

Issue No. 66

AUSTRALIAN MODEL NEWS



OCTOBER 2020

From the Editor

The Covid-19 virus has had a major effect on our model aircraft flying activities and just as we seemed to be getting over this problem another has been raised concerning the supply of balsawood.

It seems that balsawood is used as a filler material in the construction of windfarm turbine blades, similar to the construction method used on the DH Mosquito in WWII. Driven by the Chinese manufacturers of wind turbine blades the demand for balsawood has increased and the price has risen sharply putting supply of our major aeromodelling material at risk and the cost of model building significantly higher.

Hopefully design development and future availability of cheaper materials will reverse this situation before aeromodelling becomes too expensive to continue.

Thanks again to those who contributed to the content of the newsletter. Please keep sending your articles and photos.

John Lamont

This newsletter is published bi-monthly to feature model aircraft building and flying and to report on aeromodelling events in Australia and New Zealand.

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On the Cover.

Peter Hewson's 1/6th scale model of the "Southern Cross" on its maiden flight in New Zealand.

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USS MIDWAY

A Different Museum

by
Alistair Heathcote

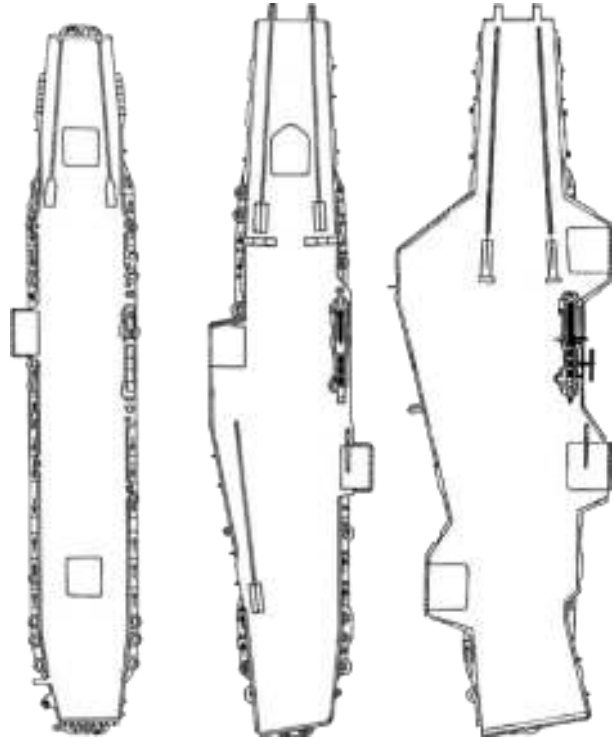
In 2008 I organised to stay in San Diego for a week and catch up with some friends. Amongst the many tourist attractions is the aircraft carrier USS MIDWAY which has on-board many aircraft used by the US Navy post WWII. You also get to see the ship itself which is somewhat impressive – guided tours also available.

The carrier was commissioned a week after the end of WWII and was until 1955 the largest ship in the world! It was also the first US aircraft carrier that was too big to transit the Panama Canal. Regularly up dated, MIDWAY ended up with a British style angled flight deck and steam catapults.

Over her 47 years of operation she saw action in the Vietnam War and Operation Desert Storm in 1991. It was opened to the public as a museum in June 2004. The number 41, above the Museum entry door denotes this is the 41st Aircraft Carrier operated by the Navy (They are up to 75 now).



USS MIDWAY as a Naval Museum in San Diego.



Deck plans for USS MIDWAY — 1945, 1957 and 1970. Commissioned in 1945, a week after the end of WWII, progressive development continued over the ship's 47 years of service.



USS MIDWAY was the 41st aircraft carrier operated by the United States Navy.



In its time it was a very technologically advanced aircraft. – no ailerons, roll control with wing spoilers; first with “fly by wire” controls; blown leading edge and trailing edge flaps; nuclear ordnance delivered through a tube between the engines at supersonic speeds! Unfortunately it turned out to be a maintenance nightmare and in 1963 was transferred to a reconnaissance role when the USA policy became submarine launched nuclear weapons. In its day it was the largest and most complex aircraft operated by the US Navy from the deck of a carrier.



On board the USS MIDWAY.



The North American Vigilante.

There are too many aircraft to mention them all but here are some of my favourites:

North American Vigilante. I remember first seeing this aircraft in *The Observer's Book of Aircraft* (which I used to have as a Christmas present in the 1950's!) and thinking how beautiful and sleek its shape was.

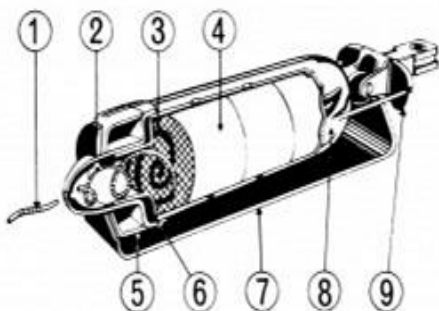
Grumman Panther. I probably saw this in the Observers Book too but do not recollect that. However I know my first interest was building a Jetex powered kit in the 1950's. For those who do not know, Jetex was a small rocket powered motor ignited by a fuse and giving about 30 sec thrust duration. They have not been made for over 40 years and are hard to find on eBay etc. The fuel also contains asbestos and other nasty stuff so is hard to locate. Anyway, I made a Veron Quicky profile model of the Panther and I note the same kit design can still be purchased – made to order for 25GB- as shown in the pic. Keil Kraft also made a 15 inch stick and tissue kit.



The Jetex powered Grumman Panther by Veron.

how jetex motors work

Solid Fuel Charge (4) is ignited by the Plastic Igniter Wick (2), the coiled end of which is held against the face of the charge by a Gauze Disc (3). The gas is compressed in the main case (8) and forces its way out through the jet at supersonic speed, producing thrust. The end cap (5) is held by spring (9), and acts as a safety valve. If the jet were to clog, the gas escapes via the end cap.



- | | |
|---------------------------|-------------------------------------|
| 1. External igniter wick. | 6. Sealing washer and flame shield. |
| 2. Internal igniter wick. | 7. Mounting clip. |
| 3. Wire gauze disc. | 8. Main Case. |
| 4. Fuel pellets. | 9. Safety clip spring. |
| 5. End Cap. | |

The Grumman Panther was a carrier borne aircraft and first flew in 1947 with a Rolls Royce Nene gas turbine as no American engine had enough thrust at that time. Nearly 1400 were built and it performed well during the Korean War until the Russian MIG 15's came along! It was superseded by a swept wing version - Grumman Cougar (which was/is also available as a Jetex model).



The Grumman Panther.

Northrop Grumman E-2 Hawkeye. My interest in this aircraft is associated with work! In about 1998, when I was in marketing, we pursued a contract to manufacture the rotating radome on top of the fuselage. This is largely made of fibreglass and the Grumman contractor in San Francisco approached Hawker De Havilland for a contract submission. In the end we did not get a contract mainly because of the logistics in transportation. I did however get a number of nice visits to San Francisco and San Jose!

