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AERO MODELLER



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p.515

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Cover:
You can't beat a biplane, especially when it's such a cracker as Bernard Sexton's Martinsyde Semiquaver. This Merco 61 powered C/L beauty has been retired from flying to become a resident exhibit at the Brooklands Museum. Photo taken at the '84 Nats - see you there this year?

CONTENTS

HANGAR DOORS	News, views and events for the aeromodeller's interest	504
LASER	Claus Maikis' latest - a sporty scale stunter for four-stroke power	506
MIDSUMMER MAGIC	Spectacular action from our Scale Weekend at Old Warden...	510
VINTAGE CORNER AT SCALE WEEKEND	...yes, and vintage models flew there too. Alex Imrie reports	515
READERS' LETTERS	More comment and opinion from enthusiasts with a point of view	519
MIND THE LINES	Andy Brough unrolls the wires for another session of Vintage control-line	520
A NEW APPROACH	All you need to know about competitive 'chuckie' flying. Mick Page, the man with the championship arm, tells us how to win...	522
BUTTERFLY 2	... and here's his championship model for you to build from our full-size plan	525
IOTA	Full size plans for Bryan Millar's docile R/C glider; just right for small-field flying	535
THE BRITISH OPEN THERMAL SOARER	Part Two of George Stringwell's analysis looks at pilot ability, compares designs and thinks ahead	537
SCALE MATTERS	Bill Dennis puts aside the scale rule and reports on latest developments	544
FREE FLIGHT SCENE	Two Nationals winners, latest results and comment from Dave Hipperson	546
KIT REVIEW	Ron Prentice's Mercury Marlin 'revival' kit is enthusiastically received by a balsa-bashing Andy Brough	550
FROM THE HANDLE	Claus Maikis takes an in-depth look at a .60 slogger which might just be the job for your big stunter...	554

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HANGAR DOORS

Was this you?

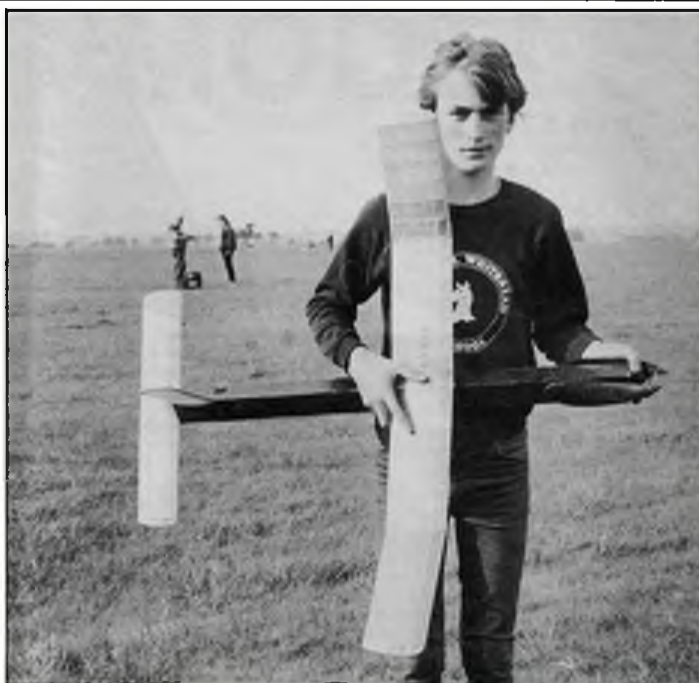
From the SMAE we hear of yet another brush with death - in the form of overhead electric power lines - by unthinking aeromodellers. Dick Whitehead, South Midland Area PRO and an engineer with the Eastern Electricity Board, reports this snippet from one of the Board's monthly reports:

'On April 25th 1986, a consumer reporting a loss of supply at Maxted Road, Hemel Hempstead, informed us that a model aircraft had flown into an 11kV overhead line (Kunzle feeder from industrial 33/11kV sub-station). The two operators of the aircraft left immediately after the incident; one of the men reportedly had his trousers on fire. It is not known if he suffered any serious injury.'

This incident was witnessed, but the type of model is not known. Presumably the modellers - or one of them, at least - escaped with burns; lucky not to lose his life, we'd say, if contact was made with the cable itself. The danger of flying with steel control lines ought to be obvious; a nylon glider towline can play the part of an electrical conductor to perfection on a damp day. The horrors of model retrieval under such circumstances hardly bears thinking about.

If this was you, maybe you fail to realise how lucky you were. Take our word for it...and think about it.

Last month's Hangar Doors asked few questions about Junior involvement in model flying. We showed a merry group of youngsters with their chuckles; here, to put a different angle on achievement, is 1986 Nationals Junior Champion Alan Cliff with his Hipperson-designed Skywalker 60. In future issues we'll feature some of the designs flown by other Juniors, including some own-designs of considerable potency!



Your editor knows from personal experience just how difficult it can be to persuade aeromodellers to stop flying, and move, when they are flying dangerously close to power lines. Nevertheless, everyone should be prepared to jump in and warn the thoughtless few. We are all responsible for safe model flying, and for the image of our hobby. Sometimes it's difficult enough to convince the general public, let alone local authorities, that we are adults pursuing a mature pastime, without this adverse P.R. work. So remember - KEEP AWAY FROM POWER LINES!

Widen your outlook

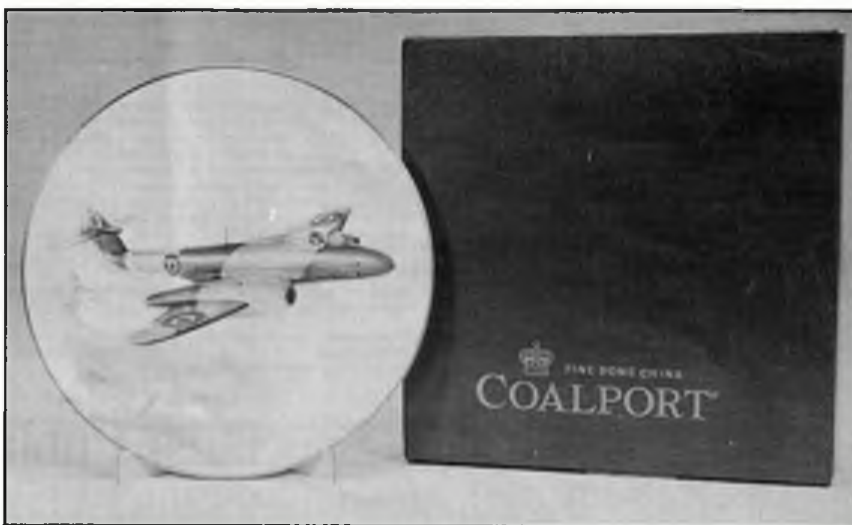
On the whole, aeromodellers are a receptive lot. New ideas are taken on board and acted upon or rejected after fair consideration. Sometimes, though, there is a danger of becoming too straight-laced or obsessive about one's own favourite part of the hobby. It's never a bad idea to take a sideways look at what's going on in the other corners of the airfield. That's why we trust that Aeromodeller's readers digest the news from all disciplines. For example, we've already heard from fun-fly CO₂ enthusiasts who have enjoyed - and benefited from - Steve

Philpott's hints on tuning up your motor, an article written as a result of competition endeavour, but capable of a much wider application. Now in this issue chuck glider supremo Mick Page tells us his thoughts on how to win. This is a candid look at the way to success and the blind alleys encountered on the way. If you're trying your luck at competitions - any competitions - for the first time this season, you ought to look closely at what Mick has to say. There might be something for you...

And for your part - what has been your greatest aeromodel-



Left: Latest Argus Books offering is the delightful 'Fifty Years of Aeromodelling' by Vic Smeed, 96 A4 pages of magical memories which will be ready for you by the time you read this. All vintage enthusiasts, or anyone with an interest in the development of this magazine from 1935 to 1985 (isn't that all of you?) will be entranced by this pot-pourri of snippets. The price? Just £4.95. Full review next month. Right: First prize in Charlie Newman's Pipistrelle competition to be held at Old Warden on 7th September is this limited edition Coalport plate depicting a Meteor F3. One of just two thousand, it has its own number certificate. Fancy it on your sideboard? It's not too late to build the model...



ling compulsion? What was the greatest lesson learned, or even the point at which you might have called it a day? We're waiting to hear!

X marks the spot

'Where is it?' you cried. Dozens of you! Vintage enthusiasts, or indeed just enthusiasts, from all points of the compass have been thumbing the pages of our latest Plans Handbook, turning it upside-down and shaking it in a vain search for the 'X' list of early or less well known designs. Don't worry - there's no black hole. Those cherished favourites are still safe and well. A new list is being prepared. This will incorporate all sidelined plans

with month and year of publication included. Until this is ready you may assume that all X-listed plans are available as before; and a note to our Plans Department will give you all the gen you require on a particular choice. They're all yours!

Indeed, we hope to feature several of these early designs in a series of 'revisited' features, rather as we dealt with the Skylark a few months ago. And as a bare list of names is fine, but not ideal if you're not familiar with the models on it, we'll show you some of the more seldom-modelled subjects, with potted biographies, every now and again just so you know what's what. You might even find the craft of your dreams!

Routes to radio control

What were your experiences of starting in R/C? We'd like to know - whether it all began for you in the days of the XFG-1, or whether you're one of the latest recruits to the hobby. Many have found the simple radio glider (like Iota in this issue) a forgiving and relatively inexpensive approach; others prefer the lightly-loaded 'vintage' model. A third method is to jump straight in with full proportional and maximum tuition!

The point of all this is that although *Aeromodeller* is maintained as a magazine devoted largely to free-flight and control-line, there is a place for selective R/C coverage within its pages. Indeed, how could a publication

with such a title not feature it from time to time? Readers will have already enjoyed our in-depth serialisation of George Stringwell's *magnum opus* on the British Open Thermal Soarer, a variety of model which should appeal to *Aeromodeller's* readers, for what is it but a potent lift-seeker, albeit a guided one?

Radio Control is being used for all kinds of interesting purposes besides Sunday afternoon club field flying. Let's hear about those R/C rubber and CO₂ projects, Indoor flyers and sport creations, particularly the unorthodox. And how about conversions from *Aeromodeller* F/F Scale plans, you small-field flyers?

What's on...

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

16-17th August SCOTTISH FREE FLIGHT NATIONALS. Classes: FA1, Open Mini and Vintage. Venue: Newbigging, Nr Carnwath. Contact: Ron Sabey. Tel: 0698 429170.

16-17th August ASP VINTAGE WEEKEND Venue: Old Warden Airfield, Biggleswade, Beds. Vintage fliers - miss this at your peril! Contact: 0442 41221.

23-25th August SMAE LONDON AREA F/F GALA Venue: Training Area 9, Salisbury Plain. Comps: Cdh, A1, 1/2A, HLG (Saturday); F1A, F1B, F1C, SOP (Sunday), O/F, O/R, O/P, Vintage (Monday). Entry fee £2 per event; Junior 50p. Special prizes for ladies and juniors. Camp site. Details and entry form from Ian Bracken, 1 Diddin House, Mingard Walk, Andover Estate, Hornsby Road, London N7 7RT.

23-25th August 1986 SMAE NATIONAL R/C AND C/L NATIONALS Venue: RAF Barkston Heath. Contact: SMAE, Kimberley House, Vaughan Way, Leicester LE1 4SE

24-25th August NORTH LAKES RADIO CONTROL SOARING ASSOCIATION SOAR-IN Venue: Club site. Meeting place: Castle Inn car park, 8 miles north of Keswick on the A591. Insurance cover needed. Contact: D.S. Atkinson. Tel: Kirkbride 51822.

24th-26th August INDOOR WORLD CHAMPIONSHIPS Venue: Cardington. Contact: SMAE Indoor Tech Committee, via 0533 58500.

30th and 31st August INDOOR EVENTS FOR OPEN INTERNATIONAL AFTER WORLD CHAMPS Venue: Cardington. Comps: EZB; Peanut Duration; Manhattan 4gm and 6gm; CO₂ Duration; Novice Pennyplane. No wire bracing of flying surfaces permitted in EZB. Also Houlberg Trophy for EZB (SMAE contest); and a Scale contest. All above comps on 30th August. The following on 31st August: F1D, 35cm and Open Microfilm; F1D for Aeromodeller Trophy (SMAE contest). Contact: SMAE Indoor Tech Committee via 0533 58500.

7th September STEEL TROPHY Class: F/F FA1. Venue: Newbigging, Nr Carnwath. Contact: Ron Sabey. Tel: 0698 429170

7th September MEON VALLEY SOARING ASSOC. OPEN EVENTS. CROSS COUNTRY. Venue: Butser Hill, Petersfield, Hants. Contact: Ken Sapsed Tel: 0705 453688. Entry fees: £2.00 non-members, £1.00 members. Frequencies 35 Mhz, even numbers only, two sets of crystals.

September 7th SHUTTLEWORTH MODEL GROUP SILENT DAY at Old Warden Aerodrome, Biggleswade, Beds. All welcome but no I.C. engines to be run. Contact M.S.F. Staples, 11, Whitehill - Road, Cambridge CB5 8LT.

14th September "TOWNER TROPHY" R/C Thermal Soaring, Golden Cross, East Sussex. Details S.A.E. to N. Couling, 7 The Green Walk, Willingdon, Eastbourne, East Sussex.

14th September C/L AEROBATICS, OPEN AND NOVICE Includes the Doug Blake Trophy. Venue: Slip End, Luton. Contact: Glen Alison. Tel: 0923 772675.

14th September ASP FOUR STROKE FLY-IN Venue: Old Warden Airfield, Biggleswade, Beds. Contact: 0442 41221.

14th September SMAE NORTHERN GALA Venue: Driffield (N.B. venue change from Lindholme) for F/F events. C/L events at RAF Dishforth. Contact: R. Hoff. Tel: 0742 732582.

14th September ST ALBANS MAC VINTAGE FLY-FOR-FUN DAY R/C or small free-flight. Venue: new club site at Bulls Mill on the A602 out of Hertford, 10am-8pm. Contact: Steve Payne. Tel: St Albans 34267.

21st September WHARFEDALE 1000 CLASS B T/R Venue: RAF Disforth. Contact: Jeff Smith. Tel: 0532 663432.

21st September SMAE "SOUTHERN GALA" (SMAE Members only) at RAF Odiham, Hants. F/F, R/C Scale, Vintage F/F, Helicopter and R/C aerobic. Details S.A.E. to N. Couling, 7 The Green Walk, Willingdon, Eastbourne, East Sussex.

21 September SHEFFIELD JUNIOR 60 AND FLYING FIFTEEN COMP Flying Fifteen to SAM 35 rules. Any radio and engine may be used in Junior 60 comp. Venue: One mile from entrance to Rother Valley Country Park on A618. 10am start. SAM or SMAE insurance required. Contact: Dave Hanson. Tel: 0742 740316.

21st September THREE KINGS SCALE DAY C/L scale and Profile. Silencers essential. Venue: Old Croydon Aerodrome. Contact: Derek Bird. Tel: 01 874 6394.

28th September SOUTH MIDLANDS AREA BARCS LEAGUE Comp: R/C Thermal Soaring. Venue: RAF Weston-on-the-Green. Contact: J.H. Shaw, 'Alvers', Witney Road, Freeland, Oxon OX7 2HQ Tel: 0993 881350. SMAE members only. Pre-entry £2.00 plus s.a.e. plus frequency details.

28th September 1986 LYMPNE TRIALS Scale Rubber and CO₂ models of Lymphne Trials craft as described in *Aeroplano Monthly*, Miami rules plus precision. Venue: Watford Leisure Centre, 10am start. Contact: Butch Hadland. Tel: Windsor 855359 (W), 0828 72402(H). Event sponsored by SAMS.

28th September ST ALBANS MAC ELECTRIC FLIGHT FLY-IN Venue: new club site at Bulls Mill on the A602 out of Hertford. Contact: Albert Botterill. Tel: St Albans 59789.

5th October S.E. AREA SMAE "LONG MAN" SLOPE SOARING Details s.a.e. to A. Lawson-Wood, 4 Cumberland Walk, Tunbridge Wells, Kent.

5th October EASTBOURNE CLUB VINTAGE DAY (R/C only). Golden Cross, East Sussex. Details from S. Coombe, 7 Petworth Place, Hampden Park, Eastbourne, East Sussex.

5th October SOUTH BIRMINGHAM VINTAGE C/L RALLY General flying for all SAM 35 and SMAE members. Fun comps to SAM 35 rules. Presented by South Birmingham MFC, SAM 35 and University of Birmingham Model Engineering Society. Venue: Rubery Hill Hospital, near Birmingham. Contact: Peter Martin. Tel: 021 444 7964.

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LASER

Go four-stroke scale stunt flying with Claus Maikis' latest - this 58 $\frac{1}{2}$ in masterpiece is designed especially for .45 engines

IF YOU HAVEN'T ALREADY considered a Laser as your next building project you should think about that choice. Certainly, it's not the most beautiful airplane in the world; yet it has some pleasing lines and - most of all - a distinctive shape. This helps the 'aha'-effect with onlookers when they discover your airplane among other unidentifiable designs. There's no doubt about it - this is 'aha, a Laser'.

Why a scale stunter?

I've pointed out several times in the past that I'm not a great advocate of scale models. I don't feel it a challenge to reproduce an original airplane in a pedantic way to a smaller scale; even less so when I know that the model will then have bad flying characteristics. When, in spite of this, I build scale-like models occasionally, it's because I'm impressed by beautiful lines and shapes. What I actually do is produce some kind of caricature: I use the characteristic elements of an original. Beautiful parts are taken over, and may be even overdone. Shapes that are less beautiful (in my eyes!) are abandoned or changed. While my freedom in design is - of course - somewhat limited by aerodynamic laws, there's still enough room to create an airplane which prevents the usual question 'is this a modified Laser?' In 1975, the American Dick Mathis wrote about stunt airplanes in his book 'How to fly U-Control'. He does not recommend scale-type stunt models unless they look like a 'serious' stunter (that's my term!). He says 'the problem is they (the scale models) tend to be "pretty" rather than "potent" and do not enhance the flight score'. This is my viewpoint too. It seems not entirely by chance that Al Rabe had similar problems when he flew his series of Sea Fury stunters some years ago. Before even seeing his airplane fly, onlookers considered his creation a bad aerobatic ship. These were pilots - and judges! Taking these thoughts into account, the Laser had to have typical stunt dimensions and proportions and - most of all - a slim fuselage.

And why the Laser?

Otherwise, the Laser is not so bad a choice for an aerobatic design. After all, the original is one! While the overall proportions are close enough to our design concept, there are quite a few details which make the Laser a good prospect as an aerobatic model. While there are a few other examples with appropriate dimensions, the Laser is the only one with the wing and tail

very near to the engine thrust lines. It is generally agreed that this is a layout to be preferred for really symmetrical characteristics on up and down elevator. I didn't use a perfect 'on one line' layout for reasons which I'll explain later. Additionally, the Laser has some features which help to draw up a simple design. This in turn helps ease of construction and - last but not least - keeps down weight!

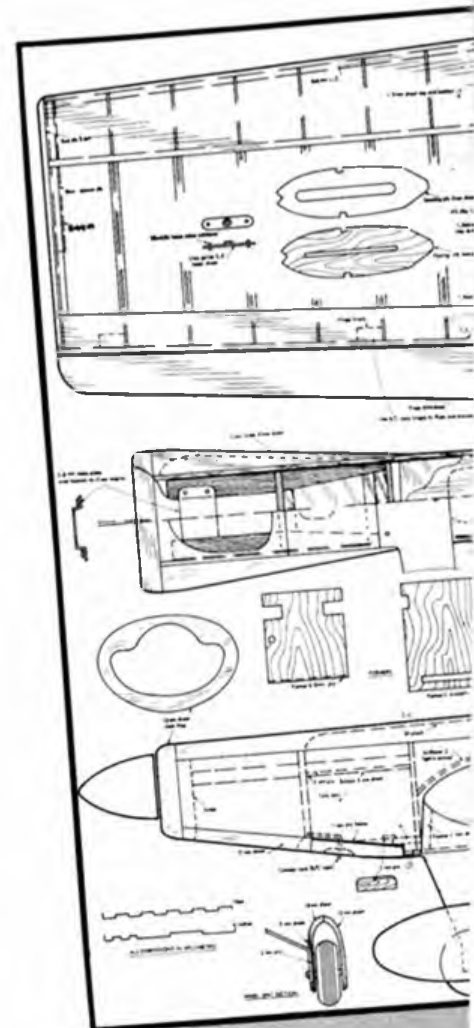
At first, we have a simple shaped outline of wing, stab, and fin. The planform consists strictly of straight lines; there are no round shapes. This eliminates heavy wing tip blocks or a complicated structure. All you need is simple rib as thick (or as thin) as you want. Note that many of the top American pilots prefer this wing tip shape in their latest models, for obvious reasons. Now this may not be the most beautiful shape, but in the case of the Laser it's an essential part of its 'character', so it's appropriate. Secondly, the undercarriage is mounted in the fuselage. This way of mounting can be accomplished much easier than wing mounting. At the same time, the wing can be built lighter because it doesn't have to take the landing stresses. While fuselage mounted landing gears are considered to be 'springy', I've built quite a number of models so equipped and I've never experienced any trouble - provided that the gear is designed well, and the wheels are in the correct location, of course. Thirdly, the shape of the fuselage nose permits the engine to be mounted without the need for a removable engine cowl. Just shape the opening in the fuselage bottom big enough and you can slip in the engine from underneath (it's best if you turn the model upside down!)

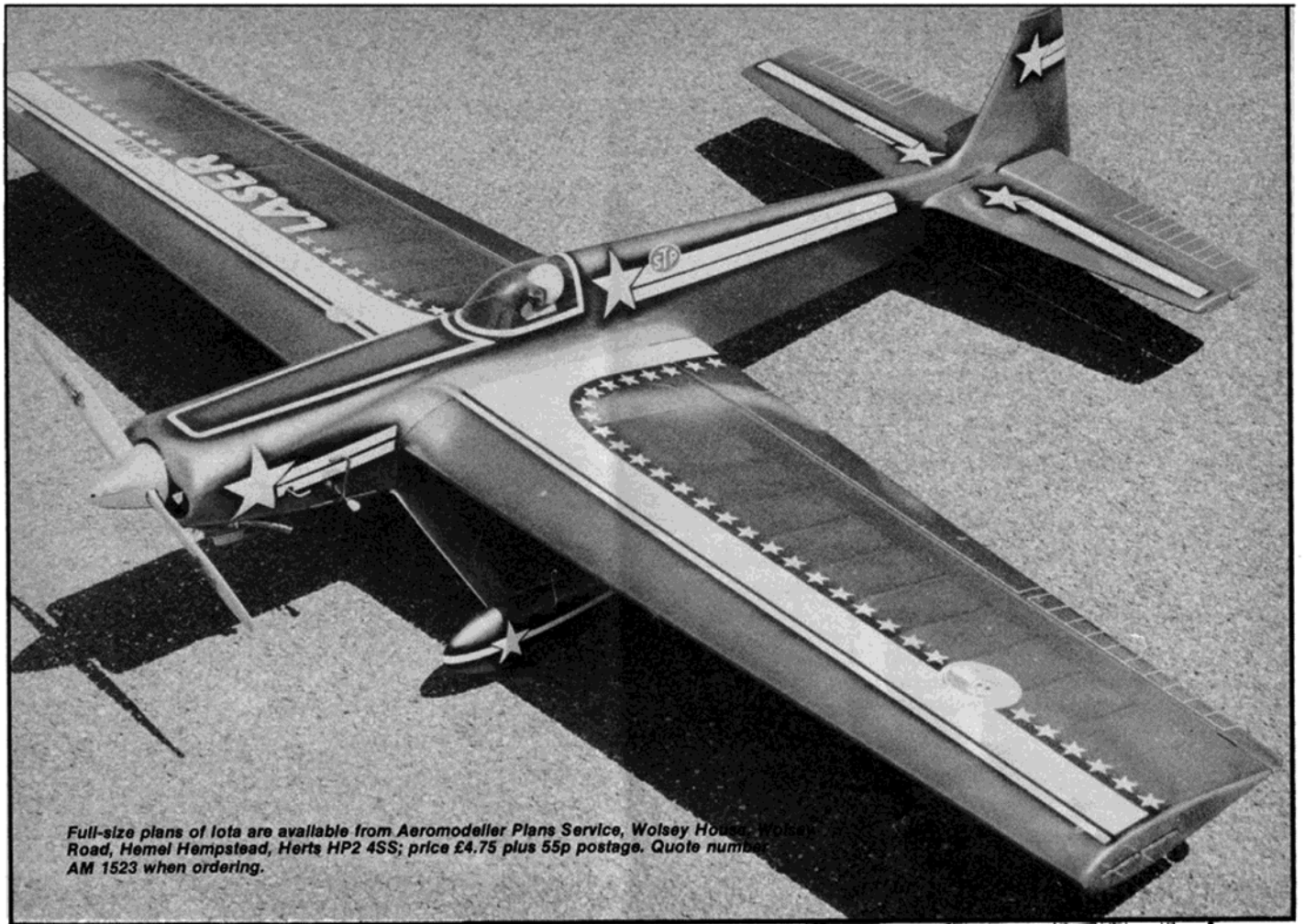
Wings, wheels and motors

The duralumin landing gear may not seem to be the best solution. Actually it isn't, because it's heavy! I chose it for certain reasons. I wanted to have beautiful, big wheel pants - they are a must on this airplane. However, take off and landing are then a problem on anything but smooth asphalt. Since I fly mostly on grass - and not the smoothest either - I wanted to have a removable undercarriage. With former mounted, bent wire gear this wouldn't have been possible, or at the very least it would have been a complicated structure. With the duralumin sheet, production and installation is extremely simple (besides, it enhances the Laser look!). I now have two undercarriages, one for grass (without

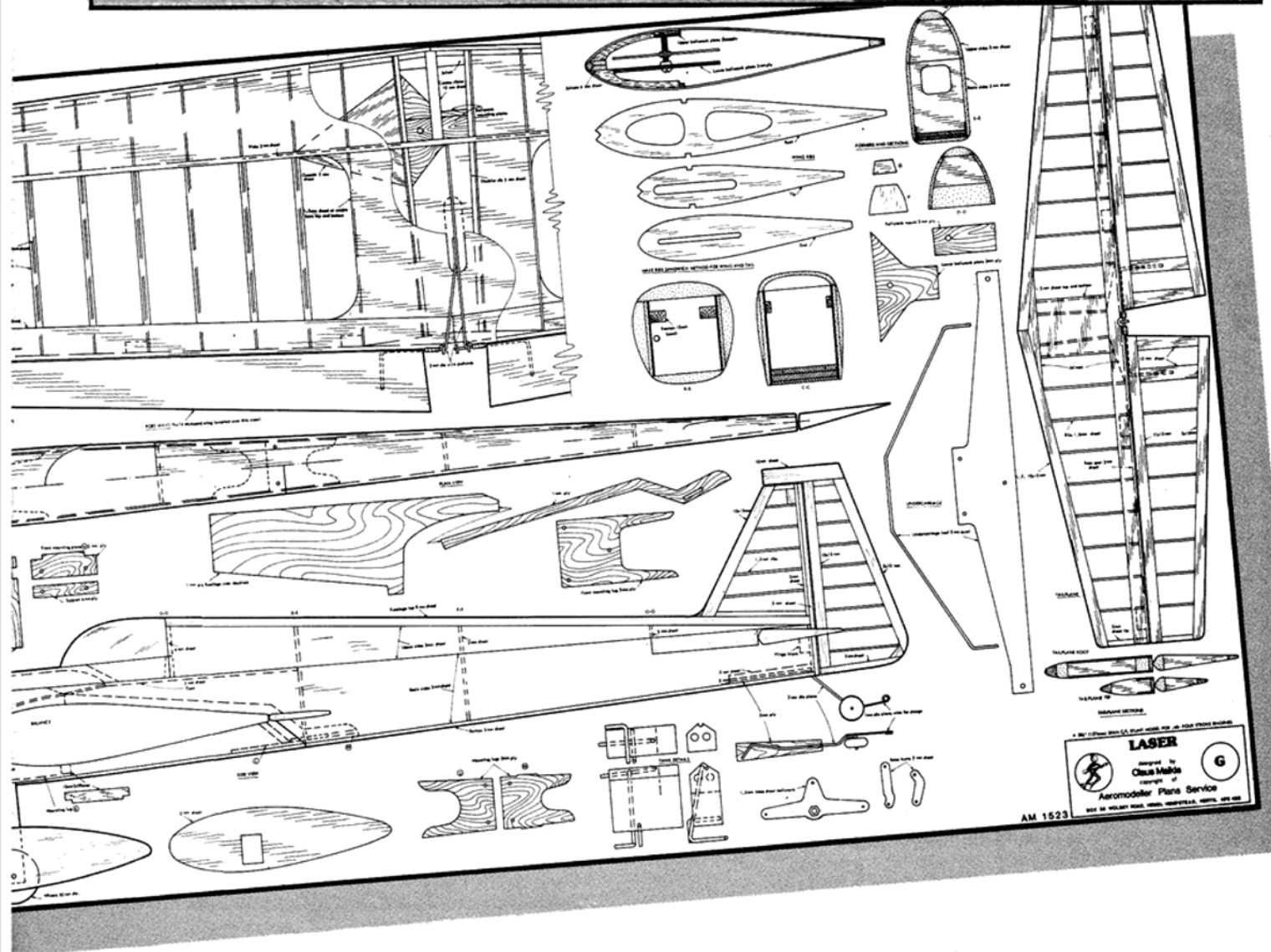
pants and with bigger wheels) and one for asphalt. If one flies only from a hard surface, and one's landing abilities are sufficient for a score of '9', the u/c dural sheet can be cut even more narrow, and the pattern can be changed for an even more rearward wheel location.

There was still another reason for the sheet landing gear: I intended to use a removeable wing for ease of transportation and for easy access to the control system. With an altogether new design, you never quite know how it will behave, and it's soothing to know that - should it be





Full-size plans of lots are available from Aeromodeller Plans Service, Wolsey House, Wolsey Road, Hemel Hempstead, Herts HP2 4SS; price £4.75 plus 55p postage. Quote number AM 1523 when ordering.



