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May 1975
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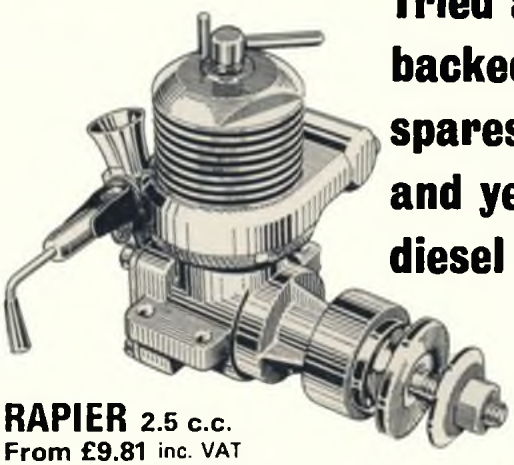

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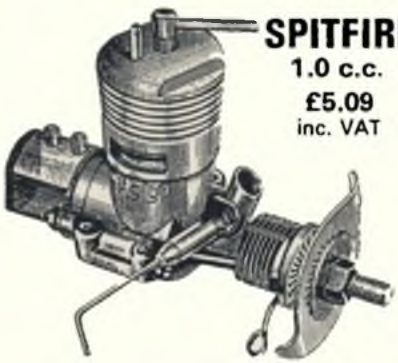

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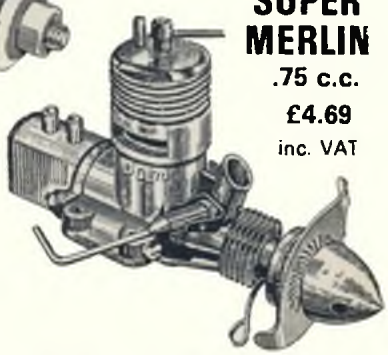

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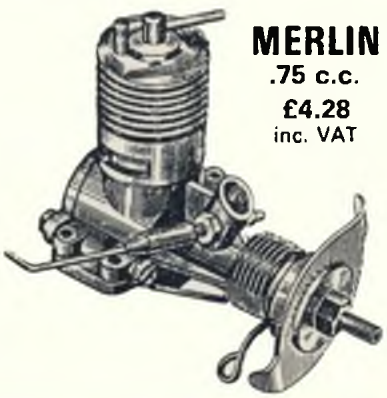

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Today, modellers fly Goodyear derivatives as R/C pylon racers (the first full-size Goodyear Trophy was in 1947). And rubber model interest has revived with 'Peanuts' scale. But still Balsa is THE material for aeromodelling construction. It hasn't changed – and it has not been beaten by any competitor.

Photo Bob Peck

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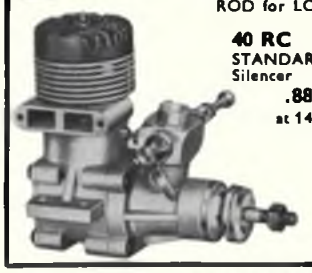

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MODEL AIRCRAFT

May 1975 Volume XL No. 472

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Comment

The Government's announcement of economies in defence expenditure listed closures of several famous Royal Air Force bases which have had a close association with aeromodelling. Nationals venues such as RAF Little Rissington and Hullavington are among those in the cut-back, as well as others which have been used for SMAE centralised contests. No one can foresee at this stage what the future holds for modelling events on these airfields. Experience is that major stations with extensive hangarage and maintenance buildings are closed off completely to all activities. Only the satellite airfields, where the establishment has been of a less permanent nature, have become available through the good offices of the Defence Land Agents. One is to hope that the excellent record of aeromodellers at the important bases about to be axed will have been noted and that any requests for the continued use as contest venues will be received favourably. Meanwhile, all thoughts centre on RAF Finningley for the Spring Bank Holiday (24th, 25th and 26th May), where the 1975 British National Championships are to be held. It promises to be an extremely active concentration of contests. Perhaps it will also provide the best possible recommendation for future Nationals at RAF stations, active or otherwise.

on the cover

Ron Pollard launches his VITAR II Wakefield at the second 1974 Team Trials, which he led from start to finish. This highly specialised model, which is detailed on pages 281–284 and forms the subject of our three-part series 'Development of a Wakefield', shows how refined and complicated a model can arise from the original contest specification. Could the originators of the original Wakefield Trophy have envisaged models incorporating metal, glass and plastic construction? (Photograph by Brian Martin.)

next month

Plans for a really practical beginner's glider, being cheap to make, robust enough to withstand rough handling, and sufficiently easy to build so as to enable non-skilled fingers to construct it, yet still giving the would-be aeromodeller a sense of satisfaction at having made his own flying model. For rather more experienced modellers, Ron Pollard details how he uses glassfibre cloth in the construction of Wakefield propeller blades, and our regular columnists bring news and views of matters concerning free flight, control line, scale and engine topics. These and other features constitute another information-packed issue – on sale 16th May.

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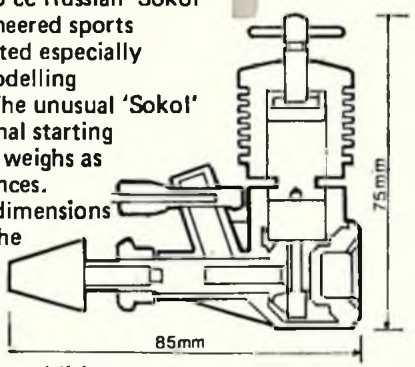

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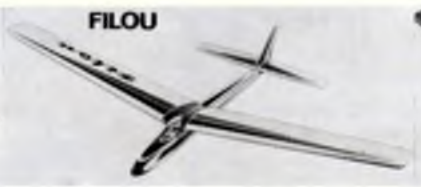

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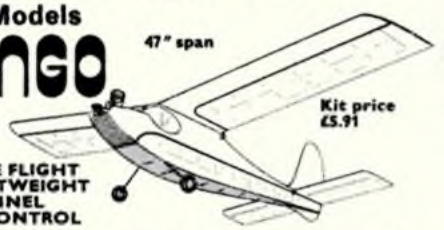

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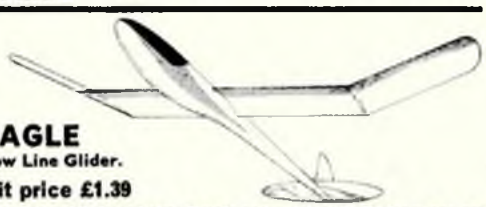

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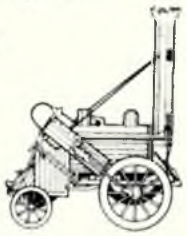

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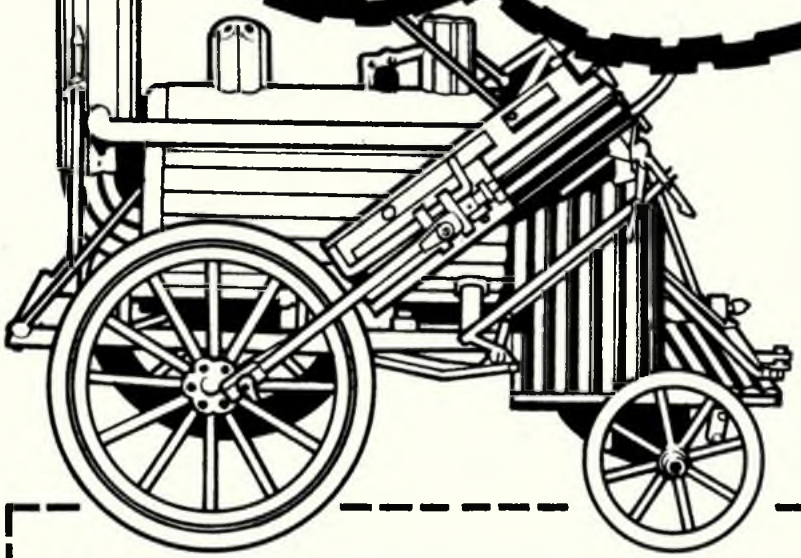

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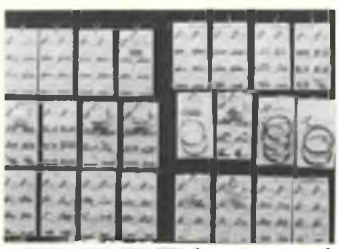

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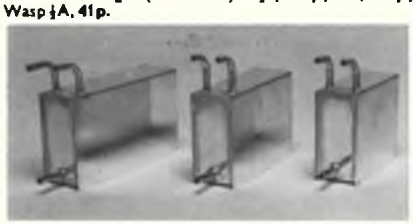

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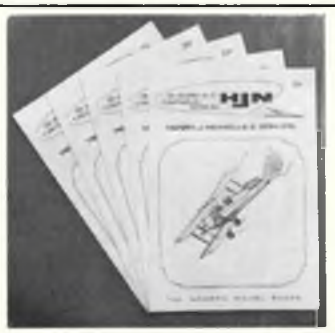

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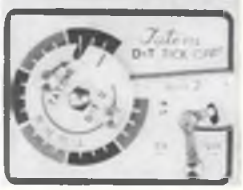

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Our Mail Order Department is at Holloway and Mail Orders should be sent there for all aeromodelling items. Full details of the current postal charges will be found in our current Mail Order Price List.
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OVERSEAS VISITORS. In our shops we accept all travellers' cheques and can take payment in any foreign convertible currency up to the legal limit allowed.

Display of almost 100 kites at Chester Arts & Crafts Centre included the flexible Parafoil (centre), all forms of Box and Eddy Kites, plus Chinese and British traditional Kites — see first paragraph.

1975 APPEARS to be the year of the kite – or one should really re-express that as the *renaissance* for the kite, because of all the forms of flight the kite is the oldest and has in its own way imparted influence on aeroplanes and aeromodelling. The SMAE started life as the *Kite and Model Aircraft Association*. Not only do we see more kites being flown this year, but there also appears to be a greater interest in organisation of festivals and exhibitions. A magnificent show was put on at the Chester Arts and Crafts Centre, through March, culminating with a kite-flying contest at Chester Racecourse on Easter Monday.

We are also planning a National Kite Flying Festival in conjunction with a vintage model flying event at Old Warden on 12th October this year. The aim of this meeting is to revive the atmosphere of the old K&MAA events, using the *original* rules as instituted over 50 years ago, of which more details in later issues. Simultaneous with the show at Chester came the release by Geo. Allen & Unwin of the British edition of the US book **'Kite Craft'** by L. S. and J. H. Newman. This 214-page book is by far the best yet publication on the subject, covering as it does the historical as well as the practical aspects of all forms of kite flying, including the latest 'airplane kites' from the USA. There are 357 photographs, 18 colour plates and 84 drawings to take the reader through a pictorial guide to the subject, and almost for the first time one finds an explanation of how to actually fly a kite to best advantage. This feature has been sadly lacking in other publications. Price of 'Kite Craft' is £5·75 hardbound edition.

CAMPING at the Nationals this year? If you are an SMAE member, then you will be receiving the appropriate application form together with competition entry forms shortly. However, non-members should write to I. B. Bracken, at 100 Torcross Road, South Ruislip, Middx. HA4 0TF, enclosing a stamped self-addressed envelope for a copy, as applications must be made on the appropriate forms. Please state the number of forms required. The fees will be £2 per adult male if applied for in advance, £4 on the day, or £8 if found on the site without permission! Women will not be charged at all, nor will those under the age of 16 on the 1st January, 1975.

1975 POSTAL INTERNATIONAL for Coupe d'Hiver models is being organised by the Cheltenham Model Aero Club, to the 'French' rules – i.e. 80-gramme minimum weight for the model, 10-gramme maximum for the motor. The five flights (all ROG) must be recorded on *one* day between 7th and 13th September inclusive, while the results must be posted to arrive at the organiser by 1st October. Awards will be made for first place, and lower placings according to the number of entries. For further details, write to the Secretary, R. Coleman, Grasshopper Green, Church Walk, Charlton Kings, Cheltenham, Glos. Entry fee will be 45p, and may be submitted via International Money Order.

1975 HOLIDAY booked yet? If not, details of the two following competitions may provide the incentive for a EUROPEAN visit! Firstly, there is the *Jura Cup International* for control line aerobatics, speed and team racing, to be held at Breitenbach. Switzerland, from 8th to 11th May, The entry fee of sFr 25 includes accommodation, but camping facilities and hotel accommodation are also available – the latter at extra cost. Entries must be received by 25th April, so be quick (we can supply copies of the entry form) and write to Aero Club der Schweiz, Heiner Borer, Murtstrasse 6, CH-4226 Breitenbach, Schweiz.

For scale enthusiasts, the place to visit is Metz, France – where the *Challenge du Graouilly* is being held on 28th and 29th June. The competition caters for semi-scale radio-controlled and control line models. The rules are very simple, avoiding too serious a contest – for example, models will be placed in the centre of a 6-metre diameter circle for static judging, and the judges are not allowed to enter that circle! Their general guidelines will be accuracy of profile, craftsmanship, finish, colour and decoration.

For further details and entry forms, write to Le Graouilly Association Modeliste, 16a Bld, Saint Symphorien, Longeville les Metz, 57000 Metz, France.

B.B.C.-TV. MODELLING SERIES Scheduled for transmission on B.B.C. 2 from 6.40 to 7.05 p.m. twice weekly through May and June, MODEL WORLD will be the first serious approach to modelling activities yet presented in British television. Produced by Peter Riding with the full co-operation of all the modelling organisations and many independant experts, the series starts on Tuesday, May 13th and continues each Tuesday and Thursday through to June 12th. While every effort has been made to balance the content of the ten, 25 minute programmes to cover all aspects of popular model making, it is inevitable that some subjects will have larger viewing than others. Model railways takes precedence with 3 of the 10 viewings, followed by an even share of two each for marine, aero and military modelling subjects.

The first three programmes will be of greatest interest to aeromodellers – Tuesday, May 13th, "Something for Everyone"– a general introduction to the wide range of subjects and basic skills required. Thursday, May 15th, "Free Flight Model Aircraft"– duration models, introducing a special glider. May 20th, "Controlled Flight Model Aircraft"– control line, and radio controlled models.

Additionally, a special B.B.C, Publications book of the series has been produced to guide the uninitiated to the various subjects. Titled *Model World* it will be available through booksellers and model shops, price £1.60 and among other drawings includes full-size pull-out plans for the 36in. glider *Skyrider*.

COASTSIDE
PACIFICA, CALIFORNIA
GYPSY MOTHS

An FAI class combat model thats as American as blueberry pie !

RICH 'VON' LOPEZ shows how its done 'stateside'

WESTERN ASSOCIATED MODELERS
W A M

BEFORE THE START of the 1974 *Western Associated Modellers* (WAM) combat season, Englishman Edmond L. Bridant and I got together and decided to develop a new Class A combat aircraft. Edmond (a 13-year expert) gave me the rib and dimensions with which to work, and I proceeded to draw up the plans and build several prototypes, plus two display models. Prior to actual competition, tests were conducted by advanced flyer Paul Klahn and I to determine the best prop. and fuel combinations.

WAM Class 'A' rules allow the use of engines from ·051 to ·19cu.in. displacement: the majority of flyers favour ·19s, but many others use the high performance ·15 engines. The *Fireflys* that we enter in competition use Super Tigre G15-19 motors, with one of our club members, rookie-expert Mike Spindler, using the Veco ·19, and we were highly successful! A seven-year expert myself, I captured the Class 'A' combat championship in the 1974 WAM contest season, with five first places and one second out of nine contests entered. Mike Spindler ran a very close second, only two trophies down, while Edmond was an even closer third, only one point down on Mike.

What prompted the development of the *Firefly* was

Firefly's designer, Richard 'von' Lopez (left), and its instigator, Edmond Bridant, show the typical American lines of their models, featuring relatively high aspect ratio wings and boom-mounted elevators. With a good glow motor running on the pressure tank system shown on the plans, you will have a really quick, manoeuvrable machine. Give it a try!

our dissatisfaction with what was available on the market for Class 'A' or FAI combat. Construction of the *Firefly* is such that mylar iron-on coverings work well with the structure: anyone who does any amount of combat flying knows that these coverings are the hot set-up. They save both time and money over conventional tissue, Silkspan, silk or nylon and dope. The use of a marking pen on the balsa structure before covering with a transparent film is an ideal way to affix name and number, clearly and permanently, to the aircraft.

Firefly is an outstanding flier; it has a very tight turning radius, and is capable of very high speeds with a 'strong' engine. It is very durable and yet light if you choose your wood properly – aim for a flying weight around 13 to 14oz. At that weight you will have a real performer!

We have been running our G15-19's on 7×6in. and 8×5in. wooden props. and using fuel with a nitromethane content of about 30 to 40 per cent. I recommend that anyone experiments with different combinations of engines, fuels and props. as what works well out here on the west coast may not necessarily be the best combination elsewhere. I have been using the Super Tigre G15 Goodyear engines in my FAI *Fireflys*. These motors need props. that are about 6¼ to 6½in. diameter with 6in. pitch in order to really perform, and they seem to run best on a fuel that contains 40 to 50 per cent nitro. However, some of the fellows at the 1974 Nationals were using as much as 60 per cent nitro, with excellent results.

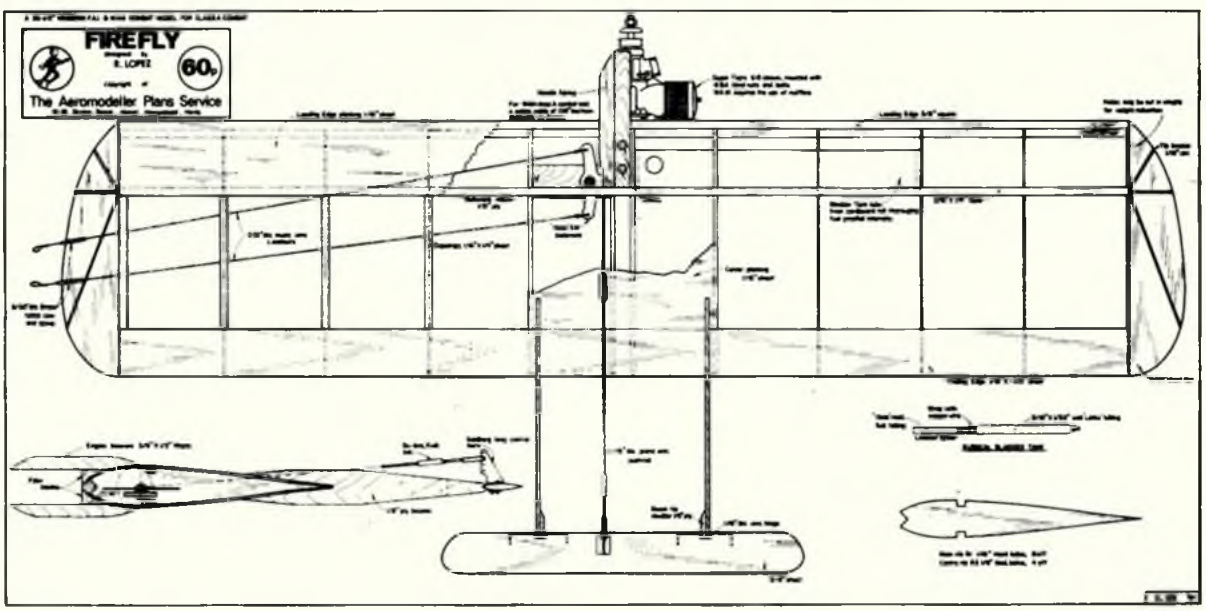
We use a spiral cardboard tube, 1½in. in diameter, as the bladder tank tube – an empty tube that contained piano wire is ideal for this application. You may unravel a layer or two of cardboard from the inside of this tube to reduce weight, and it must be doped several times and sanded on the inside before installation (roll up a full length of sandpaper to sand the inside). The surgical bladders are made from $\frac{1}{16}$in. by $\frac{1}{32}$in. wall latex tubing. They are made as shown on the plans; note that a small rubber band may be substituted for the copper wire shown on the plans. The bladders are filled with a 60cc disposable plastic syringe, as used in hospitals. Important note: The first time you fill the bladder, pinch the latex tubing ½in. from the eyelet and fill with air. This procedure will ensure that it fills from the inside to the outside every time.

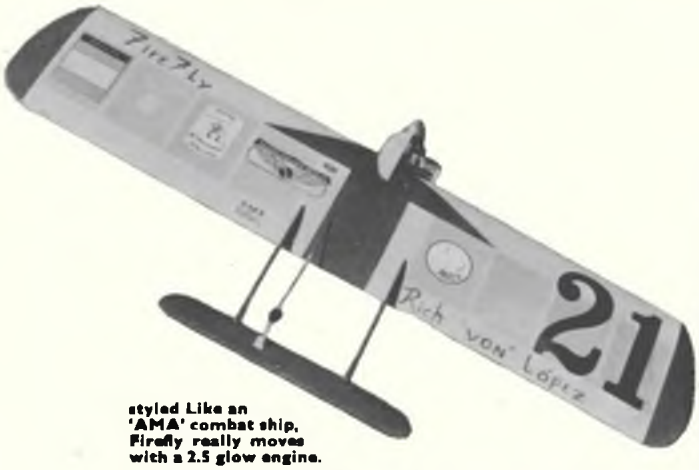
The running of a motor on a surgical bladder can be quite tricky! The initial setting of the motor may be obtained in this manner: close the needle valve, fill the bladder and hook up, using a filter. No clamp on the fuel line is necessary yet, as the needle valve is shut. Open the valve slowly until you get fuel spraying into the venturi. At this point, clamp or pinch off the fuel line. Start the motor; only minor adjustments of the valve will be necessary to allow the motor to warm up before you decide on the final setting. Try to get the richest setting possible on the ground, then launch. A motor running off a bladder tends to unload once in the air; for this reason, the perfect setting on the ground will be too lean in the air. Experiment with your own ideas on how to best use this system.

