

AIRCO DH6
1/9TH SCALE, 48" SPAN FOR ELECTRIC

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MODEL MAGAZINE

Flying Scale Models

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PLAN FEATURE
**INDOOR
SCALE
SPERRY
MONOPLANE**

Electric power R/C
with pullout
centre-spread plans



FULL REPORT

COSFORD

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SUBJECTS FOR SCALE
DART PUP



DEWOITINE
D.501



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ON THE COVER

One of the most sensational shapes seen at this year's LMA Cosford Show has to be Roland Sanatschus' Dornier Do.335 Pliel (Arrow) it spans 2.5 m (98.4") and is built to a scale of 1:5.5. Push-pull power comes from two Zenoah G-45 engines and it weighs in at 21.2 kg (46.4 lbs.)

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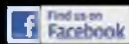
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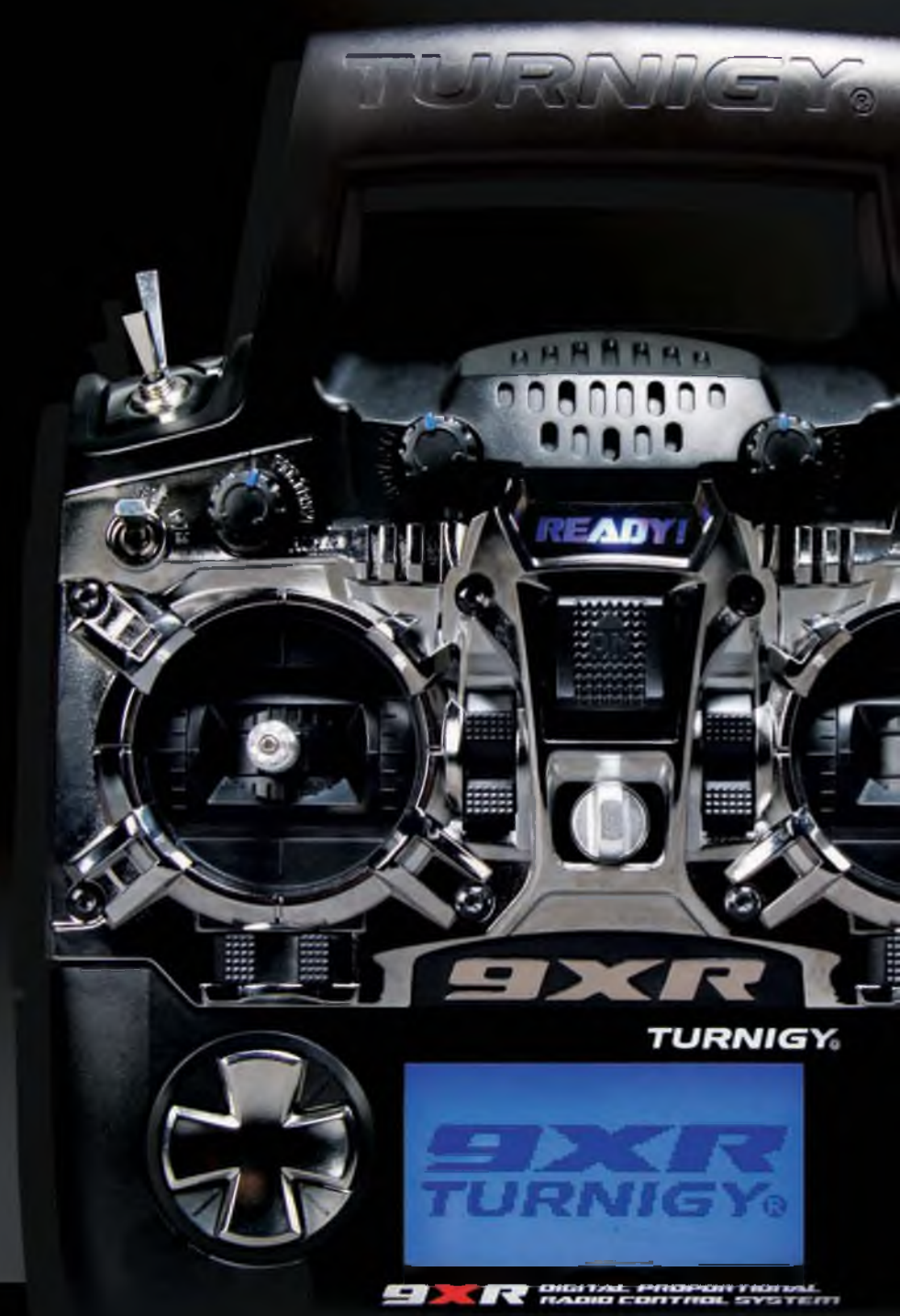


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CONTACT

Trainer type aircraft are rarely the most glamorous of types but, as scale modelling projects, some these offer a simplicity of airframe that has an attraction in terms of demands on modelling skills and also time and effort. The Airco DH6 is an example - totally boxy fuselage, constant chord wings and even commonality of wing panels between top and bottom wings, plus square-cut fin/rudder and elevator/tailplane.

When all the stuff for Peter Rake's 1/9th 48" wingspan scale electric powered DH6 arrived for presentation as this month's free full size plan feature, we decided to create a 'double-bill' on the type with a re-introduction of Don Luck's 1:6.6 scale 64" wingspan example, for those who might want something a bit bigger - and with I.C power, using a .45-.60 glow engine.

Don's model first appeared back in the Nov/Dec 1998 issue of FSM and he modelled his to represent the example of the type on which his father learned to fly, during service with the RAF, in Egypt during 1918. Don's inclusion of the relevant excerpt from Luck Senior's log book is a nice touch.

PUPPY LOVE!

Some scale modellers go out of their way to model the more obscure or even the almost-unheard-of aircraft types and this respect the 1920-1930s period of aviation is full of forgotten but fascinating types.

One of those that we've been looking to present in FSM for a while now is the Dart Pup, a very attractive little machine, the shape of which exudes its glider pedigree. What held up a presentation in FSM as a 'Subject for Scale' was the lack of a good selection of photos to back up the available scale three-view drawing, but thanks to Richard Riding, who was the launch editor of *Aeroplane Monthly* magazine, we are able to give it 'the treatment' in this issue.

As we tell you elsewhere in this issue, it's been modelled before, but it would be nice to see it done again.



AeroDetail series

Making a scale model?

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



Whitman Tailwind CD106

Two examples shown of this U.S. homebuilt lightplane, with boxy shape ideal for modellers. Complete close-up detail. (62 images)

Westland Lysander CD105

The Shuttleworth Museum's airworthy example shown in both camouflage and Special Operations black finishes. Full close-up detail. (62 images)

Waco Ymf-5 CD104

Beautiful and graceful spatted undercarriage biplane of the 1930s 'golden aviation era'. Example photographed is an accurate-in-every-detail modern replica. (130 images)

Vickers Supermarine Walrus CD103

The famous 'Shagbag' biplane seaplane, used during WW2 as an air-sea rescue craft and fleet gunnery spotter. (80 images)

Tipsy Belfair CD102

Highly attractive Belgian low wing light aircraft from the era of simple, open cockpit private flying. Machine offers scale modellers pleasant lines and simple shape. (35 images)

Thulin Tummelisa CD101

Swedish 1919-era fighter trainer that served the Swedish air arm for many years. Example depicted is a faithful reproduction. (55 images)

Supermarine Spitfire MK.XVI CD100

Last of the Merlin-engined Spitfires. This collection depicts the cut-down fuselage, bubble cockpit canopy later version. (116 images)

Supermarine Spitfire MK.IX CD99

The most numerous version of the classic Spitfire that turned the tables on the Luftwaffe's Focke Wulf Fw 190. (90 images)

Supermarine Spitfire MK XIV CD98

2nd of the Griffon-engined Spits (Mk.XII was

first), the bigger engine forced a change of the classic Spitfire shape. (58 images)

Supermarine Spitfire MK Vc CD97

Shuttleworth Museum's airworthy example presented in its latest form with classic rounded wingtip planform. (160 plus images)

Supermarine Seafire Mk17 CD96

The Seafire 17 was no navalised Spit. A true ground-up naval fighter. (64 images)

Stinson 105 CD95

Light, private aircraft of the 1940-50s era, with lots of character. (75 images)

Steen Skybolt CD94

Attractive U.S. aerobatic biplane, presented in full detail. (89 images)

Sopwith Triplane CD93

The last example of the 'Tripehound' is the one built (in 1980!) from original Sopwith drawings by Northern Aero Works and given sequential manufacturer's number by Sir Thomas Sopwith himself in recognition of the outstanding workmanship. Extensive detail. (120 images)

Sopwith Pup CD92

The charismatic Sopwith Scout (to give its correct designation) is a great scale modellers' favourite. Example depicted is the one preserved and regularly flown at the Shuttleworth Collection, Old Warden. (50 images)

S.E.5A CD91

Shuttleworth Museum's airworthy example presented in full detail. (100 plus images)

Ryan Pt-22 CD90

US military primary trainer aircraft that served with both US Army and Navy, thus providing ab-initio flight training for the majority of US airmen of the WW2 period. A highly attractive aircraft, 90 images of the preserved, airworthy aircraft, hangared at the Shuttleworth Collection, Old Warden.

Republic P-47D CD89

Bubble-canopy version of the much loved 'Jug', photographed in fine detail. (105 images)

Polikarpov Po-2 CD88

The world's most numerous produced aircraft of all time, the P0-2 was a great maid-of-all-work used by both military and civil groups in the old Soviet Union and its satellite states. Example depicted is pristine, and now in storage at Old Warden. (170 images)

Polikarpov I-15 CD87

The ultra agile Russian biplane fighter aircraft that saw widespread service prior to and in the early years of WW2 and during the Spanish civil war. Example illustrated is a superbly restored machine. (100 images)

Pitts S.1 CD86

Homebuilt example by Bob Millinchip, as seen at 2002 PFA Rally. Complete detail study. (36 images)

Piper Tomahawk CD85

Cranfield Flying School example of this civil ab-initio trainer aircraft. (54 images)

Piper Super Cub CD84

The later, 'cleaned-up' version of the famous Piper J-3, with more elegant engine cowl. Two examples shown. (80 images)

Piper L-4 Grasshopper CD83

Military version of the famous Piper J-3 Cub used during WW2 and close reconnaissance and spotter aircraft and for many other tasks. (80 images)

Percival Provost CD82

Airworthy, preserved example of the RAF piston engined basic trainer used in the 1950s. Full detail. (30 images)

Percival Mew Gull CD81

Famous 1930s racing and record setting aircraft that will forever be linked with the achievements of British aviator Alex Henshaw. (35 images)

North American T28 CD80

The advanced trainer aircraft that served in many air arms worldwide and also became a counter-insurgency ground attack aircraft. Examples illustrated are from France, where the type served for many years as the 'Fenec'. (100 plus images)

North American P51D Mustang CD79

The definitive bubble canopy Merlin Mustang. In detail, showing several restored examples. This is the Fantasy of Flight Museum's overpolished example, but the close-up detail is all there. (102 images)

North American P51B/C CD78

First of the Rolls Royce Merlin engine Mustangs, this collection depicts the Fantasy of Flight Museum's restored example, with overly polished plain metal surfaces. Much detail. (102 images) Also, 41 images of The Fighter Collection's P-51C in bare metal restoration, showing much surface and internal airframe detail. A real bumper bundle! (over 140 images)

North American B25 Mitchell CD77

Fantasy of Flight Museum's example. Photographed soon after superb restoration. Full nose to tail detail. (74 images)

North American AT6 Harvard CD76

AT-6, SNJ, Texan, Harvard – call it what you will. 55,000 were built – this example is in U.S. Army colours, with comprehensive close-up detail, nose to tail. (76 images)

North American A36 Invader CD75

The ground attack variant of the Allison engined P-51A. Photos, in detail, of the world's only airworthy example. (69 images)

Morane Saulnier MS406 CD74

French WW2 fighter that fought in the Battle of France, 1940. Swiss restored example (92 images)

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INDOOR SCALE AT SHAWBURY

By the time this issue of FSM goes on sale, we will be on the threshold of a new indoor flying season, for which the BMFA Scale Technical Committee are busy preparing for new indoor flying events, having obtained the use of the large sports hangar at RAF Shawbury, Shropshire.

One of the objectives of this BMFA initiative is the promotion of indoor R/C scale flying commencing with the first event due to be held on Sunday October 27th and will be a combined R/C and indoor free flight meeting with continuous flying from 10am to 6pm.

The Hangar at Shawbury is large enough to be partitioned in a manner to run the timed/duration (i.e. free flight) activity separately from scale flying which will include competitions classes for:-

- **Scale Indoor R/C Flying Only** (scratch built models) - for the new *RC Model Flyer* Trophy.

- **Scale Indoor RC Flying Only** (any R/C scale model to BMFA Rules) - Note that RTF and ARTF models are allowed as the builder of the model rule doesn't apply.

- **Scale Indoor Free Flight Flying Only** - open to any Scale Free Flight model built to BMFA Rules. i.e. Any Open Rubber,

CO2/Electric, Peanut, Pistachio, Kit Scale, etc model is eligible.

- **Peanut Scale** - for the Modellers Den Peanut Trophy

- **Pistachio Scale**

Contacts for the October 27th events are **Andy Sephton** (andrewjsephton@gmail.com) and **John Minchell** (j.minchell@btinternet.com)



NEW FREE FLIGHT SCALE COMPETITION CLASS

The BMFA Scale Committee has been working on a new **Outdoor Kit Scale** contest class for free flight rubber powered models, to be run at the Free Flight Nationals in May 2014.

The rules, set out below, have been formulated to be as unrestrictive as possible with the aim of attracting new participants, whether they be newcomers or from other disciplines.

This new class will be in addition to the existing *Aeromodeller/Model Aircraft* designs and the long established Open classes.

Outdoor Rubber powered Kit Scale

Aim: To provide a competition for kit scale models which rewards consistency of performance over duration, in order to attract new participants. There will be no judging of appearance, accuracy or flight realism.

Eligible models:

1. Any rubber powered scale aircraft kit ever manufactured
2. Competitors must bring with them the plan to prove eligibility if requested by CD or if a protest is made. A reduced size copy is acceptable.

3. The model should be built to the kit plan which may be enlarged or reduced.
4. Colour scheme is to be in keeping with the subject.
5. Models using a dethermaliser in flight, or any other mechanical or electronic device to limit flight time, will be disqualified.

Permitted modifications:

Minor modifications to the published design are permitted and may include the following:

1. Wings and tail can be detachable, with appropriate changes to structure.
2. Additional wing spars may be added and/or moved to the top surface.
3. Built up empennages in character with the prototype's design may be substituted for solid originals
4. The nose area may be changed to allow a removable nose block.
5. Any covering is acceptable.
6. Moving position of rear motor peg.
7. A plastic or balsa propeller may be substituted for the original, but it should have at least two blades and be non-folding in flight.
8. All manner of scale embellishments are permitted, including outline improvements (scale tail size & profile)

and details, provided the kit character is maintained.

Competition:

The competition will be held over a one hour time period to be decided on site. All flights will be hand launched from a 10m X 10m area designated by the CD. Competitors are invited to make three flights.

The flight score is the difference plus or minus in whole seconds from a target time set on the day by the CD. This will usually be 30 seconds. Competitors are required to record all their flight times to full seconds only (i.e. 23.6 seconds = 24 seconds) on a card supplied by the CD and must be timed by another competitor or appropriate person. There are no attempts, all nominated official flights count. If a competitor fails to return a score for a round, his nominal score for that round will be 100 secs.

The flight time difference of each of the three flights from the datum time is summed for each competitor and the results published in increasing order. The winner is the model with the lowest score.

In the event of a tie, the winner will be decided by a duration fly-off.



A .60 - SIZE P-47 THUNDERBOLT

Horizon Hobby already have an number of **Republic P-47 Thunderbolts** in their Hanger 9 ARTF kit range. Now there is another. This one is to 1:7.3 scale, with a wingspan of 67" (1702mm) and can be powered by a .60-.90 size glow engine, small petrol type, or electric power, all of which, the kit as supplied, will accommodate without the need for modification from standard.

During its service career, the P-47 went through a long line of variations and sub-variants. This one replicates the early P-47D-1 'razorback' version that was one of the earliest to enter service and is supplied finished the early 1942 colour scheme of 'olive drab' and neutral grey with a flat surface finish.

The kit comes with fixed main undercarriage that includes scale tyres and wheels, while other scale details supplied include a scale spinner nut. For those anxious for greater scale in-flight realism

there is the option of Hangar Nine's electrically driven retracting undercarriage and optional shock absorbing main undercarriage legs that enhance scale appearance and in further pursuit of scale realism, the two elevator panels use an internal joiner link to the elevator servo - no external control horns and push rod ends here!

Internal systems access to radio, fuel tank, control runs, batteries etc. is via a one-piece access hatch that runs from the engine firewall to the rear of the cockpit. This is magnetically secured and inside this area there are conveniently positioned hooks and mounting panels to aid systems installation.

Finally - a very thoughtful touch - the kit includes olive drab and neutral grey patch material, just in case a repair becomes necessary.

Price will be £269.99



Delectable Dewoitine

Brian Meredith Evans' pretty and very sprightly scratch-built

French 1930s and WWII military prototypes are scandalously under-modelled outside La Belle France. Yet, like a classic Citroen, these aircraft have that indefinable but quirky Gallic appeal in spades. One French beauty, the very pretty Dewoitine D-501 often gets overshadowed by her later, sleeker sister, the D-520, some-

times dubbed 'The French Spitfire'.

This is a crying shame, since the earlier D-501 and its perogressive developments that ended in the D-511, has her own undeniable charm.

The Prototype

When introduced in 1932, the full-size Dewoitine was considered an advanced



tine!

Dewoitine D-501 French fighter



design, with its cantilever monoplane structure. This relative sophistication is obvious when you compare it to its British biplane contemporaries, such as the Gloster Gladiator and the Hawker Fury. The Dewoitine could crack 250mph and was equipped either cannon or machine guns. In addition, the service ceiling of the type was 36,000 feet.

However, airframe design was advancing rapidly by the late 'Thirties. Consequently, the Dewoitine's operational life was very brief and was soon superseded by newer, more advanced, enclosed-cockpit, retractable-undercarriage, all-metal monoplane fighters. But, Emile Dewoitine's elegant design saw serious

action in the Spanish Civil War, and in China. Examples also served in locations as diverse as Dakar, Morocco, Lithuania, and the Emirate of Hedjaz. In addition, examples were sold to Japan, Poland, Great Britain, and the USSR.

The Model

Noted Welsh modeller Brian Meredith

Quirky Gallic styling marks out the D-501.





Evans admired the D-501 so much, he set about building his own.

He began with a Heller plastic kit, taking his design cues from the box. A little later he acquired a dog-eared three-view scale drawing and as his researches continued, he came across a

fine cutaway drawing on Bill Gunston's book 'Combat Aircraft'. Armed with these useful resources, Brian set about drawing up his own plan.

Construction

The model is of traditional construction,

built for lightness and accuracy. Brian carefully chose all his balsa and ply, with an eye on weight and local strength. In order to get into Brian's modestly sized family car, the whole wing, complete with lower forward nose section, radiator bath, and undercarriage, detaches from the

1: The outside finish of the undercarriage and spat. **2:** Inside finish of undercarriage with neat sprung oleos. **3:** Cooling louvres for the Turnigy 35/48 motor driving a 13x6 Turnigy wooden scimitar-bladed prop. **4:** Lots of detailing around the Rocker box cowling. **5:** Superb pilot was scratch built by Brian from polystyrene foam and balsa. **6:** Roundels were the only items bought in for the model!



Brian has captured the prototype very well.



fuselage. In fact, it will fit in his Honda Jazz fully rigged. Note also that the tailplane, fin and rudder are feature full airfoil profiles, not just simple flat sheet surfaces.

Oleos

Here and there, the whole model cleverly recycles everyday household objects.

For example, the undercarriage has fully functioning 'oleo' legs, replicating the full size. These utilise coil springs from Tesco Shower Spray bottle pumps.

Covering

Covering is 90% Steve Webb Models Toughlon Bright Silver iron-on shrink film (a bril-

liant material, says Brian). He also used some silver grey Solarfilm, sticky-backed aluminium foil, and aluminium take-away meat pie tray material for some scale detailing.

Metal cladding

Another unorthodox material Brian incorporated was the metal from an empty





Brian Meredith Evans with his scratch built Dewoitine.

MODEL SPECIFICATION

Dewoitine D-501:	1930s single seat all metal fighter (stand-off scale)
Scale:	1:7
Wingspan:	68"
Weight:	98oz
Wing Loading:	23oz / sq. ft.
Motor:	Turnigy 35/48 800kv outrunner.
ESC:	100amp Opto.
Battery:	4s 14.8v 3300mAh LiPo giving approx 8 to 10 min duration.

lager can. To access, Brian split the can (after first drinking the contents - naturally!), and turned it inside out. This revealed a beautiful shiny metallic surface. He cut this sheet into strips and it was then bent accordingly. For example, it was used to form the undercarriage leg fairings.

