MODEL MAGAZINE

MARCH 1986 £1.85

AERO MODELLER

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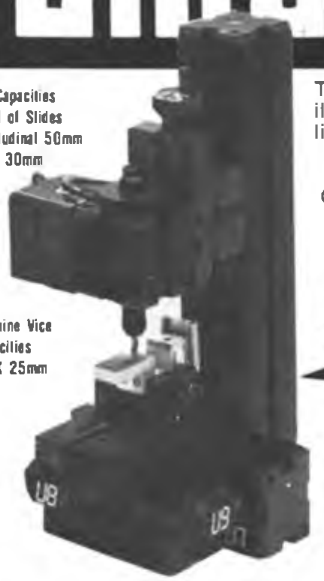

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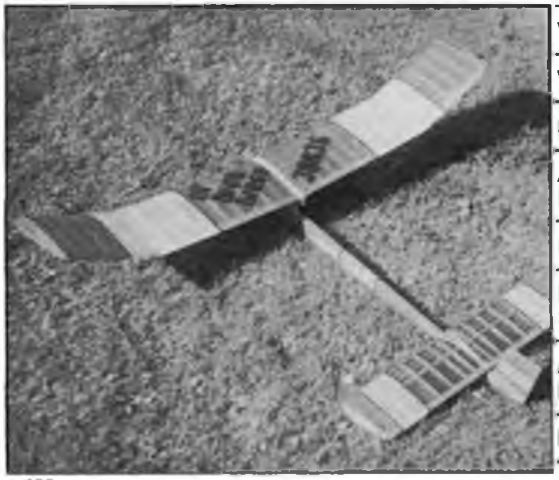

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Group Editor *Alec Gee*
Graphic Design *Jenny Hine*
Advertisement Manager *Jim Carrigan*

COVER
Scale modeller Charles Newman puts just as much effort into the overall appearance of his models as he does into furnishing their cockpits (see feature starting page 139); this is his magnificent 1/10th scale Avro 504N photographed at the 1986 Model Engineer Exhibition at which it gained a Highly Commended award. Photo Manny Cefai

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HANGAR DOORS

Reading Society 40th Anniversary

Preparations are now well under way for the forthcoming 40th Anniversary exhibition to be held at the Hexagon Civic Hall in Reading on the 26th and 27th of April 1986. The exhibition is to celebrate the reforming of the club after the war, and all the club activities will be well represented. In addition some other local clubs will be exhibiting, and a good show is expected. There will be no trade stands at the exhibition only models. For further information please contact the exhibition secretary Mr Ian Brown at 46 Geoffreyson Road, Caversham, Reading RG4 7HS.

Model Engineer Exhibition time again and, as ever, the Wembley Conference Centre played Mecca to thousands of British modellers. David Vaughan's immaculate 1/5th scale Miles Gemini (heading) was one of the larger R/C models on display with a wealth of internal detail. Among dozens of other models of interest were this 'Vulcan 50', a pint-sized version of the vintage D.A. Russell design by Mike Whittard (below) and this 1/8th scale Sopwith Pup from the Micro Mold kit designed by RCM&E magazine editor David Boddington.

Keep it legal - keep it safe

Dear Sir,

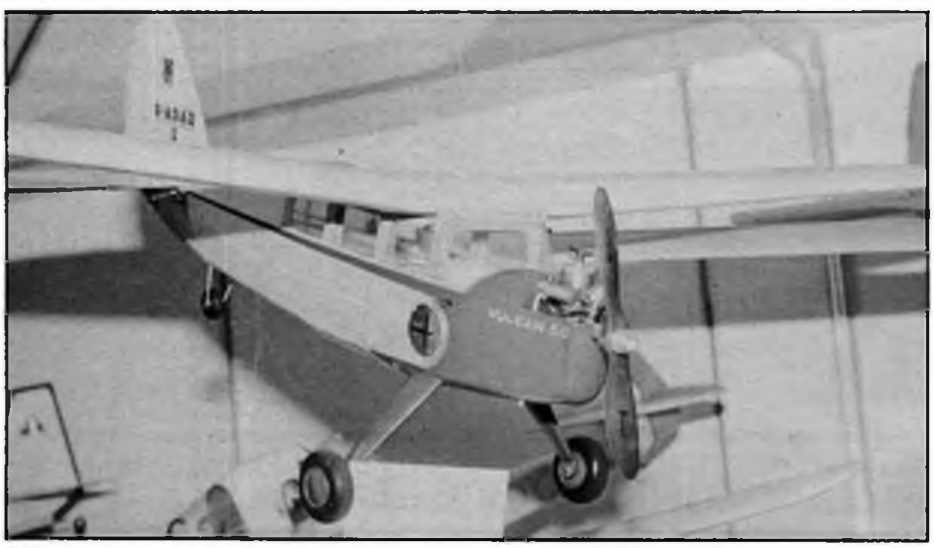
May I take advantage of your magazine to remind modellers that the SMAE fought and won the 35MHz Frequency for the operation of model aircraft. This frequency has been made exclusive to that for reasons of SAFETY. Surface modellers may still operate on 27MHz and 459MHz (and so may aeromodellers) but I regret that many surface modellers, and aeromodellers who also run cars and boats, are installing 35MHz equipment in those cars and boats.

This is illegal within the true meaning of the word. It is no defence to say that it doesn't say in any Statute that you *cannot* use 35MHz for surface models. That is true, but *it does say* that 35MHz is exclusive for model aircraft control. Statutory interpretation is that "unius inclusio alterius exclusio" - that is: If the statute names one thing then, by implication, all others are excluded.

Suffice it to say that there are many stories of model shops deliberately or in ignorance selling 35MHz equipment knowing that it will be installed in a model car or boat; probably one which they have just sold to the same customer. If you know of such cases please do not hesitate to inform the model shop owner of his mistake. If the Home Office are given "names and packdrill" they will take action under the provisions of the Wireless and Telegraphy Act.

In conlcusion I will add that in the foreseeable future, surface modellers may well be allocated their own exclusive frequency; perhaps then they will appreciate how aeromodellers feel on the subject of exclusive use. In the meantime keep surface models on 27MHz and 459MHz - keep it legal - keep it SAFE.

Roy Nudds
SMAE General Secretary



Flying Scholarships for disabled

His Majesty King Hussein of Jordan has very generously agreed to endow annually six International Air Tattoo Flying Scholarships for Disabled People. The IAT Flying Scholarships are awarded in memory of Sir Douglas Bader, the legendary World War II fighter ace who was President of the International Air Tattoo from 1976 until his death in 1982.

Up to nine IAT Flying Scholarships, which comprise a six-week summer residential flying course for a Private Pilot's Licence, are to be awarded annually. Applications from physically disabled people between the ages of 18 and 40 will be accepted. Suitable candidates will be invited to attend an IAT selection board in April 1986 for medical examination, interview and aptitude tests, after which the names of successful candidates will be announced.

Twelve physically disabled people have already learned to fly under this scheme and it is hoped that many more will achieve the goal of a Private Pilot's Licence through future IAT Flying Scholarships.

The International Air Tattoo is a biennial

Cambria Model Aircraft, that innovative outfit from Wales, started 1986 with the publication of a fine new colour catalogue and the launch of their Short Skyvan kit for R/C. Sadly, though, they announce discontinuation of their free flight and control line ranges. See below.

event and, as the largest air display of its kind in the world, is the most important fund-raising activity undertaken by the Royal Air Force Benevolent Fund.

Application forms for the 1986 Flying Scholarships for Disabled People are available now from:-
The Director, International Air Tattoo, Building 1108, RAF Fairford, Cirencester, Glos GL7 4DL or Secretary (Appeals), Royal Air Force Benevolent Fund, 67 Portland Place, London WIN 4AR.

New Catalogue from Cambria

Cambria Model Aircraft's new catalogue is now available either direct from Cambria or from any good model shop. It is free and introduces two new models to the range, the Grumman Tiger which replaces the popular Traveller, and the 1/8 scale 96in. wingspan Shorts Skyvan which is an addition to the Master Series.

The Freeflight and Control Line ranges have been dropped along with the Pioneer and Traveller although spares will still be available for these models. The catalogue, which is in full colour A4 format, has text in English, French and German and large pictures of all models in the range. Anyone who is unable to obtain a copy through their local model shop should send a large 12in. × 8.5in. SAE to: Cambria Model Aircraft, Mochdre Industrial Estate, Newtown, Powys SY16 4LF.

Old Warden '86 dates confirmed

Diary dates are now confirmed for this year's series of ASP flying events at the Shuttleworth Collection's airfield at Old Warden, Bedfordshire. As you'll see, in addition to the established favourties like Scale and Vintage Weekends, we've rung the changes to a degree with the introduction of flying days with various new themes. More comprehensive details later but, for the time being, cancel all previous engagments.

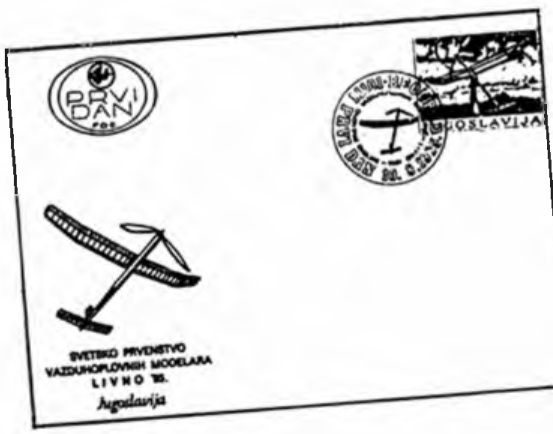
May 18th	Large Model Spectacular/ Golden Era Fly-in.
June 21st/22nd	Scale Weekend
July 6th	Helicopter Fly-in/Silent Flight Day
August 16/17th	Vintage Models Week-end
September 14th	Four-Stroke Models Fly-in.

World Champ Stamp

Dear Sir,
The staff and readers of *Aeromodeller* may be interested to now of the Yugoslavian stamp and first day cover (photocopied below) issued to commemorate the 1985 World Champs at Livno last year. I believe that this is the *first time* an International aeromodelling event has been honoured with a specific stamp issue by the host country? Perhaps your philatelically inclined readers will correct me if I am wrong...North Korea issued a set of stamps in 1976 to commemorate their victories in the 1985 World Champs.

For the information of those interested, the FDC with stamp can be ordered from D.J.M. Kerr, 2 Thorn Street, Earlston Berwickshire (a specialist stamp dealer) for 75p including postage. Let's hope other countries follow the lead of Yugoslavia, though I doubt whether the British Post Office could be persuaded to commemorate the next Indoor World Champs at Cardington!

C. E. Smithen
Welwyn Garden City, Herts.



What's On

March
An exhibition to commemorate the 50th Anniversary of the Supermarine Spitfire will be staged by the Mid Glamorgan County Library during March this year. Further details from the Library at Coed Parc, Park Street, Bridgend, CF31 4BA (Tel: 0650 57451).

30 March
SOUTHERN AREA INDOOR ALL SCALE DAY.
Comps: Peanut, Open Rubber, Open CO_2, SAM 35 Earl Stahl. Venue: H.M.S Daedalus, Lee-on-Solent. Contact: Malcolm Leach. Tel: Emsworth (Hants) 5364. Also Fly-For-Fun. Entry £1.25 (per comp or F-F-F), under 16 free. Anyone going must inform Malcolm Leach at least one week before. Flying 1pm to 6pm.

April 26/27th
The Reading Society of Model Engineers' 40th Anniversary exhibition at the Hexagon Civic Hall in Reading, open 10.00am to 6:00pm on both days.

April 27th
SMAE Indoor Scale Nationals at the Alumwell Centre, Walsall from 9.00am to 6:00pm Classes: Peanut, Open Rubber and CO_2. Fee per event £3 (Juniors half price), visitors £1:50. Pre-entry in all classes by March 31st. Large display of static models and a programme of demonstrations by leading free flight scale modellers. Full details and entry forms from Doug Shepperd, 13, Luckington Road, Monks Park, Bristol, Avon BS7 OUT (Tel: 0272 697595).

May 4-5th
Model Aircraft Rally at Holker Hall and Park, Cark-in-Carmel, Grange-over-Sands, Cumbria, LA11 7PL. (Tel: Flookburgh 328 (044 853) Enthusiasts from all over the North of England will display their scale models (R/C). Contact: Mrs. Carolyn Johnson.

June 8th
North London MFC Scale Day. R/C scale at the club's flying field at Baldock, Herts. Snacks will be available and prizes awarded. Entry will be £1 on the day. Contact Richard Barley, 44 Orchard Avenue, Berkhamsted, Herts HP4 3LS.

July 13th
North London MFC Vintage Day. R/C only (no free flight) Vintage character models. Barbecue will be available - bring own food. Contact Richard Barley, 44 Orchard Avenue, Berkhamsted, Herts HP4 3LS.

July 20th
Shuttleworth Model Group Fly for Fun Open Day. Venue: Old Warden Aerodrome Biggleswade, Beds. SG18. Gates open at 9.00 am. Contact M.S.F. Staples 11, Whitehill Road, Cambridge CB5 8LT.

July 27th
RAF Alconbury 1986 Airshow. Full-size flying programme. Contact Public Affairs Division, RAF Alconbury, Huntingdon, Cambrdigeshire. (Tel: Huntingdon 52131 ex 2174/2125).

27 July
DREAMING SPIRES F/F SCALE - SILENT VINTAGE GALA
Comps: Open Rubber (15in span plus), CO_2, Power/Electric (max 1.5cc), Twin Rubber Scale and also Mass Launch. Vintage: Wakefield, Lightweight, Lightweight Freewheel and Glider. Venue: Port Meadow, Oxford. Contact: C. Newman. Tel: 0867 73020. Note: Absolutely no diesel/glow powered models permitted - other than those entered in the F/F Scale event.

August 16-17th
Annual Model Show at Plumpton Racecourse. 300mph Dutch pulse jets, parachutists, planes, cars, boats, trains, traction engines, space rockets, junior comps, camping, live entertainment, helicopter rides, children's fairground, videos, bar, refreshments, lectures, special ladies entertainment, trade stands, etc. Contact Dave Bishop, DB Sound, 17 The Square, Tatsfield, Nr. Westerham, Kent TN16 2AS (tel: Tatsfield 77550)

September 7th
Shuttleworth Model Group Silent Day at Old Warden Aerodrome, Biggleswade, Beds. All welcome but no I.C. engines to be run. Contact M.S.F. Staples, 11, Whitehill - Road, Cambridge CB5 8LT.

LATE ENTRIES

2nd March
SAMS 4th INDOOR FLYING EVENT
A fly-for-fun event at the Watford Leisure Centre, Hertfordshire. Classes will include Scale (from 11.00am on odd hours) and EZB and Peanut duration from 12.00pm on even hours. Entrance costs £2.00 for flyers, 60p for watchers and the Centre offers the attractions of a cafe, bar and ample close car parking.

15th June
THE OXFORD M.F.C. FREE FLIGHT RALLY.
At Port Meadow, Wolvercote, Oxford. Classes A1 Glider,Coupe d'Hiver in rounds starting at 10.00am. Hand Launched Glider and Vintage - no rounds. N.B. Vintage is rubber and glider combined, span limit on rubber 36in. No power models to be flown. Contact: Andrew Crisp 30 Portland Road, Summertown Oxford.

8th June
3rd ANNUAL HUDDERSFIELD & DISTRICT VINTAGE EVENT
All vintage event will be R/C assist and classes will include Texaco, Precision and Duration. It is also hoped to run Flying Fifteen this year and radio frequencies are restricted to odd 35MHz Yellow, Green, Blue or U.H.F. only. Refreshments will be available on the field all day and further details are available from Colin Thompson, 132, Slaithwaite Road, Meltham, West Yorkshire HD7 3PW. An sae would be appreciated.

PHOTO PRIZE

Model News With Fliar Phil

Wood for the Winner

100 Sheets of balsa, nearly 200 lengths of strip wood — some prize!

All you have to do is send Fliar Phil your photograph – good quality black and white or colour prints will do, with your name and address plus details of the model, its construction, etc., on the back. Post your entries to Aeromodeller Photo-Prize Feature, P.O. Box 35, Wolsey House, Wolsey Road, Hemel Hempstead, Herts HP2 4SS. Photos will be returned after publication.

A summer's day at the flying field. An aeromodeller, replacing a rubber motor, needed some lubricant. 'There's a bottle in my box' says a friendly fellow flyer. Hastily grabbing a bottle from the box, the aerobod liberally smeared his new rubber motor. Rather a disaster really! It was the *wrong* bottle — one which happened to contain thick DOPE! Fiction? — not a bit of it — a TRUE story. Now for the dope on this month's 'Winning Wings'.

Photo 1

"Revving up and rarin' to go" is the title given this photo by Gordon Norris of New Milton Hants. A fine flyer, this cabin sports model spans 22½in. CO_2 *Telco* 'Turbotank' powered. Designed and built by Gordon, who has returned to aeromodelling after many years. Gordon says his long absence gives his model a 'vintage look'! And a very nice look too Gordon... Welcome back.

Photo 2

Always a builder of fine models this 59in. span 'Lake Buccaneer' (from a *Pilot* kit) is another masterpiece from the stable of Peter Bull of Kilkenny, Eire. *Super Tigre* X25 powered with *Skyleader* four channel radio control. F.P. could become positively lyrical (if space permitted) about the lovely young lady holding the model! She is Peter's daughter Marion. Footnote: Peter's dog Scotty has also got in on the act!

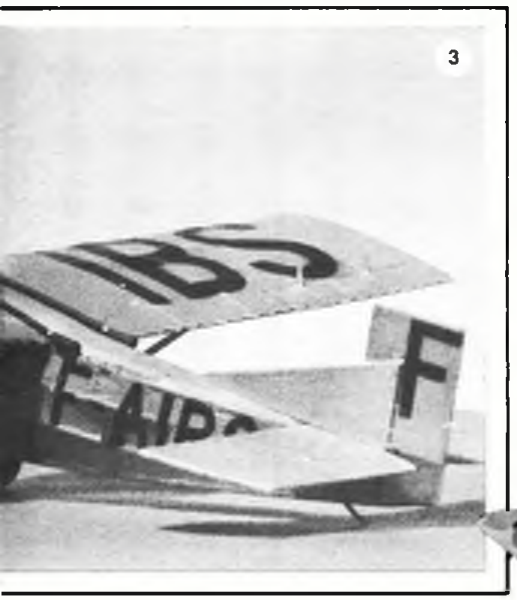


Photo 3

This very interesting peanut scale *Farman* F 170 comes from Martin Dilly of West Wickham, Kent. The original was an eight seater passenger aircraft of the mid-20s. Model weighs 11 grams and is already clocking 27 secs with obviously more seconds to come! Thanks Martin for sending F.P. this pic of a rarely modelled but fascinating aeroplane. That prop looks as if it means business!

Photo 4 Winner

Indeed the *Fokker* 'Triplane' was a formidable fighter of WW1. This fine 'flying portrait' could well be of the real aeroplane. It is the skilled work of Mick Galvin who designed and built it. Photographed with equal skill by Ken Rimell of Bosham, West Sussex. Comment by Fliar Phil would seem superfluous, the photo says it all! Ken and Mick are both members of the Chichester and District MAC and will, no doubt, share this month's balsawood!

Photo 5

Somewhat disguised by the radial engine - but all the more interesting for that - this super model is of a Royal Norwegian Air Force *Hawker* 'Fury'. The expert behind the design and building is Phillip Kent of Cleckheaton, West Yorks. Details: 60in. span, weight - 9½lbs, power - *Laser* 75 four stroke. Simprop 5AM radio. Phillip writes: "Model has litho plate nose panels." They give it that 'professional look' Phillip.

Photo 6

Surely that's a very desirable *Mills* .75 popping its cylinder head out of the engine compartment of this model! The vintage model that files behind the *Mills* is a 'Simplex 40' (an *Aeromodeller* free plan). It comes from Mr R Presnell of Haddenham, Ely, Cambs, who reports: "Its first flight at Old Warden was over 10 minutes"! Nice going Mr Presnell - and F.P's thanks for 'the vintage touch'.

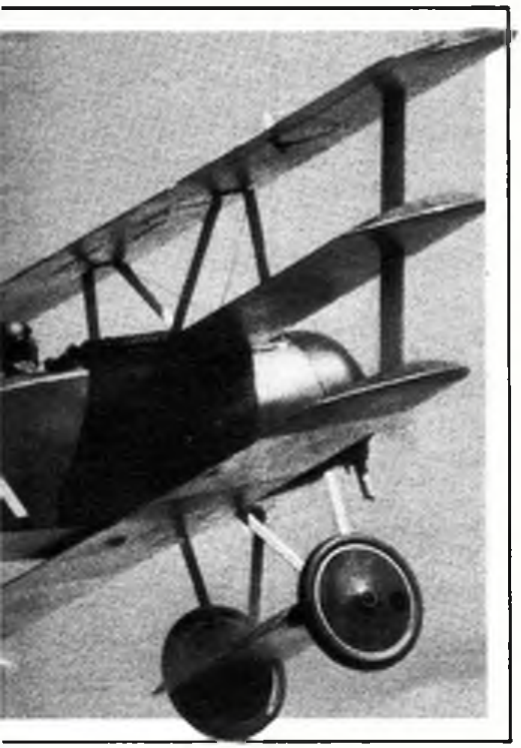
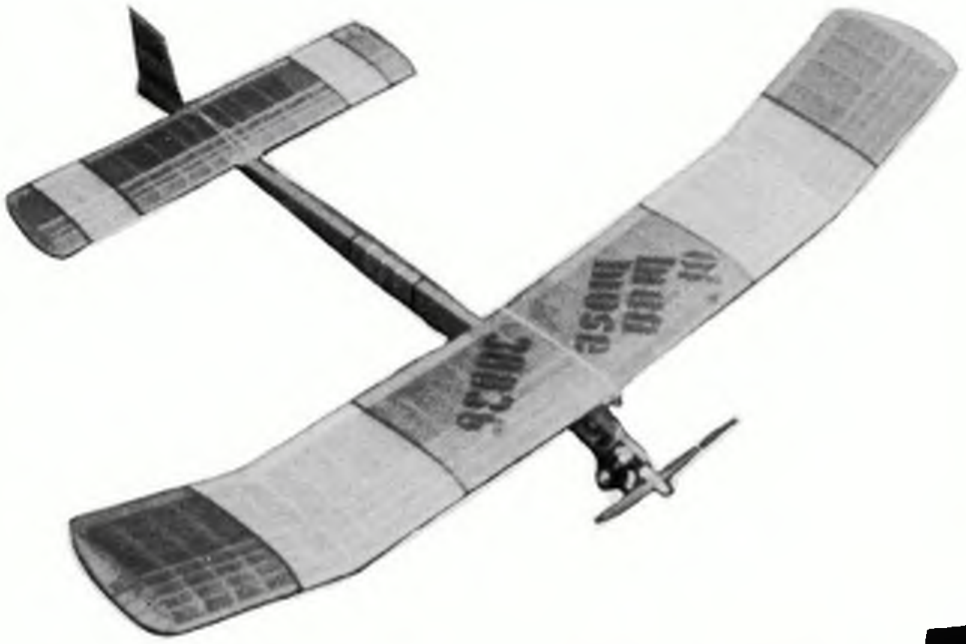


Photo 7

If you are contemplating taking up radio control then this model is the ideal trainer, according to Arnaldo Correia of Portugal. It is the *MAP* 'Tyro' powered with an *OS* 10 FSR and using *Futaba* three channel R/C. In a very friendly and informative letter, Arnaldo says: "It has helped more than a dozen people (including myself) to learn to fly R/C". F.P's thanks and Happy Landings Arnaldo!

Pop that pic in the post pronto and pop into Photo Prize Model News!

Remember folks, this is YOUR feature and Fliar Phil needs YOUR photos to keep it going!



'Ole Man Mose'

Here's a not so Slow Open Power design for 1.5cc motors to get you running this season! Designed by Andrew Crisp.

"WE BELIEVE ole Mose kicked the bucket, and we believe he's dead" run the words of the old jazz song, but the first time you try this "Ole Man Mose" under full power you will find it very much alive and kicking!

When the *SMAE* Slow Open Power class first came out I had a certain measure of success with an overweight diesel design which glided well enough but which was a bit sedate on the climb. I figured that a glow motor, in particular the *Cox* .09, would allow a lighter model and the excellent power output would more than make up for the two second extra run which diesels are allowed under the rules. By the way, for those unfamiliar with them, the rules allow no gadgetry in the form of auto-rudder, variable incidence tails, etc: motors *must* be plain baring and pressure feed is *not* allowed. Glow motors get 10 seconds run, diesels 12 seconds.

As the class prohibits auto-rudders (which are used to ensure a good transition from power to glide), the design concept was for features which would automatically give a good pull-out. Anybody who insists in altering the design to suit personal whims would be wise to confine the modifications to structure and outline (wing tips, etc.) and not to alter the force layout and incidence/CG set up.

A large wing area for the motor size was chosen to give a slow glide and light wing loading. The thin flat bottomed wing section is fast under power and is easy to build using standard model shop wood sizes. The tail area is not particularly large and is used with quite a short moment arm. This means that the CG has to be much further forward than, say a 'Dixielander', but it gives a swift recovery from disturbances and a *bouncy*, thermal-conscious glide. Under power, of course, this layout has a strong looping tendency and this is counteracted with 5° of downthrust on the motor. Because of this, the thrust-line passes over the fin and with its spiralling flow gives a strong right turn when the model is under power. This is moderated with a certain amount of left thrust and washout of the left wing tip.

Thus we have the ideal situation for a good transition without gadgets. When the side thrust stops guiding the model upwards it swings over into its right glide (encouraged by tail lift) and there is enough incidence difference to ensure a quick recovery if a stall occurs.

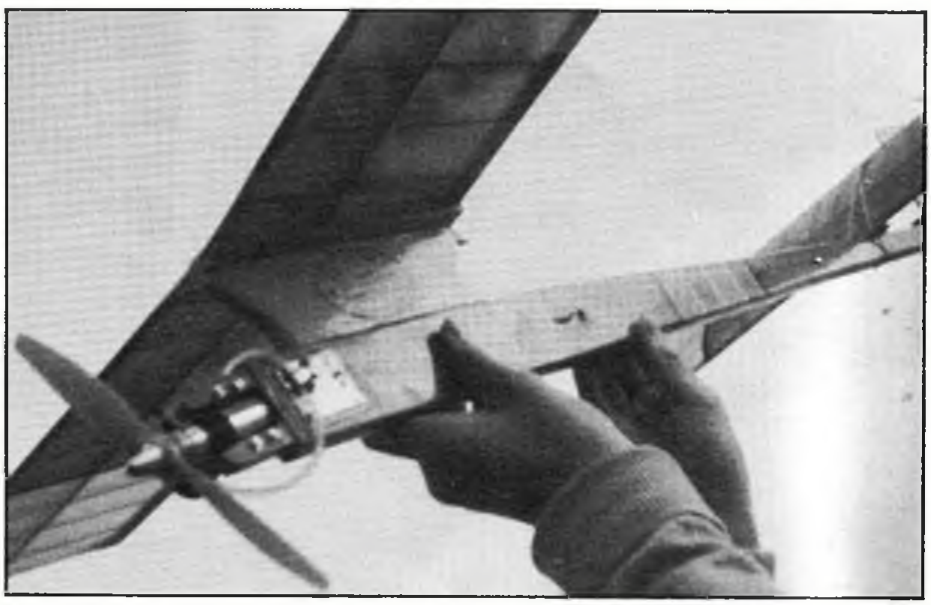
The original weighed 10 ounces and was powered by a *Cox* .09 driving a 7in × 3in fibreglass prop (like those FIC flyers use) and fed 20% nitro fuel, although I'm sure a *Cox* could take more! A well-known Wakefield flier has just built a copy as an introduction to power flying (and to gain Plugge Cup points for his club) and reports the same easy flying characteristics as the original.

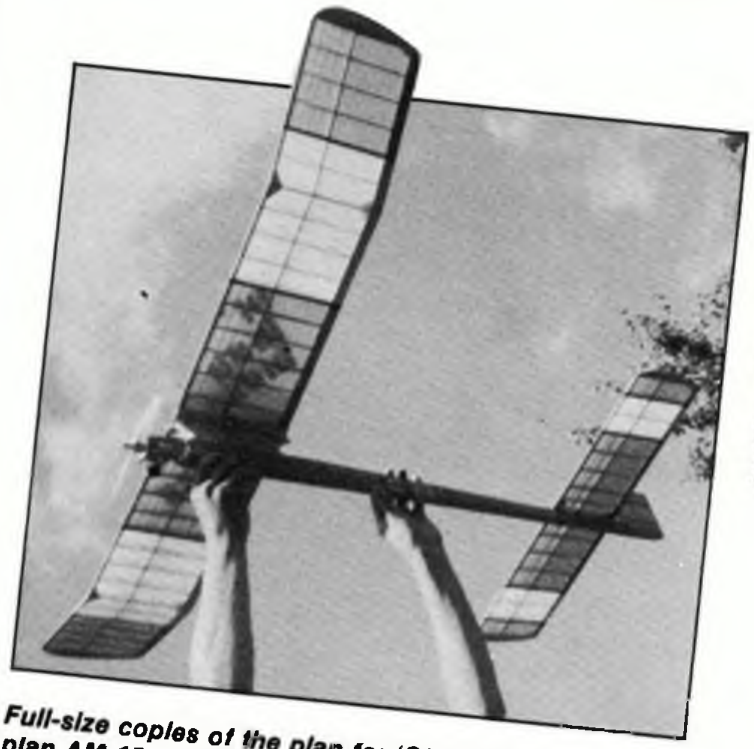
Enough of this preamble! Let's get on with the building. All balsa wood should be medium to light with quarter grain, if you can get it for the fin, wing and tail ribs and the trailing edges. It's a good idea to build the tail first to get the hang of the construction, then the wing, then the fuselage. Use whatever adhesive you prefer. I still find balsa cement hard to beat and prefer *Joyplane* which does not pull the structure about much for the flying surfaces, and *Britfix* for the fuselage. If you are in a hurry and can build accurately Cyano has much to recommend it.

Tail

Note that the centre rib is 1mm ply. I use the template which does for the other ribs. This prevents deformation by the loads of the tail hold-down bands. Note also that the webbing is thicker in the centre. Do not omit the small ply brace behind the leading edge in the centre. This point takes a bashing on a dethermalised landing. The d t band hook is firmly epoxied in place when the tail is covered and doped.

Business end of 'Ole Man Mose' showing timer arrangement; lack of dt timer means a 1oz saving in all-up weight!





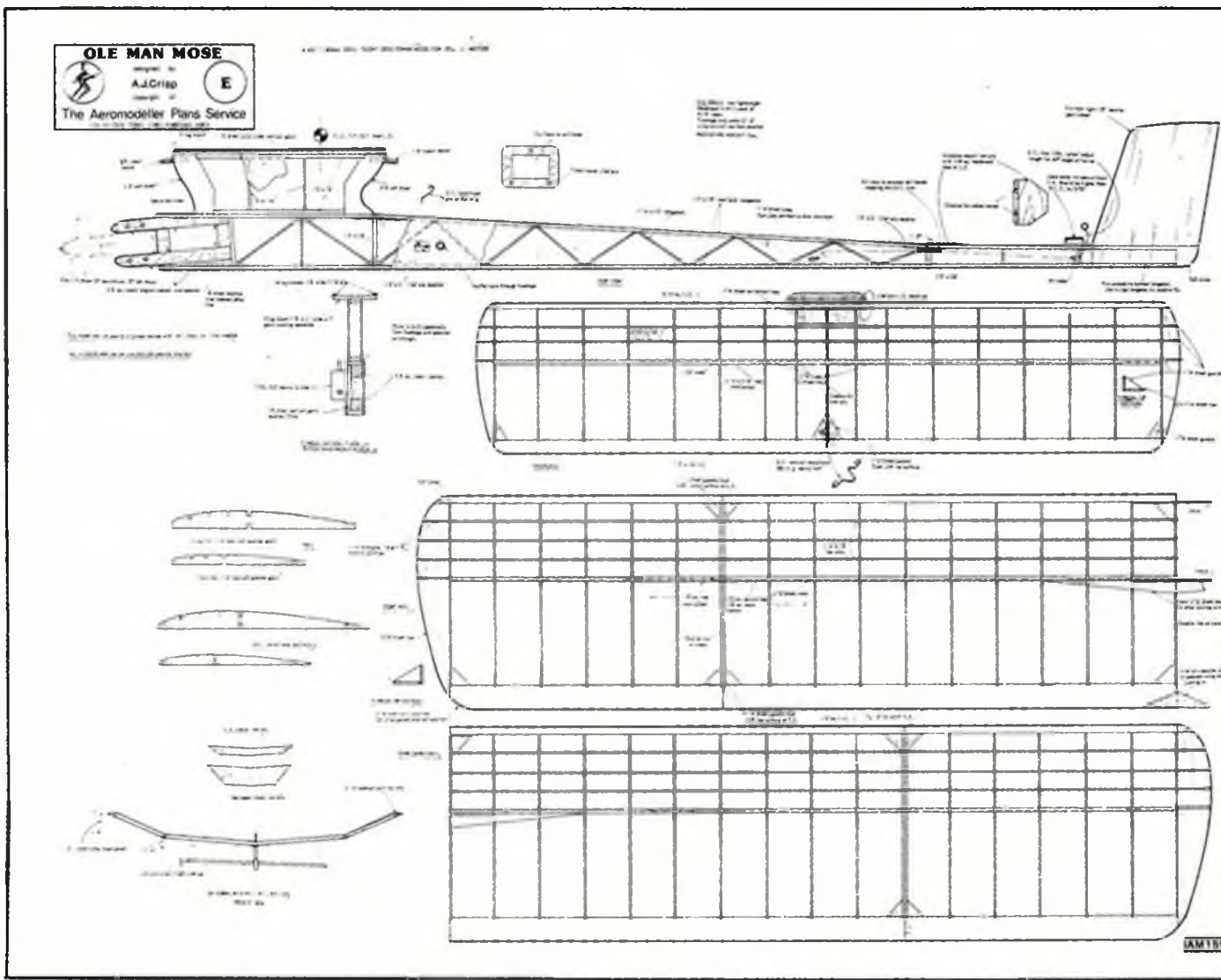
Relatively large wing area on 'Ole Man Mose' makes it a model that's easier to tame on the climb than some of the bullets we've seen. Nevertheless, this fun ship doesn't hang about – unless it's caught in a thermal...

