

**DESIGNING
FOR SCALE:**
Your How-To
Guide

Nieuport 27 in 1/4 scale Part 2

Flying Scale Models

Blustery Barkston
**BMFA SCALE
NATIONALS**



SUBJECTS FOR SCALE

**MORANE
SAULNIER MS 406**

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● Close-up photo detail study
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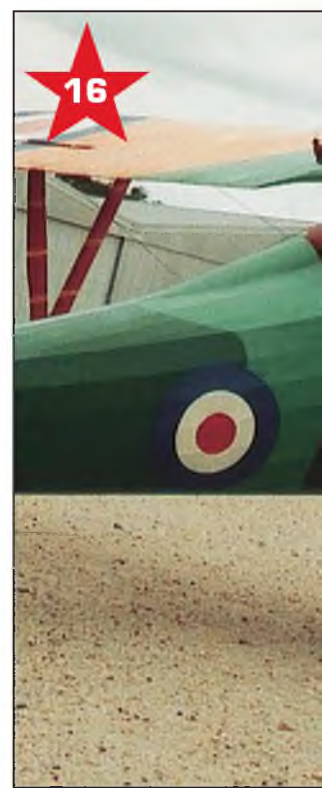
Richard Crapp's 1:33 scale Laser powered Ryan PT 22 dropping out of a moody Barkston sky – a superb model, based on the one that resides at Old Warden!

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Contact

One of our 'missions' at FSM is to try to encourage scale modellers to stray beyond the 'normal envelope' of Spitfires, Mustangs, SE5s and Tiger Moths to model one, or many, of the endless aircraft that have flown since the Wright Brothers first put daylight under the skids of their 'Flyer' back in December 1903.

Many of those lesser-known types have been modelled of course and Plans Services in countries everywhere have many of them covered, but there are still so many 'suitable cases for treatment'. All of which makes Peter Rake's current discourse on designing models and drawing plans a worthwhile read.

Thus, We hope that the Morane Saulnier MS 406 featured as our 'Subject for Scale' in this issue represents a

challenge for scale modellers with a streak of individuality in them. The MS 406 was France's most numerically important fighter aircraft of the 1939-40 early WW2 period. It's no beauty, but nevertheless has a pugnacious attraction all its own - why not give it a try?

The Hawker Fury is one of the most elegant fighter biplanes ever built and deserves popularity equal to the SE5 and Tiger Moth. The FSM Plans Service plan by Brian Brassey is a steady seller, so it's absolutely great to learn that an authentic original full size Fury, restored to superb condition by Historic Plane Services is now at IWM Duxford, awaiting test flights - something to really look forward to at 2012 air shows and featured in this issue.

LAVOCHKIN CORRECTION

I would like to quickly point out before anyone paints a model, that the 'FN' logo is shown reversed- it currently reads 'NF'. This error has been circulating around various drawings for years. Check against photos if you wish but, I guess maybe that was the original mistake - a photo printed wrong way round.

Thanks for a brilliant mag, it is the only one I take every month.

Mark Erwood



Midlands Model Engineering Exhibition 2011

2011 marks the 34th year of the Midlands Model Engineering exhibition. As one of the biggest modelling exhibitions in size, scope and duration, this year's event takes place Friday 14th - Tuesday 18th of October. The show regularly attracts over 11,000 visitors each year and covers two exhibition halls displaying models and demonstrations, together with outdoor exhibits and over 40 specialist suppliers.

Over 40 clubs and societies will be showcasing members' work this year. This will range from small stationary and IC engines, workshop equipment, right through to large locomotives and steam road vehicles.

A number of celebrations will be marked at this year's exhibition:

- Tallylyn Railway: 60 years - 2011 marks the 60th anniversary of the first passenger train to be run by volunteers anywhere in the World to marking the occasion the original Valve Gear of No. 1 will be on display.
- Swindon Model Boat & Engineering Club: 80th Anniversary - the club will be displaying engineering and working engines and boats in their demonstration area.
- Spitfire: 75th Anniversary of the maiden flight - see the display of 3 superb quarter scale Spitfires courtesy of 'Flying Legends'.

Old Warden Swapmeet 2012

This popular Swapmeet returns early in the new year on Sunday February 12th, and will take place in the Russell Hall complex of the Agricultural College, adjacent to the Shuttleworth Collection's airfield.

Doors will open at 8.30am for table holders and at 10am for public and there will also be a trade presence.

Table pitches cost £10.00 plus £6.00 per head (two per table), while public 'lookers and pickers' entry costs £8.00.

The Swapmeet covers all modelling disciplines. Bookings commence November 1st to Richard Dalby on 020 57607 6820.

Email: owswapmeet2012@hotmail.co.uk or to Peter Dirs: pd_eng@yahoo.co.uk

Bowers Fly Baby from Balsa USA

Discontinued for a while, Balsa USA's big 1/3rd scale model of the original low wing Bowers Fly Baby is back in production. With a wingspan 112" (2845mm), the model is intended for engines in the range of 2.5 cu.in. and offers a wing-fold feature exactly as per full size in which the wings, when folded, lay flat along the side of the fuselage.

Designed by American Pete Bowers, the full size prototype Fly Baby first flew back in 1962 and has been popular with full size home builders ever since. Consequently,

there are plenty of authentic colour schemes from which to choose for a model, bearing in mind that the Balsa USA kit is no ARTF but, as with all other Balsa USA scale kit offerings, a traditional balsa/plywood build.



Next month in... FLYING SCALE MODELS

Back in the December 2008 Issue, we ran a feature, with scale three-views, on aviation pioneer Charles Lindbergh's Miles Mohawk, then recently restored and put on display at the RAF Museum, Hendon. So it was a gratifying surprise, just a week ago, to receive Pantelis Papageorgiou's email from Greece, with details and pictures of his 1/4 scale model, which we will feature, in detail, in next month's issue.

From Thailand, Dr. Mike Hawkins FRaeS presents yet another of those lesser-known offbeat scale subjects he chooses to model.

This time it is the Bucker Bu 182 Kornett modelled to 1:4.5 scale for .90 - 1.20 cu.in. four stroke engines. The model spans 75" (1910mm) and we will be presenting a full construction feature, with plans, plus scale drawings and the story of the full size airframe.

That's in FSM December issue, on sale November 10th.





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AIRCRAFT RESTORATION

There seems to be no limit to what modern-day historic aircraft restorers can do in bringing aviation heritage back to life

Recently, Historic Aircraft Collection (HAC) brought a very special historic aircraft to Duxford for reassembly and display. Hawker Fury Mk.I K 5674 serial number 41H/67550 is the only authentic Hawker Fury in existence and has been faithfully restored to flying condition. The remains of this rare aircraft were discovered on a farm in South Africa and acquired by *Historic Aircraft Collection* following information received from staff at the RAF Museum.

After an 18-year restoration, this ultra rare aircraft was recently reassembled at Imperial War Museum Duxford, where visitors could see the talented team of HAC engineers painstakingly assemble this spectacular aircraft.

The Fury is now presented in the scheme in which it flew when it was last operational, as part of the famous 'Fighting Cocks', 43 Squadron, at RAF Tangmere. It was then the personal aircraft of Flying Officer Rosier, Officer Commanding 'B' Flight and later to become Air Chief Marshall Sir Frederick Rosier GCB CBE DSO.

Flying Officer Rosier first flew the Fury during December 1936, but had to relinquish the aircraft in February 1939. It was eventually sent to South Africa in 1940. Taken on charge by 13 Squadron, based at Swartkop airbase, it was damaged in a forced landing and was subsequently struck off charge in March 1941.

The restoration of this beautiful pre-war fighter aircraft, arguably the most beautiful of all the fighter biplanes, was undertaken by Retrotec Limited, who also rebuilt the extremely rare Rolls Royce Kestrel IIS engine, which was an achievement in itself!

The restored and reassembled Hawker Fury can currently be seen in all its gleaming glory in the Hangar 3: Air and Sea exhibition at Imperial War Museum Duxford, so why not make a 'pilgrimage' to Duxford to see it first hand - you'll not be dis-



A VERY SPECIAL AIRCRAFT





ET ARRIVES AT DUXFORD



1: The Hawker Fury arrives at Duxford 2: The intricate interior of the Hawker Fury seen as reassembly takes place. Image copyright Imperial War Museum. 3: Attaching the wings to the Hawker Fury as Museum visitors look on. Image copyright Imperial War Museum. 4: Attaching the guns to the Hawker Fury. Image copyright Imperial War Museum. 5: The completed Hawker Fury in all its gleaming glory with the proud Historic Aircraft Collection team. Image copyright Imperial War Museum. 6: Sleek engine cowl housed restored Rolls Royce Kestrel. 7: Main undercarriage struts and wheels. 8: Tailwheel unit.

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FREE FLIGHT SCALE ACHIEVEMENT *by Alex Whittaker*

Armstrong Whitworth

Alex Whittaker reflects that impressive scale models come in all shapes and sizes, and with varied methods of propulsion



ch Argosy

MAIN IMAGE: Clever design and thoughtful former profiling has produced a very accurate nose.
INSET: The nacelles are essentially balsa boxes with outer profile formers on top.

Every now and again you see a scale model whose very ambition takes your breath away. It need not be a thousand-hour 1/4 scale fighter. It might just as easily be a rubber powered sweetie. Now, for my money, free-flight scale is one of the most exacting of all aeromodelling disciplines. Filter that discipline down to rubber powered free flight scale, and you are left with a small but determined bunch of UK modellers. Add the additional filter of twin-engined rubber fanciers, and the number of UK protagonists is vanishing small. Add the further filter of flying a rubber-powered scale multi-engined subject outdoors, and I can't remember the last time that I saw one in the air.

Argosy concept

Mike Stuart is one of the UK's foremost scale modellers, well known for his skills with free-flight indoor scale models. However, his rubber motored Armstrong Whitworth Argosy really is a rare bird. Mike says that it had been gnawing away at him as a scale subject for many years. As a lad he used to watch Argosies trundling into Manchester Ringway airport in BEA livery, so that just had to be the scheme used for this model.

Size and wingspan

Mike's entirely self-designed and scratch-built Argosy spans 38" and weighs 104 grams. Mike says that this size was governed by the need to swing two 7" inboard *Peck* props. He cheated slightly by moving the booms out by 1/2" to allow clearance for the aircrews. This gave the added value of a useful increase in tailplane area. From the outset, Mike wanted a practical free flight scale model. Therefore the Argosy has detachable plug-in outer wing panels, with the break made just outboard of the booms. Most significantly, the Argosy had to fit in Mike's model box.

Construction

Mike acknowledges his construction method for the Argosy was heavily based on Chris Starleaf's Dash-8 design, which employs cracked-rib construction. The Argosy also uses two spars instead of one, due to its wide wing chord. The tail booms are slab-sided, so Mike has constructed two boxes of 1/16" square balsa. The balsa formers top and bottom impart the necessary scale shape. Since there is very little room inside these nacelles the formers were made of 2 x cross laminations of 1/32" balsa. This allowed the necessary large apertures without compromising the strength. The lovely bulbous nose was a challenge. It has a number of compound curves, which Mike achieved by clever use of stringers and formers together with a bit of balsa block around the cockpit area. The rear fuselage block was roughly carved from soft balsa, and hollowed out with a Dremel drill armed with sanding bits to save weight, before gluing onto the fuselage. It was then shaped in-situ; very tricky to do without breaking



Roz Stuart holds whilst Mike gets on the turns.



Literally a tense moment, hooking on one of the prop units.



The Maestro and Masterpiece: Mike Stuart and his rubber-powered, four-engined, 38" span, Armstrong Whitworth.



The Argosy has detachable outer wing panels, complete with outer motor nacelles.



Roz engaging the fully-wound outers in their clever polystyrene prop holder.



The Armstrong Whitworth Argosy is a handsome freighter.

whilst sanding.

Covering

The model was covered in Esaki white tissue. It was given a single coat of dope before painting.

Painting

The white areas of the model were air-brushed first (including those that would later be red). Mike used *Humbrol* white enamel gloss, thinned with dope thinners.

Gloss *Humbrol* enamel red was sprayed next, after all the white areas had been masked off. This proved to be a long job! The light grey undersides and the leading edge silver portions were done next. The black stripes were hand-painted using *Humbrol* matt black enamel. The model was sealed and glossed with Johnson's Clear. All the red BEA markings were cut from red decal films, and when placed over a white background, the letters showed through. The ones on the wing were placed over squares of white decal film. The wing registration letters were cut from white decal sheet.

Rubber motors

Since there is only about 4.25" in distance between the prop hook and motor peg, Mike used long skinny motors to give approximately 40 seconds of "relatively low power". Not sure what Mike means by this comment, since when I took the snaps, I thought her air performance was

very impressive indeed. Spectacular but scale-like, would be a good description. In practice, the longer skinnier inboard motors do most of the work. The wing sheeting was cut away to give motor clearance, and also to reduce weight. I was flabbergasted to learn that Mike patiently scraped away the plastic prop blades to save a smidgeon more weight. He started out with a loop of braided 1/8" rubber in each of the outer nacelles, of about three times the peg-to-hook distance. For the inners, he tried two loops of 1/8" rubber, with a loop length of about 28". By the way, Mike has a novel way of holding already-wound motors prior to flying. He used an angle section of white polystyrene packing foam to hold the props. Polystyrene is kind to the model finish, yet easy to cut to conform to the shape of the nacelles. Then, in one movement, he whips the angle out of the way, releasing all four props simultaneously. Clever!

Scale spinners

These were made by plunge-forming a balsa form (on a stick) into heated Easter Egg plastic packaging. The spinners are backed by a hard balsa plate, slotted for the prop blades. Interestingly, the gaps between the blades and the spinner were filled by *Krystal Kleer*, a water based liquid with good gap-filling qualities, as used by plastic modellers to fill airliner windows.



Trims

The tailplane has an adjustable elevator using soft wire hinges. There are similar trim tabs on the twin fins.

Flying notes

In Mike's own words:

"Only a touch of nose weight seemed to be needed to get a reasonable glide, and so some winds were put on to see what happened. First impressions were that the model seemed very lively and looked nice and stable. With a bit more down thrust on the inner props, a nice flight of over 20 seconds was achieved. In a period of calm weather later in that day, some more winds were put on and an official flight of 34 seconds was registered. I said before I started this model, that I would be thrilled to get 30 seconds out of it and that had been achieved already, so I finished the day a happy chap. Even more winds resulted in a 40 second flight. The steep climb out and stall were a bit scary, but fortunately, the model recovered well and carried on without losing too much height."

At the Old Warden Scale Weekend I reduced the power by replacing the two loops of 1/8" rubber in the inner nacelles with a single loop of 3/16". This made the climb out much more realistic, and helped the duration."

Model Specification

Mike Stuart AW Argosy

Span:	38"
Weight:	104 grams
Power:	Rubber
Prop:	Peck plastic 7"



This picture gives you the idea of how the clever polystyrene motor holder works.



The Argosy looks beautifully balanced in the air.



PLAN FEATURE *by Gary Sunderland*

Rigging

In contrast to early British aeroplanes, which mostly had posts that were at right angles to each other, the Nieuport designs were the opposite. My first step was to double-check the sweepback of the lower

wings, and the distances to the stern post (Photo 21).

With the rest of the surfaces in place, it was then just a matter of sighting down from the top leading and trailing edges to the lower wing and double-checking all

dimensions. Then, the two rear wing attaches to the pylon were drilled and tapped for the 4-4 attach screws. Photo 22 also shows the seating of the tailplane being checked level, by sighting from the top wing.

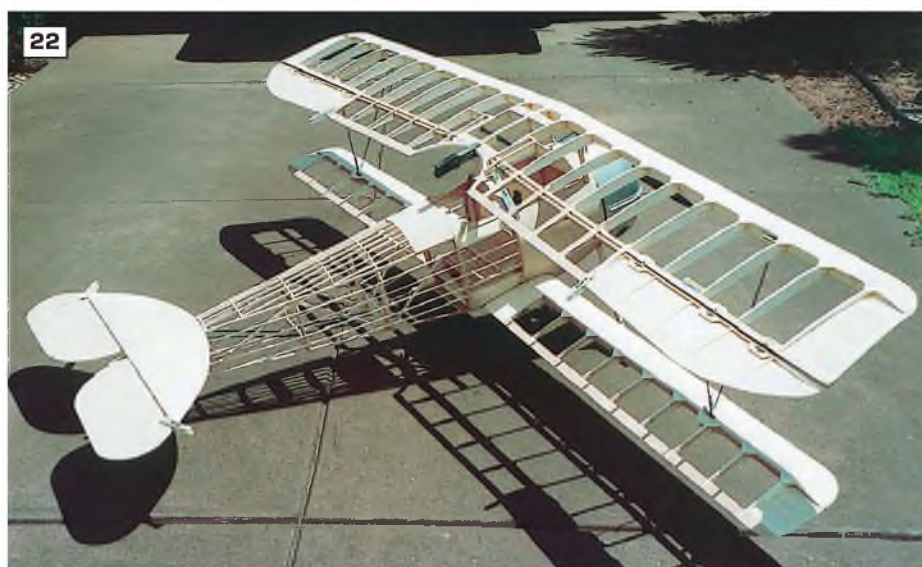
Nifty Nieuport

PART 2: Gary Sunderland
span WWI fighter



port

erland concludes the construction of his 1/4-scale Nieuport 27, neat and elegant 80.5" for 2.00 cu.in four stroke engines



Controls

These are easier to install before the covering is applied. A removable hatch in the belly fuselage provides access to the rudder servo in the centre (**Photo 23**) operating directly via pull-pull cables of 60 lbs fishing trace. The elevator servo shown left in the picture has the cables operating through nylon tube 'snakes'. The throttle operates a standard push-pull cable.

The secret of success with the ailerons is to select perfectly straight and true hardwood dowels running freely in the bearings (**Photo 24**). Shim or pack the outer bearings with brass tube segments and/or ply to line up.

