Aero Modeller

NOVEMBER 1976
30p
U.S.A. & Canada $1.25

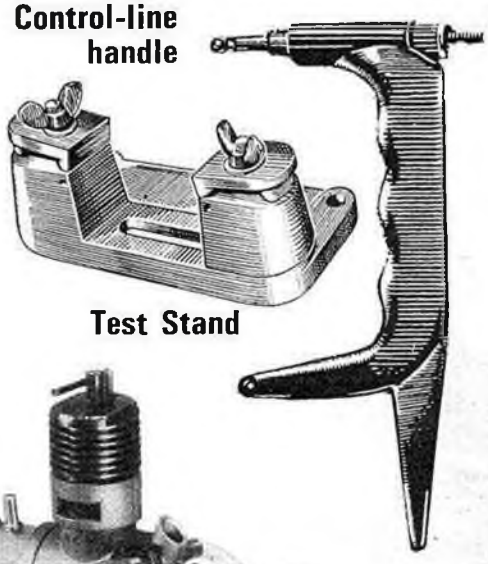
INCORPORATING
MODEL AIRCRAFT

MAP HOBBY MAGAZINE

QUICKSTART

DART
.5 c.c.

WASP
.8 c.c.



Control-line handle

Test Stand

The Motors for the Modern Modeller!

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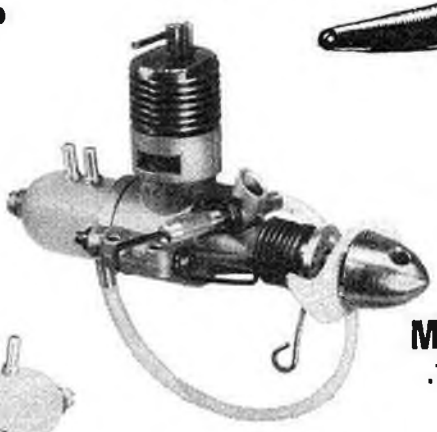

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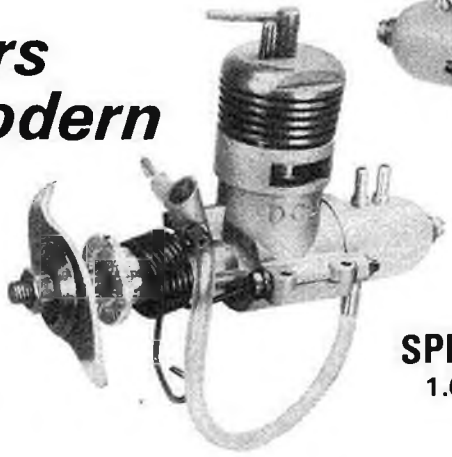

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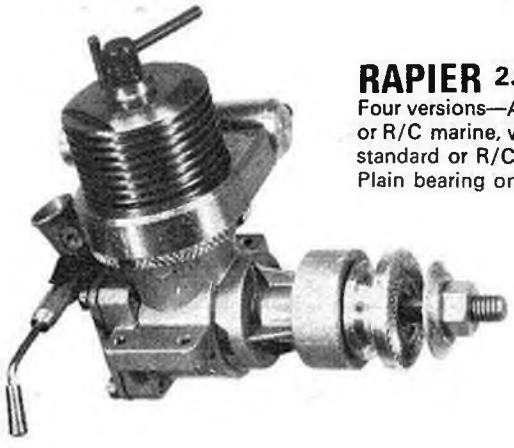

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(S)

SOLARBO

The unorthodox is always a challenge that interests many aeromodellers. Just to design – and build – something really out-of-the-rut. Almost certainly it won't fly 'off the drawing board' (or right out of the kit box) – but getting it to fly at all can be an extra achievement. We don't know how this model fared, but we'll bet the designer got a lot of satisfaction bringing it to flight-testing stage.

That's where Balsa comes into the picture, too. The ideal airframe material for one-off designs since it is so easy to fabricate – and a pleasure to work with. And everyone knows that 'Balsa models fly better', even when the aerodynamic design is unconventional! The better the Balsa you use, the better your chances of good flying results. Taking chances with unorthodox designs can be fun. But never take chances with Balsa quality. Always specify Solarbo!

SOLARBO BOOK OF BALSA MODELS, price £2.50 from your model shop or bookshop; or £2.70 post paid direct from Solarbo Ltd.

Incidentally, the SOLARBO BOOK OF BALSA MODELS also covers unorthodox projects – like making a radio from a Balsa breadboard, a slide rule, windspeed indicator, etc. There are quite a number of simple aircraft and other working model plans, too. Just the things to get 'junior' interested in, and build up his skills in Balsa modelling so that he becomes a better aeromodeller!

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For Motors up to 1·8cc (.11 c.ins.) or Electric

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Aero Modeller

INCORPORATING
MODEL AIRCRAFT

November 1976 Volume XLI No. 490

CONTENTS

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Editorial Director **D. J. LAIDLAW-DICKSON**
Managing Editor **R. G. MOULTON**
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Comment

The chase for silent flight progresses a few stages further with the arrival of initial production PMS-1 CO_2 units from Humbrol. With two of these intriguing little motors on the British market and a rapidly developing trend towards electric power and the radio controlled thermal soarer, our ecologists should have less to complain about in future.

Very latest breakthrough in this scene is the achievement of first radio controlled solar-cell powered flight by the Graupner *Solaris* on August 16th. Several experimenters have been working on this challenging concept, which uses an array of solar cells to convert the properties of light into electrical energy. The combined talents of Hilmar Bentert (who devised the first solar cell array) and Fred Militky as designers, backed up by the expertise of the Graupner/Grundig team of engineers, produced a model of 81ins span, weighing 21½oz which would fly on a 10 watt output through a special Faulhaber Micro motor. Three flights, each lasting 2½ minutes, with a climb to 50 metres will be acknowledged as an outstanding achievement.

Regrettably, within a month of the successful flights, Fred Militky succumbed to his serious illness, as reported in 'Hangar Doors'—this issue.

on the cover

For the second successive year, the Class B team racing event at the Nationals fell to a French team—on this occasion Uzan pitting for pilot Surugue. Motor is a sleeved down OS40 Schnuerle giving an airspeed of around 130 mph with its John Gray propeller. Note how a simple 'squash bottle' is used for re-fueling, instead of the more usual, and complicated, pressure system.

next month

Special bumper Christmas issue! No less than *FOUR* full size plans (two Mini Goodyear racers and a brace of Peanut scale designs) plus a construction feature on that mammoth control line stunter—Brian Dyke's superb, near-scale Stuka! Other informative articles and regular items combine to bring you an extra special December issue—on sale November 19th. Don't miss it!

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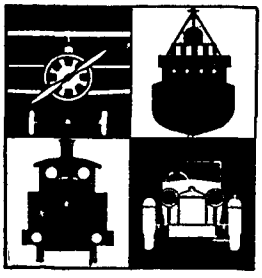

46th Model Engineer Exhibition

JANUARY 4—15th 1977

(not open Sunday)

At Wembley Conference & Exhibition Centre

LOCOMOTIVES, BOATS, AIRCRAFT, TRACTION ENGINES, MILITARIA, WOODWORK, CRAFTS

WHERE?

The Model Engineer Exhibition is moving to Wembley, and will be the first public exhibition to be held at the superb new Wembley Conference and Display Centre. If you've been through Wembley recently, this is the huge circular building on Empire Way, between the Empire Pool and the Squash Centre on one side, and York House and the London Esso Hotel on the other, all within a stone's throw of the famous Stadium.

As we have previously mentioned, the display area occupies two floors; these are at the rear of the Centre, reached through the main front entrance or, at extra busy times, through a second entrance at upper floor level, reached via a pedestrian walkway. Automatic ticket desks are expected to be in use at the main entrance, which should reduce queueing time to a minimum; any brief wait would be under cover.

WHEN?

The opening dates are Tuesday January 4th to Saturday, January 15th, 10am–8pm daily, except the last day, when the Exhibition closes at 7pm. It is not open on Sunday the 9th.

HOW . . .

Much to go in? Admission at the door for adults will be 50p, children over 5 and still at school 30p, prices inclusive of VAT. Under 5s not yet at school are not charged.

Pre-booking tickets are available and avoid waiting. Single price for small parties of up to 10, adult 45p, child 25p. Parties of more than 10, adult 40p, child 20p. Teachers in charge of parties free in ratio of one per 10 in party. Family tickets are also available (in advance only) at £1.25 for two adults and two children plus 20p per extra child.

Visitors arriving after 7pm will be entitled to entry at 30p. Season tickets are not normally available but the Exhibition Manager may be prepared to make specific arrangements in special circumstances.

TRAVEL

Rail travel to Wembley is available from Euston and Marylebone, but most travellers by public transport will probably use the Underground service; both Bakerloo and Metropolitan lines (via Baker Street) serve Wembley Park Station, which is five minutes' walk away, along the same road. Wembley Central Station is a little further away and has a limited Underground train service, but is an alighting point for some Birmingham/Euston main line trains.

By road, Wembley is easily reachable, lying only a minute or two west of the North Circular Road. Local permanent signposting to the Wembley complex exists over quite a wide radius, and although peak-hour traffic on the main roads in the vicinity can be quite heavy at times, it really is quite simple for drivers unfamiliar with London to reach the Exhibition without driving through the more confusing parts of the city.

There are extensive car parks adjacent to the Centre, and most people are glad to pay the modest charge for the convenience of parking close and without the worry of meter time running out. Coaches coming to the Exhibition only should make this clear, preferably by displaying a poster in the front window, otherwise they may be directed to the Ice Show coach park, which could mean that the coach could not be driven out until the end of the current performance.

CATERING

Wembley has extensive new catering facilities in the Centre itself ranging from a tea/coffee bar to alcohol bar on the Exhibition upper floor to a snack and light refreshment bar and an attractive restaurant on the next floor. Prices and quality will, we believe, prove attractive, and group or party arrangements can be made in advance by writing to the Catering Manager, Wembley Conference Centre, Wembley, HA9 0DW.

COMBINATION TICKETS

Details are given elsewhere of facilities available for combination rail and accommodation 'packages' offering two nights in a choice of hotels plus rail fare and Exhibition entrance. These represent good value and offer an opportunity of, in effect, a three-day trip which could be used to take in that long-promised visit to, say, the Maritime or Science Museum etc, as well as a West End theatre or even the Oxford Street sales.

Clubs and families may like to know that details are being finalised for combination tickets covering the Exhibition and the adjacent Ice Show; this year it is 'Sleeping Beauty on Ice' and these Wembley spectaculars have a well-deserved reputation for quality and entertainment value. Unfortunately, it will not be possible to offer reduced combination tickets for Saturdays, but there are three Saturday performances of the show if the families want to go there while the modellers spend the time in the Exhibition.

OTHER ATTRACTIONS

With cinema and theatre facilities available in the Centre, film shows, talks and demonstrations of interest to Exhibition visitors are being arranged. What is on, and when, will be displayed on a board at the MAP stand and tickets will be available (at nominal cost only) to ensure that enthusiasts can reserve a seat at the feature of their choice without wasting time in queues. Full details are still to be finalised, but it is expected that talks and demonstrations on such subjects as lost wax casting, woodworking, boilermaking and the like will be taking place, plus railway and aviation films. These are in addition to the many demonstrations which will be taking place on some of the 132 stands, including lathework, brazing, milling, and other workshop practices, lapidary, enamelling, wargames, miniature weapon-making, cart making, wood turning and machining, boatbuilding – a real feast of how to do it.

There is this year a special Woodworker 'show within a show' where expert advice on hand and power tools, and all aspects of carving, machining etc, will be displayed. This time, too, the demonstration area for electric flying models is at floor level, and this will permit the operation of R/C vehicles from time to time.

Many standholders have booked space for the first time, adding to the variety and choice of tools etc; they include model retailers, small gauge model railway suppliers, small lathes, specialist tool merchants, and so on.

Lots to see, lots to learn, lots to buy – you just can't afford to miss this 46th Exhibition!

Advance bookings and details from the Exhibition Manager, M.A.P. Ltd., P.O. Box 35, Hemel Hempstead, Herts. HP1 1EE

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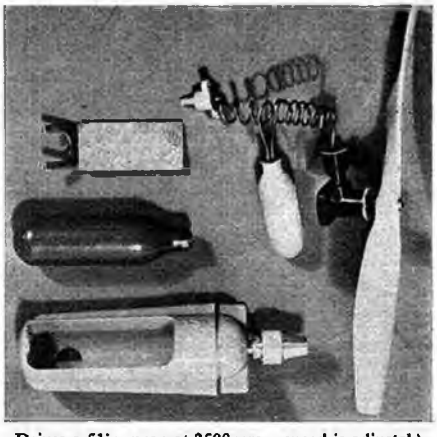

Drives a 5½in. prop at 3500rpm – speed is adjustable to suit conditions and model size and weight. Weight of motor, gas tank, tubing and recharge nozzle only ¼ ounce.

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The TELCO CO_2 MOTOR is supplied with tank and recharge nozzle connected, plastic prop, spanner for speed adjustment, special Sparklet bulb holder and one bulb. **£8.45**

*7 (or more) refills from 1 SPARKLET bulb.

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J.R. MORGAN

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J.R. BUCCANEER (*above*)

Designed by Vernon (Rat) Hunt, twice *consecutive* winner of the combat event at the British National Championships, so naturally this 32in. span model can hardly help but be a winner! Although a top performer, it is equally suitable for the non-expert and features strong yet simple construction. Use a 2·5-3·5cc engine. A contest (or sports) model for only **£4.60**

J.R. LONG JOHN SILVER

Slightly more advanced — 30in. span tow-line glider with a fine flying performance. Very clear, detailed plans and instructions will help you to rapidly build this simple but attractive model which features tissue-covered wings and fuselage. Price is **£1.75**

STOP PRESS

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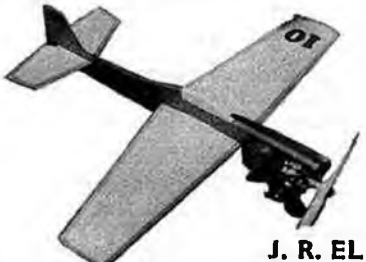

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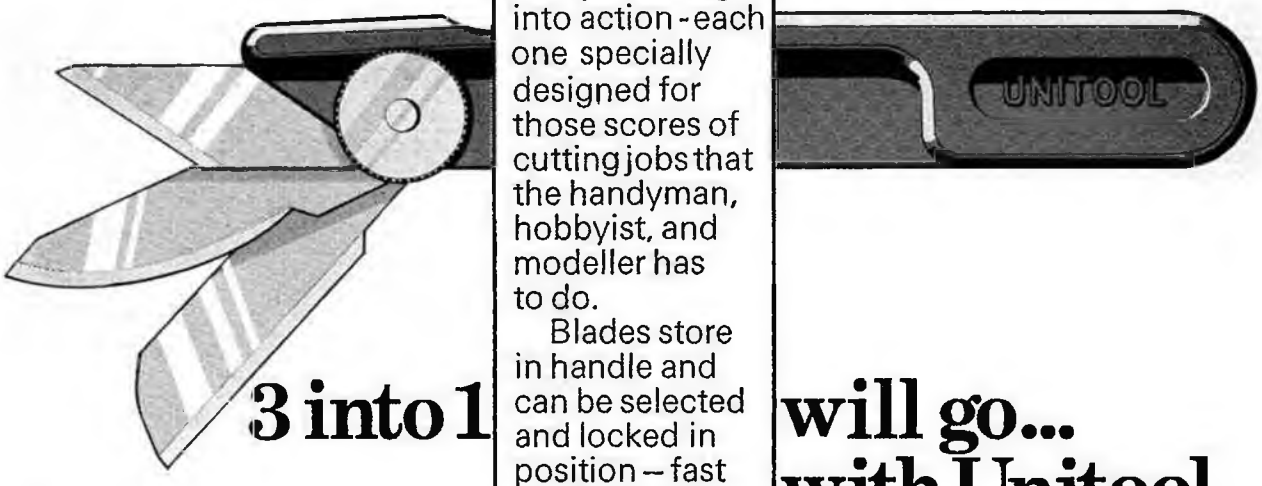

3 into 1

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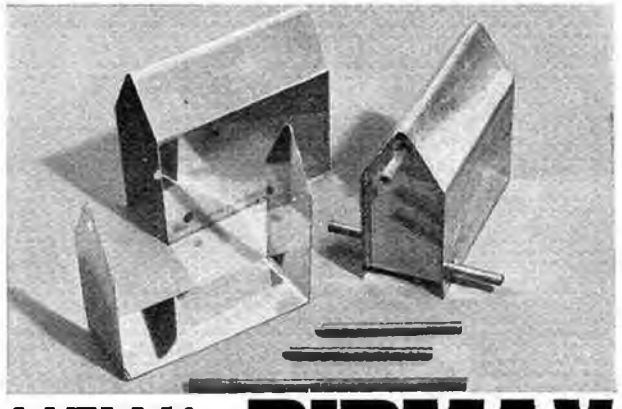

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The same four sizes will also be available in SQUARE (Kits and complete)

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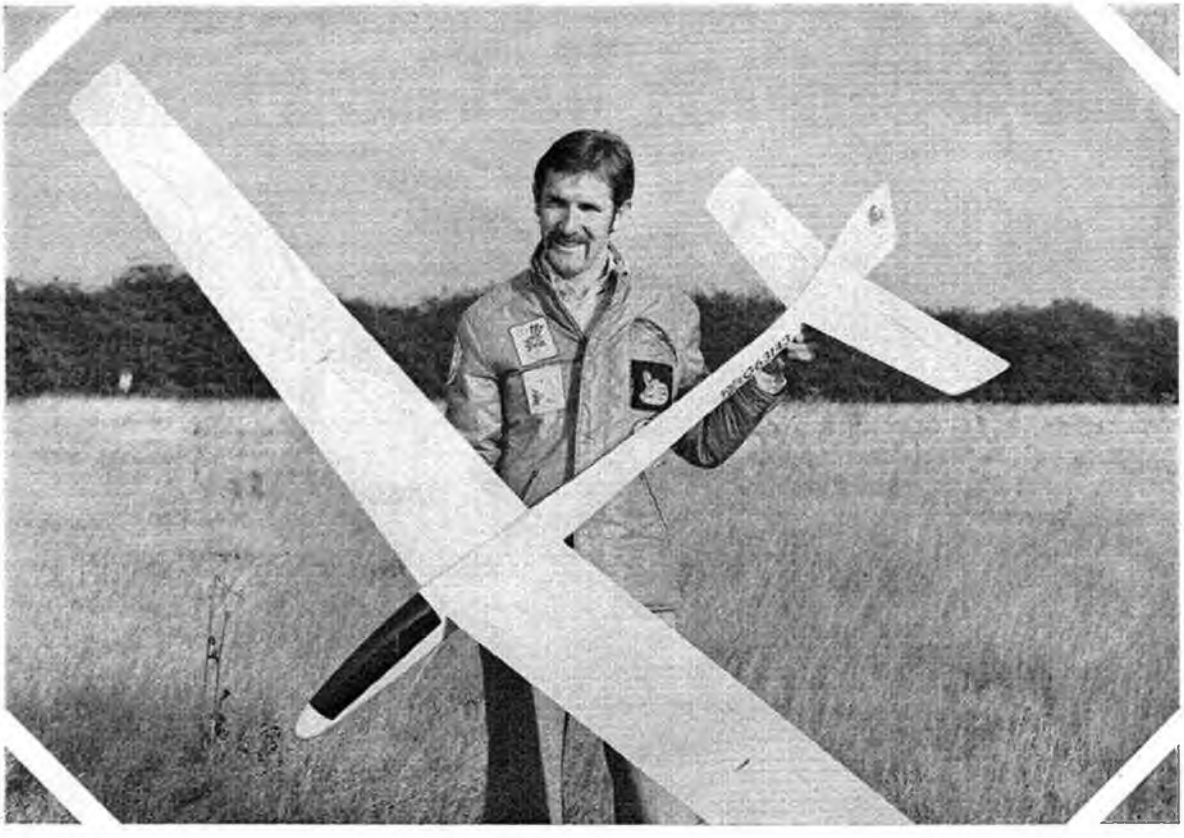

Congratulations

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The Bomber Vs The Fighter

The Cox JU-87D Stuka 6400

The Cox Combat Mustang 7700

The Cox JU-87D Stuka 6400

This super ready-to-fly Cox Stuka has all the features of the real JU-87D from the massive inverted gull wings right down to the tiny propeller driven generators.

Flies startlingly real bombing missions with a four-inch "bomb" that can be dropped in flight by simply pulling on a third line while the plane is diving – a skill tester. Sliding front and rear canopy, pilots, and rear mounted machine gun add to the realism. Authentic markings and loaded with rivet detail. Cox .049 powered. Wingspan 23½".

The Cox Combat Mustang 7700

This is the super ready-to-fly Cox model of the Combat Mustang with its invasion markings.

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It's going to be difficult deciding which of these two great Cox flyers to choose. So why not call in and see them first at your local Cox dealer. Who knows, you may end up choosing both.

Hales/Cox Flight Pack contains: 1½ volt starting battery, 250 cc can Cox fuel, glowclip with wires, fuel filter cap and tube, two .049 engine wrenches,

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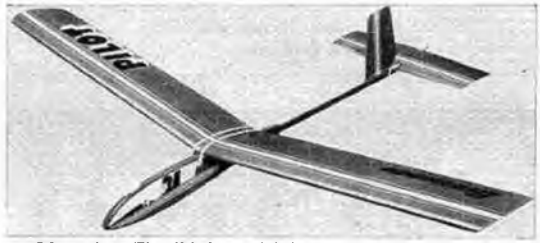
NEW!! UHU 48in. span
It's a truly fabulous kit with moulded plastic fuselage nacelle shells, all wood parts precut, shaped wire parts, all hardware, etc . . . The very latest version of a classic design with D/T and autorudder. **£5.90**

GLIDERS



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SEE THEM ALL AT YOUR MODEL SHOP

CHANGE of venue for the 1977 *Model Engineer Exhibition* will result in far more than simply a new 'home' for this mecca of modelling. That well-worn cliche 'bigger and better' never had a truer meaning – the Wembley Conference and Exhibition Centre is a brand-new, purpose built show centre, with excellent catering facilities and no less than double the 'usual' floor area will be available. Thanks to car-parking facilities for 5,000 cars, 'plushy' surroundings and increased trade support, more visitors than ever will be able to enjoy the Exhibition – and in greater comfort.

Each year attendance at the 'ME' has grown rapidly. At the same time greater publicity for all forms of modelling has resulted – but sadly, as we have frequently commented, aeromodelling is only conspicuous by its (relative) absence. Again we are provided with an ideal 'shop window' to display our handiwork to the public – so why not take the opportunity to spread the word and perhaps win a prize in the process? Full details of the Exhibition, which runs from 4th-15th January 1977 (not Sundays) appear elsewhere in this issue.

A clean sweep! Laurie Barr takes the opportunity of congratulating Melvin 'Pete' Andrews on his team's success—the Americans won both the team and individual prizes of the World Indoor Championships. See page 629 for full details.

TO MANY people the Model Engineer Exhibition is synonymous with electric Round the Pole flying, and this popular feature will of course continue to be demonstrated in 1977. There will be differences though – no longer will the 'circuit' be suspended over the main Exhibition space. Instead the flight circle will be located at floor level on the central display area – which will certainly make the recovery of crashed aircraft easier!

This in turn means that combat flying will be a distinct possibility, in addition to aerobatics and scale flying. Once again modellers are invited to bring along their own aircraft to fly at the Exhibition, and we will be repeating last year's most successful *free* contests for aerobatic and scale models. Modellers may make their contest flights on any day of the Exhibition they choose, and it will again be held on an informal basis.

Main prize will be a mains transformer/rectifier control unit generously donated by Harry Butler (Models), but there will also be special awards and other prizes for Juniors and 'deserving' cases.

Come along and fly – that's the message! It would help if those intending to bring models to fly (whether in the contest or not) send a postcard to the Editor stating the day of their intended visit – and remember that Saturdays tend to be *very* busy.

Heard at the HANGAR DOORS

ADDITIONAL KREMER COMPETITION for a prize of £1,000 will be awarded to the first United Kingdom participant who makes a duration flight lasting three minutes using *man power alone*. Regulations are based on the existing £50,000 Kremer Competition for a distance flight around a figure of eight course and the shorter distance course for prizes totalling £5,000, as laid down by the Royal Aeronautical Society. Copies of the regulations for the new £1,000 Competition, as well as for the other competitions, and any further information may be obtained from: The Secretary, The Manpowered Aircraft Group, Royal Aeronautical Society, 4 Hamilton Place, London W1V 0BQ. Who will be the first to make a 'max' under his own steam?

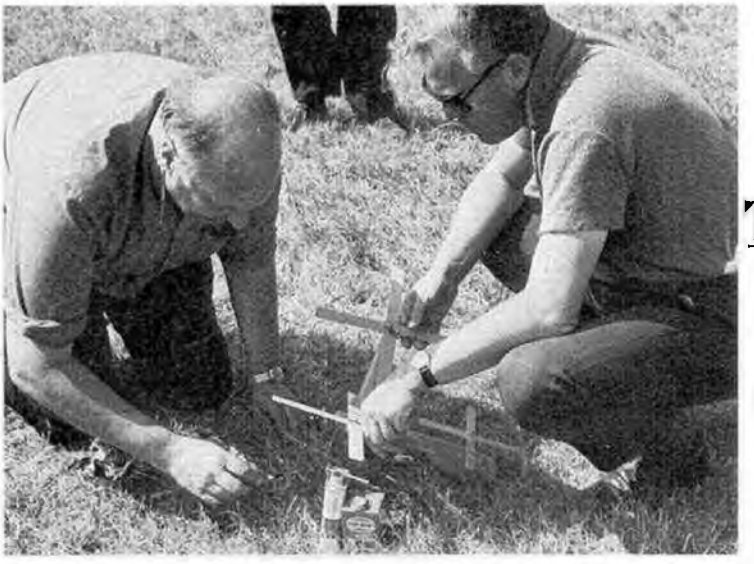
RAY MALMSTROM, the well known designer and long-standing contributor to *AeroModeller*, has been appointed to the National Committee of the Air Education and Recreation Organisation. AERO publishes a bi-monthly newsletter, free to members, which has regular features on model making, hot air balloons etc, as well as many other articles, reviews and news items guaranteed to appeal to the aviation-minded, and to those concerned with air education.