Brian makes a useful point about can metal: always make sure by reading the label that the can is aluminium based, and not steel, which would eventually rust.

Louvres and exhaust stubs

Aluminium tube, flattened in the vice, gives the oval exhaust stubs. The engine louvres are constructed from the afore-mentioned meat pie tray material. Most importantly, being truly scratch-built, all of the model was

built by Brian, only some of the decals were bought in.

Decals

The authentic Armee de l'Air roundels were supplied by *Pyramid Models*. The tail flashes and trident insignia of 4eme Escadrille du GCN II/4 (the simplest one! says Brian) were cut from Solartrim.

Pilot

The handsome and convincing pilot is carved from balsa and polystyrene foam. Superb.

Electric power

Brian was careful to give me the exact details of his electrical installation.

Accordingly, the motor used was a Turnigy 35/48 800kv Outrunner. The ESC is a BRC 100amp Opto. The motor battery is a 4s 14.8v 3300mAh LiPo supplied by Overlander. This set-up gives approximately 8 to 10 minutes flying duration.

Brian uses a separate Sanyo Eneloop nickel metal hydride battery to power the receiver, and does not use the main power pack, which is kept for motor power only.

Propeller

A key point is the propeller used. It is a wooden 13"x6" Turnigy 'Scimitar' type. The Dewoitine weighs 98oz, giving a wing loading of 23oz / sq. ft.

The Dewoitine looks especially impressive on low passes.



Flying notes

The very first test flight was carried out by John Charles of The Anglesey & District Model Aero Club. Brian used to fly full size aircraft and says he is lucky to be able to tell the tale, but the thought of the first flight of his pride and joy terrified him! Thus John stepped in. However, Brian now flies the D-501 regularly. He says that, to his great surprise, it is a very stable and enjoyable model to fly. As Brian says:

"There is nothing to compare with the buzz one gets from flying one's own creation ...". Quite so, Brian. ■



7: Note scale support struts and sprung tailskid. 8: Brian's electric installation retains a separate receiver battery for safety. See text for full spec.



Pretty as a picture, if a little boxy, the DH6 makes a slow fly past for the camera. Even the builder flies it slowly sometimes - usually while doing multiple touch and goes.

DH6

Part 1: A 48" span electric powered model designed by Peter Rake, with the prototype model built by Bjorn Terje Hansebråten

The simple lines of the DH6 have appealed to me ever since I built the not-terribly-accurate Walt Mooney rubber power model. The appearance, combined with how well the initial model flew, and what a straightforward build it was, have encouraged me to build more accurate versions in at least two other sizes. All flew just as nicely as the Walt Mooney model and, I don't think it would be out of place to say that I feel the 36" model was probably the nicest flying model I've ever designed.

So, when asked for some new designs, and armed with the *Albatros Datafile* as reference, it wasn't too surprising that a larger, far more



accurate rendition of the DH6 should emerge. The model you see here, in fact. The prototype, suitably

overpowered and in the hands of Bjørn, has proven far more aerobatic than I would have imagined possible from such a staid looking full size. Consecutive loops, Cuban eights, sustained inverted flight, rolls and even knife-edge flight have all been performed by the prototype model. All highly non-scale, but proof beyond doubt that the model flies very well indeed. Sticking with the power set-up shown on the plan will provide a far more sedate performance, just as you'd expect from a model of a trainer aircraft.

Although primarily used as a basic trainer, the DH6 did see limited service doing coastal patrols and anti-submarine sorties. Therefore, if you wish to dress up your model with guns and bombs, that wouldn't be out of place as long as you also give it the correct markings for an aircraft used in this role. The model is accurate enough for you to add as much detail as you like, but doesn't have to be draped in 'twiddly bits' to look effective. Some rigging (not required for structural support), a dummy engine (mandatory on a model of this kind) and a pilot figure will add all the realism required for a regular flyer.

The build

Because of the simple basic shape of the model there is nothing particularly complicated involved with building it.

In fact, probably the hardest part to do will be the cowl scoop and dummy cylinders.

Since virtually everything else is a straight piece of balsa or



The main components of the forward fuselage box; the 3/16 balsa sides. Note the cut outs for the struts and control cable exits.



The firewall, with the motor mount attached. Make sure you get the right parts in the correct place.



Working over the plan to get the break angles at the tail correct before actually joining the tail-posts.

hardwood the basic airframe can be assembled quite quickly. Even quicker still if you have the foresight to purchase the laser cut parts set that the publisher will almost certainly offer.

The cowl

Since I specifically mentioned this as being one of the most complicated areas of the build, it seems like as good a place to start as any. At least once this area is built you will have a good incentive to build the rest of the model to go around it. Because it is such a vital part of the overall appearance, and the model would look naked without it, I'll go into a bit more detail about creating it.

The first thing to notice is the scoop itself. Because there are large areas cut out of it to clear the cylinders, it is vital that you do a good job of pre-shaping the material used. Thin ply can be used, but is more difficult to get to stay in shape once the cut outs are made. Therefore, if you have any doubts about your ability to pre-form the ply, use thin aluminium sheet for the scoop. Either way, curve it as shown and then cut away the indicated areas. Trying to cut them out and then shape the scoop is likely to prove an exercise in frustration.

Worth mentioning is the less accurate option of simply sticking the cylinder to the outside of the formed scoop. However, since the cylinder parts should form part of the set of parts, it isn't that much of a hardship to go for the more

detailed looking original option.

So, with the options laid out for you, let's make a cowl. Lay parts C1 over the plan and glue in place formers C2 and C3. Ensure the formers are perfectly upright and fit the 1/16" balsa over formers C3. Fit some 1/16" ply plates to attach the cylinders to and then glue in place the formed and cut away scoop.

Now make up the dummy cylinders. If using the cut parts assemble the indicated number of balsa and ply discs onto a suitable rod (1/8" dowel?), apply glue and allow to dry. Fill and sand well to remove any trace of grain and then trim all cylinders as required. Join them with the wire joiner (otherwise the front cylinder is suspended in space) and add any detail you feel like including.

Repeat the filling/sanding on the cowl itself and glue your cylinder banks in position. That's it, the most complicated part of the entire model built. Make up and attach the remaining upper engine details after you have a model to which to attach everything.

Fuselage

After making the cowl assembly, this should go pretty quickly and require a far less detailed description. Please note that it isn't a horrendous error on the drawing, the rear decking really did transition from rounded to flat topped in that way. Not pretty, but accurate.

The basic construction follows my normal practice of being two box structures, built



Despite the number of ribs (and Bjørn cut his own kit of parts) the simple nature of the model is evident here.



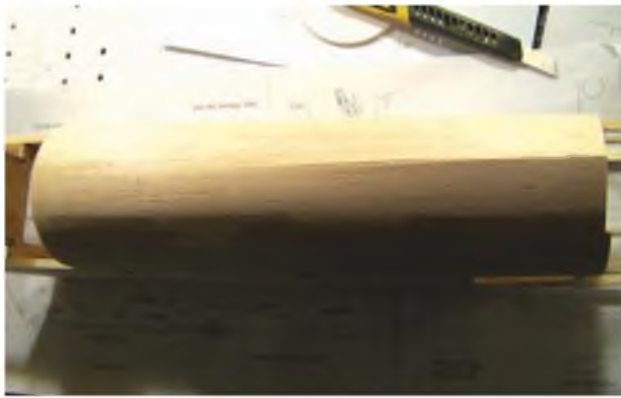
separately and then joined. I just find it the easiest way to produce a straight, square fuselage. Since the alignment of the top wing relies upon that, it seemed a sensible way to go. The fact that the original DH6 was such an angular little beastie aids us in this respect.

I like to get the centre section (c/s) struts glued into the sheet sides right from the outset - while they can be assembled directly over the plan. Others, however, prefer to get the decking in place and then cut that away to allow the struts to be added. The strut doublers allow you to use either option but whichever route you take, please take the time to ensure that the struts do align correctly.

I don't intend to insult you by telling you how to build balsa boxes. If you can't manage that you probably won't have got this far anyway. What I will describe is how I like to fit sheet decking areas around cockpits. Especially when there is such a marked difference in height between the front and back of said cockpit. Since the front section of decking needs to run parallel with the top of the fuselage side, but the rear doesn't, cut your decking sheet as if it were parallel along the entire length the same width for its entire length. Now make a slightly undersize cut out for the cockpit and slit through the section (at the centre) that will be behind the cockpit opening.. Glue the front around the former and the bottom edges to the fuselage sides, still working as if it were straight along the whole run of decking. This will ensure that the front portion does, in fact follow the line shown on the plan.

Next, curve the rear sections over F3A and F4, but don't glue them in place until you have trimmed the centre for a precise fit. Once these ends are glued in place onto the formers (and to each other) your decking should follow the line shown on the plan precisely. Open up the cockpit to the correct size and the task is completed.

It takes a little getting used to that the rounded forward decking suddenly changes to these rear fuselage formers.



Although Bjørn didn't use a cockpit cut out to aid shaping the decking, the split rear end is obvious. (see text)



They may only be thread wound paper tubes but the dummy cylinders will add a lot of realism to the finished model.

Add the rear formers and stringers, but make sure you trimmed the taper onto the top longeron (where the tailplane fits) first. Positive incidence on the tailplane is so much more effective than down elevator trim when it comes to preventing the tail 'drooping' in flight. That taper is much easier to do correctly if there aren't formers in the way while you're trying to use the razor plane.

Binding the undercarriage (u/c) wires in place is much neater if done after the fuselage is covered, so it's a good idea not to fit the cockpit floor just yet. Equally so, you could use P clips and U clips (front legs) and fit the u/c to a completely finished fuselage. The battery access hatch allows you to bolt the U clips in place and small screws work perfectly well for retaining the P clips holding the rear u/c legs.

My last warning here involves the motor mount parts. Note that down and right thrust is built into them, so PLEASE make sure you get them the right way round. Up and left thrust will do nothing at all to improve the way your model flies - for the brief time it actually remains in the air before turning itself back into a kit of parts.

Landing gear

Apart from the dreaded wire bending, there isn't too much involved with making the u/c. Bend up the 10 swg main legs, pin/tape/screw them to a board marked as a jig, bend the joiners, bind them together and solder the joints. That gets the basic wire work out of the way. Now we need to fair them in if our model is to have a scale looking u/c.

To make up the fairings I would suggest building four half fairings over the plan - two left and two right sets. Position these against the wire parts and mark precisely where you need to groove the inner face of each assembly, so they'll enclose the wire once glued in place. Take care during the

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grooving process because you will be getting awfully close to cutting right through the bass struts. Once they are securely glued to the wire the bass struts can be sanded to a nice streamline shape, while the ply parts have the edges rounded off to represent what would be metal fittings on the full-size aircraft.

Solder a couple of washers onto the axle after it is slid through its' slot, to prevent it moving from side to side in use. It will work best if these washers are outside where the elastic suspension cords will come so they can't cause the wheels to bind if there are any side loads during take-off or landing.

As regards those wheels, the ones shown on the plan work really well on models of this size and weight so don't discount them too quickly. Although I'm not sure of availability of the foam rubber cord these days, rubber tubing works just as well.

The parts are included in the laser cut set, so it seems pointless to buy wheels when you can make lighter ones that are tough enough for all but the heaviest of landings (read controlled crash). Glue the main wood parts together, alternating the grain direction, using PVA adhesive to provide a tough assembly and using the brass tube bearing to aid alignment. Don't be tempted to use CA glue as it sets too brittle. Once completely dry, use epoxy to fit the bearing tube and the



The u/c wires neatly concealed within their wooden fairings. Note the axle slot that allows suspension to be added.

ply doubler.

Cut a thin card disc, using the slope shown on the wheel drawing as the radius of the circle and score spoke positions onto it using a ballpoint pen (from the rear of the disc. 16 spokes looks about right once the wheel is finished. Remove one

spoke segment, crease the cone along the other spoke positions and join the ends. Glue the cone to the wheel after the wheel has been secured on the axle.

Next month we'll look at completing the model, covering and finishing it and how it flies. ■

Posing in the Norwegian sun, Bjørn's model shows off the simple lines of the DH6.



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Ponnier 1913 Racer

Model designed by Peter Rake for electric power of the pioneer era racing plane 50" wingspan. Published in FSM December 2006 and January 2007 issues 85 and 86 4 sheet plan.

Plan: £24.95
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PLAN384

Peter Rake Series



White Monoplane 1919

Peter Rake's simple to build sport scale model for 3 channel RC and geared 400 electric motor power wingspan 40.5". Published in FSM December 2002 issue 37 2 sheet plan.

Plan: £14.95
Cut Parts: £125.00

PLAN420

Peter Rake Series



Bristol Scout Model 'C'

A 26.1/2" wingspan, sport scale model designed by Peter Rake for IPS electric power, LiPo batteries and three-function control. Published in FSM September 2010 issue 130 2 sheet plan

Plan: £19.95
Cut Parts: £50.00

PLAN352

Peter Rake Series



Pfalz EIII

A 30" scale model of the early WWI Scout aircraft. Designed for electric power by Peter Rake. Published in FSM October 2011 issue 143.

Plan: £9.95
Cut Parts: £35.00

PLAN347

Peter Rake Series



Sperry Messenger

A 30" span, 1/8th scale model designed by Peter Rake for electric power. Published in FSM December 2009 issue 121 2 sheet plan.

Plan: £14.95
Cut Parts: £50.00

PLAN359

Peter Rake Series



Rumpler Taube

Two sheet plan of the 30" Rumpler Taube by Peter Rake for electric power published in September 2012 (issue 154).

Plan: £9.95
Cut Parts: £39.00

PLAN336

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Dornier D.1

Dr Mike Hawkins 38" span 1:6 .86 sport-scale model of a little known German WW1 fighter, for .40-.60 cu.in engines and four-function RC. Published in FSM October and September 2006 issues 82 and 83 4 sheet plan

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PLAN386

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CUT PARTS

Sopwith Dove

An easy to build 49" wingspan for .25 to .29 cu. Engines and three function RC by Norman Holme. Published in FSM January and February 2006 issues 74 and 75 3 sheet plan

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PLAN390

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Bowers Fly Baby Biplane

A 54" (1372 mm) wingspan sport-scale RC version of the Pete Bowers home build biplane for .61-.91 cu.in engines. Published in FSM November 2012 issue 156.

Plan: £29.95

Cut Parts: £135.00

PLANMF51

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Chilton DW 1a

This 1/3rd scale version comes from the expert design board of Phil S.Kent and has been built in several sizes. This 96" (2438mm) version features flaps as per the fullsize, suits 1.5 to 1.8 cu.in. four stroke engines, and five function R/C systems. 2 sheet plan

Plan: £22.50

Cut Parts: £125.00

PLAN303

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CUT PARTS

Corben Super Ace

A 50" (1270mm) sport-scale model of the delightful American homebuilt aircraft, 1/6th scale replica suits .26-.30 four stroke engines, or .20-.25 cu.in. two strokes. Four function radio systems required

Plan: £19.50

Cut Parts: £65.00

PLAN275

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CUT PARTS

Curtiss Hawk P-6E

A replica of the flamboyant 1930s American biplane fighter aircraft with a very elegant shape. 1:6.4 scale model spans 57" (1450mm) and suits .50-.60 size engines. Conventional wood construction throughout and requires four function radio control. Two-sheet plan

Plan: £19.50

Cut Parts: £90.00

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Airco DH 6

‘THE CLUTCHING HAND’

A 1:6.6 scale model with a wingspan of 64" (1626mm), for .45 to .61 engines and four channel radio. Designed by Don Luck

The 1917 Airco DH6 was produced as an elementary training machine for pilots. Cheapness, simplicity and strength of construction, together with ease of repair, plus a low

landing speed, were of utmost importance. (Not a bad specification for an ideal model aircraft perhaps?)

Captain Geoffrey de Havilland's design was his first training aircraft and was

remarkable for its low speed characteristics, a maximum speed of 75mph and a landing speed of 30mph! This probably accounted for its nickname of 'The Sky Hook' or sometimes 'The Clutching Hand', perhaps a



“Switches off, about to suck-in”. What - no chocks? Cockpit figure here represents Cadet R.E. Luck.



Heart of the fuselage construction is the front crutch assembly. It is first check-fitted to the fuselage sides and then permanently glues together.



Top fuselage decking is shaped to size, but not glued in place until the cabanes have been bound and glued.



Inverted here on the workbench. The top wing entire section is permanently fixed to the cabanes. Note lightning holes to save weight. Outer wing panels, top and bottom are also permanently rigged.



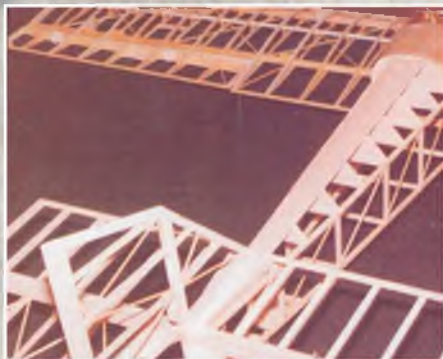
An elderly Merco 61 (yes, there are still some around!) provided more than necessary power for the prototype model. A .46 or .51 engine would be quite suitable.



View of the partially completed fuselage frame reveals the access to the radio compartment.



The airborne radio system is accessed via the hatch in the fuselage underside and provides plenty of installation space.



Two views of the finished basic airframe. For those who enjoy the art of 'balsa bashing', Don Luck's DH 6 should provide hours of bench time enjoyment.



Instrumentation in the cockpit is rudimentary. Note the wicker instructor's seat, similar to that occupied by the student pilot.

reference to its aerofoil section?

It also featured an ingenious quick-release dual control system where the instructor could over-ride the pupil via a single lever that operated ailerons, elevator and rudder, an early 'buddy' system? (Perhaps D.H. had a white-knuckle pupil freeze on the controls - we've all been there!)

The model represents my father's aircraft on which he soloed, in Egypt, in 1918. Hence the choice of colour scheme and markings.

The model retains the simplicity of construction that was a feature of the full size aircraft, with all wing panels identical. Its tail moment and area give it solid stability and all control surfaces are effective down to walking speed (well, perhaps an ambling trot). The permanently rigged two-bay wings are simply retained by four clips each side, so there is no chance of losing nuts or bolts when assembling.

With a Merco 61 for power and 13" x 6" propeller, flight tests were a delight. Initial P.I.O. (pilot induced oscillations) illustrated just how powerful the controls were and the control surface throws detailed on the plan can be regarded as a minimum. Final C.G. position needed 6 ozs of ballast under the cowl and if built to a weight of 8lbs as per the prototype model, it will fly at approx 13 oz/sq ft wing loading.

It is not necessarily just a calm weather model and has coped with gusty 15-knot winds. In fact, a breeze enables the fabled walking pace to be achieved!

Building is a breeze...

Building instructions in depth should not really be necessary, but a few pointers will avoid problems.

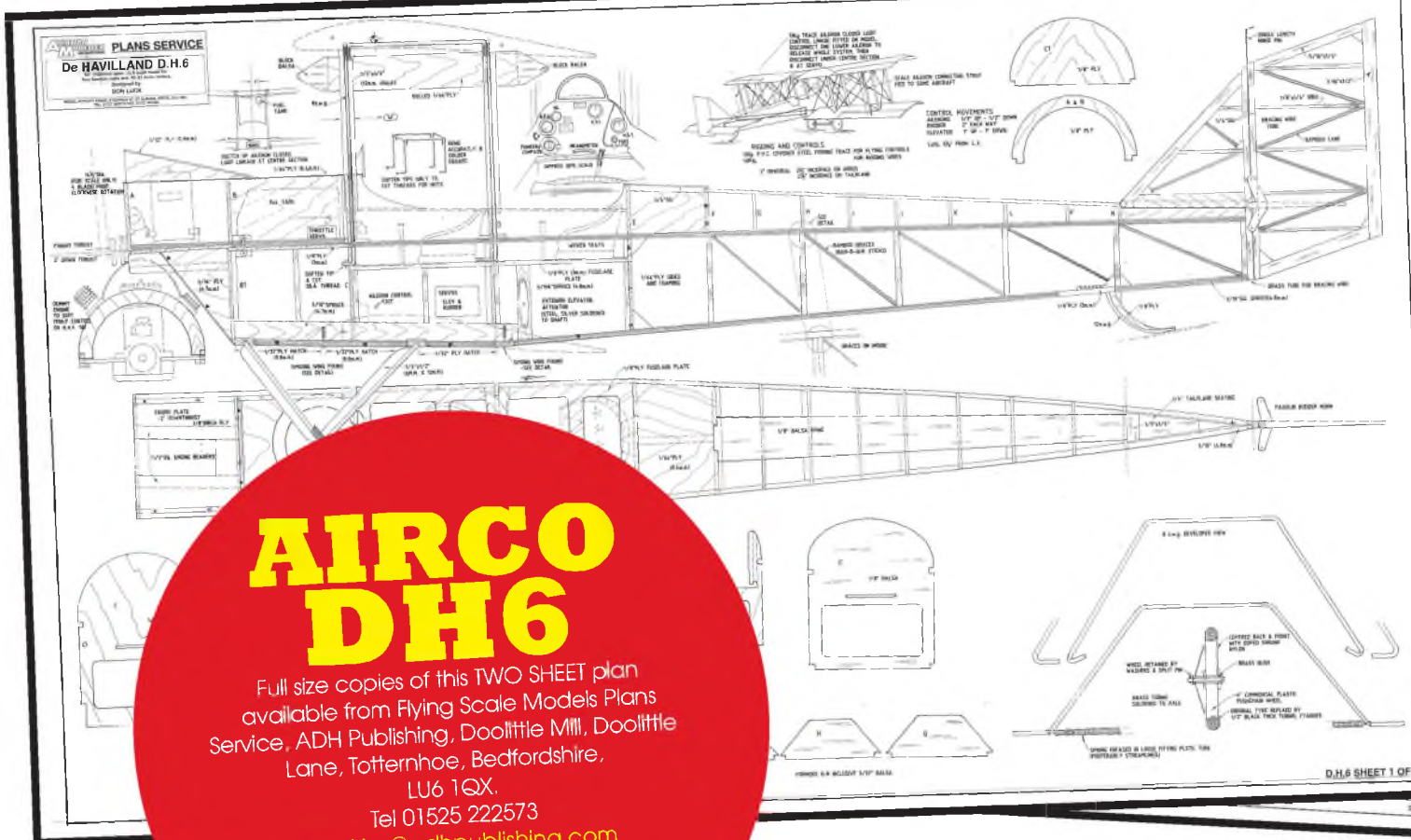
1) If using 36ins lengths of 3/16"sq. spruce

for the fuselage longerons, cut to length with staggered joints of at least 3/4in. splice.

