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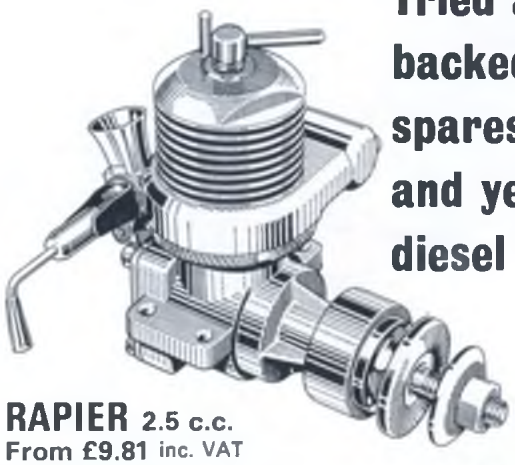

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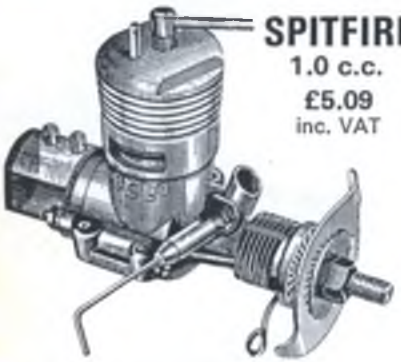

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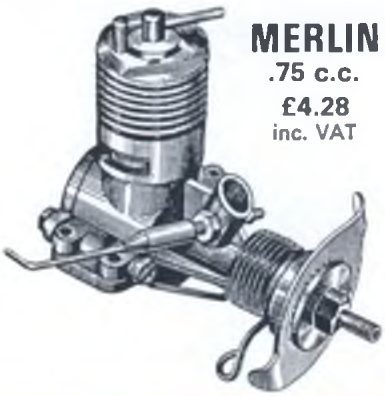

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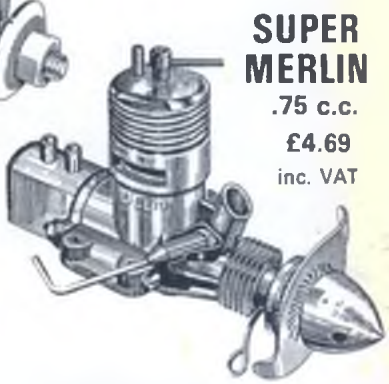

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Aero Modeller

INCORPORATING
MODEL AIRCRAFT

February 1975 Volume XL No. 469

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Comment

Enthusiasm of aeromodellers transcends all worldly problems. This was adequately demonstrated by the record attendance of delegates from twenty-nine nations at the FAI meeting in Paris 5-6th December. Despite the crippling strikes in France which paralysed all postal communications outwards from Paris, somehow the message got through by 'emergency' methods. Official minutes of this very important FAI meeting have yet to be issued but advance details of the decisions taken have already been circulated by some delegates in their National newsletters. This is the year of the 'un-freeze'. Model specifications and contest regulations had been previously fixed, and could now be changed from 1st January, 1975, subject to approval of the Models Commission.

But radical changes have *not* been made. All the detail changes reflect the result of practical experience – see Hanger Doors (page 81) for brief details.

on the cover

Bill Harney, of the USA, displays his truly remarkable control line ¼th scale replica of a well-worn, weathered and sun-bleached, tropical-based Mitsubishi A6M5 Zero. Entirely sheeted with various thicknesses of aluminium sheet, all rivets are faithfully duplicated from the real Zero while inside the cockpit even more attention to detail is obvious. All controls operate their respective flying surfaces, all instrument needles move, and the artificial horizon, compass and turn indicator actually work. All cockpit lights operate while the gunsight projects an image on the reflector! Canopy slides open, hand holds, steps and ladders are retractable, the landing gear indicator rods on top of the wing retract when the gear retracts (gear handle revolves at the same time too), the undercarriage has hydraulic action and . . . and . . . well there is much, much more! The ultimate in scale models? Perhaps, but remember, Bill placed 3rd in Static at the '74 World Champs, 7th overall. . .

next month

Plans for a twin-rotor, free-flight Autogyro to complete the feature contained within this issue. Practical advice for beginners, and more hints and tips for the more experienced modeller. Engine Test, more on Rubber Techniques, regular features and yet more will be contained in the March issue of *Aero Modeller* – on sale 21st February.

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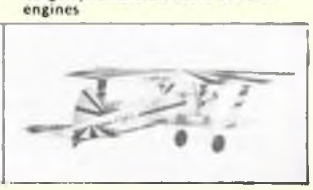

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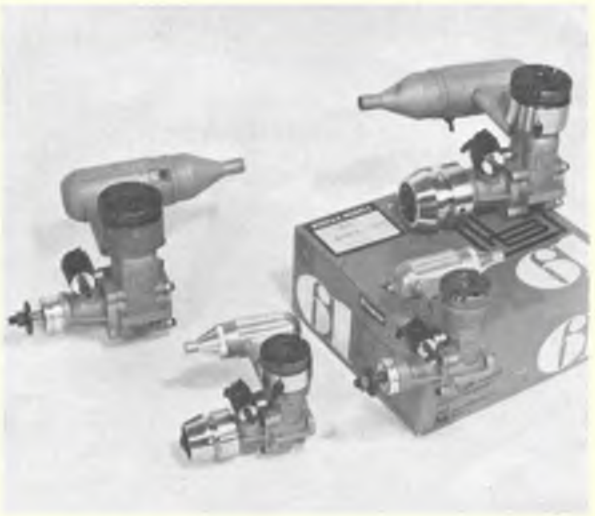

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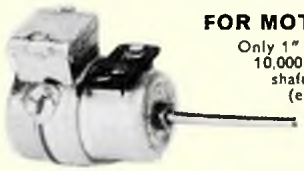

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Organisers of low-ceiling indoor meetings are particularly keen on encouraging junior competitors. At right are seen Junior flyers at the Wigan chuck glider event, being (at least, we hope the sequence is correct!) D. Sawyer, Robert Duce, Dave Roberts in the back row, with in front of them Peter Reeves, Dale Sawyer, Fiona Branigan, Garry Picken, Peter Whitlaw, Toby Owen and Steve Monks. Some well-known surnames there....

Heard at the HANGAR DOORS

THE 1975 NATIONAL Championships will be held at R.A.F. Finningley, Yorkshire, over the period of 24-26th May. However, due to restrictions placed on the full use of the airfield (for example part of the airfield will be strictly out-of-bounds, and no hangar will be made available for S.M.A.E. use) some method of reducing the number of competitors will be necessary to make this a proper Championships meeting. The various S.M.A.E. Technical Sub-Committees are thus being asked to 'seed' entries so that time will not be used up by less inexperienced fliers–especially on the Radio Control side. It has also been *suggested* that F.A.I. class free-flight events should be omitted since the S.M.A.E. Contest Calendar allows for more F.A.I. events this year. Open-class free-flight events would still be run to encourage those who regard the 'Nats' as a jamboree rather than as a 'serious' contest. However, these topics are for the Technical Sub-Committee to decide just what can be organised.

In addition, R/C Thermal Soaring will be held at the same venue, rather than at a separate one, as has occurred on the two previous occasions, and this is bound to limit the 'frequency time' available to other R/C events.

INDOOR FLYING GROWS! While the Airship Sheds at Cardington are ideal for indoor flying, there are many other venues around the country quite suitable for low-ceiling events, and thus to extend the popularity of this form of flying, a series of 'Norwind' meetings have been held over the past two or three years. These meetings are exclusively low-ceiling (approx. 25ft.) events and are intended to gather together people within a radius of say 50 miles who were unaware of what they are missing on their own doorsteps.

Of particular interest is the fact that Juniors are especially encouraged, and dividing the Junior class into two categories takes care of the 'builder of the model' aspect for those younger, would-be fliers who are not capable of producing a practical aircraft entirely on their own and, at the same time, ensures that those juniors who *can* produce their own are able to compete on a more even basis.

Details of the next two events are as shown below, while rules of the 'Keyhole Scale' events will be found under *Free Flight Comments*, elsewhere in this issue.

2nd February
NORWIND Low Ceiling Indoor Meeting. Wigan Technical College Sports Hall, New Market Street. 'Easy B' 9 a.m.–1 p.m. and 4–6 p.m. HLG and 'Keyhole' Scale 1–4 p.m. Sponsored by Whitefield M.A.C. Entry 25p per event, 50p all three, Juniors free. Guaranteed prizes £2/£1/50p. Special prize for best Junior performance. Soft footwear essential. Details: Mike Reeves 0706-44999.

16th March
NORWIND Low Ceiling Indoor Meeting. Southport Y.M.C.A. Gym, Hoghton Street. 'Indoor Fun Fly-in'. 12 a.m.–6 p.m. 'Keyhole' Scale, 'Peanut', Duration, Towline Glider, HLG Sweepstake, 'Sleek Streak', Helicopter, Unorthodox. Details: Peter Branigan 070 48–74133.

PLAN PRICES. It is regretted that the recent considerable increases in paper and other material prices plus significant rises in machinery costs and maintenance, handling charges, etc., force us to increase the average price of plans. The new prices, which include VAT and postage are shown below and relate to Plans Handbooks No. 1 published Autumn 1973 and Nos. 2, 3 and 4 published Spring 1974.

Handbook Plan price	*New price from 1st January, 1975*
Up to 45p	Add 5p
50–75p	Add 10p
80–£1·15	Add 15p
£1·25–£1·50	Add 20p
£1·70	Add 25p
£2·00	Add 30p

Please add 15% to all sets of plans costing £2 or more.

FAI RULE CHANGES:

Free Flight

Coupe d'Hiver reverts to original rules calling for 80 grammes minimum weight.

FAI Power engine runs are to be 8 seconds with the old fly-off procedure of increasing max's by one-minute increments.

Free flight contests may start *before* sunrise.

Indoor has a new 'unofficial' event for smaller models and there are improvements in the attempt rule for the World Championships class.

Control Line

Groupers are banned, lines may not be joined.

Speed contests have to use 1/100th sec. watches.

Team race semi-finals will have 2 rounds.

Stunt finalists add their best qualifying and fly-off scores together.

Radio Control

Changes in the schedule plus a ban on all open front end silencers.

Helicopter rules are being studied.

Pylon models have a cross-section rule plus a wheel track and wheel thickness dimension and transparent cockpit requirements. Specific silencer dimensions are fixed.

Soaring rules are now official status with first W/Ch. in South Africa 1976.

Scale

Pilots required in cockpits which now get fewer points than before while finish, colour and markings score more.

Weight limit is increased to 5kg *without* fuel.

Dave Rudd's Nationals winning Goodyear racer

Robust, straightforward design is easy to fly and really competitive with a 'hot' 2.5 — 3.5 cc glow plug engine

A BRIEF HISTORY of the full-size aircraft: first built in 1949 by Jim Kistler and known as the *Kistler Skeeter*, in the late '50s known as *La Jollita*, changed hands in '62 to be flown by Art Scholl and renamed *Miss San Bernardino*. Although not the fastest with a top speed around 196 mph, it had good placings in various air races, and has always been a good 'novicer' which is the main reason why the design was chosen for a C/L Goodyear Racer. Said it was a 'brief history', didn't I!

Construction

Start by joining $\frac{3}{8}$in. sheet wing piece together, using PVA (do not forget that spruce leading edge), and clamp together by use of elastic bands. Put aside to dry. Cut out the tailplane from $\frac{3}{16}$in. sheet and sand to shape, leaving the centre section untouched ('square') so that a strong joint can be obtained when joining to the fuselage. Finish off by cutting out the elevators and radius hinge edges before fitting 16 swg elevator horn (use five-minute epoxy). When dry, add nylon tape hinge, first to the tailplane, then to elevators, using balsa cement as the adhesive.

Cut the fuselage out of $\frac{1}{2}$in. sheet, and make slots for $\frac{3}{8}$in. × $\frac{1}{2}$in. beech bearers and $\frac{1}{4}$in. × $\frac{1}{2}$in. spruce (do not cut out engine space or wing slot yet). Glue bearers and spruce in place, using PVA, and once more clamp with elastic bands.

Back to the wing once again to cut out and groove for 14 swg leadout tubes (I cut out the whole segment then channel grooves in the edges to take the aluminium tubes – makes a neat job). Glue in $\frac{1}{8}$in. plywood mount for the bellcrank, then join seven-strand Laystrate control line wire leadouts to the bellcrank. Use a 14 swg bicycle spoke for the pushrod (saves soldering at the bellcrank end). Hollow out to take 10 swg aluminium tube and allow $\frac{3}{8}$in. of pushrod movement. Finish wing by carving and sanding to shape, but leave final sanding until the complete model is assembled.

Make the $\frac{1}{8}$in. ply plates for the detachable undercarriage and, with the 10 swg undercarriage leg in position, glue together, clamping in vice. Allow to dry. Then drill holes to take 6BA blind nuts. Using PVA, glue to the fuselage, making sure that the surface is flat before fitting $\frac{1}{16}$in. ply doubler – use clamps or vice once again. Do not forget to cut out the engine space and wing slot at this stage. Make up the tailskid, using 14 swg wire, and glue into position. Slide wing through fuselage and glue into position – likewise with tailplane. Ensure good alignment and allow to dry. Connect up the pushrod to obtain correct elevator neutral position and epoxy in place. Likewise epoxy the 10 swg aluminium tube pushrod guide in place.

At this time, fit the motor to the model for positioning of 6BA blind nuts, and fit cut-out bracket (epoxy and screw in position). Now for the most important piece – the engine support pod. This must be a good fit to the fuselage and wing joint – use PVA as the adhesive and employ pins to hold in position. While allowing parts to dry, make up the fuel tank. I use a Super Tigre G15 glow engine, so the tank details suit this motor. Start by marking out main piece, then drill a $\frac{5}{16}$in. diameter hole for the quick-fill tube before bending. Finish to dimensions shown; make baffles and side piece, drilling the $\frac{1}{8}$in. diameter holes before bending. Solder baffles top and bottom, then solder quick-fill tube (tin all joints before soldering) to top of tank, then add ends and side piece. Fit pressure and feed pipes – flatten pressure tube as shown and solder to inside of quick-fill tube. Check

out tank in water for leaks, anything that is suspect being resoldered. Note: before installing tank, finish sanding of model and add glassfibre reinforcement. Do not neglect this! Use 2oz. cloth on joints between fuselage and wing/tailplane, as well as on the leading edge of the starboard wing. Add fin and strengthen with glassfibre.

Sand down complete model before covering with heavyweight tissue, using colours of your choice – a dark tissue is best for the fuselage, a light one for the flying surfaces. Use cellulose dope for sticking the tissue to the balsa. Now using 75 per cent dope, 25 per cent thinners, give model three coats, sanding between each with 400 wet and dry paper, but do be careful not to sand right through the tissue. Add transfers (S.M.A.E. number and racing number), then fuelproof with two-pack clear polyurethane varnish. Allow to dry thoroughly for one or two weeks – the longer the model is left, the better, as it will be more resilient to high nitro fuels. Use only 15 per cent nitro, 65 per cent methanol, 20 per cent Castrol 'M' – I have tried higher nitro content fuels with no real advantage; remember, too, that with the higher nitro content in this fuel, a much lower compression ratio is required for the engine. Add gaskets under the cylinder head to adjust for maximum power.

Epoxy 'shut off' horn to elevator, screw cutout into position, and solder a length of lightweight Laystrate so that at 10° down elevator the cutoff is activated. Both pressure and feed pipes pass through the 'shut off'.

Engine Details

Do not expect a standard engine, just bought off the shop shelf, to be the best made and assembled unit (some are very good, others need careful examination). Strip down the engine, using gentle heat on the crankcase if necessary to extract the liner assembly. Ballraces need not be removed unless they feel rough. Minor modifications I make include a radius on the crank web and a clean-up of the transfer passage (a small grinder is necessary here). Make sure that the shaft diameters fit the ballraces properly – I aim for a finger-push fit, and check that the shaft does not foul on the plain bearing portion. The crankshaft should now spin very freely when in position. I also radius the conrod to get rid of sharp corners, and make sure that the fit of the pin and big end is free.

continued on page 89

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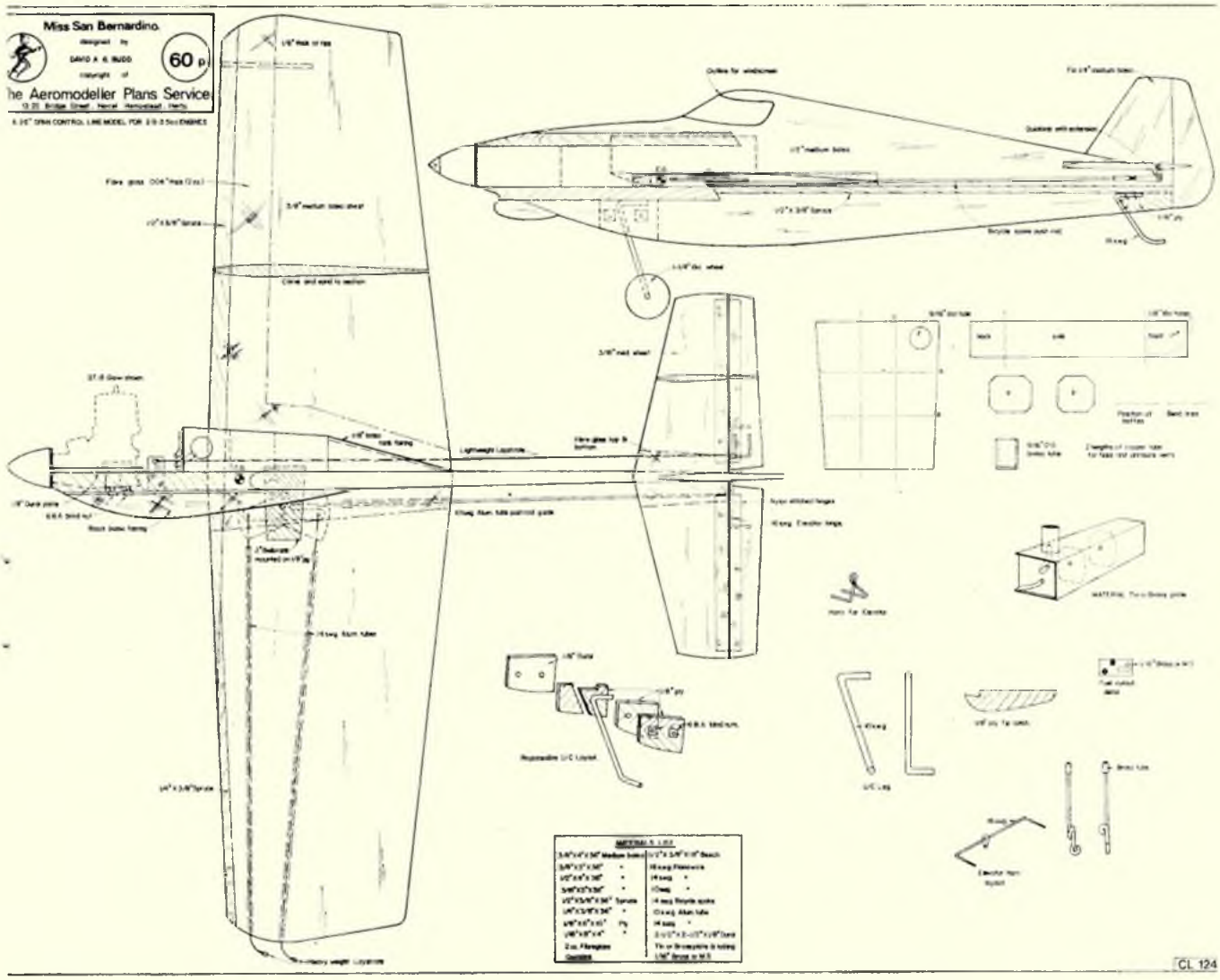


'And that's only their Junior Team'.

topical twists

by 'Pylonius'
illustrated by Sherry

* * *

Ergo Intacta

Have I been wrong all along in thinking the weight of years to be a handicap to our contest flyers in those ten flight stints, for in a series of tests where the hapless victim is coupled to an ergometer the over-fifties pedalled up higher horse-power values than the younger participants? But, reading on, I saw that these nifty-fifties were not just any old fortified over-forties but the cream of America's sub-senior citizens, and I began to wonder. . . .

It is a well-known fact that, unlike most of our elderly model flyers who got pushed on to the industrial treadmill in their early 'teens, the all-American male does not leave college until he is about thirty-five, when, having majored in Football and Astro-physics, he is in a pretty well-preserved state to begin life. By the time he reaches middle age he is spending most of his time in health salons where, between coronaries, he is pedalling away furiously on the bicycle machine, the main keep-fit piece of equipment.

It becomes obvious how he develops all that calf muscle ergo power, but whether an ageing pedaller can get the same ergo score on a dash across the airfield may be another matter. And, come to think of it, our elderly contest flyers may be equally as fit pedal wise, for anyone capable of propelling one of those rusty old retrieving bikes down a broken-up runway could do a lot of damage to any ergometer.

Colour Prejudice

Back in the old days, when a real model aeroplane was covered in good, strong oiled silk, the new, white tissue-paper brigade was looked upon with contempt by the heavyweight veterans. Very soon, though, it was the fashion to dress your model up in plain white tissue, and anyone using the new-fangled coloured stuff was considered a bit affected. Since that time we have come to accept the coloured tissue, in all its multi-hues and varied purposes, as a way of life; but from rumours we hear that, along with the colour that is fast going out of our lives, the colour is also going out of our tissue.

