

November 1974

# Aero Modeller

20p USA & Canada \$1

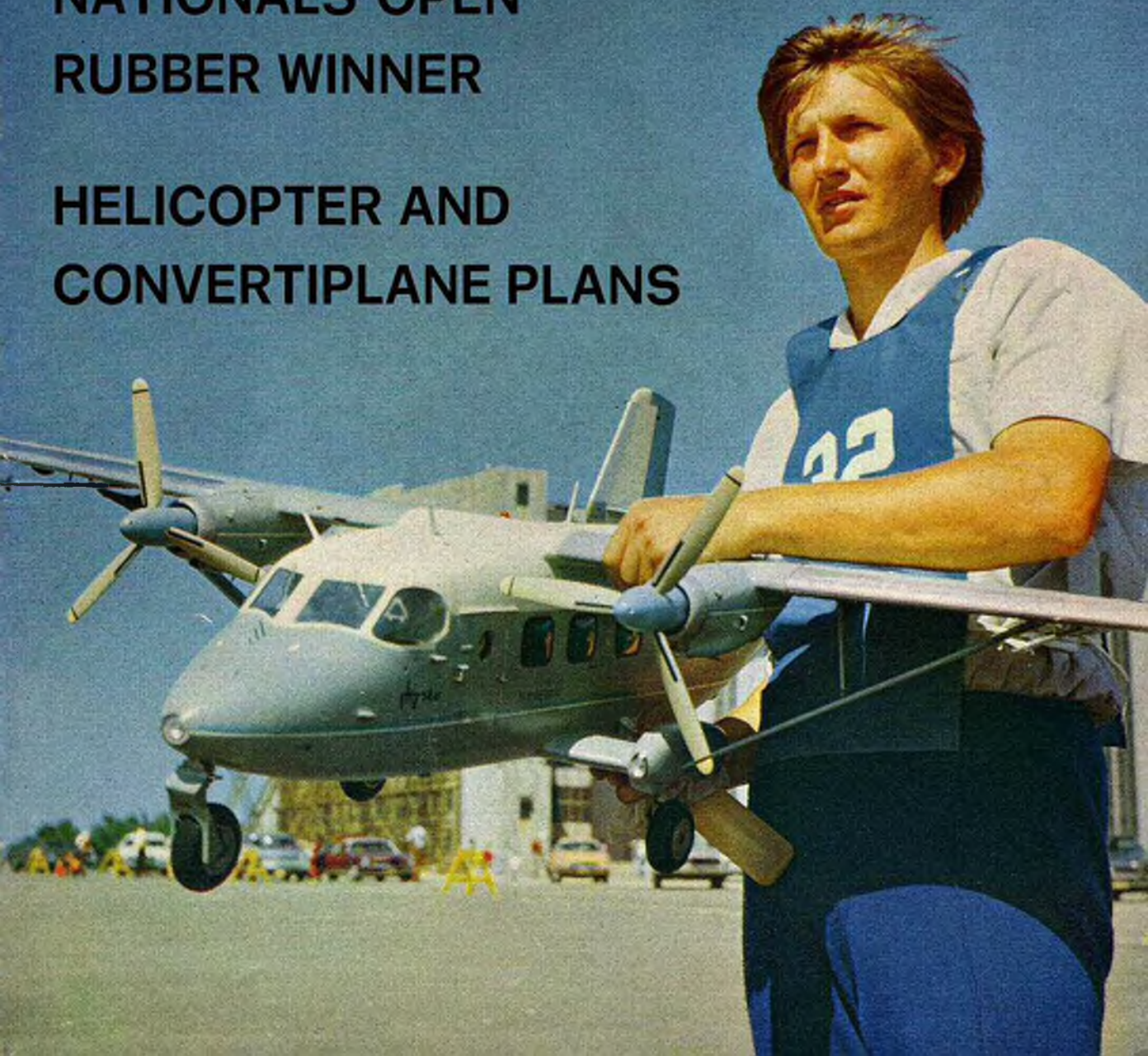
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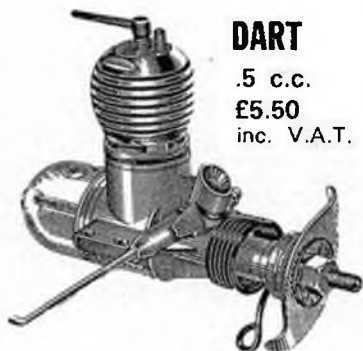
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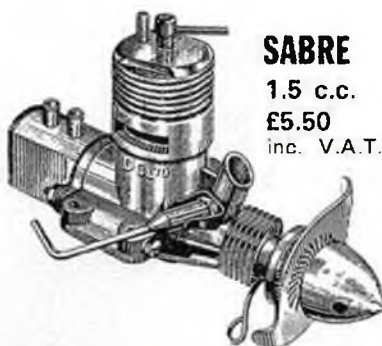






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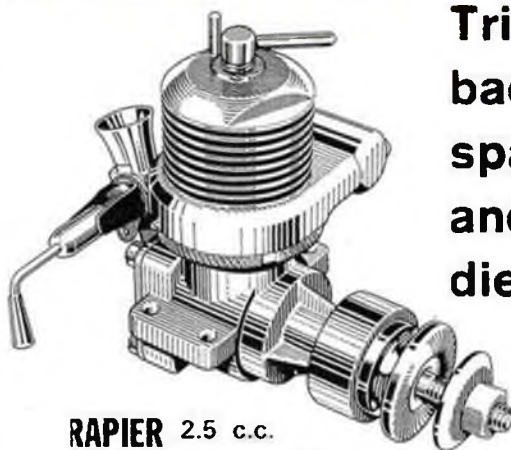
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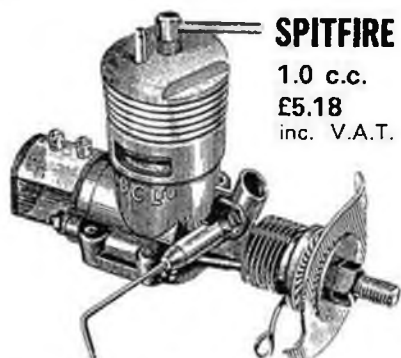


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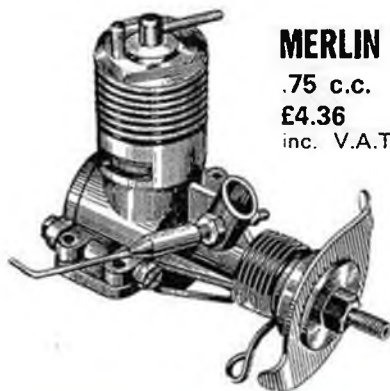
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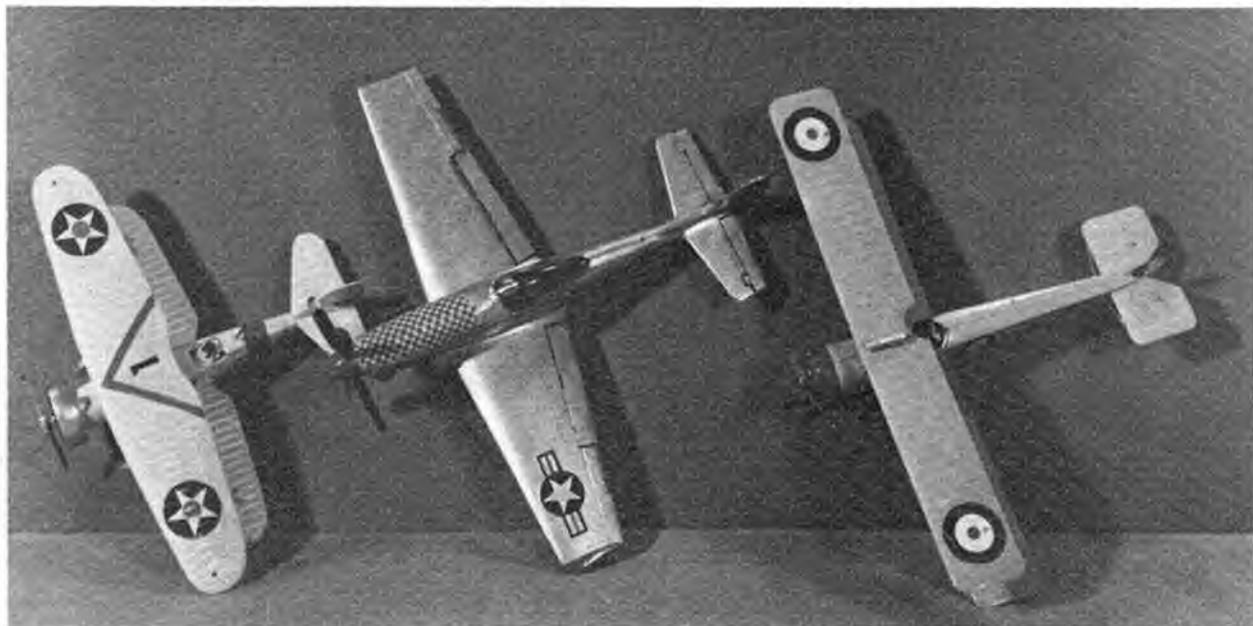
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Apart from the out-and-out 'performance' fans, it's realism which counts with most aeromodellers. Which is why, ever since the early 1930s, most people have wanted to start with flying scale models. Why the 1930s? Well, that's when Balsa was introduced as a 'standard' modelling material. Before that, if you wanted to make a flying scale model from a kit you had to buy a cardboard one. Birch and spruce, with silk covering, was for 'duration' only.

First control line and then radio took the 'bugs' out of controlling scale models in flight. So now modellers build bigger, better scale jobs than ever before. More detailed than the best of plastic kits – and far more realistic. It's safer to stick to smaller sizes for free-flight scale – but there are the exceptions that disprove the rule.

Balsa is still the 'standard' constructional material' but the man hours that go into a modern scale model have increased considerably. So it only makes sense to start with the best balsa you can get, and use it throughout. Solarbo Balsa, that is! (Ask any top aeromodeller if you have any doubts on this point.)

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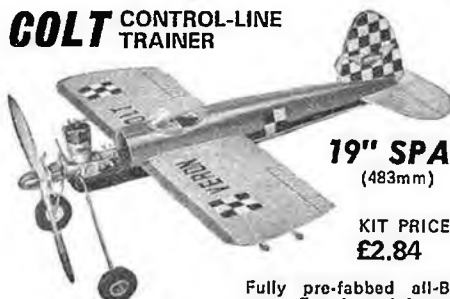


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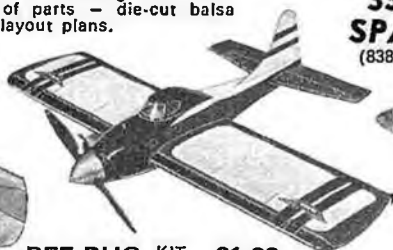
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# Aero Modeller

INCORPORATING  
MODEL AIRCRAFT

**November 1974**  
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## comment

Few modellers know anything of the difficulties faced upon manufacturers and distributors over the past few months. At a time when order books have bulged, and every retailer reports heavy demand for all kinds of kits, motors, accessories and equipment, supply at manufacturer level has been severely crippled through shortages of raw materials. Kits - if they are to be worthy of the name, contain such a variety of materials that inevitably they depend on numerous sources. Describe them in an instruction sheet, provide a printed plan, package them in a folded box and wrap with a colour printed label, then the complexity of supply becomes apparent. Thus, without exception around the world, kit manufacturers have been going through enormous problems of ensuring that their jig-saws have fitted together so they could make a complete picture. Most have been in the embarrassing situation of having kits held back from sale for the sake of wire, card boxes, tissue, rubber - even balsa wood or plywood! So spare a thought for the man behind the trademark when next you find the shop shelves bare of the kit you seek. One fine day the world will return to sanity, and stocks will resume full availability.

## on the cover

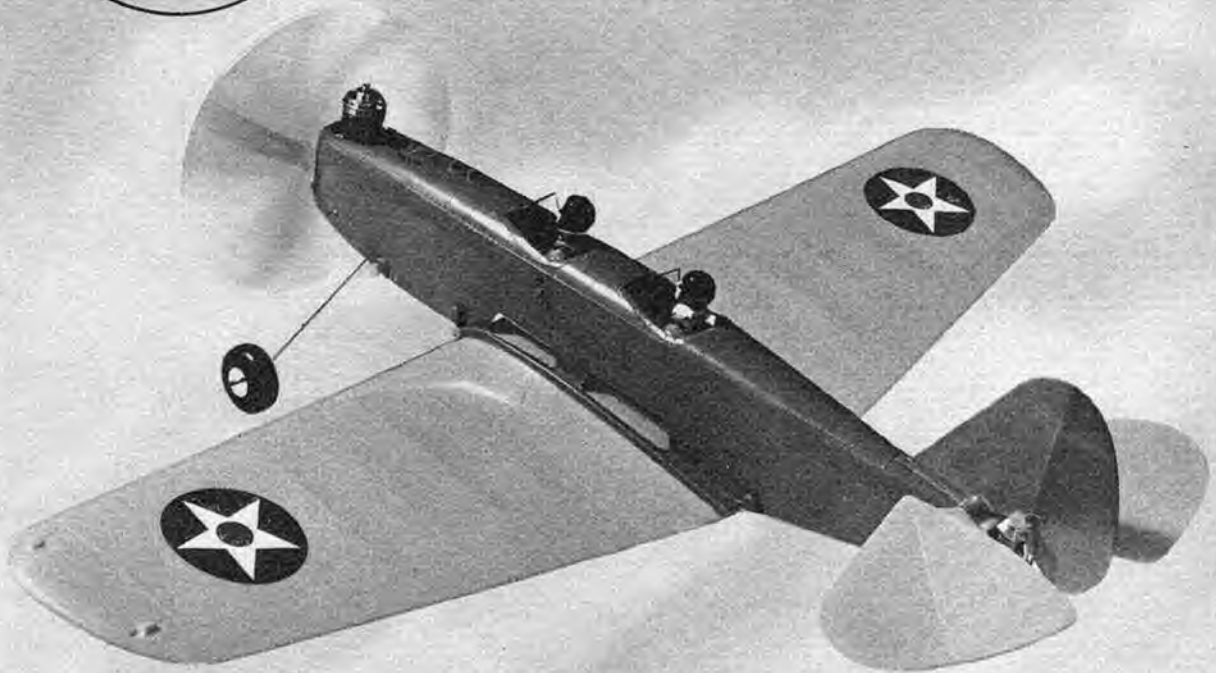
Valery Kramarenko, World Champion control-line scale modeller with his Antonov An 14M at Lakehurst, New Jersey, U.S.A. This superb model has many functional features including cargo doors, slotted flaps, retractable landing gear and lights but the most impressive element of its complexity is hidden within the scale turbojet nacelles. Special 'in-line' single cylinder 10 c.c. glowplug engines by Boris Krasnorutsky (the World Champion in team racing 1970 - 2nd in 1972) confine the power plant within the slender confines. Photographs and description appeared on page 476 of the September issue.

## next month

The traditional bumper 'Christmas' issue! Plans for Bill Draper's Kittyhawk semi scale control line stunter. How to finish a model properly, a subject covered by a professional with many trade tips. Features on free-flight and control line subjects for both beginners and experts alike, plus much more in the December issue, on sale November 22nd. You cannot afford to miss it!



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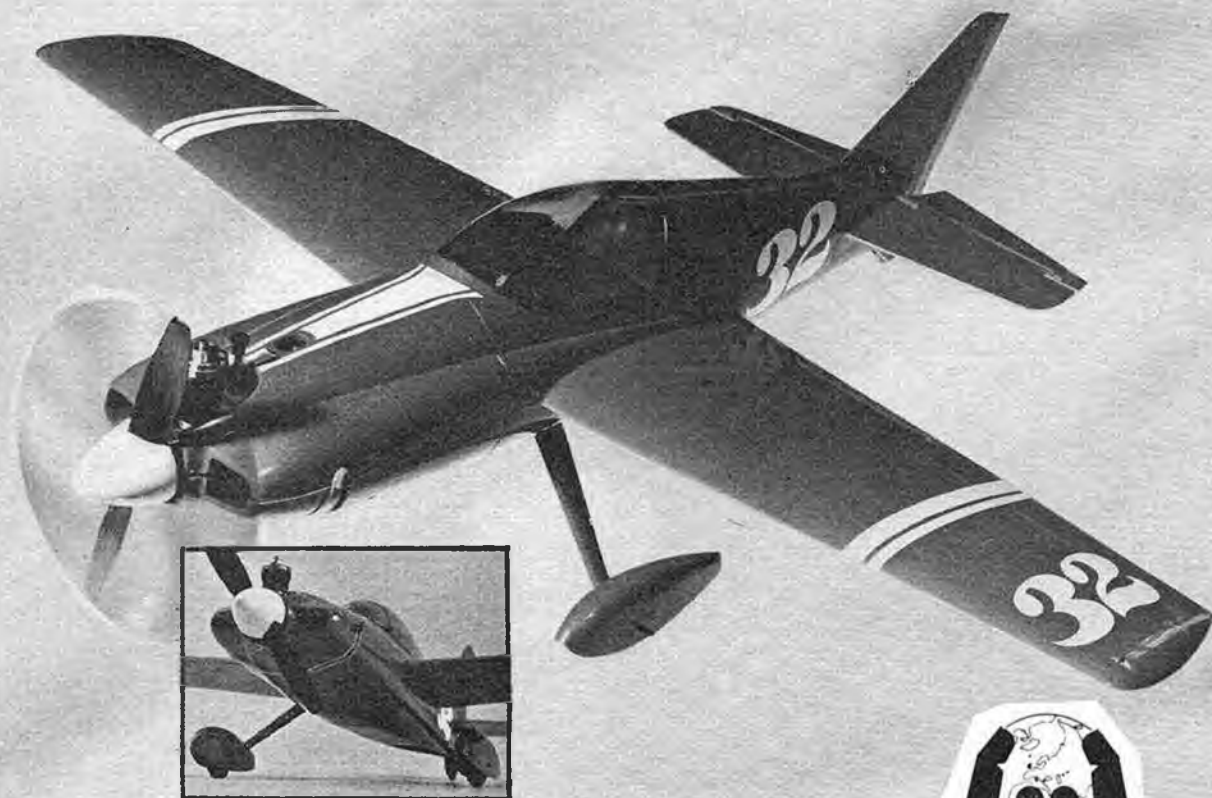
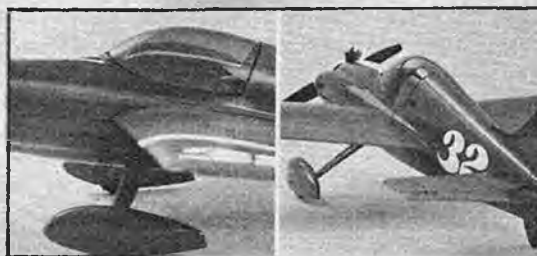


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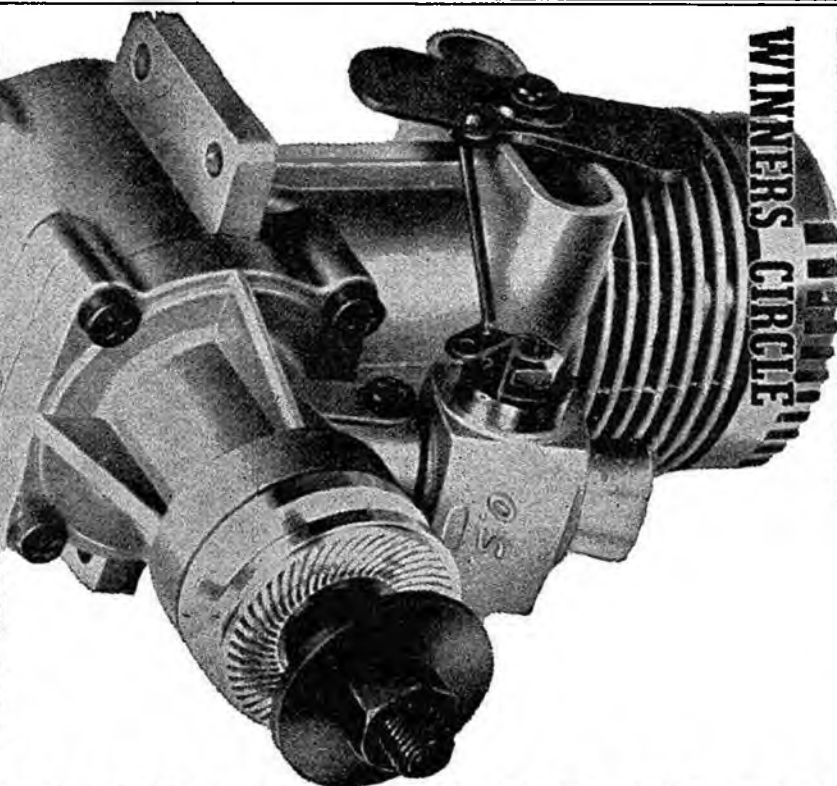
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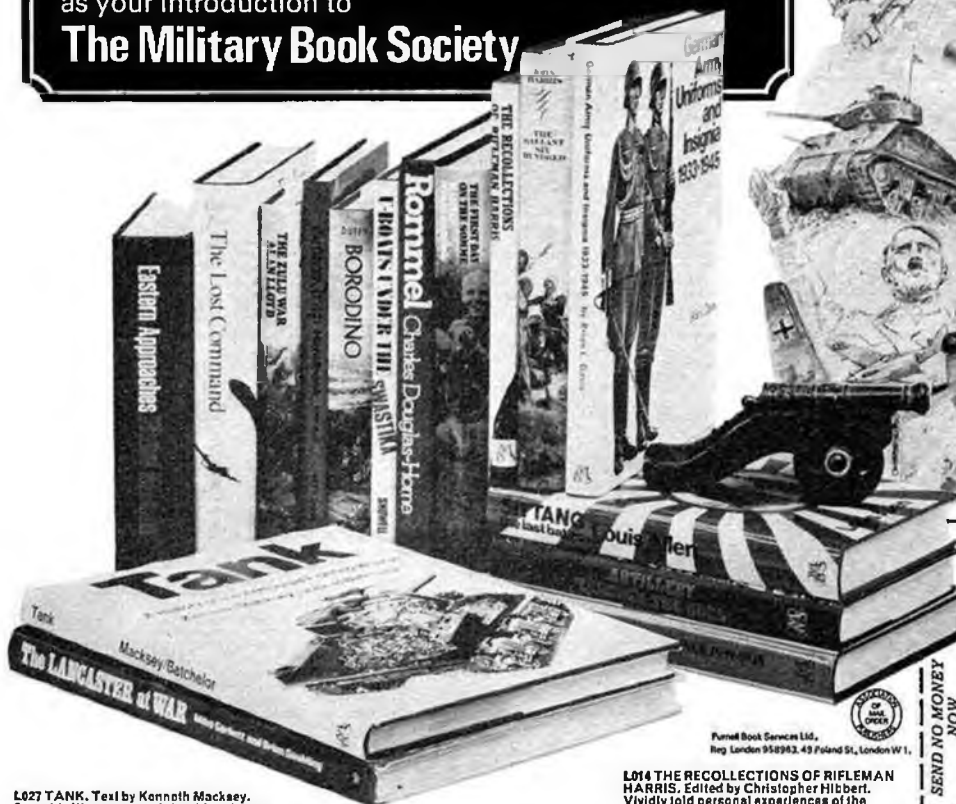
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7 1/2" dia. ..	12p
12" dia. ..	25p
Ezeebilt 3 blade	9p

### KK NYLON PROPELLERS

5 x 3	8 x 6	25p
3 blade 24p	8 x 8	25p
5 x 3	9 x 4	28p
5 x 4	9 x 6	28p
5 1/2 x 4	9 x 7	28p
6 x 3	10 x 4	42p
6 x 4	10 x 6	42p
7 x 4	11 x 4	46p
7 x 6	11 x 6	52p
8 x 4	12 x 4	55p
	12 x 6	55p

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#### High Quality Machined Props

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9 x 5 ..	39p
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10 x 5 ..	44p
10 x 6 ..	44p
10 x 7 ..	44p
11 x 4 ..	49p
11 x 6 ..	49p
11 x 7 ..	49p
11 x 7 1/2 ..	49p
11 x 8 ..	49p
12 x 6 ..	59p
13 x 5 ..	68p
13 x 6 ..	68p
14 x 5 ..	78p
15 x 4 ..	87p
15 x 6 ..	87p
16 x 4 ..	97p
16 x 6 ..	97p
17 x 4 ..	1.17
17 x 6 ..	1.17
18 x 4 ..	1.46
18 x 6 ..	1.46

## SPINNERS

### KK STANDARD

1 1/2" dia.	15p	2" dia.	18p
1 3/4" dia.	17p	2 1/4" dia.	22p
1 7/8" dia.	17p	2 3/4" dia.	27p

### KK SUPERSONIC

1 1/2" ..	17p
1 3/4" ..	18p
1 7/8" ..	18p
2" ..	22p

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Black White. Red Yellow

2" 26p	1 1/2" 22p
2 1/4" 30p	
2 1/2" 36p	
2 3/4" 43p	

## WHEELS

### KK LOW BOUNCE AIRWHEELS

pair	2.000" 65p
	2.250" 80p
	2.500" 89p
	2.750" 1.00
	3.000" 1.22
	3.500" 1.40
	4.000" 1.67