Fly this aircraft on 52ft. 3in. lines (measured from centre line of handle to centre line of model). FAI combat lines may be of ·012in. diameter, but WAM Class 'A' rules requires the use of ·015in. lines; probably a bit safer, since ·012s are very frail. WAM also demands, for safety's sake, two things: dowels through the engine mounts and a safety cable from the control system (bellcrank bolt) to the engine. This prevents the engine from flying off, hitting someone or getting lost. If you have been around the combat circuit any length of time at all, you know that occasionally engines do get away. This is due to two causes – either poor construction on the part of the builder and/or mid-air collisions.

WAM flies combat in a manner similar to the way you fellows fly it in Europe: that is, we go after small cuts and taking the whole ribbon is to your disadvantage. There are no 'kills' in WAM, and there is no pilot elimination system used. However, we do have our procedural differences, as we fly two pilots continuously until everyone has had three flights for that class.

FULL-SIZE COPIES OF THIS 1/6-SCALE REPRODUCTION ARE AVAILABLE AS PLAN No. CL1251, PRICE 60p. (INCLUSIVE OF POSTAGE AND VAT) FROM AEROMODELLER PLANS SERVICE, PO BOX 35, BRIDGE STREET, HEMEL HEMPSTEAD, HERTS. HP1 1EE.





styled Like an 'AMA' combat ship, Firefly really moves with a 2.5 glow engine.

Incidently, WAM allows only one aircraft per person per class. The 'Kamakazi' pilot seldom wins! WAM does, however, fly four classes of combat at each contest; there is ½A (·049s), Class 'A' (·15–19s), BC fast (·35s), and BC slow (·35s).

One of the best features of WAM combat is that it rates its flyers. They may be *beginner*, *advanced* or *expert*. This is done through a trophy point system – three trophy points for a first place, two for a second, and one for a third. It takes seven points from *beginner* to *advanced* status and an additional ten points from *advanced* to *expert* status. These fellows fly separately and for separate trophies at the same contest. Classes ½A and 'A' are sometimes flown 'open', combining all three flyer categories.

WAM keeps a record of the top three finishers at every contest, then the number of trophy points are totalled at the end of the year. Perpetual trophies are awarded at the annual dinner to the winners of each class, and in addition to high score of the year and club champions. The combat director is appointed at the beginning of the year, and with the help of his assistants runs combat for the entire year, thereby maximumising consistency and efficiency at these contests.

FAI combat will, without a doubt, grow in popularity in the next few years here in the States. Nineteen seventy-four was the first year that it was flown officially at the Nationals, and there were 33 entries; expect more this year. FAI was also flown at the *39th Annual Greater Cleveland National Junior Air Races* on 24th August, 1974. I placed number one there on my summer of '74 combat tour!

American flyers are anxious to get into a scrap with the rest of the world in quest of a world combat title. The day is not too far away when the United States will be sending a combat team to the World Championships, and perhaps to some of the European countries' National Championships. Should any of you who read this article wish to correspond or ask questions, feel free to do so. I will endeavour to reply as soon as possible. Address is 300 Frankfort Street, Daly City, California 94014, USA.

THE FREE FLIGHT SCENE

continued from page 288

Laurie Barr, placed second in Peanut at the East Grinstead meet, flying a Microlite-covered Piper Cub, built from the Micro X kit, which he just happens to import. . . .

QUALITY, NOT QUANTITY

One of the most extraordinary trends in British free-flight modelling in recent years has been its increasing internationalism. Only a few years ago, British modellers tended to be totally parochial. There were competitions almost every weekend throughout the spring, summer and autumn, and the high spots were the Nationals and, perhaps, the Team Trials. To travel abroad to fly in a contest was never considered, except by those few who won themselves places in British teams for World Championships. Those days have now gone. Last year for example the best part of 40 British modellers took themselves off to France for the annual *Pierre Trebod* contest in August, lesser numbers have attended competitions in Holland, Germany and elsewhere during the last four or five years, and there is a tendency now for outings in this country to be planned around the year's trip – or trips! – to Europe. Certainly there's little logic in risking models at a British meeting when you've already committed yourself to the expense of a European trip the next weekend.

It's easy to see why this is happening. Once increasing affluence had ensured that virtually every modeller had a car and was not dependent on public transport except to cross the Channel, Europe came to have many advantages. Competitions tend to be better organised on the continent, the weather is almost invariably better – indeed the *Pierre Trebod* has a near-magical reputation for good weather – and there is of course the excitement of competing against Europe's best. Add to this the pleasure of foreign travel itself and the fact that you can combine a trip abroad with a family holiday, and the attraction of Europe is overwhelming.

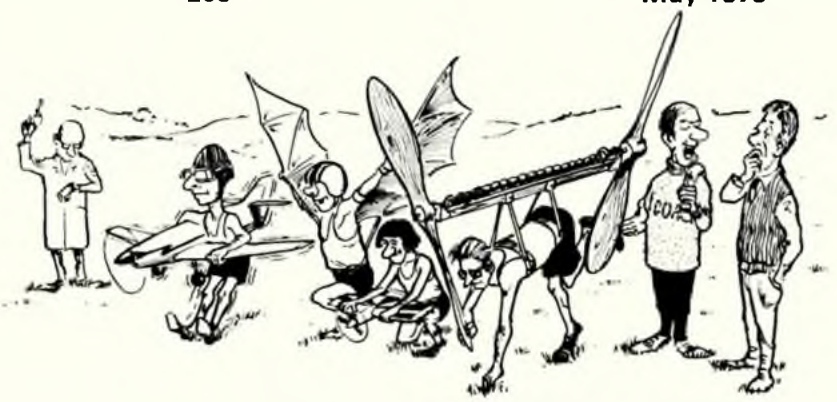
There are problems of course. It is not cheap – though by travelling three or four to a car and camping rather than staying in hotels the cost can be kept down even now – and there can be quite a bit of driving involved. The distances in fact are not all that great, though it's obviously worse for modellers from the north who have to get from, say, Manchester to Dover or Harwich before the main part of the journey even starts.

Anyway, I suspect that despite the appalling increase in the cost of petrol it's a trend that is unlikely to be reversed short of the country suffering total economic collapse! What it amounts to is that a number of this country's fliers are now opting for quality and not quantity in their competitive flying. And who can blame them? Why spend many hours building and preparing the best possible model only to risk it weekend after weekend in lousy weather? The alternative is to fly only when the weather is good or fairly good . . . except of course at the Team Trials, when the temptation of winning a trip to the World Championships encourages people to fly their models in the most appalling wind and rain. In other words, fewer fliers now accept the attitude that every competition is equally important and would rather concentrate their efforts on what they see as the top available events, and if that means in Europe, then they go to Europe.

This is all very well for those of us who are already part of the contest scene but what of the newcomers? With fewer competitions to go to, and, equally important, more of those competitions now being held on Ministry of Defence property which you can't get onto unless you're an SMAE member, the chances of the interested non-specialist coming into contact with free-flight are getting fewer. I'm not suggesting that new blood is not coming into our side of the sport, but I *am* suggesting that there are probably a fair number of potential free-flighters who are not with us because they can't find us! And if I'm right, then we would be well advised to do something about it fairly soon.

topical twists

by 'Pylonius'
illustrated by Sherry



'It's all part of the training for the next "Aerolympics"'

The Poor Modeller's Guide to Botanical Trimming

IT IS ON the bogland flying sites of southern England, where the local flora is rich in resilient weed stalk and rigid grass stem, that the widest variety of trim insertion is to be found. Pollution and the spread of development continues to take its yearly toll, but a fine graduation of down and side-thrust packings is still available to the discriminating model flyer. He may well have his own particular favourites like the *Black Toadsplurge* or the *Scarlet Goutrot*, but here are a few of the more popular botanical specimens in common use:

Common Lousewort (*Spiralla Impacta*) – 0·003in. in thickness, with a compressible factor of 0·625 at sea level;

Dandylion (*Aqua Nocturnia*) – 0·0052 in thickness, but with a wide masticatory variation;

Greater Warpbane (*Decka Stickitus*) – 0·10065 in thickness. Masticatory tests reveal a high hospitalisation factor.

Sleeping Partners

We British are pretty conservative about our leisure activities. Even before the telly took over, the only truly accepted pastime was to defy the worst the British summer had to offer, sitting doggedly on some crowded beach. It is, of course, still permissible to ill-treat various spherical objects with club or foot, but even more acceptable to watch other people doing it on television. Other leisure interests are only grudgingly tolerated, and although Morris dancing and open tiddlywinks are officially accepted as sports, model flying is regarded as very much as an eccentricity, the practitioners of which are left strictly to their own devices.

But perhaps I overstate the case. On rare occasions model flyers are accompanied by their wives, although the devoted spouses are at pains to demonstrate that they are going along strictly for the ride, and are in no way associated with the silly models. They do this by staying inside the car the whole time. They have on their slightly embarrassed faces a defiant expression, as if to say '*I know my husband's got this silly thing about model planes, but I'm standing (or rather sitting) by him as you can see*'.

It is a shock, then, for the model flyer to find the model field on the continent a filial paradise, a tribal gathering. The wives not only get out of the cars but are the principal helpers and cheer leaders. Grandads, too, are seen to join in the fun together with the well-trained children. It is true, of course, that grandads are to be seen on our own flying fields, but, generally they are the model flyers; their sons and grandchildren back at home leading normal lives in front of the telly.

Weighty Problem

The free-flight model designer of today has a crafty way of pushing his wing, as near as dammit, to the snout of the model, then blatantly indicating a CG position that could only be achieved with a microfilm rear section or a pound of lead in the nose. This is very disconcerting for any would-be champion, copying all the best bits of all the best designs. Trouble is that the plan sets out quite a chunky dose of empennage at the back, but gives no idea where the counter-balancing lead might be located in the cigar-slim fuselage.

Looking at one particular plan, and making some rough calculations, I can only conclude the prop blades are made of sheet lead.

Time Machines

I do not know if it is true that the poor are always with us, but if they are, they are the people who buy the simple free-flight kits rather than the trendy and expensive radio kits. And it is these kits, as well as the poor, which are always with us, too, for they are the same designs to which horrifying things were done on common and park land back in the days when radio was something on which you listened to Tommy Handley.

Thus, as far as the trade is concerned, we are very much a two-tier society. To the affluent it offers all the very latest in technical benefit and design advancement, and to the not so affluent something that dad outgrew way back in the flighty fifties. Now, I know these models fly, but even the vintage fiends are at pains to avoid the openwork models where the fuselage is held up by the tissue, and where there is a bus ride between each wing rib. Surely the gaga learner is entitled to some of the advantages of up-to-date techniques. The model flyer of today might not build better models than his antecedents, but he does try to build them tougher.

Burning Issue

Buy-it-yourself modellers are not the only ones who do not, like the model builders of old, burn the midnight oil, for lack of demand has made that old red-skeined lamp wick, which we use in the raw state, an exceedingly scarce commodity. So much so, in fact, that we are advised to go back to that early D/T resource: saltpetre-soaked string. This should work alright in a loop of cotton, we are told (rubber bands are on the inflation skids, too), but past experience shows that these 'shoe-string' devices can do the job a bit over-exuberantly, for the straggly ends have a nasty way of wrapping themselves around the tailplane, bringing about a combustion of the whole model. It was why we burned up the midnight oil; replacing the consumed models.

What's in it for you?

THERE ARE MANY thousands of people in Britain today who fly model aircraft. The *Society of Model Aeronautical Engineers* is the **one** national organisation that represents them. If all those aeromodellers were members of it, and joined in British model flying from the inside, instead of as outsiders, the sport's resulting strong national voice would be the best thing that has happened to the movement since the War.

But you may be one of the people who has the idea that the SMAE is an 'elite' Society for contest flyers. Rubbish! It is the *national* organisation recognised by the *Royal Aero Club* – and, at last (at the beginning of 1975), by the *Central Council of Physical Recreation* – as responsible for all forms of the sport of model flying in Britain.

In the field of motoring, the *Royal Automobile Club* is the governing body for British motor sport, but it also protects the interests of, and provides services for, the vast majority of its members who never drive anything more potent than the family Hillman. The SMAE fills exactly the same need for model flyers. Certainly it organises contests all over the country for all types of model aircraft, selects teams to represent this country at World and European Championships, and issues contest licences on behalf of the *Federation Aeronautique Internationale*. But – and this is what affects *all* model flyers – the Society is *their* voice. Its whole purpose is to do what its members want.

The SMAE nationally and locally

Much of this work is unpublicised, but a few examples may be of interest. Recently, as a result of fighting several local council byelaw proposals that would have restricted or banned model flying, some members of the SMAE Council prepared a booklet on the various types of model aircraft, their likely effect on the community, and model flyers' needs, with special reference to the use of publicly-owned land. The aim of this booklet is to ensure that local borough councils, Station Commanders and other people likely to be making decisions involving model flying, should have accurate information and definitions available *before* any questions arise. Following a lot of hard work by some SMAE areas, model flying has been accepted by most Regional Sports Councils in Britain (in the same group as climbing, cycling, angling, gliding and parachuting, for example); one result of this is that 1,600 of these introductory booklets have been sent out by the CCPR on behalf of the Society (and of you, incidentally, even if you are not yet a member) to every local council in the country. It is vital that councils realise that model flying is a sport with a responsible governing body – the SMAE – and that this body can advise them on any problems they may meet concerning model aircraft.

'Social responsibility' is a phrase that sounds a bit pompous, but the model flying movement could well do with an improved image. Since late 1974 the Society has subscribed to a press cutting service; it now receives every news item on model flying from all the national and local newspapers and magazines in the country. At present half of these reports concern complaints of noise and danger from 'model aircraft', and proposals to ban model flying. *All* of these at present appear to be caused by power-driven, radio-controlled models, the majority of them probably flown by non-SMAE members. This inflow of information gives a useful feedback to the Society, and helps to ensure that all branches of the sport get the best deal possible.

The situation at Epsom Downs is a good example of this. Since before the War, the Downs have been used for model flying. In the late 1940s and early 1950s, contests were held there with entries well over the hundred mark – Surbiton Galas, the Bill White Cup, Croydon events and many others. This, by the way, was in the days of five minute maximums and twenty second engine runs without mufflers for free-flight. Together with Fairlop and, to a lesser extent, Chobham Common, the Downs were extensively used for model flying because of their proximity to railway stations, for in those days car ownership was rare. The sky was almost black with *Civvy Boys*, *Hells Angels*, *Airflow Babies*, *Banshees*, *Mick Farthing Lightweights* – rubber and glider – and the rest. People flew control-line models, too. Complaints were rare.

As cars became common and free-flight performances improved, fewer F/F models were flown there; about the same time powered radio flying was getting under way, and the majority of models flown at Epsom today are of this type. These models were mostly unsilenced, for in the early 1960s, few mufflers existed. There were noise complaints and there were accidents involving members of the public. In 1966, byelaws were passed restricting the hours for 'all model flying' at Epsom, and requiring the use of 'silencers' on all powered aircraft. Control-line flying was also banned, because of the risk to horses from discarded lines left lying on the Downs by a few thoughtless people.

This resulted in a temporary decline in the noise complaints, but soon the local papers were carrying tales of stampeded horses and frightened walkers being 'buzzed', and the residents' associations close to the Downs again started to object to their Sunday afternoon's car washing being disturbed by the 'persistent buzz of model aircraft'.

The SMAE were approached by the Downs Conservators who were being urged by local ratepayers to 'ban model flying'. One of the local radio flying clubs made its own proposals for new byelaws, and the Society was asked to comment. A meeting was arranged between representatives of the SMAE and the Conservators. The Society took noise measurements, which showed that in most cases the noise from the radio models heard from nearby housing was less than traffic noise and the ambient noise level caused by the wind in the trees. Local affiliated clubs were contacted for their views, and the regular monthly area committee meetings (to which all affiliated London Area clubs may send representatives) discussed the situation. People flying models on the Downs were asked for their comments; a surprising number of them said that they felt that powered radio flying should be banned there, even while they were themselves

flying a model! Further questioning, however, showed that generally they had access to a local private flying site.

During the meeting with the Conservators it soon became apparent that they had no idea that different types of model aircraft existed. One very vocal member was adamant that large models were inherently more dangerous than small ones, and he wanted a four foot maximum wingspan limitation. For him, Isaac Newton might never have existed; it was not until the SMAE put the problem in terms of a small, *heavy, fast* lump of lead and a large, *light, slow* piece of thistledown, that the concept of potential energy began to sink in.

Another proposal that was made by the Epsom authorities was to limit the number of models in the air to three at any one time; this was, of course, opposed by the Society on the grounds that it would still further limit the available flying time for R/C models. It was felt that it would be helpful for the wardens who patrol the Downs to have a talk from a few model flyers, so that the various types of models, mufflers, radio transmitters and so on, could be explained in simple terms.

A suggestion made by the *Epsom Radio Flying Club* was agreed to be valuable; this defined the area from which R/C models could be flown, to enable some check to be kept on transmitters. As a result of negotiations the Conservators revised their total ban to a proposal for a reduction in flying hours for *powered* R/C models, but an increase in flying time for all other types, allowing them to be flown till sunset all year round. The SMAE dissuaded them from their interim proposal that there should be a complete model flying ban at weekends, but did feel that the ban on C/L flying should remain, in view of the extensive use of the Downs by racehorses.

The muffler requirement remains for power-driven R/C models; the smaller engines and short runs used by other types of models, frequently fitted with cowlings, have been agreed to be no problem, because of the extremely limited noise cone.

The whole of the Epsom Downs negotiations have taken four years so far, have resulted in a pile of correspondence three-quarters of an inch thick, and are still continuing.

Local Authorities and model flying

One of the basic needs in negotiations with bodies who have no background knowledge of model aviation is first to define, very simply and precisely what types of model exist, whether they are fast or slow, heavy or light, likely to cause any noise problems or not, whether they are compatible with other simultaneous uses of the same site, and so on. The experience gained by the SMAE in one part of Britain can be vital to the improvement of facilities in another; before starting to discuss matters with local authorities it is essential to see what approaches have been successful in various situations. Even a loosely-worded sentence, or a definition that disregards some types of model aircraft, can have consequences that can harm the whole model flying movement.

When it comes to the rights of model flyers and the constitutional powers of local authorities, the SMAE is lucky to have the support of George Bushell, who has prepared a booklet on model flying and legislation. This really is required reading for anyone who is likely to be locally responsible for negotiations (and is another good reason for joining the Society). To many of us working on these problems, George has been an inspiration; he has brought home to people just how ridiculous (and unwise) it is, for example, to ask councils for *permission* to fly models on public open spaces. You wouldn't ask if you could throw a cricket ball or walk an Alsatian dog, and model flying is just as lawful an activity. Let us hope that from now on model flyers will no longer adopt the pleading, second-class citizen attitude that has sometimes been the case when discussing sites and facilities with local authorities.

A legal fund

To provide practical help, as well as advice on the rights of model flyers, the SMAE in early 1975, set up a legal fund, specifically to finance any legal assistance that may be needed in future. If, for example, a public enquiry is held on any byelaw proposals, it would probably be wise to brief a Queen's Counsel to put the case for our sport. If you think in terms of £500 for this you will be fairly close to the likely cost. But for model flyers to take professional advice like this could well rid us of the unfortunate image of being eccentric amateurs, blundering along on a shoestring budget. Once the word gets round local government officers' associations that model flyers might bite, have a national organisation and are prepared to retain and improve their rights, the flying site situation will improve.

The two most common practices at present are for local councils to erect impressive notices stating *No Model Flying, By Order*, almost always with no byelaws to back them up (and which usually apply only to engine-powered models anyhow), or else invite modellers to buy a licence 'allowing' them to fly model aircraft during limited hours, usually on sites where model flying is actually just as lawful an activity as wheeling a pram or kicking a football, and subject to no different restrictions. With SMAE backing for model flyers, 'try-ons' like this would stop and flyers would realise that more sites were actually available to them. For R/C flyers this would mean that the queue to fly would shorten, as the load on sites used at present

continued on page 276

The items illustrated are now available from Ray Favre, 26 West Drayton Park Avenue, West Drayton, Middlesex UB7 7QA. Prices are: Lapel badge 75p, tie tack with chain £1, tie-bar 75p, cufflinks £2, blazer badge 75p. Make cheques, POs, etc., payable to SMAE Ltd., and enclose SAE. Items available mail order only. The 22×7cm bumper sticker below costs 5p, or is free with orders of other items.

A TRIO OF TERNS . . . . .

Three simple kits reviewed by ERIC COATES

REGULAR READERS of *Flying Scale Column* will have read of my enthusiasm for the rubber-powered scale kits produced by **Tern Aero** of Chicago, Illinois. As well as these, Tern market a series of small beginners' models to which has recently been added an absolutely basic model that practically anyone over the age of about eight can put together and make fly. This is the 16in. span *Aerobus* which along with *Traveler*, a 24in. wing span miniature soarer, and *Drifty*, an 18in. semi-scale primary glider, have been sent for my appraisal.

I passed the gliders over to two fairly experienced junior members of the *Lee Bees* Club, Mark and Alex Hudson, who have built up scale kits for some of my past reviews.

The *Traveler*, built by Mark, has a square-topped, round-bottomed, stringered fuselage and a high aspect ratio wing with tip dihedral and tapered outer panels of Clark Y section. The tail surfaces are $\frac{1}{32}$in. balsa sheet.

