Aero Modeller

APRIL 1976
30p
U.S.A. & CANADA $1·50

INCORPORATING
MODEL AIRCRAFT

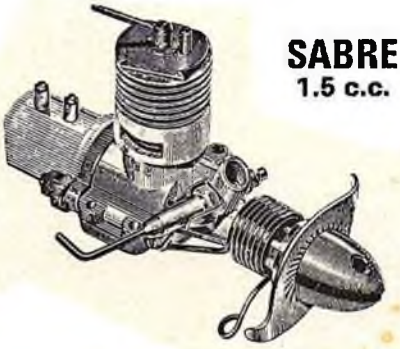
MAP **HOBBY MAGAZINE**

QUICKSTART

The Motors for the Modern Modeller!

Quality
Reliability
Economy

DART
.5 c.c.



SABRE
1.5 c.c.

WASP
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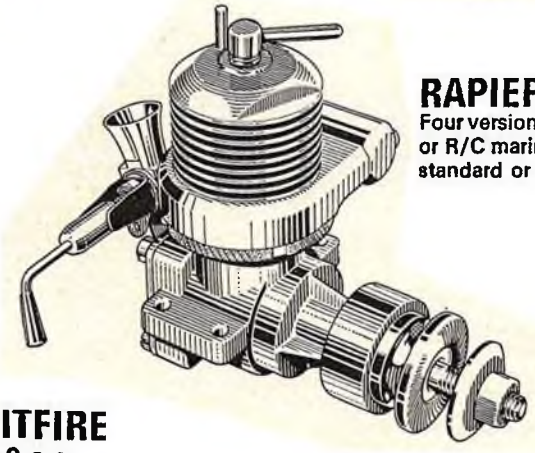
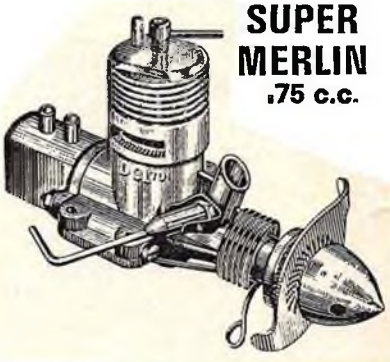
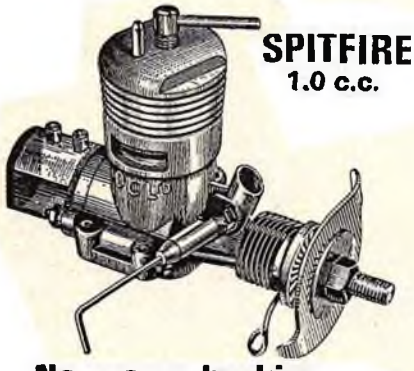


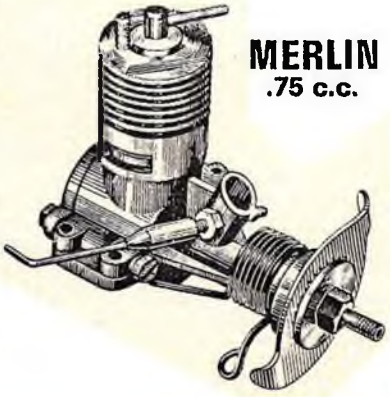
RAPIER 2.5 c.c.
Four versions – Aero standard or R/C marine, water-cooled standard or R/C.



SUPER MERLIN
.75 c.c.



SPITFIRE
1.0 c.c.



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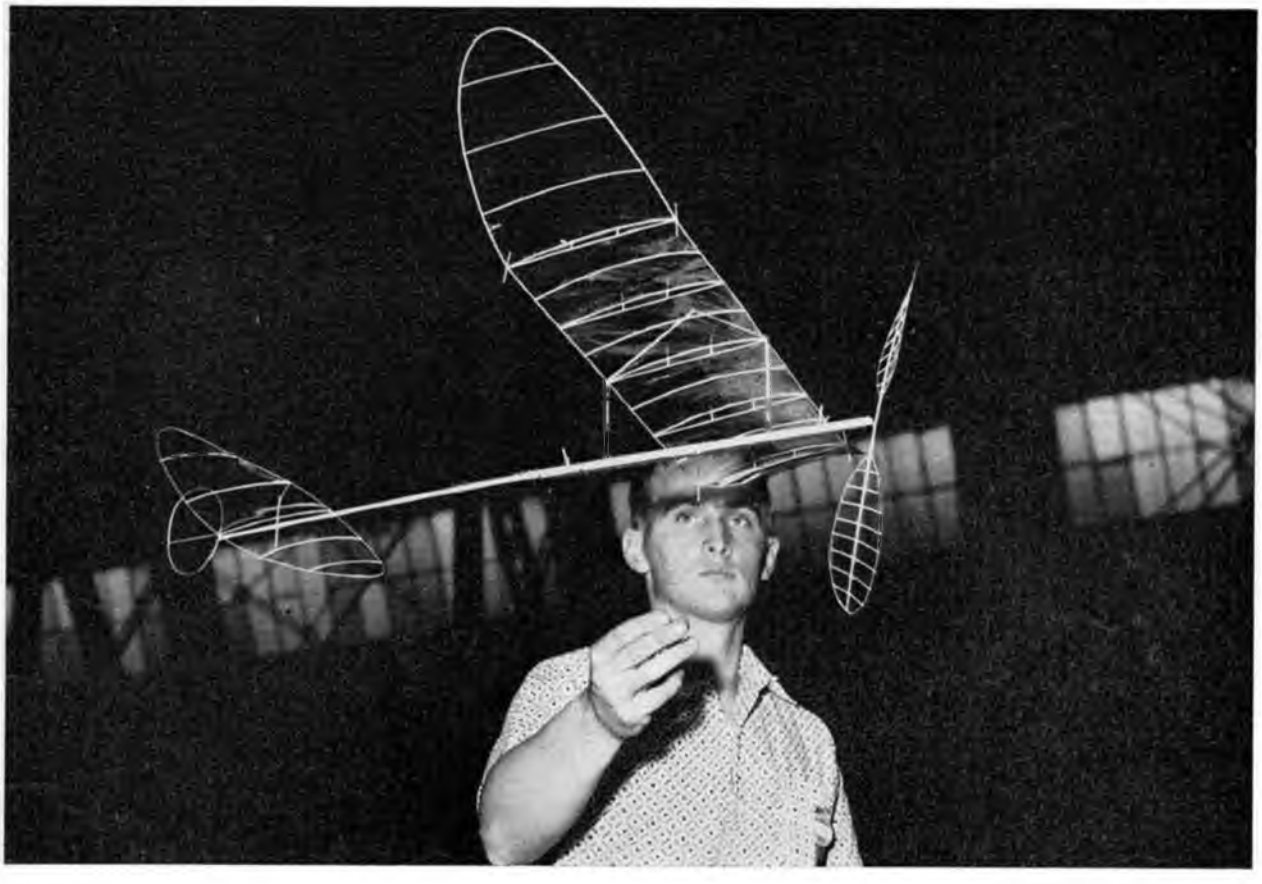

You need more than ordinary aeromodelling skills to succeed with this type of model. And a real appreciation of balsa quality and selection—and weight control. A little too heavy-handed with the balsa cement and gluing up the joints could almost double the airframe weight! (How about trying the new '10 second' anerobic adhesives? Only a tiny amount makes a good joint). Then there's the magic of making your own film covering by pouring a few drops of dope onto water, after adjusting the dope 'mix' to give the right spread and microfilm thickness.

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Aero Modeller

INCORPORATING
MODEL AIRCRAFT

April 1976 Volume XLI No. 483

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Editorial Director **D. J. LAIDLAW-DICKSON**
Managing Editor **R. G. MOULTON**
EDITOR **P. S. RICHARDSON**
Advertisement Manager **M. GRAY**

Comment

The 1976 British National Championships *are ON – and that's definite.* Or at least, as definite as can be at the present time. Venue will be RAF Elvington, near York, and the dates are 29th-31st May. Location is on the B1228, off A1079 York-Hull Road.

Those who know the airfield – especially free-flighters – may not be too pleased with the choice of venue; if the wind blows in the right direction then there will be 10,000 feet of runway for recovery, albeit with the hazards of control-line and radio control events en route. However, should the breeze not oblige, then the measly 1,200 feet width will be hard-put to contain wayward models. The penalties of a single runway Nats were pronounced clearly last year at Finningley.

So why did the SMAE select this airfield? They did not. They were obliged to accept it after fifteen previously chosen sites had been rejected for one reason or another. And why is it so difficult to find a venue for such an important event? Are modellers too noisy? Leave too much litter? No – it's just a sad economic fact that the price of hay has risen enormously in the last year, and many airfields have been put out to tender for farmers to harvest a hay crop. That reason alone 'cost' the Society many venues – including one which had been 'promised' until very recently. Add further problems like more demands being made for the use of airfields by other sporting bodies, government departments etc, and the SMAE's problem is put into better perspective.

on the cover

Nationals sunshine and the spirit of free-flight are typified by David Digby and his 'Digitalis' Wakefield from the North Surrey Aeromodellers photographed by Ron Moulton at one of the memorable Hullavington Championships.

next month

Plans and construction details of Richard Wilken's top combat model – the Blasta – including how to form leading edges and tips from polystyrene foam. More fascinating details of aeromodelling's history, a kit review, regular features and informative articles on all aspects of aeromodelling. Another great issue, the May *AeroModeller* will be on sale April 16th.

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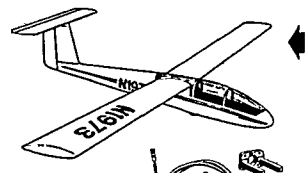

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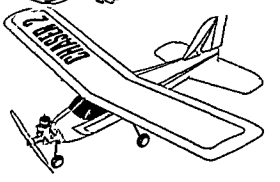

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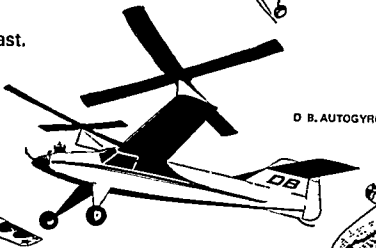
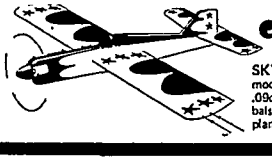


D B. AUTOGYRO



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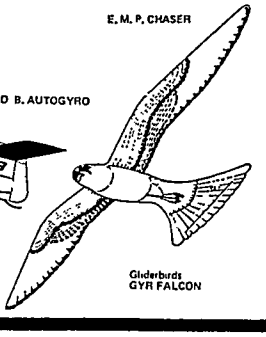

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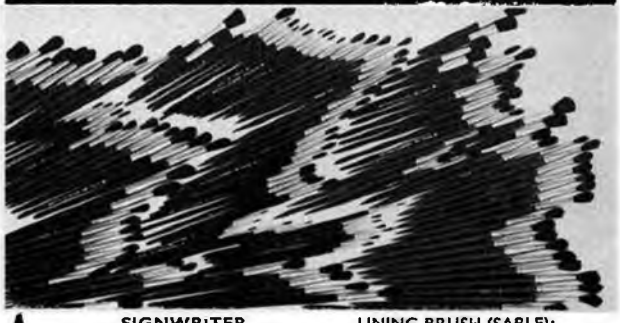

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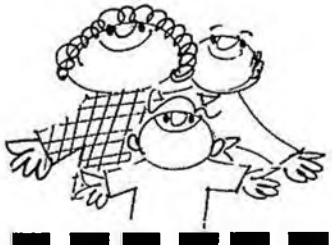

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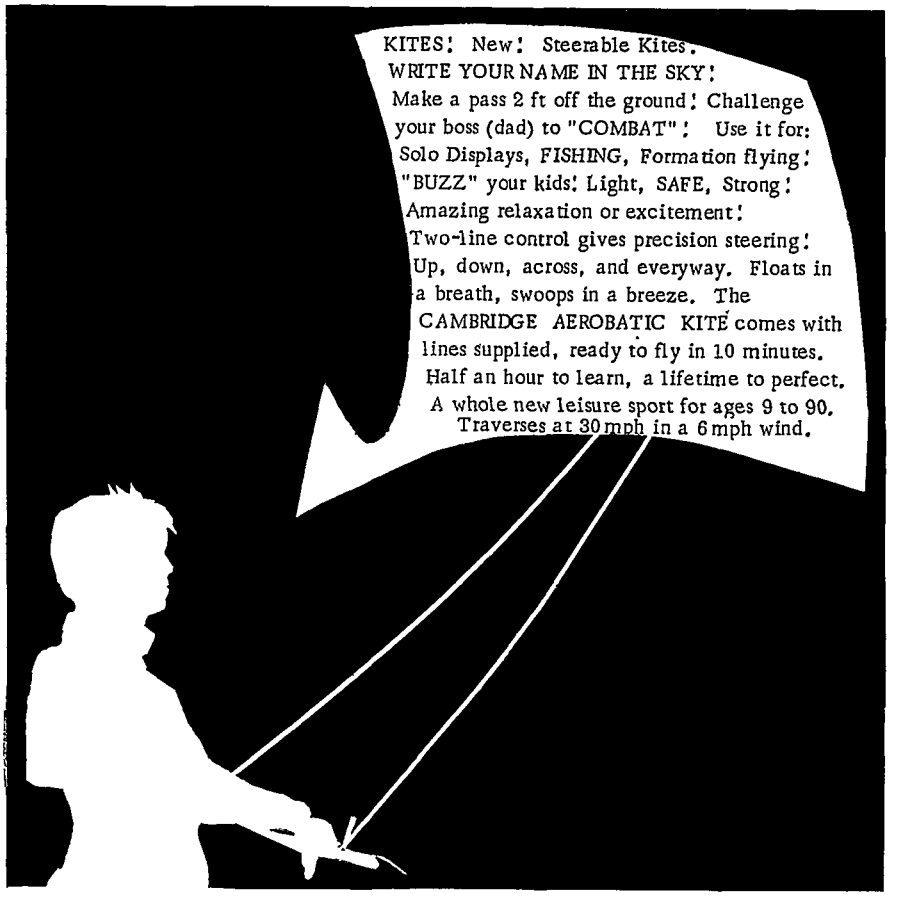

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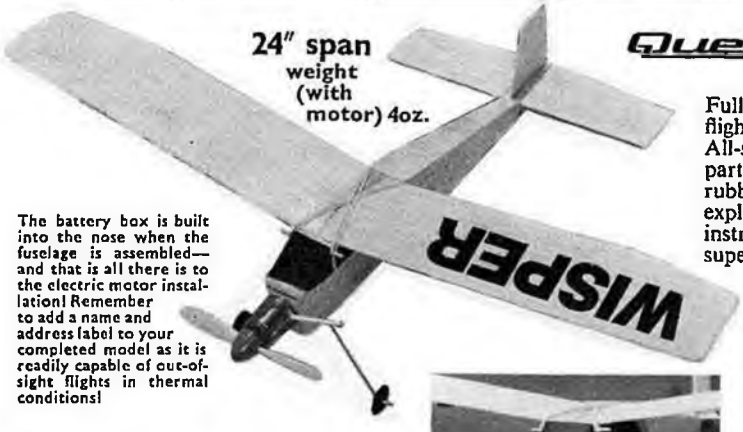

24" span
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The battery box is built into the nose when the fuselage is assembled—and that is all there is to the electric motor installation! Remember to add a name and address label to your completed model as it is readily capable of out-of-sight flights in thermal conditions!

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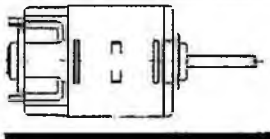

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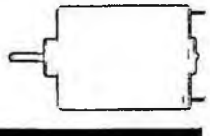

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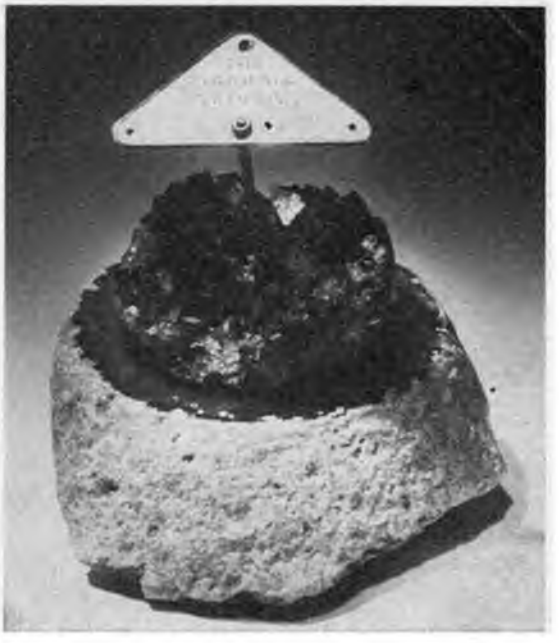

'FIREBALL' is the name given to this remarkable trophy donated by its creator Michael Beach for vintage control-line. Named after the famous Jim Walker model which started successful control-line, it is in itself a true 'Fireball' with a solid silver bell-crank and pivot projecting out of a round formed amethyst crystal mounted on a huge slice of polished Brazilian agate. First event for this valuable trophy is at our 'Summer Sunday' Kite & Vintage models day, Old Warden, 2nd May.

WILL 1976 BE *the* year for combat Internationals? Quite possibly, as we now have news of three more additions to the calendar. Firstly, there is *Combat Bavaria '76* to be held during the Easter Holiday on 17th/18th April. Pre-entry is not essential, but preferred, and if you require further details then write to Ralf Decker at Jm Klosterfeld 4, 8044 Unterschleissheim, West Germany. The venue is at Frotmaninger Heide, on the northern city border of Munich, and there should be good international participation. Trophies will be given to the top three competitors, while on the Saturday evening there will be free beer and steaks at the club room! Camping facilities are available. A well established, popular meeting that is particularly keen to attract British competitors.

Next is '*Le Grand Prix International de la ville de Namur*' scheduled for 1st and 2nd May at Namur, Belgium – where the first prize will be some 5000FB (approximately £60) plus a team prize. Entry fee is 50FB, and that includes free accommodation to those who give the organising club (Le Condor) fourteen days' notice. Alternatively, there are excellent camping facilities available adjacent to the flying site. Further details from W. Gossiaux, 10 Rue de la Colline 5000, Namur, Belgium.

Finally, our own Alfreton and District MAC are holding their *Combat '76* event from 23rd-26th July at the Derby Sports Stadium. This event, held for the first time last year, proved extremely popular with overseas competitors, thanks to the excellent venue, administration and prizes – so success should be assured on this occasion.

FIRST FLYING DAY of 1976 at the Shuttleworth Collection, Old Warden Aerodrome, near Biggleswade, Beds will be Bank Holiday Monday, 19th April. Among aircraft on display will be the Rothmans Aerobatic Team, Wallis Autogyro, the Royal Navy's last remaining Fairey Swordfish plus free-fall parachuting and the Shuttleworth Collection's own unique early aircraft. Gates open at 11am, with flying from 2.30pm. Entry prices remain unaltered at £3 per car, including all occupants. Coach passengers or pedestrians are admitted for 50p each, half price for children.

THE DOYEN among European model press editors has handed over the reins of his monthly magazines. He is of course, Maurice Bayet of Paris. For forty years he has produced *Modele Reduit d'Avion* but now both age and the pressing demands of commerce have obliged Maurice to sell out.

In his time, Maurice has pioneered many far reaching developments. He encouraged Gallic support for the Wakefield Cup, organised the first European control line contests, created Coupe d'Hiver and has always been a staunch supporter for free flight scale. Every issue had a full size plan, most so ingenious in the overlaps of lines that they required a rather special degree of intelligence to understand. For style consistency there never has been a magazine like it. Perhaps this in itself is one reason for the traditional support which MRA has enjoyed. Cover design for 1976 is almost the same as that for the earliest editions. Even under the stringent conditions of wartime occupation, MRA continued to appear and contests were run. Maurice can relate many strange reminiscences of model flying under the shadow of a Schmeiser. As publicist for the *Musee de l'Air* and adviser to SFA for air education, Maurice has contributed no small part to the recruitment of technicians in the French Air Industry. A member of the *Legion d'Honneur* he now retires gracefully, with his wife and able assistant editor, Lucette who has been his right-hand for many of those memorable years. We wish them every happiness in the rest that they so richly deserve.

New owner/editor of both MRA and the sister magazine *Modele Reduit de Bateau* is Pierre Rousselot of Lyon. Pierre is an active modeller who will maintain the long established standards admirably. The new address is 12 Rue Mulet, 69001 Lyon, whence five tons of back issues and aeromodelling memorabilia have departed from those historic rooms overlooking Place St Sulpice in Paris.

NATS CAMPING Manned continuously from 1700hrs Friday, 28th May to breakdown deadline at 2100hrs 31st May, the Nats camp site can be reached off the B1228 road York–Elvington. Lodging fees for adult individuals are £3 if pre-booked, £6 on site, and for family tents (parents and young children) £4 if pre-booked, or £8 for on-site arrivals. All on-site bookings will otherwise be at the individual rate of £6 per person. Penalty for camping without a permit will be £10 or ejection. Applications with pre-booking fees made to RAFMAA/SMAE NATS ACCOUNT must be sent to arrive not later than 22nd May at: Nats Organiser, 3 Bowrons Avenue, Wembley, Middx, HA0 4QS. Facilities will include a daily creche for youngsters, evening bar and music, film show and a bring and buy sale in aid of team travel funds.

WICHITA

by MIKE WOODHOUSE

a functional, highly competitive A/2 glider of 78in. wingspan, with a long and successful history.

OVER THE YEARS, *Wichita* has gone through quite a number of changes some retained, some rejected until it has reached the state of development presented here. Fellow modellers have accused me of not making changes to the design, and flying the same model for season after season. One reason for the fact that I do fly the same models year in, year out, is that unless I lose one they invariably last a long while.

I believe that it is quite unnecessary to build new models each season to do well, or to have masses of spares hidden in the box awaiting sacrifice. Nowadays I build about one A/2 a year, plus all necessary repairs and rebuilds of the others, so my stock is about 4-5 models at most. It is very difficult to keep more than this quantity of models in tip-top repair and trim, while it is also highly unlikely that someone will innovate an idea which provides a *significantly* better model, making existing aircraft redundant.

The *Wichita* has been developed to compete in all conditions that it is likely to be flown in. Having long since discovered that the three minute glider, for all practical purposes, does not exist, I have tried to achieve a more practical flight average. A 'good' *Wichita* should be capable of about 2:30 minutes in dead air. However, for reasons unknown, I have had perfectly 'normal' models capable of more or less! The 2:30 average is good enough as invariably a flight not in lift will be much less than the dead air time anyway, while at the other end of the scale, stability should be good enough to deal with both gales and gusts.

Besides having the ability to fly in the extremes of weather which our climate likes to inflict, the structure must be adequate. Being a lazy builder I have not gone too far in the complications of methods I use – the main areas of concern are conflicting in that the extremities of wing tip and tail must be light, but strong enough to stand tow loads. I now use wings with a tapering of spars in strength and weight to stand towing in a gale. Also, I prefer my wings not to bend excessively as this seems to lead to tow instability, which causes further bending and instability until the inevitable happens.

Now to talk specifically about the model instead of vague generalities! The original models were based upon the Ray Monks A/2s of the early sixties with added influence from Graham Freestone. A great number of copies, or near copies, have been produced by my friends in the Norwich Club which helps to cut down development time – between us we have produced versions with varying ranges of aspect ratio, sections and used most construction methods.