### KK SOFT RUBBER WHEELS

pair	Streamlined
	1 1/2" dia. 22p
	2" dia. 27p
	Balloon
	1 1/2" dia. 22p
	2" dia. 27p

### KK PLASTIC WHEELS

doz.	3/8" dia. balloon 6p
	1/2" dia. " 9p
	3/4" dia. " 9p
	1" dia. " 12p
pair	1" dia. streamlined 12p
	1 1/2" dia. streamlined 6p

### HOLLOW PLASTIC WHEELS

pair	1 1/2" dia. balloon 6p
	2" dia. " 7p
	2" dia. " 7p
	streamlined

### KK HARD RUBBER WHEELS

pair	Streamlined
	1 1/2" dia. 12p
	2" dia. 18p

## FUEL TANKS

### KEILKRAFT CONTROL LINE

Stunt	1/2 A.. 1" 27p
	Small 1 1/2" 33p
	Large 2" 40p
Team Race	7 1/2 c.c. .. 27p
	10 c.c. .. 27p
	15 c.c. .. 32p
	30 c.c. .. 33p

### Pressure Fed Team

Race	7 1/2 c.c. .. 28p
	10 c.c. .. 28p
	15 c.c. .. 32p
	30 c.c. .. 33p

### RADIO

R/C Clunk	2 oz. .. 30p
	4 oz. .. 31p
	8 oz. .. 40p
	40 c.c. metal 98p

### MERCURY TANKS

Stunt	1/2 A Wedge 30p
Standard	Wedge Stunt
	1 1/2" .. 37p
	2" .. 37p
	2 1/2" .. 39p

Economy Wedge Stunt	7 1/2 c.c. .. 30p
	10 c.c. .. 30p
	15 c.c. .. 30p
	30 c.c. .. 30p

Pressure Fed Square Stunt	2" .. 39p
	2 1/2" .. 39p
	3" .. 39p

Pressure Fed Wedge Stunt	2" .. 42p
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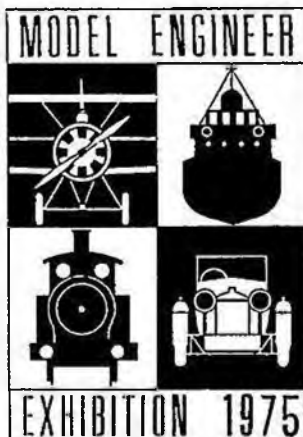
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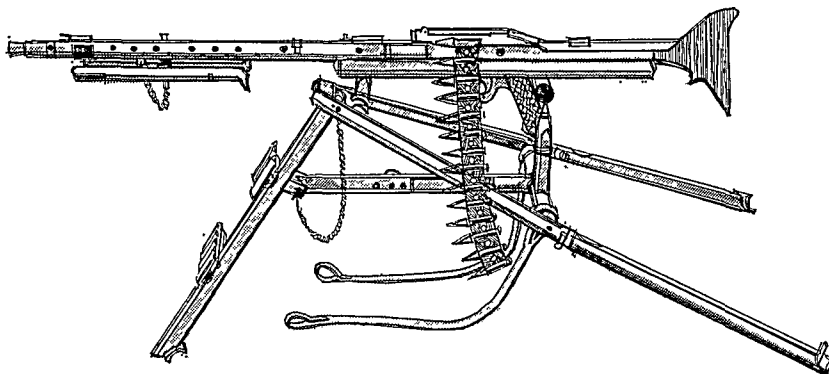
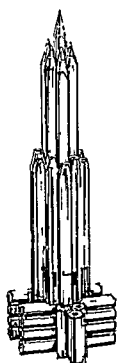


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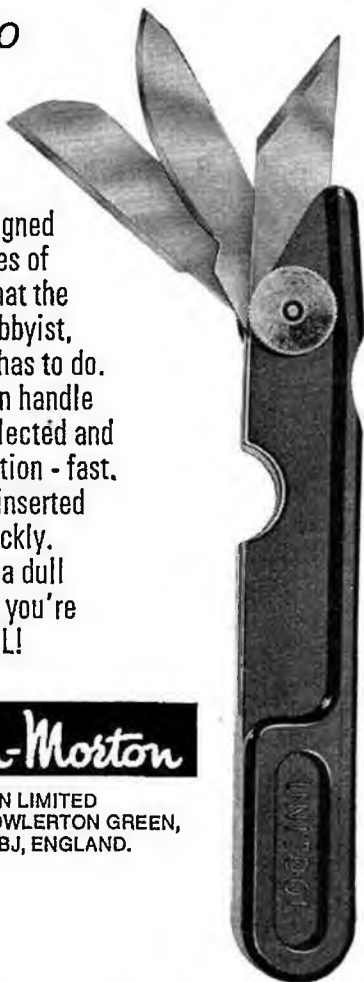
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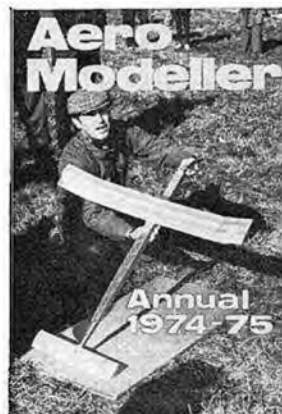
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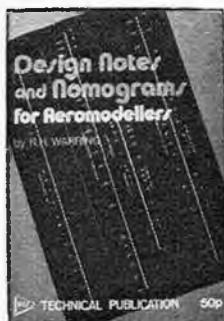
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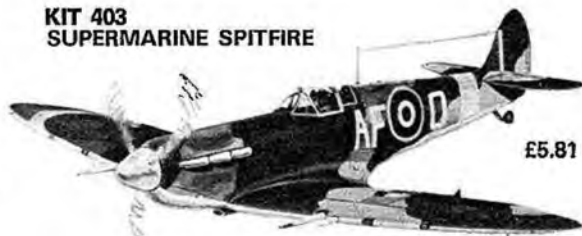
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# Heard at the HANGAR DOORS

**AMERICAN CUP EVENT** has been proposed for adoption by A.M.A. after considerable comings and goings on the introduction of the 100 gramme Coupe d'Hiver rule. Several American Free Fliers have vigorously protested the rule change which added 20 grammes to the long established Coupe d'Hiver specification. The objection was based on the consideration that the class was meant to be a stepping stone for novices before progressing to the competitive classes of Wakefield and Open Rubber events. The rule changes proposed are that the American Cup is strictly a domestic event in the U.S.A. and that basic rules should be as Coupe d'Hiver except the maximum aircraft weight without the rubber motor shall be 2.47 oz. or 70 grammes. Thus, with the 10 gramme motor restriction remaining, the American Cup reverts to the original specification of 80 grammes maximum total weight – assuming of course that one's rubber motor is to the maximum weight of 10 grammes!

**PRODUCTION DELAYS** which have upset the printing industry over the past six months have seriously affected delivery of this year's **AEROMODELLER ANNUAL**. Sale date is now established as November 18th, when we hope to clear the many outstanding orders some 2½ months late. The accumulated delays and the sky-rocketing costs have obliged a price adjustment, this year's volume is £1.50.

**SWISS PLANNING** on the 1975 World Championships for Radio Control Aerobatic models has been officially announced 11 months prior to the actual event next September at Berne Airport. This length of notice gives adequate time for the rather special regulations to sink in, for they have far reaching implications. The Swiss P.T.T. has always been very strict in their control of imported Radio Control equipment. In the early

days of R/C development, several well-known makes were refused permits for sale in Switzerland until the transmitters were 'cleaned up' and improved. Thus it is logical that for the 1975 Championships, P.T.T. have already stated that they reserve the right to decide whether the transmitter may be used. 27, 40 and 72 mHz spot frequencies will be permitted. Actual details are in a list being circulated to Aero Clubs. Much more important is the regulation that: *'all motors must be fitted with effective silencers. The maximum noise limit is 82dbA, which will be checked by full power of motor (distance 10 metres). Models which are noisier must be excluded from the competition.'* This follows the internationally established rules applicable to model boats – rules which have been extremely successful. The NAVIGA limit of 80 dbA has in no way affected performance, in fact boat speed records have tended to rise annually. (See *Model Boats*, October '74 for several features on the subject.) However, this does not get away from the fact that engine manufacturers have progressively introduced so-called mufflers which, for the sake of gain in static engine performance, have reduced the silencing effect, often to ridiculous levels. We doubt whether many of the 1974 model 'silencers' would be capable of meeting the Swiss restriction; but the manufacturers have now almost a whole year to set about the task of restoring the situation. We must commend the Aero Club of Switzerland for their wise move, which may in the long term benefit modelling everywhere.

**INSURANCE** is another service which has become affected by rising costs. Since the end of March 1973 we have counted ourself lucky being able to hold the individual fee for the M.A.P. Modeller's Accident Protection scheme to 75p. After 19 months at the 75p rate,

we are now in the situation where the fee must be increased in order to maintain the scheme. From 1st November individual membership will be charged at £1.25.

**ANOTHER LECTURE** for young people will be given by that superb raconteur, Lt. Cmdr. Alwyn Greenhalgh, the subject being *Model Aviation from the period 1744-1974*. Venue is the Royal Aeronautical Society, 4 Hamilton Place, London W.1., date January 2nd 1975, time 3 p.m. – an occasion not to be missed!

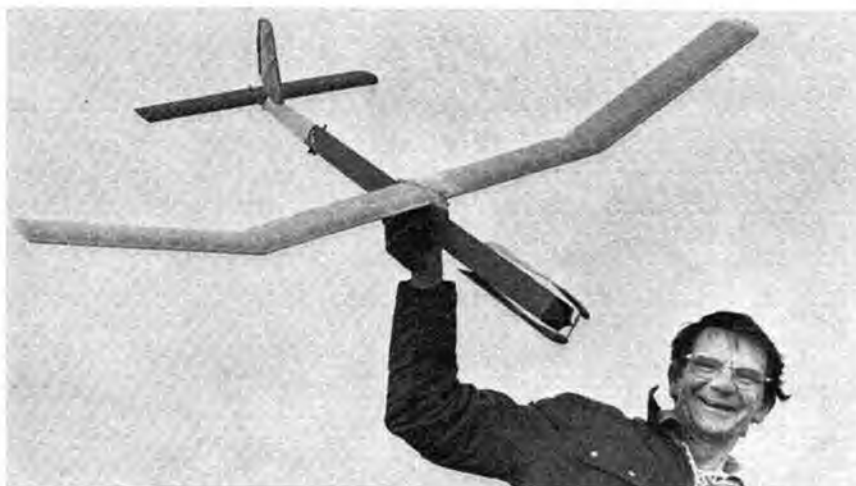
**AN UNFORTUNATE** error in the October issue resulted in an incorrect price being given for the **Graupner Catalogue**. This 192 page, full colour production which details the entire range of Graupner model aircraft kits, and accessories in fact costs 75p from your local RipMax stockist, or from RipMax Ltd., at RipMax Corner, Green Street, Enfield, Middlesex.

**COUPE D'HIVER** fliers take note! The Pierre Andreis Cup contest will take place on December 1st at Levens, near Nice, France. Generous cash prizes are offered in order to tempt foreign as well as French competitors. Those interested should write to Guy Giudici at 14 Boulevard de Cessole, 06100, Nice, France, for details.

**CONGRATULATIONS** to The Model Shop (Newcastle upon Tyne) Ltd., for celebrating their fiftieth anniversary, which we feel must be some form of record. How many of today's model shops can trace their origins of trading prior to 1924?

During October, Minoru ('Joe') Ogawa visited all OS engine and radio control agents in Europe on a research and marketing mission. U.K. agent, Ron Kell, Joe Ogawa, Eddie Cosh and Peter Chinn were caught by our candid camera during one of several long discussions dealing with new products from the Japanese OS factory.





## LAURIE BARR'S 1974 NATIONALS- WINNING OPEN RUBBER MODEL

# LICORICE STICK

THIS MODEL is the latest in a line going back over 10 years. Its forerunners have won many competitions, usually in circumstances where all the models in the fly-off have been timed to the ground within sight of the timekeepers. The model I used at the Nats was built two years ago, and was intended to have an off-set wing, similar to my indoor models and Wakefields, but I could not get it to turn properly on the glide, so a week before the event I put some extra central rib stiffening in the wing, and moved the wing to a central position. It now turned easily on the glide. I also (out of idle curiosity) tried for fit an old nose block and propeller from a previous model at least 10 years old, and amazingly it fitted perfectly, so off to Chobham to try it. It was immediately apparent that this model was something special, gliding as well as my earlier models, but the climb was something else! The prop turned so slowly, yet it climbed almost inexorably, and to heights on half-turns that was greater than some models on full turns.

In the National's 37-man fly-off, held at 8.30 p.m., the conditions were ideal; practically no drift and as near still air as one can get. All models were timed for their true duration; all flew in the same air space, and landed just a few hundred yards from the launch point.

Having done so much indoor work in the last 3-4 years, I found it hard work to wind such a large rubber motor, and by the time I was ready to launch, many of the models were already well up, with props folded in the glide, all swarming overhead like a cloud of gnats! *Licorice Stick* steadily climbed well past all other models and when the prop folded two minutes later, was nearly half as high again as its rivals; it landed for a flight of 9:09, a minute and a half ahead of its nearest rival. Due to old age (I) and lack of practice, I could only manage 880 turns on the motor (6 mm x 1 mm x 48 in. long) which should take 1,000 turns quite comfortably, so the full potential has yet to be obtained.

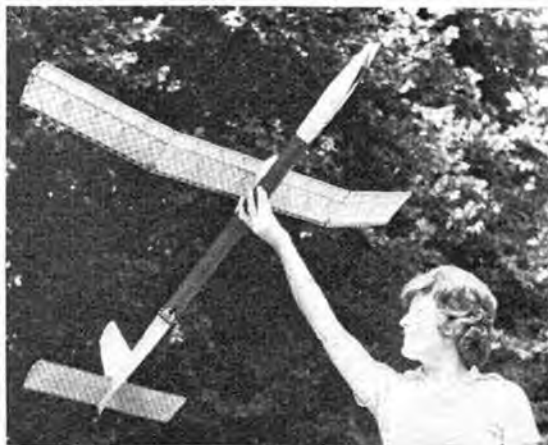
Construction is fairly straightforward, but careful selection of wood is vital to achieve a true, stiff, airframe and prop at 3 oz. total weight. It pays to 'eyeball' each strip and sheet for straightness, and to test hardness in several places for uniformity with your thumbnail. It also is a good idea to hang the strips all together over the edge of the shop counter, to see if the longerons have equal deflection.

## Fuselage

The fuselage building jig is very simple, guaranteeing a quickly built true, lightweight, fuselage. Select a dead straight piece of  $\frac{1}{2}$  in. sq. balsa or pine 36 in. long, and cut five temporary formers as pattern F1 on the plan, and one slightly smaller (measure size from front view of nose block) for the front end. Having carefully selected your medium-hard longerons, pre-splice just aft of the rear rubber

anchorage, an extra length of a softer grade. Now slide the formers at intervals down the  $\frac{1}{2}$  in. square former core, but do not glue. The longerons are slotted into the corners of the formers, and are held in place with some rubber bands. Having made the angled cutting jig shown, finding the required angles off the side elevation of the fuselage and the front view at section 'X-X', you determine the length of each 'hand' of diagonal spacers by trial and error. Having found this length, make a distance mark on the cutting jig, and you can then cut as many spacers as necessary. Most of these can be glued in place round all four sides of the fuselage - where either a former or rubber band interferes with fitting the spacers, these can be left until the rest are secure. The central core is then slid backwards to complete the rear end of the fuselage - note the special slots previously put into the end faces of the  $\frac{1}{2}$  in. sq. core, to hold the end of the longerons in the right place. Some of the rear-end spacers will not be right as they come off the cutting jig, so some 'eyeballing' and trial and error is necessary. It is best to add the rear rubber anchorage and the nose sheeting, while still in the jig, but the rear tail sheeting cannot be done until you remove the core from the semi-finished fuselage. Make sure the spacers are from soft balsa, and that when glued to the longerons they are flush or slightly proud, so that when you later sand the fuselage you do not end up with 'wavy' edges!

The fin is made by constructing the outline over the plan. Remove and add the 45° angled bottom rib. The diagonal ribs, also  $\frac{1}{32}$  in. x  $\frac{1}{4}$  in. wide, are fitted, and when all is dry, the symmetrical airfoil is sanded in. The  $\frac{1}{4}$  in. x  $\frac{1}{16}$  in.



Heading picture shows a jubilant Laurie after winning the Open Rubber fly-off at the '74 Nats. - held under virtually perfect conditions. At right his wife displays the chequered tissue undersurfaces of Licorice Stick. How did you keep the 'seams' straight Laurie?



The wing mount is made in 'mid-air' by cutting the central divider to the shape as shown on the side elevation (use the main rib template for the top shape that fits the wing undercarriage) and adding the three formers. When dry, both the side sheeting is added, using small bulldog clips to draw the ends together. Use white P.V.A. glue here, but elsewhere I only recommend balsa cement. The reinforcing along the top edge is now added (hold it in place with pegs), and then the small sheeting at each end of the top faces. The pegs can be fitted and withdrawn, to be added later with the small ply 'washers' after the finished pylon has been covered. Do not add the pylon to the fuselage at this stage.

Pre-arc the trailing edge and cut small slots to receive the ribs. Pin the L.E. to the plan, and add the two-angled tip sheets followed by the two main straight ribs to each side and the two central ribs. Then glue the diagonal ribs in place when dry, add the top main spar and then the sub-ribs between the main spar and the L.E. When all is dry, lift from plan and sand the tips to the airfoil. The L.E. is also finished off to shape, but do not sand too sharp, as one of the critical factors with both the wing and tail airfoils is a blunt entry to ensure a turbulated airflow and a really good glide.

Build one panel at a time. Start on the inner panel, pre-carving the T.E. and cutting small slots to receive the

Bend the 16 s.w.g. prop shaft to the rear shape only (the front end is bent at right angles for soldering to the prop outriggers on final assembly and after covering the nose block with tissue) and bind with cleaned copper wire, extracted from plastic covered flex. Never use cored solder,

[illegible]

it is too soft; always use 'tinmans' solder, and plenty of Bakers Fluid, as it is essential to get good bonded joints at all points on the prop unit.

## Propeller

Mark out the plan and side elevation of the prop blank and saw to these outlines. Sand the faces of the small inner ends to receive the 1 mm. ply facings, and securely glue these in place. Carve the undercamber first (I normally use a  $\frac{1}{2}$  in. wide sharp chisel) from edge to edge, finishing off with medium grade glasspaper. Do the same to the other blade and compare each blade for matching undercamber, by holding a straight-edge across several blade stations. Be fussy about all aspects of prop carving and finishing as it can make all the difference to performance. When fully satisfied, turn the blades over then carve and sand the top surfaces, finishing off the whole with fine glasspaper. If the wood is really soft, cover the blades with lightweight Modelspan tissue, and for either method, dope the blades with 3-4 coats of dope. It is a good idea to weigh both blades to make sure they are the same weight during all carving and finishing stages. Bend up the 16 s.w.g. prop spar outrigger, and try to make both of the different angles as shown in the side and front view correct. Drill the ply faces of the prop hubs accurately to the same angles as the prop spar, and epoxy the metal 16 s.w.g. bore tubes through the prop hubs, leaving a little of the tubing projecting each side of the ply faces.

## Propeller assembly jig

Obtain a flat piece of wood approx. 18 in. x  $2\frac{1}{2}$  in. x  $\frac{1}{2}$  in. and mark a centre line. Cut a square hole so that the nose block fits into this like it would on the fuselage. Hold in place with strips of balsa cemented to the baseboard, and firmly hold the nose block with rubber bands. From the centre line, mark two more stations 8 in. out from either side of the centre line. Cut two triangular pieces of  $\frac{1}{2}$  in. sheet balsa to an angle of 35 degrees, and cement onto the baseboard at the 8 in. station on either side of the shaft centre line. Slip the blades onto the prop spar and offer the blades onto the triangles and pin in place (these triangles ensure both blades are at exactly the same pitch). While in this jig, bind and solder the prop spar to the right-angled-bend front end of the prop shaft, having previously slipped on the thrust bearing. Also solder small nuts or washers on the ends of the outrigger to retain the prop blades, but be careful not to solder to the bushes on the prop blade hub ends, or it won't fold! Drill a small hole through both ply faces to take 16 s.w.g. wire in the ply blade hubs over the top of the outrigger (as viewed from the side) and epoxy into place a small 16 s.w.g. wire 'stop' to prevent the blades from opening beyond 90° to the prop shaft under power. The 24 s.w.g. spring tensioner is added after. Fit the complete unit into the nose of the fuselage and mark where the blades fold snugly along the fuselage, then fit the wood-screw for the prop stop. Bend up the 'U'-shaped bobbin holder from 18 or 16 s.w.g. wire, making sure the looped ends are folded over the right way as shown on the plan, otherwise it might slip off under full turns! For winding, I bend up a 16 s.w.g. shaft the same as the rear end of the prop shaft (less the return for the prop stop), fitting this to a wheel brace, and detach the prop for winding. Having wound, slip a 4 in. length of 16 s.w.g. wire through the hole in the bobbin to hold the motor while re-fitting the prop.

To make the blades fold, slip a small rubber band over each blade, allowing it to rest where the shaft meets the prop spar, and securing the other end of each band to the prop blade with a cut-off modelling pin  $\frac{1}{2}$  in. up the blade.

## Covering and doping

The fuselage may be double covered in lightweight Modelspan tissue but the flying surfaces should really be covered in Jap tissue. This is in short supply, but I do have a limited stock of blue and orange Jap, which can be had for 12p per sheet, limited to four sheets per person please. Add 15p for post and packing to any order which should be addressed to 4 Hastings Close, Bray, Berkshire.

I usually apply a coat of full strength dope to the entire airframe wherever tissue is to come into contact, and lightly sand off any whiskers. Using full strength dope cover one or more panels at a time and with Jap tissue that needs water shrinking, it is not necessary to pull the covering too tight, just avoid wrinkles, and put down evenly.

To water shrink, spray or brush on plain cold water, but do not soak it too much. The fuselage and fin can just hang up to dry, but the wing and tailplane must be pinned down. Get a flat piece of blockboard/ply/deal and at each cross-rib station, nail down some old  $\frac{1}{2}$  in. sq. balsa firmly. Wax the top edges and you are ready to pin down wing and tailplane (these strips allow the air to circulate). In the case of the wing, pin down the centre section dead flat, like the tailplane, and from the edges of the plank, pin some strips

of balsa long enough to reach the tips, and pin at both the L.E. and T.E. so that the correct dihedral is maintained and the  $\frac{1}{2}$  in. and  $\frac{1}{16}$  in. washout is held during shrinking and doping. (When you have done this, place the board with the wing *in situ* along the work bench edge and with the T.E. facing you. Look across the chord to check the correct warps and flatness). When all is dry, dope the fuselage from the nose-former to the rubber anchorage with 2-3 coats of 70% dope, 30% thinners; the rear end and the fin having two coats of 50% dope and 50% thinners. The wings are also treated with two coats of the 50/50 mixture, and the tailplane given two sparing coats of 40% dope 60% thinners. Leave wings and tail in the jig for as long as you can, and for at least three days, to allow the structure to stabilise.

## Trimming and flying

Make up a rubber motor of 16 strands 48 in. long from 1 mm. x 6 mm. Pirelli, put bobbins on each end, and add a few turns to check that the operation of the prop stop and folding action is O.K. Fit the tailplane in place, and fasten the wings to the pylon with rubber bands. Make a small mark on the pylon at the C.G. location shown on the drawing then move the wing and pylon fore and aft, until the model balances at this point, then cement the pylon to the fuselage. If your tailplane and the wing centre section is dead flat, and there is  $\frac{1}{16}$  in. washout on the starboard tip,  $\frac{1}{2}$  in. on the port tip, then trimming will be simple. Before starting the usual glide tests over long grass, pin a length (approx. 4 in.) of  $\frac{1}{2}$  in. x  $\frac{1}{16}$  in. strip up the starboard T.E. of the fin to act as glide turn; add to this as required during all trimming procedures, and when you are sure that the glide turn is right, they should be permanently cemented in place. Put 200 turns on the motor, and slip a piece of  $\frac{1}{32}$  in. sheet between the port top side of fuselage and the nose block and launch into wind with the nose slightly up (light the D/T). Assuming all is well, observe carefully that the model is not actually descending before the prop has folded; adjust the amount by the stop screw. You may find it necessary to add a small amount of packing under the tailplane (usually at the T.E.), but the amount of downthrust ( $\frac{1}{32}$  in.) should not be exceeded if you can help it, as this model has a large tailplane, with a long moment arm, and you may find that model will pitch over after launch. Gradually increase the turns by 100 each time, noting carefully if the flight pattern is smooth, and the glide to be 'buoyant' until full turns are reached. Try to trim in the late evening in calm conditions, for only then will you know how good your model is.

## Competitions

Always use a winding tube, and always light the D/T. fuse. A 'boomer' thermal is not necessary - just avoid bad air, and do not put on full turns every time you fly (save the motor and your retrieving energies for the fly-off!) as the performance is well in excess of the usual 3 min. maximum. Store your rubber in a light and air-proof tin, and always store the model out of full sunlight whenever you can - never allow warps to come into the flying surfaces by bad storage.

