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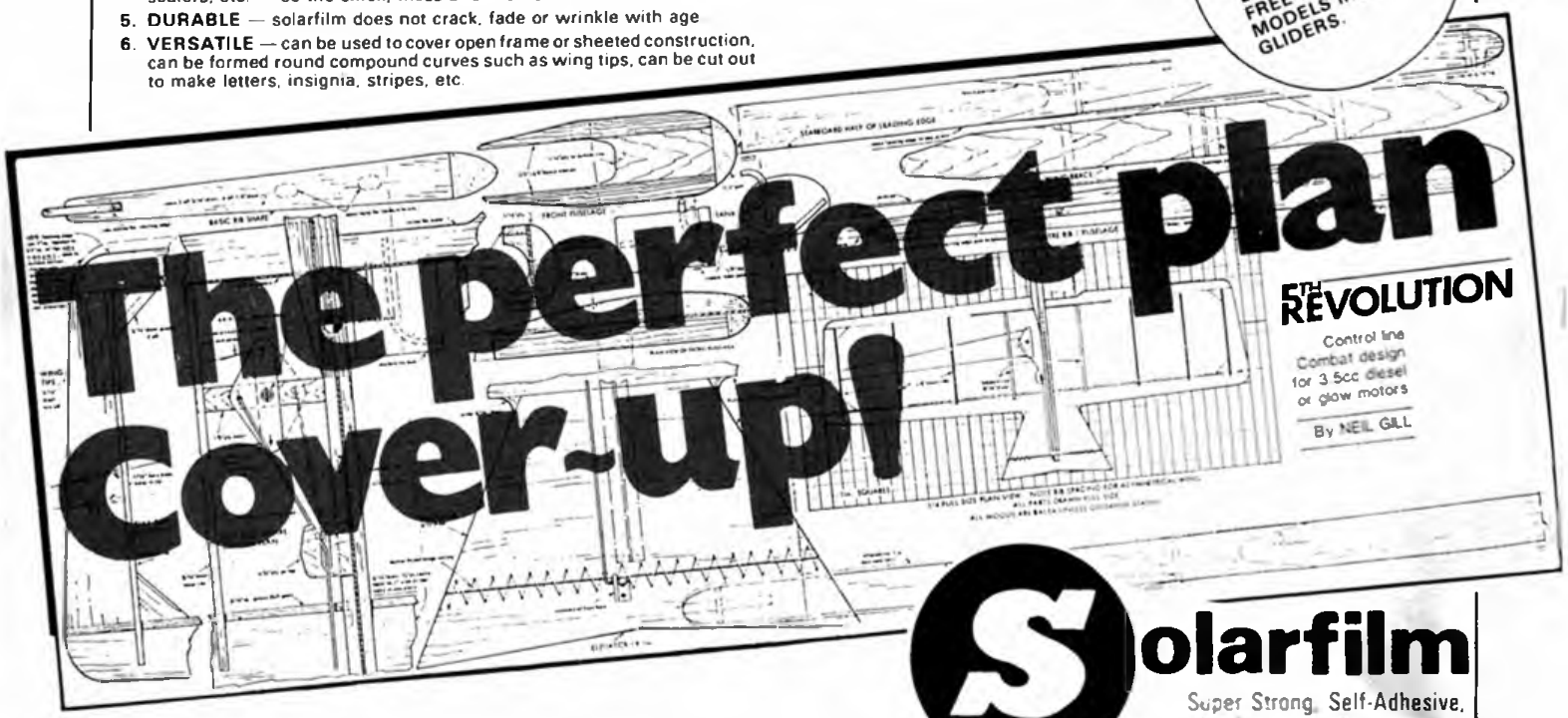

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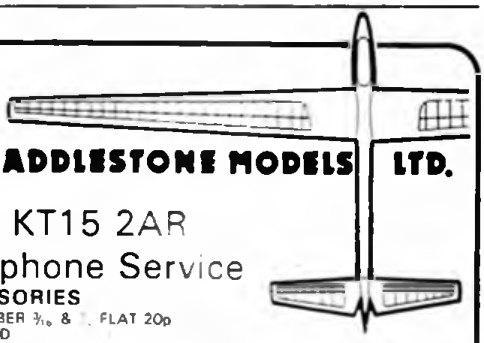

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AERO MODELLER

FEBRUARY 1984

Cover

Just to remind you what sunny summer days are like. Our cover shot this month will bring back a few memories from the past. John Kemp is holding a Club Conquest powered by a *Hurleman* 48 and Tony Penhall has control (?) of a rather fine Sky Cat powered by an original *Brown* Junior. Inset another oldie — not Jean-Marie Piedrais but the model. Flown at the Winter Cup in December this 1950's design 'Ailbas' by Rene Jo[illegible] must surely classify as a veteran Coupe d'Hiver model.

Photos by Ron Moulton

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There are always many happy faces at the SMAE's annual prizegiving. We have here just a few of this year's trophy and cup winners. The presentations were made by Mrs. Marion Jones, wife of the previous past Chairman of the Society, John Jones. Above left: John Cooper, who won the KMAA Trophy and the Ronytube Cup (both for free flight gliders). Above right: Anthony Ball holding the Junior Kit Free Flight Rubber Trophy. Below left: Stafford Screen collecting a selection of trophies/cups for his wins in free flight power - Astral Trophy, White Cup and the Eddie Cosh Memorial Trophy. Below right: Bill Draper almost in possession of the Gold Trophy for control line aerobatics.

Fun Flyers Benefit as SMAE slashes fees and includes insurance

At a very well attended Annual General Meeting of the Society of Model Aeronautical Engineers at Leicester on November 26th there was vigorous discussion of the membership structure and finance by the 142 members, club delegates and Fellows present. As a result the basic full membership fee has been more than halved to £5.00, the same as Associates will pay. Not only is the fee reduced but now includes insurance as well! Another change is that at last an SMAE-affiliated club will be what is implied in that title; from now on club secretaries will supply a signed list of all their club members and their clubs will only be accepted for affiliation if *all* their members pay the new low-cost SMAE fee.

These 100% SMAE clubs will enjoy special privileges. In future the SMAE's friendly expertise and help with flying sites (over 300 such cases have now been handled by site liaison officer Ray Favre), government negotiations, noise, heavy models, radio frequencies, safety, technical advice, air space preservation and other matters will be available *only* to SMAE-affiliated clubs, to make sure your club is not left out in the cold.

The people to really benefit from this bold change will, of course, be the fun-flyers who are not especially contest-minded, and who have been reluctant to become SMAE Full members at the previous £12 fee. Now their voice can be heard and their numbers can help to make their Society an even more powerful and effective voice for British model flying. As Full SMAE members they are covered by the Society's Ministry of Defence £1,000,000 airfield insurance policy too.

The model flyer who gets his fun from competitions will be able to up-rate his basic membership by having a competition licence at a £10 additional charge; this entitles a holder to enter SMAE contests at the normal fee, or to purchase the popular contest season ticket, which reduces the cost per event for people taking part in several of the Society's wide range of events for all types of model. Contest running costs will be covered by the competition licence revenue plus the contest entry fees. Juniors (under 18yrs) will get their competition licence *free*.

For several years it has been possible for large clubs to enjoy the benefits of SMAE affiliation with only five of their members actually paying towards the work of the Society that carries maybe 50 of their non-SMAE club-mates; now clubs will enjoy the status that *real* SMAE affiliation means.

A stamped addressed envelope to Membership, SMAE, Kimberley House, Vaughan Way, Leicester, will bring you an application form and full details. Better still, make sure your club secretary includes *you* when he affiliates the club en bloc.

Primrose Valley Hobby Holiday

MAP publishers of Aeromodeller, have been organising special interest Hobby Holidays for seven years now and have built up a great deal of experience in providing the style of activity that modellers and modelling families enjoy. Essentially these holidays, based on the Primrose Valley Holiday Estate, on the Yorkshire coast near Filey, are geared to providing facilities for all types of modelling activity, R/C Cars, Boats and Planes, Model Engineering, Free Flight and Control Line aircraft and Wargaming plus lectures, demonstrations, films, a massive exhibition, trade stands and a swap shop.

Families are not forgotten, an extensive range of Ladies' craft groups and talks are included in the programme with practical instruction and materials available on site. Junior modellers can take part in *DPR Models* 'Chuckie' events and receive instruction on miniature figure painting. Of course, all the usual facilities in the way of entertainment are available on site plus the lure of the N. Yorks Moors railway and the tourist attraction of the nearby medieval city of York. We haven't heard of any modellers or their families leaving dissatisfied yet, so why don't you consider the week of May 4 to 11 for a little bit of self-indulgence? Write to or telephone Freepost *Leisure Holidays*, 25 Stephyns Chambers Bank Court, Hemel Hempstead Tel: 0442 51224 for full details of accommodation and prices.

Below left: Messrs Croome and Ball collecting the Farrow Shield (team open rubber) on behalf of Grantham club. Below: a delighted B. Martin receiving one of the SMAE's more handsome trophies - the Gutteridge, which is for free flight rubber powered models to Wakefield specifications.

Two attractive models from the People's Republic of China. On the left an interesting twin engined rubber powered sports model. 660mm span constructed in plastic foam by Sun Yihou. On the right the designer's number one test pilot - daughter Sun Jin.

International Aeromodelling

Each year around the beginning of December, there is a large meeting/conference held in Paris that reviews the World's aeromodelling. Its principle reasons for bringing together a large number of delegates from all over the world are to discuss the state of the present international rules and also the details of past and future World Championships.

The Fédération Aeronautique Internationale (FAI) is the body that controls, directs and records international aero-space records and events. From the records of circling astronauts right through to how indoor models should be flown at the next World Champs. The December meeting is wholly concerned with aeromodelling and several British representatives travel to Paris to monitor and support items that affect *you* the British aeromodeller. Although of primary interest to the competition flyer, decisions taken at this time will often effect aeromodelling in general.

Due to possible problems in thoroughly publicising changes to rules throughout the world, there is now a four year delay put on rule changes that effect model specifications and rules that determine how an event is judged. If a special case can be made concerning safety or clarification then it is possible to have a change made more rapidly. At this meeting the agenda consisted of some 37 pages representing proposed changes to nearly all categories of models together with some internal operational procedures and of course, offers to run future World Championships.

Briefly those changes that are of immediate interest are as follows:

Free-Flight Glider The competitor may release the launching cable with a lightweight marker (such as a ring, pennant or small rubber ball) at its end.

Control Line, Team Racing tank size will be 7cc (this had previously been changed to 5cc but it was felt that this introduced a considerable safety risk and although no major competition had been run using the smaller tanks, the tank size should revert to the old size *immediately*). Also on the grounds of safety **Combat** models must now have a wire of minimum diameter 0.5mm *visibly and safely* attached between the bellcrank bolt and the engine(s) *or* withstand a minimum pull of 100N. (No indication was given as to how this pull of 100N was to be administered, so combat flyers would be well advised to adhere to the first part of this rule!)

World Championships1984

Control Line	Sept 17-22	Massachusetts USA	F2A, F2B, F2C, F2D
Indoor	Oct 13-18	Nagoya, Japan	F1D
Scale	July 2-8	Le Bourget, France	F4B, F4C

Radio Control — Aerobatics now have a clarification of what is a 'standard runway' 1. a circle of 50 metres radius *or* 2. lines across the runway spaced 100 metres apart — the runway to be at least 10 metres wide.

Radio Control — Pylon, is now upgraded to World Championship Status and had a couple of clarifications to measurement of wheels with spats and canopy measurement.

Radio Control — Thermal Soarers, no exciting changes this year but several clarifications that cover safety concerning positioning of winches, towlines, etc.

Radio Control — Helicopters, is now upgraded to World Championship Status.

Radio Control — Soaring Cross Country now has an accepted set of provisional rules.

Scale had several proposals passed but nothing that would be effective immediately.

Space Models also had several new rules but again held over until 1988.

The meeting closed with the election of officials to fill the posts for the executive bureau and the various sub-committee Chairmen. Great Britain has for some time had several names amongst these posts and is well respected for its organisational abilities. So if you have anything to say regarding any international aeromodelling matters, *Aermodeller* will be happy to pass on your letters:

FAI-CIAM officials (CIAM is the FAI committee for aeromodelling) from the UK are:

P. D. Freebrey, 2nd Vice-President CIAM.

D. Day, Radio Control Pylon Sub-Committee Chairman.

I. Kaynes, Free Flight Sub-Committee Chairman

D. Thumpston, Scale Sub-Committee Chairman.

What's On .

February 12	**LOW CEILING INDOOR CONTEST — E2B, HLG, PND, SCALE** Starts 11am. Venue Wigan Technical College. Contact Dave Yates, Tel 0942 214725. Special Rules procedures etc John O'Donnell 061 427-3711
February 18, 19	**NORTH WEST RADIO CONTROL MODEL EXHIBITION** Venue Queen's Hall, Victoria Road Widnes, Cheshire. Contact F. G. Aitcheson, 41 Hedge Hey, Runcorn, Cheshire
February 19	**SMAE WINTER OPEN MEETING OG, OR, OP, SLOW OP, VINTAGE** Venue North Luffenham. Contact M. Woodhouse Tel 0603 57754
February 26	**GRANTHAM GRAND PRIX, OG, OR, OP, COMBINED FAI, HLG** Venue Barkston. Contact P. Ball, 17 Hernswood Drive, Spondon, Derby
March 4	**LOW CEILING INDOOR CONTEST, E2B, HLG, PEANUT DURATION SCALE** Starts noon. Venue Colne Valley Leisure Centre, Slaithwaite, near Huddersfield. Contact Bernard Hunt Tel 0484 862353. Special Rules procedures etc John O'Donnell, 061 427-37[illegible]
March 11	**SMAE 1st AREA MEETING — F1F, F1A, (KMAA - Plugge), O.P (Frog Senior), O.R** Venue Local area venues. Contact Area Comp Secs OR SMAF 0533 58500
March 25	**F3B LEAGUE EVENT** Venue Church Fenton. Contact Mike Proctor, 8 Church Rise, Holtby, Yorkshire Tel 0904 489386
March 25	**SMAE — 2ND AREA MEETING** F1C (Halifax - Plugge, O R (Gamage), O G Venue local area venues. Contact Area Comp Secs or SMAE 0533 58500
April 1	**1st ROUND CLASS 'A' BRITISH DIESEL COMBAT CHAMPIONSHIPS** Venue The Embankment, Peterborough. Contact B. Waterland Tel 0778 343722
April 1	**SMAE INDOOR SCALE NATIONAL CHAMPIONSHIPS** Venue Alumwell Centre, Primley Avenue, Walsall, Staffordshire 9am-5pm - Peanut, Open Rubber, CO, Pre-entry in all classes by March 1. Registration fee £1.50 per event. £2.00, spectators £1.00. Details and entry forms from Doug Sheppard, 13 Luckington Road, Monks Park, Bristol, Avon. Telephone Bristol (0272) 697895
April 7	**'AERO JUMBLE'** Venue Fleet Air Arm Museum. Contact F. R. Veal, Publicity Consultant, Fleet Air Arm Museum, Yeovilton, Somerset. Tel Ilchester (0935) 840868 direct line
April 7-8	**READING MODEL EXHIBITION** Venue The Hexagon, Reading. Contact A. B. Milne, Esq. (Exhibition Manager), 39 Springhill Road, Goring on Thames, Reading. Telephone Goring on Thames 872949 (Solely models there are no trade

A BEGINNERS GUIDE TO FREE FLIGHT SCALE

BY BILL DENNIS

PART 2

I HAVE DECIDED to deal with wings and tails first as it makes for a more logical sequence. For example, on a biplane you will need the completed wing structure in order to accurately set up the cabane so that the wings have equal incidence.

Almost invariably with a F/F scale model we are dealing with a fabric covered structure, with at most a sheeted leading edge, and the type of structure we employ is largely dependent on the thickness of the wing section. It is essential that we do not deviate too much from the scale section since an over-thick wing will destroy the realism of the model. Let's start at the wing root and move outwards.

Wing fixings

The best, most reliable and durable way of attaching the wings on a scale model is by wire dowels located in brass tubes. This method can be used on any type, from thin winged biplanes to cantilever monoplanes. Briefly, the piano wire is bent to the correct dihedral angle and fits in a length of brass tube which is epoxied to the centre section spar, or fuselage cross-member. The wire is thus free to rotate in its tube and so imparts a degree of flexibility in this vital area. With the centre section flat on the board, the wing panels are propped up to the required angle and the corresponding tubes epoxied to the wing spars through slightly oversize holes. In this way, both wing panels are guaranteed to be at the same angle of incidence.

I use 12 swg wire for models over 40in. span, 14 swg for smaller models and let the dowels penetrate about 1½in. into the wing. Incidentally I used the same method, with 18 swg wire, on my first serious rubber scale model — a *DH* 'Moth' — and this is how it was able to survive my inept rubber trimming techniques, including flying it through a fence and into some Dartmoor boulders!

The only other type of wing fixing I would use is the tongue and box method, mainly on low wing models. These have fairly thick sections and can be built very lightly and strongly from balsa alone. Light weight helps in trimming such types, whose performance can be unpredictable. This kind of structure is less suited to the wire dowel technique. It is better if the wings are able to knock off altogether, since there are no struts or wires to cause damage and re-assembly should be a quick job. Make sure that the tongue is radiused on its LE and TE so that the wing can knock off either way (see Fig. 1). Also, bind the box well with silk or nylon so that it does not split if the landing shock comes from an unorthodox direction!

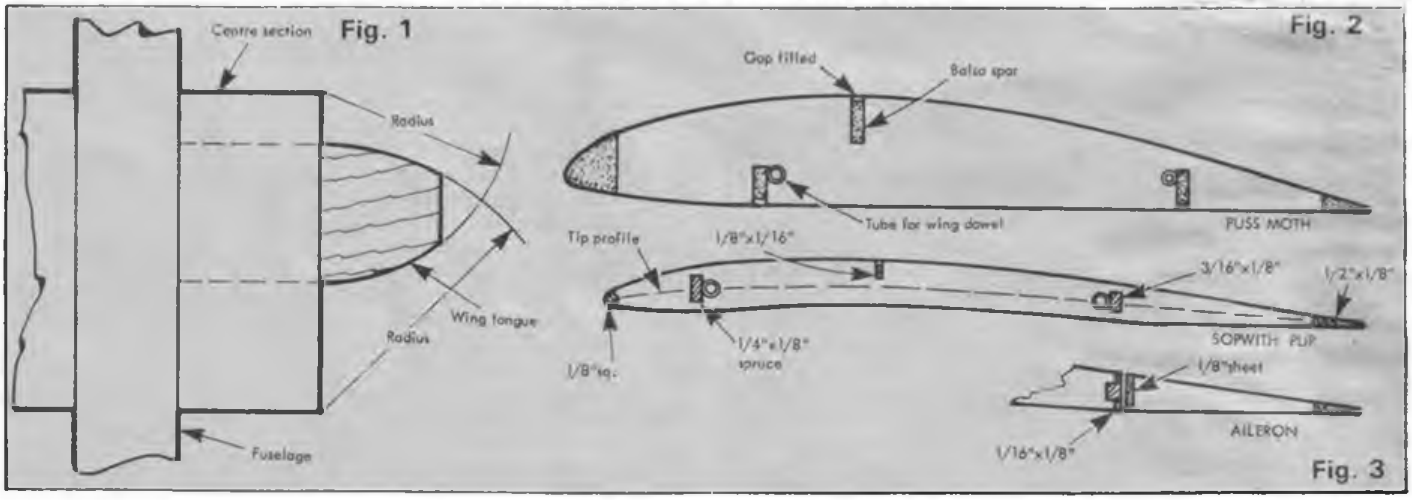
Turning to the wing structure of the *Sopwith* 'Pup,' there are no special problems here but the very wide centre section means there is a lot of wire and tube needed to cross it. As brass tube is quite expensive and heavy, I used two pieces 1½in. long at each end. While on the subject of wing roots, a recurring problem is that of the root rib pulling in after covering to give an unsightly gap. In the past I have resorted to ⅛in. ply sandwiched with ⅛in. balsa but still it pulled in. On the *DH*34 I used ⅛in. balsa faced with 1/32in. ply and filled in the space between this and the next rib with 1/32in. sheet, the grain spanwise and set in ⅛in. below the surface so that it did not foul the covering. This seems to have done the trick.

Wing structure

It is vital that the spars are buried below the surface of the covering since the sight of a spar running across the wing at the point of maximum camber looks terrible. High wing monoplanes, such as the 'Puss Moth,' usually have a thick section and here the use of balsa for spars is acceptable since they can be placed wide apart, above and below the horizontal axis, where they can exert great strength. Such a wing will be quite stiff but the wing fixing described above will give the flexibility needed in a prang. Fig. 2 shows the section from the late Fred Longbon's 'Puss Moth,' modified slightly to hide the spars. All that is needed is to increase the slot depth by 1/16in. and fill in the resulting gaps with little cubes of 1/16in. square. The actual positions of the spars are almost always determined by the requirement to pick up on struts.

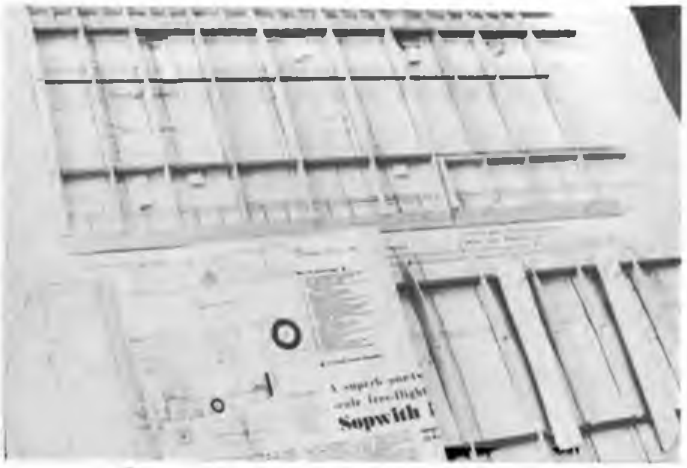
When we come to the thinner wings found on early aircraft we are no longer able to place spars above each other for strength and in this case we have to turn to spruce to provide that strength, relying on its springy nature to flex under load and not snap as balsa would.

Above: John Coker's single-bay Spartan Arrow uses piano wire rigging. Note the neatness of the detailing. Right: transport and assembly are made easier if rigging wires terminate at the wing roots, allowing the wings to be removed as a cell. Note wire dowel wing fixing.



The first job will be to produce a scale wing section, as flattened Clark Y's are frequently employed in *APS* plans. An acceptable compromise is to put in some undercamber between the front and rear spars. While this may not be true scale, having a flat section aft of the rear spar obviates the need to pack up the TE and aileron spar and so makes assembly easier.

Spar sizes can almost be standardised for a braced wing. For models over 40in. span the spruce spars are normally 1/4in. × 1/8in. and 3/16in. × 1/8in., with about 1/16in. of rib above and below. Smaller models should go down to 1/4in. × 1/32in. for reasons of weight but these sizes would have to be cut to order. A typical section as used on the 'Pup' is shown in Fig. 3. Note the 1/8in. × 1/16in. spruce spar let into the top surface, which is put in to prevent elliptical warping after covering — it seems to work, so is well worth incorporating.



Right: the Sopwith Pup APS Plan FSP 305 only has starboard wing panels shown. When building the opposite hand you will have to correct the rib and spar positions as shown here. (If you are building from an APS plan you can always get a photocopy of the original article from Aeromodeller for the princely sum of £1.00. Ed.). Below: sandwich method of producing wing ribs, note use of square 'needle' file. Centre: the original DH34 rudder, built with 3/32in.sq. outlines looked too thick, so it was replaced with another with a wider but thinner sheet outline to the 1/32in. core.

Modifying the Sopwith 'Pup'

The article in August 'Aeromodeller' on drawing plans for scale models gave details on how to check a plan for its accuracy. On the 'Pup,' the wing chord and span are OK, but the tip shape is a little too angular. Unfortunately there is no attempt to produce a scale structure and there are no separate control surfaces. The structure is also flimsy in the extreme and I wonder if in fact the original design started life as a rubber model. The wing section is quite good but the use of two balsa spars on the lower surface only, plus a 1/4in. × 1/16in. TE virtually guarantees warps.

