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(PHOTO: Bruce Corfe)

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CONTACT



INTERMODELLBAU

The universal British conversation opener of the weather is one that seems to define the worldwide perception of the British character worldwide. Well perhaps, in these times of climate change we have indeed had a substantial subject to talk about over the past few late autumn and early winter months that have seen unusually warm and windy spells, then abnormally wet, followed by a sharp cold snap.

All of that is enough to drive us increasingly in the modelling room - or the 'Toy Room' as is called in the editorial household. So anything that can be quickly built to fly at indoor flying venues and indoor club meets must surely be welcome. If so, then our two free plan features in this issue will hopefully satisfy a demand.

In the past, model exhibitions have tended to prelude each successive outdoor flying season, but the original turn-of-the-year Model Engineer Exhibition and springtime Sandown Park Show have long since discontinued.

In mainland Europe, it's rather different, particularly in Germany. The annual Nuremberg Toy & Hobby Fair, held late January/ early February, is mainly one for the model trade (although it does have a couple of public days at the end). Others are entirely public affairs including the annual **INTERMODELLBAU** at Dortmund, the world's largest exhibition for model-making and model sport, for which preparations are now in full swing for this year's show, scheduled for 20th - 24th April. Here, model aircraft fans will find lots to discover. Programme highlights include flight demonstrations in the exhibition halls and outdoor flights in the adjacent 'Red Earth' stadium on two exhibition days.

EXPERTEC, the Experts Forum for active model flyers, will again be combined with INTERMODELLBAU from 22 to 24 April.

The German Model Flying Association will provide useful information on permit procedures for models with a take-off weight exceeding 25 kg. and has already announced one impressive exhibition piece - a four-engine Handley Page H.P. 42.

Venue for INTERMODELLBAU is the Westfalenhallen Dortmund, located at Rheinlanddamm 200, 44139, Dortmund (...so put that on in your SatNav and follow it ...!).

For visitor tickets, go to:

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SOPWITH TABLOID SS3

Indoors or out? Try this delightful little 80 gram (3 oz.) 24" wingspan World War I scout for micro R/C and electric-power, designed by Mike Roach

I first came across the Sopwith SS3 while researching the more familiar Tabloid family. There are some excellent photographs in the Albatros Mini datafile No. 6 which allowed me to prepare a working drawing from which I built my first 'foamie', a 35" span version for the GWS gear I stripped out of my Pico Stick. This model weighed about 8 oz. and was just a little too large for the power available, although it performed very well indeed when I fitted one of the twin 150 motors, an 11x7

prop and a two-cell Li-Ion battery. By that time the model was fairly war-weary and it has been retired, to hang, hardware stripped out, in the ceiling of my model room until I can bear to scrap it - not a process I enjoy!

The 24" version presented here was built in response to the capabilities of the Falcon range of ultralight radio equipment. While I was working on the new drawings, I came across Jef Raskin's website (Jef is the inventor of the Click and Drag interface, as well as a host of other innovations, both scientific and

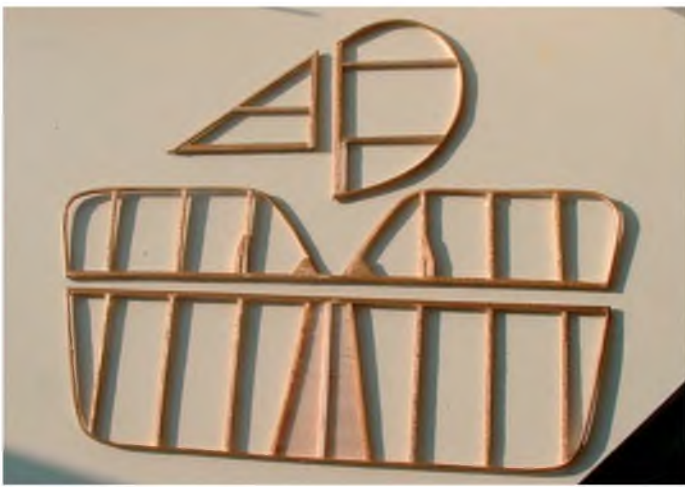
aeromodelling) where he too had found the SS3 and had prepared a set of drawings, which differ in a number of respects from mine. I think we will agree to share the honour of 'first past the post' but it was close!

The real thing

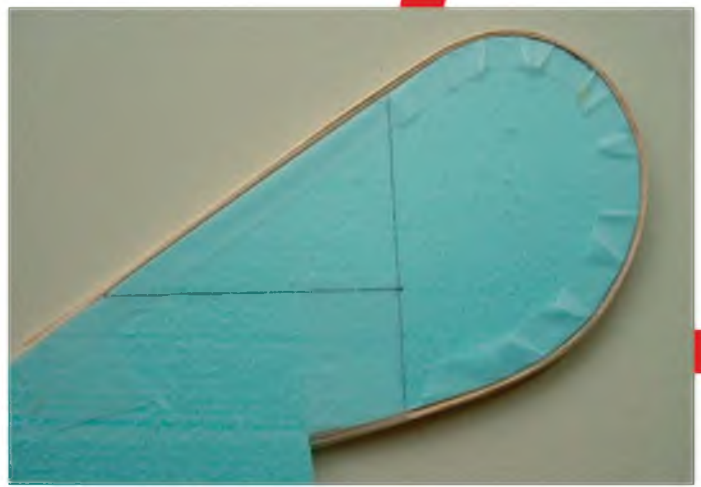
At some point in late 1914, Sopwiths made a number of changes to the design of the Tabloid to meet a Royal Navy requirement. The resulting aircraft had quite a different appearance from the earlier versions: the

Complete, ready to fly. The wingtips are from 0.8mm balsa and are just too thin for scale and too difficult to cover neatly. A laminated tip would have been better, but I think the overall effect isn't too bad.

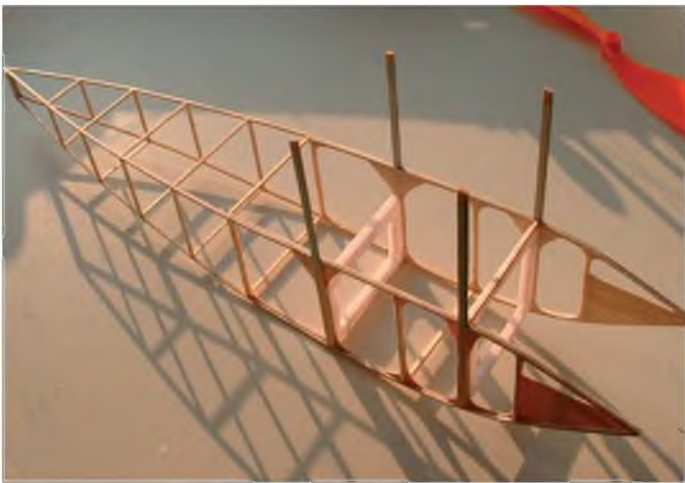




The tail is a good place to start adding lightness! This has been stained but not sanded.



I used blue foam as a former for laminating the tail outlines from two strips of 0.8 light balsa. This technique is very quick, very easy and makes a strong, light structure.



This shows the use of light foam reinforcement where you might be tempted to use balsa formers, and also the importance of the 0.8 balsa internal doubler in providing strength to the strut/longeron joints. Fretting it out afterwards is optional but does save a gram or two.



A 'rigger's-eye view' up the fuselage shows the carbon-fibre stringers and the route of the closed-loop control threads! must admit that threading them through the covered fuselage and avoiding getting them tangled up on the way is not a job to be rushed!

wings were unstaggered, being orientated about the same c. of g. as the earlier Tabloids and the upper wing was higher above the fuselage - higher even than the prototype. Ailerons were fitted to both wings and steel interplane and cabane section struts replaced the earlier wooden ones. The fuselage alloy side panels ended between the strut locations with a vertical cut-off and a ply panel aft of this line. There was a very obvious dark-coloured circular cut-out in the alloy panel above the front wing spar, possibly an access hatch.

Finally, the fin and rudder were larger, by about 25%, the tail skid was supported by a nest of struts, to give a degree of steering on the ground and the tailplane was redesigned with a straight leading edge. It sounds like a typical Royal Navy response to an existing specification! These aircraft, numbered 1201 - 1212, were delivered to the RNAS during 1915 and served as scouts on Home Defence and in the Mediterranean until the middle of 1916.

My drawings are as accurate as I can make them, taking details from the photographs in the Datafile, except that the wing section is more cambered than the original, to give a better flight performance at slow speeds.

Model design

The design of the model follows conventional free-flight practice, heavily

influenced by the Albatros C.III of John Watters and models by Ken Shepherd, and is suitable for indoor or calm outdoor flying. My philosophy is that indoor R/C models may be built at least as lightly as free-flight ones, since they will only fly under controlled conditions and will be landed carefully and gently, whereas every free flight is, by definition, a crash landing waiting to happen. So, if 1/16" square longerons and 1/32" ribs seem fragile to you, don't worry.

The SS3 and its sister model - the three-seater - are much tougher than foam models and stand up to the gentle stresses of hangars and gymnasiums very well, but it



The carbon fibre wing spars just slide into holes drilled in the extended cabane struts. Scale rigging holds the aircraft together.

is important to note that much of the strength comes from working rigging, without which they would weigh more, fly faster and break more easily!

This weight business is important. The model has a wing area of just under 2 sq. ft., so the bare airframe had to weigh about 3 oz. to get within the magic 2 oz./sq. ft. that indoor flying really needs. Since the GWS hardware I used in the past weighs 3.5 oz. that was a non-starter, so I ordered a PU01 motor, HF9 speed controller, two of the 1.7 gram servos and one of the new Li-Poly cells from Falcon Models, which brought the hardware weight down to an amazingly low figure - less than 1 oz. including the two-cell 145 mAh Li-Poly battery. Unfortunately, Falcon's new Rx was not ready when I made my order, but has appeared now, in normal form, or with two servos attached in an integral 'breeze block'. I was offered a Multiplex Rx for an extended trial and, although it weighed more than all the other electric bits put together, the model hasn't complained!

You may think that the structure is too lightweight, but I assure you that it flies well and, provided you don't crash, is strong enough for all the loads it is likely to meet. Your landings in the Sports Centre are going to be smooth three-pointers, aren't they?

All of my recent indoor scale models have been made from Depron or pink foam



The wheels (and Sub-L1, Smallhead RN) are made from foam



A paper cone with a bit of artistic licence completes the illusion of spokes and fabric covering.

and, while I like using these materials, I wanted to do something a little less 'industrial'. Also, the natural finish of the aircraft lent itself to my favourite method of staining the structure as well as the Litespan covering with thinned wood dye, which is cheap, looks perfect and is as near weightless as you can get. The balsa and carbon fibre structure has proved to be remarkably resilient; far stronger than my foam or Depron models and with a very definite 'real modelling' feel. If you wanted to, you could reduce the weight by 10 grams fairly easily by using a Falcon Rx (at least 5 grams) and by covering in tissue or one of the very lightweight Mylar films.

Building

I drew up the plan so that the span was just under 24" to 1/13th scale. I started by building and covering the tailplane, fin and rudder, which weighed 4 grams. As a comparison, a 3.0 mm pink foam set of tail feathers, painted, reinforced and edged for hinging weighed 4 grams. The foam took

about an hour to make, the balsa and Litespan set took at least three, so there's a message there somewhere!

I used 1 mm carbon fibre rod for front and rear spars and the TE of the wings, and a strip of 2.0 sq. balsa for the LE, with 1.5 mm ribs for the top wings and 0.8 ribs for the lower set. I was concerned that the carbon rods would be far too flexible, but when I took the wing panels off the board they twisted, but hardly bent at all. Once covered (bare weight 4 grams per panel, covered, 8 grams per panel) they were as stiff as any conventionally built wing.

The building and covering techniques are slightly different from conventional structures. If you want to stain the wood so that it shows through the covering, do so before you start gluing, or it will look patchy. I recommend *Coloron* wood dye for this job and *Antique Pine* is just right, applied with a brush. Then, cut out all the ribs and drill the spar holes to match the CF rod size. Cut the spars 10 mm over-length at the root end (the ends of the spars act as incidence pegs, and the

protruding tip ends support, shape the tip section), thread all the ribs onto the rods and shuffle them into the right positions, but set off to one side.

Cover the plan with clear polythene (the backing from Litespan is perfect, but don't use Clingfilm, the glue sticks to it). Pin down the loaded spars over the plan, blocking the ends so they can't move. Now, one rib at a time, put a dot of cyano on each spar over the rib position and slide the rib into the correct position. I use odourless cyano, which has about ten seconds of grab time, which is enough to make minor alterations before it sets. When the full rib set is glued, add the TE and LE, pinning them into position first, then adding a small drop of glue at each joint. I used 0.8mm balsa sheet to make the wingtips, but this is too thin for scale and needs an outline of 1.5mm for a scale tip thickness makes and the task of covering these tricky bits a lot easier.

As soon as the glue dries, the panels can be taken from the plan and covered. You can print the RNAS roundel onto Litespan or tissue using an Inkjet printer, make transfers using Microsoft Word, or paint or draw them on using compass and pen or brush. But I do recommend that you do the latter before covering rather than after, as it is so much easier! Some of the SS3s had Union Jacks under the wings and there are full details of this and all other markings on the plan.

It's best to cover the underside of each wing first. Cut some Litespan (from the long side of the sheet) about 20 mm oversize and paint with Balsaloc where it is going to touch the LE, TE and end ribs. Balsaloc the undercamber of the ribs themselves, wipe a gluestick, such as Pritt, round the outline to hold the Litespan in place, tape down the covering over the wing and remove all the wrinkles. Then, iron down the edges onto the



This 35" span version of the SS3 was my first 'foamie' and was really just a bit too big and heavy. But when re-motored with a GWS twin IPS and an 11 x 7 prop, it flew really well.

structure and trim off the excess to within about 3 mm of the wing, before removing it all from the building board. Fold over the edges using the flat of your iron and seal them tight.

Repeat that for the upper surfaces, and then gently shrink each panel a rib bay at a time. This should ensure a warp-free wing. The undercamber can now be ironed onto the ribs, taking care not to crease the covering. Finally, white Litespan can be stained with the same *Coloran* dye, to represent any stage of real weathering, from 'just out of the factory' ivory, to 'just about to be written off' pale primrose. Just thin the dye 75% with cellulose thinners and use a kitchen paper pad to scrub colour into the covering. In the immortal words of builders everywhere:- test on a scrap of Litespan first.

At 8 grams, each covered and stained wing panel weighed 0.017 grams/sq. cm., this is a significant improvement over a pink foam panel from my Sopwith Sparrow, which weighed 0.027 grams/sq. cm. The figures aren't very important, but the difference showed that I was on the right side of the weight curve.

On the real thing, the struts were steel tubing; those on the model are two laminations of 0.8mm hard balsa, sanded to an oval section, with headless pins inserted in the ends, in order to locate the struts in the wings. Using a card template, I glued each set of interplane struts into the upper wing and when set (two minutes using odourless cyano) I dry-fitted each set into the lower wings.

The results were very encouraging and, as soon as had the motor and battery available, I moved on to the fuselage. I do recommend that you have the hardware to hand and build it into the fuselage as you progress: I did it the other way round and got a bit frustrated by the size of my thumbs compared with the components!

Fuselage

The fuselage is simply a 1.5 mm square balsa strip box with the centre section struts incorporated into the structure. This makes it almost impossible to remove from the building board without breaking the butt joints between struts and longerons, so a 0.8mm internal doubler is glued over the front portion. Now the side can be removed from the building



I tried to mould the cowling in one piece but the sharp edges kept tearing the acetate. Eventually I cut the mould in half and 'push-moulded' the top and bottom separately. This is the balsa before getting out the razor plane.



And here is the push-moulding for the upper cowl.



Coming along nicely; the Falcon PU01 motor just screws to F1. You can add side-thrust with a bit of packing. Spot the mistake on the centre-section covering - it should be cut across the grain like the wings, then it would not sag so much between the ribs.



With the hardware as shown I had no need for ballast. The HF9 SC fixes to F1, the battery to the fuselage plate and the Rx to F3. The servos are underneath, between F1 and F2.

CUT PARTS SET FOR THE

SOPWITH SS3

Get straight down to construction without delay! This month's full size free plan feature is supported by a laser-cut set of ready-to-use balsa and plywood components. This provides the parts that, otherwise, you would need to trace out onto the wood before cutting out and includes wing ribs and tips, tail centre parts, fuselage doublers, top deck, formers etc.

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board and the doubler trimmed out to the lines shown on the plan. When both sides are complete they can be joined with the F formers and strip balsa (reinforced with Depron, perhaps - see the photos) and the rear part covered. Only then can the outer doublers and top coamings be glued in place, so that they trap the covering neatly underneath them. I strongly recommend staining raw balsa to represent ply and I sprayed Tamiya flat aluminium (XF16) over the rest.

The upper and lower cowlings were moulded from thin acetate and most of the radio gear fitted neatly under the upper cowl, which should be hinged on its front edge for easy access. The servos live under the lower cowl and are linked to the control surfaces with thread. I might use 0.5 mm CF rod next time, as I found it difficult to get the surfaces properly centred using the closed-loop system. Once the model has flown and you are happy with the servo operation, fix the lower cowl in position.

Flying

Once again, I found myself in a small sports centre without having test-flown the model out of doors, but the winds along the South Coast in September were just too strong for me. At take-off, the SS3 needed some right rudder and after a couple of hops, I 'committed aviation' for a couple of circuits.

MODEL SPECIFICATION

Sopwith Tabloid SS3

Type:	Lightweight R/C Scale
Designed by:	Mike Roach
Scale:	1/13th
Wing span:	24" (609 mm)
Motor:	Falcon Models PU01
No of channels:	Three - rud./elev./throt.
R/C gear:	Multiplex Micro Rx Falcon Models HF9 speed controller Two FM 1.7 gm. servos.
Battery pack:	Two-cell 145 mAh LiPoly
Construction:	Balsa/ply/carbon-fibre
Covering:	Lifespan (stained)
All-up weight:	3 ounces (80 gm)

Apart from falling into the left-hand turns, she performed well. The balance point seemed about right (no ballast needed - amazing!), but I wanted open spaces to get her properly trimmed out. After putting in about three degrees of side-thrust I waited until the next calm evening when, to my delight, she met all my expectations. The motor just hummed away and the plastic prop gave enough thrust to climb to 50 feet or more for a very enjoyable 15 minutes.

The whole point of the exercise - flying qualities - are excellent and in the big outdoors on this grey October afternoon I had 15 minutes of relaxed circuits and bumps.

Size matters

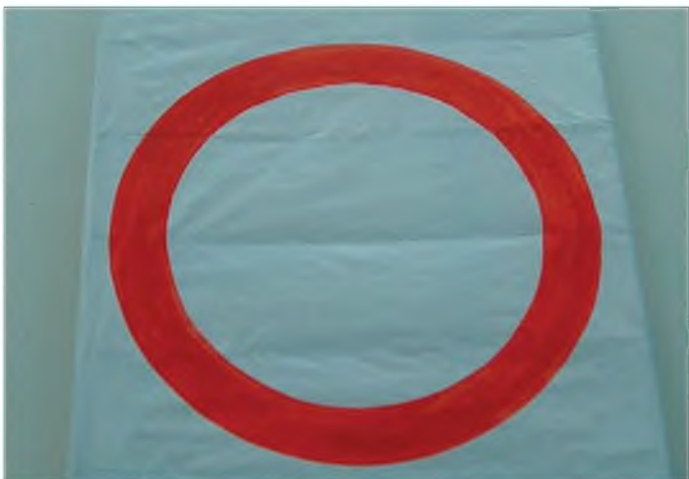
Could I build something smaller? To be honest, I was disappointed with some aspects of this model, particularly the covering, which I found very difficult to apply evenly. However, some time ago I committed myself to building a Peanut Sopwith Bee and the very pleasing results and the superb flying qualities of this little 3 oz. model have given me fresh impetus. ■



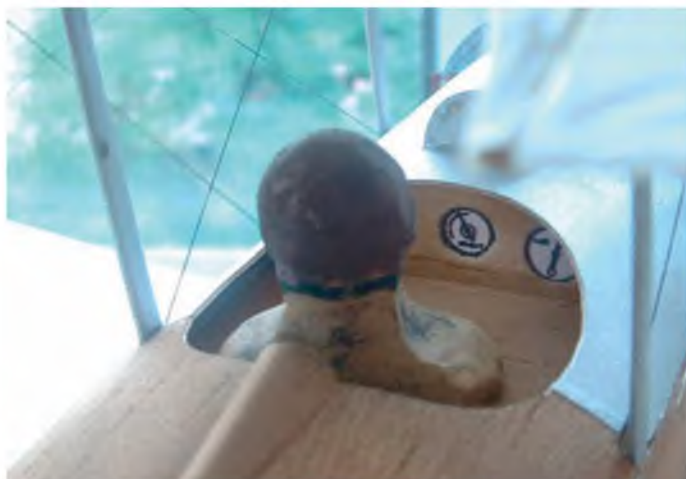
Assembly is straightforward and I used thread for a closed-loop control system - so much more elegant than pushrods. The Sopwith trademark is just drawn on using a pen. Now, I would use Lazertran transfers generated in Microsoft Word to get a much sharper result, or even print direct onto the Lifespan before covering.



The tailskid is so distinctive that it needs a bit of care. Alloy tube, ply, thread and shirring elastic are all that is needed (but it does look a bit furry close up!).



Another good opportunity to use Lazertran or direct printing, but I drew the markings onto the Lifespan using a pen and compass.



I really like the way the stained balsa contrasts with the sprayed aluminium paint. I suppose some clear varnish on the ply would be appropriate.