Like the man says - always use a winding tube. Laurie practices what he preaches too! Well worth it if you want your fuselage to last - a bunch of broken rubber can make an awful mess of longerons and spacers...



Flt.-Lt. John Stroud continues his money-saving series with the advice

## ***DON'T BUY IT—MAKE IT!***

ONE OF THE FRUSTRATIONS of operating glow plug engines is when the glow plug has burnt out and not knowing this, you try for ages to start the motor! Cowed and silenced motors make visually checking the glow impossible, and some form of test circuit is thus a great help.

I have made a number of checking circuits consisting of ammeters and voltmeters, etc., and with a little experience and basic knowledge these readings can be interpreted to give the information needed — a very good system was shown in the January, 1973 issue of *AeroModeller*. A few months ago, however, I found that all my meters had been re-employed and I looked round for another method. In the automotive world, meters are being replaced by 'idiot lights', and this made me think of a simple lamp as the basis of a checking

circuit. The apparatus can be made up from the scrap box, but even if you are forced to buy some components the cost is only a few pence.

The circuit consists of two components: a bulb and a push-to-break switch. The diagram in *Figure 1* shows the layout. Should a push-to-break switch not be available, then an ordinary on/off switch will do; if it is spring-loaded to the 'make' position, all the better. If not, clearly mark the 'make' position START and the break position CHECK.

All you have to do is push the button or select CHECK. If the lamp glows then the plug is good. I made my lamp green for 'go', and built the circuit into the modelling box along with the starter battery.

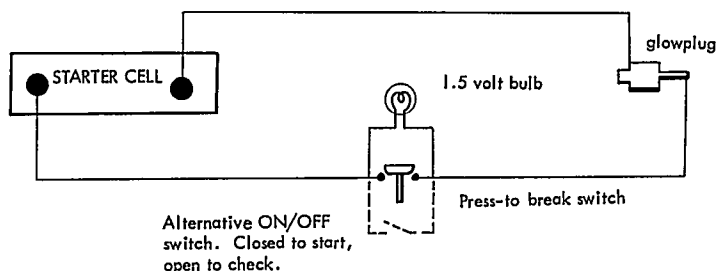
Another useful item built into my box is a resistor to drop the

2 volt accumulator down to 1.5 v. As a rule I prefer 2 volt plugs, but with my sons' Cox engines this is impossible. Fortunately, the expense of 1.5 v. dry cells can be avoided quite easily by two simple methods.

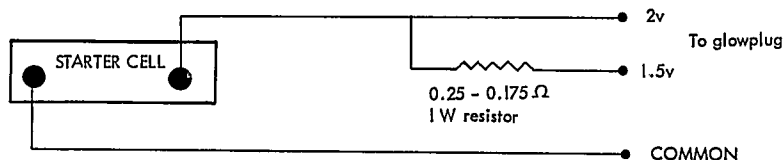
The first method I used is quite common practice: that was to make up a special set of long leads made of rather thin wire. This was quite satisfactory until the thin single-core cable started to break after repeated bending, so I therefore decided on another method and to build it into the box and provide two terminals labelled 1.5 v. and 2 v. The complete circuit is shown in *Figure 2*.

I wrapped the resistor wire round the model box handle to make a neat job of it. The coil of wire can be replaced by a resistor of about .25 or .175 ohms 1W if you can get hold of one, or make one up.

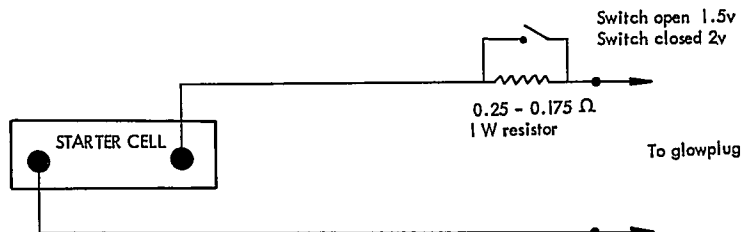
**Figure 1**  
Circuit using a torch bulb to check whether the glow plug is working. If bulb lights, plug is good — no light, no glow!



**Figure 2**  
Circuit to provide separate 1.5 volt and 2 volt outlets.



**Figure 3**  
Circuit to provide switchable 1.5 volt or 2 volt outlet.



# Readers' Letters . . . .

Dear Sir,

I was interested in the photo and paragraph of the *Birmingham Aero Club* in the August 1974 *Aero Modeller*. Although I don't know many of them, I have been able to turn up reports of this club in my early volumes of *Flight* and found reports of the *Birmingham Aero Club Challenge Shield* in the issue of June 18th, 1910. Details of an Exhibition held in the Edgbaston Botanical Gardens on May 20th and 21st were that the Lord Mayor of Birmingham opened the Exhibition and there were 170 entrants. After the judging there was flying in the grounds, but this was hampered as trees 'in close proximity to the lawn often interfered with the flights'. Stability was taken into consideration by the Judges. There were 11 different classes: *Class 1* open to original designs, *Class 2* to all-comers, *Class 3* to all Clubs, *Class 4* open to members of the Birmingham Club, *Class 5* open models to scale, *Class 6* open petrol models, *Class 7* open petrol motors, *Class 10A* open to amateurs. Best flight *Class 10b* open, best flight for *Birmingham Aero Challenge Shield*. *Class 12* aeroplane accessories, *Class 13* model aeroplanes rising from the ground under their own power.

The B.A. Challenge Shield was won by Mr. Gordon Jones. Among other winners in other classes was the well-known modeller C. P. Bragg-Smith with his stable biplane with curved lower wing meeting the top wing. Also W. Roland Ding, who later became a well-known pilot of the Handley Page Biplane and later manager of the Seaplane School on Lake Windermere.

In *Flight* of April 29th, 1911, there appears the report of the second exhibition and contests; this time held at Bourneville on Easter Monday and Tuesday. This was to have been opened by Mr. Claud Graham-White—who had arranged to fly from Hendon, a distance of 115 miles, in his 50 h.p. Gnome Farman Biplane—he left Hendon at 5.45 am but took 12½ hours, having to alight at Fenny Stratford for fog, and did not start again until 4.15 pm. He alighted again near Coventry for petrol

then he came down at Sparkhill on a football field to enquire the way to Bourneville, where he finally arrived at 6.35 pm in spite of awkward surroundings of houses and trees.

Once again there were a number of classes competed for, and G. P. Bragg-Smith won the Open Championships, and with it the shield.

There is no report of the contest in December 1913, but there is a photo of the winner of the shield, G. Brooke-Rogers with his model and the shield. It looks a very nice shield. The model is a normal twin power type. It also gives full details of the model—which I have appended.

Then in the issue of June 26th, 1914, a notice that the Championships for 1914 had been postponed to August 15th owing to the Club's ground being down with hay; but there are no further reports, possibly due to the outbreak of the war. It would appear from the inscription on the shield that they must have taken place.

Like so many other pre-1914 clubs I assume that it was never revived afterwards. It took the

K & M.A.A. till 1922 to get going again.

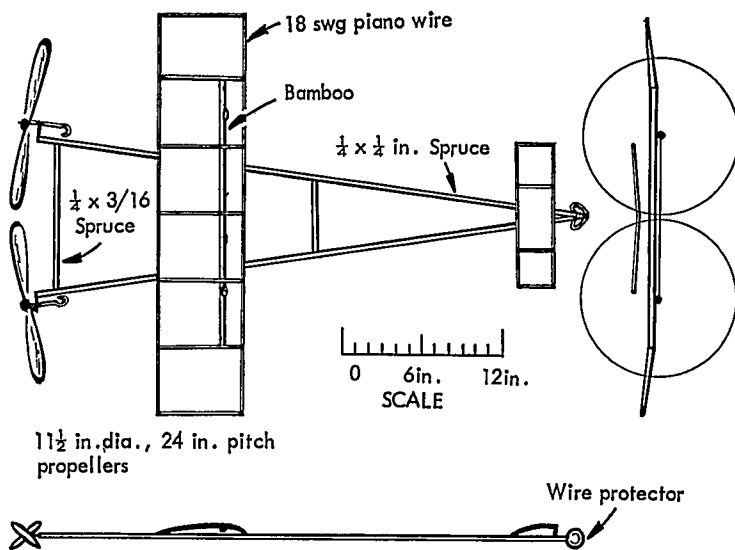
I will be interested if any of the former members get in touch with you.

Incidentally, in all the reports it is known as the Birmingham Aero Club. Only the notice in the photo, brings in the word (Models).  
Preston, Lancs. R. F. Gosling

## Extract from *Flight*, Jan. 31st, 1914

*The Birmingham Aero Club Championships Shield Winner Mr. G. Brooke-Rogers' machine. The following are the particulars of this machine:—length 40 in.; triangular frame; span 30 in., chord 6 in., elevator 10 in. by 2½ in. mounted above the framework; propellers, diameter 11½ in.; pitch 24 in.; number of strands of rubber a side, 8 of ¼ in. strips; weight of rubber 1.75 oz.; weight of machine 4 oz. total 5½ oz. Mainplane constructed of steel piano wire, gauge 18. A centre spar of bamboo is fitted at the top of the camber. The rear edge is flexible and appears to give added stability to the machine. The propellers are steamed ones.*

G. Crooke-Rogers model, as described in 'Flight', January 1st, 1914.





# FLYING SCALE COLUMN

by Eric Coates

Mad dogs and Englishmen . . . the picture that tells it all! At least, reports our columnist, the wind dropped when Terry Manley made his second attempt at the Eddie Ridding memorial trophy event!



## Indoor Nationals August 17th/18th

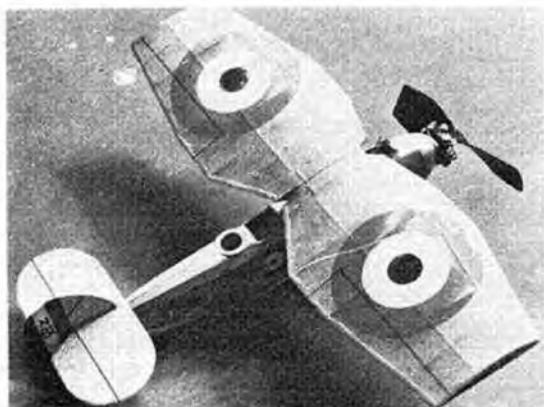
Peanut was flown on the Saturday afternoon, after a morning practice session, and attracted nine entries. All scale flying took place in the No. 2 shed at Cardington over the balloon pad – much less abrasive than the concrete floor. This was the first Peanut competition to be organised by the S.M.A.E. and was something of a tryout for the provisional rules recently formulated by the Scale Technical Committee. These quite simply dovetailed-on the aggregate of the time of three hand launched flights to the already well proven and developed static half of the S.M.A.E. Indoor Scale schedule. As the static marks maximum total was 120 it can be seen that three flights of 40 seconds duration would be required to make an even Static/Flight score ratio.

First away was the *Farman F451* of Bill Hannan, transported back from the recent Scale World Championships in the U.S.A. by Vic Willson and flown proxy by your scribe. A new motor was fitted to this delightful model and it flew perfectly in wide right-

hand circles without any adjustments being necessary. This first flight impressed everyone – not least myself but unfortunately it was terminated prematurely due to the rubber winding round the prop shaft, jamming up the works. Nevertheless 31.3 secs. was recorded. John Blagg flew his beautifully detailed *Waterman Racer* but the heavy structure told its tale and only 13.5 secs. was attained. Similar low scores were recorded by Vic Driscoll (*Wicko*), and Ray Cox (*Air Camper*) before I flew my entry, the Andreason BA4, hurriedly built for a recent review, from the Peck kit. This model proved to be an outstanding, stable little flyer and turned in top score, ('till then) of 38 secs., achieved on 700 turns of a single loop of  $\frac{1}{4}$  in. flat rubber; about a foot long. By contrast, the lowest score of the contest (6.3 secs.) was then recorded by the *Blackburn Airedale* of Peter Smart; being proxy flown by Alan Callaghan. I remembered this bat-winged machine of old – about ten years ago I made a 1/12th scale version powered by an ED 2.46 and I seem to recollect my best time was around 6 seconds, also, with a similar flight performance – literally an uncontrolled flop out of the sky! Alan's own entry was a nice *Bu. 133 Jungmeister* which recorded a consistent 26 secs. on each flight. Another smart looking machine was the clipped winged *Monocoupe* of Andrew Moorehouse; the huge fuselage allowed plenty of rubber to be used but the miniscule wings did not produce much lift, so a brick-like glide reduced its flight times to around 20 secs.

Until this moment, the provisional rules seemed to be working quite well: if you elected to build a super-detailed, spray-painted job and pile up the static marks, together with the attendant weight, then you lost out on flight points. Alternatively, static points could be sacrificed to produce a light model to achieve a higher flight score. At this point it was anybody's contest. All this was changed, however, by young Andrew Barr, son of Laurie Barr, the Indoor Duration expert. Andrew flew an ultra lightweight 'ghost' Piper Cub – one literally could see through it – built from one of the *Micro X* kits Laurie imports into the U.K. This model astounded everyone by its tight corkscrew climb to about 90 feet, nearly twice as high as anything else had achieved and not withstanding Andrew Barr, the lad who upset the Indoor Peanut rules, carefully prepared by the Scale Committee when his model flew too darn well! The Piper Cub built from a *Micro X* kit is supremely light – the secret to success at indoor flying – and this gave Andrew victory. Even his dog's attempt at 're-shaping' it failed to detract from its flying ability.





Peter Smart's Blackburn Airdale was proxy flown by Alan Callaghan in the 'Peanut' event, achieving the distinction of having the lowest flight score 6.3 seconds!



Alan Callaghan flew his Jungmeister in both the Peanut and Open events at the Indoor Nationals, placing fifth and fourth respectively. Not bad for a little 'un!

an indifferent stalled glide (due to a motor bunch) a time of 58.2 was recorded. On his next two flights scores of 62 and 60 seconds were recorded giving him a flight aggregate of 180.2! The final result was all too plain: all that followed was pure anti-climax as the apparent balance that had been achieved by the rules, had been blown wide open in favour of the duration model. The only two models with a remote chance of overhauling Andrew's score were Hannan's *Farman* and my *BA4*. I burst two rubber motors trying to extend the duration of my little biplane but to no avail, returning scores of 39 and 30 secs. respectively. I did coax a bit more out of the *Farman* but it still kept jamming up the prop shaft before all the power was expended.

When the final results were posted a lot of head wagging was to be observed amongst the scale purists. There is no doubt that the Scale Committee will have to review the rules further, to correct the imbalance, but this does not detract from the magnificent win of Andrew Barr who, on the rules of the day, could afford to throw away all his scale accuracy points (he had no documentation) and still beat his nearest opponent by 20 points!

Many more people were present on the Sunday to observe the Open Event, which attracted 12 com-

petitors, only seven of whom managed to achieve the 15 seconds qualifying time. Apart from attaining this modest flight score, duration plays no part in this particular competition as it is the *quality* of flight which matters - from the take-off to landing. Surprisingly six out of seven qualifiers managed at least one 15 sec. flight from a take-off (a hand launch not only gives a duration bonus at the beginning of the flight, but being launched 6 ft. higher in the first place it takes longer to return to ground level . . .).

First place went to the highest static scoring model - the blue, red and silver *Wapiti* of Vic Driscoll. This is the first time in competition that Vic has managed to coax this beautiful machine to take-off and remain airborne long enough to qualify, and a high second flight score put him clear in the lead with 272 points. Next came the best flier of the meeting, with 238 points, the *Hornet Moth* of Mike Reeves. This was something of a dark horse: no trimming flights having been observed before the contest. It was by far the largest model present being built, to 1/16 scale, directly from the *Aeromodeller Scale Drawings* (plan pack 2930, price 40p). Almost a scale propeller was used as a step-up gearbox was fitted. Although mechanically inefficient, requiring much more rubber than a direct drive, a gearbox model does not suffer

Second place in the Open event went to Mike Reeve's 1/16th scale D. H. Hornet Moth, the largest model present. It also proved to be the best performer in its class.

That prolific builder Alan Moorhouse flew a clipped-wing Monocoupe in the Peanut class - bulky fuselage hindered glide.



anything like as much from the power-surge problem and this usually results in a long realistic take-off and steady climb characteristics well portrayed here in Mike's model. He hand launched for the first flight, hit an obstruction on the landing approach on the second, but made no mistake to record the highest flight score of 130 on his third.

Quite some way behind, at 198 points, I surprisingly made third place with my venerable and rather battered *Puss Moth*. Never a high scorer in static, being a coloured tissue job, it nevertheless still turns in a reasonable flight performance, at a scale speed, due to its lightness.

In fourth place was Alan Callaghan flying the *Jungmeister* he flew in 'Peanut' the previous day, while Butch Hadland, busy flitting from one hangar to the next (flying in duration as well) was close behind for 5th place with a *Stosser*.

Unluckiest man of the meeting was John Blagg who could not make his rebuilt *Demoiselle* produce the 15 seconds and blew his centre-section to pieces putting on that 'one turn too many' for his second contest flight.

Altogether a very successful indoor meeting conducted in a sporting manner that was an example to many other competitions. The events were made all the more worthwhile by the excellent prizes presented by *The Small Scale Service* and *The Modellers Den*. Thanks are also due to the long hours put in by the Judges, Messrs. Cordwell, Willson and Thumpston.

## Results

Peanut	FLIGHT	STATIC	TOTAL
1. A. S. Barr	180.2	10	190.2
2. W. Hannan (Proxy E. Coates)	112.3	60	172.3
3. E. A. Coates	107	46	153.0
4. A. Moorhouse	76.7	67	143.7
5. A. Callaghan	78.6	60.5	139.1

## Open

1. V. Driscoll	120	152	272
2. M. Reeves	130	108	238
3. E. A. Coates	110	88	198
4. A. Callaghan	102	92	194
5. C. Hadland	84	106	190

## Eddie Riding Trophy

A week later on August 25th I made my annual pilgrimage to Woodford to compete in the *Eddie Riding Memorial Trophy*. The Weather Gods were not kind to the North-West area this year: a 20 knot wind and rain forecast must have deterred many would be competitors. The wind moderated slightly in mid afternoon but only three competitors were willing to fly: D. Priest of Leicester, Terry Manley and myself. I was first away with the 9a which performed steadily in the windy conditions, depositing its pair of '250 pounders' on the runway shortly after take-off. There was a brief moment of anxiety as she banked steeply left when turning before a safe altitude had been achieved but all was well and the old Mills cut out conveniently when the model was pointing back up wind again, allowing a gently-into-wind landing to be accomplished. Next to fly was the *Sopwith Snipe* of D. Priest, a very spectacular affair. After the briefest of runs this P.A.W. powered machine rapidly climbed to about 50 feet, performed a stall turn, to come zooming back down into the spectators who had to hurl themselves flat if fear of life and limb - pity they weren't clad in field grey to complete the effect! After



'Tis himself, it is! Eric about to 'eat' the opposition - in fact Bill Hannan's Farman Moustique 'Peanut' which he flew by proxy into second place. A delightful performer.

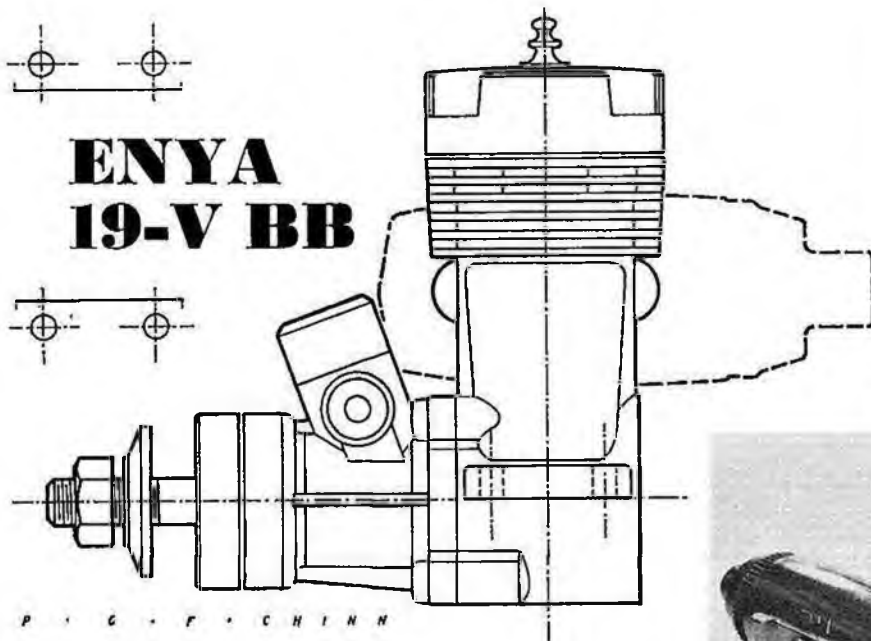
this the *Snipe* levelled out, dropped its oversized bomb, and made a quiet landing - all without the benefits of radio control. Then the rains came just as Terry Manley was about to fly his *D.H.4*. The judges asked if he wished to continued but rather unwisely, in my opinion looking at the mass of black clouds approaching, he decided to wait. When he finally made his flight, a few minutes before the contest closing time, it was teeming down. On its first attempt the '4' turned widely to the right but did a 'touch and go' on the runway about 10 seconds after take-off, so nullifying the flight. His second attempt, made without bombs loaded on the racks to reduce the wing loading turned left and just managed the minimum flight time. Terry made several more attempts, assisted by umbrella shielding officials, to improve on this flight score, but now the model was becoming distinctly soggy and was showing less and less inclination to fly in the appalling conditions. The only consolation Terry had was that although it was pouring down, the wind had dropped to nil so one could say the conditions balanced out!

## Results

	FLIGHT	STATIC	TOTAL
1. E. Coates	461	265	726
2. T. Manley	486	234	720
3. D. Priest	356	230	586

Winner of the Open event, Vic Driscoll with - would you believe? a Wapiti! Vic has had so many hundreds of successful flights with his diesel powered Wapiti, that it seems natural for him to have equal success with a scaled down rubber powered version.

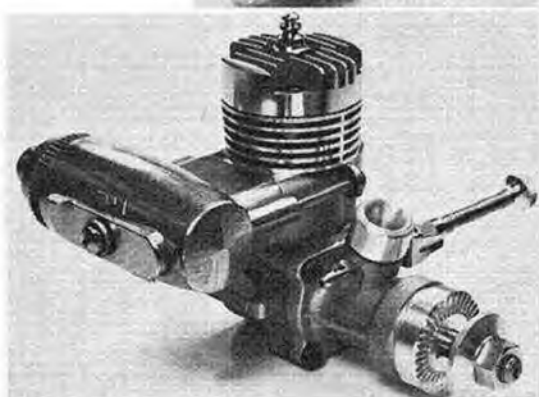
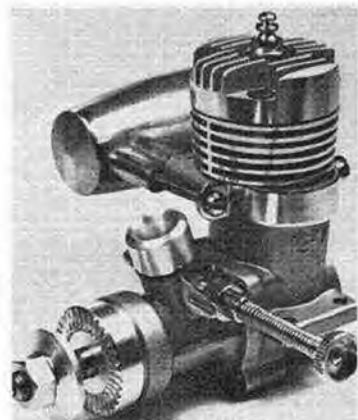




# ENYA 19-V BB

## ENGINE TEST

by Peter Chinn



OF THE EXTENSIVE range of Enya engines imported from Japan by RipMax Ltd., the latest to be seen in the U.K. is the Enya 19-V BB. Basically this is the Enya 19-V or Model 4005 design first seen in 1970, but with certain modifications including a completely new front end incorporating a ball-bearing mounted crankshaft.

It was with a .19 cu. in. class engine that the Enya company began the quantity production of model engines in the early nineteen-fifties. After producing a sandcast engine in small quantities in 1950, the Enya brothers introduced the Enya 19 Model 4002 which continued in production for five years until succeeded by the Model 4003. In 1962 this in turn was replaced by the Model 4004 which, itself, was in production for some seven years. All these engines followed the familiar Enya layout of shaft rotary-valve induction, crossflow scavenging, a one-piece crankcase/cylinder-casing with drop-in liner and a detachable front end. The most marked change came with the Model 4005, when the 16 x 16 mm. bore and stroke combination that had been used for nearly twenty years, was dropped in favour of more modern 'oversquare' dimensions of 16.6 mm. bore by 15.0 mm. stroke.

The main casting, cylinder-liner and piston and connecting-rod assembly are essentially the same as those of the standard plain bearing 19-V, although a side by side comparison of the 19-V BB with the earlier model, revealed that the ball bearing engine had slightly shorter transfer and exhaust periods. It was also noted that the wedge pattern cylinder head was slightly modified.

Whereas, in the past, ball-bearing engines have often had to use smaller diameter crankshafts than plain bearing counterparts, the 19-V BB actually has a larger main journal (12 mm.) than the 19-V (11

mm.), made possible by the use of a special 12-ball rear ball-bearing having an o.d. of only 21 mm. This has enabled the induction passage through the shaft to be increased from 8.0 mm. to 8.5 mm. The rectangular shaft port registers with a round intake aperture to give a measured rotary-valve timing of approximately 49 deg. ABCD to 50 deg. ATDC.