Wing

If possible try to use lighter w
wing tips compared with the cent
The 1/16in sheet webbing betwee
might seem like a chore but it
enormous amount of stiffness
structure for very little weight.
vary on the direction of grain for w
know in theory that the grain s
vertical but in practice horizontal
much easier to use. You just cut a str
1/16in sheet as deep as the distance
the spars and chop it off as required
bay. Fit the bottom spar, then the w
the top spar.

Dihedral braces (in centre only n
best added *after* the dihedral has s
away the rib with a very sharp blade
razor saw and glue in firmly. Note th
1/16in sheet doublers in the centre.
size and cut away the rib behind the
spar to suit. Gussets should have their
running parallel to their longest sid
should be *flush with lower surface a*
leading edge and the *upper surface a*

Full-size copies of the plan for 'Ole Man Mose', reproduced here at near 1/5th actual size, are available as plan AM 1507, price £3.50 including packing and postage, from Aeromodeller Plans Service, P.O. Box 35 Wolsey House, Wolsey Road, Hemel Hempstead, Herts HP2 4SS



trailing edge. The use of 1/8in sheet ribs at the breaks prevents deformation by the covering in this region.

Fuselage

The fuselage is based on the well-known vertical crutch profile method. Simply draw the outline on some medium weight 1/16in sheet - this will be the starboard side - add the ½in × 1/8in longerons, pinning through to a flat building board to keep straight and fill in the internal structure from ½in × 1/16in (stripped from 1/16in sheet). Because of the downthrust the top engine bearer is cut at an angle to lie snugly against the top longeron. Use scrap bearer material to space the main bearers apart to the width of the motor used. The space between the bearers accommodates the timer.

When all is dry, sheet the portside and leave weighted down overnight. Trim off the edges and sand smooth but leave a flat area where the pylon and tail mount are to go. Slot the top longeron accurately and insert the pre-shaped fin. Finish off the rear of the fuselage with soft scrap balsa.

The pylon and wing mount are made as a separate unit and glued on when the model is completed to get the C of G (balance point) in the right position. Up to ½in either way is permissible for the pylon position. If the CG is still not right after this... resort to ballast at the appropriate end. Use a good epoxy to secure the pylon to the fuselage - likewise the tank to the starboard side opposite the timer - *as near to the motor as possible.*

The tail mount complete with hardwood stop strip should be glued to the fuselage so that there is a slight amount of tilt, right side high, when viewed from the front.

The d/t snuffer tube is made from ¼in diameter aluminium tube and goes through the fuselage just behind the wing. A length of aluminium tubing underneath and to the front of the tail mount prevents the tail hold down bands from restricting the d/t line (12lb breaking strain nylon) and preventing the tail from cocking up to the d/t angle of around 40°.

Covering and finishing

The original was completely covered in lightweight *Modelspan* to an orange, white, blue and green colour scheme picked out with black lining and lettering. Everything was given three coats of 50/50 dope/thinners. I know you will have built everything dead flat (!), so as the dope dries 'coax' 3/16in wash-out (trailing edge up) into the port wing tip. The fuselage and centre six inches or so of the wing and tailplane are given a coat of good quality fuel proofer. Don't forget your *SMAE* numbers on the wing and your name and address on the fuselage.

Trimming and flying

Little can be learned from flinging a brand new model into a howling gale, so be patient and wait for a calm day before venturing forth to test your masterpiece! You will stand much more chance of success if you give the model a thorough pre-flight 'going-over' check:-

a. that there are no warps other than the washout stated.
b. that the CG is 70% or 4.9in from the leading edge of the wing.
c. that there is a trace of tail tilt - starboard side up.
d. that the wing is at zero incidence, but that there is approx. 1/8in to 3/16in negative on the tail, i.e. trailing edge higher.
e. that the motor runs and stops by the timer when desired.
f. that the d/t system functions.

Test glide and adjust negative on the tail unit until a slow glide with a hint of right turn is obtained. Use 1/64in ply shims for trimming and *always* cement well in place. If turn is too tight or non-existent pack appropriate side of tail mount.

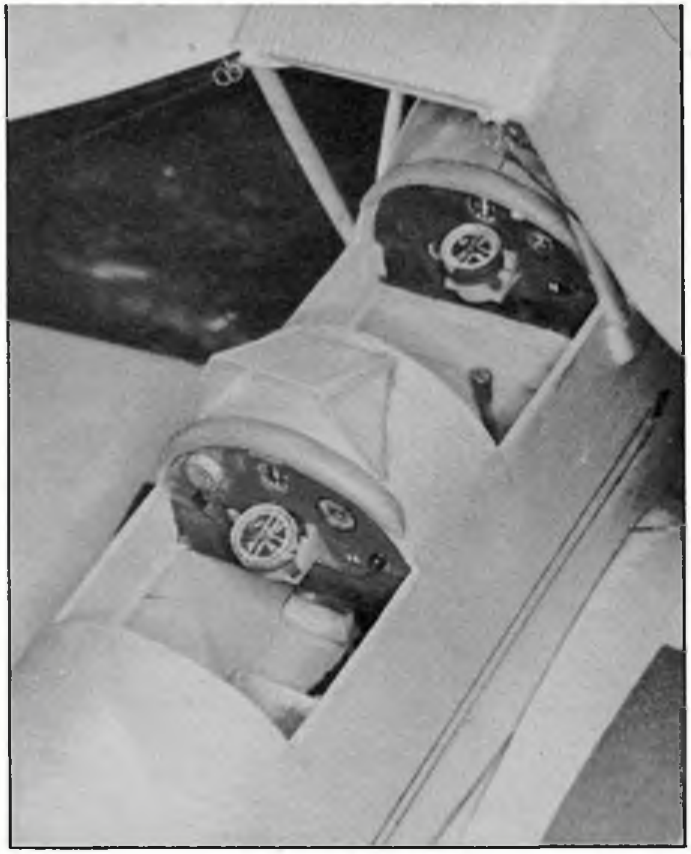
Now try some power tests. Fit a 'slow' prop like a 7in × 4in *Topflite* nylon to slow things down a bit. If possible run the motor a bit rich for the first flights. Of course, if you are using a good diesel like the *PAW* 1.5 it should 'throttle back' quite easily. Set the timer for only four seconds and launch the model into whatever wind there is. Because of the downthrust the launch angle must be quite acute. Don't worry too much about the climb at this stage just get the glide right before proceeding further.

Now fit a 7in × 3in prop and 'open up' the motor...but keep the run short. If all is well, increase the length of run until it is handling 10 seconds. Despite its 'slow' classification the speed of climb and height gained will amaze you! Ideally the model should complete 1½ to 2 turns on the climb with the nose right up and roll neatly into the glide without loss of height.

If it deviates by going too tight to the right check for warps, or add a *thin* washer under the rear bolt holes for extra left thrust. If it has too much left bias and rolls over at the top of the climb 'tweak' the trailing edge of the fin a bit to the right or glue a small piece of 1/8in × 1/16in to the right side of the fin.

'Ole Man Mose' is a real fun ship, offering lots of flying excitement for little constructional effort, but do remember to point it upwards on launch and do remember to light that d t on *every* flight. It's a sucker for thermals!

Successful and satisfying scale model building doesn't end with a convincing external finish. Look a little deeper with Charles Newman.



Cockpit Detail

Furnish that Office!

During 1980-81, I was asked to build a large fully-furnished model of an E-Type Jaguar for a friend. Owing to the large size of the model, much extra detail was required in order to 'bring it alive'. During construction, various techniques were employed to dramatically improve what would otherwise have been a fairly spartan plastic kit. The finished result was pleasingly realistic, and I felt that much of what I had learned could be used in my free-flight scale models.

I looked around for a subject which offered scope for a good deal of detail and decided upon the DH 'Fox Moth' as it offered both an open cockpit plus an enclosed passenger cabin. This was followed by my recent *Avro* 504N, which had two open cockpits to fit out, fortunately dissimilar to save boredom. These models have attracted many favourable comments plus a lot of "How do you do that" questions...

This article is offered as a basic explanation of what is involved. Anyone who has any experience of plastic modelling techniques will recognise various points here and there, for as an avid reader of magazines, I have picked up a good deal from *Scale Models* and *Airfix Magazine* over the years. Whatever your favourite modelling discipline, it often pays to read as widely as possible!

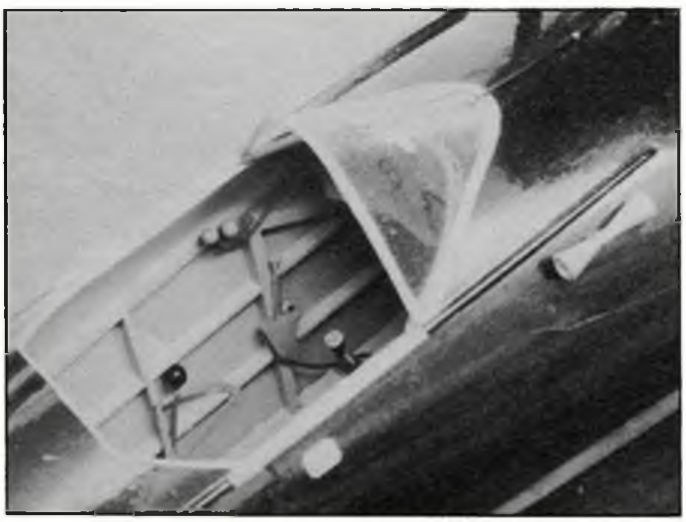
Many people build scale models, spending a great deal of time on the external detail and then leave the cockpit area a bare balsa box. Whilst I would be the first to agree that cockpit detail is totally unnecessary to flight performance and, indeed, may be heavy, a nicely equipped 'office' will certainly improve the character of any scale model and there is absolutely no need for it to be heavy.

Even if you do not wish to fly at contest level (though I wish that more people would), the production of cockpit detail is worthwhile, as the resulting model will look a proper little aeroplane from any angle, rather than merely a model.

Whilst this article will provide some insight into how this detail may be produced without a severe weight penalty, it is of necessity, general, as no two cockpits are the same. However, the various styles fall into a number of basic categories and it is up to the individual to exploit the information given here to his best advantage for any particular subject aircraft.

Below you will find a sequence of paragraphs in roughly the order in which I would tackle detailing a cockpit. It is important to think this through, however, for the subject model. Problems may otherwise occur because part 'C' will not go in as part 'A' is already in place! Rather, as one is asked to do in many plastic kit instructions, evolve an assembly sequence which will work, *before* commiting yourself with either glue or paint.

One final point before we get into detail, is the Weight Rule: if you cannot find a way of making it *light*, leave it out! Work to a weight budget. For my *Avro*, the budget was 1½oz of cockpit detail for a 32oz model. (It came in on target, by the way!)



Heading, Charles' Tiger Moth posed a double challenge to cockpit detailing skills! Fox Moth at left is more straightforward but offers plenty of scope, nevertheless, for many of the techniques outlined in the text.

Documentation

Before one can start to add details to a cockpit, it is necessary to obtain as much information *as possible* concerning the full-size machine. This will come in two basic forms: drawings and photos. The latter are the easiest to come by and are most useful to corroborate drawings. It is worth keeping a note of cockpit photos which appear in the various magazines. *Aeroplane Monthly* ran a good series on RAF cockpits during 1983-84. Best of all, should you be able to locate the full-size aircraft, then obtain permission and take some shots yourself.

As for the drawings, the best source is undoubtedly a rigging manual for the full-size aeroplane. Such manuals for WW1 machines on the whole are not very helpful but fortunately such cockpits are very simple. From the mid-twenties onwards, both civil and military machines had good rigging notes, the RAF notes in particular, containing some superb drawings.

Places where these things may be tracked down mainly include any aircraft museum with a library. The *RAF Museum* at Hendon, the *Shuttleworth Trust*, and the

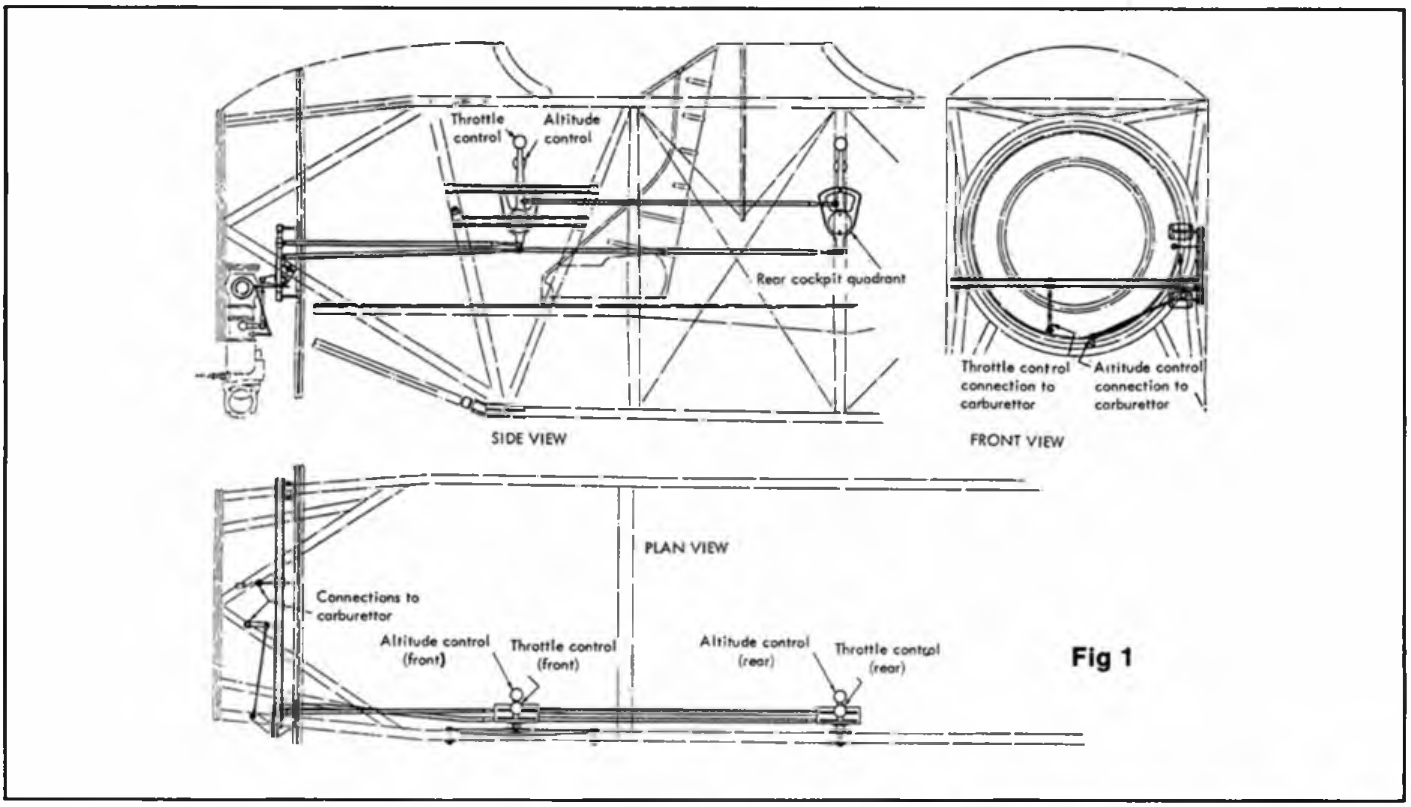


Fig 1

Imperial War Museum all have good collections of such material and will photocopy it for a small charge. However, keep an eye out in junk and second-hand book shops – rigging manuals are to be found in such places, often at little cost.

Finally, another source of information is the good old *Aeromodeller* Scale Drawings service. Many of the plan packs contain photos and sketches of cockpits, and many of A.L. Bentley's drawings give extended detail in three elevations, particularly for WW2 types.

Once you have assembled as much information as you need, extract the important details and add them to the model's plan, ie seat, dash, rudder bar, stick etc. In the case of the dash, be careful to note *what* instrument goes *where*. Make sure that all the exposed structure of the cockpit walls is shown. You are now ready to produce that 'lived-in' cockpit.

Even non-scale subjects can benefit from a spot of detail in the 'office'; this is an early example of dashboard/console titivation which Charles used as a practice exercise for later true-scale projects.

The Cockpit Area

Rather like a plastic kit, the cockpit area must be prepared before the fuselage is built up around it, and before the details are added. Cockpit areas generally fall into three groups: stick and string, solid-sided (metal or wood), and upholstered.

With stick and string fuselages, build the basic frame and then dope *all* the internal structure which will be visible through the cockpit aperture. Using 600 grade wet and dry, sand down and repeat the operation until the worst of the grain is gone – a high finish is not required and will be heavy...so do not go mad.

Next, paint the entire area with the relevant colour. If the prototype was varnished wood, use varnish, tinted with wood stain. Though probably not fitted at this stage, the cockpit floor should also be prepared. It should be made from the very lightest wood available, covered with Jap tissue, doped and painted. If there is no floor (common on many WW1 subjects), the seat will be mounted on runners. These should be spruce or dowel, depending on the section required. Again they should be rubbed down, doped and painted.

The solid-sided cockpit should be tackled thus: the fuselage sides should be cut out and sanded to a fine finish locally in the cockpit area. Add the longerons, also presanded and cover the cockpit walls with Jap tissue and dope. When dry, add *all* the basic surface detail, eg verticals, sub-stringers, strengthening and mounting plates, etc.

With a wooden subject such as a *DH* 'Moth', all this will be made from very light, pithy balsa to save weight. With a metal prototype, you may need to use strips of card or thin plastic, punched with scale lightening holes, to achieve the right effect. Once all this surface detail has been added and sealed, paint the entire area.

The fuselage should now be assembled in the usual way, taking care not to get glue marks or too much dust onto this prepared area. Any bulkheads facing into the cockpit should be similarly treated before assembly.

The upholstered cockpit is a nightmare and is best left well alone. It is the most difficult to make convincing *and* will tend to be heavy. However, if needs must, prepare any exposed structure in the cockpit as described above and paint it. If the cockpit walls and floor are carpeted, then use velvet or flock paper of the relevant colour. Use double-sided tape to fix the velvet so as to avoid clogging the pile with glue.

If the cockpit is padded leather or fabric, the lightest solution is to model each panel eg: the rear bulkhead, in bas-relief. Cast in surgical plaster and vacu-form from 10thou polycard. Once painted, this is very realistic *and* quite light. The alternative is to actually use thin fabric over plastic foam, which will be neither light nor realistic. Fortunately, most of the aeroplanes that feature such plush cockpits are American 'spam cans', with little to offer the free-flight scale fan!

Finally, regardless of the cockpit type, the top deck must be prepared. A larger than

necessary piece of wood should be cut out and prepared with tissue, dope and paint to cover the cockpit. Be sure to make the prepared area somewhat bigger than required so as to ensure that no awkward painting will be needed if the top deck goes on skew-whiff. Once prepared, put the top deck aside until the bulk of the interior detail has been installed.

The Dashboard

Let us continue with the one piece of detail that is most frequently fitted to cockpits by modellers -the dashboard. These are quite often crude or based on commercially available items. By using polycard, acetate and scraperboard, it is possible to create very effective, lightweight dashboards. Having established the correct size and shape of the dash, plus the exact positions of the instruments, cut out three identical blanks: one from 15 thou polycard, one from the thinnest acetate or clear plastic sheet you can get (not cling-film), and one from scraper-board (the latter available in small packs from art shops).

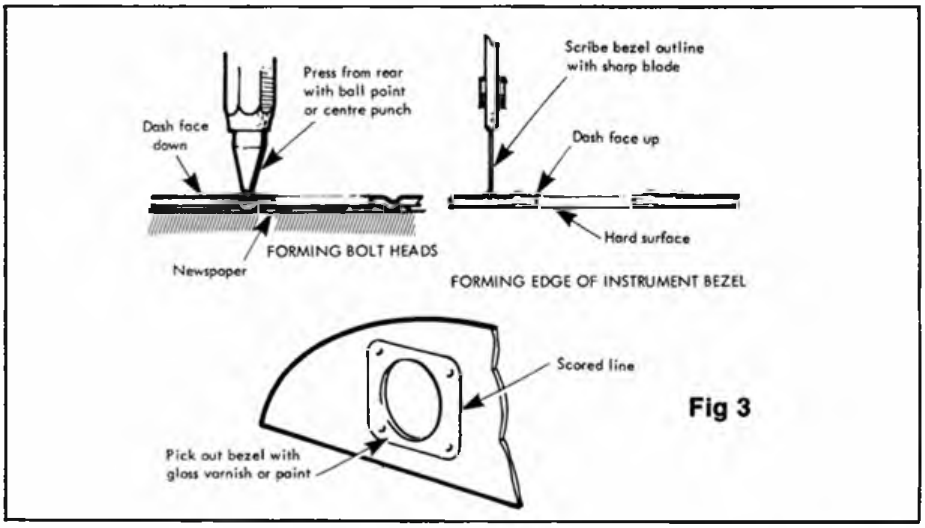
Lay the polycard blank over the scraperboard blank and with a pin, mark the centres of the instruments. Open out the holes in the dash face (the polycard), by revolving a pair of dividers repeatedly on one side and then the reverse, scoring the plastic, until it breaks away. Save the discs so formed as these may well come in handy as the basis of detail elsewhere in the cockpit, or for another model! Gently clean up all the edges with fine wet and dry.

Place the dash face, face downwards, on several sheets of newsprint, and using a ballpoint pen or scribe, press the plastic wherever a bolt-head is required. Generally this will mean four round each instrument, plus others where there are mounting brackets etc. Pressing from the rear will produce neat bumps on the 'finished' side of the plastic.

Return to the front face of the dash and scribe on the instrument bezel outlines with a pointed, sharp blade. This will produce raised lines. Make any switch housings and other lumps and bumps from polycard, moulding them from thin sheet wherever possible, to save weight. Add all these details and paint the entire dash, probably matt black. When dry, using a fine brush, paint the instrument bezels with gloss varnish or paint - on a model up to 1/10 scale, this is most convincing. If the dash is wooden, use varnished 1mm ply instead of the polycard and make the bezels from 10thou polycard.

Using the centres already marked, the instrument faces are scribed on the scraperboard with dividers. You will be surprised just how much detail is possible with this material. If some of the instruments have red script, scribe the whole thing first, then paint over the relevant area with red drawing ink - voilá, red script finer than you could ever paint it! Should there be large areas of the scraper-board that are blank, between the faces of the instruments, cut this material away to save weight.

Assemble the dashboard carefully so that instrument faces line up with the apertures in the dash. Do not use cyano for this as it might frost the clear plastic. Use *PlasticWeld* to stick the dash front to the glazed panel and dots of *Evostik* to fix the scraperboard to the rear. Fit the dash to the model, *providing* that it will still allow the larger items of detail to be installed.

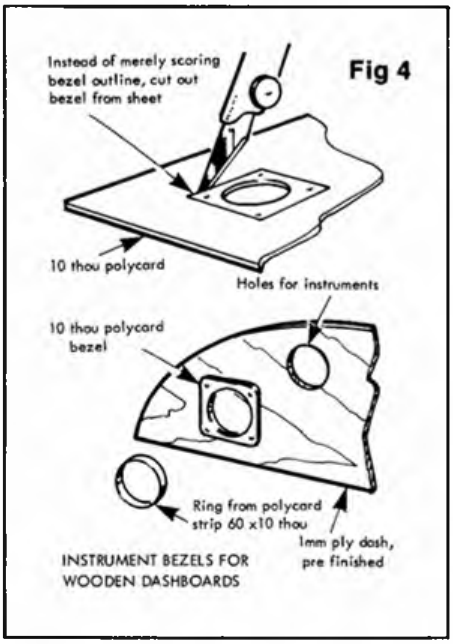


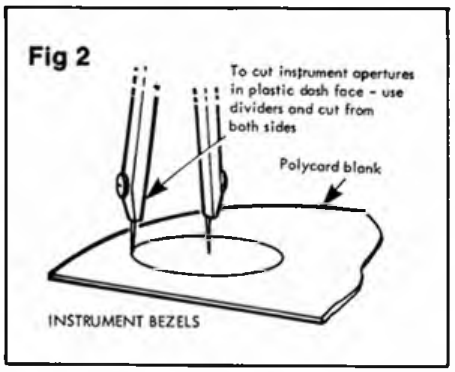
The Compass

The remaining instrument, often not fitted to dashboards themselves, is the compass. A tricky beast this and very prominent more often than not. There are essentially two shapes of compasses, cylindrical and spherical. The latter are commonly dashboard-mounted, whilst the cylindrical type tend to be mounted on a bracket somewhere else in the cockpit.

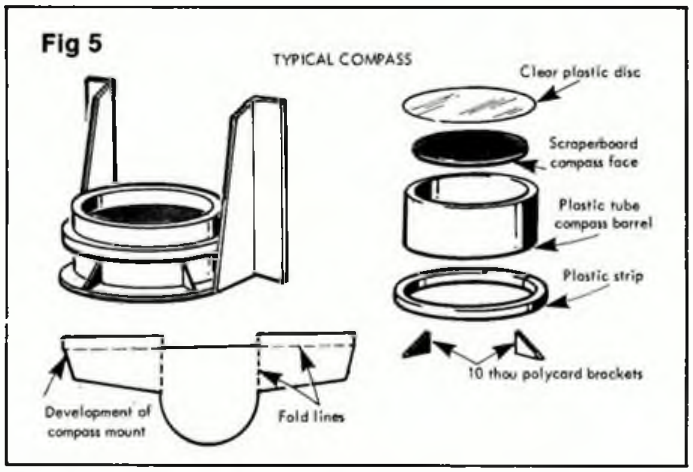
For a cylindrical compass, cut a short length of thin-wall plastic tube (eg, the 'inner' from a cotton reel). Using scraps of polycard and cyano or *PlasticWeld*, add the various flanges and other details to the barrel of the compass. Scribe a circle on some scrap scraper-board the same diameter as the bore of the tube. To this, add the details of the compass face, colouring with red here and there, as detailed above. Cut out this face with a *very* sharp knife, being careful not to break up the surface of the scraper-board. *Gently* sand it round.

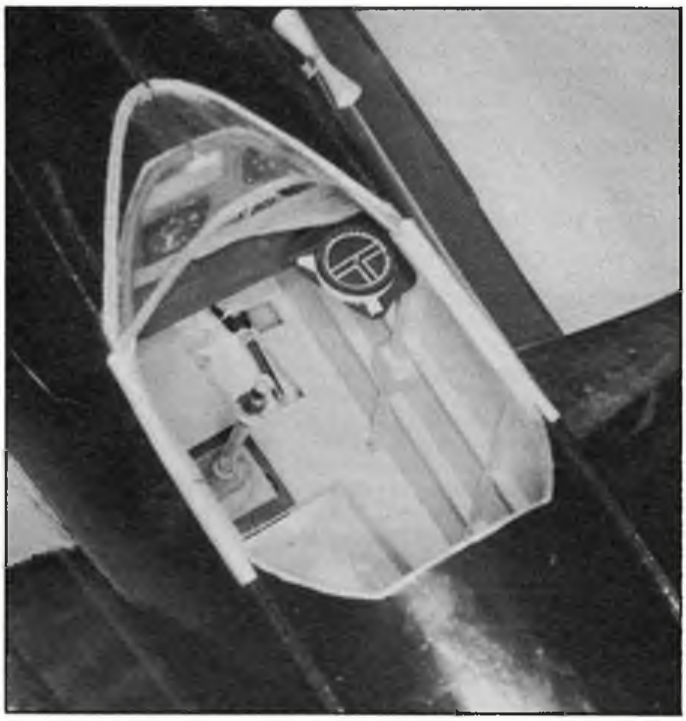
Using dividers or a leather punch, cut out a disc of thin acetate sheet to cover the top of the compass barrel. If using dividers, score from one side only, using a pad of masking tape to protect the plastic from being pierced. Leave the pad on the acetate after cutting out the disc. Paint and compass barrel inside and when dry, slide the compass face into it, fixing it below the top of the barrel. Now glue the glazed disc over the top.





Dashboard detail on the Fox Moth; model is about 1/10th scale. Scraperboard technique as described in the text produces incredibly intricate dial and gauge markings; visible here are r.p.m. gauge, turn and bank indicator and a.s.i.





Compass and control column detail on the Fox Moth; note gaiter on the latter and 'weathered' effect on front edge of seat.

To finish, charge a draughtsman's compass with paint and paint the outer ring onto the acetate, supporting the compass point with the pad previously left there. Now remove the pad and paint the rest of the compass barrel. The fixing bracket should be developed from doped cartridge paper or thick aluminium foil (from the top of a coffee tin).

Now for the spherical compass. In order to keep it light, either vacu-form the body from thin plastic, in two halves, or use an expanded polystyrene ball, painted with thinned PVA to seal. Add the various flanges and knobs from polycard. However, *do not* use either polystyrene cement or cyano on expanded polystyrene, as it will melt! Use PVA instead, as there is little or no load on the joints. Paint up and add to dash.

Seats

These come in three types: wickerwork, the metal bucket seat and the upholstered 'spam can' seat. The first should be made up just like the original, using woven, fine split cane. This is tedious but very realistic and light, if the cane is fine enough.

The bucket seat may be made up either from 15thou polycard, or from doped cartridge paper and balsa. In order to make the finished seat look the part, once painted, dry-brush the corners and the edges with silver paint. In actual fact, the seat will probably be of this type for most models.

The upholstered seat can be the genuine article, if the model is big enough. However, for anything 1/10th scale or smaller, such seats are best made solid in soft balsa or styro-foam, as weight will become a serious problem.

Add any details such as seat-belt attachments. These should be from stretched sprue. If you are not acquainted with this material, let me explain. It is simply the scrap runners which hold the parts of a plastic kit. Simply cut a length, heat over a candle flame and stretch out to the thickness desired. As someone who does not build plastic kits, I sometimes have to buy the odd *Airfix* kit to obtain some sprues! Try and make friends with keen plastic modellers and filch some old sprues from them...

Console

Whilst many early aircraft had seats and controls mounted direct to the airframe, as the aeroplane developed, these items were increasingly mounted on various forms of console or box structure, not unlike the transmission tunnel of a car.

Most of these consoles are of square-section. As one can usually only see the top of the console, make the sides from the lightest 1/32in sheet going, without any form of finish other than sanding and paint. However, the top should be from 10thou polycard. Strengthen the console where the seat is to be fitted - the only problem that I have ever had operationally with this sort of detail, has been seats coming adrift in heavy landings, so secure them well, particularly in an enclosed cockpit.

Owing to the length of the console (as with the *DH* 82, which runs from the front of the front cockpit to the rear of the rear cockpit), do not add dashboards, bulkheads, etc, until the console has been fitted into the fuselage. If the console will go in at a later stage, do not fit seats or joysticks until it has been inserted into the cockpit.

Apart from the seat, usually the only other parts fixed to the console are the joystick and the rudder pedals. Joysticks are metal or wooden, according to the age of the prototype aircraft. Use aluminium tube for metal sticks. Laminate the top with tape to form the hand-grip. Using leather punches, fashion any flanges from thin card, stuck with cyano. Paint the stick with enamel and scratch to achieve a weathered effect.

Some sticks are tapered and these may be carved from spruce or dowel. An easy short cut, is to take a section from a cheap paint brush handle. If the stick has a knob at the top, stick on a styrofoam granule with PVA. When dry, fair in with more PVA. If the stick has a WW2 fighter grip or steering wheel on the top, bend this up from aluminium tube and bind with masking tape.

Most sticks have a gaiter at their lower end where they meet the console or cockpit floor. Usually made of soft leather, this gaiter will be creased and folded. The easy, light way to reproduce this effect is via the ubiquitous moulded plastic sheet. First cut a hole in some 1/16in ply, the same size and shape as the plan view of the gaiter. Cut a piece of dowelling of the same diameter as the joystick and slightly round one end with sandpaper. Using drawing pins, attach an oversize piece of polycard to the ply over the hole.

Heat until floppy and then push the dowel into the plastic so that it forms a cone shape. Withdraw from the heat and whilst the plastic is still soft, waggle and twist the dowel to crease it, until the plastic hardens. Once stiff, trim the resulting gaiter and cut a hole in the top to accept the joystick. When painted brown or black and dry-brushed, this looks most convincing and is very light if made from 10thou sheet.

Rudder pedals vary considerably in design, some being literally a wooden bar, others, such as those on the *DH* 'Fox Moth', being mounted on a complicated metal tubular frame. The latter type should be made up from thin aluminium tubing, with polycard foot grips and other details. As with the metal joystick, paint and then scratch when dry to get that lived-in look. If the rudder controls are exposed, use waxed black thread rather than black nylon, which requires too much tension to remain taut.

Other Details

We have already covered all the major details for the cockpit but there are many other items which can be added. Especially

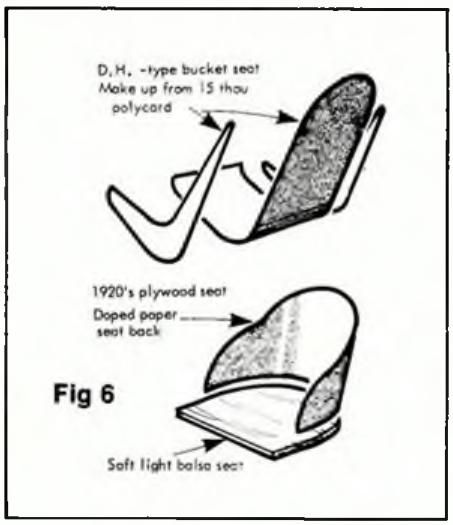


Fig 6

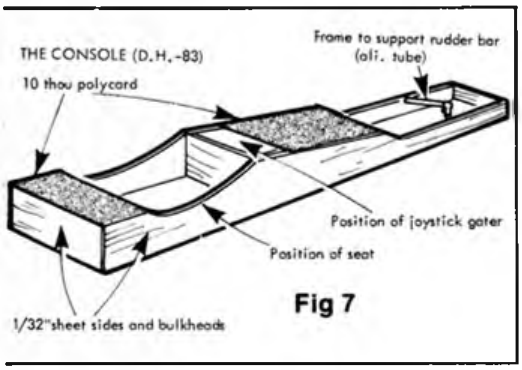


Fig 7

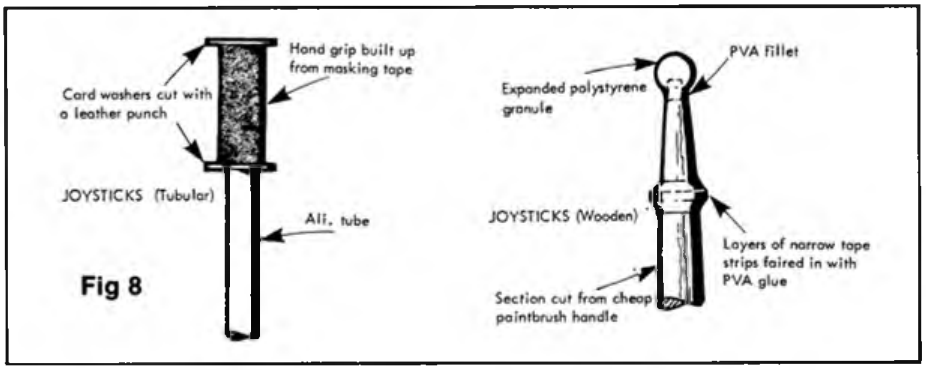


Fig 8

if your chosen subject has a cluttered cockpit, try and put in enough detail to create this effect, even if you do not put it all in. For example, the cockpit of a 'Spitfire' should look much busier than that of a 'Turbulent'.

