotherham’ pump, mounted on the forward, right cabane strut, cut then using thin CA adhesive, secure a length of 0.28mm diameter copper wire to the forward face of the ‘Rotherham’ pump and down the strut into the strut aperture in the fuselage.

120. Cement the propeller onto the rear of the ‘Rotherham’ pump, located on the forward, right cabane strut.

121. Make sure all pre-drilled rigging holes in the engine under tray and undercarriage assembly are clear of paint or sealing coat. If not, carefully run and 0.5mm diameter drill through the holes to clear them.

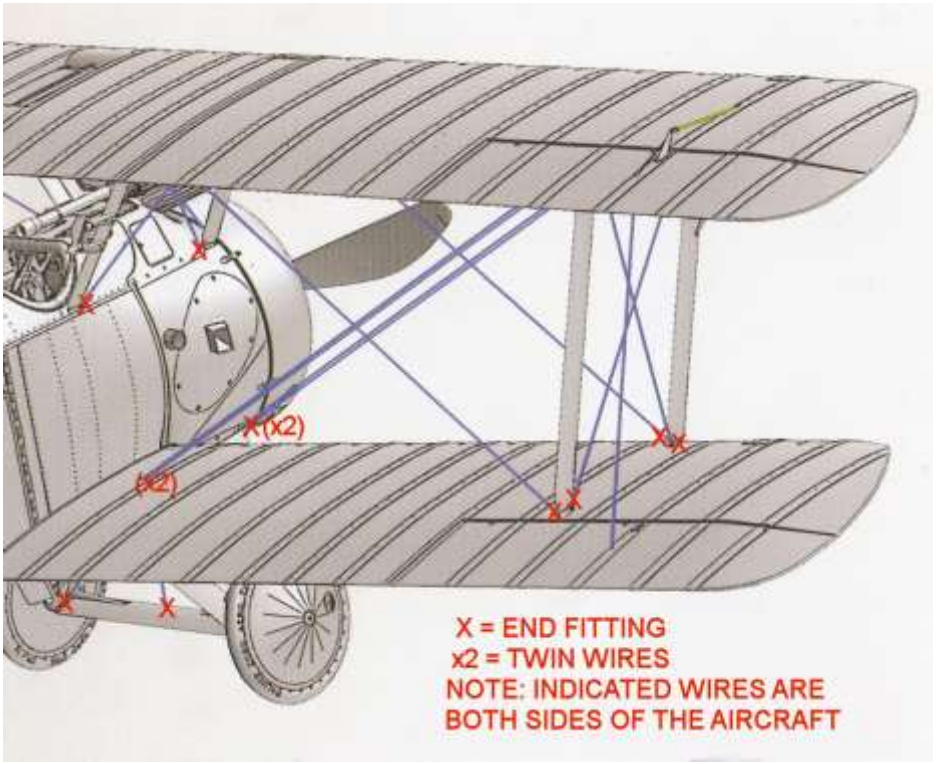
122. Cement the undercarriage assembly into the four location aperture on the underside of the fuselage.

123. Drill a 0.5mm diameter hole into the lower fuselage under shield for the engine drain pipe.
124. Cut a short length of 0.5mm diameter ‘Albion Alloys’ Nickel-Silver tube (NST05) and se cure it into the hole using thin CA adhesive.

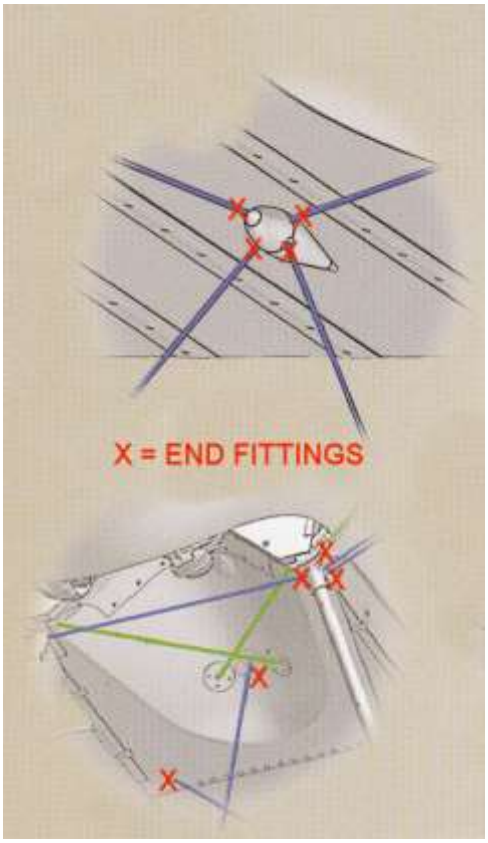
Attaching undercarriage assembly bracing:

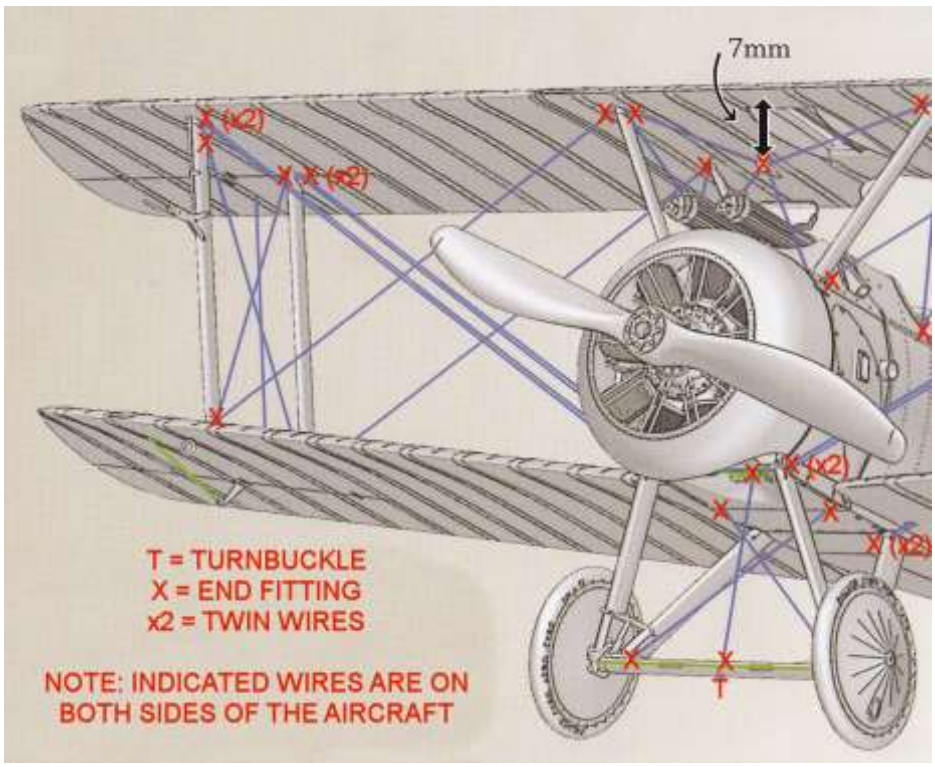
NOTE: *One end of these rigging lines should have already been prepared with a 0.4mm diameter tube and nut.*

125. Insert one tube into each of the two pre-drilled holes in the rear of the fuselage under shield, close to the rear undercarriage attachments. Secure with thin CA adhesive.
126. Slide onto each line a nut and 0.4mm tube.
127. Pass the free end of each line through the opposite side pre-drilled holes in the bottom rear of the undercarriage strut base.
128. Pull the lines taut and secure with thin CA adhesive.
129. Slide the tubes and nuts down to the bottom of the lines and secure with thin CA adhesive.
130. Repeat this procedure for the centre bracing line routed from the under shield to the centre of the axle fairing.
131. Cut away the exposed line tags.
132. Secure a pre-prepared line tube (0.08mm line) into the pre-drilled holes at each side of the bottom, forward edge of the undercarriage base.
133. Slide a short length of 0.4mm diameter Nickel-Silver tube onto each free end of the lines.
134. Pass the free ends of the lines through the ’eye’ ends of a ’Gaspatch’ 1:48th scale turnbuckle the back through the tubes.
135. Position the turnbuckle central to the axle fairing and carefully slide the tubes up to the turnbuckle, pulling the free line ends to tighten each line.
136. Once the turnbuckle is positioned centrally and the lines are tight, secure the tubes on the lines using thin CA adhesive.
137. Cut away the exposed line tags.
138. Brush paint the centre portion of the turnbuckle using ‘Mr. Colour’ Brass (219).
139. If desired, ‘knock back’ the metallic shine on the Nickel-Silver tubes and the nuts by brushing on ‘AK Interactive’ Kerosene (AK 2039).

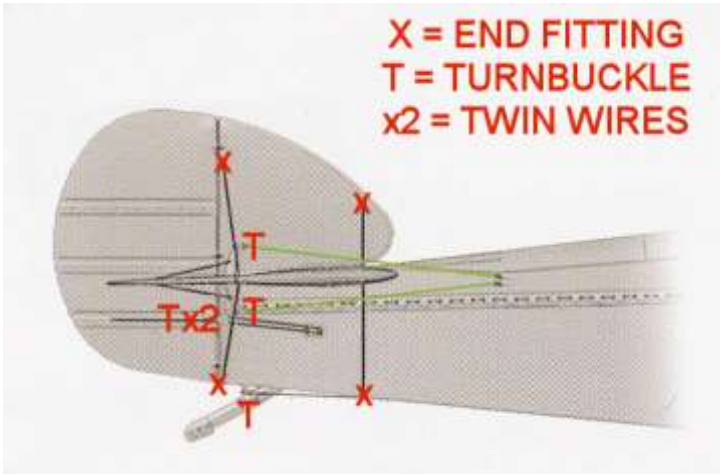


These illustrations are adapted from those in the Wingnut Wings instruction manual and are to assist in the location of the end fittings or turnbuckles that are required.





Those control wires with no indicated **X** or **T** are those with no externally visible end fittings or turnbuckles.



Pre-rigging:
At this stage of the model build pre-rigging of various model parts should be carried out, especially on the upper wing, as there is more access than when the upper wing is fitted. Pre-rigging also reduces the chance of damage to models parts during final rigging.

> **NOTE 1:** *When rigging using the kit pre-molded attachment points on the struts, do not exert too much pull otherwise the line will break through the rigging point or detach model parts. It's best to leaving the rigging slightly slack until after the model is assembled, when the rigging lines can be tightened.*
>
> **NOTE 2:** *Always create the lines longer than required, as this helps when attaching the pre-rigging the model.*

To replicate end fittings (not standard turnbuckles) for the streamlined aerodynamic flying and landing wires used on this aircraft, I used 'Albion Alloy's' 0.4mm diameter Nickel-Silver tube (NST04), which has outside diameter of 0.4mm and an internal diameter of 0.2mm. This tube is in scale for the end fittings and allows the 0.12mm 'Steelon' mono-filament (rigging line) and 'Stroft' 0.08mm diameter line to pass through. Also used are 'RB Motion' 0.51mm aluminium hexagonal nuts (1279-A).

Pre-rigging wing struts cross bracing wires;

140. Lay kit parts A1 and A16 (starboard outer wing struts) on your working surface with A1 facing to the right. Position approximately the two struts as they will be once fitted to the lower wing.

141. Cut a length of 'Stroft' 0.08mm diameter line, longer than required.

142. Cut a short length of the 'Albion Alloy's' 0.4mm Nickel-Silver tube (NST04).

143. Slide the tube on to the line, followed by a 'RB Motion' 0.51mm Aluminium hexagonal nut (1279-A).

144. Pass the line through the pre-molded attachment hole at the top of a strut.

145. Loop the end of the line back through the tube and nut, leaving the loop of line slack.

146. Repeat this with the other end of the line, but at the attachment hole at the bottom of the opposite strut.

147. Repeat this but on the remaining two pre-molded attachment holes on the struts.

    NOTE: *You should now have the two outer wings struts (A1 and A16) attached to each other by their crossed rigging lines.*

148. Repeat this procedure to pre-rig the other two wing struts (A11 and A16). The two pairs of pre-rigged wing struts will be fitted later in the build.

The following photograph shows the pre-rigged wing strut bracing lines.

Pre-rigging cabane struts cross bracing wires;

The cabane struts on this model are molded at part of the fuselage halves. Each strut has a molded location hole in the top and bottom, used for attaching rigging lines. However those at the bottom of the struts are too close to the cockpit framing and fuselage and do not allow a rigging line that is passed through to be accessed from the inside. Therefore the bottom locations needed to be rigged differently.