2) While the second fuselage side is still pinned to the board, dry fit formers C and D, sliding in the cockpit floor before fitting former E, trim and adjust until exactly square. When satisfied all fits exactly, remove all formers, glue thoroughly and refit checking with a 'T' square. Use clamps and weights to secure all in place and leave to dry before removal and fitting remaining cross pieces etc.

3) Construct the cabane with 8swg wire work separately, again ensuring squareness. Bind the four joints with fine bright florist's wire and solder thoroughly (soft solder will do). The easiest way is to use a fine jet butane blowlamp and allow the work to heat and flow the solder into the point(s).

Check fit into the fuselage via formers C and D, drill using small holes for binding to



AIRCRAFT DH6

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formers (using thick black soft florists wire), but do not fit yet!

4) Shape cockpit decking using the plan pattern, glue bamboo strips in place either side, fit cabane structure in place, first tucking the rear cabane legs into the cockpit cut-out. Leave this cockpit decking hanging loose while the cabane is bound and fitted permanently; only then glue the ply decking in place. The relatively simple construction and very easy flight characteristics suggest this could be an ideal

first WW1 scale model for the modeller who has at least achieved aileron competence.

5) Do not forget to install the closed loop aileron control wires in the wings before covering! The top closed loop part of the circuit is connected by open hook-and-eye, joined to the bottom ailerons with 11 gauge nylon trace line when the aileron servo is set at neutral and all surfaces are clamped level. To release tension of the closed loop circuit in order to release the wings, just unfasten one of the lower aileron connections.

6) Detailing is a personal choice. There is plenty of space in the engine cowling for an extensive dummy engine; the 100 hp Curtiss or RAF engines were used and the cockpit cries out for full instrumentation and wicker basket seats - although 'full detail' might be something of an exaggeration for an aircraft where the cockpit instruments were in fact a very bare minimum! The instruments were grouped around the edge of the single instrument panel in the front cockpit, presumably to enable the instructor behind the pupil to keep an eye on things!



Date and Hour.	Pilot.	Machine Type and No.
11-10-18	PRATT	DH6 2040
14-10-18	PRATT	DH6 2042
15-10-18	PRATT	DH6 2042
6-11-18	PRATT	DH6 2042
15-10-18	SELF	DH6 2042
07/18-07/40	SELF	DH6 2042
16-10-18	SELF	DH6 2042
		TOTAL TIME
		TOTAL TIME

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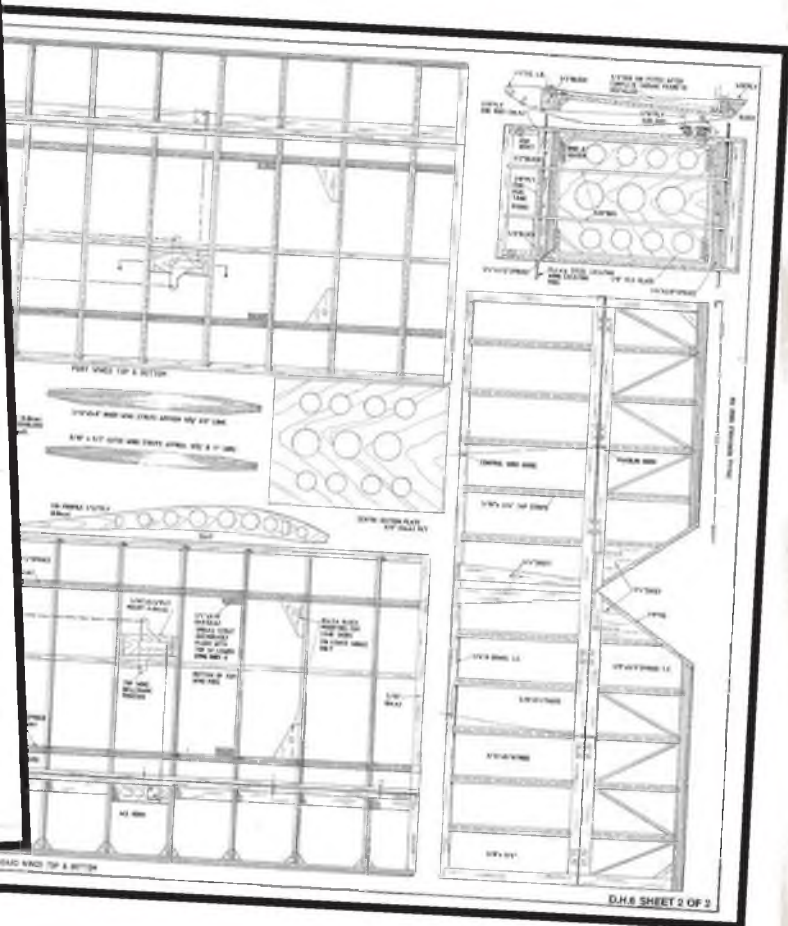
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REFERENCES:

De Havilland; 'the Golden Years' (Flight Special)
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Air Extra No.10

Few aircraft can have been blessed with so many nicknames, most of them derogatory. In addition to those quoted by Don Luck. A few of the repeatable descriptions include 'Dung Hunter', 'The Crab', 'The Flaming Coffin' and 'The Chummy Hearse'.

Despite these scurrilous epithets, it served well as a trainer in a number of combat theatres. ■

Passenger.	Time.	Height.	Course.	Remarks.
SELF	40'	500.	Aerodrome.	Taking off handings
SELF	25'	500.	"	Taking off handings
SELF	20'	500.	"	"
SOLO	25'	1000	"	Launched 1 handing
SOLO	40'	600.	"	# handings.
WEEKLY SUMMARY				
FOR WEEK ENDING 11.11.18		DUAL + SOLO		
SINCE JOINING		1 hr 25' 1 hr 50'		
		4 hr 15' 1 hr 60'		
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AIRCO DH 6

At a time when Royal Flying Corps pilot training was not particularly regularised, Geoffrey de Havilland created this purpose-designed trainer aircraft



No wonder the Airco DH 6 had such a low maximum speed - the mass of interplane struts and unstreamlined wire rigging saw to that! Note also the tandem seat bathtub cockpit for instructor and pupil. This example has the 'trade-mark' rounded fin/rudder assembly that was applied prior to the 'mass-production' square-cut shape and thus may have been a prototype or very early example.

The De Havilland name has been associated with trainer aircraft for much of its existence, best known, nowadays, for the DH82 Tiger Moth of the 1930s and the DH (Canada) DHC-1 Chipmunk of the 1950s, but previously, also for the DH 60 Moth series on which so many 'Club' pilots cut their teeth from 1925 onwards when the DH 60 first appeared.

However, Geoffrey De Havilland's association with training aircraft goes back much further, commencing with the Airco DH 6 that first flew in 1916 and can fairly be called the first purpose-designed military trainer aircraft.

So why Airco?

The *Aircraft Company* was founded in 1911 to sell and maintain Farman aircraft

at Hendon, north of London but was later renamed The *Aircraft Manufacturing Company*. Its founder, George Holt Thomas, was a business man without engineering knowledge who first met de Havilland at Farnborough when the latter was looking for a new career opportunity. Agreement was soon reached that Holt Thomas' company should start manufacturing de Havilland-designed

Another view of the very early DH 6 with the graceful 'trademark' de Havilland rounded fin and rudder assembly.



The nose profile of this DH 6 features a blunt 'flat-face' radiator typical of other aircraft of the period and may well had a Curtiss OX-5 engine installed.



and were interchangeable top-to-bottom wing. (Hence the roundels in unconventional positions on many wartime photographs of the type.) The wings used a heavily cambered aerofoil, and were braced with cables rather than streamlined wires.

On the original version of the type there was no wing stagger and while the rudder on the prototype featured the distinctive curved de Havilland outline, on production machines it was cut square. The fuselage structure was a straight box with no attempt at refinement of outline - instructor and pupil sat in tandem on basketwork seats in a single cockpit that was quite bare, even by the standards of the time.

Standard engine was the ubiquitous and readily available 90 hp RAF 1a which, because of its use in the B.E.2, had the advantage of being very familiar indeed to RFC mechanics. It was stuck onto the front of the DH.6 in the most straightforward way possible, without any type of cowling, and the usual crudely upswept exhaust pipes of this type of engine were fitted. Eventually, even stocks of the RAF 1a ran short, and various other engines were fitted to DH.6s, including the 90 hp Curtiss OX-5 and the 80 hp Renault.

The second design criterion was that the new trainer should be 'safe' to fly, both for a new pupil and his instructor. One way to obtain this safety was a 'decoupler' on

aircraft and in 1914 Geoffrey moved to Edgware and started work at the Airco factory at The Hyde, Hendon.

When World War One began in 1914, de Havilland was a Lieutenant in the Royal Flying Corps Reserve. He was called up, but was fit only for home duties because of the effects of an earlier flying accident and he served only briefly at Montrose in Scotland, flying Bleriot monoplanes on anti-submarine patrols from Aberdeen to the Firth of Forth. The War Office realised, fortunately, that he was of more use designing aeroplanes, so he was recalled to London and promoted to Captain.

Once back at Airco, de Havilland started designing aircraft. The designs that

flowed from his drawing board began to be called 'de Havillands' and carried type numbers prefixed by 'DH'. It is not now known how the 'DH' prefix came into being, but it stuck and everyone used it.

Purpose designed ...

The DH.6 was specifically designed as a military trainer, at a time when it was usual for obsolete service types to be used in this role. Geoffrey de Havilland seems to have had two design criteria in mind the first was that it should be cheap and easy to build, and above all, simple to repair after the mishaps common in ab-initio training. The top and bottom wings were identical, of constant chord, square cut,



This Airco DH 6 was operated from Padstow, Cornwall on anti-submarine duties and for that task, would have been manned only by the pilot.

the dual controls, so that the instructor could take control at any time without having to wrestle with a panicking pupil.

Another route to the desired safety was through the new trainer's flying characteristics. De Havilland's work at the Royal Aircraft Factory, where much basic research had been carried out into the nature of stability and control in aircraft, left him well qualified to design a 'safe' aircraft. In the event, the DH.6 had very gentle flying characteristics; it was probably the most forgiving aircraft of its time, allowing itself to be flown 'crab wise' in improperly banked turns, and being almost impossible to stall or spin, as it was able to maintain sustained flight at speeds as low as 30 miles per hour (48 km/h).

In fact, the DH.6 has been frequently described as 'too safe' to make a good trainer; this referred to its gentle reaction to inexperienced piloting rather than to excessive stability however, as it was designed with a degree of inherent instability about all three axes.

The aircraft's low power, strong but rather heavy construction and lack of streamlining, made for a very low maximum speed, even by the criteria of the era.

Wartime production

At least 2,280 DH.6s were built in the UK during the WW1 period, out of orders totalling about 3,000. Besides Airco, batches were built by Grahame-White, Kingsbury Aviation, Harland & Wolff, Morgan, Savages, Ransomes Sims & Jefferies, and Gloucestershire. A single DH.6 was constructed in July 1917 by Canadian Aeroplanes Ltd. as a prototype for projected production should availability of the Curtiss JN-4 prove inadequate and was the first British-designed aircraft built in Canada. In the event, there was no shortage of 'Jennies', and it remained a one-off.

Operational history

Training of RFC pilots began to be revised during 1917. The *School of Special Flying* at Gosport in Hampshire was established by Maj. Robert R. Smith-Barry with the aim of making flight instructors into specially trained experts. Thus, rather than

entrusting the instructor task to novices who had barely completed their own training, there was a move to use operational pilots being 'rested', to recover from combat fatigue.

By the end of 1917, the Avro 504K was adopted as the standard trainer and the DH.6 became 'surplus' as far as the training role was concerned.

At the end of 1917, about 300 DH.6s were transferred to the RNAS for anti-submarine patrols. While far from ideal for this work, the type proved surprisingly 'seaworthy', being known to float for as long as ten hours after ditching.

On operations, the underpowered trainer had to be flown solo, to allow a token bomb load to be carried. The built-in instability designed to keep a student pilot alert proved tiring for pilots on long patrols over water, and experimental changes were made in mid-1918 to improve stability. These included the introduction of 10 in (25 cm) of back-stagger to wings of reduced chord and camber, with narrower elevators and rudder. DH.6s modified to this standard were unofficially dubbed DH 6As.

Over 1,000 DH.6s were still in service in second line roles with the RAF at the end of the war.

Postwar and civil use

There was no place for the DH.6 in the postwar RAF, and surviving examples of the type became surplus. In 1919, many were sold to civilian operators - especially for 'joy riding'. Some were exported as far as South Africa and Australia, where they could still be found flying into the late 1930s.

SPECIFICATION

Length: 27 ft 31/2 in (8.32 m)
Wingspan: 35 ft 11 in (10.95 m)
Height: 10 ft 91/2 in (3.29 m)
Engine: 1 x RAF 1a air-cooled V8 engine, 90 hp (70 kW)

PERFORMANCE

Maximum speed: 70 mph (61 kn, 113 km/h)
Stall speed: 40 mph (35 kn, 64 km/h)
Rate of climb: 225 ft/min (1.1 m/s)
Endurance: 23/4 hours

ARMAMENT

Usually none - although a few small bombs sometimes carried on anti-submarine patrol.

OPERATORS

Australia: Australian Flying Corps
Greece: Hellenic Naval Air Service
Spain: Spanish Air Force
United Kingdom: Royal Flying Corps / Royal Air Force/Royal Naval Air Service

Some 60 aircraft were licence-built in Spain from 1921 onward with Hispano-Suiza 8 engines, refined fuselages that included separate cockpits, and rounded 'de Havilland style' rudder/fin assemblies. At least some of these found their way into the inventory of two Spanish Air Force training establishments.

A D.H.6 became the first powered aircraft to be owned by a British Boy Scout Troop, when it was presented to 3rd Hampden (Middlesex) Scouts in 1921. ■



The eight-cylinder RAF 1a engine installation that applied to most DH 6s.



A different interpretation of the 'strickly-need-to-know' principle! The cockpit instrumentation was absolutely minimal.



Easy dies it! A sedate lift-off for instructor and pupil.



PETER RAKE PRESENTS HIS PINT-SIZE SPERRY MONOPLANE, WITH FULL SIZE, PULL-OUT CENTRE SPREAD PLANS. (PART 1).

Here we go again, another instalment of electric flight excitement. However, as promised last time, I actually get to write this one myself – all of it.

Since the little Eastbourne Monoplane feature from a few months back proved so popular, I've decided to treat you all to a similar sort of column. Instead of my usual waffle, this month's column will just be a construction article to go with the first part of the full size plan that appears elsewhere in this issue. Good or what? Not only do you get to see me writing my own column, you get a free plan to boot.

The model

Once again this is a scaled down version of an already successful design. This one, however, is intended to use a Vapor receiver 'brick', brushed motor and single cell LiPo. The plan shows a *Nine Eagles* motor unit, which is pretty much like many of the *Parkzone* units. It also shows an alternative motor plate (MM) to suit the motor I actually used in the prototype model – an AEO 7 mm unit. This proved adequate for my model, so if you opt for the larger motor you'll have no problems with regards sufficient power.

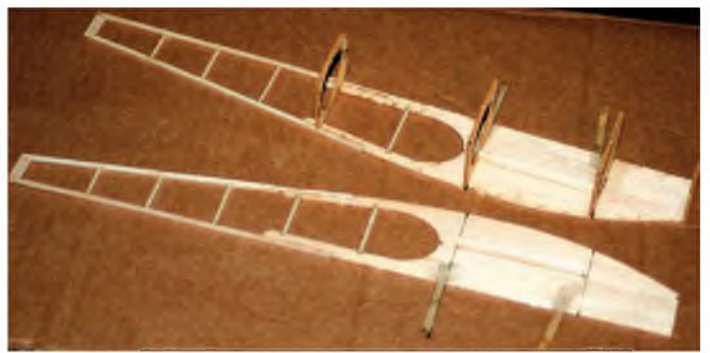
One thing that you will notice in the photos is that I used some 1/32" ribs in my wings, but the plan shows all 1/16" ribs. Similarly, my model has balsa trailing edges, but the plan shows bass. The reason for these changes is that as the tissue shrunk, my original wings buckled quite badly. They didn't just warp; they almost destroyed themselves. Ribs buckled and trailing edges actually broke

Printed tissue finishes allow the addition of as much detail as you like without adding any weight.





Totally conventional, the fuselage sides are built over the plan in the usual way.



Former positions marked and formers, radio mounts and strut position fill pieces added before joining the two sides.



How the u/c assemblies will eventually fit into formers F2 and F3.



The sheeting between F2 and F3 will need to be slotted for the U/C legs to fit into.

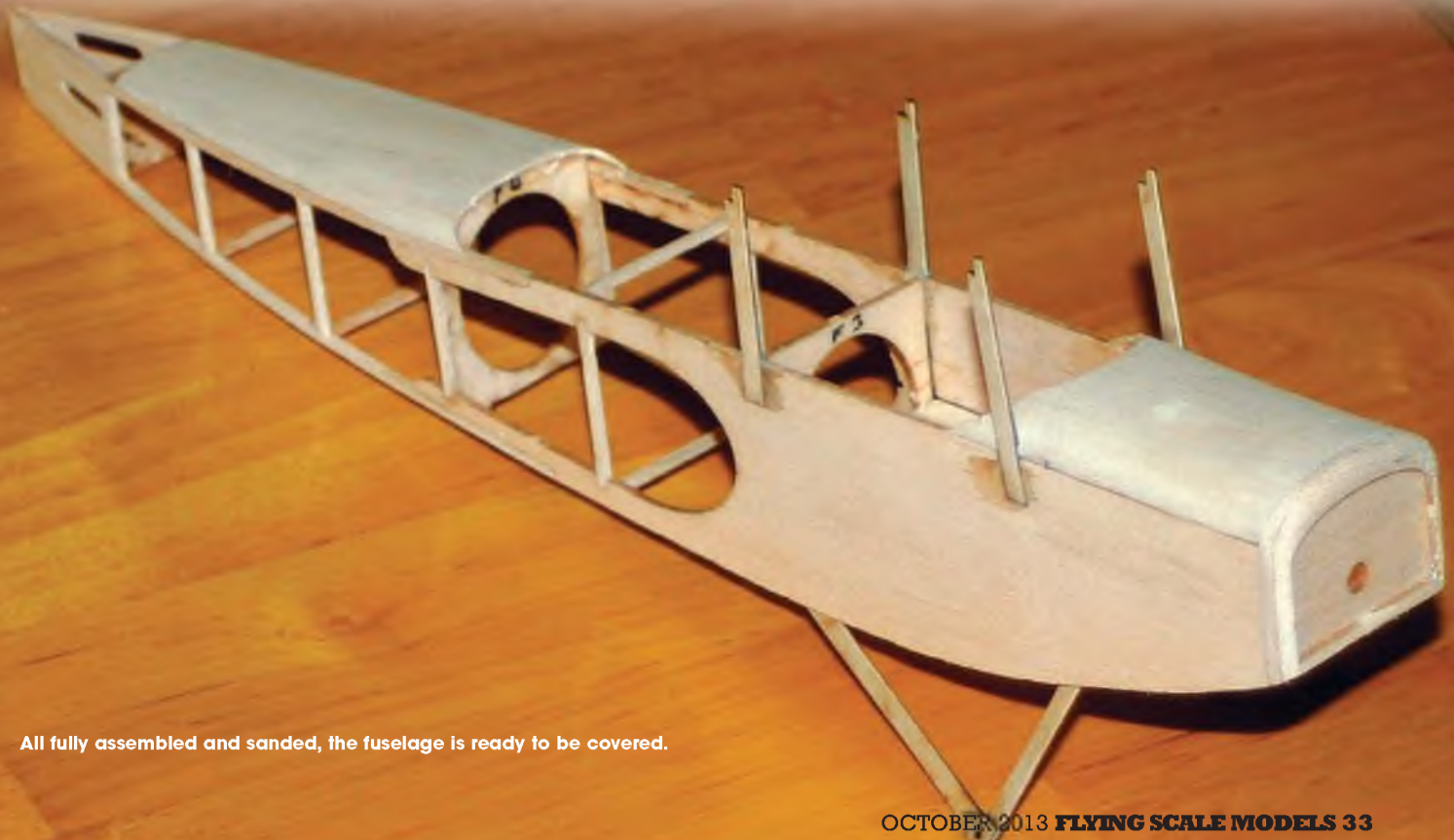
in places.