The version shown here is the best compromise I have flown to date. The total area of the model is about 10sq.in. under the maximum permitted to avoid processing problems. Tail area is standard at 75sq.in. leaving a balance for the wing of 440sq.in., with a 6in. chord, resulting in an aspect ratio of 12:1 which is a nice average figure. The section is basically that which I have used since the early version, with a slightly thicker trailing edge. It was originally derived from the section used by the Russian Sokolov in 1959 and has proved capable of a good glide with adequate stability. The tail has an undercambered section, and provided the tail is warp free and light it is satisfactory. I am not a great believer in 'fancy' tail sections. The moment arm is 4½ chords, and the fin is as small as practical; large fins seem to cause me problems. Directional stability is dependent on the washing out of the outboard wing tip by ⅛in., the rest of the wing is flat. This seems easier to set up rather than wash-in on the centre and tips washed out.

Construction is conventional for me – I will merely cover the odd points that could give rise to trouble. First the selection of timber for the wing structure to ensure adequate strength in the centres and light tips is most important. The wing is built over glass by the method described in an earlier article using epoxy as adhesive; normal techniques can be used but I prefer epoxy for better results. Keep the trailing edge blunt, this will help stiffness and prevent warps; 'knife edges' do not help performance at all. Cover the wing in heavy jap tissue and use plenty of thin dope to ensure structural stability and thoroughly weatherproof. The tail should be as light as possible, ¼oz. if you can do it. Again a blunt TE, with Jap tissue to finish.

Fuselage structure utilises a glass fibre rod as the main member. The rod is cut to length and notched to take the plywood keel and tow hook assembly. The area around the hook is filled with plastic padding to prevent the hook crushing the rod. The towhook is a $\frac{1}{16}$in. brass plate with the 14swg hook soldered on together with the 8BA nut for the adjusting screw. The hook is fitted in the slot and the $\frac{1}{8}$in. heel and $\frac{3}{16}$in. sheet sides added, joined to the rod, and all epoxied. The nose is shaped and the wing and tail mounts and fin added when dry. Now the whole model is assembled and lead cast into the front to balance. Cover the nose in glass fibre cloth to the wing leading edge and then coat the whole front area with glass fibre resin. Finish the nose with coloured dope after the whole has been rubbed down to a good smooth finish.

DO NOT hand launch to check the glide. Set the model up with $\frac{1}{8}$in. incidence under the tail trailing edge, and $\frac{3}{16}$in. rudder deflection for glide. Float the model up on a full line to 120 feet or so, then cast off gently with a 10 second D/T. Provided you have built the model and set it up as per the plan, this will work and it is a lot safer than throwing it about in long grass! Keep on the 10 second D/T until the tow has been sorted out, then get on with the glide checking.

Best of luck with the *Wichita*. I don't mind if you beat me with it, provided that you do not cross my line in doing so, and as long as you occasionally tow up-wind to prove to yourself how well it tows . . . as well as finding me lift!

No article on any design should finish without a few thoughts towards the future. There is a very fine line between introducing ideas that are improvements to the existing design, and those that lead down a blind and unprofitable alley. Bearing this in mind the future, as I see it, must include the introduction of a system of circle towing, for those days when the weather is good, is high on the list. Other features will probably be to reduce the weight of the wing tips and rear fuselage.

For those who require further details on either the history of the model or structural details more fully reproduced, I would refer you to the following issues of the *AeroModeller:* February 1968 *Wichita Story*. February 1974 *Laminated Structures*. February 1975 *Warps – How to avoid them*! May 1975 *A few ideas utilising a bandsaw*.

Also the writer is able to supply Jap tissue for covering purposes should the builder of the model require it – please send stamped addressed envelope to the writer's home address for details of prices etc: 12 Marston Lane, Eaton, Norwich NR4 6LZ.

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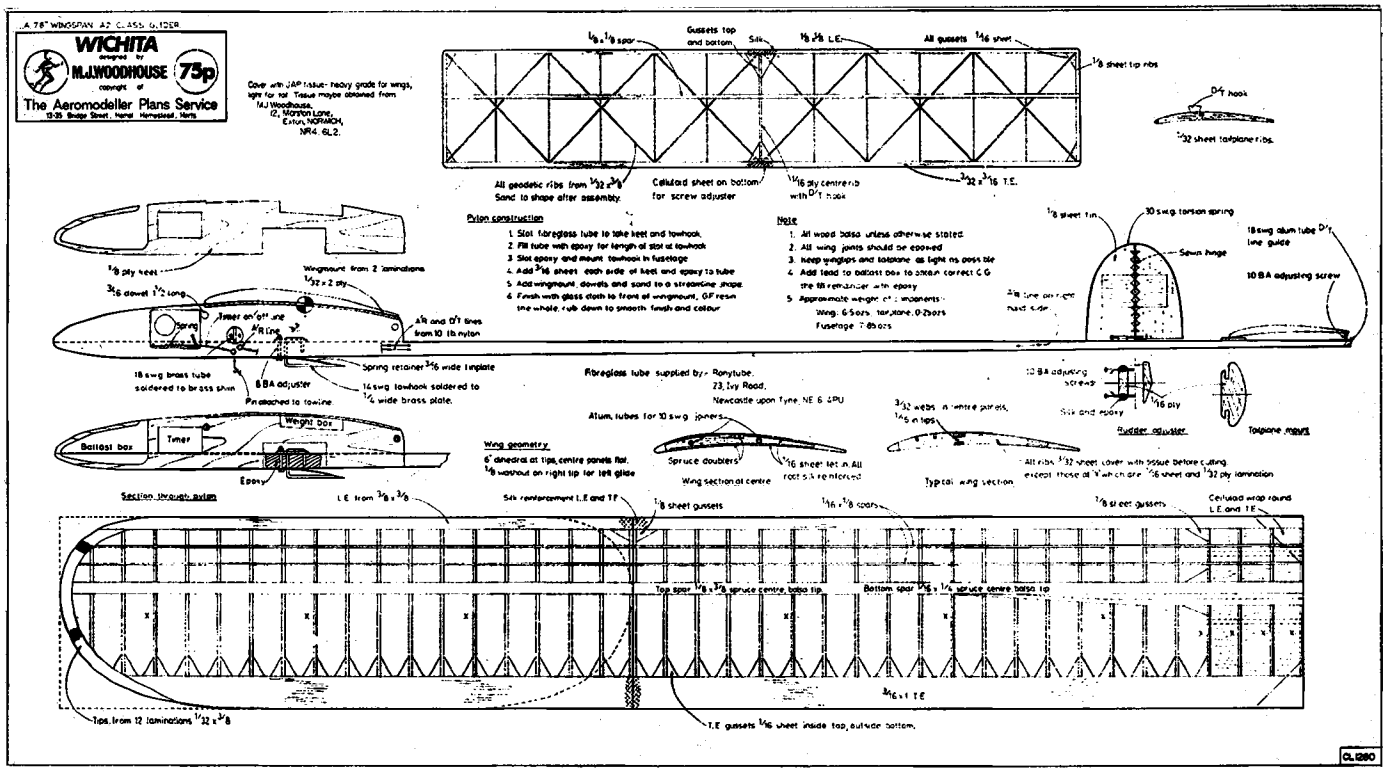
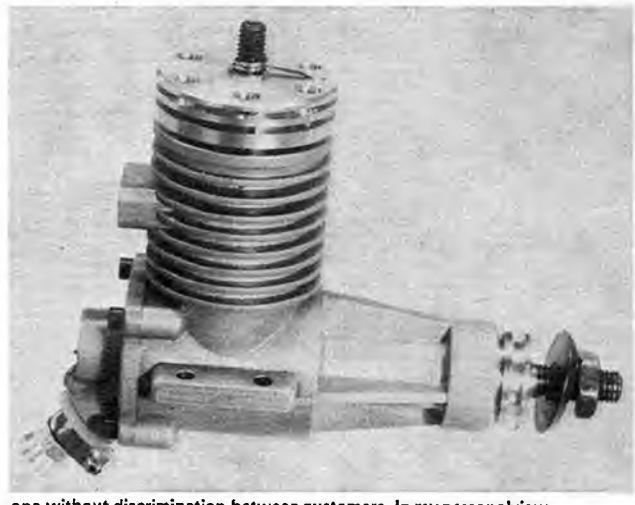


BETWEEN THE LINES

with Dave Clarkson



Latest diesel to hit the FAI team-race market, the Nelson 15D. Motor comes completely 'ready to race' with friction locked Allen headed comp. screw, Cox carburettor, small bore venturi etc. Machined light-weight team-race crutches are also available to suit this and other motors.

NEW TEAM RACE MOTOR – *the Nelson 15D*

IT IS A SIGNIFICANT event when a totally new motor manufacturer brings into production a completely new motor. It is even more significant for team race enthusiasts when that manufacturer is an experienced FAI team race competitor, having flown for his country at a World Championship – and the motor is a specifically designed diesel for team race. The last time this happened was when Paul Bugl introduced the Bugl 15D, and few will say that the Bugl is not a *really* good motor, and that its arrival had a profound effect – certainly a 'landmark' in team-race history.

This manufacturer, Henry Nelson of **Nelson Competition Engines** at 729 Valemont Drive, Verona, PA 15147, USA, states that this is a wholly serious, full-time venture for him, and that he has established two rules for the business. The first is that *everyone* pays the same as everyone else, and the second is that *all* customers are equal. He has established a delivery list and everyone, without exception, goes on that list in the order in which Henry receives deposits. He promises to make deliveries by the date stated or to promptly notify the customer of any delay. All enquiries will be answered if (from outside the USA) accompanied by an International Reply Coupon. Henry recognises that many previous entrants into the specialist motor accessory market have been better engineers than businessmen, and realises that he has a credibility problem because of this. He has specifically requested me to make clear his firm intentions as described here public, for it is his resolve to establish a high level of integrity in this venture, and make a truly competitive motor available to everyone who wants one without discrimination between customers. In my personal view, these stated intentions are more than welcome; they are absolutely necessary. I will be the first to shout if Henry lets us down!

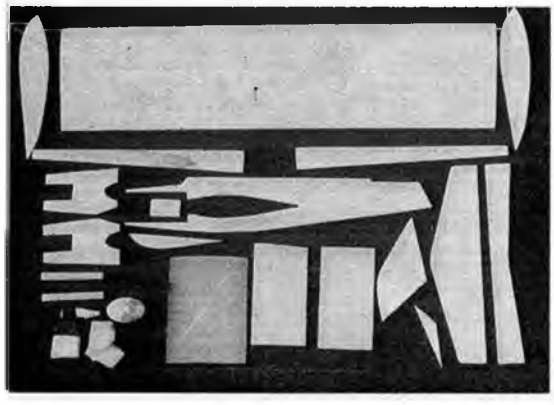
The motor itself, as the picture shows, has been developed from the K&B 15s, retaining the good parts but replacing the not so good (for this application) with improved parts. As possibly the most experienced K&B users in team-racing Worldwide, John (Daly) and I know that the K&B bottom end is about the strongest one around, and the backplate/induction system one of the simplest and most efficient. Wisely Henry has retained these, but has incorporated them into a totally new precision investment cast crankcase which now takes a revised design chrome plated liner plus a two part contra piston and machined head.

The porting system and top end construction have been developed over a one year period using machined bar-stock crankcases and the best design of case is duplicated in the production version.

Since in the USA there is very little in the way of FAI team race competition, no significant race pedigree exists for the Nelson 15D as yet. However the prototype and pre-production models have proved impressive enough for two of the teams selected to represent the USA at the '76 World Champs to have ordered production versions. Flight test results indicate an airspeed of 23·1 to 23·5 sec/10 laps for 39 laps, with arm out holding back; this by the selected US team members Dunkin/Wright. On a 3·2mm diameter venturi Don Jehlik's torque cradle has shown the motor to give 0·48bhp at 17,300rpm, and 0·50bhp at 19,300rpm.

The price has been set at $US 110.00 plus $US 5.00 for overseas postage and insurance. A deposit of $US 10.00 has been set to get a place on the delivery list (deposit deducted from final payment).

Combat flyer Dave Wiseman has started in the kitting business – below is his 'Smoothy' design for beginners, featuring a veneered foam wing (controls already installed) and robust profile fuselage, it should prove well suited to its task. Using 1·5–2cc engines and spanning 23ins. Available from some model shops – or from the manufacturers – Deco Models, 542/544a Claremont Road, Rusholme, Manchester M14 5WF. At right is Doug Harlow, a winner of aerobatics at Australian Nats.



Above – Australian Nationals FAI team race finalists were (l to r) Stu Thompson, Pete Roberts, Don Boughton, John Herron, Theo Georgiadis, Dennis Prior. At right are Mike Vella (left) and Ron Wilson with ST G20D team racer – set fastest FAI heat and Victorian record of 4:38 at Aussie Nats.

The motor is supplied in ready-to-race condition i.e. with insulated TD 049 venturi and needle valve assembly, plus Allen-key type compression screw fitted with an anti-backing off, wrapped wire type restraint. For those interested Henry is also selling machined aluminium motor crutches in two styles – long and short – both with bridged fronts at $US 7.00 each, for an extra $US 1.00 he will supply these already drilled and tapped for your motor. Deliveries of motors and crutches should commence in March.

THE 'TURTLE VII'

The *Turtle* team racer (*AeroModeller plan No. CL1209, price 85p*) is well-known internationally, and with the goodies available now from Paul Schippers in Holland is about the most complete package available to the FAI Team Race enthusiast. The accompanying sketch shows the changes to the design that have evolved since the plan was published and as you can see, the changes are confined to the flying surfaces. Hans Visser who has continued the *Turtle* developments shown here states that the changes have given about ½ sec/10 laps airspeed increase, plus improved handling qualities. Hans (one of the original *Turtle* development group) is well-known to many of us with his team-mate Eyp Buys as one of the most successful of the Dutch T/R group (I first flew against him at the incredibly windy 1972 Nats at Hullavington), and he is the only one of the better Dutch team who now uses this design as top line equipment, so he should know the design inside out. For those of you embarking on a *Turtle*, these latest developments drawn in the sketch below are definitely recommended.

1976 AUSTRALIAN NATIONALS

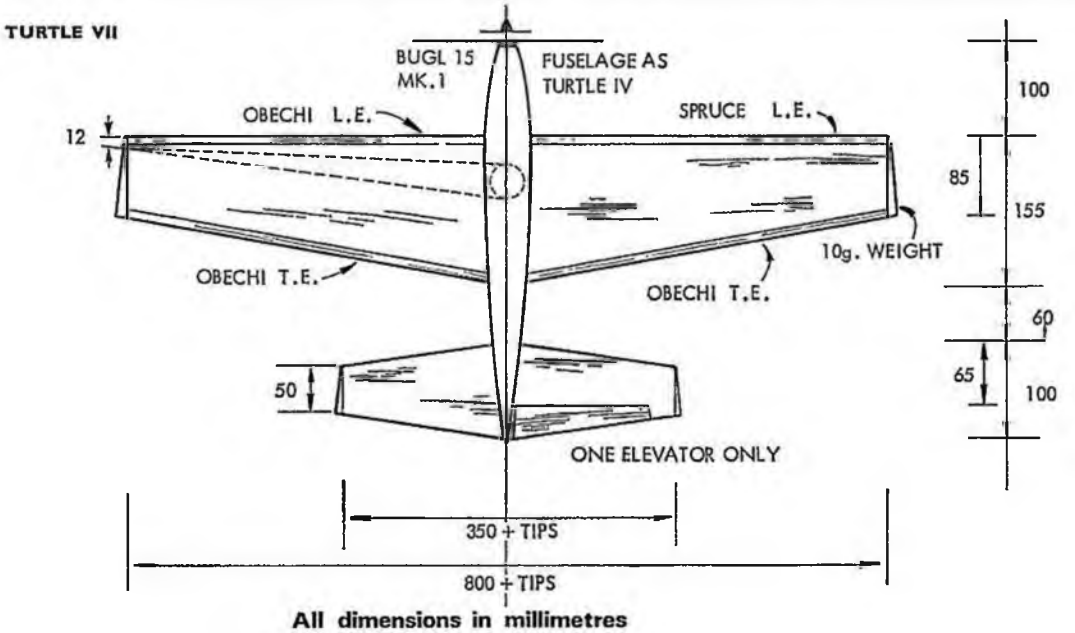
Held this year at Loxton, South Australia, over the Christmas holidays, the following information was supplied by Stu Thomson.

In **FAI team race** there were 19 entries, of whom 17 flew. Winners proved to be Herron/Broughton (10:33 final, 4:54.6 semi, 5:04 heat) using a Super Tigre G 15 RVD with G15 shaft and chrome liner. The model weighed 18oz, prop used being a Boughton 7 x 7in., while refuelling was carried out via a squeeze bottle.

Second place was filled by Pete Roberts and our correspondent Stu Thomson with a Rumpel-Rossi FI diesel in a Rumpel pan (tank from same source), resulting in a 17oz model, pressure re-fuelled. A Rossi carbon-fibre prop was used, and times proved to be a 10:56 final, 4:54 semi, 4:46 heat.

Third (12:37, 4:54.8 and 5:06) were Georgiadis/Prior also using a Rumpel Rossi FI diesel, but mounted in a Heaton/Ross pan. Their model weighed 16oz and was based on Sapalov/Onufrienko's racer. Pressure refuelling and shut off were employed, while a McCann 7 x 7½in. prop was used.

Fastest heat (4:38) went to Vella/Wilson using an 18oz model, Bartels Drazek prop, pressure refuelling and shut-off plus a Super Tigre G15D set up by Ron Wilson. Apparently the Rossi operators had a lot of cooling troubles – a typical Rossi problem – and also



All dimensions in millimetres

Travelling all the way to the NZ Nats from Brisbane, Australia was Bruce de Chastels who brought this FAI combat ship – unusual by local standards.

Newly released on the market, and seen for the first time in NZ was the HGK 15 motor used by Bruce de Chastels. None have yet been seen in the UK either.

the carbon-fibre props did not go well with the grass circles used; no less than six broke during the contest at pit-stops.

Twenty-six teams flew in the **Goodyear** event (flown to AMA rules), where engine popularity broke down as follows: 8 Super Tigre diesels, 7 Taipan glows, 4 Super Tigre glows, 3 Rossi glows and one each from MVVS, Cox and PAW. Obviously, the Rossi operators are far from sorted yet, as they did not figure in the results. Models were: *Cassutt* (6), *Argander Special* (5), *Buster* (4), *Miss San Bernadino* (3), *Pitts Special* (2) plus one each of *Bonzo, Owl Racer, Cosmic Wind, Shoestring* and *La Jollita.*

Results proved to be as follows:

		Final	*Motor*
1. Liddicut/Georgiadis	(Vic)	9:32.1	ST G15 F1
2. Dillon/Dillon	(Qld)	10:16.8	ST G15 F1
3. Turna/Adler	(WA)	128 rtd	ST G20/15D
4. Rowney/Benkesser	(WA)	40 rtd	ST G20/15D

All but one team used squeeze-bottle refuelling – and Stu reports that the general standard of models and team work was disappointingly low.

Stu also comments on the see-saw battle in 10cc **Speed** between Andy Kerr and Julius Reichardt both using ST 60 ABC motors with mini-pipes and both beating the previous record which had stood at 183mph. Andy Kerr's winning speed of just over 190mph is a top World class performance, especially considering that a grass circle was used. No one elsewhere has got near to the speeds attained by Andy (190·67mph) and Julius (187·89mph) using ST 60 ABC's – maybe their mini-pipes are really working for them. Lappages in 2·5cc **Rat** could have been higher in the Open Final if Vella/Wilson had not crashed near the end, and if Wilson/Kidd had not suffered a motor failure about halfway through.

Nonetheless Vella/Wilson won with 424 laps for the 20 minute final, followed by Herron/Boughton at 401.

These Nats were the selection trials for the team to represent Australia at the '76 World Champs in Holland. With Australian Government assistance for travelling expenses apparently being promised, a distinct possibility of live Australian participation exists particularly in classes F2A (Stunt) and F2C (team race). Stu Thompson informs me that all three top FAI Team Race teams intend to compete as well as Doug Harlow the top stunt man. 'Tubes of Forsters' all round at Utrecht lads?

NEW ZEALAND NATIONALS

You can win some of them some of the time, but not all of them all the time. How true this was for the '75/76 Nats. where it was cold, windy and wet.

Combat, the first on the programme, copped the lot. With the rain-delayed start and over 60 entries, flying continued until 9 pm. Most of the heats in the first round were won on ground time – the glow motors really suffered from bad restarts. Most models were based on the UK 'pre-feather duster' designs, mainly because as only one model per bout is allowed, a degree of ruggedness is essential. Australian visitor Bruce de Chastel was allowed two FAI models, but neither survived the first round. Bill Pepper (ex Tynemouth, UK) topped the lot with a *Hornet* styled model, Oliver powered, while in second place was Dave Bolton with a Veco 19 *Orcrist* variation.

Team Racing drew good entries this year with 20 in ½A, 24 FAI and 13 'B', actually flying. For the first time all team racing was flown to current FAI flying procedures – the pilots 'foot-out rule' caused a bit of confusion, but otherwise worked well.

½A (100 laps 5·6 miles) was very close in the top half-dozen, with times around the 5 minute mark. The final was taken by Gary Pool using a lightweight pod and boom design with an Oliver Cub swinging a cut-down Drazek 7 x 7½in. prop. The majority of flyers used an Oliver Cub and Bartels 6 x 7in. Tornado GF propeller combination. Most interest centred in the **FAI** class as it also doubled in being the final team selection Trials for the Trans-Tasman contest to be held in Australia later this year. Minimum qualifying time for the final was expected to be five minutes, but the cold wind and rain knocked that on the head. The 4:39.4 by Rod Brown and 5:7.0 by Ron Magill were very good under these conditions. The overall standard in this class has risen greatly in the last couple of years, with many doing 25 secs/10 laps and better.

The big disappointment was the absence of three Bugis, almost two years overdue in delivery. The only Bugi seen at the Nats is fast becoming obsolete due to the non-availability of spares. Converted glows are becoming quite fashionable with Rossi, K&B, and Taipans present.

Class B just had to be a cracker! Turner/Westland were practice flying at 120 mph, and Phil Staples is capable of a similar speed. Staples set the pace with a 6:35 until Turner clocked a 6:06.2. Third qualifier D. Robinson's 7:15 was rather mediocre by comparison.

The final resulted in a NZ record to Bruce Turner with 5:54.3. Motor was a rear exhaust Schneurle ported 29 made by Harvey

An experimental pod-and-boom team racer seen at the NZ Nationals: uses a diesel-converted Taipan 15 glow motor.

An FAI speed model flown at NZ Nationals, powered by a Westland 15 and fitted with an experimental mini pipe.

Winning entry in FAI team race by Rod Brown, using diesel-converted K & B. Heat time of 4:39.4 was very good in most unfavourable conditions.

Westland. Class B is starting to suffer in NZ due to the increasing popularity of FAI and the difficulty in obtaining motors. Maybe the introduction of motors like the Irvine and Westland 29 will help.

Speed maintained a good entry with FAI included to pick NZ Trans-tesman team. Performances have levelled off over the last few years, as no one really seems willing to outlay the hard cash and 'go for bust' – the exception being FAI, which funnily enough is not recognised as a NZ class. This event drew really close competition with a mixture of Rossi's and mini-piped Westland ·15's in 2nd and 4th place. No full piped Rossi's recorded a time.