Later we pursued a contract to re-manufacture the interior equipment consoles as part of an extensive refit. This got me to the Grumman factory in Long Island and the US Navy test facility in Patuxent River – near Washington DC (many museum visit opportunities!). We didn't get a contract there either – the Navy got cold feet about foreigners crawling over their aeroplanes.

The Hawkeye replaced the Grumman Tracker which in the US had been developed into an early warning aircraft. The aircraft was large and required to operate from small aircraft carriers and that produced a lot of development problems. First flight was in 1960 and development was still taking place in 1965 when it entered service. Main problem was electronics kit packed in so tightly that overheating continually caused failure. Note that valves, which generate a lot of heat, were extensively in use then. It was not until about 1971 when the E-2C was introduced with digital equipment and semiconductor electronics that the aircraft reached its full potential. Northrop Grumman is still building versions of the aircraft and continues to modify older models. It is also in operation with eight other countries.



The Northrop Grumman Hawkeye

A very interesting museum and different to see the aircraft in their "work environment". Hope you find this interesting.

SCHNEIDER TROPHY RAMBLINGS

by
Alistair Heathcote

Recently, I was reading an article in an "Aeroplane" magazine about Reginald Mitchell – the chief designer of the Spitfire – and it mentioned his large contribution to Britain winning the Schneider Trophy outright. This brought back memories of the racers I had seen in museums and the actual Trophy in The Science Museum in London. I also had photos and other info on the races. So I thought you might be interested in some selected aspects of the races.

The Trophy (not Cup or Prize – they were different) with a full title of Coupe d'Aviation Maritime Schneider was initiated in 1912 by Jacques Schneider, a French financier with interests in ballooning and aviation, to promote the development of seaplanes. The race was held twelve times between 1913 and 1931. To qualify for the time trials each aircraft had to demonstrate it was seaworthy by taking off and landing three times. The time trials were for pure speed, initially over about 280km and later extended to 350km.

Race technology advances can be traced in the Supermarine Spitfire, the North American Mustang and the Macchi C.202 Folgore.

First race on April 16th 1913, in Monaco was over six laps. It was won by Maurice Prevost (from France, as were all the competitors) at an average speed of 73 km/hr in a Deperdussin Monocoque which was designed purely for racing.

His speed would have been faster but he lost 50 minutes when he landed prematurely after losing count of the laps!!



The Schneider Trophy on display at the Science Museum in London.



Maurice Prevost's Deperdussin Monocoque won the first race in 1913.

In 1914 Howard Pixton, from Britain, won flying a Sopwith Tabloid at 139 km/hr. France, Britain and Switzerland competed with Germany and USA failing to qualify. Again, the aircraft was built for racing!

Hard to imagine racing in aircraft like these but, with the competition suspended during WWI things would change. (Incidentally, the Tabloid was effectively the fore runner of the series of very effective Sopwith fighters developed during the war)



Howard Pixton of Great Britain won in 1914 with a Sopwith Tabloid.

For the 1922 race in Italy, Supermarine modified a fighter (Sea King II) with a bigger engine and other changes to produce the Sea Lion II. It won with Henri Baird as pilot, at 234km/hr.



Benito Mussolini instructed the Italian aircraft industry to "win the Schneider Trophy at all costs" and so demonstrate the effectiveness of his Fascist government. In 1926 an Italian Macchi M.39 beat the Americans at 396 km/hr. The aircraft was very streamlined and used a Fiat AS2 engine. The Americans then withdrew from all further racing claiming there was no money available.



The 1923 race was held in Cowes, England but a modified aircraft, called the Sea Lion III was only third. Curtiss C-3 from the USA took first and second with Lt David Rittenhouse piloting the winner at 285 km/hr.



In the meantime the British RAF formed the "High Speed Flight" to develop Supermarine, Gloster and Shorts racing aircraft. So in 1927 at Venice, Italy, watched by 250,000 spectators the Supermarine S5 (designed by Reginald Mitchell of Spitfire fame) took first and second places. These had Napier Lion engines.



In 1924 the competition was cancelled as no other nation turned out to face the Americans, the Italians and the French withdrew and both British aircraft crashed in pre-race trials.



In 1925 in Chesapeake Bay (USA) Jimmy Doolittle of the USA won again in a Curtis Racer R3C-2, at 374 km/hr using financial support from the US Government. Speeds were now going up fast as the races took on National importance – i.e. pride!



The next race was at Calshot, near Southampton, in southern England. Supermarine won again with the S.6 and a newly developed Rolls Royce R engine that was eventually evolved into the famous Merlin. Winning speed was 529 km/hr.

Now that Britain had won two races it only had to win the next to keep the Trophy! However, for the next race in 1931, the British government withdrew its financial support. A private donation from a wealthy and patriotic Lucy, Lady Houston, saved the day and as the Italian, French and German entrants were not ready in time, the final race, on 13th September, 1931 had British entrants only!

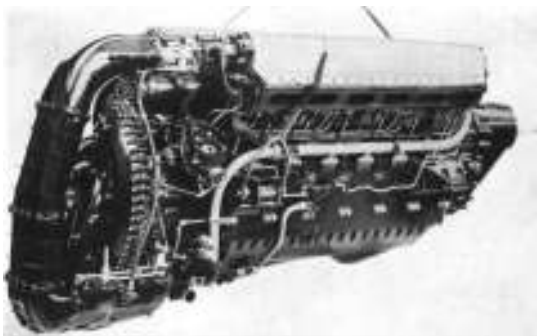
An estimated half million spectators saw a Supermarine S.6B win at a speed of 610 km/hr. The following day, the same aircraft broke the world air speed record at 655 km/hr (the first time 400m.p.h. had been exceeded by an aeroplane)



Later, the Macchi M.C. 72 which had pulled out of the Schneider race with engine trouble was further developed and reached a World Record speed of 709 km/hr which remains an undefeated record for piston engine seaplanes!



Having reached a fervent, nationalistic importance the organisers and companies involved exploited every opportunity to advertise their wares. In those days before computers, painted posters were a common form of advertising a few of which I have shown here.



The Rolls Royce R engine that eventually evolved into the famous Merlin of WWII fame.

Haydn Trudgeon's NIEUPORT 27 and PIETENPOL AIR CAMPER

This was my first lockdown Covid-19 project, a Gary Sunderland Nieuport 27 to 1/4 scale. Guns, wheels, pilot and other details are 3D printed.

The engine is a Honda clone 36cc four-stroke with a wet sump so it runs on straight petrol. It is very smooth running and well suited to this type of slow flying aircraft.

I also built a 1/3 scale Pietenpol Aircamper for an Aldi four-stroke engine from a brushcutter. This 32cc motor cost \$45 on special.

Haydn Trudgeon



Haydn's 1/4 scale Nieuport 27 is scratch built from plans by the late Gary Sunderland and powered by a copy of a Honda 36cc four stroke engine.



