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Building and detailing the Ziroli 1/5th scale Douglas SBD

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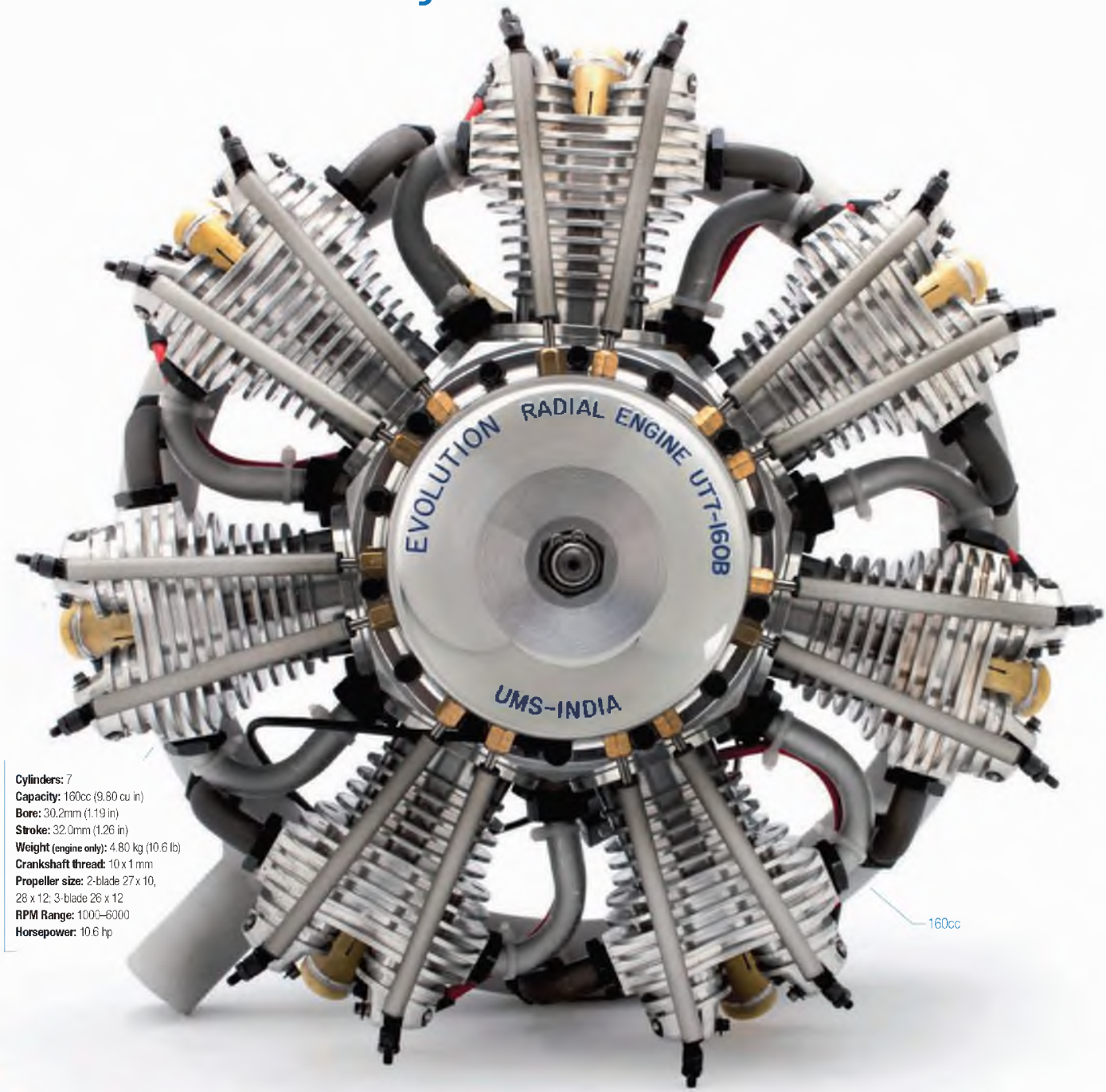

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14

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ON THE COVER

Paul Rice's Douglas SBD Dauntless was built to 1/5th scale, spans 100" (2540mm) from the Nick Ziroli plans and Belair cut-parts set. Power is a Zenoha G80 and Lidsay Todd reviews the building and detailing of this masterful model in this issue.

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CONTACT

AN OLD FRIEND RETURNS

It's a little bit of a shaker to realise that I've been in the model aviation publishing business for just over 52 years!

Yep, my first job was as an Editorial Assistant on *Aeromodeller* magazine - October 3rd 1960 was the start date, I remember it as if it were yesterday - and thus commenced a tutelage under the late, great Ron Moulton, whose office I shared.

That first day was one in the last production week for the December 1960 issue and celebrated 25 years of continuous publication of the magazine. One of the many highlights of the issue was the super-detailed scale drawings of the Supermarine Spitfire Mk.IX and I remember Ron Moulton making an interesting comment, as he leafed through the first-ever issue of the magazine (December 1935). It included a scale drawing of a fighter aircraft from that earlier world war era, the SE5a. Ron made the point that the SE5a, then, was an aircraft no older than the Spitfire was in 1960!

Aeromodeller was a great champion of scale modelling in all its forms from 'solid-scale' carved wood static replicas, through plastic kits, to flying scale in all its forms. It was a great source of scale three-views of all kinds of aircraft, produced in ever increasing detail that set the magazine apart as a source for authoritative accuracy. In doing so, the magazine drew in an increasing field of contributors capable to producing such accurate drawings.

Beyond Scale, *Aeromodeller* was always the bastion of 'traditional' aeromodelling, covering all of the model flying disciplines and actually introducing and fostering more than a few that might otherwise never have got very far.

February 2001 was the final stand-alone issue, simply dropped by its then publisher, but 'rescued' at least in part, to become part of *Aviation Modeller International* as 'a-magazine-within-a-magazine'.

Now, *Aeromodeller* is back and issue No.1 (or No.919 if you like) is on sale both in paper format at newsagents and in digital format.

Tony Dowdeswell

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Douglas Dauntless

LINDSAY TODD REVIEWS PAUL RICE'S BRILLIANT ZIROLI DOUGLAS DAUNTLESS

Sometimes, just sometimes, you have the privilege of getting to see something really a little bit special. Such was the occasion for me when Paul first moved back to the UK from Florida. To set up a business to build scale models may, to some, seem like a bit of a pipe dream. The chance to spend every day totally absorbed in our passion for all things aviation, rather than for just a few hours a week would be sheer bliss.

Well, the truth of course is somewhat different with all the pressures of running any business, but let's not destroy the image for now and live in blissful ignorance of what such an opportunity could, and in this case, has delivered.

Paul realised very early on that his reputation in USA for building first class models was pretty well established, particularly large warbirds, but he would need to develop the same reputation in the UK for his business even to be noticed, let alone be successful. For this reason he set about creating a showpiece model to take around the various meets, events and shows as a promotion of his skills and, not least, have a little fun as well. Any such model had to be of a reasonable size, be something that could be produced reasonably quickly, but to which a high degree of surface detail could be applied. Paul finally selected the Nick Ziroli Douglas Dauntless as a suitable model at a shade under 100 inches and target weight of 40lb.

Taking advantage of the excellent services from *Belair Kit Cutters* and Paul's own contacts in the USA, all the parts were brought together prior to the build commencing. It's a strategy that Paul maintains because the best way for a quick build is to have all the components to hand, engine, retracts, servos, dummy pilot figures etc. In fact, Paul creates an itinerary of bits so that he can sequence the build and have multiple parts in progress at a time so that as the glue dries on one part, progress is made elsewhere. This of course is somewhat aided by his well-appointed workshop and multiple benches that can accommodate such a practice.

Making a start

Work commenced with the fuselage, fin and tail assemblies, getting the basic structure together pretty quickly. Servos and control rods, snakes and linkages were all installed prior to the sheeting being applied as this aids access and the linkages can be tested and revised as necessary without the need for any subsequent extensive surgery.

With the fuselage progressing nicely, the wings were then laid down, focussing on the centre section together with the retract mountings, all re-enforced with glass fibre around the mountings. The retracts used on the model are the large Robart items together with a set of Dubro scale wheels.

Detailing of the centre section started with a coating of yellow oxide paint to the wheel wells prior to sheeting, even though this would subsequently be painted over. As Paul says, any scratches will then show up correctly as the correct primer under the alloy.

The wing outer panels are connected to the centre section via large-diameter alloy tubes and sleeves and a fixing bolt. Around these fixings are the linkages and drive servos for the six-section flaps and dive breaks that are fully functional and operate via a hidden linkage on the hinge line. It's fair to say, and certainly no surprise, that it took some time to get a smooth and even movement on all six sections of the flaps and dive breaks because the angles vary a little and small differences in control rod length made big differences to the throws. But the time spent has been worthwhile even though these control functions are yet to be fully

tested in flight. Paul has ensured all the control surface linkages are Scale and he mentioned that the control functions of the flaps, bomb drop pylons and retracts absorb no less than eight servos, all installed in the wing.

Zenoah power

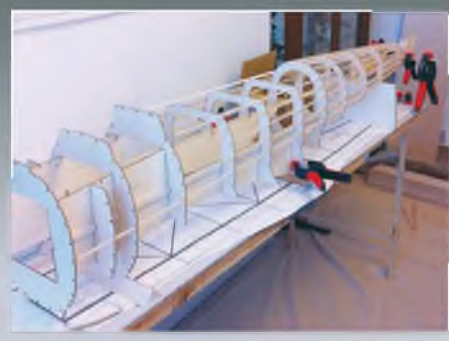
The engine chosen was the mighty Zenoah G80cc twin petrol together with the standard silencer that neatly exits through two holes in the underside of the cowl, although Paul says he will adjust this over the winter to the scale outlet positions. The G80 is swallowed by the large glass fibre cowl that also houses a resin-cast nine cylinder dummy radial engine. This has been extensively enhanced with some neat brass work, nuts and bolts, sheathed tubing and, finally, nicely weathered to give that authentic used look about it.

Beginning to look like it

The basic timber airframe took a little over three months to bring together, albeit spread over a six month period - not surprising at a time when Paul was still in the midst of setting up his business, moving back to the UK and including a trip back to the USA to compete at Top Gun. The fact that the model came together that quickly is really quite remarkable.

I think it is fair to say that the favourite part for many scale build is the detailing, a point at which we really get to know and understand an aircraft. This of course starts with preparation, not least with the airframe which was thoroughly filled and sanded prior to epoxy glass cloth being laid down and, finally, a coat of primer

The assembly commences with fin, rudder and tail.



Bare bones of the fuselage comes together very quickly.

Fin and tail fixed to the fuselage and sheeting commenced.

On the ground the Dauntless has heaps of character from every angle.

ready for detailing.

Paul invested in a vacuum formed cockpit kit from *Dynamic Balsa USA*. The detail this adds to such a large open canopy area was well worthwhile. The basic floor mouldings and central structures were glued in place and then sprayed with yellow oxide primer before the plastic canopy was fixed to the canopy rails, supplied by *Mick Reeves Models*. Paul intends to have the canopy in the open position for flight rather than functional, however the rails allow the opportunity to make these functional in the future should he choose so to do.

Test before detailing

At this point Paul decided to take a sensible and brave decision to test fly the model before committing the hours to detailing and final finishing. To this end, we arrived at a cold Rednal Airfield one Saturday morning and, having run out of excuses, the bare airframe in its grey primer and lacking the cockpit canopy, looked a little strange on the runway as Paul went through various checks prior to committing aviation.

Needless to say the test flight proved the Dauntless to be a delightful aircraft to fly with just a little trim required and no apparent vices although, with the engine still quite new and running a little rich, this was no time to explore all aspects of the envelope. However Paul was completely satisfied and ready to progress the model to its finish.

Details, details, details...

Having had several months to peruse the various forms of documentation available from which to identify a final

Detailing the elevator structure as the build progresses.

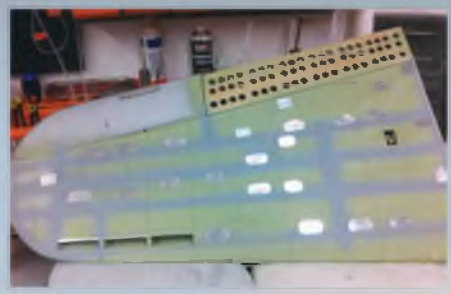
Servo installation and control snakes installed whilst access is good.

Rapid progress of the structure sees retracts, and wing joining tubes installed.

Wing servo's and linkages install prior too sheeting the final sides of the wing.

Wing outer panels structure completed and ready for finishing.

Wing is epoxy and glass cloth covered then filler primed and sanded.



The wing panels now receive the first stages of detailing with panels and panel lines.

The fuselage gets similar treatment.

Application of rivets by use of glue droplets commences on the wings.

The first undercoat of aluminium really shows up the detail.

The resin cast dummy engine will hide the Zenoha G80 engine.

The Dauntless cowl swallows the G80.

Dummy engine installed painted and embellished with a removable static scale prop.

colour scheme for the model the final selection was a based on a Royal Navy Fleet Air Arm aircraft, but with a few additions for scale effect, and given Paul's concept of a show model, I think it is fair to forgive total authenticity in this case.

That being said, Paul did want to provide an accurate airframe so detailing commenced with panel lines and rivets, together with a scale rule to ensure each rivet was accurately positioned. Yes each rivet was marked on the surface skin prior to application of a glue droplet over each marked rivet position. The end result in fact seems to have added a beneficial effect of making each rivet look like it has a centre punch - most realistic and largely by accident in this case.

Panel lines were replicated by use of thin 1mm tape and various access

panels from self-adhesive alloy film. The entire airframe was then sprayed with grey primer, the 1mm panel tape then removed to define the panel outlines and then sprayed again with aluminium silver as a base coat before the final camouflage topcoat of sky underside and two-tone grey/blue on top. I happened to drop in at the workshop just after the model had been sprayed silver and the transformation was simply amazing; literally, an aircraft seemed to have been born.

The topcoat is an acrylic paint that Paul has had mixed direct to the original reference codes. Royal Naval roundels and registration letters were produced as paint masks and spayed, then nomenclature added from one of Paul's USA sources acquired during his trip to Top Gun. Being acrylic, the paint is water based and so is given a topcoat of lacquer to fuel proof.

Final touches of weathering have been applied by airbrush with enamels. Now, the true artistry is most evident. The weathering is suggestive without being blatant; the top scale modellers seem to do this with apparent ease, but clearly it takes years of practice to know when enough is enough and stop before the effect is overdone.

Office hours

It is at this point perhaps, that many of us stop and say, finished; and indeed the result would be superb. However in this case, Paul now went on to add the details. Firstly, the cockpit was fitted out using the prefabricated vacuum formed kit and a host of other self modelled parts to build up the character, each part being painted and then added into the airframe. Even the gap between the instrument panel and its mountings has wires visible as if exiting from the back of the individual instruments. The rear cockpit has been embellished with a twin machine gun installation, another kit component finished to a very fine detail level, but look deeper onto the floor and you will find spent cartridges!

No aircraft of such detail would be complete without suitably adorned pilot and gunner / navigator and such is the case here with the superb *BBI* pilot/crew figures Alas, these are apparently no longer available, these items having been with Paul for some years and have featured in most of his other warbirds over the last few years, so quite rightly have found a seat in his latest creation.

Final touches include radio wires and masts, Pitot tube and the obligatory static only 28inch three-blade scale propeller.

Still a 'work-in-progress'!

Although Paul claims the model is still not

"In flight she is totally authentic, stable and a remarkably easy to fly."

Cockpit is based around the Dynamic Balsa kit from the USA embellished by Paul.

Elevator Trim tab detail is superb.

Subtle weathering creates that authentic look.

finished and has other details he wishes to add in the fullness of time, such as opening cowl gills linked to the throttle position and retracting rear guns etc., the model has really no more excuses for not flying. It has now clocked up some dozen or so flights and the full flight envelope is slowly being explored.

Paul says that the power from the Zenoah G80 has proven to be ideal for the model that finally weighd in at a shade over 40lb. The flaps are very effective with little trim change, but do help in slowing the model up nicely and she can be brought in to land surprisingly slowly with no signs of dropping a wing, aided no doubt by the slats on the outer panels and generous wing area of the aircraft.

The retracts have proven well up to the job although these have required a little fettling, especially with the inner door linkages that initially caused some aggravation, but have since performed flawlessly.

Reports from other model builders of the Ziroli Dauntless claim the dive breaks to be effective but to date, Paul has yet to give these a thorough testing. I think the idea of a full power dive is still a little way off, considering the effort that has been put into the model and there is little risk in deliberately stressing the control surfaces unduly so early in its life and I can't blame him.

MODEL SPECIFICATIONS

Builder Paul Rice
Ziroli Douglass Dauntless

Scale:	2.4inches to the foot - approximately 1/5th scale
Wingspan:	100 inches
Length:	78 inches
Wing Area:	1720 square inches
Weight:	42lb
Engine:	Zenoah G80 Twin
Retracts:	Robart Giant Scale specific to the model
Functions:	Aileron, Elevator, Rudder, Throttle, Retracts, Flaps, Dive Brakes and Bomb Drop

Rear Gunner position with excellent BBI pilot.

Paul Rice with his superb Ziroli Douglass Dauntless.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Ansoldo S.V.A.5

Failed fighter turned propaganda machine that was probably the fastest WW1 Allied fighter. Carlos Guerra brought his impressive model all the way from Brazil to fly at the 2012 BMFA Nationals

The Savoia-Verduzio-Ansaldo SVA5 was developed from the earlier SVA 1, which first flew in 1917. Originally conceived as a fighter, this was a largely conventional biplane with a plywood fuselage. She was powered by a 220hp SPA 6A liquid-cooled six-cylinder in-line engine. Although the SVA had a good turn of speed, it soon became apparent that she was not best suited for the role of fighter.

