MODEL MAGAZINE MAY 1988 £1.95

AERO MODELLER

LYMPNE-SCALE '88
Our new competition for the scale model flyer

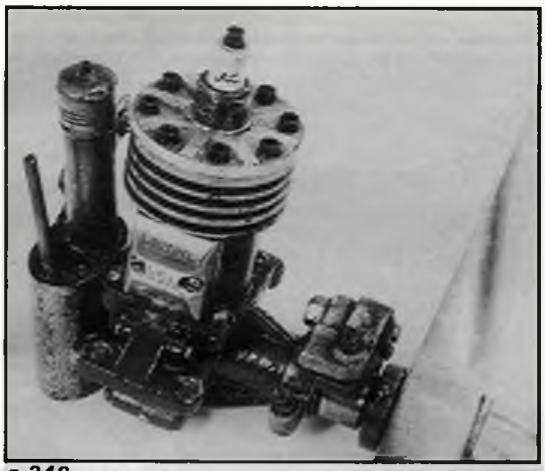
WHAT'S ON AT OLD WARDEN
Come to our super flying days this season!

DH53, XP-67, WITTMAN BONZO
Full-size plans for CO_2 and rubber scale

ARGUS SPECIALIST PUBLICATIONS

MAY 1988
Volume 53
Issue 628

AERO MODELLER



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Editor — Geoff Clarke
Group Editor — Alec Gee
Editorial Director — Ron Moulton
Art Editor — Ron Cunnington
Advertisement Manager — Paul Kavanagh

Cover:
True Vintage! At our last Vintage Weekend Ron Hill celebrated his 80th birthday by displaying this magnificent R/C Fillon's Champ, later flown to show-stopping effect by his friend and colleague Rod Holmes. News of our forthcoming Old Warden meetings starts on p.238.

ARGUS PRESS GROUP

P.O. Box 35, Wolsey House, Wolsey Road, Hemel Hempstead, Herts HP2 4SS

ABC

ISSN 0001-9232

Advertisement Offices: Argus Specialist Publications Ltd., Golden Square London W1R 3AB. Tel: 01-437-0626.

Postmaster: Send address changes to Argus Specialist Publications Ltd., P.O. Box 35, Wolsey House, Hemel Hempstead Herts HP24SS England.

Subscriptions: Direct subscription rate including Index: Home £22.20 Europe £27.00 Middle East £27.20 Far East £29.99 Rest of the World £27.20 or US $41.00 Airmail rates upon application from Infonet Ltd., 5 Riverpark Estate, Berkhamsted, Herts HP4 1HL. Tel: (04427) 76661/4.

Overseas Availability: Second class postage paid at Rahway N.J. USA. Postmaster send address corrections to Aeromodeller, c/o Mercury Airfreight International Ltd Inc, 10B Englehard Ave, Avenel, NJ 07001. Distribution to news stand sales by Eastern News Distributors Inc, 1130 Cleveland Road, Sandusky Ohio 44870. Distribution to North American hobby and craft stores, museums and bookshops by Bill Dean Books Ltd., 166-41 Powells Cove Blvd. Post Office Box 69 Whitestone NY 11357 USA Tel: 1(212) 767-6632. USA Subscription agent Joseph D Daileda, Wise Owl Worldwide Publications, 4314 West 238th Street, Torrance CA 90505.

HANGAR DOORS

Above: Peter Spalding sent us this 1949 pic of himself and a 72in 'stretched' Lulu after seeing our Super Lulu Plans Service offering. Nothing new under the sun! Left: Fancy C/L in Czechoslovakia? We can supply details.

No cover-up

With effect from this issue the cover price of Aeromodeller has been increased by ten pence to absorb rising costs, particularly for paper and printing. This is the first increase for over three years – and it amounts to less than the over-the-counter price of an extra strip of one-quarter-square. Your magazine is still no more expensive than a bottle of Modellers' Glue – or even the postage on an average-size mail order kit.

In an ideal world prices would be kept constant, or even reduced. Regrettably this is not so; but publishing economics are simple. Greater advertising revenue could hold increases at bay, but it is clearly the wish of Aeromodeller readers that the magazine maintains its unique status as the specialist magazine for largely non-R/C coverage, and thus sidestepping precisely where most advertising is generated. A look through our sister publications will show exactly where advertising revenue lies... but rest assured that we aim to bring you even better value for money in the coming year, with wider reporting and yet more plans!

Can you beat this?

Here we initiate a competition for 'furthest-travelled journey for subscription.' Don Knight tells us that he recently received a letter stuffed with dollars from Ken Sykora in the States. A friend of his, Ichiro Yamada from Osaka in Japan, had asked him to arrange an Aeromodeller subscription. Thus Ken writes to Don, who phones Infonet, our subs agent, just up the road at Berkhamsted. Total communication: Japan-USA-UK-Japan. As Don puts it, 'just about a circumnavigation!'.

From Ken Sykora comes another story we couldn't resist. Out in California he runs Old Timer Model Supplies, with a catalogue of plans, wheels, wire and so on, and, of course, balsa. Usually he can guess what his customers are up to – with one exception. One elderly gentleman orders nothing but several hundred strips of 1/16in.sq. every couple of months. By now he has got through thousands of feet of it. Never a plan or anything else. Ken has had sleepless nights trying to figure it out but is far too polite to ask...

Nats notes

Details of the 1988 SMAE F/F Nationals appear elsewhere in this issue. One important detail is that, contrary to first expectation, the FAI competitions will not carry World Cup status. Apparently several other countries made application at the same time as the SMAE so the FAI decided that to avoid an excess of events the fairest thing would be to postpone all applications.

There is now plenty of time to make representation for Open International status at the '89 Nats. We hope this goes through; it will be a welcome, logical move which will enhance our National Championship in the eyes of World Aeromodelling.

MEZINÁRODNÍ SOUTĚŽ UPOUTANÝCH MODELŮ LETADEL

SVAZARM

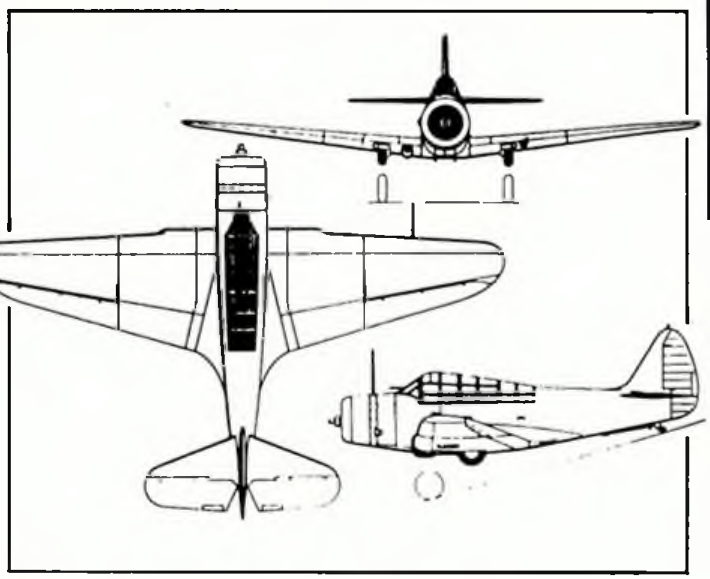
THE INTERNATIONAL CONTROL LINE MODELS CONTEST

FAI

HRADEC KRÁLOVÉ 6.-8.5.1988

A quick tour round the Earls Court Toy Fair revealed Dave 'DPR' Rawlins with his slot-together gliders as well as Estes model rockets from C.P. Associates and a full KK range from Amerang.

Want to help restore a TBD? The Coral Sea Association mean to locate and refit a Devastator in time for the 50th anniversary of the 1942 Coral Sea Battle. Let us know...



Model rocketry diary dates

Want to see model rockets in action? Time to tell you of events where smoke, flame and whoosh will be part of the entertainment. First up is the Brighton Kite Festival on 21-22nd May. Venue is Waterhall Playing Fields,

Patcham, Sussex. Some camping space is available. Contact Gregor Locke on 0273 64285 (evenings). Then on 9-10th July model rockets will take the air at Modelex, RAF Cosford, West Midlands. More on this later.

Stop press news is that we are hoping to arrange a rocketry demo at the F/F Nationals. Details next month; but we confirm that Saturday evening is the aim. Trade support is expected to augment displays by the British Space Modelling Association, including representatives of past UK Teams abroad. Come and watch the fun!

Quickstart - Chart their progress

Latest news from the Isle of Man is that model shop distribution of the Quickstart range of diesel and glow engines is to be handled by Chart-Micromold. No doubt even more of those colourful boxes will soon be appearing on model shop shelves - and thence into aircraft! Modifications to the jet assembly of the Wasp and Bee 0.8cc glows has resulted in greater power output; we report on this soon in a future Motor Mart.

Another Toy Fair offering from Amerang - the Cox Airwolf F/F chopper. Looks interesting - tests to follow..

Go for the draw!

The FAI have announced their 1988 Young Artists' Drawing Contest. Chosen subject is 'Search and Rescue Aviation' and age groups are from 5 to 8 years, 9 to 12 and 13 to 16. Gold, silver and bronze medals in each group will be awarded at the FAI General Conference in Sydney. Most important is that A3 format only is acceptable; we can supply further information here at Aeromodeller, or contact Barry Rolfe, Royal Aero Club, Kimberley House, Vaughan Way. Leicester LE1 4SE. Come on youngsters - how about a Walrus chopping through the waves, or a bright yellow Whirlwind on station near the rocks? Brrr!

Come to Old Warden!

Elsewhere in this issue will be found a resume of our 1988 model flying meetings at the home of the Shuttleworth Collection. A new airfield layout will be noted. R/C activities will be located to the right of their usual position and will be clearly segregated to allow F/F enthusiasts greater use of the 'east-west' runway area.

There is one point to stress. Use of the airfield for model flying at our meetings is effectively free. Admission at the gate is the standard Collection charge and all of the proceeds pass directly to Shuttleworth.

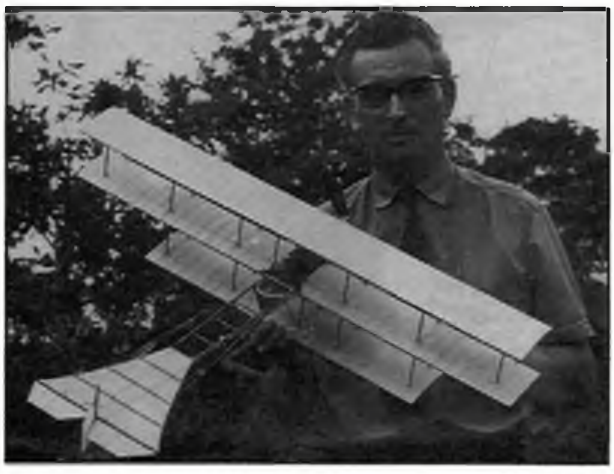
In order to give F/F focus to Golden Era Day on 10th July we announce Lympne-Scale '88, a scale competition with a difference. Read all about it further on!

Good weather ahead, we're sure. See you at Old Warden!

Whizzing Watford

Eclipsing all at the latest, most enjoyable and well-attended SAMS Indoor Fun-Fly on 6th March (full report next month) were the spirited demonstrations of Robin James' semi-scale Tiger Moth, equipped with four-function R/C gear, strip ailerons and all! Three gasp-inducing flights culminated in a fine loop - the first ever, indoors in this country? Robin's fine effort (a neat postscript to his tales of experiment in this and the April issue of Aeromodeller) deserves applause from all.

And we're certain it won't end there...



Ray Booth - a tribute from Reg Boor

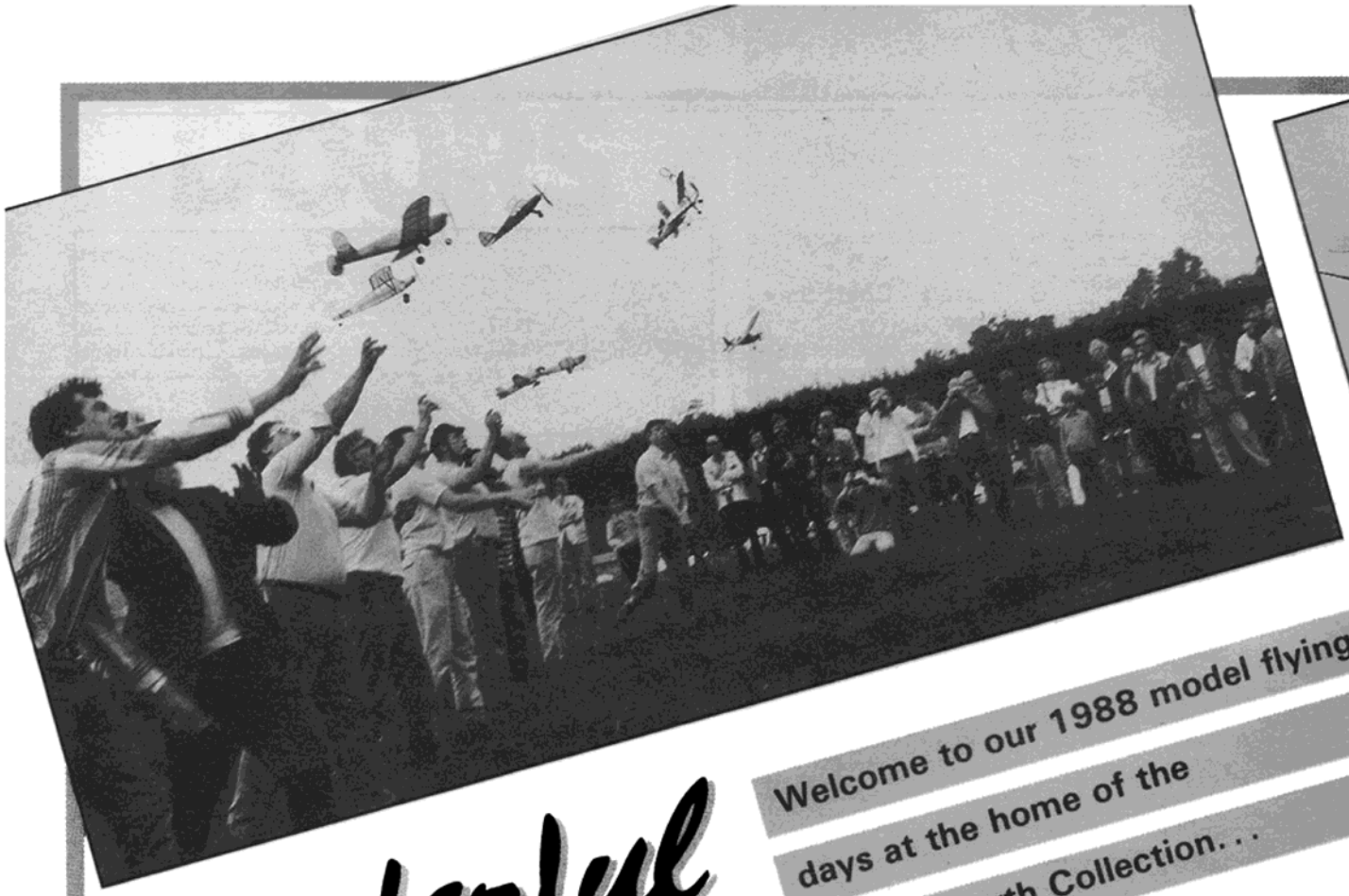
A well-known and greatly respected Manchester modeller is no longer with us. Ray Booth died unexpectedly on 26th January. He was a scale modeller and designer in both his hobby and profession, for he was lead designer of models for the wind tunnel at the Woodford site of what is now British Aerospace, but which was Avro's when he started; a position from which he retired four years ago.

As a modeller he will be particularly remembered for his two Plans Service models of Avro aircraft, a 504 K and an Avian. Local enthusiasts will recall his large Jetex powered Avro Vulcan. Also Jetex were his many scale designs for Skyleada kits.

He held an outstanding reputation in the USA for his highly detailed static scale models; an example of his work is on show in the Smithsonian Institute.

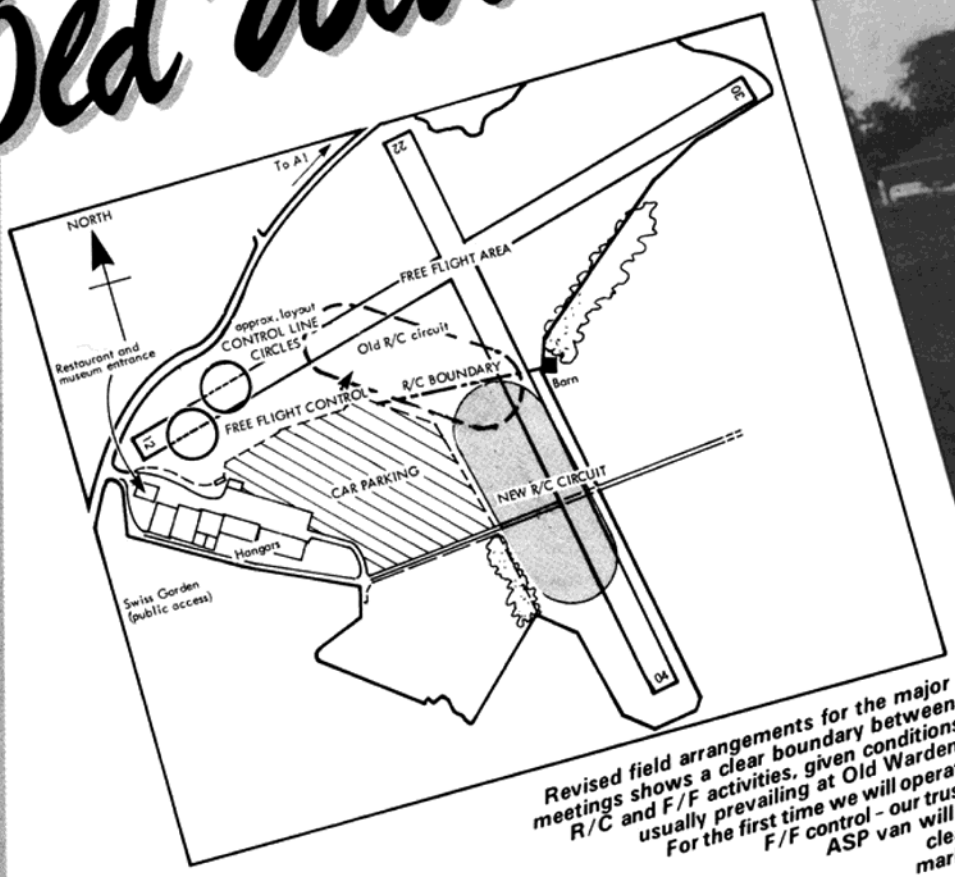
It was a privilege to have been his friend, colleague and fellow modeller. Condolences to his wife Sontine, daughter, son-in-law and grandchildren.

Ray Booth in 1966 with his fine, non flying 1/12th Roe IV Triplane which was subsequently sold to Goeffrey Verdon-Roe, son of A.V.



Wonderful Old Warden

Welcome to our 1988 model flying days at the home of the Shuttleworth Collection...



Revised field arrangements for the major meetings shows a clear boundary between R/C and F/F activities, given conditions usually prevailing at Old Warden. For the first time we will operate F/F control – our trusty ASP van will be clearly marked!

15th May **LARGE MODEL DAY**
– exclusively for those spectacular R/C giants.

18-19th June **SCALE WEEKEND**
Fun flying, informal 'best model' awards, Shuttleworth Trophy for best 'Old Warden' subjects, Jack Carter Memorial Trophy for best C/L Scale Model, P.E. Norman Trophy for best 'Spirit of P.E.' F/F power model, Fred Longbon Trophy for best APS model, Masefield Trophy for Vintage Rubber Scale.

10th July **GOLDEN ERA DAY**
Scale and vintage with emphasis on the flavour of the '20s and '30s. Period dress welcome! Lympne-Scale 88 F/F contest (details elsewhere in this issue).

20-21st August **VINTAGE WEEKEND**
The annual pilgrimage for all Old Time enthusiasts. Informal best model awards and a host of SAM 35 competitors.

18th Sept **FOUR-STROKE DAY**
Relaxed low-noise flying for R/C and C/L.

Mass launches, vintage petrol, swish racers, charming small-field R/C and scale models of all sizes and types – just a selection of the variety to be seen at our eagerly-awaited Old Warden spectaculars. More than ever on offer this year!

Bring your friends, take a picnic and enjoy all the attractions of this timeless site. Don't miss the opportunity to visit the Collection itself. . .

THE model was first flown in Cardington on a warm day in 1985. It turned in flight times of three minutes plus. However, on the next outing I discovered that on anything other than a very warm day it would not climb. CO_2 motors are very temperature dependent! I therefore substituted a Modella for the Telco, giving roughly twice the available power. This increased the weight to 4.1/2 ounces and restored the climb rate.

In flight the model does not look fast; rather it floats gently round. Control and manoeuvrability were very good. A very tight turn can be held, although roll rate is quite gentle because of the low flying speed. I have also flown the model in smaller halls at indoor meetings such as at Watford, Lee-on-Solent, and also at the Wembley Conference Centre on the occasion of the Model Engineer Exhibition. Indoor flying in a sports hall demands a completely different technique to outdoor flying. Every manoeuvre has to be planned in advance, and it is not possible to fly in a straight line and relax.

Modifications

After a couple of 'incidents' in which the battery went flat during flight, I decided to recharge for every flight. If more than three of four flights are required, it is a simple matter to change the battery.

There were still further weaknesses with this model. One was that the wing had insufficient torsional stiffness, and the other was the difficulty of getting the power setting just right. At normal flying speed or a little above everything is fine, but if the speed is allowed to build up, both tips begin to wash-out, causing a loss of lift and a dive, resulting in a classic 'tuck under'. Consequently, it is not possible even to attempt a loop with this wing.

This problem was partly overcome by adding diagonal reinforcing strips top and bottom to the first three bays of the wing. The strips were at first of glass fibre, which resists tension very well but not compression, and then paper, which I hoped would help resist compression. These modifications did result in a useful increase in maximum flying speed, but it is still not safe to dive the model.

The flexibility of the wing, which makes it so robust, is a disadvantage in this situation. The torsional stiffness of the wing could be further improved by either a larger box-section spar built of balsa, or by tissue covering the wing. It would probably be sufficient to cover only the front part of the wing.

I have not tried either of these solutions, partly because they involve extra weight. Tissue covering the wing would also make it more fragile.

More on motors

With a flight time of around two or three minutes, I found it was important to get the power setting just right. Too little power, and the model did not climb. With the power setting slightly too high, the model reached the ceiling in about a minute, and I found I was having to push the stick forward to avoid hitting the ceiling. The increase in speed when the model was forced into level flight was quite surprising, and I had to carry out violent manoeuvres (that is, very sharp turns) to burn off speed, otherwise the wing twisting problem already mentioned took over.

This problem of highly critical power setting has been noticed on other CO_2 models which have a flight time of 45 seconds or more.

something had to be done. Eventually I discovered that 50 mAh cells are available from Technicad. I have replaced the original battery with these. A pack of four cells weighs 16 grams, and will safely run a flight pack with two servos for 30 minutes, or three servos for 20 minutes. With this battery it is no longer necessary

Robin James concludes his account of Indoor R/C experiments by looking at motors - and the way ahead

Turn To Port - And Mind Th

It is partly due to the fact that the power of a CO_2 motor is very dependent upon temperature. The lower the temperature, the lower the pressure of CO_2 gas above the liquid, and so the lower the pressure of CO_2 gas above the liquid, and so the lower the pressure available.

On a normal engine, the CO_2 tank usually starts off at or around room temperature. When the engine is started CO_2 begins to boil off from the tank and the temperature falls. How far the tank temperature falls depends upon the power setting and how well the tank is ventilated. The higher the power setting, the faster the temperature falls. If there is sufficient air flow over the tank it will eventually reach an equilibrium temperature where the cooling effect of the CO_2 boiling off is balanced by the warming effect of the air circulation. If there is no ventilation, the temperature of the tank falls lower and lower, and on a cold day the engine may even stop.

The situation is further complicated by changes in air temperature. Warm air rises, so the temperature at the top of any room is always higher than at floor level. This effect is more pronounced in a large hall. Thus as the model climbs it is flying into warmer air, and the temperature of the tank may actually increase, giving more power.

I have formed the impression that when the heating is switched off at an indoor meeting the temperature difference between floor and ceiling increases during the day. This is quite possible since any cold air entering the hall will accumulate at floor level. Of course this has the effect of making the power setting even more critical.

One way round this problem would be to restrict the ventilation of the tank (or even insulate it) so that the tank temperature will decrease, giving the desired fall-off in power. Another possibility for free flight scale or sport models is to fit a larger tank, or multiple tanks, and fly on gas charges only. As there is no boiling of liquid CO_2 the problem would be almost eliminated. The temperature of the tank should be further stabilised by the larger mass and surface area of the tank. The variation of power through the flight is therefore reduced. Gas charges also give more consistent flights than liquid charges.

Longer flights

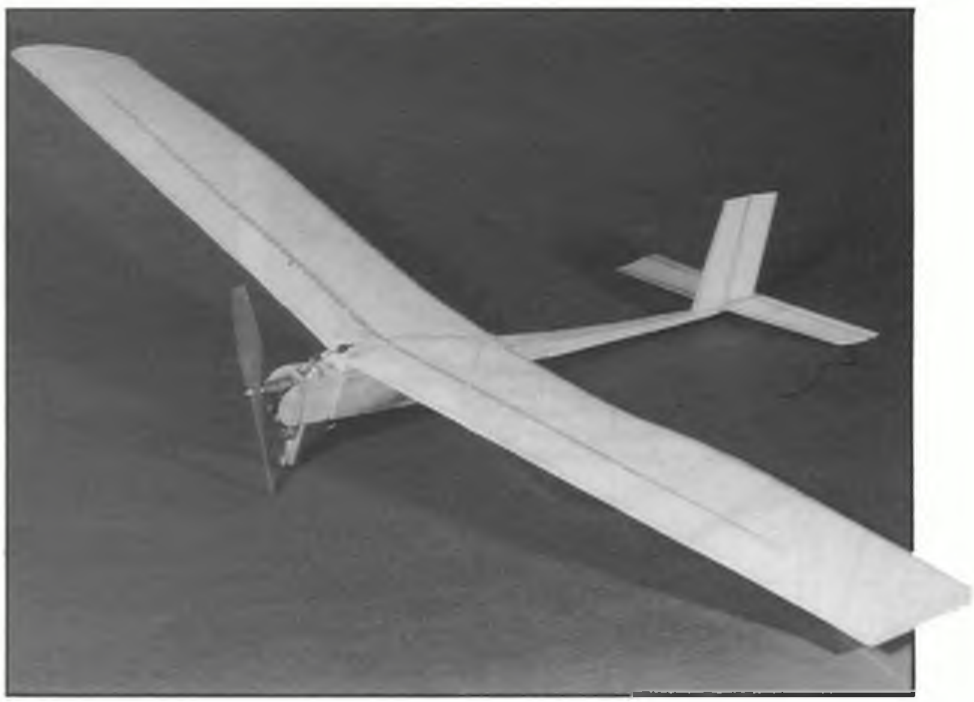
The original 10cc tank was changed to a 20cc tank to increase the flight time. The first tank had been enclosed within the fuselage and was ventilated by a forward-facing inlet at the top and a rearward-facing exit at the bottom. The 20cc tank, being longer, would not fit inside and was allowed to protrude from the bottom of the fuselage in free air. The improved air circulation was found to reduce very significantly the amount of ice forming on the tank after every flight. With the new tank there was sometimes no ice at all when the model landed. Of course, the longer flight time made the throttle setting even more critical.

The third channel

The obvious next step was to fit a throttle. The questions to be answered were: would the model carry the extra weight, and now do you throttle a CO_2 motor in flight by radio control? Structurally the model was quite capable of carrying an extra half-ounce-plus on top of the 4.3/4 ounces it then weighed with the larger tank. Climb rate would be reduced, of course, but it was felt that there would still be enough power to climb with the extra payload.

The final problem to be addressed was how to control the motor speed. Throttling the CO_2 supply with a needle valve should work, but there are practical problems since suitable needle valves are not available ready-made. A more straightforward solution is to adapt the manufacturer's method of controlling the power. On the Modella this is done by turning the whole cylinder in the crankcase so that it moves by a small amount into or out of the crankcase, thus controlling the valve opening.

A thin piano wire arm was held onto the cylinder with a loop tightened by a small elastic band. The arm was connected to a servo by a pushrod. This throttle arrangement works well, giving a range of 1900 to 2900rpm. The ratio of maximum power to minimum power is 3.5 to 1.



Diagonal glass-fibre and paper reinforcing strips help stiffen the wing on Robin's well-flown model. Trailing edge is reinforced with sellotape!

Flying with three channels

Having flown with two and three channels I have come to the conclusion that the third channel for throttle control is very desirable, if not essential, for indoor flying. Certainly for a slow flying model with a limited speed range it is essential.

It is now possible to launch with plenty of power and climb out, then throttle back when a safe altitude is reached. This is much more satisfactory than launching with just enough power for a marginal climb. In the latter case, stalling and sharp turns must be avoided as they both involve losing height while flying near the ground; highly undesirable. It is now possible to throttle back and come in for a low flypast, then open the throttle and climb out again. There is a small increase in weight and flying speed because of the extra servo (10% in weight and 5% in speed) but it is quite acceptable, and is a small price to pay for the extra control available.

More speed

I decided to gain experience of flying faster by building a smaller wing for the existing model. This wing is 36in. span instead of 42in. and with the same aspect ratio the area is 1.1/2sq.ft. instead of 2sq.ft. It has a flat bottomed section in place of the original undercambered section. See photograph.

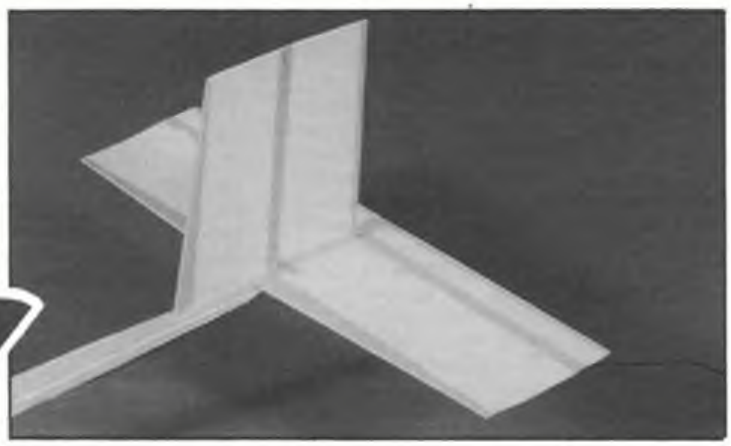
The structure is also different, being solid white polystyrene foam with the same spar structure as before, all covered in 'early bird' tissue. The weight came out at 40gm, of which 24gm is the foam, 8gm is the tissue covering, and 2.1/2gm is the balsa spars. Interestingly, the weight of tissue was 4gm so the other 4gm must have been accounted for by the flour-and-water paste adhesive; the Tamiya paint added only one or two grams.

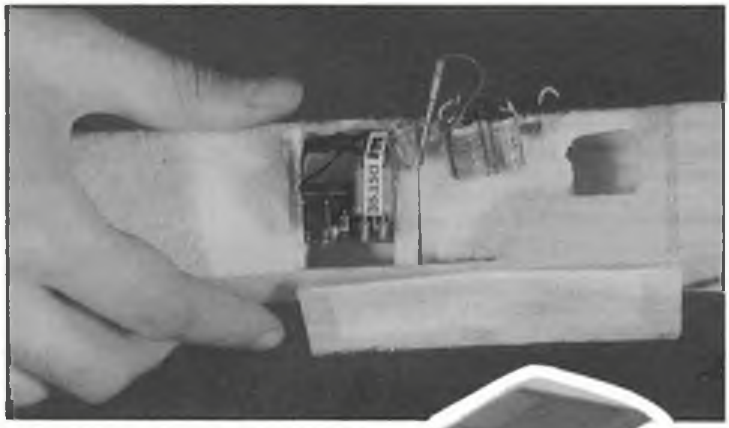
This structure was designed as an experimental basis for possible future scale models. Painted tissue gives a good simulation of a plywood covered aeroplane. However, the white foam makes up 60% of the weight, and some avoirdupois could probably be saved by changing to a built-up structure covered in 2mm foam. Also, surprisingly, the weight added by the tissue covering is twice the weight of the tissue, as already explained. The extra weight must be the adhesive applied to the foam. Much of this seemed to go into the foam. Probably some weight could be saved by applying the paste to the tissue instead of the foam itself.