The 1/3 scale Pietenpol Air Camper is powered by a modified 32cc brush cutter engine.

Tim Dehaan's

HAWKER HUNTER

I have a few projects on the go and finished a couple but they were for my two year old grandson — a workbench and chalk board stand, so not really aircraft related.

The only project that I have finished (but not yet flown) is a Tony Nijhuis mini Hawker Hunter from his plan in a RCME magazine. Tony Nijhuis has got several different mini EDF jets on his website and a few have been published in RCME.

I built it in between other projects as it required only a few pieces of balsa, some 6mm balsa for the wings, 50mm 12blade EDF using a 3s 2200mAh Lipo, 40amp esc and 3 x 6gram micro servo's. The EDF and servos I purchased through Aliexpress <https://www.aliexpress.com> and I had a spare esc.

Wingspan is 635mm (25") and target weight is 625grams including the battery, mine came in at 640grams so I'm happy with that. It took me a week to build and the only thing that took me a little time to work out was the canopy, for which I made a mould and used a plastic drink bottle (PET) heated and stretched over the mould. It turned out OK. The EDF should draw around 380 — 400 watts and produce about 600 grams of thrust but the proof will be in the flying.

The model is covered with Oracover and painted with acrylic paint.

Tim Dehaan



The Hunter has a planked fuselage with sheet balsa flying surfaces.



The completed model, requiring only the canopy to be fitted.



Radio, servos and fan are accessible through a top hatch.



The finished model ready for the test flights.

Tim Dehaan's

FOKKER D.VIII



Another project is a Balsa USA Fokker D.VIII which is mostly done and waiting for some lozenge stencils that Greg Lepp and I have been working on with the assistance of some information supplied by David Anderson.

The 1/4 scale model has a wingspan 2.13m and is powered by an OS GT22 two-stroke petrol engine.

Tim Dehaan



Streaky wing camouflage and marking as applied to the full size aircraft.



Machine guns were made on Tim's upgraded 3D printer using free software sourced from the web which allows any scale to be selected.



The base structure of Tim's Fokker D.VIII ready for covering.

Adrian Hellwig's

SE5a

The pictures are of an old Modeltech SE5a that had never been assembled.

It was found in a shed covered in dust, fly specs, moth eggs, etc. I decided it deserved to live and set about restoring it, building it, adding scale detail (and a dropable depth charge!) and now.... flying it! It flies really well though it isn't all that scale [it has strip ailerons, no Vickers gun and various other non-scale issues].

The model is 1/6 scale with a wingspan of 1.35m and is powered by an OS FS70 four-stroke engine. The colour scheme and markings are spurious French Maritime Aviation.

Adrian Hellwig



The model as found, a bit the worse for wear despite never having been completed.



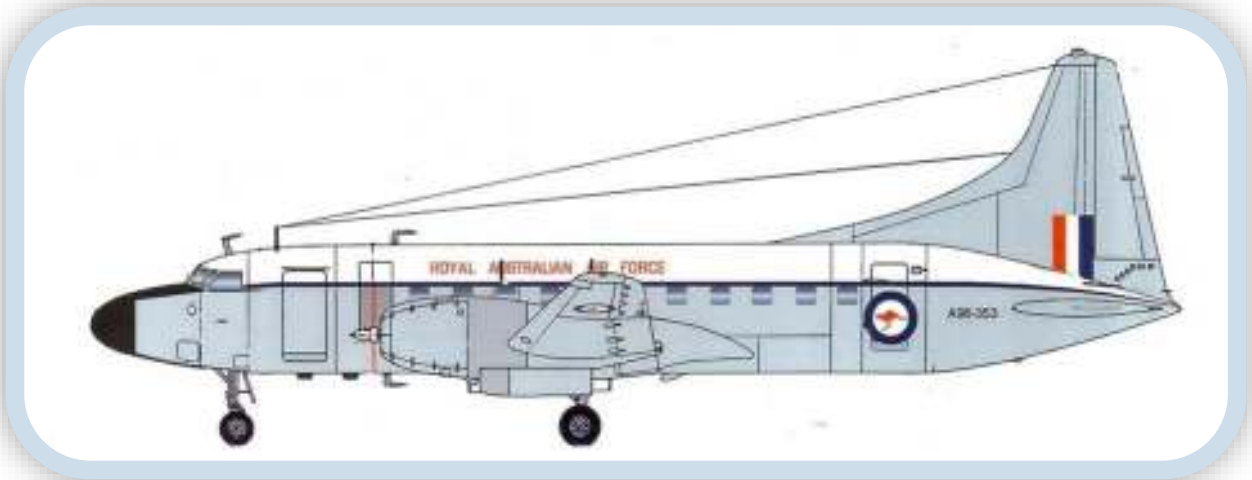
Adrian's SE5 restored, repaired and redecorated as a French maritime aircraft.



Ready to take to the sky.

Tim Dehaan's

CONVAIR CV-440 METROPOLITAN



I have always loved airliners and I am sure most of us as kids were fascinated by them. I spent many a winters' day when home from school drawing the planes of that era — DC9, DC10, Boeing 727, 747, etc. and when we could afford it I would get a plastic model to build. Moving forward 40+ years I now have the ability to build and fly some of these airliners with remote control so I was looking for a subject model. Not being into jets (yet) I was looking at prop driven aircraft and came across a plan for the Convair 440 by Don Smith. The 440 is a variant from the original 240 which first flew in 1947 with seating for 40 passengers in a pressurized cabin.

The RAAF had two of these in the early 1950's with more spacious seating (20) and were used for the transport of Royalty, the Governor General and Prime Ministers. My model will be in the colour scheme of one of these aircraft - RAAF A96-353.

I purchased the plan in 2017 with the intention of it being a future build. I scanned the plans and, in 2018, sent them off to Laser Cut Kits to get the formers and ribs cut.

The model has a wingspan 3.35m and will weigh around 20 - 22kg all being well. The engines I will be using are DLE35's which have proven not only powerful but most importantly — reliable. To keep ground clearance to scale I will be using 17 x 10 (3 blade) props.

Radio gear will be a Spektrum 20 channel Powersafe RX, Savox Digital servos with seven on the control surfaces, two on the throttles, one on the steerable nosewheel, and three on the undercarriage doors. Retracts will be Intairco/Robart with scale aluminium wheels. Lighting will be via a Booma RC unit.

I started the build with the tail plane in January this year by building the first half over the plan and then flipping that over and building the

second half over the top of the structure. The fuselage was much the same, I made a jig out of scrap to support the first half straight and level for the second to go on top. There were a couple of small errors in the plan at this stage but it wasn't until I got to the wing that some real issues presented.