Because I can't specify very hard balsa for the laser cut parts, the publisher will doubtless offer, bass is a good option for trailing edges and the thicker ribs should make your life easier all round.

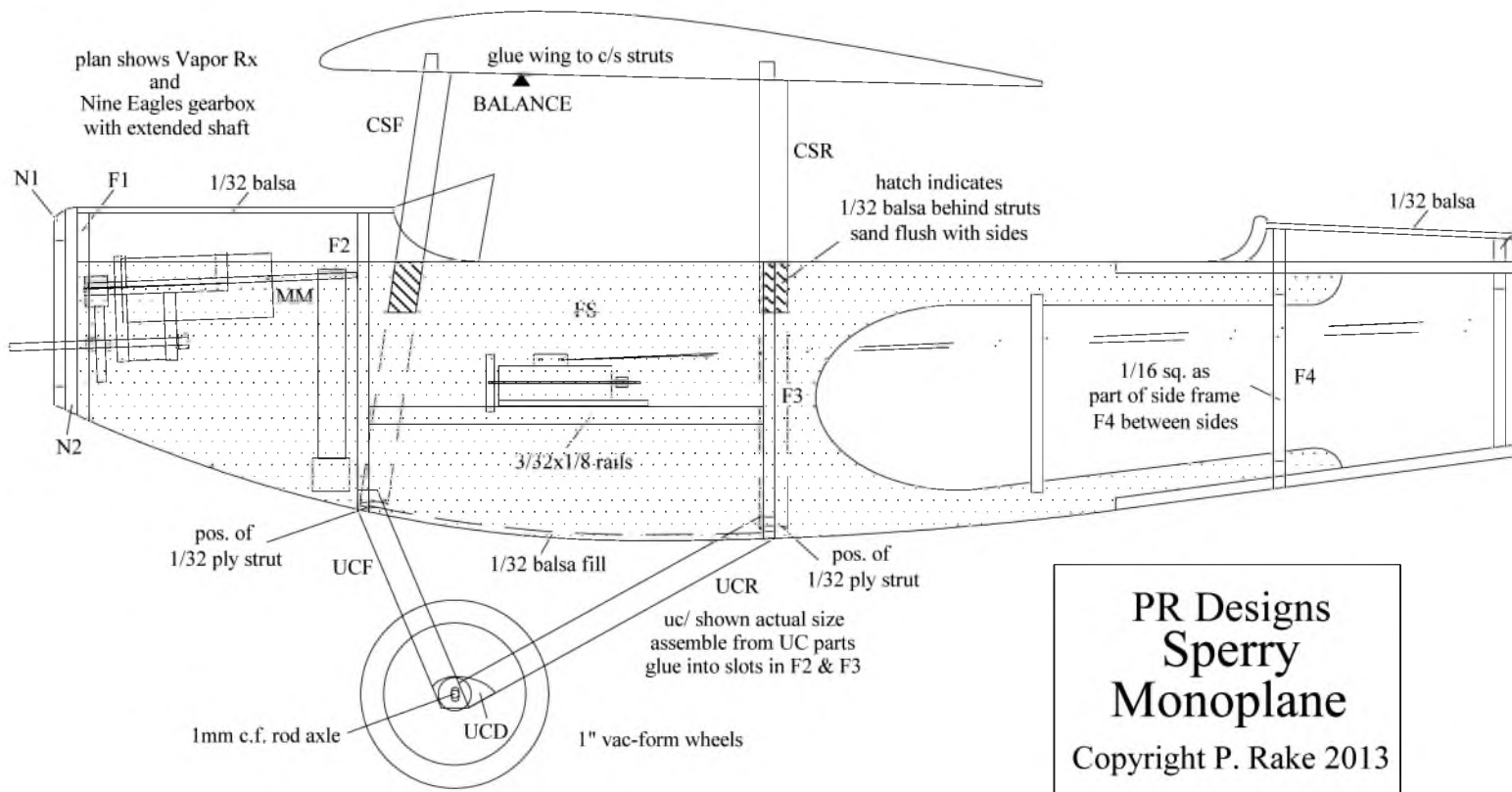
At just 18" wingspan, you are going to need to keep the model light. Even with the replacement trailing edges (from the hardest balsa I could lay my hands on) and heavily repaired ribs, my model came out at a respectable 35.5 grams ready to fly.

Let's get building

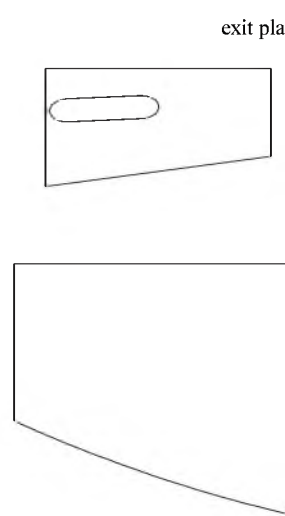
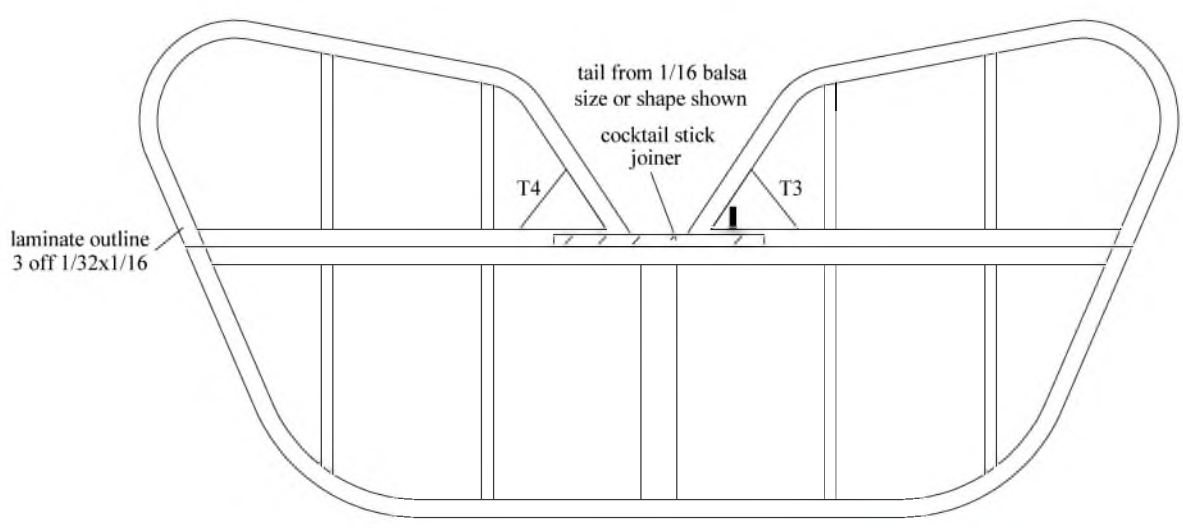
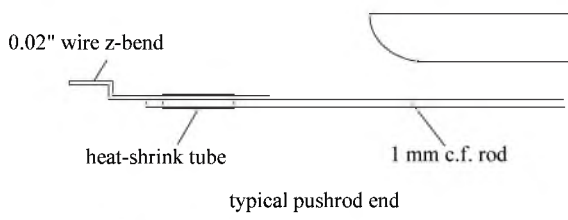
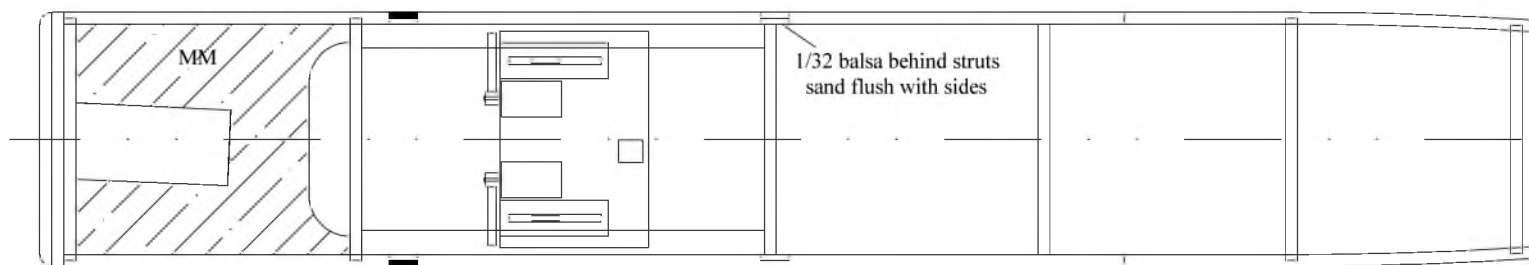
As you can see, there really is nothing particularly complicated about the build, so I won't bore you with a 'stick A to B' style article. I'll run briefly through how the model goes together, just explaining

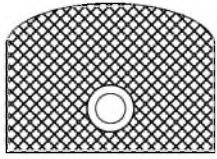


All fully assembled and sanded, the fuselage is ready to be covered.



PR Designs
**Sperry
 Monoplane**
 Copyright P. Rake 2013





cut out and glue to nose

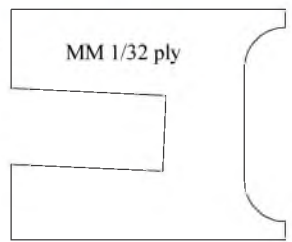
shape from scrap 1/16

laminated outline
3 off 1/32x1/16

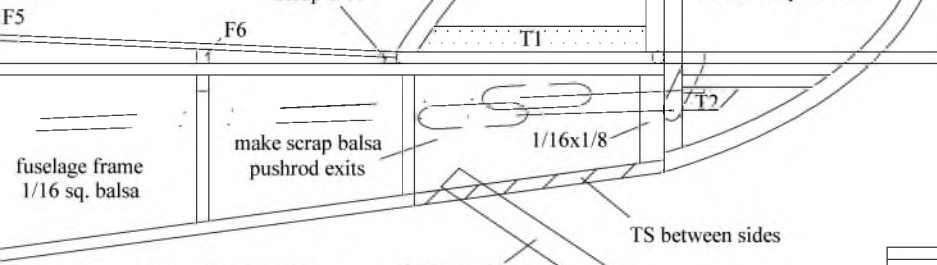
tail from 1/16 balsa
size or shape shown



alternative MM
for AEO 7 mm motor
1/32 ply



MM 1/32 ply

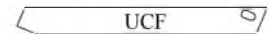


make scrap balsa
pushrod exits

TS between sides

1/32 ply skid

all these parts 1/32 ply



UCF



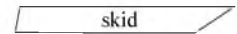
UCR



CSF



CSR



skid

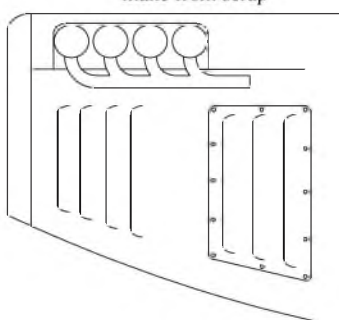


UCD

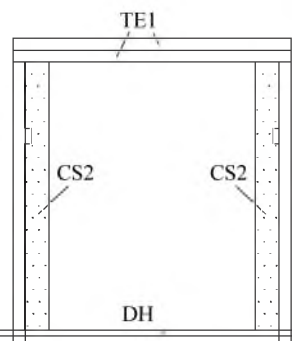


horn

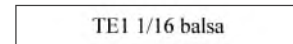
scrap view showing
optional nose detail
make from scrap



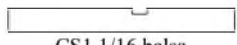
F1 1/16 balsa



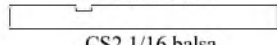
DH



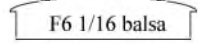
TE1 1/16 balsa



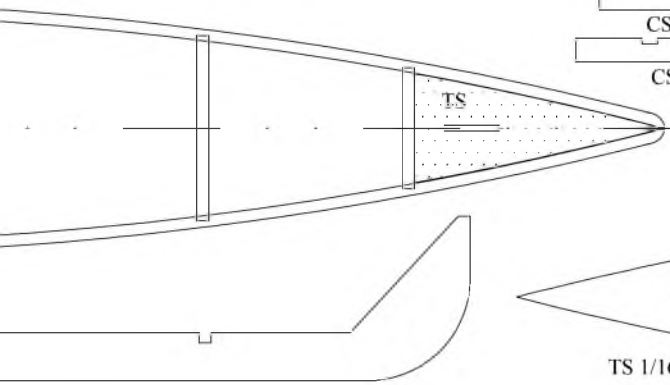
CS1 1/16 balsa



CS2 1/16 balsa

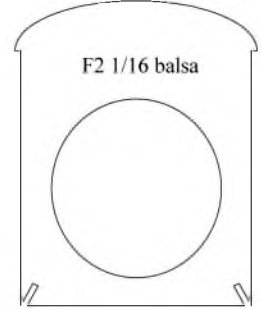


F6 1/16 balsa

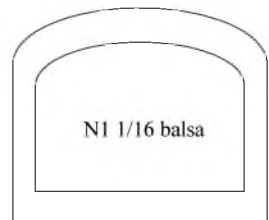


TS

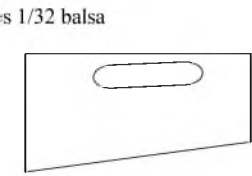
TS 1/16 balsa



F2 1/16 balsa



N1 1/16 balsa



1/32 balsa

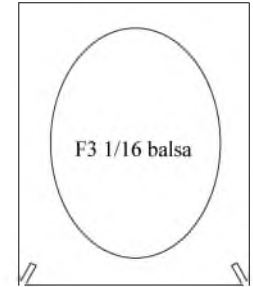
T2 1/16 balsa



T1 1/16 balsa



N2 1/16 balsa

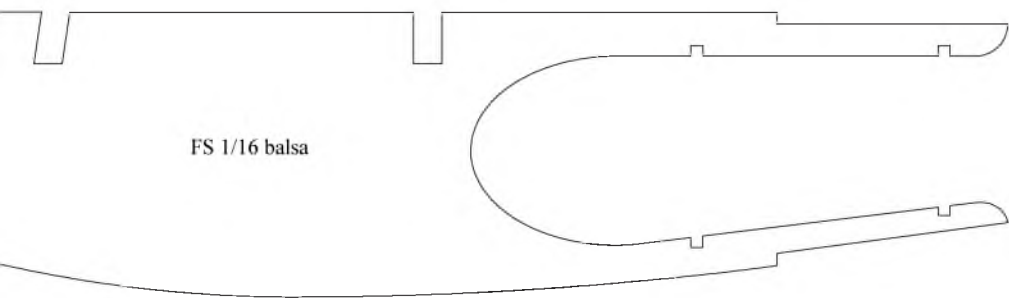


F3 1/16 balsa

T2 1/16 balsa

T4 1/16 balsa

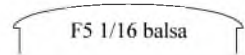
T3 1/16 balsa



FS 1/16 balsa



F4 1/16 balsa



F5 1/16 balsa



Just stoozing by in a low pass for the camera. The model is very good at low, slow passes.

anything I feel needs more information.

There's nothing unusual about the basic assembly. It's the usual 'build-over-the-plan' sort of affair. You make two fuselage side frames, mark former and receiver mount positions on them and join with formers, MM and cross braces. I built in the centre section (c/s) struts as I built the side frames, but they could just as well be fitted after the sides are joined.

Worth noting here, is the need to use fairly soft 1/32" sheet for the rear decking. Not only is it lighter, it will also be easier to curve over the formers without distorting the rear fuselage.

The main undercarriage (u/c) is

assembled as two-ply structures, which are assembled over the plan and glued into the slots in formers F2 and F3. Since the area between these two formers is filled with 1/32" balsa, you'll also need to trim slots in that to clear the u/c legs. I like to cover this area before gluing the u/c in place; it's just so much easier that way. There's absolutely nothing at all funny about trying to tissue cover around and u/c firmly glued into your fuselage.

If, like me, you opt for the AEO motor (They're cheap, and I'm very fond of cheap), position MM (the alternative one) so your prop is in the right place and glue the motor into the former. Set up thrust

lines to match those shown on the plan.

...And then

Okay, after a little sanding, you'll have a completed fuselage, so now I suppose we'd better build some bits to hang onto it.

The hardest part of the tail surfaces is laminating the outlines. I like to use Depron forms, pinned to the board. Then the soaked and glued strips can be held in place around them using scraps of balsa to hold them snug against the forms. Some people like use a pin 'fence' to shape around, but I find that tends to crease the wood.

Once the outlines are completely set, pin them over the plan and stick in all the little bits of balsa that are supposed to fill the gap. I usually sand them as complete tailplane/elevator and fin/rudder units before separating them. Be careful just how much you sand them. It's surprising how quickly your 1/16" tail surfaces can become 1/32" tail surfaces.

Although you can just make out some experimental fishing line hinges in the photo, I decided that wasn't very practical. I ended up using narrow strips of scuffed up floppy disc material for the hinges. I just found it a lot easier to work with than fishing line I could barely see half the time.

Okay, I can see I've run out of space again - the hazard of including a plan in the column, but we will finish this off next time. Then we'll finish building the model and take a look at tissue covering.

In the meantime, should you wish to contact me I will be at the usual place; PETERRAKE@aol.com ■



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DART 'PUP'

*With photos from the
Richard Riding collection*



The Dart Pup photographed by A.R. Weyl, the aircraft's designer, at Loosey Farm, Dunstable reportedly taken after the maiden flight in August 1936. (via [Richard Riding](#))

Based on 1930s glider technology this one-off type is a shape worth modelling. Would anyone like to give it a try?

Back in 1935 it was suggested at the London Gliding Club's Dunstable H.Q. that the Falcon III glider plus a small engine, might make a good ultra-light powered 'pusher' aircraft. A. R. Weyl, A.F.R.Ae.S., of the nearby firm Zander & Weyl, proceeded with this idea but did the job properly by designing a parasol pusher, first known as the Dunstable Dart. Suitable engines have always been a problem with ultra-lights and a Scott Flying Squirrel was considered, but a new,

more powerful version of the French 'Ava' had just been announced, so the design was based on the 34 h.p. expected of the high compression Ava, a tidy flat-four two-stroke.

The company was re-formed, renamed *Dart Aircraft* and the pusher became the Dart II or 'Pup'. The wing centre-section was mounted above the fuselage, housing the oil tank in its leading edge and the two fuel tanks between the spars. The Ava 4-a00 was mounted aft of the rear spar to which was bolted the

adjustable bearers, allowing variation of the thrust line during trials, and there were four supporting struts to the fuselage. The shapely wings were swept-back 15° for stability which was very suitable for the pusher layout where the forward position of the cockpit is a strong influence on C.G. position: more so with ultra-lights where pilot weight is a substantial proportion of the all-up weight and the variation weights between pilots must be catered for. The wings were understandably glider-like and had no





This side elevation view provides good detail of the cabane strutting and the engine mounting. (via Richard Riding)

internal wire bracing.

Ailerons were unbalanced and were push-rod operated by differential arms. The wings had no dihedral and were braced by V-struts attached to the fuselage by hinge-fittings and other pivots at the trailing edge of the centre section enabling the wings to be folded back. Aileron controls connected-up automatically when the wings were spread.