Generally speaking, the advantage of coloured tissue over the plain variety is its viewability against our greyish skies, plus the fact that the marks of our grubby fingers do not show up quite so starkly. We could, of course, use coloured dopes, but these are a bit showy on models built for flying rather than eyeing. And, when you come down to it, all the tarting-up of models we go in for these days is a bit of a waste, since the model flyer is never happier than when his model is doing its thing in the far and high distance. Not all that far and high, though, particularly if it just so happens to be a control line model.

Cost of Soaring

'*Free flight is dead; long live thermal soaring.*' That is the cry of acclaim that ushered in the Thermal Soarer not so long ago. There it was: all the thrills and delights of free ranging, free flight, without the leg aching, airfield consuming to and fro-ing. This new type repeal of the corn laws (foot and field) sent the harassed free flighters into raptures, and they could not convert their A/2 gliders to radio quickly enough.

But now it seems the dream has somewhat faded. What was once just steerable free flight has become full of complications. Wings have sprouted to 12ft. across and beyond, radio systems have come a long way from a mere flapping rudder, and the simple duration ideal is just an historic laugh, with the real problem that of getting the giant soarers back to earth. All the various contest styles have been tried, except perhaps balloon bursting, until the inevitable ultimate has been reached: pylon racing. A sad end to a great hope.

Out of Line

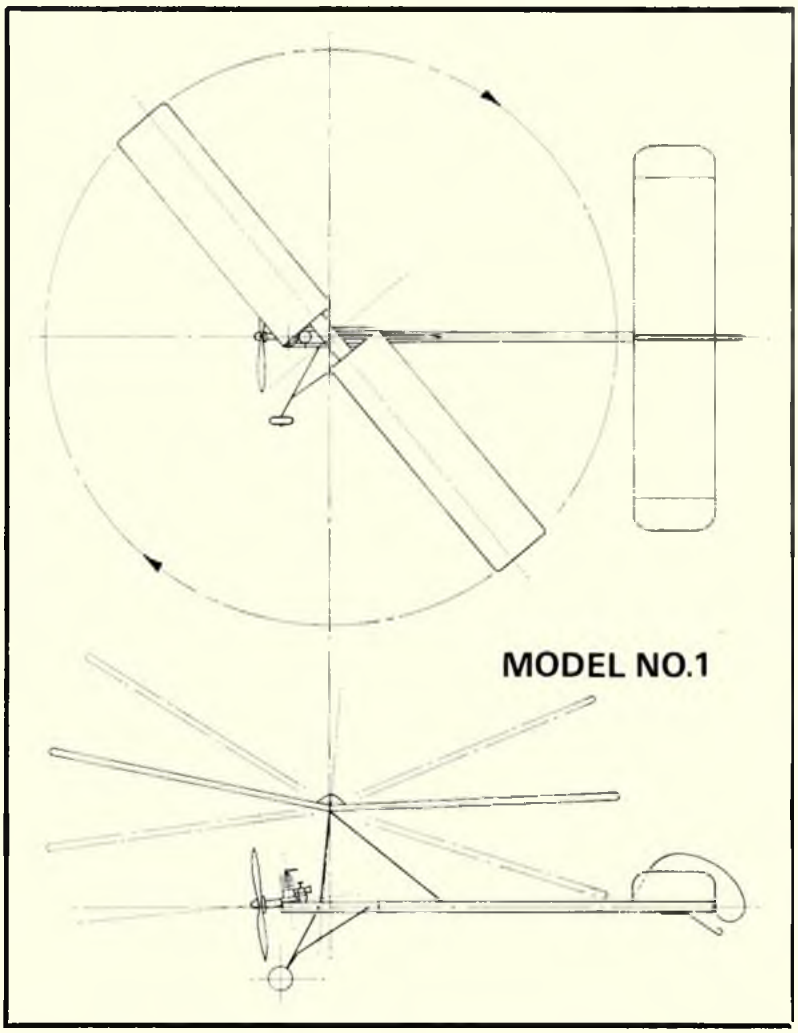
A control line model could be described as a sort of self-levitating centrifuge, something really quite different from its free-range brethren, but generally dressed up in the same sort of clothes by way of conformity. Now, this illusion of 3D-type flying machines operating on a 2D system has been shattered by a number of hot contest types, interested more in results than in presenting a pretty but useless façade. Out go the dummy pilots, fins, inboard wings, outboard tailplanes and other eye-catching impedimenta, to leave only the components necessary to centrifugal levitation. The creature that results would rate a double 'X' in any horror film – dismembered, lop-sided and an aesthetic flop.

Weather Beaten

Model flying has its vintage years. I cannot remember, offhand, when they occurred, but I do know this past year has not been one of them. The vintage year is full of calm, bright weekends, with just a touch of morning dew on the airfield to give promise of yet another glorious day's flying. It might be a mirage of the mind, a trick of the memory, but in the years when our vintage models were the latest things in flying machines, the flying fields seemed to have plenty of atmosphere but very little weather. If it did rain, it knew when to stop – and if it blew, it knew when to take a breather.

If it is true what they say, that our weather comes in cycles, I'm all for going back to the old velocipede.

Model No. 1 featured a rotor diameter of 36in. and weighed a total of 18oz. which included ballast. Power was provided by a Mills .75cc. Drawing at right is to 1/12th scale.



SOME EXPERIMENTS WITH MODEL AUTOGYROS

described by
R. W. BROWN

WITH FLYING FIELDS shrinking in both size and number, and the present-day preponderance of almost-ready-to-fly, foamed plastic, buy-your-way-to-success radio-controlled models, as alike as peas in the proverbial pod, the writer felt the need for something which, while requiring a minimum of flying space and financial outlay, would be sufficiently novel to provide scope for experiment.

One possibility which presented itself was the autogyro. Apart from a chapter on the subject in the 1952 *Aero Modeller Annual*, a few somewhat similar plans in the *AeroModeller* plans range and one or two other plans published across the Atlantic, there was little data to hand on the subject. After initial experiments with the *Ro-Dart* (A.P.S. Plan U/456, price 40p), the subject was explored on a wider front.

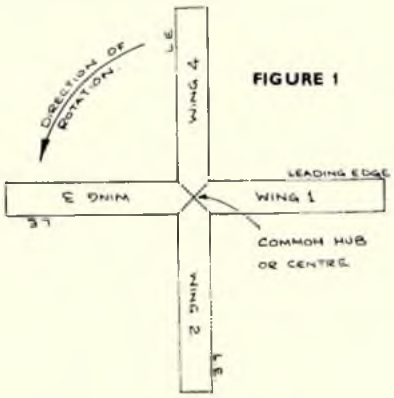


FIGURE 1

The Rotor

A conventional wing, if constrained at a certain incidence angle and allowed to move forward through the air, will descend in a more or less flat glide at a low rate of sink, dependent of course on the load it has to support. This forward motion can, however, under certain circumstances (e.g. a small landing area surrounded by obstacles), be an embarrassment!

However, imagine a series of such 'wings', each joined at one tip to a common rotating hub and spaced out like the spokes of a wheel (see *Figure 1*). The forward motion now becomes a *circular* one, and the common central hub now sinks at a controlled rate without the need for horizontal movement.

Further, if the plane of rotation of the 'wings', or rotor blades, is inclined (at an angle β) and driven horizontally through the air (e.g. by using an airscrew) with its leading edge uppermost, it will not sink but rise, due to the extra velocity of the air passing through the disc increasing the lift of the rotor blades (*Figure 2*).

Thus we have a 'wing-substitute' which, when driven through the air by a motor, will maintain height *or* climb, but when deprived of a motive force will sink gently and vertically. Apparently, the ideal vertical-landing flying machine.

Unfortunately, there are, as always, problems to be overcome. They are:

1. Because the rotor blades are travelling faster through the air when they are moving in the direction of flight than they are on the other side of the rotor disc, they produce more lift on one side of the disc than the other which tends to roll the whole disc

Figure 2

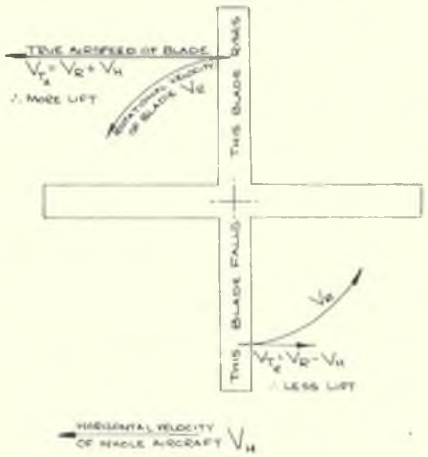


Figure 3

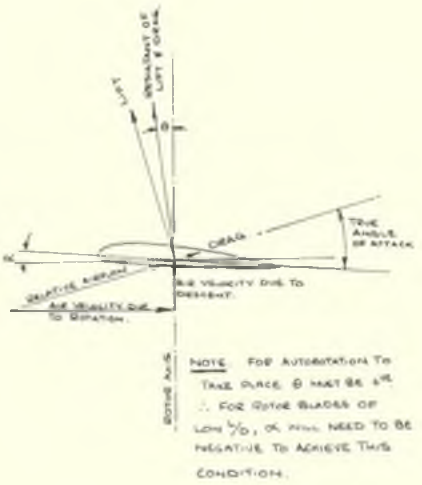


Figure 4

(and thus the aircraft) on to its back (see *Figure 3*).

2. In vertical descent, because of the friction of the rotor bearing, and because the fin has no 'steerage way', the whole aircraft tends to rotate in the same direction as the rotor.
3. Because of gyroscopic forces, if the rotor disc is disturbed (i.e. in pitch or roll) there is a reaction at right angles to the disturbing force, leading to instability.

There would appear to be a number of solutions to these problems, as follows:

(*a*) Allow the rotor blades to flap up and down, thus shedding the excess lift of the advancing blade and the gyroscopic forces (solves problems 1 and 3).
(*b*) Allow the rotor blades to 'lag' in the plane of the rotor disc, thus slowing the advancing blade and accelerating the retreating blade (solves problem 1).
(*c*) Incline the rotor head *towards* the side of the *advancing* blade to produce a sideslip which in turn causes the fin to exert a turning, and therefore rolling, force to counteract advancing-blade lift (solves problem 1 for steady flight conditions only).
(*d*) Fit small auxiliary wings with sharply dihedralled tips (partly solves problems 1 and 3).
(*e*) Fit two identical rotors rotating in opposite directions (solves problems 1, 2 *and* 3).

The angle of incidence of the individual rotor blades in relation to the plane of their rotation (α) is best determined by experiment. It will be seen from *Figure 4* that the true angle of attack at any point along a blade depends on the horizontal velocity of the air relative to the blade due to its rotational velocity and the vertical velocity of air relative to the rotor disc, due to the descent of the Autogyro through the air (this is further complicated by the aircraft's forward motion when not descending vertically). If the blade airfoil has a very good lift/drag ratio α can be a small positive angle. However, in model sizes the blades are so inefficient that a flat plate appears to be as good as anything and much easier to repair; they should then be rigged at a small negative angle to achieve autorotation (the writer uses $\alpha = -5°$).

Rotors normally require their blades to be higher at the tips than at the hubs; an upward slope (coning angle) of about 5° has proved adequate. The effect of this is analogous to dihedral on a normal wing. In order to ensure an adequate vertical component of airflow through the rotor disc when the autogyro is travelling foward under power, the axis of rotation should be given a backward tilt of 5°–7°.

The author's second side-by-side twin rotor (a development of Model No. 5, drawn opposite) takes to the air. This layout proved by far the most satisfactory, and indeed several models of this basic arrangement have now been built, all proving remarkably stable.

Fuselage

This may be a conventional structure, although provision for some form of rotor pylon must be made. Due to the inevitably high centre of drag, generous downthrust should be incorporated. An undercarriage which will absorb both horizontal and vertical shocks should also be employed.

Tail Unit

This, too, can be quite orthodox, provided that the fin is not allowed to foul the rotor (a good vertical clearance should be allowed, as blades can flex alarmingly in a heavy landing), and the tailplane may be either a flat plate or of lifting section.

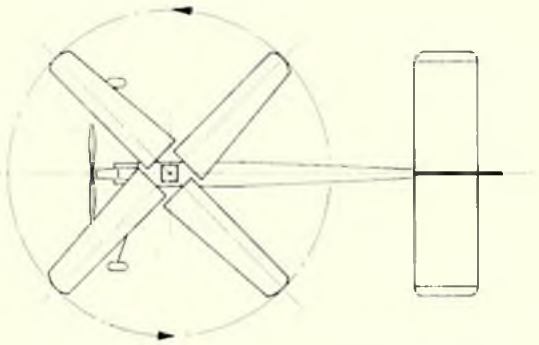
Power

Beware of under-powering model autogyros; the rotor can produce a surprising amount of drag as well as lift at high angles of attack (disc of inclination).

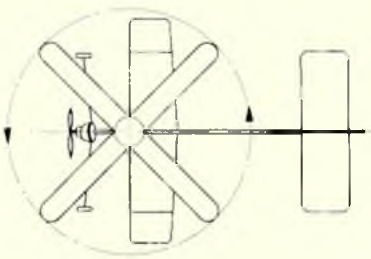
Centre of Gravity

The C.G. should lie somewhere behind the rotor hub, although the exact position depends on a number of factors, including:

1. The ratio of tailplane area to disc (swept) area.
2. The rotor hub inclination.
3. Downthrust.
4. Tailplane incidence.
5. Height of thrustline in relation to centre of drag.
6. Whether a vertical descent or a forward glide is intended when the engine stops.



MODEL NO. 2



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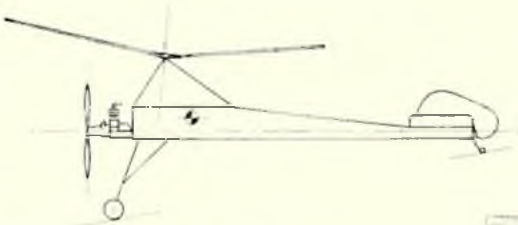
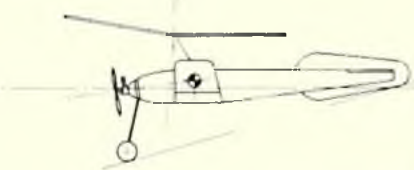
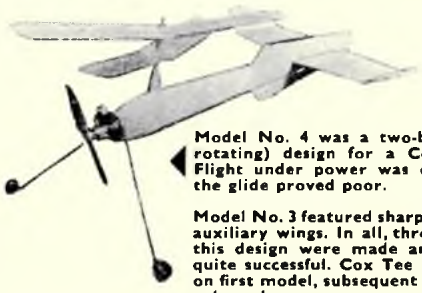


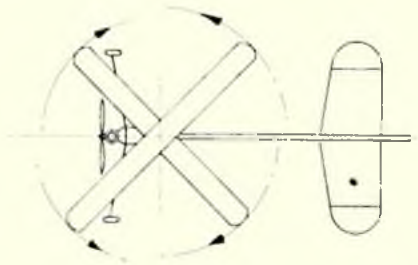




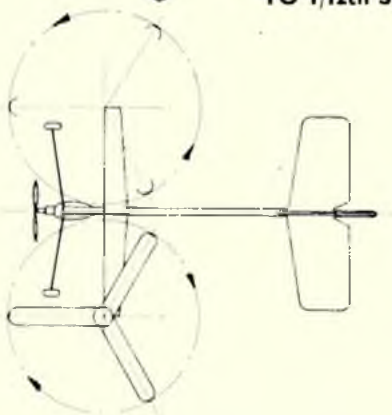
Model No. 4 was a two-blade (contra-rotating) design for a Cox Pee Wee. Flight under power was excellent, but the glide proved poor.

Model No. 3 featured sharply dihedralled auxiliary wings. In all, three versions of this design were made and all proved quite successful. Cox Tee Dee .020 used on first model, subsequent versions were enlarged.

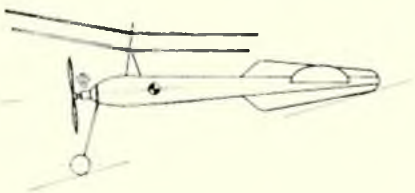
ALL DRAWINGS TO 1/12th SCALE

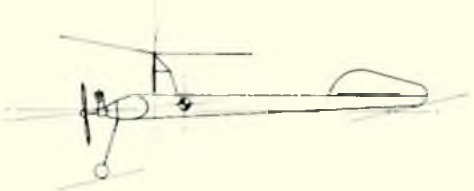


MODEL NO.4



MODEL NO.5





The first of the author's twin-rotor models (Model No. 5) flew well after much trimming, even though the Cox 020 provided rather too much power. Small prototype models have the advantage of being 'bounceable', cheap and quick to make – most useful in a lengthy test programme.

Prototype Models

Having established some sort of basic theory, together with the anticipated problems and their possible solutions, the next step was to prove all this in practice! Simple, easily repaired models were therefore built, each designed to test the effectiveness of one of the proposed solutions to the three basic problems already explained.

Model No. 1. As several full-size 'gyrocopters' achieve blade flapping (see solution No. 1) by allowing their two-bladed rotors to 'teeter' (i.e. the whole rotor is allowed to rock about its hub, one blade rising as the other falls, while still retaining the same incidence setting), a model was constructed along these lines. It did not prove successful for two reasons:

1. As the rotor could teeter, it was unable to exert any restraining influence on the fuselage in the rolling plane; therefore, especially if launched rather slowly, the fuselage would roll under the influence of airscrew torque, leading to a violent turn, accompanied by a loss of height and subsequent crash.
2. Again, as the rotor could teeter and also had a coning angle, the blade crossing the nose of the model was, in effect, at a greater angle of attack than the blade crossing the rear of the model. As a result, the rotor disc slowly assumed a greater angle of inclination to the airflow until the tailplane was unable to cope with the situation; the nose rose and forward motion ceased, followed by a rapid return to earth. All attempts at correcting this with a large tailplane of lifting section, downthrust and nose ballast failed.

Model No. 2. Assuming the complexity of 'lagging' blades (solution No. 2) would probably produce no better results than had the teetering rotor, the next model embodied a rigid rotor (see solution No. 3). It proved possible to overcome the 'advancing blade effect' under power partly by use of rudder and sidethrust and partly because the spiral slipstream acting on the large side-area of the pylon produced a correcting force. On the glide, however, things were very different; the rudder proved quite ineffective and the model was so sensitive to rotor-tilt adjustment that it was virtually impossible to obtain a respectably straight glide.

Model No. 3. Solution No. 4 proved much more successful. With sharply dihedralled auxiliary wings, the turn due to a symmetrical lift was much less vicious. Moreover, the sensitivity to rotor-head adjustment was so mild that it was possible to straighten-out the glide turn, or even induce a turn of the opposite hand.

Two other larger models of this type were built and proved quite successful. However, when ballasted for vertical descent, they still displayed a tendency to rotate with the rotor, looking most unrealistic. Also, there always seemed to be something 'impure' about an autogyro with wings!

The only solution left to explore was now solution No. 5: two identical contra-rotating rotors.

Model No. 4. This variant was thus fitted with a pair of coaxial, contra-rotating, two-bladed rotors. After a little attention to rotor-tilt, a tight spiral climb was achieved, followed by a nice straight glide. So straight, in fact, that the model disappeared into the local woodlands and has not been seen since. . . .

Attempts to improve appearances by reducing the vertical gap between the rotors in later models have not been entirely successful. Power flight has been very pleasing, accompanied by a characteristic 'swish-swish' of the passing blades, but the glide has been poor, due to interference between the rotors.

Model No. 5. It was with some misgiving that the next model – a side-by-side twin rotor autogyro with contra-rotating rotors to cancel advancing-blade effect, rotor hub friction and gyroscopic forces – was taken out one misty winter Sunday morning for its first flight.

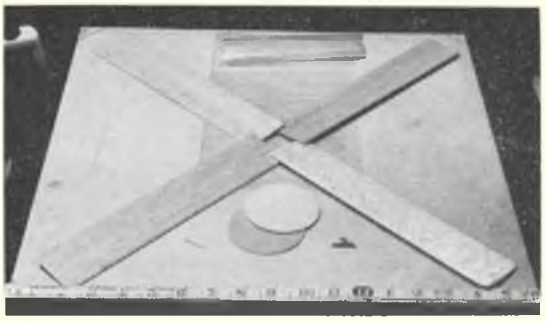
Would the rotors be properly matched? Would they run at different speeds, due to imbalance or varying bearing friction? Would it just roll over to one side and dive in? Surely, no two rotors could be sufficiently well matched!

After a bit of trouble with the tailplane setting and side-thrust, the model climbed away from a hand launch in a steady left-hand spiral, finally disappearing upward into the mist. The Cox TD ·020 stopped running, and shortly after the model reappeared gliding fast at a shallow angle in a wide circle.

This model was really overpowered with the Cox. It would loop and even roll out at the top with adjustment to the sidethrust. However, it was remarkably stable, even defying attempts to make it roll by tilting one rotor spindle back more than the other. Apparently, the increase in lift of this rotor was offset by the increase of its drag, due to the increased tilt which simply produced a yawed condition, thus presenting the other rotor at a greater angle to the airflow and re-establishing equilibrium.

Three further models were built, all to the same basic layout, with minor adjustments to areas and settings. All have been quite stable, and this led me to suppose that the layout would lend itself to radio-control as the de-stabilizing gyroscopic forces produced by tilting a rigid rotor are completely cancelled out (it should be noted that in the case of the side-by-side rotor layout no coning angle is necessary, as the rotors can be inclined

One of the rotors for the R/C version being made. Note method of 'overlapping' blades at the hub to provide the angles of incidence. Airfoil sections are not required on the blades themsleves, although the supporting stub wings are provided with a lifting section.