I wanted the 440 to stay together and sit on its undercarriage with the wing centre section bolted to the fuselage for transport. The plans only allowed for the wing tips with the ailerons to be removed which left a 2m wide centre section. This was too wide so I had to modify the plans to get the wing joint at the first rib past the nacelle. Using carbon fibre wrapped tube I relocated the wing joiner and made new ribs out of aircraft ply at the new wing joint as well as at outer ribs to take the load. I had to remake several of the ribs due to errors on the plan as the shape was either cut short or cut outs in the wrong spot. The engine supports had little to no connection to the main spar so I had to add some aircraft ply formers to the nacelle structure. I am sure Don Smith is a nice guy but his drawings are very ordinary.

I had to make the fuel tanks for the Convair as there was limited room in the nacelle with the wheels retracting forward and the rear mounted carburetors of the DLE35's. I made a mould of half a tank then produced four fibreglass halves and joined them to make two tanks. I used fuel fittings from Intairco for the outlets. The wings and fuselage will all be covered in fibreglass cloth then painted in the RAAF scheme. The model will have limited scale detail but hopefully will look OK.

At this stage I am finishing off the retract doors and fibreglassing the fuselage and centre wing section and the wings. Hopefully the model will be finished before the end of the year.

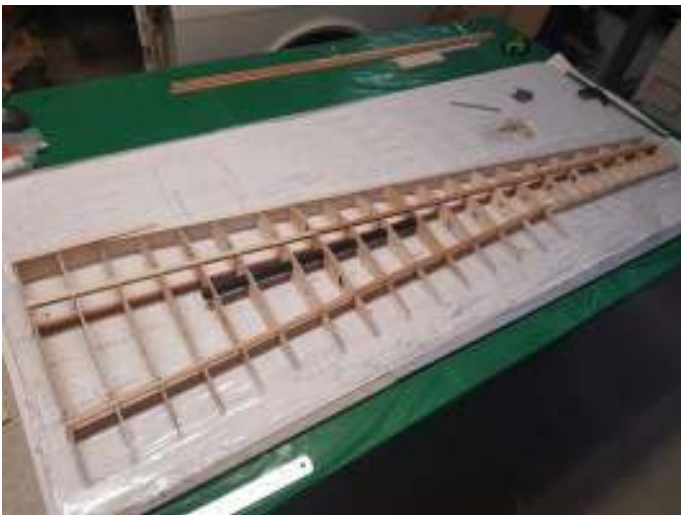
Tim Dehaan



Fuselage framework in progress.



A lot of planking required to finish the fuselage.



The modified outer wing panel.



Custom built fiberglass fuel tanks to suit the engine nacelles.



The present state of construction with the Convair. Almost ready for the fuselage and wing centre section to be fibreglassed.





The Port Macquarie RC Model Aircraft Club is on a 1000 acre ti- tree farm. We are fortunate in having a good farm owner, Claude Cassegrain, who also owns a winery nearby.

The club currently has 44 members and it is an MAAA field.

Our strip at Port Macquarie RC was flooded before last weekend.

David White



Ray Wilson, seen here with his ARF AT-6 Texan, is Club Secretary.



Richard Toppazzini with his plane. Richard is from Argentina where his parents, both Italian, migrated after WW1. Richard has lived in Australia for 48 years and his son is the chief maintenance engineer at the Hastings Flying Club in Port Macquarie where he maintains the club's planes, engines, airframes etc.



Ray Blight with his Decathlon.



David with his Spacewalker which is now 6 years old and has had 257 flights. I just did a big service on it, new flight batteries, new fuel and clunk lines, tap-pets adjusted, tightened engine bolts etc.



My student pilot Praveen, pictured with his son Prad, has now gone solo and is doing well.

Big turnout today as the weather was perfect. My FW190 went really well (two 14min flights) and my landings were good. The strip has dried out so it's no longer soft and causing problems with the heavy planes (wheel digs in and rips off the oleo).



Phil Brown's Aerosport ultralight has a DLE20 in it, flies well.



Mark Poulter with his Cessna O-2 Skymaster after the maiden flight.

Port Macquarie Miniature Aero Club

These are pics from the new Port Macquarie Miniature Aero Club strip today. This is a different club to the one north of Port Macquarie.

It is a lovely spot but has the most awkward strip I've flown at, and I've flown at twenty two different strips.

David White



Our top pilot Colin Campbell ended this flight 15 metres up in a gum tree - not good. It 's a big model with an OS33GT up front.



Colin's plane came down with help of an arborist - intact.



My Great Planes Big Stik with the north-south strip in the background.



The pits and parking area is idyllic. The guys are admiring Brian Tracey's MGB.

Peter Graeber's

SE5a



History

D'351 was built by Vickers Ltd., at Crayford and entered service with 6 Sqn, Australian Flying Corps.

The S.E.5 was a British biplane fighter aircraft of the First World War. Like the Hurricane when compared to the Spitfire in the Second World War, the S.E.5 was not as glamorous as the Sopwith Camel, nor did it achieve the same iconic status, but it was one of the most important and influential aircraft of the war.

The S.E.5 (Scout Experimental 5) was designed by the Royal Aircraft Factory in Farnborough and first flew on 22nd of November 1916. It was built around the new 150-hp Hispano-Suiza 8a V-8 engine. Only 77 original S.E.5s were built before the improved S.E.5a model took over. In total 5,205 S.E.5's were built. The introduction of the 200-hp Hispano-Suiza or Wolseley Viper resolved early engine problems and added nearly 30 mph to the S.E.5's top speed. The S.E.5a was inherently stable, making it an excellent gunnery platform. It was also one of the fastest aircraft of the war, at 138 mph it was equal in speed to the SPAD S.XIII. The S.E.5a was not a great dog fighter, lacking the agility of the Camel. The S.E.5 had only one synchronised .303in Vickers machine gun, however it did have a wing-mounted Lewis gun which enabled the pilot to fire at an enemy aircraft from below.

The S.E.5 entered service in March 1917 and the S.E.5a entered service in June 1917 and was still in production at the war's end. By 1918 the S.E.5a equipped 21 British Empire squadrons including AFC's 2 Sqn, 3 Sqn, 5 Sqn and 6 Sqn.

General characteristics

Crew:	One
Length:	6.38 m (20 ft 11 in)
Wingspan:	8.11 m (26 ft 7 in)
Height:	2.89 m (9 ft 6 in)
Wing area:	22.67 m ² (444 ft ²)
Max take off weight:	902 kg (1,988 lbs)
Powerplant:	1× Wolseley Viper V8 engine, 150 kW (200 hp)

Performance

Maximum speed:	222 km/h (138 mph)
Range:	483 km (300 miles)
Service ceiling:	5,185 m (17,000 ft)
Armament	1 x .303 in (7.7 mm) forward firing Vickers machine gun
	1 x .303 in (7.7 mm) Lewis gun on Foster mount on upper wing



The original aircraft photographed during WW1.

The Model

I decided to build this plane after I crashed my scratch built Fairy Firefly MK1 on its maiden flight. I wanted a model with a tried and tested history so I chose a ¼ scale Balsa USA kit which I purchased from my local model shop. I reasoned that all the things such as CG calculations, control throws and flight characteristics had been sorted out and all I would need to do is fine tune the model once finished.