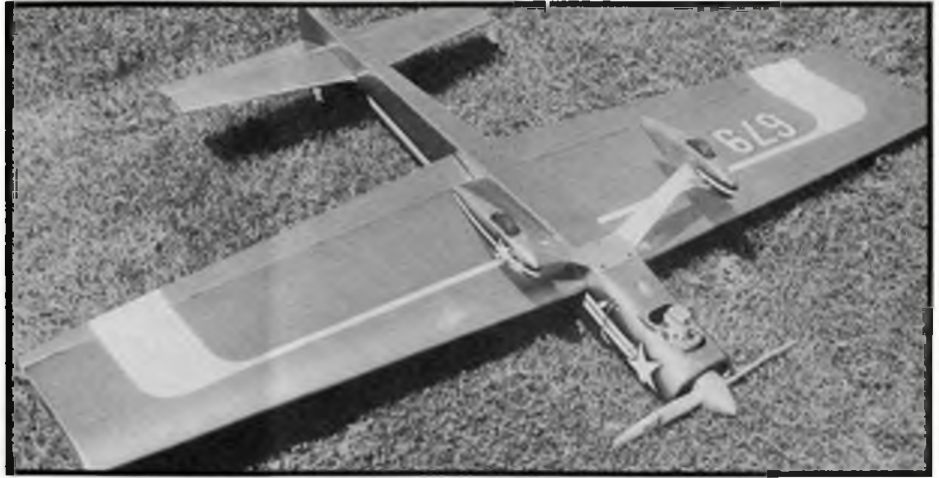

LASER
 designed by
 Claus Meißner
 member of
 Aeromodeller Plans Service
 505 10 WOLSEY ROAD, HEMEL HEMPSTEAD, HERTS, UK HP2 4SS

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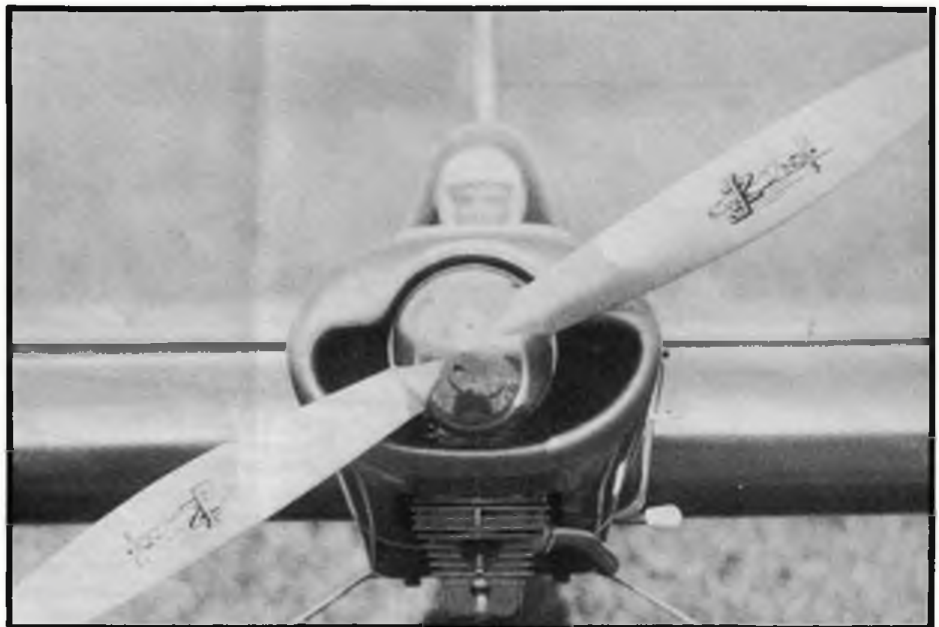
necessary - you can easily get to the flap horns and change the trim, or alter the deflection ratio of flaps to elevator. I'm well aware that a detachable wing may cost about two additional ounces (at least, it does for me!) but I had to put up with that. Now with the removeable wing, only the sheet landing gear came into question. Both - landing gear and wing - are held down in the same place with the same bolts. I just couldn't find an easier method. The removeable wing also dictated the vertical location of the wing. Had I planned a more scale location (this would mean higher in the fuselage), the fuselage cross-section would have been too shallow, and I would have feared that bending might occur during construction, and flexing in flight, so the wing came out where it is now. The double flap horn as shown on the plan was also chosen with the intended trimming abilities in mind. Firstly, two horns were needed anyway because of the swept trailing edge. The outer double horn permits a wider choice of trim possibilities. Actually I fly a set up with both pushrods (front and rear) installed at the same moment arm length - at the flaps' horns, that is! This wouldn't be possible with only a single horn.

The mounting plate for wing and undercarriage is installed in front of the second former. This is an unfavourable position, because you might have problems installing the tank, especially if you need a larger tank than mine. But I had no other choice. Installing the mounting plate behind the former would have meant a longer fuselage nose, which is precisely what I tried to avoid, at all costs! I had two very strong reasons for this. Over the years (and airplanes) I've come to the conclusion that the nose should be as short as possible. This helps the flying characteristics, especially the pullouts. Additionally, I had a very heavy engine. So, even with a considerably lengthened rear fuselage, the length of the nose should be kept at the absolute minimum. This brings us to the engine.

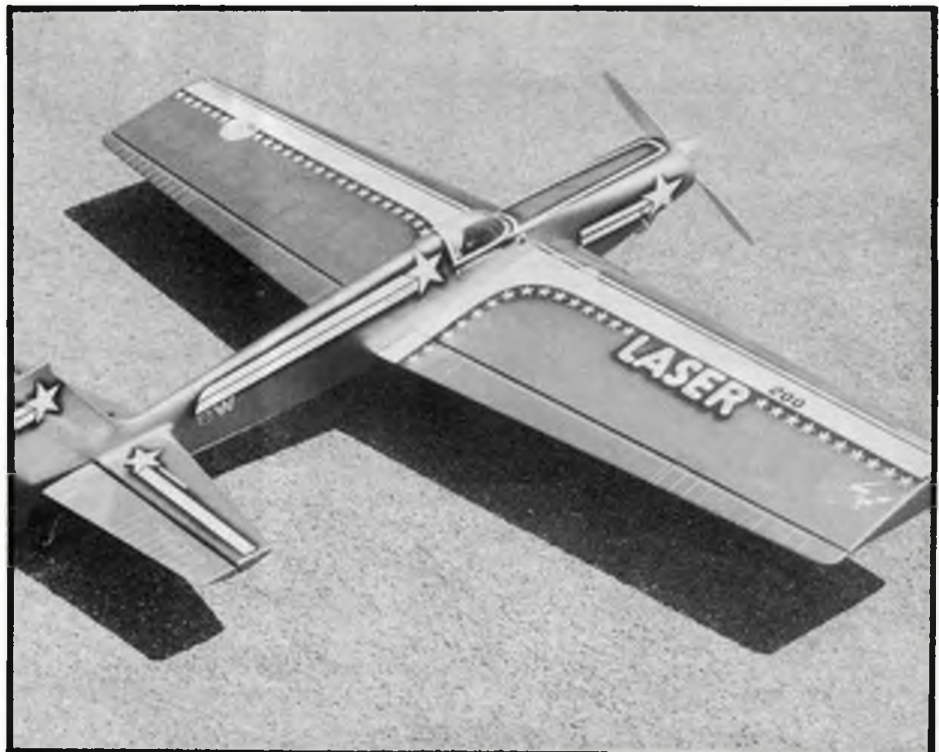
Satisfied from my experience with the OS 40 FS I decided to try another four stroke engine. When the Enya 46 4C appeared on the market, the claimed performance by the manufacturer was surprisingly high. In the meantime several published engine tests proved that this Enya was some kind of 'second generation' four stroke. My own bench tests indicated the same performance level as my old reliable Super Tigre 46 and so the Laser was designed for my Enya 46 4C. You could probably use a Saito 45 just as well. Recommending other engines poses something of a problem for me. Smaller capacity four stroke engines will probably not have enough power to fly aerobatics competitively. The larger ones (this would mean 60 size) are far too heavy. Not that the model couldn't carry the weight - Gilbert Beringer flies a smaller model with a 60 four stroke. But with the heavier engine you would have to lengthen the rear fuselage considerably. Another alternative could be the Super Tigre 60 which is so popular now. With a very light silencer it has the same weight as the Enya 46 4C, *but* it needs about twice the amount of fuel! I doubt whether a suitable sized tank could be squeezed into the Laser's tank compartment. For the sport flyer this isn't a problem. For the competition minded pilot, I feel these considerations should be mentioned, or he might select the wrong plan for the wrong engine.

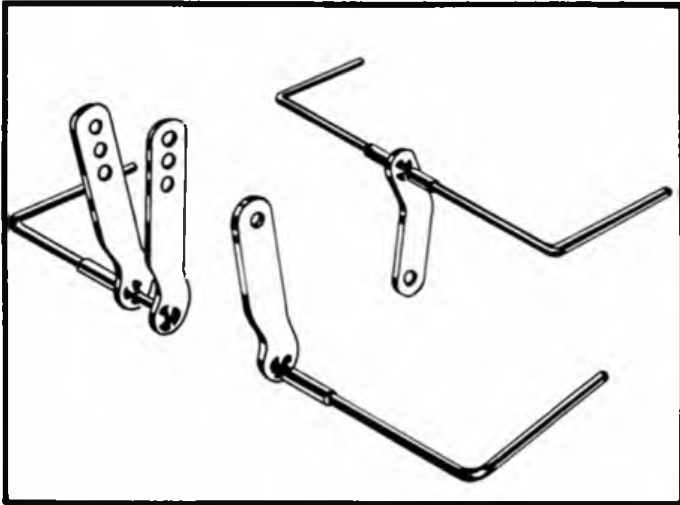


Above: the underside of Laser revealed. Robust undercarriage is clearly shown, as are the crisp wheel pants (spots to you!) Engine cooling is not a problem...



Above: ...and to prove it, here's the front end. Prop is a Zinger wood 13x5. Experiment with others - Claus eventually settled for a 12x5. Below: from any angle the Laser looks sharp. Scale lines have been stretched to suit stunt proportions. Take your time over the paint scheme - it really is worth it.





Claus' own sketch of the control horn and torque rod assemblies will help intending builders. Care taken will be rewarded by smooth operation. Practise your silver soldering first!



Engine accessibility is excellent; there's plenty of room to get at everything. Not much room for the tank, though. It's held with foam rubber at the rear. Note the little pin on the left side of the nose - it's a trigger for a home-made choke system.

Build it!

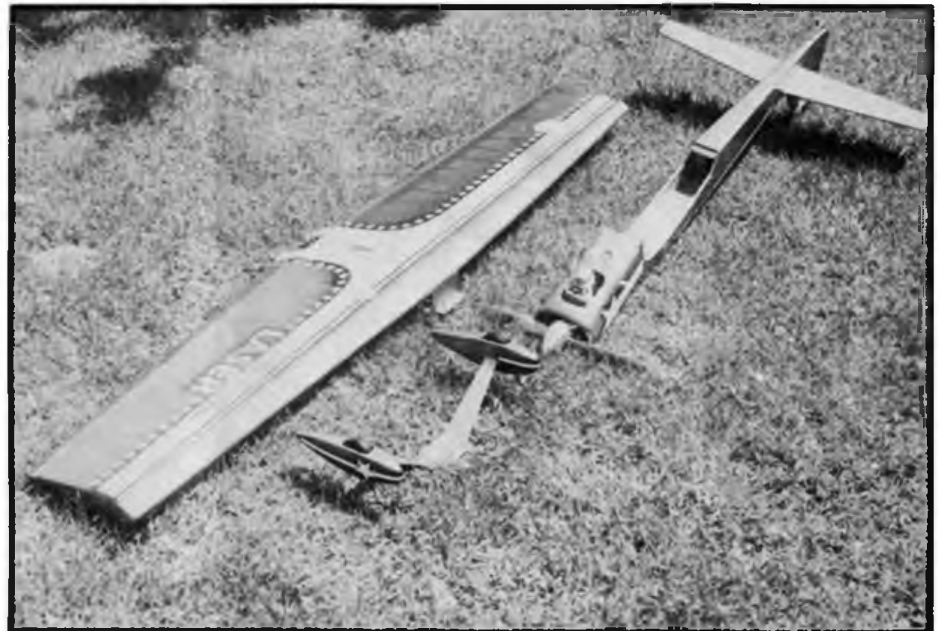
I don't think it is necessary to give detailed building instructions, for this is truly not a beginner's model. Those with some building experience can take all the information from the plan. Actually the model is not difficult to build, but to get from it all that it can offer requires very light construction (lighter than mine, that is!) and careful alignment.

In particular, the fittings of the removable wing should be made with extreme care. Poorly done, the wing might separate in flight, or the interior could become oil soaked - with the same result. To explain a few details, let me give just a few hints.

Wing construction is conventional. Because of the flat tip you need a clearance sheet (for the line guide screw head) between last rib and the plywood guide. Add some webbing between the spars at the inner three rib bays. The bellcrank platform supports are glued to these webs, so the load which is based on the bellcrank platform is distributed to the whole centre section. Take great care when installing the flap horns - with two turning axes it's easy to build in twice the friction! The horns are silver soldered, of course. If you have any doubt about the rigidity of your horn wire, you can solder a small connection between the two horns (of the double horn!) to stiffen the whole unit. The bellcrank is made in my usual fashion by soldering a nut into the brass sheet. As far as the stabiliser is concerned, I use a very hard sheet for the rear end vertical spar. Apart from this it can be built very light.

Fuselage construction is straightforward, too. Note that the front mounting lug is glued with its tongue into the former. This way it won't ever come off. The basic fuselage frame (without top) is laid on its back, with the wing carefully aligned. Now the fuselage bottom is constructed; mounting lugs are carefully shaped to fit and installed; and only then are the mounting holes drilled through and blind nuts installed. The tank floor has a mounting web in front only. The tank is fixed at the front only; the rear is held with foam. A canopy lock is used for holding the tank cover.

For the wheel pants you need four parts: two thick sheets, one plywood stiffener and



Disassembled for transport, the Laser reveals its large fuselage cut-out. Note long wing leading-edge torque and four-bolt wing fixing. Claus even finds time to mow his lawn - or is that the flying site?

one 2mm sheet. The shape of the stiffener can be taken from the plan; it includes the outline of the wheel within the wheel pant contour. This component is glued into the 12mm sheet. The shape of the 2mm sheet is given separately. Make the rectangular cut-out exactly according to the end of your landing ear blank. This cut-out is used to align the whole wheel pant!

When the wing is completely mounted, add the cabin floor and the inner fuselage stiffener. Now the fuselage top can be finished. For a perfect fit between wing and fuselage first cover the wing with the material of your choice. Now cover the centre section with some thin plastic film, pulled and fixed tightly. Mix some slow drying epoxy with micro balloons and put this mixture on the edge of the fuselage sides where they match up with the wing. Mount the wing, tighten screws, and wait till dry. Be extremely careful that no epoxy can get to the horn bearings! After the wing is removed and excessive epoxy is sanded off, you will find the fit is perfect.

And finally...

I do not intend to give instructions on finishing the airplane. Much has already been written about this topic. I still have problems obtaining a good finish on my own models. After about thirty years of modelling I haven't yet found my ideal method. It seems most of the lacquers dry much too fast. I didn't care *too* much about the finish, anyway, since I wanted to save weight. The Laser came out at about 1650 grams. Considering the heavy engine that's not so bad - for me! I'm sure you can undercut this. The tank on the plan is of 92cc, just right for about 6 minutes. I used a commercial fuel with 5% Nitro and a 12 x 5 propeller.

These days the sound of the four stroke engines in a control line aircraft is still new. New things get more attention, mostly favourable. Since flying abilities develop in inverse proportion to age, it appears that I have to rely on a purring four stroke engine in a nice airplane to stay competitive... so maybe the Laser is not for you?

The longest weekend, dozens of scale models, and Old Warden airfield. What more could you want? Geoff Clarke, Bill Dennis and Alex Imrie report on a cracking meeting - extra material by Margaret Staples.

Midsum

Scale Weekend Wins a



Heading: Low and slow - Geoff Burkett's Hawker Fury never fails to impress; it carried off the Jack Carter Memorial Trophy for best C/L biplane. Left: A classic 1930s shape. This Armstrong Whitworth XV was built for electric power by Dave Chinery. Flew beautifully. Model bears the name Arethusa and thus represents G-ABPI after rebuild. Right: Roger Morris flew this crisp and colourful Jungmeister built from the Pilot kit. Yellow, orange, green and white scheme. Above right: Not one, but two Focke Wulf Ente canards flew - and flew well - throughout the weekend. Eric Burke prepares his. That open cockpit is useful!

WHAT A WEEKEND! Even if, weather-wise, we might well have been in different countries on successive days, there was surely something for everyone. Saturday was sunny all day, but with a cruel wind that sidelined all but a handful of free-flighters - and control-line enthusiasts were there none - though R/C scale enthusiasts found plenty of room, for those who flew could fly, and fly again. Come Sunday, and the transformation was unbelievable. You could hardly call it a breeze, really; so here were the F/F and C/L Old Warden pilgrims *en masse*, and despite early fog, threatening skies and a scattering of raindrops Old Warden's reputation for flyability when all

around is grim was restored. Perhaps the pessimistic forecast kept away some radio fliers, for numbers were a touch down on what could be expected from a sunny Sunday; but the thunderstorms skirted us and no-one missed his slot. Not until we were ready for home did the rains come - but enough of this Weather Centre stuff. What of the models?

Radio control

Two days of solid R/C activity left some clear impressions; first, that the inventiveness and expertise of the scale modeller continues as strongly as ever, and secondly,

that although we are firmly in the age of the large scale model - they really do perform most spectacularly - there is still plenty of mileage left in the smaller, two-stroke-powered craft. It was also noticeable that many subjects had been built from - or at least based on - kits of obviously high quality; disappointing, though, that so many of these were kits from overseas...

Nevertheless, a healthy number of subjects were scratchbuilt, none more pleasantly obscure than the Focke Wulf Ente canards flown by Eric Burke and Bob Polson - yes, two examples of this curious inter-wars canard twin appeared at Old Warden. Data was gleaned from an Air

Summer Magic

gain!



Above: Surrounded by marker cones, nine-year-old Darren Bellworthy puts dad's Fokker Triplane through its paces with much concentration. Below: Pre-war US Army trainers are always colourful subjects. Here's Harry Potter's PT 19.



Pictorial feature, but since then (as ever) much further gen has been discovered. Two OS 15s provided plenty of urge for these 66 $\frac{1}{2}$ in. curiosities, which were perfectly stable, even in Saturday's gusty conditions. We heard a rumour that plans may appear in one of our companion magazines...

Three years old, and a Shuttleworth Trophy winner a couple of years back was Rob Cavell's Tiger Moth, a quarter scale beauty built from a Pilot kit. Rob tells us that the model has flown more in windy weather than in calm, so it was at home on Saturday; but for the first time ever the previously trustworthy OS 120 stopped in mid-air - twice! - so we were treated to a most

impressive glide. Another biplane, and a very colourful one, was Roger Morris' Bucker Jungmeister, OS 25 FSR powered; another Pilot kit subject. Basically yellow, but with orange, white and green flashes, this characterful subject was difficult to miss. For many enthusiasts there is nothing to beat the classic British pre-war fighter and there were several on view including at least a couple of Gladiators from the recent Radio Modeller plan. Particularly impressive was Dave Smith's scratchbuilt Hawker Hart, decorated in Shuttleworth colours. Dave could point to a long enthusiasm for this craft; ever since he saw 'em at the 1933 Hendon Pageant, in fact. Originally

powered by a Webra 61, bouts of overheating had led to a Super Tigre 20cc being substituted.

But the pipes didn't have it all their own way. Roger Page's Starlet was a bulky but pretty low-winger which looked good in the air. So did the sleek red Tucano of Dave Rowell. There was the customary hatful of WWII subjects but very few oldies, C Hodgson's Bleriot being an exception. This flew just as a Bleriot should, i.e. by inducing a certain amount of nailbiting tension in the souls of the spectators, if not the pilot.

Multi-engined subjects are always head-turners. Dr Jeremy Shaw's now well-known Curtiss Condor was most impressive.



Left: Dick Grainger's Microplane Veloz gets away nicely. Below: Simon Rogers flew a variety of Telco-powered craft all day long on Sunday and deserved A for effort. This is his Air Department Scout; inset pic show Simon's Supermarine Night Hawk - a challenge if ever there was one! Right: There's a certain uniformity of launch technique, if not flight pattern, at the KK/Veron kit contest first mass launch. Inset: First, second and third in the 'monoplane' section: Martin Beacon (Stinson), Ray Janyon (Piper Family Cruiser) and Dick Grainger (Ercoupe).



Lacking a certain finesse when viewed close-up it really looked the part in the air, making several low-level sorties over the Shuttleworth copse. Some were a bit low, actually - after one sortie the Condor brought back a few leaves and twigs to prove it had been there... And how can we forget Dave Chinery's Armstrong Whitworth A.W. XV Arethusa? This classic '30s airliner (the full-size prototype A.W. XV was used in some very evocative Shell advertisements) was powered by nothing more esoteric than four Acorns electric units. Could be that multi-electrics are the way ahead - who'll be first with a D.H. Albatross?

Lots and lots more impressed: Harry Potter's colourful PT 19; Arthur Searl's Bristol Brownie, Magnum 91 powered, which really did look as though someone had waved a magic wand to reduce the real one to model size; Fred Beard's one-third scale Tiger Moth, half-kit and half scratch-built, which boasted a 42cc twin motor of American origin and a picture display information board to verify its truth to scale;

and Martin Fardell's magnificent Curtiss Seahawk. Look to our companion magazines for further details of the radio scene at Shuttleworth - but we can't leave it without mentioning the splendid achievement of nine-year old Darren Bellworthy, who flew his father's Fokker Triplane in a very neat manner with perfect assurance.

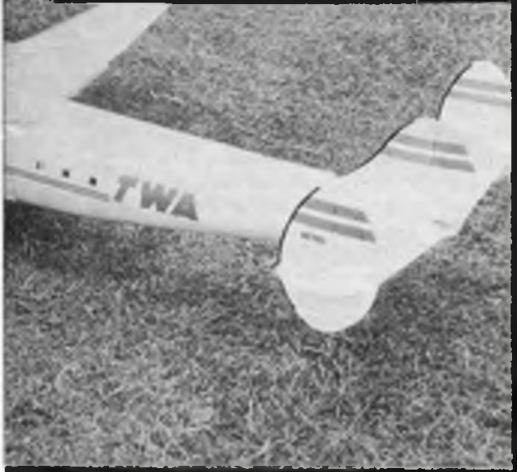
Control line

No activity on Saturday, but plenty on Sunday, meant that there was much for the C/L scale enthusiast to enjoy. First away was Mick Staples with his new Avro Avian. Mick's maiden flight was not without its problems; a small fire in the fuselage had everyone looking for fire extinguishers but fortunately they were not needed, and once airborne the Avian flew beautifully. Bernard Sexton produced his beautifully detailed Hall Racer, 39in. span and powered by an OS 50, which sported an impressive dummy Pratt and Whitney Wasp Junior. Another of Bernard's models - and one which particularly impressed Alex Imrie - was his profile RK 25, a model of a light

sporting German two-seater built by Raab/Katzenstein in the 1920s. This was correctly decorated as D1489 'Ruhland', which was flown in the 1929 Coup-Challenge International (a European tour starting and ending at Orly airport). The model was notable for its manner of decoration which consisted entirely of doped-on tissue, even the prop laminations. Bernard was just one of a strong Three Kings contingent which included Wal Cordwell, whose trusty Blenheim caused a few anxious moments until its U/C retracted properly; the father and son team of John and Patrick Robarts, both with Chipmunks (are they cloning them?) and Geoff Burkett, who as usual brought along his personal air force. Geoff's well-known Fokker Triplane (from the Tony Lunt R/C plan) was lucky to escape serious damage when the 'down' line broke near the handle. While the five-minute epoxy was setting, Geoff demonstrated his Hawker Fury (a conversion of Dennis Bryant's R/C design) which performed some impressive touch-and-goes and slow passes; and followed up with his Hanriot and Turbulent.



Below: Geoff Burkett's Fokker Triplane sits quietly while the epoxy sets. Model got away with little damage after the 'down' line broke... Bottom: CO₂ powered tropical Hurricane performed beautifully for Richard Keiser. Bottom left: Vic Westmuckett's Super Constellation (two years in the making) was a show-stopper in C/L. Heart of the flap and undercarriage retract system is shown inset. Complicated, eh?



Gerry Gibbon made a return to the flying field with an aerobatic 'no-throttle' Kawasaki Tony and, of course, Dave and Jym Leddy were there with their Short-Mayo composite, first seen last year. But without doubt the crowd-puller was the seven-foot wingspan Super Constellation in TWA livery by Vic Westmuckett of the Shuttleworth Model Flying Group. This six-foot long machine could fly at 30mph when the .90cc of OS motors (25s inboard, 20s outboard; all throttle-equipped) were hitting on all cylinders. The D.F. loop aerial protruding from the cabin roof was really a large winding key for the hefty rubber motor of the retract-U/C escapement, operated by a fourth line via a system accurately described by Bill Dennis as a 'blizzard of levers'. A bicycle pump also came into account as part of the equipment used in this mind-boggling arrangement. The gear goes up with a clunk when the line is tweaked and comes down in leisurely fashion at the next pull. A flight battery in the nosewheel bay energises individual glowplugs as required for starting when away from the pits. Each

nacelle has a simple press-switch to close that particular circuit. The Super Connie could be seen to be actually flying, rather than being simply hauled around, though with a suggestion of tail-heaviness.

Free flight

The amount of F/F scale flying on Saturday was minimal. Dick Skerrett tried his luck with a KK Ercoupe, which battled well, if inconclusively, against the stiff breeze, but that was about all. A couple of young lads had a whale of a time with their KK Soarer but we had to wait for Sunday's calm to bring out the rubber, diesel and CO₂ brigade. And come they did! By mid-afternoon the field was crowded with the largest number of F/F scale jobs seen for years.

One of the first to catch the eye was Simon Rogers, all the way from Plymouth with a selection of CO₂ oddities, including an all-sheet Air Department Scout of 22 1/2 in. span. Ever heard of it? This is a pusher biplane from 1916, with vast fin area, and a nacelle attached to the bottom surface of the upper

wing. The original was reportedly tricky to fly, which usually means the kiss of death for a scale model, but Simon persevered and was rewarded with a succession of fine flights (and many questions from captivated modellers!). Simon also tested an all-sheet Supermarine Night Hawk, a twin engined quadraplane, but this needs more work. No doubt we'll see it circling happily next year.

A craft which always impresses by its delicacy is the DH53. Ian Harwood had a 1/12th scale version equipped with a Telco 3000 (soon to be replaced by a Powermax twin). This was a lively Humming Bird, regrettably unpainted. How about a touch of decoration for 1987, Ian? Another fine-performing was the CO₂ Hurricane of Richard Keiser, built from the Stan Cole plan and very smartly finished with a light spray coat of tropical camouflage. This scheme makes a pleasant change from the green/brown to which most WWII subjects are treated. A contender for the 'most colourful model' award - not that there was one - would have been Rex Oldridge's red and

yellow Cessna CR3, a tubby rubber-powered racer from Model Builder plans. This flew well, in usual Oldridge style.

The free-flighters arranged their camps along the hedge at the northern boundary of the airfield and the result was as merry a demonstration of the variety of the scale modellers' craft as any observer could wish to see. This is a site particularly suited to the smaller lighter model, but it was encouraging that there were more diesel-powered subjects than we have seen in recent years. Croydon area enthusiasts Derry Eggs, Mike Holloway, Alan Jupp and others commanded a substantial area near the windsock. Derry's FW Stosser (from the APS plan) flew most reliably and prettily. The saying goes that you're not a real scale modeller until you've tried an engine-powered twin. Trying hard was Alan Jupp with his Airspeed Fleet Shadower, an unusual choice but one with almost sport-model proportions, even though the tram-like front end seems a bit quaint! Regrettably, although the model has flown successfully, we were not treated to the sight of it in action for Alan had to give best to a series of engine problems which meant that the PAW 80s failed to run in unison.

Ken Hinton brought along a very smart Mills 1.3 powered Tiger Moth in the livery of the London Transport Flying Club, a conversion from the Rupert Moore 'rubber' plan. A pity about the inaccurate registration, but the model itself was a delight. Has there ever been a 'duff' Tiger model? Even the Mercury kit flies beautifully... Another 'diesel' enclave saw Pete and Mike Hall's Ansaldo and Roland CII being readied for action. Italian and Teutonic bipes are colourful, if rare subjects. We ought to see more; how about one or two of those obscure triplanes?

Mass launches!

During the morning there was much trimming-out in preparation for the Keil Kraft/Veron kit contest, and at 3pm the hopefuls assembled under the watchful eye of organiser Bill Dennis, who reports:

I was well pleased with the entry of 15, although only three of these were biplanes, and almost all were K.K. I had taken some stick for setting a minimum weight of 40 grams., but this is what the model would weigh if built from the kit. As it happened, some durations were approaching a minute, so I think we were not too far wrong. The contest was run in a series of rounds in which all the models were launched together, and the first one down eliminated. Although it was rather chaotic for the adjudicators, I think the contestants and spectators enjoyed it immensely. Amazingly, there were no mid-air! The biplane class was won by Brian Faulkner with an SE5a while Martin Beacon took the honours in monoplane with a Stinson. A special award for the best

finished model went to Charlie Newman's Comper Swift; and I would like to thank Aeromodeller and Richard Grainger for the generous donation of prizes.

We will have to repeat this next year, and if you read Scale Matters you will find details of a similar event at Walsall in November. If you are trying to choose a subject, I would hazard the opinion that a model with large wing area is less important than trimming for reliability with a long-running motor/prop combination. Having said that, Doug Hunt had what appeared to be the largest model - a Piper Family Cruiser.

There really was lots and lots to see, so much so that we cannot hope to describe everything here. Surely we ought to mention Doug McHard's CO₂ Spitfire, now ten years old and looking just as good as it did when the photos were taken for that excellent publication 'Flying Scale Models of WWII'. And what about Gordon Cox's 20in. span Walrus, laboriously enlarged from a 1/72nd scale drawing? Then again, perhaps we should pass on some of the hints and tips, or obscure scale gen, aired at this scale modellers' Mecca - but wait, time runs short and much will have to wait for another time. We'll let the pictures tell more of the story...

Afterthought

In the F/F area there was some concern at the over-flying indulged in by one or two of the larger craft, which, of course, demand a fairly wide radius of action. One R/C twin was seen to bite the dust, mercifully in a sparsely-populated patch. It should also be pointed out that a C/L model left its lines and that more than one F/F craft flew over the boundary hedge to land in the road. Safe flying is everyone's responsibility, no matter what discipline they choose...

Having said that, those at Old Warden enjoyed a splendid weekend. Those who stayed away missed a good 'un - don't let it happen again!

Stop press: have you lost a float from your Supermarine Seagull? If so, call Charlie Newman on 086 77 3020 at once, for he may well have some news to your advantage.

ASP Scale Days: Events and awards

Free Flight

Outstanding performance

1 S. Rogers	A.D. Scout
2 D. Eggs	F.W. Stosser
3 R. Keiser	Hawker Hurricane
4 R. Oldridge	Cessna CR3

Keil Kraft/Veron kit mass launch

Biplane:

1 B. Faulkner	SE5a
2 V. Dubery	SE5a
3 P. Briggs	SE5a

Monoplane

1 M. Beacon	Stinson
2 R. Jenyon	Piper Cub
3 R. Grainger	Ercoupe

Masefield Trophy

1 R. Brownson	184 Gpts	Miles Magister
2 Lindsay Smith	171	Curtiss Navy Racer
3 B. Walden	115	Albatros

Control line

Outstanding performance

1 J. Roberts Snr.	Chipmunk
2 B. Sexton	Hall Racer
3 P. Roberts Jnr.	Chipmunk

Jack Carter Memorial Trophy (best biplane)

G. Burkett	Hawker Fury
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Radio Control

Outstanding performance

1 M. Fardell	Curtiss F7c-1 Sea Hawk
2 W. Barnes	Hawker Tomtit
3 D. Gladwin	Avro Tutor
4 A. Searl	Bristol Brownie

Shuttleworth Trophy (best replica of a Shuttleworth craft)

J. Simpson	Gloster Gladiator
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Left: Patrick Roberts looks pleased with his C/L Chipmunk, built from ASP plans. Right: 'Built-up profiles' look good! This is Bernard Sexton's Raab-Katzenstein RK25. Below: One-to-one scale; the ex-Leisure Sport Fokker DRI spent most of the weekend undergoing an engine change, but rewarded the team's efforts with a faultless test flight on Sunday evening. Here it awaits final checks.



VINTAGE CORNER WAS THERE TOO...

Alex Imrie was on hand at Scale Weekend to note items of Vintage interest...

ON 'SCALE SATURDAY' AT OLD WARDEN only the R/C models did an appreciable amount of flying, for there was a blustery wind that made flying anything else a risky business; thus it was that many free-flighters were 'otherwise occupied' and waited for the morrow!

Sunday remained overcast all day with only a brief suggestion of the sun coming through, but despite a few drops of rain the conditions were eminently suitable for even the smallest and lightest of our brood, for (as has already been reported) the wind had all but abated.

It is a fact that I keep repeating the simple truth that vintage modellers are always so keen to fly their creations that they snap up any chance to do so with alacrity. One can understand their frustration with just too few places left in our landscape for this sport of kings... the pursuit of vintage free-flight models; and there are all-too-rare opportunities available to them to commit their own brand of aviation. Really, one cannot blame them for gatecrashing at what used to be very much a pure scale day, and getting themselves airborne at Old Warden on Sunday.

It might have been downright anti-social in some people's eyes to fly non-scale models at this meeting, but if asked, a high percentage of the vintage modellers would plead that the multitude of half-size CO₂ powered miniatures fielded were in fact flying scale models of their big sisters! Whether or not this definition would stand



Happiness is being at Old Warden - Doug McHard proudly shows off his vintage-style Seraphy, equipped with (inset) a home-built Sparex 0.8cc diesel.

road and the runways intersection, and were a happy throng... there is no doubt that in free-flight eyes 'happines is a place to fly'. The only solemn faces amongst them were vintage flyers who remembering the strict observance placed on scale day from years gone by had not brought models with them.