Drifty, built by Alex, is very reminiscent of pre-war primary gliders with an open girder fuselage and control platform open to all the elements. The tapered wing, with plenty of Clark Y ribs, is cotton braced to the fuselage. The tail surfaces are again from $\frac{1}{32}$in. sheet. Both kits feature superb quality balsa strip and the finest quality printed sheet seen in any kit – two colours of tissue are also included in each kit.

The Hudson brothers really enjoyed building these little models; principally because of the fine quality of the materials provided which fitted so perfectly together. The performance of the *Traveler* is remarkable for so small a model – very stable on the towline, followed by an excellent glide. Naturally, with all the drag built in, the performance of *Drifty* is not so good; but it makes an interesting change to see on the end of a towline!

The Tern 'Traveler' has a remarkable performance for such a small glider, and proved very stable on the towline. High aspect ratio wing with tapered tips help add to the attractive semi-scale appearance.

Being interested in how easily *Aerobug* could be built and flown, I put this one together myself. *Aerobug* has an open framework triangular section fuselage, made entirely from $\frac{3}{32}$in. diameter dowel (young fingers cannot break it so easily). The unbraced single-surface wing has just seven ribs, and the tail surfaces, as usual, are $\frac{1}{32}$in. sheet. A metal noseblock, with mating nylon bearing, fits exactly into the triangle formed by the nose sheeting. The propeller is the 6in. diameter plastic paddle type supplied in the scale kits. With such a superb prop. the beginner is almost 50 per cent airborne already! A pre-bent 22swg undercarriage is provided with $\frac{3}{4}$in. diameter lightweight plastic wheels. The usual excellent quality balsa wood is, of course, included as is a single sheet of coloured tissue.

Also of semi-scale appearance, though from a somewhat earlier era, is 'Drifty'. Open girder fuselage is very easy to construct and yet is robust. Wing is cotton braced, which resulted in a rather poorer glide than the 'Traveler'.

Tern claim that an average youngster should be able to put this model together in around three hours. Whilst I could by no means be classed as a youngster, I was interested in just how long it would take a 'many seasoned' aeromodeller to put it together, so I timed each operation. The simplicity of assembly can be judged by the fact that I had the model completed 1 hour 58 minutes after cutting out the first item from the printed sheet! The triangular fuselage is extremely easy to assemble and its inherently stiff construction obviates the necessity for covering. Indeed, the only item requiring covering (the worst job any beginner faces) is the upper surface of the wing. The instructions state that this should not be doped or water shrunk. I, in fact, put a thin coat of banana oil on to stiffen the covering without tautening (which would warp the

very flexible structure) and also to prevent it 'pulping' when flying over wet grass.

Now to the flying. The initial tests were carried out on the lawn of the hotel at Rissington, where I was staying over the 1974 Nationals period – before breakfast, I may add! I was a little disappointed with it at first, as it was obviously tail heavy and underpowered with the single loop of ⅛in. rubber provided – a pretty poor combination in any model. It could be made to fly in this configuration, with the centre of gravity at 75 per cent back along the wing chord, but any wind made it stall – from which it very seldom recovered. By the time I had put enough Plasticine on the nose to bring the centre of gravity forward to 50 per cent chord and a stable trim, the all-up weight was really too much for one loop of ⅛in. rubber. A four-strand motor, though, absolutely transformed the model! The 6in. Tern paddler really does need a lot of power to turn it. With the new motor and 50 per cent centre of gravity it really is a perfect forgiving beginner's model with ample stability; a youngster can really learn the rudiments of flying controls from it – even ailerons are fitted. By breathing on these, the rudder, or the elevator and warping in a bit of

Built by our reviewer in under two hours, the 'Aerobug' proved a really robust rubber-powered sportster with a creditable flight performance – once more rubber had been added. Easy to trim, and definitely non-critical.

deflection, the model can be made to turn either way, climb, stall, dive, etc. Although ideal for indoor flying in small areas such as gymnasiums (it will turn in 20ft. circles without spiralling in), it is just as at home outdoors in quite strong winds, the limiting factor really being the strength of the flexible wings. Perhaps with cotton bracing it really would fly in a gale.

For anyone teaching aeromodelling to a beginner's class at a school, I cannot think of a better first subject. The three-hour building time should be easily accomplished by the average lad of 12 or so. Building it should teach the rudiments of construction far better than an all-sheet model, yet it is much simpler than the average beginner's built-up model. It could be regarded as a primer for an *Ajax* infant!

Price of all these kits is $2.00 in the States. Unfortunately, John Stennard of *Small Scale Service* only imports the Tern scale kits, but I understand arrangements are being made with a model shop in the U.K. Watch the adverts!

Readers' Letters . . . . . .

Dear Sir,

I was most interested to see the photo of 'helpers' trying to stir up a thermal, on page 166, March issue. Many years ago it was taught as normal practise to circle immediately after releasing the winch cable in full-size gliders, the theory being that the cable cut free any thermal which was about to rise. It seemed to work enough to lend substance to the idea – it certainly got me a Silver C height again.

Now, I hesitate to suggest the idea as it could cause glorious chaos, but if two helpers ran under the model with a 100ft. length of wide tape stretched between them at about waist height. . . .

M. Beach

Twickenham, Middx.

Dear Sir,

Ref. John Tysoe's letter in February *AeroModeller*, concerning the dihedral on *Fieseler Storchs*. In my report on the 1974 Old Warden meeting in the September issue, I commented on T. Brewer's model having too much dihedral; I did not say one could manage without it! My model was built well before Whittaker's drawing was published – in 1953 in fact. It was 1in. = 1ft., i.e. 48½in. span and powered by an ED Mk I Bee. The accompanying photo was taken at Colne-on-Spalding Moor last year. I would guess there was about ¾in. dihedral on the wings: certainly a lot less than Tim Brewer was using. The model flew very stably in wide left-hand turns. I will confirm, however, that it was unstable with no dihedral at all.

Like the *Puss Moth*, I think that a little dihedral is aesthetically beneficial to the appearance of the *Storch*, even if it is strictly non-scale. One-and-a-quarter inches however, as apparently stated by Whittaker on his drawings, is rather a lot and I am afraid Mr Brewer was using even more than that.

From what Mr Tyrol says in his letter though, it would appear that the Whittaker's design is spirally unstable and there may be other problems which can only be resolved by excessive dihedral. Perhaps the full span working slots and slotted flaps I used had different gaps which produced better stability? As my *Storch* was cremated some 20 years ago, I am not in a position to carry out any experiments myself in this matter. . . .

E. A. Coates

Fareham, Hants.

Layout of the Mercury Mentor kit reveals the relatively few components – and the provision of die-printed, not die-cut, sheet balsa parts. This design is a long-time favourite with modellers, and is eligible for the Junior Kit contest – so budding contest fliers pay careful attention!

Our beginners feature returns to highlight the construction techniques involved in a simple rubber powered model

BACK TO SQUARE ONE

HAVING COMPLETED a basic glider (**Mercury** *Swan*) and a more advanced glider (**St. Leonards Model Supplies** *Satellite*) in this series, we now turn to a completely different type of model – rubber-powered. There are many rubber kits on the market, and several are just as suitable for beginners as the one we have chosen – the **Mercury** *Mentor*. Probably, the thing which tipped the balance in our choice was the fact that the *Mentor* is fairly modern in design and looks like a contest model, yet still uses standard building practise.

Whether you follow our choice or pick another one out for yourself, do make sure at this stage that you get a model that uses normal construction methods, and is small enough to be built on the proverbial 'kitchen table' yet not too small to be 'fiddly'. A wing span of 30 to 40in. is just about right.

Looking at the *Mentor*, you will notice the following unusual features:

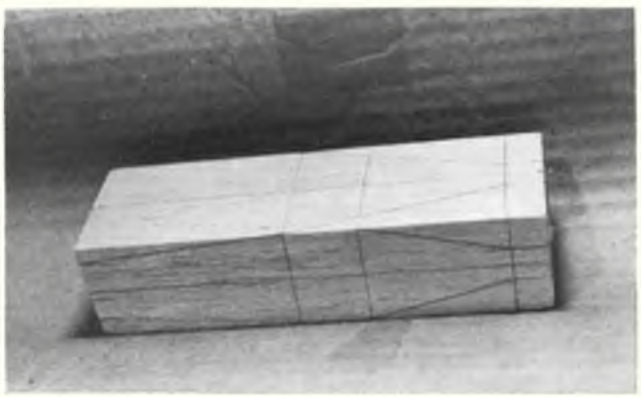
— It has only 'half a propeller' – a single-bladed propeller to be precise. And you have to carve this yourself from a solid block of balsa; perhaps the most daunting thing for a beginner, but not as bad as it looks.

— The fuselage is diamond shaped in cross-section: but look again, it is really only a square, but turned through 45° – so no problems there.

— The wing has no spars, just leading and trailing edges plus ribs – so warps will need to be carefully avoided.

— The propeller folds up against the fuselage when not in use. This is a common 'trick of the trade' with high-performance rubber models. When the rubber motor is unwound, the propeller stops and then folds itself back to reduce drag when gliding, and hence increase the flight time. The mechanism is surprisingly simple to make.

Some of these features mean that we ought to review our tool kit before going any further, and two or three items come to mind immediately. Firstly, carving the propeller is not *impossible* with a razor blade or a normal balsa knife – but it would be unnecessarily difficult. A 3 to 4in. whittling blade or a very sharp penknife makes a lot of difference. If you have an X-acto knife, the No. 26 blade is ideal. Secondly, the propeller has got to end up with an undercamber (or concave) section, and it is almost impossible to do this unless you have some convex sanding blocks in various grades of garnet or glasspaper. A short length of stout cardboard tube is ideal (the centre of a kitchen paper roll is a fairly good size, but tends to collapse easily; a drawing-paper storage/postage tube is just right). If you have access to a gouge-shaped woodworking chisel, not too curved, then that would help to save a lot of time and dust, but we would not recommend the purchase of one just for this model. Thirdly, a small amount of wire-bending is required, and hence a good pair of pliers will be needed. Normal tapered-nose pliers will suffice, and if they have a wire-cutting facility behind the pivot then that will be an advantage – although there is a lot to be said for cutting piano wire (spring steel) by notching the wire all round with a fine file and then snapping it off at the notch mark. Finally, a few items have to be cut from a printed sheet of $\frac{1}{16}$in. ply, and although they can be cut (with patience and care) with a balsa knife, it is rather tedious and blunts the blade rapidly. A fret-saw or small coping-



Mark out the propeller blank accurately, preferably using a steel rule, set-square and ballpoint pen. It is helpful to mark centre-lines around the block to act as a guide when carving.

saw is what is really needed here – as in most other models you will build through the years. Apart from these items, your basic set of tools – knife, rule, pins, sanding blocks – is all that is necessary.

By the way, to buy even these extra items of tools would cost more than the kit itself – and we appreciate that youngsters may not be in a position to do that. Do try to borrow these tools from a friend or relative (or ask for one for a birthday present!). If you are in an aeromodelling club, then there will be no trouble in finding someone willing to loan such tools – the only trouble will be stopping them from doing it all for you!

The Propeller

Now to building. Because carving a propeller is often feared by beginners, we are going to break tradition and describe this first – just to give you encouragement.

Firstly, it is necessary to mark out the $6\frac{1}{2} \times 2 \times 1\frac{1}{2}$in. balsa block as indicated on the plan. A ballpoint pen is best for this. A small set-square will also speed up the job, but is not essential. You will find it a help to mark centre-lines around the block to act as a guide.

Now let's start to think about removing the unwanted wood so as to leave the marked-out shape. The trickiest parts to remove are going to be the long wedge-shaped pieces between the $\frac{1}{4}$in. square shank and about half-way along the blade. If you are not careful, it is all too easy to remove parts of the $\frac{1}{4}$in. square shank as well. For this reason, try to make as much use as possible of a saw of one form or another. Saws are steadier and less likely to slip or follow the wood grain than are knife blades. A fret-saw is suitable (with practice) or a makeshift saw from a hacksaw blade with a tape wrapped round one end as a grip is ideal.

The first cuts should be right across the end of the block – two cuts in each direction, leaving a 'noughts and crosses' frame, with the $\frac{1}{4}$in. shank as the centre 'box'. These cuts should be exactly $\frac{1}{2}$in. deep also, and this will be easy to judge as you will have your markings on the sides to guide you (see Figure 1).

Now tackle one of the difficult pieces between the shank and about half-way along the blade. Start with one of the $1\frac{1}{2}$in. sides. If you are using a saw, carefully make a shallow starting mark squarely across the side, just below the ballpoint line, as shown in the sketch. Then tilt the blade to the required angle for the piece to be removed and carefully saw towards the shank – checking the saw at both sides of the block and cutting parallel to, and only just above, the marked line. When you meet your first cuts around the shank, the wedge-shaped piece should come away cleanly. Simply repeat this exercise on the other $1\frac{1}{2}$in. side of the block.

Before making further cuts, you will need to mark out guide lines again for the 2in. faces onto the sloping faces you have just cut. Then cut the wedges from the 2in. faces, as before.

If you do not have a saw, then your task is going to need more time and care, but you should follow the same sequence of cuts; only, when removing the wedge-shaped pieces, we recommend doing it in separate small blocks with sizes depending on your knife length and using only cuts with the grain always at right angles to the block side faces (see Figure 2).

Finally, taper the 2in. faces of the blade furthest from the shank, as indicated by the ballpoint markings.

Now what do you do with this odd-shaped lump of wood that you have made? Well, nothing for the moment – just pause and look at it and try to imagine it purely as a hollow box which has been made to just hold one blade of a propeller held inside it with the square shank as a locating device. A propeller must be set at an angle to its plane of rotation (otherwise it won't propel!),

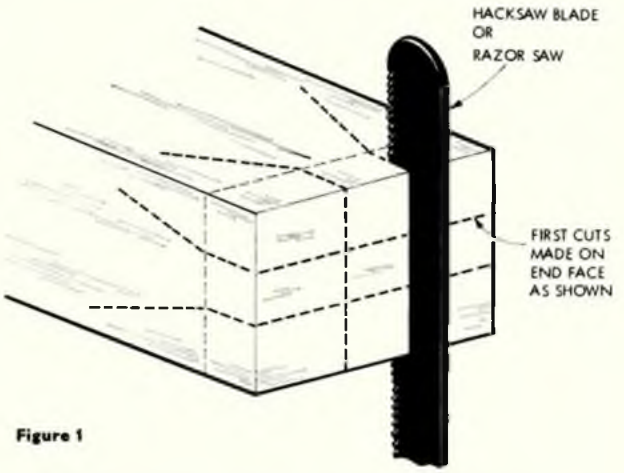


Figure 1

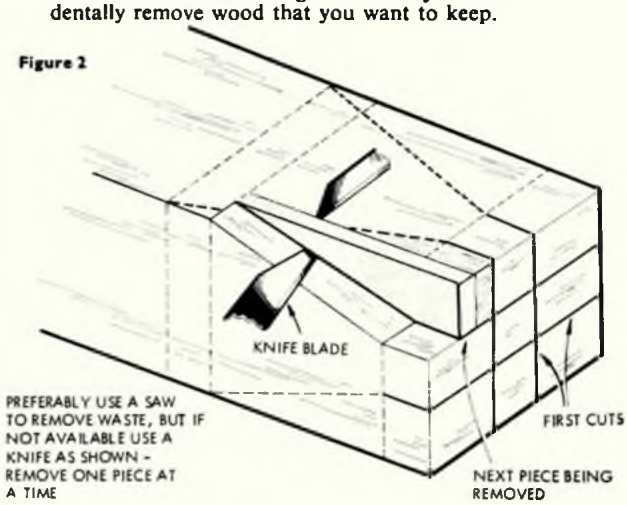
and for efficiency it must be smoothly shaped like a wing section. Imagine it trying to scoop the air from in front of it as it rotates, and the rotation is conventionally anti-clockwise viewing the propeller from the front. So you must now decide which is going to be your *leading edge* and therefore the diagonal opposite edge will be the *trailing edge* – i.e. looking at the end of the block, draw a rough diagonal line from the bottom left-hand corner to the top right-hand corner (2in. sides horizontal). If you draw in the diagonal the other way you will build a 'left-hand propeller' and you will have to wind it the 'wrong' way! With this diagonal as a guide, draw in a free-hand shallow-cambered line above the diagonal, but starting and finishing it in the corner. The maximum camber should be about 30 to 40 per cent along the diagonal from the top right-hand corner, but it is not critical. A maximum camber of $\frac{1}{4}$–$\frac{3}{8}$in. will be fine – again, it is not critical. Thicken this line by $\frac{1}{4}$in. or so in the middle to make the shape look like a wing rib.

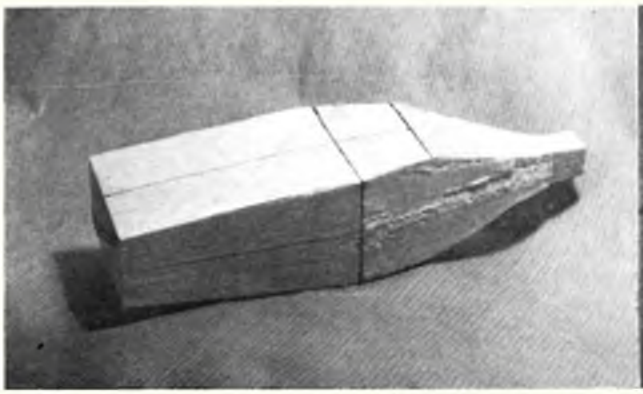
Now you can start carving away, remembering which is the leading edge. For carving, the long flat blade will be required, and do remember the following points:

(*a*) Always hold the propeller behind the cutting point and always carve *away* from you – a blade will not stop for fingers, and it doesn't half give the wood a funny brown colour!

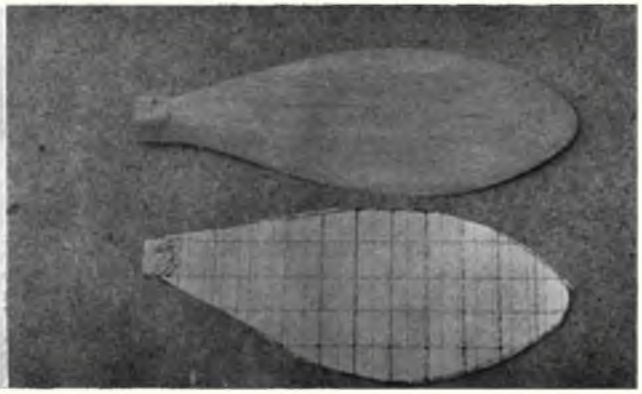
(*b*) Always carve so that the grain of the wood tends to guide the blade away from the line you are working to – otherwise there is a high risk that you will accidentally remove wood that you want to keep.

Figure 2





The blank cut to rough outline after using the methods shown in either Figure 1 or Figure 2 – compare with picture of original blank on page 274.



Finished propeller blade is shown above the paper template, which has to be drawn up from the half-size sketch on the plan. Quite an easy job using the squares as scaling marks.

You will be able to carve most of the wood from the convex side of the propeller (front face), but obviously not into the concave back face. You will also see that the original odd-shaped blank we made automatically produces the familiar 'twist' to the blade (or, if you like technical words, the *pitch* of the blade changes along its length – being coarse (large angle) near the shank and fine (shallow angle) at the tip, the angle being measured in relation to the plane of rotation of the propeller. Be careful not to carve into the square shank at all.

To get the concave rear surface, you must use the convex sanding blocks or the wood gouge.

The whole thing takes surprisingly little time. Do not worry too much about your sketch on the end of the block. It was put there as a guide (and reminder) only. You will find that the airfoil section comes quite naturally – but do keep an eye on which is the leading edge.

After a while, place the propeller blade between finger and thumb and run them along the length to gauge the thickness. You will almost certainly find a need to take more off the rear face about 2 to 3in. from the shank end. Keep sanding, carving, etc., more and more carefully until you have a maximum thickness of about $\frac{1}{16}$in. and nicely shaped tapers outwards from that. Sand to a smooth shape – except the shank, of course.

Finally, on the plan is a half-size 'squared' drawing of the blade planform. Draw this up full size on a piece of paper (it does not have to be very accurate) – lay this over the blade itself. Mark out the shape on to the blade and then cut to the markings – again, finishing off with nicely rounded edges and a smooth finish!

That's about all there is to it! Next month we will start on the main parts of the model, which will not be very different from our earlier series on the *Swan*. The propeller isn't quite finished yet, but the psychological effect of carving the blade makes all the rest look easy!

No, we are not at this stage yet, but a glimpse of what the completed propeller assembly will look like does give some encouragement!

THE SMAE IN 1975 *continued from page 271*

decreases; smaller sites, unsuitable for free-flight and, perhaps, even for R/C too, could still be used for control-line flying.

With the Society's national network of affiliated clubs and area committees to ensure that the right people know that a particular borough needs advice on model flying, all the legal fund needs now are contributions. Of course, some will come from the SMAE's general funds, but do you non-members really *want* 5,000 Society members to subsidise your flying? Remember that he who pays the piper calls the tune.

Already traders and equipment manufacturers are realising that the machinery now exists within the SMAE to protect the flying sites which their customers need, and on which their livelihood depends.