The culmination of several years of experimentation – and many models – the author's single-channel radio-controlled model described in the text. Results are most pleasing – and, indeed, we hear rumours that this design may soon be produced in kit form . . . but no more details yet! Free-flight and unorthodox enthusiasts, however, will be glad to know that plans for a side-by-side rotor autogyro will appear in March issue of 'Aero Modeller'.

inwards to give a 'dihedral' effect). This, in fact, proved correct, as my latest project was indeed a radio-controlled twin-rotor autogyro, using MacGregor single-channel proportional control for the rudder.

The model derives its lift from two contra-rotating rotors, each of 22in. diameter, giving a total swept area of 760sq.in. These are mounted on short pylons at the tips of stub wings, which themselves have an area of just 111sq.in. With 8° of engine downthrust, and following a couple of rather marginal nose-up flights (cured by the progressive increase of tailplane incidence), I was rewarded by a very pleasing flight pattern. Gentle, climbing turns or tighter turns losing some height are easily made, but as no throttle servo is fitted one has to estimate when the Webra Record diesel is about to stop, as the descent is almost vertical. The model must therefore be positioned over a suitable landing spot in anticipation! Descent is fairly rapid, the disc-loading being a little higher than the free-flight prototypes, but by no means damaging. Naturally, the climb is not in the 'rocket' class with a 1·5cc diesel, but quite adequate.

There still remains a lot to be investigated. Contra-rotating tandem rotors present interesting possibilities. Also, in larger models there may be a significant gain in performance from blades of airfoil section. Ideally, the rotor blades should incorporate a twist along their length as the ideal value of α will vary from root to tip (see *Figure 4*). It may even be possible to replace the tailplane by a further rotor, or pair of rotors. The possibilities are legion and should provide plenty of scope for anyone of an enquiring turn of mind. However, in the meantime, budding autogyro enthusiasts with their appetites whetted will have to wait for the next (March) issue of *AeroModeller* for plans of a twin-rotor, free-flight design which was seen scudding around the skies at last year's Nationals!

MISS SAN BERNARDINO

continued from page 83

Most important piece is the cylinder liner, which should be lapped out if it is tight. I relieve the top of piston for $\frac{1}{32}$in. to form a taper of ·001in. Check out the piston head clearance: for 15 per cent nitro, I use ·008in. Likewise check the seating of the plug face so that element's end is flush with the top of the squish band. The engine is now completely assembled (making sure that all traces of lapping compound, if used, is washed out) and lightly oiled. A motor 'set right' only needs around fifteen minutes of bench running and is then installed in the model – do not forget those dural mounting plates!

Flying

Use a low-geared handle, as you will find that with a glow engine fitted the model will zip off the ground (the prop. I use is a Bartels 7×6 type Tornado) and with the C.G. correctly located it will handle just like a good F.A.I. team-racer. Make sure the cutout works before take-off, just in case a lean setting is obtained – it does not help the engine! If anything, set the motor slightly rich for the first couple of flights.

Best restarts are obtained with the engine 'wet' – i.e. stop engine by means of 'cutout', then release cutout and fuel will be pushed through to the venturi (due to pressure in fuel tank). Then refill tank, flip prop. with glow clip connected, and result is first flick starts every time! Pitman Richard King uses a 'hot thumb' device – i.e. contacts to cylinder head and plug head on thumb (as illustrated in December 1974 *AeroModeller*) via an ammeter to check plug condition. Remember, practice is needed for those quick restarts, and pitmen – do not forget to check the plug after warm-up!

Best of luck flying. See you in the middle, and let's not make it just a two-horse race – *Ginneys* and *Arganders* let *Miss San Bernardino* lead the way!

The lad himself displays his 'cheekily' decorated racer – fitted with a Super Tigre G15 FI and glassfibre Bartels 7×6in. type Tornado propeller. Careful attention to accurate, neat construction reward Dave with a reliable airframe which is as essential as a good engine for top performance.

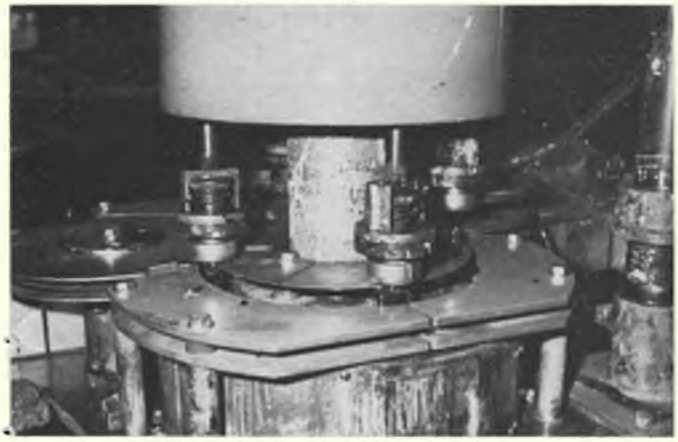
Lifting the lid on HUMBROL

TODAY, THE WORDS 'Humbrol' and 'modelling' are synonymous and thus it was with great pleasure that we recently accepted the kind offer of a conducted tour around the Marfleet plant, near Hull.

Undoubtedly, the average enthusiast would have difficulty in envisaging the size of the very modern Humbrol factory – it seems that one naturally assumes small tinlets of paint and tubes of adhesives *must* come from an equally miniature plant! Not so, as although this may indeed have been the situation in 1919 when the company was founded, today the spacious office block and production facilities occupy several acres of land, and over 300 people are employed.

Sophisticated high-speed automatic equipment now fills some 300 tinlets a minute (there is now a range of 250 colours produced in this distinctive package), while tube-fillers can churn out fifty thousand tubes a day not just for the model market, but for the ever-growing

Top picture reveals the modern, well-planned offices and factory unit at Marfleet, Hull, of Humbrol (known until only a few years ago as 'The Humber Oil Company', reflecting the company's origin as producers of small packs of cycle lubricating oil). Below that is seen the end of one of the production lines – tins of boxed 'Authentic Colour' enamel paints (so beloved by scale enthusiasts) are automatically placed in cartons and merely require to be packed for despatch. At bottom, empty cans join the conveyer belt for filling with the appropriate paint. Note the light, spacious and tidy layout of the production area. Several production lines operate side by side, enabling many different products to be packaged simultaneously.



Above: tubes of adhesive are filled, the ends crimped up, and then continue the journey along the many feet of conveyer belt. Below: each and every can of epoxy paint is check-weighed against a standard.

Above: Heath Robinson-inspired it may look, but we would place our money on this piece of machinery tightening up jar tops quicker and more reliably than you could!

army of 'Do-it-yourself' fans too.

Humbrol's chief concern lies in manufacturing high quality products, and it is specially interesting to visit their research laboratories and see the periodic checks that take place. Consistency from one batch to another is any manufacturer's bugbear, but this problem is overcome by an intensive system of physical and chemical comparison tests of colour carried out in the laboratory as well as on the factory floor. Indeed, it is the company's proud boast that no paint is packed into tins without a sample of it being matched against an approved standard held in the laboratories.

Briefly, the production of paint is as follows: the raw material delivered to the factory site is diluted with specialised solvents and blended to the appropriate shade. Once satisfied that the colour is as required, the paint is fed into 50 (or 100) gallon tanks and taken to the packing area. Here, the famous Humbrol tinlets are fed onto the conveyor belt, filled, capped and boxed in one continuous operation. From here the boxes of paints are taken to the warehouse department – another vast area separated from the main unit by electrically operated, self-closing steel doors, and await transport by road to the various distribution points – or to the docks (Humbrol products are exported to some ninety different countries). And the warehouses are necessarily huge – at any one time there are over six million tinlets alone in stock!

As is the case with all major companies, Humbrol are diversifying their interests, and now market the Multi-craft range of modelling tools, Humbrol-Badger airbrushes, artists brushes, Hinchliffe Military Models, and are now encroaching into the 'toy' market with their much advertised 'Paintabout' sets. All this of course is in addition to supplying industrial users with stove and roller coating enamels, drum paint, coach finishes, etc.

However, with Gerald Barton, a *genuine* modeller at the head of a company containing such specialist, enthusiastic staff, then there is no fear that the modeller will be forgotten. Far from it . . . in fact we heard more than a strong rumour that a new range of finishes, particularly suitable for the aero modeller will be available shortly. But more of that later!

At right, a sight to gladden any aero-modeller's eyes, as tube after tube of balsa cement, all automatically filled and boxed, pass on their way to being cartoned-up and despatched. Far right: spray paints are being widely used both by modellers and do-it-yourself enthusiasts who appreciate the quick-drying, easy application virtues of this type of painting. Spray-button heads (and those plastic caps) are applied manually.

READERS' LETTERS . . .

Easy?

Dear Sir,

Re: The Lyons Maid Flightmaster *Competition.* Easy from 6ft. 6in.? It's b . . . . . impossible!

The launch height for the *Flightmaster* event was not 6ft. 6in. but 8ft. This puts the competition in better perspective, since the best lift/drag ratio achieved by the little (and excellent) *Flightmaster* (on its flight of 42ft 11in.) was 5·36:1.

The 'Open' competition was run at a launch height of 5ft. 7in. Hence, the *worst* lift/drag ratio achieved by the runner-up was 6·90:1 (29 per cent better than the *Flightmaster*) and the average of third place man's performance gave a glide ratio of 5·39 (again to one). . . .

Permission granted to take egg off face.

London. *Paul Masterman.*

O.K. – honour is satisfied, Paul. Our figure of 6ft. 6in. came from the rules of the contest and its qualifying rounds. We should have checked.

Flying the Storch

Dear Sir,

Whittaker's *Fieseler Storch* (August 1957 *AeroModeller*) seems to be enjoying a revival. Imagine my pleasure when, on the day mine made its first flight, I saw in your September issue that Tim Brewer's *Storch* received a favourable mention in Eric Coates' flying scale column.

Just a couple of points, though. In Whittaker's original article, he stated that 1½in. dihedral was sufficient, with careful trimming. Now, Eric Coates criticises Brewer's aeroplane because it has too much dihedral, and says this is unnecessary, based on his own experience. It is with some trepidation that I cross swords with the man responsible for the excellent design and with the highly respected Mr. Coates, but I must say quite definitely that the *Storch* does require Mr. Brewer's dihedral, or a pendulum rudder, otherwise it goes into a graveyard spiral under power.

I am no beginner, and I did fifty flights in a month to carry out micrometer-style trimming on this *Storch;* when directionally trimmed 'on a knife edge' it will spiral in either direction indiscriminately. One shim of sidethrust, or the slightest tweak of the rudder, can determine which way, but this is small comfort. Increasing the dihedral to that used by Mr. Brewer converts it instantly to a marvellous sport model which flies just like a *Storch,* but unfortunately resembles a rubber cabin duration model from some angles.

In any event, I like flying the machine, and my enjoyment would be enhanced if either of the gentlemen concerned feel like arguing about it, because I say: *(a)* Mr. Coates' memory is playing him false in this instance, and *(b)* Mr. Whittaker must have written his original article before he flew the *Storch* with more than a five-second engine run.

Who could resist a challenge like that?

Ontario, Canada. *John C. Tysoe.*

Silencers

Dear Sir,

The *North Cheshire Radio Club* are extremely grateful to the *AeroModeller* for including the notification of our newly formed group and wish to state how really serious the flying field problem is, more than one can realise!

Ironically, as we all are aware the models spend most of the time in the air, and the need for a suitable take-off and landing area is becoming more and more acute, due to the noise of many so-called 'silencers'. Many R/C-ers are turning to gliders and yachts, which means engine manufacturers will soon have many unsold engines on their shelves unless some form of action group or committee is formed to decide the design (and restrict certain) silencers for the engines – which today develop greater power than of years ago.

When R/C first began way back in radio gear with batteries weighed 1½lb., people were very interested and came in dozens to watch us fly the models WITHOUT SILENCERS! Then they were mainly diesels; it was a novelty and no one complained – not many were about!

But today I can honestly state in my twenty-four years' experience with R/C flying the main culprits for loss of flying areas are the unthoughtful and, in many instances, inconsiderate high-powered, screaming engines with sound boxes called silencers – flown by the competitions fliers. Such fliers lost a local Hadfield area because they just wanted high speed and power. Well, no one is going to have their Sunday shattered by ear-splitting sounds with a noisy engine. In my opinion, competition fliers with inefficient silencers (they are not really silencers) should go and practise on the moors; they are skilful enough to land on the pathways, etc.! Then, again, the blame must not be totally competition fliers with high-power engines, but modellers who persist in flying very low over property, or not making sure that their engine is properly silenced. As I said, the flying field situation is so serious we have had enquiries from as far as twenty-five miles to join us, because of 'being chucked off', etc. Unless something immediate is done, the radio model will be a vintage piece and only gliders will be seen in the air.

R. Wilson.

Combat with diesels!

Dear Sir,

May I be allowed to take the opportunity of replying through the *AeroModeller* to the Outlaws club about their *'Glow motors for Combat?'* article in the December issue?

Although my flying ability at present is sadly lacking when compared with theirs, I did enter and fly in five combat competitions this year, and observed the Outlaws' and other glow-users' fortunes.

The Outlaws suggest that diesels – presumably Oliver Tigers – are expensive to buy and maintain, needing considerable 'sorting' before they will do a consistent 85 mph or less. What nonsense! A stock Tiger is only marginally dearer than a G 15, and usually lasts a whole year/season before needing a rebore and maybe a new conrod. Compared with a glow motor consuming plugs in copious quantities (one a competition), an Oliver will have cost you less at the end of a long season of practicing and competition. Not only that, it will travel at a slower speed and therefore sustain less damage to motor and model in the event of a crash.

Certainly, Oliver Tigers do vary in their individual power output (and so do G 15's), but they only require a minimum of 'sorting' in prop. sizes and settings. If the Outlaws consider these minor variables as 'a good deal of sorting', then what do they consider their own fiddling around with babies' dummies and Bulldog clips to be? Amusement?

To say that a diesel needs a good deal of sorting – reason number two – is NOT the same as saying that every example is not as good as its predecessor, despite the Outlaws' indications to the contrary. The former implies a characteristic peculiarity intrinsic to the basic design of the motor, the latter implies deviations from manufacturing accuracy – the two are not the same.

If we are to take Messrs. Lismore, Hammersley and Strudwick's word in this matter, we should equate the degree of 'sorting' required with the subsequent performance from that motor. If this is the case, then by the Outlaws own 'reasoning' they should not be using Super Tigre G 15's!

The result of anybody taking up the Outlaws' recommendations can be imagined. You would end up with a very fast, not as manoeuvrable, easily destroyed, plug-consuming model that your pit crew can't get off the ground, and you can't handle even if they did. The advantages accruing to superior speed would be more of a disadvantage, unless you were good enough to make full use of them. Some advantages!

It would appear, then, that the only real justification the Outlaws have in using glows is that they fancied a change – but is this a basis for everybody else to use them? Most certainly, if people do fancy a change, but until the Evans', Tiernan's and Hunt's swop their Tigers for G 15's, then the rest of the sheep will invariably follow them (myself included!).

You may care to publish this letter in order to present the Outlaws' article in a different light. I hope you do.

Derbyshire. *N. W. Scott.*

Contest Directors' woes . . .

Dear Sir,

I would like to add weight to a few of the opinions you put forward in reply to Dave Clarkson's *Between the Lines* in the January issue.

I was Contest Director for the Goodyear event at Wymeswold in '74, and although our team of timekeepers, scribes, etc., was adequate for the size of entry, we ran into trouble a few times because these helpers lost patience waiting for flyers to turn up

continued opposite

Contest Calendar

February 16th	**EAST GRINSTEAD INDOOR MEET.** Open microfilm, EZB, Peanut scale. Pre-entry (40p per event; 10p Juniors) essential. Details, etc., from A. C. Grantham, 'Woodlands', Redehall Road, Smallfield, Horley, Surrey RH6 9RY. Please send s.a.e. Venue: King George Hall, Moat Road, East Grinstead, Sussex.
February 29th	**LONDON AREA FREE FLIGHT FAI MEET.** Classes F1A, F1B, F1C, 5 rounds, 2 before 12 p.m. – 10 a.m. Start at Bassingbourn, nr. Royston, Herts. S.M.A.E. cards essential.
March 2nd	**S.M.A.E. F/F MEET.** Mini Comp – C.d'Hiver, ½A Power, A/1, H.L.G. Venue: R.A.F. Little Rissington, Gloucestershire.
March 9th	**S.M.A.E. C/L MEET.** F.A.I., ½A, Goodyear T/R. Venue: Western Area.
March 9th	**S.M.A.E. R/C AEROBATICS.** Venue: To be announced.
March 9th	**DEVON WINTER RALLY.** Open R/G/P, Chuck glider. 9 a.m. start. Fly-offs 3.30 p.m. Venue: Woodbury Common, Nr. Exmouth, Devon.
March 16th	**S.M.A.E. INDOOR MEET.** Open class scale, F/F duration. Venue: Cardington, Beds.
March 23rd	**S.M.A.E. 1st AREA CENTRALISED.** F.A.I. glider, Open R/P. Area venues.
March 23rd	**S.M.A.E. R/C PYLON RACE.** Venue: North Luffenham, Leicestershire.
March 30th	**R/C THERMAL PYLON & POWER SOARING.** Entries to W. Longley, 21 Ambassador, Bracknell, Berks. Venue: To be advised.
March 31st	**R/C OPEN CLUB 20 PYLON RACE** at Wokingham. Details: W. Longley, 21 Ambassador, Bracknell, Berks.
April 20th	**S.M.A.E. INDOOR MEET.** Duration. Venue: Cardington.
April 26th–27th	**S.M.A.E. C/L TEAM TRIALS.** Venue: To be announced.
April 26th–27th	**S.M.A.E. F.A.I. MEET.** F.A.I., R/G/P at R.A.F. Sculthorpe, Norfolk.
April 27th	**S.M.A.E. R/C AEROBATICS TRIALS.** Venue: Hixon, Staffordshire.
May 4th	**S.M.A.E. 2nd AREA CENTRALISED MEET.** F.A.I. Power, Open R/G. Area venues.
May 4th	**S.M.A.E. R/C PYLON RACE.** Venue: R.A.F. North Luffenham, Leicestershire.
May 4th	**S.M.A.E. R/C AEROBATICS.** Venue: R.A.F. Little Rissington, Gloucestershire.
May 11th	**VULCANS F/F RALLY.** Venue: To be announced.
May 18th	**S.M.A.E. F/F TEAM PRACTICE.** Venue: To be announced.
May 24th–26th	**BRITISH NATIONALS**
June 1st	**S.M.A.E. INDOOR MEET.** Duration. Venue: Cardington, Bedfordshire.
June 8th	**S.M.A.E. F/F TEAM PRACTICE.** Venue: To be announced.
June 15th	**S.M.A.E. 3rd AREA CENTRALISED MEET.** F.A.I. Rubber, Open P/G. Area venues.
June 22nd	**S.M.A.E. C/L MEET.** F.A.I., B, ½A, ½A Goodyear, Speed, Aerobatics, Combat. Venue: N.W. Area.
June 29th	**S.M.A.E. F/F CLUB CHAMPS.** Open R/G/P. Venue: To be advised.
June 29th	**S.M.A.E. R/C PYLON RACE.** Venue: R.A.F. North Luffenham, Leicestershire.
July 6th	**S.M.A.E. INDOOR MEET.** Duration. Venue: Cardington.
July 13th	**S.M.A.E. SCALE MEET.** F/F, C/L, R/C. Venue: R.A.F. Little Rissington, Gloucestershire
July 20th	**S.M.A.E. 4th AREA CENTRALISED MEET.** Team Glider (Open), F.A.I. Power, C.d'Hiver. Area venues.
July 20th	**S.M.A.E. R/C PYLON RACE.** Venue: R.A.F. North Luffenham, Leicestershire.
July 20th	**S.M.A.E. R/C AEROBATICS.** Venue: Wymeswold, Leicestershire.
August 10th	**S.M.A.E. C/L MEET.** F.A.I., Goodyear, B team race, Speed, Stunt, Combat, Rat race. Venue: London Area.
August 16th/17th	**S.M.A.E. INDOOR NATIONALS.** Scale, Open and Peanut, F/F, EZB, Open, Penny, H.L.G. Venue: Cardington.
August 17th	**S.M.A.E. R/C AEROBATICS.** Venue Wymeswold, Leicestershire.
August 17th	**FACCT R/C THERMAL SOARING MEET.** Percentage/slot scoring system. 50p pre-entry to N. Webb, The Bungalow, Fast Street, Fritwell, Oxon. Venue: Weston-on-the-Green, off A43, Oxford–Northampton Road.
September 7th	**ROLLS-ROYCE R/C FLY FOR FUN.** Venue: R.-R. Hucknell.
September 7th	**S.M.A.E. 5th AREA CENTRALISED MEET.** Team Power, F.A.I., Rubber, A/1. Area venues.
September 7th	**S.M.A.E. R/C PYLON RACE.** Venue: North Luffenham, Leicestershire.
September 14th	**R/C THERMAL SOARING** at Bracknell. Venue: To be announced. Details: Bill Longley, 21 Ambassador, Bracknell, Berkshire.
September 14th	**S.M.A.E. R/C AEROBATICS.** Venue: Middle Wallop.
September 21st	**S.M.A.E. INDOOR MEET.** Duration. Venue: Cardington.
September 28th	**SOUTHERN GALA.** F/F: Open R/G/P. Scale: F/F, C/L, R/C. Venue: R.A.F. Odiham, Hants.
October 5th	**NORTHERN GALA.** Venue: Rufforth, Yorks.
October 12th	**S.M.A.E. 6th AREA CENTRALISED.** Team Rubber, F.A.I. Glider, ½A Power. Area venues.
October 12th	**S.M.A.E. SCALE MEET.** F/F, C/L, R/C Class 2. Venue: R.A.F. Little Rissington.
October 12th	**S.M.A.E. R/C PYLON RACE.** Venue: North Luffenham.
October 12th	**S.M.A.E. R/C AEROBATICS.** Venue: Wymeswold, Leicestershire.
October 19th	**S.M.A.E. INDOOR MEET.** Duration. Venue: Cardington, Bedfordshire.
October 19th	**NORTHERN AREA F.A.I. GALA.** Venue: Elvington, Yorkshire.
October 25th–26th	**S.M.A.E. F.A.I. MEET.** F.A.I. Rubber, Power, Glider. Venue: Sculthorpe, Norfolk.
November 2nd	**S.M.A.E. INDOOR MEET.** Scale Open Class. Venue: Cardington, Bedfordshire.

for their heats, and had gone off to watch other events. One can hardly blame them, especially when, at one point, we had nearly an hour's gap in the programme because there was no-one to fly! This, after telling the teams approximately when they would be racing.