I do not know if a non-scale model came into conflict with a scale type, but I heard comment on the disastrous effect that a large power-driven free flight vintage model might have on a clutch of Peanuts or similar models if it decided to alight on them. While appreciating that there is no argument against this worry, the same hazard might obtain if a large power-driven scale model decided to do likewise. It is worth remembering that not all such craft are radio controlled, and some pretty missile-like objects have been created over the years. In particular, we think of many flying scale models from the late 1940s - before the advent of R/C but after the model internal combustion engine (particularly the compression ignition motor) came into its own. Modellers could make these prototypes and fly them at the scale meeting creating the havoc hinted at above...

Free-flight

Entering the aerodrome I met Denis

Stevens of Northolt retiring from the fray with a broken rubber motor on his 24in. span Curtiss Robin built from the pre-war Comet kit plan. Denis attends all these functions, always with a small rubber model; and while I was chatting to him another regular attendee passed: Clive Bunyan of Luton with his 52in. Gazookas, an enlarged version of the three-foot model Calhoun Smith described in the August 1950 issue of Air Trails. Having seen this black and silver beauty before, my attention was more taken with his Jaunty, a Howard Boys design based on the Auster high-wing monoplane but without bracing struts. Clive's version was powered by a Mills .75 replica.

A model seen for the first time was the Ron Warring-designed Hobbies Champion. Hobbies Ltd of Dereham, Norfolk were, of course, the fretwork people who ran a model aircraft section in their weekly magazine. They also produced a limited number of model aircraft designs over the years. Their Champion was s36in. span high wing cabin model with Warren Girder type diagonal ribs (in best Warring geodetic style) in wing and tail. The example seen was built by Alan Clarkson of Kettering who used a DC Dart for power.

Simon Rogers whose scale exploits are mentioned elsewhere, had a nicely made rubber-powered grey Bucker Jungmeister



Alan Morris' Challenger gets away from another bout of vintage free flight.

up to close scrutiny is not known (shouldn't think so! GC) but guilty or not, such modellers were present on the aerodrome on Sunday and helped swell the numbers of free-flighters (the total certainly surpassed the count of R/C participants). They covered the grass area along the Northern aerodrome boundary hedge between the

designed by A J McRae Jr and described in the January 1938 Model Airplane News.

Arthur Rodaway from Hemel Hempstead was flying a twin-ruddered pylon model which performed well but evaded your humble servant's identification. It transpired that the design was Arthur's own and had never been published! He created this in 1947 after having experienced trouble with Bill Dean's Slicker, and used the then basic rules of thumb, with fuselage length equal to 2½ times the wing chord, and a thin high lift section. Arthur selected the Marquardt S-2, heavily undercambered indoor aerofoil, for the wing, while the tailplane was of course, of lifting section, Clark Y being adopted. The model flew well on the Amco .87 diesel; and recently Arthur made a replica of his old model for a DC Merlin. This is the fine-performing example that I saw at Old Warden. Arthur also had an interesting story to tell about his Kolibri, the early Czechoslovakian diesel design by Z Stanicek which first appeared as a reduced size drawing (with no descriptive article) in the August 1946 *Aeromodeller*. Arthur made his model by enlarging the small plan and did not read the small print, so quite apart from not realising that full-size plans were available, he did not appreciate that the majority of the construction was hardwood! After he had built the model he bought a full-size plan... Has anyone else made a model this way? I have done it myself when the urge to cut wood has been too great to waste time sending for the full-size plan until after the model was completed!

Most builders have had trouble trimming their Kolibriks. I certainly did, giving up with a severely damaged model long before any consistent flights had been obtained. John Kay, I seem to remember, did get his model to fly after a hectic battle. Both John and I built our Kolibriks in the age of vintage and did not dare depart too far from the laid-down design, but Arthur, remembering his earlier model, lopped 1½ in. off the rudder height and made a sub fin instead. He also fitted two additional sub fins on the bottom of the tailplane to lower the C/L, and incorporated generous washout on both wing tips... anyway, here it was, powered by a Keil Kraft Cobra 049 and flying well, but modified away from what one would call a true vintage model. Arthur and I watched Mike Allen of Birmingham trimming his beautifully built yellow and silver 35in. span rubber driven Heston Phoenix, designed by Eric Fearnley (first described in *Aeromodeller* in June 1938, it was recently re-issued as plan FSR 1458, price £2.50 plus 55p package) and Arthur related how he used to work on the full size Phoenix many years ago!

Doug McHard took the other approach to trimming his Ariel (re-named) Swift in a Plans Service handbook a few issues ago where it is identified as FSR 301 X), a design by Tim Hervey which was described in the September 1948 *Aeromodeller*... imagine changing a name in that way; how can we model historians hope to succeed when this sort of thing goes on? The C/L monstrosity which took over that splendid name would have been more appropriately named 'Square', for that is what it is! The mid-wing rubber model with which we are concerned here is a beautifully crafted aeronautical shape. It uses a very sharp-nosed aerofoil

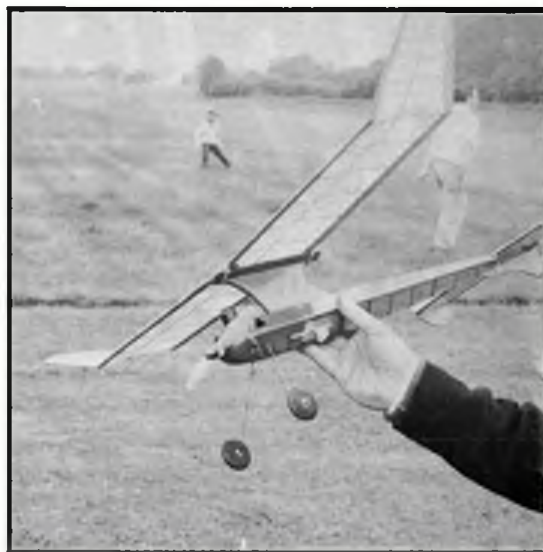
section which should normally improve performance but Doug's immaculately built model was not making an easy transition from power to glide. Short power flights were beautiful stable affairs, but when the power ran down the model tended to flick off onto either wing tip and cartwheel into the ground. Settings are not easy to adjust because the wing attachment is fixed, but Doug was eventually forced to introduce changes in longitudinal dihedral in his elusive hunt for a stable glide.

Some months ago Doug made a little .8cc diesel that was described in the May 1947 *Aeromodeller* by L H Sparey. Doug says that he would have been pleased had the engine run at all, since he was concerned about the extremely fine limits necessary (and so often quoted) to make acceptable piston cylinder fits and doubted that he was good enough to achieve them. Nevertheless, the engine ran with so much power that Doug felt he just had to design and build a suitable model for it.

That he did this to good effect is shown in the lines of his 40in. shoulder-wing Seraphly (a word play on the name L. H Sparey), a model that is not unlike Peter Westburg's WS-3 which was described in the July 1938 Model Airplane News. This in turn was similar to the Douglas O-43... what is really meant by all this is that I know Doug had a particular liking for the very distinctive wing plan form of both these machines and used it! This vintage-style model is fitted with wheel spats, attractively finished in red and yellow it bears not only original ABA black and silver transfers on wings and tail but to commemorate Doug's long association with the RAFMAA, of which he was a founder member, the model also carries the golden winged insignia of that organisation on the sides of the fuselage.

Masefield Trophy

Vic Dubery and Paul Weeks were again running this interesting contest which sadly was not as well supported as previously. Full details of contest rules were given in last year's account but briefly, the event is for rubber-driven flying scale models published or kitted before 1st January 1951. Total flight times for three flights are adjusted by a percentage bonus depending on whether the model was multi-engined, waterplane, has more than one wing or is tiny! There were nine entries this year in better weather conditions than 1985 so it is a pity that more modellers did not take advantage of that fact. This year's 1st and 2nd place winners did not place at all last year, while last year's winner could only make third place this time! Models were generally Earl Stahl designs, which makes documentation easy. Vic Dubery stuck to his Keil Kraft SE5, this year's version being decorated in the colours of the Irish Air Corps, but his flight times were low, and even with the 'biplane factor' taken into account he finished up only 6th. The winner was Ron Brownson with a Miles Magister, his 142 seconds flight time rising to 184.6 points after applying the bonus. Second place man was Lindsay Smith with his 13in. span seaplane Navy Racer made from a 1936 Comet plan. His 95 seconds flight time was bumped up, for reasons mentioned, to 171 points! Bob Walden with his Albatros DV (last year's winner) had 72 seconds to convert to 115.2 points for third place.





Top left: Arthur Rodaway of Hemel Hempstead with his 36 inch span diamond fuselage pylon power own design from 1947; original had an Amco .87 diesel; replica flew well on DC Merlin. Left: Peter Ball of Hornchurch and his Telco powered example of Scotty Murray's famous design. Bottom left: Chris Boultie of Bracknell had countless flights from his orange and white DC Bantam powered Scalded Kitten whose distinctive shape turned many a head. Above: The Stearman biplane is from a Fiyline kit powered by DC Dart, while the ABC Robin from ASP plans has a dummy flat twin made from a dieselled Cox Pee Wee. Both built by Mike Holloway from Wallington. Right, top: Brian Downham's biplanes are usually R/C with floats and roundels! This one, however, is the rubber-driven Ladybird, designed by H J Pridmore and was described in the April 1948 Aeromodeller. Right, below: Earl Stahl Mig 3 built by Bob Walden, down after one of its many high altitude flights, held by Ron Knight who flew it into 5th place in the Maselield Trophy. Bottom: A flying associate holds the big Gazookus and the Howard Boys' designed Jaunty. Unmistable wing and tail outlines confirm that Howard was employed in Auster Aircraft's drawing office when he drafted this one!



More Free-flight

I simply lost count of the number of Simplex that I saw. This 60in. span Paul Plecan design, first described in the February 1941 Air Trails, seems to have caught on in a big way and looks like ousting the old Junior 60 as the most popular power model. Adrian Culf, down from Suffolk had a good flying 30in. span Pacific Ace made from the SAMS sheet parts kit. He had used obechi for fuselage and spars. This black and white model powered by 4 strands of 1/4in. flat rubber was flying all day. Another regular performer was Chris Boutle from Bracknell with his orange and white DC Bantam powered Scalded Kitten, a vertical climbing power model designed by R H W Annenberg that was described in the 1949 *Aeromodeller Annual*. The distinctive look of this model with its swept forward end-plated wings sprouting from a profile fuselage was said to have been '...sufficiently startling...to whet the appetites of all contest flyers.' The plan is available from ASP as PET 352, price £1.80 plus 55p postage. Another model that I saw for the first time was Alan Morris' ED Competition Special powered all-red Challenger. this simple 52in. span high wing model was designed by H A Thomas of Little Rock, Arkansas for his sister Mary Louise to build and fly, which she did to the tune of winning several contests. This model is even simpler than the Simplex and I would not be surprised if it caught on. It was first described in the May 1941 Air Trails, and when it appeared again, in Air Trails Model Annual for 1943, it was called Tiger! Here we go again with name changes for exactly the same model!

Dr Michael Farrell from Peterborough was one of the Simplex owners, but he also had a black and silver Bowden Midget with full span slats. When I saw him he had just returned from a fruitless two hour search for his Mills-powered Ehling-designed Request, a 44in. polyhedral high wing cabin model that was described in the September 1941 Air Trails. His model flew in a straight line, due North, both on power and glide and ended up on the horizon amongst some trees.

Other models that easily come to mind are the orange Jaguar Wakefield by Colin Frith of Skegness, a Mills .75 powered Keil Kraft Ladybird by Alec Lang of Chingford, an all-red Sporty biplane (a Jack Humphreys design) made as a first model by Alex Wasse of Ashwell, and Brian Ferrett's Amco .87 powered Pinocchio II French sport biplane, which is also from the 1949 *Aeromodeller Annual*; plans are still available as PET 351, price £1.00 plus 45p postage.

I was impressed by the good flying being obtained with an Early Knight, a 36in. wingspan high wing cabin model designed by John Godden which was a free plan subject in the May 1985 *Aeromodeller*. The machine I watched was built by Roger Turner of Bury St. Edmunds, and although not vintage, it has all the looks of an old stager that I would be quite happy to title as 'vintage style'. Talk about turning the clock back... I had not previously seen the ready-to-fly Cosmo RI; yet here too is vintage style, for although the propeller, wheels and so on are plastic, the bamboo outline and paper covering is very much the part. Ben Bowdler of Kettering was the youngster with this 'stick tractor', a term that he doubtless had never used for his model...



Top: Alex Wasse of Ashwell, Herts chose Jack Humphreys' Sporty as a first model and powered it with a PAW 1.49. Plan is available ASP as PET/367 price £2.50 plus 55p postage. This photo: Mike (Jetex) Wilson of Enfield with his yellow 28 inch span Jetex Contest 200. Note the highly aerodynamic nose and mono wheel landing gear.

Historic models

Down by the windsock the models lay thick and fast and I nearly trod on two oil-stained ducted fan models. These were P E Norman originals; the 28in. Javahawk and a 23in. version with modified shortened duct named Son of Javahawk! Both models were fitted with Frog Vibromatic engines, and are merely an introduction to what Alan Jupp of 5 Alcester Road, Wallington, Surrey has fortunately preserved for posterity. He has saved some eighty of P E Norman's old models, and a number of Fred Longbon's masterpieces too. He will be bringing samples of these expert modellers' art to the Vintage meeting in August and is perfectly keen to answer any questions on these models if you write to him enclosing an SAE. Apart from the famous P E Norman fighters he has the original Ants Pants, Beesneez and Natsneez, plus a plan of the smaller version of the last named model that was shown at the Second Dorland Hall Model Aircraft Exhibition of 1945/46. P E Norman was awarded a special prize at that show when he produced his 'Nats' family which included Natswhiskas and Natsbyte! Alan also has in his possession the Old Nog and Nimbus sailplanes. He has restored some of these models and can document PE's output from 1946 until 1964.

Jets and triplanes

On the point of leaving the aerodrome I encountered the Jetex Brigade; Mike Wilson from Enfield and Steven Glead of Colchester with a trio of Jetex models, a Jetex Contest 200, a Min-O-Jet for the Jetex 50 motor, and an Aero-Jet for the '100'. These enthusiasts never tire of searching for Jetex items, and

are willing to trade all sorts of rare merchandise for them. They are continually on the look-out for fuel, motors, wick, plans, kits, augments tubes and so on. Readers having such impedimenta for disposal are asked to contact Mike direct at 26 Birkbeck Road, Enfield, Middx. EN20EP. Just before the rain started coming down solidly at the end of the day, the ex-Leisure Sport Fokker Drl triplane replica taxied out and took off for a local test flight which included an aerobatic showing of loops, a barrel roll and a stall turn, which brings to mind a well-known pilot's statement that a triplane when doing aerobatics looked '...like an intoxicated flight of stairs!'

Other Vintage news: Warwick Vintage Day...

Charlie Essex advises that the Coventry and District MFC is holding a vintage Fly for Fun meeting on Warwick Racecourse on September 29th from 1000 to 1800 hours. There are many competitions to enter, including an Ajax Contest; or if competitions are not your thing come along and join in the general free-flight scene, for more details call Charlie on Coventry 70472 or write him, enclosing an SAE, at 25 Whoberley Avenue, Coventry.

and incomplete captions

The July column showed two Wrens and an AM Cabin Duration, the builder's names for which had been 'lost in transit!' Numerous enthusiasts came to me at Old Warden with the information that the Wrens were by Stan Ford and Bob Brown, both of whom hail from Newbury. In fact, this is Bob Brown himself holding the little Bill Dean model. Many thanks, chaps.

READERS' LETTERS

What have you got to say about the hobby of aeromodelling? Here's your chance to air that opinion

F1C development - more than one way?

Dear Sir,
I read, with great interest, Dave Hipperson's article in the June issue of *Stafford Screen's* aluminium wing covering technique. It took the lid off a superb piece of production engineering in a most informative way.

I take exception, however to the phrase... 'it seems to have fallen on Stafford to do everyone's development work', which is both untrue and slightly insulting to those who have been involved in F1C a good deal longer than Stafford (no disrespect to Stafford at all). Aluminium foil covering is not the only way to construct longer, thinner, more efficient wings, as Dave seems to think, although it is good way.

Aeronautical engineering very rarely yields solitary solutions to particular goals or problems, and improving wing torsional rigidity can be tackled in a number of ways. Just because the Russians and Chinese have settled on foil covering doesn't mean it's the best way, especially if one's building facilities can't cope with it.



John Buskell's Verbitsky-sectioned F1C - more competitive than his ability, he says...

I've only been building F1Cs for a few years so I'm still a beginner, and any opinions I might voice carry little competition success to give them any credibility. But, for what it's worth, my own efforts are directed towards wing aerofoils and propellers (not folders yet, I'm afraid). I've used $\frac{1}{2}$ As and chuck gliders to try different ideas alongside my father's experiments stemming from turbulated F1C wings and stepped-wing chuck gliders, which have been related elsewhere. All his $\frac{1}{2}$ A and my chuck glider successes have been with stepped aerofoil equipped planes, as was my 4th place in the '84 F1C Trials and his 3rd place in F1C at the '85

Nationals. I like to think, therefore, that our development isn't going nowhere.

Perusal of Dave's photos shows that Stafford has chosen a Verbitsky (or similar) section for the foil covered wing. I've been flying a plane with this section for three years. The two-metre span wing has a rather poorly designed geodetic-ish structure within the sheet covering to provide reasonable torsional rigidity, whilst still allowing a degree of flexibility in bending. Certainly it's more competitive than my flying ability. However, I don't intend to use the section again. (See photo).

I feel that Dave may be looking through the rose-tinted glasses of hero worship; his writing is usually challenging, and he writes from a wealth of experience concerning rubber flying - long may he continue. But, sadly, as far as F1C is concerned he has a tendency to talk through a hole in his fuselage.

Stapleton, Bristol. **John Buskell**

(Dave Hipperson replies: 'Sorry if I gave the impression that Stafford was the only one researching and developing - it wasn't what I meant!')

Teams and public relations

Dear Sir,
Having been a modeller since I was 16 (I am now 65) and an organiser of clubs 'Regents Park' and 'Debdenairs', and being acquainted with a member of our last team, I would like to make several points, namely:

1. It would seem to me a hopeless proposition to try and 'catch up with the Russians'.
2. It would seem to me that some of our team members have a hard job keeping up with their own models! *Tempus Fugit!!*
3. From which, it would be a good idea to declare a moratorium on entry to the contest until we have trained a new team of young men, and/or women, who would be fit and adaptable enough to cope with 'unusual conditions on the day', as they say.
4. And why oh why must we be so obstinately amateur and not consider sponsorship by a really big concern? We must be the only sport (compare with so-called 'sports' such as darts and snooker) who do not consider this, and would not the Indoor Champs this year be good publicity?
5. That brings me in short order to my biggest gripe. When this aspect is tackled at all, it is by someone who is distinctly contest oriented, and is therefore biased in outlook and overlooks the stark fact that 99% of modellers are not, repeat not, interested in (in fact, they shy away from) contests of any kind. I know this from personal experience, having had a very hard job trying with my own club, offering them excellent trophies, etc. Out of a membership of some 60 one would be hard-pressed to get a contest of six people. This is a fact, so one would aim at information and getting this wonderful sport craft hobby with all its variations and disciplines, across to all the Joe Soaps

and local councillors, MPs, and so on, and drag them in financially by whatever means possible.

When I attend an Indoor meeting, I always look for the local mayor and press - with a singular lack of success. It seems such a shame to pass up such an opportunity of getting our message across. In case you should wonder, I've won two Indoor meetings at our local Community Centre, the second of which was sponsored by Ripmax and the trophies donated by the local Sports Council. Affiliation to the local Art Council is also worthwhile - a very neglected area, this. Is not our hobby a form of mobile art? One could run an exhibition on those lines alone. And do we know any professional publicity agents? If not, why not?

6. And last, but not least, it took me many years to find that 90% of club members were not members of the SMAE at all and therefore did not even subscribe to the national body which is (or was) constantly short of funds - why? I have always insisted on 100% membership and could never see any other way of being involved. Why should the SMAE be only for contest fliers? We all fly at rallies.

I hope one or two of my points strike a note, and that you don't mind a gripe by an old campaigner. I sometimes wonder why I've tried to organise people who don't want to be organised! I'm hoping that some of this may raise a bit of comment and thought on a very important subject. Remember, I'm not advocating direct state sponsorship, though that's what we have to fight from other nations.

Loughton, Essex. **R.G. Harris**

(Well! Strong words, indeed. Perhaps we could have some comments by those actively involved in promoting our hobby, whether at local or International Team level - many of whom, we note, are that oft-maligned 1%; competition modellers...GC).

An early challenge

Dear Sir,

In the course of researching a book on the Personal Column of *The Times*, I came across the following challenge to a competition, published on 18 February 1921:

"A prize of £5 is offered for the best designed model biplane or monoplane, to make a straight glide or flight. Size from tip to tip of wings not less than 12 inches and nor more than 18 inches. Made out of stiff drawing or Turkish mill paper. Models to be forwarded at owner's own risk to Major P C Suckley, RAF Club, 13 Bruton Street, W, not later than Feb 28th."

Does any reader remember this competition, or have any recollection of Major Suckley?

London, SW1. **Stephen Winkworth**

The editor is not bound to be in agreement with the views expressed by correspondents.

MIND THE LINES

with
Andy Brough

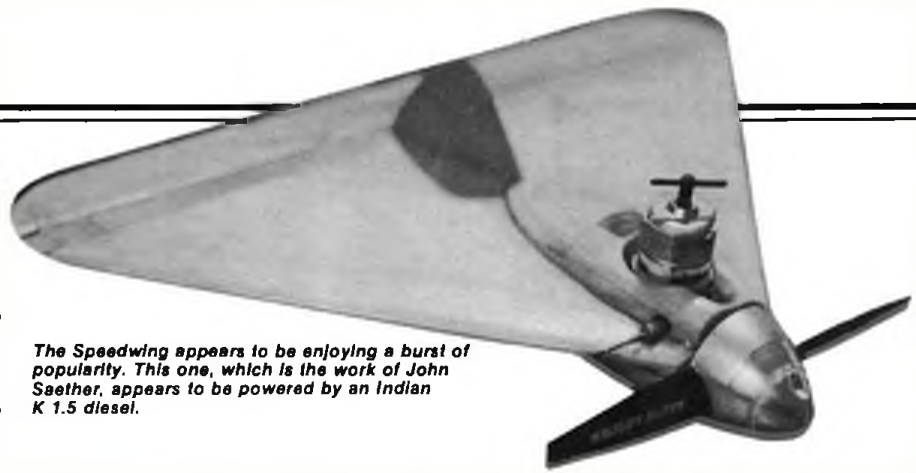
Old Warden 1986

This copy should be out just before our annual pilgrimage to the fields of Bedfordshire for Aeromodeller Vintage Weekend. The number of control line models there increases each year and even by having two days to try and spread the activity a little, the pressure for flying space is still evident, although Saturday is rather less hectic.

After last week's event some criticism was received regarding the formal competitions which took place on the Sunday. Not so this year, chaps. Ron Prentice and I will be holding the Vintage Stunt and Class 1 Speed events on the Saturday, but the rather less formal Fireball event will still be on Sunday. Fun flying will take place all day on Sunday so let's see as many models as possible in the air.

Perhaps a brief resumé of the events is called for. The new Midge, or should I say Class 1 speed event rules were published in the February 1986 issue of this magazine. They are pretty much as before but with the inclusion of any speed model design reduced in scale to a minimum span of 12in or any genuine Class 1 design (all to have been kitted or published before December 31st 1950). The winner of the Class 1 Speed event will receive a trophy, and the fastest Midge will be rewarded with the 'Lancastria Cup' for one year. Don't forget a genuine vintage motor will earn a 15% bonus added to the speed. Anyone got a cheap Javelin? The speed event will begin at 1:00pm sharp, so get your engine tuned.

Vintage Stunt will start at 3:30pm which should allow some time for practise. The rules are almost as published in the April '85 column, but with the following exception: Rule 6 is deleted, i.e. no scaling up or down is allowed. Flight pattern points will be awarded as follows: Nil for a poor flight, 5 if it is fair, 15 for good and 25 for excellent. Go for it.



The Speedwing appears to be enjoying a burst of popularity. This one, which is the work of John Saether, appears to be powered by an Indian K 1.5 diesel.

As happened last year, Mike Beach and Ron Prentice will walk about the control line area and pick out models that capture the spirit of the pre-1950 control line era. The owners of these models will be asked to fly them and flight marks will be added to the static score, the winner is awarded the Fireball. There were some really authentic models last year so let's hope it's as good this time.

Speedwings and things

Talking of speed models (as we were a moment ago) I've sent out quite a few Speedwing plans so with luck we'll see a good number on Vintage Day. One recipient was John Saether who wrote a long letter from Hong Kong. John has built two models and wishes to pass on a few hints on the building sequence. After all he has had some practice!

Cut out all the parts. Assemble and glue the wings and trailing edge. Fit the ply top deck, trim the shape wing. Fit bellcrank, insert leadout tubes and fit leadouts. Shape and fit top fairing and fin. Shape and fit elevator, horn and push rod. Make fuel tank and lower cowling. Fit engine, fuel tank and cowling and fair in rear of pod with scrap block. Trim wing to give clearance hole and check the assembled pod. Make up rear lower fuselage from scrap. Finish sanding and obtain good finish with successive bouts of sanding sealer and wet and dry paper. Apply war paint. John also says that it's a good idea to make the engine clearance hole in the wing a generous one, for ease of engine swaps later.

This model is a good engine test bed, and John has made up a number so he can try a variety of engines in the same model under the same conditions. Very useful if you have several 1.5 diesels and can't decide which is best! The Speedwing plan was originally

published in the September 1950 *Aeromodeller*, was repeated half size in the February 1986 issue and is available, full size, from myself for an S.A.E.

Still talking of speed models I've found a reference to a Class 1 speed model called the Bullet which was designed by a chap called R. Prentice, whoever he is! This model was apparently powered by a 1.3 Mills MkII turning a 7x8in prop and was capable of 80 to 85mph. Now there's a challenge! My best speed with a Midge plus standard PAW is 86mph so if a Mills can go as fast I want to know more... The other bits and pieces I know about are: Span 10½in, chord 3in, area 22.5 sq.in., a symmetrical-section built up wing skinned with 1/16in. balsa, and a hollow log fuselage. The most interesting point is the centre of gravity, reported as 7/8in back from the leading edge, which by any standards is quite rearwards for a speed model. This could account for its rapid progress with a Mills, i.e. the blooming thing could fly! Most Midges I've seen have the CG near or at the leading edge. How about re-drawing the plan Ron? The more Class 1 models the better...

Whilst doing some research for this column (sounds good doesn't it; but really it means reading old magazines) I came across a paragraph concerning the above mentioned gentleman, in Bill Dean's Power Talk column in *Model Aircraft*. I quote: 'Ron Prentice of Ilford, Essex goes in for really large stunt models these days. His latest is an Atwood Champion-powered 820 sq.in. original - weight 3¼lb. Others of his recent models are an Easy (Frank Ehling design) and a de Bolt Stuntwagon - both Atwood powered. The Stuntwagon weighs 3½lbs, and has 667 sq.in. of wing area. Quite a change from Ron's early Mills powered models like the Smallfry.' I bet Ron wishes he had an Atwood or two these days.

Continuing my research I also came upon



This picture: Dick Roberts and his superb Arkansas Traveller. Guess what the motor is! Model is finished in black and white - a crisp combination. Bottom of page, left to right: Jym Leddy with a pair of Mills-powered Stooplates; a red and yellow Tantlvy, bearing prop damage, spotted at Old Warden; and a miscellaneous gathering at a past Vintage Day meeting. How many can you identify?



a Gamages advert showing an Elmic C/L handle, the like of which I've not seen before. From the sketch and the description it would appear that the line attachment part of the handle rotated when a trigger was pressed. This was to eliminate crossed lines. I assume that after the loop one pressed the trigger and rotated the arms holding the lines through 180° until it locked into position. If anyone can report more on such a device the information will be gladly received.

Model of the Month

I am getting very strong indications that vintage team racing is going to take off in a big way. A recent visit to Barkston heath for a Vintage event yielded up to 30 models and only the usual Barkston gale prevented a super contest. The KK Rangers and galley Mercury Team Racer are back in production, and several plans are available from MAP. Classes now cover 1/2 A, A and B; and the main purpose of introducing vintage team racing is *not* to provide yet another serious competition class but to give an excuse (as if one was needed) for building and flying some of those classic team racers designs of the 1950s. So writes Dave Campbell of the Grantham Club who will run vintage team race events this year. For further details contact Dave at 2 Sycamore Close, Burbage, Hinckley Leics LE10 2JU.

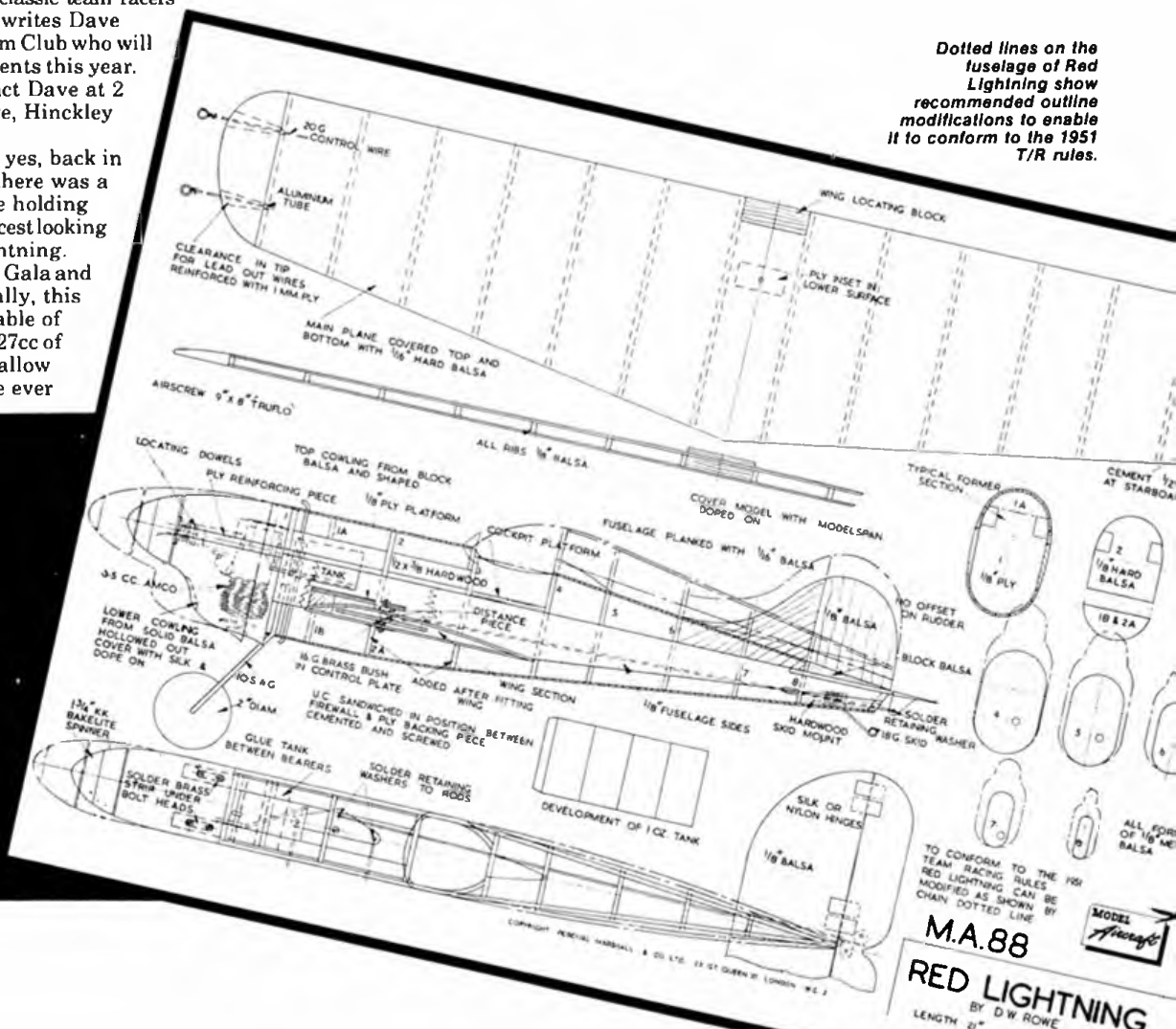
Now where was I? Oh yes, back in the January 1986 issue there was a picture of 'Skipper' Rowe holding what to me is one of the nicest looking racers ever, the Red Lightning. Winner of the West Essex Gala and third in the All Herts Rally, this Class B design was capable of 80 m.p.h. and 47 laps on 27cc of fuel (although the rules allow 30) when powered by the ever

popular Amco 3.5. A glance at the reduced plan highlights the sleek open cockpit design which design which looks every inch a 'real' racer. I'm sure that powered by a suitable motor, (an ETA 29 or even a PAW '29) this design would give a good account of itself. I'm not sure whether this plan is still available (No. MA 88) but it can always be scaled up and the original article is available from myself for a S.A.E. No excuse now, have we?