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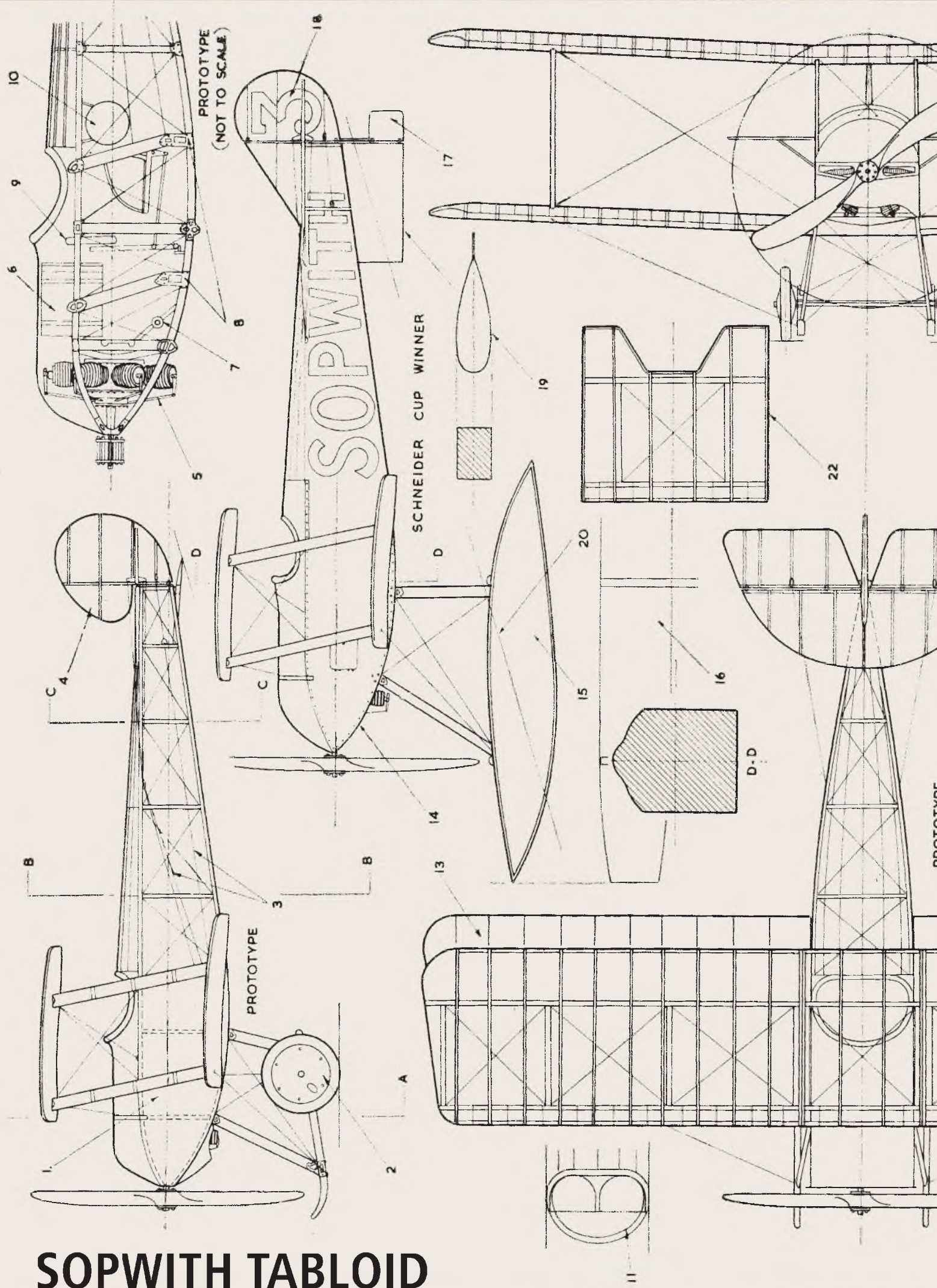
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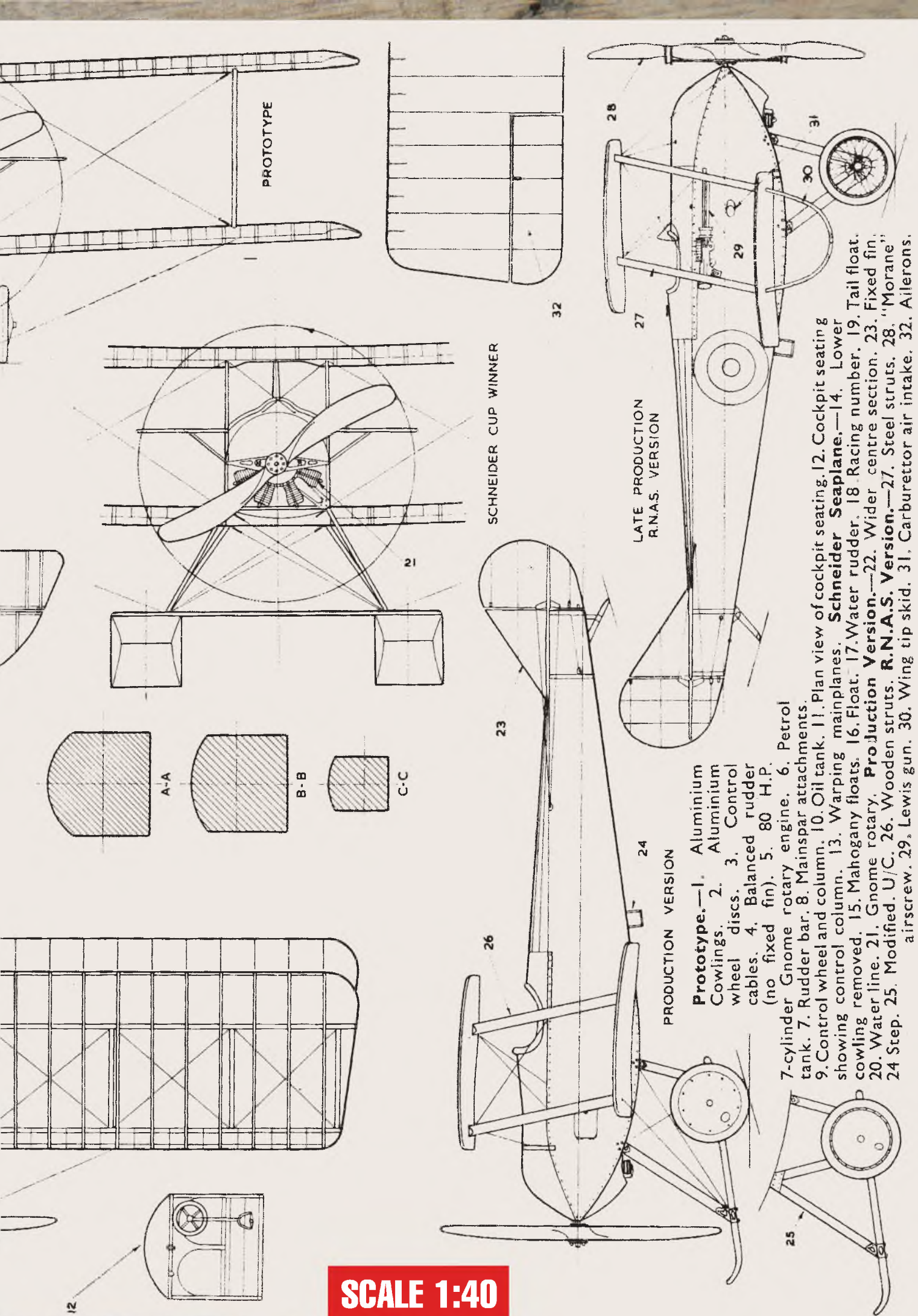
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SOPWITH TABLOID





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PRODUCTION VERSION

Prototype.—1. Aluminium Cowlings. 2. Aluminium wheel discs. 3. Control cables. 4. Balanced rudder (no fixed fin). 5. 80 H.P. 7-cylinder Gnome rotary engine. 6. Petrol tank. 7. Rudder bar. 8. Mainspar attachments. 9. Control wheel and column. 10. Oil tank. 11. Plan view of cockpit seating. 12. Cockpit seating. 13. Warping mainplanes. 14. Lower cowlings removed. 15. Mahogany floats. 16. Float. 17. Water rudder. 18. Racing number. 19. Tail float. 20. Water line. 21. Gnome rotary. 22. Wider centre section. 23. Fixed fin. 24 Step. 25. Modified U/C. 26. Wooden struts. 27. Steel struts. 28. "Morane" airscrew. 29. Lewis gun. 30. Wing tip skid. 31. Carburettor air intake. 32. Ailerons.

SCALE 1:40



MAIN IMAGE: This excellent painting by the late Ken McDough captures the excitement of the 1914 Schneider Trophy race at Monaco, where the Sopwith Tabloid was the winning aircraft, piloted by Howard Pixton. (First used on the cover of AeroModeller December 1961 issue)

TOP RIGHT: Howard Pixton piloted the Sopwith Tabloid to win the 1914 Schneider Trophy event at Monaco. The Trophy is now in custody of the Royal Aero Club, after the outright 3rd consecutive win by the British team in 1931.



SOPWITH TABLOID

When it first appeared it was, compared to its contemporaries, an object lesson in minimalist, practical simplicity

The 1913 Tabloid was a new concept in aeroplane design; a classic example of compact simplicity. Hitherto, biplanes had been braced by a multitude of struts and wires and were predominantly of the pusher type. Though experiments along similar lines were made at Farnborough, the Tabloid was a more practical design and enjoyed publicity both as a product of private enterprise and for the battle over its name, with a medical tablet company.

Originally designed as an exhibition machine, the little biplane astounded the crowds at Hendon when Harry Hawker flew it there, after the completion of its official trials at Farnborough. With pilot and passenger, it

had a top speed of 92 m.p.h. which few monoplanes could emulate, and also the low stalling speed of 37 m.p.h.

Chief distinction of the Tabloid was the single bay tractor layout. There was nothing superfluous in the design. Given the engine power available in those days, it would be difficult to conceive a more practical airframe. The Gnome rotary engine was completely cowled and cooled by two small slots in the front of the aluminium cowling. The fuel tank followed the contour of the fuselage and the seats were mounted side by side. Lateral control was by warping and the wings were braced by four interplane struts and the minimum of cables. The undercarriage was a neat twin-skid affair with aluminium

“ Chief distinction of the Tabloid was the single bay tractor layout. There was nothing superfluous in the design. Given the engine power available in those days, it would be difficult to conceive a more practical airframe ”



A Naval example fitted with pontoon floats front and rear. Note the increased fin area.

GENERAL INFO

PROTOTYPE

TYPE: Two seater scouting and exhibition aircraft. Power: 80 H.P. 7-cylinder Gnome rotary engine. Construction: Single bay tractor biplane wooden structure, wire braced, fabric covered. Aluminium covering on front fuselage.

DIMENSIONS: Span 25 ft. 6 in. Overall length 20 ft. Chord 5 ft. Height 8 ft. 5 in. Wing area 240 sq. ft.

PERFORMANCE: maximum speed 92 m.p.h. at ground level; stalling speed 36.9 m.p.h.; climb to 1,200 ft. 1 minute.

MILITARY VERSION

POWER: 1 100 H.P. 9 cyl. Gnome Monosoupape.

DIMENSIONS: span 25 ft. 6 in. Length 20 ft. 4 in. Weights: empty 730 lbs. Loaded 1,120 lbs.

ARMAMENT: Lewis gun mounted on centre section or on side of fuselage with deflector blades on airscrew. 4 x 20 lb. bombs.



Close-up of an early military Tabloid, showing the undercarriage 'horns' to help prevent nose-overs.

An civilian example of the Tabloid used for air racing, and featuring V-strut undercarriage. Note the air intakes in the upper engine cowl.

faired wheels.

In 1914, a special version, powered by a 100 H.P. Monosoupape Gnome and equipped with floats, won the Schneider Trophy (top right) at Monaco piloted by Howard Pixton. The compact little seaplane had a profound influence on French manufacturers who until then, had placed their faith in the monoplane layout.

During the early stages of the First World War, the Sopwith Tabloid saw service with both the R.F.C. and the R.N.A.S. But for the lack of a suitable interruptor gear it would have been more than a match for the Fokker Eindecker which copied the French

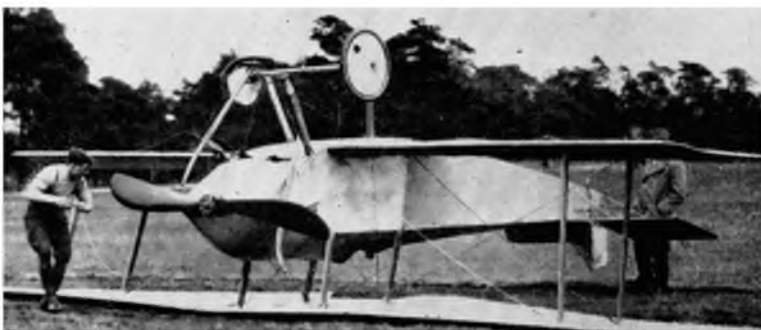
Morane. The R.N.A.S. did indeed attempt to solve the problem by fitting deflector blades to the airscrew after the manner of the Morane Bullet, but such experiments met with limited success.

In a military capacity, the Tabloid is chiefly famous for the attack on the Zeppelin sheds at Dusseldorf and Cologne in October 1914. Flying from Antwerp, F/Lt. R. L. G. Marin destroyed the new Zeppelin Z.IX, bombing from a height of 600 ft. This was the first German airship to be destroyed by a British aircraft.

Military Tabloids differed little from the civil counterpart. The main modification was the addition of a fixed fin in front of

the rudder and a stronger undercarriage. Production Tabloids were single seaters and only the prototype was equipped to accommodate a passenger. Later, a neat Vee-type undercarriage was incorporated, dispensing with the cumbersome skids and some of the final aeroplanes had ailerons.

About 40 Tabloids were produced. They were distributed widely among the R.F.C. Squadrons in France and served with Wing-Commander Samson's Eastchurch Squadron in Belgium. Two Tabloids were among the aeroplanes operating from H.M.S. Ark Royal during the Dardanelles campaign. ■

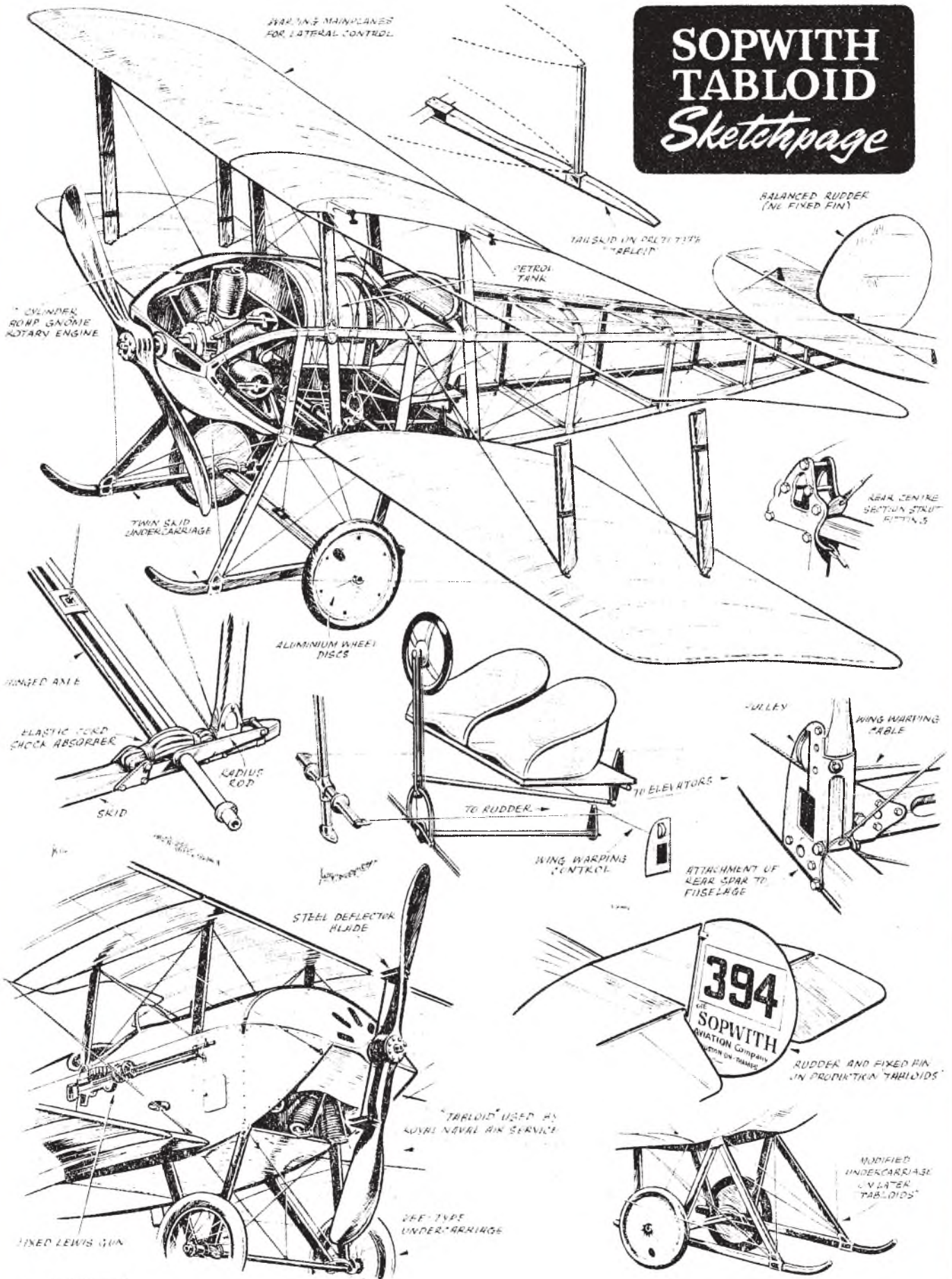


This upturned military machine seems little damaged, apart from the undercarriage. Sopwith patented a form of split axle which was applied to later examples in an effort to reduce landing accidents.



An early example of a military version of the Tabloid, with wing warping for lateral control.

SOPWITH TABLOID *Sketchpage*



WARPING MAINPLANES
FOR LATERAL CONTROL

BALANCED RUDDER
(NO FIXED FIN)

TAIL SKID ON DELTA TYPE
TABLOID

PETROL
TANK

7 CYLINDER
RUMP GIGNONE
ROTARY ENGINE

TWIN SKID
UNDERCARRIAGE

REAR CENTRE
SECTION STRUT
FITTINGS

ALUMINIUM WHEEL
DISCS

HINGED ANGLE

ELASTIC CORD
CHECK ABSORBER

RADIUS
ROD

SKID

TO RUDDER

TO ELEVATORS

WING WARPING
CONTROL

ATTACHMENT OF
REAR SPAR TO
FUSELAGE

PULLEY

WING WARPING
CABLE

STEEL DEFLECTOR
BLADE

TABLOID USED BY
ROYAL NAVAL AIR SERVICE

DEF TYPE
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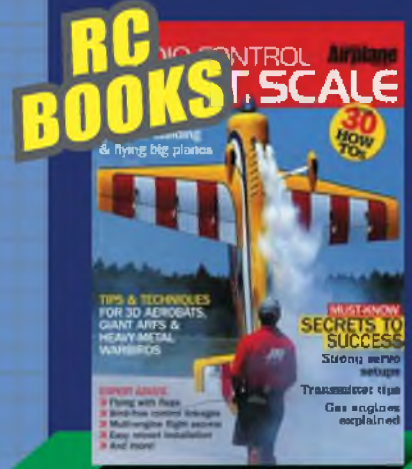
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Techno Scale Mike Evatt tra

Dave Platt was born in London and after working on the 'Battle of Britain' film, designing models for that movie in 1966, moved to the USA to join Topflite. Subsequently he founded Dave Platt Models Inc. with a web site at www.daveplattmodels.com

In addition to his "Black Art" constructional video series, here you will find scale RC kits, semi-kits, and plenty of nice accessories to make your models "...the best you ever built...".

Zirol Plans at <https://ziroligiantyscaleplans.com> offer an outstanding range of Giant Scale warbird and civilian aircraft plans. These include full-size templates for all the required parts, allowing you to cut a complete 'kit' before you start construction. A number of third-party laser cutters also cut many of their designs. However, what I spotted here amongst their range of fittings and accessories was a superb Clerget 9B nine cylinder 130 HP 1/3 scale cast resin engine kit.

The company making **Biela Propellers**

was established in 2000 and has a web presence at www.smigla.com They now sell their superb scale propellers to clients all over the world. These are all handmade, based on carbon and fiberglass from the best quality of epoxy. For propellers of more than 30" diameter they add Kevlar roving, while the hub is made of hard wood. The propellers are light and very stiff and come in basic colours of white on the front, black on the backside, and with red blade tips, but they will provide your preference to order. Therefore, whether it is a four-blade propeller for your Corsair or Mustang or a five-blade one for your Pilatus 21 this is the shop for it.

Based in Thailand, **Tmmy Scale Composite** have twenty years experience specialising in fiberglass composite manufacturing and supply classic scale models. Few companies feature old airliners in their catalogues so I was delighted to find a rather impressive 1/8th scale Douglas DC-3. This has a wingspan of 150 inches and is designed to take two 26-50cc IC engines. The Kit

Includes: ready built fuselage, wing and tail assemblies, push rods, servo mount, wing tube, pair of dummy engines, canopy and accessories package. Check it out at

www.tommy.pantown.com

If you like your WWI warbirds big, then look no further than www.billhempel.com

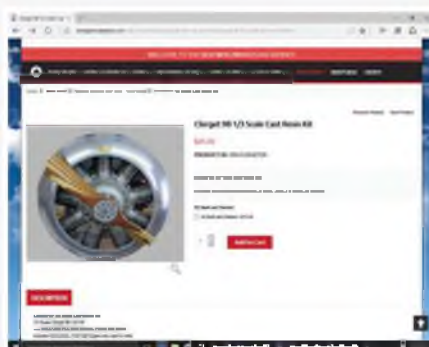
Bill Hempel has created what is claimed to be the LARGEST WWI ARF in the world, a 65% Fokker DR-1 triplane. This monster ARF has a top wingspan of 16 ft. and is designed for motors of 275cc and larger.

The model is covered in high quality Ultracote finish and can be completed in almost any scheme you desire.

Sullivan Products at www.sullivanproducts.com was founded in the 1940s, to produce wire lines, handles and connectors for control line flying. They still make many of those products today although over the years they have diversified into components for R/C models. Their SkyWriter(tm) Smoke System is an electronically controlled Smoke Pump for on-board smoke



Dave Platt's superb scale pilots.



A beautiful Clerget 9B 9 cylinder 130 HP 1/3 Scale Cast Resin Engine Kit from Zirol Plans.



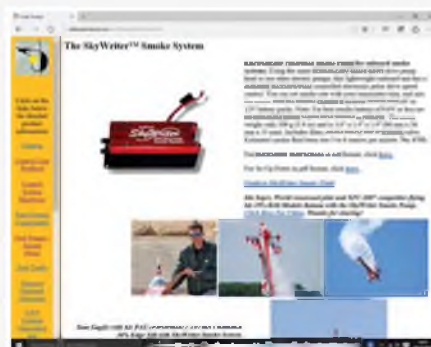
Biela propellers for all your scale needs.



A rather impressive 1/8 scale Douglas DC-3 from Tmmy Scale Composite.



The 65% Fokker DR-1 triplane claims to be the LARGEST WWI ARF in the world.



The SkyWriter (tm) is an electronically controlled on-board smoke system from Sullivan.

awl's the web for more TechnoScale Topics...

systems. Using the same ultrasonically sealed direct drive pump head as their other electric pumps, this lightweight on-board unit has a miniature microprocessor controlled electronic pulse drive speed control.

There used to be a sense of adventure poking around in the stockroom of my local model shop, unearthing scale kits from a couple of decades earlier. This activity is sadly a thing of the past. Or is it? Log-on to www.oldmodelkits.com and you may get the same thrill.

Oldmodelkits.com sells rare, out-of-production and hard-to-find kits from the 1930's to the present. Unless otherwise specified, old kits are guaranteed to be originals and NOT re-issues or reproductions. The screen-shot features 1/16th scale Jack Stafford Models B-24D Liberator 'Strawberry Bitch' - 90 Inch wingspan for R/C.

Westbourne Model Centre at www.westbourne-models.com prides itself on being the largest model boat stockists in England. However a glance at its on-line store shows that it is also a

major supplier of model aircraft. Spotted here was E-flite's indoor slow flyer foam version of the famous German Fokker D.VII This gem is presented in the markings of Ernst Udet's personal aircraft and features one of the brightly painted colour schemes used by the aircraft of Jasta 1, more commonly known as the Red Baron's Flying Circus.

Whatever your scale discipline **IFlyTailies** is an on-line cornucopia of scale embellishments, from Cockpit accessories, instruments and instrument panels to armament, ordinance and much much more. They even have a German WWI Map of France, which includes a legend on the bottom featuring many details indicating: beacons; Flak search lights; break through paths; search light zones; name of air bases with runway length etc. Available in five different scales!

Check it out at www.iflytailies.com
The French company **Heli-Scale** at www.heli-scale.fr stock the Roban Compactor range of super-scale helicopters. Roban's new 700 size Bell AH-

1W is now available. It's the fourth product in their Super Scale series. Their new 'True Scale' design locates the cockpit exactly at the right spot, unlike most scale fuselages that are based on 3D mechanics. The fuselage of the Bell AH-1W stands out through the detailed crafted surface details and the overall correctly scaled down shape. This unique scale look and details stun and make it hard to see the difference from the real helicopter.

I always drift back to the **Dumas** website at www.dumasproducts.com to peruse their collection of rubber powered 'Walnut Scale' models. These delights have a wingspan of 18 inches more than the smaller 'Peanut' class and are a tad easier to fly. The kits are well designed, have laser cut parts and very comprehensive plans and build instructions. The series includes such rarities as the Fokker E.111 and the Air Camper shown in the screen-shot. ■



Oldmodelkits.com sells rare, out-of-production and hard-to-find kits.



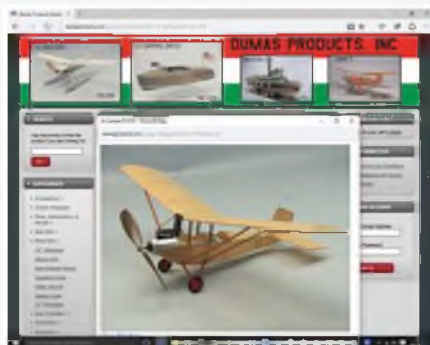
E-flite's indoor slow flyer foam version of the famous German Fokker DVII.



IFlyTailies is an on-line cornucopia of scale embellishments.



Roban's new 700 size Bell AH-1W is now available from Heli-Scale France.



The Dumas 'Walnut Scale' Air Camper.



That's all there is time for from me this month so switch on the Broadband and if you find something out there of interest that might be good to share, email me at:

mikeevatt@hotmail.com

FOKKER EINDECKER E.1

GERD REINSCH'S OUTSTANDING 40% MODEL FROM THE INCOMPARABLE PAOLO SEVERIN KIT, CAPTURED ON CAMERA BY ALEX WHITTAKER

The Fokker E.I was a truly remarkable aircraft. Its monoplane layout set the pattern for most military aircraft down to this day. It was Germany's first fighter of WW1 which precipitated the 'Fokker Scourge' of 1915, when it trounced all the Allied opposition to achieve German air superiority. Significantly, it was not an all-new design, since it borrowed heavily from the earlier Morane-Saulnier Type H of 1913. However, the Morane was essentially a wooden aircraft, whereas the Fokker used a tough

and innovative tubular structure, which was well suited to factory production. It was therefore a little surprising that instead of ailerons, the Fokker E.1 employed wing warping.