The build progressed normally as per the instructions but you get to the point when you want to personalise the plane. The first thing I did before completing and covering the fuselage was to detail the cockpit. This is where I found out that just about all SE5a cockpits, although basically the same, have minor differences in the layouts. Possible due to changes as result of experiences in combat or pilot preferences? Once settling on a layout I drew up and 3D printed all the instruments, pumps, switches, throttle/mixture, trim wheel, joy stick, guns, and other bits. All this was built in and the fuselage covered.



3D printed cockpit details

The engine is a Saito FG40 four- stroke petrol and its installation was very straight forward. The ignition unit and battery were kept as far forward as practical as I was advised by other modelers that WW1 aircraft tend to need nose weight to balance them.

The radio installation was also straight forward. The receiver is a Spektrum 6 channel receiver using Dualsky DS589 servos and a 7.2 volt LiPo battery. All the servos and the receiver battery are located as far forward as practical. There are four servos in the fuselage one each for the throttle and rudder and two for the elevators. The remaining two servos are in the wing and set up for differential aileron movement.



Stainless steel rigging wires replaced the hat elastic of the kit.

I was then able to get the correct masks printed for the roundels, lettering and kangaroo etc. The model was then painted in acrylic paints using these masks .



The finished model in the colours of 4 Squadron AFC and with the kangaroo emblem once considered for use on present day RAAF aircraft.



The finished airframe.

The wing rigging wires were the next item that I changed. The instructions recommended using hat elastic for the rigging which I didn't really like so I decided to use stainless steel fishing trace threaded through small brass tubes and connected to springs inside the wings. This way the rigging would look more realistic and the springs keep tension on the wires. This had to be setup before the wing was covered.

The covering of the model was straight forward. It is covered with Solartex that I was given by a friend and Koverall. The fuselage was covered with Solartex and the wings with Koverall. The model was then doped and painted in acrylic paints.

The model chosen was that of an Australian training squadron in England late in WW1. It is the basic olive green and beige colour with a red band and white kangaroo. To get the kangaroo outline I scanned the one in a picture of the aircraft that I was modelling my plane on, converted it to a dxf file and tied it up in cad.

While the building, painting, etc, had been going on I was trying to resolve my biggest problem. Where do I get a pilot ? I tried to 3D print one but this proved not to be very successful. After talking to club members I finally managed to get one from Premier Pilots in the USA, it's on its way! To get the CG in the correct position I have cast a lump of lead to fit just behind the radiator. The model is slightly nose heavy at the moment and will need adjusting when the pilot is installed.

The model has not yet flown but I am looking forward to flying it with the help of my more experienced colleagues.

Peter Graeber



NEW ZEALAND NEWS

Mike Mulholland's



WESTLAND LYSANDER

Mike Mulholland's superb 50" wingspan rubber-powered scale model has already had test glides, which showed a need for tweaking the elevators, and is now awaiting completion of paintwork. The model is super-detailed with moulded parts and much surface detail and

weighs around 150g. The undercarriage legs are divided, allowing dismantling of the lower section including wheel and spat assembly to make the model more compact for storage. Wheels are sprung within each spat.



Mike Hage's **SCRUB CUBS**



Mike Hage, a member of the Port Macquarie RC Model Aircraft Club is an accomplished aluminium fabricator who has directed his talent to the production of 1/3 scale Piper J3 Cub aircraft constructed from aluminium tube and sheet material and covered with plastic film. The models are 3.6m wingspan and are equipped with flaps for STOL performance.

The Scrub Cub is available from Mike as an ARF with flying surfaces and pre-hinged control surfaces covered with film, push rods fitted, seat and dashboard and 200mm balloon wheels. Eight servos are required and the weight is 20kg.



Scale construction of the airframe complete with hunting gear and deer carcass.



Fellow Port Macquarie member Doug Way's Scrub Cub is powered by a Roto 170 four cylinder four-stroke petrol engine.



Mike's Scrub Cub is powered by a twin cylinder four-stroke engine.



Robert Hage (Mike's brother) and Colin Buckley with their matched pair of Scrub Cubs at RAAF Richmond model flying field.



Mike Hage's Scrub Cub in flight.



A Scrub Cub fitted with leading edge slats for even greater STOL performance.

Peter Goff's

**COMMONWEALTH
AIRCRAFT
CORPORATION**



CA-16 WIRRAWAY

The CAC Wirraway (an Aboriginal word meaning "challenge") was a training and general purpose military aircraft manufactured in Australia by the Commonwealth Aircraft Corporation (CAC) between 1939 and 1946. It was an Australian development of the North American NA-16 training aircraft and has been credited as being the foundation of Australian aircraft manufacturing.

During the Second World War, both the Royal Australian Air Force (RAAF) and Royal Australian Navy (RAN) deployed a number of Wirraways into combat roles where they served in a makeshift light bomber/ground attack capacity, striking against the advancing forces of the Empire of Japan.

While the type had been primarily used as a trainer and general purpose aircraft, being present in small quantities within the majority of front-line squadrons for these purposes, the aircraft was often pressed into combat when required. Typically, fighter versions of the Wirraway were operated over theatres such as New Guinea to perform ground attack missions and other Army co-operation tasks over extended periods until more advanced aircraft become available in sufficient quantities.

General characteristics

Crew: 2
Length: 8.48 m
Wingspan: 13.11 m
Height: 2.661 m
Wing area: 23.760 m²
Empty weight: 1,811 kg
Powerplant: 1 × Pratt & Whitney R-1340 S1H1-G
nine-cylinder air-cooled radial engine, 450 kW

Performance

Maximum speed: 350 km/h, 190 kn at 1,500 m
Cruise speed: 293 km/h, 158 kn) at 1,500 m
Range: 1,160 km, 630 nmi at 264 km/h
Service ceiling: 7,000 m
Rate of climb: 9.9 m/s

On 12th December 1942 a Wirraway flown by Pilot Officer John S. "Jack" Archer achieved the types only shoot-down of an enemy aircraft, thought to be a Mitsubishi A6M Zero at the time but later determined to be a Nakajima Ki-43 Hayabusa.