Aerobatics suffered 25-30 mph winds, gusting up to 40 mph – not the most enjoyable conditions to compete under for a National title and place on the NZ team. Hard working Laurie Chrystall rose above Pete Wheeler this year to top spot. Having won himself a place in the F/C aerobatics team, Bruce Turner proved his versatility by taking third place in the NZ team.

	Heat	*Final*
¼A Team Race (20 flew)		
1. G. Pool	5:12.1	5:41
2. P. Staples	5:04.9	5:21.0
3. M. Stringer	5:06.9	99 laps
FAI Team Race (24 flew)		
1. F. Brown	4:39.4	9:55.3
2. W. Forbes	5:21.7	10:54.0
3. R. Magill	5:07.4	12:50.8
'B' Team Race (13 flew)		
1. B. Turner	6:06.2	5:54.3
2. P. Staples	6:35.0	6:35.0
3. D. Robinson	7:15.2	7:53.4

A couple of diesel-converted K & B 15's. The motor at bottom recorded fastest heat and final in FAI team race, using Boughton 7 x 7in. and Graham Howard's 'South African' glass fibre preparations.

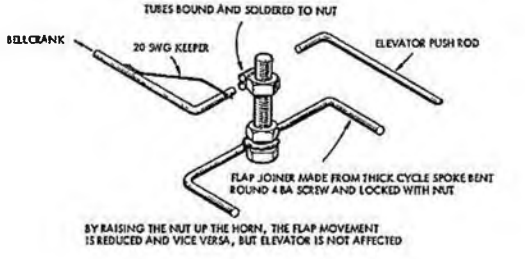
FAI Speed (8 entries)	
1. L. Chrystall	121·65mph
2. R. Brown	116·58mph
3. W. Manson	115·38mph
Class 1 Speed 0-2·5cc (8 flew)	
1. L. Chrystall	136·31mph
2. H. Westland	129·44mph
3. W. Manson	118·37mph
Class II 2·51-3·5cc	
1. L. Chrystall	119·95mph
2. P. Staples	116·08mph
3. W. Manson	97·82mph
Class III Speed 3·51-5cc (4 flew)	
1. P. Staples	128·52mph
2. L. Chrystall	126·71mph
3. W. Manson	100·52mph
Class IV & V 5·01-10cc plus Jet (4 flew)	
1. P. Staples	138·41mph
2. A. Pearce	124·09mph
3. L. Chrystall	123·24mph

THE AEROBATIC SCENE *by Glen Allison*

There has been an enthusiastic response to the introduction of CLAPA – the *Control Line Aerobatic Pilots Association* which has been formed to stimulate and integrate the stunt movement in England. Up to the middle of February, 24 flyers had joined including five juniors (anybody in full-time education). The first newsletter has been published which contains details of contest dates, and articles on trimming stunt models by Jim Mannall, and another on fuel tanks by Ted Fowler. An interesting point to arise from the questionnaire initially sent out to canvass flyers' opinions was that there should be a register of judges. The SMAE already has a small one and if you would like to be on the register as a stunt judge then write to either Bob Horwood, SMAE C/L Sub Committee Chairman, 145 Downend Road, Horfield, Bristol, or Jim Mannall, 27 Kestral Road, Bedford. Any other enquiries regarding CLAPA to Jim also please.

At the moment the first stunt competition of the season will be at Henlow, Beds, on 4th April, which is being run under the St Albans club banner by Ted Fowler. For full details and map send SAE to him at 38 The Groveside, Henlow, Beds. It should be interesting to see what new models appear after the winter's hibernation.

The accompanying sketch shows an adjustable flap horn designed by Jim Mannall whereby the flap/elevator ratio can be altered to aid trimming. It has the advantage that the bell crank to elevator ratio does not vary.



FLYING SCALE COLUMN

by Eric Coates

Andrew Callaghan brought this superbly built and finished Rearwin Speedster to the Catford Indoor meeting, but did not enter it in the contest.

INDOOR FLYING scale competitions are becoming quite popular now all over the country during the 'closed' season, very often being combined indoor meetings in school halls and gymnasiums, sharing the air time with other indoor duration classes. Typical of such events are those held by the NW Area at various Lancastrian venues in the winter months. Peanut is usually the most popular scale class, but I am informed by Mike Reeves that Keyhole – a type of miniature Class 2 – is preferred in Northern climes.

With the advent of modern Sports Centres mushrooming in many urban areas, a whole new range of quite large flying halls are becoming available. Unfortunately, not being under the benevolent care of the armed forces, the hiring of such halls is not cheap, so flyers and competitors are faced with unaccustomed high entry charges for the privilege of flying. This is the only way in which the organisers can pay the hefty hiring charges.

Catford indoor site

On the evening of 17th January, I attended such a meeting at the Sports Centre in Catford, South London, where the hall measures 120×110×30 feet– large by any standards, except Cardington. Only 'Peanut' was featured, which attracted 17 entries, including most of the Cardington regulars. I entered my old and tatty *Andreason* BA4 purely for the fun of it, and also Bill Hannan's now venerable *Farman Moustique*. The competition was dominated by Laurie Barr and Butch Hadland flying extremely well detailed low aspect ratio 'Ajax' type American homebuilds i.e. a pair of *Lacey M10's* and the winning model, a *Fike Modele*. This must be *the* ultimate in low aspect ratio machines – the original measuring 20ft span, with a chord of 6ft 8in, giving an aspect ratio of just 3:1.

The competition was organised by Alan Callaghan and prizes were awarded by local modellers and traders. As well as overall prize winner, Laurie Barr also collected the best duration award, while the prize for the best static score went to Dave Banks, who flew a superb *Bristol Scout*.

Many competitors, used to the limitless (well almost!) height of Cardington, found the 30ft ceiling restrictive. I found it necessary to use downthrust and lighter motors to prevent banging the top too often, which cut the flight scores considerably. Many were heard to be muttering unkind things about the present Peanut rules, which are channelling all design thoughts into low aspect ratio homebuilts. Unless something is done about the 13in maximum span rule, without any restriction on area, it is just going to develop into a specialised mini low aspect ratio 'Ajax' comp for rubber duration fiends.

RAF Museum

I visited the RAF Museum at Hendon again recently, the prime reason being to see the German Aviation exhibition in the newly opened Dermot Boyle Wing. I had not visited the Museum since I reviewed it in this Column just after it opened, but very little has changed in the main hall in the intervening years – everything looks just as clinically clean as it did in 1972.

On entering the German exhibition (for which a charge of 20p is made) the first thing which strikes one is the dramatic lighting used to show off the exhibits. There are two exhibition rooms; the first devoted to WWI and the second to WWII with a connecting corridor, the walls of which are covered with photos of inter-war German aeroplanes. This is an era which is not well documented, aeronautically, and one which I personally find fascinating. In the late 20's and early 30's the clandestine build up and training of the Luftwaffe, by its very nature, shunned publicity.

The WWI gallery is dominated by the ex-Nash collec-

Typical of the current crop of low-aspect ratio Peanuts is the Lacey M10 – this being Butch Hadland's model which placed third overall at Catford.

Another machine seen but not entered at Catford's Sports Centre was Andrew Moorhouse's Vickers Vildebeste. Rather unusual subject, but very suitable for rubber power.

tion Fokker DVII, undoubtedly the best German fighter of that war. The machine is beautifully restored and immaculately (if inaccurately) painted all red with a white nose. Although the lighting of this hall is subdued, the D7 is highlighted making photography possible if using very fast film and large apertures. The usual RAF Museum ban on flash applies of course.

There are many photos of German aviation covering the period from the beginning of the century to 1918 plus a continuously running slide show. Most useful exhibit, from a modelling point of view, are portions of lozenge camouflage printed fabric and genuine fragments of Richthofen's Red Triplane – quite a dark red, but it may have darkened over the years.

The WWII gallery's principal exhibit is a Bf 109E 4, in a much more authentic colour scheme than the DVII, surrounded by a variety of armament of the period. Also included is the DB801D engine and cowling of Fw190A/Ju88 type and many more photographs.

A representative collection of 1/72nd scale models of aircraft used in both wars are featured in both galleries. These are to a much higher standard than the majority in the main exhibition galleries, which I criticised in my original review. Outside the Museum the visitor can see and more easily photograph a Ju87, Me410 A-1, Me262a, V-1 and V-2.

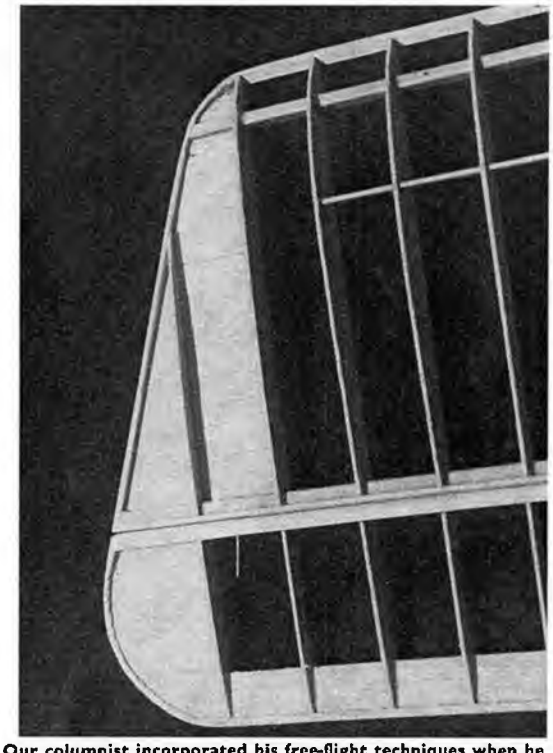
The exhibition is well worth the visit and I can recommend it to all aviation historians. For those who want more details, see *Scale Models* February '76.

Wing construction for biplanes

Continuing my update on constructional methods this month I shall deal with the wing construction of my Martinsyde *Elephant*.

With a thin sectioned wing, as used in most machines of the First World War era, without doubt a solid trailing edge is by far the strongest. It is, however, rather unscalelike by mid 1970 standards. All the bipes I have built to date have fe. tured solid TE's, usually on a F/F machine in the 40-50in span bracket, of $\frac{1}{2}$ x $\frac{1}{8}$in section. Having observed various modellers, in recent years, trying to achieve more realistic small section TE's I decided to try something new on my *Elephant;* built in 1974/75. As can be seen from the accompanying photographs and sketch this is really an extension of my well known sandwich construction I use for tail surfaces and wing tips. In essence one extends the wing tip from the leading edge through to the wing root.

The 1/32in. edge grain balsa sandwich, capped top and bottom with $\frac{1}{8}$in.sq. sanded to an overall $\frac{1}{8}$in. half round, certainly produces a lightweight scale-like and tremendously strong wing tip – I cannot remember whan I last had a wing tip collapse in a prang. One occasionally suffers local damage, due to striking a stone or other hard objects, but the rest of the tip usually remains stable and one can thus continue flying, making a repair later. The *Elephant's* trailing edge is 1/32 x $\frac{3}{4}$in. with a piece of very hard $\frac{1}{8}$in. square butted centrally behind it, and this is sanded down to a wedge section. When covered and painted, the whole looked very realistic, but it must be pointed out that it is not as 'stable' as the solid TE, and warps are likely to appear, especially after a hot summer. Close scrutiny of photos, taken in the First War, often reveal similar warps occurring on machines in service; so



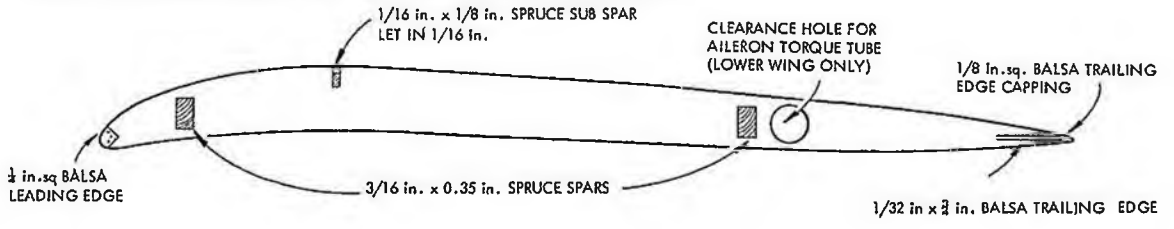
Our columnist incorporated his free-flight techniques when he built this R/C Martinsyde Elephant. Photograph of the wing tip reveals the sheet core for the tips (the tip bow material is glued top and bottom so that a strong warp free tip results with a true-to-scale thin section)while the trailing edge employed is as described in the text – and drawn below.

perhaps this is quite realistic. If you don't believe me go and look at the TE of the RAF Museum's *Tiger Moth*! Of course this form of TE construction has virtually no bending strength, but this is of no importance as the flying and landing wires should be doing 80 per cent of the work on a large machine such as this. The TE's sole purpose is to keep the ribs apart at the back.

On the original *Elephant*, all four wing panels were identical, each carrying an aileron. Full size practice, on four aileron biplanes, is to link the top horns of the upper ailerons together, via a balance wire running over pulleys, which connect the upper and lower ailerons together by further wires and then connect the lower horns of the lower ailerons with a similar wire to the top pair; 'tying' it to the bottom of the joystick en route. In this manner all lateral control loads are imported to the ailerons via wires in tension. I know purists who have waggled their ailerons in this manner, substituting the aileron servo for the bottom of the joystick, but I didn't fancy this as it is difficult to maintain, prone to high friction loads and not very 'bendable' in a prang. I, therefore, transmitted the lateral control to the lower ailerons using torque tubes, transferring the loads to the upper ailerons via 16swg push-pull

continued overleaf

MARTINSYDE ELEPHANT WING SECTION (drawn half actual size)



Peter Cock's KAN-DOO revisited

IN THE DECEMBER issue we mentioned that Michael Beach was keen to promote interest in vintage control-line models, sufficiently keen in fact to make a special trophy to encourage would-be builders. The response from readers was most favourable, so Old Warden near Biggleswade, Bedfordshire will be the place for old time enthusiasts to head for on May 2nd 1976.

The meeting will be strictly informal – it is intended to be a fly-for-fun day out, not a highly competitive event, and the recipient of the trophy will be the person who the group of judges consider most closely abides by the spirit of the era and produces the best reproduction.

Tentative rules are simply:

(a) The design most have been published, or kitted, prior to January 1950, and fliers may be asked to produce proof this fact.

(b) Model may use any engine of any age, but the marking will favour the most original reproductions.

(c) One qualifying flight must be made to demonstrate that the model can reproduce, to some extent, the performance of the original. However, marking will favour care in construction and original reproduction rather than flying ability.

* * *

To help further interest in this 'revival', plans are drawn opposite for the winner of the 1948 Gold Trophy – Peter Cock's famous *Kan-Doo* our drawing being based on that published in the 1949 *Model Planes Annual*. The original's ED Comp. Special turned a 9 x 8in *Tekni-Flo* propeller at 8,000 rpm static – and had survived some 800 hours running without any replacements. Although the designer recommended that the weight should be kept down to 11-14 ounces, a 16 ounce *Kan-Doo* was capable of the following manoeuvres:

Vertical climb and dive.
Vertical wing overs.
High-level flying (wires over 45).
Five consecutive loops (from normal flight, upwards).
Five consecutive outside loops (from normal flight downwards).
Five consecutive loops (from inverted flight, downwards).
Five consecutive outside loops (from inverted flight, upwards).
Inside and outside square loops.
Inverted flying.
Consecutive horizontal figure eights.
Vertical figure eights.
Consecutive overhead figure eights.
Vertical figure 'S'.
'Spectacles' and other manoeuvres embodying combinations of the above.

Flying scale column

continued from previous page

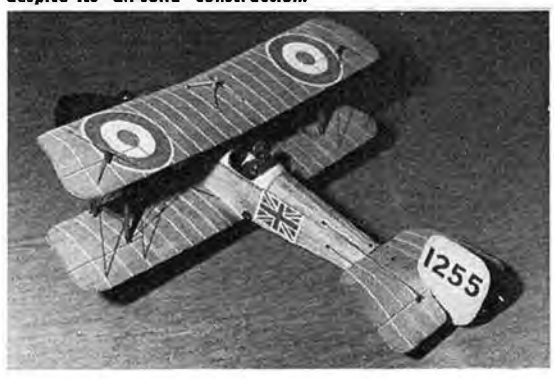
rods – which do not look out of scale. I was a bit concerned if they would bow under high loading. Maybe they do, I haven't had the guts to do a roll twenty feet up in order to observe them. There is certainly plenty of aileron power available, so I am not bothered.

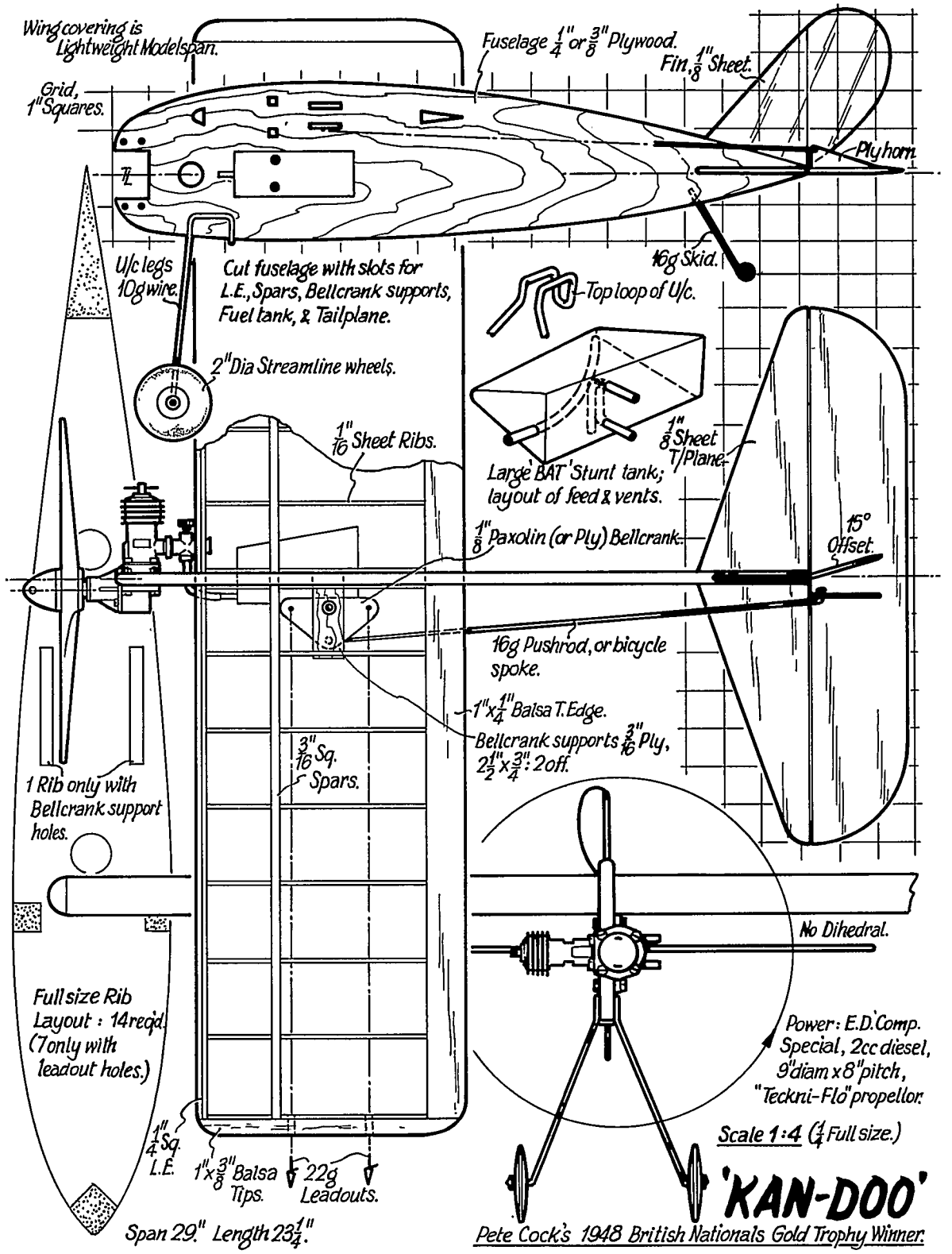
The torque tubes are $\frac{5}{16}$ in. o/d light alloy tubes chemically etched to a few 'thou' thick except for about the last 1in. which protrudes into the fuselage. This end is slotted to engage 16swg wire on a stub shaft in the fuselage connected to the aileron servo. The stub shafts and the torque tubes run in Tufnol bearings, epoxied to the bottom of the fuselage and end ribs respectively. The lower aileron spar is epoxied to the torque tube and a single outbound plastic hinge is used.

I must admit a little trepidation in using this method, especially cutting $\frac{3}{8}$in. clearance holes in ribs only $\frac{1}{2}$in. deep, aft of the rear spar, but it all worked extremely well and gives very positive control, with the ability to remove a completely rigged pair of wings from the fuselage, for transport, without too much difficulty. What is more it survived 'the Great Elephant prang', as a system, practically unscathed.

The rest of the wing construction is normal for this era of machine. The section is a little unusual – it droops a bit at the LE and I described the method of rigging in the January issue of this magazine.

What can only be described as a 'typical McDonough' – Ken's superb all-sheet Bristol Scout Peanut scale design. Very light despite its 'all-solid' construction.





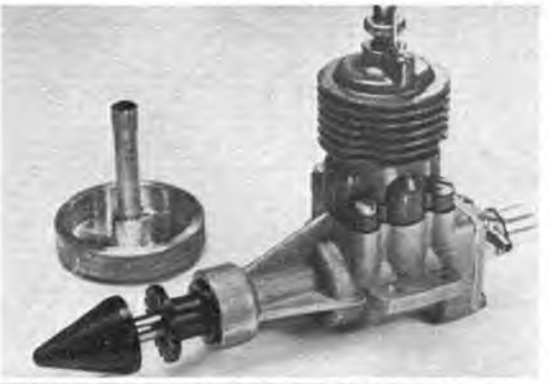
'KAN-DOO'

Pete Cock's 1948 British Nationals Gold Trophy Winner.

AAP LLOYD '76

Latest Engine News

by Peter Chinn



At top right is the Soviet built KMD 2·5cc diesel, which is of unusual design. Key at left is for adjusting compression. The new Cox Conquest 15 (seen at right) is a radical departure from the traditional Cox design. Could well be a strong contender in the 2·5cc horsepower stakes.

Cox 'Conquest' 15

For something like 15 years, the Cox 'Tee-Dee' ·09 and 'Tee-Dee' ·049/·051 engines have been the most powerful motors available in the 1·5cc and ·8cc classes. Back in the early 'Sixties, Cox also made a 2·5cc contest motor, the 'Tee-Dee' 15, subsequently developed into the '15 Special' and '15 Special Mk.II', which enjoyed some success in the FAI free-flight power class until outpaced by the Super-Tigre G15 which, itself, was eventually ousted from first place by the all-conquering Rossi 15.

Now, after the best part of ten years without a competitive motor in the 2·5cc contest class, Cox are re-entering this field with a totally new engine, the Cox 'Conquest' 15.