We had one poor soul who spent almost the entire day going up and down the airfield trying to round-up flyers. Eventually we resorted to the technique of flying-off heats, with whoever was available, and dismissed the pre-drawn pairings. This situation was not due to novice flyer's ignorance either, as certain well-known teams (*NOT* Messrs Clarkson/Daly – they were raring to go every time, *AND* they won the event . . .) just did not turn-up for the first round at all, and ended up being put in the last heat of the second round. That is cutting it a bit fine, I think you will agree.

This is not a satisfactory state of affairs for either organisers or flyers, so please remember, team racers, *we* are trying to run the races for you, and if *we* get frustrated and impatient, who's going to organise the events?

On the subject of giving warnings, we used a portable loudhailer at Wymeswold, and although not exactly Hi-Fi, it made a loud enough noise for pilots to know that some misdemeanour had been spotted. These devices are more likely to be 'borrowable' than a whole PA unit. Maybe other organisers have ideas on this front?

Incidentally, Mike Oldfield's glider is on the sleeve of *Hergest Ridge*, not *Tubular Bells*, more logical when you think about it! Spondon, Derby. *Kit Spackman*

WARPS – How to avoid 'EM!

by Mike Woodhouse

WARPS, be they accidental or deliberately induced, affect the flight of every model; unwanted warps causing disaster in many cases. Geodetic structures and Warren-girder type bracing have been introduced over the years, particularly for free-flight models, to aid the maintenance of stable flying surfaces. Building boards constructed to the shape of the undersurface of both wing and tail to provide a jig for construction, and then used as a permanent home for those components, are popular in some quarters – and, indeed, such a system was described by Tony Cordes in the December 1974 issue.

In common with several other flyers, I have started to move away from using cellulose-based cement as an adhesive, to epoxy resins in an effort to obtain greater structural stability. Cellulose cement is notorious for its effects on 1/32in. sheeting and thin tailplane ribs, causing quite dramatic buckling of these items. The thought naturally occurs as to how is it possible to produce stable surfaces if they are built with warp inducing glue? Epoxy resins do not have this problem of warping caused by shrinkage of the glue, as they set due to catalytic action.

Bearing in mind the basis of epoxy resin jointing, my procedure for constructing A/2 glider wings is now as follows:

1. **Wing ribs** are cut from quarter grain, medium grade 1/16in. sheet which has first been covered with lightweight Modelspan tissue and given a couple of coats of 50/50 dope and thinners. This combination of timber and tissue covering prevents ribs from collapsing, at the trailing edge in particular, and adds little weight. For further strengthening, every fifth rib is cut from 1/16in. plywood, as are dihedral joints and ribs in the first few centre section bays for wing-joining dowels.

2. **Tips** are normally elliptical and are laminated, using Cascomite as the adhesive, the method being that described in the February 1974 *Aeromodeller*.

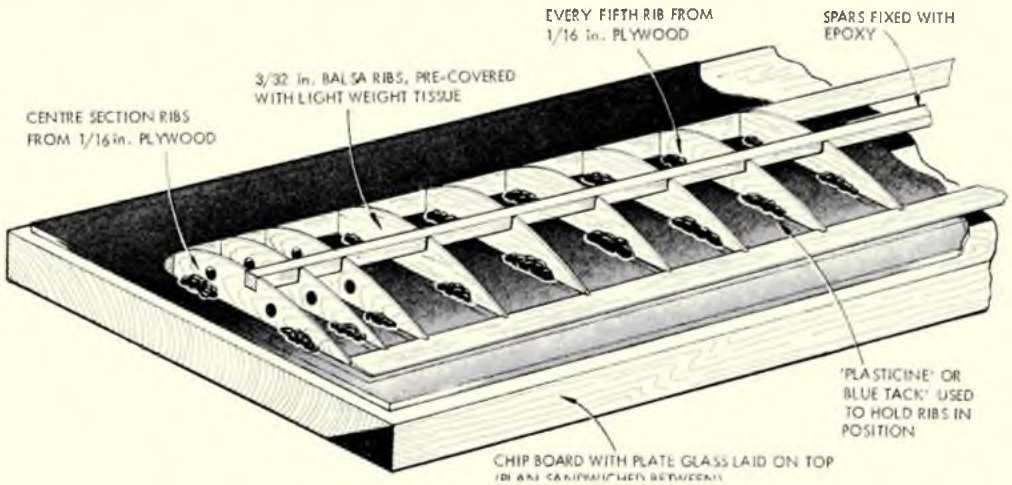
3. **Spars** – all reinforcing spars are jointed with epoxy.

4. **Assembly** is the new trick for some. Build on *glass*! A sheet of plate glass laid on a suitable piece of chipboard with the plan sandwiched between the two! For those who are ahead of me at this point, I of course agree that you cannot stick pins into glass; but I use Plasticine to hold all the bits and pieces in place, while a substance known as 'Bluetack' is even better as it is a sort of self-adhesive Plasticine! A word of caution, though: joints must be true and not forced, as the structure will not be held as rigidly as a structure pinned on wood. The biggest snag is reflection caused by looking at the plan through glass: the problem is the same as that of looking at a pond and the optical illusion of it being shallower than it really is. This drawback, however, is avoided by working as directly above the board as possible.

Gluing a structure with epoxy rather than balsa cement soon reveals the differences between the two in 'stickiness'. With cement the ribs of a wing are easily held in the correct location by the immediate tackiness of the cement; whereas epoxy does not hold the joint and ribs can, if poorly fixed, keel over in the night if a slow-drying epoxy is used. I have tried both quick-setting and normal epoxy with little or no apparent difference in strength between the two. Both have advantages in use; the fast-setting variety may be mixed in small amounts and the quick-hardening properties enable progress on a wing to be made rapidly. The slower drying varieties enables more working time but less construction in a single session, due to the need, in some stages, to let each operation dry before proceeding further.

A few concluding tips to make life easier. Work as cleanly as possible; epoxy when it has hardened is not easy to sand off the structure, and if used excessively can add to the model weight. Epoxy can be mixed on the corner of the board and easily scraped off when dry, although personally, I prefer a ceramic tile as a pallet.

I have now built four wings using epoxy and found them all satisfactory in the view of warp prevention; none have 'moved', and my fears of extra weight were unfounded. One final thought to send you to bed unhappy: try laying a ruler on the underside of a wing, the end of the ruler on a lower spar edge to the trailing or leading edge. Run the ruler back and forth under the light and watch the deviations in the structure . . . !



FLYING SCALE COLUMN

by Eric Coates

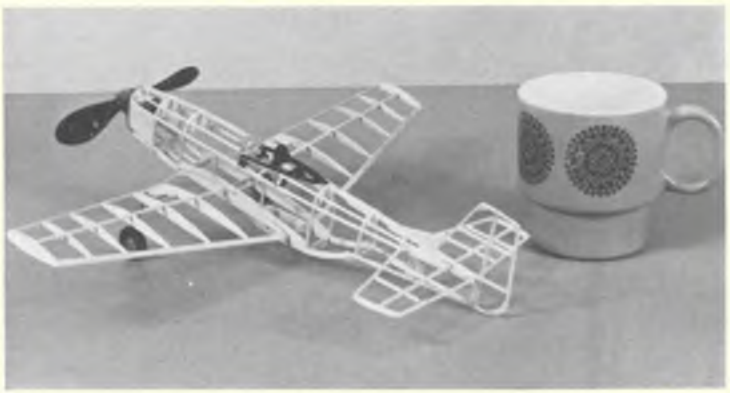
Pictured top right is Andrew Moorhouse's delightful Luton Minor which placed fourth at the S.M.A.E. Peanut-scale meeting, held at Cardington. Below is an Avro 'F' built by Ron Coleman, which flew well but was not entered in the competition. While Cardington is ideal for all types of indoor models, much smaller venues are quite suitable for 'Peanuts' and the like.

THIS IS AN exclusive 'Peanut' edition, reflecting, I think, the interest of a large body of the free flight scale world at this time of the year, with seemingly endless grey days of wind and rain. In addition to the major S.M.A.E. Scale Indoor meetings held in Cardington, many clubs are starting to hold their own indoor meets in rather less spacious halls, situated in their own locality. My own club (*Lee Bees*) has been fortunate to secure the use, on occasions, of the camp cinema of the Royal Navy shore establishment, H.M.S. *Collingwood*. I also attended recently a meeting organised by the East Grinstead club in the gymnasium of their local sports centre. Neither of these sites are perfect, requiring rather tighter turning circles than is ideal, and are somewhat restricted in ceiling height, but indoor flying is possible and great fun can be had. The Peanut is probably the optimum-sized scale model for these events, and one problem which became apparent at the East Grinstead meeting is that *simultaneous* flying of scale and duration models at these restricted sites is not compatible. In the vast length of the Cardington shed it is possible to fly Scale, Duration and Chuck glider simultaneously without undue interference between the flying areas; but if peace is to be maintained between the various disciplines, it is essential that periods will have to be allocated for the flying of each category. This will be no problem as far as scale is concerned; apart possibly from time for trimming. A scale flight is of relatively short duration, and even flying one at a time, as has been customary in the past, thirty flights per hour are easily possible – and, of course, static judging can be carried out during the period of the duration flying. I am informed that the East Grinstead club hopes to hold a contest on these lines on February 16th, 1975 — see Contest Calender for details.

The leading producer of Peanut kits in the U.S.A., **Peck Polymers,** have just released two new models and sent samples over to me for review. These are a refreshing change from the usual Peanut range of light planes and racers in that they are a pair of W.W.II fighters – the *Mitsubishi A6M.2 Zero* and the *P51.D Mustang*. The P51.D was built up by Terry Manley, and I knocked together the A6M.2 just in time for the December S.M.A.E. experimental Peanut meeting at Cardington.

Without doubt, these are the most complete Peanuts offered by Peck. Both feature fuselages built on the central keel principle and 1/20in. square balsa stringers. I think the A6M fuselage lends itself better to this form of construction than the P51, with its many compound curves. Incidentally, I do not like the way the instructions suggest that one complete half of the fuselage – i.e. stringers and all – is built whilst the keel is pinned to the plan. If one does this, a banana-shaped fuselage, when viewed in plan, is almost bound to materialise. The correct method, in my opinion, and the way I built the *Zero* is to assemble the formers either side of the keel first and then add the stringers symmetrically each side of the fuselage. This way, although more fiddley, will produce a truly straight fuselage.

The wings of both models feature a goodly number of ribs so that a reasonable wing contour is achieved – airfoils are modified to Clark Y for ease of construction and better lifting ability. The usual accessories – Kaysun prop., plastic wheels, nose bush, wire, rubber, etc. – are included. As usual with Peck, the wood is of good quality, and perhaps the nicest feature of these kits is the excellent acetate-moulded canopy and spinner (the A6M canopy has all the frame lines moulded in). A set of press-on decals is also included. To finish a very complete kit,



Peck Polymer's Peanut-scale version of the North American P51 'Mustang' is obviously Terry Manley's cup of tea! Basic structure is straightforward enough, but care must be taken to avoid warps in either wings or fuselage. Terry used the standard Kaysun prop. supplied, and this, combined with lack of time to trim the model properly, resulted in him failing to qualify for judging in the static section at Cardington. Next time should be a different story, though . . .

excellent quality tissue is provided – white in the case of the *Mustang* and grey for the *Zero*.

I spent a bit more time finishing the A6M than I have on previous review kits. To enhance the realism, I sheeted the top decking up to the cockpit and framed the canopy with thin strips of paper painted grey. Paper wing fillets were also added – models of W.W.II fighters without fillets look ghastly to my eyes! I also sprayed a thin coat of light grey dope over the tissue to hide the rather stark stringers protruding through the tissue covering. All this, of course, puts up the weight and consequently detracts from the performance; but if one wants a high performance Peanut, one does not chose a *Zero* or a *Mustang* for a subject! I was very pleased with the result. A very realistic model, apart from the rather large tailplane, being the reward for a pleasant week of evenings work.

Both these models were trimmed out at Cardington on December 8th immediately before the Peanut competition. The A6M flew better than the P51, probably due to the fact that I had substituted the prop. supplied in the kit for a chopped-down *Tern* unit. This is undoubtedly a more efficient airscrew than the standard Kaysun which Terry fitted – the result being that although heavier, with its spray finish, the *Zero* climbed much higher than the *Mustang* to record flight times of around 20–25 seconds each flight after the initial trimming. These are not fantastic times, but the little machine really looked the part in flight, flying at scale fighter speed albeit with the 'legs' down! In the competition, Terry in fact failed to achieve the necessary 50 seconds' aggregate to qualify under the rules of the day. This, I feel, was not due in any way to the model design, but really due to lack of trimming time available before the competition and an incorrect prop/motor combination.

The competition attracted seventeen entries which included two from your columnist. The experimental rules allowed two entries to give experience of as many types as possible, although I in fact was the only competitor to take advantage of this. I was very busy indeed, as I also entered proxy the delectable *Farman Moustique* of Bill Hannon. This machine, as always, flew beautifully, recording an aggregate of 115 seconds for the three flights – but, alas, all to no avail, as I had left the documentation at home, it therefore automatically being disqualified in the static section. Sorry, Bill! The Barrs, father Laurie and son Andrew, both flew ultra-lightweight *Piper Cubs*, built from **Micro-X** kits, and both suffered similar fates! The judges, Denis Thumpston and Dave Clarkson, worked strictly to the rules which required at least a 1/144th general arrangement drawing plus one photo, or a coloured three-view. As at the Indoor Nats, the younger Barr's machine was the longest flyer by a mile – 167 seconds aggregate. Only one flight, however, was a 'max' (timing ceasing at 60 seconds). Laurie's model, in transparent yellow wrapping, only achieved a 117 seconds aggregate. This was, in fact, one second less than I achieved with my second entry, the by now well-battered (after much contact with small-hall walls and ceilings) *Andreason B.A.4*. Only other entry to top 100 seconds was the eventual winner – a delightful *Blackburn 1912*, built by Butch Hadland. Structurally, this is just about the most accurate Peanut I have seen, and should be a major force at many a Peanut event to come in the future.

Bob Peck himself built this 'Mustang' from one of his own kits. Looks great, too, and a nice change from the majority of 'Peanuts' which tend to originate from the time of the First World War. Who will be the first to fly an indoor scale model with retracting undercarriage?

At left, Butch Hadland's winning model – the 1912 Blackburn – achieved highest points in both flying and static sections. Above is seen the nicely moulded canopy (and spinner in the background) supplied in the Peck 'Zero' kit.

Six entries in all failed to make the 50 seconds qualifying aggregate time: Eric Herbert's *Halton H.A.C.2 Minus* just managing 53 seconds, whilst a further five managed aggregates in the sixties. Analysing the times, there were in fact three distinct groups: the non-qualifiers, the 'Sixties', the 'Hundred and Tens' – plus Andrew Barr!

The judges were in a hard mood when it came to static marking, eliminating a further four competitors who did not come up to the minimum 50 static points requirement. How hard can be judged by the fact that the *Blackburn 1912* only scored 116 out of a possible 180. This, added to his high flight score, gave Butch a clear lead over the beautiful *Desoutter* of Andrew Moorhouse – also having its first airing. In third place was the well-known *Waterman* racer of John Blagg, closely followed by another new model – a *Luton Minor* built by Andrew Moorhouse. In fifth position, and the only other model not to be eliminated on one count or another, was my *A6M*.

Results

Entrant	*Model*	*Static*	*Flying*	*Total*
1. C. Hadland	*Blackburn 1912*	116	106	222
2. A. Callaghan	*Desoutter*	102	62	164
3. A. Moorhouse	*Luton Minor*	88	60	148

* * *

After the competition a discussion was held between the competitors and the judges to see what was thought of these experimental rules and to guide the Scale Technical Committee in its endeavours to produce a set of rules acceptable to the majority. Whilst some present were in favour of more emphasis on duration, the majority were in favour of a contest which gave an even split of marks between flying and static. The experimental rules were, in fact, quite well received, except for the 50-point qualifying clauses in both static and flying sections.

However, there was considerable support for trying out a system now gaining much favour in the U.S.A. known as the 'Miami' rules. I will give further details of these in next month's Column, but briefly the system is that flying and static are automatically evened out, without the need for a maximum flight time, by simply adding the placings in order of merit in both flying and static, and he who has the lowest aggregate is deemed the winner – i.e., if contestant A is 3rd in static and 4th in flying, in order of merit, he would get 7 points. If contestant B was 5th in static but 1st in flying, he would get 6 points and beat contestant A.

A further experimental Peanut competition, therefore, will be held, to 'Miami' rules, at the next S.M.A.E. Scale Cardinton Meet scheduled for March 16th. The principle event on this date, though, will be an Open Class Scale competition.

One final point. In my review of the Indoor Nats in the November issue, I said unkind things about the flying ability of Peter Smart's *Blackburn Airedale*, likening it to my unsuccessful beast ten years ago. Peter has now completely confounded me by fitting a Brown Junior CO_2 motor and making it fly like a dream! Whenever I looked up on December 8th, it seemed to be airborne . . . you can stop flying it now, Peter, you have made your point! The *Airedale* is a beautiful model!

Our columnist built this A6M Zero from another Peck kit and has achieved a great deal of realism by sheeting the top decking up to the cockpit, adding paper wing fillets and framing the canopy, while a light airbrushing job completed the handiwork. Note the neat 'hint' of aileron and elevator lines rather than Bob Peck's over-emphasised detail on the 'Mustang' opposite.

Society of Model Aero

ANNUAL PI

at the Grand Hotel, Lei

Above: Malcolm Ross and Derek Heaton relieved Mrs. Baddeley of four pieces of silverware for their 1974 efforts in team racing: the Knokke No. 1, R.A.F. M.A.A., Wharfdale, and Budapest trophies. Below left: Don Beaumont receives the R.C.M. & E. trophy for F.A.I.-class Pylon racing at the Nationals.

Above: two newly elected vice-presidents of the S.M.A.E. – Air Commodore Eric Baddeley (at microphone) and John Crampton of Hawker Siddeley (foreground) with S.M.A.E. Chairman, Jack Hartley, in between. At left, Mick Staples receives the Knokke trophy for his control-line scale efforts, while below Pete Tindal and his wife admire their newly acquired Gold Trophy.

Above: Mike Fantham managed to oust 'our' John O'Donnell from top F/F spot by winning the British Senior Free Flight Championship, and that requires a tremendous amount of effort, too! Below: Roy Collins, No. 1 Power team member for 1975, collects the 'Aero Modeller' Power Trophy which he shares with Ken Faux.

nautical Engineers Ltd.

RIZEGIVING

cester, November 23rd.

Above: what a lot of clobber! North, East and West free-flighters with their loot: Ron Pollard, Joe Barnes, Julian Hopper and Alan Jack (now moved to Southampton). Below: trophy table with Henry Nicholls and George Lynn hidden by the much-prized F.A.I. Group Diploma awarded to the S.M.A.E. in recognition of its contribution to International modelling.

Above: 'Now we've got it – what do we do with it?' Derl Morley and Joe Barnes get to grips with the Farrow Shield. Mrs. Baddeley, wife of our new vice-president, who kindly presented the prizes, looks horrified at the thought of cleaning it! At right, P.R.O. Mike Birch collected many trophies for R/C aerobatics – as usual!

Above: Terry Manley receives the Super-scale prize for winning the F/F scale event at '74 Nats, while below, Laurie Barr receives the Model Aircraft Trophy for Open Rubber won at the same meeting. Right: 'Ouch, that tickles!' Actually, Mick Tiernan won the Whitney Straight Trophy for Combat; but, sensible fellow, thought we would rather see his wife collect it. You're right, too, Mick!

P.P.P. . . .

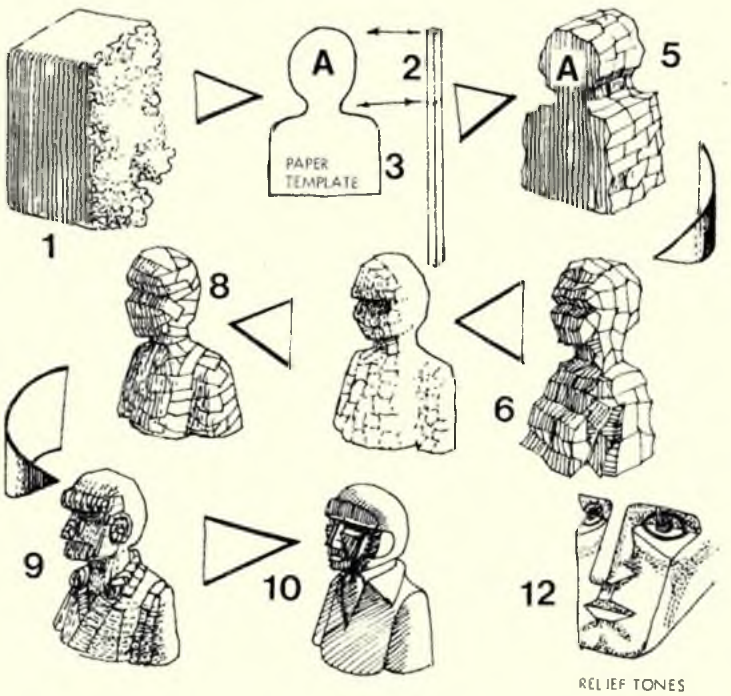
Polystyrene and Paper Pilots

by Trevor Faulkner

Super lightweight pilots made by the author for installation in his rubber-powered Kania S-3. Pilots are virtually essential for any flying scale model – nothing looks worse than a model flying without a driver!