Seat belts are to be found in all aircraft and are relatively easy to do. Make them from masking tape, stuck back to back, and stripped up with a knife and steel straight-edge. Buckles and other fittings should be made from 10thou polycard and stretched sprue. Paint all items separately before assembly.

Throttle, brake and trimmer controls, etc. that are to be found on cockpit sides are made from 10 thou polycard, sprue and plastic rod. Many have spherical knobs. These are easily made using granules of expanded polystyrene, the sort used for house insulation or stuffing cushions. Just pierce with a sharp knife, slip over the control arm and stick with PVA.

Throttle and brake cables may be made from the very fine insulated wire to be found in telephone switchboards - no, I am not inciting you to destroy *British Telecom* property, just wait until you see an engineer working in your office or at one of those roadside green junction boxes: they usually leave hanks of waste wire behind! As it comes in many different colours within the same hank, you do not even need to paint it!

Some throttles are connected to the engine with rods rather than cables. The lightest way of reproducing these is with dried grass from the garden (now perhaps your wife will understand why you are so reluctant to mow the lawn!). This is very rigid and straight and is incredibly light. Once painted, it looks very good.

Some aircraft will have subsidiary consoles with instruments and banks of switches, usually either side of the cockpit. Make the boxes from 10 thou polycard or doped paper. However, be especially careful with this type of cockpit, as one can easily run over budget weightwise.

Trim and other control wheels are best made from sliced plastic tube, sanded to section and fitted with plastic rod or sprue spokes. A good source of plastic tubes of various diameters is the plastic cotton reel. Even the narrow ones are moulded in two parts, as a tube within a tube, so each reel will offer at least two different tubes. They all seem to be made of a styrene type plastic which is easily stuck both with cyano and *Plastic Weld*.

Odd items such as fire extinguishers can often be knocked up from something in the spares box. A 1000lb bomb from a 1/72 scale plastic kit makes a reasonable base for a 1/12 scale fire extinguisher, suitably doctored! The purchase of one of those star-wheel leather punches is worthwhile as one is able to quickly produce small discs of varying thicknesses and diameters which greatly aids the production of *all sorts* of details, not merely within the cockpit. In this sort of game, it is the imagination which counts, so if a particular feature has not been covered here, work out a light solution for yourself.

Assembly

Having produced all the various parts for the cockpit, I generally set them up 'dry' outside the model, preferably over the plan. This will allow you to check that everything is satisfactory and in the right position relative to the seat. Hopefully, you will impress yourself by doing this, though it will look a whole lot better once installed in the fuselage.

Assuming that all is well, instal the console and rudder pedals. Rig the rudder pedals with the control lines, if required. Before fitting the seat and joystick, apply the detail to the cockpit sides, such as the throttle, brake, switches and possibly the compass. Next add the throttle linkages.

Before installing the seat and stick, check once again that all is well. If so, go ahead and attach them, plus the dashboard. The top deck or cockpit cover should now be applied. In the case of open cockpit subjects, once the top deck is fixed down, resist the temptation to cut out the cockpit aperture - this will keep out dust during the remainder of construction. If the model has an open-work structure, carefully seal round the cockpit area as well as you are able with newspaper and masking tape.

The model's construction should now continue as usual. Once it has been covered and is ready for painting, the cockpit area should be *carefully* masked, especially if the model is to be sprayed. The best way of avoiding mishaps is to gently pack the entire cockpit full with soft tissue, then cover over with masking tape or film.

So there you have it. There are degrees of detail that one can invest in a model cockpit. Keep things in perspective, however, *and* always keep an eye on weight. Over the years, I have thoroughly enjoyed producing scale cockpits. As a result, I have even been known to embelllish the cockpits of non-scale sports models! However, if this article encourages people to add just a little detail to their models' cockpits, I will be well pleased...

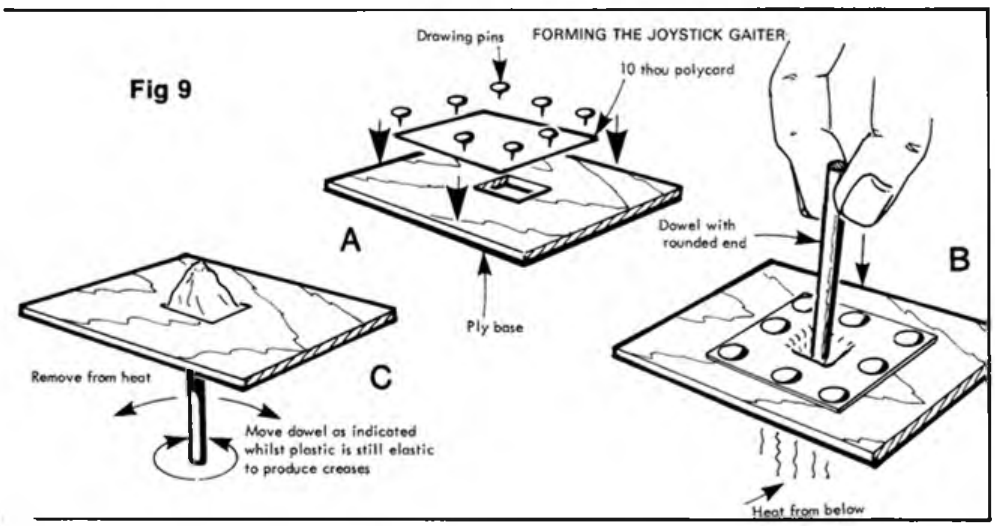


Fig 9

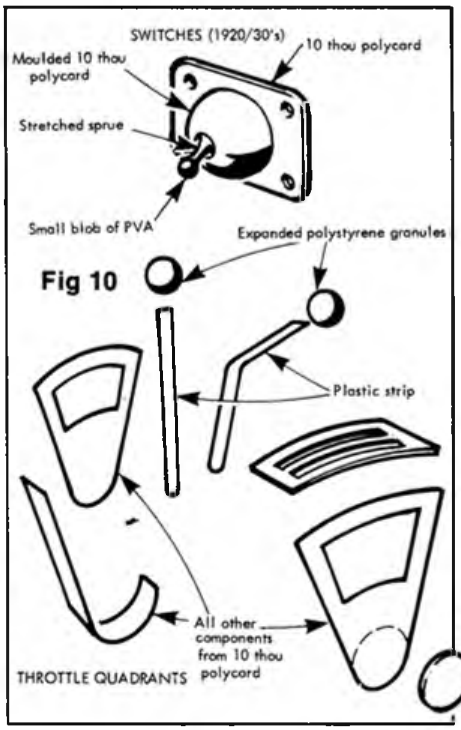
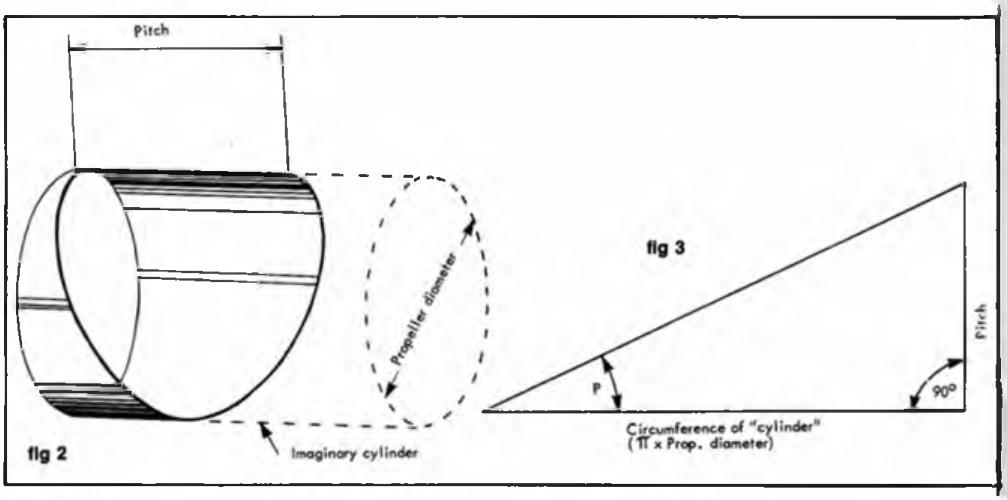


Fig 10

CUSTOMIZING INDOOR PROPELLERS

Rob Porter takes the terror out of prop building

AFTER BUILDING my third EZB I realised that there was more to this propeller business than meets the eye. Forming propeller blades around a coffee tin is fine until one wants to try a different pitch. Looking at plans of EZBs I would see things like: Propeller 14in. × 22.5in. or some other seemingly meaningless specification; obviously something other than a coffee tin was needed. After several false starts I developed the following technique. It may look a little forbidding at first glance, but perseverence will pay off with a propeller that you *know is right.*



A little theory...

An aircraft propeller is often called an airscrew because it screws its way forward through the air in a similar manner to the way a woodscrew screws through wood (figure 1). The distance that the propeller moves forward during each revolution is known as the pitch. The pitch is actually theoretical because, due to factors such as airframe drag and propeller rpm, the actual distance moved per revolution will be less. Model aeroplane propellers are specified according to their *theoretical* pitch, which makes our calculations a lot easier.

With a bit of imagination you can see that the shape described by one propeller blade in one revolution takes the form of a right angled triangle wrapped around a cylinder (compare figures 1 and 2). If this triangle is rolled out flat (figure 3), it can be seen that the base length is equal to the circumference of the 'cylinder' and the height is equal to the pitch of the propeller. The angle formed between the base and the sloping side of the triangle is equal to the angle of the propeller blade tip. This triangle forms the basis of the propeller form design.

The propeller form is made out of sheet wood and is only a little bigger than the propeller itself. Figure 4 shows just where the triangle fits in. It is obviously too large to use as it stands, so it must be reduced to more manageable proportions. The easiest way of describing this is by example: Let's say that the plan of the EZB you want to build gives the propeller dimensions as 14in. × 22in. In other words, the propeller has a diameter of 14 inches and a pitch of 22 inches. Transfer these sizes to the triangle (figure 5). Now divide the vertical side (pitch) by the horizontal side (circumference of the 'cylinder'). This gives a ratio of vertical to horizontal that will be the same for any triangle having the same angle (*P*) *no matter what lengths the sides are.*

22/43.982 = 0.5002 (or approx 0.5)

If we decide that our propeller form is to be 2 inches wide, then to calculate the height the form should be so that the pitch angle P remains the same, simply multiply 2 (width of form) by 0.5 (ratio calculated above).

2 × 0.5 = 1

The height of the form will be 1 inch (figure 4).

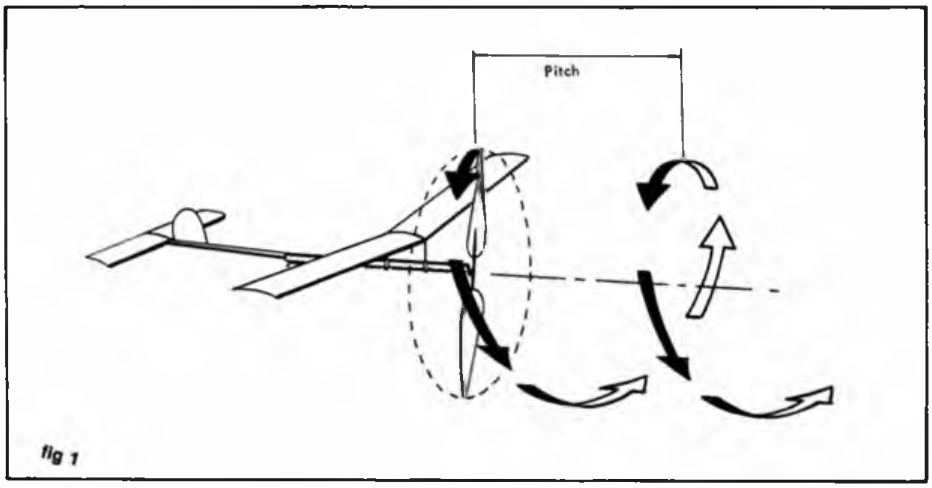
Now we have to do the same thing to find the angle of propeller blade at the end nearest the centre. The pitch of the propeller is the same all along its length. As the diameter decreases, the length of the base of our triangle in figure 3 will become *shorter* and therefore the pitch angle (P) becomes *steeper*. Let's say the length of the propeller blades in our example are 5 inches. This means that the diameter where the blades start, is 4 inches. The triangle at the bottom of the blade will look like the one in figure 6. Again divide the pitch (22) by the circumference of the 'inner cylinder' (Pi × 4 = 12.566)

22/12.566 = 1.75

We have already selected 2 inches as a width for the base of our form. The triangle at the bottom of the propeller blade will be 2 (width of form) times 1.75 (ratio calculated above).

2 × 1.75 = 3.5

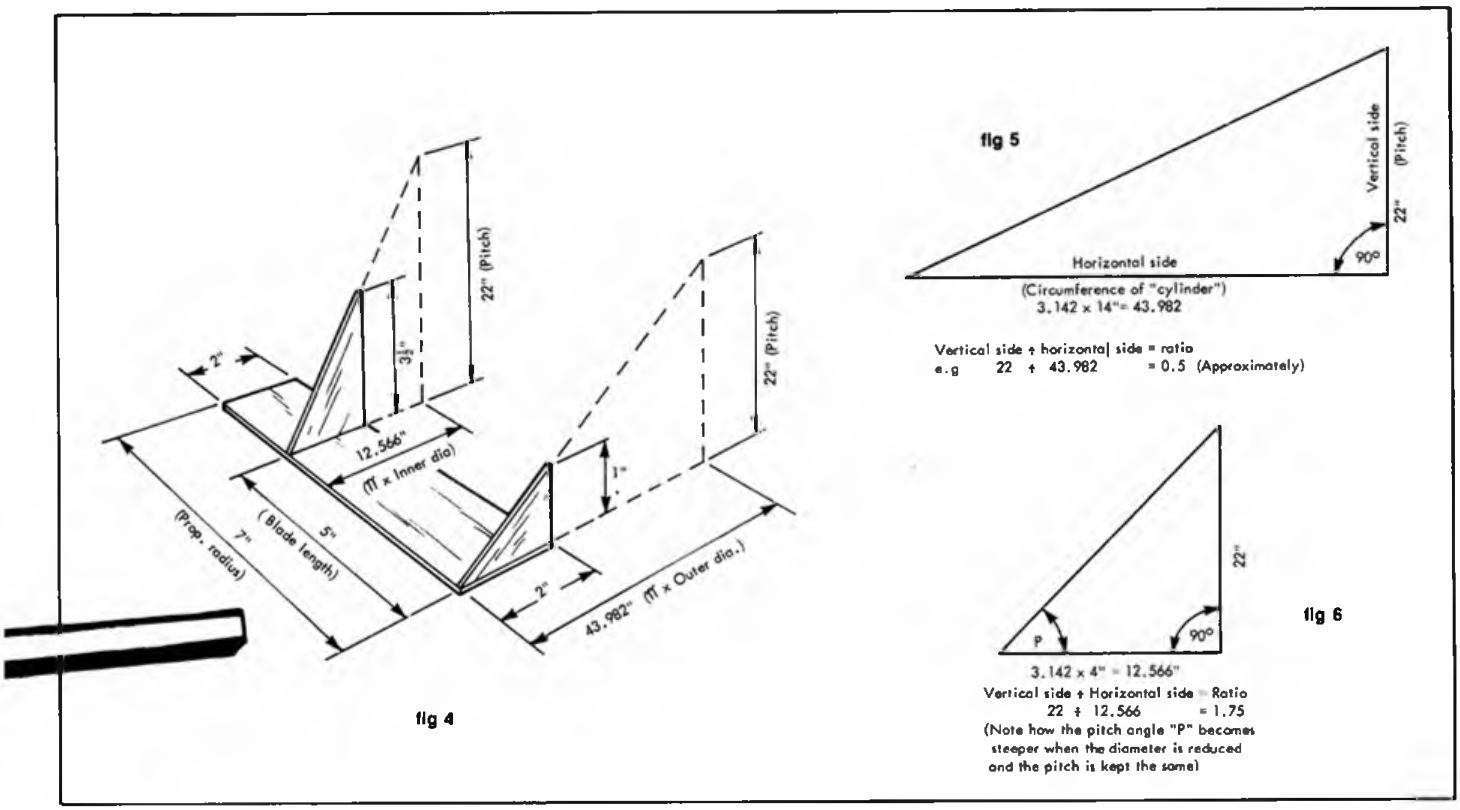
The height of the form at the bottom of the propeller blade will be 3.5 inches (figure 4).



Building a propeller form

Select a sheet of warp free 1/8in. balsa. Cut out a base and the two triangles to the dimensions you have calculated for your propeller and glue them in place as shown in figure 4. If your propeller is to have undercamber, it is a good idea to cut out the triangles with a curved sloping side corresponding to the desired undercamber. The upright piece at the end of the form is to hold the propeller shaft upright when the time comes to glue the propeller spar to the blades.

Carefully check your form to make sure



the dimensions are all correct; it's far easier to make corretions *now*, than when the form is finished. Now plank the form with 1/16in. sheet strips. When dry, sand carefully to a smooth finish. Give the form a coat of non-shrinking dope or sanding sealer to waterproof it (figure 7). Congratulations, the form is finished...

Making the propeller

The propeller is made in the usual way, by binding the soaked planks to the propeller form. Make sure that you have marked a centre-line on the blades and a corresponding one on the form so that the blades may be positioned accurately. Once both blades have been formed, fasten one of them back on to the form using small pieces of masking tape. Fix the propeller spar/shaft assembly to the upright at the end of the form with a small piece of masking tape around the prop shaft (figure 8). The spar may now be fixed to the blade using your favourite method i.e. either letting the shaft into the blade or glueing it on top of the blade. When dry, remove from the form and fasten the second blade in the same way.

The dimensions I have used in the example above result in a rather large form. The base width could be a lot smaller, say 1½in. which would reduce the vertical height of the form in proportion. In fact, the base does not even have to be the same width all the way along its length. For example, the base width could be 2in. at the blade tip and 1½in. at the blade root, so that the vertical height at the blade root is reduced, making the form smaller and easier to make and store.

Experimenting further...

The beauty of making your own propeller forms is that it allows you to experiment. For example, you could build washout into the blades by using a slightly finer pitch for your calculations of the triangle at the tip of the blade than at the base of the blade.

If you are mathematically inclined you may wish to calculate the triangle dimensions using trigonometry. Refering to figure 3, a simple formula can be derived as follows

$$\text{TAN P} = \left(\frac{\text{pitch}}{\text{PI} \times \text{Prop. diameter}} \right)$$

$$\text{P} = \text{ARCTAN} \times \left(\frac{\text{pitch}}{\text{PI} \times \text{Prop. diameter}} \right)$$

This formula gives the 'pitch angle' P of the propeller blade at any diameter of the propeller you choose.

Finally, there is no reason why this method of making 'customised' propellers should be confined to EZBs. Many peanuts suffer from abominable home-made propellers... Fly with pride, make your propellers right!

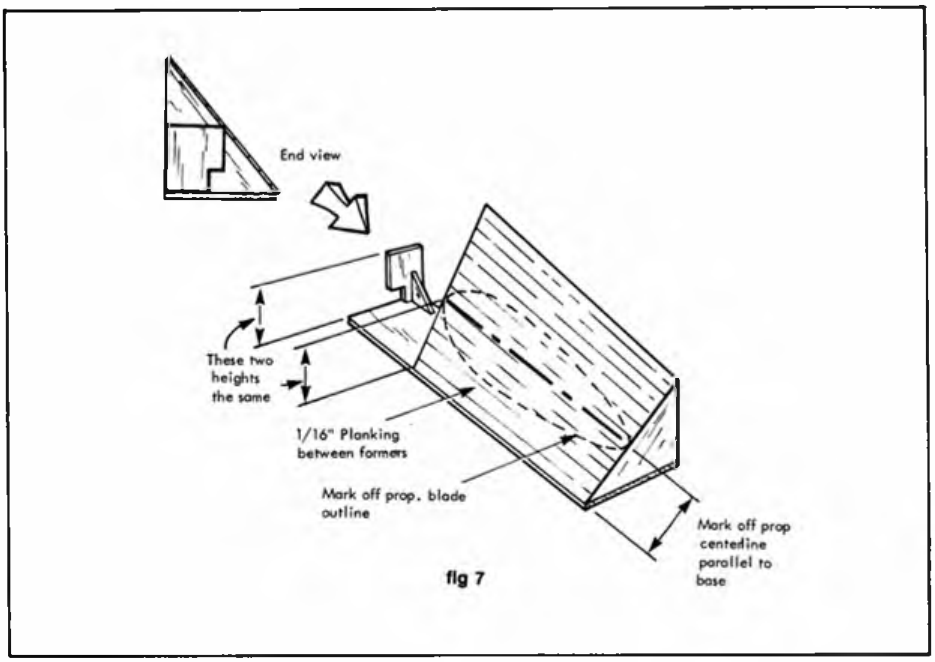


fig 7

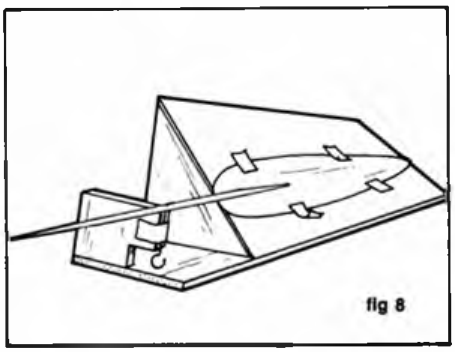


fig 8

VINTAGE CORNER

WITH ALEX IMRIE

The 'Kanga Kite' was the first petrol model to fly at Gibraltar in 1938. Here it is, powered by an upright 6cc Baby Cyclone, taking-off from the race-course which became the site of the aerodrome during WW2.

Kanga Kite

C E Bowden liked the slow, stately flight of the large petrol model and after his *Kanga Kub* proved so successful, including the winning of the 1937 Sir John Shelley Cup by C R Jeffries, he made an enlarged version called the *Kanga Kite*. This model preserved the same lines as the *Kub*, but with its increased size differed structurally in various ways - just how it differed Phil Smith of Bournemouth has been finding out!

Amongst the "Bowden Papers" were some photographs of the *Kite* and Phil retained these fully intending to draw the model up "one day". He was spurred into action sooner than anticipated when SAM 35 member Ian Potts advertised recently for information on this model, and in a very short space of time he had drawn the plans on two sheets. These are available at £5.50p per set, post free, direct from Phil at 32 Verwood Crescent, Southbourne, Bournemouth, Dorset, BH6 4JE. The plans show suggested control surface hinge lines for R/C Assist and contain the usual historical notes that Phil first did on his excellent *Comet* drawing.

The *Kanga Kite* was made while CEB was based in Birmingham and was flown both on Warwick racecourse and at Porlock in Somerset, his home town. It is known that he built at least two machines of the type, and probably as many as four! Kanga Models of Birmingham sold kits at £3- 5/- (£3.25p) and blueprints only at 8/6 (42½p) and it would be interesting to find out if any of these original drawings exist today. According to Mrs Grace Bowden (proprietress of Kanga Models), not many kits or plans were actually sold before the outbreak of war and the subsequent reduction in power model flying.

A write-up of the model appeared in the January 1938 *Aero Modeller* which came out in time to whet Christmas shoppers' appetites! It says, "For those desiring a slower flying model with a really beautiful floating glide and feather-light landings the *Kub* has been scaled up, and with suitable modifications is offered with a 6 feet 9 inches span and called the *Kanga Kite*. The flying ability of this model, with an engine of only 6cc such as a Cyclone...must be seen to be appreciated...has also been fitted with a 9cc Ohlsson engine with success, although the extra power is actually not necessary."

Phil came up with many interesting points during his research. He knows the Comet series of models well and was struck with the similarity between these and the *Kub/Kite* design; in fact, he states that the original *Kub* seemed to have exactly the same tailplane outline as the *Comet* and this was initially fitted below the fuselage. The span of the *Kite* flat on the building board was 7 feet, but with the large amount of dihedral favoured by CEB (15 degrees per side) this became 6 feet 9 inches tip to tip.

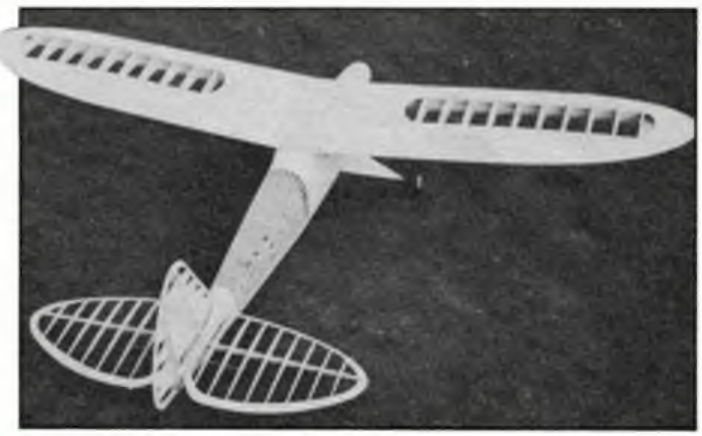
The fuselage length appears to have been determined by the normal length of 3/16 inch strip balsa of 36 inches, and the curving of the bottom longeron of this length material automatically introduced the downthrust necessary at the front bulkhead for the powerful engines fitted. These were carried on a cast elektron mounting which was supplied in the kit and this was one of the many practical features that CEB introduced to power modelling.

I can recommend its use, not only for the survivability that it provides in the event of a crash, but also for the extreme ease with which side and downthrust settings can be made. Additionally, if a test stand is made with a suitable square aperture, it is a piece of cake to test the engine out of the airframe.

When C E Bowden was posted to Gibraltar early in 1938 he gave one of his *Kites* to A.D. Rankine from Ayr "for services rendered" in the engine development work that helped produce the amazing speeds that he had obtained with his hydroplane hulls. Mr Rankine flew the *Kite* a number of times before placing it in his box room where it survived the war and was planned to be used for radio control experiments around 1950; how he fared in this endeavour is not known.

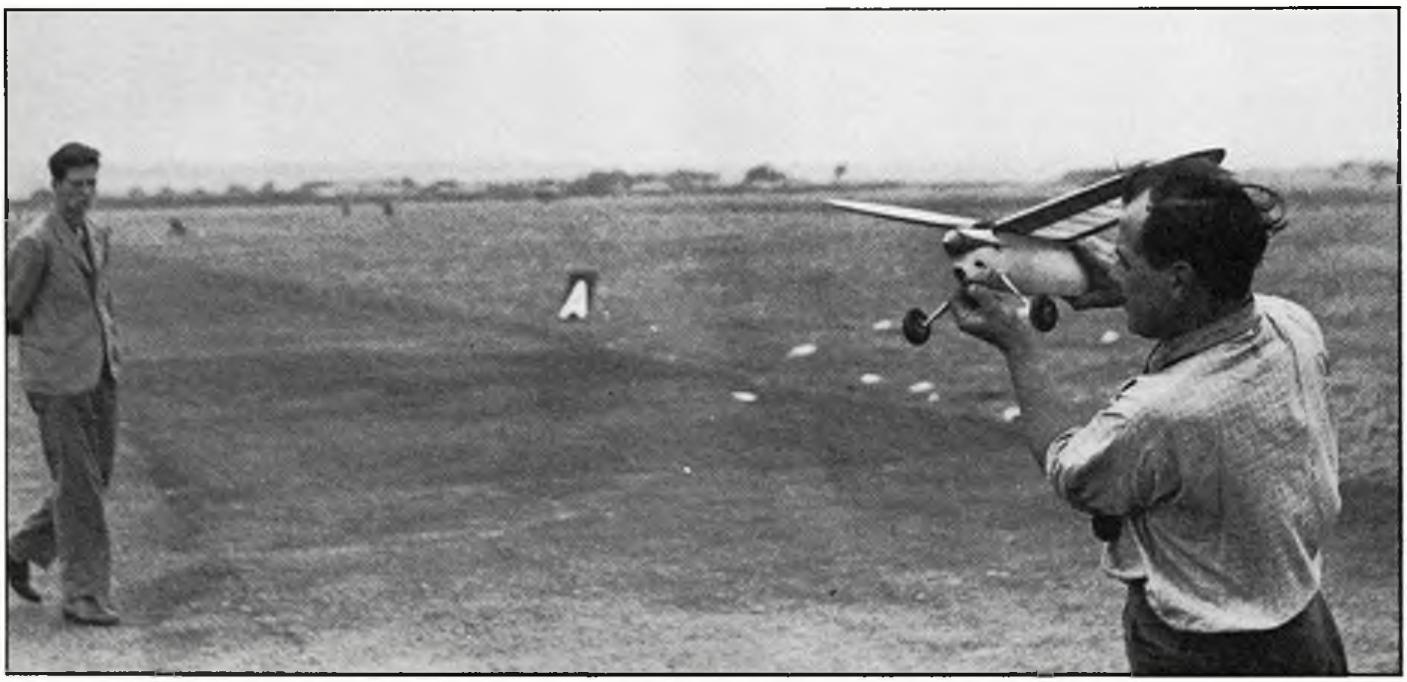
CEB either took the other *Kite* with him to Gibraltar or built another example while stationed there, since photos exist showing

'Kanga Kite' built by C E Bowden given to A D Rankine of Ayr "for services rendered". Note silk sewn to mainplane ribs in order to preserve undercamber. Powered by Baby Cyclone; note double cabin windows and booster socket on left side of fuselage (see text).



The one and one third size Mercury IV that was shown in the November last issue is seen here in skeleton form revealing spruce spars and longerons, all flying tailplane and hidden linkages. Dave Tappin's helper on this fine job was Dave Whitehouse.

P E Norman "for whom high wing loadings held no terrors" with his 'Antspants' 48 inch span power model at Fairlop on Power Contests Day 1947.



FROG ready-to-fly 'Hawker Hart' meets its big brother; Brian M Wright took this photo of his model alongside the undercarriage wheel of the Hawker Hind at Old Warden (see text).

this model flying at Gib. Because of the similar appearance of the *Kub* to the Kite, CEB sometimes managed to mis-caption his photographs, and the well-known shots of this type model at Gibraltar seen in his books *Petrol-Engined Model Aircraft* and *The History of Model Aircraft* are photos of the *Kite* although the original photographs are marked *Kub*! Nonetheless, the captions for these illustrations in the books mentioned do not actually describe the model by name. Sleuth Phil found the explanation that possibly "threw" CEB. The Gibraltar *Kite* has only one window like the *Kub* and is marked C.E.B. on the fuselage side whereas the previous *Kite* photographs show both one and two windows and at least two *Kites* with the fuselage legend "Kanga Kite".

We will probably never know if the Gibraltar *Kite* was modified to the state shown in the photographs, or if it was a new model. Whether there were two, three or four *Kites*, we do not know, but it is a good guess that there will be more *Kites* flying at Old Warden this year than were flying 48 years ago!

Balza III

In the March 1985 *Vintage Corner* there appeared a photograph of an attractive low-wing Wakefield with the request for information on the model or its builder. Some time later I received the following letter from Tony Finucane of Chorleywood which I duly passed on to Ron Swinden of Darlington, who, in the interim, has informed us that in August last he presented the model to the Richmondshire Museum, the curators of which are previous pupils of "Pop" Vernon the builder, and are themselves retired masters of the Richmond Grammar School. Tony's letter, which is full of interest, although earmarked for inclusion in an earlier Vintage Corner, somehow evaded publication until now.

"As a vintage ex-modeller (me - not the models!) I buy an occasional *Aeromodeller* for old time's sake. But what a surprise to see a picture of my old friend *Balza III* in the March issue. Almost certainly this model was one of three in a series designed and built between 1935 and 1936 by my old maths master "Pop" Vernon of Richmond Grammar School, Yorkshire. It was he who started me on modern (at the time) aeromodelling using a brand new medium - balsawood.

I referred to this - and to *Balza III* - in an article - *"The Rising Generation"* published in *Aeromodeller* December issue 1955 which you may have in your archives. In this I wrote, "...our maths master, who one day startled the class by describing the mathematical layout of an airscrew blank. This done, he produced from his pocket a well-carved Wakefield propeller. It transpired that he was a vintage modeller (sic!) who had recently designed and built three balsawood "fuselage" models of about three-feet span. I recall that *Balza III* was not unlike one of those streamlined Wakefields which have lately become so rare..."

I helped him to fly this - in the usual style of the day, steep climb, stall turn followed by straight flight downwind - at Catterick RAF station in 1937 or 1938. The last time I saw the model was when it was displayed together with two of my own rubber driven scale models in a shop window (Woolworths, I think) in Richmond during a "Wings for Victory" week in 1940. As far as I can recall,

Nice looking 'Buccaneer 48' powered by Ignition Ohlsson 23 by Jim Alsback of San Diego, California. The model had a few revisions and was lightened somewhat for competition work. It was lost when it passed out of sight directly overhead after 23mins. 40 secs. at Chicago Aeronuts' Old Timer contest last August.

the prop, missing from the photo, was 12-15 inch diameter with freewheeel built into the rear of the spinner boss rather on the lines of *Flying Minutes*, one of which I built in 1939/40.