The aileron servo is mounted as required to line up (**Photo 25**). A 3" (80mm) arm produces about 45mm up travel and 20mm down throw.

Covering and painting

The choices are almost endless, from vintage or silver *Solartex*, but I chose the 1917 summer camouflage scheme as described

earlier.

The basic 'structural' covering is my favourite *Sig Koverall*, applied with Stix-it adhesive. This is smoothed with an iron and two coats of nitrate dope (**Photo 26**). The whole model was then covered with natural fine silk fabric, the job of which is just to provide the surface for the paint.

Once again, this is extra work, but I have found it a worthwhile investment to make for a nice finish, which will last several flying seasons. This time, I applied the silk dry, after ironing to remove creases, doping carefully from the centre outward on each panel.

Previously, I have tried using the silk wet and then ironing the edges onto *Balsaloc*. That way, you don't have to iron the creases out first. The results are much the same in the end. I think I prefer the dry method for small models and the wet silk method on larger models like my Albatros C.III.

Before painting, I masked out the outlines of the camouflage and roundels with pencil, using a small piece of plywood, taped

on to establish the centres for the compass.

A variety of paints were used on the models. The undersides were painted with water based 'Jo Sonta's Primrose', together with the tailplane and the port wing undersurfaces. To obtain the weathered and darkened-with-age look, these were then varnished with Wattyl urethane stain and varnish 'Golden Oak' using minimal application, applied chordwise.

The camouflage was applied with a brush, using *Humbrol* 120 Light green, 5026 Khaki, 105 mid-green and finally, Wattyl paint 'mission brown'. This last is also available in a spray can, which was used for the engine cowl. Wattyl 'pewter' and aluminium were also used on the undercarriage struts. I have found that these Wattyl paints are almost as good at resisting glow fuel as two-part paints and a lot less trouble and expense.

Finally, *Humbrol* was used to apply the many roundels and the ruder stripes.

Rigging

I chose 100 lbs fishing trace for the undercarriage wires, with *Du-Bro* quarter-scale turnbuckles. These will stretch from a heavy landing; so will occasionally require tightening up.

The wing rigging is all 0.32" piano wire, with copper tube sleeves and the ends bent back. The 2-56 clevis ends at the top provide some fine adjustment, which should produce a nice note from the wires when these are plucked!

All the scale rigging is FUNCTIONAL, including the tailplane/fin wire, which is also 0.32". Note that, like most of my models, the 5/16" tube axle is re-inforced with a 1/4" steel piano wire insert. This makes a tough model which, in the event of a minor prang, will only require a few wires to be straightened or adjusted for it to be flying again.

Engine installation

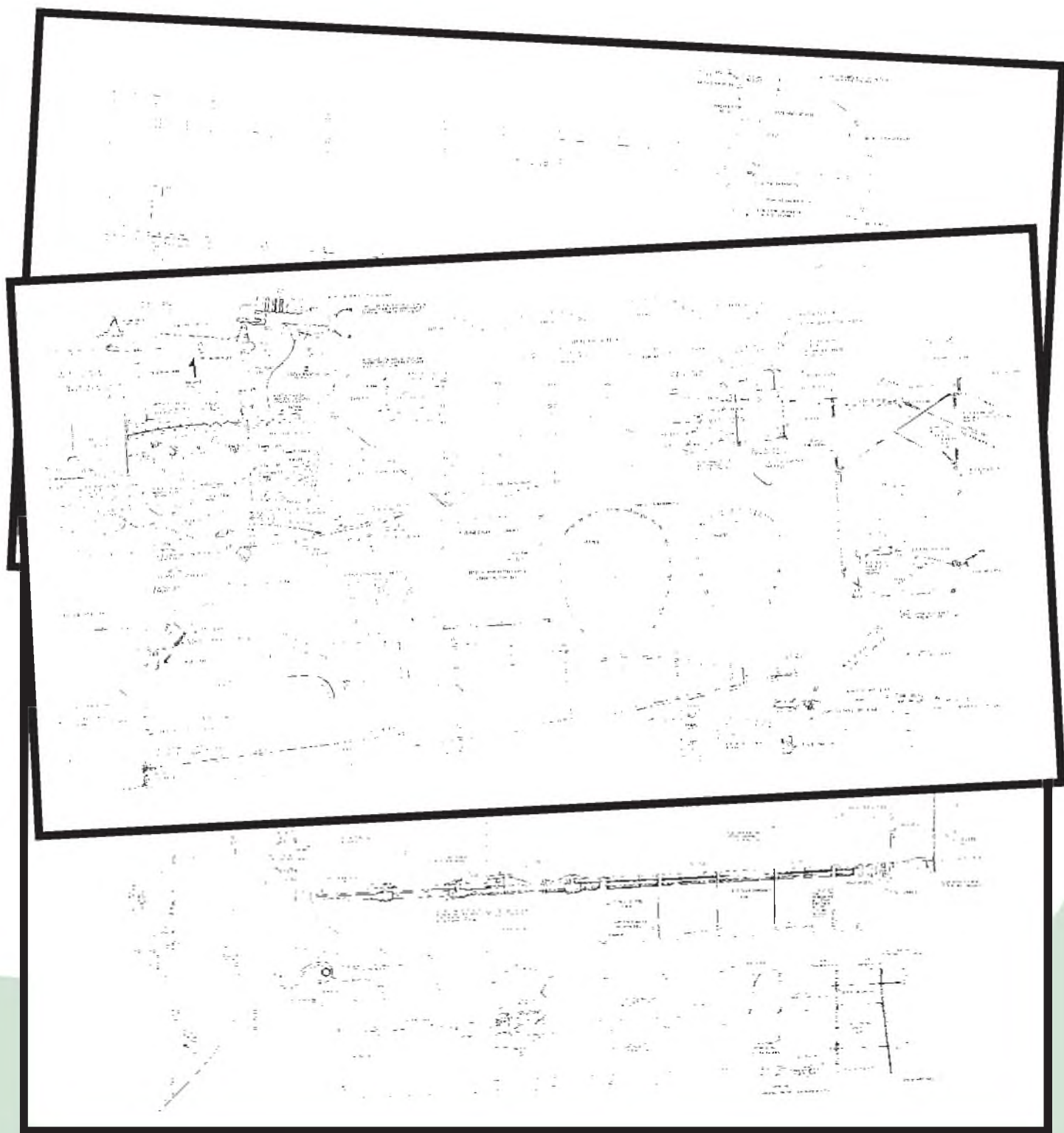
The model was designed around the O.S.200 which, as shown in **Photos 27 & 28**, is a tight fit. This engine has power to spare for contest flying, so any four-stroke from 120 size upwards will be adequate for a nice scale flying model. The O.S. 120 will fit straight onto the same engine mount, but for other engines, you may have to relocate the mount bulkhead. My model balances nicely so, with a lighter engine, you will probably require some lead in the nose.

Details

Talking of weight in the nose, a possibility for a dummy engine is a length of plumber's threaded brass tube. This can be sliced in half and brazed together to form some realistic 'cylinders' and is fairly heavy (saves lead!).

However, for my N.27, I had to make a relatively light dummy engine. I started with three *Williams Bros* Gnome cylinder kits, which furnished six halves. Added to a





spray-can lid, these formed part of a master nine-cylinder quarter-scale engine. **Photo 29** shows the master screwed to a board and above it, a flexible silicone plastic mould cast from it.

From the mould, I then cast two epoxy 'engines' with balsa inserts at the back,

which saves expensive resin and weight. The major cost is the silicone mould, which has been put away for a future project (80 hp. Renault).

The next step was to build up the dummy on an aluminium back plate (**Photo 30**), with two extra cylinders screwed on from

the rear. Steel wire forms the 'pushrods' and a drybrush of copper-over-steel grey paint looks a bit like baked-on castor oil. The final result in **Photo 31** shows the nine-cylinder engine in place and only the fat push-rod covers of the O.S.200 are too obvious.



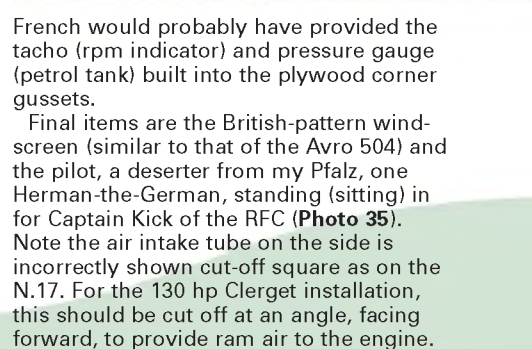
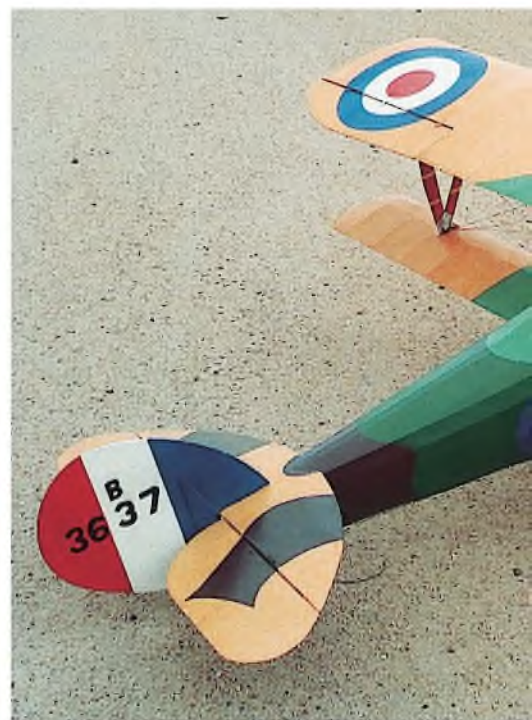
26



27



28



Something borrowed and something red, white and blue in **Photo 32**. One advantage of building for most of the time in one scale can mean being able to re-cycle parts from old models! In this case, the N.27 and my old Halberstadt D.IV shared a rather small mainwheel size, namely six inches o/d at quarter-scale. The old wheels were cleaned up and repainted in roundels, ready for new tyres of 19 mm (3/4") diameter foam rubber.

Being equipped for the RFC, this French-built Nieuport also had a very British pitot-static head installed on the starboard strut. This was salvaged from my Bristol F2B which, due to pilot error (mine), failed to full out of a dive-bombing attack! Note the copper tube connector down to the lower wing. This was a feature of both French and British-built Nieuports and would have resulted in loss of instrument reading when the aircraft was flown in rain.

The Lewis gun shown here is the observ-

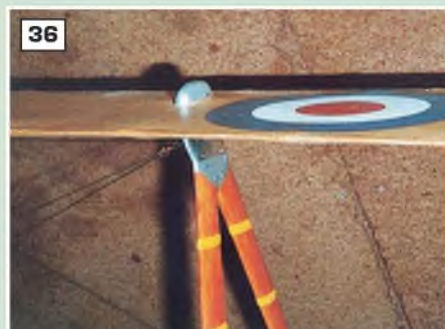
er's gun, straight from the 'Brisfit', before conversion.

Re-styling to replicate the over-wing installation on a British N.27 involved cutting off the flared nozzle and gas chamber and fitting a restored straight barrel. This was then covered by a 12 mm (0.5") diameter aluminium tube (**Photo 33**). My initial idea was to make the Foster mount rail from brass, as for the original, but my piece of brass was a bit short, so I finished up laminating the rail from plywood and painting it brass. The rear mount was soldered from wire and tinned steel, while the front mount is rivetted aluminium.

Some other Bristol Fighter parts also made it into the N.27 (**Photo 34**). Unfortunately, I could not find a photograph of an N.27 instrument panel, let alone one of an RFC Nieuport. However, I reasoned that the limited space would be occupied by an A.S.I., cross-level and watch, plus an aneroid (altimeter). The

French would probably have provided the tachometer (rpm indicator) and pressure gauge (petrol tank) built into the plywood corner gussets.

Final items are the British-pattern windscreen (similar to that of the Avro 504) and the pilot, a deserter from my Pfalz, one Herman-the-German, standing (sitting) in for Captain Kick of the RFC (**Photo 35**). Note the air intake tube on the side is incorrectly shown cut-off square as on the N.17. For the 130 hp Clerget installation, this should be cut off at an angle, facing forward, to provide ram air to the engine.





The incidence of the lower wing on all the 1.1/2-wing Nieuports was readily adjustable via a clamp at the lower V-strut. This was covered by an aluminium fairing which is reasonably obvious (Photo 36), but the 'trouser' added on the top is usually not visible in three-views and photographs (Photo 37), where it is covered by the wing tip.

The completed model shown here came out at just under 7 kg. which was lighter than I had hoped. With no added lead, it balanced just forward of the aileron cranks in the centre section, which I think is about right.

Flying

At such a light weight and with excess power available, caution needs to be exercised on take-off. Just hold in a little right rudder and very slowly increase revs while holding in full back stick. Once moving, ease the stick forward to keep the model running along the ground and lift off with about 1/3rd throttle, keeping straight with rudder.

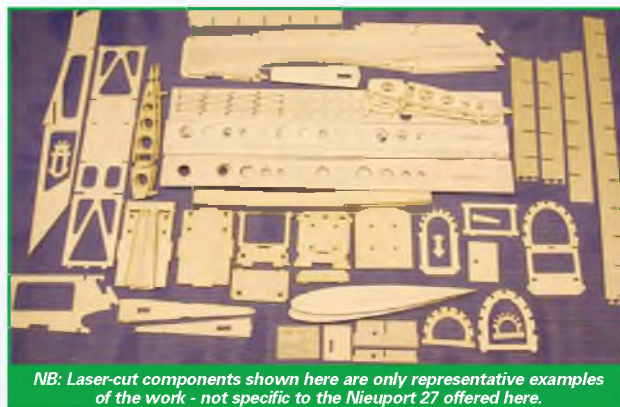
Normal flying and sedate manoeuvres, such as a barrel roll are executed with 1/3rd to 1/2 throttle. At low speeds, use a little rudder in turns to assist the ailerons. Full throttle is only used for vertical manoeuvres, such as the Loop, Half-Cuban and the Immelmann Turn. In fact, the N.27 is the only WW1 Scout model in my stable, which will perform a regulation Immelmann Turn. The others will usually run out of speed and fall out of the half roll - not surprising, given that most have wing incidences of about five degrees,

My model Nieuport 27 has the upper wing at a true-scale two degrees and I have set the lower wing at zero. Thus, there is no pitch-up when the throttle is opened in the air. The two degrees right thrust seems about right and the Loops are satisfyingly round, straight and easy.

The elevator is set down two degrees for level flying.

Take-Offs and Landings MUST be initiated straight into-wind and that short fuselage means that it has a steep nose-up attitude at rest, so land level on the wheels, at minimum speed and use rudder to keep it straight during the roll-out. For preference, operate off short grass strips, rather than hard runways.

Happy Landings!



NB: Laser-cut components shown here are only representative examples of the work - not specific to the Nieuport 27 offered here.

PLANS AND CUT PARTS SETS

for the NIEUPORT 27

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TYPE HISTORY

With pictures from the HARRY WOODMAN Collection

Nieuport 27

Arguably the most elegant of its kind, the Nieuport 27 was of the line of this French-designed sesquiplane series of WW

BELOW: Caption Wendell W. Rogers MCV of No.1 Squadron in his RFC Nieuport 27. This good close-up shows the machine armed only with the Lewis Gun on a Foster mount. The fittings for a Vickers can be seen under the Aldis sight.

RIGHT: Another RFC N.27, also probably of No.1 Squadron RFC, flown by 2nd Lt. F.G. Baker, who became a P.O.W.



the last
N1 fighter types

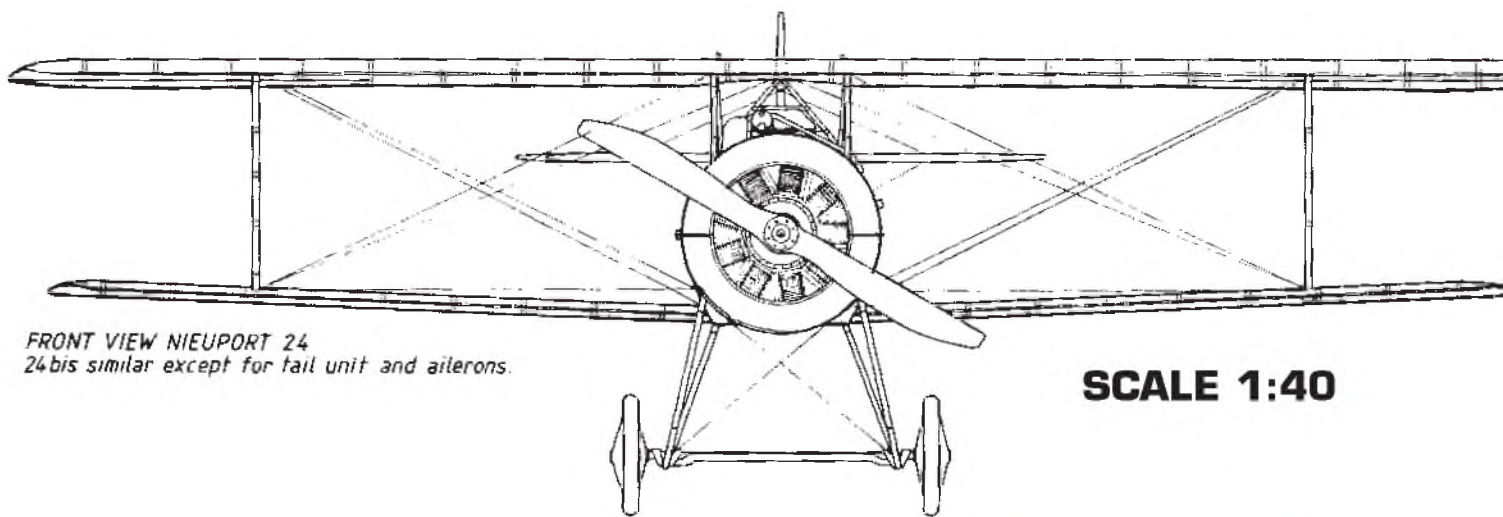
The Nieuport 27 represented the last of a design configuration that commenced with the Nieuport 10 in 1915, introducing the distinctive sesquiplane wing configuration in which the lower wing of this biplane layout was no more than 50% of the area of the upper wing. The most practical value of this layout was the improved downward view for the pilot, since the ability to be able to spot and keep the enemy in view during combat is crucial. The layout also produced the 'V-strut' interplane bracing, which was also such a prominent feature of this line of Nieuport fighters.