That's all folks; but by the time you're reading this we'll probably all be at Old Warden chatting and flying vintage models like nothing else mattered. It doesn't does it?

Stop Press! I've just received notice of a Vintage Control Line meeting run by Peter Martin of the South Birmingham MFC. Held at Rubery Hill Hospital, Rubery, near Birmingham on October 5th. These are very good do's, as often reported by yours truly, so make it an event not to miss. For more details contact Peter on 021 444 7964.

Dotted lines on the fuselage of Red Lightning show recommended outline modifications to enable it to conform to the 1951 T/R rules.





Mick Page, National HLG Champion in 1979, 1984, 1985 and 1986 - that's him on the left - lets us into his winning secrets

A NEW APPROACH ...TO COMPETITION HLG'S

RIGHT, LET'S GET STRAIGHT down to business. How is it that I am prepared to give away all my secrets? It's quite simple. Hand-launch glider (HLG) is suffering - like all the other free-flight competition classes - from the disappearing aeromodeller syndrome. Yet if I go to a rally where there is no HLG competition I can usually spot up to a dozen flyers with this type of model. At a competition they have vanished, leaving just those enthusiasts who know what they are doing. The others have convinced themselves that they have no chance of winning. Actually, when I said they had vanished, this is not quite true, because in many cases the models are still there; it's just that they are left in the car all day. When I ask why this is, the reply always goes like this:

'I would have entered but I didn't get it trimmed before the rally and it is too windy to do it today, and look over there - Phil Ball is flying so I don't stand a chance and it's a bit cold and look at the sky, I think it might rain...' and so on. Now if these modellers really believed what they were saying they wouldn't even get the car out of the garage, let alone attend a meeting; so let's get one thing straight:

If you do not enter you cannot win.

I have come to the conclusion that these negative thinkers are, potentially, disappearing aeromodellers; and now must be the time for every serious competition modeller to take one of these negative thinkers under his wing and educate him so that he becomes - at least - a potential competition flyer. One must also accept that one of the differences between a negative thinker and a potential competition flyer is that the latter believes that he will be able to beat his tutor one day; and if that belief starts to founder then (dare I say it) you must even - if only once - deliberately let him beat you. Otherwise we may never again fly in large numbers in competition (unless we go abroad). If you go to the informal rallies, such as Vintage Weekend at Old Warden, you will see a large number of potential comp. entrants enjoying their flying in a different way - so let's help them

to come aboard if they want to.

In fact, not only do I offer this article to help all beginners, negative thinkers and potential competition HLG fliers, but I also offer my services as a tutor; so look for me at the HLG 'box' at any meeting. If I seem to have gone on a bit about this it is because not until I put pen to paper did I realise that the future state of competition flying is in the hands of today's participants.

Negative thinking

I'll start with a little history. There once was a time (and it still hurts to have to admit it) when I was one of those negative thinkers. Not that I couldn't make a HLG go well, for I have always been able to do that. What I mean is that there was a time when I would come last in every competition, making hard work of it too; so let's be clear about one more thing:

If you think negatively you will lose this year, and the next, until you give up altogether.

To discover how I changed to positive thinking, read on...

In the late '60s/early '70s the basic theory behind the HLG was as follows:

- (a) Wing and tail incidence settings 'zero/zero' for maximum height gain at launch
- (b) No height loss allowed during transition to glide circle
- (c) Model should be light for a floating glide.

My first model, built at this time, appears in Fig 1, which is drawn from memory. That's a mistake in itself; if one aims to be good at aeromodelling then start keeping records.

The model was trimmed out to comply with point (b) above. Later versions had rounded tips to the wing, tail and fin. It was very consistent in transition and had a minimum still-air time of 45sec from very little height, for the undercamber and light weight prevented the model getting up very far. As I flew only when it was dead calm, results were bound to be consistent as anything should fly well in those conditions.

Now, did you notice that I said '45sec minimum'? Reasons were: I would fly not just in calm conditions, but only when it was sunny; so thermals would obviously be present. At that time I did not appreciate what thermals were - they were those

invisible things used by the experts; certainly not by beginners like me. Yet if I put in nine flights then two of them would max by catching lift, four would be 45sec and three would catch a bit of drift to end up in the region of 47 to 55 seconds. Adding together my best five gave me a score of four-and-a-quarter to four-and-a-half minutes, and if you look in *Aeromodellers* of that era you will find that such a total would mean a win in many HLG competitions.

So off went this clever dick to his first comp expecting that not only would the sun shine out of... well, shine, anyway, but that he would naturally win the event too. They do say 'if the cap fits, wear it', and it certainly fitted that day as I was given a very large lesson in the difference between sport and competition flying. To start with, it was very windy. I had never flown in wind, remember; nor could I understand why anyone would want to. Then I found another invisible force called 'turbulence' that seemed to be present whenever I flew but which magically disappeared for the others. I could go into a very long description of how my model flew, but it's enough to say that during one of my flights a paper bag was blown downwind and it beat my model easily. The moral:

If you want to be a competition flyer you must be prepared to fly in wind, turbulence, wet and cold.

My lightweight model was totally useless in wind, let alone in turbulence. Because I was a negative thinker I could not admit it, and to prove that my model was fine, and that I had just suffered bad luck at the competition, out I would go on the next calm evening; and sure enough, the model would fly beautifully again. This carried on for a couple of years, until I reached the state when I was about to become a disappearing competition flyer. If only an expert had taken me under his wing. I really did need some help, for I had reached a real low.

Then a wonderful thing happened. Somebody turned up at the Grantham club event with a model with a wing 3/16in thick. It was based on a design called Solid Gold, a drawing of which was published in the 1973-74 *Aeromodeller* Annual. This reached a phenomenal height and flew well in wind. I didn't realise that the main reason for the craft's altitude was that the flyer could throw 'higher' than anyone else; and of

course a lot of the stability came from the fact the model would then have missed the ground turbulence. Back home I went, thinking that if I built a model like his I would soon be winning. Fig 2 shows the result of this ambition.

I really loved flying this model. The thin, flat-bottomed wing section plus the extra weight - and most of all, the long moment arm - gave excellent height, the model going straight up and just flicking off at the top. If you threw harder the model would go higher still, yet would not require any trim change; so one was always trying to throw harder! As I am only a little chap, getting a model to such a height did wonders for my ego. One of the photographs shows the height comparison between myself and Bruce Melton, one of my pupils (note that I practise what I preach). Nevertheless I was still a sport flyer, trimming-out the model on those calm evenings (negative thinking again) so even when I thought I had got it right I was reminded that at competitions there is usually wind and turbulence, and in these conditions the new model was nearly as bad as the old one. Fortunately for me there were a few rare periods of calm weather in the Seventies, and I was thus able to win a few competitions. My enthusiasm knew no bounds, and even when I did not do very well I was really enjoying coming last. Enjoyment was the name of the game; positive thinking was beginning...

At this stage I was regularly flying against Phil Ball in the Grantham club events. I would take all day putting in my nine flights; then, an hour before the end of the content Phil would turn up and walk all over me. As I did a lot of HLG flying I was seen a lot; this in turn meant that some people thought I was good at it, so when I had been trying hard (you guessed it, in windy conditions) someone would come up to me and say, 'I thought you experts could do better than that.' Down would go my ego; and what was worse, the comment was almost correct, for although I was not an expert I should have been after all the time I had spent flying this class of model. So decision time finally arrived. I had three options:

- (a) Carry on as I was
- (b) Stop flying in HLG competitions
- (c) Start thinking positively.

Because I was dissatisfied it could not be (a). It could not be (b) as I enjoyed competition flying too much; so it had to be option (c).

From negative to positive thinking

I had always dreaded getting to this stage for I had imagined that it was going to be the hardest thing in my life; yet it is the most simple thing to do, because positive thinking is nothing more than accepting reality. To put it slightly differently:

A positive thinker competes against his fellows and wins often, and A negative thinker competes against himself and usually loses.

If you have read 'Expert's Forum' in *Aeromodeller* you will have noticed that most have one thing in common - that is, each expert has set himself a goal to achieve. This is positive thinking of the first order. In my case, the choice of goal was easy. It fell into three parts.

- (a) To produce a HLG that would fly in wind and turbulence
- (b) Use it to beat Phil Ball (a matter of

honour)

(c) Then win the British National Championship with it.

Note the order: to win a competition was the last of the three priorities.

Let's look at point (a) in a little more detail. After I examined the rules and aims of the competition itself I came to the conclusion that a whole new approach was required to win.

The rules are: Each flight has a one-minute max
 Nine flights are allowed, all to be launched from the HLG 'box'. The best five are to count.

The aim, therefore, is to produce five maxes and the longest flight in the fly-off (if any).

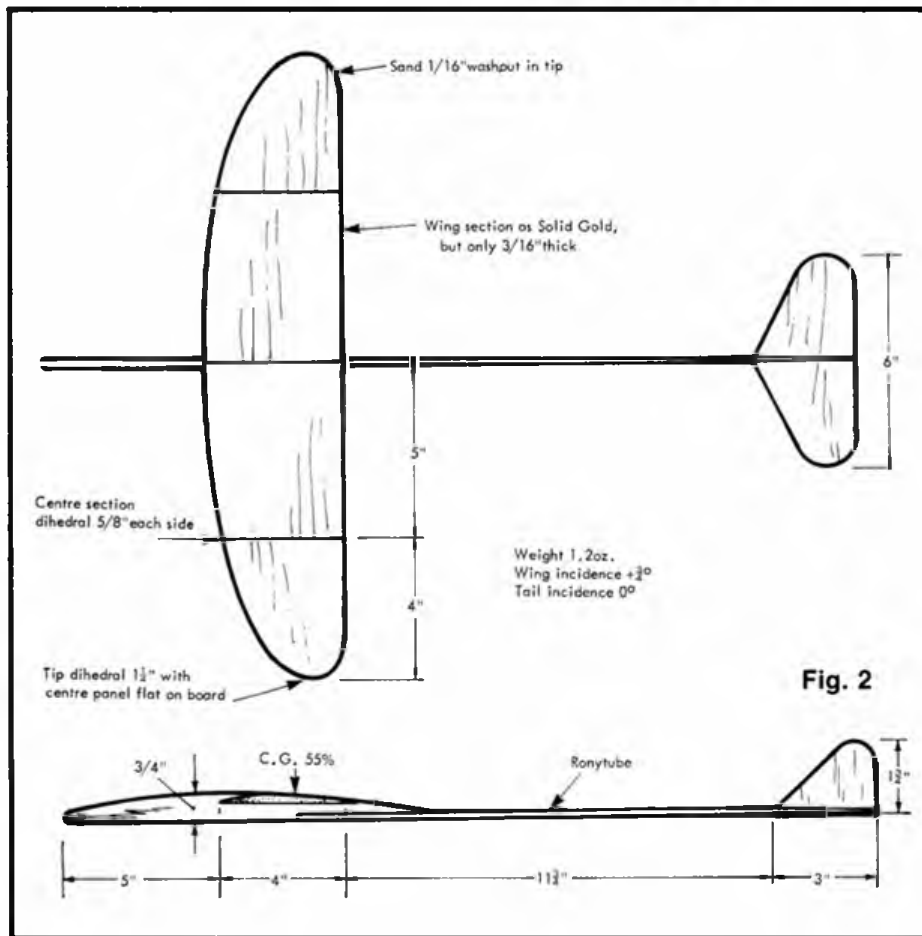
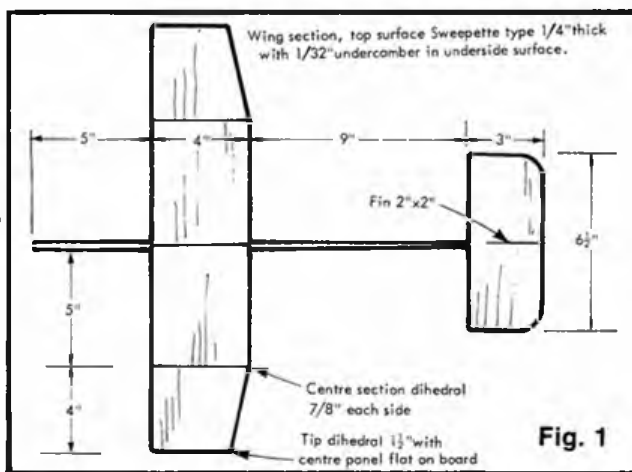
In other glider classes (Open or A/2, for example) fly-offs often take place despite the

fact that the models have to max on three flights out of three. It should follow that HLG gives rise to massive fly-offs but they are rare in practice. Why? After all, flyers like Phil Ball and John Buskell can make their models stay aloft for at least one-and-a-quarter minutes indoors at Cardington. My own best time at this site is 55sec; yet the question I am asked most often by beginners is 'what is your still-air time?' Unless you fly indoors or when it is very calm (i.e. during the week!) I can say that:

In 99 cases out of 100 still-air times are totally irrelevant to your chances of reaching the fly-off.

In fact the models I use most often have a still-air time of only 45sec or so. If you can do this with your model, or mine (plans appear in this issue) you have the physical ability to win. But to get to the point: if turbulence is present, no-one can launch high enough for the model to max without lift being present.

Heading photo: Mick Page relaxes in the evening sunshine with Bruce Melton, one of his protégés, after another enjoyable session flying HLGs. Mick's advice on competition work has a wider application besides chuck glider contestants, everywhere, should read and digest. Right and below: two milestones along the way - see text.





Just for the record - Mick flies in other classes too! Here he is at the 1986 F/F Nationals with his third-place A/2 (John O'Donnell photo). The approach works...

Conclusion: In these conditions the model will have to be launched into five thermals.

Perhaps HLG flyers are not very good at picking lift. But this can't be so, because a lot of the 'names' max out in other classes. Maybe HLGs don't thermal very well? Anyone who has flown one knows that's rubbish. So why are there few HLG fly-offs? Right - here he goes using reverse logic (just another name for positive thinking): Most HLG competitions are lost, not won. By this I mean that most flyers spend their time working on improving their still-air performance, moving the CG back for more height, running harder at launch, trimming for better transition - yes, all of these will increase the duration but none will guarantee a max. *Only by putting the model into a thermal will it max*, and if you do this then the extra duration obtained by the other processes will not be needed.

The owner of the above model might claim that his increased height gained at launch means that he will still produce a good back-up flight if he misses the thermal, and as we have seen that most competitions are won without a fly-off then he may well be justified in his claim; but remember that the transition will have to be perfect, or else the very-rearward-CG model will come down as quickly as it went up. Furthermore, consistency in launch decreases as you throw harder. It would have to be accepted that (say) two flights would go wrong, the model diving in, for the sake of higher back-up flights. On the other hand, my view is that if you are aiming to win then you are aiming to reach the fly-off, which means - yes, that's it - five thermals, so I would say that our friend had reduced his chances of finding them by two. Then he would have to concede that with a rearward CG position, his worst enemy is the spiral dive, and if there is turbulence then he will spiral in at least once. Only six changes left to find five thermals... Lastly, our friend's model will usually be trimmed for a wide circle, so what happens if it is just on the edge of a thermal but is unable to tighten into it? Straight into sink it will go. Or it may take too long to begin its circling and miss the thermal that way.

Chances of gaining five maxes are now reduced to five attempts. In other words, the aim becomes perfection itself. Yet a competitor with a forward-CG model with transitions well after a 'rolling' launch and with resists spiralling-in will still have his full nine chances, despite an inferior still-air

performance. Even though his opponent may well have a model which would be superior in a calmer evening fly-off, he will have eliminated himself along the way. A case of 'heads I win, tails you lose.'

Design philosophy

From all this positive thinking we can re-write what is needed from the model.

1. It must transition at thermal height on all nine attempts. This must take place near to the point of launch in order to catch the thermal that you have just detected.
2. It must have a neutral glide circle so that it will centre into lift.
3. It must be able to resist spiralling-in in all weathers.
4. It must have an effective D/T.

Transition ends only when the model has entered its glide circle. If we accept that we cannot produce a model that will make a perfect transition every time then we must produce one that will recover well from a dive so that even if transition is poor the thermal may still be caught. This is achieved by the use of large 'negative' angles, a bit of 'up' elevator - or both. What prevents the model from looping? It must be made to spiral climb (like a Vintage power model). At this stage considerable help is at hand in the shape of the volume Circular Airflow by Frank Zaic, which - in my opinion - is the best-ever book on model aerodynamics.

Of course, a spiralling model won't get as high as an HLG with a more rearward CG. To keep it climbing as long as possible, and also to prevent that loop, the model must be heavy. Now we have to consider how best to get the model to roll. I will save you pages by describing the main conclusions of all the experiments I tried:

1. As one increases wing dihedral the model will roll more easily in launch.
2. If one uses a butterfly tail then the model will roll and loop more easily in launch.
3. As the CG moves forward the model will roll more easily in launch.

I used a combination of all three. As the model was very 'rolly' I thought that if it encountered lift it would be able to bank quite naturally to tighten up the circle - in other words, that it would be thermal-prone. However, to prevent spiralling-in one would normally require a set-up that did not easily induce banking, but in this case I needed bank in order to prevent the loop at launch. The way round this was to introduce these factors:

1. Lower the CG by raising wing on pylon
2. Lower the CG by lowering frontal area (which contains D/T weight)
3. A forward CG plus a bit of 'up' elevator to compensate
4. Add more washout to right wing tip
5. Add washin to inner left wing panel.

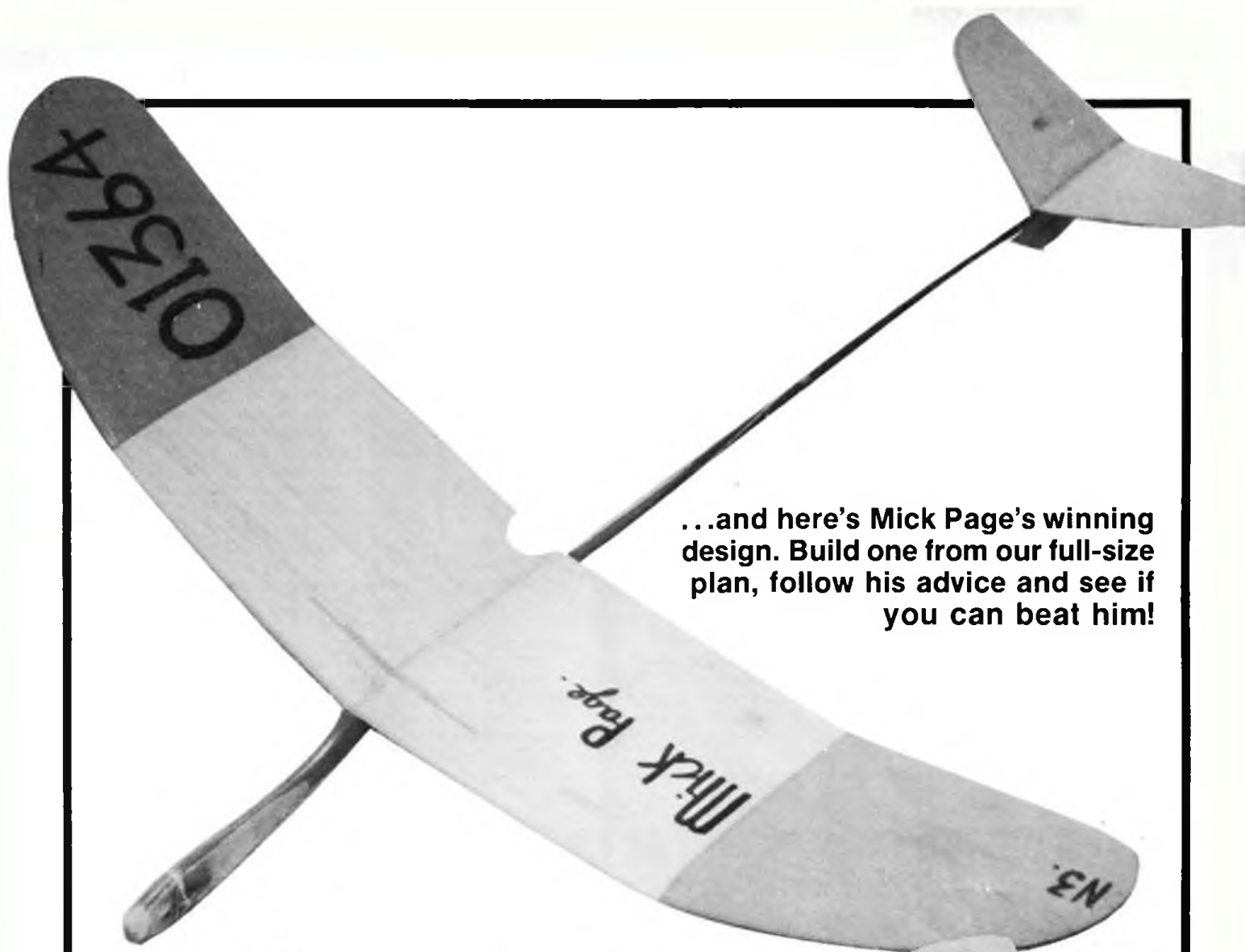
Note that frontal area comes into the reckoning. Too large, and although you will be able to pick a spot in the sky and launch at it every time you will have an awful job obtaining transition. The model may also tend to fly in 'square' circles. A long moment arm was retained; and after these mods had been tested on a soon-to-be-redundant 3/16in-wing model, I built a 'quarter-inch' wing job called Butterfly 1. How did it go? All three parts of my original goal were achieved in one swoop; I won the 1979 Nationals with it, and went on to successes at the next two Grantham club events and mini-rally. I had cracked it at last...

There's always a 'but' in Butterfly...

Butterfly 1 had a still-air time of only 40sec. Too hard a launch and the model would loop. In wind the launch pattern was all over the place but transition would take place at the same height each time, with just a small stall at the end which would allow the rudder to bite, causing a tight circle which in turn allowed the negative tail incidence to raise the nose: good thermal-searching characteristics. Indeed, the model was always trying to find lift. It was also very spiral-free. But if you found a thermal it had to be a strong one. The six-million-dollar question: How to keep the good points of the design but get more height?

Increasing model weight helped but at the expense of the glide which became brick-like. It might have seemed logical to go for a larger model of 22-24in span but I had already concluded that craft of this size did not perform well in wind. The compromise was Butterfly 2, a fifty-gram, 20in design. Over the next two years I familiarised myself with the model's tolerance limits, and now I can reproduce them so that they fly from the building board. You still have to win on the day, though!

Butterfly 2 is the best compromise of the three in the series as it will reach a good height but still retains that thermal-hunting bounce. Spiral stability in very bad weather is not as good as the 18th Butterfly 1. Latest version is Butterfly 3, which has a 22in wing and has been designed for dead-calm weather. At a Bassingbourn meeting back in 1979 it was calm all day and I was at a disadvantage with my forward-CG models. Other competitors had very large, super-light HLGs and I was reduced to flying my 12in Indoor model. A photo showing this appeared in the August 1982 *Aeromodeller*; my facial expression tells the whole story! I resolved not to be without a calm-weather model again. Mind you, I had to use Butterfly 3 for my last two maxes in the '84 Nats after '2' became waterlogged, and it was used again for my final max in '85 when my last '2' disappeared in cloud and was not found. The only snag is that Butterfly 3 does not like strong wind or turbulence! This means I have a new target... but the rate of 'positive thinking per hour' needed to solve this is a bit lacking at the moment, so it's back to making a new set of Butterfly 2s for the 1986 Nationals (and we all know what happened, don't we - another victory...GC).



...and here's Mick Page's winning design. Build one from our full-size plan, follow his advice and see if you can beat him!

BUTTERFLY

THE NATIONAL HAND LAUNCH GLIDER Trophy, kindly donated by 'the master' Phil Ball has five names engraved on it, these being: J. Buskell (1980), D. Edmondson (1981), P. Ball (1982), M. Simms (1983) and myself (1984 and 1985, with '86 to be added). Dave Edmondson's name may not be as recognisable as some but one of the nice things about HLG is that every now and again someone comes along to surprise the experts. Dave was a Country Member who flew only once a year - at the Nationals - so if he can do it, so can you.

Some models will win just in the hands of their designers, but this is not the case with Butterfly. My companion Mark Benns has had successes with it (he was second at the '84 Nats) and several members of the Peterborough club - most of whom are C/L fliers - have also built them. All fly well. The design is stable and will recover from a bad transition before hitting the ground. At

many rallies I have found beginners who do not believe this. When this happens I hand them the model and tell them to have a go. I have yet to break a model this way...

Eyeball or accuracy?

I expect most builders make their models by eye. When I started I certainly did; the wing section was sanded without being checked, squareness of alignment was not verified. I could not understand why America's ace chuck glider flier, Lee Hines, uses a set square, let alone a micrometer when building his Sweepette; but then I was the beginner...

Nowadays I wouldn't dream of building a HLG without the aid of a 0.1 micrometer. The reason is that in the course of a normal year I have at least five flyaways, which means I have to replace at least two models, and the new models cannot be just any old HLGs but must be exact replicas of the lost

ones. The keyword is 'accuracy'. You will notice from the plan that certain dimensions are given tolerances; if your model is not built within these limits it will have different characteristics to mine. Take note of the various warps and duplicate them accurately, for you will then have a model that will fly off the board, leaving you with the job of trimming for the weather conditions on the day of the competition - quite enough on its own.

Fuselage

Two main parts here. The rear consists of a carbon Ronytube and the front is made up from 1/4 x 1/4in. spruce. Sources of supply are shown on the plan, even for the spruce; your local model shop may sell only radio gear! Cut to length and epoxy together, roughening the surface of the Ronytube if it is one of the old glass-cloth type. If there is a slight bend in the Ronytube epoxy it to the

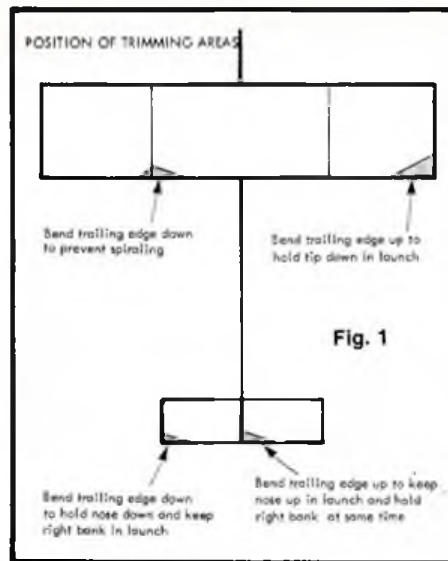
spruce assembly so that there is a 'left rudder' bias. Sand laminations to shape, cut slot for D/T box and make a hole for the D/T tube; glue the latter in place and add the 1/32in. ply VIT box sides.

At the bottom of the fuselage is curved it is not possible to take a micrometer reading at the wing LE position, so 'mike up' at the trailing edge and sand the top of the fuselage to give 0.070 to 0.080in. positive incidence. Mark the I.E point with ball pen and make sure you don't sand away wood here, or your wing incidence will be insufficient. See plan. Two coats of sanding sealer and some work with wet-and-dry paper complete the job - but make sure that the rear of the fuselage is sanded to give 1/64in. left rudder.

Wings

The various warps and dihedral angles will not only control the glide circle but will govern the standard of launch, transition and spiral stability. If you don't put much effort into your wings then you won't get much of a result. Remember that keyword again - 'accuracy'.

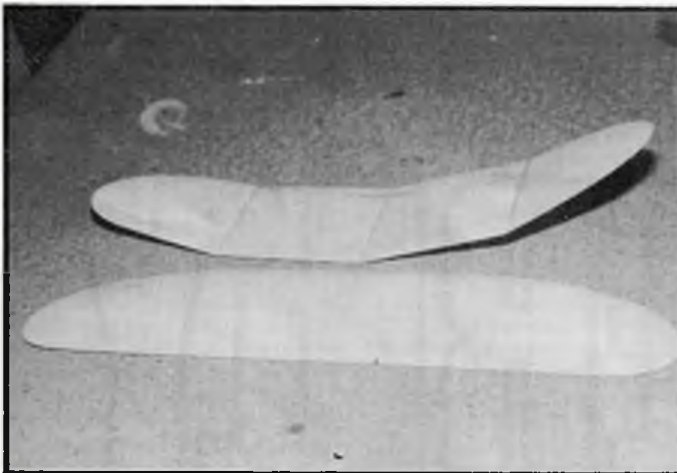
My choice of wood is: '5 1/2 lb.' balsa - minimum weight for a sheet 1/4 x 4 x 36in. should be 1.8oz. (51gm) - up to a maximum of '7 lb.' wood, a sheet of which should weigh 2.3oz. (62gm). The last inch of the trailing edge (at least) should be quarter-grain. Some modellers prefer to use quarter-grain for the whole wing but this can be very hard to find.



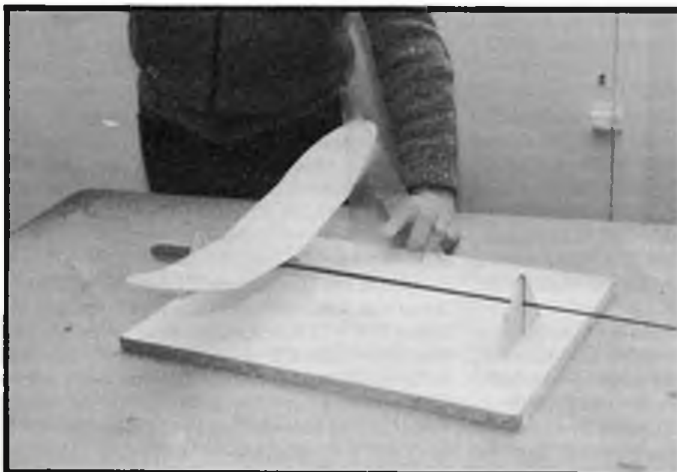
If you are making your wing from more than one piece of balsa glue them together carefully. Cut out the wing itself. Sand in 0.090 to 0.110in. washout on the right-hand wing tip, using the micrometer in the same way as you did to obtain the correct angle of incidence on the top of the fuselage. See photo for finished result. Repeat for left-hand tip, but note that washout is less, namely 0.030 to 0.060in. Pin down wing and add leading edge from 1/16sq. spruce strip or 1/16in. dowel with a flat sanded along it.

Next, cyano button thread along the trailing edge. Mark a line on the bottom of the wing 1/4in. from the I.E and sand in a chamfer of 1/64in. Next, mark out the high point on the top surface and carve wing to approximate section with a razor plane, noting the taper of thickness at the tips. Check the high point at one-inch intervals with the micrometer. The thickness does not have to be spot on but it must be the same each side to a tolerance of 0.002in. If this is not so, subsequent models will not perform in the same way. It's all in the name of accuracy of duplication... The section is finished using wet-and-dry paper, checking against a template. Last of all, recheck!

Two coats of Joy sanding sealer are applied. I always put in a few drops of castor oil to prevent it from getting brittle. The wing is then cut into panels. The inner ones are propped up at the dihedral angle to enable the correct chamfer to be sanded in (the traditional 'edge of table' method is used). Check that the angle is square to the TE in plan view; if it is not, you will be building in unknown amounts of washin or washout. Check the panels for correct length. Before epoxying together, put some pinholes in the surfaces to be joined - this will allow the adhesive to key into place. Note: the dihedral at the centre panels must be 5/8in. (minimum) to 21/32in. (maximum) each side. If your wing is from very light wood (i.e. '5 1/2 lb.') then add two centre dihedral braces of 1/16in. ply. **continued on p.553**



Above left: Before and after - a wing blank, shaped and marked into panels, lies in front of a finished example. Above right: Right-hand tip washout. Take care to get all trimming angles correct. Bottom left: A simple jig ensures accuracy. Note set-square, which is used in conjunction with lines marked on jig base. Bottom right: Quarter-grain wood is used for the butterfly tail. Button thread outline adds strength for negligible weight.