Having drawn in the correct rib positions, using red ballpoint, the first constructional step is to produce the ribs. On the 'Pup' I used 1/16in. ribs as they are fairly widely spaced but where they are closer than 1½in. I go down to 1/32in., even on large models.

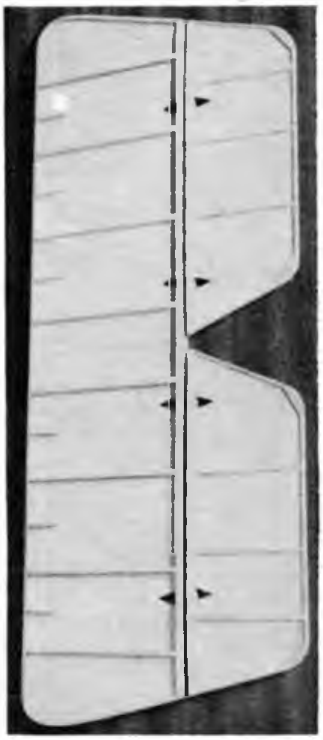
Scale models always have lots of ribs and the best way of producing them is by the well known sandwich method. If you are still laboriously cutting each rib around a template then I urge you to try the sandwich technique. A number of rectangular blanks are held between two identical template ribs, cut from thin aluminium or 1/16in. ply, with all the spar holes cut out. Secure with pins and do not exceed a total thickness of about 2in. at one go, otherwise the whole can distort and lead to inaccuracy. Using a *Stanley* knife and sanding blocks, the sandwich is reduced to the correct section, checking with a straight edge that there is no 'dome' between the templates. The surface slots for the LE and subsidiary spar are cut with a razor saw and the spar holes drilled through and finished with a 1/8in. square file. It is essential that the spar passes easily through the hole since a force fit will cause stresses that will appear later as warps. The same thing goes for all the joints in your model.

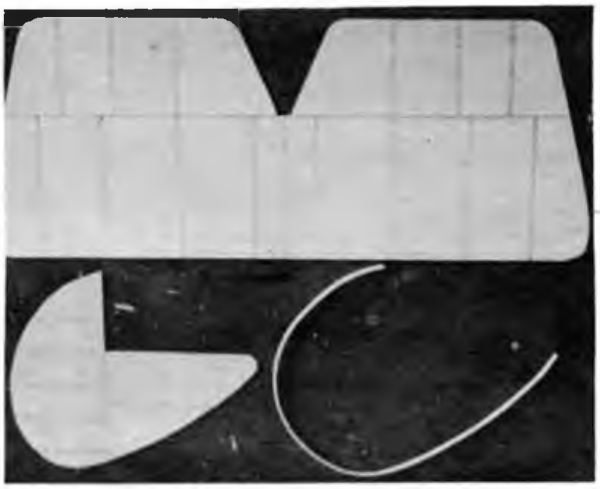
Below left: aeroplanes without a centre-section are rare, but in this case the wing dowels have to be bent integral with the cabane struts. Model is an AW FK8. Below right: the DH34 uses shirring elastic rigging, which allows a small and neat fitting around the struts to be used. The drawback is that the elastic needs periodic replacement.

The next step is to slot the TE sections for the wing and aileron panels and pin them down. I always use a wide section TE of 1/4in. × 1/8in. stiff balsa in order to allow a thin edge without warping. If care is taken with the follow-through of the rib profile the inside edge will be almost invisible through the covering.

Prepare the spars from straight wood and lightly round the edges to make assembly easier. I also drill a fine hole through for the strut hook, about half an inch from where the strut attaches. This may seem structurally weak but I've never had a wing fail here. The alternative is to bend a clip shape into the hook, to go over the spar. The ribs are now threaded onto the spars and arranged in their respective positions over the plan. Note that the ribs at the aileron break have to be cut. Divide them halfway through the rear spar hole so that there is some wood left above and below the spar to locate the rib vertically.

Since a wing like this is built largely 'up in





Far left: the completed tail structures. Note the cutouts for the stiff aluminium hinges. Left: make oversize holes for wing dowel tubes, and epoxy in place with panel propped up to 3°. Below: the first stages in making the tail surfaces are to mark out the sheet cores, and pre-curve the 3/32in. square strip outlines for each side.

the air,' accurate packing under the spars is essential. Also, it is possible for the whole structure to deviate chordwise between the aileron break and the tip, since the ribs here do not locate in the TE, hence do not fix the chord. You can check this visually by peering down vertically over the spars to see that they line up with the plan evenly along their length. It is so much easier on a sport model where you can nail the spar down onto the plan! The message is to take more care than usual to ensure everything is lined up accurately. Place a heavy block at the root-rib station so that the spars can butt up against it and so be located span-wise. Then apply PVA to the ribs and push them into the TE slots. The structure can now be pinned down using long balsa strips across both spars, then juggle the ribs around until they are square and vertical. When satisfied, apply glue to each spar joint using a syringe, or a pin. The LE is now added. This is usually from ¼in. square balsa, although you can go down to ⅛in. square on a small model with close rib spacing, or many riblets. Hold it against the ribs with a length of ⅛in. sheet rather than pins, otherwise a wavy edge may result.

The subsidiary spar can now be put in and the gaps filled, plus gussets, riblets, etc. The ailerons are built with the wing for accuracy. Start by holding the ⅛in. sheet spar against the rear mainspar with pins and then add the remainders of the shortened ribs — cut ⅛in. shorter from the wide end of course. The rear spar has to be built up with 1/16in. wide strips in the region of the aileron for the covering to attach to.

At this point the wing is lifted and gluing completed, prior to building in the tips. The tips always take a battering and the open structure often found on plans cannot withstand end-on impacts without being made intolerably hefty. The method in common use is the sheet insert, whereby the full tip shape is cut from hard quarter grain 1/16in. sheet balsa, with the grain spanwise. Use that piece of oak-like wood you bought in desperation from the model shop because it was all they had! Extend it inboard sufficiently that it makes contact with both the LE and TE. On *DH* types this can mean that it traverses two ribs at least.

Before gluing in place, with balsa cement, study photographs of the aircraft to make sure that you get the camber right. Many models have been ruined by the use of flat wingtips but by the same token don't go overboard.

The commonest way of making the edge of the wingtips is to cement pre-shaped strips of ⅛in.sq. balsa above and below the 1/16in. sheet core. The strip is formed by compressing it with a thumbnail every ¼in. or so, so that it adopts a curve. With a cambered tip, of course, two way curvature is necessary. Not all stripwood is amenable to this treatment, so persevere until you find the right piece; although don't try it in the model shop. A medium grade seems best.

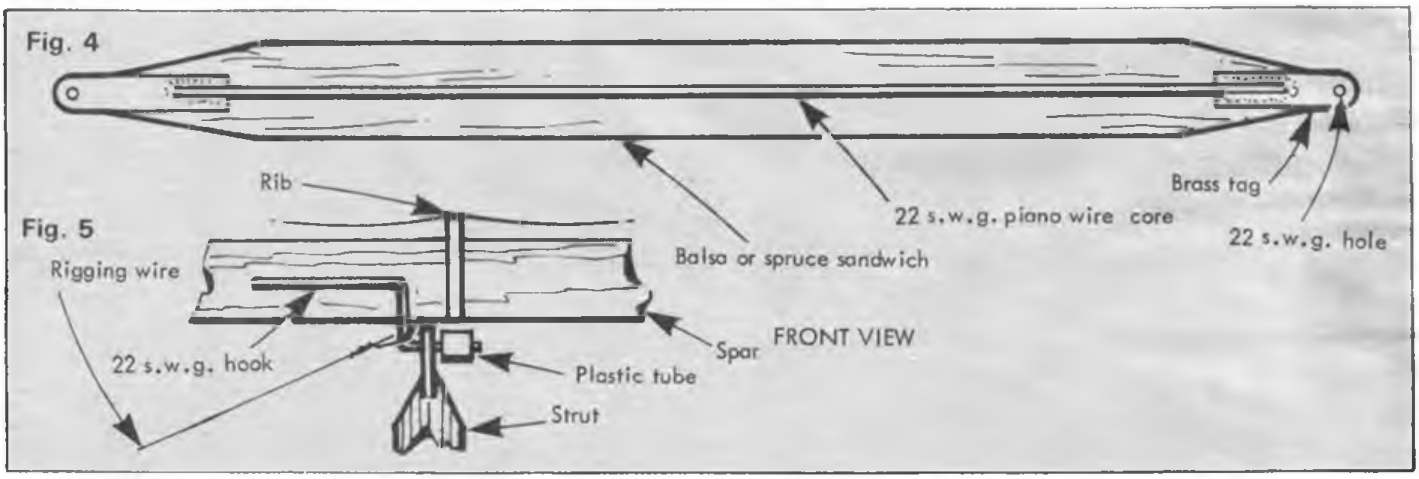
An alternative method is to cut the profile shapes from 1/16in. ply, about ⅛in. wide. This is stronger and can be sanded down to a thinner edge. It is also more resistant to scuffing when the model is careering about the runway on yet another failed take-off attempt!

All that remains now is to add the various little blocks to act as hard points for horns etc., face all end ribs with thin ply and go over the wing with a large sanding block, taking care to keep the edges sharp.

Wing bracing

The majority of the models we are likely to fly free flight will have their wings braced in some way, whether by struts above, as on a high wing monoplane, or a combination of struts and wires.

Unless you enjoy re-rigging your model after every flight, it is best to attach struts permanently to the wings but in such a way that they can 'give' in a crash. Many and various are the methods that have been described for constructing and fixing struts and I've tried most of them! Inserting a metal tag into the end is all right most of the time but sooner or later the tag will pull out in a heavy landing. The method used on the *DH*34 and 'Pup' gives a very strong and accurate length strut in that both ends are linked. Firstly make the required number of thin brass or tinplate tags, about ¾in. long × 3/16in. wide and drill a hole to loosely fit 22swg wire close to one end in each. Stick two pins into a length of balsa the correct distance apart, cut the heads off, and place two tags over them. A length of 22swg piano wire is soldered between them and the whole then sandwiched between the two wooden halves of the strut — balsa for painted struts and spruce for varnished, see Fig. 4. With balsa there is no need to groove the wood to take the wire, simply clamp it tightly in a vice between strips of hardwood until the glue dries. Finally, carve and sand to the required thickness and section, referring to photographs — 'pit prop' struts look dreadful.



Wing tips are made in a similar manner to the tail surfaces, if you look closely at this picture you can see the small indentations caused by Bill Dennis' nails as he has formed the tip outline. Scale modellers take note not to bite your nails . . . even if your model is approaching terra firma from an unorthodox angle.

Where the struts attach to the wings they are located on 22swg wire hooks epoxied to the spars. During initial assembly and trimming, hold them in place with lengths of plastic tube stripped from electric flex, Fig. 5. Replace these finally with little coils of soft wire soldered in place. On a monoplane, the struts are best tensioned through the fuselage by a strong band, relying on the wing dowels to take most of the strain. Similarly, the wings must be held to the fuselage by a band running through the fuselage or centre section between hooks on the wing root.

There are two systems commonly in use for representing rigging — each has its advantages and disadvantages and I seem to alternate between the two for each successive model. The first is to use shirring elastic in a purely decorative way, in that it performs no practical function. This is probably the more realistic method at the scales we work at since the attachment points can be made smaller. These are either soft wire hooks or thin metal tags pinned and glued to the wing root or base of the strut. The rigging can terminate on the wing root rib itself, rather than the fuselage, enabling the wings to be removed as a complete cell for transport. When doing this, it is wise to have cardboard jigs to prevent the wings flopping about and damaging themselves.

The drawbacks with elastic are that it eventually frays, and it does not give the satisfaction of 'working' rigging. The other system is to use wire, either piano or control-line, although it is more difficult to get a realistic attachment, since the wires have to be tensioned with a small band. On a two-bay biplane, you can get away with using only four wires in each cell, by passing the C/L wire through a bent tube epoxied to the spar. When the wire is tensioned, the resistance caused by friction in the tube causes a girder effect.

Tail surfaces

These components more than any other have been the subjects of a vast number of different constructional methods, mostly over-complicated and warp prone. The problem we have, is that of building an adequately strong and warp-free structure of something approaching scale thickness. Most scale sections are nearly symmetrical and can be reproduced safely on a flying model. One extreme example is the *Albatros* BII of the First World War which appears to be framed in 1in. tubing and is completely flat! When a tail is this thin, I think it is best represented by sheet surfaces. The rib positions are simulated by heavyweight tissue rib tapes and can look very realistic. You know you've done it properly when people squeeze your elevators to see if they're solid or not. For thicker tails, the sheet core method is well known and widely used. It is a simple and quick structure since you do not need to cut out ribs and when covered it is strong and warp resistant. Choose some stiff and flat quarter grain ⅛in. sheet and cut out the tailplane and fin rudder shapes to the full outline shape, then mark the positions of all ribs and ribs on both sides. The surface may be held together by stiff aluminium hinges, so it is best to cut a recess in the sheet core at this stage to take them. When the structure is complete, the hinges are held in place using small patches of ⅛in. balsa either side, stuck with epoxy.

The elevators and rudder are separated and the pieces pinned down flat on the board. The structure is then simply glued on, beginning with the main spars along the hinge line. On the 'Pup' I used ⅛in. square balsa, but this may have to be increased for thicker sections. The outline is usually made from ⅛in. square in the same way as for the wing tips but it is important that the strip follows the curve easily, otherwise forcing it will result in warps — Fig. 6.

Some aircraft, the 'Pup' included, have noticeably thin trailing edges to their tail surfaces and if the ⅛in. square is sanded too thin, it loses all its strength. In this instance it can be replaced by 1/16in. spruce which can be sanded to 1/32in., giving a total edge thickness of 3/32in. Going even further, the elevators and rudder on the *DH34* appear to be almost knife edge and in this case I employed strips of balsa 1/16in. × ⅛in. wide and sanded them down very thin. Although the maximum thickness at the edge was only 1/32in., the extra width and the glue line gave the required stiffness — Fig. 7.

Ribs are represented by ⅛in. × 1/16in. balsa blanks, followed by hard points for struts, horns etc. When this is finished turn it over and complete the other side. Finally, the whole is sanded to section using a large sanding block.

Tail surfaces are probably the area of the model that cause problems for most people. They have to be treated carefully to capture the realism. The best example of a fin rudder I have seen recently is Charlie Newman's 'Fox Moth.' The original surfaces showed the outline badly pulled in by the covering between the ribs and this was reproduced faithfully. It is this kind of attention to detail that can set a model apart.

A thin tailplane can be quite flexible, so if it is braced, make it work properly by using 22swg piano wire soldered to tinplate tags passing through the central core.

One final point. In common with many *APS* scale plans, the 'Pup' sports a pendulum rudder. As a general rule, I do not believe in the efficacy of pendulums, especially in an inherently stable subject like this. I can only recall one example of a flying model where the pendulum was definitely exerting corrective action in a meaningful way and that was an *APS Fokker* 'Triplane' with no dihedral but sported a pendulum elevator. In short, if a pendulum is shown, leave it off. A statement like that is bound to create some correspondence!

Next month — fuselages.

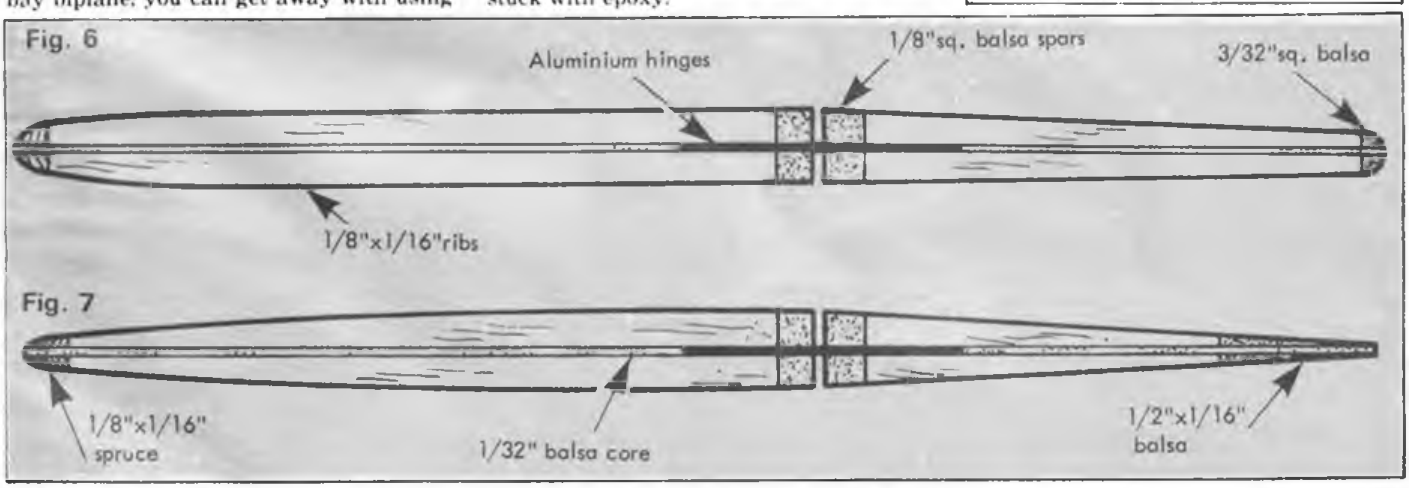


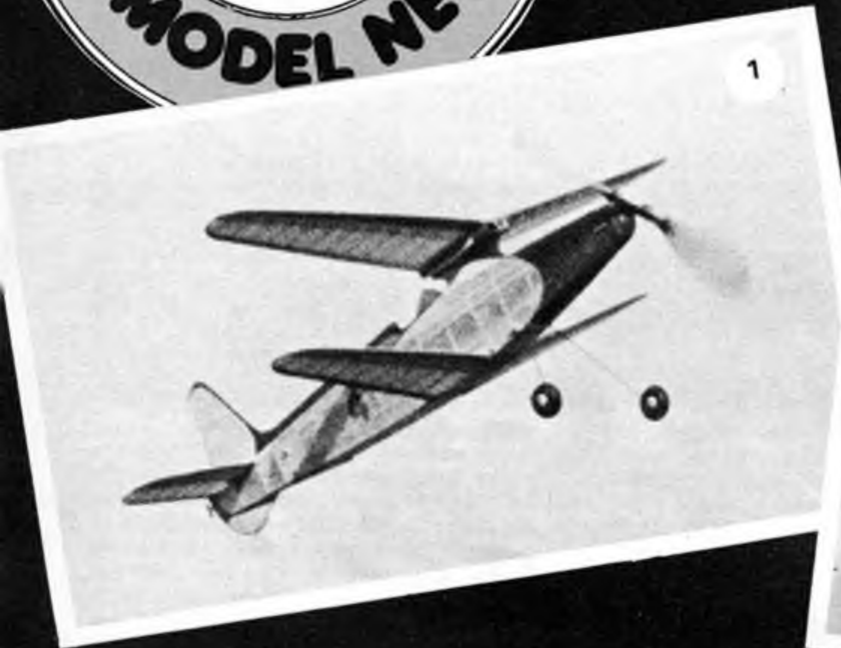
PHOTO-PRIZE MODEL NEWS with Fliar Phil

WIN A COSINA SLR CAMERA

IT APPEARS from the newspapers and TV that there are a lot of rather uncivilised beings going around the world, shooting at each other! However there are (thankfully!) another lot of more civilised people (aeromodellers of course!) also doing some shooting — BUT with a camera! Fliar Phil is again privileged to present the results of *their* shooting, in another excellent collection of photos.

Photo 1

'Up and away,' is this model, called 'Beautiful Bess,' a 38in. span contest rubber powered job. Cruising at around 200ft., the picture was taken with a telephoto lens. It comes from Donald Ross, of New Jersey, USA. Donald writes, "The Bess does two minutes consistently on 40 grams of rubber."



1

Photo 2

Not frequently found in model form is the 1926 Waldo Wittman Gosling racer. However here is a fine model of this 'old-timer.' It comes from one of our RAFMAA friends. Maj. L. Smith of RAF Marham, Norfolk. It is to 1/12th scale, and came fifth at the Barkston Nats. Nice work Major!

3

Photo 3

Flying shots, including a nice 'bit of sky,' are not easy to get. However Guido Meer of Holland has done it with his photo of a 1/10th scale version of Ray Heils 'Scram.' Powered with a standard Telco CO_2 motor. Longest flight to date three minutes, 22 seconds and two minute flights are standard.

Photo 4

Fliar Phil was really intrigued with this photo from George Steiner of California, USA. The model is of the 'Lincoln Beachey' of 1914. In his letter George says, "The full size aircraft lasted but a few days, diving into San Francisco Bay, killing Lincoln Beachey. The model is 1/5th scale, span 60in. and weight 4lb. Power is a Saito 40. Flies very slowly and needs coupled rudder and ailerons for smooth flight." A most realistic photo George.

4

Photo 5 — Winner

The efficient lines of the *Spartan* 'Arrow,' a popular light aircraft with flying clubs in 'the thirties,' have been well captured in model form, in this fine photo which comes from Mr. A. J. Coker of Guildford. Built from Mr. Coker's own plans, it is a 1:8 scale F/F power model of 45 in. span, with an *ED* 'Super Fury' (1.49cc) up front. Its flight performance matches its looks, as it flew virtually, 'off the board.' This month's camera is 'winging its way' to you Mr. Coker!

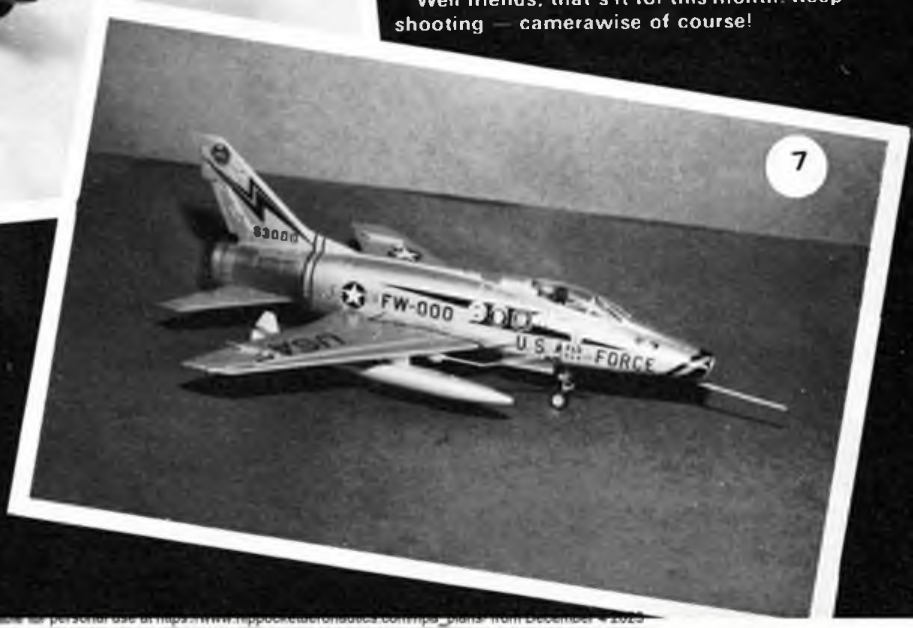
Photo 6

This is one of those occasions when Fliar Phil wishes there could be a second prize in this feature! It would certainly go to this fine photo from Mr. Cox of Cornwall, of his C/L *Avro* 'Lancaster.' Built from an MAP plan (CL1081), and fitted with four 1.5cc *DC* 'Sabre' engines. Almost 'too good to fly,' it now resides, in the markings of 617 (Dambusters) squadron, at Paignton Aircraft Museum, where it obviously gives a lot of pleasure to visitors to the museum.

Photo 7

Fliar Phil has not included any photos of plastic kit 1/72 scale models in his monthly collections to date — but felt he just had to 'pop in' this beautifully detailed F100D 'Super Sabre.' Airbrushed aluminium finish, with micro scale decals. It is the work of Tim Redifer of Columbus, Ohio, USA. Quite a masterpiece Tim!