At the front, the shaft is carried in a  $\frac{1}{4} \times \frac{1}{8}$  in. ball-bearing, shielded on its outer side. The bearing is also protected by a new large-diameter machined prop driver that is located by a sunk key. Instead of the metric thread formerly used, the shaft now terminates in a standard  $\frac{1}{4}$  UNF thread.

Necessarily larger, to accommodate the ball-bearing mounted shaft, the front housing is secured with 3.5 mm., instead of 3 mm. screws and extends the engine's frontal overhang by approximately  $\frac{1}{8}$  in., but total engine weight is increased by less than  $\frac{1}{8}$  oz. The larger diameter intake boss is less sharply raked forward and there is a choice of 6.8 mm. or 7.3 mm. i.d. intake venturi sizes. These, after allowing for the spraybar, give effective choke areas of approximately 11 sq. mm. and 14 sq. mm. respectively. The engine is also available in a radio-control version, known as the Enya 19-V BB TV and can be easily converted to this type merely by fitting the appropriate Enya throttle type carburettor.

### Performance

From the very first, the 19-V BB was found to be easy to start and very free running. It was, nevertheless, given a full sixty minutes of intermittent running to ensure that it was fully run in.

The first series of tests was carried out with the smaller (C/L Stunt size) venturi choke in place and with the standard Enya small size expansion-chamber fitted. This silencer has a 6 mm. outlet and is



reasonably effective in muffling the exhaust note but, understandably, at the cost of some top end power. Prop revs recorded at this point, using 5 per cent nitro fuel, included 10,750 r.p.m. on a 10 x 3½ Top-Flite wood, 10,900 on a 9 x 4 Tornado nylon, 11,300 on a 9 x 4 TopFlite nylon and 12,100 on an 8 x 6 Power Prop wood. There is no point in propping the engine, under these conditions, for faster speeds since, at 12,000 r.p.m., it has already reached its peak power.

Switching to the larger venturi insert (still with the silencer fitted) had little effect at speeds below 11,000 r.p.m., but flattened the torque curve slightly, raising peak output approximately 5 per cent to just over 0.30 b.h.p. at 12,500 r.p.m., equivalent to an increase in prop speed of about 200 r.p.m. when the engine is propped for around 12,000.

Finally, the 19-V BB's gross b.h.p. on 5 per cent nitro with the large choke venturi was checked by removing the silencer. Again, the increase in maximum torque was not dramatic but, as expected, considerably greater power was liberated at the top end, b.h.p. being increased to 0.34 at over 14,000 r.p.m. Prop speeds were raised between 300 and 700 r.p.m. in the 11,000-14,000 r.p.m. range.

The performance of the Enya 19-V BB was in line with expected levels for an engine of this class and displacement, running on standard 5 per cent nitro fuel. Admittedly, power output was not markedly better than was achieved earlier with the plain bearing 19-V model, but this is not to say that different results might not have been obtained with two other examples. Our earlier report on the 19-V had shown our test sample to be rather better than another example checked out at the same time. We suspect that the present 19-V BB was no more than an average example, so it is reasonable to suppose that the manufacturer's claim, that the 19-V BB is about 10 per cent more powerful than the 19-V could be right.

In all other respects the 19-V BB was more than pleasing. Handling and running qualities were excellent. Hand starting was always quick and reliable and the engine remained docile even on the smallest sized props allowing speeds in excess of 15,000 r.p.m. On both large and small props, the 19-V BB ran steadily and smoothly. Incidentally, although the average owner is unlikely to need to use anything larger than a 9 x 5, the 19-V BB showed no distress at being loaded down with much larger props; for example 10 x 4, 10 x 5, 11 x 4 or even 11 x 5, such as a free-flight scale enthusiast might wish to use with a largish model.

#### SPECIFICATION

Type: Single cylinder, aircooled, glowplug ignition two-stroke with crankshaft rotary valve and twin ball-bearings.

Bore: 16.8 mm. (0.6635 in.)

Stroke: 15.0 mm. (0.5905 in.)

Swept Volume: 3.246 c.c. (0.1981 cu. in.)

Checked Weights: 172 grammes — 6.1 oz. (less silencer)  
215 grammes — 7.6 oz. (with silencer)

#### General Structural Data

Pressure diecast aluminium alloy crankcase/cylinder casing with drop-in steel cylinder-liner. Pressure diecast aluminium alloy detachable front housing secured to crankcase with four Phillips screws and containing on 12 x 21 mm. 12-ball steel-caged ball journal bearing at rear and on 1/4 x 5/8 in. 6-ball steel-caged shielded type ball journal bearing at front. Hardened steel counterbalanced crankshaft with 12 mm. main journal, 8.5 mm. gas passage and 5 mm. solid crankpin. Lapped cast-iron piston with straight baffle and fully floating 4 mm. o.d. tubular gudgeon-pin with brass pads. Pressure diecast aluminium alloy connecting-rod with cast-in bronze big-end bush. Pressure diecast aluminium alloy deeply finned cylinder-head with machined joint face and cast-in brass thread insert for glowplug and secured to cylinder casting with four Phillips screws. No head gasket. Machined aluminium alloy prop driver keyed to shaft with short 2.5 mm. square sunk key. Machined aluminium alloy choke tubes giving choice of 6.8 mm. i.d. or 7.3 mm. i.d. Nickel-plated brass spraybar assembly with flexible needle-valve extension, reversible for left or right hand use. Beam mounting lugs.

#### OPTIONAL EXTRAS

- (i) Enya expansion-chamber type silencer.
- (ii) Barrel throttle carburettor (for conversion of engine to 19-V BB TV type).

#### TEST CONDITIONS

Running time prior to test: 1 hour approx.  
Fuel used: 5 per cent pure nitromethane, 20 per cent Newton R castor-oil, 75 per cent methanol.  
Glowplugs used: Enya No. 3 (medium reach. 1.5 volt, platinum-rhodium filament).  
Air temperature: 11 deg. C (51 deg. F).  
Barometric pressure: 1014 mb. (29.94 in. Hg.).  
Silencer used: Enya expansion chamber type (28 sq. mm. outlet area).

Following the conclusion of all tests, the 19-V BB was dismantled and its parts closely examined. These were found to be in excellent condition.

**Power-Weight Ratio** (as tested on 5 per cent nitromethane fuel):

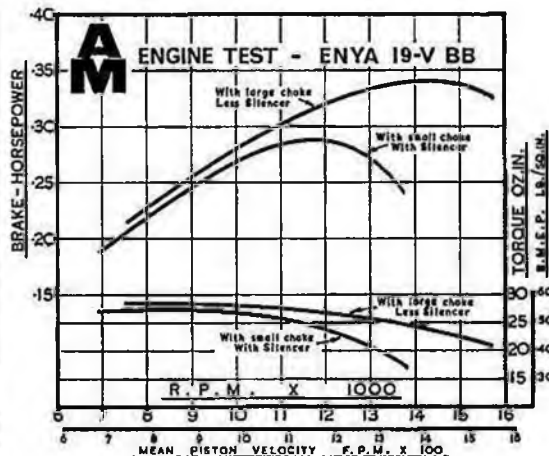
0.61 b.h.p./lb. (small choke, with silencer)

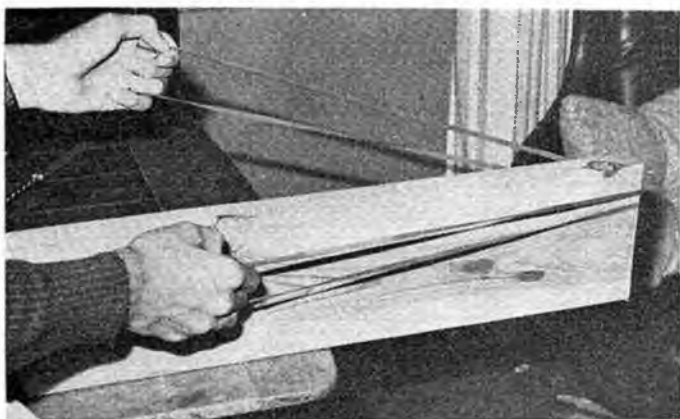
0.89 b.h.p./lb. (large choke, less silencer)

**Specific Output** (as tested on 5 per cent nitromethane fuel):

88 b.h.p./litre (small choke, with silencer)

105 b.h.p./litre (large choke, less silencer)





### Talk about Turns

A table of turns (as shown in Figure 1) is a useful guide when starting to wind up a new rubber motor, however, the figures should not be taken too literally. It is well worth sacrificing a new 'Coupe' motor to discover just how many turns it will actually take, as no two batches of rubber are ever quite the same. I believe that rubber which has been kept for a long time in air and light-tight conditions will take a larger number of turns than a fresh stock just arrived from the manufacturers.

Is it necessary to 'break-in' or 'run-in' a rubber motor? Yes, simply because more turns can be stored at maximum torque value on a motor that has been correctly broken-in. If a 'Coupe' motor (10 grammes of  $\frac{1}{4}$  in. strip) is made up from brand new rubber, lubricated, and then wound up, it will

break through all six or eight strands before arriving at the potential maximum turns. If, however, the number of turns is only gradually increased, giving the motor a little time to 'recover' each time, then the potential maximum turns at maximum torque value can be attained. As mentioned in Part III of this series, this can generally at most be obtained on two occasions from any one motor; in an important contest I use a new motor for each flight.

### Method of Running in Motors

1. Lubricate motor, and hook over a smooth door handle or other fixture that will not cut the rubber strip. It will be six or eight strands, but eight gives a quicker result.

## RUBBER TECHNIQUES

### Part IV of Ron Coleman's hints for beginners to rubber power

'Coupe' motor being hooked over end of 8 ft. long board to be stretched up to, and hooked over, the other end - and left for exactly 15 minutes. The motor is then fully broken-in or run-in.

2. Wind on half maximum turns with the hand-drill winder and let it run down. It will spin the hand-wheel rapidly.

3. Wind on three-quarters maximum turns, and let it run down.

4. Repeat (3).

It is often possible to use these running-in sessions as short test flights for trimming the model, perhaps a week before a contest - the rubber then has several days to 'recover'. However, running-in motors in large quantities, say 20 or more, using the hand-drill to continually wind up and release, can be a very tedious business.

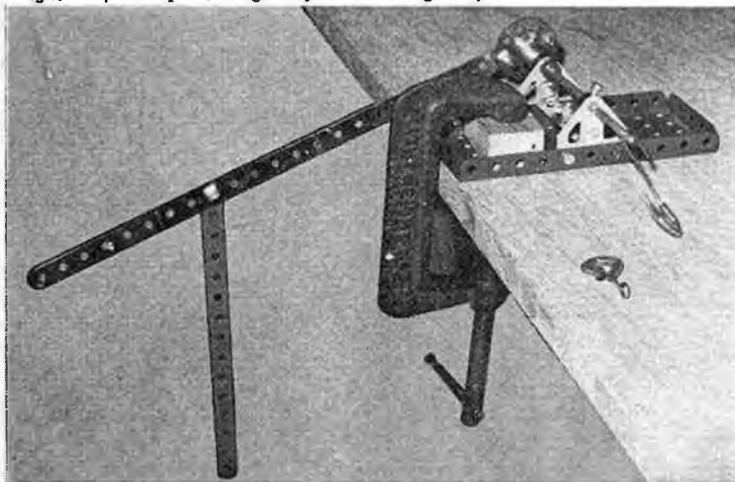
An easier method, far less time consuming, is to take the motors one at a time, without lubricant, and stretch them for seven times

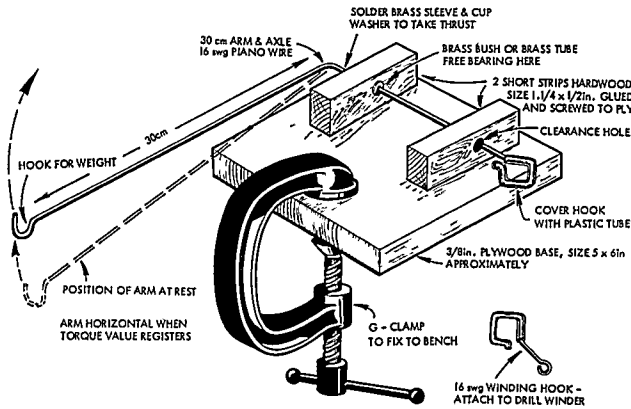
Figure 1  
Table of Turns for  $\frac{1}{4}$  in. x  $\frac{1}{24}$  in. x  $\frac{1}{24}$  in. rubber strip.

Number of Strands	Turns per Inch
2	60
4	41
6	34
8	29
10	26
12	24
14	22
16	19

Maximum Turns may be reckoned as inversely proportional to the square root of the motor cross section.

Maximum Turns =  $\frac{C}{\sqrt{S}}$   
 where C = coefficient depending on condition of rubber. Good rubber should be between 9.2 and 10. For "safe" number of turns reduce to 8.6  
 and S = total cross section of rubber motor.





**Figure 2**  
Simple torque mechanism to measure torque of rubber motors in gm/cm. This is an alternative if Meccano parts are not available.

their length and hold in position for 15 minutes. Large, round-wire nails driven securely into two convenient fence posts in the garden provide handy anchorages for this job! Perhaps screws or cup-hooks would be safer to avoid catapulting a large nail through a neighbour's window – if that is not stretching (!) the imagination too far. . . .

A long piece of board, an inch or more thick, with the corners rounded off is a good alternative for indoor use. Make the board  $3\frac{1}{2}$  times the motor length, then the motors can be doubled around (see photo). For Coupe d'Hiver motors having a five foot length of rubber (making a 30 in. loop) a board 8 feet long is required, this allows two inches for the thickness of the board and the remaining seven inches for the rubber used in knotting the loop (calculated length of board is 8 ft. 9 in.).

The operation of stretching the motors on to the board does seem to be rather drastic at first – there is the impression that the rubber surely cannot stretch enough to hook over the far end of the board. It is necessary to fix the board, by holding in a bench vice or by attaching to a table edge with G-clamps. After a few motors have been stretched, the determination and technique are readily discovered. Take care to leave the motors in this extreme-stretched condition for not more than 15 minutes; they should be allowed to recover for at least three days before use in the model.

There can be considerable variation between one batch of rubber and another. Sometimes a very good batch will give the best per-

formances to the model with lots of max. flights, then the next lot purchased seems to be absolute rubbish by comparison! It is all very well to have a table of turns, or to discuss at length with other competitors the number of turns one has managed to put on a given motor. Extravagant claims are sometimes made on published drawings about the number of turns possible on Coupe motors, e.g. 400 plus on six strands. Yes, but at what torque value? The only times I have managed such a number have been with 'clapped-out' rubber that wouldn't keep one's pants up, let alone the model . . . it is the torque value that puts the model 'upstairs'.

At the end of a summer flying season there may be several dozen Coupe d'Hiver rubber motors in various plastic bags and boxes, in all sorts of conditions and states of usability. Some are new motors, just run in (but the label has been lost from the bag). Some have been used only once (who put

these in the wrong bag?) Some are completely 'whacked out' (don't you ever get rid of clapped-out motors?). And so on – a great pile of mixed-up motors; how can they be quickly and efficiently sorted out?

First, put them all through the washing machine and spin dryer. Place all broken and obviously 'chipped' motors on one side for possible later re-knotting. Now place the remainder in a large plastic bag, pour in some lubricant and give them a good rubbing-in.

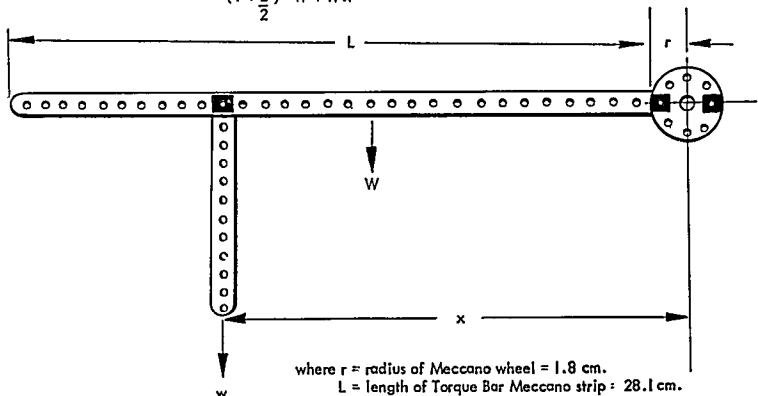
Now proceed to pass the motors, one at a time, made into eight strands, through the torque apparatus illustrated. Hook each motor on to the end of the spindle and to the winding drill by means of the plastic-tube covered hook and ring, then stretch the motor to twice its length and carefully wind on turns, counting and noting the number of turns of the handle until the torque bar just lifts into the horizontal position. If your winder has a  $3\frac{1}{2}:1$  ratio, something like 22 to 25 turns shows a good motor. Place in the bag labelled 22-25. Perhaps the next motor will take 30 turns to lift the torque bar. Place it in the bag marked 28-31, and so on. The numbers of handle turns simply provide a reference measure of the torque potential of the motors, and so they can be fairly quickly sorted out, and may be put to use next flying session with confidence.

The torque value measured in gramme-centimetres for a given motor at maximum turns can be found by adding weight to the torque arm of the apparatus, measuring the weight and the distance, and applying the arithmetic shown in figure 3 below.

**Figure 3**

TORQUE IN GM/CM = WEIGHT OF TORQUE BAR  $W$  multiplied by length  $x$

$$= \left( r + \frac{L}{2} \right) W + Wx$$



where  $r$  = radius of Meccano wheel = 1.8 cm.  
 $L$  = length of Torque Bar Meccano strip : 28.1 cm.  
 $W$  = weight of Torque Bar in grammes  
 $w$  = weight of 15-hole Meccano hanging strip  
 $x$  = distance in cms of strip from axle centre

# topical twists

by 'Polonius'

illustrated by Sherry

## Not for Love or Money

There is not much good you can say about inflation, but it does tend to throw us back on our own resources. I mean, we are less likely to ask for that quick-fit component when we see that the p-factor has doubled overnight. And now that a tighter family budget puts the newest in hover machines in direct competition with a replacement Hoovercraft, the workbench may become as important a sphere of model production as the shop counter.

What adds to the problem of initiation are the demands of women's libbing. In the good old days of male dominance the little woman was put to darning socks and re-arranging the broken bits of furniture over the holes in the floor covering, while big hairy hubby whacked out liberally on the latest model luxuries. Now a docile species of hubby strives to keep his wife in the manner to which the trendy women's mags have accustomed her, so that before he can think about that latest propo equipment he has to provide wifey with her own brand of goodies, like central heating and colour television. And, bringing him right down on his knees, he has to waste precious building and flying time in taking her out.

It was not unknown for an old pre-lib enthusiast to pass his wife in the street without recognising her. Over the years of intensive, head-down hobbying it is possible that he had never had a really good look at her, meeting her only on special occasions and times of crisis: at the altar, for instance, and when the three-year-old child got lost in the overgrown garden. Happily, the breed is not entirely extinct, and the most to be admired are those who actually train their wives to build and fly model planes. Life, to such wives must be cruelly frustrating, for what do they find to complain about?

## Chopper-y Waters

The phlegmatic calm of the great British public in the face of world shattering events is something that continues to bemuse the excitable foreigner. Thus, when a model helicopter was presented at British Customs for an historic attempt on the English Channel, our imperturbable customs men were wholly unimpressed, possibly giving it an officious going over for contraband and pleaded with not to bash it too hard with the jumbo sized rubber stamp; then sending it on its momentous way with not so much as a twitch of a stiff upper lip.

The model landed, together with its parent chopper, however, to a quite rapturous welcome from the French Douanes, who wrote all manner of historic valedictions on those parts of the model which were not already covered with commercial billings. Truly, a 'la mere's' tale to rival that of Bleriot's.

Come to think of it, we in this country, took old Bleriot's fateful landing with a good deal of insouciance, too. Some agitated bucolic may have waved a threatening pitchfork, and a few letters appeared in *The Times* on the peril of aerial crop damage, but



generally the English were not prepared to greet the event as the dawn of a new air space age or anything like that. And, as far as we know, old Bleriot had to dig the propeller out of the cabbages himself.

It is probably a good thing that this commercial package tour was not the other way round, for whilst there is nothing really worth smuggling out of utilitarian England, there are plenty of forbidden goodies and baddies to come in from the other side, and our own *douanes* would have had the model stripped down and even put in quarantine for six months.

## Keeping our Distance

It is not long before the 'free' in free-flight will, in fact, be in inverted commas. Already the pundits are exploring the possibilities of putting it on the radio control leash, and now we have the various nations falling over each other to cut down performance to a point where timekeepers will, perforce, give up their stopwatches in favour of tape measures.

Personally, I should say enough is enough. Acknowledge that you can no longer fly models high, wide and handsome, and you might as well give up free-flight altogether – certainly before you reach that dreadful point where the organisers dish out 15p Streakers to the competitors.

What the free-flyters should be fighting for is not less model but more space. All too often the organisers of international events are keener on flying the bunting than the models, and the smaller the field the denser the flag concentration – and how colourful they look against the green background of the surrounding forests.

Oddly enough a plea for quite drastic flight reduction comes from Russia, where, it seems, even the vast Steppes are covered with Workers' flats. They want the Wakefield rubber content reduced so much that you would not be certain whether the motor was the wing retaining band or vice versa, and you wouldn't need a winch for a glider towline, but a cotton reel.



# SPACE MODELS WORLD CHAMPS

Dubnica, Czechoslovakia,

September 4-8th, 1974

Reported by Peter Richardson

Winner of the true-scale event, was Ottokar Saffek of Czechoslovakia who spent many hundreds of hours on his Saturn 5. The additional transparent fins for greater stability are just visible, as are the protruding ends of the three motors used, although five can be fitted.



WITH THE EXPERIENCE of having organised annual International Space Model competitions since 1965, the Dubnica club were more than qualified to arrange this second World Championships event – and they proved perfect hosts with excellent accommodation for the nine competing nations, good field administration and efficient organisation, all of which helped make this most friendly meeting a big success.

British participation consisted of Peter Freebrey and John Wheddon, each of whom had competed in the first World Champs (in Yugoslavia) as well as in the 1973 *Dubnica* May International – with more than a little success (Peter in fact had twice placed second in the Boost Glider event). Your editor, paying the price of being easily led (when it comes to modelling topics!) had become interested in this new sport following the report of the '72 World Champs and was talked into joining this pair to make a full British team. Space modelling being illegal in this country, there was no opportunity to test-fly the models – John and Peter relying on

their previous experience, while my own were built as a result of picking their brains and following their designs.

Six competitions were arranged, and as these events are 'foreign' to British (and European) modellers, the rules are briefly explained as applicable, but to appreciate this form of competition some details should be borne in mind. Total thrust developed by the motor is restricted in each category, although different motor types produce different thrust curves – these characteristics are important and are chosen to suit your particular requirements. After the thrust has expired, a further (reverse) charge causes the nose cone to be blown off, releasing the recovery device (streamer or parachute). As the rocket will still be travelling fast when the motor has exhausted, there is a delay before this eject charge operates, enabling the rocket to 'cruise' to maximum height (apogee). Again different motors have different delays, and this choice is again critical so as not to eject too soon or too late.

In all of the contests, two flights were

permitted (best to count) but only one model could be used and this had to be returned to the flight director within one hour of launch in order to record a time.

## Parachute Duration

As its title indicates, duration is the name of the game, and for this category two main options are available to the competitor. Either use a slim rocket (less drag = more height) which will only hold a fairly small parachute, or aim for less height with a fatter rocket capable of holding a much larger 'chute which will give better duration. However, to complicate matters, wind strength and visibility come into play – a big 'chute goes a long way on a windy day, but will be more visible than a small one – and remember the 'retrieve in one hour rule'! Fortunately, to ease the latter dilemma, the organisers had provided each team with a 50 c.c. motorcycle (and rider) for recovery duties.

Our approach was to use slim rockets with small (24 in. dia.) 'chutes in order



At far left is Peter Freebrey, aided by John Wheddon, readying his world record breaking scale altitude version of the Skua Mk. 1. Below: Zygfryd Franckiewicz of Poland displays his parachute duration bird – and the gold medal it won for him.





Pete and John 'prep' the former's payload model helped by Stancko Mazak, of Czechoslovakia, who also assisted us tremendously, particularly with translations and recovery duties. At right, S. Mokran of Czechoslovakia 'loads' his R/C boost glider onto the launch rod - note the nose pod housing the cluster of three motors.



to record a score, then to 'go for broke' on the second attempt. John Wheddon broke the ice, recording a very useful 235 seconds. I was next and recorded 282 o.o.s. - and was greatly relieved to see John return via the motorcycle clutching the model, having fully expected to lose it in a thermal (which are definitely not wanted unless you have sorted out the complexity of a D/T). Peter however, was less fortunate having experienced severe ignition problems, and then missed recording a score when his parachute failed to deploy - a disaster which occurred on the second attempt too. John then tried a 30 in. 'chute which only partially deployed and my own second effort resulted in the shock cord breaking, releasing the rocket body from the 'chute, causing a zero time.

The eventual winner, Frankiewicz of Poland, used a 31 in. diameter 'chute in a 'fat' rocket to record 375 seconds, but the hard luck story went to the Spanish team who lost a large 'chute in a thermal after being visible for quite a considerable time. A glance at the scoreboard reveals very 'erratic' times, most competitors recording one good and one poor flight, which says little for consistency - there are many factors that can, and do, go wrong! The weather itself caused problems, with periods of calm interspersed with moderate breezes during the brief three-hour period of the contest.