> **NOTE 1***: Extreme care should be taken when pre-rigging the cross bracing of the cabane struts, as they are molded as part of the fuselage halves and can be easily knocked and broken away.*
> **NOTE 2:** *Given how fragile the pre-molded attachment hole are in both ends of the wing and cabane struts are, it would be very easy to break them when fitting and tightening the bracing lines. Therefore it is best to pre-rig these struts, leaving the lines slack, which can then be tightened and secured after the struts and upper wing have been fitted.*
> **NOTE 3:** *The bracing lines should not be tightened or secured in place, but left slack, as they will be finally fitted and tightened during the build.*

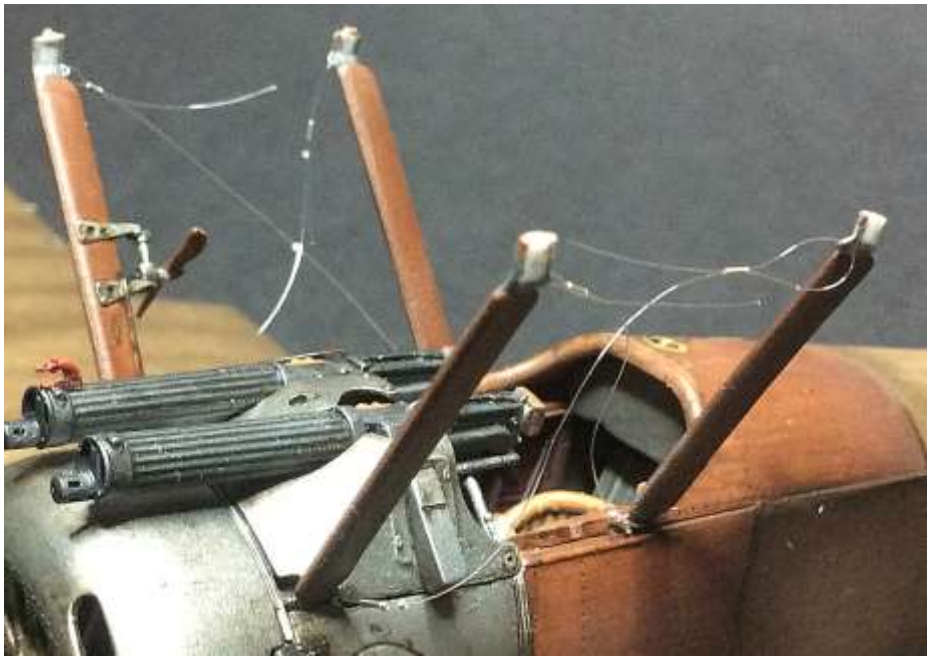
149. Drill a 0.3mm diameter hole into the framing at the attachment hole at the bottom of both rear cabane struts.

150. Twist 0.125mm diameter copper wire around a 0.2mm drill shank, to form an anchor ’eye’.

151. Cut away the twisted tail of wire to leave approximately 3mm.

152. Insert the tail of the anchor into the pre-drilled hole and secure using thin CA adhesive.

153. Carry out the same procedure for creating the cabane struts cross bracing as was detailed for the wing struts cross bracing wires, but using the copper ‘eyes’ instead of the location hole pre-molded in the bottom of the rear cabane struts.



Pre-rigging upper wing flying and landing wires;

NOTE 1: *Refer to the illustrations on page 116 (x marks the locations).*

NOTE 2: *Prepare these rigging lines* ***on the underside of the upper wing only****.*

154. Cut a length, as required, of 'Steelon' 0.12mm diameter line, longer than required.

155. Cut a short length of the 'Albion Alloy's' 0.4mm Nickel-Silver tube (NST04).

156. Position the tube close to the end of the line and the nut against the tube.

157. Secure the tube on the line using thin CA adhesive.

158. Cut off the line tag at the end of the tube.

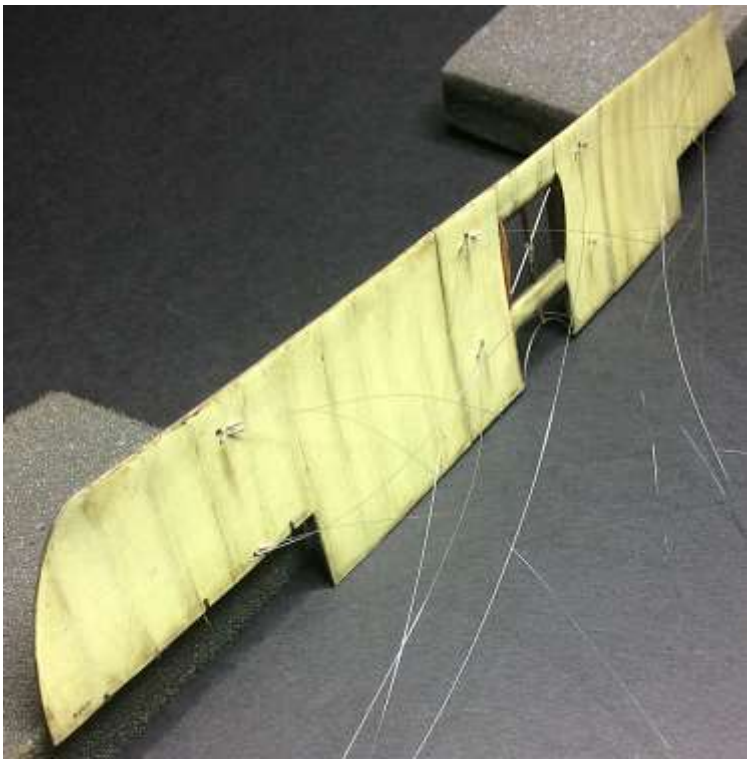
159. Repeat this procedure to create all of the flying and landing wires required.

160. Ensure all of the pre-drilled rigging location holes in the underside of the upper wing are clear of paint and decal and if not, 'clear' out the holes with a 0.5mm diameter drill.

161. On the underside of the upper wing, insert the tube of each line into the appropriate location hole, at the correct angle to align with the bottom wing and fuselage rigging locations.

162. Secure each tube into the wing using thin CA adhesive.

163. Slide a 'RB Motion' 0.51mm Aluminium hexagonal nuts (1279-A) onto each line, and against the installed tube and secure with thin CA adhesive.



Actual end fittings for flying, landing and bracing wires.

Pre-rigging control line wires to control horns;

The control surfaces (ailerons, elevator and rudder) were connected to their control wires at 'control horns', which were attached to the relevant control surface. The control lines were attached to the horns with turnbuckles so the controls could be adjusted. To make it easier for final rigging to the aircraft, these control horns are pre-rigged with the wires required.

NOTE 1: *Refer to the illustrations on page 115 (T marks the locations where applicable).*

Pre-rigging ailerons control horns:

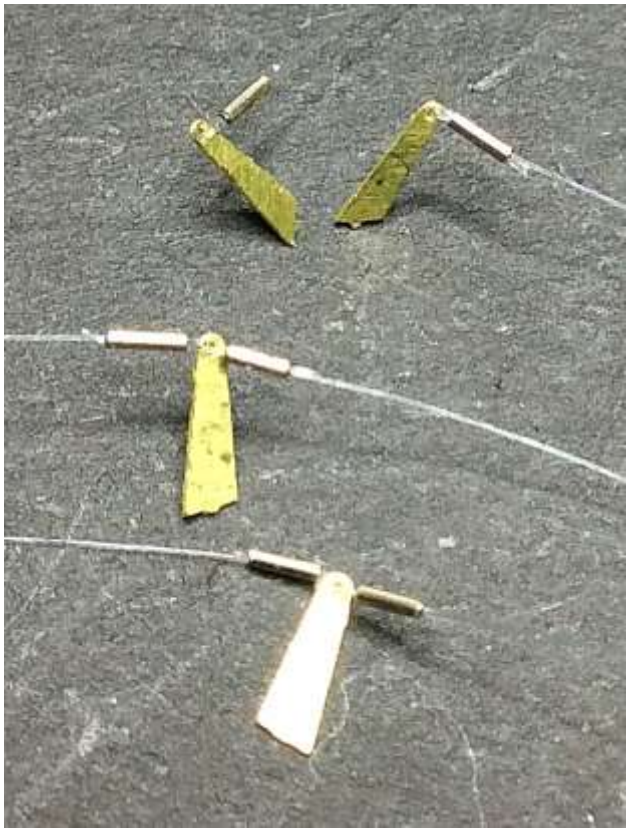
NOTE 1: *The external control lines for the ailerons had no turnbuckles fitted.*

NOTE 2: *Pre-rigging the control horns reduces the chance of them breaking away from the ailerons when being rigged later in the build.*

164. Cut a length of 'Stroft GTM' 0.08mm diameter line, longer than required.
165. Cut a short length of the 'Albion Alloy's' 0.4mm Nickel-Silver tube (NST04).
166. Pass the line through the cut tube then through hole in the aileron control horn.
167. Pass the line back and through the tube.
168. Position the tube close to but not touching the control horn.
169. Secure the tube on the line using thin CA adhesive. Ensure the loop of the line is free to move inside the control horn hole.
170. Repeat this procedure for the other three aileron control horns.

NOTE: *The two ailerons on each side of the wings were interconnected by a single wire. This needs to be attached to the either the upper wing horns* ***or*** *the lower wing horns. The other end of the line will be attached later in this build.*

171. Cut a long length of 'Stroft GTM' 0.08mm diameter line.
172. Cut a short length of the 'Albion Alloy's' 0.4mm Nickel-Silver tube (NST04).
173. Pass the line through the cut tube then through the hole in the chosen aileron control horn.
174. Pass the line back and through the tube.
175. Position the tube close to but not touching the control horn.
176. Secure the tube on the line using thin CA adhesive. Ensure the loop of the line is free to move inside the control horn hole.
177. Repeat this procedure for the other matching control horn.



Pre-rigging elevators control horns:

The elevator control horns were located on the upper and lower surfaces of each elevator half. Single control wires were attached between the control horns and fuselage. A single wire was connected the rear of each pair of control horns and was routed through the elevator.

NOTE: *Pre-rigging the control horns reduces the chance of them breaking away from the elevator when being rigged later in the build.*

178. Cut a length (to reach the fuselage rigging hole) of 'Stroft GTM' 0.08mm diameter line and a short length of the 'Albion Alloy's' 0.4mm Nickel-Silver tube (NST04).
179. Pass the line through the cut tube then an 'eye' at one end of a 'Gaspatch' turnbuckle.
180. Pass the line back and through the tube.
181. Position the tube close to but not touching the 'eye' of the turnbuckle.
182. Secure the tube on the line using thin CA adhesive. Ensure the loop of the line is free to move inside the 'eye' of the turnbuckle.
183. Cut a long length of 'Stroft GTM' 0.08mm diameter line.
184. Pass the line through the 'eye' at the opposite end of the turnbuckle.
185. Pass one end of the line through the hole in the replacement photo-etch control horn.
186. Pass the other end of the line through the same hole, but from the other side of the control horn.
187. Pass both ends of the line through a cut 0.4 mm tube.
188. Hold both ends of the line and pull the lines taut and position the turnbuckle and tube close to, but not touching the control horn then secure the tube in position using thin CA adhesive.
189. Pass the free end of the line through the pre-drilled hole in the elevator half.
    NOTE: *In the following step, make sure the line is not tightened or secured to the tubes, turnbuckle or control horn. The line through the end fittings at this end needs to be left slack so that the line can be tightened and secured to the end fittings later in this build (when the control line is fitted to the model).*
190. At the other side of the elevator half, repeat the steps 180 to 188 at the end of the long free line so that you have created the following configuration:
    Line, tube, turnbuckle, control horn, tube, line - elevator - line, tube, control horn, turnbuckle, tube, line.
191. Create a second elevator control run for the other elevator half.