Well friends, that's it for this month. Keep shooting — camerawise of course!



All entries should be good quality black and white or colour prints. Your name and address should be on the back of the print. Details if possible should be given about the model and its construction. Send all entries to: Aeromodeller, Photo prize Feature, PO Box 35, Wolsey Road, Hemel Hempstead, Herts. HP2 4SS. Photos will be returned after publication.

PROFILE SCALE

Control Line

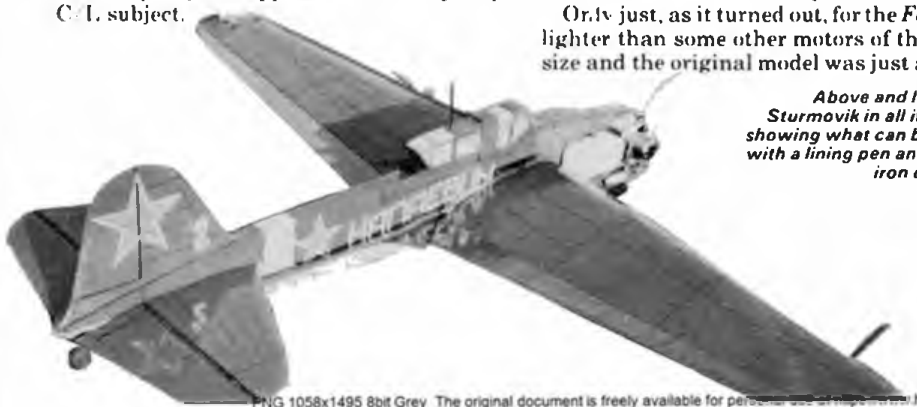
Expanded polystrene foam for a quick easy .40 powered stunter — described by Ian Peacock

DURING the preparation of the 'Profile Scale' series, published in *Aeromodeller* in the spring of 1983, many of my friends and local club-mates, bitten by the bug, produced models for this class. Some were newcomers to the scene, others were long-term modellers, now deep into R/C and looking perhaps with just a touch of nostalgia, at their early C/L days. Many models were constructed, some to assess kits, others to 'prove' new plans and some, just for the pure joy of designing one's own model! One from the latter category was dreamt up by my clubmate and colleague, Rick Willoughby. Rick is a modeller of the old school, producing models of the highest craftsmanship and of recent years has been successful in the thermal soaring scene. Nevertheless, he has always had a soft spot for C/L and could be seen from time to time flinging the odd combat wing around. Like many people, Rick does not suffer from an abundance of spare time, and therefore decided that there was little future in following the Peacock Principle, for despite the relative simplicity of structure used in my models, it still consumed more time than Rick was willing, or indeed able, to supply. Accordingly, Rick drew upon his structural knowledge from the glider world and adopted a somewhat novel, if effective approach.

This approach is now offered here on the grounds that there may be others with an 'equal dislike of balsa wood'(!!) and who, like Rick, might appreciate the time saved.

The model depicted is the *Ilyushin Il2*. The *Il2* 'Sturmovik' was a Russian close-support aircraft widely used in WWII and successful due to its amazing ruggedness. It was chosen on two main counts, one that it was not one of the more hackneyed designs and also that its shape lent itself to C/L stunt being, as it is, of almost perfect proportions.

The 'alternative' construction was something that Rick had been kicking around for some considerable time in the quest to find a method of shortening building time. Foam was to be the prime material on the grounds of speed and cost. Similarly heat-shrink film was to be the prime covering material. With film covering of course, the wing would have to be of self-supporting structure and consequently Bluefoam (again a spillover of technique from the glider scene) was used for the majority of the airframe, with wood used only for strategic reinforcement. The resulting model proved to be sound in structure and more than acceptable in performance, and it was felt that almost any model could be made by following the same principles. Consequently the following could equally be applied to virtually any C/L subject.



As with any project, the drawing up of a scale plan is the place to start and Rick's route is a good one to follow. A 3-view of the subject was obtained (in this case from the excellent range of M.A.P. drawings) and a transparent 1/72nd scale photo-copy obtained — (Local photocopy shop will do an A4 size transparent copy, suitable for projection for around 40-50p!) This copy was put onto an overhead projector and projected onto the wall. A few minutes of jiggling the projector about produced an outline of the correct size. A large sheet of white drawing paper was taped to the wall and the entire plan pencilled in. All outlines together with any surface detailing, panel lines, cockpit frames, etc. can be added in a very short time. Using a coloured pencil, construction details (not that there are many) can be added as well. Total time to produce a good working drawing to full size was less than 2 hours, and you can't get much quicker than that. If you don't have access to an overhead projector at your place of work, try your local copy bureau or (perhaps better) cultivate your local school or college. Most head-teachers will show sufficient interest in what you are doing to allow you access to school property — usually during evening classes — and little aggravation should be encountered.

Personal taste has, of course, a large bearing on the subject matter and the *Il 2* caught Rick's imagination, the wide choice of available colours being just one attractive point. The rather short nose, not uncommon in WWII aircraft, could be 'stretched' a bit if needed, but with a good '40' up-front, the balance would be about right.

Or.ly just, as it turned out, for the *Fox* 40 is lighter than some other motors of the same size and the original model was just a touch tail-heavy and needed a little lead behind the motor. The 'Sturmovik' was an extremely rugged aircraft and a willing workhorse, attributes demanded of the model too — so it seemed an even more fitting choice. To achieve the wing area necessary for a reasonable stunt performance, produced a model some 56in. wing span and 44in. long. To construct a model of this size in balsa would be reasonably expensive whereas the *actual* cost in structural material alone was well under £5.

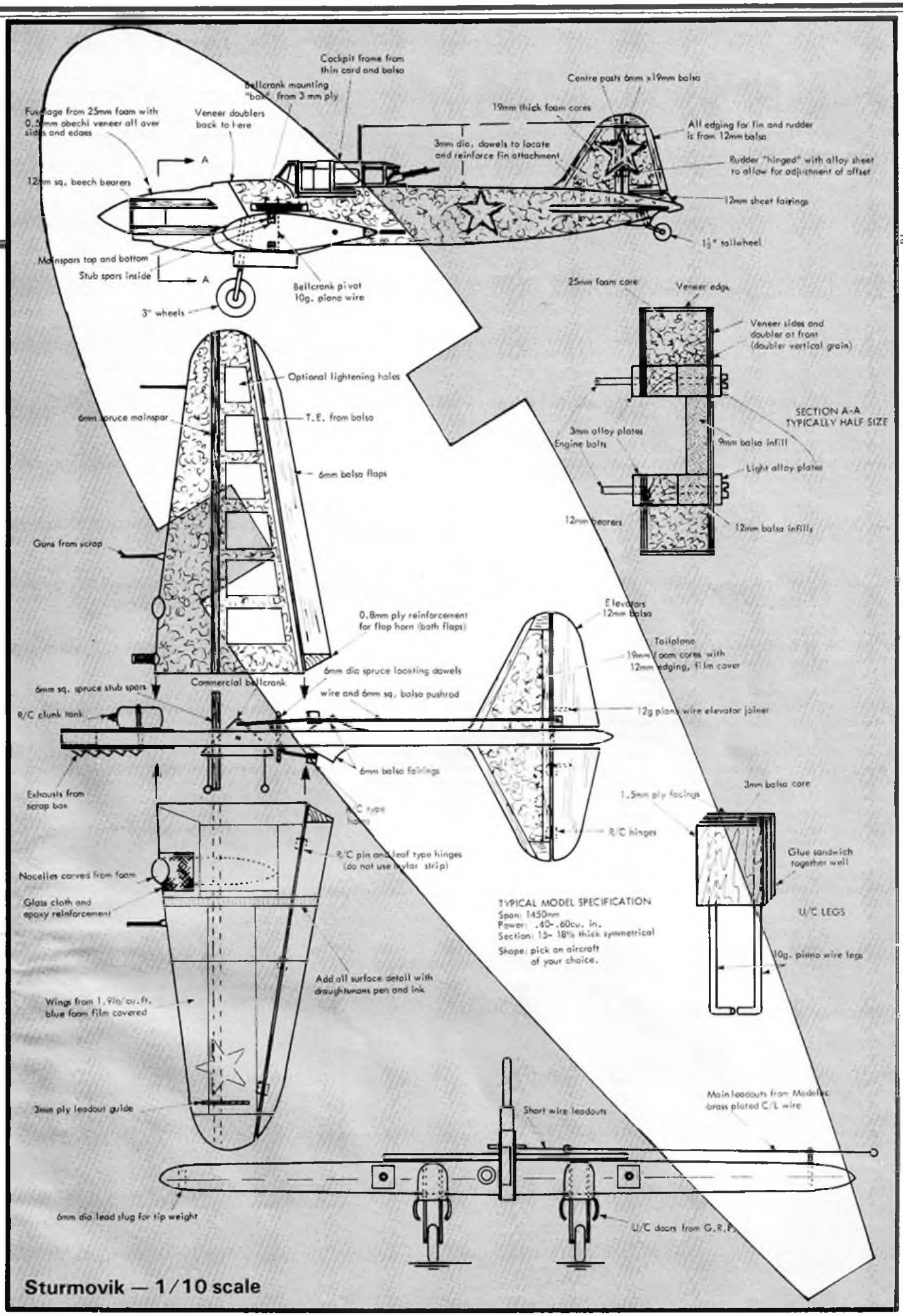
Above and left: the Sturmovik in all its glory showing what can be done with a lining pen and some iron on film.

General construction notes

These are transcribed from Rick's original notes and would apply equally to almost any similar subject.

Bluefoam is the prime structural medium. Use a grade of approx. 1.9lbs./cu.ft. This is used widely by glider types (R/C that is —) and should not be too difficult to obtain. It is somewhat heavier than the white foam traditionally often used in model structures (usually around 1.0 lbs./cu.ft.) but it is a great deal stronger and much easier to work. In addition to hot wire cutting, bluefoam can be cut with a sharp knife and can be carved and sanded. A razor plane works well and abrasive papers of between 80 grit and 180 grit are suitable. An electric carving knife also works well and component blanks can be sawn — by hand, using a bandsaw or the ubiquitous *Dremel* jigsaw. Make sure that knives and razor planes have new blades fitted and with a little practice bluefoam may be worked just like balsa! The finished surface is much smoother than with white foam and can be covered or painted without further preparation.

Lightly stressed areas may be film covered without any stiffening, but surface reinforcement may be be added with veneer, ply or balsa and local reinforcement can be achieved with patches of gauze bandage or glass cloth, applied with PVA glue or with epoxy resin (DON'T use polyester resin — it



dissolves foam!) PVA adhesive can be used for most wood/foam and foam/foam joints with epoxy for major assembly and *Copydex* for veneering. Blue foam is commonly available in 25mm, 50mm and 75mm thicknesses, but can be cut to almost any finished size.

Fuselage

Fuselage construction is unusual but is very quick, cheap and strong. The part-built original was actually used for a soft-ball cricket bat to silence sceptical colleagues (and to the amazement of wife and children who thought that Rick had finally 'flipped his lid'!).

Cut a slab of 25mm thick foam about 20-25mm oversize and mark on thrust line. Cut bearer slots with a fretsaw, tenon saw, bandsaw, Dremel or saw-edged breadknife, either way keep slots square to foam slab. Lay slab flat on building board and use PVA to add engine bearers from 12mm x 9mm hardwood. Add spacing pieces from 16mm x 12mm balsa to bring bearer area up to 25mm slab thickness. Line rear of engine bay with 9mm balsa. Cut bellcrank slot and face all edges thereof with 3mm ply. Face both sides of slab with obechi veneer (grain lengthways) — use thinned down *Copydex* for adhesive.

Re-mark thrust line onto veneer sides and trace profile of fuselage from plan onto the veneered slab making sure that outline is in line with the thrust line! Saw out entire fuselage shape from the veneered slab, taking care that all edges are at right angles to the sides. Using *Copydex* again, veneer all round the edge using 25mm strips of obechi with the grain along the fuselage. Nose doublers can be added with extra veneer (grain runs from top to bottom of fuselage). Use PVA adhesive and press fuselage between boards to keep flat whilst glue is drying.

Trim off any overhanging veneer from edges, particularly round engine bearers and bellcrank slot, and make holes for main spars, tailplane, tailwheel, etc. Drill engine mounting holes and hole for bellcrank pivot. If you don't have a drill long enough for this job, sharpen a length of piano wire, it will work just as well.

This completes the fuselage other than for decorative detail, cockpit framing, exhaust stacks, guns, etc. These can be added later from scrap balsa, dowel, card, etc.

Wing

Wing cores are cut from 50mm or 75mm thick foam using the now accepted 'hot wire' technique. A little more heat and a little thicker cutting wire may be advisable for bluefoam but the method is identical. Wing tips or other compound curves (as found on the *Ilyushin* and others) can be sawn, carved and sanded to blend into the rest of the wing. Spar slots can be cut with a hot wire, although a sharp modelling knife and steel straight-edge is just as quick. A sanding stick from an offcut of 6mm sheet with 180 grade abrasive paper stuck to its *edge only* is a quick way of levelling the bottom of the spar slot. Note that 6mm square spar slot is deepened at the inner part of the wing (6mm wide x 12mm deep) to take the stub spar that acts as wing joiner (one top and one bottom). Tape together several hacksaw blades to enable a cut to be made of the appropriate thickness for u/c legs. Test on scrap foam first!! Cut a slot in the inboard wing tip to take the lead out guide (made from 3mm plywood).

Add top and bottom 6mm balsa spars and 9mm square false trailing edges. Several ounces can be saved by carefully fretting out large holes in the wing as shown. Surprisingly no strength loss is apparent and the weight saved is worthwhile. Don't go too mad over this however, leave 'ribs' of at least 25mm width.

U/C and Nacelles

The position and style of these will vary from subject to subject and for the *Il2* they are a little more complex than some. However, they were still simple, cheap and effective. The u/c legs themselves are made from piano wire sandwiched between ply plates with a central infill of scrap balsa each side of the wire legs. When dry, the rough edges can be cleaned up and the entire sandwich epoxied into the wing slot. Surface reinforcement can be added from gauze soaked in PVA. This method is equally valid for a single leg as it is for the twin units used on the *Il2*. The prominent nacelle bulges on the *Ilyushin* were carved and sanded from a scrap of blue foam finishing with a coat of emulsion paint as a primer/filler coat. Overall time for the nacelles was about ½ hour each with an extra hour or so for the u/c legs. Although amazingly simple, this undercarriage method appears to be more than satisfactory and has proved strong enough in use to stand up to the roughest flying strips.

Tailplane, Fin and Rudder

These are simply made by edging foam sheet with balsa. 12mm thick or 19mm thick slabs are cut to 12mm undersize and edged all round with 12mm sq. or 12mm x 19mm balsa strip. When dry the whole assembly is planed and sanded to section. This is a great deal quicker than producing templates and hot wire cutting. However, that route is also valid if it is your preference.

After sanding, the rudder can be split from the fin and hinged with stiff wire or aluminium tabs to allow for adjustment to the rudder offset (useful for fine trimming).

Flaps and Elevators

Unless one has an obsession with foam, there is little to be gained by its use on these thin section, high-stress components. Six mm balsa was used for the flaps and 12mm for the elevators. It is considerably easier to sand these items to section if they are 'tack' glued to the trailing edges of wing and tailplane respectively and sanded in situ, breaking them off for hingeing when complete.

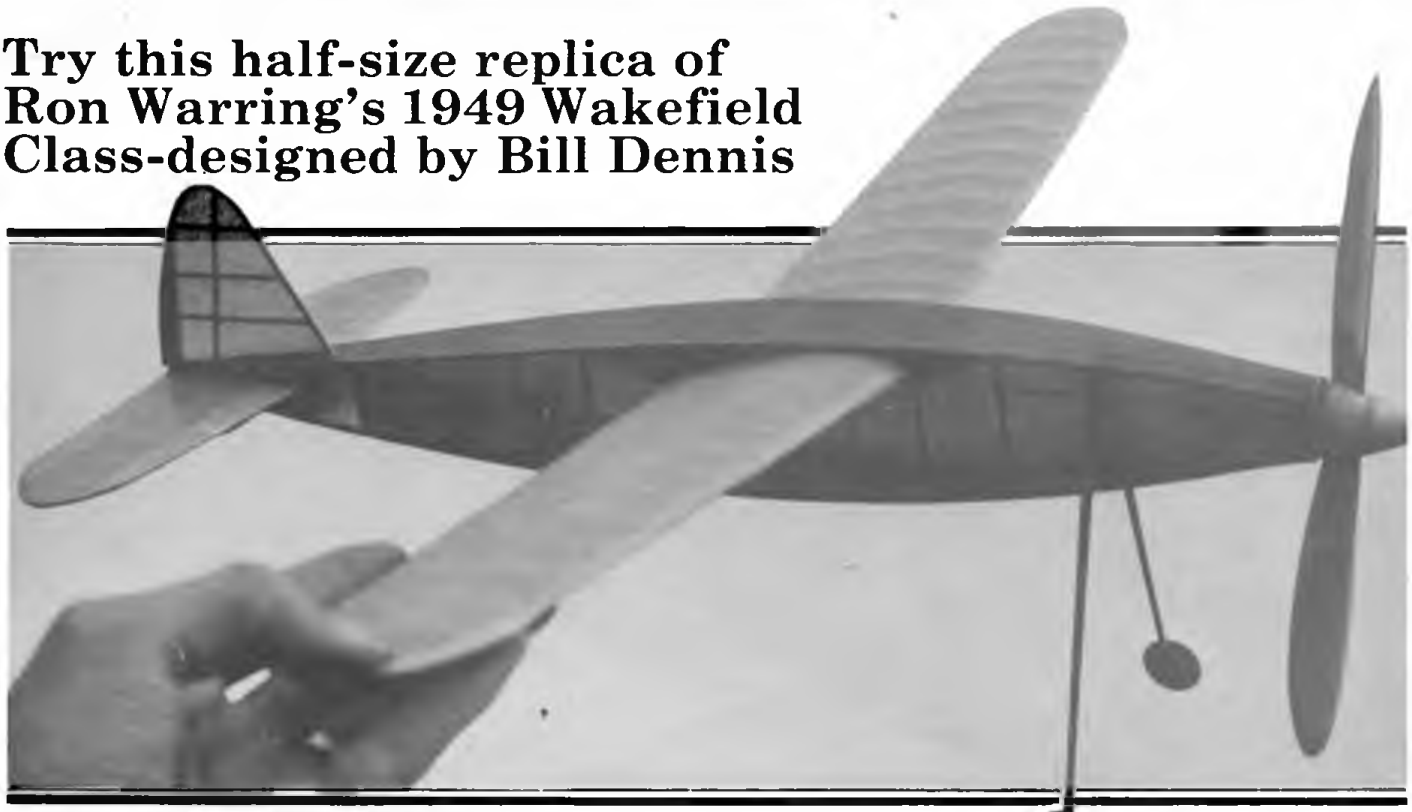
Assembly

With all the major parts complete, it is convenient to cover the wings before assembly to the fuselage. This allows the film covering to be taken 'round the corner' at the wing roots by some 3mm which helps to make a fuel-proof wing/fuselage joint later. Cut the 6mm square stub spars from straight grained spruce and also the 6mm diameter alignment dowel. Carry out a 'dry' run assembly to check the alignment of the wings and (most important!) to ensure that there is good contact between the stub spars and the main spars. When satisfied that all is well, mark round the wing roots with a pencil to give a glue/alignment guide, mix up plenty of SLOW epoxy (1 hour minimum and 24-hour preferred) and put the whole lot together. Check carefully for alignment

Continued on page 99

Below left: close up showing detail of Sturmovik armaments and simple way in which cockpit detail may be achieved. Below right: undercarriage and nacelle structure add great realism and are well worth the effort required to give the finishing touch.

Try this half-size replica of Ron Warring's 1949 Wakefield Class-designed by Bill Dennis



Zombie

LIVING AS I NOW DO in the middle of Devon, I am surrounded by miles of countryside. The bad news is that it is divided into very small fields by very tall hedges! I was looking for a model suitable for flying in a confined space but with a bit of character and I was inspired by the SMAE/SAM indoor event for half size Vintage Wakefields. Three years ago I had built a 'Zombie' which flew extremely well at the Nationals, but was last seen heading toward Skegness at about 2,000 feet. Hoping that a small version would be successful too, I set to work and managed to finish it in three evenings. I fly my model outdoors, but more careful wood selection and a balsa prop would reduce the weight considerably and make it a good indoor flyer.

Fuselage

It was a long time since I had built with 1/16in. square. I found the most accurate way to pin the longerons down was to use scraps of 1/8in. balsa over them. When assembling the two sides take care that the spacers are accurately cut since these thin longerons are easily distorted. The best way is to fit the spacers midway between F2 and the nose and tail and then trim the others to suit. Note that the fairing over the tailplane is fitted after covering.

Flying surfaces

No special comment required here, except to extol the virtues of basswood (available from SAMS, see classifieds) for making very strong, thin and light tip laminations. Bending is made easier if the strips are first soaked in a 50 per cent solution of household ammonia — preferably outside! Two sets of ribs can be made in minutes by the sandwich method, but start at W2, since the thick W1 rib will distort the taper.

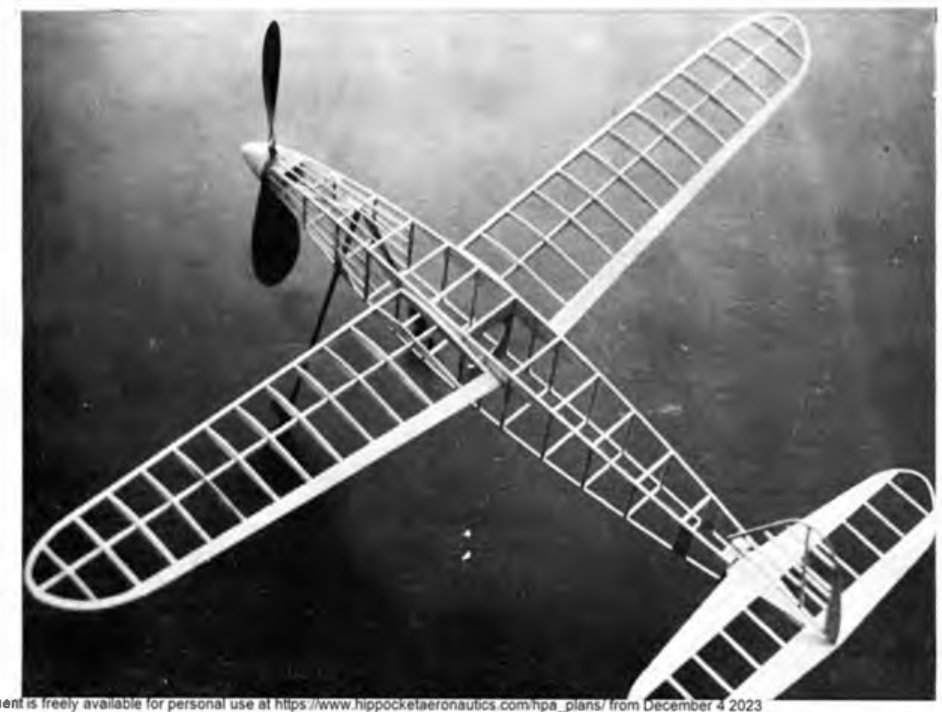
Covering

Use Jap tissue for the wings and tail, and lightweight modelspan for the fuselage. If, like me, you haven't used Jap before, you will find it somewhat different to modelspan. Firstly, it is relatively impermeable, so you cannot attach it by doping through. Instead, use thinned PVA on the structure, or dope. Secondly, all the shrinkage occurs during the water shrinking process and gives a nice smooth finish, while the dope has relatively little effect.