Most noteworthy was the interrupter gear fitted to the E.1 by Anton Fokker. Once again, it was not his invention, but his version was practical and effective. Infamously, for The Allies, German Ace Max Immelmann put this fearsome mechanism to deadly use in his E.1 over the Western Front. Astoundingly for such an aviation legend, only 54 Fokker E.1s

were built, although later variants were built in greater numbers. The Fokker ascendancy was only eclipsed when The Allies introduced types such as the Nieuport 11 and the DH2

The Model

First and foremost, this immaculate model is massive. She is built to forty percent scale and spans a majestic 159" (4.04m). She weighs 44lbs (20 kg.), and is powered by a Valach 120cc petrol engine.

She was built by German show pilot Gerd Reinsch, known to Brits from his many appearances at the UK summer shows, where he is a firm favourite.

His astounding Eindecker was built from an advanced kit from the unmatched Paolo Severin. Paolo has the eyes of an artist and hands of an engineer and his kits have no close competitors. Their quality, fidelity, and sheer completeness is unsurpassed. Paolo has worked hard on scale accuracy with his E.I. The model

“ Most noteworthy was the interrupter gear fitted to the E.1 by Anton Fokker. Once again, it was not his invention, but his version was practical and effective ”





employs exactly the same aerofoil as the original and also uses exactly the same +6 degree wing incidence, while the model's construction faithfully mimics the tubular original. Only metal and wood materials are used in the model, there is

no glass fibre, balsa, or carbon composite used in the kit.

The Plan

Severin returned to primary historical resources to draw up his meticulous plan.

The kit is based on the later production E.1, with the larger aspect-ratio wingspan of 10 metres.

Construction

As per the full-size, the model uses a wire-

Model is covered in woven polyester ProfiCover. All decals are painted with Relius brand paints.



1: Fully articulated scale undercarriage with rubber bungee suspension.

2: The E's authentic scale undercarriage is thoroughly braced with wires and turn buckles.



braced steel tube fuselage. This, and the all-moving metal tube rudder and tailplane have been sandblasted before finishing. The wing has plywood ribs threaded onto a cedar wood spar. As already mentioned, the ribs follow the true scale section of the full size aircraft and the the wing of the model also replicates the wing warping mechanism of the full size. All steel fittings are laser cut and pre-shaped ready for fitting and the pilot's control column is linked to the operation of the lateral and longitudinal controls (wing-warp and 'elevator').

Engine

Gerd fitted a Valach VM 120B2-4T twin petrol engine. This was sourced from *Toni Clark Models* in Germany and is a four-stroke motor with a capacity

of 120cc. The engine has nickel-silicon coated bores, and uses Honda valves. The engine is fitted with a classic Walbro carb, familiar to generations of petrol modelers and employs Valach's own electronic ignition system powered by two lipo cells.

Exhaust

Gerd first flew the model with an exhaust borrowed from an Aeronca C3, but it is now fitted with a custom Severin exhaust. This exhaust, coupled with four-stroke petrol operation and that big prop delivers an exceptional sound. It has quite a bark when run on full throttle.

Prop

Gerd chose a Fiala 32x12" wooden prop.



The Paolo Severin kit is designed with a good speed range. Can fly very slowly indeed when required.



3: Pilot Helmut is nicely dressed and the cockpit is edged in leather. **4:** Crisp detailing on machine gun and the king post. **5:** Nicely executed riveted windscreen frame in aluminium. **6:** The wing warping king post assembly is a work of art. Model comes complete with all cable terminations, turnbuckles, pulleys, cables and turnbuckles. **7:** The cowl, side fairings and metal cowling on the fuselage uses aluminium. Note slots for undercarriage travel. **8:** Dummy Oberursel engine expertly masks Valach 120 Petrol Twin. **9:** Sheet metalwork and fastenings are executed to an astounding standard. **10:** Laser cut steel fittings abound. Note engine turning on aluminium cowl.

Cowl and fuselage side panels

The aluminium cowl is supplied preformed, as are the cowl's side fairings. A scale-like engine-turned finish is used. The metal fuselage panels are from light aluminium sheet, of a heavier gauge than the litho plate that modelers often resort to for such panelling.

Undercarriage

Unsurprisingly, this is true scale and a fully

functional articulated unit. It uses rubber shock absorbers, bungee style and it fitted with scale wheels from a Toni Clark Albatros that, co-incidentally, fit.

Control

The authentic scale wing warping means that the control stick is directly connected to the surfaces. The rudder pedals are also connected to the rudder bar. Elevators and rudder can be easily removed for transport.

Scale Items

All fixtures, fittings, cables, terminations, and turnbuckles are faithfully reproduced in the kit ready for fitting when the build sequence demands.

Covering

Gerd used an adhesive backed woven polyester fabric called ProfiCover available from Toni Clark Models in Germany. Its particular property is that it



11: Scale details everywhere!
12: The kits are supplied with all cable terminations, turnbuckles, clevis pins, and fittings.



shrinks more tightly along the roll than across it.
www.toni-clark.com/english/zubehoer/proficover.htm

Painting

Gerd used two-pack polyurethane from the Relius paint company.

Decals

The model uses no decals: everything is painted.

Flying

I have long been an admirer of Fokker Eindeckers. There is something pure and elemental about this famous design. So, to my eyes at least, this is a very special model aircraft. Its sheer presence is a delight, and in the air she has a surprising flight envelope (which easily surpasses that of the original).

However, that is not the name of the game in scale! FSM readers wish to see authentic scale flying. So, if you wish to see a fully wing-warping Eindecker model in flight this coming season, this is the one. I was privileged to see this model fly on three separate occasions last summer, and I think Gerd will be back on the UK Scale Events circuit this year. On each and every flight she looked utterly entrancing. The wing warping is surprisingly effective, and the sound of that big engine is addictive, although it is not a rotary like an Obersursel, of course.

However it supplies a big throaty sound that Gerd makes more authentic as he blips the imaginary

magneto on slow approaches. Gerd is a superb pilot and a real showman. One of his party pieces with the Fokker is extended inverted flight. I have to say, scale or no, an inverted Eindecker is something to behold. But, Gerd's most chilling manoeuvre is to dive the model vertically on full power. Then he flips her through a 90-degree pull-out at more-or-less zero feet.

The G-forces this inflicts on the airframe are truly eye-watering but the Severin's metal construction kit just shrugs it off. My favourite memory of 2015 was at Little Gransden Willis Warbirds Meeting. Watching her slip over the boundary hedge in the gloaming, with the wind in her wires and her engine burbling softly, was a rare treat. ■

SPECIFICATIONS:

Toni Clark Fokker E.1

Scale:	40% or 1:2.5
Length:	108" / 4.04 m
Wingspan:	159"
Wing Area:	4650 sq inches / 3.0 sq m.
Weight:	44lbs as flown at Cosford 2015 with smaller batteries (saves 1/2 lb) and the wheels from Toni Clark Albatros DV kit (which saves 1lb)
Engine:	Valach VM 120B2-4T petrol
Capacity:	120 cc.
Prop:	Fiala 32 x 12" wooden prop
Control:	Wing Warping and elevator



AeroDetail series

Making a scale model?

Finding the detail needed to finish a scale model can be difficult and getting full size images is not always practical. Our range of detail photo collections provides extensive close ups of a wide range of popular aircraft all on CD in J-peg format



Junkers Ju87G-2 Stuka CD65

The aircraft that defined the term

Hawker Typhoon CD109

The Hawker Typhoon was a British single-seat fighter bomber, produced by Hawker Aircraft. While the Typhoon was designed to be a medium-high altitude interceptor. 117 images

Hawker Tomtit CD64

Mid 1930s RAF biplane trainer aircraft, from the era open cockpits of silver dope and polished metal. (140 images)

Hawker Tempest Mk 2 CD63

The final development of Hawker

Hawker Sea Fury FB XI CD62

Hottest of all the piston-engine fighter aircraft, the carrier-borne Sea Fury is also admired for its elegant profile. (140 images)

Hawker Hurricane MK1 & MKIV CD61

Two versions of the famous 'Hurri' - one a true Battle of Britain survivor painstakingly restored to perfect authenticity, plus the cannon-armed, Mk.IV 'tank buster'. (170 images)

Hawker Hart & Hind CD60

A combo collection featuring the RAF Museum's Hart bomber and Hart Trainer, plus Shuttleworth's Hind. (115 images)

Hawker Fury CD59

No authentic example now exists, but the accurate replica photographed in extensive detail in this collection is as good a guide as can be found of this elegant 1930s RAF fighter. Includes some general arrangement pictures authentic to the period. (55 Images)

Grumman FM-2 Wildcat CD58

First of Grumman's highly successful line of prop-driven 'Cats', the Wildcat, in guises from F4F-3 to FM-2 held the line after the Pearl Harbour attack and served from then until the end of WW2. It was idea for operations from the small escort carriers. (90 images)

Grumman F8F Bearcat CD57

Hottest of Grumman's prop-drive fighters - it arrived too late for action in WW2 but was standard ship-borne fighter equipment in the immediate post-WW2 era. (90 images)

Grumman F7F Tigercat CD56

The awesome twin engine long range fighter of the late WW2 era operated by US Navy and US Marines. (90 Images)

Grumman F6F Hellcat CD55

The US Navy's most important, and most successful fighter of WW2, photographed, close-up, from nose to tail and wing tip to wing tip. Example shown is part of The Fighter Collection, based at Duxford. (90 images)

Grumman F3F CD54

A study of the faithfully replicated example of the 1930s U.S. Navy biplane as seen at the 2001 Flying Legends Show. (34 images)

Gloster Gladiator CD53

The Royal Air Force's last biplane fighter, star of late 1930s air shows and flown in combat during early WW2, including Battle of France, Battle of Britain, Mediterranean operations and North Africa. (50 images)

Fokker D.VIII CD52

The Fantasy of Flight Museum's example of the late WW1 Imperial German Air Service monoplane fighter, in full detail. (69 images)

Fokker D.VII CD51

The most famous of all the German fighter aircraft of WW1. The collection depicts the RAF Museum, Hendon's authentic, restored example. (44 images)

Focke Wulf FW 190A CD50

Germany's 'butcher bird' fighter of WW2, active on all combat fronts from 1941 onwards.

Fieseler Storch CD49

Arguably the first military STOL aircraft, this storky looking aircraft has long been a modellers' favourite. Two examples are represented, the machine at the Fantasy of Flight Museum in Florida and the RAF Museum Cosford's example. (90 images)

Fairey Gannet ASW1 & T.2 CD48

The Royal Navy's post-WW2 anti-submarine workhorse, that also served with a number of other air-arms. Most images are of Mk.T.2, that was more-or-less the same as the ASW.1. (110 images)

Fairchild Ranger CD47

Elegant U.S. high wing light aircraft in full detail. Two examples shown. (60 images)

Erco Ercoupe 415 & Avalon Ercoupe CD46

The elegant twin finned light/sport aircraft. Both original Type 415 and later Alon resurrection examples. (115 images)

DHC Chipmunk CD45

A bumper bundle of images that provides a vast array of detail pictures, plus photos of examples in both RAF trainer and civil colours. (70 images)

DH Tiger Moth CD44

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. (110 images)

De Havilland DH89 Dragon Rapide CD43

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. (100 images)

De Havilland DH84 Dragon CD42

Forerunner of the more famous DH 89 Dragon Rapide, this collection depicts a superbly restored example. (40 images)

DE Havilland DH 60 CD41

The aircraft that set the British 'club' flying movement on the road to success during the 1930s. (140 images)

De Havilland DH 53 CD40

1920s lightweight low wing sports aircraft designed to a low-power specification. Machine illustrated is the sole remaining example. (60 images)

Curtiss P-40M CD39

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. (100 images)

Curtiss P-40B Tomahawk CD38

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! (130 images)

Curtiss Jn-4 'Jenny' CD37

An authentic, restored example in full detail. (130 images)

Curtiss Hawk 75 CD36

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. (130 images)

Comper Swift CD35

1930s racing aircraft. Example depicted is the radial engine example at Shuttleworth Mussel (91 images)

Cierva C.30 Autogiro CD34

A study of the example hung in the Fantasy of Flight Museum, finished in RAF WW2 colours. (35 images)

Christen Eagle CD33

The spectacular, stylish aerobatic biplane revealed in close-up. Example shown is the two-seat version. (90 images)

Chrislea Super Ace CD32

Late 1940s civil light aircraft with distinctive twin fins and nosewheel type undercarriage. A fully restored example. (123 images)

Chilton DW1 CD31

Original upright engine version of this diminutive British low wing sports/racer. (90 images)

Chance Vought F4U-1D Corsair CD30

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

Bucker Jungmeister CD29

Radial engine version. Example from Fantasy of Flight Museum. (79 images)

Bucker Bestmann CD28

Authentic example as exhibited at the Fantasy of Flight Museum, in WW2 Luftwaffe colour scheme. (43 images)

Bristol M.1C CD27

Early WW1 fighter monoplane. Example depicted is the faithfully authentic replica built by the Northern Aero Works and operated by the Shuttleworth Trust museum. (100 images)

Bristol F2B Brisfit CD26

Full close-up detail, including photos of engine cowls for both Rolls Royce Falcon and Hispano-Suiza engines. (28 images)

Bristol Bulldog CD25

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. (60 images)

Boeing Pt-13/17 Stearman CD24

Subject aircraft is a current British civil register example used for air-show displays. (54 images)

Bleriot Monoplane CD23

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. (74 images)

Bell P-39Q Airacobra CD22

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. (130 images)

Beech D18 Staggerwing CD21

The distinctive back-staggered 1930s biplane with retracting undercarriage. (45 images)

Avro 504k CD20

The Shuttleworth Museum's superbly maintained machine, in full detail. (140 images)

Arrow Active II CD19

Sole remaining example of this 1930s racing and aerobatic biplane restored to pristine condition. (50 images)

Aeronca Sedan CD18

The last and most graceful of the Aeronca line of light/sports aircraft in fine detail. (80 images)

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THE FOKKER EINDECKERS

Germany's first true fighter aircraft. The late Alex Imrie, aviation historian, traces the development of this famous line of aircraft and the impact it had on WW1

During the first months of World War One, the introduction and development of aircraft armament had high priority. At the start of hostilities, Germany did not have a suitable lightweight machine gun for use in aircraft, but modified infantry weapons were soon in use from a variety of makeshift gun mountings.

It was appreciated that a machine gun, firing

forward in the direction of flight, would be the best solution and this gave rise to the appearance of armed pusher aircraft. Another approach to the problem was the construction of twin-engined aircraft, since the observer/gunner in the nose of this type of machine did not have any airscrew avoidance problem. Various methods were tried by both sides and one of these, used by the French, had a machine gun free-firing through the

With their ground crew (centre) at Sivry, France in 1916, two Eindecker pilots display the kind of clothing used by WWI aviators for protection against cold at altitude.

“ Garros managed to destroy his downed aircraft before capture, but the remains included the propeller with its armoured deflector wedges, sufficiently intact to reveal the principle of the ‘System-Garros’ to German technicians ”



ground crew at Sivry, France in 1916 display the kind of clothing used by WWI aviators for protection against cold at altitude.



area of the rotating airscrew to provided a practical, if somewhat dangerous solution. In this arrangement, metal deflector wedges were bolted to the wooden airscrew in a line with the muzzle of the machine gun and this prevented damage to the blades from the few rounds that would otherwise have struck them.

This device, known as the 'Saulnier Armoured Propeller' was fitted to several Morane Type L Parasols and was used operationally. One of the most successful pilots to use this set-up was the famous pre-war pilot Roland Garros, who managed to shoot down a number of German aircraft in a few short weeks before he in turn was shot down behind German lines, to be captured in April 1915.

Garros managed to destroy his downed aircraft before capture, but the remains included the propeller with its armoured

deflector wedges, sufficiently intact to reveal the principle of the 'System-Garros' to German technicians.

Investigations into how best to utilise this rather crude device revealed the surprise to Germany authorities, that Anthony Fokker had previously conducted experiments in this direction and that he already had a mechanical synchronised gun that worked.

Fokker has immediately asked to fit his interrupter system to an aircraft and he installed it into one of his Fokker M5K single-seat scouting aircraft that he was already supplying to the Imperial German Air Service. The new armed single-seat Fokker M5K/MG aircraft prototype was then taken to the Front and demonstrated to selected units. Pilots with experience of rotary-engined aircraft were given the chance to fly the new machine and gave it an enthusiastic endorsement.

Redesignated E.1, the 80 hp, seven cylinder rotary powered aircraft, with wing warping for lateral control, went into production, with 15 examples operational by the end of July 1915.

Success was immediate. Initially, one example was allocated to each two-seater unit on the active parts of the battlefield and in the hands of aggressive pilots, it was soon shooting down the slower, less manoeuvrable Allied aircraft. The long months of the 'Fokker Scourge' had begun.

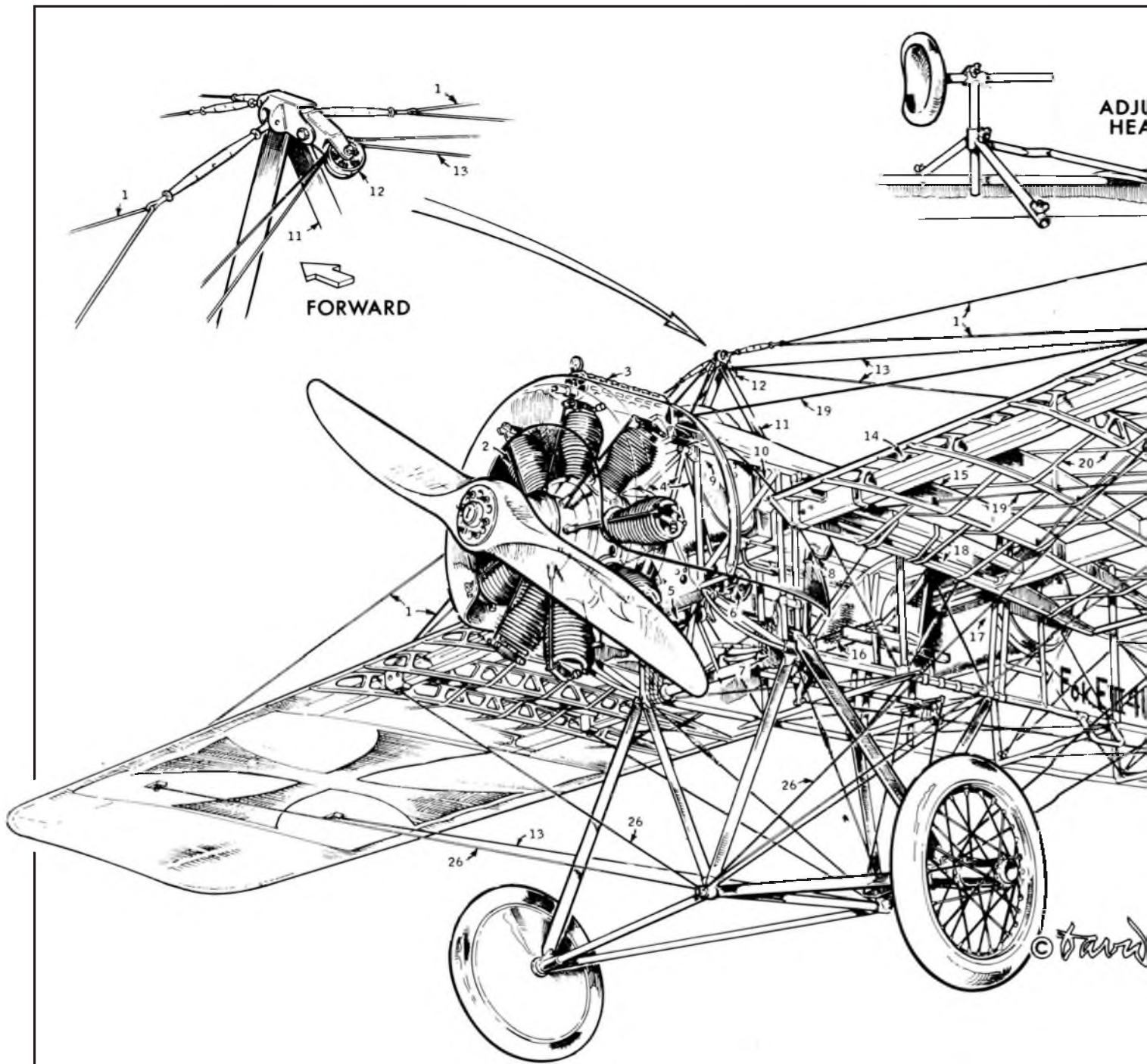
It was soon realised that a more effective means of maximising the new machines superiority was by operating the single-seaters in groups, resulting in non-permanent formations known as *Kampfeinsatz-Kommandos*, which were formed and dissolved as the tactical situation required. It was soon appreciated that fighting in single-seaters was a specialist job and while many



The man himself, Anthony Fokker looks well pleased with himself in front of this E.III. Machine gun is offset to starboard.



Oberleutnant Kurt Student with his Fokker E.IV, which features the standard twin-gun armament of production examples. Student became General of Paratroops during WW2.



© David R Jones. First published in the Cross & Cockade GB Journal, Vol. 5, No. 1

FOKKER EINDECKER E.III

of the early Fokkers were flown by two-seater pilots who did this work in addition to their normal two-seater duties, the dedicated single-seater fighter pilot now emerged.

Some of these pilots began to amass considerable victory scores and their names became household words in Germany as news of their achievements and decorations became known.

Such air superiority could not be left unchallenged and sparked the beginning of the never-ending fighter technology race

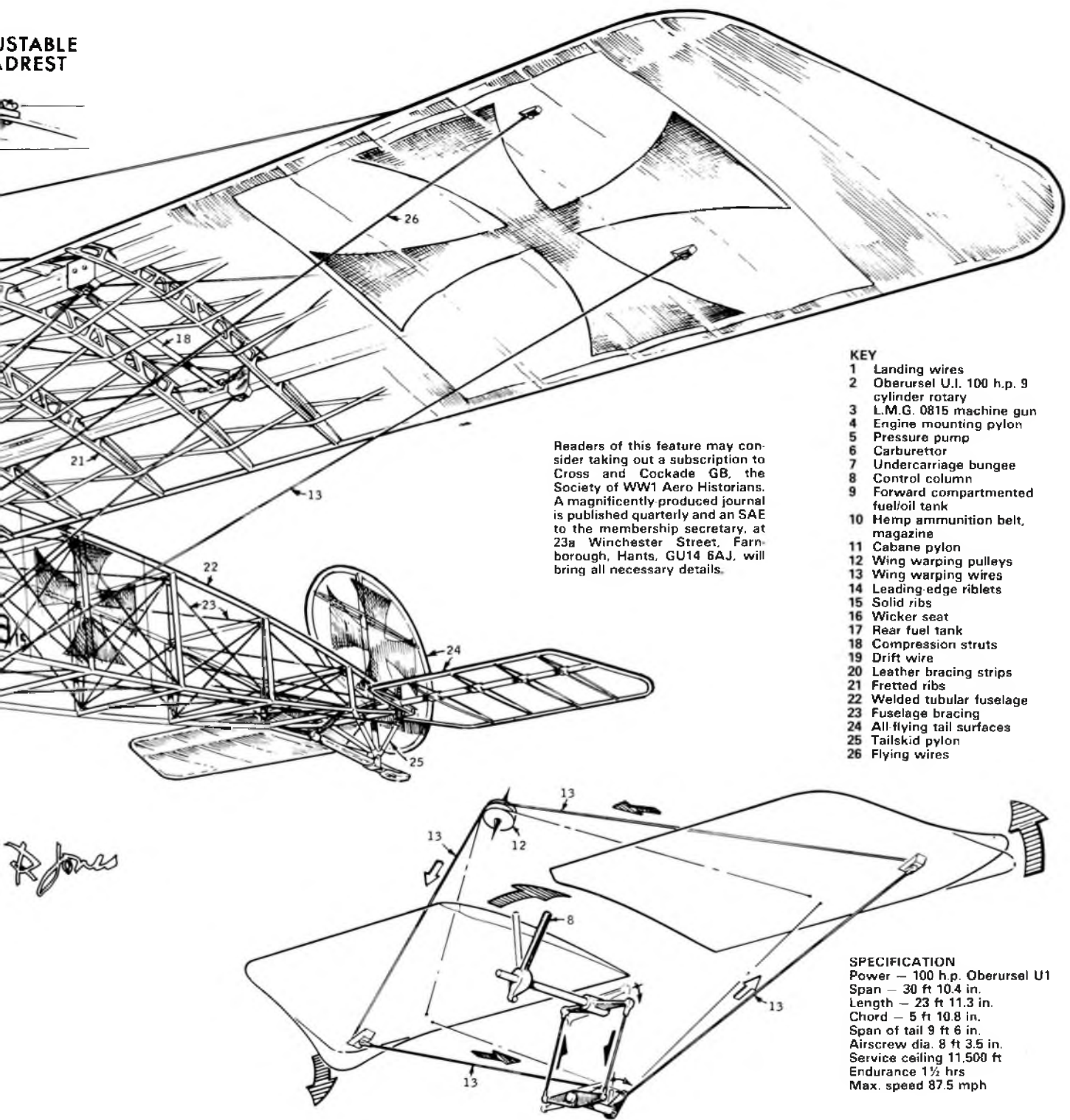
that persists to this day. The Allied reply came in the form of nimble biplanes, the British de Havilland DH2 and the French Nieuport 11 to herald the end of the operational life of the Fokker E-type monoplanes of which there were 140 on the Western Front at the commencement of the Battle of the Somme on July 1st 1916. Outnumbered and outperformed, only a few lingered in the newly formed Jagdstaffeln which came into being in August to briefly serve alongside the new Albatros, Fokker and Halberstadt

fighter biplanes.