Darlington, the location of Ron Swindon, is very near Richmond, Yorkshire. This lends credence to the probability that this is the same model. Incidentally, Ron Swinden may be the same chap - or related to - who won the 1955 Bowden Contest with a tricky little amphibian called *Duckfoot* (*You are quite right, Ron won the 1955 Bowden. Editor).*

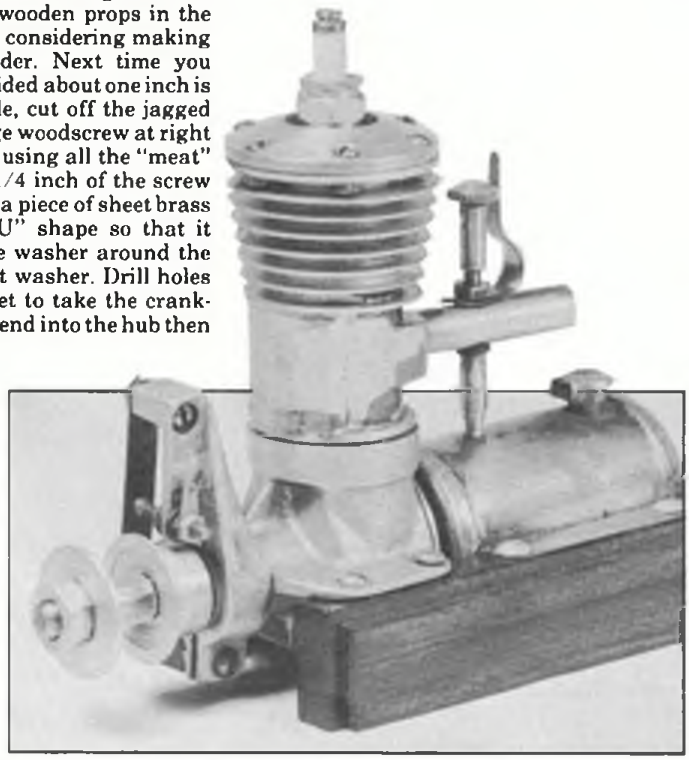
I recall seeing him fly this and seem to associate him also with a pretty "suitcase" type sailplane with a laminar flow wing - called the *Saint*, I think? I flew a lot with the Darlington club at Croft during 1947/48. They had the first *Zippers* and *Banshees* which I ever came across. These were mostly powered with Owat or Micron 5cc fixed compression diesels. They were a great crowd and included a very capable enthusiast called Poad.

In the early 1950s I was an official of York MAS where we had a powerful Nordic A2 group of maestros including Ron Firth, Arthur Wharrie, Harold Budding and Ted Sykes. The big red letter "Y" under the wing tip was prominent throughout the northern area. During the mid 50s I was clubless but flew power scale free flight at Epsom Downs, frequently with a great guy called P.E. Norman to whom high wing loadings held no terrors. My last serious involvement with the movement was as Chairman of Norwich MAS in the late 50s when we had a great time together. Nowadays, apart from infrequent and somewhat halfhearted radio slope soaring, my happiest aeromodelling comes from an occasional glance at your vintage pages..." Tony is, of course, the designer of the fine flying scale Blackburn 1912 Monoplane still available as FSP/567 price £4.40p plus 50p postage.

Ake Roggentin holds Sune Stark's original 1937 Wakefield, while Sune puts on the turns at the Oldtimer meeting held at Uppsala, Sweden on 31 August last (see text).

Single-bladed power propellers

The photo of Joe Beton's Brown Junior powered *Buzzard Bombshell* with broken wooden propeller reminds me of what used to be a common practice - single bladed propellers. If you use wooden props in the larger sizes it is worth considering making and trying a one-blader. Next time you break a propeller, provided about one inch is left of the broken blade, cut off the jagged break and insert a large woodscrew at right angles to the hub hole using all the "meat" and allowing approx 1/4 inch of the screw shank to protrude. Cut a piece of sheet brass and bend it into a "U" shape so that it extends from the drive washer around the woodscrew to the front washer. Drill holes through the brass sheet to take the crankshaft and shape it to blend into the hub then pour molten lead into the space around the woodscrew until the whole space is filled.



This 1937 Bunch Mighty Midget was recently acquired by Jim Alaback and is a duplicate of the first engine he owned "way back then". Readers interested in such ancient engines (and more modern ones, too) are recommended to join MECA (see text).

The bane of freeflighters. Stouffer photo of Joe Beton's Brown B ignition powered 'Buzzard Bombshell', taken at Bong in June 1984 showing the curse of freeflighters - the broken wooden propeller blade. A candidate for the treatment outlined in the text!

Balance carefully; although the lead weight cannot get away due to the brass retainer it is not recommended to use this type of propeller on engines that rev. above about 8000 rpm. I have used these props (answer to a Scotsman's prayer) on Baby Cyclone and Brown Junior and, when fitted to stop in the position shown in the photograph, you will have to be unlucky to break a prop again! The idea has been shown many times in the model press over the years, one of the first was that by Peter Bowers in the 1938 *Zaic Yearbook* but this used the woodscrew only wrapped with cored solder. I prefer lead and have always used the brass retainer that can't let go since it is held fore and aft via the crankshaft. Try it.

Sune Stark releasing his 1950 Wakefield at the Swedish MAC Vingarna 50th Anniversary meeting; rubber he used was over 30 years old (see text).

Bob Hawkins

It is with sadness that I have to report the passing of yet another member of the 'old guard'; Bob Hawkins died in November last. I know little of his past other than that he was involved with Ed Packard of Cleveland Models and designed several models for this undertaking in the 1930s. He also built exhibition models for them including that giant *Clipper* flying boat that was shown at the 1937 Cleveland Exposition. Bob served in the US Air Force reaching high rank in WW2 and was based in UK; he liked this country so much that when he retired he came to live here and was a regular attender at our model meetings. He will be sadly missed. Can anyone tell us more of this quiet enthusiast who during the last few years has seldom missed attending Vintage Day at Old Warden?

FROG Hawker Hart Manual

Brian M. Wright has been investigating the cost of a production run of a facsimile book of instructions for this fine model, but requires a number of firm orders at around £3 per copy before he can proceed with the project. All interested are asked to contact Brian direct at 17 Mattock Way, Abingdon, Oxon, OX14 2PD. He would also be pleased to hear from any FROG ready-to-fly enthusiasts with the object of forming a FROG group or club.

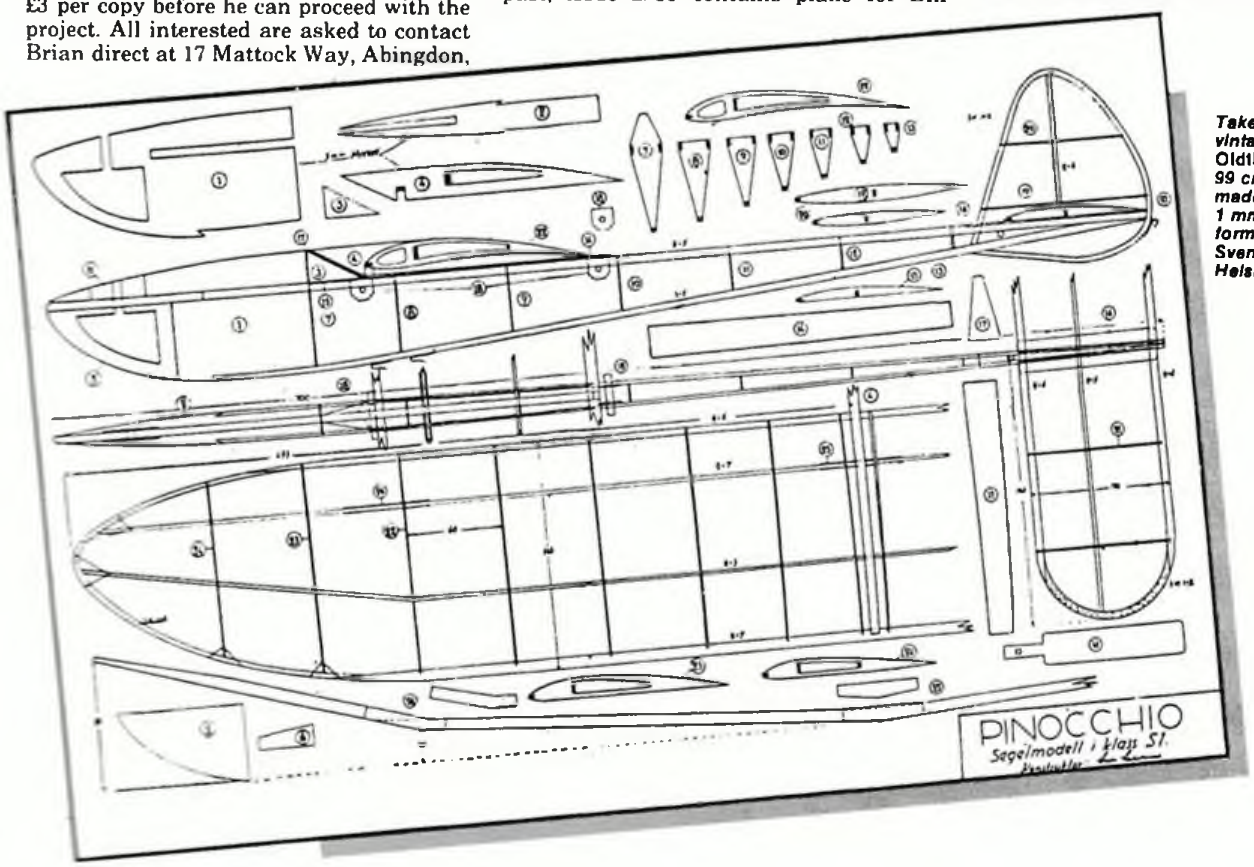
Part of the display of vintage models held by the German Society of Antique Modellers during an indoor championship meeting at Neu-Isenburg near Frankfurt/Main. Note the modeller with the 'Wasp' skeleton fuselage in the foreground; other exhibits included 'Graubele 0', 'Westmark I', 'Milan', 'ES 120 Tailless', and a one third scale Grunau 'Motorbaby'.

Vintage in Sweden

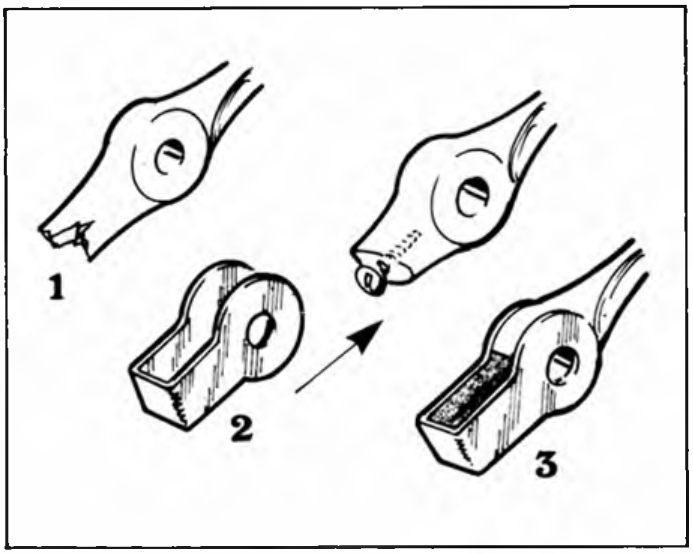
Sven-Olov Lindén recently sent a copy of "*Oldtimer*", the Swedish equivalent of *SAM 35 Speaks*. Apart from reproductions from many hard-to-find magazines from the past, issue 2/85 contains plans for Bill Dean's *Contestor*, *Pinocchio* (a 1943 sailplane by Sven Salonius), Guillemard's attractive 1945 high wing power model called "*D.A.D.*", Ideal's 36 inch span Nieuport Monoplane from 1913, and C.A. Rippon's *Air Cadet*. This varied selection shows the diverse interests followed by the Swedish modellers; in addition there are articles on Jetex, gears, and direct injection model diesels.

Also sent were the results of the Swedish Oldtimer Championships held at Uppsala on 31 August last and, while we cannot reproduce the complete list, winners in the different classes and names of their models are given at the end of Sven-Olov's letter:

"We were about 35 contestants with nearly 80 models competing in four rubber classes, one power class and three glider classes including HLG. Uppsala Aero Club had its 50th anniversary, very appropriate as in 1938 the first official Swedish Championships were held in Uppsala. The



Taken from the Swedish vintage magazine Oldtimer, here is the 99 cm span 'Pinocchio' made in hardwood with 1 mm plywood ribs and formers, designed by Sven Salonius from Helsingfors in 1943.



Diagrammatic sequence of single blade propeller counterbalance. (2) shows propeller ready for fitting the brass retainer before the lead/solder treatment. (3) finished job.

enclosed picture shows two members of the famous Vingarna MAC of Stockholm which was also 50 years old this summer and held a special meeting to celebrate. The model is the same one that Sune Stark flew in the Wakefield in UK in 1937. It is original except the twin-fin stab which has been rebuilt.

This model was not entered in the anniversary competition, he used his 1950 model shown in the other photo for this, it being the same model that he flew in Finland in 1950, and he placed 3rd with this model at Uppsala using rubber of 1952 vintage! He said "I have not bought rubber since 1952, so it must be that old!"

Ake Roggentin brought an even older model, a 30 inch span 1936 design, famous because of its recorded flight of 42 minutes 43 seconds on 19 July 1936, an unofficial world record at the time. Ake did not fly this model since the covering was too fragile, but he intends to fly it in 1986 on its own 50th anniversary! I did not mention that Sune Stark was Wakefield Champion in 1951, but all of you know that, don't you?"

Vintage in Germany

Last year much work was done by the Chairman of the Society of Antique Modellers in Germany, Herr Friedhelm Mink, in spreading the word. This culminated with the participation in a television programme *"Wanted/Found"* where the emphasis was, of course, on vintage items like books, plans, engines, etc. Such material is still sought and should readers have any German vintage item that they are willing to loan for copying, please advise *Vintage Corner* who will either pass the material on to Herr Mink or arrange copying in this country. All material loaned will be handled carefully and returned after use. This is a worthwhile cause, since the German modellers are keen to see their own country's vintage models brought into the limelight instead of merely building British and American designs.

This year further events are planned starting with an exhibition at Friedrichshafen on the Bodensee between 12 and 16 March when German, Austrian and Swiss vintage enthusiasts are invited to participate. This will be followed by a showing of models at the Modellbau '86 exhibition in Dortmund when more space will be allocated to vintage items. It is anticipated that flying meetings will be held again both on the Wasserkuppe and on the Winterberg but dates of these are not to hand. Readers interested in any of these German events are advised to contact Herr Friedhelm Mink, Chairman of the Society of Antique Modellers in Deutschland at Grevenstein, Im Weissengrund 9 D-5778 Meschede, Western Germany.

SAM 35

For the benefit of new readers, the Society of Antique Modellers has a world wide membership and forms itself into groups called Chapters. SAM 35 is the UK Chapter and is one of the largest groups in this organisation, representing almost one third of the total membership. Subscriptions are £9-00 per year in UK and £12-00 for overseas members. For this amount members receive 12 issues of *SAM 35 Speaks*, a magazine full of information not easily available elsewhere, and which, of course, keeps them aware of all happenings in the vintage world, and additionally provides coverage in a group 3rd Party insurance scheme. Apply with an SAE to LT Duffy, Membership Secretary, 9 Queens Road, Wellington, Somerset, TA21 9AW; if you are serious about vintage you will never regret this move.

R.G. Moulton and V.E. Smeed were both voted into Life Membership at the 1985 Annual General Meeting held at the RAF Museum Hendon on 26th October last; both are well-known modellers whose contribution to the hobby over many years has included keen support for the vintage movement in this country.

Class A2 Rubber maximum span 50 cm

1. Bertil Dahlqvist, (Laholm)	27 + 74 + 58 = 159	*Trim II*
2. Sven-Olov Lindén, (Orebro)	37 + 39 + 47 = 123	*Trim II*

Class B2 Rubber 50-75 cm span

1. Bertil Dahlqvist, (Laholm)	155 + 180 + 115 = 450	*Fröjds*
2. Sten Persson, (Halmstad)	119 + 118 + 93 = 430	*Clipper*

Class C2 Rubber 75-100cm span

1. Stan Persson, (Halmstad)	135 + 136 + 169 = 440	*Prim*
2. Bengt Rosègren, (Mellingen)	35 + 61 + 59 = 155	*Landegren Special*

Class D Wakefield (designs up to 1950)

1. Berti Dahlqvist, (Laholm)	125 + 134 + 131 = 390	*Joseph*
2. Einar Hakansson, (Malmö)	105 + 125 + 136 = 366	*Ellila*

Class F Internal combustion engines up to 2.5cc

1. Johan Edström, (Uppsala)	101 + 46 + - 1 = 148	1/2 size *Brooklyn Dodger*
2. Anders Edström, (Uppsala)	9 + 133 + = 142	*HU 10C* 1/2 size

Class SI Sailplane up to 100 cm span

1. Sten Persson, (Halmstad)	169 + 180 + 177 = 526	*Sunnanvind*
2. Kurt Sandberg, (Halmstad)	180 + 180 + 164 = 524	*H W*

Class S2 Sailplane 100-250cm span

1. Lars Larsson, (Sollebrunn)	166 + 179 + 180 = 525	*Balder*
2. Kurt Sandberg, (Halmstad)	122 + 180 + 180 = 482	*SM-vinnaren*

Model Engine Collectors Association

UK members are reminded that annual subscriptions are now due; this is still $16-00 and at the current rate of exchange is £12-00 which includes postage, and should be sent to Keith J Harris, MECA Region 13 Director, 21 Burns Lane, Warsop, Mansfield, Notts, NG20 0PA. For new readers not acquainted with MECA, this organisation is a world wide assembly of enthusiasts devoted to the model aeroplane engine and its history. As collectors they have been responsible for unearthing many old engines that would have otherwise lain dormant, and are a constant source of supply of parts difficult to find and complete running engines that can be used for vintage flying or exhibition.

Dealings are governed by a strict code of ethics, and engines offered in the bi-monthly *Swapsheet* are much cheaper than dealers usually ask - additionally, the buyer has the added protection that any item can be returned within 10 days to obtain complete refund and/or commence renegotiation. If you are interested in joining, send an SAE to Keith at the above address for full details.

Why don't you...

Swiss teenager Madeleine Bodmer's enthusiasm for, and growing success in, competitive aeromodelling represents the very essence of hope for the future of the hobby. The emergence of such talented young fliers bodes well for the popularity of aeromodelling over the years to come but many more young modellers are needed to swell the ranks. So...why don't you?

My interest in aeromodelling came as the result of watching the sailplanes of my father and brother flying on the slopes. I thought it marvellous to be able to build such models which could fly for so long and was anxious to try for myself. So I started building a beginners' model.

After I had successfully entered a few contests, my father designed for me a beginners' vane-controlled soarer of 2 meters span; the model was finished the evening before the next contest and trimmed quickly next morning. During the first round it achieved a near max (4min 40 sec) and I had to retrieve it at a distance of more than 1km. I had never expected such a successful beginning and you can understand my sadness after the model was squashed by a train just after its fourth flight!

This was in April 1982. So I had to repair this model and build another one quickly from a kit: I wished to enter the Europe-Cup in Germany in July. At the end of this contest I was sad again, because the first model was perched on the top of a 25mm beech and the other had dt'd into a thick wood. Fortunately, both planes were rescued the next day.

Later I built successively two other magnet steered models; this time with the rudder sited at the tail. A long balsa rod transmits the force of the magnet to the rudder. In 1984 I lost my second model in Austria during the Europe Cup: the plane flew backwards, trailed by a 15m/sec wind.

The most successful year for me was 1985; at three contests I finished in second place. The last time, in Arosa, I got through to the second fly-off after five 5 minutes and one 8 minutes flights. In this contest I was obliged to fly all three of my models.

At the moment I am preparing my models because tomorrow we'll go to the Swiss National Championships. At this contest I was unfortunate three times: I was classified each time 21-23rd (the first 20 are allowed to enter the selection for the national team.)

My dream is to enter the European Championship; since I'm only 16, I think I have time to achieve it. In these five first years of model flying, contests have taught me that winning is agreeable but one must also be able to accept misfortune - the loss of a plane, a short flight due to a downdraught, a high tension line or an OOS into a cloud.

Heading, Madeleine Bodmer with her favourite F1E magnet flier 'Iliuc'. Centre, a spot of trimming on the local flying field with the latest model, 'Radulina'. Madeleine has her sights set on a place in the Swiss National Team... Above, magnet bay on 'Iliuc'; pivotted bar magnet has pushrod connection to rudder and contributes to noseweight.

Birgit Püttner, pictured here with her UHU wing-based magnet glider at the 1985 German F1E Nats, is another young modeller on whose shoulders the future of the hobby rests.

SCALE MATTERS

Free flight with Bill Dennis

Barrie Hotham built this attractive Alexander C-7 'Bullet' peanut model; massive wing area makes it an excellent choice.

In a recent column I mentioned an event to be held at the Old Warden Scale Day for the *Keil Kraft* and *Veron* rubber scale kits. Believe it or not I have actually had some response with several readers making helpful suggestions. So, knowing the tremendous amount of time it takes to build a scale model, I thought it about time to formulate some rules.

The first question I gave thought to was that of how much of the kit must be used. Initially I had intended on a 'kit wood only' rule, but this is obviously unenforceable and some clown is bound to turn up with a model built from indoor materials. So, you can replace as much of the timber as you like and the model will fly all the better for it... but it won't do you any good here, because they will all have to be *ballasted up to minimum weight* for this competition!

The event will be a mass-launch competition, whereby all the models are launched at the same time and the first down is eliminated and so on. Obviously, if the entry is large, it may be a little difficult to judge the early rounds! It would also seem fairer to have separate classes for biplanes and monoplanes since the former would be at a disadvantage. Within the monoplane class the minimum weight for 'wheels up' models will be slightly higher to cover any drag advantage.

I've compiled the rules, such as they are, below. With any event like this, there may be loopholes and inadequacies, but I hope people will enter into the spirit of the thing.

Finally, there will be *prizes*, not only for the winners, but also the best junior and best finished model.

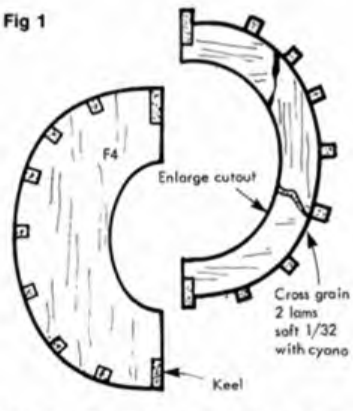
1. Model to be from the *Keil Kraft* or *Veron* range of flying rubber scale kits.
2. Two classes will be flown; biplanes and monoplanes.
3. The basic structure of the kit *must* be adhered to but the wood may be replaced. Modifications to the noseblock assembly are allowed to make operation easier.
4. Any propeller/rubber combination may be used.
5. Models must weigh a *minimum* of 40 grams and be ballasted if necessary. The exceptions being models of aircraft with retractable undercarriage built without the u/c which *must* weigh a minimum 48 grams.
6. All models in each class will be launched together and the first to land is eliminated. This process is repeated at short intervals until a winner emerges. If entries are large, the number of models eliminated in the early rounds may be increased.

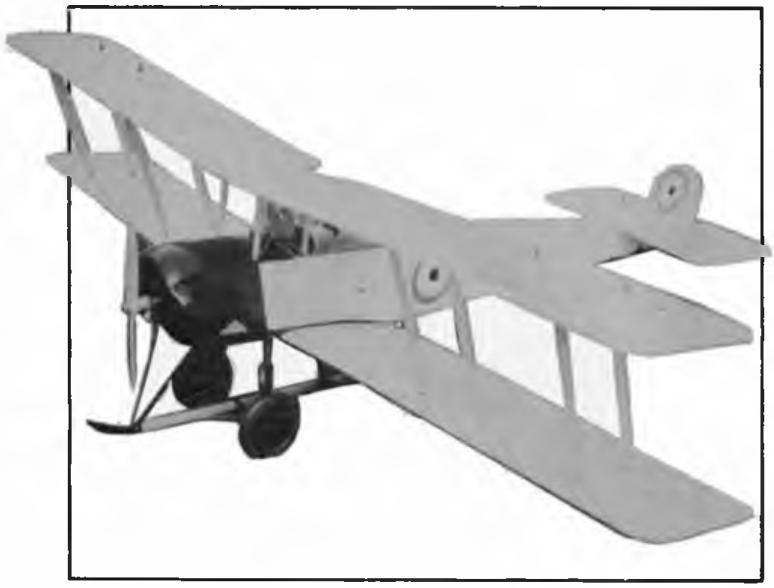
For those of you who have had little success with these models, it might be an idea to outline some suitable modifications to make them better flying machines.

The first thing to look at is weight. The strip-wood supplied can vary from very hard to uselessly soft...but the sheet-wood is always heavier than necessary and it is best to replace it. This may be a little tedious on those kits built on the half shell principle with a large number of formers, each with numerous notches for 1/16in. square stringers. A short cut is to simply reduce the former by 1/16in. all round and forget the notches - just glue the stringers to the surface (fig 1).

It is especially important to use light wood for sheet tail surfaces (more often seen in the *Keil Kraft* kits.) Using decent wood will dramatically reduce the weight of the model. The 'Hurricane' and 'Nieuport' built from the actual kits by Vic Willson and myself weigh around 2oz., but a more recent *Veron* 'Jodel' with lighter materials is under an ounce. Most of the weight saved, of course, is nose ballast.

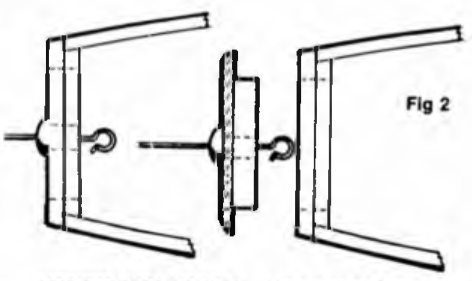
Fig 1



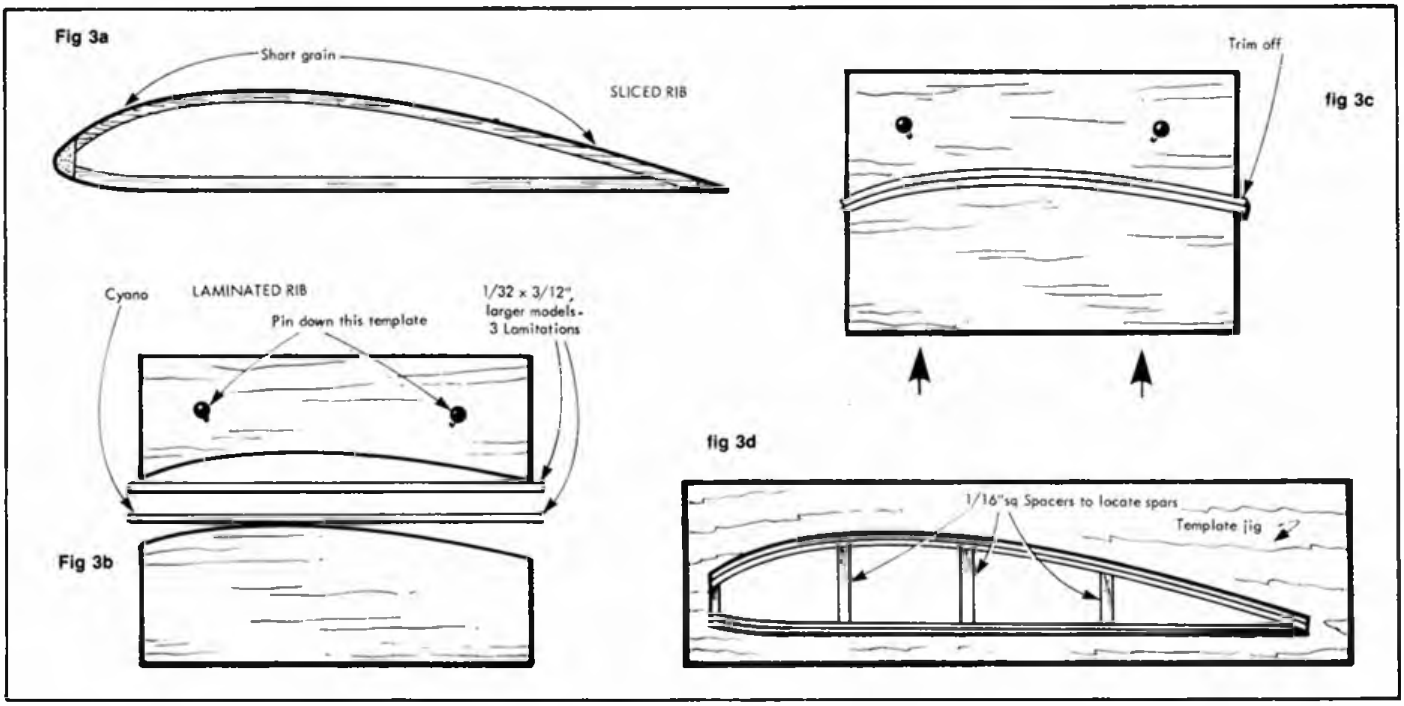


This Avro 504 gained 4th in F/F Scale at the 1982 Australian Nationals for Gary Sunderland; note long ailerons and early markings on this 1914 version.

Fig 2



MODIFIED NOSE ASSEMBLY Use portion cut from nose former as plug on rear of 1/16" ply noseblock.



I don't like models that you can see through and have never been impressed by the excuse that paint is heavy. I decorated the 'Jodel' from aerosol cans, and the paint finish contributed 0.8 gram to a total of 22 grams. Incidentally, spraying in damp cold conditions gives a matt finish, so you can try camouflage with this method.

The most important modification concerns the propeller and motor - those supplied in the kits are inadequate. If you don't feel like carving a 'real' propeller from balsa then *SAMS* supply a range of *Peck* props - it is worth trying the next size up and cutting it down to get more blade area. You will have to experiment with motors to get maximum duration but I would suggest starting with a loop of 1/4in. between 1 ½ and 2 times the length of the fuselage. If you can arrange for the model to land with a few turns left, you need not bother with a freewheel...

The kits are supplied with a small plastic nose button which fits into a hole of approx 1/4in diameter and it is well nigh impossible to get the knots of the wound motor back into the fuselage. You can get round this simply by making the hole in the front former much bigger and mounting the button through a 1/16in. removeable former, as in figure 2. If the hole is big enough you may be able to insert a winding tube and really pile the turns on, as described by Dave Hipperson in the January issue!

Rib construction

I am currently building a fairly large rubber scale model for this season, and as it is a monoplane I am looking for ways to reduce weight. The wing has a lot of ribs and is quite deep in section, so I originally considered the sliced rib technique but the drawback on a wing section with a lot of camber on the top surface is that the grain direction is unsuitable (fig 3). The method I used of laminating the upper and lower pieces is not new but I wanted to use cyano to considerably speed up the building process. An upper template is waxed and pinned down onto a non-stick surface such as a polythene bag. A strip of 1/32in. × 3/32in. balsa is placed against this, and another with cyano applied placed against the other template.

The lower template is then pushed against the upper, sandwiching the strips and bonding them together. Another strip is added and the ends trimmed while still between the formers. I then placed the upper and lower laminations in another template for the addition of vertical strips at the leading edge and spar positions.

SMAE Scale Committee

There are some changes following this year's elections. After many years of service Vic Willson did not seek re-election and Roy Yates had resigned mid-term. Vic and myself were replaced by well-known radio flyers Peter McDermot and Mick Reeves and the latter will take over Vic's control line duties. I have filled Roy's place for one year and will continue the free flight presence, while Doug Sheppard is the Indoor man, apart from acting as our World Champs Team Manager. If you have anything to raise on any of these disciplines, please direct it to the appropriate person via the SMAE's Leicester Office.

Kit Review

D.P.R. Models ALBATROS

John Watters samples an interesting 46in. glider from the Cosmo series.

Finished 'Albatros' prior to test flying; young modeller is Michael Watters who contributed to the construction effort. Model went together well but required a few detail mods - see text.

A NUMBER of years ago I had what I still regard as a very fortunate experience - to spend some time in Moscow. There, I visited what is reported to be the largest 'toy' shop in the world. Large though it was, but I can only say it was somewhat behind the times.

What I did find was a kit for a model aeroplane. Opening the box, as most modellers like to do, the contents came as something of a surprise. The model was for a control line trainer, the plan was reasonably drawn, but the wing and fuselage parts consisted of two sheets of 1/8in plywood. There were, of course, the other necessary bits and pieces. As it seemed against Russian custom to examine the contents on the counter, I packed it away again. I must say that I am sorry now that I did not buy the kit, as I am quite sure it would have made quite a conversation piece. (How about that Ed? Kit reviews from strange and exotic places.)

What has all this to do with this kit review? Well, interesting enough, having seen and built some kits from countries and manufacturers who are well-known, it is always nice to come across the not so well-known.

'Albatros' then, is a 46in span towline glider, and is distributed by *DPR Models*, but is manufactured in Korea. The manufacturer, *Cosmo*, have a range of kits, starting from the ultra simple, mini-gliders, through small stick fuselage rubber jobs, upto the 'Albatros'.

The box art presentation for this kit is quite striking, my first impression was that whoever had built the model used in the photograph had gone to a lot of trouble to decorate the wings and tail in small checked squares. Opening the box revealed that the tissue supplied was in fact *printed* with small red and white squares. Ahem!

The actual kit contents are quite comprehensive, including a tube of cement, small tow-ring and elastic bands. All wing and tail ribs are die-cut and presented separated in a plastic bag. All the leading and trailing edge pieces are pre-shaped and slotted to accept the ribs. For a model of this type and size, the grade of wood supplied was somewhat on the hard and therfore heavy side. Some of the balsa strips used in the wing assembly were also warped. These required steaming straight before using.

With this model being described as suitable for both the expert and novice alike - not that I regard myself as an expert - my 11 year-old son, Michael however, does fall into the category of novice. With this in mind and to get what was probably an unbiased view, some of the building of this model was given over to Michael.

Tailplane

The tailplane is a conventional built up structure, using pre-shaped and notched leading and trailing edge pieces. The die-cut ribs were all well finished although cut from quite hard sheet. All the pieces of strip were cut to almost the correct length, requiring very little in the way of trimming. A thin piece of die-cut sheet was added to the top and bottom of the centre section to complete the tailplane.