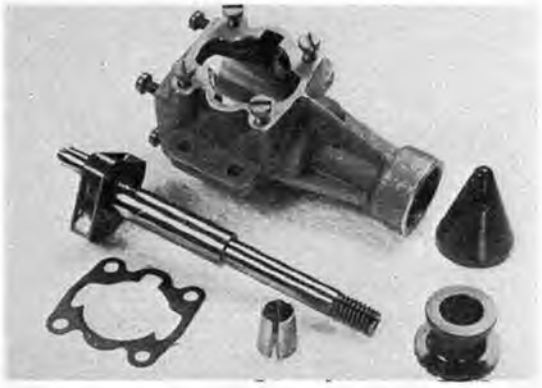
This new motor breaks completely with traditional Cox design that has been part of the model engine scene for most of the past 25 years. It has, for example, a die cast crankcase instead of one machined from extruded aluminium bar and its crankshaft runs in ball bearings instead of directly in the case material. It has a finned aluminium cylinder jacket with hardened liner instead of a machined one-piece unhardened steel cylinder with integral fins and it uses Schnuerle type porting with rear exhaust.

KMD induction unit has drum type rotary valve and a multi jet carburettor.

At the time of writing, the new Cox 15 has not yet reached retailers' shelves, but Dave Goodwin of Sheffield has managed to acquire one of the first examples released from the factory This might well be the *only* one in the UK at present and we are indebted to Dave for sending it along for a look-see.

It is very clear that in the design and construction of this motor, Cox were influenced by the Rossi and were not oblivious, either, to the existence of the Australian Taipan rear-exhaust 2·5cc engine (see *Aero-Modeller* Engine Test article, August 1975 issue).

For example, although its external styling may hide the fact, the design of the crankcase and jacket is very similar to that of the Taipan. As on the Taipan, the jacket separates from the main casting just above the crankcase thereby simplifying casting of the three transfer channels, the 18mm o.d. of the cylinder liner being used to align the two parts. Four long screws pass through the jacket from the cylinder head to tie the complete cylinder assembly to the crankcase. The piston and conrod assembly are fairly conventional. The lightweight



KMD crankcase and crankshaft assembly. Shaft is mounted in two ball bearings.

KMD features one-piece diecast alloy cylinder jacket, encasing Schneurle ported liner.

lapped cast-iron flat-crowned piston has a thin skirt and small bosses and is coupled to a forged aluminium connecting-rod by a hollow gudgeon-pin retained by wire circlips.

The crankshaft has a slightly bigger main journal (11mm o.d.) than the Rossi (10·5mm) or Taipan (10mm). As on the Rossi (but not the latest Taipan) the shaft is of the internally counterbalanced type. It has a combined prop-driver/spinner-backplate mounted on the front end with a split taper collet. The machined aluminium spinner and steel nose cone are much the same as on the Rossi, except that the spinner shell is not dovetailed into the spinner backplate. A departure from conventional practice is the gas passage through the shaft which, instead of being parallel, is divergent: 6mm i.d. at the forward end of the long rectangular valve port, opening up to 8mm at the exit.

The cylinder head design is much the same as the Rossi's, consisting of a drop-in glowhead insert secured by a separate machined ring forming the outer part of the head. The glowhead has a trumpet shaped combustion chamber similar to that of the Rossi (itself inspired by the original Cox Tee-Dee shape) but has a slightly smaller o.d. It could possibly be used as a (less expensive?) alternative to the Rossi glowhead, but the Rossi glowhead will not fit the Cox.

The standard carburettor assembly is similar to the Rossi's which, however, was based on a Cox design anyway. It consists of a machined venturi intake having six peripheral jets fed from a tangent mounted needle-valve assembly. The venturi has a ¼in. (6·35mm) throat, giving an effective choke area of just under 32sq.mm or 12 per cent larger than the standard 6mm Rossi venturi. The venturi is fitted into a large i.d. intake boss which feeds a long narrow induction port offset in the direction of rotation for a tangential gas flow.

One minor point on which the Cox differs from both the Rossi and the Taipan is its use of a screw-in crankcase backplate and this is unorthodox in that, rather than a paper gasket, it uses an O-ring which is compressed by a tapered seat in the crankcase opening.

The Cox Conquest is a more robustly built motor than previous 2·5cc Cox units and is about 0·6oz heavier than the Rossi, scaling 179 grammes or 6·3oz.

Cox are also offering the Conquest in a throttled version for radio-control. This is equipped with a Perry carburettor and a plain prop driver without spinner assembly. It also has a one-piece finned cylinder-head that accepts conventional glowplugs.

We hope to be able to publish test figures for the new Cox 15 in due course.

KMD 2·5 diesel

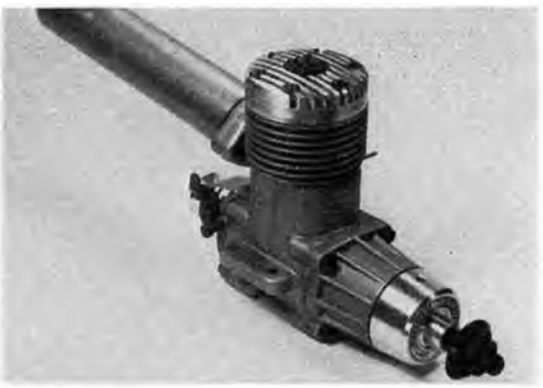
This recently introduced Russian product is a rear rotary valve, twin ball bearing diesel intended primarily for team-racing. A power output of 0·35bhp is claimed in the Russian instruction leaflet issued with it.

The KMD is of quite up-to-date design and features Schnuerle type porting using two angled transfer ports flanking a right hand exhaust with an upwardly inclined third port on the opposite side. The cylinder liner is contained in a die cast jacket and head unit, flanged at its base and secured to the crankcase casting with four screws. The crankcase itself includes the front housing which is well braced with stiffening webs. The one-piece crankshaft has an 8mm dia main journal and a 6mm front journal, resting in, respectively, an 18mm o.d. rear and a 15mm o.d. front, ball journal bearings.

Induction is via a reverse drum type rear rotary valve. The valve rotor has an o.d. of 8·5mm and an i.d. of 7mm and is housed in a substantial backplate into which is inserted a machined venturi having Cox type peripheral jets (4) and retained by a tangent needle-valve assembly. Our engine came with two venturi inserts of slightly different choke i.d., giving a choice of 7sq.mm or 9sq.mm choke areas.

The compression screw is not fitted with a lever or tommy-bar. It terminates, instead, in a ratchet

King 29 parts. Engine had sand cast crankcase and backplate.



Left: K&B SR.II 6·5cc for R/C pylon racing and rat-racing. A full description appears in the April issue of R.C.M.&E.

Right: Probably more OS Max 15s have been sold than any other 2·5cc engine. This is the latest version, soon to replace the highly successful Max-III 15 model.

device topped by a squared-off end, over which a separate key is fitted when one wishes to set or readjust compression. The key is supplied with the engine and consists of a large (1½in.) diameter machined aluminium drum keyed to a short length of 6mm dia. steel tube.

The KMD 2·5 has a bore of 14·5mm and a stroke of 15mm for a swept volume of 2·477cc or 0·1512 cu.in. The checked weight of our example is 176 grammes (6·2oz).

One for collectors

We frequently have requests for help in identifying old or little known model engines. Here, for a change, is one that other collectors may not have come across, the 'King' 29. This motor was made in Japan about 1951 and the example illustrated is one of several older Japanese motors donated to the writer's collection many years ago by Shigeo Ogawa, the head of the O.S. company, who built his own first model engine 40 years ago and who also has one of the world's finest collections.

Apparently, very few of these engines were made and the King 29 is now quite a rare item, even in Japan. When Akira Fujimuro, writer on model engine topics for *Radio Control Technique* magazine, heard that we had one, he wrote asking for photos and details of it. By the high standards of modern Japanese model engines, the King looks a bit rough but, by the standards of 25 years ago, the engine was not of unattractive appearance, with its machine-finned head and the bulbous 'Dooling-ish' looking crankcase. The crankcase is machined from an aluminium sand-casting and has a bronze main bearing. The crankshaft has a 10mm o.d., a 6mm o.d. tubular crankpin and a 7·8mm i.d. gas passage fed from a round 7·1mm dia. valve port.

The engine has conventional cross-flow scavenging, the cylinder being machined in one piece with integral fins and topped by a flat aluminium head. The lapped cast-iron piston has a fully floating gudgeon-pin and the conrod is bronze bushed at the lower end. Two long screws, only, tie the cylinder assembly to the crankcase fore and aft (a not unusual arrangement at the time) and two more, shorter, ones secure the sides of the head to the cylinder.

Checked weight of our King 29 is 226 grammes (7·97oz) and the engine has the still widely used 5cc bore and stroke combination of 19 x 17mm, giving a swept volume of 4,820cc or 0·2941cu.in.

In brief

The Japanese Hiness company have announced a 10cc axial type engine similar in layout to the specially-built Krasnorutsky motor used by World C/L scale champion Valery Kramarenko's ANT 14 – i.e. with normal '90-degree' shaft/cylinder configuration 'opened up' to 180-degrees by means of bevel gears so that the drive shaft sprouts from the 'bottom' of the crankcase to produce a virtually cylindrical engine.

The Hiness 60-BBSL is claimed to turn an 11 x 7½ prop at between 12,500 and 13,500 rpm, according to fuel used. It has the usual 10cc bore and stroke combination of 24 x 22mm and weighs approximately 750 grammes (26½oz). It is priced at Y80,000 (approximately £130) in Japan.

The King 29 of 1951 is a real collector's item – only a few were ever produced. The bulbous crankcase casting gives it a distinct likeness to the famous American Dooling motors. Cylinder was machined in one piece with integral cooling fins.

BLASTA DEVELOPMENT

Richard Wilkens describes the reasoning behind his highly successful combat design — and his 'new' approach to building techniques.

When Richard returned to combat flying after a seven year break he brought a refreshingly new approach to the subject. When his first (relatively) huge models appeared he transformed the combat scene with their speed, manoeuvrability and his own aggressive flying style.

I GAVE UP combat flying seven years ago because I was fed up with losing and building models the old way, which involved lots of carving and sanding the structure before the nylon and dope covering was applied. In those days the Oliver Tiger was the *only* motor to use for combat, so all models flew at about the same speed and struggled to out-turn each other. No one had a noticeable margin of aerial superiority for very long as good designs were copied and improved upon. I remember, for instance, someone once copied a *Dominator* and added booms to it to improve its turning performance. I won't mention his name, but he was good looking!

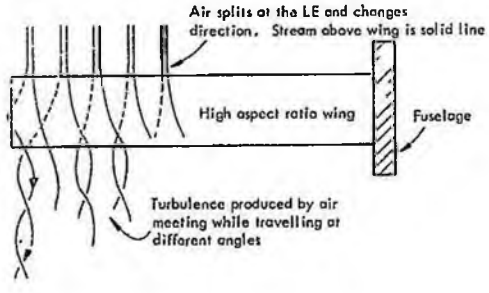
I decided to take up this exciting sport again in 1974, by which time Mylar covering was universal, and 5-minute epoxy speeded construction considerably; models were larger and turning tighter but were still very slow, weighing 14-15oz. The Olivers were still droning on, the waiting list for one of these being about 18 months and they cost around £20 after George Copeman had fed the worms. The thought of having to develop a model powered by one of these motors, when it eventually arrived, deterred me from placing an order and an alternative had to be found. Seeing the *Outlaw's* models at Cranfield 1974 convinced me that glow power was here to stay; the Super Tigre G20/15s were giving wild model performance, and it was that team I wanted to join as they, led by John Hammersley, were the most experienced and exciting to watch, and fun to fly with.

Being lazy, and wanting a short cut to success, I listed what I wanted from the models and how much effort I was prepared to put into making them. Here is the list:

1. Zero effort in building, plus as little mess and smell as possible in the modelling room. No carving and sanding. No doped covering.
2. Very fast and cheap model construction. The number of components and precision fits had therefore to be kept to a minimum. Where a precision fit was essential, it had to be very simple to construct.
3. Highest possible aerial performance to give a real as well as a psychological advantage during the combat match. Performance criterion, in order of importance: (a) *Steerability* the model must go where you want it to, if it doesn't it is useless, no matter how tight in turns. (b) *Manoeuvreability* must turn tighter than the best opposition. (c) *As fast as possible* but a high rate of turn is much more important than a

'Our hero' watches while pit-man John Hammersley attends to the Super Tigre G20/15 in the pre-Blasta models. These models which gave 'Wilkie' many victories, featured several polystyrene parts in their construction.

Figure 1 – induced drag with high aspect ratio wing.



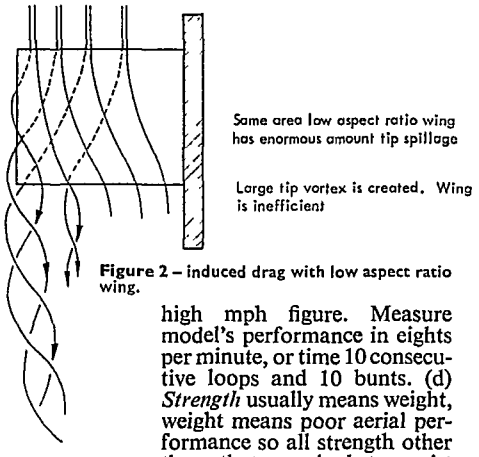


Figure 2 – induced drag with low aspect ratio wing.

high mph figure. Measure model's performance in eights per minute, or time 10 consecutive loops and 10 bunts. (d) *Strength* usually means weight, weight means poor aerial performance so all strength other than that required to resist aerodynamic forces was forsaken.

4. I did not want to experiment with alternative wing sections as this model was designed to outfly other flat section wing models and simply thickening the wing would improve its lift generating capability.
5. Smallest amount of test flying. Once one model has been test flown and its CG and elevator movement noted, it must be possible for an exact duplicate to be built with a similar weight distribution and control system.

There are a few aerodynamic facts worth mentioning that improve this type of model's performance. Most of the drag of the wing is skin friction, and a great deal of the total drag is of course produced by the lines. There is little one can do to reduce either of these, so the induced drag of the wing is the one to work on.

To keep induced drag to a minimum you must use a high aspect ratio wing and reduce the models weight.

What is induced drag?

During a loop the difference in air pressure above and below the wing is even greater than in level flight, and the air always tries to equalise this pressure difference. The only way it can do, or try to do, this is for it to spill round the wing tip. All the air below the wing tends to move out towards the tip as it travels from the leading edge to the trailing edge, and all the air above the wing does the opposite and tends to move inward. See *Figures* 1 & 2. The heavier the model the more the wing 'pushes itself downwards into the airstream', likewise the lower the aspect ratio the more tip chord there is for the air to spill over (this is why sailplanes and seagulls have long thin wings – tip spillage is reduced). When the air divided by the leading edge reaches the trailing edge, the two airstreams which are now moving (when viewed from above) in slightly different directions, meet at different angles and produce turbulance which slows the model down. The greater the wing loading, model inertia and angle of attack of the wing, the more this drag induced by the wing becomes, and the more the model slows down round corners.

Tip spillage creates a tip vortex which is visible in some flight situations. Watch for jet fighters doing tight turns at air shows in damp air or rain where the vortex is visible in the form of a long thin 'tube' of extremely low pressure air in which the temperature drops and forms what is in fact a cloud.

The maximum aerobatic wing thickness in common use is 18% of the chord and many stunt models have their wings this thick. However for combat models, where speed has to be considered 12-15% is perhaps more suitable. Many British 1974 models had 1in thick tapering wings with root and tip chords of about 12in and 7in respectively, which correspond to thicknesses of 14.3% at the tip and 8.3% at the root which is very inefficient. The 1¼in thick *Blasta* wing with a 9in chord is 13.9% thick and this makes it more efficient than its counterparts. By tapering the wing tip spillage is reduced but this is offset by the poor root efficiency.

How strong should it be ?

It is worth at this stage to consider the importance of increasing the combat model's tight-turning capability. If a model hits the ground it is possibly due to pilot error, either he calculates that a certain manoeuvre is possible, then finds out that it wasn't, or he becomes mentally confused for a short period and fails to steer it away from the ground. Either way, it runs out of airspace or alternative flight paths in that small hemisphere of sky it was flying in. To make that hemisphere appear bigger to the pilot the model must fly smaller radius manoeuvres. At this stage already there are two ways of solving the problem, a negative thinking pessimistic one and a positive thinking optimistic one! The first is to assume that the model will hit the ground – and therefore beef-up the structure in an attempt to make it crash proof. The other is to assume the model will not hit the ground, and therefore throw out every bit of unwanted weight (spruce trailing edge reinforcement, gussets, nylon covered centre sections etc). This latter answer produces a model that is even less likely to hit the ground, because being lighter it has a superior aerial performance and will not be forced to fly risky attack and evasive manoeuvres during a combat match. After all, gussets and spruce trailing edge reinforcement are only of use on *some* occasions when the model is actually decelerating while in the process of hitting the ground. The remainder of the time they get a 'free ride' in the model, to the detriment of its ultimate aerial performance.

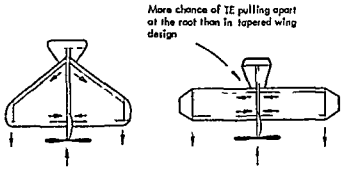


Figure 3 – model planform and impact stresses.

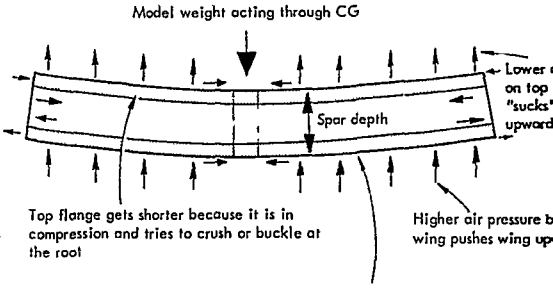


Figure 4 – greatly exaggerated view of spar under stress in loop.

No existing wing structure seemed ideal, or entirely logical, so a new structural system had to be developed. I could not help thinking how silly it seems to cut down South American trees, then slice them up into little strips only to stick them together again when the age of plastic and alloys is upon us. However balsa (and spruce) are the materials that are stocked in model shops, so that's what is generally used. Typical 1974 models were tapered wing designs with 1in thick sections – their leading edges

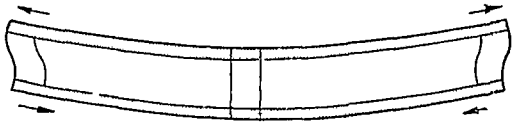
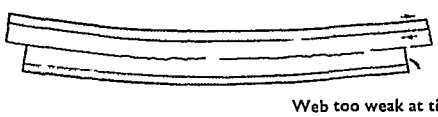


Figure 5 – showing how flanges distort flexible tip webs.

Figure 6 – effect of using weak web at tip.



Forming the leading edges from expanded polystyrene is very quick and easy, the only tools necessary being those that you can make yourself. A car battery is used to supply the heat for the hot-wire cutter – how to do it will be described in the May issue.

← Lower air pressure on top of wing "sucks" wing upward

pressure below wing upward

d

were built from 3 separate strips and then hand carved. It is difficult to produce two of the same shape and weight and they are also expensive, messy and require precise construction construction in order that they may fit the ribs. They have a two part job. One is to act as a spar and stop the wing from folding in half during a loop, and the other is to separate the airflow above and below the wing. It has a constant spanwise section and therefore is not an efficient spar *ie* it ought to be thick at the root and thin at the tip.

Ribs that slot into the leading edge require 10 cuts to produce, and if the ribs are all of different lengths, they have to be positioned precisely to produce a good fit. Trailing edges are expensive and time consuming to build, requiring an accurate root joint and if cut from a 36in sheet, the leading edge has to be shorter than 36in between tip ribs, thus limiting the final span somewhat which goes against the high aspect ratio rule, resulting in a reduction in wing efficiency. If you decide to build models from 48in sheet balsa it becomes even more expensive, and there is usually a smaller selection of this length wood in the model shops. Should the elevator be mounted on or near the trailing edge, the rear part of the wing is pushed downwards by the elevator reaction when the model performs a loop, and thus acts against the rest of the wing lift. Only the front part of the wing is lifting upwards efficiently. The 1 metre lengths of plastic film covering currently popular tend to restrict the span to about 38in, so a new tip system had to be evolved to enable the span to be increased. The conventional balsa plate tip is aerodynamically incorrect, having too sharp a cross section and it produces little lift for its area. A more rounded section tip is better, so polystyrene tips were developed which are cut out with a hot wire 'cheese cutter' in a few seconds.

One good point about tapered wing structures is that the large centre chord spaces the LE and TE more at the root, so that when the model hits the ground (negative pessimistic thinking) the tensile and compressive forces that suddenly occur in the LE and TE are more easily resisted. That is the end of the good points, and any way we are not going to hit the ground, are we? See *Figure* 3.

Figure 7 – tensile failure.

Figure 8 – compressive failure.

The alternative LE is the spindle moulded variety which again have a constant spanwise section (bad spar). Their weight varies and are very expensive with a difficult rib to LE joint. You have a limited choice of section, if you don't like what is supplied by the manufacturers, hard luck!

Spar design consideration

The *Blasta* spar is situated right behind the polystyrene LE and is built up with a balsa web and two spruce flanges so it looks something like an iron girder. The flanges resist the tensile and compressive stresses that occur in the spar when the model is manoeuvring while the web resists the sheer stresses imposed on the spar by the flanges. The deeper the spar is, the greater its resistance to bending is, and the lighter it can be because less material is required in the web and flanges to resist all the stresses.

When the model does a loop the spar always bends a little bit and providing the web does not split, fracture, shatter, or come unstuck from the flanges, the top flange will get a bit shorter and the bottom flange will get a bit longer as shown in *Figure* 4 (greatly exaggerated), and the spar will resist the G-loading which tries to make the wings 'clap hands'.

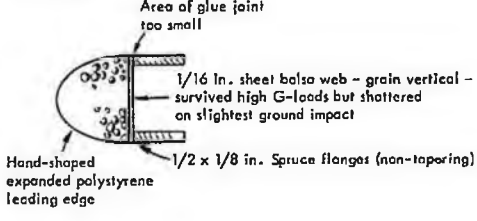
Notice at the tips the web is being *pulled* one way by the bottom flange, and *pushed* the other way by the top flange. This is shown in *Figure* 5 where for demonstration purposes we will assume the webs at the tips are made of soft rubber, so that the action of the flanges may be investigated. In this situation the flanges do not change length – they distort the rubber instead. The arrows in *Figure* 4 on the web at the tips show the direction of the forces that the web exerts on the flanges, making them change length. Note *it is the web at the tips that forces the flanges to change length*. If, however, the web is too weak, the flanges will make the web shear as shown in *Figure* 6.

The job of the web is to keep the flanges in their correct positions relative to one another, so that the tensile and comprehensive forces may be resisted. Once the web fails there is nothing to stop the flanges bending and the wing snapping in half. In this case extra web material is required at the tips where this shear force is greatest and may be in the form of a sheet balsa plate between the two tip ribs in each wing.

Provided the web does not fail, the only way the spar *can* snap, is for one of the flanges to fail at the root, causing either a tensile failure (*Figure* 8) or a compressive failure (*Figure* 7). Should it snap you just beef up the flanges on the next model, and try again. If your models never break in the air you may be carrying too much around to the detriment of the model's overall performance.

To sum up, we need extra web material at the tips where the sheer forces are the greatest, and extra flange material at the root where the tensile and compressive forces in the

Figure 9



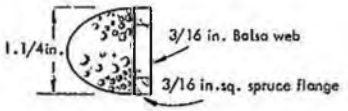


Figure 10

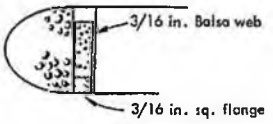


Figure 11

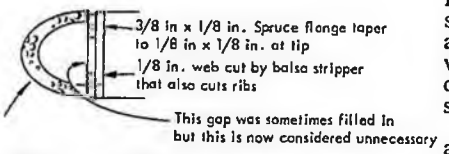


Figure 12

spar are the greatest.