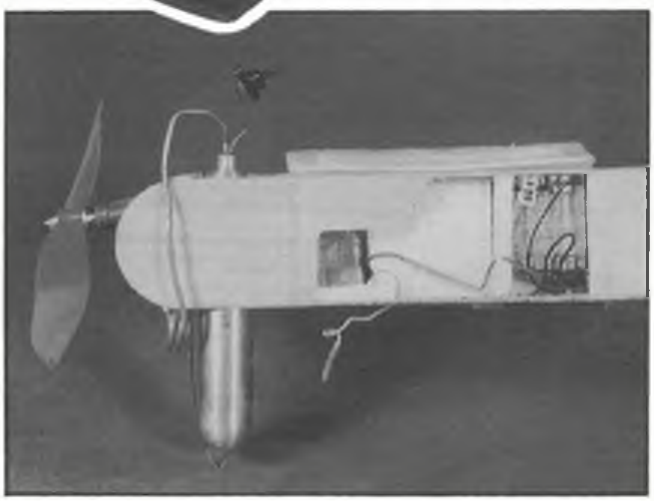
Certainly the subjective impression is of a much faster aeroplane, giving one less time to think and making the hall seem

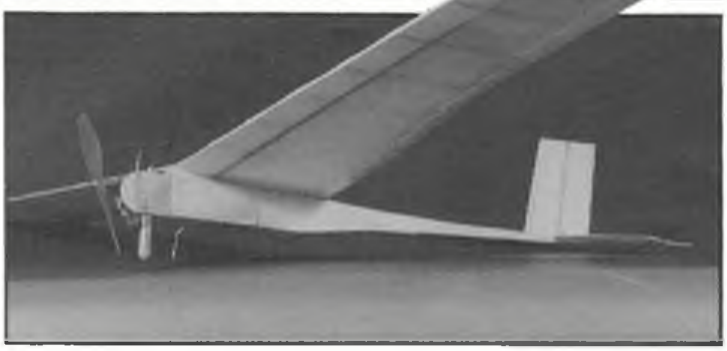
he Lights...

Anti-clockwise, from below: Smaller, stiffer wing gives faster flight - useful preparation for future projects... Tiny Fleet receiver and battery pack in situ; the complete model in standard form (note twist in fuselage boom!); shown inverted for a better view, receiver and flight pack are removed from their housings - switch is a simple single-pin connector; foam tail unit is strategically reinforced with balsa.

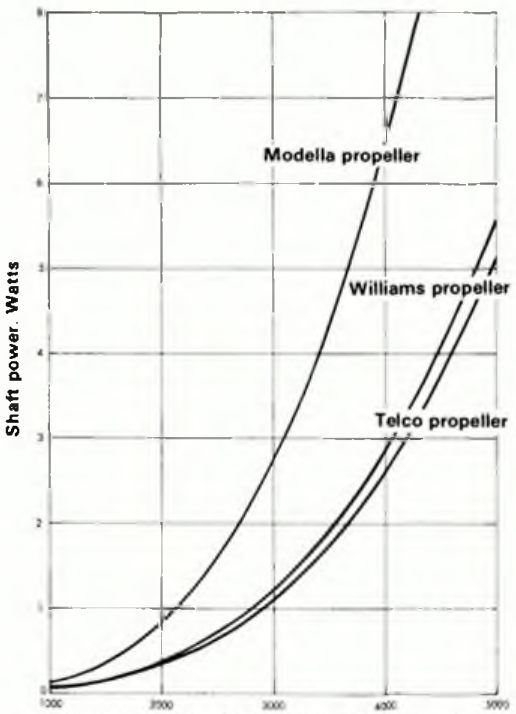








Useful graph, below, enables power available to be deduced from revs turned with quoted props. F/F and R/C enthusiasts alike can monitor their CO_2 and electric set-ups to best advantage...



Shaft power VS RPM: Common CO_2 propellers

smaller! The stalling speed seems to be very much higher; the wing would probably benefit from a turbulator. At the time of writing this wing has not been fully test flown. It should be capable of loops. Surprising how much courage is needed to attempt this manoeuvre when flying in a small space!

Propeller revs

I have measured torque against RPM for three common propellers, enabling power versus RPM to be calculated. See graph. From this, anyone with a tachometer can find out how much power he is using to fly his model, provided he is using one of the quoted propellers. The graph applies equally to electric and CO_2 motors. It is also possible to calculate quite simply the efficiencies of small electric motors by measuring the input power and obtaining the output power from the graph.

Where next?

The technology for making indoor radio controlled scale models exists. It only remains for someone to do it! The most suitable subjects are light aircraft up to about the nineteen-thirties. It should also be possible to fly faster models such as World War II aircraft in a larger space such as Csardington. My experience suggests that wing loading need to be around two or three ounces/sq.ft. for the slower models, or perhaps four to six ounces/sq.ft. for the faster ones.

As for motors, one Modella will fly an efficient model of about five ounces. If more power is needed, why not use two Modellas or four Telcos, or the Denton motor from the USA? Unfortunately, the excellent American Brown Twin CO_2 is no longer in production.

Using electric motors, the all-up-weight will be higher. I estimate that a one-ounce motor and two or three ounces of batteries will be needed for an eight-ounce model. The British-made electric unit available from Knight and Pridham Ltd is much more powerful than a Telco but probably not man enough for a radio controlled model - larger batteries will be needed than for free flight in order to extend the flight time. They would be ideal for a twin, though...

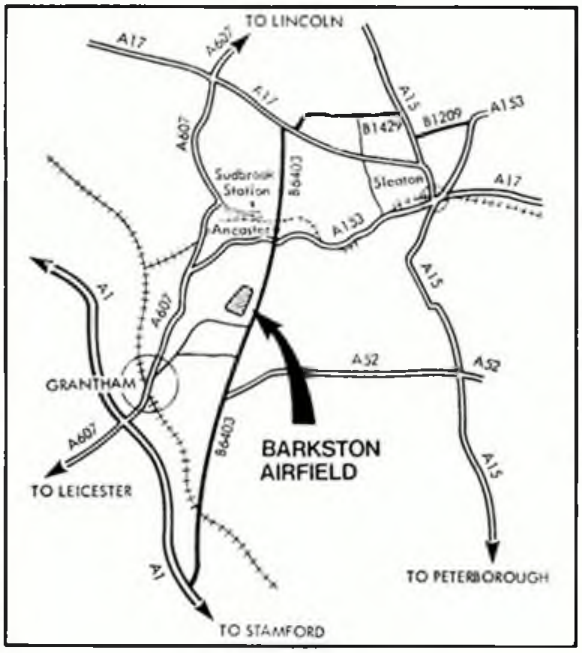
The American company VL Products manufacturers two motors in this range, the HY70 at 0.75 ounces approx. and the HY42 at 1.75 ounces. They are available by credit card at $4.20 and $13.25 respectively (plus postage, VAT and duty) from Penn Valley Hobby Center, 837 W. Main Street, Lansdale, PA 19446, USA.

Lastly, I must stress that I strongly recommend the use of a third channel for throttle when flying in low-ceiling halls. Two channels would probably be adequate in Cardington.

Come on - try it!

Come to the...

1988 SMAE FREE-FLIGHT NATIONALS



Far left: Tony Hall launches his Frog 500 powered San de Hogan in last year's Vintage flyoff. Centre and below: How to get there! Above: Ivan Taylor gets ready for the 1987 Open Rubber flyoff.

ALL ROADS lead to RAF Barkston Heath on the holiday weekend of 28-30 May - the occasion of the 1988 SMAE Free Flight Nationals. Events are confirmed as follows:

Saturday 28th May: Mini Day 10am-6pm. A/1 Glider, Coupe d'Hiver, 1/2A Power, CO_2 Duration and HLG (Chuck Glider, if you like!).

Sunday, 29th May: Open Day, 10am-6pm. Open Glider, Open Rubber and Open Power, plus the Frog Junior, Women's Cup and Vintage Events, with the 'unofficial' Junior Kit Competition too.

Monday, 30th May: FAI Day, 6am start. F1A (Glider), F1B (Wakefield Rubber) and F1C (Power), plus Tailless and Slow Open Power - the last two events beginning at 10am.

Note that Tailless and SOP have switched from the usual Sunday to Bank Holiday Monday this year. And come on, you Tailless enthusiasts - don't forget the variety of awards to augment the Lady Shelley Cup. There is the prize for 'Highest Original' model; that is, the highest score made with a model of a different class from the winner. Then, for the first time ever, there will be an award for the highest placed Power model and - also new this year - for the highest-placed Vintage tailless model. Cut-off date for 'Vintage' here is pre-1958; models to have been published or in existence then. As John says, this lets in the Penumbra, and other interesting craft from our fondly-remembered Aeromodeller Annuals.

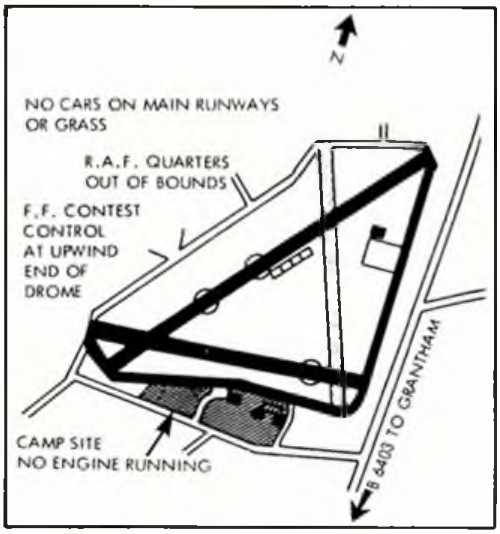
The Junior Kit Competition for under-16s takes place on Monday. Any rubber kit below 40in. span and any glider under 60in. is eligible; the latter with a maximum towline length of 50 metres.

What other Nats news? Entry forms are available now from the Tech. Committee Chairman, Ian Bracken, at 1 Dibden House, Mingard Walk, Andover Estate, Hornsey Road, London N7 7RT; or from the SMAE Head Office.

Win, win, win

Who has failed to be coerced into buying a handful of raffle tickets at past Nationals? They'll be there at the gate again this year ... so reconcile yourself to paying-up and look forward to winning! The draw will be at 3pm on Sunday. First prize is a colour TV; other prizes (largely courtesy of Finlux UK) will consist of household items such as a vacuum cleaner, power drill, and so on. Can't wait? Go for tickets now via your club sec, or contact Dave Greaves at 39 Victoria Road, Cirencester, Glos.

Your help is requested, too. It would be appreciated if anyone interested in taking responsibility as contest Director for Open and FAI Days could contact Ian Bracken. An enjoyable task - and it might give the usual incumbents a chance to get some flying in this year...

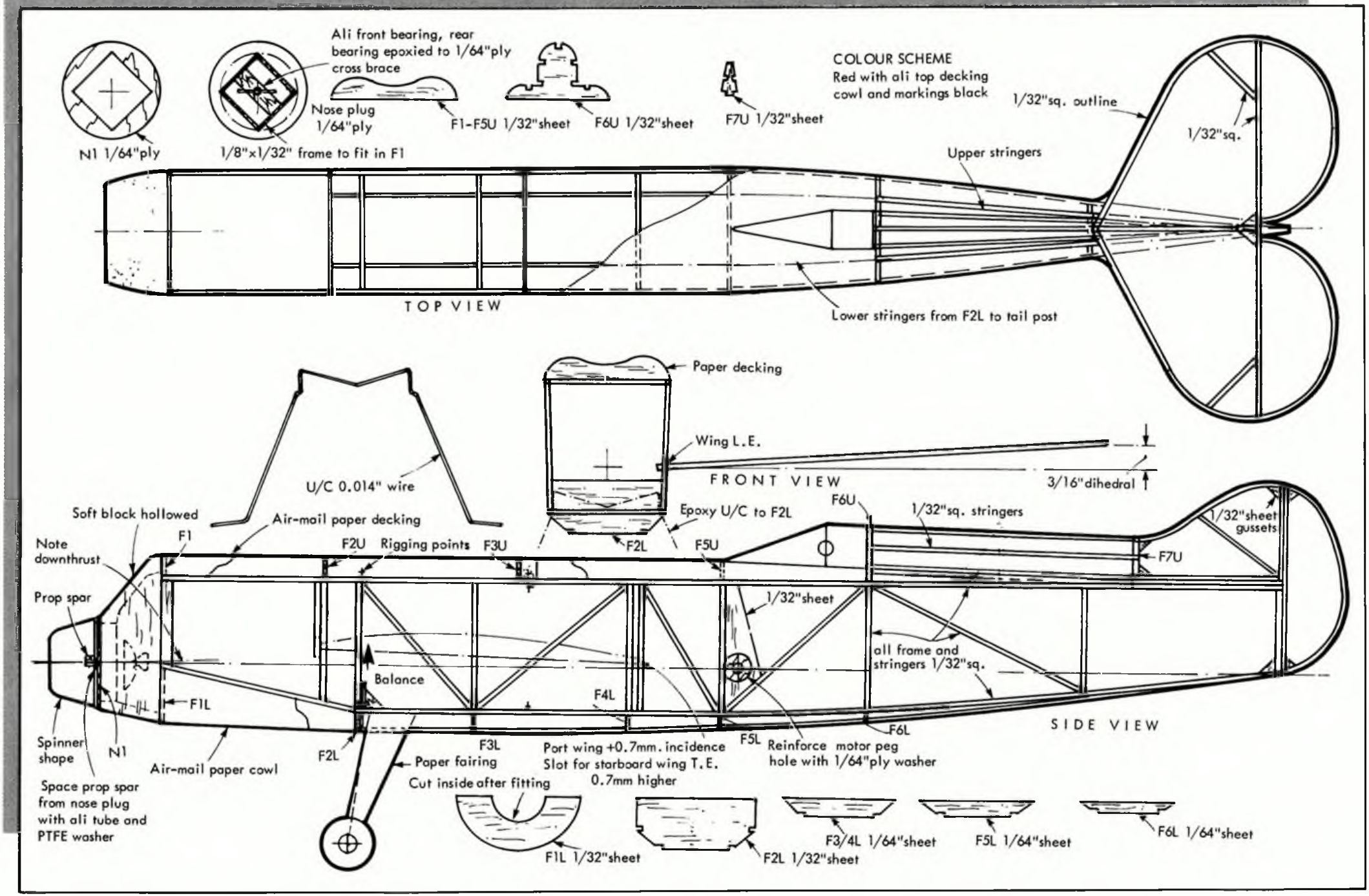


An essential part of the Nationals is the evening fun-flying. Take a model or three and join in - but please take care too. Remember - fun-flying doesn't mean irresponsible behaviour.

Go and see the country's best in Free Flight! Make the date now - and see you there...

At-the-gate admission is £1 per person or £4 per car. Camping rates available on request from Ian Bracken.

DETAILS OF FURTHER ATTRACTIONS NEXT MONTH!



BUILD A BONZO!

Try Nick Peppiatt's Pistachio-scale racer for sports-hall fun-flying

STEVE WITTMAN'S Bonzo was a minimal airframe designed around a Curtiss D-12 435hp liquid cooled engine, unlike the majority of Americans racers of this period which had air cooled radial engines. The model is based on the 1937 version of the prototype, fine photographs of which appear in Reed Kinert's Racing Planes and Air Races, Volume 3, alongside a G.A. drawing.

The plan presented is based on my second version of this machine. The first took many indoor sessions to get to fly reasonably. It would glide without the propeller when otherwise suitably balanced and would power-glide steadily under very low power. However, the destabilising effect of extra thrust resulted in the dreaded phugoidal flight path with an increasing amplitude of oscillation. The cure was to bring the centre of gravity further and further forward until it reached the position marked on the plan, when a fast stable flight pattern was achieved, the model looking every part the air-racer.

The first machine was rather battered at the end of this trimming process so a second was built with the rubber motor peg nearer to the wing trailing edge to reduce the amount of nose weight. The weak-spots discovered on the first model were also strengthened. The moral is obvious and well-known - keep it light, especially aft of the CG.

How's it made?

The model should be built of firm indoor-quality wood, obtainable from SAMS. I use aliphatic resin glue because of its stiffness and lightness; this is applied with a hypodermic syringe with the top of the needle ground off.

The wing outlines are from two laminations of 0.050 × 0.012in. basswood, well soaked in water. The excess water is wiped off, a thin bead of adhesive is applied to one strip and they are wrapped and taped to a waxed card former and allowed to dry thoroughly (at least overnight). After the outline is removed from the former, the wing half can then be assembled over the plan in the usual way. The solid root ribs are set at an angle to allow for the slope of the fuselage side and dihedral angle. The remaining few ribs are sliced 1/32in. square.

Tail surfaces are made by soaking 1/32in. sq. wood in water and forming the outlines over card formers. They should again be taped and left to dry out; the frames are then constructed over the plan. Note that the rudder is hinged with 5amp fuse wire.

The Bonzo box fuselage

The framework is basically straightforward, but the 1/32 in sq. requires a bit of practice in handling. Sides are built over the plan in the standard way and the basic box is constructed. Note that this is not square but broader at the top than at the bottom. The sides are jigged on the building board upside down against card formers to give the required fuselage cross-section. On removal from the building board the excess adhesive is cleaned off and the 1/64 and 1/32in sheet formers added. The 0.014in dia wire landing gear is epoxied to its former and the bottom stringers added. Before the top structure can be completed the stabiliser and lower fuselage should be covered. The tailplane is then glued in place and the fin and cockpit and fairing structure added. Prior to covering I brushed the framework with red ink to reduce the effect of the wood showing through the translucent covering.

Gently, now...

I use two covering materials; condenser paper dyed with red ink for the wing and stabiliser (only the top surface is covered) and for the lower and rear parts of the fuselage. Taking a leaf out of Mike Hetherington's book, the aluminium cowl and decking was simulated with silver-sprayed doped air-mail paper.

Condenser paper is coloured by sticking it to a wooden frame with dope and spraying it with light coats of red ink from an airbrush. This process usually seems fairly close to disaster as runs occur as the dampness causes the paper to sag, but it usually comes right as the paper dries. Keep the paper flat by storing between the leaves of a large book before use. I use 50/50 dope/thinners to stick it to the airframe. Tissue trimming requires a very sharp blade. It is advisable to pre-decorate the tissue. In this case, it is only a matter of the license number on the rudder and the control surface outlines. Staedtler Lumnocolor waterproof markers are excellent for this.

Air-mail paper is prepared by taping it to a board and doping first one side and then the other (when the first is dry) with the 50/50 dope mixture. The paper is then lightly sprayed with a suitable silver colour - either dope or Tamiya acrylic aluminium paint. This covering is best stuck to the frame with Evo-stick. The pieces are best cut to shape before attachment to the model, although some trimming around the nose can be done afterwards. Cover in the order: lower cowl, aft top deck, front top deck.

The front end

The nose is carved from soft block and faced with a disc of 1/6in.ply. A square cut-out is made to accommodate the nose plug.

The propeller is 3.75in. dia. with 5in. pitch. Blades are from 1/64in. plywood. Don't worry about the weight here - you will need it. They are well soaked in water, strapped to a 2.5in. dia. can at 28 degrees to the vertical and dried in an oven for one hour at 120 degrees C. Leave strapped to the can overnight to allow the moisture content to recover. The prop spar is 1/16in. sq. spruce with a 0.014in. dia. shaft. A jig (as sketched) is used to assemble the prop blades which are slotted to take the spar. the spinner, laminated from 1/16in. balsa, is fitted to the spar.

The nose plug is 1/64in. ply glued to a frame made of 1/8×1/32in. to fit the hole in the nose. The prop shaft bearings are cut from a ring-pull can top which is epoxied to the front disc and a ply cross piece at the back. Clearance between the spinner and the nose plug is provided by a short piece of ali tube and a PTFE thrust washer.

Details

The cockpit canopy, formed by plunge moulding, is inhabited by one of Plecan's profile pilots.

The wheels are from foam plastic (Rohacell) bushed with cyanoacrylate tubing. They are retained by small pieces of electrical insulation sleeving. The u/c

leg fairings are from air-mail paper folded in two either side of the wire. The rigging struts are fine shirring elastic painted silver. Where the rigging passes through the condenser paper covering, short tubes of rolled tissue provide the rigging points.

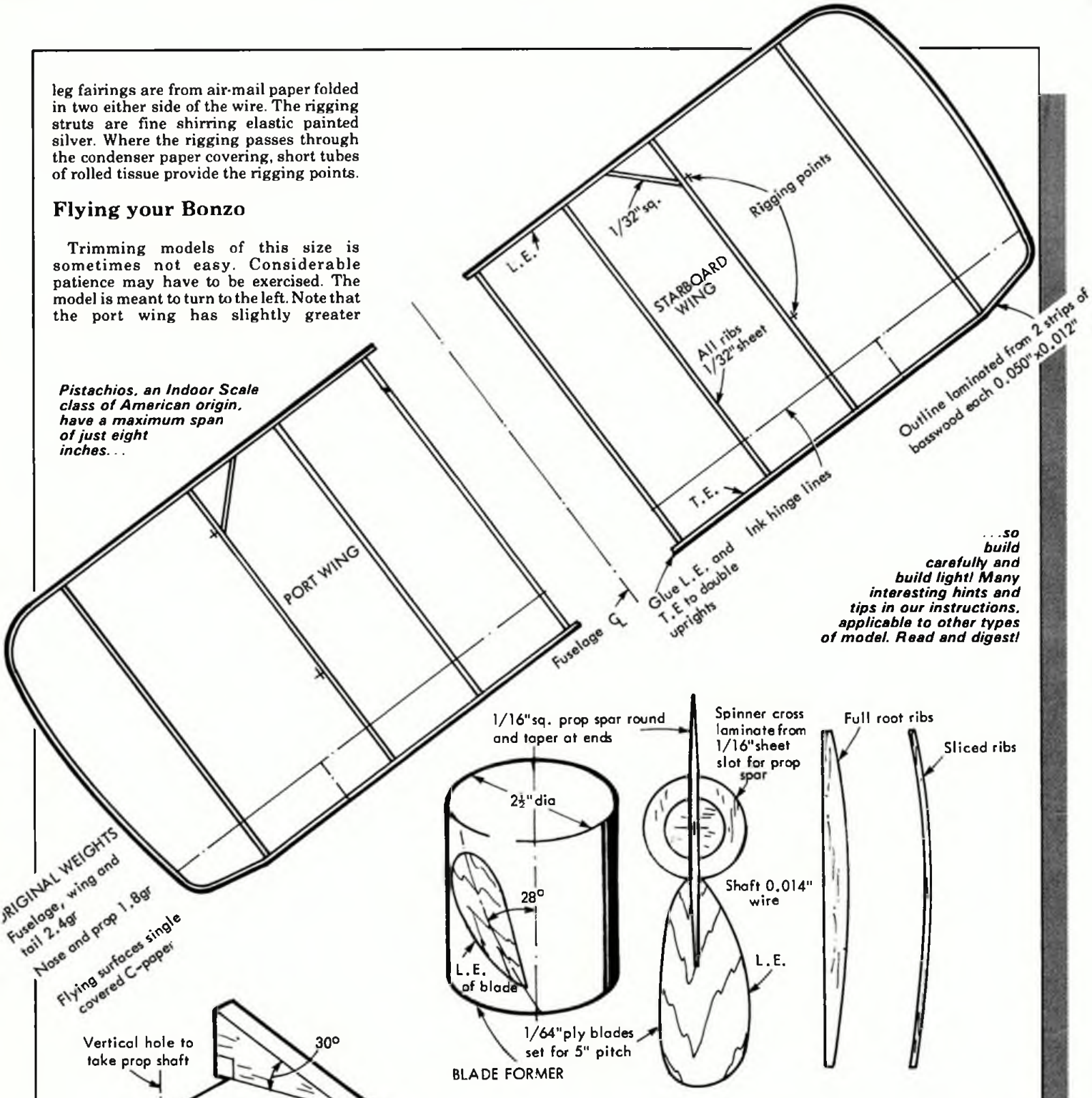
Flying your Bonzo

Trimming models of this size is sometimes not easy. Considerable patience may have to be exercised. The model is meant to turn to the left. Note that the port wing has slightly greater incidence than the starboard. Slight washout in each wing panel is desirable. The original models turned left under a combination of motor torque, tip weight (less than 0.1 gram) and slight left rudder. Weight should be added to the nose until the CG position shown on the plan is achieved. A convenient place for the nose weight is inside the square locating frame of the noseplug. The original models flew on an 11in. loop of 0.050in. Pirelli although something less powerful is recommended for initial flights. It is likely that the elevators will have to be bent upwards to prevent diving.

Much of my Bonzo flying has taken place in a hall approximately 50ft. wide with a 17ft. ceiling. Once trimmed a very satisfying flight pattern can be achieved from hand launches!

Pistachios, an Indoor Scale class of American origin, have a maximum span of just eight inches...

...so build carefully and build light! Many interesting hints and tips in our instructions, applicable to other types of model. Read and digest!



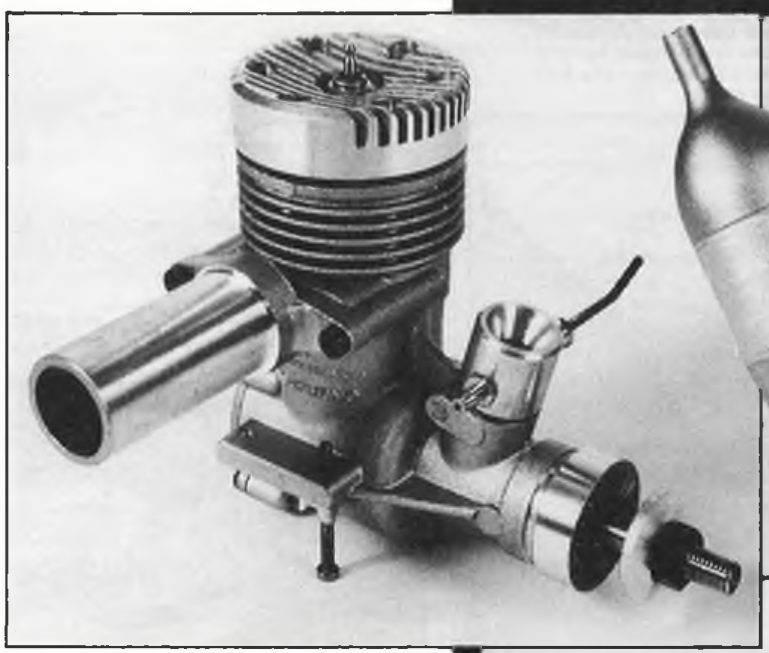
MOTOR MART

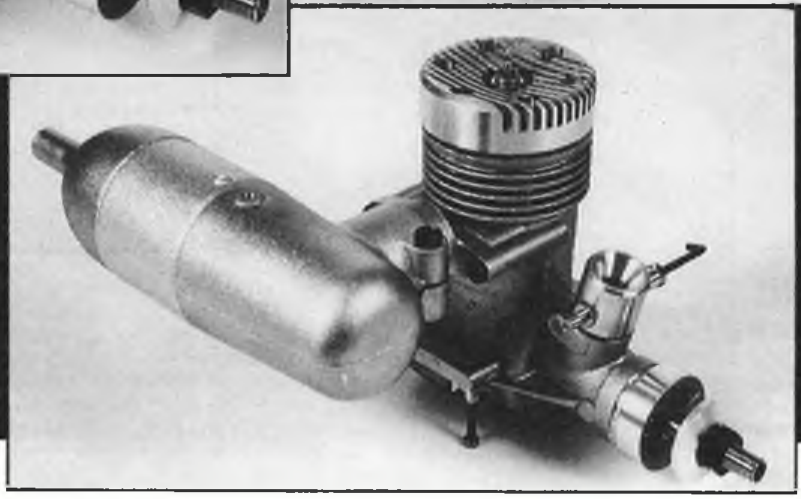
We look at a new version of an old favourite and spot a rare bird or two

The new Super Tigre ST.60K - latest development of this popular stunt engine.

Tigre news

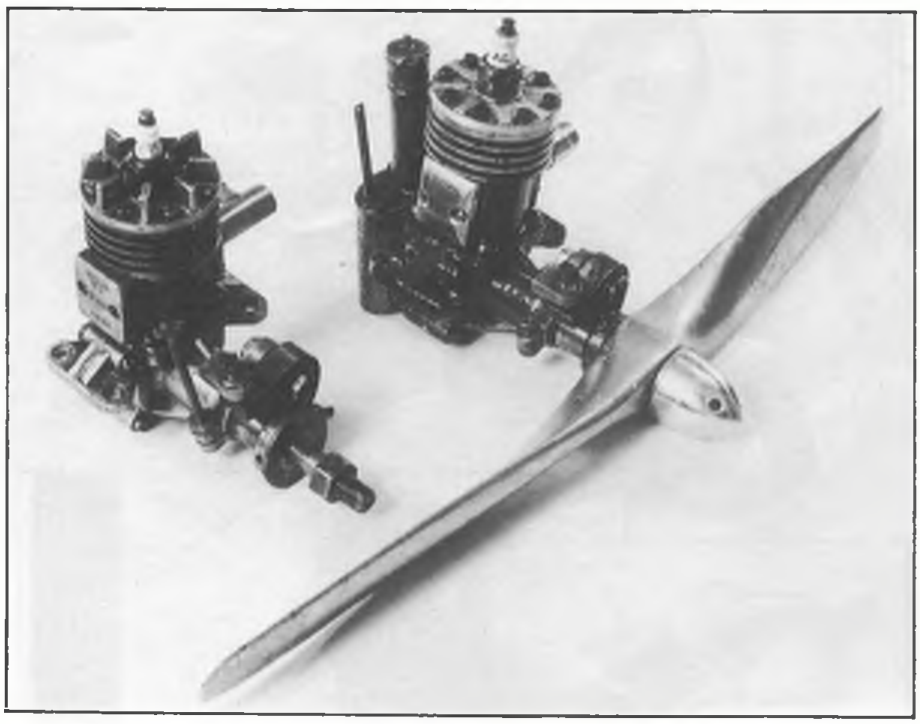
Mick Wilshere from Tigre Engines has sent along the latest ST.60 Stunt for us to have a look at. Known as the ST.60K it impresses by crisp castings and fine machining. Obvious differences between this and the .60 we all know and love are that it now has tapped holes in the crankcase lugs to facilitate the fitting of the ST 'swing' type silencer and internally there are now three 'window' exhaust ports instead of four. Price remains unchanged at £75.12. We hope to follow up with an air test in From the Handle shortly.





Adoption of the Super Tigre 'Swing' silencer means the ST.60K will suit a wider variety of installation layout. Tubular manifold (above) allows 360 degrees of movement, subject to airscrew clearance, and wide transverse range (above right). Conventional position shown at right.

Above: Instantly recognisable - a kit-built GHQ, at least forty years old. Fitted for flywheel operation and crowned with full-size spark plug, this remarkable but incomplete specimen contrasts with (below) a newly discovered Loutrel - the fuel tank is genuine vintage fitting! - and an airworthy GHQ. See text...



Rare bird

Out of the blue came a telephone call from Barry Shaw, a local F/F modeller. 'I now have in my possession an old parasol monoplane,' quoth he, 'which has an old engine on the front. A Loutrel, actually.' A Loutrel? One of the rarest-ever petrol engines?

Such it was. In fact, the model is extremely interesting in its own right. As will be explained in a future Vintage Corner, it seems certain this is a pre-war design by Dick Sharvell, of Wembley.

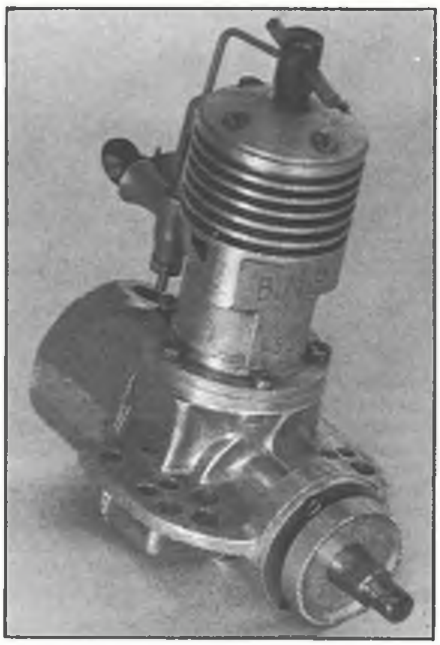
The Loutrel, illustrated here in company with Alex Imrie's GHQ - a later derivative, of which more anon - sports a fiendish metal prop which is still capable of churning round at a cool 4,000 or so rpm, clockwise rotation and all. As to background, the Loutrel engine was built to high standards, but in low numbers, in the States during the mid-thirties. GHQ, an existing kit manufacturer, took over Loutrel interests in 1936. Engines were then mass-produced, many appearing as kits of parts during the war when nothing else was available. The reputation of the GHQ is not high, but the earlier Loutrel is a fine engine. Very few are known; perhaps fewer than a dozen in the world. Barry's is No. 155. Comparison with the GHQ will show minor differences. At some time in its career the radial cylinder head fins have been trimmed off, perhaps to help spark plug access; but Barry intends to restore engine - and model - to original condition so replacement will be made.