However, the design was soon developed into a fast reconnaissance aircraft, a role in which the aircraft excelled. Ansaldos also completed the famous Italian propaganda 'Flight Over Vienna' in August 1918, where they dropped propaganda leaflets, and safely

The Ansaldo is over three metres in span.

returned. The instigator of this famous stunt, the Italian poet and patriot Gabriele D'Annunzio, flew in an Ansaldo of the 87ma Squadriglia, bearing the famous 'Lion of St Mark' device on it fuselage.

Quite what the astonished Viennese made of hundreds of sheets of poetry dropping from the sky (which the unthinking D'Annunzio did not even bother to translate from the Italian) is not recorded. That Italian braggadocio notwithstanding, the Ansaldo was considered by many to be the fastest of all Allied aircraft of WW1. She remained in production until 1926.

The model

Whilst covering the 2012 Scale Nats for this proud organ, on a tip-off from my mates in the LMA, I slipped off one lunchtime to see a new model they were all raving about. This turned out to be Brazilian Carlos Guerra's stunning WWI Ansaldo SVA 5. Trust me, it made quite a stir. The model's sheer presence, at one-third scale, initially drew the crowds. However, on closer inspection, it was Carlos's truly exquisite craftsmanship, especially in wood, that most impressed.

This *Dawn Patrol* Ansaldo is beautifully put together, with truly superb finishing throughout. She really is that good. Even the handcrafted prop was carved by Carlos himself. On the day, I took the enclosed photos and made a few hurried notes, but had to rush back to the Scale line. Later, Carlos very kindly emailed me some notes on his building, which I have used below. Incidentally, gifted Carlos is the only Brazilian member of the LMA and UK Dawn Patrol.

'Dawn Patrol' size

Carlos made the bold decision to construct his SVA 5 to one-third scale, as favoured by the *Dawn Patrol Group*, which meant a wingspan of over three metres, and a fuselage length of a magisterial 2.7 metres. This delivered a flying scale model that weighs in at 37 kilos.

The plan

Carlos did not have access to an existing plan. So he assembled a full range of pictures of the full size aircraft, then he drew up his own plan, based on the full-size measurements.

Fuselage
The fuselage was jig-built for accuracy on a SLEC jig. This structure is built over plywood formers, with cyparis longerons, to give the distinctive contoured topsides and triangular rear section. The ply formers are fretted out for lightness, with balsa planking added to the fuselage top. The forward lower fuselage has additional plywood doublers, again fretted out for lightness. Plywood fuselage side-panels are also used. These provide the necessary fuselage hard points, to which the wings spars and undercarriage attach. Over this tough substructure, Carlos has added the distinctive decorative hardwood panels and the dummy radiator.

Wings
The wing panels are of traditional construction using balsa and plywood, with cyparis main spars. The tough but slender ribs have true scale sections and spacing, and are cut from light plywood. The distinctive SVA struts are made from cyparis. The full-size SVA 5 did not require bracing wires, which were a common feature of the majority of WW1 era aircraft.

Tailcone
The rudder, fin, tailplane, and elevator are all of built-up construction for lightness.

Engine paneling
The metal engine panelling is made from polished litho sheet.

Engine
Carlos fitted a DLE 170cc twin petrol engine, driving a 32"x10" wood propeller. Being a skilled wood worker, Carlos carved this by hand.

Exhaust
Again, this was fabricated by Carlos, copying the full size item. The working scale exhaust stacks are made from flattened brass tube silver soldered to the hand-made aluminium manifold.

Undercarriage
Once more, this is all of hand made construction.

Fittings
All of the wing, spar, and undercarriage terminations and fittings are hand made from aluminium sheet.

Handsome Italian scale subjects make a welcome change from the normal run of Sopwiths and Fokkers!

1: The Ansaldo is a feast of scale pulchritude. **2:** The famous 'Lion of St Mark' heraldic device of the 87ma Squadriglia. **3:** Although not a sesquiplane, the Ansaldo has unequal top and bottom wings. **4:** Huge ailerons assist the handling, but coordinated rudder and aileron turns remain the order of the day. **5:** Twin fuel tanks on the top wing. **6:** The subtle grain in the panels, and the restrained scale fastenings assist the illusion.

1

2

3

4

5

6

ABOVE: **Carlos Guerra with his one third scale Ansaldo SVA 5.**

LEFT: **The DLE twin petrol engine lurks behind the radiator. Note hand-carved wooden prop.**

Covering

Carlos used white Solartex to cover the model throughout.

Surface finishing

Carlos says he used 'normal paints' allowing 24 hours to dry for a nice finish. So now you know. Legending and decals were all hand made. Carlos chose this specific registration number 11721 in honour of its participation of the Vienna Raid.

Flying notes

When it came to the full-size aircraft, even experienced pilots found the fast-flying aircraft quite a handful, especially when coming in to land. Carlos reports that:

"The model has the same characteristics - fast flying, with fast landing, as the full size".

This is undoubtedly true, but she looked utterly superb in the air, and on low passes this is a truly magnificent flying scale model to behold.

Green roundels confirm the Italian parentage. All the woodwork is superbly finished.

MODEL SPECIFICATION

Scale:	1/3rd
Wingspan:	3.03 metres
Fuselage length:	2.7 metres
Weight:	37Kg
Engine:	DLE 170cc twin
Prop:	32"x10" wood

KING CUB

Measuring 106 inches, wingtip to wingtip, this magnificent Hangar 9® recreation of the venerable Piper Super Cub commands attention wherever it flies. Almost every line and curve faithfully mirrors the real thing, right down to the shape of the fillet on the vertical stab. Its impressive list of scale details includes things like functional bungee-type landing gear, a realistic instrument panel and even a full-body pilot figure.

The same attention to detail is evident in the flight performance. Like the full-scale version, this model has working flaps that give it amasing short-field takeoff and landing abilities. You'll enjoy the forgiving, slow speed characteristics Cubs are famous for too. But don't let its mild side fool you. It will eagerly perform sport aerobatics using any of the recommended power choices.

NEW ¼-Scale PA-18-150 Super Cub ARF

SPECIFICATIONS | HAN4540

Wingspan	269 cm (106 in)
Length	173 cm (68.0 in)
Wing Area	150 sq dm (1630 sq in)
Weight	7.50–8.40 kg (16.5–18.5 lb)
Engine	20–26cc 2-stroke gas
	1.20–1.60 2-stroke glow
	1.20–1.80 4-stroke glow
Electric Motor	Power 110
Transmitter	5+ channel
Servos	8 servos (7 if electric power)

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PLANS and PARTS

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ELECTRIC CANBERRA B(I)8
Plan price £29.50 Plan No.262
Component Pack £175.00
From the building board of electric ducted fan scale expert Chris Golds, this 84" (2,134mm) span model is the 'Interdictor' version of the famous jet bomber. Prototype used two Hacker B50-16L motors and two ten-cell 3300 NiMH power packs. Four sheet plan shows retracts and flaps. Plans are supplied complete with step-by-step written construction sequence.

PIPER SUPER CUB
Plan price £16.50 Plan No.146
Component Pack £95.00
G/F Cowl price £17.50
A great first-time scale model for novices and sport fliers who want real scale accuracy. 79 ins span 1:5.33 scale model suits a range of engines .40-.60. Two sheet plan. Glass fibre cowl available.

CORBEN SUPER ACE
PLAN PRICE £19.50 PLAN NO.275
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A 50" (1270mm) wing span sport-scale model of the delightful American homebuilt aircraft, this design is an excellent introduction to the world of radio control scale modelling, featuring simple airframe structure that will result in a scale replica ideally suited to regular club-field flying on a regular week-upon-week basis. 1/6th scale replica suits .26-.30 four stroke engines, or .20-.25 cu.in. two strokes. Four function radio systems required.

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RUMPLER C.IV TAUBE
PLAN PRICE: £19.50
PLAN NO. 269
COMPONENT PACK: £110.00
A 1/7th scale 80" (2032mm) wing span sport-scale model of the early German WW1 aircraft designed for .60 cu.in. size four stroke engines and four function radio control operating rudder, elevators, ailerons and throttle.

De HAVILLAND DH 82a TIGER MOTH
PLAN PRICE £26.50 PLAN NO.051.
COMPONENT PACK £115.00
An 80 inch (2032mm.) wingspan, 1:4.33 scale model for 1.20 cu.in. motors and four function radio control systems. No moulded cowl required - all wood construction. Three sheet plan.

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PLAN NO.267
COMPONENT PACK £88.00
Accurate 1/5th scale 75.6" (1920mm) wing span replica of the British early WW1 pusher fighter. Requires .78-.91 four stroke engines and four function radio control system. Excellent for electric conversion.

FELIXSTOWE F2A
PLAN PRICE £19.50 PLAN NO.276
COMPONENT PACK £110.00
An amazing 1/6th scale fully flyable replica of the British WW1 maritime patrol flying boat. Model spans 100.5" (2553mm) and suits two .25-.30 cu.in. two stroke engines. Can be flown from water or from land using a take-off dolly to safely landing on its hull. Prototype model won "Best of Show" at the prestigious Toledo R/C Expo in USA. All the detail is there on the plans for an impressive model.

FOKKER D.VII

1/4 PLAN NO.241, 1/5 PLAN NO.242
PLAN PRICE (EITHER SCALE) £26.50
COMPONENT PACK 1/4 £125.00
COMPONENT PACK 1/5 £120.00

1/4 scale spans 82.5" (2095mm) for 30cc (1.8 cu.in.) two stroke engines. 1/5th scale spans 65.7/8" (1673mm) and suits 15.cc (.90 cu.in.) four stroke engines. BE SURE TO QUOTE SCALE REQUIRED WHEN ORDERING!

HAWKER FURY

PLAN PRICE £17.50 PLAN NO.091
COMPONENT PACK £125.00

A 1/6th scale replica of the RAF's most elegant 1930's biplane fighter. 60" (1524mm) wing span model requires four function R/C gear and .60 cu.in. motor.

D.H. 103 HORNET

PLAN PRICE £22.50 PLAN NO.052
COMPONENT PACK £130.00

80" wingspan sport-scale replica of the hottest production piston engined fighter ever. Suits engines .40-.53. Original retracting undercarriage unit included with the plans.

BOEING PT-13 STEARMAN

PLAN PRICE £19.50 PLAN NO.243
COMPONENT PACK £99.50

A 58" (1473mm) wingspan replica of the famous bi-plane radical engined trainer aircraft of the WW2 era. Designed for 700 size electric motors, but with option of i.c.engine power using a .52-.60 four stroke engine, with modifications shown on a separate plan sheet. (Ready-cut wing ribs and fuselage formers available - see below) Three sheet plan.

TIPSY JUNIOR

PLAN PRICE £19.50 PLAN NO.286
COMPONENT PACK £95.00

A 1:3.44 scale, 79" (2006mm) wingspan replica of the late 1940s Belgian light aircraft, designed to suit .90-1.20 cu.in engines. Designed by Philip S.Kent, the model features all built-up balsa/ply construction throughout and makes an excellent entry into R/C scale modelling. Rudder, elevator, aileron and throttle controls.

AVRO AVIAN MONOPLANE

PLAN PRICE £19.50 PLAN NO.278
COMPONENT PACK £110.00

Designed by respected R/C scale expert Philip S.Kent, this quarter scale replica of the radial engined version of the 1930s air racer spans 96" (2438mm) is an ideal/introduction to the world of large scale. The model suits 1.50 cu. in. size four stroke engines and requires four function radio control operating the basic control functions of rudder, elevator, ailerons and throttle. Conventional wood airframe structure throughout.

SOPWITH CAMEL

PLAN PRICE £14.50 PLAN NO.188
COMPONENT PACK £79.50

1/6th scale replica of the famous RFC WW1 fighter biplane, for .24-40 size motors and four function R/C. 56"(1422mm) wing span.

SOPWITH PUP

PLAN PRICE £16.50 G/F COWL PRICE £17.50
PLAN NO.177 COMPONENT PACK £135.00

Superb, true-to-scale 1/5th scale replica, features accurate outlines and rib-for-rib reproduction of the full size wing structure.63 ins. (1600mm) span model is of manageable size for transport and offers realistic flight performance.For.60size motors and 4 function radio. Glass fibre engine cowl available.

BUCKER BU180 STUDENT

PLAN PRICE £26.50 PLAN NO.015
COMPONENT PACK £120.00

The R.A.F. maritime recce/ anti-submarine patrol aircraft, modelled by renowned electric scale expert Chris Golds. 86" (2185mm) span model flies on four Speed 400 electric motors, driving pusher props. Full step-by-step written building instructions.

050/12

WHAT DO THE CUT-PARTS SETS CONTAIN?

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

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VELODROME VIGNETTES

Alex Whittaker celebrates the start of the indoor scale season at the Manchester Velodrome

The nights draw in, and a scale man's fancies naturally turn to thoughts of indoor flying. Happily, the Manchester Velodrome indoor scale meeting has quickly been absorbed into the Free Flight Scale year. Just to refresh your memory, free flight modellers fly in the central area, their models protected from straying over the bicycle track by gentle and transparent floor-to-ceiling nets. This works well, but it is a strange experience when twenty-odd cyclists thunder past on the banked track as you are watching a silent free flight model ROG.

Models I saw

Some pilots had travelled a very long way for this one-day event. For example, my auld mucker Mike Hadland travelled all the way from Swindon to attend, complete with his trademark tea-pot and electric kettle. Overall, there were more than twenty pilots competing in the various classes, so I make my usual disclaimer at this point. With several co-extensive comps intertwining, I could not hope to get shots and details of every scale model at the event.

What follows centres on the scale subjects that presented themselves to the camera in flight, or those models that I could track down in the pits. As you can imagine, it is not convenient to a pilot during a fraught competition to be interrupted for a nice photo. (Though, if he is a mate I often do).

Brit-Scale Auster Agricola

Peter Fardell had a number of interesting scale models. The first that caught my eye was his lovely Auster Agricola. For my money, this is a criminally under-modelled British scale subject. It has its own quirky charm, and I can remember seeing one dusting crops many moons ago.

Now I also remember that agricola (`farmer') was one of the first words they taught us in Latin classes at school, so you can see the venerable Auster and I share a similar vintage. This scale model is Peter's own design, spans 24", and weighs 36 grams. She is powered by two strands of 1/8" rubber. A very fetching flying scale model.

Chazal-Gourgas Monoplane

Another own-design from prolific Fardell Jnr, the Chazal-Gourgas Monoplane was a real sweetie, combining gallic charm and Edwardian elegance. Peter built her entirely from a few photos from the

Pilots fly inside the banked wooden track, with models protected by the netting.

ABOVE & RIGHT: Tim Milner's exquisite Junkers Ju87 Stuka from the famous Keil Kraft kit. Mine Tim Milner made a superb job of his.

ABOVE& LEFT: Kevin Wallace's scale model of the FacetMobile. Rubber motor goes right through the pilot's midriff - a truly 'diferent' choice of scale subject, eh!

RIGHT & BELOW: Andy Sephton's own-design Whitman Bonzo to the No-Cal profile-scale scale rules.

LEFT & BELOW: Great to see Team Boor with their Bernard GR 121: Joan and Reg. The Canary yellow Bernard flew very well.

internet, producing his own three-view on the way. It is powered by a Co2 motor.

Fokker E.V

Peter Fardell also flew a lovely Fokker E.V (later after disterous initial service introduction, the designation changed to D.VIII) from the *Aerowerks* kit. The Fokker is 20.5 inches in span, weighs 40 grams, and is powered by Peter's favourite two loops of 1/8" rubber. Peter has achieved a superb finish on this model.

Farman Moustique

Another gallic aeroplane, and one of my own favourites, was Dave Crompton's blood red Farman Moustique. When you look at the Moustique's layout, you realise how advanced Henri Farman was in his aeronautical design concepts. Dave built the Farman from an 'enhanced' Lubomir Koutny kit. She spans 16 1/2" and weighs 25 grams. The model is powered by a single loop of 3/16" rubber. She is superbly finished in *Esaki* tissue and airbrushed red satin enamel. Utterly delightful.

Whitman Bonzo

No-Cal profile scale models provide an interesting and highly practical indoor flying niche. Andy Sephton was flying his nifty own-design Whitman Bonzo, which weighs 10 grams. This appliance was happily knocking out 2.1/2 minute flights. Power was supplied by "four strands of 63 thou (January 09) Tan Supersport", quoth Andy.

Stuka

Tim Milner had just finished a very impressive 'kit scale' Junkers Ju87B Stuka. Yes! It is based on that very same and very famous Keil Kraft scale kit that you and I both attempted in our youth, but could never get to fly. Even The mighty Tim was having a few teething problems trimming her, but fret not - in Tim's reliable hands this will be a spectacular flying scale model. More details on this model soon. In the meantime, there are a couple of photos to whet your appetite.

ABOVE & RIGHT: **You might think this is a clipped wing Fokker Eindekker, but it's Tim Horne's delightful Hergt Monoplane Peanut.**

ABOVE: **Laurence Marks' Piper Vagabond banking nicely as she comes in to land.**
LEFT: **Laurence concentrates on the all-important ROG.**

Hergt Monoplane

I always see Peanuts as valuable sources of scale inspiration, even for those of us who normally fly overweight, tubby, outdoor radio models. In fact, a couple of years ago, I was so impressed when I first saw Tim Milner's Peanut Hergt Monoplane, that I instantly drew up my own quarter-scale version for R/C. Mine should be ready to fly by the spring.

