

Aero Modeller

JULY 1977 35p
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MAGAZINE



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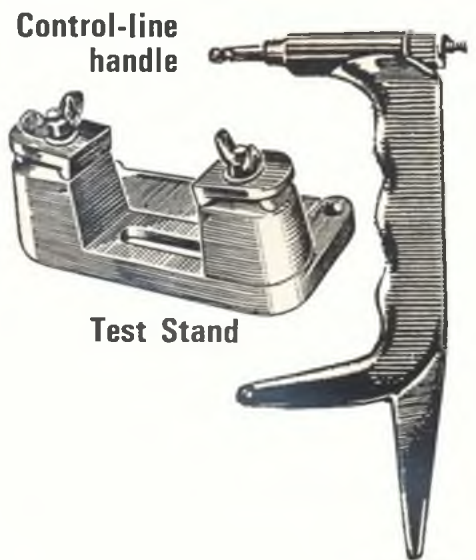
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The power? Well, we were thinking of twin CO₂ motors with the gas tanks in the nacelles. And really lightweight construction, of course, to keep the airframe weight right down. Not an easy model to design or build, but it would work out.

If you want to play it more safely, control line (or radio control) would be the answer—when you would need a much larger model. Or to stick to a small model, electric powered RTP (when you could use all-sheet construction). Four different possibilities. All demanding balsa airframes. Using the *best* balsa, of course, to which particular question there is one simple answer. Solarbo Balsa every time!

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Aero Modeller

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MODEL AIRCRAFT

July 1977
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Vic Smeed bids farewell

This month marks the departure from MAP of someone who has been infinitely more than a friend and colleague over the past 24 years. Vic Smeed has done so much to promote the modelling scene in all spheres that



there can be hardly a single enthusiast in the land who has not benefited from his talents. When he joined the team he was already well known for the 'Especially for the Beginner' series. This ran to no less than 35 parts, introducing those classic designs *Tomboy* and *Electra*, which joined *Ethereal Lady*, *Debutante*, *Popsie*, *Pushy Cat*, *Mamselle*, *Madcap* etc and set so many aeromodellers on their way to successful free-flight sport. He won the Queen's Cup (above) and the Bowden Trophy, established the *AeroModeller* Golden Wings scheme with the glider of the same name and through *Paageboy*, introduced a sporting version of the payload contest. With the growth of model yacht and powerboat interests, Vic moved from the air to water as he continued his prolific output of designs, first in *Model Maker* and then with our company move to Hemel Hempstead, in the launch of *Model Boats*. Now he leaves to do his own thing after years of directing our nautical helm, though staying in close contact as consultant. We're sure that all who've ever had the pleasure of building a 'V.E.S.' design will join us in wishing him all success.

on the cover

James R. Spurgeon, past President of the U.S. National Glider Association, displays his model of a John J. Montgomery hang glider against the backcloth of a Californian sky. Photo by Bill Hannan.

next month

Plans for a very straightforward Wakefield - but one that secured a place in the 1977 British team for its designer Brian Kenny. Background story on the models and team who flew before the Soccer Cup Final match at Wembley stadium. News and views on varied aeromodelling topics - all in the August issue, on sale 15th July. Don't miss it!