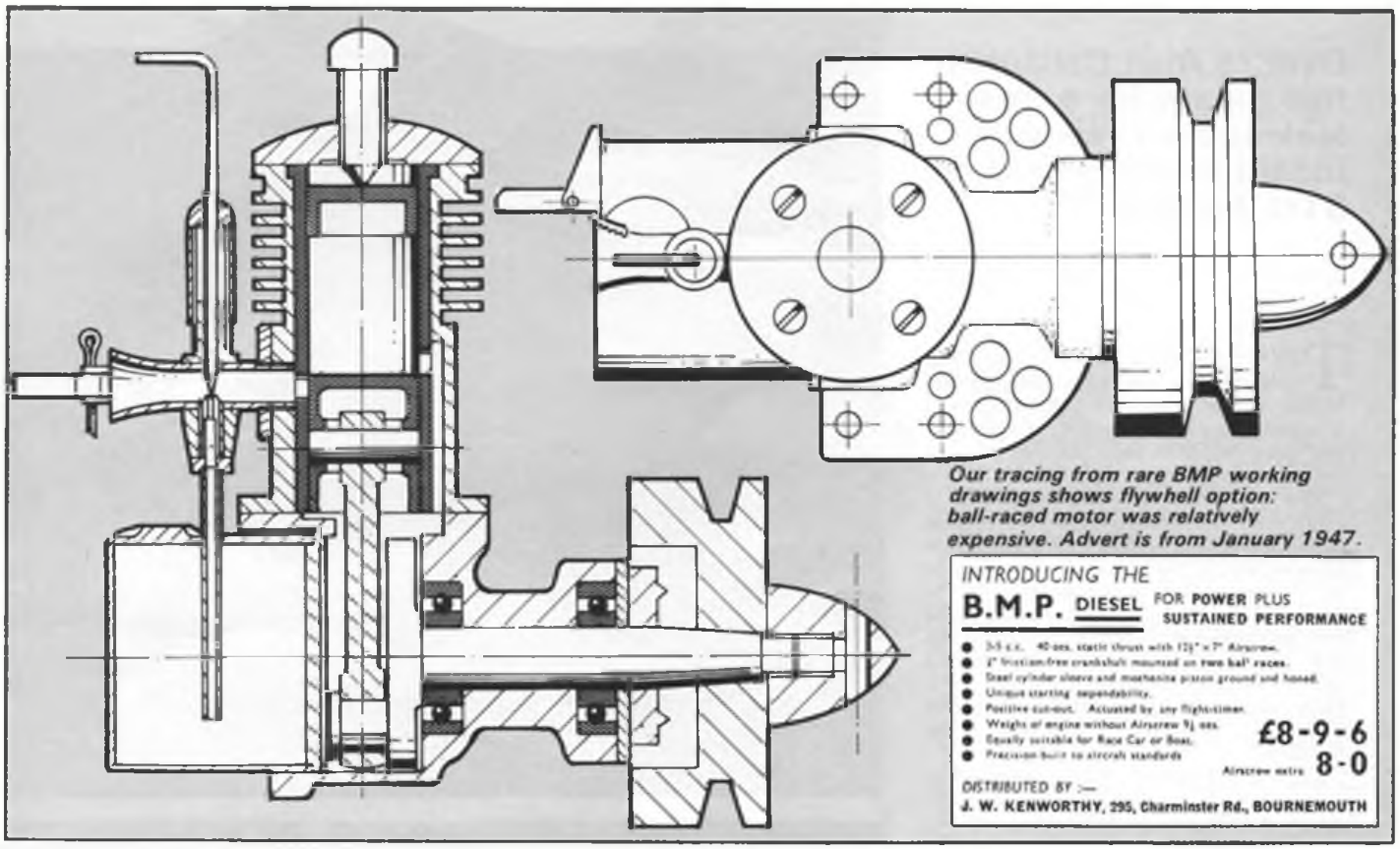
A further photograph on the same theme shows your editor's 'orror - a flywheel-driving GHQ bought from a junk stall for £3 about ten years ago, full-size spark plug and all. Inexpertly built from a kit (who knows when!) various parts are missing but the quality of the castings makes it unlikely that this engine will ever be encouraged to run again. Currently it performs quite adequately as a paperweight.

More old motors...

G. Fathers took notice of our request for news of odd or interesting motors. He says: 'I thought I would write to you about my BMP3.5 diesel. I obtained from a school colleague a cardboard box full of castings he'd bought from a jumble sale for £5.00 in 1975. I paid him £5.00 for the box and upon examination found enough

Sturdy lines of the BMP 3.5 - one of the better early post-war large diesels.





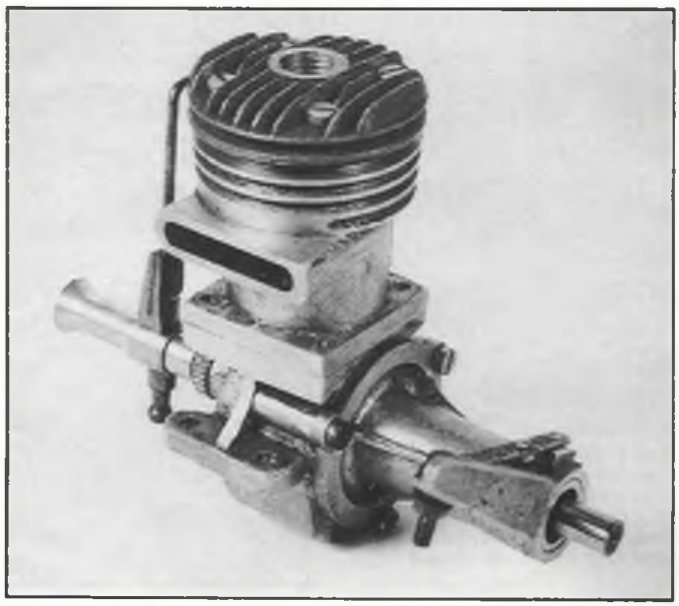
Our tracing from rare BMP working drawings shows flywheel option: ball-raced motor was relatively expensive. Advert is from January 1947.

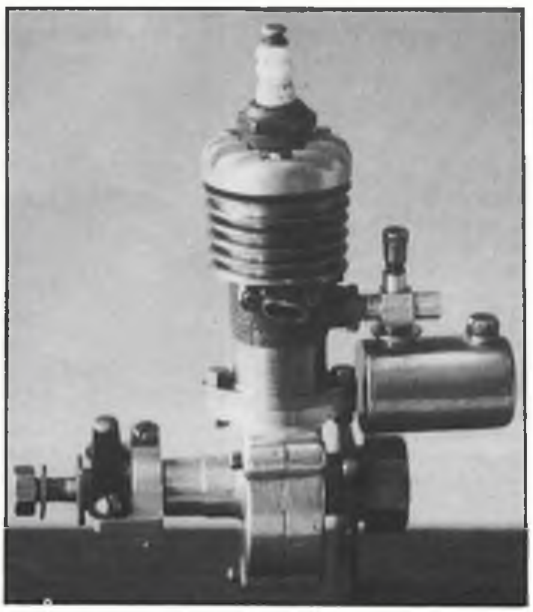
components for three engines. I sold one set of castings for £5.00, leaving me with enough parts for two engines and some spares. There was also a works drawing with the engines of which I have also sent photocopies to you. The engines require a small amount of work to get into running condition and I have already enquired into this.' Could we supply further details?

Briefly, a number of designs came from the South Coast in the early post-war years. Foursome, Kalper and Majesco immediately spring to mind. BMP, or Bijou Mechanical Productions (Bournemouth) Ltd, produced in small numbers not only the fine ball-raced 3.5 but an exceedingly rare 0.9cc diesel. Actually, we were unaware that casting sets for the 3.5 were made. Perhaps someone knows more?

Much better known is the '1066' Falcon, a motor produced as complete engines and kits just after the war. The motor shown here has recently passed to your editor via Dave Lowery, editor of our companion magazine Model Railways (whose accounts of getting to grips with R/C helicopter flying appear in current issues of Radio Modeller; yes, we're a versatile lot here). Although a few bits are missing, including the piston and conrod this engine will turn a prop again before the year is out.

And what is the mystery 2-2.5cc petrol engine shown here? Bipin Cholera from Michaels Models wondered if we could identify it. No, we can't; but it certainly looks maddeningly familiar. Someone will jog our memories! Please...

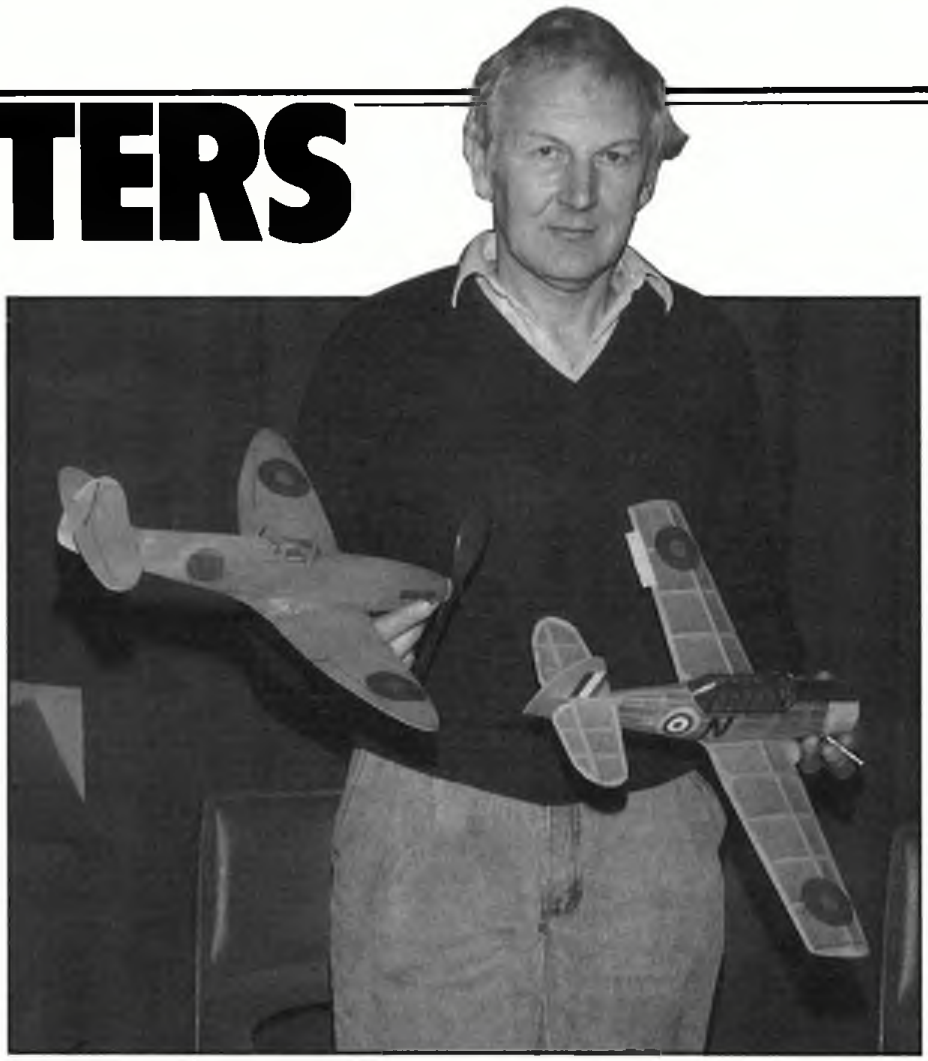




Far left: Just as it recently surfaced - the incomplete 1066 Falcon referred to in text. Left: What's this? We'd love to know...

SCALE MATTERS

Over to Alan Callaghan this month for a close look at the Crawley Indoor Meeting held on 31st January



THIS WAS the 13th annual meeting at this venue under the guiding hand of the SMAE South-East Area. It is a reliable fixture in the contest calender that has done much to keep interest alive in indoor scale flying.

The event for the 'big-stuff' was a combined CO_2, rubber, and electric contest attracting 18 entries. Multiple entries were allowed, and although this is not a thing to be discouraged, it would seem fairer to those not making more than one entry that only one model is allowed to take a place in the final results. Lindsey Smith's achievement in tying with himself for a place (we won't say which!) is neither easy to emulate nor the real solution to the problem.

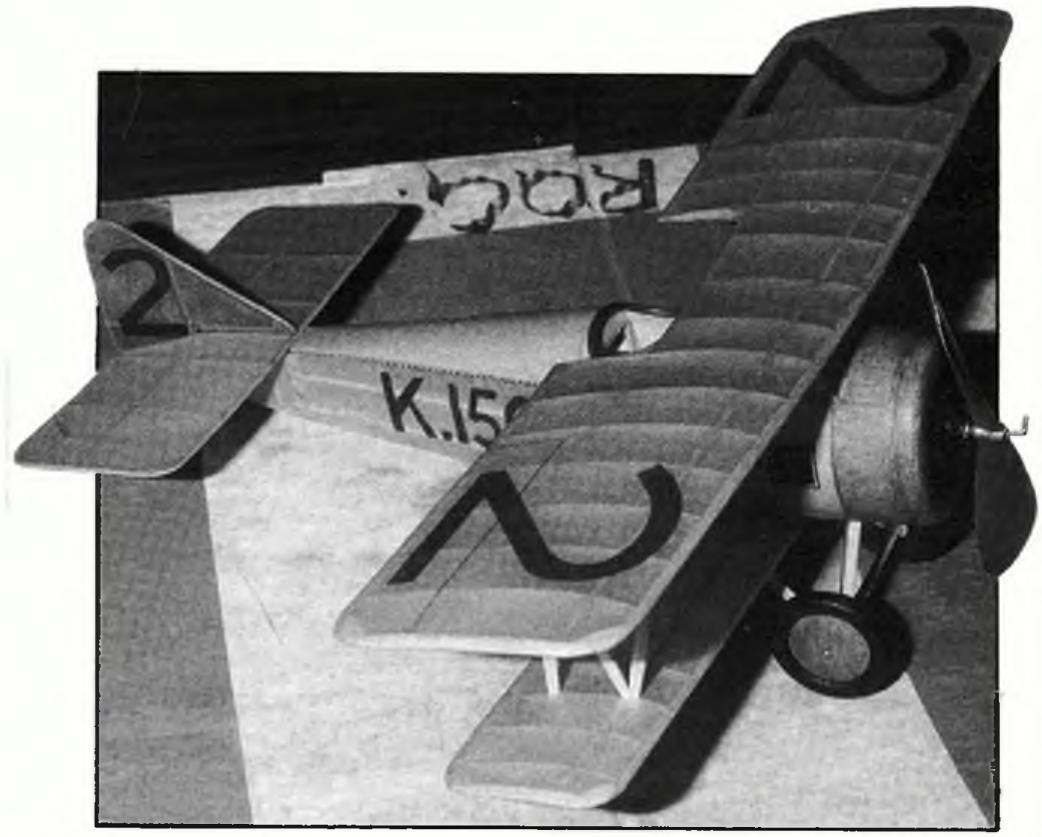
There was a distinct and welcome lack of overweight, overpowered models demonstrating airspeeds which would put to shame Derek Knight's Peanut Hawker Hunter; and the general standard of flying was quite good without being outstanding. Of all the Laceys present Chris Blyth's was easily the slowest in the air, showing just how an indoor scale model really should go, but the noseblock tended to dislodge easily on landing to prevent a really high flight score being made. Peter Frostick's 3rd place Westland Widgeon I could also possibly have placed higher but for the prop hitting the ground before the wheels on landing, spoiling the touchdown and overall flight score.

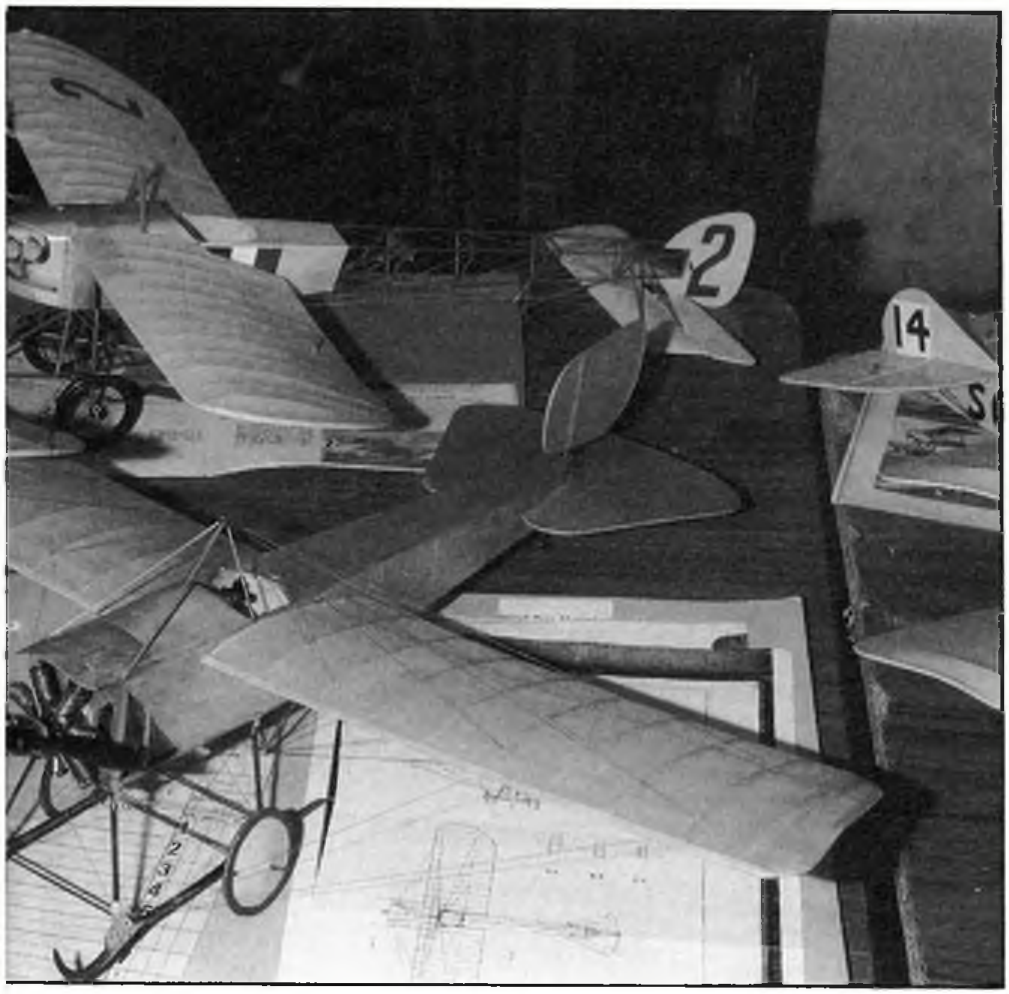
Gordon Hannah's winning Vickers Bleriot replica was rubber powered, and Chris Strachan's second place Bristol Prier used a Telco. These typical subjects from the pioneer era of flying are ideal models for indoor events. They are large, lightly-loaded, fairly slow in flight, and interesting to look at. Full-size constructional methods are easily duplicated by standard model building techniques, and the only tricky parts are the usual spoked wheels and the rigging.

As far as low and shoulder-wing subjects go, the high aspect ratio configuration has shown itself to be quite manageable on an indoor model. When trimmed to fly in proportionally tight circles, however, more often than not the model's wingtip will touch the ground before the wheels on landing. Messrs. McMeekin's and Knight's large Avro 560s, CO_2 and electric powered respectively, both did this, but were outdone by Gordon Hannah's Bristol Brownie which on one flight made seven wingtip touch-downs before landing. One may wonder who will be the first to nominate this as a proper in-flight option.

Gordon Hannah's Hatfield Little Bird is Telco powered and something different. Ideal C/L scale combat wing!

Nick Peppiatt's Peanut-size Gipsy Moth 'Jason' is CO_2-powered by a Campus A-23 motor. 5th in the Crawley Open Event. Right: Awaiting the judges - Chris Strachan's Bristol Prier (front) and Gordon Hannah's rubber Vickers Bleriot placed second in CO_2 and first in the combined event respectively.





Main picture: David Beales at Crawley with two fine-flying Veron kits by himself and son Adam. Flights of 25-30 seconds achieved on KK propellers. No undercarriages are fitted! Left: This neat little Grahame-White GWE 6 Bantam by Steve Finch is from a Walt Mooney Model Builder plan. Jap tissue covering.

A Tiger Moth has been used to pick up a handkerchief in this way, and the intrepid Mr. Lowe-Wylde in 1933 occasionally demonstrated the trick in his ultralight Drone. A superb photograph showing this can be found on page 381 of the April 20th 1933 issue of Flight magazine. Scope for scheming there!

The Peanut event, as usual, had the largest entry, with 17 qualifiers from 23 starters. It is extremely difficult to give a blow-by-blow account of this since competition flights are made simultaneously, but how pleasant to see a fresh model taking top honours against stiff opposition. Chris Hutchinson's Farman, a delightful little subject, was drawn up from Vol.1 of Bill Hannan's book Peanuts and Pistachios. This was Chris's second version, at 12 grams weight, the first being 18 grams. The benefits of having more than one attempt at a good subject are obvious. The model is covered in condenser paper, sprayed with acrylic mixed in cellulose thinners, and it uses a slightly trimmed Peck plastic propeller. Beating a Fike, a Lacey, and a Cougar at their own game is never an easy task, and we will surely see more of this model near the top of the results in future.

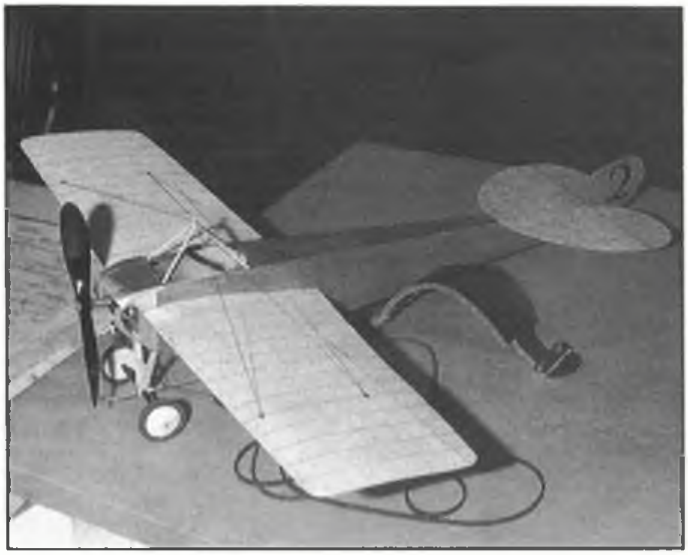
Rising standards

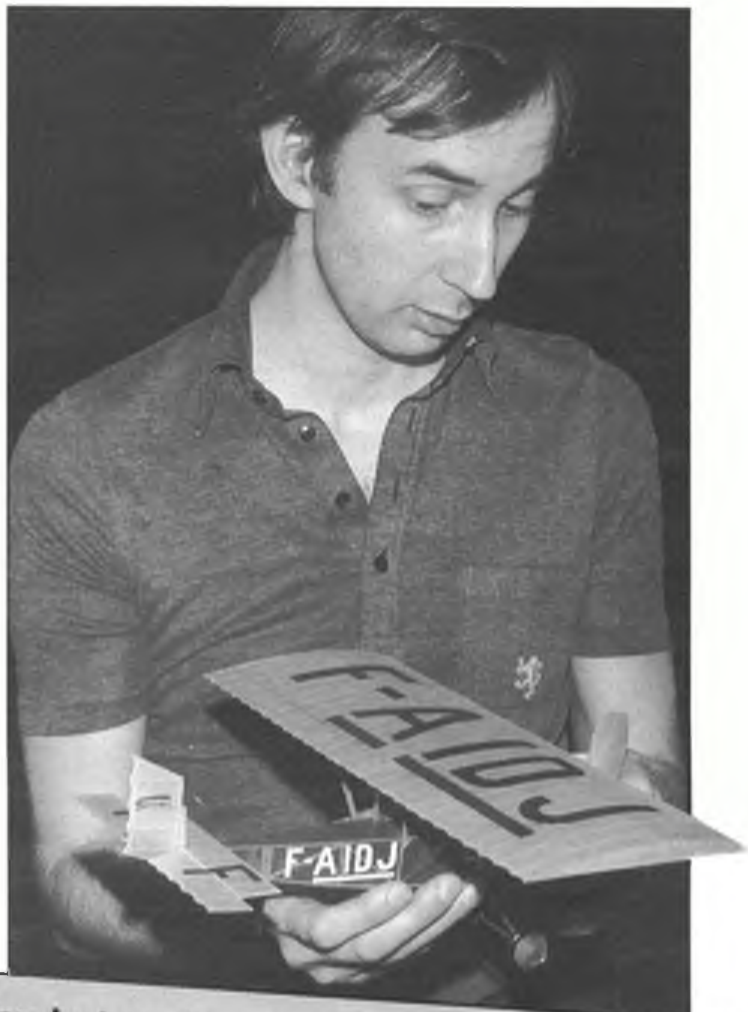
It is interesting to consider, over the number of years the Crawley meeting has been held, what constitutes 'progress' in relation to indoor scale models. It is always difficult to quantify building standards and static scores because, amongst other things, judges change, opinions differ, and all standards vary. These are factors one has to accept on the day. One thing which is not arguable is that the rising standard of flying of Peanut models, measured by a stopwatch, has outstripped that of any other free-flight scale model, flown indoors or out. The average flight time for each of two flights returned by the first four models in this competition was 47.5 seconds, and this does not include the model making the highest times altogether. This would have seemed incredible in 1975. How many larger and purportedly 'better' scale models, similarly powered, can get anywhere near that figure under any conditions?

Peanut models are occasionally knocked for having see-through finishes, for not having scale propellers for static judging, and for being much too fiddly to mess around with. If we are, at least in the forum of this magazine, concerned with *flying* scale models, surely there are some lessons to be learnt here somewhere?

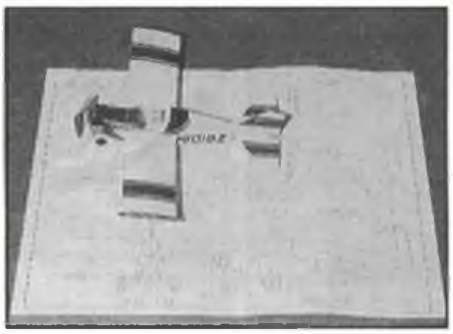
Thirteen has to be unlucky for some. My

Right: It's a wise man who knows his Lacey! We think this is Peter Lee's, turning right on a competition flight. If you know different, send a postcard to GC here at Aeromodeller. Below: Chris Blyth's Nieuport is an all-sheet model from a Bill Hannan plan, indoor timber used. Campus A-23 power. Below right: Chris Hutchinson explains a few details on his Farman. Silver and red model won Peanut.





Right: Eight-inch Tefft Contestor by Nick Peppiatt consistently outflies much larger models. It's actually been to Miami and back (but not on one winding!).



own ultralight Peanut Rearwin Speedster, which was present at the first Crawley meeting, suffered its second major mid-air collision here when the port wing was almost severed at the root. As the most consistent and problem-free flying scale model I've ever built, it is long overdue for a full overhaul. The air-time it has accumulated must be measurable in hours by now, and I wish I had kept a proper record from the beginning. It has never been entered in a competition, and although it would never have been given more than a token score in static judging, the amount of real flying satisfaction this model has provided over the years far outweighs any derived from any super-detailed competition-orientated model I have attempted. I suppose there is a moral here too!

Crawley Indoor Meeting: 30th January

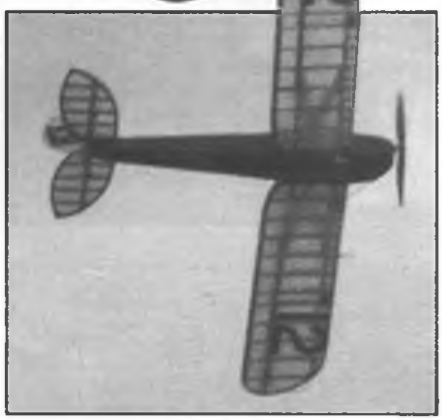
Open Scale

1	Gordon Hannah	Vickers Bleriot	Rubber
2	Chris Strachan	Bristol Prier	CO_2
3	Peter Frostick	Westland Widgeon I	Rubber
4	Nick Peppiatt	Sopwith Tabloid	CO_2
5	Nick Peppiatt	DH Gipsy Moth	CO_2

Peanut

			Best 2 Flights	Place	Static	Place
1	Chris Hutchinson	Farman	98	3	74	2
2	A. McMeekin	Fike	89	4	63	7
3	Peter Lee	Lacey	100	2	55	11
4	Chris Strachan	Cougar	83	5	61	8
5	Lindsay Smith	Voisin	43	14	82	1

LYMPNE SCALE '88



Take part in our Golden Era Day contest at Old Warden on 10th July. Ian Harwood tells all

A NEW event will take place during Golden Era Day at Old Warden on 10th July. Called Lympne-Scale 88, it will be a competition for CO_2 and electric-powered free-flight scale models of the light planes that took part in the Lympne Trials of 1923 and 1924. There will be two unusual features: all the models will be to the same scale and entrants will receive a documentation pack for their chosen aircraft.

Don't despair if you have a Lympne subject outside this scale: a separate Open category welcomes all.

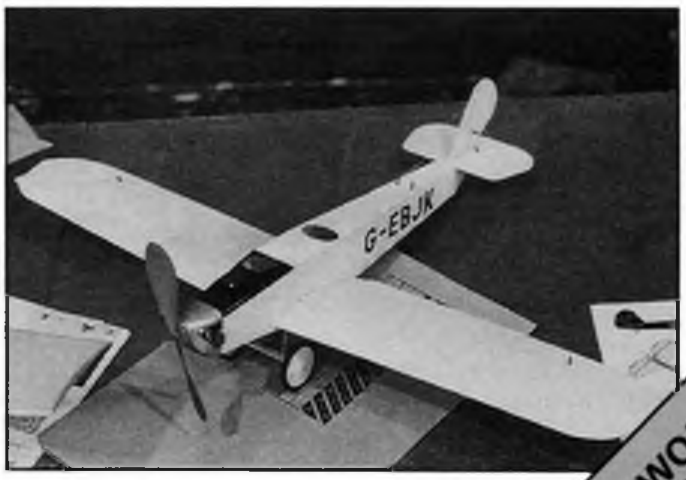
The search for an inexpensive 'aerial motorcycle' for the man-in-the-street gathered momentum soon after World War I. Following a gliding competition at Itford, Sussex, in 1922, there was a series of Light Aeroplane Trials at Lympne in Kent from 1923 to 1926. The resulting aircraft make most attractive flying scale models, several of which have appeared in *Aeromodeller* from time to time. Some very successful informal indoor Lympne competitions have been organised by Butch Hadland at Watford Leisure Centre for models up to 1/12th scale. It was during one of these events that I thought how splendid it would be if the models were all made to one scale, so that they bore the same relationship to each other as the full-size aeroplanes.

Ideal subjects

In the first two Lympne Trials, the maximum engine capacity was limited to 750cc for the solo 'motor-gliders' of 1923 and to 1,100cc for the two-seaters the following year. These low-power machines are ideal subjects for CO_2 and electric power, and the restrictions on engine size means that the models can indeed be built to a uniform scale. Some of the originals were biplanes, some monoplanes (one was actually both!) with wingspans from 18 to 38 feet, so a scale must be found that avoids unacceptable extremes. At 1in. to the foot, the largest would be too big for such small motors, while 3/4in. to the foot would make the smallest virtually Peanut-size. After much careful consideration, a scale of 5/6in. to the foot has been chosen, leading to the sizes and wing areas shown in the table. My own DH53, for CO_2 power, published elsewhere in this issue, is to this scale and it flies well in reasonably calm conditions.

The Lympne light-planes were fully described in Flight magazine at the time of the competitions, mostly with full-size 3-view drawings and detail sketches. More recently they have been covered in articles (with different three-views showing cross-sections) in Aeroplane Monthly and these were revised for inclusion in the book Ultralights: The Early British Classics by Richard Riding, who has most kindly provided high quality prints of both sets of drawings, copies of which will be included in the documentation pack for each aircraft. To help in preparing the model plans, an enlarged outline to 5/6in. : 1in. will also be provided, based where possible on the Flight three-views, most of which are fully dimensioned.