Tim's Hergt 15 gram is based on the Walt Moucha plan, downloaded free from t'internet. (Google it). It flew very well in Open Rubber at the Velo, as did his well-known and suitably flashy Kenn Haas Racer.

Stealth Peanut

Kevin Wallace always has an interesting take on scale modelling. His new Facetmobile FMX-4 research aeroplane was a very good example of his out-of-the-rut approach. It looks like a free-lance sports model, but is actually a scale model of a real full-size design. Kevin's canny model is a Peanut, so she certainly uses most of the permitted area.

It weighs in at 25 grams and flew very well too, stable and nippy with it. Call me odd, but I loved the way the rubber motor went right through the scale pilot's midriff. Incidentally, to bone up on the full-size Facetmobile, try this website: *http://www.facetmobile.com*

Fly Baby Bipe

Kevin was also flying an old favourite of many a scale modeller, the celebrated Pete Bowers Fly Baby Bipe. His Peanut version of approximately 1/20th scale, was finished in blue and white, based on a British registered example. This model is tissue covered, and then spray painted. Kevin quotes the wing loading as 5 grams/dm2.

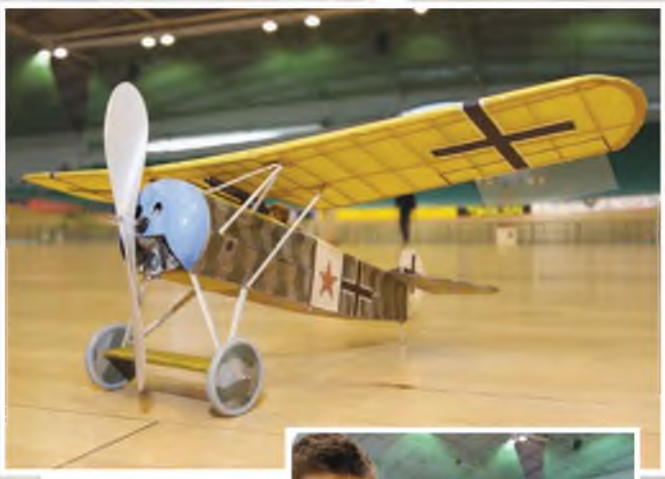
The model is entirely his own work, employing no commercial items. I loved its chunky good looks and Kevin had gone to the trouble of making a second static prop too.

Piper Vagabond

Laurence Marks brought his beautifully finished 32" span Thomas Designs Piper Vagabond, which weighs 30 grams. The handy proportions of the Vagabond have

RIGHT: **Dave Crompton's Farman Moustique is a little smasher.**
BELOW: **Dave immaculate model was built from the Lubomire Koutny kit.**

LEFT: **Colin Taylor's very attractive tissue-covered Albatros D.II.**
BELOW: **The Albatros looks good from any angle.**



ABOVE: Peter Fardell's new Fokker E.V 20.5" span, weighs 40 grams. **RIGHT:** Peter's Fokker E.V was madefrom the Aerowekes kit. 2 loops of 1/8" rubber for power.

ABOVE: Meccano-based rubber winder. Love it. **LEFT:** Ski Hi Products Rubber Torque Meter http://www.skyhi.org.uk

rightly made it a hardy perennial of the scale movement. I was lucky enough to be out in the centre of the Velodrome when she circled me, allowing me to get a nice shot of her descending to a perfect touch down. Jammy, or what! Incidentally, you can view this self-same Thomas plan on the internet at: *www.thomasdesigns.net*

Miles Magister

Team Boor (Reg and June Boor) flew Reg's very nicely finished 13" span Miles Magister 2 (M-18) Peanut scale model. This is based on the Peck Polymer kit, but extensively modified for scale fidelity.

Bernard SAB 121

The Boors also flew Reg's much larger, bright yellow 'Oiseau Canari' Bernard SAB 121. The Bernard flew just as well indoors as she did outdoors at The Eddie Riding Scale Event.

Albatros Kit

Colin Taylor had a very nicely finished kit-built Albatros D.II, in silver and yellow, of which I managed to get a few static shots. As you can see, this is a really pretty little model. In the hurly burly of the interlocking comps, I didn't manage to see her flying, but I hope to remedy that omission next time.

Gypsy Moth

Colin Taylor also brought along a very smart tissue covered D.H.60 Gypsy Moth, based on the well-known *Peck Polymer* kit. Being a Peanut, she is 13" span.

Indoor Turbulence

Now here's an odd thing. A number of modellers made remarks concerning the negative effects of indoor turbulence. Since we were standing inside a huge centrally-heated space, you could forgive me for being skeptical. However, close inspection of the lighter models taking off, and in flight, showed that indeed, there were some deleterious effects on the flying.

Now, even though the whirling cyclists were garbed from head to toe in 'low cd' lycra, complete with super-streamlined head gear, they were definitely stirring the air. However, after a few more minutes careful observation, I

ABOVE: We've seen her before, but what a consistent flyer! Mike "Tea Party" Hadland's Bucker Jungmann. **RIGHT:** Tim Horne's nippy Kenn Haas Racer bowling along.

ABOVE& LEFT: Peter Fardell's Chazal-Gourgas Monoplane is Co2 powered.

concluded the constant opening and closing of doors below the track was the most likely culprit.

There was a definite draught of cold air as the doors banged open. It seemed to me as a punter (and I am certainly no F/F indoor expert) that if the models could just get out 'ground effect' then they were OK, but some clearly could not get 'on the plane', and faded too quickly. One scale man told me that his model was flying well the day before, but on that occasion had trouble just getting off.

Mind you, indoor trimming is not an exact science. There are probably a million-and-one reasons for this, some related to temperature, and some related to rubber, but I came away convinced that the performance of some of the 'old faithfuls' was affected by the disturbed air. Answers on a post card, please.

Use it or lose it

Although this event is now well established, new scale pilots are very welcome. To remain viable, we need to give the brave organisers of NW BMFA every opportunity to recover their costs. There is certainly greater flying capacity at this venue, the air is always clear, and no-one is standing around waiting to fly. So my bold suggestion to you is this: Why not attend the next Velo Event with your own scale indoor model?

Ackowledgements

Grateful thanks to NW BMFA for doing all the donkey work on our behalf. It is appreciated. Also, deep gratitude once more to ubiquitous Gordon Warburton FSMAE, for his good offices all day, followed by the prompt emailing of the results the next morning.

Official BMFA Results
Scale Indoor Free Flight - Manchester Velodrome 24th November 2012

Open Rubber/Electric/CO2

Name	Model	Flt 1	Flt 2	Flt 3	Flt 4	Best Flight
Tim Horne	Hergt Monoplane	1500	1762	1593	1464	1762.0
Tim Horne	Misty	1495	1665.5	1748	1684	1748.0
Laurence Marks	Vagabond	0	1619	0	1740.5	1740.5
Reg Boor	Bernard GR121	1515.5	1716.5	1392.5	1663.5	1716.5
Mike Hadland	Bucker Jungman	1600	1599.5	1642	1566	1600.0
Derek Knight	Fairchild Argus	0	1403	0	1547	1547.0
Kevin Wallace	Piper Family Cruiser	1369	1352	0	1525.5	1525.5
Peter Fardell	Johnson Betty Jo	1310	1466	1313	1296	1466.0
Ken Bates	Comper Swift	1219	1170.5	1457	1305	1457.0
Peter Fardell	Auster Agricola	1017	970	1102	1306	1306.0
Laurence Marks	ABC Robin	0	0	0	0	0
Dave Crompton	Farman F450	0	0	0	0	0

Peanut Scale

Name	Model	Flt 1	Flt 2	Flt 3	Flt 4	Flt 5	Flt 6	Best 2	Flt Pos	Static	Stat Pos	Flt + Stat	Place
Mike Hadland	Bucker Jungman	60	65	0	0	0	0	125	1	112	1	2	1
Nick Peppiatt	Blackburn Bluebird	32	41	45	0	0	0	86	3	107	3	6	2
Kevin Wallace	Bowers Flybaby	38	39	35	27	0	0	77	5	108	2	7	3
Chris Chapman	Hawker Fury	38	6	45	40	0	0	85	4	86	6	10	4
Colin Taylor	Gipsy Moth	26	29	0	0	0	0	55	7	88	4	11	5
Dave Crompton	H P Sayers	38	46	48	45	49	52	101	2	49	9	11	6
Bryan Stichbury	Piper Cub	29	38	0	0	0	0	67	6	70	7	13	7
Reg Boor	Miles M18	13	14	0	0	0	0	27	9	87	5	14	8
James Day	Lacey M10	18	13	0	0	0	0	31	8	66	8	16	9

Pistachio Scale

Name	Model	Flt 1	Flt 2	Flt 3	Flt 4	Flt 5	Flt 6	Best 2	Flt Pos	Static	Stat Pos	Flt + Stat	Place
Chris Chapman	ME109	16	27	30	0	0	0	57	3	55	1	4	1
Nick Peppiatt	Lippisen Storch	50	65	0	0	0	0	115	1	43	5	6	2
Reg Boor	Bristol Brownie	26	27	24	0	0	0	53	5	53	2	7	3
Tim Horne	Screamin Meany	24	31	0	0	0	0	55	4	44	4	8	4
Dave Whitehouse	DH37	18	26	21	53	33	32	86	2	34	6	8	5
Bryan Stichbury	Andreason BA4 B	15	23	29	0	0	0	52	6	47	3	9	6

Venue Details

Tip: Punch the post code into your Sat-Nav or tellingbone before setting out. Central Manchester can be very confusing to an Englishman.

Manchester Velodrome: Stuart Street, Manchester. M11 4DQ. 0161 223 2244. nationalcyclingcentre.com

Kevin Wallace's scratch-built Fly Baby bipe employs no commercial parts whatsoever.

Great to see Peter Fardell's Auster Agricola. Scandalously under-modelled Brit. scale subject!

Smart Gypsy Moth from the Peck Polymer kit, by Colin Taylor.

Great lads! George (left) and James Day - eleven years apiece - flew both Peanut and Penny Plane. Ken Bates is their proud granddad.

FULL SIZE FREE PLAN

PART 2

Pietenpol AIR CAMPER

Tim New completes the building process of Peter Rake's 58" span, simple-to-build, electric powered, model of a home-builder aircraft with a long history, and then test flies the prototype

Throttled back the model sinks in for another perfect landing. At least, they're perfect since Tim replaced the wheels (see text).

The model 'A' & radiator

I needed the engine and radiator before proceding any further. Working from the dimensions on the plan, I fashioned my Model A out of balsa and styrene plastic. The main engine body is a shaped balsa block, hollowed and sealed. The exhaust pipes are cut styrene tube and the curved intake pipe is from the same material. I filled the tube with salt before heating and bending it so it would maintain its tubular shape. The intake bowl is scrap balsa turned on a Dremel and sanded to shape. The radiator port is made of smaller diameter styrene tubing and I added various flat styrene pieces to the engine block to give it some depth. For the bolt heads on the engine block I used drops of plastic putty. The engine was then sanded, primed, painted and sealed. I made the spark plugs out of (4) #2 nuts and bolts and 22 gauge wire. Before imbedding the spark plugs into the top of the engine block I soldered the wire to them and sheathed the threaded ends with heat shrink. The wires run into the cowl and are connected to an imaginary Alternator. *(Shouldn't that be a Distributor Tim? PR)*

Initially I was going to use brass for the radiator, but even the thinnest brass stock would have resulted in a heavy radiator. Instead I used styrene channel (used for

model railroads) painted with brass paint for the frame. The radiator core is made of eight elongated balsa ovals with rounded edges and smaller balsa spacers between them and I painted the core gloss black. The radiator cap is a small piece of tube and a bobbin off a broken antenna. The radiator hose is a bent piece of solid wire encased in heat shrink.

Back to the fuselage

Now that I had a 1/6th scale Model A engine, I could finish the fuselage. Using the engine as a guide, I made the engine cut-out on the cowl block. The turtle deck was marked and cut for the radiator and the centre section struts. The motor, engine/cowl and radiator were installed and checked for fit. When I was happy with how it all went together I glued the engine cowl to 'C'. I filled in the dings, dents and mistakes with wood putty and sanded. More wood putty was added and then more sanding performed. Finally I cut the engine cowl/'C'/battery hatch free.

I thought about trying to cover the front in aluminium *Monokote* but decided my meagre covering skills weren't up to the task, so I painted it. I taped off the front and top areas and painted with aluminium spray paint. I ended up spraying four light coats sanding down with very fine grit between the coats to get a smooth finish.

Some details

The roomy fuselage allows plenty of room for the rudder and elevator servos. I mounted them as far forward as possible, laid out the pull-pull pathways and glued in plastic tubing where the pull-pull wires exit the fuselage.

There is more than enough room for the electronics. After verifying that I would be able to easily slide in and remove my battery, I glued a strip of Velcro and the 3/8" battery stop to the ply battery tray which was installed as on the plan. The ESC fits nicely to the back side of the battery tray.

I fabricated a bottom hatch that allows easy access to the rudder and elevator servos and makes pull-pull adjustments quite painless. The receiver is mounted on the inside of this hatch and I temporarily connected the electronics to ensure that the servos were centred and everything operated normally.

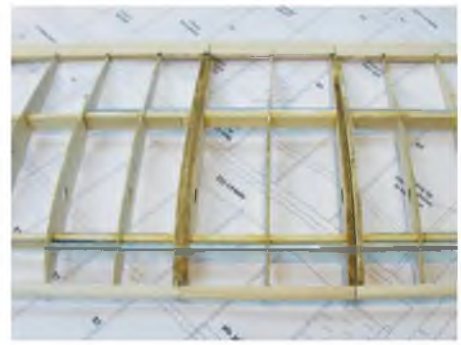
Covering

It was now time to cover the tail feathers and wing. But first I installed the wing servos and the 12" extension leads, taping the connections together to avoid having them separate at an inconvenient moment. Then I started covering the wing bottom. Covering the under-camber wing was a total non-issue. I laid the covering over the wing, tacked the corners and then worked the covering from the centre outward. When I shrank the aluminium *Monokote*, it stayed firmly attached to the bottom of the wing ribs and I then covered the top as usual.

After covering the wing sections and ailerons, these control surfaces were attached. As part of his 'cheaply-built' philosophy, Bernard Pietenpol used everyday items whenever possible. For example he used piano hinges attached to the wing top to hinge his ailerons. I couldn't find piano hinges small enough, so I used pinned hinges instead. I sanded the wing tailing edges at the hinge locations so the hinge would be flush with the top of the wing and epoxied these in. I achieved the look I wanted, but afterwards it was rightly pointed out that this wasn't the best solution. Hinging with film and drawing on

The hardest part about building these under camber wings is probably sliding the ribs onto the spars before pinning it all down to the board.

The servo plate fits into the rib slots and strut mounts glue to both rib and spar.



Aluminium tubes in all three wing sections and carbon tube joiners ease transport for those who need to dismantle the model.

Saddle clamps are a good u/c mounting alternative, as it Tim's radio access hatch. There's no shortage of space for the gear.

Simple printed instrument panels add interest to the cockpit interior. I've still no idea how the pilot sees anything around that radiator.

Rigging cables aren't essential, but do add to the realism. Also note the control horns and closed loop cables.

the detail or installing the pinned hinge at 45 degree angles (which would mean the pinned hinge is actually in wood) would be better ways to get the same look. Later I drilled holes through the hinges and trailing edge and glued toothpicks in the drilled holes - just in case!

Covering the fuselage is fairly simple. The only hitch I had was when I nearly forgot to attach the 1/8" x 3/16" side stringers to the fuselage before covering. These fairings run the length of the fuselage and are an important part of that 'Old Time Air Camper' look.

Some more details

With everything covered, it was time to work on those tasks that, although a small portion of the build, take an inordinate amount of time. For the leather cockpit edge I split the appropriate size rubber hose, glued it around the cockpit openings and then painted it brown. The windscreens were cut from a clear plastic two-litre soda bottle and glued these on with canopy glue. I used painted styrene strips to hide the edge between the paint and covering.

I found a photo of the instrument panel online. Before gluing them to the dashes, I resized, printed and spray sealed them. I cut the wing and rudder lettering out of black covering, then created the fuselage lettering in a graphics program and printed it on white decal paper. To avoid cutting tha out too precisely, I outlined the lettering in a red that closely matched my red covering.

Here's where I deviated most from the plans (I'm sure Peter cringes when he hears those words). I opted to install a tail wheel in place of the drawn skid. I have two reasons; the full-scale I'm modelling uses a tail wheel and I couldn't locate a suitable piece of spring steel to use as a tailskid.

Final assembly

Before attaching the tail feathers I ran the spider wire for the pull-pulls. I attached the wire to a sewing needle, threaded it through the plastic tubes and then let them drop down to the servos. With the horizontal stabilizer held in the correct location, I marked and then removed a strip of covering from the top and bottom. The tail feathers are glued in place, again verifying that it all lines up. The centre section struts are slid down into their slots and glued and the centre wing section is slid onto the struts and glued. I wrapped the aileron servo wires in heat shrink and ran it from the wing to the engine compartment. Hopefully it looks like the gas line from the wing tank.

After the wings were slid onto their rods the outer struts were attached using brass strut ends made from 1/32" brass strip. Pete had planned for the wings to be held in place by the outer wing struts but something didn't quite work out and my wings sagged a bit. I ended up using two strips of aluminium cut from a soda can to hold the wing assembly tight. The strips are run across the bottom of the centre section and are fairly well hidden. I added four balsa blocks with blind nuts to the outer wing sections. Screws hold the strips tight and ensure the wings aren't going to separate. *(In order to prevent this happening to you, it may be worth adding 1/8" ply plates to the lower, central root bay and use a single brass strap screwed across these plates. If you don't need the strap, all well and good, but it does no harm to have the ply plates there just in case. PR).*

The Pietenpol Air Camper wasnow ready to fly.