IOTA CAN BE FLOWN safely and successfully from quite small areas. It possesses good inherent stability and recovers quickly from large control inputs, and a superb floating glide enables precise landings to be made; indeed, Iota can be landed literally on a sixpence - or perhaps I should say 'one pound coin' in modern parlance, and to allow for inflation. Many flights have been terminated with Iota being flown back to the operator and caught in the hand. It is equally happy flying from a towline or from a slope, will accommodate any of the 'cheap and cheerful' two-function R/C sets currently available, and is inexpensive and quick to build. What more could you want?

Wing construction

Invariably I begin a model by cutting out the wing ribs with the aid of a thin plywood template shaped to the outline only. Iota's wing section is based on the Benedek 8535 B2 with increased undercamber at the rear, by the way. A stack of ribs for one wing half are held together with pins pushed in from both sides and the slots for the tapered mainspar and the rear spar are made with care. The spars themselves are from hard 3/32in sheet balsa, cut (again, with care) using a sharp, stiff blade and a long metal straight-edge.

The three wingtip pieces are glued together directly over the plan (which is best protected by a thin polythene sheet overall). When removed, they are glued to the leading and trailing edges with a scrap piece of 1/8in sheet used to support the middle of the tip. The front of the trailing edge is packed with pieces of 1/16in sheet to allow for the undercamber. The rest of the wing is straightforward, although it is easier to fit the lower mainspars after the initial assembly has been removed from the building board and the wing joining tubes have been aligned.

To ensure that the wings do not move apart during flight, hooks are built into the underside of the sheeted centre section to enable a small rubber band to keep things tight. The hooks are recessed to prevent them from damaging other parts of the model during transit to and from the flying field.

Riblets strengthen the wings, improve the airflow and add to the appearance with very little weight penalty. They are quickly and easily cut from 1/16in sheet with the aid of an appropriate template. Don't be tempted to omit them!

Next, the fuselage and tail

Sides should be cut from 1/16in sheet with grain and density as near identical as possible to prevent distortion in plan view. When selecting wood from your model shop, don't assume that just because two sheets are next to one another in the rack they will be of the same cut; often this is so, but someone else may well have been sorting through them before you, and a better match may lie elsewhere in the pile. Take your time before choosing...

The fuselage sides are first glued to formers 2 and 3, then, when set, to former 1 and the fin (which should be sanded to streamline section before assembly). Note the 1/32in packing pieces which give a fuselage width of approximately 5/16in at the rear. To help with accurate alignment, draw a centre line on the sheet used for the



IOTA

Fancy some gentle slope-soaring or tow-line flying? Only a small field at your disposal? Don't worry - Bryan Miller's 60inch soarer is just the job, so turn to our full-size plan now!

bottom of the fuselage. The noseblock is laminated from 3/16in sheet, and the equipment access hatch, made from 3/32in sheet, is faced underneath with 1/32in plywood which extends about 3/16in to the front in order to provide a locating flange. At the rear security is provided by a wire bolt that slides in a slot in the hatch and locates in a plastic or metal tube.

There is nothing unusual about the tail assembly which is built over the plan in the traditional way. Sand the rubber to a streamlined section at the rear. Elevator halves are joined with a shaped length of 1/4in dowel; this is a much lighter method than the wire-and-tube arrangement often used in larger models.

Radio installation

The servos move the rudder and elevator via music wire chosen to be an easy sliding fit in an 'outer' of white plastic tubing - that sold in model shops as a 'snake' tube. To reduce friction and to prevent side-strain it is necessary to introduce gentle bends in these tubes; again, exercise care. Balsa pushrods may be used, in which case it may be necessary to make the rear of the fuselage a little wider. On my original I used tinplate rudder and elevator horns, sewn and glued in place. If commercial items are used, they should be the smallest and lightest available.

I fastened the servos directly to the fuselage sides with two 1 x 3/16in strips of servo pad tape. This gives sufficient grip and makes for easy removal. Initial centring is done when the servos are

installed; subsequent alterations can be made by bending a small kink in the wire. Maximum throw of rudder and elevator should be 20 degrees either side of neutral.

My airborne radio system consists of a Futaba FP-R29S receiver, two Futaba FD-30M servos and a 100mah button cell battery pack. For several years I have flown small, lightweight models with the case removed from the receiver and have never experienced damage; benefits are a reduction in width and length of about 1/4in. However, as shown on the plan, there is enough room to accommodate the gear without the necessity to hack it about (*and remember, to cut open new equipment will invalidate the guarantee quicker than you can say 'glitch'...GC*). A slight increase in the width of Former 1 would enable 225mah cells to be used, but the smaller pack gives adequate flying time when micro-servos are used.

Finishing

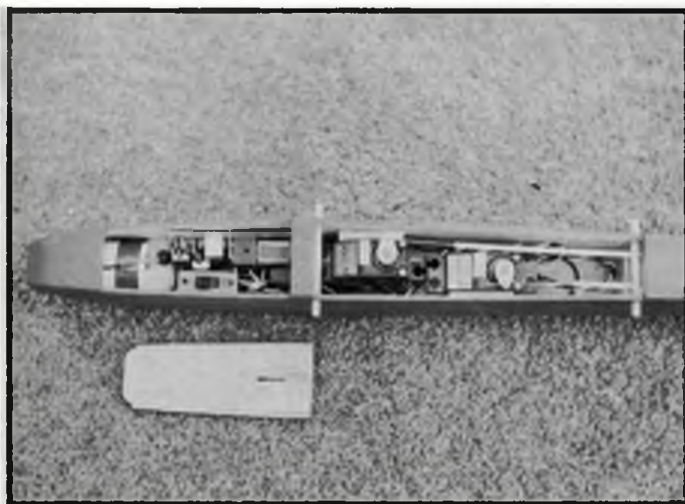
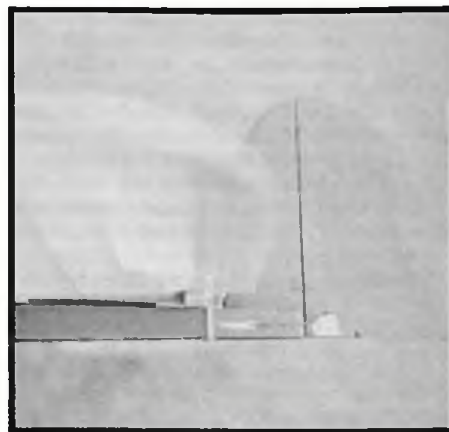
The complete airframe is sanded and given a coat of thinned clear dope; it is then sanded again before being covered with lightweight tissue. I used thinned PVA to fix the tissue to the undercamber of the ribs; tissue paste was used for all other parts of the model. No doubt you will all have your pet methods of covering! Coloured tissue is to be preferred, but if you must use coloured dope confine it to the fuselage, fin and rudder, taking care to avoid a build-up of weight at the rear. In fact, I applied colour in the form of thinned artists' acrylic paint, which was light and effective. Wings and tail were finished with two coats of 50/50

clear dope and thinners with a few drops of castor oil added. This creates a slightly flexible mixture which helps to prevent a too-brittle covering.

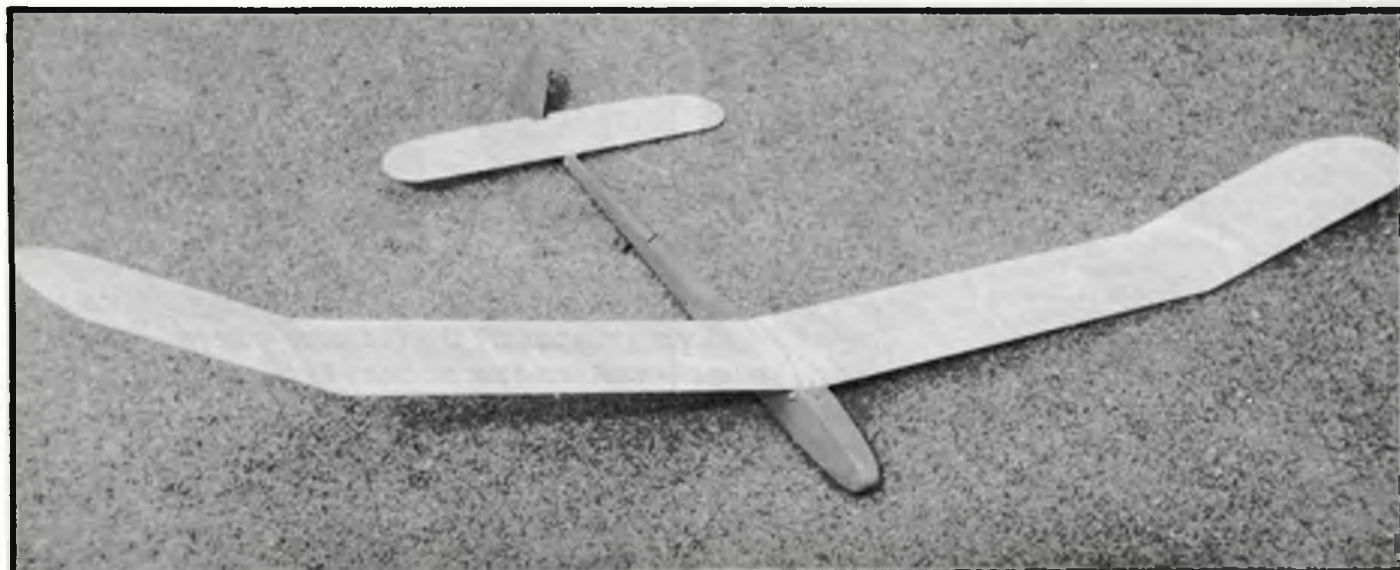
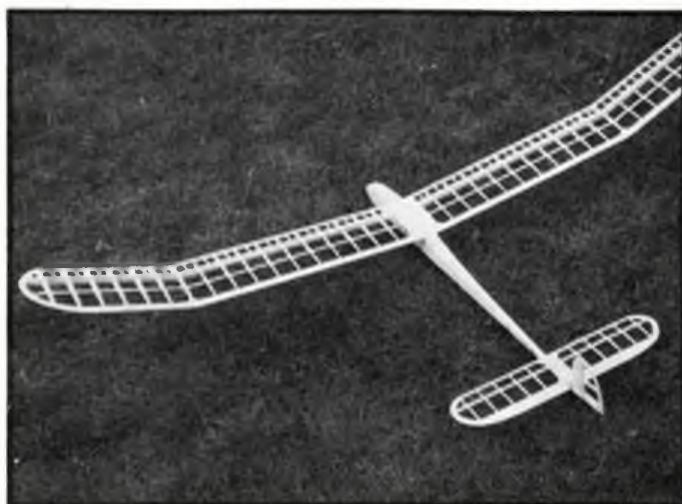
It's all yours!

Just make sure that your Iota balances where shown on the plan, give your R/C gear a good charge up and you're ready to go. Take things gently at first, the better to get used to any new model, and be prepared for many hours of lightweight gliding fun with Iota. And do try for that 'back to operator's hand' landing - but don't blame us if you bust the tissue...

Below: Tail and detail shows rudder horn, control wire and tube, and sewn hinges. Receiver aerial emerges under the tailplane.



Above left: Prototype radio installation. Note cut-down servo arms and tidy layout. Much of the foam packing in the receiver and battery compartment has been removed for the photograph. Above right and below: Simple and efficient - that's the layout of Iota.



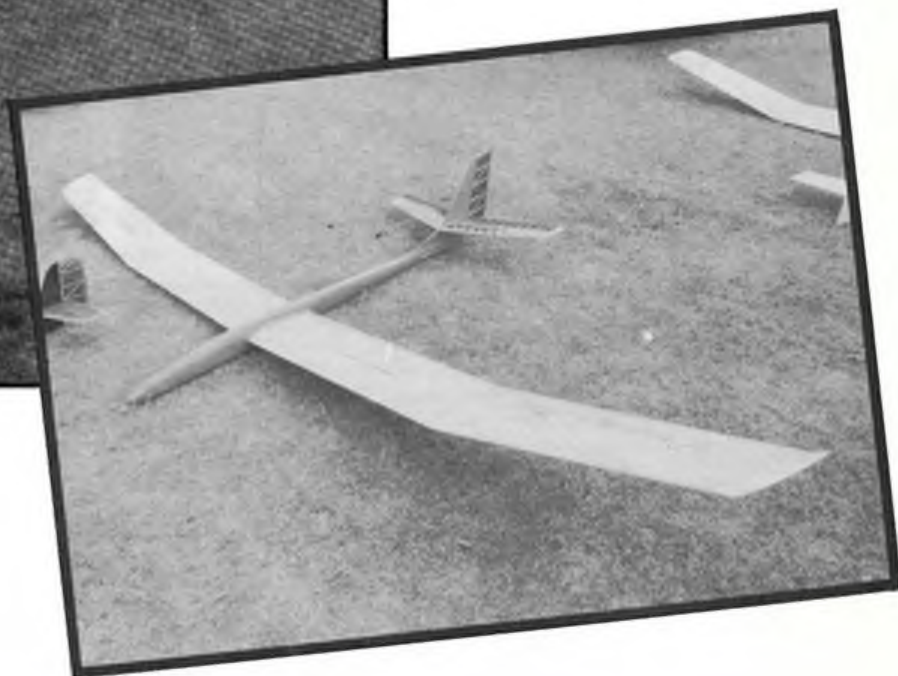
The BRITISH OPEN CLASS THERMAL SOARER

Part Two

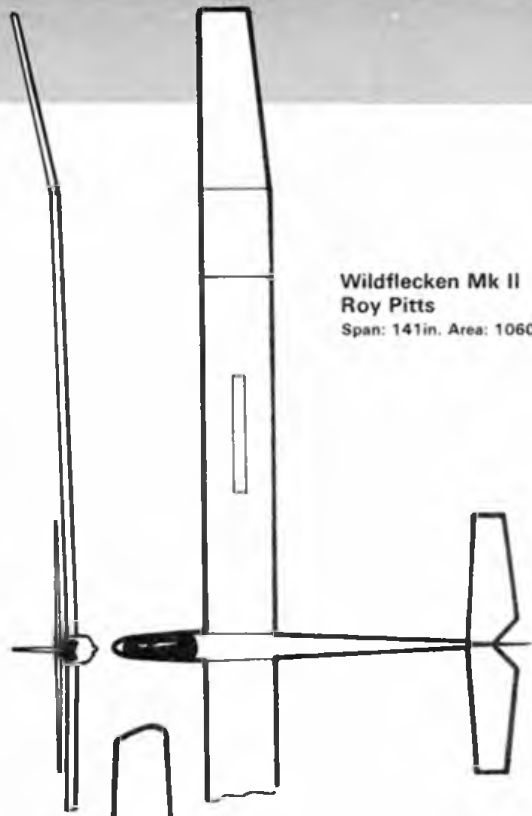
George Stringwell concludes his in-depth study of these magnificent masterpieces with a look ahead...

Pilot ability

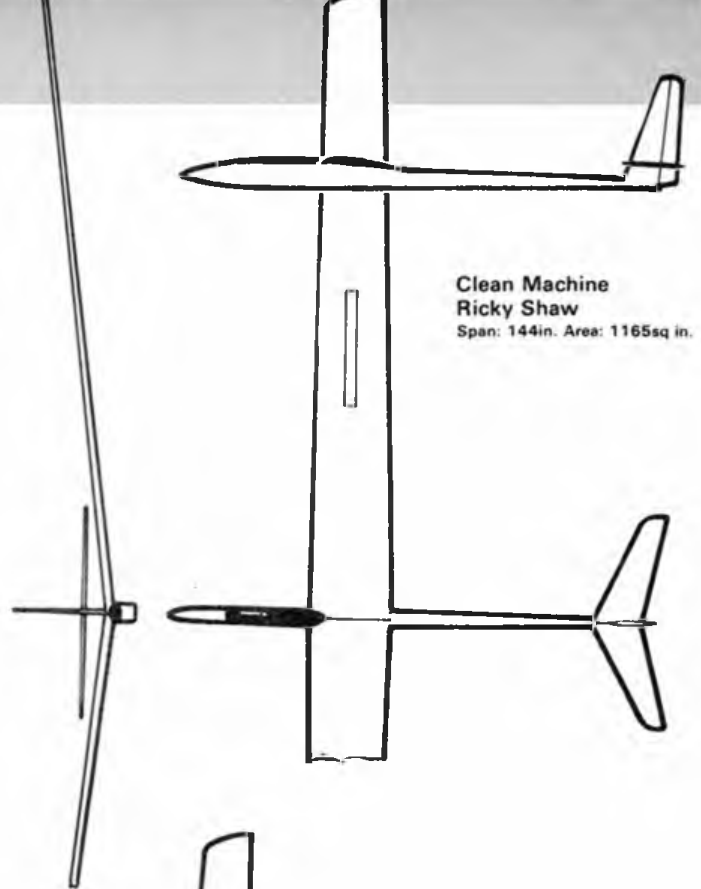
There is no doubt that the current breed of Open class soarers are much more exciting and satisfying to fly than were their counterparts of ten or more years ago. This is a two edged sword, however, since they are more demanding of the pilot than the earlier models. The headings in Table VI cover the principal attributes of a good thermal soaring pilot. They can be acquired, and it is quite evident to those of us who have been around the contest circuit for some time that the *overall* standard of flying is very much higher than it used to be, particularly in respect of the ability to detect and use lift, often in the most unpromising conditions. As always, a few individuals



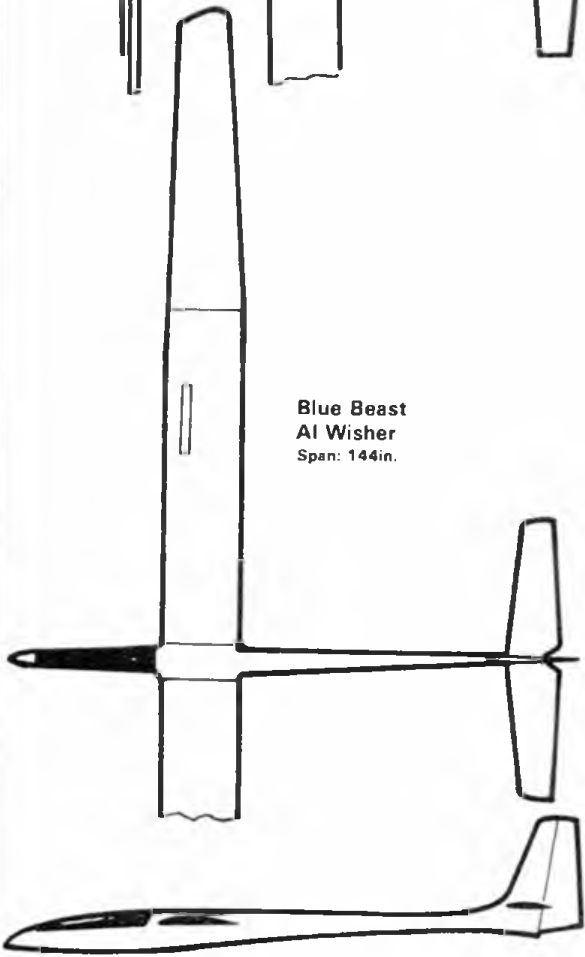
Main picture: It's 1977, and Don Marquis shows off his eleven-foot Texas Wedge pod and boom soarer. The 'V' tail is unusual; otherwise the structure is very typical of the period. **Right:** Five years on to 1982, and all-sheeted wings are becoming 'de rigueur', as on John Wesley's twelve-foot Preacher Man.



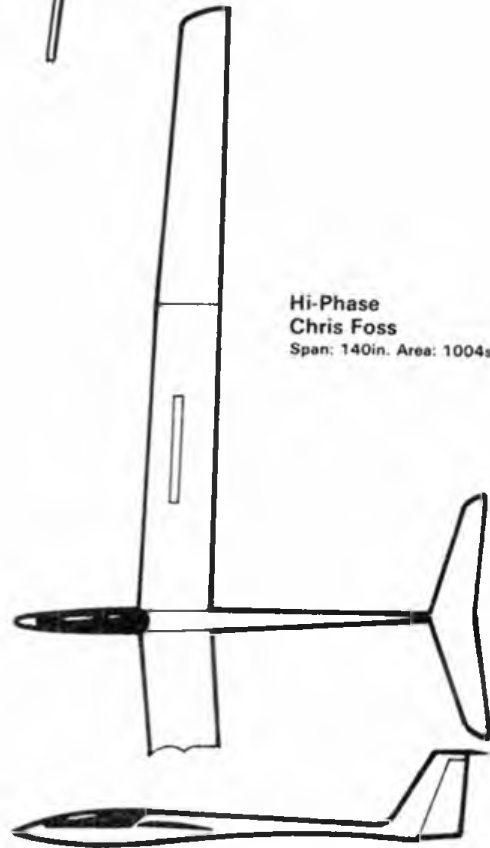
Wildflecken Mk II
Roy Pitts
 Span: 141in. Area: 1060sq in.



Clean Machine
Ricky Shaw
 Span: 144in. Area: 1165sq in.



Blue Beast
Al Wisher
 Span: 144in.



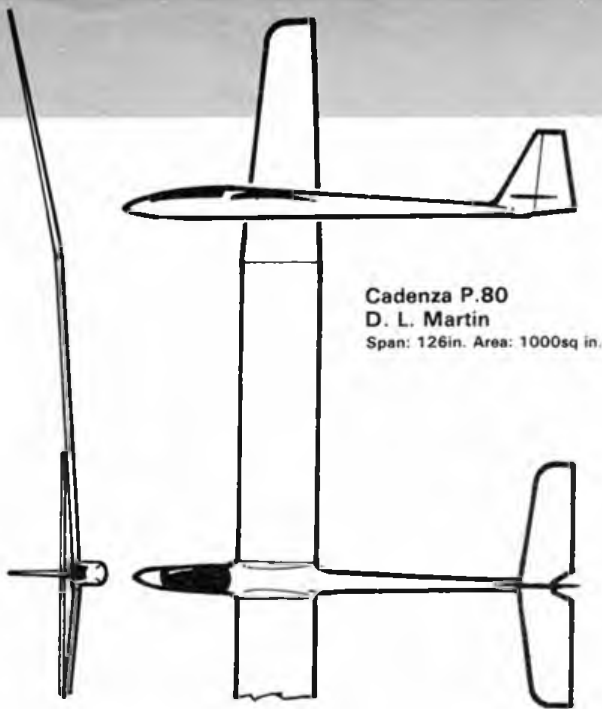
Hi-Phase
Chris Foss
 Span: 140in. Area: 1004sq in.

(possibly seventh sons of seventh sons?) seem to be born with uncanny ability, but the average competitive thermal pilot has definitely risen to the challenge provided by the greater abilities of the present day model. Although much has been made of model development, and a good pilot with a good open model is a formidable thing, a good model with a poor pilot will be beaten every time by a good pilot with an average model...which, to many, is one of the attractions of the class. The final arbiters will always be skill and that little bit of luck: it can never become wholly a 'technology race'.

The 'X' factor

Development in any field is never wholly predictable. There is always an 'X' factor - developments sparked by the enthusiasm of groups or individuals. As with most non-professional, non-profitable 'sports', thermal soaring relies for its forward impetus on the efforts of real enthusiasts, and in Britain we are fortunate to be blessed with many people who have made important contributions to the development of the Open class model and Open class soaring. Table VII shows a few examples of developments which are the

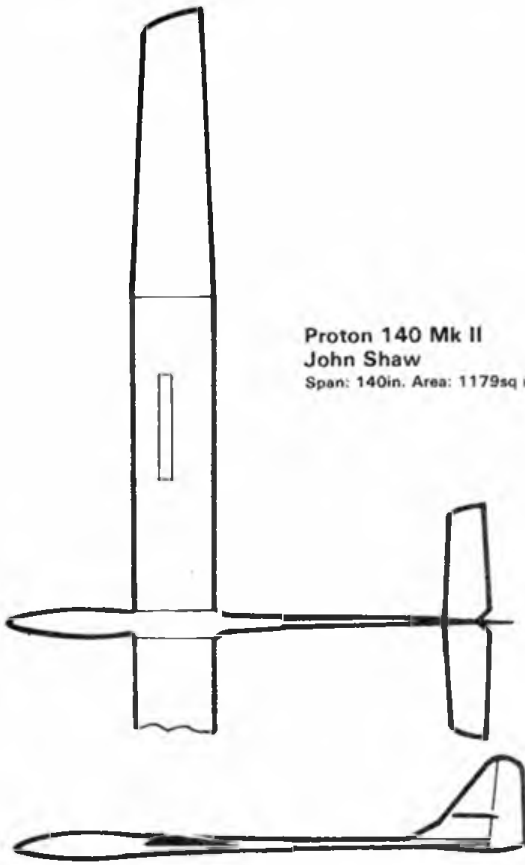
result of individuals and groups sitting down and doing some thinking - it is not meant to be a comprehensive list of important developments, or to imply that others did not start thinking the same way at the same time. Some of the factors are also interdependent; without the popularity of the percentage slot rules, their manifest fairness and the relative ease with which contests using them can be organised by clubs, we would not have seen the great popularity of the BARCS soaring leagues, for example. The concept of high speed 'ping' launches leads to the need for better wing structures... and vice versa.



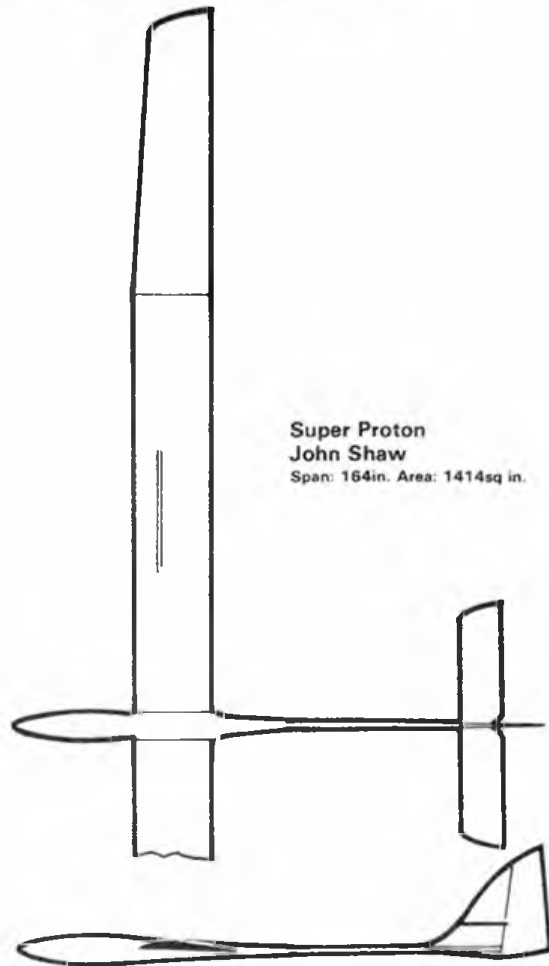
Cadenza P.80
D. L. Martin
Span: 126in. Area: 1000sq in.



An absolute classic, the Hi-Phase. This is Chris Foss's own prototype built-up wing version, seen in 1980, but in the following five years the design has won scores of contests for dozens of different pilots.



Proton 140 Mk II
John Shaw
Span: 140in. Area: 1179sq in.



Super Proton
John Shaw
Span: 164in. Area: 1414sq in.

Some important designs

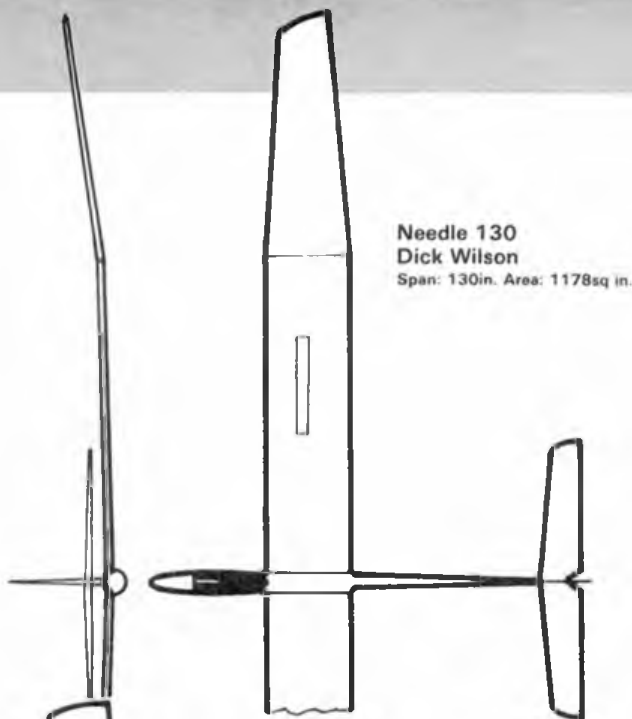
The list given in Table VIII highlights some of the 'benchmark' open thermal designs of the past twenty years. When looking at this, please remember that it is a personal list - others might exclude some of these models and include different ones. However, I think that anyone who has been in the game for a number of years will be familiar with most of these designs, and will probably have been influenced by some of them. Some of the dates given are approximate, indicating perhaps when the

author first became aware of the model in question rather than when the designer first produced it.

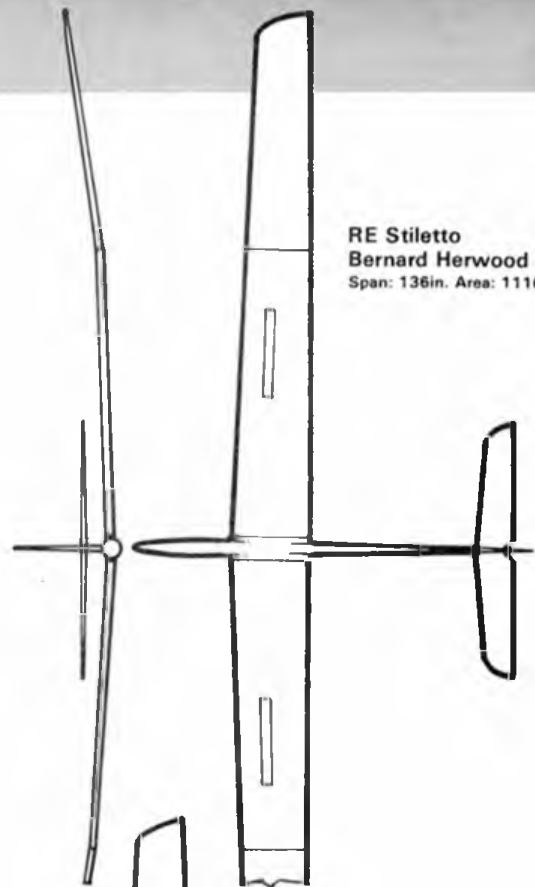
Remember too what has been said in the foregoing section about *influences*. For example, most people have concluded (to date, anyway) that a model of around 12 feet span is a good size to build to produce a competitive craft for the existing rules, yet it is one which can be built strongly enough with available technology so that it can handle the average sort of weather which one might encounter. . .and so on.