Membership details can be obtained from the National Secretary at Carwarden House, 118 Upper Chobham Road, Camberley, Surrey. Tel No 0276 61951.

† FRED MILITKY

It is with deepest regret that we have to announce the death on September 20th of Fred Militky at Kirchheim in Germany. Fred had been seriously ill for several months and his passing at the early age of 55 is terribly unjust for one whose genius has given so much to hundreds of thousands throughout the world. His talent for successful development of new concepts made him the most influential model designer in all of Europe.

Solaris, his 294th and last creation, which flies on Solar energy, will be yet one more memorial to this great personality. Our sympathies are extended to Wilma his wife, his relations and all his colleagues at Johannes Graupner. A full appreciation will appear next month.



BI-GYRO & TRI-GYRO

a pair of free-flight Autogyros to provide the maximum fun from a minimum of expense

by Bob Brown

THESE SMALL AUTOGYROS were originally designed and built as part of a programme intended to establish the most suitable configuration for a prototype radio-controlled model: hence the simple construction which makes for quick building and easy repair. Both have been flown extensively over local flying fields, the long grass of which enabled them to survive the inevitable crashes terminating early flights, during which the correct trim was established.

Bi-gyro proved to have plenty of power in hand on the Cox Pee Wee ·020, whereas, although a slightly smaller model, *Tri-gyro* was somewhat underpowered on its Cox TD ·010, with a very modest rate of climb. No doubt this was due to the extra drag of the tail rotor, as when fitted with a conventional tailplane, performance was quite sprightly. It is intended to re-engine the latter with another Pee Wee ·020 as soon as circumstances permit, which should transform the model's performance. Anyone building this model from scratch might well fit the larger motor as 'original equipment'.

Bi-gyro and *Tri-gyro*, together with a close cousin fitted with co-axial two-bladed contra-rotating rotors, were flown at this year's Nationals. *Bi-gyro* climbed away strongly into the moderate breeze and had to be retrieved from a considerable distance downwind, whereas *Tri-gyro* found the turbulence downwind of some hangars just a bit too much and would have benefited from a bit of extra power under those conditions.

Construction

Bi-gyro – first build the rotor beam assembly from ⅛in. x ¼in. spruce struts and spacers over the plan as shown in the front elevation, having first covered the plan with a sheet of thin polythene to prevent the adhesive sticking to it. Use either PVA (white glue) or epoxy as the joints must be strong; the glueing area is small and the material is rather non-porous hardwood. Do not forget the reinforcing fillets at the tips and centre-section. When the joints are thoroughly set, remove the plan and drill one hole for each rotor shaft exactly as shown on the plan. For those lucky enough to own an electric hand drill and stand, or better still a small pillar drill, this is easily achieved by holding each tip in turn with a machine-vice (or a G-clamp and a square wooden block) so that the boom assembly is perfectly vertical when viewed from the side, but with the upper strut running down from tip to centre-section at an angle of 12½°. A hole then drilled vertically will give the correct inward tilt to the rotor shafts, while the backward tilt of the shafts will be controlled by the final location of the assembly in the slots in the fuselage. The holes should be a good fit on the shafts to ensure accurate alignment, the shafts themselves being secured with epoxy, building up a good surrounding fillet for strength.

Next cut the profile fuselage from medium-hard balsa, making sure to position the slots for the rotor beam assembly and the front edge abutting the motor bulkhead accurately. Cut the fin from two pieces of ⅛in. sheet then join and glue in position on the fuselage. Accurate assembly can be ensured by pinning the fuselage flat on the building-board, followed by the fin pieces which are shimmed off the board by scrap 1/16in. sheet, thus ensuring that the fin is exactly on the fuselage centreline, and truly vertical. When set the edges of the fuselage may be rounded off

and the fin sandpapered to a streamlined section.

Cut two circles of ply for the motor bulkhead. The easiest way to cut thin plywood to a curved shape is to use an *old* pair of scissors, finishing off with the glasspaper block. Stick the two laminations together using epoxy or PVA adhesive. When dry the holes for the motor mounting screws should be carefully drilled and the bulkhead securely epoxied in place on the fuselage, checking the down-thrust and side-thrust angles before fitting the ¼in. sheet balsa fillets.

Cut the tailplane from $\frac{3}{32}$in. x 4in. fairly light sheet, sand to a symmetrical section and glue in position with PVA, building up a little fillet of adhesive either side of the fin. Check that the tailplane is square to the fin and at zero incidence relative to the top edge of the fuselage.

Now for the clever part! Turn the fuselage on its side and insert it nose first between the upper and lower struts of the rotor boom assembly. Align the struts with the slots in the fuselage and turn the fuselage through 90° to the upright position, when the strut roots should fit neatly into their slots. Glue very securely, ensuring that the boom assembly is at right angles to the fuselage in plan view and that its 'dihedral' is equal on both sides when viewed from the front.

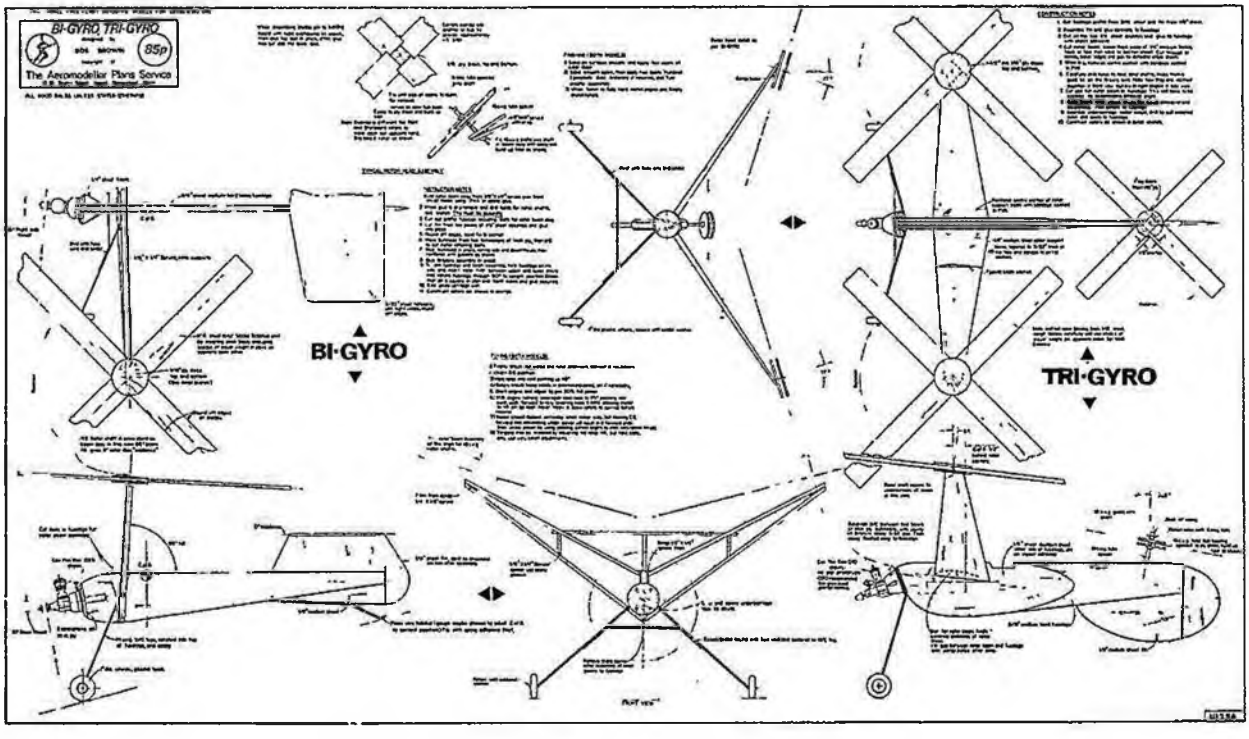
Add the undercarriage as shown, leaving the tailskid until after finishing, and then choosing the gauge of wire necessary to bring the centre of gravity to the point shown on the plan.

The rotors are built-up as shown. The method of overlapping the blade roots, if accurately done, ensures that the correct pitch of each blade which should be approximately —5°, but this may vary slightly depending on the exact thickness of the material used. Try to cut all the blades from the same sheet of balsa, which should be straight grained and warp free, medium-hard stock. It

helps if the blades are weighed and blades of equal weight assembled in pairs opposite each other. The upper ply disc is added while the four blades are still pinned to the building board. When the glue has quite set, the rotor assembly is removed from the board and the second disc glued in place on the underside of the hub. Finally round-off the edges of the blades and epoxy the 16 swg brass tube in place, making sure that it is exactly in the centre of the hub, and at right angles to the plane of the blades. Note that there is *no* coning angle, the inward tilt of the rotors providing for lateral stability.

Tri-gyro – Construction is very similar to the *Bi-gyro* except for the following points: The fuselage is first cut from medium-hard $\frac{3}{16}$in. sheet and the fin from medium-soft ⅛in. sheet and assembled to the fuselage, only in this case the fin is shimmed away from the building board with $\frac{1}{32}$in. scrap sheet. Next the ⅛in. sheet doublers are added – use an impact adhesive for this job as PVA used

FULL SIZE COPIES OF THIS ¼th SCALE REPRODUCTION ARE AVAILABLE AS PLAN NO. U1296, PRICE £1.00 (INCLUSIVE OF POSTAGE AND VAT) FROM AEROMODELLER PLANS SERVICE, P.O. BOX 35, BRIDGE ST., HEMEL HEMPSTEAD, HERTS HP1 1EE.



Airborne—and not a wing in sight! Tri-gyro makes a very different profile in the sky with its three rotors spinning wildly. Never throw the model—just let the blades build upto speed whilst walking forward before launch.

over such a large area causes the wood to expand and curl away from the joint, making it difficult to hold the parts while it dries. On the other hand, traditional balsa cement sets so quickly that there is barely time to position the parts carefully.

The rotor-boom is in this case built after the fashion of a chuck-glider wing, with much reduced chord and increased dihedral. Reinforce the centre-section joint with bandage soaked in PVA. Next drill the two holes to take the rotor shafts, making them good fit on the 16 swg wire. Note that they are inclined towards one another in front view, but are at right angles to the under-surface of the boom when viewed from the side.

Carefully cut a slot in the fuselage to take the rotor beam. Note that the bottom of the slot is inclined at an angle of 6° to the top edge of the fuselage, which may be taken as a convenient datum. The slot will have to be considerably deeper than the thickness of the boom because of the pronounced 'dihedral'. Slide the boom into position and glue it to the fuselage with PVA, making sure that the 'dihedral' angle is the same each side. When dry, the gaps between the fuselage and boom may be filled with balsa scrap.

The undercarriage is made up as shown on the plan, modifying the shape of the upper end to ensure that it misses the fixing screws of whichever motor is used. In this case the 1mm ply bulkheads are stuck to either side of the undercarriage top bend, using plenty of epoxy to fill the gap. 'Five minute' epoxy is recommended here as otherwise it will all have run out of the gap by the following morning, and firmly stuck the assembly to your building board/radiator/dining room table!

Next, drill the bulkhead/undercarriage assembly to take the motor retaining screws and epoxy it in position on the fuselage nose. Securely epoxy the main and rear rotor shafts in position, checking for alignment while the adhesive sets. Apart from size, the rotors are similar in construction to those of *Bi-gyro*.

Finish

Sand all surfaces carefully and then apply two coats of clear dope; sand again, lightly to remove the raised grain, and when dry give two coats of Humbrol Epoxycote. Any transfers may then be applied and when dry protected with a localised coat of clear fuel proofer. Make sure that no dope, Epoxycote or fuel proofer finds its way into the rotor hub bushes or onto the rotor shafts. Fix the motor in position when the finish has had time to become really hard (about three days) and finally assemble the rotors and distance pieces to their shafts. Each rotor is held on its shaft with a blob of epoxy on the shaft above the upper spacer. This ensures that the adhesive does not run down and stick the rotor itself to the shaft and also allows easy removal for rotor replacement or repair.

Flying

Before flying either model, check the tail surfaces for warps and rotor shaft alignment and correct as necessary. Hold the model nose into wind, and pointing up at approximately 45°. The rotors should rotate freely in the direction shown on the plan without vibration or 'chatter' in the bearings. A drop of light oil on each rotor bearing will help there.

Next start the motor and adjust to give maximum rpm. If there is any wind it is worthwhile having a helper to hold the main rotors to prevent them from rotating while starting up, as otherwise they make handling difficult and may foul the glowplug lead or the starter's hands. With the motor running steadily once more, hold the model nose-up and into wind to start the rotors turning. The tail rotor of *Tri-gyro* will run itself up without assistance as it is in the slipstream of the airscrew. Now walk forward more or less briskly depending on the strength of the wind, lowering the nose a little to the normal flying attitude (about 15°–20° nose-up), and allow the model to lift itself out of the hand. *Never throw* the model from a standing position, as unlike a conventional model's wings, the rotors need to adjust their rate of rotation to suit the model's forward speed in order to produce sufficient lift to support it.

Both models, if built as shown, should descend vertically when the motor stops. It is however possible to obtain a forward glide by removing the centre of gravity forward and re-trimming under power. Trimming under power can be achieved on either model by adding suitable packing between the motor and its bulkhead to alter sidethrust and downthrust angles. *Tri-gyro* also responds to adjustment of tail rotor tilt: as the rotor is supporting part of the model's weight by producing lift, a nose-up attitude will be achieved by tilting the rotor shaft forward and nose-down attitude by tilting it backward. Similarly a right turn may be induced by tilting the rotor to the left and *vice versa*, but do not overdo it!

If initial flights can be made over long grass then so much the better. However, broken rotor blades are easily repaired by butt-jointing using epoxy and two 'splints' of scrap wood wrapped in polythene sheet to prevent their becoming a permanent part of the model and held in place with clothes pegs or paper clips. Once trimmed, the models should not come to much harm, as they descend vertically on an even keel and do not therefore nose-over on landing on rough ground as is so often the case with a conventional sport power model. After all, there are still many people who believe the Autogyro to be the safest form of flying machine when properly designed and built.

WORLD CHAMPIONSHIP

F1D 1976

R.A.E. CARDINGTON

INDOOR WORLD CHAMPS

Report by Bob Bailey

Photographs by Mike Fantham

ALTHOUGH THE official timetable allowed for practice flying on the Saturday, most competitors took the opportunity of some flying on the Friday afternoon. The weather was hot, but a stiff breeze was blowing which caused rather turbulent and drift-prone conditions in the No. 1 Shed. Most of the 'old hands' who have seen Cardington before did not bother to fly, the principal exception being ever-active organiser/competitor Laurie Barr, flying a 'windy weather model'.

Regular attenders at Cardington were impressed with the thoroughness of the preparations in clearing the Shed; all barrage balloons and the maze of wires at the end furthest from the doors had been removed and this allowed a superb (rare) view of the whole length of the cavernous interior.

Official practice was quickly characterised by some unbelievably heavy rain; water poured in at several places along the side, causing one model box to be almost floated away. The weather was reminiscent of the 1972 Champs when it played the same trick on the eve of the contest – and 1974 in the last rounds – that this should happen after months of drought was almost uncanny and people feared that conditions would be so bad as to ruin the contest.

Heading picture shows Bud Romak, moments after the 39:36 flight which clinched the event Left is second placed Edward Ciapala (Poland), while below are Jim Richmond and Bucky Servaites (right) of the USA – placed 9th and 8th respectively to gain team prize.

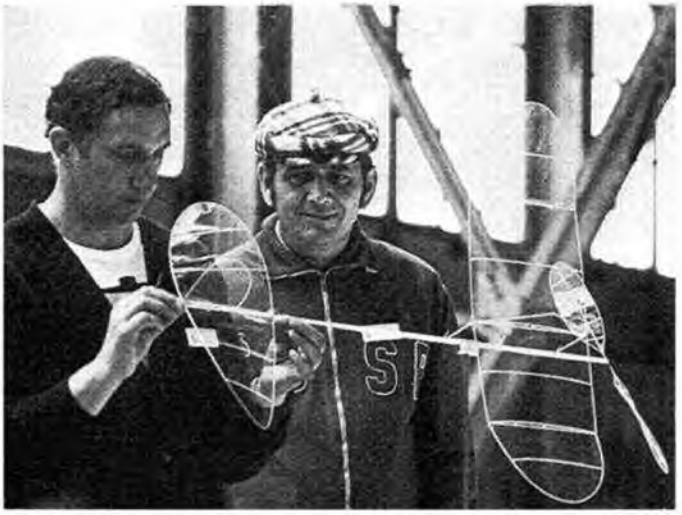
Fortunately the cloudy weather meant that drift was very low by this year's standards, when it has been bad at most meetings, and the contest was not spoilt.

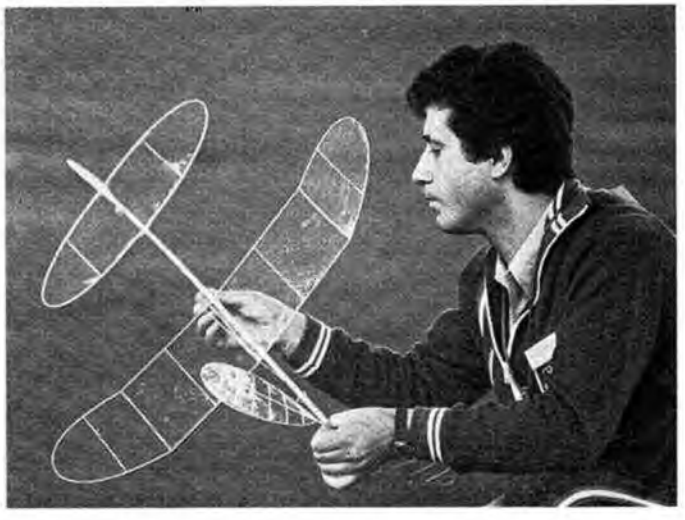
The air inside the Shed was in consequence rather cool, with considerable ground turbulence which caused a lot of problems for those trying to find model trim in a hangar far larger than normally available. This included the Swedes who were flying very conventional models, and the Swiss who were not. Their models had enormous fuselages (36in. long) and large propellers with very narrow tips, and to start with were unable to get much altitude. Because of the long moment arm, the CG positions of the Swiss models were at 105% of the wing chord!

Most people tested first on half length motors to keep the model safe from hitting the roof and also to speed up trimming.

Techniques noted at this stage included Bucky Servaites' use of tapered motor sticks (not very popular these days, but effective) and Jim Richmond's fuselage bracing system. A Y-shaped mounting held the fuselage bracing at the centre of the motor stick; the two bracing wires are brought together to single mounting posts at each end of the motor stick. The Americans and Canadians used wood cut by Ron Plotsky which appears to be of considerably superior quality to that normally available. Efforts are being made to see if it can be imported to this country.

Winding techniques varied widely from many who wound very quickly (including the Japanese who had trouble blowing motors) to Chlubny of Czechoslovakia and Jim Richmond (USA) who wound much more slowly. The latter two wound, after stretching the motors to about four times its original length, to about half the target torque figure relatively quickly, then stopped to give the motor time to re-adjust. Winding continued slowly with frequent stops moving in, keeping the torque between fairly close limits near the target value. Jim Richmond smoothed out the knots in the





motor during each stoppage; this reduced the torque quite appreciably and presumably removes excessive local strain from the rubber It is fairly generally recognised that the rubber has to be allowed to readjust during winding to get the turns on; this being of course the object of the exercise

Back to the flying. Bud Romak quickly showed form by recording over 30 minutes; others were still flying on half motors. By 1 o'clock the air had warmed up considerably and the British lads got down to some practice. Ron Green indicated the potential of his best model by clearing 31 minutes from a little over half Shed height; the rpm on his 22 x 40in. pitch propeller being very slow; the average prop rpm for the flight was less than 40. Very promising.

Many models showed the effect of unbalanced propellers, the models wobbling as the propeller rotated. Jim Richmond was unable to get high enough on his large (200sq.in. model, plus tailplane to suit) with a 22 x 36in. prop – he changed to a smaller propeller which he retained for the contest with rather more success.

Events proceeded fairly quietly for a while after the competitors enjoyed a magnificent cold buffet with the occasional pint from the bar to match; all very civilised and set up by RAF Henlow, where most people were staying. At about 5pm some spectacular times suddenly came in, all from down at the far end of the Shed over some lino. The air was very buoyant for up to 2 hours, while the light deteriorated rapidly. Dieter Siebermann did 37:53 (nearly double his previous best), Ciapala of Poland produced 38 minutes, so did Ron Green, while Laurie Barr topped the group with 39:39 – this proving to be the longest flight of the meeting. Laurie ballooned the model to prevent it from hanging up, the model dived for about 50 feet and *still* did 39:39! It was reckoned that a flight of up to 45 minutes was on the cards, the model still being almost in the roof at 31 minutes. By 7pm the light was terrible, it being difficult to see models which were high and near the sides of the Shed.

Those staying at Henlow were greeted by a good dinner (at the very acceptable price of 75p) and this was then followed by another showing of the two famous modelling films *Wings and Things* and *180 is Max*. A number of the 'stars' had the dubious pleasure of seeing themselves on the silver screen.

Conditions for the first contest day (Sunday) were cool and unhelpful with low level (up to 20 feet) turbulence which caused stalling troubles for many. Flying times ran from 10.30am to 6.30pm and it was soon established, to the surprise of many, that the contest was *not* to be flown in rounds; the only provisos being that (*a*) three flights to be flown on each day and (*b*) only one member of any team to be in the air at once.

It was assumed that each team would have a pair of timekeepers, both to time each flight. In practice, each competitor had his model processed for weight and wingspan, drew two timekeepers from the pool and then made his flight — a system which worked fairly smoothly. It was soon evident that when the air had warmed up a bit, time was going to be very short.

The first official flight was put in by Sven Pontan of Sweden; his model climbed to about half Shed height and was down for 17:07 – a classic example of using too thin a motor, the result usually being that the model lands with lots of turns remaining. Although the air was heavy, drift was mercifully low. Mike Thomas was the first Canadian flyer, with a model that climbed very fast but it was evident to many that the model was going to hit the roof. It did – *hard*. The model bounced around, fell off several times, flew through a very small triangular gap in one of the main roof members, hit a cross tie, hung by the propeller for several seconds – and then fell off. This exciting part of the flight was watched by many, with some cheers each time the model fell off. Miko's model landed safely in the centre for 32:19 – a *very* respectable start. Ryszard Czechowski, the reigning World Champion, was not so lucky; his model hung for 10:05.

The British team selected their flying order by drawing lots: Ron Green flew first, ballooned his model when high up and still climbing to drop it a few feet; he would have been *very* close otherwise. An excellent start for 33:10. Laurie Barr also started extremely well with 34:30; only John Blount got something wrong with maybe a duff motor for 25:25; however, he more than made up for it on the next two; these turned out to be his best flights.

Bud Romak's first flight caused some consternation when his two timekeepers recorded times exactly two minutes different. The rule book was followed and the average went on the scoreboard

Top picture shows British team member John Blount adjusting a tail warp while Edward Chlubny (Czechoslovakia) looks on – obviously with a certain amount of apprehension! Centre is Canada's all-rounder Mike Thomas concentrating hard fitting a tight motor. Team manager Paul Roberts is clearly expecting the worst to happen, but nothing broke . . . The previous World Champion, Ryszard Czechowski of Poland (bottom picture) was right out of luck, finishing way down in 28th place.

although many other watches timed the flight and agreed with the lower time. This at one point threatened trouble with the team scores when GB and USA were running level, but fortunately the 'threat' disappeared later on.

Meanwhile Ciapala from Poland was on form with his first two flights; these put him firmly in the lead with Laurie Barr second. Laurie's second flight was made with the same motor, a bit more wing incidence and a few more turns for the best flight of the day at 36:54. Czechowski and Richmond in particular were having great difficulty in judging the launch torque correctly, their models either hung up or struggled to half Shed height; they still cleared 30 minutes, however.

The Canadians were having a great time; their national record went twice on Sunday afternoon, ending with Jack McGillivray's 36:06 using a model with an enormous wing and looking impressive. Mike Thomas was undoubtedly the champion at knocking dust off the rafters, he got away with many contacts on his first *three* flights (what did he tread in?).

By 5pm it was getting very dark near the roof; one model drifted into the side which was so gloomy that the timekeepers could not see it and had to clock off. Some rain occurred during the afternoon so that by 6pm the conditions were very turbulent near the sides.

At this time there was a mad panic to get models into the air; some teams were allowed more than one flight simultaneously, surely an administration fault. Our team was as well organised as anyone and kept moving so that they managed to complete their flights safely.

By the end of the day, GB was in the lead with USA second and Canada third. This was an excellent performance from Britain and augured well for an exciting day to follow.

Another good dinner back at Henlow was followed by a showing of *Those Magnificent Men in their Flying Machines* put on for the visitors' benefit. Only trouble was – Jiri Kalina said he had already seen the film 12 times! However it was much enjoyed by all.