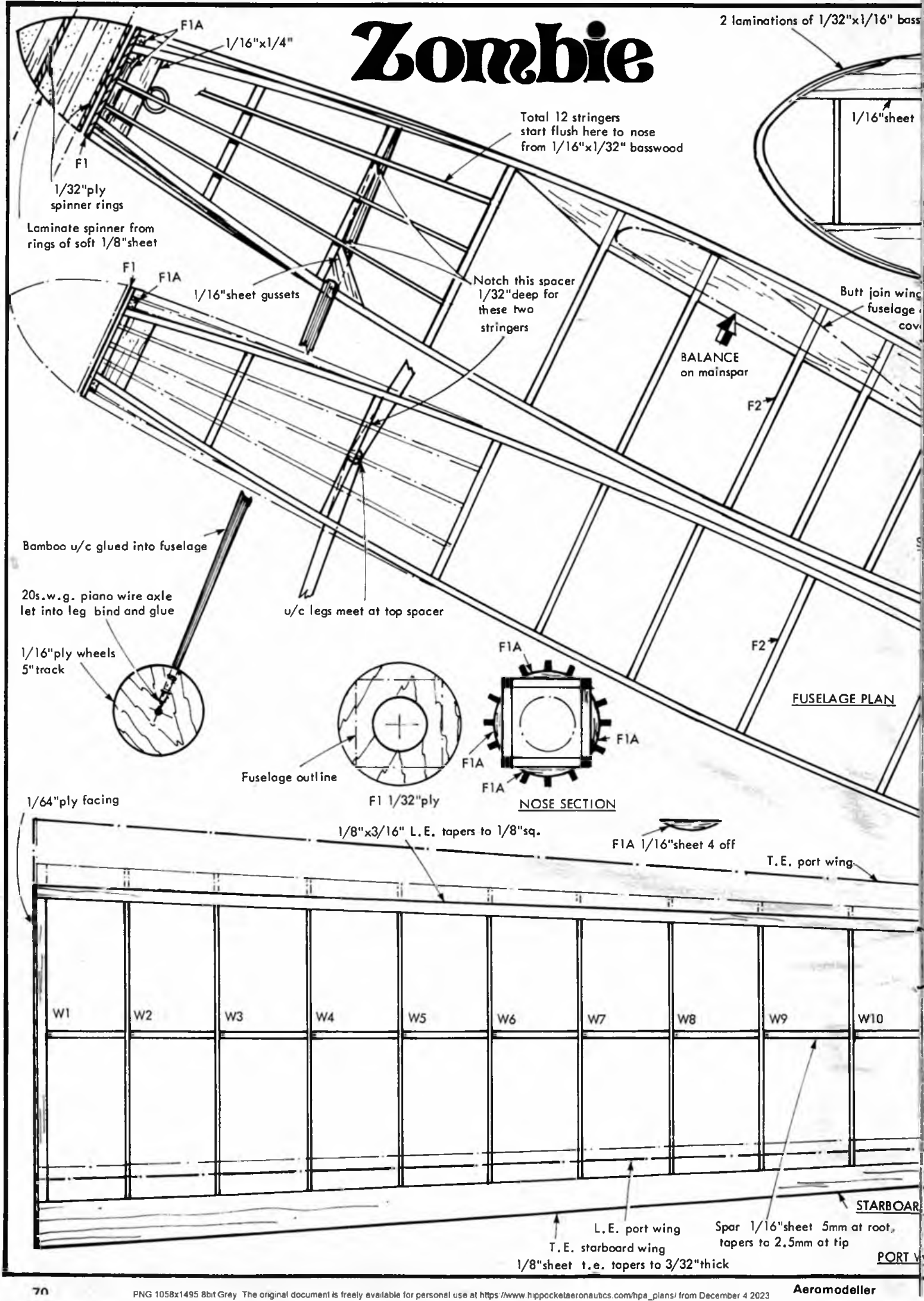
Flying

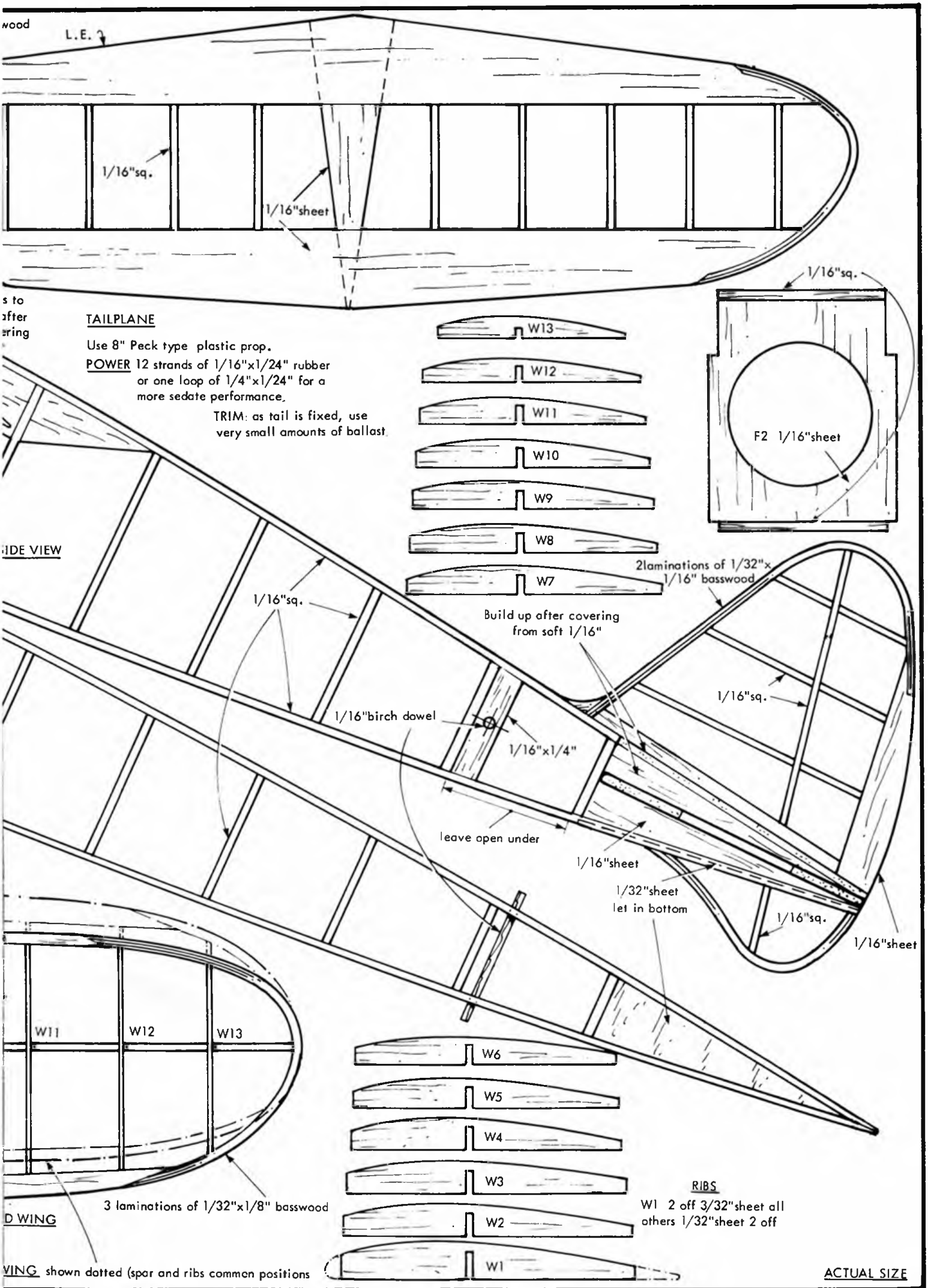
My model was nose heavy, so I had to ballast the tail to get the CG on the main-spar. I powered my model with 12 strands of 1/16in. × 1/24in. rubber, which made it fly like a real Wake should, with a zippy climb. With a loop of 1/8in. performance should be a little more sedate. In either case the model is very stable. Hand launches with a model of this size will not tell you much about the glide, so judge this on low power flights. With the tail fairing it is more convenient to trim the glide with ballast, although the prototype flew with no adjustments, except for 1/32in. downthrust.

Simple structure of 1984 'Zombie' still showing the clean lines of Ron Warring's original 44in. span high performance contest model of 1949.



Zombie





FOR NINE YEARS Aeromodeller has hosted the annual Coupe d'Hiver as a follow-on from the Anglo-French Challenge previously held each February in France. If ever proof were needed that the class is popular, then this series of comps provides ample evidence that for the pure fun of free flight *and* competitive challenge, 'Coupe' is up there with the best!

1983 produced the greatest total of entries seen so far, 104 in 80gm and 81 in the 100gm ROG (rise off ground) class. Two stalwart entrants came from France to maintain the 'International' atmosphere, but it would have been revealing to see if those aces of earlier years, Georges Matherat and Bernard Boutillier, could still outshine the performances which are now so good among the British fliers.

From first light on Sunday December 4 the weather looked good. Cool ... yes, but clear blue skies and with only a light breeze, the grass field at RAF Henlow slowly shed its morning frost and the scene was set for a perfect day. The competition was due to start at 10.00am but most of the entrants were already airborne well before this time and many models could be seen in the air as last minute (and for some, first time...) trimming flights got under way. Most encouraging was the broad spectrum of modellers that this event attracts. From dyed-in-the-wool rubber enthusiasts right through regular glider and power fliers to vintage modellers (complete with vintage 'coupe' models).

100 gram

These models must rise off the ground (in deference to the creator of the class, Maurice Bayet), in practice this does not mean that these models have to have an undercarriage! Models are held with their tail end touching the ground and should be released by the modeller *without* any assistance in the forward direction. Somewhat difficult to monitor, the ROG requirement is a sort of 'leveller.' It is interesting to note that fewer maxes are recorded for 100gms than for 80gms, even allowing for the smaller number flown. Light thermal activity was to be found throughout the day and with the light breeze making the retrieval fairly simple it was not surprising that scorecards were soon returning back to 'control' at a steady rate. In fact the first 'full-house' was recorded by Dave Hipperson within the first 50 minutes! This was followed only 12 minutes later for Stewart Savage (Canada) flown proxy by Ian Dowsett. At this point the organisers began to have worries about enormous fly-offs but no other full houses were to be recorded through the following five hours. Dave Greaves lost only three seconds on his second flight to place third and John Cooper ten seconds on his third to place fourth. Only a total of 22 maxes were achieved in this class.

80 gram

Here the modeller may launch (throw) the model into the air with as much effort as he/she and the model can withstand! This usually, not only ensures a few more seconds in the air but allows a greater precision in placing the model into what one hopes is a thermal! Again the scores would tend to bear this out, as some 125 maxes were recorded! These were spread fairly evenly over all five 'rounds' but with a slightly higher percentage over the first three.

Top Anglo-French challenge as Jean-Marie Piednois and Peter Michel simultaneously launch their low wing 'Ailbas' Jossien designs - J-M maxed too! Centre left is perennial Bruce Rowe - it wouldn't be a 'Coupe' without Bruce. Came 13th in 100gr this year. Left is another regular stalwart, Rupert Harris off into the wide blue yonder, flying for the Debdenaires. Right: in both fly-offs, Dave Hipperson was on top form but had to settle for fifth in 80gr with this one.

With five flights to make in this class, it is not surprising that it took a little longer to see which way the results were pointing! In all, 16 competitors maxed on four or more flights, seven stayed the course to record 'full-houses' and reach the fly-off. Among those who dropped on one flight only were all three of last year's finalists, Mike Chilton, John Spooner and John O'Donnell (once again flying proxy for American Frank Monts).

Fly Offs

When the competition closed at 3.00pm with fly offs scheduled for 3.15 (80gm) and 3.30 (100gm), there was still a clear sky with light wind but with a rapidly setting sun.

At 3.15 ... the signal to start broke an eerie winter silence. There was little tension among the seven finalists ... who would launch first? Ian Davitt in no real hurry was first off at about 3.20 ... no mass launch, the others followed in their own time ... Dave Hipperson last, having broken two motors trying to obtain just that little bit more ... we wait for the results to come in. First is the youngest amongst the fly off, John Walker with 3:04, ahead of Gerry Ferer with 2:43, third Peter Carter with 2:41. The Aeromodeller Cup goes to John Walker.

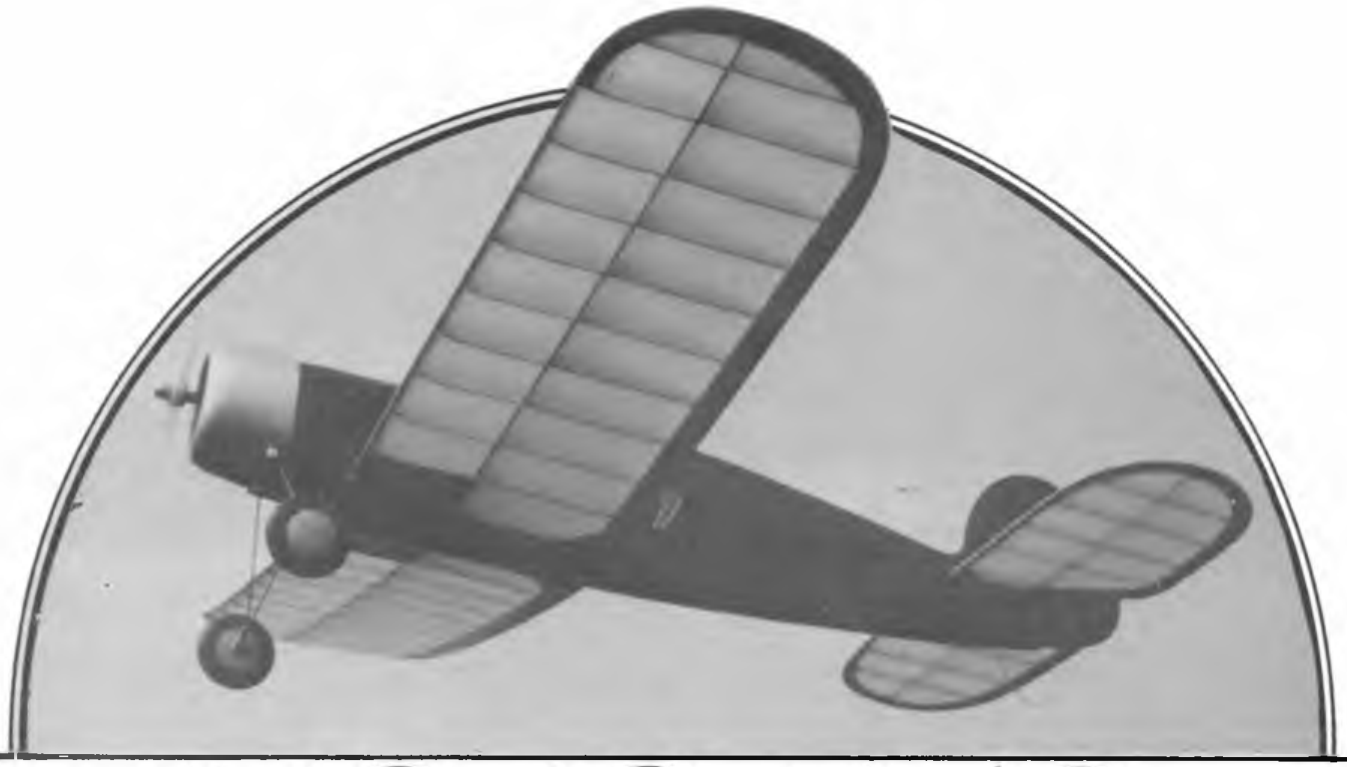
Three-thirty and Dave Hipperson is out there for the second time together with Ian Dowsett for the 100gm fly off. Both make smooth launches but Dave's model finds better air, even so both 100gm models beat all but one of the 80gm fly off times. Dave Hipperson took the Bernard Boutillier Trophy with 3:22 and Ian Dowsett a very good second with 2:58.

These remarkable performances concluded one of the most pleasant 'Coupes' in memory with over 520 recorded scores, and as darkness approached rapidly the competitors moved off to the RAF Henlow Gym for traditional prizegiving where *everyone* collected something thanks to the generosity of Messrs. Micro Mold, Gloy, Joyplane, Solarbo, Dave Stapleton, MAP Ltd. and all competitors, whose entry fees were converted back to prize monies to take home, there was even a friendly tussle among well-known personalities to claim the dubious honour of coming last! Long live the Coupe d'Hiver!

Results

80gm (Aeromodeller Trophy)		100gm (Bernard Boutillier Trophy)	
1. J. Walker	600 + 184	1. D. Hipperson	360 + 202
2. G. Ferer	600 + 163	2. S. Savage (Canada) (Proxy I. Dowsett)	360 + 178
3. P. Carter	600 + 161		
4. C. Shepherd	600 + 138	3. D. Greaves	357
5. D. Hipperson	600 + 137	4. J. Cooper	350
6. I. Davitt	600 + 134	5. I. Kaynes	339
7. R. Chilton	600 + 107	6. J. Bailey	338
8. P. R. Harris	597	7. P. Carter	337
9. J. Cooper	594	8. R. Miller	329
10. J. B. Spooner	593	9. G. Sharp	325
11. W. E. Colledge	588	10. P. D. Michel	322
12. F. Monts (USA) (Proxy J. O'Donnell)	581	11. R. Chilton	318
		12. M. Chilton	314
13. B. V. Rowe	578	13. A. J. Crisp	313
14. M. Chilton	572	13. I. Dowsett	313
15. D. Greaves	568	15. M. Dilly	311
16. J. W. Anderson	563	16. A. R. Wells	306
16. J. Brooks	563	16. L. Ranson	306
16. G. Sharp	563	18. J. Brookes	299
19. D. Davitt	561	19. N. J. Beaumont	294
20. C. D. J. Strachan	559	20. F. Monts (USA) (proxy J. O'Donnell)	270

Top: a nouveau trend? Trio of Rene Jossien 'Ailbas' CdH low-wingers by Messrs Michel Piednois et Clarke (du SAM, mais oui!) could be the start of a vintage category. On the other hand, Monts' and Savage's models are possibly just as old and still trotted out annually by Proxies John O'D and Ian Dowsett - see results! Talking of which, that's Ian and the Canadian model, preparing for 2nd in next pic. Above left: Bob Wells, holding for Len Ranson - they tied at 16th spot! Left: young John Walker headed the 80gr fly-off with a 'Figaro.' Right: Stephan Chateau pre-decorates his white tissue with fantastic Rotring cartoon sketches, some of which are, Ooh la la! Flies well too.



IRONSIDES

40 inch free flight sportster for .5cc-.75cc engines by B. Cracknell

THIS OVERWHELMING URGE to create some oddly shaped flying machine seems to overtake me at regular intervals. The pleasant memory of my last aberration — a kind of powered tea tray — was beginning to fade, so I began to look for some new distraction with which to jack up the adrenalin levels.

It was then I realised that I hadn't built a conventional low winged aircraft for the best part of two decades. So that was it! A conventional low wing design: a bit ordinary perhaps, but maybe it could be big on personality.

'Ironsides' began very grandly with a set of design criteria.

1. The aircraft would have a low wing.
2. The 'shape' would be reminiscent of the light aircraft of the 1930s.

It would be designed primarily for slow stable flight.

4. A good flat guide, with the ability of *land* every time without nosing over, would be important.
5. Easy general handling was essential.
6. A light robust airframe was required; remember that well known aerodynamic axiom — 'lighten and simplify.'

Within a week it was designed and built; it looked just right, and aeroplanes that look right usually fly right.

When I got to my flying field for the initial flight testing, I was met by the entire committee of the Lee Bees model club, who were coincidentally doing their own thing at the time. Under the full glare of this formidable official scrutiny, I found that 'Ironsides' glided immediately without alteration — and that there was no getting out of putting the power on. It flew first time, and with a tweak on the trim tab to achieve a pleasing circle, I haven't had to touch the trim since.

The plane will take off and circle in steady, slow, head high circles with my Mills .75 throttled back. With more power on it will climb nimbly but the slow flying characteristics are ever present even with its nose easing up. The glide and touchdown are a real joy.

'Ironsides' performs comfortably in a stiffish breeze, there are plenty of reserves of stability. Given calm flying conditions this

Heading photograph of 'Ironsides' seems to capture the character Brian Cracknell has wanted to achieve with this model. An attractive mixture of solidity of fuselage and yet a light floating impression with the open wing structure showing quite clearly. Above and left: two views of 'Ironside's' fuselage whilst under construction, showing how simple construction can produce a design with 'character.'

Two views of 'Ironside's' fuselage whilst under construction, showing how simple construction can produce a design with 'character.'

is a real precision flyer, it will do exactly as it is told on minimal power. The whole flight is characteristic of a full sized aircraft of the 1930s period.

Fuselage

Build the two basic frames first, one on top of the other, with a piece of cling film between to make separation easy.

Remove side frames from plan and join with spacers top and bottom (immediately over the wing housing only at this stage). When dry pull the rear of the fuselage together and glue at the stern post. Then fit other spacers top and bottom — aft of wing.

Add nose formers, slide engine bearers into place and glue. (Note, you may wish to mark out the position of the undercarriage wires on the appropriate formers and drill holes for sewing through before fitting, although a hot wire will be capable of forming any holes required after the formers have been glued in place!).

Now lightly sand basic fuselage box.

Fit all remaining formers on top of fuselage, add stringers and cockpit sheeting.

Sew and epoxy undercarriage in place on the fuselage formers, bind the two legs just above each axle with fuse wire and solder.

Drill fuselage and trial fit wing and tail retaining pegs, do not glue at this stage. Then remove pegs until after the fuselage is tissue covered, when the pegs are finally fitted and glued in place.

Cowling

Cut cowling formers and plank from soft sheet. It is useful to link the cowl formers at the top and bottom and both sides first. Do this with balsa planks about ¼in. wide. This will establish the basic cowling shape right from the outset, before continuing with the planking.

Wings

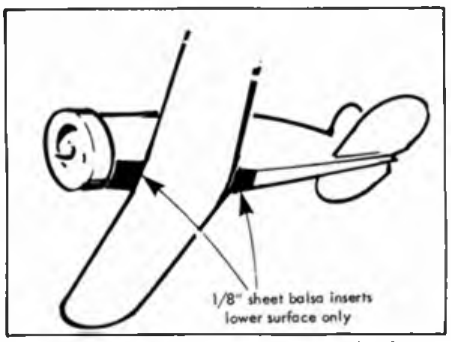
Construct the mainspar first, this will establish dihedral angle before any building begins.

Lay out leading and trailing edges of one wing only, on the plan. (Note, ensure that the trailing edge of the wing is blocked up towards the tip — as per plan instructions — this will add tremendous flying stability to the finished model).

Fit all wing ribs and tip shape *(no mainspar at this stage)*. Allow structure to dry really thoroughly, then remove from plan.

Repeat procedure for the second half of the wing. Remember to block up the tip trailing edge; and not to fit the mainspar yet.

When the basic wing panels have dried they can then be carefully slipped onto the mainspar. Each wing slides onto the mainspar *(do not glue yet)*. Check that the undersurface of the spar coincides exactly with the undersurface of each wing rib. Then glue ribs to mainspar with PVA glue.



Above: detail showing local strengthening fore and aft of the wing mounting. Below: close up of 'ront end showing simple but effective engine cowling.

Place both wings, now linked together with the mainspar, flat on a board at the centre section. Prop each tip up to the correct dihedral and add the wing centre section trailing and leading edges. Leave to dry thoroughly.

Add last centre section rib, plus gussets and any sheeting. Sand lightly ready for covering.

Tailplane and fin

Construction is straightforward. Build fin first then the tailplane is made in two halves and each half is glued on either side of the fin.

Finishing

The cowl is given several coats of sealer, rubbed down and then painted. This component is held back against the fuselage by two internal rubber bands. The rear cowl former locates on the engine bearers. The wire tailskid is fitted to the rear fuselage. Shape the fin to flow into the rear fuselage lines. Note that the windshield is fitted after covering and doping.

Covering

Cover all flying surfaces with lightweight Modelspan tissue. I double covered the fuselage with lightweight Jap tissue. By itself one layer of Jap would not be strong enough but there are some attractive colours available which can make the double covering worthwhile. If you don't fancy double covering, then use lightweight Modelspan tissue all over. You may even be lucky enough to have some coloured sheets stored away somewhere.

I use tissue paste to affix tissue and water shrink afterwards.