It is, of course, no coincidence that the list is bulging with National Championship,

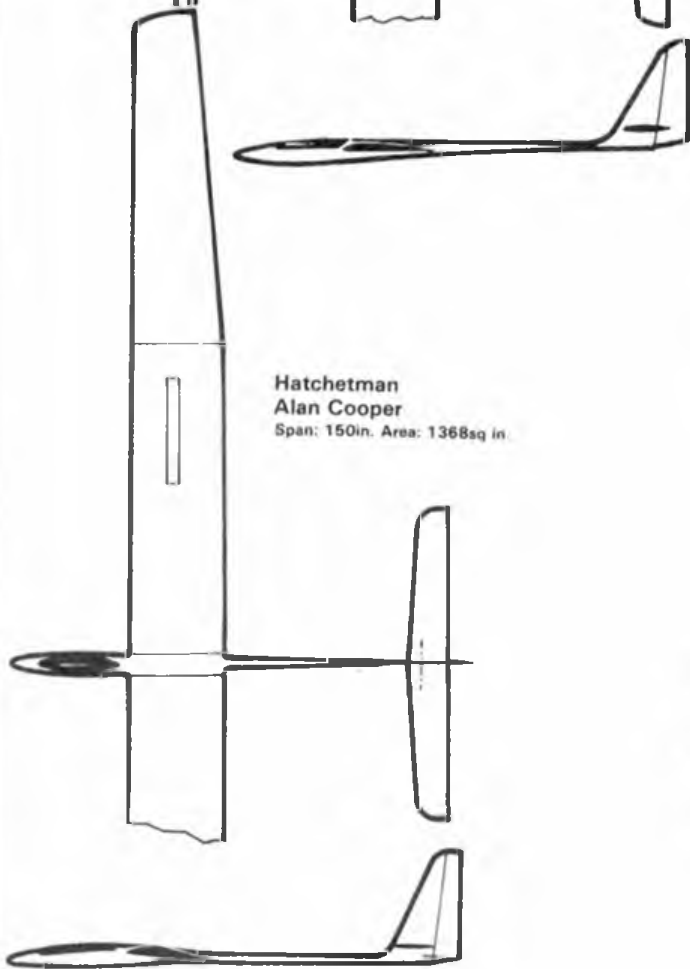
Radioglide and BARCS League winners. Excellence brings its own rewards. Some of the models listed are very much 'one man machines', but have contributed ideas to countless other 'own designs'. Some were, or are commercially available as kits, plans or construction packs, and many of their successes have thus come in hands other than the designers'. Small scale drawings of a number of the models are reproduced here; they are not intended in any way for constructional purposes or for scaling up, but simply to give some pictorial indication of the type of models we are dealing with to those who are not familiar with them.



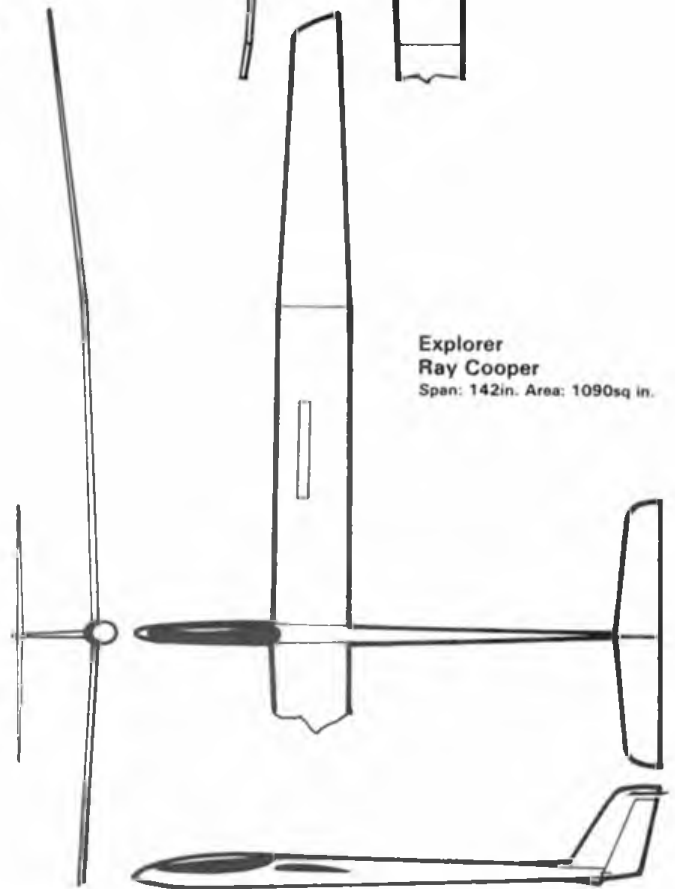
Needle 130
Dick Wilson
Span: 130in. Area: 1178sq in.



RE Stiletto
Bernard Herwood
Span: 136in. Area: 1116sq in.



Hatchetman
Alan Cooper
Span: 150in. Area: 1368sq in.



Explorer
Ray Cooper
Span: 142in. Area: 1090sq in.

The future

Having delved fairly extensively into the past of the Open class model and open class soaring, what may we expect to see in the next few years?

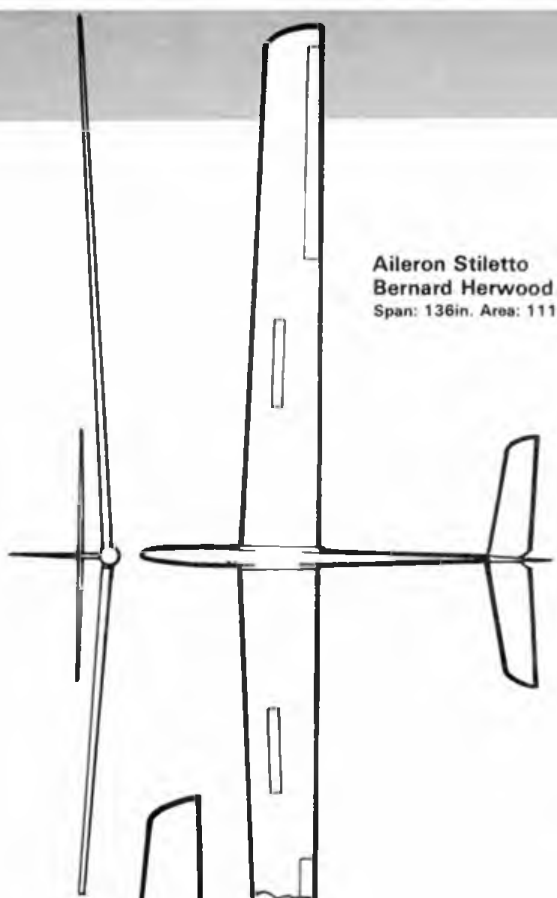
If we look at our 'Factors affecting development', then it is reasonable to conclude (short of another ice age!) that the British weather is unlikely to change its character dramatically, so the type of model which is needed to deal with it will not change to any great extent. We already fly in pretty strong winds as a matter of course, and although it seems unlikely, perhaps we

shall see even stronger and more heavily loaded models so that soaring in a gale may become a practical proposition! Personally, in those circumstances, I would rather go to the pub and indulge in some bar-room flying, but everyone to his own taste! Seriously, we can assume that our ability to build better and stronger structures will continue to develop, therefore pushing forward the limits of conditions in which the models may be flown, and perhaps more important, bringing about a useful increase in strength and performance reserves in more normal conditions.

Rules may well change. It is difficult to

predict how, but if they do, this may change the direction of model development. However, notwithstanding the possible trend towards thermal cross-country events which might encourage the development of larger models with concentration on better glide angles, I still expect that the major competitive activity in thermal soaring in the UK over the next ten years at least will be a duration percentage scored event very similar to the present one, but perhaps with factors introduced to make the task more difficult.

It is to be expected that the general level of pilot ability, and proficiency in the basic



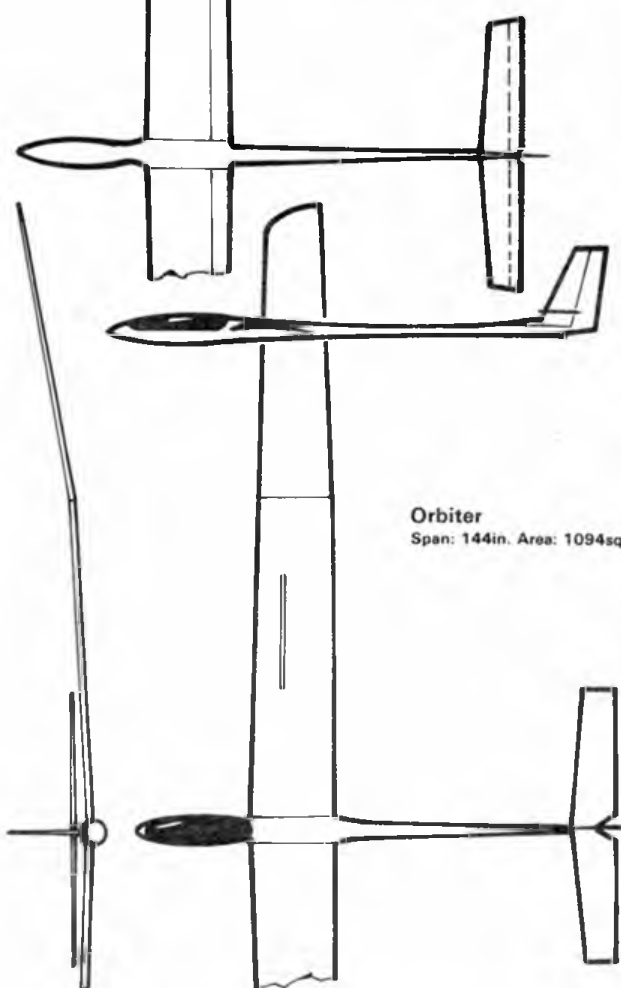
Aileron Stiletto
Bernard Herwood
Span: 136in. Area: 1116sq in.



Optimist
Mike Francies
Span: 117in.



Shabby Tiger
John Goldsmith
Span: 147in. Area: 1150sq in.



Orbiter
Span: 144in. Area: 1094sq in.

tasks of lift detection and utilisation will continue to improve as more people get to grips with better and better models. In terms of the percentage slot contest, this does not necessarily make competition that much more difficult, since, if there is one brilliant pilot in your slot, you have to beat him to gain the 1000 points; if there are five brilliant pilots, you still have to beat the best of them, and if you do this the rest are then irrelevant. Indeed, to some extent, I always think it is *easier* to get a good score if flying with a group of top-class pilots - one of them will find lift and you just have to make sure that you get to him!

As far as the 'X' factor is concerned, I think that thermal soaring is in much better shape than most other branches of the aeromodelling hobby. The level of experiment and innovation which one finds in the average soaring club, or group of enthusiasts is pretty high, and most soarers are willing and eager to latch onto and develop any new techniques. It is as well not to become complacent, though; the well being of *competitive* open class soaring in this country depends upon the efforts of a relatively small number of people, despite the wide participation. As in all classes of aeromodelling, the competitive element

tends to lead and set the tone for the general level of activity. This is why the competition side has been stressed here. The more people who are involved in thermal soaring, the bigger the 'base' and the better it is for all enthusiasts; and it is very much enlightened self interest for those of us devoted to this particular class of R/C flying to promote it vigorously amongst our fellow modellers and the public at large.

To end with a few predictions:

1. Methods of construction which are at present limited to a relatively small number of competitive soarers will become the norm rather than the

Table VIII: Some important open designs

Period	Design	Designer	Span	Controls
Late '60s	Thermal Rider	Dallimer	120"	R/E
Early '70s	Wildflecken	Pitts	144"	R/E/B
1972	Cirrus	Graupner	118"	R/E
1974	Phase Lift	Foss	120/144"	R/E/Flapperons
1976	Phoenix 100S	Mattingly	100"	R/E
1978	Opus II B	Hunt	180"	R/E/Flapperons
1979	Clean Machine	Shaw	144"	R/E/B
1979	Cadenza P80	Martin	130"	R/E/B
1979	Blue Beast	Wisher	144"	R/E/B
1980	Hi-Phase	Foss	140"	R/E/B
1981	Proton	Shaw	140"	R/E/B
1981	Needle	Wilson	132"	R/E/B
1982	Plus Max	Worrall	150"	R/E/B
1983	Stiletto	Henwood	140"	R/E/B
1983	Fendon	Paddon	144"	R/E/B
1984	Electra	Wright	144"	R/E/parachute
1984	Optimist	Francies	180"	R/E/flapperons
1984	Multiphase	Foss	144"	R/E/Ailerons
1985	Hatchetman	Cooper	150"	R/E/B



An experiment with flapperons by Alan Cooper in early '80s proved unsuccessful, but a change of development from Slot Machine led to the potent Hatchetman of 1985.



Just to show you can get out of the rut, Keith Humber with his low wing twelve-foot Kema in 1980. A particularly elegant craft.

Ricky Shaw's popular Clean Machine rivalled the Hi-Phase throughout the early '80s as the model flown most often. Note the wonderful flying site!



exception for sport and competition flyers alike, just as, in the past, have such things as glass fibre fuselages and epoxy/glass skinning of wings.

- After sticking around the twelve foot mark for a number of years, we shall see a gradual but noticeable increase in the average size of model seen, at least in the competitive field. Coupled with this will be the much more common use of ailerons and, possibly, variable camber wings (flaps and flapperons).
- Inevitably, standards will improve at the top to the point where 'ordinary' models are less competitive than is the case at present. Unless we do see some rule changes, this may thankfully not happen to any great extent due to the inherent 'luck' element - there are times when the best model and highest ability cannot help you if you turn the wrong way. I hope that we will not be faced with a replay of the situation confronting multi-task (F3B) soaring at present, but if there are any definite signs of Open class soaring losing the widespread support of the club flier, then rapid action will be required, maybe involving a rethink of the rules. 1985 saw just a slight down-turn in numbers competing in the BARCS Leagues, and although the situation is still very healthy, it needs to be watched carefully, but we need to make sure that open thermal soaring remains an enjoyable activity within the reach of the modeller of average means and average skill.

Table VI: Pilot ability and flying technique

- Launch technology and fast launch capability
- Ability to quickly detect bad/good air
- Ability to 'work' small/light/difficult air
- Landing accuracy, time and place
- Judgement, that is:
How far need I go downwind in marginal lift to win?
When should I start the descent?
When should I set up the approach?
When is it worth taking a risk?
TACTICAL AWARENESS - how much do I NEED to do?

Table VII: Examples of 'X' factor developments

Initial urge to develop open soarers	Dallimer, Dyer, Foss and others
Percentage slot scoring concept	FACCT club
League competition concept	BARCS
Flapperons for open models	Foss, Hunt and others
Ping towing	Sitar brothers (F3B)
Alloy tube spars	Sean Bannister developed for Open model use by the Sheffield club.

My final (biased of course!) words to any modeller (or non-modeller) reading this who has never tried either flying a good open class thermal soarer, or competing with it, are 'Try it... you might be surprised at the rewards you will enjoy'.

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SCALE MATTERS

Free flight with Bill Dennis

Derby diary date

Following the continued and increasing success of the Indoor Scale Nationals, the SMAE Scale Technical Committee will be holding an additional meeting at the same site - the Alumwell Sports Centre - on Sunday, 2nd November. I say 'Technical Committee' but really it is Doug Sheppard who is the driving force behind these meetings, and fliers will be pleased to hear that he will be in charge again. It is to be hoped that this event will be well supported, for its continuation will depend entirely on the response.

The timing of this meeting will be ideal for sorting out those new models for winter's other events, culminating of course in the Indoor Scale Nationals on April 26th.

Entry on the day will be for the usual Rubber/CO₂/Peanut categories, and there will be some sort of event for the Keil Kraft/Veron rubber scale kits, run on the lines of a knockout duration contest. The rules to be used will be classified as 'experimental', the implications of which are described below. It is Doug's intention that there will be plenty of time for trimming and non-contest flying.

Rule changes?

At its last meeting, the Technical Committee was discussing possible rule

changes to be put to the SMAE Council for approval, and I would like to go over one or two points of relevance to F/F, and indoor in particular.

First item was the vexatious Peanut problem. As I have discussed in a previous column, there was no doubt that the static positions at the Indoor Nationals bore little relation to the merits of the models, and I was keen to try and alter the rules, even though there had been hardly any reaction to a circulated questionnaire which asked for suggestions. One idea was simply to adopt the Miami-type rules, as used by the RAFMAA among others, which are basically similar except that the static score is multiplied by a workmanship 'K' factor. The advantage of unifying the rules is a tempting one, but we did not feel they would necessarily be much better. The following changes were agreed and will be in force for the November meeting and thereafter. Note that the Peanut rules are *provisional* which means that the Committee can change them without Council approval, provided three months' notice is given.

Section 5.8.4: Appearance. Marking under the following headings to be increased as follows:

- (a) Workmanship: 0-15
- (b) Complexity of colour/markings: 0-10
- (c) Authentic details: Many, 5 (remainder unchanged)
- (d) Flying surfaces: Double covered: 4 (remainder unchanged)
- (e) Type of covering: Colour doped: 9 (remainder unchanged)

The other change to Peanut is that the number of official flights is increased from three to four.

We then turned to the CO₂ and rubber events, and the proposal that the qualifying



time for CO₂ be reduced to fifteen seconds for indoor only was agreed and will be put to Council.

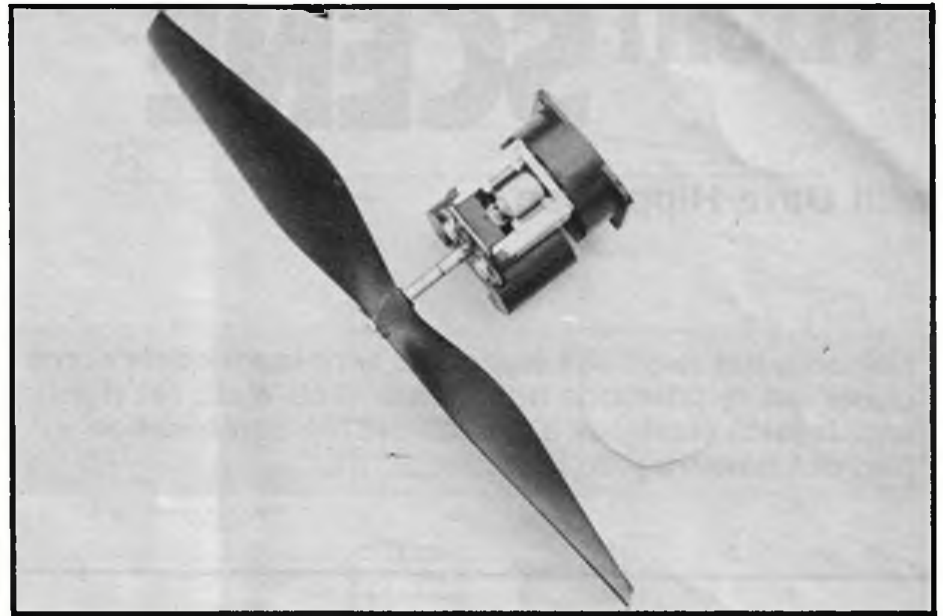
The most contentious item was the idea to adopt a complexity bonus to be added to the static score to reward the more ambitious model. Simply put, given two equally accurate and well-built models of say, a Lacey and a Bristol Fighter, the latter should have an advantage. At present, the sensible thing to do if you want to win a competition is to choose the simplest subject, since there is less scope for error. That most people do not do this is a tribute to their sense of adventure!

The big problem with such a bonus is the difficulty of scoring it. If you classify each part of the model separately for a complexity mark, the system becomes cumbersome, as in the old Superscale rules. On the other hand, the majority of the

U.S. TWINS

These scale rubber twins are the work of Dick Howard, a Scale Staffer member from Lake Havasu, Arizona. Below left: This Grumman F7F-1, from Dennis Norman's Model Builder plan, was the winner of the Flying Aces Nats WW2 Mass Launch with times of 1:31 and 1:15. Below: Bare bones of a 30in. MIG DIS. If you please!





committee felt that allowing the judges to determine a bonus for each model by comparison between the whole entry could give rise to inconsistency and personal bias.

For this reason the proposal was withdrawn, but the system will be tried out at the November meeting only, to see if it is feasible. However, I do think it is the case that, as in all classes, certain modellers win often, simply because they build accurate models and trim them well, while others consistently do not.

All the latest...

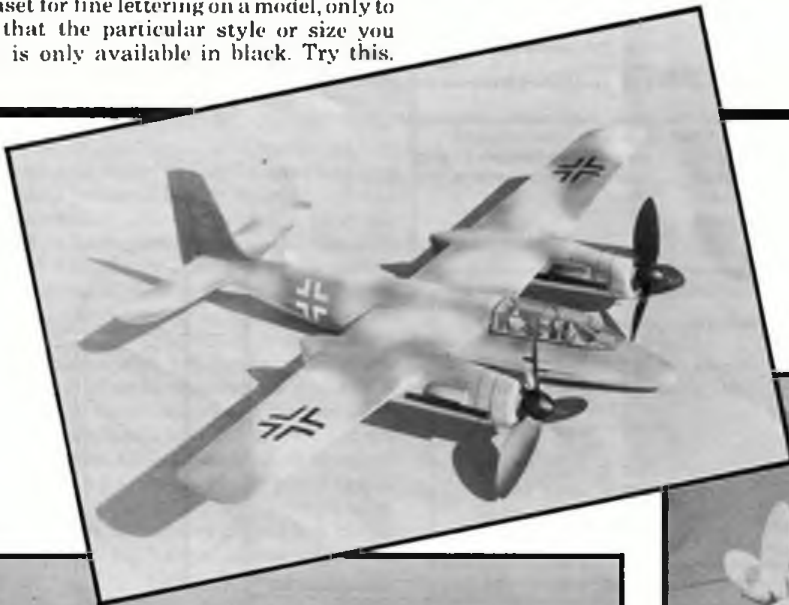
Here is a tip you may not have heard of, passed on by Peter McDermott. Occasionally you may want to make use of Letraset for fine lettering on a model, only to find that the particular style or size you want is only available in black. Try this.

The area to be lettered is first sprayed in the colour of the required lettering, usually white, and black Letraset applied. The whole is then sprayed with the model colour, after which the Letraset is pulled off with sellotape, revealing the white lettering beneath. It may sound a bit dodgy, but the results on Pete's Cirrus Moth are perfect. Like so many of these good ideas, you hear about them too late, and this method would have been ideal for the flowery script on the side of my Avro Avian monoplane.

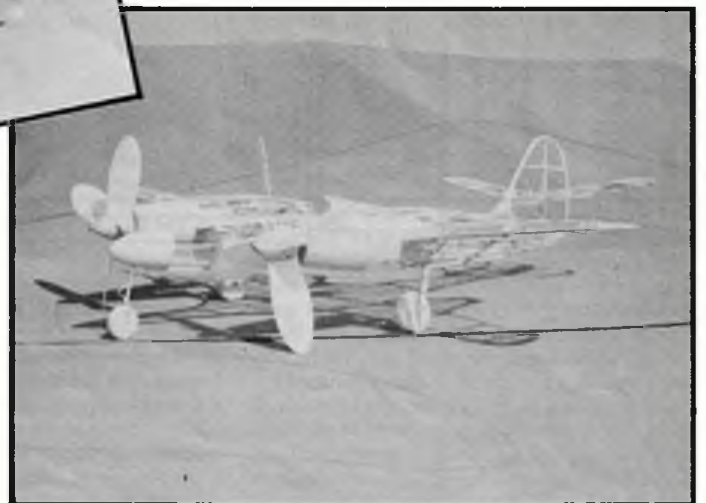
At Old Warden, John Blagg showed me a very interesting electric motor from the USA. The VL Products HY-70 is an integral motor and gearbox, onto which fits a rechargeable battery. A charger is available

Above left: The one we nearly had - two Interstate plans were almost simultaneously, but independently, offered to Aeromodeller earlier year. John Watters' version was published; here is Philip Kent's, which flew beautifully at Old Warden. Above right: VL Products' HY-70 electric motor (see text).

but John was using a dry cell to give about 1 minute of charge. The weight of 20 grams is similar to that of a Telco, and it appears to deliver slightly more power than a CO₂ motor at full throttle. The gearing enables a six-inch prop to be used, and a freewheel is incorporated. The motor is very impressive and would suit sports models, but for scale the big disadvantage is its physical size which would limit it to radial cowlings. I understand a number of these motors are being brought into the country shortly, but you can contact VL Products directly at 7871 Alabama Avenue, 16 Canoga Park, California 91304, USA.



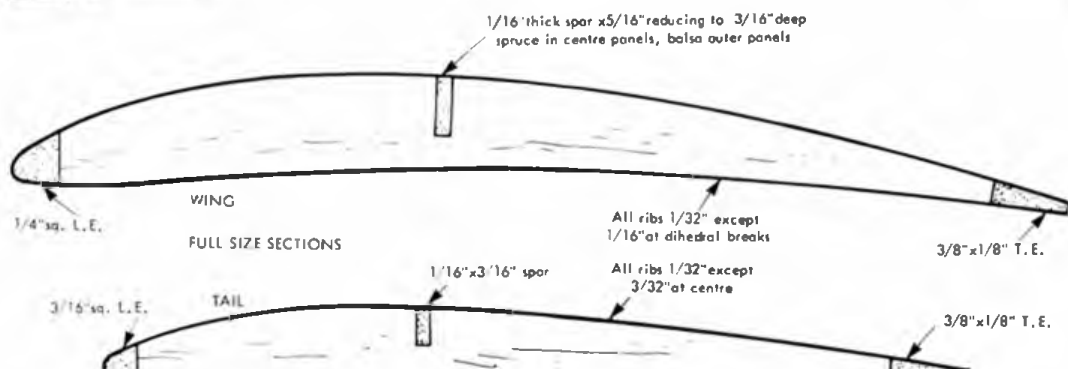
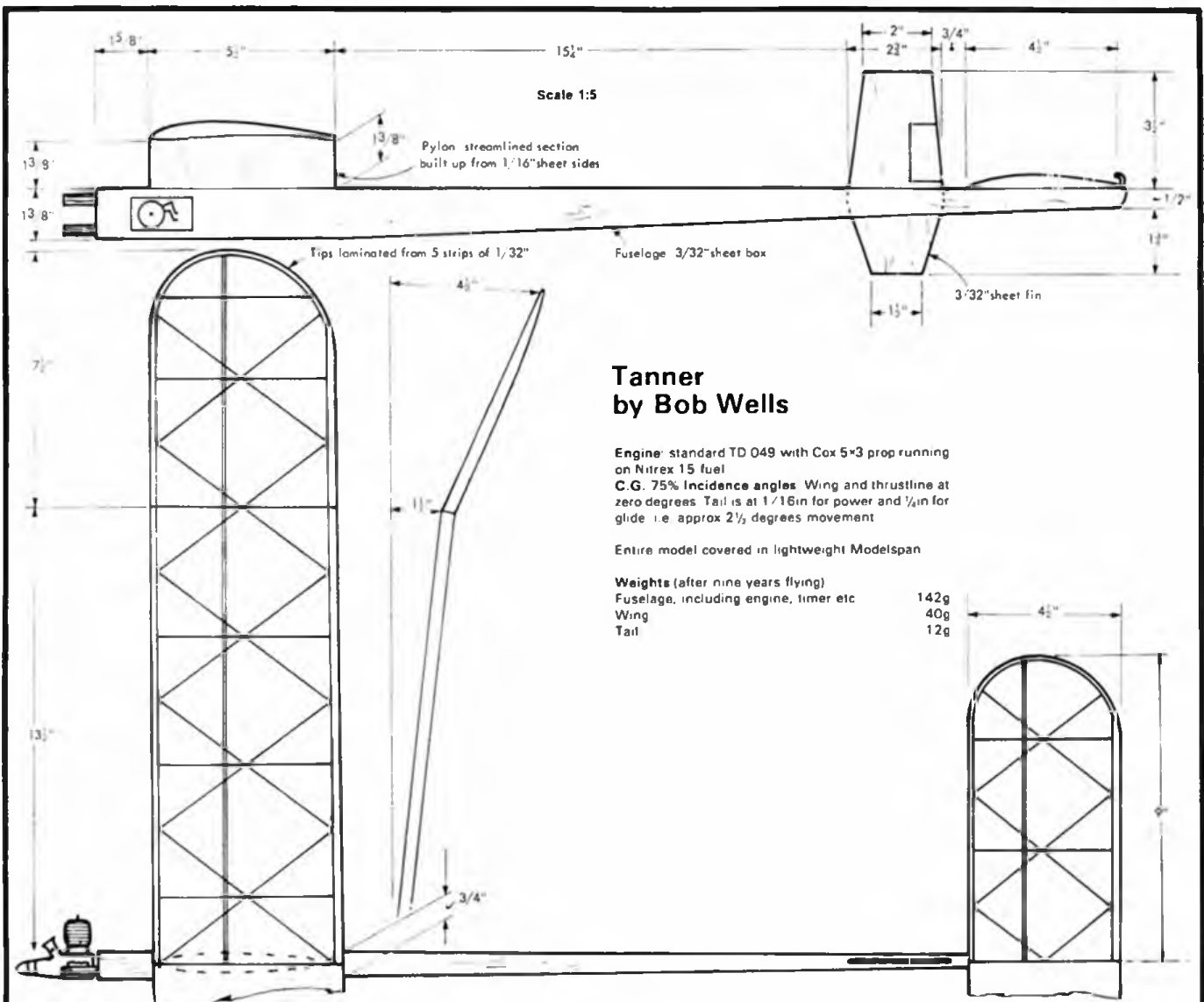
More Dick Howard twins. Below left: Tiny F7F-1, eight in. span, can manage flights of 20 sec. plus. Weighs 3.75 gms. Left: An attractive subject - this Focke-Wulf Ta 154 Mosquito is to 1/24th scale. Below: You don't see many McDonnell XP-67s. This is Dick's second - his first one, 22in. span, made a best flight of half-a-minute.



FREE FLIGHT SCENE

with Dave Hipperson

Not one, but two 1986 Nationals winning models come under the microscope this month. Bob Wells (at right) and Jessica Nash are a championship combination — find out how they do it...





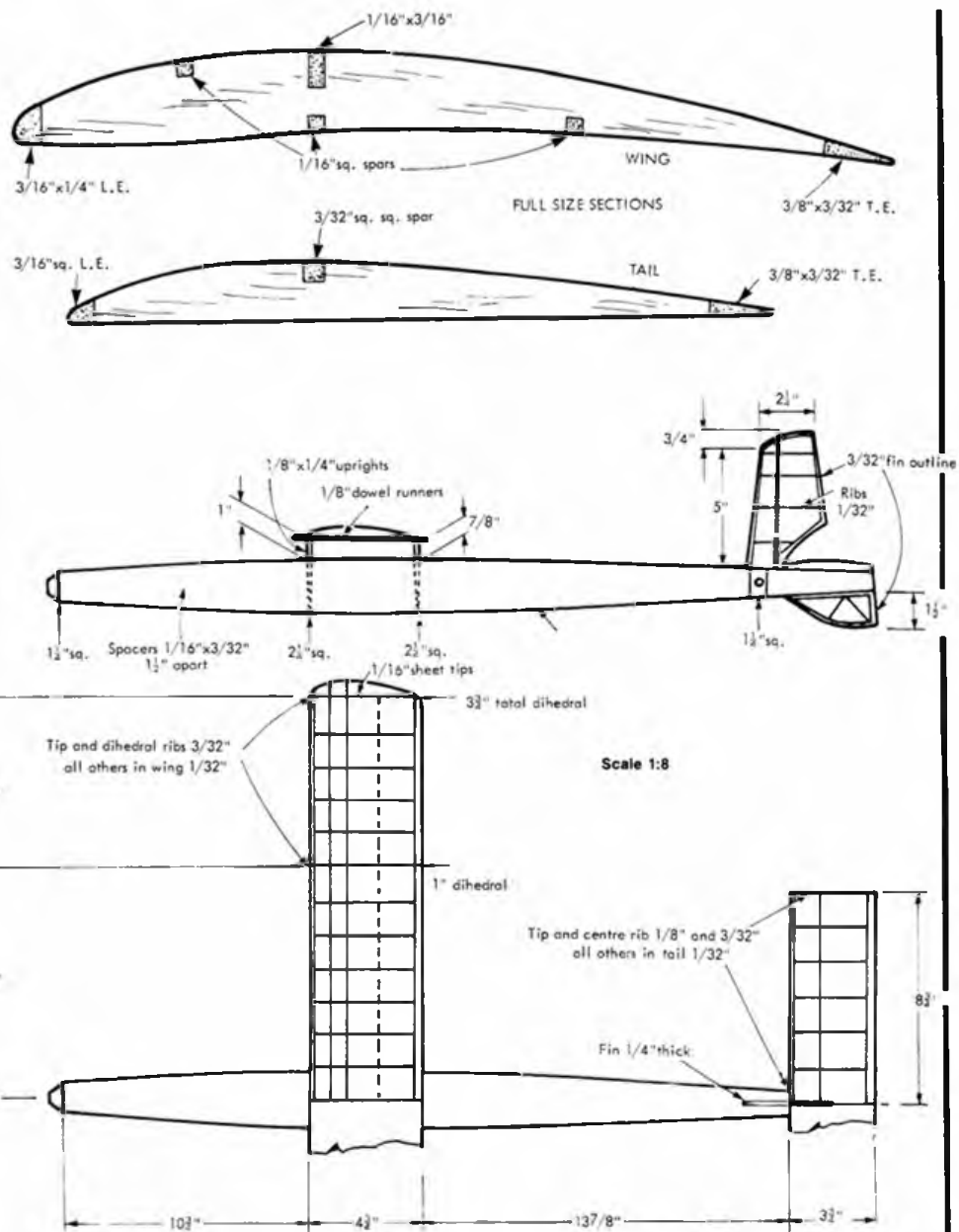
Tanner: Bob Wells' 1/2A Nats Winner

This is no new model but a well proven and straightforward design which has been in existence since 1977; in fact, Bob reminded me that its debut was at the SMAE Mini meeting in February of that year, where it won with a flyoff time of 2:39. I recall that one too as it was the occasion of my first outing with the original and now much flown Artoo. Bob has done well to get a 1/2A to last almost ten years, as power models are notorious for their short lives when used regularly. My original CDH has just been retired!