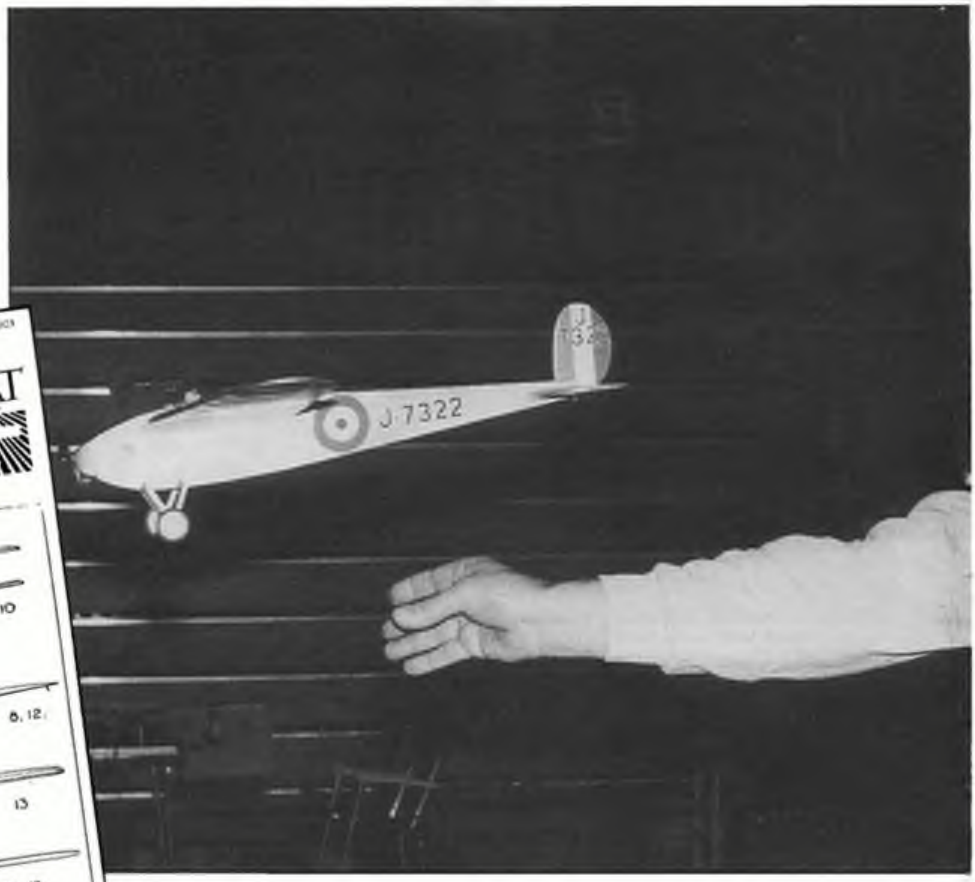
At Lympne in 1923, the main competition was for the longest distance

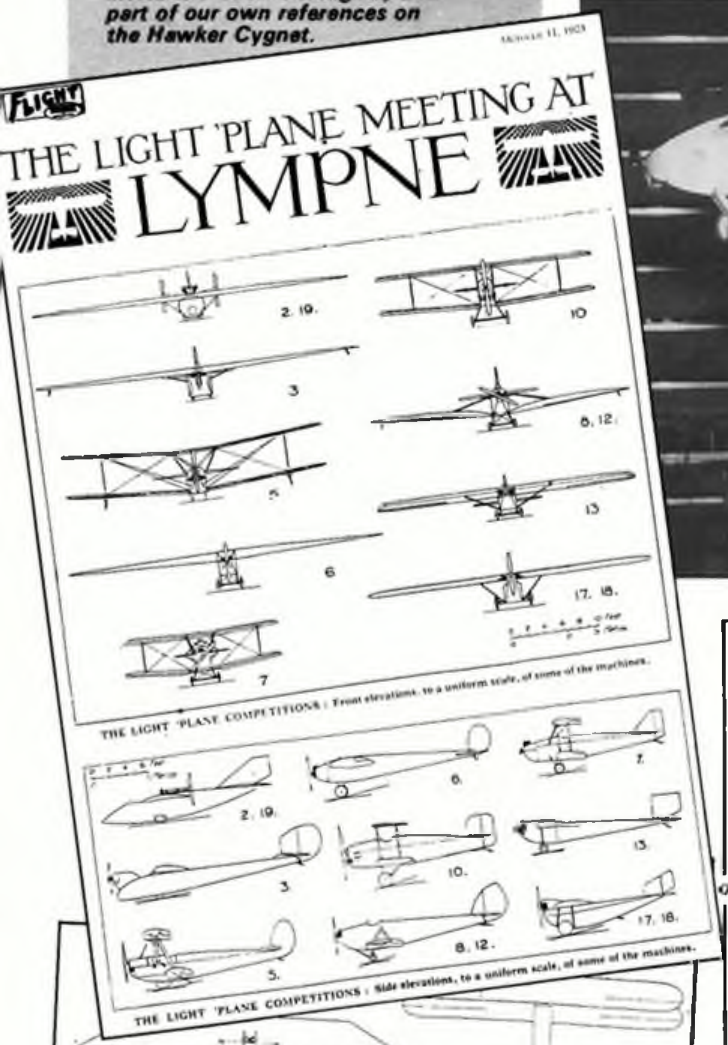


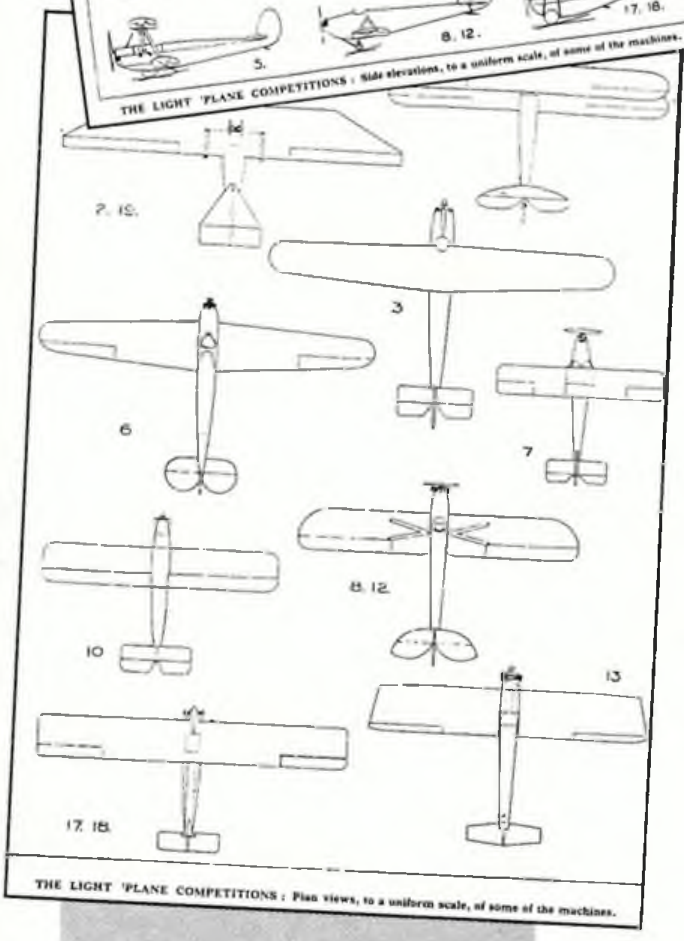
Our Lympne competition is particularly aimed at CO_2/Electric models to 5/6:1ft scale - but to attract models already in existence, such as David Wolstenholme's Avro Avis (left) and Gordon Hannah's Bristol Brownie, all Lympne craft, whatever their size and propulsion, will be welcomed in a special Open category. Come on - let's see you at Old Warden in July!

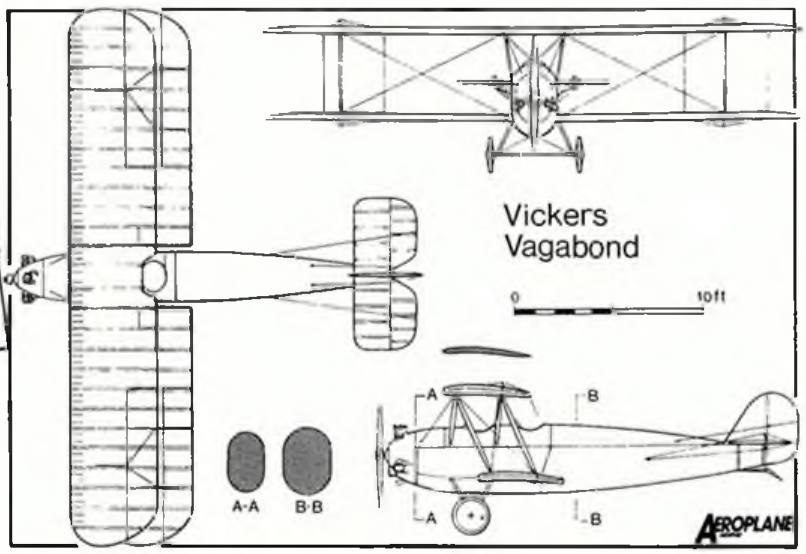
PRIZES TO BE WON! All Lympne models eligible. Send for details now...

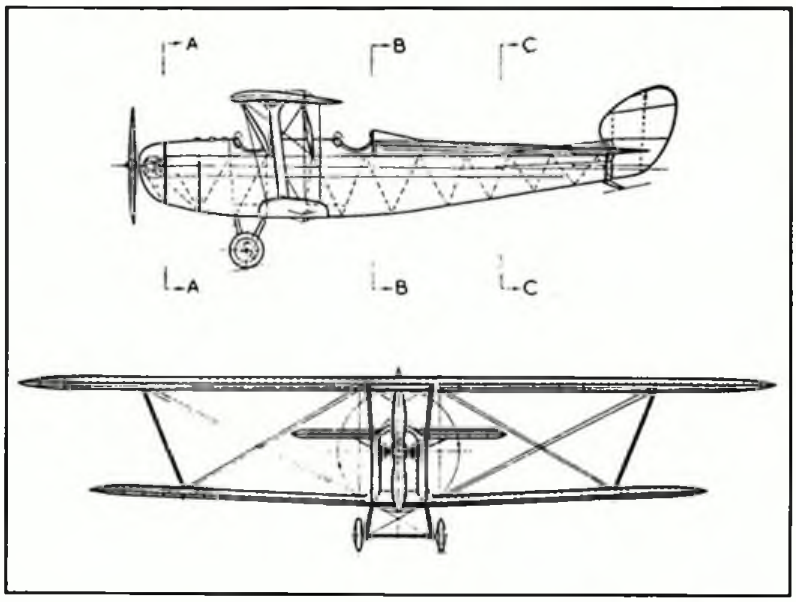
Below: Same-scale three views of the 1923 Trials machines were published in Flight magazine in October that year. Also on this page are Aeroplane Monthly drawings of the Vickers Vagabond (thanks to Richard Riding, editor of that magazine and author of the invaluable book Ultralights) and part of our own references on the Hawker Cygnet.











Derek Knight test glides his Avro 560 which is fitted with one of his own K&P 01 electric units. Why not try a Wren or H.P. Sayers?

flown on a single gallon of petrol. There were other awards for the greatest number of completed circuits of the course, for the two fastest laps and for the highest altitude reached. Take-off and landing trials had to be abandoned because of gusty weather. Lympne-Scale 88 will translate some of these events into model terms with prizes for the longest flight on a single charge; for the best aggregate of six timed flights; and there will be a precision landing contest. Static points will be assessed on a standard score-sheet, and the overall winner will be the contestant with the highest total marks.

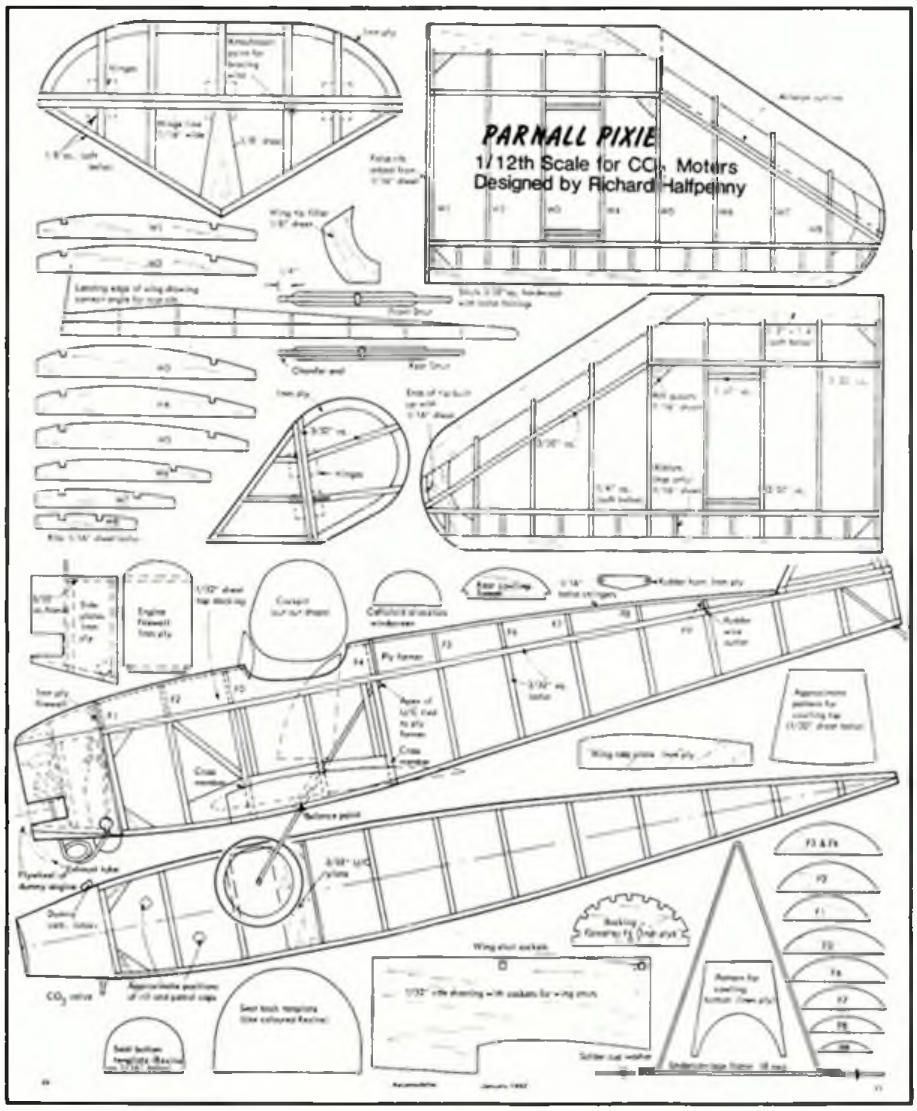
Try it!

To enter Lympne-Scale 88, choose your favourite light-plane from the table, and send a postcard to us at *Aeromodeller*. You will then receive a documentation pack comprising a photocopy of the original Flight article and three-view, plus additional sketches where possible; a photocopy of the recent Aeroplane Monthly three-view; and enlarged Lympne-Scale (5/6in. : 1in) outlines, based on the Flight drawings where possible. Competition rules and a score-sheet will also be included.

It will be up to you to produce your winning model design from the information provided, plus any extra documentation you may find for yourself. There are over two dozen subjects to choose from, so let's see a goodly number of these delightful little light-planes in the air on Golden Era Day. What could be more appropriate at Old Warden, where two of the original 1923 machines (the Wren and the Humming Bird) are on display in the Shuttleworth Collection? And don't forget your 1920s period costume!

May 1988

Below: Our 1982 plan for the Parnall Pixie would be eligible for the Open competition - and would be very competitive if wood sizes were reduced. £1.50 and an SAE will get you a photocopy of the feature.



Lympne-Scale Model Data
(5/6in. = 1ft.)

1923	Type	Span (in.)	Length (in.)	Wing Area (in.²)	Flight 1923 (date and page)	Additional Sketch	Aeroplane Monthly
ANEC I	m	27.36			29/3; 170		9/84
Avro 558	b	25.00	12.98	100.69	4/10; 605		7/84
Avro 560	m	30.00	16.25	115.28	4/10; 606	18/10; 644,5,6	8/84
DH53	m	25.07	17.50	96.83	27/9;577	18/10;645,6	4/85
Gannet	b	15.00	16.41	83.33	4/10;610	18/10;645	11/84
Gull	m	30.28	13.89	71.52	31/5;293	18/10;644,6	3/79
Handasyde	m	25.00	16.25	109.03	20/9;564		1/85
HP-Sayers	m	30.42	15.97	94.10	18/10;640		4/85
Hurricane	m	19.17	17.50	111.81	11/10;625	18/10;646,7	12/84
Peyret	m	26.94	13.33	55.55	11/10;627*	18/10;647	
Pixie I	m	23.75	15.21	113.89	18/10;654*	18/10;645,6	
Pixie II	m	14.86	15.00	69.44	18/10;654*	18/10;645,6	10/80
Poncelet	m	30.42	15.00	41.67	*	18/10;645,7	10/80
Viget	b	20.83	17.92	145.83	20/9;560		
Wren	m	30.83	14.38	138.89	23/8;504	18/10;646	2/85
			20.21	104.16			10/84

*No full-dimensioned 3-view drawings

1924					Flight		
ANEC II	m	31.67			589		
Avis	b	25.00	17.22	128.47	606		
Bluebird	m	23.33	20.00	177.08	594		6/85
Brownie	b	30.48	18.06	168.75	596		8/85
CLA II	m	24.72	21.88	123.61	599		
Cygnet	b	23.33	19.58	155.21	601		7/85
Pixie III	m	27.02	16.87	114.58	604		8/80
Pixie IIIA	b	27.02	17.71	95.14	607		10/85
Satellite	m	28.33	17.71	165.28	711		10/80
Sparrow	b	27.77	19.79	116.67	615		10/80
Vagabond	m	23.33	19.58	177.78	617		11/85
Wee-Bee	b	31.67	18.33	163.19	591		9/85
Widgeon	m	26.66	18.47	128.86	623		12/85
Woodpigeon	b	18.96	17.50	100.69	620		5/85
			16.26	107.64			2/86
							4/86

BUILD FROM OUR FULL SIZE PLANS!

Sylvia II

Enter Lympne-Scale '88!

A real charmer and a proven flier on CO_2 – how can you resist?

Ian Harwood's

5/6in:1ft DH 53

THIS IS actually my third DH53 for CO_2 power, developed over the last five years or so.

To my eye, the original Lympne prototypes with horizontal twin 750cc Douglas engine were better looking than subsequent versions for larger motors. Most of the published drawings are for various later machines but fortunately, the earliest three-view, published in Flight on the 27th September 1923, was reproduced in the book de Havilland: the Golden Years. The same drawing, at reduced size, appeared in the October 1987 issue of *Aeromodeller*. I chose to model the second machine at Lympne, named Sylvia II and numbered 12 in the competition. The other, number 8, was called Humming Bird and gave its name unofficially to the type as a whole.

Although there is nothing very complicated in the construction of the model, there are one or two slightly unusual points. To simulate the thin sheet ply fuselage skin, I used 1/80in. sheet balsa, obtainable in 15 x 2.1/2in. packs from Ballards, 54 Grosvenor Road, Tunbridge Wells, TN1 2AS. For the main structure I used 1/20in. sq. balsa from SAMS, The Chapel, Roe Green, Sandon, Nr Royston, Herts, but the drawing shows 1/16in. sq. which should be chosen as light as possible. I find aliphatic glue best for most purposes, keeping cyano and epoxy for particular application. I also believe that card templates are the easiest way to duplicate identical shapes; and they ensure the exact placing of hole centres, such as wing dowel and undercarriage tube positions.

The fuselage

The fuselage assembly method is due to Bill Dennis (Avian Monoplane, *Aeromodeller*, February 1986). Pin down two lengths of 1/8in. sheet along the inside edges of the longerons on the plan view and make up two sets of 1/16in. spacers in between. Leave one set pinned in place and move the 1/8in. jigging pieces to the outside edges of the longerons. Crack the sides at F3 and F8 and lay upside down on the plan between the jigs and the spacers. Check for squareness and glue sides to spacers. Add the second set of spacers before removing from the plan. Chamfer the sternpost uprights and join together before adding the 1/16in. sq. doublers aft of F8 and sanding to shape. Run in some liquid cyano along the cracks to consolidate the structure. Cover the rear curve with 1/80in. sheet, grain vertical to avoid caving-in. Fill the bottom triangular space aft of F8 with soft 1/16in. sheet grain crosswise, to support the bamboo tailskid.

F1 is made from 1.5mm ply. It is best at this stage to make up the motor mounting block with its ply facing, and drill the holes for the motor bolts at 15mm centres right through the block and F1 to ensure alignment. The four holes in F1 are for air circulation around the CO_2 tank, and the slot is for the feed-pipe. Before epoxying the 10BA nuts, sand the rear face of F1 to allow the adhesive to key to the ply. Chamfer the edges of F1 to suit the fuselage outlines and epoxy in place, square and upright. Sidethrust can be better controlled with wedges later.

The 20swg aluminium wing dowel tubes, embedded in a 1/16in. balsa sandwich, act as continuations of the spars across the fuselage. The front one also carries the undercarriage tube, which is not put in till later. Each tube lies between two lengths of 1/16in. sq. with a slot for the U/C tube at the bottom of the front sandwich. Epoxy each sandwich together and, when cured and trimmed to fit, set aside to harden, epoxy in place, locating with lengths of 20swg piano wire through the holes already pierced in S2.

For the U/C suspension I have cribbed an idea from John Watters (DH 60 Moth, *Aeromodeller*, January 1984). The main legs pivot backwards in the aluminium tube, and the front legs (originally the radius rods) are sprung with a small elastic band through the front paper tube. Bend up the legs from a single piece of 20swg piano wire to the dimensions shown on the drawing, not forgetting to include the pivot tube. The forward ends of the wire are folded back on themselves to form hooks for the rubber band, with sleeves of flattened aluminium tube to make everything neat. The 20swg axle is bound with fusewire and soldered into the angle of the legs. Epoxy the pivot tube into the slot left in the front wing-tube sandwich, making sure there is still room for the two cockpit floor-pieces of cross-grained 1/16in. sheet. The entire bottom fuselage can now be skinned with 1/80in. sheet, with grain running lengthwise. Any joins should be supported by the cockpit floor.

Make up the strut attachment eyelets from 26swg piano wire, coiled tightly around a piece of 20swg wire held vertically in a vice. There are six of these, three as shown on the drawing and three of the opposite hand. Push the angled end of the eyelet into W3, so that the coils fit snugly over the rear decking. Repeat the other side, using an opposite-handed eyelet. Secure the eyelets in place with a strengthening piece of 1/8 × 1/16in balsa epoxied across the fuselage at F3.

The CO_2 filler valve is supported in the cockpit on a 1/16in. sheet balsa platform running across the top longerons, where it can be hidden by the dummy pilot.

The engine cowling is simply moulded from 0.030in. plastic card. Make a plug by spot-glueing a balsa block in the cowling position. Carve and sand this to shape, then remove and add pieces of 1/8in. sheet at the rear and underneath, to give extra material for trimming. Cut-outs for the engine are best done with the cowling fitted over the plug, held by its handle in the vice.

Wheels and tailskid

Cut two discs from 0.5mm ply, and make the tyres from 1/16in. balsa sheet, glued each side of the ply with opposing grain directions. Drill the ply discs with 1/16in. holes and epoxy 20swg aluminium tube hubs in place, with eight spokes of 1/32in. sheet balsa. These are little right-angled

triangles which keep the hub tubes properly aligned. Finish off with paper cones over the spokes, leaving the insides flat. To secure the wheels to the axle, cut two tiny lengths of aluminium tube, crimp them onto the wire with pliers and apply a drop of cyano, taking care not to seize up the entire wheel. Hint: when cutting thin-walled aluminium tube, run a length of wire through to stop it flattening, and roll a knife around it. The shirring-elastic u/c bracing is cyanoed to each side of the axle and runs through the front paper tube with the elastic-band suspension.

Laminating outlines

Cut templates from 1/16in. card to the inside shapes; in the case of wingtips and vertical tail, extend the length by at least 1/2in. at the open ends. Rub the edges of the card with a candle to prevent the glue sticking to it. Pin the templates to a flat board covered with clear film. Cut 1/16in. wide strips of balsa from 1/32in. sheet about 1in. longer than needed, and soak them in water. Take out three lengths, blot with kitchen paper, and glue them on top of each other. Hold against one end of the template with scrap balsa and a pin. Gently but firmly draw the strips round the curve, securing frequently with more scrap balsa. Make sure the laminations stay flat against the board and do not ride up on each other. Wipe off excess glue and leave to set for at least two days. If you remove the laminations too soon they are sure to warp.

Humming Bird wings

The wings are of parallel chord in plan view, but their thickness tapers at both root and tip, with a constant-depth section between W5 and W8. I have used the same wing section as the full-size original, namely RAF 15 with the upper ordinates increased as required. This means that although the upper surface varies, the undercamber is constant.

The ribs are best made by the sandwich method. Make one template of W2 and W11 and two of W5 and W8 from 0.5mm ply or aluminium. Do not cut the slots for spars or leading edges yet. Clamp the templates together so that LE, TE and undercamber all tally. Drill two 1/16in. holes through all four, roughly where indicated on W2. Insert two 10BA screws and nuts. Now cut spar and LE slots, including the stepped slot for the aileron spar. The main 1/16in. square spars are let in below the wing surface, so the slots are 3/32in. deep.

Make ten rib blanks from quarter-grain 1/32in. sheet and stack up between the templates: three between W2 and W5; four between W5 and W8 (the parallel part) and three between W8 and W11. Drill through and insert 10BA bolts. Shape the ribs and file out the slots. Repeat for the other wing, remembering that the ribs must be 'handed', left and right. The two tip ribs are made separately from 1/32in. sheet.

The root ribs, W1, are laminated from 0.8mm ply and 3/32in. sheet balsa. Once glued and dried, drill the dowel-wire holes and cut away the balsa at LE, TE and spar positions, leaving the ply layer intact.

The lower spars must be raised up with 1/16in. sq. packing strips between W2 and W12. Carefully mark the position of W2 on both spars, and also W12 on the rear one. Remove; lightly score and crack the underneath of each at the marks, and replace. Insert a piece of 3/32in. balsa under both spars at the W1 position to raise them for the root taper. Trim the spar ends to butt up against the ply lamination of W1 and glue W1 in place, resting on the 3/32in. packing piece.

Glue ribs W1 and W11 in place. Cut the front spar at W12 and butt-joint this rib.

Now lay the top spars in place, glueing first at the constant depth section. Score and crack both spars at W5 and W8; glue inboard as far as W2 and outboard to W11. Score and crack again at W2, then glue to W1. Leave the rear spar sticking out at the tip for the moment, and glue LE in place between W1 and W10.

Sylvia II, the second Humming Bird, is infrequently modelled. Go for its blue-fuselaged sister at the Lympne Trials if you prefer!

Lift the wing structure and carefully remove the packing strip from the two lower spars. Pin down the laminated wingtip and cut to final length. Sand two lengths of 1/4 x 1/16in. balsa to triangular TE section, turning over on alternate strokes to prevent curling up. Cut the tip shape and rib slots, replace the TE on the board, and glue the ribs into the slots, ensuring that they lie flat on the board aft of the rear spar, raising the LE above the surface. Fit the curved 1/16in. sheet piece at the root, with the small reinforcing gusset outboard of W2.

Remove from the building board and glue the tip in place. Trim off the top and bottom rear spars to butt against the inside of the laminated tip, chamfering the spars as necessary to avoid a step. Strengthen all spar cracks with a drop of cyano.

Add rear spars and fill remaining slots with 1/32in sheet scraps. These can be left slightly proud and then smoothed flush with a fine sanding block, which will also be used to shape the LE riblets of which there are two between each pair of main ribs on the supper surface, but only one underneath. The exception is between the more closely-spaced rib W7 and W8, where the aileron sprocket and pushrod mechanism were situated, with inspection panels top and bottom. Typical riblets are shown on the drawing of W5/W8, and the rib templates may be used to make them by the 'slicing' method. Notch the upper riblets at the spar position, so that they sit *on* the LE and *over* the spar.

1/16in. sheet infills between the spars from W1 to W2, and each side of W5, to reinforce the strut attachment points.

After making the second wing, the dowel tubes are epoxied in place. Lay the two wings on a flat board and align them with straight pieces of 20swg piano wire through the holes in the root ribs. The tubes are threaded onto the wires to locate them in the correct positions before applying the adhesive. Allow the epoxy to cure thoroughly before dismantling.

That curvaceous tail...

This was the first time I have tried hinged tail surfaces, as a result of which the model has certainly been easier to trim than previous versions. The hinges are short lengths of bin-liner ties – the plastic type, not the paper sort, which are slightly waxed and will not glue. Make up each spar from two thicknesses of 1/16in. x 1/32in. balsa. Lay down one thickness of each on the drawing, separated by pins at the hinge line to give a small gap. Press and cyano the hinges in place, then press and cyano the second spar thicknesses on top.

To prevent the flat tail warping I added 1/16in. capping strips of 1/80in. sheet, top and bottom, over ribs and spars as shown. They give extra stiffness and great realism for very little weight. Leave them in one piece, right across the hinge line, until after covering and doping.

Struts and dihedral

Make the struts from two pieces of 3/32in. sheet balsa, joined at the top and reinforced with an inverted V-piece of 0.8mm ply, as shown. Epoxy the aluminium tubes into the struts, but leave the 20swg wire angle-piece free until the wings are correctly rigged.

Release the front rubber band and swivel the undercarriage forwards, so that the fuselage will sit flat on a board, with the nose projecting over the edge. Put a small weight in the cockpit to keep the fuselage level. Make up the wing dowel wires as shown and insert them in place in the wings. Assemble the wings and struts. Adjust the wire angle-pieces at the wing ends of the struts until all the eyelets pick up correctly, altering the angles slightly if required. Lock the angle-pieces at the lower ends with a drop of cyano in each tube, but leave the fuselage ends free. Put 1.1/8in. dihedral packing under each wing tip, making sure that the fuselage is still flat on the board. Finally, lock the upper angle-pieces with cyano to set the dihedral. The V-struts can now be removed by sliding forwards out of the eyelets.

Motor installation

Plumb in the motor as neatly as possible, but leave enough spare copper tube to help removal. The CO_2 tank stays quite well in place if supported only by the tube, but, if extra support is given, do not impair the airflow. Once the tank is in place, add top decking to the forward bay.

One of the plastic dummy cylinders from SAMS makes a passable opposite number for the Telco unit. Cylinder head and exhaust-pipe detail can be added by reference to photographs of the original. Nose ballast will almost certainly be needed so it may as well earn its living by improving the model's appearance.

Tissue and trimming

There is no conclusive information about the colour scheme of the two original DH53s at Lympne. They are allegedly identical. However, many photographs taken at the trials show a very dark fuselage with a thin white trim line and translucent flying surfaces. The much-restored prototype at Old Warden has blue fuselage and silver surfaces, which are supposed by many to be authentic. But the orthochromatic black-and-white films of the 1920s were highly sensitive to blue, which came out extremely pale in tone, and were insensitive to red, as exemplified by photographs of RAF roundels. We do know that the DH52 gliders, entered the previous year at the Itford competitions, had black fuselages with white lines, and clear-doped wings and tail surfaces (see Radio Controlled Scale Aircraft Quarterly, Autumn 1986, p34). Furthermore, when the DH60 Moth made its first public appearance in February 1925, it too had black fuselage and translucent wings and tail. I believe that this was also the livery of the two DH53s at Lympne in 1923; I am glad to see in the October 1987 *Aeromodeller* that the editor agrees with me about this. (*Actually, I don't quite; but I certainly think Sylvia II, the second DH53, was so painted. GC*).

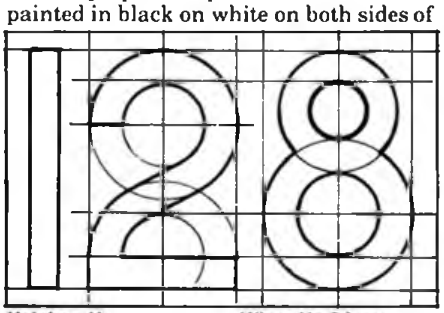
The original almost certainly had a covering of Madapollam (thin cotton fabric) over the fuselage plywood. My Sylvia II had two thinned coats of banana oil over the 1/80in. sheet balsa, which was then covered with Jap tissue, stuck down at the edges with thinners soaked through. This was then water-shrunk and given two coats of well-thinned clear dope. An outline of white dope was applied next with a brush, wider than the eventual line. A thin strip of masking tape was then laid over the white, and the whole fuselage given two coats of gloss black aerosol cellulose car spray, following Bill Dennis' usual method. The tissue will slacken during spraying, but will tighten again as the paint dries. The masking tape was then removed to leave a narrow outline around the fuselage sides.

Details such as aileron linkage and wingtip skids add authenticity; weight increase is negligable.

I covered the flying surfaces with SAMS Early Bird tissue, but the new Superfast from the same source in antique linen finish may well be even better. There are many ways to apply tissue; I always use two coats of banana oil as adhesive, placing the tissue in position on the structure and attaching it with clean thinners on a brush. This soaks through the tissue and dissolves the banana oil underneath, which then forms a strong bond. The undercamber on the wings means that the tissue must be stuck to the underneath of the ribs. Cover each surface as a complete item; do not separate ailerons, elevators or rudder yet. Cut a small 'x' at each eyelet and stick the tissue to the surrounding gussets. Water-shrink the tissue by spraying, then give the wings two coats of 50/50 thinned clear dope and the tail one coat.

When the dope is really dry, run a sharp knife along the aileron dummy hinge line and stick the tissue down into the groove where the false spar was chamfered. Carefully cut the gap in the trailing edge beside W4. Cut away the tissue at the hinge line of the tail surfaces, checking that the elevators and fin will move easily but not too freely.

The Lympne competition numbers were painted in black on white on both sides of the rudder and the underneath of both wings, as shown on the drawings. The proportions and geometry of the numbers seem to be as per diagram.



On the No.12 aircraft, the name SYLVIA II was painted in plain (presumably) white capitals each side of the forward fuselage. Edding rub-down transfer letters ref: 1802 (Helvetica Medium, 2.5mm) are just about right; possibly the initial S was slightly larger, in which case Normatype 29320 Haas-Helvetica 3.2mm will do. Number 8 had HUMMING BIRD in much more fancy letters, which will have to be copied from a photograph. Guess why I chose number 12!