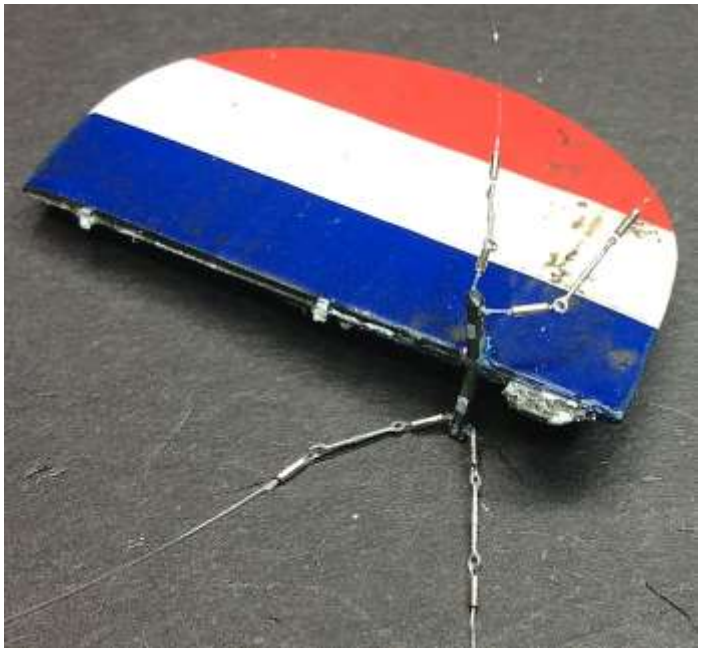
Rudder control wires - rigging:

The type of turnbuckles for control wires are as in the following photograph.

NOTE 1: *The rudder has two control wires attached to each side of the control horn.*

NOTE 2: *Refer to the illustrations on page 115 (X marks the locations).*

192. Cut a length of 'Stroft GTM' 0.08mm diameter line, longer than required.
193. Cut a short length of the 'Albion Alloy's' 0.4mm Nickel-Silver tube (NST04).
194. Pass the line through the cut tube then the 'eye' at one end of a 'Gaspatch' turnbuckle.
195. Pass the line back and through the tube.
196. Position the tube close to but not touching the 'eye' of the turnbuckle.
197. Secure the tube on the line using thin CA adhesive. Ensure the loop of the line is free to move inside the 'eye' of the turnbuckle.
198. Repeat this procedure at the other end of the turnbuckle.
199. Pass one free end of line through the pre-drilled hole in the rudder control horn (A17).
200. Carry out this procedure for the other rigging line.
201. Position the two lines vertically against the control horn.
202. Secure the two lines in the control horn using thin CA adhesive. Carefully cut away the tags of line.
203. Repeat this procedure for the two rudder control lines on the other side of the bell crank.



Rudder operating wire:

204. Cut a long length of 'Stroft GTM' 0.08mm diameter line, longer than required.
205. Cut a short length of the 'Albion Alloy's' 0.4mm Nickel-Silver tube (NST04).
206. Pass the line through the cut tube then around the end of the rudder control horn.
207. Pass the line back and through the tube.
208. Position the tube close to but not touching the control horn.
209. Secure the tube on the line using thin CA adhesive. Ensure the loop of the line is free to move on the control horn.
Pass the free end of the line through the pre-drilled hole in the rudder.
210. Cut a short length of the 'Albion Alloy's' 0.4mm Nickel-Silver tube (NST04).
211. Pass the line through the cut tube then around the end of the rudder control horn on that side.
212. Pass the line back and through the tube.
213. Position the tube close to but not touching the control horn.
214. Gently pull the line taut and secure the tube on the line using thin CA adhesive. Ensure the loop of the line is free to move on the control horn.
215. Cut away the exposed end of the line.

Tailplane bracing - rigging;

To replicate end fittings (not standard turnbuckles) for the streamlined aerodynamic bracing wires used on this aircraft, I used 'Albion Alloy's' 0.4mm diameter Nickel-Silver tube (NST04), which has outside diameter of 0.4mm and an internal diameter of 0.2mm.
This tube is in scale for the end fittings and allows the 0.12mm 'Steelon' mono-filament (rigging line) and 'Stroft' 0.08mm diameter line to pass through. Also used are 'RB Motion' 0.51mm aluminium hexagonal nuts (1279-A).

NOTE 1: *Refer to the illustrations on page 115 (X marks the locations).*

216. Cement the rudder control horn onto its location in the rudder.

217. Cement the fin and rudder onto the fuselage.

218. Pull each pair of pre-rigged rudder control lines taut and secure them into the oval apertures in the rear of the fuselage sides.

219. Ensure all of the pre-drilled rigging location holes in the tailplane, fin and bottom rear of the fuselage are clear of paint and decal. If not, 'clear' out the holes with a 0.3mm diameter drill.

220. Cut two lengths, as required, of 'Steelon' 0.12mm diameter line, longer than required.

221. Cut eight short lengths of the 'Albion Alloy's' 0.4mm Nickel-Silver tube (NST04).

222. Insert one end of each line into the pre-drilled holes on one side of the bottom, rear fuselage and secure with thin CA adhesive.

223. Onto one line slide a tube, then two ‘RB Motion’ 0.51mm Aluminium hexagonal nuts (1279-A) followed by another tube.

224. Pass the free end of the line up and through its pre-drilled hole in the tailplane.

225. Repeat step 170 on the line.

226. Pass the free end of the line up and through its pre-drilled hole in the fin.

227. Repeat step 170 on the line.

228. Pass the free end of the line down and through its pre-drilled hole in the tailplane.

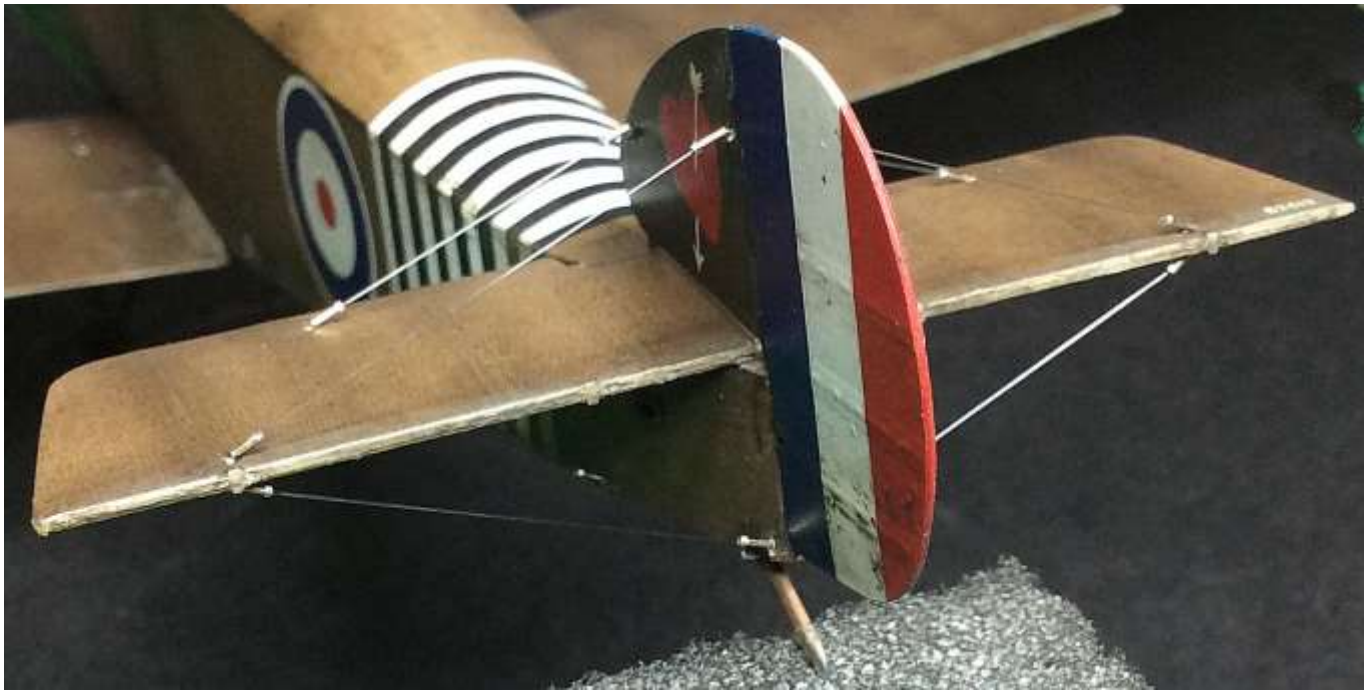
229. Repeat step 170 on the line.

230. Insert the free end of the line into the pre-drilled hole on the opposite, bottom rear fuselage.

231. Pull the line taut and secure in position using thin CA adhesive.

232. Slide each pair of tubes and nuts up to the model surface and secure in position using thin CA adhesive.

233. Repeat this procedure for the other tailplane bracing line.



Tail skid control wires - rigging;

The steerable tail skid was controlled by two wires, which were attached to a bell crank below the rudder. These control wires had turnbuckles fitted for adjustment of the wires.

234. Cut a length of ‘Stroft GTM’ 0.08mm diameter line, longer than required.

235. Cut a short length of the ‘Albion Alloy’s’ 0.4mm Nickel-Silver tube (NST04).

236. Pass the line through the cut tube then the ‘eye’ at one end of the turnbuckle.

237. Pass the line back and through the tube.

238. Position the tube close to but not touching the ‘eye’ of the ‘Gaspatch’ turnbuckle.

239. Secure the tube on the line using thin CA adhesive. Ensure the loop of the line is free to move inside the ‘eye’ of the turnbuckle.

240. Repeat this procedure at the other end of the turnbuckle.

241. Pass one free end of the line through a cut tube then through the pre-drilled hole in the tail skid bell crank (part of tail skid D17).

242. Pass the line back and through the tube.

243. Position the tube close to but not touching the bell crank.

244. Secure the tube on the line using thin CA adhesive. Ensure the loop of the line is free to move in the bell crank.

245. Cut the turnbuckle line so it can be attached inside the aperture under the fuselage rear.

246. Pull the line taut and secure in the aperture corner.

247. Repeat this procedure for the control wire on the other side of the bell crank.

Build continued:

Undercarriage bungee suspension:

The kit supplied suspension spools (A45 and A46) for this particular aircraft are of the earlier suspension type, where the suspension bungee cord was wrapped around the spools and over and under the axle.

The later suspension type had no spools but instead the suspension bungee cord was wrapped around each side of the undercarriage struts and rod projections in the front and rear of the struts.

Kit spools A45 and A46 are molded with only faint outlines of bungee cord and only on the upper surface. To better represent the bungee cord:

248 Cut a length of ’EZ Line’ (White heavy).

249 Secure one end of the line to the underside of a spool.

250. Pulling slightly on the line, wrap it six times around the two spools, so that it is routed over and under the axle.

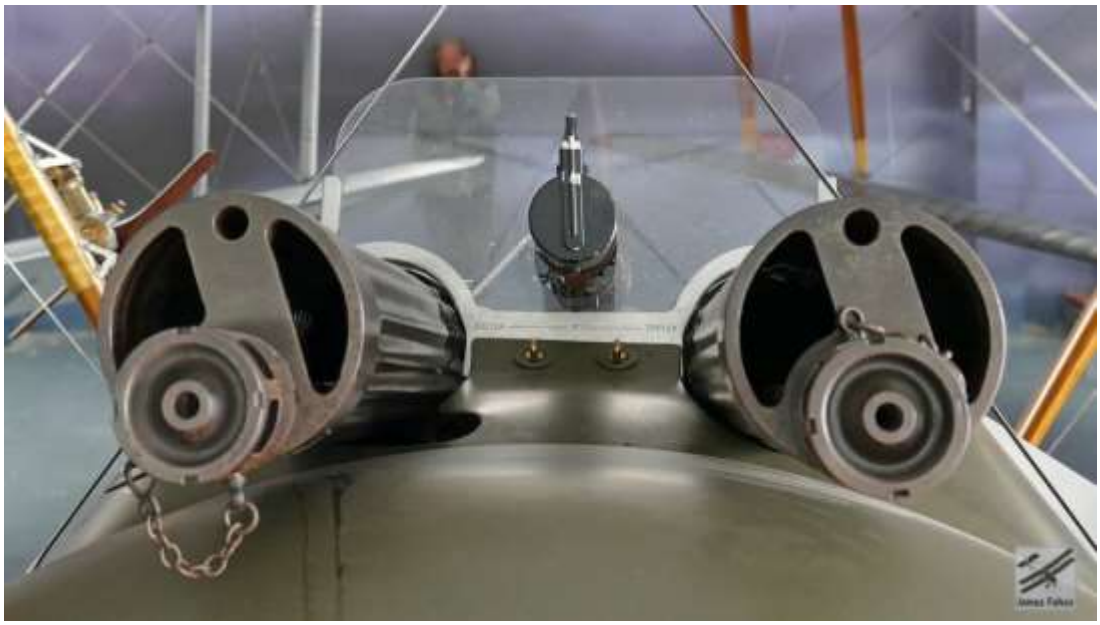
251. Hold the free end taut, secure the line to the spools using thin CA adhesive.