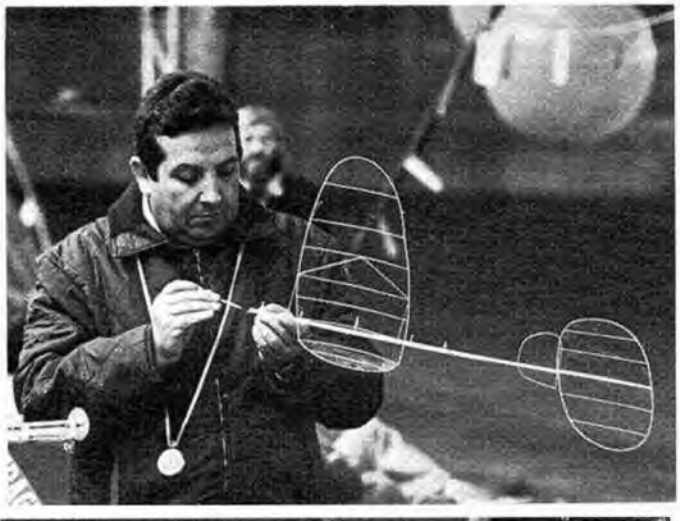
Next day conditions were very much as on the Sunday; fairly cool with considerable ground turbulence in the early morning so that activity to start with was minimal. By about 11.15am some flying was under way. Disaster caught Ron Green on his fourth flight; he launched over an inordinately large crowd of people on the floor (who should not have been there) and the turbulence created by their body heat – yes, this is sufficient – caused the model to stall and tail slide. Ron caught his model but the motor stick collapsed and wrote off most of the model – a great shame since it was his 'No. 1' of course. Ciapala's model stalled, he caught it, launched again for the second attempt but the model continued to stall badly and was down for less than a minute. Jim Richmond again didn't get high enough; he found his model was over-elevated despite its not stalling.

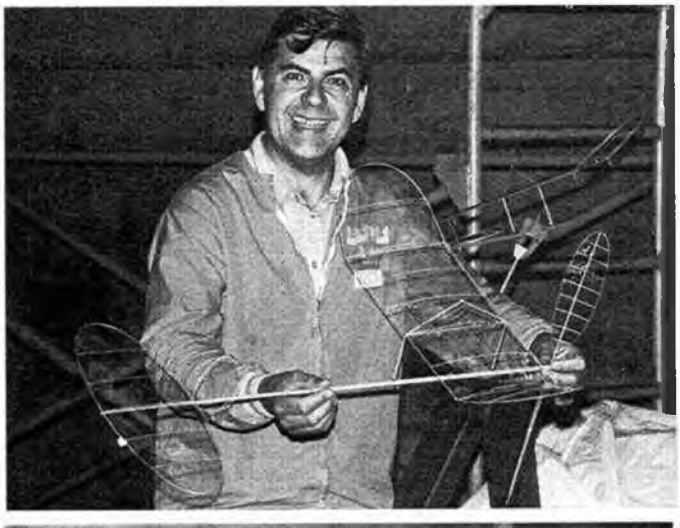
Laurie Barr suffered a motor break; a piece of the motor broke off and fractured a bracing post on the fuselage which was supposedly a few safe feet away; a model change was therefore needed; and the subsequent 32:05, although good, did not improve his position.

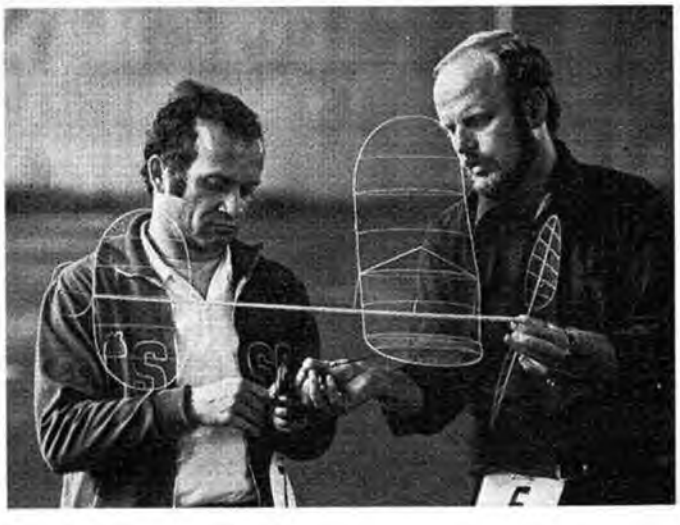
By 1pm an inversion layer, which extended over most of the Shed, broke up over the lino which had provided the 'thermal' flights on Saturday. Bud Romak launched his fourth flight, but the model stalled at about 15 feet for about 2 minutes with plenty of torque on. Eventually it climbed away and levelled out under the centre catwalk. Some 2,200 turns at launch ensured a very long flight – 39:22 – which put Bud into the lead.

During the day John Blount, Ron Green and Jim Richmond improved their standing slightly – with one flight to go; however this improvement was completely overshadowed by *the* flight of the contest – Bud Romak again! With more than 2,300 turns on the motor he launched and stalled a couple of times. This did Bud a favour since after a rapid climb the model levelled out after about 10 minutes very close to the catwalk. The model drifted slowly along the length of the Shed, maintaining virtually the same altitude for the next 15 minutes! John Blount launched almost exactly 10 minutes after Bud and drifted down the Shed following Bud's model but having climbed for somewhat longer. It was very impressive watching the two models with the team prize in the balance but steadily going the American's way.

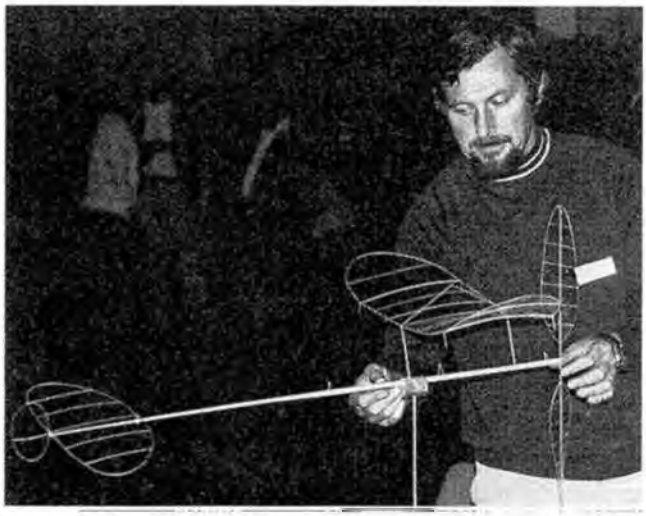
As Bud's model came down, a circle was cleared round it to



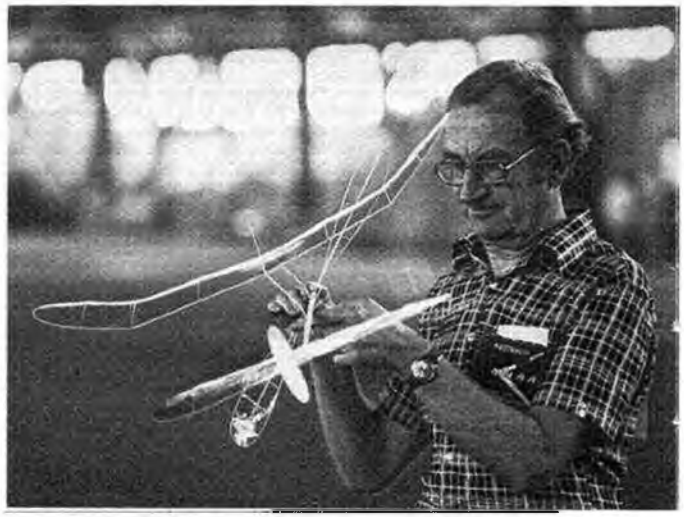




Italian team member Carlo Cotugno (top picture) just failed to crack the '30 minute barrier', finishing in 27th place – shows how competitive this form of sport is at the highest levels. Happy modeller seen at centre is Sweden's Sven-Olov Linden – he has just improved his personal best duration from 14 minutes to 34! Secret? A good piece of rubber donated by Mike Thomas. Bottom picture shows two of the highly-fancied Czechoslovakia team members at work. Karol Rybecky (left) winds for 1970 World Champion Jiri Kalina – note absence of torque meter.



One of those long long Swiss models typified by Werner Heise, who had the unfortunate distinction of placing last in these Championships.



Australia's Boyd Felstead attended in person, after having been represented by proxies for the past two Championships. Reg Parham acted as his team-manager, placed 11th overall.

avoid disturbance. Bud steered the model when about 20 feet up and nearly made a complete mess of it, but released safely for 39:36 a tremendous flight (couldn't happen to a nicer bloke) which was appreciated by all present.

This flight of course put the Americans in a virtually unassailable position and meant that everyone else 'in contention' had to go-for-bust. This resulted in some spectacular climbs and hang ups – the Canadians were enjoying themselves! Models were being allowed to shoot up into the roof; most flyers crossed their fingers and hoped for the best.

Name	*Country*	*1*	*2*	*3*	*4*	*5*	*6*	*Best 2*
1. B. Romak	USA	34:54	29:23	32:48	39:22	39:36	—	78:58
2. E. Ciapala	Poland	35:45	36:18	30:19	0:46	29:32	2:48	72:03
3. **L. Barr**	**UK**	**34:30**	**36:54**	**17:44**	**32:05**	**13:45**	**11:03**	**71:24**
4. **J. Blount**	**UK**	**25:25**	**35:42**	**34:05**	**18:05**	**34:44**	**24:58**	**70:26**
5. M. Thomas	Canada	32:19	35:32	33:18	23:14	28:20	27:51	68:50
6. K. Rybecky	Czechoslovakia	34:35	33:39	31:22	34:08	9:17	15:49	68:43
7. **R. Green**	**UK**	**33:10**	**34:33**	**33:06**	**30:12**	**33:53**	**18:49**	**68:26**
8. B. Servaites	USA	34:37	14:27	10:15	32:34	23:48	33:41	68:18
9. J. Richmond	USA	9:37	31:32	36:29	20:53	31:41	17:28	68:10
10. A. De Mello	Canada	33:22	34:33	11:12	29:34	4:30	28:51	68:05
11. B. Felstead	Australia	27:25	31:47	31:37	32:18	20:23	35:45	68:03
12. J. Kalina	Czechoslovakia	32:45	33:34	7:25	32:42	9:33	23:17	66:19
13. T. Strazberger	Jugoslavia	27:30	23:34	29:28	29:21	36:51	—	66:19
14. J. McGillivray	Canada	29:50	36:06	29:02	26:20	12:10	6:27	65:56
15. V. Kmoch	Jugoslavia	26:28	30:31	34:58	26:03	29:39	19:41	65:29
16. E. Chlubny	Czechoslovakia	28:57	36:04	24:28	28:46	11:39	—	65:01
17. R. Butti	Switzerland	23:25	29:40	22:33	5:40	34:29	14:15	64:09
18. W. Wetzel	West Germany	30:04	31:01	—	32:17	13:32	—	63:18
19. L. Gabrijel	Jugoslavia	26:34	33:41	13:00	1:12	1:28	29:22	63:03
20. S. Kujawa	Poland	29:02	32:45	16:56	8:29	28:26	5:15	61:47
21. E. Liem	Netherlands	26:03	8:55	—	25:05	22:53	34:12	60:15
22. S. Pontan	Sweden	17:07	19:14	28:09	11:32	20:33	31:35	59:44
23. Y. Banba	Japan	28:48	29:26	30:14	21:55	29:20	19:08	59:40
24. P. Migani	Italy	26:14	7:35	33:15	25:49	8:30	13:46	59:29
25. F. Migani	Italy	24:38	19:49	28:22	30:01	7:30	18:30	58:23
26. D. Siebewmann	Switzerland	26:20	29:55	27:03	26:31	27:46	28:14	58:09
27. C. Cotugno	Italy	28:53	29:10	24:54	16:15	22:01	7:17	58:03
28. R. Czechowski	Poland	10:05	30:24	8:45	23:51	8:51	27:23	57:47
29. C. Wolthdorn	Netherlands	25:54	26:42	11:38	28:39	22:36	26:19	55:21
30. K. Vogler	West Germany	17:25	28:25	15:14	23:33	26:19	17:32	54:44
31. P. Nore	Finland	27:42	19:22	17:52	20:25	25:47	3:42	53:39
32. H. Enomoto	Japan	22:40	25:43	22:03	24:01	4:27	14:45	49:44
33. H. Raulio	Finland	22:35	20:53	24:43	20:31	5:23	4:29	47:18
34. K. Nottolmann	West Germany	21:36	18:39	19:40	19:31	25:33	5:47	47:09
35. S. Linden	Sweden	12:26	1:38	7:20	12:45	34:06	5:17	46:51
36. H. Odagiri	Japan	20:39	22:29	—	19:04	23:10	15:05	45:39
37. H. Erofejeff	Finland	18:42	19:19	21:08	23:23	18:42	0:16	44:31
38. W. Beekmeyer	Netherlands	16:21	21:56	9:10	19:54	9:24	3:01	41:50
39. P. Sodersten	Sweden	16:36	17:34	21:45	18:47	15:13	—	40:22
40. G. Cognet	France	14:03	16:07	17:39	7:41	19:38	1:07	37:17
41. W. Heise	Switzerland	14:58	13:37	16:39	1:15	0:53	14:21	31:37

Loner Boyd Felstead, the farthest travelled from Australia, was set for 35 minutes, he said, when his No. 5 hung up at the 20th minute, then his No. 6 alighted on a high pile of bales at 35:45 when much more (and maybe a 3rd place?) was in his grasp. Boyd has the distinction of flying brand new models in NASA, California, Akran Ohio, Lakehurst New Jersey and Cardington, Beds, on successive weekends.

The contest was very exciting with the team event not settled – the hard working caterers found time to stop work and ask how the home team was going.

By 5.15pm it was very dark, and raining hard outside, causing peculiar air conditions with strong lift at times in the middle and much drift and turbulence at the sides. Any real chance of altering one's place had gone since the conditions deteriorated to very bad at the end of the contest which finished at 18.00 hrs. It was surprising that the Czechs tried to get some flights in after this time since apparently understanding at 5.57pm that they had three minutes in which to launch.

Other Comments

As always there was a large spread in talent and ability between competitors. The Swedes had rarely flown above 8 minutes before and their national record stood at eleven minutes. Sven Linden had struggled all weekend to clear 20 minutes but then Mike Thomas gave him a motor and he then did 34:06! An excellent illustration of just how important a good bit of rubber is!

Bud Romak was renowned to have used some old Frank Zaic Pirelli which he had buried in his back garden for many years! Might be worth a try with some of the green Filati available a few years ago.

Attitudes to the use of steering balloons varied enormously; most stood and watched their models drift dangerously near the sides – then panic measures with a balloon which was as often as not too soft for steering at high altitude, which is not easy. The British team was well versed in the use of the balloon; the 'shark's tooth' near the nose of some of their models helped considerably in keeping the balloon line out of the propeller. Cardington this year has been full of tricks *re* drift; the lessons learnt from earlier sessions were of great value. I have just read from my latest copy of *Indoor News and Views* that balloon steering is only now allowed in AMA contests; an extraordinary state of affairs since we never fly FAI models in Cardington without using balloons – it's too risky most of the time.

Drift conditions during the contest were much kinder than they have been most of the time earlier in the year; a good thing since otherwise the luck element would have played a larger part.

I must mention the excellent efforts of the riggers who were on duty all weekend to rescue hung models; this was done with considerable speed and very little damage – thank you very much lads – I expect I'll need your assistance again sometime soon!

The Championships were concluded by the final dinner at the *Angel's Reply* in Hitchin where a convivial evening ensued with chance to view the superb trophies – the *Ernest Kopeckny Trophy* for the longest single flight won by Bud Romak and the *C. S. Rushbrooke Memorial Trophy* for the Individual winner – again Bud Romak. These trophies are set in clear plastic and are similar in style to the 'Fred Boxall Trophy' for Wakefield awarded at the Nationals, and are highly prized.

British team at work! Ron Green gets away, anxiously watched by Laurie Barr. Credit for the whole meeting must go to Laurie who was not only its instigator, guarantor and SMAE Technical Committee Chairman – but he also took 3rd place! Incidentally, T-shirts specially printed in colour with the World Championship logo (see above and page 629) are available price £3.00 plus postage – 25p inland, 50p overseas, from Laurie Barr at 4 Hastings Close, Bray, Berkshire. Souvenir programme brochures may also be obtained from the same address, price 50p plus postage.

TEAM RESULTS

	Points		*Points*
1. USA	215·26	9. Netherlands	157·26
2. UK	210·16	10. Japan	155·03
3. Canada	202·51	11. Switzerland	153·55
4. Czech.	200·03	12. Sweden	146·57
5. Jugoslavia	194·51	13. Finland	145·28
6. Poland	191·37	14. Australia	68·03
7. Italy	175·55	15. France	37·17
8. W. Germany	165·11		

Japan fielded a full team once again. Below is Hideyo Enomoto (left) with team manager (and former team member in '72 and '74) Shigeyoshi Nonaka. At right: disaster time for Sylvester Kujawa on practice day. It was at this time that those in the near vicinity learned the Polish expression for 'bother'.

BETWEEN THE LINES

with Dave Clarkson

Dutch combateer Jacko de Ridder has a neat solution to carrying his Super Star II models around – all made from expanded polystyrene offsets too! That little lot should just about be sufficient for a day's competition flying . . .

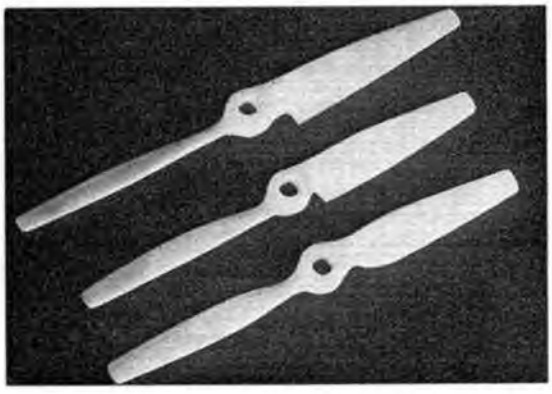
MAKE IT EASY: A Built-in Glow Fuel Can Filter
Saw this one first at the US Nationals, and since returning have noticed a few people have started to use it in combat where its particular relevance lies.

We all know the bother that results from dirt in the fuel. More than mere bother can result from dirty fuel, for the usual result is a lean run and nothing wears out a motor faster than lean runs. This idea is particularly applicable in combat where glow motors are now the norm, as are the associated 'pacifier' or 'bladder' type pressure tanks, and because glow motor combat users use lots of fuel and therefore tend to fill the tanks using syringes which are filled by sucking the fuel out of a big can or bottle (typically a half gallon or 2 litre container).

All that is necessary is to solder two tubes into the can's metal cap and then attach fuel tubing and a good line-fuel filter (like you find in R/C 'clunk' tanks) as I hope *Figure 1* shows. For plastic fuel containers with plastic caps, two old/broken motor spray-bars suitably screwed through holes in the cap can be substituted for the soldered tubes recommended for metal caps.

As you can see, the cap of the can need never be removed on the field (dusty and dirty places especially in this drought-ridden year) except when all of your fuel has gone. This helps in several ways, namely, not losing the cap, keeping dirt out anyway and also in keeping water out of the fuel.

A selection of propellers produced by John Gray in glass fibre. At top is the Class B item, in the centre the FAI prop and in the foreground, a semi-cuffed Goodyear racing special. All are now in limited commercial production.



GOODIES DIRECTORY
Haven't done one of these for a bit, mainly because little seems to have come through the letter box of relevance until recently. However the three really high-class sources of 'goodies' make this quite an important addition to the Directory.

John Gray Propellers
For a few years now, John Gray has been making glass fibre team-race props, mostly for himself and a few friends but never before for direct sale. Now that John feels that the quality and performance of his props have become top class, he is finally embarking on direct sales of three props, namely: 7 x 7½in. (cuffed root) for FAI Team Race. 8 x 7¾in. (cuffed root) for 'B' Team Race,

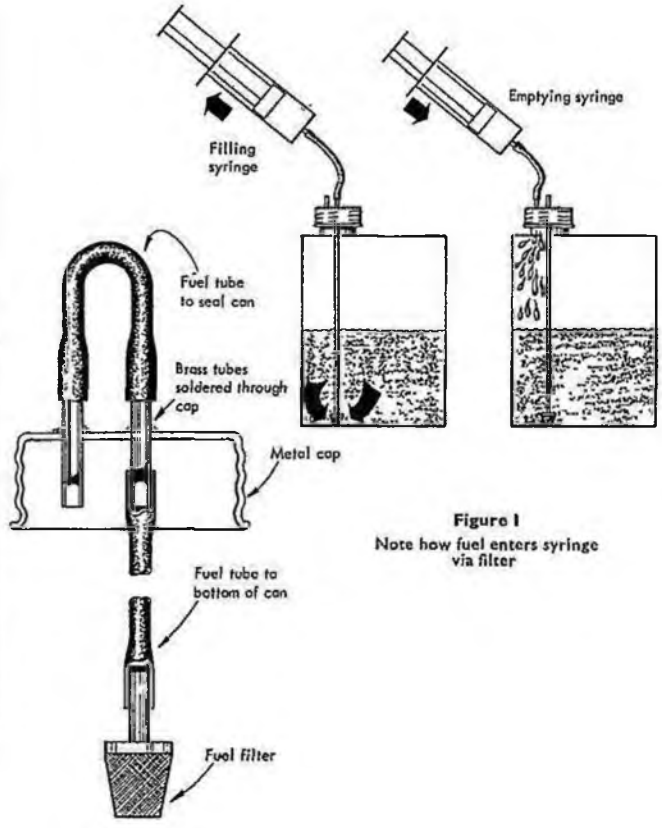
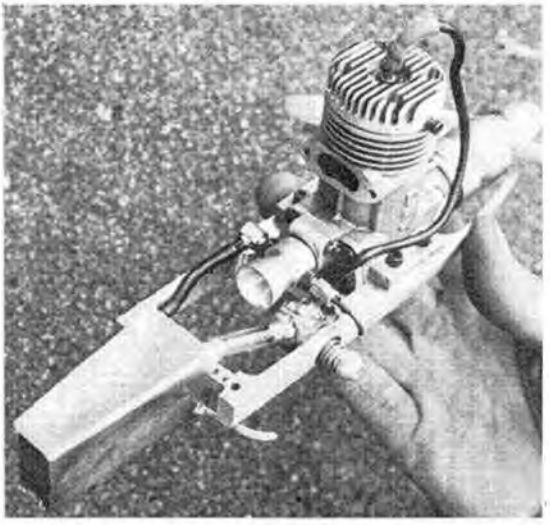
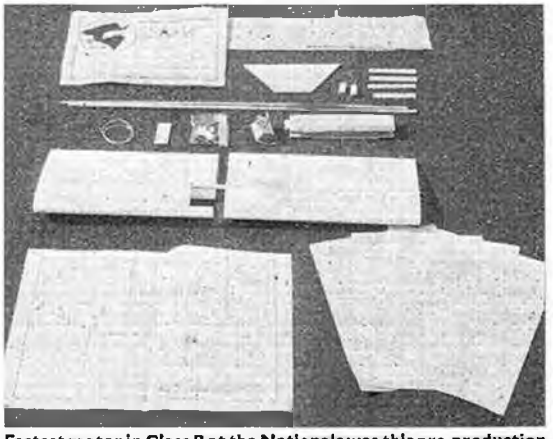


Figure 1
Note how fuel enters syringe via filter





Fastest motor in Class B at the Nationals was this pre-production OPS 29 TRS (left) used by Nixon/Campbell. Pressure re-fill valve is very clever, combining its function with that of supplying the current to the glow plug. Above is the new Starlet kit from Outlaw Model Products – note comprehensive instructions and foam wing.

and a 7 x 6in. (semi-cuffed root) for Goodyear – as advertised separately in this issue. John points out that the supply of his props will be limited. I hope he can fill his orders because these are really excellent props as the following record shows for this 1976 contest season:

UK FAI Team Race Records

Heaton/Ross 4:04.4 (Heat)
Heaton/Ross 8:16.8 (Final)

World Championships

2nd place – Petersen/Geschwendtner (Denmark)
4th place – Bugl/Straniak (Austria)
9th place – Gürtler/Baumgartner (Austria)
12th place – King/Rudd (England)
13th place – Heaton/Ross (England)
23rd place – Smith/Fry (England)

British Nationals 1976

1st place – B Team Race – Surugue/Izam
2nd place – B Team Race – Nixon/Cambell
3rd place – FAI Team Race – Heaton/Ross

Quite a pedigree! In addition to this, John has asked me to point out the 'plus' features of his props, which are the high fibre content (plus high strength) and the accuracy of moulding, particularly of the hub to ensure both faces are truly flat and parallel.

Aluminium foil for covering T/R Surfaces

Since the start of this year, Graham Bryant has been flying using aluminium foil covered flying surfaces on his team racers. A lot of us have admired the obvious strength and stiffness together with the lightness of his wings and tails. Fortunately for those interested in following his lead, Graham has finally revealed his source to be: *Foam-Foil*, 37 Slead Avenue, Brighouse, West Yorks HD6 2JE.

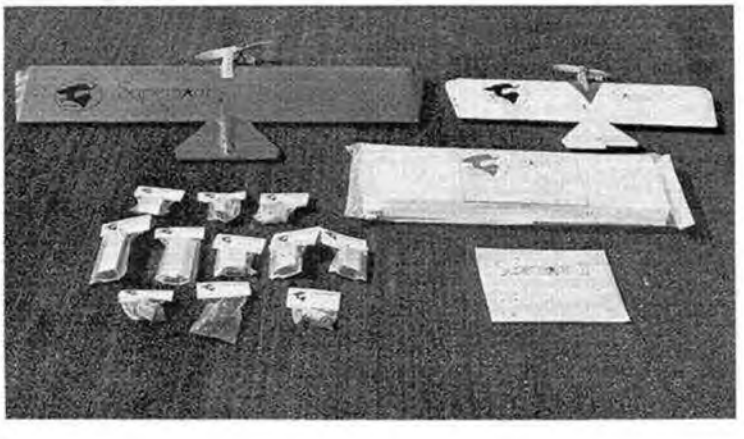
Foam-Foil sell the foil in two thicknesses, 0·1mm and 0·06mm (the thinner grade being the best for team race use). Both grades come at 75p per metre, 600mm wide. Terms are cash with order plus 75p on any size of order for postage & packing (UK only). Graham uses 3M 'Fast bond' contact adhesive for bonding the foil to the wing core, but points out that Foam-Foil also can supply their own adhesive – as yet untried by Graham.