Junior Flyers

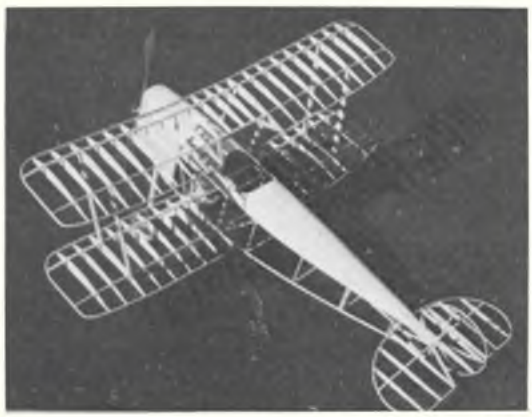
Do you ever wonder where all the younger flyers are today? So does the SMAE, but the Society is *doing* something about it as well. Its *Junior Activity* schemes have been taking shape for two or three years now, and 'One Model Contests' and 'Junior Kit Events' are a regular feature at several meetings throughout the year. But running events like this needs manpower (with apologies to Sue Miller who is handling the Nationals event this year). If the excitement of full-blown contest flying (so-called, of course, because of the appalling weather on contest days . . .) does not appeal to you, how about lending model flying your skill and enthusiasm in encouraging less experienced flyers? You, too, can be somebody's hero.

Finally, if you are already in a club, why not become an SMAE club and make your voice heard in British model flying? Affiliated clubs have one vote at General Meetings of the Society for every SMAE member they have on their strength. It's up to you, because *it's your Society*.

(*And for details on how to join* your *organisation, write to the Society of Model Aeronautical Engineers, Dept. M.S., 116 Pall Mall, London SW1Y 5EB.*)

Peanuts anybody?

If small rubber powered free flight scale models are your bag, then try this 'Jungle Fresh' design by WALT MOONEY



AVRO 534C RACING BABY

THIS RACER, built by Avro in 1921, was ill fated: it never did actually race, but crashed into the water following a power failure. Several other versions of the *Baby* were built, but this particular one was selected for a 'Peanut' as it had the shortest wing span of any. Its proportions are just about ideal for a rubber-powered model, with one exception – its nose is rather short, so it is *really* important to keep the tail light.

The model has all the standard components of an early '20s biplane. It utilises standard building techniques throughout, with the possible exception of surface outlines, if you are so inclined. Scale rib spacing is employed, but the leading edge riblets of the full-scale aircraft were omitted. Wheels manufactured by Fulton Hungerford were used, and these are truly beautiful. However, the model shown required quite a bit of nose ballast, so hardwood or plastic wheels are recommended.

The surface outlines can all be made in the fashion shown on the wing plan. Cut them out of sheet balsa to the shape shown, which will require four to five pieces for the rudder, and as many as eight or ten for the horizontal tail. The technique is familiar to anyone who has ever built a model.

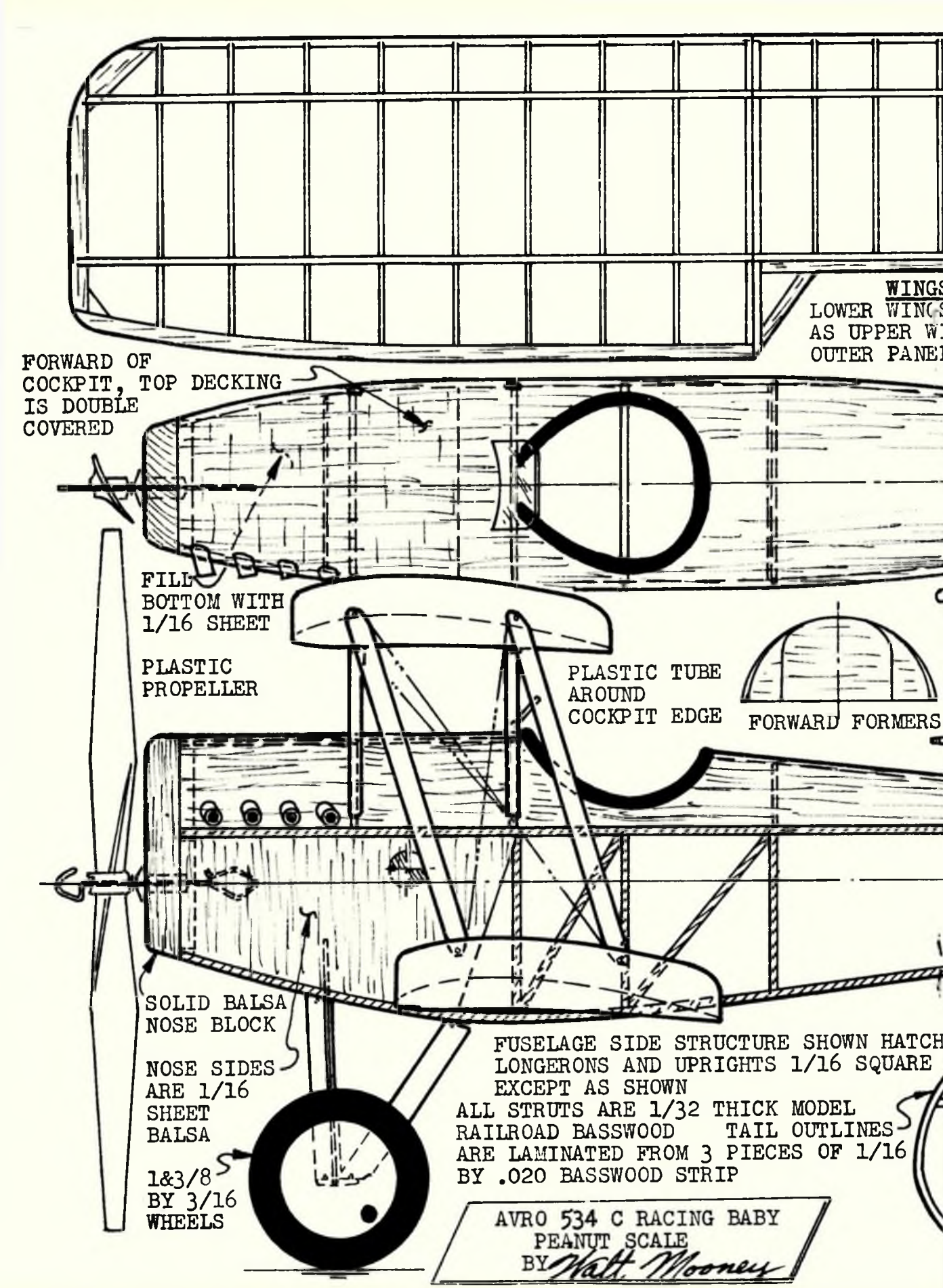
OR . . . the surface outlines can all be laminated out of thin strips of model railroad basswood. This results in outlines which look much nearer true scale. Actually, the model illustrated even has the wing outline made of basswood laminations. If basswood is not available, thin balsa strips can be used for laminations, but basswood is easier to work with as it can be bent around curves formed by pins without wetting. Balsa will require soaking in water and bending around a card or balsa former to prevent cracking. This might even be almost impossible at the trailing edge of the wing tips. If you are limited to balsa, making the wing outlines as drawn is recommended. The basswood used for the laminations is ·020 × $\frac{1}{16}$in. and three laminations are used to form the outlines. To bond the laminations, use white glue (PVA) thinned with approximately 50 per cent water, or one of the new instant cyno acrylate bonding agents. One of the latter was used on the original and proved a real pleasure for laminations, as they set faster than you can pull the pins out of the workboard! However, do read the instructions and hazard warnings first.

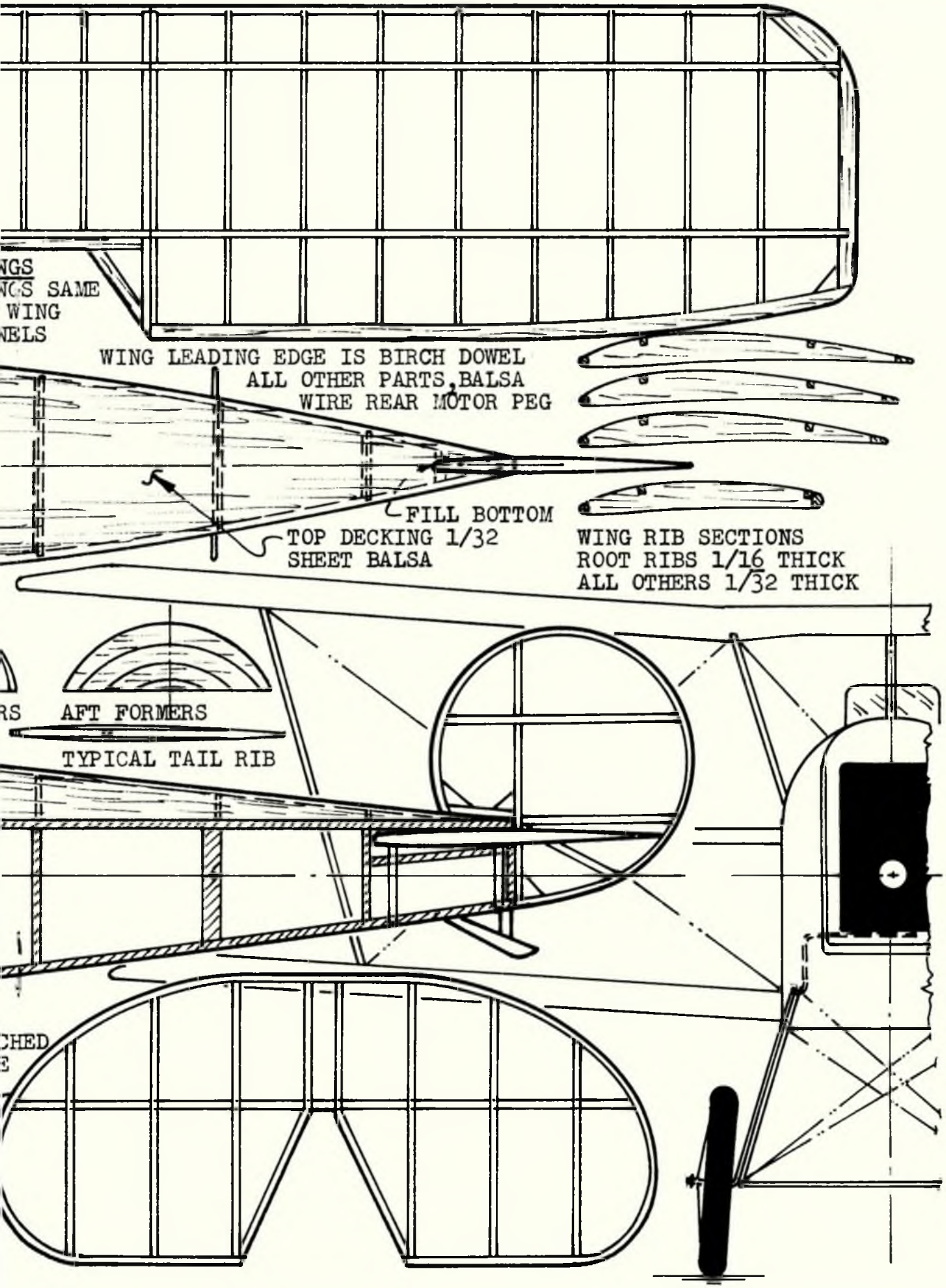
Full Size Plans overleaf!!

The wing spars are notched into the top surface of the wing ribs. Scale spars would not contact the wing covering; but in the case of models this size, the turbulating effect of the spars is beneficial for flight, and the top location of the spars keeps the wings from bending upward when the covering tissue is shrunk.

The tail surfaces can be built with a flat airfoil section directly over the plan, or after they are removed from

If you want a good flight performance – keep it light! This is particularly true of the tail surfaces, as the nose is very short which can cause centre of gravity problems. Finish (silver) was applied from a spray-can – just one coat, applied very sparingly.





the plan, soft balsa sticks can be cemented on top of the rib pieces and then sanded to the airfoil section shown.

The fuselage is a standard box structure with top formers and decking. Construct the two side frames first, directly over the plans. The longerons and uprights are shown hatched. Sheet balsa is used at the front end where the real airplane was sheet metal. After the sides are dry, remove from plan and separate, if they were assembled simultaneously. Cement together at the aft end, and add the cross pieces working from back to front. The formers are then cemented on the upper cross pieces in the proper position – note that the differing thickness as indicated.

Cover the top of the fuselage with one layer of thin sheet balsa from the front of the cockpit to the tail post – use two layers forward of the cockpit for strength. When dry, sand smooth, cut out the hole for the cockpit and add the landing gear wire. Fill the bottom of the fuselage with $\frac{1}{16}$in. sheet back to the aft landing gear leg position. Add a triangular gusset at the aft end of the fuselage to support the tail skid.

All parts of the model are covered with lightweight tissue. To attach the tissue, I like to use white glue thinned 50 per cent with water. When the adhesive is dry, expose all the covering to a 'fog' of water for tightening the tissue. I use an old deodorant bottle to provide the light spray of water.

When the tissue has shrunk and is dry, give all the components one coat of thinned clear dope, and then the fuselage a second coat.

The final finish paint on my model was applied prior to final assembly. I used black tissue for covering, then after the application of clear dope, carefully cut the registration letters out of masking tape and pressed them in place. Brush around these tape letters with clear dope to seal the edges. With a spray can of silver lacquer, apply a very light coat to all the components. This should be as thin as possible while still giving a 'solid' silver colour. For minimum weight, light should still penetrate and be visible from below the model. When this single coat is dry, remove the tape letters and the paint job is complete.

Biplanes are a little more difficult to assemble accurately than monoplanes, especially in the area of the top wing. To aid locating the top wing correctly, make a jig board from $\frac{1}{16}$in. thick sheet balsa which should be as long as the top wing

Just look at those wheels! Expensive perhaps, but these Fulton Hungerford wheels do 'make' the model – not available in UK, unfortunately. Remember to add the wing bracing, as this really completes the job.

centre section span and as wide as the distance between the front of the front spar and the rear of the aft spar. Make a notch in each corner of the jib board to locate the top ends of the four centre section struts. Press the top ends of these struts into the notches and cement the bottoms of the struts into slots cut in the top fuselage sheeting at the proper places. The jig can now be carefully adjusted to simulate the wing centre section. When this assembly is dry, remove the jig, leaving the centre section struts rigidly secured in the proper position. Note the small holes in the ends of the wing struts – these are to facilitate the installation of the rigging.

The lower wings are simply cemented to the sides of the fuselage and the lower wing struts are cemented in place. There are two braces for the tailplane on each side of the fuselage; these go from the lower longeron to the tail leading edge and spar at the second rib out from the fuselage.

The landing gear struts are now fitted and cemented in place, Note that the wooden struts are located just inside the landing gear wire in the front view. The wire which is the structural support for the wheels should not be cemented to the struts, but left free to flex and absorb landing shocks. This is not absolutely scale-like, but it is hardly noticeable and really will save the model better than a rigid undercarriage assembly.

Details are what gives these old biplanes character. The exhaust stacks are made from $\frac{1}{8}$in. diameter aluminium tube, while the rim around the cockpit is made from a piece of brown plastic tube – I used insulation from electrical wiring, slit down one edge and glued in place.

The last detail is the wire bracing. I prefer monofilament nylon fishing line for this, but any thin thread will do. Just thread the 'wires' through the holes in the struts and pull them taut. Tape them to the wing outboard of the struts temporarily and put a small drop of cement on each 'wire' where it goes through the strut. When dry, cut flush with the outside of the struts and remove the excess and tapes. Five-pound breaking strain or weaker line is recommended; stronger stuff is too stiff.

My model was very tail heavy, and required ballast to get the balance point in the position shown. Do everything possible to keep the aft end of the model as light as possible.

Although all the wood sizes shown are common sizes, the model is stronger and heavier than a Peanut really has to be. The $\frac{1}{16}$in. dimensions could all be replaced with $\frac{1}{20}$in. dimensions, the $\frac{1}{32}$in. with $\frac{1}{40}$in., etc. A source of special Peanut scale wood is Mike Taibi, 4339 Conquista Avenue, Lakewood, California, USA 90713. He is cutting 2×18in. sheet in $\frac{1}{20}$in., $\frac{1}{32}$in., $\frac{1}{40}$in. and $\frac{1}{64}$in. thicknesses, and sticks $\frac{1}{20}$in. square and $\frac{1}{20}\times\frac{1}{10}$in., and $\frac{1}{20}\times\frac{3}{20}$in. in extra fine balsa especially for the Peanut scale builder. So if you want to build an especially fine Racing Baby, drop Mike a line to get his price list.

Because of all the ballast, my model required a loop of 5mm Pirelli to fly; best time to date being 24 seconds. A lighter model should do lots better!

DEVELOPMENT OF A WAKEFIELD Part 2

Ron Pollard discusses the construction of his VITAR II design

LAST MONTH'S article dealt with the development of *Vitar II*, covering almost every aspect of the design of this model, and with the influences which had led to decisions to use a certain wing section, a certain propeller, variable incidence tailplane and rudder, etc. However, perhaps what was not made obvious was the desire to make this design *reliable*, and this was the overriding factor which influenced the *constructional* design.

Where possible, metal (usually aluminium) is used without causing a weight penalty. Metal-to-metal faces are employed to virtually eliminate wear, while glass-fibre cloth and epoxy resin is used liberally in highly stressed areas, all with a view to reducing wear, and as a consequence almost entirely eliminate trim changes and unreliability.

This is an advanced design both aerodynamically and structurally and thus involves techniques which are not common practise to all modellers. Consequently, the following constructional notes were never intended to be step-by-step instructions. However, I am sure that the techniques described will be of interest to the expert, and useful to the model flyer who wishes to improve his own building and flying standards. The accompanying drawing is to one eighth scale, and provides sufficient detail for the experienced modeller to produce a model, although it should be stressed that full-size plans are *not* available.

Wing

Choice of the airfoil has already been discussed; its thin, low-camber shape fitted the overall design concept of the model, but did not lend itself to a sturdy wing construction. It was thus decided to make maximum use of the lack of rib depth, and to apply a full depth 'I' beam spar. To further increase the strength of the wing, glass-fibre tubing (6in. into each wing half) was epoxied into the 'I' beam spar.

The ribs are cut from hard (12lb./cu.ft.) quarter-grained balsa. Pre-shape the LE and TE, pin down, and build the two centre panels in the usual way. Remove from the board and add the gussets and the bottom spar. Cut and fit the webs, noting that the first six bays, at the wing root, have double webs – i.e. a tapering gap to receive 6in. of *Ronytube* glass-fibre tubing. Cut the necessary amount from the ribs and epoxy the tube in place. Now epoxy the upper spar in place to complete the 'I' beam spar. The tips are built in the conventional way to the same state of completion as the centre panels. Note that the LE is split, and cemented, to give the necessary curvature. Epoxy the tips on to the centre panels and add the 3mm hard dihedral ribs (cut either side of the spar to fit).

A piece of 16swg piano wire, 50mm long, is used as a dihedral brace in the centre. Epoxy the wire into the *Ronytubes*, then epoxy the two wing halves together, remembering to set the starboard wing at +0·5mm relative to the port wing. Add the centre rib, the LE sheeting and the cap strips, then finish in the conventional way. I have had no warping problems with this construction, and I think this is mainly due to the gussets and the cap strips. For a wing to twist, it is necessary for the ribs to distort. The gussets reinforce the thinnest and weakest part of the rib and the cap strips make the

Heading picture shows the clean, slim lines of Vitar II. Anodised aluminium motor tube gives a slim fuselage and keeps the wetted area down to a minimum. Prop. assembly neatly houses a double ball-raced silver steel shaft, and look at the shine on the prop. blades!

The relatively short nose is highlighted by the prop. blades folding some 40mm under the wing root. With such a slim fuselage, it is not possible to get a perfect propeller fold – which makes a prop.-saving skid essential. Note the 0·8mm turbulator some 3mm back from the leading edge of the wing.

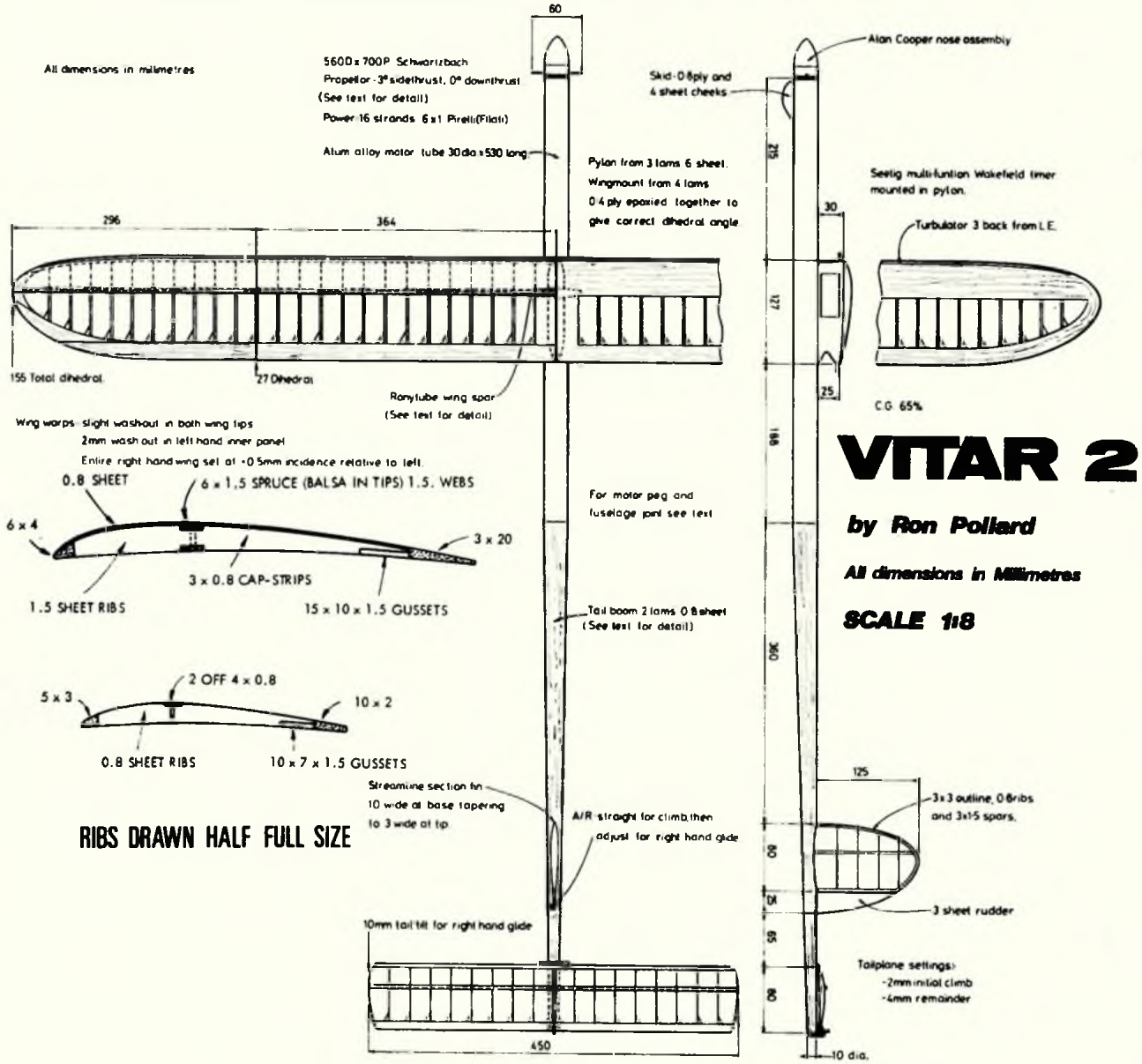
rib into a 'T'-section. At the 1973 World Champs (held at Wiener Neustadt) no attempt was made to shield the models from the sun during the practise days. It was hotter than would normally be experienced in Britain, and this was an attempt to 'weather' the models, one of which could be termed as 'new' at only six weeks old. No changes in trim were necessary before, during or after the Championships.