The Nieuport 27's shape closely followed the form of the N.24 in which the flat, slab sided fuselage, typical of the Nieuport 11 and 17 fighters was replaced by a semi-rounded rear fuselage and semi-rounded wing tips and ailerons. This curved outer fuselage surface was achieved by applying the necessary formers down the rear fuselage over the basic box structure, over which, stringers were run in the manner we would do for our models.

In addition to the rounded rear fuselage section, the Nieuport 27 had an elegant, curved tailplane shape that further enhanced its aesthetic appeal. First applied to the Nieuport 24, this tailplane configuration initially produced some intense flutter problems that, eventually, were only solved by applying tailplane-to-fin bracing wires that the new shape and structure had been introduced to eliminate. But that led to prolonged delays to service entry, the initial fix for which, on the N.24 was the reversion to the square-cut, braced tailplane shape of the Nieuport 17 to produce the Nieuport 24bis.

Thus, the Nieuport 27 did not come into service with the French *Aeronautique Militaire* or the Royal Flying Corps until December 1917/January 1918. Some Nieuport 27s were used operationally, armed either with a synchronized, fuselage-mounted Vickers machine gun (in French service) or a Lewis Gun mounted on a Foster mounting on the top wing (in British service). Two guns were occasionally fitted, but this had a severe effect on performance, which was, at best, little better than that of earlier models.

But by that time, more advanced types, including the SPAD XIII and SE5a were well established among front-line squadrons and most Nieuport 24/27 fighters



FRONT VIEW NIEUPORT 24
24bis similar except for tail unit and ailerons.

SCALE 1:40

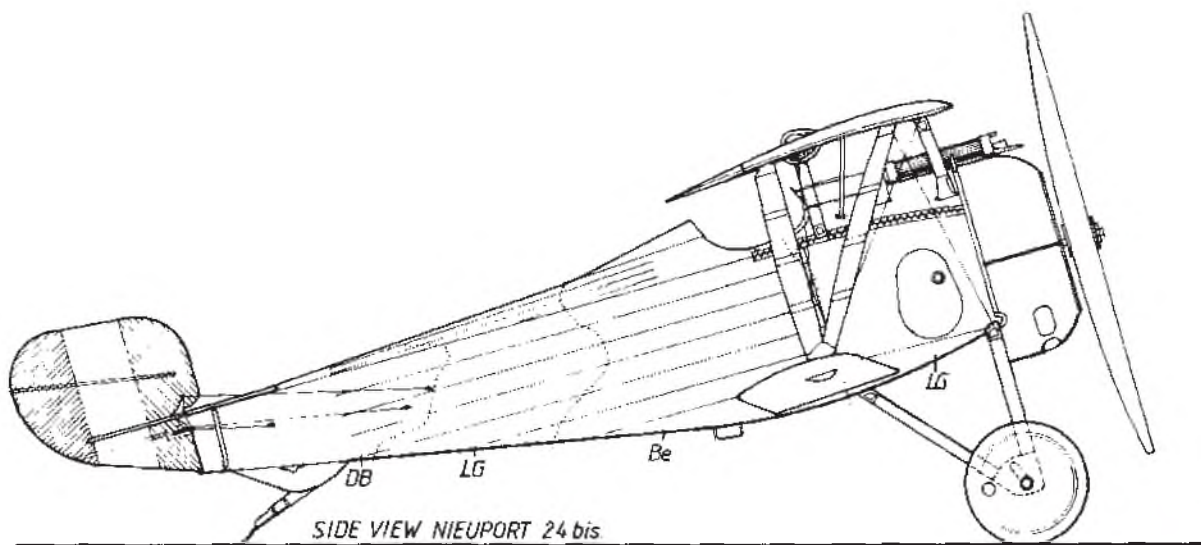


LEFT: The captured Nieuport 27 of 2nd Lt. F.G. Baker of No.1 Squadron RFC, clearly 'under new management'! Since the aircraft appears in good condition throughout, the most likely cause of both aircraft and pilot ending up in enemy hands was probably engine failure.

BELOW: The Nieuport 27 was the last of the 'V-Strutter' Nieuports. This example is a trainer at an unknown French unit.



PLAN V

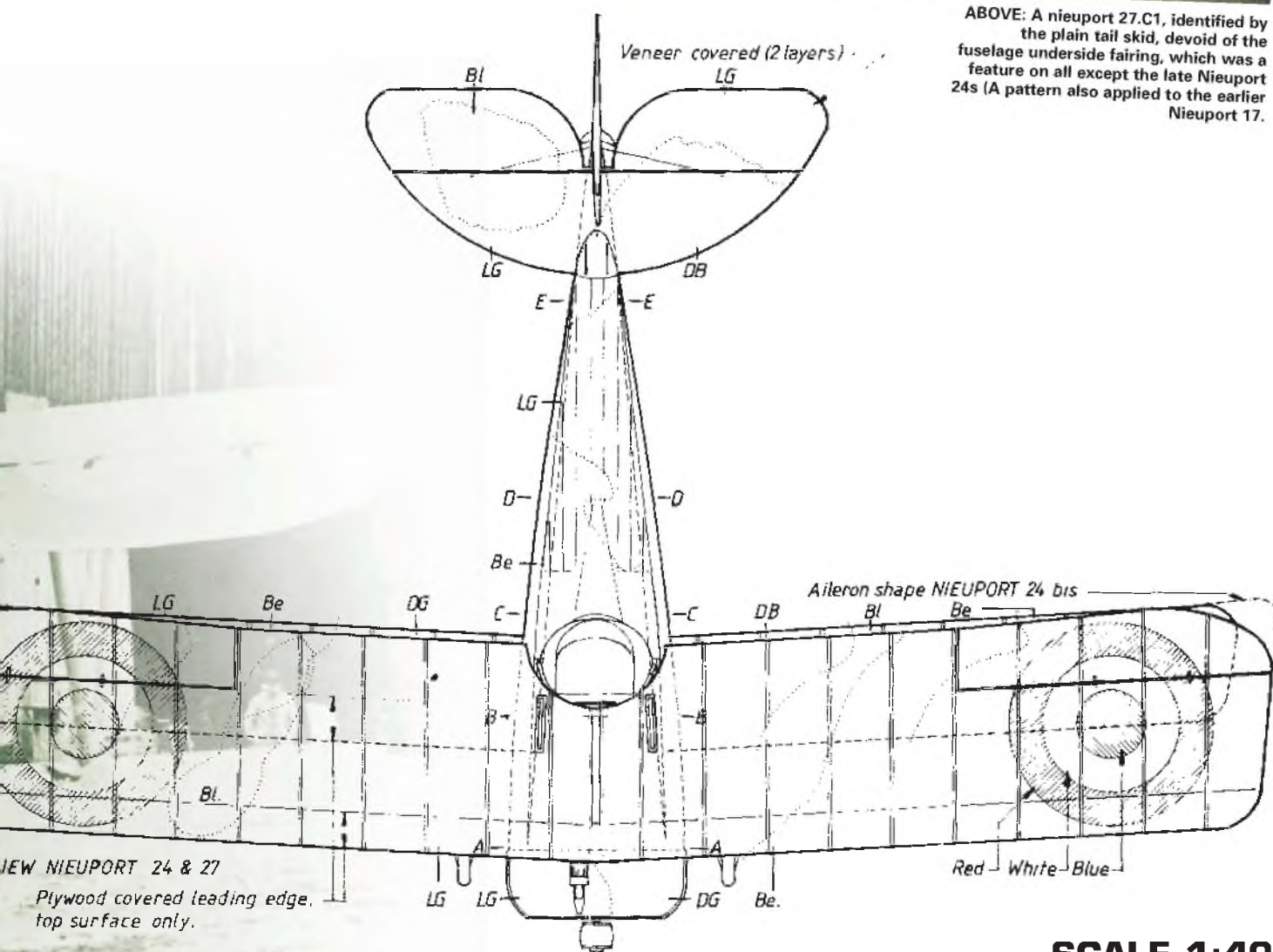


were actually used as advanced trainers, the specified 130 hp Le Rhône Rotary engine of the 24bis, being often replaced by a 110 or 120 hp version.

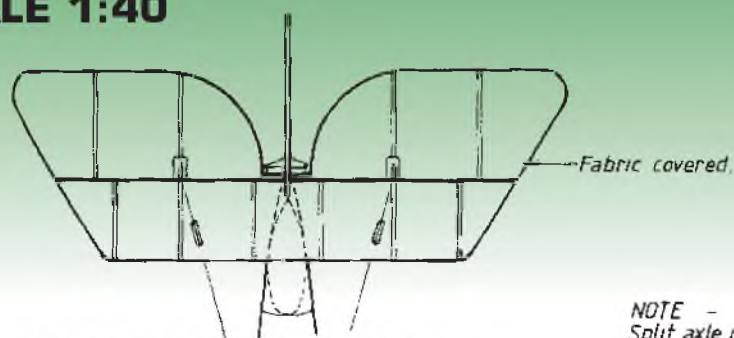
The type was supplied to Italy, and built there by the Nieuport-Macchi Company at Varese, but the Italians regarded it less favourably than the Belgian Hanriot HD.1. Approximately 120 Nieuport 27 aircraft were bought for the United States Army Air Service for use as trainers in 1918, while other operators of the type included Japan, Russia/USSR, Uruguay and Poland, to where a single example was supplied in 1919. ■



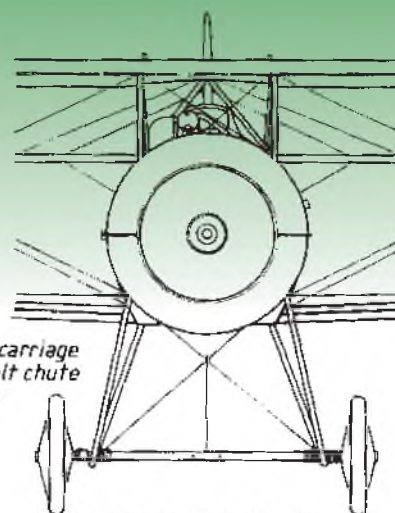
ABOVE: A Nieuport 27.C1, identified by the plain tail skid, devoid of the fuselage underside fairing, which was a feature on all except the late Nieuport 24s (A pattern also applied to the earlier Nieuport 17).



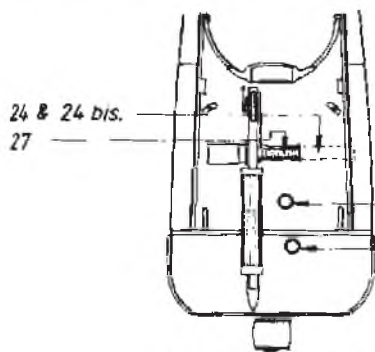
SCALE 1:40



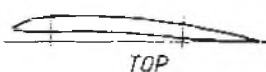
PLAN VIEW NIEUPORT 24bis TAIL PLANE



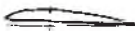
FRONT VIEW NIEUPORT 27.



DETAIL NIEUPORT 27.



TOP

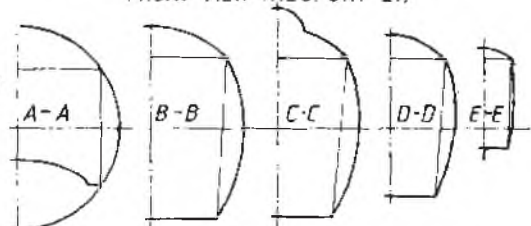


BOTTOM

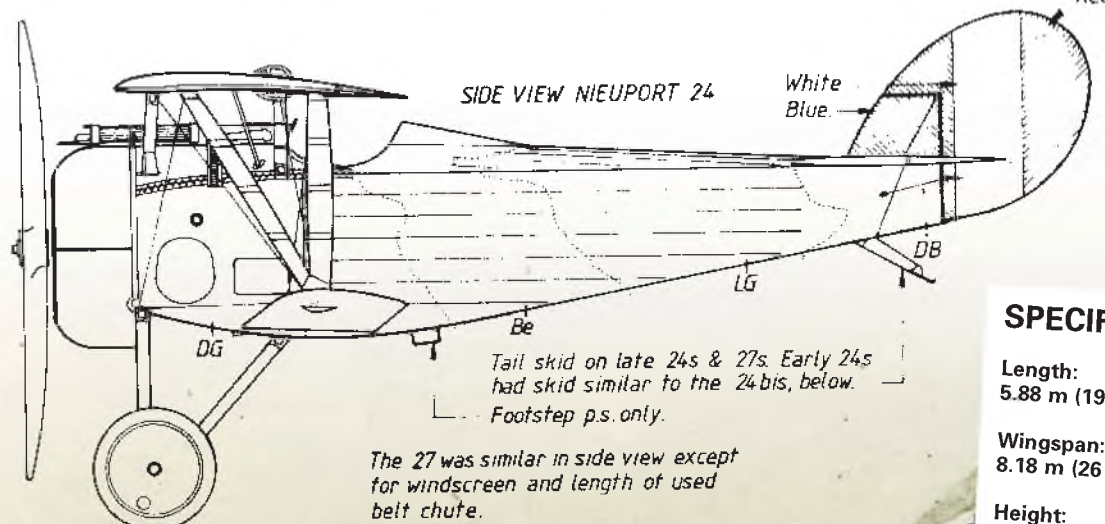
WING SECTIONS.

Fuel. Cowling & cowling panels were similar on all 3 types.

Oil. Lewis gun could be mounted over the top wing.



FUSELAGE SECTIONS



SIDE VIEW NIEUPORT 24

Tail skid on late 24s & 27s. Early 24s had skid similar to the 24bis, below. Footstep p.s. only.

The 27 was similar in side view except for windscreen and length of used belt chute.

SPECIFICATION

Length:
5.88 m (19 ft 31/2 in)

Wingspan:
8.18 m (26 ft 10 in)

Height:
2.44 m (8 ft)

Powerplant:
1 x Le Rhone Rotary,
90 kW (120 hp)

Maximum speed:
187 km/h (116 mph): 5,550 m
(18,200 ft)

Armament
(French/Italian service): 1 x syn-
chronised Vickers machine gun
(British service): 1 x Lewis gun on
Foster mounting on upper wing



An example of the Nieuport 27s of the United States Air Service. Most of approximately 120 supplied were used as trainers.

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Sole remaining example of this 1930s racing and aerobatic biplane restored to pristine condition.

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The distinctive back-staggered 1930s biplane with retracting undercarriage.

BELL P-39Q AIRACOBRA - (130 images)

Superbly restored example of this much maligned WW2 fighter aircraft, that was used with great success by Russian forces in the ground attack role and with saw much action in the south Pacific, from where this restored example was recovered.

BLERIOT MONOPLANE - (74 images)

The Shuttleworth Museum's machine, the oldest original example still flying. Much close-up detail showing all the exposed rigging, structure and the 'bedstead' main undercarriage, plus Anzani engine.

BOEING PT-13/17 STEARMAN - (54 images)

Subject aircraft is a current British civil register example used for airshow displays.

BRISTOL BULLDOG - (60 images)

This collection depicts the example assembled from two donor airframes and restored to superb standard by Skysport Engineering. It can now be seen at the Royal Air Force museum, Hendon.

BRISTOL F2B 'BRISFIT' - (28 images)

Full close-up detail, including photos of engine cowls, for both Rolls Royce Falcon and Hispano-Suiza engines.

NEW... BRISTOL M.1c - (100 images)

Early WW1 fighter monoplane. Example depicted is the faithfully authentic replica built by the Northern Aero Works and operated by the Shuttleworth Trust museum.

BUCKER BESTMAN - (43 images)

Authentic example as exhibited at the Fantasy of Flight museum in WW2 Luftwaffe colour scheme.

BUCKER JUNGMEISTER - (79 images)

Radial engine version. Example from Fantasy of Flight museum.

CHANCEVOUGHT F4U-1D CORSAIR

(132 images)
The famous 'bent wing bird' and super detail.

NEW... CHILTON DW1 - (90 images)

Original upright engined version of this diminutive British low wing sports/racer.

CHRISLEA SUPER ACE - (123 images)

Late 1940s civil light aircraft with distinctive twin fins and nosewheel type undercarriage. A fully restored example.

CHRISTEN EAGLE - (90 images)

The spectacular, stylish aerobatic biplane revealed in close-up. Example shown is the two seat version.

COMPER SWIFT - (91 images)

1930s racing aircraft. Example depicted is the radial engined example at Shuttleworth Museum.

CURTIS HAWK 75 - (130 images)

The 'export' version of the Curtiss P-36 that saw service in during WW2 with Finland and during the 'Battle of France' in May/June 1940. Example shown is a combat veteran.

CURTIS JN-4 'JENNY' - (130 images)

An authentic, restored example in full detail

NEW... CURTIS P-40B TOMAHAWK

(130 images)
Rare, full restored example of the early version of the Curtiss fighter aircraft that was at Pearl Harbour on Dec. 7th 1941 - and survived the attack!

CURTIS P-40N - (100 images)

One of the later versions of the famous Curtiss Warhawk, the WW2 fighter aircraft that saw service in just about every combat theatre of operations.