An early attempt was made to improve the performance of the E.I by employing the higher powered Oberursel U.1 rotary engine that offered 100 hp to produce the E.II type with shorter wing span and higher wing loading, but this was not a success. New wings of 9.52 metres span were then fitted to produce the E.III which became the most numerous version of the Fokker monoplane line, with 110 example at the Front by the end of April 1916.

The Final offspring was the E.IV, a redesign

UNSTABLE
DREST



Readers of this feature may consider taking out a subscription to *Cross and Cockade GB*, the Society of WW1 Aero Historians. A magnificently produced journal is published quarterly and an SAE to the membership secretary, at 23a Winchester Street, Farnborough, Hants, GU14 6AJ, will bring all necessary details.

KEY

- 1 Landing wires
- 2 Oberursel U.I. 100 h.p. 9 cylinder rotary
- 3 L.M.G. 0815 machine gun
- 4 Engine mounting pylon
- 5 Pressure pump
- 6 Carburettor
- 7 Undercarriage bungee
- 8 Control column
- 9 Forward compartmented fuel/oil tank
- 10 Hemp ammunition belt, magazine
- 11 Cabane pylon
- 12 Wing warping pulleys
- 13 Wing warping wires
- 14 Leading edge riblets
- 15 Solid ribs
- 16 Wicker seat
- 17 Rear fuel tank
- 18 Compression struts
- 19 Drift wire
- 20 Leather bracing strips
- 21 Fretted ribs
- 22 Welded tubular fuselage
- 23 Fuselage bracing
- 24 All-flying tail surfaces
- 25 Tailskid pylon
- 26 Flying wires

SPECIFICATION

- Power — 100 h.p. Oberursel U1
- Span — 30 ft 10.4 in.
- Length — 23 ft 11.3 in.
- Chord — 5 ft 10.8 in.
- Span of tail 9 ft 6 in.
- Airscrew dia. 8 ft 3.5 in.
- Service ceiling 11,500 ft
- Endurance 1½ hrs
- Max. speed 87.5 mph

to accommodate a twin-gun armament installation, with wingspan increased to 10 metres. The fuselage front end was revised, a more enclosed cockpit position added, together with 160 hp Oberursel U.III 14 cylinder double-row rotary engine.

However the greater torque and gyroscopic effect of the bigger, heavier engine actually restricted manoeuvrability so that the optimum performance had been achieved with the E.III. and there were also problems associated with the synchronisation of the two guns and also of

three guns, installed on a few E.IVs of which, only 29 are recorded as being with Front-Line formations.

Construction

Although there were differences in engine installation, cowlings and wingspan, construction remained very similar throughout the series. The fuselage was a steel tube structure, braced with wire and covered with fabric. It was rectangular in cross section from the pilot's position aft in both plan and side elevation, terminating in

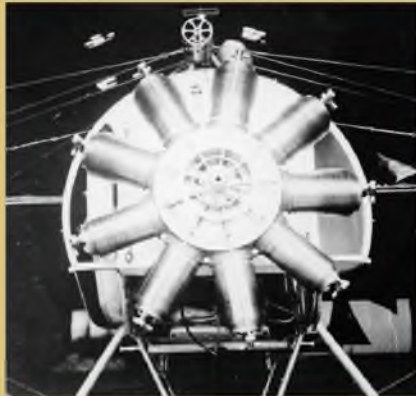
bearings for the tubular main spar of the elevators. The rudder was hinged vertically at this position, its bottom hinge being attached to an inverted pyramid of steel tubing that supported the tailskid.

No tailplane or fin was employed, the rudder and elevator being aerodynamically balanced.

The forward fuselage was clad in aluminium sheet and bulged fairings were fitted to the sides of the nose to fair the circular shape of the engine cowling into the fuselage. The cowling was left open at the



Although it is still in German national markings, this captured E.III is caught in the act of being tested by an allied pilot for evaluation.



The installation of the nine-cylinder Oberursel U.1 100 hp rotary engine in a Fokker E.III.



The bare bones of the prototype E.IV, showing the installation of the 14 cylinder double-row Oberursel engine and the experimental three-gun armament installation.



Viewed from the cockpit of the E.IV seen at left shows, much better, the three-gun installation.



Head-on view of the prototype E.IV, werk No.298, delivered from the Fokker factory on September 27th 1915, showing the experimental three-gun armament installation. Note - no cooling frets in the cowl front at this stage.



An E.IV in standard format pictured in early 1916.



The cut-outs in the front of the engine cowl immediately identify this machine as an example of the later Fokker E.IV.

bottom to provide entry of cooling air and to prevent accumulation of oil or petrol that might impose a fire hazard. The top decking of the fuselage varied with different models and on the E.IV it extended aft of the cockpit to form a short 'turtledeck'.

The axles for the undercarriage wheels were pivoted at the front apex of an inverted wire-braced steel tube trestle, the compression leg, working in a slot in the fuselage, being sprung inside the fuselage by means of shock cord. Undercarriage drag loads were taken by steel tubes extending from the bottom of the compression leg to the rear apex of the undercarriage trestle.

Wings were of two (wooden) spar construction with metal tube drag struts and wire bracing, of parallel chord with raked tips. Ribs and riblets were of wood. The wings were fitted to the fuselage sides almost on the thrust line, the front spars being braced with steel cables from a small steel tube pylon just ahead of the cockpit and from the axle pivot point on the undercarriage trestle.

The rear apex of the undercarriage trestle carried a rocking lever actuated from the control column, which operated the wing warping cables to points on the rear spars on the wing under-surface. Balance cables from similar points on the rear spars on the wing upper-surface ran through two pulleys attached to the wing-bracing pylon.

On the E. III, the main fuel tank was cylindrical in shape and mounted aft of the pilot, extending across the fuselage, its capacity being 100 litres. This tank was pressurised by a hand pump on early models, but later a windmill-driven pump fitted to a strut on the undercarriage trestle became a standard fitting. Fuel was transferred by cock selection from the pressurised tank to the gravity tank situated in front of the ammunition box. The gravity tank held 22 litres and, in

Unteroffizier Knieste with E.I. The upper surface bracing mast, LMG 08 machine gun installation and forward fuselage detail are well shown.



Leutenant Diemer poses in the cockpit of his Fokker E.III 420/15. Some of the undercarriage is usefully revealed here.



A brand new Fokker E.III. The undercarriage struts are also visible here, together with the V-strut anchor for the wing warping mechanism.

addition, had an integral compartment for 25 litres of castor lubricating oil.

Airscrews fitted were usually of the Garuda type and were of 2.20 metres diameter on the 80 hp E. I and 2.5 metres diameter on the higher powered Fokker E. III.

Colours

Fokker 'E' monoplanes were covered in natural, unbleached linen fabric which, when clear doped, presented a beige appearance. National insignia in the form of the Iron Cross was carried above and below the wings, on the fuselage sides and on the

rudder against white backgrounds.

Some early aircraft did not always have the fuselage cross and some of these machines did not have white-painted backgrounds to their national insignia. Few Fokker 'E' monoplanes carried unit markings for the simple reason that such decoration was not yet in general use. Some aircraft did begin to employ markings that signified the Army to which they were assigned and during the Summer of 1916, and there was a general increase in the use of individual markings, which were mostly confined to the wheel covers or to a simple numeral or letter

marked on the fuselage.

Fokkers flying for the III Armee had their wheel covers painted half black and half white and similar machines on the strength of Armee Abteilung-Gaede had the rudders over-painted black. Later, these aircraft also carried various black and white fuselage bands to further indicate their assigned Armee. Wheel cover decoration was commonly used in the V Armee area on the Fokker E.IV monoplanes used by its Kampfeinsatz-Kommandos during the summer of 1916. ■



A clear view of the sparse cockpit interior of an E.III reveals the absolute minimum of instrumentation. What looks like a blank instrument panel in front of the control column is a box for empty cartridge belts. The control column surmounted by a ring and twin hand grips was typical of the type carried over to other German fighter aircraft, of which the Albatros D.I and D.II were examples.

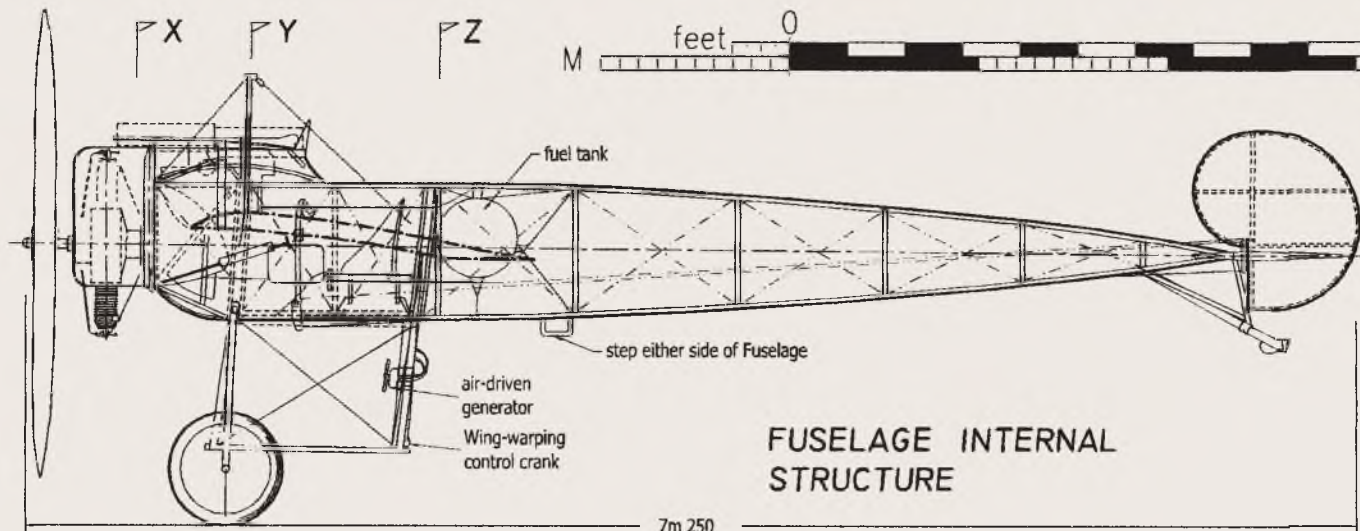


The fragility of WWI aircraft is well illustrated by this unhappy E.III which has nosed over. But such damage could be easily rectified by skilled riggers.



Leutenant Muller and his Fokker E.IV pictured at Bonn Hanglar April 25th 1917 - very late for any 'Eindecker'. Cowl for the double-row 14 cylinder Oberursel engine and upper undercarriage anchor points are well illustrated. Note the dangling wheel chocks.

SCALE 1:40



FUSELAGE INTERNAL STRUCTURE

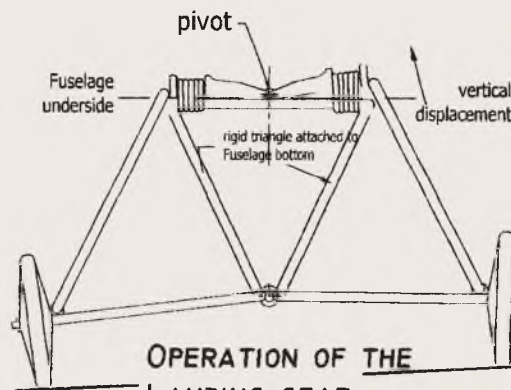
7m 250

The comma-shaped Rudder is the only change from the equivalent Morane. It is made up of two semicircles conjoined vertically at their diameters with the smaller of the two in front of the pivot line forming area compensation. Rudder Area is 0.7 Sq M.

The later EIV was much 'improved' from the design of the E III. The Engine used was a twin row Oberursel rotary of 160hp but the weight penalty incurred led to an increase in size and form of the aircraft. After a short production run the type was deemed to be inferior to other aircraft of the time.

**FOKKE
Military E**

The E.II was delivered in small quantities however, the power output of the engine increased from 80hp to 100hp (no doubt). Since this was the only discernible change it can be taken to apply to both Mk.



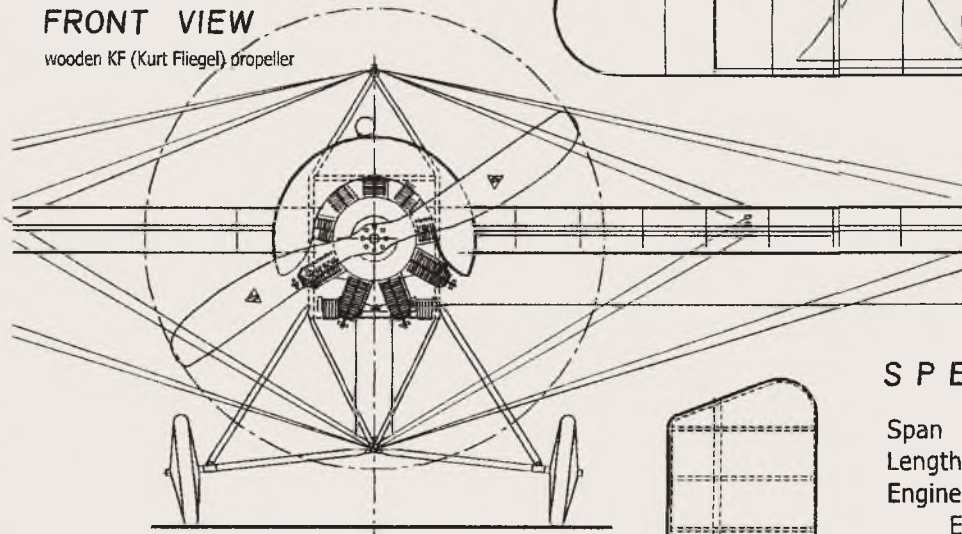
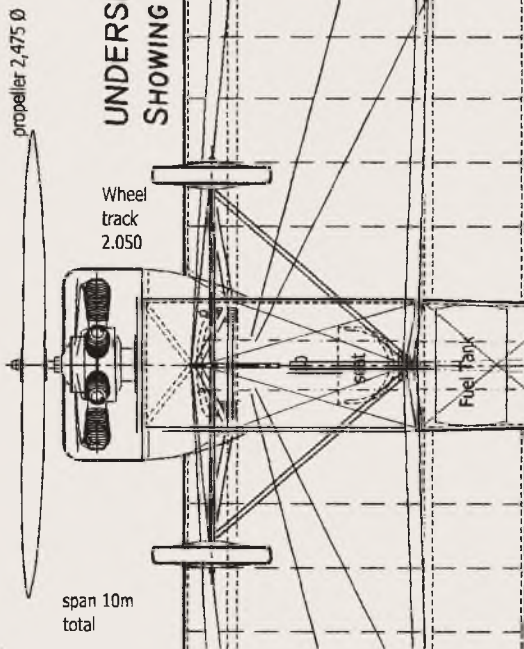
OPERATION OF THE LANDING GEAR SUSPENSION SYSTEM

markings omitted from this view

UNDERSIDE VIEW SHOWING STRUCTURE

FRONT VIEW

wooden KF (Kurt Fiegl) propeller



All-moving Rudder & Tailplane. Construction of these is entirely from metal tubes.

Fuselage

Length is 5,900, ignoring cowl & empennage. Max. width is 700mm x 750high, tapering to the rear, terminating with a horizontal intersection,

S P E

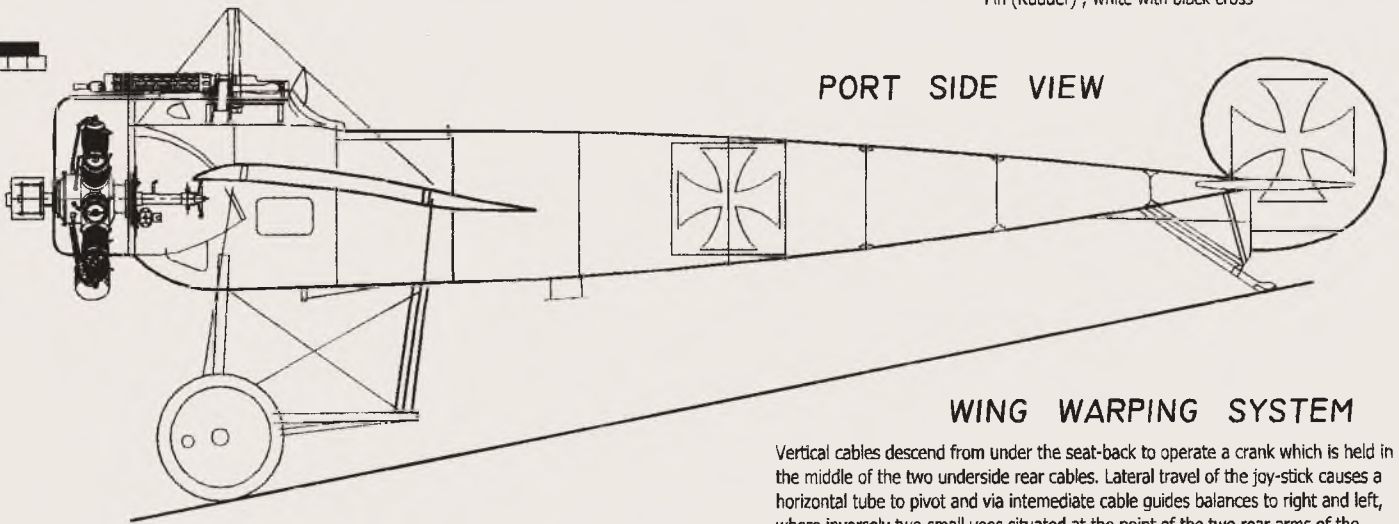
Span
Length
Engine
E
Propeller
Armament
Initially
then Sp
sync' fi

Perform
Max'sp

Climb R
Ceiling

Fin (Rudder) ; white with black cross

PORT SIDE VIEW



WING WARPING SYSTEM

Vertical cables descend from under the seat-back to operate a crank which is held in the middle of the two underside rear cables. Lateral travel of the joy-stick causes a horizontal tube to pivot and via intermediate cable guides balances to right and left, where inversely two small vees situated at the point of the two rear arms of the underside cabane frame linking the rear underside control cables. The upper rear cables pass freely over a pulley attached to the peak of the top cabane.

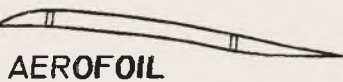
For transportation the Wings can be mounted on the sides of the Fuselage.

In 1916, the colour of the Fokker coverings was generally beige.

Empennage.

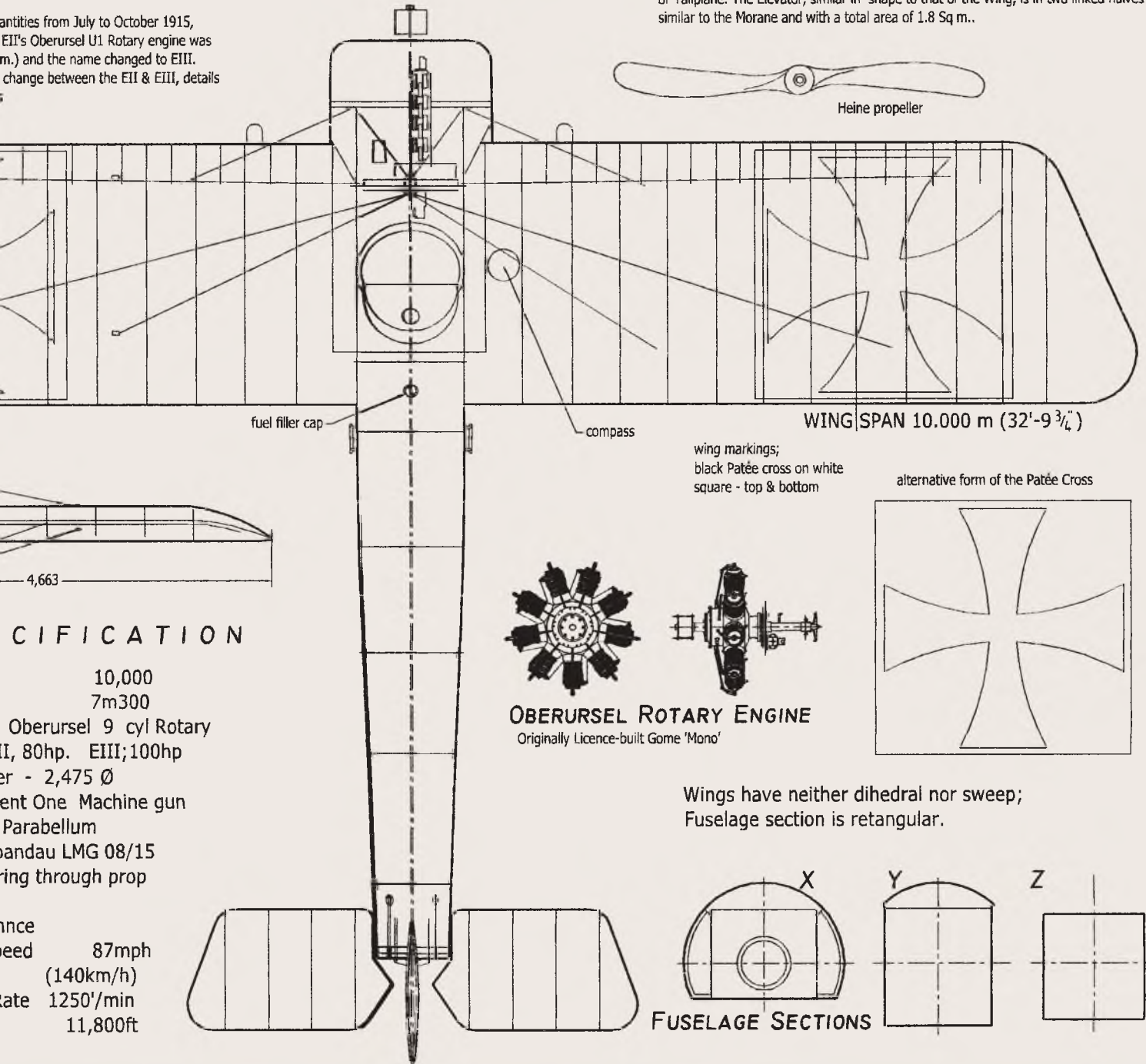
In contrast to the German norm of that time, there is no fixed area of either Fin or Tailplane. The Elevator, similar in shape to that of the Wing, is in two linked halves similar to the Morane and with a total area of 1.8 Sq m..

R M.14 II & E III



AEROFOIL

antities from July to October 1915,
EII's Oberursel U1 Rotary engine was
(m.) and the name changed to EIII.
change between the EII & EIII, details



Heine propeller

WING SPAN 10.000 m (32'-9 3/4")

fuel filler cap

compass

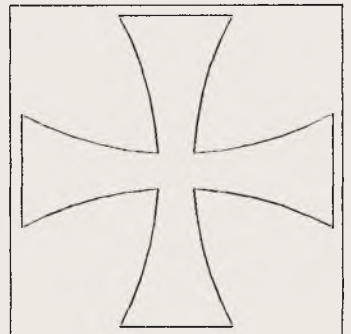
wing markings;
black Patée cross on white
square - top & bottom

alternative form of the Patée Cross

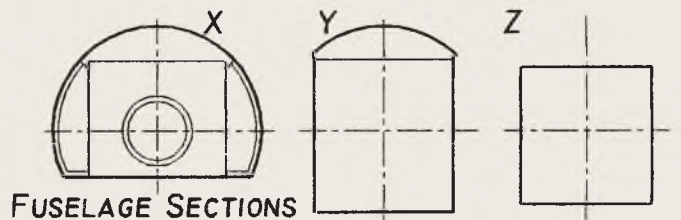


OBERURSEL ROTARY ENGINE

Originally Licence-built Gnome 'Mono'



Wings have neither dihedral nor sweep;
Fuselage section is rectangular.