For transport by road, wings, tailplane and rudder were easily removed. Due to the high engine thrust line and the necessary up-thrust angle, the slipstream played onto the tailplane, so variable incidence gear was provided to cope with engine on/off trim changes, but in practice this proved unnecessary as no

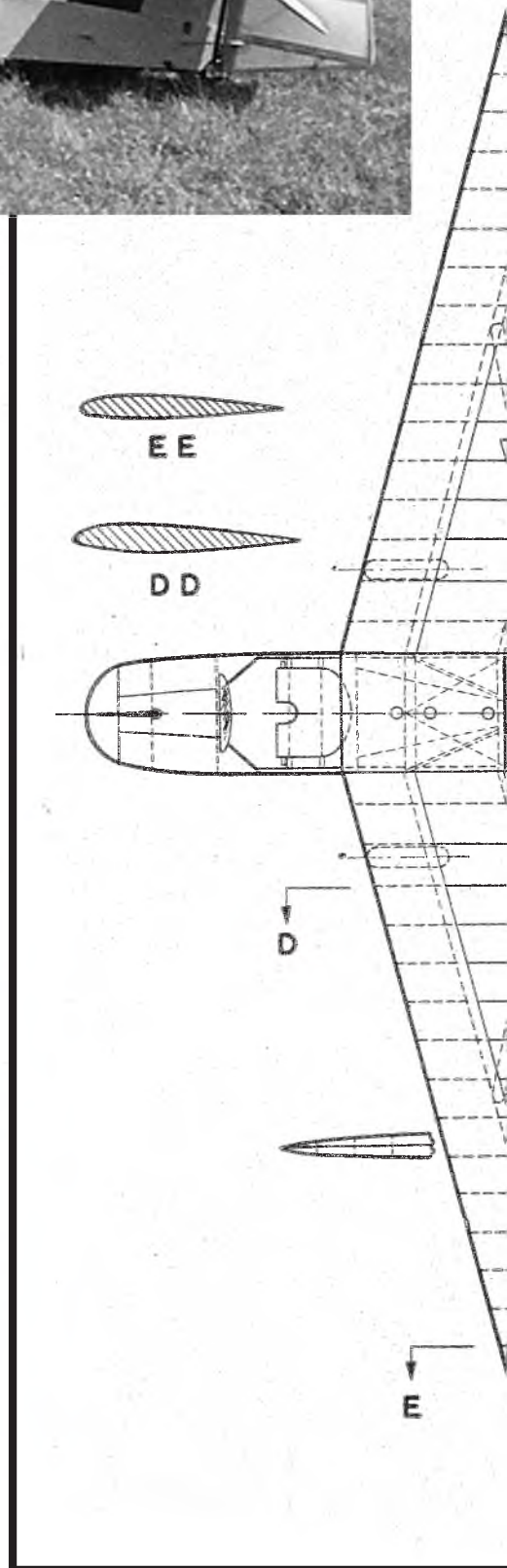
change trim occurred.

The main undercarriage had brakes, with springing and rebound shocks taken by rubber compression discs. The tailwheel was solid rubber the aircraft also featured a glider-style nose-skid.

Mr. Weyl made the first flight in July 1936. It became apparent that the Pup was underpowered and a variety of propellers and thrust line adjustments were made. Although pleasant to fly, the take-off run was phenomenally long and absolute ceiling was 2,500 ft. It eventually transpired that the engine was not the 34 h.p. model ordered but had been detuned to 27 h.p.! The makers had not informed Dart Aircraft that the 34 h.p. model had been abandoned due to overheating and its pursuance was



In September 1937 the Pup was sold to Anthony E. Green. In August, he stalled the aircraft while taking off from Bishop's Tachbrook aerodrome, Leamington and it was written off. By this time the Pup's Ava engine had been replaced by the more powerful Bristol Cherub. (via Richard Riding)

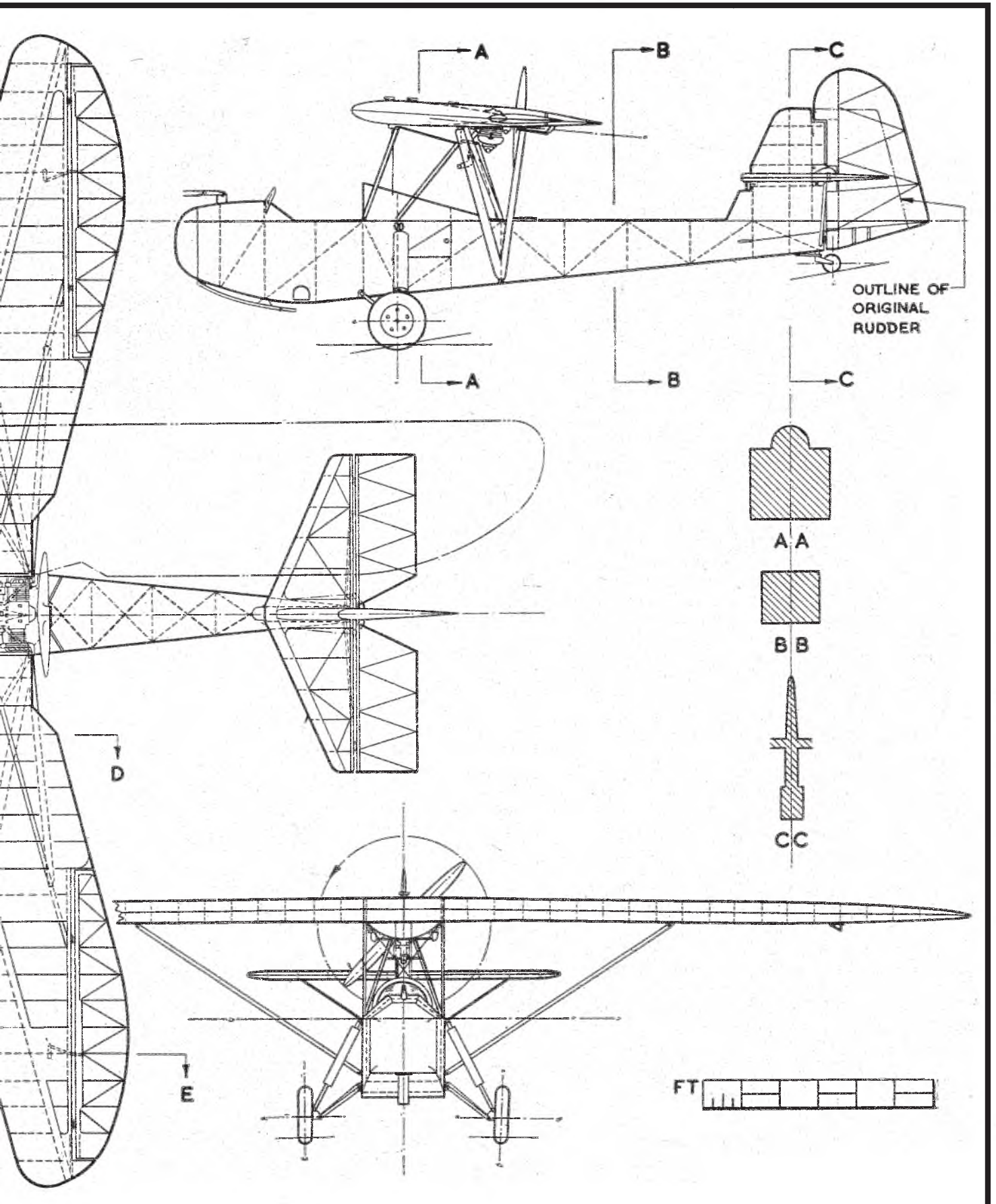


discouraged by the French Air Ministry's classification of ultra-lights as aeroplanes with 25 h.p. or less.

This 'faux-pas' by the makers meant that the Ava would never be good enough, but further modifications were made hopefully to overcome the lack of engine power. To improve rudder response in the Ava's mild slipstream a larger rudder was

fitted and a taller undercarriage increased the ground angle. However, a complete cure was effected by a trusty 36 h.p. Bristol Cherub III in June 1937, but as this engine was out of production, the prototype was the only Pup ever built. In the air the Pup was viceless, with a gentle level sink rather than a stall. A faster than usual glide was due to the 'draggy'

parasol pusher layout, allied to the above average loading and the NACA 23012 basic airfoil (used in the Auster) which, while giving good speed on low power, lacks maximum lift at low speeds. Stability was positive in all three planes and a peculiarity of great virtue was the Pup's ability to land itself without human interference!





A conference between Eric Zander, W.R. Scott, Hedges, Wimmelreich and designer A.R. Weyl at Dart HQ at 29 High Street North, Dunstable in August 1936. The Pup is substantially complete but without wheels. The 27 hp Ava 4a 100 engine was subsequently exchanged for a 32 hp Bristol Cherub III. (A.H. Curtis via Richard Riding).

A month after acquiring the Cherub, the Pup was sold to a Mr. Green who, after having a lot of fun, wrote-off the Pup shortly before the outbreak of WW2. He failed to clear a hedge while taking-off with full load near Birmingham, and so ended the life of an aeroplane, the future of which was spoiled for lack of a really suitable engine. ■



The Dart Pup's width, with wings folded was 9 ft 8 in and here it is seen after being towed from Dunstable to nearby Loosey Farm. (via Richard Riding).

SPECIFICATION

Wingpan: 29 ft. 7 1/2 in.

Length: 19 ft. 8 1/2 in.

Empty wt.: 485 lb.

Loaded Wt.: 705 lb.

Wing Area: 114 sq. ft.

Wing Loading: 6.18lb./ sq. ft.

Max. Speed (Ava): 75 m.p.h.

(Cherub): 90 m.p.h

Stalling Speed: 35 m.p.h.

Landing Speed: 37-40 m.p.h.

Landing Run: 50 yd.

Take-off Run (Cherub): 80 yd.

CONSTRUCTION

All wood with mild steel fittings. All struts of engine mounting, centre section, tailplane, wing and undercarriage of steel tube. Fuselage was ply-covered box with integral fin and detachable rounded alloy nose cap. Tailplane had box spar and ply-covered nose and centre section with cut-out to drop over fin. L.E. of rudder ply covered.

COLOUR SCHEME

All fabric clear doped. Ply covering on fuselage and elsewhere cream, except for red trimming on nose, leading edges and tips. All struts and lettering in red.



This airborne view of the Pup shows the pronounced sweepback on the semi-cantilever wings. With no dihedral, the wings had an area of 114 sq ft, a loading of 6.18 lb per sq ft and a NACA 23012 aerofoil section. (A.H. Curtis via Richard Riding).

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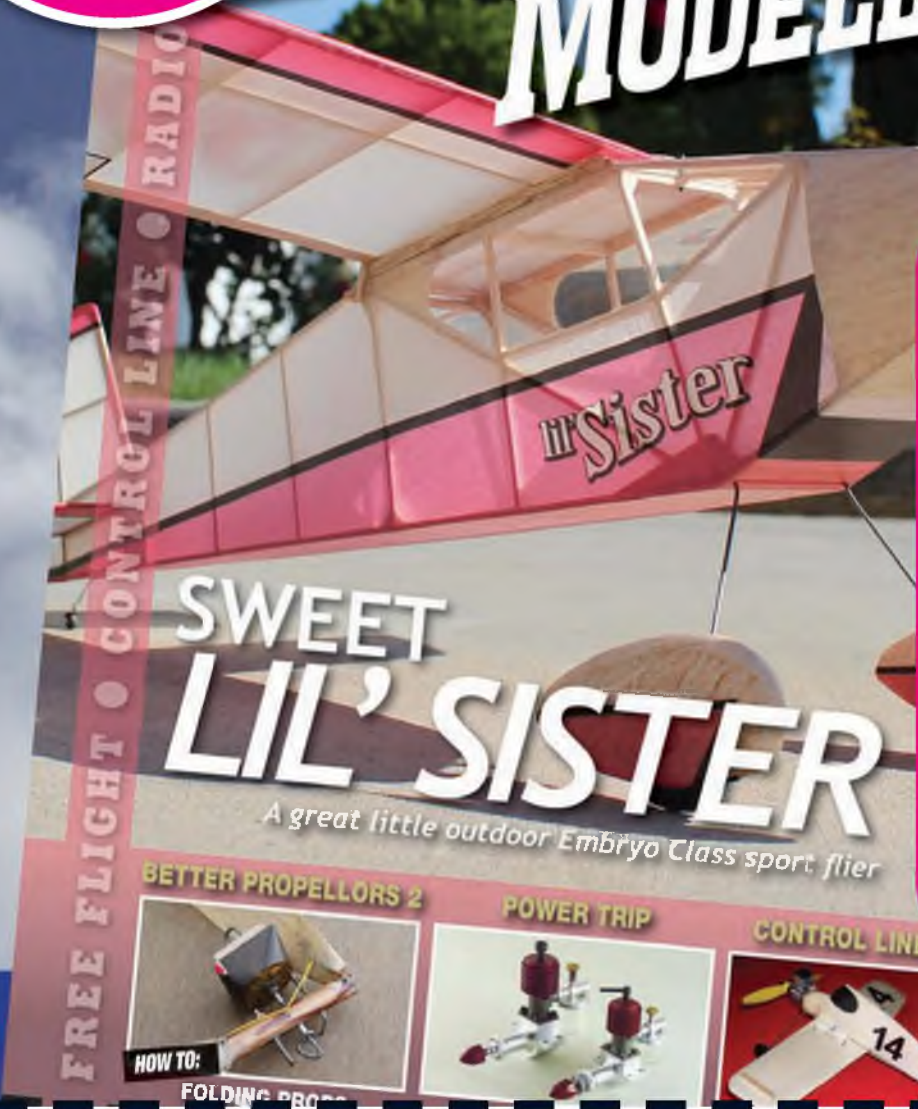


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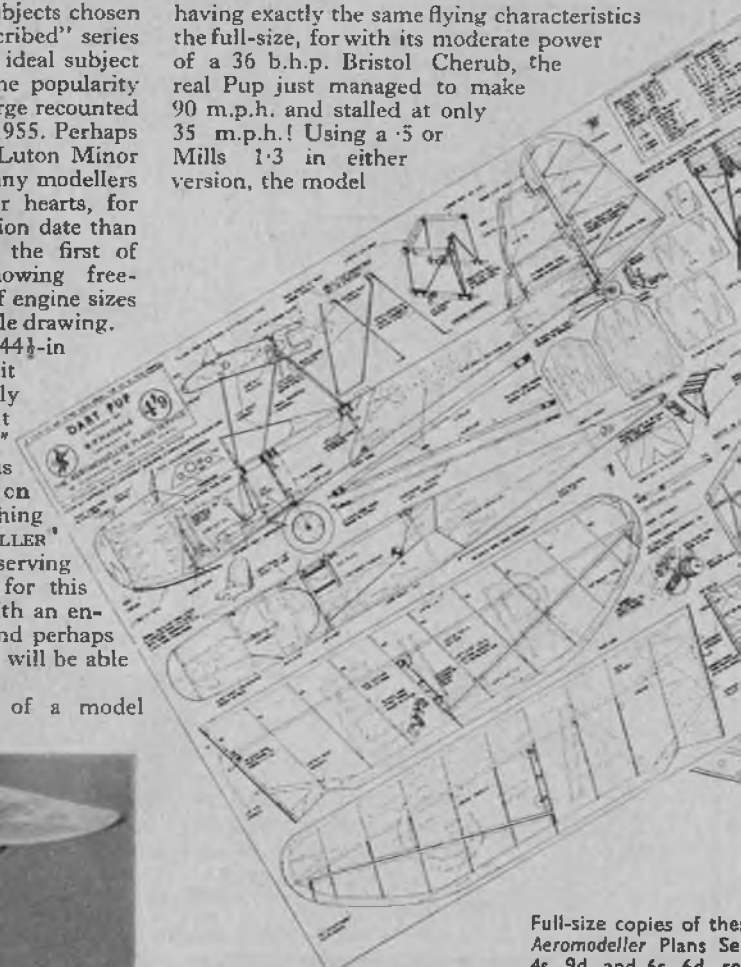
A BRAC
Two sizes of this popu

PRACTICALLY EVERY ONE of the subjects chosen by George Cull for his "Aircraft Described" series has been received with alacrity as an ideal subject for flying scale, but none can rival the popularity of the Dart Pup, history of which George recounted so delightfully in our issue for April, 1955. Perhaps it was because of the success of the Luton Minor (another Cull introduction) that so many modellers took the parasol-winged Pup to their hearts, for scarcely a month passed after publication date than the editorial office began to receive the first of literally dozens of photographs showing freelance models built for a wide variety of engine sizes from enlargements of our 1/72nd scale drawing.

Among them were Pete Holland's 44½-in version with structure blended to suit modelling purposes, very appropriately "Dart"-powered, and Flight-Lieutenant D. Barton's larger model of nearly 60" span with exactly the same construction as the full-size and flying very neatly on the power of a Mills 1.3 c.c. By publishing both drawings through "AEROMODELLER" Plans Service we hope that we shall be serving the wide demand that obviously exists for this attractive ultra-light, so that anyone with an engine of between .46 c.c. and 1.5 c.c. (and perhaps some of the earlier 2 c.c. engines also) will be able to build a Pup of his own.

This is another classic example of a model

having exactly the same flying characteristics the full-size, for with its moderate power of a 36 b.h.p. Bristol Cherub, the real Pup just managed to make 90 m.p.h. and stalled at only 35 m.p.h.! Using a .5 or Mills 1.3 in either version, the model



Full-size copies of the Aeromodeller Plans Service 4s. 9d. and 6s. 6d. re your order with A.P.S. smaller model,

Back in the February 1956 issue, *AeroModeller* published plans for two free flight scale models of the Dart Pup. The first of these was a 1/8th scale model for 0.5 -

0.75cc power designed by W.Peter Holland with a wing span of 44.5" (1130mm). Also included was F/Lt. D Barton's 1/6th scale 59" (1500mm) version for engines up to 1.5cc - F.Lt Barton's model had a Mills 1.3.

Unfortunately, plans for the larger version are no longer available, but we've managed to track down availability of Peter Holland's 1/8th scale replica, still available in the old *AeroModeller X-list*

CE OF DART PUPS

lar subject for free-flight scale

ete Holland's Pup
ke-off with appro-
riate Albatross Dart
user, it has a larger,
balanced rudder shape
like F-11, Barton's
Mill 1.3 straton

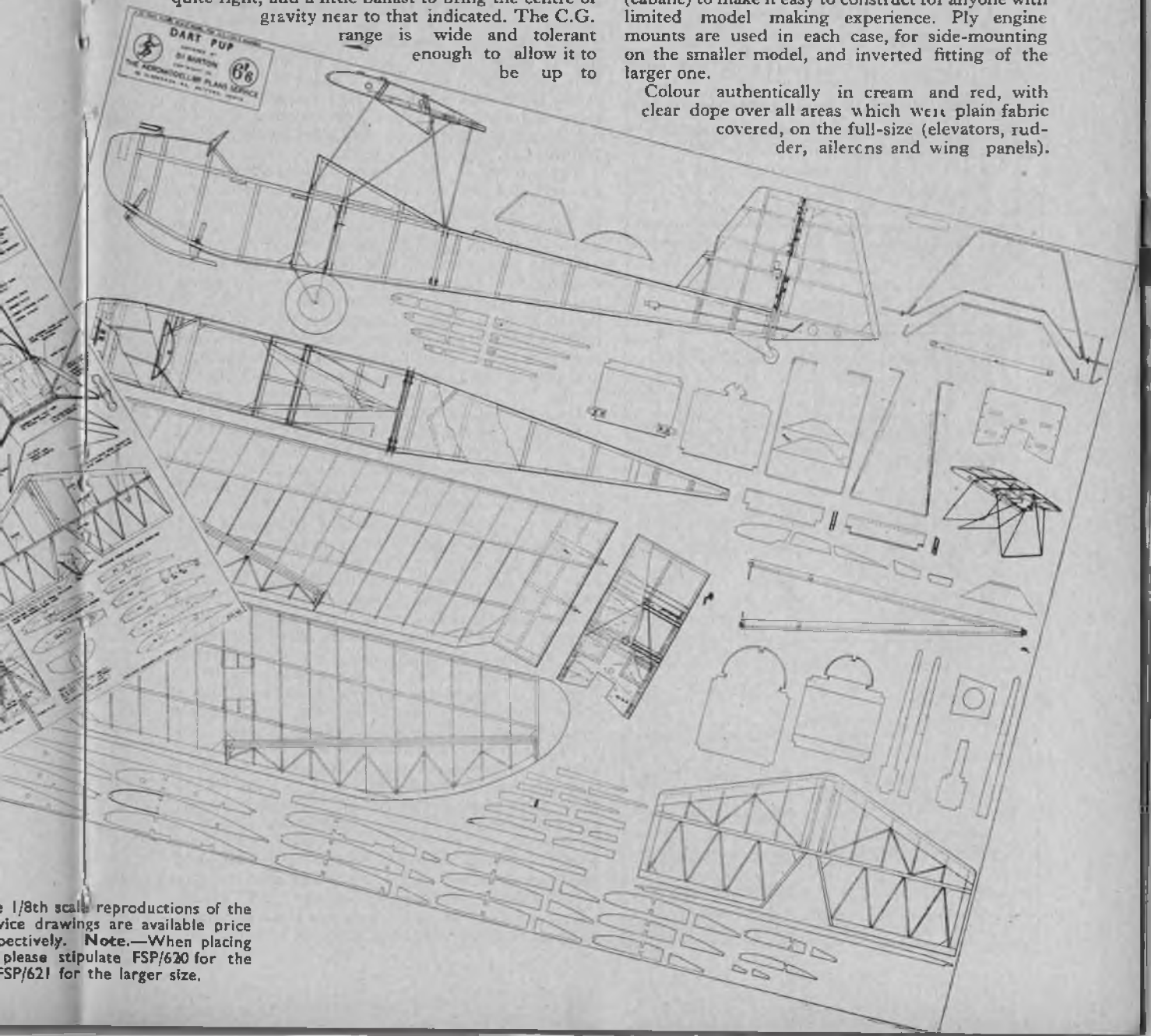
is likewise a slow flier, with a gentle level sink rather than a stall, and is perfectly viceless to trim. An indication of this is the arrangement of fixed angles of incidence on wing and tail of both models—just build according to the plan, and if the balance is not quite right, add a little ballast to bring the centre of gravity near to that indicated. The C.G.

range is wide and tolerant enough to allow it to be up to

1 inch out of position without affecting the flight pattern seriously enough to cause a crash.