De HAVILLAND DH84 DRAGON - (40 images)

Forerunner of the more famous DH 89 Dragon Rapide, this collection depicts a superbly restored example.

De HAVILLAND DH89 DRAGON RAPIDE - (100 images)

Graceful twin engine biplane airliner that saw service from pre-WW2 through to the mid 1950s. Several are still flying and three are shown in this picture collection.

NEW... De HAVILLAND DH 53 - (60 images)

1920s lightweight low wing sports aircraft designed to a low-power specification. Machine illustrated is the sole remaining example.

NEW... De HAVILLAND DH 60 - (140 images)

The aircraft that set the British 'club' flying movement on the road to success during the 1930s.

DH TIGER MOTH - (110 images)

Much close-up detail of civil register example, plus further detail of the IWM Duxford's example in Royal Navy trainer colours, showing the blind flying hood.

DHC CHIPMUNK - (70 images)

A bumper bundle of images that provides a vast array of detail pictures, plus photos of examples in both RAF trainer and civil colours.

ERCO ERCOUCPE 415 & AVALON ERCOUCPE (115 images)

The elegant twin finned light/sport aircraft. Both original Type 415 and later Avalon resurrection examples.

FAIRCHILD RANGER - (60 images)

Elegant U.S. high wing light aircraft in full detail. Two examples shown.

FIESELER STORCH - (90 images)

Arguably the first military STOL aircraft, this stalkey looking aircraft has long been a modellers' favourite. Two examples are represented, the machine at the Fantasy of Flight Museum, Florida and the RAF Museum Cosford's example.

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SUBJECTS FOR SCALE



MORANE SAULNIER MS406

Defender of France during the dark days of mid-1940, this pugnacious little fighter is a worthy subject for scale fans looking for something 'different'

By the mid-1930s aircraft manufacturers and air forces in general were fully aware that there was simply no further mileage in the two/four-gun fighter biplane configuration that had dominated air-power thinking for a decade and a half.

Thoughts among all involved were, by then, concentrated on the cantilever winged monoplane coupled to a new generation of more powerful engines, with a clear leaning (though not exclusively) toward in-line, liq-

uid-cooled engines in a quest for all possible airframe drag reduction.

In France, both their Air Force (*Armée de l'Air*) and their fighter-orientated aircraft designers and manufacturers were no different. Among them, *Aéroplanes Morane-Saulnier* had been at the forefront of combat aircraft development and construction from the very beginning and so, were well placed to take up the challenge of a new fighter aircraft specification issued by their Air Force in 1934 for a modern interceptor that would





SPECIFICATION

LENGTH:	8.17 M (26 FT 9 IN)
WINGSPAN:	10.62 M (34 FT 10 IN)
HEIGHT:	2.71 M (8 FT 10 IN)
WING AREA:	17.10 M ² (184.06 FT ²)
POWERPLANT:	HISPANO-SUIZA 12V 31 LIQUID-COOLED V-12, 6 40 KW (860 HP)

PERFORMANCE

MAXIMUM SPEED:	486 KM/H (303 MPH) AT 5,000 M (16,400 FT)
RANGE:	1,000 KM (620 M)

ARMAMENT

1 X 20 MM HISPANO-SUIZA HS.404 CANNON
2 X 7.5 MM MAC 1934 MACHINE GUNS



replace the fixed-wing, fixed-spatted undercarriage, open cockpit Dewoitine D.500, Loire 150 and retracting U/C Nieuport 161.

At stake was a 1,000-example production contract as France, along with other European nations prepared for the perceived inevitable confrontation with Nazi Germany.

The Morane-Saulnier response was their M.S.405, powered by a Hispano-Suiza HS 12Y in-line engine, first test flown in August 1935 with fixed undercarriage, which was quickly replaced by a fully retracting system after initial testing.

The new aircraft displayed excellent flying characteristics and test flying continued after installation of full military equipment, so that in 1937, this pugnacious looking little fighter was selected from five competing designs for production and service with the Armée de L'Air.

The M.S.405, the physical characteristics of which therefore defined the M.S. 406 that quickly followed was, by later WW2 standards, a very small aircraft, the product of typical European thinking of the time with the emphasis on low air-time endurance, optimised for metropolitan defence, in the same manner as the British Hawker Hurricane, Supermarine Spitfire and Messerschmitt Bf 109 D/E. The M.S. 405/6 was also, by comparison with these other three, seriously under-armed.

Nevertheless, it offered what was, at the time, a good performance for a fighter aircraft, with 250 mph at ground level, 304 mph

in level flight at 13,000 ft and capable of being dived at 450 mph.

For all that, the '405 was no more than the progenitor of the M.S.406. Only 15 examples of the former were produced before giving way the M.S.406 in the Spring of 1938, using the Hispano Suiza HS 12Y 31 'moteur-canon' engine which incorporated a Hispano-Suiza S9 or HS 404 20mm calibre canon firing through the crankshaft. With 60 drum-fed explosive shells, this centre-line location imparted a 'point-and-squirt' aim devoid of the requirement for range harmonisation, although this remained necessary for the twin, wing-mounted 7.5mm machine guns.

M.S.406s began reaching the squadrons of the Armée de L'Air in December '38/January 1939, with a steady build-up during the following months, so that just prior to the commencement of WW2, 10 fighter groups were so equipped in metropolitan France.

During the 'phoney-war' period from September '39 to May '40 the M.S.406 was the mainstay of the French fighter arm as the service awaited delivery of Curtiss Hawk 75 (P-36) fighters from USA to supplement fighter strength. M.S.406 action during this period consisted largely of reconnaissance escort duties and reconnaissance interception as both sides probed opposing defensive lines and a certain amount of 'mixing it' with Messerschmitt Bf 109s took place with losses on either sides.

All that changed with the thunderclap that descended across France's eastern

boarder on May 10th 1940. In the following six weeks, culminating in the Armistice that came into effect on June 25th, the M.S. 406s of the Escadrille of the Armée de L'Air gave battle where-ever and whenever they could against a background of fall-back, disorganisation and lack of air raid early warning of the kind newly installed (and still secret) in Britain.

Further service

In the aftermath of the German victory in France, in 1940, Germany scooped up whatever M.S.406s became immediately available, for use as trainers in Luftwaffe service. One wonders how trainees transferring from the conveniently wide undercarriage of the M.S.406 fared with the deadly narrow track of the Me 109?

Under the terms of the 1940



Franco-German armistice, southern France remained 'free' under its Vichy administration and M.S.406s continued in Vichy service further afield, in French overseas possessions in North Africa and in Syria. M.S.406s also found their way to French Indochina (now Vietnam) and were used in a frontier war with

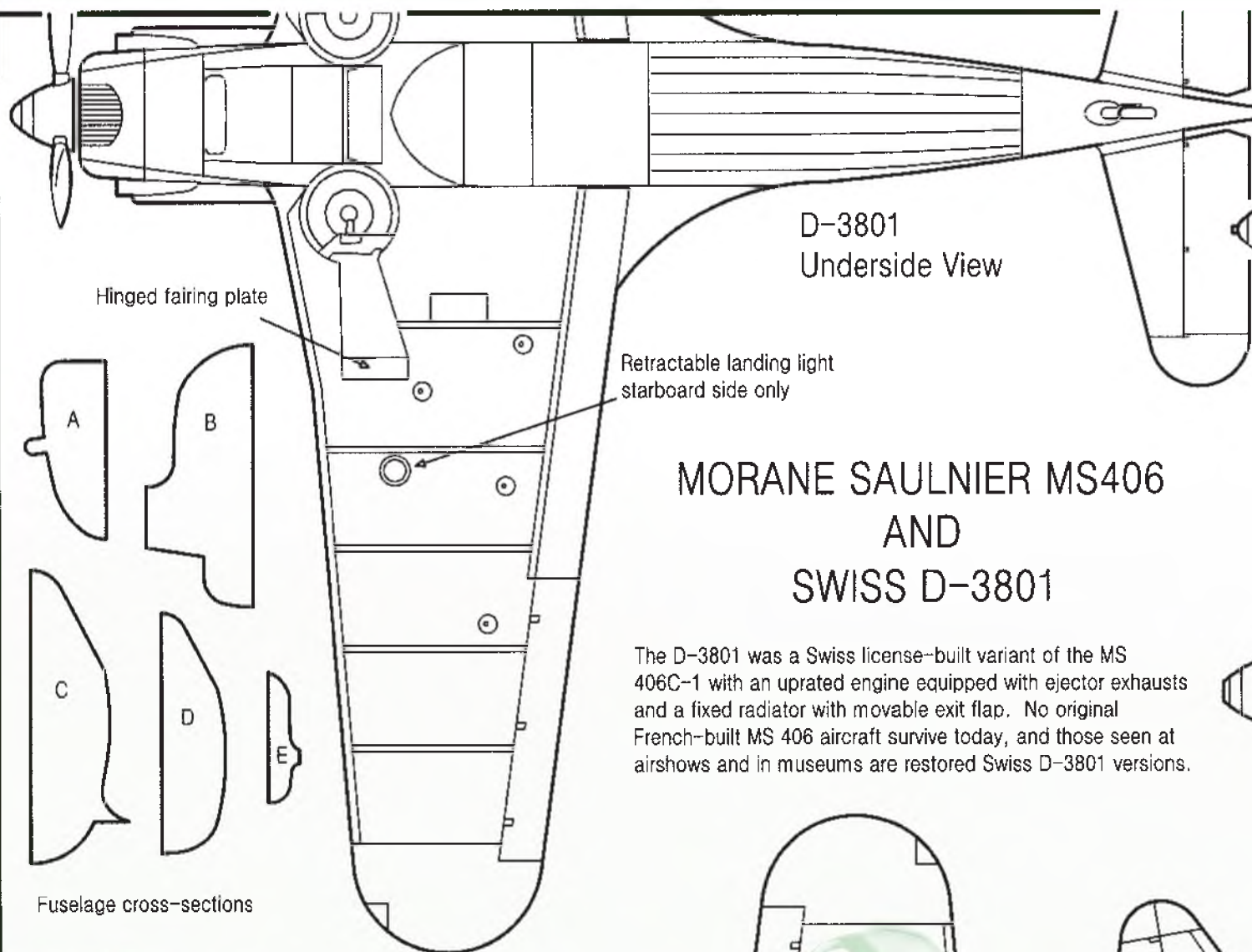
Thailand until, after French withdrawal, some wound up with the Thai Air Force.

Finland received 30 M.S.406s from France in early 1940, plus a further 46 and 11 of the later M.S.410s in 1943 from Germany. Turkey received 45; while Bulgaria took 20 and a few also went to Italy.

Switzerland built a specifically developed version under licence in a number of variants of the type designated D-3800/3801/3803, completing a total of 224, including 17 assembled from spares during 1947/8, although by then, the type was only in service as a trainer type. ■

The aircraft depicted here is actually a Morane Saulnier D-3801, a Swiss manufactured version built under licence. The most obvious differences from the MS 406 are the radiator air intake that extends ahead of the wing leading edge, and the tailwheel unit, that replaces the fixed skid of the MS 406.





MORANE SAULNIER MS406 AND SWISS D-3801

The D-3801 was a Swiss license-built variant of the MS 406C-1 with an uprated engine equipped with ejector exhausts and a fixed radiator with movable exit flap. No original French-built MS 406 aircraft survive today, and those seen at airshows and in museums are restored Swiss D-3801 versions.

LEADING PARTICULARS

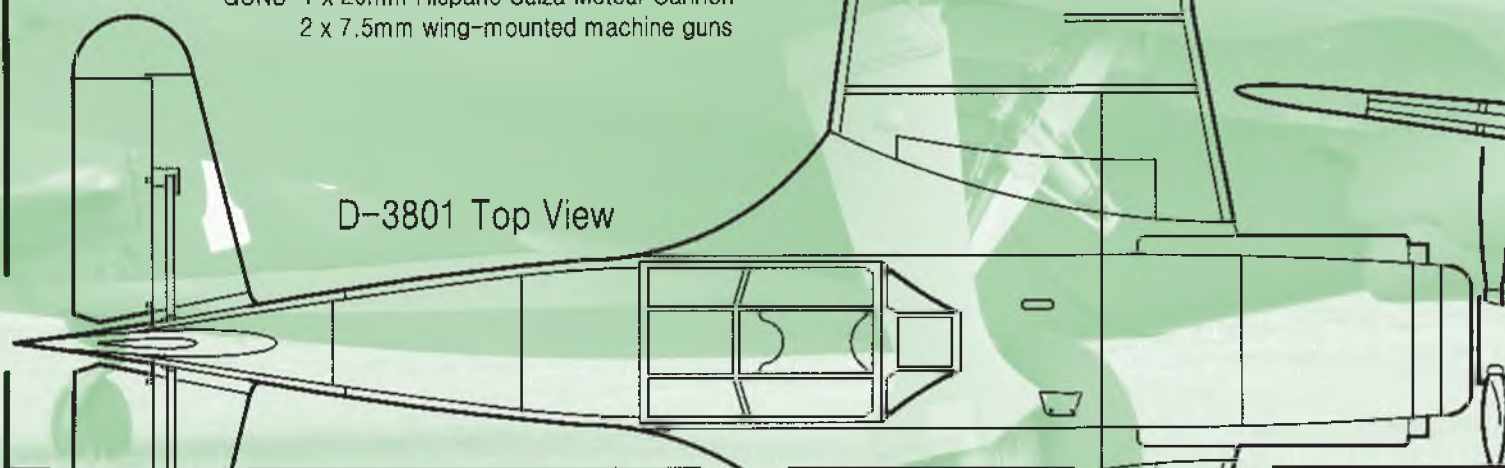
WING SPAN	34ft 10in
LENGTH	26ft 9in
WING AREA	184sq ft
EMPTY WEIGHT	4173lb
NORMAL LOADED	5348lb

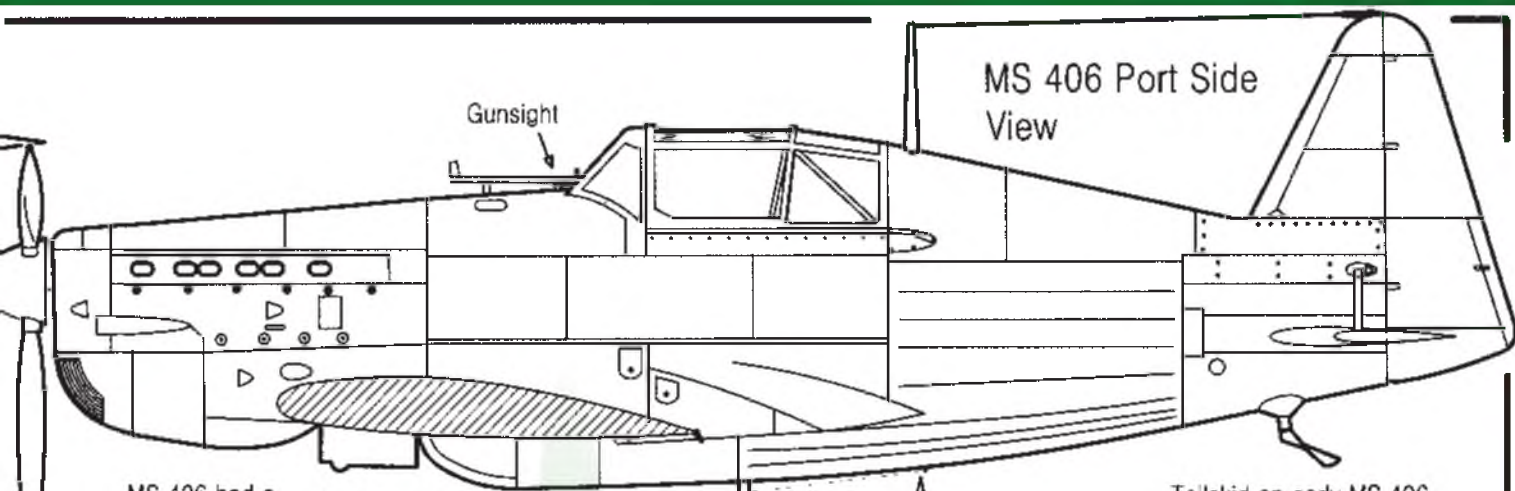
MS 406: Engine 860hp Hispano Suiza 12Y31 V-12
Max Speed: 303mph at 16,400ft