#### Boost Glider

This event, held in the afternoon of the same hot day, is potentially the most difficult. Here the object is to obtain the greatest duration from a glider which is carried aloft by rocket motors, and which are then ejected - this distinguishes the machine from being a rocket-propelled glider. There are two main approaches to this exercise: either a glider of up to A/1 size is used, being propelled by a motor (or cluster of motors) in a nose pod, the motors being ejected at apogee. Problems with this set-up is the difficulty of trimming the glider for the vertical climb under power (over 9 lb. thrust with the motors allowed for this event!) consistent with suitable trim for a good glide. The second approach is known as a 'parasite' glider - a conventional rocket carries aloft a chuck glider-size model which is released at apogee to glide down to earth. This set-up has the advantage of gaining much greater altitude (less drag) although the glide is not as good, and the model presenting a much greater degree of eye-strain for the timekeepers.

Our approach was the latter - Peter using the same model as placed second at the previous international - the glider being a canard, as this presents greater 'fin area' to the rocket for the climb, obviating any stability problems under power at the expense of glide performance. My own was a copy of this vehicle, with a slightly larger-area glider, while John employed a simple V-dihedral conventional chuck glider of greater wing area. In the contest, John's model proved the best of the British team, the first launch being perfect with good transition, followed by a near 2½ minute flight, but he failed to record a second score when the glider and rocket refused to separate.

Peter Freebrey's first launch was fine, but the glider was out of trim, which he later corrected to score just two seconds less than John's score. My own glider suffered from too tight a turn on the first flight - and adding ballast to the wrong tip (!) worsened this considerably on the second attempt...

The winner S. Mokran of Czechoslovakia favoured the 'rocket glider' approach using a cluster of three engines fired simultaneously, as did his team-mates - the only difference being that he used single channel R/C to control the glide. All perfectly legal, and an ideal solution to keeping the model within eyesight, let alone the ability to steer the ship into thermals. The casualty rate in this class was high, many zero scores being returned - and the prize for the most novel must go to American Mike Micci, who had a para-wing glider totally enclosed within a very long, slim rocket. At apogee, out popped the glider, spreading its polythene wings at a great altitude. Unfortunately, matters then went wrong as the model stalled and never recovered...

#### Payload

An altitude event, the only limitations being the total impulse allowed (10 Newton seconds) and that a 28 grammo load weight be lifted. A further requirement was that a recovery parachute had to be employed, and perhaps most important of all, the rules decreed that if the model was not seen by the four tracking stations, then the fault was yours, and a zero score was recorded.

Working until 3 a.m. that morning, Pete had made a copy of the American's 'secret weapon' - a piston launcher, a device which utilises the rapidly expanding gases of the motor at take-off to provide extra propulsion, and this worked well in practice.

Peter was really unlucky - his second flight (using a Czech 'Widow Maker' engine and the piston launcher) being tracked at 556 metres - easily better than the final best score but unfortunately our lack of experience of using parachutes on this class of model caused his downfall, the model sailing away out of sight, and without the motorcycle retrieval (which was only available on the first day) we could not find it - thus losing this score. My own rocket proved marginally unstable, with a 'spirally' climb which lost altitude - and on the first flight the parachute became detached, causing no score. John proved best with his much longer (and more visible) rocket, eventually placing 7th, again using the piston launcher and Czech engine.

#### Altitude

This class of model was restricted to 5 Newton-second impulse engines and merely required streamer recovery, so retrieval proved no problem. The main criterion affecting altitude really concerned motor thrust characteristics, low drag and optimum weight, thus most models were very similar, although some tried the approach of using two-stage rockets. Again we stuck to simple basic models, and this would have paid off but for a bit of luck!

John was most unlucky - his first attempt suffering from a motor failure which destroyed the top part of his rocket body. This 'catastrophic failure' permitted him a re-flight, so he simply shortened the body tube by a couple



At right: K. Urban (Czech) with 4th placed Saturn V, but certainly best performer. At far right: Col. Howard Kuhn of U.S.A. readies his two stage altitude model on its piston-launcher – no other 'guidance' being felt necessary, although we used the piston within a tower launcher, for greater reliability.

of inches and was back in business, only to have his flight go un-recorded by the trackers. Peter was equally unfortunate – his first flight being exceptionally good, but unseen, while a poor motor (it happens occasionally) cost him around 100 metres on the second run. This we can only assume, as my own rocket is marginally larger in diameter, and used the same type of motor and launcher, recording a best flight of 502 metres.

#### Scale Altitude

By the third day the excellent weather deteriorated to provide low cloud and dull conditions – not the ideal weather for an altitude competition with 40 Newton-second motors permitted!

The contest caters for perhaps 'Class II' scale rockets, with points awarded for scale accuracy and flight performance. Pete and John had both spent many hours finishing off their models at the contest site, working through into the early hours of each morning!

John was first to fly with his *Sky-lark* – a single stage rocket – but had the misfortune to have the parachute detach itself following a good boost-flight and successful separation, nullifying his score, but luckily without serious damage. On the second flight the worst happened: the 'chute failed to deploy and it turned over to plummet to the ground with the usual i.e. fatal, result. Peter was not without problems – on the first launch his superb *Skua* suffered a motor failure – the eject charge following the initial power burst with no delay causing a spectacular 'blow-up' as the parachute deployed while the model was still rapidly climbing. It landed, fortunately not hard, breaking a fin which he repaired with '8-second' glue. Early in the second round he made his second attempt – and what a beauty! A perfect boost pushed the model to an incredible height – and right through a small clear patch in the otherwise overcast sky. A great relief – it was tracked to give Pete not only first place, but also setting a World Record in the process! A great achievement following an otherwise frustrating week for him, making all the midnight oil burning sessions seem so worthwhile!

Many of these altitude scale models suffered catastrophes with fins being shredded on the climb (9 lb. thrust



remember), parachute failures and instability problems.

#### Scale

The only event which we did not contest was for true scale models, which merely have to fly sufficiently well to qualify for a score, although this flight is judged for realism. Once more Saturn 5s predominated which reflects the easy availability of information and ample scope for complexity points for this rocket. Workmanship was superb, the eventual winner, Ottakar Saffek, spending literally hundreds of hours on his huge (approx. 4 ft. long) Saturn 5 which used a cluster of three motors for power. His first flight was a heart-stopper, the model reaching only a few hundred feet before turning over and returning at the same speed that it climbed! At the last moment the 'chute deployed and it landed with minor damage.

Most impressive flight was by K. Urban, also of Czechoslovakia, and also with a Saturn – but his even duplicated the slow rotation of the full-size on lift-off – clear plastic stability fins were angled to achieve this. Howard Kuhn of the U.S.A. flew his superb Javelin (had to make 48 Phillip-headed screws for each section!) – but it performed too well disappearing through the low cloud to reappear eventually dangling on the end of its parachute.

Thus as a team we did well with a 'first' individual place, one second, one third and three fourth team places. Bear



in mind too that we are deprived of the opportunity to try out our craft, and the competition we faced all had to compete in team-trials to qualify for this meet.

Are space models so easy to fly that beginners can succeed? Yes and no – at present the rules allow a large element of luck to decide winners, but on the other hand, being practising aeromodellers proved a big advantage. Many modellers there were specialists in space-models and perhaps lacked an appreciation of the importance of streamlining and light weight.

#### Results:

##### Parachute Duration (25 entries)

1. Z. Franckiewicz (Poland) 375 sec.  
2. A. Nikolov (Bulgaria) 373. 3. V. Constantineanu (Romania) 322. 4. P. Richardson (G.B.) 282. 8. J. Wheddon (G.B.) 235. 22. P. Freebrey (G.B.) 28.  
Team Results: 1. Bulgaria. 2. U.S.A. 3. Poland. 4. Great Britain.

##### Boost Glider (22 entries)

1. S. Mokran (Czech) 281. 2. T. Taborsky (Czech) 264. 3. B. Kacavanda (Yugoslavia) 222. 8. J. Wheddon (G.B.) 148. 9. P. Freebrey (G.B.) 146. 13. P. Richardson (G.B.) 63.  
Team Results: 1. Czechoslovakia. 2. Yugoslavia. 3. Great Britain.

##### Payload (22 entries)

1. O. Klimes (Czech) 516 metres. 2. Z. Maichrazak (Poland) 515. 3. S. Mokran (Czech) 514. 7. J. Wheddon (G.B.) 429. 12. P. Freebrey (G.B.) 364. 13. P. Richardson (G.B.) 359.  
Team Results: 1. Poland. 2. Great Britain. 3. Czechoslovakia.

##### Altitude (22 entries)

1. J. Taborsky (Czech) 570 metres. 2. R. Riedon (U.S.A.) 539. 3. O. Klimes (Czech) 536. 6. P. Richardson (G.B.) 502. 13. J. Wheddon (G.B.) 415. 15. P. Freebrey (G.B.) 400.  
Team Results: 1. Czechoslovakia. 2. U.S.A. 3. Yugoslavia. 4. Great Britain.

##### Scale Altitude (14 entries)

1. P. Freebrey (G.B. – *Skua Mk. I*) 1,401 pts. 2. J. Divis (Czech – *Saturn Mk. IB*) 1,327 pts. 3. H. Kuhn (U.S.A. – *D. Region Tomahawk*) 1,278 pts. 12. J. Wheddon (G.B. – *Sky-lark*) 546 pts.  
Team Results: 1. Poland. 2. Yugoslavia. 3. U.S.A. 4. Great Britain.

##### Scale (18 entries)

1. O. Saffek (Czech – *Saturn 5*) 949 pts. 2. J. Divis (Czech – *Saturn IB*) 940. 3. P. Horacak (Czech – *Sojuz II*) 937.  
Team Results: 1. Czechoslovakia. 2. U.S.A. 3. Poland.

A contrast in boost gliders. At left, Pete Freebrey readies the Editor's canard parasite glider (top part of rocket detaches to release the glider). In the centre is Jim Pommert of U.S.A. with large, all sheet glider approach, while at right John Wheddon's swept-wing chuck glider showed excellent promise with good altitude and glide, but visibility problem.



Shake out the contents of your scrap box and build a couple of 'quickies' from these full-size plans!



A Laurence Baguley painting depicting a projected Westland tilt-wing, 100-seat airliner of the 1980s. (Westland Aircraft Ltd. photo)

## HELICOPTER versus CONVERTIPLANE



Manufacturer's model of the retractable undercarriage version of the civil Westland Lynx (Westland Aircraft Ltd. photo)

**ROGER DUDLEY**  
compares the merits of each with simple, but working, fun models

IN 1907, the first man-carrying helicopter left the ground. Now nearly 70 years later, when many fixed-wing aircraft fly at more than twice the speed of sound, the maximum speed of a conventional helicopter is still less than 200 mph. A few prototypes are capable of higher speeds, but they make use of small wings to off-load the rotor, and auxiliary jet engines or propellers to increase thrust. However, even with these extra aids, it has been found impossible to increase the top speed of this type of 'compound' helicopter much above 300 mph. This speed barrier is caused by phenomena well known in fixed-wing circles, i.e. compressibility and the stall. At first glance, it may seem strange to the fixed-wing fraternity that both the stall and compressibility should prevent high-speed flight, but if the main rotor of a modern helicopter is used as an example, in this case that of the *Westland Lynx*, the reason should soon become clear.

The Lynx main motor which has a diameter of 42 feet provides both lift and thrust. It turns at approximately 326 rpm giving a rotor blade tip speed of 490 mph. When flying at 200 mph, the helicopter's maximum permitted speed, the rotor blade that is moving forward (the advancing blade) is flying 200 mph faster at 690 mph; whilst the rotor blade that is moving rearward (the retreating blade) is flying 200 mph slower at 288 mph. Inboard of the tip of the retreating blade, the speed of the airflow passing over the blade decreases until, when nearing the hub, air actually flows in the reverse direction.

This area of 'reverse flow' which is always present in forward flight, gets larger by expanding outwards along the retreating blade as the helicopter's speed increases.

To generate the necessary thrust for the helicopter to fly forward at high speed, the pilot moves the cyclic stick forward to give the advancing blade a small angle of attack and the retreating blade a large angle of attack. Thrust is further increased by the pilot lifting the collective lever, this action increases the angle of attack of all blades by an equal amount. Maximum speed is reached when the high angle of attack and low airspeed causes the last effective part of the retreating blade, which is the tip, to stall. At the same time on the opposite side of the rotor, the tip of the advancing blade is also in trouble, for it is suffering from the effect of compressibility with the approach of Mach 1, the speed of sound. Vibration with eventual loss of control will result if the pilot fails to reduce the speed of the helicopter and angle of attack of the retreating blade.

For many years designers have attempted to overcome this speed barrier by combining the vertical flight characteristics of the helicopter with the high speed of the fixed-wing aeroplane. One result of their labours has been the tilt-wing convertiplane which is the subject of the second plan.

The tilt-wing convertiplane takes off and lands as a helicopter with the rotors horizontal and wing vertical; for forward flight the wing, together with the rotors, are mechanically moved

through approximately 90 deg., the rotors then act as propellers and the wing supports the weight of the aeroplane. With this helicopter/fixed-wing combination, it is possible for the aeroplane to have a speed range of 0 to about 500 mph.

In the past 20 years, a Canadian and a number of American prototypes have been built and successfully flown, but due mainly to their complexity have not been produced in any numbers. However, with the ever present need for higher speeds in both civil and military aviation, it is possible that in a few years convertiplanes will be as familiar to us as helicopters are today.

The following models originated because of a challenge from a fellow aeromodeller who worked with me in the drawing office. He suggested that to break the general boredom experienced during the lunch hour, interested parties should build from odds and ends a model capable of climbing 10 feet to pass over two overhead roof beams. When it was decided the winner would receive a small monetary sum, many hands began to work feverishly constructing odd looking devices.

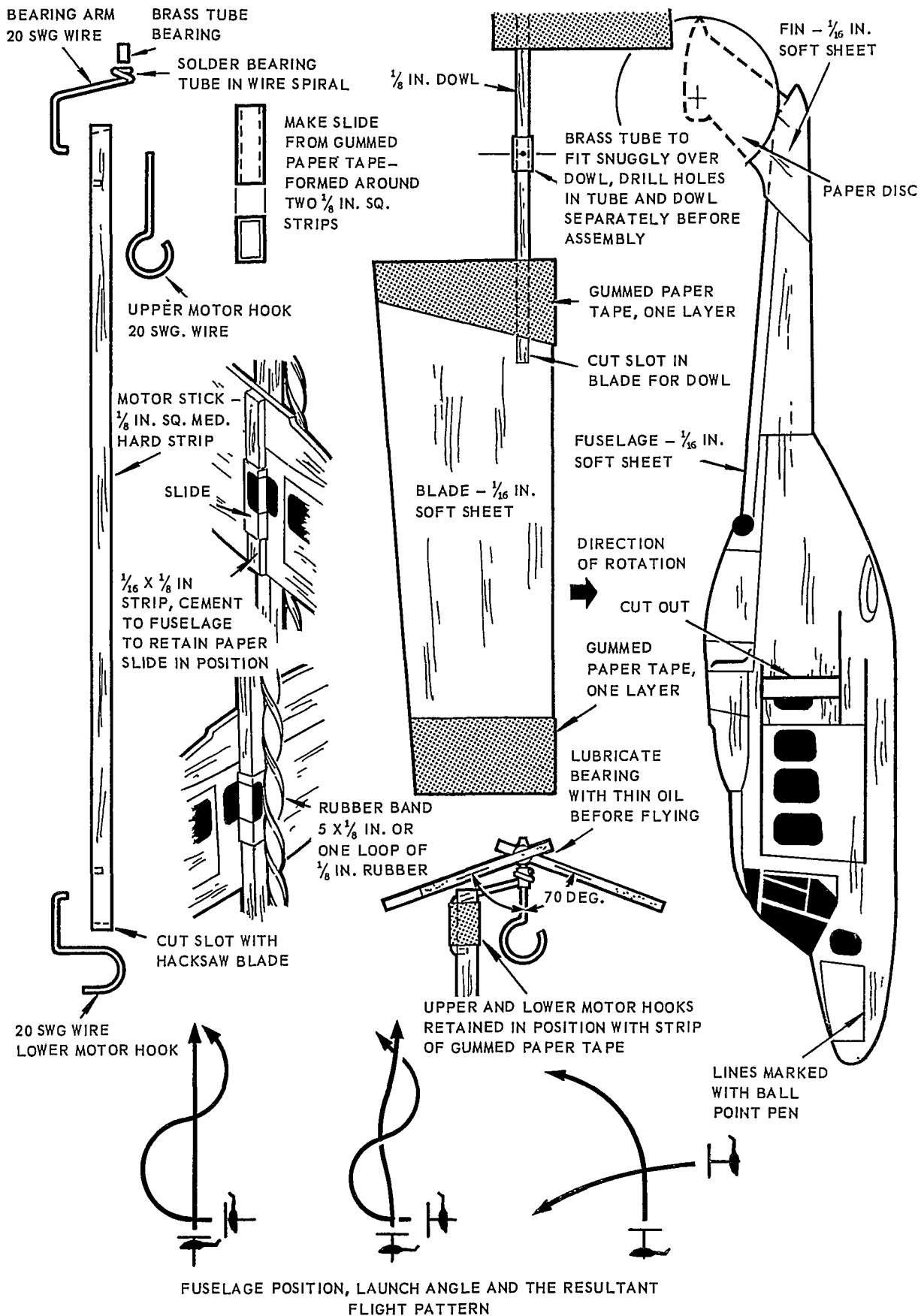
My first model (a rudimentary Lynx) was constructed from artists' paint brushes, gummed paper parcel tape,

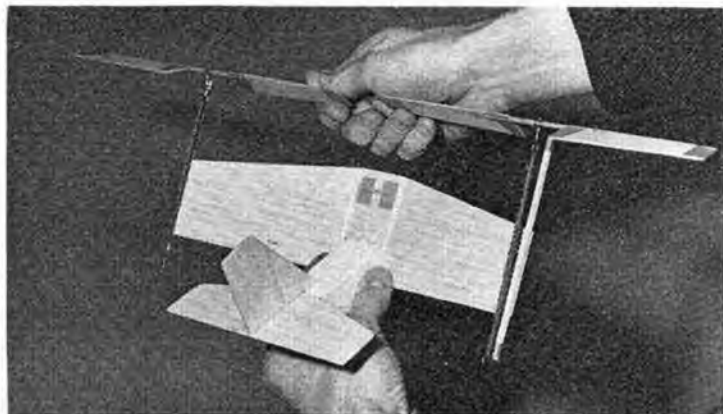
### LYNX MODEL



All parts drawn full size







The correct hand position for launching the converti-plane model. Roof beams, here we come!

rubber bands and paper clips. Although this model frequently tried to drill holes in the 30 foot high office ceiling and occasionally disappeared through an open skylight, it could not, however be persuaded to go over more than one beam. After further thought, it was obvious a new approach to the problem was required. This resulted in a rather rough version of the tilt-wing model shown in the plan, but it proved to be quite successful and after a few modifications was able to negotiate the beams with ease.

### Lynx Model

This model has a single lifting rotor powered by a rubber band, one end being anchored to the rotor, the other end to the fuselage motor hook. With this arrangement, torque from the motor rotates the fuselage in the opposite direction to the rotor. The small size of the model makes it impracticable to have an anti-torque tail rotor, instead the fin provides drag and slows fuselage rotation. The sliding fuselage changes the flight pattern by altering the model's balance and stability. The model is most stable with the fuselage close to the rotor and least stable with the fuselage furthest from the rotor. Various flight patterns are shown on the plan.

**Building Hints** Although construction of this model is straightforward, it is advisable to assemble the rotor as follows:-

The lower motor hook and the wire bearing-arm should be attached to the motor stick using two layers of gummed parcel tape (the lower hook will have to be removed later to fit the paper slide). The bearing can then be soldered to the bearing-arm; however before soldering, line up the bearing with the lower motor hook by threading a length of 20 swg piano wire through the bearing, the free end of the wire is then attached by a small rubber band to the lower motor hook.

The rotor hub should be assembled after first drilling the two hub components (tube and dowel); a twist drill can be made from a 1 in. length of 20 swg piano wire suitably sharpened. After drilling, slide the tube over the dowel and line the holes up. Attach the rotor hub to the bearing-arm using the upper motor hook; solder in place only where the wire pokes through the top of the hub, then spin the hub to see if it runs true. Cement the rotor blades in position, but before the cement dries, spin the rotor to see if the rotor blade tips pass through the same path, if not adjust blades as necessary.

Finally check the balance of the blades and add extra gummed tape to the lightest blade tip.

### Converti-plane Model

This tilt-wing convertiplane is an indoor model although performance is equally good outdoors on a calm day - the flight pattern is shown on the plan. For best performance, it is important to keep the weight of the aircraft as low as possible, so select the balsa carefully using soft sheet.

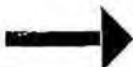
Two rotors are required; when viewed from the front, the left rotor rotates anti-clockwise and the right rotor clockwise, this should be remembered when assembling the rotors. If the Lynx model has been built, its rotor and motor stick can be used on the left-hand wing.

The tilt-wing mechanism is very simple; the high thrust line of the rotors pulls the wing from the 'up' position to the 'down' position and to prevent the wing moving too rapidly during a transition, the damper should just allow the wing to fall under its own weight.

**Building and Flying Hints** The fuselage which is made from a block of expanded polystyrene, is roughly cut to shape using a fine toothed hacksaw blade; final shaping and finishing being carried out with fine glass paper. The hole for the damper can be made using either a small tube with a sharpened cutting edge or a hot wire. When the fuselage is finished, cut the wing-hinge slot with a fine toothed hacksaw

Converti - plane model with the wing in the position for a vertical take-off. All parts for this model may be found in the average 'scrap box' - virtually a 'free' model!

### CONVERTI-PLANE MODEL

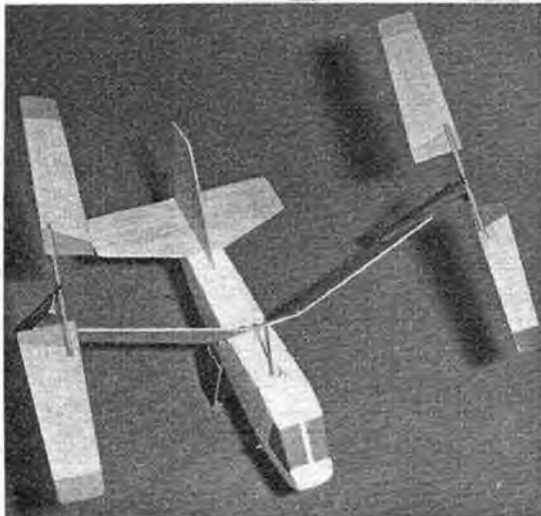


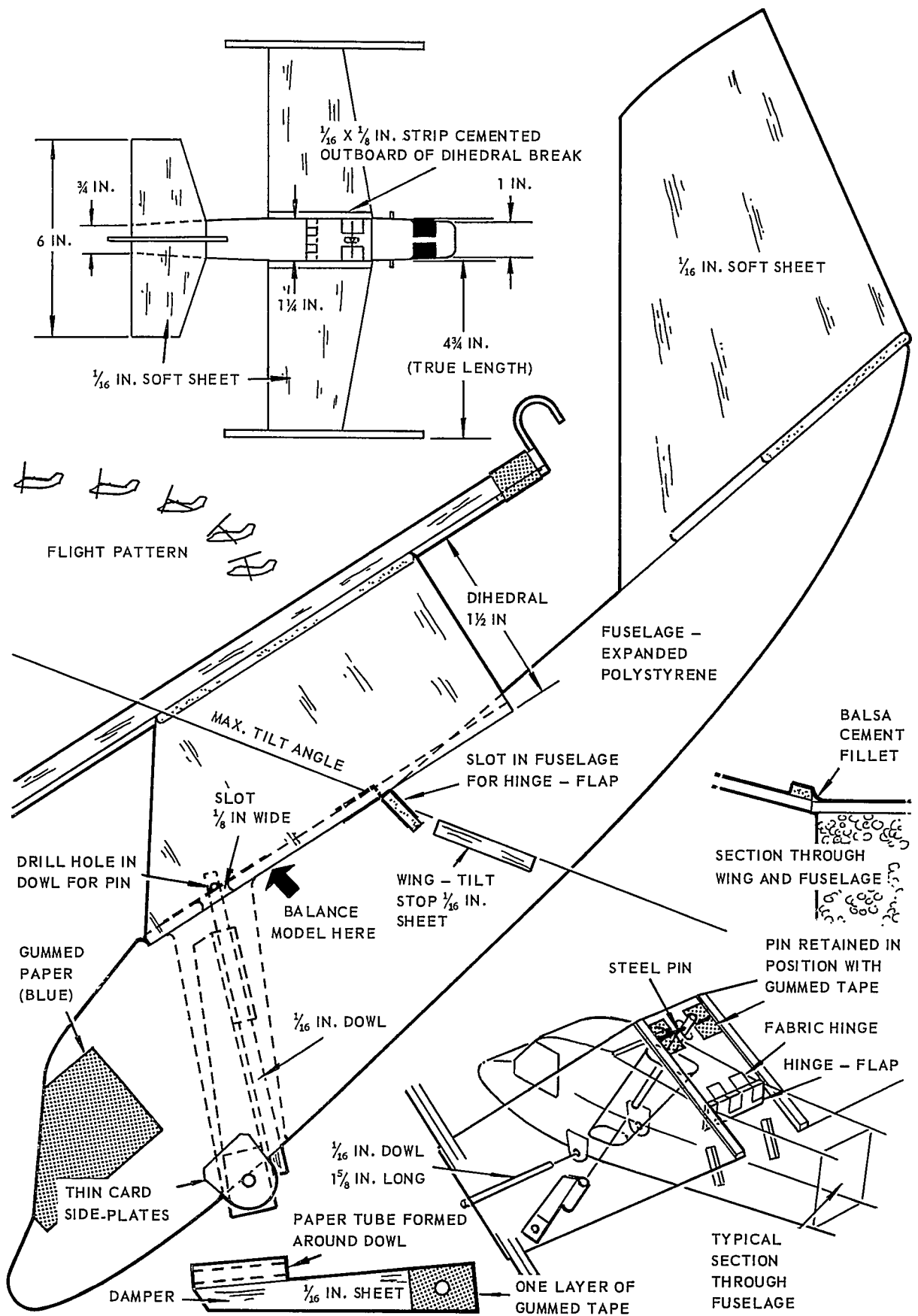
All parts drawn full size except as noted.

blade and cement the tailplane and fin in position using PVA cement.

