

July 1974

# Aero Modeller

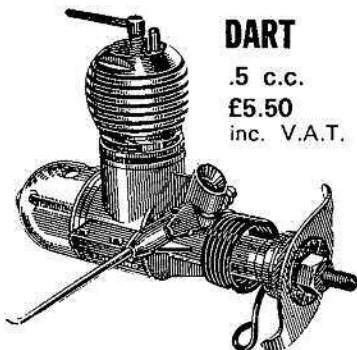


HOBBY MAGAZINE

20p USA & Canada \$1

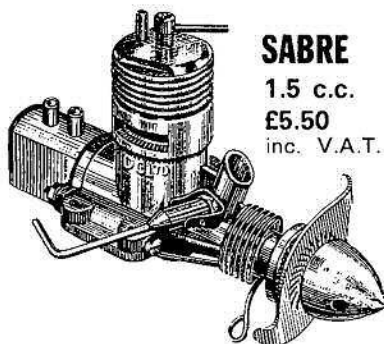
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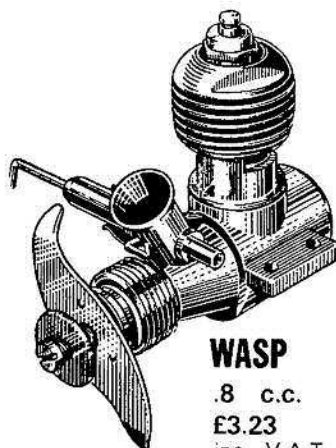
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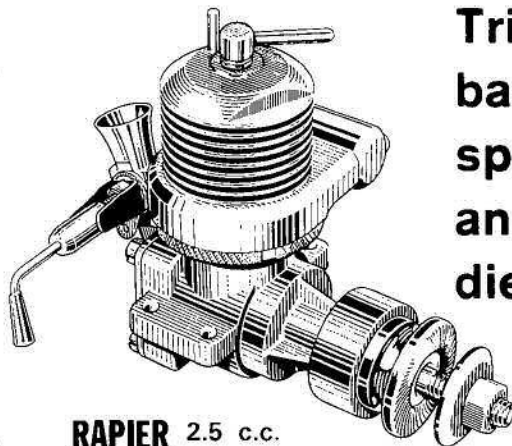
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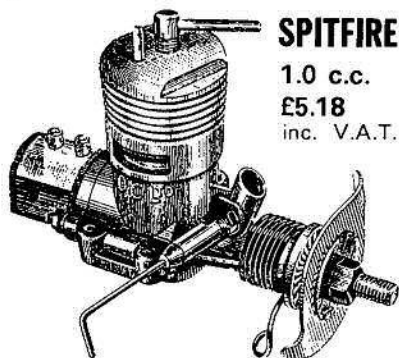
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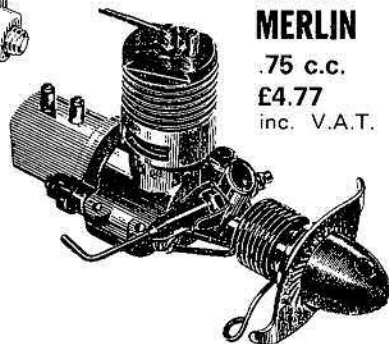
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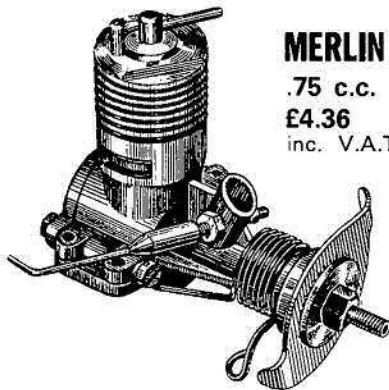
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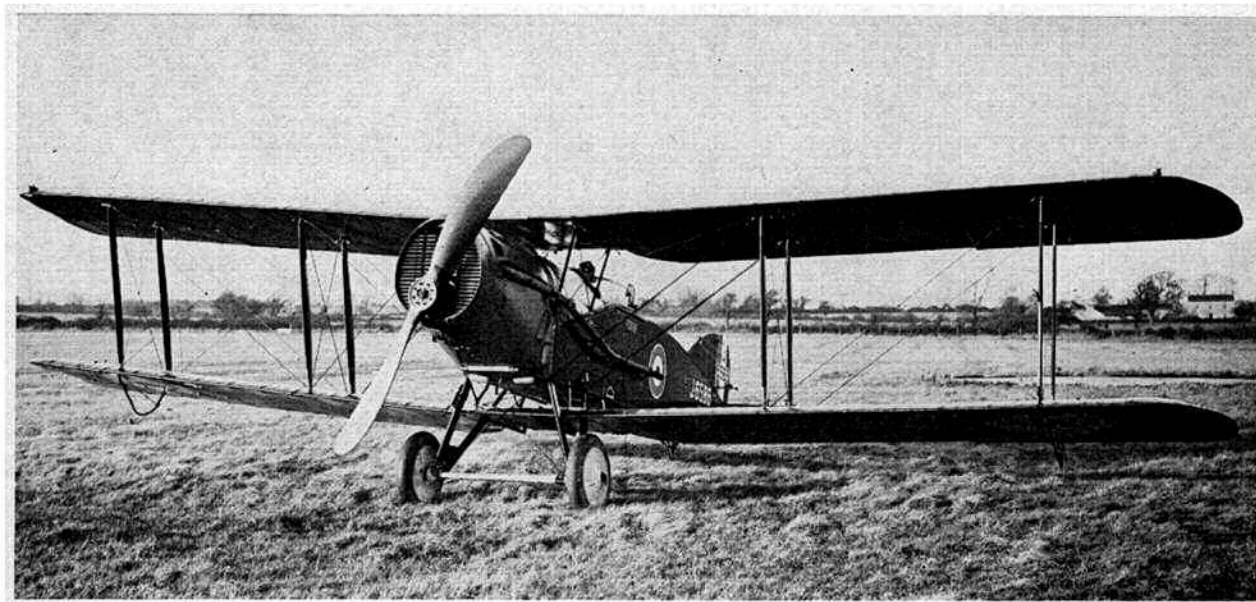
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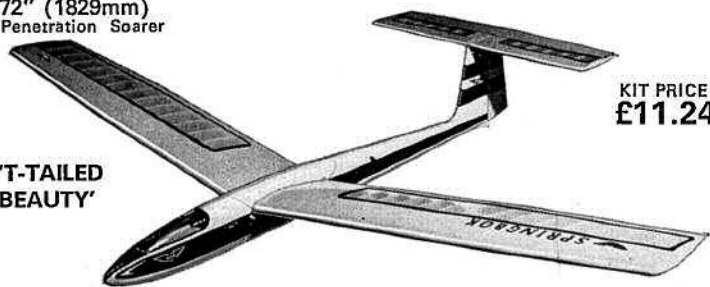
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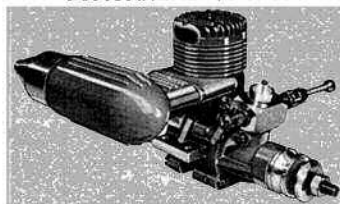
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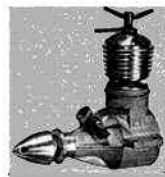
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# Aero Modeller

INCORPORATING  
MODEL AIRCRAFT

July 1974  
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## comment

If ever there was cause to provide a situation report on aeromodelling in Britain, then the Super-Nats at R.A.F. Little Rissington on May 25th-27th must surely have established the most favourable impression of a healthy hobby. In every category, the enthusiasm and proficiency of the participants exceeded all previous standards. Never before have there been so many visitors and competitors from overseas, nor has the camp site extended over so vast an area. Ingenuity abounded from unique tailless gliders to a scale radio-controlled swing wing F14B Tom Cat. Activity ran from 5 a.m. to 10 p.m., the wasp-like combaters providing a continuous choral background with their endless manoeuvres. Crack of dawn free-flight contests, with evening fly-offs involving simultaneous orbits by up to 40 models (some airborne for over 30 minutes, to land within a short distance from the airfield boundary), spelled sheer pleasure for the participants. It was in every way a memorable Nats, and one which will be the main feature of next month's issue.

## on the cover

*Jonathan Livingston Seagull, you've got a mate! Douglas Pain, as he describes on page 362, developed his slope-soaring radio-controlled 1:1 scale version of the Gyr Falcon from a kite. Between these two extremes he naturally experimented with various prototypes, a few of which are also featured on the cover. In the centre is the first glider - designed for free-flight and with sheet balsa wings, while on either side are the first and second wire-framed experiments from which the final all expanded-polystyrene version was formed. All look remarkably realistic.*

## next month

Full coverage on the 1974 British National Championships - one of the most enjoyable ones in recent years too, we might add! Plans for Peter Miller's *Duchess* control-line biplane. More on metalwork, rubber motors, building techniques and, of course, regular features! Don't miss the August issue, on sale July 19th.

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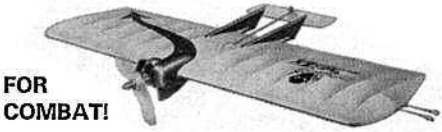
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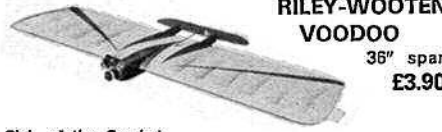
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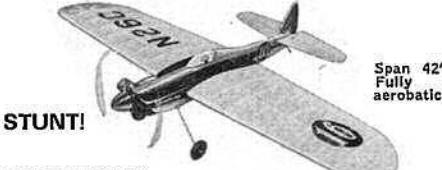
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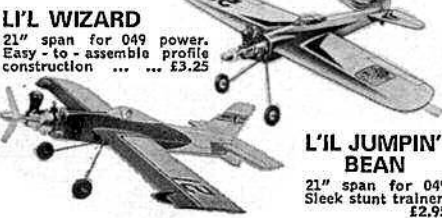
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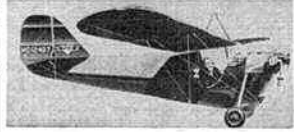
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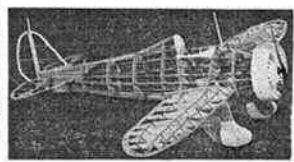
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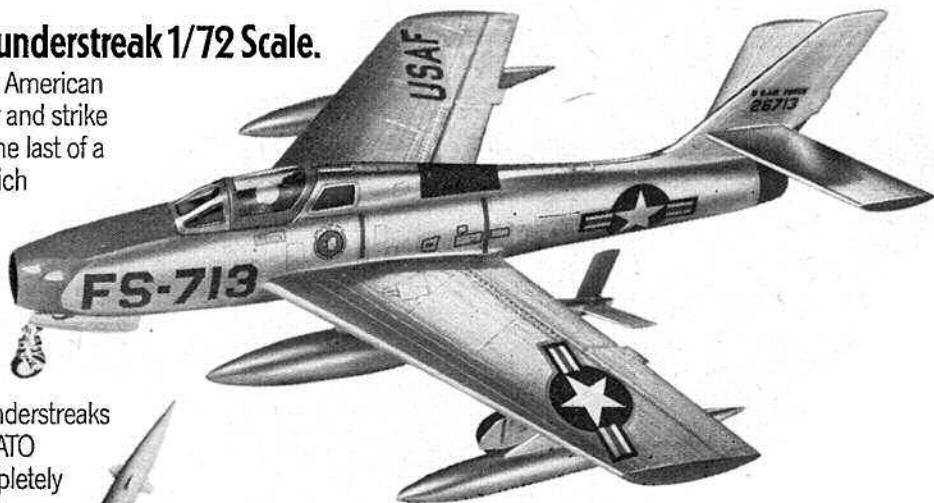


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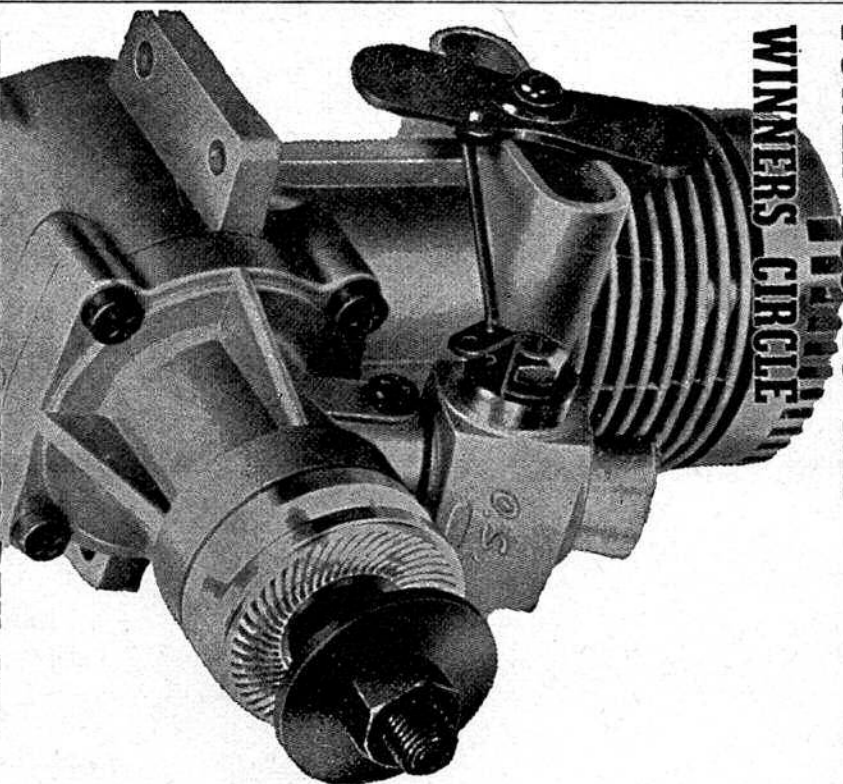
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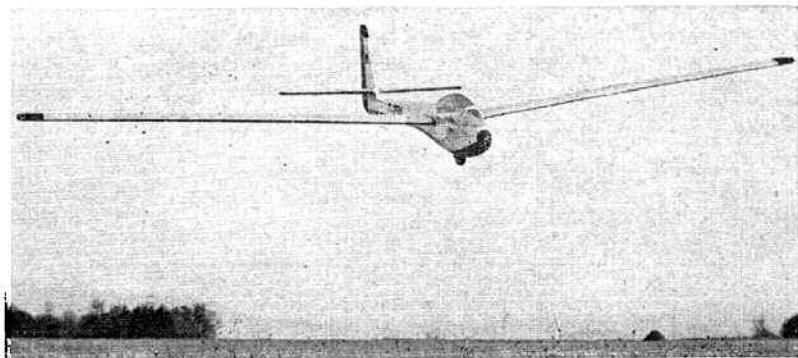


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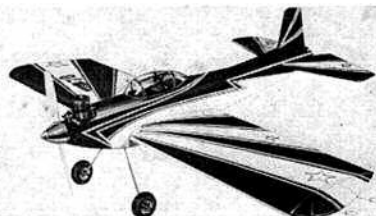
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# Heard at the HANGAR DOORS

IN A BID to encourage more young people to take an interest in aeronautics and aircraft design, a nation-wide competition has been launched to find the champion paper glider maker in Britain. The competition is in two classes, and the winner of each class will receive a *Sir George Cayley Trophy* and a cheque for £100. There will also be generous cash prizes for the runners-up in each class.

Sponsored by the mobilising division of the *Lyons Maid Ice Cream Company* (which includes *Mister Softee*) the competition has already attracted considerable interest in aviation and model aircraft circles, and it is expected that several thousand entries will be received.

The two trophies – one gold-plated and one silver-plated – have been named after Sir George Cayley (1773-1857) who, in 1804 built the first working model glider and laid down the basic principles of aeronautical science. He is universally regarded as 'the father of the aeroplane'.

As part of their contribution to the competition, the Company will be distributing two million leaflets about it from their *Lyons Maid* and *Mister Softee* sales vans during June and July. The leaflet embodies a design for a delta-wing twin-tail glider which competitors can cut out and assemble and enter for the competition. This is called the *Flightmaster* and trials with early production models have achieved flights of over 30 ft. from a launching height of 6 ft.

One of the classes in the competition will be for the best indoor performance by a *Flightmaster* model. In this class there is an upper age limit of 16.

There will also be an 'Open Class' in which a *Designer's Trophy* and cheque will go to the best indoor performance by any paper glider entered by an individual or group. There is no age limit in this Class and the only restriction on entrants is that the glider should be made from a standard A4 (size 210 x 297 mm) sheet of paper plus adhesives and necessary ballast.

The final fly-off for both classes, and the presentation of the awards will take place in London in September this year. A number of distinguished people in the world of aviation history and science have provisionally agreed to act as judges, and details of these will be announced later. In the meantime, next time you queue up for an ice-cream from a *Lyons Maid* or *Mister Softee* van, ask for details, carefully study the rules, and start cutting and folding paper!

**1974, THE DIAMOND JUBILEE** year of Naval Aviation (the Royal Naval Air Service was formed on 1st July 1924) will be celebrated by a number of 'Air Days' throughout the year, these being as follows:

*Saturday, 27th July – Royal Naval Air Station, Lee on Solent, Hampshire.*

This will commence at midday and flying displays will feature Naval Aircraft and Helicopters, Aerobatic Display Teams, Historic Aircraft and Free Fall Parachuting by the Red Devils.

*Wednesday, 31st July – Royal Naval Air Station, Culdrose, Cornwall.*

The gates will open at Britain's largest helicopter station at 10 a.m. with the flying display being from 2.30 p.m. to 4.30 p.m. Among the many exciting events, the following have been invited: The Red Arrows, Rothmans Aero Team, Fleet Air Arm Historic Flight, Battle of Britain Flight.

*August 3rd and 4th – Portland Open Days, Dorset.*

Gates open at 11 a.m. and in addition to ships and other exhibits and displays there will also be flying by the Red Arrows, Jet Provosts, Gnats and Fleet Air Arm Aircraft.

*Saturday, 21st September – International Air Day, Royal Naval Air Station, Yeovilton, Somerset.*

At the Royal Naval Air Station, Yeovilton, Headquarters of the shore-based Fleet Air Arm, on Saturday, 21st September 1974, will be staged a similar aviation spectacular to that which attracted 50,000 people last year. All types

of service aircraft, past and present, both fixed and rotary wing, together with internationally-known formation teams and famous solo units have been invited to participate.

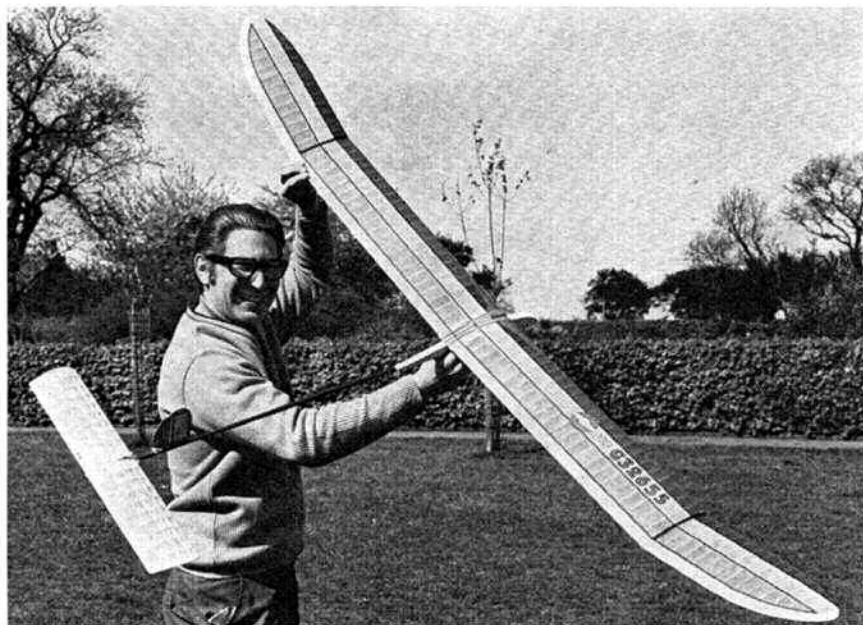
**FOLLOWING THE SUCCESS** of the Junior Stunt event at the 1974 Nationals – 16 entries – (this being written just 24 hours later!), there will be a similar event at the Northern Gala on 28th September, to be held at R.A.F. Rufforth, Near York (on B1224 road, four miles west of York). Contest organiser once more will be Bob Walker, who assures us that the rules will be exactly those as used at the Nationals, and as published in the May issue. All budding control-line fliers under the age of 17 on the day of the contest and no matter their skill, or lack of it, should attempt to enter to ensure the future of this event and to enjoy themselves, of course!

**FOR THE FIFTH** consecutive year, the American *National Free Flight Society* announces its 'Model of the Year Awards'. In 1974, the recipients will be:

Wakefield: Robert White *No. 72-9, A/2 Glider* Paul Crowley *The Happy Hooker*. F.A.I. Power, the Rossi Brothers *The Rossi 15 engine*. A.M.A. Class  $\frac{1}{2}$ A, A Power: Dennis Bronco and Sal Taibi, *Orbiter*. A.M.A. Class B, C, Power: Mel Schmidt, *SCHOCer 750*. Indoor Rubber: Ed Stoll and Paul Crowley, *CS-1*. Hand Launched Glider: Ray Harper. Open Rubber: Roland Anderson, *Roamer*. Rocket Power: Ned Smith, *Sunduster*. Scale: Jack McCracken, *Sopwith Triplane*.

Most of those receiving these awards will display and discuss their winning models at N.F.F.S. symposium, to be held at the U.S. Nats in August. Drawings, photos and features about the models will appear in the N.F.F.S. Symposium Report.

**MAURICE GIBSON**, a doyen among the model trade representatives, who for almost 20 years has been London and southern counties' salesman for Veron, passed away on 31st May. We are sure that all retailers who have been so faithfully served by this true gentleman will join us in extending sympathy to the management and staff of Model Aircraft (Bournemouth) Ltd.



**TONY CORDES**  
explains the  
reasoning behind the  
design of this 77 in.  
span A/2 class glider  
– and his approach  
to competition  
flying.

Glider's needn't be drab – a little imagination from the builder can result in a very eye-catching colour scheme with no weight penalty. Tony's current version is trimmed in red, white and yellow tissue on the top surface, while underside has red tissue for the centre panels, yellow tips. Different, most attractive, and it helps the time-keeper, too!

## LONER

a modern A/2 for the experienced builder  
and flyer – not recommended for novices

LONER has been developed to its present form over a period of six years, during which time many versions have been built and flown in countless competitions. The great aim for any designer of A/2s is to produce a design that can cope with the full spectrum of British weather and flying sites, and continuously realise the 180 seconds flight time demanded. The *Loner* is perhaps my most successful yet in this respect, but in all honesty it cannot be claimed to be the ultimate, and development will continue.

Two approaches can be made to competitive flying by the serious flier; first, he can have a fleet of specialist models, each one trimmed to suit specific weather conditions, and secondly, he can have a fleet of similar models which represent a compromise for all weather conditions. My approach falls into the latter category, mainly because if a model is lost or damaged during a competition, then a similar replacement is always available to continue flying, without having to resort to retrimming a model which has been set up to cope with differing conditions to those prevailing. The adage that 'a good model is good in all conditions' more or less sums up this approach.

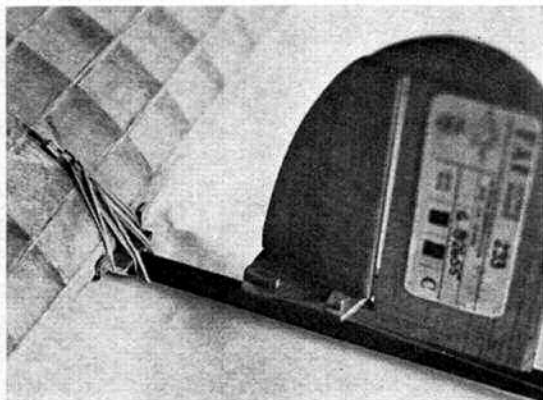
When a competitor is fortunate enough to have a fleet of similar models it soon becomes apparent that no matter how much care is taken to make two or more models exactly

the same, then for some inexplicable reason one always flies better than the others! This would suggest that if sufficient models are made, then the required number of superior models required for a competition (two for Open contests and three for F.A.I.) should emerge. This is the basic driving force why I build *Loner* after *Loner*. At the present time I have five versions, two of which I consider worth serious competition flying, and the other three I consider expendable.

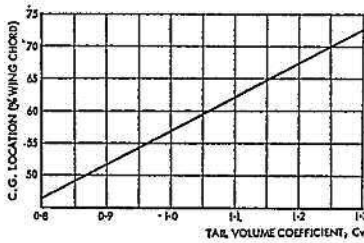
So what constitutes a good contest A/2? In my opinion it is essential that the model tows well in all conditions; it must be capable of riding the weakest of thermals, since no A/2 yet has cleared 180 seconds without thermal assistance, and yet remain stable in the strongest of thermals and turbulence, and it must have a reasonable 'still air' glide performance, say in excess of 150 seconds.

*Loner* is a compromise. It will certainly clear 150 seconds unassisted but this performance has been gained at the expense of towing stability. *Loner* can cope comfortably with wind speeds up to 25 m.p.h. (this is approximately 12 metres/second, supposedly, the F.A.I. limit for contest flying, a ruling which is somewhat controversial in Britain at the present time) but at higher wind velocities care must be taken to avoid the model towing in on the glide turn side. With this in mind, my technique of flying in very windy conditions, when one may argue that a competition becomes a lottery, is to make the decision when to fly on the ground and then tow straight up and release the model as soon as it is overhead. I thus avoid the risk of violent instabilities incurred during a prolonged tow but at the same time I risk putting the model into bad air if my ground decision is wrong. This approach, however, is second when tactical flying or piggy-backing in Open contests, but may be open to question when flying in F.A.I. contests when all the competitors fly from a crosswind-located line.