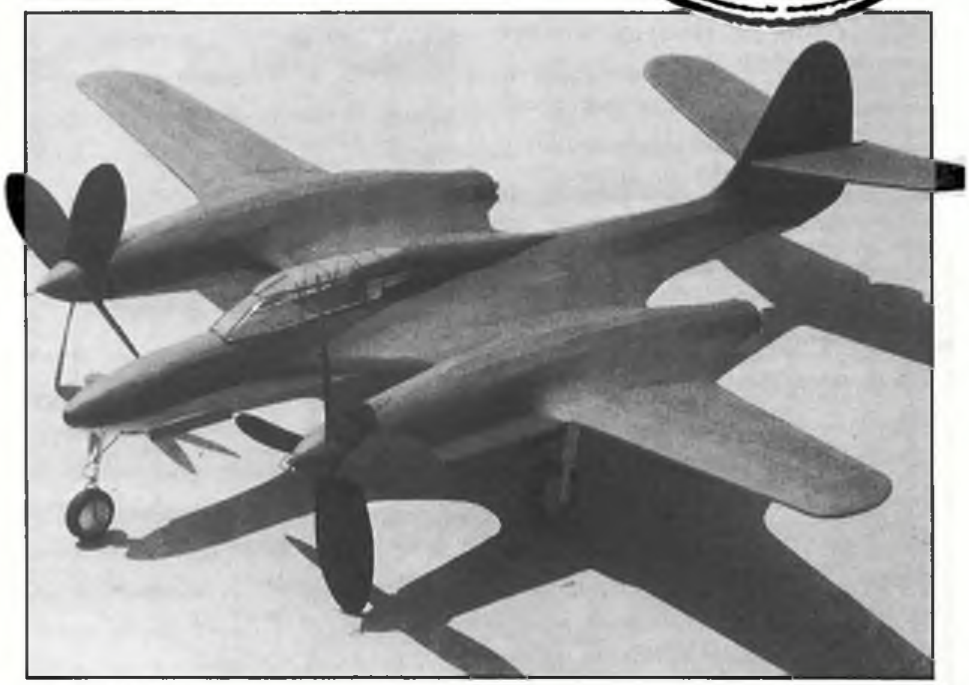
When the letters have been applied, the tail unit may be assembled onto the fuselage. Make blind holes in the tailplane gussets for the 0.040in. bamboo struts, which should be painted black before glueing into position with cyano. Before finally attaching the fin and rudder, make sure that the elevators do not foul the finpost.

Flying!

Guesswork and calculation both suggest a CG position about 33% to 34% of the wing chord back from the leading edge, and a small amount of Blu-tack was added at the nose to achieve this. As mentioned earlier, some of this weight can be usefully employed in dummy cylinder head details, exhaust pipes and so forth. The only way I can get a low-wing CO_2 model to fly safely is by trimming to fly left circles on both power and glide. Right turns always seem to lead to spiral dives. To keep the inside wing up in the turn, I detached the port aileron completely and re-glued it with enough packing along the top spar (yet another use for the 1/80in. sheet) to give a 'down' deflection of between 1/32in. and 1/16in. at the trailing edge. My model also needed about 3 degrees of right thrust, but the thrust line is so high on the DH53 that no downthrust was needed. Over the proverbial long grass, adjust rudder and elevators for a flat glide with slight left turn, then try a flight on low engine power. You may even need a touch of upthrust to get a decent climb. Choose a calm evening; this is not a model for a windy day...

Try Dick Howard's rubber-powered McDonnell XP-67 for twin fun

BUILD FROM OUR FULL SIZE PLANS!



Marvellous MOONBAT!

THE XP-67 was developed in the early 1940s as the McDonnell Aircraft Corporation's introduction to aircraft design and construction. Its first flight was in 1944, but poor performance of the two Continental XI-1430-1 engines caused cancellation of the project.

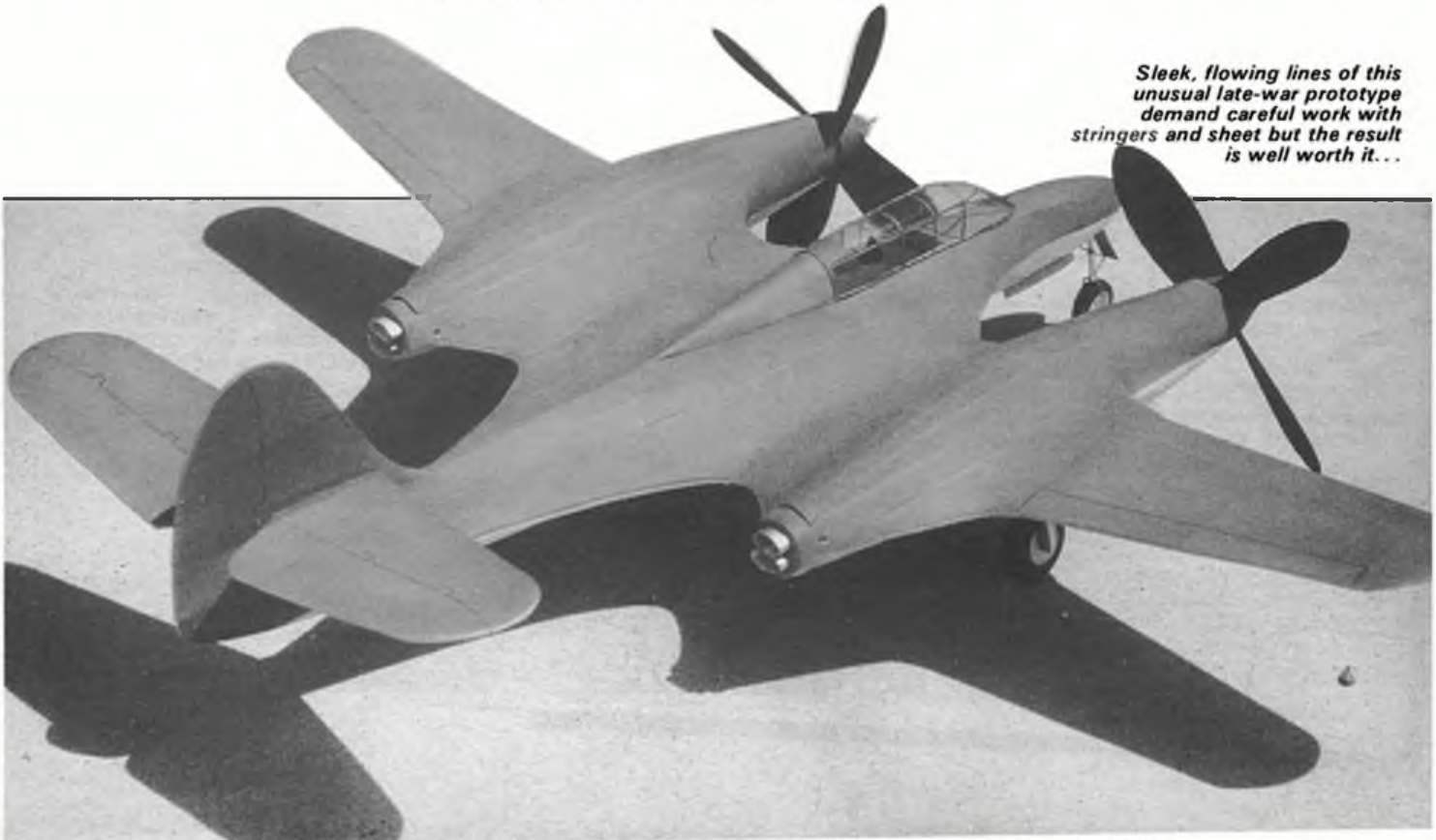
Let's go!

Construction of the model is, by necessity, different from the norm, as it is built on the plan view outline. Trace, photocopy or cut from the plan and glue into position to create the whole outline. My first model used laminated balsa for the outer frame, while the second used 1/16 x 1/8in. strip and 1/16in. sheet balsa. Laminated construction is stronger and lighter but it is more difficult to arrange, for the Moonbat is of complicated shape.

Since the fuselage, wings and vertical tail are built as one unit, this is the logical place to start. Begin by pinning down and glueing the frame outline, leaving it unglued at the tail. Do not fit the leading edge of the wing yet. Glue the 1/16in. sq. cross pieces at stations 2,3,6 and 7, and fix the 1/6in sq. rib bottom to the trailing edge, cutting them off slightly beyond the leading edge, to be trimmed to exact length later. Add the 1/16in. sq. nacelle side stringers, which extend to the trailing edge, and fit the cross pieces at stations N1 and N2.

Glue the 1/8in. sq. leading edge on top of the rib bottoms. Leave them over-length at the wing tips. Next, add the front and rear spars, making sure that the rib bottoms and nacelle stringers fit correctly in the notches. Secure with cyano. Add the rib tops, cracking them at the spar location.

When all has set, crack the fuselage cross pieces at the centre line by pressing with your thumb nail and raise one side of the structure 1.7/8in. to give 15/16in. dihedral at each tip. Glue the spar ends together, adding short lengths of 1/16in × 1/4in. as reinforcement across the joints. Now glue the frame at rear of fuselage.



Sleek, flowing lines of this unusual late-war prototype demand careful work with stringers and sheet but the result is well worth it...

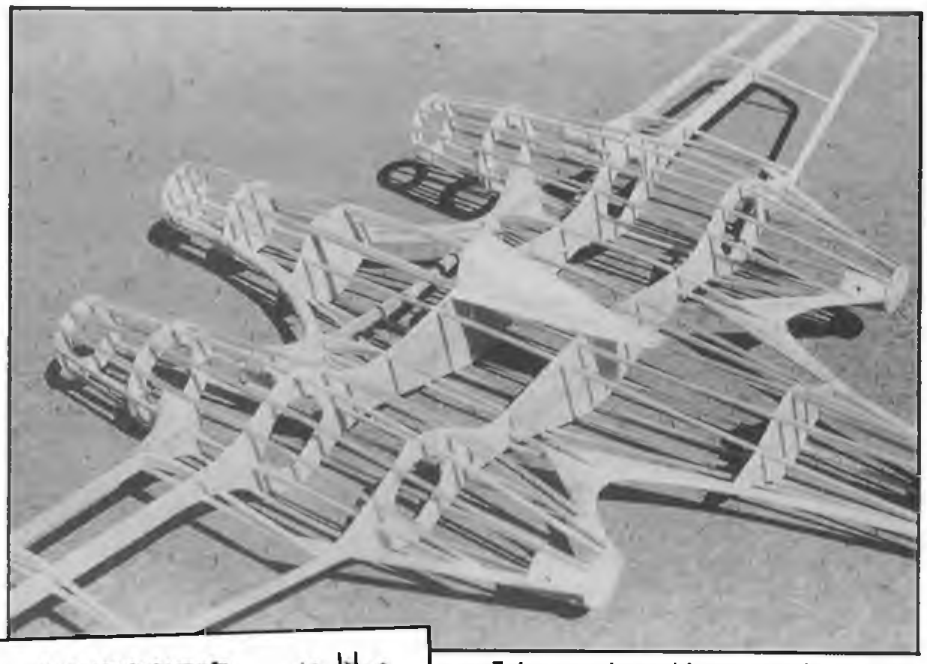
The frame can now be lifted from the board and the formers added. Former F4-3(T) is glued to the top of the front spar, and F5-N4(T) to top of rear spar. Add bottom halves of F4-N3 and F5-N4 to their respective positions. All other formers can now be glued in place against the cross pieces. Add 1/16 x 1/8in. reinforcing pieces to N3 and N4 as shown on the plan to allow for the motor cut-outs.

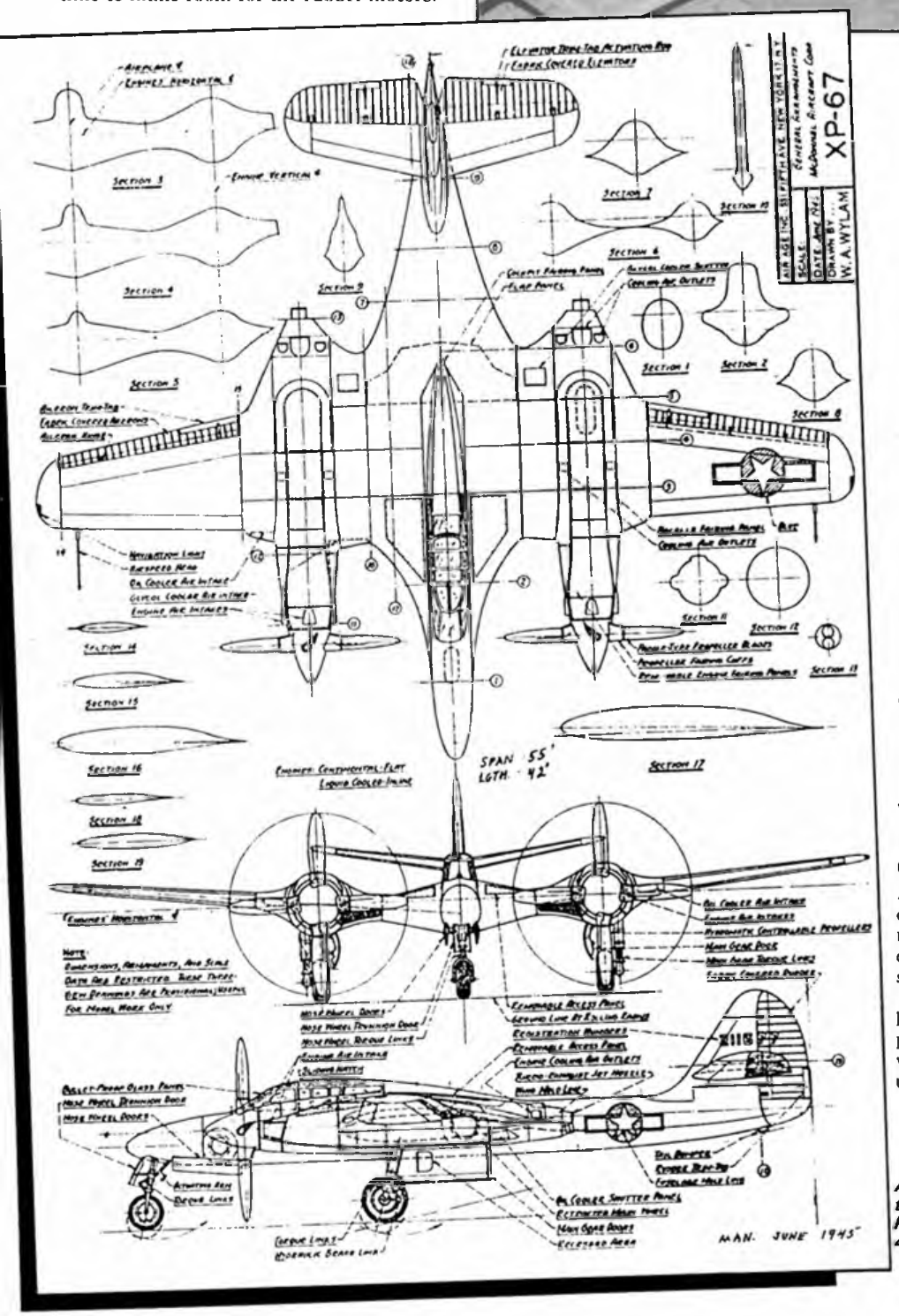
Glue the top centre stringers and bottom centre stringers in place, then add remaining stringers two at a time on top, then two underneath, and so on. Fit temporary braces between formers if necessary, to retain shape during this procedure.

Accuracy is vital!

The vertical tail outline is built on the plan, then set in place on the frame and ribs added.

With all the stringers in place, now is the time to make room for the rubber motors.





Take your time with construction. Build the outline first - a real '100% crutch' method!

Working through a hole in N1, drill a hole in N2, using a length of 1/4in. tubing notched in saw-tooth fashion. Enlarge the hole to size with sandpaper glued round a 1/4in. dowel. In the same way cut holes in N3 and N4.

Now comes the tedious part of adding the soft balsa fill-in pieces to give the smooth, flowing lines of the prototype.

Use 1/16 x 1/8in. to fill leading edge between rib bottoms, 1/8in. to the wing tips, and 1/8in. to W1-W2 top and bottom between F3 and the nacelles. Next are the fillers from nacelles to wing. Sand these to give a smooth transition in contour.

Add the nose block, 1/4in. nacelle front pieces and motor peg blocks, and sand to shape.

The rear of the cabin, from F4 to top stringer behind F5, can be covered with bond paper on 1/32 soft balsa. I chose to use paper with a 3/16in. flange at the bottom. The flange, which strengthens the turtleback, is glued to the stringers, and provides a surface for tissue covering.

The horizontal tail is built in two halves to be glued in the fin with ten degrees of dihedral.

The canopy was vac-formed over balsa mould (the traditional 'pressure-mould' method works just as well) and doped tissue strips applied with transfer tape create the framework.

Get ready to fly Moonbat!

Although commercial plastic propellers could be used, I prefer making contra-rotating props with blades cut from plastic dairy food containers and set in balsa spinners at 45-50 degrees.

My prototypes use motors each of two loops of 3/32 FAI rubber, 20in. long and pretensioned. Wind equally! Trimming is vice-free so go ahead and enjoy flying a unique shape...

And here's your documentation, thanks to Model Airplane News, June 1945. Full-size wingspan was 55ft; length 42ft. Our model scales in at 1/30th.

FROM THE HANDLE

Claus Maikis discusses proficiency at Stunt – a philosophy relevant to all competition flying...

FOR MANY years I've watched several pilots who never seem to improve. Sometimes they are in good form and have an unexpected success, but at the next contest they fall down again to a level of several years back. Usually the complaint is lack of sufficient practice. While this may be true in some cases I doubt that it's the only reason. As long as the pilot's mentality is the one of a 'Sunday flyer' and he doesn't mind placing at the end of the list, all is nice and well. But if he's unsatisfied with this situation (he usually is) it's time to look for the reasons. Obviously the talent is there, otherwise the occasional rise in performance wouldn't be possible. In my opinion, a wrong attitude to our sport is often the greatest hindrance to improvement. I can decide to be just a hobby flyer and have my fun at that level. If I can decide to participate in contests (besides, I can't see any reason not to do so!) then I should see it as a whole unit, and practising is part of it. After all, practising is not such a frustrating thing; but more on that later.

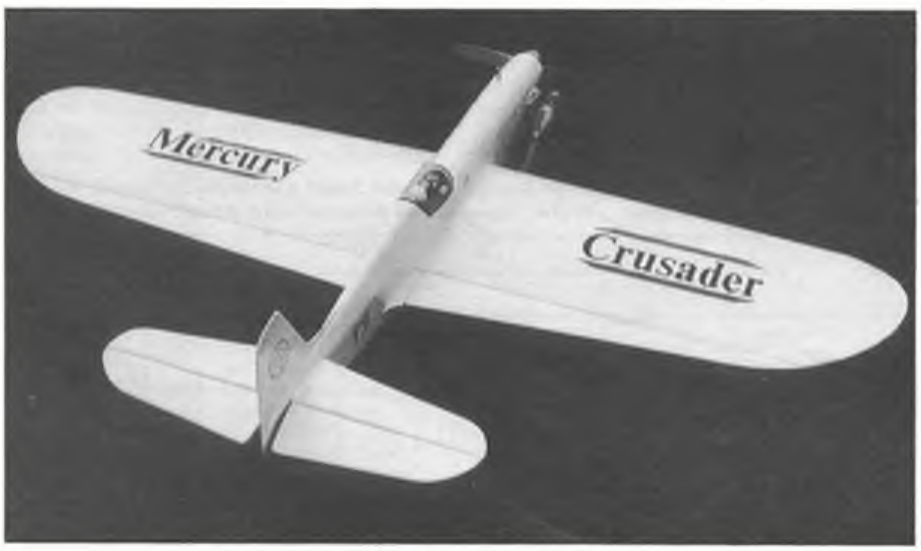
From my own experience I know that an attained level of proficiency is not proportional to the time expended and flights achieved. A learning process usually doesn't proceed in a linear way. Sometimes a plateau is reached, and only considerable additional effort will get you to the next step or any further. So it's clear that at some points in your career you simply have to work harder. It's like a barrier you have to overcome. Once you've done it, you don't usually fall back. You can then keep at this level with surprisingly little endeavour. The interesting point is that for some aspects of flying a certain level is absolutely necessary. Without it further improvement is not possible at all. I remember my own situation many years back when I moved to another town and consequently had the luxury of a (more or less) regularly available flying field. After a few months my flying had not improved, but my performance was much more consistent, and I didn't have to concentrate so much on the execution of manoeuvres. Only then was I able to watch my airplane in flight. I let my hand fly, so to speak, and concentrated on looking at the airplane and how it behaved – or didn't! From that time on I was able to trim my models.

A matter of procedure

One important part of my approach to stunt flying is to develop certain procedures. A procedure is a system which is necessary for consistent performance. It allows repeated success. Without it, in case of trouble you don't know what to do and have to guess. Helplessness is the last thing I need in the contest circle.

These procedures can start – if you prefer – right at home when you load your car with all the goodies. They continue at the flying field and include all those preparations before a flight. Most important: don't think they are useful only at the contests. They are also necessary on the practise site – actually, you must practise and develop them there! For instance, I always fly with a stopwatch. Besides preventing the unpleasant situation of the engine dying in the cloverleaf, it's the only way of learning about the influence of temperature on flight time, needle setting on flight time, needle setting on flight time, prop on fuel consumption, and so on. During practise flights I learn how to stop my engine at will without extraordinary and dangerous manoeuvres; besides, they don't look professional. Of course, this is only possible near the end of the flight. But I can do it at a safe distance to the seven-minute limit, and it looks as if I can do it at will any time! You asked how to impress the judges...

My regular flying field is a narrow R/C grass strip. The surrounding area is a cabbage patch of a field with bunches of weeds and mouseholes – a stunt flyer's nightmare and an absolute guarantee of a broken wing at every landing. I have to be sure to be able to land on the grass strip! Well, I have learned to make spot landings, and on some contest sites this has helped me too.



Right: Spotted at the '87 Nats – Ron Prentice's Mercury Crusader, K&B .40 powered, alas no more after a rich run caused loss of line tension... Below: Dion Beesley's fine Classic overcame fuel feed problems to perform well.

Procedures are helpful in the pit areas where you prepare for the official flight. Tony Eifflaender can confirm that a procedure is really needed when flying a diesel! Starting the engine is another procedure; I've covered this in the past. Also, other things have to be taken into account. Spend some thoughts on the schedule: there are some points where an engine cut means a catastrophe (the climb into a wingover, and the exit from the clover-leaf). However, there are other spots which seem to be dangerous, but with some precaution you can prevent the disaster. Think over the whole schedule, imagine that the engine is stopping somewhere (everywhere) and find the emergency exit. In some cases there's only one way; sometimes it depends on your preference. Consider landing inverted. Beginners in particular have an antipathy to this method but it may be the only way to save the airplane. You see, procedures are not only sequences of manual acts. They can include mental training too.

Observation

Consistently practised procedures will give you confidence in your equipment as well as in your abilities. Confidence can calm down those butterflies in your stomach. Besides these procedures I'd like to mention a few general rules which might help you to improve. What I won't give you is a guide to the execution of the particular manoeuvres. Jim Mannall wrote an incomparable article in the July 1973 *Aeromodeller*. This is one case where I cannot improve. Please read Jim's article - nobody can tell it better. There's a lot of advice on how to execute manoeuvres. A great help is to have a coach. It's all too easy to practise your own mistake. Preferably, the coach should be a competent flyer. A tape recorder might help the coach to record the errors (I think one cassette will do). I've even seen the Israelis using CB radio to instruct the pilot. Well, you can overdo everything...

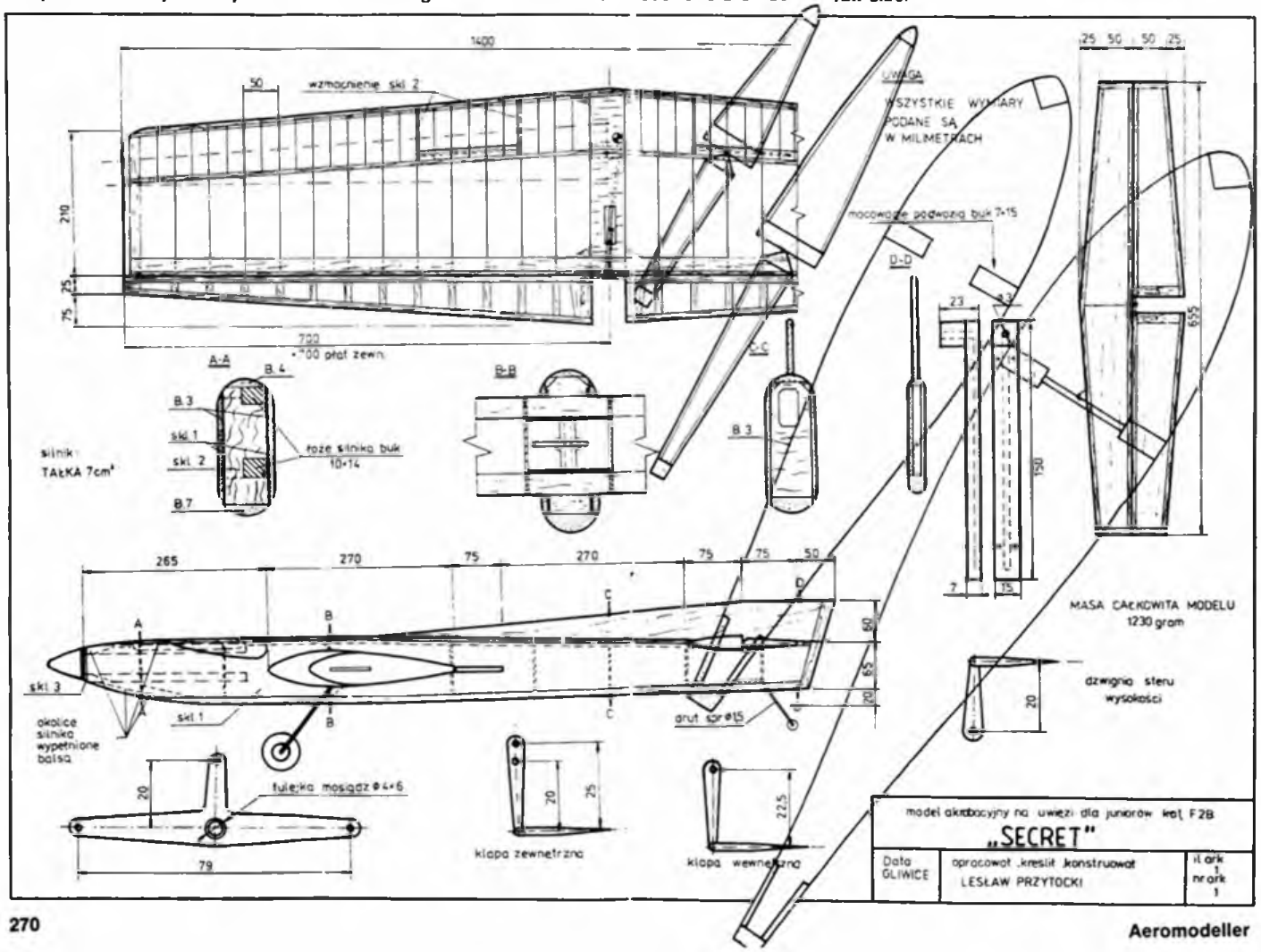
During your flight, watch the wind to see whether it changes direction or strength. If your tank size allows, you can fly an additional lap or two between manoeuvres to check direction, or wait for a better moment.

Usually I try to avoid this. After all, you don't know what the wind will decide to do in the next moment. In almost calm air the wind has a tendency to change direction; sometimes it can even turn 180 degrees. If possible I still try to fly manoeuvres in the same place; that is, away from the judges. In these conditions I'm prepared for this situation, so I will have set my engine a little faster anyway. From my experience flying before the judges' noses will cost more points than a mediocre manoeuvre against the wind.

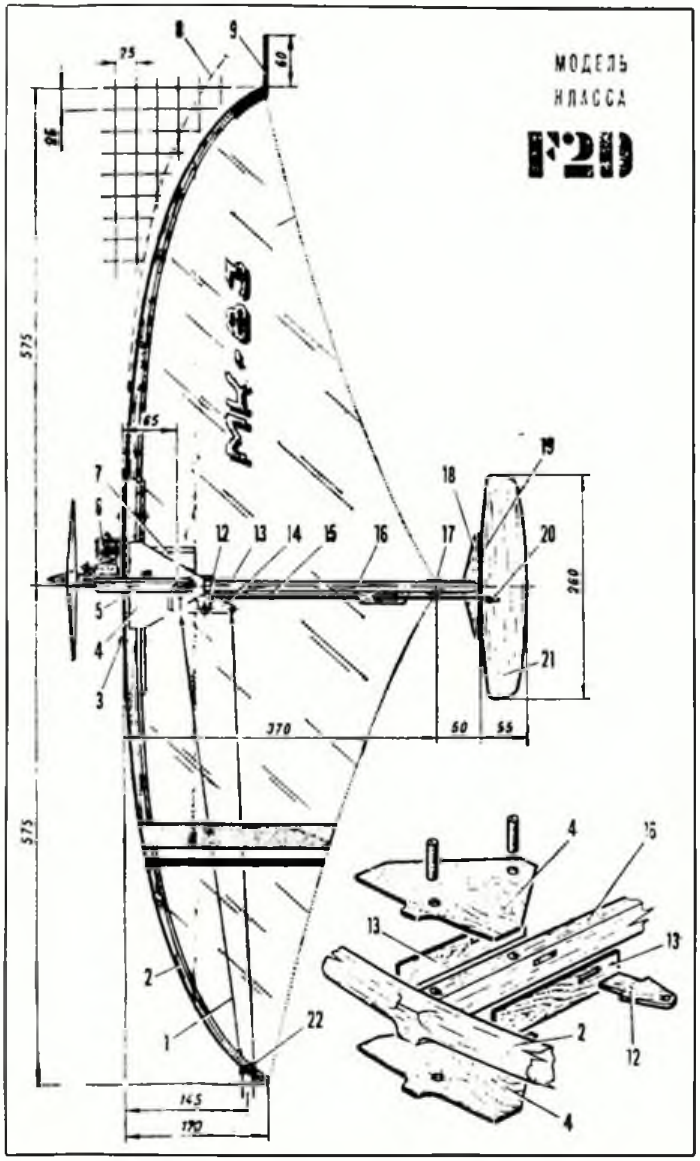
Conditions

I shouldn't have to mention that your equipment should be in top condition, and you must have necessary spare items with you. Nothing is more frustrating than - after a half hour drive to the flying field - to find a blown plug or a leaking tank with no possibility of replacing the parts. Make provisions for inadequate equipment, broken parts or changing weather. For instance, I always have a spare tank with me which is bigger than that in the model (you never need a smaller one!). Also, check your own condition. I never go flying when I don't feel like doing so. Flying without fun and concentration doesn't help at all. World Champions sometimes tell horror stories about how much they practise. If the champion's crown is your goal - well, then you have to pay the price; but first you should be sure that this goal is within your scope. Otherwise the result may be sheer frustration. On the other hand, it can happen that I wish to fly even if there is light rain. In this situation I go flying - only heavy British rain can then hold me back!

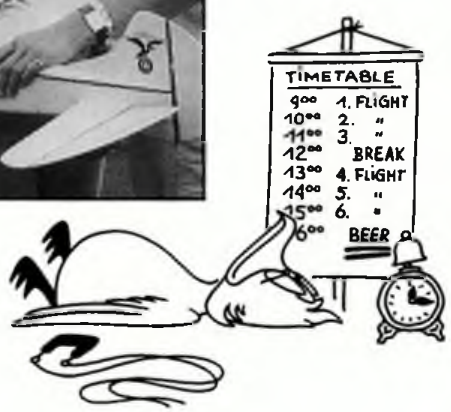
From the pages of Modelarz comes Secret, a Junior Stunt contender by Leslaw Przytocki. Straightforward cosntruction could adapt to a variety of shapes... Note: Drawing has been reduced, so sections are not full-size!



More Nats activity. Top to bottom: Barry Pickles adjusts the flaps on his Freebird; Terry Taylor looks happier with his model than his teeshirt slogan might suggest; and Team Eifflaender get down to the problems to help tony place third in the Gold Trophy.



Above: Unusual Russian combat wing features nylon or mylar covering, 'tensioned-bow' leading edge and wire T.E. Anyone care to try it?



For a pilot like me it's important to start practice flying early in the year, if weather permits. After a long winter break I need a lot of flights to be in form again, so the beginning of the season is sometimes sheer stress to me. I try to take it easy. Problems are there to be mastered. When you're back in form you feel much better. After all, you can't get anything for nothing.

When you have reached a satisfying level, practice flying can be reduced to an amount which ensures consistency. You'll soon learn how much you need. Everybody can - at least - reach his limit, but he cannot exceed it. With excessive practise one may be able to improve by a small percentage. This percentage, however, is much smaller than the percentage variation of one's daily form. Therefore you might increase your level through intensive practise by - say - three per cent, but a previous night's enjoyment of alcohol may well cost you 10 per cent of performances. I've heard it said! So take your choice. I feel stunt flying is strongly influenced by psychological factors. Try to be in a good mood the days before as well as during the contest. Of course this can't be planned, but at least conditions can be arranged. Usually I practise a lot two weeks before a contest, but then I try to relax and enjoy taking things easy. During the contest I value a nearby restaurant with delicious food and excellent wine. In the past this fact has certainly influenced my final placing at the Nationals!

VINTAGE CORNER

To the transmitter! Alex Imrie looks at the pros and cons of Vintage R/C

Very suitable for R/C Assist are these large models by Michael Barton (right). The Willis is 9ft. span, Merco 61 powered and uses three-function R/C. The smaller model is D.A. Russell's famous Cyclonic.