Fuselage

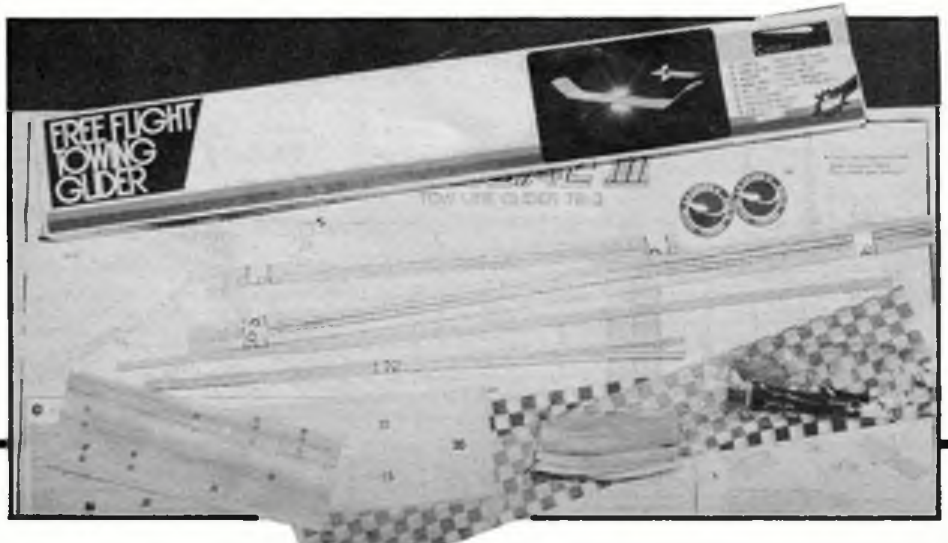
Assembly, I think, is the correct expression in the case of this model, as there is no gluing required. The fuselage pod consists of two moulded plastic halves which 'bolt' together, after including the supplied steel rod nose weight.

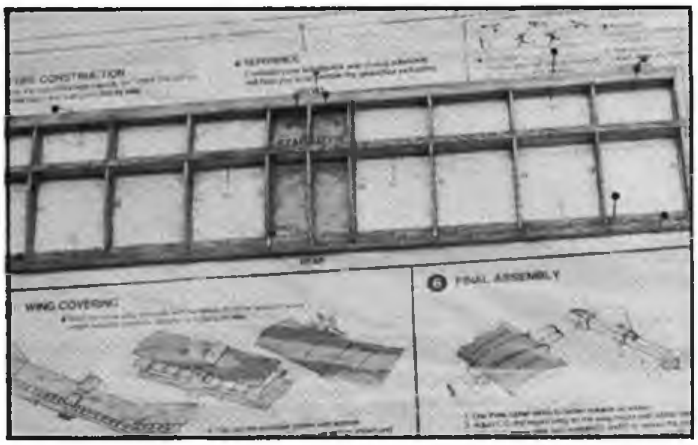
The boom is a nice straight length of pre-shaped spruce, which fits into the pod and is retained by plastic collar. A set of plastic wing mounting and tow hook components are slid onto the boom and locked in place with small plastic wedges. All that remained to complete the fuselage was to glue on the thin pre-cut, expanded foam, fin.

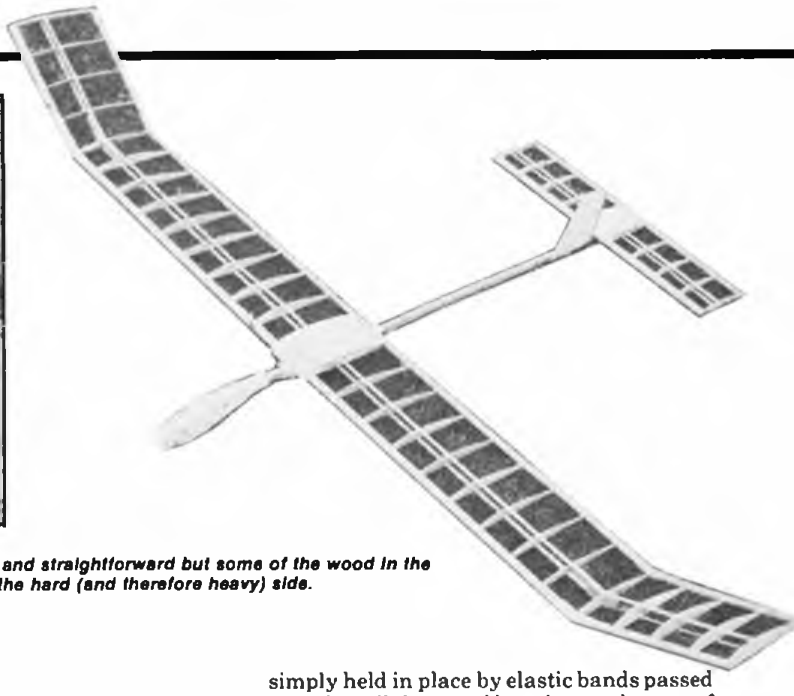
A simple modification to the fuselage, was the addition of a small, thin balsa tailplane platform and leading edge stop. This helped to locate and steady the tailplane rather than rely solely on the width of the boom as support.

Wings

The wing is a single piece structure, built up from a flat centre section with tip dihedral. Ribs are a thinned Clark-Y section. Construction of the wing following the diagrams on the plan gave no trouble. With the leading and trailing edge and spars pre-notched, rib alignment offered no problem. The wing was built in two halves, adding all the wing ribs, except the one at







Construction is simple and straightforward but some of the wood in the review sample was on the hard (and therefore heavy) side.

the dihedral joint. After cutting both the leading and trailing edges and the spars at the dihedral joint and packing up the tip, the die-cut balsa dihedral keepers and remaining wing rib were added. The top and bottom spars are added after the wing tip has set.

The second wing half was built in exactly the same way as the first. Completion of the whole wing required the two wing halves to be joined together at the centre section. This was done by using the die-cut balsa joint strips provided.

All that remained was to cover the wing centre section with thin die-cut pieces of balsa. What seemed rather strange, was that in the explanatory diagrams shown on the plan, it shows the wing and tailplane centre section sheeting, to be added after covering with tissue!

The grade of wood supplied to make up the wing, made the wing a strong, if slightly heavy structure, some of the strips which had previously been straightened by steaming had now re-warped and put a bend in the wing trailing edge on one side.

Very little in the way of sanding and trimming to shape was required, although the whole wing structure was given a light sanding.

Covering

The three sheets of pre-printed tissue supplied in the kit are quite adequate to cover the model and probably best described as shoe-box tissue quality. Steps in covering the model are described on the plan...and if followed carefully, any beginner should have no difficulty. I decided to use the supplied tissue to cover the wing tips and tailplane. The wing centre section was covered with lightweight *Modelspan*. This was for no other reason than that I do not fancy an all chequered model.

A disappointment with the supplied tissue was that when using dope to attach the tissue to the balsa structure, if the tissue was rubbed with your finger some of the red colouring smudged onto the white squares. Although the tissue goes on well and toughens nicely, this colour run can be a problem if doping is not done carefully.

Assembly

This is a straightforward operation and is well explained on the plan. The tailplane is simply held in place by elastic bands passed over the tailplane and locating on the rear of the fuselage boom. As described under the fuselage heading, moulded plastic wing retaining pieces are provided. These consist of collars which can be slid along the boom and are held in position by small plastic wedges. The model was set up with the wing retainers positioned as shown on the plan. This gave a balance point too far back, so a small amount of extra weight was added to the nose. The all-up weight of the model came out at 160grams. This was 35grams heavier than stated on the box.

Flying

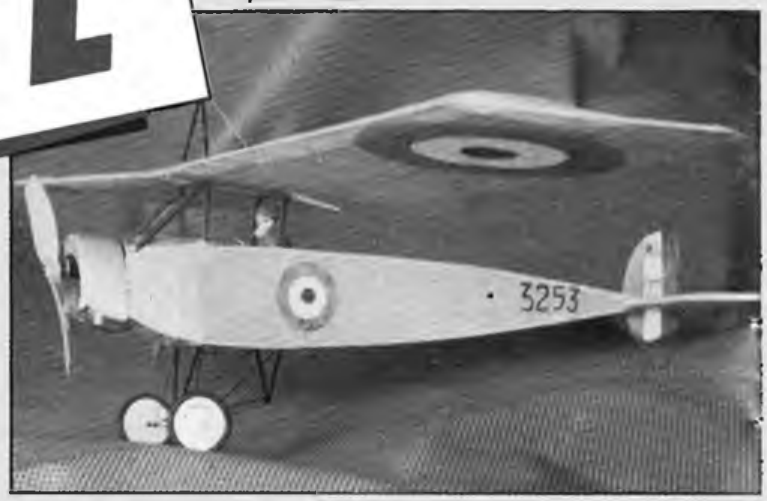
Living as I do on the northern side of Manchester, and carrying out the test flying in mid-October, the atmosphere at this time of year is nearly always damp. This particular day was no exception, although the wind was quite light.

The initial hand launches showed a

Continued on page 185

Structure couldn't be simpler, making 'Albatros' an ideal model for the youngster or beginner; in the case of the fuselage, construction is kept to such a basic level that you hardly require glue! Pre-coloured covering tissue is supplied in the kit but take care when doping - see text above.

Morane 'L'



Flight-proven both indoors and out, the diminutive Morane with high, simple wing is both easy and quick to build.

H. Stephens offers a delightful CO_2 powered 25in. span replica of one of the world's first fighter aircraft

The Model

This is a flying model primarily and it does fly extraordinarily well. At last year's *Aeromodeller* scale event at Old Warden the wind was so strong that most CO_2 models were broken or grounded. This model flew consistently and sustained no damage...

It has also flown successfully indoors returning very good durations. As the wing area is large and the weight is low, the flight is slow. This is a great help when the roof or walls are hit at indoor meetings as little damage results.

To achieve this performance, true scale has been sacrificed in the tail areas and aerofoil. But I think when you have flown your *Morane* you will agree that the sacrifice is worthwhile. For best results keep this model *light*.

Wings: The wings are built in one piece over the plan. Pin down the lower spar and shaped trailing edge. Add ribs, ensuring that the 1/16in. ribs are positioned as shown. When this assembly is dry, fit the leading edge and tips, packing the leading edge of tip to butt against the wing leading edge.

The top spars are cut just outboard of the outer rib and bent down to meet the tip, the ends being chamfered to fit. Leave until all glue has set. With wings still pinned down, cut through the spars and leading edge with a razor saw. Unpin one wing and cut spars at an angle to give correct dihedral.

Pack free wing up to 7/8in. at the outer rib and glue butt joints of spars and leading edge. Fit the dihedral braces. When assembly is dry, unpin and fit centre section cut-out edge members. These are at mid-spar position at the front and flush with the trailing edge at rear.

The wing is now ready for covering. I used pre-dyed lightweight *Modelspan*, water shrunk and given two coats of thinned clear dope. The centre section pylon may now be fitted. This is made from bamboo sanded to oval section. The bottom ends are sharpened and sit in 3/64 × 1/32in. deep holes drilled in the rear spar, and in the 1/16in. rib just aft of the front spar.

Undercarriage and cabane: These are very simple structures. The only special point to watch is to fit the wing attachment members *after* fitting the struts to the fuselage. Ensure that both are at the same incidence angles.

Fuselage: This is a basic 1/16in. square structure. Select fairly hard wood for the longerons as the extra strength is worth the weight. Build the sides over the plan and note that the longerons should be chamfered to fit onto the top and bottom of the tailplane. There is no vertical or horizontal member at the rear. Adjust the gap between the longerons at the rear to fit the thickness of the tailplane if necessary.

When glue is dry, remove from the plan and fit the cross members. These are all 1/16in. square with the exception of the undercarriage attachment frames, which are 1/8 × 1/16in., with the 1/8in. vertical, and at the skid position where a piece of 1/16in. sheet is fitted (see plan).

Add the centre section struts and the undercarriage. These are bound with cotton and glued to the longerons and cross members as shown on the plan. Now fill in the 1/16in. nose side panels and add the top deck formers and 1/32in. sheet decking. Fit the 1/32in. sheet piece to form the rear of the cockpit, and the 1/16in. sheet cross member at the bottom behind the firewall. Do *not* fit the skid at this stage.

Tail unit: Here is where you *must* save as *much* weight as possible. A gram overweight on the tail will require three to four grams in the nose to balance it. The 'fish-and-chip box' foam is the lightest material I've discovered. It is stiff, does not warp, and weighs less than a light tissue covered structure...

There is no magic: all you need is very sharp blades to cut it, then fine sandpaper to shape it. Work it like balsa wood, but remember that white glue *must* be used as cyano or balsa cement will dissolve the foam. Once you have used this for tail surfaces you will never use balsa again!

This foam comes in different thicknesses, but over 1/8in. thick pieces are much lighter than 1/16 balsa. Wash the foam in detergent to remove the parting off compound (and the remains of fish and chips). The fuselage should be tissue covered after fitting the tailplane and fin.

Rigging: The use of black cotton for the rigging wires on models of this size should be *banned* with the utmost rigour of the law. Black cotton is the *wrong* colour, is too thick, and as it is hairy it causes enormous drag...

At the time of building this model I knew of no alternative, and therefore left the rigging off. Were I to build this model now, I would use grey invisible mending thread, available from *Woolworths*. This is a good colour, is the right diameter, and as it is smooth it causes minimum drag.

The one drawback is that it is nylon, and is difficult to knot. To overcome this problem I tie a simple knot which I then prevent from slipping by fixing it with a drop of cyano.

Rigging could be used on the upper surface from the pylon to the wing. This would enhance the appearance without spoiling the performance or preventing the wing from 'knocking off'.

Motor mount and cowl: The motor mount is built up from a balsa-ply sandwich. The 1/32in. ply piece on the rear face is full width across the fuselage and is behind the firewall. No downthrust was used on this model; sidethrust was obtained by inserting a piece of 1/32in. ply sanded to wedge shape under the motor attachment bolt on the left.

The cowling is very simple. Note the grain direction shown for the firewall and front. Cut the cowling skin from 1/16in. soft sheet, soak in hot water and pin to front of cowl and firewall.

When dry, the skin can be glued in position and the whole sanded to shape. The cowl and motor mount assembly was attached to the front fuselage with epoxy.

Finish: I use thinned artist's acrylic paint for producing pre-dyed modelspan, and also for painting the foam tail. Yellow ochre mixed with white gives a good unbleached linen colour...

The centre section struts were painted brown, and the centre section pylons and the undercarriage were painted black. The wheel centres were white on the outside and 'linen' on the inside. The rudder stripes and roundels were artist's acrylic, with artist's

Fit the tail-skid *after* covering the fuselage. If you wish to produce a 'French' version, reverse the colours of the wing roundels and omit the fuselage roundel!

Flying: If this model balances as shown on the plan with the angles shown it will give you all the exercise you need outdoors. Start with a gas charge and low motor revs. Trim to turn left under power *and* on the glide, using rudder and motor offset.

Gradually increase motor power to obtain the climb you want. I do not recommend liquid charge on thermic days unless you like long retrieves...

FREE FLIGHT SCENE

with Dave Hipperson

1985 Nationals memories; Phil Ball launches his taper wing fly-off model before a critical group of fellow competitors.

Falcons Gala - 17th November

Although it is becoming increasingly evident that substantial and guaranteed prizes draw entries, it is usually the case that the weather gods remain unimpressed. This has certainly been so of the last few Falcons Galas where there has always been a keen contest but invariably a rather windy one. This year their number came up and they picked themselves the definitive calm day. With a cold clear sky and wind never over 5 mph, usually less, few problems were encountered with the limited size of Lindholme. Light was at a premium, however, and events closed just before 3pm to allow plenty of time for all four fly-offs.

Glider produced a duel between Philpott and Bartle, the former still on form from his Trials successes, zooming to a half minute lead. Vintage needed a re-fly after Tony Hall had demonstrably won it with his impressive Frog 500 powered *San de Hogan* but Ball and Davitt had managed to tie at 2nd with a little over 4 minutes each. Dennis Davitt had made the maxes with his promising *Yankee 4* Wakefield design, now turbulator equipped, but switched to the higher performance *Lanzo* stick for the fly-off. This was expected to have had the edge but a freak motor bunch in the nose of Ball's *Hi Ho* seized the prop after a few seconds so he had no chance to prove otherwise.

The top times in power had help but glided just a few yards so the final fly-off for rubber was interesting. Almost the entire entry had qualified (could have been a bigger max on a day this calm) and the top times were certainly all in the air together. Most found good air, the winner simply using it better than the others. This was an extraordinary model by most standards but not by Mark's. A 500 sq. in. V dihedral with even more prop pitch than usual - 56in. This produced an 'indoor' model like climb folding after a *literally* staggering 4 minutes! The model had only been flown for the first time that day and a mere two trim flights had been all that it had required to reach this astonishing trim.

By this time a thick blanket of mist covered the entire aerodrome and models actually disappeared into it in the last few seconds of their flights. A great day was rounded off with a prizegiving, distributing over £100 worth of well thought out goods.

Results

Open Glider 21 flew

1 S. Philpot	9:00 + 3:12
2 D. Bartle	9:00 + 2:35
3 G. Le Vey	8:54

Open Rubber 18 flew - 13 flew off

1 M. Croome	9:00 + 9:52
2 P. Ball	9:00 + 9:06
3 D. Morley	9:00 + 9:04
4 J. Carter	9:00 + 7:28
5 J. O'Donnell	9:00 + 6:32

Open Power 12 flew - 6 flew off

1 R. Peers	9:00 + 8:43
2 P. Harris	9:00 + 7:51
3 T. Hargreaves	9:00 + 6:49

Vintage 12 flew - 4 flew off

1 A. Hall	9:00 + 5:28
2 D. Davitt	9:00 + 4:07 + 3:40
3 P. Ball	9:00 + 4:07 + 0:39

Tony Hall prepares for Falcons Gala fly-off flight; 'San de Hogan' is actually Frog 500 powered - not by a Fox 29!

The Grantham Grand Prix

The first of the major non SMAE events is planned for 23rd March at Barkston Heath. The organisers have asked me to point out that, although the usual events are to be run - three open classes, combined FA1 and HLG - Open Rubber is to be extended to 4 flights, the first one to be made before 12 noon so don't be late if you are planning to fly that class. There are new trophies now for Open Glider and Combined FA1 as well as the existing ones for the other events. I should point out, however, that although I may have initiated the idea for the Open Rubber award it is certainly not the Dave Hipperson Trophy; it is, of course, the Open Rubber Trophy built for my event of a few years ago by the Grantham CD Phil Ball.

Co2 Duration...Mayfly

Duration Co2 models are delightfully compact and straightforward to design and construct - flying them is a very different matter. Some people who remember have likened it to the frustration of flying Jetex! That's a bit harsh, as Co2 units now are much more reliable but there do seem to be inumerable variable factors to consider when contest flying. Ambient temperature, tank temperature, charge temperature; are there any leaks in the charger, is the head of the motor leaking or is it the valve in the filler? How long have you held it after charging and how much has it warmed up in this time? It makes finding a thermal a simple business by comparison!

I reasoned that, to be consistent, my original ideas of a super light airframe and floating glide had to be somewhat modified. Not so much because models like that didn't work - they did - but looked a bit silly in wind and turbulence being blown around like so much waste paper even if they did usually manage to stay airborne after a fashion.

Throughout the six or so years that I have flown this class, only one contest had been

calm - the very first one - so about this time last year I tried the set-up here with a view to producing something a little sturdier but most of all with penetration. Hence the flat bottom wing and shorter run - around 60-70 secs. A much snappier climb resulted. With the sturdy wing - the webbing isn't essential but it helps - it is now possible to launch the model more positively even in wind. Before, I was tending to allow it to pull out of my hand - fine if you were dead into wind and the wings stayed level but if not the model was 'in' very quickly.

The idea paid off with 2nds in both the SMAE events last year including the Nats. In both I continued with these models into the flyoffs. At the Nats this was essential as the turbulence had not died away at all but the Spring Meeting may have benefitted from a change of model to the lighter set-up.

The section is an own-design drawn originally for the Sports rubber model of a few years ago published in *Aeromodeller, Susie's Too.* In fact, the entire layout and construction is borrowed from that design but the section has also been tried recently on an experimental CDH to good effect. That tip shape is excellent at resisting the gravel rash normally associated with long inverted journeys down abrasive runways - at least it only wears off balsa, it doesn't rip tissue.

The fuselage is covered with light glass cloth - the lightest available, in fact. This is doped on and improves the boom strength enormously even though it does add a gram or two. It is important that the fuselage can withstand a bit of rough and tumble - you are going to crash it occasionally no matter how careful you are. Either a poor charge or a gust or even not noticing that the prop is going the wrong way - yes, I have done that too, and in a comp! Plenty of dihedral helps it to roll around its tight power spiral and masses of incidence and a fairly forward CG maintain stability even in rough air. Don't ask me why all the upthrust - I don't know but all my Co2 outdoor models have needed it and in some cases left thrust too!

I aim for a fairly tight right hand power turn so if, by accident, you get a longer and slower run than intended, the model will still turn and not just chug off into wind. Remember that with a run of little over 60 secs it is necessary to flick the prop and release the model quickly if you are not going to waste much of the useful early burst.

'Mayfly' for CO_2 Duration; successful model features own-design wing section and weighs in at under 50 grams.

For comp. flights the tank is pre-cooled with an aerosol electrical component freezer before charging. The charge in turn is kept at body temperature. In cool weather 40-55F - the motor and tank unit is thawed out between flights with an electrical hair dryer running off a car battery. Not doing this cost me a win last year. Those little holes in the front of the fuselage are to facilitate this heat transference process. A piece of foam plastic behind the tank and in contact with the holding screw helps freezing as the aerosol is squirted directly into this as well as at those parts of the tank visible through the holes.

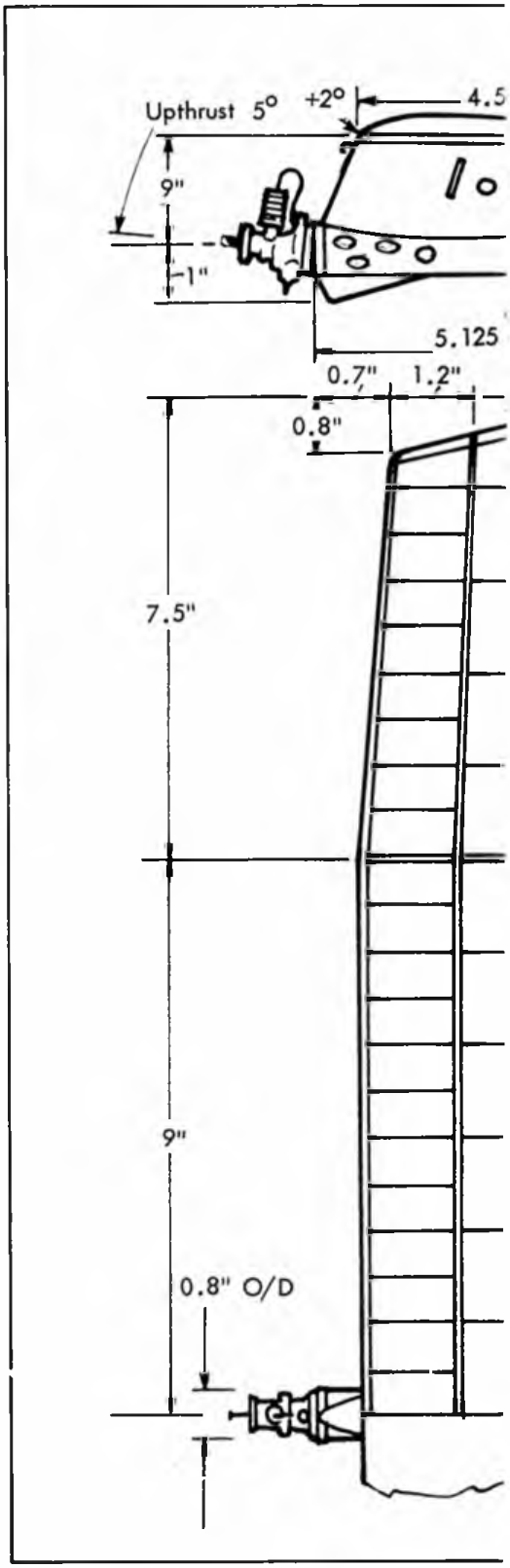
I think it might be advantageous to have greater access to the tank for this part of the charging cycle but a bigger hole would require some other reinforcement.

Why is the model called *Mayfly?* Well, that always seems to be when the season ends - no Co2 comps after the end of May - strange.

More on covering

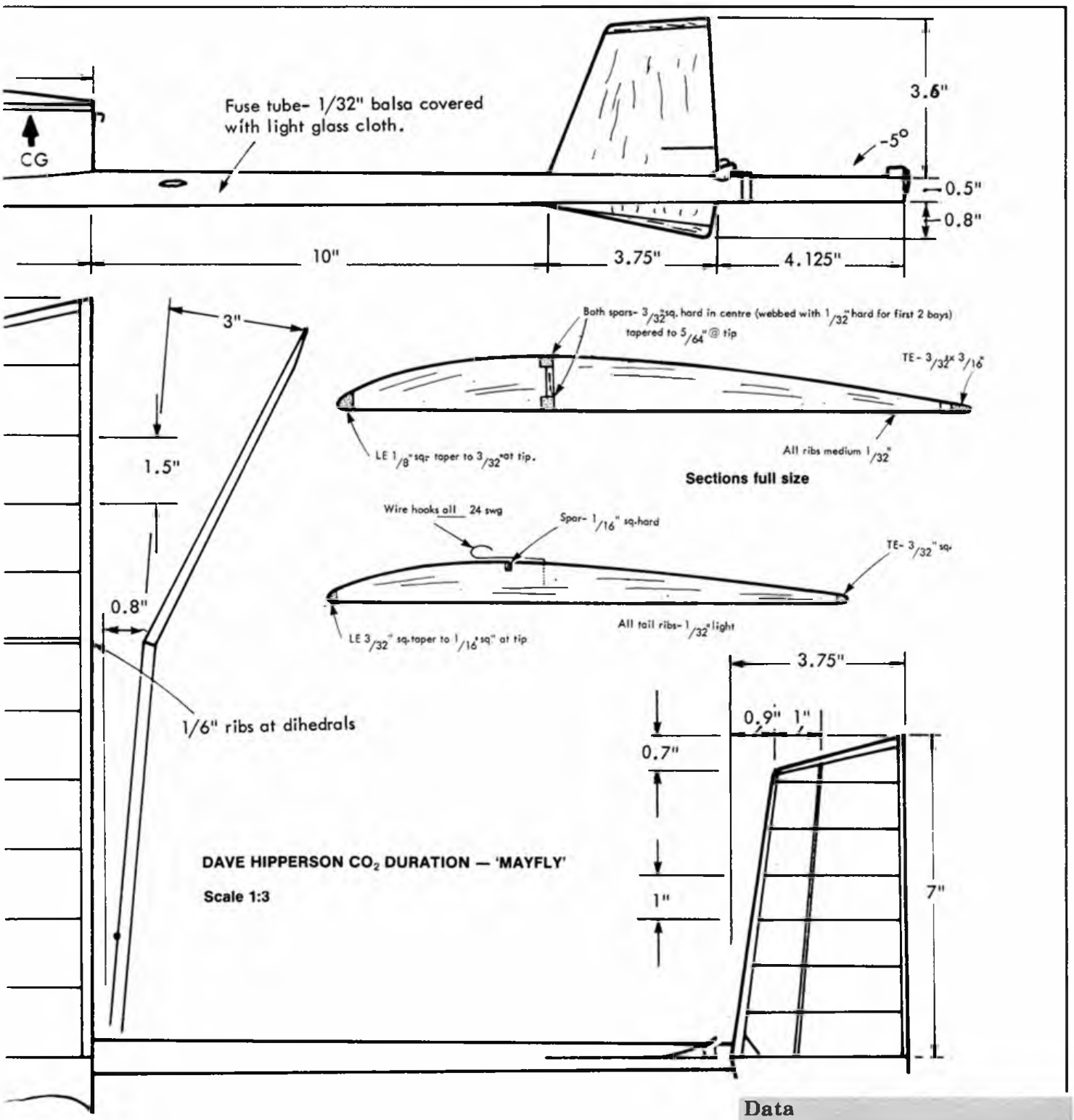
My suggestions on avoiding unsightly problems of tissue pulling away from undercamber has sparked off some correspondence. Particularly interesting are Pete Michel's experiences with covering. He applies all covering WET whether it be Modelspan or Jap tissue! Obviously fuselages and compound curves like prop blades lend themselves to this technique but wet Jap on undercamber..?

Pete's way around the problem is to predope the structure twice with 50/50 dope thinners which is just what I try to avoid and then give the undercambered side a third coat for good measure. The tissue is then layed over the structure dry and sprayed with water and allowed to expand



for a moment or two. One end and then the other is lifted up and allowed to flop back on the structure until the wet tissue is smoothly covering the structure.

Surplus tissue is then trimmed off - whilst still wet - with a new razor and 50/50 dope thinner is run along all rib to tissue lines both inside and out in the case of undercamber. Undersurfaces of wings can be helped a bit by lifting the leading edges and trailing edges of the wet tissue and doping



Data

Weights:-

Fuselage, engine and prop.	34.0 g
Wing	13.0 g
Tail	2.5 g
Total	49.5 g

Prop - Pine or hard balsa 6in × 6in or 8in × 8in single blade folder.

Motor Run - adjusted for 70 secs for turbulent weather, up to 2 minutes for calm.

Trim - right. Right power, open glide.

Warps - all panels flat apart from 1/8in wash in on starboard inner.

the structure quickly and allowing the tissue to flop back. The adhesion of the wet tissue to the pre-doped balsa structure is really exceptional - much more than you would think. The wing can safely be inverted, the tissue won't fall off.

Pete emphasises that it is important *not* to try to stretch the tissue; it will only introduce stress or warps. Keep the panels already covered in a damp state by spraying occasionally whilst the rest is being worked on. The component is allowed to dry naturally without pinning down. Pete only pins the panels down after the very last coat of dope. Strewth, the confidence of the man!

A very useful side-effect of this technique is that surfaces so covered are claimed not to slacken off nearly as much in the damp as conventionally covered wings. What is more, it has been found that super light surfaces like fins and tailplanes seem to finish up more true this way as well.

AT THE LAUNCH PAD

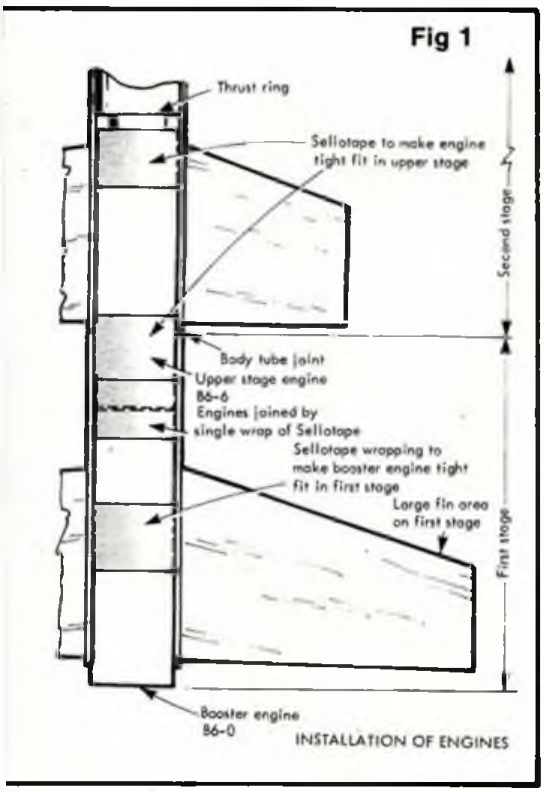
with John Wheddon

Award for Stuart Lodge

Each month the Estes company makes an award for innovation in model rocket design. Any type of model launcher or recovery system is eligible and, accordingly, Stuart Lodge, a frequent contributor to this column, sent off the details of his 'Multiple Canopy Recovery System'. Regular readers will recall that the system was featured in the January '86 edition of *Aeromodeller*. Estes were so impressed that they awarded Stuart a 'Design of the Month' first prize which is a very useful $75 worth of goods from the Estes range. It is very unusual for the prize to be awarded outside the United States and it is definitely the first time anyone from these shores has won. Congratulations, Stuart!

Details of the scheme are given in the colourful Estes catalogue which can be obtained from Pegasus Models of Caston Attleborough, Norfolk, cost £1:35. The catalogue makes interesting reading even if you don't want to buy anything.

***Spaceflight News**, the exciting new bi-monthly magazine that's on sale now. This issue (the December/January '86) has 46 pages and plenty of colour, all for £1.25. Publishers are Spaceflight News Ltd., 1, Wothorpe Road, Stamford, Lincs. PE9 2JR (Tel: 0780 55131).*



New magazine

Spaceflight News, a magazine devoted entirely to space programmes, past and present, recently appeared on the bookstalls. The magazine features some really impressive colour pages and contains a wealth of interesting material for model builders. The first two issues included an interesting history of the British 'Blue Streak' launcher project.

The magazine is published by Key Publishing and issues will be at the news-agents in early February, then April and at two monthly intervals.

Two-stage rockets

It is possible to obtain better performance by using multi-stage rockets to lift heavy payloads. Full-size spacelight launchers are universally multi-staged and we have become familiar with the routine of booster and stage separation during televised 'Shuttle' and 'Ariane' launches.

The most common type of multi-staging in model rocketry is known as series-staging in which the stages are fitted end to end and are fired in succession. The first stage booster engine is a special type which has no delay or ejection charge. As the propellant is burnt the final phase of combustion causes small burning particles to be thrown forward to ignite the upper stage engine.

The booster engines can be identified by the designation '0' instead of the usual delay time. e.g. C6-0. The second stage is powered by a standard engine and contains a normal recovery system and appropriate payload: see **fig 1.**

Stability

The main problem for two-stage models is that the addition of a second engine to the rear of the rocket causes rearward shift of the c.g. with attendant stability problems. So, to counteract this, booster stages are usually fitted with large fins - it is a good rule to use fins on the booster which are at least twice the area of the second stage fins.

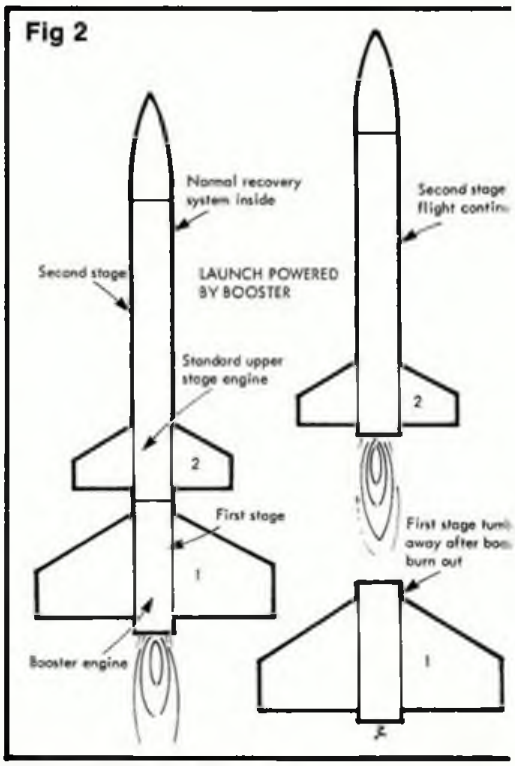
Engine installation

Fig. 2 illustrates how the stages are assembled relative to each other; note especially that the body tube for the first stage is considerably longer than the booster engine and overlaps the second stage engine. This overlap is important as it assists in giving a smooth in-line separation of the two stages.