Only with this spar arrangement are you able to design, by trial and error, a minimum weight spar that will resist all the G-loading and that is easy to fit to the ribs and enables you to employ a custom made leading edge of your own design. It leaves no mess on the floor of your modelling room and is extremely cheap and simple to make, especially if mass produced.

The web of the Blasta spar is made with an $\frac{1}{8}$in or $\frac{3}{16}$in balsa sheet and is not therefore the lightest. A $\frac{3}{32}$in or $\frac{1}{16}$in web may be used if extra sheet is laminated at the tips.

Some taper wing models were built with $\frac{1}{8}$in sections and hand carved expanded polystyrene leading edges and tips, backed up by a spruce and balsa spar whose cross section was similar to a steel channel girder, as seen in *Figure* 9.

It was found that the wing held up under high G-loads with this spar, but the web was too thin and did not resist the shocks imposed on landing. The glue joint was too small, and sometimes failed, and the spruce flanges were too large and in that position the ribs had to be notched. It was difficult therefore (or time consuming) to taper the flanges as the rib notches would have to be of different sizes. The polystyrene weighed next to nothing and protected the wood frame from minor shocks, but it's strength was so low that for design purposes it may be disregarded. Because of this only a very small amount of glue is required to hold it in position and stop it from falling off when the model is airborne.

The Super Tigre glow powered model was *too* fast to follow diesel powered models because it overtook them too often, so the wing was thickened to produce extra drag and extra lift was obtained as a bonus. The next series of spars had heavy $\frac{3}{16}$in square spruce flanges and a $\frac{1}{16}$in balsa web infill. These were very much tougher – as drawn in *Figure* 10.

Two problems were yet to be solved, one of dimensional co-ordination and constructional accuracy, and the other was how to taper the flanges without notching the ribs or tapering the web.

The first problem, which is quite a mouthful, was simply that $\frac{3}{16}$in square spruce is never *exactly* $\frac{3}{16}$in square, and when glueing them to the web it was difficult to get a good rib fit quickly and to end up with a $1\frac{1}{4}$in deep spar every time (*Figure* 11).

The next series of spars (*Figure* 12) are the ones still in use. The flanges are set very slightly in from the edge of the full depth web so that a precision fit is not required. They taper towards the tip, and the taper need not be accurately cut to produce a good looking job. The web is cut by balsa stripper (described later) being very easy to make and fits exactly to the same depth rib, also cut by the stripper, and a set square. The plastic leading edge is cut with a hot wire made from 3 strand Laystrate C/L wire and a 12v car battery which need not be removed from the car. All very simple and ultra cheap. A jig is used so that every LE is the same shape, while white woodworking glue (PVA) employed to fix the LE, which is held in position with tape while the glue dries.

The hinged piece

To create an efficient moment arm, the elevator must be situated at some distance from the trailing edge. Delta tails, which are extremely economical and easy to make, were chosen in favour of the more complicated American twin boom method – which consists of two accurately made booms plus a thick elevator carved and sanded to an airfoil section. They then use two wire hinges fixed to the elevator which pass through two bushed holes in the booms. You can almost make a complete *Blasta* frame in the same time as it takes to put this lot together!

The tail has a very good stabilising effect during flight, and thus the model is very 'steerable' (it goes where you want it to) and you should find that the model will flick into rock steady level flight after a tight turn.

Cutting the plastic bits

Twelve volt car batteries have six 2v cells which are connected to each other by lead strips that are situated just below the top surface of the battery casing. If you examine the top of the battery you may find drilling points marked which are used by battery dealers who drill down to the lead strips enabling them to test the individual 2v cells. Should you not be able to find those marks, consult a dealer as to where to drill. After drilling holes and inserting screws into the lead strips you may tap off 2, 4, 6, 8, 10, as well as 12 volts for the hot wire by the use of crocodile clips fitted to the hot wire leads. Smear plenty of Vasalene round the screws to prevent corrosion.

You may find the commercially available hot wire cutters better but they are much more expensive, and all the plastic cutting I have done up to now has been done with this simple arrangement.

Using a jig you can produce very quickly one-piece crushable (shock absorbing), cheap, accurate and aerodynamically correct tips and leading edges that are very easy to fit to the model and to cover.

Having by now described the 'raison d'etre' behind the *Blasta* design, the reader is no doubt left with the impression that this is a truly different combat ship – and that the author is a really idle so-and-so! Its all true folks! Read next months thrilling instalment, in which we detail the plans for rapid building jigs and constructional details – not forgetting of course flying and operating advice to help such people as Bob Morgan, Richard Evans *et al.*

It might not look so very different, but the construction and thought behind the design certainly is out of the rut. See next month's (May) issue for Blasta plan – and details of mass production techniques necessary to keep ahead of the competition.

Above: two large R/C scale models by P. Scowan – a Chance-Vought Corsair (which placed third in Class I) plus a Skyhawk with engine in the nose. Above right is seen B. Borland, winner of the F/F scale class with this DH4.

SCALE at the NEW ZEALAND NATIONALS

EVERY NATIONAL Championship is different, and the 28th NZ Nats was no exception. Different because the weather was different – and almost unprecedented for a New Zealand Championship, being wet and windy – mostly a steady 25mph, gusting to 44mph and turbulent. There were delays and postponements due to weather, while itching to fly were no less than 132 entrants in scale.

Last year, the *Scale Modellers Association* took responsibility for all scale events and ran them with few hitches, the Executive Council operating as an executive-management group and providing the necessary co-ordination and Nationals organisation.

As a result the well established Scale Modellers Association which has been responsible for the big increase in scale models in New Zealand as well as setting the pace by running the scale events at the Nats became the 'model' organisation upon which other groups such as C/L and F/F were based.

So the whole Nationals was run by groups of modellers catering for their own classes with the F/F group providing a Contest director for F/F events and the C/L group doing the same. Vintage had their own Director and so did Radio and yet the scale modellers, who had demonstrated so effectively what they were capable of in terms of organisation, were obliged to submit themselves to the directors of other groups because they were flying R/C, F/F or C/L ! Needless to say the Scale Modellers will insist on their 'own' director next time.

Seven scale events were run. Two classes in all F/F, C/L, and Radio events and for the first time a Peanut event was run using

Above right is Scale Champion J. Godfrey with his free-flight Cessna OE-1 complete with timer operated throttle.

N. Maurice prepares his C/L Black Widow – always a popular subject.

The ETA 1001 Peanut Trophy with Paul Lagan's winning Lacey M13 – obviously doesn't take long for one design to dominate an event in all corners of the world!

the SMAE/Miami rules as published in *AeroModeller*. This new event was also the result of the Scale Modellers Association activity who set up the organisation, decided on rules, and approached **ETA Foods** – a large manufacturer of Peanut based foods and obtained support in the form of a gold Peanut figure – **Mr ETA 1001 Peanut Trophy.** The Association provided score sheets – as they did for all other scale events – and ran the event itself. Because of the weather and the Peanut fever that swept some parts of the camp, the hall was filled with spectators for the event. Models ranged from American built kits to APS plans and builders' own designs. Best flight times during practice were put up by Paul Lagan's *Lacey M3* (55 secs) with J. Henson's beautiful *Zero* – complete with working retract u/c – doing 35 secs. Most flight times were down because of the damp weather and the relative inexperience of the modellers in this class. The average flight time amongst the top flyers was 34 seconds.

Free flight scale was postponed twice because of weather conditions and each time new judges had to be found since those previously chosen were committed to other events. The standard was high despite the fact that many modellers were not prepared to risk their models under the conditions. Beginning each day at 6.00am, the F/F band met on the airfield prepared to brave the conditions if the judges decreed that the event would be held. By the time F/F modellers met for the third time their numbers had dropped, tension was growing and so the event was flown. The arch rivals B. Borland and D. Hope-Cross were threatened this year by the arrival of J. Godfrey with his large *Cessna OE-1 Bird Dog* which sat on the end of the take-off strip with motor idling, then as the timer began its work, slowly gained full revs, began a take-off roll and shortly after take-off throttled back for the remainder of the flight. Timer operated throttles have arrived in F/F scale! In Class I F/F the models that flew best were the winners and the models best able to handle the conditions were N. Havills *Blackburn Monoplane,* Worsley's *Piper Super Cruiser* and W. Rousé *Rearwin Speedster.*

Control Line was less of a problem under the conditions but some modellers still chose to wait until the end of the flying programme in the hope that better weather would result. Such was not to be. In Class 1 the models with the best static score and a high wing loading were the winners. In Class 2 the flight score again decided the result. Most notable models were the *Provost* by Junior M. Walters and the *DH Comet* with excellent retract gear by N. Havill. Very impressive in the air was the 1/6 scale *Chance Vought Corsair* by M. Feist.

Radio had its largest following in Class 2 where once again spectacular performances were put up by the Wellington Radio Flyers who flew most realistically. Most awe inspiring was the high speed display with a *Douglas A4 Skyhawk* by P. Scowan. However the newest arrival in B. Borland carried off the Class 1 event with a 1/6 scale *Turbulent* built and flown to a high standard. Brave indeed were the builders of twins – R. Dunford with his *BN Islander* and B. Sutton's *DHC Otter* who both chose to fly – and succeeded under the difficult conditions.

Altogether, a Nats that was a challenge to the scale modellers and yet one that will be remembered for the impact and success that the Scale Modellers Association has had on the New Zealand scene as shown by the record number of scale entries – 132.

		Flying	Static
Peanut			
1. P. Legan	*Lacey M3*	118·0	34·5
2. J. Henson	*Zero*	58·6	31
3. J. Godfrey	*Cessna C34*	59·2	25
Free Flight Class 1			
1. B. Borland	*DH 4*	160	612
2. D. Hope-Cross	*DH 83 Fox Moth*	165	586
3. J. Godfrey	*Cessna OE-1*	170	565
Free Flight Class 2			
1. J. Godfrey	*Cessna Bird Dog*	182	83
2. N. Havill	*Blackburn*	170	88
3. P. Worsley	*Piper S Cruiser*	174	51
Control Line Class 1			
1. B. Borland	*Curtiss P40*	187	563
2. R. Jones	*Fokker E1*	225	513
3. N. Maurice	*Black Widow*	205	462
Control Line Class 2			
1. J. Godfrey	*Beagle Pup*	150	78
2. N. Maurice	*Typhoon*	146	80
3. M. Feist	*C V Corsair*	148	71
Radio Scale Class 1			
1. B. Borland	*Turbulent*	220	609
2. L. Ackroyd	*Tiger Moth*	220	520
3. P. Scowan	*C V Corsair*	145	486
Radio Scale Class 2			
1. R. Johnson	*Citabria*	164	87
2. B. Sutton	*DHC Otter*	152	80
3. R. Cartwright	*N A T28B*	155	74

Ron Moulton studies the birthday card presented to Howard Boys by fellow Northampton club members on the occasion of his seventieth birthday – er, Howard's that is, not our own Managing Editor's! While Howard performed cartwheels across the dance floor, history does not relate whether our Fearless Leader followed suit . . .

HOWARD BOYS —SEPTUAGENARIAN

A SPECIAL PARTY organised on 24th January by Northampton MAC members at Kingsthorpe Hall celebrated the 70th birthday of that unique aeromodeller, Howard Boys.

It was a splendid occasion where there was no doubting who was the honoured celebrity.

One seemed to see more of Howard's underside than his ever-active head as he performed lively cartwheels across the dance floor. His energy outpaced many a younger participant and when it came to blowing out 70 candles spread over two of his special health food cakes (delicious too!) it was a fantastic one-puff operation.

During the evening Howard was presented with a colour print of his portrait which appeared on July 1941 *AeroModeller* cover, signed by artist Rupert Moore, and the Club members gave him a huge birthday card enclosing a handsome cheque to help him on his 1976 tour of Europe.

These tours are becoming legendary. He is as well known in Germany and Czechoslovakia as he is here, and largely because he always travels by homemade car or motorcycle. For Howard has *always* made his own vehicles – ever since he came of age to drive! His first were 3-wheelers, not unlike a fuselage on a trio of motorcycle wheels and they were widely featured in the technical press.

In aeromodelling, Howard's pioneering of the tail-less model, with many records to his credit, and his beautiful free flight scale models – including the *Lysander* which is still one of our most popular APS designs, tend to be forgotten against his fame as the first R/C columnist.

Proportional pulsed rudders or ailerons were operating on H.B.'s models 25 years ago. Many a leading light today can look back on early circuits which Howard tested and approved, sometimes with forthright comments that created a stir in the trade. His published opinion of one certain unbalanced relay achieved notoriety – and also made him the best of friends with the manufacturer! One could go on for ever, reminiscing about this personality, his attire, transport, the incredible model box that stood on end and became a transmitter, and above all his dedication to our hobby and his local club.

We all salute you, may you carry on and break that Century!

HARROGATE ★ LONDON
BRIGHTON ★ NUREMBURG

TRADE FAIRS '76

At right and below right are the new British made CO_2 motor to be distributed by Humbrol plus a F/F kit designed to suit.

THERE IS very little in the way of built-up kit modelling at any of the British Toy & Hobby Trade Fairs at Harrogate, London and Brighton. They deal with the less specialised and broader interests of boxed items and toys; but it is always possible to find something in the aeromodelling field, if one looks hard enough. This particularly applies to the novice ready-to-fly type, and for 1976 there will be a host of new ideas in the shops.

At **RiKo's** room in the London Show we found a fascinating range of imported packs for scale profile rubber flyers. Pre-shaped, painted in authentic colouring, these models came in two sizes. Each has a cambered wing, and the fuselage is a very clever wrapping over a core so the flat printed plastic covers both sides. The gimmick is a motor tube unit: each model has a slip-in power tube. You can even wind it up, then insert in the fuselage! They fly well too, and are inevitably based on the *Zero*, *Spitfire*, *Hellcat*, *Mustang* etc.

Also in the London Show, **JNT Models** was one firm with loads of balsa kits. Comet, Guillow etc, but what took our eye was a new glider towline (or Kiteline) reel of useful size and simplicity. Cheap too if our note of the price is right at only 39 ponce. Similarly priced is the TopFlite Kite from JNT, great value and an excellent flier.

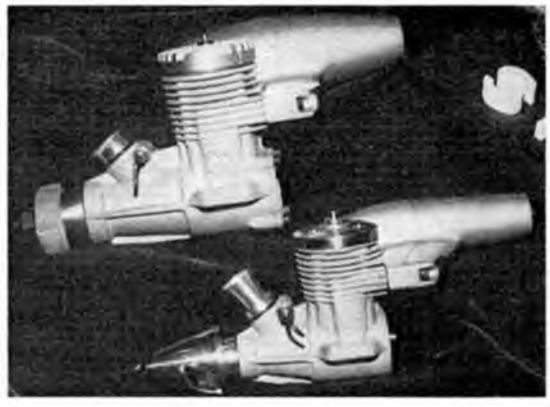
At Brighton, **A. A. Hales** had a stand that was of entirely new items and though mainly plastics, they included North Pacific and L. M. Cox imports. Last year N. Pacific introduced their compressed foam wings and the already famous Fleet Streaks entered a new phase of performance. This year, they've gone biplane – and with a neat fuselage to match. Cox have several surprises apart from their Conquest 15 & 40 engines, of which more later. There's a version of their long established 049 with 'quiet running muffler' and a Crusader RTF stunt trainer with ingenious 4 position control system. Looking like a Vought Crusader, it has 19in. span, thick symmetrical wings in a special foam plastic that is both lightweight and fuelproof. The large all-moving stabilator is powerful enough for loops and inverted manoeuvres while scale appearance is preserved by having a hatch to cover fuel filler lines and needle valve access. But the big surprise comes in the trio of Cox 'Electro Chargers'. Two different Spitfires and a Mustang are each 15¼in. span and come with an electric motor and rapid rechargeable batteries installed. Under the rear fuselage there are two sockets which engage on standard Lantern Battery contacts. Charge for a couple of minutes, switch on and hey presto! Duration is according to amount charged but usually 40 secs is enough for whirling around on short lines. Ideal for fun with the youngsters in the park, these are the first successful electric powered control liners to appear.

Airfix launched a range of foam plastic rubber driven semi-scales which are larger than usual. Story is they were once intended

Below is just one of three designs packed in a single box by Thomas Salter – a novel approach. At right: 'What me fly a control-liner?' George Fuller extols the virtues of the new Cox electric powered, all plastic, control-line models – instantly rechargeable from a dry cell.

At left is the secret to Airfix's rubber powered 'Friendship – flexible drive shafts take the power from the motor in the fuselage out to the nacelles. At right: the two new Cox Conquest motors in 0·15 and 0·40 cu.in. capacities. Silencers are *not* of venturi type.

Below left is a ready-to-fly profile scale rubber powered model displayed by Riko – note the (just visible!) pre-loaded motor tube in the foreground.



for electric power but the very useful looking propellers and long fuselages make them much more natural for rubber drive. Mustang, Messerschmitt and Spitfire are well shaped and ought to go well. It is the Friendship which is different. This one is a twin, has the motor down the fuselage nose-to-tail and a gear unit that converts the torque to a pair of flexible wires out in a snakeline to the propshafts. If Airfix have overcome the torque of two LH props, without using dihedral and using flexi-drive with very few fixed point bearings, they have solved quite a few problems. One might refer to it as miraculous. If it really *does* work then the possibilities are limitless for two-motor scale rubber subjects.

The Wingbat is Airfix's foam wing chuckabout novelty that can be flipped underarm to perform loops, inverted on long glides. A plastic nose provides weight and a reflex aerofoil section gives the performance. It's a playwing that needs space for safe flight.

Better known for craft kits and educational toys, **Thomas Salter** have an unusual three in one 'Hi Flyers' kit with different models to suit weather conditions. Ultra simple, the first is a polystyrene glider, then a larger chuck glider and the third model is a sizeable balsa winged rubber driven design. Each is attractively coloured and the trio sell at £2.75 in a bright box.

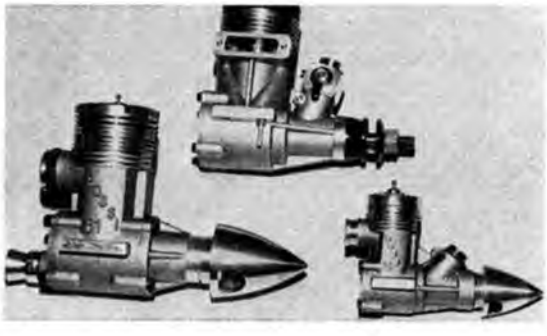
And so to CO_2. Readers will be well aware of columnist Eric Coates' enthusiasm for these little gas engines and the general lament that they have been hard to come by, and expensive. Such problems will melt away when the **Humbrol** Shark engine arrives with its smart red and black plastic parts, and the novel filler unit for £6.40. Four different kits are being made. First is *Sharky*, which will come complete with the power unit. One CO_2 bulb as sold for 'Sparklets' can provide enough gas for 6 flights so making CO_2 one of the cheapest energy sources available. Moreover, they are quiet, clean, start immediately and work in either direction. Orders for the Shark are said to be phenomenal and we're not at all surprised. With plastic crankcase and cylinder, the design of the engine makes it ideal for mass production. It should open up a new field for small scale models and hall flyers that all aeromodellers will warmly welcome.

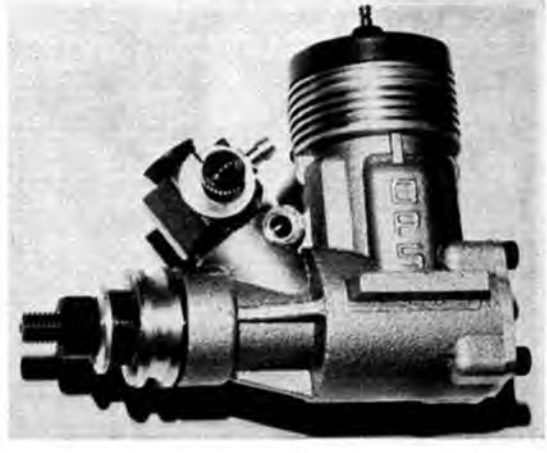
Contrasting with the British Fairs, the annual Nürnburg International Toy Fair does provide a very welcome shop window of new items that will (hopefully) be released later in the year. It was pleasing if a little unusual to note that most of the really new products were *not* aimed solely at the R/C market (details of new products in this field are described in the April issue of *Radio Control Models and Electronics*).

New engines abounded at this venue, and most interesting to our eyes were the new Conquest .15s and .40s from **Cox.** Both 'standard' and R/C versions of these rear exhaust, Schneurle ported motors were shown, together with large capacity expansion-chamber type silencers. The reputation of this American company's mass production, precision engineering, techniques are second to none and first performance reports sound *most* encouraging.

For some time now we have expected to see the ABC versions of the **Rossi** 15 glows, and these in fact were displayed on the Klaus-Dieter Horn (KDH) stand, together with two (surprise) new versions of the Rossi 61. For R/C (or C/L carrier deck?) enthusiasts there is a front rotary version with a choice of ringed piston or an ABC set-up, while a rear-exhaust, rear induction, ABC piston/liner version for the speed enthusiast was also on display – a choice

Power! Below are a trio of new Rossi motors. The 2·5cc glow motors are now available in ABC form (Aluminium piston, Brass liner – Chrome plated) while the rear exhaust 10cc motor is all new and a truly impressive hunk of metal! The front-rotary '60' is available in ringed or ABC versions. At right is the new OPS 19 – another potent looking motor for this Italian concern. Could be 'useful' in C/L Goodyear racing perhaps?





At left is the Australian Taipan 40 Schneurle potent motor – with a very different look. Above is the Carrerra 'Miro' all-plastic glider complete with electric motor mounted on a pylon above the wings. Battery pack is contained in the fuselage, behind a plastic 'grid'. Note plastic wing of Jedelsky type construction.

of piped or 'normal' models too.

Also on the same German distribution stand was the **Taipan** 40 – a Schneurle ported front rotary motor, also with an ABC piston/lines assembly, and with a very distinctive appearance.

Webra displayed a neat, rear-exhaust Schneurle ported front rotary glow motor, for which both a tuned pipe and a silencer are available. Capacity? Now that's the pity – 1.8cc, although a 2.5cc is a possibility for the future.

Not a serious production unit yet, but built to gauge public reaction was the in-line twin cylinder engine displayed by the Austrian **HP** concern, consisting basically of two HP61 motors joined upon a common shaft, but interestingly, with each cylinder being timed to fire 180° apart.

The Italian **OPS** factory has become well-known for their high performance motors, and the new .19 motor should be a strong challenger to its competitors if its heritage is anything to go by. In addition, the Speed '60' now features a rotary disc induction system which enables a larger venturi to be used than did the previously used rotary drum – result is more power at the top end.

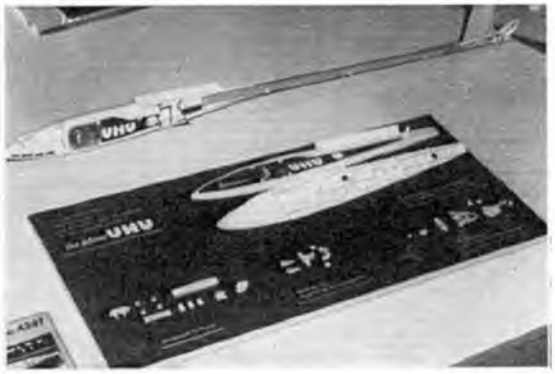
Contrasting with the noisy ic engines, were the electric units designed for free flight – an area of aeromodelling which we feel sure is to rapidly expand in the near future. **Carrerra** had two very different units on display. Most basic was a geared unit looking very similar to an updated version of the Mattel unit first used in the *Superstar*, which is complete with two miniature nickel-cadmium cells, recharged by four 1.5 volt dry cells. A ready-to-fly, all plastic model named *Planet* is available, so this complete package looks set for the 'toy market' – although the motor unit is listed separately in the catalogue.