252. Repeat the procedure at the other side of the undercarriage.

253. Apply ’AK Interactive’ Kerosene (AK 2039) to weather the line and better outline the separate strands. A suitable dirt pigment can be dry brushed over the bungee to weather it.

Windscreen:

Typical installation of the windscreen with the ‘Aldis’ gunsight installed.



There are several different versions of windscreen designs supplied in the kit and all make provision for the 'Aldis' tubular gun sight. Versions wide main and side screens were mainly used on RNAS aircraft. It seems Barker chose to have the 'Aldis' gunsight removed from B6313 and therefore kit windscreen C1 was used on the model. The base of the windscreen was secured to metal flap between the two machine guns on the forward decking. The support frame for the windscreen was across the bottom and half way up each side.

254. Brush paint the support frame with 'Mr. Colour' Stainless Steel (213).

255. Apply cement ***sparingly*** to the back of the mounting plate of the windscreen and secure the windscreen in position.

Build completion:

NOTE 1: *The various rigging attachment points have been pre-drilled (refer to Part 1l of this build log) into the wings, undercarriage, struts and control horns.*
NOTE 2: *Pre-rigging should already have been carried out on the upper wing, wing struts, cabane struts and control horns.*

256. Cement in position on the lower wing the two pairs of pre-rigged wing struts - right side A1 and A16 and left side A11 and A16. *Make sure that the struts are seated fully into the wing and that the rigging lines are clear from the base of the struts otherwise the pre-rigged lines may become cemented to the struts.*

257. Using CA adhesive, secure the pre-rigged aileron control horn into the location slots on the relevant aileron. Make sure the horns are tilted slightly towards the leading edges of the aileron.

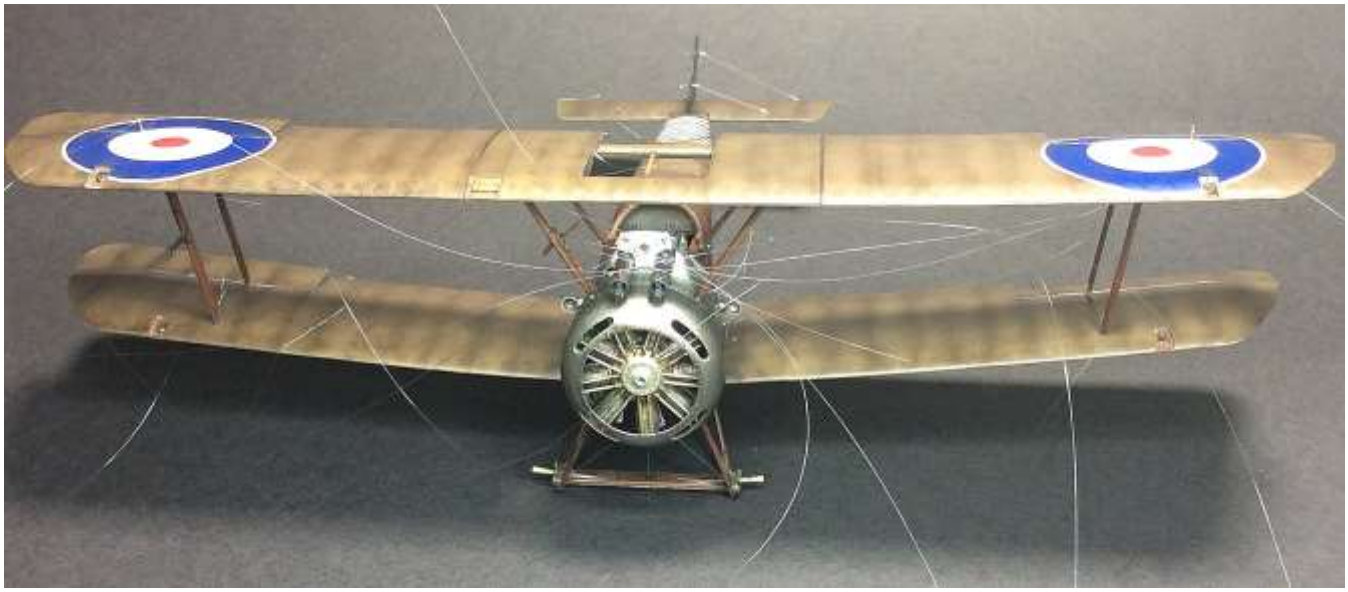
258. Pass the longer interconnecting line between the ailerons on each side, through the pre-drilled hole in the chosen aileron. Leave the line slack (until the CA adhesive has fully set.

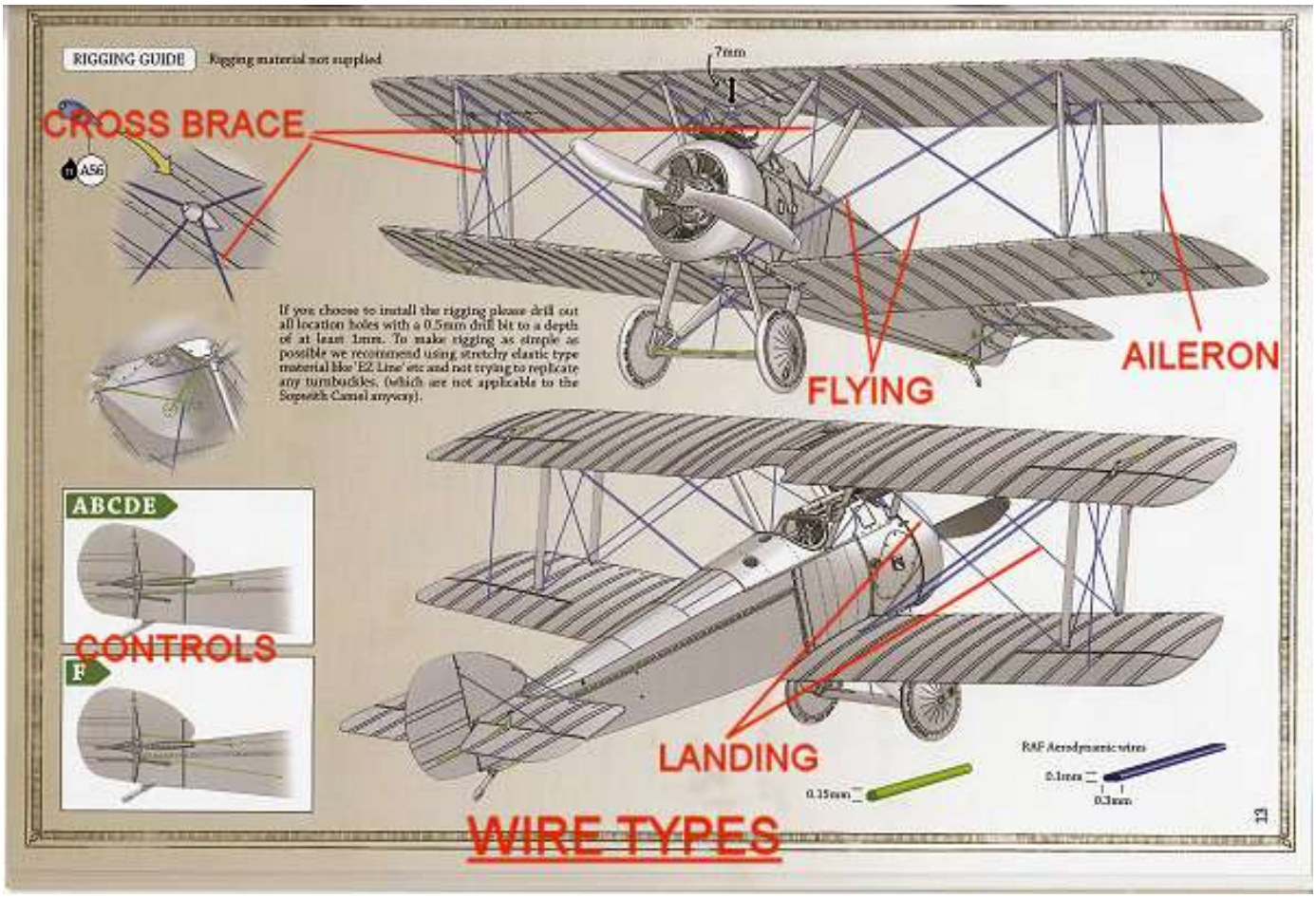
NOTE: *The positioning of the ailerons on each side of the aircraft depends on what position you installed the cockpit control column. If not central, the ailerons should be angled by the same amount:*

Control column central - all ailerons should be inline with the wings.
Control column to the right - right side ailerons up, left side ailerons down.
Control column to the left - right side ailerons down, left side ailerons up.

259. Using CA adhesive, secure each aileron onto its locating pins and make sure each aileron leading edge is close to the wing trailing edge.

260. Once the lower wing struts have set, cement the upper wing onto the four wing struts and for cabane struts. Make sure the wing is fully seated onto the struts and that rigging lines are clear from the strut joints otherwise the pre-rigged lines may become cemented to the struts.

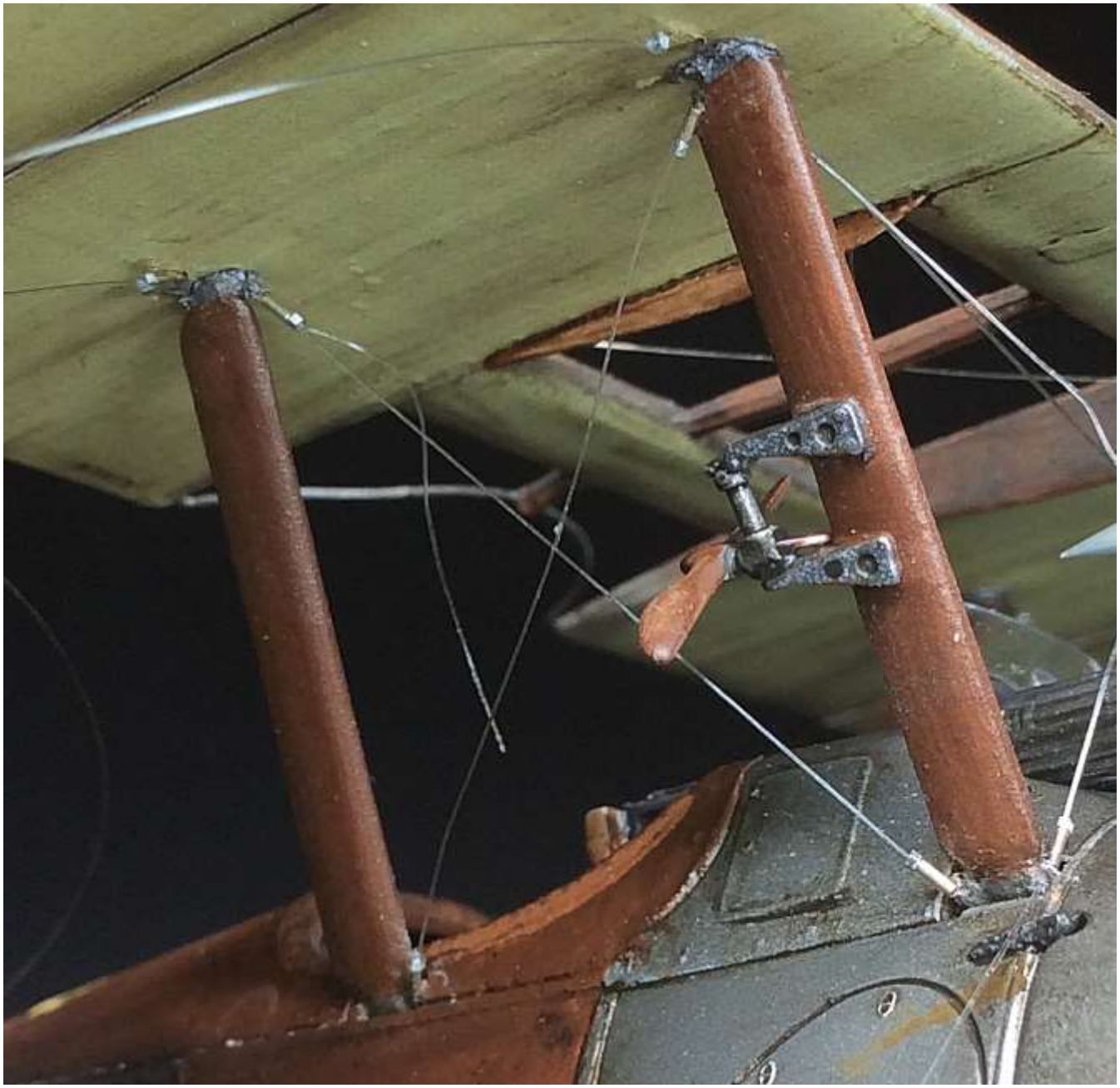



RIGGING GUIDE
Rigging material not supplied
7mm
CROSS BRACE
A56
If you choose to install the rigging please drill out all location holes with a 0.5mm drill bit to a depth of at least 1mm. To make rigging as simple as possible we recommend using stretchy elastic type material like 'E2 Line' etc and not trying to replicate any turnbuckles. (which are not applicable to the Sopwith Camel anyway).
FLYING
AILERON
ABCDE
CONTROLS
F
LANDING
RAF Aerodynamic wires
0.1mm
0.3mm
0.35mm
WIRE TYPES
13