In both models particular care has been taken in producing the A.P.S. drawing to show the construction of the parasol centre-section strutting (cabane) to make it easy to construct for anyone with limited model making experience. Ply engine mounts are used in each case, for side-mounting on the smaller model, and inverted fitting of the larger one.

Colour authentically in cream and red, with clear dope over all areas which were plain fabric covered, on the full-size (elevators, rudder, ailerons and wing panels).



1/8th scale reproductions of the drawings are available price respectively. Note.—When placing please stipulate FSP/620 for the FSP/621 for the larger size.

range, still maintained by MyHobbyStore Ltd. The 'X-List' range is not listed on their web site, but the 1/8th scale version of the Dart Pup is still available under its original AeroModeller Plans Service number of

FSP/620 and costs £22.50. Best way therefore to place an order is to call them on 0844 848 8822 (UK) or +44 2476 322234.

Once you have a copy of the plan, modern copying methods can be used to

scale up or down to any size you might fancy - so why adopt this unusual, yet attractive little 1930s aircraft as your next scale modelling project?

Brandenburg C.1

A 35" (889mm) 1:15 scale model of the WW1 German reconnaissance aircraft, for 0.75 - 0.8cc engines.

Designed by BILL DENNIS

The Brandenburg C.1 was designed by Ernst Heinkel of the German Hansa und Brandenburgische Flugzeugwerke and subsequently also produced under licence by the Austrian Phonix and UFAG companies. A remarkably sleek machine when judged against others of the time, the Brandenburg came into service in early 1916 and remained one of the mainstays of the German flying services until 1918, hauled along by a wide variety of engines, enclosed in a similarly varied styles of cowling. At the beginning of its career it was used as a long-range reconnaissance machine, but was later adapted to other roles, including artillery spotting and bombing.

The Brandenburg has an almost ideal layout for a free flight model, and yet I have only ever seen one other model, an indoor Peanut. Perhaps the reason is the documentation; there are a confusing number of variants and this, three-view drawings tend to be confusing.

Nevertheless it is an interesting subject and makes a challenging building project. It certainly takes off and flies beautifully

and is a very practical model. With hindsight, it could have been a little larger - maybe 40in span for a good Mills .75 - because I had to fly mine with the wick turned well down. A PAW 55 would be suitable (apart from the needle valve), but here it is as built. Mine only weighed 14oz - don't go much higher than this or you will lose the slow flying characteristics that are the appeal of free flight.

My particular version is an early model, that has a different rudder and side panels to the cowling which make it easier to conceal the engine.

Fuselage

The essential starting point is to buy two identical sheets of bendy 1/16in balsa; you will find these lying next to one another in your model shop! Cut the sides in pairs to match the grain; it is important to do all you can to keep the fuselage straight at this early stage, and soaking the cut-out sides in ammonia solution will help. On my model I had tried to build the sides right up to F1, but the curve was just too much and the extreme front end distorted. To rescue the fuselage, I cut the front off at F2 and replaced it with block

as shown. During assembly use plenty of jiggling triangles to keep things true, but of course this is complicated by the bulge in the middle of the fuselage - but don't be put off, this is the only tricky part.

At an early stage you must decide if you are going to panel the fuselage in ply. Some machines were painted all over and in this case you will be able to leave the fuselage all-balsa - much easier, but less rewarding. If you are going to model an example with plain-varnished fuselage, note that there is no balsa sheeting to the top or bottom of the fuselage, the ply alone is plenty strong enough. The rear sides can also be largely cut away, but don't do this until the last thing.

Scrutiny of photographs shows great variation in the top decking on the forward fuselage and this area is not easy to reproduce using conventional techniques. In the end, I tack-glued soft balsa to the top forward fuselage and carved and sanded this to shape. With this block still in place I heated up sheets of plastic card and pulled them over the former. The resultant mouldings were trimmed and cut away for the various apertures, cockpit, engine etc. They are





LEFT: Mills 75 diesel engine and dummy replica are here removed to reveal the engine bearers. **BELOW:** Mills diesel and dummy re-installed. **RIGHT:** Detail of the dummy scale Austro-Daimler engine and wheel. **BOTTOM RIGHT:** Cabane struts, dummy tank and radiator.



sufficiently strong to need little internal structure; just a 1/2" former F5 to separate the engine bay from the cockpit, which you will see is largely open space.

With this task done, the decking can be removed until a later stage. Add the engine bearers, undercarriage and lower wing dowels, plus the cabane wires. By their nature, being integral with the wing dowels, these need very careful bending and be prepared to throw a few away. Bind a length of 16swg between them and spend a lot of time checking all the angles before soldering the joints. I usually tack-glue strips of wood to the fuselage to act as datum reference points - get this wrong and the model will not work properly!

Make up a cowling block, tack in place and shape it. Remove and finish, then make a plaster cast and lay it up in fibreglass. There is little room at the front end and you will need to refer to the photographs. In fact things are so tight with a Mills that the screws holding down the engine plate have to be countersunk to lie under the engine lugs. So how to tighten the countersunk engine bolts? Make the plate from 1/8" brass (yes, that much side thrust!) and solder the bolts to the underside so they will not turn. The plate can then be screwed to the bearers.

There is no way to arrange a detachable panel, so the engine must be able to be operated with everything in place. The compression screw is reached with an Allen key through the cowling, the tank is cut down to the right size for a one-minute run and filled using a syringe, and you don't need to touch the needle valve.

The dummy engine is assembled from dowel, bamboo and tubing and mounted on a firm base; this is screwed down to a matching block inside the fuselage. The only part of the nose that is detachable is the front cowl, which has a 1/8" ply bulkhead epoxy-glued in. Two holes are drilled through from the front to allow 6BA screws to pick up on nuts soldered into

each end of brass tube and sunk into the nose block.

Almost there now. Cut 1/64" ply panels and fix in place with contact glue. The only tricky part is that small panel behind the rear cockpit where the section changes and the curve is quite sharp. I had to sand the rear face right down to the outer lamination to get it to bend easily. The edges are wrapped with a 1/4" strip of heavy tissue and the fuselage doped and varnished; I used three coats of satin antique pine and it is vital to seal the end grain around the nose to withstand oil seepage. Add the top decking panels and any other fiddly bits.

Wings

The construction of the wings is rather unusual and the desire to have a go at reproducing the thin, scalloped trailing edges typical of German and Austro-Hungarian machines of the time was one of the attractions of the project. Do not be put off - it is quite straightforward, but if

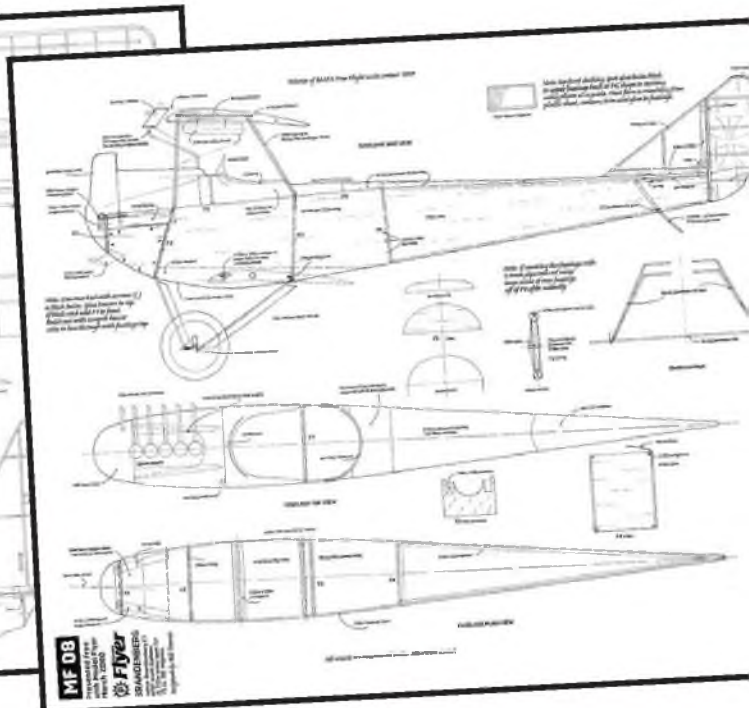
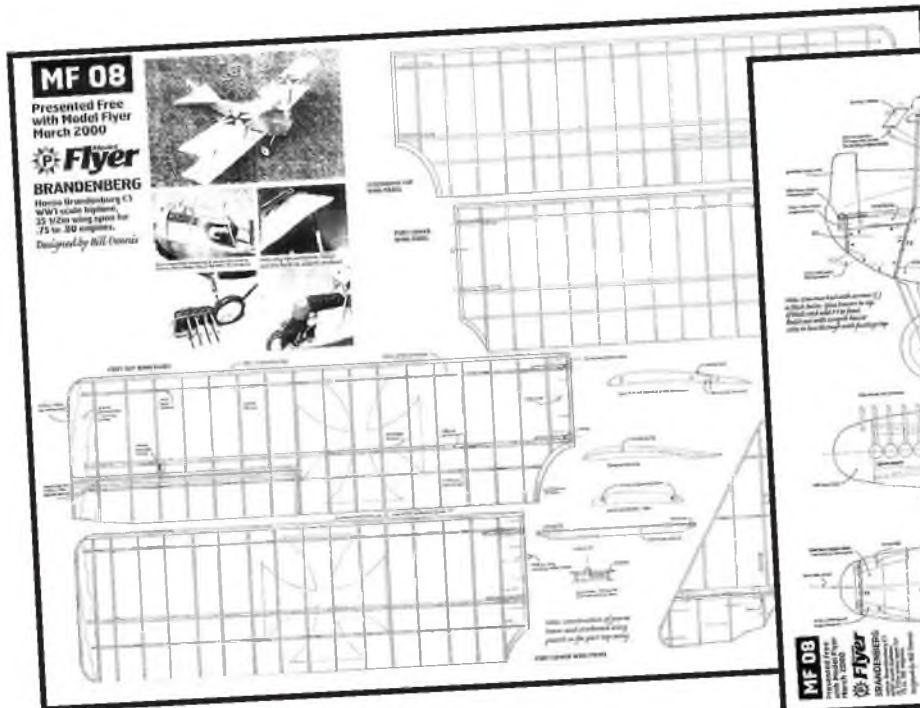
you do not fancy it, replace the thread with a conventional wooden spar and move to the next section!

Building the wooden part of the wing is easy, just be sure to use stiff wood for the ribs, keep them flat to the board and leave them about 1mm deep. Note the outer ribs are curved for the washout and that the ailerons are faked by using strips of 1/8" x 1/16" laid 1/16" apart, top and bottom. The thread I used is called Barbour thread, I presume for repairing Barbour jackets and I got mine from John Lewis. Attach at one end with PVA or balsa cement and then the other, pulling taut but not tight. There is no need to leave it slack to pull in; if you do you will be in trouble later on. Secure to each rib and that's it until covering.

Tail Surfaces

The plan shows the tail surfaces as I built them. I had hoped to use the same technique as for the wings but it was not successful and I had to resort to a sheet





core for the elevators and rudder, thus losing some of the translucent effect. In truth it was not noticeable; if I were to do it again, I would just get some nice, light quarter grain 3/32" sheet and cut the tail from that!

Covering

The flying surfaces are covered with silk only, rather than the usual silk-on-tissue. The wings are covered in one piece as follows. A panel is cut large enough to go round the wing with a reasonable margin. Washed and ironed (to remove the starch) the panel is laid over the lower surface and sprayed with water from an atomiser. The silk must be kept damp throughout the process, as it is carefully pulled straight and taut and attached at the wing leading edge (LE) and tips with dope. Still damp, it is wrapped around the trailing edge (TE) and taken forward to the LE. Work carefully and you will be surprised at how well it goes. Don't try to pull in the scallops, they will form as the silk dries. If the scallops are too great, the wrinkles will appear.

The only tricky part of the whole process is the doping. Silk is horrible stuff to dope, as the liquid tends to just go straight through. Try to lay the dope on the surface and don't go over it twice. Above all, hold the wing panels LE down, so that any dope going through will run away from, not into, the TE, where it will stick the upper and lower layers together. Work carefully and there should be no problem.

Decorating

Spray with Ford Ivory car paint, using just sufficient to cover without making the wings opaque. I applied the markings by hand using a mixture of matt and gloss black paint in order to achieve sheen.

Flying

Trimming was a fairly straightforward task. With all the angles and CG as shown, the model has a long, flat glide with neutral elevators. Power trimming showed there was more than enough power and the Mills had to be tamed with a 9x4in propeller fitted back to front at first. From

hand launches it soon became clear that it was turning too tightly to the left and this could not be corrected with rudder without endangering the glide.

Another engine plate was made, with what is quite a lot of side thrust shown on the plan. One washer of down thrust was needed to eliminate a slight stall and that was it.

Once the flight was sorted, the model had a beautiful straight take off. It is essentially a nice-weather model; I am sure it can cope with a breeze, but because the loading is down at 5oz/sq ft, take-offs can be brief.

The Brandenburg has a large margin of stability fore and aft, less so directionally. It does not like turning tight left and will not tolerate a right turn at all. Keep it fairly wide and there will be no problem. I suspect that this could be traced to a slightly small rudder and a lot of forward side area being hit by the rotating prop wash. I have shown the standard, larger rudder on the plan if you want to be ultra-safe. Good flying! ■



BRANDENBURG C.1

Full size copies of this TWO SHEET plan for the Brandenburg C.1 are available from Flying Scale Models Plans Service, ADH Publishing, Doolittle Mill, Doolittle Lane, Totternhoe, Bedfordshire, LU6 1QX.

Tel 01525 222573

enquiries@adhpublishing.com

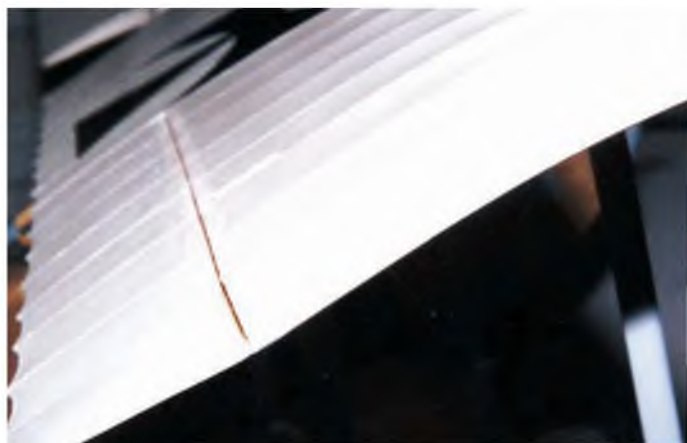
Free plan with purchase of Model Flyer March 2000 (Plan MF/08) plus p&p (U.K £2.50; Europe £4.00; Rest or World £6.00.



Tailplane underside showing scale support struts and dummy control cables to elevator and rudder.



Pilot and observer/gunner were closely positioned, with latter behind the pilot.



Detail of the wing tip upward curvature of the dummy aileron that produces wing washout.

CUT PARTS SET FOR THE

BRANDENBURG C.1

Get straight down to construction without delay! This month's full size free plan feature is supported by a laser-cut set of ready-to-use balsa and plywood components. This provides all the parts that, otherwise, you would need to trace out onto the wood before cutting out.

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Hansa - Brandenburg

Unglamorous in outline and shape, it was reliable and effective

Usually it may have been and unusual in its interplane strutting, but the Austrian Hansa Brandenburg C.1 was one of the most reliable and well developed two-seat reconnaissance bombers of World War One. Designed by Ernst Heinkel, it was made under licence by both the Phoenix and Ufgg factories and during the period of its service, it was fitted with five different types of engine. The number of variations seems infinite.

Among the more interesting modifications was the raising of the rear gunner's ring mount to the level of the upper wing as shown in separate detail on the scale drawing that accompanies

this feature.

Usually, the crew of two were seated back to back in a 'bathtub' cockpit, the front coaming of which varied according to the type of engine fitted. A fixed forward firing machine gun was mounted above the centre section, and at a later date in the aircraft's service career, also on the port side the engine cowl, the latter synchronised to fire through the airscrew. The wing mounted gun was either water or air cooled and was sighted to clear the apex of the airscrew disc.

As a bomber, the C.1 carried a useful load of one 176 lb. bomb and a pair of 22-pounders. It served with the Kaiser und Kaisaris Luftfahrtropen and the K.u.K. Naval

Air Force (land-based), being in action on the Italian front.

As a subject for scale modelling, the C.1 has much to commend it. The large triangular tailplane is of adequate area for a flying model and the deep cowling should give camouflage for any model engine. Shallow dihedral, coupled with the generous keel surface of the fuselage and vertical tail ought to provide sufficient lateral stability. Even the undercarriage and propeller sizes could be safely reproduced to exact scale. ■

DIMENSIONS

Wingspan:	40 ft. 2 in.
Length:	27 ft. 10 in.
Height:	10 ft. 6 in.

This Hansa-Brandenburg C-1 features a rounded engine cowling and high mounted radiator - just one of the varied engine installations applied during the aircraft's service career.

rg C.1.

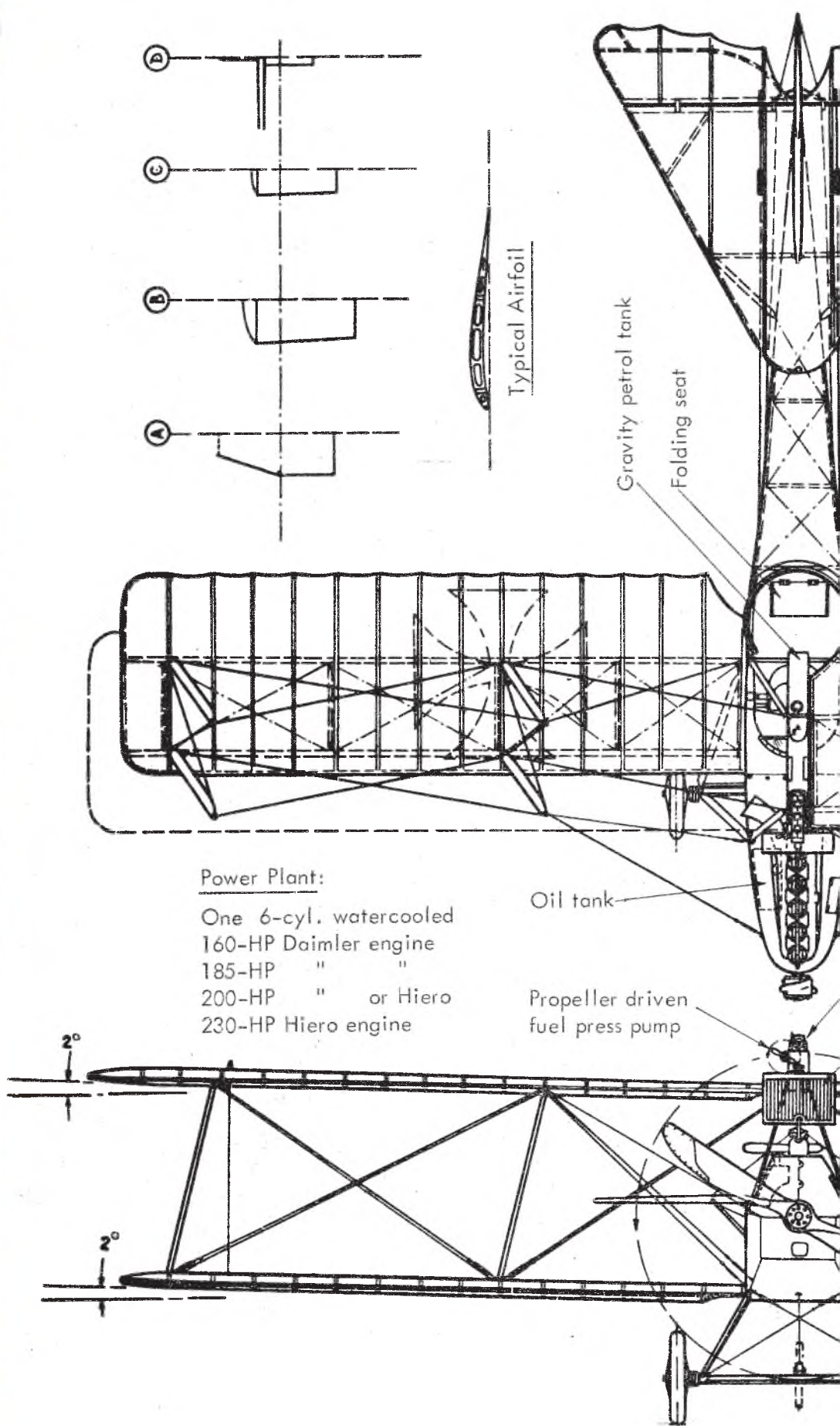
A view of the fixed, forward-firing machine gun atop the upper wing. Note also the crew positioning.

