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# Aero modeller

JANUARY 1982

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EDITOR COLIN RATTRAY  
Graphics LORNA CULLEN

MAP MODEL DIVISION MAGAZINE

Advertisement Director M. GRAY  
Managing Director RON MOULTON

## Comment

ON NOVEMBER 13 I attended the opening of "London's Flying Start" exhibition at the Museum of London. The atmosphere of the period is immediately conveyed as one enters a rather austere brick surround complete with sound effects.

Further in, one enters a reproduction of A. V. Roe's railway arch workshop, complete with a full size replica of his 1909 triplane. It is always incredible to me that these early aviators survived, just sitting in frail machines in their shirt sleeves,

probably with no straps, and in A. V. Roe's case the aircraft was initially covered in brown paper! (it was reinforced with impregnated linen).

I was delighted to find that aeromodelling was well represented; rightly so as nearly all the early aircraft designers proved their designs by building flying models. Alwyn Greenhalgh has been responsible for the aeromodelling exhibits, which includes a 1909 Twining No. 3 kit of a Wright biplane complete in box as originally sold.

Another exhibit that interested me was the 'Autoplan' compressed air powered model that was imported from Germany

and sold in Gamages Department Store around 1913. The three cylinder compressed air motor used the piston of one cylinder to act as the valve for the next.

There are various full size engine exhibits and some beautifully built models by Joseph Michie. The exhibition consists largely of photographs with captions and is levelled, in my opinion, just right for general interest, as well as a fascinating study for any aviation enthusiast.

Take a look before it closes on May 9 — who knows, we may have a new movement of veteran flying models appearing in 1982?

Editor

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### On the Cover

Scale models taking part in this year's Control Line Nationals held at Barkston Heath. It was good to see such a wide range of models in this rather neglected area of control line flying. Come on you at there — let's see more in 1982.

### Next Month

We have a treat for all small scale enthusiasts, a full size plan to build a DH Tiger Moth for CO<sub>2</sub> power. All our usual news and another super free competition with over £300 worth of prizes. On Sale January 15, 1982.

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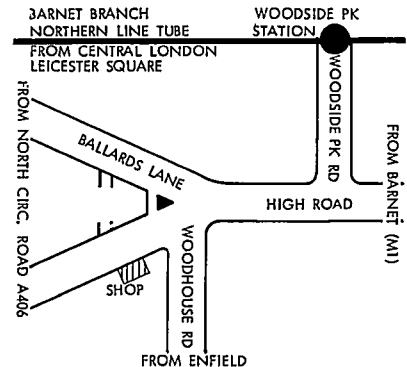
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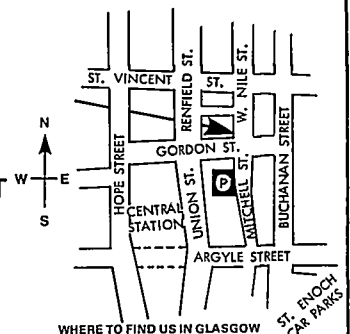
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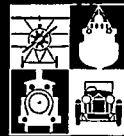
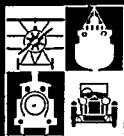
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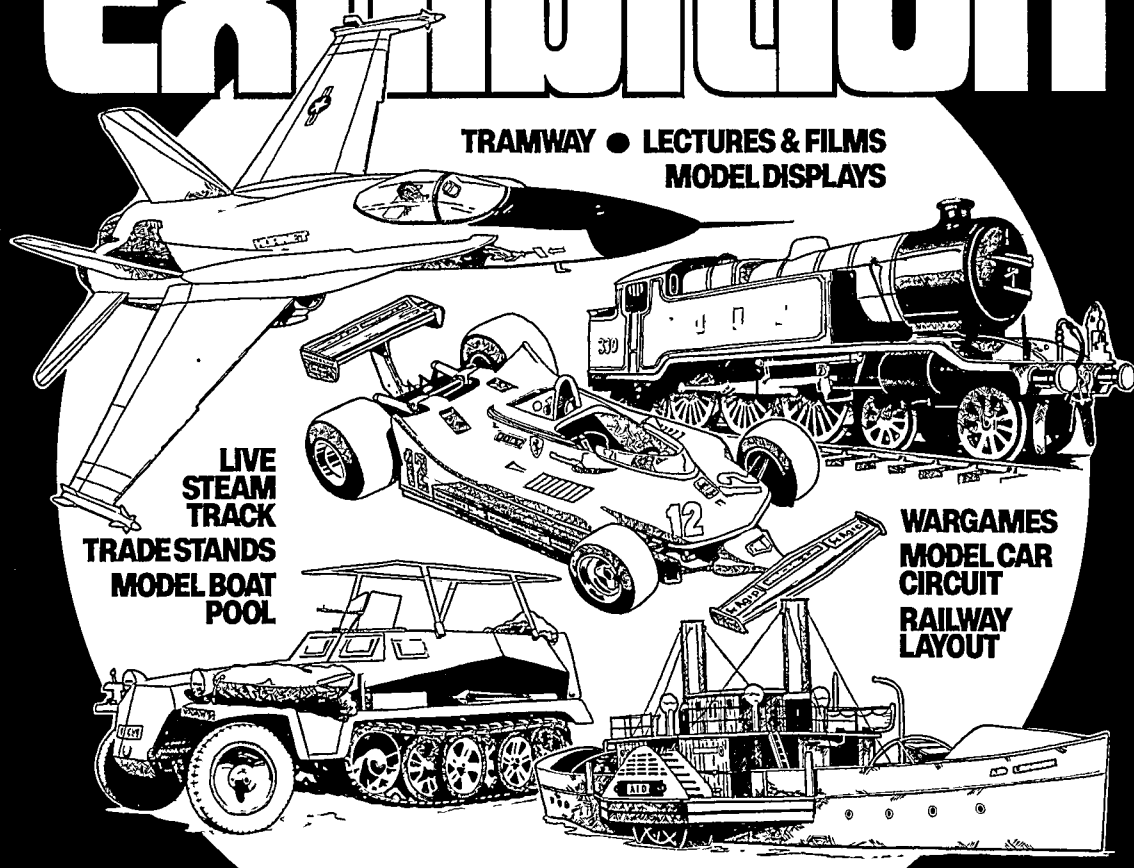
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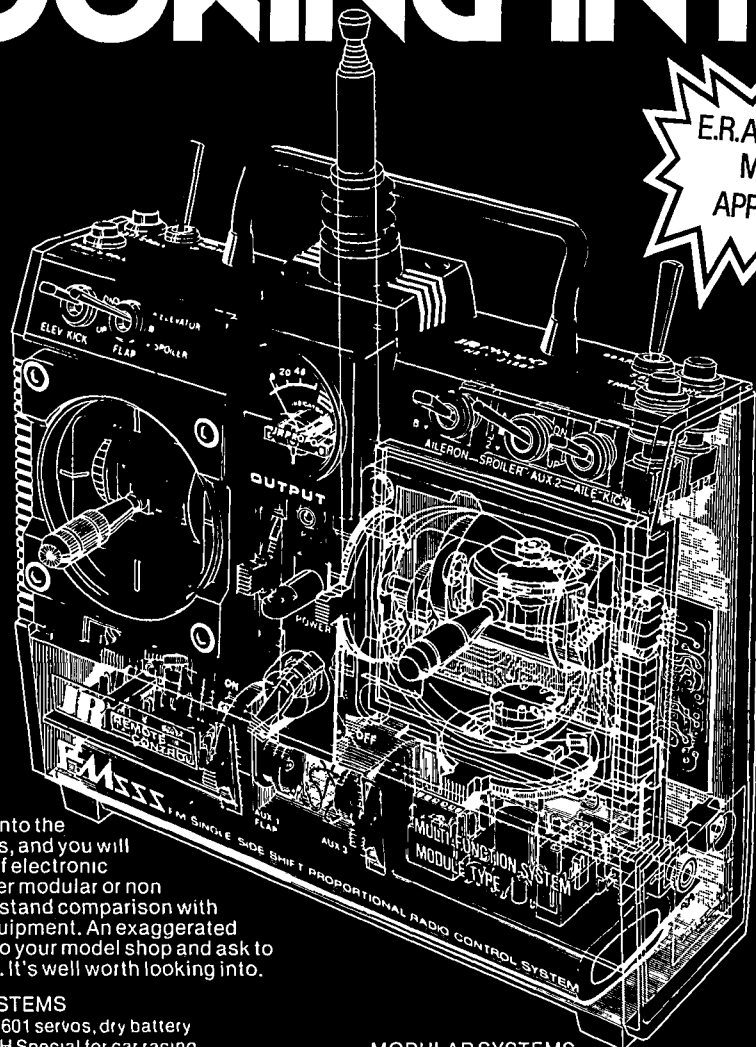
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Sir Wilson KG, OBE, FRS, MP, will be opening the Model Engineer Exhibition on January 7, 1982.



## MODEL ENGINEER EXHIBITION

As ever, the Model Engines Exhibition Guide will be on sale prior to the opening; available at newsagents on December 18, 1981, price 50p. The catalogue contains entries of models in all categories and a full list of lectures. There are around 30 films and lectures specifically for aeromodellers, one of particular interest being "Getting the most from model aircraft" by Martin Dilly. Other organised events and a full list of firms having trade stands are also included.

The increased number of vintage models entered this year, we are sure is due to the stirring efforts of Alex Imrie, in his Vintage Corner series of articles.

Looking at the list of over 60 flying models there are subjects such as: a double size Miss Vintage, 1936 Wakefield, Flying Stick of 1937, 1981 F1C model by a member of the Russian World Champs Team, Westland 'Witch,' Bristol 138A Research Aircraft and The World's smallest flying model. The range is truly superb, so be sure not to miss out on this year's show. Once again we remind RTP enthusiasts that there will be demonstrations on Monday, January 11 and further flying on Saturday 16. All are welcome, with models, on both days.



Photo shows Robin Gowler holding the transmitter and Barry Richards holding the model after the successful flight.

## R/C MODEL RAISES £600 FOR CHARITY

A radio-controlled model aircraft has raised some £600 for charity with a sponsored flight from RAF Upwood to the ex-RAF airfield at Waterbeach in Cambridgeshire. The model, an 8¾ft. span Aeronca 'CHAMP' from a Precedent kit, was started by John Lymer, a member of Cambridge MAC, shortly before he died from kidney failure.

The uncompleted aircraft was taken over by Barry Richards of the Cambridge club and completed, powered with an OS twin-cylinder four-stroke engine. Together with Robin Gowler of the Ramsey MAC, they developed the idea of a Memorial Flight to raise funds for a kidney machine at Addenbrookes Hospital in Cambridge.

The flight took place on Sunday October 25, 1981 when the aircraft, loaded with over four pints of fuel, took off from the runway at RAF Upwood. Barry flew the model from the back of a small van with Robin alongside as co-pilot. The route of some 30 miles was carefully planned to avoid built-up areas and to give as clear a run as possible. Members of both clubs did point duty at crossroads and escorted the control vehicle all the way. Fifty minutes later the aircraft was landed at Waterbeach and the flight had been completed with no problems whatsoever.

After a bottle of champagne had been opened to celebrate the successful completion of the flight, Mrs. Lymer congratulated the pilots. Over £600 has been pledged in sponsorship and this will go a long way towards the kidney machine which is so urgently needed.

## DUNLOP'S PITTS CONTEST

Further to the mention of this competition in last month's Hangar Doors, we can now confirm that the contest will be held at Old Warden on July 4, 1982. Four contests will be run and trophies will be awarded for the best replicas of the Pitts Special in Dunlop livery. Although G-BOOK, the Dunlop Pitts flown by Brian Lecomber, is an S-1S, models of the S-2 version will be accepted for judging.

The four contests are: Static — i.e. non-flying; Free Flight — i.e. powered by a

rubber motor, CO<sub>2</sub> or internal combustion engine with a minimum qualifying flight of 20 seconds; Control Line — i.e. aerobatics in circular flight; Radio Control — i.e. stand-off scale judging standards and with aerobatic performance.

## Entry

All competitors will have free admission to the Shuttleworth Aerodrome plus a handsome souvenir of the day. A special award will be given for the best R/C Aerobatic performance following Brian Lecomber's Group IV display pattern.

1. All entries must be decorated in Dunlop livery as detailed on APS Plan 3042 and illustrated in Scale Models magazine, January 1982.
2. Entrants must assure the organisers that they are the builder of the model.
3. Each entrant is restricted to one entry in each class.
4. Professional model-makers are not eligible.
5. Models may be to any scale.
6. Except for the Static Class, all models must make a flight of at least 20 seconds to qualify for judging.
7. Judges' decisions are final.

A Dunlop colour brochure of their Pitts G-BOOK is available from the editorial offices on receipt of a stamped address envelope.

Aerobatic flights by Brian Lecomber with the full size aircraft will be part of the entertainment at which will be a most memorable event.

## MARITIME ENGLAND

There will be a Windermere Lake Festival for two weeks between July 3 and 18, 1982; this will cover three weekends.

On Friday 9 it is planned to have model yacht racing on the lake in the day and model flying boats in the evening. During this weekend (10/11) a hall will be made available for an exhibition of both types of model. If you want further details contact Barry Tullett, model event organiser, at Room WLF (M), ART Dept, Ashleigh, Windermere, Cumbria LA23 2AG.

## LONDON'S FLYING START

Information we received about London Museum's "Flying Start" exhibition (see

December, 81 Hangar Doors) did not include details of Alwyn Greenhalgh's lecture of Saturday 27 February, 1982, entitled "The History of Model Aviation in the United Kingdom." This commences at 2.15pm in the lecture theatre at the museum. It will be illustrated with many examples of veteran model aircraft and engines, and also with indoor flying models depicting the various types described. This will also be a celebration for Alwyn as it is his 50th lecture of this title. His previous talks have been most warmly received at such venues as the Model Engineer Exhibition, young people's lectures in the Science Museum, branches of the R.Ae.S. and many SMAE clubs.

## NEW CRAFT GUIDE

We often get requests for hard-to-obtain items such as thin bamboo cane, etc. This new guide entitled "Popular Crafts Guide to Good Craft Suppliers" could be of interest; over 2,000 suppliers of craft materials are listed. On sale from booksellers, price £1 or direct from Popular Crafts, 13/35 Bridge Street, Hemel Hempstead, Herts., HP1 1EE, price £1.25.

## ERRATUM

The adult entry fee for the Model Craft and Country Show is £2.00, not £1.50 as published in the December Hangar Doors.

## BURGOS — AGAIN

Without exception, the international model press has castigated FENDA's direction and the bully boy tactics of the Civil Guard at the Free Flight Champs in Spain. Most outspoken, and detailed, is the account in *Modelflyve Nyt*, the Danish magazine. It challenges FENDA to comment on eyewitness accounts of the assault on Lothar Doring, the world champion in Wakefield and others. A statement has appeared in the Spanish 'RC MODEL' in which blame was laid upon celebrating modellers who discarded their identity badges and broke the rules.

## CIAM AGENDA

As we go to Press, the CIAM delegates are having their annual reunion in Paris to determine rule changes and future championship locations. Their agenda was 37 pages long, plus appendices, with yet another full revision of the rules for combat, and new rules for RC Slope glider speed

proposed by Austria. R/C Thermal Soaring occupied a large proportion of the suggested amendments. The Canadian rocket launch winch was clearly out of favour, France wanted winches to be eliminated completely from the event. The distance task and the 12 lap max were also targets for dissent. Australia wants none of it and said it wasn't a test of models or pilots while other nations preferred to keep the task but remove the 12 lap limit. Among many other fascinating proposals Denmark wanted to see max weight raised to 20kg to permit quarter scale, Austria asked for team race tanks to go down to 5cc, the RC noise reduction committee sought increase of engine limit to 20cc while Germany asked for 15cc, and Switzerland wanted 10cc two-strokes, 20cc four-strokes and no limit for electric motors. Germany also wanted RC helicopters to increase weight limit up to 7kg without fuel; but strangely no-one has made a plea for larger rotor dia.

Austria joined Australia and Argentina in offering to host the 1983 Free Flight Champs and for 1982, a decision had to be made between the USA and USSR for R/C Scale, Sweden is the only nation to undertake Control line and Rumania for Indoor in 1982.

The many proposals should have made for a lively discussion especially after the scandals of 1981 World Champs. We hope that the due process of democracy enabled full consideration of the agenda to be undertaken by the experts of all countries (including UK) so that we shall be able to report wise decisions in an early issue.



Dear Sir,

Brian Welch's letter in the October edition of the *Aeromodeller* promotes a great feeling of *deja vu*. Every so often we hear the cries, "Why isn't something done for the sport fliers?" "Why are the magazines full of contest news?" Has Mr. Welch never opened a fishing paper or a cycling magazine? It is the competitors that feel strongly about their hobby and are

*moved to organise and write about it. Competition is positive and encourages development in materials and techniques, but it is also FUN! Remember that for every contest flight made, the competition minded modeller probably makes dozens of trimming or training flights to get it just right and these are all for fun and enjoyment, even with the occasional mishap which we learn to accept as part of the game.*

*If Mr. Welch really wants to get with the action, why does he not progress a little further down the line from the Achilles and build a 'Coupe' to fly at the Aeromodeller 'do' at Henlow on December 6.*

**Oxford. Andrew J. Crisp**

Dear Sir,

*The enclosed started off as a letter, then got out of hand. You may care to use it.*

*Nostalgia — That which is generated when there is little left to think about.*

*Having attended the Old Warden Vintage Day and reading Pete Russell's and Alex Imrie's report on the event, in particular the 'pure thoughts,' I am prompted to pick up my pen and make a few observations and express a thought or two of my own.*

*Having travelled from 'up North' with other club members, the events and happenings of the day sent us back home euphoric, nostalgia brimming in our eyes, tired but happy.*

*The few vintage free-flight models we had stuffed into the rear of the car remained there due to the wind conditions causing us to 'chicken out.' This gave ample opportunity to wander amidst the three 'camps' into which things seem to have since been placed.*

*For the first time in years here was a meeting where one felt people were not concentrating on pot hunting or generally lost in their own importance, but simply out to enjoy themselves along with others.*

*If the Vintage scene is to survive however, it will not be through rules and regulations that exclude the enthusiastic non-purist. Guidelines yes, with the option to change things as personal choice and circumstances dictate. Not all of us can or want to afford a vintage engine or the numerous expensive accessories that seem to be the "thing" in some quarters to make it acceptable.*

**North Humberside R. N. Kinroy**

# What's Happening?

## INCLUDING FREE FLIGHT

**December 27**  
WIGAN 70 & HLG. Venue: 3 Sisters Recreation Area, Wigan. Start 10am. Contact: Russell Peers. Tel: (0270) 60893.

**1982**  
**January 10**  
NORTH WEST MINI GOODYEAR. SMAE rules but no age limit. Venue: Littleton Road Sports Field, Salford, Manchester. Contact: Martin Daglish. Tel: (061 766) 5313.

**January 10**  
INDOOR MEETING EZB, HLG. SCALE. 11.00am-6.00pm. Venue: Colne Valley Leisure Centre, Slaithwaite near Huddersfield. Contact: Bernard Hunt. Tel: Huddersfield 862353.

**January 23**  
INDOOR MEETING ORGANISED BY SOUTH BRISTOL MAC. Venue: Grange Sports Hall, Warmley, Bristol. Contact: Doug Sheppard, 13 Luckington Road, Monks Park, Horfield, Bristol, Avon BS7 0UT.

**February 7**  
CRAWLEY INDOOR MEETING HLG, EZB, RUBBER AND CO<sub>2</sub> SCALE. Venue: Crawley Leisure Centre. 12.00-6.00pm. Contact: J. Dolding, 22 Loxwood Walk, Ifield, Crawley, Sussex RH11 0HY.

**May 23**  
IRISH THERMAL SOARING NATS. Venue: Mallusk, Co. Antrim. Contact: K. Townsend, Beechwood, Church Lane, Greystones, Co. Wicklow.

**May 1/2**  
MUNSTER R/C CHAMPS. Venue: Waterfall, Co. Cork. Contact: K. Townsend, Beechwood, Church Lane, Greystones, Co. Wicklow



# CZECHOSLAVAKIA'S INDOOR INTERNATIONAL BRNO, July 11/12, 1981 report by Laurie Barr



BERNARD ASLETT and I planned a trip to this contest, if our models survived the first team trials at Cardington the week before.

We were both in good shape, the models OK although Bernard had the misfortune to be unable to return a good score in the trials, due to unpredictable weather, in spite of having two models which had exceeded 37 minutes on previous trips to the 'shed'.

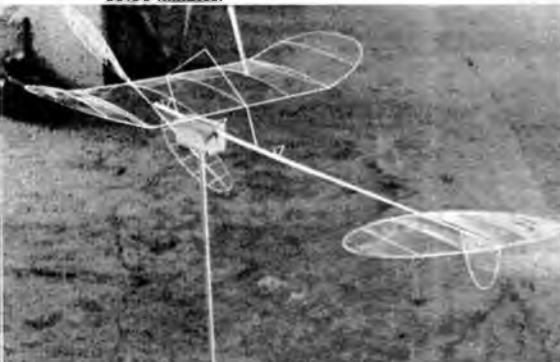
In order to ensure safe arrival of our delicate cargo, and to be able to take a vital cylinder of helium for the gas balloons for steering, we set off for the trip in the Jaguar. On the way to Dover, we had a (fortunately) rear tyre split, but luckily suffered no ill, and managed to get a spare at Maidstone.

The trip out was uneventful and the clear perspex tops to our model boxes, together with the Brno contest invitation (printed in four languages) made our passage through various customs easy. It is amazing how knowledgeable police and customs men are when confronted by two crazy Englishmen going 2,000 miles just to fly transparent toy aeroplanes!

A short overnight stop in Prague was enjoyed due to the great hospitality of Jiri Kalina, an old friend of many years, and a party of six cars set out in convoy to drive the 150 miles to Brno. All the way across Europe we followed a big high pressure area, and the weather (a vital factor to indoor flyers!) was perfect, warm and not too windy.

The 'Z' hall in the exhibition grounds at Brno is an FAI category 3 hall, and is approximately 110ft. to the top, however in the centre is a large circular ventilation hole some 30ft across, above which are louvres to outside atmosphere to allow the hall to 'breathe' during hot weather. Although the local fliers drape a muslin net right across the hole, in hot weather there is a very strong thermal underneath it, and if you fly an indoor model within 20ft. of it, you will almost certainly get sucked up onto the muslin, like a fly onto a spider's web, to lose the flight and probably the

Bernard Aslett's 1981 winning model which totalled 69.06 minutes.



model as well. The contest was to standard rules, i.e. max wing span 65cm to minimum air-frame weight 1gm, three flights on each of two days, best two to count towards your score.

The problem was in choosing the right size rubber motor, and launch torque levels, so that you levelled off after climbing, well under the dreaded hole, but with sufficient energy to sustain the model in a long cruise, and slow descent. Normally at Cardington, we have been using 1.3gm of rubber, but after advice from our host Jiri Kalina we made up some motors of 1.1 and 1.2gm weight. This meant that the model's total weight was less, they flew slower, but in the case of my ships, the centre of gravity moved from 78 per cent to 81 per cent, a trim which proved to work fine on the first day, but not on the second.

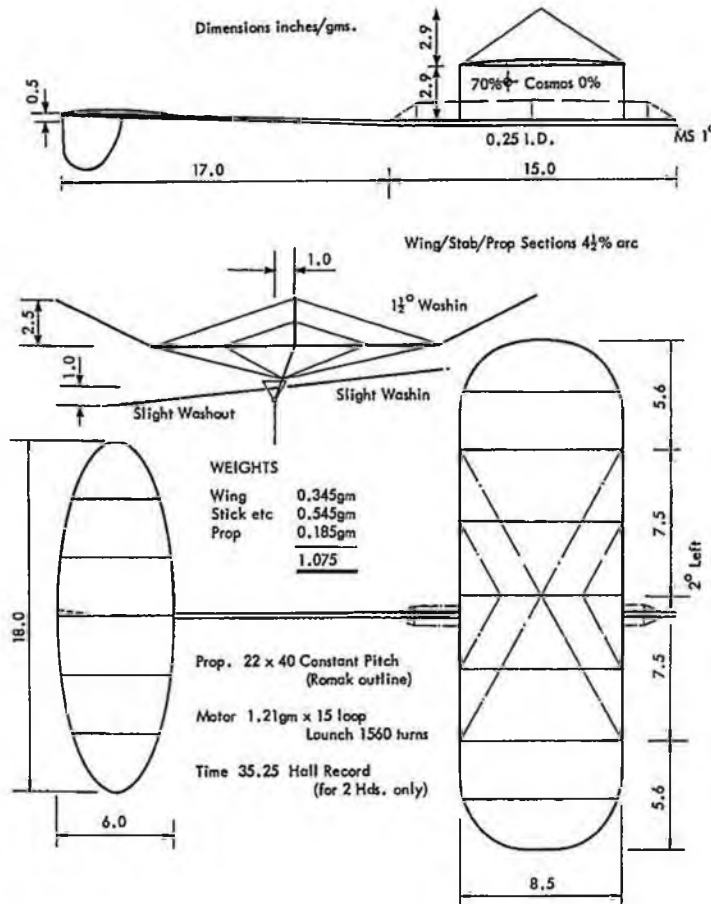
Two hours were allowed to trim the models prior to the contest, not much time for an indoor flier, being four flights of 30 minutes each if you were lucky to get your sums right, and very inadequate if you did not! Bernard suffered a broken wing on one of his 'best' models during a handling accident, but thereafter as the score sheet shows put up the most constant flying this hall has ever seen, with an amazing series of flights well over 30 minutes (a good time in the Z hall) and in the second round broke the previous hall record held by Jiri Kalina of 34.46 set in 1977, with a superb flight of 35:23! and after the loud applause from

all inside the hall (a nice 'indoor custom' at the end of any notable flight) was surrounded by fliers wielding cameras, measuring devices and sketch pads. In round two I had a good flight going, 20 minutes so far, but dangerously close to the fly trap, and an agonising decision to be made, should I steer the model away to one side to avoid the worst of the updraft or leave it?