NOTE: *To give easier access between the wings and rigging lines, the wing rigging lines should be fitted in a certain order.*

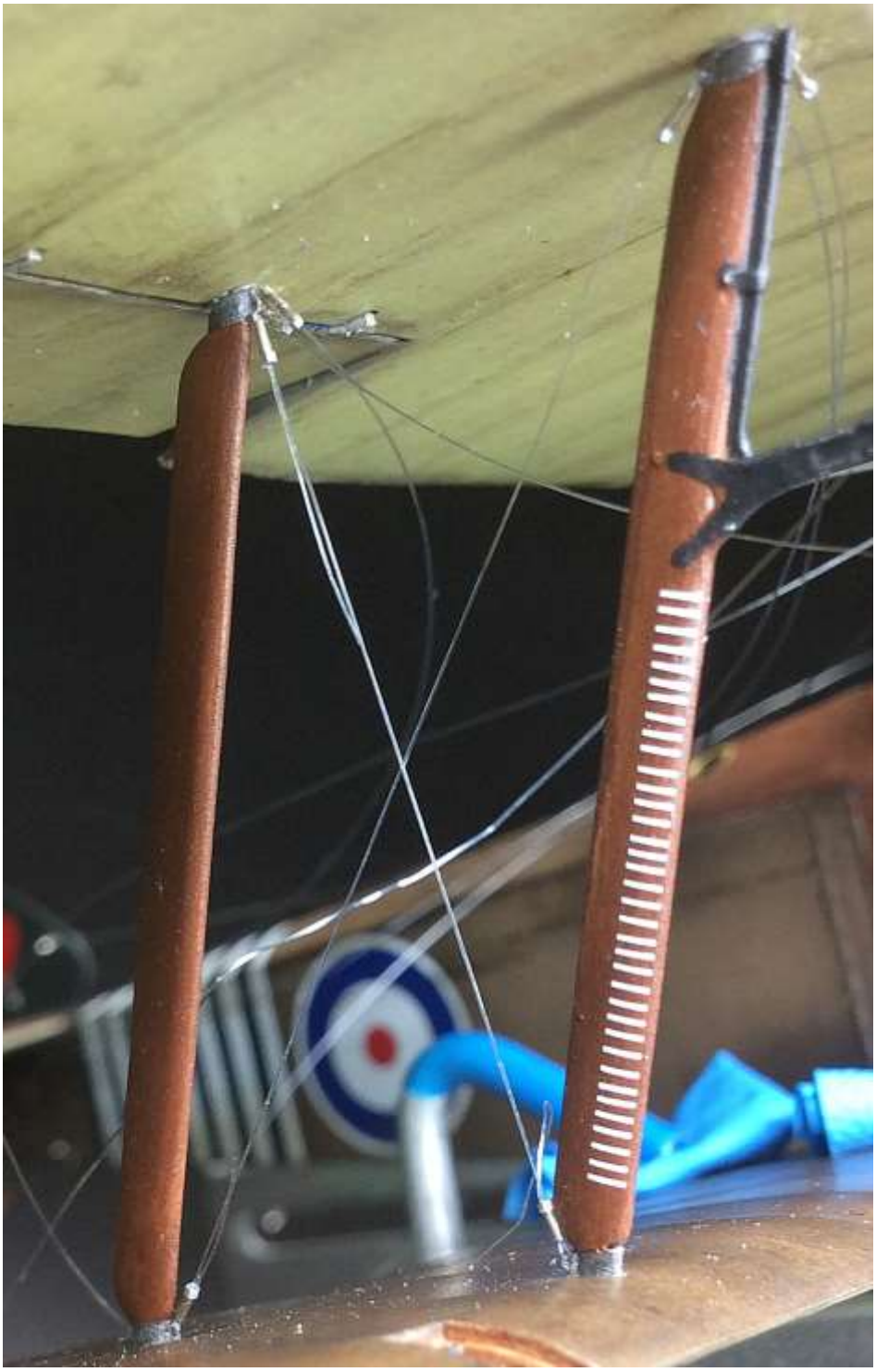
261. Cabane struts - cross bracing (refer to illustration on page 128):

1. At the corners of the cabane struts, hold the rigging line and the free end of the line from the end fittings.
2. Move the 0.4 mm diameter tube and nut up to the attachment hole.
3. Secure in position using thin CA adhesive.
4. Repeat at the remaining corner end fittings, keeping the line taut.
5. Carefully cut away any exposed line tags.
6. If the lines are too slack and once the adhesive has fully set, apply heat (refer step 264) to tighten the lines.
7. If necessary and for additional strength, add a small drop of PVA adhesive to the line location points.



262. Outer wing struts - cross bracing (refer to illustration on page 128):

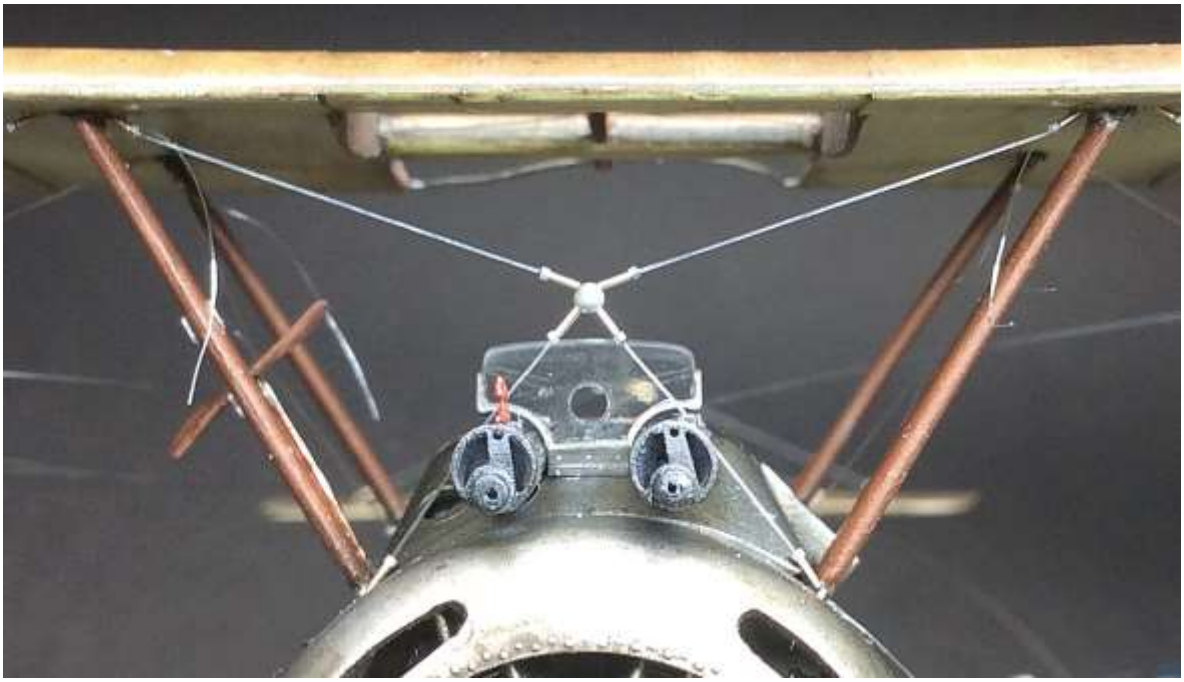
1. At the corners of the cabane struts, hold the rigging line and the free end of the line from the end fittings.
2. Move the 0.4 mm diameter tube and nut up to the attachment hole.
3. Secure in position using thin CA adhesive.
4. Repeat at the remaining corner end fittings, keeping the line taut.
5. Carefully cut away any exposed line tags.
6. If the lines are too slack and once the adhesive has fully set, apply heat (refer step 264) to tighten the lines.
7. If necessary and for additional strength, add a small drop of PVA adhesive to the line location points.



263. Upper wing to fuselage - cross bracing (refer to illustration on page 128): The under wing surface, inside of the two forward cabane struts, should already have been pre-rigged, including end fittings on each. Kit part A56 is the streamlined wood centre piece that braces the two lines. It has four indents that are the locations for the bracing lines.

1. Drill, using a 0.3 mm diameter drill, into part A52 from each indent until a 0.12 mm line can be passed diagonally through two of the holes.
2. Slide onto both lines a nut then a short 0.4 mm diameter tube.
3. Pass the two lines through the holes drilled through the streamlined wood centre piece, so that the free ends exit diagonally. Make sure the tail of part A52 will be facing the rear of the aircraft.
4. Holding the free ends of both lines, slide part A52 up towards the upper wing until it is approximately 7 mm from the wing. Make sure it remains central between the forward cabane struts.
5. Slide onto the free ends of both lines a short 0.4 mm diameter tube then a nut.
6. Pass each free line through its location at the bottom of the forward cabane struts.

   NOTE: As viewed from the front of the aircraft, you should have the line from the top left routed diagonally through part A52 to the bottom right and vise-versa for the other line.
7. Pull both free ends of the lines downwards, making sure part A52 is still approximately 7 mm from the upper wing and centrally between the cabane struts.
8. Slide the upper two tubes and nuts against part 52 and secure in position using thin CA adhesive.
9. Secure the lines at the bottom of the cabane struts, using thin CA adhesive.
10. Slide the lower two tubes and nuts up and against part 52 and secure in position using thin CA adhesive.
11. Carefully cut away any exposed line tags.
12. If the lines are too slack and once the adhesive has fully set, apply heat (refer step 264) to tighten the lines.



264. The cross bracing rigging between the cabane struts will not be easy to access once the wing rigging lines have been installed. If these cross bracing lines are slack and need to be tightened, now is the time to do it.

WARNING: *Great care must be taken when using a heat source. Apart from the obvious dangers:*

1. Applying heat too close to the rigging lines or leaving the heat source stationary at one location WILL cause the line to melt and break.

2. You must keep the heat source moving.

3. Care needs to be taken to avoid touching any part of the model or other rigging lines as damage will occur.

4. *Don't try to overtighten the lines as this may cause the lines to break or to pull out of their attachment locations.*

Normally, when mono-filament has been used for rigging, the installed lines can be slightly slack. These lines can be tightened by the moving a heat source along and close to each line. The heat will cause the mono-filament to shrink slightly and therefore tighten the line. For this use a small electrical soldering iron, moving the heated tip close to and along each line.

265. Twin flying wires (rear) (refer to illustration on page 128): Twin flying wires were fitted between the top of the rear outer wing struts and through the lower wing to the top of the rear undercarriage struts. The kit rigging point locations should have already been 'shallow' drilled (refer to page 41).

1. Offer up each of the two flying lines and carefully cut the free ends so that the lines, under slight tension, can be inserted into the drilled location point.
2. Add a drop of CA adhesive to the free end of the forward line and under slight tension, insert it into the drilled location point. Hold in position until the adhesive grips the line.
3. Repeat this procedure for the rear flying line.
4. Once both lines are held in the location point, add a small drop of CA adhesive to ensure both lines are securely attached.
5. Repeat this procedure for the rear flying lines on the opposite lower wing.
6. If the lines are too slack and once the adhesive has fully set, apply heat (refer step 253) to tighten the lines.

Underside end fittings:

The rear twin flying wires passed through the lower wing and were attached at the top of the undercarriage rear struts. To replicate these wire end fittings:

7. Cut four lengths of 0.12mm 'Steelon' mono-filament.
8. Cut four short 0.4 mm diameter micro-tube.
9. Slide a cut tube and nut onto a line.
10. Position the tube and nut against each other and secure both to the line using thin CA adhesive.
11. Cut the line flush with the end of the tube opposite to the nut.
12. Offer up the tube to the top of an undercarriage rear strut, with the nut end angled up to the rigging location on the underside of the lower wing.
13. Trim the exposed line so it can be inserted into the pre-drill rigging hole.