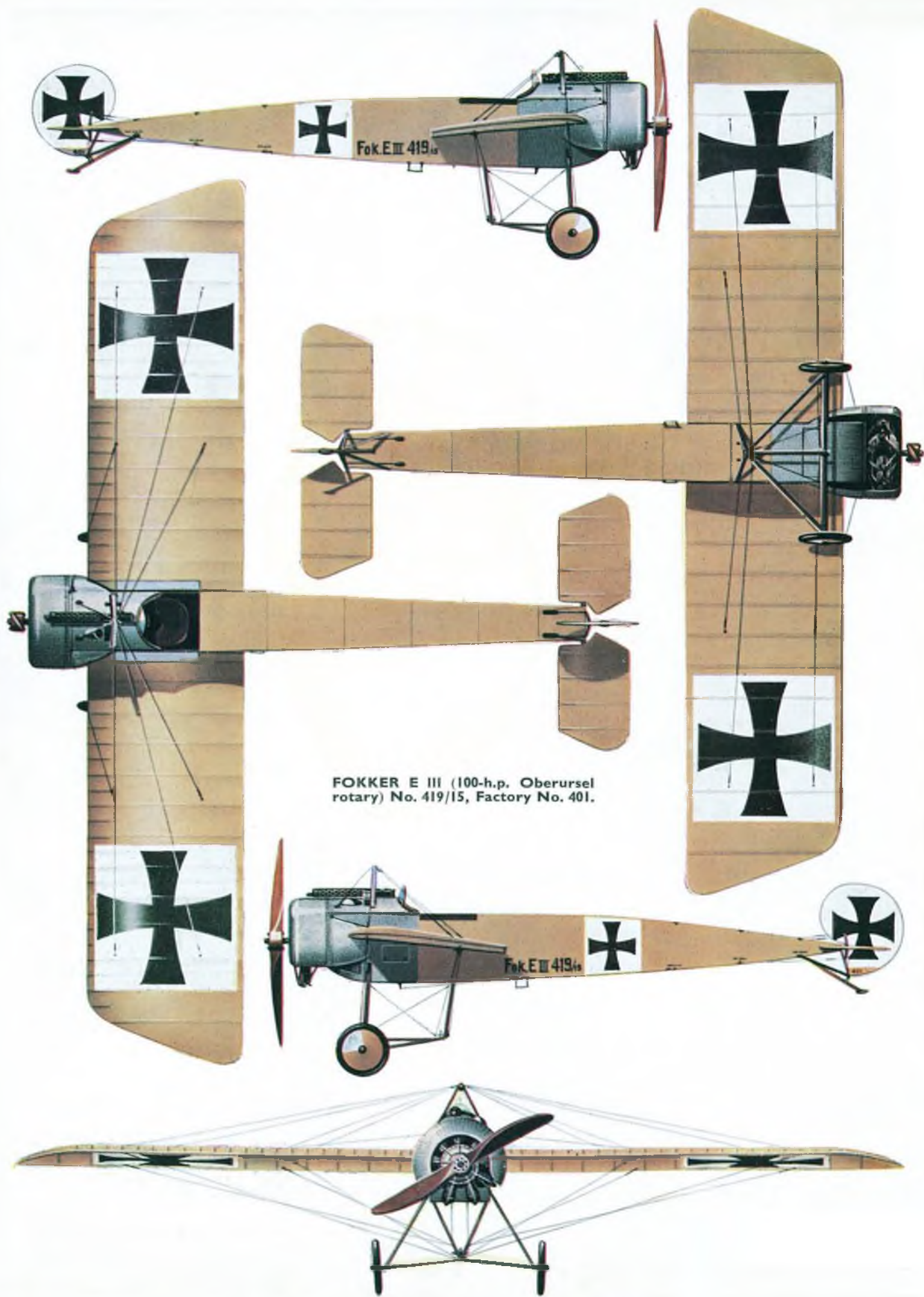
FUSELAGE SECTIONS

PERFORMANCE SPECIFICATION

Wing Area 10,000
Wing Loading 7m300
Engine Oberursel 9 cyl Rotary
Power I, 80hp. EIII; 100hp
Propeller Diameter - 2,475 Ø
Armament One Machine gun
Type Parabellum
Caliber Sandau LMG 08/15
Mounting Ring through prop

Maximum Speed 87mph
(140km/h)
Propeller Rate 1250'/min
Climb Rate 11,800ft

FOKKER 'ENDECKER' FLYING COLOURS



FOKKER E III (100-h.p. Oberursel rotary) No. 419/15, Factory No. 401.



Fokker E I, E I/15 the first of all.



E I armed with synchronised Parabellum gun.



Fokker E III, E III 422/15. Note unusual position of serial number.

Fokker E III, E III 210/15. This aircraft is at present in the Science Museum, London.



Fokker E II (Serial number unknown) flown by Vizefeldwebel Eduard Böhme of the Bavarian Air Force. Armed with synchronised Schwarzlose gun.



Fokker E III, E III 345/15 (Position of serial number probably standard) Flown by Lt. Buddecke on the Turkish Front. The black square eventually became the official Turkish insignia.



Fokker E I, E I 03.51, Austrian Air Force. Armed with synchronised Schwarzlose gun.



Wing marking, Turkish Front.



Fokker E I, 03.43, Austrian Air Force. Armed with Schwarzlose gun.

Front view EIV



Fokker E IV, E IV 174/16. Armed with twin Spandau and streamlined cockpit decking.



available to use.

Being quiet, clean and electric powered, nobody is even likely to know you're there. I've had many happy hours flying models on our local cricket field, all without a single complaint from the neighbours, a whole world of difference from the days of my youth (shortly after the dinosaurs became extinct) when I used to fly UN-silenced .35 powered control-line models on the same field. In those days, however, nobody seemed overly concerned about the noise. A Merco .35 in a 56 inch span stunter (Mercury Crusader) isn't the most socially acceptable instrument of model aviation imaginable. Just try something similar nowadays!!!

So, here is another small, electric powered model intended to make use of commercially available micro radio of the type fitted to those little foam models that are so popular. Popular, yes, but also prone to lead very hard lives (and quite brief in some cases). The number of slightly-the-worse-for-wear examples that turn up on a certain auction web site is a clue to how readily available reasonably priced radio equipment can be.

If you do go this route to acquiring the equipment for your micro model, just be aware that the servos built into the receiver brick are not the most durable items. A tiny speck of grit in the gears is all it takes to stall a servo and possibly burn out its associated receiver board components. Grit, a spot of wayward glue or chip of balsa - it doesn't matter what form the obstruction takes - all can prove terminal to either the servo itself, or the receiver. So, if going this route, please ensure that the equipment you are buying

As I sit and write this, just after Christmas, many of our flying fields (in the UK) are badly waterlogged, if not actually flooded (it's been a particularly

damp winter so far). That being the case, it seemed an ideal opportunity to include the plans for another small model that can be flown either indoors, or from practically any small field you may have

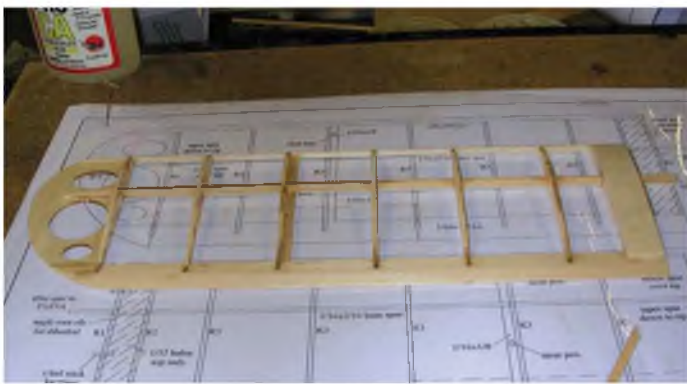
AERONCA L-3 DEFENDER

PETER RAKE PRESENTS A 21" WINGSPAN ELECTRIC POWERED MICRO MODEL, WITH PROROTYPE MODEL BUILT BY BRIAN ALLEN

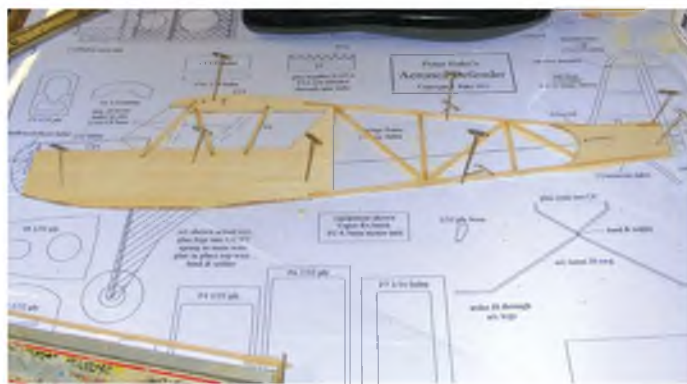
(FULL SIZE FREE PLAN ON ONE SIDE OF THIS MONTH'S PULL OUT PLAN SHEET)



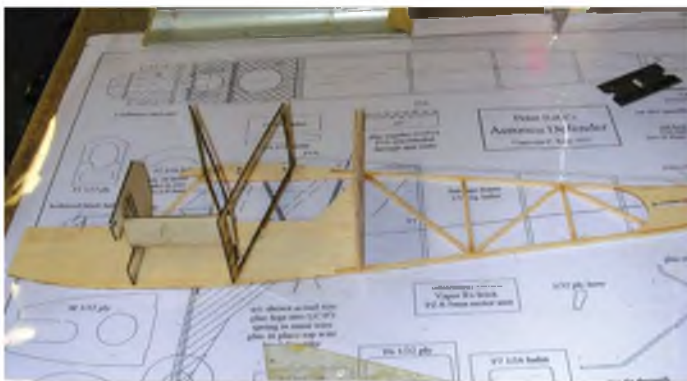
Although lacking markings and final detailing, this is how the model was test flown - on both occasions.



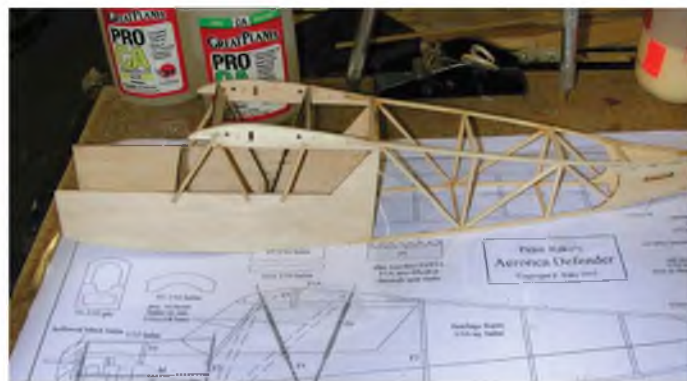
Nothing at all complicated about the wing panels. Note the spar extension at the wing root.



Fuselage construction follows the traditional route of building two identical side frames over the plan.



The main formers and battery/receiver tray are added to one side.



The second side added and tail joined. Note the extra fuselage bracing Brian fitted. Not required if your longerons are hard enough.

does actually still function as intended.

That said, there are many DSM2 'clones' about these days, so the purchase of micro radio is no longer the spendy proposition it once was. As for me, I take the easy way out and persuade other poor, unsuspecting modellers to build the prototypes for me. Absolutely no expense at all; all I have to do is draw up the plan and write the article and on that note I would like to extend my thanks to Brian Allen for the hard work he put in building this particular model. Without such willing volunteers there would be far fewer of these designs for you to enjoy.

Okay, hands up those who cursed those prototype builders because it means you have to endure yet another of my designs. You know full well how disappointed you'd be if they stopped appearing in these hallowed pages.

SO WHAT'S THIS MODEL THEN?

Over the past few months you've had a WW1 model (the DH6) and a 1920s observation plane (Martin MO-1), both of which were intended for exactly the same equipment as this particular model. This time, however, we're going modern. Well, modern by my standards.

As some of you will be aware, my era of interest ends shortly after WW1. I know I have produced designs from more recent eras of aviation, but they are in the minority compared with most of my designs. Although still far from actually being a modern type, the Aeronca Defender is a borderline WW2 type, and very modern for me; not exactly a warbird, but of roughly WW2 vintage nonetheless.

Another variation from my usual style of model is that it's a high wing, cabin monoplane. As we all know (we do, don't

we?), high wing types make for much easier to fly models. They also provide more space into which we can cram our radio gear. As such, even though the model only spans 21 inches, there's plenty of room to allow the battery pack used to assist with balancing the model. If you need more nose weight, you can even fit a slightly larger battery than the one usually supplied with the foam models. Those batteries from micro helicopters and quadcopters are eminently suitable, and about twice the capacity - resulting in much longer potential flight times.

ABOUT THE MODEL

Since the model is pretty straightforward to build, and I don't actually have room for a full construction article, so rather than present a 'stick A to B' style article I'll just explain any points that I feel may cause some head scratching for those not used to this style of building.

The first, and probably most obvious point I need to make is that the model needs to be kept very light, so please don't be tempted to 'beef up' the structure. As designed, it has already proven adequately strong enough for normal use. No, it won't survive a full speed pile into the ground unscathed (not many models will), but even heavy landings shouldn't pose any major problems. The controlled crashes might need a few minutes spent carrying minor repairs, but anything less should be fine.

The key to this durability is to keep the ready-to-fly weight of the model to around two ounces, but not to skimp in certain areas. The longerons should be HARD balsa to prevent fuselage damage and the wing spars must, at the absolute minimum, be made of bass. Spruce is

heavier, but perfectly suited if you can't get bass. Obечи is also acceptable, but the grain tends to wander all over the place and may, if you aren't very careful, induce warps.

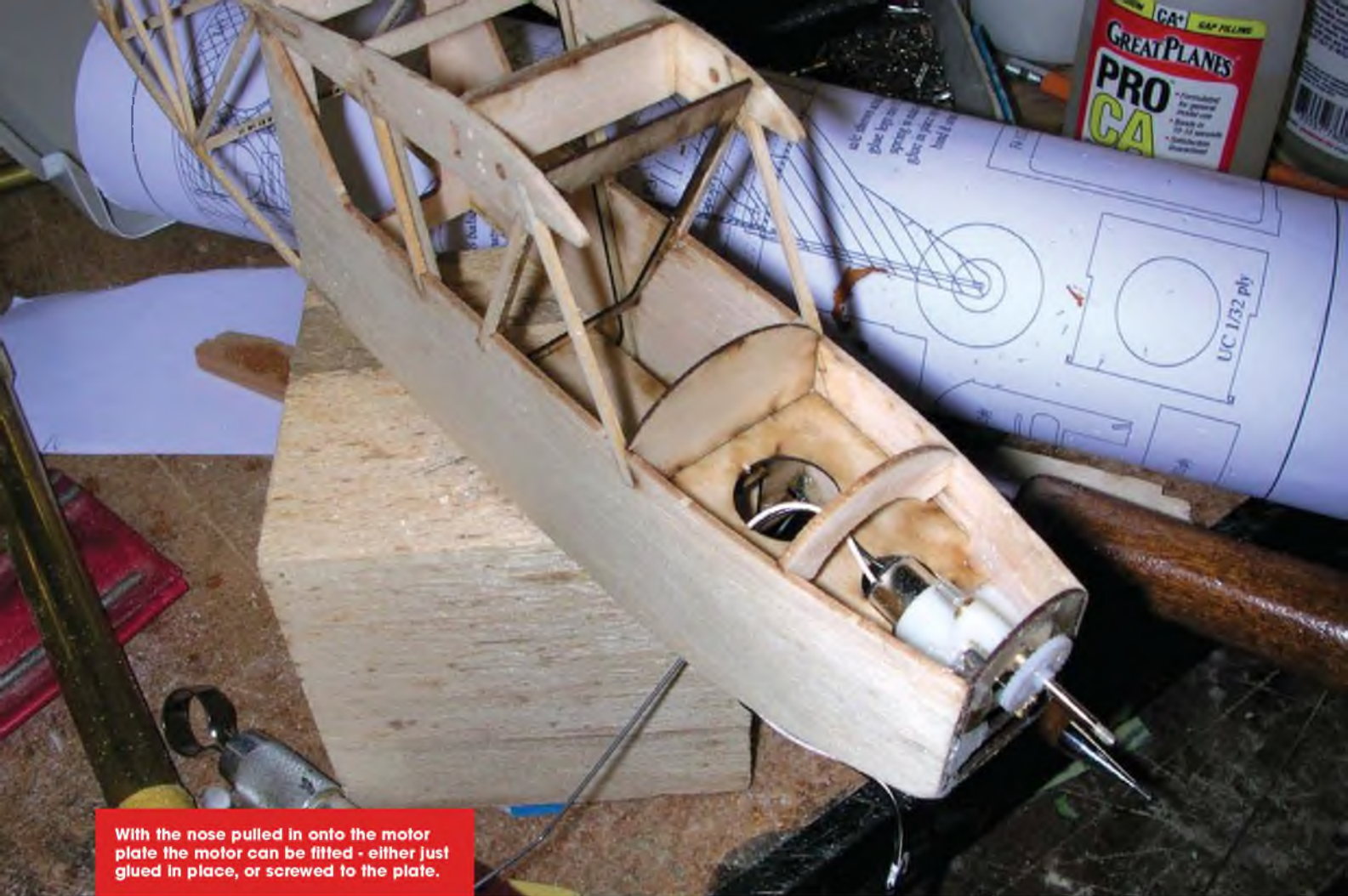
The reason I stress using such hard wood for the spars is because they will be taking all the flight loads on the completed model - and the occasional wing catching the ground during landings. Using anything less means you are likely to lose a wing somewhere along the line unless you modify the design slightly to make the struts far more functional that I intended them to be.

I've used this style of wing mounting on countless models, including some much bigger than this little tiddler, and it has never failed me yet. This includes during consecutive loops. So, if it will withstand that, a two ounce model isn't going to stress it too excessively.

The next important point involves positioning the receiver brick. Because the pushrod runs, and exit plates, have been carefully worked out, your brick needs to be in the same position as shown on the plan otherwise, if it's too far out, you may well find that the pushrods will bind where they exit the tail. As you can imagine, based on earlier comments, this is not a good idea at all for the longevity of your brick servos.

GETTING TECHNICAL

Although the brick unit from Vapor style models, including the Mini Vapor, is perfectly fine (and what I use), you'll be needing more power than the Vapor motor unit is capable of providing. For models like this, you need the much more powerful 8.5 mm diameter motor unit as supplied for the Parkzone P-51D Mustang and F4U Corsair. These will drop straight



With the nose pulled in onto the motor plate the motor can be fitted - either just glued in place, or screwed to the plate.

into the Defender and can simply be glued to the motor plate using Uhu Por. You can screw the motor unit in place if desired, but it isn't really necessary.

In the event of hitting something, it's much better just to have the motor unit break away rather than damage the gearbox or nose of the model - not, of course, that this is an excuse for flying into things. Slap your wrist for even considering such a thing.

I've made mention of pushrods, but not actually told you anything about them. Whilst the style of pushrod supplied with the foam models, suitably adjusted for length, is eminently suited to these models, you may not have any of these available at all, to apply such adjustments.

This isn't a major problem though, since all you need is some 1 mm carbon rod,

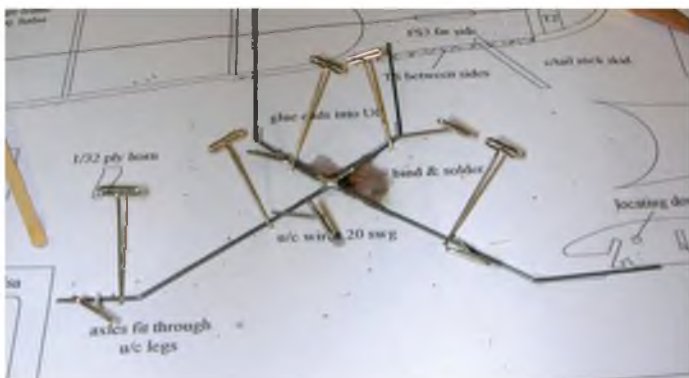
0.020" wire and small heat-shrink tube to produce your own. Just bend up a couple of short (around 1 inch) Z-bent pieces of wire for each pushrod and use the heat shrink tube to secure one to the carbon rod at the servo end. Fix it with a tiny drop of thin CA adhesive. The other can be slipped onto the carbon rod (having pre-shrunk the tube) after the rod is in place and the Z-bend engaged with the servo arm.

When performing this operation, I personally like to do it before the receiver is secured to the model. I cut the carbon rod over-length, with one piece very much over-length. Both servo-end wires are connected to the output arms and the longest rod fed down the fuselage and out through its respective exit plate. This means that the long rod is in place long before the shorter one comes

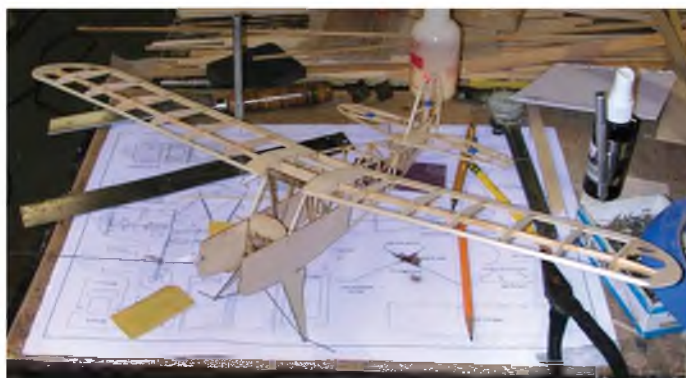
anywhere near poking holes in your carefully applied covering.

Now, feed the second rod into position. Apply a few tiny spots of Uhu Por to the radio tray, manoeuvre the receiver into the correct position and carefully press it onto the glue spots - without getting any glue anywhere near the servo gears. Allow the glue to dry before slipping on the control horn end Z-bends. Fit the control horns to the pushrods and THEN glue them into the control surfaces.

Make any final adjustments to pushrod length by sliding the wire/heat shrink along the carbon rod, secure with another tiny drop of CA and finally trim off the excess carbon rod. I like to use nail clippers for this because they cut the carbon cleanly without putting any stress on the pushrod/control horn.



For those who dislike wire bending, this is the only wire assembly required for this model. Dead simple stuff.



The temporarily assembled model reveals it's simple structure and how the spar stubs/F5/F5A assembly set the dihedral. Locating dowels set wing incidence.

HINGES

As you'll notice, Brian used Blendederm tape to hinge his control surfaces and that's fine. It isn't the fidiest method, but it's simple and works well. Personally I prefer hinges slotted into the surfaces, but obviously commercial hinges are too thick for the 1/16" thick tail surfaces involved. Also, they're too stiff to operate as freely as is needed with those tiny servos.

A good alternative source of hinge material, if you can find some, is narrow (3/32-1/8" wide) strips of floppy disc material. Sand off the coating from both sides, cut into strips and use them just like commercial hinges. Tiny spots of CA are perfectly adequate to secure them and these little models aren't stressed sufficiently to pull them out.

FLYING

As is usually the case, when a photographer is available, the weather is too windy to allow for flying shots. Typically, when the weather is calm there's no photographer to hand. Oh well, such is life and it explains why there are no flying shots of this model. Trust me, it flies just fine even though there's no photographic evidence of this.

As intimated, the maiden flight, if that's quite the right term, took place in far from ideal conditions. The poor little Defender was buffeted about by the wind and only just survived the experience without damage. It did, however serve to demonstrate the need for a little more nose weight and 30% exponential on the throws.

The second outing took place in much better conditions and the little model proved to be an excellent flier. Brian's test pilot, Ron Anderson, did the hand launch and sorted out the trims before handing over to Brian for an enjoyable five minutes or so of just stooing around.

Brian says the Defender has no bad habits and just flies where you want it. I don't think you can ask much more than that and it's exactly what I had hoped for when I drew up the model. In fact, it flies pretty much the same as the much larger version I drew up several years ago.

In case you were interested, this model, and her 39 inch span sister, were both loosely based on the Walt Mooney rubber power model that is much smaller than either radio control version. Hmmm, now there's a thought for some true micro radio gear. Radio control peanut models anyone?

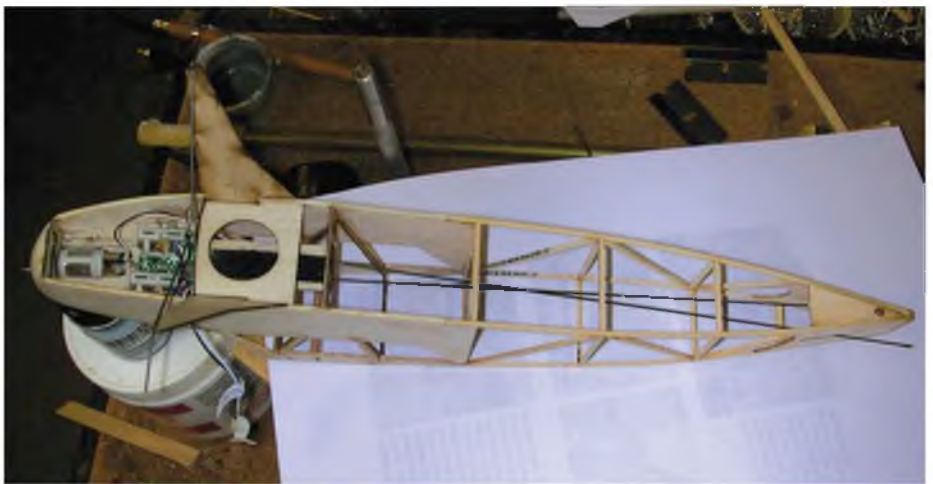
If you'd like to contact me for any reason, except abuse or begging letters, you'll find me at PETERRAKE@aol.com ■



The struts are only cosmetic on the 'as designed' model and simply glued in place. See text if you have any doubts about the strength of your spars.