Fuselage

The motor tube consists of an aluminium tube 30mm in diameter, with a wall thickness of no more than 0·3mm. When cut to a length of 530mm, this gives a weight of approximately 35 grammes. I would strongly advise that the tube be anodised. This enhances the appearance (especially if it is coloured), but is not the main reason which is to harden the surface of the tube both inside and out, thus increasing its resistance to dents and scratches. Cut 3° sidethrust on one end and square the other end up to give an average length of 530mm. Machined aluminium fittings are used at both ends of the motor tube. Suitable fittings can be obtained from Alan Cooper (68 Station Road Wombwell, Near Barnsley, Yorks). Before anything is epoxied onto, or into, the motor tube the anodising must be removed and the aluminium scored to give extra keying area. An internal rear rubber anchorage is used and the details are best seen in photo No. 5. The peg in the rear fuselage coupling is made slightly over-length to key into the motor coupling.

The pylon is of normal construction and is considerably strengthened by covering with thin glass-fibre cloth and thin epoxy resin. Reinforce the timer screw holes with 1mm ply discs. The wing mount has been a minor source of trouble with a number of mounts having been broken on heavy D/T landings, especially when these occur on concrete! The most successful mount has found to be four laminations of 0·4mm plywood epoxied at the correct dihedral angle.

The pylon position is given as 215mm from the front



former, but this is for carefully controlled weights for the various components such as the tailplane, fin and rear fuselage. The best way to find the exact position of the pylon (to provide a 65 per cent centre of gravity position) is to complete the model, install a motor, add the timer and rubber-band the wing to the pylon. Now move the wing/pylon assembly until the correct centre of gravity is obtained. Mark the position, score the aluminium and then pin-prick the underside of the pylon for extra keying. Use a good quality, slow setting epoxy for this highly stressed area.

The rear fuselage construction will be featured next month, as the technique used is similar to that used on the propeller blades. When complete, the rear fuselage is 'squared up' and epoxied on to the rear coupling. Three holes are added to accept the nylon lines to the VIT, AR and D/T – one hole with three lines equals a tangle! Difficulty was experienced with a ply/spruce/glass cloth tailplane mount. This was overcome by using thin 'L'-sectioned aluminium epoxied in place to give tail tilt.

The VIT arm is made from aluminium, drilled and tapped 10BA or smaller. It is spring-loaded backwards and pivoted on a piece of 18swg piano wire which is epoxied to the fuselage rear. The tailplane D/T angle is regulated by a stop on the VIT line, also as illustrated.

Tailplane

This is of conventional construction, but with a genuine attempt to keep the weight down. Try not to exceed 5 grammes for the completed tailplane. The main spar is of the 'T'-section type and has been found to be of just the right dimensions to give a reasonably flat tailplane. If the depth of the web is increased it will bow downwards, and if reduced or missed out altogether it will bow upwards. The LE is fairly sharp and prone to wear in the centre, so reinforce this area, where it is in contact with the tailplane mount, with thin glass-fibre cloth and epoxy. Add a small piece of 0·4mm plywood in the centre of the TE to prevent wear from the VIT arm adjustment screw, with its consequent trim changes.

Fin

Again, the construction is conventional and the weight should be kept down to 2·5 grammes complete. The auto rudder is actuated by a torsion bar of 30swg piano wire, some 60mm long and hinged by tape for lightness. The torsion bar should be bent at 60° to give adequate tension. A small plywood horn is mounted at the bottom of the left side of the AR to receive the nylon AR line.

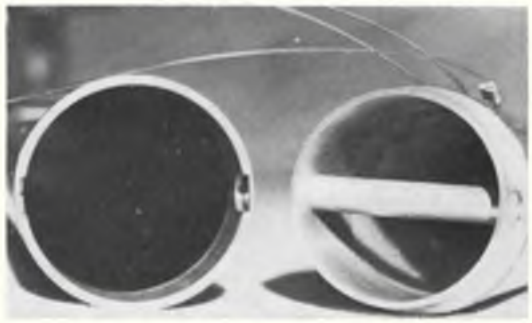
Propeller

The production of the propeller blades, and the techniques involved, were considered sufficiently interesting to warrant a separate article, so this is to be featured next month.

Trimming

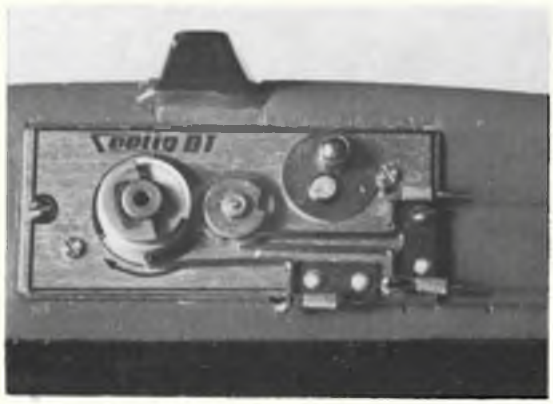
Most model flyers tend to view gadgets with suspicion and only use them when forced to! With the dramatic increase in power obtained from engines over the years, the need to control the climb of a power model has also increased. There has been a reluctance to use gadgets for this control, with most Open power model fliers relying on larger tailplanes, more rearward CG's and the high thrust line layout.

However, FAI power flyers, almost exclusively, have looked to variable incidence tailplanes and auto rudders to get the maximum performance out of this formula. The use of AR on gliders is more readily accepted because of the virtual impossibility of obtaining a straight



Above: The two fuselage couplings with the peg in the rear half which keys into the motor tube. Note the three nylon lines, the VIT line on the right complete with D/T angle stop.

Below is the three-function timer mounted in the pylon. The timer discs are set for 6, 27 and 190 seconds, which actuate the VIT arm and line (upper), AR (lower right) and D/T (lower left).



tow from a model trimmed for a circling glide. There is also a reluctance to use VIT (and to a lesser extent, AR) on Wakefields. It is my experience that these gadgets do not complicate the trimming of a Wakefield, but simplify it! With reference to the torque/time curve in *Figure 1* of last month's article, it can be seen that the climb has three distinct parts. *Figure 2* shows the arrangement. The timing of Part 1 is important and should be accurate, but Part 3 is only approximate and should be 3 to 4 seconds from the end of the power run.

Above: At the 'other end', the VIT arm is in position, and the tail is held down on to the lower stop (for initial 5 seconds). The screw is for glide adjustment. At left is result of D/T being actuated – note how VIT arm springs backwards.

Part	Time	VIT	AR
1	0– 5 seconds	IN	IN
2	5–27 seconds	OUT	IN
3	27–30 seconds	OUT	OUT

Figure 2

Before you start to trim your model, double check to make sure that certain design features of the model are correct. The centre of gravity should be 65 per cent with 3° right side thrust, and do not forget the tailplane tilt!

First obtain a reasonable glide, from hand launches, by adjusting the VIT arm adjustment screw and the AR glide stop. When satisfied, leave the VIR in the glide position, wind the timer and set the AR disc to approximately 10 to 12 seconds and hook up the AR line, pulling the AR straight. Wind on some 50 hand turns, launch, and observe carefully. The model should fly in a gentle right-hand turn. When the prop. folds, watch the glide carefully. Adjust and repeat until you are satisfied. You now have the two AR settings and the VIT *glide* setting. Your VIT *power* setting can now be set on the bottom stop at 2mm less than the glide setting. Increase the turns steadily until 70 per cent turns (which is *not* 70 per cent torque) is reached, and there should not be any vicious tendencies. Now hook up the VIT line, set the timer discs to operate at 6 seconds for the VIT (5 seconds plus 1 second for the launch) and 27 seconds for the AR. Wind on as many turns your confidence will allow, and launch the model at an angle of less than 45°. Observe the climb pattern critically. If there is a tendency for the model to 'wing over', increase the VIT; and if the model tends to roll to the left a little, reduce the VIT difference. It may be necessary to increase or reduce the side thrust a little for final trim. When correctly trimmed,

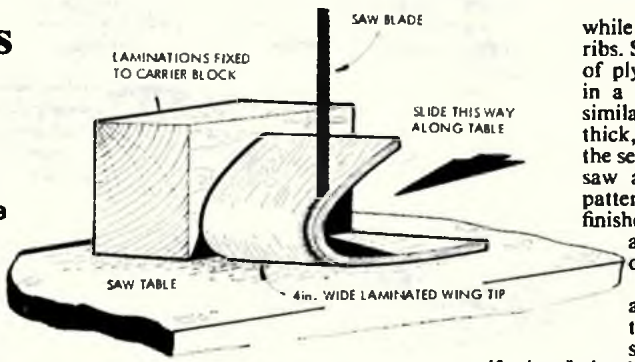
Rudder uses piano-wire torsion bar for spring-loading. Much neater than rubber bands or external coil springs – and more reliable, too, which is one of the main 'themes' of this design.

it should not be possible to detect when, first, the VIT change takes place, and, secondly, when the AR changes before the prop. folds. Always use the D/T function of the timer, even on your trimming flights. Besides the obvious reason, it helps the sequence of preparing the model with the three lines to VIT, AR and D/T. The trimming procedure just described was evolved for *Vitar II* with its various design features. It is probable that, should any of the design features be neglected or changed, the trimming would have to be changed, too. When you are satisfied with the final trim, remember that it is trimmed for 16 strands of reasonable-to-good rubber, wound up to near maximum turns and torque. The model will not react the same way with half-turns, poor rubber or broken strands! However, from my experience with *Vitar II*, should an extra powerful motor appear in a batch (usually indicated by a shorter than usual motor), then this design will cope without any changes in trim. It just goes up faster, that's all!

To be continued

A few ideas utilising a band saw

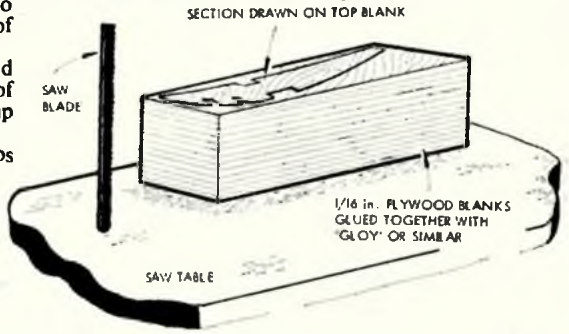
as suggested by Mike Woodhouse



WHEN A FRIEND purchased a bandsaw and described its capabilities at a Club Meeting, it stirred a few ideas in my head. Firstly, a bandsaw can be used to accomplish tedious tasks such as the cutting of thick timber very quickly, or to attempt new constructional techniques. A few ideas I would suggest are:

1. Cutting heavy-gauge plywood.
2. Reproduction of components by the use of a thin metal template, previously cut with the saw, using a different blade if necessary.
3. Slicing the length of sheet balas, using the adjustable angle available on the cutting table, to prepare for the construction of a Mederer-type wing.
4. Laminations can be produced in bulk by the lamination of 4in.-wide sheet and slicing it up on the saw.
5. I like to use plywood wing ribs in quantity in my A/2 wings, and a balsa knife takes a long while to produce only a few ribs. So the idea is to cut blanks of plywood and stick together in a sandwich with 'Gloy' or similar glue, in a pile up to 1in. thick, and trace on to the top the section outline. Place on the saw and cut carefully to the pattern, then sand down the finished article and split the ribs apart with the now redundant knife.

The ideas quoted above are a few of the possibilities that can be tried. Me? I'm still trying to persuade my wife that I should purchase a band-saw to help with the DIY articles around the house– she still prefers to use an ordinary saw!



The Free Flight Scene

this month:
Michael Warren

THIS IS THE second of our new series of free flight columns, and we sincerely hope that the mixture of news, technical data, opinion and the rest of it is what you want! There is no way in which we can please everyone of course. The best we can hope for is that we manage to please all of the people at least some of the time. We won't know how we are getting on though, unless you tell us; so if there is anything that you think would be of general interest and that is not being covered or explained enough, then let us know.

INDOOR FLYING AT EAST GRINSTEAD, 16th Feb., 1975

One of the boom sectors of free-flight in England during the last couple of years has been indoor flying. It is the side of the sport that the general public, and even most other model flyers have probably seen least yet it manages to be both an excellent way into model flying for the young enthusiast, whilst at another level it can be a highly specialised and technical affair.

This country has three great advantages as a centre for indoor flying: we have one of the world's best indoor flying sites (the huge airship sheds at Cardington), we have a small but very enthusiastic group of regular indoor flyers and, with Laurie Barr importing Micro-X supplies from America (and advertising regularly in this magazine) we have a nearby source of the super-light balsa, bracing wire and other equipment that is necessary for indoor flying at its best.

The accent in the indoor modelling world is on the *flying*, and on adjusting model performance to suit the surroundings. By using a different length or thickness of rubber for example, and thus varying the amount of torque, you can control the height that the model flies to and make best (and most effective) use of the space you have available. And though beginners' models have to be very substantial by indoor standards, a lot of fun and good experience could be gained in school halls and gymnasiums.

Not all flying is done in places the size of Cardington, even by the experts. There is now an increasing number of low ceiling sites being used, the latest being the King George's Hall, East Grinstead, a gymnasium some 115ft. long, just under 60ft. wide and with a ceiling height of about 27ft.

At the February meeting this year, three classes of model were flown – two pure duration classes, Open microfilm and Easy B (alternatively spelt *EZB* or *Easy Bee* in case you get confused!) and 'Peanut' scale. Easy B, originally a class for beginners to indoor flying, attracted 14 effective entries – i.e. entries that were actually flown – and the difference between the experts, who were averaging six minutes and more per flight, and the 'also-rans' plus newcomers was very marked. There were times during the Easy B sessions when pretty well all fourteen models were airborne and it really got a bit crowded up there. By comparison, microfilm attracted six effective entries, and though flight times tended to improve during the day as fliers came to terms with the conditions, there is no doubt that the hall is not really large enough for the FAI-size models that were being flown. Interestingly, Martin Shepherd placed second in microfilm flying a far smaller 35cm model, and twice clearing 10 minutes with it.

Norwich Club member Geoff Lefever used braced wing ribs for his FAI microfilm model which he flew at the East Grinstead meeting.

Winner of the Easy B contest, with one of the most impressive models of the day, was Ron Green of the St Albans Club. I am grateful to Ron not only for the plan but for the following information:

"This is my third attempt to produce a competitive model, the first being a flop in more ways than one. It was light (·96grm) but far too weak. With no bracing allowed on Easy B models, correct selection of balsa, particularly for wing spars, is essential. A really stiff and light motor stick is also required. The model drawn weighs 1·15grm and is reasonably stiff.

"The large tailplane seems to work well, controlling the first burst of power. The wash-in/wash-out on the tailplane was unintentional, but does appear to increase tail tilt and help get the nose round on high torque. A large fin also keeps things in the groove during the climb. A small amount of wash-in is required on the starboard tip. Without this, the tip assumes a negative incidence on high torque, causing the wing to tuck in . . . there is a tendency for the wing posts to bend at first due to twisting of the motor stick under the first power burst.

"At the East Grinstead competition, the model was flying on a 15in. loop of ·040in. rubber for the 8 minutes 29 seconds flight. This was a lucky one as I overdid the launch torque and it banged about on the ceiling and girders for about two minutes. Twice it hit the wall and slipped down to about half ceiling height before climbing back up again! In contrast the last flight of 7:35 on a 17in. loop of ·043in. climbed to within about one foot of the girders and cruised the length of the hall without a touch.

"I intend trying a higher aspect ratio tailplane and longer tail moment on the next model, but I think the right propeller/rubber combination for the ceiling conditions is what really matters."

I am by no means an expert on scale models and have to admit that my first-ever view of Peanut scale was a disappointment. A flight of five seconds or more qualified a model for inclusion in the final results, and it was clear that few of the entrants had come to terms with their models as flying machines. From conversations at East Grinstead, I understand that the Peanut fliers themselves are concerned that the balance between the various sets of points awarded (for choice of aircraft, standard of construction, flight time, etc) is not satisfactory at the moment. I must admit that from what I saw I agree with them. Flights varied from the good – Laurie Barr's *Piper Cub* was outstanding – to the very poor. Obviously some fliers have come into this class of model from the free-flight end of the spectrum and have a built-in advantage. It is to be hoped that the others, who are attracted primarily by the scale side of it, can learn enough from the free-flighters to make the most of their models in future. Otherwise, isn't much of that work making a flying scale model – which by definition is made to fly as well as to be to scale – rather a waste of time?

Just for the record, it is worth pointing out that the King George's Hall costs £2·50 an hour to hire, and therefore set the Club back £20 for the eight-hour session. Even after this, and the purchase of prize plaques, etc, the meeting came out only £4 in the red, which was both a relief and an encouragement to its organisers.

RESULTS

Easy B *(Best three flights from six)* – 1. R. A. Green (St Albans) 8:29+6:55+7:35. *Total:* 22 min 19 secs. 2. M. Shepherd (St Albans) 7:43+5:26+8:03. *Total:* 21 min 12 secs. 3. J. Blount (Croydon) 6:18+6:32+7:31. *Total:* 20 min 21 secs. *(14 entries.)*

Open Microfilm *(Best three flights from six)* – 1. L. G. Barr (Hayes) 10:06+11:22+14:13. *Total:* 35 min 41secs. 2. M.Shepherd (St Albans) 9:04+10:16+10:27. *Total:* 29 min 47 secs. 3. R. Bailey (St Albans) 9:40+9:57+7:51. *Total:* 27 min 28 secs. *(6 entries.)*

Peanut Scale – 1. A. Moorhouse (Cambridge) *Luton Minor* Scale points – 8, flight points – 8. *Total:* 16. 2. L. G. Barr (Hayes) *Piper Cub:* Scale points – 1, flight points – 10. *Total:* 11. 3. R. S. Oldridge (C.M.) *Blackburn:* Scale points – 10, flight points – 1. *Total:* 11. (14 *entries.)*

GLIDER FLYING 1975

It's only a few months now to the 1975 World Free Flight Championships, which are to be held at Plovdiv, in Bulgaria, and the reports and photos will start being published, the new developments will be discussed and so on. To put part of this in some sort of perspective it might be useful, particularly for those not actively involved in this side of the sport, if I gave a short summary of the three or four most significant developments in model glider flying during the last ten or fifteen years.

The most radical of these developments was the introduction of the clockwork D/T (dethermaliser) timer – now universally used in competitive flying. Once the rules started putting the emphasis on a combination of performance *and* consistency, by demanding more flights than before but of limited duration, it became necessary to bring models down to earth safely and at a predetermined point in the flight. The effect of the D/T has been discussed fully in a recent series of articles in this magazine, but briefly the tailplane moves to a position at approximately 50° to the horizontal, and the model, its trim upset, floats down to earth. The significant point is that unlike the slow-burning fuse type of D/T, which of course has to be lit before the model leaves the ground, the clockwork timer, with its spring-loaded on/off switch, can be started at the moment the model is released from the top of the towline. Thus in theory the flier can continue towing the model for as long as he wants before releasing it, hopefully into 'good' (i.e. rising) air for a three-minute or whatever flight is required.

It was at this point that towing started becoming an art in itself, and with it, modellers started to obtain an increasing amount of knowledge of thermals and ways of identifying them at ground level. Other, comparatively minor developments in this same period were to the tow hooks on the models and consisted of different and simple systems to ensure that the towline would not disengage from the model before the flier intended it to.

Two additional types of equipment then started to be developed:

1. To give the model a 'zoom' or 'catapult' launch. For years it tended to be assumed that the most effective possible glider for competition use was a super-efficient, slow gliding, high aspect ratio model, which would out-float everything else. This assumed that since the rules allowed 50 metres of towline and no more, the most important part of model development was to reduce sinking speed and thus increase flight time.

   But what if it was possible to tow the model quite fast and start it turning just before it left the line, so that after release it would continue going up for another 15ft. or so before levelling out into its normal flight pattern? Wouldn't that be just as good? And probably even better because you could use it in all weathers, whereas the floating A/2 tends to come unstuck in rough (i.e. British) conditions?