Stability testing

Before launch of a new design it is vitally important to carry out pre-flight stability checks and we have described the 'swing-test' method in previous columns. In two-stage models, the test is even more important because of the greater potential for problems due to the weight distribution.

The first stage should be checked first, complete with installed engines of the type intended for flight and with the recovery system in place. When this has been carried out satisfactorily, add the booster stage and test the complete rocket.



MIND THE LINES

with Andy Brough

'Midges' at Three Sisters

One regular writer to the column is John Nobel, actually a fellow Whitefield member, also a very keen vintage flyer of the roundy roundy and free flight (launch and hope?) brigade not to mention occasional radio assit. John is predisposed to run the odd 'Midge' competitions at Three Sisters, usually fixed on a date when I am away, so, I've not yet been to one, therefore he also acts as reporter to boot. So over to John:

"The Three Sisters 'Midge' event on October 27th attracted sixteen entries (the highest yet) including three glow plugged models, a *Novorossi* which flew and two *Cox* TD 09s which didn't.

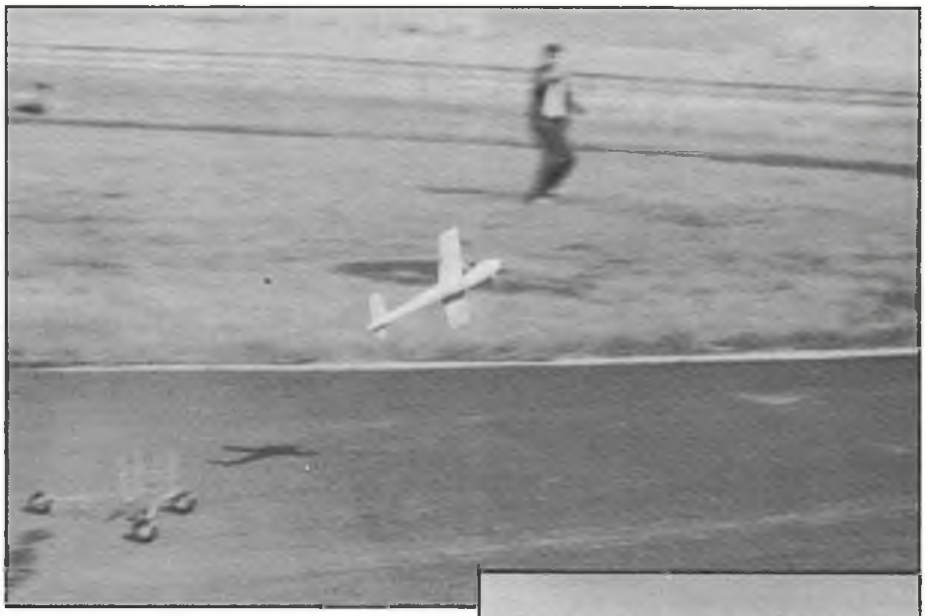
Richard Grindly had tried out, a month earlier, a dolly for his 'Midge'. The results were as I hope you can see from the picture reasonably spectacular as it hit the tarmac more or less inverted less than a second after the picture was taken. My kind, charitable nature stopped me taking any further photos (I had also run out of film).

As for the event, again the Class 1 (Vintage and 'permitted' motors) proved the fastest. Skitt/Clews recorded three official flights at 9.38, 9.45 and 9.97 seconds (fastest 95.95 mph) and a practice at 9.33 (96.46 mph) Second fastest were Eifflaender/Isles with a best time of 10.00 (90.00mph) using a standard D.S. *PAW* dropping to 10.64 when a Schneurle was fitted!

This plain wood machine is quite the nicest 'Midge' I have ever seen. Third was Malcolm Ross using a *Frog* 150. He made one flight only, clocking 10.59 (84.98mph). The rest of the field were in the sixties and seventies except for yours truly who recorded a resounding 58.06mph with an *Elfin*, missing very badly (don't forget the +15% this year John...ACB) Landing problems stopped me having another attempt...

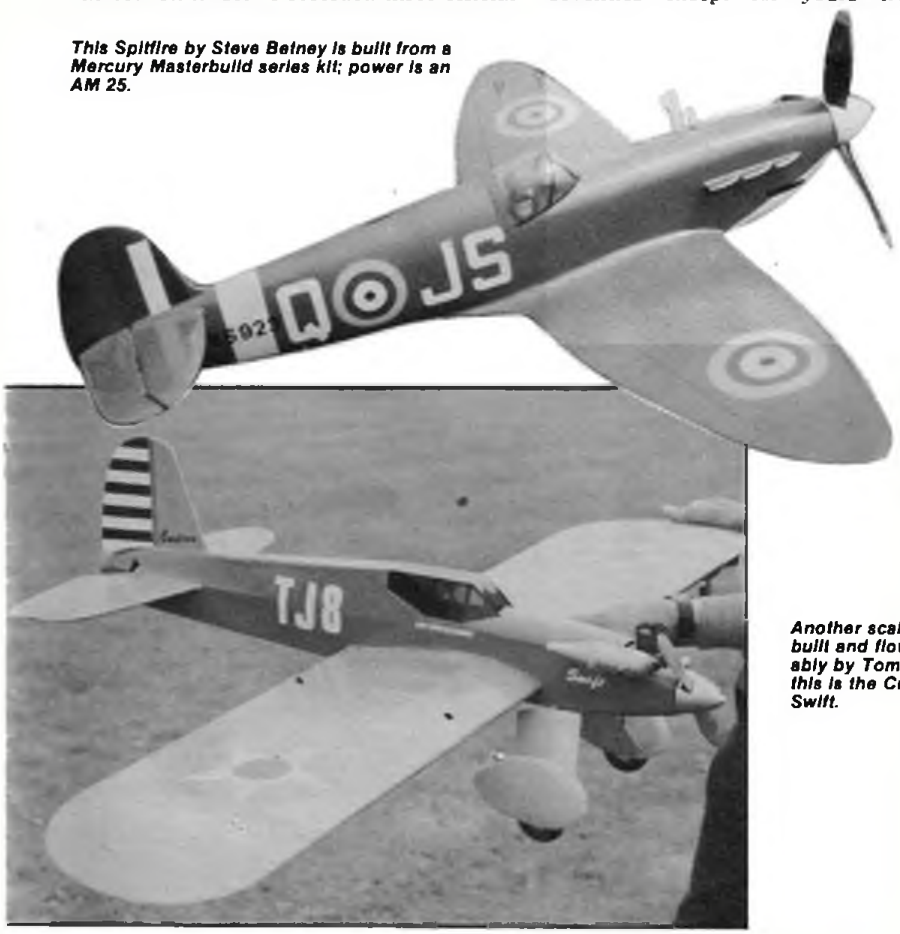
One chap turned up with a left hander but had difficulty flying that way round and so his 'official' flight was proxy flown by none other than Gig Eifflaender. Altogether fourteen flyers recorded times. My other picture from that day, shows Three Sisters Chairman Ken Morrissey. He only got back from a business trip to France on the Sunday morning, to be rewarded by a best speed of 77.59 and the rather severe 'Midge bite' or 'propeller rash' as just visible on right index finger - where is the *Elastoplast...*" (I do hope it's a 1.5cc Ken...not a 2.5! ACB)

The next Three Sisters date on the Calendar for 'Vintage goings-on' is June 30th/July 1st. Vintage Team race, Class 1 speed, etc. and, as ever, 'Mind the Lines' is on holiday again!



Oops! Midge about to return to kit form - rise off dolly excitement at Three Sisters. Right, bloodied but unbowed; Ken Morrissey suffering from prop rash but still happy...

This Spitfire by Steve Betney is built from a Mercury Masterbuild series kit; power is an AM 25.



Another scale stunter built and flown very ably by Tom Jolley; this is the Curtiss Swift.

Steve Betney's beautiful 48 in. span, O & R spark powered Tipsy Junior is based on the June '49 Aeromodeller plan - see opposite.

Scale Stunt

One enthusiast of scale stunt is Alan Kingswood, who wrote a long letter which was most informative and well worth inclusion in the column.

"Last year I carried out a survey of Scale Control Line designs from my own sources and enclose a copy of the results. This used a December 1950 cut-off date but I have added a few that I know of from that date to December 1952.

The early control line models in the USA seemed to be aimed at speed operation and, to make this more interesting, scale outlines were used. I use the 'scale outline' tag as with the huge cylinder sticking up they do not seem to me to be '*real scale*' models in the currently accepted sense. With the advent of aerobatics, scale models with this ability were produced but they still seem to have relied on excess power for their aerobatic ability. Jerry Reiss's *Piper* 'Vagabond' is a case in point, the stunt version shows an *Ohlsson* 0.23 whilst a lightly built version shows an 0.049!

The 'Tipsy Junior' seemed very popular including the three *Aeromodeller* versions by Harry Hundleby one in *Air Trails* and one in *Model Airplane News* (both with symmetrical sections). There was also a kit in the U.K. by R D Randeson, I believe, and a plan by *Weston*.

The *Weston* plans were available from Weston-Super-Mare in about 1949-1950. I have several which seem to have been designed by R A Ward, who designed the *APS* 'Fokker D7'. They tend to be over-powered by my standards and only approximately to scale. I have the *SE* 5, *Albatros*, *Laird* 2 RT, *Brown* 'Miss Los Angeles' and *Gee Bee* 'Sportster' plans.

For genuine scale stunt from the designs I have listed - I would recommend the following:

Air Trails D.H.4 - W Musciano, *Model Airplane News*: 'Travelair Sport Biplane' - J. Hunt, *A M*: 'Globe Swift', *A M*: 'Wackett Boomerang', *A M*: 'Ercoupe', *A M*: 'Tipsy Junior' (all 3! but use a symmetrical section).

All these are acceptably to scale and have sufficient wing area, the 'Globe Swift'

Vintage Scale Control Line Models Survey

Source	Name	Span	Engine Size	Designer
AT	Albatros Triplane	26"	.19-.35	Walter Musciano
AT May 49	DH-4	38"	.35-.60	Walter Musciano
AT Jly 48	Curtiss R3C-1	22"	.19-.29	Dick Ealy
AT Jan 51	Sopwith Dolphin	32"	.19-.29	Vincent Manfredi
AT Jan 50	AT-6 Texan	42"	.32-.60	S Calhoun Smith
AT Aug 49	Piper Vagabond	32"	.049/.19-.29	Jerry Reiss
AT	Aeroncd C-3	50"		Chuck Hollinger
AT Dec 49	Mooney Mite	27"	.049-.099	
AT	Roland D-2			
AT	Long Midget		.29	S Calhoun Smith
AT	Morane Saulnier			Chet Lanzo
AT Dec 48	Caudron C-460		.19-.60	Walter Musciano
AT	Waco UPF	34"		
AT	Laird Super Solution	26"		
AT	Cosmic Wind Minnow	38"		
AT Feb 48	Aeronca Champion	39"	.19-.30	William Seidler
AT May 48	Boeing L-15	40"	.19-.35	Paul Plecan
AT Oct 49	Tipsy Junior	30"	.19-.29	Aubrey Kochman
AT Nov 48	Curtiss Pusher	28"	.19	Henry Struck
AT Dec 47	Wittman Spc 1 Buster	24"	.19	William Tyler
AT Jly 50	DH-6		.099-.19	Werner Frake
AT Jly 50	Texaco 13 Mystery ship	28"	.19-.29	Walter Musciano
AT	Folkerts Speed King	19"	.099-.29	Walter Musciano
MAN Oct 44	Knight Twister	29"	B-C	Charles Zeihl
MAN Dec 47	Wittman Buster	24"	.099	James Noonan
MAN Jly 50	Curtiss 02C-1	24"	.099-.19	Walter Musciano
MAN Nov 50	F4U-1 Corsair	22"	.099	Dick Ealy
MAN Dec 50	Douglas A2D Skyshark	32"	.19-.49	Walter Musciano
MAN Aug 50	Pitts Little Stinker	24"	.19-.33	Walter Musciano
MAN Apl 50	Consolidated XP-81	25"	.19-.23	Dick Ealy
MAv 49-50	SE-5a	28"	1.5-2.5 cc	Bill Blake
MAv 49-50	DH-71 Tiger Moth	22"	.75-1.0 cc	H J Watkins
MAe 49-50	Nieuport 17	19"	.75-1.0 cc	R D Randerson
MA	Mew Gull		1.0-1.5 cc	R A Twomey
MA	Hawker Fury		1.0-1.5 cc	Ron Warring
MA Aug 50	P-47 Thunderbolt	28"	1.3-3.5 cc	P M H Lewis
AM Jly 50	Ercoupe	39"	3.5-5.0 cc	Don Dooley
AM Dec 48	Fokker Triplane	26"	.09-.19	Walter Musciano
AM Dec 50	Fokker DVII	29"	2.5-5.0 cc	R A Ward
AM Nov 49	Hawker Tempest II	31"	2.0-3.5 cc	H J Pridmore
AM	Lockheed Sirius	32"	.09-.29	Walter Musciano
AM Annual	Sopwith Triplane	20"	0.8-1.0 cc	J Pleydel
AM Jne 48	Tipsy Junior	28"	1.0-2.0 cc	Harry Hundleby
AM Jne 49	Tipsy Junior	34"	2.0-5.0 cc	Harry Hundleby
AM Jne 49	Tipsy Junior	39"	5.0-10 cc	Harry Hundleby
AM	DH TK-4			Ron Moulton
AM Jan 50	Miles M 48 Messenger	36"	2.0-2.5 cc	H J Pridmore
Veron Kit	Spitfire 22	27"	1.0-5.0 cc	Phil Smith
Veron Kit	Seafury X	25"	1.0-3.5 cc	Phil Smith
Veron Kit	Wyvern	26"	1.0-3.5 cc	Phil Smith
Veron Kit	FW 190	33"	2.5-5.0 cc	Phil Smith
Veron Kit	Long Midget	24"	1.5-3.5 cc	Phil Smith
Weston Plans	Miss Los Angeles	23"	3.0-6.0 cc	R A Ward
Weston Plans	Boeing XF6B-1			
Weston Plans	Gee Bee Sportster			R A Ward
Weston Plans	Aeronca Super Chief			
Weston Plans	U S Navy Racer			
Weston Plans	Laird LRT 1938	20"	2.0-4.0 cc	R A Ward
Weston Plans	Seversky P-35			
Weston Plans	Fairchild Argus			
Weston Plans	Mr Mulligan			
Weston Plans	Cosmic Wind			
Weston Plans	Tipsy Junior			
Weston Plans	Chryslea Super Ace			
Weston Plans	DH Chipmunk			
Weston Plans	Percival Proctor			
Weston Plans	Percival Vega Gull			
Weston Plans	Percival Gull 1934			
Weston Plans	Percival Prentice			
Weston Plans	Miles Hawk Major			
Weston Plans	Miles Sparrowhawk			
Weston Plans	Miles Falcon			
Weston Plans	Miles Merlin			
Weston Plans	Gloster Gauntlet			
Weston Plans	DH Tiger Moth			
Weston Plans	Hawker Fury			
Weston Plans	A W Scimitar			
Weston Plans	Nieuport			
Weston Plans	Bristol Fighter			
Weston Plans	SE-5	19"	1.5-2.5 cc	R A Ward
Weston Plans	Sopwith Pup			
Weston Plans	Albatros D-3	25"	1.5-2.5 cc	R A Ward
Weston Plans	Henschel			
Weston Plans	Fokker D VII			
Weston Plans	JU 87			
Skyleada Kit	Curtiss Hawk	24"		
Skyleada Kit	Auster	27"		

Key
AM = Aeromodeller
AT = Air Trails
MA = Model Aircraft
MAe = Model Aeronautics (Ian Allen)
MAv = Model Aviation (Ian Allen)
MAN = Model Airplane News

MAN Mch 51	Brunner Winkle Bird	18"	0.035-0.049	H A Thomas
MAN Apl 51	Boeing F4 B-4	30"	0 15-0.29	W Musciano
MAN May 51	Wittman Buttercup	27"	0.074-0.19	P Palanek
MAN Sept 51	Westland Wagtail	23"	0.09-0.15	P Palanek
MAN Oct 51	Gee Bee Z	30"	0.19-0.29	L McBrayer
MAN Dec 51	Schoenfelt Firecracker	29"	0.19-0.29	L McBrayer
MAN Jan 52	Travelair Biplane	41"	0.19-0.35	J Hunt
MAN Feb 52	DHC-2 Beaver	48"	0.19-0.35	D Stukil
MAN Mch 52	Piper Tripacer	22"	0.074-0.099	P Palanek
AM Jan 51	DH T K-4	23"/30"	2.5-5 cc	R Moulton
AM Jan 52		28"	2.5-5 cc	W Musciano
AM Sept 52	Globe Swift	40"	3.5-5 cc	Buxton
MA	Mew Gull		1.0-1.5cc	Twoomey
MA	Hawker Fury (Mono)		1.0-1.5 cc	R Warring
MA Aug 50	P-47 Thunderbolt	28"	1.3-3.5 cc	P M H Lewis
MA Nov 50	N A Harvard	40"	2.5-5 cc	T Wardell
MA Mch 52	Boeing P-26A	23"	1 5-2.5 cc	P M H Lewis
AM	Wackett Boomerang	38"	3.5-5cc	C Taylor
MAN Nov 52	Tipsy Junior	40"	0.29-0.35	W Blanchard

having been enlarged for this purpose I believe. Three-line control line systems may have made their appearance early on - H A Thomas in his "C/L Commentary" in this magazine mentions a 'Tiger Moth' - but the Roberts system was one of the first practical balanced systems and first available around 1960. I always found stunting three-line systems difficult when the lines got twisted together, but it may have been my technique!

Walter Musciano's 'Triplane' you included as the 'Model of Month', would not be suitable unmodified. It is very 'touchy' with the CG well backwards, and with its very short nose it isn't easy to get it forwards! My Pleydel Sopwith Triplane also had similar problems. Pete Cock of 'Kandoo' (never heard of it! ACB) fame, said he did all his early stunting with a 'Sopwith Tripe'. I believe there's a photo if it in one of the *Model Aviation* series magazines.

For a multi wing model, back stagger seems to be more successful, so the *Air Trails* 'Sopwith Dolphin' may be a good bet, even though the nose is a little short."

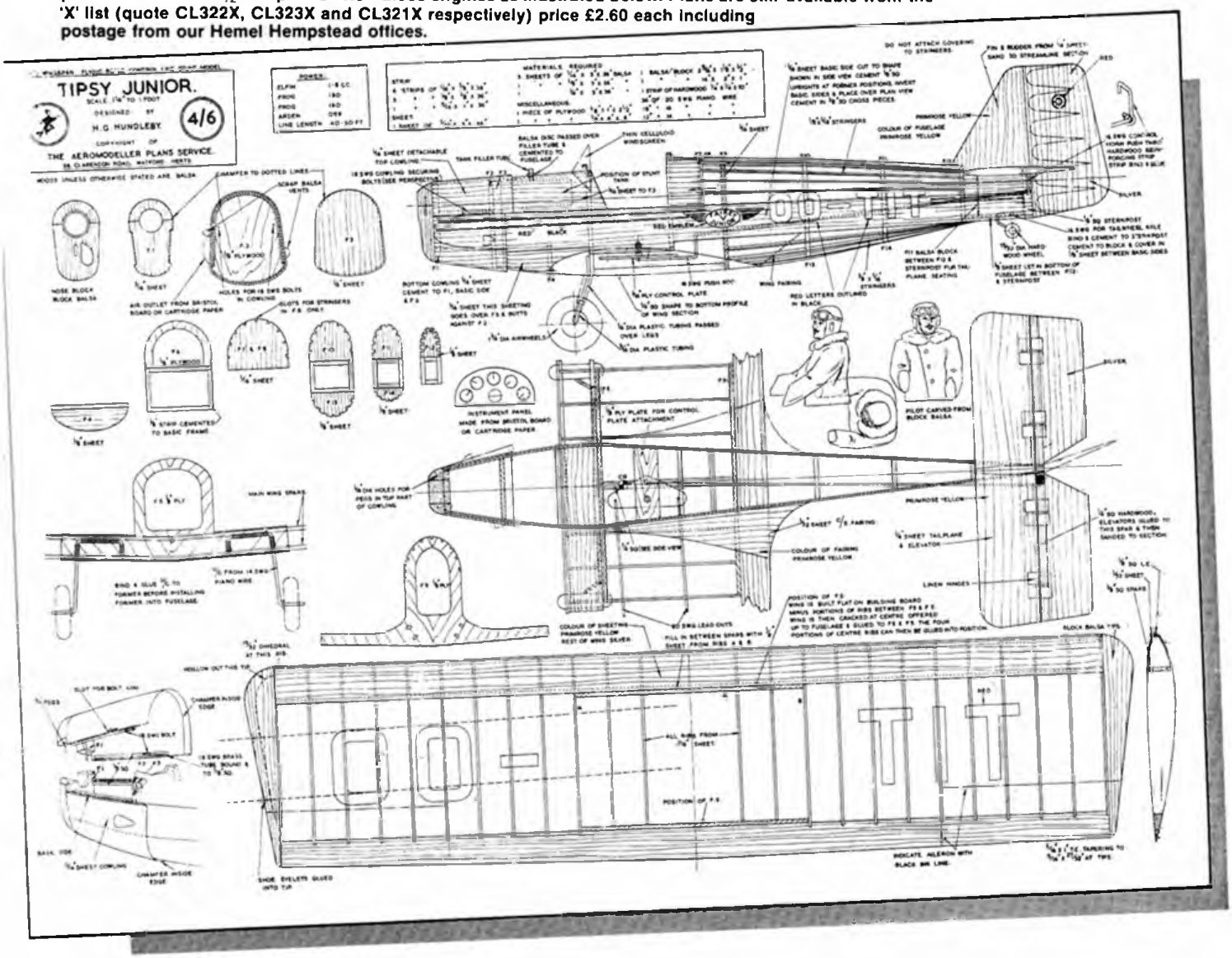
Thanks, Alan; with a few more letters like yours, I'd just need to be the editor of the column! Talking of 'Tipsy Juniors', it just happens I had the June 1949 *Aeromodeller* to hand...so here is a look see at a reduced copy of the plan.

Although Alan says that to be aerobatic a symmetrical section should be used, our friend Mr. Hundleby says, and I quote:-

"Readers will note that a symmetrical wing section is not used, instead a bi-convex section similar to that used in full-sized practice is employed. This was done for two reasons, firstly, to preserve scale appearance and secondly, because the writer does not believe that fully symmetrical sections are essential for stunt work. Flight tests proved this latter assumption correct as the model flys inverted most happily" So there!

Just to further confuse the issue I have a comment from Steve Betney, whose photo of his 'Tipsy' is included. He says his 48in. O&R spark powered version flys very fast but is *not* aerobatic! It's a very pretty plan though... cheers.

The Tipsy Junior appeared in *Aeromodeller* in three sizes in 1949 - 34 in. span for 2.0 - 5.0cc motors, 39 in. span for 5.0 - 10cc power units and 28½ in. span for 1.0 - 2.0cc engines as illustrated below. Plans are still available from the 'X' list (quote CL322X, CL323X and CL321X respectively) price £2.60 each including postage from our Hemel Hempstead offices.



EXPERTS FORUM

Dave Hipperson points the way

Dave certainly practices what he preaches, as can be seen from this shot at last year's SMAE Prizegiving. As in many sports, the skills necessary to succeed are in all of us - you just need the time and dedication to hone them to a fine edge . . .

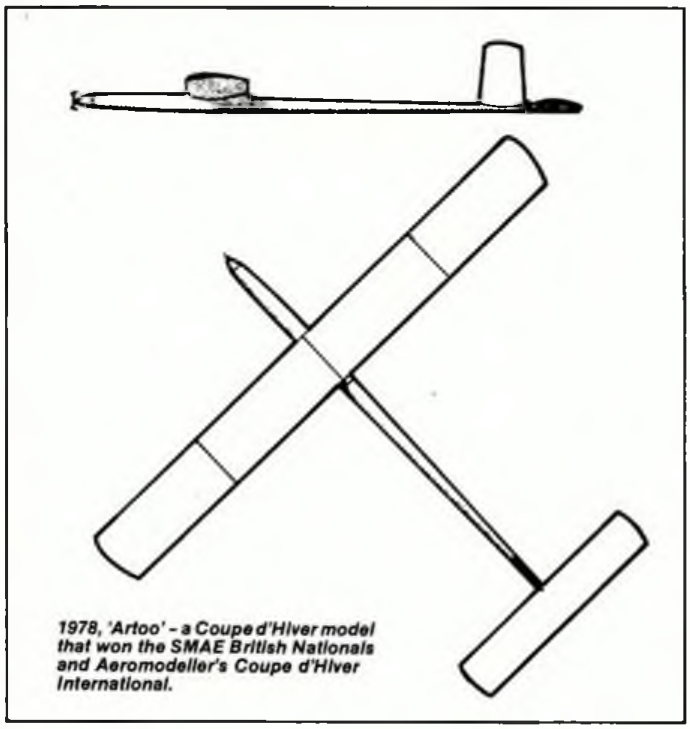
It was the Hornchurch Gala at Chobham Common on 2nd September 1962. That spring I had made my first appearance and since had been enjoying myself each Sunday flying an assortment of small power models whilst rubbing shoulders with the great names of the time. The place was knee deep in experts and power was so popular then. This particular autumn day had been very warm and calm, but there was no ½A class so I had flown my most competitive model - a rather small, poor gliding TD049 O/D - in Open Power. Mid-afternoon I managed to 'fluke' my third max and was facing my first ever flyoff and, for that matter, my first ever placing in anything!

Terrified would not be too strong a word to describe how I felt as the contest closed. The two others with full scores were both infinitely more experienced than I - Pete Giggle also with a ½A model and no less than George French himself - a man for whom I was to develop enormous respect over the next few years. French was flying that mighty *Ramrod 750* - I was overawed. When the moment came, incredibly Giggle cut very short and was out. My little model stayed right in the groove and pulled out at respectable height to be passed as expected, by the *Ramrod*. I will never forget the cries of alarm from French's supporters as the engine continued to nearly 11 seconds!

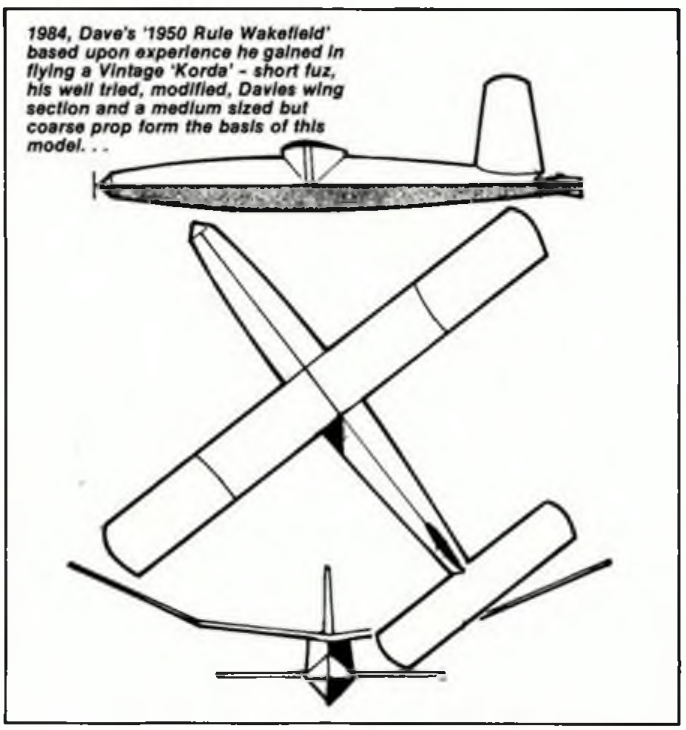
As I began my chase across the common I knew I had won already. All the details surrounding this are now burnt indelibly into my memory. I can remember the flight time, 4.44 and the exact point from which I launched it. I could take you to exactly where it landed and remember the clubmate that helped me retrieve - thanks, Ken. It didn't go far - half a mile or so but then came that extraordinary glowing sensation as I walked back with the model to be presented with my prize! I was hooked - and I was hooked for life.

Almost 25 years later a good win, even a lucky one like that, still feels most elating but the more I have the harder come the defeats - it's the price you pay. Nothing comes free. Chances are you remember your first win just as vividly as this and if it's an experience that has eluded you as yet, then all the more important that you read on...

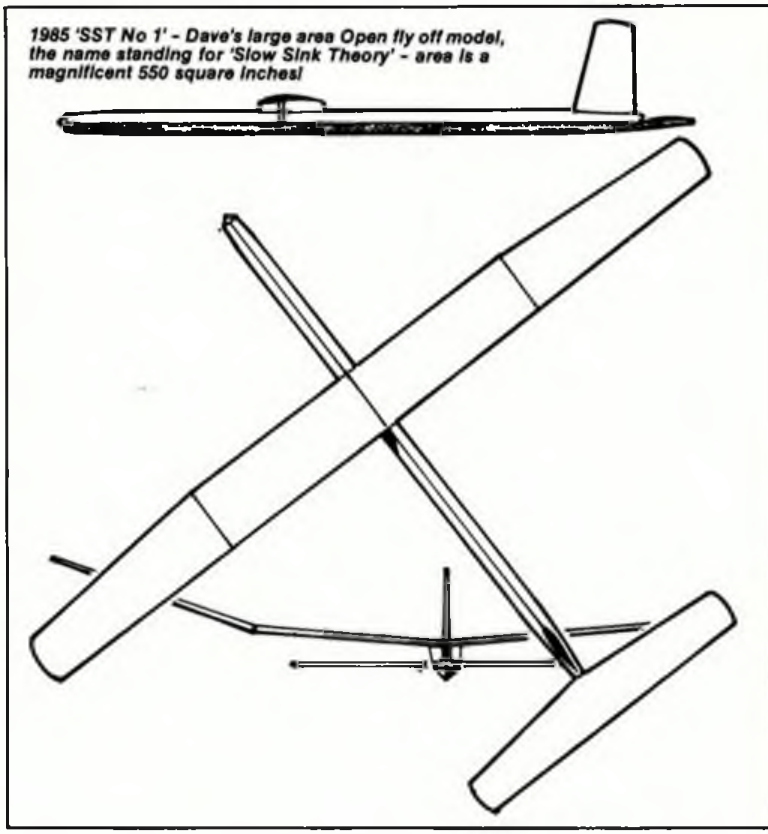
Expert's Forums recently have seemed to over-emphasise the importance of model design; I don't intend to do this. Virtually all the designs I fly have been published somewhere in the last few years - I thought I might expand on the philosophy and motivation behind the flying! Since that day in '62 the intensity of my activity has fluctuated with interest edging away from power and into rubber before the end of the 60s thanks to that ill-conceived, but thankfully short-lived, silencer rule. During those early years at Chobham I was greatly influenced by both Croydon clubmates many of whom took me to and from contests as well as all those 'names' that flew there - Dave Posner, Mike Gaster, Vic Jays, Tony Young, Al Wisher - teaching by example, they all left their mark.



1978, 'Artoo' - a Coupe d'Hiver model that won the SMAE British Nationals and Aeromodeller's Coupe d'Hiver International.



1984, Dave's '1950 Rule Wakefield' based upon experience he gained in flying a Vintage 'Korda' - short fuz, his well tried, modified, Davies wing section and a medium sized but coarse prop form the basis of this model. . .



1985 'SST No 1' - Dave's large area Open fly off model, the name standing for 'Slow Sink Theory' - area is a magnificent 550 square inches!

Season's aim

A lot has changed since then, venues have become more few and far between or are we too fussy where we fly now? I find it more satisfying now to start each season with a positive aim. There is little reason in flying in event after event just for the sake of it - individually or collectively they must mean something. Perhaps that is why I get so upset when I see contests run badly. The last two years the effort has been focused on the Senior Championship title but there have been less ambitious targets. Even selecting just a few events that appeal to you and going for broke in them can be very rewarding without consuming vast quantities of time. My first such endeavour involved ½A Payload in the mid-sixties. Not many people were flying that and there were two or three major SMAE Trophies for it during the season. The Pan American Airways Trophy for that class flown at the 1965 Northern Gala was my first SMAE Trophy. If you want to win it now you will need a thermal soarer, sadly.

Above, planning, performance and persistence are three Ps Dave knows well - it all pays off when you get in the UK F/F Team twice running. Seen here with other 1986 European Champs F1B team members Brian Spooner and Ron Pollard.

If you go for an overall season's aim, it could well be to appear as high in the Senior Champs list as possible or even to make the top six in all events that you fly or always reach the fly-offs - if you happen to fly in Open Rubber or Power. Whatever it may be, don't be too ambitious at the start - choose something attainable so that you can enjoy the satisfaction of reaching your own personal goal. Remember we are supposed to be enjoying ourselves! One more thing whilst on this subject and something I have only learnt in the last year or two. Unless there is a very real chance of model loss or serious breakage, try to finish your flights. It is surprising how high you can place particularly at big events, if you make all the flights in your classes even if you have dropped one or two. It is tough to resist the temptation to pack up and go home but, believe me, it leaves a better taste if you finish.

If the last one just happens to be a max it will cheer you up for the drive home and the next contest. One of the reasons I report the events I attend for this magazine is so that when I make a mess of the day I can't stomp off in a temper - I have to stay to take the final results! As most organisers go to the bother of having prize-givings nowadays - it is courteous to attend these. You won't need much encouragement if you have something to collect, but it's harder if you haven't. Go and applaud the winners even when you aren't one, otherwise next time you win there might not be anyone there to clap you!

Left, Dave in relaxed mood strolling back to the flight line at last year's Nats - relaxed he may have been but for once the winning places eluded him except for Vintage.

My '85 season's successes came through not inconsiderable investment of time, but it is important no matter how much you intend to spend that you apply it wisely. Concentrate on the crucial aspects rather than being side tracked. Your aim should be consistency first. Use a sensible model or models - someone else-proven design if you are just starting out, but if you already have a model with which you are happy then turn your attention to the fine detail. Work on this can be carried out at home - you don't need a calm day. Planning, building, maintenance and setting-up before trimming are all indoor jobs.