It's not easy to steer a model at high level where (A) you cannot get the balloon much higher than the model, and (B) when there is very good light so the thin and transparent outline disappears into the background foolishly as it happened I attempted to steer the model, and only succeeded in catching it in the wrong place, and folded the wing. In the event, it probably decided the outcome of the contest.

Having broken a wing, I changed models for round three, and using the same size motor/turns/launch torque as in round two, my model was still cruising at high level at well over 30 minutes, showing commendable reluctance to come down. The prop seemed to be scarcely turning and still it did not come down, however it finally landed with 80 turns left (potentially another two minutes plus!) for another new hall record of 38.10 seconds, an average 37.5rpm. After the now customary clapping, the army of measurers etc., deserted Bernard's model and gave mine the 'treatment' (oh how fickle!),

## Scale 1/10th



1981 BRNO International F1D 1st place by Bernard Aslett



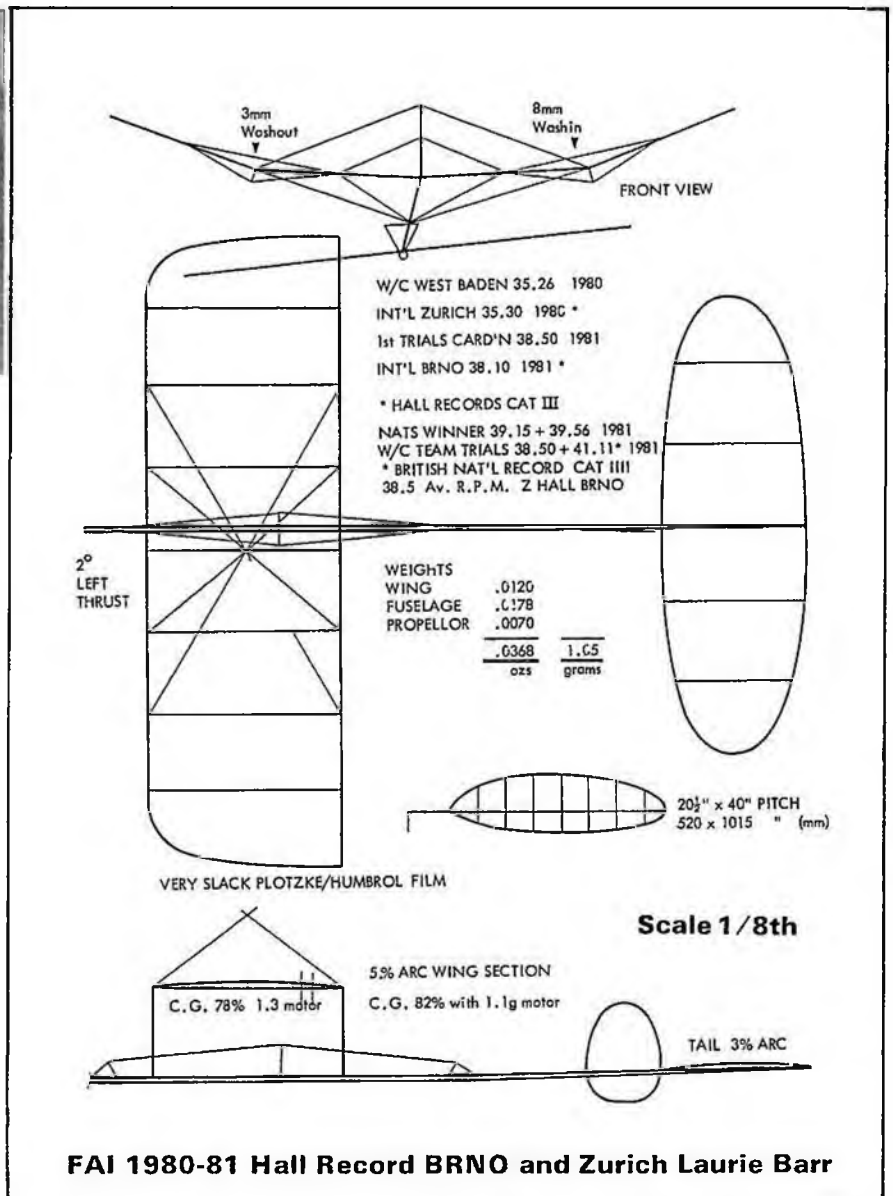
Laurie Barr's model that recorded a record flight in the 'Z' Hall of 38.10 minutes.

While all this was going on the Poles and the Czechs were putting in good flights while Kalina was trying so hard, he hung on four of his six flights! A rare state of affairs for the acknowledged master of most of the world's better indoor halls. Dieter Siebermann was trying a new large high pitch prop, which refused to work, and saved his best efforts for day two. Day one finished with myself in the lead, Bernard second, Ciapala third, Chlubny fourth. With no further breakages, and another fine day forecast for tomorrow, it all looked promising. An excellent late night meal at a new hotel (the one we were in did not do any kind of food!) and the portable rations taken with us, including life saving tea making capacity (courtesy Mrs. L.G.B.), made us ready for day two.

Early morning test flights showing our models and motor combo's still looked right, certainly misled myself, as this day was later to be hotter, with a bigger thermal up top, and as the air had to come from somewhere, the turbulence at ground level was bad. With a CG shift of three per cent, and only wanting a simple flight of about 32 minutes or so, (in the event I would have needed only 30:55 to win) I backed off too much torque at launch, and the model stalled down on the last two flights trying not to go high. In between trim flights on the same power, ballooned after gaining enough height, showed none of the vices during rounds five/six, oh well that's life! It was not to be. Bernard in the meantime had done his second best flight and contest winning 33:43, and had a collision with another model in round four at 40ft. or so with what could have been an even better flight than his earlier record of 35.23. A re-flight gave him a 33:34, to be followed by another great flight of 32:42 in deteriorating air.

Siebermann during all this had changed props to slot into fifth, Sierko of Poland (a new name to me) clinched fourth with a last round 31.53 and

Inside the 'Z' Hall showing the muslin 'fly-trap' being removed after the event.



ex-1974 world champ Czechowski having finally avoided the only two invisible hanging wires often enough to get time for third place.

Bernard thoroughly deserved his No. 1 spot by consistently high times, and if it was an all six flights to count contest, he would have won by a mile!!

I suppose we had every right to be feeling pleased with ourselves, with a first and second, plus a new hall record, we took three out of the four awards between only two people.

The banquet in the evening got going in style, after the pipes carrying the beer were unfrozen!! and everyone got commemorative certificates. With the meal finished groups of many nationalities were talking avidly about our sport as though we all spoke the same language, which aeromodellers the world over actually do! and you find no bigotry or political/ideological differences

man to man. What a pity the world cannot be always like these great festivals of sport.

On the first day, we drove from Brno to the Dutch border at Anchen, a distance of some 650 miles, in approximately seven hours actually driving.

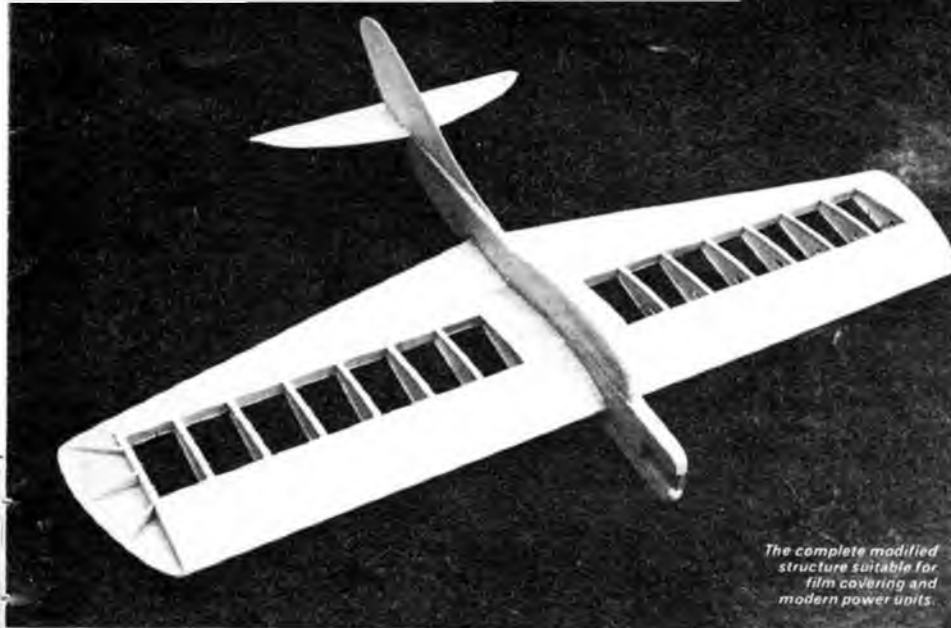
An enforced stop en-route, brought about by one of the many BMWs who wanted to 'do' a Jag, wrapping itself around a tree some ten minutes later, and the German police stopped all motorway traffic, to land a Bell helicopter with medics aboard with inches to spare over his rotor diameter.

It was a great trip, well rewarded, and I commend indoor flying to those who have not tried, so why not come up and see us at Cardington some time? It is one of the great flying sites world wide and the British hold their own with the best in the world.

Indoor International FAI Microfilm		1	2	3	4	5	6	Best 2 flights
1. B. Aslett	England	30:34	<b>35:23</b>	11:04	<b>33:43</b>	33:24	32:42	69:06
2. L. Barr	England	<b>30:00</b>	20:00	<b>38:10</b>	24:42	0:43	9:31	68:10
3. R. Czechowski	Poland	28:01	9:44	30:03	<b>33:11</b>	<b>33:52</b>	29:12	67:03
4. S. Sierko	Poland	<b>32:40</b>	12:40	9:39	30:43	11:54	<b>31:53</b>	64:33







makers belonging to other people. My impressions were that it was very smooth, manoeuvrable and easy to fly. I remember recommending it to the people starting out on stunt as an advanced trainer. The nicest one I remember was a lightweight powered by an AM 2.5 built by one of the lads as his first stunter. The hairiest was powered by an ETA29 which the inexperienced owner could not keep away from the ground. We have built two Peacemakers, so read on to find out if they were as good as they used to be.

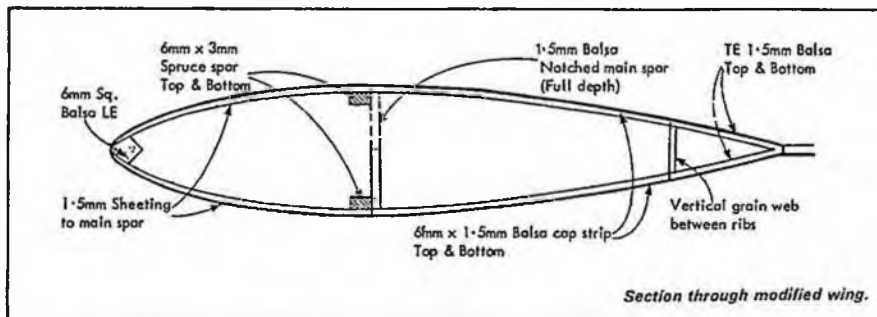
Ian, one of our young club members, had rushed into combat models and found them difficult to fly. He has a rather tired old ENYA19 so I advised him to build a lightweight 'Peacemaker.' To keep the cost and weight down, it was covered with tissue. The original wing structure is rather unusual to modern eyes but there was no point in making changes for their own sake. Built exactly to the original plan, the model flew as well as I remembered. The old ENYA is fitted with a silencer but still produces enough power to pull the 20oz model through all the basic stunts. Ian likes flying the model but feels he needs to get the engine rebored to make it easier to start.

Having an OS Max 15 in prime condition and doing nothing, I decided to build one



myself. Being the sort of chap I am, I immediately racked my brain to think up 'improvements.' I concluded the aerodynamics are exactly right for this type of model and therefore left them unaltered. However, the original structure relies on the covering for some of its strength. This is fine for tissue or nylon but not the Solarfilm I intended to use. Solarfilm adds less strength to a structure so it was beefed up to use the more modern covering. Care was taken to keep the original wing section.

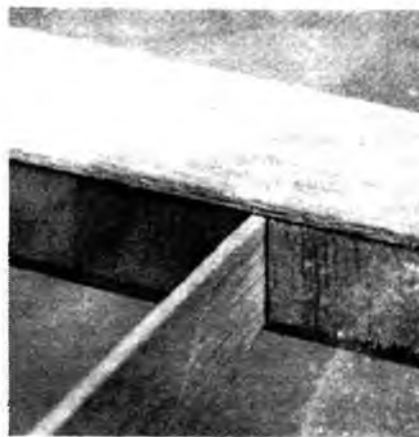
Firstly a set of ribs is made exactly 1.5mm smaller all round than the outline shown on the plan. Pin them together in a block and sand to shape. With the aid of a small saw,



cut the notches to fit the leading edge, spruce spars, and main spar. Cut the main spar out of good 1.5mm sheet balsa and carefully notch it in the same way as on the original plan to take the ribs. Make holes in the inboard ribs for the leadout wires and then glue all the ribs to the main spar over the plan. Next glue and pin on one side of the trailing edge followed by the vertical grained trailing edge web. I have suffered from 'curly' trailing edges without this web. Glue and pin on the top of the trailing edge plus the spruce spars and leading edge. Leave this structure to dry under weights to keep it flat. Select two pieces of medium hard balsa to sheet in the leading edge and

*OS Max 15 and tank arrangement. Note: a suitable tank can be made using tin plate from a five litre oil can.*

dampen the side intended to go on the outside with a cloth. In a short while it will bend to almost the exact curve needed. While this is happening, fit in the ply bell-crank mount and control system. The leading edge sheeting can now be fitted with little or no extra bending and only a few pins. Add the tips, capping strips, tip weight and centre section sheeting. The box section formed by this structure is extremely strong and surprisingly light. Apart from extending the ply doublers back an inch or so more, I made the remainder of the model as the plan shows. The fuselage I covered in lightweight Modelspan and the wing, tail and fin in Solarfilm. The colour scheme is black and yellow with nice simple white trimtape lines. Finished, my model weighs



*Trailing edge detail. Note the vertical grain of the web between the trailing edge sheet. Cap strips not fitted. Below: section through wing showing position of full depth spar and rear web plus 6mm square leading edge.*

450g which is 100g or so lighter than suggested originally (I think it must have been for a nylon covered version).

At the time of writing, we have only flown my model a few times. On 50ft lightweight lines it is an absolute delight to fly. Control response is crisp and line tension is as good overhead as in straight and level. I know my plotting is a bit rusty but I am sure this model is better than my recollection. It is years since I got round a clover leaf but I cannot wait to have a go with my Peacemaker. It has brought back some memories for me and a real pleasure in flying that I have not felt for some years. I strongly recommended this classic design to anyone who wants a simple model on which to develop their aerobatic skills.

# SCALE MATTERS

by Alan Callaghan

## MILTON KEYNES INDOOR SPECTACULAR

A VERY bright but chilly October day saw the occasion of this the second major indoor meeting to be held at Middleton Hall open space at the Milton Keynes shopping centre. This venue has so many points in its favour that it is to be hoped that many more indoor meetings, both scale and duration, will take place here in future. The space is much larger than the average leisure centre sports hall, and being fully glazed from floor to ceiling on the north and south sides, a very bright atmosphere is naturally created in the hall on a sunny day. At night-time the lighting is excellent too. A slight problem existing at the moment is that the hall is linked with two parallel shopping malls which in turn are open to the outside air in several places some distance away. On a windy day the air in the hall can be quite turbulent at times and careful positioning and launching of models is necessary. Upon leaving I did notice that the external entrance points were being fitted with glazed pivot doors which means that the draught problem will probably be eliminated by the time of any future meetings. Being close to the M1, the site is readily accessible from most parts of the country and a strong contingent of northern flyers were in attendance. The idea of holding the next Indoor Scale Nationals here was brought up during the proceedings, as a break from the popular Derby venue where they have been held in recent years. At this juncture this seems a firm possibility for 1982, but more news when everything is confirmed.



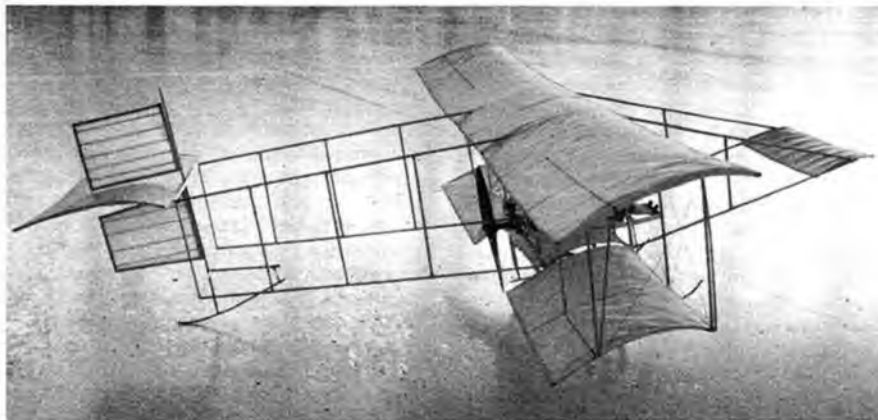
John Whatmore won CO<sub>2</sub> Scale with his very simple 'Avro G' which was of all sheet construction built from a Bill Hannan design. Motor is one of the new Brown Campus A-23's which flew the model quite adequately. (All photographs by Alan Callaghan).



Bill Sponge, a regular of many indoor scale meetings, is seen here with his Peanut 'Gee Bee' variant, neatly finished in coloured tissue.

Contests were run for CO<sub>2</sub>, Rubber and Peanut, as usual and these mingled with the duration events seemingly without any major catastrophe due solely to this arrangement. An exception occurred when one half of the hall was allocated to scale testing and trimming while the glider event went on in the other half over a clear floor space.

The scale events demonstrated the usual pattern of entry; CO<sub>2</sub> drew six, Rubber drew eight, and Peanut twenty-seven. It is always surprising that more people do not enter the events for the larger models. After all, they are easier to build and fly, but it says much for model builders of today, however, that the most irresistible attraction seems to come from the most challenging instead of the easiest class. Well-known Vintage and F/F Scale flyer, Geoff Clarke, on making a special trip to this meeting to take a hard look at indoor scale, was most impressed with the variety of subjects tackled in all three classes, the seemingly impossible F/F subjects that were putting up creditable (but not incredible!) flight times and the general absence of a highly competitive atmosphere. I am sure most people had an enjoyable time although as always there are penalties to be paid for careless and even unlucky flying. Last year a model of my own finished up in a tree (yes inside the hall!) and this year my new SE5a decided to do a hardness test on the polished marble floor. Several other models developed a liking for the hanging lights and loudspeaker systems without realising that the attraction was mutual and for all we know are still there.



Mark Hinton's short S-34 has frame longerons made from grass! Campus A 23 provides the power. See text for details.



*Trick Dennis holds his S. G. 101 during a test flying session at Clibham Common. Twin Mills 75 powered model is very impressive but proved directionally unstable.*

Had there been a prize simply for the most original model at the meeting, it would almost certainly have gone to Mark Hinton's *Short S-34*. This model featured normally built-up wings with tissue covering but the exposed framework of the 'fuselage' was made from grass stems! Very careful bracing was achieved using a mixture of tungsten wire, as used on micro-film models, and elasticated thread. At 510mm (20 inches) span the *S-34* weighed only 18 grams complete and ready to fly with its Campus A-23 CO<sub>2</sub> motor. As far as flying was concerned it demonstrated characteristics typical of full size aircraft with this layout i.e. a tendency due to the almost total lack of fuselage side area, to sideslip into the ground. The torque reaction from the tiny motor was still sufficient to turn the model into a tight slipping turn with no apparent cure other than to resort to covering the boom frames with cling film. Whether the model is actually capable of being trimmed for sustained circling flights remains to be seen but it seems certain that having found such a perfectly suitable lightweight material for the struts a more carefully chosen prototype such as a *Houdini Voisin* biplane or similar with fabric between the interplane struts and a boxkite format tailplane would be a quite practical proposition. Whether the material used was actually *Deschampsia cespitosa*, *Agropyron junceiforme*, or one of several others, Mark could not say, but certainly a completely new field of construction has been opened up...

An emerging and welcome trend in CO<sub>2</sub> seems to be the building of larger models. However hazardous this may at first appear for indoor models, the fact remains that better wingloading figures can be achieved using standard building materials and it usually follows that the models will be better flyers. Previously the typical wingspan of a single bay biplane has been around 18-20 inches using a standard CO<sub>2</sub> motor. Now we are seeing spans of 24-26 inches as with Nick Peppiatt's *Sopwith Tabloid*, and at this meeting Rick Granger was testing for the first time a 26 inch span *Austin Ball AFB1* scaled up twice size from

an American peanut kit. This model weighs 65 grams, was covered in natural Early Bird tissue, and uses a standard Telco fitted into a rubber mounted engine plate. This made it not only more crash resistant but it seems to help dampen down some of the motor noise too. Some propeller efficiency must be lost due to vibration but even at this size the model was anything but underpowered and only needed a larger tank for increased flight duration. ROGs were very good.

The surprising winner of the CO<sub>2</sub> event was a neatly built quickie all sheet balsa *Avro G* biplane from a Bill Hannan design entered by John Whatmore. Flying against much more highly detailed models, John's A-23 powered subject showed that even now the simplest of models flown well can occasionally put you in amongst the prize winners.

With insufficient space to mention everything worthy of comment, other interesting models included Barry Pursglove's peanut *DH29* built no doubt from information in the excellent large new paperback *De Havilland* book but only capable of flights of

20 seconds or so at the moment. Harry Perrens' *Widgeon III* was flying as well indoors as it does out, but could have used a bit more headroom even from an ROG. Peter Frostick was achieving some remarkable 100 second flights with his all foam peanut *Rearwin Speedster* — built in only three hours and weighing around six grams ready to fly with 2200 turns on the motor.

At the next meeting it will be worth trying for one single photograph showing the entire complement of models and flyers just to give some idea of the very good response that the scale fraternity makes to a meeting like this. In the meantime all thanks are due to hardworking judges Butch Hadland and Ron Green, and to other members of the Indoor Technical Committee for good organisation and an excellent spread of prizes covering all events.

## F/F SCALE NEWS

Entries for this year's Nationals Super-scale and Rubber events were rather disappointing and one ambitious model which undoubtedly would have been a star attraction was a new WWI *Gotha G4* bomber by Bill Dennis. Following his experience with the *Handley Page O-400*, his latest unfortunately did not survive test flying a few weeks prior to the event. Powered by two Mills 75s, the model flew well in a straight line but due to having insufficient fin and rudder area in the slipstream of the motors, it was not stable enough to turn safely — a great disappointment. Undaunted, Bill wishes to re-ignite interest in the F/F Scale contest scene in 1982 and would very much like to organise anything up to three events but this is very much dependent upon interest shown beforehand. Venues would be either Barkston Heath or further south, so if you wish to have a say in the matter and are keen to support F/F Scale, write to Bill now at 27 Wheble Drive, Woodley, Reading, Berks.