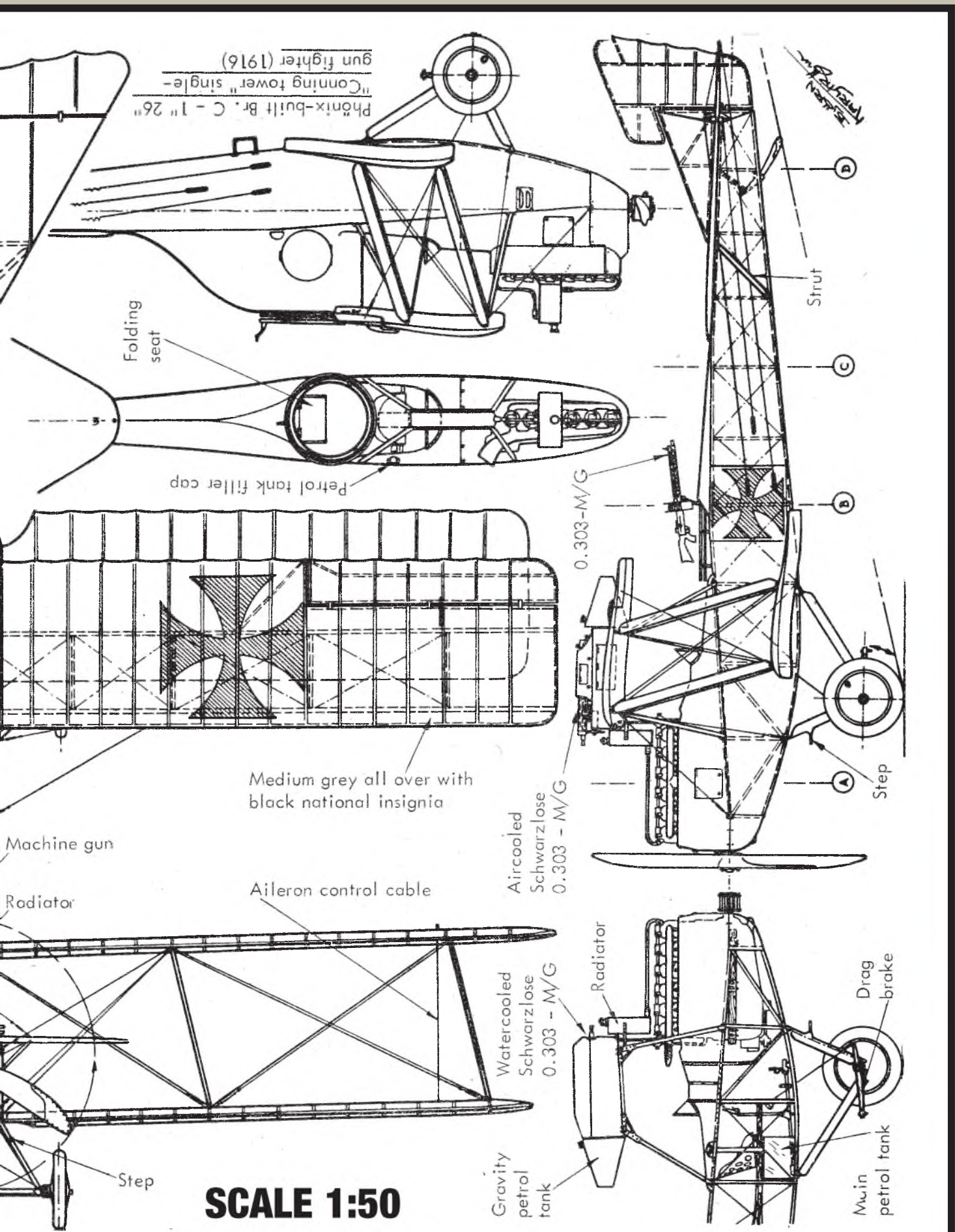


Cockpit area of a UFAG-built example of the Brandenburg C.1, showing the back-to-back crew positions and the mounting ring of the Observer's machine gun.



U1 Brampebury





SCALE 1:50

LMA COSFORD

THIS YEAR LMA'S BIGGEST MEETING WELCOMED ACE

Cosford is the Big One on the Large Model Association Calendar, and it attracts one of the largest Trade villages of any show this side of The BMFA Nats. For

most radio modellers, these two facts alone give it the gravitational pull of a dark star.

I love Cosford for the variety of models, the superbly rehearsed flying troupes and the non-stop action. I also

welcome the opportunity for a mid-season stock-up on my depleted flying goodies.

Dornier Do.335 Pfeil

The big news this year was the arrival of



LEGENDARY FIGHTERS PREP THEIR MODELS JUST BEFORE TAKE-OFF.

2013 WARBIRDERS FROM GERMANY!

a stunning scale team from Germany, called *Legendary Fighters*. They flew US, British, and German warbirds, in a variety of appealing colour schemes. In all, they gave us a very professional show. This came complete with some of

the loudest pyrotechnics I have ever heard, from Frenchman Lionel Berthelot. Three of this troupe's models stood out for the keen scale modeller. The first was a really refreshing choice of subject, the wonderfully aggressive and

fast-flying Dornier Do.335. Yes, the wicked late WWII one, with an aero-engine each end! Wow, and double wow! This was a very imposing scale model, and was flown with appropriate panache by Roland



Roland Sabatschus' wonderfully aggressive Dornier Do 335 Pfeil on full flap approach.



Sabatschus. It spanned 2.5 meters, the fuselage was the same length, and the model weighed 21.2 kgs. The Pfeil (Arrow) was powered by two Zenoh G-45s, and did not hang about. It was built from the *Engel Modellbau* kit.

Heinkel Salamander

Another under-modelled WWII scale subject, the He.162 Salamander, was a

very impressive performing early jet fighter. This fine model was built and flown by Armin Morgenweck, and it weighed 19.6 kgs. It spanned 2.3 metres, and was powered by an Alfred Frank Raptor gas turbine. It looked very

convincing scorching along just above the grass.

Me 109G

It is a curious thing, but British modellers have a soft spot for German WWII fighters,



Hiding a Desert Aircraft petrol engine under the engine cowling, Pat Dare's rarely-modelled Siemens Schukert DII.



Great lozenge scheme on Pat Dare's Siemens Schukert.



Pat Dare's Siemens Schukert has Bob Smith's friendly Fokker Tripe guarding his tail.

Steve Bishop on final approach with the Red Duo Red Arrows' liveried Bae Hawk.



and German modellers have a soft spot for Spitfires! However, it was also fascinating to see how a gifted German scale modeller dealt with an Me 109G. Staffen Zaun's Adolph Galland Me 109 was very crisply modelled and could stand a good, hard, appraising look. I thought it excellent. She spans 3.3 metres, weighs 37 Kgs, and is powered by a King B2 195 petrol engine. The Me 109 looked fabulous flying through the flames.

A Boddo Bentley 504

Almost. You see, Andy Johnson's Avro 504k was actually built from an enlarged version of the famous David Boddington Plan. However, superlatives are insufficient for Andy's overall achievement, since - wait for it - the '504 is powered by his scratch-built Bentley radial engine! More details soon, so watch this space.

Siemens Schukert D.III

Scale maestro Pat Dare brought along yet another work of art. This time it was a rare Siemens Schukert D.III WWI scout. This tubby, short-coupled, radial-engine beast radiated raw character. The lozenge pattern was as meticulous as we now have the right to expect from one of our greatest scale men. This is a lovely scale model that flew well



Superb Heinkel Salamander by Armin Morgenweck. Weighs 19.6 kgs, 2.3 metres, powered by an Alfred Frank Raptor gas turbine.



Mark Hinton's unusual P200 SX powered Yak 130. The real one is sub-sonic. I kid you not.



Ian Turney-White runs up to the JPX 425cc petrol engine in his Hanriot HD-1.



Colin Strauss's unusually-schemed Hunter. Can you guess the theatre?



As the old saying goes: Two Corsairs are better than one.



The Yanks in the r/c Jeep must be escorting a captured Pfiel.



Ansaldo SVA by Carlos Guerra. One third scale, spans 3 metres, and powered by a DLE 170cc twin. Weighs 37 kgs.



Carlos Guerra's Ansaldo SVA scout on a low pass.



Me 109G of the legendary Fighters, flown by Staffen Zaun.



Stunning Me 109G by Staffen Zaun. Spans 3.3 metres, weighs 37 Kgs, and powered by a King B2 195 petrol engine.



Half scale Ghost Squadron Tiger Moth flown by John Greenfield. Impressive.



The pilot in John Greenfield's Tiger Moth has that authentic 1930s matinee idol look.

despite its tricky stance for ground handling. I had a good chat with Pat in the Trade village and managed to take down no details whatsoever! However, fear not, we will return to this superb flying scale model later in the year.

Hawk Red Duo

When he is not organising the famed Weston Park Show, Steve Bishop and much-better-looking son Matt have been working up their amazing Red Duo. They perform all the evolutions of the Red Arrows as a pair and the effect is electric! This really is a top notch crowd pleaser. Sadly, on the day, the dull leaden sky did them no favours and obscured much of their painstaking and otherwise highly effective coloured smoke trails. A really gripping display, especially on those hair-raising cross-overs.

Heinkel He.III

There was an annoying, but hopefully relatively minor, mishap on Sunday. There was a troubling cross-wind, and Phil Robertshaw's much-loved Heinkel He.111 sustained some nacelle damage when out-landing on the grass. Fixed by now, I'm sure, but annoying for Phil and Robbie nevertheless. This was a shame since the big Heinkel is very popular on the NW Warbird circuit. I trust that the model will be back in the air by the time you read this.

Tiger Moth

We have seen her before, but I must record that John Greenfield's Ghost

Mike Booth with his Spitfire Mk IX which recently flew The Channel.





Axis Dawn Patrol! Italian Ansaldo and Austrian Albatros climbing out.

Squadron Tiger Moth remains a hugely impressive model aeroplane. She is impressively large, crisply detailed, and flies utterly convincingly. Mind you, the 'model' - if you want to call it that - is built to half-scale, spans a cool 14 feet, and weighs 55 kgs. It is powered by a mighty Weslake 342 light aircraft petrol engine, specially home-tuned, of 350cc capacity. This produces prodigious, but highly controllable grunt, via a 35x14 propeller.

Ponnier

Very large scale models are Ian Turney-White's forte, and he has built an even bigger, even more impressive Ponnier than last time. Watching this lovely early aircraft roll into wind and gently waft into the air - at what seemed like an impossibly slow airspeed - reminded one graphically just how brave those early pioneers were. This is aeromodelling on the grand scale. There is nothing quite like it.

The Verdict

One of my most respected mates, Alphabob, who attended as a ticket-buying punter, declared Cosford 2013 a "bumper year". Cosford remains a "must attend" event on the flying scale calendar. Most importantly, most of the models you see have been built by their owners in their sheds, so creativity is king. The flying was continuous and engaging, though this year the slotting arrangements appeared to come under some strain. Nothing that a full de-brief by the capable LMA Committee will not sort out. Anyhow, roll on LMA Elvington! ■



Oh no! Phil Robertshaw's well-loved Heinkel He.111 sustained some damage when out-landing. Fixed by now, I'm sure.



Andy Johnson's immaculate 504K from an enlarged Boddo plan, complete with its 9 cylinder radial. Wow!



Superlatives are insufficient. Andy Johnson's magnificent achievement. His Avro 504 k, complete with his home-built Bentley radial engine.



Scorched earth! Legendary Fighters put on a superb show, with their gallant gallic pyrotechnocist Lionel Berthelot.

Surviving Free-flight

Part 5 - The fiddly bits: It's built and covered! But how do you make those items that make a scale model look right?

The quality of the lettering and intricate markings on a scale model aircraft are the real eye-catchers, but it is not easy to achieve. The spray wizards simply (?) mask and spray delicate trim and lettering, but I have not been successful at this yet.

Alternatively, you can spray some fine Jap tissue in the colour of your markings, then cut them out and apply to the model using thinned PVA glue. The tissue, being very thin, appears as if it has been sprayed on.

To cut the shapes accurately and neatly from tissue, place the tissue in between two layers of writing paper; then, on top of the sandwich, place a further piece of paper containing the accurately drawn decorations. The complete pile is taped to a cutting board or mat and then, using a new scalpel blade, the shapes are carefully cut out. Several layers of tissue can be cut at the same time, if all your

markings are the same.

To attach the markings to the basic surface covering, first brush the approximate location on your model with thinned PVA glue, then slide the decoration into the position you have previously marked on your model, using a soft pencil. If things go drastically wrong, simply try again. This method is very easy to master and can be used in the same manner for small indoor models and others, all the way up to large R/C models. The photocopier is a very useful tool for enlarging designs and producing masks.

Where do you get those wheels?

The wrong size, or type of wheel on your model can detract from your efforts and spoil the overall effect. For the modern type of low pressure wheel, as used on light aircraft - Pipers and Austers, for instance - then there are dozens of commercially available items which can

be modified to suit your needs. This usually entails sanding off the tread and making new hub caps.

Turned balsa wheels are okay for smaller models, but they do suffer on tarmac. One way to reduce this, is by painting them with car rubber tyre paint, or by putting a thin rubber cover over the balsa. This can be cut from a section of bicycle inner tube, or rubber glove fingers. The application of cyano glue will harden the balsa and this helps as well.

For the early fabric-covered spoke wheels, we have to resort to building them, since commercial types are heavy, inaccurate, expensive - and never in the required size. The simplest method to make a set of wheels takes under an hour - and are both light and durable.

The sketches show how this is done - the 1/32" or 1/16" ply discs are cut out using a compass or stout scissors. Glue the sandwich together using epoxy, then stack all your heavy books on the wheels

FIG 1: Card or plastic disc, score on reverse side to form detail of spokes and lacing, using a ball point pen.

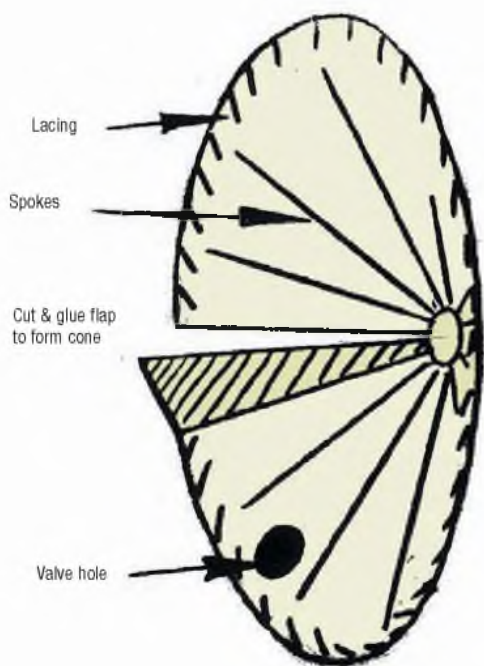
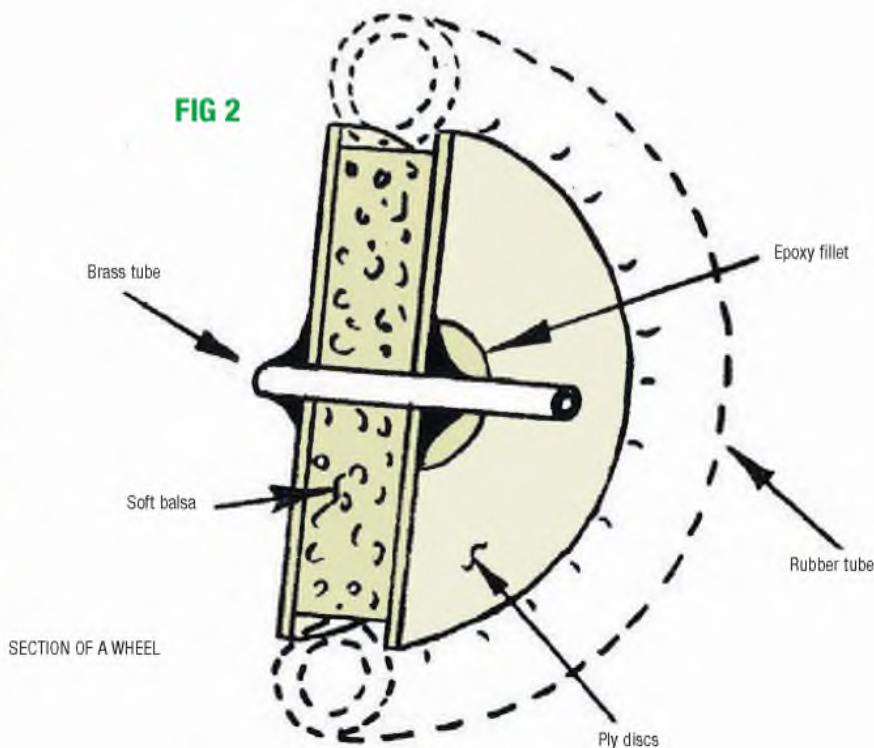


FIG 2



Scale by Andrew Hewitt

blanks to ensure a good bond. The brass tube axle needs to be accurately aligned and supported by a good fillet of epoxy - after all, a loose hub produces a take-off roll resembling something out of a clowns act in a circus. The simulated fabric spoke covering discs are simply cut from card, or better still plastic card, scored with details on the reverse side. This is simply folded into a cone and glued to the wheel. The tyre is made from rubber tubing (a shower hose, for example - anything circular and light, cut

to size and cyanoed together to form a hoop). Don't worry about the colour, since black tyre paint can soon alter that. Your local garage often has a myriad selection of rubber hose tube diameters, and small models can use Vacuum cleaner fan belts. The best material I have found to date, is neoprene sponge, used for releasing concrete moulds! This can be bought in a variety of sizes from rubber manufacturers - use your Yellow Pages! The tyre can be glued to the wheel using cyano - dead easy!

Engines, armaments and things

Dummy engines, guns and all the other bits and bobs are the most enjoyable details to make, using the old 'Blue Peter' techniques - any old bit of wood, wire, plastic and string are used to fool the eye into thinking things are not what they seem. Air-cooled cylinders are simply balsa dowel wrapped with thread, or soft wire, to represent cooling fins. Or, for the more tediously challenged, alternate discs cut from plastic card and balsa. Valve gear is simulated with wire, springs and bits of wood. The crankcase is made from ply and balsa with embossed details on the plastic or paper reverse side.

The key to all this kind of detail is the finish, so use plenty of dope to seal and smooth the surface, paying particular attention to the essential characteristics of the full size engine. Paint your engine and apply the dirt to suit the subject. This can hide many shortcomings in detail and enhance its appearance. Usually, only part of the cylinders are visible, or just a couple, the task is usually simplified by the proximity of the cowlings. Water-cooled engines are simpler, since no string is required, just carve into shape then seal and paint, but they do require more pipe work. Soft wire or aluminium wire and tube is excellent for simulating engine plumbing.