14. Secure the line and end fitting in position using thin CA adhesive.

15. Repeat this procedure for the remaining three end fittings.

266. Twin flying wires (front) (refer to illustration on page 128): Twin flying wires were fitted between the top of the front outer wing struts and to the top of the front undercarriage struts. The forward wire was also routed across the front undercarriage struts.

1. Slide a nut and cut 0.4 mm tube onto the rear flying line.

2. Pass the rear flying line through the pre-drilled hole at the top, rear of the front undercarriage strut.

3. Pull the line taut and apply thin CA adhesive to secure the line and end fittings in position.

4. Repeat this procedure for the rear flying line on the other wing.

5. Slide a nut then a cut 0.4 mm tube onto a front flying line.

6. Position the line between the front of the forward undercarriage strut and the rectangular ‘lug’.

7. Pull the line taut and slide the cut 0.4 mm tube and nut up to the strut.

8. Secure the line, tube and nut in position using thin CA adhesive.

9. Cut away the exposed free end of the line at the inside of the strut.

10. On the other front flying line, slide the following in the specified order:
Nut, two cut 0.4 mm tubes, two nuts, a single cut tube.

NOTE: *In the following step make sure that a nut and tube are positioned each side of the undercarriage struts.*

11. Position the line between the front of the forward undercarriage struts and the rectangular ‘lug’ (across the underside of the fuselage).

12. Pull the line taut and slide the cut 0.4 mm tube and nuts up to the struts.

13. Secure the line, tubes and nuts in position using thin CA adhesive.

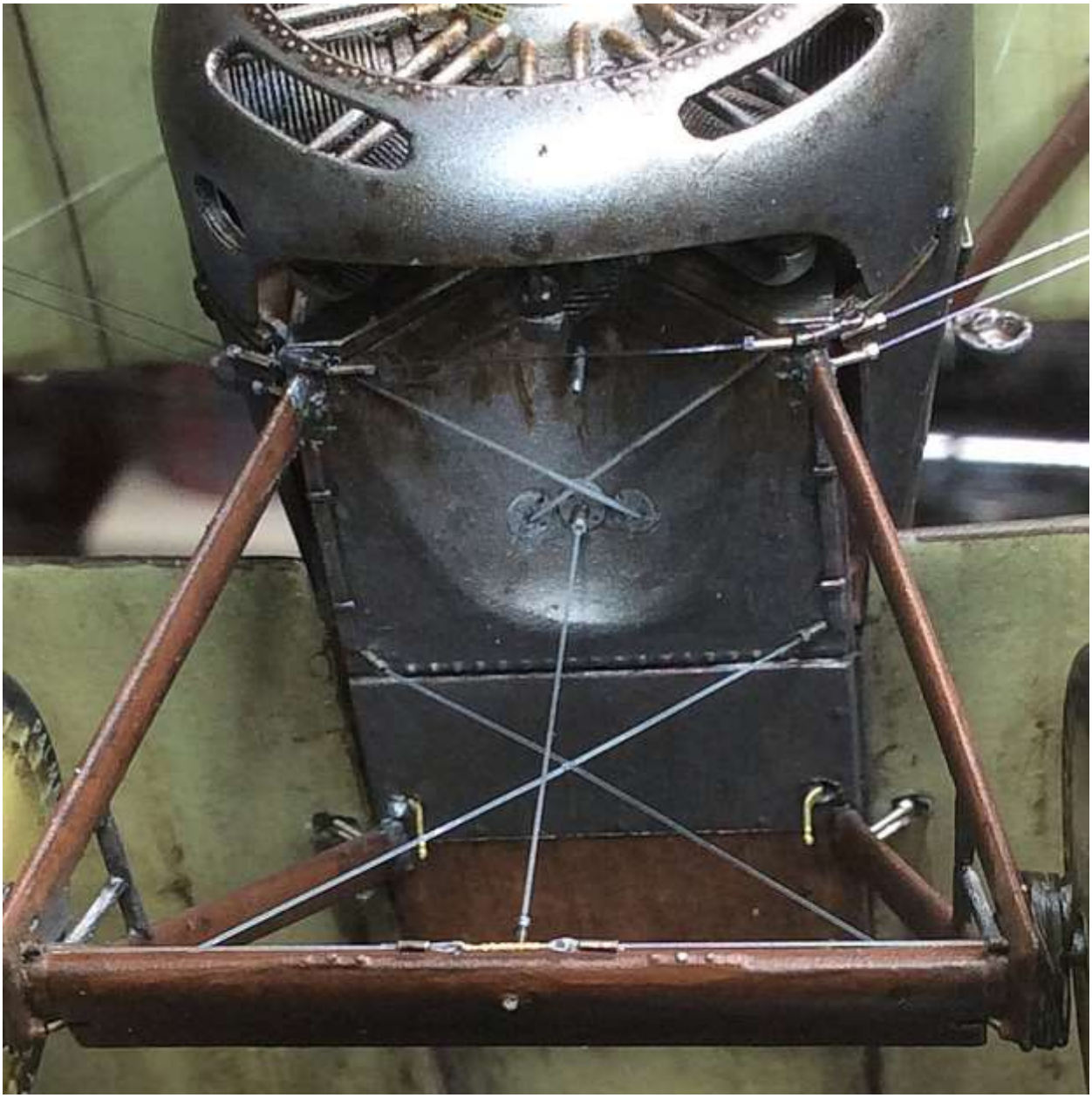
14. Cut away the exposed free end of the line.

15. If the lines are too slack and once the adhesive has fully set, apply heat (refer step 264) to tighten the lines.

267. Single landing wires (front and rear) (refer to illustration on page 128): Single landing wires were fitted between the top of the cabane struts and the bottom of the outer wing struts.

NOTE: *The location points on the lower wing should have already be pre-drilled.*

1. Offer up a landing wire to its pre-drilled location hole in the lower wing upper surface, adjacent to the relevant outboard wing strut.
2. Carefully cut the free end so that the line, under slight tension, can be inserted into the drilled location point.
3. Slide onto the line a nut then a cut 0.4 mm tube.
4. Position the tube at the end of the cut line and secure using thin CA adhesive.
5. Position the nut against the tube and secure using thin CA adhesive.
6. Apply thin CA adhesive to the end of the tube and insert it into the location hole, keeping the line taut.
7. Repeat this procedure for the three remaining landing wires.
8. If the lines are too slack and once the adhesive has fully set, apply heat (refer step 264) to tighten the lines.



268. Rudder:

The twin rudder control lines should already have been pre-rigged and the rudder fitted.

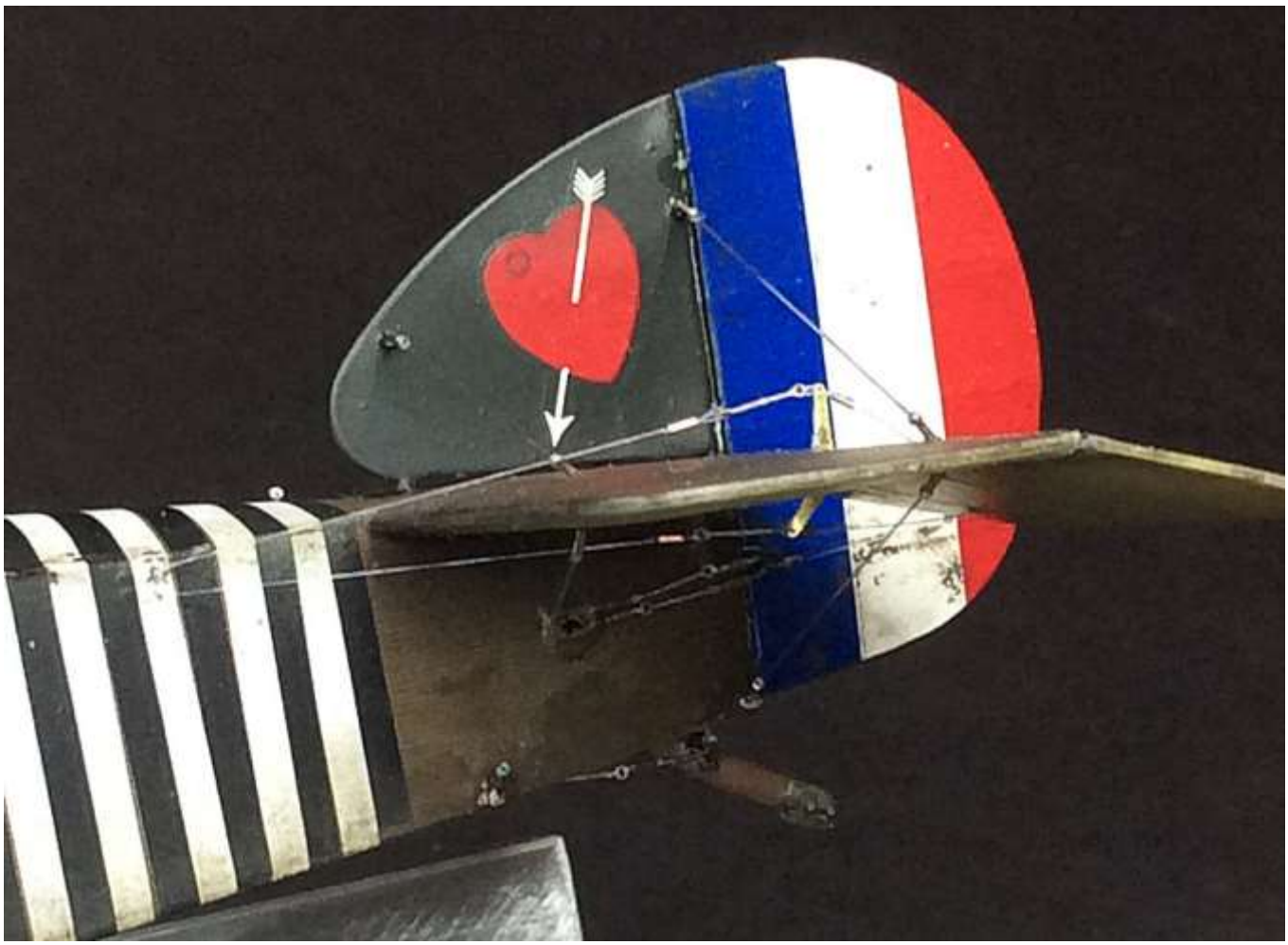
1. Cement the rudder onto the rear of the fuselage. Make sure the pre-rigged control lines are positioned to each side of the fuselage.
2. Insert the free end of a line into the relevant oval aperture at the rear of the fuselage.
3. Pulling the line taut, secure it into the aperture using CA adhesive.
4. Repeat this procedure for the remaining three control lines.

269. Elevator halves:

The elevator was previously separated from the tail plane and cut at the centre to create two halves. This was done to allow the position of the installed elevator to be altered and for convenience when handling during pre-rigging.

1. Cement the elevator halves to the tail plane. Make sure the pre-rigged control lines are not trapped in the joints.

2. Pass each of the four control lines under the tail plane bracing lines and making sure the turn buckles are aligned, cut the free end of the line leaving 10 mm for inserting into the relevant pre-drilled hole in the top of the fuselage sides.
3. Insert each line into its location hole and pulling the line taut, secure in position using CA adhesive.



270. Paint the centre area of all turnbuckles with ‘Mr. Colour’ Brass (219).

NOTE: *Two underwing tie-down rings were fitted to some Sopwith ‘Camels’ and were located near the wings forward struts, on the underside of the lower wing. From the photographs of B6313 it’s difficult to see whether the rings were fitted or not. However the Wingnut Wings instructions show these fitted on the earlier colour scheme for B6313, so these were fitted.*

271. Cement the two tie down rings (B3) into their location slots on the underside of the lower wing.

272. Secure the four photo-etch replacement attachment brackets for the bomb rack into the kit location holes in the underside of the fuselage. Make sure the brackets have the bend facing inwards from the location holes (refer to photograph on page 53).

273. Carry out any final ‘touch ups’ needed, such as weathering, stains etc.

274. Mask the windscreen using ‘Humbrol’ Maskol’, to prevent overspray.

275. Apply a light sealing coat over all of the rigging and any final weathering etc applied. Use either ‘Alclad’ Light Sheen (ALC-311) lacquer or ‘Tamiya’ Semi-Gloss (X35) with added ‘Mr. Colour’ levelling thinners.