   And of course it is both possible *and* better, and is a technique now being used all over the world.
2. To allow 'circle' towing. Towing a conventional model glider, even when one of the simple 'anti-fall-off' devices is being used, demands that a certain amount of tension be maintained between the model and the man towing it. And this normally means that you have to keep moving into wind. Thus you have to keep moving more or less in a straight line, which in turn means that if you can't find the thermal you want, you eventually run out of steam or out of flying field. Equally, on a flat, calm day it's not always easy to keep enough tension to ensure that the model stays on the line. So some years ago the Russians started developing a system which would:
   (a) allow the model to be towed normally,
   (b) allow the model to be towed in a circle without the towline disconnecting, thus allowing the flier to stay within a limited area and wait for a thermal to come to him or at least near him, and
   (c) to allow the model to be catapulted up into the thermal to make the best possible use of it.

Andrew Moorhouse notched up another 'Peanut' victory when he flew this Luton Minor at the East Grinstead indoor meeting.

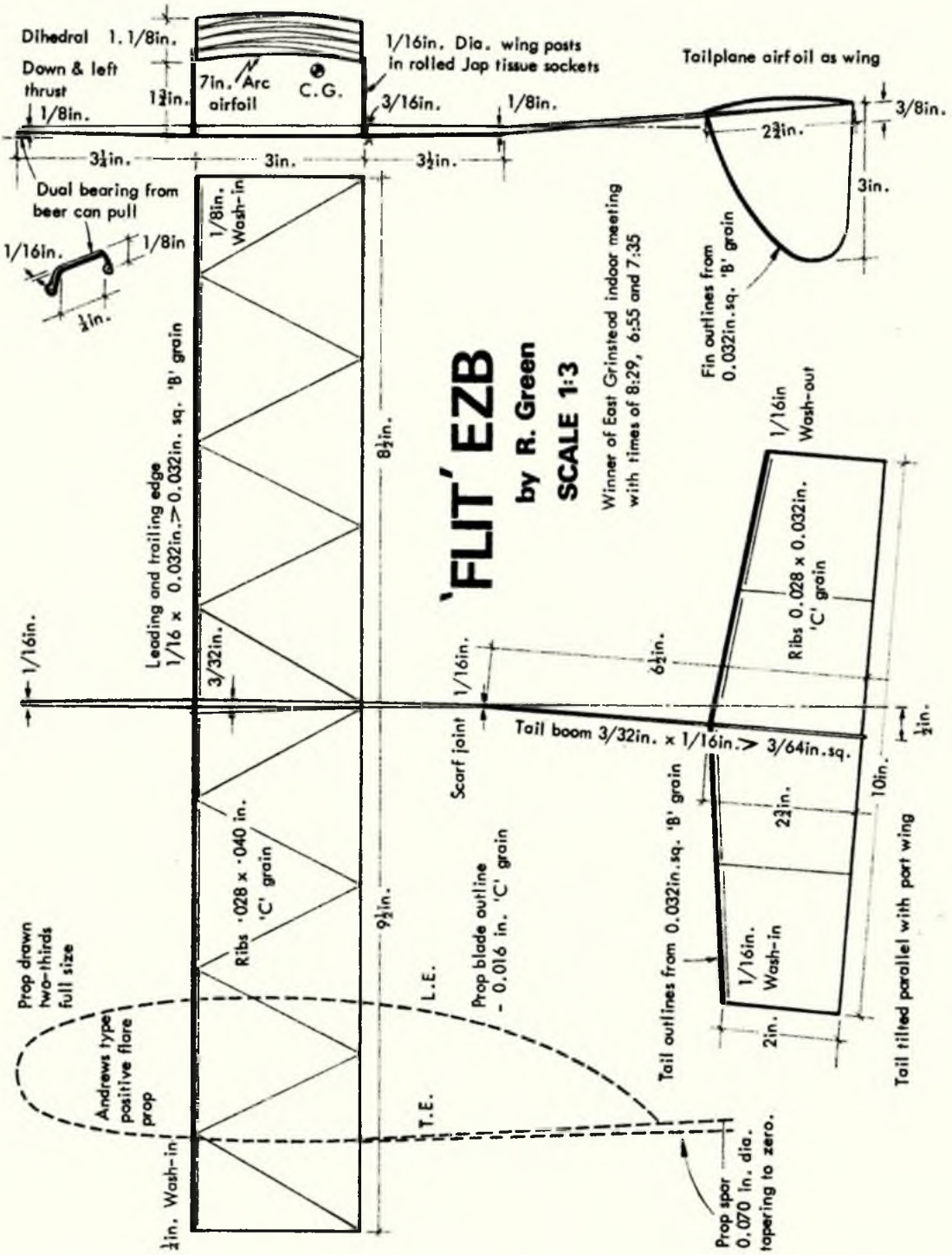
This is not the place to examine the ironmongery necessary for all these tasks – that will form a separate series of articles shortly – but it should be said that no suitable equipment is available commercially in this country, so it's very much a case of do-it-yourself.

I do not think that I can do any better now than quote from an article by New Zealander, Paul Lagan, in a recent edition of *South Island News*. After a detailed analysis of Ekhtenkov's 1973 A/2 winner, which he praises for its combination of strength and lightness, he goes on to discuss flying technique:

"There is little doubt that the circle tow technique is superior to straight towing. Anyone that disputes this has his head in the sand. The disadvantages of circle towing are ones that can be overcome with practice and with good engineering. The only time that straight towing is better than circle is when the 'circler' has not had practice or his engineering has let him down. It is very much a question of how serious you are! If you are a 'casual' glider flyer that just wants to fly effectively at club level and enters the Nats in hope – not too serious nor really very interested – then you had best stick to the good old conventional hook. If you want to get stuck into this glider game then you will be attracted by circling. The technique of circle-towing and hooks to obtain this have been covered fairly well. We won't go over this ground again, but will point out that practically all East Europeans use this technique, the Swedes and other Scandanavians use either circling hooks or, at least, a 'zoom' hook that enables the fast turning, climbing launch that can give a good 15 seconds advantage over a 'floated' launch. Even the British, whose weather often hamstrings their development in glider, now accept 'zoom' launching hooks as a desirable feature."

"One trap with circle towing is that of using it when it is not necessary. The best launch is **still** *the one just underneath a thermalling model and the best way to achieve this is still to wait and wait and wait until such a model or bird comes into 'range' then up and off. Often, the circle tower will think himself a cut above the general flyers and will go off merrily circling and find his own private' thermal just downwind – very satisfying when it comes off but unless that flyer is extremely practiced in the art there is always the possibility of getting a bit fouled up and mucking-up the flight. When conditions are such or the entry is so small that piggy-backing is not 'on'* **then** *is the time to circle away! Another variation is when one tows up near what 'looked' like a thermalling model only to find no great tension on the line when the position of release comes. With straight towing this is one hell of a feeling – it usually means a trot upwind and often means a downdrafted flight. With a circle hook at least one has the chance to hang around for the next bit of good air."*

Ron Green with his winning EZB design drawn opposite. Since the first East Grinstead meet, he has achieved 13:57 at Cardington, using a 15in. loop of 0·05in. rubber with a 14in. dia. prop. having a pitch of approximately 18in. Now it seems that the '20-minute' EZB is a serious possibility. Thinks . . . does not 'EZB' stand for 'Easy B'?



Of the three members of the British A/2 team for this year's World Championships, one, John Cooper, has been developing circle tow and catapult launch equipment for two or three years, whilst another of them, Mike Fantham, is developing it at the moment. Both of them have incorporated 'override' systems, so that the pivoted towhook necessary for circling can be pulled forward against a non-moving stop, turning the model into a conventional fixed-hook model. As John Cooper explains: *'You have to nominate which three models you're going to use three days before the competition, so you need models that you'll be able to fly effectively whatever the weather'*. A good point, but then not everyone has John's problem of having to decide which model to fly – he has no fewer than nine A/2's at the moment, three fitted with circle tow and catapult systems and one other fitted with a catapult launch system only.

John Boon, who was placed second in last year's wet and windy Team Trials, has four 'standard' A/2's (based, like Mike Fantham's models, on Mike Woodhouse's *Wichita* design) and in addition is building a 'floater' in case the weather is very calm. It will have a high aspect ratio by British standards – 100in. wing span and 4½in. chord – with a sheeted underside to the wing. But John Boon feels that the main task in the run-up to Plovdiv will be to ensure that *all* his models are sorted out. *'Normally you have one model that you tend to fly more than the others, to fly regularly as your "first" model. That's OK, but for the World Champs. you've got to be sure that you can fly any model if you need to, and it'll perform well.'*

Looming out of Bassingbourn's fog for the A/2 fly-off are (l to r) Messrs. Warren, Cowley, Greaves and Dilks. At right is NZ flier Martin Gregorie, with short moment arm A/2.

LONDON AREA FAI MEETING, 23rd February, 1975

With one or two notable exceptions, last year's free-flight competitions in this country were flown in foul conditions. By the end of the year most people had seen enough wind and rain to last them a lifetime, and retired to a winter of repairing or new building in the hope that 1975 would bring better weather. So it was particularly annoying that the first of the major 1975 FAI competitions – the London Area meeting, at Bassingbourn – should have suffered from, of all things, thick fog! It was ironic that at the start of the season, when there are new models to trim and check and a lot of work to be done, we should be lumbered with weather that was perfect in one sense – it was very calm all day – but that at the same time made any sort of flying a bit risky . . . there were times during the day when models were going out of sight only 40 or 50 yards from where they were launched!

The fog was a pity, not only because the contest had attracted a good crowd from London and the south-east, but because a number of long distance travellers had joined us – Ray Monks and David Greaves from the Midlands, and, amongst others, Terry Dilks, John Boon, Russell Peers and – of course – John O'Donnell from the North.

Originally advertised as a five-flight FAI contest, with two flights required before 12 noon, the day had to be severely reorganised. The morning was a complete write-off. One or two brave souls started flying when it was still really very foggy – an A/2 glider could *just* be seen at towline height, but had to be followed very closely after release to make sure it was kept in sight. Towards lunch-time the appalling visibility improved slightly and it emerged that a contest *was* to be held – of three rounds, 45 minutes per round. Two major departures from normal procedure were introduced, both dictated by the poor visibility – timekeepers could follow the models, and (since it was as foggy upwards as well as sideways) the power run for Class F1B was reduced to five seconds.

It was a difficult day. Lift was available over quite wide areas from time to time, but it was not dictinctly marked, no bubble machines or other thermal detection equipment was being used, and it was largely a matter of being in the right place at the right time or being very patient (and having patient helpers and timers). It was not a good day for serious power flying of course, though one might have expected slightly more from the Wakefield fliers none of whom managed to string three maxes together. Eventual winner was Ron Green – again – flying a model he describes as 'rough and ready and built in about a week'. O'Donnell would probably have come out on top but on his third flight he launched at the wrong moment and went out of sight upwards into that fog after only 48 seconds!

Terry Dilks flew this A/1 at the St. Albans mini-contest at Bassingbourn. Similar to his A/2 that had such good windy weather performance during the 1973 season, this model uses extensive anti-warp structure in the wing.

Four fliers made it through to the glider fly-off – Martyn Cowley (one of several who had made good use of the still conditions to practice circling towing) Terry Dilks, Dave Greaves and myself. By fly-off time the fog was closing in again, and it was perhaps a bit surprising to find that despite the relaxed competition that had preceded it – with no launch line being enforced for example – the fly-off was apparently (or potentially) the first of an FAI-style fly-off. Anyway, we were allowed four minutes in which to launch and a four-minute flight was required. Martyn Cowley towed up immediately, started circling and disappeared downwind into the fog, closely followed by his timekeeper! After a couple of minutes Terry Dilks and Dave Greaves went away and launched almost immediately into promising-looking air and I followed soon after. All three models were circling more or less within sight of each other and drifting slowly downwind. After a minute or so Martyn loomed out of the fog, still towing, and launched near my model, which was holding up slightly better than the others. But the lift was faint and dying fast, and he was down in just under 2¼ minutes. The rest of us cleared three minutes and my model was last down, d/ting just a few feet off the floor after four minutes ten seconds. As only one person had flown for four minutes no further fly-off was required, which was a great relief since by that time it was not only foggy but pretty cold as well.

On a personal note, I have no doubt that my win was due more to my Richmond Club team-mates than to any superiority in the model or advantage in the time it was launched. Regular readers of this column will know that not only is thermal *detection* part of the current free-flight competition scene, but also attempts at thermal *creation*. At last year's Europa Coupe meeting in Germany, it was common to see a model being followed by anything up to half-a-dozen people, waving shirts or jackets in the air in an attempt to break relatively warm air away from the ground into a thermal. In Germany it was used not only to improve poor or moderate flights, but in some cases to guarantee what already looked like secure three-minute maxes. It goes without saying that it's usually too windy in this country, but when it *is* calm enough to keep up with a model as it drifts across the field, then the technique may well prove useful. At Bassingbourn there were five or six trying it with my model, and though there's absolutely no way of being sure, I've little doubt that at least some of that four minutes was directly attributable to their efforts, for which I'm very grateful.

And even if it didn't work, it was a good way of keeping warm!

FAI Rubber – 1. R. Green (St Albans) 8:39; 2. B. Rowe (St Albans) 8:29; 3. M. Woodhouse (Norwich) 8:24; 4. L. Ranson (C.M.) 8:12. *(17 entries).*

FAI Glider – 1. M. Warren (Richmond) 9:00+4:00; 2. T. Dilks (Falcons) 9:00+3:20; 3. D. Greaves (Birmingham) 9:00+3:07; 4. M. Cowley (Northampton) 9:00+2:25. *(36 entries)*

FAI Power – 1. A. Child (Brighton) 7:52; 2. P. Harris (Evesham) 7:35; 3. R. Baggot (Birmingham) 7:34; 4. P. Bond (Anglia) 7:27.

continued on page 268

BETWEEN THE LINES

with Dave Clarkson

MORE ON 'B' FUELS

IN ANTICIPATION OF a full article from 'down under' on Class B team racing, I thought it timely to publish some of the fuel formulae I have been receiving from that part of the world, together with the performance envelopes given, and the relevant motor data.

(a) Current New Zealand Final Record Holder

Motor:
Super Tigre G21/29 FI with ABC liner set. Using ST head with clearance set using a tachometer to give maximum rpm. Cox type ¼in. dia. venturi.
Fuel:
20% Castrol 'M', 54% Methanol, 13% Xylene, 13% Nitromethane.
Performance:
113–115mph for 45–50 laps.

The 'standard' NZ brew is as above, but with 20% Xylene and 20% Nitromethane. This they 'water down' with straight fuel in practice on the contest day to determine the best motor run.

(b) Current Top Melbourne Flier

Motor:
Super Tigre G21/29 RV ABC with head clearance set at 8 thou.
Cox 15 venturi bored to ¼in. dia.
Fuels:

Long Range (1)	*Medium Range* (2)	*Short Range* (3)
25% Castrol 'M'	20% Castrol 'M'	20% Castrol 'M'
12½% Nitromethane	20% Nitromethane	30% Nitromethane
40% Cumene	20% Xylene	10% Xylene
20% IPA (Iso propyl alchol)	40% Methanol	40% Methanol
2½% Nitrobenzene		

Performance:
Long Range (Ron Lucas) Brew: 112mph for 75–80 laps.
Medium Range Brew: 115 mph for 40–45 laps.
Short Range Brew: 118 mph for 35–40 laps.

I hope to augment this data with further news about 'B' in New Zealand and also from the current Australian record holder in coming editions. However, the data given above is more than interesting for we UK 'B'-men, especially those medium range brews, because we now have to do the equivalent of 43½ laps on the old line length, i.e. just what the medium range formulae gives!

I believe that the fastest heat so far under our 'metric rules' is 4:03 made (by John and I) with a very tight motor, one pit-stop plus a motor seizure at the end of the first tank, and a glided finish.

Class 'B' combat is growing in popularity – a good big 'un beats a good little 'un any day! On the left is your scribe with his Fox 36 Combat Special powered own-design 'Foxbat', while Ian Hutchinson displays his HP40 F-powered 'Nemesis II'. Both circulate at around 110mph on mild fuel.

The fuel (7½% Nitromethane, 5% Nitropropane, 10% Xylene, 10% Castor Oil, 10% Synthetic Oil, 57½% Methanol), was a very mild version of the medium range brews quoted above as our motor was so tight.

By 'Nats' time we hope to have loosened off the motor to the extent that we can use a *real* medium range brew and get near the speeds that seem possible.

A NEW FLYING SITE

Nice to hear from Doug Blake with some really good news: 'It is refreshing in these days of hard-to-come-by C/L sites, to find ourselves being *invited* to fly at an interesting venue. The site in question is in the grounds of the world-renowned pre-war racing circuit – Donington Park, home of the Donington Collection of single seater racing cars. A few weeks ago I was invited, together with several well-known C/L stunt fliers, to Donington to inspect the facilities and also get in some practice flying on the site.

'After a tour of the park, we agreed upon a suitable area adjacent to the buildings housing the Collection and this area is to be mown.

'Donington Park has toilet blocks and a cafeteria as well as the Collection of over seventy single seater racing cars, in immaculate condition, which have to be seen to be believed and are worth a visit in themselves.

'This year will be a form of experiment in order to ascertain the popularity of flying at this site. Three dates have been arranged for competition when stunt, carrier, Class II scale and combat will be catered for, these being 4th May, 27th July and 14th September, 1975. The three contests will be run on a points system but competitors must fly in the last contest to qualify. Entry fee for contestants and spectators will be at the special rate of 50p each. This covers contest entry, parking, entry to the Collection, use of cafeteria and other facilities. We have to thank Pete Galloway and Ken Burton for being prime movers in this situation and we hope that many aeromodellers will make the effort to attend the three meetings so that we may show that the offer of these facilities is appreciated.'

A true example of what can be achieved with some effort and enthusiasm. If other groups can have similar success (especially with some tarmac), then we control-liners will be well served indeed.

THE NEW 'MARK' FOR 'B' HEATS

Had a thought-provoking letter from John Gray in which he stated his thoughts on the 'target' for class team race B heat times, viz:

	secs.
90 laps at 118mph	— 190
1 stop at 15 sec. loss	— 15
1 start at 5 sec. loss	— 5
	210 i.e. a 3:30 heat.

I would argue with John in that 118mph may be a little optimistic, but not by much. Enough data on Super Tigre G21/29 RV ABC's has come from 'down under' already to indicate that, on a good day, speeds of 110–115mph for 45–50 laps are perfectly possible using such fuels as 25% Nitromethane, 20% Xylene, 20% Oil, 35% Methanol.

Taking 110mph as a very practical speed, the 'mark' becomes 3:45, which is the figure I am aiming at – but if John Gray makes his 'mark', then I shall be the first to congratulate him!

YET MORE GOODIES

Illustrated in the accompanying photo is a selection of glass fibre – epoxy resin props received through the post from Aldon Kelly of 4616 S. Harvey, Western Springs, Illinois 60558, USA.

Aldon sells them at $3·00 for the 7in. props and $4·00 for the 8in. prop, with a 30 per cent discount for orders of 10 or more. His range includes some moulded from Tornado Presswood originals (rare) and also a left-hand prop for Carrier use (definitely interesting). At the moment Aldon is offering the following: 7×3 Type – Cox; 7×6 Type – Tornado Presswood; 7×6 Type –

Tornado Nylon; 7×7 Type – MVVS; 7×7 Type – Drazek; 8×8 Type – Tornado Presswood.

'These Kelly props are well made and have nice thin blades as moulded, making for little work in finishing them off. The pitch variation on the de-flashed props is quite small meaning that a pitch gauge is not essential to aid finishing. I was particularly impressed by the two Goodyear props, however the two FAI team race props are rather old fashioned by present-day standards. For those who reckoned that the Tornado Presswood 8×8 was the 'B' prop, the Kelly GFRP copy is a most faithful reproduction. Definitely worth a try!' Write to Aldon (enclosing an International Reply Coupon, of course) for more details as he is currently developing new props for Goodyear and FAI team race.

* * *

Ron Tribe can now supply lightweight (approx. 1oz. per square yard) glass fibre cloth, ideal for covering team racer wings, etc. Note that this is NOT a tissue, but a very fine woven cloth, which readily 'wets out' with a polyester or epoxy resin. Price is 40p per square yard, or £1·00 for 3 square yards, inclusive of postage – Ron's address is 87 Spurrell Ave., Bexley, Kent DA5 2EX.

AMERICAN TASTIES . . .

Been getting hoards of information in the post from the USA so I thought I would bundle it all together!

. . . *Southern California AMA Combat League*

1.	Pete Vitale	7 pts.
2.	Patty Sak	6 pts.
3.	Lorna Samuel	5 pts.

Above is the remains of Jurgen Lenzen's FAI speed ship – and a caution to others from Jurgen. Apparently, this new model proved his fastest yet, when suddenly it broke-up in mid-flight for no apparent reason. Later inspection revealed that the lightweight structure was just not stiff enough to accept the increased speed. Remember that Jurgen is a very experienced, methodical and accurate builder – we wonder what would happen to some models flown in this country should a sudden speed increase be found, such as line groupers would give. Some people are still applying pressure to have groupers permitted in Open speed events – but is it really wise? Above left is Stockport Club member Ian Hutchinson's latest FAI combat wing, powered by an Oliver running on crankcase pressure. A new shape for '75! At left is our columnist's prototype Class 'B' combat machine, powered by an OS40. Note the refuelling syringe on wing tip.

Pretty boring you say? – second and third are WOMEN. If you have flown one of these machines then this becomes remarkable. I am told that Lorna Samuel is a nice 'homely' English girl from Chatham Kent – what an export!