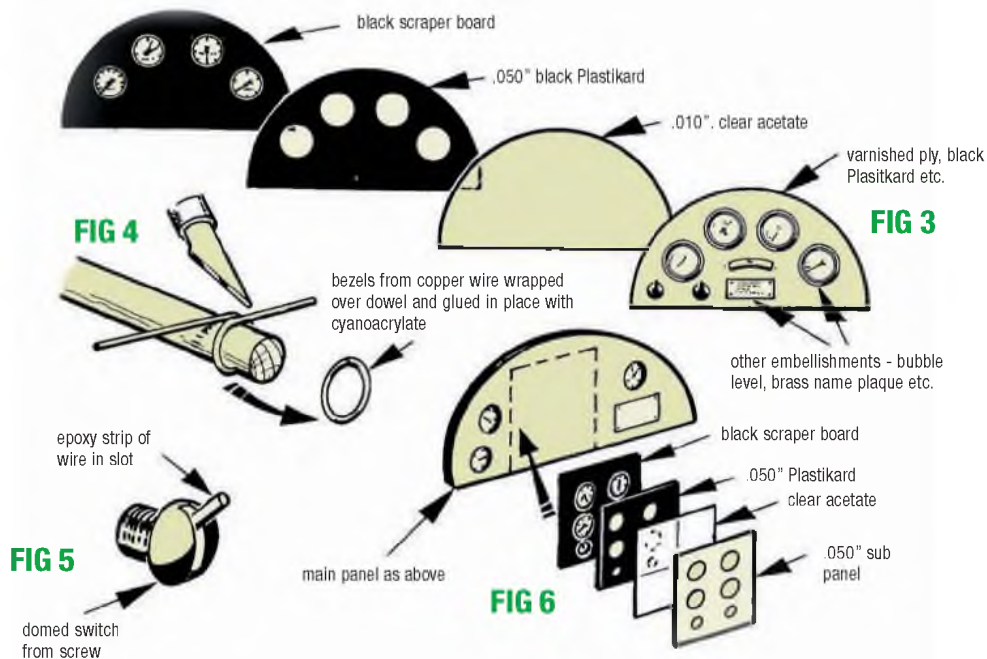


FIG 7: Whirlwind type

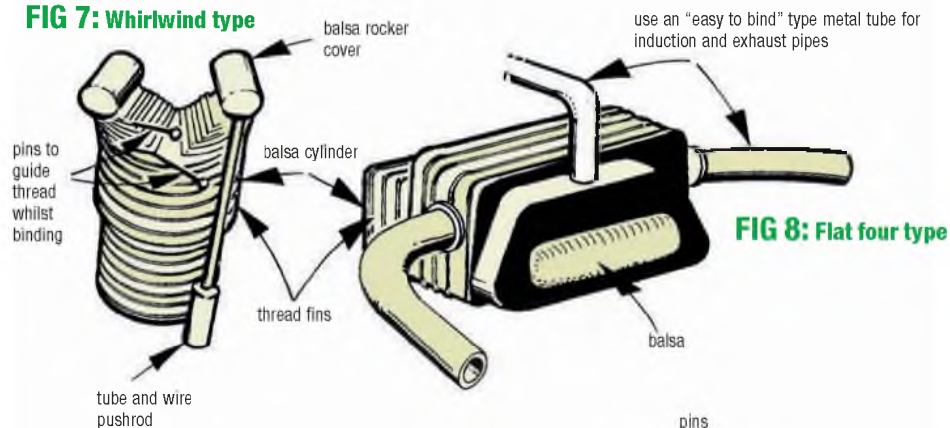
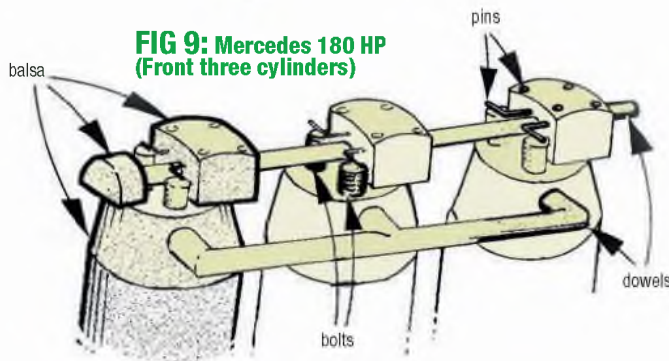
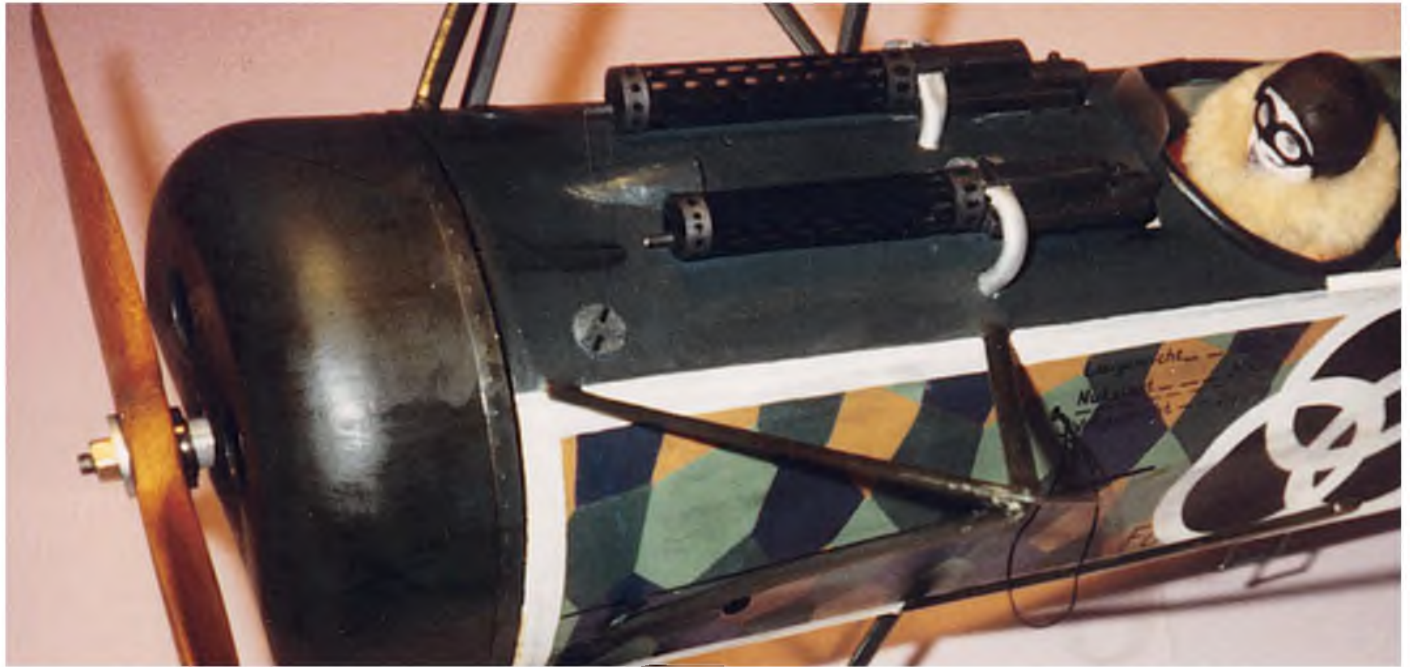


FIG 9: Mercedes 180 HP (Front three cylinders)





External details - and in the cockpit - give the scale model that 'believability' factor, as with Anrew's Fokker, above.

For larger inlet or outlet pipes, use the heavy grade of single-core insulating electrical wire. It can be bent to shape, glued and painted easily. Long exhaust pipes can be simulated with balsa dowel, paper or plastic tubes. Again, it is in the finished surface that gives the quality - and painting works wonders. Exhausts are always dirty, and so should yours, brown, black and pink paint dabbed and wiped on top of a silver base coat, gives a good dirty exhaust. To hold the dummy engine in place, use hooks and rubber bands, Velcro or better still, press studs.

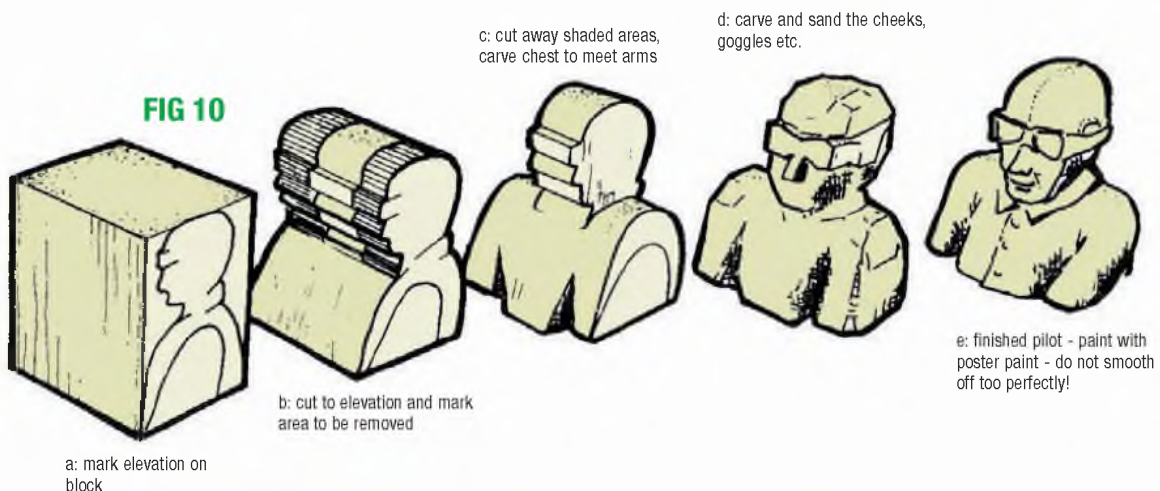
Guns are simulated using plastic or aluminium tubes for the barrels and then bits and bobs for the rest, Plasticard is excellent, since no filling is required. The Vickers gun jacket is simulated by a scored piece of Plasticard to simulate the grooves. This is rolled around a balsa dowel. The tricky German equivalent, the 'Spandau', can be similarly produced but first, draw out the fretted jacket, photocopy onto clear film, cut out and roll up.

The office

No matter how accurate and wonderful

your model, a bare cockpit stands out like the proverbial sore thumb.. Everyone looks into the cockpit and comments are guaranteed!

For most early aircraft, the cockpit is almost bare, except for the instrument board. Instruments can be drawn out several times bigger than required, then reduced on a photocopier to required size. These can be mounted inside bezels cut from sections of tube (old pens, aluminium tube, etc.), then they can be stuck to a stained ply instrument board as per full size. The seats can be cut and



folded from card and an overweight head-and-shoulders of a portly pilot can hide all the rest! However, the most important thing to bear in mind is that it is rearwards of the centre of gravity - so you must be very aware of weight. Nose details often help to balance a model, but cockpits and pilots often produce undesirable weight penalties. Where possible, use paper and plastic - and keep it light!

Joy rider

For pilots, I use blue or pink foam and carve him to shape, I do not use a full pilot, but use head and shoulders (to reduce the amount of dandruff). For his clothing, I use brown tissue, or very thin leather, stuck on using PVA glue. His goggles conveniently hide most of his face, and a piece of 35mm film outcut can be used for tinted goggles. Enamel paint will put colour in his cheeks, and a small patch of Velcro will secure him in his office.

Your work is rewarded with a very light pilot. A scale model flying without a pilot ruins the effect of realism in the air, and is normally penalised in a competition flight.

Cockpit thrills

The padded cockpit coaming associated with early aircraft is simply reproduced with black or brown tubing. This is slit along its length, then simply inserted along the edge of the cockpit decking, a dribble of super glue fixes it in position.

The windscreens are also simple to reproduce, with clear plastic and framing from litho plate. For the greenhouse type enclosures, a frame would have to be built, or mouldings made, onto which strips are stuck to represent metal frames.

Dummy propellers

Dummy static propellers are the finishing touch to any scale model and are used for static judging only, since they are of such fearsome diameter and pitch, that few commercial model engines could swing such props to produce a meaningful draught.

All my dummy propellers are carved from balsa to speed the process, since it is usually the weekend before the competition that I remember what I had forgot to make! The correct outline is drawn onto a block before the pleasant activity of propeller carving begins. A razor plane makes short work of a balsa block. Pay particular attention to the

FIG 11

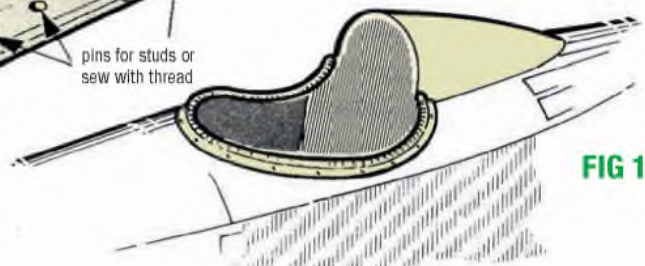
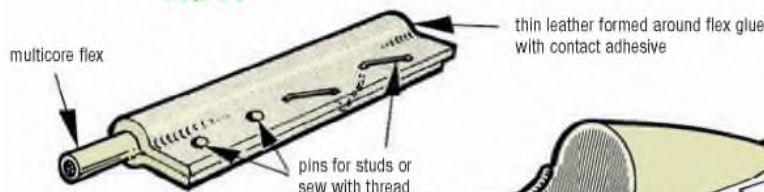


FIG 12

“No matter how accurate and wonderful your model... everyone looks into the cockpit!”

shape of the curves and overall finesse of the full size component. Most early propellers were natural, stained wood, with perhaps some brass sheeting to protect the tips. To achieve a good representation of varnished wood, sand, seal and dope your blade to an excellent finish. Now build up several layers of French polish to the desired colour, this is simply brushed on and allowed to dry between coats. After five or six coats, a stunning finish and colour is the result. Alternatively, several coats of the appropriately coloured varnish will suffice, but takes much longer to dry between coats. Laminated propellers can be simulated with alternate layers of balsa, one of which has been dark stained prior to gluing and carving.

Many early propellers were fabric-covered, then painted grey or left in natural fabric. This makes the production much easier, so it is important to refer to your documentation to ensure you do not get carried away! The hub details are simulated with a card or aluminium disc on which small nuts have been glued, to represent the mountings. Brass sheet sheathing can be simulated with enamel paint, which can be buffed up then dirtied with a soft pencil to good effect. This really is the fun part of scale modelling - so enjoy!

Credit due

The sketches for this article have been taken from Gordon Whitehead's now out of print 'bible' for scale modellers - "R/C Scale Aircraft for everyday flying". ■

FIG 13

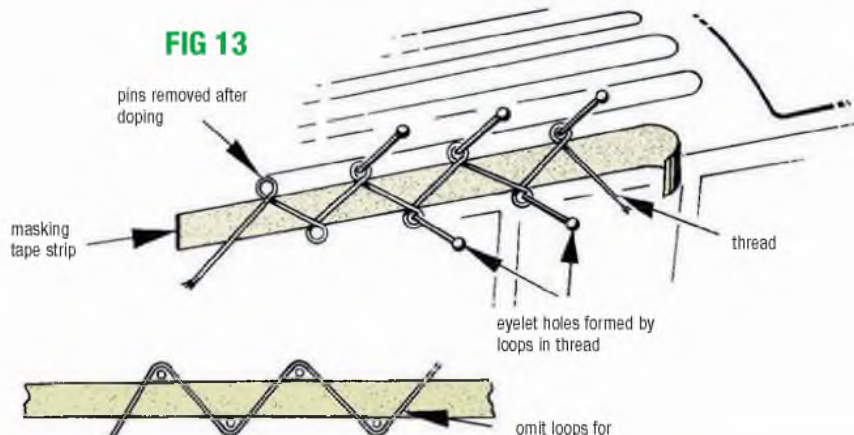


FIG 14

NEXT MONTH: ANDY LOOKS AT OTHER POWER SOURCES FOR SCALE

Techno Scale Mike Evatt st

Contrary to what you may have read, **Micron Radio Control** are not closing down, merely re-focusing on 'micro' planes. They are currently selling off surplus stock so you may pick up a bargain.

Log-on to www.micronradiocontrol.co.uk to see the wares. Microns are approx 75gm all up weight and below. There are some enchanting examples like the Hergt 1918 Monoplane This is a delightfully obscure model airplane from 'The Great War' reproduced in miniature form for the Parkzone Vapor or Spektrum AR6400 receiver modules. Get one - you'll be addicted!

The Slingsby T67 Firefly basic military training aircraft is **BillKits'** first venture into the world of scale models. Their model is a 60 inch wing span semi-scale aircraft and is suitable for .35 to .45 size two stroke engines or .40 to .50 four strokes. The aircraft is an attractive tricycle undercarriage low winger which makes an ideal second model, although having said this, the scale lines and superb handling make it a great model for any

pilot to enjoy. The prototype model fitted with an O.S. .40 weighed 4.5lbs which gave the model a nice low wing loading of under 22oz per square foot. Check it out at www.billkits.com

Seen on the **Electricwingman** website at, unsurprisingly, www.electricwingman.com an Austria Pickler kit of the KA-7 glider. The original KA-7 is a two-seater trainer with good performance, winning a speed record in 1964 around a 500km circuit. This combination of two-seats and superb performance was a rare combination around the time of the planes introduction in 1960. The Pichler KA-7 is designed for four-channel R/C operation (rudder, elevator, ailerons and optional throttle if you install a suitable power set). Of course, many will desire flat-field performance using an optional electric power setup and to this end, the KA-7 has a removable fibre-glass nose to simplify motor installation.

Power Scale Soaring is an exciting dimension in Radio Controlled model slope soaring! PSS is all about building and flying scale model gliders of full sized

jet, rocket or piston powered aircraft, excluding powered gliders. These basic guidelines enable the modeller to construct slope soarers based on a huge variety of full sized aircraft. PSS began in the mid 1970s, when a group of modellers at Moel Famau in North Wales were buzzed by a full sized DC-3 Dakota and the rest is history! Check it out at www.pssaonline.co.uk

If the above has grabbed your attention then log-on to <http://leadingedgegliders.com> to see some of the EPP PSS models that are available. Every Leading Edge High Performance EPP Slope Glider is designed to be the best in its class. You will be delighted to find that most of the hardware is pre-fabricated and ready to install. With Leading Edge Gliders, you do not have to choose between scale fidelity and high performance - you can have both! The screen-shot shows Rick Schwemmer's P-51.

The main aim **IMAC U.K.** is to promote competition flying, in several different classes, of scale model aerobatic aircraft in sequences of aerobatic manoeuvres



Micron Radio Control are not closing down merely re-focusing.



The Slingsby T67 Firefly is BillKits' first venture into the world of scale models.



A 'Pichler' of Austria KA-7 glider.



Power Scale Soaring is an exciting dimension of R/C model slope soaring.



Rick Schwemmer's P-51 Power Scale Soarer.



IMAC U.K. promotes the competition flying of scale model aerobatic aircraft.

even the internet for more TechnoScale Topics...

as flown by their full size counterparts. The aircraft must be scale but can be of any size (Basic class models must be under 70" span) and can use either electric or I.C. power. The above mentioned classes vary in their degree of difficulty with newcomers starting at an easy level (Basic) and progressing by results attained on to the higher classes (Sportsman's Intermediate Advanced and Unlimited). For more information take a peek at their website at www.imacuk.org

Nigel Cheffers-Heard's website at <http://carrier-deck.com> gives a fascinating insight into this interesting sub-discipline of Control-Line model flying. It's one of the simplest to describe (flying a simulated mission from an aircraft carrier) but one of the most difficult to perfect! On this website you will also find a description of the conversion of a Hobby King BF109 ARTF from R/C to C/L. This is the BF109T - the version intended for use on the German Aircraft carrier *Graf Zeppelin* in WW2 (but never completed).

ALIGN-TREX.co.uk are an internet on-line based company, dedicated to

bringing the customer high quality products and services. The company was founded in September 2009 and is part of Flying-RC.com which is owned by R&K Enterprise Ltd, founded in 2005. They specialise in the model helicopters, starting from the micro T-Rex 250 through to the ever-growing popular Nitro T-Rex 700, which means you will always get an original part or product. Their extensive web presence may be found at www.align-trex.co.uk where scale fans will find 500 Airwolf scale fuselage suitable for T-REX500 Helicopter.

With the trend to petrol and electric power, propeller choice and design has never been more important. **Propguy** at www.propguy.co.uk specializes in supplying propellers, both in wood and carbon fibre in at the widest range of sizes and pitches and can even cater for custom products. They also supply carbon fibre and aluminium Spinners, adapters and related products that will constantly be expanded to provide the best possible choice for the customer.

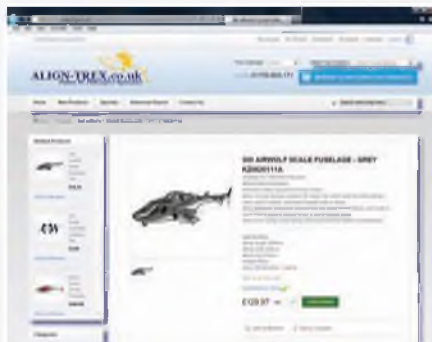
FEMA Modelltechnik with a web presence at www.fema-modelltechnik.de

is a German specialist company supplying high-quality accessories for the scale modeller. I particularly liked their superb range of retractable undercarriage units for scale gliders. The good news is that their superb wheels are back in stock and they still sell an on-board starter! *With the FEMA on-board starter*, internal combustion engines can be started by radio control - this is easy and safe and it is possible to start the engine on the ground as well as in the air. Their complete catalogue is available for download as a PDF file.

And Finally! **H S Walsh** has been the leading supplier of tools and equipment for jewellers and horologists. They have been supplying jewellery findings, clock and watch materials to the jewellery and horological trades for more than 65 years and are the largest outlet in the UK. We aeromodellers have a requirement for the same sorts of tools be it magnifiers, measuring devices or micro hand tools. Visit www.hswalsh.com it could make your life easier and more accurate. ■



Nigel Cheffers-Heard's excellent Carrier-Deck website.



A 500 Airwolf scale fuselage ALIGN-TREX.co.uk.



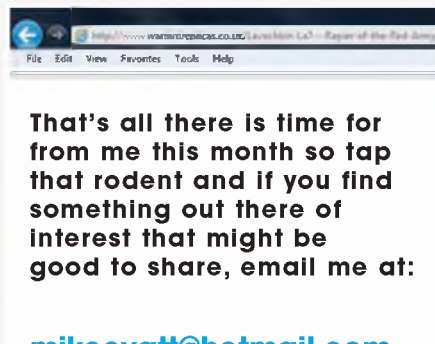
'Propguy' specializes in supplying propellers, both in wood and carbon fibre.



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Magnifiers, measuring devices or micro hand tools are available from H S Walsh.



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

mikeevatt@hotmail.com

Classifieds



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