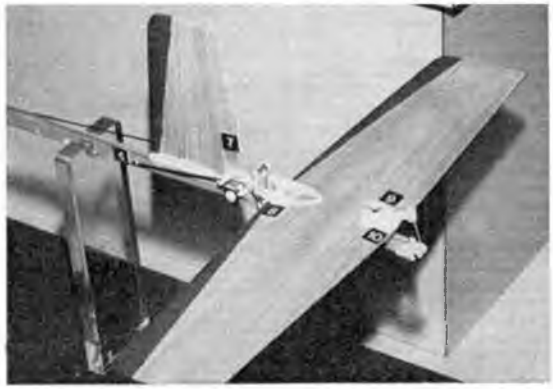
In addition, the same company displayed an 'electric pylon pack' – an electric motor (not geared) mounted very neatly in a plastic pylon, designed to be fitted over a wing via elastic bands, just like a conventional power pod for gliders. The battery pack consists of four rapid-charge cells, of around 'HP7' pen cell battery size – sufficient we are told for a power run of up to five minutes. Doubtless, this accounts for the D/T timer displayed which appeared to operate a motor switch as well as its normal function. Recharging is via a 12 volt battery.

A different approach was shown by the **Gunther** concern, who had a pair of ready-to-fly-all-plastic models powered by salt-activated silver chloride/magnesium battery cells. Very neat too – 'plug in' the plastic cased battery, and away you go. Unfortunately such cells are non-rechargeable, so it's use once and throw them away. Same company also displayed an amazing variety of kites mainly of bird or insect patterns printed on clear plastic, but the most novel was a hang-glider 'Deltaplan complete with pilot.

On the model (non R/C) front, there was less to enthuse about. **Comet** had a new 34in. span *Curtiss Jenny* on display with very robust construction for a rubber powered F/F design – would convert easily to electric RTP – while **Robbe** displayed a C/L *Piper Commanche* for 2.5cc motors, with very conventional contruction. **Graupner** can always be relied upon for a new innovation – and this year their choice as *Der Kleine Uhu* – a beginner's glider with extensive use of moulded plastic parts. For example, the fuselage pod is moulded in two halves and all the dethermaliser/auto-rudder parts – such as horns saddles, hooks, etc, are moulded for fiddle-free assembly. Provision of screw adjusted tailplane incidence and rudder movement are very nice touches.

At right is very basic electric powered ready-to-fly model from Gunther – uses salt activated 'throw-away' batteries. Below left is shown the Graupner 'Kleine UHU' beginners' glider fuselage with plethoria of plastic parts. Below right is the tailplane from the same design with nicely moulded plastic D/T and A/R parts.





topical twists

by 'Pylonius'

illustrated by Sherry

'He's the club all rounder'.

Origin of Species

THE TERM 'all rounder' no longer conjures up a vision of the club whizz kid juggling a C/L handle, a F/F winder and R/C transmitter with contest winning dexterity, we think instead of the rotund, sedentary figure we now see on the flying field who has given up chasing anything, even models. We live in the age of specialisation, where we are known by our particular fixations. A sense of unease runs through the club enclave when old Bloggs staggers onto the flying field with anything other than his customary SE5, and there are mutterings and black looks if the established Wakefield flyer infiltrates a Coupe d'Hiver event. Perhaps the nearest we have to an all rounder is the Radio man who sportingly enters the chuck glider event on gala day, or the club room hanger-on who is surprisingly seen to be flying a model.

Any biologist, running a practised eye over the club room assembly, could easily identify the various factions by their particular genus characteristics. He will note first the fat cats; the sleek, slow moving Radio men, then the wild, hairy C/L pack, all banter and bonhomie, and lastly the lean and urgent free flighters, given to dark, tribal mutterings. He will know that model flyers do not choose their particular vocations; they are born to them, just as monkeys are to climb trees and donkeys to dither.

So what price club unity with the members going off in all directions like a rampant MRV? A club night film show of skidding pylon racers and jumpy helicopters will have the free flighters making snide remarks like '*How money flies*' and '*probably clockwork*', whilst a shot of a C/L team race will bring from the radio boys a derisive, '*What's on after the Flintstones?*'. What, then, can you get an all-rounder-appeal talk or lecture on apart from '*Flight and other characteristics of the Birds and the Bees*' that would be illuminating to all the diversely motivated members? Should you try a building demonstration? Well, you could, but to many members of the plastic age balsawood is just something they use in slapstick comedy scenes. Perhaps the club could most usefully bring along a biologist chap – buy-ologist for radio – to give a talk on how to recognise the species of modeller to which you belong.

Last Round Up

The counterpart of the recently formed *Model Flying Field Association*, the 'Radio Cowboys Club', already is putting into effect plans to foil any attempt at organised flying on the few surviving unbanned open spaces. Engine exhausts are being opened up, fail-sure radio gear double botched and areas of maximum nuisance charted. Meantime model shops throughout the country have been taking on extra staff to meet the demand for kits and radio accessories for a maximum cowboy offensive in the spring. Speaking from a secret launching point somewhere in Britain the noted low flying cowboy, 'Hopalong Crashedly', stated that he was well satisfied with the club's preparations, and a bumper crop of flying sites could be expected to fall. A series of 'Radio Rodeos' were to be staged in the more important urban areas, and lone ranger patrols will cover the rural districts.

Flyers are reminded that membership is free, no licence or insurance is required and there are no rules.

Growing Problem

Someone writing on the early days of model flying has recalled the time when the Wakefield was not both a limited size and weight affair but merely had an eight ounce weight limitation, and this only imposed, rather sadly, when crafty modellers began to build models that floated rather than flew. This kept Wimbledon Common at the top of the venue list for a shaky year or two, but along comes some Smart Alec with the eight ounces lightly distributed over a colossal piece of flotatiousness and won (stop watch) hands down. So it was goodbye Wimbledon Common here we come Faireys, and off with the gaiters and on with the running shoes.

Now we find history repeating itself. Just as we were getting on nicely with our one minute plus Coup d'Hivers, giving minimum strain on the old pins, we get a Coupe Blimey jolting from some friendly Frenchman with outsize ideas on how much model you can wrap around six strands of quarter flat. The British mini models were not only fog bound they were frog bound, and it was the biggest victory over the perfidious Albion since Bleriot beat the free flight opposition of the day with his lightweight single channel job. For us it is not only back to a larger size in drawing boards but extra embrocation for those knee joints.

Full Steam (?) Ahead

With recommendations for all forms of reductions in power and other means of model levitation flooding in from countries with restrictive views on not-so-free flight we wonder what the International scene will look like in say, 1980. We can be sure that the international jamboree will be less hampered by the model flying, which should be safely encompassed between the town bandstand and the forest of flagpoles. FAI Power will, of course, be electric, chuck glider will replace A/2 (plus a 10 inch bicep restriction) and, unless a delivery of Filati comes through by 1980, which looks extremely doubtful, it will be office rubber bands to the rescue, and not many of them either.

THE FREE FLIGHT SCENE

by Bob Bailey

Photographs by Martin Dilly

Russell Peers of Falcons flew this Cox Tee Dee ·049 Mini Woodpecker but dropped one flight at the St Albans Mini event. At far right is Ray Paveley with his neat Coupe model which uses W. H. Smith's mauve wrapping tissue to cover its wing. Grain-less, but reasonably strong.

OPEN CLASSES

IN MY LAST article I briefly described the specifications for the FAI classes and the 'Mini' class of free flight models. Unfortunately, in these descriptions, a printing error occurred which stated the maximum weight of an A/2 to be 410g (14·6oz). This should have read 'the *minimum* weight of an A/2 . . .'. Our apologies!

Incidentally, it was pointed out to me that I had forgotten to describe the types of Open class models. These models can be of any size or weight provided they do not exceed the FAI maximum weight of 5kg (11·2lb) or 150sq.dm (16·14sq.ft) for the total wing and tail area.

As to the type of models flown, A/2s predominate in the glider class since they are, under most conditions, as competitive as any larger or lighter models. Open rubber models are usually a bit bigger than Wakefields (250–300sq.in is typical), but are considerably lighter at around 2½-3½oz for the airframe, and carry more rubber, often in the region of 3-4oz. Consequently they have considerably higher performances than Wakefields with 4-7 minutes being typical, so that Wakefields are not really competitive. Consequently the three minute maximum usual in SMAE contests is fairly easy to achieve, with the result that Open rubber contests become one flight affairs, visibility usually determining the winner.

The better Open power models are bigger than FAI models, and use ·29-40cu.in. size motors with wing areas of 5-600sq.in. Although no faster on climb than FAI models, their superiority lies in their glide performance (larger size and lower wing loading) plus better visibility during the fly-off. Again the three minute max used in SMAE contests is fairly easy to achieve, provided the model is not launched into downdraught (or 'hole' as it is often called).

While we are on the subject of Open models, I have had a plea for more reporting of Open contests, in particular the SMAE Area contests. In return, I will put out a plea for people to send reports to *AeroModeller* on the Area comps! The reason is quite simple – we cannot be everywhere at once so that the current Columnist cannot report more than one Area. Therefore we must rely on others to send reports from the other Areas – then we will print them.

One footnote; Martin Dilly described some goodies from NFFS including noseblock assemblies for unlimited models – 'unlimited' is another name for Open.

Dave Hipperson launches for an historic flight – due to a wing warp, the 310sq.in. model provided Dave's first non-max Open Rubber flight in six years!

PROPELLER DESIGN

I read with considerable interest Dave Clarkson's article in the January 1976 issue titled *Understanding Propeller Pitch*. For those who prefer to design their own propellers – myself included – it is definitely recommended reading (yes, many F/F modellers read the C/L articles as well – we certainly can learn a lot from them, especially about fuel systems for example).

(a) FAI Power prop design

I started using the principle described in Dave's article soon after taking up FAI power in late 1969. With Super Tigre G15's which were the engines of the time, it seemed reasonable to assume an engine speed of about 19,000rpm and a climb speed of around 30-40ft/sec. The subsequent calculations produced some interesting results, which were of course compared with propellers known to give good performance, to find out if the assumptions made were reasonable.

Using the above figures, the advance/revolution of the propeller is about 1.3 inches. As opposed to Dave's figures of 2° incidence added all the way along the blade, I settled on a figure of 6° based principally on the fact that a flat plate of high aspect ratio stalls in a low speed (well subsonic) airstream at about 7-8° incidence. Maximum efficiency is usually gained by operating just below the stall, hence the choice of 6° incidence. The propeller pitch distribution calculated was:

Radius	0·75in.	1·75in.	3·5in.
Angle to rotation plane ..	22°	13°	9·5°
Pitch	3·9in.	4·5in.	7in.

This pitch distribution was used for my original design of propeller made from polyester resin and glass rovings. Flight testing, when a strong enough propeller was made, proved the design to be considerably superior to the one used as a yardstick. It is evident from the unusual pitch distribution that quoting the propeller pitch is quite meaningless! I have often been asked what is the pitch of my propellers and have found it difficult to give an answer, as will be evident from the above. If most FAI power propellers are measured, it will probably be found that the pitch distribution along the blade is far from uniform.

Incidentally, my figures agree with Dave Clarkson's observation that it has been found better to have less pitch at the root than further out.

For FAI power, with the 7 second run, it is important to have rapid acceleration during the initial climb rather than a very high ultimate climbing speed – it takes several seconds to get up to full speed. Higher initial acceleration can be obtained by reducing the propeller pitch – a suitable compromise is achieved by washing out the tips a few degrees.

(b) Indoor model prop design

I have also applied the same principle of advance/revolution to indoor flying. Here, numerical information is much easier to get since one can count the prop rpm, time the model round one circle and measure the diameter with reasonable accuracy if the model is low down. Again I compared with existing data to estimate the required incidence, which turned out to be 5°. Results obtained for indoor propellers are quite different from FAI power in terms of pitch distributions – not altogether surprising.

My last year's EZB props were quoted at 15in.+5°. The pitch distribution using these figures is unusual but seemed to work better for me than everything else, the criteria of efficiency being cruise torque (that required to maintain the model's altitude) and rpm during cruise. The product of the two gives a direct measure of power consumption and hence of efficiency. To return to the pitch distribution, the figures I got were:

Radius	1in.	2in.	3in.	4in.
Pitch	19·3in.	17·8in.	17·8in.	18·0in.
Radius	5in.	6in.	7in.	
Pitch	19·0in.	18·8in.	19·0in.	

These show a marked reduction in pitch at the centre of the blade in contrast to the steadily increasing pitch of the power model propellers.

It is worth mentioning that while development in model design or engines will probably modify the calculations on which the prop design is based, it is a simple matter to update them, but not always quite so quick to make propellers to suit (masters for power props being a particular example).

INDOOR MODEL SUPPLIES

While on the subject of indoors, I have often been asked where to get the materials required for competitive indoor models. Laurie Barr supplies all materials (wood to specified grain, thickness and density, wire, cement, condenser tissues for EZB and Pennyplane, microfilm solution, EZB and Peanut kits etc. Drop a line to Laurie at 4 Hastings Close, Bray, Berkshire, telling him what sort of model you want to build, and he will be able to advise on wood selection etc. Certainly Laurie gave me a great deal of help when I started up on EZB, for which I have been very grateful.

From time to time, I am hoping to give some hints and tips on indoor building. To many it may seem a mystery (*"couldn't possibly build anything like a microfilm model"* – and this from one or two very successful outdoor free flight men!). Not true – there is at least one easy way of doing the job, and umpteen difficult ways, which are *very* difficult!

Incidentally, if you have any queries or difficulties on any aspect of Free Flight (we've said this before and no doubt will say it again) please write to us c/o *AeroModeller;* the letter will be sent to the appropriate columnist.

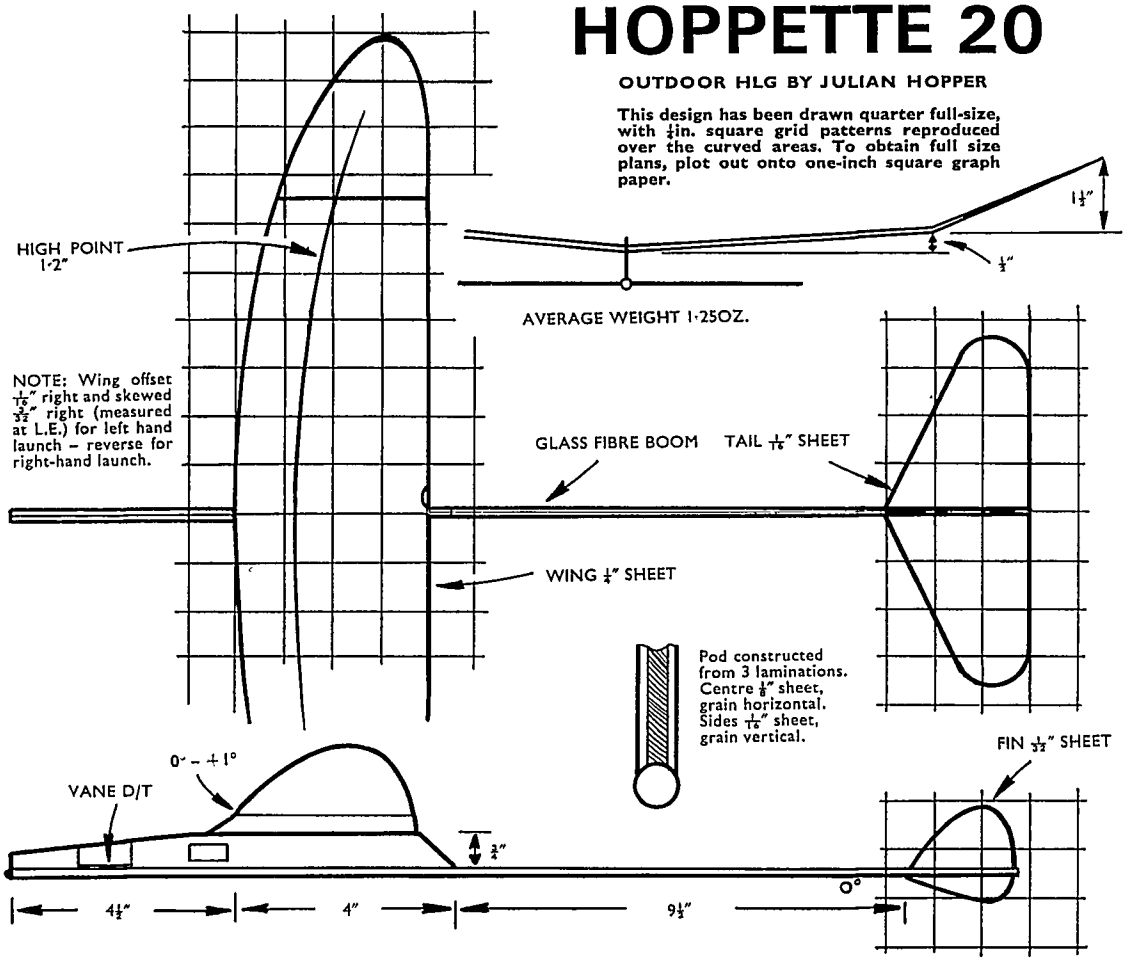
FLOOD-OFF SYSTEMS

To start off what I hope will be a series on helpful items for budding F/F competition men, here are a few of the systems for stopping the engine, used by some of the top FAI power fliers in the country. These systems are also applicable to Open and ½A power. There is little doubt that flood-off provides the most positive way of stopping the motor, and contrary to what one might think, has no harmful effect on the engine's insides.

The principle of flood-off is quite simple. The fuel tank has to be pressurised from the engine's crankcase, which is essential for a good run on almost all glow motors (the Cox 049 being a notable exception). An extra line feeds from the tank parallel to the feed line and leads directly into the engine's air intake (see *Figures* 1, 2 and 3).

When the engine is started up, and during the climb, the flood-off line is pinched closed, by one of various methods described below. When it is wished to stop the engine the flood-off line is opened via the timer and the tank pressure forces a liquid jet of fuel direct into the air intake to flood the motor and stop it very quickly. Very simple, and *provided there is a good reserve of fuel still in the tank,* very effective.

Now to a bit more detail. *Figures* 1 and 2 show a typical tank



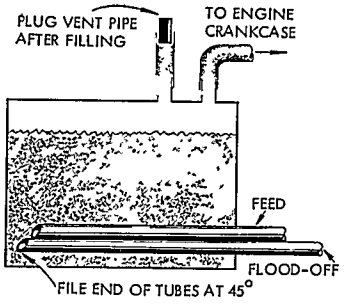


Figure 1 – tank side view

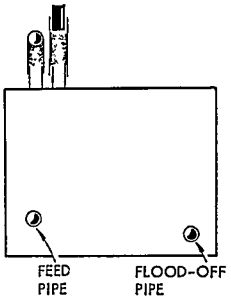


Figure 2 – tank front view

layout. The feed line and flood-off lines must run to the back of the tank (remember that the model climbs vertically when on climb) to ensure that the end of the line remains under the fuel surface. Also do not forget to angle the tubes at 45°; it helps to prevent blockages and cavitation gas pockets in the corners of the tank.

NB It is vital that there are *no* leaks in the tank; your soldering has got to be good, with no dry joints anywhere. Penalty? The engine will never run properly, one pin hole is enough!

Figure 3 shows schematically two means of injecting the fuel into the engine – the faster the better. The fuel can be injected into the top of the intake via a copper tube bent as shown and anchored in position by, for example, the engine mounting lug. A more effective, and neater, method is to epoxy a copper tube into the intake *below* the spray bar assembly. Before drilling the hole, make sure that the intake port is closed, and that the intake is well blocked with a tissue. Swarf is easily removed afterwards by washing with a jet of fuel from the filler bottle. Clean off all burrs and degrease with dope thinners or similar.

Figure 4 shows the pressure tapping on the backplate. Drill a 1/32in. dia. hole in the backplate, then drill almost through with a ⅛in. drill (fits 16swg tubing). Epoxy a ⅛in. length of tube in place after degreasing – the depression in the backplate forms a secure seating for the tube which will vibrate off otherwise.

Certain engines have pressure nipples listed as optional extras – and these are often substitutes for one of the backplate retaining screws (the top screws on the transfer port side) and are obviously very easy to fit. Another alternative is to purchase a pressure nipple, then drill and tap a backplate to suit. A touch of Loctite on the thread will prevent it from vibrating loose.

There are several methods in use for actuating the flood-off itself i.e. opening the flood-off line. All these methods use a rubber tube as the flood-off line which is sealed (squashed flat) while the engine is running, usually by a piece of wire. The engine timer releases the wire, allowing the tube to open up and release the pressure driven fuel into the engine. *Figure* 5 shows a neat and simple method of releasing the line – an 18swg wire lever is pivoted on the fuel tank and is pressed against it via the line to the timer. The lever pinches the flood-off line shut and the engine timer releases this lever when the engine is to be stopped. A neat and simple system.

Figure 6 shows an even simpler system. A wire loop attached to the engine timer pulls the line into a tight loop and prevents fuel flow. Flood-off is initiated by releasing the wire loop. Simple in principle, but not quite so easy in practice; it depends on the length and thickness of tubing. *Figure* 7 shows another system of pinching the flood-off line; the line to the timer rotates the lever assembly which pinches the fuel line shut.

Suggested uses? *Figures* 5 and 7 for an external tank just behind the engine; *Figure* 6 when the tank is inside the fuselage and there is a convenient flat surface like the side of an engine bearer handy.

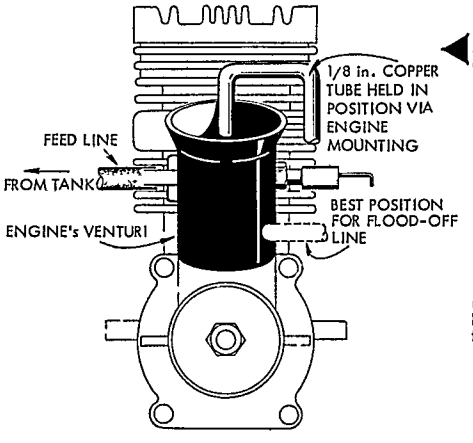


Figure 3 Front view of engine

Figure 5 using wire lever to pinch float-off line

JULIAN HOPPER'S HLG

This model has produced very good results for Julian – winning the SMAE Centralised Mini and the St Albans Winter Gala with close to a full house (five one-minute maxes). The following is extracted from Julian's letter, kindly sent to me with the sketch, re-drawn on these pages.

"After trying all the popular layouts, this one suited best, with a glass fibre fuselage and the wing pod to eliminate breakages on diving to the ground – a freqeunt occurrence when getting used to the model.

A side arm technique is used to achieve the 'swoop and away' pattern; the word 'technique' is all important and will vary from one person to another. Much practice is required!

Using a D/T is advisable after all that practice; it's easy enough to lose the model when the 'technique' is working."

The D/T used consists of a flap opening out from the fuselage to spoil the trim; more about chuckie D/T's in Martin's article next month.