Three coats of dope and thinners will be needed. The first two coats can be a 50/50 mix. The final coat is 60 per cent dope, 40 per cent thinners.

Now is the time to add the windshield and any decor that you wish. My model has a black fuselage, silver cowl, and white flying surfaces.

Finally add one thin coat of fuel proofer all over.

Flying

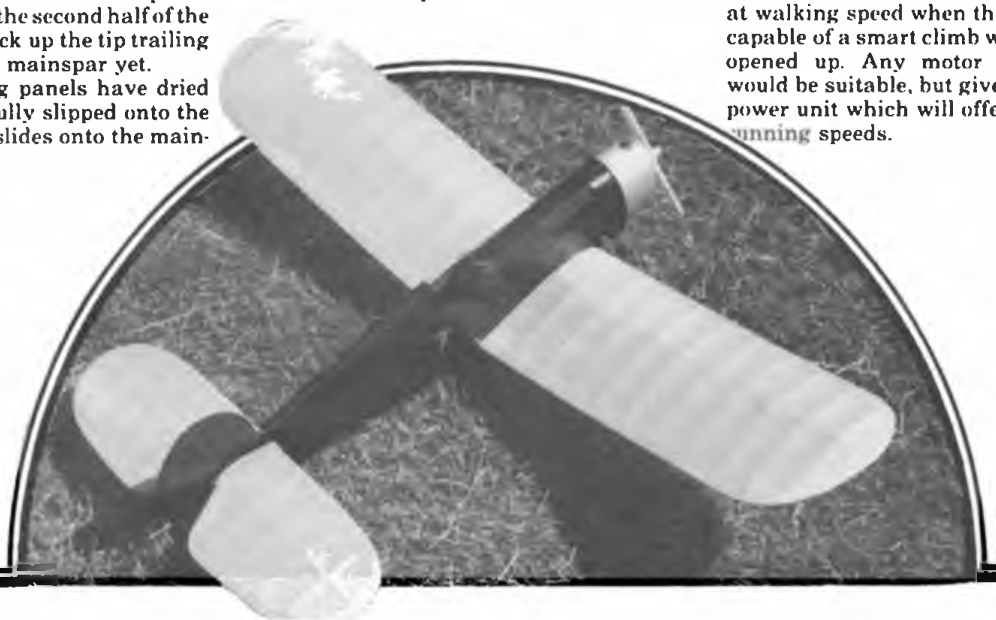
Check that there are no warps in the airframe. Balance model at the indicated balance point. Establish a flat straight glide by handlaunching the model into the wind.

When satisfied, start the motor, throttle well back, and aim for a gentle climbing turn. The trim tab is effective in controlling direction.

The original 'Ironsides' flies in left hand circles, but it trims and flies equally well in right hand circles. Have fun...

Power

The Mills .75 is the ideal power unit because it runs smoothly over a wide range of engine settings. A lot of pleasure will come from operating 'Ironsides' at different power settings. The model will float around at walking speed when throttled back, or is capable of a smart climb when the engine is opened up. Any motor from 0.5 to 1cc would be suitable, but given a choice, pick a power unit which will offer a good range of running speeds.



Alex Imrie's VINTAGE CORNER

South Midland Area SMAE Meeting

This was held at Old Warden under fine settled weather conditions on 23rd October and was another of those low key functions about which I continually enthuse. Although much sport flying was undertaken, a very high proportion of the models were vintage, it was also pleasing to see that free flight models were well in evidence. Organising officials circulated amongst the flyers and awarded commemorative plaques in the four main classes of model, R/C Assist, Free Flight Power, Free Flight Rubber and Control Line. Since there was a complete absence of the latter, it was suggested that this fourth award be given instead to the most impressive electric model, of which there are now ever increasing numbers. Unfortunately I was unable to ascertain who won the awards other than that for Free Flight Power which was deservedly gained by Charlie Havis with his nicely finished and fine flying example of 'Brooks Bipe'. A group of dedicated *SAM 35* members held an impromptu precision power competition, where a total flight time of 120 seconds was aimed at from three flights, and the following results show just how closely run this event was. The field of over a dozen starters even included a lady competitor (Dave Baker's daughter Allison). Young Chris Knight won with his *DC* 'Dart' powered 'Abzug' S3 (119.5 seconds), closely followed by Jack Law flying his *Indian Mills* 1.3 powered 'Spearhead Senior' (121.7 seconds) and in third place was John Kemp with his Frog 1.75 powered 'Little Vagabond' (122.8 seconds).

The wind was fairly light all day, with little drift and as a result the flying was well controlled and incidents were few, although a few models fell victim to the Old Warden 'forest'. Colin Watts' *Super Cyclone* powered 'Rambler' hit the fence which effectively removed its port tailplane. Brian Ferrett also experienced a collision on landing and unfortunately damaged the *Brown* 'Junior' engine of his 'Red Zephyr', while Howard Boys was seen returning from the aerodrome with the pieces of his tail-less model under his arm. These instances merely show that if you fly you can sometimes meet with misfortune!

R/C Assist vintage models were airborne all day, and the usual gaggle of 'Junior 60', 'Powerhouse', 'Buccaneer', 'Falcon', 'Hornet', 'Manx Monarch', 'Scorpion', and 'Flying Quaker' were joined by a new shape in the form of a beautifully built *GHQ* 'Sportster' (the first one I have seen) powered by an *ETA* 5cc diesel by Ian Potts. It is quite amazing just how infectious R/C aerobatics are, and after the loops and rolls of a double sized 'Scorpion', one could detect a slight air of abandon in the flying of models that had hitherto behaved in a sedate manner! The fever did not, however, last long and soon the steep climbing turns off the ground reverted to normal aeronautical practice.

Obviously one of the joys of electric power is its complete lack of noise, in fact I had not really appreciated just how quiet the meeting was with the whirr of CO_2, the barely audible thrusting of rubber propellers, the subdued diesel notes and the gentle purring of 4-strokes, until I flew my 'Miss Tiny' with its *Ohlsson* 23. Although not a 'hot' engine by any means, the crack of that exhaust note, which I enjoy in the

Above left: Tony Penhall holds his Ohlsson 23 powered Bowden Contest aloft, showing well the slots, spats and dummy radiator, all original features of this fine CEB design, plans of which are still available from MAP as PET 225 price £4 85 plus 50p postage. Above right: Charlie Havis was awarded the commemorative plaque for free flight power at the South Midlands Area SMAE Meeting at Old Warden on October 23 last for his nicely finished fine flying example of Brook s Bipe.

Left: Derek Ridley's 13-year-old daughter Sarah with his 10ft. span Yeabsley Super Sunbug, described in the 1949 Model Planes Annual. Plans for a similar machine, the Yeabsley Sunspot are available from MAP as G/283 price £6.50 plus 65p postage. Right: Bill Langley with his KGS at Old Warden. Presently fitted with an ED 3.46 MkII, Bill plans to fit a Vivell 35 ignition engine.

isolation of my local rural flying field made me want to hide at Old Warden. The only thing that could possibly have been in its favour was its short duration.

This then, was a blue-print meeting, but was not overly crowded because of other functions. Those attending were mainly flyers and many models were still airborne until the onset of darkness when the formation of heavy dew drove the hardier spirits reluctantly to their cars.

Canadian Wakefield Biplane

Don Knight built this model from plans in the 1937 *Zaic Yearbook*. The drawing was made from photographs and measurements and does not reveal structural details of the original model, but Don has managed to reproduce the machine in a very pleasing way. The designer, Fred J. Rogerson from Hamilton, Ontario, a model builder of some 20 years' experience had always been a biplane enthusiast when in 1935 he made this 36in. span back-staggered gull-wing biplane for that year's Canadian Wakefield Competition. This contest was run on the basis of the best of three flights, and was held in stormy weather conditions where the 22mph wind upset most of the orthodox high wing models. However, Rogerson's biplane flew stably and well and won the event with a flight of 72 seconds with only 720 turns on the rubber motor. Charles Hampson Grant, the editor of *Model Airplane News* was of the opinion that the stability of this model was a direct result of Rogerson having the CLA and the CG in approximately the same horizontal line.

Apart from the touches of realism that Rogerson incorporated like a gilded nose and spats, RAF insignia, open cockpit, windscreen, headrest and instrument panel, practical features included a special free-wheel arrangement inside the propeller spinner that allowed the tension of the rubber motor to be quickly released in the event of a crash, and internally hinged and rubber sprung monostrut undercarriage legs that gave excellent shock absorbtion. Writing in the magazine *Canadian Aviation* Rogerson had this to say about his model:

"There is no doubt in my mind that my Wakefield design is sound and would show surprising results if intended for duration only. The fuselage and landing gear were designed to give a low value of drag at small angles of attack. This was achieved by fairing the square fuselage to a shape somewhat resembling a tear drop with a flat lower surface. The greatest deviation from regular practice was the unusual design of the wings. The aspect ratio was high, nine to one. The top wing is highly gulled at the centre section, making for a good gap-chord ratio, and to gain full advantage of the gull wing it was carefully faired into the fuselage, at right-angles to the surface, to give a minimum of interference. The lower wing is quite small and is also attached at right-angles to the surface of the fuselage. Negative stagger was used to delay the stall and to allow for a much steeper angle of climb. The chief disadvantage of negative stagger, is that it decreases the overall

Above: Bill Archer of Inverness (right) with his replica of R. N. Bullock's Wakefield (plan available from MAP as MA 36 price £4.85 plus 50p postage) at the Scottish Vintage Meeting held at Newbigging on August 21 last, for vintage buffs whose location is too far removed from Old Warden. Below: Don Knight's model of Rogerson's Canadian Wakefield Biplane built from plans in Frank Zaic's 1937 Yearbook (see text).

Below: Peter M. Bowers with his Fly Baby record breaking Class A seaplane in 1940. This model powered by a Madewell Mite was described in April 1945 Model Airplane News. Below right: Peter Foulsham's Halcyon held by son Greg, plans appeared in June 1940 Aeromodeller, and in late editions of Rushy's ABC of Model Aircraft Construction.

VINTAGE CORNER

Above: MAP's Ron Moulton managed to include the Twilleys hot-air balloon in the picture when he shot Ian Potts with his 75in. span GHQ Sportster powered by an ETA5 diesel. This model designed by Julius Unrath was kitted by GHQ Models and was also described in July 1936 Model Airplane News. Right: P. A. Scorey with his DC Sabre 1.5cc diesel powered Air Trails Sportster at Old Warden during the South Midlands Meeting. The Sportster is a nice compact design by Ben Shereshaw originally described in September 1939 Air Trails, plans still available from MAP as PET/961 price £3.25 plus 50p postage. Below left. Marion has appeared in this column before, here she is again, this time with the float equipped Buccaneer Standard made by her father Peter Bull of Kilkenny, Eire (see text). Below right: G. W. W. Harris with one of his last streamlined Wakefields. This model is almost identical to his 1946 Wakefield Mkl which was described in the January 1947 issue of Model Aircraft, plans of which are still available from MAP as MA 16 for £2.75 plus 50p postage.

efficiency to a certain extent. The wing arrangement as stated is approximately the equivalent in efficiency to the best of high-wing monoplanes."

Fred J. Rogerson was one of the small band of forward thinking modellers like Gerry Ritz in USA and F. W. Schmitz in Germany who, even at this early date were aware of the physical differences between model and full-size aerodynamics. His writings on slow speed aerofoils show that he knew of the advantages to be gained by using sharp leading edges and thin flat aerofoil sections. His choice of the C-72 aerofoil for use on his Wakefield biplane would initially seem to be a reversal of this knowledge, since the C-72, a good high lift section in full-size practice, was known to be not very suitable for model use, given to sudden stalling at high angles of attack. However, there is no doubt that Fred knew what he was about and obviously the 20 degrees of negative stagger and large gap used in the cellule of his biplane design reduced the apparent shortcominge of C-72 and produced a winner.

Vintage Seaplanes

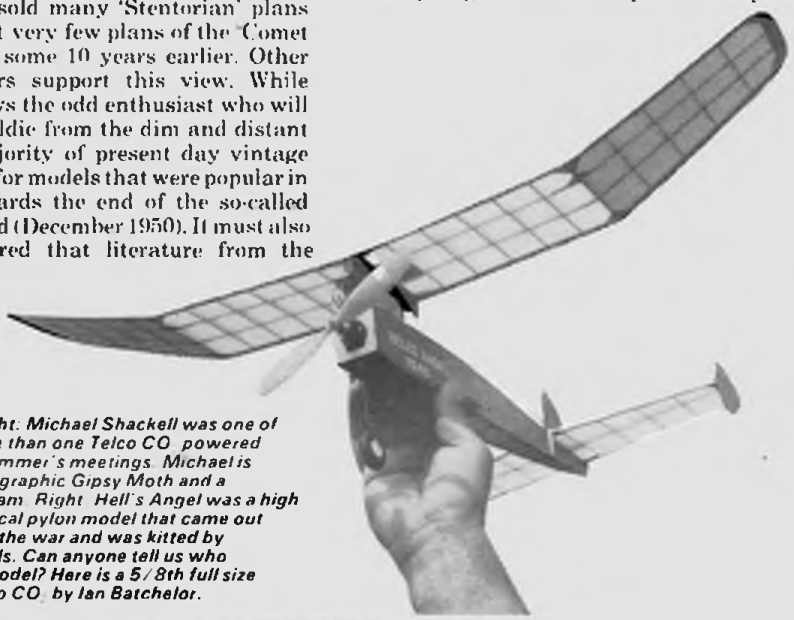
Peter Bull of Kilkenny writes to keep us up to date on his R/C 'Buccaneer' made from a Ben Buckle kit, that we mentioned in last September's Vintage Corner. He is now using *Fleet* 3-channel R/C and reports that the interchangeable float/wheel undercarriage has enabled this model to make many hundreds of flights over the last year. Peter states that the model will rise off the water but does not tell us how the water landings went or how many flights the model has made as a seaplane. As a matter of interest *Berkeley Model Supplies* were advertising *Gondolier* Float Kits for their 'Buccaneer' early in 1940, these floats were 30in. long and appear to have extended approximately one third of their length ahead of the propeller. Well known American modeller Peter M. Bowers undertook some seaplane

modelling in 1939/40 and had a *Comet* 'Clipper' with a triple float layout. He maintained that this was most satisfactory from an operational point of view with the model riding out wind and rough water better than a twin float machine, although of course, the installation was not as clean aerodynamically. He personally liked the twin-float layout, since he felt that it was the most realistic of pontoon arrangements. Although rough water characteristics were good it was necessary to exercise great care during trimming to ensure that the floats did not 'dig in' on touchdown. His 'Fly Baby' was 48in. wingspan and had floats of approximately 20in. in length, their bows extending one fifth of their length ahead of the propeller. Float design and location are especially important on free flight models to ensure 'dry' landings, less so of course, with R/C to arrange a level or tail down attitude for touchdown. There has been much recent interest in water flying and we would be pleased to hear of readers' experiences with 'hydro-vintage' whether R/C or free flight.

Vintage Interest

It is considered that the most interest amongst present day vintage enthusiasts centres around the designs with which they are familiar, remembered, either personally or via the contemporary books and magazines on the hobby. In a recent letter Phil Smith tends to confirm this by relating that he has sold many 'Stentorian' plans from 1946 but very few plans of the 'Comet II' design of some 10 years earlier. Other plan suppliers support this view. While there is always the odd enthusiast who will build a real oldie from the dim and distant past, the majority of present day vintage modellers go for models that were popular in kit form towards the end of the so-called vintage period (December 1950). It must also be remembered that literature from the earlier period (pre-1940) is harder to find. Models from that time do not usually possess such good performance or appearance as later models. Replicas are difficult to make using the original materials and methods of construction and working engines from the period costly to obtain. Another factor that influences the choice of the present generation of vintage builders is obvioulsy the availability of vintage plans and kits suitable for R/C, hence the large numbers of 'Junior 60's, 'Falcons' and 'Buccaneers' that one sees at the meetings. One vintage supplier has said that it is hardly worth drawing up or reproducing a plan for some obscure model, since subsequent sales would never recover the initial cost. Customers generally going for the models that they have seen perform well in the field at flying meetings, thus proving that exposure is still the best possible advertisement for a good product.

We are grateful however, that the other type of vintage enthusiast still exists. He is the modeller who ferrets out a design that is so rare that no one else is flying one. Not only is it a personal achievement to find the plan or sufficient data to enable a reasonable replica to be built, but often the building itself is fraught with difficulty and the flying capabilities of the finished model may be well below par. Since the popular models only became popular because of ease of construction and good flying performance, the little known vintage model often possess shortcomings not readily apparent to a would-be builder, these being the factors that kept the model from becoming one of yesteryear's favourites.



Top of page, right: Michael Shackell was one of many with more than one Telco CO powered model at last summer's meetings. Michael is holding an Aerographic Gipsy Moth and a Moorhouse Scram. Right: Hell's Angel was a high performing typical pylon model that came out after the end of the war and was kitted by Precision Models. Can anyone tell us who designed this model? Here is a 5/8th full size version for Telco CO by Ian Batchelor.

Left: Trevor Davies with his Telco CO, powered Piper Super Cruiser, this model with scale dihedral and scale tail-unit area flew well at Old Warden on October 23 last at the South Midlands Meeting. Right: seeing is believing! Proof that Alwyn Greenhalgh DID fly at last year's Vintage Day Meeting corrects the statement that I made in the November issue. Photographic evidence from Jack Spain of Dundee

From THE HANDLE

Control Line News

RACING
by Jim Woodside

AT THIS TIME OF YEAR there always seem to be numerous small but important items left unpublished over the past months. Accordingly I am leaving the topic of wing covering until the March edition.

I would like to take the opportunity to wish regular readers a successful coming season. Give it all you can!

What is 'central' about SMAE Centralised Meetings?

There is a small voice often to be heard saying, "How come we travel so far (i.e. the length of England) to a centralised meeting? The venue is by no means near the centre!"

It is true to say that the word centralised was intended to mean under SMAE authority rather than area or club control but in practice has come to mean 'Heart of England.'

In order to air the topic, John Horton of the Wharfedale Club has prepared a map upon which can be measured those miles of travel to available competition sites for the mythical Ashbourne Team Race Club of 100 members, representing UK teamrace activity. Clearly Derby is the centre of the known universe and on this basis London, Newcastle, Bristol and Scottish clubs have the worst deal. However, as many contests are held at Barkston or Three Sisters the inbalance is tilted further against the peripheral clubs on particular days. The most extreme example of 1983 was Newcastle to Bristol return for a day's racing.

Views on the subject as well as information on the availability of potential or actual contest sites would be welcomed by the CL sub-committee as a guide in fixing the racing calendar. Personally I miss the big area meetings like Woodford and Cranfield which once gave such focus to local buffs as well as a good reason to travel long distances. Further, at the end of the day, the availability of a venue and volunteer personnel will determine the location rather than convenience cost factors. Have we reached a stage where the concept of flying all CL events on one day on one site is no longer always practical? At the cost of losing 'atmosphere' it may be possible to organise the racing events on a more equable travelling basis if the needs of aerobatics, speed and combat did not need to be considered. This is not a solution I favour. While accepting the necessity of the present 'split' Nationals, I remember the combined events with affection.

SMAE CL Subcommittee, 21 Burghley Road, St. Andrews, Bristol 6.

Man of the Year(s)

No votes have been cast in this poll — only that of the writer. The award goes to Henry Nelson for almost single-handedly providing the engine that has kept F1C teamrace alive over the last five years or so. Not only did the *Nelson* enter the scene at the same time as the untimely death of the late Paul Bugl removed a source of premium engines but they were also available in large numbers. This ease and quantity of availability gave many teams, myself included, their first real chance of competitive success. The subsequent introduction of ABC and then AAC liners in a variety of timings has kept the basic engine at or near the top levels of competitiveness. Nearly every open or limited entry international since 1978 has had at least one *Nelson* in the final — quite a record. So — thanks Henry. Let's hope the next five years sees the continuation of this achievement.

Jurgen Lenzen Speed Specialities

1. The Certified FAI Speed Prop Type 2

This single blade undercambered speed prop represents 25 years of competitive experience. The prop is made to high standards of accuracy — hence the title. It is intended that the only modification to the blade should be in diameter reductions of 0.5mm stages until the optimum revs are achieved. Alternatively it is possible to effect small increases or decreases in pitch by reworking the combined centre-plate/counterbalance.

Basic construction is of carbon but some glass fibre is included at the centre to give better impact resistance should the model touch the ground with the engine running.

By the time this appears brass counterweights should be available. The prop blade is priced at 16 DM and is accompanied by a comprehensive leaflet.

2. Sidewinder Speed Pan

Designed around the *Rossi* 15 this neat item incorporates a filleted root for a single inboard wing. Webs are cast into the pan's internal shape to give great strength. Although some finishing is required this is minimal and should be possible with hand-tools. Cost is 50 DM.

Amongst the other items available are alloy skinned wings and tails in several patterns, special *Rossi* spray bars and other speed props. Contact: Jurgen Lenzen, Alfred Dobbert Str 57, 5600 Wuppertal 1, Germany.

Bartels Props — a special offer

A chat with doyen glass fibre prop maker Jurgen Bartels at the 1983 European Champs revealed that after a couple of hectic years building a new house, prop production is again in swing. While no less than 34 different props are on offer, Jurgen is making a special offer to team race enthusiasts.

For only £2 per prop Jurgen will supply any of the older pattern racing props. These are still excellent patterns, still competitive and cheap! Of main interest will be:

1. 7 × 6 Tornado

Right Lenzen Certificated FAI Speed Prop. On the left is a 'standard' prop. To the right are props with -0.5mm and -0.5mm diameter. Note solder blobs to rebalance props fitted to old counterbalance/centre plate. Below: Lenzen Sidewinder Speedpan unfinished casting at rear. Finished one in foreground has been painted or anodised black for better heat transfer. Note alloy spar for mounting wing

2. 7 × 7½ Drazek
3. 7 × 8 MVVS
4. Fischer Nitsche
5. Bugl Baumgartner
6. 1976 Metkemeyer Bros.

Please add extra for postage. Bartels — Propeller, Postfach 3001, 2900 Oldenburg, Germany.

Cipolla Master TR Diesel MkII

As can readily be seen in the photograph the latest version of this Italian motor has four mounting points designed to employ direct fuselage mounting. Other changes visible are: alloy prop driver replacing the earlier magnesium version; alloy backplate rather than moulded plastic; removal of the exhaust stack. Internal changes include a stronger crankshaft and hard chroming of the cylinder liner, which remains a drop-in item of the AAC configuration. The neat multi-function valve has separate fill and feed points which means metered primes via fixed volume chambers are a possibility.

Regular readers will know that the *Cipolla* has put in some very good performances in the 1983 season. For those interested, the following are the main details:

Ref. No.	Cost in Lire
25000 Master Diesel 2 5 AAC	250.000
25600 Refuel valve	55.000
25100 Needle for valve	5.000
25160 Venturi (3 1 or 3 6mm)	10.000

Postage within Europe is 10,000 lire.

Postage to countries outside Europe 20,000 lire.

At the time of writing there are about 2,500 lire to £1 sterling.

Orders and enquiries to: Cipolla Engines, via Teoclosio, 23, 20131 Milan, Italy.

USA F2C Selection Trials

Held at Houston, Texas, on the weekend of October 8/9, six teams turned out to contest the three available places. Not unexpectedly Albritton-Perkins came out on top. More interesting is that ex-patriot Feltham member Stoo Willoughby partnered by Bob Oge came a very close second. Previous team members McCollum-Knoppi took third place with much improved performance over their last selection times. The winners used the well known 'Shadow Wing' design while Willoughby Oge used a conventional tail model to score 3.38 and a wing model to achieve 3.33.

All the six teams used *Nelson* motors so it seems the rumoured home grown engines are still not at the stage of matching 'out of the box' performance. One detail which caught my eye was that Willoughby's model used a tube crusher and tank valve to achieve 40 lap range. This might indicate a trend towards vital fuel conservancy for the 1984 season with its smaller tanks. Results: six flights, best three counted, 7cc tanks.