As far as thermal riding is concerned, *Loner* is adequate: it excels in the weather thermal when its good gliding performance proves an advantage. It will hold and tighten in the strongest of thermals found in Britain without any tendency to spin in, provided the small amount of washout stipulated on the plan is built into the outside wing relative to the turn. I always avoid using wash-in on the inside wing of *Loner* as this can force the model to turn out of strong lift. Difficulties were experienced at Wiener Neustadt because the wash-out was not built in at that time, with the



Note the rudder stops of  $\frac{1}{4}$  in. square spruce glued to ply auto-rudder base – neat, positive arrangement. Rudder is hinged by pins pushed through top and bottom of pin.



Adjustable tow-hook is neatly buried within glass fibre fuselage. Note also aluminium tube used to keep nylon line to timer clear of fingers.

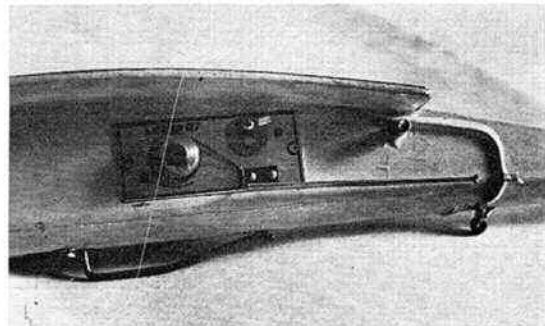


Figure 1

result that in strong Continental thermals prevalent at the '73 World Championships the model tightened up too much in the glide and it virtually spun in for scores of around 135 seconds. The use of this warp has detracted a little from the glide performance.

It is very important when competition flying to know the characteristics of the model. This can only really be achieved with much practice flying and perhaps also by using Open contests as a means to an end for gaining experience for F.A.I. contests. I think it takes at least a year of flying a model before it is safe to say 'I know this model and all its quirks'.

How do I design an A/2 and why was Loner developed into its present form?

Experience has shown that as far as British weather conditions are concerned, an adequate glide performance and sufficiently strong wing can be obtained by limiting the aspect ratio to a maximum of around 14:1. The accepted tailplane area may be taken as 15-18 per cent of the wing area, with an aspect ratio of about 5:1. A simple means of

calculating the moment arm and centre of gravity location is by making use of the parameter, tail volume coefficient, Cv. Analysis of successful A/2s has led to a relationship between Cv and CG location (figure 1). Cv may be defined as follows:

$$Cv = \frac{\text{projected wing area}}{\text{projected tailplane area}} \times \frac{\text{average wing chord}}{D}$$

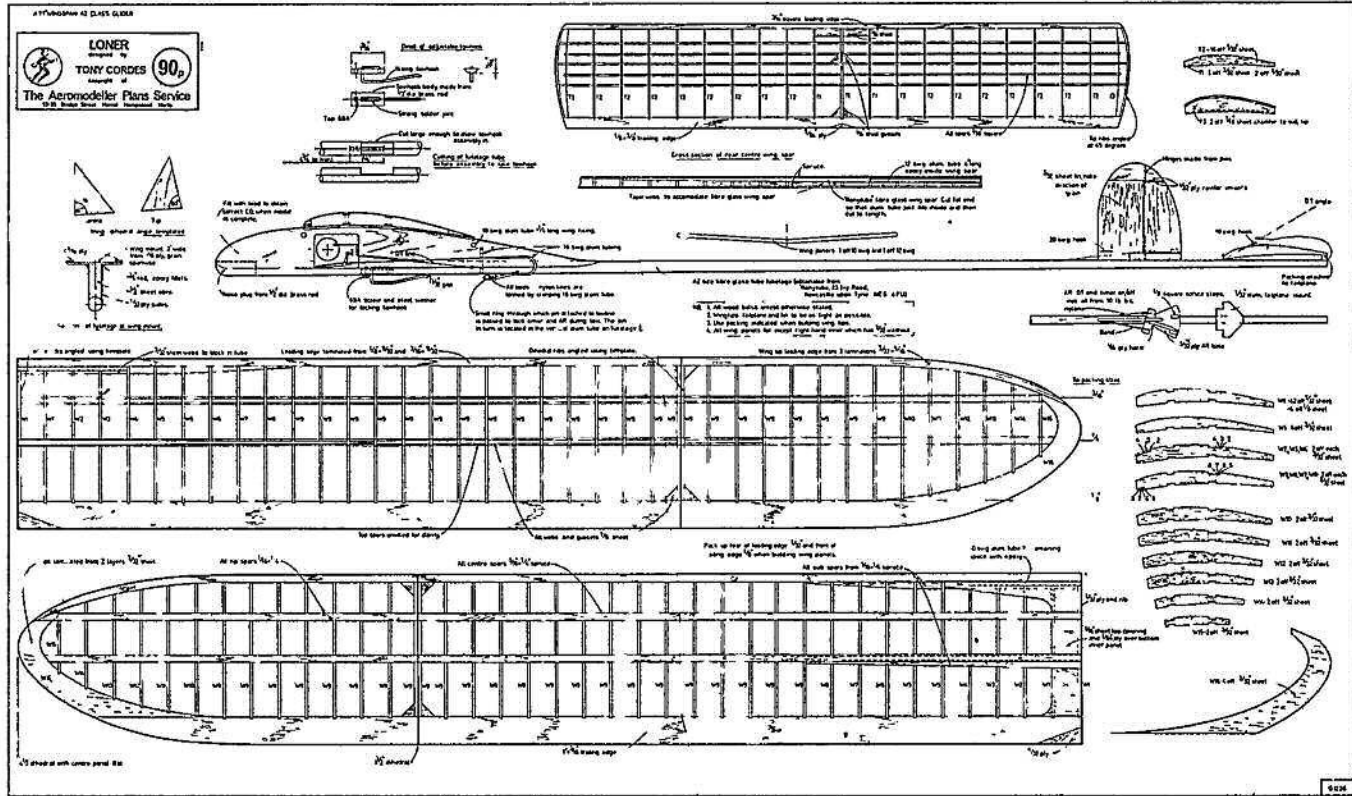
Where D = distance from the wing leading edge to 25 per cent of the tailplane chord.

The value of Cv most commonly used is 1.00 to 1.05 which gives a CG location of 55-60 per cent. Let us now see what sort of model results from this analysis.

- Total projected area ..... 525 sq. in.
- Wing projected area ..... 450 sq. in.
- Tailplane projected area ..... 75 sq. in.
- Hence percentage tail area to wing area ..... 17%

$$\text{Average wing chord for an A.R. of 14:1} = \frac{450}{14} = 5.7 \text{ in.}$$

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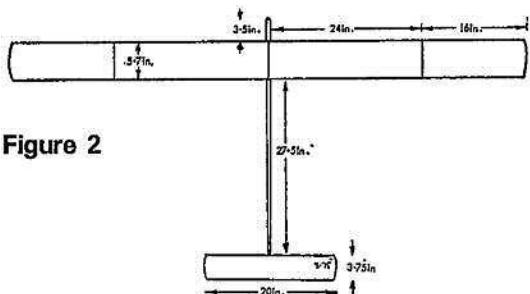


Figure 2

Picture at right shows aluminium tailplane mount - note bent-up tabs to act as pivots and leading edge stop.

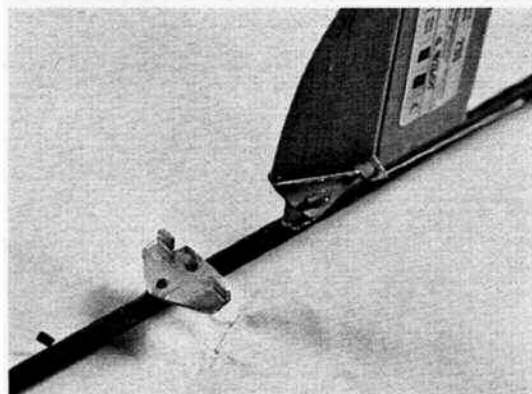
Wing span ..... 5.7 x 14 = 80 in.

$$C_v = 1.00 = \frac{480}{75} \times \frac{5.7}{D}$$

Hence  $D = 34.2$  in.

and moment arm =  $34.2 - (5.7 + 1.0) = 27.5$  in.

Figure 2 shows the design resulting from this simple calculation and as can be seen, is fairly typical of the basic British A/2. The analysis, however, can only be taken as approximate, since it ignores the dynamic characteristics of the airfoils, but it forms a useful platform upon which to develop a model. All that is needed to complete the initial design phase is the choice of airfoils which, of course, is purely personal - section used on the *Loner* wing is a development of the Mike Burrows section, circa 1964.



Push the correct length of 12 swg tube into the glass fibre spar until it just fits, and then remove the surplus from the 'fat' end. The spar is then cut to length to suit the wing by removing the surplus from the thin end. Construct the wing panel in the usual way, leaving out the top rear spruce spar, but adding all the webs including the tapered ones. Place the glass fibre spar centrally over the spar notches in the ribs and mark off the width of the spar at each rib. Cut a V-notch from these marks to the depth of the tapered webs in each rib and then, using the spar as a sanding blank, sand the notches to a U-shape so that the spar fits snugly along the top of the webs. Epoxy in place and then epoxy and glue in the top spruce spar.

In the case of trimming, I shall again assume that the builder is sufficiently experienced to rig the model to produce the following characteristics by adjusting the towhook location and rudder and tailplane settings.

When the model is being towed gently, it should fly straight, and when towing at 90 degrees to the wind direction, the model should follow. Try to avoid launching out of wind except perhaps towards the glide turn. When towing fast, the model should have a bias towards the glide turn so that a catapult launch may be achieved - after such a launch, if it is in lift, the model should whip around fairly quickly into wind and turn in about 60 ft. diameter circles. If it is not in lift, then it will fly a fairly long downwind leg and then turn in 200 ft. diameter circles until either it hopefully catches up the lift that may have been missed through too slow a launch, or finds its own lift. If it is down, then it is as bad a model as any other!

Be prepared to trim the model over scores of flights in all weather conditions, making minute adjustments until just the right set-up is achieved. If after a reasonable amount of trimming there are still inconsistencies in the glide, then a carpet thread turbulator should be added to the wing. The best location appears to be  $\frac{1}{4}$  in. back from the front of the leading edge, but this in turn may have to be varied during the trimming process. Remember, as I said earlier, it takes around a year of regular flying to get to know and trim a model for maximum performances, so the very best of luck.

The original *Loners* (1968-71) were similar to that shown in figure 2. The changeover to elliptical-tipped wings was made for the following reasons:

a) By using elliptical tips then either for the same area and span (i.e. the same aspect ratio), a larger chord may be used in the central position of the wing with a consequent gain in torsional and bending strength, or for the same area and basic chord as the rectangular wing aspect ratio is increased.

b) Theory has shown that elliptical profiles are aerodynamically superior to rectangular profiles. However, it is very difficult to calculate the exact profile for maximum benefit and hence it may be argued whether they are worthwhile or not. They certainly look nicer!

c) With earlier versions I experienced considerable difficulty in obtaining a stable dethermaliser action and on several occasions the model would contort down, and on landing, break off a wing tip. In an attempt to cure this I resorted to using a shallow D/T tip-up angle so that the model came down under a controlled spin. Unfortunately, although less frequently, tips were still being dislodged due to the heavier landing incurred by the spin. I put this down to the squared tip pivoting on the ground surface (usually a runway) with little give, so that the levering forces set up caused the fracture. With elliptical surfaces the tip is more likely to roll rather than pivot and consequently induce smaller forces. Since converting to elliptical surfaces I have only dislodged one tip over a period of three years.

d) An inherent benefit of using a larger chord in the centre section of the wing is that a more accurate rib profile is used. If a person can cut a shape to a tolerance of, say,  $\pm 1/100$  in. of the correct size, then obviously the larger the shape the smaller the percentage error.

Construction should prove relatively straightforward to the experienced modeller. The only new concept perhaps is the use of glass fibre wing spars and these are easy to instal.





If you can't buy it

# MAKE IT!

that's the advice of  
Flt.-Lt. John Stroud

Careful use of a hacksaw can provide the aeromodeller with a perfect starter battery for glow engines, at no cost! See text for details.

FOR a number of years I have looked forward to my two sons becoming aeromodellers, but when they were old enough I suddenly realised that much of my hobby was going to cost me at least three times as much as before, with three times as much wood, fuel, glue, engines, plugs, etc., to buy! As their eager friends also found it a struggle to buy all the things they needed on their normal pocket money, I therefore started to look around for ways of setting-up as an aeromodeller at minimal cost.

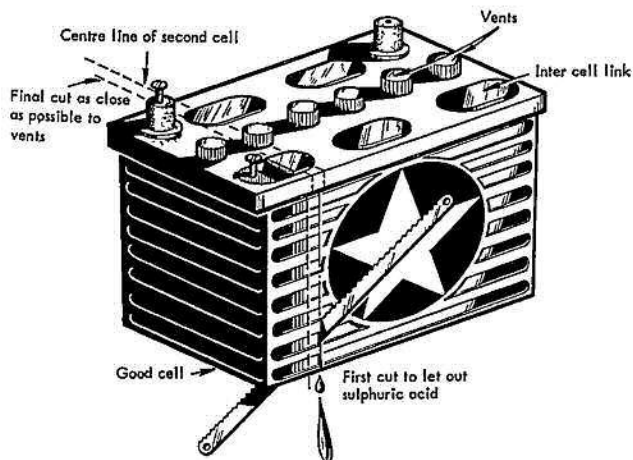
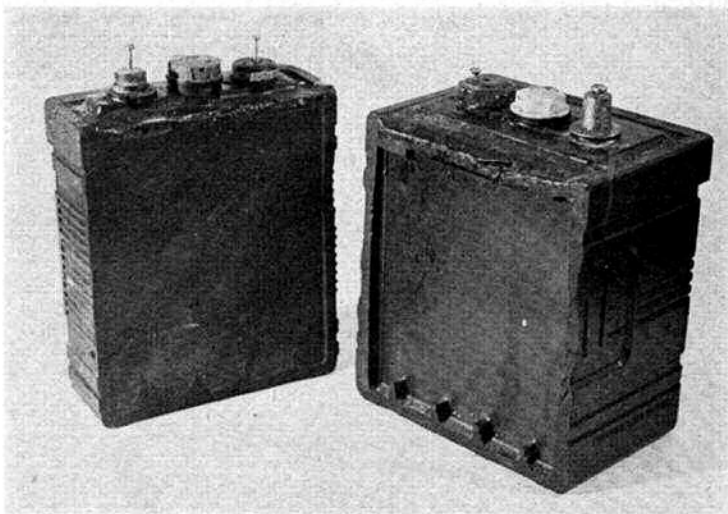
The first item most boys want is an engine. There are many good cheap engines on the market today which have a performance that is more than adequate for a beginner and to keep the overall costs low, an engine of .8 to 1.5 cc. is ideal. (I can recommend the DC Wasp as a fine little motor which is very reasonably priced.) Advice on motors, especially second-hand ones, is best obtained from an experienced modeller, and if you ask around it is amazing how many people know an ex-modeller with an engine in the rubbish drawer. Free ones are always good value, but do not be tempted by one that is too worn.

It is likely that the first engine is a glow and here is where we first get into the cost-cutting game. To your horror you find it cannot be started without a battery. Schemes using flash lamp cells never work for long and are generally a frustrating and expensive waste of time. The best starter cell is the 2-volt lead acid type, but the cost usually puts one out of the reach of schoolboys (and some Dads). However, all is not lost. Here is how to make an excellent one for next to nothing. The first step is to make friends

with a nearby garage owner. When a car battery comes to the end of its useful life it is normally because one or two cells are no good, but within this scrap battery the rest of the cells are often perfect for starting model aircraft engines with 2-volt glow plugs. The snag is that the whole battery is far too heavy to lug about, so my idea was to cut out the best cell and throw the rest away. Your friendly garage man will tell you which is the best cell in the battery and if you have a choice, choose a battery with the good cell on the end and with external cell connections. The more modern batteries with hidden connections are slightly more difficult to convert.

Having chosen your cell, now we come to the tricky bit. Inside the battery is sulphuric acid; if you get it on your shoes or clothes they will fall to pieces!! You must therefore be very, very careful. The best way is to do the job under the supervision of a science master, or if you are not able to do this then follow these instructions and get Dad to help you. First saw out the inter-cell connection link (see shaded portion in Figure 1). Now choose a suitable spot on which to drain the acid. A hole dug in the garden will do, but check that Dad does not intend to plant anything there for a while, and if it is in reach of the garden hose, all the better. The next step is to saw a nick in the bottom edge of a cell *next* to the one you want to use. Saw it with an old hacksaw blade until the acid starts to run out, and then stop and keep the battery upright. As soon as the acid has stopped running out, give the drained cell a good flush out with ordinary water - which is why you need the hose. When you have done this, remove the battery from the hole in the ground and 'water' the hole to help wash the acid away and fill the hole back in. Next cut the battery into two pieces close to the vent valve shown in the sketch. Tidy up the edges of the cell you want and there is your starter battery. Connections for crocodile clips are easily made by drilling holes in the terminals and putting in two self-tapping screws.

The smallest lightweight starter battery can be made from a motorcycle battery. I have one at the moment which is very large and was made from a 6-volt car battery. It will start three engines at once with no trouble and lasts for many weekends between charges. One last piece of advice. As these cells do not stand up very well, due to their small base, it is advisable to build them into the model box so that they cannot fall over.



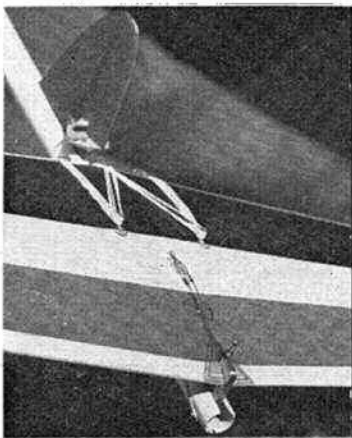


ONE OMISSION from last month's selection of contest reports was the S.M.A.E. Area Centralised meeting of 17th March. If this sounds a long time ago, it should be remembered that the very nature of this type of event involves time-consuming collation and distribution of results. On this occasion, moreover, the results took a surprisingly long time to arrive, and hence missed my 'press date' for the June *AeroModeller*.

From reports received from a couple of Areas plus conversation with a number of competitors, it has been possible to obtain a reasonable picture of conditions up and down the country. Everyone had fairly windy conditions for most of the day, whilst parts of the South had some rain as well. The most peculiar conditions were at Beaulieu where it started windy, then rained for much of the afternoon. After many would-be competitors had left for home, the rain stopped, the wind dropped, and the sun came out! Nineteen maxs were recorded in an hour.

An early start, combined with efficient use of this unusual weather, enabled John Cooper (of Southampton) to win the Open Rubber even with a 4:30 fly-off and take second place in A/2. Alan Jack also did well in both events, and took two fourth places - their glider scores helped Southampton to an early lead in the *Plugge Cup*, the season's club championship, just ahead of Norwich, Croydon, and Bristol and West.

Perseverance paid off in other Areas as well. The North West had wind but plenty of lift at Chetwynd - and Phil Owen flew A/2 extremely well to win the *KMAA Cup* with a 20:16 total. He was using a bubble machine to mark lift, and only dropped a little score on two flights. The next



Left: rear end of Ken Faux's F.A.I. power model reveals neat V.I.T. installation and ample rubber band 'springing' for tailplane.

Right: front end of same model reveals the inevitable Rossi 15 fitted with carbon fibre prop and housed in a very neat, streamlined pan. Whole model is similarly well engineered.

## John O'Donnell's FREE FLIGHT COMMENT

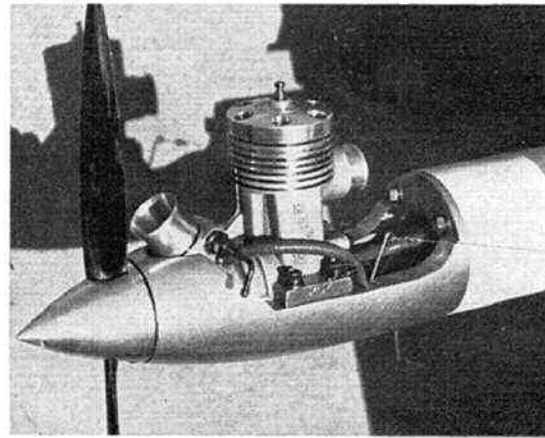
Ken Faux's latest F.A.I. power shows continental influence. Has 72 in. span wing, triple fins, Burrows glass fibre fuselage, all-sheet surfaces and an extremely fast climb.

competitor at this venue was several minutes behind.

I went over the Pennines to fly at Elvington with the Northern Area. In an attempt to avoid 'overloading' their facilities this Area require 'outsiders' to write in for permission to fly with them - approval appears automatic, but then the scheme was apparently only intended to stop other Areas arriving *en bloc*: The Northern Area donate a nominal prize (of £1) for the highest score in each event at these meetings - but this award is now restricted to their own members. At the particular meeting being reported, the A/2 prize was given to Keith Proctor for the fourth best score at Elvington - myself, Brian Barnes and Terry Dilks all being ineligible!

Part way through the day, one of my A/2s lodged itself 60 ft. up an unclimbable tree. Its retrieval the following weekend involved the hiring of an extension ladder (under £1 from a local rental firm!) and the purchase of sufficient aluminium tubing to make up a 20-odd ft. pole. I would recommend these techniques to those in similar straits. . . . Assistance on site is obviously necessary and my thanks are due to Keith Proctor and Paul Lester who came out to help.

The only national place achieved at Elvington went to Russell Peers who was second in the *Frog Senior Open Power* contest, with the same old Eta 29-powered *Woodpecker* that has served him so well for some years. His fly-off was just a second short of four minutes. The trophy, however, was won by Paul Bond who flew, not with East Anglia, but with the London Area at Bassingbourn. His extra flight was almost 4½ minutes and was made, almost certainly, with an F.A.I. model. Third place went to Trevor



Payne, also flying at Bassingbourn, with a disappointing score from his *Forte* (see May's plan and article), thanks to the motor seizing part-way through the climb. This, in turn, was due to filling it with grit on the preceding landing. A different sort of trouble afflicted John West at Ashdown Forest when his Rossi F.A.I. model disappeared into low cloud at 50-odd seconds! (Tony Child found it for John on the Tuesday afterwards.)

As already mentioned, the Rubber event was topped by John Cooper. Second was Dave Hipperson with a 3:45 fly-off at Bassingbourn, whilst third went to Trevor Grey whose model disappeared for ever into the Ashdown Forest's low cloud and mist. This contest also saw the demise of John Carter's 6 ft. 'visibility special' - ending its days hung up in high-tension wires downwind of Chetwynd.

The support given to these contests varied from class to class. The A/2 event attracted well over 100 actual scores - whilst two Open events barely exceeded a couple of dozen apical *Plugge Cup* influence is presumably part of the explanation - as are modellers' opinions of the 'chances of survival' in the Open events.

\* \* \*

Despite the complete absence from the S.M.A.E. of any advance details as regards location, the two-day F.A.I. Meeting at Sculthorpe on 20th and 21st April was well supported. 'Word-of-mouth' information plus that contained in *Free Flight News*, obviously reached most of those likely to be interested.

As well as being a contest in its own right, this meeting was being used as a Selection Trials to decide the teams to represent this country at the forthcoming European Championships. Despite the need to pay one's own fares and fees, there was a fair amount of interest in qualifying for the A/2 and Wakefield Teams and going to the Saar in September. In contrast I know of only one who wanted to go to Yugoslavia for the Power Champs - and I can hardly pretend to be surprised!

Considering the importance of this two-day meeting, and the time, trouble and expense expended by participants, the organisation was a disappointment. The best I could say is to describe it as casual, and the worst would be scathing to the extent of being unprintable.

The schedule announced in 'F.F.N.' called for a 10 o'clock start on the Saturday morning. The Contest Director arrived exactly at five minutes to ten, and promptly said that flying would start at five past ten! To cope with the fact that no-one had entered, blank flight cards were handed to anyone who asked for them - and competitors told to fill in their own names, etc. This action is unheralded - even in the present permissive era. Obviously, punctuality is no longer a virtue, as the 'organisation' was again late in arriving the next morning and even later in functioning. It was also noticeable that competitors are now starting to expect a tardy start and are timing their own arrivals accordingly!

As an aside I would comment that the only response I get to any criticism of organisation shortcomings is the 'hardy annual' that I should take office and run it the way I think fit. The obvious implication is that the present incumbents are running matters their way. This is in some conflict with the simultaneous claims of a democratic society, etc., etc. Perhaps I should also add that I have many years' experience as a club and Area Official (including the running of contests) so I know something of what is needed on and off the flying field. Generally speaking, what is usually required is not more effort, but merely a different way of doing things.

Despite these criticisms, the contest itself was hard fought and went surprisingly well. Much of this was due to the size of the airfield. Previously 'unknown' to all but a handful of the 'locals', the 'drome' was rumoured to be immense - and certainly lived up to this description. Even in the breezy conditions that prevailed for much of the weekend, flights of five or six minutes landed comfortably in the field. Retrieving was therefore easy and this made for continued participation by many fliers who would normally have retired after one or more poor flights.

Events were flown in a rubber/glider/power sequence of 40-minute rounds. A starting line was used in deference to F.A.I. procedures, but one timekeeper (with or without binoculars) was sufficient. Four rounds were flown on the Saturday in cold, breezy and overcast conditions. The balance was concluded on the Sunday in much pleasanter weather, warmer, brighter and definitely windier! Thermals on the Sunday were strong - and let some fliers 'try the 'drome for size'. I was one of these, and indeed was still searching downwinds when the fly-offs were in progress and I should have been taking photographs!