Build the wing from soft 1/16 in. sheet taking care to check the size of the wing cut-out against the fuselage; there should be about 1/32 in. gap each side between wing-root and fuselage. After the dihedral has been incorporated, add the two completed power units, bearing in mind direction of rotation. The 'hinge-flap' can now be added to the wing centre-section using five 1/2 in. x 1/4 in. fabric strips. When the fabric hinge is dry, the wing can be temporarily attached to the fuselage by pushing the 'hinge-flap' into the fuselage slot. The damper mechanism is now fitted. The card side-plates should be positioned and cemented in place with PVA so that the damper does not foul the sides of the hole when the wing is tilted through its full travel. By lightly sanding the push-rod or gently squeezing the paper tube a smooth wing-tilt action can be attained. As previously mentioned, the damper should just allow the wing to fall under its own weight. This will probably mean removing the lower part of the damper or the wing several times until the right stiffness is acquired. The 'hinge-flap' and the 'wing-tilt stops' should be cemented in place with PVA glue, only after initial flight trials have shown that damper stiffness is satisfactory.

To fly the model, the rotors should be given a similar number of turns by winding until both bands appear equally bunched. The wing can be held at any angle and the model launched in the same line of flight as the wing. The accompanying photograph shows the easiest way to release the model. If the wing is at the 'max. angle' position, it is advisable to give the bands maximum turns because the rotors will be providing all the lift until the wing takes over with the approach of level flight. If the model dives to the ground or climbs steeply without the wing tilting forward, the damper is probably too stiff. With the model balanced as shown on the plan, it should climb gradually after the transition until power is expended. If the model fails to fly straight, check blade pitch, fin offset and the number of turns given to each rotor. If the model should consistently turn one way, one band may be stronger than the other - this can be counteracted by offsetting the rudder slightly.







# BETWEEN THE LINES

with Dave Clarkson

Our columnist once complained that stunt model design had stagnated, all models looking alike. America's Al Rabe disagrees — as is evident by the pictures of his beautiful, original designs. At left is Al with his Sea Fury, which won the U.S. Nats. in '72 and '73, together with the Mustang which placed 3rd in '74 (a tactical error we are assured!).

## Changes on the SMAE C/L Technical Committee

We control-liners seem to be an ungovernable shower if the tenure of the post of SMAE C/L Technical Committee Chairman is anything to go by. In 1971 we had Derek Heaton the team Chairman resign following personal criticism by some rather less successful fellow T/R competitors. Derek's brief reign (which had produced the new 'pink' Rule Book — a noteworthy labour) was followed by a quiet and rather inactive period under the Chairmanship of my Editor (sorry Petel) who struggled hard but finally admitted defeat by his intransigent proletariat. The new SMAE C/L Committee then resolved the problem of who was to try this difficult (some would say impossible) job by not electing one at all! No-one was willing to do the job for many months until in mid 1972 Jack Hartley, the SMAE's Chairman dragged Doug Blake in — being the C/L Chairman. Doug brought with him a completely new style — that of 'if you won't do it, I will cancel it' — which stirred some of us, actually into doing, under greater protest what needed to be done, such as organising the 1973 and 1974 Nats. Not all of us liked the technique much, but Doug commanded respect for doing the seemingly undo-able. Now Doug has resigned, again over a matter of personal and uncalled for back-biting, and we would seem to be facing disorganisation again. Bob Horwood

has volunteered to act as Chairman until Christmas so that vital and delayed rule-change deliberations can be satisfactorily concluded and presented for approval for the 1975 Season and also to the CIAM meeting in Paris soon. Bob will also have to plan the Trials for the 1974 C/L European Champs. He deserves better support than we have given his predecessors.

## Dead Stick Speed

I opened my copy of the Rand M.A.C.'s *Termac Torque* newsletter from Johannesburg and rolled all over the floor laughing when I read the following report of a 'fun' contest run at their last club competition. Report by Neville Koch:

The rules of the event are broadly:

- (a) Any model may be used.
- (b) Line thickness must be the same as would be required should the model be entered in its normal class.
- (c) After the motor stops, the model must be whipped around for a minimum of 3 laps, after which it will be timed over  $\frac{1}{2}$  mile distance.

I was first off — everybody wanted to see the guy who was responsible for the crazy idea to be the first to make a fool of himself. As it turned out, I made a fool of myself, but managed to achieve 61 m.p.h. using an F.A.I. racer on the 52 ft. 6 in. lines. Second away was Henry Dawes, also using an F.A.I. racer on 52 ft. 6 in.

lines. Henry had two attempts, but couldn't work up enough steam on either occasion to prevent the model landing itself. At this point I get a complex — I am unbeatable! The following couple of entrants (Pat Parsley with 47 m.p.h. from a B racer on 60s, and John Bilyard with a 5 c.c. speed job also on 60s at 59 m.p.h.) only served to deepen the rose tint on my glasses to the point of oblivion. Just imagine, I'd probably have my name splashed all over the *Aeromodeller* (almost right, Neville — DCCJ).

John Wellman was responsible for shattering my dreams of power. Using the same equipment as I had, he turned in a great 70 m.p.h. In my own defence, I must protest that he was WHIPPING and I saw him PRACTISING a week before. At this point my pedestal really began to crumble. Alan Hamilton using Pat's outfit (do I hear cries of foul, foul?) came across with 62 m.p.h. I felt better when John Nevin, quite legitimately, used Henry Dawes outfit to record 60 m.p.h. — after all, it's that 1 m.p.h. that separates the men from the boys.

Seriously, though, some of the flying styles were quite phenomenal! Can you imagine a duck with a ball and chain tied to its left leg, trying to escape from a drake with amorous intentions? The most difficult part is the ability necessary to twist your head 180° round to the right. It is the only way of ensuring that you can still see the model when you are  $\frac{1}{2}$  lap ahead of it.

## Results:

- 1, J. Wellman, 70 m.p.h. (F.A.I.-T/R);
- 2, A. Hamilton, 62 m.p.h. (B-T/R);
- 3, N. Koch, 61 m.p.h. (F.A.I.-T/R);
- 4, J. Nevin, 60 m.p.h. (F.A.I.-T/R);
- 5, J. Bilyard, 59 m.p.h. (5 c.c. Speed);
- 6, P. Parsley, 47 m.p.h. (B-T/R);
- 7, M. Tanski, 41 m.p.h. (Rat Racer);
- 8, H. Dawes, Zero (F.A.I.-T/R).

Is this one for the 'Guinness Book of Records'? Personally, I know of one or two here in the U.K. who should give John Wellman a hard tussle or who could beat him out of sight!

## Woodford Rally 25th August

An unmitigated disaster caused by heavy and continuous rain that started falling around 3.30 in the afternoon, thereby stopping all contests, with the racing events just into the second round. Fortunately, Stunt was just finishing, but in the Racing events, the pots were awarded on first round times only; in Speed on the basis of recorded times up to cessation, and Combat came out of the hat.

Al Rabe's aerobatic machine for next year - a D.H. Hornet with opposite rotation engines and featuring a fully automatic retracting undercarriage.

The features of the contests were firstly Martin Radcliffe putting in three runs with his OPS 60 (piped) speed model in the teeth of a gale and achieving a new British record. This was done with no apparent difficulty, although Martin doesn't think that he has got the 'pipe' right yet, I also heard a rumour that he was using Keil-Kraft Nitrex fuel! Roy Everitt and Bill Cooke put in a 4:47, using their Oliver Major powered *Argander* in Goodyear, the improvement being attributed to the installation of a '100 lap' tank and allowing pit-stop time saving. John Gray put in two beautiful heats (3:02 and 3:04) in 'B', getting 70 lap range at 105-108 m.p.h. out of his ST G21/29 RV A.B.C. powered model - he told me after the Nats that he would do this and now true to his word he has done it! The 'lost' record of 2:55 recorded by Ron Lucas in 1963 must surely fall soon to John and his almost redundant pit man. Finally, in F.A.I., we had a rather unhappy event despite Heaton/Ross, Hammond/Williams and Smith/Harknett all recording sub 4:40 times. In practise, Ron Tribe whose model did not seem to handle well in the wind, planted his Bugl-type model, converting his Bugl motor into bits in the process; Sutherland/Woodside demolished their model and bent a 'coming on' K&B rather badly in their heat when a line broke; and so on! Les Davy and Joe Devenish showed how they did a 4:10 at Driffield - Joe's HP 15 is about the best T/R motor in the U.K. now that the backplate has been 'looked at', his model is also quite the most minimal I have seen and is very light (15½ oz.) because of this. Unfortunately, in the high wind, Les had a lot of difficulty in keeping it under control, and when coupled with very high speed (23 sec./10 laps) he incurred the displeasure of two different contest directors. A real pity this because, in the right race and under the right conditions, Joe and Les must be almost unbeatable.

I do not think that any more space should be committed to this sad rally. When the sun shines, Woodford is one of the best U.K. rallies, but Woodford too often does not see the sun.



#### Results:

##### Combat

1. A. Cox
2. R. Morgan
3. A. Heming

##### F.A.I. Team Race

1. Heaton/Ross (Norwest) 4:32 Bugl
2. Hammond/Williams (Feltham) 4:35 G.20D

##### Goodyear

1. Everitt/Cooke (Norwest) 4:47 Oliver Major 'Argander'
2. Clarkson/Daly (Norwest) 4:54 MVVS 'Deerfly'
3. Perry/Perry (Wolves) 5:10 G15 'Jenny'

##### Class B - Team Race

1. Gray/Lopez (Feltham) 3:02 G 21/29 ABC
2. Blair/Paton (S.A.A.) 3:26 ETA 29
3. Horton/Haworth (Wharfedale) 3:34 ETA 2.8 c.c. Special

##### Speed (Handicap)

1. M. Radcliffe (Feltham) 180.2 m.p.h. 10 c.c.
2. K. Morrissey (Sharston) 155.3 m.p.h. 2.5 c.c.
3. I. Mander (N. Sheffield) 164.4 m.p.h. 5.0 c.c.

##### Stunt

1. J. Mannall (Bucks) 1,017 pts.
2. R. Tindall (Dagenham) 968 pts.
3. J. Heenan (Rolls Royce) 912 pts.

### Northern Area Model Flying Rally - 1st September

R.A.F. Elvington - 1.9.74

Held on Elvington's enormous runway on quite a pleasant day, this now traditional meeting had strangely low

entries - too far for the London lads? This meeting is the Northern Area's 'money maker' and they try to organise everything meaning a busy day for those who compete in all racing events! Brief event reports follow with help from Messrs. Davy and Davies, who also did some of the organising.

##### F.A.I. - Team Race

A low entry meant no semi-finals (as was the case in all other racing events). Qualifiers for the final were as follows with the final times achieved:-

- |                  | Heat | Final      |
|------------------|------|------------|
| 1. Heaton/Ross   | 4:28 | 3:17 Bugl  |
| 2. Davy/Devenish | 4:51 | 9:42 HP 15 |
| 3. Clarkson/Daly | 4:35 | 9:47 K & B |

Joe Devenish had to use his No. 2 model after Les seriously damaged Joe's '4:10' model earlier in the day. We flew on stranded lines and were slowed by a seized contra piston in the final, causing cock-ups frequently towards the end. Horton/Haworth were seen practising a new 'flying wing' model following the demise of the first of this line at Driffield. The new one flies perfectly; this type of model must be lighter and less damage prone.

##### Goodyear

Isn't it strange how the same names keep on cropping up in Goodyear. I am getting quite fed up (vice versa, I am sure) of meeting Derek and Roy in Goodyear finals! This familiarity bred contempt, and we indulged in the dirtiest final I am ashamed to say I have participated in - I for one should have been disqualified!

1. Everitt/Cooke - Oliver Major 'Argander'
2. Clarkson/Daly - MVVS TRS 'Deerfly'
3. Heaton/Ross - ETA 15 'Deerfly'

We declare our MVVS now finally clapped (5th rebore coming up!), the piston used since being lightened at Wymeswold by the con-rod is being preserved for posterity while the Heaton/Ross ETA digested itself quite thoroughly during the final.

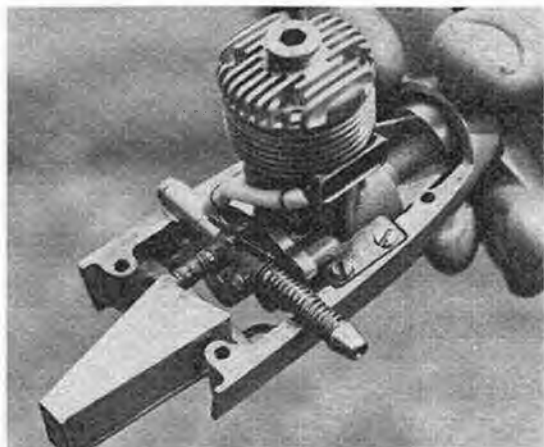
##### Class B - Team Race

Fairly pedestrian heats and a disastrous final marked this event. Our ST G21/29 RV is running in still, but allowed us a 3:18 one-stop heat with a Graham Howard 200 x 200 GFRP prop on 15% nitro fuel mostly because of 'instant' re-starts and an F.A.I. team race style pit stop technique (shut off, pressure re-fuelling, nose skid, etc.). In the final we retired after Ridley/Burn's model de-leadouted by Montezuma at the first stop. The re-run saw

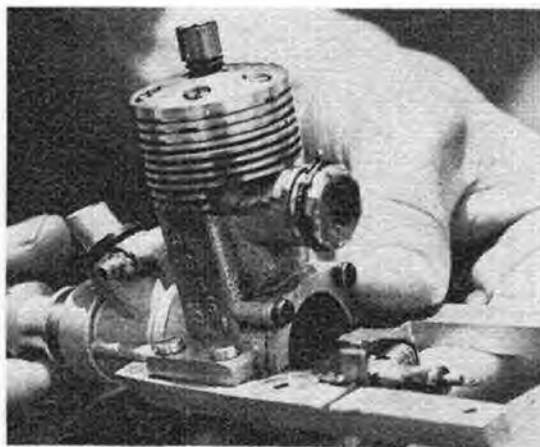
Another Rabe design (cannot accuse him of being stereotyped!) this time a Bearcat, built by Ron Harding who has achieved several first place awards in the south-west of the U.S.A. Finish is immaculate, in the Al Rabe style!







Shapovalov/Onufrienko's World Champs winning TMA features drum induction and has Tufnol backplate. Note how engine lugs are recessed into the crutch, the wired-on fuel tubing and the miniscule length of tubing between tank and filler/shut-off valve.



Probably the best Rossi diesel seen at Hradec Kralove was Nora/Ekholm's. In this instance note particularly the restricted exhaust outlet, small choke (insulated by rubber ring) and extended prop shaft - plus the 'minimum' crutch.

Ridley/Burn's model on full up at the first stop, causing it to do a wing-over and self-destruct on the tarmac. In doing this their lines bound up the neck of the pilot half of the winning Perkins/Underwood team, causing their model to self-destruct also.

- |                      |      |         |
|----------------------|------|---------|
| 1. Perkins/Underwood | Heat | Final   |
| (Nuneaton)           | 3:33 | 48 laps |
| 2. Ridley/Burns      |      |         |
| (Nuneaton)           | 3:36 | 38 laps |
| 3. Clarkson/Daly     |      |         |
| (Norwest)            | 3:18 | ret'd   |

#### 1A - Team Race

A tiny entry of only six meant a very short contest which was noted only by Campbell/Perkins (Hinckley) appearing with a NEW MODEL - a noteworthy event in this class - and by Heaton/Ross ominously running in a new piston in their usually unbeatable motor. Campbell/Perkins unfortunately suffered from bad stops in the final which lost them 2nd place.

- |                         |      |       |
|-------------------------|------|-------|
| 1. Heaton/Ross          | Heat | Final |
| (Norwest)               | 4:13 | 8:50  |
| 2. Langworth/Williamson |      |       |
| (Wharfedale)            | 4:22 | 9:25  |
| 3. Campbell/Perkins     |      |       |
| (Hinckley)              | 4:15 | 9:54  |

#### Combat and Speed

Didn't get to see anything of these and with no other reports received, I can only report the results. Sorry, lads! If I don't get any reports, I can't print them, can I?

#### Combat

1. D. Wood (Stockport)
2. R. Ambler (FAST)
3. D. Dowdeswell (Glevum)
4. P. Silcock (Peterborough)

#### Speed

1. K. Morrissey (Sharston)
2. G. Isles (Sharston)
3. R. Everitt (Norwest)

Hey! What's that - big Roy placing in Speed? I knew Bill Cooke's reworked Oliver Major was good but not that good. (Actually he used a TD 09 glow, but I thought I would try to shock a few people.)

#### International T/R News

Received a letter from Gösta Bengtsson in Stockholm. Gösta is a fellow K&B user and has been working for 50-lap range, claiming a speed of 24.5 to 25 sec./10 laps for this range. Gösta uses a chromed liner in his K&B and gets additional cooling by using a full tin, barrel diameter liner top flange and a similar flange on the fixed part of his two-part contra-piston. Gösta uses the Rossi 7 x 8 CF prop (made in England, I believe, but never seen here) at 176 mm diameter and a GF fuselage model developed from Kvido Klemm's Scorpion design similar to that used by Saffler/Kodytek as illustrated in the May 1972 *Aeromodeller*. Anyway, all of this seems to work rather well as will be seen from the

Swedish and Scandinavian Champs. results given below.

#### Swedish Championships (24-25/8/74)

- |                     |      |       |       |
|---------------------|------|-------|-------|
| 1. Larsson/Rylin    | Heat | Final | Rossi |
| 2. Bengtsson/Böhlén | 4:26 | 8:55  |       |
| 3. Winkler/Portan   | 4:29 | 9:11  | K&B   |
| 4. Winkler/Portan   | 4:22 | ret'd | Rossi |

#### Scandinavian Championships (Finland 7-8/9/74)

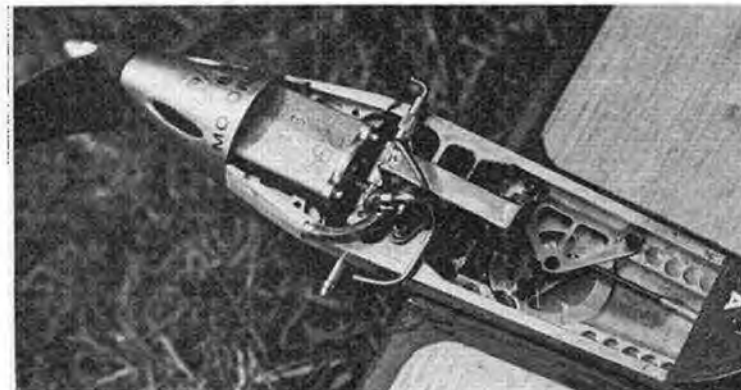
- |                     |      |       |       |
|---------------------|------|-------|-------|
| 1. Larsson/Rylin    | Heat | Final |       |
| (Sweden)            | 4:23 | 8:44  | Rossi |
| 2. Nora/Ekholm      |      |       |       |
| (Finland)           | 4:36 | 8:55  | Rossi |
| 3. Bengtsson/Böhlén |      |       |       |
| (Sweden)            | 4:33 | 9:17  | K&B   |
| 4. Winkler/Portan   |      |       |       |
| (Sweden)            | 4:38 | X-15  |       |

Sad news received from the U.S.A. is that Hodgkins/McCollum have given up F.A.I.-T/R and have dispersed their equipment. Following the retirement of Stockton/Jehlich, Big Al and John Hodgkins were the top American F.A.I.-T/R team achieving 4th place at the 1972 World Champs in Helsinki. This is very much a minority event in the U.S.A., a fact that was well illustrated at the 1974 World Champs at Hradec Kralove where the Americans were obviously very short of contest racing experience. Without the leadership of a truly World Class team of fear that F.A.I.-T/R in the U.S.A. is in for a very thin time indeed.

I also hear rumours of Paul Bugl planning the production of 500 motors in 1975, motors so good that even a man with two left hands can do under 4 minutes. To augment this claim I hear further rumours that Paul very recently went near 3:30 and into the 7 minute zone for heat and final distances back home in Austria. HELP!

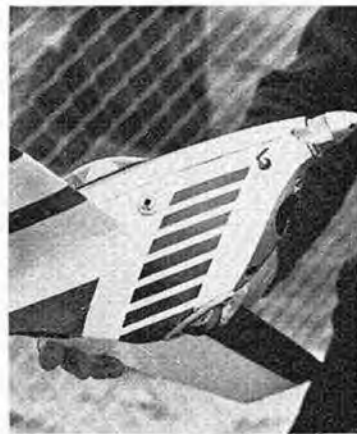
The European C/L Championships will be held at Verviers in Belgium, July 9-14th 1975.

Characteristic neat hardware installation by Paul Bugl in this model which placed second at World Champs. Motor is standard 'same as you can buy' - and certainly seemed no faster than any other Bugl present. Note attention paid to lightening all metal components.



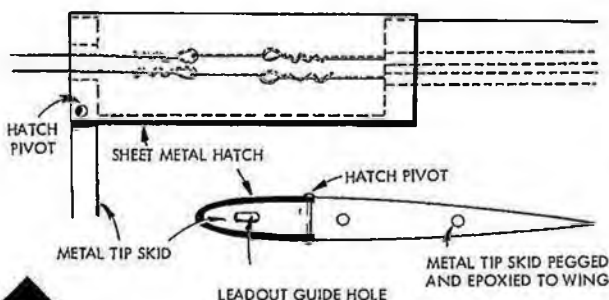


Left: sad to hear that 'Big Al' McCollum and his pilot John Hodgkins are giving up team race. They are a very competent team who have succeeded despite all the odds being stacked against them and will be sorely missed in future World Championships.



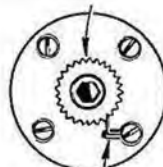
Right: J. Rosinski of Poland used this deep-bellied cowl on his team racer to shroud the wheel and improve streamlining. Fuselage is moulded from glass fibre - a metal plate retains the wheel and provides a wear-proof surface. Rossi 15D used for power.

## TEAM-RACE DETAILS — AS SEEN AT 1974 WORLD CHAMPS:



**LINE HATCH** as used by Sapovalov/Onufrienko (U.S.S.R.). This very neat, light and streamlined hatch allows lines to exit in the desirable forward location. Metal hatch simply swings outwards to provide access to the line connection.

CLOCK WHEEL BRAZED TO COMP. SCREW

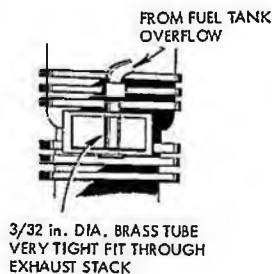


20 swg WIRE 'CLICKER' RETAINED BY CYLINDER HEAD BOLT

GROOVE FOR CLICKER WIRE FROM BOLT RECESS TO STOP WIRE ROTATING



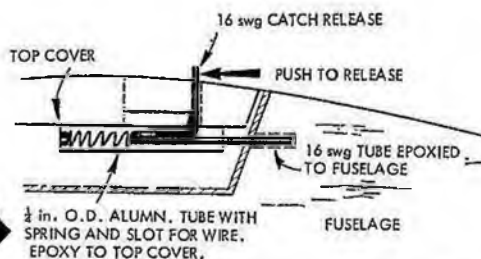
**COMP. SCREW CLICKER.** Not new or original, but used by Fontana/Amodio (Italy) on their spare Super Tigre. Allows precise and known (i.e. 1 or 2 'clicks') adjustment - and comp. screw cannot back off.