It is time well spent if you are as meticulous at these stages as possible. Funny thing, I noticed my performances improved soon after I started building and flying Vintage models seriously.

The building of Vintage was a discipline new to me - following very close to someone else's plan. It improved my accuracy and with that came greater consistency. I can also understand better now why some modellers enjoy 'scale' as Vintage is really a form of full-size scale modelling. I would recommend it to those requiring to improve their building - although it is hardly the place to learn simple trimming.

Try to develop an attitude that actively enjoys building. As with all things, if you enjoy it you will do it better. Moreover, if you can build accurately you can duplicate and if you can duplicate a model you can reduce the time it takes to trim. Trimming time - those all too precious calm hours - are the most valuable of all. I have reached the stage only quite recently where I can fly rubber models straight from new with the very minimum of adjustments. I occasion-

Left, Dave's staunchest supporter and helper on the aeromodelling field is wife Sue - bearer of the umbrella that protects both flyer and model until that vital launch. Below, yet another class that Dave has attacked with success is CO_2, seen here about to launch for 2nd place at the 1985 Nationals.

ally get one that needs no adjustments at all! This is the exception, but intelligent and critical observation at home can save so much time, not to mention eliminating those costly trimming 'accidents'.

Of course, it is always best to leave a new model for as long as possible before it is flown at all to let the structure cure and settle but during that time keep observing it. Watch and correct the warps, check fuselage and fin alignment, does the incidence look right - why not measure it exactly? Check all the moving parts, does the timer run every time, does the DT foul anything, are the wings and tail seating square? One day you might *have* to use a new and unflown model on a comp. flight. What would its chances of survival be?

I can remember George French having to do this in an FAI power trials once. Full bore, 10 second run VIT and auto rudder - it was a lot to ask but it flew very nearly a perfect pattern and got him in the team! George French built and prepared remarkably well even if he did have the occasional over-run!

If time permits try to fly as many classes of the same discipline as possible. It is surprising how much of the preparation is common and how much you can learn from one class and apply it to the others. You can always keep one type, say a smaller one, for experimenting with new ideas and gadgets only applying them to the others if they are proved to work. Model development usually comes in a series of little jumps forward but always remember to prove new ideas in contest conditions before adopting them wholesale. Too many people scrap last year's models on the whim of a fashion and live to regret it when their new 'world beater' starts exhibiting nasty habits they didn't expect.

Trimming

You can actually do *too much*. Don't be tempted to 'play' with models just because it's a nice evening - it's risking damage every time. After a healthy amount of testing put it away and try another. The exception to this may be glider flying now so much importance is attached to circle tow technique and unless you are actually clouting things on the ground it is unlikely that you will wear the model out before yourself.

When trimming, always be critical - look for sources of trouble, don't turn a blind eye to them. Models must be flown to the limit too - no half measures. Full power, full length runs, max. winds, fast powerful zoom launch - whatever. Even though you will inevitably be trimming in calm conditions, don't be tempted to adjust models for ultimate calm weather performance - the chances are you will be flying them during the day in thermal turbulence.

I am lucky having a suitable trimming site close to home. My usual procedure is to make numerous short visits during the year taking only one or two models each time. Mixing classes can be very confusing when trimming just as it can be when contest flying. I did a great deal of trimming like this last year - nearly 100 hours actually on the field in a series of some 40 trips. I very rarely make trim flights at a contest as there is too much to do.

Planning

Apart from planning what events you wish to attend during the season it is also useful to have some plans laid for each day. The fewer decisions you have to make on the contest field, the clearer you can keep your head for the business of making maxes. Decide in advance which of your models suit what conditions. Decide too, on which class you will start with in any given weather and which events you will fly later if you are able to fly in more than one. Above all, don't mix classes. That is don't start flying in another class before you have finished the first - unless of course you are forced to because of rounds. In the first place it is often quite difficult to make the mental adjustments from one class to another and, if the weather improves and you have kept a class unstarted, you will immediately have an advantage over those that have spoilt their flights.

Flying

It might not be superfluous to say that models should be on trim when you arrive at the contest. In fact, more than that, they should all be in such a state of preparedness that you have confidence to fly any of them without checking. Check flights are at best risky and quite impossible in bad weather. Fly-off models - becoming more important each season - will have to be chosen only just before the fly-off to suit the conditions prevailing at the time so there will never be time to check them. Once again, the better your building, the more likely that they won't let you down.

So the preparation is perfect but you will still have to do the flights and survive the day. It will help if your field kit is in good order. Don't expect anything to work better at a contest than it does at home. I am afraid the reverse is true. Tow-lines, motors, fuel, starters, winders, repair kits and tool boxes should be checked on *return* from every outing - so that they are always ready to go out at a moment's notice. The same

applies to the models themselves - these should be repaired and checked as soon as possible after returning home. It's no good putting them away - it's too easy to forget and find the damage when you come out to fly again.

Of course, you can minimise the work you have to do every time by not damaging the models and certainly not losing them unnecessarily. There will be days when the conditions are such that if you hope to win you will have to risk breaking and losing models, but you can reduce the risk if you are firm with yourself on retrieving. I am afraid many of the people who lose models do so because they are not determined enough to do otherwise or give up too soon. If you are not actually holding it then the next best thing is to be right underneath it.

On calm days catch them if possible, even an unlucky DT landing can damage a model. In wind get after them as quickly as possible. There is no substitute for keeping the distance between you and your model as small as possible. Better than all the binoculars in the world. Not everyone is that physically fit but bikes make life much easier, on aerodromes at least, but even walking straight after it is better than nothing at all. Over rough terrain when all the chasing is on foot, admittedly it can be counter productive to dash off down a valley to have the model disappear almost immediately over the brow of the next hill. Not a bad idea to actually go off sideways in such situations so that at least you and your time-keeper have different lines on the model.

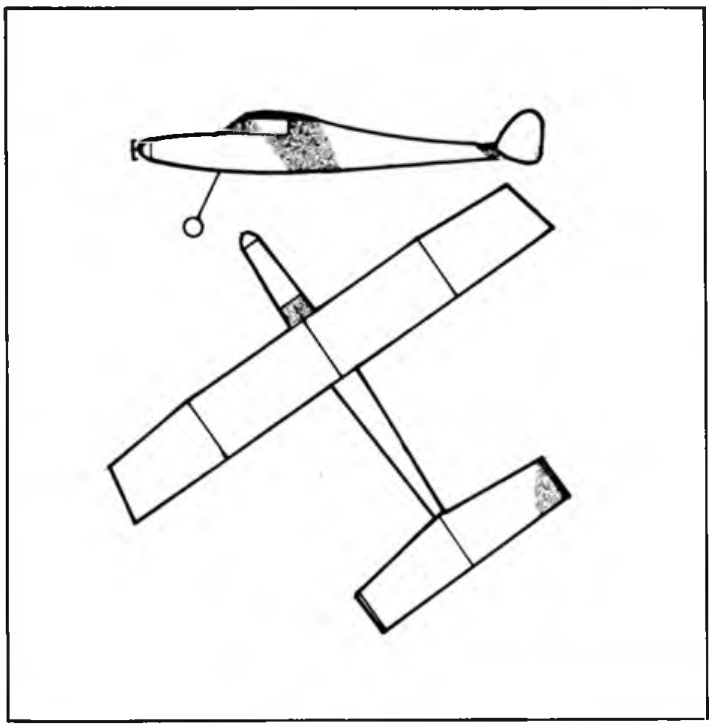
Whatever you do, don't hang around chatting and then complain when your model is run over by a car or stolen - get after it! The only model I lost last year was the one I didn't (couldn't) chase. It was either that or not being there for the Caton Trophy fly-off (no choice).

Storage

I have a big problem with this. I have more than 40 contest airframes now - all rather bulky. It would be laborious to pack before each outing so classes are allocated their own boxes and kept in them permanently. Boxes are universally thin ply - 1/8th for domestic classes and 1/4 ply for anything that might have to be carried abroad. In this way all the parts necessary are always together - no chance of leaving a bit behind - and it has the added advantage of keeping all the tissue in the dark thus inhibiting colour fading.

Boxes are stacked in an integral but unheated garage so any temperature changes are minimum. This also reduces the tendency to warping and allows observations of models from time to time in stable conditions. If you have a lot of models, of course, a van or estate car becomes the only suitable transport to and from contests. Even so, with the number I carry to a major event like the Nats, space - even in an 18cwt Transit - does become a problem.

Another advantage of individual boxing is that notes and details can be kept with each model. This is vital for me when one considers that some of mine are used perhaps only two or three times a year. It would be impossible to remember just what state of trim they were in the last time flown. Similarly, any trim flights and adjustments can be noted as can tendencies or moving warps. Of course, it is a good policy to also have all warps written down on the wings themselves in case the model is damaged or soaked and warped during a contest and has to be flown again that day. If you have this data on the wing then you can get closer to the original set-up even if it is rather a bodged field repair.



Left, 1982: 'Suzy's Too' a 33 inch 'Open Coupe'! With 20 grams of rubber this simple, attractive model is quite capable of 3 mins. in still air - Dave's pursuit of performance is always there . . .
Below, regular columnist for Aeromodeller, he always keeps readers informed on the ins and outs of useful gadgets, his torque meter seen here is more of a necessity if performance is the aim . . .

The future

This year I will be slackening the offensive somewhat. I have a considerable stock of models so I am planning some attention to performance improvements, particularly in CDH and Wakefield, with useful lessons being applied to Open in due course. I also hope to build another 'pedestrian' 1/2A model and get in some contest practice with that and its existing stable mate with a view to taking the class more seriously in '87.

As for events themselves I shall concentrate more on the major centralised contests and those that have prestige or tangible prizes whether they be SMAE or not. I have long believed that annual trophies are very important and have an attraction for me because they are History and are tangible proof to visiting family and friends that you really do something on Sundays! Your name engraved on a trophy is there forever just as reports of contests in *Aeromodeller* document the development of our hobby. Think how many times you hear people reminiscing about past contests; the events that actually *happened*. It's rarely the models that are discussed, they are just the tools. Of course, my ultimate ambition is to collect more trophies at the SMAE dinner than the great John O'Donnell did in 1958. That year he won 8. That was 6 actual comp. wins - his seventh trophy being for the overall Senior Champion. He tried to refuse this arguing that the SMAE had calculated the points wrongly (nothing has changed, has it) but they insisted that he took it. For his sportsmanship in pointing out their error they awarded him the Arthur Mullett as well!

Hence 8 trophies - for me I think that will always be an impossible dream and perhaps that's as it should be...

HOLLAND'S HINTS

There are many ways of building...this series offers groups of sketches from Peter Holland's construction notebook. Each of the series deals with related details in the enthralling business of making various types of aircraft...

by Peter Holland

Large or small, models with built-up construction (as oposed to sheet models), form the major part of the construction scene. The traditional methods shown here go back many years and vary only in minor detail.

Fuselages

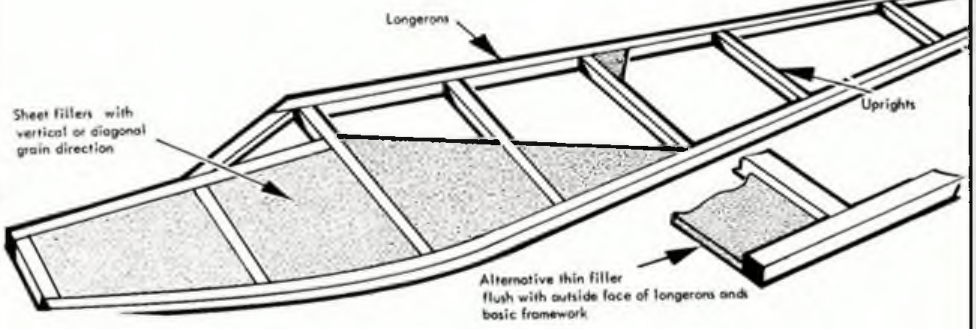
Simple box section fuselages are light and reasonably strong, with long strips of balsa at each corner. These are called longerons, and may be sized from 1/16in square for 'Peanut' sized models, up to ¼in square for larger machines...Anything stronger may be done in spruce, leaving only the uprights and spacers (which go across the fuselage), in balsa. **Sketch A** shows a typical fuselage side using square section longerons and uprights...Some people refer to uprights as 'spacers;' true, they space the longerons, but they are upright. The spacers are cross-pieces, so if the instructions refer to 'uprights', the 'spacers' really do space the sides apart. If they say 'spacers', then look out for 'cross-pieces' in plan view.

In order to save weight, the spacers, uprights, etc., aft of the wing can be rectangular strip - say ⅛in × 1/16in - set on edge with longerons of ¼in square. Up front, fairly soft sheet of the same thickness as the longerons may be cut to fit inside the frame. This gives rigidity where it is needed and prevents clumsy fingers going through when starting the engine, or wrestling with the model on a gusty day. Thinner sheet may be used, but it should be flush with the *outside* face of the framework. Who is going to be the first to make two identical sides with the sheet on the wrong side of one of them? Flip that second side over before infilling it! It reminds me of the time I carefully made left and right handed rotor blades for an autogyro...

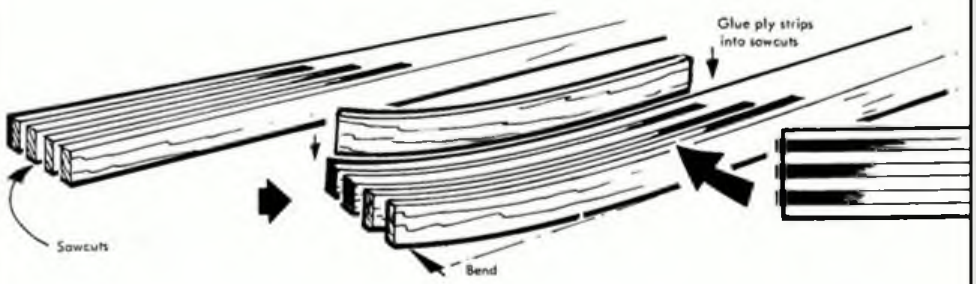
If the longerons have to be sharply curved the only real excuse for that is 'scale' - make knife cuts down the end of the longeron, vertically to the side view. This aids bending and the strength may be restored by coaxing glue into the slits after bending. A scrap of paper helps here, or by dabbing thin cyano glue in *afterwards*, when it will run into the slit by itself. Extra strength can be had by slitting with a razor saw and slipping in 1/64in ply as seen in **sketch B.**

Assembly of the fuselage box is seen in **sketch C.** It is helpful to have a couple of rigid formers to aid the task of keeping things square, then, if a pencil mark is placed centrally on the lower part of each former, it can be aligned on a centre line, drawn the length of the fuselage on the building board. The sketch suggest a logical order of assembly.

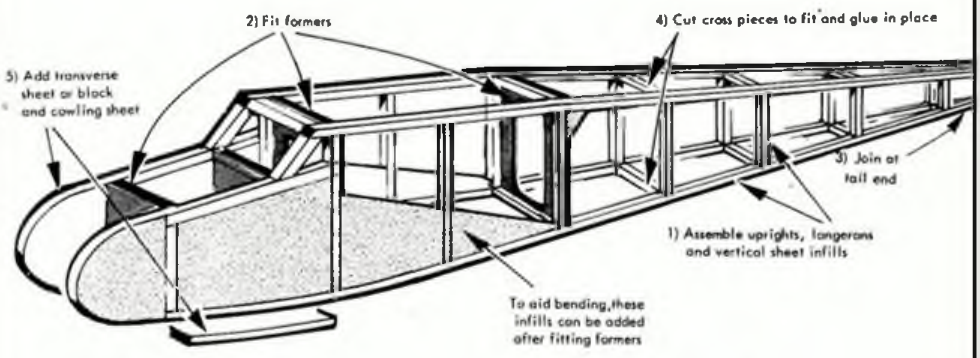
FUSELAGES



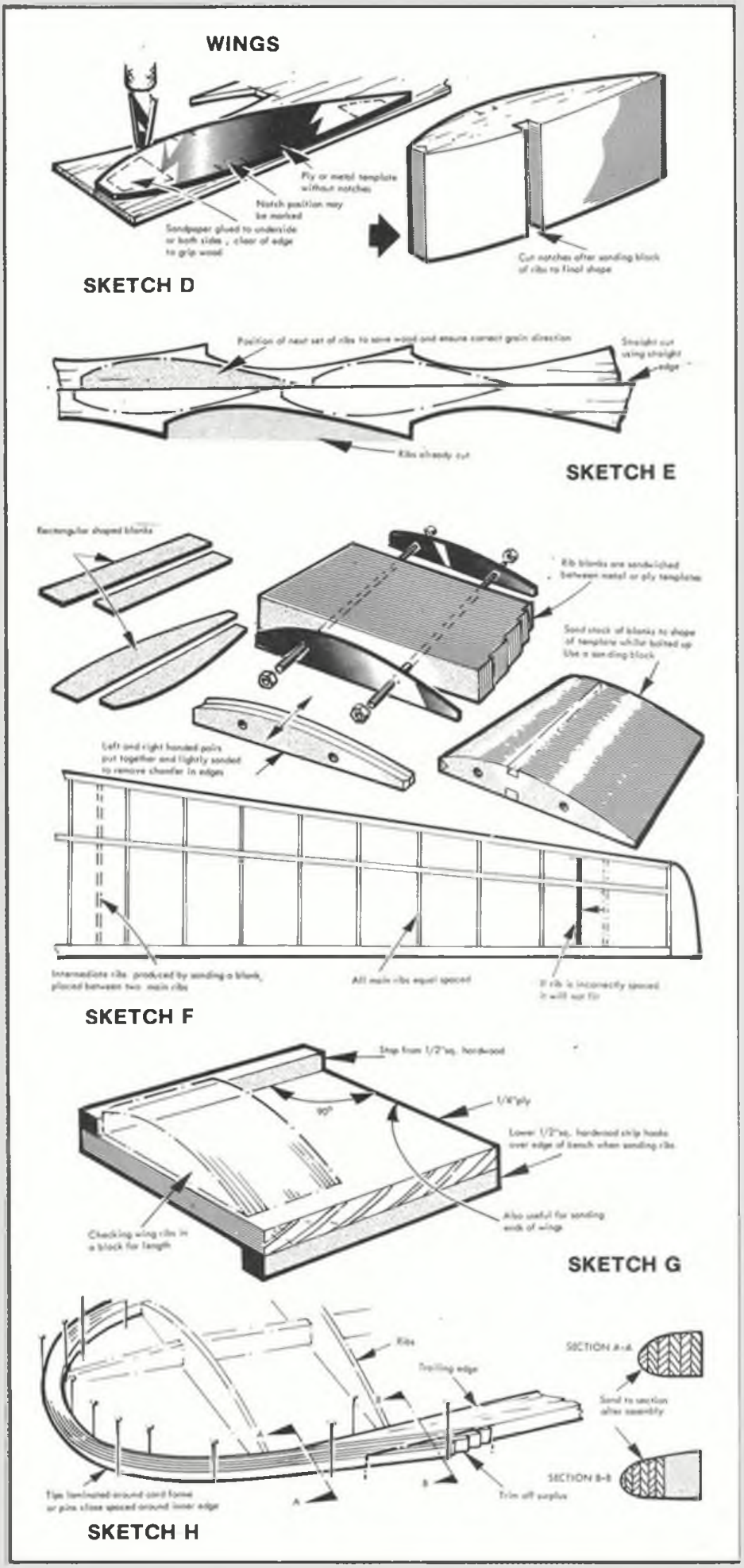
SKETCH A:
LONGERONS, UPRIGHTS AND FILLERS



SKETCH B:
LONGERON CURVING TECHNIQUES



SKETCH C:
BASIC BOX FUSELAGE ASSEMBLY



Wings

Built-up wings are usually much lighter - size for size - and can be more rigid when correctly made and tissue, film or fabric covered. Accurate aerofoil sections may be produced only when the ribs are accurately cut and spaced fairly close together...The more cambered the section, the closer has to be the spacing; otherwise the covering will be pulled down and reduces that camber when the dope shrinks it.

Right - let's cut some accurate ribs...Ideally, a template of aluminium sheet should be used - this will last for years, but if you are careful with the modelling knife, 1/16in ply will do. It is easy to hold the template in position on the sheet balsa selected for the ribs, if small pieces of sandpaper are stuck to the template, grit side out to grip the wood. Cut from the centre out towards leading and trailing edges, so that the grain does not pull the blade in, or split the wood. When sufficient ribs have been cut (quarter grain sheet is ideal), pin them together to check their accuracy and lightly sand the whole stack of edges. Clamp them up and file or saw the slots for spars, leading edges and, if so shaped, the trailing edge. Separate out all those with extra holes or slots and clamp them up for that operation. **Sketch D** illustrates these stages. Ribs should have the grain running lengthwise (chordwise) for greatest strength, so take a look at **Sketch E**, to see how to do this and save wood at the same time.

A useful bench hook of the type shown in **Sketch F** will speed the alignment and sanding of a stack of ribs. Packing strips may be dropped in between the rear strip and the leading edge of the stack of ribs to bring the trailing edge flush with the opposite edge, so that the sanding block can reach the trailing edge taper.

Tapered wings

Only two rib templates need to be made, one for the largest and one for the smallest rib. Slice up some sheet into as many blanks plus one as there are ribs in one wing. Stack them between the templates and bolt together on pieces of studding (screwed rod). Sand down to the edge of both templates by bridging with a sanding block. Now separate the ribs and do a second set, pair these up each with its opposite number and remove the chamfer by sanding lightly.

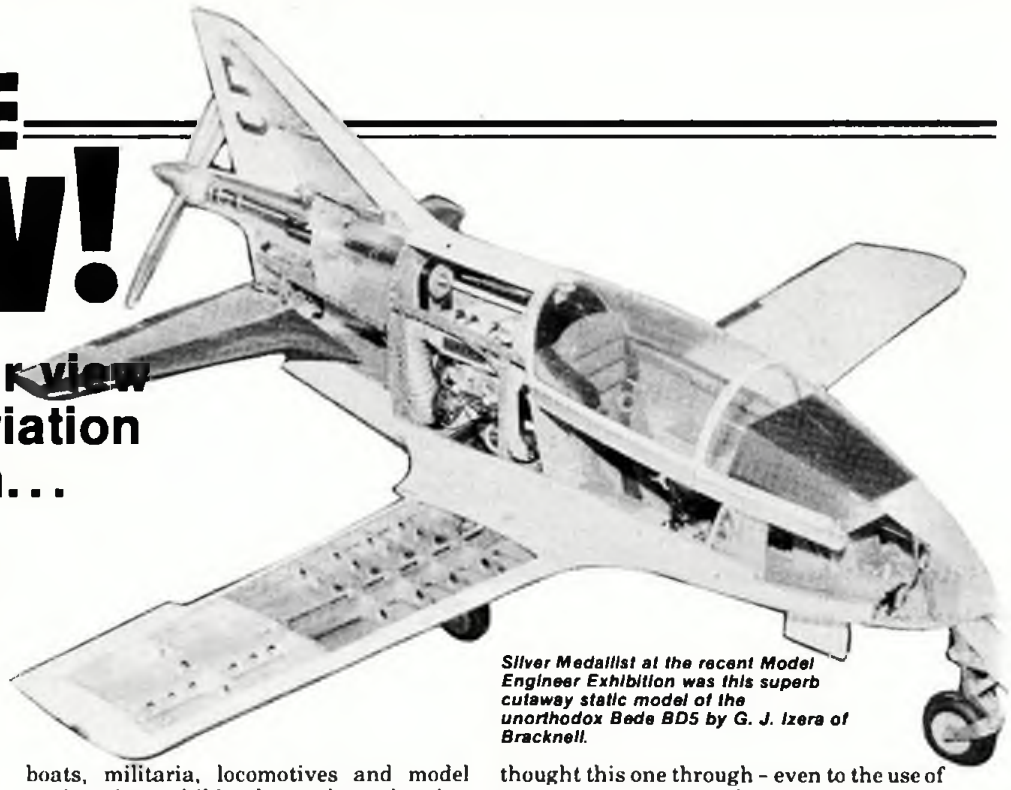
Chuck out the smallest rib of each set and move all the others up one. They should now fit the wing frame. If ribs are unevenly spaced, no way can the 'sandwich method' of rib cutting be used. Sharply tapered wings, too, will result in inaccuracies, unless scraps of unwanted sheet or wall lining expanded polystyrene sheet are inserted between each blank to flatten the angle whilst standing. If intermediate ribs have to be fitted, say at the root, then cut extra root ribs and sand them down using adjacent ribs as templates. **Sketch G** shows the assembly.

Tips

A block of soft balsa often suffices for a wingtip, but more rounded tips may be made nice and light by laminating strips of balsa around a card template or pins, then sanding to a rounded cross section as seen in **Sketch H**. If desired, a strip of 1/32in, or several strips of 1/64in ply, may be interposed between the balsa strips for added strength.

ADVERSE YAW!

A regular, irregular view on the world of aviation from Ron Moulton...



Silver Medallist at the recent Model Engineer Exhibition was this superb cutaway static model of the unorthodox Bede BD5 by G. J. Izera of Bracknell.

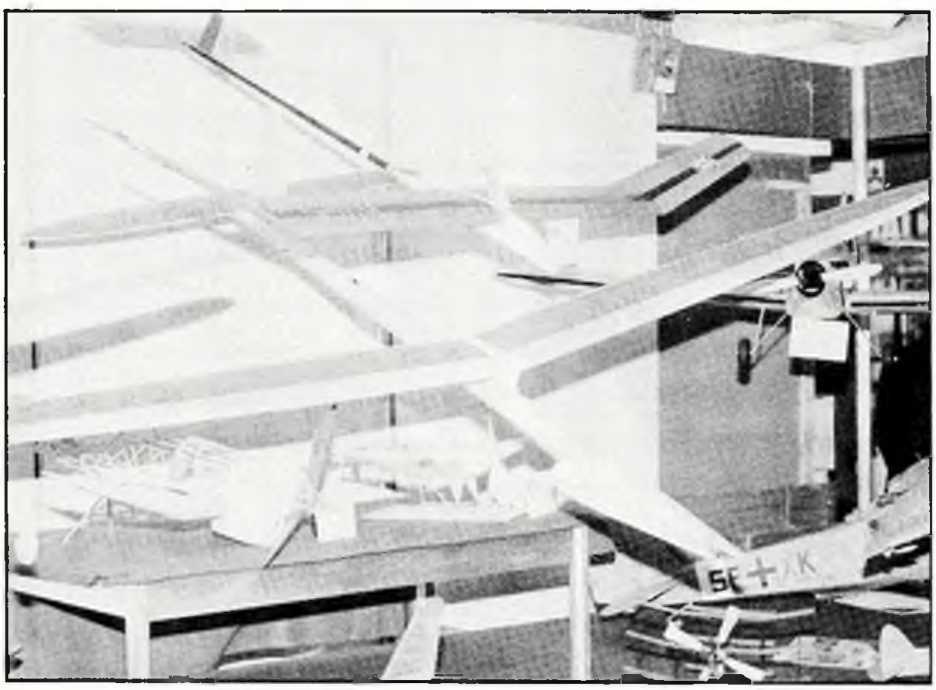
As ever, the 'Model Engineer Exhibition' lived up to its high reputation yet again for '86. Both SAM and SMAE must have impressed thousands of visitors with their variety of models in the club stands and especially for their informative advice on hand from experts. Among surprises in the competitions was Mick Staples, lawn green Control Line Avian Monoplane. Does he really work that fast - or was it just coincidence that first scale drawings appeared in R/C Scale Aircraft Quarterly about the time entries were due? And who could believe that David Vaughan's P51B Mustang could look so pristine in the knowledge that it has served on World Championship Teams and at several Nats. The ME Exhibition gives the gawper a chance to get close to these gems. Shaking heads signify slight disbelief that modelling skills can reach such heights and not always for sheer excellence in finish - more often for the astounding ingenuity which fellow modelling mortals absorb and appreciate. For me, the size and elegant design of Bill Cliff's huge streamlined Open Rubber duration model with 90 inches of ellipical wing and almost five feet of fuselage was an eye popper. So too was G J Izera's (non-flying!) cutaway Bede BD-5 with all the internals revealed. Little wonder these beauties were Silver medalists. They were rivalled by dozens of other outstanding entries, any of which commanded attention and like the mass of boats, militaria, locomotives and model engineering exhibits, leave the pedestrian onlooker humbled and yet inspired by such ability.

The great YO-50 search

Long term readers will have to excuse a return to that 'elusive' Bellanca YO-50 search. In chasing detail it was all too easy to overlook why Chester Smith wrote to us for a source of drawings. His memory hadn't let him down, that prototype he saw in the war years had perfect proportions for free flight or R/C Scale even if - as correspondence reveals - it was from such a beast that one test pilot walked away muttering "never again..."! Thanks to many friends and specially to John Carroll in Dublin we've a fine 3 - view out of November 1942 *Model Airplane News* while Hurst Bowers, curator of the AMA Museum, extracted plans for a well designed 39in rubber or electric free flight YO-50 by Hal Cover of Covergraphics 1222 Knowlwood Dr Newbury Park California 91320. Hal has thought this one through - even to the use of a return gear system for twin skeins, and he's wisely departed from the troublesome slots and flaps. Price quoted is a modest $2.75 plus return post. Maybe that's no longer current but for anyone seeking a well drawn two minute flier to build for Old Warden it's a bargain.

Have models, will travel

Scale is getting bigger than ever worldwide and nowhere more so than in the US where the 'Giant Scale' activity seems to have no bounds. Imagine a Greyhound Bus (if you haven't seen one in its natural stainless sheen) as a road version of the Junkers 52 with a better looking back end and bigger, dark green, tinted glazing. It's about the size of the standard European cruiser coach, possibly more powerful and looking twice as tough. Well Bob Seigelkoff has one, - to go to 'Giant Scale' meets at the Ranches fully converted as a motor home. Wow! But you'd think all that underfloor storage and vast interior would be just great as hangarage for his GS models. Not so. An outhouse trailer is hitched up to accommodate the models. Maybe to make room for a jaccuzi, inside the Greyhound-mobile? Or perhaps to provide space for bigger and better building boards, that's a kinder thought.



Bill Cliff's spectacular large open rubber model - another Wembley Silver Medallist; almost five feet of fuselage and not far short of eight feet wingspan, the model dominated (literally) the well presented aircraft stand in the Hampton Room.

The more the costlier

According to '*Model Aviation*' membership of AMA reached an incredible 105,389 by the time their February issue went to press. That would be around the end of November. Numbers like that come out of bold enterprise - and need for togetherness. It brings its own peculiar problems, one of which is cost of insurance. Their bill of $236,000 amounts to £166,000 at Jan '86 exchange rates. Try that for size - especially when combined with requirement to halve the limit amount and to self insure for the first $150,000 of claims. Insurance has

emerged as a dirty word over the pond. Product liability has put great names out of the light aviation business and scared the daylights out of homebuilder plans services. The same trends are heading our way.

What's in a name?

What's in a name? Why wasn't there an 'AVRO ANVIL' heavy bomber? So says the Scale Staffel San Diego Newsletter which runs into gripe water with the Bristol Banal, Handley Page Hacienda, De Havilland Discord, Hawker Headlong, Miles Membrane and Short Schrift. With all the politicing over Westlands I'd reckon 'Warlock' to be ideally suited, or perhaps 'Waver' or maybe 'Waiver' - check the family dictionary, the definitions fit perfectly. Back to the newsletter, why pick on us? After all, a Boeing Brobdingnagian, Douglas Dinosaur, McDonnell Mangaroo, Lockheed Levitator or Fairchild Fidget would be just as fitting but litigation conscious corporations defend themselves behind numbers. I wonder what they'll do when they get up to 797 in Seattle?

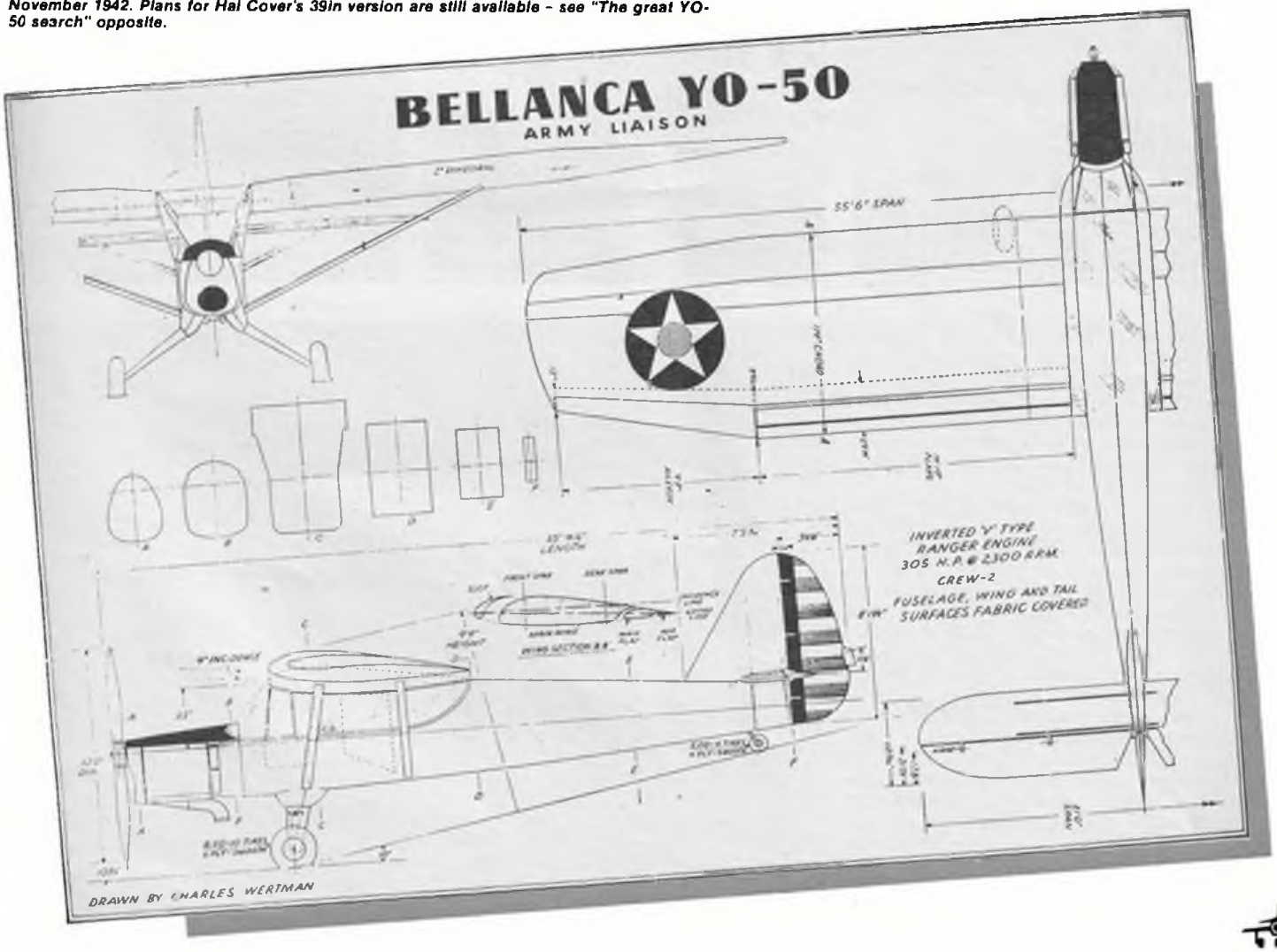
A change of name can throw one right out of kelter. When Tim Hervey asked if we still ran his neat semi scale mid-wing in Plans Service we could only think of it as 'Ariel'. Published in September '48 when Tim managed Eaton Bray aerodrome, it featured as a Rupert Moore cover painting. But finding a print was another matter. No longer listed and not under the 'D' for duration in the plans 'bible' we keep, the plan was totally elusive, - until the penny dropped! In error, we christened another Ariel (in fact we were to find *two* others!) and had re-named Tim's model as 'Swift'. So to save furrowed brows among Vintage fans, order plan RSS 301. It's a delight. Ask Doug McHard, who built one and still keeps to the original name.