D-3801: Engine 1060hp Hispano Suiza 12Y51 V-12
Max Speed: 332mph

GUNS 1 x 20mm Hispano Suiza Moteur Cannon
2 x 7.5mm wing-mounted machine guns

D-3801 Top View

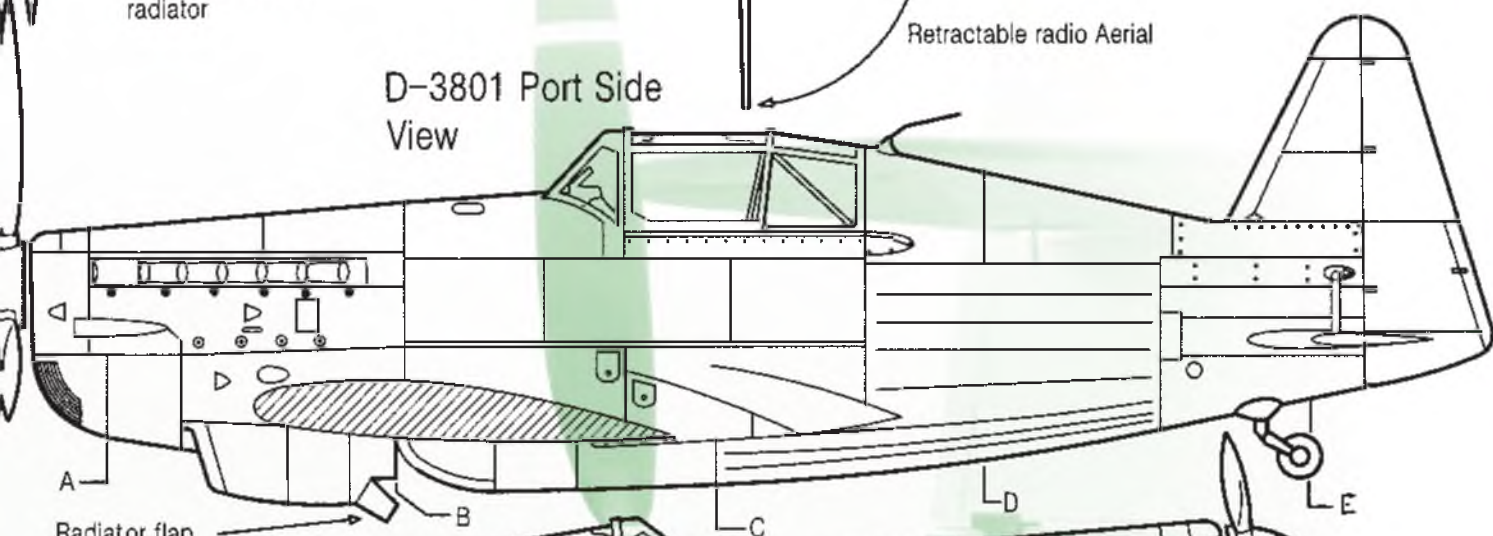




MS 406 had a retractable coolant radiator

Tailskid on early MS 406

Retractable radio Aerial



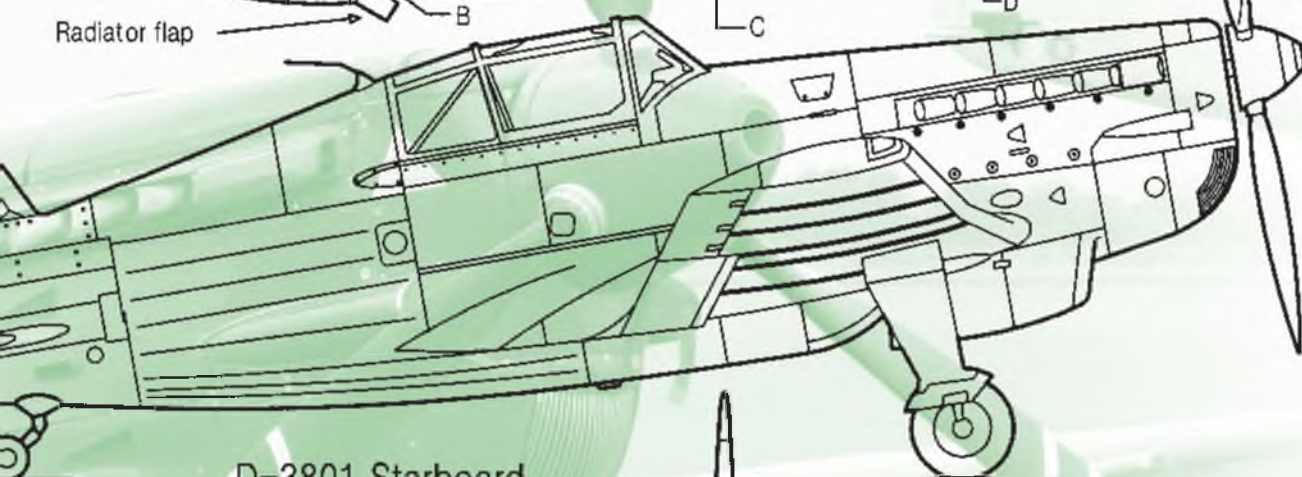
A
Radiator flap

B

C

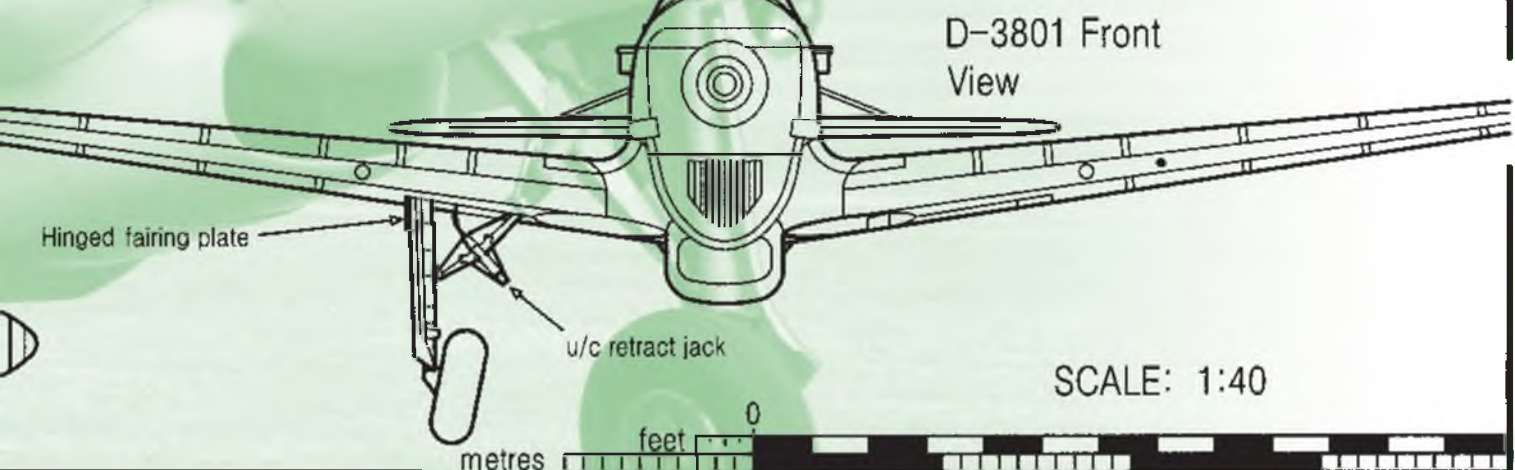
D

E



D-3801 Starboard Side View

D-3801 Front View



Hinged fairing plate

u/c retract jack

SCALE: 1:40

metres 0 feet

IN DETAIL

MORANE SAULNIER MS406

THE SUBJECT OF THIS DETAIL STUDY IS ACTUALLY A SWISS-MADE D-3803 VARIANT RATHER THAN AN M.S.406. BASED IN SWITZERLAND AND SUPERBLY RESTORED TO FLYING CONDITION, IT IS A REGULAR PERFORMER AT THE ANNUAL FLYING LEGENDS AIR SHOW AT DUXFORD.



1: Panel line and sliding cockpit canopy rail detail.

2 & 3: Deep wing-to-fuselage fairing. Note tread panel both sides.

4: Further close-up showing the enclosed cockpit canopy guide rail.

5 & 7: Front and rear cockpit canopy sections. Note the crash pylon added to aircraft after initial landing accidents.



4



5



6



7



8

8: Complete tailcone. note the rivet lining and partial fabric fuselage covering.

9: Detail of the fairing over the upper tailplane strut anchor point.

10: fairing over rudder control cable which doubles as an access panel.



9



10



11: Detail of the metal surface fairing panel over fin-to-fuselage attachment. 12: Radio mast atop the rudder/fin hinge line.
13 & 14: Forward fuselage, showing panel detail and exhaust stack. 15: Front spinner - note the hole for the 'moteur-cannon' aperture.
16: Front fuselage detail, revealing air scoops and vents, plus engine access panels.





17



18



19



20

17: View of lower half of the engine cowl.

18 & 19: Two views of the radiator air scoop. This is the unit as applied to the Swiss-made D-3803 version in which the intake extends ahead of the wing.

20: Main undercarriage door and wheel.

21: Main undercarriage locking strut - an unusual arrangement.

22: Main undercarriage wheel well.

23 & 24: Main undercarriage wheel and wheel hub detail.



21



22



23



24



25: The tailplane-to-fin bracing strut. 26: Close-up of the tailplane-to-fin strut lower anchor point. Note also the elevator hinge bracket.
 27: Tailplane tip, showing the aerodynamic balance.
 28: The tailwheel unit. Note; French-built M.S.406s had tailskids, but this is a Swiss-built D-3803 variant.
 29: A further view revealing panel lines along the fuselage centre section and the wing-to-fuselage fairing and landing flap internals.





30



31



32



33

30 & 31: Two views of the retractable landing light hinged on the underside of the left wing.

32: Close-up of the rear of the rear extremity of the wing-to-fuselage fairing.

33: Aileron on right wing panel. The flap is partially extended, which is why it looks as though the aileron trailing edge extends aft of the wing trailing edge.

34: Wing leading edge showing the pitot head (in safety cover), gun port and leading edge spoiler.

35: Another view of the wing flap, showing the internal rib formation.



34



35



G.C.III/1, 6TH ESC.
[SPA 93]



AIRCRAFT NUMBER
MARKED OVER SERIAL
ON FUSELAGE SIDE

MORANE SAULNIER
ESCADRILLE (SPA
NORRENT-FONTES



RUDDER STENCIL DETAILS

MORANE SA
Flying



M.S.406, NO. 101, OF GROUPE DE CHASSE G.C.III/1, 6TH
1933; ON 10TH MAY 1940 THIS UNIT WAS BASED AT
FRANCE, IN SUPPORT OF THE VIITH LAND ARMY.



PYLATIER 406
Colours

M.S.406 NO. 597 FLOWN BY ADJ. PIERRE LE GLOAN OF
G.C.II/6, 5 ESCADRILLE; APRIL 1940.



M.S.406 NO. 989, G.C.II/3, 3/4 ESCADRILLE; APRIL 1940.



M.S.406 NO. 132 FLOWN BY COMMANDANT MAURICE
ARNOUX OF G.C.III/7, 6 ESC; JUNE 1940



M.S.406 NO. 461, FIGHTER TRAINER, VICHY AIR FORCE;
AULNAT, FRANCE, 1942



M.S.406 NO. 1047 FLOWN BY LT. BURZYTYN OF G.C.II/2
(EXPATRIATE POLISH PERSONNEL); 25TH JUNE 1940.



M.S.406 NO. 270 OVERHAULED AT S.N.C.A.S.O. CHATEAUROUX,
1941, FOR DELIVERY TO FINNISH AIR FORCE.



M.S.406, HLELV 28, FINNISH AIR FORCE;
CONTINUATION WAR



PILATUS BUILT D.3801 OF SWISS AIR FORCE, MAY 1945.



M.S. 406, TURKISH AIR FORCE.



SCALE IN ACTION *by Alex Whittaker*

Richard Crapp's Ryan PT-22 on a fell swoop.



Alex Whittaker takes



Boisterous Barkston!

With his camera to the BMFA 2011 Scale Nats

The auguries for the 2011 Scale Nats did not appear good. Barely an hour before the gates opened I only just managed to spring my best camera out of digital hospital. This was a great relief. Also, although the weather forecast was iffy, it turned out to be windy and cool. In

fact, apart from torrential rain overnight, it stayed surprisingly dry throughout the competition days. Only about an hour was lost all weekend due to strong winds, an amazing outcome under the circumstances.

Twin-track approach

There are actually two BMFA Scale Nats

Comps, held side-by-side: 'Flying Only' and 'F4C'. ARTFs are eligible in the former, but not in the latter. F4C is the senior competition, for build-it-yourself, highly accurate scale model aircraft. This two-track approach seems to be working well, though the BMFA Scale Technical Committee have now advanced well con-



Richard Crapp cranks up his PT 22 assisted by SAA Scale Ace Alex Kennedy.



Jim Reeves' Weddell-Williams Racer is electric powered - and fast.



Tim Ruck starting his superb 70" span / 13 lbs / Laser 150 powered Martin Baker MB5.



Tim Rucks's Martin Baker MB5 - a stunning performer, with jet-like looks.



Ace scale pilot Mike Sollitt's flew this ARTF Trojan in Flying Only.



Dickie Scarbrough entered Flying Only with his ARTF Thunderbolt and placed third.

sidered plans to adjust the rules to reflect the new realities of the ARTF age.

As usual in a photo report, I'll let the images tell the story, but one or two models are worthy of comment in print.

Fly Baby Biplane

The first new model I saw caused me to do a double-take. I was told it was a Fly Baby Biplane, but it was unlike any I have seen before. It was too curvy, and had a radial engine, rather than the normal inline job. However, Dutch visitor Bert van Eijk assured me it really was a Dutch home-built Bowers Fly Baby 1B. This is a beautiful model, of 1.8m span, built to

1:3.6 scale, and powered by a Laser 150. The model was scratch-built by Bert to his own design. Bert also made the superb dummy engine. Look at the pictures and judge for yourself just how pretty this model is in the air.

Mick Reeves Spitfire

Mick Reeves is as creative as ever. He and his industrious son Jim had brought their new Spitfire, which is available in parts, or as a full kit. In tune with the times, this Spit is electrically powered. It is built to 1/4 scale, with a grp fus. The urge comes from a 7kW motor, driving a 24"x12" prop, with a 12S / 10Ah battery. The battery

alone weighs 3kgs, with a model AUW of 15.5kgs. The model also has electric retracts. Fit and finish are superb. When it came to the flying, it sounded very, very, good. In fact its prop noise alone proved surprisingly convincing.

Fairey III

Martin Fardell has the knack of producing large, impressive, and characterful models every year. Also, when it comes to flying in duff weather, he has no fear at all! His latest masterpiece was a wonderful Fairey III F. This is scratch built, to 1/4 scale, and Laser 360V Twin powered. At a distance, at first I thought it might be some sort of

One of the best model aircraft you will ever see, Mick Henderson's new DH9a. Just stunning.



Norwegian visitor
Per Iverson's very
smart Stearman.



Jeremy Collins' nifty electric powered BAC Swallow 2. Built to 1/4 scale, 128" span, and weighs 27lbs (12.5 kgs).



John Carpenter's very fine Bulldog T Mk 1. Built to 1/4 scale, and Laser 180 powered. Excellent flyer.



Popular annual visitor, Gert Rutten's own-design Beech TC-35 twin. Built to 1:5.5 scale, powered by 2 x Saito FSR 91s.

Hawker Hart, but the proportions seemed unusual. It looked a bit too long, and not as finely figured at the cowl. Up close it was clearly a very different beast - and what a model! I really loved this model aeroplane. It's a wonderfully large biplane, which confounded us all by handling the appalling gusts with ease. I instantly noticed the flaps on both top and bottom wings, put there for carrier operation. In addition, I loved the authentic sound that Martin coaxes from his engines. She sounded just right.

DH9a

Mick Henderson was campaigning his all-new Airco DH9a. She is built to 1/4 scale, Laser 360 powered, and uses many epoxy glass mouldings to keep her flying weight down. She weighs in at 14.7 kgs. Her fit and finish comfortably exceed what one might expect from a top museum static exhibit. On top of this, she flies with all the weight and authority one would expect from an instrument of Imperial power. It is no surprise that she won the Scottish Nationals in August 2011. I urge you to see this aircraft. She is easily one of the very best I have seen in over 50 years of scale gawping. In addition, the 'office' is a cockpit fancier's delight.

Goldby Dolphin

We lost Mike Goldby recently. Mike was one of those people who are net contributors to our hobby; the types who put in more than they take out. The British aero-

modelling hobby in general, and UK scale modelling in particular, owe him a debt that sadly cannot now be repaid. So, I was delighted and touched to see Mike's exquisite Dolphin being flown again by his friend Ian Pallister. This is a highly detailed and very attractive model that performs very efficiently indeed. She spans 98", is built to 1/4 scale, and is powered by a Laser 300V turning a 20"x8"

wooden propeller. She weighs in at 13.5 kgs.

It was good to see the Dolphin and reflect on Mike as a man. The last time I saw him, although very ill, he was conscientiously marking a scale comp. He died just a few days later.

Blackburn Dart

Terry Manley was flying his latest project



Ian Bryant's majestic 27% scale DH 51, Laser 300 V twin powered. Based on the Old Warden example Miss Kenya, the first aircraft on the Kenyan register.



Terry Manley's amazing Blackburn T-2 Dart Torpedo Bomber, built to 1/6th scale, Laser 150 powered. Superb.

plucked from the pages of the Blackburn designs portfolio. His latest masterpiece is an amazing 1/6th scale, Laser 150 powered, Dart T-2. It is a curious shape. Once dubbed the ugliest aircraft of all time, I think that judgement is unduly harsh. It is a characterful and idiosyncratic aircraft, and a stunning modelling subject. Take its nose. It is turned up like a snuffy puppy, whilst its hogs-back fuselage appears to be following an altogether unsympathetic line. I love the copious wire-bracing, the fussy engine exhaust arrangements, and

the thick fuselage. It goes without saying that Terry's models are finished to the highest standards. They also fly well. All-in-all, I reckon that the Dart is a truly superb scale model.

Ryan PT-22

The Ryan PT-22 was the US Army's first non-biplane trainer. Richard Crapp's model spans 111", is built to 1:3.3 scale, and is powered by a Laser 300 V Twin. She is modelled on the Old Warden-based example. Richard achieves very high standards

with all his models, and the PT-22 flies in a very convincing manner. She looked particularly atmospheric on low passes. By the way, the radial engine is superb too.

Spitfire VIII

A distinctive South African liveried Spitfire MK VIII was flown by Dave Cossins. This was built from the celebrated Brian Taylor plan and has Laser 140 power. The light coloured tail was distinctive, always a good thing in a scale event! However, it was the unusual - and documented -



Bert van Eijk's adorable Bowers Fly Baby 1B.



Fardell does it again - another amazing airframe from Martin, this time a fantastic Fairey IIIc.



John Elkington's smart 1/5th scale ARTF Cessna 182. Zenoah 38 petrol power. Excellent in the gusting wind.



Dave Charles (son of the famous Mick) flew his fine Spitfire Laser 150 powered Spitfire Mk IXc, from the Bryan Taylor plan.