With the nose block and forward decking in place the model starts to resemble an Aeronca.



Here you see how the u/c assembly fits, the receiver installation and the pushrod blanks in place.



Chief test pilot, Ron Anderson, lends scale to the little Defender. Tiny, isn't it?

VQ Models

NORTHROP P-61 BLACK WIDOW

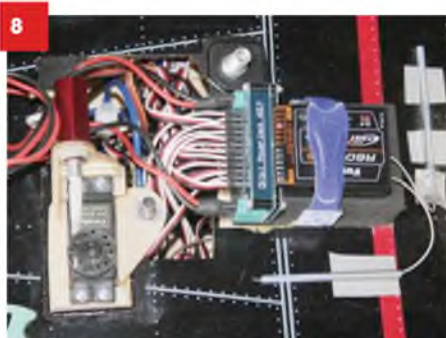
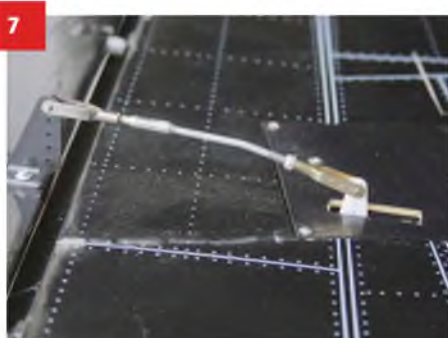
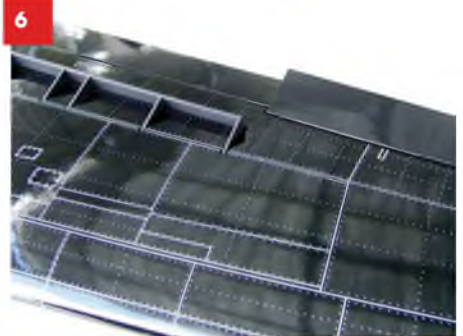
Bruce Corfe and Ray Anderson appraise an unusual scale twin from Vietnam, converted to electric power

VQ (Vinh Quang RC Models) were one of the first R/C kit producers in Vietnam and have been operating for 20 years. Throughout their range of scale R/C model kits, construction is all built-up, using largely traditional materials like balsa and ply. VQ have an unusual (maybe even unique?) method of adding surface detail like panel lines and rivets, plus of course National insignia and unit/individual aircraft markings etc. - these are pre-printed onto the coloured adhesive-backed covering material which also incorporates camouflage schemes etc. The material used is tough and resistant to

In flight, on what Aussies call a 'Glory Pass', the VQ P-61 Black Widow looks super-realistic



“ The Northrop P-61 Black Widow is an unusual choice of aircraft for scale modelling, even more so for a mass-production kit manufacturer and one must admire this manufacturer for selecting such a refreshing choice of subject ”



1: Lots and lots of balsa and ply! (VQ models). **2:** Half-figures of the pilot and radar operator in the forward cockpit, nicely to scale, from 'Aces of Iron'. **3:** Authentic-looking nose-art graphics. **4:** The centre hatch/ turret placed to one side, revealing the Futaba Rx and Orbit Power Jack, Robart retract valve and air fill valve, Intairco air flow limiting valve, two HD switches/charge sockets and two Intairco 2100mAh LiFe packs powering the systems and servos. **5:** Small spoiler servo adjusted on TX to operate in one direction only, to allow spoiler to extend and retract in concert with the ailerons as part of the lateral control function (as per full size). **6:** The mass of panel and rivet detail incorporated in the VQ covering material; also note the combined action of the port aileron plus spoiler. The tiny ailerons and spoilers operate together for roll control. **7:** Outer main flap linkage with large horn to minimize any play in operation. **8:** The receiver and Orbit Power Jack. Aerials at 90 degrees. Many extension leads! **9:** All set in the pits and looking great on its custom trestle, now just got to fly it!

wrinkles e.g. in sunlight and about the only criticism people have is that it tends to have a glossier finish than a full-size front-line WWII warbird might have had.

The Northrop P-61 Black Widow is an unusual choice of aircraft for scale modelling, even more so for a mass-production kit manufacturer and one must admire this manufacturer for selecting such a refreshing choice of subject, well out of the mainstream, but a welcome opportunity for anyone wishing to get away from the run-of-the mill range of scale subjects so regularly none to death.

Their offering is designed for .60-.75 two-stroke or .90-1.20 four-stroke I.C. engines (although see what Ray installed below) - specifications are as follows:

Wingspan: 89"/ 2.26m

Length: 67"/ 1.7m

Weight: c.20lb/ 9kg

Wing area: 1165 sq in/ 8.09 sq ft/ 75.2 dm sq.

Radio: six channel min/ 13 servos min.

Ray Anderson is a member of the South West Associated Radio Modellers Society

(SWARMS), who operate from their club field near Capel, a town in the South West region of Western Australia, located 212 kilometres south of Perth and midway between Bunbury and Busselton, near picturesque Geographe Bay. The club has a new pits area/ hangar, which is enormous, and adds to the already excellent facilities at the SWARMS field.

The annual SWARMS Scale Rally weekend is a much anticipated date in the modelling calendar and your scribe caught up with the Black Widow and its pilot at that event.

Ray Anderson has previously had his glow-powered Grumman Hellcat and Fw190 previously featured in *Flying Scale Models*. He and his family came to W. Australia in 2009 from South Africa, to join his wife's family wine business in Margaret River (well someone had to...) His models were the first item aboard the shipping container!

Over to Ray:

I have been flying with multi channel radio since 1983. I had messed around with some models on two channels prior

to this, but actually taking off and landing on a runway started for me then. I was always attracted to scale models and that has been my main interest over the years. I am more of a builder than a flyer and sometimes go for long periods without flying. I think that the building and the focus on creating something that looks as 'real' as one can manage is what has kept me interested in modelling and motivated over the years and I am still working towards more realism in my models. I want them to look like a miniature of a real aircraft rather than a toy. It's a long road.

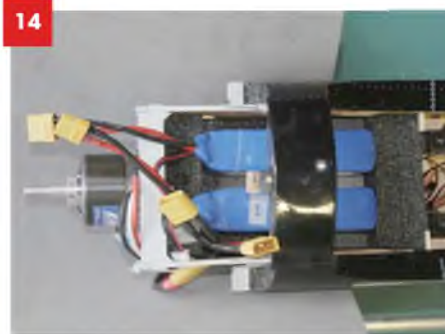
I have had the Nick Ziroli P-61 plan, retracts, accessories and laser cut kit for a number of years, but have not got around to building it. When I saw the VQ P-61 ARF in a model shop I could not resist buying it, thinking it would be a great introduction to twins and as a trainer for the 'big one'. It turned out to be a much bigger project than I ever imagined, with little problems putting it on the back burner for long periods of time.

The original plan was to use two O.S.91FXs, but after seeing a twin North

10



14



10: Tru-Turn all spinner and Master Airscrew 14 X 9 prop. **11:** Cowl hatch removed showing foam lined battery box and 90A series connector. **12:** Extended boom showing position of motor and 90A Hyperion ESC bolted underneath the firewall extension. **13:** Boom showing battery compartment, rudder and elevator servos, retracts and door operating air cylinder. **14:** Two 4-cell LIPOs easily fit into the available battery space. **15:** Retracts and oleo showing single BVM air ram and bell crank operating the two main doors. **16:** Another view of the boom battery access. **17:** Retract mounting and door operating air cylinder.

11



American B-25 Mitchell fly with electrics I thought I would go this route hoping to avoid the 'great fear' of one engine stopping. I returned the O.S. 91s and they were replaced with E-Flite 90 brushless outrunners and Hyperion 90Amp ESCs - I was guided by the model shop as I had no experience of higher power electrics and was not sure what voltage I would end up using.

This would be a typical heavy warbird with whatever extras I would normally add to a model like this. Solid strong retracts and oleos, rubber tyres, pilot figures and some detailing in the two cockpit areas - it would just be powered by electric motors, instead of I.C.

The build -some comments

There were some issues that needed to be sorted out. One boom was clearly out of alignment as the fin was canted over. This required the wing seat to be modified and one of the outer wing panels had the spar tube incorrectly fitted. The wing roots at the join would not meet thus requiring some surgery and I also strengthened the booms at the rear of the main wheel wells with ply doublers as this was a weak spot (discovered after a boom fell off the bench!)

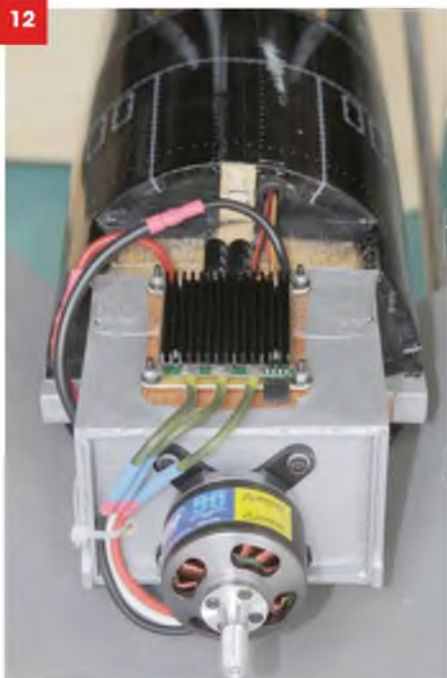
Personal preferences:

The hardware for the attachment points on the booms and the centre cockpit section were all replaced with metal blind nuts and metric nylon and steel bolts. Additionally, larger dowels were substituted in the wing leading edge for the booms.

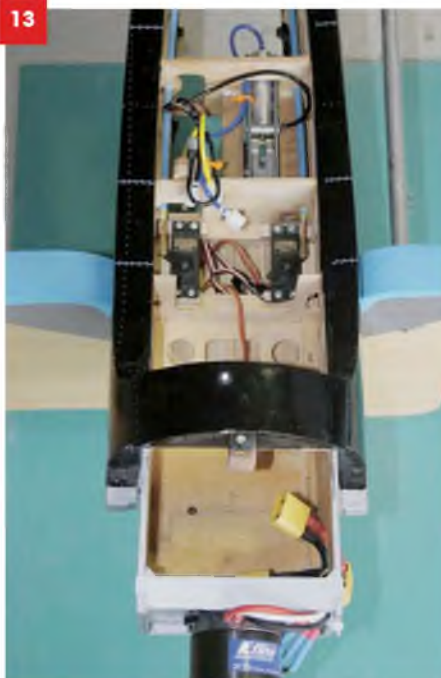
The flaps and ailerons/spoilers operated via bell-cranks. This set-up allowed too much play in surfaces so I decided, instead, on a servo for each control surface and spoiler. The flap horns were positioned very close to the hinges so would be less precise in operation and I therefore applied long horns with a revised servo and pushrod layout. Hinges were replaced with large Robart pin hinges.

The boom fairings on the front and rear of the wing were G/F moulds which were supposed to be screwed to the wings.

12



13



15

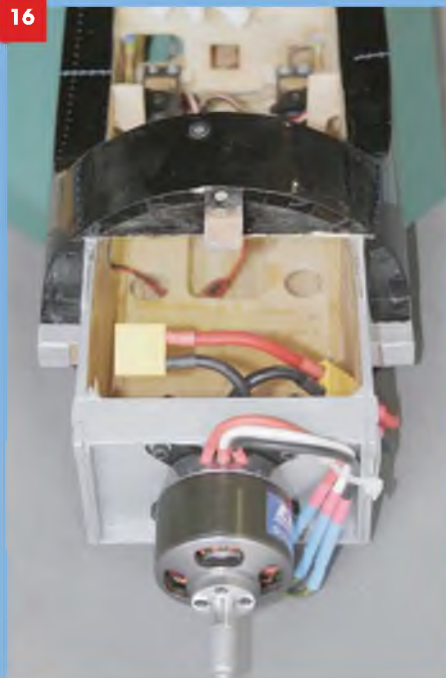


Horrible! I built balsa fairings which were glassed and painted and I added a pilot and gunner to the front cockpit. 'Aces of Iron' (www.acesofiron.com) produce very detailed figures that really look good. I added some details to help fill out this area. The radar operator was left out of the rear compartment but his instruments and gear were added.

Modifications for electric

The firewall had to be moved forward as the electric motor was much shorter. I removed the firewall and extended the boom sides and bottom, tying the extension into the existing structure. This would increase the space where the fuel tank would have been, providing a useful area for the batteries. The problem was one of access to the batteries without removing the spinner, prop and cowling. This required the cutting of a hatch into

16



the top of the cowling to allow access to the battery compartment. Some careful measuring and checking was needed - this turned out well.

Retracts and wheels

Standard Robart retracts and Robostruts were used; 90deg 630 units on the mains and a 100deg 639RS unit in the nose. The nose wheel employed was a Robart item, while mains were Dubro inflatable wheels.

Wheel doors were operated with small BVM air rams, one per set of doors. The 'doors-open' command was linked to 'retracts-down', while 'doors-close' was operated through a BVM air micro switch on the nose leg, which was slowed down via an air flow limiting valve.

Servos

Two on ailerons (small digitals): 2-56 rods with Robart horns, Sullivan clevises.

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Two on spoilers
 Four on flaps: 4-40 rods with Robart horns, Sullivan clevises and Dubro ball links.
 Two on rudders: Sullivan blue pushrods, Robart horns, Sullivan clevises.
 Two on elevators: Sullivan blue pushrods, Robart horns, Sullivan clevises.
 1 on nose steering
 1 on retracts.

Power to receiver and servos

I used an Orbit Power Jack 6014 (it regulates the RX supply to 5V but allows the full voltage to the servos). The Orbit is a 14 channel servo-amplifier / buffer with double inputs for the Futaba 6014 receiver. It is directly plugged onto the 6014 by 42 precision jacks. The power is supplied via two MPX high amp connectors from the batteries or the switch harnesses. (Because of its small/lightweight construction, the Power Jack is



particularly suited for mid and large models with longer wiring and/ or digital servos). Two LiFe 6.6v battery packs via two switches provide power to the systems. There were a large number of extension cables needed to connect everything up.

Fore/aft balance (CG)

For balance with retracts 'up' (all wheels go backwards to retract), VQ quote the CG position as 76mm - 89mm aft the wing leading edge and for comparison, I checked the Zirolli plan and his equivalent position was at 80mm. I ended up slightly tail down at 80mm with only 79g of lead in the nose. With the wheels down, the nose dropped dramatically.

The reason I needed so little lead in the nose is because I balanced the model (before I bought the four LiPo packs) by putting weight in the battery boxes till it balanced. I then bought LiPo packs that would provide the weight I needed, in this case four 419g each, totalling 1.676kg. (Hyperion G6 HV 4400mAh capacity packs rated 60C).

Power

I spent hours searching for useful information on power set-ups for a model

like this, but very little practical info was found although the E-flite motor instruction manual was very useful. I wanted to keep close to their guideline for calculating power requirements for 'sport aerobatic and fast flying scale models' of 90 - 110 watts per pound. The P-61 was to weigh at least 24lbs and therefore needed something in the region of 2400 watts.

The motor was rated at 50 amps continuous and 65amps burst and the ESC was well within these parameters, but I needed to do some testing with props. I wanted to use three-blade types as I had some very nice Tru-Turn aluminium spinners cut to suit but I did some testing with two blade props (14 X 8 and 16 X 8) on six cells and found the power and revs were too low. We needed more volts, resulting in the following findings:-

16 x 8 three blade prop on 8 cells:
69A, approx 1880 watts, 7200 RPM. Motor HOT. (Amps too high).

15 x 7 three blade prop on 8 cells:
43A, approx 1260Watts, approx 8160 RPM. (Looking good).

14 x 9 three blade prop on 8 cells:
42A, approx 1260Watts, 8100 - 8400RPM. (Looking good!)

Motor and batteries were just a little warm on the last two, but I went with the 14 X 9 size to make sure I would have the speed. Just in case, bought four packs of 4400mAh LiPos each of four cells. Two would be linked in series giving 29.6V to each motor. Two packs would fit comfortably in the battery box behind the firewall and I created a foam cradle for the batteries so they could not move.

Flying

How would it fly? Would it even fly? I asked myself the usual questions regarding a new and unflown model, concluding that it should have enough watts to fly - two motors generating about 2400 watts, driving good diameter props with enough pitch, turning at 8,000rpm - should work!

Wing loading: Area: 1165sqin. Weight: 25lbs/ 400 oz. Loading 49.4 oz/sq ft. - should be OK for a model this size I thought.

First flight

How nice to simply open the throttle and taxi out. Good ground handling. Line up into wind and wipe the sweaty hands. I opened the throttle slowly and acceleration was good, with lift off in



about 40 metres. With undercarriage up, a little aileron trim correction was applied and the P-61 was flying.

It tended to climb through the flight because I did not have enough down trim, so I adjusted the elevator neutral position before the second flight. I had mixed in some down trim on full flap (full flap is 40 degrees) but this proved to be unnecessary. All three undercarriage legs move forward when the wheels are down, automatically moving the CG moves forward, so the 'mix' would need to be removed before the second flight.

The model felt stable in the landing circuit and came in steadily for a reasonably smooth landing with little bounce. I needed a little more elevator throw than I had originally set, as it was a little sluggish in getting the nose up on touchdown. After a scale-like taxi back I was a happy man.

Second flight

After adjustments were made as above we were ready for more. Conditions were quite windy and turbulent but take off worked as well as on the initial test with good positive acceleration and climb-out. After throttling back to cruise-power, the model was flying positively. In fact it was

so quiet that I had to take better note of the position of the throttle stick.

I flew several circuits and low passes to enjoy the menacing look of the P-61, which flew as I would expect a well powered model to fly. It was just so quiet! I even managed a roll, which was fairly slow, but it's a relief to know that those small ailerons and spoilers actually work and I also found that it needs rudder input in turns.

I started my landing circuit after my 5-minute timer, but went around once as I was too high. I felt comfortable with it in the approach and was a bit fast but landed on the runway and taxied back to the pits, delighted that I have a model that is different and flies so well. I'm looking forward to more sorties with the Black Widow.

After landing I checked the ESC, motors and batteries and they were all only just warm, the approx. six-minute flight using approx 60% of the battery capacity. I was very happy with the model after two flights in less than perfect conditions. The model felt good on the controls and had enough power (although I found it a bit tricky to judge this as it was so quiet).

Some concluding thoughts

I think this sort of electric conversion is

great. I'm not interested in super light weight structures and specially light accessories, but I do see electric power as an alternative to glow and petrol engines, subject to the correct choice that suits a particular model.

I found E-flite's motor designations, in line with glow motors, a great help. There is a lot of mumbo jumbo talked about electrics, but what is particularly pleasing to me is the fact that the P-61 has flown well as an electric model, even though it is really designed and built for glow power. I used standard (heavy) Robart retracts and there was nothing I could do to lighten anything. I like the fact that going electric offers a straight alternative should one want to go this route without being an expert on 'electrics'.

One final helpful comment from a fellow modeller: "It's too quiet. Would be better with two glow motors winding up!" ■

LINKS:

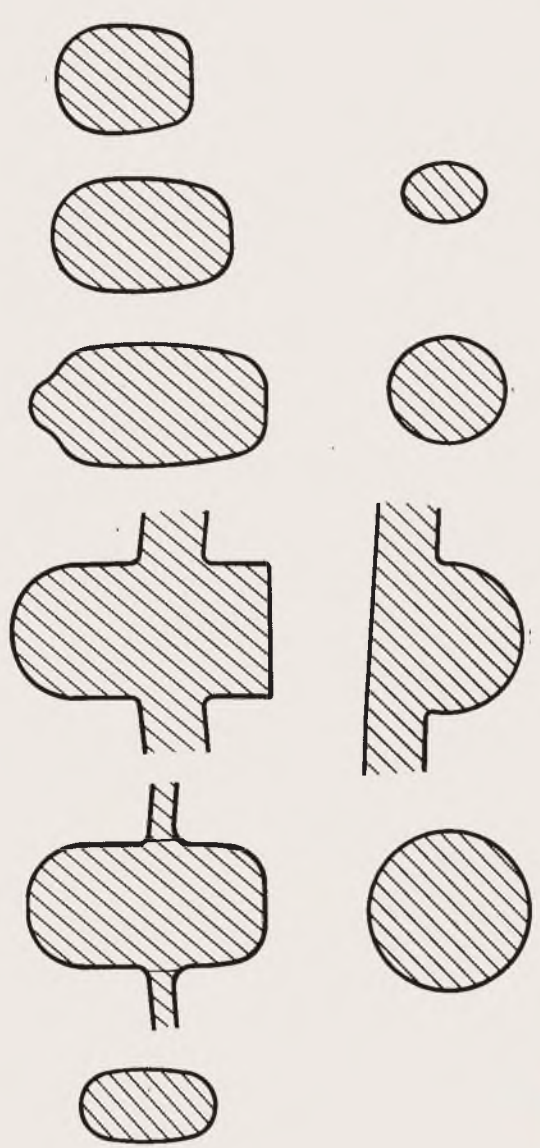
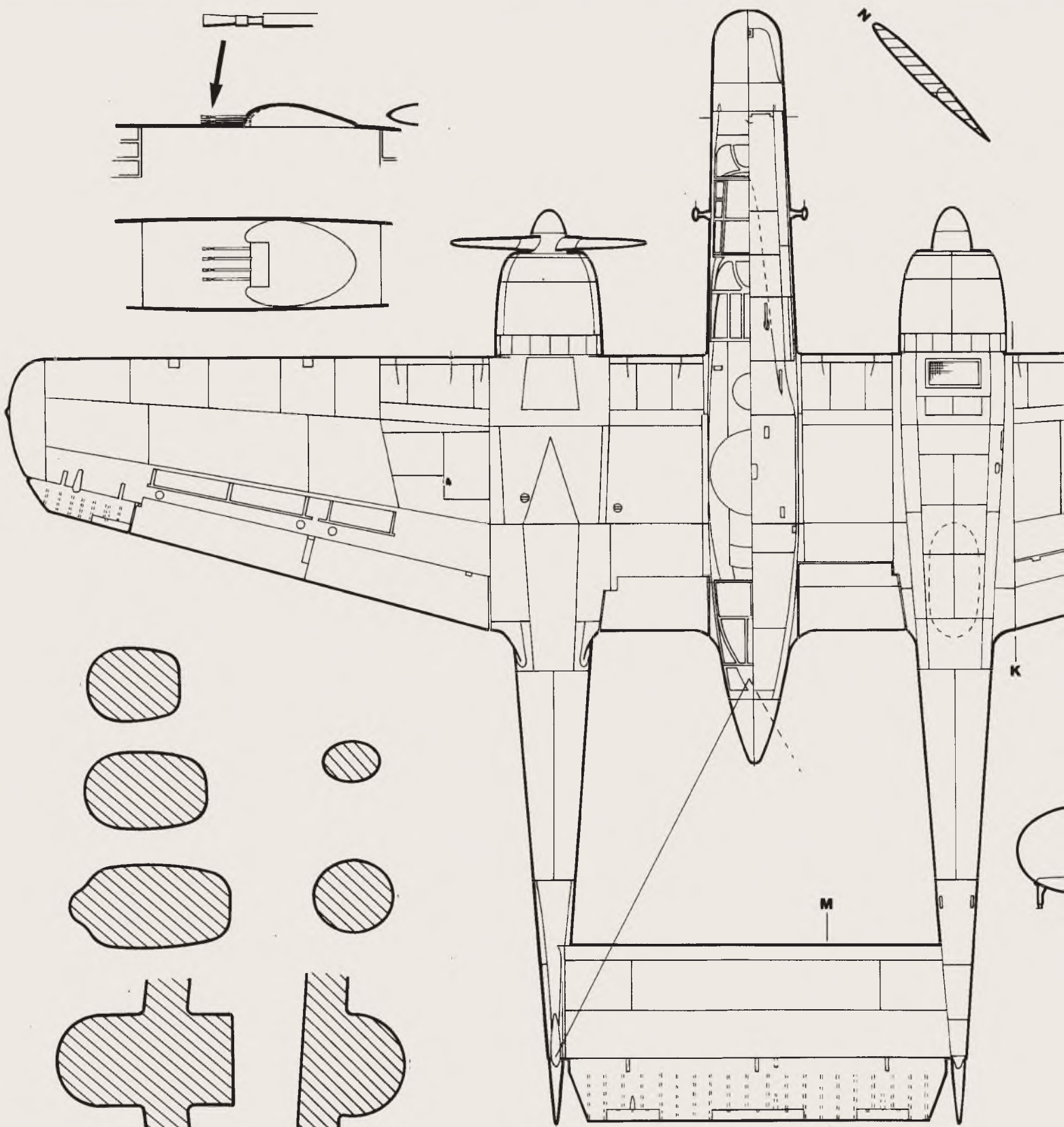
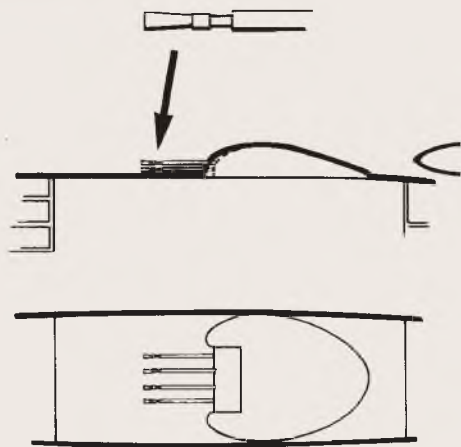
P-61Build review + photos (I/C version): <http://tinyurl.com/P61Build>