IF AN ENTHUSIAST scales-up a vintage free flight design (that is, makes it oversize), incorporates R/C actuated control surfaces which were originally fixed into the tail unit, overpowers the model with a massive four-stroke engine and then drives the result around the sky at speeds and in attitudes that the original never assumed in a month of Sundays, can he (or she) really claim to be indulging in this thing called Vintage? I fear not. Now, I say this not because I am a stick-in-the-mud traditionalist (*you are, G C*), but because I am a realist - do these present-day vintage builders ever pause to read a magazine or book on the subject from the 1930s or 1940s? I suspect not, and gather that they obtain their information from the regurgitations of old designs that are currently on offer in today's journals. Before I get myself cut out of somebody's will, let me say I don't decry the practice, but I really feel that a new name should be found for it since its similiarity to vintage is purely coincidental! However, it is the above type of activity that is now generally accepted as Vintage, so perhaps it is natural that there will be different attitudes towards this approach within the vintage movement as a whole. Regardless of what your particular viewpoint is, it is always worth listening to what the other chap has to say, and some interesting comments are given below in excerpts from readers' letters. If you have strong feelings about any subject allied to Vintage we would be pleased to hear from you. Maybe your interpretation will throw a different light on a particular aspect and so enable the rest of us to benefit from your approach.

Free Flight versus R/C Assist

It appears that there is presently rather more unrest than usual in the ranks of the vintage modellers about the merits or otherwise of fitting R/C to vintage power models. I have aired my personal views on this subject often enough in this column, so regular readers will know that I class the fitting of R/C as a non-authentic exercise; but the size and activity of the vintage movement today depends upon its use, so my personal likes or dislikes are of little concern to the bulk of the enthusiasts. Remembering the introduction of the R/C Assist idea some twenty years ago in USA, it is of interest that both free flight duration and precision competitions were tried with radio control fitted. However, the rules were that models would be flown in the old manner and points would be lost every time the transmitter button was touched. Some of the old dyed-in-the-wool free flighters ended up in the trees despite their radio gear, so competition minded were they that they would not cheat by applying an R/C command!

However, R/C is very much part of the model aviation scene nowadays. It is a facility that most present day modellers cannot do without, but there is a difference between flying a vintage model as an R/C model or flying it as a vintage model and utilising the R/C as an assist mode. There is really no compromise involved. If an R/C modeller wishes to build a vintage model and fly it around like a sports or scale model, putting some revered design into ridiculous poses, he can do it, but he will only be fooling himself and those of his kind if he calls it vintage. His problems, apart the lack of education in such matters are doubtless compounded by the provision of too many levers for him to play with! Now the other chap who makes the same model and fits rudder only R/C has had most of the temptation to overcontrol removed in the first place. He will hopefully fly his model in a vintage manner; that is, he will use full power for the duration of the engine run, and will have trimmed his model in free flight style to cater for this. The glide too will be without human interference unless (or until) some unacceptable obstruction presents itself. This might be the encroachment into some forbidden area due to the small size of today's flying fields - a tree that the flyer does not particularly want to climb or risk tangling his model with, or some other such hazard that was either not around forty-odd years ago, or if it was, present day outlooks label as being undesirable.

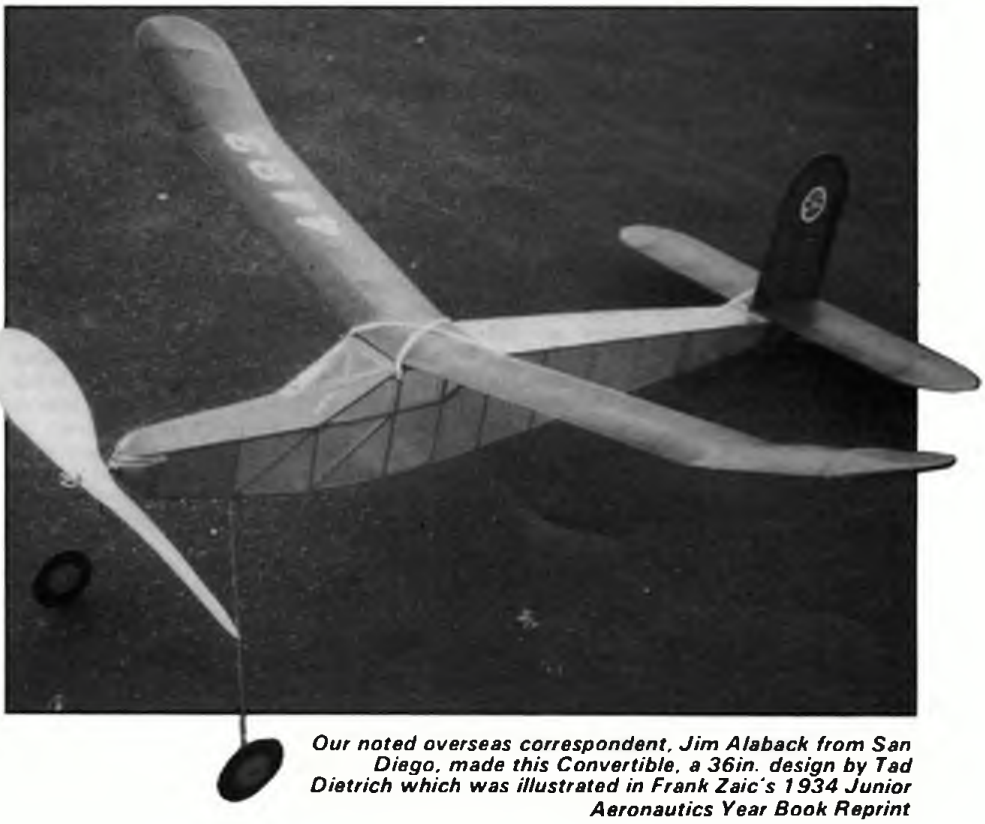
Unless lightweight R/C (like the Ace system) is available small power models like Gerry Brofmann's Spectre of 1942 are best left F/F. This one is powered by a PAW 1.49 diesel and was made by Stuart Ludar-Smith of Bishops Stortford.

Clive Taylor of Worcester made some structural changes to his DC Wasp powered GE Cabinette, a Frank Ehling design that was described in June 1942 Model Airplane News and again in Air Age Gas Models. Models like this 36.1/2in. high performance craft are best flown free flight with the engine run limited by the field size and weather conditions.

Guidance or not?

There is no doubt that if you want to fly, and fly a lot, you will have more chance of achieving this in this weather-forsaken country of ours (Alwyn Greenhalgh says that we don't so much have weather here as an experimental environment!) with R/C fitted to your vintage model than you will without it. I personally fly free flight and use a fairly small field; as a result I require almost still air conditions, so you can well visualise the number of times that I get airborne in the year! Owning some big models of seven and eight feet span with very flat, floating glides, I have my fingers well and truly crossed when watching their transition from power to glide. If the engine stops at the wrong place in the pattern or a bit more drift exists upstairs than was evident from the ground, there is repair work (or worse) ahead thanks to thorn and branch damage. I don't know why I submit myself to this torture; I suppose that I am happy thinking 'this is now it used to be', but in all honesty a little R/C installation working the rudder to guarantee that these models would glide back to my immediate vicinity would be a worthwhile investment. I have been promising myself such a refinement for years (especially for the larger models) but it appears that the lure of the wild blue yonder is too strong!

Now, a chap who took the plunge some years ago, and who confirms that he did far more flying with his KG3 and Vulcan by this means in six months than he had previously logged with them in 15 years, is Noel Barker, who is absolutely sold on the terrific advantages that R/C gives the vintage modeller. Noel should know, of course, for he got his fair quota of free flight over the years having been at the business since 1938 when he was an Aircraft Apprentice at Halton, but he sees in R/C that something that removes the more distasteful aspects of model aeroplaning like climbing trees and pursuing rapidly-disappearing distant specks over unfriendly terrain.



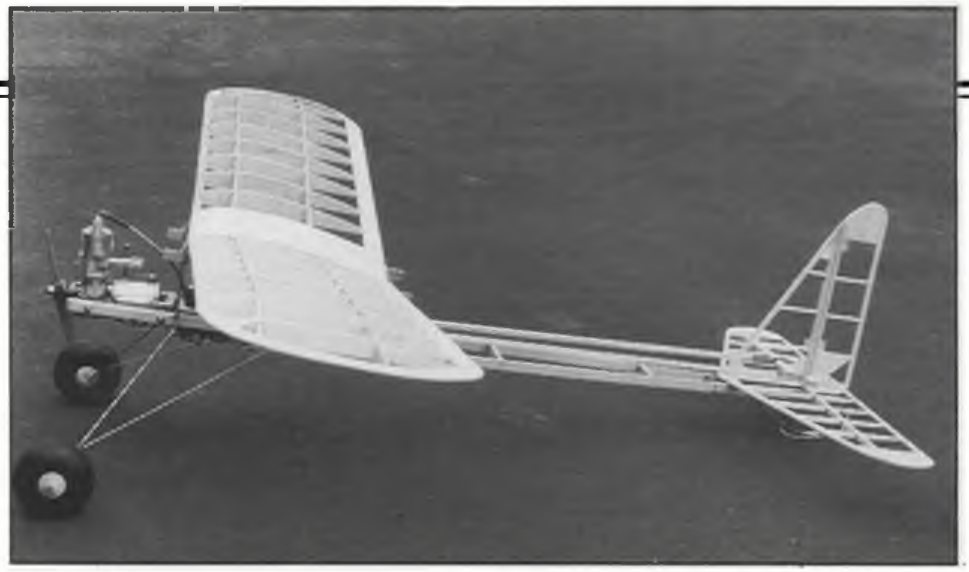
Our noted overseas correspondent, Jim Alaback from San Diego, made this Convertible, a 36in. design by Tad Dietrich which was illustrated in Frank Zaic's 1934 Junior Aeronautics Year Book Reprint

Boring recipe?

Another mature modeller who sees the virtues of R/C is Denis Fairlie, and although the following interesting account that he has written is not merely devoted to the vintage model it contains much that is relevant. Over to Denis:

'I am quite baffled and dismayed at the seemingly constant sniping that goes on against radio controlled models. Most R/C flyers have progressed from F/F into R/C yet many people seem to have a fixation that the quite elementary airframes of the old F/F models are the "only way". At times I feel they live in a closed world, never seeing the R/C magazines that contain models vastly more demanding than those of F/F. Make no mistake, given a calm summer evening and suitable ground, I greatly enjoy rubber powered F/F. But the whole business is so limiting. As David Boddington once said to me when I was still a mere free-flighter "What possible advantage is there in chasing downwind to retrieve a model?" Too true – even more true if the said F/F model finishes in a tree or bush!

'However, I do regret the fact that R/C



Right and far right: This Flying Aces Stick (designed by Effinger and Petrides and described in Flying Aces, September 1936) was built by Jim Alaback of the San Diego Aeroneers (SAM 41). He uses a Wahl repro Brown Junior for power. Initially the model used visible pushrods for linking the servos to the control surfaces (elevator on starboard side of the tailplane only) but the writer talked Jim into changing these for the less prominent snakes seen in the photo of the covered model, which is finished in blue with orange sunburst on wings and tail as per the original machine.

has promoted the extra large models and the ARF kits. That the kits have attracted people who have no previous aeromodelling experience is to be expected; however, as a modeller in both activities I can assure anyone that real R/C is far more exacting a skill than F/F trimming. The regret of it all is that now R/C attracts people who are only interested in flying; building and designing is avoided by many newcomers. In this sense both the R/C ARF kits and the vintage movement could accept responsibility. The kit manufacturers offer no requirements other than assembly: the vintage rules tells us that we must not originate any new designs, only build what was made before, or rather to make an even narrower choice, only that which was published in yesteryear.

'This is a recipe for boredom. How can one go on building over and over again the same designs? No doubt the vintage movement has revived many an old modeller's interest, but there are just as many exiting due to over-narrow rules. In my own club for example, I see fellows who have built all the "oldies" they need. They are now reverting to original designs. Another problem is that flying grounds are limited, and if the only source of a flying ground arrives from an "organised event" that promotes only one type of activity (even worse, one type of model) we are all going to suffer. Even today I know committed modellers who no longer go to main events to participate since the venue limits the type of model they can fly. If someone turns up with an "original" design they feel it necessary to apologise for the entry. Sometimes they feel they are not welcome. What a poor reward to all those modellers of the past, to find the outcome of their original designs was to merely impose a clamp on future modellers!'

To comment briefly on what Denis writes about the 'recipe for boredom'; the resurrection of the old designs is the main activity of the vintage movement, and although one sees many examples of the popular models, every year we do seem to keep unearthing designs from the past of which most have not previously been aware, far less have seen built-up as models, and this variety offsets the vast numbers of the better-known models that dominate our events. I think that it was to be expected that modellers who saw vintage as another avenue to be explored for R/C would revert, after having built a few examples of the oldies, to their hotter and more demanding sports, pattern and scale models (at least then they have greater freedom and don't have vintage nit-pickers finding fault with their building or flying!). The problem of flying ground availability is well understood, and it is especially nauseating, after travelling to a model meeting to be told 'You can't fly that thing here!'

Protection

Peter Valentine of Ickenham is also moved to write to us in support of the R/C of vintage models and indicates thus his views:

'The reason for using radio at Old Warden is simply to protect the model in order to fly another day, and also to have a long enjoyable flight within the confines of the aerodrome. The ideal radio is three channel: rudder to return the model to base, elevator to penetrate a stiff breeze and motor control to fit a large tank in order to maximise the enjoyment of seeing these old shapes in the air and to bring them down when the Old Warden hooter goes. The patterns flown are laid down by the organisers in order to reduce the risk of collisions. I feel that David Boddington and his team do a first class job. For safety the maximum number of models in the air at any one time is about eight and one can't book a second flight until everyone has had his, or her, first flight. The 'her' I refer to being Lesley Anne Young flying her old timer. The attendances at Old Warden are surely positive proof of the large numbers of people attracted to the hobby.'

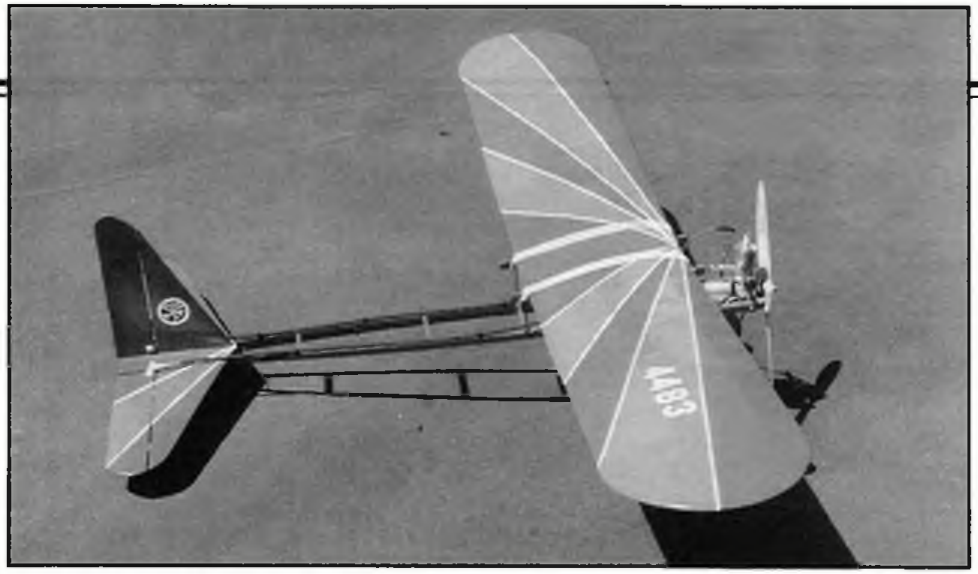
On the question of enlarging or reducing existing designs Peter says: 'I see nothing wrong with scaling up or down. I have had enormous pleasure, still do, from my Super Scorpion (1 1/2 times) so I consider what is good enough for Jim Travers and Mike Whittard is good enough for me. I first scaled-down when I was a teenager back in 1947. A lovely design called Black Magic had just been published in *Aeromodeller* (Sept 1947). My only engine at the time was an Amco .87 so I had to scale down Black Magic to fit.

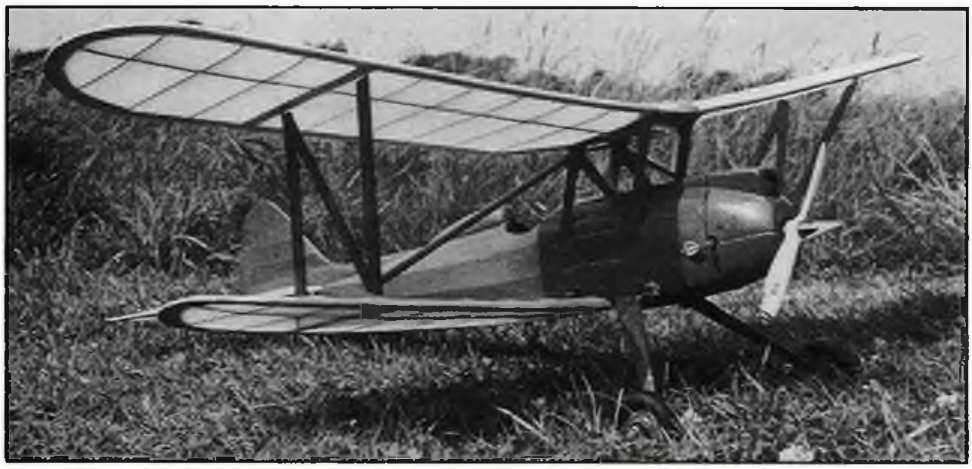
'Ben Buckle did more for the vintage movement than anyone else in recent years to bring the old timer designs to the notice of the average modeller. Ben seemed to have no inhibitions about including rudders and elevators on his plans; he also scaled up the Junior 60 and called it the Majestic Major. What was good enough for

No R/C problem here! Ray Jenyon of Timperley with his Denny Black Bullet rubber model at Old Warden last year. This model was later kitted by Skyleada in U.K.

An accident investigation team would be interested in the position of the main airframe components here! Regardless of how posed this picture masy look, I can assure readers that no one disturbed any part since the model's arrival at high speed...

Dave Larkins of the Canadian Army, serving in Belgium, brings his 35-year-old Frog Firefly, powered now by a Doonside Mills .75, to Old Warden each year. Dave rebuilt this model from remains that had lain under the bench for 25 years... old models never die!





Ben should be good enough for all of us. It is important at this point, to say that the feelings of all the R/C people to whom I have spoken are of respect towards their free flight colleagues as they commit their often superb creations to the air without the protection of a radio. I remember years ago people like John Haggart, Ron Raddon and Noel Barker, complete with straw hats, showing the way it used to be done. The real way to show people the way to the future is by giving the right example, not by knocking them. In any case people do their own thing regardless.'

Peter's views all seem pretty fair but I would like to comment on his statement of scaling up or down. I know that this is popular and some people appear to have done it in the old days. Personally, I don't like it unless there are instances of commercially produced scalings. I can't really say why, it's just a liking that I have for the old models in the sizes they were then, I suppose. I remember well that the thought never entered my head to do this say, in the late 1940s. When I made CE Bowden's (68in span) Contest for my Phantom Model G Petrol engine I also possessed a Frog 100 diesel at the time but never considered making a reduced size Contest for it; yet, when C E Bowden produced what was just that, in the form of his 48in. Meteorite, I made that too. *(Peter Valentine's point is surely that his Amco was his only motor. GC).*

Above: Semi-scale has an attraction all of its own. For one thing, no-one can criticise the finish and markings, as they might a scale model! This is Jack Humphreys' MS Wasp, a 1950 design by Tommy Kennedy. Plans are still available from The Model Shop, Newcastle-upon-Tyne.

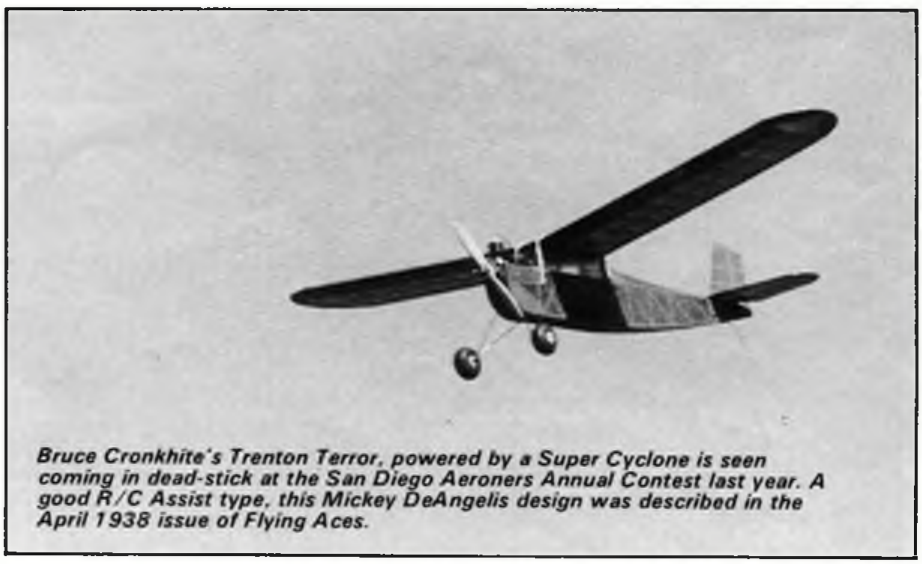
Colin Firth of Skegness with his Vintage Style twice-size Victoria Parker which he modified to incorporate many design features that he personally favours; seen at Old Warden last year.

Above: Described in Vintage Extravaganza last November was Charlie Havis' 1946 Bowden Trophy Winner, a design by Alec Wilson of Hayes that dismantles into quite a small package thanks to hooks and rubber bands at the tail unit and outer wing panels.

Henlow, Henlow, Henlow...

Held at Henlow Sport Hall on Sunday, 7th February the latest Swopmeet really proved that the previous successful meetings held at this venue were not flukes! Comfortably warm, correct in size, with refreshments laid on, this is an ideal place (especially during the winter months) to hold vintage get-togethers. This one attracted almost 100 enthusiasts who not only brought along unneeded 'junk' they had been harbouring for years but also showed-off their latest acquisitions to make others drool! Engines seen included Tony Penhall's Atom Minor, which defied attempts to demonstrate its running capabilities (the old story - it ran OK on the bench at home!). Brian Ferrett's Grayspec 15cc petrol engine was a particularly fine example, but it used a normal needle valve instead of the standard Gray float carburettor; and we also saw Peter Lilley's fine Japanese OS Type 6 replica, one of the first to reach this country. This is a reproduction of the first quantity-built ignition engine made by the OS company in 1937. Beautifully crafted, it comes complete on a green-painted wooden mounting with all electrics - very nicely presented indeed, and although I am not a replica-engine person, this one could turn my head! The afternoon passed with buying, selling and trading engines, old kits, plans, magazines and books. There was something there for everyone. All agreed that these Henlow sessions are the high points of our modelling winter (after the ME Exhibition, that is!). I recommend them to all. Although they are organised by SAM 35 member Peter Harvey, non-SAM members are welcome. Do come to our Autumn meeting!

Fitting R/C may not be the end of your troubles, but merely the beginning of other problems that you never had with free-flight! This beautiful four-stroke R/C stroke Buccaneer came to grief at Old Warden during Vintage Weekend - for no apparent reason...



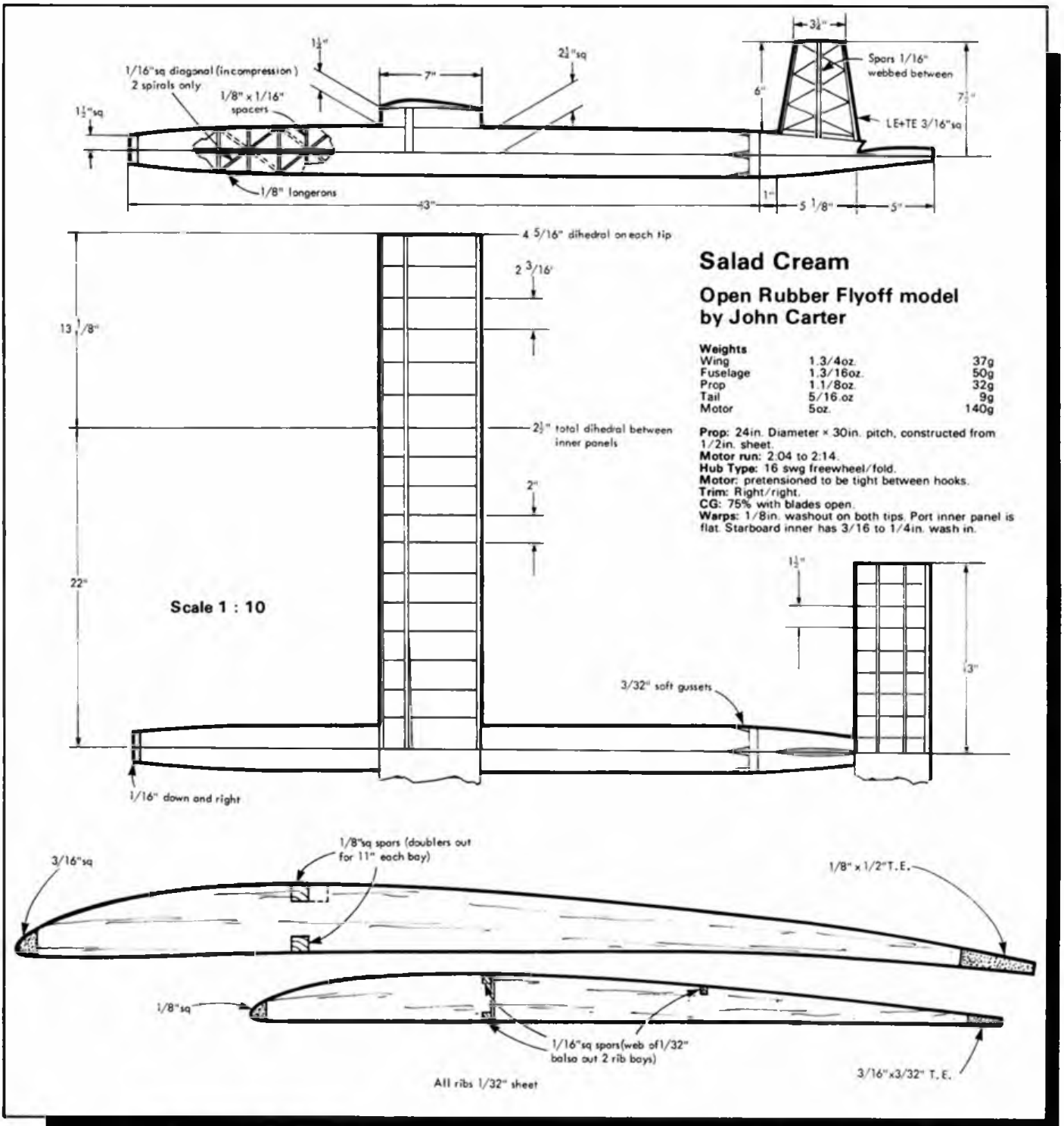
Bruce Cronkhite's Trenton Terror, powered by a Super Cyclone is seen coming in dead-stick at the San Diego Aeroners Annual Contest last year. A good R/C Assist type, this Mickey DeAngelis design was described in the April 1938 issue of Flying Aces.

FREE FLIGHT SCENE

Dave Hipperson begins this month with a look at John Carter's Open Rubber Flyoff model

SALAD CREAM is a perfect example of how it is possible to build a large model very light if it is kept compact. A huge wing of nearly 500sq in is kept down in span with a modest 10:1 aspect ratio and is linked to a stumpy fuselage and quite modest tail of a mere 26%. Nevertheless, John manages to cram 5oz of rubber into the 43in. motor section by virtue of pre-tensioning down what must be a raw motor of at least 58in. This requires a freewheel-fold system with the motor still tight between hooks even after all the turns have run off. The fuselage diagonals are arranged to absorb compression loads only and there are just two spirals – once again the very minimum for torsional stiffness, even with 1/8in. longerons. Actually, I would consider 37 grams for a finished fuselage even of this truncated length a real achievement given all that surface area of tissue, and dope. I know John is never frightened of using the very lightest of wood, but I bet it weighs a lot more now after a couple of years' flying.

Other unusual features are the thin wing and tail sections; only 8%. This of course has its advantages in reduced drag, both induced and 'head-on'. However, it makes building a light wing much more difficult. I would consider John's spar arrangement allied to 1/32in. sheet ribs the very minimum for flight loads. This is a design that looks to be crying out for a web between the spars; at least down the centre sections. Of course this design would be considered at its best in virtually zero drift anyway with that size of wing. John would probably not claim any greater still air



performance from this layout than a good model of half the size but in light lift, no matter how slight, a model with such a slow sink rate on the glide as this will inevitably fly the longest.

Sometimes John gets it into a real thermal. At the Southern Gala a few years ago I was congratulating myself on a flyoff of a little over 11 minutes with my big model when this one of John's floated over my head still at climb height and on its way to a 20-minute flight. Oh, I was sick...

1st SMAE Area Centralised event: 24th January

Traditionally the SMAE Area contest calendar has started around early March each year. It was brought forward this season as a bold (some might say misguided) step to utilise that very early part when although it is cold, conditions are often ideal for flying; lift is at a minimum and fields and trees are free of growth. Worries that the three east coast Areas would be snowed in, although very real, were unfounded on this occasion. In fact - just the contrary. The weather dished up was absolutely typical for March, countrywide!

So much for that experiment.

Northern venues had much snow lying until the night before when a tremendous increase in temperature melted the lot in a few hours, leaving the ground very waterlogged. Chas Plant flying Glider at Driffield split up an otherwise Bristol & West domination despite a dropped flight of less than a minute. Ron Audley's winning score at Merryfield comprised three maxes and a final couple of flights of around two minutes despite a slight improvement in the weather at this time. It was mild, overcast, windy but dry - very similar to other parts of the country. At least flying in the winter had levelled out the variations in conditions from venue to venue!

John O'Donnell fared less well at Driffield when what could have been a formality went badly wrong after winding gear broke on nearly full turns in the Open Rubber flyoff. Stuck with a blocked winding tube and little time he had to make the best of it with a hastily and under-wound replacement motor and no tube to protect the fuselage. The air he launched into was also unforgiving. At the same venue Gerry Ferer's model dived in because of a broken longeron. Reg Uden used one of his trusty Skywalker 60s to snatch 3rd place at Beaulieu, but it was Nigel Lee who made the best flight of all at Ashdown Forest when the wind slackened at flyoff time. It also eased somewhat for Neil Cliff's similar effort at Bottesford. Bottesford had proved alarmingly turbulent despite the relatively uncluttered upwind countryside. This was probably as much because of the huge quantities of water on the ground playing havoc with the lift than the presence of any real obstructions.

There was an extraordinary coincidence at this venue. Russell Peers' first comp flight had ended in some very distant main grid power lines - enormous affairs. The model - or the remnants - could clearly be seen all day hanging from the wires. Russell's further efforts were to end in disaster when a gust caught his last launch and piled the model in, leaving him with only two maxes. Then at the end of the day when Cliff flew off in Rubber and Payne made his Power flight the wind had abated somewhat; Cliff's four-minute-plus flight was gliding in front of the lines close to Peers' 'remains' when it just stopped flying! It too had been caught in the wires. Only minutes later Peers' model then fell out! Cliff was not so lucky and it was a few days before his model blew free. It was found that the motor had been burnt through at the prop hook end and the propellor itself was missing. There were also numerous small burns elsewhere on the structure. The result of extremely high voltages streaming off into the air through the model?

There were no such frights at Sculthorpe where Julian Hopper put each of his maxes outside the perimeter fence and still had some repairing to do after each flight. It was worth it. He topped the results with a fine 6-minute-plus flyoff to win his first trophy of the year. Five more to go, Julian! Trevor Payne's flight - taken a few minutes after Cliff's at Bottesford - cleared the power lines but was not enough to challenge for better than second place. Pete Harris' full score was completed so

SMAE 1st Area event: 24th January

F1A KMAA Trophy and Plugge points (55 flew)

1	R.Audley	Merryfield	11.35
2	C.Sharman	Merryfield	10.56
3	C.R.Plant	Driffield	10.10
4	G.Pink	Merryfield	9.30
5	C.James	Beaulieu	9.27

Open Rubber No trophy (17 flew)

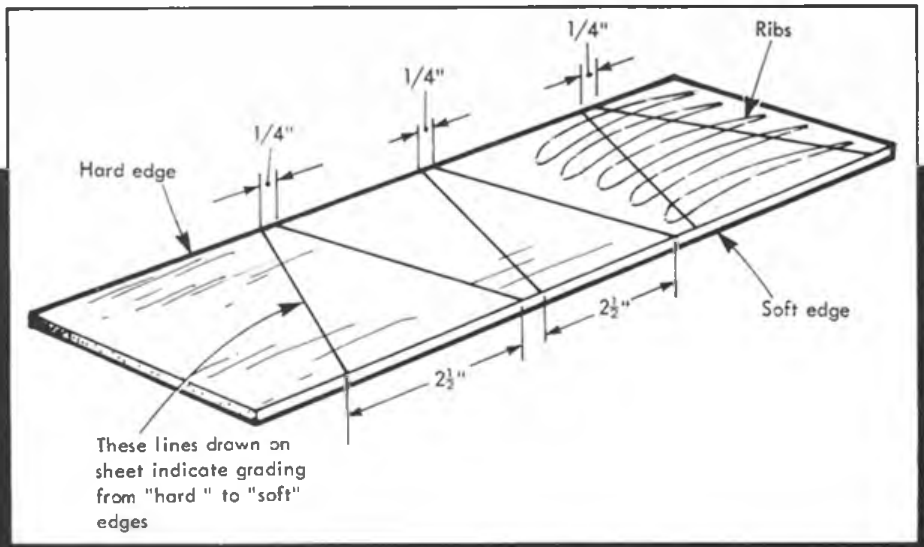
1	N.Lee	Ashdown Forest	7:30 + 4:42
2	N.Cliff	Bottesford	7:30 + 4:21
3	R.Uden	Beaulieu	7:30 + 3:40
4	J.O'Donnell	Driffield	7:30 + 2:57

Open Power Frog Senior (9 flew)

1	J.Hopper	Sculthorpe	7:30 + 6:01
2	T.Payne	Bottesford	7:30 + 4:42
3	P. Harris	Bottesford	7:30

Plugge points after one event

Bristol & West	292
Biggles	212
Anglia	202
Vikings	198
Crookham	197



All models, not just competition F/F ones, benefit from careful wood selection.
Try this tip...