. . . *The OS 40 SR gets better*

Herb Stockton asked Don Jehlik to run-in an OS 40 SR bought by Herb off the shelf from a discount store. Don did so and just for interest put it in his torque cradle and 2·05 HP on 40 per cent nitro was the result – way ahead of any other stock 40 he had seen. When popped in a Rat on two 0·018in. lines it turned 160mph. Incredible!

. . . *Miniature Aircraft Combat Association*

Recently formed to cover the Combat fliers. Besides having lots of info. on AMA Combat, their newsletter (a very good one, too) also covers FAI Combat. If you are interested contact either Bill Allen at 418 Fairmont Drive, Dekalb, Illinois 60115, or Tom Southern at 2207 Paul, Longview, Texas 75601.

Their newsletter costs just $4·00 per year to locals so should be cheapish for us.

. . . *Fantastic speed results in North Carolina*

Just look and ruminate over these handicap speed results achieved at the 1974 Triad, Winston-Salem, 9–10th November, 1974.

			mph	*% record*
1.	Bartley, Garner and Hulf (Thomas 'Ironsides Too' kit with Thomas head)	*Open Jet*	204·00	103·06
2.	Mike Ianglois (Rossi 15 with ST shaft and RV, monoline)	*Senior 2·5cc*	172·34	102·68

Bill Allen's Falcon Goodyear racer is typical US racer. Model was designed by John Kilsdonk, engine an Aldrich-fitted Rossi with special venturi insert and will eventually run on 60–65 per cent nitro-methane. Landing gear is titanium, made by Glen Lee. Finished in Hobby Poxy paint, model weighs 21¼oz.

3.	Mike Ianglois ('Super Burb' with Thomas type head)	*Senior Jet*	204·93	101·26
4.	Frank Garzon (OPS 60 with mini-pipe)	*Open 10cc*	200·37	100·00
5.	Tom Roman (OPS 60 with mini-pipe)	*Open 10cc*	191·62	95·63

Unlucky were Bill Garner who hit 176mph in practice in Open 2·5cc with a Rossi 15 using a ST shaft and RV (monoline, of course) but could *only* do 171mph in the contest, and fifth place Tom Roman, who hit 200 mph just a week or two before with his mini-piped OPS 60.

. . . Goodyear Rossi's get too good

In desperation, the Californians are starting to run a non-Rossi Goodyear event so that the majority who don't have Rossi's have a chance. An impressive list of 160 lap (10 mile) 3-stop Goodyear final times is emerging with the 'norm' being around the 6:30 mark and the fastest ever at 6:09, all using Rossi's with airspeeds in excess of 115mph. If you think about it, our Goodyear records look lame indeed.

. . . Groupers swan-song?

Someone way out West put a set of grouped lines on his 'cooking' Rat Racer (only 150mph usually) and scared himself silly with a speed jump to 165mph. Fortunately for all, the AMA has now banned groupers.

* * *

Thanks to B. B. Brown, Jr., Bill 'Moose' Allen and Charlie Johnson for tit-bits. I hope to be able to publish more bits of tasty news in future editions so keep the info. flowing, please!

If any one of my readers wishes to swap a Bugl for an Aldrich Goodyear Rossi, then I can arrange this. Come on! someone must have a spare Bugl; I want to see a proper Goodyear Rossi in the air. The 115mph version that is, not the pallid 105mph ones everyone is whispering about here in the UK!

THE 1975 AUSTRALIAN NATS.

The Aussies run the sort of Nats you might expect for Aussies, i.e. all-in competitive fun! Their 28th Annual Nats was, this time, held at Camden, New South Wales, with temperatures in the 35–40°C range and humidities varying from 65–85 per cent; conditions very strange to us compounded by the very fact that they fly everything over grass *including* speed and team racing. Remember this when you look at the results.

With 15 C/L events being run, space does not permit coverage of them all so I concentrate on events we know.

Stunt

With 27 entries, this was a highly competitive event where big models predominated, as the following data shows:

	Motor	*Prop*	*Wt.*	*Wing area*	*Span*	*Lines*
1. J. Tidey	*Merco 35*	11 x 5in.	46oz.	644sq.in.	57in.	63ft.
2. R. Towell	*Fox 40*	11 x 5in.	53oz.	660sq.in.	60in.	67ft.
3. P. Turner	*Fox 40*	11 x 5in.	47oz.	553sq.in.	60in.	60ft.
4. D. Harlow	*Fox 40*	10 x 6in.	56oz.	760sq.in.	62in.	65ft.
5. P. White	*Enya 45*	11 x 6in.	63oz.	750sq.in.	63in.	65ft.

FAI Team Race

It seems that Australian grass must be hard stuff, as the top times recorded were quite respectable.

	Best Heat	*Semi*	*Final*
1. Oddy/Reichardt (NSW)	4:54·6	4:52·8	10:19·5
2. Herron/Boughton (Vic)	5:00·4	4:58·6	10:21·2
3. Kerr/Shing (NSW)	4:59·0	5:04·4	10:40·2

The reasons became more obvious when we look at the model data, Oddy/Reichardt used a Bugl 15 and Bartels 'Baumgartner' prop to get around 87mph for 40 laps with an 18oz. model and Kerr/Shing used a Bartels Drazet prop to get over 90mph from their Bugl at less range. Both Bugls were not starting too well which probably let in Herron/Boughton's much modified Super-Tigre G15 RV-D installed in a 17oz. model.

A lot of motor work seems to be going on with converted KB's and Taipan TBR's showing promise, especially a converted Taipan which showed 90mph for 36 laps in practice.

Goodyear

Flown to AMA rules, this the first running of Goodyear at the Aussie Nats, attracted 20 entries – all brave men to use two wheel undercarts on grass! Strange that only four *Arganders* were in the entry and but one *Ginny*; not a single MVVS diesel either.

		Heat	*Final*	*Model*	*Motor*
1. Keogh/Tilley	(NSW)	4:04	8:42	*Buster*	G20/15D
2. Rossi/Cunningham	(NSW)	4:34	10:54	*Argander*	G20/15D
3. Liddicut/Simon	(Vic.)	4:09	11:03	*Buster*	G15/FI
4. Millen/Geolan	(NSW)	4:57	45 laps	*La Jolita*	G20/15D

A selection of glassfibre props. from Aldon Kelly. Props. are nicely moulded with their blades requiring a minimum of finishing. Hubs have metal bush moulded in place to accept crankshaft.

Speed

Sixteen entered FAI, but only seven recorded speeds (a well-known story). All of the front runners used Rossi's, the third place man using the F/F version without pipe! The winner used a pen-bladder plus a centrifugal switch whereas the rest used metal tanks in the normal style. The winner also USED GROUPERS (bad lad!) to set up this new Australian record.

1. B. Treagus	(Vic.)	Rossi 15 (piped)	136·86mph
2. B. Esther	(NSW)	Rossi 15 (piped)	121·99mph
3. G. Evans	(NSW)	Rossi 15 (normal)	113·22mph

Even fewer flew 5cc speed (seven) and this event was troubled with busting bladders possibly due to the prevailing 42°C temperature (108°FI). The winner used a DJS 29 on pipe and got in just one decent run. 10cc speed was similarly poorly supported with only six competitors, but the ST60 ABC men get their 'mini-pipes' working well as the results show.

1. J. Reichardt	(NSW)	150·74mph
2. P. Tilley	(NSW)	143·88mph
3. D. Baird	(NSW)	143·43mph

Third place Julius Reichardt suffered a collapsed piston crown on his G60 ABC which prevented him showing the full potential of his model.

1. A. Keiller	(Vic.)	183·67mph (new record)
2. A. Kerr	(NSW)	177·87mph
3. J. Reichardt	(NSW)	163·79mph

'B' Team Race

Eleven teams flew to the Australian rules (just like our old 'Imperial' rules but with 140 lap heats as well as finals and up to four fliers). One team (Pilgrim/Gapps) pulled a real surprise, a Super Tigre 29 converted to a diesel – one flick starts, too! Not good enough to find a place though, since these went to:

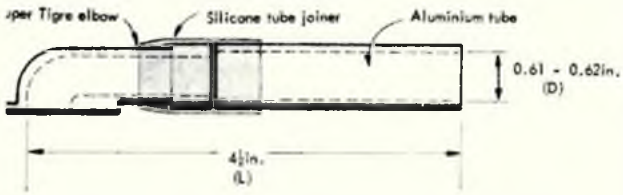
1. Baird/Patsky	(NSW)	7:00·1
2. Tilley	(NSW)	7:38·8
3. Potter/Whyte	(NSW)	DNF

A 'new' design for Goodyear racing – the 'Swee Pea', as originally raced by Art Chester (the full size, that is!). This model is Bill Draper's Oliver-powered version, but the Cooke/Everitt team have a couple powered by HB20s.

MINI-PIPES

The evidence for the mini-pipe is building up slowly: both American and Australian speeds reported above speak volumes for their effectiveness. I do not remember ever seeing one in this country, so I suppose most of us are completely ignorant on this topic!

Some time ago I wrote to George Aldrich asking (cheeky!) for some mini-pipe data and, being the gentleman he is, George supplied the accompanying drawing as being what he recommended for 5cc speed using an ST G21/29 RV.



These dimensions quoted being for the ST, using equal exhaust and transfer dwells at 140° and propped for the 23,500rpm range. George stated that up to a 1,000rpm gain could be made.

I must admit that I have never tried this set-up believing, until recently, that the benefits were *not* worth the effort (i.e. disbelieving the benefits!), but the evidence is now convincing . . . so our new Goodyear has a mini-pipe, and John and I are contemplating one for the 'B'!

It is not too difficult to scale George's data since his quoted length is actually identical (well, nearly) to the exhaust path centre-line distance from the exhaust port in the liner to the end of the pipe, and therefore a general formula can be calculated.

The general tuned pipe formula is:

$$L = \frac{f}{rpm} \times \frac{\text{exhaust dwell}}{360} \text{ (inches)}$$

Working in George's data and simplifying we get:

$$L \text{ (inches)} = 755 \times \frac{\text{exhaust dwell}}{rpm}$$

The diameter (calculated by working back George's data) is given by multiplying the motor displacement by $4{\cdot}52 \pm 2\frac{1}{2}\%$ and making the total pipe volume equal to this. This volume factor ties up pretty closely to the factors used by full-size exhaust system designers, so seems OK.

An example will show how to do the calculations.

10cc speed model (ST G60R ABC)

Motor displacement	=	0·60cu.in.
Exhaust dwell	=	140°
Rpm	=	21,000

$$L = 755 \times \frac{140}{21{,}000} = 5{\cdot}04 \text{ inches}$$

$$D = \left(\frac{4{\cdot}52 \times 0{\cdot}60 \times 4}{pi \times 5{\cdot}04}\right)^{\frac{1}{2}} = 0{\cdot}827 \text{ inches}$$

All that remains is to work out the engineering details and make it work! The engineering is simple enough especially on ST's and all rear exhaust motors.

As I say, I have no experience with mini-pipes, so the formula may well be wrong. However, I suspect that they should be a good guide to start experiments with, and doing some experiments definitely seems to be worth the effort.

From all reports, mini-pipes are nice and easy to use – not at all like the 'proper' tuned pipe. Indeed, the Americans use them on Goodyears, where a hyper-critical needle would make life impossible.

SPEED IN '75 (by Mike Nash de Villiers)

Probably the most important changes for '75 are the 'Lines Ruling' with line groupers being banned, but a handle grouper (as detailed in the April issue) is still legal. Also, no intentional twisting of lines is allowed in the FAI class.

The SMAE have also asked for a new pull-test load of 40g. (40 × model weight), and this is to include the safety strap. Therefore, it is important that *all* two line users have the safety strap anchored in a central position on the handle so that the load applied will be taken equally by both lines.

Well, that's the business part over, now for the flying!

The first big meeting of the year will, of course, be the 'Nats', and what a year it promises to be! We hope again to have the colour of foreign competitors with German, Belgium, Dutch and possibly an American this year. Never before has there been so much interesting machinery about.

In the '60' class we have Martin Radcliffe, Ivor Roffey, Ken Morrisey and possibly Ron Irvine, flying piped OPS 60s, Ken's being George Aldrich tuned. Mike Billington will fly his stretched K4B 40 (45), Ray Cox his new Super Tigre 60, and Brian Blackwell a new Rossi 60 model. In the '40' class there are two or three OPS 40 piped motors, several K4B 40 and my own work HPs. The new Irvine 40 (piped) should also be flown by Martin Radcliffe and very imposing it looks too – another threat in this competitive class.

The '·29' class *must* have a new record this year with the current holder, Brian Jackson, flying his works OPS 29, plus Ian Manders, Brian Blackwell and Dave Smith all using good piped motors.

FAI will be the usual 'Rossi Battle', and I personally do not think anybody is going to catch Ken Morrisey in 'Open'. Do you remember the '74 Nats when Ken's big arm pulled his Alan Lee-Rossi up to 155mph, and then the look on his face when it went on to 162·1mph! A fantastic flight.

THE AEROBATICS SCENES (by Glen Alison)

Ever have tank troubles with your stunt model? I had a particular problem last year with a Fox 35 in a *Stormaker*. The engine would burp and lose power during the high manoeuvres towards the end of the schedule and yet I would still get an over-run when down to level flight. Eventually, the problem was traced to the feed pipe not being covered by the fuel (see *Figure 1*).

The solution was to let the feed pipe go where the fuel was, i.e. make it flexible as in a clunk tank. This cured the fuel pick-up matter but left a leaning-out effect during the run. We know that in conventional tanks this can be prevented by making them 'Uniflo'

FIGURE 1
View from rear of model

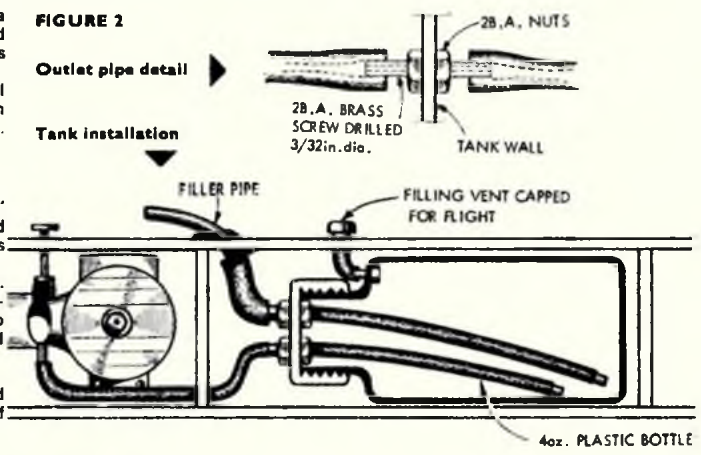
i.e. the air vent is submerged. So, I made a clunk Uniflo *(Figure 2)*, and it worked! Both feed pipe and vent are of equal length and made of silicone fuel tubing with a ½in. length of copper pipe in each as a weight.

There is also a vent used when filling the tank only and this is blocked off for flight: the flying vent is brought through the side of the fuselage for filling. All the tank exits are made by drilling a $\frac{1}{16}$in. hole through a ½in. length of 2BA brass screw minus its head.

* * *

I have just received details of the range of balsa covered foam wings for stunt models from *Control Specialists*, USA. Sections of the foam are hollowed out after the balsa is applied to make them even lighter and they are available for many standard models – *Nobler, Shark, Skylark*, etc. I shall be receiving one shortly for a full review; they make short work of a new stunt model, with the added advantage of a guaranteed true warp-proof wing.

FIGURE 2



GOLDEN WINGS AEROMODELLER MODEL CLUB

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

Nationals 1975

In the April issue, we gave further details of the *Junior Kit* event to be held at the British National Championships over the Spring Bank Holiday. However, control line enthusiasts have not been forgotton – 'Pop' and Frank Warburton Jnr. have again generously offered to donate a trophy for a *Junior Stunt* event, and Bob Walker has agreed to act as Contest Organiser – although, no doubt, he would appreciate some help in judging. . . .

The competition, which will be held on Monday, 26th May, and will be run to the following rules – which are the same as for 1974, except that it cannot be *guaranteed* that each competitor will have two flights, as in previous years. See *Rule 3* for details:

1. *No model or engine size restriction. Model must withstand a 10G pull test (i.e. ten times weight of the model), and may be flown on lines up to 60ft. (max.)*
2. *Event will be held over grass, so any launching method may be used – wheels are not necessary.*
3. *All competitors will be allowed at least one flight. The number of competitors allowed a second flight will be at the discretion of the organisers, bearing in mind the time available and first flight performance. The winner will have the best* single *flight score.*
4. *Manoeuvres (a) Four laps level flight, K = 2. (b) Wingover, K = 4. (c) Three consecutive loops, K = 1, 2 and 3. (d) Four laps inverted flight, K = 4. (e) Three outside loops, K = 1, 2 and 3. (f) Horizontal eight, K = 4. (g) Vertical eight, K = 5. (h) Overhead eight, K = 5. Each manoeuvre is marked out of 10, then is multiplied by the K or 'difficulty' factor.*
5. *No take-off or landing points will be awarded. Five minutes is allowed for the schedule, including time for two full laps between each manoeuvre.*
6. *Points will be awarded for quality of building and finish, with K factor of 5.*
7. *A handicap system will be used, based on the age of the competitor, who must be under 17 years old on the day of the contest. A competitor's score will be increased by 10% for each year that he is below 17 – i.e. a 13-year-old has 40% of his score added on.*
8. *Flying wing (combat) model flyers count as two years older for handicap purposes – i.e. a 16-year-old has 10% of his score deducted.*

(Note – Manoeuvres, etc., are marked out of 10, then multiplied by the K (or difficulty) factor. Thus, a horizontal eight worth 5 out of 10 is given 25 points).

Entry to the competition is free, but competitors must have proof of third-party insurance cover for model aircraft flying (such as is provided by the MAP insurance scheme). The contest will be located near the other control line event, but on the grassed area, and entries will be accepted up until 2pm. Don't be afraid to enter – it's all in fun, and you may surprise yourself, too . . . and remember that the trophy is a *permanent* one – the winner does not have to return it in the future. Remember the venue (RAF Finningley, Nr. Doncaster, Yorks), the date (Monday, 26th May) and the time (from 2pm – but come and practise fly as early as you like!).

● ● ● ● ● ●

BEEN PRACTISING the 'wingover' described in the April issue? Are the 'corners' nice and sharp with the climb and dive portions at 90° to the ground and the model passing directly overhead? Do you start and finish the manoeuvre at the same height? Of course not! If it were that easy, there would be no fun in stunt flying; but as long as you can handle your 'plane confidently and the wingover is at least *recognisable*, then you are ready to move on to the next step!

Inside Loops

Actually, the chances are that some of your wingovers will, in fact, have looked more like loops than was intended. Everyone knows what a loop looks like (note: **not** 'looping the loop', please!), so let's just describe how to fly one.

Keep the model at a 'safe' height – i.e. around 10–15ft. – for a few laps. Then, when on the down-wind side of the circle, apply full 'up' elevator quite suddenly. The model will rise sharply – too sharply – so slacken off the control a little to 'widen' the loop. As the model turns over on its back, increase the 'up' control to recover to normal flight. Probably, your first few attempts will resemble the first diagram – or the manoeuvre will be even less recognisable as you pull out to level flight again. Remedy is to fight your natural instincts, and do not just apply full-up elevator. This simply causes the 'plane to lose speed and stall, or 'mush', rather than loop. As you practise, deliberately try 'flying' around a loop. Start with a fair amount of 'up', then slacken off as the nose rises. Increase it a little to make it turn on its back, then slacken off. Increase to 'pull it round', then slacken off as you head towards the ground. Finally, add more 'up' to recover to normal flight. In effect, you have to 'saw' your way through a loop to make it nice and rounded.

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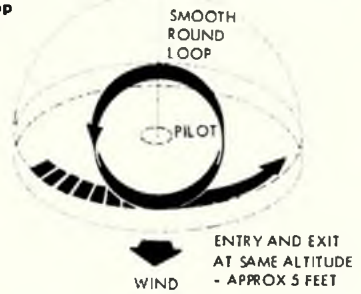
Sounds worse than it is – just go out and try it. The only 'golden rules' are *(a)* keep to the downwind side of the circle and *(b)* avoid jerking your wrist and over-controlling when flying. Incidentally, do not worry about twists in your control lines – they will not affect control unless you do *lots* and *lots* of loops! However, after every flight, do untwist them carefully by turning the handle in the opposite direction – not by running a finger between the lines, this will just curl them and make them useless.

Eventually, your loops should resemble that shown in the second diagram. When they do, try doing two consecutive loops, one 'on top' of another, but do make sure that the loops are big and smooth (the angle of the control lines when at the top of the loop should be 45°) to avoid killing off the speed of the model – you will need it for the second, or third, or fourth loop. . . .

First attempts

'Perfect' loop



Dear John Bridge,

I am between 10 and 16 years of age and would like to become a member of the 'Golden Wings Club'. With this application I enclose postal order (International Money Order) for 25p to cover cost of the enamel club badge, two coloured transfers and membership card.

NAME IN FULL.....

ADDRESS.....

.....