Any contest of this nature is difficult to describe on a blow-by-blow basis - so I will merely comment on the final outcome of the three categories, only Wakefield was decided with out a fly-off. Even so, Mike Woodhouse won with a perfect seven-max score, flying the balsa-tube model used to illustrate his constructional article in the February *AeroModeller*. The designs follow current trends, apart from having twin sheet pylons - with a timer slotted through the



John Godden performs a copy-book example of the 'rise-off-ground' with his Northern Star to win the Vintage fly-off at the Northern Area Rally.

port one.

The next four places were fairly close - but some two minutes below the winning score. This is some indication of the difficulties of lift detection during some parts of the contest. Runner-up was Trevor Grey flying a simple design employing a Laurie Burrows glassfibre fuselage. Third place went to Bob Wells - just ahead of Dave Greaves and Ray Elliott. The last named had a disastrous final flight after being almost assured of second place! Another Croydon flier, Ian Kaynes, started well with four maxs on the Saturday but could do nothing right thereafter. I understand that the top three will almost certainly go to the European Championships.

The A/2 fly-off caused some controversy when qualifier Dave Barnes had a protest lodged against him for flying after time on Saturday afternoon! The complaint was upheld and this left three in the fly-off (with Dave dropping to 23rd place). Apparently Dave had his *Accipitor* on tow when the round end was signalled, but he continued to tow for some time thereafter. Those who noticed this presumably waited to see how the situation developed as the contest progressed. Using the progressive max approach, two fly-off rounds were needed to resolve the glider event. In some ways the first fly-off was decisive, since G. Martin of Welland Valley (a new name in the lists) broke his towline to record a zero, and Brian Picken's best model failed to D/T. The second fly-off was an anticlimax, being held in very poor air. Brian's reserve veered off on tow, losing a little height in the process and lost out by just four seconds to Phil Ireland's 1:11. Concentrating nowadays on glider, Phil made all his flights with just one model - and didn't have a reserve. Those who failed to max out were headed by Tony Young and Jim Baguley - tied at 20:54.

Power had two 'full houses' - from Ray Monks and Dick Johnson. For unspecified reasons it was decided to ignore the rule book and go straight to using four-second motor runs for the fly-off. Nevertheless, the F.A.I. two-minute interval approach was used to fly off in sequence. Dick flew first, only to have the motor falter just after launch, but continue to 'burble' as the model dived in for four-and-a-half seconds. With the event 'in his pocket', Ray then overran! This, of course, gave a tie - that expediency dictated should be resolved by another fly-off.

Dick's troubles continued with starting difficulties that noticeably exceeded his time allowance (but which went unpenalised) and a disappointing flight of just under a minute. Ray then did about 90 seconds to win. His model was very impressive throughout the weekend, and had some interesting features. Most obvious was its use of triple fins (à la current Scandinavian practice, but first pioneered by Conover on his *Lucky Lindy*) - and a Burrows glassfibre fuselage. Power patterns were different to the usual straight approach, having an initial banked sweep to the right, with the nose rising throughout the ten-second climb. Ray uses sheeted surfaces, a Rossi, and a homemade timer. In this class the near misses came from Bob Bailey, Russell Peers, and Fred Chilton - all with six maxs and one otherwise.

Perhaps I could conclude this report on a personal note. Having damaged one Wakefield I was forced to re-fly liter-



Winner of the 'Pannet' power trophy at the Northern Area Rally (covered in the June issue) was Jim Moseley, using this  $\frac{1}{4}$ A power model.

ally in the last minute of the sixth round. Heading towards the starting line with the ready-wound model, I heard a (car) hooter sound - so promptly launched before the sound stopped. Part way through the climb the official signal was sounded! Whilst the effects in this particular case are academic, this type of irresponsible action (be it humour or malice) is something new to aeromodelling and hardly in keeping with our much vaunted sportsmanship.

Leaving aside the Area Meeting of 5th May (as results are not yet available) it is convenient next to report the Vulcan's rally held at Elvington on 12th May. The host club provides a new name in this year's reports, but it is comprised essentially of the free-flight members of the Sheffield Society of Aeromodellers. Although small, the new club is keen, and made it clear that it intended to run a worthwhile meeting. There were even timekeepers available from control, an unheard of luxury these days!

The meeting was scarcely favoured by the weather, in that the wind blew in the shortest possible directions across the airfield. Fortunately, at this time of year, there is little problem in retrieving and few real difficulties were encountered. Support was less than I would have expected - unless the impending Nationals deterred prospective participants.

With a mainly overcast sky, thermal lift was lacking early and somewhat unpredictable most of the day. This is reflected in the scores recorded in the various events. Naturally enough, Open Glider attracted good support - but the combined Mini event had even more entrants (22 against 19). Although helped by the amalgamations of three classes, I suspect that the three-flight, two-minute max rule had its attractions.

Winner of Mini was Ewan Jones flying a  $\frac{1}{4}$ A power model to three straight maxs (off seven seconds run) - and admits he was lucky with lift. I started too early with a  $\frac{1}{4}$ -minute Coupe d'Hiver flight that 'factored up' to just short of a max. Weighing up the opposition I decided to continue, rather than start again with another entry. Two later maxs gave me second place, just ahead of John Godden with another  $\frac{1}{4}$ A model.

Glider gave fliers a lot of trouble with very patchy lift, and some severe turbulence at times. Terry Dilks started well with two maxs, and finished off (after a very long wait with the line-out) with nearly another. I managed second with 8:12 total - only one max, but with the other two both over 2½ minutes. Dave Hambley was third, with a poor flight in between two good ones, flying his now distinctive low aspect ratio deep pod design. Al Wisler, the furthest travelled entrant, had a similar series of scores - but the loss of his *Pelican* on his first flight was decisive. Al, in fact, spent most of the day endlessly towing his A/2 - but didn't often help those waiting downwind. There were times when I wondered if he deliberately released in sink!

Open Power saw Keith Harrison of Penrith (now a Northern Area club, geographical locations notwithstanding) prove an easy winner with a treble. Second, despite or because of considerable trouble (including one complete write-off due to auto-rudder line breakage) was Russell Peers - whilst third place went to Tony Rushby with a  $\frac{1}{4}$ A model.

Ewan Jones won his second event by topping his chuck glider speciality with an excellent total of 4:52 out of a possible 5 minutes. John Turner was second with two maxs in his 3:43 total. Long after the contest was over (and even after the prizegiving) two Wharfedale fliers returned their cards with scores worth second and third. Despite the delay being due to retrieval problems, it was decided that the scores were unacceptable. Normally I would oppose disqualifying a flier for the timekeeper's inaction - but since this case involved two friends timing each other (in itself perfectly legal - and increasingly commonplace) the decisions appeared justified.

The only event needing a fly-off was Open Rubber - hardly a surprise except that it was required to resolve a tie at 8:53! Participants were Pete Harris and Mike Sanderson, who had dropped score on their first and third flights respectively. Mike had reverted to a small windy-weather model (after going miles with his first normal model) and thus proved decisive on the fly-off with only 2½ minutes or so. Pete judged his D/T well to get 4 minutes in sight, and the model back. He was, however, still searching for the one used to complete his three flights!

Prizes for this meeting included large wooden shields for the main event winners, on to which are to be affixed separate plates with the annual winner's names. It seems just a little risky to entrust the holders with mounting their own plates, as strict uniformity is hardly likely! Nonetheless, the scheme reveals a heartening attitude in that the host club is taking action to encourage fliers. Prizes extended to a Junior Champ shield - taken on this occasion by 14-year-old Alan Godden flying power.

Overseas news this month consists of an unsigned report on the South African Nationals.

By our standards, entries were low - but this is inevitable when the immense distances involved are considered, aggravated nowadays by petrol difficulties. Some names familiar to readers will be noted - including John Bailey (only very recently returned to Africa), and Alan Carter, one-time of Liverpool.

F.A.I. events were flown in seven rounds - with check weighing of both Wakefields and their motors being mentioned. This event was won by Horst Wagner with six maxs following a 90-second first flight (this doesn't add up to his 1,121 total). He did over 15 min. on one flight despite D/T operation, and only drifted half-a-mile!

Horst, in fact, went on to win Open Rubber (with John Bailey being the only other entrant), Open Glider, and Chuck Glider. These successes, plus other places, gave him the overall championship and the 'Aeroclub National Championship F/F colours'.

Other interesting snippets included mention of circling tow-hooks in Open Glider, a fly-for-fun Vintage competition but no indication as to how it was judged, an unusual MVVS topping F.A.I. and Open Power in the hands of H. Rimmer and weather universally described as hot and calm!

#### CONTEST RESULTS

S.M.A.E. Area Centralised Meeting, 17th March 1974  
 K.M.A.A. Cup (A/2 Glider) 7 x 3 min - 119 entries - 109 scores:  
 1. P. Owens (Liverpool) 20:16; 2. J. Cooper (Southampton) 19:54;  
 3. D. Thomson (Croydon) 19:27; 4. A. Jack (Southampton) 19:26;  
 Frog Senior (Open Power) 3 x 3 min. - 26 scores: 1. P. Bond  
 (Anglia) M+4:42; 2. R. Peers (Falcons) M+3:59; 3. T. Payne  
 (Northampton) M+1:47; 4. D. Welch (Brighton) M+1:45; Open  
 Rubber - 2 x 3 min. - 25 entries: 1. J. Cooper (Southampton) M+4:  
 4:30; 2. D. Hipperson (Croydon) M+3:47; 3. T. Grey (Sitting-  
 bourne) M+2:50; 4. A. Jack (Southampton) M+2:31. Plugge Cup  
 (after 1 contest): 1. Southampton 277 points; 2. Norwich 269 points;  
 3. Croydon 267 points; 4. Bristol & West 262 points.  
 S.M.A.E. Two-Day Meeting, 20-21st April, Sculthorpe  
 Wakefield - 25 scores: 1. M. Woodhouse (Norwich) 21:00; 2. T.  
 Grey (Sittingbourne) 19:18; 3. A. Wells (Anglia) 19:04; 4. D.  
 Greaves (Birmingham) 18:44; A/2 Glider - 53 scores: 1. P. Ireland  
 (Southampton) 21:00+4:00+1:11; 2. B. Picken (Wigan) 21:00  
 +4:00+1:11; 3. G. Martin (Welland Valley) 21:00+zero; 4. A.  
 Young (Croydon) 20:54; J. Baguley (Hayes) 20:54. F.A.I. Power -  
 17 scores: 1. R. Monks (Birmingham) 21:00+zero+1:28; 2. R.  
 Johnson (St. Albans) 21:00+zero+C:58; 3. R. Bailey (St. Albans)  
 20:57; 4. R. Peers (Falcons) 20:42.  
 Vulcans Free Flight Rally, Elvington, 12th May 1974  
 Open Rubber - 7 entries: 1. P. Harris (Evesham) 8:53+4:02; 2. M.  
 Sanderson (Grimsby) 8:53+2:31; 3. J. Anderson (Tynemouth) 8:35.  
 Open Glider - 19 entries: 1. T. Dilks (Falcons) 8:42; 2. J. O'Donnell  
 (Whitefield) 8:12; 3. D. Hambley (York) 7:18. Open Power (11  
 entries): 1. K. Harrison (Penrith) 9:00; 2. R. Peers (Falcons) 8:00;  
 3. C. A. Rushby (Grimsby) 7:53. Combined Mini 3 x 2 factor -  
 22 entries: 1. E. B. Jones (Sunderland) 6:00; 2. J. O'Donnell (White-  
 field) 5:52; 3. J. Godden (Leeds) 5:49. Chuck Glider - 5 from 9  
 1 min. max - 10 entries: 1. E. B. Jones (Sunderland) 4:52; 2. J.  
 Turner (Darlington) 3:43; 3. E. Smales (Blackburn) 3:14. Best  
 Junior: A. Godden (Morley) 6:47.  
 South African Nationals 1974  
 Wakefield: 1. H. Wagner 1,121; 2. M. Van Eyk 966; 3. D. Pettifor  
 875. A/2 Glider: 1. M. Lambert 1,238; 2. N. Murray 1,195; 3. H.  
 Wagner 1,135. F.A.I. Power: 1. H. Rimer 1,149; 2. M. Van Eyk  
 1,068; 3. A. Carter 866. Open Rubber: 1. H. Wagner 900; 2. J. Bailey  
 627. Open Glider: 1. H. Wagner 659. Open Power: 1. H. Rimer 866;  
 2. J. Bailey 762; 3. K. Lambert 634. 1/2A Power: 1. J. Bailey; 2. E.  
 Smith; 3. G. Morris. Chuck Glider: 1. H. Wagner 327; 2. M. Van  
 Eyk 293; 3. H. Rimer 256. A/2 Glider: 1. J. Bailey 510; 2. H.  
 Rimer 480; 3. K. Lambert 352. Vintage: 1. H. Abbott 211; 2. A.  
 Hamilton 137. Overall F/F Champion: H. Wagner.

# Letters to a young modeller . . .

Dear Simon,

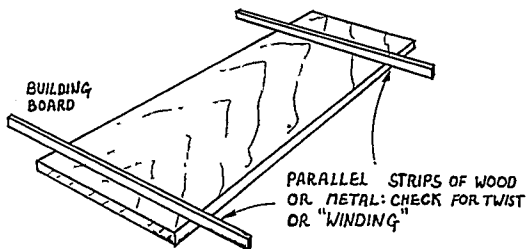
I've already written to your parents thanking them for a most enjoyable stay, and it occurred to me whilst I was writing that one of the things that had made the time pass so very quickly was our series of discussions on the subject of aeromodelling. Perhaps our nattering away has helped to clear up one or two of the problems which have been troubling you in the early stages of construction, and I'm sure you must be looking forward to the arrival of your new kit at the local model shop.

The difficulty most youngsters face is knowing what to build, particularly if they are interested primarily in Free-flight, and I suppose that your preference for small-scale rubber models has now disappeared! I hope you didn't mind my going on about this for quite a spell, as I could see my mistakes of 30 years ago being repeated almost exactly. If I may be permitted a modest claim to fame, it is that early failures didn't stop me proceeding until a really successful model emerged . . . most youngsters have usually fallen by the wayside before then. It may of course be as your Aunt says . . . I'm too stupid to know when I'm licked!

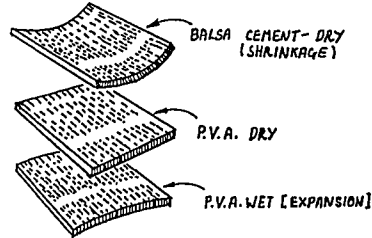
Reference to my pile of back-numbers of the magazines has shown that I was correct in thinking that your new kit will have had over 25 years of history behind it! I think that you'll find the undercarriage a useful feature in the early stages of trimming at least, as there is a degree of what is known as 'pendulum effect' because of the weight of the wheels. This tends to assist the dihedral's stabilising efforts, and it could help to save damage to the prop. or its shaft in the event of an unfortunate landing. A 30-inch span is a very reasonable size, too; you won't need the dead calm conditions that a smaller model in the hands of a beginner needs.

You'll find your *AeroModeller* copies of constant use for reference purposes . . . (they may even be collector's items in time if they remain in good condition!), and I think you're wise in reserving other books on aviation through your local Branch Library. I find our City Library has copies of the 'A.M.' going way back . . . and some of these old issues are fascinating. There's a great deal of information on Free-flight, as C/L and R/C just hadn't happened then; difficult to imagine, isn't it? And yet there was never a shortage of really interesting reading each month, often with a good choice of plans to scale-up for use. I'm sure a whole lot of budding engineers got their first feel for drawing-board work from magazines of the earlier days.

Keep your hand in with the glider; it did demonstrate how important it is to remove all the warps before trying to trim a model, didn't it? The culprit is often a warped build-



ing board, and I think your new one will be much less likely to give trouble of that nature. The shrinkage of balsa cement is quite dramatic, isn't it? If joints aren't close and



accurate, the cement is bound to distort the frame. You'll like the P.V.A. glue because of its non-shrink properties, as well as the longer time available for fitting things together (it also washes off the hands quite readily, so you shouldn't be carrying an acetate skin on your fingers quite so much in the future!). Don't throw away your cement, though; you'll find it invaluable for some applications.

Your Aunt has just suggested that if your kit arrives by the beginning of the Summer Holidays you might like to pay us a visit for a few days and I could give you a bit of assistance should you run into difficulties. You could also have the run of the workshop, and this might help you to choose the kind of tools you feel would be worth investing in after having sampled my collection at first hand.

Let me know if the idea appeals to you.

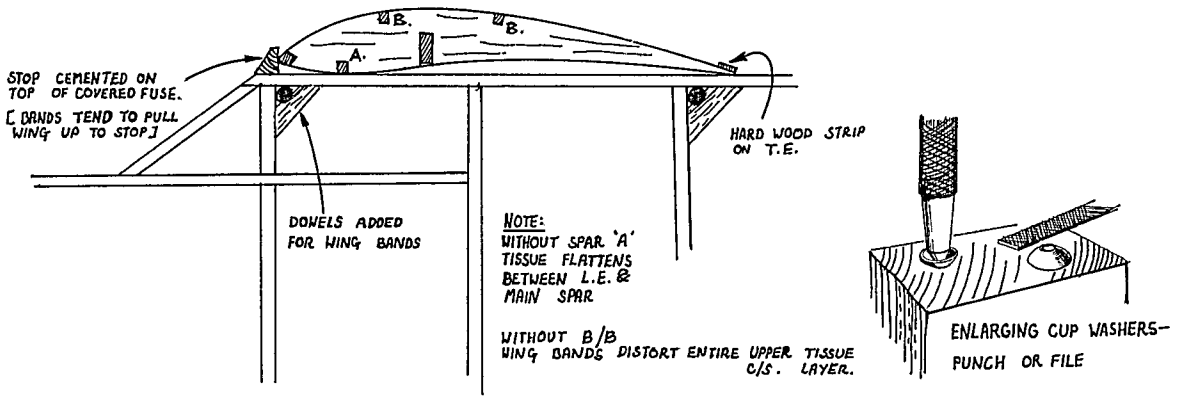
With kindest regards,  
Uncle Bob.

Dear Simon,

We found this odd sock under the bed after you left, perhaps you've not missed it yet, but I'm sure Mum will rest her eagle eye on the gap in your wardrobe before long!

I hope you enjoyed your stay . . . I know I certainly did. There's something very exciting about opening up a new kit, isn't there? Perhaps this makes the subsequent shortcomings even more disappointing. We know that it's better for rubber and other perishables to be bought separately, and so we don't expect to be able to start in right away, cutting and gluing together, but I feel sorry for the youngster who hasn't read the small print on the box-lid, and whose local shopkeeper perhaps doesn't bother to warn him either. What I do consider very lax is the inclusion of wrong wire gauges and poor die-cutting of ribs. It's just as well that I've a reasonable stock of wire and tube, as a 20 gauge prop-shaft wobbling away in 18 gauge holes in prop. and nose block is neither funny nor efficient. Good thing we had a sharp, narrow, scalpel blade to ease out the ribs; aren't they hard to see when there is no printing on the sheet and the dies don't pass right through?

P.T.O.



continued:

Of course, there's always a credit side to these setbacks; we wouldn't have learned how to make a simple reamer to open out the prop. to 16 gauge, or to find out which files work best on the wire. The nose-block bush we made up will be much better than that plastic button thing, although I suppose we could have bought one of those nice screwed brass bushes had we needed to. You now appreciate how useful it is to be able to solder, and I'm sure this will be of assistance in many applications outside the range of your hobby. That acid flux does make soldering easy on steel . . . I remember trying unsuccessfully with the resin-cored stuff until reading a feature in the *AeroModeller*, after that, it all seemed child's play.

Of course, bending the 16 swg. shaft is a bit tough for the lad with small hands, and I suppose that 18 swg. would have worked at a pinch. We would still have had to exchange the wire in the kit for the correct size, and it seemed a good idea to demonstrate the reaming, etc., whilst we were about it. There is little fear of that shaft bending, but the smaller size would have been a little more vulnerable. The cone punch made short work of opening up those cup washers a spot, didn't it? I didn't think to mention that we could have filled the domed area to get the same effect, had a punch not been handy.

Like you, I couldn't see any advantage in slipping rubber bands around the whole fuselage in order to hold on the wings; I'm sure our modification is an improvement as well as an alteration. The dowel I had in my scrap-box was just the right size . . . I must remember to replace it next time I'm down at the hobby shop.

I think you will find the modification to allow a dethermaliser (D/T) to be used worthwhile in the long run, and you must be congratulated on being astute enough to spot that design fault on the plan which would

have meant the wing tissue alone being responsible for holding the wing position constant. (I wonder how many versions of this kit have been built with rocking wings and variable trim since its inception?)

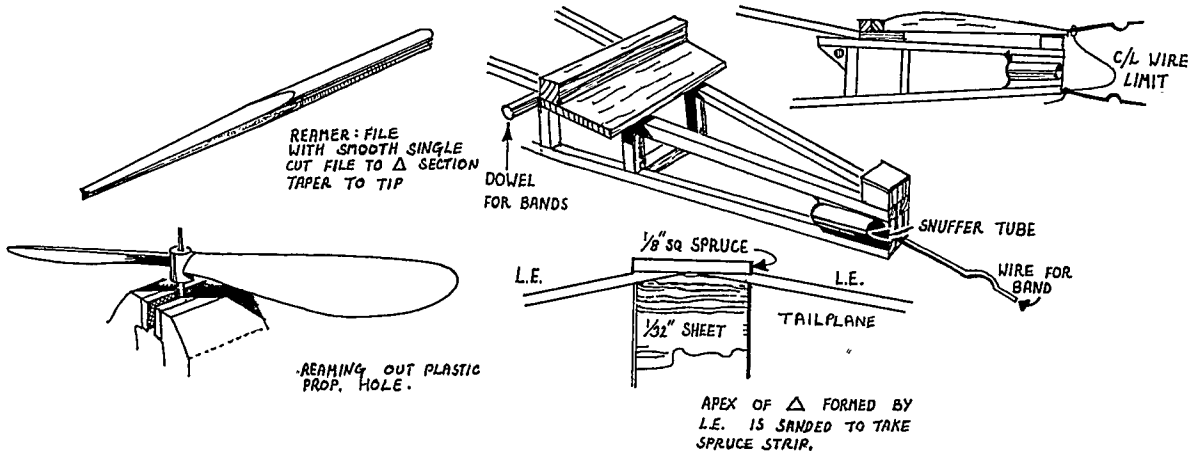
Your idea of building a duplicate model from the plan might be a good one. When we discussed this, I suggested that you'd save a deal of time by not making the wing tail-plane, and rudder tips from sheet in the elliptical form on the plan. There's everything to be gained from a simpler, lighter tip.

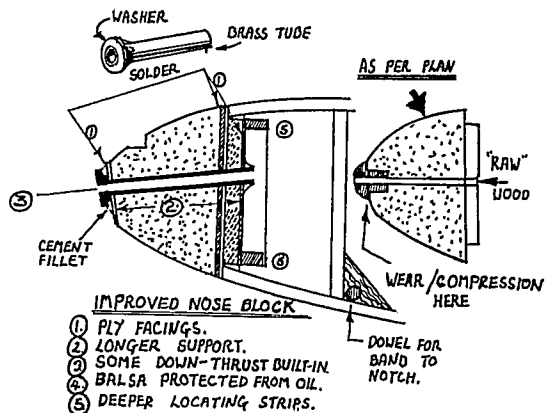
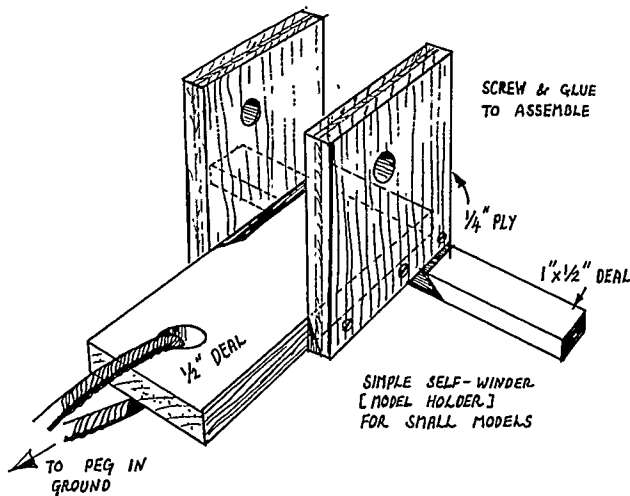
The very thin ply facings we added will help you to trim out the flight pattern; unlike balsa, they won't compress and change shape, and the 1/16 in. square spruce fitted where the holding bands could cut into the wings and tail will be invaluable.

I'm glad we had time to try wet covering in conjunction with Polycell on the fuselage. Didn't it make a super job? The under-cambered wing section does need the insoluble type of adhesive like the dope we used to work properly. Don't forget the trick of adding Castor Oil to the dope to slow down the rate of drying and to avoid shrinkage on the thinner trailing edge parts of wing tail. It's a good idea to label this special dope carefully; I once doped a wing with this mixture thinking it to be shrinking dope. Naturally, the effect was unexpected, and the nice, shiny, wrinkled tissue had to come off and be replaced by a correctly doped successor!

It transpires that I shall have to be making a trip Southwards before too long, and I could break the journey to admire your model, which I assume might well be finished by the end of the month. If you drop the hint, I'll be happy to call by with a few modelling goodies and any further articles of clothing yet to be revealed!

Happy building,  
Yours,  
Uncle Bob.





Dear Simon,  
Many congratulations on your birthday. I hope the parcel might contain items of interest and utility to facilitate your exploring further horizons (literally!).