*Rick Granger's Large Austin-Ball AFB 1 was Telco powered with the motor mounted on a crash resistant rubber plate. Model flew very well but lacked tank capacity for long flights.*





# Vintage Corner

By Alex Imrie

## SAM 35 Flying Day Old Warden

Well over 200 enthusiasts turned up on 18 October for this splendid meeting; wet and windy weather rapidly turned into sunny interval stuff and Lo and Behold, the wind dropped right off to a complete calm in the late afternoon. A great time was had by all, and it was encouraging to see many types of vintage model that have not generally been seen at our meetings before. Amongst these were Don Knight's Newcastle Model Shop Privateer and his HA Thomas Southerner. The air was quite thick at times with every type of model, and there were some 'near do's' where models missed other models and modellers by inches!

Brian Yearly fielded two Flying Minutes and a Smoothie, Mick Staples flew a beautiful Rippon Air Cadet, and there was a black Korda (I did not get the builder's name) that was often seen high in the air sniffing at whatever thermal like currents the October sun could cook up. Amongst the rubber models there were various twin pushers that flew well including Dick (or was it David?) Hardwick's Manulkin with enclosed motors built from drawings in the 1937 Zaic Yearbook.

Bert Judge was there with his own version of his 1936 Wakefield Cup Winner, while his Wakefield teammate from 1936, Dennis Fairlie was also active flying various small diesel powered models including a fine looking Deperdussin complete with large polished brass fuel tank! No Old Warden meet is complete without Howard Boys, and he was often to be seen in hot pursuit of his tailless model; he also had one of his original radio control models with



Above: The original Viper II after a hand launch at Leavesden aerodrome during one of the machine's last outings around 1950.

Left: Mr. Leonard Taylor was in the next bed to Mr. C. Rupert Moore at Ventnor Sanatorium (IOW) and he faithfully copied the Viper I design shown here in a realistic pose. The practice of marking the wing serial numbers on the upper wing surface stemmed from the manner in which Avro Ansons were marked at the time (1936). Incidentally K-2716 was the serial of a Fairey Gordon!

him powered by Mills 1.3 Mkl using a magnetic rudder actuator.

Types there were in abundance, and the following power models, amongst others, were to be seen: Gas Flea, Cloud Airmaster, Cloud Elf, Miss Farnboro', Rambler, Wasp, Junior 60, Porlock Puffin, Comet II, Kanga Kub, So Long, T-Beam, Scram, Coronet, Miss San Diego, Fly Baby, Miss Tiny, Banshee, Slicker, Bowden Contest. Sid Sutherland flew his Westerner now fitted with a Super Cyclone, but suffered a broken rear fuselage early in the proceedings and had to retire for a masking tape repair. The trees claimed a number of models again, especially early in the day when the wind was stronger, some models could actually be seen in the branches, but were absolutely inaccessible. One of the unfortunates was Brian Ferrett who lost his Sadler Pacemaker (ED 2cc diesel-powered) in this manner and had to content himself by flying his Coovert 1938 Berryloid Winner

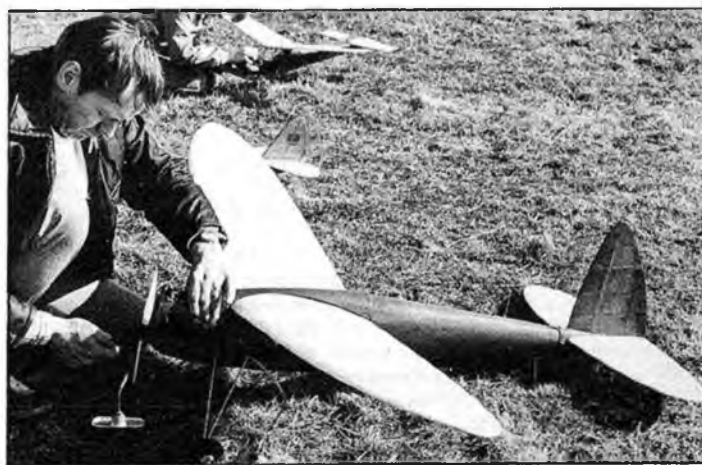
Left: Sid Sutherland with his version of Mons. E. Fillon's 1937 Wakefield winner. Note the use of appropriate headgear!

Colin Watts with his Streamlined Cyclone, plans of which appeared in 1938 Zaic Yearbook. This model is tricky to trim for high performance but will fly well on very little power.

(Mechanair 5.9cc petrol) for the rest of the day (but read on). Jack Frost could have spent the whole day aloft in the branches, but it must be realised that he is not a one-man recovery service. The authorities at Old Warden welcome information on models that are tree bound, and as and when models are recovered, the owners will be contacted, this means that many models will only be temporary out of use and not lost for ever. A few stalwarts tried control line, and there were a number of radio models, including Powerhouse, Rudderbug and a fine flying Corben Super Ace. As is usual on such days, the last modellers only vacated the aerodrome due to the onset of darkness.

## SAM 35 AGM

This was held at Downs Farm Youth Centre at Hatfield on Sunday, 25 October and was attended by almost one-third of the membership which now exceeds the three hundred mark and is still increasing. There has been dramatic growth during the last year when about 70 members were listed at the previous AGM. Much of this growth was attributed to the publicity ob-





*Cliff Billington from Merseyside with his Leon Shulman designed Skyscraper, this model is 54in. span and uses a mono nose wheel and two wire skids as a landing gear. Described in Air Age Gas Models reprints of which are still available.*

tained in *Aeromodeller*, especially through the regular appearance of Vintage Corner. Organisational changes that took place concern the division of the country into five regions each having a delegated representative. The writer was pleased to accept the position of President for the next twelve months, taking over from David Baker, who in his turn, has taken over the Editorship of SAM 35 SPEAKS from Ben Buckle. Ben was elected as Safety Director, a task that is likely to keep him busy with all aspects of flying site, safety and control. The meeting ended with a special award to the Hardwick family for their splendid endeavour in retrieving lost models from the vicinity of Old Warden, fourteen at last count including Brian Ferrett's Pacemaker mentioned earlier.

## Found

We have just learned that a Mr. Siddons of Old Warden (Tel. Northhill 226) recently found a red and white Matador in trees to

the south of the aerodrome. Will the owner of this model please contact the finder and give the necessary additional information in order to claim the model back.

## Radio Vintage

My comments on radio controlled designs in the November last issue were not meant to stir up any hornets nest, I was merely stating what is currently happening in this field. It did however, promote discussion, which is always healthy and caused a number of radio modellers to 'zero in' on me at Old Warden on 18 October. Their views were interesting in the extreme and really confirm that there are four classes of radio control related to vintage models.

Firstly there is the radio controlled vintage model, this is a pre-1951 design that was fitted with radio control at that time,

*Left: Jack Law, regular attender at all vintage functions with his Brown Junior powered Scientific Mercury, a 6ft. span 1939 design. Note the use of large fibre glass propeller.*

*Brian Ferrett primes the Mechanair engine of his Covert 1938 Berryloid Trophy Winner. This competition was for the best finished gas model, and Frank Covert used only Berryloid products finishing off the twelfth coat of colour dope with rubbing compound and car polish! This attractive 6ft. span model was described in November 1939 Air Trials.*

this model presents no problems, but one has to remember that there was no proportional equipment then.

The second category is eventually expected to become the most popular, called R/C Assist, this can be fitted to any vintage model and should be rudder only. Although ideally the trim tab alone might be used for this, it is known that small area tabs can be ineffective under certain conditions. Whether the modeller should select a prototype with a large enough tab, or resort to an all moving fin/rudder worked from internal linkages is a matter of choice.

Third in line is Free Flight Radio as described in this column in the October last issue, and information on its practical use would be received with interest.

Finally there is the radio-controlled vintage shape, and this is the fly in the ointment, being really more a new type of radio model, than it is a new branch of vintage modelling. It is very popular and doubtless will continue to flourish, but with structural changes necessary to provide the multiple controls employed, the model has departed too far from its original form to be termed a true vintage type.

It is a fact that many working drawings of vintage models are now being re-drawn incorporating features that the original never possessed and it has become necessary for the builder to do a thorough research job if he wants to produce an accurate vintage model.

Of course, the foregoing remarks do not apply in the "Fly for Fun" field, there anything goes! But, these factors will most certainly arise during competition processing, a commodity that we have not yet used to any great degree in UK vintage. However, as the movement grows and competitions become more commonplace, it will be necessary to segregate the classes of model, and rules will be needed. Human nature being what it is, in the competitive atmosphere that will then prevail, it will be the entrants themselves who will demand rule enforcement.



One of the original Jackdaws built by Mr. J. Putters. Why he decided to use an earlier registration than the prototype is not known. It is hoped to renovate this particular machine and fly it at Old Warden during this year's Vintage Day competition.



## Jackdaw II

When in 1941 the Watford ATC required a more advanced model aircraft design than the flimsy duration types that they had been building, one of the squadron aeromodelling instructors, Mr. C. Rupert Moore, undertook to supply this by modifying a successful design of his called Jackdaw I. This was a 33-inch span semi-scale high wing monoplane, and was his conception of what a 2/3 seater light aeroplane should look like. It had been built while a bed patient in Ventnor Sanatorium (Isle of Wight), and the designer still has vivid memories of spending hours outdoor in nine inches of snow during the winter of 1935/36 (fresh air treatment meant what it said in those days!) keeping his tube of

*Right: John Kaye with his 40in. span Snipe. This model designed by Ed Miller was described in March 1943 Flying Aces and is a sturdy good flying design for the Bantam 19. John's model flies well on the power of its DC Spitfire diesel.*

*Derek Ridley with his PAW 2.49 cc diesel powered Banshee, another Shulman design. This model flew many times at Old Warden on October 18 where its tight spiral climb brought back memories of the late 1940s competition scene.*



Secotone soft by means of his hot water bottle!

Mainly of hardwood construction, Jackdaw's tail unit, wing tips and undercarriage were of piano wire. Displaying the black registration letters, G-MOOR on its white doped thin brown paper covering and using a twin skein motor, the 6.21 ozs. all-up weight gave a wing loading of 6.6ozs. per square foot, and this resulted in a speed of around 15mph with maximum durations in the neighbourhood of 70 seconds. The wing was moveable and the model was usually flown with the leading edge some three inches aft of the windscreen top in order to get the centre of gravity in the correct place without resorting to the use of ballast.

Jackdaw II had an increased wingspan of 35 inches and a fixed position for the wing over the cabin in order to retain scale appearance. The shape of the fin and rudder were changed and a single skein motor used via an ingenious step-up gear box whereby the loss of rubber tension allowed the propeller to freewheel. These changes helped the performance and maximum durations were now in the region of two minutes. The shortage of balsa at the time was no problem, and basswood, spruce and birch were employed in a similar way to that used on the earlier model. In order to re-coup expenses the design was commercialised in June, 1942 when it was described in *Aeromodeller* and plans made available from "Aeromodeller Plans Service Ltd", this magazine then ran various Jackdaw competitions, and now... Forty Years on... another Jackdaw competition is in the offing!

Thanks to SAM 35 it is planned to hold a duration competition for Jackdaws at Old Warden during this year's Vintage Day. Final details are still in the process of being formulated, but will probably result in the contest being for the best of three flights. Plans for the model are available from SAM 35 at 22 Ellington Road, Muswell Hill, London N10 3DG at 60p per copy post paid. The purists might want to build exactly as the original with hardwood construction and geared motor, but many modellers no doubt will make ungeared balsa versions, and this will probably mean doubling up on material sizes, as well as slightly extending the length of the undercarriage legs in order to utilise larger propellers. At this stage the competition is seen as a "Fly for Fun" event rather than a serious vintage contest where static judging for authenticity would obviously favour the hardwood geared motor entry.

Whatever course you take, all Jackdaws will be welcome, so come along and join in the fun.





# Find the balance point MODEL COMPETITION

The great  
**Aero  
modeller**  
Give away  
contest  
£350 of  
prizes must  
be won



This month: five four  
stroke engines must  
be won, two Enya  
40s, one OS 40, two  
Saito 30s.



## RULES

1. The competition is FREE and open to all Aeromodeller readers.
2. The model has been erased from this picture. Use your skill and judgement to determine not just the position of the model in the picture, but its exact balance point.
3. The first ten entries with the centre of a cross nearest the correct balance point will be judged the winners of this month's prizes. If you prefer not to cut the picture from this page a same-size facsimile (photostat) is acceptable.
4. Any number of entries may be made, but each entry must be

accompanied by a separate entry coupon, clipped from the page. The coupon must be the original — photocopies are not accepted.

5. Only five crosses per entry.
6. Entries in this January edition competition close after first post on January 18, 1982. Results will appear in Aeromodeller March 1982 edition.
7. The Editor's decision is in all cases absolutely final and no correspondence will be entered into nor responsibility accepted for late, mislaid or lost entries.
8. Employees of MAP Ltd. and their families are not eligible.

## The November winners are:

Roger Vaughan, Abbots Bromley, Staffordshire. Andrew Blakeson Glasgow, Scotland. Bill Newton, Altincham, Cheshire. R. Wilson, Stockport, Cheshire. C. T. Sharp, Sandbach, Cheshire. G. H. Gilliat, Spalding, Lincolnshire. J. E. Mills, Sleaford, Lincolnshire. S. W. Ramsay, Prestwood, Bucks. P. J. Adams, Bingley, West Yorkshire. Peter Bull, Kilkenny, Eire.

MODEL COMPETITION, PO BOX 35, BRIDGE STREET,  
HEMEL HEMPSTEAD, HERTS HP1 1EE

NAME .....

ADDRESS .....

.....

.....

.....

To Aeromodeller Magazine. Please accept my entry for your January 1982 "Find the Balance Point" competition. I understand the rules of the contest and accept the editor's decision as final.

Signed.....

NB: Coupon must be original — not facsimile copy  
**Entry Coupon**  
Aeromodeller  
"Find the Balance  
Point Contest"  
January  
82.

# MAGNET FLYING

THE STATE OF THE ART  
BY  
TREVOR FAULKNER



Lightweight rear-rudder magnet-steered glider. Span 72in., chord 7in., Gottingen 500 section, weight 11oz. Used in winds up to 10mph.

ONE OF THE MOST surprising features of any 'class' of model flying is that it never seems to reach a position where improvement stops.

My feelings are that continued development is the combined result of multiple experience, (a lot of people doing it!) and the response to even more demanding versions of competitions such as limited motor runs, all-up-weights or rubber motor restrictions.

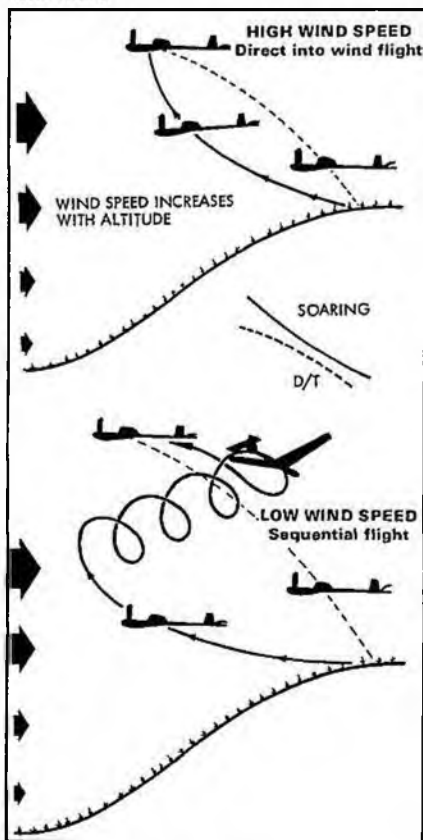
In this light, it may interest readers to have some sort of resume concerning a competition class in which the structure, weights and principles of operation have retained their individual and original characteristics, and yet has continued to improve directly in response to the demand for better performance under very testing conditions.

The 'testing conditions' in question, concern those factors which had in the past been considered essential to any form of slope soaring, namely reasonable lift, (wind-speed generated), and a good slope to take advantage of it.

Now, the focus has passed from the subject of the fliers' ability to record 5 minute maxes from good slopes in good to fair conditions, to a concentration on similarly high flight times from low hills in very low wind speeds.

How is this achieved? Obviously by the production of models with extremely low sinking speeds, low flying speeds, and dependable programmed flight-patterns to make the most of limited lift-bands.

For the uninitiated, it must be explained that the F1E Magnet model is steered by a bar magnet linked either directly or indirectly to a rudder. It is launched from a slope facing the prevailing wind as near as possible, and is normally trimmed to fly fractionally above wind speed, i.e. to 'stand' or hang in the lift-wave above the slope. A moment's consideration will show that every heavier-than-air model has a minimum air speed, below which it cannot be trimmed to fly satisfactorily. If this minimum speed is above the speed of the prevailing wind, the model will (if steering a straight into-wind path) progress outwards, away from the launch point. Put this together with a 5-min. max and it can be appreciated how far even the slowest model will go.



Wind speed m.p.h.	Model speed m.p.h.	Distance (in 5 mins.)
8	10	293 yds
6	10	586 yds
4	10	880 yds

Note: 10 m.p.h. is an average A-2 type speed; the distance is that of the model flight path. The retriever will travel rather more due to the ground contours... and the last bit is always uphill

However, if the model can be made to return to the lift zone, not only will the distance travelled away from the launch point tend to be less, but the model will reach a greater height.

Earlier techniques had been explored to produce figure-eights along the slope, circles into wind, or to interrupt the direct

flight path by means of a circular session.

Of these three alternatives, the latter has proven to be the most fertile ground for experiment.

The late Mario Feruglio (Italy) produced a series of beautiful models which featured programmable steering linked to a clock-work timer. As the mechanism was conceived and used, the only trim variable prior to D/T was the application and subsequent freeing of the rudder.

As most of us know (sometimes to our cost), changing trim by rudder alone will turn a satisfactory straight glide path into a lethal spiral dive unless certain very critical conditions are met. These may be summarised as:

- (i) a modest application of rudder (i.e. large radius circle) only,
- (ii) there must be no hint of under-elevation, and ideally the model must be on the edge of the stall when flying straight,
- (iii) there must be a non-critical C.G. position for instance, 35-40%, which will have allowed for a large incidence difference between wing and stab...

Feruglio's technique was as described, and gave excellent results just so long as wind speeds were of reasonable magnitude.

But what about conditions of a more testing nature? Imagine a very light wind; what is required? First, the model's sinking speed must be as low as possible.

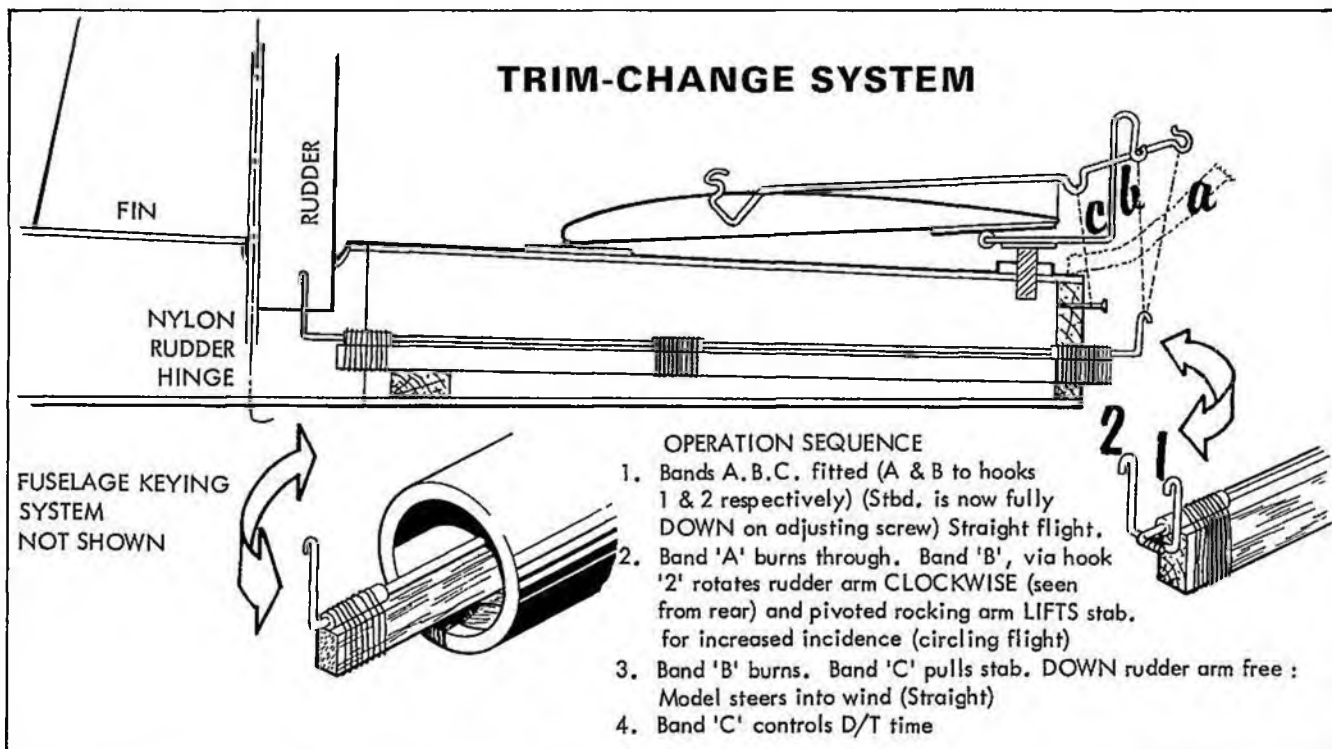
This means that the model must be light and slow-flying. (Drag increases as the square of the speed, remember). The glide angle doesn't matter, but the sinking speed does. Second, the model must be trimmed to its lowest sinking speed.

The difference between general model characteristics and the fine edge of performance that an individual model can achieve is not always recognised. Where the ultimate is being sought for light-wind magnet flying, we're in the realm of 100% C.G. positions, with incidence differences of perhaps 1°. Such models are very tricky to trim, & C.G.'s of 60-70% are practically more desirable, even though a little less efficient.

At this level of refinement, it is impossible to apply rudder to even the stalliest of trims and avoid a spiral dive, therefore, when a turn is initiated, the negative incidence of the stab must be increased. This brings us into the trade-off situation between degree of turn and incidence change. One thing is certain, in order to turn, models must bank. The greater the angle of bank, the less is the vertical lift component, (the force helping to keep the model up). Hence the desirability of a flat turn, and the associated large diameter circle required.

No asymmetrical warps can be employed due to their prejudicial effect on the model's straight flight trim.

The most interesting developments have



been the results of the search for models and trimming devices to satisfy these criteria.

Models for light-wind work are tending towards all-up-weights of some 10ozs. (300g) with wing areas of around 4 square feet, 576 sq.ins. A great deal of thought has gone into making warp-free structures of this size, and one significant break-through has been in the use of the mountaineering-type 'space-blanket' for covering. As this substance does not need to be doped, and will reflect a high percentage of the light/heat rays to which it is subjected, it can be seen that its use in conjunction with a lightweight structure has many advantages.

The aluminized foil Mylar or Melinex is secured to the framework with thinned rubber (contact) cement, which is allowed to dry and is then heat activated using an electric iron. Heat shrinking is a little trying, as the reflective properties manifest themselves and the film works hard at keeping

its cool!

Trim-change devices have progressed from the simple types often seen on power models to the pattern which keeps almost all its features on display and yet seems capable of confusing most observers. The real break-through is the return from increased incidence position with associated turn, to low incidence and free rudder prior to D/T.

My version of this arrangement allows for a detachable rear end, fail-safe 'rudder-off' movement, adjustable incidence platform and a quickly variable D/T angle.

The increased negative incidence of the stabilizer for the circling interlude can be adjusted by careful bending of the upper loop of the rocking arm.

One feature which magnet fliers have always had to ensure is the efficiency of their rudder configuration. The high aspect ratio has been utilised for about a quarter century, and the aerodynamic balance has to be precise. The amount of deflection required is very small, (10° each way is

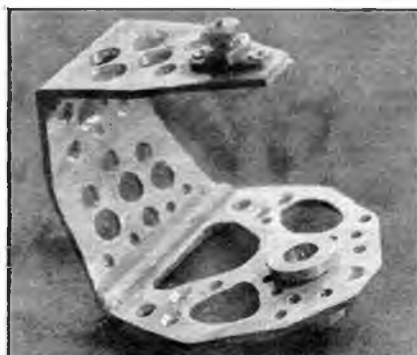
normally sufficient), and tends to look minute to eyes more accustomed to the large angles through which squat (and less efficient) R/C rudders often move.

Recent correspondence with Hans Gremmer the German maestro reveals that small buzzers, originally employed for model location have been formed to turbulate wings, and to improve stability.