Combat Goodies

Following on from his (still available), highly influential and revolutionary *Super Star II* FAI Combat plan plus instruction pack, Richard Wilkens in the guise of *Outlaws Model Products* has available two kits and a lot of tanks etc – all as illustrated around these pages. The FAI combat size *Super Star 1* kit is possibly well known already, having achieved limited retail distribution, now this is followed by a smaller version the *Starlet* intended for 1·6cc motors. Both kits come with very complete instruction packs including, for the *Starlet*, advice on trimming as a basic trainer or a contest weapon and some excellent illustrated flying instructions for the beginner. The *Super Star* and *Starlet* kits both feature all-foam wings – a feature recognised now by combat flyers to give easier and faster building plus reduced finishing cost, plus smoother and more reproducible flying characteristics. Both kits, in addition, contain fully soldered metal tanks.

Besides the kits, 'Outlaws Model Products' now have properly packaged tanks – a vast variety of fully soldered metal tanks plus a pack containing 40 beautiful pacifiers. More good items on the way I am told, like an elevator horn with a base large enough to eliminate the need for a plywood anti-crush plate underneath on the elevator when using (as we all do) soft to medium ⅛in. balsa sheet for the elevator.

There have been enough adverts in this magazine for the all-important address to be unnecessary, but if you still haven't got it indelibly printed on your mind here it is: R. Wilkens 'The Laurels' Rack End, Standlake, Oxon. Price lists etc, for all 'Outlaws Mode, Products' are available if you send an SAE to this address.



More combat items from the Outlaws. The combat wing is the very successful Super Star I (to be the subject of a Kit Review in the near future), while smaller brethren is the newly announced Starlet – see also above. Both metal fuel-tanks and bladder tanks are newly available items – obtainable through good model shops or direct from Richard Wilkens.

topical twists

by 'Pylonius' illustrated by Sherry

"Miss Universe be blowed! It's the Wakefield contest".

Posing Problem

Model planes always have been difficult things to photograph. Try to catch one in mid flight and it comes out like a bluebottle on a window pane; static wise it has a chameleon-like ability to merge with the background, disappearing into tarmac and melting into grassy depths. But it was not long before the photographic wizard found the ideal solution, or rather background – a pretty girl. Get some little raver holding the model, and even if the model doesn't come out too clearly, well, who cares? The idea also gave scope for the caption writer to exercise his wit with a few nudge nudge phrases like "... *and he has plans*".

We have all enjoyed this way of studying model design, but I wonder if the whole thing has gone too far. Over the years the models have got bigger and more curvaceous, and, so too, have the girls. And where uncovered versions have been depicted, the girls have more than kept pace. At one time we felt a bit sorry for some of the wee lassies as they grappled manfully, or rather womanfully, with the huge, multi engined models that were becoming all the rage, but the wily photographers seem to have found a new breed of super girl who could take on the monsters at their own frame filling game; so, as decollete vied with decolage and curve jostled curve, the models began to be edged out of the picture, leaving beauty unadorned by model or very much else.

There is a danger that this could lead to a situation where your favourite model journal might not be all too easily discerned among the clutter of girlie magazines on the bookstalls, and you could be subjected to some domestic harassment were you to come home clutching a copy of 'Playfair'. ". . . *Alright, I believe you, but don't go back with it wearing that dirty raincoat* . . ." Even so, it might well be that your model book will carry its very own *Planemate of the Month* across its centre pages, and who knows what you might not find under 'Gadget Review'.

School Daze

When I read that a student teacher was to make a study of aeromodelling as a subject, I became more than a bit alarmed. Now, I know it is more agreeable for the teachers to see the pupils happily engaged in model building, instead of having to ram irregular verbs and suchlike down their reluctant throats, but I am concerned for the future readership of this Column, and the dubious effect of modern teaching methods on the hobby.

What with all the gamey things that go on at school these days, which not only includes all the things we used to do outside school when I was a lad, but subjects like rock climbing and rug making, the boys get precious little time to learn their letters as it is, and if they put model building on the curriculum as well we may have to think in terms of producing the model mags in pictures.

Then again, if the trendy methods by which they 'teech speling' are applied to model making we can look forward to some pretty unusual models. "*The reesun wy this buyplan has ownly wun wing is beecawse I plaid trooant.*" And when we read in the school report that '*Johnny tackles the subject enthusiastically but lacks a proper sense of direction*', this would mean that Johnny has probably whanged his radio model through the school roof.

I also feel that it is desirable for the lads to have something left to do outside school, for it is in the boring out of school times that they undertake the demolition of new housing estates and demonstrate their peculiar brand of basic English with the aid of paint aerosols. You may agree with the sentiment that '*Free Flite Rools O.K.*', but would not wish it to be splashed on the side of your house. Asking a blasé teenager if he had thought of taking up model flying, he would undoubtedly reply that he did all that sort of kid stuff at school.

Public Nuisance

Not so many years ago the model plane was a commonplace sight on our public open spaces, and most people had a good idea what a model plane looked like – some at too close a range. I know that when I used to fly my '1066 and all that' rubber models amid all the swooping spectacle of modern electronic wizardry that filled the air over the local common, the only glances I got were ones of sympathy. "*Poor chap,*" you could almost hear them thinking, "*either very poor, or very stupid, to be messing about with silly little elastic models. Probably both.*" But perhaps I wasn't all that stupid, albeit very poor, for all the heavy spectacle stuff has long since vanished, whereas my little elastic models are still very much a going concern. And when I do operate them in my own, non-progressive way, people not only watch the flights with intense interest, but ask me questions about the models – something totally unthinkable even five years ago.

This is rather odd, considering the amount of PRO stuff that has been going on over the past years. By strenuous effort the great indifferent public has been wooed and won, and it would love to see model planes in action and give them its support, if only the models were anywhere to be seen. At one time people could happen upon, or even make a special trip to a Rally or Gala, but that was in the balmy days before the big bureaucratic crackdown, when you could fly without triplicated permission, and security just meant checking your braces. Now, when an airfield is grudgingly given over to model flying for just one day, the penal conditions attached, though ludicrous in the extreme, have one clause in common: the rigorous exclusion of the public on a members only basis.

If PRO means 'for', we should now change it to CON (Can Operate Nowhere).

BRITISH NATIONAL CHAMPIONSHIPS — 1976

RAF LITTLE RISSINGTON, AUGUST 14th - 15th

THE REASONS why this year's National Championships were delayed until mid-August are now part of modelling history; the important point is that they *did* take place — and were as enjoyable as ever. The weather co-operated admirably, and we were treated to bright sunshine with winds varying from non-existent to light. Internationalism extended to include Australian, Canadian, Dutch, French and German modellers and the only real disappointment was the reduced entries received in virtually all events.

To some extent this was caused by the fact that the full quota of events were squashed into two days of intense contest activity, with the result that some modellers were forced to choose some contests at the expense of others. This problem of forcing a quart into a pint pot also contributed to friction between the free-flight and radio control fraternities when the prevailing wind direction dictated that free-flight should operate from the same area as R/C aerobatics — an event which is 'immovable' due to the tarmac requirements. This problem has been avoided in the past by the various events being held at different times, but despite 6am starts for F/F, there just had to be an overlap to accommodate all interests. Eventually, sanity prevailed and the free-flights moved to a less-than-perfect position — only to have to move base yet again as the wind swung around. Meanwhile control-line enjoyed possibly the best site ever — an enormous apron of smooth tarmac, enabling all events to be tightly controlled in close proximity.

Suffering a very drastic fall in entries, the radio control events (detailed in our companion magazine *Radio Control Models & Electronics*) could hardly fail to cope adequately with their competitors. Thermal Soaring, originally scheduled to take place at a separate site, instead took place at the main venue, and the airfield had an unexpected quietness from 11am to 4pm on the first day ('peak viewing time' for spectators) while all other R/C events ceased to permit this. A strange piece of programming, as even the diehards must admit that thermal soarers present little spectator appeal.

Nevertheless, an enjoyable week-end of flying at this Gloucester-based airfield, which has served modellers so well over recent years. Thanks as ever to the hard-core of SMAE workers who put so much into making it a success, and of course to the RAFMAA for their continued, essential, co-operation.

			Best Flight	Static	Total
FREE FLIGHT SCALE					
1. T. Manley	Blackburn	*Blackburn Swift*	627	501:5	1128:5
2. E. A. Coates	Lee Bees	*DH9A*	623	408:25	1031:25
3. W. Dennis	CM	*LVG CVI*	450	437:5	887:5
4. A. P. Creedy	FFSC	*DH9A*	537½	323	860:5
5. R. Oldridge	CM	*Albatros DVa*	460	386:25	846:25
CONTROL LINE					
1. V. Willson	Three Kings	*Zlin Trenor*	1098	939	2037
2. M. Staples	Shuttleworth	*Fokker D7*	691	961	1652
3. R. Truelove	H. Wycombe	*HP Hampden*	1021	516	1537
4. D. Ashfield	N. Norfolk	*Isaacs Fury II*	670	740	1410
5. W. Cordwell	Three Kings	*WACO CUC-6*	742	689	1345
RADIO CONTROL CLASS I					
1. D. Vaughan	KAARCS	*Wirraway*	402	493	895
2. M. Reeves	Ramsey	*Fournier RF4D*	476	410	886
3. D. Moore	Liverpool	*PZL Wilga*	343	383	726
4. D. Hutson	Exmoor	*Jodel D112*	364	186	532
5. W. Neild	Winsford	*SE 5a*	285	202	487
RADIO CONTROL CLASS II					
1. B. Taylor	Ilminster	*FW 190A*	525	588	1113
2. F. Coulson	Bristol	*P36A*	562	542	1104
3. E. A. Coates	Lee Bees	*Martinsyde Elephant*	451	602	1053
4. T. Ruck	Hastings	*Martin Baker MB5*	573	479	1052
5. C. Foss	Sussex	*Loving Wayne*	461	530	1033

A Swift take-off! Actually, it just happens to be Terry Manley's free-flight scale winning Blackburn Swift.

SCALE CONTESTS

FREE FLIGHT

Just a dozen competitors this year, of whom nine managed the 30 second qualifying flight — a somewhat higher ratio than recent years. Several new models were on show as well as a number of trusty old faithfuls. Best of the bunch was Terry Manley's torpedo dropping *Blackburn Swift*, forerunner of the more famous *Dart*, standard torpedo carrier of the FAA in the late 1920s. After some rather erratic flying in the early rounds Terry managed to make the angular silver machine perform reasonably well, and with the flight judges in a very generous mood, he eventually received 627 points, just four in front of the venerable *DH 9A* of Eric Coates, still flying as well as ever in its fifth year. Also flying well was Rex Oldridge's perennial *Albatros D. Va.*, while oldest machine present was Geoff Abell's *Vultee Vigilante* built some 15 years ago and rescued from the attic! This fine old Bridgewood design of the '50s turned in some very creditable flight scores, but age took its toll on the static score. A. Coker had a beautifully constructed 1/12th scale *Fokker Triplane*, in a realistic streaky green colour scheme, but had great difficulty in making it perform sufficiently well to qualify. Longest flyer was the *DH 9A* of A. Creedy; finished in the North West frontier, mid-twenties silver colour scheme of 27 Squadron. This machine was not yet fully detailed and was much lighter than the Coates version, thus possessing a much higher rate of climb. This, coupled to a two minute plus engine, resulted in an out-of-the-field first flight. Another fast climber was the *LVG* of W. Dennis, somewhat overpowered by a Mills 1·3cc. This immaculate lozenge camouflaged model was a little reluctant to rise from the ground at first, but shifting the CG aft cured this problem, albeit at the expense of longitudinal stability. For the first time a CO_2 powered model competed in the 'Super', the delightful Brown

Either it's a lightweight, or Ron Truelove has been answering Charles Atlas advertisements! His 'Handley Page Hampden' scored good flight points, but suffered from lack of documentation when it came to static judging.

powered *Bristol Scout type 'D'* by Dave Banks was rather at a disadvantage against its larger brethren in the breezy conditions on Saturday evening, but nevertheless managed over half flying marks in the calm of Sunday morning.

Static judging took place after flying, and resulted in a clear win for Manley from Coates, with Dennis in third place, hotly pursued by Creedy. **E.A.C.**

RADIO CONTROL CLASS 1

Only five models were entered in this most exacting competition and of these only three could be considered as true 'Class 1' standard; the two survivors of the British World Champs team (Mike Reeves' *Fournier RF4D* and David Vaughan's *Wirraway*) plus newcomer to the scene Phil Moore's *PZL Wilga*. Not surprisingly the *Wirraway* was judged to be the finest model – the cockpit detail in both this and Reeves' *Fournier* are of the highest standard ever seen in this country. Although impressive at first glance the *Wilga* proved to be rather inaccurate in execution, particularly in the bulged cockpit region, while the silver grey paint finish was also not a very realistic representation of the polished metal of the original. Despite these faults the craftsmanship was of a very high order, so lifting the static mark to respectability.

None of the Class 1 models were flown very impressively. Mike Reeves had a very poor first flight but improved to record top score on his second at 476. This, however, was just not quite good enough to overhaul Vaughan, whose 83 point static advantage was sufficient to keep him up front despite only modest flying. **E.A.C.**

RADIO CONTROL CLASS 2

As always this event attracted by far and away the biggest entry – only about half of last year's record, but nevertheless a hefty 28. The standard of model has risen tremendously, so that now good flying ability is no longer enough: a well built model is essential for success. In fact, apart from cockpit detail, the top dozen would have been close contenders in Class 1 a few years ago.

For the first time for many years, all the R/C Scale models were weighed. This factor was well publicised beforehand and all models were found to be under the mandatory 11lb, unfuelled. Several were perilously close though, and it was noticeable that on some of these, a number of details had been removed prior to judging!

Top static score was achieved by the Eric Coates' *Martinsyde Elephant* closely followed by the *FW190A4* of Brian Taylor. Only other models to beat the 500 static marks were Whitehead's colourful *Gamecock*, Fred Coulson's *Curtiss P36A* and the *Loving Wayne* by Chris Foss. Significantly, four of these models eventually finished in the 'top five'. The odd man out was the *MB5* of Tim Ruck who put in the best flight of the contest at 573 to lift his average 479 static mark enough to give him 4th place overall.

No less than four *Pitts* biplanes were entered, the best belonging to P. Ramsey which placed 8th. Three very large models appeared; W. Evans' *Wellington III*, by far the most consistent twin engined machine ever to appear on the scale contest circuit, but still plagued with U/C collapsing problems. Ricky Shaw's *Fournier RF5*, which flew beautifully on the Sunday and a mammoth *Art Chester Special* which unfortunately, crashed on its first flight.

First place was hotly contested by those two rivals of the Wessex League: Brian Taylor and Fred Coulson. Fred had the edge in flying on Brian on both days, particularly on the landings. Taylor's superior static score, however, was just sufficient to give him a 9 point overall lead and victory.

There was only one point separation between third and fourth, where again the superior static score of Eric Coates' *Elephant* was just sufficient to counter the excellent flying of Ruck's *MB5*. Coates was first to fly in the first round at 9am in perfect flat calm conditions but it is reported that too much red wine the previous evening caused orientation problems with a resultant mediocre flight score. In round two the wind was quite strong for a lightly loaded biplane, but he nevertheless managed to improve. Chris Foss flew the *Loving Wayne* well, but perhaps too much like an aerobatic model, to come fifth. The *Gamecock* put in two pretty awful flights – appearing to be completely laterally unstable, but whether this was electronic or aerodynamic it is difficult to say. Arthur Searle's *Bleriot* looked pretty in flight even if the rate of climb and flying speed were a bit excessive but, unfortunately, motor trouble prevented him completing his flights. **E.A.C.**

CONTROL LINE

Near perfect weather conditions ('near perfect' because there is always somebody who likes 'more wind' or 'less heat') meant that it was mutually decided to complete the event on the same day, so both flight rounds and the static judging followed one another.

First to fly in round 1 was Mick Staples with his immaculate *Fokker D VII*, as entered in last year's Nats, and which also brought home a 'gold' for Mick at this year's Model Engineer Exhibition. However, he suffered with 'first flight nerves', and an unfortunate motor failure on landing. Dennis Ashfield, also fielding last year's entry in the shape of the *Isaacs Fury* put in a very successful flight; no 'nosing' over this time but the taxi demonstration was a bit lost coming in the middle of the flight pattern . . .

This year's British World Championship entry was of course Vic Willson and he was next to fly. The *Zlin Akrobat 526A* looked

At left, Chris Foss's R/C 'Loving Wayne' gets a weight check – this simple rule enforcement brought about several 'crash diets . . . Below is Fred Coulson's 'Curtiss Hawk P36A', with gear in process of retracting backwards. No truth in the rumour that the legs were bent to that angle after the first landing.

Action, modern combat style, as Richard Evans releases a Super Tigre G20/15 powered 'Super Star II' (what else!) and Bob Morgan sprints towards the spare

and sounded superb in the air; first the U/C retracted and extended, then a flaps demonstration was followed by a real 45 degree turn. All this with only a whisper of noise from the well silenced motor; the only down pointing must have come from the slightly 'rough' landing. Vic's control system is in fact 'almost radio' with throttle, U/C and flaps all worked by servos controlled by a closed circuit transmitter and receiver, the signals being pulsed down the two lines. No doubt this method will be the rule rather than the exception at the majority of the future top level contests but a bit pricey for 'yer average' C/L flyer.

The *WACO KQC-6* (or whichever number you like to apply to it) of Wal Cordwell's, although lively enough showed a reluctance to land, and when it did, not very gracefully! Also, there was a slight dispute regarding the working of the flaps: as these are situated halfway across the wing and inboard of the struts they are a job for both pilot and judges to see. A demonstration on landing convinced all that they were indeed working.

Last to fly, and well worth waiting for, was the *HP Hampden* – latest model from the Ron Truelove stable. This was in fact 'premiered' at the Old Warden, All Scale Day, but on tarmac it was even more impressive. This time a torpedo was added to its options and indeed a really high amount of points were scored, putting the *Zlin* and *Hampden* in the same bracket. The U/C retracted in a most realistic way. No flaps, but the torpedo drop made up for that.

The same flying order was adopted for round two and the flying carried on after only a slight delay. Mick Staples and the *D VII* improved their score with a far better flight and the motor behaved itself by not stopping when the time for a taxi demo came, also the 45 degree turn was noticeably better. Dennis on the other hand didn't fare so well, his machine appeared to be well underpowered and wallowed in flight. Ground handling on the other hand was very good. He had apparently tried more power in the form of a '61' but ran into vibration problems. Sometimes you just can't win.

Vic also dropped points on this round, when his engine cut on landing, which was a shame for the overall flight including the touch and go's were very good. Wal also improved his score (I think the judges were looking for those flaps with field glasses) and taxied in front of the judges' chairs then closed down engine. Ron, just to show he wasn't going to be outdone proceeded to drop his torpedo almost in Ven's lap. Good job it wasn't a Bob Ivans type, they actually explode!!

So concluded the 1976 C/L Scale flights, the remainder of the day provided rest for the pilots and more work for the judges, who came up with the accompanying results, the only surprise being the *Hampden's* low static score, for an extremely well built and detailed model. Answer was lack of scale data provided for the judges – there simply is very little available on this subject.

Well done the lads who 'had a go'; but what has happened to the C/L scale entries? The atmosphere is as good as ever (better in fact for now the practice is to employ C/L people to do the judging) so it's really up to you lads if C/L Scale survives in the SMAE contest calendar. Never think your model is not good enough to enter. **W.C.**

(Scale reports submitted by Scale Columnist Eric Coates, who judged one event and then placed second and third in the other two, and Wal Cordwell who, though slightly less successful with his entry, made his presence felt by his enthusiasm – and corny comments!)

CONTROL LINE

FAI COMBAT

Run by Outlaws MAC, combat saw its lowest number of entries for at least a decade, with somewhat less than the pre-entry total of 71 actually flying. Speeds were much higher than in previous years, with Oliver diesels being the exception rather than the rule. There was a fair variation in motors used (Super Tigre, Rossi, MVVS, Oliver) but the majority of flyers are now using large polystyrene models, or very light balsa structures with some polystyrene components. The standard of flying appeared to be very mixed, with a lot of entrants not being able to cope with their 90 mph plus models – in some cases it seemed as if the models had minds of their own, and a lot of the bouts were one-minute bursts of unleashed power, followed by three minutes of untangling lines and keeping pit crews fit. Continental teams were well represented with crews from Holland, France and Belgium.

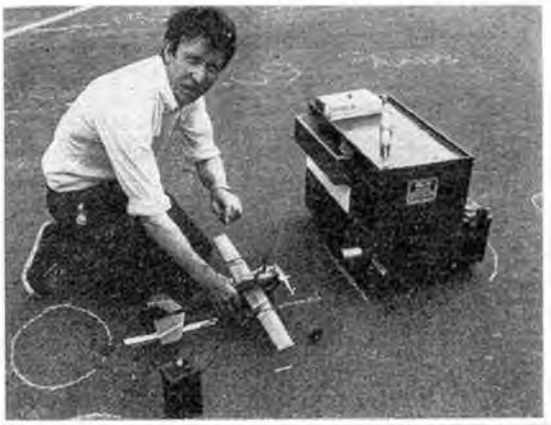
So, to the contest itself. With all the fast machinery about, it was noticeable that the majority of flyers were formed into well organised teams. The newly formed *Posse* team of Richard Evans, Dave Wood, Mick Lewis and Bob Morgan seemed very well prepared, whilst the re-formed *ACE* team, now comprising of Vernon Hunt and Dave Wiseman (with more old names promising to come out of retirement) were doing a lot of practice, until they decided to fly Super Tigre glows instead of their Rossi diesels. Other teams going well on the first day were *Cosmo, Archers, Outlaws* and the majority of the foreign competitors.

The second day's flying proved to be more interesting, with the wind having picked up a little, and also with the remaining competitors being eager to do battle. By the second round some familiar names were reduced to the sidelines: John Hammersley being beaten by a very on-form Pete Tribe in the elimination round, and Dave Wood losing to M. Loughlin after three re-flys, also Rod Bamford losing to Mittler, and Frank Smart being another Pete Tribe victim.

By round 3 just 16 pilots remained and with many of the bouts being reflown due to flyaways (models being cut off the lines) it was becoming a laborious task to get through each bout. This round saw Richard Wilkens (of Outlaws *Superstar* fame) lose to Holland's Ron Kaptain and also the eventual finalists Mick Lewis and Pete Tribe disposing of Alec Herring and Dave Williams respectively.

Thus the quarter finals found Mick Lewis against van der Gaag (Holland), Ron Kaptain versus Mick Tiernan, Bob Morgan

William van der Gaag prepares another 'whatsit' for fellow Dutch combat flyers. Never before has combat been dominated by so many teams using near identical equipment.



Mike Billinton with super-light 10cc class speed model—motor being a bored out K & B 40. Lightweight means a lower pull-test, which in turn results in a thinner control wire being necessary. Less drag equals more speed—which makes up for the lack of capacity. See? It's easy really!

Martin Radcliffe prefers the old fashioned approach—big motor (OPS60 with tuned pipe) in sturdy, rigid structure, where total weight must be double that of Mike's machine. At the moment, Martin's combination is proving fastest, but time will tell.

versus Vernon Hunt and Pete Tribe versus Richard Evans. All of these bouts (with the exception of Tribe/Evans) had to be reflown to get a result, Mick Lewis coming out on top over van der Gaag, Tiernan beating Kaptain and Hunt narrowly overcoming Morgan (after a very closely fought match) and Pete Tribe disposing of Richard Evans.

The semis saw Mick Tiernan and Mick Lewis doing battle (*Posse* chasing the *Outlaws*, or was it the other way round?) but eventually the *Posse* triumphed, and then Pete Tribe beat Vernon Hunt. With both the losing semi-finalists out of models, third place was decided on the highest number of points scored.

The final saw Mick Lewis and Pete Tribe demonstrating just how Combat should be flown, with both competitors very eager to become the new British National Champion. Lewis got in quickly and took two cuts, which was soon reduced to a one-cut lead by Tribe. Another couple of minutes' flying saw both competitors on the floor, and the *Posse* team working very hard to get their pilot airborne, whilst Cosmo had theirs back in the air. Mick Lewis's crew worked hard, but failed to get him airborne, but by his one cut lead and only a small amount of ground time against him, he became the victor. **J.H.**

SPEED

Warm weather, little wind and a near perfect contest area located between two large hangars, resulted in no less than 73 attempts, 47 successful flights and two new British records from the 23 entries.

Jo Halman created modelling history by becoming the first woman to fly a speed model in a British contest, and although an official time eluded her, the practice speeds showed that she could well soon be competitive. Indeed, with a little more practice and a bit more experience, it may not be long before we see the first husband and wife team representing Great Britain in FAI speed. Pete himself used one of his own carbon fibre props and a Rossi 15 in an asymmetric model to record 140·6mph on two flights in the FAI class.

Mike Billinton had a very interesting ·60 class model, built to FAI specifications. It weighed only *17ozs complete* due to the construction which was a laminated 1mm ply crutch and all balsa remainder, plus the powerplant which is a K&B 40 bored out to 0·51cu.in. capacity. Unfortunately, although Mike used a 7 x 12½in. prop cut from a 9 x 12½in. Topflite, and a ·0148in. monoline he only managed 167·1mph. This was disappointing, as the motor has previously done 180mph on a thicker wire, in a heavier model! The theorists who were watching can now argue where the loss of speed went to . . .