Flying

After many false starts the weather finally cooperated and I took the Air Camper to the club field. The field was almost dry, the batteries were charged and so there was no reason to not put the Pietenpol in the air. I double checked the balance and pull-pulls (these were still tight!) then set it down on the runway. After the range check and a final control surfaces check, I throttled up and 25 ft later the Air Camper was in the air. Even though it is not a small plane, it soon became evident that the Pietenpol is a light wind flyer. There was a bit of wind above the tree tops that buffeted it about but when below the tree line, the Pietenpol flew well. After a few minutes of lazy circles I lined the Air Camper up with the runway, lowered the throttle and landed. The modell rolled out, came to a stop and then tipped toward its side and one of the spoked wheels failed - a somewhat inglorious end to what was otherwise an enjoyable maiden flight. I subsequently made balsa/ply wheels to replace the spoked ones.

For the first few flights, the model had a strong tendency to climb nose-up under power. Going to a smaller prop (11x6) corrected that problem, but by the fifth flight I was flying hands off. Because of the radiator, struts and wires, the airframe is very draggy and the Pietenpol will drop a wing if the airspeed is too low.

Although very likely not scale flying, I have looped and rolled the Air Camper. Stall turns are especially fun, since the rudder is very effective. This makes ground handling a breeze too. Because of the bungee landing gear, a nice little bounce always precedes the roll out. A lovely reward for the extra work required on the landing gear.

The motto of full-size Air Camper flyers is *"Low and Slow Since 1929"* and that is what this model excels at. It has a classic presence while stooging down the runway. Even club members who usually

only pay attention to the latest ARFs noticed it and gave it a round of applause at the last club picnic.

I wish to thank Pete for another delightful design and Ken Stroud and Kevin Dahlhaus for taking the pictures. Take a bow gentlemen.

I've been flying the Air Camper for over three years now and she has held up well, although the wing could stand to be recovered and I've replaced the aluminium straps that hold the wings together with rubber bands. This gets me in the air much quicker. I found the slow flying speed makes her a perfect camera ship. I fashioned a bracket out of balsa and rubber bands and attached one of those cheapie video cameras to the struts for an unobstructed view.

While I don't take her to the field every time, when I do, the Pietenpol Air Camper is always the first one in the air. ■

Despite the slightly wrinkled wing covering (the model is over three years old now) this is still a striking shot of her swooping in for a low pass.

ROYAL AIRCRAFT FACTORY R.E.8

This one is for scale modellers who enjoy rigging wires, or who simply have spare bales of rigging wire to use up!

Glamour has much to do with pleasing aesthetic appearance, often coupled with notable achievement. In terms aesthetics, the Royal Aircraft Factory R.E.8, was an 'achiever' largely thanks to the bravery and determination of the crews who operated it on the 'boring' but vital missions they flew over the Western Front during WW1. But the aesthetics is another story!

More than four thousand R.E.8 artillery reconnaissance aircraft were built and the only conclusion one can draw from this figure is that this aeroplane was one of the most successful flops in the history of aviation. (R.E. stands for Reconnaissance Experimental).

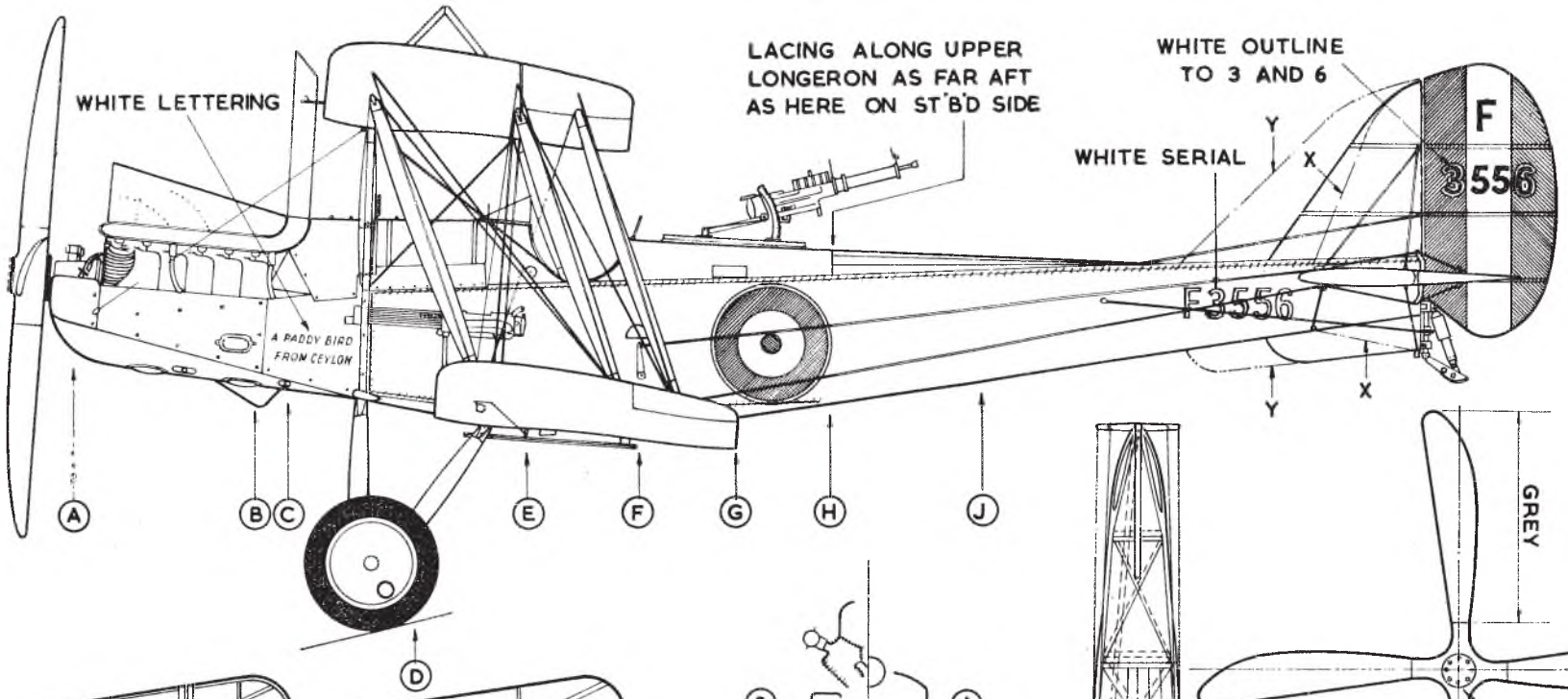
It was successful in the award of large contracts to several constructors and in the results of hazardous sorties by its courageous flying crews, but it was a flop in that it was designed to an ill-conceived specification and, from the outset, was inadequate for the duties it was intended to perform.

Without the guiding hand of precedent, the military strategists of 1914 envisaged' aerial warfare chiefly as a duel between artillery-observation and bombing aeroplanes in one corner and anti-aircraft batteries in the other, and this pattern of thought determined the layout of the B.E. series, of aircraft. The B.E.2c was a very stable observation post for an observer who sat in the front cockpit and who was given a variety of small arms with which to defend his machine. Increasing attacks from enemy scouts soon made obvious the need for a rear gunner, and a three-seat version was built; but by this time the B.E. aircraft was well and truly obsolete and the Royal Flying Corps requested a replacement.

It was insisted that the new machine should be able to defend itself but surprisingly, no mention was made of the handicap imposed by stability in such an aeroplane and that to stand a chance against attacking scouts, a reconnaissance machine must be manoeuvrable rather than inherently stable.

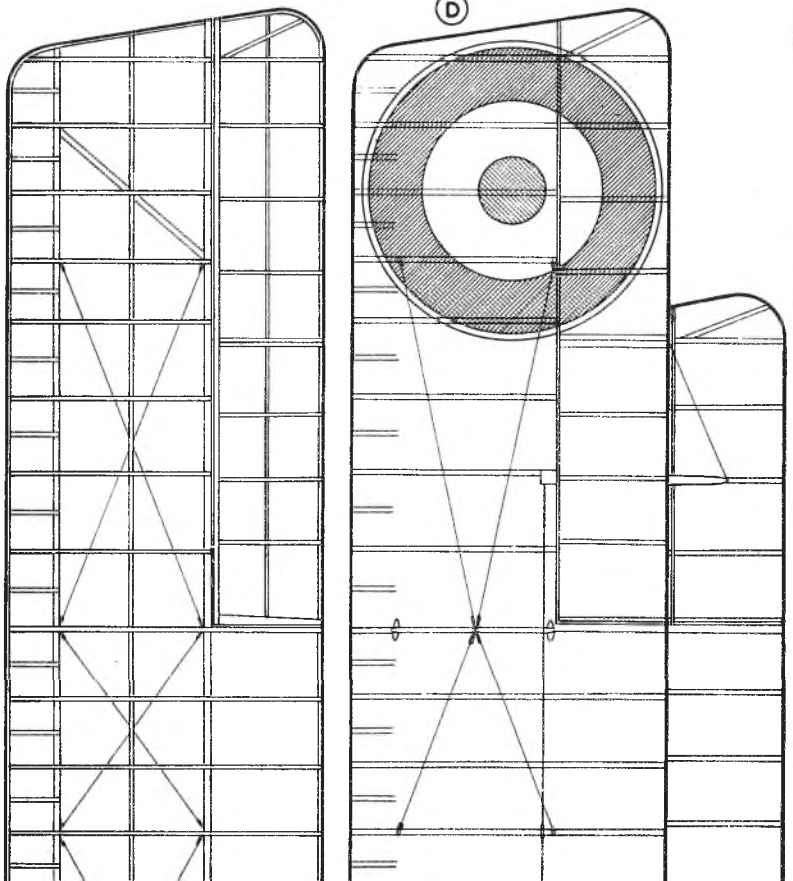
Work began on the R.E.8 early in 1916. The prototype first flew on June 17th and in July of the same year that same aircraft was sent to France for evaluation. This machine had a

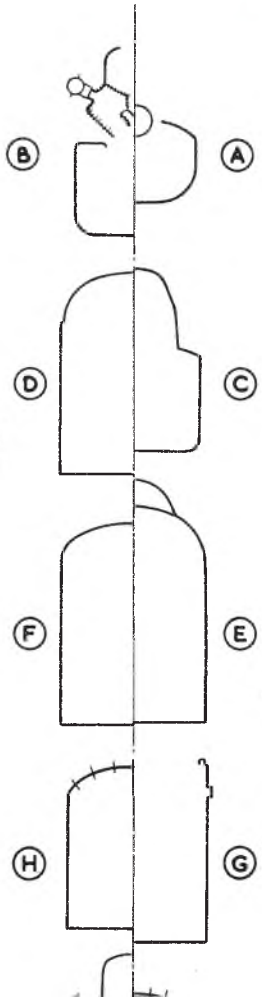
A quite early production example of the R.E.8 featuring the 'slimline' nose shape section and small size fin. There is no forward-firing machine gun on the fuselage side below the pilot's cockpit. Note also the external control wires to the elevator.

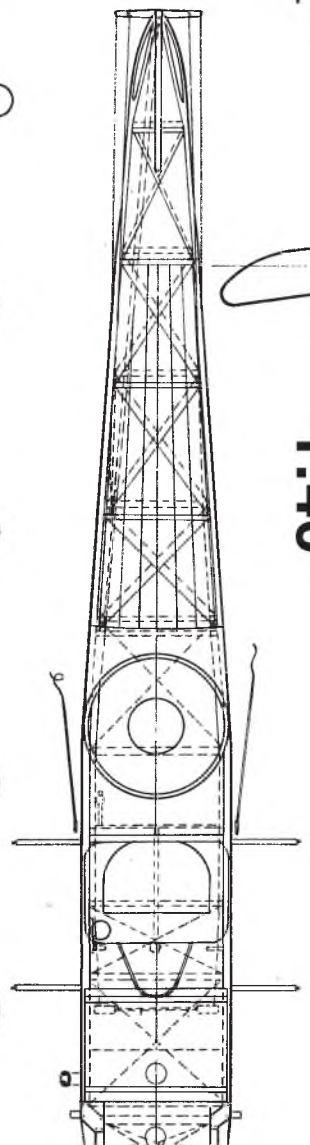


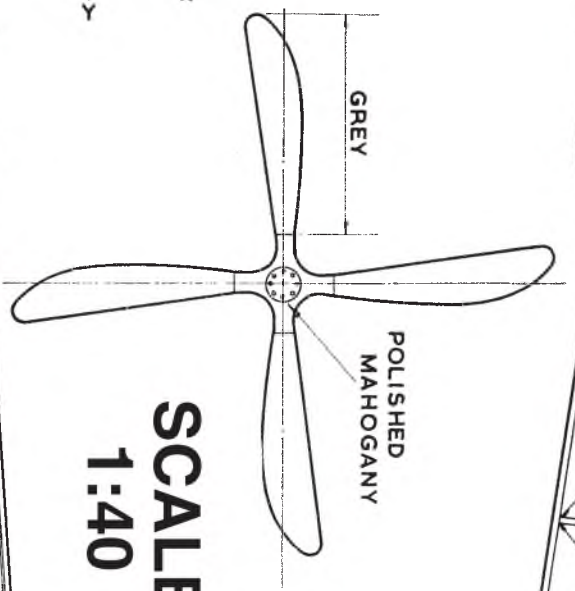
X - PROTOTYPE FIN SHAPES

Y - FINAL FIN SHAPES



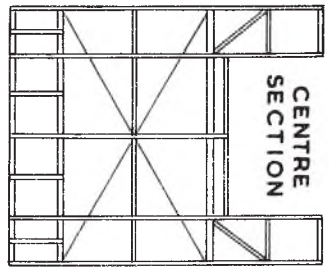


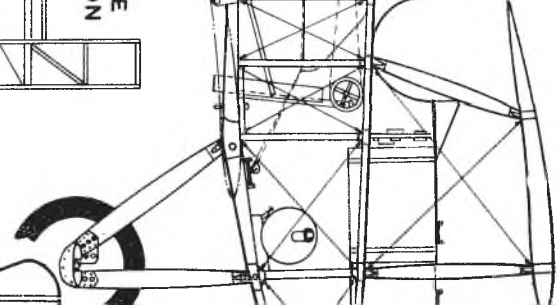




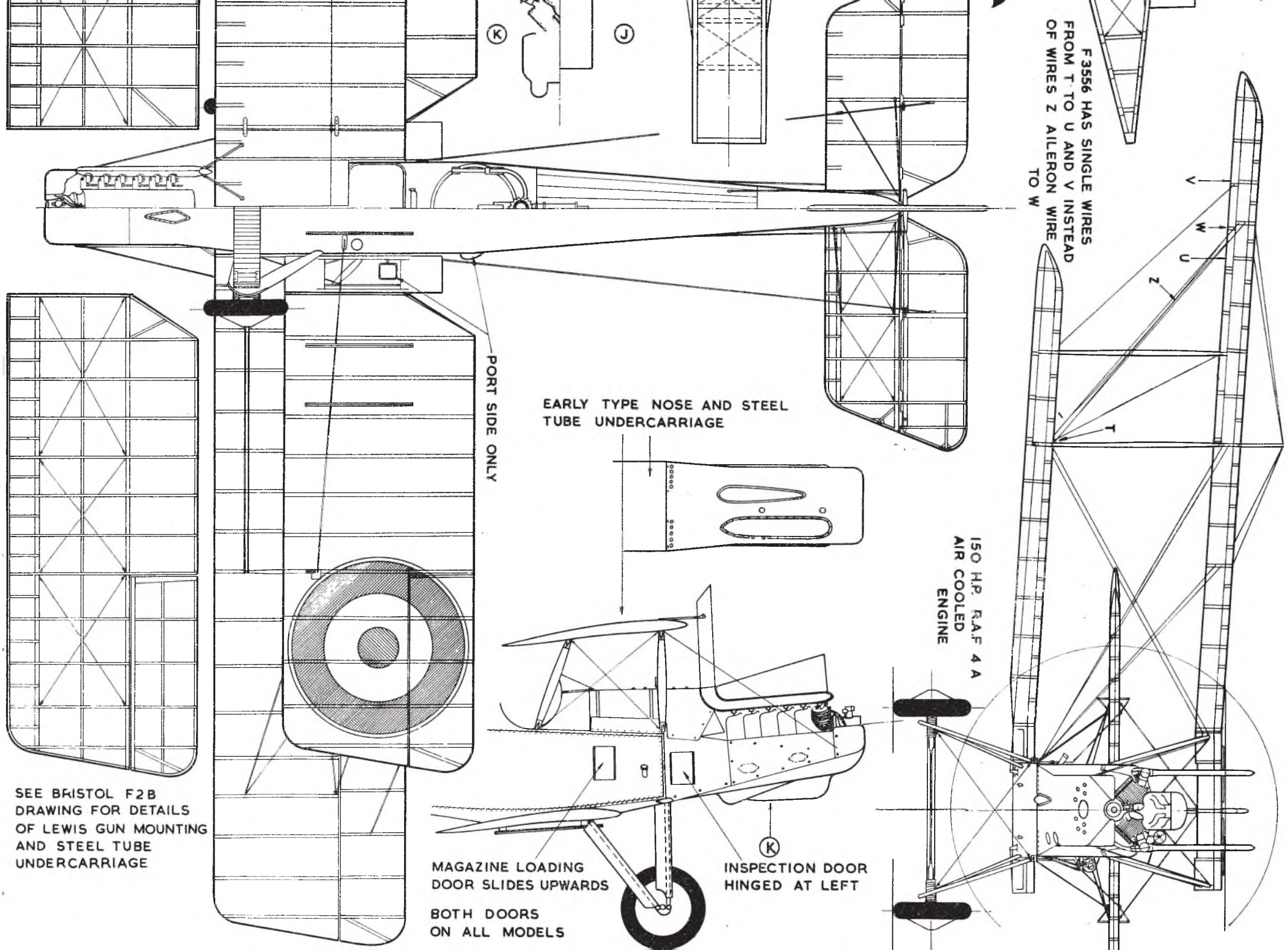
SCALE 1:40

CENTRE SECTION





F 3556 WAS BUILT BY DAIMLER, AND NOW RESTS IN THE IMPERIAL WAR MUSEUM, LONDON


F 3556 HAS SINGLE WIRES FROM T TO U AND V INSTEAD OF WIRES Z AILERON WIRE TO W
PORT SIDE ONLY
EARLY TYPE NOSE AND STEEL TUBE UNDERCARRIAGE
150 H.P. R.A.F 4 A AIR COOLED ENGINE
SEE BRISTOL F2B DRAWING FOR DETAILS OF LEWIS GUN MOUNTING AND STEEL TUBE UNDERCARRIAGE
MAGAZINE LOADING DOOR SLIDES UPWARDS
BOTH DOORS ON ALL MODELS
INSPECTION DOOR HINGED AT LEFT
K
J
V
W
U
Z
T

The nose section profile of this R.E.8 differs from the one on the previous page due to the deep sump installation on its engine, which required the revision of the shape to fully cowl the installation. Inscription under cockpit reads: PUNJAB 25, KANOPA CURDSASPUR

pillar type Lewis gun mounting and no forward-firing Vickers. The tailskid was attached directly to the rudder and the vertical fins were very small. First reports on the R.E.8 were so enthusiastic that the War Office immediately placed large orders with seven contractors and the die was cast.