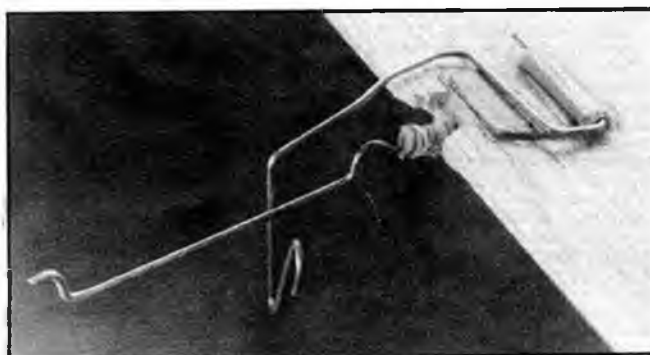
This is an adaption of wind-turned testing at sub-critical speed ranges.

In addition, flexi-foil stabilizers are under review — an example of a simple structure providing complex and desirable characteristics.

If anything characterises present day magnet fliers, it is their desire to get much from little. This objective cannot be gained by lavish expenditure, only by a clear comprehension of the principles involved and their application to suitable structures. The opportunities for development remain, and the degree of satisfaction to be gained once the rudiments of the art are mastered is immense.



Left: magnet housing for lightweights. Lower bearing is sprung, and carries a fine ball-point tip. Upper pivot allows removal of magnet unit.



Right: stabiliser from below, showing hold-down hooks, rocking-bar and pivot. Wire components are bent to give correct action of bands and also the incidence difference required for circling flight.





AT THE END of the Great War, having previously sub-contracted to other makers, Parnall Aviation of Bristol were producing their Panther Naval reconnaissance biplane. This chunky little two seater was one of the first aircraft specially designed for carrier use. Unusually the fuselage folded, instead of the wings, for stowage, and it was fitted with flotation bags, and a hydrofoil, to ease accidental 'ditching.' Quite a number of Panthers were built, and some of them were sold to the Japanese Navy, which was then building up its aviation, under British guidance.

Another venture, in 1923, was the Plover. A single seat fleet fighter, it was meant to compete with the famous Fairey Flycatcher, which it quite resembled in appearance. Unfortunately, the Plover did not compare with its rival for rugged construction, and there was only a small production run.

Our Pixie was also built in the same year, for the Lypne Ultra Light Aeroplane Trials. More of this later, but mention must be made of what many would regard as Parnall's *piece de resistance*. This was the *Peto* floatplane. A small two seat biplane, appearing to be dwarfed by its own large Armstrong Siddely Mongoose radial engine, the folding winged *Peto* was built to fit the hangar of submarine M2. The first aircraft carrying submarine in the world, M2 had been converted from one of the still mysterious Monitor submarines, which were themselves built from the last K Class steam submarines. M2 could catapult her aircraft, and the *Peto* could return to her in calm weather. Otherwise, the aircraft's two hour endurance enabled it to fly to a shore base. After about five years of experiment, M2 foundered, off Portland Bill, in 1932, with tragic loss of life. It was believed the hangar door was opened too soon after surfacing, and water that must have been rolling over the foredeck rushed in.

Now for the Pixie. There were three main competitions at the Lypne Trials. One for fuel economy; one for climbing ability; one for speed. The Pixie, designed by Harold Boland, was prepared as a composite aircraft, with two alternative engines, and two sets of wings. With the larger wings, of 28ft. span, and smaller engine it would be entered for economy. The same airframe, fitted with the larger engine, would compete for climb. The combination of large engine, and small wings of only 18ft. span, would be for speed. There would have been no point in coupling the small engine with the small wings: this would have been the worst of both worlds.

The larger of the two Douglas engines, a little under the Trial's cubic capacity limit of 750cc, was rated at six horse power, indeed, the smaller engine was only rated at three and a half. This was a purely nominal assessment however: most probably the larger engine developed at least 30 brake horse power. Since these were basically motorcycle units, they were placed under the propeller shaft in the aircraft, which they drove by reduced gearing chain drive. What appear, in photographs, to be rocker boxes, were actually lubrication reservoirs for the open valve gear, which they were supposed to keep oiled, via wicks.

Although the Pixie, looking like a miniature Spitfire, attracted great interest, it did not shine in the economy, or the climbing sections of the Trial. However, it won the speed competition, reaching 81mph. Curiously, when fitted with the large wings it was known as the Pixie I, but in its 'racing' version it became the Pixie II.

Despite this success, the machine was obviously underpowered, and a Blackburn Thrush engine, of 36 horse power, was later tried. This was an inverted vee twin, again much like a motorcycle unit. In this form the Pixie appears to have been doped aluminium, and it had red, white and blue stripes on its rudder, with the red stripe at the rear. Similar to service fashion, it had the serial number J7323. At that time Parnall were trying to market it as an inexpensive air force training machine. It was not adopted, but the Blackburn engine version did some further racing.

Subsequently, an enlarged two seat version of the Pixie was built. Known as the Pixie III, this had a still larger, three cylinder Bristol Cherub radial



Full size plans -  
see pages 25-28

## Flying scale CO<sub>2</sub> powered model of this 1923 ultra light aeroplane

By Richard Halfpenny

engine, and the simple steel tube under-carriage of the early aircraft was replaced by an oleo type. And, for increased load carrying, this one could also be rigged as a biplane!

Those wishing to know more about the Pixies should read the feature on them by Kenneth E. Wixey in *Aeroplane Monthly* for October 1980. This provided the inspiration for me to build the model.

### Building the fuselage

Build up the fuselage basic framework in the usual way, from  $\frac{3}{32}$ in (2.5mm) square balsa strip. Make sure the  $\frac{3}{32}$ in sheet infilling for the wing roots is added before lifting from the plan, as it prevents the sides from 'springing' out of shape.

When adding the cross members, note that three of these, at the bottom of the fuselage, are of  $\frac{3}{32}$ in. sheet. They support the undercarriage and wing roots, and their depth and positions are shown on the side elevation drawing.

Cut the nine top decking formers from  $\frac{1}{16}$ in. (1.5mm) sheet balsa, and the one plywood one, which supports the apex of the unique Pixie undercarriage, from 1mm ply. This is the only former notched for the stringers.

When the formers are all in place with the plywood one glued to the back of No. 4, and notched between the two top longons, try test laying a piece of  $\frac{1}{16}$ in. square balsa strip from here to the tail end. If it describes a smooth curve, all well and good. But, if it does not, sand down, or pack up, respective formers until it does so. Now the seven stringers can be added, making sure they are spaced evenly around the circumference of the formers, as well as being notched into the plywood one.

Sheeting of the top, forward part of the fuselage must be done with care.  $\frac{1}{32}$ in. (.75mm) balsa is used here, for lightness. If balsa cement, or clear dope, are applied here, they may cause distortion and shrinkage. The cockpit may be cut before, or after assembly. To get a pattern for the forward parts, try bending a piece of paper around the formers, and tracing the framework on it with a pencil.

The side sheeting, back to behind the cockpit, is really optional. I have it on my model, but am not entirely sure, from evidence of photographs, whether the prototype Pixie had it or not. Weight could be saved here. But, whether you have this or not, do fit the two 1mm ply wing root plates. The main purpose of these is to ensure that the wings align properly, and are at the correct incidence.

The 1mm ply firewall (steel on the full size Pixie) is simply cut oversize, glued in place, and the edges trimmed when dry. Beware, balsa cement does not stick well to plywood; these latter parts are better fixed with woodworking glue. The tailskid is made from split cane.

### Wings

As the Pixie was what was known as a SEMI CANTILEVER monoplane, the wing section was greatly deepened at the point of maximum stress, just where the struts join it. Thus, from front view, the wings have a gull like appearance, and all the ribs are different.

The leading edge is  $\frac{1}{8}$ in. (6mm) square balsa strip, and TE  $\frac{1}{8}$ in. by  $\frac{1}{8}$ in. (6 x 12mm). Ready shaped stock is a great help here. Pin these parts out and add the ribs, cut from  $\frac{1}{16}$ in. balsa sheet. Use the dihedral template to set the inner rib at the correct angle. Wingtip filler is  $\frac{1}{8}$ in. (3mm) balsa sheet. Fit this before the spars, which are  $\frac{3}{32}$ in square balsa strip. These need to be tapered slightly at the end, where they rest on the wingtip filler.

The leading edge riblets, on the top only, are simply pieces of  $\frac{1}{16}$ in balsa, glued in slightly proud, to allow for later contouring. Add all the other little knick-knacks, such as strut doublers, edge of wingtip with  $\frac{1}{16}$ in. scrap, and all gussets. When the wing is lifted from the plan, the inner rib doubler, meant to resist tissue shrinkage, can be added, oversize, from  $\frac{1}{16}$ in. balsa sheet, and trimmed down when dry.

### Tail

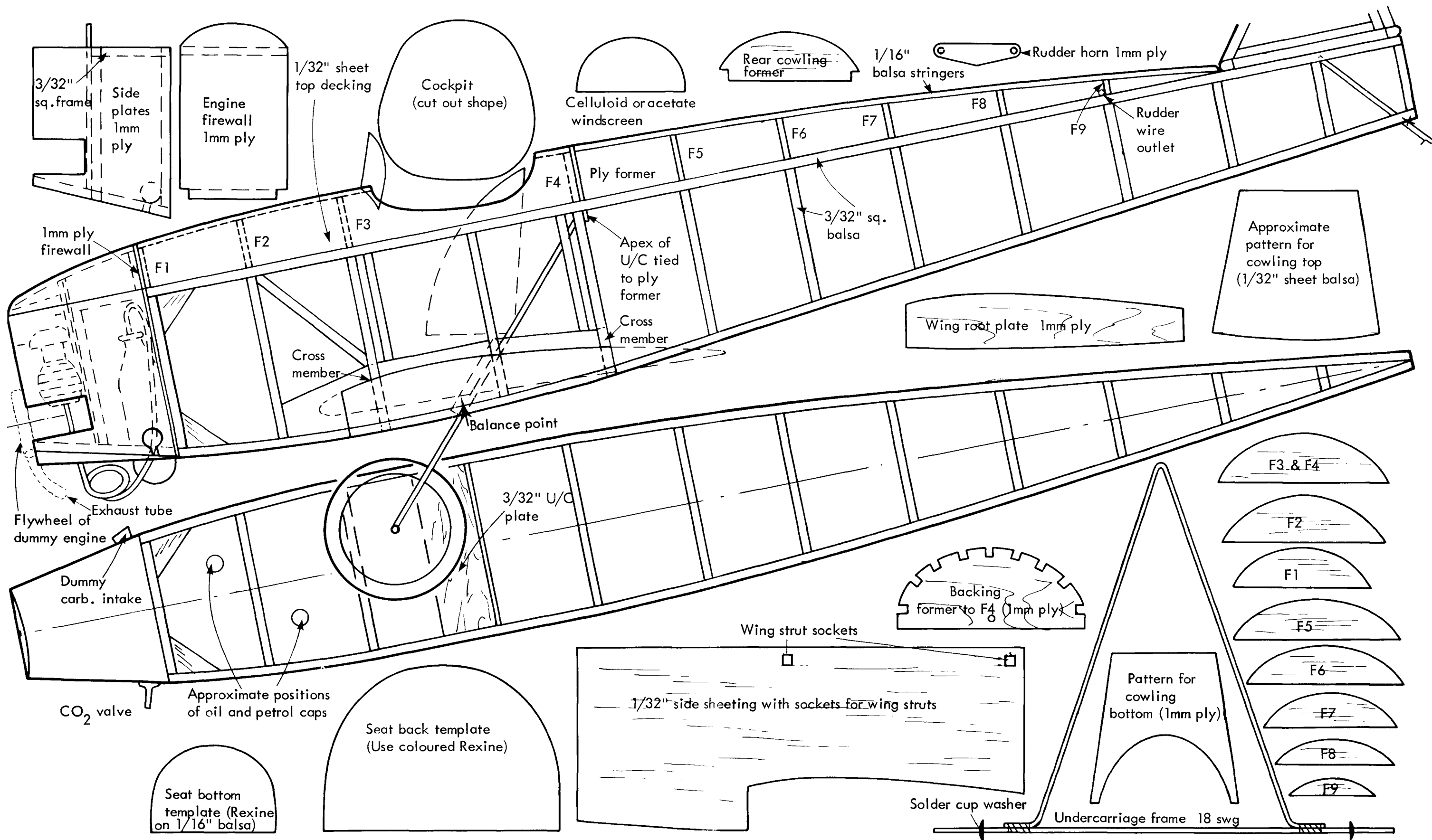
The tailplane and elevator are separate, with adjustable hinges. Pin out, as shown from  $\frac{1}{8}$ in. square strip. The 1mm ply trailing edge can be cut out with scissors, but will then develop a 'set,' and must be carefully straightened before assembly. Sand the ribs, and spar ends down to a streamline shape, to meet the trailing edge.

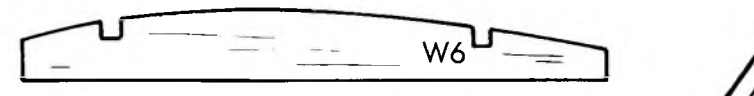
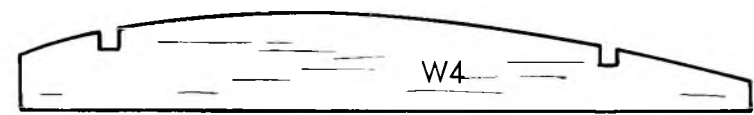
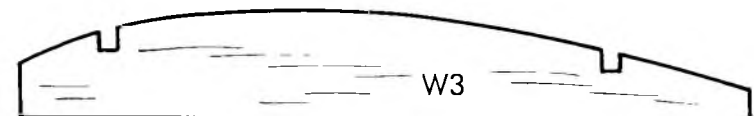
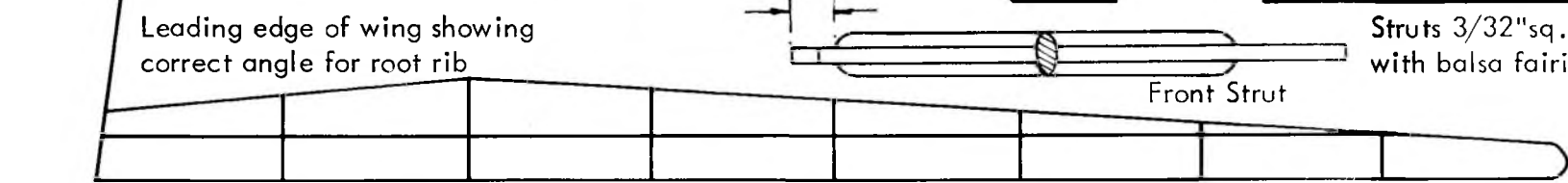
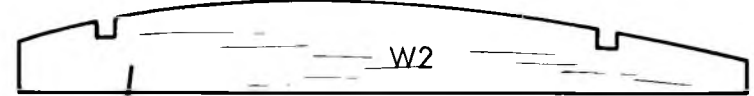
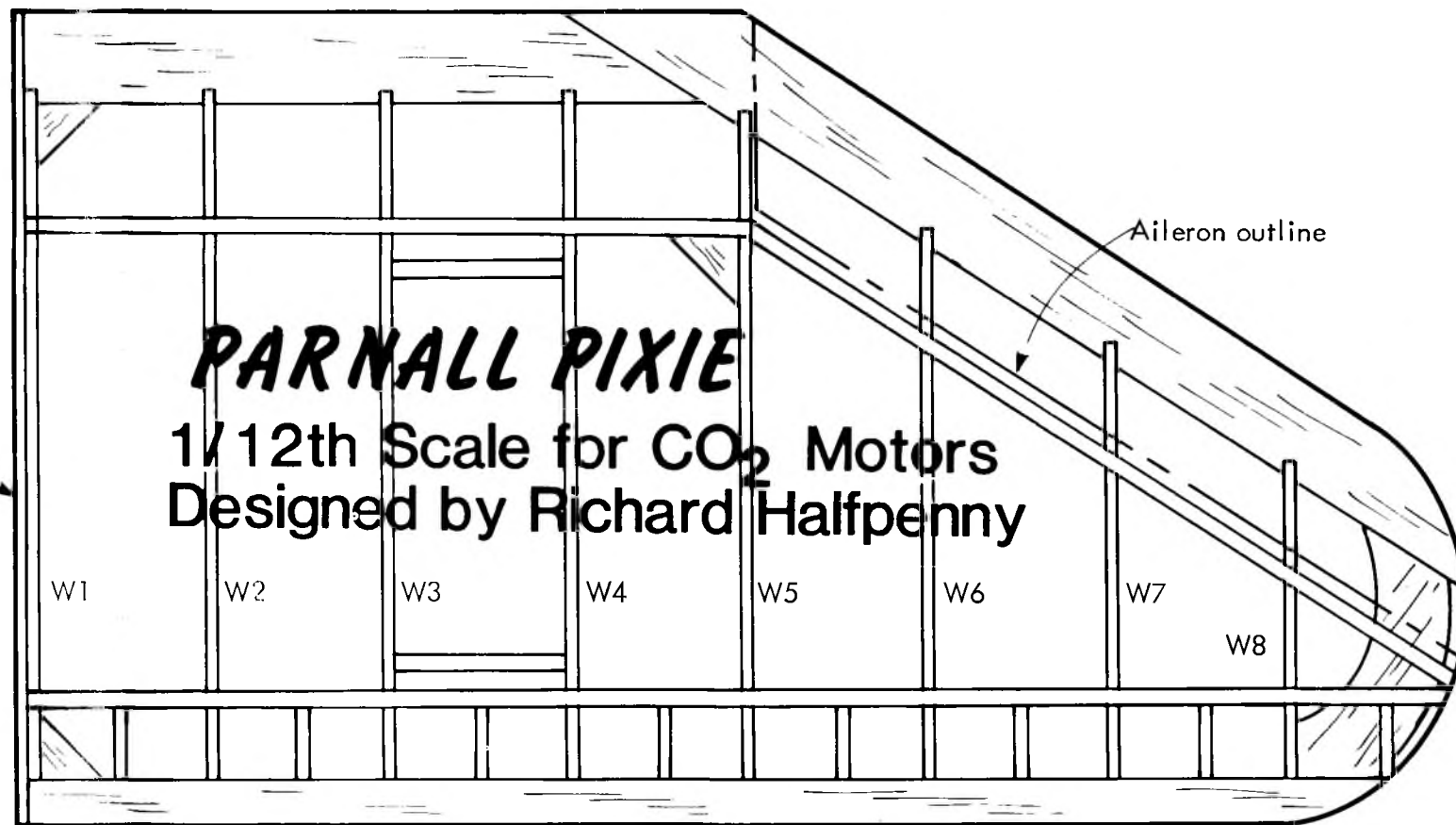
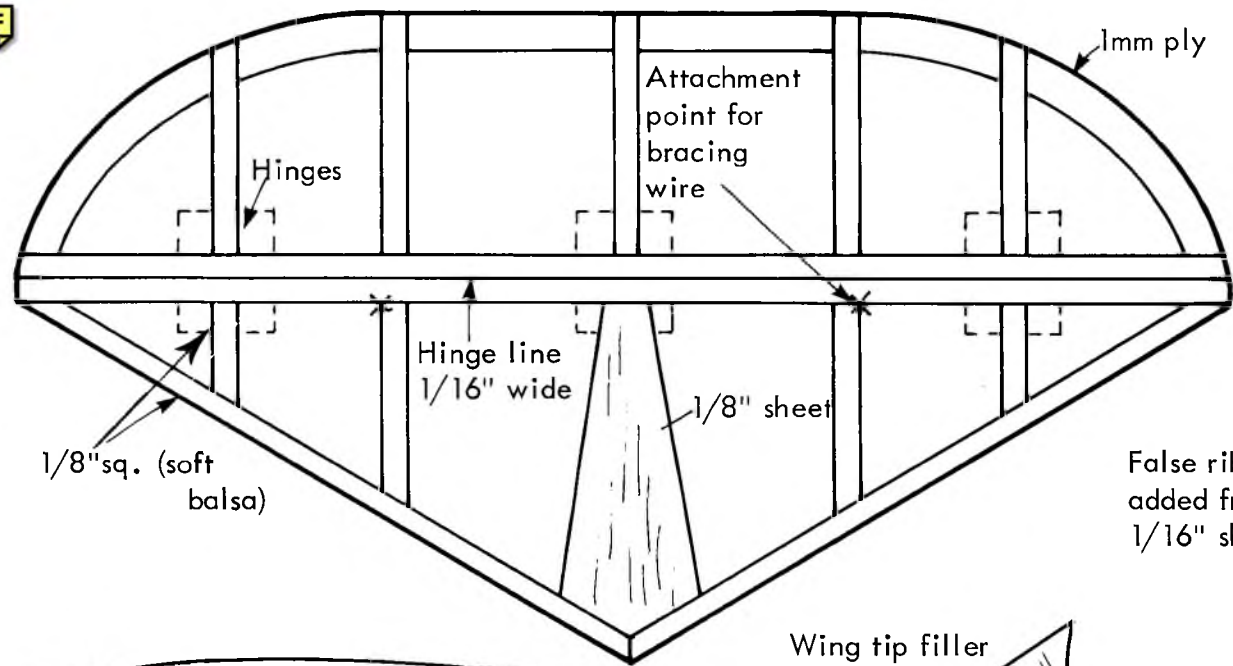
Both tailplane and elevator should be generally rounded off by sanding, before fitting the hinges. Cut these from zinc, or aluminium gauze, approximately  $\frac{3}{16}$ in. square. Aluminium is the lighter, but tends to bend too easily in rough landings. Make slots for the hinges in the rear spar of the tailplane, and front of the elevator, cutting a little into the ribs, with a sharp modelling knife. Cement in the hinges, leaving a gap of about  $\frac{1}{16}$ in between tailplane and elevator.

The fin and rudder are in every way exactly like the tailplane, construction wise. If you are going for detail, make a slot for the rudder horn (or yoke) where shown. The Pixie had a rod operated elevator, the workings of which could not normally be seen.