'Man of the match' as they say, must have been Ken Morrisey who set new records in both the ·049 and ·29 classes, despite having to fly wearing a corset to support a slipped disc. The ·049 record was the first to be broken and in fact Ken broke this on all three of his contest flights. He made a

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COMBAT

1. M. Lewis	Posse	
2. P. Tribe	Cosmo	
3. M. Tiernan	Outlaws	
4. V. Hunt	Ace	

AEROBATICS

1. J. Newnham	Rolls Royce	2058·5 pts
2. J. Mannall	Buckaneers	2038·5 pts
3. G. Billon	France	2007·25 pts

NOVICE AEROBATICS

1. D. Tipper
2. T. Cafferty
3. R. Quilter

JUNIOR AEROBATICS

1. B. Ensten
2. D. Scott
3. D. Hinton

SPEED

Class 1 (·049cu.in.)

1. Lee/Morrisey/ Isles	Sharston	100·76mph
2. M. Gagg	Wolves	88·2mph

SPEED

Class 4 (FAI)

1. B. Jackson	N. Sheffield	140·6mph
2. P. Halman	Sharston	140·6mph
3. D. Smith	Southend	137·24mph

Class 5 (0·29cu.in.)

1. Lee/Morrisey.	Sharston	170·7mph
2. P. Eisner	Feltham	160·9mph
3. R. McGladdery	Feltham	160·9mph

Class 6 (0·40cu.in.)

1. M. Billinton	Elliott	173·4mph
2. Powell/ O'Sullivan	Anglia	173·4mph

Class 7 (0·60cu.in.)

1. M. Radcliffe	Feltham	178·9mph
2. M. Billinton	Elliott	167·1mph
3. I. Roffey	Elliot	165·7mph

½A TEAM RACE

1. Nixon/ Campbell	Hinckley	9:27.0
2. Wilson/ Gardner		10:04.5
3. O'Neil/Evans		Disqualified

FAI TEAM RACE

1. Flores/Van de Voort	N'lands	8:24.7
2. Heaton/Ross	Norwest	8:32.2
3. Helmich/Kroon	N'lands	9:12.6

NOVICE GOODYEAR

1. Pegg/MacAlpine
2. Girling/Maclin
3. Knox/Aberdeen

GOODYEAR TEAM RACE

1. Bryant/ Chilton	Norwest	8:54.7
2. Horton/ Howarth	Wharfedale	9:12.0
3. Green/ Cunningham		10:15.0

CLASS B TEAM RACE

1. Surugue/Uzan	France	6:31
2. Giles/Harknett	Feltham	7:34
3. Nixon/ Campbell	Hinckley	Retired

CARRIER

1. V. Willson	3 Kings	480 pts
2. B. Perry	Wolves	446 pts
3. A. Sopp	Maidenhead	438 pts

No prizes for recognising Derek Heaton and Malcolm Ross—nor for that matter their Bugl powered FAI racer. They have now placed second in this event for four successive years.

Evans/O'Neill with brightly decorated Ginny Goodyear racer—isn't this the sort of model that the rules envisaged? Motor is a G15, fitted with a Clarkson head.

record attempt and with his diminutive 4oz monoline model on a carbon fibre prop, made 100·7mph. He flew as part of the Lee/Morrisey/Isles team with each member contributing to the model. Later in the contest Ken tried his OPS 29 model (also on monoline) and clocked 124·9mph. After disappearing for a while he returned and surprised everyone by increasing his speed by almost 50mph! When Ken made this flight his T-shirt became entangled in the yoke of the pylon which tied him up so well that he could no longer rotate. By arching his injured back and waving the uniline handle above his head he managed to save the motor; the model just clipped the ground and the motor stopped. In this instance his flight was a two-man team effort shared by engine man Alan Lee.

Owen Warboys flew his OPS 60 mini-piped model at a creditable 164·4mph and was followed by his clubmate Ian Skinner who had a new OPS 29 monoline set-up. Ian achieved 150·1mph using methanol/castor fuel and a 7 x 7½in. Topflite propeller. On the Sunday morning Don Powell made the fastest flight ever on two lines in this country, when using two ·011in. wires, Don flew the team entry K&B 40 rear exhaust at 173·4mph for a personal best time.

Making a welcome return to the contest scene after a 10 year absence in the Merchant Navy was Peter Tribe – older modellers will remember Peter as the flying department of the Copeman/Tribe combat team! The model he attempted to fly was a very futuristic asymmetric ·40 model built by the other half of the Tribe/Paige team entry, but a poor dolly design prevented any flights being made.

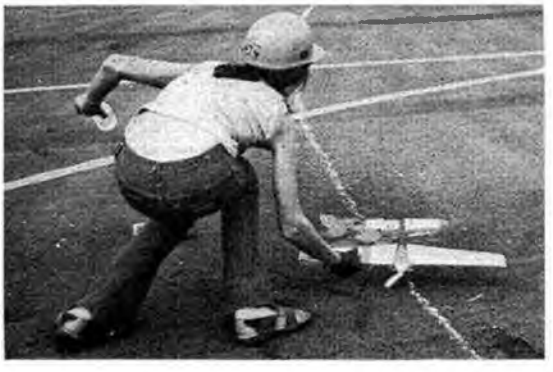
Ivor Roffey flew a 32oz lightweight OPS 60 model on mini-pipe and pen bladder, but on the first attempt only clocked 159·7mph. He then bench ran the motor which had a new liner and piston assembly decided the mini-pipe was too slow and proceeded to use a tuned pipe. After obtaining an increase of 3000rpm, Ivor decided to make a metal tank on the field. After a quick rummage in a refuse sack, a suitable piece of 10 thou tin was found in the form of a 'Double Diamond' beer can. A couple of hours later, Ivor was ready to fly with the model converted to tuned pipe and metal tank, running on pipe pressure. Two flights were made, and on both of these the motor overheated due to the new liner/piston assembly, and 165·7mph was the result. As they say a Double Diamond works wonders (sometimes). **I.R.**

½A TEAM RACE

This class remains very much a minority event, with only 18 teams competing this year. In view of the comparative cheapness (and the low noise levels) it is a pity that this event is not more popular, despite the comparative difficulty in obtaining suitable motors. The heats produced few surprises, but a notable success was when the Heaton/Ross team managed a time of 4:02 to claim a new British record. They were followed by clubmates Woodside/Sutherland who led a whole group of teams with times around 4:30.

In the semi-finals, firm favourites for the event, Heaton/Ross were put out when the compression screw of their home-built engine came out during the first engine run, the compression not backing off until Malcolm Ross tried to retstart the motor at the first pit stop. Another strong contender for the finals place, the team of Woodside/Sutherland, were unfortunate to break their model during practice. Davies/Broadhead also failed to make it when their motor cut raggedly and was still running as the model went past the pitman, causing him to miss a catch. The eventual finalists were Nixon/Campbell, Wilson/Gardner and O'Neill/Evans. In the final both Nixon/Campbell and Wilson/Gardner flew consistently, the former team having the faster model and pitstops to become the winners in a time of 9:27 with Wilson/Gardner second at 10:04·5 and O'Neill/Evans disqualified to come third after the model ran-in from a missed catch. **R.A.H.**

Although Bert Metkemeyer could not attend this year, his brother Rob did make a non-serious attempt in FAI. Below however, we see the talents of Christine M.—pitting the ½A racer for Paul Reitbergen. At right Stan and Brian Parry flank Charlie Cotterell. Their Miss San Bernadino racer is Rossi powered (tuned by Charlie) and runs on 20% nitro. Prop is a Bartels 7 x 6 trimmed to 6½ x 5½in. Total weight is 19oz.



FAI TEAM RACE

This, the doyen of the racing events, attracted the largest *flying* entry of all the racing events (43) including a number of foreign entries from Holland, France, Germany and South Africa.

Round 1 was held on the Saturday afternoon and with little wind, segment choice was never a contentious matter. The first heat set the picture for the meeting with Nixon/Campbell and Tribe/Broad respectively recording times of 4:39.2 and 4:28.4 and results like these were seen time and time again throughout the day, with 18 out of 24 times recorded in the first round being sub 5 minutes. This compares with 1973 when breaking 5:10 was good enough to make the semi-finals! The improvement in standards in the last three years has been astounding, and most of this may be put down to two motors – the Bugl 15 and the Rossi 15 which have become relatively easily obtainable. The surprises of the round were a faultless 4:13.4 from Broadhead/Davies and a far from faultless 4:35 from the Dutch top team of Flores/Van der Voort. Perhaps the unluckiest team were Heaton/Ross who cut on 98 laps at 3:56 to finally record a 4:14.2 with their retracting undercarriage model.

Starting at 8.30am on Sunday with the first heat of the second round bang on time, saw Heaton/Ross using a fixed undercarriage model recording a new British record of 4:04.4. This was not the fastest time of the round however as Flores/Van der Voort recorded a truly superb 4:02.2.

Another high point of the second round was when Alan Van Breda from South Africa (partnered by pilot Roy Everitt) recorded his best ever time of 4:28, good enough to put him in the semi-finals. It is pleasing to see that only one team (that of Daly/Howard) were disqualified for an oversize tank, compared with the sessions of disqualifying six or seven teams that have occurred in the past. People at last seem to be reading the rules – though Bugl shut-off units are still a matter of controversy regarding the volume of fuel contained within them.

In the first two semi-finals little happened of note, except that Flores/Van der Voort, put in a smooth, clean 4:07.5 and in the second heat Helmich/Kroon were disqualified for repeated whipping of the model, with a motor setting which was far from ideal. In addition Horton/Howarth failed to take off with a motor (Howarth-Eta) which refused to start after the warm-up period. In the third semi-final things broke into almost open warfare between the teams of Heaton/Ross and Broadhead/Davies which led to the disqualifcation of both teams – an event almost unprecedented at the Nationals. Such conduct is hardly what one expects at this level of competition, especially since it prejudices the third team's performance.

In the second round of the semi-finals Helmich/Kroon came very close to a second disqualification for whipping, but finally recorded a time of 4:19.6 – just good enough to make the final. With only one heat to go, the three fastest times were 4:07 from Flores/Van der Voort, 4:19.6 from Helmich/Kroon and 4:24.5 from Tribe/Broad. In the last semi-final Horton/Howarth again had troubles, but Heaton/Ross recorded a faultless and warning free 4:11.2 to displace Tribe/Broad in the final.

In the two hundred lap final Flores/Van der Voort and Heaton/Ross had almost equal airspeed, with the British pair perhaps having the edge, whilst Helmich/Kroon were by far the slowest. Enrico Flores' pit stops were *very* fast, and they looked like certain winners despite a shortage of range, until their motor cut at 198 laps. Missing disqualification for gliding *more* than two laps by the length of a segment, they finished 8 seconds quicker than Heaton/Ross while Helmich/Kroon were just half a dozen laps behind in third place. A good clean final featuring all Bugl power and Heaton/Ross for the third year running have just missed winning the premier FAI T/R title in this country, and each time to a different Dutch team too! **R.A.H.**

GOODYEAR

Once again Goodyear attracted the highest home-grown entry of 43 with the standard varying so greatly as to be positively dangerous at times now that speeds are approaching 95-100mph, and with many inexperienced pilots competing the danger of mid-air collisions is always present. Although only one occurred, that may be put down mainly to the good weather conditions and luck rather than skill. The early heats were run without the assistance of a PA system and this inevitably resulted in disputes regarding the starting times, and caused several re-runs to be held.

The major surprise of the first round was the poor time recorded by the Heaton/Ross team due to tank troubles, and most of the other performances were predictable, though it was pleasant to see the Bryant/Chilton team at last realising the full potential of their Rossi glow powered model, which has *looked* fast for some time, but has been plagued by starting troubles. The fastest time of the round, and in fact the competition, was put up by the Feltham team of Fry/Smith with a 4:23. They were followed by Bryant/Chilton and Horton/Howarth returning the fastest diesel powered time in third place with a 4:33 from their diesel converted Taipan 19 powered model.

Round 2 saw the Heaton/Ross team produce something more like their normal performance with a time of 4:38, whilst the Scots teams of Pegg/MacAlpine and Knox/Aberdeen produced consistent runs giving them times of 4:57 and 4:49 respectively and these teams together with Green/Cunningham 4:48.5 and McMahon/Myska 4:52.2 made up the semi-finals. The most unlucky team in the heats must have been Hutchinson/Lee who missed the semi-finals by a mere 0.4 secs!

The models making up the semi-finals were powered by six Rossi glows, one Rossi diesel and two Taipan 19 diesel conversions, the draw bringing all three diesels together in the third semi-final!

The first semi-final featured Perry/Perry, Fry/Smith and Knox/Aberdeen. After some 20 laps disaster struck when Perry's model ballooned up in front of the faster model of Dave Fry, and a midair collision resulted. In the re-run it was discovered that the Fry/Smith model had a burst tank, causing them to retire and a reserve team to be brought in to enable Knox/Aberdeen to put in a time, as the Perry/Perry model was a total write-off.

The next semi saw Pegg/MacAlpine Green/Cunningham and Bryant/Chilton fly a fast race with no trouble, the latter two with times of 4:30.2 and 4:37.2 respectively.

The third semi-final was between Horton/Howarth, Heaton/Ross and McMahon/Myszka, the former two using converted Taipan 19s and the latter a Rossi diesel. Horton/Howarth had a perfect setting as did McMahon/Myszka whose Rossi diesel lacked the airspeed so vital in all racing events; Heaton/Ross with a poor setting never looked in contention.

The Novice Goodyear final for the recently donated Elliott trophy was between Pegg/MacAlpine, Knox/Aberdeen and Girling/Maclin. This proved to be somewhat disappointing when after 20 laps the controls on the Knox/Aberdeen model jammed nearly causing disaster to the other models. In the re-run Pegg/MacAlpine flew cleanly and well, whilst Girling/Maclin never looked serious challengers with an engine setting which was never right. So the Elliott trophy goes to Scotland this year to the deservedly successful team of Pegg/MacAlpine who flew well throughout the meeting.

The final was between Horton/Howarth, Bryant/Chilton and Green/Cunningham. The latter lacked the airspeed of the other two and it was soon obvious that the race for first place was between Horton/Howarth and Bryant/Chilton. Bryant/Chilton having slightly better airspeed but their stops were fractionally slower. Horton/Howarth were unfortunate to cut one lap after their last scheduled stop, losing precious seconds and giving the race to Bryant/Chilton after one of the closest fought and cleanest Goodyear finals at the Nationals for years.

Incidentally, it was rather sad to see Mini-Goodyear abandoned this year after only three entries were obtained, particularly when last year there were some 15 or 16 entries and perhaps some rule changes should be made in this class to make it a more attractive proposition. **R.A.H.**

CLASS B TEAM RACE

People came to the meeting expecting a very tight event and only two crashes robbed the meeting of its expectations in a contest with 23 entries and plenty of fresh enthusiasm.

Round 1 was on Saturday morning and whilst defending champion Roland Surugue from France made a faultless 3:30.2 using last year's model with sleeved-down OS40 power, the event really came alight when Nixon/Campbell produced a new British record of 3:26.5 despite relatively poor stops. Secret of their sudden success was use of a prototype OPS 29 team race special running on 25% nitro with a John Gray 200 x 200 glass fibre prop – sufficient to give an airspeed of around 130mph. Production units of this motor are now available in the shops . . .

Buys/Van der Voort at 3:41.0 and Giles/Harknett with a new lightweight model at 3:50.6, with slow stops and suspect time-keeping completed the highlights of the round.

Round 2 next morning saw the Norwest team of Heaton/Ross put out of the competition when the motor pan sheared, and they had no reserve model to use. The Burns/Ridley team improved on their first time and started to realise the potential of

1. The French team of Surugue/Uzan won Class B, using the same model as last year when the pitman was Jean Magne. Same result then too! 2. Vic Willson took Carrier with faithful APS Seamew. 3. Junior stunt winner Barry Ensten receives his prize from the donor—Pop Warburton. 4. Nixon/Campbell had a busy weekend—flew in all racing classes except Goodyear—this being their FAI model. 5. Alan Lee (left) and Ken Morrisey with their Cox 049 and OPS 29 record holder. 6. FAI team race went to the Dutch again—this time the Flores/vd Voort duo. 7. Dave Sallows 'consumed' three models in Round 1 of Combat. Uses G20/15s. 8. Gold Trophy winner—John Newnham. 9. Billon nearly took the Gold Trophy to France, but eventually had to be satisfied with 3rd place. 10. Don Haworth remains faithful to his reworked Eta 15 in FAI team race. 11. Combat winner Mick Lewis insists that the model is an own-designed 'Rocket Ship'—not a 'Super Star' hiding behind that covering paper. 12. Taking the strain of the pull test Martin Radcliffe, 10cc speed winner with OPS 60. 13. Bryant/Chilton and Goodyear winner.

their OPS 29 model to record a 3:54 whilst the airspeed of the Gray/Devenish team was impressive, but the motor did not start well and tank problems limited them to 20 laps per tank.

Between the second round and the semi-finals, disaster had struck the Giles/Harknett team when the push rod quick-link sheared during practice causing the model (a new one built specially for the Nats) to be written off. Hard work during the lunch break refinished the pan, which had bent in the accident and which was common to both models, saw them just able to make it to the starting line for the semi-finals with their old familiar red model, and only a ground setting to rely on.

The first semi-final saw disaster strike Nixon/Campbell who paid the price of having a model much faster than the opposition. This 'new breed' of racer has suddenly emerged being some 20mph faster than the 'norm' and the sudden leap in performance creates large problems, especially if a short pilot with a fast model is drawn against a pair of much slower racers. Overtaking then becomes an incessant nightmare – and dangerous. Fortunately, when Dave Nixon crashed seconds after completing his race following a mix-up in the centre, a pilot of his experience and ability was at the controls – but Class B is now in urgent need of a rule change to match the currently available horsepower.

Back to the races – Surugue/Uzan recorded a slow but clean heat in 3:52 to reach the final whilst Giles/Harknett recorded a steady 4:01. In the meantime Nixon/Campbell had prepared their reserve diesel (overbored Rossi 15) powered model and these were the three to take part for the final.

In the final Nixon/Campbell elected not to leave the ground, knowing that their model was totally uncompetitive and that to fly it at the same time as the two much faster models would have constituted an unnecessary hazard. In the end the French team won convincingly with a time of 6:31 just managing to two-stop the final, with Giles/Harknett recording a 7:54. **R.A.H.**

AEROBATICS

Despite reduced entries in almost all other categories, the Gold Trophy still attracted 41 flyers including a record number of foreigners. They included Doug Harlow and John Tidey from Australia, still in Europe after competing in the Dutch World Championships, plus Paul Tupker and Peter van Doesburg from Holland, and four flyers from France including World Champs 4th placed man, Gerard Billon.

There were two circles in operation this year, with a pair of judges in each. The entry was divided in half and flew one round in each circle, and the top flyers from the first day qualified for a further two round fly-off on the Sunday. The final score was the sum of the best of the first two rounds added to the best of the second two rounds. Unfortunately one pair of judges was marking higher than the other and indeed 13 of the 15 finalists got their qualifying score from this circle. This system would have been satisfactory if flyers were consistent in their flying, but it handicaps a pilot who puts in a poorer flight to the high scoring judges because he will not receive the benefit of a better flight before the low scoring judges. There was talk that some sort of equalisation factor should have been applied, but it may have been fairer if the top seven or eight flyers from each circle had been included in the final, instead of just the top scorers. All of the foreigners reached the fly-off, thus leaving just seven British lads, and raised the question, would the Gold Trophy go the same way as the team race, and be won by an invader? It certainly made for an interesting event.

Weather on the Saturday was very warm with only a slight breeze which was variable in direction. It is a fact that more flyers have line tensions problems with no wind than when it is blowing well. The wind certainly gained in strength overnight, and its effect was to highlight the more experienced flyers who had the confidence to run their motors more slowly and then use the wind to advantage. Only one circle was in use for finals day, with all four judges (Mick Harvey, Cyril Green, Gordon Bryant and John Harley) in attendance.

What of the models present this year? Top men from France, Billon and Lavalette used similar *Olympus* designs, rather plain in appearance, nylon covered and weighing about 61 ozs, both being Merco 49 powered. Our own John Heanon had a brand new version of his *Maxi*, now at Mark 5 stage with a Fox 40. Star of the future must surely be Peter van Doesburg who flew a strikingly original, orange twin boom model named *Orion* fitted with Fox 35. It was noticeable that all of the foreigners did very crisp, sharp, square manoeuvres.

It was unclear until very late in the competition as to just who might be the winner, with likely contenders being John Newnham and Jim Manall for England and Billon and Lavalette for France, and that was in fact the finishing order; a first time win for John. Surprise fifth place was John Heanon followed by Pete Tindal. **G.A.**

CARRIER

The excellent weather enjoyed at this year's Nationals allowed the Carrier event to achieve the best results yet. However, the *'Seamew Still Rules OK'* legend applies especially in the hands of the experienced carrier pilots and despite the previous week's results at Woodvale Rally where *Seamews* failed to get into the first three. Winner Vic Willson of Three Kings MAC achieved the highest score ever for UK carrier competitions at 480, being a combination of 82 and 24½mph high and low speeds and a full scoring landing on his first approach. Last year's winner, Brian Perry (Wolves MAC) had to be content with second place, still using his familiar HP 60 gowered *Seamew* having disastrously crashed his new *Skyraider* model in practice the day before the contest. Late entrant Alan Sopp of Maidenhead MAC also a past Nationals Carrier winner, put in a third place – winning flight of 438 points with his Class 1 *Seamew*.

Seven of the 12 entrants scored good landings, this being an unusually high degree of success for this competitive class. The models presented included ever popular APS *Seamews* and *Firebrands*, a *Martin MO1* and a *Seafire*. This latter model, built and flown by C. Ledster of Exmoor MAC showed great promise on its first try-out on the deck.

This event is slowly achieving some degree of support, and a hard-core of experienced pilots is appearing, the problem being of course the relatively few chances of practice, this usually only occurring during contests when a kind-hearted Contest Director allows slots for practice flying.

S.A.P.

(The control line reports were submitted by John Hammersley, Ivor Roffey, Bob Horwood, Glen Alison and Stan Perry, each of whom took an active part in the contests concerned—either as competitors or organisers, or even both. Many thanks to all).

JUNIOR EVENTS

JUNIOR KIT

In common with the other classes, these events suffered from a low entry, there being just 11 entries in Glider, 10 in Rubber. Compensating for this though was the high standard of flying in the quite helpful weather conditions. There were several

Below left, Neville Dickinson with very nicely built 'Nimrod V', built from the AeroModeller plan, and powered by a Merco 35. In the centre is Marc Lavalette from France with his Billon designed 'Olympus' stunter. Nylon covered, it uses a Merco 49 powerplant, and was flown to fourth place. Below right is Tony Harknett who placed second in Class B with his pilot Dick Giles, using this familiar Super Tigre racer—the new model was 'totalled' when the pushrod failed.

father-and-son teams competing, and while this is good in many respects, it must not be allowed to get out of hand so that over-zealous fathers (or other highly experienced modellers) dominate the event. Less parental influence was evident in the high standard of construction seen – and it must be admitted that some of these 'beginner designs' are quite tricky for young, inexperienced hands to assemble.

Performances certainly were good – several competitors scoring maxes, including Gary Dowsett, whose glider was lost out-of-sight even after the dethermaliser operated, some 16 minutes after the take-off. Fortunately it was later found some five miles away but it spoilt his chances of victory. Perhaps even more unlucky was the youngster who scored three maxes with his glider only to be (reluctantly) disqualified for having a model consisting of *Asteroid* fuselage and tail with *Satellite* wings – the rules specifically state that models must be built as per kit, and thus a 'mixture' of parts is not allowed.

Winner of this section eventually proved to be John Walker with his St Leonards *Satellite* – just ahead of the sole girl entrant, Ruth Abbey. In the Rubber category, Stephen Wingate topped Lionel Ferer by 16 seconds to give him victory, following much verbal assistance from his father Jimmy Wingate, a well known modeller in the late '40s and early '50s – when he himself was a junior.

Superb prizes for this event were made possible due to the generous support of Kelston Kits, Keil Kraft Ltd, Model and Allied Publications, Ripmax Ltd, Solarbo Ltd and St Leonards Model Supplies – not forgetting of course Norman Foster whose specially made trophies will be awarded at the SMAE's prizegiving in November. **I.D.**

NOVICE/JUNIOR STUNT

For the first time, the junior C/L event at the Nationals was flown to the new Novice/Junior rules – and some 11 entries were received. Flown before the same set of judges, but with differing schedules and 'K' factors, this is in effect two separate contests in one. Overall winner proved to be Arthur Tippor from the Wharfedale Club with an OS35S powered Bob Palmer *Smoothie*, who put in two good flights leaving him with a clear lead. A very impressive performance in this his first year of contest flying. Overall fourth, but first Junior, proved to be Barry Ensten of St Albans, and he thus became this year's recipient of another of Frank Warburton Snr's trophies

Above is Novice stunt winner Arthur Tipper of Wharfedale while at right is John Tidey who travelled somewhat further to compete in the Gold Trophy. From Australia actually. Placed 8th.

'Pop' Warburton has done much to encourage this side of Junior activity with his generous donation of trophies – which incidentally are 'permanent' ones. Barry flew a PAW 2.49 powered combat model to narrowly beat David Scott by just 7 points – he was flying an Oliver Tiger powered *Junior Nobler* with a high degree of competence. **G.A.**

(*Junior events were reported by Ian Dowsett and Glen Alison, both of whom have done much to encourage beginners to the sport by organising such contests.*)

FREE FLIGHT

Reported by Martyn Cowley, Martin Dilly and Dave Hipperson

FAI Events

SATURDAY kicked off at 6am with half hour rounds for the three FAI classes, in the order F1C, B and A; any appreciable wind would have made retrieval for the next round very tight indeed, especially for those flying in two events, let alone three. Luckily it was all but flat calm at sunrise with just enough drift to necessitate F/F control being positioned close to the campsite so the first round Rossis gave the campers an early morning call (another good reason for a split Nats, Happy Campers I).