Since that time, Tanner has been a regular placer, but of course Bob's main activity is rubber so it's not flown that often.

A rather unusual but attractive layout with forward fin allowing a very neat VIT system (Fig 1) it uses the traditional NACA 6409 section in a very light wing of just 40 grams. Full geodetic ribs and single deep 'I' spar construction greatly add to spanwise and torsional stiffness. Contrary to Stafford Screen's highly specialised and tuned approach Bob points out that his model flies with an 'off the shelf' Cox 049, standard Cox prop, uses Nitrex 15 and is totally unmodified, running on suction and using a very novel fuel disconnection system (fig 2). Bob claims as positive a cut off with this as with any brake system - he uses a similar arrangement on his FIC - although the flexible fuel tubing has to be just 'right' to allow it to be flipped off, but not fall off, in use. Of course, lack of flood-off saves the strain on the mechanical components of the motor and conservative percentages of nitro have meant few blown heads. In fact no blown heads - it's still running on the same head as in '77! Incredible? Not really when you consider this is the man who has flown a complete seven-flight Wakefield Trials on one motor then complained at the end that it had shed a couple of strands. Bob makes things last.

Another sensible detail is the treatment of the timer levers. These allow semi-captive lines but still enough linear movement to free the triggers on the tail plane without recourse to long moments and hence excessive loads on the timer discs - very clever (fig 3).



Jessica Nash's Nationals '86 Winner — Womens Cup

Prop: 16in x 24in helical, twin blade folder, 16swg wire hub and shaft Blades from 1/2in sheet. Maximum chord 2 3/8in. Undercamber at max chord 1/8in Prop run: 1:15 on 750 turns CG 75%

Weights:	
Wing	22g
Fuselage	30g
Prop	18g
Tail	6g
Motor (39in. long)	50g

Bob Wells' Tanner: Contest Record

SMAE Mini, Barkston Heath	Feb 77:	10:00 + 2:39	1st
Nationals, Little Rissington	Aug 77:	10:00 + 1:54	6th
SMAE 6th Area	Oct 77:	10:00 + 3:05	1st
Nationals, Everleigh	Aug 79:	10:00 + 2:27	3rd
Watton Mini	Nov 81:	6:16	2nd
SMAE Mini, Bassingbourn	Oct 83:	9:18	3rd
SMAE Mini, Barkston Heath	May 84:	9:38	2nd
Nationals, Barkston Heath	May 85:	7:49	6th
Nationals, Barkston Heath	May 86:	9:55	1st

Jessica Nash's 1986 Women's Cup Winner

A slightly over-enthusiastic scribe in one of the Vintage magazines recently compared Jessica Nash with Helen of Troy - something about encouraging people to build RAFF V's and launching a thousand ships! Be that as it may, Jessica's competitive activities have certainly stood the test of time. She has improved steadily since she first started under Bob's watchful eye. This year isn't the first time she has

won the Womens Cup either but it was the first double win for the Nash/Wells Team. The model she used, which is drawn here, was built deliberately in the vintage style after her successes with numerous RAFF V's which she finds comfortable to fly.

Originating in 1980 with a sparless wing it wasn't very consistent so a more modern multi-spar arrangement was built to replace it. There was a great improvement. First contest was the now infamous wet Nats of '84 where the model survived and stayed on

trim despite the conditions. In winning this year it survived an even windier day without a scratch.

The model is quite rugged. Airframe weight is nearly 80 gms and it is certainly not over-powered with 50 grms of rubber. It's not unlike a slightly scaled-down Skywalker built a little heavy. A perfect introduction to competitive open rubber.

SMAE 4th Area Event, 8th June

In past years entries at this event have always been adversely affected by its coming so soon after the Nats. Usually, enough is enough for most people. Not so this year, for after a Nationals when contestants got plenty of exercise but little flying it was a case of wanting more, and there was an above average entry Nationally on a day of not impossible weather, with a positively massive attendance at Barkston; over 30 flew in glider alone. Driffield and Barkston had the best of the weather although it was generally similar throughout the country - a fine sunny start with a slight deterioration and increasing wind, but no rain.

The top two in Glider flew off at Barkston in quite discouraging thin overcast, cool and windy weather. Both they and Gerry Ferer, who was doing likewise in Coupe, managed very well picking their own lift. Runner-up in glider, Drew flew at Merryfield in the West and headed the winning Bristol & West glider team which also comprised Audley and Sharman. The considerable points thus earned put them comfortably in the lead in the Plugge Cup although technically things could be very different if the rules governing what events count towards this award are taken to the letter - see comment elsewhere in this month's column.

New Zealand visitor Paul Lagan made amends for his early retirement at the Nats, when his model was mislaid, to return a fine set of maxes in Coupe but a disappointing fly-off was bettered by Ian Davitt in generally smoother air at Driffield.

I am afraid most FIC flyers are beaten before they start when there is wind. Only ten competed nation-wide and the top five all flew at Barkston. Screen was head and shoulders in front on reliability. His fly-off was also taken in quite poor conditions and the model travelled a distance that would suggest a wind in excess of 20 mph.

SMAE 4th Area Event, 8th June

Results

Open Glider - No Trophy Plugge Points (92 flew)

1 J Williams	Freebird	7 30 + 6 11
2 W Colledge	Birmingham	7 30 + 6 03
3 E Drew	B & W	7 30 + 5 36
4 R. Audley	B & W	7 30 + 3 57
5 J Bailey	Biggles	7 30 + 2 48
6 J Flynn	Liverpool	7 30 + 2 27

Coupe D'hiver - No Trophy (32 flew)

1 G Ferer	Timperley	10 00 + 3 02
2 I Davitt	Morley	10 00 + 1 47
3 P Lagan	N Z	10 00 + 1 36
4 P Ball	Grantham	9 55
5 J Carter	Falcons	9 47
6 R. Peers	Falcons	9 46

FIC (FA1 Power) - Astral Trophy (10 flew)

1 S Screen	Birmingham	12 30 + 3 56
2 P Watson	Birmingham	12 14
3 R Moore	Biggles	12 05

Team Glider for Model Engineer Trophy

Bristol & West A (Drew, Audley, Sharman)	22 50 + 11 30
Falcons (Dilks, Carter, Peers)	20 46
East Grinstead B (Lee, Richardson, Howick)	20 15

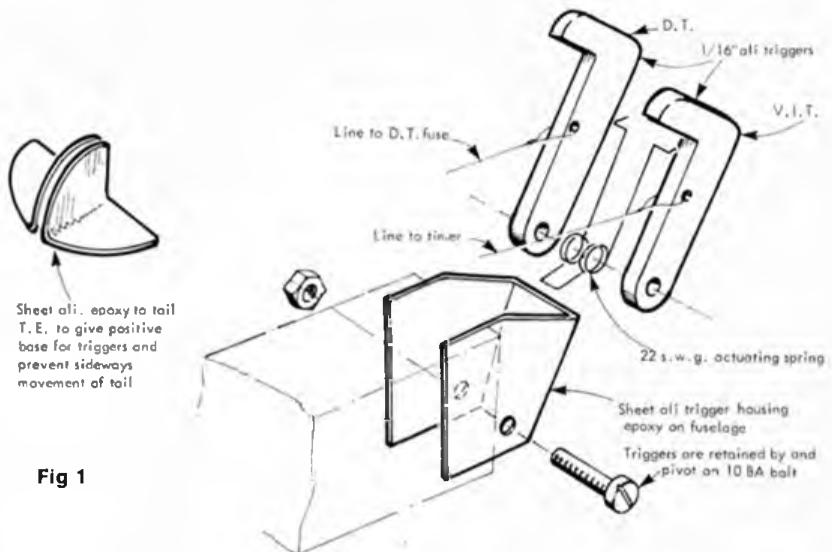


Fig 1

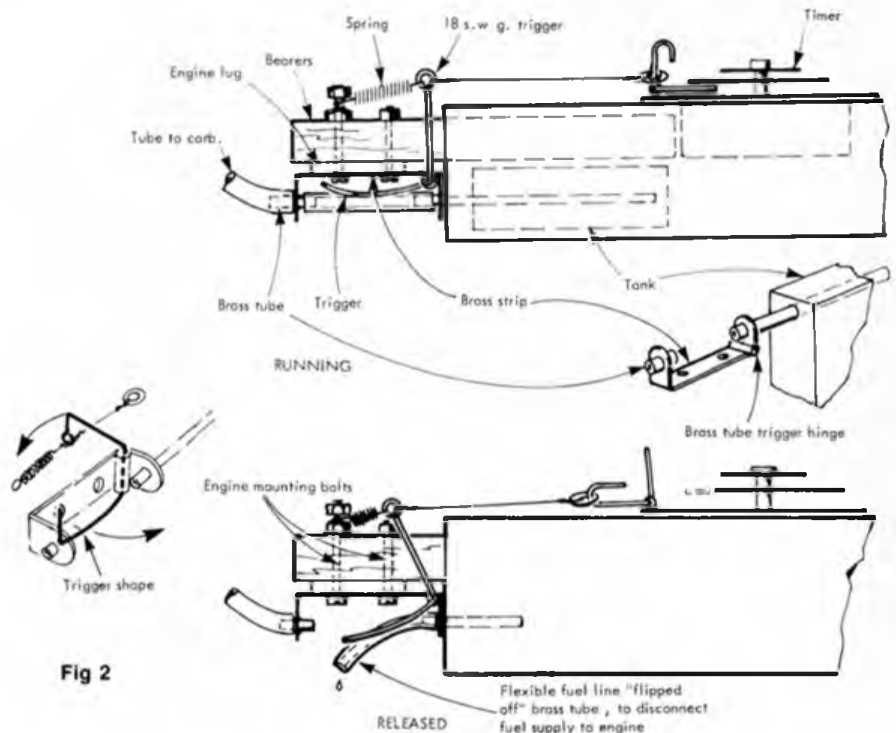


Fig 2

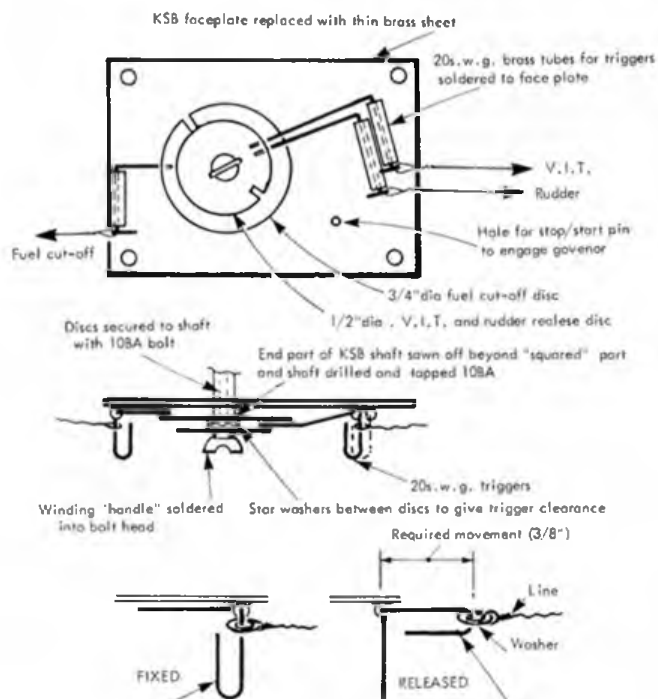
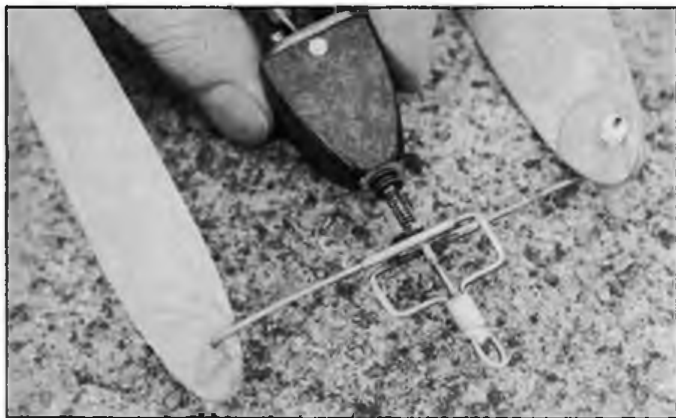


Fig 3



Two interesting bits of gadgetry. Above: Johnathan Walker sports this clever variable pitch prop assembly on his current Coupe d'hiver model. Square wire loops are filed flat to allow sufficient flexing under full torque to increase slightly the blade angle. Model also has a very neat launch release mechanism, more details of which in a later issue...



The fuel shut off system on Trevor Payne's 1/2A Slow Open model. He uses a modified DT-timer which he doesn't recommend as it is too erratic but the mechanics are super simple and allow a plate equipped timer to run on after fuel shut off. Spring loaded lever crimps down onto tube just behind engine.

Plugge Points after four events

Bristol & West	843
Birmingham	819
Anglia	813
Biggles	710
Vikings	509
Morley	406

RAFMAA Champs: Barkston Heath, 14/15th June

For the past few years this event has experienced exceptionally summery weather and true to form in 1986 it offered a full stop to the winter. For the first day at least conditions were only a little cooler than the Yugoslavian World Champs last year! Forecast temperatures were hopelessly out and shade thermometers soon recorded the mid-eighties. The first day was set aside for three FAI rounds followed by Champagne Fly-offs in the FAI classes. With a very light and variable wind direction it was necessary to move the control point many times and this proved very awkward. On the light easterly breeze models were gravitating towards the 'compound' although as one would hopefully expect of RAF organisation there was none of the paranoia about this that so marred the Nationals. Models that did stray were returned enthusiastically. I believe I even sensed slight disappointment in the tone of one of the security staff when I explained that we would be moving our launch point and would probably not be bothering him again. Despite what some 'official' sources would have us believe, when handled politely these chaps seem to be only too pleased to help.

At the end of the first days' rounds full scores were plentiful in all events although once again entries were sadly depleted in FIC. The organisation delayed the progressive fly-offs for two hours which, although contrary to their published literature, seemed a sensible move as at 6pm (the programmed time) it was quite breezy and very thermally. The breeze never abated (not until it was nearly dark anyway) so these single flights had to be made eventually but were at least in cooler conditions.

The 15-knot drift was enough totally to discourage any FIC participation and considerably depleted FIB, although the rather late control move before the start hardly encouraged those who had set up

already. The first round proved decisive in FIB. Davitt's early launch looked to be far and away the best of the field when they flew as a bunch at the end of the five minutes. However, one model, that of Mike Evatt, broke away to turn tightly on the glide and centre in lift not found by any of the others to make the four-minute max comfortably. In glider both Madelin and Williams did likewise, to return and fly much later in the somewhat cooled conditions and then contact nothing. Such Champagne Fly-offs are certainly FAI flyoff 'practice' which is something too few of us get, and for that idea alone they are to be commended. A five-minute time slot shows up the areas of weakness all right and is a rather more satisfactory arrangement in FAI than the Open equivalent when durations can be so much longer.

The following day was just as hot, but with a clear blue sky instead of the hazy cloud and with a north-easterly steady both in direction and strength. Those that doubled in Mini, and flew early on, did best as the wind rose throughout the day reaching nearly 30 mph by the end, taking models high the deep into cropped fields.

Hipperson dropped his first flight of the morning in FIB but on the 2nd round so did nearly everyone else apart from Kaynes who now had both a full score and a comfortable half-minute lead over the field, thus disproving the theory that bubble machine thermal detectors don't work well in sunny weather! In FIC both Monks and Screen were in trouble and dropped flights. The wind was rising and the tree-induced turbulence was now becoming very difficult to fly in but the gliders seemed to cope - very few lost control on the tow - so by the finish it was not surprising to find that four had full scores. Nats winner Mike Chilton looked all set in Coupe too after a string of three early maxes but the worsening wind took its toll and let in John Brookes who was flying his distinctive high-pylon twin-finned-tail layout. Despite losing one model early in colossal lift he managed nearly 8½ minutes total. Peers had really had a complete flyover in ½A power which had had dominated from his early start after declining to continue in FIB. This left clubmate Terry Dilks flying his Head Beagle FIB design to carry the flag again and clinch 3rd, but to lose a model in the process. During the day Terry had been putting so much into winding his FAI rubber that on one occasion, when a motor

blew at high turns, there was smoke coming out of the end of the winding tube as if from the barrel of a gun!

Despite a little confusion surrounding the punctuation of the FIB final round Kaynes got away to clinch top place with his seventh max - the last two in all events being reduced to 2:30. Of course this reduction was followed by the usual grumbings from those that discovered that they would have more difficulty catching up. Quite true, but why grumble when it happens? Why not explain your dissatisfaction with such a rule in advance? More likely it's only a nuisance when it works against you...

It was left to the four glider qualifiers to supply the finale. By now it was very windy but still hot. It was therefore incredible that the only lift encountered was quite gentle. Dick Staines, bravely first away, played tag with good air for long enough to make the four minutes but never climbed above line height. The others found little or no help and had their fair share of towing drama in the turbulence.

Trophies were awarded to the three winners, with more Champagne and cash going to the runners-up. This event marked Gill Hart's debut as CD and apart from some tiny hiccups it was a popular and well received week-end's flying.

RAFMAA Champs: Barkston Heath, 14th & 15th June

F1A - Royal Air Force Review Trophy (28 flew)

1 R. Staines	20 00 + 4 00
2 C. Edge	20 00 + 2 28
3 M. Fantham	20 00 + 1 01
4 W. Colledge	20 00 + 0 45

F1B - Thurston Trophy (17 flew)

1 I. Kaynes	20 00
2 D. Hipperson	19 35
3 T. Dilks	19 09

F1C - Royal Air Force Cup (7 flew)

1 S. Screen	19 20
2 R. Monks	19 12
3 R. King	17 52

Champagne Flyoffs F1A (13 flew)

1 G. Madelin	4 00 + 2 15
2 C.P. Williams	4 00 + 1 51

Continued on page 552

MERCURY M

FOR BRITISH CONTROL LINE enthusiasts, the Mercury Marlin was a milestone in design and performance. Launched on 1st May 1949 it spearheaded Mercury Models' control line range which was to produce such famous kits as the de Bolt Super Bipe, Speedwagon, Marlin Mite, and the Monitor. The current hot stunt motor of the period was the Elfin 1.8 and so it was that Dennis Allen designed the Marlin around this motor, although the plan shows other currently available radial mounted motors; the Elfin 2.49 (bigger brother of the 1.8), the Frog 1.8 and the Arden 0.19 and Ohlsson 0.23 glowplug motors.

With such a well known designer as Henry J. Nicholls, a well proven motor and a certain elegance (unlike most of the opposition) this kit was to be a great commercial success, and it is very fitting with the growing interest in vintage control line that the design should appear again.

What you get and what you do

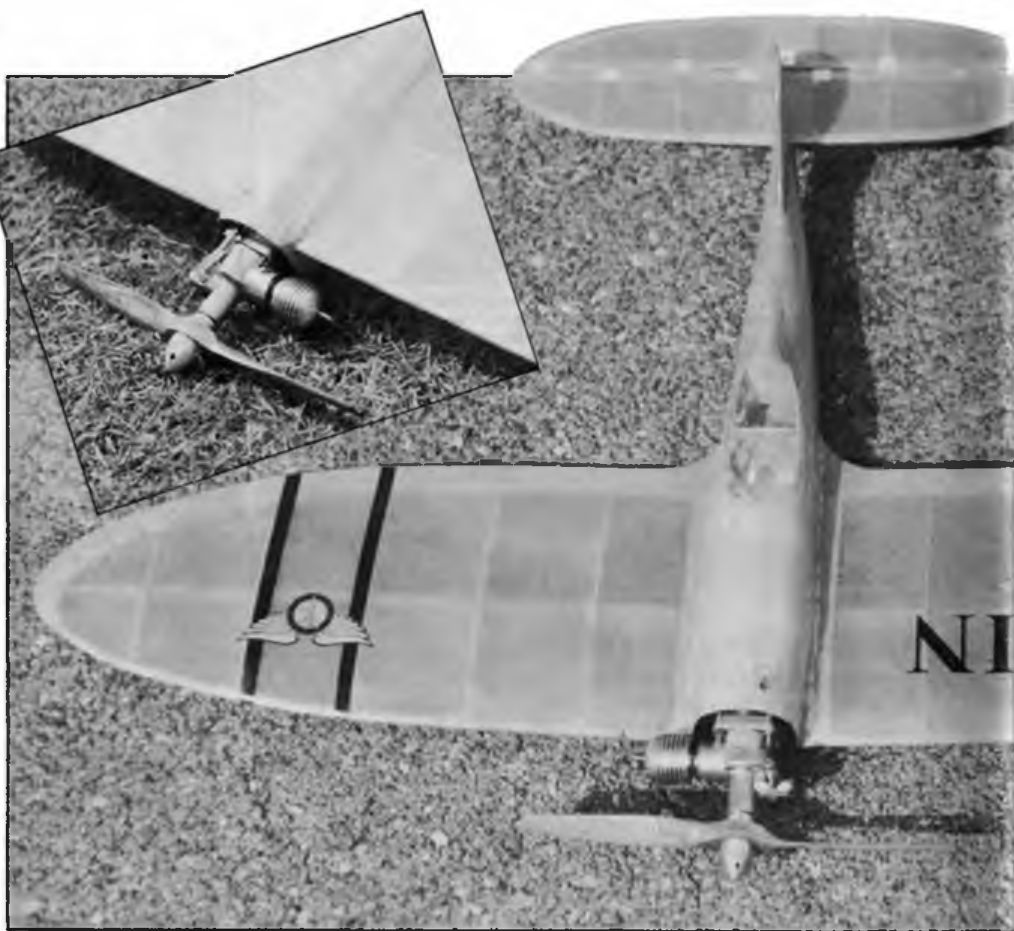
The reproduction kit comes (at around £26) in a plain brown box with a sketch of the Marlin on one side of the lid and 'Mercury Marlin' in large letters on the other, with Ron's name appearing discreetly under the sketch. The box is very full and as with Ron's Monitor kit it's very difficult to get all the bits back in the box after inspection.

The re-drawn plan, which is of high quality is almost a copy of the original (if a Marlin Mite plan is any guide), and the building instructions are reprints of the original. The kit is complete with all formers, ribs, wing trailing edge and tips cut to shape (the original kit had printed parts, I believe), ample stripwood, a tin plate tank kit ready to solder together, bellcrank, horn, canopy and a plastic spinner. Also provided is heavyweight tissue, a hardware pack and a set of self adhesive letters; but what is not provided, disappointingly perhaps, is a Mercury transfer. A list is provided so the buyer may check the contents.

Job number one, of course, is to read the instructions and study the plan. It soon becomes apparent that the original advertisement comment 'this is NOT a model for beginners' is still relevant today.

In fact, for a person brought up on radio models, this kit will be an eye opener, but for us 'proper' aeromodellers it is a joy to build. Unusually for me I followed the instructions, and I advise you to do likewise. I'll pick out some of the points and elaborate a little but constant reference to the cutaway sketches on the plan are most revealing (ahem).

One has to decide at the outset what motor is to be used. If no radial mount engine is available use a plastic mount and any 1.5 to



2.55cc modern diesel. My choice was an Elfin 2.49 replica by Dunham's. Next, make up the fuel tank, but before soldering in the feed pipe consider where it will come through the bulkhead, for it may foul the engine. I had this problem with the 2.49 and so had to bend the feed pipe.

A Mind the Lines double!

**Ron Prentice's latest
reproduction kit is
checked out by Andy**

Brough

Do remember to cut away the centre of the formers, because they are provided solid in the kit and clearance for the pushrod and bellcrank is required. Drill all the holes in F1, epoxy the screws for the engine or engine mount and epoxy the crutch members to this former after gentle steaming to obtain the correct amount of curvature. Now follow the rest of the fuselage instructions but leave F4 in position but unglued (this is to allow for adjustment when fitting the wing later). I epoxied as much balsa as possible between F1 and F2, encasing the tank, to provide a

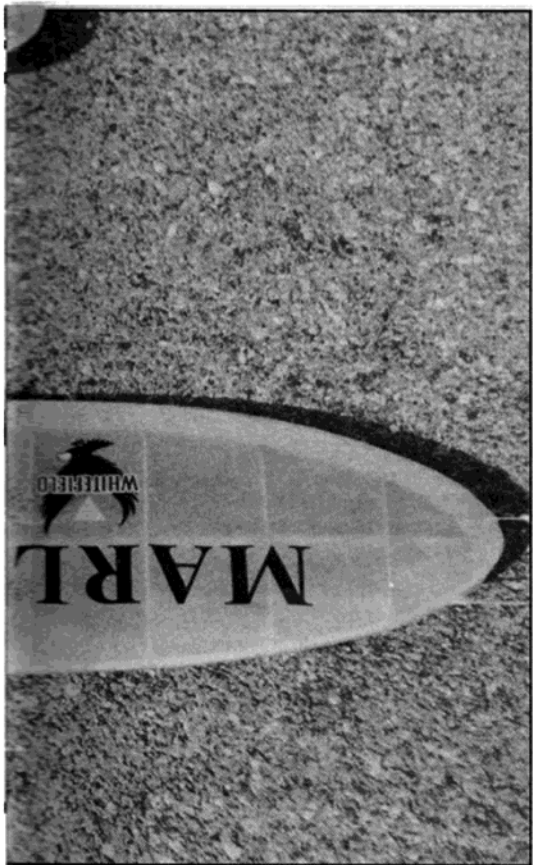
rigid box that did not rely too much on the exterior planking.

Remember to make holes in ribs for the leadouts before assembly. I didn't, but a long rat-tailed file came in very handy! Wing assembly is quite easy; one begins by pinning down the two spar halves and gluing on the ribs. You now have to remove from the plan and glue on the top and bottom trailing edges, followed by the wing tips. I then stuck on (with cyano) the inner leading edge lamination which terminates in a butt joint at the tip. The next two laminations were stuck to the first with balsa cement. In fact, apart from a little epoxy, the whole model was stuck together with either balsa cement or cyano, depending on my patience at that time! The rest of the wing construction was exactly as the instructions.

The bellcrank assembly plus both leadouts were installed in the wing before fitting the wing to the fuselage. It makes the wire bending and soldering easier and all that is required is to cut away F2 when the wing is added, and glue it back afterwards. Assemble the wing to the fuselage and to make sure that all is square and the incidence is zero. F4 should be moved into position now butting the trailing edge, tacking all in place with drop of cyano, and when you are sure all is square fix with epoxy. Add the push rod and solder to the bellcrank.

Now comes the really enjoyable bit;

MARLIN



Heading and inset: The top and bottom of it; the sleek lines of the Marlin - note the aggressively uncowed Elfin 2.49 replica - are very attractive. Quite unusual for 1949, the year the Marlin was first introduced! Right: A period announcement, from the May 1949 Aeromodeller (the Marlin appears top left). Look at all those other delights...Below: Control-line models were pretty simple thirty-seven years ago. Nevertheless, the 1986 'Prentice' Marlin should be as aerobatic as its famous forefather. Try one!

May, 1949 AEROMODELLER

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Release date to be announced.

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This short-coupled high-speed stunt model with a normal flying speed of 80 m.p.h. is the most advanced C/L design ever to be kitted up. The 59" version is for 10 c.c. motors, the 38" for the Amco 3-5. Exclusive features—straight line-up, no offset—for high efficiency, detachable wing with built-in control system, no wires outside fuselage, and many others.

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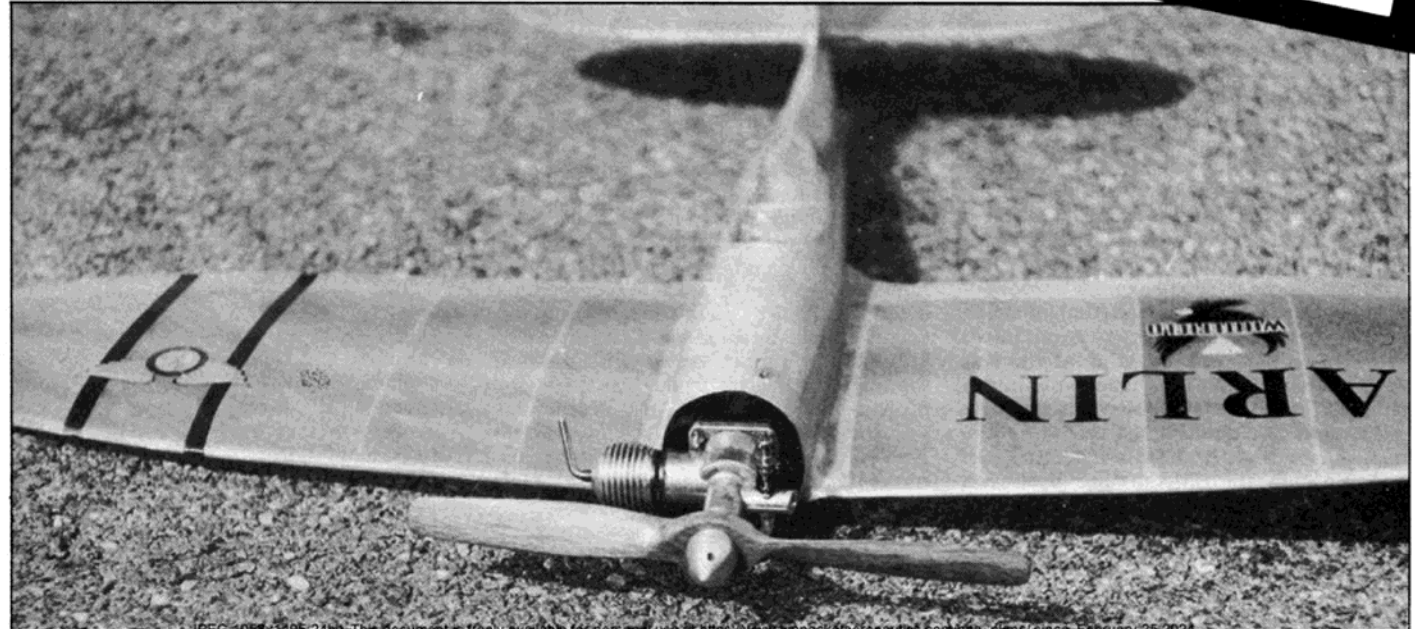
MERCURY RADIO-CONTROL.