Rib weight selection system

The density of a sheet of balsa, particularly if it is quarter-grain as favoured for ribs, invariably varies across its width; sometimes dramatically. This can be useful because ribs cut from the harder edge can be kept aside for the inboard areas of the centre panels, at dihedral breaks and for tip ribs. Ideally, the remainder can be spread evenly along the span of the wing with the heaviest at the centre, progressing to the lightest at the tip. However, have you ever tried to decide which of two ribs is the lighter after they have been cut?

There is a very simple way around this. Before cutting the ribs draw a couple of lines across the width (or widths) of sheet that you intend to use. Taper the lines so they meet at the 'heavy' edge and are, say, a good 2.1 2ins apart at the 'light' edge. (Lines drawn lightly in pencil will be quite sufficient.) Now after cutting the ribs and the inevitable jumbling-up, their relative weights can be seen at a glance by the distance these lines are apart. 'Heavy' ribs will have the lines closer together, and the farther apart the lines are the lighter the ribs will be. If you intend to cut up a complete sheet it is best to arrange the 'taper' of the lines so they occupy the same station.

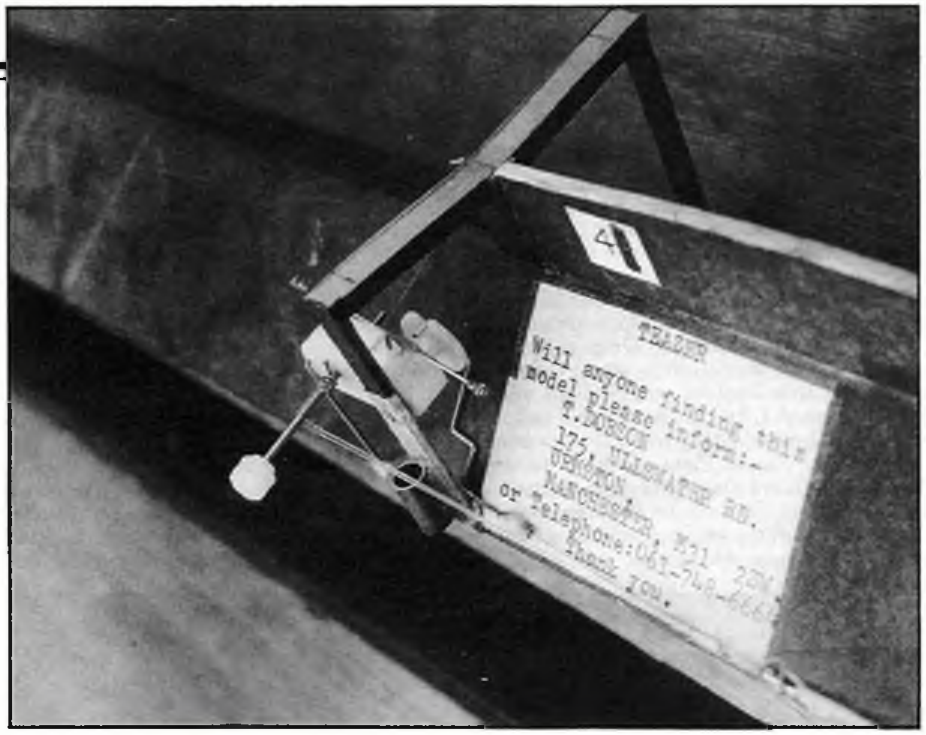
close to the end of the day he had no time to retrieve and return for the flyoff; presumably he had used two models already.

Plugge Cup holders Bristol & West scored only eight points short of a maximum possible in Glider. They could only have managed that if their three best men had actually tied for 1st place. What a start. The rest of the clubs 'in the hunt' are the usual names but the flying of Pink, Sharman and Audley has already put Bristol & West a clear 80 points in the lead!

SMAE Winter Open Meeting: Bottesford, 14th February

Some of the limitations of this new site became evident quickly during this first Centralised event. Competitors retrieving extended maxes were soon exploring unknown territory off the north edge of the drome. Many of the fields were cropped - admittedly very early sugar beet and oil seed rape but where was all that sheep grazing country? Almost as discouraging were the lines of trees and small woods. Even though these were some way out, flights DT'ing a little long on the 2:30 max were reaching them in the 20mph breeze, which seemed to pick up slightly towards the end of the day; by the flyoffs models were reaching the woods comfortably.

After a lot of rain beforehand the day itself was pleasantly dry with constant light overcast damping out any strong lift. This was lucky, considering the closeness of the hazards. Launch point was on the southern edge of the drome where a sizeable hedge offered local protection from the southerly breeze. However, this didn't help models for more than a few seconds after launch and numerous competitors were seen to release quite a long way out of wind, such was the barrier effect. Although most models suffered a slight hiccup when they got the full force of the wind the general airflow was smooth. Once away, few models had trouble.



Very intricate on/off stop mechanism on Terry Dobson's Open model Tomy timer DT system. Note snuffer tube for fuse facility at flyoff time.

The fliers having the most difficult day were undoubtedly the glider competitors who were faced with either towing on the debris-strewn old runway (which was dangerous and 'line-tangly') or running in the tiny sugar beet plants which was to be avoided - and next to impossible anyway, such was the softness of the waterlogged soil. It was particularly commendable therefore that Dave Brawn managed to qualify for the Vintage flyoff with a Lulu.

This was the only glider to max out - an achievement, notwithstanding the longer line allowed in Vintage. What made Glider even more difficult was that the lift was so slight. Joe Flynn was lucky still to have a model after his first effort when a couple of young locals were persuaded to give it up after they were found to be walking off downwind with it! Likewise a few of the short Power flights were receiving more than their fair share of attention from these lads - one flier spending many hours searching before he eventually discovered his model tucked down the side of a hanger, rather upwind of where it had landed! Be warned when flying at Bottesford - there are children who obviously know the value of our models...

Thanks to encouraging weather forecasts, attendances were high for a February meeting and entries were spread evenly through the classes. The one

Steve Fielding at Bottesford with his third-place OS powered Slow Open model.

Dennis Davitt used this very practical Apex vintage design to reach the flyoff at Bottesford.

John O'Donnell releases for first comp. flight at Bottesford. Challenger went on to max out and win the flyoff.

notable exception was Open Power. It was as if my predictions last month had come true already. Despite the 10sec engine run still in force this season, power fliers are already deserting Open in favour of Slow Open, even though Slow Open should in theory be more difficult! Once again it wasn't a .40 model that won. On the contrary, Eric Redfern was flying a very well trimmed 1/2A, the wings and tail of which showed distinct Slow-worm parentage. Steve Fielding had to be content with 3rd place this time, opting to leave his hot Beatnik in the box to use instead a slightly smaller but just as well adjusted OS-powered model.

Trevor Payne's three perfect flights in Open Power were enough to win, as Russell Peers had another bad day with a misbehaving model that eventually dived in hard and was lucky to escape with scratches. The two events that went to flyoffs were Open Rubber and Vintage. Control was moved to overfly more of the drome, which was logical, but unfortunately it didn't mean the trees got any further away!

Vintage was first and the wind hadn't really slackened. Conditions were generally unhelpful. Strachan's Lanzo was climbing slowly, as was Davitt's Apex. Even O'Donnell's successful Challenger didn't seem to be getting that high but his glide was excellent and he took first by a minute. This Challenger must certainly be the model to beat on the vintage circuit at the moment. It has improved enormously ever since the

***Below:* This very tidy Senator was given an airing at Bottesford. Flew well but didn't max. *Bottom left:* Pete Gaunt's interesting Open Rubber design. Rolled fuselage is light and practical especially for the rough and tumble of the comp flights. Full house achieved at Bottesford but model was lost on last max - so no flyoff.**

***Right:* Trevor Payne's Bottesford winning Open Power model. This model was also 2nd at the 1st Area Meeting a few weeks before. Lurid fluorescent green wing tips!**

fuselage was demolished at Woodbury last year.

Flyoff times were rather below average (apart from JOD's). Everyone else seemed to suffer varying degrees of sink which prevailed right through both periods. It was perhaps into slightly less sink that Hipperson launched towards the end of Open Rubber with a very delicate model, unflown for five years and built around the time when lightness was thought to be the most important criterion to Open Rubber performance! It was a miracle that the model held together at all for flight - it certainly didn't when it hit the downwind trees! Anthony Ball's flyoff even later class was made right at the end and although he benefitted from less drift and landed in front of the trees the sink was still there.

Retrieval of the flyoff flights proved a wearisome task in the glutinous mud and dense woods (much of which was dead vegetation, flooded by swollen streams). It all had to be negotiated in the dark. Tough!

SMAE Winter Open Meeting, Bottesford: 14th February

All classes flown to 2:30 max

Open Glider (9 flew)			
1	J. Cooper	7 04	
2	J Flynn	6 26	
3	J. Cuthbert	6 13	
Open Rubber (11 flew)			
1	D Hipperson	7 30 + 4 36	
2	A Ball	7 30 + 4 07	
3	R Peers	7 30 + 4 03	
4	J Carter	7 30 + 2 44	
Open Power (2 flew)			
1	T Payne	7 30	
2	R Peers	2 15	
Vintage (8 flew)			
1	J O'Donnell	7 30 + 4 45	Challenger
2	C Strachan	7 30 + 3 46	Lanzo
3	D Davitt	7 30 + 2 47	Apex
4	D Brawn	7 30 + 1 56	Lulu (glider)
Slow Open Power (10 flew)			
1	E Redfern	7 23	
2	A Hall	6 58	
3	S Fielding	6 36	
4	K Woods	5 59	

Slow Open Power - the first six years

Our newest free flight class has now been with us for six years. It doesn't feel that long. Its introduction was at the aptly titled SMAE Experimental event in February '83. Later that year full rules were drawn up and passed through Council for the '84 season. At present those original rules stand unaltered. Incidentally that original event was run to a seven-second power run and a two-minute max. How prophetic! Maybe that had some bearing on the fact that only four flew in the class, compared to nine in Open Power the same day.

Since then the class has been added to the Nationals and the Spring Mini event - however, our statistics look at its progress at the traditional SMAE season opener in February. Since its introduction it has never failed to attract more entries than 'full' Open, culminating in an extraordinary imbalance reached this year.

The class has indeed gained in support far faster than had been envisaged. It has also spread to other countries and the concept has even rubbed off into something the Australians call Slow Open Glider. Presumably straight tow only!

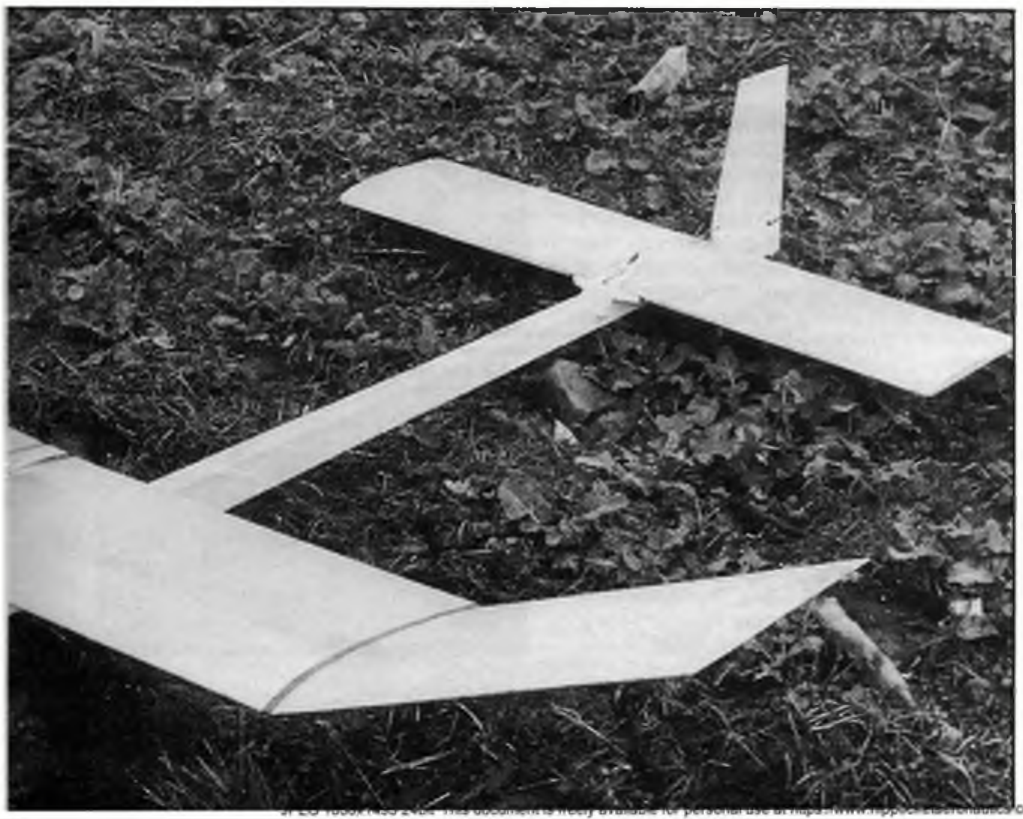
However it goes to suggest that simplicity in building means more to the average power flier than ease of trimming. Anyone will tell you that a Slow Open model, particularly a potent one, will demand the very most from its owner at the initial adjustment stage. However if he can cope and the model stays straight and warp-free, presumably there is then very little to go wrong and the minimum of maintennce will be needed. This too has had a positive bearing on its success. Indeed, a number of rubber fliers have commented that a Slow Open model demands less in terms of maintenance than an Open Rubber model, which may suffer from motors breaking strands and so forth.

It is encouraging that those initial rules, drawn up after considerable consultation with *flyers*, are still suitable. There has been occasional talk of limiting the engine capacity. Something around 3cc has been discussed. Contrary to what might have been expected the class has not bred a rash of .40-powered models, simply because such machinery would have to be extraordinary large to possible to trim without VIT. I am surprised it hasn't, as my preference would be for a massive 800-900sq. in. model (remember the big Ramrods?) tame to trim and superior to just about anything on the glide. It would appear that the class has allowed-in the simple 1/2A and more of the old fashioned 2.5cc Open designs from the 60s. Excellent - but personally I would be against a capacity limit for the sake of it until the big models start to dominate. The best rules are the simplest. What is more, a cut-off at 3cc would make the jump to 1989 full blown Open Power even larger as on the 7sec runs of next year the emphasis will undoubtedly be on expensive hardware and ballistic trajectory rather than the flight pattern.

Sadly I can hear the death knell for Open Power and it's not too distant, either. I wouldn't like that to come about. Would you?

Year-by-year comparison of entries

	Open Power	Slow Open
Feb '83	9 flew	4 flew
Feb '84	5 flew	5 flew
Feb '85	4 flew	10 flew
April '86	5 flew	14 flew
Feb '87	7 flew	10 flew
Feb '88	2 flew	10 flew



What's Happening

SMAE Free Flight

April 24th SMAE Spring Mini.
A1/CDH/CO2/1/2A/HLG/ Vintage/Slow Open Power.
Venue: Barkston Heath. CD: Dave Hipperson.
Contact: Phil Ball; 0332 665361 (FFTC).

May 8th 4th Area Centralised SMAE Free Flight. F1C for Astral Trophy
O/G for Plugge points and Model Enginer Trophy for glider teams
CDH - no trophy.
Venue: Areas
Contact: Area comp secs or SMAE
Comp Sec: Richard King; 01-890 4504.

READERS' LETTERS

Not free-flight!

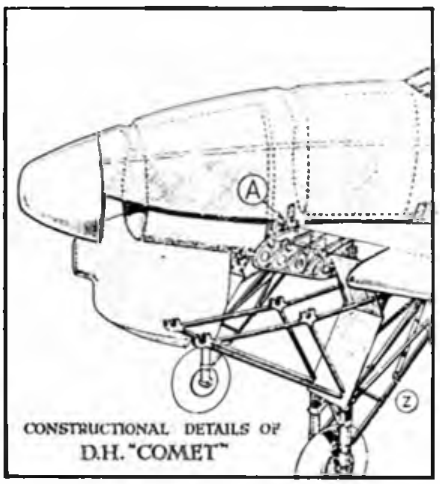
Dear Sir,
With reference to the paragraph R/C F/F in January's Hangar Doors, I would like to point out that when an R/C equipped aircraft has the R/C gear switched on, the aircraft is no longer free flight, since it can be interfered with, whether static or in flight. Furthermore, no other aircraft on that frequency can be flown until the first set is switched off. This precludes the second aircraft (and third, and so on) from taking advantage of conditions while the first is switched on.
The facts are simple.

If a model has radio gear, it is simply R/C.
If a model has wires to control it, it is C/L.
If it has neither, it is F/F.

From reports, it seems that Thomas Koster has devised a system that would allow enough frequencies for many models to be equipped with R/C D/Ts, and Piggy-backing could still be used.
Such a system should be available to other participants, but the current principle is that you have to develop your own gear yourself. OK. With R/C equipment there could be some less-than-accurate gear built that would cause radio interference. To control this would require the Contest Director to have a frequency monitor on the field, or to check all R/C gear at processing. This, I feel, is not Free Flight.
Participation in top level contest classes has decreased because of the costs of ancillary gear and highly developed models. R/C D/Ts would push this trend even further. I hope that there will be a long-term swing back to free flight once the current generation of computer kids are replaced by youngsters who will make a commitment to something they choose, but I cannot accept some present-day features that push F/F closer to extinction!
Being able to D/T a model immediately after an over-run (or a line cross, or a motor blow-up) gives an R/C modeller an advantage over one not so equipped. This seems to be unfair to the flyer who has to retrieve a model after a full flight in order to refly. I'm not sure if this is good or bad. It seems that the R/C D/T could split the F/F flyers into the 'haves' and 'have nots'. Circle-tow hooks have done this to a small degree, but we have coped with it. The cost of Rossi engines has done the same and the have-nots are flying other models. There's a risk and I don't like it. Irrational but real!
Airborne Magazine, Victoria, Australia **Merv Buckmaster**

Tanks a lot

Dear Sir,
The DH 88 Comet has always been, to my mind, one of the most visually attractive aircraft ever made, quite apart from records set, etc. I have just been looking through your August 1987 edition with a



Comet on the front page, and others inside, when the question arose: what did they put in the nose of the fuselage?
Such a huge nose seems a waste of space and unnecessary reduction of forward vision for the pilot. Did the Comet begin as a tri-motor design? Did it conceal a bunk for sleeping in? It could hardly have contained black boxes, computers and other instruments in the 1930s. Fuel tanks? Fishing rods to use during stopovers?
The question just won't go away. Can you help?
Kokkedal, Denmark **Geoffrey Dodd**

(This letter was addressed to the Editorial Brains Trust. Ahem! As the illustration from a contemporary Flight magazine shows, the space in question was occupied with fuel tanks. After all, what else but fuel capacity does a record-breaker need? GC)

Hargrave hiccup

Dear Sir,
Recently I had the good fortune to obtain a copy of Vic Smeed's book Model Flying - the First 50 Years which I found to be of absorbing interest; and I would like to congratulate Vic on producing a work of great historical value.
From my own experience in historical research, I am aware of how difficult it is to get it all 100% right, and in this respect I would like to point out, in the interests of historical accuracy, that Hargrave's pioneer rotary engine of 1889 was not driven by petrol, as stated on page 3. It was, in fact, a small compressed air creation, with three cylinders of .88 inches bore and 1.3 inches stroke, weighing 7.1/2 ounces.
I think that Vic may have been misled by a similar statement which appeared in an English aeronautical monthly a few years ago. Actually, Hargrave's attempts at petrol engines were singularly unsuccessful; his own comment being only that 'manual skill in silver soldering and light machine work was acquired'.
Incidentally, it seems possible that Hargrave may have taken the World free-flight duration record from Penaud with a compressed air, flapper-propelled model which flew 312 feet in 19 seconds in 1890. Other flights of 368 feet and 343 feet were made, though no times are recorded for these. It is a pity there were no official FAI observers then.
Victoria, Australia **Jim Fullarton**

CO_2 clarification

Dear Sir,
It has been brought to my attention by the CO_2 repairs department that we have received a number of CO_2 motors back which the senders have claimed under guarantee.
Investigation of these motors have shown them to be badly scored internally and generally misused. In two cases we have talked to the persons concerned and they have admitted that they had been following the instructions in John Pool's Aeromodeller article with regard to 'modifying your Telco motor for better performance'.
I think it would be advisable that in any future articles a notice is inserted pointing out that any work carried out on a new motor would invalidate the guarantee.
In all cases so far we have replaced the units under guarantee but pointed out to them that the fault was with their attempt to improve the motor and not with our quality control.
Chart Hobby Distributors
Littlehampton, Sussex **Ken Rippengale**

(Yes - dismantling any new motor, or indeed any other new equipment, cancels the guarantee at once. GC)

Identification parade

Dear Sir,
May I be allowed to refer you at this rather late date to the photograph in Hangar Doors on page 664 of the December 1987

Above and below: 1938 Frost Trophy winner Norman Taylor, and Mr Crabbe, who did not place...

From last December's Hangar Doors, the Frost Trophy group now identified by Josh Marshall.

issue of Aeromodeller for which help and identifications were requested?

I have seen this picture many times, and I was present when it was taken, but do not appear in it.

The Frost Trophy was competed for on August 28th 1938. The venue was, of course, the Fairey Great West Aerodrome. Hangars can be clearly seen in the background; the exact spot is now under the centre terminals of Heathrow Airport.

I am able to identify for you some of the persons which are in your picture; from left edge: Fred Milne; Edgar Lovelock; Harry Bohling; Colin Brind; not known; the youngster, a school friend of Roy Wilson; A.C. Minion (striped tie); Jack Wheatly, just visible, and extreme right: not known.

The competitor starting his motor is a Mr Crabbe.

The Frost Trophy was donated by (who else?) one Mr Frost who hailed from Epsom, and is believed to have owned a large garage business. The contest was organised by the Hayes and District Model Aero Club which was formed in September 1933 by some employees of the Fairey Aviation Co. to exploit the facilities offered by the airfield. At the date of the photo, the Club boasted 100 members, most of them with power models. The Hayes and DMAC has maintained a continuous and fruitful existence for nearly 55 years, and has explored most branches of our sport; it is now mostly involved in Thermal Soaring and Electric power.

The Frost Trophies (for there are in fact two) are still very much in existence and are competed for within the Club every year. The present cleaner is John Knott.

I submit two ancient photos. One shows the 1938 Winner, Mr Norman Taylor with his model; the other shows the demise of the model on the take off board in your pic!

Hayes, Middlesex **Josh Marshall**

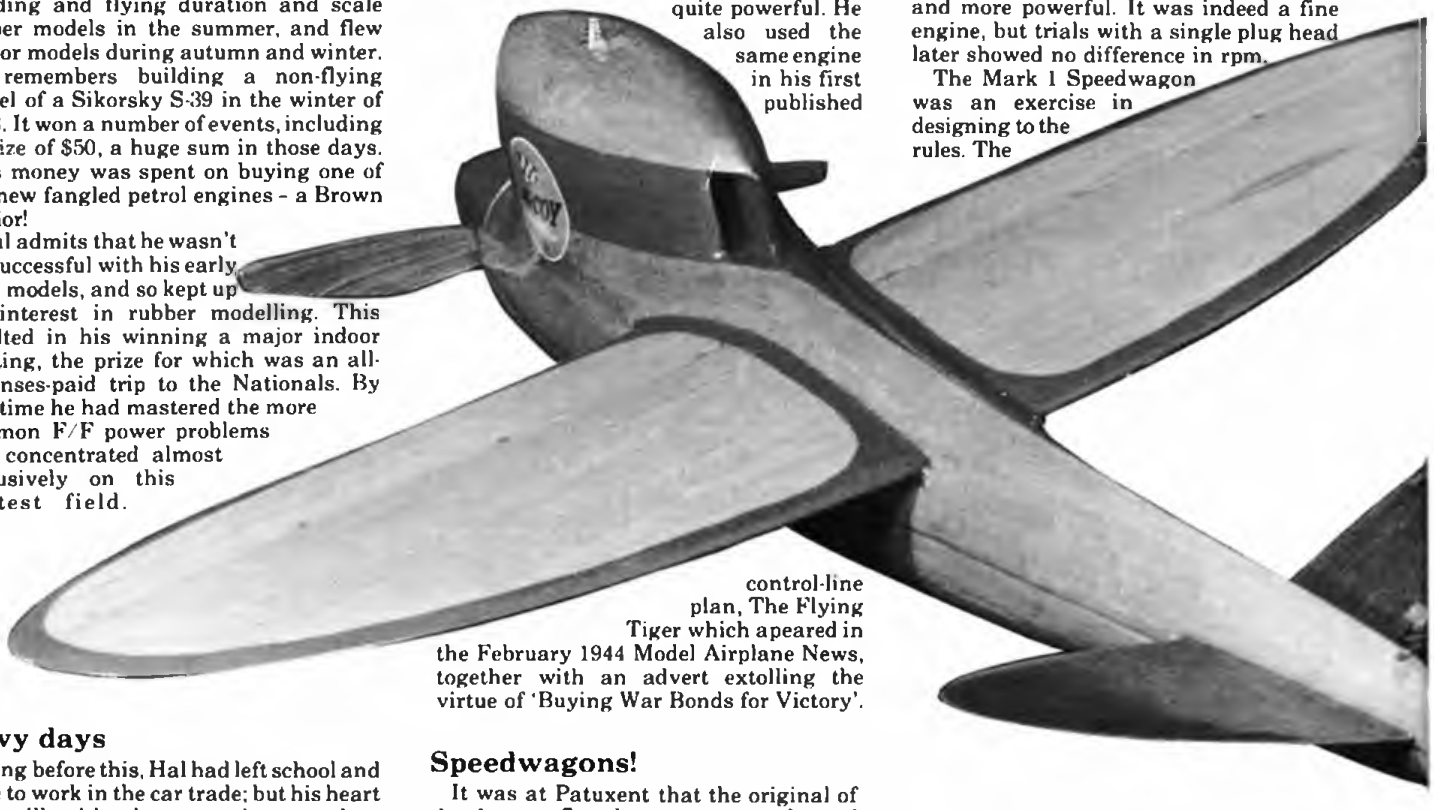
MIND THE LINES

Ron Prentice begins the Hal de Bolt story with a look at Speedwagons and the early days of Dmeco

HAL DE BOLT is known to the present crop of modellers as a radio control man who writes a series on Vintage R/C in an American magazine. It may come as a surprise to some readers to learn that he has been active in almost every form of aeromodelling, with successes in outdoor rubber duration, indoor rubber, control-line stunt, speed and free flight scale.

Needless to say, Hal's modelling career started way back in his very young days. Born in Geneva, New York, he encountered model building by the route most usual in those days - via an interest in full size aircraft. In 1929 he built a solid scale model of his favourite real aeroplane. Next came a small rubber-powered free flight model; and then he was hooked. Hal points out that Geneva, a small community of some 15,000, had an active modelling programme supported by the American Legion, which was a big help to youngsters who didn't have the ready money for their hobby (it was the depression era). He settled into a routine of building and flying duration and scale rubber models in the summer, and flew indoor models during autumn and winter. He remembers building a non-flying model of a Sikorsky S-39 in the winter of 1933. It won a number of events, including a prize of $50, a huge sum in those days. This money was spent on buying one of the new fangled petrol engines - a Brown Junior!

Hal admits that he wasn't too successful with his early 'gas' models, and so kept up his interest in rubber modelling. This resulted in his winning a major indoor meeting, the prize for which was an all-expenses-paid trip to the Nationals. By this time he had mastered the more common F/F power problems and concentrated almost exclusively on this contest field.



control-line plan, The Flying Tiger which apeared in the February 1944 Model Airplane News, together with an advert extolling the virtue of 'Buying War Bonds for Victory'.

Navy days

Long before this, Hal had left school and gone to work in the car trade; but his heart was still with planes, so he moved to Buffalo and went to work in the aircraft plants there. He worked for the Bell and Curtiss factories, his last job being as troubleshooter on P-40 fighters. When he went into the Navy, he did more or less the same type of work at the big base at Patuxent. Because of his talent for getting complex mechanical work straightened out, the Navy kept him at that station throughout the war. Naturally, model interest went with him into the Navy and since Patuxent is practically surrounded by water, control-line was the most feasible form of flying. Hal and his friends found a suitable spot in a hangar to set up their modelling workshop. After a while the Commanding Officer got wind of their activities, and sanctioned what was probably one of the first official Navy model plane clubs - The Patuxent Model Engineers. During his three years at Patuxent, Hal and his friends entered all the big contests they could get to. At one big meet they cleaned up in the speed event and Hal won Stunt with a twin-engined stunter based on the Grumman Skyrocket.

In spite of his control-line successes, he did continue to fly free flight, and one of his fondest recollections was of a local meeting when three of his designs, Blitzkreig, Thunderbolt and Airfoiler won three classes, each with a flight of over one hour. 'The weather was absolutely perfect,' he recalls; "All flights landed within sight of the field.'

Hal's first control-line model was a Stanzel G-Shark, probably, he says, because of its F/F-style construction. Power was a Bunch .45 petrol engine, a simple engine to operate which was quite powerful. He also used the same engine in his first published

Speedwagons!

It was at Patuxent that the original of the famous Speedwagon range of speed designs first saw the light of day in 1944. Where did the name Speedwagon originate? Probably on Madison Avenue N.Y., where some bright advertising man made a bundle with it. In the 40s, heavy trucks were monstrous, ponderous things. The Reo Motor Co. introduced a new line which was named Speedwagon, although a more descriptive name might have been Tortoise or Rhinowagon. However, as Hal says, 'it's a cute name for an aircraft aimed at speed!'

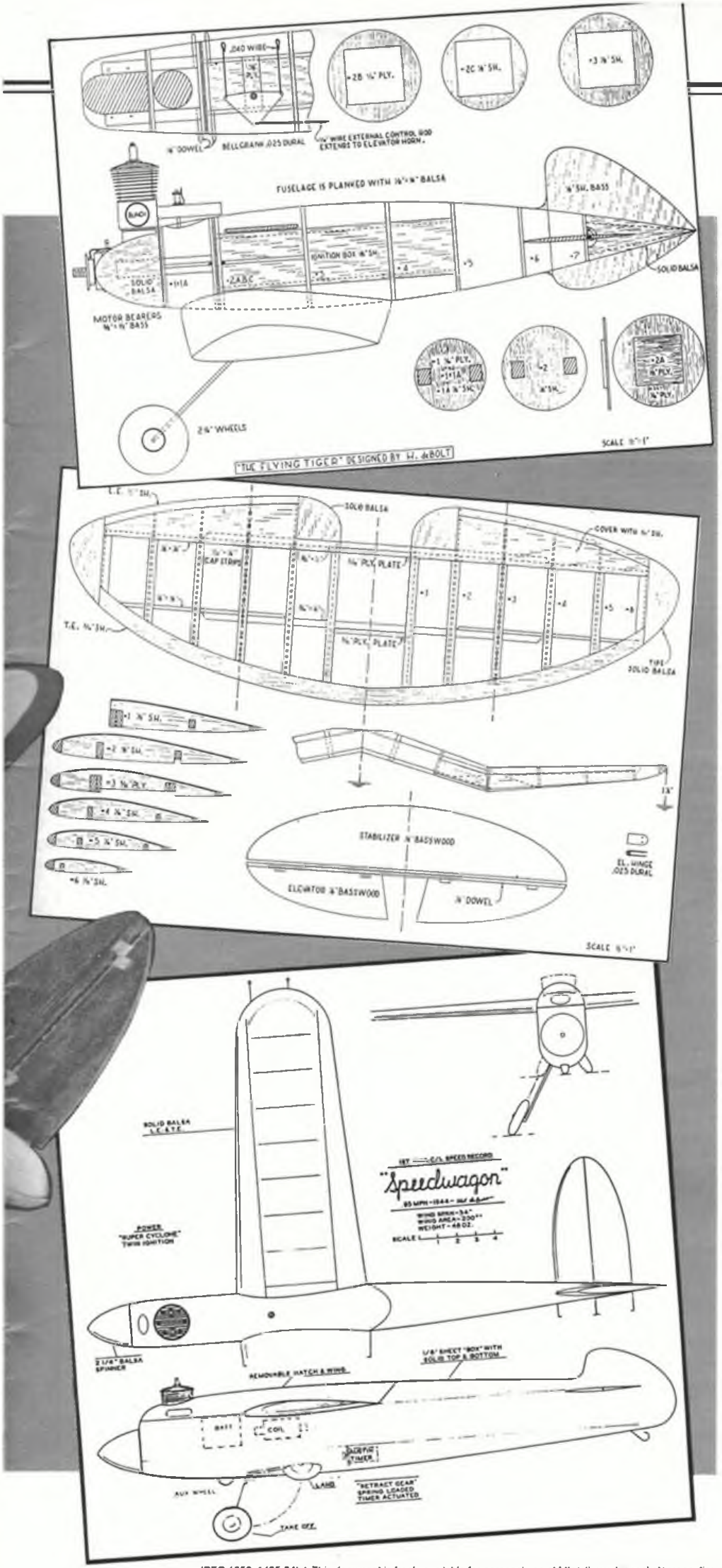
If you were into C/L in the 50s and think we have the wrong three-view for a Speedwagon, take heart. Your recollections are of the many which followed which were Speedwagons in their own right!