For FAI Power (F1C) a max off seven seconds engine run is no walkover as many proved in the liftless start to the contest. Ray Monks and Stafford Screen had no difficulty

and on past form could be expected to continue to max, much to the concern of Tom Smith who missed his max by three seconds. Jack Allen, back in free-flight after an investigation of the possible appeal of R/C thermal soaring, provided the only other max of the first round (proving that there was, after all, *some* early morning lift) after a bad pattern following a left launch. If the contest ran according to the form books, then this first round could well have decided the event.

Wakefield was next away and, despite the extensive use of bubble machines and thermistor detection devices, most flights reflected still-air, liftless scores. By the start of the first A/2 glider round at 7am the sun was climbing through a layer of mist on the horizon and many were hoping to fly at the last possible moment in the round, hoping for lift. As it turned out, it was a most interesting start to the event, since the lift failed to materialise and, although there was some helpful air, not a single max was recorded.

Among the overseas competitors in this event were Hans Wilkening from West Germany and several Canadians (among them Peter Allnutt, silver medallist at Plovdiv) who were taking in the Nationals, the Pierre Trebod and the World Indoor Championships on a single trip to Europe.

The first round provided the best competition conditions for a long time, fully justifying the early timetabling – pity the whole contest could not have been held under such equalising weather but through

Below is yet another French aerobatics competitor—Marconcini, with attractively decorated stunter which has more than a little 'Nobler' influence. Uses an O.S. 35 for power, he eventually placed 15th. Below right is Jan v. d. Kroon preparing for the FAI team-race final, where he placed third with his pilot Henry Helmich. They won the event in 1974 with the same model design and of course Bugl power. Bugl engines (and Dutch teams!) have dominated this event for the past four years.

out subsequent rounds the air became more and more thermally with those in the lead early on becoming unreachable provided they continued to max. However, 8am also brought the first of the R/C Pattern *models, at well under towline height;* hardly surprising as the first of the six R/C take-off points was laid out on the runway just 150 yards from its upwind threshold. This unfortunate state of affairs continued doubtless to the concern of the Pattern flyers as well as the A/2 towers until, as usual, free-flight was moved to a less-than-ideal launch point.

Taking a break from his efforts organising the World Indoor Championships was Laurie Barr, flying the Wakefield he used at Säve in 1971, with an alloy motor tube and Benedek 6445 airfoil. Joe Barnes, also flying Wakefield has now abandoned the 'click' system he used to trigger his auto-rudder from the prop fold reaction; he finds that a high torque motor tends to operate this prematurely, usually with unfortunate results to the climb. Triple fin Wakefields are becoming fashionable, one of the neatest being Steve Marriott's with an octagonal sheet balsa fuselage, Hoerner tips and dihedralled tailplane.

As well as the changed launch area dictated by the R/C hazard, the steadily shifting wind made another move necessary, and finally, at the end of the first day's FAI flying at 10am West Germany's Hans Wilkening was leading from Elton Drew in A/2 with Richmond's Pete Williams third and Pete Freebrey fourth. Although chronologically the Open events took place next, we will continue with the FAI report, and hop forward to 10am on the second day; the idea of this timing was so that FAI flyers would have both calmish, low-lift, early morning conditions and also middle of the day, thermally air to fly in, while still leaving time for complete Open events on each day.

On Sunday the calm and warm conditions had gone and instead a stiffish breeze looked like opening the event out. In Power, Stafford Screen dropped a flight by engaging the wrong groove in the scroll on his Seelig timer, and fellow Birmingham clubmate Ray Monks had the misfortune to *rip the delay fan from his timer as he removed* the start pin prior to launching resulting in an instant run-down of the timer and Ray's consequent retirement. This left Tom Smith using his highly refined all-sheet Rossi model in the lead. In Wakefield John O'Donnell had a comfortable minute's lead flying his prop-delay model until a disastrous stalling glide dropped him down again to leave Wakefield wide open. In A/2 *it was also up to the leaders to keep maxing* to maintain their positions, but the pressure proved too much for Wilkening while Freebrey spun out of good lift for 59 seconds.

In the final rounds the lift combined with the stiff breeze was resulting in heavy losses especially in Wakefield and A/2. During the fifth Wakefield round an A/2 being flown upwind (certainly against the spirit of FAI flying, but there was nothing in writing prohibiting 'pilot models') flew over in obvious lift so Alan Jack, Mike Duce, John O'Donnell and Dave Greaves availed themselves of the opportunity of sharing it. In the fifth A/2 round Brian Baines led a group of eight models into tremendous lift all models continuing to gain height another eight minutes after they D/T'd, finally disappearing upwards miles downwind. Among them was Biggle John Cooper, who had the consolation of finding himself elevated to take the lead from Alan Jack by one second with one round to go. *In the final round Alan flew first and maxed,* requiring John to do the same to keep his lead, which he did towing for his own lift on a line cross re-fly just before the contest ended, to give him his second consecutive win in A/2 at the Nationals. John used three A/2s during the contest. For the first four flights he used a circle tow, rounded-tipped aircraft with Warren girder rib layout, followed this with a couple of flights with an old model which was lost on Round 6 and for the last flight used a model that is basically a *Rolling Stone*, fitted with a Russian type circle hook giving 'all or nothing' zoom function, putting on full glide turn when the hook unlatches. The model had recorded 22 consecutive maxes until it dropped a flight the previous day in Open Glider.

In Wakefield both the top two flyers, Ray Elliott and Dave Hipperson, were using the Croydon System – bubbles upwind and the chart recorder checking the air temperature near them. Chris Batty, who took fourth place behind Joe Barnes, flew a very simple pair of models, gadgetless and with square sheet fuselages, using ¼in. balsa at the front and 1/16in. for the rear boom, with either square or triangular corner longerons.

F1C winner Tom Smith had a cliff-hanger on his last flight; after about a minute and a half he was down to some 50 feet when he hit lift and went away to max and beat Stafford Screen by just over a minute.

OPEN EVENTS

Starting as the first part of the FAI flying ended at noon on the Saturday, **Open glider** rather dominated proceedings, as 90 competitors chased three maxes each – and over a quarter of them made it through to the fly-off. Inevitably we missed details of many of these, but among them were Peter Allnutt flying a Hacklinger-airfoiled, outrigger turbulator model with a hollowed out hardwood nose and shroud for the hook and timer, ex-Croydon member Philip Moate, back into contest free-flight after eight years' inactivity, took third place with an eight year old model, and Andy Crisp, flying the model he won the 'Four Flight FAI Meet' with at Sculthorpe earlier in the year. The visibility was not too good for the fly-off and the models that launched at the start of the 15 minute period mostly found marked sink, leaving Martin Shepherd the winner from Elton Drew.

The final **Coupe d'Hiver** results indicate *that people are taking the class seriously.* John O'Donnell started flying early but a one minute flight put him out of the top three. Stan Taylor took third in the class, with a triangular fuselaged model using a wing of about Wakefield size and a prop featuring a tension fold device, rather than the currently-fashionable torque sensing Montreal stop. Many were the stories of upward travelling D/T'd models. Mike Thomas, visiting from Canada for the Cardington Championships had one cure on a very sophisticated model – D/T the fin as well as the tailplane! As well as this feature, Mike used a flexi-jointed fuselage, a two piece wing 54in. x 4¾in. wire braced on a sprung pylon, which allows the wing to flatten when the model lands inverted, thus taking the load off the tips, and eight strands of rubber turning the 20 x 24in. prop. The propeller was an outrigger type, but the actual pivot was about 2½in. along the blade from the root, which both reduced the CG shift as the blades folded and also reduced the bending moment at the point where the outrigger pivots through the blade. The model used a ¾ second timer-operated delayed start to the prop run, one blade resting on top of the port wing as the model was energetically hurled into the air until the timer let everything start turning.

Second placing Steve Marriott flew a diamond fuselage, straight dihedralled aircraft, and tied with Dave Greaves who *scored 9:45 for the five flights, necessitating* a fly-off to decide the Coupe winner out of two flyers with recent Wakefield successes on the continent. Dave launched first in very unhelpful cool conditions. He was down at 1:16. Steve wound and had a motor break, replaced motors, re-wound and waited for ages. No lift came through so he launched his neat red and white tissue-trimmed model, which sank firmly after a spirited climb, vanishing behind the close horizon – a hump on this section of Little Rissington that had already been responsible for many short times. The timekeepers made it 1:15; both models had gone over the hump and were not seen down. So it was a win for Dave Greaves and his *Ind Coope* (ouch!).

Hand Launched Glider was again flown from a ten metre square box and provided quite an audience spectacle of continuous javelin-type launches, following much waiting for soap bubble thermal detecting. Being fixed in this way, the 'chuckies' in lift provided easy markers for a whole pack of Open Glider, Coupe and ½A flyers waiting hungrily only yards downwind for tactical flying. Lift was very powerful and Martyn Cowley was off to a good start with five maxes out of seven flights within an hour and a half. Most of the flights D/T'd at about 1:30 to continue for 3½ to 4½ minute flights landing outside the airfield. Ian Allen of Falcons, last year's winner, came well prepared with a special chuck glider model box, but suffered from badly off trim throw patterns, together with a model lost upwards with no D/T.

Other strong challengers throughout the afternoon began to fade as the spare flights, best five from nine, dropped short of the minute mark. An early D/T for Cummings to give 55 seconds as an opening flight spoilt an otherwise promising challenge, and Pete Bayram, again with probably the best HLG at the meeting, was perhaps too distracted by flying ½A Power to be in *contention. Top Junior in the event was* Biggles' Mark Prickett, flying a 22in. *Harvest*, with three maxes in his 4:41 total. Drama was introduced towards the end of the contest with Julian Hopper who had four maxes and one flight left, having lost his best model with a vane D/T malfunction. He eventually maxed, providing a two-way fly-off at 6.45pm, by which time the weather was cold and breezy. Cowley launched first to score 43 seconds; Julian followed quickly afterwards to misthrow for three seconds and second place. Greater things were in store for Hopper and his wife Linda the following day . . . Martyn's winning model was a 24 x 4in. version of his *Harvest*, that took third at last year's Nats, and was published in *AeroModeller* earlier this yea

1. Dave Greaves, Coupe d'Hiver winner, winds aptly named model. 12 years old Steven Wingate (2) won the Rubber section of Junior Kit contest with his 'Performer'. 3. Linda and Julian Hopper took Women's Cup and Open Rubber between them. 4. A/2 winner John Cooper also flew this Open Rubber model. 5. John Downs used this Mills 1.3 powered 'Hells Angel' to take top Vintage honours. Fellow South Bristol member Alan Brocklehurst (6) won tail-less. 7. ½A Power victor was Dave Pymm – again! 8. Frog Junior winner Nick Walton won the fly-off with Wichita-wing original A/2. 9. Chris Batty completed a successful weekend by winning Open Rubber. 10. Martyn Cowley emerged victorious in HLG after stiff competition. 11. First and second in Wakefield went to Ray Elliot (right) and Dave Hipperson (left), flanking Jack North and thermistor chart. 12. Jonathan Walker's 'Satellite' gave him first place in Glider section of Junior Kit contest.

Canadian Mike Thomas launches delayed start Coupe d'Hiver – note way in which prop blades are folded.

A greater degree of gadgetry was to be seen in **½A Power** this year – a class which seems to have benefited from the seven second engine run and the two minute maximum. Some 35 people flew in this event, and many seemed to be treating it as a mini FAI class – VIT and all. Much tactical flying was evident in both this class and in Coupe; with no start line some flyers were launching downwind of the already downwind glider flyers, but the short max left most flights still on the airfield. Russell Peers lost his *Mini Woodpecker* on the last of five maxes, and therefore joined the other four in the fly-off with a somewhat inferior reserve model. Third place went to Sunderland's Ewan Jones flying his *Doubloon* which had an overly straight climb, a consequently poor recovery and dropped about eighty feet at the start of its glide to land at 1:24. Tom Smith's son Tony took fourth after going very tight right, perhaps after a crosswind launch, ending at little more than head height for 36 seconds. Winner Dave Pymm, repeating his success in the same event last year, had by far the best climb pattern, went a little straight during the first part of the glide but won by over a minute from Peers, who obviously missed his *Mini Woodpecker*, languishing downwind. Pymm's model was in the usual neat Pymm tradition with elliptical surfaces; in Open Power he was using a Taipan ·15 with Schneurle porting on a similar-shaped 395sq.in. aircraft. His ½A climb was so superior to the opposition that it drew deserved applause from the crowd, which included a number of people from the R/C and C/L circles, visiting the upwind end of the airfield to see what it is that we actually do. An unfortunate note was struck when the fifth ½A fly-off qualifier, Tyson from Southampton, failed to turn up on Saturday evening, having been understandably misled by the official Nats programme which stated in the Sunday contest listings, that *all* fly-offs would take place that evening.

The **Women's Cup** produced only three entries, Linda Hopper maxing out flying an Open rubber model to take the trophy, after opting to fly on the Saturday in the much calmer conditions. A D/T failure on her first flight could have produced a far different result, but she produced two further maxes to retain her '75 title. Third place went to expatriate-American-at-Oxford Page Ayres, flying an A/1 in her first ever contest under the tutelage of Martyn Cowley.

Tailless was not exactly over-subscribed, but won convincingly by Alan Brocklehurst of South Bristol with a couple of maxes; his model used a two piece wing, which tipped for D/T, after another fuse first allowed the fin to spring to a highly offset position.

Frog Junior, with 16 entries, produced a fly-off. Nick Walton of York, flying an original A/2 with Wichita airfoil, glassfibre rod fuselage, and the timer replaced by a wadge of Plasticene for the fly-off, D/T being by fuse for this occasion, came out nine seconds ahead of Wolves member Steven Johnson, flying a St Leonards *Performer* rubber model.

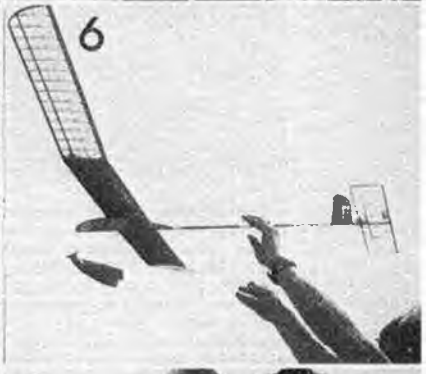
The Sunday Open events (Rubber and Power) A/1 and Vintage had windier conditions to cope with, and were flown in two time slots – 6am to 10am and 2.30 to 6pm. The lazy ones who didn't get up early missed the calmest weather of the day, although even at dawn it was obvious that the breeze was going to increase, so the serious flyers did not delay their starts. Quick off the mark was John Copper in **Rubber,** first up only minutes after the start, soon to be followed by many more, particularly in Rubber; immediately it was clear that although very little wind could be felt on the ground, 200 feet up or so it was fairly whipping along and at a slight shear. Most three minute flights landed outside in thankfully cut crops. This was mostly brought about by the situation of main control, sited so models did not overfly the tent city set up for R/C and the associated trade stands, instead of using the full diagonal of the airfield and overflying the hazards. On the other hand, there was nothing to prevent Open competitors from launching anywhere on the airfield they chose. Eventually, since flyers seemed reluctant to fly away from the main area of parked F/F cars, the control van was moved to a more advantageous corner.

As expected the early start in Open Rubber led to the usual large fly-off. A four minute max would probably have been more realistic for the early flights but as the wind picked up it was obviously not going to be easy for those who had elected to have a decent night's sleep and fly purely in the afternoon. The end of the day saw 21 in the fly-off but a more nine in Power. Power standards and entry numbers have never really recovered from the arbitrarily imposed silencer rule of ten years ago – in 1962 there were 24 in the Power fly-off in only slightly better conditions. Among those not maxing out in Power was Peers who managed only 2:41 for his last flight.

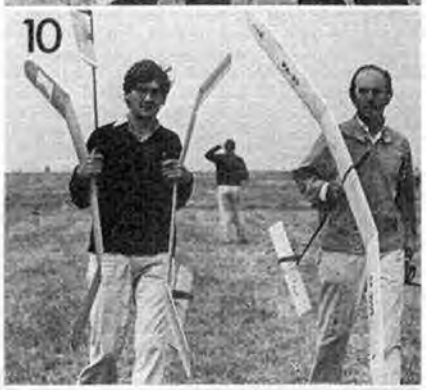
At fly-off time **Power** was first away with Tom Smith launching his K & B 40 *Super Nog* for a superb climb; the noticeable thing about this aircraft is that from anywhere near its launch point all you can see of it on the way up is a view straight up its tail with never a glimpse of plan or side view. The motor is cowled and the flying surfaces are sheet-covered. Tom was off into reasonair but a transition stall lasted for 30 seconds into the glide; Ewan Jones, Pete Harris and Fred Chilton were away in less helpful air, with Chilton going left on the climb to land at 3:22. Stansted's Julian Hopper produced a very large K & B ·40 model built for just such occasions as these. A very respectable climb and pull-out put him in good air which he must have recognised as such almost immediately as he looked very happy about it. At this time Tom Smith was nearly down and looked in the running when he landed at 4:30. One favourite, Trevor Payne from Biggles, had a good climb with a reserve *Forte* which had a slightly poor transition, due most probably to the rotten air that had his huge 800 square inches down after a mere 2:42. Earlier in the day Trevor had the misfortune to tangle with clubmate Steve Marriott's towline just after launching, writing off both models as the ·40 ship 'blew up' dragging Steve's A/1 along the ground at about 60 mph to leave a trail of matchwood remains. Tony Child produced a characteristically impressive climb from the only model on the fly-off field that everyone knew the name of; his huge *Ramrod* powered with yet another K & B, this time with an intake extension and turning a Tornado 10 x 4in. nylon prop. It pulled into the glide perfectly, but then disaster – a stall picked up quickly and he was down from one of the best climbs in a little over two minutes.

At that point it still looked like Tom Smith until a scan of the horizon clearly showed Julian Hopper's model still well up more than five minutes after launch. Power was over and Julian had a victory by over a minute, giving the Hopper family two trophies in a day.

A/1 glider proved to be another close finisher. Several early flyers, some benefiting from a couple of maxes in the morning calm, had useful scores around the 9:50 mark and, with the wind freshening, looked in a strong position. Most eventful day's flying was by Steve Marriott who, with two maxes up was circle towing for his third when Trevor Payne's Power model got into the act, as mentioned earlier. Relatively undeterred, Steve maxed on the re-fly with his reserve model, only to fold the wings while towing for his fourth. He repaired this damage, maxed again and returned ten minutes before the close of the contest with a two piece wing again and a missing fin. 'Zap' saved the day and he used the fin from the wreck of the other damaged model to produce a flyable A/1 again. Again he towed for lift, only to be 'shot down' by a Junior Kit competitor with a line tangle, leaving insufficient time to find lift for a fifth max. Less spectacular flying produced full houses from John Abbey, who lost his model on its fifth flight, Rex Woodruffe and Martyn Cowley. In the fly-off five minutes circle towing found no lift for Cowley, but Woodruffe, flying a standard St Leonards *Asteroid* with a Seelig timer, neat pinking sheared tissue trim and a large underwing arrow pointing in the direction of glide turn, made 2:21 to win the event. Not in the top part of the results but nonetheless flying an interesting aircraft was O'Donnell with a foam-winged A/1, skinned with 1/16in. balsa on top and 1/32in. underneath and an offset hook, not used on this occasion, and a theory to set a few



1. Roger Baggot displays Ernie Vye's A/2 – features all moving fin, circle hook and mid-wing. 2. Third place in ½A went to Ewan Jones with familiar APS 'Doubloon'. 3. Mike Woodhouse hooks up the prop on his Wakefield. 4. Norman Hockin with Warring 'Zombie' (APS plan) flown in Vintage. 5. Looks like new, but it's 10 years old! Nigel Noel with pristine A/2. 6. Jim Waddington (or at least his head and hands) launches Brian Baines' A/2. 7. Rex Woodruffe won A/1 with standard 'Asteroid' kit. 8. Stafford Screen consults the thermistor as Graham Walker waits to fly in Wakefield. Vintage enthusiast Jim Travers (9) flew this 1¼ times Keil Kraft 'Scorpion' – 66in. span with De Long 30 power. 10. Elton Drew (left) and Canadian Peter Allnutt head for the Open Glider fly-off. 11. Andy Crisp and windy weather A/2, using Shoaf airfoil and offset twang townook. 12. Tony Smith launches for 4th place in ½A with Tee Dee model. 13. Betty Barr holds for husband Laurie, taking time out from organising the Indoor Champs.



Alex Cameron flew neat A/1 with swinging circle tow hook, two piece wing and dihedralled tailplane.

people thinking. While maintaining low moments of inertia in the pitch mode, the model deliberately uses a heavy wing to get a high inertia in yaw so as to maintain the glide turn. It may be the way to use some of that wood in your model shop's racks at last.

With the wind rapidly calming, 18 of the qualified 21 went out for the Rubber fly-off. Most flew from the area near the control van but Chris Batty and Dave Hipperson went somewhat upwind, Batty right to the top corner of the airfield in fact. Most of the herd flew during the early part of the period, but Laurie Barr flew late using the model with which he won the previous Rissington Nats, and placed second while Hipperson went within ninety seconds of the final hooter. Third placing Canadian Mike Thomas from Toronto flew at the same time as Barr but about 300 yards apart from him, using a very light, two piece wing, rolled balsa fuselage and 80 grammes of rubber to give a very pretty climb pattern, similar to the other rubber models he flew during the Nats weekend. Nobody contacted any obvious lift, apart from Batty who floated away all on his own for 8:07 out of sight. He spent all the following day searching for it, only to discover that someone had brought it back right after the winning flight. Wing is 5½ x 48in. with an undercambered airfoil, airframe weight is 3·1ozs, and rubber weight is 4·5, swinging a 24 x 30in. helical pitch mounted on a ¼in. diameter alloy hub with a Montreal stop. The motor Chris used to win was made from remnants that Falcons John Carter and Russell Peers discarded at the East Anglian Gala at Wyton. For him it was a pretty successful Nats, with a third in A/2 and a fourth in Wakefield to add to his Open Rubber win.

In **Vintage**, which took place discreetly away from the rest of free-flight, perhaps in deference to the rather shallower rates of climb of most of the power models flown in the class, there was a garden party atmosphere, with people standing in front of r.o.g.-ing models and wandering about generally. One of the best looking climbs came from Andy Crisp's *Ether Rocket*, a Dutch pylon design that climbed left and rather rolly under the power of its Mills ·75, complete with original Keil acetate wheels. The winning model was a *Hells Angel* with a Mills 1·3 and an Elmic timer, built by John Down of South Bristol, who made 8:00, beating Andy into second place.

FAI GLIDER (64 flew)

1.	J. Cooper	Biggles	20:11
2.	A. Jack	Southampton	20:10
3.	C. Batty	Bristol & W.	19:59
4.	J. Bailey		19:57
5.	H. Wilkening	W. Germany	19:30
6.	E. Drew	Bristol & W	19:29
7.	D. Truluck		19:24
8.	M. Woodhouse	Norwich	18:41
9.	P. Freebrey	Northwood	18:17
10.	P. Jellis		17:47

FAI RUBBER, FIB (24 flew)

1.	R. Elliott	Croydon	20:13
2.	D. Hipperson	Croydon	19:51
3.	J. Barnes	Liverpool	18:35
4.	C. Batty	Bristol & W.	18:19
5.	J. O'Donnell	Whitefield	17:52
6.	M. Duce	Liverpool	17:50

FAI POWER FIC (15 flew)

1.	T. Smith	BAC	20:57
2.	S. Screen	Birmingham	19:52
3.	J. Allen	Crookham	19:10
4.	R. Taylor	E. Grinstead	18:57
5.	R. Baggott		18:50
6.	D. Cash		17:27

OPEN GLIDER (86 flew, 23 in fly-off)

1.	C. Shepherd		M+2:30
2.	E. Drew	Bristol & W	M+2:22
3.	P. Moate		M+2:18
4.	E. Jones	Sunderland	M+2:06
5.	J. Carter	Falcons	M+2:05
6.	A. Jack	S'hampton	M+2:04
7.	P. Allnutt	Canada	M+2:03
8.	L. Rennan		M+1:58
9.	J. Abbey	Leicester	M+1:56
10.	D. Truluck		M+1:54

OPEN RUBBER (37 flew, 21 in fly-off)

1.	C. Batty	Bristol & W	M+8:57
2.	L. Barn		M+5:25
3.	M. Thomas	Canada	M+5:15
4.	J. Anderson		M+5:13
5.	P. Ball	Grantham	M+5:04
6.	A. Jack	S'hampton	M+4:58
7.	J. Hopper	Stansted	M+4:52
8.	J. Carter	Falcons	M+4:47
9.	C. Chapman		M+4:44
10.	M. Fantham	Richmond	M+4:43

OPEN POWER (26 flew, 9 in fly-off)

1.	J. Hopper	Stansted	M+5:36
2.	T. Smith	BAC	M+4:30
3.	P. Harris	Birmingham	M+4:01
4.	E. Jones	Sunderland	M+3:25
5.	F. Chilton	Crookham	M+3:22
6.	C. Rushby	Grimsby	M+3:08

A/1 GLIDER (31 flew)

1.	R. Woodruffe		M+2:21
2.	M. Cowley	Biggles	M+1:31
3.	C. Abbey	Leicester	M+0:00
4.	J. Williams		9:59
5.	J. Hanson		9:20
6.	D. Bailey		9:06

COUPE d'HIVER (23 flew)

1.	D. Greaves	Birmingham	M+1:16
2.	S. Marriott	Biggles	M+1:15
3.	S. Taylor	CM	9:31
4.	J. O'Donnell	Whitefield	9:02
5.	L. Moore		8:56
6.	G. Pink		8:52

2A POWER (34 flew)

1.	D. Pymm		M+2:36
2.	R. Peers	Falcons	M+1:15
3.	E. Jones	Sunderland	M+1:24
4.	A. Smith		M+0:36
5.	E. Tyson		M+0:00
6.	A. Wells		9:52

FROG JUNIOR (16 flew)

1.	N. Walton	York	9:00+1:36
2.	S. Johnson	Wolves	9:00+1:27
3.	A. Gough		7:40
4.	S. Wingate		6:55

HLG (26 flew)

1.	M. Cowley	Biggles	5:00+0:43
2.	J. Hopper	Stansted	5:00+0:09
3.	P. Bayram		4:55
4.	I. Allen	Falcons	4:54
5.	M. Prickett		4:43
6.	R. Cummings		4:42

TAIL-LESS (3 flew)

1.	A. Brocklehurst	S. Bristol	6:00
2.	M. Page	Peterborough	5:18
3.	R. Robinson		2:58

VINTAGE (21 flew)

1.	J. Down	S. Bristol	8:00
2.	A. Crisp	Biggles	7:34
3.	E. Jones	Sunderland	7:31
4.	D. Brawn	Biggles	7:26
4.	S. Philpott		7:26
6.	B. Harding		6:48

WOMEN'S CUP (3 flew)

1.	L. Hopper		9:00
2.	J. Nash		8:22
3.	P. Ayers		4:13

GLIDER JUNIOR KIT (11 flew)

1.	J. Walker		4:55
2.	Miss R. Abbey		4:29
3.	D. Edwards		4:13
4.	G. Brown		3:05
5.	S. Ayres		3:00
6.	D. Hey		2:48

RUBBER JUNIOR KIT (10 flew)

1.	S. Wingate		5:46
2.	L. Ferer		5:30
3.	S. Johnson		4:38
4.	S. Moore		3:56
5.	S. Bower		3:26
6.	S. Dixon		2:47

Pete Harris (Birmingham) launches triple finned, all sheet, Rossi powered FAI model.