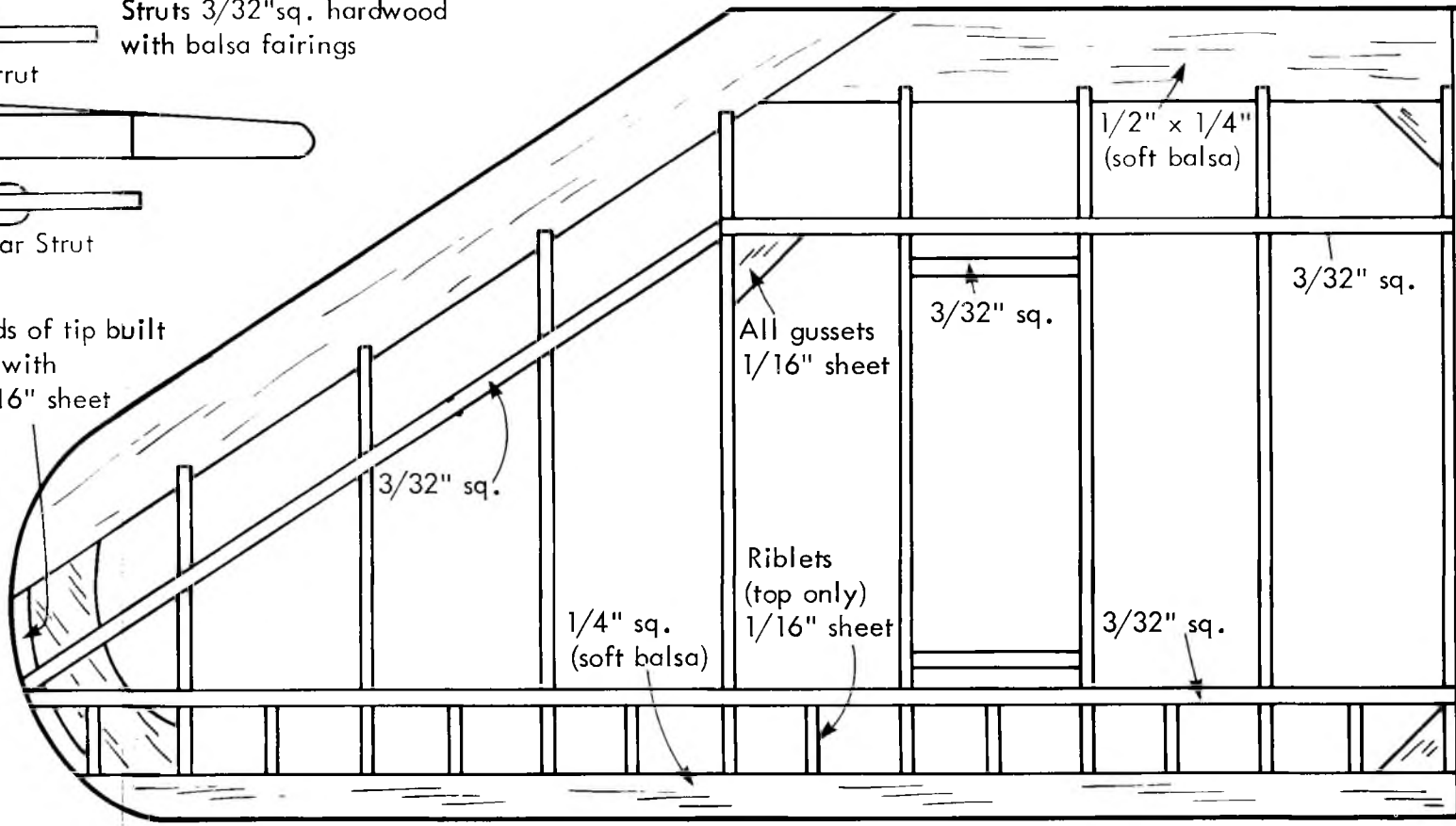
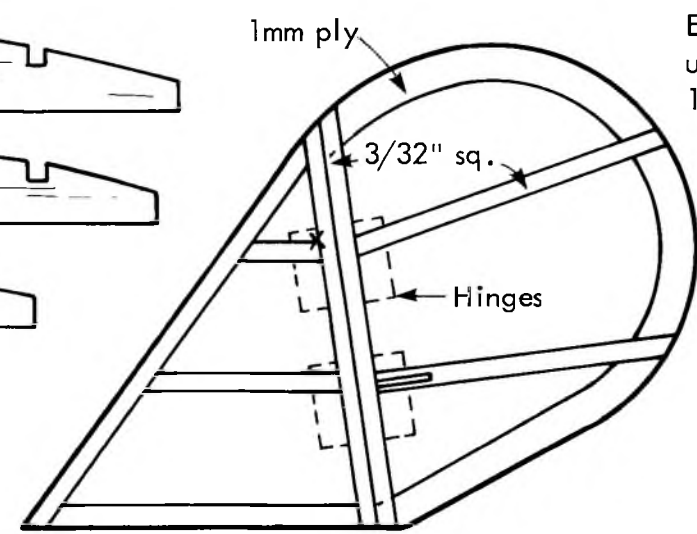
### Engine cowling

This is basically a 1mm plywood box, built onto the fuselage firewall. It has  $\frac{3}{32}$ in. square balsa backing framework where shown. The lower part has a cutaway at its rear, ostensibly to expell cooling air, but, in our case, to allow the bottom of the CO<sub>2</sub> tank to emerge into the airstream. This lower part is curved with the aid of steaming, before





Ribs 1/16" sheet balsa







Left: dummy engine detail. On the right, complete structure. Note the plywood wing root fairing is glued to the fuselage sides before fixing the side sheeting in place.



gluing into place. A fillet of filler should be run along the inside of the corners here, so that the outer ones can be well rounded off. The upper part of the cowling is made from laminations of 1/2 in. sheet balsa, and, due to its greater curvature, a piece of shaped aluminium gauze makes a good base for it. There is no front former as the cowling is open. Chamfer the leading edge, as shown: this was a feature of the real Pixie.

Note that the top front corners of the cowling, having no framework behind them, are bent slightly in. The cowling top is held down by tape, or doped tissue, in case it needs to be removed. Due to the high thrust line, the CO2 motor (in my case, a Shark) is mounted as high as possible on the engine bulkhead.

The mounting bolts go right through. The motor requires about two or three degrees downthrust, and three or four degrees sidethrust. With a little calculation, the motor can be offset enough to make the propeller boss come on the centre line of the model. Sidethrust, of course, is to the right.

### Undercarriage

The simple, steel tube assembly of the full size Pixie caused great interest in its time, but was only really suitable for a very light aircraft.

On the model, it is made of 18swg piano wire. The joints are bound with fuse wire, and soft soldered, or Super Glued, the latter being quite strong enough. In the same way cup washers should be fixed inside of the wheel positions. Now the framework can be fitted to the fuselage. The apex is lashed, with strong thread, to the hole in the one plywood former, behind the cockpit. And, a piece of 1/8 in. balsa sheet is cut to fit against the sloping cross member at the bottom of the fuselage. With liberal cementing, this sandwiches the piano wire in place. Then the thread holding the apex is also cemented.

### Covering

Make sure all surfaces are smooth. Use light-weight Modelspan, with the grain lengthwise when possible. The shrinkage is greatest in this direction, and this helps to minimise pulling in of longerons, and sagging between ribs. I used normal strength cold tea as shrinking water. This gives a natural look to the fabric.

Most surfaces, on the fuselage, wings, and tail, are quite flat, the only places where separate panels are needed are the rather humped rear top decking of the fuselage, and, just possibly, the top of the wings, due to their 'gull' configuration. It may be best to avoid dopping tissue over the front sheeted top of the fuselage, because of distortion danger. Otherwise, all components should have two coats of thinned clear dope. Pin down the wings while drying.

### Detail

The seat is made by cutting its base from 1/8 in. sheet balsa, which is covered with leather coloured rexine, or similar material. Its back is made from rexine, glued to the base with its leather surface inward. It will be found that the seat fits neatly on top of the U/C cross member, resting back against the U/C wire frame. Who needs a dummy pilot, with a seat like this! Also, it is very light.

My own wheels are 1 1/2 in. Pepk Polymer Grey Vintage ones. They look just right, but are a little heavy, and being bored for much thicker wire than 18 gauge, they had to be laboriously bushed.

The rudder horn is cut from 1mm ply, with small holes drilled for the control wires, and glued into

the slot in the rudder (this is really optional).

The windscreen is celluloid. Hold in position with pins, and fix with Super Glue.

Petrol and oil caps are from any scrap material, glued into place. The dummy carburettor intake, which can be cut from a piece of plastic tube, is fixed opposite the hole in the cowling for the CO2 charging valve.

Aileron outlines are black tissue. This can still be got as wrapping tissue, from stationary shops. If you cover this with a wider strip of yellow, or brown, tissue, it suggests framework on each side of the joint, and also slightly mutes the black. Use clear doping for all such work, and, if you are going to finish with banana oil, it is really best applied after such decor, but NOT after transfers.

The dummy Douglas engine could be left until the very last. It pushes into place, being a close fit in the slots on either side of the cowling. I built mine from thin layers of ply and balsa, with the crankcase forming a box around the cylinder of the CO2 motor. There is no great need to study lightness: I had intended to remove the dummy for flying, but found its weight is needed to bring the centre of gravity far enough forward. It can be taken out to adjust the real engine.

I turned my flywheel from aluminium, but the cut down cap of a large cigar tube would make a fine one. This is bolted in place. Rockers: their oil boxes, and inlet stubs can be suggested by rounded 1/8 in. balsa strip. Pushrods are merely pins, and the exhaust stubs formed from 1/8 in. (or thereabouts) plastic kit sprue. These need to be fixed firmly, and I burned sockets for them in the cylinders with a red hot wire. Paint matt black and silver, and if you really want to cut a dash, paint the exhaust stubs copper.

### Decor

When the Pixie first appeared at Lypne, it looked very plain. Apparently clear doped, and natural linen finished, it had 'Pixie' in small letters on the fuselage sides. The number 24 was on its rudder, and, presumably, under its wings. The cowling may have been aluminium finish, but looks darker in a photograph.

I borrowed the 'lucky 13' for my model from a

later stage in the machine's career, when it had the Blackburne engine. I also took licence to have large numerals on top of the wings, as well as underneath. It is very easy to cut these from coloured tissue.

I used commercial transfers for rudder numeral and 'Pixie'. Incidentally, the eventual civil registration of this aircraft was G-EBKM. At that time it was also customary to have an additional large G (standing for Great Britain) on each side of the fin, or rudder, and even on the top and bottom, each side of the tailplane. I varnished over the transfers, and colour doped the sheeted part of my fuselage. This is optional, though, and does add a little weight.

### Assembly

The wing dihedral on the real Pixie was adjustable: I decided, on the model, to have just an inch under each tip. This is equivalent to the tip dihedral of the long winged version, but in our case, the short span slightly increases the angle.

Fix the wings to the root plates on the fuselage with woodworking glue, making sure they align with the top profiles of these, and with their front edges. Wings can be held in place while drying by propping up, or suspending the tips with thread. When dry, fit the struts, pushing their outer ends down into the slots, to rest on top of the wing's thickest rib. Use woodworking glue again, this does make a very strong assembly.

The tailplane is fixed to the top of the fuselage: a little packing or sanding ensures it aligns, by eye, with the wings. The fin is glued on top of this, and bracing carried out by giving a turn of button thread around the framework at the points shown. Pull this tight in a half granny knot around the tailskid, and spot with woodworking glue. This can then be tightened whenever need be.

Taut rudder wires are easy. Dope an extra thickness of tissue over the fuselage decking where the wires emerge. Make a puncture each side, and pass a small rubber band through, tighten cotton at each end of the band and stretch and tie to the rudder horn. This leaves the rubber band hidden inside the fuselage.

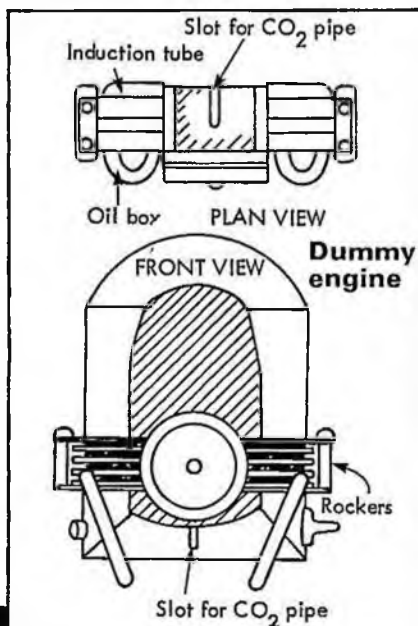
The CO2 motor is bolted to its mounting, and the gas tank packed to one side of the compartment behind with a piece of foam plastic, so that its bottom end projects slightly from the cutaway in the cowling. The gas pipe also leads out here, and a slot must be cut a little way back from the front edge of the cowling bottom, exactly in line with the centre of the cylinder, to allow it to pass up to the motor. The charger valve should be a tight fit in its hole.

### Trimming and flying

The centre of the gravity should be approximately one third of the chord back from the leading edge of the wing.

The Pixie glides fast from a hand launch, due to its rather small wing area. It is as well to start using power quite early on. Trouble can be saved by realising that, on small models like this, tendencies to roll, and spin in, can be far better cured by an unobtrusive celluloid wing trim tab, than by rudder adjustment. Nose heaviness can be treated with slight up elevator. Tail heaviness, and stalling in glide, call for a little added noseweight.

The now customary wide left circle is perhaps the best trim to aim for. But, anyway, once you are satisfied with the adjustment of rudder and elevator, 'set' them against further accidental movement. Happy flying and landing.



# Free Flight Scene

**MARTIN DILLY**  
reports

## The Witchford Meeting

Held on October 25 near Ely, the 1981 Witchford Meeting was a new departure in several ways. The organisers were several free flight competitors who wanted to involve flyers from a wide area, rather than a club or SMAE Area committee. The site chosen was a central one, consisting of farmland comprising stubble and a little beet, surrounded by the perimeter track of a former airfield, making 360° access easy in case of a change of drift. As well as providing the stimulation of contest flying, the event raised money for local charities for the disabled, attracting 153 entries from as far as Scotland, Bristol and Southampton. While there is plenty of room for organisational improvements, the majority of competitors, including some non-SMAE flyers, felt the event was a success, thanks in part to very light drift for most of the day and a bright autumn sun. Generous support from Aeronautical Models Ltd., Ian Dowsett, MAP Ltd., John Murray (Publishers) Ltd., H. J. Nicholls and Son, Phil Uden and Michael Warren was most welcome and helped make what is hoped will be the first of many annual Witchford Meetings a success.

Maxes for the FAI classes were set at two and a half minutes for the first two flights, and then increased to take advantage of the change of drift; the organisers posted a man downwind throughout the day to monitor the recovery situation. Glider flyers at times had to cope with towing in a ploughed field, but towards the end of the day the light wind meant that aircraft were only about two-thirds of the way across the field when they D/T'd at four minutes. Certainly the F1A fly-off, which started with a four minute round and then, as a last minute decision, finished with an unlimited one, saw steady lift even in the late autumn afternoon. Of the three finalists, Mike Fantham was down in 5:06, while Chris Edge decided that the visibility warranted a nine



Ian Davitt of Leeds, third place in Coupe d'Hiver, seems to have spotted some lift at Witchford.

minute D/T; John Cooper went for broke and simply hooked his D/T line onto something solid, to win the contest with a flight of over 14 minutes in the failing light. At least he won a D/T timer, as well as one of the specially-designed trophies.

Junior flyer Jim Anderson of Biggles has only a year's contest flying experience behind him, but won the Coupe d'Hiver contest with the only five max score; his aircraft used parts from several others, and had a sheeted front end to the fuselage; the shoulder wing used a Dave Hipperson airfoil.

Of the four Mini events only 1/2 A Power required a fly-off, with Birmingham's Pete Harris coming out top.

The organisers have already had some helpful criticisms of this year's Witchford Meeting, together with several letters and cards of congratulation; what they would like now is offers of help with the pre-planning and running of next year's event. Can you sacrifice one day's flying next year to organise it? Please contact Martin Dilly if so. Finally, thanks to all those who helped with time-keeping are due from all competitors, especially including the following:

## A simple release scroll for ultra-light timers

ONE of the publications that comes my way is a US one called Model Rocketeer; a recent issue included an interesting idea for an off-the-shelf release scroll that should be handy for people wanting to use all-nylon clockwork drives as D/T timers. My own first efforts featured a dural Seelig-type scroll that I made during a teach-yourself-screwcutting session on Bryan Spooner's ML7 lathe. Now Stephen Waide describes his use of an aluminium alloy sheet metal screw for the same purpose. Screws of this type have a rather coarse thread in which the land is thin compared with the trough, since they are intended to self tap into fairly thin material; fridges and washing machines are held together with them, although I was unaware of the existence of light alloy versions till reading Stephen's article.

He uses a screw about an inch long and epoxies this onto the motor shaft. The screws normally have a cross-head, so keying to the adhesive should be straightforward; however the load on the joint is rather more than would be the case with a Seelig type of scroll, so make sure that both surfaces are as clinically clean as you can get them before applying the epoxy. I suppose it might be possible to drill an axial hole into the head of the screw and either tap this to take a thread you cut on the drive shaft or else to give an improved



Right: CO<sub>2</sub> competitor to max out was Grantham's Phil Ball, with Telco model. Three of the A/2s lined up ready for the first sign of lift at Witchford.

## Results

### F1A

1 J. Cooper	Biggles	4 maxes	+ 4:00	+ 14:50
2 C. Edge	Welland V	4 maxes	+ 4:00	+ 9:28
3 M. Fantham	Richmond	4 maxes	+ 4:00	+ 5:06

### F1B

1 G. Foster	RAFMAA	4 maxes	+ 4:00
2 F. Sharp	Croydon	4 maxes	+ 3:10
3 J. Barnes	Liverpool	4 maxes	+ 2:52

### F1C

1 S. Screen	Birmingham	4 maxes	+ 4:58
2 P. Harris	Birmingham	4 maxes	+ 4:37
3 K. Faux	Freebirds	4 maxes	+ 4:33

### A Power

1 P. Harris	Birmingham	4 maxes	+ 3:12
2 E. Vye	Welland V	4 maxes	+ 2:47
3 A. Jack	Tynemouth	4 maxes	+ 2:18

### A/1

1 G. Beal	—	10:00
2 J. Carter	Falcons	9:58
3 B. Barnes	RAFMAA	9:41

### Coupe d'Hiver

1 J. Anderson	(J) Biggles	10:00
2 Brookes	—	9:56
3 I. Davitt	Leeds	9:46

### CO

1 P. Ball	Grantham	10:00
2 Lee	—	9:43
3 C. Blanch	—	9:40



glue joint to the shaft.

The forward end of the dethermaliser line ends in a small wire loop, which is hung onto the screw near its head after the timer is wound. Stephen uses half a dozen threads of the screw and cuts the remainder off. In use the screw simply unwinds until the loop falls off and the tailplane pops up. To minimise the bending load on the shaft, especially at the end of the timer's run-down, it seems sensible to have the line pulling not directly against the tailplane pop-up band's tension but instead used to hold a lever-trigger to which the tailplane hold-down bands are hooked.

To slow the 'waggler' that governs the run-down time, Stephen uses a single pin with a blob of epoxy on its head. The short length of pin is carefully pushed into the nylon waggler after being treated, and adding or subtracting epoxy from the pin's head alters the running time of the timer. He warns against oiling the mechanism or over-winding the spring. His timer combines his own ideas and those he read in Aeromodeller, so obviously international cross-pollination occurs in model rocketry as well as in model flying.

## DAVE HIPPERSON reports

**Southern Gala — Odham — 4/10/81**

The wind and wet played a large part in this year's premier Southern SMAE event and as if the elements were not enough long flights were in jeopardy from an unexpected source. A group of lively bullocks a couple of fields out and directly downwind made short work of Russell Peers' second rubber flight and as a main course ate one of Julian Hopper's power models and Trevor Payne's Nats winning 1/2A! Rubber and motors were retrieved on all occasions but the airframes were rather horrible!

St Albans club members many of whom have

been semi-dormant this year came out of hibernation almost 'en Block' and very nearly cleaned up. John Fletcher took 1/2A with his customary design and a full score that made it look easy. Lumsden taking Open Glider with the only full score in this event and Tim Gray leading Coupe most of the day and eventually finishing 3rd.

By about lunch time it was obvious the solid overcast and intermittent drizzle would not clear but the wind, that had never been turbulent, began to ease. By the end it was perhaps 10 mph, less than half what it had been in the morning, so the standard in some of the Mini events became quite high as many of the best flights were put in during the last two hours. Hipperson who had his third Rubber flight turn in from considerable height and spiral into the runway had determinedly set about CO<sub>2</sub> and Coupe in the afternoon when there looked to be insufficient time for one class let alone two. The almost lifeless conditions suited his models and he won both events. Likewise Julian Hopper who had finished his total in Power filled in the time before the flyoff reacquainting himself with HLG and won that event.

To add to the excitement in the closing stages a Helicopter interrupted flying for more than 10 minutes just as a number of winning totals were being completed. It was with some relief that those involved learnt of the Contest Directors decision to lengthen the event to exactly compensate for the 'hold'.

The only events requiring flyoffs, Rubber and Power, got underway at about 5:15 by which time it was becoming very murky. After the 'bull incident' earlier Peers had opted to fly his last flight late in the calmer conditions and use a large light model which he could then use again for the flyoff. He maxed but the plan went wrong when the model failed to dt and disappeared way up and

*Trevor Payne surveys the growing downwind murk just prior to his Open Power fly off flight.*



Above: Dave Hipperson winning CO<sub>2</sub> Coupe d'Hiver models held here by 'vital assistants' Sue Hipperson and Mike Bull. Left: Jessica Nash holds for Bob Wells in Rubber fly off.

### Results

#### Open Glider

1. P. Lumsden	St. Albans	7.30
2. C. Parry	Biggles	7.02
3. N. Lee	East Grinstead	7.01

#### Open Rubber — Flight Cup

1. M. Presnell	St Albans	7.30 + 4.01
2. I. Davitt	Leeds	7.30 + 2.17
3. B. Wells	Anglia	7.30 + 0.58
4. R. Peers	Falcons	7.30

#### Open Power — Short Cup

1. J. Hopper	Standstead	7.30 + 4.39
2. T. Payne	Biggles	7.30 + 4.01

#### A1 Glider

1. P. Cameron	Crawley	9.30
2. K. Taylor	East Grinstead	8.23
3. C. Parry	Biggles	7.38

#### Coupe d'hiver — Gloy Award

1. D. Hipperson	Croydon	10.00
2. I. Davitt	Leeds	9.23
3. T. Gray	St Albans	8.59

#### 1/2A Power — Quickstart Trophy

1. J. Fletcher	St Albans	10.00
2. P. Harris	Birmingham	9.46
3. M. Bull	C/M	9.14

#### CO<sub>2</sub> Duration — Sparklets Award

1. D. Hipperson	Croydon	9.27
2. P. Buskell	Crookham	7.19
3. G. Head	Petersfield	5.17

#### HLG

1. J. Hopper	Stanstead	4.28
2. W. Simms	Crookham	4.13
3. G. Smith	C/M	3.03



### SMAE Sixth Area Free Flight Event — September 27, 1981

#### A2 Glider — SMAE Cup (23 flew)

1. J. Cooper	Biggles	14.20
2. C. Pudney	Southampton	13.57
3. E. Drew	B and W	13.07

#### Farrow Shield — Open Rubber. Individual plus Plugge

##### Points

(35 flew)

1. C. Chapman	B and W	9.00	+ 6.02	100
2. P. Ball	Grantham	9.00	+ 4.57	97
3. D. Wain	B and W	9.00	+ 4.38	94
4. P. Davis	B and W	9.00	+ 4.24	91
5. R. C. Uden	Crookham	9.00	+ 3.35	88
6. A. Jack	Tynemouth	9.00	+ 3.03	85
7. J. Walker	Birmingham	9.00	+ 2.56	82
8. N. Lee	E. Grinstead	9.00	+ 0.14	79

#### 1/2A Power — no trophy (8 flew)

1. P. Harris	Birmingham
2. J. Flynn	Liverpool
3. T. Payne	Biggles

#### Farrow Shield — Open Rubber — team placings

1. Bristol and West	Chapman, Wain, Davis	27.00	+ 15.05
2. Birmingham A	Walker, Gibbs, Dixon	24.32	
3. Biggles	Cooper, McDonald, Lavis	24.11	

#### Plugge points after sixth and final event

1. Birmingham	1297	MFFG	190
2. Biggles	1188	Whitefield	185
3. Grantham	1023	Swindon	181
4. B and W	830	Darlington	141
5. Cookham	758	Cheltenham	136



robbed him of a very real chance in the flyoff. Certainly the damp had been putting out fuses all day and in some cases affecting structures that may not have been actually rained on. Thus the Rubber flyoff produced a crop of times far below what would have been usually expected. Bob Wells' model had survived a first flight fuselage break and managed the following two maxes but the repair failed on the climb in the flyoff and the model dived in for less than a minute. This left Martin Pressnell's 4½ minute flight, clocked off in the murk at a second over four, sufficient to take the Flight Cup over Ian Davitt's rather under-estimated 2 mins plus.

Power went rather more to the book with Julian Hopper ending his annoying run of 2nds this year by taking the Short Cup in poor air but with such a climb that his model was up for well over 4½ in comparison to Trevor Payne's 4 minutes with a better glide but from less altitude.

### Northern Gala — Church Fenton — October 11, 1981 —

Conditions at this, the last of the SMAE's meetings of '81 made the previous four windy weeks look calm by comparison. A near gale of 25 to occasionally 30mph all day deterred all but the hardy. Church Fenton is not a very clever shape so it was no surprise to learn that models were reaching the boundary fence in 90 seconds or less. As compensation the virtually empty fields stretched for miles downwind and made retrieving a straightforward if lengthy business.

Peers and O'Donnell were flying Open rubber in earnest right from the start and Jeff Anderson maxed on this first flight too but suffered the novel problem of being able to locate the fuselage and tail but not the wing. He made up for this later with some useful flights in the last hour to take second place in Open Glider.

Power was very much a one horse race — but a magnificent display nevertheless. Julian Hopper, whose ambition it is to win all five SMAE Open Power trophies in one year, is not put off by a bit of wind. Two flights from his OS35 model would have been enough but he did all three and they were all maxes. He won the Hamley Trophy for the second year running. Towards the end of the day we were either becoming used to the gale, or there was a slight slackening. A number of gala flights were attempted — none too successfully. Chris Parry's total was hard earned and probably one of the lowest ever to win a major event. The battle in Open Rubber had hotted up after both the two early fliers had dropped their second flights and Hipperson had maxed on his first two. He needed only 2.18 to catch the others after their final maxes. Forced to fly a big model as his second flight was too far downwind to retrieve the problem was expected to be the launch. Miraculously it got away only to power stall repeatedly across the aerodrome on a trim intended for far smoother conditions. It gained no height and eventually ditched at 1.38 leaving Russell Peers the deserving winner. Even John O'Donnell looked happier than usual. In rubber at least it had been a better contest than the usual single flight lottery in the calm after unrealistic qualifying flights.

It was surprising that activity was so limited. The supporting Mini and Vintage events run separately were virtually blown away.