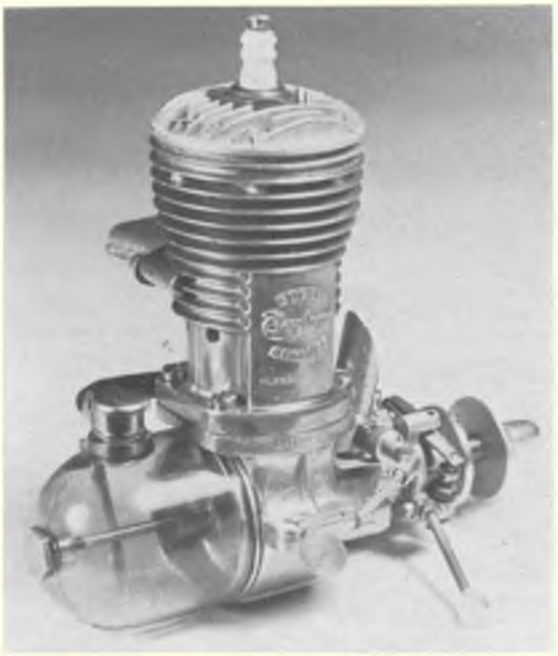
BEING A CONFIRMED 'make it from the scrap box rather than buy it' type, I was seeking a way of producing two little fellers to fill the gaps in the cockpits of a rubber scale job. There was as little weight as cash to spare, and yet the result had to look convincing at a short distance. Having some expanded polystyrene around, thoughts wandered in that direction. The soldering-iron was to hand, already warm, and a doodle or two convinced me that the material had possibilities, and this was the method employed.

1. An oversize lump of expanded polystyrene was broken off a discarded packing piece.
2. An estimated 10in. (adult head length) was marked on a scrap of wood, scaled as required.
3. A basic shape (A) was roughed out on a scrap of paper to coincide with the exposed part of the pilot's head and shoulders.
4. The soldering iron was covered in aluminium foil.
5. Basic shape 'A' profile was melted out with the soldering iron.
6. Side view was then imposed in the same manner, and the corners rounded.
7. Head length was checked, and reduced to just *under* finished size.
8. Strips of Modelspan tissue were wound around this core after being coated with Polycell-type wallpaper paste. About three layers were added, using contrasting colours to ensure uniform coverage.
9. After this was dry (accelerated by pressing out all excess paste), soft toilet tissue was pasted and applied in rolls, folds, etc., to form the basic features. This was in turn allowed to dry.
10. A spackle-type filler or similar compound was added to give further details, using a scalpel blade, cocktail sticks, etc., to shape, and again allowed to dry (forced drying is quite permissible if you are in a hurry).
11. The dried model was dipped in clear dope (neat); this gives a good strong surface for painting, and seems to deposit the dissolved expanded polystyrene inside the paper in a harder shell.
12. The paint job was carried out with a fine (No. 1 or 2) sable brush, using a water-bound paint (poster colours, polymers, acrylics, water colours with a spot of white to give opacity are all suitable). A light coat of thin dope gives a slight lustre. The relief of small replicas is increased if areas in shape are painted darker – the reverse of stage make-up, which aims at removing shadow effects, generally. Paint in stippled textures for hair, fur, fabric, etc., aiming at an impression. (Some carefully made occupants of model cockpits often have real zips installed . . . looking like the prototype is wearing a section of tank track! You cannot scale down leather with leather, and the paintbrush helps to avoid that kind of over statement.)
13. The finished figure was installed asymmetrically by sanding a sloping base to cement to a fitted sheet section cockpit level.



LATEST ENGINE NEWS

by Peter Chinn



A famous vintage engine, the American Super-Cyclone spark-ignition motor. One of the four small supplementary air induction ports, queried by one of our correspondents, can be seen below the bottom cylinder fin.

FUJI 15-IV

Compared with O.S. and Enya, the two most successful Japanese makes, Fuji engines are not very well known outside Japan. They have, however, been available from time to time in the U.K. At one time, for example, they were distributed by that pioneer model firm, Hobbies Ltd. The Fuji Bussan Co. Ltd., who have been making model engines for the past twenty years or so, have never taken much interest in the high-performance contest engine side of the market and their engines, moderately priced, have always been of small to medium displacement glowplug motors aimed at the beginner and strictly fly-for-fun modeller.

Fuji designs have generally been simple and orthodox: crossflow (or in some earlier models reverse-flow) scavenged, with shaft rotary-valves, plain or bushed bearings and ranging from ·049cu.in. to 0·35cu.in. swept volume. Fuji have, however, been noted for a few quite unusual and interesting efforts, such as their 2·5cc outboard motor and, more recently, a ·19-engined radio-controlled motor-cycle.

The latest engine in the range is the Series 4 version of the 2·5cc model and known as the 15-IV. One such motor was recently sent to us from Japan for examination and is illustrated in the accompanying photographs. This, like most other Fuji motors, is available in a choice of standard or throttle-equipped versions. As the photos show, it is a neat, purposeful-looking little motor, similar in layout to the 15-III model that it supersedes, but is appreciably altered in appearance and has a number of less evident internal modifications.

The new Fuji 15-IV seen here in its throttle-equipped version and, right, with the appropriate Fuji silencer.

The most obvious of the external changes are the new shorter main casting with only four cooling fins which is surmounted by a deeply finned head surrounding the top part of the cylinder-liner. A 0·2mm soft aluminium gasket is used to make the cylinder head joint. As on the 15-III, the liner is very thick walled (2·75mm), has flute-type transfer ports and is located by a narrow annular seating in the casting instead of by the usual top flange. The cast-iron piston is coupled to a bronze bushed diecast aluminium connecting rod with a 4mm o.d. fully-floating gudgeon pin.

The crankshaft has a crescent counterbalance, a 10mm o.d. journal with a 7·7mm i.d. gas passage (slightly larger than the 15-III) fed from a rectangular valve port and a 4·5mm crankpin. The shaft runs in a bronze bushing cast into the detachable front housing.

The engine submitted for examination was fitted with a new-type Fuji R/C carburettor. This is of a barrel throttle pattern with an airbleed control, but includes an adjustable automatic mixture control device as

well – a not-too-common refinement on an engine as small as this.

Also available for use with this new motor is a new Fuji silencer of the vented type. It has a 7mm i.d. outlet and a 4mm vent tube. Incidentally, the 15-IV has a wider exhaust duct than the 15-III and the new silencer cannot be fitted to the earlier model.

Checked weight of the 15-IV R/C was 153g (5·4oz.) or 192g (6·8oz.) with silencer. The engine has the popular 15×14mm bore and stroke combination, giving a swept volume of 2·474cc or 0·1510cu.in.

READERS' QUESTIONS

We get a lot of letters from readers asking all sorts of questions – many more letters, in fact, than we have time to answer. Here are three recent ones, the last of which might be of interest to budding engine constructors.

Question. *I am interested in vintage events and have acquired an old Super-Cyclone petrol engine made in the U.S.A. It is in fair condition, but has two holes in the front of the cylinder below the bottom fin and two more at the back. The holes are about ⅛in. in diameter and seem to show that some part of the engine is missing. Can you tell me what this is, please?*

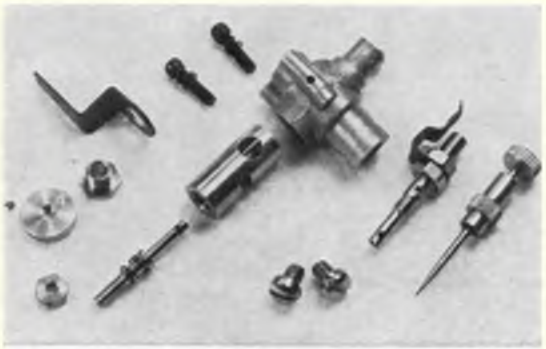
T.R., Wiltshire.

Answer. Not to worry! Nothing is missing. The holes are uncovered by the skirt of the piston as the latter reaches the top of its stroke and their purpose is to open the crankcase to atmospheric pressure, in order to increase the weight of the air/fuel charge subsequently transferred to the combustion chamber for increased power.

Question. *I have a new McCoy 35 which is difficult to start. I am not completely clueless about engines and am puzzled why this engine is so awkward, as there does not seem to be anything obviously wrong with it. The plug is OK, the fuel is getting through and the compression seems reasonable – at least, it is when the engine is vigorously flicked over – but it has a habit of stopping with the piston up. It seems as though the piston or piston-ring is too tight at the top of its stroke, although there is no evidence of this when the engine is turned over. I would be grateful if you could offer any suggestion as to how I might overcome this problem, as the engine was bought in Canada so I am unwilling to return it.*

Assuming that I can get the engine going, can you also tell me how fast I can expect it to turn a 10×6 Punctilio prop. on straight fuel?

R.D., Cheshire.



Parts of the Fuji 15-IV carburettor. Surprisingly, for a small, moderately priced R/C engine, it features an adjustable automatic mixture control device.

Major component parts of the Fuji 15-IV reveals new main casting with just four cooling fins. Crankshaft has crescent counterbalance, and runs in bronze bush cast in front housing.

The new Fuji still retains internal flute-type transfer parts, but now has very deep cylinder head. Thick-walled liner uses an aluminium gasket to form good joint to the cylinder head.

Answer. It so happens that we encountered this problem with a similar motor two or three years ago. We got over it by temporarily reducing the engine's compression-ratio with an extra ·015in. aluminium head gasket. This enabled the engine to 'plop' over compression more easily and resulted in an immediate improvement in starting. After about thirty minutes' total running time, the gasket was removed and the engine was then found to have freed up sufficiently to start quite readily. You can, if the engine runs satisfactorily on the fuel you are using, retain the extra gasket, but it may cost a couple of hundred rpm. An alternative would be to use an electric starter during the early stages while running-in.

The McCoy, of course, has a one-piece cylinder with integral fins, but for the benefit of readers with other engines we ought, perhaps, to mention that it is not unknown for a piston to stick at the top of its stroke through the head being over-tightened. Over-tight head screws can distort the cylinder casing and squeeze the liner.

The McCoy 35 runs best on a little nitro, but you should get around 10,200-10,400 rpm on a 10×6 Punctilio prop.

Question. *I am a student teacher studying three-dimensional design and technology and am in the middle of making a 2·5cc model engine. As this is my final project, it is important that the thing works.*

The engine is based on the Enya 15-III, though it has been changed a great deal so that it can be made that much easier. The big difference and the one which I really need your help is that the cylinder and crankcase are two different pieces which, as you know, must form a perfect seal. It is this connection that is causing my problem. Threading aluminium is not a good idea, as it can be stripped easily. I then considered clamps, but this I felt was too heavy and complicated. The idea that I feel suits this problem is the use of heat-resistant Araldite. Although I and my lecturers feel this is satisfactory, my examiners might not unless it is backed by expert advice. I hope the diagram will make things easier.

Another problem is how varied the compression can be for the engine to work. At the present time, I will be using the Enya head and my own piston. But the compression will be different and I will not have the raised strip on the piston – it will have a plain head.

Also looking from the drawing, I would be grateful if you could point out any points which in your mind need changing.

J.M., Bangor.

Answer. Provided that the adjoining faces of the cylinder-jacket and crankcase are accurately machined and finished, there is no reason why a satisfactory seal should not be obtained without resorting to Araldite or gasket cement. One feels, however, that instead of having the jacket plugged into the crankcase, you would do better to use the o.d. of the cylinder liner to centre the cylinder assembly in the crankcase. You will then have a much wider joint surface between the crankcase and cylinder jacket which should eliminate any risk of gas leakage but, more important, will provide a substantially thicker crankcase wall. In order to locate the cylinder-liner, this should then have a top flange, enabling it to be clamped, in the usual manner, between the head and cylinder jacket, the whole assembly being securely tied to the crankcase with four long screws, as shown in your drawing.

If you do not wish to change your present arrangement, the only solution would be to widen the crankcase, as it is felt that the existing wall thickness (apparently only 3mm) is insufficient to provide for screws of adequate thread size. One would suggest 6BA or 4-40 ANC (preferable) or 2·5 Metric Coarse (minimum). It is advisable that similar screws are also used for securing the crankshaft housing.

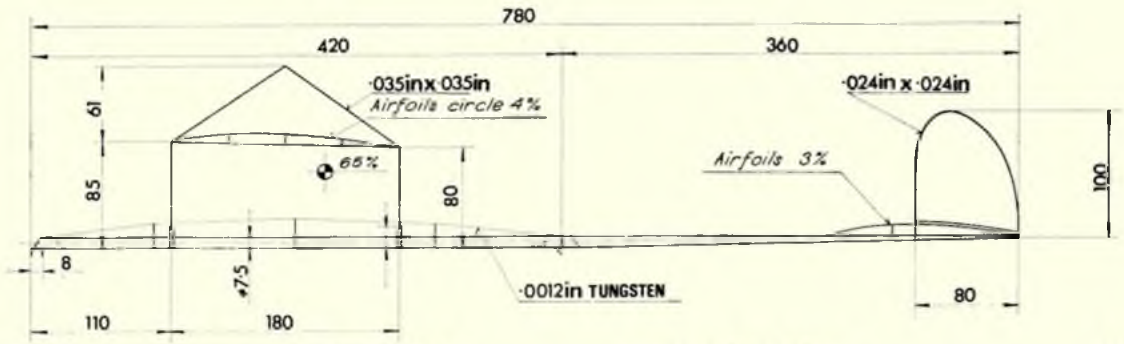
Regarding compression-ratio. It is suggested that you aim for a nominal c.r. of 10:1 and make some decompression gaskets from soft aluminium or copper shim to enable the most appropriate c.r. to be determined by practical experiment. The optimum geometric compression ratio is likely to lie between 8:1 and 10:1.

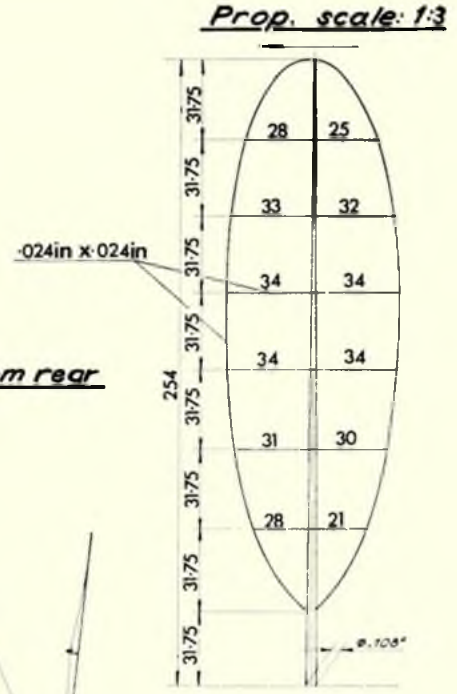
In reply to your final paragraph, there are one or two points which call for comment. For example, the transfer flutes are shown as extending up to the level of the top of the exhaust port. It is advisable, especially as you propose to use a flat piston crown without baffle, to lower the transfer flutes in order to delay their opening by at least 10° of crank angle after the exhaust port opens. Secondly, there is no point in using brass for the front housing. In the absence of a bronze bush, a plain aluminium alloy bearing is good enough for a simple low-performance engine. Thirdly, and in connection with this, it is suggested that you extend the main bearing length further into the crankcase and reduce the crankpin overhang to bring the connecting rod much closer to the crank disc. Finally (possibly this might be an error in material identification on the drawing), it is not possible to use a ringless aluminium piston in a steel cylinder liner, due to the very much greater coefficient of expansion of aluminium. A suitable piston material would be an innoculated cast-iron, such as Mechanite.

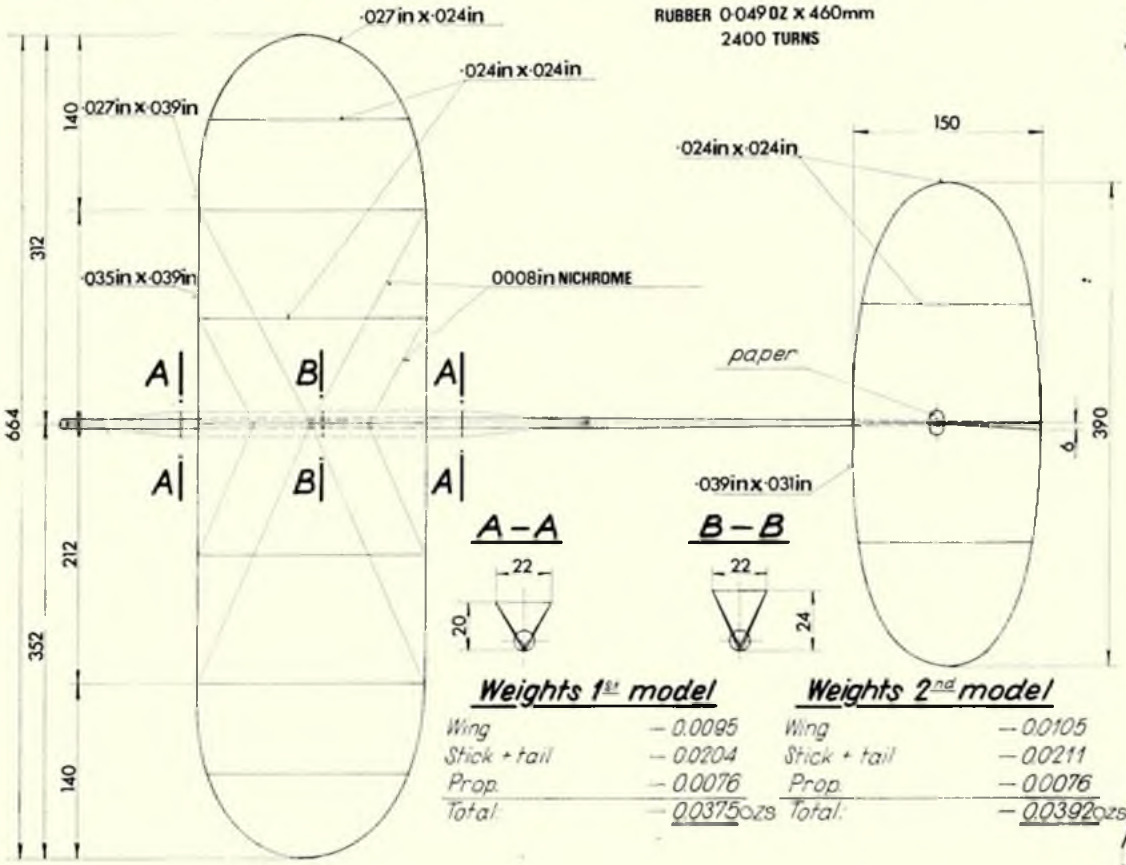
A rather different type of motor for this column! Harry Butler (Models) can now supply various sizes of Johnson electric motors geared to suit larger propellers for round-the-pole flying. Tests have shown this to be a most reliable arrangement, enabling models of up to 36in. wingspan to be flown in this manner. See 'Classifieds' for details.

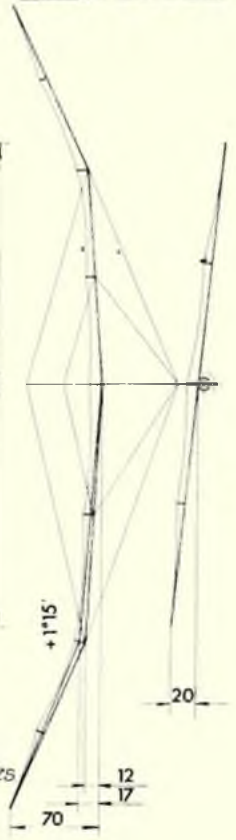
Alexander Listropad placed fourth at the U.S.S.R. National Championships with this design, strikingly finished in yellow, white and gold and powered by an American Fox 35, turning a 10×6in. propeller.

Also flown at the U.S.S.R. Nationals was A. Ganzin's model, fitted with a Russian 7cc Akrobat engine – note also his own designed circular muffler. This engine is popular with Soviet aerobatic flyers and gives a very steady engine run.









Weights 1st model

Wing	— 0.0095
Stick + tail	— 0.0204
Prop.	— 0.0076
Total	— 0.0375 ozs

Weights 2nd model

Wing	— 0.0105
Stick + tail	— 0.0211
Prop.	— 0.0076
Total:	— 0.0392 ozs

1974 WORLD CHAMPION

F.A.I. class Indoor model
by
RYSZARD CZECHOWSKI
(POLAND)
Best time 34 min 56 secs.

Scale 1:6

ALL DIMENSIONS IN MILLEMETRES UNLESS STATED OTHERWISE.

John O'Donnell's

FREE FLIGHT COMMENTS

Robert O'Donnell (now, that's a familiar name! Yes, stand-by Junior flyers, the O'Donnell family is trying to clean-up in all categories now . . .) launches his EZB at the Sheffield meet. John's seven-year-old son flies his model – built by himself, incidently – on a loop of ¼in. rubber and has achieved a best flight of 1:39 so far, despite very 'solid' construction, such as 1/16 × ¼in. leading edges, etc.