GOLDEN WINGS AEROMODELLER MODEL CLUB

Are you between 10 and 16 years of age? Then don't delay, join today

Steven Johnson of the Wolves club is a youngster who can obviously build a tidy model—and fly it well too. At the recent British National Championships he flew this 'Performer', built from the St Leonards kit, to second place in the Frog Junior contest.

JUNIOR KIT CONTEST

SUNDAY, 19th September was a glorious day for model flying at Cranfield, Beds. where several Golden Wingers were in the *Junior Kit* contest. There's no thrill so great as hitting a great big thermal, then having the model dethermalise down only a few hundred yards away. This was the experience of several competitors both while testing and in the actual contest. Lionel Ferer of Leicester had his *Performer* going so well he was only 6 seconds short of a perfect score for his three flights. So he was winner of the Rubber-driven section, followed by Stephen Johnson of Wolves, and – wait for it – 9 year old girl flyer Michaela Sullivan of Wanstead. Watch it lads!!

Another young lady, Ruth Abbey, from Leicester, did very well in Glider. She beat her brother by placing 2nd, and only lost by 20 secs. to Jonathan Moulton, the winner. *Satellites* were popular and went really well in the calm conditions. It was a perfect day for testing those new models – shall we see you there next year?

Dear John,

My friend and I have just learnt to fly control-line, and would now like to have a go at combat flying. We would like to build a model from one of the AeroModeller plans – which would you suggest as being the most suitable? Should we use a diesel or glow engine?

Devizes, Wilts. *E. Kitsen*

Probably your best choice of model would be the Dominator, Plan No. CL893, price 55p including post, bearing in mind that you are novice flyers and are bound to hit the ground a few times – hard! This model, though no longer competitive in national competitions, is perfectly good for learning with and for club contests. In particular, it is extremely strong when nylon-covered and is simple to build. As for an engine, I would recommend a diesel for ease of operation and handling. When learning to fly combat, the last thing you want is an overpowered 'bomb' with erratic performance. Keep it relatively slow and within your capabilities, and you will soon learn to avoid line tangles and to fly 'two-up'. Later, as you progress, you can convert to lightweight, glow powered models.

Dear John,

I am very interested in scale models, and would like to build a 'Peanut' scale kit, but I do not have a large enough hall nearby to fly it in. Do they have to be flown indoors?

Radlett. Herts. *D. Wilson*

While 'Peanut' contests are always flown indoors, there is no reason at all why these little rubber powered models should not be flown outdoors in calm conditions. This summer we have had numerous hot, calm evenings – ideal conditions for these little models – and you will be amazed at the performance possible from the really light models. You might even find that a de-thermaliser would be a useful accessory!

Dear John,

I am making a big control line stunter to my own design, but I am having troubles with a fuel tank. I am no good with a soldering iron so cannot make my own properly, and it seems impossible to buy large tanks from the model shop. Does anyone make big fuel tanks anymore? All I can buy are tank kits, but they are no good for me.

Leicester *W. Horton*

There are two solutions to your problem Firstly, Micro Mold now market a large range of fuel tanks, which are fully assembled, in sizes up to 125cc – surely large enough for any stunter! These tanks should be available from any Micro Mold stockists, and that includes most model shops. Alternatively, have you considered using a polythene bottle clunk-type tank, as used in the vast majority of radio control models? A wide variety of sizes and shapes are available, and no soldering is required. They certainly work satisfactorily in C/L models, and should solve your problems quite well.

Dear John,

The controls on my control line models always seem very stiff and hard to move – can you suggest any way to make them move properly, as it makes the models hard to fly properly.

Bagshot, Surrey *A. Sage*

Bet it does make it hard to fly too! Ideally, the weight of the elevator should make it droop when the control lines are disconnected – the hinges should be that free. Without seeing your model, it is of course hard to give a solution, but the most common are paint or fuel-proofer on the hinges, or even 'glueing' the elevator to the tailplane. Obviously, prevention is better than cure, but try running a knife blade between the elevator and tail to make sure that they are separate, then squirt some fuel on the hinges and 'waggle' the controls until they free-up.

Another common cause is that the piano wire leadouts have kinked slightly, and are binding in their tubes. Ideally, you should use leadout tubes much larger than the leadouts themselves to allow room for this, or better still use flexible leadouts in over-size tubes.

Is the bellcrank binding? Oil, or slacken off the locking nuts if possible. Is the elevator hole too small, causing binding on the push-rod? Perhaps the pushrod itself is rubbing against formers in the fuselage? Check item by item until you find the solution – and make sure that it does not happen on your next model.

Dear John Bridge,

I am between 10 and 16 years of age and would like to become a member of the 'Golden Wings Club'. With this application I enclose postal order (International Money Order) for 50p to cover cost of enamel club badge, two coloured transfers and membership card.

NAME IN FULL.....

ADDRESS .....

.....

YEAR OF BIRTH..... SCHOOL.....

NAME OF ANY OTHER CLUB OR CLUBS TO WHICH I BELONG (if any).....

.....

Send to: GOLDEN WINGS CLUB, AEROMODELLER, P.O. BOX 35, BRIDGE STREET, HEMEL HEMPSTEAD, HERTS HP1 1EE.

11/76 15p in the £1 Rebate plan purchase coupon for Golden Wing Members G.W. No.....

40 Years of Flying Scale

Looking back on early days of scale model flying by R. F. L. 'Bob' Gosling FSMAE

IT WAS IN the early 30's that successful flying scale models of aircraft became practical, this being due to the introduction of balsa wood at that time. However, the scale modeller had many problems to contend with then, compared with the present day. It was not possible to obtain authentic plans of the planes one wanted to reproduce so the only solution was to scale up small drawings of aircraft which had appeared in journals such as *Flight* and *The Aeroplane*, and of course by studying their description and photos in the articles which accompanied them. Even so, most scale models built at this time were more often than not really semi-scale, conforming generally only to the outline and not structurally.

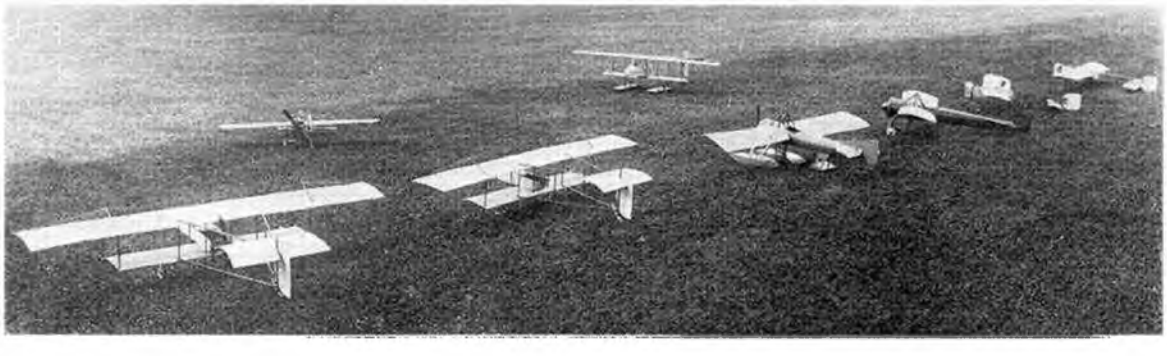
It was in 1935 that the *Bradford Model Aircraft Club* decided to stage a scale model competition in the following year. All models were to be built to one-twelfth scale with an extra 10% allowed on the tail surfaces, and a larger-than-scale diameter propeller, which however had to clear the ground when the model was in the horizontal position, using a true scale undercarriage.

When the day for the scale contests dawned in June 1936, five entries turned up at Yeadon Aerodrome, consisting of a *B.A. Swallow*, two *Percival Gulls*, a *Westland Wapiti* and my *Miles Hawk Major*. A *Heston Phoenix* was also entered but was not finished in time. The models were judged by Capt H. V. Worrall, of the Yorkshire Aeroplane Club, who was also well known as Sir Alan Cobham's co-pilot when they flew round Africa in the *Short Singapore* flying boat in 1927/28.

I well remember the thrill of finding that my *Miles Hawk Major* received the highest marks and also achieved the best flight time of about 35 secs. At that time the Bradford club was one of the most active in the North of England. Our chief rivals were the Lancashire Model Aircraft Society of which C. S. Rushbrooke ('Rushy') was the leading light. As we had inter club contests, I took the *Miles Hawk Major* to Burton the following year and placed 2nd in the contest with the LMAS. Incidentally at this meeting, Alwyn Greenhalgh and his father were among the LMAS members taking part in the duration contests. I am pleased to say that Alwyn now has this particular model of mine in his historical model collection.

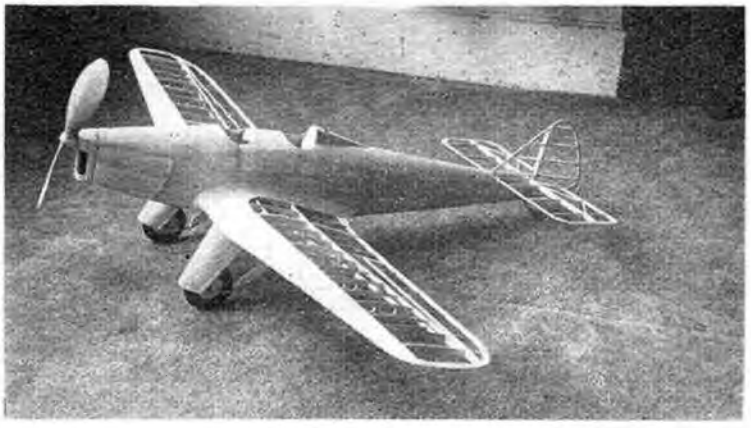
Now for some details of the model itself. As already mentioned, I obtained information from articles in *Flight*, and I also managed to obtain a copy of an outline drawing from Phillip & Powis Aircraft, the builders of the *Miles Hawk Major*. It was my intention to reproduce as much as possible the construction of the full size prototype. The fuselage was covered with $\frac{1}{32}$in. sheet balsa while the wings had the correct number and spacing of ribs; this was seldom the case with most scale models at that time.

The power was of course rubber, and having previously had considerable experience of geared drive, I decided that it would be an advantage to use twin gears, with the propeller geared 2:1. This would enable me to give more 'turns' to the motor and it also avoided all torque problems. But the greatest advantage, as mentioned by Eric Coates in his *Flying Scale Column* of December 1972 was that the weight of the gears and bearing in the nose block were not wasted, as



Made to 'fly' in prophetic Aerial/Naval battle scenes at the 1913 Imperial Services Exhibition, Earls Court, London, this group of scale models must qualify as being among the first ever of their kind.

Bob's 1/12th Miles Hawk Major structure (right) and comparison with full size (opposite) shows we've lots to learn, even 40 years after!



the model would have to be ballasted at the nose in any case to bring the CG forward to its correct position. I used a ¼in. gear on the prop shaft, and two ⅜in. gears on the motor spindle.

A breakdown of the weights of the various parts of the model is as follows:

Fuselage	78gms
U/C & Spats	21gms
Wings	25gms
Tail & Rudder	8gms
Nose, Gears & Prop	28gms
Rubber Motor	45gms
Total Weight: 205 gms (approx. 7¼oz.)	

YOU & SMAE

INSURANCE

This bulletin follows on from the 'You and SMAE' column in the October issue, in which we looked at two alternative methods of obtaining third party insurance cover. Now we examine two more in detail.

Public Liability Policy – Many insurance companies offer straightforward protection to individuals/companies/groups against claims by Third Parties as a result of virtually anything – including, if required, model flying.

Many clubs negotiate such policies through a local broker or direct with well-known companies. Little more needs to be said except that these policies can be attractive and entirely suitable – but they need to be looked at carefully at the start just to make sure. Certainly the specific use of 'model aircraft' must be included and a reasonable cover must be insisted upon – at least £100,000 arising from one incident. (Other points to watch are mentioned later because they can apply to all insurances.)

Special Insurance Schemes – A few brokers have taken the trouble to arrange special insurance schemes for model flyers – usually for clubs rather than individuals – and the rates are very attractive for Third Party cover. SMAE members can obtain the addresses of the brokers concerned, as one of the many services to members.

The SMAE has also been consulted by a broker who is considering a scheme of 'Fully Comprehensive' insurance for model aircraft owned by SMAE members, i.e. including cover against damage/write-off of the model. Naturally it would be expensive but could have a great deal of merit for those who put hundreds of hours into a special model. SMAE members will be kept informed via their own individual copy of the SMAE newsletter *Model Flying*.

Factors to Note with all Third Party Insurances

(a) All the types of insurance for Third Party cover only provide *you* (the holder and flyer) with cover – except, possibly, as indicated with the Householder's type, members of your family may also be covered.

(b) If you fly on Ministry of Defence land (RAF airfields, for instance) extra insurance will be required by MoD. This can be expensive. SMAE members can obtain this extra cover *without charge* via their Area Representative because SMAE negotiates an annual special policy specifically for such purposes and pay for it from central funds.

(c) If you have a club policy it is not unusual for it to *exclude* cover to claims from fellow club members. This is a very important aspect – so insist on 'member-to-member' cover. The extra premium is negligible.

(d) If you take part in a display *your normal Third Party insurance will possibly be invalid* and it is therefore imperative that you seek special cover for the event. (An 'organisers' insurance'). If your display is part of a larger event, the main event organiser may also have such a policy but, again, it is unwise to assume that it will also cover you.

(e) If you are a 'junior' check that your cover does not require you to be supervised at all times by an adult – and if you are a parent/guardian, check this twice! (you are OK with MAP Insurance).

(f) *Do not* attempt to restrict your cover to specific types of model aircraft (e.g. R/C models) nor to specific operating sites. The SMAE will refuse to accept such restrictions from its members, for good reasons, and so should you.

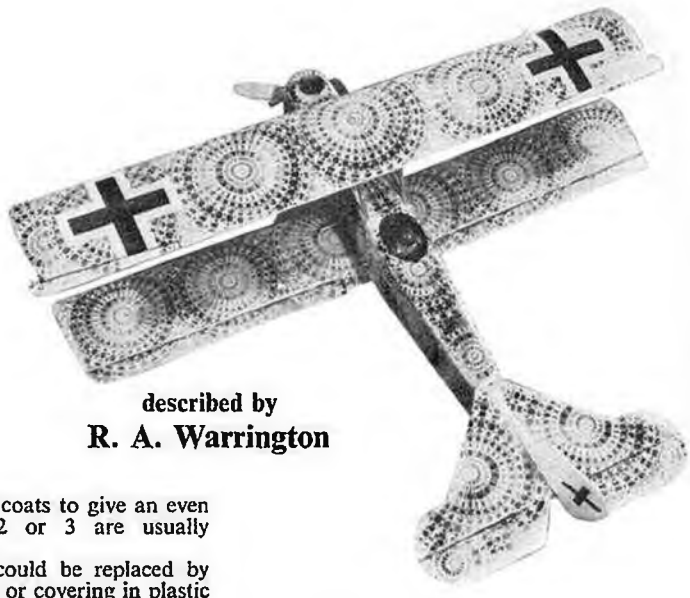
(g) Some club policies have clauses linking the premium to size of membership and requiring the club to notify the insurance company if the membership exceeds certain numbers. Make sure you keep track of this and duly notify – or the insurance could be inoperative just when you need it.

This concludes our articles on Insurance. A new topic will be commenced next time. If you are a member of the SMAE a 4-page pamphlet would be available to you on Insurance – a vital service to members and one which continues to occupy the time of SMAE officials.

* * *

For information regarding joining the Society of Model Aeronatucial Engineers, the only officially recognised body for model flyers, send an SAE to the Membership Secretary, 22 Blackheath Rise, Lewisham, London.

FROM CAKES TO CAMOUFLAGE



described by
R. A. Warrington

FANCY a very snazzy finish for your sports model? Then try this method which has the added advantage for those who are lazy, or who do not expect their models to last very long, that it will cover a multitude of omissions at the surface-finishing stage!

Put as simply as possible, the colour scheme consists of finishing in a plain colour and then spraying a contrasting colour (using either a spray gun or aerosol), through a paper or plastic doily to produce an overall doily pattern, as shown in the accompanying pictures of my totally non-scale (Class 4?) Fokker DVII *Mein Bender*. The resultant finish is very reminiscent of wallpaper, and was obtained as follows:

1. Sand smooth with ever finer grades of glass paper – being lazy I usually stop at Grade 1 or 2 (150 or 100 grit).
2. Brush on one coat of sanding sealer.
3. Rub over lightly with flour paper – just enough to make it smooth to the touch. Repeat stages 2 and 3 as many times as you think necessary.
4. Wipe off all dust with tissue, dampened with Turps or water, and allow to dry thoroughly.
5. Mask off parts in the normal way if desired, and then spray all over with a light colour using sufficient coats to give an even colour (2 or 3 are usually enough).

This stage could be replaced by brush painting or covering in plastic film. In other words, as long as the surface feels smooth, and looks reasonable from a distance of about six feet, it makes little difference whether the finish is like that on a first-ever kit or up to exhibition standard! A close study of the picture of the *Fokker's* starboard side will reveal the imperfections which only show against the light. Even runs and snags caused by over spraying are not likely to show very much, if at all, when you have finished, but obviously the ideal is a dead smooth, even surface.

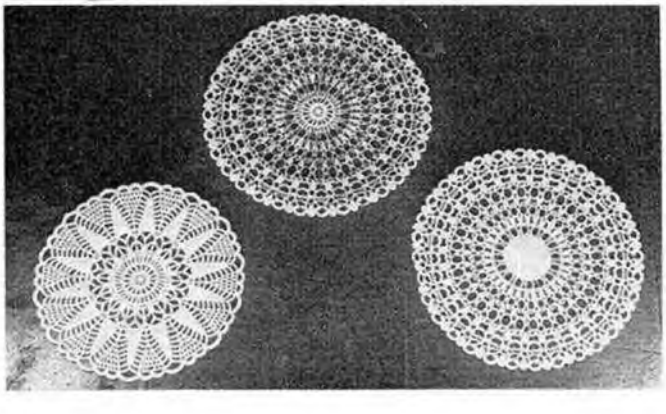
6. Put aside to dry thoroughly and purchase some paper or plastic doilies. The ideal is about 9 inches in diameter, made of plastic (although paper will do if you don't mind throwing them away afterwards) and most important, it should have more holes than surrounding material – paper doilies commonly have solid centres or solid patches around the outside, but it is quite possible to make a suitable doily by cutting the solid centre from one and replacing with the centre from another. Several doilies are needed as you may need to cut them to fit between cabane struts or straight edges against a fin etc.
7. Start with a simple surface such as a wing. Lay the doily over the surface, making it lie reasonably flat but it does not have to touch all over; in fact, it is better if it does not. Hold the doily to prevent it from blowing away, but be careful that your hand does not mask anything, then spray a dark colour. You will not normally be able to apply a second coat, so make it reasonably dense and do not attempt to spray right up to the outside edge – just spray the main area.
8. Remove the doily and examine the pattern. You will find that some parts are darker than others, also that some parts will be sharply defined and others will be 'fuzzy'. As long as most of the area is patterned this is satisfactory. Should any part be considered not dark enough, then it is possible to replace the doily, *carefully* matching the pattern, and re-spray.
9. Place the doily to overlap the previous pattern and spray again. Repeat until the complete surface is covered.
10. Fuel proof the entire surface.

There are several points to watch, and several areas open to experiment –since the doily is laid on overlapping the previous spray pattern, it follows that the paint used should be quick drying, e.g. cellulose. Be very careful to spray around edges and corners as they will otherwise tend to look worn or 'bald'.

Areas of plain colour, such as the fin and crosses on the *Fokker* will still show surface imperfections, so bear this in mind when at the surface

continued on page 657

The outer two doilies are not suitable for this painting technique as there is too much 'solid' material The centre doily is satisfactory, and was made from the centre of the left-hand item, glued into a larger version of the one shown on the right



WHO NEEDS A PLAN?

Asks TREVOR FAULKNER

I FEEL SURE that a large number of 'own designs' become successfully airborne without their originators having ever drawn anything remotely resembling a full-size working drawing from which someone else could build a similar model. The time taken producing such a drawing, particularly one approximating in quality to those published by this magazine, is considerable, and would involve a great deal of repetitious work not required by the designer/builder in order for the model to be constructed successfully.

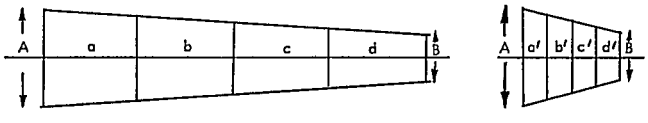


FIG.I

Vertical divisions equal in each diagram, where proportions a:b:c:d = a' :b' :c' : d' Smaller diagram more convenient.

THIS PRINCIPLE IS VERY USEFUL IN MANY MODELLING CONTEXTS

This is not to say that models can be built without planning, the only true example of this is the 'bitza' assembled, often in desperation, from an already existing set of components from various sources. The decisions so important for the creation of any new design can be carried out more conveniently on a sketch-pad rather than on a drawing board, if only because of the speed of both realisation and alteration. Once the decision-making is complete, it is surprising how few lines on paper are required for quite complex models to be built. Even draughted details can often be 'shrunk' in one dimension without detriment (see *Figure* 1).

Of course, there are two cases which demand a full-size detailed drawing. The first is where a replica of someone else's model is to be built. The justification is the extra clarity with which otherwise confusing detail can be explained, usually without recourse to more than the shortest written comments. The second is where a scale replica of an actual aircraft is to be made 'from scratch'. Here, both the relative size and form of components need to be controlled in order to preserve the required fidelity to the prototype. This usually involves consideration of factors which are, in terms of the model, 'decorative' rather than functional. For instance, the exact shape of a spinner, the profile of a fin and rudder or the 'sit' of the model both on the ground and in the air, might have little influence in improving flight characteristics compared with less accurate interpretations of the 'real' features essential to the 'spirit' of the job being undertaken, and need to be documented at the correct scale and in sufficient detail to allow construction processes to continue without pitfalls to the completion of the model.

Outside these limits, however, there exists tremendous scope for the 'own designer' to proceed to an equally satisfactory conclusion, with much less drafting time being involved. Perhaps the greatest single factor is the mass of 'rules of thumb' which lay down safe general guidelines on such subjects as moment arms, tail areas, fin/rudder areas, prop diameters, engine sizes and so on.

As these outline rules exist on merit, and have safely assisted many newcomers to the design field to succeed at the first attempt, initial planning can be done in the simplest possible way. Let us assume that the area of a wing has been established. The variables are now its aspect ratio, section, outline, and method of construction. (Aspect ratio and outline may be somewhat interdependent, but that need not concern us in general terms here). For purposes of clarification, let us assume that a parallel chord wing is envisaged: the chord will naturally result from the decision on aspect ratio; the airfoil section upon the characteristics of the model type, and your preferences (or fads!) on the subject of constructional methods will dictate this side of the recipe. All these decisions are independent of drawing board or tee-square.

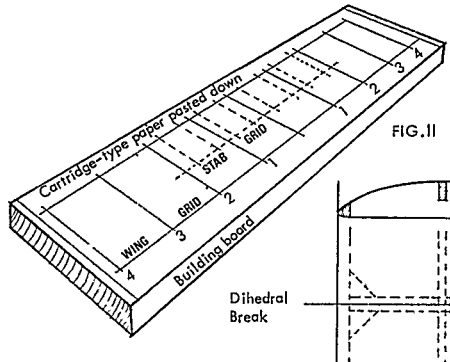
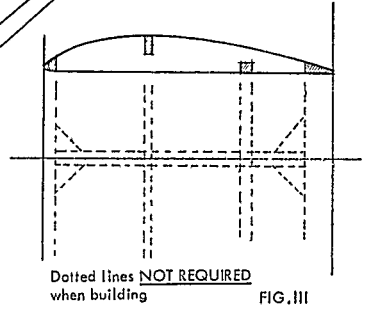


FIG.II



Dotted lines NOT REQUIRED when building

FIG.III

Now let us turn to building preparations. The span is fixed (area versus aspect ratio remember), so we know how long the leading edge needs to be. The angle between ribs and LE we can assume in this first case to be 90°, and by deciding on our rib intervals we can conclude how many lines at right angles to the LE we shall need to check their alignment. Again, by reference to the chord we are using, the trailing edge outline position can be decided in terms of notated distance from the LE. Once more, all these decisions are made without using drawing office facilities. All we really need to allow us to start are the two long lines (front of the LE and rear of the TE) and the correct number of intermediate lines at right angles to these for rib position and alignment (*Figure* 2). What is more, depending on the building board you are using, there may be the chance to put down these lines directly onto the board without recourse to an intermediate piece of paper.