Thanks for the chance to see your completed rubber job, and to have a hand in the trimming-out stage. Lucky for us that the weather was so good, and that the field had a good long covering of grass; I've seen quite a number of breakages occur on our local 'rec' after a close mowing session in hot weather. There's a hard crust 'neath the greensward!

You'd done a pretty good job on the covering, and I think you were wise to spend a couple of coppers on a sheet of coloured tissue to supplement the white in the kit. Very smart indeed. Your idea of cutting out a rear peg access hole was good; it's very difficult to position the motor properly when all one can see is a dim shape through the tissue. The aluminium tube will be a better fixing for the motor when you come to use a self-winding device, and it will still take a run-true bobbin to speed your motor fitting. A good thing that I had my evening paper available to put between motor and grass when we had to make up a new, tensioned 10 strands motor. You will probably find that the 1/4 in. strip in the parcel will be easier to tension than the 10 strands of 3/16 in. specified, as it will allow you to use only eight strands for almost exactly the same power.

The bottle of rubber lube will last a long time, and you won't need to wash the motors after use (unless you drop them and they get gritty). Keep your rubber away from air and light and heat . . . then it will last almost indefinitely unless you start doing 90 degree maximum turns flying.

I liked your idea of holding the nose-block in place with a band and dowel. The slots on the upper surface will prevent incorrect assembly as well as holding the bands in position. It would probably be a good thing to make the locating piece a little deeper than was shown on the plan, as a bunch in the rubber might still dislodge the nose-block despite the bands . . . a case of belt and braces policy. Didn't the drop of oil help the free-running of the prop? (Useful thing, a car's dipstick, should you forget the oil-can!)

You seem to have picked up the elements of trimming very well from your instruction books. The difference in flight pattern when

the model is launched slightly out of wind comes as a bit of a surprise though. When you fly the 'normal' way (right turn on the climb) it's prudent to launch a little to your LEFT of wind, and with the right wing level, or even a whisker up . . . never, never down. (Remember that screaming right hand turn at zero feet? Shredded nerves if not a shredded model.)

The free-wheeling prop, seems to ruin the glide angle, although it is simple and safe. You could certainly try a single-bladed folder of the same weight. I know competitions have been won by free-wheeling prop models, but the pitch (blade angle) of the one supplied is a bit on the fine side. Do you recall the noise, rather like a miniature machine gun, when the motor tension was too great and the free-wheel device was clicking the prop shaft in and out with each rev? This shows how tensioning turns must be right, and also how they re-position themselves after a flight or two.

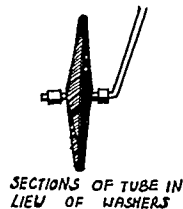
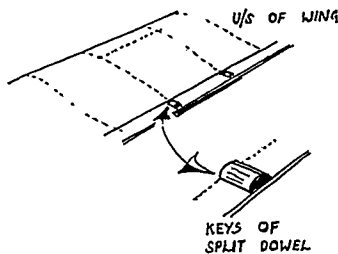
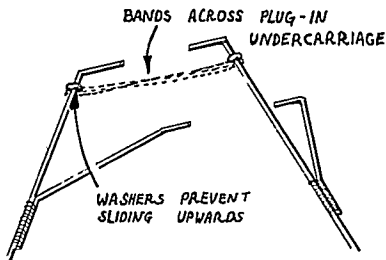
The washers on the undercarriage legs certainly made the fixing secure; there's nothing more annoying than to have loose bits puncturing the tissue after each landing, when the detachable undercart does just that. The inadequate number of cup-washers in the kit hasn't worried us after we decided to use sections of brass tube in lieu. I still get a bit annoyed when manufacturers skimp on this type of thing, particularly in the Beginner's range of their products. The bus fare to buy the item often costs more than the item itself, particularly for you Country dwellers.

The stability of the model was, I thought, most impressive, it seemed to cope with gusts remarkably well (pendulum effect helps), and the 33 per cent C.G. assists rapid recovery. Your pre-flight check system is very good, and you certainly spot deviations from perfect alignment with this method. I venture to suggest that keying the wings and tail with split dowel may help this essential task even more; 3/16 in. dowel would be fine for this.

I look forward to seeing you again before the Summer has gone, when we might manage a flying session or two. It's surprising, however, how many days throughout the year one can fly models . . . it's just that week-ends have the reputation for turning sour!

I hope the party goes well, and that you get the right (i.e. modelling) sort of gifts.

Yours as ever,  
Uncle Bob.



# GADGET REVIEW

a selection of readers'  
hints and tips

SO OFTEN, there is an easy answer to a 'fiddly' job – so easy in fact that it can often be overlooked in the heat of the moment. For example, fitting neoprene fuel tubing onto a fuel pipe or over the raised nipple of a needle valve can be infuriating if the only available tubing is just a *fraction* too small for the job! Junior reader L. A. Graham of Bracknell, Berkshire has rediscovered an old idea which may not have occurred to some. Firstly making sure that there is no fuel (highly inflammable!) on the pipe, he forces it over the tapered end of a paint brush and then gently heats this over a flame (*see Sketch 1*) rotating it all the while. The tube will soon soften, then it is taken off the brush handle and pushed onto the spraybar, etc. As it cools it will shrink slightly once more and grip tight.

Bristol reader and FAI power enthusiast J. Krell is concerned about the vibration caused by our single-cylinder, two-stroke motors. No matter how well props may be balanced some vibration will still be present, and this can cause flying surfaces to 'buzz', decreasing aerodynamic efficiency. Where wing leading and trailing edges touch their mountings scorching can occur, whilst vibration can also cause those expensive cast pans to crack. A quick and inexpensive remedy for all types of engine powered craft is as drawn in *Sketch 2*. From an old car inner tube, cut out a piece of rubber, using the back of the engine mount as a template. Now trim off 1/16 in. from all edges to allow for spreading of the rubber when the mount is bolted to the firewall. Cut out bolt holes and holes for any fuel lines etc. using a long tapered balsa knife blade – for easy cutting, make the holes square.

Is this the ultimate in de-luxe winders for rubber motors? Glen Alison of Rickmansworth, Herts, per-

haps best known for his abilities with a control line handle, has recently been sampling the delights of indoor rubber powered scale models and from his 'odds and ends' box, dreamed up the very neat electrically driven winder shown in *Sketch 3*. Heart of the system is the small electric motor and the counter from an old tape-recorder mounted on a ply plate which is strapped to the operating battery with rubber bands. Reset the counter to zero, engage the hook with the rubber motor and depress the micro switch. The electric motor then winds on the turns, recorded by the 'counter', until the switch is released. Neat, simple and fits in your pocket – but do not attempt to wind a Wakefield motor, it's only a small electric motor remember!

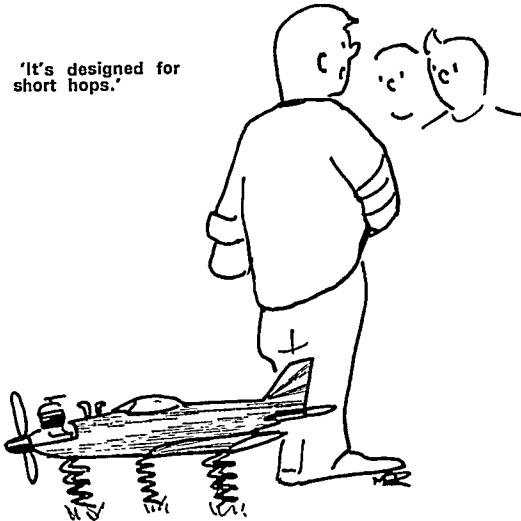
New Zealand reader Malcolm Foster is a free flight sports fanatic, being particularly fond of Vic Smeed designs. Many of these designs feature an underfin, and Malcolm prefers to incorporate a small tail wheel sandwiched within this underfin. Slim plastic wheels (approx. 1 in. diameter) are easily fitted – for wider wheels use a piece of packing balsa either side of the fin between the spats – see *Sketch 4*. A pin or piece of wire passed through the spat will act as an axle.

Mathew Peacock finds gluing glass paper onto a block rather a chore as it is a slow job to change (never tried using double-sided Sellotape, Mathew? Works a treat) so his solution is that shown in *Sketch 5*. The basis is a suitable, small rectangular tin such as one used to house cough-lozenges – those without hinges are ideal. He then wraps the glass/wet or dry/garnet paper around the tin lid so that when the lid is forced back in position the abrasive paper is stretched taut. This, of course, does mean that the tin lid should be convex – they mostly are. The slight flexibility of the tin is useful for many occasions.

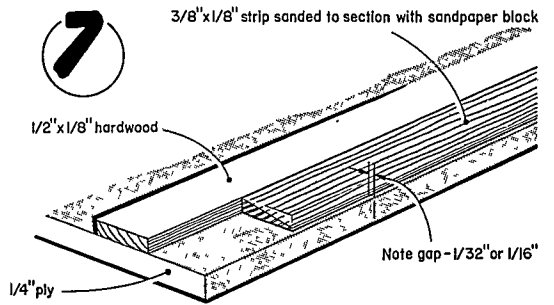
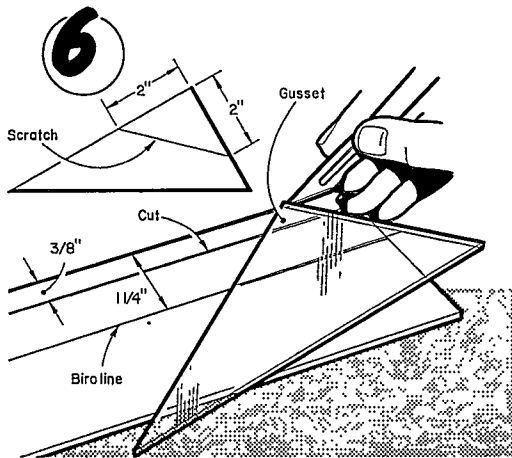
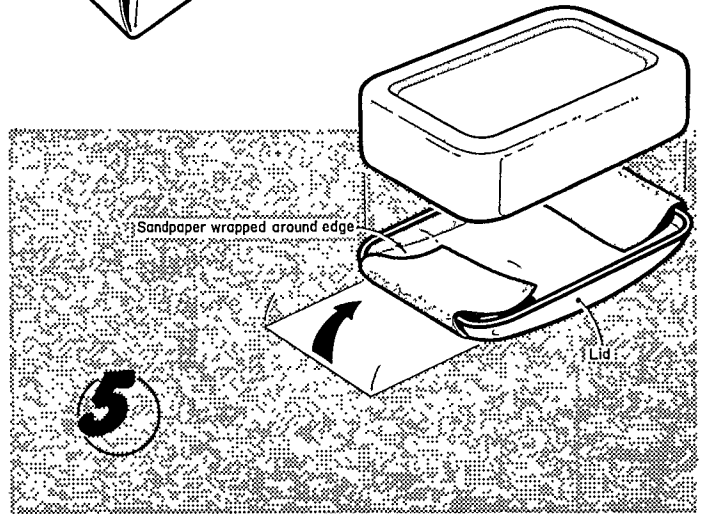
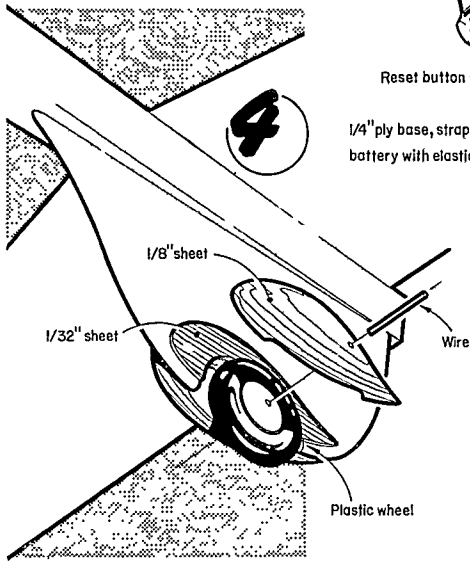
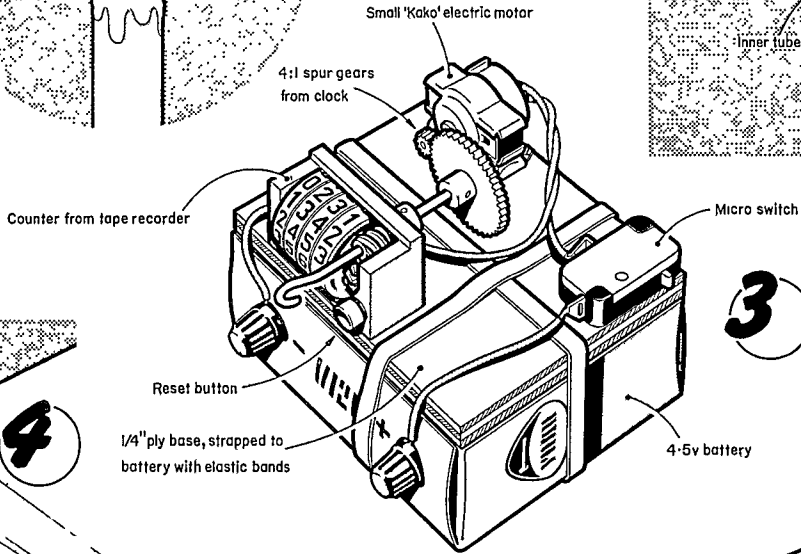
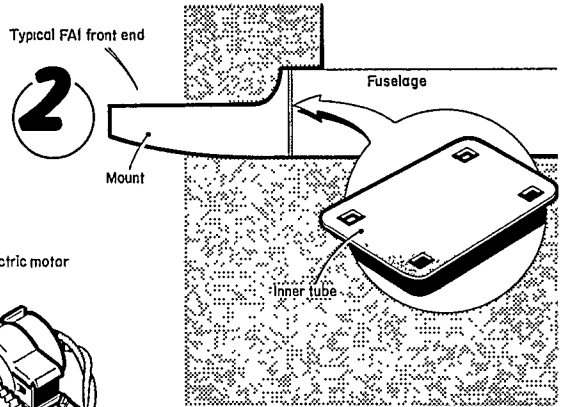
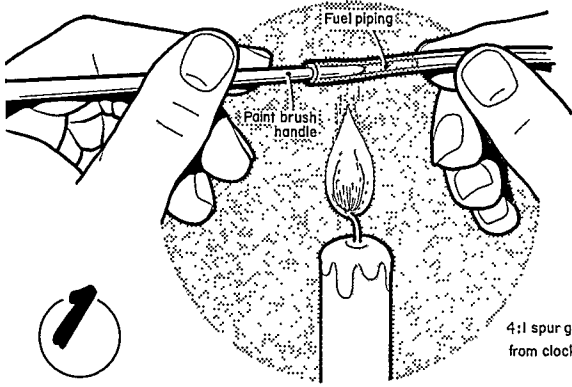
Reinforcing gussets are rather a tedious chore to cut out, but Roger Hardcastle of Leeds has a method of making the task a little more pleasant. He bought a cheap polystyrene set square (with 30, 60, 90 deg. angles) and scratched a line on it as shown in *Sketch 6* using a pin – this can be made clearer by rubbing over the scratch mark with a soft pencil. A 3 in. wide sheet of balsa then has a ball point line drawn along its length 1½ in. in from one side. Next cut a strip some 6 in. long and ¾ in. wide (depending on size of gussets). A model knife or razor blade can now be used to cut the first gusset, and further ones can be made by moving the triangle as shown.

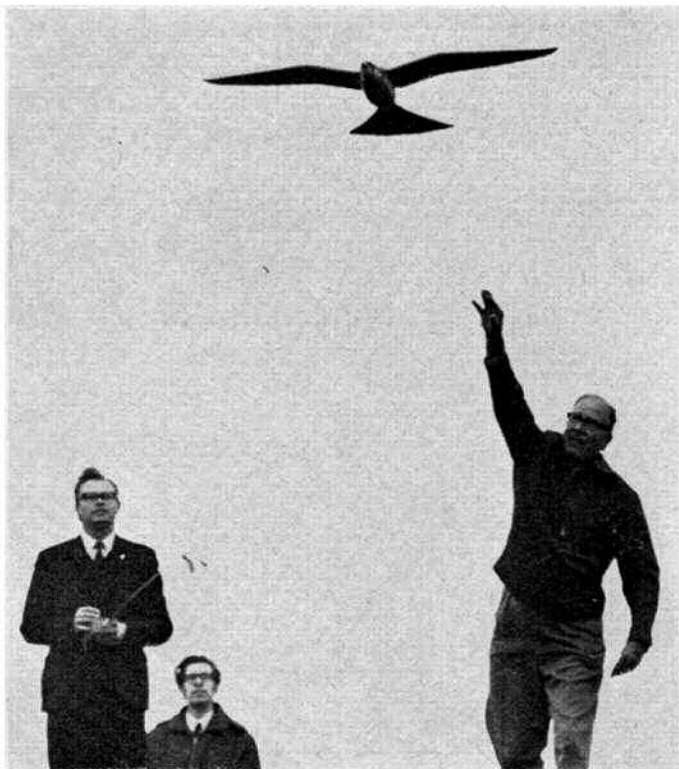
The same reader also has a good method of pre-shaping trailing edge stock, sketched in *Sketch 7*. To make ¾ x ½ in. stock Roger glues a piece of ¼ x ¾ or ½ in. hardwood to a piece of ¼ in. ply – the hardwood is *not* glued ¾ in. from the edge of the ply, but 13/32 or 7/16 in. so that the trailing edge does not taper right down to zero when the sanding block is applied. This same idea can also be used for pre-sanding commercial trailing edge stock prior to building the wings – especially useful in the case of ultra-lightweight structures.

'It's designed for  
short hops.'









## 'FLIES LIKE A BIRD'

That's a description which certainly applies to Douglas Pain's creation, which he describes from conception to commercial production

The designer launches his production R/C Gyr Falcon at Ivinghoe Beacon, with R.C.M.&E. editor Tony Dowdeswell on the controls.

THE WHOLE THING started in April 1970, when my 13-year-old son, a keen ornithologist like myself, said, 'Dad, please would you make me a kite like a Buzzard?'

He was then at school in Somerset, where the Common Buzzard is indeed plentiful, and a beautiful sight soaring over the wooded green hills and valleys. I decided on a Peregrine Falcon, a bird smaller than the Buzzard and easier to make out of balsawood for a kite. I should say here that I had a background of aircraft design before the war with the old firm of Airspeed Ltd., when the Joint Managing Director was a man known universally as 'Neville Shute', and that I spent the war as a pilot in the R.A.F. with Coastal Command. However, after many years away from flying I had naturally become very 'rusty' indeed.

The prototype kite emerged with a hollowed-out balsawood body, a tail of sheet balsa, wings of sheet balsa with no aerofoil section but correct in plan form and 'gulled' in frontal aspect, with a transparent fin framed in piano wire for directional stability.

The machine flew after a fashion, but required more weight in the nose (or rather beak!), to stabilise it. I then realised that if the whole project were to be con-

verted into a glider, it would be much more original and exciting. After a little trial and error with the nose ballast, it glided surprisingly well, being stable in pitch due to the flat wing section, but with a steepish gliding angle. It made prolonged glides into wind down slopes and, painted in the correct colours, looked remarkably realistic. Photographs taken from underneath looked so like the real thing that many people have been taken in by them!

By this time I felt that I had something rather unusual and novel on my hands, and that if in these days of growing interest both in slope soaring gliders and wild life generally, it could be produced in quantity at a reasonable price, it might well turn out to be a very good seller commercially. I was still thinking in terms of a free gliding 'chuck' glider for boys, of course.

The next step was to build a more efficient and lifelike pair of wings, and I decided that for experimental work a structure of piano wire would be very suitable, as it could be bent into a variety of shapes and wing cambers, determined by trial and error, until one arrived at a combination of the most efficient and also the most lifelike shape. I decided not to weld or solder the structure to-

gether, but to 'angle' the joints and bind them together with thin strips of masking tape wound tightly round these joints, so that the design could be altered easily. In practice, the joints proved as strong as welded ones, and the wings made by this method, when covered in parachute silk and doped, were virtually indestructible and quite reasonably light.

I started with the correct plan form, cambered the wing exactly like a bird's wing, as far as possible, and tried this out. After a certain amount of lateral instability, caused by too great an angle of

Douglas Pain displays the all-balsa R/C slope-soaring glider prototype. This version was much heavier than later expanded polystyrene versions, but flew well despite the high wing loading.



attack from the main wing joint outwards, was corrected, the performance was quite promising. The main trouble was found to be in keeping the bird gliding forward into wind for a reasonable length of time.

I also found that lateral stability was much improved by turning the tips of the wing up a little, exactly as the tips of the primary feathers of a soaring falcon turn up automatically in flight. Thus, the shape of the glider's wing, determined largely by trial and error, evolved into an exactly identical shape as that of a soaring falcon! Mother Nature was right all the time . . .

An aeromodelling friend who runs a plastics factory, was most helpful with encouragement and advice, and he introduced me to a very good pattern maker, who created a beautiful pattern of my bird. As my wire wing was single skin like a bird's wing, we evolved a wing section by using my top surface, and a convex curve to fill in the under surface, as of course a foam plastic wing needs to be thicker in order to give it sufficient strength.

The section was similar to a Clark 'YH', but varied considerably from root to tip. It was intended to mould the glider in expanded polyurethane, and in fact this was done on an experimental basis, using glass fibre moulds.

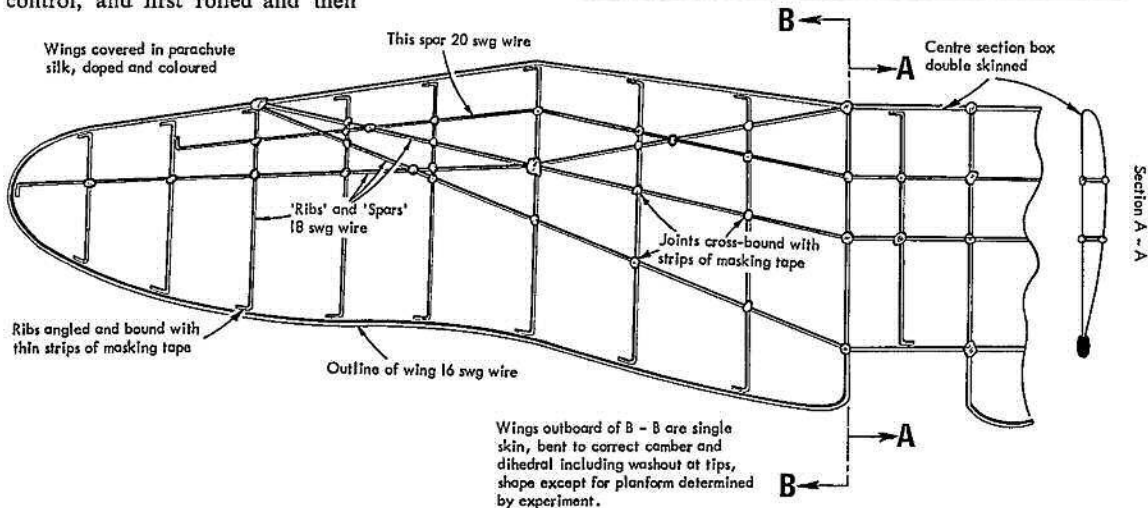
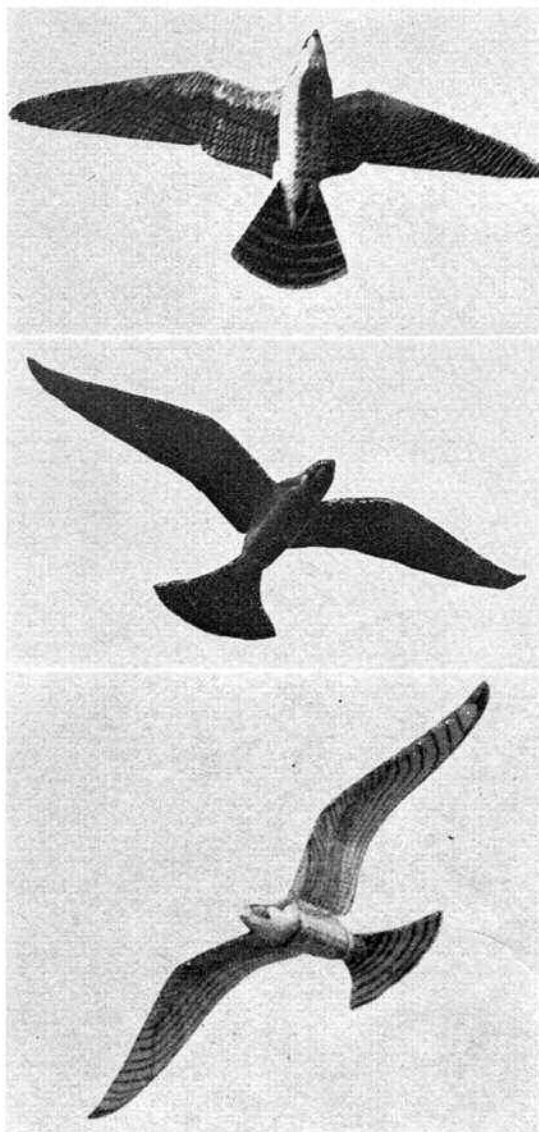
Whilst carrying out free gliding experiments, the model came to the notice of a professional model maker, who was very much captivated by the conception, and asked to be allowed to fit single channel radio control to it, using rudder control. It was found, however, that owing to the heavily 'gulled' wing, which made it nice and stable in free flight, it reacted violently against rudder control, and first rolled and then

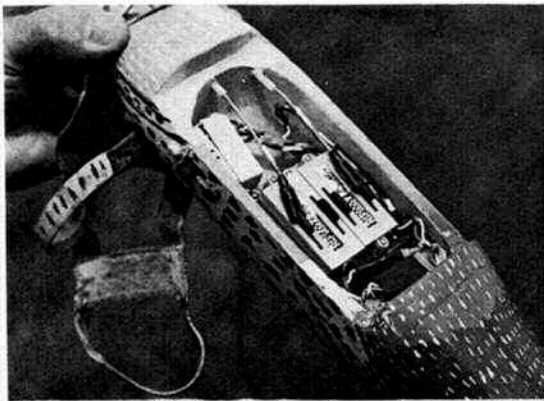
First prototype 'Peregrine Falcon' free-flight glider which featured sheet balsa wings, hollowed-out balsa body 'fuselage' and piano wire framed transparent fin. Was stable in flight, but glide was rather poor due to lack of airfoil section.