THE TAIL END of 1974 has seen plenty of free flight activity, both indoors and out. For those in the north west, at least, there has been a peculiar blend of outdoor 'Winter Rallies' inter-mixed with low ceiling indoor contests – a combination due to continue until the spring!

In contrast to some of the meetings described last month, the more recent outdoor rallies have escaped the worst of the weather – and have been rather better supported as a result. Taking events in order, the **Richmond Gala** at Bassingbourn on November 3rd featured a comprehensive programme of F.A.I. and Mini events. On arrival the wind was light, but soon swung sufficiently to necessitate a move of both control and launch site – just as the events were about to start. The re-location exercise effectively delayed flying until rain appeared imminent and only a handful of flights were recorded before the rains commenced in earnest.

Since the F.A.I. events were to be flown in five rounds, with the first ending at noon, the situation looked interesting to say the least. Fortunately (for the meeting as a whole, if not for the 'early birds'), the rain eventually stopped with some 10–12 minutes of the round still to go and there was an immediate rush to fly in what proved to be 'good' air even for the A/2s.

Not everyone got away before the deadline however – and a couple of late power launches were subsequently disallowed. The organisers' action makes a marked contrast with some of the lax attitudes encountered earlier in the season. The 'firm hand' later extended to disqualifying a Wakefield max, launched downwind of the 'limit line' that was applied to all events. I would add that the transgressors were all experienced contest fliers – and the general reaction indicated that the casual approach is now expected, and widely accepted. The 'time for change' appears to have come, and I am happy to see the beginning of a reformation!

The afternoon was bright and sunny, with sufficient wind to take models well across the 'drome. Fortunately, the wind direction permitted full use of the field, the model recovery merely meant a long walk. The lift was peculiar and harder to detect than might well have been anticipated – a situation amply reflected in the scores of all events.

Left: Ernie Vye with spare ½A model used for final flight to win at Syerston. Tail and wing centre areas are spray-painted!

Right: Chris Peters with winning A/1 at Syeston – use of flat-bottomed wing not normally recommended!

FULL-SIZE PLANS OF RYSZARD CZECHOWSKI'S WORLD CHAMPIONSHIP WINNING MODEL (DRAWN OPPOSITE) WILL BE AVAILABLE AS ORDER No. D1247, PRICE 50p (INCLUSIVE OF POSTAGE AND VAT) FROM AERO-MODELLER PLANS SERVICE, P.O. BOX 35, BRIDGE STREET, HEMEL HEMPSTEAD, HERTS HP1 1EE.

There was only one class with a perfect total – F.A.I. Power topped by Russell Peers with five maxs despite his sheet-surfaced Rossi model tending to straighten out towards the end of its climb. Second and third were Bob Bailey and Jack Allen, dropping one flight apiece – the latter through under D/Ting. Only one other flier finished his quota of flights.

Place for place, scores in Wakefield were a little higher than in A/2 a rather unusual result. Ray Pavely won Wakefield with only two maxs in his 13:26 total, successive positions going to Indoor specialist John Blount and then Mike Woodhouse. In A/2, John Cooper managed three maxs to total 13:19 and take first place, comfortably ahead of Ernie Vye and Brian Baines.

The Mini classes suffered from many participants also trying to fly F.A.I. This was especially noticeable in A/1 where several entrants did not record a score – this at 40p an entry! Winner of this class was Gerry Madelin with 8:39 aggregate. Second place was tied at 7:45 between Dave Glue and Don Thompson, and was resolved by a fly-off. Despite returning from his fifth flight to find this fly-off in progress, Dave responded with the better score! Incidentally, both runners-up were re-entrants, with A/1 being the only class in which this facility was utilised.

½A Power was flown to three-threes, and was won by Pete Bayram with two maxs in his 8:36 total, well ahead of Julian Hopper and Bob Wells. Stanstead's star flier also topped chuck glider – making five launches out of the allowed nine – with second place going to Martin Cowley. Last and least (supported) event was Coupe d'Hiver, which I won with my delayed prop-release model. Ray Pavely provided the only likely opposition.

Prizes were a nice change, comprising trophies (for event winners) plus a choice of useful modelling merchandise. 'First pick' went to the winner of the largest event, and so-on down the list – a logical enough system. The small profit on the meeting went to an appropriate Army charity as a mark of appreciation for use of the airfield.

A fortnight later saw the **York Rally** held at the host club's 'home' airfield of Elvington. From the flying point of view the day could hardly have been better, being calm and mild. For much of the day a clear sky and sun contrasted with haze downwind – though visibility was never a problem during the contest itself. Lift was generally very weak.

The York club had kept its options open before the date by declaring that maxs and number of flights would be decided in the light of prevailing conditions. Obviously this idea was intended to cater for the possibility of inclement weather and the rally was in fact run to the normal arrangement of three-threes. With hindsight, it is apparent that an opportunity was missed, as the rules could have been varied to suit the good weather actually experienced – a higher max in rubber and power, and/or more glider flights might well have provided a better and more interesting contest.

Better known, perhaps, for his exploits with R/C scooters and motor-cycles, Blackburn's John Bridge turned his hand to Easy B at the Southport meeting. Note balsa stiffening employed on fuselage, plus use of electrically powered winder/counter/ torque motor – also seen above.

Open glider was dominated by those who waited until late afternoon – as the light improved markedly at a time when most people had given up hope, and settled for scores in the seven minute region (or less!). Those who started late did significantly better to the chagrin of many itching (and unable) to re-enter. The glider winner was Jim Moseley with 8:46 total, including two maxs out of the six recorded in the whole event. Next positions went to A. Williams of Grantham and Martyn Wharrie. Practically everyone flew conventional A/2s – with large lightweights being conspicuous only by their absence in conditions ideal for their use.

The other Open events were straight-forward fly-off contests. Power was won easily enough by Julian Hopper with just over five minutes with a G15 model showing *Pendleton Fault/Woodpecker* influence. Runner-up Ewan Jones had a little under four minutes, but was still well ahead of Doug Scott and B. Harding. Rubber was topped by Russell Peers thanks to his getting away well before the other six qualifiers and being seen that little bit longer in rapidly failing light – he only flew this class after 'dropping' in Power! Second in Rubber was Jeff Anderson with his variation of the *Superb*, closely followed by Ted Smales.

Mini was flown with 'k' factors, and needed a fly-off in consequence between Gerry Le Vey and myself. As there seemed little chance of real lift I decided to plump for a quick launch immediately after winding my Coupe d'Hiver. Gerry then towed his A/1 on what seemed like a collision course, but my model had climbed above towline height! The air was helpful as shown by my 2:15 to his 2:08. With the factors used (1·3 for Cd'H, 1·2 for A/1), the difference was magnified. It might be relevant to add that the top positions would have been unaffected if unfactored scores had been used. Third spot went to Arthur Wharrie.

Chuck glider was badly supported with but three entries. The outcome could hardly have been closer as Ewan Jones beat John Turner by but a single second. The top junior prize went to Tony le Vey, deservedly as he has flown glider consistently all season.

Prizes were cash – and at a level that demanded augmentation of the entry fees by a subsidy from Club funds. York feel this situation is almost inevitable for a Club gala – but it naturally encourages the holding of traditional (and hopefully popular) events rather than anything experimental. Re-entry was barred as they felt this gives a better contest even at a financial penalty.

Although not quite in sequence it is convenient next to report the **Falcon's Gala** held at Chetwynd on December 1st. Reflecting current interest in the N.W. Area, the choice of events was Open R/G/P plus chuck glider. In view of the time of year, flying was scheduled for an early start at 8.30 a.m. with a sensible closing time of 3 p.m. Re-entry was allowed and proved both popular and expensive.

The weather was overcast, quite cold, and breezy – with the drift dangerously close to the worst of Chetwynd's woods. Nevertheless, interest was high amongst those attending, and the events were quite keenly contested. A possible contributory factor, and certainly the cause of much interest and comment, was the array of unique prizes. These consisted of a set of specially-prepared china plates, embellished with a falcon crest and suitable wording, and complete with clips ready for wall-mounting. Credit for the inspiration and

execution is due to Falcons' members Ian Allen, Paul Johnson and Ivan Taylor – all hailing from the area round Stoke-on-Trent, otherwise known as 'The Potteries'. The relationship between interest and prizes is surely worth remembering by other organisations in our present materialistic era.

Open glider was easily the most popular class with twenty individuals averaging one-and-a-half entries apiece. Long-distance entrant Pete Stewart was the eventual winner with an apparently modest total of 7:52. This was only a few seconds ahead of John Hanson – also a re-entrant. Third was Dave Hambley with two maxs surrounding a poor middle flight. Fourth and top junior was Terry Dilks' eleven-year-old son, Philip – flying a *Caprice* and improving rapidly.

Rubber and power both needed fly-offs, and these were held simultaneously. The former saw John Cooper launch about a minute before Joe Barnes, with both models going away for good flights. Visibility was difficult, with John scoring 3:14 to Joe's 4:34 – out of about five and nine minutes aloft respectively. Incidentally, both models were recovered that afternoon!

The power fly-off was rather an anti-climax as Doug Scott suffered a lengthy over-run leaving Russell Peers only needing a nominal score to win. Consequently he cut his run down to around five or six seconds, with an immediate D/T thereafter. This procedure was a little more exciting than expected as a weak rubber band permitted the tailplane trailing edge to lift just after launch to give a wild, loopy climb. At least it shows that his 40 model has strong wings! The third places in rubber and power went to Ken Brown and Fred Chilton respectively – although when Mick Duce returned from retrieving Joe Barnes' fly-off he found that his own flight card had not been returned to control – his 'good deed' cost him a prize!

Chuck glider was flown to the usual five from nine – but with a one-and-a-half minute max. This variation boosted Tony Slater's winning score to over five minutes, but hardly affected the outcome otherwise. Runner-up was Ian Allen, whilst a new name appeared at third – Stephen Philpott of Walsall.

All-in-all this meeting was notable for attracting support from far afield and for being hard fought in uninspiring conditions. Good and guaranteed prizes appear to be a worthwhile policy, and one that is popular with the fliers.

• • •

In between these last two galas came the first of this winter's Indoor meetings. Such events flown in smallish halls with 'low ceilings' have proved to be extremely popular in the N.W. Area over the past two or three years, and continued interest has led to a comprehensive programme being arranged for the coming months.

Categories that have proved popular with the 'locals' are Easy B, Chuck Glider, and what has become known as 'Keyhole Scale'.

(It is hardly my province to discuss the last-mentioned at length – but the latest set of rules is appended, and it will be seen that the accent is on flying rather than on 'rivet-counting'. Since these three classes of model are largely incompatible they are flown one-at-a-time rather than simultaneously.)

In general the N.W. meetings have not been widely advertised, partly to avoid the embarrassment of people travelling long distances

Junior fliers in action. Fiona Branigan launches her chuck glider while Robert Duce watches in the foreground. Wigan Indoor Meet attracted several junior flyers who gave a good account of themselves.

Brian Picken pulled off a 'double' at the Wigan indoor event, winning both EZB and chuck glider. Note asymmetric wing and boom bend on the Easy B model. The technical college site is best yet found for low-ceiling events.

to what might be considered inadequate facilities, and partly because one can be too successful!

The **Liverpool Indoor Meeting** held in the Y.M.C.A. Sports Hall, Southport, on November 24th, was a case in point – with sufficient attendance to render flying conditions difficult for the Easy B models through congestion and turbulence. The hall is quite small (82 × 50 × 23ft. high to the girders) and it is only too easy for flights to drift and 'hang-up' on the walls or the roof girders. Retrieval is no problem, but such collisions ruin the flights.

In these circumstances it is significant that the winning Easy B flights all came in the final session of the meeting when many modellers had gone home. Pete Redhead and I vied for top position – with my very last flight equalling his best of 5:16. Since my back-up flight was slightly better (by two seconds), Pete had to settle for second. Incidentally, he was using stripped-down *F.A.I. Supplies* rubber rather than the usual *Pirelli*.

Mick Duce had a good day with third place in Easy B, and a fourth consecutive win in chuck glider. He uses a very light model – under 5 grammes for a 15½in. span $\frac{1}{16}$in. sheet wing, 16¾in. long fuselage of ¼in. × $\frac{1}{16}$in., and $\frac{1}{32}$in. sheet tail. Its influence is starting to show on the opposition! Subsequent positions in chuck glider went to Brian Picken and Peter Branigan. It is worth mentioning that there were five juniors out of the twenty-one entries in this class – whilst several other youngsters flew but did not compete.

Keyhole scale was topped by Whitefields' Mike Reeves whose *SE5* had a better balance between scale and flying than either Eric Herbert's *Fournier* or Tony Evans' *Auster Arrow*.

The week-end of December 7th and 8th saw a two-day Indoor meeting run by the **Wigan Club** in their home town's technical college. This particular sports hall is easily the best low ceiling site yet encountered being 108 × 59 × 25ft. with a flat roof and recessed lighting that permits the rafter-banging style of flight. Even the walls are clear of obstructions.

Saturday was devoted to test flying, with Easy B scores running to a best of around seven minutes by Peter Branigan. He was unable to duplicate this the following day, and in general contest scores were a bit lower than expected. Only Brian Picken flying a new, light, and very asymmetric model, managed to clear six minutes to record a deceptively easy win. I was second, just ahead of Dave Yates whose efforts were split between flying and organisation (together with Pete Farrimond). Being less of an 'obstacle-race' than at Southport, the Easy B scores tended to close-up with five minutes being cleared by two-thirds of the entry.

Chuck glider was dominated by the same three fliers as at Southport, but with Brian Picken finally ousting Mick Duce from the premier position – and achieving a double win in the process. Mick had 'thrown-off' a wing the day before and the repairs had dulled his model's 'edge'.

Scale had less entries than usual – perhaps through being announced as 'Peanut' (which implies a span limit of 13in.). On the day this was extended to 'Keyhole' so as to attract a few larger models. The winner was again Mike Reeves, whilst second was a tie between Arthur Bailey's pretty but untrimmble *Bird-Dog* and Roy Roberts' stark but capable *Turbulent*.

The success of these meetings surely contains a lesson that can be applied elsewhere. In recent weeks I have also attended a non-competitive get-together in a little hall in Sheffield, whilst my own

Dave Williams releases his Piper Cub (built from Micro X kit) at the Wigan indoor meet. Superb flying design puts performance before scale appearance, owing success to minimum weight.

club have tried out a new and local sports centre that has a demonstrated five-minute capacity! There seems little shortage of suitable low-ceiling indoor sites if fliers want this sort of event. Perhaps it should be added that Juniors seem keen on chuck glider – perhaps our programmes expect 'too much too early'.

It should not be overlooked that these indoor halls have to be hired – but even dividing the cost between only a few people could well be cheaper than driving elsewhere!

• • •

Before closing it is pleasant to report yet a further British success in the annual Spanish Postal International contest – now in its eighth year. Dave Barnes of Liverpool won the Individual A/2 award in the 'Juvenile' (under 21) age category – top of sixty entries with an impressive score of five threes, plus a four min max, plus 1:30. He used an *Accipitor* modified to take a glass-fibre rod, and flew at Elvington during the Northern Area's Easter Sunday meeting.

Next year's event is already announced. Team and individual events for both A/1 and A/2, five flights with progressive max, any Sunday in April 1975. Details available from Comite Nacional De a Aeronautica Deportiva Para la Juventud Ortega Y Gasset, 71 – Madrid 6 – Spain. All entrants receive a souvenir pennant – surely sufficient incentive to bear this event in mind.

'Keyhole' Rubber Scale Rules:

Rubber power only (no CO_2).
No span limitation.
No weight limitation.
No maximum duration limit.
No minimum qualifying flight limit.
Unlimited number of flight attempts permitted.
Score: overall placing in event will be decided by lowest aggregate of scores obtained in each of the three categories shown below. Tied scores to be decided by highest R.O.G. duration score.
Flight duration: *sequence placing decided by two best flights, only one of which may be handlaunched. (1st Place = 1 point; 2nd Place = 2 points, etc.).*
Static realism: *sequence placing decided by judge on basis of general appearance. (1st Place = 1 point, 2nd Place = 2 points, etc.).*
Flight impression: *sequence placing decided by judge on basis of in-flight realism. (1st Place = ½ point, 2nd Place = 1 point, 3rd Place = 1½ points, etc.).*

RESULTS:

Richmond Gala – *Bassingbourn, November 3rd, 1974*
A/2 Glider *(5×3 min., 33 entries)* – 1. J. Cooper (Southampton) 13:19; 2. E. Vye (Welland Valley) 12:40; 3. B. Baines (RAFMAA) 12:01. **Wakefield** *(5×3 min., 15 entries)* – 1. R. Pavely (Anglia) 13:26; 2. J. Blount (Croydon) 13:09; 3. M. Woodhouse (Norwich) 12:37. **F.A.I. Power** *(5×3 min., 9 entries)* – 1. R. Peers (Falcons) 15:00; 2. R. Bailey (St. Albans) 14:55; 3. J. Allen (Crookham) 14:47. **A/1 Glider** *(5×2 min., 16+3 entries)* – 1. G. Madelin (Crookham) 8:39; 2. D. Glue (Crookham) 7:45+1:21; 3. D. Thompson (Croydon) 7:45+1:09. **Coupe d'Hiver** *(5×2 min., 4 entries)* – 1. J. O'Donnell (Whitefield) 8:43; 2. R. Pavely (Anglia) 7:23; 3. P. Taylor (C.M.) 4-02. **½A Power** *(3×3 min., 7 entries)* – 1. P. Bayram (Richmond) 8:36; 2. J. Hopper (Stanstead) 7:45; 3. A. R. Wells (Anglia) 6:56. **Chuck Glider** *(best 5 from 9×1 min., 11 entries)* – 1. J. Hopper (Stanstead) 4:15; 2. M. Cowley (Northampton) 3:53; 3. A. Crisp (Oxford) 3:00.

York Rally – *Elvington, November 17th, 1974*
Open Rubber *(3×3 min., 15 scores)* – 1. R. Peers (Falcons) M+5:21; 2. J. Anderson (Tynemouth) M+5:08; 3. E. Smales (Blackburn A/C) M+5:00. **Open Glider** *(3×3 min., 20 scores)* – 1. J. Moseley (Leeds) 8:46; 2. A. Williams (Grantham) 8:33; 3. M. Wharrie (York) 8:01. **Open Power** *(3×3 min., 13 scores)* – 1. J. Hopper (Stanstead) M+5:02; 2. E. B. Jones (Sunderland) M+3:51; 3. D. Scott (Morley) M+3:01. **Combined Mini** *(5×2 min., K factor used, 12 scores)* – 1. J. O'Donnell (Whitefield) M+2:55; 2. G. LeVey (York) M+2:33; 3. A. Wharrie (York) 9:55. **Chuck Glider** *(5 from 9×1 min., 3 scores)* – 1. E. B. Jones (Sunderland) 3:46; 1. J. Turner (Darlington) 3:45; 3. R. Hoff (Vulcans) 0:57. **Top Junior** A. LeVey (York) 6:53 (Glider).

Falcons' Gala – *Chetwynd, December 1st, 1974*
Open Rubber *(3×3 min., 9+2 entries)* – 1. J. Barnes (Liverpool) M+4:34; 2. J. Cooper (Southampton) M+3:14; 3. K. Brown (Liverpool) 8:46. **Open Glider** *(3×3 min., 20+9 entries)* – 1. P. Stewart (Crookham) 7:52; 2. J. Hanson (Liverpool) 7:48; 3. D. Hambley (York) 7:18. **Open Power** *(3×3 min., 8+3 entries)* – 1. R. Peers (Falcons) M+0:22; 2. D. Scott (Morley) M+0/R; 3. F. Chilton (Crookham) 7:39. **Chuck Glider** *(5 from 9×1½ min., 6+1 entries)* – 1. A. Slater (Leatherhead) 5:10; 2. I. Allen (Falcons) 4:03; 3. S. Philpott (Walsall) 3:41. **Junior** 1. P. Dilks (Falcons) 7:14; 2. A. Godden (Morley) 6:06 (Power).

Liverpool Indoor Meeting – *Y.M.C.A. Southport, November 24th*
Easy B Tissue-covered Rubber *(best 2 flights, 10 entries)* – 1. J. O'Donnell (Whitefield) 9:56; 2. P. Redhead (Whitefield) 9:54; 3. M. Duce (Liverpool) 8:27. **Chuck Glider** *(best 3 from 9, 17 entries)* – 1. M. Duce (Liverpool) 63:7 seconds; 2. B. Picken (Wigan) 60:5 seconds; 3. P. Branigan (Liverpool) 58:7 seconds. **Best Junior** D. Roberts (Wigan) 41:6 seconds. **Keyhole Scale** *(14 entries)* – 1. M. C. Reeves (Whitefield) *SE5*; 2. E. Herbert (Blackburn) *Fournier*; 3. A. Evans (Liverpool) *Auster Arrow*.

Wigan Indoor Meeting, *Wigan Technical College, December 8th*
Easy B Tissue-covered Rubber *(9 entries)* – 1. B. Picken (Wigan) 12:30; 2. J. O'Donnell (Whitefield) 11:05; 3. D. Yates (Wigan) 10:58. **Chuck Glider** *(best 2 from 9, 21 entries)* – 1. B. Picken (Wigan) 49:5 seconds; 2. M. Duce (Liverpool) 46:8 seconds; 3. P. Branigan (Liverpool) 46:4 seconds. **Best Junior** D. Roberts (Wigan) 43:3 seconds. **Keyhole Scale** *(7 entries)* – 1. M. C. Reeves (Whitefield) *SE5*; 2. tie: A. Bailey (Timperley) *Bird Dog*, R. Roberts (Wigan) *Turbulent*.