The detailing in Mick Henderson's DH9a is just exquisite - far exceeds museum quality.



British Flying Only Scale Champion, Steve Fish just before his winning flight.



Mick Henderson wisely donned these ski goggles to combat the boisterous wind.



Incredible cockpit detailing on the Goldby Dolphin.



Brian Perry's colourful ARTF Hellcat competed in flying only.



Bert van Eijk ponders the engine on his Bowers Fly Baby Bipe 1B.



Distinctive South African liveried Spitfire MK VIII by Dave Cossins, built from the Brian Taylor plan. Laser 140 power. Note undercut on rudder base.



Alex Kennedy's multi-championship winning 1/4 scale / 88" span DH 82a Tiger Moth (SKII). Weighs 7.6 kgs / Laser 180 /Swedish markings.



Peter Mc Dermott's incredibly accurate DH9a floating by.



David Womersley's scratch-built and accurate DHC Chipmunk T Mk 10. Built to 1/4 scale.



David Toyer's immaculate 1/4 scale / Laser 180 powered Miles Messenger. Note triple fins.



Lovely, accurate, 1/4 scale Magister from John K. Thomas. Built to 1/4 scale and Laser 180 powered. Smashing model.



Truly excellent 1/4 scale Sopwith Dolphin built by much-missed Mike Goldby, now flown by Ian Pallister. Laser 300 V twin powered.

undercut on the rudder base that provoked the most comment amongst the assembled Spitfire fanciers.

DH 51

Ian Bryant's divine DH 51 Miss Kenya has appeared briefly in these pages before. This scratch-built model is based on the Shuttleworth example, the first aircraft to be entered on the Kenyan civil register.

She is built to 27% scale and powered by a Laser 300 V twin. Ian flew very well in the difficult conditions, which frankly were grossly unsuited to a large biplane. He turned in consistent flights to reach top place on the podium. Only the two DH9s of Henderson and McDermott achieved higher static scores. We had our F4C Winner.

Verdict

If you left aside the wind, it was a great Scale Nats. There were lots of interesting models and some epic flights. However, one thing is beginning to gnaw at me, and it is not restricted to The Nats.

I reckon this long run of poor weather over the past several summers is taking its toll on Nats attendance. Certainly, ruinously high petrol prices, and general cost inflation are prime issues, but I reckon the perception of poor weather is partly to blame, too. Families reported to me that they are looking at the total cost of atten-



Mick Reeves' latest Spitfire bustling in on final approach, full flap.



Alan Glover's ARTF Black Horse DHC Chipmunk in Flying Only. 84" span, SC 120 FS power.



Peter Fullard's 1/6th scale ARTF T-28 Trojan, Laser V 200 powered. Has 11 servos. Rock steady.



Persil white! Andy Bowman's Stampe SV4B, built to 1/4 scale, from the late 1970's Svenson kit. SC 180 FS power.



Terry Manley's with his Blackburn T-2 Dart Torpedo Bomber, built to 1/6th scale, Laser 150 powered.



Dave Knott's 1/6th scale Laser 120 powered MK 1 Hurricane. British Nationals Winner in 2005.

dance, and making a final judgement based on weather. Don't misunderstand me, the BMFA Nats is still very well attended, and superb value. However, economic uncertainty, linked to doubts about

the weather, could be adversely affecting attendance.

Acknowledgements

Grateful thanks to the hardy Scale Judges,

CD Graham Kennedy, and Results Supremo (and much else) Gordon Warburton FSMA. Another triumph for the BMFA Scale Technical Committee. ■

David Gibbs' 1/5 scale P 51D Mustang, scaled up from the Brian Taylor plan. MVVs petrol engine.



BMFA Official Results

F4C (18 entries)

1. Ian Bryant
2. Peter McDermott
3. David Womersley

- DH 51
DH9a
DHC Chipmunk

Flying Only (18 entries)

1. Steve Fish
2. Peter Fullard
3. Richard Scarbrough

- Spitfire
T-28 Trojan
P-47 Thunderbolt

ON SILENT WINGS by Chris Williams

SCALE SOARING

The 'Bergfalke test'

Times move on quickly sometimes with a bi-monthly column such as this one. The last time around saw the maiden flight of the 1:3.5 scale Spalinger S25a, since which I have assembled and flown a Bergfalke 1, built to 1/4 scale. The Bergfalke occupies a special place in the fleet, more of which later, but suffice it to say this is my fifth or sixth version, so I have it pretty much off 'pat' by now. The

need for a new model came about when my old pal Motley lost his new version in a mid-air at an aerotow event and, feeling sorry for the old lad, I gave him my Bergfalke II 55 as compensation. The MU13E, sometimes known as the Bergfalke 1, has straight wings rather than swept forward, and a rounded rudder, as well as a few other detail differences, so I reverted to my old plan, but embarked at the same time upon a pro-

gramme of weight reduction.

This involved leaving out some of the usual scale details, such as the scores of ply gussets in the wings, making up lightening holes in the formers and ply sheeting in the fuselage and covering the flying surfaces in film rather than 'Tex and paint. I have to say that I was more than a little disappointed when in the final tally the AUW came to just under 10lbs, a mere half pound lighter than its predecessor.



Author's MU13E Bergfalke under construction.



The Bergfalke prior to its maiden flight.

sor. One more design change saw the reduction of thickness of the HQ35 wing section from 12% to 11%, purely in the interests of Science, of course.

The maiden flight took place one windy Saturday afternoon on my favourite slope and, once again, despite having what I thought was a forward balance point, the model was more than slightly 'tender' in pitch! An extra chunk of lead cured that and the model went on to perform pretty well as I would have expected. Should the interest take you, putting BERGFALKE 1 FIRST FLIGHTS into the search box will reward you with the highlights of that session.

So, what's so special about this model that I should make so many of 'em? Well, as any slope rat knows, there are days when you arrive on the hill when it seems that the wind has gone off on its holidays. Afficionados of the old White Sheet club's competitions will be able to tell you that

these conditions often coincide with a scale soaring event and in such cases, what happens? That's right, a handful of lightweight thermal type floaters will wobble off in search of an elusive thermal, often with success. The scale types are usually ground-bound, and this is where the Bergfalke comes in.

Fast-forward now to a lovely summer evening a few days after the maiden flight. Despite the forecast of a light Nor' Wester, the wind has expired, and a flat calm reigns: time for the 'Bergfalke Test'! The model is hoisted aloft and, after a great thundering run, shoved off into the void. Due to the initial impetus, a little height is gained; say ten feet or so, before the model settles into a slow glide, just above stalling speed. A gentle turn is initiated after enough distance has been travelled, and the glider starts the beginning of a complete three-sixty turn. If the initial thrust is sufficient, a landing can now be

entertained, preferably at the pilot's feet, but in order to successfully pass the test, at least at the same height on the hill as the launch point. This is the 'Bergfalke Test'...

Several questions are answered this way concerning the model's design. Turning close to the ground at slow speed used to be the recipe for instant disaster. When I first entered the scale soaring arena there were few scale gliders able to accomplish this feat, indeed, for many of them, turning at altitude was adventure enough. When you consider that the Bergfalke's wings are built flat without recourse to washout, it just goes to show how much we have learnt since then. A scale model of any type, if built by the owner, has had many hours of patience and dedication invested in it, so it's only sensible to make sure that, in the

Typical scene at the White Sheet club's slope scale event.





The Bergfalke in action after passing its test.

air, it behaves itself, especially in the low-speed regime, which is where most potential disasters lurk, ready to trap the unwary. If there had been sink immediately after launch, then the ability of the airframe to take a hard landing would have been tested, although I have a fair degree of confidence there.

So, a sensible compromise has been reached: the maximum efficiency (no washout) coupled with safe behaviour near the stall. I have a reasonable confidence that my larger machines, were I just strong enough, would be able to pass the test also, but I'm usually too busy in the workshop to spend time at the gym.

The new Bergfalke passed its test with flying colours (pun intended!) and now it's only a few weeks away until the second of the White Sheet club's scale slope fly-ins. Should the wind be absent-without-leave, I know of at least one scale model that will fly, however briefly...

White sheet scale fly-in Aug 28 2011

To many scale soaring fanatics, flying from the slope is a very special experience. This is probably because it is possible to see your creation close up in its natural element, to hear the air flowing over its flying surfaces, and to repeat the process endlessly for as long as the wind blows. Thus it is that the White Sheet Club's two scale fly-ins of the event-season are eagerly anticipated.

The downside of slope soaring is that unless you are blessed with a slope for every direction, you are at the mercy of the weather gods. White Sheet hill has two main slopes, one facing Northwest, one Southwest and, not only has 2011 been a very windy year, it's been a pretty wet one too, so you wouldn't get very good odds at the bookies for a dry day, with a moderate wind in either of these two directions. Thus it was that twenty or more diehard optimists sat in their cars that Sunday morning

watching the unrelenting rain, whilst the wind blew exactly between the two slopes. Event director Steve Fraquet proved more optimistic than most: despite the rain he had set up a tarpaulin shelter and was rigging his new Racek 3 Möwe. (Seagull) This was a 1930s glider built by amateurs, and as this snippet reveals, things were a lot tougher in those days...

'...F. Kantor, then 18 years old, wrote about the construction: "*I was employed as window decorator in a draper's shop. I came home around eight thirty in the evening, though my working hours finished earlier. None of the employees dared to leave work first only to avoid a bad reputation with the shop owner. And (the fact that) that I was building a glider; I had to keep a secret. The colleagues and employer did not have an understanding for such a hobby. I only had the nights, Sundays and holidays left for my glider.*" (Excerpt from Dirk Schipper's documentation piece on the subject)



Pat Teakle readies his new 1/4 scale Slingsby Swallow.



Event Director Steve Fraquet with his newly completed 1:3.5 scale Racek 3 'Möwe'.



The Racek in action showing its complicated wing structure.



Martin Tigg's Nimbus gets the heave-ho from nominated launcher Steve Fraquet.



Nigel Welsh displays his new Fly-Fly DG 808S.

The Möwe proved to be a success, as did Steve's model because, yes, optimism rules: by midday the sun made an appearance, the rain went off for a tea break, and Mr. Fraquet set the tone for the day by being the first to fly. Although unlikely to be chosen as a winner in any sailplane beauty contest, the Racek is an arresting sight in the air, the complicated wing structure showing up well. (The lack of 'D' box sheeting and subsequent diagonal cross-bracing went contrary to later established practice, although the wings of the Slingsby T.31 Tandem-Tutor have a similar construction).

It was unfortunate that the all-moving tail of the Racek suffered some minor damage on its first landing, although Steve still had his trusty Petrel to fly. Pat Teakle, long-time scale maestro and oft-time winner of the White Sheet's scale comps in the old days, had brought along his newly completed Type 45 Slingsby Swallow, which performed very well in the increasingly blustery conditions. The wind, having started off as a light-moderate, abandoned the 'light' in favour of 'strong' as the day wore on and, being in between the two slopes, there was a great deal of chop, especially near the ground, making for some very interesting landings. Despite this, there was little in the way of untoward excitement,

and as far as I know, all the models made it home unscathed, with the minor exception of the Racek.

Perhaps the most impressive performance of the day, given the conditions, was that of the tiny DG 1001M belonging to Antonia Gigg. Despite its modest proportions, she has packed into it an up-and-go, retract, tow release, vario and (unbelievably on the day), not one, but two miniature video cameras! (The fact that they failed to work as advertised, takes nothing away from the achievement)

Martin Tigg's Nimbus and Nigel Welsh's new Fly-Fly DG 808S were able to make light work of the conditions, thanks to their superior glass efficiency, although Clive Learwood, finally cajoled into bringing his new Flamingo to a slope event, found the going a little more difficult, having launched into one of the many periods of sink. At

times during the afternoon, the lift was stupendous, with some daring souls going cross-country to the northwest slope, but as teatime approached and the wind shifted further north, it was time to call it a day.

Steve Fraquet deserves our congratulations for putting on a fine event during a season fraught with meteorological difficulty, it is to be fervently hoped the same can happen next year, when perhaps we really will have a barbecue summer...!

c_williams30@sky.com



Steve Fraquet's 1:3.5 scale Slingsby Petrel at the White Sheet event.



Antonia Gigg's diminutive DG 1001M in action.



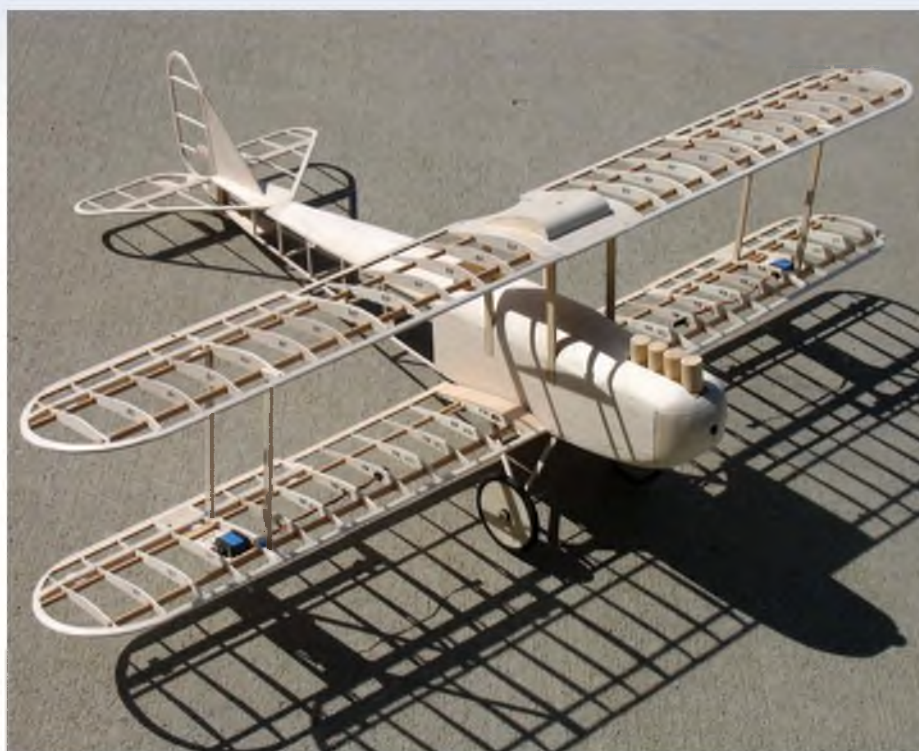
Clive Learwood's 1:3.5 scale Flamingo gets a launch.

R/C SCALE ELECTRICS *by Peter Rake*

THIS MONTH:
Peter Rake goes into further depth of
the drawing techniques he uses when
designing his models

When designing something like this Albatros D.Va there are many things to be considered during the drawing stage.

The Quiet Zone



Yes, you lucky people, it's time for another thrilling instalment of your favourite electric flight column. Not your favourite? Well hard cheese, it's my favourite electric flight column. You don't think I might be a little biased, do you? Oh well, whatever the case, off we go again.

I have to get quite a bit of material covered this month, so please accept my apologies if there isn't room for as much inane waffle as I'd like to include. Sometimes life is hard and we just have to live with what we're given. For those who've just breathed a sigh of relief, just watch it, I'll get you eventually.

Getting down to business

Now, where were we? Don't panic, I solemnly swear not to spend the entire column catching up. Right, we have a scale drawing imported into CAD (*TurboCAD* in my case) and the outlines, panel lines and control surface details traced onto our computer screen. We've also scaled the drawing/tracing to the precise size we want our finished model to be. Now, at risk of repeating myself, (a not

Although the AIR-1 is a relatively simple model to design, you still can't avoid drawing lots of wing ribs. Fortunately, most are only minor variations on a basic rib shape.

totally unheard of phenomenon) let's just take a closer look at precisely how I go about tracing those details, so that it makes my life easier later on in the plan drawing process.

Since, in most cases, I'll be tracing over a black outline, I like to use a nice bright colour for the tracing. I usually trace basic details in red, using a pen size of 0. Obviously, it won't actually be 0, but that is the thinnest line size available and gives a nice fine line, once the plan is printed. Items like control surfaces, wing positions and the like, I usually trace in another colour so that I can tell at a glance which is panel line and which is moving part.

It's only fair to point out at this stage that I'm an old dinosaur, and still like to work in inches as my measure. I've spent a modelling lifetime using Imperial measurement and can automatically visualise what size any given part will be, and know what is the minimum size I can safely get away with. Remember what I said in the first part of this article, all those months ago; I design models to fly, not to survive crashes. Personally, I prefer models that are less prone to crashing and lighter models are easier to fly because they don't have to fly so fast just to stay in the air. Flying slower makes them easier to control and being easier to control makes them less inclined to crash. Even when you do get a severe case of dumb thumb and the worst happens, damage is often minimal because there is often less mass.

The design bit

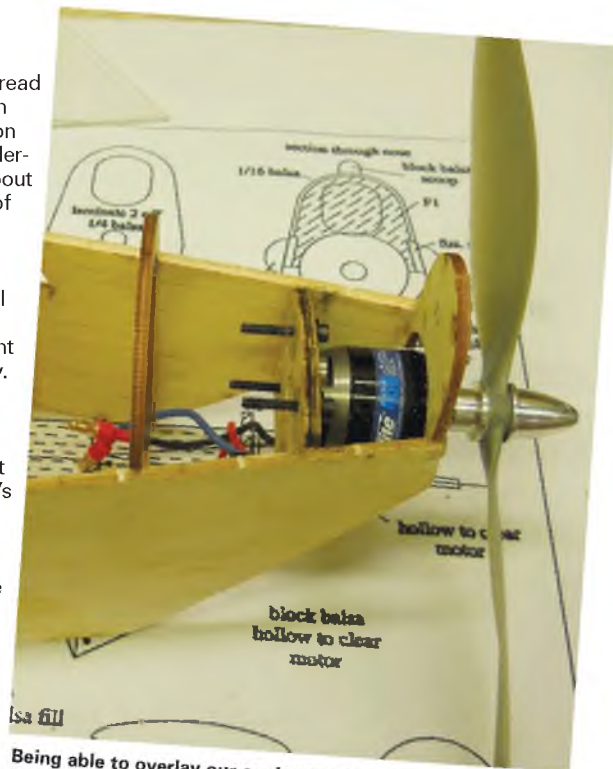
Bearing the above points in mind, this is where we need to start using our brains. Any fool can add wood to increase the strength of their model, but that is often self-defeating. If you go that route, the more wood you add, the heavier the model becomes. The heavier the model is, the faster it will need to fly. The faster it flies, the more chance there is of a crash - because it's harder to control. Being heavier, and flying faster, it will hit the ground harder and cause more damage.