Note that the LE and TE thicknesses, plus rib thicknesses are not shown. Reason . . . your decisions on methods of construction will have solved this problem, and so long as the extreme LE and TE are in the right place, everything else will fit. Your ribs, cut according to the chosen section, will have made allowance for all the undrawn details, and so long as the ribs are assembled and aligned consistently all left or all right of the grid lines, their spacing will be uniform and correct (*Figure* 3).

Similarly, spar slots will dictate positions of such parts, and need only to be cut accurately to allow assembly in the correct manner without reference to a drawn line.

Duplicate wing ribs (as for instance at dihedral breaks), thicker ribs at centres and tips and reinforcements such as gussets and ply sections can be fitted as experience dictates, and certainly without need for a 'picture' to be made prior to construction, again see *Figure* 3. A most useful aid is a numbering system working from the centre line outwards to both tips (this prevents the repeated counting of rib bays in more complex structures where a miscount could provide a degree of assymmetry in the component being built!).

Where all-sheet construction is used, extensions of a grid can be transferred to the sheet, or the grid actually drawn on the lower sheet inside surface. (*Figure* 4).

Summarising, we can see that the only information required on the building-grid is that directly concerned with geometrical accuracy. Information which we already have, for example, 'experience' innovations, etc, is more conveniently applied directly during the process of building, any novel decisions being best resolved in sketch form.

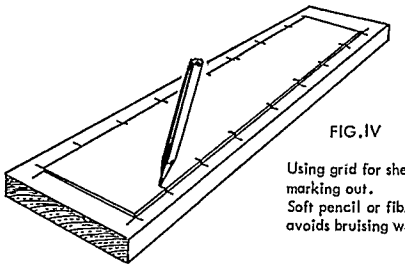


FIG.IV

Using grid for sheet construction marking out.
Soft pencil or fibre-tipped pen avoids bruising wood

It follows, of course, that the tailplane may be constructed in an exactly similar way, and in fact, can usually be built on a secondary grid superimposed on that of the wing (*Figure* 2). My procedure for this is to use contrasting colours for rib spacing, all wing ribs being black and tailplane ribs red on the grid. The numbering of rib places is done similarly, using the same colours.

If our attention is turned to the fuselage, we can see that in the majority of 'Formula Model' designs, the dimensioned sketch is capable of doing all our problem-solving with regard to distances of nose-block to motor-peg, minimum internal diameter of motor-tube, wall-thickness of motor tube, length of boom, if used, length of glass fibre rod (if used), size of space required for timers, exotic tow-hooks etc. Detailed working drawings are hardly ever required, as the sketch can be transferred by measuring directly onto material much more accurately than by including an extra stage (the full size drawing) in the transfer process.

Where fuselage patterns are used, the most common type is the hard-wood mandrel around which wood or wood laminates are rolled. In such cases, diameters are fixed anyway, and the only relevant measurement is linear, and a rule is just made for this job! In 'Open' models, lightness of structure may dictate a longeron and spacer method of building. If the fuselage is to be built 'in the air', using diagonal longerons, temporary formers mounted to a sturdy central backbone can be drawn out full size on the material – usually card – from which they will be made. Where a straight fuselage taper is to be used, the length of the component can be drawn foreshortened, still keeping the correct ratio of diminution, to construct the formers full size. (Again see *Figure* 1).

The variations necessitated by a curved profile can be plotted to a good 'organic' shape by bending a piece of flexible balsa strip stock to the degree of curve required, starting and finishing at the correct point (*Figure* 6). Plotted from this, and directly onto the building surface, distances from the curve to a centre line can be taken at the appropriate former intervals, and the temporary formers drawn up from this half measurement simply by doubling.

Where this does seem to involve some extra complication is in the 'Old Timer' type fuselage, with cabin configuration, and curved profile in top and side views. In such exceptional cases, and where the models are really of the 'sport' type, the pleasure the designer/builder gets is probably enhanced by the therapy of deciding the exact nature of the appearance on the drawing board. After all, the fun model needs to look attractive and its appeal is certainly not its functional lines. Even here, only roughly sketched outlines need be drawn as representing the profiles

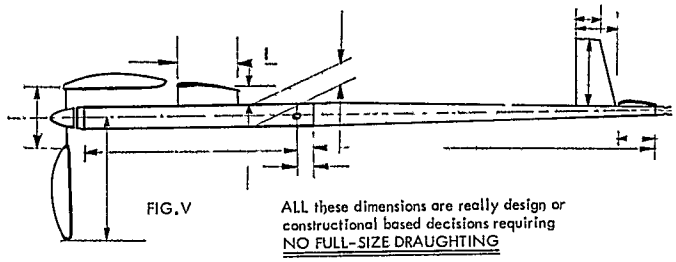


FIG.V

ALL these dimensions are really design or constructional based decisions requiring NO FULL-SIZE DRAUGHTING

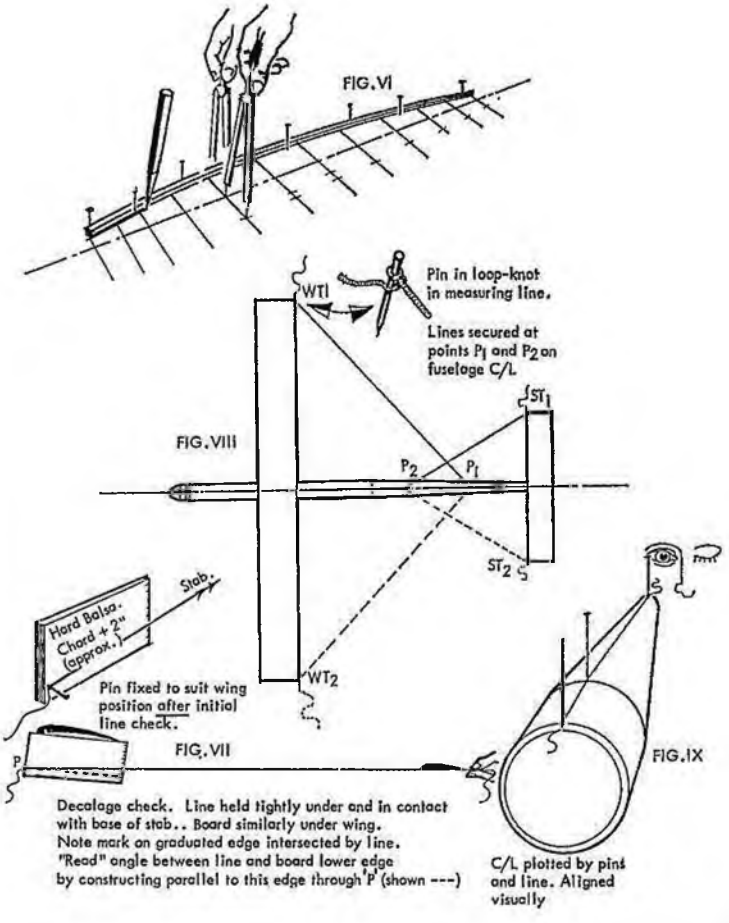
required, and material thicknesses left to the builder to arrange.

Rigging

One of the advantages of a complete plan in the conventional sense is the help it gives towards the accurate construction of surfaces or fitments on which wings and tail will seat.

It is very easy to check longitudinal-dihedral by using a straight edge, or a string (*Figure 7*). The notional rigging angles arrived at by eye will usually be refined by trimming anyhow, and it is usually possible, during the construction of most types of model, to work to a fuselage datum in order to fix wing incidence with relation to such a datum line. (Here is the opportunity to arrange the model's attitude in the air. The *smaller* the wing incidence measured from the fuselage datum, the more 'nose up' the model will tend to fly, and the more drag will be created by exposing a greater fuselage cross-sectional area to the airstream).

Other aspects of rigging cannot be satisfactorily considered by reference to a plan. These involve the location of wings and tail at 90° to the model's centre line when seen from above *Figures 8 and 9*. (Any slewing of surfaces would be a trimming device, of course and should certainly not be the accidental result of unchecked and inaccurate wing and tail fixings).



FROM CAKES TO CAMOUFLAGE

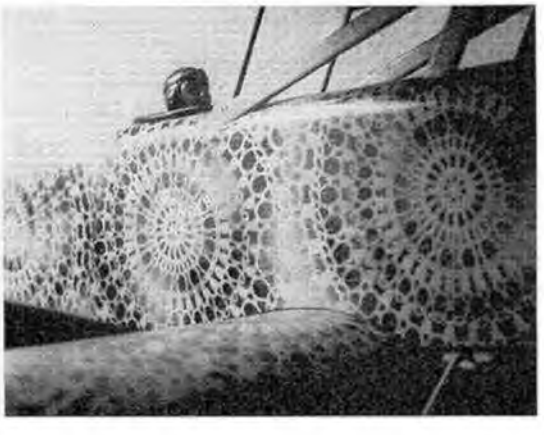
continued from page 654

finishing stage, although a matt fuel proofer (if you can get it!) will tend to minimise the effect.

Transfers tend to be translucent and may therefore show the spray pattern through their own colour. The second colour sprayed should be the darker colour for its improved covering capabilities as this will normally be a single coat – however this is obviously open to experiment as is the use of more than one colour for the base coat or more than one colour for the pattern coat. Another source of experiment is the pattern mask.

There is a large variety of lace materials available from fabric shops although these may be too expensive. As far as colours used are concerned, I personally have only used black on yellow and black on red. Both are very effective, but the darker red colour gave more the appearance of wallpaper.

Having produced your masterpiece of whatever wierd and wonderful collection of colours and patterns, you may be worried about touching up the paintwork after the inevitable dents, scratches and prangs. You will find it surprisingly easy – for a small blemish, just touch up with the nearest appropriate colour. No great effort need be made to match the pattern, only the colour. You will find that it cannot be seen from a foot away. Of course this may not apply if lace has been used as the pattern will be much more regular, but with a doily the pattern becomes very confused due to the overlapping. With a major repair such as a broken wing, you will either have to respray the whole area or match up the colours and pattern by hand.



A bright light shining along the fuselage reveals balsa grain showing through the finish but it needs careful inspection to find it–the web pattern effectively camouflaging such flaws!

CLUB NEWS

Lots of control line interest shown by members of the Fenland MAC – and quite a few *AeroModeller* designs too by the looks of it.

FIRST TO SORT out a bit of a mix up. We have received a letter-cum-report from Mr F. E. Mann, the Secretary of the **Stanstead MFC**, in which he expresses surprise at both the content and the source of the short report, seemingly emanating from the club, which appeared in our September issue. Some mystery here, but nevertheless, the Annual Exhibition in Saffron Walden, the subject of the report, turned out to be a great success. By co-opting the help of other model societies in the area, the club was able to fill the Town Hall to good advantage. Close on 1200 people attended the exhibition, including the Mayor and Mayoress who, together with the other visitors, greatly appreciated the wide range of models exhibited. Particularly eye-catching were the R/C scale models – a beautiful *Tiger Moth* by Mark Summers and Don Wilson's partly completed *Lysander* and *Spitfire*. Adding life to the proceedings were the electric rtp models that were flown all day and the Scalextrix track for the young in heart. Altogether the event yielded a revenue of £110, all of which went to local charities and an Old People's holiday fund. But equally important to displaying models is where to fly them, and I did query in the September issue the present state of the old Debden Airfield. Well, it appears that the club R/C flyers have had the use of the field for quite some time, but free flighters are restricted by the ATC gliding school on the 'drome. This means that weekend flying is out, but F/F okay for weekdays. Incidentally, the free flight section is a particularly strong and successful one, headed by Julian Hopper and his wife Linda. To give an example, Julian took first in Open Power at the Nationals and came 5th in Rubber. Linda became Ladies Champion for the second year running, whilst Mike Bull was 8th in ½A Power and John Williams 4th in A/1 Glider. Generally, though, the 60 strong club is predominantly Radio.

A more deeply autumnal date for the **Northern Area Rally**, put back to 3rd October due to works on the Elvington Field, and now to be held at Rufforth. This, apparently, cancels the Northern Gala, formerly booked for that date. All very confusing this late switching of airfields that seems to be a disrupting feature of modern event scheduling, and it says much for the Area organisers that they cope so admirably with these frustrating pressures. This info culled from *Northern Area News*, strong as always on its contest reporting. These, and the result sheets, seem to suggest that Area free flight support is still quite good, with A/2 Glider maintaining its popularity. Maestro Henry Stubbs, who was winning comps as far back as I can remember, is seen to be topping the Free Flight Championship list, and it is further gratifying to see old stager, Bob Amor's name well to the fore too. For my part the spirit is willing, but what I need are seven league boots, or at least seven flight legs. Apropos retrieving, a point made in one of the reports is that good, calm morning weather is often wasted in trimming flights, leaving the actual contest flights to the inevitable breezy afternoon with long legging stints and even lost models. I know at least one successful modeller who whacks in as many early flights as possible and then relaxes – a seemingly wise policy. Some modellers, though, only get the use of a decent field on contest occasions, and, perforce, have to spend the early part of the day trimming out. A few bouquets handed out in the newsletter to the Nationals organisers for a job well done. Finally, a cautionary tale from a United States source of a modeller who had a can of fuel blow up in his face. His starter battery leads somehow got latched on to the metal can, glowing same and blowing the fuel. A point to watch, though people now use mostly plastic containers.

High Flyin', the newsletter of the **Anglia MFC**, is happy to report two successful club days: Scale and Gala. In Scale (Radio, of course) there were eleven entries from various clubs, making for a picturesque line up. Some good flying, with Mike Daish of Chingford taking the honours with his *Bell P.39 Airocobra*. He did a tight schedule well in the judge's view. Second was Anglia's Mike Ross, flying his spectacular *Lockheed Lightning*. This twin engined model really does look something in flight, with the retract u/cart adding to the sense of realism. On the Gala Day the high spot was the *Sleek Streak* event, with the children outflying the adults with these little ready made rubber jobs. They notched up some pretty nifty 20 second flights and thoroughly enjoyed themselves in the process. Bill Forrester, the Chairman, was much impressed with this display of youthful enthusiasm, and wonders if more could be done for youngsters, particularly those less fortunate than club members' children, by a simple approach. In my own view, young people tend to enter aeromodelling at a slot too high for their capabilities, and are often influenced into building and attempting to fly highly unsuitable models. This particularly applies to control line. Some of the small, heavy models are altogether too much of a handful for the novice who would be better off with something larger and lighter. Question asked on the free flight side: is it really getting windier each year, or is it just imagination? I know that each year

calm spells that are a welcome feature of our normally variable climate. On the other hand we can be thankful for the mild winters extending the flying season well into the 'ember' months and beyond. A disconcerting feature of this over hot summer has been the super boomers that have made a mockery of our normally reliable D/T systems, and not a few club models have been lost going upwards, putting paid, in many cases, to reasonable club contest hopes. Even so, the free flight section has had its share of successes during a very active season, keeping well up in the Plugge Cup Club competition. Again it has been Bob Wells and Roy Collins who have collared the top honours, getting firsts in Wakefield and Power respectively at the SMAE FAI Centralised event in April, and they and other members have placed well at most meetings.

No complaints against the weather from the Concorde MAC, who give our remarkable summer all praise, and it has been an all flying season for all sections of the club: radio, free flight and control line. It could turn out to be a glorious, but sad, finale, because with the departure of the BAC, from Fairford, there will be too few members remaining to carry on an effective club. Many members will be going to Filton where, it is hoped, they will fit happily and zestfully into the model scene. Meanwhile life goes on, with the club putting on a number of displays through the summer, all helping to spread the aeromodelling gospel. New models have been appearing: the combat circle acquiring gusto from two *Talismans*, a profile *Spitfire*, an *Airocobra*, a *Tomahawk* and a *Pfalse Fighter* – the latter described as a frightening bundle of energy on 40 foot lines. Other newcomers include a S/C *Timber* and a Veron *Robot Trainer*. The latter was built in two weeks flat, but flies sweetly in spite of the two dimensional idiosyncracy. The Hon Sec, Mr R. F. Morton, sticks to his veteran *Gypsy Moth*. He says it has 35 flights in its log book, and with its Mills firing at every other lamppost it is a worthy contender for Old Warden. Let us hope this is not the last newsletter as Mr Morton fears.

The **Watford Wayfarers** newsletter opens with the news that the Club Chairman is in hospital following a hang glider accident at Dunstable Downs. Undercarriage failure is given as the cause, and he has both legs in plaster to prove the vulnerability of this glider component. What he now looks for is what is required for successful hang gliding: a quick recovery. In model flying you don't damage your legs so much as wear them out, unless you happen to fly Radio, as most of the Wayfarers seem to do. And, judging by some of the models listed in the newsletter, they have the means of putting on quite a display, static or activated. The club can also stage a pylon race: devising a handicap system to open up the entry. This I get windier about flying in anything but flat calm, and certainly in this freak summer we have had a few of those

proved to be rather tricky, as size of engine is not always a true guide of performance. One of the fastest machines was a lightly handicapped ·049. Next time the formula is to be based on the square root of the engine capacity.

Model flying is no bed of roses, and if it is it is the thorns we feel more than the heady scent. I take this view after reading a couple of stories in the **Leicester MAC's** bulletins. First, it is drawn to members' notice that the main runway at Wymeswold is a crash landing area for Donington Airport, so if you are a bit nervous of radio models then how your back hairs will bristle at the sound of a Tri-Star at zero feet. Second, there is a reply received by a member from his MP, on a question of illegal transmitting on 27 Mhz. Seems the law does not prohibit the *ownership* of illicit transmitting equipment, but *can* act upon the *use* of same. Apart from the law being ineffective it could be extremely hard to locate an offender, particularly if he is mobile. Back again to Wymeswold, there is a survey in one of the bulletins of club flying sites. Wymeswold is listed as an all types field, but with free flight banned during the grass and grain crop period – June to August inclusive. Arnesby is a rented field, generally unrestricted for Radio, but C/L and Glider towing is out due to the presence of power lines. Cramped for free flight, but okay for trimming. Borough Hill, a County Council concession, is 13 miles outside from the city centre, but is limited to R/C gliders only. From this it can be seen that the free flight section operates only outside the club environs during the summer months, and they get their flying in, quite usefully, in the now very full contest calendar. Gerry Ferer, Chas and John Abbey and the others have had their share of successes, but particularly encouraging were the results achieved by the younger members at the Nationals. Lionel Ferer flew his *Senator* into second place in the Junior Kit Contest, and in the Glider section of the same comp Ruth Abbey got another second place. And across the drome Roger Quilter placed third in the Novice Stunt Comp.

FMA News is styled 'The Voice of the Everglades and Other Odd Places'. It is not where they fly the old crocks but where the **Florida Modelers' Association** finds its inspiration. Our own editor, Pete Richardson, gets a mention in the newsletter. He has appraised our Floridian friends of the flying field power set up in the old country. It is all very democratic, with no government pressure to allow the use of airfields to the modelling movement. And what matters more than model flying is the hay crop. Hay, like money, is something you make, and so it's 'move on, please' for the sake of the green stuff – they will not let the grass grow under your feet. Seldom, though, do we now see a Jetex model fly over our grasslands, cropped or uncropped. They call it 'Rocket' over there, and have developed some high grade techniques for getting the most out of the little motor units. One problem remains, though: gasket leakage. I remember I used to use fairly hard gaskets and rub the cylinder base into it with car graphite compound.

Another welcome offering to the free flighters in the sunny south of the USA, is the **Southern California Aero Team's** *Scatter*. Main talking point is the threat of making the World F/F Champs a three year rather than a two year event. It does seem odd to me that we had annual Wakefield events before the war, when air travel was in its infancy, and that in a shrinking world they can only be held every three years.

Two other overseas newsletters giving good F/F and general coverage, are the *Bulletin* '76 of the **Palmerston North Aeroneers** of Wellington, New Zealand, and the Association of Rhodesian Aeromodellers Newsletter.

More newsletters and reports would be welcome.

Clubman

Contest Calendar . . . .

October 16th/17th	**SMAE 1977 WORLD CHAMPS – F/F TEAM TRIALS,** 2nd weekend. Venue: Sculthorpe, Norfolk.
October 17th	**NORTHERN AREA FAI RALLY.** F/F, R/C, C/L at RAF Elvington, Yorks. SMAE members only.
October 17th	**TOWNER TROPHY.** ¾ slot thermal soaring plus scale glider at Golden Cross, Lewes, E. Sussex. Pre-entry for Towner Trophy (75p) and scale (free) to G. Hockney, 1 Bainbridge Close, Sleaford, E. Sussex. SAE please.
October 24th	**WOLVES F/F GALA.** Open R/G/P, ½A, Cd'H A/1, HLG, F/F Scale. Venue: Chetwynd Airfield, near Newport, Staffs.
October 24th	**ELLIOTT 'ROCHESTER 1000'.** To 'Rufforth rules', for Class B or FAI racers (with 30cc max. fuel tank). Fastest time for 1000 laps. Venue: Elliot Marconi, Rochester Airport, Kent. A229 off the M2.
October 31st	**WHARFEDALE 'RUFFORTH 1000'.** Class B racings. Details J. Horton, 10 Lawn Ave, Burley-in-Wharfedale, Ilkley, Yorks.
October 31st	**SOUTH BRISTOL MAC GALA.** F/F: Open R/G/P, All-in FAI, HLG, Vintage Precision. C/L: Fly-for-fun, including Vintage. R/C: Thermal Soaring. 50p Pre-entry for R/C to K. Jones, 16 Heathcote Rd, Bristol. 9.30am to 4.30pm at RAF Little Rissington. SMAE members only.
November 7th	**SMAE INDOOR SCALE.** Open rubber, CO_2/Electric. Venue: RAF Cardington, Beds.
November 7th	**RICHMOND GALA.** FAI R/G/P, A/1, ½A Power, Cd'H, HLG. 10am start at Bassingbourn on A14 north of Royston.
December 12th	**SMAE CENTRALISED MINI CONTESTS.** A/1, Cd'H, ½A, HLG. Venue: Bassingbourn?

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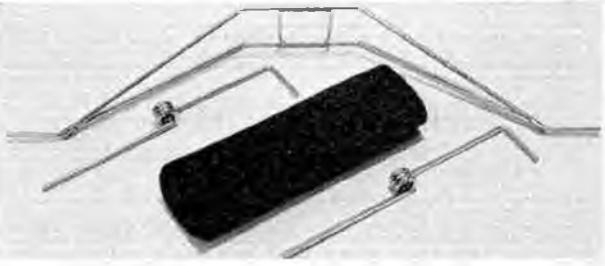

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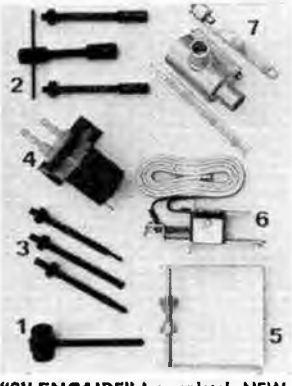

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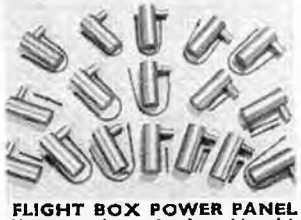

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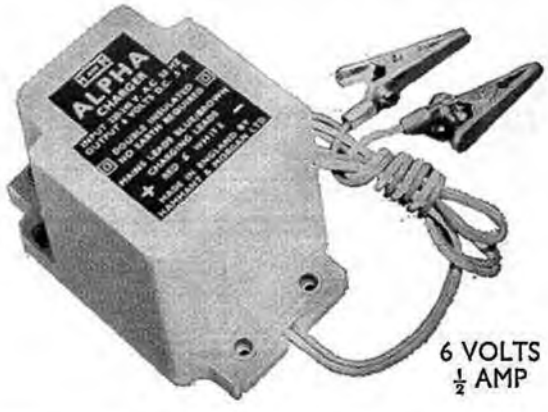

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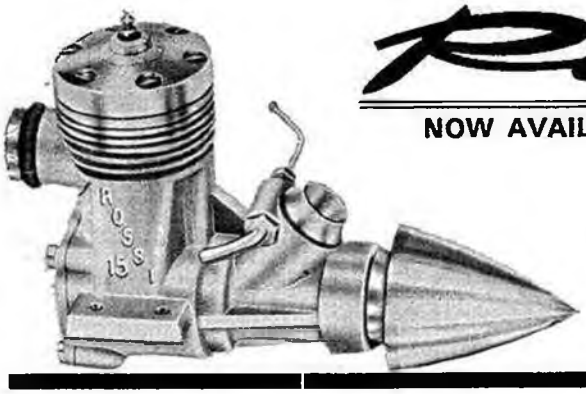

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Closed lunch 1pm–2pm Mon.–Fri.

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8pm

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Flying Scale models

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WWII—Spitfire, Hurricane, Me 109, Focke Wulf 190, Mustang, Westland Lysander.

WWI—S.E.5, Nieuport, Sopwith Camel, Fokker D-8.

Military & Private—Fairey Gannet, Percival P.56, Chipmunk, Fairey Junior, Auster Arrow, Beechcraft Bonanza, Globe Swift, Cessna 140, Piper Family Cruiser, Piper Super Cruiser, Stinson, Luscombe Silvaire, Ercoupe.

24 Fully detailed models to choose from

These models can be built to display standards if desired and detailed camouflage drawings are included with the WWII fighters. Matching transfers are also available.

See your local retailer for details

PRICE 85p inc VAT

Manufactured in England by **E. KEIL and Co Ltd** Wickford Essex