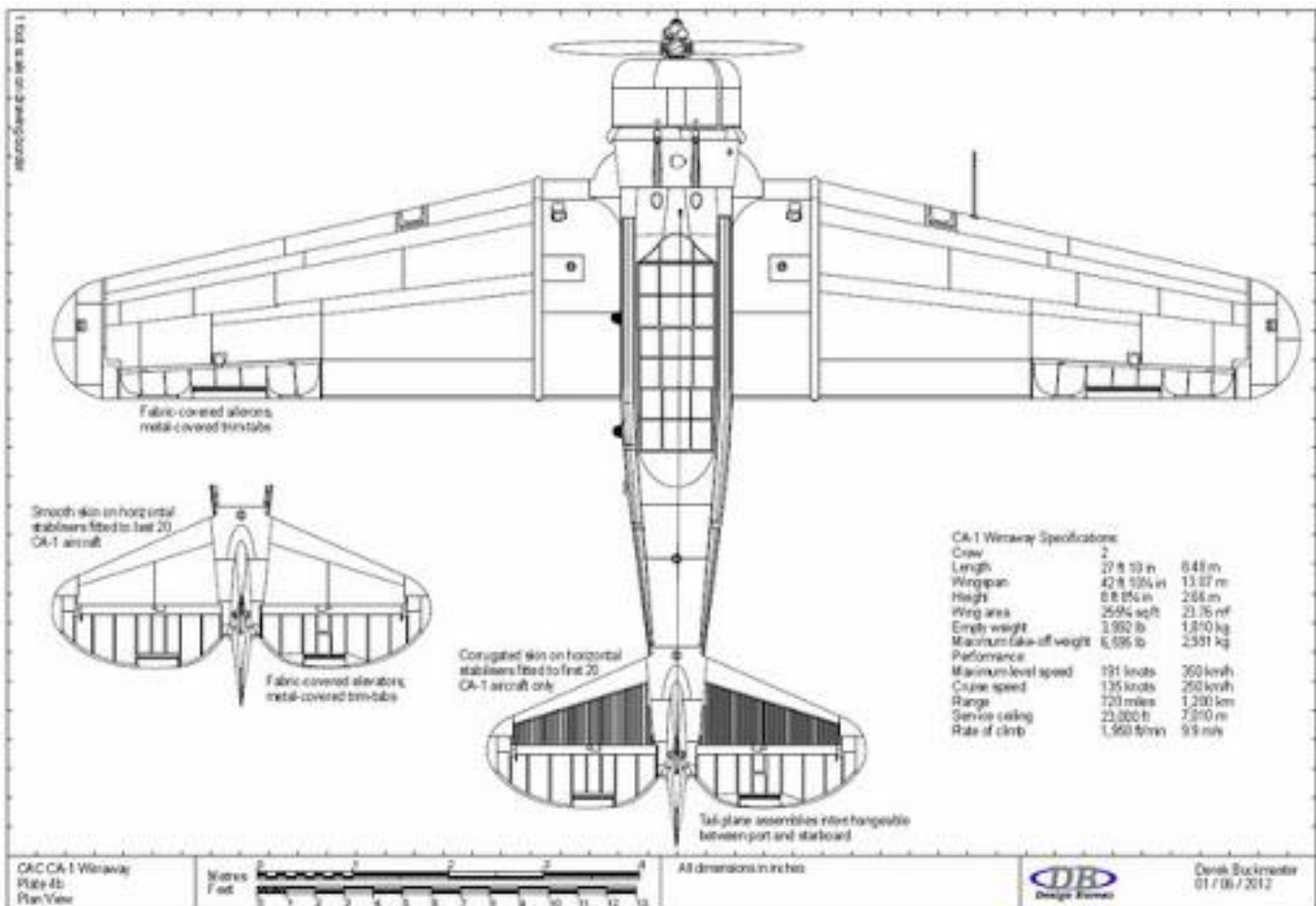
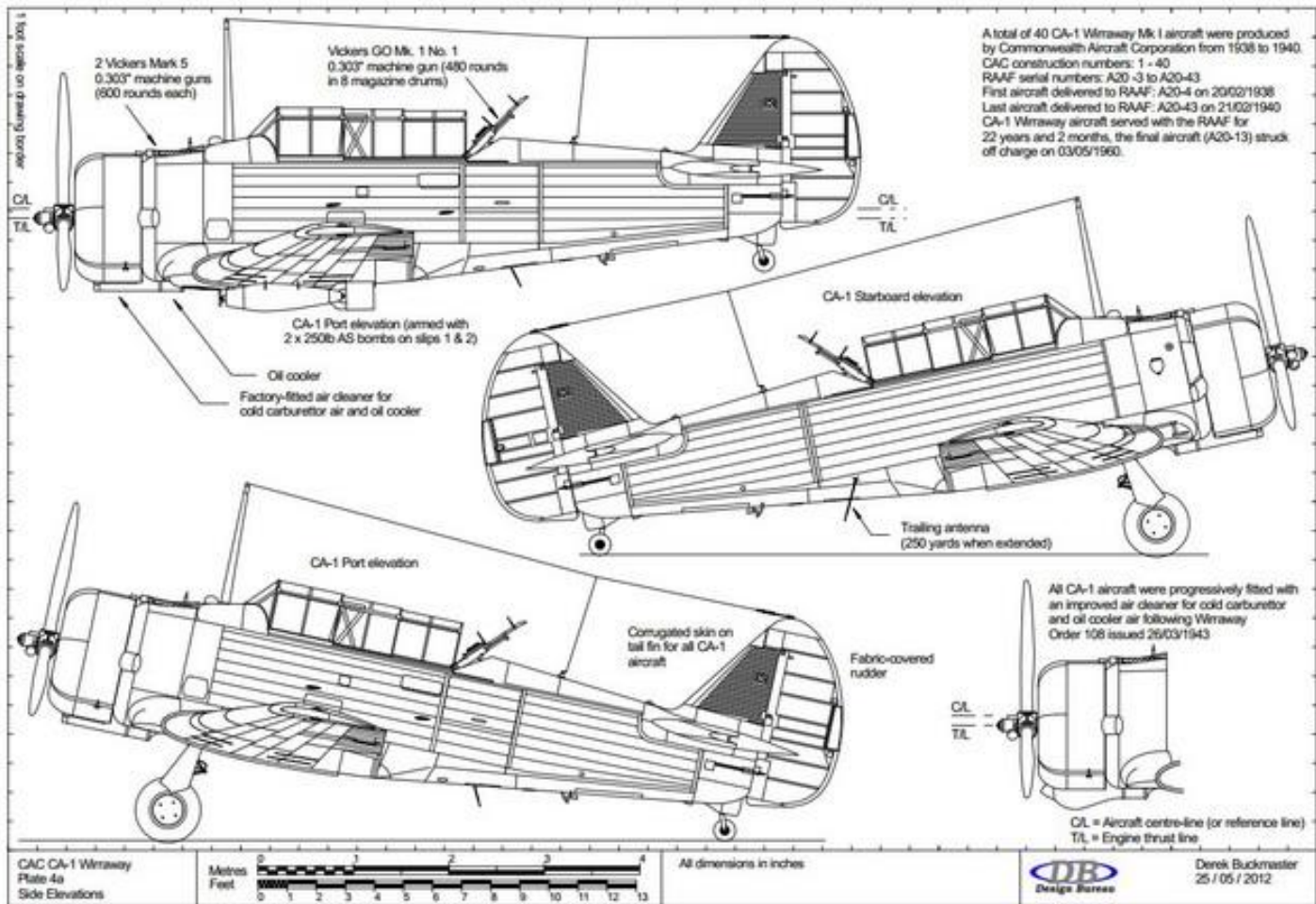
Following the end of the conflict, the Wirraway was operated for over a decade as a trainer by the RAAF, the newly formed RAN Fleet Air Arm, and the squadrons of the Citizen Air Force. In 1957 the last of the RAN's Wirraways was retired and replaced by the newer jet-powered de Havilland Vampire As the CAC Winjeel came into squadron service, the RAAF phased out its remaining fleet of Wirraways during the late 1950s. Officially, the last military flight to be performed by the type was conducted on 27th April 1959. Notably, the Wirraway also functioned as the starting point for the design of the Boomerang, a wartime "emergency fighter".