Misfortune accompanied the R.E.8 from the start. A shortage of raw materials caused a serious delay and then the unreliability of the R.A.F. 4A engine, coupled with a tendency to spin, began to take toll of aircraft and crews. Rumours had circulated for some time that the long upper wing of the B.E. biplane was structurally unsound and likely to fracture under stress; when, therefore the R.E.8 was found to have a similar wing arrangement, it was regarded with suspicion from the beginning.

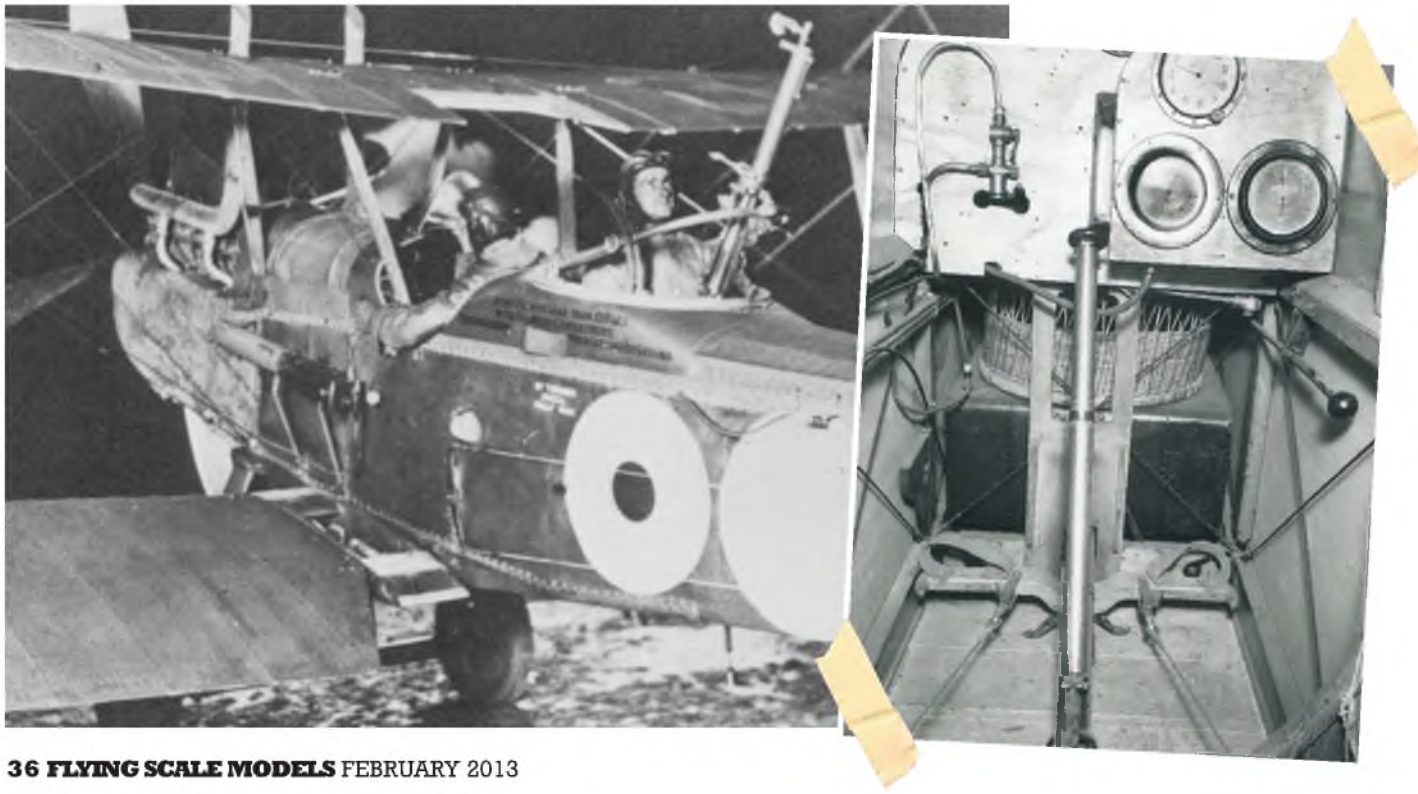
To enable the machine to take off from small fields and improvised landing grounds, the designers gave the R.E.8 a very high ground angle of attack. This produced a 'bent-in-the-middle' appearance (a wit is quoted as saying that the R.E.8 was the only aeroplane with both lateral and longitudinal dihedral). It imparted an attitude during landing to which pilots were unaccustomed, and which led to a succession of accidents.

The first unit to be equipped with the R.E.8 was No. 52 Squadron, which arrived in France in November 1916, and it was not long before the combination of prejudice and inexperience caused so many mishaps that morale was seriously endangered and the R.E.8 was replaced temporarily by the aircraft it was designed to replace - B.E.2c.

'Harry Tate'

It is a national characteristic of ours to regard the trusty steed and the lame duck with equal affection, and it was this feeling that prompted the army to nickname their new acquisition 'Harry Tate'. Because of early manufacturing delays, the R.E.8 was obsolescent by the time it reached France in any number and yet once production was under way, the type arrived in France in a steady stream, to be flown on all sectors of the battlefront and, all too often, to fall prey to German fighters. The Harry Tate was a sight familiar to all troops as it chugged across the lines to drop bombs, take photographs or report to artillery batteries on

BELOW LEFT: Preparing either for the dawn patrol, or a night action, the crew of the is R.E.8 check their guns prior to take-off. BELOW RIGHT: Sparse cockpit and instrument panel of the R.E.8, viewed from the pilot's seat position.



the results of their bombardment.

Several minor modifications were made to the original Farnborough design in the light of service experience. The fin area was almost doubled in two separate stages and the tailskid assembly was attached to an extension of the front tube of the rudder. The nose of later models was deepened allowing the removal of the two lower fairings under the engine. One machine, A4683 (one of a batch of 99 built by Coventry Ordnance Works) had an extra deep cowling beneath the nose - deeper than either of those shown in the scale drawing that accompanies this feature.

A Scarff ring mounting for either one or two Lewis guns was fitted to the rear cockpit and the steel tube undercarriage of early models, which was very like that of the Bristol F2B Fighter, was replaced by a stronger one of solid ash. The wire bracing to the upper wing was modified and may be seen in this form on F3556 at the Imperial War Museum, although this appears to be a very late modification.

In 1916, twenty-two R.E.8s were supplied to the Belgian Government, and these were fitted with 180 h.p. Hispano engines cowled in a similar manner to the SPAD fighters. Also in 1917 an improvement on the R.E.8 was designed and two prototypes built. This, the R.E.9, differed from its predecessor in the shape of its rudder and in its wings, which were two-bay equal span.

The R.E.9 was much more pleasant in appearance, but its performance did not justify production.

The R.E.8 was, of course, of all-wood construction, with ply covering around the cockpits and metal panels in the nose. The engine, an R.A.F. A4 of 150 h.p., was air-cooled and to achieve satisfactory cooling of the rear cylinders a large air scoop with internal baffles was fitted between the banks. A main petrol tank holding 37.5 gallons and a 10.5-gallon service tank were mounted on the upper longerons directly behind the engine with the 3.5-gallon oil tank below these - an arrangement that greatly increased the fire hazard on crash landings.

TOP RIGHT: No information accompanied this picture from our achive, but it appears to be a four-gun, forward-firing installation mounted between the fuselage centre section and the main undercarriage axle. The guns are angled down, suggesting some sort of ground attack capability. SECOND RIGHT: This view of the pilot's cockpit emphasises the curved wrap-around of the windscreen. BELOW: Briefing before action. This R.E.8 has two rearward-firing machine guns, whereas most exampleshad only one.

The first prorotype R.E..8, ready for initial test flight at Farnborough, late June 1916.

ABOVE LEFT: This very early R.E.8 has the original fin shape, with triangular underside sub-fin in front of the the tailskid. ABOVE RIGHT: One of the extremes of fin area revisions applied to the R.E.8, this one, in May 1917 is all of 12 sq.ft. in area.

An offensive armament of two 112 lb. or four 65 lb. bombs, or their equivalent was carried under the lower wings, bringing the loaded weight up to 2,869 lb. compared with an empty weight of 1,803 lb. At 6,500 ft. the maximum speed was approximately 100 m.p.h., depending on the load, and with full tanks the endurance was four and one-quarter hours. The service ceiling was 13,500 ft.

On October 31st, 1918, there were 1,913 R.E.8s on charge out of 4,077 total produced. Of these, the Royal Aircraft Factory actually build only 44 examples, the remainder being sub-contacted among Austin, Daimler, Siddeley, Napier, Standard, and the Coventry Ordnance Works.

After the November 1918 Armistice, only a few R.E.8s lingered on in service, including operations by the newly formed Royal Air Force in Russia in support of 'White' Russian Imperial forces in the far north around Archangel; with No.6 Squadron RAF at Basra; while No.141 Squadron in Ireland operated a single example. The Royal Aircraft Establishment also kept a few, at least one of which was used for experiments with variable pitch propellers.

SPECIFICATIONS

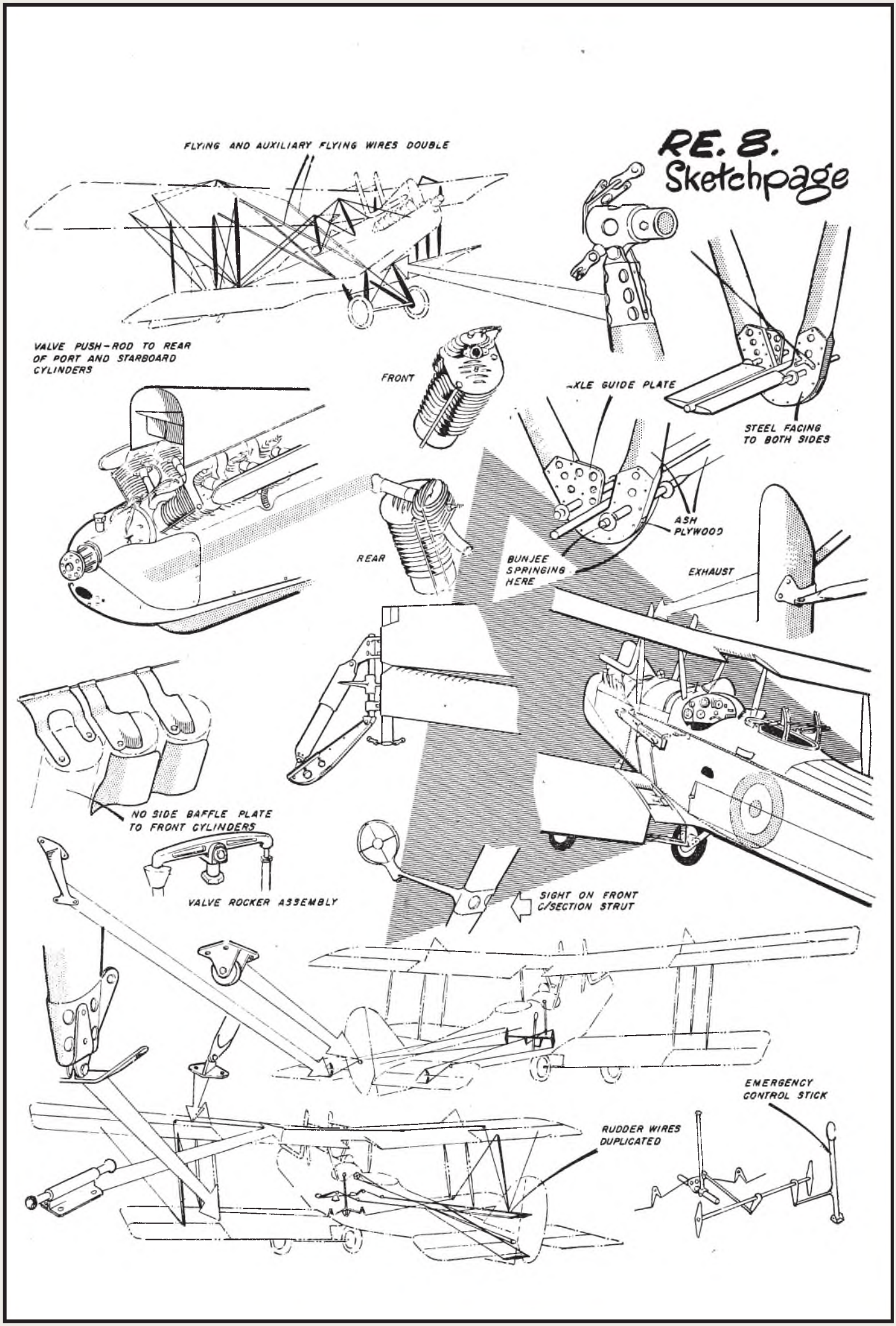
Data from The Royal Aircraft Factory(14)

General characteristics	
Crew:	2 (pilot & observer/gunner)
Length:	27 ft 101/2 in (8.50 m)
Wingspan:	42 ft 7 in (12.98 m)
Height:	11 ft 41/2 in (3.47 m)
Wing area:	377.5 sq ft (35.1 m²)
Empty weight:	1,803 lb (820 kg)
Loaded weight:	2,678 lb(1) (1,217 kg)
Max. takeoff weight:	2,869 lb (1,304 kg)
Powerplant:	1 x Royal Aircraft Factory 4a air-cooled V12 engine, 140 hp (104 kW)
Performance	
Maximum speed:	103 mph (90 knots, 166 km/h) at sea level
Stall speed:	47 mph (41 knots, 76 km/h)
Endurance:	4 hours 15 min
Service ceiling:	13,500 ft (4,115 m)
Climb to 6,500 ft (1,980 m):	21 min
Armament	
Guns:	1 x .303 in (7.7 mm) forward-firing Vickers gun and 1 or 2 x .303 in (7.7 mm) Lewis guns in rear cockpit
Bombs:	up to 224 lb (102 kg) bombs

Where to see one now?

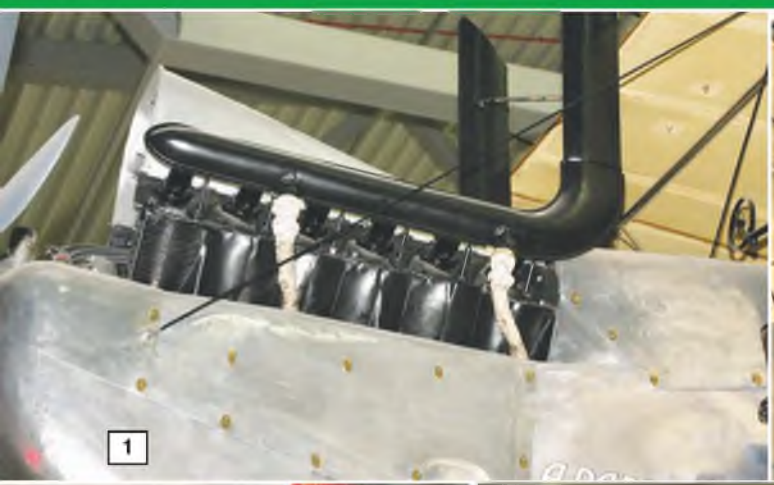
At the *Imperial War Museum,* Duxford, Cambridgeshire, there is an original, fully restored example (F3556) on display but unfortunately hung from the hangar roof like a big plastic kit!