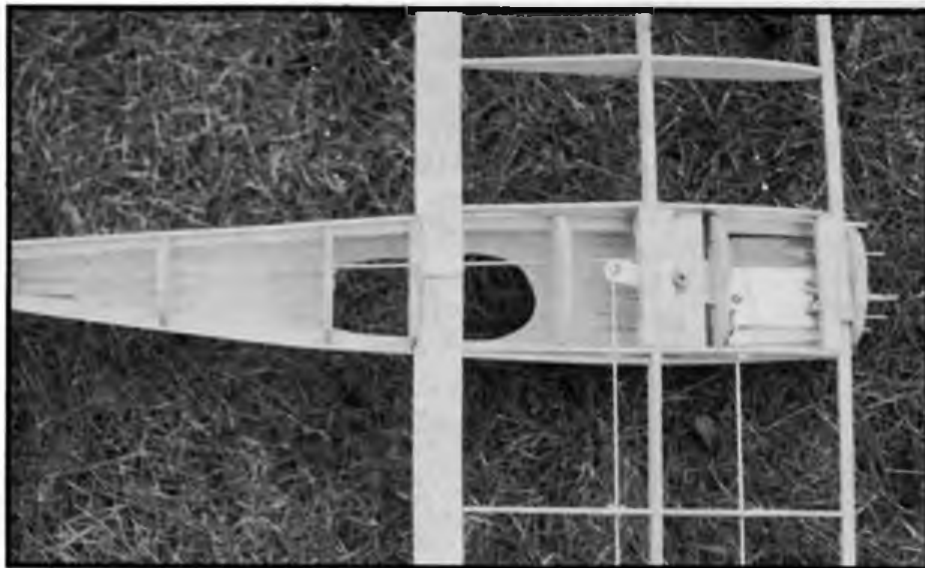
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Fuselage planking is semi-complete here, allowing an inverted peek at the Marlin's hardware. Make sure that the pushrod doesn't bind on the 'up' leadout - a trap for the unwary on many designs. Wing may look fragile by modern standards, but 'light is aerobatic'!

planking the fuselage. Take your time, use plenty of balsa cement; and before you know it the skeleton is transformed into a thing of beauty. It really isn't hard; just have plenty of patience and be prepared to scrap ill-fitting planks. Plenty of sanding is needed but go easy on this as the planking can soon become very thin. I made sure to do a good job as I intended to cover the fuselage with lightweight nylon, and the presence of filler would be seen.

Nearly ready to go

I covered all the open structure in yellow heavyweight tissue (white is supplied in the kit) and used yellow nylon for the fuselage. The self adhesive letters can be used in two ways. One method to peel them off the strip and stick them to the wing (this is what I did) or you can stick the outline of the letters to the wing and use it as mask for spraying. I pinched a Mercury transfer from a Midge

kit, added two black tissue stripes and that was it. The final act was to trim the canopy to size and stick it to the fuselage with balsa cement. It fell off with cyano! (Try R/C Modeller's Glue. GC).

You may have noticed that I left off the cowl. Whilst I realise that the cowling does add to sleek appearance of the models, I hate such animals when they come between me and my fiddling with the engine. Actually a cowl made of glassfibre would be very practical, and it would hide a plastic engine mount, but as I used a radially mounted motor there seemed no need.

Complete and ready to fly, my Marlin came out at 12oz, compared with the 9½oz quoted on the plan. However, with the Elfin 2.49 up front no problems were envisaged and even at 8.65oz/sq.ft. it still works out at a lighter wing loading than most vintage designs.

If this were a new design a flying report would be essential but a vintage design with such a proven track record is bound to fly provided it's built well. I have to say that when I came to fly it I found the engine a little tight and rather than risk a seizure, took the engine out to run it in. I shall report as soon as I am in a position to do so.

Price about £25. Worth it? I should say so. There is good value in the parts provided; wood is of good quality, the model is a joy to build and is a thing of beauty when finished. You'll all see it at Old Warden on Vintage Day.

The kit is available from Ron Prentice The Mill, Ash Priors, Taunton, Somerset. Write now!

FREE FLIGHT SCENE

Continued from page 549

F1B (8 flew)

1 M. Evatt	4 00
2 I. Davitt	3 01

A/1 Glider (7 flew)

1 M. Brown	8 58
2 J O'Donnell	7 57
3 J. Carter	7 34

Coupe d'Hiver (12 flew)

1 J. Brookes	8 26
2 M. Chilton	8 08
3 G. Ferer	7 56

1/2A Power (3 flew)

1 R. Peers	8 44
2 T. Payne	6 07

Plugge on regardless?

In Free Flight News there is a most amusing and very clever piece from Martin Pressnell bemoaning the fact that his club, Vikings - formed for the express purpose of Plugge Cup honours - fell foul of some slightly obscure (some might say outdated) rule governing score recording at the last Area meeting. This invalidated his and a club mates' times and thus substantially reduced their club's Plugge points for the day. Quite rightly he has pointed out anomalies in the SMAE rules book and

quotes some classic illustrations. He recommends it for light reading saying it's that amusing. I couldn't agree more, and to think it was cleaned up and re-written only the year before last. It puts me very much in mind of the story of the lads in the prisoner of war camp who aren't allowed to tell jokes so they commit them all to memory and number them 1 to 50. All that is necessary after lights out is for one of them to mention a number and everyone dissolves in laughter. Give it a read and memorise a few. 3.2.6 Trials...mild laughter. 3.17 Vintage...near hysterics and lucky there is a number for that one otherwise we would be here all day telling it. Here's another: 2.1.3 Annual Leagues...no laughs? Try another: 3.1.10 Plugge Cup...dead silence. What's gone wrong?

I'll tell what's gone wrong. Someone took another look at the rule book following Martin's advice and we have got a problem over the Plugge Cup. The book states very clearly under both of those last sections numbered above that the Plugge Cup is determined on the results of certain named events; named by the Trophy awarded to the individual winner in the first three cases and the top team awards in the last three. Two such are the KMAA (first Area Glider events) and the Halifax Trophy FAI Power contest held at the 2nd Area meeting. The rules are quite clear as they name the event

by its Trophy. There can't be any misunderstanding. There's a problem this year though as those two particular events weren't flown at Area level! They were moved to the Easter meeting and nobody realised the error. So to be strictly accurate those that flew at Easter and *not* those that flew in the first two Area events should be counted as earning the Plugge points for their clubs. It's a major slip and one that perfectly illustrates my continual advice to be very careful when changing the rules or the calendar. Is there an embarrassing knock on effect lurking around the corner? Too many examples of that very thing this year already. One wonders what an official protest might do. To save you the laborious calculations, if the Easter Meeting is to count, but not the Area meetings, the Plugge positions up to and including the 4th meeting would be:

Biggles	700
B&W	542
Birmingham	504
Anglia	423
Falcons	402
Vikings	272

...and so on. Doubtless, Bristol & West members will now be wishing they had come in force to the Easter Meeting which was almost on their doorstep. Either that or they will be looking for a very good solicitor!

Assembly

We are now ready to epoxy the wings to the fuselage. The photo shows the jig that I use to check that the wings are 'square'. It is OK if the wing is skewed so that the left wing is back slightly (maximum tolerance 1/32in.). I know this means less lift on the inner wing but take my word for it, it works. The left wing may also be slightly heavier. The finger throw is made from 1/16in. ply and 3/16in. balsa. Be sure that it is comfortable before epoxying in place. After covering the fuselage with heavyweight tissue add finger grips of wet-and-dry paper and the piece of foil that prevents the D:T fuse from igniting your model. If your wings were made from light wood cover them with lightweight tissue.

Tailplane and fin

Find some real good quality '7lb' 1/16in. quarter-grain balsa (a three-inch wide sheet

will weigh 0.437oz or 12gm.). Sand in 1/32in. washout on the right panel, and cyano button thread all the way round the outline. Two coats of sanding sealer are needed; dihedral is put in as per the wing. The more dihedral there is, the more the model will roll and loop in launch. The fin is straightforward; make from 1/16in. quarter-grain '6-7lb' wood with button thread edging. Note the grain direction of the rear part. The tail must be set at just the right amount of negative incidence. Just tack it in place at first. Rest the wing on a jig so that is level and use another jig, angled at precisely - 1 1/2 degrees to align the tail accurately, packing with slivers of balsa if necessary. Epoxy in place, using the wing jig to make sure of squareness. Be careful not to induce different angles on each side; and don't forget the tail lift. The fin may be epoxied in place, and the D:T weight is made up so that the CG comes out at 50%. Attach the D:T line.

Trimming

Many of the trimming hints here can be

adopted for other HLGs but remember that some are peculiar to Butterfly 2 only. Refer to Fig. 1. In my article in the June 1982 *Aeromodeller* I said that the model turns right in the climb and simultaneously rolls left. This is not strictly true, for it is trying to loop as well, but because of the right bank at launch it appears as though they are turning right. To prevent looping, the right bank may be augmented by a touch of 'up' on the right tail panel, or 'down' on the left. Because Butterfly 2 has such a rolling climb, left rudder can override all of these forces so an extra force, i.e. more right tip washout, may be used. That's more angle, not area. The trick is to hold down the right wing to prevent a vertical loop and to get the left-roll force from the rudder to reduce the bank as the power of the launch dies down so that the model is rolled and turned into the glide circle. By changing the variables all kinds of patterns may be produced, from 'straight up with a flick roll at the top' to a full helical spiral.

Now a few words about how I trim. First, I do not test glide, but go flat out from the word go. Nevertheless, as I have written this to help beginners I will assume that you will have to trim-out the model. If you have built in some inaccuracies by rushing the easy part (the building) you will have made the hard part (trimming) even more difficult...

Beginners should choose a calm day; and remember, *effort = results*.

Test glide. There should be 1/64in. 'up' on the right tail panel. At this stage there should be no washin on the inner wing panel. If the model dives, increase 'up' elevator to 1/32in. Still it dives? Move the CG back to 2 1/2in. from LE. If the dive persists, go home and refit the tail at the correct angle. Should the model stall, move the CG forward up to 1 1/2in. from the LE. If this fails to cure it, remove the 'up' elevator or try a bit more left rudder. If this doesn't work, go home and - yes, that's it; refit the tail at the correct angle.

Once the model is gliding correctly with just a bit of left turn we can try our first hand launch. Because of the negative tail incidence we do not have to launch at a steep angle; in fact, you can launch horizontally if you like. You have to remember that the less steep the launch angle, the faster will be the launch (and the greater will be the influence of our warps). The launch pattern can be varied by altering the angle of launch. Before trying your first launch, you might care to read Mike Fantham's piece in the June 1982 *Aeromodeller*.

Our first launch really needs slight right bank; also the fuselage should point up at about 20 degrees. Don't launch so hard that you fail to become consistent.

Now refer to the trimming chart.

One surprise was that when I looked at Lee Hines' 1965 Sweepette feature during the course of writing this article, I noticed that he mentions built-in washout, a 0-1 micrometer for accurate building, thermal seeking is highlighted as the main objective, as is the fact that the highest launches are not essential to win - and I called my article a 'different' approach. I dare not look in any 40-year-old *Aeromodellers*!

One last point. Don't let my insistence on accuracy put you off. Some juniors in the Peterborough club built Butterfly 2s, certainly without the aid of micrometers, and despite the resulting models giving rise to doubts about juniors' eyesight, they all flew. Why not think positively - go and do the same. You can win if you want to!

Launch trim chart for Butterfly 2

Launch pattern	Analysis	Remedy
Model barrel rolls to the left, comes out of transition very fast and spirals in.	Left rudder overpowering forces that produce right bank. More up elevator may be required.	Reduce left rudder. Add 'up' to right tail panel. Check wing for warps. Increase 'up' on right wing tip. Add 1/64in. washin to left inner panel. Give more right bank at launch.
Model barrel rolls to the left and enters a very tight glide circle. Good for catching thermals but dangerous in wind.	Left rudder still overpowering 'right bank'. As no spiral dive, tail incidence is correct.	As above, but an equal amount of 'down' may be needed on the left tail panel to keep longitudinal stability the same.
Model performs a vertical loop.	Left rudder now equals 'right bank' forces.	Reduce left rudder. Add 'down' on left tail panel. Increase 'up' on right wing tip. More right bank in launch.
Model turns and loops to the right but finishes 'nose up' and dives in, usually after just 90 degrees of turn.	Left rolling forces coming in too quickly or too powerfully. All 'right bank' is lost so model tries to loop but runs out of energy. If no recovery, tail has too much lift.	Add more 'up' to right tail panel. Reduce left rudder and add more negative incidence to tailplane.
As above, but model recovers from dive very quickly.	As above. Longitudinal stability is correct.	Reduce left rudder. Increase 'up' on right wing tip. Give more bank at launch.
As above, but model completes a minimum of 180 degrees of turn, i.e. performs a banked loop.	'Left' forces coming in too late or 'right bank' too strong - or not coming off soon enough.	More left rudder. Reduce 'up' on right wing tip. Reduce 'up' on right tail panel. Reduce bank in launch.
Model follows correct launch pattern but turns and rolls too slowly into glide circle at transition.	Trim used is not having enough effect at slow speed.	Try wingtip weight on left tip. Reduce washin on left inner panel. Add a little 'up' elevator to help rudder to 'kick over' at stall.
Model follows correct launch pattern but stalls at end of transition and beginning of glide circle.	Loss of 'circular airflow' as model goes straight before changing to left circle. Read 'Circular Airflow' by Frank Zaic.	As speed will increase after stall, left rudder will come in and model will circle tightly to catch the thermal. Remove stall only if it occurs below thermal height. Stop trimming and start competing!

Glide trim chart

Glide circle	Analysis	Remedy
Model is too stable longitudinally	CG is too far forward	Remove nose weight or increase 'up' elevator
Model drops and stalls	Too much 'up' elevator	Reduce 'up' elevator
Model banks to the right, especially when turning into wind	As model turns into wind the warps that induce a right bank have greater effect.	Reduce washin on left inner wing panel. Reduce washout on right wing tip. Add more left rudder and decrease tail tilt.
Model spirals in very turbulent conditions	Glide circle is being tightened up beyond the model's ability to cope	Try a touch of washin on left inner wing panel, more washout on tip or re-trim model with more 'negative' on tail.

FROM THE HANDLE

CONTROL LINE NEWS

Claus Maikis takes a long look at the Super Tigre 60 — the right choice for your large model?

Subject of scrutiny - the ST60 is a good, honest slogger; and it's light, too. These are important considerations for the stunt flyer.

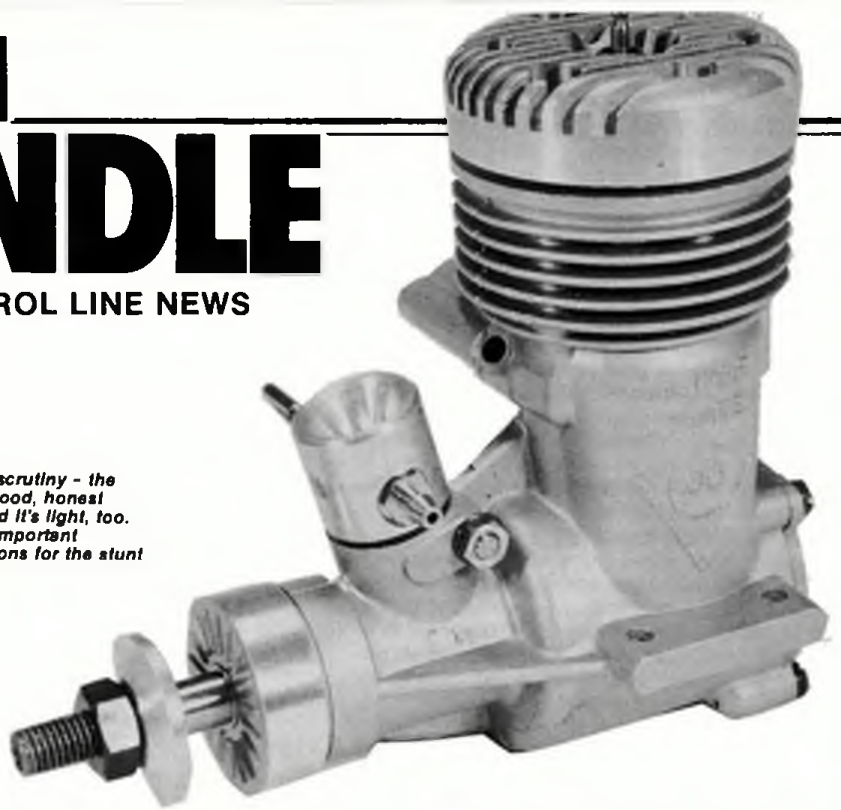
Tigre Rag

Our American friends say: "If something is good, more is better". Maybe that's not exactly the European way of thinking. I feel we are a little more careful with quantity, and more concerned about quality. However, there are always exceptions from the rule, and in this case there's actually a quality gain!

Not being one of the top flyers, it was more out of curiosity that I built my first 60-powered ship back in '76. Big airplanes were showing up at that time with convincing success. Not knowing the quality of the Super Tigre 60 and its suitability for aerobatic flying, I was convinced by its weight (that is - the lack of it) which is considerably lower than that of most engines used then, even those of smaller capacity. My Crescendo (*Aeromodeller* plan CL 1359) was an instant success. Although I used other engines in the following years, I had realised that the big engine had a lot to offer. Years later I learned that the Americans were (again!) ahead of Europe. The results of their last Nationals and Team trials show Super Tigre 60s in most top positions. Seven pilots with a 60 among the first ten places tells the complete story.

While the market offers a lot of engines which are much more powerful, the ST, in my opinion is still the best control line stunt engine currently available. If it is available! Since R/C flyers don't see a reason for buying an engine like the ST (they don't seem to fiddle about with engines so small any more) many importers have dropped it from their line. You might have some problems finding one. Maybe an Italian vacation will make your family happy - and you, too! Nevertheless I feel the endeavour to get an ST is worth it. After all, you won't wear down the engine in a few seasons. And you'll get some advantages you'll rarely find on other makes.

(Here in the UK we are lucky. Mick Wilshere of Tigre Engines can supply - from stock - the ST60 with factory stunt venturi (7mm diameter). Price is £60.96. Just for the record, the ball-race 46 costs £53.95. GC.)



First of all, its weight is unmatched by all its rivals. At 360 grams (complete with stunt venturi) it's several ounces lighter than any other 60. Certainly, it's not the strongest of 60s, but nowhere else could we get so much power at this weight. Another advantage is reliability. When we use smaller engines we have to challenge them a little more, maybe to the point where reliability suffers. You can use the Tigre without ever demanding its full potential and you won't know it, except for the fact that your engine will last forever. An added bonus is its consistency. The less percentage of available performance you use, the less critical the needle setting will be. You have a nice power reserve available should you ever need it. Even if your Tigre doesn't produce all its theoretically available power, you've got enough to fly your airplane. If you can't get by with that power, you should consider another airplane design or check your scales for errors. One of the best features of the Tigre is its running characteristics which are exactly what we stunt flyers want. That four stroke/two stroke change can be produced just how we like it. Some of the Schnuerle motors can give us real pains here. Last but not least, starting the Tigre is a real joy. First flick starts are the norm for a well set-up engine. As my engine is a little over the hill now, I have to flick twice. If more than that is needed, then something is wrong.

Mr. Garofali is well known for changing a design without notice, and more often than we'd prefer. I don't know how many models of the ST60 have been produced. In my possession there are three, and each is different. The later versions all feature the Perry port system which can easily be seen when looking into the exhaust. The Perry ports are the two vertical slots situated near to the piston baffle, two on each side. The Tigre is not available in a control line

Just by way of a change - small is beautiful too. Here we have (top) a Spitfire Mk 14, powered by a PAW 149, and a Mk18 - based version with an OS 25, both the work of Noel Stephenson. The Mk18 is capable of the full FAI schedule. Look for plans in this magazine soon!



Aeromodeller

version, so you have to make your own venturi (not in the UK - see previous note! GC).

I've made mine from nylon and from aluminium. The first ones were too large so I made one with a bore of about 6.5mm. 'About' means that I drill a hole with a 6.5mm drill; then a trumpet shape is turned on a lathe, on the intake side as well as on the bottom end. Finally, a smooth contour is formed using needle files and 500 sandpaper. This means that the final diameter might be a wee bit more than 6.5, but I don't know by how much. This diameter may seem a little small to you. Actually I intend to go to bigger holes in the future. Don't be confused when you read about the dimensions the Americans are using - their venturi bore is around 7 to 7.5mm. At first, I, too, wondered how they can handle that huge hole. The explanation: they use the Super Tigre spray bar. It's thickness is 4mm, thereby reducing the actual open intake from 16.16mm² to 10.46mm². My intake area is at least 10.5mm² because I use a spray bar with a thickness of less than 3.5mm. It's alright to use the Super Tigre needle assembly. The needle is clamped by a nut thus allowing for an infinite adjustment - you don't have to set the needle in step 'from click to click'. Don't say this is unimportant - it can make a difference. For my venturis, I use a needle valve assembly of a Taifun engine no longer produced. I bought all the remaining stock from Graupner because this needle valve has a very fine thread, actually the finest I've ever seen. The needle is held by a ratchet system, but this is very fine, too. Additionally, the spray bar has no machined end, but threads with nuts on both ends. This way, I can easily fix it with the hole right in the middle of the venturi - in any venturi!

There are several ways to mount the venturi. The Americans drill a hole - the size of the spray bar 2 right through the carburettor socket of the crankcase. I don't like this method. I'm afraid some tiny metal chips may find their way into the interior of my engine, and I'm too lazy to disassemble the engine just for the sake of mounting the venturi. My spraybar is mounted through the venturi, just above the socket. Then the venturi is held down with the original clamp screw. So far I haven't found any drawbacks with this system. Of course, the spray bar location is a little higher now (or lower, if the engine is inverted) and I have to set up my tank accordingly. Typically, a tank with a height of 27mm would be mounted 3mm off the engine bearers.

My spray bar is installed with the hole pointed down to the crankshaft opening. I'm aware that this is not the best position as far as atomization is concerned. The highest negative pressure caused by air flowing around a cylinder is shortly after its maximum diameter, say about 80 degrees to the direction of airflow (this has been tested). Because of my kind of starting procedure though (I force fuel through the spray bar into the crankshaft) I have to have the hole in this position (again, you can see that certain requirements can cause you to choose a less than perfect solution). In its original form, my needle has a knurled knob. I remove this and replace it with an angled wire. This way its easier to control, and I can easily see the amount of change of setting. Also, I can check whether the needle was turned unintentionally. Maybe you might want to paint a dial on your fuselage?

I've pointed at the necessity to have a very fine needle thread and 'infinite' adjustment. You'll feel this comfort when trying to tune your engine exactly to the point where it



Above: The ST60 pictured with the 46 for comparison. Below: From every angle, the ST60 looks good. Claus recommends it - and it's easily available...

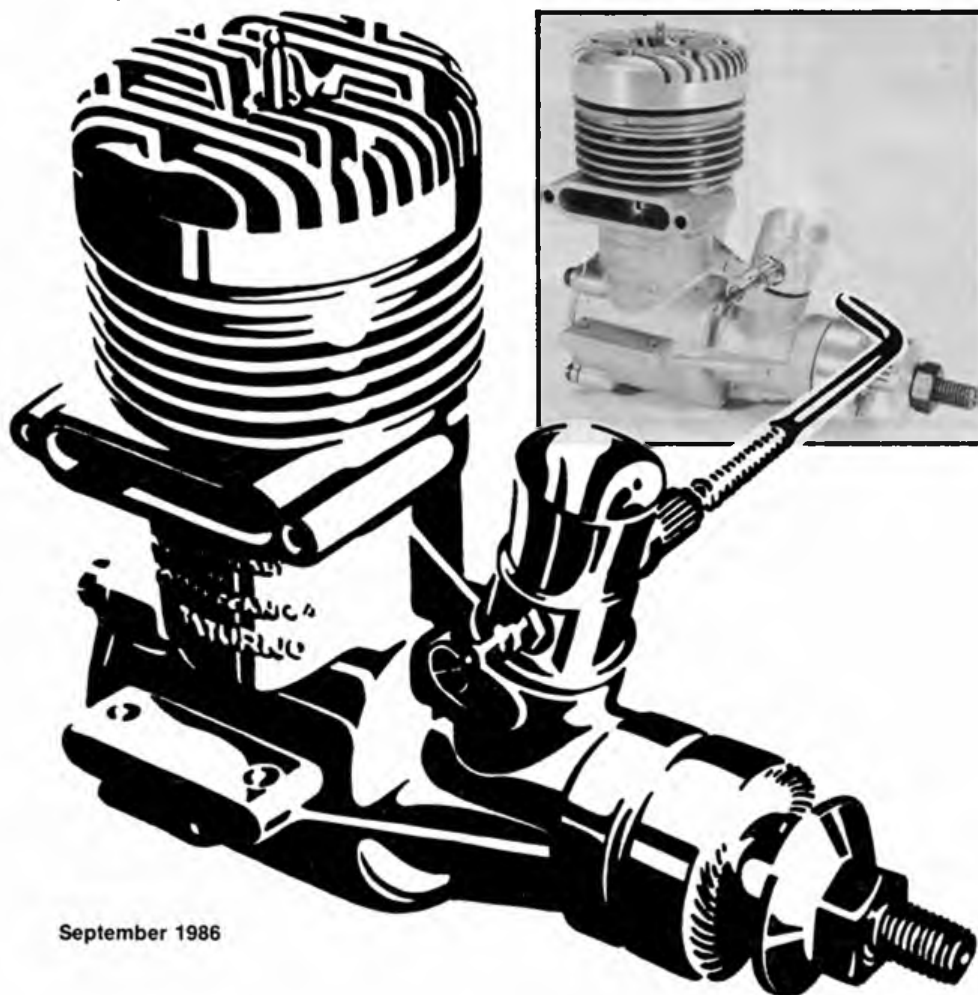
will run as you want it to. That often-quoted four stroke/two stroke break is of course controlled by other means. But on the flying field, it's the needle! A phenomenon which I noticed on my 46 engines years ago now appears on my 60 too. When turning the needle in or out you allegedly control engine speed and fuel consumption, for the two are linked. Sometimes this doesn't work, though. Apparently the moving and oscillating gas masses in certain speed ranges form a stable system. The range is small, but within that range, you can change fuel consumption *without* changing the speed! I haven't made test flights to check exactly this, but I've experienced flights where I turned in the needle to increase airplane speed and got an increase in flight time instead! If you're able to get this under control, you may have a nice opportunity to compensate for changes of weather which influence your flight times.

Other considerations

It's not possible to say much about tank size. So far I've used a volume of almost 180cm, but much depends on the preferred fuel. Until now I haven't used more than 5% nitro. In the future I intend to increase nitro content, so I expect to have to build a bigger tank. Of course, venturi diameter, prop and silencer are determining factors of fuel consumption, too. I just try to keep the venturi diameter as small as possible for optimum suction. Propeller choice is still wide open. I intend to change from my present three blade 12 x 5 to a 13 x 5 two or three blader, which should make my Tigre even more thirsty!

Forget about the original muffler. You wouldn't want your airplane to carry around a superfluous ton of metal, would you? Do whatever you can to obtain anything lighter. I don't like the Bob Hunt type muffler which the Americans use but they seem to get on with it. Obviously the Tigre doesn't mind this little heat builder. There are several sources of this muffler in the States.

I'm quite aware that it's not necessary to fly a 60 airplane in order to be competitive. With a model built properly and light, you can get by with less engine capacity. After all, it's not the materials - it's the man who flies good or bad. On the other hand, if you are like me and have a never ending fight with the scales and the engine performance, the ST60 is a pleasant sedative - if not a life insurance.



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TRY A GLIDING HOLIDAY
Residential clubhouse, bar, professional instructor, launches by aerotow or winch. Three two-seaters and Falke motor glider available.

Write to: Holiday Manager, Dept AM, Bristol & Glos. Gliding Club, Nymptonfield, Stonehouse, Glos. GL10 3TX. Tel: (0453) 860342

GLIDING

GLIDING HOLIDAYS

SLOPE SOARING - TRY YOURSELF!
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Apply
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Tel: 0742 301831 (7pm-10pm)

TRY IT FOR REAL

Take your holiday gliding course with the **YORKSHIRE GLIDING CLUB** Fully residential Clubhouse with licensed bar, full time professional instructors. Three top: Winch, Glasshby K21 two-seaters Falke motor glider. Hill, thermal and wave soaring. Courses April to October. For details contact
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Why not build a full size aeroplane? Join the Popular Amateur Aircraft industry with the **Popular Flying Association** and learn how to build your own flying machine. Send 75p for information pack.
POPULAR FLYING ASSOCIATION
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Name

Address

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Signature.....Date

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The Mail order Specialists

WHERE QUALITY DOESN'T COST - IT PAYS

Our range of basic building materials includes:-
 Modelspan type coloured tissue in both L/W &
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 white Modelspan L/W & H/W. Solartex & Piano
 Wire - 3mm Lite Ply - Adhesives.

All of these items can be found in our 1986 price
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 and birch plywood. Birch dowel - Beech Engine
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Now available Jelutong for prop blocks. Prices
 on request.

Your One-Stop Shopping Service
 Please send SAE for Price List to:

THE Balsa Cabin

Unit 5, Mill Lane, Fullbridge,
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 Tel: (0621) 59711



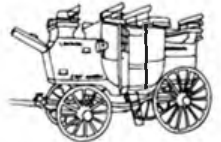
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KK Conquest.....	£3.78	Futaba Challenger 4 ..	£113
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PAW 29	£32.00	KK Ladybird	£10.40
PAW 1.49 Glow	£18.49		
PAW 1.49 R/C Glow	£24.00		
ED Racer	£15.00		
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 18 Fountain Street
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Many more Aero and Marine. New
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 P.O. for lists. Duty free - Export
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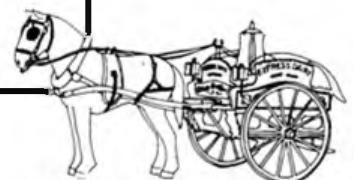
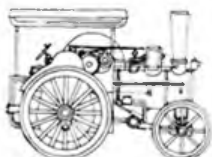
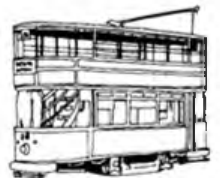


**EXHIBIT YOUR MODEL -
 INSPIRE OTHERS**

**The result of all your hard work,
 patience and skill deserves to be
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 admiration and inspire enthusiasm in
 others, and where better than at the
 world - renowned**

MODEL ENGINEER EXHIBITION
**to be held at the Wembley Conference
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 Tel: 0442 41221





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Armstrong Whitworth Siskin
First all-metal RAF fighter.
22 1/2 in model for 1.5cc engines
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Douglas A26 Invader
Straightforward twin for
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Tough!!
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	From £1.40 to £5.50	55p
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Please supply the following plans.

Plan No.	Title	Price
Plan No.	Title	Price
Plan No.	Title	Price

Please debit my Access Barclaycard A/C No.

Cash total Name (Block Caps)

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CLOSED WEDNESDAY ALL DAY.

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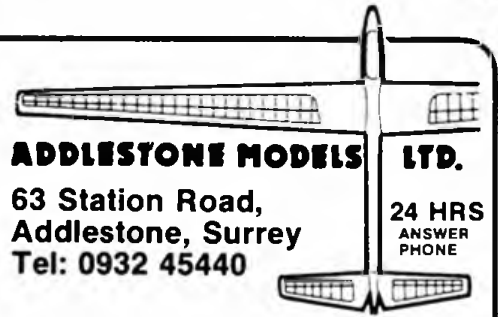
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	Radios + kits over £15	2.50
	Other items	.75



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Staggerwing Biplane 22"	8.90
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Bi-matic Series - complete kits.	
Foam Fuselage, Wing & Tail parts.	
superb flyers with remarkable Bi-matic Gearbox 2:1 ratio and unique free wheeling action.	
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Designed for Telco Turbo Tank 3000	
CO₂ AIRCRAFT KITS - STANDARD	
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Standard	13.95
3000	16.95
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(To order only on above 2 - approx. 2 week del.)	
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80 STD	16.68
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2.49 Contest 3	21.85
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35 R/C + Silencer	43.70

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Raw 149	21.28
249	22.43
149 R C A C	27.60
249 R C A C	29.90
COX	
Pee Wee 020	19.95
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Super Chipmunk	12.99
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Aero Star	11.49
Try I	11.49
Piper J3 Yellow Cub	14.99
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BEN BUCKLE	
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KEIL KRAFT	
BALSA WOOD KITS GLIDERS	
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APPENDIX - Links to the plans

The original issue comes with two free plans (Butterfly, Iota) printed front/back on a pull out banner of four sheets. The banner is not included in this document.

Laser by Claus Maikis

CL Stunter

No full size plan for free download found

[Document Page: 6](#)

Butterfly by Mick Page

FF Chuck Glider

[https://outerzone.co.uk/plan_details.asp?ID=10527 ...](https://outerzone.co.uk/plan_details.asp?ID=10527...)

[Document Page: 25](#)

Iota by Bryan Miller

RC Glider/Soarer

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Semi-scale control line stunter plan