276. Remove the ‘Humbrol’ Maskol’ from the windscreen, using a wood tooth pick or similar.

Propeller:

NOTE: *If the propeller needs to be set in a certain position, such as when figures are to be used, then it may be best to leave fitting of the propeller until the figures are finally in position.*

277. Cement the propeller to the engine shaft.

Wheels:

278. **NOTE:** *The aircraft’s wheels were secured to the axle, which was fixed at the centre of the axle fairing. Either end of the axle was restrained by suspension ‘bungee’ cord, which was wrapped over the axle and around the axle end fittings. When airborne, the weight of the aircraft was not acting down onto the wheels and therefore the axle was straight and the wheels vertical to the aircraft. However, when on the ground, the weight of the aircraft acting down onto the wheels caused the ends of the axle to deflect upwards against the restraining ‘bungee’ cord, deflecting the tops of the wheels towards the aircraft. This should be born in mind when fitting the wheels to the axle.*

    1. Dry fit the wheels onto the axle.
    2. Place the model onto a flat surface and note the angle the wheels make to the aircraft.
    3. Into the tyre of each wheel, drill a 0.8 mm diameter hole deep enough to be able to insert a metal pin. *Make sure the hole is drilled such that when a pin is fitted and the wheel installed onto the axle, the pin is vertical to the model (not inline with the wheel).*
    4. Cut two straight lengths of metal rod from a standard office paper clip. The length of these rods should be enough to be fully inserted into the wheel holes with enough rod protruding for inserting into the holes in the chosen model base.
    5. Secure the rods into the wheel holes using thin CA adhesive. Make sure the rods are vertical when viewed from the front and sides of the model.

279. Aileron pulley inspection windows:

NOTE: *The aileron inspection windows supplied in the kit are molded to fit the apertures, but without any paint etc having been applied. Once primer and paint have been applied to the apertures, the windows may not fit flush to the surface of the wings. Therefore, when dry fitting the windows, some thinning of the underside edges may be required.*

1. Dry fit the inspection windows for the aileron pulleys (C3 x4 and C2) and sand the edges to ensure a good fit.

2. Mask the inspection windows for the aileron pulleys using 'Humbrol' Maskol' or cut masking tape.

3. Brush paint the inspection window surrounds with a dark brown - mix 'Tamiya' Deck Brown (XF79) and Rubber Black (XF85) with a small amount of Semi-Gloss Clear (X35).

4. Remove the 'Humbrol' Maskol' from the inspection windows, using a wood tooth pick or similar.

5. Secure the inspection windows into their locations on the upper and lower wings, using small drops of PVA adhesive or cement in each corner.

PART 12 - FIGURES AND ACCESSORIES

The two figures I chose to use for this model were the 'Blackdog Models' RFC Fighter Pilot 1914 -18 No.1 (F32014) and the 'Copper State Models' RFC Mechanic (F32-0026). These figures are very detailed as they are cast in resin.

NOTE 1: *Take care when handling resin parts as resin is brittle and small or thin parts can easily be broken*.
NOTE 2: *Be careful when working with resin as resin dust or particles are harmful if they are inhaled or ingested.*
NOTE 3: *The casting of many resin items can leave small 'blow' holes and other types of imperfections. The 'Blackdog Models' pilot figure in particular is not cast that well with gaps behind the knees on both legs. Also the joints of the arms to the body are roughly cast. Additionally there are obvious casting seams that need to be removed. I have three of this particular figure and all three have the same problem areas.*

Preparation:

1. Before assembly, cut away the resin casting blocks and remove imperfections and seam lines by scraping with a sharp scalpel blade. *I smoothed out the creases in the pilot figure legs as the molding was too sharp*.

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

   NOTE: *To aid in alignment and to strengthen joints, pins are added where necessary.*

3. Drill a hole of 0.8mm diameter into the centre of the neck and body of each of the figures and if necessary, also into the arms and bodies.

4. Cut lengths, as required, of 0.8mm rod from an standard office paper clip.

   NOTE: Resin parts need to be assembled using CA adhesive, as normal plastic model cement will not bond the parts together

5. Secure the figures arms and heads onto the bodies using CA adhesive.

6. Carefully drill a hole of 0.8mm diameter up into one leg of each figure.

7. Cut a two lengths of 0.8mm diameter rod from a standard office paper clip.

8. Insert the cut rods into the holes drilled in the figure legs and secure in place using thin CA adhesive. These rods will serve to hold the figure in a pin vice whilst being painted and also to secure the figures to the finished display base.

9. Fill any 'blow' holes, gaps or imperfections using a modelling putty, such as 'Deluxe Materials' Perfect Plastic Putty.

NOTE: *Once I had assembled the pilot figure I decided that both hands did not seem correct. The left hand, which is inside the flap of the left pocket, has the thumb exposed, which did not look natural. The right hand seemed too straight and too large.*

10. The thumb of the left hand was cut away. The right hand was cut away and the cuff of the arm drilled out to accept a replacement hand from 'Hornet Models'.

11. The replacement right hand was secured in position using CA adhesive.

12. Prime the two assembled figures by airbrushing with 'AK Interactive' Primer and micro-filler (Grey - AK758).

The photo below shows the pilot figure with the original right hand.

William Barker:

Reference:

'Osprey' Publishing - Men-at-Arms - British Air Forces 1918-18 (2) - Andrew and Peter Cormack.

Despite the Royal Flying Corps (RFC) and the Royal Naval Air Service (RNAS) amalgamating on the 1st of April 1918 into the Royal Air Force (RAF), many service personnel still wore their previous uniforms or insignia, due to a lack of RAF uniforms. As such William Barker was still wearing his uniform with appropriate rank insignia of 'Major', a rank not adopted for the RAF.

Based on the photograph the basic uniform would have been green/brown Khaki with fawn coloured leather insets on the trousers. Rank insignia on the sleeves, badges and buttons were in gold/brass. Belts and straps were leather and shoes brown leather. The boots on the figure used are dark leather coloured.

Painting:

NOTE:
The figure was previously primed with 'AK' Interactive' primer and micro-filler (Grey - AK758).

1. Brush paint the flying boots with a mix of 'Tamiya' Hull Red (XF9) and Flat Brown (XF10) with a few drops of Rubber Black (XF85).
2. Brush paint the cap, jacket and using a mix of 'Tamiya' Olive Drab (XF62) and 'AK Interactive' British Uniform (AK3081) as a base coat the add WW1 British Uniform Shadow (AK3083) to highlight the shadows/creases.
3. Brush paint the belt and cross strap using a mix of 'Tamiya' Hull Red (XF9) and 'Humbrol' Leather (62).

4. Brush paint the cap peak and chin strap using ‘Tamiya’ Semi-Gloss Black (X18).
5. Brush paint the belt buckles, buttons and cap badge using ‘Mr. Colour’ Brass (219).
6. Brush paint the shirt with a mix of ‘Tamiya’ Olive Drab (XF62) and ‘AK Interactive’ British Uniform (AK3081) and lightened with ’Tamiya’ Cockpit Green (XF71).
7. Brush paint the tie using and inside leg ‘chaps’ using ’Tamiya’ Dark Yellow (XF60).
8. If desired, using appropriate colours, brush paint the medal ribbons and RAF insignia above the right breast pocket. (MC, DSO and French Croix de guerre) (check online for the ribbon colours).
9. Brush paint the flesh using blends of ‘AK Interactive’ Light Flesh (AK3012), Highlight Flesh (AK3013) and Shadow Flesh (AK3014).
10. Brush paint the eye whites with ‘Tamiya’ White (X2) and the pupils with Rubber Black (XF85).
11. Brush paint the hair, eye brows and moustache as desired - I used ’Tamiya’ Flat Earth (XF52).
12. Brush paint the walking stick using ’Tamiya’ Hull Red (XF9), for the handle Dark Yellow (XF60) and for the tip ‘Mr. Colour’ Brass (219).
13. The figure was then brushed with ‘Tamiya’ Clear Flat (XF86).
14. The boots, belt, cross strap and walking stick were brushed with a mix of ‘Tamiya’ Semi-Gloss (X35) and Clear Flat (XF86).
15. Weathering of the boots was done using ‘Tamiya’ Weather Master Set B (Rust).

Mechanic:

Reference:

'Osprey' Publishing - Men-at-Arms - British Air Forces 1918-18 (2) - Andrew and Peter Cormack. The basic uniform would have been green/brown Khaki. Rank insignia on the sleeves/ badges were either red or brass. Buttons were brass. Shoes were brown leather. The leg puttees and belt were Khaki coloured.

NOTE:

The figure was previously primed with 'AK' Interactive' primer and micro-filler (Grey - AK758).

1. Brush paint the forage cap, jacket, trousers and leg putties using 'AK Interactive' British Uniform (AK3081) as a base coat with WW1 British Uniform Shadow (AK3083) to highlight the shadows and creases.
2. Brush paint the shoes with a mix of 'Tamiya' Hull Red (XF9) and Flat Brown (XF10).
3. Brush paint the buttons and forage cap badge using 'Mr. Colour' Brass (219).
4. Brush paint the flesh using blends of 'AK Interactive' Light Flesh (AK3012), Highlight Flesh (AK3013) and Shadow Flesh (AK3014).
5. Brush paint the eye whites with 'Tamiya' White (X2) and the pupils with Rubber Black (XF85).
6. Brush paint the hair, eye brows and moustache as desired - I used 'Tamiya' Rubber Black (XF85).
7. The figure was then brushed with 'Tamiya' Clear Flat (XF86).
8. The shoes were brushed with a mix of 'Tamiya' Semi-Gloss (X35) and Clear Flat (XF86).
9. Weathering of the shoes and coat was done using 'Tamiya' Weather Master Set B (Rust) and Set D (Oil Stain).

Accessories:
The intention of adding hand tools for the mechanic figure is to pose the figure as though he was completing the modification of the engine cowl (additional cooling slots).

The tool box, hand brace, file and mallet are from the resin 'Copper State Model' Tools and Cans set (AE32-005). Spanners, screw driver and pliers were from the 'Aber' 1:35th scale photo-etch Hand Tools (35-A68). The step ladder was from the 'Kellerkind' Ladder and Trestle set (54-061).

Tool box:
The resin tool box had a separate carrying handle, which seemed to be slightly over scale. This was replaced by a length of 1 mm diameter brass rod, located through holes drilled through the top ends of the tool box. After priming with 'AK Interactive' primer and micro-filler (AK758), a base coat of 'Tamiya' Wooden Deck Tan (XF78) was brush painted. Once dry the desired wood finish was applied (refer to Part 2 of this build log). Chipping at the edges was applied by dry brushing with 'Tamiya' Wooden Deck Tan (XF78).

Hand brace:
The resin hand brace had a pre-molded drill bit, which was over scale. This was cut away and a hole of 0.4 mm diameter was drilled into the chuck of the hand brace. An actual drill bit of 0.4 mm diameter was inserted into the hole and secured using CA adhesive. After being primed with 'AK Interactive' primer and micro-filler (AK758), a base coat of 'Tamiya' Wooden Deck Tan (XF78) was brush painted onto the central handle and end handles. Once dry the desired wood finish was applied (refer to Part 2 of this build log). The metal frame and drill chuck were brush painted with 'Mr. Colour' Stainless Steel (213).

File and screw driver:
The handle of the photo-etch file had extra 'handles' added from the photo-etch sheet, using thin CA adhesive. After priming with 'AK Interactive' primer and micro-filler (AK758) the file blade was brush painted with 'Mr. Colour' Stainless Steel (213). The handle was brush painted with 'Tamiya' Hull Red (XF9).

Mallet:
After being primed with 'AK Interactive' primer and micro-filler (AK758), a base coat of 'Tamiya' Wooden Deck Tan (XF78) was brush painted onto the handle. Once dry the desired wood finish was applied (refer to Part 2 of this build log). The metal head was brush painted with 'Mr. Colour' Stainless Steel (213).

Spanners and pliers:
The photo-etch spanners were with 'Mr. Colour' Stainless Steel (213).

Step ladder:
The step ladder is made from laser cut wood and was assembled using thin CA adhesive. After priming with 'AK Interactive' primer and micro-filler (AK758), a base coat of 'Tamiya' Wooden Deck Tan (XF78) was brush painted. Once dry the desired wood finish was applied (refer to Part 2 of this build log). Chipping at the edges was applied by dry brushing with 'Tamiya' Wooden Deck Tan (XF78).