The original Speedwagon established the first AMA control-line model speed record with a speed of 95mph in Class C. Shortly afterwards, fellow club member, Marty Kania, established a Class B record of 75mph with his design called C1H. This model was later kitted by the Megow Model Aircraft Co.

The Speedwagon Mk.1 was large by modern standards, with a span of 34in. and weighing 48ozs. The engine used in the original model was all that was available; one that had been painstakingly cared for and used only for 'special occasions'. Hal says it was a good one as engines went in those times. You just couldn't look in a catalogue and pick the right engine for the job. When the dollars were laid down for this Super Cyke, a few more were put with it to get the 'dual plug' version, in the hope that the ads. were right - that it was better-running and more powerful. It was indeed a fine engine, but trials with a single plug head later showed no difference in rpm.

The Mark 1 Speedwagon was an exercise in designing to the rules. The wing was nicely tapered to the minimum 200 square inches. The airfoil was semi-symmetrical (which, the books said, meant less drag). The fuselage cross

Later versions of the Speedwagon were elegant, all-elliptical craft. This one is fitted with that classic speed motor, the McCoy 60.



Left: The Flying Tiger plan appeared in Model Airplane News in February 1944. Power (perhaps unsurprisingly) was a Bunch Tiger. Gull wing is attractive - and note clockwise rotation. Bottom left: The original Speedwagon, which achieved a record speed of 95mph in 1944. Splayed-wheel retract gear is unusual!

section rule was met by bolting the Cyke to a couple of 3/8 x 1/2in. bearers, then bending 1/8 x 2in. sides around the bearers, topping the resulting box off with balsa block fairings. To get the best results the landing gear would have to be retractable, but the rules said you must 'land on the same wheels, with which you took off'. Nothing was said about their position, so the solution was to leave enough sticking out so that a landing could be made. The retract was operated by a timer which was actuated as the model was released.

Speed secrets?

Shortly after demobilisation, de Bolt, now back in Buffalo, formed the de Bolt Model Engineering Company, and operated his little business on a one-man basis. The first Dmeco product was naturally a Navy plane, a Grumman Super Wildcat Stunter of 32in. span that would do the full pattern of the time. This was the period in speed flyng when everything a contest modeller did was top secret. You mixed your fuel like a witches' brew in the dark of the moon; rumour had it that some hotshots put a dash of perfume in each fuel batch - so their competitors couldn't tell what was in it by smelling the burnt fumes! At least, that was the impression one gained from reading the mags at the time. However Harold de Bolt says otherwise: 'One misconception about the control-line contest flyer was the so-called "secret" jazz. For my part it should be known that our club, the Flying Bisons, was aggressive and we had a major portion of the top speed flyers of the day as members. We operated as a team, sharing all ideas and efforts which surely gave us an advantage over individuals. We even rented an indoor flying site for Winter months. I managed to provide transportation to many big meets for members. At one Nats a Junior swept his events, a Senior did well and I did my share in the Open. We also shared our doings through magazine informative articles, hoping to promote speed flying. Our Leonard Wagner shook up the speed fraternity with a Class C record of about 165mph when the .60s were hardly hitting 140. The Flying Bisons really worked at speed; their effort reflected on all of us'.

Next time I will continue Harold de Bolt's story, with the emphasis on the development of his stunt control-line designs...so see you then!

WHAT'S ON

17th April
SOUTH BIRMINGHAM MFC CONTROL LINE FLY FOR FUN RALLY
Venue: Rubery Hill Hospital, Rubery, Nr. Birmingham. 10am start. General flying for all SAM and SMAE members.
Contact: Peter Martin. Tel: 021 459 5520.

17th April
INDOOR FLYING AT CARDINGTON
F1D Team Practice and fun-flying, subject to no interference with F1D models.
Contact: Bob Bailey. Tel: 0438 723642.

24th April
WITHAM CUP C/L AEROBATICS EVENT
Venue: Slip End, Luton. Open and Novice C/L Aerobatics. Contact: P. Burgess. Tel: 0376 516881.

24th April
SMAE INDOOR SCALE NATIONALS
Venue: Alumwell Centre, Walsall (Junction 10, M6). Peanut and Open Rubber Scale plus CO_2/Electric. Informal competitions for Team Racing and kit scale models, entry for these on the day. Static exhibition of free-flight scale models; talks and demonstrations by leading scale modellers; really enjoyable day out for the family. Full details and entry forms (SAE please) from: Doug Sheppard, 13 Luckington Road, Monks Park, Bristol, Avon BS7 0UT. Tel: 0272 697595. Pre-entry by 22nd March.

24th April
MODELVILLE '88
2nd model exhibition. Crookhorn School, Stakes Hill Road, Waterlooville, Portsmouth, Hants. 10am-5pm. Adults £1.50 - Children/Senior Citizens 60p. Trade stands, model aircraft and boat displays, engineering, railways, trams, soldiers, wargaming, etc. Free parking. Organised by the Rotary Club of Waterlooville in aid of Rotary charities.
Contact: Peter Tipping, 4 Westbrooke Close, Horndean, Portsmouth, PO8 9RE. Tel: (0705) 595145.

24th April
WHARFEDALE 1/2A COMBAT COMPETITION
Venue: Dewsbury. Contact: Jeff Smith. Tel: 0532 663432.

30th April
BRISTOL AND WEST WOODBURY WEEKEND
Venue: Woodbury Common, Nr. Exmouth, Devon. Saturday, 5-7pm: Champagne fly offs, O/R, O/G, O/P, Vintage Rubber. Sunday, 10am start: O/R, O/P, O/G, SMAE rules Vintage. Monday, 8am start: Combined FAI (5 rounds). Caravan accommodation at special rates. Sunday evening supper.
Contact: Elton Drew. SAE to 2 Downfield Close, Alveston, Bristol BS12 2NJ.

1st May
SPRING KITE FESTIVAL
Venue: Old Warden Airfield.
Contact: Aeromodeller. Tel: 0442 41221.

1-2nd May
HOLKER HALL RALLY
Venue: Holker Hall and Gardens, Cark-in-Cartmell, Nr. Grange over Sands.
Classes flown: A: Best All Round and Entertaining Model, Holker Trophy & cash prize. B: Best Biplane - cash prize. C: Best Sports Model - cash prize.
Contact: Mrs C. Johnson. Tel: 044 853 328.

1-2nd May
CRANFIELD EXPO.
Details from: Ross Willis, 15 Council Street, Woolaston, Nr. Wellingborough, Northants. Tel: 0933 6637001.

1st May
INDOOR FLYING AT CARDINGTON
F1D Team Practice and fun-flying, subject to no interference with F1D models.
Contact: Bob Bailey. Tel: 0438 723642.

1st May
TYNEMOUTH MAC RALLY
Venue: Albermarle Barracks. O/G, O/R, O/P, Combined Mini, Vintage, HLG. 10am start (11am for power). Pre-entry essential before 25th April.
Contact: Tony Brown. Tel: 091 2362155.

8th May
THREE KINGS C/L SCALE FLY IN
Venue: Old Croydon Aerodrome, Purley Way, Croydon, Surrey. Stand-off and Profile Scale classes. Silencers and proof of insurance essential. Contact: Wal Cordwell. Tel: 01-764 1661.

7-8th May
1988 SANDOWN PARK SYMPOSIUM
Venue: Sandown Park Racecourse, Esher, Surrey. Trade and club stands, model flying demonstrations. Entry £3.50. Children and OAPs £1.50. Family tickets and BR discount. Free parking.
Contact: G. Hazlewood. Tel: Ashford (Middx) 43022.

15th May
ASP LARGE MODEL DAY
Venue: Old Warden Airfield, Beds.
Contact: Aeromodeller. Tel: 0442 41221.

15th May
PETERBOROUGH MFC 1/2A COMBAT.
Venue: The Embankment, Peterborough.
Contact: Mick Taylor. Tel: 0733 204484.

15th May
GRANTHAM VINTAGE C/L MEET
Venue: Barkston Heath.
Class A and B T/R, Midge Speed, O.T. Stunt. Flyers must be SMAE members.
Contact: Ian Horne. Tel: 0773 820181.

15th May
WHARFEDALE MINI-GOODYEAR COMPETITION
SMAE rules but Open models.
Venue: Dewsbury.
Contact: Jeff Smith. Tel: 0532 663432.

22nd May
INDOOR FLYING AT CARDINGTON
F1D Team Practice and fun-flying, subject to no interference with F1D models.
Contact: Bob Bailey. Tel: 0438 723642.

22nd May
WHARFEDALE C/L AEROBATICS COMPETITION
F2B and Novice Stunt.
Venue: Ilkley.
Contact: Jeff Smith.
Tel: 0532 663432.

22nd May
SMAE NORTH WEST R/C FLY IN
Hosted by Blackpool and Fylde RCMS.
Venue: Blackpool Zoo flying site. All flyers welcome.
Contact: Chris Bromley. Tel: 0253 25080.

28-29th May
ST ALBANS MODEL ENGINEERING SOCIETY EXHIBITION
Venue: Marconi Hall, Longacres, St Albans, Herts.
Contact: K. Chiesa, 49 Mount Drive, Park Street, St Albans, Herts.

28th-30th May
1988 SMAE FREE FLIGHT NATIONALS
Venue: RAF Barkston Heath.
Contact: SMAE.
Tel: 0533 518500. Details next month.

4-5th June
WEST MALLING INTERNATIONAL MODEL AIRSHOW
Venue: West Malling Airfield, nr. Maidstone, Kent. 10am to 6pm each day. Adults £2.50, Children and OAPs £1.50. Camping available. Free car park programme, raffle entry. Discount tickets in advance. Contact: David Watts, 58 Salisbury Road, Tonbridge, Kent TN10 4PE. Send SAE.

5th June
THREE KINGS C/L PROFILE CARRIER & VINTAGE STUNT EVENT
Venue: Old Croydon Aerodrome, Purley Way, Croydon, Surrey. Silencers and proof of insurance essential. Contact: Wal Cordwell. Tel: 01-764 1661.

5th June
BLACKPOOL AND FYLDE ELECTRIC FLY IN
Venue: Blackpool Zoo Flying Site. Contact: Chris Bromley. Tel: 0253 25080.

12th June
KEIGHLEY DISTRICT MAC NOVICE AEROBATIC AND DIESEL A COMBAT MEETING
Venue: East Riddlesden Hall, Keighley, contact: Barry Pickles (days). Tel: 0535 604428; or Bob Walker (evenings). Tel: 0535 33408.

12th June
OLD TIME MODEL FLYING JAMBOREE
Venue: Albermarle Barracks (on B6318), 10 miles west of Newcastle. Classes: Glider, Rubber, CO_2, Power, Sport, Jetex, Chuck Glider. All classes of Control Line. R/C Vintage and R/C Assist (pre-1960 designs). Entrants from outside N.E. Area must supply their names one week in advance as authorities must be informed. SMAE members only. Cards must be produced. Entry £1. 10.30am start.
Contact: Terry Bailey, 19 Jennifer Avenue, Castletown, Sunderlands, Tyne & Wear. Tel: 091 5490064.

18th-19th June
ASP SCALE MODEL WEEKEND
Venue: Old Warden Airfield, Beds.
Contact: Aeromodeller. Tel: 0442 41221.

19th June
INDOOR FLYING AT CARDINGTON
All-in Index and fun flying.
Contact: Bob Bailey. Tel: 0438 723642.

19th June
CHILTERN CUP C/L AEROBATICS EVENT
Venue: Slip End. Open, Novice and Vintage C/L Aerobatics.
Contact: R. Landon. Tel: 0525 713472.

2-3 July
EAST TILBURY AEROMODELLERS FLY FOR FUN EVENT
Venue: Bata Sports Field, East Tilbury, Essex. Licensed bar, childrens' attractions, possible parachute display, static microlight display.
Contact: Geoff Harris, School House, Princess Margaret Road, East Tilbury, Essex RM18 8SB.

3rd July
PETERBOROUGH MFC DIESEL 'A' COMBAT.
Venue: The Embankment, Peterborough.
Contact: Mick Taylor. Tel: 0733 204484.

3rd July
SMAE F/F SCALE MEETING
Venue: RAF Abingdon. Power, Rubber, CO_2/Electric Scale. No flying before 10am.
Contact: Charlie Newman. Tel: 086 77 3020.

3rd July
INDOOR FLYING AT CARDINGTON
Novice Fly-Rod and fun flying.
Contact: Bob Bailey. Tel: 0438 723642.

10th July
ASP GOLDEN ERA MODEL DAY
Venue: Old Warden Airfield.
Contact: Aeromodeller. Tel: 0442 41221.

16-17th July
SMAE INDOOR NATIONALS
Venue: Cardington.
Programme:
16th July: EZB for Houlberg Silver Trophy (best 2 from 6); Index for Manhattan Cabin, Novice, Fly-Rod, HLG, EZB, Pennyplane, Novice Pennyplane, CO_2 Duration, Peanut Duration. (Best single score from 6); CO_2 Duration from Sparklets Trophy (best 2 from 6); CO_2 Duration for Sparklets Longest Flight Trophy (best flight from 6 on 16/7); fun flying.
17th July: Index for F1D, 35cm Microfilm, Open Microfilm (Best from 6); F1D for Aeromodeller Trophy; Fun flying.
Contact: Bob Bailey. Tel: 0438 723642.

16th-17th July
INTERNATIONAL WINGS & WHEELS SPECTACULAR
Venue: North Weald Aerodrome, Essex. Junction 7 from M11.
Contact: J. Woodley. Tel: 04024 71494.

17th July
SHUTTLEWORTH MODEL GROUP DAY
Venue: Old Warden Aerodrome.
9am-6pm. Everyone welcome for general flying.
Contact: Mick Staples 0223 241 978.

17th July
BLACKPOOL AND FYLDE SCALE FLY IN
Venue: Blackpool Zoo flying Site. Semi-scale to Super-scale, all welcome. Good grass runway.
Contact: Chris Bromley. Tel: 0253 25080.

17th July
KNAVESMIRE FREE-FLIGHTERS ANCIENT AND MODERN SILENT MINI-EVENT
Venue: York Racecourse.
Events: Coupe d'Hiver, A/1 Glider, CO_2, Mini-Vintage Rubber (34in span max.), Mini-Vintage Glider (54in span max), H/L Glider, Kit contest, Best Junior and other impromptu small classes. 9.00am start in rounds, variable max.
Contact: John Pool, 8 Sycamore Road, Barlby, Selby, N. Yorks YO8 7XB. Tel: 703060.
Prizes - Specially commissioned commemorative mugs and cash. NB - please phone before travelling far.

17th July
WHARFEDALE CLASS A COMBAT COMPETITION
Venue: Dewsbury.
Contact: Jeff Smith.
Tel: 0532 663432.

24th July
COLCHESTER MAC VINTAGE DAY
Venue: Bures. R/C Vintage Model Fly-In plus Texaco, Class 1, Class 2 and Class 3 Ratio competitions to SAM 35 R/C rules. 10am start. Proof of insurance required. Spectators welcome. There will be a BBQ and refreshments. SAE for full details inc map to: Peter Grant, 2 Duncan Rise, Gt. Yeldham, Halstead, Essex CO9 4QE. Tel: 0787 237967.

24th July
OXFORD MFC DREAMING SPIRES GALA
Venue: Port Meadow, Oxford. All classes of F/F Scale plus Silent Vintage. No power models apart from F/F Scale.
Contact: Charlie Newman. Tel: 086 77 3020.

31st July
FACCT THERMAL SOARING RALLY BARCS LEAGUE EVENT
Venue: RAF Weston-on-the-Green.
Pre-entry £2 + SAE + Frequency.
Contact: Mr H.G. Webb, The Bungalow, 13 East Street, Fritwell, Oxon OX6 9PX.
SMAE members only.

7th August
INDOOR FLYING AT CARDINGTON
All-in Index and fun flying.
Contact: Bob Bailey. Tel: 0438 723642.

7th August
NEWBURY AND DMAC VINTAGE MEET
Venue: Newbury Racecourse. Vintage R/C and C/L. Proof of insurance required.
Contact: Mark Richards. Tel: 0256 841273.

7th August
THREE KINGS C/L PROFILE CARRIER & VINTAGE STUNT EVENT
Venue: Old Croydon Aerodrome, Purley Way, Croydon, Surrey. Silencers and proof of insurance essential. Contact: Wal Cordwell. Tel: 01-764 1661.

20-21st August
ASP VINTAGE MODEL WEEKEND
Venue: Old Warden Airfield.
Contact: Aeromodeller. Tel: 0442 41221.

21st August
FACCT MINI GLIDER BARCS RULES
Venue: RAF Weston-on-the-Green. Pre-entry £2 + SAE and 2 frequencies.
Contact: Mr. N.G. Webb, The Bungalow, 13 East Street, Fritwell, Oxon OX 6 9PX.

28-29th August
INDOOR FLYING AT CARDINGTON
Team Trials for 1989 Indoor Eurochamps (best 2 from 6) and fun-flying.
Contact: Bob Bailey. Tel: 0438 723642.

28-30th August
SMAE SCALE AND R/C NATIONALS
Venue: RAF Barkston Heath.
Contact: SMAE. Tel: 0533 518500.

More events next month!
Have we got *yours* yet?

INTERNATIONAL WHAT'S ON

Contact SMAE at Kimberley House, Vaughan Way, Leicester (0533 518500) for details of all Championships.

World Championships

28th May - 1st June
WORLD INDOOR CHAMPIONSHIPS
Venue: Johnson City, Tennessee, USA.
Organising body: AMA. Class: F1D.

5 - 11th August
WORLD CONTROL LINE CHAMPIONSHIPS
Venue: Kiev, USSR. Organising body: FAS of USSR.
Classes: F2A, F2B, F2C, F2D.

8 - 15th August
WORLD JUNIOR FREE FLIGHT CHAMPIONSHIPS
Venue: Leszno Poland. Organising body: Aero Club of Poland.
Classes: F1A, F1B, F1C.

14 - 19th August
WORLD ELECTRIC R/C CHAMPIONSHIPS
Venue: St. Louis, USA. Organising body: AMA.
Class: F3E.

5 - 11th August
WORLD CONTROL LINE SCALE CHAMPIONSHIPS
Venue: Kiev, USSR. Organising body: FAS of USSR.
Class: F4B.

3 - 11th September
WORLD RADIO CONTROL SCALE CHAMPIONSHIPS
Venue: Gorizia, Italy. Organising body: Aero Club d'Italia.
Class: F4C.

European Championships

3 - 9th July
FREE FLIGHT EUROCHAMPS
Venue: Zrenjanin, Yugoslavia. Organising body: Aeroklub Zarko Zrenjanin.
Classes: F1A, F1B, F1CV.

25 - 31st July
RADIO CONTROL AEROBATIC EUROCHAMPS
Venue: Norrkoping, Sweden. Organising body: Organising body: SMFF.
Class: Class: F3A.

30th August — 4th September
SPACE MODEL EUROCHAMPS
Venue: Suceava, Romania. Organising body: Federatia Aeronautica Romania.

13-18th September
RADIO CONTROL HELICOPTER EUROCHAMPS
Venue: Eibergeu, The Netherlands.
Organiser: G. Nijhuuis
Class: F3C.

21-24th September
MAGNET SLOPE SOARING EUROCHAMPS
Venue: Banska Bystrica, Czechoslovakia.
Organising body: Ustredni Modelarsky Klub CSSR
Class: F1E.

Open International Events

(Generally non-R/C only listed here)

26th April - 1st May
WASSIL DEMIREVSKY - JULIU CUP
Venue: Stanke Dimitov, Bulgaria.
Organising body: Ikar Aeromodelling Club, 2600 Stanke Dimitrov, POB 50, Bulgaria.
Class: S3A, S6A, S4B, S7, S8R.

30th April - 1st May
CUPR OF LORRAINE
Venue: Marville, France.
Organiser: Jean-Paul Perret, 22 Rue de Mousson, Atton, 54700 Pont à Mosson, France.
Classes: F2A, F2B, F2C.

7 - 9th May
CONTROL LINE INTERNATIONAL
Venue: Hradec Kralove, Czechoslovakia.
Organising body: Ustredni Modelarsky Club CSSR, Opletelova 29, 116 31 Praha 1, Czechoslovakia.
Classes: F2A, F2B, F2C.

12 - 15th May
14TH INTERNATIONAL MILITKY CUP
Venue: Pfaffkon/ZH, Switzerland.
Organiser: Emil Giezendanner, Feldstr. 258, 8330 Pfaffikon, Switzerland.

12 - 15th May
1988 INTERNATIONAL FESSLFLUG CUP
Venue: Kraiweisen - Salzburg, Austria.
Organiser: Johann Niederwimmer, Bessarabier Strasse 39, 5020 Salzburg, Austria.
Classes: F2A, F2B, F2C.

20 - 21st May
MEMORIAL FULOP SANDOR
Venue: Domsod, Hungary.
Organising body: Modell Klub Budapest, PG-614, 1374 Budapest, Hungary.
Classes: F1A, F1B, F1C. World Cup points.

4 - 5th June
AKRO 88
Venue: Nafels, Switzxerland.
Organiser: Modellfluggruppe Glarnetland, Elmer Kaspar, Lowengase, 13, 8570 Glarus, Switzerland.
Class: F2B.

11 - 12th June
CRITERIUM MIDDEN NEDERLAND XX
Venue: Utrecht, Luchtvaarveringing De Kempharen, Eduard Verkadalaan 123, 3584 Gt Ultrecht, The Netherlands.
Classes: F2A, F2C.

12 - 13th June
7TH INTERNATIONAL COMPETITION OF ORLEANS
Venue: Orleans, France.
Organiser: Jacques DELcroixm 7 Rue de Foucemange, 45000 Orleans, France.
Class: F1D.

18 - 19th June
LORRAINE CUP
Venue: Eblange, France.
Organiser: Jean-Paul Perret, 22 Rue de Mousson, Atton, 54700 Pont a Mousson, France.
Class: F2D.

25 - 26th June
MIDSOMERNACHT TROPHEE
Venue: Terlet (Srnhem), The Netherlands.
Organiser: T.V. Eeden, Vermerlaan 15, 3764 WB Soest, The Netherlands.
Classes: F1A, F1B, F1G, F1H.
World Cup points.

13 - 14th July
17 HERI KARGL CUP
Venue: Karneralm, Slbg, Austria.
Organiser: UMSC Kolibri, Ober-Grafendorf. Felix Schobel, sen; 3200 Ober-Grafendorf, Austria.
Class: F1E.

15 - 17th July
EUROPACUP-AUSTRIA
Venue: As above.
Organiser: As above.
Class: F1E.

26 - 27th July
1988 SCANDANIVIAN OPEN
Venue: Revinge, Sweden.
Organiser: Thomas Koster, Harloseve| 184, 3400 Hillerod, Denmark.
Classes: F1A, F1B, F1C. World Cup points.

27th July
29 SOKO CUP
Venue: Mostar, Yugoslavia.
Organiser: Aeroklub N.H. Ljubo Bresan, Krpicas 8, 7900 Mostar, Yugoslavoa.
Classes: F1A, F1B, F1C.

30th July
12 MEMORIAL IZET KURTALIC
Venue: Livno, Yugoslavia.
Organiser: Aeroklub Izet Kurtalic, Dure Pucara 3, 71300 Visoko, Yugoslavia.
Classes: F1A, F1B, F1C.

19 - 21st August
POITOU INTERNATIONAL
Venue: Thouars-Noize, France.
Organiser: Michel Poussard, 78 Rue La Fontaine, 79100 Thouars, France.
Classes: F1A, F1B, F1C, F1G, F1H, F1J.
World Cup points.

26 - 28th August
VAR CUP
Venue: Gyula, Hungary.
Organiser: Istvasn Gombocz, Pf.614, 1374 Budapest, Hungary.
Classes: F2A, F2C.

26th - 28th August
12TH INTERNATIONAL INDOOR MEETING, FLEMALLE
Venue: Flemalle, Belgium.
Organiser: Fernand Van Hauweart, Grand Place 1, bte 52, 4110 Flemalle, Belgium.
Classes: F1D, beginners' F1D.

27 - 29th August
19TH EIFEL POKAL
Venue: Zulpich, W. Germany.
Organiser: Hans-Peter Gatzweiler, Kolnstrasse 52, 5352 Zulpich, F.R. Germany.
Classes: F1A, F1B, F1C. World Cup points.

3 - 4th September
1988 MBZB CUP
Venue: Breitenbach, Switzerland.
Organiser: Christian Gafner, Genn, Wedmullerstr. 12, 8804 Au/Wadeswil, Austria.
Class: F2B.

3 - 4th September
INTERNATIONAL AROSER CUP
Venue: Arosa, Switzerland.
Organiser: Peter Glur, Feldstrasse 23a, 5442 Fislisbach, Switzerland.
Class: F1E.

16 - 18th September
2ND CARL NEUBRONNER CUP
Venue: Gergzhofen, W. Germany.
OrganiserL Gunther Jordan, Schweinfurter Strasse 120, 8719 Schwarzach/ Main, F.R. Germany.
Classes: S4, S6, S8E.

23 - 25th September
NOGRAD CUP
Venue: Salgotarjan, Hungary.
Organiser: Istvan Gombocz, Modell Klub Salgotarhan, Pf. 614, 1374 Budapest, Hungary.
Class: F2B.

1 - 2nd October
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Organiser: Club de Aeromodelismo, Mallorca, C/Tomas Rullman, Num.64 5° Basrtolomé Dey a Billon, Spain.
Classes: F2A, F2C, F4B.

2nd October
EUROPA CUP
Venue: Utrecht, The Netherlands.
Organiser: Utrechtse Luchtvaartveriniging De Kemphanen, Eduard Verkadelaan 123, 3584 GT Utrecht, The Netherlands.
Classes: F2A, F2C.

8 - 9th October
14TH CALIFORNIA FAI
Venue: Taft, California, USA.
Organiser: Juan A. Livotto, 13212 Lake Street, Los Angeles, California 90066, USA.
Classes: F1B, F1C.

15th - 16th October
12TH SIERRA CUP
Venue: Roger Simpson, 2625 Queenswood Drive, Ranch Cordova, California 95670, USA.
Classes: F1A, F1B, F1C. World Cup points.

21 - 22nd November
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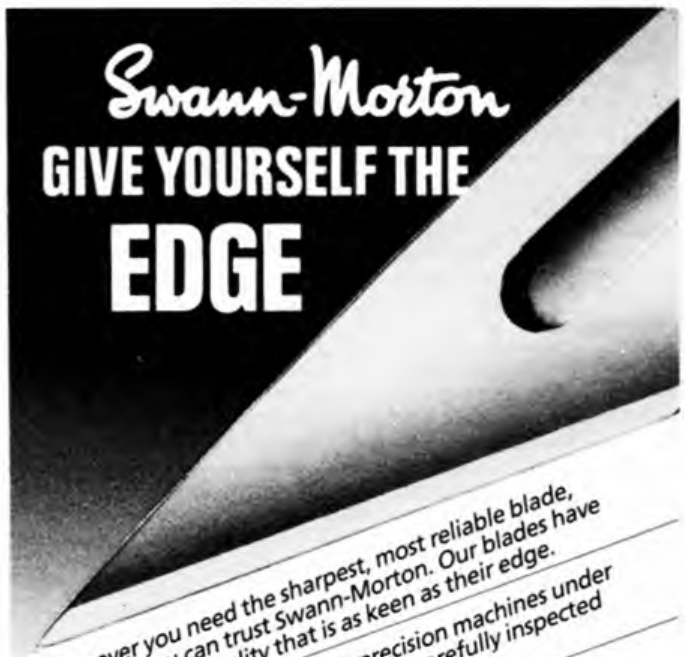

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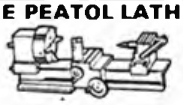

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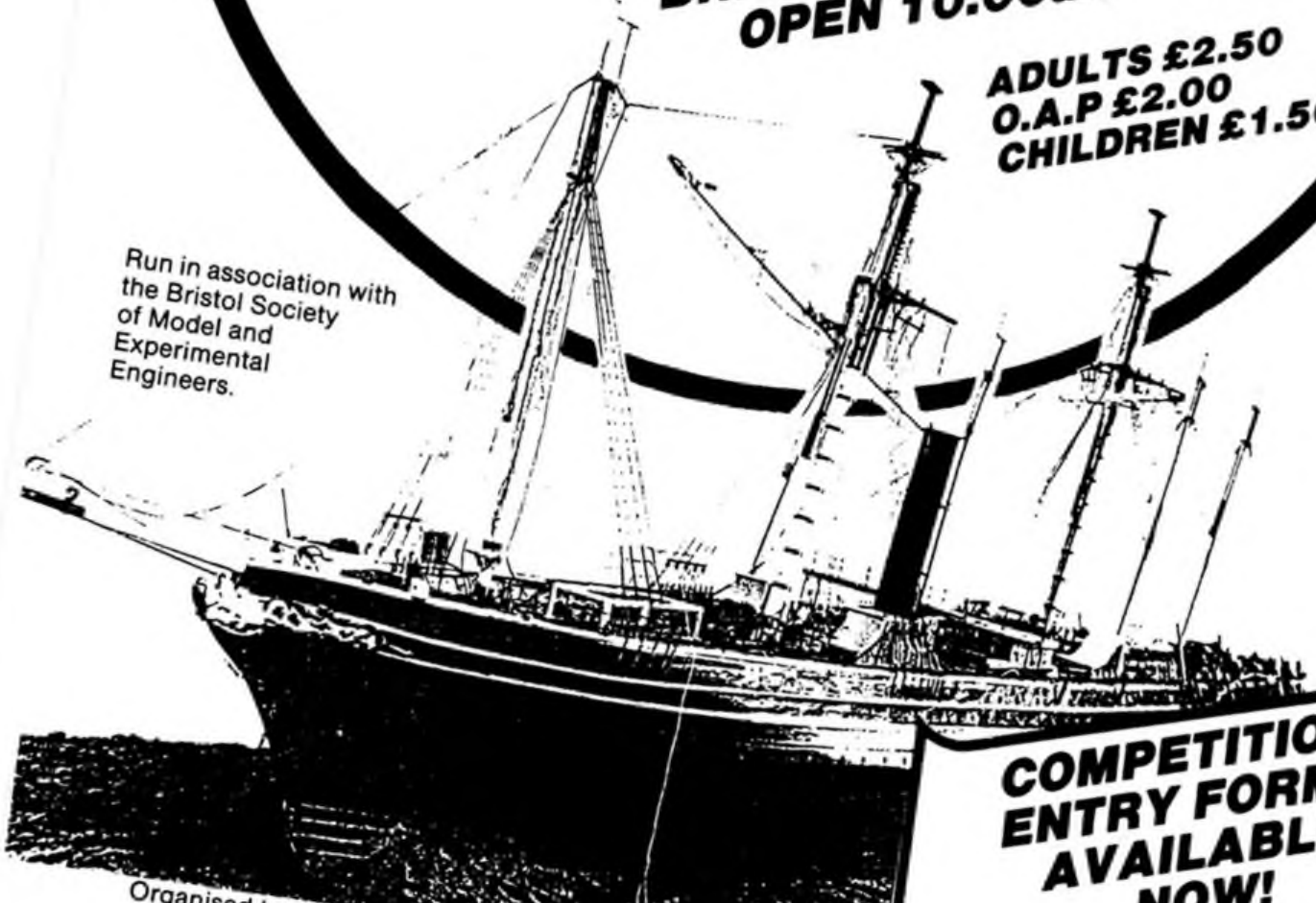

COMPETITION ENTRY FORMS AVAILABLE NOW!

Organised by: Argus Specialist

Appendix - Links to the plans

The original issue comes with two free plans (Sylvia II, XP6 67 Moonbat) printed front/back on a pull out banner of four sheets. The banner is not included in this document..

WHITTMAN BONZO by Nick Peppiatt
FF Rubber Pistachio
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LYMPNE SCALE 88 - Reference to the Parnall Pixie from Jan 1982 by Richard Halfpenny
Old Warden Parnall Pixie CO2
https://outerzone.co.uk/plan_details.asp?ID=2398 ...
https://www.hippocketaeronautics.com/hpa_plans/det ...
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SYLVIA II DH53 Hummingbird by Ian Harwood
FF CO2
https://outerzone.co.uk/plan_details.asp?ID=8757 ...
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XP 67 MOONBAT by Dick Howard
FF Rubber Scale
https://outerzone.co.uk/plan_details.asp?ID=2000 ...
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