1	Albritton-Perkins	3.31, 3.34, 3.35, 10.40
2	Willoughby-Oge	3.33, 3.33, 3.38, 10.44
3	McCollum-Knoppi	3.44, 3.49, 3.51, 11.24

The UK F2C Selection Trials

In anticipation of 1984 the UK trials were held using 5cc tanks. Although a meeting was scheduled to be run to these rules during early August this was cancelled owing to a lack of a venue. Thus all teams showed up with only the experience of practice sessions as a guide. One theory, which, at present, failed to hold out in racing,was that there would be no reduction in airspeed: In my own case I had to reduce the carb size by 0.2mm to 3.6 in order to reach 26/27 laps per tank at about 19.4/10 airspeed. Other teams reported similar circumstances and indeed several four stop races were witnessed.

Most pilots seemed keenly aware of the potential hazard caused by the extra stop(s) and took great care in landing. In this, the day was kind in being almost windless, allowing teams to often keep two segments apart and so lessening the chances of collision.

After six rounds only the first two teams had shown steady consistency in their times. Out of luck contestant on this occasion was Dave Banks who can only meet pilot Ed Davies at contests. They had range and speed but suffered unusual problems like non-revolving wheels and missed landings.

Regular team members Smith and Brown did not take part in this trial as Mrs. Brown was expecting a second child at the time (Daniel Piers Brown has now weighed in — congratulations). I am given to believe that Steve and Colin will be recommended for selection as third place members of the team on the basis of their previous excellent contest record. While most people support the good sense of this, it is the first time in my memory that the control-line sub-committee has exercised its perogative to actually 'choose' a team. It is bound to be quoted as a precedent in coming seasons.

Results

1	Heaton Woodside	3.45, 3.47, 3.48, 3.53, 3.54, 3.55
2	Wilson Gardner	3.48, 3.54, 3.54, 3.56, 3.56, 4.09
3	Smith-Brown	selected on merit
Reserve		
	Langworth-Broadland	3.56, 3.57, 4.00, 4.00, 4.08, 4.30

AEROBATICS
by Bill Draper

F.A.I. Aerobatics (F2B) Team Trials — Three Sisters 25th September

The trials were held to select the UK Team for the 1984 World Championships. The venue of these championships has been the subject of some discussion, but is currently planned for the U.S.A. (Latest info is Westover Air Force Base, Massachussets, two hours drive from Boston . . . *Ed*).

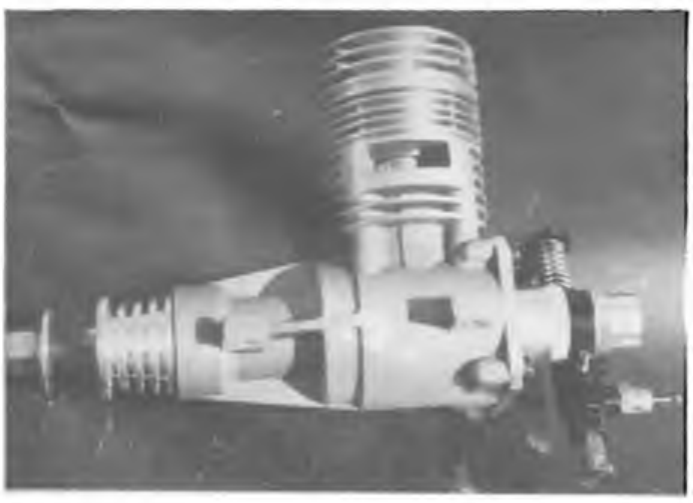
Based upon their past performances in SMAE events, ten competitors were invited to fly. In the event, only eight attended, and so Alan Madeley, who was performing a warm-up flight for the judges, was allowed to fly in the contest as an unofficial entrant for experience, using one of the vacant flying places.

Judges were Reg Lowe, John Harley and Mike Harvey, whilst Ken Reeves took on the job of Contest Director, score-keeper, etc. The weather was initially uninviting, cold, dull and with some high level tubulence. These conditions persisted throughout the morning for the first round. The second and third rounds flown in the afternoon were in more pleasant conditions, warmer and with a calmer and more settled wind. The flyers' position was based upon the sum of their best two scores.

After the warm up, round 1 was opened by Bill Draper using his *Enya* 45 powered 'Superhawk'. Arthur Tipper followed, his plane now pulled by an *S.T.*60 swinging a 12x6 nylon *Tornado*, whilst another *ST* enthusiast, Peter Arkley, used a 46 in his civvy coloured 'Kittyhawk', sounding very sweet and smooth. Pete Tindal was using a 'Chipmunk' rebuilt from his 'Renogade' after a crash the previous week and was not too happy with the trim. Tony Eifflaender's *PAW* 20 diesel swings a full 11 x 6 to whizz his 50in. model through the manoeuvres, whilst Peter Coates prefers the slower approach with the *ST*46 four stroking for most of the time. Barry Robinson was using his well used 'Northwind' whilst Nev Dickinson's model was still quite new and he was experimenting with props on the *OS*15 throughout the contest.

The end of the first round saw Bill Draper, Barry Robinson and Peter Coates holding the first three places. The second round saw a little re-shuffling as several flyers made distinct improvements in their scores, with Peter Coates moving up to second place. However, the third round was a repeat order of the first, and settled Barry back into second place by a mere four points.

The final order and team selection was Bill Draper, Barry Robinson and Peter Coates, a repeat of the '83 team, with Nev Dickinson as Reserve.

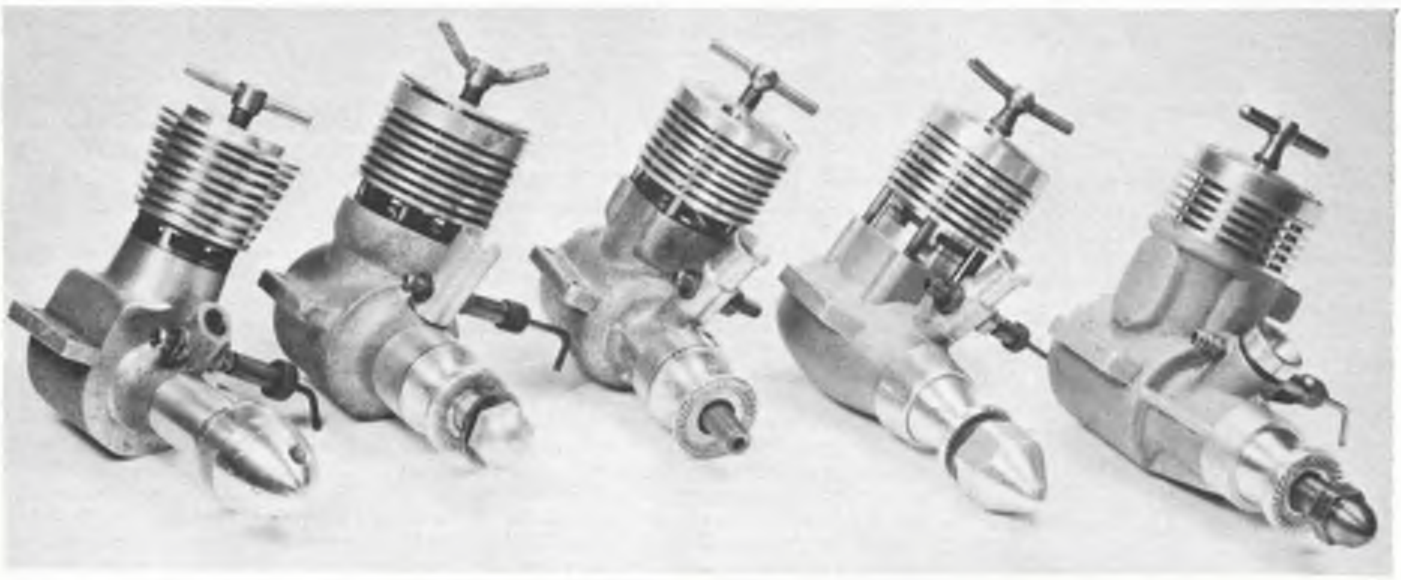


Latest Cipolla 2.5 Teamrace engine employing integral case for bolting direct to the fuselage. This example is the property of Hughie Lorimer.

Results, best two scores to count:

Position	Name	Round 1	Round 2	Round 3	Total
1	C W Draper	2853	3015	3046	6061
2	B P Robinson	2841	2829	3003	5844
3	P Coates	2839	2899	2941	5840
4	N Dickinson	2750	2812	2859	5671
5	A C Eifflaender	2744	2829	2802	5631
6	A Tipper	2660	2808	2768	5576
7	P Tindal	2636	2818	2655	5473
8	P Arkley	2617	2774	2598	5390
9	A Madeley	2148	2376	2322	4698

PETER CHINN'S Engine News



A Unique Oliver Line-Up

The collection of five different Oliver Tiger diesels, shown in our photograph, is probably unique. Covering all five Mark numbers, it belongs to Ian Russell. Older readers may remember Ian as being active in control-line circles some 20-25 years back — and very occasionally in later years.

Of course, everyone remembers the Tiger Mk.III, a few will know of the Mk.II, but how many have ever heard of — much less seen — a Mk. I?

John A. Oliver (the senior partner of the family concern formerly responsible for Oliver engine production which passed into the hands of John S., after his father's retirement) built his very first experimental model diesel in 1945-6. He described it to the writer, some years later, as '*a barefaced swipe of the Swiss 2cc Dyno*'. Dyno inspired designs, it needs to be said, were not at all uncommon in the mid-40s. At that time the model diesel was something that had emerged in Europe during the dark days of the Occupation and was a mystery to almost everyone. Many of the experimental engines that followed it used the Dyno layout, their constructors no doubt feeling constrained to stick to a proven design in order to be convinced that the 'ignitionless' engines really did work . . .

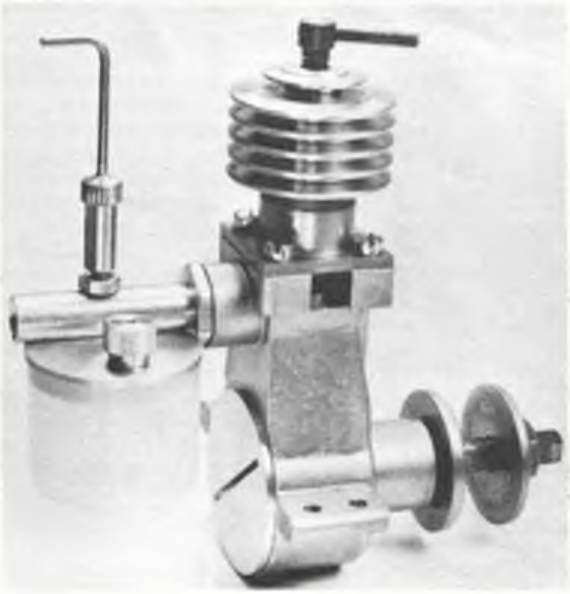
Another new arrival on the modelling scene in the immediate post-war period was the tethered ('round-the-pole') model racing car. A sport that had originated in America with 10cc spark ignition engines, this was extended, in Europe, to include 5cc, 2½cc (and eventually 1½cc) classes and it was in the 2½cc class that the Olivers entered the fray with their first production engine, the J.A.O. Twin-Shaft diesel. It was called a 'Twin-Shaft' because an additional drive shaft and housing was installed in place of the crankcase backplate, the engine being laid across the chassis with the cylinder horizontal and the driving wheels secured directly to each shaft. A car with one of these engines achieved a speed of 42mph, a record at the time.

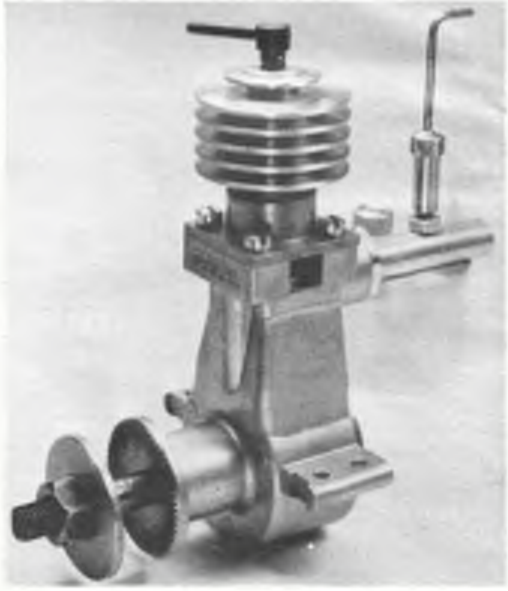
From that point, Oliver engines became as firmly established in the 2.5cc class, as the American Dooling 61 had become in the 10cc class. By 1955, Oliver Tigers had broken every 1.5cc and 2.5cc model car record, in every distance class, from ¼ mile to 10 miles, including the absolute speed record for a 2.5cc car at 88.24mph with a Tiger Mk. II twin ball-bearing twin-shaft engine.

When 2.5cc class control-line team racing began to catch on in the early-50s, the success of the Oliver Tiger in model car racing was not long in attracting the attention of keen T/R contestants, who soon found that the upright single-shaft twin ball-bearing Tiger Mk. II could propel a Class A team-racer faster and farther than any other existing power unit. The outcome of this was that the Olivers were prevailed upon to devote an increasing proportion of their production to single shaft units and to the aircraft version of it in particular. In 1954 the most successful Oliver engine of all, the Tiger Mk. III, was introduced and from then, until the end of the decade, Oliver engines dominated the international contest scene, not only in team-racing but also in FAI free-flight power.

The origin of the Mk. I aircraft motor, however, has long remained shrouded in the mists of time. It has been commonly supposed that such a motor never really existed and that the first production model Oliver Tiger, to be made for aircraft use, was the Mk. II. We have Ian Russell to thank for having ferreted out the story of the Mk. I after he had rescued the motor shown in the photograph, not knowing, at the time, its true identity.

It seems that a small batch of these motors; aircraft versions of the plain bearing Mk. I car engine, were made to the special order of a Swedish customer in 1949.





Above: Ian Russell's unique collection of Oliver Tigers covering 30 years development from the extremely rare Mkl of 1949 on left to Schnuerle-scavenged MkV, far right. Left and right: another modern replica of an oldie. Former manufacturer of the Australian Taipan engines, Gordon Burford, has produced this quality version of the much maligned 1948 2cc 'Deezil.' Deezil includes rear bowl type tank common to free-flight engines of pre-rotary-valve era. Engine weighs 5.7oz complete.

The motor shown in the photograph is the only other known example and carries the serial number AT.201. The story goes that it was deposited with a photographer for some photos but never recovered. This same engine surfaced umpteen years later, unidentified, in a job lot of motors offered by the trader from whom Ian Russell purchased it. Undoubtedly, he has a real collectors' item in this engine. The question is: how many examples — if any — of this one-off batch (believed to have numbered not more than 40), exported to Sweden, still survive?

Strangely enough, one of the other engines in Ian Russell's collection of Olivers also has a 'history'. The Mk. III seen in the centre of the photo turns out to be No. AT.3517 — none other than the motor used in 1954 for the 'Engine Test' report published in *Aeromodeller*'s rival at the time, *Model Aircraft* magazine. After the M.A. Tests, the engine was handed over to one of the fuel manufacturers for further duty as a guinea pig for fuel experiments. AT.3517 emerged again in 1967 when, now owned by S/Ldr. R. W. Rollins, it was returned to Olivers for a new crankshaft, propnut and carburettor.

The *Model Aircraft* test report on the standard Mk. III credited it with a power output of 0.305bhp at 14,000rpm. Nearly 30 years ago, this was the highest power output obtained in a test of a 2.5cc engine. Equivalent to 124bhp/litre, it was also the highest specific output recorded for a model compression-ignition motor. Oliver Tigers could, however, be factory modified for extra power and most of the keen contest flyers opted to have this work carried out, which consisted, basically, of improving gas flow through the ports and reducing reciprocating weight. When we tested a 1961 Works-Modified Mk. III, power was found to be increased to 0.365bhp at a remarkably high 18,000rpm.

After a production run of almost 13 years, the Mk. III finally gave way to the Mk. IV model in February 1967. For this, a new and stiffer crankcase casting was designed which also allowed the fitting of an exhaust collector ring. The cylinder wall thickness was increased, crankcase compression was raised and the transfer ports modified. On test, a stock, unmodified engine returned an output of just on 0.36bhp at nearly

Above left: specially made for Performance Kits, the .76cc PK F-80 diesel. Based on D-C Merlin parts, with deluxe external trim. Above right: Deezil partially dismantled. Long-stroke layout is typical of early diesel design philosophy derived from original Swiss Dyno of 1941. Below: from America's best-known provider of control-line engines, comes the new 'Series 5' Fox 36C!. Compact 5.9cc glow engine, based on Combat Special Series III main casting, has Schnuerle scavenging and single ball-bearing crankshaft.

16,000rpm and there is no doubt that a reasonably good tuned example would better 0.40bhp.

Oliver Tigers have always been strictly 'hand-made' limited-production quality motors. Like Morgan sports cars, they have enjoyed, over the years, the patronage of a changing but enthusiastic group of customers, so that demand has always kept ahead of supply. Happily, as one door has closed, another has opened. When the popularity of tethered model car racing declined in the 50s, there was an even bigger demand for Tigers from the international team-racing and free-flight fraternity. When FAI team racing, in turn, declined in popularity, as it became an event for exotic toolroom-specials, and when free-flighters switched their attention to high-performance glow-plug engines, it was the C/L combat flyers who began absorbing more and more of Oliver's output.

Oliver production of recent years has been concentrated on the Tiger Mk. IV in Standard, Combat-Special, Modified and R/C versions and on two 1.5cc models, the Tiger-Cub Mk. II and the newer Tiger-Cub Schnuerle scavenged model. Recently the 3.5cc Tiger-Major has been re-introduced and has found favour in its R/C version with many vintage event enthusiasts.

An example of the last engine illustrated in Ian Russell's 2.5cc Tiger line-up was described and illustrated in the June 1981 *Engine News*. At that time, there were no plans to produce this entirely new Schnuerle-scavenged type Tiger 2.5, of which only a small experimental batch had been manufactured. This position remains unchanged for the present but the engine has now, John tells us, been accorded the title 'Mk. V' which should, at least, end some of the confusion that has previously existed about it.

A final note. Readers are reminded that Oliver Tiger engines are available only direct from the manufacturer. For prices and delivery (there is invariably a waiting list) write to John Oliver (Engineering), 248 Ringwood Road, Ferndown, Dorset.

Burford 'Deezil' Replica

When, at the end of the 1939-45 war, having discovered that the Swiss had apparently made the model spark-ignition engine obsolescent, British manufacturers joined their Continental counterparts in a rush to produce 'diesels', few of them were aware that, on the other side of the Atlantic, the best spark-ignition motors had progressed a very long way since 1939. This is not so very surprising for domestic producers were isolated from transatlantic influence and competition by Government controls which prohibited precious hard currency being frittered away on anything so frivolous as the importation of American model aeroplane engines.

So, by comparison with the top American engines of the period, most of those early European diesels tended to be rough, heavy and sluggish and the Americans were unimpressed by them. Even the diesel's major advantage, the elimination of the weight and complication of a spark ignition system, was short lived: in 1947, Ray Arden achieved the same thing by introducing the glowplug.

But, in the post-war seller's market, the US produced some diesels of its own which were not very good either and just about the worst of the bunch was a 2cc unit which rejoiced in the name 'Deezil'. The Deezil

Continued on p.99

FREE FLIGHT SCENE

Slow Open Power? . . . Dave Hipperson

One addition to the SMAE rule book for this coming contest season which seemed to receive almost enthusiastic acceptance by the SMAE Council is that of the Slow Open Power class. (Full rules in December Aeromodeller and of course from SMAE head office at Leicester). Slow is rather a misnomer as there is nothing in the rules to reduce speed as such, apart from the limitation to standard plain bearing engines.

However by banning the use of any timed moving surfaces apart from DT and disallowing engine pressurisation the intention is to offer a class more along the lines of the models being flown in the 60's but that is not to say the aim is to retard progress. The accent is on aerodynamics, trin and spiral stability rather than encouraging unstable trajectories held on course by in-flight adjusters.

Understandably a number of power *experts* have registered their guarded disapproval although most of them offer their own very similar solutions when pressed. It is quite correct to say that a power model is more difficult to trim without VIT, auto rudder, pressure feed, flood off and prop brake. That is *exactly* the point. It requires a different approach and a simple model. It will appeal to those that want a competitive power model class that can be taken out of the box and flown without the need to take a refresher course in miniaturised plumbing and reacquainting oneself with a pre-launch check list that would not look out of place on a Saturn rocket — before one flies it.

The response to the experimental event for this class run last February was promising, particularly considering the very limited advance publicity. Here we have the details of the winning model that day. Maurice Gilmore used a layout of exactly the type expected to be successful. Originally designed for PAW 1.49 Maurice chanced his arm and replaced the diesel with an OS Max 15. Much more power but the same weight! (Now of course there is a two second engine run advantage allowed to diesels so the original power plant might be very competitive). All up weight came out around 14oz with the CG way back at 80 per cent, no down or side thrust and precious little incidence difference between wing and tail. The resulting power trim took the form of a very safe spiral pattern with enough height for nearly four minutes in the dead air flyoff. The wing section is from an *APS* 'Eliminator' but with different spar treatment. Of course the 'Eliminator' itself might be competitive as would numerous other *APS* designs. An excuse for a browse through some back copies! Fairly recently, certainly from the end of the 60s back, you might well look at the 'Cuddy,' 'Sloworm,' 'Creep,' 'Climax,' 'Heatwave' and of course 'Dreamweaver,' 'Dixelander' and George French's tremendous 1/2A Train which certainly in his hands would match most 1/2As being flown now.

Being a coward my preference would be for a large slightly underpowered set-up. To concentrate on a good glide of course ... nothing to do with my inability to handle fast power models! Some idea can be seen in the other illustration adjacent to Maurice's. A *Cox TD* 09 for power, 40 per cent tail to control the climb and a large 350sq. inch wing to get me back into the ways of trimming power of this sort, but gently. I can remember thinking nothing back in '63 of using a *TD* 049 in a model as small as 160sq. inches and not so much as an auto rudder!

Trimming

Many tempted to fly this class may not have tried power duration before, or if you have it may have been so long ago that you have forgotten the basic essentials of trimming. A few reminders may not come amiss, although I can hardly pretend to be an expert. Certainly my introduction to contest flying in '61 was through power and in those days everyone, myself included, flew fixed wing aeroplanes and very many more flew then too!

To stop a model looping all over the sky on full power it is necessary to fly with very little decalage. (Difference in incidence between wing and tail). One or two degrees was the norm, although rarely measured — it was usually arrived at by starting with a very rearward CG of 75-85 per cent and trimming the glide from hand launches hoping that gave an incidence set-up close enough for the first power hops. Wings, certainly on models of the size illustrated here, should have ⅛in. or so of wash-in on the starboard inner panel and about the same amount of washout on both tips.

Tails should be flat and thrust lines straight at least to start with unless you insist on flying with a more forward CG when you will need some downthrust. Glide turn will be from tail tilt. Tilt the tail up on the side you wish the model to turn towards. All pylon type power models should turn to the right on power because of complicated forces like gyroscopic reaction to the prop's high revs, therefore it is good policy to have the glide in the same direction so as to ease the tricky pull-out stage. Therefore tilt the tail up to approximately parallel the starboard inner wing panel.

After these basic adjustments the model should be ready for power, as long as the glide from a hand launch looks flat and slightly to the right. If you are using a motor that can be run at reduced power than do so as it will enable you to double check the glide if nothing else. However most modern motors, including many diesels don't take happily to this treatment so you may have to go straight to full power. Adjust for a very short run, two seconds, but before flying make sure there is a hefty amount of power 'tab.' I usually stick a strip of 3/16in. × ⅛in. perhaps as long as 2in. down the starboard side of the fin rather than cutting into the fin — it's more robust.

It is safer to have too much right turn tendency at this stage than too little as this could leave the model in an embarrassing attitude and unable to recover from a stall when the motor cuts. Launch the model steep with a slight right bank and slightly right of the wind. If things look about right continue with longer engine runs. More likely is too tight a turn to the right. If so keep the same length run and cut off some tab until it climbs all the way through the run.