#### Results (All 2.30 maxes)

Open Glider		
1. C. Parry	Biggles	3.12
2. J. Anderson	Tynemouth	2.40
3. N. Parry	Biggles	2.08
Open Rubber (Caton Trophy)		
1. R. Peers	Falcons	7.17
2. J. O'Donnell	Whitefield	7.11
3. D. Hipperson	Croydon	6.38
Open Power (Hamley Trophy)		
1. J. Hoppers	Stanstead	7.30
2. M. Gilmore	Grantham	3.40
3. C. Plant	Darlington	2.07

## BOB BAILEY reports

### Indoor Spectacular Milton Keynes, 11-10-81

For the second time, thanks to the generosity of the Milton Keynes Development Corporation, we were able to use Middleton Hall which is situated in the middle of the shopping centre. The hall is about 120 foot square and 40 foot high to the roof which is mostly clean. To date, the only disadvantage of the hall is the fact that it is connected by covered walkways 20 foot wide and 10 foot high to the outside; these cannot yet be sealed off.

This means that if the wind direction is unfavourable, considerable draught appears at lower level up to 10 feet. This played an important part in the HLG competition as will be seen later. However it is expected that for next year the walkways will be sealed; this will make the site one of the best in Britain. The floor is smooth rendering the site ideal for all indoor scale flying.

There is no doubt that the indoor scale men are crying out for suitable venues for flying the larger (CO<sub>2</sub> and Open) models. Most small halls simply are not big enough although they are adequate for Peanut. The only other suitable sites used on a regular basis are Derby, Crawley and Cardington.

A full programme of events was run from 12.00pm to 7.30pm consisting of HLG, EZB, Manhattan, Open Scale, CO<sub>2</sub> Scale and Peanut. The scale events will be reported elsewhere. Weather was sunny and breezy, making for reasonable conditions in the hall.

#### Hand Launch Glider

This attracted a relatively low entry of 9, but what quality. Only one circle was needed, each flyer making 3 flights at a time and then going to the back of the 'queue'. I had been busy erecting ropes, etc. and had about 10 minutes to trim a new Upstart and entered late (to make up the numbers). It soon became clear that as before, the large lightweight carbon fibre reinforced flapper models as typified by the Upstart IV were going to lead the way.

The first round saw many flights of over 30 seconds but it soon became apparent that 37 secs.+ was going to be needed to place. Bernard and Ron Green soon set the pace with flights of 38 seconds each. Graham Davitt changed to a new model of 4.6g after the first flight, in the Upstart style but with a somewhat larger tail. The

pull-out at the top was almost instantaneous and a magnificent glide ensured flights of 38 secs.+. These three were way ahead of the others.

The times continued to improve with Bernard and Ron changing places for the lead. Ron's last two launches were superb, pulling out at 35 foot altitude, but both flights were robbed of 3 secs. each by turbulence at 4 foot altitude.

This left Bernard requiring 40 seconds to win off his last launch. A good throw and good pull-out — the flight was counted down on the P.A. — yes, it was enough; 43.0 seconds for a well earned win. But for the turbulence, the result would have been different.

I ended up 4th, a long way behind due to not being able to get enough altitude — good for lower ceilings though!

#### Manhattan

More popular this year than last year with 5 entries, again these models need a bigger space than is available in most halls. The main hazard was the loudspeakers hanging from the roof. The main problem confronting most fliers was collision with the structure. Bernard Aslett lost a prop blade from his model on test when it hit the ceiling rather hard and the undercarriage on mine was nothing like strong enough (a rebuild that hadn't been tested). In the 1 hour period this sort of problem didn't leave much time to get motor sizes etc. sorted out.

However there was some very good flying; Manhattans fly faster than EZBs and hence are less susceptible to turbulence of which there was an appreciable amount at ground level.

The standard lack of torque meters for Manhattan meant that altitude judging was difficult (no problem in Cardington since it is very difficult to get them to the roof and get a good time as well).

Cardington times are around seven minutes; Henry Tubbs' best time of 4:51 was therefore no mean achievement. With a 3:45 this gave him a comfortable (but no easy) win over Laurie Barr. Mike Hetherington flew very well with a best of 3:02 for a well deserved 3rd place.

#### EZB

This was flown in two sessions, the first being run simultaneously with Manhattan. The hall is big enough for the two to be kept separate; I didn't hear of any problems with EZBs being damaged by Manhattans. The contest was run to the Northern EZB rules which require an air frame weight of 1.2g — this is an advantage in any site where there is turbulence. Performance is not much impaired — Dennis Davitt's 19 minute flights in Cardington at the Indoor Nats is one



Left: Graham Davitt, Bernard Hunt and Ron Green placed third, first and second respectively in HLG and all seem well pleased enough! Martin Dilly does a little trimming to the tail of his EZB model.



good evidence of this.

The main problem was hang-ups in the loudspeakers and in the rows of light fittings in the ceiling — these caused much more trouble than last year when the conditions were so turbulent that it was almost impossible to get a light model high. Bernard Hunt was playing things very cautiously, not risking his best models (presumably being kept for the Northern circuit) and ended up with two quite reasonable flights for 3rd.

Laurie Barr was trying out a new set of bits without any real expectation of doing well and made 2nd by 6 seconds over Bernard. Graham Davitt was flying a model with polyhedral wing, a very long tailboom and very high aspect ratio tail — it looked very good, but hang up troubles prevented him from placing.

Two of us nearly lost models completely — there is a ledge right at the top on one side which is inaccessible by balloon or rope. I managed to retrieve mine by balloon but at the expense of breaking the wing posts. Clearing up duties as well prevented me from making any official flights.

Dave Pymm showed his current good form with EZB by notching up two excellent flights to win comfortably — he somehow managed to avoid disaster often enough but not every time.

Results: EZB 1. D. Pymm 11:34+12:17=23:51; 2. L. Barr 8:24+9:26=17:50; 3. B. Hunt 7:48+9:56=17:44. Manhattan (5 entries) 1. H. Tubbs 4:51+3:45=8:36; 2. L. Barr 3:43+4:06=7:49; 3. M. Hetherington 3:02+1:24=4:26. HLG (9 entries) 1. B. Hunt 44:1+43:0=87:1; 2. R. Green 41:3+42:7=84:0; 3. G. Davitt 39:7+41:4=81:1.

### Sweepette Trophy 1981

Four events were scheduled; 3 events had entries and the other had none at all. Overall the support was rather thin, to the extent that John Buskell flew in two events, won both and his total score was enough to win. His totals were 61+59=120 and 64+64=128. Total 248 seconds.

### Cardington Cup

This is awarded to the best Junior. This year we only had one entry — M. Bennis at the Indoor Nats so the cup goes to him. Come on you juniors — have a go and perhaps you may win yourself a free ticket to the annual dinner held at the end of November.

### Sparklets Trophy

This was dominated by Dave Hipperson as will be remembered from my earlier reports. He won all 4 events with combined totals of 14:27, 11:22, 12:09 and 12:02 — very consistent.

Congratulations to all concerned, thank you everyone for your support at Cardington. Please come and help us again next year assuming the charges are not raised to such a level that we get priced into oblivion!

## TREVOR FAULKNER reports

### Lofer, Nr. Salzburg, Austria. Report by Trevor Faulkner

For the first time in many years I found myself free to attend this competition. On this occasion the rule stipulating that only representative National teams might participate was in force.

Unlike our Continental counterparts, F1E fliers in the UK have no programme of events or eliminators which could even remotely be classed as likely to be useful for team selection. Fortunately the SMAE practised some very nifty footwork at short notice and offered to facilitate the entry of a token team simply to get us declared as entitled contestants.

As it happened, the length of time between Jeff Palmer and myself deciding that we would like to compete and the date of the Championships was so short that there was no chance of doing more than send in the forms. As a result two thirds of a team set out at the end of July, leaving behind the most unflyable season we had known for years, with north winds preventing any of our club sites

*J.P. waits for the breeze! Practice day, brilliant sunshine, superb scenery. F1E models remain competitive for years - this one's been around a L-O-N-G time!*

being used for practice. There was, in fact, just one morning when a light westerly drew us both to our local slope for a short session prior to going to work.

Meanwhile, the Continental lads had been going through the conventional sorting out, and getting well into their stride, 14 F1E competitions starting in February prior to the E-C in Germany. The Czechs were unusual in that the winner of their eliminators (Juri Kalinin) chose to go along as team manager.

As usual, a 'practice day' was designated to help competitors to get used to the conditions. Unfortunately, there was no wind of any useful nature until noon. Together with the Czechs (most other teams having decided that it wasn't worth staying), we made the most of a fitful afternoon breeze which was veering 45° either way and producing more thermal than slope-lift. The recovery of models was very hard going, with steep climbs after retrieval for most flights.

As often happens, Competition day was very different. F1E contests consist of 5 x 5 minute rounds. There was the option for the Controller to fly on one or two days. He opted (wisely) to go for the whole lot of five rounds on the first day, giving some 7½ hours flying in one block (it rained and hailed the day after).

Rounds one, two and three were flown in almost ideal conditions with light slope lift straight up the valley for most of the time. Given a straight flying model and no wind shifts, five minutes didn't look too difficult, assuming that the flier could get downhill some ½ to ¾ mile, recover his model and get back up again for the next round.

Neither Jeff nor I had any doubts about our approach. We would have to circle, hoping to progress forward sufficiently to catch a little lift from a second forward slope, and ride it back to the launch point. After the first round only six out of 17 fliers had maxed, Jeff had got four minutes dead, I had dropped 25 seconds and we didn't feel too badly about matters.

The second round was fatal; we both suffered a wind shift of some 90° immediately after launch, drifting sideways and touching down for 69 and 49 seconds. This was hard luck as apart from our misfortunes, ten fliers maxed with ease and winds set fair.

Round three and we put in good maxes. (Strangely enough Jeff's seven minute flight landed nearer the launch point than my six



minute effort . . . not many competitions where you ease retrieval by lengthening the fusel). About three minutes straight ahead, then three-four minutes circling back seemed the answer. Then the wind and weather changed. Drizzle and light winds from North, swinging up to 90° either way brought round four maxes down to three, with the most successful fliers opting to go straight out over a dense conifer forest with 60ft. trees, flying fast enough to ignore sideways drift caused by wind changes. Four maxes were recorded in the last round, fliers who could not affect team or personal positions significantly chose not to risk models unnecessarily. Not so the Czechs, whose fitness and determination had to be seen to be believed. Their technique was to launch and tear after the models like fell runners, keeping as near underneath as possible. Even then, treeing a model meant its loss, even though its location was known . . . not a very satisfactory feature of the terrain.

After we adjourned to the Chalet hotel for the evening dinner and prizegiving, we found that the Father of F1E, 'Onkel Hans' Gremmer had been devising modifications to the rules which would permit the Contest Director to fix max times aimed at giving an adequate element of competition without there being undue emphasis on recovery risks. The number of flights would remain the same but the max times could be varied. One problem arose . . . that of the 'value' of a max of say, three minutes, compared with a max of four. This was solved by our suggestion of the use of the percentage max system common in thermal soaring. When this was explained in German, Czech, Italian and English, representatives from the six participating nations got together and signed identical proposals to be sent to their individual national bodies. As Hans said, "The fliers should make the rules, not the officials."

Final team places showed the Czechs with first, third and fifth individuals to have won with a convincing 4105 seconds total, West Germany (3333) second, and Austria (3267) a close third. UK . . . well, a modest 1853 from a 'Minimannschafft' (team) as we were christened.

### Individuals

- 1. R. Musil (Czech)..... 1409 seconds
  - 2. K. Lintner (Austria)..... 1405 seconds
  - 3. F. Bartak (Czech)..... 1381 seconds
- Palmer, J. 12th with 946, myself 14th with 907. Entries 17, teams six (or should one say 5½?).



*Above: Trevor Faulkner with mylar covered rear-steerer - only one in the champs, very slow flier.*

*Fuse operated programme. Czech team members, Juri Kalinin (dark anorak) and Musil (77). Dark trees, middle distance, 60ft. and higher. Conventional models, super-fit modellers! Musil's model large, high aspect ratio.*



# Engine Test

by Peter Chinn

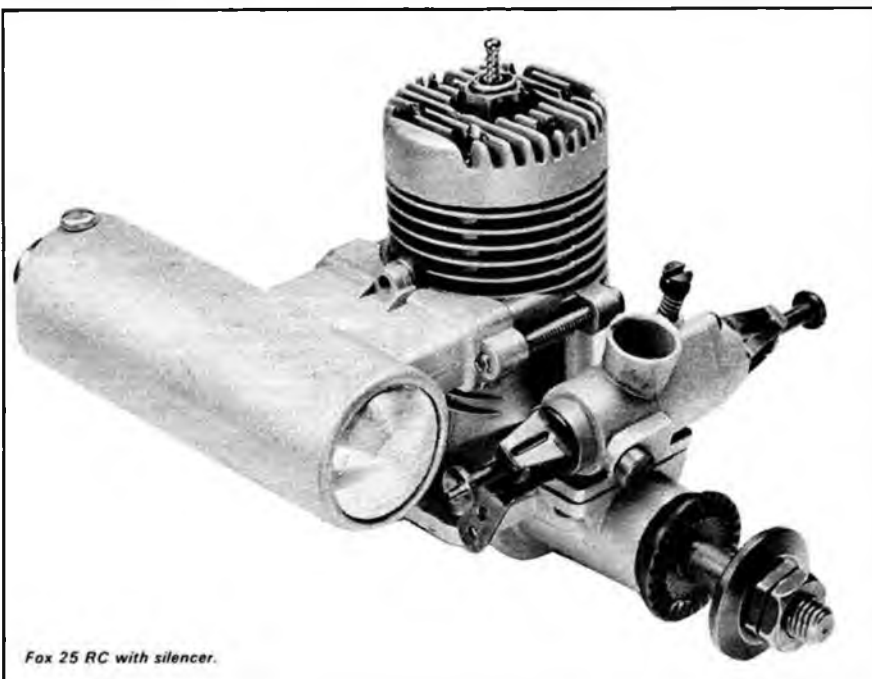
## Fox 25 R/C



1982 marks the thirty-fifth anniversary of the appearance of the first Fox engine. This was the 9.72cc Fox 'Hi-Torque' .59, a rear rotary-valve twin ball-bearing spark-ignition engine of distinctive design and appearance. In 1949, it was followed by what was to become the most widely used and most successful control-line aerobatics engine of all time; a winner of countless contests and an engine that is still in production today: the Fox Stunt 35.

Since that time, the American Fox company has produced vast numbers of engines of all types, ranging from .049 cu.in. (.8cc) beginners' engines, to a big twin-cylinder 1.2 cu.in. (20cc) unit. Fox's most popular engines, however, have always been in the middle displacement sizes from .19 cu.in. to .40 cu.in. and one such current model is the Fox 25.

The first Fox 25 was introduced in 1972 in both standard and throttle equipped



Fox 25 RC with silencer.

### 1981 FOX 25RC

#### SPECIFICATION

**Type:** Single-cylinder, glowplug ignition, crossflow scavenged two-stroke, with shaft rotary-valve and side exhaust. Bushed main bearing. Throttle type carburettor with adjustable automatic mixture control. Carburettor interchangeable with plain venturi and needle-valve assembly.

**Bore:** 0.680in. (17.27mm)

**Stroke:** 0.680in. (17.27mm)

**Swept Volume:** 0.2470 cu.in. —

4.047cc **Stroke/Bore Ratio:** 1.00:1

**Nominal Compression Ratio (full stroke):** 7.2:1

#### Checked Weights:

195 grammes —

6.9 oz (less silencer)

238 grammes —

8.4 oz (with silencer)

#### GENERAL STRUCTURAL DATA

Pressure diecast aluminium alloy crankcase / cylinder-casing / front-housing unit with bronze bushed main bearing. Pressure diecast aluminium alloy backplate secured with four Phillips screws. Counterbalanced one-piece case-hardened steel crankshaft with  $\frac{1}{16}$ in. dia.  $\frac{1}{16}$ in. dia. main journal,  $\frac{1}{16}$ in. bore gas passage,  $\frac{1}{16}$ in. dia. crankpin and  $\frac{1}{4}$ -28 UNF propshaft thread. Steel prop driver keyed to shaft by short splines. Drop-in leaded-steel cylinder liner located by flange at top. Ground and lapped Meehanite cast-iron piston with straight baffle and  $\frac{1}{8}$  in. dia. solid gudgeon-pin pressed into tapered hole in rear piston boss. Machined aluminium alloy connecting-rod with plain eyes. Pressure diecast aluminium alloy cylinder head with wedge pattern combustion chamber and channelled to fit over flange of cylinder liner with .010 in. soft aluminium gasket and secured with six Phillips screws. Flange mounted Fox two needle AMC carburettor with pressure diecast aluminium alloy body and steel throttle barrel. Fox 'B' size silencer (optional) with pressure diecast aluminium alloy expansion-chamber/entry-duct and machine aluminium alloy baffle tube.

#### TEST CONDITIONS

**Running time prior to test:** 1½ hours

**Fuels used:** (i) 5 per cent nitromethane, 25 per cent castor-oil, 70 per cent methanol. (Running-in and Test 1). (ii) 25 per cent nitromethane, 20 per cent castor-oil, 55 per cent methanol. (Test 2)

**Glowplug(s) used:** Fox 1.2 volt RC long-reach.

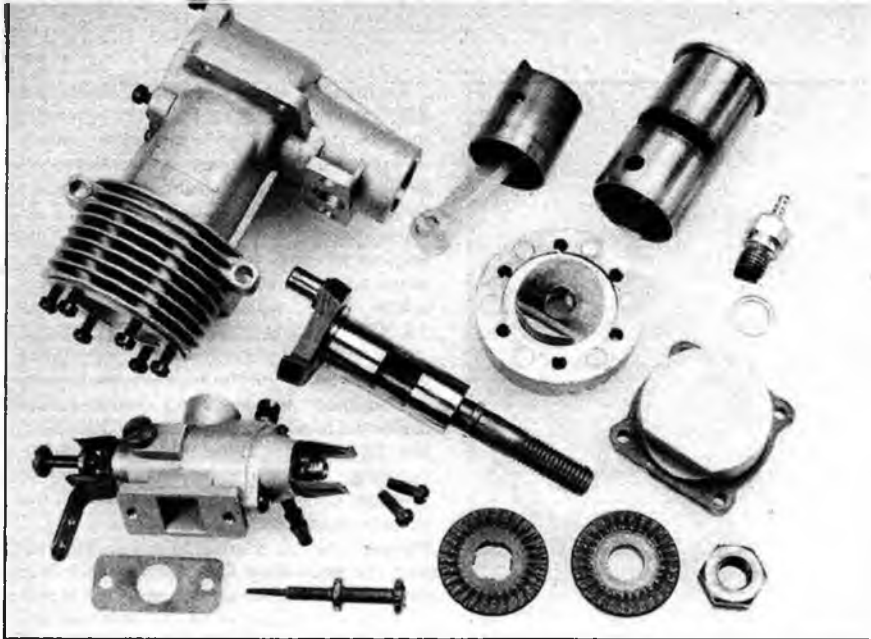
**Silencer used:** Fox Type B, P/N 90222.

**Air temperature:** 13° (56°F)

**Barometric pressure:** 756mm (29.76in.) Hg.

**Relative humidity:** 74 per cent.





Parts of the Fox 25RC. Traditional Fox construction: simple and durable.

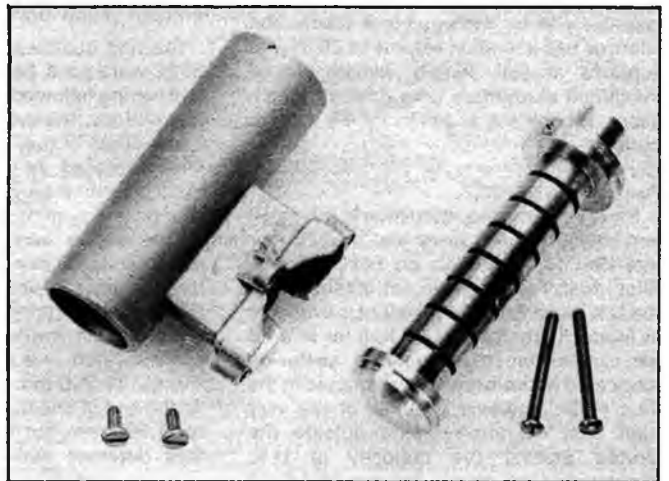
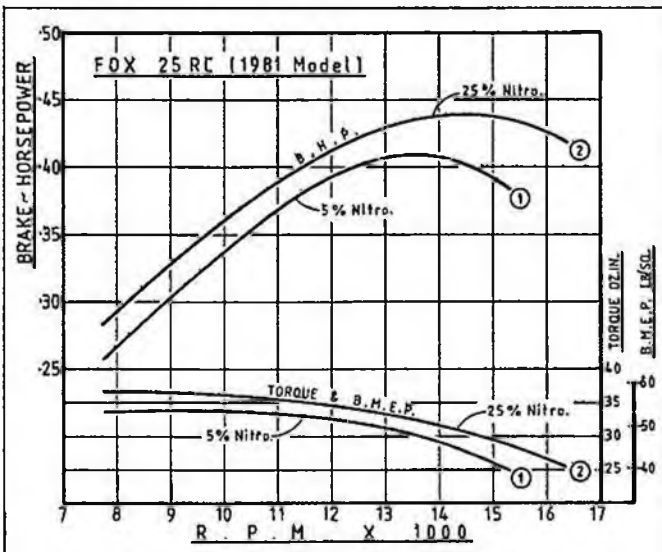
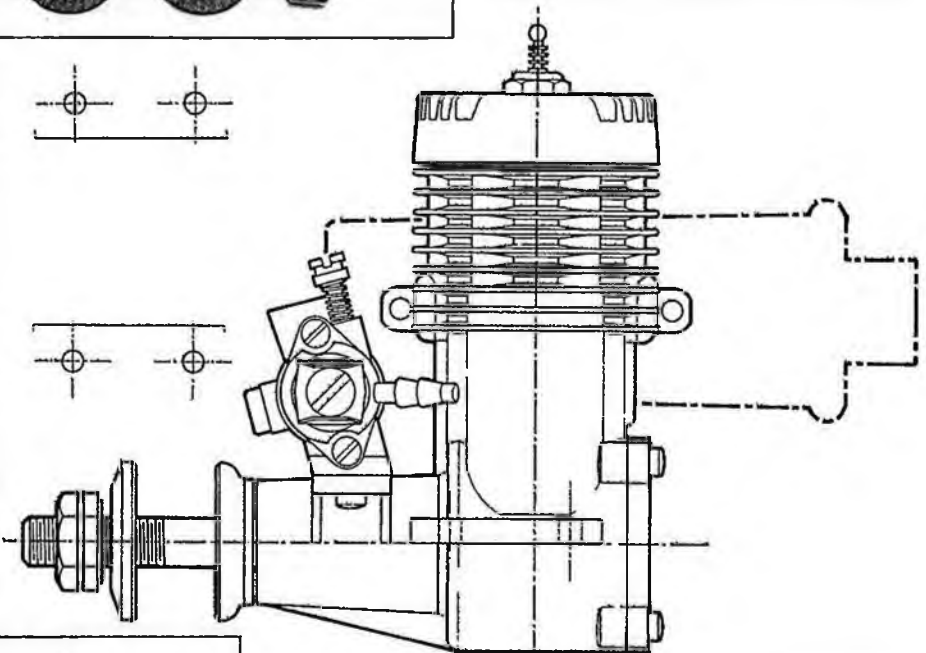
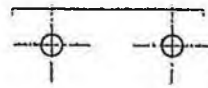
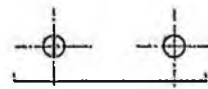
The crankshaft, counterbalanced, as before, by a crescent counterweight and by cutaway web flanks, now has a 20 per cent larger diameter crankpin and its rectangular valve port uncovers the circular intake port for a lengthened induction period, beginning at 43 degrees after bottom-dead-centre and closing at 52 degrees after top-dead-centre. The prop driver is now of steel instead of aluminium. The cylinder-liner's two unbridged diametrically opposed ports are open, according to our measurements, for 133 degrees (exhaust) and 116 degrees (transfer).