The *Musee Royal de l'Armee et d'Histoire Militaire* in Brussels, Belgium has another genuine original, while at the *Royal Air Force Museum, Hendon,* an authentic reproduction R.E.8 is undergoing final assembly in the Grahame White Annex, where it now resides after a late-2012 series of appearances at UK air shows while operating out of the Shuttleworth Collection airfield at Old Warden, Bedfordshire. This should be on full display by the time this issue of FSM goes on sale. ■


RE. 8.
Sketchpage
FLYING AND AUXILIARY FLYING WIRES DOUBLE
VALVE PUSH-ROD TO REAR OF PORT AND STARBOARD CYLINDERS
FRONT
REAR
AXLE GUIDE PLATE
STEEL FACING TO BOTH SIDES
ASH PLYWOOD
BUNJEE SPRINGING HERE
EXHAUST
NO SIDE BAFFLE PLATE TO FRONT CYLINDERS
VALVE ROCKER ASSEMBLY
SIGHT ON FRONT C/SECTION STRUT
EMERGENCY CONTROL STICK
RUDDER WIRES DUPLICATED

ROYAL AIRCRAFT FACTORY R.E.8

A study of the original, restored example on display at the Imperial War Museum, Duxford.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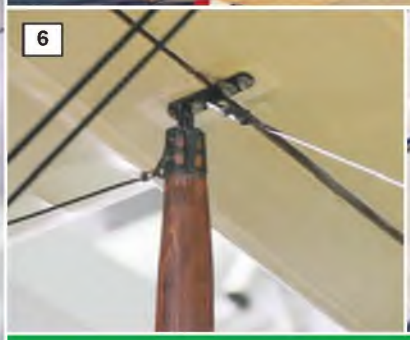
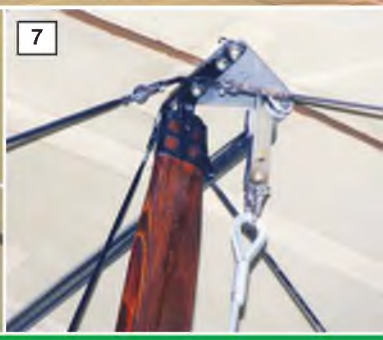
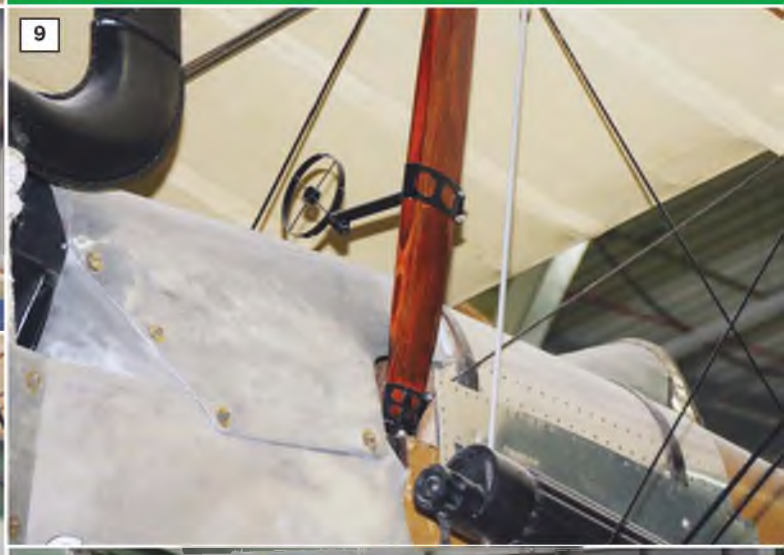
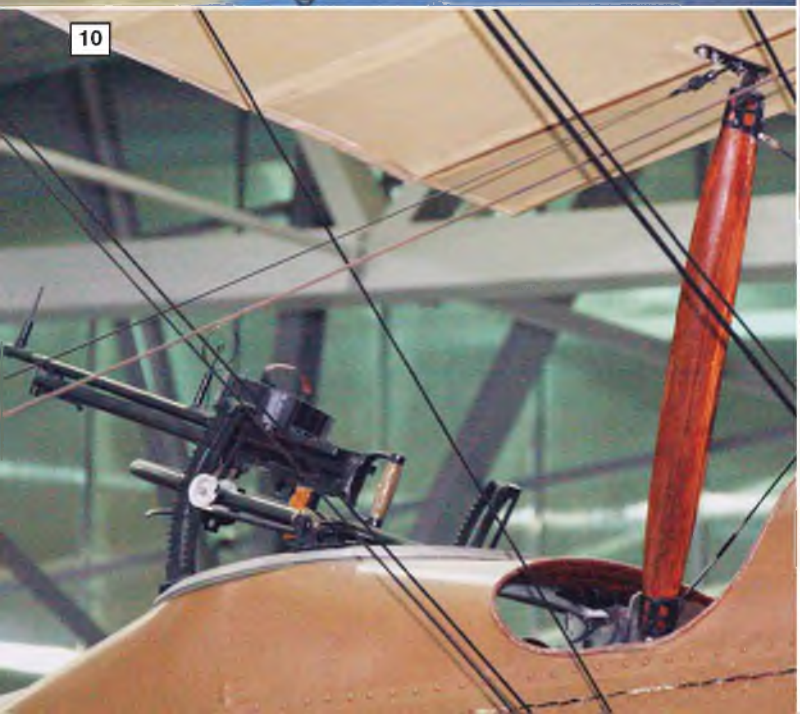


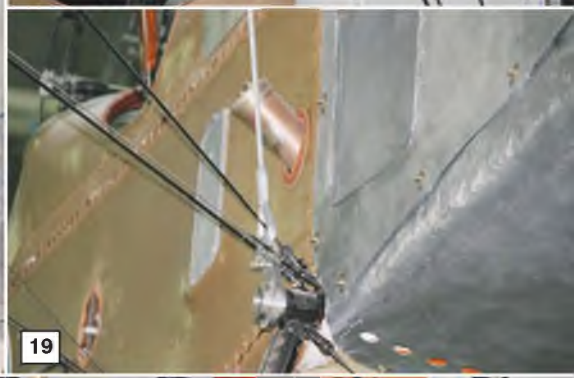


1 & 2: The R.A.F. 4a V12 engine and it's twin-stack exhaust.
3: The forward-fiiring 0.303 Vickers Gun, showing the mounting.
4: Centre section wing struts. Note also the fabric stritching.
5: Outer wing struts and link strut to the aileron.
6: Rear interplane strut upper anchor point.
7: Same for front strut.
8: Lower wing strut anchor point showing the metal cap.
9: View showing the front centre-section lower anchor point and the gun sight for the Vickers Gun.
10: Front and rear cockpit surrounds and rear centre section strut.
11: General view of the tailcone.

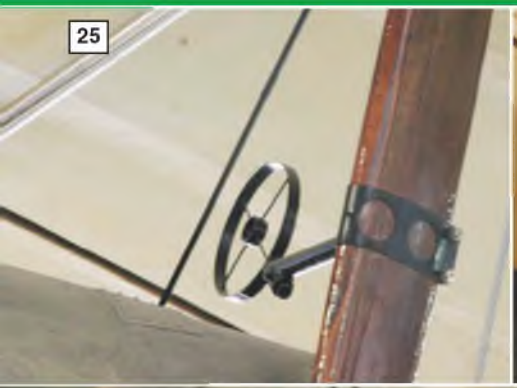


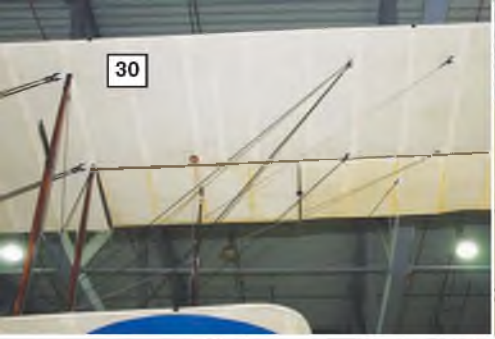


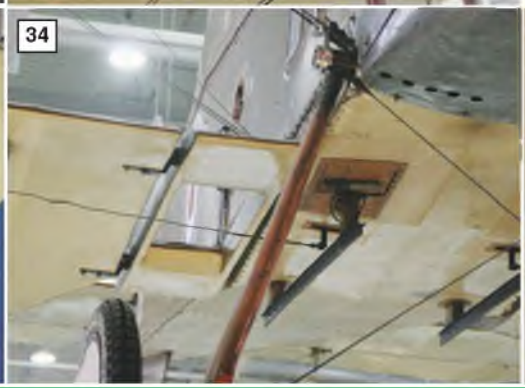
12: Tailplane underside, showing bracing wires, elevator control cable and pulley. Rudder horn extreme left: 13: Full view of the tailplane/elevator,also showing the sub-fin and tailskid. 14: Another view of the Vickers Gun, panel detail ahead of the front cockpit and the windscreen. Note external switch, lower front edge of cockpit. 15: Fuselage entre section underside, showing twin bomb racks. Note also the two clear vision cut-outs at wing roots. 16: Another view of the front cockpit showing the shape of the windscreen. 17: Fuselage cockpit area detail showing surface panels and bracing wires. 18 & 19: Two views showing metail access panels and engine cowl panel lines, plus the front anchor point for the main undercarriage strut. 20: Note the leather retaining straps over the metal access panel ahead of the front cockpit. 21: This view shows the stitching line along the fuselage side. External crank ffr the elevator control wire just visible at bottom of picture.



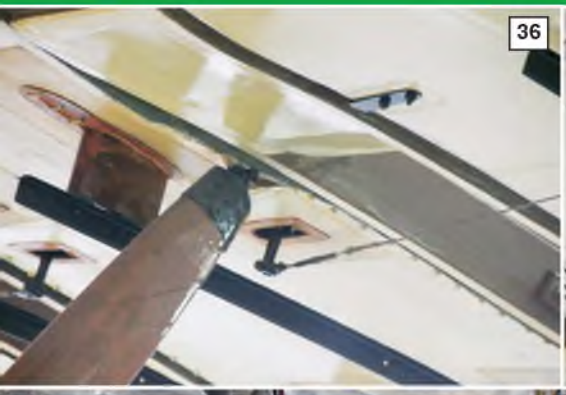
22: Humps, bumps and panel lines of the lower front fuselage section.
23 & 24: Two views of the four-blade propeller and attachment.
25: Close-up of the gun sight for the forward firing Vickets Gun, mounted to the left front centre section strut.
26: Detail of the Pitot head on the left wing interplane strut.
27: The stearable tailslid, linked to the rudder control.
28 & 29:Two views of the rearward firing Lewis Gun. Inscription reads:
'DO NOT FLY WITH LESS THAN 160 LBS IN THE GUNNER'S COMPARTMENT'.

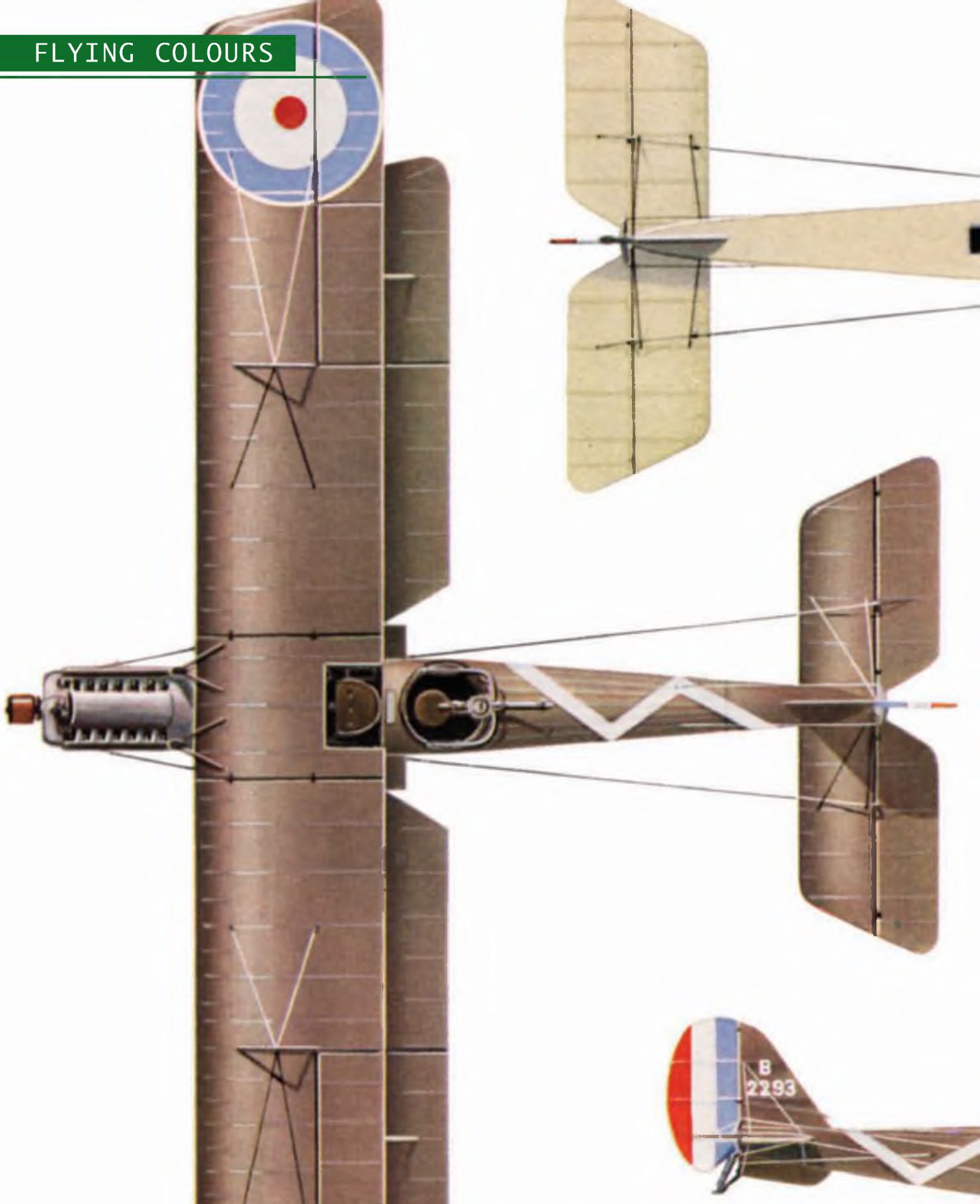






30, 31 & 32: General views showing the arrangement of bracing wires. 33: Aileron control cable runs externlly from the fuselage, along the wing underside before feeding into the outer wing. 34: Another view of the fuselage centre section underside, showing the wing cut-outs to facilitate downward clear vision. 35: Bomb racks on the lower wing underside - four per wing panel. Note also, again, the aielron control run along the wing panel underside. 36: Detail of the main undercarriage rear strut mounting point. Note also the aileron control crank linked to its control cable. 37: Detail of the main undercarraige front strut mounting point. 38: Front profile of the main wheel. 39: A full view of the main undercarriage. 40: Mainwheel and axle close-up.





ROYAL AIRCRAFT FACT

R.E.8

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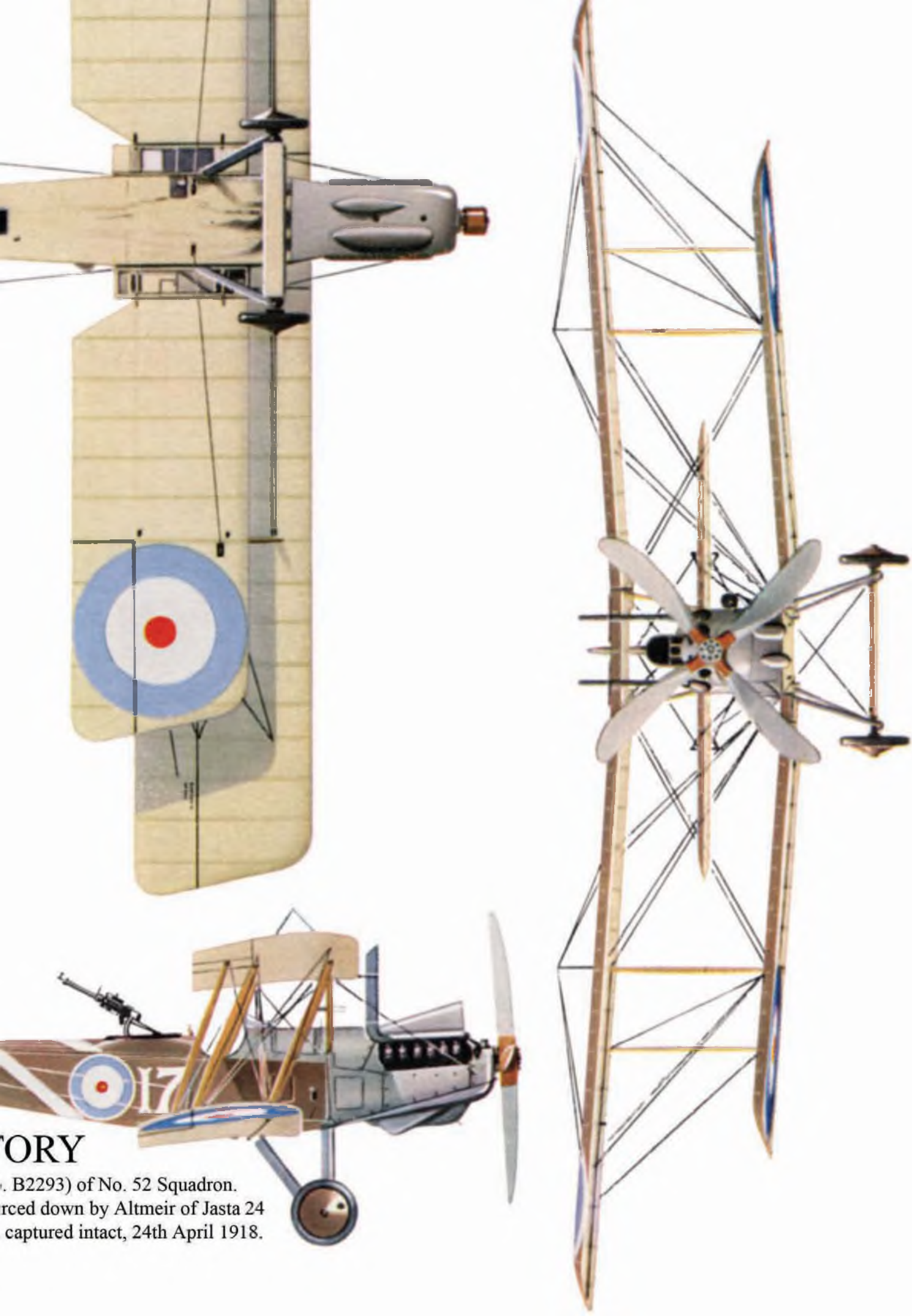

TORY

. B2293) of No. 52 Squadron.
rced down by Altmeir of Jasta 24
captured intact, 24th April 1918.