The grass mat is thick in places so the four areas where the legs of the step ladder and the tool box were to be positioned needed to be cut away in the mat. This allowed the ladder and tool box to be fixed in position using CA adhesive. Once dry, the four leg locations of the step ladder were reinforced with PVA adhesive.

The mechanic figure was secured in position on the ladder using CA adhesive.
The tools used were secured in position using thin CA adhesive.

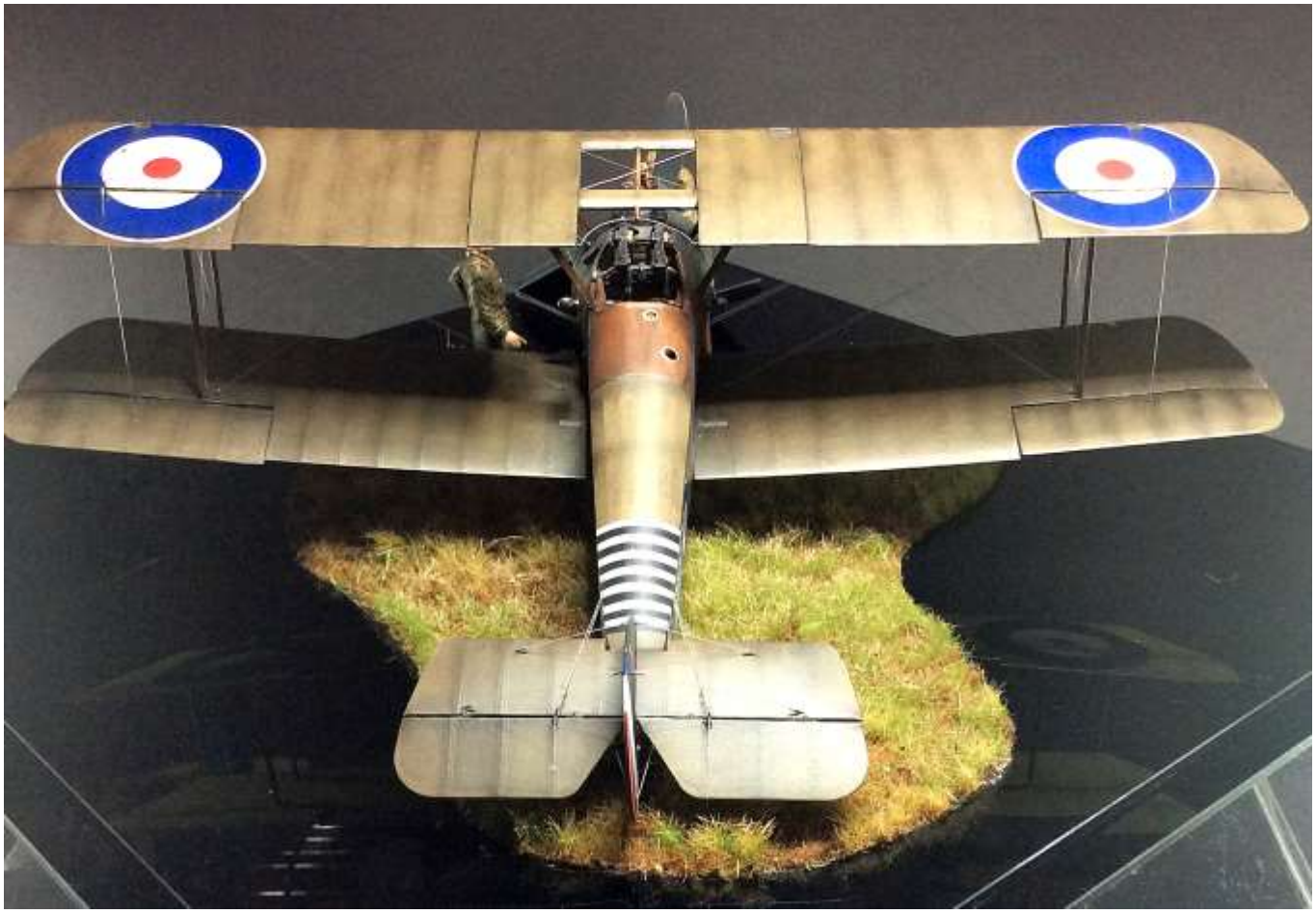
PART 13 - DISPLAY BASE

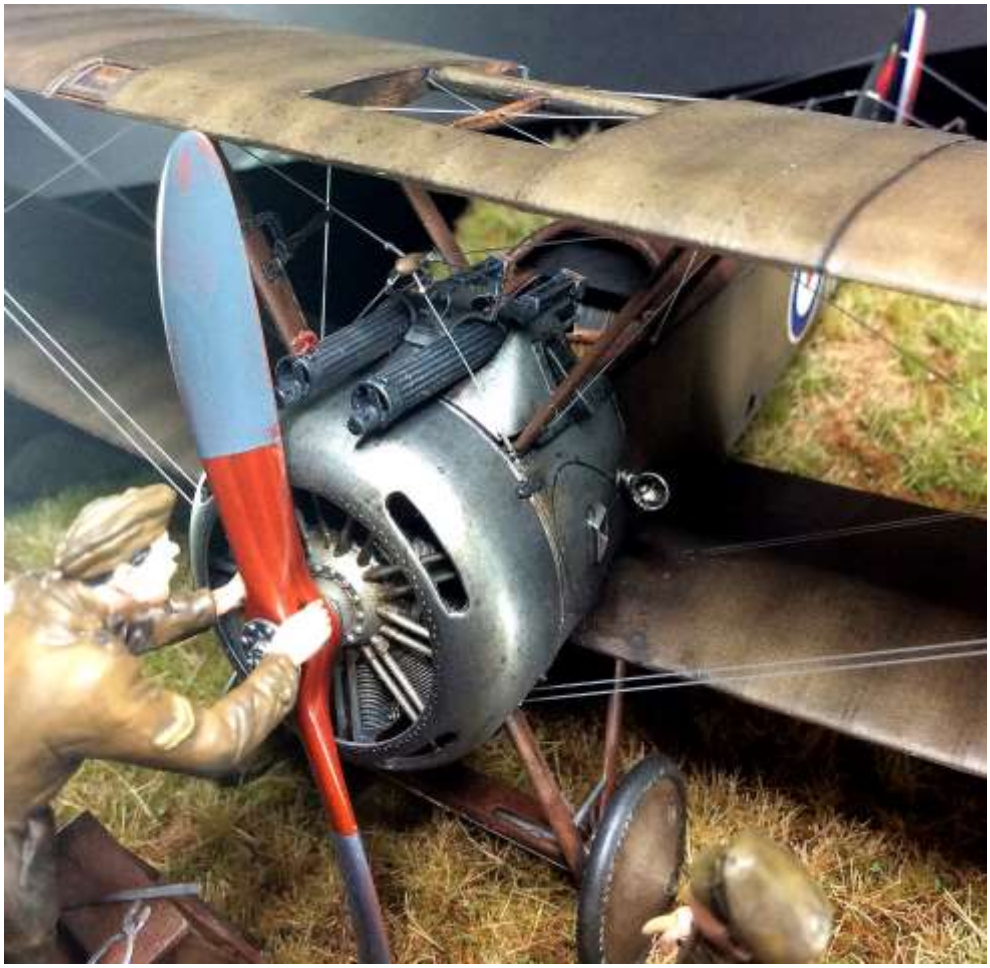
The display case is made from sheets of 3 mm thick piano black Acrylic sheet, cut and cemented together to form a 'shouldered step' for seating the transparent top, which is fabricated from 3 mm thick clear Acrylic sheet. This was made to measure for this model by an on-line manufacturer, who also made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

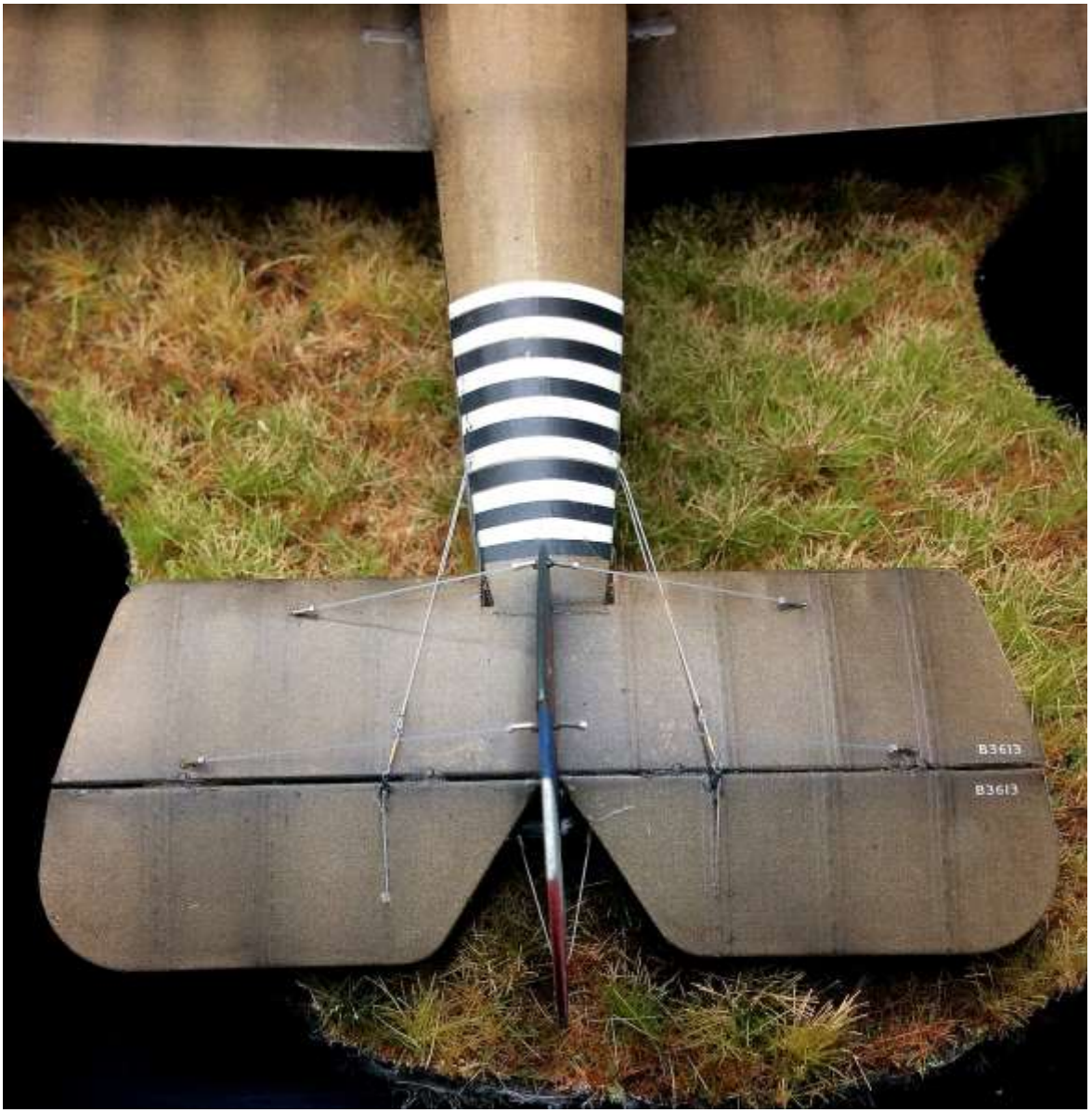
The 'Polak' Wild Meadow (4706) grass mat was cut to the desired shape. The clear plastic backing was removed from the grass mat, which was then positioned on the base. The mat was laid onto the display base and positioned to ensure the model would clear the display top when located. A soft pencil was 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' and several heavy books were then stacked onto the cling film, to press the grass mat fully in contact with the display base. The books and cling film 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 and highlighted by dry brushing with 'Tamiya' Wooden Deck Tan (XF78).

The aircraft and figures were positioned on the base in their final positions and the location of the pins in the legs of the figures and the wheels of the aircraft were marked on the grass mat. Holes of 1.0 mm were drilled through the grass mat and into (not through) the base. PVA adhesive was then applied to the two wheel pins and the model was carefully seated into the two previously drilled holes. Light pressure was applied to the wheels and rear fuselage to ensure the model 'sat' naturally on the grass mat. The same was applied to the two figures. Any accessories, such as crates, oil drums, tool boxes etc were either added directly onto the grass mat, using PVA adhesive or if necessary, were drilled and pinned and fitted as for the aircraft and figures.

PART 14 - COMPLETED MODEL PHOTOGRAPHS



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