N. AREA WINTER RALLY *RAF Elvington, 11th January – by Jeff Anderson*

The first Northern Area event of 1976 started with a bright and mild day, but flying was nearly impossible owing to the strong westerly wind which varied from about 25/35mph, with the dubious advantage of being very nearly straight down the 2 mile runway.

In spite of this near gale, a few brave enthusiasts were present at the commencement of flying at 9.30am. A decision was made to reduce the max to 2:30 and Russell Peers was soon away with a good flight of 2:14 in Open rubber – this plus a maximum second flight was good enough for first place in front of Keith Proctor who was unlucky in having his last flight go OOS at 1:48.

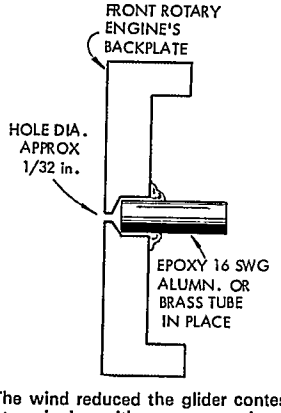


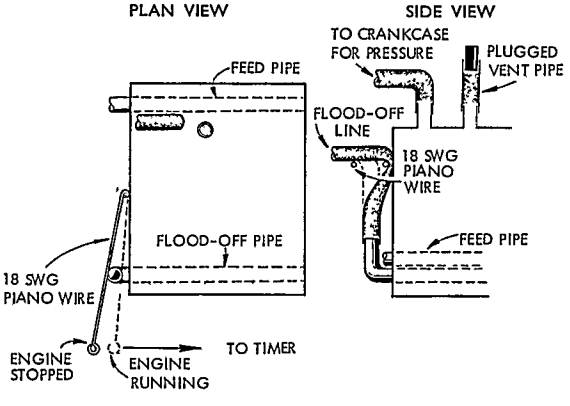
Figure 4 pressure tapping

The wind reduced the glider contest to three entries with John Carter winning with one max, and one 'minute and a bit' flight from Dave Hambley, who was unlucky to hit a 'hole' for a second flight of only 26 secs.

In power, Joe Flynn, all the way from Liverpool, put in a very consistent effort in atrocious conditions to aggregate 5:05 using a TD powered ½A model.

The Area Free Flight Champion John Godden had a 'fly-over' in mini, his excellent two minute flight with a ½A being sufficient. The elements proved too much for Brian Worthington's A/1.

Open Rubber: 1. R. Peers (Falcons) 4:44; 2. K. Proctor (York) 3:59. **Open Glider:** 1. J. Carter (Falcons) 3:57; 2. D. Hambley (York) 3:19. **Open Power:** 1. J. Flynn (Liverpool) 5:05; 2. R. Peers (Falcons) 1:30. **Combined Mini:** 1. J. Godden (Leeds) 2:00.



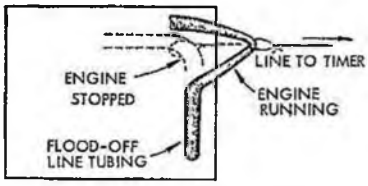


Figure 6 – tank side view.

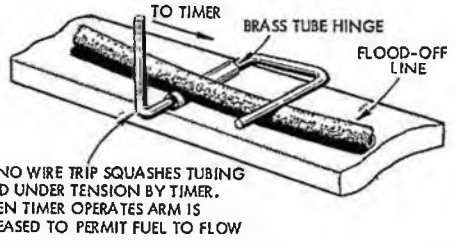


Figure 7

NE AREA INDOOR MEETING – *Sunderland, 11th January*
The first event in the NE was held at the Washington Sporting Club, the indoor training centre for Sunderland football club. The site measures 226ft. x 122ft. with a 40ft. ceiling – makes me wish it was a bit closer! Three impromptu contests, EZB, HLG and Peanut were held and considering the lack of indoor experience the standard of flying in EZB was very good. Alan Jack put in a spurt at the last minute to go two minutes clear of Ron Pollard, who won HLG after a hard tussle with outdoor exponent Ewan Jones. Ron flew a Lee Hines *Sweepette* weighing 5 grammes and the top three EZBs weighed 1½–2 grammes.

Peanut was a more leisurely affair with just three competitors and in the absence of a scale expert, the models were assessed by Terry Bailey to the following rules. Realism K=20, Workmanship K=10, plus time in seconds. These casual rules produced very close results. Apparently the indoor bug has bitten the NE with much demand for Micro X goodies!

EZB (best 2 from 5): 1. A Jack (Southampton) 12:03; 2. R. Pollard (Tynemouth) 10:03; 3. A. Clarke (Novocastine) 9:30. **HLG:** 1. R. Pollard (Tynemouth) 2:08; 2. E. Jones (Sunderland) 2:05; 3. T. Bailey (Sunderland) 1:41.

ST ALBANS WINTER GALA – *Bassingbourn, 18th January*
Overnight and early morning the weather promised to be calm, if overcast. Unfortunately the wind freshened somewhat so that by 11am the Experimental Open Rubber max was necessarily constrained to 3½ min; this remained the case for all three flights. No fly-off was necessary; Dave Hipperson putting himself right out of contention with a very off-trim first flight. Russel Peers won with a steady 10:13.

A/1 and Coupe suffered from considerable ground turbulence as was shown by no competitor getting more than one max each. Pete Stewart won A/1 without even getting one! Lift was not easy to detect, the air feeling uniformly cold most of the day. Dave Hipperson made up for Open rubber by a convincing win in Coupe by more than a minute.

¼A and HLG were both to a high standard; Julian Hopper dropped only 13 secs in HLG (best 5 from 9, 1 min max) and won ¼A with 10:00 plus a nominal flight against Bob Wells who elected not to fly-off.

Open Rubber (3 x 3.30 max, 4 entries): 1. R. Peers, 10:13; 2. J. Cooper, 9:33; 3. A. Crisp, 8:56. **Coupe** (14 entries): 1. D. Hipperson, 8:38; 2. R. Elliott, 7:31; 3. D. Roche, 7:08. **A/1** (12 entries): 1. P. Stewart, 7:53; 2. C. James, 7:51; 3. G. Madelin, 7:34. **¼A** (6 entries): 1. J. Hopper, 10:00+; 2. R. Wells, 10:00+; 3. R. Peers, 9:50. **HLG:** 1. J. Hopper, 4:47; 2. A. Crisp, 4:03; 3. M. Bull, 2:17.

RAF INDOOR CHAMPIONSHIPS – *RAF Brize Norton, 31st Jan/1st Feb*
A very cold gym (temp 42°F!) greeted the RAF flyers and a few invited civilian indoor regulars (Laurie Barr, Reg Parham, Ron Green, myself and, of course, George Lynn) on Saturday, 31st. Test flying with lightweight EZB's (0·9 grammes and less) proved impossible due to extreme low level turbulence. 'Old bangers' were therefore resorted to for trimming, and some were used the next day.

Nick Zotov put up a very impressive 2:33 flight with his re-created helicopter (designed by telephone and Reg Parham's asisstance) to stay well clear of the rather small field. Nick's flight is now a new RAFMAA record.

In HLG, model carnage was matched only by repairs with *Zap*, which was sometimes reluctant to set in the cold but dry conditions. Butch Hadland won with a very light model but only after some fierce competition. He achieved a new RAFMAA record of 2:27 for five flights.

EZB was won by Nick Zotov, beating Butch by 25 secs (his second successive RAF Champs win). The Novice section was won by Paul Channon who has only just started on indoor – he followed my footsteps by becoming an expert after his first contest!

Visitor's EZB was held for us (who were invited along to help those having problems with their models) on Sunday. Ron Green deservedly won with Ian Turner who is a relative newcomer, second. Ian has been developing EZB very extensively over the last few months and is improving rapidly; a name to watch in the future. I came third with my old 'banger' which was too heavy to be really competitive (should have flown the light one when the conditions improved). Laurie Barr's model was distinctive in having a very high pitch propeller giving him a very slow climb and letdown.

Highlight (relief wise) was of course the *Sleek Streak* scramble. Forty-eight entrants each bought a *Sleek Streak*, had half an hour or so to trim them, then into the first round. At the signal, 38 models were launched simultaneously! The first model to land was eliminated; this process was repeated at 1 minute intervals for 37 rounds to decide the eventual winner, one competitor being eliminated each round – the longer flying models therefore gave less time for winding up (by hand of course) for the next round. Ron Green and I were left in the last round, Laurie Barr having eliminated himself early on by breaking his motor – instant death! Ron won with a nice flight after I put mine into the wall! Tremendous fun, hard work for those still in, but not to be missed (must have a 'tuned' one for next year).

Last but not least was Peanut Scale. It is arguable that Peanut does not fit the confines of this Column, but it is indisputable that Peanut has been dominated by the free flight men (Butch and Laurie to name but two) to the discomfiture of some scale men. This competition was in fact a Hadland family benefit with Butch taking first two places with his *Lacey M10* (Ajax!) and his *Wittman Tailwind*. Butch's elder son, Mike was 3rd with a *Lacey M10* (Achilles!). Mike Hadland won the Junior Prize with a 3rd in Peanut, and 2nd in Helicopter.

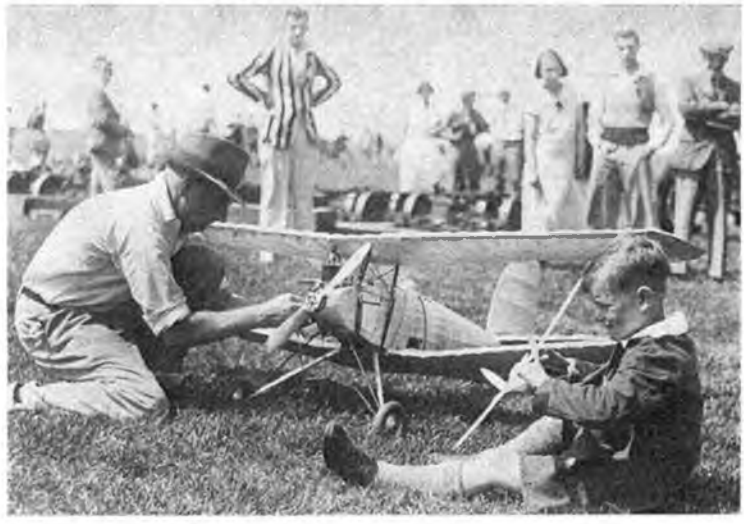
Finally, the meeting was honoured by the presence of Air Marshal Sir Reginald Hardland and Lady Hardland (who presented the prizes) and Air Commodore Eric Baddeley and Mrs Baddeley. Thanks to Nick Zotov and Butch Hadland for invaluable assistance in reporting.

HLG (*Best 5 from 9*): 1. C. Hadland, 147:0; 2. P. Channon, 131:0; 3. H. French, 124:0. **Helicopter:** 1. N. Zotov, 4:47; 2. M. Hadland 4:02; 3. J. Meaney, 0:47. **EZB** (*Overall*): 1. R. Green. 17:34; 2. I. Turner. 16:38; 3. R. Bailey, 15:30; 4. (*1st RAF*): N. Zotov, 14:24. **Peanut:** 1. C. Hadland (*Lacey M10*); 2. C. Hadland (*Wittman Tail Wind*); 3. M. Hadland (*Lacey M10*).

Anglia club member, Bob Wells, took second place in the ¼A event at the St Albans meeting with this neat, elliptical-surfaced model.

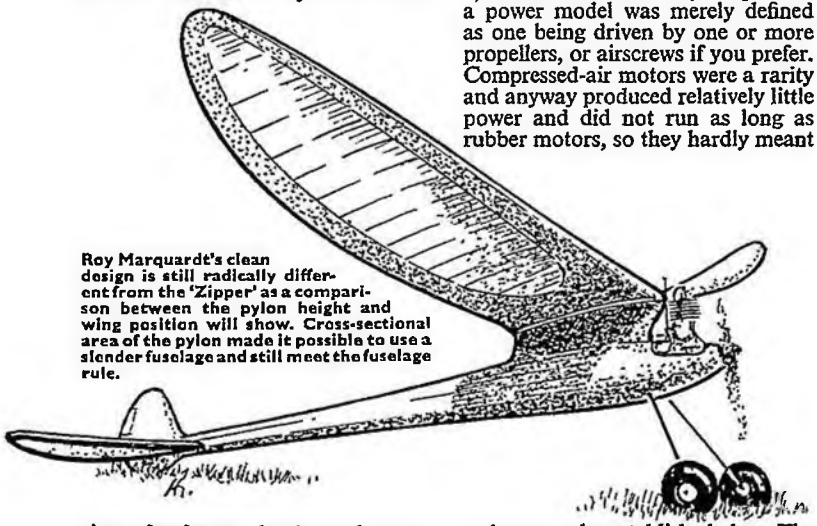
THOSE EARLY DAYS Part 3

by "Magpie" with photographs from Alwyn Greenhalgh's collection



Capt C. E. Bowden starts up the Wall 28cc petrol engine in his 7ft. 'Kanga' which set the British record at 12min 48secs in 1932 as described in the text.

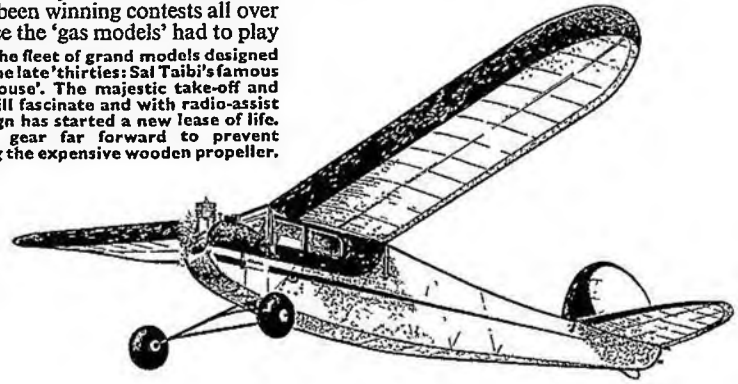
'FOOLS RUSH in where angels fear to tread . . .' The author was forcibly struck by the truth of this snippet of wisdom when he surveyed his collection of reference books and magazines, plus the notes he made for this third article. How to do justice to pre-war development in power and glider design within the space of a couple of thousand words? So let us not waste time and space on trivialities and get down to it, with the undoubted risk that much will be ignored that readers will regard as essential, and including much that they will condemn as irrelevant.



Roy Marquardt's clean design is still radically different from the 'Zipper' as a comparison between the pylon height and wing position will show. Cross-sectional area of the pylon made it possible to use a slender fuselage and still meet the fuselage rule.

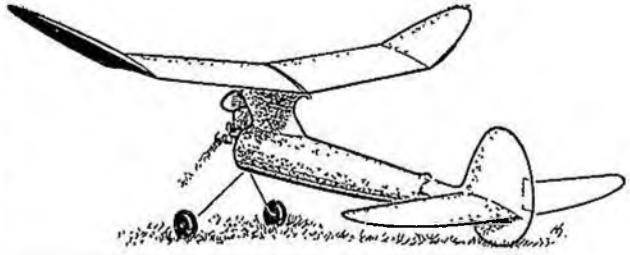
The first flight with a model driven by a petrol engine was made in 1914 by Mr D. Stanger who put his V-twin engine in his Wright-type biplane and set up a record of 51 seconds. It was only some fifteen years later that the modern 'gasoline' model was launched in the United States by Maxwell Bassett. This started a completely new class of model, and ended the absolute reign of the rubber types. The story goes that in those days contest rules were extremely simple and a power model was merely defined as one being driven by one or more propellers, or airscrews if you prefer. Compressed-air motors were a rarity and anyway produced relatively little power and did not run as long as rubber motors, so they hardly meant a threat to the established class. The internal combustion engine, however, was quite a different proposition. Maxwell Bassett only had to fill up his tank and let go of his model; the rubber boys were nowhere. After he had been winning contests all over the place the 'gas models' had to play on their own ground, the engine run being limited by stipulating the amount of fuel in relation to the capacity of the engine. Later this was replaced by limiting the engine run to thirty seconds, and when that proved to be too much, it was reduced to twenty seconds.

Seen from the perspective of some forty years, one might be inclined to regard that period as the truly glorious days of power flying. One has only to look at the Antique and Vintage Rallies, both in the States and in Great Britain, to realise the hold these old-timers have on our imagination. Many builders today are attracted by designs that are some ten to twenty years their senior. They find some intangible magic in those great models that take off with ponderous deliberation to commence their majestic climb to operating altitude. Those were the *Miss Americas*, *Quakers*, *Buccaneers*, *Bantams*, *Cavaliers*, *Playboys*, *New Rulers*, *Record Hounds*, *Buzzard Bombshells*, *Clippers* and *Guffs*, to name just some of the better known; grand designs, all of them. Manufacturers in the States realised there was an enormous market and rallied round with kits, like Berkeley, Cleveland, Comet, Megow's and Scientific. But all this



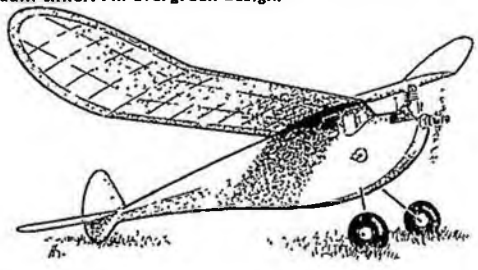
One of the fleet of grand models designed during the late 'thirties: Sal Taibi's famous 'Powerhouse'. The majestic take-off and climb still fascinate and with radio-assist the design has started a new lease of life. Landing gear far forward to prevent breaking the expensive wooden propeller.

The 28cc Wall, reduced to 56oz from its original much heavier model boat installation was almost half the total weight of Capt Bowden's 'Kanga' record holder. Ignition was kept handy on outside of fuselage!



'Zipper', the model that began it all, as Frank Zaic put it. By mounting the wing on a tail pylon, using a large 'lifting' tailplane and rearward position of the centre of gravity (wing leading-edge over the engine), Carl Goldberg was able to control a small (54in. span) high-powered model.

Bill Englehardt's 'So Long' is a typical example of the moderate span, cabin-type contest model. Pigeon-breasted fuselage and high thrustline enabled the designer to use a short landing gear. Cabins were far from empty: they housed an industrious working party that looked after the ignition. Engine cut off by means of vacuum timer. An evergreen design.

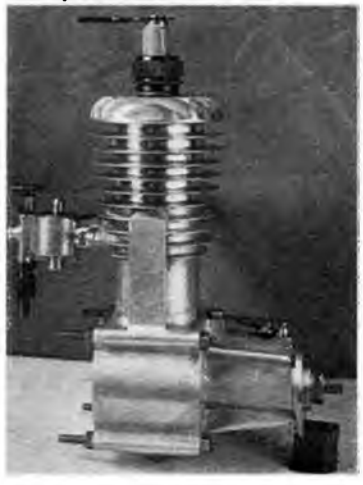


had to be supported by an industry supplying engines and these varied from 3 to 10cc or more; the famous Brown Junior, Baby Cyclone, Synchro Ace, Trojan, Elf, Brat, Husky Junior, Bantam, Ohlsson and Forster. They went into mass production and poured into the shops by the thousands.

Nothing of the kind took place in Europe, but it would be unfair to blame the manufacturers in the Old World. For one thing, the United States covered an immense territory, free from chauvinistic and restrictive elements, with a well-established aeromodelling movement supported by a sophisticated industry. At that economically difficult time one was supposed to 'Buy British', or French or German, whatever the case might be. Import duties made American engines and kits expensive. Americans could obtain their know-how from three leading journals: *Air Trails*, *Flying Aces* and *Model Airplane News*. In Europe anyone who wanted to be informed had to take in or at least consult various papers in different languages. In spite of excellent national publications – in Great Britain there were *AeroModeller* and *Model Aircraft Constructor* – the spread of technical knowledge was mainly on the national level and necessarily limited. International contests, the happy hunting ground for new ideas, only came in a few years before the second World War. Yet, even the Wakefield contests where the American wins by Gordon Light, Jim Cahill and Dick Korda clearly showed the future trend in materials as well as design philosophy, did not teach us Europeans that our methods needed revising, or at least adapting to more modern ideas. Remember how long it took for the 'lifting tail' concept to gain ground and the firmly rooted conviction that a free-wheeling propeller offered less drag than one with folding blades? But we are digressing, and should return to the power model.

All engines put on the market were single-cylinder two-stroke jobs, running on petrol mixed with the necessary lubricating and cooling oil. Being just miniature engines they needed the traditional spark plug and that implied a complete electrical system. Aeromodellers should be thankful that they no longer have to cope with the vagaries of the elusive spark. It required a coil and condenser, with the contact breaker at the front end of the crankcase; its control handle uncomfortably close to the propeller. Then one had to carry batteries and the whole outfit might well exceed the weight of the engine, decidedly so when it was a small one. To start the thing, ignition had to be advanced, but if this was overdone it could result in a most painful kick-back. If the engine was left idling with the ignition too much retarded the beautiful miniature plug oiled up, and

Edgar Westbury's 15cc Atom Minor as sold by A. E. Jones Ltd in 1932-4.



The Atom Minor 6cc, a pioneer of rotary valve induction, plans still available (PE 13, 45p through APS).

George Baster of Bournemouth MAS was well known for his "Comet" and its 30cc Grayson 4-stroke engine which dominated the front end.

out came the spanner, steel brush and cleaning rag.

Engines of 9 to 100cc were quite common, but these were by no means the diabolical power units we know today, as they delivered little more than one-quarter to one-third of a horsepower, which is what we now expect from a good 2.5cc diesel or glowplug job. The design of any model still shows characterjstics akin to those of the vicious circle, but it was probably even more so in the case of the power model of the thirties. Engines were heavy and so was the equipment, which gave one a fixed 'payload' around which the lightest possible model had to be built. Even if they had never heard of it, designers soon discovered the inescapable natural law which in simple terms states that take-off and climb performance are determined by the product of wing and power loading. When it is too high, your model will not take-off, when it is very small you will have a winged rocket. Having a considerable weight to deal with, power loading was bound to be high, so the only way to get performance was to have a large wing and that implied large tail surfaces, and a large fuselage. In short, a big model. Six or seven feet span meant quite a modest model, while eight to ten feet was no exception. Wings had some two dozen ribs with a chord of twelve to eighteen inches. Balsa was cheap in those days!

It is here that we should pay tribute to Frank Zaic, one of the best internationally known figures in model aviation, not only as a designer, but mainly on account of his amazing publishing efforts. During a period of some thirty years he has written and edited his famous Yearbooks, containing thousands of plans and hundreds of articles, many of them leading to a better understanding of the fundamental problems in the design of model aircraft. Zaic has discontinued the series, probably because the diversification of model activities has made it impossible to do justice to all the present classes within two hundred pages. Reprints of older issues are in great demand today and anyone studying the books will be surprised that so much can be gathered by one man, working without a research staff and earning his living at the same time. The shameful thing is that Zaic's Yearbooks never sold more than a few thousand copies, whereas worldwide sales *should* have amounted to tens of thousands.