R.E.8, A3229 in standard finish, with original fin.

R.E.8, A3474 of No. 34 Sqdn. R.F.C., Villers-Brettoneux, France, Spring 1917.

R.E.8, A3224 of No. 21 Sqdn. R.F.C., Droglandt, 1917.

R.E.8, B5106 of No. 59 Sqdn. R.A.F., Vert Galand, May 1918. Fitted withdeep sump cowling andnavigation lights

R.E.8, B5116 of a training squadron, Yatesbury, U.K., March 1917.

R.E.8, A3662, No. 69 Sqdn. (No. 3 Sqdn. Australian Flying Corps). Fuselage legend reads "Presented by Mr. H. Teesdale Smith of Adelaide".

R.E.8, Belgian Air Force

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from Flying Scale Models

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- All types come with four sets of de-centred, scratch-resistant lenses (Cat 0, Cat 2, Cat 3 mirror & Cat 4) as standard, including a light-enhancing set for dull days, plus a quality carry case, a neck-strap and a cleaning cloth at an affordable price
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- All of our sunglasses offer 100% UVA / UVB protection, and conform to British and European Safety Standards, plus US ANSI Z80.3 - these sunglasses will help to protect your eyes from flying debris should you crash. Our glasses are impact-tested at the factory
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- Comfortable fit - rubber nose pieces and side-arm inserts, plus good flex in the frames, ensure you'll feel great wearing them
- Wrap-around styling offers protection from the effects of light and wind right around your eyes
- Prescription stand-alone frames with interchangeables bring all of the above benefits to spectacle wearers
- Polarised Nimbus and Innovation Plus sunglasses have not one but two sets of polarised interchangeables, a light-enhancing set and smoked Cat 4's, all for an amazing £44.99 UK RRP (See the next page for more information on polarisation)
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PART 2

MILES M.38 MESSENGER

Peter Shaw continues the construction sequence of his Graham Smith designed quarter-scale 100" (2540mm) wingspan model for engines in the region of 1.20 cu.in

Last month I covered building the fuselage and it is now time to get on with the building of the wing. Looking at the excellent plans it does, I admit, look a daunting task with all the built-up ribs and pushrods to the control surfaces, but taken a-bit-at-a-time then it becomes a joy to construct and gives a real feel of achievement. As previously stated, this is not a model that is going to be finished in a couple of weeks! I find that if a difficult point is reached, then I put it to one side and try to finish a part that is easier. It's amazing that when doing something else, the solution to the original problem becomes obvious. After buying Graham's plan (MF21) I determined that I would take my time and not be rushed.

The wing

Just like the fuselage, there are copious builder's notes on the plan, made by Graham and I found that by following these, construction was reasonably straightforward.

Before starting the building of the wing, two decisions have to be made:

1) Construction of wing in two halves, or a single-piece wing. Both options are shown on the plan and since I had the-means of carrying the wing in one piece, I opted for this (as was the original build).

2) I chose to have individual servos to flaps and ailerons rather than the linkages shown on Graham's plan, largely because one of the features of the full size Messenger is the drooping of the ailerons when the flaps are deployed, for instance - if the flaps are dropped by 30%, the ailerons droop by 10%, imparting a STOL capability to the aeroplane - so why not use this feature?

My Multiplex Royal Evo12 handled this well and was easily programmed into the transmitter. The plan shows how this can be achieved by the use of offset linkages, which was the way Miles designed the prototype and is further explained in Gordon Whitehead's excellent scale modellers book *'Scale Aircraft Models for Everyday Flying'*.

Once these decisions have been made, it is on with the build.

The first parts to construct are the spars, which are spruce strips planed to size and then laminated with 1/64" ply - you finish up with very realistic box spars. There are various inserts to incorporate in the construction of the spars for fixing the

undercarriage and for dihedral braces. The spars are very strong, but light, and of course, the dihedral has been built in, along with the designed washout. It is important to take your time with the initial step of construction of the spars, as these are the foundation of an accurate wing. Also, remember to mark the rib stations onto the spars as this will ease building and ensures that the ribs are at the correct angle relative to the dihedral.

Rear wing box

I made up lots of right angle braces (you can see these in the attached photos) from scrap balsa and ply and these assisted in getting the ribs in place. The plan shows the wing ribs being made up from three parts and some are of geodetic construction. I didn't do anything different than follow the designer's notes, but it is perfectly possible to ease this process and make all the ribs from sheet balsa - but when the wing is in 'barebones', it really is a thing of beauty!

When the basic building is completed, there are many brass fittings to be made to form the hinge system for the ailerons and the flaps, so it is time to get out the fretsaw and tin snips. As stated previously, this model does not use any commercial parts for the hinging system - it relies on 16swg wire and the brass parts I have shown in the photos hereabouts - it is a bit of work, but very satisfying when complete and as the system is authentic, the scale gurus can't be picky.

I chose to make the inspection hatches work so that it was a lot easier to fit the linkages together (Part 3 will cover all the detailing such as making the inspection hatches, etc.).

It seems a shame, but the bare bones of the wing have to be sheeted. I made up templates from paper, joined several sheets of 4" wide balsa, then transferred the basic shape of the wing to the wood and allowed a little overlap to allow for

The first will panel of the basic wing. Note the 'W'-braced centre sections of the ribs. It is designed for lightness, without loss of airframe strength.

A further view of the right hand wing panel, also showing the flap sub-assembly.

wing curvature and fine-tuning. Once I was happy with the fit, I glued the sheeting to the wing frame using a contact cement, applied to the ribs and the sheeting in the appropriate places. It is absolutely essential to get the placement correct when using contact cement, as it is difficult to remove and reposition, so take time in placing it accurately. It is also important to mark out the inspection hatch positions ready for cutting out at this stage, reinforcing the cut-outs with 1/64" ply. The underside of the wing has undercamber at the flap station, so this has to be factored in when sheeting.

With the wing sheeting applied and the hinge mechanisms in place, then the trial fit of the flaps and ailerons can be undertaken. When satisfied with the geometry and the movement, you can

David Toyer's Miles Messenger lifts off, during the BMFA Nationals at Barkston Heath. *(Photo: Alex Whittaker)*

Close-up of one of the flaps, which, like the full size, will be fabric covered - the rib spacing needs to be as per full size.

Like Graham Smith's original, Peter Shaw elected to build the wing as a one-piece structure. Here, the mainspar centre section is prepared, prior to laying down the left hand wing panel.

stand back and admire your handiwork!

A 9 feet wing with flaps like barn doors and the whole structure nearly two feet in chord with a lovely thick wing section should support a very stable model in flight. I checked that all servos were working properly and that I had programmed in the drooping ailerons, etc.

Leading edge

Another key area is the wing leading edge construction. The plan offers two options - using stiff paper laminated to 1/32" sheet, or 1/64" ply. I opted for the ply. Again, this follows full-size practice and makes an exceptionally strong 'D' box structure. Of course, if weight is not an issue, then the leading edges could be constructed from balsa and planed to shape etc, personally, I don't think the

Deep, crisp and even! Baisc finished airframe of Peter Shaw's Messenger against a wintery background. Scenes like this send you back to the modelling room/shed very quickly!

Glass fibre moulded cowl on Peter Shaw's model.

Full size G-AKIN in action.

weight penalty would be that great, but I think the ply looks very realistic, so why not go for it!

I did this part of the wing after sheeting the main part with balsa and thus I was able to shave down the forward edge of the sheet so that the 1/64" ply mated up exactly and very little sanding was needed to get it flush.

Covering

After a good all-over sanding, I applied an even coat of SIG 'STIX IT' covering adhesive. This is the best product I have used for sticking covering to an airframe since it is heat-activated when applying a hot iron. As for the fuselage, I chose SIG Koverall, as it is light and very compliable. After the covering had been applied, I added several coats of banana oil as this is non-shrinking and adds little weight.

So now we have a completed wing and when the ailerons and flaps are fitted, it is the time to stand back and start thinking of the detail for finishing the model. I had already selected the colour scheme and so it is on with the detail for the cockpit and finishing.

Next month...

The undercarriage is the trailing arm type and is a key feature of the Miles Messenger, so next month I will cover the construction of the undercarriage, making the seats, instrument panel, throttle quadrant, and the Pitot Head, operating hatches, glazing the doors and making the mould for getting the front bowl of the canopy vac-formed. ■

ABOVE LEFT: The left wing panel with plywood leading edge rolled around the wing ribs and fully skinned.

ABOVE CENTRE: Skinned wing underside, showing the wing flap hinge points.

ABOVE RIGHT: Skinned wing underside, showing servo installation and main undercarriage bracket.

RIGHT: Two views of one of the wing flaps - in this case balsa sheet skinned.

MILES MESSENGER

Full size copies of the plan for the MILES M.38 MESSENGER are available from Flying Scale Models Plans Service, ADH Publishing, Doolittle Mill, Doolittle Lane, Totternhoe, Bedfordshire, LU6 1QX.
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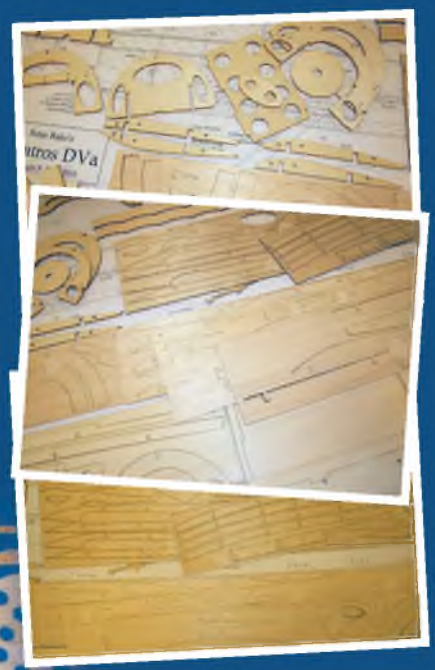

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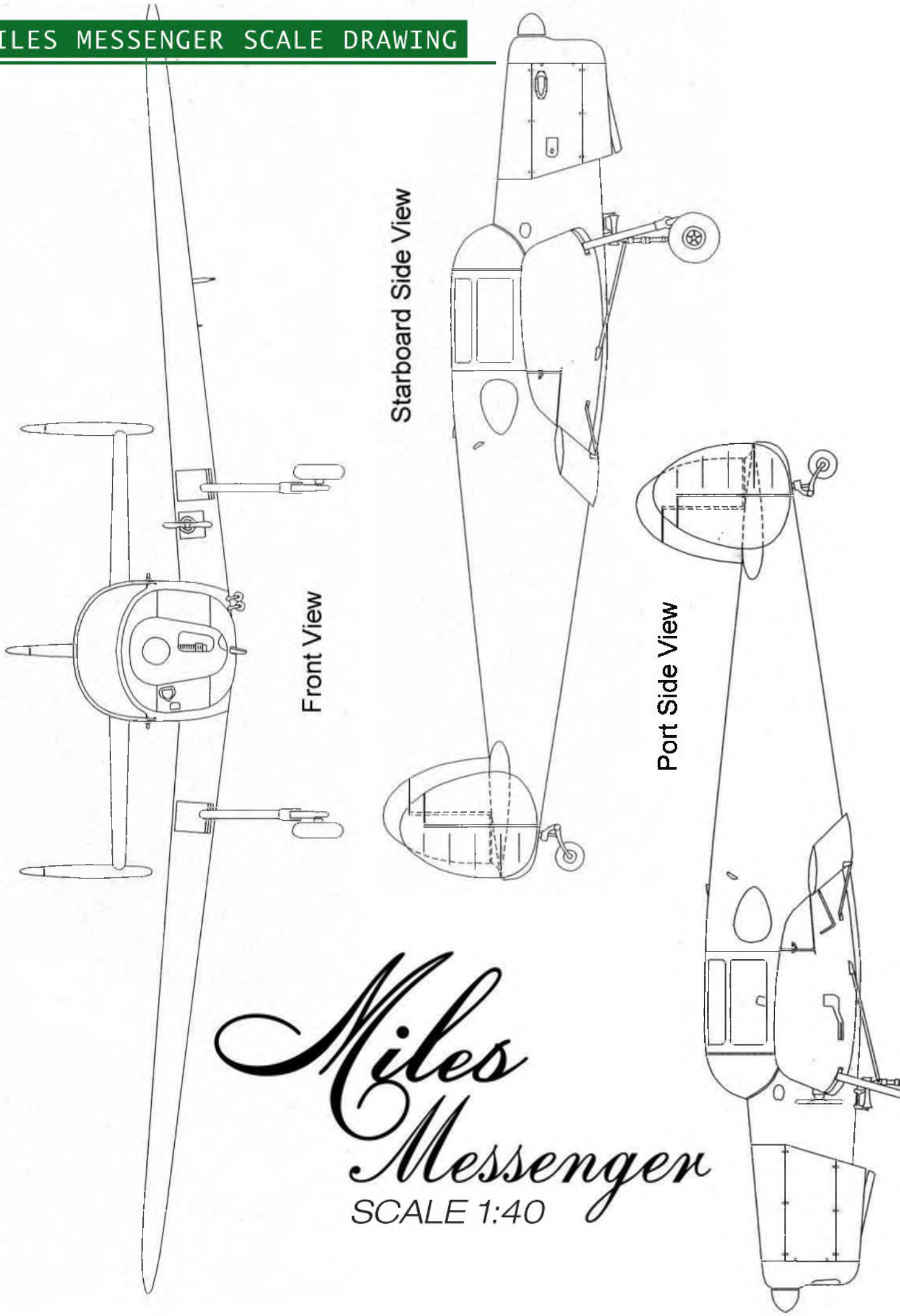
Starboard Side View
Front View
Port Side View
Miles
Messenger
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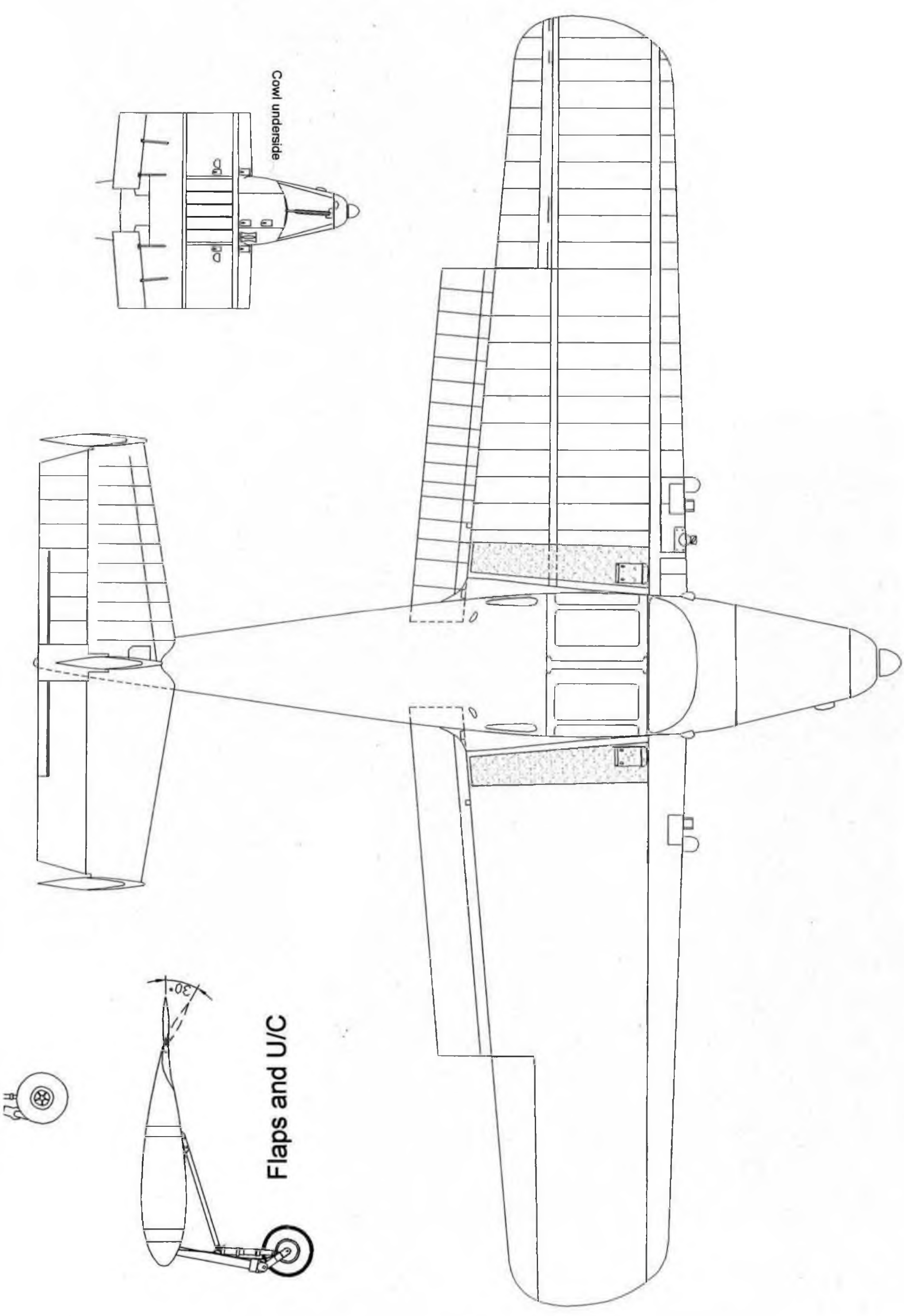

Cowl underside
Flaps and U/C
30°

MILES M.38 MESSENGER

The detail you need to make a convincing job of Graham Smith's quarter-scale Miles M.38. Photos by David Toyer, who used these pictures in the finishing and surface detailing process of his example.