3/32 in. DIA. BRASS TUBE VERY TIGHT FIT THROUGH EXHAUST STACK

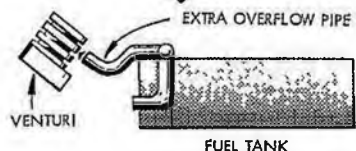
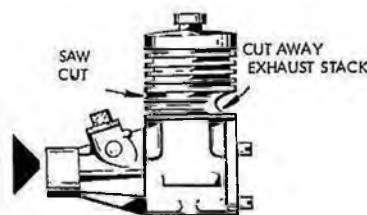
**EXHAUST PRIME NOZZLE.** By using tube with a hole in its wall, Mearns/Nelson (U.S.A.) varied amount/direction of prime by rotating tube.

**TOP COVER CLIP.** Neat, quick to operate system by Tribe/Tribe (G.B.) enables top cover of model to be readily detached.



**CARB. COOLER,** employed by Sapovalov/Onufrienko. As tank fills, overflow squirts fuel onto outside of venturi, cooling it and providing 'fuel-ic' air for rich take-off.

**CASE DISTORTION COMPENSATOR.** Deep saw-cut opposite exhaust effectively makes crankcase weak fore and aft, allowing liner to remain straight despite thermal distortion. Used by virtually all MVVS owners.





FOR THE PAST nine years entries have been increasing and this year the 10th Criterium Pierre Trebod had the highest number of entries ever: 138 in F1A (Glider), 63 in F1B (Wakefield) and 36 in F1C (Power). It is so encouraging to attend a contest that is in the ascendancy and this year attracted entries from 17 nations, yes – *seventeen*(!) including U.S.A., Canada, New Zealand, Egypt, Spain and Portugal as well as the usual European and Scandinavian countries, and must now rate as second only to the World Champs itself. The camping and practice flying during the preceding few days help bond old friendships and set the atmosphere for the contest proper.

The first contest day (Sat. 24th) was Glider with the first round at 7.30 a.m. One of the most striking features of this contest (and seemingly continental flying in general) was the amazingly calm conditions, and during the midday period, the erratic thermal activity. Flying was in groups of eight per timekeeper with 78

Heading picture shows Austria's H. Chmelik, Wakefield champion after two fly-offs. Also placed 8th in glider, dropping just 17 seconds. Below is Carston Hohls, second in A/2 with his Jedelsky winged, circular tow glider. At right, Bjorn Soderstrom holds for Jan Jatterdahl – both these Swedish Wakefield flyers fell victim to the treacherous thermals.



## MARTYN COWLEY REPORTS ON THE PIERRE TREBOD FREE-FLIGHT INTERNATIONAL

August 24th-25th 1974

minutes per round! With F1A being a game of no mistakes, many people lost their chance by having to fly when it was their turn, whether there was lift or not.

In the first round when there was only a couple of patches of weak lift, only five of the 23 British entrants maxed. Of these John Woodhouse, Dave Glue and Jim Baguley all dropped their second flight and Alan Jack broke his tow line in a line cross with his second attempt, to receive no score in the third round. The model complete with tow line actually went away in lift overhead with no 'systems' working, only to eventually descend to the same spot some time later. This left Ray Monks, making a rare return from power to glider flying, as the only British hope. Ray managed 5 maxs before dropping both the last two rounds.

The only air movement seemed to be that generated by the thermal activity and air would be sucked in from all sides towards the centre of the lift. This had the unfortunate effect of having to tow with the wind to get towards a thermal and many models were just dropping off the line. Conditions were so calm and thermally that several flights in excess of 90 minutes were successfully retrieved. One of those to suffer such a marathon flight was M. Mehrez flying for Egypt, although currently living in Aberystwyth, costing him a missed round while retrieving.

After the calm of the first two rounds lift became more plentiful and most people had little trouble in maxing in the middle three rounds; only as the air cooled towards evening did the maxs once again become scarcer. With all the British scores broken,



the battle was now on for the top runner-up places, and John Woodhouse who had dropped only 5 secs in Round 2 continued maxing to become top British flyer at 6th place. As for the rest of our contingent, a typical score was a dropped early flight followed by 5 or 6 maxs.

The rest of the field was now down to less than 10 and Round 7 saw Gaensli and Siebenmann of Switzerland, Gaull and Wittle of Germany and Dennet of France all drop a flight to leave only 4 perfect scores for the fly-off. Carsten Hohls, normally a power flyer, had his 6th round flight down to 30 feet, before waving team-mates started a bubble of hot air to take him away for a max and an eventual surprise place in the fly-off, with his Jedelsky circling tow model.

In the fly-off Carsten Hohls was up and off first — quickly followed by Timmeman and Lopez and Braud the Frenchman, who had been flying away to one side. Of the bunch Timmeman had the best of the air to gain the only 4 min. max and become the 1974 FIA champion.

The second day was for Wakefield and Power combined again flying in groups of eight per timekeeper (next year it is hoped to be a proper 3-day event), the pattern of weather being identical to the Saturday with clear blue sky from dawn till dusk. The scarcity of lift during early and late rounds gave trouble to most flyers and thermal activity upset power flyers during midday with risks of big downdraughts.

It may be significant that there were 13 British entries in Wake; seven maxd in the first round, Barry Kershaw D/Ting himself at 2:30. Only Ian Kaynes and Ray Elliott got two maxs before both dropping their third round along with Jan Zetterdahl of Sweden, and last year's runner-up Louis Dupuis. Bob White, last year's champion and being proxy flown by Pierre Chaussebourg, had already dropped the first round.

The air was perhaps the most treacherous ever witnessed by the British contingent. Models were continually climbing away in strong lift to 2 or 3 times still-air height, only to be crushed on the glide by a downdraught; models were descending on the glide through clouds of rising bubbles. Altogether most unpredictable weather. The Continentals, with more experience of such conditions, were telling us that the really steady lift was too high for most models to reach, and that the reachable air was just a melting pot of thermal turbulence.

Few people survived but Pete Allnutt of Canada achieved 6 maxs before scoring 1:41 with his best flight; an unfortunate weekend for him as he'd only missed one max in glider the day before. Steve Marriott looked all set for 4th place having started with a 2:35 until his 6th round flight, way up in strong lift, spiralled straight in, leaving 4th place instead to Ian Kaynes with his 2:34 in the third.

In fact only two flyers reached the fly-off: H. Chmelik of Austria and R. Allais of France. Both had good air to make the 4 min. max, returning for a second fly-off trying for 5 mins. This time the air was less helpful and although launching together Chmelik looked convincingly superior, scoring 3:45 to Allais 3:04.

In Power, running concurrently with Wake, one has the feeling that the 7 rounds during the day are really superfluous to the contest proper i.e. the fly-offs. For models expected to max off 6 or even 4 seconds, a 10 sec. engine run flight is a mere formality; the difficulty being to avoid the downers.

One of the earliest to suffer this fate was V. Horcicka, the reigning World Champion, who lost 7 secs. on his first flight, although subsequent flights appeared to be having transition spiral trouble with his unique left-left trim. Other 'star' victims were Alain Landeau France, Roger Simpson U.S.A., Hans Seelig Germany, and our own Ray Collins was his own worst enemy with two premature D/T flights.

By fly-off time there was still Ray Monks, Ken Faux and Laurie Burrows along with six others. Laurie launched flat in the 8 sec. fly-off to go out with 2:37. In the 6 sec. fly-off Ken Faux had the misfortune of being timed O.O.S. at 2:59 on a flight timed by retrievers at 3:10. Bearing in mind the importance at this stage of the contest one wonders why binoculars were not being used as in the *Code Sportif* to help reduce such human error. This left only four flyers going for a max off 4 secs. Ray Monks was first off and was given a 4.1 sec. over-run on a 2:47 flight. Next away was Thomas Koster with his latest flapper *Hot Stoned Tuna* probably the best model at the meeting: a poor transition gave a stall all the way down for 1:17. This left Jan Akesson of Sweden down to his third model, after trim crashes, the eventual winner over Seigfried Reda of Germany.

As always the finale of the contest was the prize-giving and dinner attended by all competitors later that evening in the local village. Extra prize winners were a Danish couple who had cycled all the way to the meeting and most distant traveller Tom Hutchinson from U.S.A. A new trophy for the highest placing nation in all three events was the 'Jean Magniette Challenge Cup' which went to Frenchmen Braud (F1A), Allais (F1B), and Ferrero (F1C), although no-

*continued on page 623*



Down to his third model by Power fly-off time, J. Akesson of Sweden did 2:36 to win the 4 second engine run fly-off.



THE LARGEST get-together of British and European competitors could be looked upon as a preliminary for next year's Criterium, but to be honest neither the standard of flying nor the organisation this year was impressive as in the past. In fairness though, the high winds and torrential rain did not help the *Daedalus* club and W.O.C. combat team of Amsterdam in this matter. Taking up our Nationals rule of 'all cuts count' i.e. even if the thread is detached in the process, a ruling of line cuts not counting brought us back to square one.

Accurate combat was impossible over the weekend except perhaps for the last couple of hours on the Sunday around finals time; one could win a heat purely by staying airborne for the required four minutes. The English provided nearly half the total entry of 104 which made life difficult in the latter stages. It was good to see an entry from both Sweden and Italy; perhaps the Italians would have

done better to have looked for a team race event!

Besides individual achievements, the importance of the team event was strongly in evidence, the main contenders from the start being a combination of Outlaws, Bristol, Stockport, Glevum clubs to form GO! and Alfreton and Hunters forming A.H.A.

Heads rolled because of the conditions; last year's finalist Mick Lewis being the first to suffer from Marchall of West Germany—two cuts all and ground time the decider. As the Dutch fly-off losers, it was necessary to 'prune' to have 32 for the third round, this being done by picking 16 fliers at random. Nationals champion Mick Tiernan wished his name had not come out of the hat, as he narrowly lost to John Hammersley. Of the last 32 fliers, 23 were British so matching of fliers from the same country was inevitable. For myself, the biggest upset was the defeat of Richard Evans by fourteen-year-old Andy Walker of Alfreton (sorry;

A.H.A.!) by two cuts to one. Other notable heats in this round being Steve Bingham's win over Jim Carolan and Tribe's victory over Fred Meyer of Holland.

At the quarter-final stage Rose of Hatfield defeated Andy Walker of Alfreton (who also had Tim Court's scalp under his belt), Steve Bingham putting out an impressive John Hammersley, and Dave Wood beating Vernon Hunt, both flying the *Titan* design. Another new face being that of Martin Fox of Nottingham who had a good victory over Avery of Finchley by two cuts to nil.

In the semi-finals Steve Bingham of A.H.A. had a three cuts to two win over Rose of Hatfield, while Martin Fox was, to say the least, unfortunate to lose to Dave Wood. It looked to be another surprise result until he clipped Mick Lewis, one of Dave Wood's pitmen, whilst going for a 'take-off' cut during the heat. Instant disqualification, without consideration for the pitman actually being inside the circle.

Vernon Hunt, our reporter, is another to join the 'Titan-users' club, forsaking his well known Warlord design.

Mick Lewis of Glevum with what is becoming a familiar sight at combat meets—a Solarfilm covered *Titan*.

Holland's Bob Metkemeyer of the host club battles it out with England's Bob Rippengale.



## SPAARNDAM '74 Combat Internats

Hollands annual combat meeting  
reported by VERNON HUNT

Action! D. Williams launches Martin Fox's model as another pit man retrieves another stricken craft.





Left, Derek Dowdeswell from Glevum used model showing strong 'Titan' influence, plus Solarfilm covering for speed and lightness.



Right, winner Steve Bingham stays with his distinctive Anduril design. His long experience at combat flying put him in good stead in a 'classic' final.

A third and fourth 'fly-off' took place with Rose the victor over Fox, other placings down to eight being decided on a points basis.

The final was a very good one with Steve Bingham's experience standing out a mile. After making the initial attacks and taking the streamer and knot separately to count as two cuts, he was content to fly defensively. The art of putting one's opponent into the ground

was at its best; as soon as Dave removed the streamer leaving the knot, his time accumulation on the ground would make no difference to the result if he had removed the remaining part of the streamer. Congratulations to both for showing what combat is all about.

Team prize went to *Alfreton-Hunters Associates* while further victories included the English winning the football matches again this year by beating the Dutch 1-0

and the Danish who had beaten West Germany by two goals to nil!

#### Results:

1. S. Bingham (A.H.A.). 2. D. Wood (GO!). 3. Rose (Hatfield).
4. M. Fox (Nottingham M.A.C.). 5. V. Hunt (A.H.A.). 6. J. Hammersley (GO!). 7. Walker (A.H.A.). 8. Avery (Finchley).

## PIERRE TREBOD INTERNATIONAL

continued from page 621

one could work out why the Germans did not win with their 4 of the top 9 placings. Tribute was duly paid to Monsieur Magniette and hard working Yves Olard the contest director, before the dinner and celebrations continued long into the night.

#### RESULTS

##### F1A Glider

1. W. Timmeman (D) M+240. 2. C. Hohls (D) M+228. 3. J. Lopez (E) M+173. G.B. Placings: 6. J. Woodhouse 1255. 13. D. Groves 1234. 19. S. Marriott 1219. 31. R. Monks 1177. 33. P. Steward 1170. 34. D. Glue 1162. 50. R. Bailey 1118. 52. D. Barnes 1113. 59. P. Jellis 1094. 65. P. Whiston 1079. 68. J. Cooper 1068. 70. G. Madelin 1065. 72. G. Martin 1054. 77. A. Jack 1037. 84. J. Baguley 1006. 103. G. Lefever 948. 109. G. Pink 908. 112. M. Cowley 901. 116. P. Kimber

866. 132. P. Mastorman 511. 133. D. Thompson 432. 137. D. Stapleton 343. 138. J. North 237.

##### F1B Wakefield

1. H. Chmelik (A) M+240+225. 2. R. Allais (F) M+240+184. 3. S. Gaul (D) 1254 total. G.B. Placings: 4. I. Keynes 1234. 20. S. Marriott 1141. 25. J. Barnes 1088. 27. N. Elliott 1085. 28. R. Elliott 1081. 32. M. Duca 1067. 33. B. Kershaw 1064. 35. D. Greaves 1059. 37. A. Jack 1043. 40. J. Baguley 992. 47. D. New 937. 51. G. Lefever 885. 54. P. Mastorman 872.

##### F1C Power

1. J. Akesson (S) M+180+180+156. 2. S. Reda (D) M+180+180+129. 3. T. Koster (DK) M+180+180+77. G.B. Placings: 4. R. Monks M+180+180. 5. K. Faux M+180+179. 8. L. Burrows M+0. 12. R. Collins 1239. 21. R. Bailey 1119. 22. J. Allen 1107. 25. F. Chilton 1088. 26. T. MacCombie 1048. 27. R. Johnson 1001. 30. A. Chilton 926.



Left, 'Hot Stoned Tuna' - Thomas Koster's latest 'flapper' suffered from poor transition and a stalling glide which reduced last year's champion to third place in Power. Below, similar models used by Guedin and Lacroix of France, typical of many high aspect ratio models used by Continentals for the early, still-air rounds.





CONTEST ORGANISATION is a thankless task – as those involved know only too well. Nevertheless their efforts are vital not only for the mere existence of competitors, but also for their quality. The attitude and actions of those in charge of a contest can well be reflected in the response of the competitors. Of course, there are other factors involved, such as the weather and the status of the meeting, but the organisers' influence can often be discerned in the contest results.

These days most contests are run on a casual 'do-it-yourself' basis, with the competitors themselves being expected to do much of the work. Fliers have had to supply their own timekeepers for many years, but only recently have the competitors been trusted to fill in their own flight card details (at the Trials this request was accompanied by threats of disqualification for those failing to supply complete information!). This arrangement leaves the officials free to accept entries, record scores, and collate results – chores often delegated to wives or other non-fliers. The only *real* organisation comes at fly-off time when the qualifiers have to be found, briefed, and supervised. The subsequent prize giving is rarely a formal affair.

Trying to decide between cause and effect is almost a classic case of 'chicken and egg'. However, there can be little doubt that casual organisation goes hand in hand with a casual attitude to both participation and close adherence to the rules. *Does it really matter?* sums up the majority reaction to many situations. Even when controversy does arise there is a growing trend to decision by emotion rather than 'by the book'. My own approach is a little more rigorous, as I subscribe to the belief that 'hard cases make bad laws'.

The past few weeks have seen a variety of meetings held up and down the country – and run in a number of different ways. It will become obvious that I consider some of these are better than the others!

Prior to this activity, however, there was a very quiet period on the contest front, for reasons that I discussed last month. In the whole of July there was but a single F/F competition – the S.M.A.E. Area-centralised meeting held on the 14th. With this style of competition the weather prevailing locally is all important, as the variations across the country can be considerable. On this occasion the East coast seems to have had reasonable weather early in the

John O'Donnell's

## FREE FLIGHT COMMENTS

Arch indoor enthusiast Laurie Barr, gently, very gently, prepares to release his F.A.I. microfilm model – placed third eventually at the British Indoor Nationals.

day, but stronger wind thereafter, other regions had wind all day!

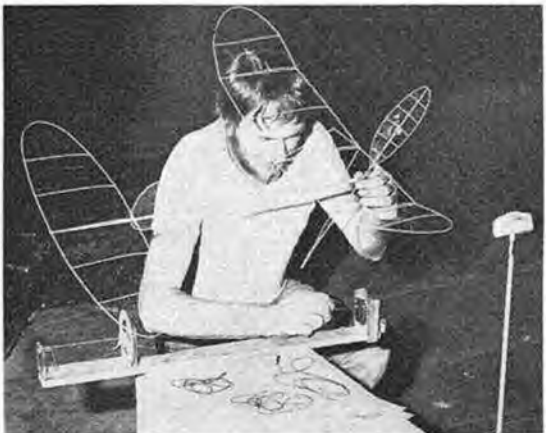
Not surprisingly the *Team Glider* event for the *M.E. Cup* was by far the most popular on the three separate contests. Glider is currently more popular than the other classes, the event was team rather than individual, and also counted towards the *Plugge* (Championship) *Cup*. The indifferent weather experienced throughout the country is reflected in there only being eight trebles from over 150 entrants!

Richmond 'A' were the winning team with a four-man total of 34:29, flying at Basingstoke. They had three trebles (Pete Bayram, Pete Williams and Mike Fantham), plus a good back-up score from Mike Warren. To finish off they also took the first and third individual places – Pete Bayram being top man with a fly-off just short of five minutes. Successive team scores fell away quickly, runners-up being Crookham 'A' with just under 32 minutes. They complained of a marked absence of lift at Beaulieu, with Cliff James managing their only treble. Third and fourth places went to South Bristol and Norwich, again with but one perfect score apiece.

The *Plugge Cup* is only of direct interest to the few clubs striving for the overall club championship. Nevertheless, it seems to affect participation in the Area-centralised events to a significant extent. Consequently it is a little surprising to find that although both the Southampton club's A and B teams were well down the 'M.E.' list, they still managed to hold onto their lead in the *Plugge* – and by a barely diminished margin!

In comparison to the Glider event, that for *Coupe d'Hiver* was scarcely well supported with only a couple of dozen fliers. There has been much grumbling, particularly in the U.S.A., about the effects of requiring 100 grammes s.u.w. for this class of model but I would have thought that the contest flier would have learnt to cope with this specification by now. Be that as it may, *Coupe* scores were far from impressive. The National winner proved to be Mike Sanderson of Grimsby who recorded a five flight total of 8:27 at Barkston Heath. I flew at Elvington in rather mixed weather and managed second place with my delayed-prop-release model. Third place went to Ray Paveley. No one else cleared eight minutes.

The F.A.I. Power event for the *Astral Trophy* fared even worse, as regards both quantity and quality. Very few of the well-known exponents of this class feature in the results – a pretty fair indication of the status of Area-centralised events. The most noteworthy aspect of the *Astral* was the



Left, Bruce Edwards transfers the wound motor from its winding ring and 'loads' it onto his F.A.I. class Microfilm model.



Right, Indoor chuck glider contestant Pete Bayram used models featuring Ronitubo glass fibre fuselage and under-slung fin.



Left, Tony 'the arm' Slater solves the problem of the concrete floor wearing away his indoor chuckiel

Right, Reg Parham with new and novel approach to Penny-Plane! Inspiration came from very successful American models seen at Lakehurst.



father-and-son success of Fred and Andrew Chilton who placed first and second. Dave Welch was third, appearing 'back in the game' after a long lay-off. The remaining scores fell away rapidly. One casualty, in the literal sense, was Pete Harris, forced to retire with back trouble (he slipped a disc at the Nationals) after starting with a double max.

August was busier than for some years and I, for one, covered a lot of miles in consequence. First and furthest of these meetings was the Torbay Rally held at Woodbury Common near Exmouth. Advancing the date to 4th August, instead of the Bank Holiday Sunday, avoided coinciding with Woodford. Naturally enough this increased the number of long-distance visitors to Devon - especially as the Motorway extensions have made for a much easier and quicker drive! The rally was unlucky with the weather, the morning being very wet and the balance very windy (naturally the day either side was gorgeous!). When the rain stopped about mid-day, the organisers quickly announced that the various events would proceed as arranged. With plenty of space available they saw no need to alter the three-minute max, but allowed the use of binoculars in all events. Normally, of course, this concession is only allowed in F.A.I. However, the accepted practice of doubling-up flights has complications if the rules differ from Open to F.A.I. - so allowing 'aids-to-vision' for all was a sensible simplification. After all, one of the advantages of the Club gala is in not being bound to S.M.A.E. (or F.A.I.) rules. Deviations need to be spelt out, of course!

Russell Peers and I were the first to fly off, and a private battle for the combined F.A.I. event soon developed. Although Power was far better than Wakefield when it comes to penetrating the severe ground turbulence, the situation was balanced somewhat when Russell's best Rossi-powered model landed somewhere behind a downwind wood. His reserve was off-pattern giving a surprisingly close result, Russell winning with 11:23 to my 10:43. Third place went to Chris Chapman with 7:12, also flying Wakefield. By doubling flights Russell and I took the premier positions in Open Power and Rubber respectively.

Glider towing was very difficult in the prevailing conditions - and there were a number of disasters. Dave Bailey won this class mainly by its only max. Dick Cummins was second thanks to Alan Jack playing it too safe with a very conservative D/T on his last flight. Everyone who flew glider had a flight of 30 odd seconds or worse! Chuck glider saw a fairly easy win for Dick Cummins.

The organisers were clearly concerned in doing all they could to ensure the success of the meeting, supplying timers and even help with recovery. It was noticeable that a remarkably high percentage of those present seemed willing to 'have a go' in very uninspiring weather. Mention must be made of Chris Chapman stopping on after the prizegiving to wait for Russell Peers' return from his downwind search. They were still in the car park when a passing local ex-modeller stopped to chat and, hearing of the flyaway, offered to fly over the area in his son's light plane! Subsequently the model was pinpointed, retrieved and left with Chris ready for me to collect (whilst still in Devon on holiday) prior to seeing Russell at the next contest. Those who regard this combined operation as an extreme piece of luck, might consider that it was precisely because it was a Rossi model that the air search was made.

The following Sunday, 11th August, was the S.M.A.E. Free-Flight 'reserve' date - but was considered unsuitable when the need to move the Trials arose. With a 'vacant'

date and permission available for the use of Basingstoke, the London Area seized the opportunity to run a free-flight gala. A comprehensive programme of three separate F.A.I. classes (in rounds), plus four mini events, was advertised.

There were some difficulties in deciding the launch site due to having an awkward wind direction, and this together with a fair rate of drift and downwind crops led the officials to reduce the max in F.A.I. to two minutes. We don't want to lose the airfield was the stated reason. This hardly explained why there were only five rounds rather than the anticipated seven.

Despite, or because of, the low max the standard of flying was remarkably poor. Many fliers 'went through the motions' using their worst models, rather than risk good ones, while others lost heart and gave up - often after a single flight. When the wind did drop in mid-afternoon there was more enthusiasm to trim than to compete.

In the whole range of events there were no fly-offs - and only one perfect score. This was recorded by Russell Peers with the very model I had just returned to him that morning! Second in this event was Paul Bond who dropped a little score on his first flight. Fred Chilton was the only other flier to persevere after the second round - whilst three fliers gave up after a swift max! Clearly this class of model has become too precious to use.

A/2 Glider had the largest entry with 18 fliers - and was won by Pete Harris of Sittingbourne with just over 9½ minutes. Tony Cordos came second due to being 'given' a third attempt by the officials after handing in his card with a 'zero' score in the second round (following a tow-in and a line-break). This ruling, or rule invention, pushed Cliff James and Pete Stewart down to third and fourth.

Competition in Wakefield was much closer with seven out of nine entrants finishing the course. Everyone had at least one flight of below two minutes, whilst winner Alan Jack had two! He forgot to start his timer on launch for his first flight, but came down through lift sans A/R, V.I.T. and D/T. Peter Williams took enough time off from thermal soaring to place second. He was lucky in getting in a second attempt after crashing very late in one round.

Best score in the Mini events was 9:52 from Tony Abrams in J.A. Power, well ahead of runner-up Johnson. The A/1 Glider event was won by Trevor Grey with a Baguley Astaroid flying very late after finishing Wakefield. Martin Kinder and Cliff James took the next positions. Coupe d'Hiver was topped by Ian Dowsett flying Stuart Savage's model proxy - just as he did at the Nationals. Chuck glider proved to be an expert's event with Pete Bayram beating Andy Crisp, Ewan Jones and Julian Hopper.