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

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

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

5/75 15p in the £1 Rebate plan purchase coupon for Golden Wing Members G. W. No. ____

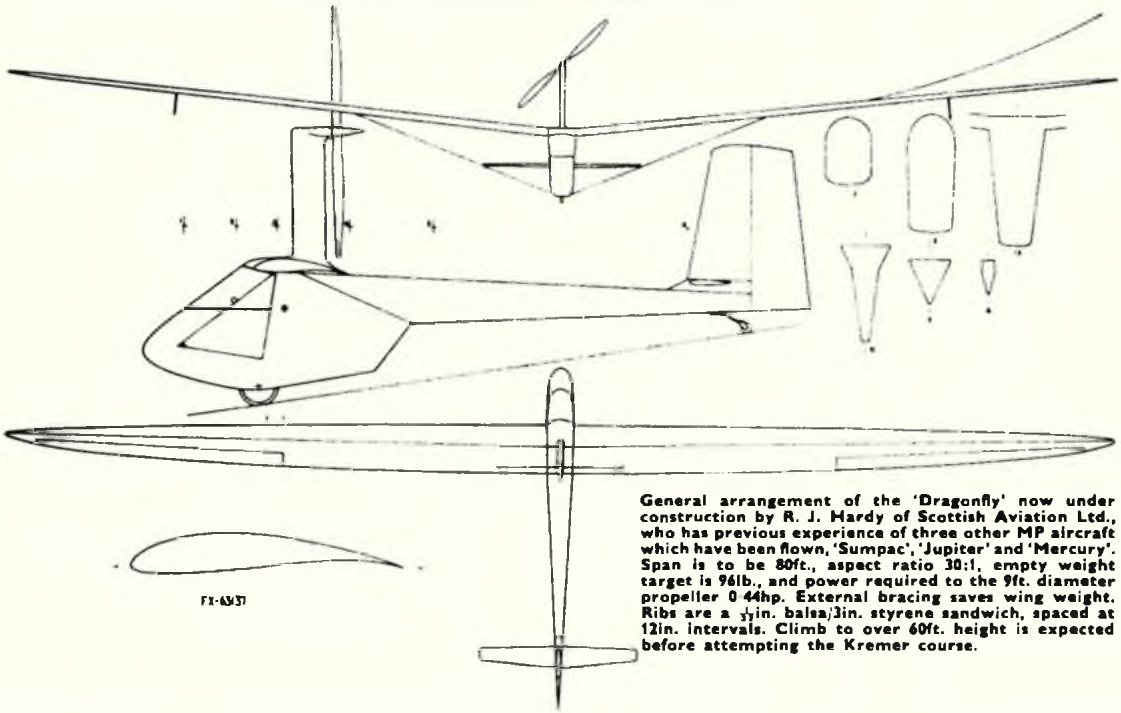
Peter Wright of Melton Mowbray is completing his second MP aircraft which, like his first, employs carbon fibre-reinforced epoxy extensively. In fact, the 'Micron' is almost all plastic and has been produced in moulds so that others can be made later. Aspect ratio is 'over 40:1', and the vee-tail has butterfly rudder-vator controls. The 'Micron' will have a 9ft. diameter propellar and what promises to be high efficiency performance from the narrowest wing yet seen on a man-powered aircraft. The whole design and construction has been a solo effort and included making the scale test model which Peter is seen holding at the Royal Aeronautical Society Symposium.

PROGRESS WITH MAN POWERED FLIGHT . . . . . .

£50,000 IS STILL waiting to be won by the first officially observed man-powered flight around the now legendary figure-of-eight course for the Kremer prize. Despite many serious attempts which have been made in the UK over the past 20 years, by a range of designs from simple to super-sophisticated, the challenge remains, and it's still possible to start afresh with a new project, as witness the Wright *Micron* and Hardy *Dragonfly* on this page.

These were two of the new designs revealed at the first symposium on MPF held by the Royal Aeronautical Society on 10th February. Over 150 keen enthusiasts took part in this day-long series of eight lectures, among them 11 people at least, who have flown man-powered aircraft, including Franz Villinger and Cdte. Maurice Hurel, who came specially from Germany and France. As is usual at such inspiring seminars, the cross-talk arising from questions out of the audience was just as fascinating as the well-delivered lectures. Many aero-modellers were prominent in the discussions, and it was clear that practical experience in working with balsa plus an appreciation of the problems of slow-speed flight are a pre-requisite for success.

Further information on the contest for the Kremer prize, and copies of the papers read at the symposium, can be obtained through the Secretary, MPA Group, The Royal Aeronautical Society, 4 Hamilton Place, London W1V 0BQ.



General arrangement of the 'Dragonfly' now under construction by R. J. Hardy of Scottish Aviation Ltd., who has previous experience of three other MP aircraft which have been flown, 'Sumpac', 'Jupiter' and 'Mercury'. Span is to be 80ft., aspect ratio 30:1, empty weight target is 96lb., and power required to the 9ft. diameter propeller 0·44hp. External bracing saves wing weight. Ribs are a $\frac{1}{32}$in. balsa/3in. styrene sandwich, spaced at 12in. intervals. Climb to over 60ft. height is expected before attempting the Kremer course.

CLUB NEWS

AT THE TIME of writing this we seem to have emerged (hopefully) from that long battering spell of perpetually windy weather into somewhat more stable conditions. And what a treat it is to watch your model circling calmly overhead instead of away in the turbulent distance. The heavy, high-powered radio model may cope quite well with a blustery breeze, and even the control-line model holds its own, but the real joy of free flight, whether contest, scale or sport, comes when the air is calm, or with just a modicum of drift.

More evidence of the good publicity value of these columns is given in a short report we have received from Arthur Lloyd, the secretary of the **South Essex MAC**. He informs us that the club has acquired several new members as a result of our write-up in the last issue. PROs please note! However, when it comes to flying, Mr Lloyd has some stiff competition in the family, for his wife is a keen falconer. This sport has a lot in common with model flying, and Mrs Lloyd is to demonstrate to the helicopter-minded club what the hovering business is all about; her buzzard and kestrel chicks are to do a spot of tactical flying around the clubroom. Finding the bird in hand has pushed his light under a bushel, as it were, Mr Lloyd came blazing back with a 'Sam the Flying Flea' rubber-powered helicopter. It rocked the radio 'chopper' boys back on their well-heeled heels, particularly as it cost a mere 20p as opposed to 200 quid. And it flew.

The aeromodelling zealot is often torn between his need to build models and his desire to serve the cause as an organisation man. Bill Draper of the **Nottingham MAC** is no exception. According to PRO Ted Hewitt, Bill has put duty before the balsa knife by serving most effectively on the club committee, but this year is for him a sabbatical one in which he will strive to replace those two famous Kittyhawks he haplessly crunched. A suitable successor, however, forthcoming from the wealth of membership – fifty in all, we are told. And there is other wealth around, too, for the club kitty is brimming over with some three hundred quid. Members have contending ideas on how to use this sumptious sum – certainly it would seem better to spend it than allow it to devaluate. What is not devaluating is members' keenness in SMAE C/L events. In Combat the *Archers* team got a fourth at Amsterdam with Martin Fox, and a first at Elvington from David Williams. Hopes are set, too, upon the Goodyear teams: Bill Draper/Mick Chapman and Robin Woodhead/David Walker. Success hinges much on just how the mechanical pulling devices are specially breathed upon, and people have their differing ideas, but at least the Bill Draper approach has much to commend it for he has already wrung 90mph from his PAW, powered 24oz. Ginny.

New in this year's club contest calendar is a Junior Stunt and Junior Mouse race. Open to any Junior in the area, and youthful enthusiasts are asked to get in touch with Ted Hewitt by phoning Nottingham 264782 or by dropping in at the clubroom at the Russell Youth Club, Lowdham Street, Notts., any Tuesday evening.

Sittingbourne and district MAC seem to be sitting pretty for 1975, according to the *Bourne Flyer*. They have cheap fuel, an excellent flying field and good company. Moreover, they can boast quite a reasonable line in club fees. The general feeling of buoyancy owes much to the coming of spring, and, with the lambing season almost upon us, members are asked to observe the old Bach dictum of '*The Sheep May Safely Graze*' rather than grazing the sheep with their models. Intent on putting that fine flying site to full use, the committee have worked out a pretty full contest calendar for the year, with at least one event per month; the grand finale to be the Unorthodox Comp in December. Certainly the last one brought out the members in full inventive cry, particularly the Juniors. Sad to say, most of their weird and wonderful devices proved to be flights of fancy rather than of actuality. Well down the list was a flying(?) toilet seat, which should have been good for a couple of rolls, but was next to bottom. However, a thing called a wingless windbag did, surprisingly, fly. The prize was shared between a flexi-wing that thrashed itself to death, and a very convincing flying fish – highly suited to the weather.

The **Cheltenham MAC** newsletter urges its members to come along to the area days that have been calendared at some of the fine venues they have in the western area. One such venue is RAF Little Rissington. This is a big, big field in which you can comfortably max out without getting countrified. It gives occasion for the sport flyer, as well as the contest fiend, to spread his wings. He can make some really long flights, get a close-up view of some fine models in action, and see, at first hand, how the experts do it. He might, for instance, get a glimpse of how a Coupe D'Hiver model should be handled – a particular club interest since Hon. Sec. Ron Coleman proposes to run a world-wide international postal event for these models. Suggested here that the Coupe is a good trainer for Wakefield. We look forward to more news of this event.

Well, the saga of Croydon Airfield in war and peace goes crackling on in the pages of the **Three Kings'** *Court Circular*. We are now at the end of World War I, and the airfield is heaped with left-over war planes. These were sold off to the public at bargain prices. Anyone who bought a plane for £2 – the price at which they were offered – would find it to have appreciated quite a bit in value over the years. Thinks: nowadays they would still be on the secret list. The war being over ended one trying period, and another trying period, hopefully over, is that long spell of nasty weather which destroyed much of the last flying season. Already there is quite a bit of dry-looking activity on the Croydon patch, mostly of the Goodyear and sport type, although some serious stunt work has been put in. Oddest-looking model to be seen is Albert Briggs' *Trainer*. It is, in fact, a flying test bed. It has a massive sprung undercart and a motor mount that will take any size engine. It is particularly useful for running in.

The AGM of the **Whitefield MAC** revealed a membership of 49, of which 14 are Juniors. Interests are across the board: F/F, C/L and R/C. The annual subscription fee is a modest £2·50 for Seniors. This includes a 75p insurance factor but not, of course, SMAE membership. Even so, members are urged to give their support to the Society, for no better reason than it is the safeguard nationally against the many factions that threaten our flying facilities. But such facilities must be fought for at local level, too, and this the Whitefield club seems to be doing most successfully. Permits are now obtainable for flying at two nearby sites. The times of use: 9am to 7pm appear quite reasonable. The other principle condition of use is that engines must be adequately muffled.

Quite a hive of modelling activity the **East Anglian** area, for listed in it's newsletter are no less than 18 member clubs. The 450 Society members contained therein can display quite a wealth of radio equipment, for the club list includes several big radio groups. Not that free flight goes unsung in the area: Norwich and Anglia are names that feature quite prominently on the National scoreboards. Naturally, there are many more clubs and individuals in the area who could benefit from membership, and a particular benefit is the many contests and fly-in's laid on by the area at the fine sites available. One such was the R/C fly-in held at RAF Watton back in January. This was run by the Waveney club, who had the task of looking after some 49 transmitters in the compound, the operative media for a quite breathtaking array of models, with some outstanding examples of aeromodelling art like the *Whirlwind* and *362 Delta*.

Brian Sherman writes to inform us that the **Dumfries MAC** has been re-formed. This is the third time the club has been re-constituted in its thirty year history, but this new start looks quite promising, for members have a permanent clubroom, something which the previous clubs lacked, and a disused airfield – complete with tarmac runways – as a flying field. Brian Sherman, who is the PRO, stresses that no 'class snobbery' exists in the new club and it is rather a matter of hob-nobbery between they who fly buttoned and those less inhibited. In fact, a free-flighter who referred to a radio model as a toy had to apologise under threat of a swift trampling over of his rubber job. All interests then, to be found congenially together every Wednesday evening at the Gracefield Art Centre.

I, personally, have never come into contact with a club with its own premises; usually I am chilled to the marrow in some grotty church hall, or smoked like a kipper in some noisy pub room, so all credit to the **Maidenhead Model Makers Club** for the wonderful facilities it offers its members: building tables, rtp equipment, and an indoor pool – not for swimming though, but for model boats. In addition there is a six-lane slot track for car fans. A further indoor amenity is the use of a local warehouse for indoor flying. A lecture from top indoor man, Laurie Barr, stimulated interest in this branch of modelling, and now everything from *Sleek Streaks* to microfilm models are brushing the rafters. No mention here of outdoor flying sites except for a small chuckie and Combat one, but there's plenty doing, it seems. The chuck glider team is already well known at the major comp venues, and honours in F/F and C/L are looked for at this year's Nationals. Transport has already been arranged and the members will proclaim themselves by the club's new sew-on badges. New members welcome. The club meets every Friday at 8pm at The Model Club, off Cookham Road, Holmanleaze, Maidenhead. Report from PRO Alan Sopp.

The speciality of the **North Cheshire Radio Model Group**, according to secretary R. Wilson, is the Radio Training School they have set up. This has already launched a number of beginners on to successful modelling careers without the anguish of the usual crash course. Any model flyer in the North Cheshire area who wants help – engine-, model- or radio-wise – is invited to join the School. A phone call to Mr Wilson at 061 368 9621 will put you in the picture. Local modellers also look out for the club's Fly for Fun event at Hadfield School, Hadfield, nr Glossop, Derby, on 1st June. Everything laid on: catering, car parks, toilets, etc. Again, phone Mr Wilson for particulars.

Your reports and newsletters welcome.

Clubman.

Contest Calendar

4th May	**SMAE 2nd AREA CENTRALISED MEET.** FAI power, open R/G. Area venues.
4th May	**THREE KINGS OPEN C/L RALLY.** Stunt scale, carrier. Silencers essential. Venue: Croydon Airport. All cars to be parked in Imperial Way.
4th May	**DONINGTON PARK C/L MEET.** Stunt, carrier Class II scale, combat. At Donington Park.
10th May	**SAA R/C MEET.** FAI aerobatics, fun events. At Bent Playing Fields Hamilton, Scotland.
11th May	**SAA COMPETITION.** R/C Class II scale, fun events, C/L combat, scale. Venue: as above. Cups and prize money for all events.
11th May	**WOLVES C/L FLY-IN.** Class II scale, stunt, carrier, combat and 'Australian Rat' to Whitfield Club rules. Silencers essential. Refreshments available. Details: J. Mysaka, 41 Fairview Road, Wednesfield, Wolverhampton. Tel: Wolverhampton 737524. Venue: Aerospace Ltd. Playing Field, Fordhouses, Wolverhampton.
11th May	**NORTH BERKS THERMAL SOARING.** Send 40p + sae to T. Franks, 54 Queensway, Didcot, Oxen.
18th May	**SMAE INDOOR MEET.** Open microfilm. At Cardington, Bedfordshire.
24–26th May	**BRITISH NATIONAL CHAMPIONSHIPS.** At RAF Finningley, nr. Doncaster, Yorkshire.
1st June	**SMAE INDOOR MEET.** General indoor fly-in. At Cardington.
1st June	**FELTHAM C/L RALLY.** FAI, Goodyear, combat. At Charville Lane, Hayes, Middx.
8th June (Saturday)	**BURNS BROWN COMBAT MEET.** For Burns Brown Trophy, plus good cash prizes! Pre-entry (35p) essential to P. Rabjohn, 47 Hillyfields, Dunstable, Bedfordshire. Venue: RAF Halton, nr. Aylesbury, Bucks.

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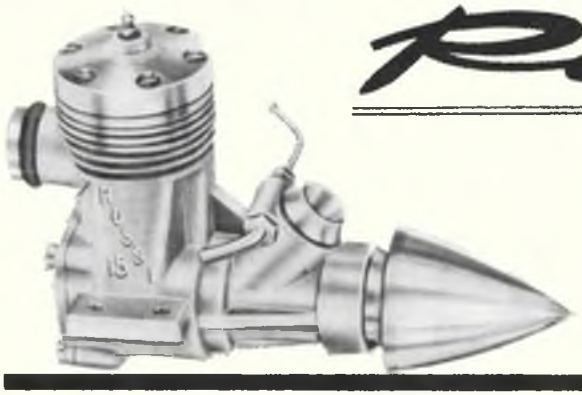

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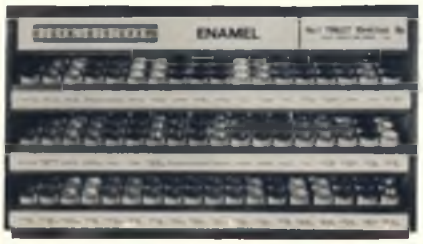

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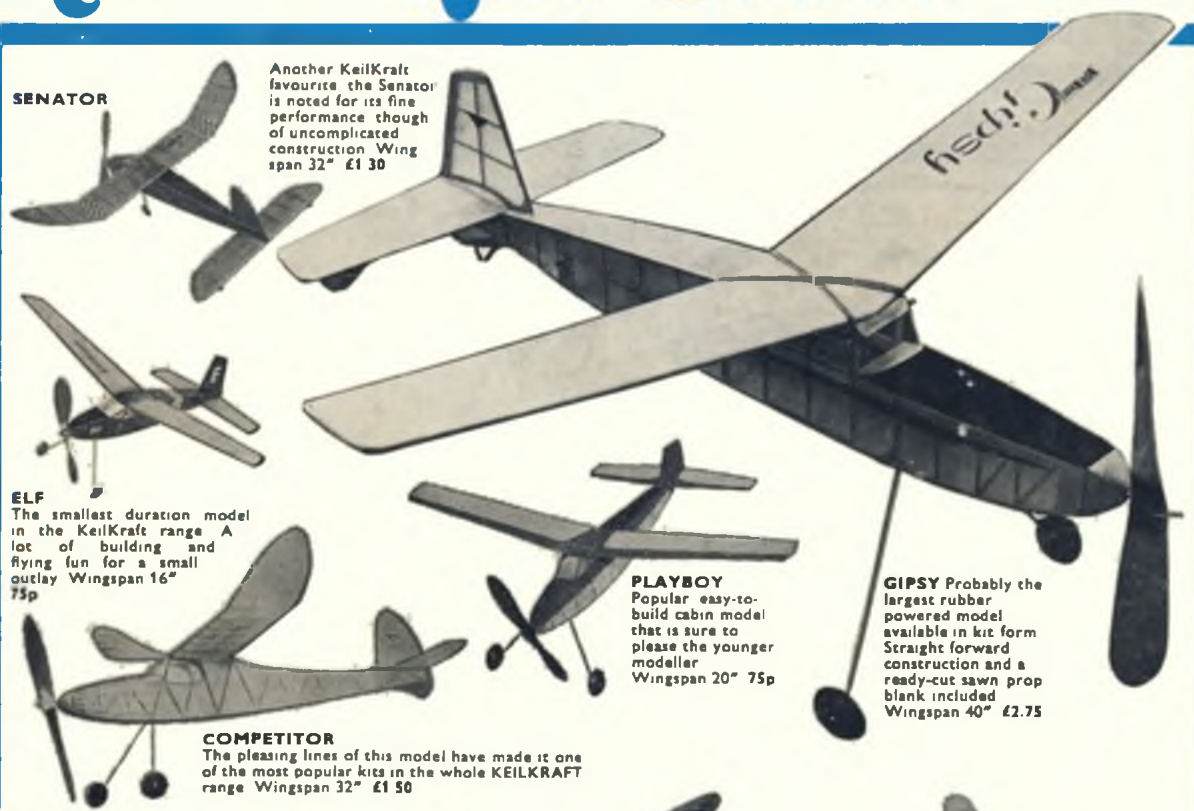

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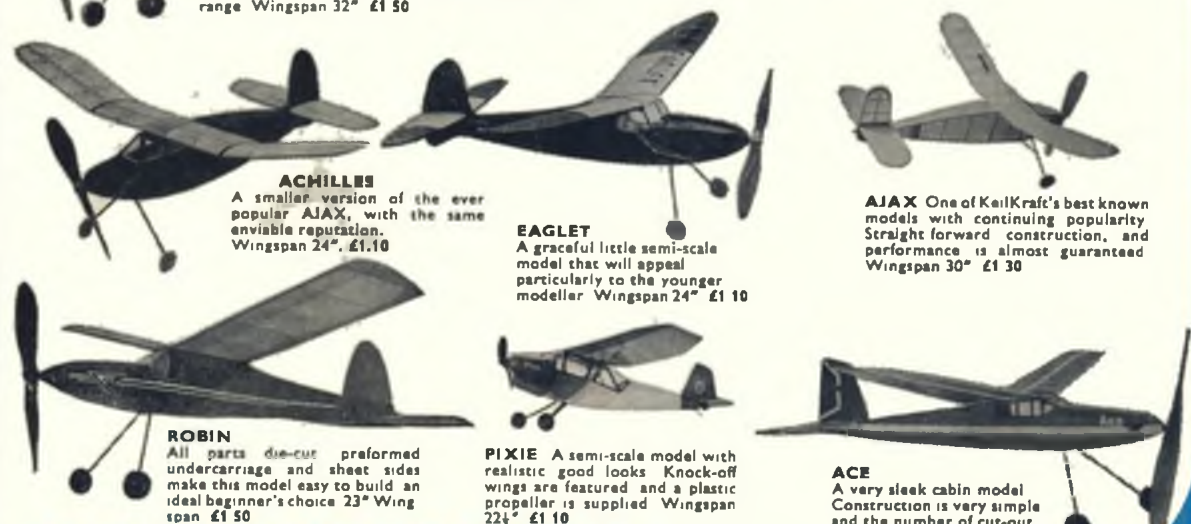

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ALL OTHER PARTS, BALSA
WIRE REAR MOTOR PEG

FILL BOTTOM TOP DECKING 1/32 SHEET BALSA

WING RIB SECTIONS
ROOT RIBS 1/16 THICK
ALL OTHERS 1/32 THICK

FILL BOTTOM WITH 1/16 SHEET

PLASTIC PROPELLER

PLASTIC TUBE AROUND COCKPIT EDGE

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