Roy Roberts of the host club placed third in Keyhole scale at the Wigan meeting with his 'Turbulent'. Stark appearance compensated for by reliable flying performance.

A photographic measuring cylinder, a ball of suitable string, a quantity of saltpetre, and you can go flying safely once more with 'home-grown' dethermaliser fuse – and a reliable D/T action too!

Ron Coleman's

RUBBER TECHNIQUES

Part 7: Do-it-yourself Dethermaliser fuse

JUST WHEN the weather is calm and sunny and the air full of thermals – free flight dream weather – dethermaliser fuse goes in short supply! It is usually a Saturday, and that wonderful day on the flying field has to be put off. Or, perhaps one risks it, and makes some trim flights without the dethermaliser, relying on a non-folding airscrew to draw the model down. I have lost two Coupe D'hiver models that way, so I never risk it now. . . .

FIGURE 1
Tie cotton links on card former.

The man at the model shop sadly shakes his head. He doesn't know when (or if) he'll be having the next lot of D/T fuse in ('*No demand, sir*'). One has to think up an answer to the problem, or there might not be any model flying for a long time.

So go home, and *do it yourself!* Home-made fuse will certainly be cheaper. On your way, call at the chemist to buy a small quantity of saltpetre (potassium nitrate) – you may need to reassure him that you do not want to make gunpowder; it does help if you are personally known to him! Again, not all chemists hold stocks of saltpetre, and you may have to wait awhile or search several shops.

Using a photographic measuring cylinder, place two level teaspoons of the saltpetre into 5oz. of hot water. When stirred and dissolved, soak in the solution a few yards of soft cotton string – this string should be as thick as possible and not less than about 3mm in diameter.

It is well worth the trouble obtaining a variety of samples of string, and soak them all in the solution. When thoroughly dried out, the samples can be measured off and cut into test lengths of 5 or 10cm. They can then be ignited and timed with a stopwatch to record the various rates of burning – the 3mm diameter string seen in the photograph will burn at a rate of 1cm every thirty seconds.

Now it will be necessary to experiment to make sure that your chosen fuse burn has sufficient heat content to burn through the usual dethermaliser rubber band, *each* time and *every* time, even allowing for the variety of slightly thicker bands that may crop up in a day's flying. Commercial D/T fuse is of such a good diameter that the heat produced will burn through any rubber band ever likely to be used on a D/T mechanism, but home-made string fuse could be too thin, and the band too thick, thus the fuse could be extinguished without breaking it: result, an out-of-sight, lost model! One of my Coupe d'Hiver models flew from the 1971 Nationals at R.A.F. Hullavington to a farm at Cricklade, a distance of about fifteen miles. Fortunately, the point (with the model) was brought home to me some three months later!

If there is any doubt about the ability of the fuse to break the D/T rubber band, you might try what I call my '1950 cotton link method'. To explain: in that year I was flying a modified Keil Kraft *Bandit* with a Mills 1·3 engine, inverted and cowled, with the tailplane high 'T' mounted. In those days the engine run permitted was 20 seconds. I used strips of blotting paper soaked in saltpetre and folded into a vee to stiffen them. The strips were then marked off in seconds' burning time and the burn would break a cotton

continued on page 113

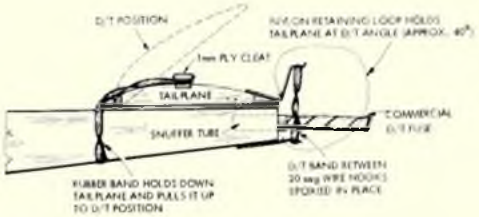


FIGURE 2A
Normal D/T arrangement at tail end of fuselage

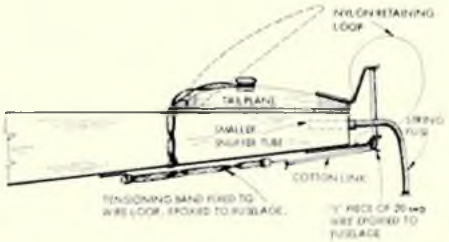
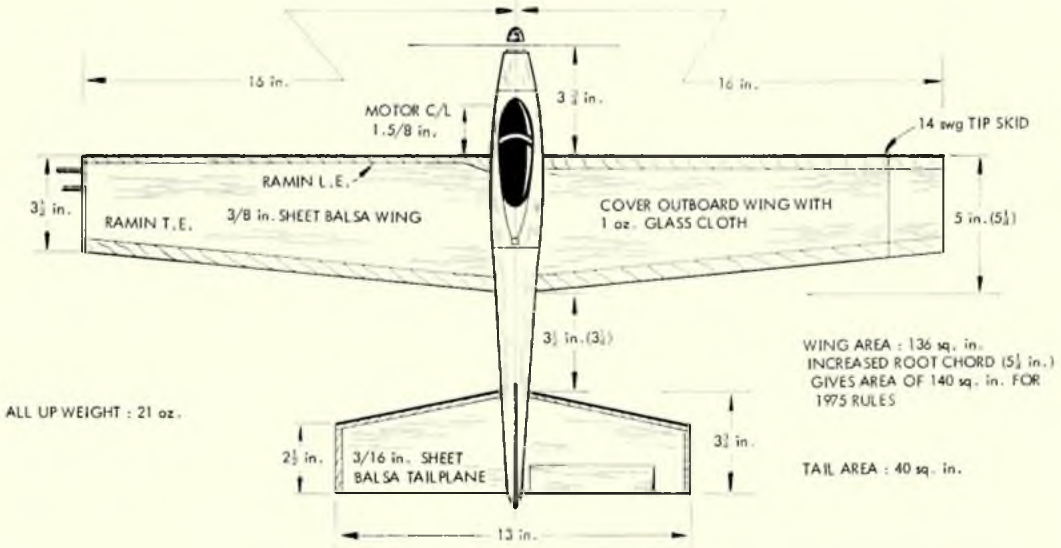


FIGURE 2B
Model adapted o cotton link and string fuse system

MONTEZUMA'S REVENGE

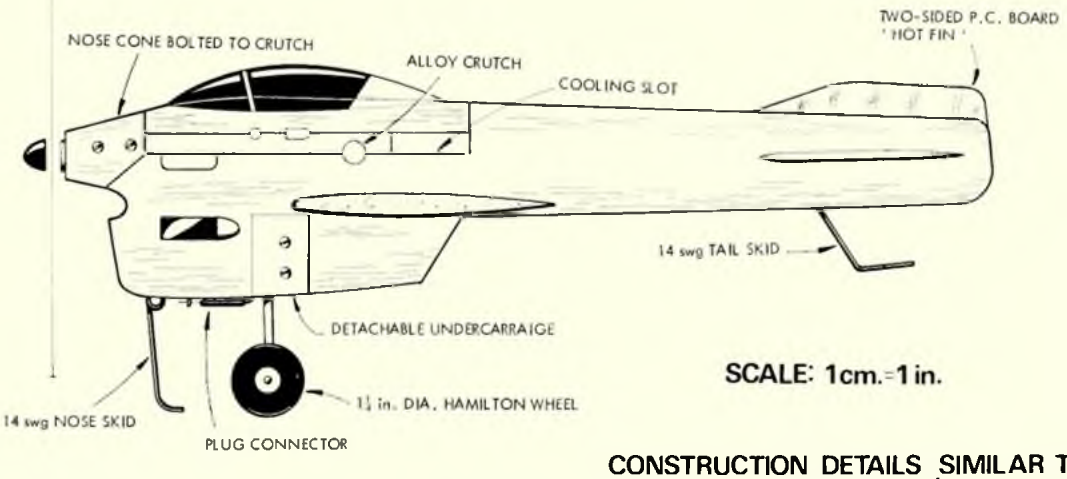
by D.C. CLARKSON

SCALE: 1cm.=2 in.



POWERED BY DALY - TUNED
SUPER TIGRE G21/29 RV (STEEL)

200 x 200 mm GFRP GRAHAM HOWARD PROPELLER



SCALE: 1cm.=1 in.

CONSTRUCTION DETAILS SIMILAR TO SIMPLE SPRINT DESIGN (APS CL1236)

BETWEEN THE LINES

with Dave Clarkson

Combat enthusiasts in this country are currently well advanced in their plans for holding an International meeting on July 5–6th – where prize money will exceed some £200! Venue (seen at left) will be the Municipal Sports Ground, Osmaston Park Road, Derby – an ideal site with both cafeteria and bar facilities. Pre-entry will, of course, be essential, so for further details contact Vernon Hunt at 19 Chapel Street, Holbrook, Derby DE51 TQ.

More about Glow Tanks for Combat

EXCELLENT ARTICLE by John Hammersley and friends on glow motors for combat, wasn't it? There have been a few fliers this last season using glows, including young Mr. Roberts of Sheffield who used G 15's on pressure tanks most successfully in this his first season. Extra power must always be desirable in combat, either to give extra speed or to drag around a bigger, more manoeuvrable model, and glow motors are the easy way to get the power. Those who have used glows have found that very mild fuels (5–10 per cent nitro) are more than adequate for the power required, so fuel costs are hardly excessive; existing glow users have the built-in advantage that, if a horse-power race develops, they can add nitro – the diesel men have no such possibility.

The Outlaws' article concentrated on the use of 'pacifier' tanks – the cheapest and most easily obtained and assembled form of pressure tank, but in the interests of variety I present here two further types of pressure tank suitable for combat models. For fuel tanks, drawings are much more useful than photos, so I hope the accompanying sketches reveal all. The 'surgical tubing' tank was learnt from Charlie Johnson (the Yank who came!). It enables a very streamlined model installation and gives the highest pressure fuel-feed available from any tank. Suitable surgical rubber tubing is available from Gallemkamps (the laboratory suppliers – see your 'Yellow Pages' for their local branch). To fill such a tank (and a 3½in. length of tube can take up to 100cc of fuel) a 50ml disposable type medical syringe is essential. Such syringes are obtainable via dispensing chemists, and they are not a prescription item. These surgical tubing tanks are handled just as John Hammersley *et al.* described for 'pacifiers'. Using the Gallemkamp tube, the tank blows up to a sausage about 1⅜–1½in. diameter and also lengthens by about 40 per cent, so these dictate the compartment dimensions. I, and others in my club, have used such tanks most weekends for some months now, and no problems at all have been experienced once we learnt how to handle them – the fuel feed given is perfect and includes a virtual flood-off as the last 'cc' is forced into the motor, thus preserving the plug and also telling you when the tank is about to empty (the motor suddenly four-strokes for about one second and then stops).

The second type of tank is the metal pressure tank, and the tank design sketched below is one developed some years ago for MVVS diesels. Since then, others in my club have used them, mostly on G 15 glows, and always found a totally consistent motor run – essential with a glow motor. Even though it is a bit complex, I thoroughly recommend it to anyone interested.

The tank shown is 65cc capacity which is marginal for a glow motor (was just enough for the MVVS diesel!), so an increase in depth to, say, 1¾in. may be a good idea (increases volume to 83cc).

FIGURE 1 — 'Surgical tube' tank

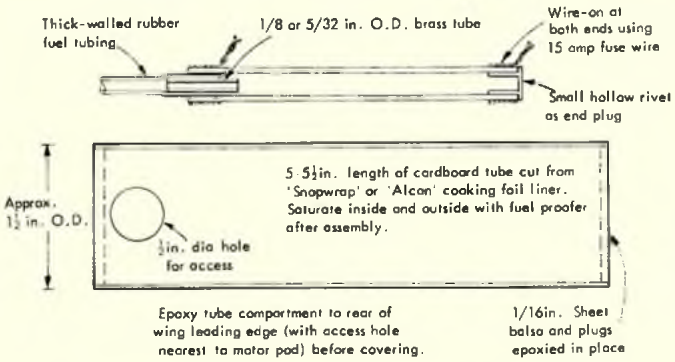
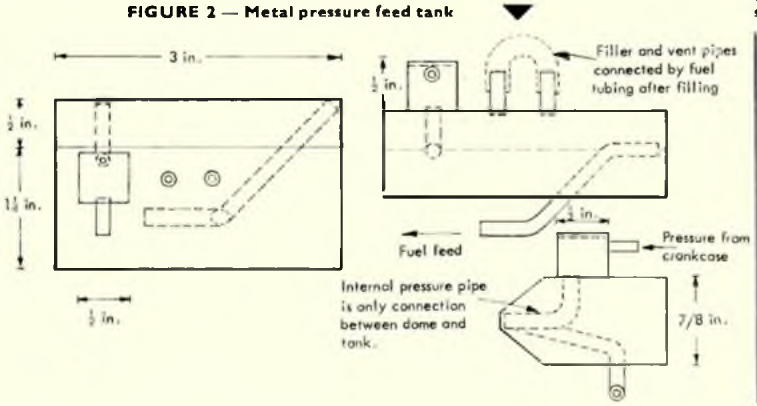
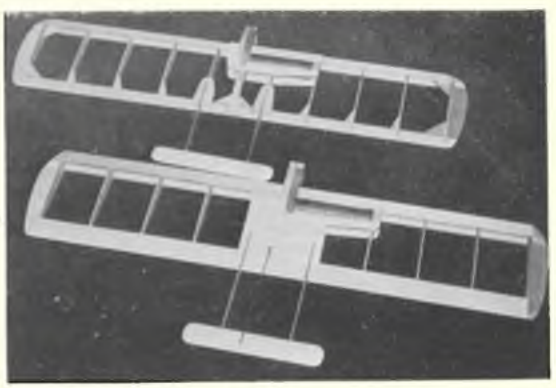


FIGURE 2 — Metal pressure feed tank



Our columnist recently constructed these American-style combat models and employed surgical-tube type tanks (see Figure 1) housed in cardboard tubes from the centre of toilet rolls! Completely unmodified, these tubes – bog standard, in fact. . . .



The Future for 'B' Team Race

With 'B' Team Race being flown, to my knowledge, in at least eight countries in the world, 'B' is definitely the second team race event and, who knows, in the future we may have an International 'B' Contest. I look forward to this event (not as unlikely as it may seem) and hope that the recent metrication of our 'B' rules by the S.M.A.E. helps towards this. 'B' is becoming a popular event again here in the U.K. – at one contest in 1974 (the Northern Gala) 'B' entries outnumbered those in F.A.I., perhaps because 'B' finals have seemed over the last year or two to be much more exciting than F.A.I. finals. It is easy to understand why, years ago, the 'B' final was always the premier final at any big rally.

The new rules have cast a new light on this very old event in that no longer will the non-stop heat be possible (in my opinion), this is because both heats and finals are now 25 per cent longer in distance than they were under the old rules. This puts the real experts – i.e. the super range addicts – at a disadvantage in the all-important heats. No more the monotonous tortoise beating the hare with depressing regularity; now we have pit stops for all – democracy at last! I think that a new breed of 'B' team racers will appear – models built with fast pit stops in mind, i.e. rearward wheels, nose skids, auto refuelling systems, motor shut-offs and modern lightweight model designs. To encourage this breed, the accompany-

ing three-view details my *Montezuma's Revenge* model (present U.K. final record holder), one of the first 'modern' B team racers.

Built in the same way as shown on my *Simple Sprint* plan, *Montezuma* sports a Daly-ised ST G 21/29 RV (steel liner) modified firstly to make it fit an old F.A.I. model(!) motor crutch and enable the fitment of a venturi-mounted fuel shut-off, and secondly rebored, etc., because the motor was second-hand. The major constructional differences from *Simple Sprint* are the use of a thicker wing, a 'hot fin' made from two-sided printed circuit board to get the sparks to the motor from the battery/fireman, a tail skid to stop the flat tail being ground away during pit stops, and the wing mounted lower in a deepened fuselage to enable the bellcrank to be fully enclosed below the tank bay floor. Our *Montezuma* is not that quick; the fast times recorded last year were due to fantastically quick (for 'B') pit stops – quite as quick as we get with our F.A.I. models.

One real plus point for 'B' team racing at the moment is the availability of excellent motors at most reasonable prices. How long this situation will last, I do not know; but suspect that it may only be for a short period. I have a feeling that now is the time to buy a 'B' motor, and the current choice is between the following ballrace 5cc glows, all of which have been proved in various countries to be most competitive. In descending order of price, they are:

Super Tigre G 21/29 RV ABC, ETA 29 Mk VIc, Super Tigre G 21/29 F1, Enya 29 BB.

Worldwide form indicates that the ST G 21/29 RV ABC is the best motor available, with examples of this motor holding most of the national records elsewhere and is the automatic choice in most countries outside the U.K. The only one in contest use here in 1974, John Gray's, showed itself to be quite the best 'B' motor around. The ETA 29 has been the standard choice here, but now seems a little dated; not surprising really, because the design is over twenty years old. The G 21/29 F1 only seems popular in New Zealand, where one holds their current ten-mile final record at under six minutes; with an ABC liner set it is, according to reports, as good as the RV ABC, but is much easier handling. Considering its low price, I suspect that the G 21/29 F1 is a very good buy indeed; in standard form (steel liner) it should be as good as the steel liner G 21/29 RV's that have done so well here recently. The Enya is a factory-assembled special, available in very limited quantities on a once-only(?) basis; a pity perhaps, because the three examples seen at the 1974 Rufforth '1000' were very reliable and economical with most adequate power. One motor not dealt with above is the OPS 29R, mainly because I know of no one who has had a go with one in 'B'. George Aldrich has suggested that an OPS 29 plus mini-pipe should do 125–130 mph for thirty-five laps on 10 per cent nitro fuel using 60ft. lines. Maybe George (a man who really knows glows) is right, someone *should* have a try. . . .

Under the old rules, most competitive 5cc glows could do 100–105 mph for thirty-five laps using Keil Kraft Nitrex 15 fuel and a Bartels 8 × 8 GF prop. Tests indicate that adding only 10 per cent of a suitable range ingredient (e.g. Cumene) will give one-stop heat range under the new rules with no loss in speed. Further fuel fiddling than this does not seem necessary, but, who knows, new rules usually bring new ideas. Maybe the range specialists will rise to the top of the heap again.

Why not try 'B' in 1975, the new rules make it a whole new ball game?

Left: Emil Rumpel is the latest flyer to try a 'wing' type F.A.I. racer, but it proved unsuccessful – turbulence from the fuselage/wing joint caused the elevator to become inoperative. Outline marks show where wind-tunnel tests reveal wing should be trimmed for greater efficiency.

Right: Josef Frohlich has just completed this Rossi 60 powered, uniline, speed model – hopes to compete at our Nationals with it.

Make-it-Easy – Golf Tees for Squash Bottles

This is one I picked up from Tony Harknett, of Feltham in London, way back in 1970 – I don't know if Tony invented it; however, he was the first one I saw using this idea. The problem with squash bottles when trying to fill a fuel tank fast (for example, in a Goodyear pit stop) is that of getting its nozzle connected to the tank. If you modify your squash bottle to take a drilled-out golf tee, as in *Figure* 3, you will find fast tank-filling much easier. The conical inside shape of the golf tee guides the bottle on to the tank filler tube, and also acts as a sort of taper seal between bottle and tank, to stop too much fuel escaping whilst the tank is being filled.

There are quite a few types of golf tee. Reject wooden and polystyrene (brittle plastic) tees as these are no good for us. Try instead to find the biggest possible nylon or polypropylene (flexible plastic) tees. If you are using a plastic-spouted squash bottle (e.g. hand cream container, etc.), then all that is needed is to cut the tee down to ¾–1in. length, drill it $\frac{1}{16}$–$\frac{3}{32}$in. down its axis, trim the bottle spout until the tee pushes in and finally wire the tee firmly into the spout. Other types of bottle may be used, such as washing-up liquid bottles, and alternative mounting methods are easily worked out.

Combat Kits

At the S.M.A.E. Annual Dinner, I had my ear bent by Mick Tiernan who was there to pick up the *Whitney Straight Trophy* for winning Combat at the Nats. Seems that Mick has regarded my column as being *Titan* biased and has underplayed his *Anduril* design, as used by Mick himself to win the 1974 Nats and also by Steve Bingham to win the 1974 Spaarndam International. O.K., Mick, point taken; your *Anduril* is a winning design, and quite obviously one of the best around. Mick bent my ear because he is kitting the *Anduril* – one kit I shall wait for with great interest.

The kit scene has always had a place for more than one good combat model. For the last year or two the **Pegasus** *Warlord* has had the field to itself and seems to have sold well (it should have done, considering its pedigree). Now we are getting the *Anduril*, and I hear rumours (only rumours though) of a *Titan* kit in preparation and also a kit of Dave Wiseman's *Sho-gun* (won Cranfield in 1972). If all of these kits hit the market, then you combateers will be more than adequately served!

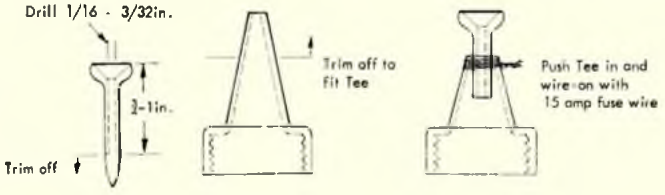
Goodies Directory – 3

Just a short one this time, again concentrating on team race equipment. This month's suppliers are true amateurs making goodies in their spare time with very limited facilities – real enthusiasts making things for like-minded enthusiasts.