Armament

Guns: 2 × 0.303 in (7.7 mm) Vickers Mk V machine guns
1 × 0.303 in (7.7 mm) Vickers GO machine gun

Bombs

2 × 227 kg bombs and 2 × 113 kg bombs (CA-16 only) *or*
3 × 45 kg bombs *or*
12 × 3.9 kg *or* 52.4 kg bombs and 8 × marker flares



The Wirraway project started some fifteen odd years ago when NSW scale modeller Dean Erby decided to design and build an F4C project for World Championship competition. The aircraft is modelled off VH-BFF at Temora Aviation Museum and Dean spent many hours researching and designing the model before commencing the build. Dean's priorities changed as the years passed and around 2011 I was fortunate enough to be offered the project to continue it through to completion. The aircraft is 1/3 scale with a 2.74m wingspan and is expected to weigh around 14.5kg.

The aircraft was on its wheels with the wings ready for finish, and the basic construction of the fuselage complete. Dean had also already designed and made the cowl, canopy molds, dummy engine and some other fiberglass bits which made my life much easier.



The underside of the lithoplated port wing outer panel with access covers.



Wirraway construction was well advanced when Dean Erby passed the project on to Peter Goff.

One thing Dean chose to start was covering the turtle deck and fin fillet of the fuselage in lithoplate. Each panel was carefully replicated to match the full size.

After picking up the model, Dean asked if I would be kind enough to attempt to continue the process over the rest of the model and I decided to give it a go



Wingtip detail and navigation light.



Lithoplate fairings on the rear deck and fin.

This project has been a long drawn out process for me when combined with work and other priorities, however, after about six month's work I completed the lithoplating of the wings. In short, each panel was measured from drawings, cut, and sanded smooth. If there were compound curves then the annealing process was achieved with a flame torch and the panels were glued down using Selleys's contact adhesive. The Wirraway in most part has overlapped panels, therefore this was a delicate process. I made many duplicates during the process due to mistakes and learned a lot. I'd never put this much detail into a project before so the skills I gained along the way were invaluable because of the uniqueness of the design. There was metal work, fibreglassing, fabric and woodwork all in one model.

I shelved the bulk of the work on the model around 2014 due to work and other projects, but periodically chipped away on the cockpits doing little details as I went. In 2019 I pulled it down and committed to getting the model completed ready to fly.

After months of work I finished the cockpits just prior to Covid-19 hitting Australia. This became somewhat of a blessing in disguise as working from home allowed me to really get the progress rolling.



Rear cockpit detail.

Once the cockpits were finished I could frame up and cover the sides of the fuselage and attach all the wing fillet detail including panels and hatches. I made the top hatch in front of the windscreen removable for access to air fill, fuel fill and charging while access to radio gear and batteries is from underneath the center section.



Wing fillets and fuselage sides completed.

Ailerons and gear doors were next, followed by antenna masts, navigation lights, rivet detail on the wings and fitment of the cowl to the dummy radial. I am powering the model with a Saito 90cc R3 which once fitted, I made all the baffling to suit. I sent the canopy moulds to Russell Mitchell at Aeroscale in Queensland to pull canopies for me and the canopies returned recently in fantastic 1.5mm quality. I'm currently half way through framing these up and after finishing the cowl oil cooler shroud moulding it will be ready to paint. Temora Museum were generous enough to provide me with authentic colour chips for reference so I should be able to get an accurate finish. I hope to have the model flying by Christmas with its first competition sometime in the New Year.

Peter Goff



Cockpit detail completed.



Front cockpit detail.



Underside of wing centre section showing the flaps and access to radio gear.



Wheel wells with detailed hydraulic tubing.



Dummy Pratt & Whitney nine cylinder radial engine.



Fibreglass baffles direct cooling air over the Saito 90cc engine.



Current status of Peter's Wirraway.

Phil Crandon's

GRUMMAN

FM-1

WILDCAT



Grumman fighter development began with the two-seat Grumman FF biplane. The FF was the first U.S. naval fighter with a retractable landing gear. The wheels retracted into the fuselage, leaving the tires visibly exposed, flush with the sides of the fuselage. Two single-seat biplane designs followed, the F2F and F3F, which established the general fuselage outlines of what would become the F4F Wildcat. In 1935, while the F3F was still undergoing flight testing, Grumman started work on its next biplane fighter, the G-16. At the time, the U.S. Navy favoured a monoplane design, the Brewster F2A-1, ordering production early in 1936. However, an order was also placed for Grumman's G-16 (given the navy designation XF4F-1) as a backup in case the Brewster monoplane proved to be unsatisfactory.

It was clear to Grumman that the XF4F-1 would be inferior to the Brewster monoplane, so Grumman abandoned the XF4F-1, designing instead a new monoplane fighter, the XF4F-2. The XF4F-2 would retain the same, fuselage-mounted, hand-cranked main landing gear as the F3F, with its relatively narrow track. The unusual manually-retractable main landing gear design for all of Grumman's U.S. Navy fighters up to and through the F4F, as well as for the amphibious Grumman J2F utility biplane, was originally created in the 1920s by Leroy Grumman for Grover Loening. Landing accidents caused by failure of the main gear to fully lock into place were distressingly common.