1


2


3

1 & 2: Two views of the outer aileron hinge. Inner hinge similar. 3: Propeller driven generator at the left wing leading edge. 4: Cockpit windows and glazing, also showing the cockpit access tread mat and the foot step, let into the flap. Also shows the wing-to- fuselage fairing.

4

5: A further view of the cockpit/cabin also showing the flap in the drooped position and the aileron hinge line.

6: Twin venturis position on the fuselage underside centre-line.

7 & 8: Rearward retracting main undercarriage leg and wheel.

9: The tripple tail fin/rudder assembly.

10: The elevators, also showing their trim tabs. The elevators are 'cuff-faired' with the tailplane at the hinge line.

11-13:The cockit/passenger cabin is a prominent feature of the Miles Messenger, so needs much attention. These views show the individual glazed panels. 14: Detail of the hinges of the cockpit hatches that hinge upwards. 15: The tailwheel unit. 16 & 17: Two views of the engine cowling showing panel lines and air intakes. 18: Profile of the propeller spinner.

19 & 20: The wing flaps are fabric covered as seen here, revealing the rib positions. 21 & 22: Wing flaps viewed from the wing underside, showing the two hinges. 23: Close-up of one of the wing flap hinges. 24: Another view of the main undercarriage, also showing the underside of the engine cowl.

24

THE QUIET ZONE

R/C SCALE ELECTRICS BY PETER RAKE

Yes, I'm afraid it's that time again. Time for that flippin' bloke to bend your ear about electric flight again. Will he never give up? The simple answer to which is a resounding NO!!!

Last month's QZ looked at how Pat Lynch produced the plastic surface details for his stunning Fokker D.VII model, so you now have all the information before the actual plan article appears and now, Pat has been persuaded to describe how he did much of the other detailing on his model. Yes, you've guessed it; I got someone else to write the column for me again. Despite the fact that it means there won't be the usual waffle content, I feel sure you'll find it interesting. Don't worry though, I'll make up the waffle next time.

SO, OVER TO PAT (AGAIN)

When I discussed the Fokker design with Pete, I gave him a rather short brief. The cockpit area and the space under the guns should be as clear of structure as possible; the battery hatch should be on top, making everything easily accessible (he would have done that anyway) and include the radiator and dummy motor. Also, the wing strut mounting should be done so I could make it look close (ish) to the real 'plane.

Keeping the cockpit area clear would give me the incentive to do a bit more in this area than my previous builds. Plenty of good photos were available and these

SCRAP-BOX DETAILING IN EARNEST! PAT LYNCH REALLY GOES TO TOWN ON HIS NEW FOKKER D.VII

had inspired me to put as much effort as I could into the cockpit, weapons and the dummy engine, as I figured these would be the focus of most folk looking at the model (including myself!)

Peter's designs usually feature a plywood box at the front, supporting all the various high-stress connections and this often continues around the cockpit zone. As the cockpit sides were actually the external fabric in real life, the 1/8" Liteply in the model was disguised by applying some pale lozenge pattern printed paper to the visible internal areas so as to look like the inside surface of the fabric. The balsa longerons were hidden under the top panelling and under the floor - great compromise with no loss of rigidity.

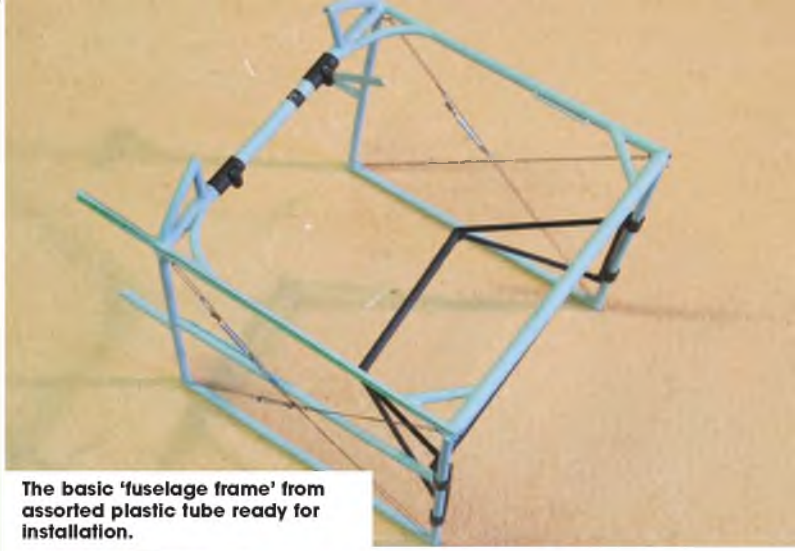
GETTING DOWN TO IT

The Fokker D.VII had a steel tube frame and these visible parts in the model were replicated from various sizes of styrene tube and rod. Together with the seat frame and various brackets for pumps, levers etc, the dummy frame was built as an assembly that could be squeezed up through the still-open lower wing seat. Dummy tensioning wires were fitted where visible in the exposed dummy framing with tiny turnbuckles from thin aluminium tube with ends tapered in the Dremel. Thin wire looped at each end for the cable was fitted in each turnbuckle. The wire was stranded beading wire with a grey plastic coating.

Behind the pilot's seat, a fabric panel was usually laced across the fuselage. This was made of textured paper with small holes punched around the edge for the lacing. 'Eyelets' were formed from canopy cement around the holes and painted in a brass colour. After the fuselage had been painted, but before fitting the lower wing, the whole cockpit frame was inserted and glued in place.

A cockpit floor of thin varnished ply was mounted on blocks inside the fuselage. This was pre-assembled with pedals, lower parts of the control column, dummy rudder and elevator cables, boot plates and dirtied-up with graphite powder before fitting in place. The magazine was of litho plate, CAed together and

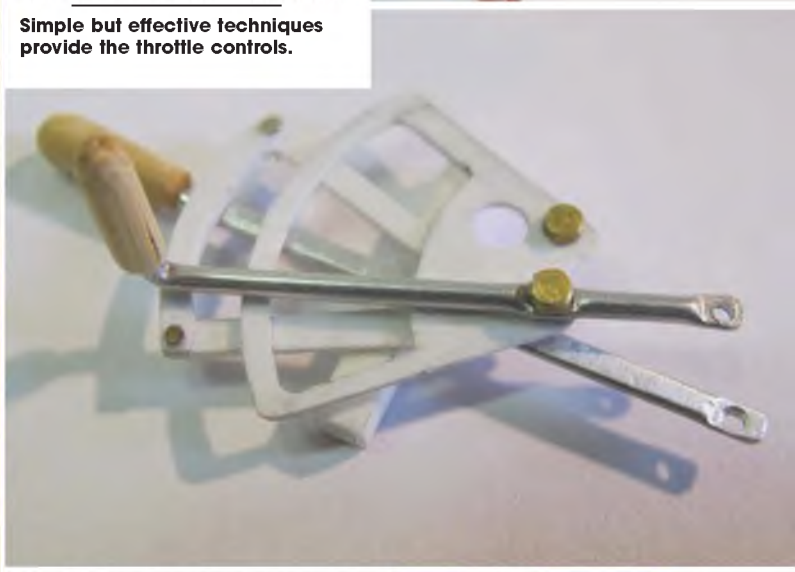
A DESERVING WINNER OF ITS COMPETITION FIRST PLACE. PAT'S FOKKER D.VII ALL SET TO GO CAMEL HUNTING.



The basic 'fuselage frame' from assorted plastic tube ready for installation.

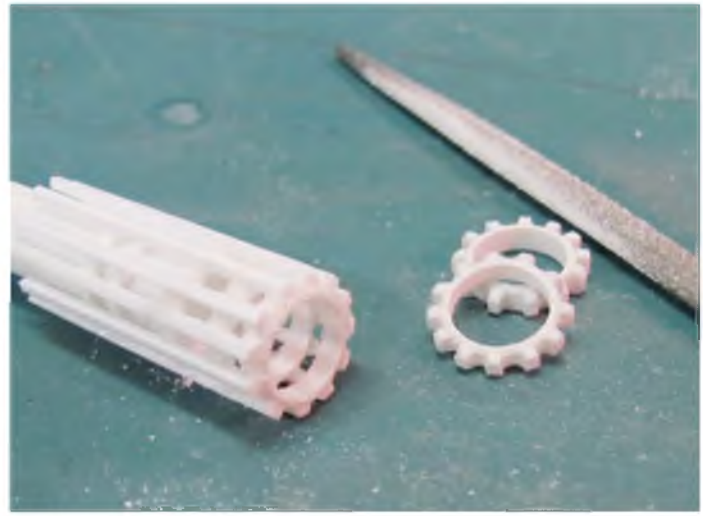
Really nicely done seat and safety harness means the pilot doesn't have to straddle the control runs.

Simple but effective techniques provide the throttle controls.



Now it begins to look like the office of a Fokker D.VII. Note the paper lozenge panels hiding the models' solid areas.

The external 'clutter' so common to aircraft of this era - including those Fokker nuts and flare cartridges.



How the castellated nuts are made as a strip and cut off as required. Definitely easier than trying to make each one separately.

Once fitted and painted those simple bits of plastic look most realistic.

A multitude of Fokker nuts. The idea is that they work like weather vanes - the slipstream prevents them unscrewing if they come loose.

An almost finished dummy engine nestles on the battery access hatch. Hard to believe its' humble origins.

complete with embossed rivets and 'schwurling' (my term) done with a rubber tool in the Dremel. *(I think the correct term is 'Engine Turned' - Ed.)*

The lower, barely visible instrument panel is varnished wood with various dials, switches, magneto and fuel controls built from scrap material. Images of the dials were found on the Internet, resized and punched to fit some plastic tube, as was a thin clear lens. Fuel cocks (and many other parts) were from wire and plastic rod, thickened where necessary with blobs of canopy cement. When painted a brassy colour and dirtied up, these look the part. The Magneto was of plastic scraps, painted matt black and lightly buffed with graphite, giving a metallic sheen. Tiny labels were made as decals and applied to aluminium sheet - these were held in place with #00 size brass nails where needed.

GOING UP

With all the basic deep-down detail bits done, the external plastic panels were detailed, painted and glued in place. Details included holes for gun ejector chutes, hinged inspection panels, fuel gauge, filler caps, windscreen, and lots of little 'Fokker nuts'. Most parts were of styrene sheet and rod with canopy cement screws, rivets etc. Dummy hinges from strip and half-round plastic were made - the half-round section being scored to form the hinge and dummy, glue rivets along each side. When finally painted and dirtied up (fuel spills etc), the panels were glued in place and the next layer of detail applied.

The Williams Bros. Spandau kits needed a lot of cleaning up and had extra details added - single action cocking levers and associated gears (old HS55 servo gears), ejector chutes etc. A spray of flat black and a light brushing over with graphite powder gives a metal look. These sit in mounts formed from brass strip, plastic tube, and dummy bolts, fastened to the internal dummy framing.

The various major dials are from plastic tube, made larger where required by winding a strip of 0.005 plastic strip around it until the desired diameter is reached. Recessed fronts and varying diameter bodies can be made this way. Dummy rivets, screws and attachments were applied before painting. Dials and glass were made from punched discs and scaled photos of actual D.VII instruments. I keep a collection of various sizes of brass tube - many of these can punch discs of plastic, photos etc that will fit neatly inside stock diameters of plastic tube - makes instrument cases easy!

The seat is from leather-textured card fixed to a balsa 'cushion' and painted a worn leather colour. The balsa cushion was carved to look like the real thing and brass nail 'buttons' inserted. The harness was made using a measured diagram found on the internet. The webbing belt is a strip from a fabric roller blind with buckles and ends made from plastic sheet, painted black. The ends have a stud and locking pin with chain as per full size. Magnets in the seat back retain the pilot and allow his removal to see the open cockpit easily. The distinctive leather padding on each side of the cockpit is from very thin glove-leather, glued to shaped foam plastic and fastened to the fuselage with contact cement.

Most detail parts can be simulated with plastic and metal, but many parts can be fashioned from odds and ends retired from a previous life! Ball-pens, cigarette lighters, old electronic equipment and a partner with a keen eye for 'something useful' are all assets that can be utilised.

When suitably painted and given a convincing finish, almost any detail is possible - easier at larger scales of course, but by keeping the detail in proportion and to scale, a model can look as good on the ground as it does when flying!

(An inexpensive, and simple method of producing buckles is something I learned in my military modelling days. Heat and stretch a piece of kit 'sprue' to the desired thickness - or use ready-made plastic rod. Then tightly wind it around a suitable former, clamp it in place and steam it over a kettle spout for a couple of minutes. Once allowed to cool, still on the former, it will retain the shape. Cut through one side and you have a selection of little buckle shapes. Tweak them and glue the cut ends before gluing them to the strap that needs a buckle. A little kink in the strap at the buckle position simulates the loop around the buckle shaft. PR).

DUMMY ENGINE

Nothing is more attractive to scale modellers than a detailed exposed engine. It is usually the first part closely examined, usually eclipsing even a well-detailed cockpit! The D.VII with its water-cooled Mercedes engine is no exception. I wanted to make this replica motor as well as my eyesight and skills would allow and hopefully learn a few

new tricks along the way - so as to do better next time!

Plenty of data for the Mercedes engine was available so there is no excuses for a shoddy job. First - what needed to be modelled? Only the cylinder heads from just below the manifolds were possible as the dummy motor sits on the battery hatch. That leaves the inlet/exhaust manifolds, water pipes, camshaft and rocker boxes, valve gear and some miscellaneous gearboxes, water pump and other sundries - plenty to catch the eye.

Like any seemingly complex structure, the engine can be broken down into smaller, simple sections. First were the six cylinder heads. These were made by forming some heated styrene sheet with a simple dowel plug and were joined by a length of styrene tube representing the upper water pipe between cylinders. Each cylinder head has short sections of plastic tube added as inlet and exhaust stubs, plus two smaller tubes as the valve guides. All these holes were cut with sharpened, heated brass tube and the bits of plastic tube glued in place with styrene glue. The joins were then given a fillet of medium CA and immediately hit with a spray of CA accelerator. This solidifies the CA and looks like a welded joint.

The rocker boxes were formed using a shaped plug with heated styrene and attached to squares of plastic which, in turn, sit on pieces of telescopic plastic tube to form a dummy camshaft housing. Again, the rocker boxes had short bits of tube inserted as the bosses for bolts and rocker pivots, filleted with CA as before ... and so on!

These major assemblies were then attached to each other and the next layer of details added.

Exhaust stubs had plastic flanges glued to them complete with tiny hex bolt heads from *Plastruct* hex rod. The rocker box bolts were made the same way. Valve rocker arms were built up from several tiny bits of sheet plastic and shaped to look like the photos. These were drilled for the pushrod/valve stems and used even smaller hex rod as clamp bolts. Valve springs are from ball-pen springs cut to size and the spring retainers are discs of plastic and tube. All parts were glued in place with CA or plastic cement.

Inlet manifolds were formed plastic tube, slit, bent to shape, filled and filed. The tightening rings on the inlet branches are 1mm square strip glued around a plastic ring and slipped over the manifold stubs. The rings were made in bulk and sliced off as required - the photos show it better than words! The 'saxophone' exhaust manifold was hot-formed from plastic sheet using a basswood plug and attached to various sizes of tube, fitted with flanges to mate with the engine, then glued in place.

Other engine parts were the camshaft gearbox and front water pump. Again, these were broken down into smaller parts and built up from plastic pressings, tube, rod and sheet. CA was used to form fillets and help to look like castings. The almost-invisible spark plugs are hex rod, plastic tube and a brass nail head.

With all the bits together and to my satisfaction, all was sprayed flat black. The manifolds were given a coat of semi-gloss black while other items were touched up using very dark grey. Varying the shades of 'colour' gives more interest - I think!

The exhaust stubs and flanges had a light dry-brush with a rust-coloured paint - just enough to look as though it had been hot. Finally, everything was lightly dusted with graphite powder and the larger areas rubbed very lightly with a fingertip or soft cloth. This gives a slight metallic sheen but shouldn't be overdone.

At last, some balsa discs were glued into the cylinder head bases and the engine glued down to a dark-painted battery hatch. Nothing described here was difficult - just a matter of looking closely at the parts to be modelled and working out what normal materials might be assembled to look like the many references. A very useful tool when detailing was a scale chart giving the scaled sizes of common small dimensions. For instance various hex nuts and bolt heads are often oversized on models - so I scaled up the available hex and round stock to see what it represented at full scale. It saved me from having 2 inch nuts holding exhaust pipes in place!

BACK TO PETER R. ...

There you have it, lots of information about how Pat achieved just two areas of detailing on his model. There are many other items he didn't mention, like the photo-etched radiator grille, but to cover all these points would take far more space than we have available.

Obviously Pat's efforts weren't in vain because his model took first place in the military section of a district competition - a good day all round for our hero because his Great Lakes Trainer also took first place in the civilian class. Yes, it is another of my designs, but more about that some other time.

In the meantime, if you'd like to see your model featured here, have a query or want to contact me for any other reason (I draw the line at begging letters - but will keep on sending them), I may be found at PETERRAKE@aol.com ■

Don't you feel you could almost climb into that cockpit and fly the plane? You could if you're less than 12 inches tall.

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