The third prototype glider to use piano wire framed wings, as drawn below, also featured a hollowed-out balsa body and polystyrene tail surfaces.

First version of the Gyr Falcon to use all expanded polystyrene construction. At this point the model was still intended for free-flight, but single channel R/C was fitted, although not too successfully at first due to the over-stable, heavily 'gulled' wing which was later altered once more.

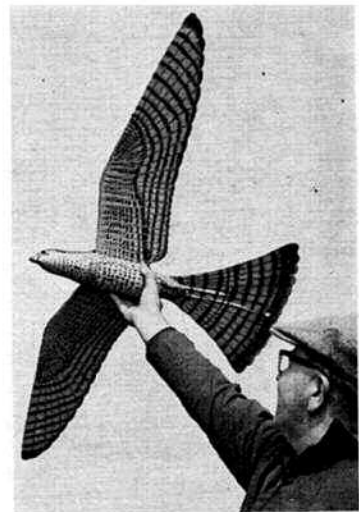
Sketch below shows the construction of the wire-wings. Note how thin strips of masking tape were used to hold the structure together.





Typical installation of two function proportional radio control equipment at left. Servos are held in place with 'Twinstick' (double-sided Sello-tape) while batteries are mounted in hollowed-out portion of the detachable head.

The designer displays the attractive markings of the arctic Gyr Falcon - all applied with felt pens tool



dived uncontrollably! He thus designed a 'milder' version of the wing, larger, to take the weight of the radio apparatus, less heavily 'gulled', and constructed in balsa-wood using semi-monocoque construction. The wing section was Clark 'Y'.

As by this time sufficiently light two function proportional radio control equipment was available, we decided to fit elevator control as well. The result was fairly successful, but there remained much to be done before a practical, stable model could be produced.

The Clark 'Y' section wing, though giving high lift, proved very unstable in the pitching plane at high speed, and required great concentration to fly. As I was also learning to fly, so to speak, a not inconsiderable number of 'prangs' occurred! However, everything stood the strain, and a version of this model, using these original balsa wings is still flying, and though the wing loading is positively astronomical, it will slope soar in quite a light wind, and its powers of penetration are quite fantastic!

During experiments it was found that expanded polyurethane was too heavy and in this light mix form it tended to warp in strong sunlight. I have always felt that expanded polystyrene, suitably handled and reinforced, where necessary, would be the best material for mass producing model gliders, and I also think that eventually it will be used for full-sized aircraft, using it on the *D. H. Mosquito* principle as the centre of the 'sandwich'. (It is, for control surface components in many cases and for all of the *Rand KR - 1* single-seater - Ed.)

With the help of a firm who worked with this material I constructed three prototypes, reverting to a wing section similar to

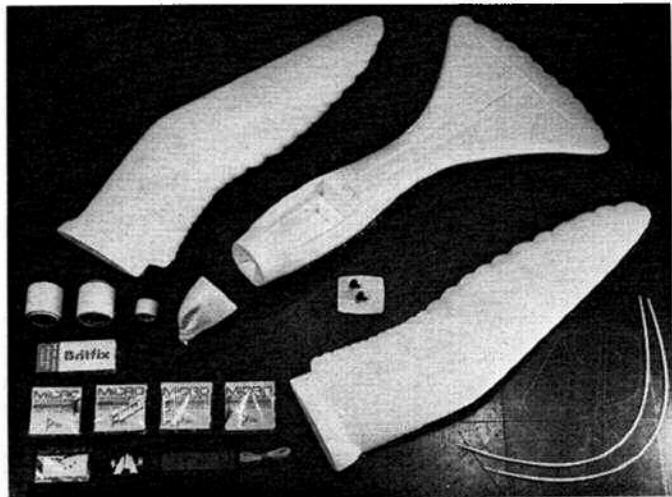
Clark 'Y H', though this section also varies from root to tip. I found that owing to the airflow over the tail, less incidence is required at the root and out to the main wing joint. It is then increased, with washout, at the wing tips.

The result was immediately successful as the all-up weight was halved, from 2 lb. 8 oz. to 1 lb. 4 oz., with a consequential improvement in performance and ease of handling, and the instability in pitch was completely cured. Indeed, the glider is now a delight to fly, full of character, with a tremendous speed range, and it is highly manoeuvrable. It is often mistaken for the real thing, and is frequently 'mobbed' by other birds, exactly as they will behave to a real falcon!

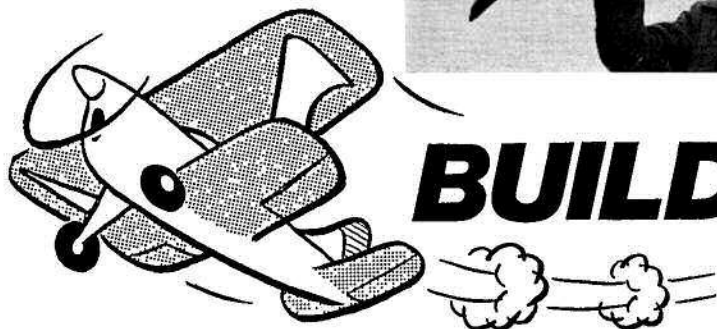
Since the original conception some four years ago, the 'bird' has changed somewhat. The peregrine falcon has since been altered to become a gyr falcon, the largest of the falcons as the extra wing area was necessary to carry the load of radio control. Likewise, the original idea of commercially

marketing a bird-like chuck glider has changed. The idea has now gone into production (indeed it is marketed by A. A. Hales Ltd. in kit form as a *Gyr Falcon* at £15) as a radio controlled slope soarer which can be made with a minimum of skill or time. All components being moulded in white expanded polystyrene it is easily decorated with black felt-tip pens, in which guise it represented the 'white phase' variety of this bird. The real 'white phase' gyr falcons are occasionally seen in the British Isles, having wandered South from their Arctic Circle home. No doubt bird pundits will be bombarded with innumerable reports of many more sightings along the hilly slopes in the near future!

Contents of a pre-production kit (some components have been changed in final versions) reveal the completeness of the pre-moulded design. Literally buy today, fly tomorrow!



C'mon you control-line fliers, why not try something a little different and . . . ?



## BUILD A BIPE

Peter Miller passes on the benefit of his experience – plans of his 'Duchess' to come next month!

CONSIDERING the many advantages of the biplane for control line aerobatics it is surprising how few designs of this type actually exist. A biplane is smaller, and therefore easier to store and transport, as well as usually being cheaper than the equivalent size of monoplane, and it is always a guaranteed crowd pleaser when really put through its paces.

There are however, one or two minor disadvantages (there always are!). Firstly, there are two wings to build, but this is offset by the fact that the wings are often simpler in construction and can usually be built at the same time due to their smaller size. The second disadvantage is that, unlike a normal stunter, a poorly designed biplane is often impossible to stunt at all. The purpose of this article is to eliminate this second disadvantage . . .

Let's go through the design procedure for a .35 cu. in. powered biplane stunt model; the accompanying table gives the proportions for models for other engine sizes.

### Wings

The first essential to be determined, as with any model, is the wing area, and immediately we find that

biplane requirements are very different from those of monoplanes. A good rule-of-the-thumb is to use the wing area for the next size down of monoplane, or in other words, for a .35 powered biplane use the wing area that you would use on a .19 powered monoplane. Thus for our .35 powered model we really want a wing area of about 450 square inches and this should be divided equally between the two wings. This arrangement may not be as aesthetically pleasing as unequal span wings, but there is a sound reason for it; due to the wide separation of the wing from the thrust line, any major variation in wing size moves the centre of drag away from the centre of thrust and this has a marked effect, i.e. if the centre of drag is well above the thrust line the model will be hard to bunt. For the same reason, dihedral is not recommended as it would be hard to retain a realistic appearance with the thrust line raised enough to compensate for the higher centre of drag.

Next on the list is the shape of the wings – I tend to use a standard aspect ratio of 6 to 1 which looks reasonably realistic, though minor variations should not affect performance. The top wing can be swept,

Engine size (cu. in.)	Wing Area (sq. ins.)	Span (in.)	Chord (in.)	Gap (in.)	Stagger (No. in Sweep)	Nose Moment (in.)	Tail Moment (in.)	Total T/P area (sq. in.)	Elevator Area (sq. in.)
.15	300	30	5.00	5.00	1.75	5.00	5.0-6.50	54	25
.19	350	31	5.75	5.75	1.75	5.75	5.0-5.75	63	30
.25	400	33	6.00	5.5-6.0	2.00	6.00	6.0-8.00	70	35
.35	450	36	6.25	5.5-6.0	2.00	6.00	6.0-8.00	80	40
.40	500	39	6.50	6.00	2.00	6.00	6.0-9.00	90	45
.60	600	42	7.50	7.00	2.50	7.00	7.5-9.50	100	50

Heading picture shows the author with a pair of his own-designed bipes – the one on the left being a semi-scale SE5A, the other a Cavalier which is scheduled to be kitted by Pegasus Models.

MODEL PROPORTIONS FOR VARIOUS ENGINE CAPACITIES

and this has the advantage that it helps to reduce the 'wobble' that can develop in tight loops. If one was trying to build a semi-scale *Jungmeister*, both wings could be swept, a sweep of  $\frac{1}{2}$  in. per foot of span on each panel works well. So for our .35 powered model we now have two wings of 36 in. span and 6 in. chord with  $1\frac{1}{2}$  in. sweep on each panel of the top wing.

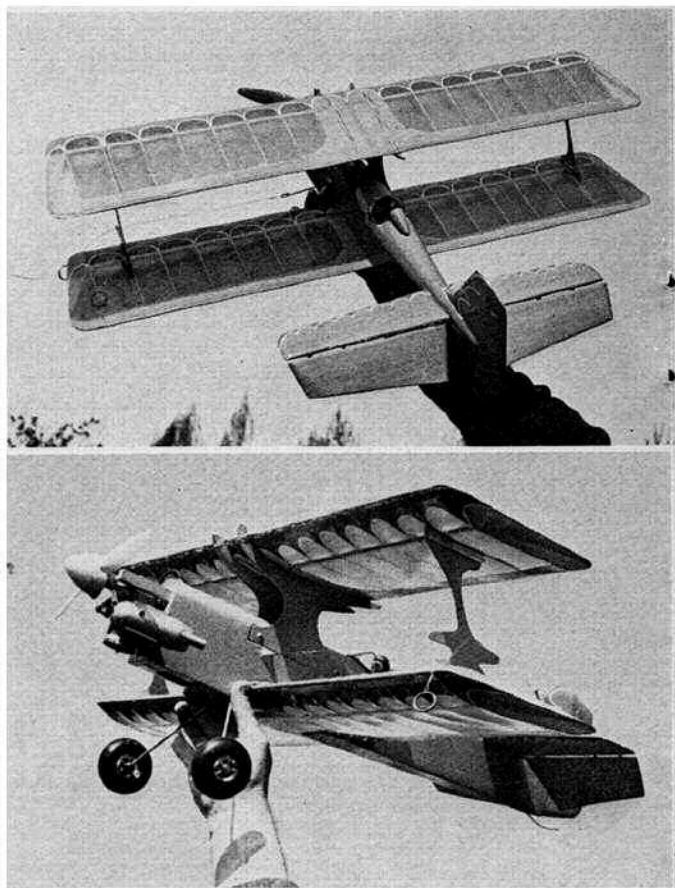
Contrary to popular belief, a thin wing section is not advisable on a biplane. For my early models I used wing sections in the 10-12 per cent range but found that tight or consecutive manoeuvres became very soggy; in particular square corners suffered. On my first *Cavalier* design I went up to 18 per cent (in fact good old NACA 0018) and the difference was amazing. This model was the first of my biplanes to fly the full SMAE schedule and do consecutive clover leaves. I now use this section or the *Aeromodeller E.S.* section (featured in the June 1972 issue) which gives almost as good results, but nothing thinner. Bear in mind that it has been shown that a symmetrical section with the sort of chords that we are using will give similar results to a flat plate section if it is under 10 per cent thickness.

### General Proportions

I normally start a design with the fuselage side view, but I have discussed the wings first as their shape, and whether they are swept or not, controls much of the rest of the design.

As mentioned previously, the relationship between the centre of drag and the thrust line is critical if equal radius loops and bunts are to be achieved; the optimum position for the thrust line is just below halfway between the wings which allows for the undercarriage and fuselage drag. This is tied in with the gap between the wings which should be equal to the chord or just under, measured from chord line to chord line. On our 0.35 cu. in. powered model this gives us about 6 in. with the thrust line  $2\frac{1}{2}$  in. up from the lower chord line. Having decided on our gap, we must next consider the *stagger*; the amount that the upper wing is in front of the lower wing. I personally am not convinced that this serves any useful purpose on a model of the type we are designing, as, ideally we want aerodynamic symmetry in inside and outside loops. However, it looks ugly if not incorporated, and would give a very short fuselage - so use approximately  $\frac{1}{3}$ rd chord stagger on a model without sweep on the top wing, but if you are using sweepback on the top wing, increase the stagger at the centre-line of the wing by half the amount of the sweep.

Possibly, one of the biggest factors in designing models of this type is the amount of wing incidence. Unlike any other control liner, a 'biplane' should not be

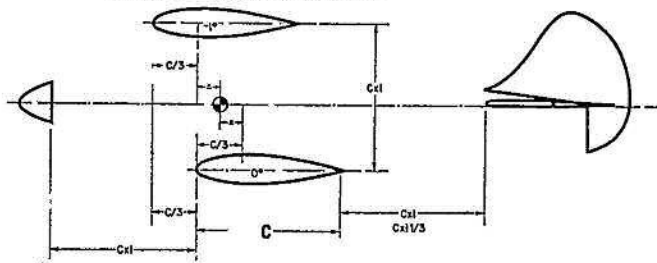


Above, two pictures show a *Cavalier* built by George Strohm which in this case features a detachable top wing, although this practise is not recommended. Note ample tail surfaces and absence of flaps - model is fully aerobatic despite this deviation from 'normal' stunt design procedure. Equal chord/span wings not only seem to work better, they also make for quicker building as the ribs, leading and trailing edges, etc., may be 'standardised'.

rigged with all angles  $0^{\circ}$ - $0^{\circ}$ ; one wing must be at  $1^{\circ}$  negative incidence as this makes the model far steadier in straight and level flight, and I have found that it is best if the top wing is the one set at minus  $1^{\circ}$  due to the fact that in an outside loop, when the top wing is blanketing the lower wing, the negative incidence is acting as positive, so giving extra lift to compensate for the reduced efficiency of the lower wing. It should be noted that in the case of back-staggered wings such as the *Beech 17* and *Sopwith Dolphin*, the reverse does NOT apply.

We can now consider the moment arms: the nose moment will depend on the engine used, but a good guide is one chord from the spinner backplate to the leading edge of the lower wing in the case of a conventionally staggered wing set-up. Tail moment arm should be from one, to  $1\frac{1}{2}$  chord from the trailing edge of the rear wing to the leading edge of the tailplane - the longer measurement is only recommended when one is trying to produce an almost scale model. Tailplane area should be 18 per cent of the total wing area although some reduction

Figure 1 - Typical proportions.



is possible if a scale model is being designed, but in any case should not be less than 15 per cent. The elevators should take up 50 per cent of the tailplane. The large areas are needed because biplanes can be stunted at virtually zero airspeed and one is then relying on slipstream effect for control; for the same reason never use less than 45° movement each way. My *Cavalier* (soon to be kitted by *Pegasus Models*) can be made to loop in its own length, and if one continues through part of a second loop until the model is pointing vertically up it can be made to hover while still remaining under control.

All that remains to be determined is the centre of gravity location. The easy way to do this is to mark the  $\frac{1}{4}$  chord position on the top wing and drop a line down to the datum line, then do the same on the lower wing, bringing a line up to the datum and then split the difference. Where sweepback is incorporated on the top wing take  $\frac{1}{4}$  chord plus half the sweep and then the lower wing is calculated as above. The front leadout should be on, or just in front of, the C.G. and swept back slightly. You should now have a drawing similar to *Figure 1* and can fill in the outlines to taste.

Below is a lightweight version of the *Cavalier* built and displayed by Peter Clitherow and Fox 35 powered. Note use of single fixed central strut used to support top wing in lieu of twin plywood struts used by George Strohm. Below that is Peter Miller's semi-scale SE5a - dihedral on top wing does not adversely affect flight. With a little effort, a practical C/L stunter can be built which certainly resembles full-size craft.



## Construction

Most of the construction on a biplane follows conventional practice but there are a few items not normally found on monoplanes.

### Wings

These should not have the leading edges sheeted, only the centre section should be treated this way as this saves weight and, in the event of a crash, allows the wings to break at the centre section sheeting which is easier to repair than a break in the fuselage. Nose riblets can be used to preserve the section forward of the main spar.

### Struts

The cabane struts are a critical factor in aligning the wing and should be designed to give positive location to the wing. A central pylon of  $\frac{1}{4}$  in. ply with the top portion shaped to match the inside of the top surface centre section sheeting, so that when the wing is pushed fully home it takes up the designed 1° negative incidence, works well. A similar system can be used with ply cabane struts each side of the fuselage, but make sure that they can be replaced without too much surgery. The SE5a uses aluminium tube screwed to the bearers and epoxy glued into hardwood blocks in the top wing, but this method needs very careful aligning. Wire struts are heavy and unless you can bend them really accurately, can present serious problems. A cabin biplane like the *Wacos* or *Beech 17* is the easiest solution of all.

### Rigging

Biplanes should always have 'working' rigging from lightweight Laystrate control line wire as this greatly reduces crash damage by supporting the wings and transmitting shock loads through the airframe.

### General

Weight and drag are the two biggest performance-killers on a biplane. Wing loadings should be about 10 oz. per square foot; go over 15 oz. per square foot and the manoeuvrability drops off very quickly. A biplane has more than enough built-in drag to start with, so avoid big radial cowls and bulky fuselages.

## Scale Subjects

A fully aerobatic scale biplane could well be an ideal contest model. Unfortunately, there are very few that come even close to the desired proportions, possibly the nearest is the *Pitts Special*, but that bulky fuselage would call for extra power. The *Meyer Lil Toot* is similar and both these planes should be capable of loops, bunts, inverted flight and eights.

There is still much work to be done before a biplane can enter a stunt contest on equal terms with a monoplane but I believe that it is possible. I have not tried flaps yet but these might help if ultimate perfection is desired. My *Cavalier* and *Duchess* designs will fly the full SMAE schedule without them, and for pure fun these planes are great, and make perfect practice models.

Flying a stunt biplane is a unique experience, why not try it? If you do not fancy designing your own just yet, then my *Duchess* design may foot the bill perfectly - see next month's issue for plans!

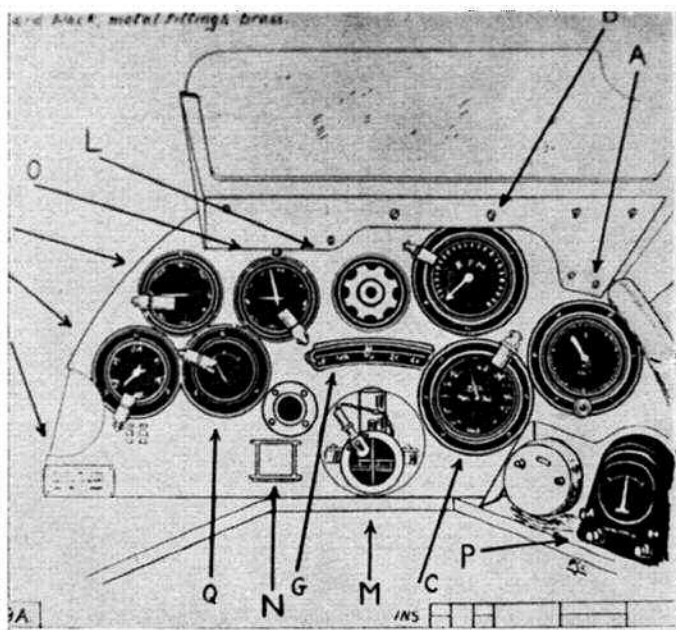
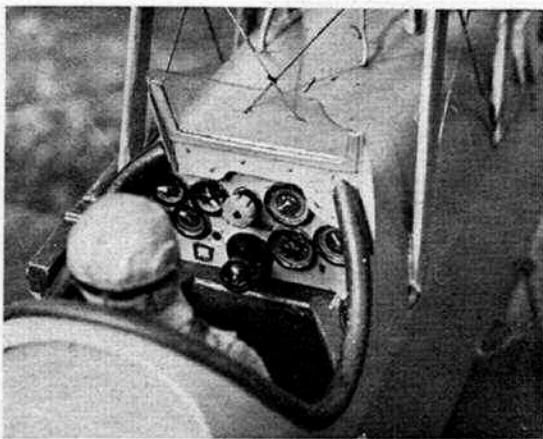
# FLYING SCALE COLUMN

by Eric Coates

Drawing of a DH9A cockpit canopy - photographed from a magazine drawing and printed to correct size (1/11th scale) to suit the author's model. Technique explained in text.

MANY SCALE MODELLERS, and I confess I am one of them, do not take kindly to internal detail work in cockpits. Most of us enjoy representing the structure of the machine, painting it and once the initial trimming is over, flying them. But cockpit detail, which can only be seen when closely examined, is something a lot of us baulk at. In years gone by, before wireless emplaced itself into the scale model, such internal detail tended to be ignored by the F/F and C/L flyers. About ten years ago when the huge radio scale model became a practical reality, which didn't prang every other flight, due to equipment failure, interior detail began to appear more regularly. Generally modelled to scales twice as large as F/F models and often being W.W.II subjects with vast cabins, unless something was put inside then they looked terribly stark and bare. The rules were altered so that generous marks were given to interior detail (too generous in my opinion, and in many others too, as recently moves are afoot to have this K factor reduced in the F.A.I. and S.M.A.E. Scale rules) and almost overnight it seemed a new generation of miniature cockpit furnishers were born. Some of the models to be seen in the late sixties were literally works of art - more time must have been spent on these model's internals than on the rest of

Finished cockpit of DH9A reveals bezels glued onto the photograph of the instrument panel - the compass and other details were added later.



the structure. Very often, unfortunately, more time spent on the basic engineering of the model, especially in the engine department and learning to fly R/C models, would have paid greater dividends in terms of contest successes . . .

These 'super' detailed models had two major effects on the scale fraternity. The first was to divide R/C scale into two classes: I and II. Class I was for really detailed models and class II was for less detailed machines which could be produced in a fraction of the time and no account was taken of cockpit detail in the static marking. Unfortunately many people took advantage of the class II rules and, to put it bluntly 'some right old rubbish' was flown in competitions. Happily, I think, a happy medium has now been struck with the class II rules and some very presentable scale models can be seen in such competitions, still without much cockpit detail but produced in a reasonable time - not two years hard labour. The second effect and this is the subject I wish to deal with chiefly this month, was to raise the standard of cockpit and cabin detail in the smaller F/F and C/L models. Class I static rules apply equally to both these classes as in R/C, in all S.M.A.E. competitions, therefore some useful marks can be picked up in this area even if the workmanship and accuracy is far from perfect. Luckily the models which fly best free flight tend to belong to the pre-1930 era and these had relatively sparse and somewhat crude instrumentation and furnishings. The majority of suitable stable subjects of this era also had open cockpits so that a nice fat leather coated gent, plonked in the driving seat, nicely obscures the greater part of the lower furnishings! The item which is not obscured, however, and always catches the eye is the dashboard - if done crudely it can really put one off the entire model.

Early machines of the '14-'18 war did not have a proper dashboard; they just had one or two instruments littered about the cockpit. These instruments were usually about the size of dinner plates and the cases are not difficult to reproduce, either in wood or metal, dependent upon one's facilities. Turned brass looks fine, as in the early days these very often were not painted but by about 1917, the number of



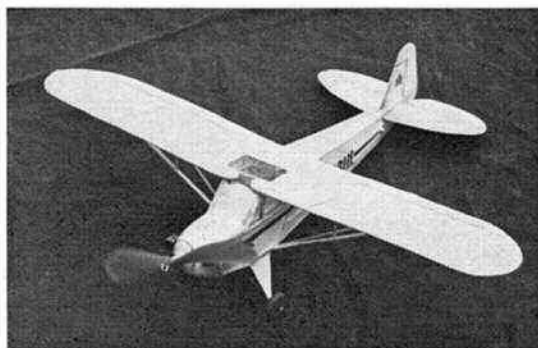
instruments had grown and they were presented in a reasonably orderly manner in a dashboard – this latter could be of wood or metal. The individual instruments usually had a fairly prominent bezel, in brass or duralumin, but usually painted to prevent glare. These bezels can be reproduced fairly easily by cutting washer-like pieces from suitable sized tubes.