VQ Models:

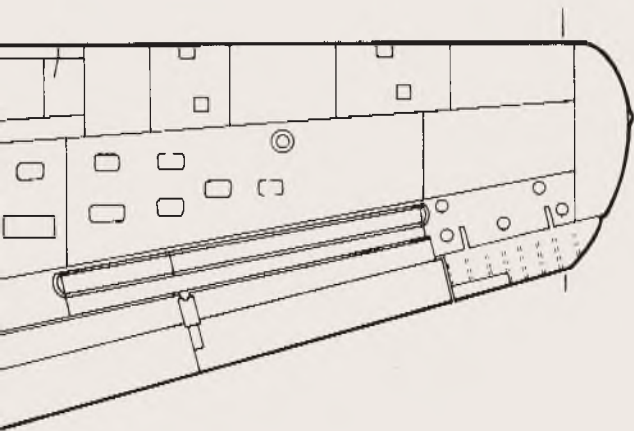
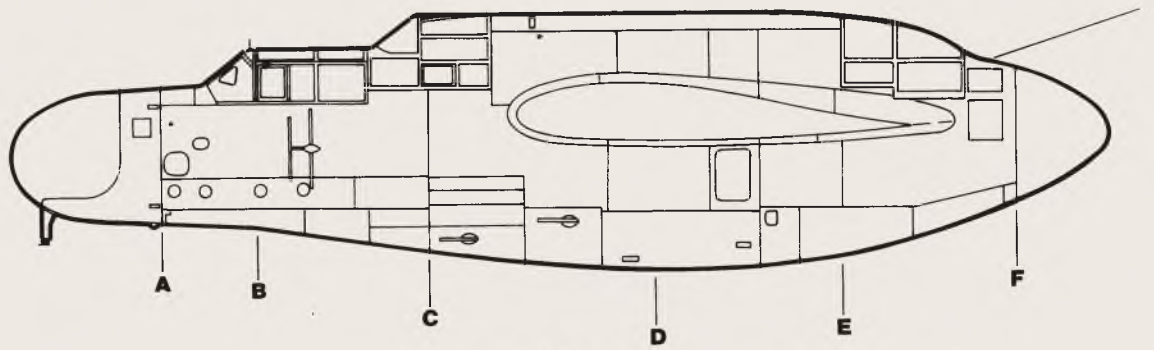
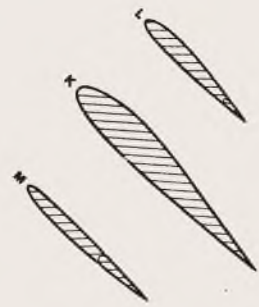
www.vqmodel.com

* Images Wikipedia Commons

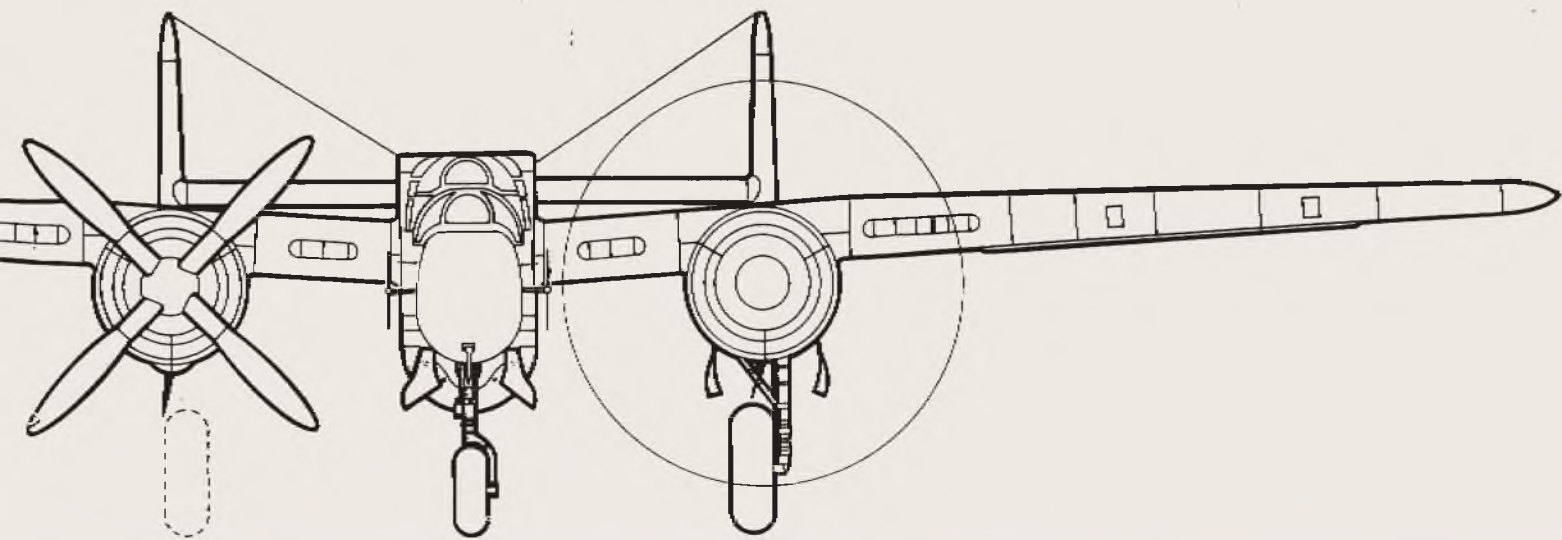
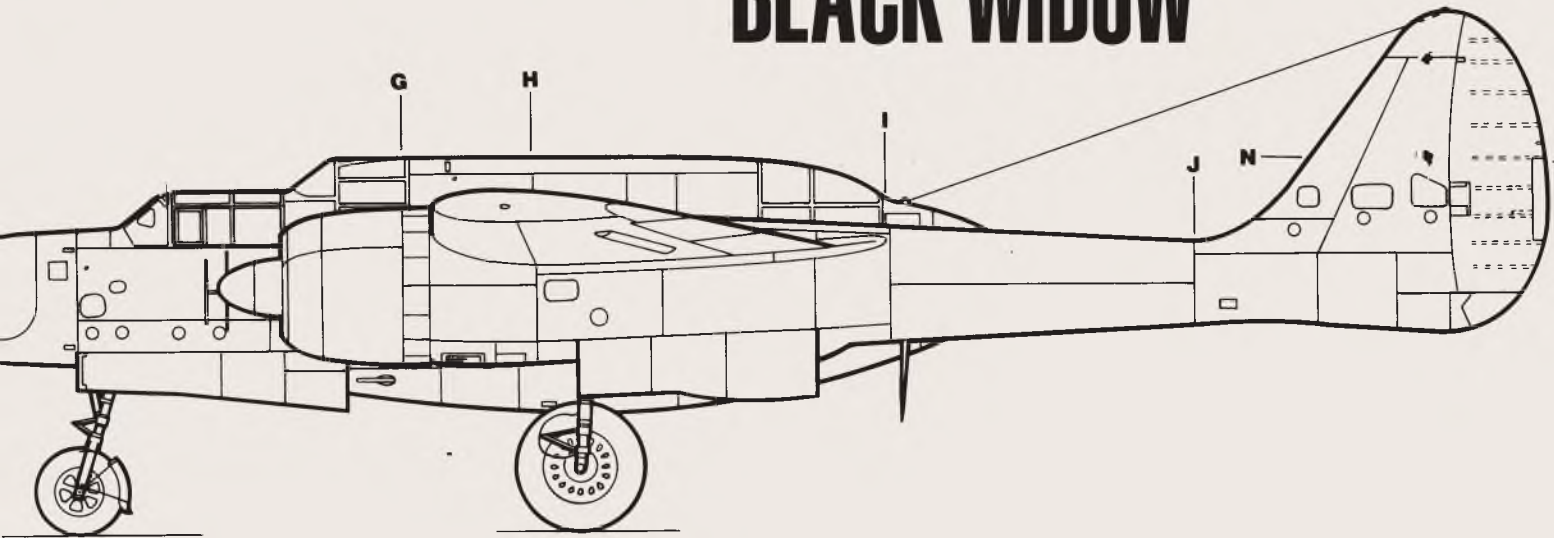




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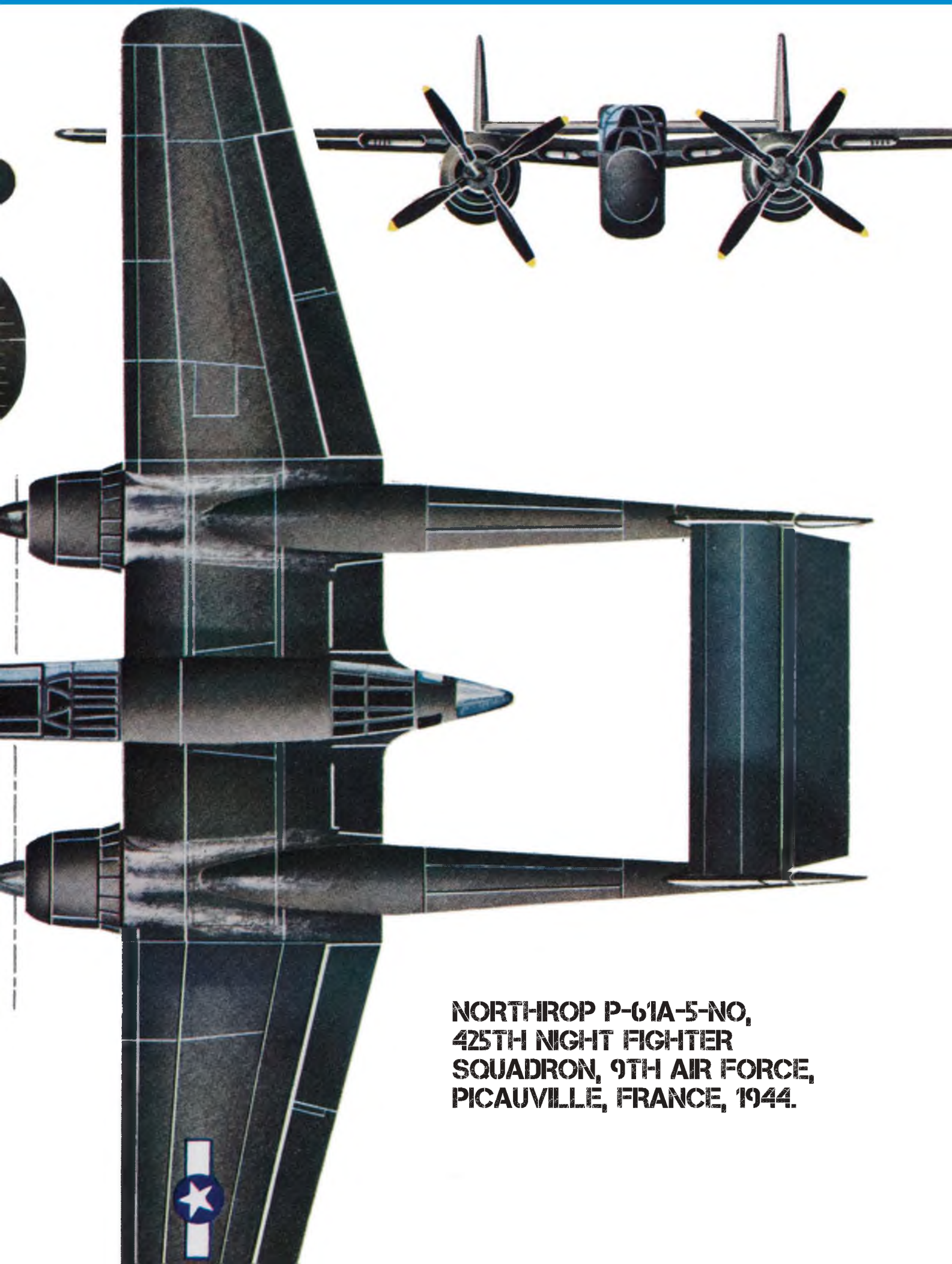


NORTHROP
P-61
BLACK WIDOW



NORTHROP P-61 BLACK WIDOW ' FLYING COLOUR





**NORTHROP P-61A-5-NO,
425TH NIGHT FIGHTER
SQUADRON, 9TH AIR FORCE,
PICAUVILLE, FRANCE, 1944.**

NORTHROP P-61 BLACK WIDOW

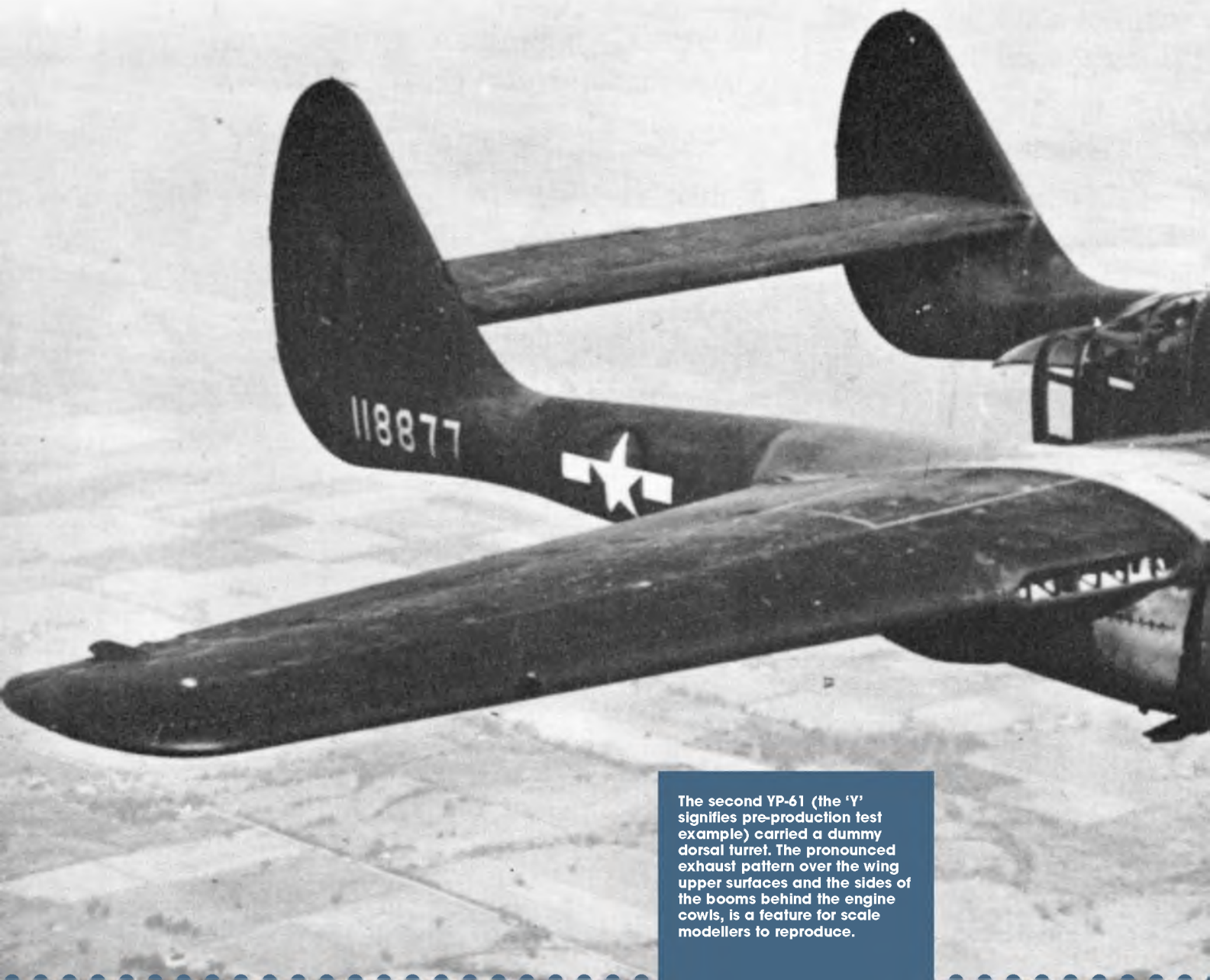
The first fighter aircraft specifically designed from the ground up to carry airborne interception radar equipment - big as a medium bomber, but surprisingly nimble in the air!

The Northrop P-61 Black Widow was the world's first military aircraft designed specifically for night interception and was also the first aircraft specifically

designed to include a radar system. It was a 'first' only by a matter of months, just ahead of the Heinkel He 219 Uhu, although the latter was a resurrection of a high-speed bomber project that never

left the drawing board.

At the time of the initial development of Radio Detection Finding equipment (RDF) as it was initially called in U.K., the equipment was ground based, bulky and



The second YP-61 (the 'Y' signifies pre-production test example) carried a dummy dorsal turret. The pronounced exhaust pattern over the wing upper surfaces and the sides of the booms behind the engine cowls, is a feature for scale modellers to reproduce.

BLACK WIDOW

heavy, but it did not take some of the scientists involved long to extrapolate the theory from ground-to-air detection, to a system tailored to one that could be installed in an aircraft for night (or even poor weather daylight) interception.

It would take further development in miniaturisation and weight reduction, but by the end of 1939/40, dedicated

prototype AI radar equipment was on hand, so that the new Airborne Interception radar could be installed in an aircraft, allowing it to operate independently of ground stations.

Development, then, was sufficiently rapid that on the night of July 2/3 1940 an AI radar equipped Bristol Blenheim of the Fighter Interception Unit (FIU) from RAF

Ford in West Sussex successfully intercepted and shot down a Dornier Do 17 during a Luftwaffe night raid.

The Bristol Blenheim, first introduced as a bomber had been further developed as a heavy, long range day fighter, and it's size and twin engines made it the best candidate immediately available to carry the AI radar. Other more suitable aircraft

“ In August 1940, 16 months before the United States entered the war, officers of the US Army Air Corps Office in London were briefed on British research into radar, which had been underway since 1935 and information that was passed across included that for airborne interception radars ”





A P-61B equipped with underwing fuel tanks, seen at Clark Field, Philippines in August 1945.



A P-61A of the 419th Night Fighter Squadron moves along the perimeter track on an airfield at Guadalcanal soon after the introduction of the type to combat in the Central Pacific combat Zone.

interception radars.

At that stage, U.S.A. lacked even a day fighter type capable of matching the performance of leading European types like the Messerschmitt Bf109 and Supermarine Spitfire, let alone a dedicated night fighter type, but high ranking US Army Air Corps officers fully realised what was need for the future - including requirement for effective night fighters.

Simultaneously, the British Purchasing Commission evaluating US aircraft, set the pace by declaring their urgent need for a high-altitude, high-speed aircraft to intercept the Luftwaffe bombers attacking London at night. The aircraft would need to patrol continuously over the target area throughout the night, requiring at least eight-hour on-station duration. It would carry one of the early, heavy, AI units, and possess multiple-gun turrets. These requirements were conveyed to all the US aircraft designers and manufacturers they were working with.

Among those was Jack Northrop of the California based Northrop Aviation Inc., who realized that the speed, altitude, fuel load and multiple-turret requirements demanded a large aircraft with multiple engines. On 5th November 1940, Northrop and Vladimir Pavlecka, Northrop's Chief of Research, met US Air Material Command officers and presented them with Northrop's preliminary design.

would soon be pressed into service, particularly the Bristol Beaufighter and the de Havilland Mosquito but again, both were night fighter developments of existing aircraft types.

In August 1940, 16 months before the

United States entered the war, officers of the US Army Air Corps Office in London had been briefed on British research into Radar, which had been underway since 1935 and information that was passed across included that for airborne



The prototype XP-61E airframe became the basis for the F-15 Reporter aircraft re-engineered for the task of photographic reconnaissance. This is the prototype XF-15A.



The XP-61E was the final version of the P-61 line, intended as a heavily armed long-range day escort fighter to shepherd aircraft of the Boeing B-29 force in their aerial assault on the Japanese home islands. All the guns were concentrated in the forward fuselage and the aircraft had a crew of only two. It never went beyond the prototype stage.

What Northrop tentatively proposed was an all-metal, twin-engine, twin-boom design with a crew of three: pilot, gunner, and radar operator, with an armament of four 20mm (0.79in) Hispano M2 forward-firing cannons mounted in the lower fuselage, and four 12.7mm (0.50in) M2 Browning 'aircraft' machine guns. The turrets were to be located in the nose and rear of the fuselage, plus a remote-controlled dorsal turret. This 'paper' design incorporated tricycle landing gear and featured full-span retractable flaps in the wings. Engines were to be Pratt & Whitney R-2800-25S Double Wasp radials, turning 12ft diameter Curtiss C5425-A10 four-blade propellers.

The fighter aircraft standards of the day, the aircraft was huge as Northrop had anticipated. While far heavier and larger multi-engine bombers existed, its 45.5 ft (14 m) length, 66 ft (20 m) wingspan and projected 22,600 lb (10,251 kg) full-load weight were unheard of for a fighter.

As the detail study progressed, changes were inevitably made, particularly to the armament, the configuration finally being four 20mm Hispano M2 cannon in a fixed fuselage underside ventral position and four 0.50" Browning machine guns in a remotely controlled swivelling upper turret, positioned behind the rear cockpit position.

First test flight of the XP-61 took place on 26 May 1942, with the first production P-61A aircraft rolling off the assembly line in October 1943. Interestingly, during operational testing, three early examples were given different colour schemes to assess visual acquisition under night time searchlight illumination. After, first an olive drab painted aircraft and then a bare metal one ran the test, the ground-based

tracking team waited patiently for the last one, painted gloss black with some distinctive red panel lining. They never detected it, confirming this as the obvious choice of standard surface finish. From that point on, the Northrop P-61 became the 'Black Widow' after the colouring of the similarly named deadly spider with its predominantly black colouring with traces of red too!

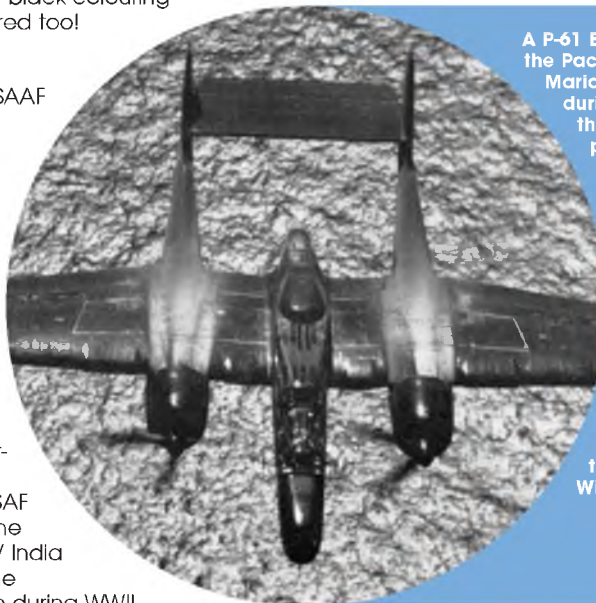
Into service

P-61s joined USAAF night fighter combat units more or less simultaneously in both the European and Pacific theatres of operation during the summer of 1944, proving to be an effective night-fighter, also serving with USAF squadrons in the China/ Burma/ India theatre and the Mediterranean during WWII.

In Europe, P-61s were employed in countering the pilotless V-1 flying bombs launched against UK in the months before the launch sites were progressively overrun by advancing Allied ground forces. The aircraft also proved useful during the German Ardennes offensive (Battle of the Bulge), Dec. '44/Jan '45, where its considerable firepower was used effectively in ground attack missions in the

desperate actions to stem progress of the advancing Wehrmacht.