1. *Cast Aluminium Pans and Crutches*

A vast range, best inspected on the contest field. The accompanying photo shows most of the varieties ranging from ½A to B pans and

FIGURE 3



A small selection of team-race pans and crutches available from Derek Heaton – but note that they are only sold in rough-cast form, not as finished above.

including many different F.A.I. crutches. I don't need to introduce the producer, because he is known to us all; his name also tells us something about the quality and design! D. Heaton, 4 Carpenter Grove, Padgate, Warrington. Drop Derek a stamped-addressed envelope for full details, or else approach him on the contest field; he usually carries round a fair selection and all at most reasonable prices.

2. *GFRP Props.*
One of the best collectors of props. in the world has been John Wellman, and he has used his collection to produce a most interesting range of glassfibre props. His range includes ½A, F.A.I. and 'B' props. The F.A.I. props. are moulded, using Russian masters, one of these being identical to the prop. so successfully used by Heaton/Ross at Hradec Kralove. Very interesting props. and quite reasonably priced, and quality seems O.K. for a home-made product. Send an International Reply Coupon to John for details at: J. L. Wellman, P.O. Box 11131, Johannesburg 2000, Republic of South Africa.

3. *The 'Feltham' Pressure Refuelling System*
Those of us who notice such things will have seen the very neat and beautifully engineered pressure refuelling systems used by most of the Feltham Club team in 1974. Illustrated in the photo, the total system is available from: C. F. Summerfield, Flat 7, 14 Riverdale Road, East Twickenham, Middlesex TW1 2BS, at £6·50. For an extra £2 the system is engineered to include a 0–15 psi pressure gauge. S.a.e. to Colin for full details because a fair amount of adaption to personal preferences is possible. The filler valve is the King/Rudd valve that suits Schraeder valve tank valves, and the fuel/air reservoir is to aircraft engineering standards – definately well-proven items.

Right: Colin Summerfield sells the 'Feltham' pressure-refuelling system, which he makes to an extremely high standard. Pressure gauge shown is an optional extra.

The Bugl 15D Mk II
Eagle-eyed readers of the January issue will, no doubt, have noted that the drawing of Paul Bugl's new diesel, which appeared in his advertisement, showed a threaded portion near the front of the crankcase – enabling the conical fairing to screw directly into place. This is necessary as the motor now features a one-piece crankcase – and, incidentally, before Bugl owners inundate Paul with requests for new type crankcases, please note that parts are **not** interchangeable between the two models.

One further point. The impressive list of victories achieved by Paul's engines over the last year were nearly all achieved using Bugl-Baumgartner designed propellers, produced in either glass or carbon fibre and made of course by our old friend Jurgen Bartels!

RUBBER TECHNIQUES *continued from page 109*

loop which held back the spring-loaded engine cut-out (a built-in feature of the excellent Mills) operating at 19, 19½ and 20 seconds with fascinating and welcome regularity. The club used the same method to demonstrate glider towing – we had a *Slicker 50* towing a glider fitted with an undercarriage to roll along the runway on take-off. The blotting paper fuse would break the cotton link in the towline, releasing the glider at the top of the climb.

Advantages of the cotton-link string fuse system of dethermalising are:

(*a*) Low cost of fuse, as string is relatively cheap, and a few ounces of saltpetre will make several dozen yards of fuse.
(*d*) Saving on rubber bands, as cotton links are cheap to make.
(*c*) The system is much lighter in weight, as both fuse and snuffer tube are smaller in diameter – a decided advantage for very small models, including, of course, chuck gliders.

In the absence of suitable string, fuse may also be made from rolled newspaper tube, about $\frac{3}{16}$ in. diameter, and a detailed method of production is given on page 128 of the 1975 *Aero Modeller Annual*. For dethermalising, however, a slower rate of burn is required, and it is necessary to experiment with extra thicknesses of newspaper and/or a weaker solution of saltpetre to produce a convenient length of paper tube for a two or three-minute-long flight. When you have your fuse, do not forget to ignite it! Use a 'bomb' like that illustrated on page 129 of the Annual.

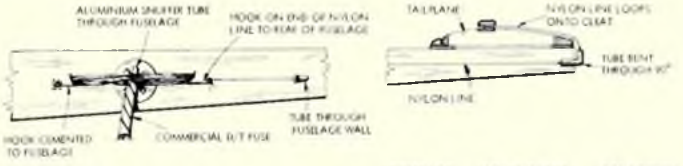


FIGURE 3A ▲
Normal D/T system on fuselage side.

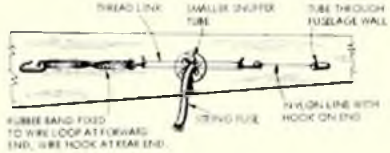


FIGURE 3B Adapted to cotton link and string system. ▶

Tucktonia

help build the "Best of Britain"

THE GREAT EXHIBITION of 1851, and the *Festival of Britain* exactly a century later, sought to exhibit to the world the 'Best of Britain'. Now a new exhibition with the same aim is under construction, and is scheduled to open in the summer of 1976.

This new exhibition will be very different to its predecessors in that it will be a *permanent* outdoor exhibition. The exhibits will be an integral part of a landscape, representative of Britain's cities, villages, countryside and coast, and will be built to 1/24th scale.

The 'Best of Britain in Miniature' which, when completed, will be the biggest model landscape in Europe, extending over 3½ acres, will be known as **Tucktonia.** It is being built as part of a leisure complex known as **Tuckton Park,** which covers some 21 acres at Christchurch just outside Bournemouth, owned by Watney Mann (part of the *Grand Metropolitan Hotels* group).

The aim of Tucktonia's planners is to include in the landscape the best of Britain's past and present – her famous and historic buildings, her pageantry, leisure facilities, old-world charm, her technological achievements, industry, commerce and famous stores.

Help Build Tucktonia

Surely, any exhibition representing the 'Best of Britain' must include a tribute to Britain's aero industry, and so, when *Aero Modeller* heard about this exciting project, we thought some of our readers might like to help build such a tribute. We have discussed the possible involvement of our readers with **Tucktonia Ltd.**, the company set up to build and run Tucktonia, and as a result this company is proposing to run, in conjunction with *AeroModeller*, a competition for aircraft models to be on permanent display at Tucktonia.

How to Enter

Very obviously, a project of the size, complexity and importance of Tucktonia demands overall planning and the establishment of precise specifications for the construction of its models. Therefore, if you or your modelling society would like to take part in the Tucktonia project, you should first write to **Tucktonia Ltd.** at 10–12 Old Court Place, Kensington, London W8, for a copy of these specifications.

Next, you should prepare brief details (with estimated costs) of all materials required for the model you would like to build for Tucktonia. Such briefs must be received by Tucktonia Ltd. not later than April 30th, 1975. From such briefs, a selection committee will select the models they wish to commission for Tucktonia, and Tucktonia Ltd. will undertake to underwrite the cost of the materials required for the building of the commissioned models. Completed models will be required to be ready for exhibiting at the *Model Engineer Exhibition*, to be held in London in January 1976.

An independent panel of judges will assess these models and, subject to the judging panel being of the opinion that sufficient models of a sufficiently high standard have been submitted to merit so doing, the following prizes will be awarded:

First	£200
Second	£100
Third	£75
Fourth	£50

All models selected for permanent display at Tucktonia – £25.

The builders of all models selected for permanent display at Tucktonia will receive full credits in the exhibition catalogue and, wherever practical, on the model itself.

Although it is a condition of entry that all models entered are available for permanent display at Tucktonia, the ownership of the models will be retained by the builders, and in the event of the models ever being withdrawn from display they will be returned to their owners.

£500 Prize

Similar competitions are being run in conjunction with other MAP publications, and the amateur model maker or society which, in the opinion of the judges, enters the best model of all the models entered will receive a cash prize of £500.

Charity Exhibits

It is the intention of Tucktonia Ltd. to invite six leading charities to participate in the Tucktonia project. These charities will gain publicity for their cause by the permanent display of a suitable model in the landscape; will have the opportunity of selling suitable souvenirs at Tucktonia, and each charity will be given one day every summer when the entire admission takings will be given to that charity.

If you, or your society, would like to build the exhibit for one of these charities, you should again write to Tucktonia Ltd. at 10–12 Old Court Place, Kensington, W8, for the names of the charities and full details of a special competition for charity exhibits the prizes for which are:

First	£400
Second	£200
Third	£150
Fourth	£100

Good luck to all of you who get involved in this imaginative and exciting project!

CLUB NEWS

SOMEHOW OR OTHER, I seem to have lost touch with model flying over the past months. Every time I have poked a wetted finger outside the door, it has either encountered a blasting wind or got decidedly wetter. Certainly, there has been little climatic inducement to go and fly a model. Of course, it takes a lot to keep the keen contest flyer down, and in the face of storm and tempest most of the contests have been flown off – or, in some cases, blown off. We can only hope that more placid climes prevail for the coming season.

Nowhere has the weather been worse than in the eastern part of the country, so you may be sure that reports of flying in the *East Anglian News* – now, in its professionally produced form, the official publication of the East Anglian area – are of man battling with the elements. Typical was the October Area F/F meeting at R.A.F. Watton. True to forecast, the day turned out cold and showery, with a moderate wind making things more unpleasant by veering each time a launch site was established. But the clubs, **Anglia** and **Norwich** stuck to their task in the *Farrow Shield* (Team Rubber) and turned in some respectable scores, with Bob Wells and Ray Paveley of Anglia each putting in three maxes to make for a nice dramatic fly-off. Won by Bob with 4:09. The same flyer had demonstrated, earlier in the year, his winning way with rubber by getting a team place at the Wakefield Trials. He was joined in this honour by club mate Roy Collins, who qualified in Power with his nicely prepared, very consistent model. Also braving the wind and rain in October were the Area control liners. They flew an Areas team race at Alpheton. Lots of gardening needed to get the overgrown runway trackworthy. The poor surface and the battering wind searched out the weaknesses, and quite a few models retired with fault and fracture. Not so John Green, who, in the final, smashed the Area Goodyear record with a winning time of 11:44.

Still in East Anglia, we have to hand *High Flyin'*, the newsletter of the **Anglia M.F.C.** Looking back over the year, the mag recalls two items worthy of note. One the aforementioned team successes of members Bob Wells and Roy Collins and, second, the highly successful club gala, where the membership congregated in force, mostly around the excellent barbecue. Other highlights of 1974 were the fête displays. These always started off with Bill Ashdown's model towing the A.M.F.C. banner, after which, among other tasty offerings, there would be sweet-dropping for the kiddies followed by a shower of 2p bangers. Some of the kids mistook the latter for peppermints, but found them to be somewhat hotter.

Our first report this month comes from Mr. R. Wilson of the **North Cheshire Radio Model Group.** He flatteringly informs us that membership is now very good, thanks to the publicity in these columns. Not least of the reasons for people seeking out the club is the shortage of available flying fields, due to loss by noise – a chastening thought. Needless to say, the club has its own flying facilities, but these, apparently, are of a temporary nature, as proper arrangements are yet to be sorted out by the committee – the club is still very much in the throes of formation. The club field, when available, is on loan from a friendly farmer. Anyone wishing to come along to fly – non-members, that is – are welcome. Just 'phone 061-368 9621. You need to bring along licence and insurance and pennant. No comp fliers or noisy engines. Mr. Wilson, who is the P.R.O., would like anyone writing in for information to enclose a s.a.e. His address is 92 Mottram Old Road, Gee Cross, Hyde SK14 5NJ.

Optimism does not usually get you very far in our climate – the odds are stacked very much in favour of the pessimist, especially lately; but a sanguine spot of expectation came up trumps last September for the **Leatherhead M.F.C.** The programme they had laid on for a local fête depended on full co-operation from the weatherman, particularly as electric r.t.p. is more of an indoor pursuit, and it turned out fine and warm on schedule. Both the flying and static displays were well received by the visitors. Again, on the social front, Stuart Tucker gained first prize in the Handicraft Section at the Ashtead Horticultural Show with a fine model of Guy Gibson's famous *Lancaster*. Such community activities were very good reasons why the Leatherhead Sports Council awarded the club a certificate for services to sport. As Mr. Stuart V. Tucker, the Hon. Sec., says, the C.C.P.R. may not recognise aeromodelling as a sport, but some authorities certainly do! Seems the club is strictly a fly-for-fun group, with one exception – that well-known chuck glidist, Tony Slater, who is to be seen at all the major contests.

Plenty of aeromodelling sport to be seen on Leigh Marshes by the **South Essex M.A.Soc.** Mr. Arthur Lloyd, the Secretary, writes to tell us that the club is mainly composed of 'Radio Boys', but there are other interests, and well subscribed in our current spell of weathery weather is indoor r.t.p. Not that the circulators have it all their own way; there are the new craze Peanut models flitting across the lines. A mid-air collision between an *Andreason B.A.4* and a *Messerschmidt 109* made for a glorious bit of off-the-field excitement. The club covers all tastes in aeromodelling and meets in Southend on the second Tuesday and last Wednesday of each month. New members still welcome – just 'phone Mr. Lloyd at Basildon 710925.

The **Sittingbourne & District M.A.C.** are holding an Unorthodox contest on their Straymarsh flying field, according to *Bourne Flyer*. All they need is some orthodox weather as opposed to the kind which makes marshes what they are. Everything goes in this event, from deltas to hot-air balloons, and judging will be of the clapometer type: the best reception from the onlookers. Design flair is also needed for two indoor events on the agenda – Paper dart and Indoor helicopter. Other scheduled winter diversions are demos of foam wing cutting and glass-fibre moulding. Newsletter tailpiece: When learning to fly R/C, is it necessary to go on a crash course?

There have not been many *Scimitars* flashing around this last year in the **Buckaneers Model Club,** but an effort to produce more newsletters this year is on the resolution list. Meanwhile, members have been actively using Finmere – mostly for shopping at the Sunday market. They have been advised that access to the field is for flying not buying, but who can blame them in the sort of weather we have been having? Although the Buckaneers have an advantage over most other clubs in the wet – they are also a Boat Club! Both sections came together in a combined Radio Boat and Plane display at the Milton Keynes Show. They had competition from local hovercraft and the Army Blue Eagle helicopters, but a nice show-stealer was Dennis Lowrie's *Aggravator*,

fitted with floats. It made some superb take-offs. And still in watery mood, enthusiasm overcame better judgement when members braved the weather at its wettest and windiest to have a go in the Thermal Soaring Pylon Event at the Cranfield meeting. Surprisingly, the frail-looking craft stood up to the conditions extremely well, holding the wind and making it back safely to terra firma. One flyer penetrated by means of 22oz. of lead in his fuselage.

Also bucketing around at Cranfield were some of the **Three Kings Aeromodellers,** according to *Court Circular*. The event in question was the C/L Scale Event, held under the aegis of our Managing Editor, Ron Moulton. Just think of all those super finished models fighting it out in those appalling conditions! But if things were bad at Cranfield they were even worse at the Little Rissington All Scale meeting in October. It stormed so violently that even the 'hardy' Radio Scale models stayed grounded and it was left to the even hardier control liners to get air-cum-waterborne. Naturally, there were disasters. W. Cordwall wiped the retract undercart off his *Heston Phoenix*, and nasty things also happened to a *Mosquito* and a *Dornier 17*. A word of caution in the mag on some of the more slaphappy 'make and mend' practices. A model was escried on the circuit with the lines joined up by a reef knot. Had it been a granny. . . . Wal Cordwell tells how he was cleaning up his retract gear when he noticed an elderly man taking an interest. They got to chatting. He turned out to be Group Captain P. G. Tweedie who used to fly *Handley-Page H.P.42*'s (*Heracles*) from Croydon before the war. He told how they went about a fog take-off in the pre-electronic age – by means of a white line across the grass runway. It was also a possible means of telling if the pilot had been drinking. A friend of aeromodelling, the Group Captain refused to sign a ban-the-model-flying petition, even though his house backs on to the Croydon field.

The autumn edition of the **Whitefield** *Newsletter* has gone all indoor, and quite understandably, too, with all that nastiness outside. Trouble is the ceiling height of the school hall – only 12ft., less if you hit the light fittings. Best chuck at a recent Glider comp was made by Mike Reeves – 12 seconds. Indoor models may be harmless, but outdoors Power models can be anything but. Members are asked to be specially careful if there are children on the flying field. They tend to be inquisitive, with no sense of danger. Where there is any risk of a flyer's machine hitting a child, he should stop flying.

Ron Magill, the Editor of the **New Zealand** *News of the North*, demonstrates that he is as active on the model field as with the pen by two free-flight firsts at the King Country champs at Te Kuiti last October. Remember Payload – you'd be grey-headed if you're British – is one of the events he won. The meeting ranged over a number of C/L and F/F events, but oddly no Rubber, unless it was covered by something called 'Aggregate'.

Reading through the New Zealand newsletter, I am reminded just how complicated model flying is becoming. Listed are the rules of Midget R/C Pylon Racing – you do not need a helper so much as a lawyer. Then there is a report on a Thermal Soaring meeting. It is not just a jolly little fly-around, but a series of 'tasks'. What I would call an uphill struggle.

By way of contrast to the reasons why we stay car bound of our flying fields, **San Valeers** *Satellite* carries a story of modellers on the Taft field sticking to their cars because of the overwhelming heat. In that sort of weather D/T's just didn't D/T. In fact, you could a max with a bubble machine.

Clubman

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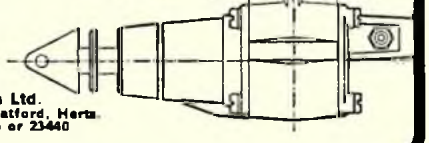

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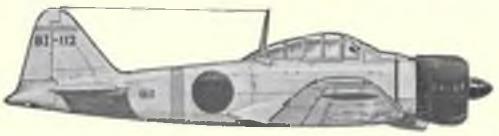

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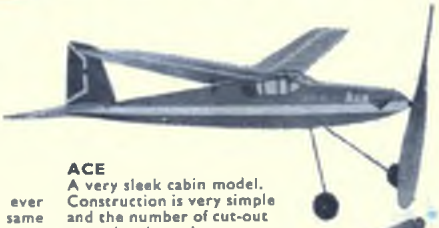

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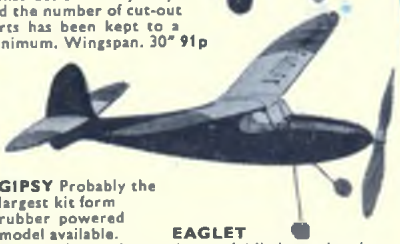

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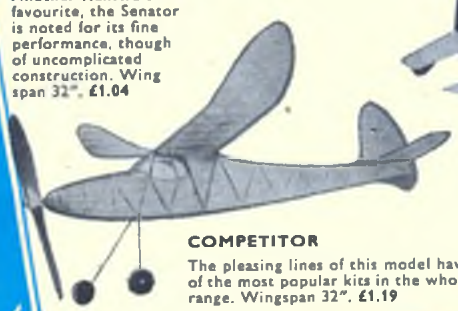

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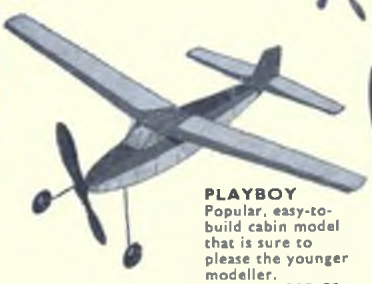

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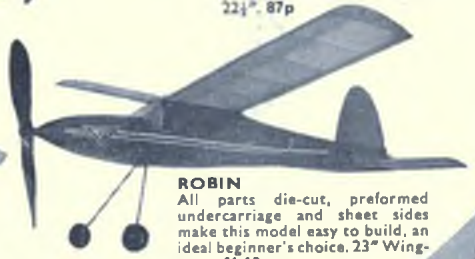

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ANNUAL PRIZEGIVING

at the Grand Hotel, Leicester, November 23rd.

Above: Malcolm Ross and Derek Heaton relieved Mrs. Baddeley of four pieces of silverware for their 1974 efforts in team racing: the Knokke No. 1, R.A.F. M.A.A., Wharfdale, and Budapest trophies. Below left: Don Beaumont receives the R.C.M. & E. trophy for F.A.I.-class Pylon racing at the Nationals.

Above: two newly elected vice-presidents of the S.M.A.E. – Air Commodore Eric Baddeley (at microphone) and John Crampton of Hawker Siddeley (foreground) with S.M.A.E. Chairman, Jack Hartley, in between. At left, Mick Staples receives the Knokke trophy for his control-line scale efforts, while below Pete Tindal and his wife admire their newly acquired Gold Trophy.

Above: Mike Fantham managed to oust 'our' John O'Donnell from top F/F spot by winning the British Senior Free Flight Championship, and that requires a tremendous amount of effort, too! Below: Roy Collins, No. 1 Power team member for 1975, collects the 'Aero Modeller' Power Trophy which he shares with Ken Faux.

Above: what a lot of clobber! North, East and West free-flighters with their loot: Ron Pollard, Joe Barnes, Julian Hopper and Alan Jack (now moved to Southampton). Below: trophy table with Henry Nicholls and George Lynn hidden by the much-prized F.A.I. Group Diploma awarded to the S.M.A.E. in recognition of its contribution to International modelling.

Above: 'Now we've got it – what do we do with it?' Derl Morley and Joe Barnes get to grips with the Farrow Shield. Mrs. Baddeley, wife of our new vice-president, who kindly presented the prizes, looks horrified at the thought of cleaning it! At right, P.R.O. Mike Birch collected many trophies for R/C aerobatics – as usual!

Above: Terry Manley receives the Super-scale prize for winning the F/F scale event at '74 Nats, while below, Laurie Barr receives the Model Aircraft Trophy for Open Rubber won at the same meeting. Right: 'Ouch, that tickles!' Actually, Mick Tiernan won the Whitney Straight Trophy for Combat; but, sensible fellow, thought we would rather see his wife collect it. You're right, too, Mick!