The carburettor is of a new type. In the past, Fox carburettors have invariably been of distinctively different design. They have generally worked well but have called for a different adjustment procedure. As a result, some modellers, used to the

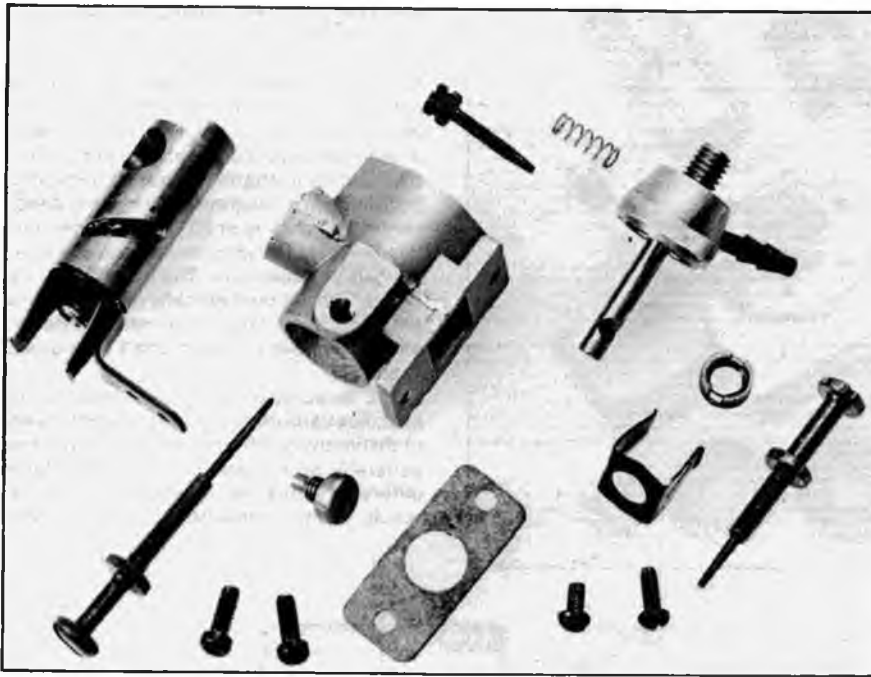
versions and the standard version was dealt with in the A.M. Engine Test series in the same year. Since that time, the 25 has been steadily improved, culminating in the new 1981 version that is the subject, in its throttle-equipped variant, of this report.

Although, in overall dimensions and general appearance, the 1981 motor is not greatly changed, most of its component parts are new or have been modified in some way and all the changes are for the better, as we shall see in a moment.

For example, the main casting, in the interests of increased durability, has a larger o.d. main bearing housing and a thicker saddle for the distinctive flange-mounted carburettor. Also changed is the method of securing the silencer, which is by means of a pair of lugs, located fore and aft, instead of tapped holes above and below the exhaust duct. A bead-blasted matt surface is now used on the casting which, one feels, looks better than the original tumble-polished finish.



Improved Fox 'B' silencer features diecast body and machined baffle tube.



Parts of the new automatic mixture control carburettor as fitted to the latest Fox 25RC and 19RC engines.

sequence of adjustments applicable to the now popular "two needle" type, have found the earlier Fox carbs slightly confusing. The new Fox carburettors, therefore, incorporate the basic design principles now used by most other manufacturers. That is to say, a barrel throttle with circular choke is now employed, the barrel moving axially as it is rotated, carrying with it a separate, adjustable, low-speed needle, which reduces fuel flow through the jet tube as the throttle moves towards the idling position. As before, however, the carb has flange mounting, rather than the usual spigot mounting. The effective choke area is just over 14 sq.mm.

As already noted, the method of attaching the silencer is now fore and aft, rather than top and bottom. Also, the silencer itself has a rim that fits around the exhaust duct to make a stronger assembly, much less likely to be damaged in a crash. The silencer has a modest volume of 25 ml and contains a full length radially-slotted machined aluminium tube through which gases escape via a generous 85 sq.mm. outlet.

#### Performance

Most Fox engines, particularly the small and medium sized ones like the 25, are intended for operation on Fox "Missile-Mist" fuel. Fox fuels are not obtainable in the U.K. but a British equivalent is available in Model Technics' GN-25 fuel, or in a 25 per cent nitromethane content, castor-oil lubricated home-brew mix, as quoted in the data table. However, in view of the very high cost of nitromethane outside the United States, the majority of U.K. customers tend to opt for a milder fuel; commonly a 5 per cent nitro blend. For this

report, therefore, tests were carried out on a 5 per cent mixture as well as on the recommended 25 per cent blend.

**Starting and Running** Fox glowplugs are available in standard or R/C (idle-bar) types and with long or short reaches. They are also made in two ranges: the original type, identified by a plated body, which is now nominally rated at 1.2 volts and is for use with nickel-cadmium or dry cells, and the 2 volt type, which has a black body and is for use with the lead-acid cells more commonly used in the U.K. the engine is normally supplied with a 1.2 volt long-reach plug. Therefore, if you are intending to employ a 2-volt cell with this plug, make sure that you use long dropping-leads, or a suitable resistance or rheostat so that the applied current is not excessive. Check by removing the plug: the element should glow a reasonably bright red, but not a brilliant yellow-orange.

Starting qualities of our test model Fox 25RC were good. Before replacing the plug, and having followed the maker's setting-up instructions, the cylinder was primed with a few drops of fuel through the plug hole. This produced an instant first-time cold start. Warm (non-primed) re-starts were also prompt.

The engine was given a total of approximately 90 minutes' running time before test figures were recorded. Only about 15 minutes' running were required to reach the point where the 25RC, with the silencer fitted, was able to hold a steady full throttle 11,200 rpm on a 10x4 Zinger prop. At the end of one hour this figure had risen to 11,500 rpm, but no further improvement was detected during the remaining 30 minutes and the engine was then considered ready for testing.

As regards actual running qualities, the 25RC ran quite well on the 5 per cent nitro mix, except when lightly loaded for speeds in excess of 12,500 rpm when there was some unevenness of firing, accompanied by increased needle-valve sensitivity. As most owners will probably be using the engine for R/C trainer or scale models, when a 9x5 or 10x4 prop would be appropriate — i.e. when static rpm is below 12,000 — this is unlikely to be a problem.

There is no doubt, however, that this Fox does run better on the higher nitro blends. In addition to providing extra power (reflected in prop rpm increase of 300-400), the 25 per cent nitro mix gave steadier running, greater tolerance to mixture strength variation at the top end and better throttle response.

**Power** The Fox silencer is not so quiet as, say, the equivalent O.S. silencer, but does not absorb so much power. In fact, it is only at speeds in excess of 14,000 rpm that any power loss becomes discernible.

As the performance curves show, a peak power output of 0.44 bhp at 14,600 rpm was determined on 25 per cent nitro with the silencer fitted. Removal of the silencer raised this figure only marginally to approximately 0.455 bhp at 15,500 rpm. These are very good figures and are among the best we have recorded for a plain-bearing crossflow-scavenged engine in this capacity group. Switching to the 5 per cent nitro fuel, as expected, lowered torque (mostly by between 6 and 8 per cent) and resulted in a peak bhp of 0.41 at 13,500 rpm.

Typical speeds obtained on maple wood props and using 25 per cent nitro, included 10,200 on a 10x5 Top Flite, 10,900 on a 9x6 Zinger, 11,550 on a 10x4 Top Flite, 11,800 on a 10x4 Zinger, 11,700 on a 9x5 Zinger, 12,200 on a 9x5 Top Flite, 12,800 on a 9x4 Top Flite, 13,000 on a 9x4 Zinger, 13,700 on a 9x4 Power Prop and 14,100 on an 8x5 Zinger.

**Throttling** The new Fox carburettor worked well. The best running setting on 25 per cent nitro with the test engine were: main needle 2 turns open; low-speed needle 1¼ turns open. These settings allowed a minimum safe idling speed of 2,600 rpm on 10 inch diameter props, rising to 2,800/3,000 on 9x4 props.

#### Comment

Fox engines are not found on the shelves of every dealer, some of whom claim that they are not sufficiently "pretty-looking" for their customers. To this, one can only report that Fox motors are well finished where it matters most, i.e. inside, and that overall they have a very good reputation for durability.

**Manufacturer:** Fox Manufacturing Company, Fort Smith, Arkansas, U.S.A.

**U.K. Sales & Service:** (i) Fox Mfg. Co. UK, The Haven, Rixey Park, Chudleigh, Newton Abbot, Devon. (ii) Model Aircraft (Bournemouth) Ltd, Norwood Place, Pokesdown, Bournemouth, Dorset.



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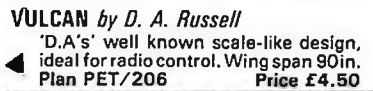
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# FROM THE HANDLE

**GLEN ALLISON**  
reports

## Open International Stunt Competition at Dodington House, Avon 5/6 Sept., 1981

A fantastic new site in the grounds of Dodington House in the County of Avon was the venue of a new two-day open international meeting organised by S.M.A.E. C/L committee chairman Arthur Eves. The event nicknamed "Arthur's Inter" was timed to try to attract foreign competitors who had attended our Nationals the previous week to remain in UK and take advantage of both competitions. In the event however none of the Nationals competitors remained but four Continentals came over just for this event. Marc Lavalette and Phillippe Gauthier from France, Uve Kehman from Germany and 11-year-old Florian Kloight from Austria came to fly in Novice, even though he had only a profile trainer to fly.

Glorious weather blessed the whole weekend which made the camping facilities very attractive and gave the event an intimate atmosphere. There was a 'banquet' organised for the Saturday night within the grounds, included in the entry fee, which made the whole weekend more of an occasion.

The overall entry was rather low at only 10, probably because of the Nationals the previous weekend, and also because the team trials follow so closely that many top fliers may have preferred to practice privately. Being at such a Westerly location near Bath may also have had a deterrent effect with the cost of travel being an important consideration these days.

Notwithstanding all this however it was still a successful competition in delightful surroundings, a pleasant contrast to a bleak airfield.

### RESULTS

Position	Flier	Score	Model	Engine
1	Marc Lavalette (F)	3850	Panter	Merco 49
2	Phillippe Gauthier (F)	3519	Olympus	Merco 49
3	Uve Kehman (WG)	3401	O/D	ST 46
4	Terry Taylor (GB)	3326	Sig Chipmunk	Merco 35
5	Bryan Lack (GB)	3277	'Quagar'	HP 40
6	Glen Alison (GB)	3227	'Cavalier'	Irvine 40
7	Chris Shelley (GB)	3116	Genesis	ST 46
8	Marco Beschizza (GB)	2939	Atlantis	ST 60
9	Arthur Eves (GB)	1989	Olympus	Merco 49

Novice — Florian Kloight 606 plus 10%

## C/L Aerobatics Team Trials for the 1982 World Championships

**Venue:** Three Sisters Recreation Centre, Ashton-in-Makerfield.

**Date:** 13th September, 1981.

**Judges:** Reg Lowe, Mick Harvey, Gordon Bryant.

**Contest Director:** Arthur Eves.

**Weather:** Calm at first after heavy overnight rain, but the wind gathered strength throughout the day. Bright sunshine directly downwind. Occasional clouds.

Contestants for the team trials are selected by their performance in at least three Centralised competitions out of five (including the Nationals) on a points basis whereby fliers are given 10 for 1st, 9 for 2nd etc., the top ten from this list are invited to compete.

The Three Sisters site is purpose-made with three tarmac circles and should be an ideal venue for international competitions. However the stunt circle has two disappointing features. Firstly the

## Control Line News

Right: British stunt team for 1982 from left to right: John Newnham, Bill Draper and Barry Robinson. Below left: Arthur Tipper with his North Wind Merco 49 powered model. Right: Glen Sibley with his Nimbus, powered by an ST46.



centre of the circle is raised slightly above the perimeter, thus posing the problem of what is the correct height to fly for 'straight and level'. Does one fly with the lines horizontal with the model too high off the perimeter or when the model is at the correct height of 1.5m, the lines are sloping down towards it and created a strange effect. Secondly, and much more importantly, the circle is surrounded for three-quarters of its circumference by a high grass bank which creates the difficulty of being completely featureless. This makes it hard to visualise the horizon for consistent pull-outs. Also in the high wind which prevailed, the bank caused very severe turbulence which made it very difficult for fliers to pinpoint

Pete Tindal after a good first flight was unfortunate to have his engine cut after the loops, investigation showed that two engine bolts had fractured. Bad luck indeed, which made it even more important for Pete to put in a good third round flight. The majority of the fliers improved their scores.

The third round started with both more wind and more tension as 'do or die' attempts were made to improve the scores. First off was a very good flight by Bill Draper with 2818 which just about guaranteed him a place. The next serious contender Pete Tindal still has not got his engine run sorted out and he crashed in the square eights, eliminating his chances. Barry Robinson put in a consistent flight of 2746 likely to put him in the team. John Newnham was going well until he was blown out of the hourglass by the wind. It was not over yet because Nev Dickinson was last to fly and could easily affect the result, but the flight was not quite good enough to make the team, but he is number 1 reserve.

## JOHN JAMES reports

### Dutch Combat International 1981 Amerongen

Once again Combat fliers from all over Europe flocked to the hockey club at Amerongen for this the 10th anniversary Dutch Combat International. The British went in force making up 27 of the 79 entries. Other countries included West Germany 16, Holland 13 France 8, Denmark 6, Spain 5, Belgium 3, Czechoslovakia 1. All looked

the actual downwind point which is so important when flying in strong wind.

The first round was started by Bill Draper and was rather uneventful as people sorted themselves out and settled down. Not everyone had had an opportunity to practice on the site. At the end the leader was John Newnham 2775 closely followed by Bill with 2746 and Barry Robinson 2727.

In the second round the wind was stronger.

### RESULTS — TEAM TRIALS STUNT

Name	Model/Engine	Rd. 1	Rd. 2	Rd. 3	Total
1. Bill Draper	Super Hawk/Enya 40	2746	2787	2818	5605
2. John Newnham	Nobler/Merco 35	2775	2768	2526	5543
3. Barry Robinson	North Wind/Merco 49	2727	2729	2746	5475
4. Neville Dickinson	Genesis/O.S. 40FSR	2639	2510	2649	5333
5. Arthur Tipper	North Wind/Merco 49	2545	2602	2629	5231
6. Glen Alison	Stilomag/HP40 GC	2435	2461	2573	5034
7. Rob King	Chipmonk/ST 46	2473	2292	2509	4982
8. Pete Illife	Genesis/ST46	2373	2476	2408	4884
9. Glen Sibley	Nimbus 3/ST46	2378	2292	2258	4670
10. Pete Tindal	CAP 21/Merco 61	2719	362	1905	4624

set for a good competition as in addition to the flying, a couple of surprise events were planned for the weekend.

### 1st Round

The first round commenced early on Saturday morning and the organisers were immediately presented with their first problem. There had been an extremely heavy dew and the streamers were not holding together. However, the problem was quickly resolved by running masking tape down all the streamers.

As is usual for the first round of an event like this, the standard of flying was not very high and an awful lot of models were broken. However most of the not too good fliers were weeded out, although unfortunately quite a few of the better ones were destined to join them as well. By the end of the day, we had lost four British fliers, including the glow man himself, John Hammersley, who had come out of retirement especially for the event.

### 2nd Round

This proved very interesting with Pete Tribe, Uffe Edslev of Denmark and Emmanuel Saadi of France each taking five cuts in their respective bouts, disproving the theory that modern FAI combat is a hit and miss affair. Also continuing on his winning way was team race pilot Steve Smith who was flying very casually, disposing of Jiri Karger without too much trouble. Steve had come complete with his supply of Sainsbury's bitter, evidently not trusting the continental brew. Unfortunately this round proved to be costly to the British with over half our fliers losing. Those now out of the competition included Ray Sibbald, current European Champion, who lost to Norbet Figus.

### 3rd Round

As the competition moved into the third round, things started to hot up as fliers came that bit closer to the coveted trophy. The standard of flying improved enormously and some very exciting combat was taking place. Pete Tribe was looking good as he beat Saadi of France. Vernon Hunt eventually beat Ron Kaptijn of Holland after a re-fly and both pilots had put in a protest. Ian Kennedy was also flying extremely well and beat Cabantous of France by 3 cuts to 1. Mike Whillance, our second team member to be knocked out, was unlucky to lose when, after a crash, Knudsen's pit crew were a few seconds faster in getting the model back into the air. Still that's combat.

### 4th Round

With 6 British still remaining out of 16 fliers. Neil Gill and Tony Jenner were the only two to go which left four Britons in, and an excellent chance of the trophy returning to British hands after a two year absence. All four won their bouts with Vernon Hunt the only one to have any ground time scored against him, which increased the likelihood of a British winner enormously as they were the only four fliers left in the competition.

### Semi-Final

First to fly were Vernon Hunt and Pete Tribe. Vernon had been practicing flying low and inverted and put this to good effect until Pete followed him, also low and inverted, and Vernon flew into the ground. So Pete became the first finalist. In the second semi, Dave Willis flew Ian Kennedy. Ian's models were looking a bit sad by this time and he went down to the better prepared Dave Willis.

### Final

So not only an all British final, but an all COSMO final which proved to be one of the better finals seen for a while. Both fliers had obviously flown each other frequently, if only on the club field, and each had the measure of the other. Pete however was the one who came out on top by taking four cuts to one after a fine display of clean attacking combat.

The most interesting models were those flown by the Danish team. Uffe Edslev claimed to have reduced his model weight down to 330 grams.

This included the motor which had all the excess metal removed by filing so much off that the resultant engine no longer bore any resemblance to a Super Tigre. The models had most of the foam removed and were covered in lightweight tissue. Any strengthening required and there did not seem to be much, was achieved by an extra layer of tissue. Elevator movement was 45° up and down which produced very quick changes of direction.

As usual the competition was extremely well organised by a small group of people who work nearly all year to ensure a successful contest. Unfortunately because of the workload, it looks like this could be the last Dutch Combat International, or if there is one, it will be a much lower key event. There is little doubt however, that if there is one, there will be an equally good attendance as in previous years.

Since this was the 10th Anniversary, we were treated to a buffet banquet on the Saturday night which proved to be excellent. Once we got used to the Continental queuing system (first come first served and women and children can look after themselves), the range of meats was amazing. There was even an enormous seafood cake with the Dutch Combat International emblem of two combat models depicted in the centre. Following the banquet was a rock concert by a band consisting of Dutch Combat fliers who entertained us late into the night.

## JIM WOODSIDE reports

### The USA team for F2C at the 1982 World Champs, Sequin, Texas, August 1981

Eleven teams entered the USA trials, which was almost twice the expected entry! Albritton and Perkins showed that they had a commanding lead with a string of times in the 30s and 40s. Kusiak and Jolly had paired up again for the trials and put in a smooth performance except that lack of range meant that they had to stop almost every race.

Before the contest, Tom Knope and I had test flown his equipment and achieved a competitive setting. A long distance call brought John McCollum from Los Angeles on a midnight flight. Tom changed to pitting and the two managed to secure 3rd place. In fourth place were Shew/Pardoe of Albuquerque. They had good quick equipment but took several races to get their act together.

#### RESULTS:

1. Albritton/Perkins	3:41.6	3:35.8	3:36.8
2. Jolly/Kusiak	3:44.5	3:51.6	3:56.1
3. McCollum/Knope	3:51.4	3:51.0	3:57.2
4. Shew/Pardoe	4:04.1	3:52.9	3:56.0

#### USA National Championships Final

1. Albritton/Perkins
2. Shew/Pardoe
3. Jolly/Kusiak

### Team Trials for the 1982 World Championships — Three Sisters, Sunday, 13th September

The Trials for F2C were reduced to a one-day event with each team flying six times — the total



Left: Shew/Pardoe second in the USA National Championship Final.

Right: USA team for F2C from left to right: Jolly/Kusiak second, Albritton/Perkins first and McCollum/Knope third.

of the best three flights to decide the outcome.

In contrast to the British Nationals when most teams seemed to be struggling for speed, a gaggle of hopefuls were circulating in the range 19.8-20.1 seconds for 10 laps. There was obviously going to be a great emphasis on good pitwork and piloting with no margin for error.

In the end the results were even closer than imagined with the last race of the day, in which Gray/Haycock recorded a 3:34, bring changes in the likely composition of the team.

All the competing teams used Nelson AAC engines of one sort or another. The top five teams all used flying wing models either exclusively as in the case of Smith/Brown, or for some flights as in the case of Langworth/Broadhead.

#### Results — total of best 3 races

1. Smith/Brown	3:35.7	3:36.5	3:37.7	10:49.9
2. Gray/Haycock	3:39.2	3:51.2	3:34.7	11:05.1
3. Langworth/Broadhead	3:42.9	3:42.6	3:40.9	11:06.4
4. Wilson/Gardiner	3:42.0	3:42.2	3:42.4	11:06.6
5. Fry/Thorpe	3:43.6	3:37.9	3:46.1	11:07.6

Apart from Smith/Brown's commanding lead, I do not think results have ever been closer. The top three were, by coincidence, the same finalists as at the British Nats.

### Goodyear Plan — Shoestring 1974

John Neil over in Norfolk has sent me a copy of his outline style plan of Ray Coate's Shoestring '74. Sufficient detail is provided to build an interestingly different Goodyear racer. With Don Haworth showing the way with his 'Wild Turkey', John's plan is another alternative to the 'Deerfly' and 'Lil Quicke' designs.

Cost of the plan is £1.20 plus postage (or send a stamped 10 x 8 envelope), from John Neil, 2 Knapet Close, Attleborough, Norfolk NR17 2NR. Phone: 0953-454145.

By the way John mentions that he has found the LLam 2.5 diesel from Russia is comparable with his Rossis and thinks it might be useful for 'diesel only' combat.

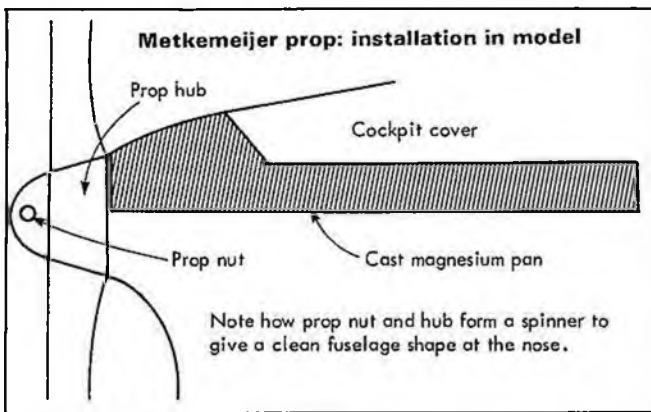
### The large hub Metkemeijer 1980 prop

About a year ago, Rob Metkemeijer did some research into propellers, aided by considerable computer time. Hopefully Rob will eventually publish his findings at some length as a complement to the superb FMV engine development article. One of the main conclusions was that there is no such thing as 'super' prop. Most of the popular designs will perform at a good standard if they are pitched and trimmed to the optimum for an engine/model combination.

Rob's approach was to design a prop which combined sound aerodynamic principles, high mechanical strength and a shape which would blend cleanly with the profile of the brothers' model. To this end the prop has:

1. a non-cuffed blade with a rather thick hub reminiscent of the Tornado wooden props of the 60s.
2. construction in carbon fibre.
3. a substantial hub. The size of the hub has puzzled many people on account of its apparent clumsiness. However it has two important functions. Firstly it adds strength to the prop's structure. Secondly the hub tapers back face to front face. When held in place with a domed nut, the whole unit has the clean shape of a spinnered model — very neat and very clever. Of course most pans presently available are too narrow at the front to make





proper use of the hub design. No doubt these will become available and the extra width will be very useful in allowing more material into which to embed the front hold down studs. At present most users are reducing the size of the hub to more conventional proportions.

### Availability

At the moment there are three sources of the prop:

1. Tribe Propellers in the U.K.
2. Flemming Jensen in Denmark — style No. 5.
3. Shadow Racing in the USA — style No. 16. This moulding already has the hub size reduced to suit conventional nosed models.

### Pitch distribution and diameters

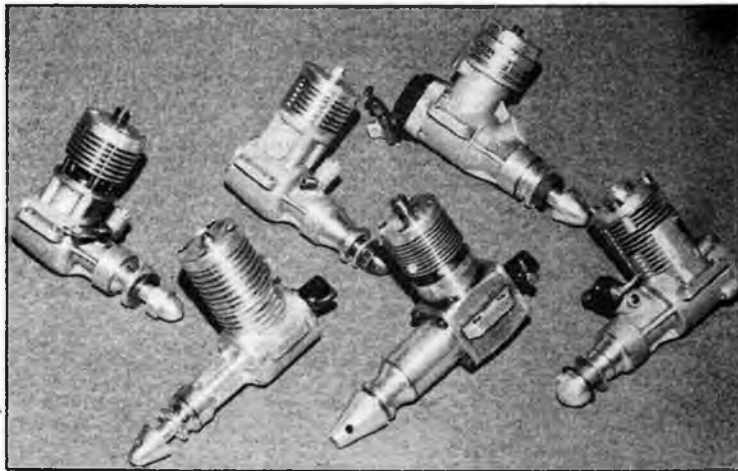
The prop is best run at small diameters — in the range 158-162mm. Do not be put off by the small size — it does work. However the pitch is a little higher than usual. The figures given below are those taken from a Rumpel style pitch gauge.