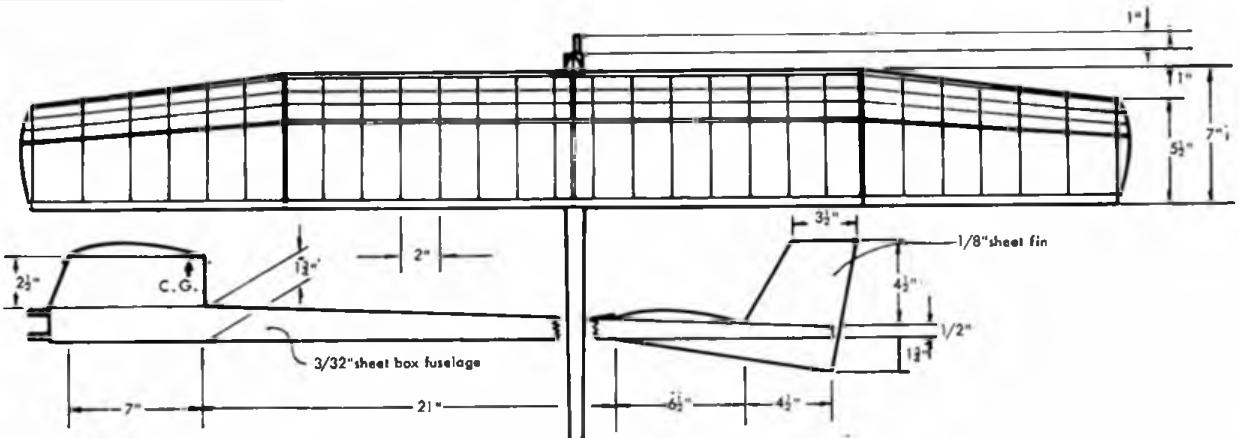
If the model loops over onto its back reduce the decalage — if it tends to flatten off straight ahead then the decalage needs increasing. The first sign of a roll to the left should be evident as you lengthen the run to five seconds or so. If the model is not rolling you have a problem as it is essential that something stays in step with the looping tendency even if that tendency is only very slight. It is this balance that gives the true spiral climb. Without roll this will be impossible. Add more wash-in if the model will not roll, or even wash-out on the port panel. Once rolling at a steady rate the trick is to adjust the turn so that it stays in phase with the roll. A perfect pattern would be 1½ to 2 complete turns in ten seconds, maintaining a very steep angle all the way. Very reliable and a pattern that will hold up in a wind too.

As you reach these final stages you will notice that a tiny reduction in decalage accentuates the rolling tendancy and a tiny increase in decalage decreases the rolling tendancy. This can be used at the later stages to perfect the climb. Some designs exhibit a tendancy to roll more at the end of the power run, when they are travelling faster, than at the start. This is annoying and makes a clean pull out difficult. The pull out without auto rudder has to rely on the motor cutting cleanly and the model still travelling at sufficient speed to roll out into the glide. Beautiful to see if you can achieve it but you may have to be content with a slight stall.

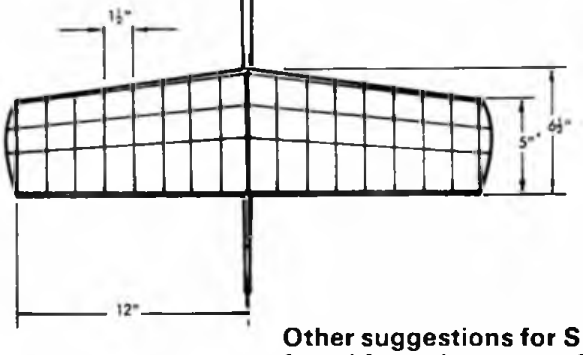
Often after the power is sorted out, you discover the whole set-up is slightly tail heavy and a glide stall develops. It stands to reason that with a short nose and a long tail moment it is vastly easier to move the CG back with a little ballast in the tail than to move it forward so it is good practice at the building stage to tend towards a slightly further forward CG than you think you will need. The glide trim can then be fine-tuned by approaching the stall with ballast (not incidence) after the model is safe on the full power run.

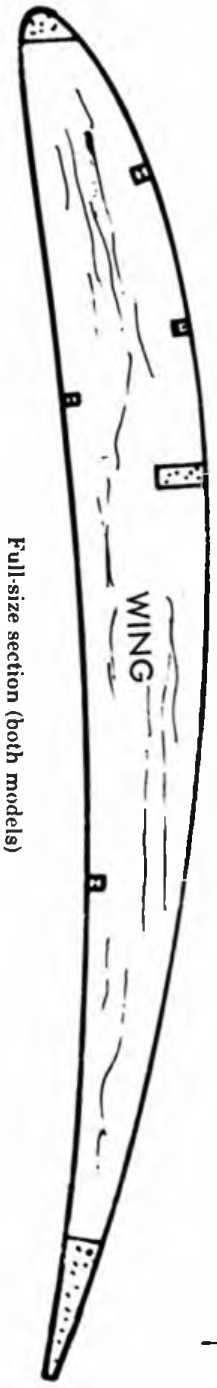
How easy the above operations are depends entirely on how much power you intend to use in how small a model. Maurice Gilmore's model is somewhat of an expert's aeroplane with its *OS* Max 15. Better start with the very reliable *PAW* 1.49 (remember you get two seconds more engine run). My first off is based loosely on a configuration I flew to some effect in the early 60s. It's concessions to modern fashion being the tapered panels. I have also added 50sq. inches to the original area so that it will not frighten me too much! Built light it should certainly glide.

Remember some of the best trimming advice is published along with those past power designs already mentioned. A careful study of the articles will shed light on the problem from a lot of different angles. I hope the Editor can list the relevant back copies so as to lessen your searching time.



The 'Hipperson' approach to Slow Open Power . . .

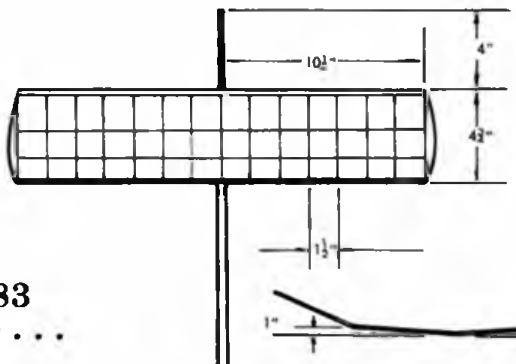




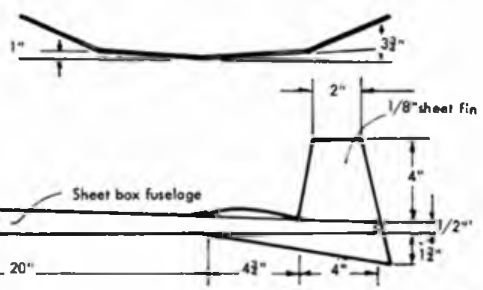
Full-size section (both models)

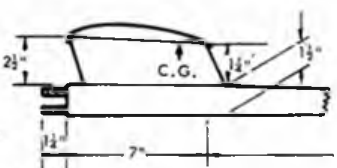
Full-size section (both models)

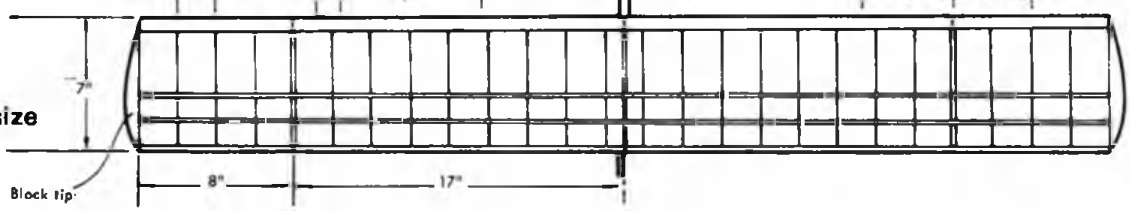
Other suggestions for S O/P can be found from the pages of Aeromodeller.
Creep (PET/609X) November '55
Dreamweaver (PET/653X) Apr '57
Heatwave (PET/686X Jan '58
Climax (PET/973X June '68
½A Train (PET/994X) Jan '69
Cuddy (PET/1207) Oct '73
Plans for the above are available from Aeromodeller Plans Service (see back cover).



Slow Open Power '83 by Maurice Gilmore . . .







Models 1/5th size

SMAE Mini . . . October 30 . . . North Luffenham

At the cold and windy second SMAE Mini meeting a deep valley and various buildings upwind meant that all day, flyers had to cope with rolling turbulence right across the 'drome. Although it was never vicious it made flying Cd'H and CO_2 very difficult indeed. A high standard was set in ½A however with Baggott, Wells and Peers all outclimbing the turbulence despite occasional gusts of over 25mph around mid-morning. The class was won eventually by Screen with only five seconds short of a full score. Stafford flew his old orange model again, after it had been found in a Beaulieu forest over a year after its loss! The above average motor had obviously not suffered as the climb was really exceptional. A1 Glider flyers had little trouble with turbulence but it deterred all but a handful. This class is tricky in a wind. In fact John Carter's winning total represented the only five flight score so presumably wing folds were taking their toll — certainly Cooper had one to place 2nd with only four flights. Considering the largely unsuitable conditions Cd'H had a large field although during the day only 9 maxes were recorded. The average flight time being around a minute. It stands to reason therefore that as Dennis Davitt had three of these maxes himself he should emerge a clear winner. It was not a day without incident for him however. After a delayed start from home with a flat tyre, he managed to break down twice on the way to the aerodrome and in two different and quite new vehicles! His eventual arrival coincided with the improvement in the early afternoon weather and after all the effort of getting there he obviously wasn't about to let a little wind upset him.

CO_2 was a one horse race with Ball demonstrating his expertise, he also sewed up HLG a few hours later. A reluctance for anyone else to risk it in CO_2 prompted Carter to make an attempt for a place. Then, less than an hour before the close Russell Peers decided he too would have a go. He had one problem. He had no model nor motor! However, such small hurdles do not put off a desperate man. He commandeered a club mate's 'Turbo' unit and stuck it on the front of his precious 'Wigan 70'. This act of desecration was enough to attract a small crowd of supporters to egg him on. After an abortive first flight 'trimmer' some extra incidence and a little up-thrust were added and Russell proceeded to fly rather better than his club mate Carter. To complete six flights in 35 minutes rather resembled a scramble. Sadly, he had no time for his last flight, so all five he had completed had to count, including the very short first flight. Both Carter and Benns, who was also short of flights but had logged two maxes, pushed the exhausted Peers out into 4th place. Never has anyone worked so hard to come last!

Ball's double victory had clinched the '83 Senior Champs for him and Trevor Payne had made a very professional job of running the day despite the cold. A successful meeting with vastly more entries than the earlier Driffield event.

Results

A1 (10 entries — 4 flew)

1. J. Carter	Falcons	8.32
2. J. Cooper	Higgles	7.21
3. M. Kinder	Falcons	5.24

Coupe d'hiver (17 entries — 12 flew)

1. D. Davitt	Leeds	8.39
2. M. Chilton	E.P.S	8.02
3. G. Sharp	Croydon	7.48

½A Power (15 entries — 9 flew)

1. S. Screen	Birmingham	9.55
2. R. Baggott	Birmingham	9.51
3. A. Wells	Anglia	9.18

CO. (8 entries — 4 flew)

1. P. Ball	Grantham	8.59
2. M. Benns	Peterboro'	4.45
3. J. Carter	Falcons	3.46

HLG (15 entries — 9 flew)

1. P. Ball	Grantham	5.00
2. M. Page	Peterboro'	4.39
3. J. Hopper	Freebird	4.29

European Team Trials . . . April 30, May 1, Nov 12, 13

After something of a false start in May when only four flights were completed before the weather closed in, this 2nd Trials to finally determine the team to attend the European champs next August, posed something of an organisational nightmare. Ten flights in two days with the daylight available in November lasting only until 4pm *and* the very real chance of fog, considering the Norfolk venue. A meterological miracle was worked however and suitable visability with light lift and drift for the whole weekend, coupled with the vastness of RAF Sculthorpe encouraged even those who had dropped from the running to continue to the end. FIC flyers proved particularly determined here. Although only a handful of 12 had entered, every one completed the 14 flights and provided the closest finish of the contest with Screen and Jack fighting it out in a flyoff that went to the six minute round before both contenders called it a day. Pete Harris made up the three, by maxing continually after having dropped the very first flight back in April.

FIA saw an unusual situation with a tie at the top between Fantham and Baines after both had dropped 58 seconds somewhere along the way. Fantham losing time on three of his first five flights whereas Baines had done better earlier to lead the first four flights, only to allow his score to slide a little on the final day. The resultant fly-off gave Fantham victory with another flight over three minutes taken after he had watched his rival launch early for only 2.19 when appearing to be just on the edge of the lift. Third place was resolved after a dramatic disaster for Maurice (Dr Teeth) Gilmore who, looking set only seconds behind the leaders, misjudged a circle on tow for the penultimate flight, to have the model unlatch very low down and in buoyant enough air to well exceed the 20 secs. attempt! An easy max, had it come off at full height! In the circumstances, remembering some of his past disasters Maurice took this very well. In came the very consistent Philpott fresh from his 7th place at the Australian World Champs only one month before. His launches were spectacular — the model climbing like an HLG off the top of the line — to gain as much s 30ft. on

A bumper bundle of winners at the European Team Trials, it's surprising that they all look happy after this year's protracted selection programme. All names to be read left to right with no attempts allowed . . . Right: FIB Wakefield trio, Russell Peers, Dave Greaves and Roy Miller. Below left: FIA Glider, Brian Baines, Mike Fantham and Steve Philpott. Below right: FIC Power, Stafford Screen, Pete Harris and Alan Jack.

occasions. This extra height certainly gave him the advantage in the rather neutral wintery conditions that prevailed for the whole weekend.

Dave Greaves has come close to team places many times. He knows, perhaps better than anyone, what it feels like to finish 4th so it must have given him great satisfaction to dominate F1B at these Trials from start to finish. His early lead was whittled away in the final 10 flights when he maxed only five times but the shortfall was never serious enough to let anyone catch him. He even became bold enough to switch to a model with a very uncharacteristic *round fuselage* for some of the final flights, although we didn't let him pose with it for the final photos! His climb was always very fast and more important, on pattern every time. The same could not have been said of Ron Pollard who after clawing his way back up to third after a first flight of 2.12 and some very stally climbs, blew it on the final flight with a 1.36! Roy Miller jumped into 3rd place immediately with rather steadier flying and second place found Russell Peers making the team at his first ever try with a model much inspired by clubmate Ivan Taylor. On this day at least he flew it rather better than his mentor. He did drop time towards the end of the day but less than anyone else, thanks to a reliable trim and excellent glide.

Most contestants seemed satisfied with the outcome but it can only be a matter of time before someone questions the wisdom of limiting our Trials events to largely calm conditions when the last two World Champs have been windy and wet!

Results

F1A

1.	M. Fantham	41.02+3.14
2.	B. Baines	41.02+2.19
3.	S. Philpott	39.53
4.	E. Drew	39.19
5.	A. Cordes	38.55
6.	M. Gilmore	37.52
7.	M. Dilly	37.37
8.	A. Crisp	37.06
9.	T. Le Vey	36.53
10.	M. Gregorie	36.52

F1B

1.	D. Greaves	40.32
2.	R. Peers	40.03
3.	R. Miller	39.31
4.	R. Pollard	38.43
5.	M. Duce	38.42
6.	I. Kaynes	38.06
7.	I. Taylor	37.59
8.	A. Wells	37.40
9.	J. Barnes	37.10
10.	M. Woodhouse	30.15

F1C

1.	A. Jack	42.00+4.00+5.00
	S. Screen	42.00+4.00+5.00
3.	P. Harris	41.42
4.	R. Monks	41.17
5.	J. Bailey	41.10
6.	K. Faux	41.02
7.	R. Johnson	40.38
8.	F. Chiltern	39.47
9.	R. Baggott	39.14
10.	R. Collins	38.37

Indoor Nationals — August 27-29 ... Laurie Barr

We were not quite blessed with the superb summer heat-wave which preceded that August Bank Holiday weekend but the conditions were fairish!

Saturday was a quiet day, most people trimming and chatting! As anticipated, we had an 'International' atmosphere with the arrival of Dieter Siebenmann from Switzerland, Otto Rodenburg and G. Weekenstroo from the Nederlands, Bernie Clifton and Eddie Kelly (ex-patriots, now from Belgium) and Jos Melis and Bob De Smet *real* Belgians. All the makings for a great meeting...

CO_2 Duration had only two entries and a newcomer D. Wolstenholme won over Graham Davitt. Our Technical Committee may well look at revising the rules to make this event more popular.

In Manhattan the six gram model still reigns supreme under our 4g/6g handicap rules and Henry Tubbs won comfortably over Ken Bates second, and D. Wolstenholme third, who must have been pleased with his first taste of 'The Big Hall.'

Sunday produced a large entry in EZB for The Houlberg Silver Medal (Individual) and the final day of the AGM Novice/Experts Pairs Trophy, which has been running all year.

The events were hard fought all day and all who took part said it was the best EZB competition ever! The result remained in doubt even with the last models in flight just before the six o'clock deadline.

Bernard Hunt who has clearly been our best EZB flyer for two years now, did 24 minutes plus in practice (a new un-official record as it was only timed with his own watch!) but stayed in third gear during competition flights to win with only two 21 minutes flights! This gave him a 2 min. 16 sec. advantage over Graham Davitt in second place, with Bob Bailey running third.

The AGM Novice/Expert EZB pairs contest has been a fair success with its objective of getting experts to help novices, by mixing up the pairings throughout the year. Special mention must be made of young (12 years?) Robert Jones Jnr., who can build and operate an EZB like a veteran, way beyond his tender years. Keep it up Robert, you are the stuff potential champions are made of!

Monday dawned grey and overcast, but the gloom was relieved by the re-appearance in the hangar of Dieter Siebenmann who had been harshly struck down by a virus infection which had laid him low all Sunday in Bernard Hunt's caravan!

For most of the day the flight times were pretty average, but Jos Melos joined the 30 minute club with 34 min. 21 secs. Other (British) fliers were saving their best models for the team trials but Bernard Aslett found a 'good-un' and the contest was decided during the last two flights, both models being launched just before the six o'clock deadline, and in the best air we had had all weekend.

Dieter was flying his usual long film ship *but* with a narrow bladed 24in. diameter prop *(65cm wingspan is approximately 25½in!)* and he is the only flier who I have seen get a 24 'propped' FID right up under the centre catwalk.

Having done that he gained the benefit of the slower let-down to record his first ever 40 minute plus flight, the final descent took place at the far (airship) end of the hangar, while Bernard Aslett's was doing its stuff at the 'door' end for a splendid 39.54. Just short of *his* first ever 40.00 minute official flight in FID. With a better back-up flight, Bernard won the contest with 40 seconds to spare over Dieter. Otto Rodenburg was a most worthy third. A most exciting finish to one of the best ever Nationals.

With a *record* 44 entries for the two gram 'Flyrod' novices EZB contest on October 9 our Indoor scene has never looked better, and the ultimate aim is to get more Microfilm fliers *involved* in what is by far the most enjoyable class of model and thus strengthen the already high world class stature of British Indoor Flying.

EZB — AGM Pairs Trophy Final (Total for three previous meetings) — 15 entries

1.	R. Bailey	69.50
	A. Robertson	
2.	B. Aslett	67.39
	R. Jones Jr.	
3.	S. Godfrey	67.09
	G. Davitt	
4.	R. Green	66.07
	R. Jones Jr.	
5.	G. Davitt	64.16
	R. Jones Jr.	

Results

CO$_2$ Duration (Sparklets Trophy)

1.	Wolstenholme (East Lancs.)	8.58
2.	G. Davitt (Leeds)	8.41

Manhattan — four entries

1.	H. Tubbs (Leeds)	13.09
2.	K. Bates (Clee MAC)	10.23
3.	D. Wolstenholme (East Lancs.)	7.18

International group of finalists in FID Microfilm at the Indoor Nationals. Left to right: Dieter Seibenmann (2nd), Bernard Aslett holding the Aeromodeller Trophy and Otto Rodenburg (3rd).

EZB (Houlberg Silver Medal) — 20 entries

1.	B. Hunt (Huddersfield)	21.00 + 21.02 = 42.02
2.	G. Davitt (Leeds)	19.40 + 20.06 = 39.46
3.	R. Bailey (St. Albans)	18.52 + 19.40 = 38.32
4.	D. Davitt (Leeds)	18.17 + 19.51 = 38.08
5.	B. Kenny (Vulcans)	18.26 + 19.24 = 37.50
6.	J. O'Donnell (Whitefield)	18.12 + 18.29 = 36.41
7.	B. Clifton (Genk!)	18.23 + 17.43 = 36.06
8.	Otto Rodenburg (Netherlands)	17.37 + 18.15 = 35.52
9.	L. G. Barr (St. Albans)	15.18 + 18.09 = 33.27
10.	S. Godfrey (CM)	15.53 + 16.26 = 32.19

The Aeromodeller Trophy F1D Microfilm — 13 entries

1.	B. Aslett	37.24 + 39.54 = 77.18
2.	D. Seibenmann	36.28. + 40.10 = 76.38
3.	O. Rodenburg	33.39 + 38.24 = 72.03
4.	R. Bailey	34.55 + 36.15 = 71.10
5.	D. Pymm	35.30 + 34.10 = 69.40
6.	D. Morley	29.28 + 37.12 = 66.40
7.	L. Barr	33.25 + 33.10 = 66.35
8.	J. Melos	34.21 + 31.39 = 66.00
9.	J. Lefevre	30.42 + 32.45 = 63.27
10.	B. Hunt	29.37 + 33.42 = 63.19

Open Microfilm

1.	J. Melos	34.21 + 31.39 = 66.00

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Two more useful ideas from T. Faulkner

1. Cutting G/F Cloth or Mat

These materials often prove intractable; fine weave cloths often pull threads even when extremely sharp blades are used.

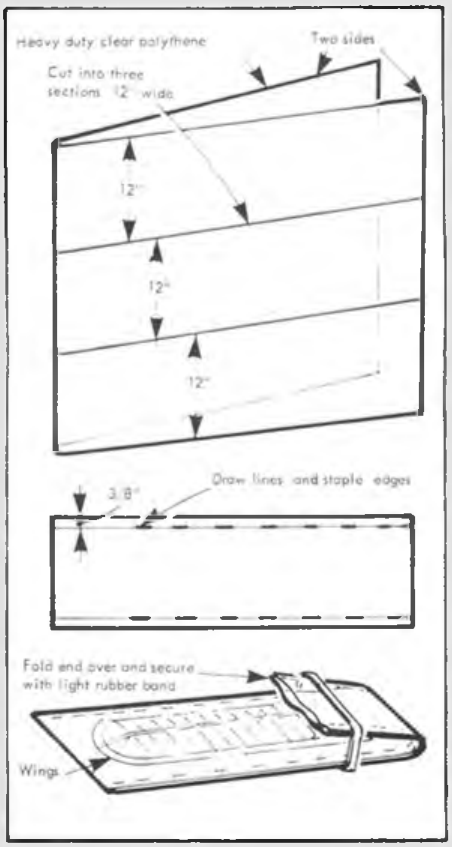
I have found that a 'wavy edge' kitchen knife overcomes all the problems usually associated with these products. My particular knife is a stainless steel job, blade about 6in. long. It is hollow ground, but seems to respond to sharpening on either a grindstone or oilstone equally well. The glassfibre should be supported on any type of sheet material which yields to the knife (e.g.: card, newsprint, plywood). Hardboard or chipboard are not so good.

2. Dihedral Braces/Wing Joiners

These components need to be flexible and yet retain their shape when under normal loading conditions. Aluminium can distort, as can wire, unless excessive thicknesses are employed. In such case, damage to the wing itself can occur.

Recently, I have used plastic plant labels, sawn and filed to shape and size. They have ideal physical characteristics, are light in weight and show no directional grain weaknesses.