French delights

Our French friends have moved the Coupe Maurice Bayet from Persan Beaumont as announced here last month to another equally vast aerodrome at Reau-Villaroche south east of Paris on February 22nd. If you're just packing to go be sure to fit in a trip across the autoroute a few kilometres to La Ferte Alais and view Jean Salis' collection of rare and airworthy vintage planes. Jean and his father before him have built up something way bigger than Shuttleworth, with just the same atmosphere, especially in this land of prototypes (the 'Rafale' is just announced as Dassault's 92nd). Like Old Warden, La Ferte Alais is a haven for scale modellers that never disappoints. Jean recently acquired a flock of Yaks out of Egypt to liven up the museum business.

Bright skies, soft wind and thermals for the Coupe d'Hiver - Maurice Bayet's memorial deserves all of that.

Above, Brian Peckham's Bristol Scout won the Bristol Challenge Cup at Wembley and a Silver Medal. Below, traced at last! Elusive drawings for the almost ideally model proportioned Bellanca YO-50 which appeared in the American Model Airplane News for November 1942. Plans for Hal Cover's 39in version are still available - see "The great YO-50 search" opposite.



Coupe d'Hiver '85

R.A.F. Henlow again kindly hosted Aeromodeller's Coupe d'Hiver International on 1st December 1985. Weather: clear and fine...but oh that wind!

Winners

Trophies were presented by John Worth (Executive Director of the AMA in America) - Above, to John Cooper who won the 100 gram class Bernard Boutillier Trophy and right, Steve Philpott, seen here making final flight for the 80 gram Aeromodeller Trophy. Far right, top junior Mark Francis winner of special prize donated by Stanley Tools of Sheffield.

Aeromodelling's annual winter gathering, the famed Coupe d'Hiver (Winter Cup), is not best placed in the modelling calendar from a weather point of view - which makes it all the more remarkable to record that the morning of last year's event, December 1st at RAF Henlow, dawned bright and clear.

With some 49 entries in the 80 gram Class and 21 in the 100gram, the day seemed set fair for some pleasantly unseasonal flying - but then the wind arrived and, later (but luckily just as flying was finishing in the afternoon) the rain! As a result, there were plenty of breakages, many on the ground as models were being prepared, the wind whipping tails away and twisting wings, and those models which did get airborne successfully were either whisked quickly to the ground or carried off downwind faster than their owners could run! Nevertheless, there were a handful of maxes in both classes but the weather prohibited any hopes of consistency even from the top flyers and, of course, there were no fly-offs.

Despite all this, most seemed to enjoy their day at Henlow and, in the best traditions of British model flyers who get plenty of practise at coping with adverse conditions, kept flying right up to the end!

Coupe d'Hiver Results 100G Class.

Position	Name	Rd.1.	Rd.2.	Rd.3.	Total
1	J. Cooper	93	104	78	275
2	F. Monts	75	56	120	251
3	R. Peers (1)	120	40	71	231
4	E. Hawthorn	58	100	61	219
4	D. Roche	120	44	55	219
6	A. Tennant	101	63	53	217
7	M. Dilly	120	50	43	213
8	J. Billam	120	43	36	199
9	G. Walker	54	85	40	179
9	N. Beaumont	67	61	51	179
11	A. Crisp	43	42	90	175
12	I. Davitt	50	47	61	158
13	G. Sharp	58	52	36	146
14	R. Peers (2)	35	53	54	142
14	M. Richardson	39	67	36	142
16	J. Carter	28	26	29	83
17	A. White	55	23	3	81
17	J. White	15	38	28	81

Scores of Competitors who failed to complete three rounds.

P. Carter	174
D. Greaves	57
M. Chilton	35

Above, one, two, three, - Pete Carter shows how to do it, with a perfect rise-off-ground sequence for the 100 gram class, sadly the weather finally beat him and he was unable to complete all three competition flights. Below left, some idea of the wind can be got by studying the expression on Martin Dilly's face, as he struggles to hold his model safely whilst waiting for the best moment to lauch.

Right, Ian Davitt with version of model described on October's 'Free Flight Scene'... but this time maxes eluded him. Far right, Angus Tennant got in several very good flights and looked a potential winner in 80 gram class but was finally pushed down to 4th place.

Results of the Coupe d'Hiver 80G Class

Position	Name	Rd.1.	Rd.2.	Rd.3.	Rd.4.	Rd.5.	Total
1	S. Philpott	74	120	70	95	101	460
2	P. Harris	73	120	82	120	60	455
	M. Chilton	120	100	90	86	58	454
4	A. Tennant	120	73	120	70	60	443
5	J. Dyer	49	112	57	101	120	439
	N. Lee	69	120	52	66	120	427
7	L. Ranson	89	59	99	120	45	412
8	P. Michel	91	82	77	47	106	403
9	A. Wells	82	64	120	60	67	393
10	I. Davitt	93	68	46	55	120	382
11	J. Bailey	54	42	112	59	120	387
12	D. Roche	99	65	67	84	57	372
13	J. Ferer	62	42	58	120	85	367
14	G. Beal	77	120	49	54	60	360
14	P. Ball	58	81	27	120	47	360
14	M. Francis	58	51	120	56	75	360
17	D. Morley	114	44	76	57	58	349
18	V. Dubery	63	65	59	88	73	348
19	G. Sharp	68	74	85	65	52	344
20	A. Ball	52	74	94	36	86	342
21	B. Peers	75	66	38	68	75	322
22	W. Colledge	58	55	80	47	63	303
23	A. Crisp	59	54	64	63	60	300
24	J.E. Carter	42	23	110	70	49	294
25	A. Screen	46	73	59	61	47	286
26	D. Tennant	74	24	98	35	53	284
27	M. Dilly	71	47	75	48	30	271
28	K. Fordham	59	48	55	62	43	267
29	D. Beales	35	76	82	29	26	248
30	A. Bealea	57	46	55	59	26	243
31	J. White	48	46	39	43	37	213
32	K. Smith	30	57	40	40	30	197
33	A. Cliff	30	30	60	30	36	186

Scores of competitors who failed to complete five rounds.

R. Chilton	287
A. Gibbs	284
K. Taylor	234
M. Dixon	209
N. Beaumont	170
D. Davitt	140
S. Dixon	126
B. Horsley	116
A. Fathers	86
R. Monks	67
B. Lavis	67
J. Walker	58
M. Brown	47
C. Shepherd	45
M. Horwich	44
J. Cooper	29

FROM THE HANDLE

Speed with Dick McGladdery

Mike Billinton (right) prepares a speed model for flight; those who have never flown speed before will have little conception of just how exciting and physically and mentally stimulating the discipline can be - Dick provides a glimpse in his column below.

There must be many readers who have never seen a speed model fly, and even those who have probably do not fully appreciate what they are like to fly and why speed fliers enjoy it. Many (full-size) aircraft magazines feature pilots' descriptions of flying sundry aircraft and it seemed a good idea to crib this theme.

As an example, a Mike Billinton model typifies a very successful formula. Mike favours Class VII for 10cc motors, which he equips with a bladder fuel system and minipipe. His models are built small and light (under 30ozs.) to exploit the thinner wire allowed by the SMAE rules and he invariably runs on a fuel of around 70% nitromethane, 10% propylene oxide and 20% oil. For optimum air setting, the ground setting has to be only slightly rich, which means there's an awful lot of power about for release and take-off; the small and light model has to be restrained in a heavy 'rat-trap' dolly to maintain adequate stability for take-off.

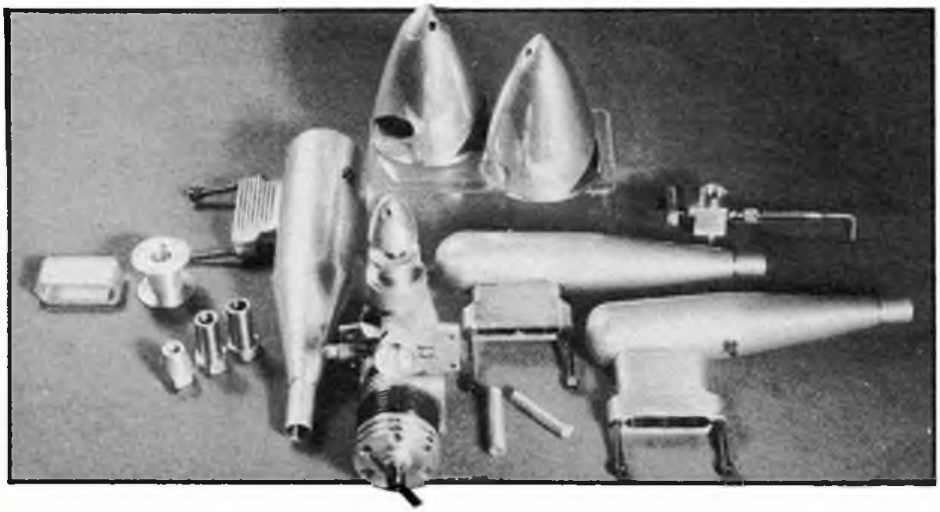
Start-up is a service usually provided by an 'ear defenders-equipped' Martin Radcliffe, who is very experienced at 'catching' the motor on the needle after fixing it up on a prime, and at finding good settings. The noise and fumes accompanying this phase are such that I expect to see Martin in a dragster-type respirator mask before long. On the fuel described, the motor is often reluctant to fire at first and requires careful warming-up. The mixture must be kept leaned out to get the temperature to build up and, as this happens, the motor effectively leans out, so the needle has to be opened gradually until fully warm. Immediately before release, the mixture must be slightly enriched by further opening of the needle, followed fairly quickly by release before the motor starts to cool down again on the rich mixture.

Down the other end of the handle, Mike stands poised ready for release. Acceleration is pretty dramatic, but because of the small model and heavy dolly, about half a lap is covered before 'unstick' - this is rapidly followed by dolly release, and this is the really hairy part of the proceedings. Full 'up' has to be held on to get airborne, but once relieved on the weight of the dolly, it's like warp drive kicking in - the model accelerates and climbs like a rocket, and must be levelled off as soon as possible. Mike is very experienced at this split-second manoeuvre and is aided by the most responsive monoline control system I've ever seen, plus a model that will square off and maintain altitudes that would be disaster for most.

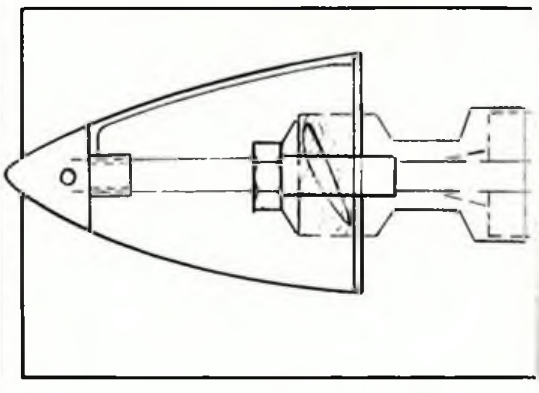
At this point, the speed is up around the 150 mark and still accelerating rapidly, so it is pulling like a train; whilst trimming the model down to below 4½ metres as required by the contest rules for a timed run, the pylon has to be located, approached and engaged. This is a very tricky operation, especially for a comparative lightweight like Mike, but he is usually settled in within 2-3 laps of release. By this time, the speed will be around 190-200 mph, and Mike has to run to keep up with the rate of rotation.

The handle is provided with a large hoop-like hook which is engaged on a central pin on the pylon, enabling it to take all the pull, in the region of 70-80 lbs. by now, and leaving Mike free to concentrate on trimming out any incipient orbits that may develop whilst running like mad to keep up with the model. It may take 2 or 3 laps before the timekeepers clock on, then the model must be kept below 4½ metres for 8 laps. Sufficient fuel will have been put in the bladder to allow for start-up and approximately 15-20 laps of flight; as the bladder empties, it has the odd characteristic of slightly increasing fuel pressure, so the end of the run is signalled by a slight richening-up some 2-3 laps from the end, whereupon the motor cuts and all that remains is to glide in for the gentlest landing possible with such a well-trimmed brick.

For the pilot, such a flight is 20-30 seconds of furious activity, demanding its own peculiar combination of skill, agility and strength. Successful completion is as exhilarating as any sport testing such



Kuentz art! A few of the top quality accessories of Armand Kuentz (left) and, below, a typical Kuentz 3 part spinner consisting of nosecone and backplate; note that extension mounts directly onto the shaft instead of prop driver.



talents, and if the pre-flight preparation work has the desired effect, there's the added bonus of improving on previous performances, and on rare occasions setting a new record as well. A '60' model doing its stuff is also exciting for spectators, and a Billinton flight can always be relied upon to impress. By way of contrast, a future article will describe flying an FAI model, something of which I have more recent experience.

Stunt with Claus Maikis

Kuentz Art

Many of the accessories we need regularly are not available from the big model manufacturers, at least not in the execution and quality we prefer. Here the so called 'garage' or 'cottage industries' come to our help. Cottage is the right description of the building where Armand Kuentz produces his excellent accessories...

Where his ancestors stored the hay, he has set up some high precision machinery. I've mentioned him quite a few times lately; Armand has helped me out of many a problem, some things wouldn't have been possible without him. On my aircraft you usually find at least one piece which was made by him. I fly his spinners, mufflers, carburettors, shaft extensions, and special items.

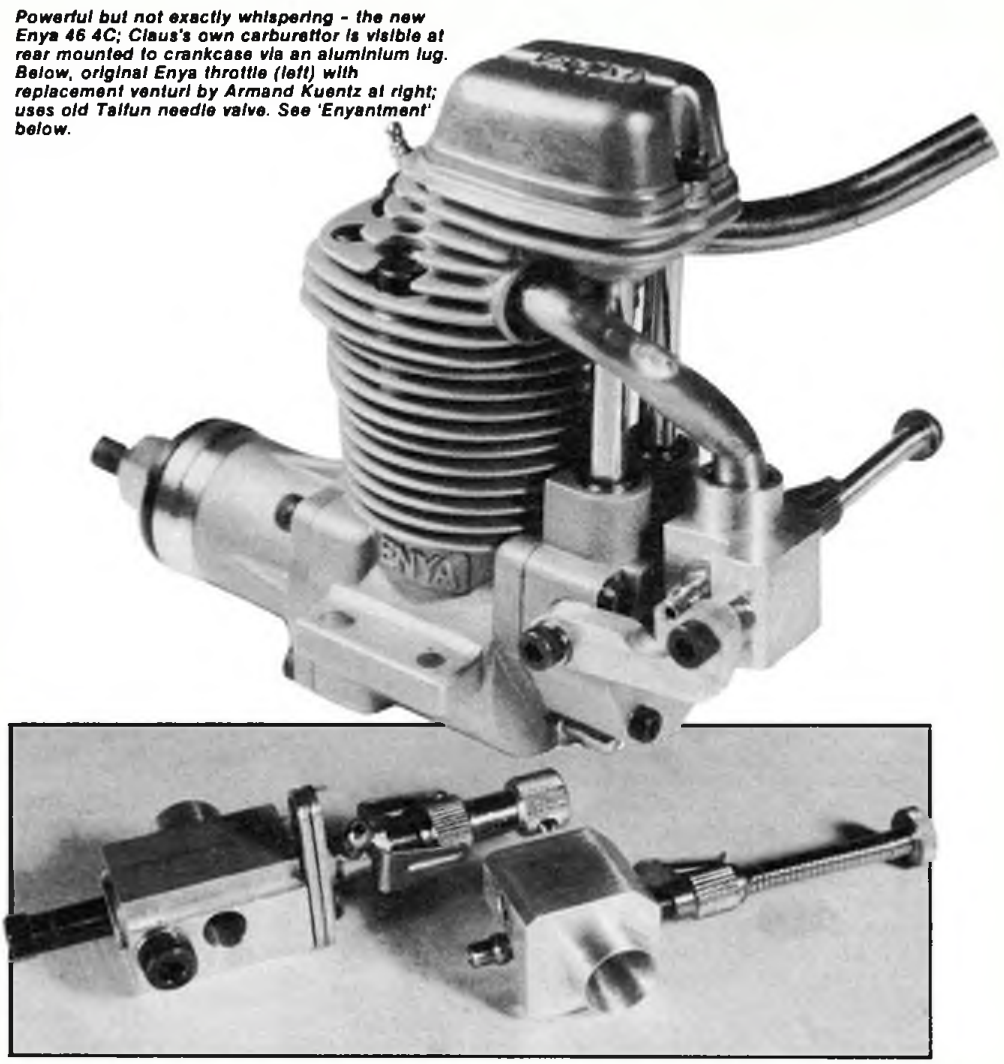
Some of the Southern German, Swiss and, of course, French, flyers use his products. Armand is the main source for fellow countryman Yves Fernandez. The quality of Armand's workmanship is beyond any doubt; when you hear that this is not his profession, but instead he's a self-taught person, you appreciate his abilities so much the more.

Recently Armand has sent me a list of items he's able to produce including shaft extensions for the most popular engines. Besides normal extensions you can get complete units which replace the prop driver, so the extension is perfectly centered. There's also a wide range of spinners from 45mm to 60mm diameter; you have the choice of round or pointed shape, with propeller blade cut out for 2,3 or 4, blade props. Cut out is the shape of the Fox spinners or the old Veco spinners; at your request Armand leaves a little more metal on the spinner or removes as much as possible. The spinners are suitable for all engines, just specify the power unit and he'll include the suitable fastening screws.

Armand's mufflers are similar to the Czechoslovakian type but again can be tailored to your wishes. There are variants of three diameters and lengths and different tail pipe diameters. Muffler adaptors can be had separately for most stunt engines. On application, you can have almost any part (if you provide exact drawings) like carburettors, needles, team races accessories, bellcranks, engine parts, etc. Armand has even turned one of my glow engines into a diesel!

The list includes prices and at first glance you might gasp for breath. But if you consider the quality, if you consider that all items are hand made and if you consider that you can get them nowhere but from Armand, then you relax - slightly. He told me that it takes him about 8 hours (depending on type) to produce a spinner and, considering that, the price is absolutely ridiculous. Now, I'd like to make one thing clear: when you order an item, you don't get it the following day. Armand does all this work in his spare time. Besides this work, Armand is a model flyer and French, too... He has several other interests and the Alsatian wines are a strong reason to take a break now and then (I know!).

Anyway if you're in need of something special write to:-
Armand Kuentz, 37 Rue d'Jllzach, F 68270 Wittenheim, France and ask for his list. His English is not very good... For detailed information, he'd prefer French or German!



Powerful but not exactly whispering - the new Enya 46 4C; Claus's own carburettor is visible at rear mounted to crankcase via an aluminium lug. Below, original Enya throttle (left) with replacement venturi by Armand Kuentz at right; uses old Taifun needle valve. See 'Enyantment' below.

Enyantment

While Gilbert Beringer has demonstrated that four stroke engines are possible in stunt, he does not have many followers. I must admit that I'm still convinced by the superiority of the two stroke engine. It's just curiosity or the desire to try something different that caused me to go four stroke. However, now the new generation of these engines seem to be more suitable for stunt flying.

For the new Enya 46 4 C a horse power figure of 0.75 is given in the catalogue and, as this compares quite favourably with the Super Tigre 46 figure, I bought an Enya. On the test stand both engines showed the same RPM figure for several props. Since the weight of the Enya (without silencer and small 410 gram tank) is only slightly heavier than the Super Tigre (with original muffler and large 400 gram tank with Czechoslovakian 340 gram muffler) I concluded that a typical Super Tigre size model should be just right. Before beginning construction though, the Enya had to suffer some modifications.

The throttle valve of the Enya has a nice feature which I intended to use: it has a built in choke which is quite helpful when starting the engine. On the other hand, the carburettor case is a clumsy block with lots of unnecessary metal. The air intake is a simple hole drilled into this block. The throttle barrel (as with most R/C carburettors) had a smaller bore than the intake which forms a rather ugly edge which, in my opinion, shouldn't be there. With an extension rod the barrel can be pulled sideways, thereby closing down the intake. Alas, I discovered that the choke doesn't work if the barrel is fixed in the open position (a necessary measure for control line use) so the throttle was discarded and a new venturi made by my friend Armand Kuentz of France.

As ever, Armand did an excellent job. He made the venturi according to my drawings and specifications and now I can instal my usual needle valve which has a very fine thread (this makes for easy needle

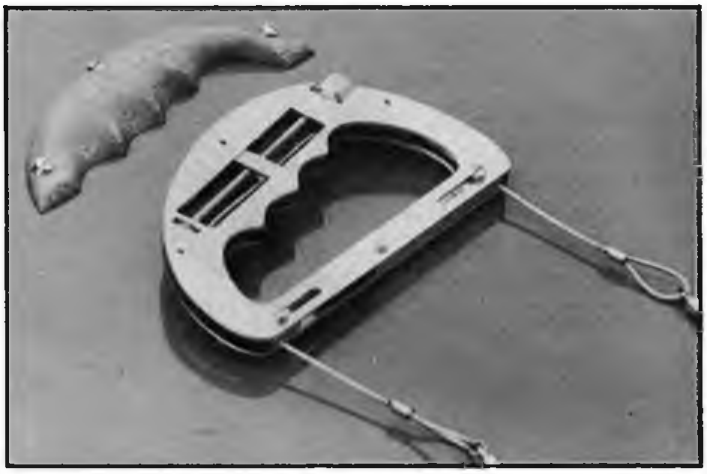
adjustments). The intake was moved farther away from the crankcase; this was necessary for installing my own choke, which is fixed to the fuselage. I had to bend the intake pipe to fit the venturi location. Last, but not least, the air intake is now a beautiful trumpet shape, as it should be. The whole venturi is fixed to the crankcase by a solid lug, not the flimsy device delivered by Enya.

I managed to keep the model weight within acceptable limits so there was no problem at all with the engine. It works convincingly and there's enough power. Alas, with the power the noise has increased; the soft purring sound of the first generation four strokes has gone - the Enya is about as loud as a Super Tigre with muffler. After one not too busy season, the Enya had considerable play at the front bearing; it has a new front housing now which is said to be stronger.

From my (not too extensive) four stroke experience I feel it's quite possible to use this engine type in stunt. The new generation engines - especially the larger capacities - are very powerful. They run with any commercial fuel, though a special four stroke fuel is to be recommended. This fuel has a lower oil content, which is fully adequate, leaves the model less oily and gives a better fuel consumption (smaller tank volume!).

The Enya is not critical on tank location and starting is almost as reliable as with two strokes but care should be taken with the tank design. On four stroke engines suction seems to be somewhat less; short 'hi-cups' in the clover leaf appear now and then, even if there's enough fuel for a full seven minutes flight.

Thinking about this, I came to the conclusion that the tank volume is the actual cause for this problem. A four stroke tank has only one half or (at most) two thirds of the capacity of the two stroke tank (for a given engine size). While the relative fuel volume (the percentage of the full fuel tank) at a certain point of the schedule - say the clover leaf - is the same in both tanks, the actual amount of fuel is much less, of course. In my case that's about 9cc compared to 16cc (that's about one tenth of the full tank - I've worked this out by comparing the time of the clover leaf with the time of engine stop). So with a smaller amount of fuel the feed pipe can be uncovered more easily. Maybe this is the reason for the 'hic-cup'; the obvious solution is a very flat tank.



German Lutz Hetges' beautifully engineered control line handle; line spacing adjustments are easily made via the long threaded rod and knurled knob, visible here beneath the shaped wooden grip.

Slow running characteristics of the Enya are not quite as smooth as I'd like; it seems that, during development of the higher power output, the slow running capabilities have been lost. It's not advisable to use a large propeller (which the engine undoubtedly can handle) at the low rpm figures we usually set for our engines; a smaller diameter prop with a wide blade, or a three blade prop might help. Maybe even a smaller air intake should be considered.

There's still not much four stroke knowledge; how about exchanging experience and ideas? I'd like to hear from you...

Too precious to handle

Lutz Hetges of Southern Germany is one of those slow, circumspect characters. It usually takes him a little longer to do something. But when he's done it, it's always thoroughly thought out and well set up. When he showed me his latest creation, I fully understood that he didn't have the time left to build another model. With my limited English vocabulary, I feel unable to define this item. The word 'handle' is just too crude. I leave it to you to find a name for this jewel.

Lutz was inspired by an article in a German control line newspaper in which I presented my ideas on how a control line handle for stunt should be. He added his own ideas and this is the outcome!

I'm not going to give step-by-step building instructions for everybody - a handle like this should be reserved for aerobatic pilots only. Between two aluminium frames there's a centre piece made from Pertinax, a brown plastic material which includes fabric layers. A long threaded rod is mounted so that it can rotate with the knurled knob but not moved. A small runner with a threaded hole sits on the rod, but it cannot rotate. When you turn the knob, the runner moves up and down. It has a small hole through which the leadout cable is fixed (soldered) and there's a groove in the plastic centre piece to guide the cable. The cable is further guided by two small aluminium blocks which slide in the front part of the handle.

Claus calls this handle a 'jewel' and it's not hard to see why; based on some of his own ideas for the ideal stunt handle.

This way, the line spacing can easily be changed, each line can be fixed separately (which is necessary if you have problems with an unevenly turning model - more corner in one direction). Lastly, two carefully shaped wooden halves give a very comfortable grip. These can be shaped to the individual hand size.

So much for the technical description; I feel the aesthetic approach shouldn't be forgotten. The two aluminium frames can be gilded. The wooden halves should be made of South African walnut with artistic carving, or inlaid work with Phillipine rosewood. This should be given a final coat of UV resistant varnish.

I'd like to mention that such a jewel should only be presented on a white cloth...

SHOP TALK

NEW MODEL HOBBY PRODUCTS REVIEWED

Two of a kind
Bristol F2B Fighter by Chas. Bowyer, Ian Allan Ltd. hardbound, 128 pages, fully illustrated, £10.95. and Vintage Warbirds No. 4 - The Bristol Fighter by J.M. Bruce, softback, 64 pages £4.95.

Quite why it should be the case, would be most difficult to define, but the certain charm which surrounds the Bristol F2B since it was first designed by Captain Frank Barnwell, has been the subject of glowing attention from all aviation enthusiasts. It is thanks to the Richard Shuttleworth Collection at Old Warden that we can see the *Brisfit* airborne so frequently each year. Both the RAF Museum and the IWM have other examples, recently restored. And it is because this reviewer was once most fortunate to take a ride in the rear cockpit of the Shuttleworth machine at one of their air displays, that I can express the special affection which always emerges when the Bristol Fighter is discussed. Yet, as is quoted in Chas Bowyer's book, "flying can be absolute *agony*" in those open cockpits, particularly for the rear gunner.

It's a surprising experience when the big motor first rumbles and that huge chopper of a propeller begins to bite the air for take off. The passenger is pre-warned not to stand up, for, to do so, is to completely wreck rudder effectiveness! There's a small seat for squatting as the forward coaming and the pilot's head serve to shield the slipstream. The Brisfit floats on air, obviously light on the controls and a delightfully stable platform. But once airborne the temptation to stand is too great and the experience of looking forward *over* the top wing, facing that slipstream, unbelievable. No wonder Arch Whitehouse's quotation is respected by all who have flown in that rear cockpit - the airflow from that huge propeller imbeds goggles into cheek bones, tears scarves from the neck, makes turning around hazardous for fear that all will be lost the moment the wind pressure is gone and turns to suction as the passenger faces back. Even with the tightest of helmets, the draught gets everywhere. Those gunners of 1918 who went above 20,000 feet were real heroes, how they swung the rear gun in a classic back-to-back operation I shall never know, but, in time, anyone can get used to such hardship, compensated by the sheer pleasure of being airborne in such a delightfully manoeuvrable aircraft. It's a little like being caught standing up in a hammock by a sudden tornado.

In Chas. Bowyer's book we get the full story, reminiscences and factual accounts of the *Brisfit* in war and peace. Countless photographs will inspire the modeller. There's a full range of colour schemes, weird markings and civil registrations. The modeller can have it with stripes, chequer boards or fish scales. Drawings to small scale but finely detailed from Colin Huston's drafting pen and technical data make this, the more expensive of the two titles, but a perfect 2nd complete documentation reference for all model makers.

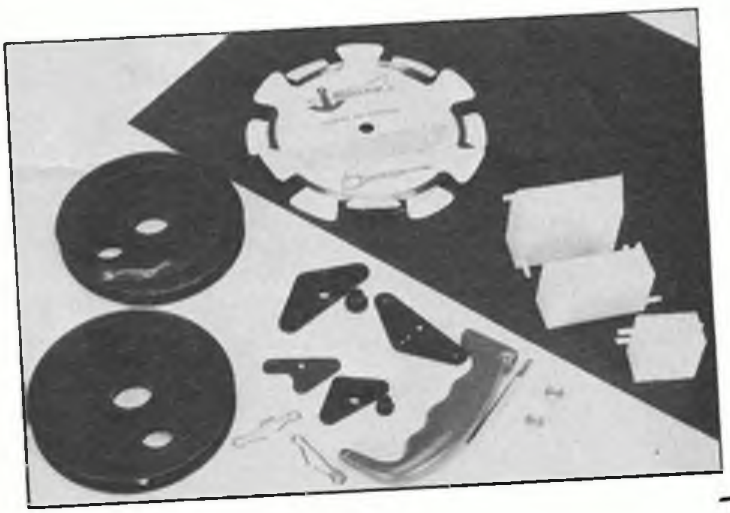
The slimmer Vintage Warbirds title follows the pattern of being a selected picture book with a summary in the introduction and extended captions. There were 135 photos selected by Jack Bruce, doyen of all World War I aero-historians and among the photos just a few which overlap the hardbound title. Reproduction on a coated paper is a trifle better and some of the close-up detail perhaps more useful. But our choice would be to have *both*.

They are each a classic capsulation of tribute to a great machine which will always be popular with aeromodellers.

Modelhob from Micro Mold

Micro Mold of Station Road, East Preston, Littlehampton, West Sussex BV16 3AG (Tel: 0903 773170) are importers of the extensive Modelhob range of control line accessories from Spain and, until recently, we hadn't realised just how comprehensive a range it is. They have everything from bellcranks to handles and tanks at surprisingly attractive prices (15p for a small poxolin bellcrank can't be bad!) and a comfortable basic control line handle at only £1.60. Other prices reflect equally good value for money. Among the attractions are: glass filled nylon bellcranks at 25p (small) and 30p (large); C/L connectors at 45p per pair; 32 metres of lightweight wire at £1.38; 36 metres of stranded steel cable at £3.50 (complete with reel) - or the reel itself at 55p; 10cc '½A' and 20cc 'A' rectangular tanks at 60p and 64p respectively; and a 50cc 'B' Wedge at only 88p. As we said, really excellent value for money.

Spanish Modelhob bits and pieces from Micro Mold; prices are extremely attractive and the range a large one comprising most control line accessories.



ALBATROS Cont'd from p. 155

tendency for the model to dive. This also proved the general strength of the model and in particular the nose pod. A weakness found almost immediately was that the rear wing retaining collar wedge came out on impact. This wedge was eventually lost in the grass and replaced with a piece of hardwood, which was glued to the fuselage.

Although there still remained a 'dip' in one wing centre panel, it did not seem to have much effect on the glide pattern. After curing the dive by packing up the tailplane trailing edge, all seemed in order to try some tow launches. Letting out about 50ft of line and towing into the light wind, the model went up very easily, but before getting to full height, pulled off the hook and dived straight in...disaster! But no...examination showed only a slight stress tear in the wing tissue. After a number of abortive tows, one ending quite spectacularly with the model burying its nose vertically in the ground, some re-trim thinking had to be done.

Even when the model was launched well off the line, its flight path always terminated in a dive. As the model was standing up remarkably well to the knocks it was taking, I decided to experiment with a few changes. The wing was moved back about ¾in thus moving the balance point. Rather than re-pack the tailplane, I decided to bend the boom upwards. This is quite easy to do and may or may not be a good thing. But it seemed to have the desired effect. The boom was further 'tweaked' until a flat hand launch glide was achieved. Further towed launches showed that the model was now behaving properly, although flight durations were not overlong. The model was sensitive to any changes in rudder trim, but with a little coaxing could be steered satisfactorily on the line.

Conclusions

As it must be taken that the kit sample I received is typical, the grade and quality of the wood supplied has to be noted as being heavier than I would have chosen; on the other hand, beginners often find the harder grades of wood easier to work with.

Generally the model goes together will, but as pointed out would benefit from the small modifications mentioned, to assist assembly.

Performance is not of the 'floating' quality found on a competition glider, but very much in this model's favour, is its ability to suffer a great deal of 'abuse' and still live to fly again, which many models aimed at the beginner do not.

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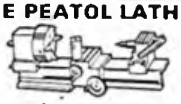

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FF Power Open Slow
No available free plan found
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FF CO2 Scale
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Tipsy Junior (CL 321,322,323) by H.G. Hundleby
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