Where most people come unstuck, unless they have microscopic eyesight and a hand as steady as the Pyramids, is in marking the scales of the instruments. The earlier larger jobs are not so bad as they were usually black figures on a white background, therefore a sharp 'B' pencil on white card produces quite a good scale. A coat of clear dope fastens the pencil marks and prevents smudging. Later instruments usually have white figures on a black background and were invariably smaller in order to get them all in the panel. I once tried to produce instrument scales about  $\frac{1}{8}$  in. diameter with white ink in a mapping pen on a black card background. The results were appalling! No doubt the technical artists amongst us would regard such a task as child's play but when it comes to this sort of work I, like so many others, am a very backward child! I have, therefore, devised a photographic method of producing instrument panels which although it won't come up to the absolute purists standards nevertheless produces, by mechanical means, an instrument panel which should satisfy the average scale modeller. One needs to be something of an amateur photographer to accomplish this, but as photography and aeromodelling are complementary hobbies which many enjoy, I am sure that many of my readers will have the necessary equipment.

The two essential items are a camera – preferably a single lens reflex job, although this is not essential – and an enlarger.

First one wants an instrument panel or a picture of one to photograph. As with all aspects of scale modelling things are better if a preserved example of your subject still exists. Photographing dashboards is not the easiest of jobs as they are invariably dark and it is difficult to get into a suitable position to photograph. A wide angle lens is an advantage, enabling one to cover the whole subject from a close position – with a standard 50 mm lens it is often difficult to get far enough back. To prevent distortion it is desirable to get the camera plumb behind the subject so a trestle alongside the fuselage, just aft of the fuselage, on which one can climb and lean over to the centre-line simplifies things. Of course the co-operation of the machine's owner is essential for such an operation . . .

Failing taking your own photograph then the next best thing is to copy a suitable photograph. These can often be found in instructional manuals or pilot's notes for the aeroplane in question – a single lens reflex camera, with extension tubes, is the best instrument for copying photographs. If a suitable photograph is not forthcoming, and very often only oblique shots are available, then we shall have to make a drawing of our dashboard. Now it is much easier to draw large instruments than small ones and with the ability of the enlarger to produce us whatever size print we desire there is no point in trying to draw a microscopic dashboard which we can fit directly into the model. We might as well draw our panel a foot across, or even larger if desired, with instruments  $1\frac{1}{2}$  to 2 in. diameter. Similarly the wonders of photography will allow us to draw with black ink, or soft pencil, on white card. If we then use reversal film in the camera, what was black becomes white, and

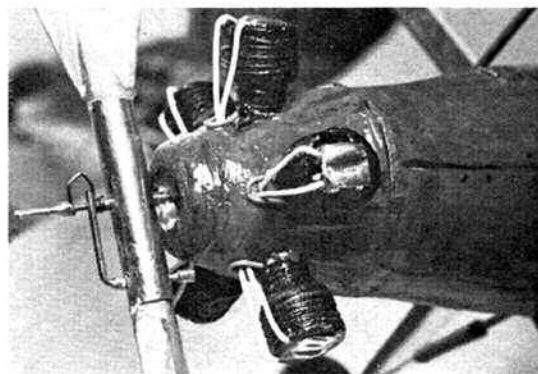


The fine-flying clipped wing Piper Cub, as built from the Peck Polymer kit which our columnist recently reviewed.

vice versa! One can reverse process black and white film to achieve this effect but the chemical process is tedious – it is simpler to use one of the colour slide films such as Kodachrome. Your instrument panel picture can be fitted in with pictures of the kids, dog, etc. It will then come back from the processers all ready to go into your enlarger.

Now to produce the actual model instrument panel. First we must determine the base dimension of our panel by measuring the width of our model which is then marked on the enlarging easel. The enlarger is

Trevor Faulkner is currently trying his hand at rubber powered scale models, and reckons that magnet steered models, his usual forté, are child's play in comparison! This Kania 3, about to be launched by daughter Julia, is unravelling many of the 'secrets' of this form of flying – all of which are being noted in methodical fashion.





then adjusted and focused to throw exactly the correct sized instrument panel we require. This is then printed onto glossy double weight paper, fixed, washed and glazed. After mounting onto a suitable bulkhead in the model the bezels can then be added, if required, using contact adhesive. If the dash is for a more modern machine in which the instruments are sunk slightly in the panel then it will pay to make two prints. On the second the instruments are cut out leaving apertures - this must be done cleanly with a very sharp balsa knife. A 1/32 in. balsa sandwich, with oversize apertures, is inserted between the two prints. The rearmost, of course, being the full one with the instrument faces. A piece of thin celluloid can be also sandwiched immediately under the foremost print for even greater realism.

For the earliest machines individual instrument faces can be produced in exactly the same manner. It is amazing how much neater hand-drawn figures look if they have been drawn four times full-size and then reduced photographically, than if drawn straight on to the instrument face.

I realise that a reasonable amount of photographic 'knowhow' and equipment is required to produce panels by this method, but judging by the fact that photographic shops, crammed with expensive Japanese equipment, outnumber model shops by at least 10 to 1 in the U.K., an awful lot of amateur photographers are around! So even if you have not the necessary equipment yourself, if you show this article to a photographically minded friend I am sure he can help you out.

\* \* \*

Now for one or two news items on the propulsion front.

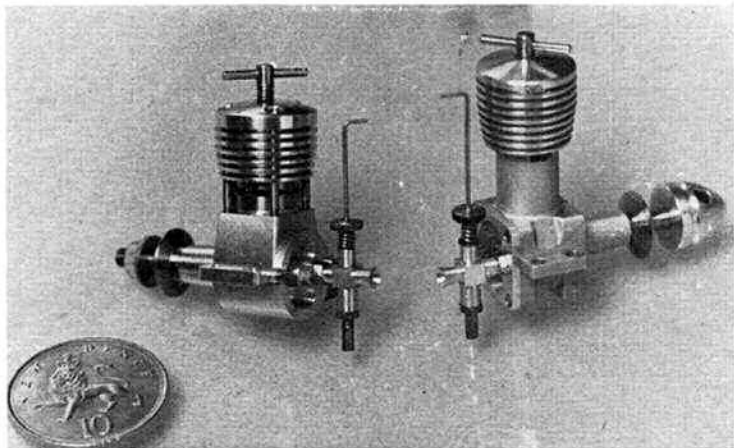
A few of the new Brown CO<sub>2</sub> motors are appearing in G.B. These can be either horizontally opposed

The latest from the Brown Junior Company - a horizontally opposed twin for CO<sub>2</sub> power. Can be converted to a single (with half capacity, of course) by unscrewing one cylinder, removing the piston and rod assembly and screwing in a blanking-off plug.

twins, as shown in the accompanying photograph, or as singles. In the latter form one cylinder, piston and con rod assembly is omitted and the hole in the crankcase plugged. These engines are considerably more robust than the earlier '1000 off' single produced by Bill Brown. The feed pipe is coiled round a spigot projecting from the cylinder head. Speed adjustment, as on the original model, is accomplished by rotating the whole cylinder barrel which is screwed into the crankcase. This action brings the piston further up, or down (dependent upon the direction of rotation) the cylinder; so governing the amount of opening of the gas inlet valve which is operated by the piston crown. This was a very weak point in the design of the original engine. The pipe on that engine, the one I have in my Ryan P.T., ran straight into the head. Unless the 'McHard' modification (described in the '72-'73 *Aeromodeller Annual*) is made the feed pipe is soon fractured by making speed adjustment. The coil on the cylinder head(s) of the new engine should prevent this happening.

On the twin I recently handled I found it rather difficult to adjust each cylinder to give even power. No doubt the knack will come to owners after a bit of practice. Even when not quite correctly adjusted the inherently better balancing of a twin produced a much smoother power run than from the single. These engines are still not readily available from stockists yet, but when they are they will be rather expensive. There will not be much change out of £20. I am told, when one is equipped with prop and loader.

Scale modeller, Les Saxby, of Hillingdon, has recently made himself two miniature diesels to power his 1 in. scale W.W.I machines. These are the two beautiful 0.375 c.c. units seen in the accompanying photo. Both are rear disc induction motors making them ideal for installation in scale models and Les claims 11,000 r.p.m. plus on 6 x 3 props. With a weight of 1 oz. apiece they should be ideal power units for models around 25-30 in. span. What a pity something similar is not available commercially.



A couple of beautifully made 0.375 c.c. diesels, produced by Les Saxby for use in his scale models, an application for which they should be almost perfectly suited.

# MIRABILIS

attractive, fully aerobatic  
control-line stunter for  
engines of around 1.5 c.c. capacity,  
designed by P. F. ELLIS

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## YOUR FREE FULL-SIZE PLAN

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down on the plan, then adding the ribs, followed by the top spar. (Ribs and half ribs are made of the sandwich method, using the root and tips sections drawn.) Add the leading and trailing edges, making sure that the panel is true, with no warps being present. Cement the half ribs in place. Bind the undercarriage legs to the plywood rib, and epoxy.

Build the starboard wing in an identical position, then join the two halves, reinforcing the joint with  $\frac{1}{8}$  in. x  $\frac{1}{4}$  in. spruce as shown. Make up the bellcrank assembly and bolt to the  $\frac{1}{4}$  in. bellcrank mount. Add leadouts, then epoxy the bellcrank mount in place. Glue wing tip blocks in place, then carve end panel to shape.


Install the pushrod and sheet in the centre section, then accurately join wing and fuselage.

Make up the flaps, hinge to the wing, then cement the pushrods to the elevator, making sure that both are neutral. Bend the tail wheel leg to shape and epoxy to fuselage side, then glue fin and rudder in place, followed by the cockpit floor and cockpit canopy.

Drill bearers for mounting the engine, instal engine and epoxy the cowl retainer (bicycle spoke) in place before making up the cowl.

Mount the wheels, then bind and epoxy the ply cores to the undercarriage. Complete the undercarriage leg fairings.

Cover the entire model with lightweight tissue and apply three or four coats of clear dope, followed by colour as required, but do keep the finish light – the completed model ready to fly should not weigh more than 20 oz. Fuelproof carefully, making sure that all hinges are free and that the controls move smoothly, then oil everything that moves! Bolt the engine in place, using an 8 x 4 in. propeller and appropriate spinner. All that now remains is to check that the C.G. is in the position shown, then head for the flying field for some (economical) stunting!



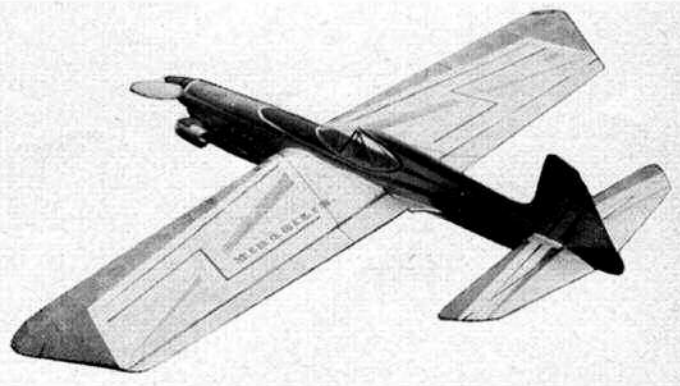
THERE'S A LOT to be said for a small stunter – low initial cost of both model and engine, ease of transport, and little fuel is consumed as a whole day's flying can be gleaned from a pint of fuel! However, the usual drawback is that these smaller designs tend to be rather less than 'pretty', and the flying style is more in common with a barge than a 'proper' stunter. Not so *Mirabilis*! Based on the conventional aerobatic lines with its coupled flaps and elevators plus generous nose movement, it is a very smooth and attractive performer and with a good engine of around 1.5 c.c. capacity (the original used an O.S. Max 10,) will fly well on lines of 45-52 ft. long single-strand control-line wire.

Construction is quite straightforward, though not really suitable for the absolute novice – it's best to have a little experience under your belt before attempting this one!

Firstly, make up the tank from tinplate, soldering all joints carefully and test for leaks. Next, cut out the fuselage made from 3/32 in. sheet and add the 1 mm ply doubler – an impact adhesive may be used for this. Cut the hardwood bearers to length taper as shown, then glue to frames F1 and F2, using an epoxy resin adhesive, sandwiching the tank between them. Now glue the fuselage sides to this assembly.

When the glue has set, cement the ends of the fuselage sides together at the tail (making sure that the fuselage is true), then add the remaining formers. Instal the completed tailplane assembly, then glue rear decking in place, followed by the backbone block, and finally plank the front end of the fuselage.

Now for the wings, which are built in two halves. Build the port wing first by pinning the lower spar





## PART 2 of Ron Coleman's feature on the handling of rubber motors for the beginner

'A drop of the soft stuff', just brewed as described in the text, is poured into its container - in this case an empty saccharine dispenser.

DIRT, DUST, GRIT, grease and oil are all enemies of the rubber motor. Dust and grit particles cut into the strands and start off the business of motor breakage while dirt, oil and grease, more slowly cause the breakdown of the rubber molecules, leading to breakage.

It is of course always worthwhile making the necessary preparations that will help reduce the effects of these triple enemies. A good supply of fresh newspaper will provide ever-ready clean surfaces on which to place rubber, especially during the messy business of lubrication.

Pour a teaspoonful or less of lubricant into one cupped hand, and coil the motor, or motors, on top of it and rub well in with both hands - imagine you are washing

your hands with rubber soap! Lubricant will rapidly cover hands, rubber and anything else in the near vicinity . . .

Have some newspaper ready to drop the motor on, or a plastic bag ready to contain it. It is far better to over-lubricate than have the motor dry and starved, for if the strands cannot slip and slide freely over one another when being wound, they cannot absorb the power evenly throughout their length. The strands would bind together and a chain of local over-stretched spots begin to build up, when suddenly (usually at maximum turns in a contest!) the weakest spot in the chain parts. If we have something less than maximum turns we may be lucky and only one strand breaks. If the

whole motor breaks the fuselage can be suddenly smashed by the lashing, unwinding ends of the rubber skein, unless protection is afforded by a good winding tube (see photo). Solid sheeted 1/16 in. and 3/32 in. balsa box fuselages on Coupe d'Hiver models, and 1/16 in. sheet balsa rolled fuselages of 1 1/4 in. diameter will often withstand complete motor breakages for quite a long time; however it is best, if sudden disappointment in a contest is to be avoided, always to use the winding tube.

A single broken strand can be repaired - just wash the broken ends free of lubricant, reef knot together and 'lock' with rubber solution rubbed into the knot.

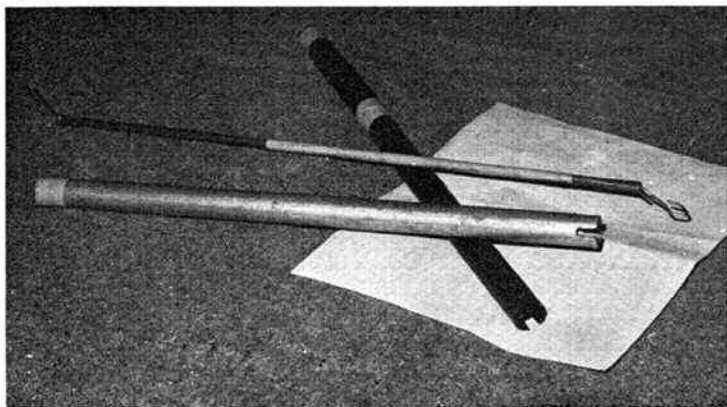
Excess lubricant will be ab-

'Hubble, bubble, toil and trouble!' The mixture, comprising of 4 oz. soft green soap, 4 oz. glycerine and 1 oz. distilled water are gently simmered in a saucepan.



A 10 gramme Coupe d'Hiver rubber motor about to be lubricated by 'washing hands' with rubber and lubricant.





sorbed by the newspaper on which the motor is laid. Then it should be transferred to an air-tight, light-tight tin box, glass jar, or plastic bag ready to take to the flying field. I keep my rubber motors free of lubricant until an hour or two before setting off for a spot of model flying. Motors should be washed in warm soapy water, rinsed and dried as soon as possible after return from the field. One of the best methods of drying rubber motors after washing and rinsing is to take over the family spin dryer for ten minutes or so, especially when dealing with fairly large quantities of rubber strip. Whenever a new hank of rubber is purchased I place it straight in the washing machine (tied up in four or five places to stop tangling) with warm water and a little soap. After rinsing and spin drying you may feel reasonably sure that dirt, dust and grit which may have been picked up during manufacture or on the journey from Italy, has been fairly well removed.

#### 'Brew Your Own' Lubricant

Rubber lubricant seems to be almost unobtainable in model shops these days; small tubes of a rather thick lubricant are sometimes available but the generous one- and two-ounce bottles of good liquid lubricant of pre-war days are long gone! Never mind do it yourself! Why not make up eight ounces now, enough to last two or more active flying seasons?

Purchase a 4 oz. jar of green soft soap and 4 oz. of glycerine from the chemist. These might cost approximately 32p, so lubricant at around 4p an ounce is quite reasonable. Place the glycerine and soft soap together with an ounce of distilled water (a tablespoonful) in a small saucepan and simmer gently until all

Above: a couple of winding tubes and a steel winding rod with piano wire hooks at each end. One tube is from seamless steel with  $\frac{3}{4}$  in. internal diameter, other is similar sized but made of plastic and is from welding rod packing tube. As seen below, winding rod is connected to the motor, the winding tube then slipped over the rod and inside the fuselage. Winder then engages with rod and turns applied. Finally, winding tube is slid out of fuselage and prop assembly substituted for the winding rod - no chance then of a motor damaging the fuselage should it break during winding.



the soap has melted and mixed with the glycerine. Stir continuously; the distilled water takes care of evaporation.

One-oz. empty liquid-saccharin plastic containers make ideal dispensers - wash out in hot water. The top (under the screw cap) can be removed for filling with a narrow-necked funnel and if a quicker dispensing is required, drill out the spout with a  $\frac{1}{8}$  in. diameter drill.

In warm weather, up to one-third more glycerine may be added to the lubricant to minimise the drying-off effects of sun-

shine. Also, keep it dark! - the rubber, that is, as much as possible, away from the dreaded rubber-rotting ultra violet rays ever present in daylight.

#### Preparation of Motors (for Coupe d'Hiver Flying)

I prefer the definitive French competition which is flown on the last Sunday in February. This contest was for many years held at Chavenay on the South-West of Paris, but in 1972 it moved to the old First World War airfield at Le Plessis Belleville a few kilometres out on the North-East of the city.

Three flights of two minutes are required, but English Coupe d'Hiver contests often have five two-minute flights. English contests permit hand launches, but the French contest - much more interesting to my mind - requires rise-off-ground, which in practice means that one point (the tail) touches the ground at the moment of release. Each competitor tends to develop his own particular method of holding and release, at the take-off. The most usual is to hold the fuselage in the right hand lightly just behind the wing (or hook the fingers under the wing

trailing edge, fingers each side of the fuselage) whilst the left hand holds the propeller in the open position. The airscrew is released a second or two before letting go with the right hand - otherwise the nose could drop disastrously. The tail under-fin touches the ground meanwhile until the model leaps away! There ought not to be any push with the right hand, but there often is. power-assisted take-off!

Such tactics are really unnecessary as they merely devalue the contest currency. A declaration of 'no flight' by the timekeeper would

A loading stick 'charged' with a Coupe d'Hiver motor, while yet another lies protected from the dust and dirt in its polythene bag.

soon discourage the worst features of this practice.

Whereas the French are easy on this R.O.G. aspect they are often keen to carry out weight checks of models and of rubber motors, as well as being on the mark in respect of their six minute time allowance for winding up and release of model. A Coupe d'Hiver rubber motor must weigh not more than 10 grammes when lubricated: this is near enough a 5 ft. length of  $\frac{1}{4}$  in. rubber strip. However, allowing a quarter of a gramme for lubricant, the dry weight of the motor, with knot locked with rubber solution and ends trimmed, should be 9.75 grammes. To achieve this I usually weigh out pieces of rubber strip on a Stanton electronic scale whenever it can be borrowed, or on my own balsa balance (see *Aeromodeller Annual 1974*) which is still going strong after two years hard usage, to 1/10 gramme accuracy. When trimmed off, the motors are sorted into groups: those nearest to 10 grammes when lubricated are called 'Red Label', and under and over-weight motors in packets 'Yellow Label' and 'Black Label' respectively. 'Red' motors are kept for contest flights and the others for trim and test flights.

#### 'Ever Ready' Motors

The competitor for Coupe d'Hiver in France has six minutes in which to wind up and launch his model, after collecting the time-keeper from Control and arriving out at his selected take-off point.



The tense job of winding up begins. Maximum turns are put on, and so the winder is pulled right back, giving the motor a stretch of four or five times its length. Held at this stretch, 50 per cent of the turns are wound on, when the motor is gradually brought in until maximum turns are arrived at, at the nose of the model.

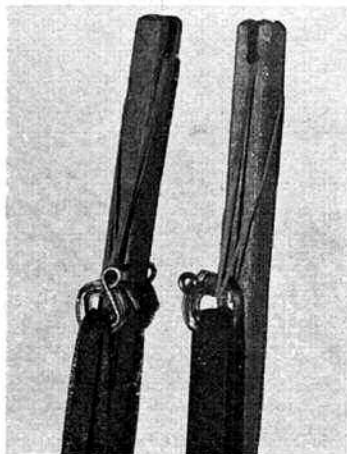
At this point the motor could break. It all-to-often does! If lucky, just one strand goes . . . click! If not, WHAM! — the six or eight strands of  $\frac{1}{4}$  in. flat rubber part; the rear half slams down into the winding tube, whilst the front portion whirls away like an angry bee at the end of the winding rod.

The competitor now has the choice of dismissing the time-keeper, or replacing the motor and still getting his model away within the same six minutes, of which perhaps less than four now remain. If he has had to spend a long time in retrieving his model from the previous flight, and the contest round is about to end, he

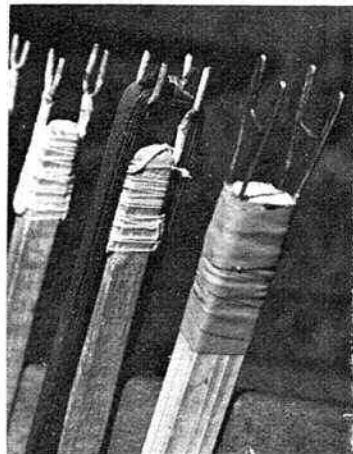
cannot afford to dismiss the time-keeper for this is his last chance to win! I have seen a Frenchman 'beating the four-minute mile' in a run to his car to fetch a new motor, re-load, wind, and still light the fuse and launch within the time; such miracles are beyond my own ancient physical capacity!

My motors are made up, pre-ringed upon loading sticks ready to push into the fuselage and engage the motor anchor peg the moment the broken motor is extracted from the motor tube and/or fuselage. A reserve tube is desirable in case the bunched-up motor is jammed hard in the rear end.

The loading sticks with motors attached are protected from dust and dirt by being covered with polythene bags, or just wrapped in a strip. They are lined up in a special box for immediate use. Thus a new motor can be in place in less than a minute and the launch completed into that ever-hopefully eight-minute long thermal . . . !



At left is close-up view of Coupe d'Hiver motors on sticks of the propeller end. This shows winding rings held by rubber bands to notched end of stick.

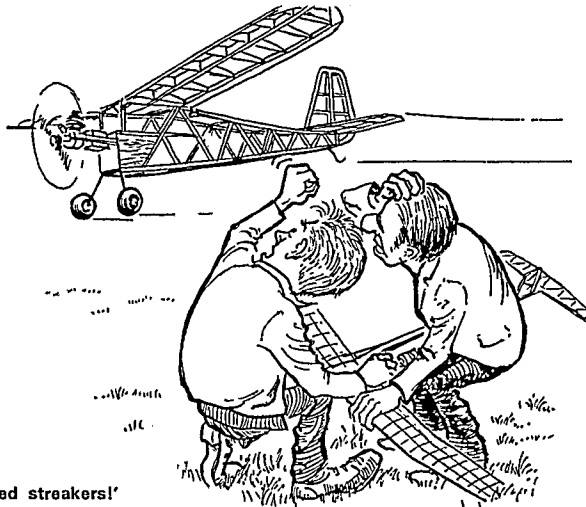


At right, rear or peg end of three loading sticks shows clearly how wire ends are bound to sticks of hardwood about  $\frac{1}{4}$  in. x  $\frac{1}{2}$  in. section. Nearest stick made of 20 swg piano wire, has plastic strip covering cotton binding. This is long stick for 'Open' models. Other three with soft galvanized wire 'Y' pieces. Six-strand Coupe motor on 2nd stick.

# topical twists

by 'Pylonius'

illustrated by 'Sherry'



'Damned streakers!'

## Coming a Cropper

Nothing stimulates debate, argument and sheer hell-for-it chat in this wet and windy island of ours, than the uncertain and capricious nature of our abominable weather. It harries the holiday maker, saturates the sportsman and confounds the expert. Even as a warm afternoon is promised by the unquenchable weatherman, hailstones are zinging on the studio roof. Yet, in the face of all this blow warm, blow cold variability, and the let downs of the past, the model movement is once again basing its contest schedules on predictable variations in wind strength – or so they think. Some years ago the weather went through one of its quaint phases where the wind dropped in the evening and stayed that way until breakfast time. Model flyers were quick to seize upon this phenomenon, and for a time model performance was measured in still air times. But that was a long time ago; nowadays the wind blows with unabated lustiness morning, noon and night, though, by some odd quirk, it calms down during the winter months, when more model flyers are to be seen about than in the summer.

All this concern for calm air flying is not due to any reluctance on the part of the model fliers to chase after their models; it is because our once green and pleasant land has turned somewhat brown and nasty. Where once the green fields rolled to the horizon there are huge prairies of crops, with not a treadable blade of grass in sight. And it is all fiercely guarded. One intruding foot and the reaction is all too swift and angry – out of all proportion to the 'crime'.