At that point, you decide you should have built it stronger and the vicious circle begins again. More wood, more weight, faster flight,

etc., etc; not what we are trying to achieve at all! No, what I try to do is tread the fine line between such well known designers as the late David Boddington and Paul Plecan. Both designed wonderful models that flew well, but went about it in totally different ways. Creatures of their time, both designed to suit what was available at the time. Dear old Boddo had the advantage of modern radio gear and powerful engines. Paul Plecan, in contrast, was from the 'vintage' era and was faced with inefficient engines that were usually quite heavy. Please, don't get me wrong, I have great respect for both designers and have built and flown models of both their designs, without which, I wouldn't be sitting here boring you rigid. So, it's their fault you have to endure this.

Seriously though, if you look at some of David's earlier designs, from his *'Sport & Single'* days, you will see that they would actually have made great electric power models. It was only with the advent of reliable (by comparison to single channel) radio gear, that he seems to have adopted a *'never use one piece when ten will do'* approach to designing. Paul, at the opposite extreme, seemed to use only just enough wood to hold the covering in shape and prevent a fly-away engine; as I said, creatures of their era. In Boddo's case, radio gear was large and heavy compared with what we're used to seeing these days, so his structures needed to be able to handle that weight, unlike his single channel designs, or those of Paul Plecan, where the engine itself was the only heavy item.

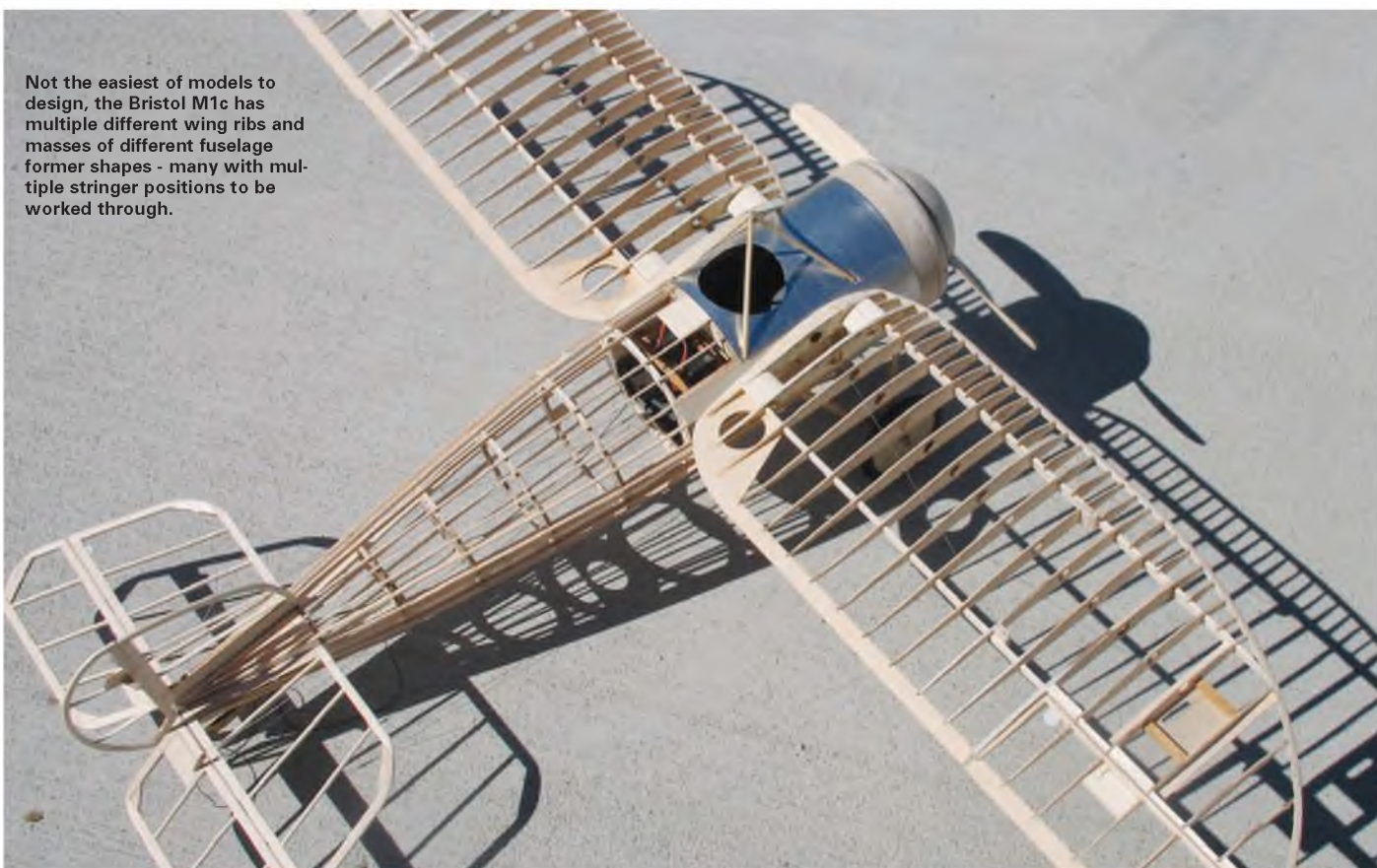
Sorry if I appear to be labouring this point, but it is vitally important to the way I set about designing a model. It's all a case of designing to cope with the stresses involved, but still only using the bare minimum of wood to achieve that goal. In addition to the mere structural implications of the model I'm designing, I also take into account the appear-



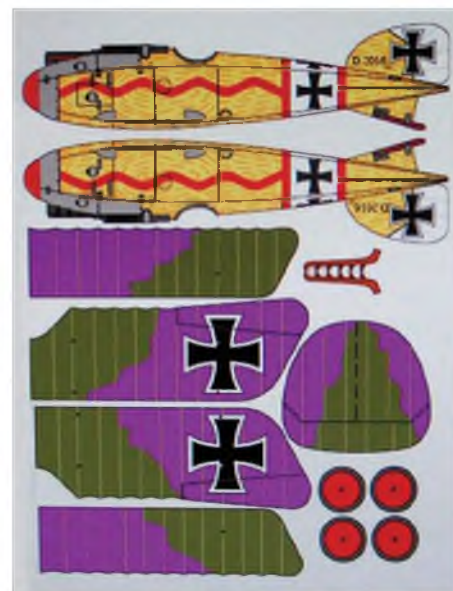
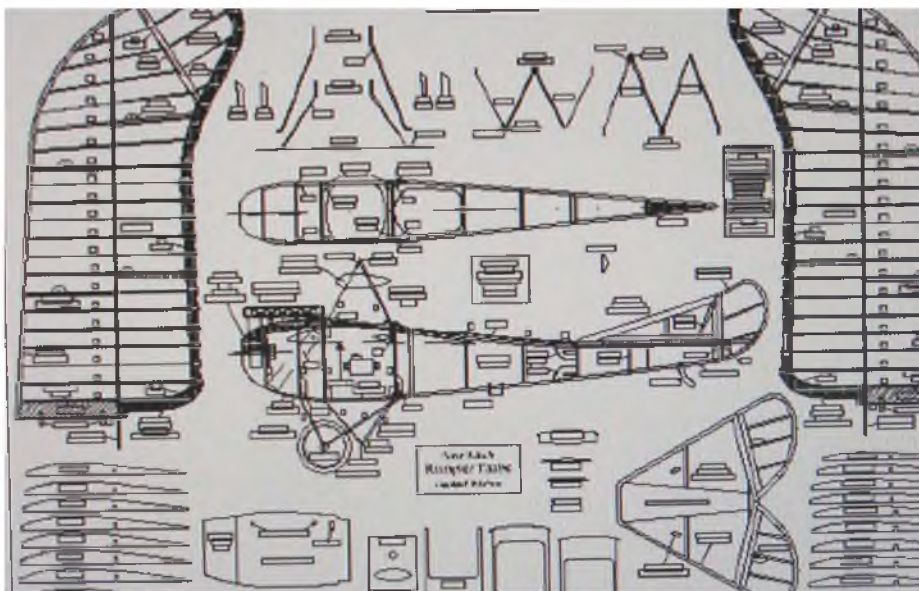
Being able to overlay our equipment templates allows accurate fitting components once we start building the actual model.

ance and performance of the prototype being modelled. At least, that's what I try to do. Just as it's pointless to design something like a DH2 or SE5a that is so heavy it has to fly at Mach 2 just to stay in the air, a gentle, floaty model of a WW2 fighter would be just as wrong. Similarly, whilst an all sheeted Bristol Scout would look almost as bad as a stringered Albatros D.Va fuselage.

Basically, what I'm saying is that, with structural considerations taken into account, we then need to take a long, hard look at our chosen prototype and set about designing a model that reflects both the flying style of the original, and how it was built - but in a form that doesn't over-engineer the model. CAD,



Not the easiest of models to design, the Bristol M1c has multiple different wing ribs and masses of different fuselage former shapes - many with multiple stringer positions to be worked through.



ABOVE LEFT: Once you've finished drawing all the parts, moving them into the correct positions on the drawing sheet is made relatively simple using CAD. **ABOVE RIGHT:** This shot of one of my indoor, profile designs reveals the level of detail that can, given a bit of thought, be achieved with CAD. The wood grain prints a lot less starkly than it appears on the screen.

combined with laser cutting (or careful knife-work) allows us to do just that.

Onto the drawing

Nothing has really changed from my earlier, hand drawn designs. It's just that CAD means I can make them that much more intricate (knowing things will fit properly). With hand drawn plans I'd start off with a pencil drawing, which I'd refine and adjust in pen. With CAD, I start off with a red drawing, which is gradually refined, adjusted and perfected by

changing it to a black drawing. What CAD does do, as far as free plan type things are concerned, is cut out the 'middle man'. So many of my hand drawn designs were wrongly 'interpreted' by a draftsman who might have no more idea about model aircraft than I do about walking on the moon. Now, I finish my plan, convert it to the format the publisher wants, submit it and wait to see it in print. All things being equal (they aren't always) the free plan you see in the magazine will be just what I always intended it to be. Nothing altered, added or omitted.

The first point we need to look at is the 'refining' I mentioned earlier. I'll go into this at some length, because readers have asked how I do certain tasks when using CAD. No matter how careful you are during the tracing stage, by the time you've enlarged your tracing to model size you'll see that gaps have opened up, curves aren't quite right and lines

don't meet where they're supposed to.

I find getting curves to look right is probably the hardest part of the whole process. Using 'splines' or 'Bezier' curves sort of works, but they will only be as even as the points you put in. Since the drawing has been enlarged considerably, any unevenness in the curve will have been multiplied by the same amount - and they look b****y awful. Fortunately, there is a way to replace them with far more even, accurately shaped curves. The wonderful thing about CAD is that you are able to take an individual graphic, in this case an arc, and stretch it to suit your needs.



Because we can overlay our wing ribs onto the side view, and then move them out of the way, getting strut locations right isn't that difficult. It also allows us to draw accurate struts at the same time.



A Fokker D.VIII wing represents quite a challenge when it comes to plotting the individual wing ribs. These taper in both chord and thickness, causing no little head-scratching in the effort to get them right.

It doesn't always work precisely, very long, shallow curves being a point in question, but it is possible to overlay more than one stretched arc until you have just the curve you want. Don't worry about the actual length/height of the arc; I do these with yet another colour 'pen' and fully expect them to extend beyond the curve I'm trying to form. As long as they match the curve in the section I'm working on, that's fine. Any slight, and I do mean slight, imperfection in how the arcs overlay will be taken out during the next step.

What is that next step? Quite simple really; by using a polyline, and nearest on graphic snap, we trace over the entire curve and eliminate those imperfections. The result, if you got it right, is a smooth, accurate curve that matches the full-size precisely. Then you simply select the arcs and delete them from the drawing.

However (Isn't there always a however?), just how much of the curve you draw as a single entity needs a little bit of thinking about. Take, for example, a fuselage side view where part of the structure will be stringered and part sheeted. You're going to have to indicate both of these on the drawing and, if formers are to fit correctly, it would be awfully nice if inner and outer curves were exactly alike. Yes, you could just use the old polyline and snap method to re-trace that section of the curve, but tracing curves soon loses its fascination. Much better to put a little forethought into the original extents of the curve and make them do the work for you. All you then have to do is select the section of curve, copy it, paste it into the drawing and move it to the required distance from the original curve. Instant indication of wood thickness.

Once the curves are sorted out, it's a relatively simple task to re-draw the straight lines, making sure they run at precisely the angles they should. A wonderful feature of CAD is that you get a little toolbar at the bottom of the screen. This toolbar tells you exactly how long a line is (to the number of decimal places you opted for), but even more important, precisely what angle the line is at compared to the horizontal datum. This feature will reveal just how vital it is later on, once we start in earnest on the top view.

The plan begins

So, once I've refined my traced outline and am happy that curves curl correctly, that all lines meet where they're supposed to meet and are at the angles I need them to be, it's time to start turning our refined three-view into a plan from which a model aircraft can be built.

My first step usually involves copying the various sections of the drawing and pasting them into clear areas of the 'page'. It doesn't matter exactly where you put them, just that they aren't too close to any adjoining sections. Just remember that, when the time comes to move them to their final positions, then you need to be able to select a rectangle around the section involved in order to move it. It helps not at all if that rectangle has to include part of a drawing you don't want to move. Suddenly removing the spar from a wing, for example, is hardly the most helpful thing in the world.

The sections you need to copy and paste should be fairly obvious; those are the areas that will become individual components of the model. Such areas as fuselage side-view, fuselage top-view, tail surfaces and a wing panel. Yes, just one wing panel (for a monoplane) and really you won't need more than half the top view of the tailplane. Because of a feature that involves creating a mirror copy of any given groups of graphics, and using the snap function to make sure it pastes precisely where it's needed, we only need to draw half



If you're going to start drawing in CAD, learning as you go along, something simple is never a bad idea. The Farman Moustique is about as simple as it gets.

of some parts and then mirror copy them. So, absolutely no excuse for banana fuselages, rib spacing that isn't quite the same on opposing wings panels or tailplane halves that are only almost identical.

The use of CAD to design your model eliminates all these possible faults and helps ensure highly accurate plans that result in a model that assembles easily, all of which, assumes that you get things right in the first place. CAD is a wonderful aid to accuracy, but it most definitely doesn't make plan drawing idiot-proof. With that thought in mind, let's start filling in some details on our plan.

Templates

If you intend to do much of this plan drawing lark, there are certain things that can be done to make your life a whole lot easier. A series of templates for commonly used items is well worth amassing. For every different motor I use, I make a precise drawing. The various sizes of servo I'm likely to use also get similar treatment. I now have an archive that contains a whole selection of accurately sized drawings of motors, receivers and servos that can be used to ensure that I get bulkheads, wing ribs and things like cable exit points in just the correct position.

Other time-saving items worth adding to your template selection include control horns and a basic wing section. I've never found two models that use precisely the same chord wing, but I do tend to use a very similar wing section for almost all my designs. Using the features of CAD to stretch your basic section to suit saves having to draw the entire thing

each time you sit down to design a model. Wing ribs (by the dozen) are boring enough already, so anything that lightens the load has to be worthwhile.

Yes, there will always be exceptions, but those I don't mind drawing as I go along. For instance, although a flat bottom wing can be 'scaled' fairly easily, it doesn't work so well with under-camber wings. The curves involved just refuse to play ball and you can easily end up with some very strange looking wing sections - very strange indeed.

Maybe the templates don't solve all the problems, but it's awfully nice to know that your chosen equipment will actually fit into the finished model in precisely the fashion you envisaged.

Okay, I can see it's happening again, I'm rapidly running out of space. Well, when I first started this I mentioned that it could fill an entire book, not just a single column. That was before I decided, in response to requests from readers, to go into greater detail. At this point, I can foresee this going on for at least another column but, as I'm sure you are aware by now, I won't know until I actually start to write it.

What we'll do next time is take a general look at my design philosophy, and then move on to details about how I do certain things while drawing the plan. We have our three-view split up into model style sections, so I suppose it's probably time to actually create the plan it's taken so long to get to.

If you have any contribution to make to the column, or just want to plead with me to stop waffling, I may be contacted at PETERRAKE@aol.com



The beauty of designing your own models is that little known types, like the Farman Sport monoplane (there's also a biplane version) become more than just a pipe-dream.

Techno Scale

Mike Evatt examines hyperspace for more TechnoScale Topics



ABOVE LEFT: The Black Horse Chipmunk re-captures all the charisma of this RAF trainer.

ABOVE RIGHT: A new version of RC Factory's Yak 55 has awesome performance.