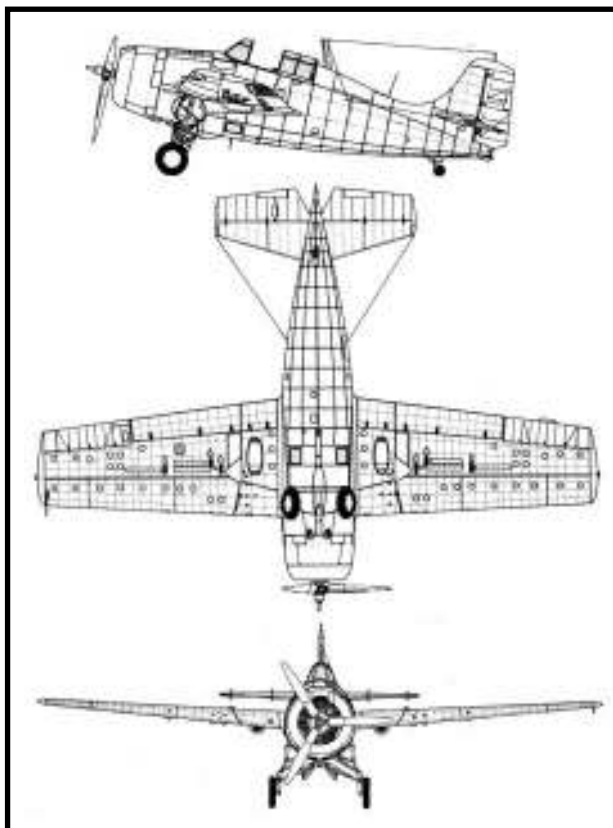
The overall performance of Grumman's new monoplane was felt to be inferior to that of the Brewster Buffalo. The XF4F-2 was marginally

faster, but the Buffalo was more manoeuvrable. It was judged superior and was chosen for production. After losing out to Brewster, Grumman completely rebuilt the prototype as the XF4F-3 with new wings and tail and a supercharged version of the Pratt & Whitney R-1830 "Twin Wasp" radial engine.^{[9][12]} Testing of the new XF4F-3 led to an

order for F4F-3 production models, the first of which was completed in February 1940. France also ordered the type, powered by a Wright R-1820 "Cyclone 9" radial engine, but France fell to the Axis powers before they could be delivered and the aircraft went instead to the British Royal Navy, who christened the new fighter the Martlet. The U.S. Navy officially adopted the aircraft type on 1 October 1941 as the Wildcat. The Royal Navy's and U.S. Navy's F4F-3s, armed with four .50 in (12.7 mm) Browning machine guns, joined active units in 1940.

Even before the Wildcat had been purchased by the U.S. Navy, the French Navy and the Royal Navy Fleet Air Arm (FAA) had ordered the Wildcat, with their own configurations, via the Anglo-French Purchasing Board.

The F4F initially known in British service as the Martlet was taken on by the FAA as an interim replacement for the Fairey Fulmar. The Fulmar was a two-seat fighter with good range but operated at a performance disadvantage against single-seater fighters. Navalised Supermarine Seafires were not available because of the greater need of the Royal Air Force. In the European theatre, its first combat victory was on Christmas Day 1940, when a land-based Martlet destroyed a Junkers Ju 88 bomber over the Scapa Flow naval base.^[15] This was the first combat victory by a US-built fighter in British service in World War II.^[15]



The type also pioneered combat operations from the smaller escort carriers. Six Martlets went to sea aboard the converted former German merchant vessel HMS *Audacity* in September 1941 and shot down several Luftwaffe Fw 200 Condor bombers during highly effective convoy escort operations. These were the first of many Wildcats to engage in aerial combat at sea.

The British received 300 Eastern Aircraft FM-1s giving them the designation Martlet V in 1942–43 and 340 FM-2s, (having changed to using the same name as the US) as the Wildcat VI. Nearly 1,200 Wildcats were flown by the FAA and by January 1944, the Martlet name was dropped and the type was identified as the Wildcat. In March 1945, Wildcats shot down four Messerschmitt Bf 109's over Norway, the FAA's last Wildcat victories.

The last air-raid of the war in Europe was carried out by Fleet Air Arm aircraft in Operation Judgement on May 5, 1945. Twenty eight Wildcat VI aircraft from 846, 853 and 882 Naval Air Squadron, flying from escort carriers, took part in an attack on a U-boat depot near Harstad, Norway. Two ships and a U-boat were sunk with the loss of one Wildcat and one Grumman Avenger torpedo-bomber.

General characteristics

Crew:	1
Length:	8.76 m
Wingspan:	11.58 m
Height:	3.61 m
Wing area:	24 m ²
Empty weight:	2,226 kg
Gross weight:	3,367 kg
Powerplant:	1 × Pratt & Whitney R-1830-76 14-cylinder air-cooled radial piston engine, 1,200 hp (890 kW)
Propeller:	3-bladed constant-speed propeller

Performance

Maximum speed:	533 km/h, 288 kn
Range:	1,360 km, 734 nmi
Service ceiling:	12,000 m
Rate of climb:	11.70 m/s
Wing loading:	139 kg/m ²

Armament

Guns:	4 × 0.50 in (12.7 mm) AN/M2 Browning machine guns with 450 rounds per gun.
Bombs:	2 × 100 lb (45.4 kg) bombs and/or 2 × 58 220 litre drop tanks.

The Model

I've loved miniature things since childhood and scale modelling started for me with Airfix plastics before my introduction to R/C around the age of twelve. Like most I have a bucket list of "want to build one day" models and the Wildcat finally made to the top of the list. When I retired a few years back I shouted myself a Laser 360 engine, a set of Robart F4F retracts and purchased the Jerry Bates plans. A good set of plans, reasonably accurate with only a few head scratching moments. My build is recorded on <https://www.rcscalebuilder.com> if you'd like to see a step-by-step account of the construction. The photos reveal a standard ply/spruce/balsa skeleton for the entire structure then sheeted with balsa. The fuselage is somewhat unusual where the bulkheads are split to allow the top half to be constructed on the bench then flipped over to allow the bottom to be added.



Phil Crandon with his Grumman FM-1 Wildcat.

The passion in recent years has been the pursuit of a greater level of realism in my models. With the advent of social media, access to numerous scale modelling sites around the world has provided a huge resource for building and finishing skill learning. High on this list are some superb plastic modelling pages on FB where the skill levels for painting are simply jaw dropping. These modellers skillfully use the concept of light and shade to maximize the 3D appearance of their models.

My Stuka was the first attempt at this and the Wildcat is an improvement. I'm told the trick is to look at the subject your modelling and see the "other" colours that are present in the full size. This is a learnt skill and you don't have to be an artist. So if you're keen, you need to investigate the techniques that the plastic builders use. Airbrushes, powdered pigments, coloured inks etc. all can be used to "dirty up" your scale models.

At the time of writing I only have four flights on the Wildcat and I'm still finding the correct CG and engine settings. I can say that it's a lively little cat when it gets on the step and will fly well at half throttle. Early indicators show great aerobatic qualities. Landing on the narrow undercarriage is the great challenge. There is a reason aircraft carriers always point into the wind for arrivals.

This the Atlantic colour scheme of Dark Gull Gray over Nonspecular White. The Wildcat operated off the US carrier escort Guadalcanal in January 1944. The model is balsa / ply construction and covered with 3/4oz glass cloth. All up weight is 14.9kg and it's guided with a Jeti radio.

Phil Crandon



Upper half of the fuselage.



Wings and fuselage assembly.



Starboard wing panel under construction.



Simulated weathering applied to the aluminium panels.



The complicated narrow track Grumman retracting undercarriage.



Appropriate oil staining applied.



Detailed canopy and pilot figure.



Laser 360 twin cylinder four stroke engine.



Phil's Wildcat in flight with the undercarriage extended.



Phil's Grumman FM-1 Wildcat in flight.