## All Under Control

Human nature is odd. If, some years back, it was suggested that the radio controlled model plane would come within the reach of all, no one would have imagined that there would be any reluctance to embrace the joys of on-the-spot, be-your-own-pilot, flying. You only have to think of the glorious advantages: no tiresome retrieving or lost models, and no looking on impotently as that nasty stall builds up – one flick of a switch and all could be sweet equilibrium and home to daddy.

But coming to the actual millenium, there were a few ingrates who preferred the primitive, chuck-it-and-run life: the uncertainties of trim and the zest of the chase. One such rebel against electronic emancipation, who has long resisted the beckoning of the button, is now fingering the white flag, according to his published assessment of the free flight situation. He seems to think that the day, when like the free range hen, the F/F model comes under

battery control, is nigh; it cannot survive in a non-free environment.

All very sound, if somewhat gloomy reasoning, no doubt, but before you dump your Wakefields and take out that second mortgage for the radio gear (remember, a disadvantage of control type contesting is that you are out on a limb if you haven't the best available equipment), may I remind you that there is a lot of happy, non-complicated life left in the free flight model, and if anything is under environmental pressure it is the radio model. When the time comes – if ever – for free fighting to pack up, you can be sure there won't be any radio flying either.

## Going Quackers

If you turn from the troubles of the world about you to the solace of your rubber duck perambulating gently around your bath, then the latest in radio controlled models, a full-size, life-like duck, should be right up your overflow. Just think of the delights of playing ducks and drakes with the drakes on your local pond as a restorative aftermath to say, a bout of pylon racing.

'You do Radio Control then. Model Planes?'

'No. Ducks.'

'Don't you ducks Me . . .'

## Bang-Bang Radio

What is the ultimate in Radio Control? Not self control, as you might hope, but working machine guns. The more advanced models, are already equipped with droppable bombs, firing rockets and pilot-ejecting devices, but now have the rat-a-tatting machine gun to add to their armoury.

We do not expect from Radio models much quiet, but it seems as if there is to be no 'peace' either.

## Flaps down

*Daedelus* was not called 'Dead Loss' for nothing. However man was to achieve flight, the old flapperty principle was demonstrably strictly for the birds. When it came to him trying to emulate his feathery friends it was a case of flop rather than flap, and has been ever since. Reason being that the bird is a bit of a cheat, with its hollow bones, variable incidence and changeable camber. Man's ultimate answer, after falling flat so often, was the airscrew – two small wings, in effect, doing their revolutionary and efficient thing.

Even so, the 'flapper' thing is still on, with a £1,000 prize for the first person to flap it across the channel, full-size or model. One hint, though: don't stick your wings on with wax.

# BETWEEN THE LINES

with Dave Clarkson

## What's new in Goodyear?

A good question - to which I suggest that for the past few years the answer has been very little indeed. I can remember right back to the beginning of Goodyear here in the U.K. (what's that? My age is showing? You cheeky s - - - -!). All sorts of new ideas abounded - hollow wings and fuselages, construction using plastic foam, pressure-fed diesels, and so on. All of those innovations came to nought, and we are left with the basic all-sheet Goodyear powered by a suction feed diesel at the mercy of the half-dozen or so pitmen in the U.K. who can start a glow motor quickly every time. I haven't even seen any fresh designs about recently, even though a very adequate number of 3 views (and accurate ones, too) are widely available; such 3 views as:

Rivetst	Owl Racer*	Mace Shark R2*
Ol' Tigart	Ol' Blue	Idjit's Midget
Cosmic Wind*	Stringer	Thunder Chicken
Shoestring*	Aquarius	
Bonzo	Deja Vu	
Cassutt*	El Bandito	
Boo Rayt	Long Midgett*	

from only two of the sources I know (A.P.S. scale plans and 'Racing Planes' Annuals). But no, it is the same old mixture as in the past few years; the Ginny frequently woefully inaccurate, or just bent, against A.P.S. Arganders

with a sprinkling of *Boo Rays*. Building standards are pretty low, as are rule enforcement standards.

Come on, Goodyear nuts. Goodyear is a fine event, or at least used to be - it would be a shame to let it die through lack of new ideas and designs.

## S.M.A.E. 2nd Centralised Meeting

Held on a really nasty day (cold, wet and windy) at R.A.F. Little Rissington, only the prospect of some much-needed pre-Nats practice on the actual Nats site persuaded many to emerge from their cars. Not a few in F.A.I. T/R and also speed wished that they had not emerged when they got out the brushes to sweep their models back into the boxes for the return journey (including myself). Thanks are due to Ken Morrissey (Speed), John Lynch (Stunt), Frank Smart (Combat) and Chris Coote (Team Racing) for results and reports - keep the reports flowing lads, every one gets an accolade!

### Speed

Organised on the usual handicap basis to keep things simple, it was not surprising that no new records were achieved. Ivor Roffey tried for the 10 c.c. record with his new piped O.P.S. 60 model which had shown more than enough potential in practice; unfortunately the wind and dolly problem rather disastrously prevented this being proved. Rossi 15s filled all four top places in both Open and F.A.I. configurations with both Paul Eisner and Ken Morrissey using very mild brews in their Open models. The speeds achieved, as noted below are good, considering the conditions.

1. P. Eisner (2.5 c.c. Open) 151.2 m.p.h.
2. D. Smith (F.A.I.) 133.1 m.p.h.
3. N. DeVilliers (F.A.I.) 133.1 m.p.h.
4. K. Morrissey (2.5 c.c. Open) 147.2 m.p.h.

Brian Jackson using a new Super-Tigre X-15 in F.A.I. had no joy achieving only 122.4 m.p.h. Details of the top four models are: Paul Eisner used a Rossi 15 on monoline and with 30 per cent nitro fuel, turned an MVVS 145 x 200 prop. Both Nash de Villiers and Dave Smith used Rossi 15s on 80/20 fuel, as did Ken Morrissey in the Open class who used an Alan Lee prepared motor, a home-made torque-type monoline unit and a TopFlite 5½ x 7½ speed prop.

### Stunt

In the absence of Steve Blake and Jim Mannall, and with John Nawnham spectating, this was a more open contest than usual. In the first round held in a high and blustery wind, many had motor problems and also some 'hairy' flights were seen. The second round in lighter winds, allowed most the opportunity of improving upon their first round scores with the following results.

	1st Round	2nd Round
1. J. Heanan	839.5	891.5
2. J. Lynch	743.5	867.5
3. M. Turner	679.5	739.5
4. K. Burton	636.5	684.5
5. G. Alison	656.5	373

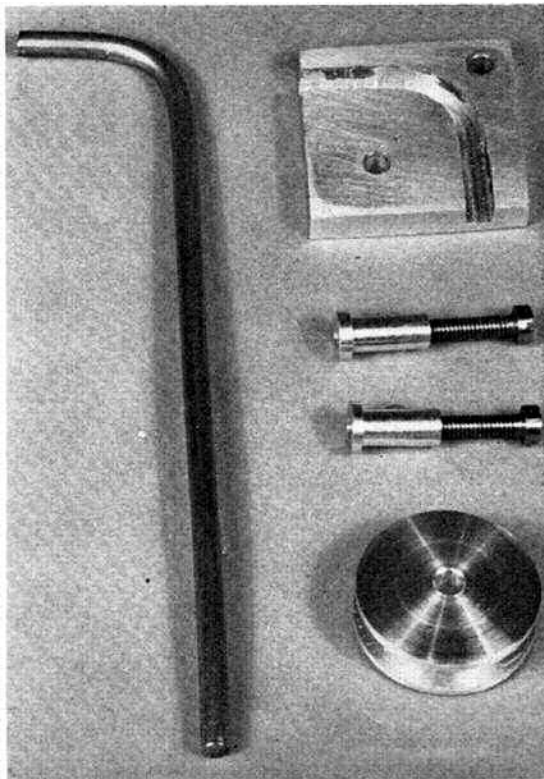
(bad motor run)

Doug Blake (C/L Committee Chairman) and Cyril Smith judged.

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

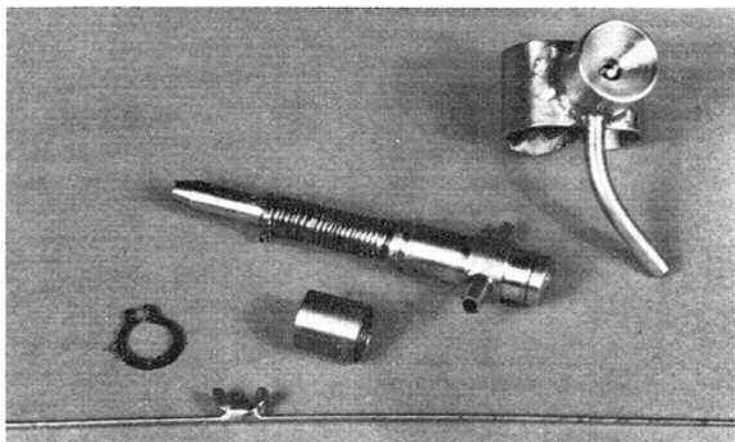
Would you believe it - Heaton/Ross were not the fastest in the heats (although they retrieved their honour with really rapid pit stops in the second round). The 'yellow jersey' went to Pete Sutherland and Jim Woodside with a John Daly K&B 15 (D) in a 17 oz. Henry Helmich parts model; an easy 4:41 for this new name amongst the sub-5 min. men. It was not to be Jim and Pete's day when their model ran in at 1:95 laps in the final following an unexpected pit stop, they had been leading Heaton/Ross up to this point. Sad men were Daly/Howard, Harknett/Smith, Bryant/Haycock and

Team racer undercarriage leg and mount set as made by Alan Cooper (also shown with wheel hub). Wire is good tight fit in groove, Full instructions supplied, together with the mounting bolts, for just 75p.





At right: a pair of Alan Cooper team race goodies. Top right in the picture is the finger valve, while in the foreground is the other essential part of the pressure refuelling system, the tank filler valve and combined fuel shut-off. Valve is mounted through the fuel tank (using steel sleeve supplied) and is retained by circlip. The cut-off resetting arm works on torsion bar principle, and is easy to install, virtually foolproof in operation. Very clear instructions sheet/drawings provided.



Below are yet more of Alan Cooper's products to please team race fans - no excuses now for not building an F.A.I. racer! The circular bell-crank is supplied with bush, pivot bolt and Laystrate leadouts already fitted and anchored for 88p, while the socket-headed comp. screw and appropriate Allan key cost 44p (state motor). The spinner nut illustrated is the same price, and has two flats machined on for quick, easy prop changes.

ourselves who all retired with more or less shattered models.

1. Heaton/Ross (Norwest)
2. Horton/Haworth (Wharfedale)
3. Sutherland/Woodside (Norwest)

#### ‡A - Team Race

As normal for this event, the entry was low - only a few Oliver 'Cubs' left? The final featured the destruction of the Horton/Haworth model and a damaged motor (following a nudge perhaps in the middle) - a most unfortunate accident.

1. Harknett/Smith
2. Coote/Horwood
3. Horton/Haworth

#### Combat

Again a report by Frank Smart - what a worker!

The decision to run this event was not made until nearly lunchtime following the morning's atrocious conditions, and 35 subsequently entered. Although the wind kept up for a while, the rain terminated and the latter part of the rally was held in reasonably sunny conditions.

Being fairly near the Nats, most competitors were using last year's models. The first round proved the first rally for father and son team Mr. Whale and son Michael, 13 years. They would have met in the 2nd round if both had won their bouts! Both flew a really well-built A.P.S. *Hornet 3* and did very well with an above average standard of flying; hope to see them at future events!

Dave Wood of Stockport who did so well with his new Titan design at Glevum rally, found it was not his day and lost to Walker in the first round. Yours truly flew Vernon Hunt who managed to see me off 3 cuts to 2, even with his glasses knocked off! Mick Tiernan, well on form after taking no less than seven cuts off Neil Blackburn in the first round, did better than myself as he went on to beat Vernon.

Notable newcomers and crew from Sheffield was Roberts with a well-sorted out crankcase-pressured Super Tigre G.15 although not manoeuvring particularly tight, kept the opposition at bay till the 3rd round.

When the quarter-finals came we had Lindly against Mick Tiernan (Leicester Hunters) and Halfpenny (Alfreton Acers) against Pete Farrant (Bath M.A.C.).

As forecast, Bath club are promising an interesting season; John James being placed 4th at Glevum rally and now Pete Farrant being placed 4th with his swept-wing design *Fantic*. Pete would have almost certainly been in the finals if his two new models had not been written off.

The final between Mick Tiernan and Halfpenny got off to a good start but it was soon evident that Mick (MVVS diesel-powered swept-wing model) had everything in his favour and brought him a well-deserved win. Mick now has a newly-formed team called the 'Hunters' (Leicester combat team name from the old days), team members being veteran Leicester combat flyers who have taken to the arena once again and it was noticeable that their teamwork transmitted to Mick.

#### Northern Area C/L Meet

As with Little Rissington the week before, this contest held at R.A.F. Driffield was blessed(?) with cold and windy weather. Since the wind direction was locally variable (I always suppress a giggle when I see the F/F lads leap into their cars and roar off like a swarm each time the wind direction changes), the organisers sensibly permitted two-up heats for all racing events throughout the day. By the time the finals were due, the wind had moderated somewhat, permitting three-up finals in all cases except the Novice Goodyear Final in which a two-up final was agreed to be most prudent. The mantle of organisation fell upon the Wharfedale Club for all events - thank you Wharfedale, for a well-run contest.

Because of the early date and the poor weather, entries were low. However, three really fine finals happened in the racing events making the whole thing thoroughly worthwhile. Anyway, here goes with the results and one or two comments as appropriate.

#### Combat

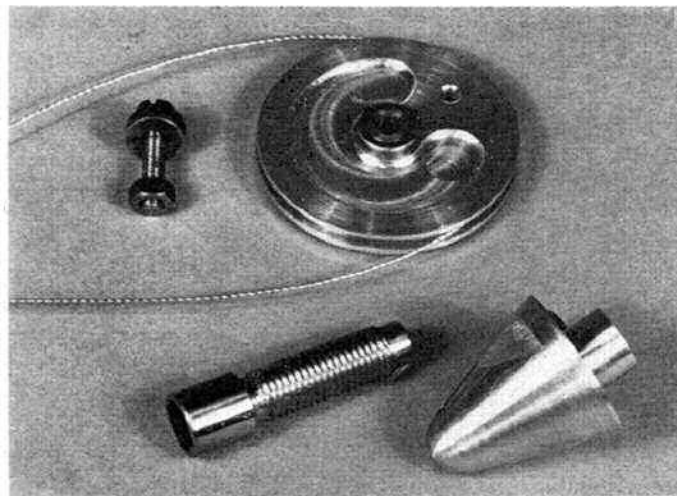
Essentially a three-cornered fight between the Hunters, Preston and Stockport clubs. Stockport had four fliers in the quarters, but all lost, so the Hunters and Preston split the places between themselves with Mike Tiernan coming out top. Combat finished early this time - well done the organisers Messrs. Atkinson, Morton, and Cohen.

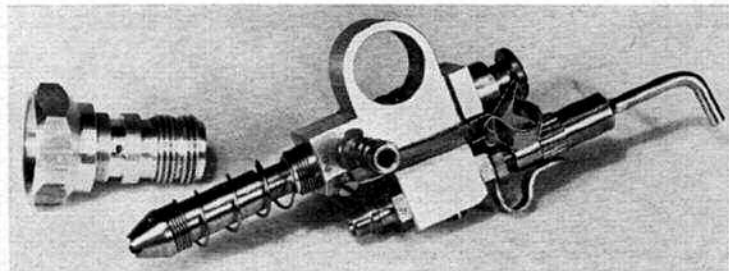
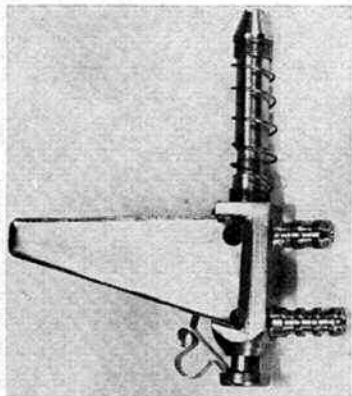
1. M. Tiernan (Hunters)
2. B. Favell (Preston)
3. R. Ambler (Preston)
4. R. Bamford (Hunters)

#### Goodyear

John Horton and Don Haworth now flying together again, proved once more that Don's PAW 3.5 Special-powered *Johnson Special* is formidable indeed, with by far the fastest heat and a comfortable win in the final. Donald is working on a diesel-converted rear induction converted Taipan 3.5 c.c. Schneurler motor - help! Everitt/Cooke also impressed with a very neat Oliver Major-powered *Argander!* Heaton/Ross kept their new ETA-powered *Dearlie* in the box and relied on their trusty *Ginny*. Newcomers Danes/Stangroom won the Novice final with a beautifully-finished *Argander* powered by a Taipan 3.5 c.c. Schneurler glw - symptomatic of a new trend perhaps?

	Heat	Final
1. Horton/Haworth (Wharfedale)	4:46	10:16
2. Heaton/Ross (Norwest)	5:08	10:32
3. Everitt/Cooke (Norwest)	5:06	10:45
<i>Novice Final</i>		
1. Davies/Stangroom (Wharfedale)		Solo finish
2. Morton/Morton (Norwest)		retd. 30 laps





Sorry to repeat photographs, but the last time these items were illustrated was over two years ago, and now that the 'goods' are available again, well justified, we think! Originally produced by Konrad Kaul, these TEC items are now made to the same high standard by his team mate Gunther Schwarz. Above is the 'piece de resistance', the motor valve with fuel shut-off, primer, and tank filler all combined. This unit is for motors with screw in venturi (state engine) but motors without this feature may have their backplates adapted at slight extra cost. At left, is the tank-mounted filler valve/fuel shut-off/auto prime.

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

Four teams put in sub-5 min. timers in the heats, namely Davy/Devenish (4:50), Heaton/Ross (4:51), Horton/Haworth (4:57) and Clarkson/Daly (4:57). Use of the rule book avoided the necessity of a fly-off for the third final place. Nice to see Joe Devenish back after his year's lay-off, with a new, very attractive H.P. 15-powered model. Few new models or teams were seen, I suppose the adverse weather affected this.

The final was a very tight affair and had not both John Horton and Les Davy accidentally operated their fuel shut-offs (in John's case it seemed to be a result of some rapid avoiding action during a three-model overtake), then the results would have been very different. Heaton/Ross's Bug! seemed definitely off-colour to the extent that they used an ETA for the second round. Also off-colour were all of the K&Bs present - even when plastered with tape, none behaved well, the cold weather again, I suspect.

	Heat	Final
1. Heaton/Ross (Norwest)	4:51	9:58
2. Davy/Devenish (Wharfedale)	4:50	10:00
3. Horton/Haworth (Wharfedale)	4:57	10:34

#### B Team Race

A low entry meant only a few heats which were marked only by the lack of success of Barker/Hill with their still handsome semi-scale *Spitfire* and by Sutherland/Bridge writing-off their Dooling 29 when a line broke at top speed - it did the tarmac some damage, too! The final was very close to the end with a big glow winning out over Don Haworth's 'big' diesel. Heaton/Ross had bad luck with a damaged model halfway through and had to retire. I love watching 'B' finals if only for the noise and excitement of seeing big glows hammering round. Let us all hope that future rule changes do not adversely affect this event.

	Heat	Final
1. Everitt/Cooke (Norwest)	4:42	7:48
2. Horton/Haworth (Wharfedale)	3:37	7:54
3. Heaton/Ross (Norwest)	3:57	retd.

#### Dutch T/R Trials

As we do here, the Dutch operate a one-day Trials system and for the C/L World Champs this year in Czechoslovakia they ran this event on Sunday, 12th May in quite acceptable weather conditions. The selected team in the order of aggregate trials times is:

1. Kant/Kant
2. Metkemeyer/Metkemeyer
3. Visser/Buys

I don't know whether there has ever before been a husband and wife team flying in a C/L World Champs, certainly I think that Christine Kant will be the first lady pilot - makes the judges' job easier on seeing the observation of one of the piloting rules anyway. Best of luck to Christine and husband Joust in your first World Champs.

Previous Dutch team members, the brothers Metkemeyer and Visser/Buys complete the team. Significantly perhaps, the Metkemeyers only used their Bug!-powered model for one round, using their ST G.15 F.1 (D) and ST G.20 D models for all other rounds. The results were very close together with all heat times in the 4:30 to 4:50 range, and Visser/Buys had to work very hard to secure their place.

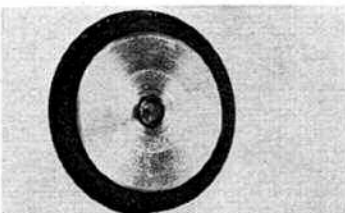
#### Goodies Directory—Part 2

This time those bits of metal-work so vital to all F.A.I. Team Race competitors that always seem in short supply. Increasingly, if you want to become competitive or remain competitive in Goodyear and even B and soon perhaps JA, the same goodies, viz. refuelling systems, auto-reset shut-offs are becoming *de rigueur*. Many people (the erstwhile lucky ones) who possess or have access to machine tools and know how to use them, make their own and this is a pronounced trend in British T/R where nearly all 'top' teams do so to the considerable disadvantage of newcomers. Therefore I launch with a little trepidation into T/R Goodies (disclaimers as before).

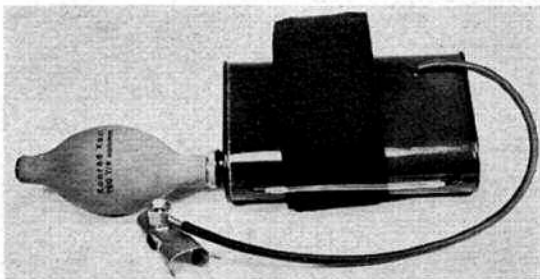
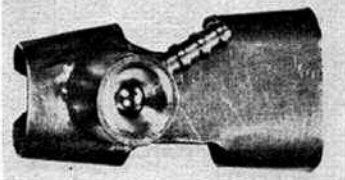
Three reputable sources of T/R Goodies exist. Henry Helmich in Holland - well known for his *Turtle* bits and as advertised previously in this magazine; Günter Schwarz in W. Germany - now producing Konrad Kaul's original range of goodies; and a new name to us all, Alan Cooper whose excellently-engineered parts made in England will, I am sure, become very popular indeed. Of the three the most hard-pressed at the moment is Henry Helmich, and for this reason

continued on page 380

At right is TEC teamrace wheel, bushed and fitted with hard rubber wheel that will never come off! Below that is the TEC finger valve, securely soldered to brass plate which slips over your finger. Price is 8 D.M. from Gunther Schwarz.



Below: pressure refuelling system consists of metal can with fuel tube level indicator on side, rubber bulb plus, of course, the finger valve unit. Elastic band-age keeps unit on forearm.





# MAGNET MEET

Paul Fynn reports from the  
1974 European Championships  
for magnet steered slope soarers  
at Himmelberg, Germany

Your reporter Paul Fynn launches his 84 in. span forward fin magnet soarer from the slope for a five-minute 'max' flight in the second round. The model is steered by a magnet unit supplied by arch enthusiast, Hans Gremmer - who also provided these photographs.

THE 1974 CHAMPIONSHIPS were held in a unique spot near the small village of Melchingen, 30 miles south of Stuttgart, Germany. Unique, because for miles around the surrounding hills were almost entirely clad with tall pine trees, the exception to this being a fertile plateau about 10 square miles in area, bounded on the eastern side by a treeless ridge, which lies 2,500 ft. above sea level and approximately 400 ft. higher than the plain itself. This ridge running north to south proved to be an ideal slope for westerly winds.

We arrived on the Thursday evening to allow a day for practice, and found the wind to be blowing from the east. The camp site itself, located a couple of miles away, was out of this world with impeccable standards of cleanliness and even included a car wash bay!

Next day, there was a westerly wind but after a bright start the weather soon deteriorated, leaving very little time for flying before rain started, although it later abated and a few useful flights were made in the evening. A team meeting and a briefing was scheduled for that evening at a local hotel with Hanns Gremmer acting as interpreter. One of the intended rules allowed for a "flight box" at a fixed location on the hillside from which all launches should be made, but we suggested that no down-slope limit should apply, and this was eventually adopted, as next day the box was open-ended, and the Continentals with their lighter models were able to take great advantage of this.

Early Saturday morning we were awoken by very heavy rain and at 6 a.m. we found intermittent rain, low cloud and fairly strong winds coming from the west, an ominous but English start to the day! The weather soon moderated and by 8 a.m. the rain had stopped, but we were very glad of the team and mess tents, plus a very efficient PA system supplied by the German army. At 10 o'clock various dignitaries of the German Aero Club and of the Model Flying Governing Body assembled and in due course the

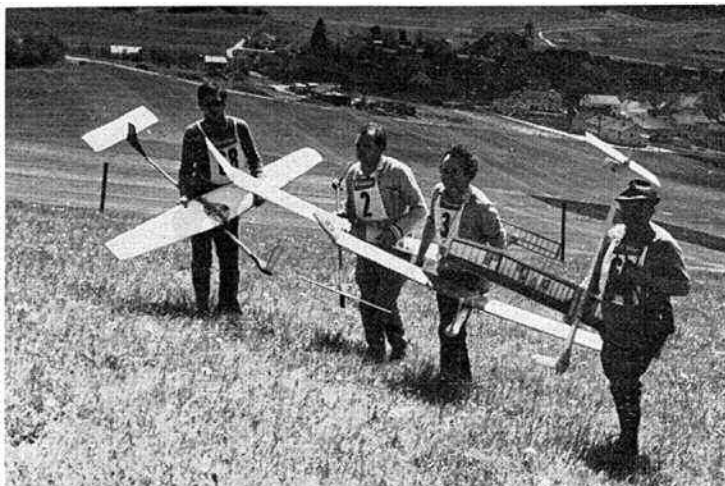
event was officially started, round 1 being at 11 a.m. By now the wind had lessened but was still variable, swinging through about 30 degrees. The Continentals chose their heavyweight models and the English their lightweight ones. Out of 84 fliers the first three rounds produced 45, 41 and 45 maxs respectively, but only 15 of these were trebles.