While the American boom was about to start, things were happening in Great Britain. It was Captain (now Colonel, retd.) C. E. Bowden, who decided that Stanger's 1914 record had stood long enough, and this made him a true pioneer of the power model. As a keen and experienced aeromodeller, Bowden would have little trouble with the airframe, provided he knew what kind of engine he could put into it. That led to a long association with an engine-wizard called Edgar T. Westbury, who designed and built engines to put in his speed boats. His own engines were too big; 52cc with flywheel magneto and disc valve fuel induction system, but Westbury produced an old but very stout 28cc 'Wall' from one of his boats, being the smallest they could find. Bowden was obviously keen to keep the size of his model down so that he might carry it in his famous sports car. Even so, the engine still weighed 3lbs 8ozs, including 18 ounces of ignition and wiring. *Kanga* (named after A. A. Milne's story of the mother Kangaroo, because Bowden hoped the model would 'hop' when required) was a functional cantilever biplane, which allowed a lot of wing area with a modest span (7 feet), the all-up weight being 8lbs 14oz. A clockwork timer was fitted to reduce the revs to idling, while a cut-out stick would switch off the engine altogether. Throttling back was set for 60 secs. The writer is much indebted to J. E. Pelly-Fry (now Group Captain ret'd) for information regarding the duration record set up by *Kanga* on Whit Sunday of 1932. Both he and the late Richard Langley, official timekeepers of the SMAE were present. Although a beautifully smooth surface, the grass at Fairey's aerodrome, Heathrow (now hidden somewhere under that vast concourse of London Airport) was still too long for the specially made Dunlop wheels and the motor tended to cut out because the stick hanging down was being brushed by the grass. With the use of a lawn mower and by dint of a lot of pushing they managed to cut a strip about 30 metres long by 8 to 10 metres wide.

The classic Carl Goldberg 'Sailplane' as flown by Ian Lucas of Brighton with Super Cyclone, was kitted by Comet.

Who'd have guessed it? Frank Zaic at the Detroit Nats in 1936 (left). Frank went on to tour the world and become a leading chronicler with his annual 'Year Books. (Sold through Modellers Den). Right, is Ian Lucas and his Stellasphere (1939), one of SMAE's longest serving officials.

Away went *Kanga*, taking off after a run (from memory) of only about ten metres. With the timekeepers available, complete with stopwatch, a record was officially declared. It somehow just happened. The time was still a modest 71 secs, but it would soon be improved upon. Pelly-Fry recollects that hardly anybody else was there, which is why the account in *The Model Engineer* (that splendid journal which gave so much space to aeromodelling) quotes Warrant Engineer H. Harris, RN (ret'd) as being the witness. Later that day, Pelly-Fry produced his new rubber-driven model *Stork* (because of its long undercarriage) and made a first flight of 89 secs.

Col Bowden followed up *Kanga* with a large number of designs, such as the *Blue Dragon*, the *Bee* (15cc), the *Kangette*, the *Gull* and many others, including flying boats. But we should return to more general aspects of design in the later thirties.

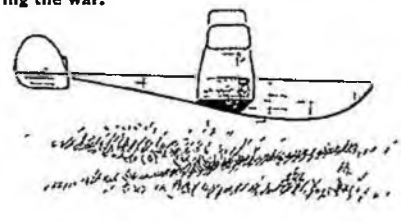
One typical design feature which applied to all models, (rubber, power and gliders), was the use of fairly thick airfoils, say 11 to 13 per cent. The magic section was RAF 32, but Eiffel 400, NACA 6412, various Goettingen types and the Grant series were running it very close. Undercamber was modest to modern eyes. Two factors influenced the choice: generous spar depth and the reputation that they were 'high-lift' airfoils. Few people realised that, although this was true for fullsize work, the model wing stalled far below the peak of the lift curve plotted for high Reynolds Numbers. The later Goldberg G-2 and G-5 airfoils as well as NACA 6409, with more undercamber and less maximum depth, gave an indication in which direction the trend would go.

With steady development, engines began to produce more power and duration contests would obviously favour the model that was capable of the longest glide after the engine stopped, which implied a high rate of climb. It was found that the standard 'cabin' layout on the lines of the sports model, was not suitable to deal with that power and torque when designed as '*the lightest model around the biggest engine*', which is what a high ceiling demanded. Gradual development, both in Nature and the handiwork of Man, is sometimes interrupted – or assisted – by a sudden jump forward. This was certainly the case when Carl Goldberg produced his *Zipper*, the model which, as Frank Zaic put it was '*the beginning of it all*': controlling high power on small models. It had a low aspect-ratio eliptical wing on a tall pylon, a short moment arm of the large tailplane and the CG at around 100 per cent, much further back than most designs. Climb was a very steep, righthand spiral. It was only after the War that this formula spread all over the world, but the short moment arm developed into a very large one. It was an amazing effort, and a real breakthrough.

The development of gliders followed a quite different course. Before the German designer Horst Winkler invented the tow-line launch with the towing hook fairly close to the CG, gliders could only be flown from slopes. It now became possible to fly them from flat country and they soon became popular all over Europe. Even countries with hills and mountains have many flat areas! Germany undoubtedly led design thinking during the initial period, but national trends soon appeared.

One of the most popular models was the *Big Winkler*, a very functional affair with profile fuselage, most suitable for a beginner in spite of its six feet span. A smaller *ab-initio* type, built in thousands, was the Kirschke *Baby*. Much more sophisticated and better looking were the *Strolch* (Tramp or Vagabond) and *Oskar Gentsch*. Models were large, six to ten feet span and construction was mainly hardwood, three ply, cane and silk or heavy paper covering. It took some time before balsa was used for wing ribs. The large size led to good performance in spite of modest design refinement like high aspect ratio. With the CG at around the quarter chord position, longitudinal stability was generally poor and in turbulance many models refused to return to an even keel. It took much time before designers began to see that the 'lifting tail' with the CG around 50 per cent also worked well

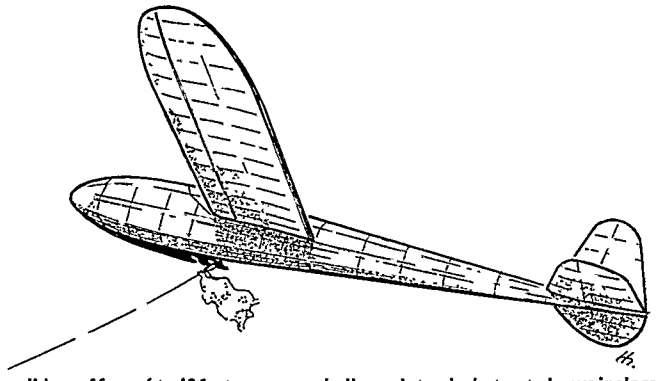
A very approximate sketch of Horst Winkler's 6 foot functional glider which introduced many aeromodellers in Germany and neighbouring countries to the pleasures of towline launch. It may be said that from that time on gliders became the dominating class on the Continent. Lack of rubber and bans on power flying greatly helped glider development during the war.



Maxwell Bassett's 6ft Red Zephyr kitted as 'The Champion of France' by Scientific, cost $6.95 (less motor!).

with gliders. Duration soared, literally, and with towlines of one hundred metres (333 feet) that is hardly surprising, but in the end there was little joy to be had in seeing the result of many months of building effort disappear into the clouds for a fly-away, even if it did mean winning the contest. It was Goldberg again who created the solution with his tip-up tailplane, but that was not generally adopted until after the War.

There was only one International model sailplane contest before the War. King Peter of Yugoslavia had offered a cup to be flown alternately with rubber models and gliders. In 1938 Great Britain had won the rubber event, so the SMAE had to organise the glider contest in 1939. Flying took place at Fairey's Heathrow Aerodrome, eight national teams taking part. The good people who framed the rules were doubtless well-intentioned, but the result was regrettable: points being awarded for height, distance and duration. Through no fault of the organisers there was insufficient height-measuring apparatus, which caused much delay and the distance factor was dependent on the chance that the model would be found miles away, so a lost model meant loss of valuable points (and the score was not only influenced by thermals, but also by a favourable wind). In the end the French team won with Great Britain second and Germany third, but it did not show up the real potentialities of the models.



Pre-war gliders of from 6 to 10 feet span were bulky and sturdy, but not always inelegant. Fairly thick airfoils were used and construction was mainly of hardwood and threeply. Centre of gravity was usually at the quarter-chord line which could lead to longitudinal stability problems. There was a widespread belief that a battery of towhooks was needed for different conditions: the stronger the wind, the more forward the towhook to be used. It took years to discover that this was a fallacy and one single hook should suit all conditions.

The first International Contest for the Bowden Trophy was won by Carrol Krupp of the USA, whose model was proxy-flown by his countryman Herbert Fish. This interesting event, the only one in which maximum duration played no part at all, did not really become international until after hostilities ceased, so we will deal with it in the fourth and concluding article.

READERS LETTERS . . . .

Dear Sir,

What a very pleasant surprise from the postman this morning – that March issue of *AeroModeller* with (if I may say so) that dramatic picture of 'Clodhopper II' on the front cover.

It certainly made fascinating reading; I am tempted to say that overworked word 'nostalgic', but in truth as it all seems not so very long ago (whereas in reality it is – wait for it – some 45 years ago) I personally do not feel particularly nostalgic.

Apart from some technicalities which I hope to comment upon later, there are other elements of those early days which perhaps the current generation of aero-modellers would be interested to hear about.

Few, very few, of us were blessed with a motor car. We not only had to design and build a model for a particular purpose (like the Wakefield) but we also had to do the same thing in the form of a suitable box in which to carry the precious object on a bus or train. My own journeys from Kensington to Wimbledon, to Fairey's aerodrome, to Halton, to Hendon aerodrome and other venues, clutching a large box, were almost as full of incident as the assembly, testing, and then the competition flying itself. That done (and hopefully with a win for one's efforts) there was always the journey all the way back home.

When I found myself, at the ripe old age of sixteen or so, on the Committee of the SMAE, you can well imagine that I felt that I was a real and substantive aero-modeller. Richard Langley, Ralph Bullock (the greatest, to my mind), W. E. Evans, D. A. Paveley, Mullins, Dr A. P. Thurston; we used to meet at various places, the one I remember most being a private room in Joe Lyons' Corner House in Tottenham Court Road. And after the meeting, downstairs to 'The Club' to have a coffee and a bun before getting on the bus home. Halcyon days!

Bullock and I accompanied Sir Sefton Brancker one evening to a place of learning called Eton. The then Director of Civil Aviation gave a talk to the boys after which Bullock and I gave a demonstration of indoor flying which included Bullock's 'featherplanes'. I wonder if anyone has since used natural birds' feathers for an indoor model? Wingspan was about 6-12 inches mounted upon a thin spruce stick. Bullock's flair for all manner of design was fabulous.

Magpie mentioned the Frog models. The Brothers Wilmot (of Wilmot Mansour Ltd) once challenged me to produce an outdoor model of about 12 inch span that would actually fly satisfactorily. The result was the P-F seaplane (later put on wheels) which I got out of its box at Hendon one Saturday afternoon, much to the amusement of the old hands. Oh well, nothing ventured! A short semi-glide, wound on a couple of hundred turns, maybe more, and off she went to stay up for something like 40 seconds. To say that I was elated is an understatement. The tendency for 'wing rocking' was later cured by a small fin underneath the tailplane in the float version. Twin skeins of rubber were coupled together thanks to a friendly watch repairer who supplied the gear wheels. By sheer chance (I'm sure), the 'Frog' appeared on the market; and they made the fuselage of two pressings, like an Easter egg, liké the young men suggested. (*The Frog Interceptor – Ed.*)

Van Hattum came into my life one day at the Model Engineer Exhibition. A typical Dr Livingstone meeting; "Pelly-Fry I presume?" We both laughed because each thought the other was at least 40 years old! (How could any aeromodeller write articles for the *ME*, the *Boys' Own Paper, et al*, who was actually under 20 years of age!). Almost fifty years later, unhappily, with that tiresome war in between, we still communicate and see each other. Still the endless discussions, the debates, the massive correspondence.

Some points about the Magpie article. Purely from memory, I think that the 1932 Wakefield was declared void because it took place outside the time-scale provided in the rules. It might well have taken place, for example, too late in the year. Heaven knows just why that kind of rule was in force; whatever it was, it was no fault of the competitors, and probably an embarrassment to all concerned.

The '200 yards in a straight line' I think was a noble but silly attempt by the UK old hands to try and penalise what they called the 'paper bags' from the USA and thus force our cousins to make 'proper model aeroplanes' like the British. Just the same, Gordon Light's elegant model (which I enjoyed flying on his behalf) seemed to have no trouble in this regard. You just put on a few turns, enough for the purpose trimmed her to go straight to pass the test, and then trimmed her again for the real thing. In 1933 Kenworthy was lucky and caught a thermal; Tony Willis and Gordon Light's models did not – and Tony beat the USA into third place by three-tenths of a second!

Meanwhile, there is no doubt at all that the art of aeromodelling has advanced beyond all recognition; and what is so heartening is the fact that the participants have multiplied in equal measure. Nowadays it all seems highly organised, highly competitive, highly sophisticated, and global. Dammit! As likely as not you even need a dinner jacket to attend the prize-giving. Folks, that's REAL progress.

With best wishes and again my thanks

James Pelly-Fry

Sherborne, Dorset

CLUB NEWS

A WEIGHTY POSTBAG this month, so let me weigh in straight away with our first report. This comes from the **Stanbridge** AMC which could be described as an extra curricular activity of the Stanbridge Earls School, Nr Romsey, Hants. Tarik Wildman, who describes himself as Sec, PRO and Gen. Menace, informs us that the 10-15 membership is mainly concerned with free flight sport and glider, but do have an occasional trauma with handle and button. The young clubsters were fortunate in having an experienced F/F modeller Stan Waterman working in the school. He not only helped start the club but also gave the lads some of his models, A/2s etc, to get them off the ground. Not that they are all that short on models; they have no less than 23 of such in airworthy condition, ranging in size from a 36in. Veron *Classic* to a 118in. Graupner *Cirrus*. No mention in the report where they fly this wealth of model craft – we can only assume it's the school grounds.

Still with the accent on youth, we get something of a lament from Mr P. A. White of Shrewsbury. His earlier appeal to aeromodellers in the **Shrewsbury** area, which we published, did not get the sort of healthy response we like to think our epistles evoke. Mr White is still determined to form a club, and is intrigued by the lop sided equation that exists between the apparent dearth of aeromodellers in the area and the rapidity with which the local newsagent sells out the *AeroModeller*. Perhaps some of those selfsame gentle readers might now get the message and drop a line to Mr White at 167 Monkmoor Road, Shrewsbury, Salop.

Not so much a club, more a way of life, is how you might describe such competition groups as the **Crookham Contest Modellers.** We are informed by Mr R. C. Uden that although the club is relatively small, 14 members in all, most of them are active contest flyers, with the knack of lifting the odd pot or two. During 1975, around the contest scene: the Nats, SMAE events and sundry galas, they notched up six first places, seven seconds and nine thirds. These included 1st in F1C by Jack Allen at the Nats, and successes by Pete Stewart and Fred Chilton at the Sculthorpe two day meeting. There were also fine performances from Gary Madelin and Cliff James. All of which effort gained the club 8th place (out of 42) in the *Plugge Cup*. Sad to say, Jack Allen, the club's stalwart Chairman, is re-returning to the Brighton club, and hanging up his legs – or, in other words, taking up Thermal Soaring.

According to the report from the PRO, of the **Elliott Model Engineering Club,** Mr D. J. Chambers, 1976 is to be the 'Year of the Novice', with two new glamorous trophies to entice the initiate into the contest arena. One of the awards, the Elliott Goodyear Novice Trophy, will go annually to the highest placed team starting out the year as novices. 1975 winners were McMahon/Msyska of Wolves, proving that it's not just a parochial benefice. The other award is for speed, which Ivor Roffey will be donating for the best performance by a newcomer at the Elliott April Speed Meeting. Like old soldiers, old modellers have a way of fading away, and to keep viable, particularly on the contest field, a club must regenerate itself with youthful talent. Back again to speed we get the quote of the month from speedman, Mike Billinton, who says that "*Team Racing is far too athletic*". Odd remark, this, since chasing a 180 mph model around the yoke is one way of training for the hop, skip and jump championships. If you don't believe it, give it a twirl. Generally, the active membership of around 40 divides its time nicely between the four deadly sins: Stunt, Speed, Team Race and Combat. And watch out for the eight Goodyear teams the club is fielding this year.

Plenty of C/L enthusiasm out Norwich way, too, where to find the **Broadlands Control Line Group** looking after the rotatory interests in the area. Norman Ashford, the PRO, who sends this report, happily informs us that the club has two local park sites between which it sensibly alternates the weekend flying. But it's not all home patch stuff, for even now the 1976 Display Team is limbering up for the coming season. Spectacle is to be provided by Slow Combat and Formation flying with throttled models of WWII aircraft, and a few twin engined jobs hotting up the pace. Still away from home the contest flyers have been active around and about. There were several placings in 1975, with a notable victory by Mike Jacobs in Combat at the Eastern Area C/L Gala. The 50 or so members meet at the YMCA Building in St Giles Street, Norwich on the first Thursday of each month. New members welcome.

Modellers are noted for their love/hate relationship with the weather, and it's more hate than otherwise when you get your club champs blown and washed out, the fate of the **Bilston MAC** (West Midlands). It was the final rounds of the club champs which got the heavy treatment from the weather, leaving the champs table with Phil Baldwin top, John Marsh second, and Robin Clews, the PRO, who sent in this report, equal third with Dave Holmes. Behind this drama yet another, darker one was developing. The clubroom landlords, the Church, applied to put a new building on the site, but along came a preservation order, saving yet another ancient monument – the clubroom. Membership small but increasing, and Mr Clews would be interested to hear from you at 1 Arthur Street, Bilston, West Midlands.

Wondering a month or two back what had happened to that steady flow of newsletters from the **Buckaneers Model Club,** we are now apprised of a few relevant facts by PRO Mike Parrott. Seems Pete Smoothy was the voice of them all, but due to domestic troubles and business commitments he had perforce to hand in his pen and ink. His successor hopes to find enough time from the prime business of flying to drop us the occasional line. The club, he reminds us, is situate in the new Bucks town of Milton Keynes. There is a steady influx of new settlers, not a few of whom find their way into the club. This has helped push up the club membership to a wowing 150. Is this saturation point? But no. A few more placings yet before the notice goes up, "*The Buck Stops Here*". Club interest is mostly fly for fun radio, but there is now a little Peanut Indoor and a Club 20 team. The C/L side comprises the one man wizard of the lines, Jim Mannall. The club has three fields. Fly when you like on two, but watch out for the scrummages on the Rugby field. The old meeting place, the Old Church Hall, is out due to a swingeing increase in fees, and now it's every third Wednesday of the month at the Village Hall in Bletchley.

Why have our newsletters not been featured of late, asks an aggrieved **Three Kings Aeromodeller** note. Pure accident, we answer, and right away make suitable amends. But what heresy do I find being discussed by hardliner control liner Wal Cordwell? Nothing less than radio augmented C/L flying. Seems you can get more functions functioning this belt and braces way. Not much point to it in general flying, but could have its place in the display side of things. Radio, of course, has a way of picking off C/L flyers, ten green bottle fashion, and cur-

rently is making piratical forays into Croydon Airport territory. But in spite of the glamorous lure of radio the C/L circles are not short of an aficiendo or two, and, as the Comp Sec points out, they mostly get involved in contest flying, sooner or later. Testifying to this is the published league table for the *Doug Blake Trophy*, showing Dick Large topping a 22 strong list.

That Northern group of committed C/L flyers the **Wharfedale & D Aeromodellers**, have done themselves proud with their club magazine, *The Circle*. Nicely presented inside an attractive cover, the issue to hand does not lack for content. Surprisingly, we find the club not nearly so wire-bound as we supposed, for in the pages there is a generous larding of R/C gossip, plus a plan of that common instrument of C/L relaxation, a chuck glider. There is also a nice spread given to that other popular sport, the Nostalgia Stakes with the Chairman recalling the Flintstone days of the 1940s when kite and model flew bravely in the same uncluttered air.

Briefer coverage in the small but attractive *Fellside Falcon*, newsletter of the **Penrith & DMC**. Among other features there is a cautionary tale of an R/C model coming to a bucolic demise, all in local dialect, and the club statement of accounts shows a slight amount of money in hand in spite of very low club fees.

The renascent *Northern Area News* continues to do a useful job for the Area. This month we are reminded that all model flying is risky, but you compound the hazards when facing up to the blasts and rigours of winter. You can be lucky with your winter events, but the Area Rally on 11th January got the full works, only the doughtiest of flyers trying to get airborne. Full marks to the people who risked models to make a go of it. Back again to the sticky issue of club displays. Some clubs find it hard to rustle up a couple of old C/L Stunters for the occasion, but it seems the Pontefract club can be more selective. It has a system of awards for increasing levels of R/C competence, and not until you have reached the Silver Bar standard are you eligible for the display team.

Particular moan in the **Leicester MAC** bulletin is all the perks and support model flyers receive in most other countries at local and national level compared with the nil support and nil interest of the powers that be in Britain. In certain countries you can become a National Hero, a Master of Sport and all sorts of ego boosting things by shining on the international stage. We in this country, are expected to do our own thing in our own way, and since we have initiated most of the sports and pastimes that keep people from fighting each other throughout the world it couldn't be such a bad thing. Any perks you do get come ultimately out of your own pocket.

Clubman

Contest Calendar

March 28th	**OUTLAWS FAI COMBAT RALLY.** Pre-entry 50p to R. Wilkens, 'The Laurels', 3 Rack End, Standlake, Oxon. Trophies 1-3. Venue: Next to A415, 5m SE Witney.
March 28th	**INDOOR MEETING** EZB, HLG, Peanut. Hall size 226 x 122 x 35ft high. Venue: Sporting Club of Washington (nr Washington North). Beginners, experts, juniors welcome. SMAE members only, soft footwear essential. Details: J. Anderson, Durham 68493.
April 4th	**S.E. AREA INDOOR MEETING.** Peanut, EZB, HLG, CO_2. Pre-entry 60p/event, juniors 30p. Hall size 120 x 105 x 30ft. Venue: Crawley Sports Centre, Haslett Ave Crawley, Sussex. SAE for details/entry forms from A. C. Grantham, 'Woodlands', Redehall Road, Smallfields, Horley, Surrey or 'phone A. C. Boyle – Horley 3664.
April 4th	**ST ALBANS MAC C/L STUNT GALA** at Henlow, Beds. Details of venue from Ted Fowler, 38 Groveside, Henlow, Beds. Tel: Hitchin 811017.
April 4th	**ELLIOT C/L SPEED MEETING.** All classes handicap speed plus 'Best Newcomer Award'. Details: I. Roffey, 283 Burnoak Lane, Sidcup, Kent. Venue: Elliot Bros, Rochester Airport, Kent. (A249 off M2).
April 11th	**ST ALBANS R/C THERMAL SOARING.** Venue: Nomansland, Wheathampstead, Herts. Limited entry. 10.30am start.
April 11th	**SMAE SCALE TEAM TRIALS.** FAI R/C and C/L at Little Rissington, Gloucester.
April 11th	**GLEVUM COMBAT RALLY** at Townham, Glos. 50p pre-entry to M. Lewis, 16 Tilnor Crescent, Norman Hill, Dursley, Gloucester.
April 18th	**SMAE C/L MEETING.** FAI T/R, Class B, Rat, Speed, Stunt, Combat. Venue: T.B.A.
April 25th	**BUCKANEERS C/L STUNT GALA** at Bronham Hospital, Nr Bedford. Details: J. Mannall, 27 Kestrel Road, Bedford. Tel: Bedford 52960.

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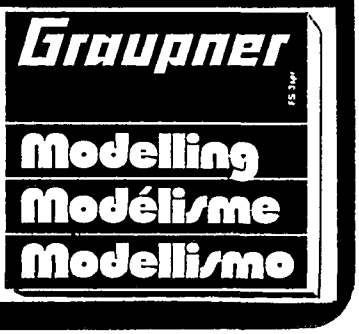

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