Progress of the Mini events was very difficult to follow due to an incomplete and all but illegible scoreboard. There was no attempt to enforce the 'posted' rule of recording each flight before making another. I saw at least two completed flight cards accepted by the officials without comment. All in all this contest left me very disenchanted. To advertise a meeting so that modellers are attracted from all over the country and then *ad lib* rules and regulations is irresponsible. If the venue is marginal in size under the easily predictable combinations of wind and crops then a full-blown rally should not be staged. A local informal get-together would seem much more in keeping with the available facilities and the 'organisers' inclinations.

The weekend of the 17/18th August saw the S.M.A.E. Indoor Nationals held in the Airship sheds of R.A.F. Cardington. Being the first such meeting since 1962 (also in Cardington) something special might well have been antici-

pated. Certainly the programme as given in the May issue of the S.M.A.E.'s *Model Flying* was both comprehensive and explicit; quoting microfilm and Peanut scale for the Saturday, with the Tissue events and S.M.A.E. Scale on the Sunday.

Being involved only in Easy B and Penny Plane I arrived late on Saturday hoping to get in a little trimming before dark – only to find that the programme had been 'revised' so that all the duration events were being run simultaneously over the two days. In short, the events I had come to fly were half over! From conversations with those present it became apparent that few had noted the published arrangements, and that even less cared about the changes or their implications.

This attitude typified the general approach to this meeting. Most regarded the weekend as an indoor flying session rather than as a contest and treated it accordingly. Organisation was rudimentary. To enter you helped yourself to a flight card, wrote your name on the score sheet, and added flight times subsequently. I asked subcommittee chairman Laurie Barr when Sunday's contests would end, and was told 'when it's dark'. This proved to be literally true with Mike Page still making official flights at 7.30 p.m. with all the official paraphernalia packed away and only a handful of people still present.

The actual flying conditions were good throughout the weekend, with little drift and sufficient warmth to give high times. The microfilm events were dominated by John Blount who recorded seven flights of over half-an-hour and topped both categories. He set a new British record (assuming such things still officially exist) in the F.A.I. class with 35:21 – but got a better average from his open machine. Microfilm entries were low, only nine people being represented, but the standard was high. Paul Masterman joined the '30 minute club' with a minute to spare.

Easy B was by far the most popular class with 17 entrants. The name is becoming inappropriate as an ultra light airframe is essential for really high durations. John Blount looked a 'cert' winner until late on the Sunday when Laurie Barr managed a 15-minute flight and another over 14 minutes. Third place went to Butch Hadland, whilst Bob Bailey showed 'instant talent' with fourth place and a best flight of over 13 minutes.

There was little interest in Penny Plane as an event, but a great deal in Reg Parham's new model. This was a weird and wonderful layout based on American designs seen the month before in Lakehurst. It could be described as a 'bi-plane' but the accompanying photograph will confirm that this is hardly an adequate description!

Chuck Glider was flown in the No. 1 Shed along with the Scale events. The latter were run to the announced timetable, and looked like an organised contest. Scale might not lend itself to the D.I.Y. approach but the comparison with the duration events was striking! Pete Bayram was in a class of his own in Chuck Glider – with consistent 50-odd second flights, and a best of 58 seconds. His model had a Ronitube fuselage, a completely underslung fin, and wings with an 'extra' butt-joint part way out along the inner panels. Obviously there is a shortage of top-quality  $\frac{1}{4}$  in. sheet!

After the 'Indoor Nationals' I wonder whether duration contests are really viable in Cardington – since most regular attenders are far more interested in performance than in competition. The venue is ideal for flying 'against the clock' and for trying to raise ones personal best score. This approach seems more popular (and practical) than trying to beat the experts at 'their own game'. After all, they are clearly very good, and to compare demands considerable effort and a lot of high-ceiling flying. Such specialisations appeal to few people.

To sum up, I would rate the Indoor Nationals as a very poor contest, but a very satisfactory flying session. Most people were more than content with the latter.

\* \* \*

The North Western Area's Woodford Rally has become something of an institution. The public have always been encouraged to attend – and this aspect has been influential in Hawker Siddeley Aviation Ltd. continuing to loan their airfield for the rally – and in the choice of the Summer Bank Holiday Sunday as the traditional date. Attempting to combine the requirements of public and modeller, provide satisfactory competitions in F/F, C/L and R/C, and still make a profit is no small task.

I must confess to having a 'soft spot' for Woodford, perhaps due to it being the scene of early personal success and perhaps due to having been directly involved in its organisation for many years. Being almost 'on my doorstep' also has its attractions! Consequently I find it rather embarrassing to report that this year's Woodford was hardly a shining example. Admission was charged at £1 per car, an administrative convenience that made attendance expensive for those arriving on their own. The compensating factor of free entry to the contests could well have been emphasised to the modellers.

The F/F programme had been augmented at a late hour

by an A/2 event – reputedly through there being some spare prizes! Requiring seven flights seemed rather out of keeping with the other events. For once the running of 'Mini' to the ridiculous rules of three *threes* caused a furore from prospective entrants – but Contest Director John Carter remained adamant.

He left fliers little opportunity for argument by immediately commencing to fly himself. The administration was left in the hands of a couple of girl friends, aided intermittently by Falcon club members.

A stiff breeze blowing across a limited width of airfield promised recovery difficulties. These, in fact, hardly arose unless models went an exceptionally long way. Perhaps I was a little unlucky as my A/2s chose 'good' hiding places, and I spent most of the day searching downwind. Consequently I saw little of the flying and missed being able to make a final flight in A/2. This cost me the contest which was won by John Carter, by only half a minute in fact. Andy Crisp was the only other entrant to complete the course (or indeed record more than two flights!).

Open Glider was harder fought with 26 actual scores recorded. Winner was Martin Dilly, thanks to flying in early afternoon when the drift abated somewhat. He managed two maxs in his 8:05 total, using a catapult launch (as distinct from circle tow) model. Second and third were Terry Dilks and Pete Oliver, again with two maxs apiece.

Russell Peers took both Open Rubber and Power, against very mediocre opposition. His rubber model was found and reported twice by local residents. The controversial Mini event saw Julian Hopper win with a  $\frac{1}{2}$ A, but was closely followed by several A/1s. Tony Slater topped Chuck Glider by nearly a minute.

The F/F Rally Championship for total aggregate in all events was taken by Andy Crisp with a very impressive score of over 33 minutes. He flew Rubber, Glider, Power, A/2 and Chuck – and picked up a couple of third-place plaques in the process. The similar Junior title went to J. Abbey with a three-event total of 9:21. I reckon these two fliers worked very hard for their awards.

With no need for fly-offs there was plenty of time between the end of the contest and the formal prizegiving. This interval (and indeed the final 20 minutes of flying) saw a heavy downpour and the complete disappearance of the public. The modellers remained – or at least those with something to collect. Tankards and trophies were the prizes – plus a bonus kiss from the 1974 Miss Aeromodelling Christine Eyrel.

To be fair, and balance the picture I have painted of recent contests, I would like to have continued with reports of September's meetings. However, my space allowance is not infinite – and the 'better' events will have to wait another month!

## Results

### Fifth S.M.A.E. Area-Centralised Meeting – 14th July 1974

**M.E. Cup (Team Glider) (35 teams)** 1. A. Richmond, 34:29. 2. A. Crookham, 31:51. 3. (South Bristol), 30:34. 4. A. Norwich, 29:46. **M.E. Cup Individual Scores (151 entries, 140 scores)** 1. P. Bayram (Richmond), 9:00+4:57. 2. M. Woodhouse (Norwich), +2:52. 3. C. P. Williams (Richmond), +2:35. 4. A. Wisher (Croydon), +2:24. **Astral Trophy (F.A.I. Power)** 1. F. Chilton (Crookham), 19:43. 2. A. Chilton (Crookham), 17:40. 3. D. Welch (Brighton), 14:24. 4. D. Cash (East Grinstead), 12:19. **Coupe d'Hiver 24 scores** 1. M. Sanderson (Grimsby), 8:27. 2. J. O'Donnell (Whitefield), 8:21. 3. R. Paveley (Anglia), 8:12. 4. A. Grantham (East Grinstead), 7:30. **Plugge Cup (after 4 events)** 1. Southampton, 1,042 points. 2. Norwich, 970 points. 3. Crookham, 858 points. 4. St. Albans, 791 points.

### Indoor Nationals, Cardington – 17th-18th August 1974

**Easy B (Total best 2 from 6)** 1. L. Barr (Hayes), 29:38. 2. J. Blount (Croydon), 28:52. 3. C. Hadland (RAFMAA), 25:41. 4. R. Bailey (St. Albans), 24:49. **Penny Plane (Total best 2 from 6)** 1. R. Parham, 18:31. 2. N. V. Zotov (RAFMAA), 11:00. 3. J. O'Donnell (Whitefield), 7:30. **F.A.I. Microfilm (Total best 2 from 6)** 1. J. Blount (Croydon), 66:17. 2. R. Parham, 63:58. 3. L. Barr (Hayes), 61:32. 4. P. Masterman (Norwich), 58:35. **Open Microfilm (Total best 2 from 6)** 1. J. Blount (Croydon), 67:32. 2. B. Edwards, 56:12. 3. P. Masterman (Norwich), 53:38. **Chuck Glider (Total best 2 from 10)** 1. P. Bayram (Richmond), 1:55. 2. M. Fantham (Richmond), 1:36. 3. A. Slater (Leatherhead), 1:27.

### Woodford – 25th August 1974

**Open Rubber (11 entries)** 1. R. Peers (Falcans), 9:00. 2. K. Proctor (York), 7:32. 3. A. Crisp (Oxford), 7:30. **Open Glider (26 entries)** 1. M. Dilly (Croydon), 8:05. 2. T. Dilks (Falcans), 7:35. 3. P. Oliver (Whitefield), 7:11. **Open Power (7 entries)** 1. R. Peers (Falcans), 7:54. 2. J. Hopper (Stanstead), 7:27. 3. P. Harris (Evesham), 7:15. **A/2 Glider (7 entries)** 1. J. Carter (Falcans), 16:36. 2. J. O'Donnell (Whitefield), 16:01. 3. A. Crisp (Oxford), 11:40. **Combined Mini (13 entries)** 1. J. Hopper (Stanstead), 5:45. 2. C. H. Abbey, 5:36. 3. M. Dilly (Croydon), 5:20. **Chuck Glider (5 from 9 x 1  $\frac{1}{2}$  min.)** 1. A. T. Slater (Leatherhead), 5:37. 2. R. Roberts, 4:41. 3. I. Allen (Falcans), 4:36. **F/F Gala Champion** A. Crisp (Oxford), 33:27. **F/F Junior Champion** J. Abbey 9:21.



# CLUB NEWS

GENERALLY the attitude to the flying field situation is one of gloom and despondency, but usually when I have come fresh – or should I say, jaded – from a nowhere-to-fly doomwatch report I am bemused to find some very likely flying site grossly underused, or not used at all. Naturally, the situation is bleak if you want to fly heavy, fast radio models or two-miles-a-flight free-flight machines, but there is still ample scope for less ambitious forms of model flying.

Nowhere is this argument better illustrated than in our first report, which comes from the **North Cheshire Radio Model Group**. In the interests of preserving the use of the 80-acre site they have acquired from a friendly farmer, all competition flying, entailing, as it inevitably does, loud screaming motors and inefficient silencers, is strictly taboo. The emphasis on the field is on sport and fun flying, and any radio flyer suffering from an overcrowded site, or no site at all, is welcome to come along for a day's flying. The fee for the day is a mere 10p, but the visitor must bring along his licence, insurance and, of course, colour code pennant. All that is needed is a phone call to 061-368 9621 to make the arrangement. There is still room in the club for a few more members, and anyone interested can make the necessary inquiries on the same telephone number. The club is also fortunate in having the use of a decent soaring slope. It is hoped to stage a fly-for-fun event next year, together with a Thermal Soaring contest.

I did say that the situation for free-flight contest flying was bleak, but this highly rewarding form of model flying still goes on apace – it depends where you live. Now, the **Vulcan Free-Flight Group**, from whom we have a report by Dave Goodwin, is fortunate in having the use of Ringinglow Moor, to the west of Sheffield. Power flying on the site, like so many public open spaces these days, is strictly verboten, and the group, formed earlier this year, and consisting of such doughties as Ron Firth (Sec.), Brian Kenny, Roy Hoff, Dave Goodwin, Bernard Mackay and Paul Kenny, flies only rubber and glider. The club is a breakaway from the Sheffield S.A., which is too dominated by what Dave calls the 'three dimensional model railway clan' to be interested in the S.M.A.E. As a comment on this Radio/Free-Flight hiatus that exists in so many clubs I would point out that whereas it is in the immediate interests of the free-fighters to belong to the S.M.A.E., because of the contest benefits, many, mainly radio clubs have to realise that a strong central body is a safeguard against unhealthy pressures from anti-model flying lobbies and a means of keeping the frequency allocations open. Now with winter on our wet doorstep the club hopes to run some indoor contests in a local college.

Stuart V. Tucker, Hon. Sec. and Treasurer of the Leatherhead M.F.C., reports not much benefit from a local government shake-up either, it seems. The club

has been granted the use of the Fetcham Road Sports Ground for another year, but only on certain Sundays throughout the year. From observation it would seem that C/L site options are not all that popular. The C/L provision is the easiest one for any council to make, but the real demand is for radio facilities, and these are hard to obtain in urban areas. But perhaps C/L flying is not all that popular in the club at present, anyway, for they do not have their usual display team going this year. However, they have had the good fortune to enlist the aid of the very able *Three Kings Club* to fill in at their various bookings. On the credit side of things the club contributed for the twelfth year running the B.A.C.'s Sports Day Exhibition. The junior section fared particularly well. Peter Bullard came first in the under 15s class with his Graupner Amigo, and Andrew Halcrow second in the same class with a Mercury Swan. Peter Bullard also gained another first in the under 15s plastic section with a 1/24 scale Hawker Hurricane. All the rage at club meetings is electric r.t.p., with two models flying in the same circle.

Just to prove that Radio has it's competitive as well as it's 3D Model Railway side, we have a report from John Stacey on the **Penrith & District M.C.'s** R/C Novelty contest held back in July. It was staged on the club field on Helton Fell, near Askham, Penrith, and the guest clubs which came along to enjoy the fun and fury were Kendall, West Cumberland and Carlisle. The programme consisted of Concours, Pylon, Aerobatics, Balloon Bursting and Limbo; a nice mixture of the serious and the light-hearted. Weather was windy, but did not deter the 15 entrants or the large number of modellers and wives who turned up to spectate. Penrith had successes in Concours and Limbo. Mr. Stacey, the Secretary, tells us that the club has been going strongly in other directions, too, with demonstrations at two local Gala, taking part in the Leisure Activities Exhibition, and, biggest achievement of all, 'starring' in the 'Hobby Horse' series on Border T.V. Fellow modellers are welcome at Helton Fell any Sunday afternoon.

The **Flying Druids'** newsletter reports the best Middle Wallop Rally ever, well attended, and with a final balance of £81. Only disruptive factor was the weather; a succession of torrential showers threatening to upset the rather tight schedule. But luck was with the Druids, who richly deserved it after all the work they put into the event to make it a success. Highly encouraging was the turn out of members overnight to erect the tents, rig the ropes and generally set the scene. This rally was all serious stuff: Helicopter, Pylon, etc., but for the September Club Day it was free beer, lemonade and snacks against a festive background of Spin, Spot and Simple Aerobatics events. Even so, Radio flying is not all beer and skittles, and the sort of expensive risks involved is illustrated in the story of a member who crashed through a push rod connection failure, rebuilt the model, flew it for a time quite happily, then suffered another crash – a smitheren one this time – through some apparent structural weakness. If there is a moral here, it is that radio models are fast, sensitive and highly vulnerable, and can be quite a challenge to skill and character.

A correction from the **Waveney M.F.C.** I did say, a couple of issues back, that the club airfield was R.A.F. Watton, but the newsletter Editor, Dick Wickham, informs me that they use it only when an S.M.A.E. event is held there. Normally, the club flies

at Beccles and Ellough. But wherever you have to fly, you must have a reliable model. What not to do is fall into the trap of buying a duff kit. This happened to the Chairman, Rod Roper. At £41 it was an expensive outlay, and no two pieces fitted. A complaint to the factory brought forth the quite extraordinary admission that they had never actually built a model from the kit. But given that you have the right model, you must expect increasingly stringent safety controls on airfields. The Waveney Club has now produced a quite formidable list of rules to be observed at the Ellough Airfield. At least they look formidable on paper, but are welcome by the responsible model flyer who prefers good order to ruinous chaos. If power radio is strenuous on the nerves, thermal soaring can be ditto on the other muscles. An advert in the mag is for a four minute miler to tow up a Monterey. I have seen a few people myself wilting under the strain, and the only civilised answer is the mechanical winch.

You may think a nice stretch of concrete would make for ideal radio operation, but when the Watford Wayfarers flew in a 'do' at Greenfield they found the deck solidity none too kind to prop ends and other sensitive points of contact. It's a case of being either forlorn or for lawn. One comp they flew there was a '3 loop' affair, in which the flyer was required to fly one circuit, including one roll and three loops, and land again in the shortest possible time. Quite amazing the variety of radio comps you get these days; mostly designed to coax the average flyer into activity who may not be equipped for pure aerobatics or the rigours of pylon flying. I am sure these popular competitions put a bit of spice into club life, and help to raise flying standards.

According to the Norman Chapman column in the *Three Kings' Court Circular* the latest diversionary craze in the aeromodelling fastnesses is a gadget that is something between a discus and a flying saucer. Arthur Simpson is the expert in the art of building and projecting these U.F.O.s. His model, the newsletter says, the 'wimpy a 24 in. disc of balsa'. Now I do not know much about the aerodynamics of wimpling, but you can – given a good heave – spin the dome topped disc to a height of 70 feet and a distance of 200 yards. Could have a good novelty competition potential. The club appears to have enjoyed a lively season of comps, demos and – well, just model flying, which, after all is what the hobby is all about. The tendency, generally, appears to be towards the purely Scale model, and this is also very much the case in Radio. Functionalism seems now to be the sole prerogative of free-flight, although we are reminded in the newsletter that, at the July Open Day at Old Warden, there appeared to be more Free-Flight Scale than anything else. Even so, the C/L flyers were far from obscured.

The Whitefield M.A.C., is one of the few clubs – at least to my knowledge – that runs purely internal free-flight contests. These days you just do not get that much contest support within a club – the contest minded people often preferring to 'nurse' their models for the more important rally and national events. On the lighter side of things, the club has held an r.t.p. contest (thought not so light in character, considering some of the work and expertise that goes into the activity these days) and a Chuck Glider event (you could almost say the same for that). In fact, the club 'fun' events seem to be taken with ever increasing seriousness these days. A good thing, too, as they are a great help in keeping a multi-interest club together.

Comment in the *East Anglian Area Newsletter* is of the high summer quietness that prevails on the Free-Flight front. It is a lull which finds favour in the editorial, for free-flight and growing crops do not co-exist happily together, particularly during the summer we have just had of high, drift off the airfield winds. Models landing in corn are almost impossible to locate, and searches not all that welcomed by the farming fraternity. It is suggested here that the contest moratorium should extend from July 1st to September 15th, so that the crop hazard can be minimised. It is no laughing matter to lose the type of expensive, detailed machine required for modern day contest work. During the generally windy season, though the Area has had its share of luck with a number of events coinciding with the less hostile patches of weather. The Summer Gala was a case in point, and the Club Championship at Stradishall another.

Reproduced in *WMC Patter*, newsletter of the Willamette M.C., of Oregon, U.S.A., is a plan of a very elegant 'gassie' of the pre-war period, *The Buccaneer*. This slow flying model looks very impressive in flight, and is the sort of vintage model that they now steer around by radio.

Your reports welcome – and newsletters.

Clubman

## Contest Calendar. . . . .

October 27th	NORTHERN AREA F.A.I. RALLY. F.A.I. R/G/P in rounds, S.M.A.E. members only at R.A.F. Topcliffe, Yorks.
October 27th	LONDON GALA at R.A.F. Wyton Nr. Huntingdon, Hunts C/L F.A.I. 'B' Goodyear team race. Speed, stunt, scale R/C, Class II scale. Entry on day.
October 27th	WHITEFIELD GALA F/F: Open R/G/P Chuck Glider. C/L. Combat. Venue R.A.F. Chetwynd, Salop S.M.A.E. members only. Trophies and plaques to winners – previous winners please return your trophies in time!
November 3rd	C/L AEROBATICS TEAM TRIALS at Croydon Old Airport, Croydon, Surrey. Details J. Mannall, 3 Totnes Close, Bedford.
November 10th	NORTHAMPTON 10th ANNUAL COMBAT RALLY at Midsummers Meadow, Northampton (on A428). Trophies plus cash prizes. 30p pre-entry from F. J. Pateman, 71 Stanhope Road, Northampton. 50p field entry.
December 1st	FALCONS F/F GALA. Open R/G/P (3 x 3 mins.) Chuck glider (best 5 from 9, 14 min. max.). Venue Chetwynd airfield, Nr. Newport, Salop. 8.30 a.m.-3 p.m. S.M.A.E. members only.
December 8th	S.M.A.E. INDOOR SCALE. Venue R.A.F. Cardington, Beds.

### CLUB SECRETARIES

Please forward details of your forthcoming contests or rallies as soon as possible to avoid duplication of dates and/or interests in next season's Calendar. Items for insertion in the Calendar must be received at this office by 10th of the month, for publication in the next immediate issue. Details should be brief but explicit, and include exact location of venue.

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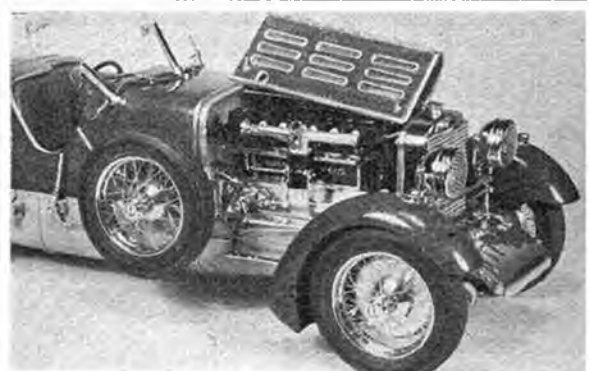
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## Scale Models

Scale Models comes back into colour with the November issue of this popular monthly and provides a wealth of modelling data. Hasegawa's latest 1/32 scale masterpiece is the Boeing P26a Peashooter of the 'thirties' which is reviewed in depth by Bob Jones, who also provides back-up camouflage and markings data. Gerald Wingrove is a name synonymous with quality scale models, his latest, a vintage Hispano Suiza and Duesenberg are no exceptions as we show the masterpieces in full colour leaving Gerald to outline the various methods of construction.

Norman Wilcomb explains with the aid of colour drawings some insignia as applied to the SPAD Escadilles during the First World War and devotees of this period will find it of great interest.

There's another RAF museum subject, another car drawing by the Taylor/Wood team and Chris Jelley takes time off from Meccano Magazine to review some recent die cast car releases.

Marine Modelling, Autominology and most regulars round off this fact packed issue which is on sale now. Price 20p, available from your local hobby shop or direct from M.A.P. Ltd., P.O. Box 35, Bridge Street, Hemel Hempstead, Herts HP1 1EE (add 9p postage).

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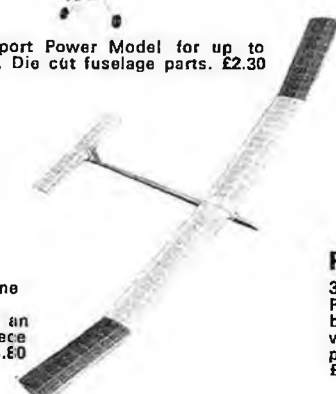
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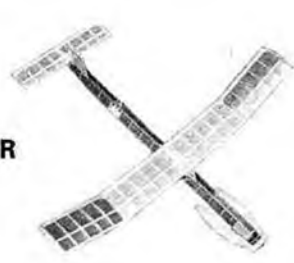
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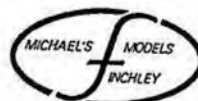
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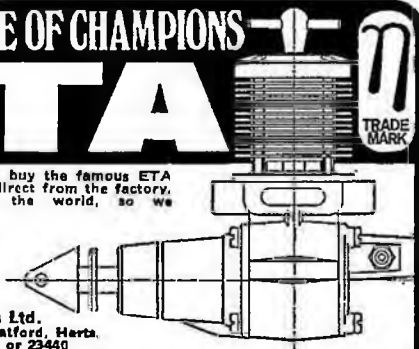
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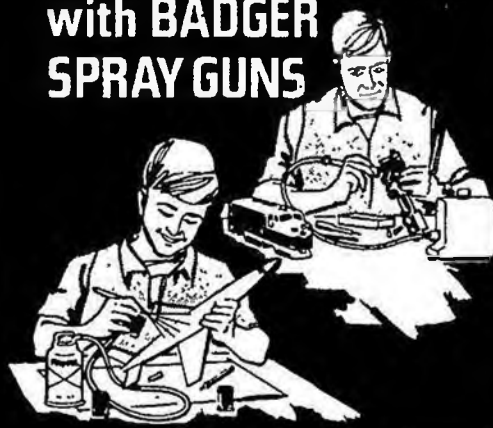
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