Station	1	2	3	4	5	6	7	8
Pitch	5.0	6.25	7.0	7.25	7.25	7.25	8.0	

I have been very pleased with the performance of this style of prop — it does seem less sensitive in a race than the cuffed root varieties. Well don't expect miraculous improvements from your 24/10 racer, but worth trying if you have most aspects sorted.

### 1/2A Teamrace Engines

Several times recently I have said that interest in 1/2A racing is on the increase. It really does give a lot of enjoyment for a fairly modest outlay when compared with the other main categories. It seems I am not alone in taking this point of view. Over the winter Wharfedale Club member Bernie Langworth persuaded several engine buffs to bring their 1.5cc diesels along and carry out some comparative tests. After testing all the engines, Bernie put together the following information.



1/2A Team Race engines described in Bernie Langworth's article below. Top line from left to right: Oliver MkII Cub, Oliver Schnuerle (side exhaust), DES 1.5. Bottom line from left to right: Haworth MkII, Haworth MkI and O'Neil-Daly's Webra Speedy.

The last year or so has seen a long-awaited shot in the arm for 1/2A Team Racing, namely a selection of Schnuerle ported engines plus the widespread adoption of more up-to-date F.A.I. style models and techniques. Which is the more important — the motor or the model is a subject much argued, but the topical question was how good were these new motors when compared with the accepted standard for 1/2A Team Racing — the Oliver Tiger Cub.

The Cub was about the only choice for 1/2A since its introduction in 1958, and the situation showed little sign of changing until the 1977 Nats when Bergtar/Böhlin out-performed everything with a dieselised Webra Speedy. It was then obvious that to get a Schnuerle ported engine into a 1/2A model was of top priority.

There were several attempts to convert Webras but so much skillful work was required that most were not too successful. However the one notable exception was O'Neill/Bollens example which demonstrated the high speed advantages of this motor.

About the same time, Don Haworth, famous for his 'specials' had put Schnuerle ports into an otherwise 'traditional' design with some good results.

Dave Smith, however, was developing a very up-to-date design incorporating all the accepted features of the top FAI motors, which resulted in good performance in the speed/range department.

When the Oliver factory finally released their Schnuerle Cub on the market, the scene was set for some very competitive racing in the 1/2A circles.

Last season's results have been well covered in

the *Aeromodeller*, but suffice to say that new records were set and the afore-mentioned engines featured in top places throughout the season.

To get all these engines while in peak condition straight from their racers on the same test bench for evaluation is not an opportunity that arises too often, and thanks are extended to those who made it possible.

### Test Conditions

Commercially available propellers were chosen for the test so that figures from other sources could be compared at a later date. The same fuel was used for all runs, performance checked with a strobe tachometer, backed by a direct drive tachometer — which gave a slight drop in r.p.m. The temperature was around zero giving confidence that the results were not over-flattering but every effort was made to get consistent results. Fuel used: 15% castor, 35% ether, 48% paraffin, 2% I.P.N.

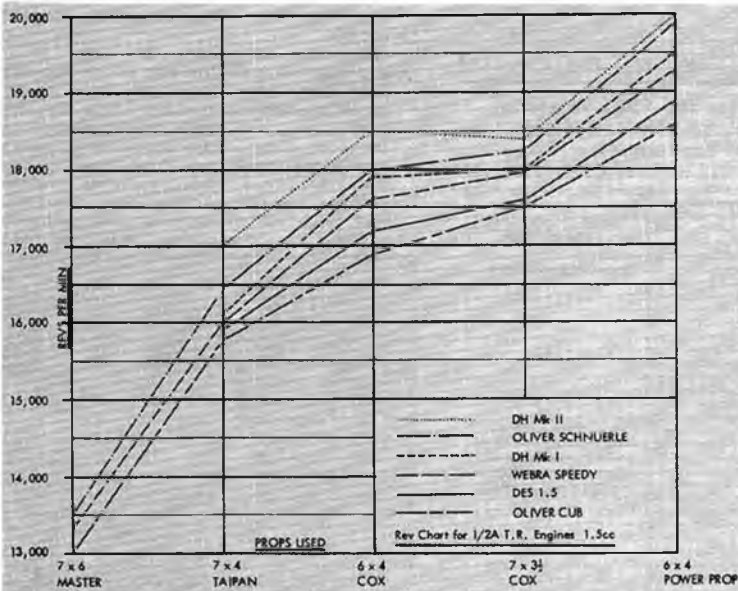
### ENGINES

**Standard Oliver Tiger Cub circa 1970 — John Broadhead**

This engine is an 'out of the box' example that has been raced with success for many seasons. As this motor has earned its keep in prize-money, it can be accepted that it is a good example of this engine and as such, chosen as our standard of performance to compare the other engines with.

**DES 1.5 — Dave Smith**

The intricate constructional features of this engine have been published in the December 1980 *Aeromodeller*, but suffice to say it is a very



### COMPARATIVE PROP/RPM TESTS ON 1.5cc TR ENGINES BY DON HAWORTH AND BERNIE LANGWORTH.

Engine	7x6 Master	7x4 Taipan	6x4 Cox	7x3 Cox	6x4 Power Prop	Cylinder Timing	Flight Perf.	WT
Oliver	13,000	15,750	16,900	17,500	18,600	140° Ex	50/60	99gm
Tiger	13,000	15,750	16,900	17,500	18,600	135°	laps.	
Cub						trans	best ever heat 4.08	
Des 1.5	Not tested	15,900	17,200	17,600	18,900	135° Ex	54 laps heat in trans. in low 4 mins.	122gms
Webra Speedy 1.5	13,300	18,000	17,600	17,950	19,300	148° Ex	40 laps Sub-4 mins.	114gms
Oliver Schnuerle	13,500	16,450	18,000	18,250	19,900	135° Ex	40 laps 7.51 trans. record	90gms
DH Special	Not tested	16,100	17,800	18,000	19,500	120° Ex	50+ laps heat record	130gms
Special MkII	Not tested	17,000	18,500	18,400	20,000	122° Ex	Unfl'n heat record	90gms
DH Special MkII	Not tested					102°	trans.	



up-to-date design, incorporating most of the latest FAI engine developments i.e. F.M.V. type tufoi housed drum valve. Its performance reflects the engines excellent construction and hopefully it may become commercially available.

#### Webra Speedy — Taffy Bollen

Based on a Webra 1.8 crankcase and shaft assembly, this motor is extensively rebuilt. Its Daly piston and cylinder was well produced showing a lot of know-how. This was contrasted by its rather poor two-part contra-piston assembly which gave some trouble during its testing. Probably the most successful Webra raced to date.

#### Schnuerle Tiger Cub — Bernie Langworth

A very loose example of this engine which possibly helps with rpm but the volume of fuel pumped from the front race during test no doubt accounted for its lower range. Ironically latest productions are claiming exceptionally good range. Current final record holder.

#### Schnuerle Mk I — Don Haworth

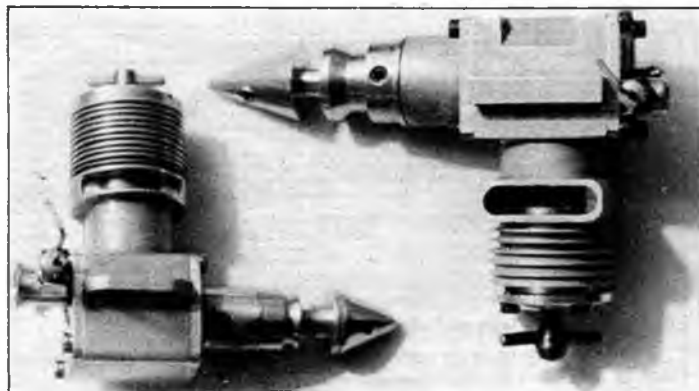
Fairly orthodox D.H. design, featuring un-fashionable rotary disc induction, with Schnuerle ports machined in a flanged cylinder liner, i.e. cylinder fins and crankcase are separate — not the most efficient cooling system. Perfectly constructed in every way, its performance seems to make a mockery of fashion. Current heat record holder.

#### Schnuerle Mk II — Don Haworth

The only unflown motor tested, its power qualifies it for inclusion without hesitation. A smaller and lighter engine than the Mk I, this engine has two distinctive features over the previous engine. Firstly the cylinder fins are now attached to the crankcase by the four cylinder bolts in the same manner as the new Cub, which should give better stability during a race. Secondly this engine uses a mylar reed valve, which has been developed on Don's Nelson with good results. A beautiful engine to look at with performance to match.

#### Concluding notes and remarks by J.W.

1. On the 20th March I flew my Schnuerle Cub for the first time. Performance improved throughout the day to take 2nd place in the final to Don Haworth's MkI. As suspected, the engine was overcooled in a cowling built for a MkII Cub. Inlet and outlet slots have now been reduced to 1/4 in. width and this will I think, stabilise the cooling. The cowl is a close fit (1/16 in.) to the fins, the outlet side of the cowling was actually increased in width to 7/16 in.



Above: Dave Lovgren holding back (with great effort) R. S. Melhuish's spare.

Left: pre-production side ported Schnuerle Oliver 'Cub.'

Right: successful Canadian National stunt model, Fred Tellier's Snowbird.

2. The Schnuerle Cub shown in the photograph above is a pre-production side exhaust version not the production rear exhaust version.

3. Would John Oliver (Engineering) consider changing his Cub crankcase design to accommodate interchangeable venturis? I know this would be a welcome change. A few letters to this effect might help — polite of course!

4. John Daly did produce a small batch of Webra Speedy conversion piston-liner-heads. At the moment I do not know if he will produce more.

5. Henry Nelson has more than once muttered something about making a 1.5cc.

6. I see D.E.S. engine going into production? Any comment Dave?

7. I think I would like to own the Haworth MkII — a real beauty.

## PAUL SMITH reports

### Canadian Nationals and Team Trials

The 1981 meeting was held, as is the custom in odd years, at the Centralia Air Park, an abandoned RCAF base in the province of Ontario. Located only 15 miles from the shore of Lake Huron, this is a really nice place to have a contest. One of the present occupants of the hangars is Trail Manufacturing, producer of the Quadra Engine. They hosted a continuous open house for the modellers and permitted needy contestants to use their machine shop facilities. As in most MAAC (Model Aeronautics Association of Canada) contests this Nats was a low-budget operation in which the contestants were expected to help in the judging. I prefer this to high-budget approach of AMA that results in triple the



to 75mph. Unfortunately, it also slowed down the number of entries from about 16 to six. The author was able to take first place without so much as breaking a prop, so maybe these rules have some merit for saving equipment if not making beginners winners.

Steve Kott of Michigan won the fast event with a Super Tigre G21/35.

In F2A and F2C the Canadians have a system of several team trials at different sites and times. They compare the scores against a 'world standard' as well as between the contestants. Only those who meet this standard are allowed on the team, even if an incomplete team results.

In F2A Sam Burke is the lone team member. His colourfully painted, Rossi-powered asymmetrical model did 143mph on one flight, possibly better at a later trial.

The Fairey F2C team had a nice model with balsa wood tank fuel-proofed with Hot Stuff. I saw one flight of 3:44, but there were still two full contests to go.

The F2D team will be one of the world's most experienced. All three members are previous World Champion competitors. Ross Melhuish and Cliff Gibson kept up their record of making every team in the history of the event.

Pierre Sigouin made it for the second time and his son Dan is the alternate for the second consecutive time. Ross and the Sigouins went all-Russian after their Poland trip. They had a complete arsenal of Russian planes with a couple of Russian motors and MVVS to fill out the fleet. I was allowed to fly one of these aircraft in a practice flight. It seemed to me that this design would be absolutely unbeatable in competition.

Cliff Gibson remained loyal to the crown and used his old reliable foam Jaguars with Cox Conquests.

The entry level was very low, maybe because of travel expenses from the west side of the country or because some of the lesser flyers conceded to the veteran team. The plan was to have three separate single-elim contests with three points for first, two for second, and one for third.

In the first contest, it became apparent that the 'Russian' team was having trouble needing their engines on their hard tanks. Also the wing was a problem as crash resistance was nil. Ross took first, Cliff Gibson (with the Jaguar) second, and Pierre third. Dan Sigouin had pitting trouble when he had to fly his normal pit man, his father.

Cliff Gibson grabbed a sure spot on the team with a first place in the second contest. Pierre moved up the second to tie Ross in points, and Dan Sigouin took third to stay in contention. Dan won this match by falling back on his modified Superstar.



The team was completed in the first match of the final contest when Pierre again beat his son, also mainly because of Dan's inability to find a crew that could run the tricky hard tank system. Cliff Gibson won a match against Ross to make himself the number one man on the team.

Before the contest Gibson was a bit intimidated by the spectacular performance of the Dorochenko models, but in the end he beat them all with tried and true basic equipment. Hopefully, by next year Ross and Pierre will have enough contest experience with their new equipment to use it more effectively.

# SHOP TALK

The latest in products for the modelling scene

## Bonda-Filler SL

This filler is ideal for aeromodelling due to its lightweight, quick setting and ability to be carved and sanded when set. The filler consists of a two part mix, requiring only four per cent of the hardener to be added. This amount is quite critical. Fortunately the hardener is red and we found only a smear was necessary, just enough to tint the filler after a thorough mixing. In a room temperature of about 70° the filler will set within ten minutes. The material is most suitable to make fairings and fill-ing quite large holes etc. Distributed by Bondaglass-Voss Ltd., Beckenham, Kent. Price £2.27 per 130 gram tin.

## One shot resin

Also available from Bondaglass is a new resin which required no hardener additive. The resin will cure when exposed to daylight or under the light of a 150w household bulb. It takes about 30 minutes to set in strong sunlight and around 120 minutes under a 150w bulb. The obvious advantage to this material is that curing time can be controlled by simply eliminating the light. As with most resins, when set it becomes translucent. Price £2.23 per 250 gram can, and £3.14 per 500 gram can.



## Badger 350-3 Airbrush

We are often questioned, "what type of airbrush is suitable for model use?" Although the Badger 350 airbrush has been on the market for some time it is well worth a mention. The complete set includes the airbrush, propellant can, ¼oz colour cup, ¾oz paint jar, hose and propellant can regulator valve.

Although classed as a needle-less type of airbrush, it does in fact have a fluid needle

assembly to control the amount of material. The airbrush works on the venturi principle i.e. air passed over the fluid needle assembly causing a partial vacuum. This allows atmospheric pressure to force the paint up into the flow of compressed air. Adjustment to the spray pattern can be made by pre-setting the position of the fluid needle. The fluid needles are supplied in three sizes to cope with various consistencies of material. A spray pattern of about ¼in. wide can be achieved, so with masking, quite fine detail is possible. Obviously there is a limit to the area that can be satisfactorily covered but this airbrush is generally ideal for most modelling requirements.

Price £28.75 available from Morris and Ingram (London) Ltd., 156 Stanley Green Road, Poole, Dorset BH15 3BE. Replacement air cans in three sizes at £1.30, £2.15 and £3.15.



## Astro 020

A rather neglected area of aeromodelling is the free flight electric powered model. The Astro 020 running off a 4.8v .550mAh vented Ni-Cad pack gives about the same power output as a Cox 020 Baby Bee. World War I aircraft are an obvious choice for



electric free flight as they usually require some ballast up front. The power unit can cope with models around 30in. span.

There is also a compatible speed reducer designed to fit onto the front of the motor. This enables larger propellers to be used for models with a large frontal area. Both items are distributed by Micro-Mold. Astro 020 motor £5.85, 020 mechanical Speed Reducer £10.95.



## Impala 120-A1 Glider

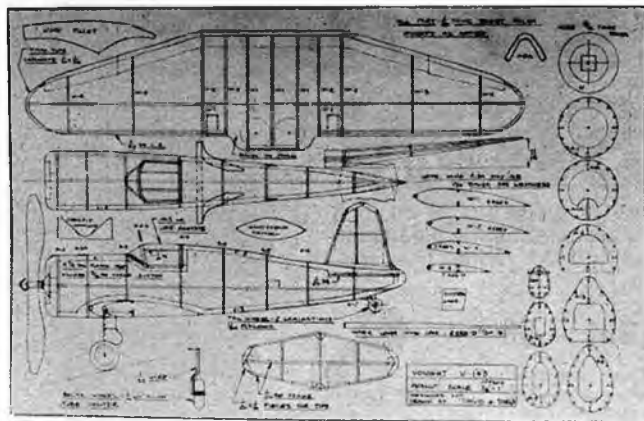
Sussex Model Centre, 10 Telville Gate, Worthing, are importing a new range of kits from Italy. The Impala shown here which has a span of 1220m is one of three glider models in the range. The fuselage has a pre-cut profile plywood front end which fits to a balsa boom. The wing is of conventional construction. All ribs are die-cut and pre-shaped leading and trailing edges are slotted to accept the ribs.

Included in the kit are covering tissue, a packet of tissue paste, lead shot ballast, decals and a good set of plans. Although in our sample kit the instructions were not in English, we found that the diagrams were self-explanatory. The straightforward construction makes this an ideal model for the beginner who wants a glider with a potentially high performance. Price £5.35. The other two gliders in the range are the 'Panda' 80 span 820mm — price £3.99 and the 'Koala' A1 class span 1220mm price £4.95.



## Graupner 'Funny' Glider

This all balsa built up construction glider has a span of 1200mm and is designed for two function radio control working rudder and elevator. All components of this Graupner kit are beautifully die cut. The fuselage is of all sheet construction, and all of the assembly is amply illustrated with stage by stage photographs on a large instruction sheet. The wing is spar-less, relying on the strong leading and trailing edge sections for strength. These are pre-shaped and slotted to accept the ribs. Tissue, tissue paste and a small tube of contact adhesive are included in the kit. The very straightforward construction and simple layout makes this a most suitable model for the sport flyer. Distributed by Ripmax. Price £17.75. A matching pylon for power assisted flight is available, price £3.80.



### Peanut Plans

A range of interesting peanut size plans has been sent to us by David Diels of PO Box 101, Woodville, Ohio 43469. All of the designs are based on scale three views, the only deviation on some being an enlarged tailplane area. Scale references are included on each plan and where possible scale markings and building instructions given on a separate sheet. Cut out parts are also given on a separate sheet, so the need to trace or cut up the plan is avoided. The average price is \$1.75 plus postage but there are discounts of 20 per cent if more than one plan is ordered and 25 per cent if over six plans are purchased.

The Vought V-143 illustrated here costs \$1.25 plus 25c for separate detail sheet. Other models in the range include: FW56 Stosser, Brewster SBN1, Northrop N-23, Boeing XF7B-1, Boeing P26, Fairey Spearfish, Northrop P-61A, Curtiss SB2C, Lockheed Model 9 'Orion' and others. A full price list is available from the above address, (please mention Aeromodeller when ordering).



### Taibi 'Power House'

Golden Era Kits, 3 Bell Street, Mander Centre, Wolverhampton, have produced a kit of Sal Taibi's famous 'Power House' design of 1938, which should appeal to all vintage fans. The design was published in various sizes, the kit being for the largest 84in. span version, originally intended for spark ignition engines of 0.60 to 0.99cu. in. capacity. A glow motor of 0.40 to 0.61cu. in. can be used as an alternative. Details and parts are included for fitting a rudder and elevator for 'radio assist' or you can build it as a free flight model if you wish.

Fuselage construction is almost entirely of 3/8in. square balsa, with hardwood engine bearers and ply inserts at stress points. Wings have four 1/4in. square spruce spars with a 3/8in. square balsa and 1 1/2in. x 1/2in. TE. Tailplane spar is 1/2in. x 1/4in. spruce, the LE is 1/4in. square balsa and the tips and TE are of 1/4in. sheet. Add to this some hefty wire bending to be done and you have model you can really get your teeth into. However, some of the hard work is done for you, the ribs are ready bandsawn to shape and all of the sheet parts are ready shaped.

The plans are in two sheets (rolled) and lightweight nylon covering is supplied in two colours. There is also an instruction booklet.

Available from Golden Era Kits or your model shop, price: £37.95.

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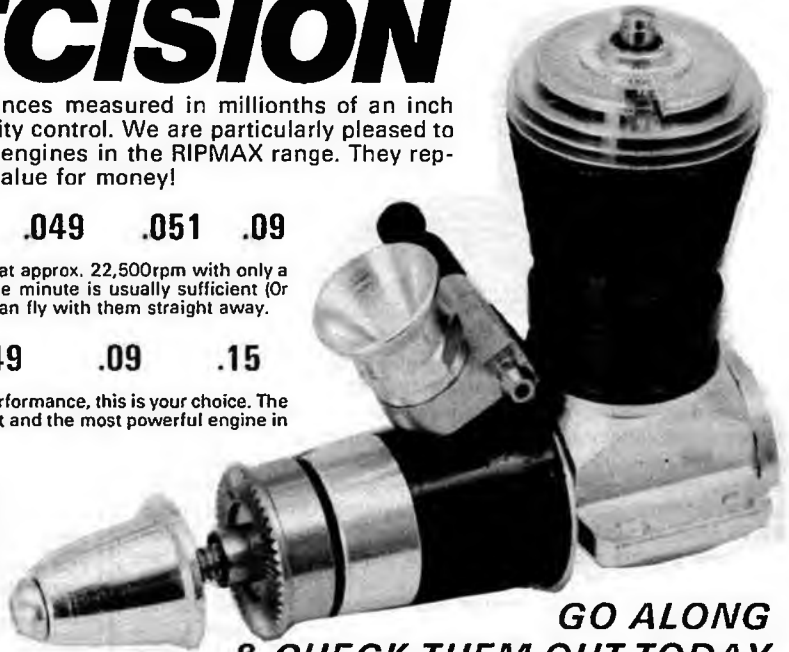
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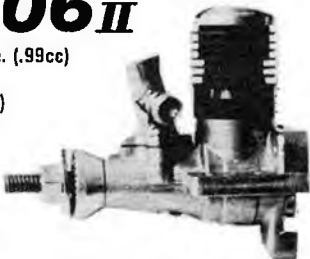


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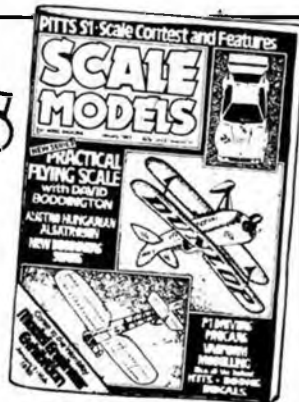


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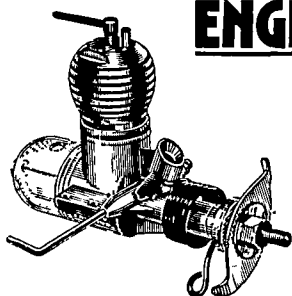
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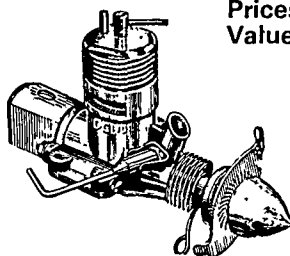
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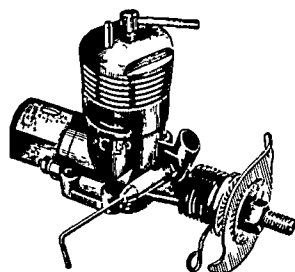
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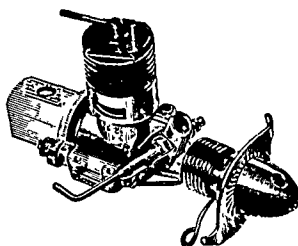
**DART** 0.5cc DIESEL **£11.25**



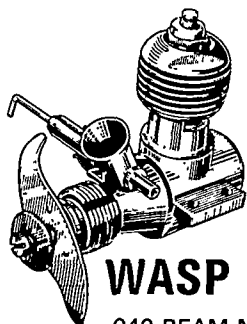
**MERLIN** 0.75cc DIESEL **£10.50**



**SPITFIRE** 1.0cc DIESEL **£11.62**

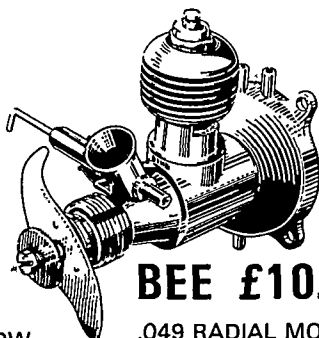


**SABRE** 1.5cc DIESEL **£11.82**



**WASP** **£8.20**

.049 BEAM MOUNT GLOW

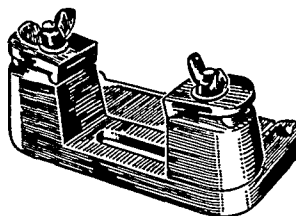


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