Ours was the only team in the first round to achieve three maxs and that alone made the trip worthwhile! In round two the wind freshened, making it very difficult to get away from the ridge and the higher wind speed over the coll to the right of the launching point took many models back behind the main lift point of the ridge, and curtailed any promising-looking flights. The rain was light but continuous and round three showed more variable wind speed. Even so, it was still quite a struggle to escape the ridge face and it was agonising watching the first 30 sec. of many flights.

That evening at the Town Hall we were met by the Burgomeister - the first item on the agenda was to watch the T.V. sports programme and al-

though the football enthusiasts had only allowed us some 15 seconds, a substantial crowd was attracted next day. The organisers were delighted that we had come so far for their competition, and presented us with a Graupner modelling box apiece while the team was presented with a model of the latest VFW 614 Passenger Jet. On Sunday, a 9.30 a.m. start was scheduled, but the wind was from the east and very much lighter. The organisers were reluctant to move the flying site as the main control was well established and the weather report was adamant that the wind would eventually swing to a westerly direction, and certainly the clouds bore this out. The start of round 4 was thus postponed, and sure enough the wind started to veer, although it never did reach the required direction. In fact, the wind now passed the southerly face and round 5 was flown from the westerly face in the hope that the wind would have moved round. Flying from the southerly ridge the air proved very turbulent, due to the blanketing effect of the adjacent hills, and consequently, round 4 saw various approaches from heavy to light

It's a long walk back! Ray Sutton (2) and Paul Fynn make the ascent flanked with Dieter Drosler (left) using a lightweight styro foam wing, which flexed visibly in turbulent air, and Heinz Unger with a conventional forward-fin model.





weight models: the latter having styro-foam wings and rear steering. However, no one model showed particular advantage and it is significant that none of the previous day's treble maxs were added to in this round, and that only in round five, when it was clear that it was purely a thermal-finding competition, were a few more maxs achieved. In this round we had an option of flying from the south or the westerly slope - the Swiss chose the latter and had thermal spotters on a plain below in radio contact with the launch point. They programmed their

steering system to take the model to the point of the thermal and then circle. From the southerly slope it was possible to find sufficient lift for a max; of the eight maxs in the last round, five were achieved by Swiss flyers.

The high level of turbulence present was demonstrated on my last flight, when from launch the model climbed until almost a dot in the sky, but D/T'd a very short distance from the ground, having come down in very much less time than it took to go up!

At the prizegiving, we were most

pleased to find that the British team was in third place.

In conclusion a very rewarding, informal competition. It was interesting to note that the more 'unusual' names at the top end of the result list were this time excluded by the unorthodox techniques required to cope with the fourth and fifth rounds and one can only speculate as to what the outcome would have been had the Italian team arrived - a dispute among Customs Officials on the Italian border delayed them so much that they did not make the journey from the border. Had they arrived, there would have perhaps been a greater number of rear-steered models, but as it was, these were greatly outnumbered by the conventional forward fin arrangement.

Results

1. K. Meier (Switzerland) 300+300+300+236+300=1436; 2. H. Schnesboll (Switzerland) 300+300+153+300=1353; 3. R. Haller (Switzerland) 223+300+300+227+300=1350; 4. E. Morgeneier (Germany) 300+300+300+133+300=1333; 5. H. Handler (W. Germany) 282+300+300+253+194=1329; 6. P. Fynn (G.B.) 300+300+300+100+300=1300; 54. G. Palmer (G.B.) 300+87+300+92+113=892; 69. R. Sutton (G.B.) 300+110+73+118+125=726.

(84 entries)

## Between the lines

I have not included Henry's bits. For details, however, note his new address: Kaartmakersring 121, Eindhoven, Holland. Günter Schwarz confesses limited time and production facilities and hopes that he will be able to service all inquiries without too much delay. Alan Cooper hopes that he will be able to deliver in no more than 14 days.

As before, in alphabetical order to show no prejudice:

Alan Cooper, Team Race Components of Top Road, Hardwich Wood, Wingerworth, Chesterfield S42 6RQ.

Part No. CD 10 Circular Bellcrank 88p  
Machined from aluminium alloy bar, supplied complete with bearing pin, spacers, centre bolt, leadout anchorage and full instructions.

Part No. CD 11 Wheel Hub (supplied without tyre) 38p  
Machined from aluminium bar, drilled to fit 10 swg wire. Deep groove for tyre retention. (Cut tyre from laboratory rubber bung and Araldite on.)

Part No. CD 12 U/C Leg and Clamp 75p  
For use in a bolt on U/C installation. Leg formed from 10 swg piano wire. Clamp and retaining nuts machined from aluminium bar. Complete with full instructions.

Part No. CD 13 Socket Drive Comp. Screw Conversion 44p  
Easily fitted to most 2.55 c.c. T/R motors state motor with order). Supplied with Allen key and full instructions.

Part No. CD 15 Finger Valve £1.87  
Precision machined from brass bar with brass finger ferule. Can be dismantled for cleaning. For use with Part No. CD 19.

Part No. CD 18 Spinner Nut 44p  
Machined from aluminium alloy bar. Types available to fit most T/R motors state motor with order).

Part No. CD 19 Tank Mounted Cut-off/Fuelling valve £2.40  
Body machined from brass bar with honed bore. Slide machined from silver steel. Provided with a special fitting to be soldered into tank from which valve assembly is removable. Supplied with trip wire and full instructions. Cash/Cheque/P.O. with order (payable to A. J. Cooper). Please add 15p for postage and packing. All prices include V.A.T.

Besides these standard items, Alan is working on a pressure refuelling system 'kit' and is prepared to carry out custom machining to your drawings or patterns subject to quotation.

Alan is the mechanic half of the Cooper/Green T/R team, well known in the U.K. for some years now and therefore his items, as he uses himself, are well tried.

continued from page 378

Günter Schwarz - TEC Team Race Equipment of 7145 Markgröningen, Ludwig Heyd Str. 6, W. Germany.

A. TEC Refuelling and Shut-off Systems

Item 1a)	Complete refuelling system	35 DM
1b)	Kit for refuelling system	19 DM
2)	Finger valve	8 DM
3a)	Tank valve with shut-off	19 DM
3b)	Tank valve with shut-off, soldered to tank base-plate	22.50 DM
3c)	Tank valve with shut-off complete with checked tank	36 DM
4a)	Motor valve with shut-off and primer for screw in venturi motors (e.g. H.P. 15, ST G.15 RVD)	30 DM
	Needle valve extra to order.	
4b)	As item 4a) but for motors without screw in venturi (e.g. Kosmic K-15, K&B, etc.). Send back plate for adaptation.	33 DM

B. TEC Motor Accessories

Item 5a)	Needle assembly for item 4 with straight supply	7.50 DM
	Pipe	8 DM
5b)	As item 5a but with angled pipe	4 DM
6)	Jet ring for venturi	4 DM
7a)	Venturi for item 4a	8 DM
7b)	Venturi for item 4b	8 DM
8)	Allen key-headed camp screw	2.50 DM

Notes: for items 4 to 8, state type of motor with order, for item 7, if no special choke size is requested the standard size is 3.3 mm diameter.

C. TEC T/R Model Accessories

Item 9)	Team race wheel	7.50 DM
10a)	Circular bellcrank	4 DM
10b)	Circular bellcrank with housing	12 DM
11)	Glass cloth at 27g/sq. mm, 1 sq. m	10 DM
12)	Team race handle	12 DM

Please add 2.50 DM forwarding charges. Payment by International Money Order only.

Günter Schwarz with Konrad Kaul are well known in the U.K., having won F.A.I. Team Race at the '72 Nats and Goodyear at the '73 Nats. They have represented Germany internationally many times. This TEC equipment is by now well known throughout the world, no further comment is necessary.

Write to Günter (with International Reply Coupon) for his well-illustrated catalogue and with questions, etc., about his equipment. Günter speaks and writes good English and is a 'nice bloke', so no problem there.



POWER MODELS are not the most welcome intruders into a residential environment, and most clubs operate on fields far from the easy-to-make-mad crowd, but sometimes, as in the case of Keen's field, Hemel Hempstead, there is just nowhere else to fly in a very large radius. Two newspaper clippings sent to us give coverage to the problem, and to the preparations for a demonstration of radio controlled models to the local council. Part of the procedure will be a noise test to be carried out by Environmental health officers. Let us hope the clubs concerned can convincingly demonstrate that they can fly without undue noise and nuisance – not an easy thing to achieve in a public field in a residential area.

Some further problems of Radio flying are discussed in the newsletter of the Watford Wayfarers M.A.C. There seems a fair amount of dubiety over the use of split radio frequencies. And coming once again to the noise problem, the Wayfarers have as many as 17 models out on the Moor on a Sunday afternoon. Fortunately, whilst the turnout is increasing in number there is a tendency towards smaller, and consequently quieter, models. In order to open another flying option where take-offs are smoother and spectators fewer, the club is mulling over the offer of a fenced off patch, 70 yd. x 70 yd. Cramped and dangerous, I would say. Odd club comp held on the moor was a slow/fast differential over a hundred yards. Mick Wilshire's flap system paid off with a first place.

A thought provoking point is made in a letter to Ron Firth's *Model Aeroplane Gazette*. The writer is Maurice Doyle, from whom we used to hear quite a lot ourselves a few years back. He thinks the English model flyer (he lives in Northern Ireland) is entitled to a greater part of the national expenditure on recreation than he gets. A good argument he gives in support of a bigger handout is the tax yield on model goods which, if you look at some of the pricey equipment sold, must be quite enormous; entitling us, at least, to a central flying field for our big events. Also in the newsletter is an example of a newish trend: 'Scale Vintage'. The plan reproduced is that of a 1938 *Vickers Vildebeeste*. Would make up into a nice little rubber job, though.

Do we fly model aircraft or just toy aeroplanes? The nuances of the case are discussed in depth in an article in the *East Anglian Area Newsletter*. The general tone may be whimsical, but the conclusion is inescapable: we fly toys. For my own part, not being a Scale enthusiast, I claim to operate small flying machines, which is as good a euphemistic term as any. But models or toys, they get equally a bad

mauling from our British type winds. And there was plenty of puff at R.A.F. Watton for the 2nd Area F/F Meeting; it accelerated during the day from a not-so-gentle 15 m.p.h. to over 20 m.p.h. Only one rubber job took the air, but sufficient Glider and Power models braved the conditions to make a go of the event. Latest news of Area C/L was of training and preparation for the Nats.

Main news in the *Three Kings' Court Circular* is of a pending Carrier event. Already the old *Flycatcher* is at action stations and a nice trophy in the form of a golden cockerel, donated by Messrs Courage, awaits a winning deck drop. No super scale *Seamew* required, merely a simple profile model with a throttling device. Other news is of the first Good-year event of the year, but the last of the 1973/4 series. An exciting final with Derek Bird winning in a time of 15:04. This put him well in front in the final league placings: 26 points – 9 in front of the second man, Pete Mason. Away from all that horrid weather we seem to be getting, r.t.p., is a popular indulgence. Many and colourful are the miniscule models that circulate the pylon, like Mick Clanford's *Herald*: twin motored and tricycle undercarted, and Wal Cordwell's *Swordfish*. Still indoors, the static competition yielded a fine winner in Vic Wilson's *Hawker Sea Fury*. An interesting historic feature of this 7½ lb. model is the individual markings: those of the only *Sea Fury* to shoot down a MiG 15 in the Korean war.

Good news concerning flying sites is hard to come by in these constricting times, but the cry of 'New venue' goes up in the haunts of the *Scottish A.A.* The site, by kind permission of farmer friends, is at Newbigging, not too far from Edinburgh. It, like the gesture, is expansive, and will happily accommodate the R/C, F/F and C/L meeting in June. This piece of good luck is, unhappily, offset to some extent by the loss of the team race site at East Kilbride. Meantime all T/R events are postponed until another site is found. A condition for flying in any S.A.A., contest is the showing of an insurance card. This is most sensible, but it is also pointed out in the newsletter that you must know exactly what your insurance covers, remembering that only S.M.A.E., insurance is valid on M.O.D. sites.

They may talk about models at the *Telford M.A.C.*, but they build them as well – and then some. At a static display at Wrekin Youth Centre the 25 members set up no less than 30 models. Amongst other eye catching models was Dave Barber's yet to be finished *Handley Page Hannibal*. This model of the famous biplane has a nicely simulated corrugated aluminium effect on the fuselage. And a nice exercise in engineering was George Carter's *Stampe Monitor* display model, ingeniously wired up to a 3-line handle. And an odd man out in this generally R/C, C/L club, was a Wakefield rubber model by Simon Turner.

The *Northampton M.A.C.*, newsletter quotes the remarks recently made by a pundit to the effect that there is no such thing as club contests these days, and effectively ripostes by publishing the results of a whole range of club competitions. And very impressive they are, too, particularly the times put up in the F/F events. It appears to be one of those clubs with a highly contagious contest bug. Top man in the F/F tables is M. Cowley, with C. Parry leading the Junior section. Mr. Cowley is also the Senior C/L Champion, which says much for his versatility. Top of the C/L Junior league is T. Baker.

Formed only on 1st January this year, the **Aldershot Model Club** is still busy establishing itself. Mr. B. E. Ballard, the Secretary, writes to tell us that the main problem is one of flying sites. The land around the garrison town is largely M.O.D., property, and this authority appears quite stringent in its attitude to R/C flying; that of limiting it to one site only and to weekends after 4 p.m. Other possibilities are naturally being looked into, and already a new site on out of town farmland has been acquired. As Mr. Ballard says, it is best to have a number of site options so to avoid 'over flying' on one site - the thing that draws complaints. The club started out with a dozen R/C fliers, but has since expanded to around the 40 mark, taking in other interests such as R/C cars and gliders. The latter are to be seen on Sunday mornings on Butser Hill. The club meets once a month in a room at a local pub where, apart from the obvious entertainments, film shows are put on. Good flying discipline and behaviour are the club's watchwords.

Odd we should have commented on the dearth of model news from Northern Ireland these days, for we now have to hand a letter from Dr. Denis O'Hara giving us information on a new body set up: the **Northern Ireland Association of Aeromodellers**. This is not a breakaway from the M.A.C.I., but a means of getting on terms with local government. The new institution speaks for the three main clubs in N.I., the **Belfast M.F.C.**, the **North Down Model Club**, and the **Ulster M.A.C.** It will endeavour to keep in close contact with Government Departments, Local Authority Groups and Education Departments, in order to keep the interests of aeromodelling to the fore. Dr. O'Hara stresses the need for the S.M.A.E., to get itself registered as a Sport - Ireland always follow the English lead in such matters!

The May Bulletin of the **Leicester M.A.C.**, discusses the withers and wherefores of model flying. The way ahead looks bleak for F/F, with all our air-space fast a-shrinking, but then you have radio bods, anxious to give their ulcers a rest, casting longing eyes at low risk, low cost free flight. One advantage of F/F is that you can stay fairly static, doing the same thing, but with Radio it is ever the latest innovation to keep up with. An obvious disadvantage of free flight is highlighted by a notice in the Bulletin to the effect that from early June to early September no F/F models to operate on Wymeswold. Reason: crop growth.

The **Waveney M.F.C.**, newsletter rejoices in all the fresh, flyable Spring air, after the gloom and depression we have gone through. And what adds zest to the proceedings is the very inviting club field: R.A.F. Watton. This is tucked well away from urban spread, and can unobtrusively accommodate the club's growing membership. The club appears to be an all-control affair, with interest shared between Radio and C/L.

Frustrating not to savvy the Swedish, for in the copy of *Aviatikern* which has come to us from model conscious Sweden, there is a Coupe d'Hiver propeller described, and it looks intriguing.

According to a notice in *Torque*, the club mag of the **Christchurch M.A.C.**, (New Zealand), Colin Stace is to retire from the Editor's chair after a run of six years. It's a question of well deserved change; the putting down of the pen and the taking up of the balsa knife.

Clubman

## Contest Calendar . . .

June 23rd	<b>FINCHLEY C/L GALA.</b> Combat, stunt. Venue Glebelands, Summers Lane, Finchley, N.3. 9 a.m. Pre-entry (25p) to J. Goodwin, 77 Gallants Farm Road, East Barnet, Herts.
June 23rd	<b>SOUTHAMPTON F/F RALLY.</b> Open R/G/P, and A/2 glider at Beaulieu Airfield.
June 30th	<b>S.M.A.E. CLUB CHAMPIONSHIPS.</b> Open R/G/P at R.A.F. Stradishall, Suffolk.
June 30th	<b>ELLIOTT C/L RALLY.</b> Scale, Stunt, Goodyear, Combat, Junior rat-race (up to 3.5 c.c., for 16 years and under). Venue: Elliott Bros., Airport Works, Rochester, Kent.
July 7th	<b>LONDON AREA C/L MEET.</b> F.A.I., Goodyear team-race, Combat at Charville Lane, Hayes.
July 7th	<b>LONDON AREA C/L MEET.</b> Class 1 Scale, Stunt, Navy Carrier at 10.30 a.m., Croydon Airport, Purley Way, Surrey. Silencers and insurance proof essential.
July 7th	<b>WESTERN AREA F.A.I. MEET.</b> F.A.I. Team race, F.A.I. Speed and F.A.I. Combat at R.N.A.Y. Wroughton, Wiltshire. Pre-entry (essential) 40p and s.a.e. to R. Horwood, 145 Downend Road, Horfield, Bristol BS7 9PY.
July 14th	<b>S.M.A.E. 5th AREA CENTRALISED.</b> Team glider, Cd'H, F.A.I. Power - Area venues.
July 14th	<b>S.M.A.E. SCALE.</b> R/C Class II, C/L, F/F. Venue: Little Rissington, Gloucester.
July 14th	<b>COLCHESTER M.A.C. THERMAL SOARING GALA.</b> Venue: Sir Charles Lucas Comp. School, Colchester. 11 a.m. start. Pre-entry (35p) to D. G. Sargent, 17 Old Heath Road, Colchester, Essex. State Freq.
July 14th	<b>STOCKPORT COMBAT RALLY</b> at Warth Meadow, Stockport. Prizes: Min. £10 cash plus Mainstream Trophy plus sponsored prizes for first place. Cash and prizes for second and third. Send 60p and s.a.e. for pre-entry and directions to D. Wood, 18 Royon Drive, Cheadle Heath, Stockport.
July 21st	<b>S.V.A.S. MODEL SECTION OPEN DAY.</b> All modellers welcome, with accent on free-flight and C/L scale, at Old Warden, Nr. Biggleswade, Beds.
July 21st	<b>S.M.A.E. 4th INDOOR MEET.</b> Venue - Cardington, Beds.
July 28th	<b>S.M.A.E. 4th C/L MEET.</b> F.A.I. T/R, Combat, 1/4 T/R, Speed, Stunt. Venue:
August 4th	<b>TORBAY RALLY</b> Open R/G/P, Chuck Glider, All-in F.A.I. (5 flights only). Venue: Woodbury Common, Nr. Exmouth.
August 11th	<b>PERFORMANCE KITS SPORTS DAY.</b> Fly-for-fun rally. All types welcome. Also informal meet of Model Engine Collectors Assoc., 9.30 a.m. at Old Warden, Biggleswade, Beds.
August 11th	<b>LONDON AREA F/F RALLY.</b> F.A.I. R/G/P, C. d'H, A/1, 1/4A Power, HLG at Bassingbourn Old Airfield, Royston, Herts. S.M.A.E. members only.
August 11th	<b>MIDLANDS AREA RALLY.</b> C/L Stunt, Combat, F.A.I. & Goodyear T/R. Pre-entry to C. Draper, 31 Ashchurch Drive, Wollaton, Nottingham. Also R/C (provisional) Class 2 scale, Spin & Spot, Touch and Go, Fly-for-fun. S.M.A.E. members only.
August 18th	<b>S.M.A.E. 5th INDOOR MEET.</b> Venue: Cardington, Beds.
August 18th	<b>S.M.A.E. 5th C/L MEET.</b> Stunt, Speed, Goodyear & 'B' T/R, Combat. Venue:
August 18th	<b>NORTH BERKS R/C THERMAL SOARING.</b> Venue: Nr. Garford on A388 Wantage-Oxford Road. Pre-entry 50p to P. Clarke, 7 Candwell Close, Grove, Nr. Wantage, Berks.
August 25th	<b>F.A.C.C.T. THERMAL SOARING MEET.</b> Pre-entry to N. Webb, The Bungalow, East Street, Fritwell, Oxon. Send 50p. S.A.E. and frequency. 20 prizes! Venue: Weston-on-the-Green airfield, Nr. Bicester, Oxon, off A43.
Sept. 1st	<b>NORTHERN AREA RALLY.</b> Nearly all classes of F/F, C/L and R/C! 10.00 a.m. start at R.A.F. Elvington, Nr. York (B1228 road, 7 miles S.E. York).
Sept. 1st	<b>ASHFORD R/C RALLY.</b> Class 1 Scale, Fun/Novelty, Team & Demo events. Individual demos are invited. Details: M. Tate, 60 Towers View, Kennington, Ashford, Kent. (Tel: Ashford 26459.) Proof of R/C Licence and Insurance essential.
Sept. 8th	<b>S.M.A.E. 6th AREA CENT.</b> Team Power. F.A.I. Rubber A/1. Area venues.
Sept. 8th	<b>LONDON AREA C/L MEET.</b> F.A.I., Goodyear & Combat at Claville Lane, Hayes.

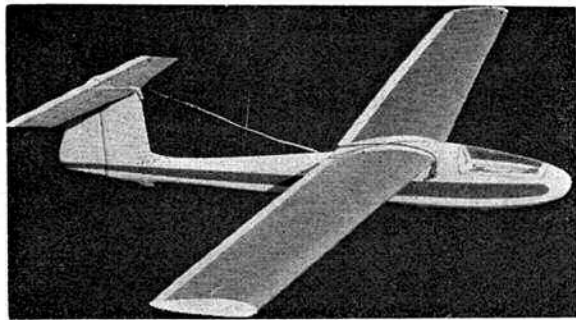


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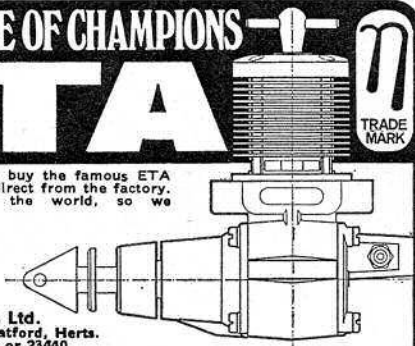
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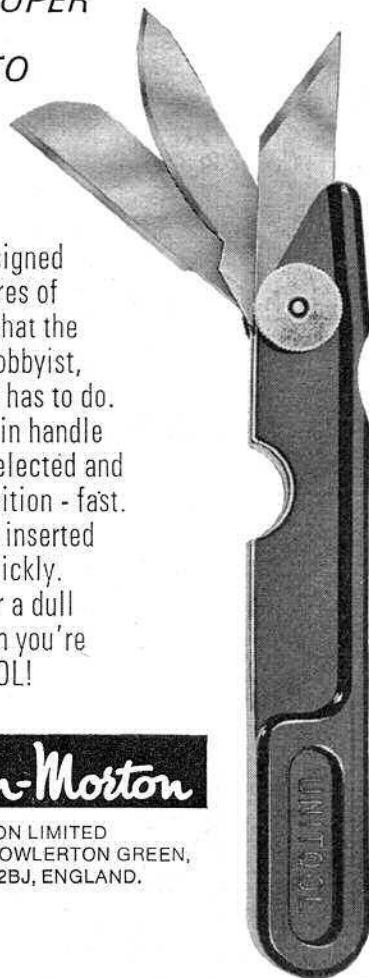
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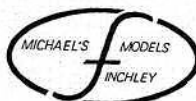
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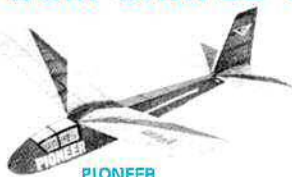
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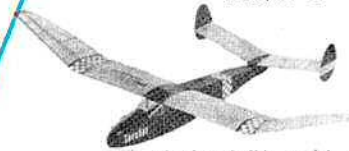
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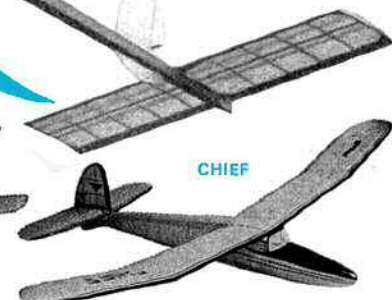
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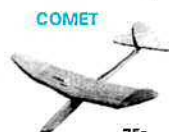
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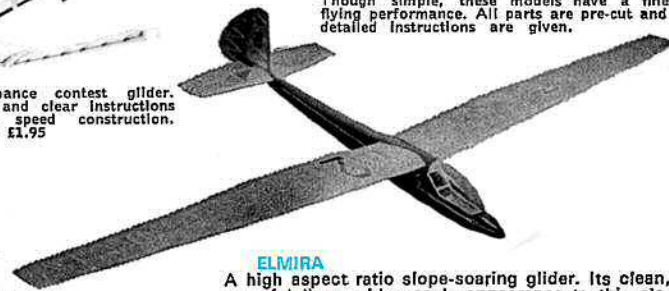
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