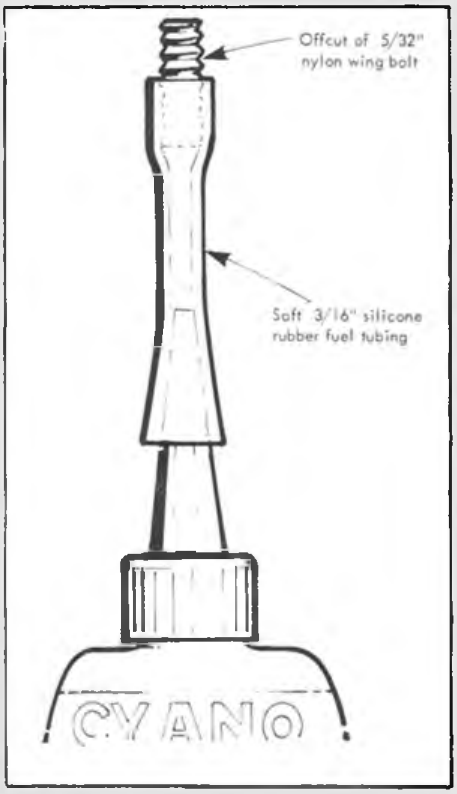
Models so far using these joiners are my 'Jackdaw' and 'Fred' (two versions). I would suggest that 36in. span, 7ozs. models represent the upper limit for single joiners, but doubling up should extend the range.



Model Protection from E. S. Wisbey

This idea scores on two counts: (1) it really does offer a reasonable degree of protection for any model with removable wings and tailplane; (2) Whilst offering this protection you can see exactly what is protected and treat the contents with the care they require. Newspapers fulfil a similar function, but what is inside may be a lightweight tailplane or a solid sheet structure . . . one usually finds out too late!

The diagram should be self-explanatory, the only items needed are heavyweight polythene sheeting available from your local D.I.Y. shop and a stapler. Dimensions given may be altered to suit your particular needs.



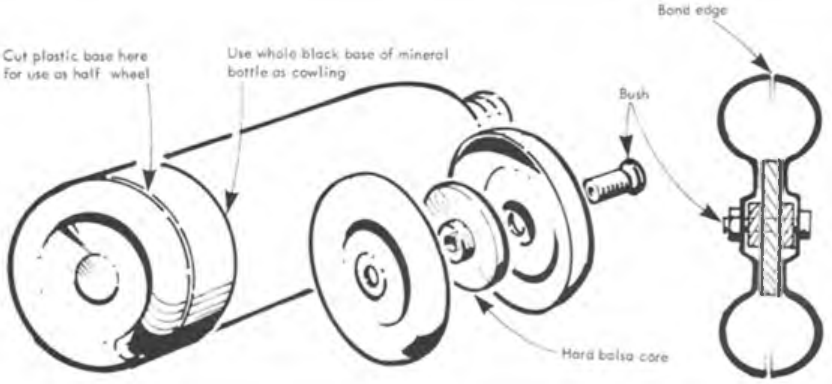
Simple Leak Stopper from P. Michel — Winner

One annoying problem facing cyano glue users is how to stop the stuff leaking out into your bits-and-pieces box when, as so often happens, the bottle tips over on the way to the field.

Here is a solution from vintage rubber flyer Peter Michel using cut-offs of nylon wing-bolts and silicone fuel tubing (the nice green or blue squishy stuff). Just screw the bolt into the tubing and there you are — an instant stopper which won't gunge up!

Peter says that as you push the stopper on to your bottle, the air pressure forces any remaining cyano back down the nozzle, thus countering the annoying tendency of cyano to congeal and gum up the works in this area.

It also works a treat on the good old balsa cement tube.



Two 'Pop' ideas from E. Marsden

The modern mineral water containers, made from flexible plastic, have a moulded base. If this is cut away from the empty container it will make an excellent radial cowling for .049 to .09cu.in. size engines (or large scale rubber).

Two of these bases, suitably trimmed, may be bonded together to make the old style, hollow, lightweight wheel. These are suitable for large vintage rubber models, or small power models. A balsa core in the web, plus a bushing to suit the axle size may be epoxied into place.

FAMILY FLIGHT

by Joanna Livingstone

MY HUSBAND is addicted to aeroplanes — well, more obsessed with them, really. As a result I too have become an expert, though not a very willing one. But I reckon I could write a book on Airfields of South-East England — perhaps "Muddy Fields I Have Known" would be a better title.

John had the sense to keep quiet about the subject before we were married and although I knew his parents' house was littered with stray wing sections and skeletal looking fuselages, I assumed these were merely remnants of his childhood. It was after we were established in our own place, when it was too late, that I found aeromodelling was by no means a thing of the past, but very much a current affliction. It seems to go in phases, rather like those illnesses that have a period of recession and then come on again, worse than ever.

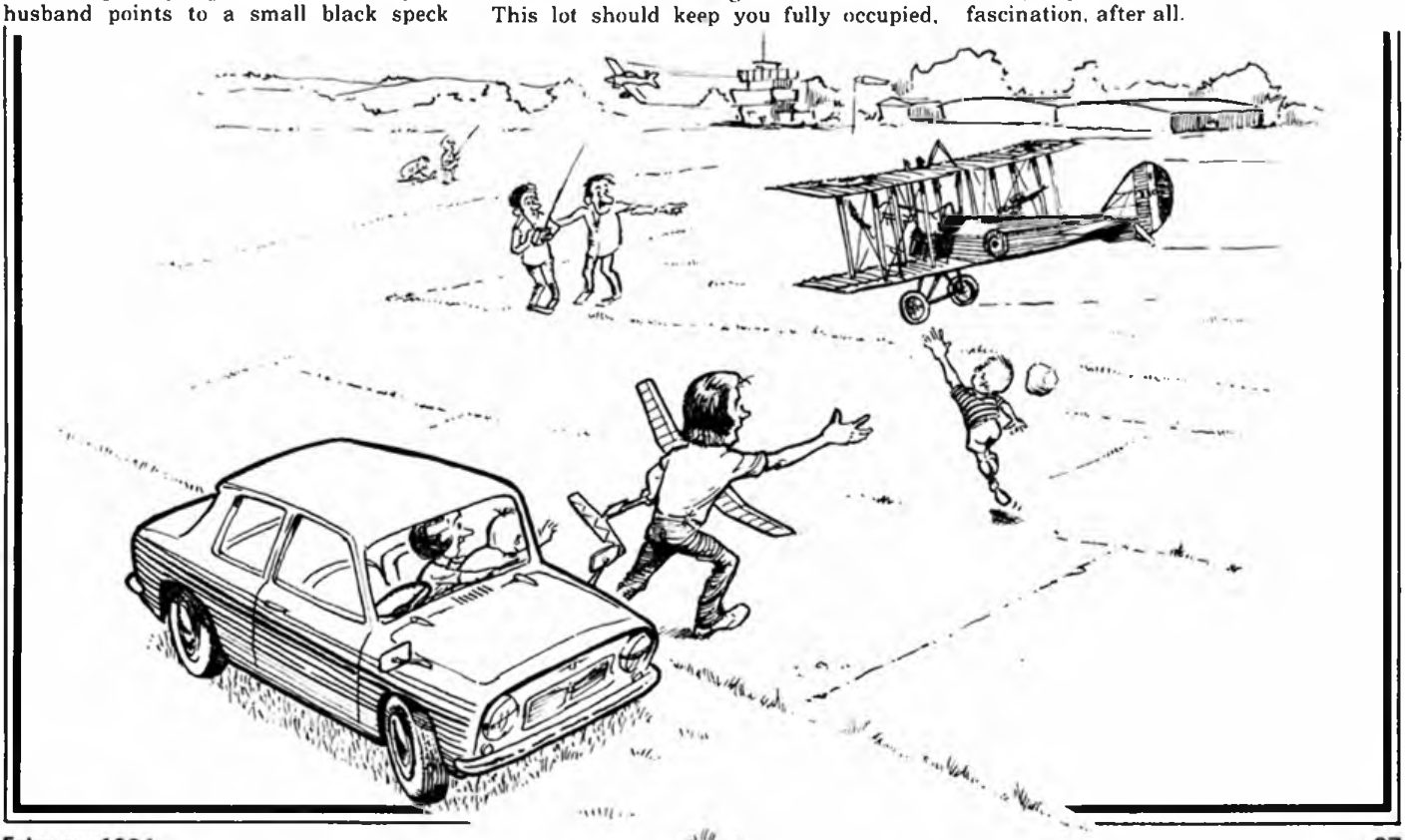
Anyway, one of the fringe activities, the one which the whole family gets involved in, is air displays. This doesn't sound too bad, if you say it quickly, and occasionally it isn't. You need a fine summer day, preferably at the end of a long dry spell, a high resistance to boredome, good eyesight and a well-trained bladder. That last is an essential — I've never known an airfield yet where the toilet facilities were anything but abominable. The good eyesight is needed when your husband points to a small black speck vanishing into the clouds, and expects you to admire its undercarriage mechanism, engine mountings, or any other endearing little features it may have. As I need glasses to see to the end of the garden, I don't do very well at this bit.

The fine day is necessary, not just so you can sit and sunbathe if you manage to escape for a few minutes, but also because every airfield I've come across has this ambition to become one vast mudpie. Most of them succeed. A typical day at one of these shows consists of hopping through ankle-deep mud, losing the odd Wellington boot as you go and picnic in an east wind. You see the odd aeroplane vanishing into middle distance with a noise like 'Concorde' and you're told every half-hour or so how much you're enjoying yourself.

Once you have children, the emphasis shifts a little. At last you can feel you're really being of some use. How else could your husband have that virtuous glow which comes from taking the family out for the day and still be free to watch every event of the afternoon? So Dad is able to leap happily from Rat Race to Hand Launch Gliders, from Open Rubber to the Pylon Race. Meanwhile Mum can sit snugly in the car, feeding the baby with one hand, eating her own lunch with the other and mending her son's broken chuck glider with her teeth. This lot should keep you fully occupied, along with several trips through the mud to those unspeakable toilets. And when your husband staggers back to the car loaded down with leaflets on five-minute epoxy and thermatic glowplugs, you will both be able to feel you've had a full and satisfying afternoon.

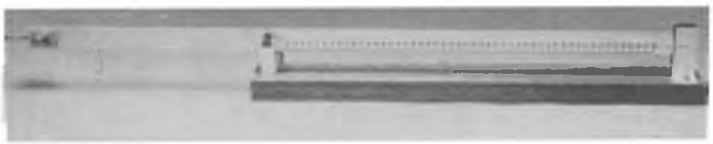
Another hazard for modelling wives is the trip to the local flying field. In some ways this is better than the more formal occasions — it's a lot nearer and needn't last so long, although somehow it usually does. Against this is the fact that it's always there. You can't claim you'd promised to help at the school jumble sale because that only takes care of Saturday afternoon. I know you don't have to go at all, but if you stay at home you will quite definitely have to look after the kids, while if you go all out there is that faint ridiculous hope that your husband might do sentry-duty for half an hour, while your curl up with a good book.

Actually, you know quite well how it will be. The toddler will be trying to catch the planes as they come in to land, the baby will be screaming encouragment, while your husband swears that he'll-never-bring-that-adjectival-brat-anywhere-near-the-field-again and what's he-trying-to-do-now-kill-himself? But somehow, in spite of all this, there you are again the next Sunday. I don't know, maybe those models do have a sort of fascination, after all.

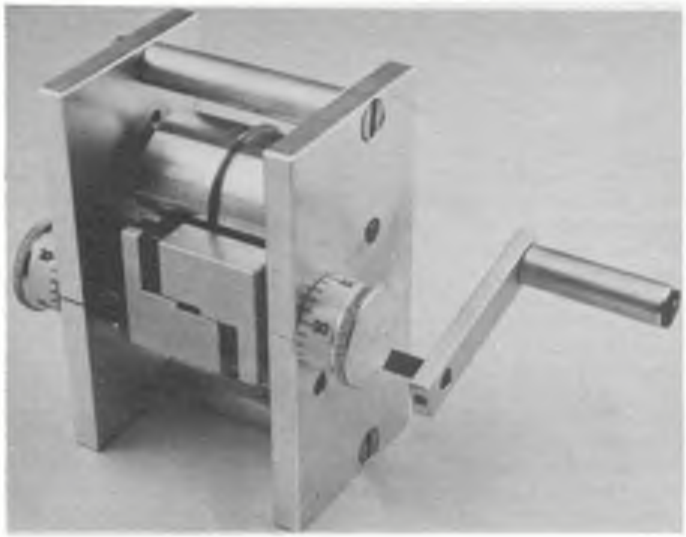


SHOP TALK

NEW MODEL HOBBY PRODUCTS REVIEWED



American indoor 'goodies' available from SAMS the indoor specialists. Above left: sensitive beam balance. Above right: super accurate balsa stripper. Below: the latest in rotary rubber strippers.



SAMS Indoor Offerings

Latest news from SAMS, 2, The Drive, Blackmore End, Wheathampstead, Herts ... three upmarket items for the indoor modeller. These are all from the precision hands of Ray Harlan in America and represent really top grade equipment but also with a top grade price! First is a 'Precision Rotary Rubber Stripper weighing in at £77.58. A beautiful piece of work and will certainly complement that special Pirelli rubber you have been hoarding away! Second at £42.24 is a sensitive Indoor Beam Balance, the metric version of which will read to 1.4 grams with 0.005 gram divisions ideal for weighing even the smallest of model parts. Thirdly, we have a Micrometer Balsa Stripper at £38.62. Length is two feet and includes two quality micrometers, a heavy aluminium straightedge and a precision blade holder to ensure square cuts, all mounted on a rather superior redwood base.

Pusher Props

Fulfilling a need seems to be the Punctillio watchword. Latest offering is a small (but will expand) range of pusher props. Coming under the popular Airflow range are three largish pushers 14 × 6, 14 × 8 and 15 × 6 ... should be available from your normal Airflow stockist.

Model Technics 'Military Glowfuel'

This is not exactly a new *Model Technics* product for they have already marketed this fuel for several years for military drone use. So successful has 'Military Glowfuel' proved, that *Model Technics* have decided to release it to modellers. Available in 'straight' no nitro mix or 5% nitro content, the fuel is sold in 1 litre, ½ gallon and 1 gallon containers.

A new synthetic oil is used in this fuel which does cause some staining on light coloured paint and GRP finishes, but has no effect on conventional fuelproofed or heat-shrink film finishes (such as 'Solarfilm'). Amazingly, the light blue staining is a photo-sensitive phenomenon, the staining does disappear after a couple of days exposure to sunlight.

The major benefits of the oil and nitro combination are smooth running, enhanced power output and none of the gummy residue left by a castor based fuel. Power output of 5% nitro 'Military' mix is claimed to be equivalent to a 10-15% nitro castor based fuel.

Prices of Model Technics 'Military Glowfuel' are as follows:

Straight

1 litre	£1.35
½ gallon	£2.40
1 gallon	£3.95

5% nitro

1 litre	£1.70
½ gallon	£3.10
1 gallon	£5.20

Pilot gliders

If you are thinking of building an A1 Glider you would be well advised to look carefully at these two Pilot kits, distributed by Irvine Engines Ltd. Pilot have quite a reputation for producing well-finished and presented products. 'Humming' and 'Peter' certainly follow this tradition. Diecutting is very good both on the balsa and ply parts. The instructions are fairly brief and, although supplemented by a series of clear photographs, could do with some additional comments on finishing and trimming. One nice point is the provision of full-size drawings of all the parts included in the kits.

The 'Peter' has a simple profile fuselage and parallel chord wings, 'Humming' has a built-up box fuselage and wings with a slight taper. Both models are a stated 1200mm (47 in.) wingspan and also claim they may be used with single channel radio control. 'Humming' is probably the better bet for R/C with its box fuselage, whereas 'Peter' could prove to be quite a competitive A1. Both kits should be available from model shops and cost. 'Peter' £10.50, 'Humming' £12.75.

Continued from page 91

Engine News

appeared in 1948 and was another variable-compression engine that showed obvious Dyno influence, even to using the Swiss engine's 12 × 8mm bore and stroke measurements, but it fell down sadly on quality and ended its career ignominiously in 1949 when remaining stocks were offered, in the form of kits of ready-to-assemble parts, for $2.95 — at that time a little over one pound Sterling.

Now, 35 years later, the despised Deezil is making a comeback — as a replica made in Australia. With a nice touch of irony, Gordon Burford (former manufacturer of Taipan engines) chose the Deezil to prove that, by substituting quality materials and quality workmanship, even the Deezil could be turned into an easy starting and reliable engine. So far he has built twelve of them.

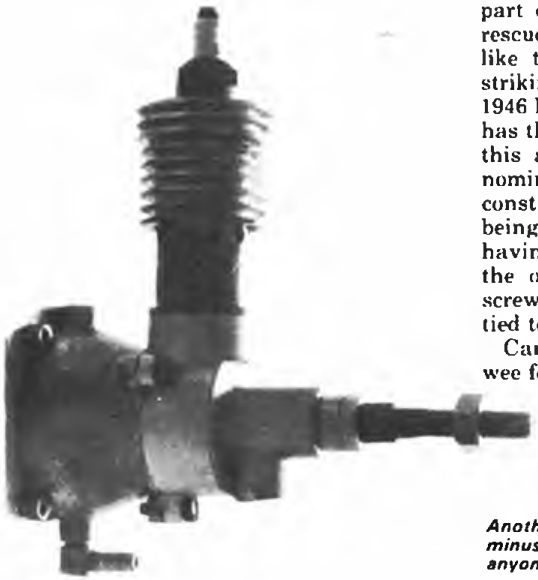
The Burford Deezil Replica uses a nicely finished investment cast crankcase with a Meehanite bushed main bearing for its hardened and tempered alloy steel crankshaft. The piston and cylinder assembly consists of a ground and lapped Meehanite piston running in a hardened alloy steel cylinder with honed and lapped bore. A 7075-T6 high-duty aluminium alloy connecting-rod is used, coupled to the piston by a pressed-in hardened and lapped gudgeon-pin.

We are indebted to Ron Moulton, who owns the engine shown in the photos, for the opportunity to examine the Deezil Replica. Shortly after the engine was returned to him, we had a visit from Gordon Burford who, as Australian delegate to the CIAM, was en route from Queensland to the annual Paris FAI meeting. He told us that he has reason to expect that the Society of Antique Modelers, in the US, will shortly accept the Deezil Replica as eligible for vintage events and that he will then go ahead with small scale production. Any SAM-35 members interested in acquiring one of these motors may then care to write to him at 86 Tierney Drive, Currumbin, Queensland 4223, Australia.

P.K. F-100

O. F. W. Fisher of 'Performance Kits' (now located in the Isle of Man) would like it known that his new 0.9cc 'F-100' diesel is now in production. The engine is based on the D-C Spitfire but is distinctively finished with a black crankcase and polished alloy finned cylinder jacket. The engine is aimed at 'Sport' and 'Vintage' enthusiasts.

Also available from Performance Kits is a larger D-C based engine, the 1.2cc 'Z-12' (already mentioned in these columns) and a smaller model, the 'F-80' which is based on the D-C Merlin. Like the Merlin, it has a bore and stroke of 0.375 × 0.420 in. giving a swept volume of .0464cu. in. or 0.760cc. The engine is claimed to reach 10,000rpm on a D-C 7 × 4 prop and 12,000 on a 6 × 4.



Another mystery engine. No, it is not a Frog 175 minus contact-breaker and carburettor. Any ideas, anyone?

Another Mystery Engine

The elderly small spark-iginition engine shown (with contact breaker assembly and carburettor missing) in the photograph is part of Peter Fisher's collection and was rescued from a rubbish tip(!), but he would like to know if anyone recognises it. A striking resemblance to the layout of the 1946 Frog 175 will not go unnoticed. It even has the same bore and stroke. Peter quotes this as 12.75 × 14 mm. The Frog had a nominal bore and stroke of 12.7 × 14 mm. But construction is different, the crankcase being separate from the fuel tank but having an integral front end — rather than the other way round. Also, the cylinder screws into the crankcase instead of being tied to it by a pair of full length studs.

Can anyone positively identify this poor wee feller?

Continued from page 68

PROFILE SCALE

and find something else to do until it is all dry. If all is well you can now mix up some micro balloons with a little epoxy and scrape into the wing/fuselage joint with a spatula to form a 3mm fillet. Smooth even with a wet finger. Fit tailplane and fin with PVA noting the alignment/reinforcing dowels for the fin.

Details

The u/c doors are glass-fibre mouldings and are quite simple to make. Simply cut off the relevant part of the nacelle and cover with glasscloth smeared with epoxy. (2 layers is adequate). When set, trim to shape and dissolve the foam away with cellulose thinners. The tip weight consists of a short length of 6mm square plumber's solder pushed into undersized holes drilled into the underside of the outboard tip (before covering!). If it is made to be a tight push fit there is no need to glue it in place. On the *Ilyushin*, Rick chose to use a home-made, adjustable line guide, but any proprietary unit will suffice. All hinges are of the R/C Nylon type with wire pin pivots. DON'T use mylar hinge strip — it is far too stiff for control line models. Bellcrank is home-made from 3mm G.R.P. printed circuit board and is secured by a 10swg piano wire pivot pin pushed in from under the fuselage. Tailwheel is assembled as per the main u/c (only using thinner wire and ply) and is fitted in the same manner.

Much against Rick's better judgement (I suspect!) the flap/tailplane linkages and horns were the same as I used on my profile models and appear to be quite satisfactory. A proprietary rectangular clunk tank was used utilising small curtain hooks, screwed into the engine bearers, to hold the retaining elastic bands.

Finishing

Finishing is always a matter of choice, however Rick felt that two main options were open. (1) all film covering and decoration and (2) brown paper covering on the foam and painted finish. Finally it was decided to effect the good old British compromise and film cover all the flying surfaces (directly onto the foam) and to paint the veneered fuselage and u/c nacelles. A single coat of *Hobbypoxy* clear polyester finishing resin was all that was needed to fill the grain on the veneered fuselage and any proprietary paint finish can be used. *(Humbrol* enamels, car touch-up aerosols or the newer ranges of fuel-proof epoxy paints such as *Hobbypoxy).* With care one can get a good enough match for the film covering to satisfy all but the most critical.

Heatshrink film (Microcover Dk green for top surfaces and solarfilm in pale blue for lower surfaces) adheres well to bare blue foam and has proved quite serviceable in use, although it is a bit tender compared with sheeted surfaces. However, quick, economical building coupled with light-weight, more than outweigh the need for a little care in handling and transit. Trim and details can be added as required with a draughtman's pen, trim tape, lining tape, transfers, airbrush, etc., but don't forget to fuel-proof over the paintwork and any trim lines.

Conclusions

Rick says that, whilst the foregoing is not meant to be the complete answer to all one's problems, it should be sufficient to point the right way for anyone to adapt the technique to their own chosen prototype. Time taken over construction was satisfyingly quick, especially the fuselage that was initially felt to be the most time-consuming part. Although some aspects might appear to be crude, they do work and work well. Furthermore, they do help to cut building time. Rick's view of Profile Scale is that models will always be only a caricature of the real thing and anyway flying performance is of a higher priority than pure scale outline. Therefore, there is little point in overdoing the scale accuracy and detail. If you want the model to have good, aerobatic flight performance, then keep the weight down. The *Il2* finished up at 59ozs. for a wing area of 563in². This was a little heavier than Rick would have liked (but Rick is a perfectionist!) and anyway, scale detail like the u/c system adds weight. After sorting out a few bugs in the engine department the model has proved to have a good all-round flight performance, and being well capable of the square manoeuvres. Rick obviously is well pleased with this approach as he is now contemplating another 'foam wonder' for C/L. This time a *Bede* BD-8.

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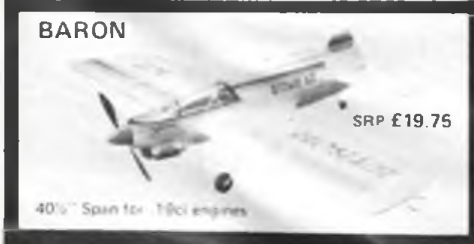

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