The DHC-1 Chipmunk is one of the most recognisable and charismatic trainers of the last 40 years whether training RAF pilots or giving ATC youngsters their first flight. The **Black Horse Chipmunk** re-captures that charisma in a good size model that the average club pilot can fly. She has a 64.5" span, and you've even got flaps for those really slow flypasts or short landings. It's hand built from accurate laser cut parts and GRP mouldings to ensure absolute accuracy. When you add that dramatic RAF training colour scheme in durable *Oracover* it becomes really hard to resist! Check it out on **Ajay Models**

website at <http://shop.ajaymodels.co.uk> **Electric Wingman** at <http://www.electricwingman.com> have in stock a new version of **RC Factory's Yak 55** with the same awesome performance and a fantastic new colour scheme. Made from EPP, this almost indestructible radio controlled EPP model makes an ideal 3D and aerobatic trainer and can be repaired very easily with cyano. This Yak 55 EPP model can be built in 1-2 evenings and features a composite landing gear, large control surfaces and a unique circular cowl to lend even more character to these stunning 3D EPP planes. The **West Wales Models** website at

<http://www.westwalesmodels.co.uk> really unlocks an Aladdin's cave of modelling goodies - from Anemometers to Zenoah engines. However what caught my eye here was their range of Lightspeed Batteries which claim to be the most technologically advanced in the World and carry a two year warranty. Lightspeed cells use only the highest quality components coupled with some very special chemicals in their construction. This means that only can the charge times be reduced, but the lifespan of the battery is hugely increased above and beyond that of a conventional Lithium Polymer battery. **SW Distribution** at <http://www.swdistribution.co.uk>



ABOVE LEFT: Lightspeed Batteries claim to be the most technologically advanced batteries in the World. ABOVE CENTRE: The delightful and unusual Velle Monocoupe from Aerographics. ABOVE RIGHT: The new B-25 Mitchell from HC Hobby is available at Ultimate RC Models.



TOP LEFT: George Maiorana's pictures of the progress of his C-133. **TOP RIGHT:** Wendell Hostetler's plan range includes Classics of the 30's to modern high performance racers. **ABOVE LEFT:** Found on the Amerang website is a lovely DH Mosquito. **ABOVE RIGHT:** Downloading plans from StarCadPlans.net has never been easier.

tion.co.uk is the importer and wholesaler of Enya Glow Plugs, Bolly Clubman props, World Model Co. Almost Ready to Fly (A.R.T.F.) kits and other associated radio controlled products. However I was drawn to the delightful and unusual Vellie Monocoupe from Aerographics. This is just one in a range of kits. Most are rubber powered with the option to fit small electric motors or even for CO2 motors.

Ultimate RC Models at <http://ultimatercmodels.co.uk> are dedicated to getting you flying radio controlled planes with the minimum of fuss regardless of your piloting abilities. They have selection of radio controlled electric planes that are suitable for the absolute beginner through to the experienced pilot. For all the warbird fans out there, the new B-25 Mitchell from HC Hobby is a fantastic scale model, with a span of 1355mm, which has both the design and appearance of the real bomber. With 2 powerful brushless motors, the B25 has plenty of power for short distance take-offs from grass or tarmac and is capable of aerobatic action.

National Association of Scale Aeromodelers' NASA is the official AMA Scale Special Interest Group (SIG) for scale aeromodeling and maintains a web presence at <http://www.nasascale.org>. As such, NASA hosts the annual Academy of Model Aeronautics Scale National Championship. All AMA Scale classes for C/L and R/C are held during this event. Its extensive website also contains many images of models under construction such as George Maiorana's pictures of the progress of his C-133 shown in the screenshot.

Wendell Hostetler's Plans announce the release of their latest designs, a Cessna L-19 Bird Dog and a De Havilland DHC-2 Beaver. Check them out at <http://www.hostetlers-plans.com>.

They are dedicated to the sport flyer who desires a model aircraft that is truly functional and can stand the rigors of day after day, week after week flying. Their plans feature all balsa construction with basswood and plywood as needed for sound and practical applications. The range of their designs

includes the Classics of the 30's to modern high performance racers that include Jon Sharp's Nemesis, Patti Johnson's Full Tilt Boogie and the most outstanding home-built of the decade, the Lance Neibauer designed Lancair.

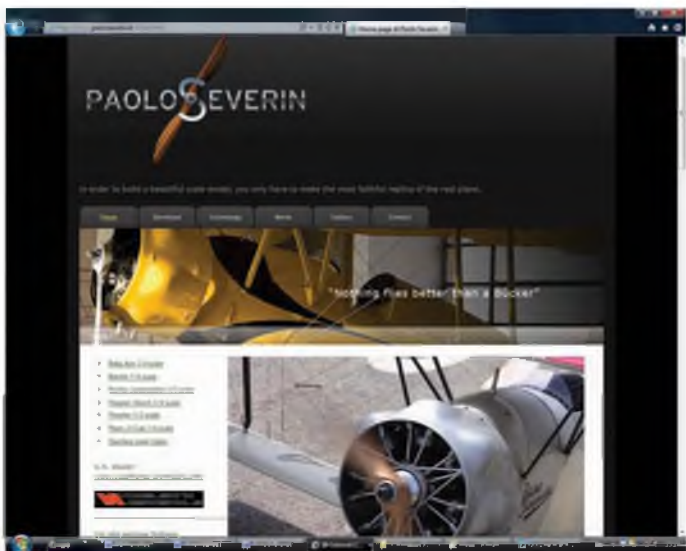
Found on the Amerang website at <http://www.amerang.co.uk> is a DH Mosquito. Experiencing the thrills of flight has never been easier than with one of these stunning EPP Foam aircraft. The strong but flexible construction means they are very durable and with the powerful, fully controllable motors, they are also very agile. Ultra bright LED Lights means night flights are possible and great fun. The wingspan of this delightful twin-engined model is 38cm. It is rather a shame that this is still listed as being sold with a 27mHz transmitter.

StarCadPlans at <http://www.starcadplans.net> has an interesting collection of plans for download including many scale subjects such as the Nakajima Tenzan designed by M F Hawkings for control-line. Downloading plans from StarCadPlans.net has never been easier. All of the designs presented are in Adobe PDF format, and if you have Adobe reader installed on your computer the design will download and open in your web browser. From there you can save the file to your hard drive and print a hard copy to any scale you desire.

Paolo Severin's website at <http://www.paoloseverin.it> is really something special. Paolo builds beautiful scale model aircraft. He attempts to design each structure to replicate the full size aircraft so if the original has a welded steel tube fuselage then so does his replica. The results are simply astonishing. This site is well worth a visit just for the stunning photographs. Who knows you might be tempted to buy one of Paolo's fabulous kits!

And finally! Proxxon have been producing Micromot tools for almost 30 years. High quality fine power tools for model makers, instrument mechanics, form makers, tool makers, opticians, jewellers and more. Log on to their website at <http://www.proxxon.com> and you will find all the tools you need for delicate work. They are quiet, precise and vibration-free for extended use. For model making precision you should look no further.

That's all there is time for from me this month so flick that switch and if you find something out there of interest that might be good to share, email me at mikeevatt@hotmail.com



ABOVE LEFT: Paolo Severin's models are really something special. **ABOVE RIGHT:** For model making precision you should look no further than Proxxon.

Shelflife

Book of the Month

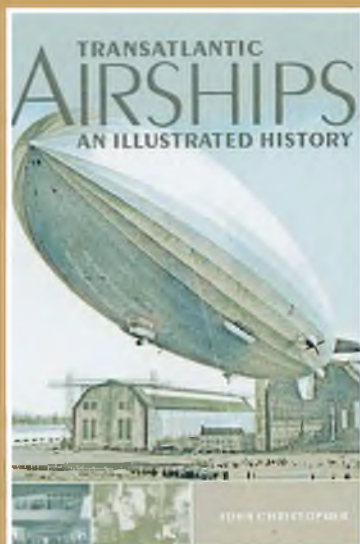


CHASING THE MORNING SUN

ISBN: 978-1-908117-09-0. Tel: 020 7401 2100. Price: £20.00

By Manuel Queiroz, foreword by Polly Vacher. Hardback, 250 x 176mm, 160 pages, b/w & colour illustrations. Published by Grub Street, available from Ian Allan Bookshop, 45/46 Lower Marsh, Waterloo, London. SE1 7RG.

Ten years ago Manuel Queiroz declared his intention to fly solo around the world. Having just beaten cancer, he was buoyed by the recent brush with mortality and ready to take on a life-changing goal. Five years ago he fulfilled his ultimate dream and Chasing the Morning Sun is the exhilarating story of his record-breaking journey. In February 2006 he circumnavigated the globe in a home-built aeroplane on an adventure which took him 27,056 miles. The journey lasted thirty-nine days, as he made eighteen stops in twelve different countries, becoming the only Briton ever to achieve this feat, for which he was honoured by the Royal Aero Club with their highest award, the Britannia Trophy and which was bestowed on him by His Royal Highness the Duke of York. Taking off from an icy Britain he was, within days, flying over burning deserts, through tropical rainstorms and the sweltering equatorial heat; within a week he had landed on a tiny island in the middle of the Pacific Ocean. The journey was not all plain sailing; there were dangers to confront and overcome, flying through sandstorms in the Saudi desert, terrifying electrical storms, taking off from unlit runways at night and the ever present possibility of mechanical failure over an inhospitable ocean. It was a truly solo effort, having no co-pilot to take over the controls when exhaustion set in, no ground staff to handle repairs, no one to check the route or weather, or turn to for advice when critical decisions had to be made. This inspiring tale of personal strife against impossible odds, both inside and outside the cockpit, makes Chasing the Morning Sun not just a book for pilots or adventurers, but for anyone looking for inspiration from the realisation of a life-long ambition.



TRANSATLANTIC AIRSHIPS AN ILLUSTRATED STORY

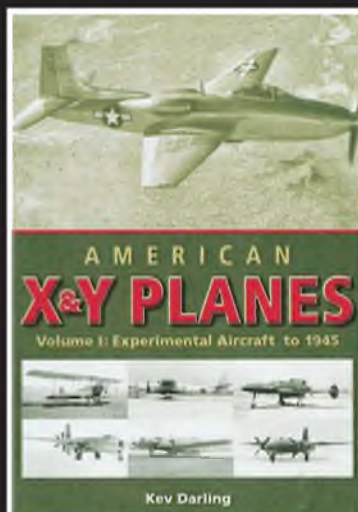
ISBN: 978-1-84797-161-6
Tel: 01672 520320
Price: £19.95

By John Christopher. Hardback, 250 x 180mm, 192 pages, b/w & colour photographs. Published by The Crowood Press, The Stable Block, Crowood Lane, Ramsbury, Marlborough, Wiltshire. SN8 2HR.

In Transatlantic Airships John Christopher recounts

the fascinating story of the lighter-than-air 'pond hoppers' from the earliest schemes and bold pioneering flights, including the triumphant double crossing by the R34. The book goes on to describe the rise of the Zeppelins and the ambitious British scheme to connect its far-flung Empire, the US Navy's lighter-than-air craft and the incredible post-war proposals for colossal atomic-powered leviathans.

It is a story of fantastic visionaries, incredible flying machines, great moments of triumph and, ultimately, of spectacular disaster. John Christopher has been a professional balloon pilot for twenty years and has had a long involvement with airships. A recognised authority on all aspects of the lighter-than-air flight, he is a director of the Airship Initiatives, a consultancy service with the primary aim of putting airships to work.



AMERICAN X&Y PLANES VOLUME 1

Experimental Aircraft to 1945.

ISBN: 978-1-84797-141-8
Tel: 01672 520320
Price: £19.95

By Kev Darling. Hardback, 252 x 180mm, 144 pages, 100 b/w photographs. Published by The Crowood Press, The Stable Block, Crowood Lane, Ramsbury, Marlborough, Wiltshire. SN8 2HR.

The world of experimental and prototype aircraft

throws up many interesting and unusual machines, and the aircraft manufacturers of the USA were no exception. Within a few years of the Wright Brothers' first flight in 1903, World War One greatly accelerated the development of aircraft as the fighting machines of all sides were pushed to the limits to gain more speed, altitude and firepower.

This book, the first of a two-volume history of the USA's 'X' and 'Y' experimental planes from the earliest years of aviation to the present day, covers the period from the Wright Brothers to the end of World War Two. As well as famous names such as Curtiss, Northrop and Boeing, many long-forgotten manufacturers such as Loening and Thomas-Morse appear in these pages. The detailed text, supported by extensive illustrations throughout, gives a fascinating insight into an often-overlooked area of aviation history.

Kev Darling spent more than twenty years in the Royal Air Force, engineering aircraft ranging in size from the Tiger Moth to the TriStar. Medically discharged after the First Gulf War, he strengthened his writing career, which he had begun in 1986. Since then he has authored numerous magazine articles and more than twenty books and monographs. This is his seventh book for Crowood.



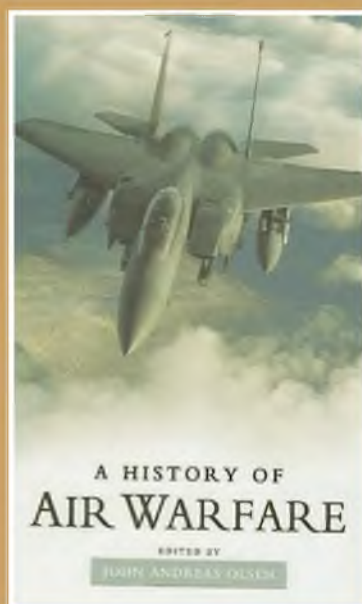
HERMANN GÖRING FIGHTER ACE

The WWI Career of Germany's Most Infamous Airman

ISBN: 978-1-90650-266-9. Tel: 020 7401 2100. Price: £20.00

By Peter Kilduff. Hardback, 252 x 174mm, 192 pages, profusely illustrated in b/w photographs. Published by Grub Street, available from Ian Allan Bookshop, 45/46 Lower Marsh, Waterloo, London. SE1 7RG.

Over the last seventy years, in countless books and essays, Hermann Goring has rightly been defined by his crimes and excess during the Third Reich and the Second World War. However it is his activities as a young career military officer in World War One that has invariably been glossed over - until now. This is the first in-depth look at Goring's role as a military flyer and air combat leader from 1914 through to the end of the Great War, and how those experiences shaped the personality that came to the world's attention in 1939. At the outset of the First World War, Goring was eager to prove his value to his fatherland in initial skirmishes with French troops. When struck by severe rheumatoid arthritis in September 1914, the twenty-one-year-old officer's burning ambition and ego could not tolerate being sidelined and the following month he forced himself out of a sick bed to begin a new career as an aviation observer. Goring went on to become a fighter pilot with twenty-two downed enemy aircraft to his credit, the last wartime commander of the Red Baron's own fighter wing, Jagdgeschwader Richthofen, and recipient of a row of prestigious medals including Prussia's highest bravery award, the Pour le Merite. Peter Kilduff has produced a landmark volume based on extensive research into Goring's military records and thousands of German and Allied documents to put the neophyte airman's life and events into perspective. Among other sources the author drew on Goring's own combat reports and related writings.



A HISTORY OF WARFARE

ISBN: 978-159797-433-2
Tel: 020 7401 2100
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Edited by John Andreas Olsen of the Royal Norwegian Air Force. Softback, 230 x 150mm, 488 pages, 27 b/w photographs. Published by Potomac Books Inc., distributed by Chris Lloyd Sales and Marketing, available from Ian Allan Bookshop, 45/46 Lower Marsh, Waterloo, London. SE1 7RG.

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This carefully researched work represents an even treatment of history, balancing critical analysis and historical background, providing an invaluable resource for military historians and aviation enthusiasts.

PAINTING AND FINISHING TECHNIQUES

Osprey Modelling 45

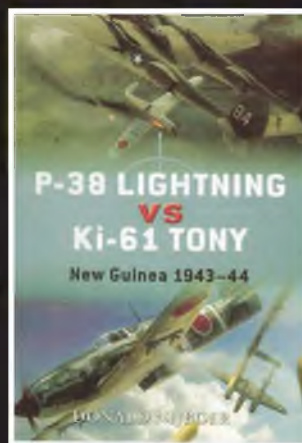
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By Gary Edmundson, Consultant editor Robert Oehler, Softback, 248 x 184mm, 80 pages, profusely illustrated in colour. Published by Osprey Publishing, PO Box 140, Wellingborough, Northants, NN8 2FA.

Although many modellers can master the basic techniques of construction, it is with the painting and finishing of their kits that many begin to struggle. It is these skills that give the model its distinctive look and feel, and separate the truly great model from the good one.

Aimed at both the beginner and the intermediate modeller, this book presents a detailed, step-by-step approach to addressing the difficulties involved in creating realistic, colourful finishes to armour and aviation models using a variety of different styles and techniques. Contents include:

Introduction: fundamentals and kits used; Paints and Finishes: types of finishes and colour authenticity; Set-up Tools; Painting and Finishing Model Aircraft: from cockpits and interiors to pre-shading, camouflage patterns and decals; Painting and Finishing Armoured Vehicles: interiors, hull and turret and weathering; Figures and presentation. The list is endless!



P-38 LIGHTNING Vs Ki61 TONY

New Guinea 1943-44
Osprey Duel 26

ISBN: 978-1-84603-943-0. Tel: 01933 443863
Price: £12.99

By Donald Nijboer. Softback, 248 x 184mm, 80 pages, b/w & colour illustrations. Published by Osprey Publishing, PO Box 140, Wellingborough, Northants, NN8 2FA.

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The components, in balsa and ply that you would otherwise have to trace off the plan onto the wood and then tediously cut out prior to commencing building! Basic strip and sheet wood not included. Be ready to start building as soon as you unfold the plans!

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Specifications

Wing Span: 112 inches
Wing Area: 1900 sq. in.
Flying Weight: 24 lbs.
Fuselage Length: 72-3/4 inches
Engine Size: 2.0-4.0 cu./in.



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408 1/3 Scale Nieuport 28c-1*
406 1/3 Scale Fokker D7*
408 1/3 Scale Ercoupe (415-D)*
415 1/3 Scale Super Cub*
460 1/3 Scale Stearman*
462 1/3 Scale Morane Saulnier A-1*
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461 1/3 Scale Sopwith Pup*

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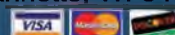
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