In the Pacific war theatre, only four USAAF squadrons used the P-61, operating at night over Guadalcanal, New Guinea, Philippines and the Mariana Islands. Crews assigned to it were, at first, sceptical of the big fighter, as large as a medium



A P-61 Black Widow over the Pacific Ocean in the Marianas Island group during 1944. Note the long narrow panel demarcation outline that extends across both wing panels from the centre fuselage pod to outboard of the twin booms. These were red, the black and red colours giving the connotation to the Black Widow spider.

bomber, but as in Europe, it proved highly manoeuvrable.

As US army and naval forces began to draw the noose tighter around Japanese held territory and with their daylight superiority lost, Japanese air combat units resorted ever increasingly to night time nuisance raids which presented useful 'trade' for the P-61 Black Widow units.

Such night time encounters became

progressively fewer as Allied forces closed around the Japanese home islands, but on the night of 14 August 1945, a P-61B of the 548th Night Fight Squadron named 'Lady in the Dark' was unofficially credited with the last Allied air-to-air victory before VJ Day.

Pastures new

After the war, the P-61 (redesignated the F-61) served in the United States Air Force as a long-range, all weather, day/night interceptor for Air Defence Command until 1948, and with the Pacific based Fifth Air Force until 1950.

Last variant of the Black Widow line was the P-61E, intended as a long-range day escort fighter to support Pacific B-29 operations. Here the shape of the central fuselage pod was considerably different, slimmer, dispensing with the clear rear plexiglass crew position and with the extensive 'birdcage' multiple-frame stepped-up original cockpits in favour of a tandem-seat two-man bubble 'blown' canopy cockpit and with all guns concentrated in the forward fuselage.

However, progress of the war in the Pacific negated the need for the aircraft

and in any case, the P-82 Twin Mustang had been designed to do much the same mission.

Further tasks

The P-61E was then modified to create the F-15 Reporter unarmed photo-reconnaissance aircraft for the USAF, the prototype of which first flew in October 1945 and was ordered into production as insurance against the possible failure of the evolution-troubled Hughes XF-11 - also with a twin boomed airframe configuration.

A total of 36 production F-15s were produced and subsequently used in a major operation in the immediate post-WW2 period for aerial mapping of the Japanese home islands up until 1949. Operating from the same Japanese base, the same mapping operation was undertaken over Korea.

The last aircraft of the P-61/ F-15 line was retired from military service in 1954.

The Black Widow evaluated

Conceived at a time when effective night-fighting tactics had yet to be developed, and when radar equipment

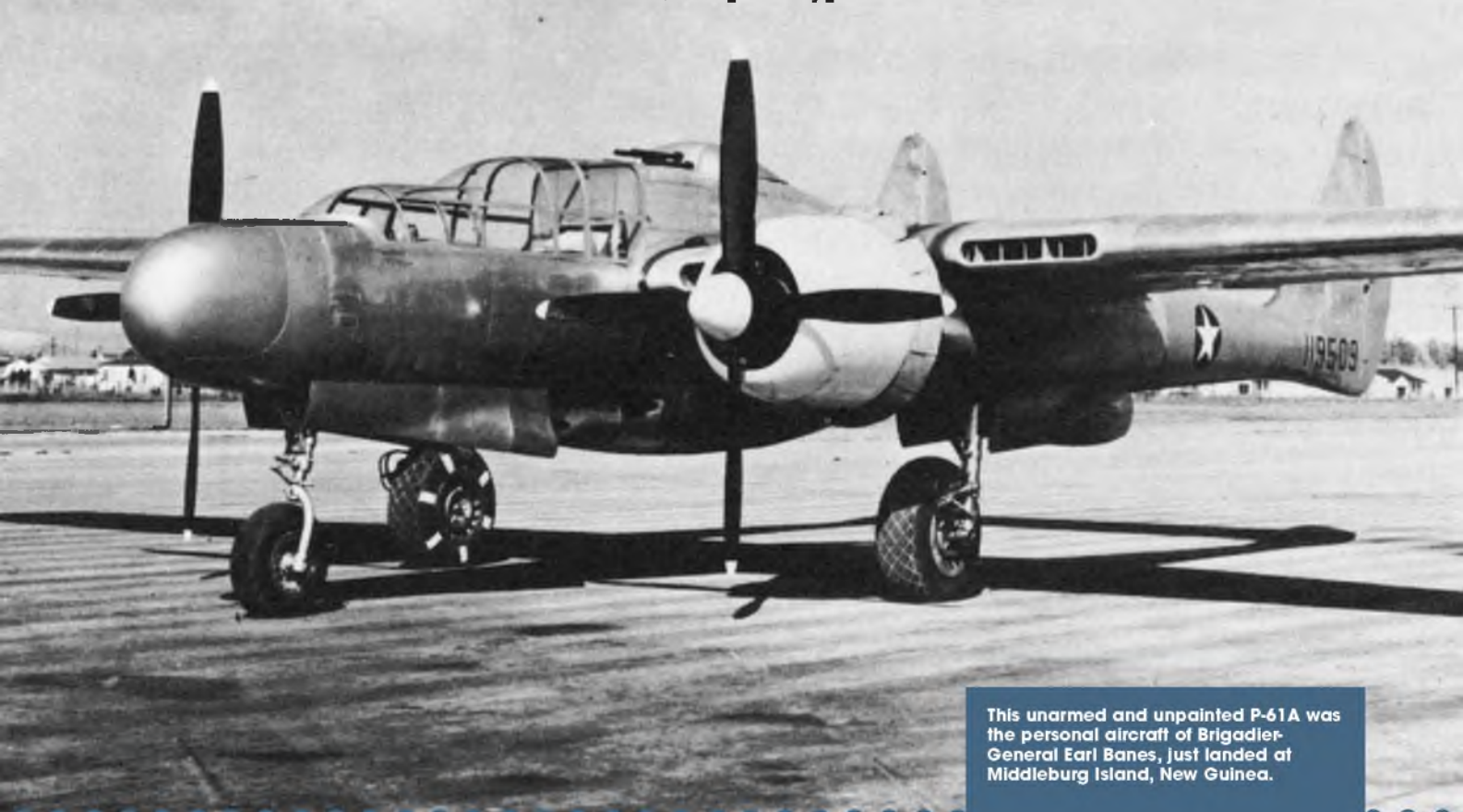
then under development was bulky and heavy, the P-61 was unusually large for a fighter aircraft. Yet, due to the use of full-span flaps and drooping ailerons, the Black Widow was exceptionally manoeuvrable for its size. Another positive factor in its favour was its potent armament, a feature of considerable importance when one considers that in night combat, the pilot had often only one chance to get a good firing position.

Radar development made quick advances and by 1944, smaller and lighter sets were available, to be installed in smaller single crewman aircraft such as the Lockheed P-38M, the Grumman F6F-5 Hellcat and F4U Corsair.

During its deployment, the P-61 was plagued with radar equipment failures and hydraulic system problems yet, until 1950, it remained the only night fighter aircraft available in substantial numbers to US Army Air Forces and, later, the newly independent USAF.

All of it however, was valuable background experience for the USA's first jet night fighter, the Northrop F-89 Scorpion ... another first! ■

“ The P-61E was then modified to create the F-15 Reporter unarmed photo-reconnaissance aircraft for the USAF, the prototype of which first flew in October 1945 ”



This unarmed and unpainted P-61A was the personal aircraft of Brigadier-General Earl Banes, just landed at Middleburg Island, New Guinea.

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“ The first model I saw was a DB Sport & Scale Albatros. Oddly enough, though I remember the kit boxes from the old summer shows, I can't remember seeing one constructed before ”

CLUBMAN SUMMER SCALE

Alex Whittaker looks back at last season's popular Skelmersdale Scale Day clubman event in deepest Lancashire which had a refreshing emphasis on non-warbird aircraft types

Skelmersdale lies in the Golden Triangle bounded by Wigan, Liverpool, and Southport, very close to the M62 corridor. Their Clubman scale event attracts

modellers from as far afield as Yorkshire, North Wales, and Cheshire. The Skem Club is well-run, well noted for its friendliness and has been a hotbed of Clubman Scale activity for many years. It

is also part of the Northern Scale League, propagated by Alan Glover, whose low-key scale comps are based on Phillip Kent's very accessible rules. Held every summer, the Skem Scale Day has

Chris Moore's Albatros C1, one of the late David Boddington's fine WWI scouts.





Lindsay Todd's EPO foam / electric Freewing Flight Design CTLS sports monoplane.



Phillip Kent's Franklin-engined Monocoupe in an American Pilot Training scheme. 78" span, Laser 70 power, and weighs 6lbs. More familiar in spats.



David Heaton's camo-finish DB Auster kit. Saito 72FS power, weighs 8.5lbs.



Lindsay Todd's pretty own-design Lockheed Vega. Free plan in RCME.



Lindsay Todd's Spitfire on short finals.



Barry Sherborne's Beaufighter just after rotation.

become a very popular fixture on the North West scale calendar.

Boddo Albatros C.1

The first model I saw was a DB Sport & Scale Albatros. Oddly enough, though I remember the kit boxes from the old summer shows, I can't remember seeing one constructed before. Chris Moore's Albatros C1 is 84" in span, and SolarTex covered. It is a wonderful bit of traditional building, full of Boddington practicality,

and bags of wing area. It would make a lovely Winter Project. This C.1 is powered by an ASP .91, driving a 15"x8" prop. She flew very well indeed, with a good speed range, and that indefinable feeling of vintage air navigation.

Albatros D.Va

Another take on the Albatros theme was Keith Fear's 1/5th scale Albatros DVa. This is from the Maxford kit, and spans 70". It is electric powered, and weighs 9 lbs.

Curiously, it has foam cylinder pots on its workmanlike dummy engine. You can get the model in a film or fabric finish. Keith said she needed watching in the air, but her red scheme looked pretty while swooping over the green grass of summer. He told me this was Richtofen's scheme - and steed - before he adopted the Fokker Triplane.

Wittman Buttercup

Now this was a rare beast modeled to

Alan Glover's Fokker DVII. 88" span, Laser 200 V powered, weighs 21 lbs.





Dummy engine on Keith Fear's 1/5th scale Albatros DVa. 70" span, electric powered, weighs 9 lbs.

Keith Fear's 1/5th scale Albatros DVa. 70" span, electric powered, weighs 9 lbs.

his own design by Andrew Reid and scratch-built. She is 72" in span, weighs 4.5 lbs, and has ideal proportions for a flying scale model. Electric powered, she uses a Purple Power 4Max 750 Watt motor with a four-cell lipo pack. She flew well and I thought that her simple green and yellow scheme was very effective, too.

Sig Piper Cub

These used to be all over the place a generation ago. Today they are rather thin on the ground; I speak of the venerable Sig Kits Cub. Chris Moore's immaculate version is O.S. 70FS powered and looked very nostalgic with the sun shining through her covering. Sig Cubs have legendary handling, by the way.

Bristol Beaufighter

Barry Sherborne's 1/9th scale Beaufighter is known to us, having been featured in

these pages in 2013. Barry scratch-built her, and she has a wingspan of 78". She is powered by two ASP .61 four strokes fitted with standard exhaust manifolds but without silencers, to give a better more realistic sound and appearance. Barry over-propped her a little with two three-blade 12" x 6" Master Airscrew props, to limit the prop speed down to 9,000rpm. Barry told me that this keeps noise levels low, and that "...three blade props always make a warbird look a lot more realistic...". (Can't disagree with that).

Each engine has two degrees of outward side thrust which, along with a basic gyro on the rudder, will help maintain some stability should an engine quit. The cowls have one degree of offset which helps to disguise the side thrust of the props.

Before he put the engines in the Beau, Barry had run them up, and fully tested

them, in a twin-engined Ripmax Harmony sports model. This process ensured initial engine reliability.

The model is fitted with retracts, the mains being air-up /spring-down units are by YT International, with basic sprung oleos from Ripmax. Barry told me he prefers his chosen soft Robart Airtrap wheels.

The tail retract is a cheap little plastic job operated by a 9 gram servo, restricted with an electronic 'servo slow' device. This is an ambitious homebrew flying scale model and is mightily impressive on a fast low pass. Corr!!!

Meyer Little Toot

Another rarely flown model, Colin Terry's pretty Meyer Little Toot was built from the famous Dennis Tapsfield plan. She is 1/4 scale and Laser 120 powered. For the record, she spans 57" and weighs 10.5 lbs.



Andy Bowman's 84" span clipped wing Cub from the World Models kit. OS 120 FS powered and covered in Sig Koverall. Rib tapes cut with mini pinking shears.



Neil Sherborne's Miles Sparrowhawk, 63" span, SC 80 FS power.



Chris Moore's OS 70 FS powered Cub from the venerable Sig plan.



Built by Jim Dobson, Keith Fear was flying the Buhl Air Sedan. OD 70 FS power.

I have only seen two Little Toots in the last five years, which is such a shame because it is a very cute little aircraft for the early post WW2 beginnings of the American home-built movement spawned by the Experimental Aircraft Association (EAA). Colin's agile example

really did look they part in the air. The Little Toot logo always makes me smile.

Pobjoy Comper Swift

Scale Maestro Philip Kent crossed the Pennines with one of his latest scale designs. This was the Pobjoy-engined Comper Swift, like the one on display in the Shuttleworth Collection at Old Warden. It was a hectic day on the Skem flightline, and I

was unable to grab Philip to jot down any more details, but we can tell you that it is earmarked as a full size plan feature for FSM in the coming months.

Fokker D.VII

Noted scale man and NW scale comp organiser Alan Glover was campaigning his new Fokker D.VII from the Arizona Model Aircrafters kit.

This is 88" span, is Laser 200 V powered and weighs 21 lbs. Alan has finished her in Arizona's lozenge fabric that looked very



Cockpit on Fred Corless' RV-3, 48" span and weighs 6lbs.

Fred Corless' Van's RV-3 from the Peter Miller RCME plan.



Colin Terry's Little Toot from the famous Dennis Tapsfield plan.



convincing and which produces a handsome model. It flew very impressively. Mind you, as the wind changed on landing, she narrowly missed the rough!

Van's RV-3

Fred Corless flew an interesting and really cute little scale model, a Van's RV-3, built from the Peter Miller plan. This works out at a handy 48" span, and weighs 6lbs. Fred elected for electric power and fitted an AXI 4120-14 motor, with a four-cell 3,200 lipo and a 13"x8 prop. Flaps are fitted, too.

Clipped Wing Cub

Andy Bowman's 84" span clipped wing Piper Cub was built from the World Models kit. I had one of these kits a few years ago to test fly a home-built glow twin, and they fly very smoothly indeed. Andy's example is O.S. 120FS powered and covered in Sig Koverall. Rib tapes were cut with mini pinking shears.

Monocoupe

An all-time modellers' favourite, the Monocoupe line of light aircraft is

perhaps better known with Anzani radial engines and elegant fixed spats. Donald A. Luscombe built the first example in 1927, so Monocoups have a good pedigree. Lord-of-Scale Phil Kent decided to ring the changes, and his new own-design is the lesser-known Franklin-engined Monocoupe and is finished in an American Pilot Training scheme. The 'Coupe spans 78", is Laser 70 powered, and weighs 6lbs.

Buhl Air Sedan

We have seen her before some years ago, but Buhl Air Sedans are as rare as tax rebates. Genial Jim Dobson originally built her from the Philip Kent plan over ten years ago but nowadays this model is owned by Keith Fear. She is a very attractive sesquiplane that spans 72". Originally, Jim fitted an O.S. 52FS, but this has now been updated to O.S. 70FS power. A very interesting model in the air, with a nifty scheme.

Auster J.1

There was another fine David Boddington design at Skem. This was David

Heaton's large DB Sport & Scale kit Auster J1. She is a good size at 1/5th scale, yielding a span of 87". Handily, the DB kit includes the canopy and two-part cowl. David's example is powered by a very sweet Saito 72FS and he is clearly a light builder, since she weighs a commendable 8 lbs! This Boddington penned kit is still available from DB Sport & Scale. Telephone: 01792 897501 or check this internet link: www.dbsportandscale.com/auster-j1-6515-p.asp

The Verdict

Skem Scale is a classic no-nonsense Club event. No formality, no airs-and-graces, and no silly rules. You are assured of a flying slot and genuine Lancashire hospitality. It is so absorbing to spend a day just flying, watching the models, and nattering about scale techniques in the pits. An ideal way to spend a summer Sunday.

Look out for the date of this year's event! ■



Colin Terry's Little Toot from the famous Dennis Tapsfield plan. 1/4 scale and Laser 120 powered. 57" span/ weighs 10.5 lbs.



Scale Maestro Philip Kent with his new design, the Pobjoy-engined Comper Swift.



Dummy Pobjoy engine in Phil Kent's own-design Comper Swift



Henry FARMAN



FIG.1: This pre-WWI advertisement in a French-language publication clearly refers to 'Henry Farman', not 'Henri'.

GENTLEMEN, PLEASE MIND YOUR LANGUAGE!

Gary Sunderland, always a stickler for accuracy in matters aeronautical, debunks a few misnomers of aviation terminology.

It is now one hundred years since the Great War, or World War One as it is now officially known, and all sorts of people and organisations have been writing books, presenting films and video shows and generally having a great time presenting 'their' version of history. Some of the results have been remarkably good, particularly where the account uses original text as a basis, without too much alteration. Given that the common English language has changed over the last one hundred years, as also has our understanding of aeronautical science, technology and war, some explanation and interpretation is required.

This brief note will attempt to explain some common changes in terminology and, hopefully, dispel a few myths which seem to have been repeated so often that they are taken as fact.

Many writers and the general public are familiar with World War Two terminology and references to 'fighters' and 'bombers' used in that conflict, so a modern author will usually adopt World War Two language when writing of the earlier war. During the Great War, in the British services, a 'fighter' was generally an armed two-seat aeroplane, such as the Vickers 'Gun-Bus', the Sopwith 'Strutter' or the Bristol 'Fighter'. Single seat aeroplanes were 'scouts', so we have 'scout pilots'

and 'scout squadrons' engaged in combat. Incidentally, the French were the leaders in aeronautics before and during World War One and formed 'chasse' units of fast armed aeroplanes early in the war which could be 'monoplace' (single-seat) or 'biplace' (two-seat), sometimes of the same type. (Ref. 1). British squadrons were often equipped with French aeroplanes which has led to some confusion. For simplicities sake, this brief note will concentrate on publications in English about British Empire forces and equipment.

After one hundred years, it is not surprising that many popular myths exist, not only in the press, but also in historical journals, despite the efforts of respected authors to correct the record. A classic example is the 'Henri' Farman story which began well before World War One with the French and then the British press. 'Henri' entered the popular culture and was common usage within the Royal Flying Corps (R.F.C.) Even the Farman F.40 was labelled as an 'Henri' Farman!

For the record, Henry Farman was a British subject who established an aeroplane factory in France with his brother Maurice. Their first product was clearly labelled 'Henry Farman 3' and the correct spelling was used in French and British documents, such as contracts, but

not down to Squadron level. (Ref. 2).

Fig.1 illustrates an advertisement in a 'period' French publication in which Mr. H Farman is clearly referred to as Henry Farman.

In recent times the renewed interest in World War One flying has seen model aeroplane magazines inventing a number of new words, for example 'lozenge', for the German multi-coloured printed or painted camouflage. Actually, the word is applied to a four-sided figure in heraldry. The Americans used to refer to 'hex fabric' at one time but in recent years they seem to have adopted 'lozenge' as well. (Ref. 3).

STRUT YOUR STUFF!

During World War One, biplanes had 'centre sections' and 'centre section struts'. Monoplanes usually, but not always, were 'cabane' braced, with cabane wires to pylons on top and underneath the fuselage. In recent times magazine writers have taken to misnaming centre section struts on biplanes as 'cabanes', which they are not. To add to the confusion, some biplanes with extended top wings, such as the B.E.2e, R.E.8 and Curtiss are cabane braced from pylons on the top wings. (Ref. 4).

Early in the war, as trench warfare developed, it looked as though aerostats

(airships and kite balloons) would be more useful than aeroplanes. Only free balloons are true 'lighter-than-air' craft, Airships are flown 'heavy' and depend upon the aerodynamic forces in flight to maintain control. As fuel is burned, the crew is forced to vent gas to remain under control. The Germans had three

A.M.C. and its licenced contractors never labelled their products except by the design - MF.7, MF.11, D.H.1, D.H.2 etc. **Fig. 2** is the cover of the D.H.9 Parts Catalogue and there is no mention of the A.M.C. or any other manufacturer. Also note that the aeroplane was described as a 'fighter' although it was mainly used as a day bomber.

To further illustrate the naming of D.H. aeroplanes, the detail design of the D.H.9a was carried out by the Westland Aircraft Company, because the A.M.C. design office was fully engaged with the D.H.10.

Geoffrey de Havilland was capable of controlling two design offices at the same time in developing two different aeroplanes, the D.H.9a and the D.H.10 twin-engined bomber. Late in the war, the aircraft industry was threatened by the British Government's Excess Profit Tax, introduced to penalise profiteering. Given that, prior to the War, the industry made few aircraft and even fewer profits, many aircraft manufacturers closed down at the end of the war as contracts were cancelled. The Aircraft Manufacturing Company was one of these and G. Holt Thomas formed a new company called AIRCO to manufacture D.H. aeroplanes on a small scale for the infant civil transport industry. At least one D.H.4 civil conversion was exported to Australia. Once again none of the AIRCO products had this as a prefix and the aeroplanes were simply known as D.H.4 etc. The AIRCO firm also closed down with the formation of the de Havilland Aircraft Company Ltd. on 25 September 1920. (Ref.6).

Clearly Holt Thomas concentrated on manufacturing and left all technical matters to Geoffrey de Havilland. An A.M.C. prefix makes no more sense than AIRCO in this context and the late J.M. Bruce listed D.H. aeroplanes as such in his major works and not under an 'A' label of any sort.

(See Fig.2).

Another source of much confusion is the military use of the civilian sport-pilot qualification system as basis for a military pilot standard.

The Federation Aeronautique International was set up at a meeting of national aero clubs in 1909 to establish rules for the conduct of all air sports and record flying, including minimum flying standards for pilots. For aeroplane pilots, any pilot who could take off, complete a circuit and land near the take-off point could qualify for a F.A.I. certificate. Later the tests were extended to include figure eights and a glide approach to land without power.

These F.A.I. certificates of competency were valid for all time, unlike civil pilot licences which were not introduced until 1919 under government control. The civil pilot licence system continues to this day and usually is valid for only twelve months, requiring a flight test for revalidation.

Even before World War One the French military instituted a military brevet or qualification for service pilots, including

cross country flights and altitude tests using a barograph for verification. Similar tests seem to have been carried out in Germany and Austria.

In general the flight training system based on civilian standards was low, with stalls and spins avoided rather than practiced. With low standards of instructor training, the level of crashes and fatalities in Britain was unacceptable during 1916 and 1917 and was only solved by the introduction of the Gosport system of training set up by Major Robert Smith-Barry in 1917.

During 1917, Australian pioneer J.R. Duigan had been an instructor at Harlaxton and in October that year was selected to attend the Gosport School of Advanced Flying. He said this experience probably saved his life several times later during operational flying with No.3 Squadron, Australian Flying Corps (A.F.C.). Jack survived and won a Military Cross.

This system became the standard in the post-war RAF and R.A.A.F., and ironically in the future civil pilot licencing systems, but came too late to save the bulk of the World War One pilots, many of whom would be unable to identify or recover from a spin.

There are many more myths and legends out there, mainly concerned with air combats, but the real history of the first air war, and the war itself, was in the application of modern technology on a vast scale. Despite their new monoplanes, the flying troops of the Central Powers simply ran out of both pilots and fuel.

The history lesson was not learned and we all had to repeat the exercise again, with the same results.

ACKNOWLEDGMENT

Special thanks are to Colin Owers, who provided reference 5 as well as copies of D.H.9 and D.H.9a parts catalogues. ■



FIG.2: The covering page of the RAF Schedule of Spare Parts, dated August 1918, refers to the DE HAVILLAND 9 ... not an 'Airco' or an 'AMC' is sight!

manufacturers of airships, although the Zeppelin firm was the largest and most successful. Kite balloons were used by both sides and provided the best control of artillery fire at medium ranges.

Despite the emphasis of Hollywood 'histories', most air activity involved dangerous but vital reconnaissance and artillery observation flights by two-seat aeroplanes. These aircrew suffered terrible losses and were the true heroes of the air war.

Air combat developed slowly but, far from jousting with lances, the job of the scout pilot was to sneak up behind the enemy and shoot him in the back without being seen.

Another creation of the popular magazines relates to the name 'AIRCO'. The facts are that George Holt Thomas established the *Aircraft Manufacturing Company* in 1912 to build Farman aeroplanes under licence, and the MF.7 'Longhorn' and MF.11 'Shorthorn' were used in large numbers for basic training in the early years of the war.

In late 1914, Geoffrey de Havilland joined the firm from the Royal Aircraft Factory, to establish a design office. Contracts to manufacture Farman and later D.H. aeroplanes, used the abbreviation 'A.M.C.' for the firm. (Ref.5)

During World War One, and after, the

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