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Model Boats Extra—



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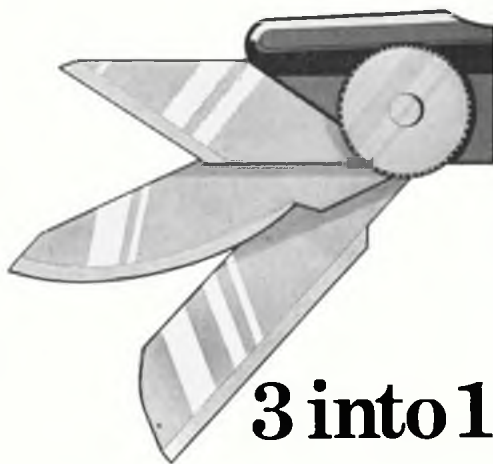
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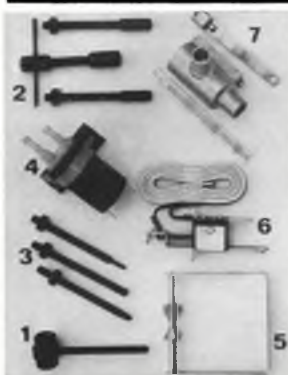
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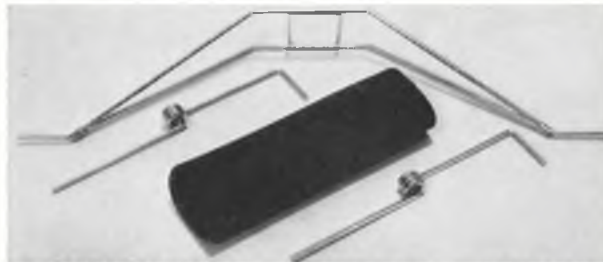
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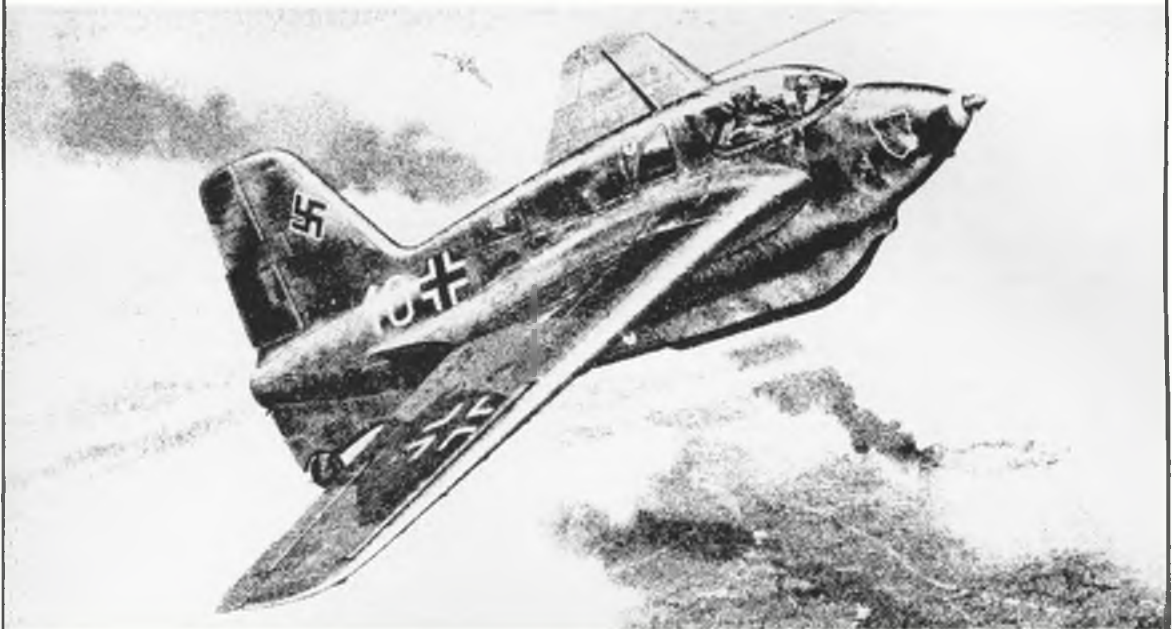
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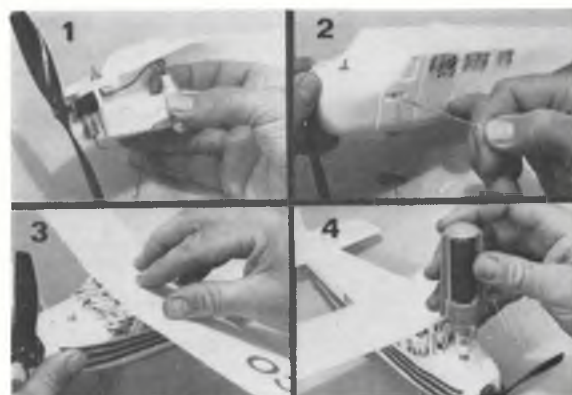
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"THE LARGEST Model Centre in Europe", that is the proud claim made by Hamleys of London, the world famous toy shop, when they recently opened their new model department in Welbeck Street, just a short distance from the renowned Oxford Street shopping area. With a total floor space of 5,000 square feet this West End emporium is devoted to all forms of modelling from plastics, militaria, railways and boats to aeromodelling: stocking full R/C equipment, balsa, fuel, adhesives and accessories. Conveniently located opposite a multi-storey car park, this venture by a large corporation (Debenhams are the parent company) confirms a growing trend in model retailing. It is also pleasing to note that Hamleys have gone to the trouble of recruiting experienced modellers to staff this model centre.

NATIONALS 1977. As previously announced, this year's Championships will be spread over a full five days, providing an ideal opportunity for competitors to show their skills, for newcomers to learn more about the sport and for old friends to renew acquaintances.

To ensure that all those attending Europe's largest (there's that phrase again!) model flying event enjoy their visit to the fullest, the SMAE will be providing a wide range of additional services. For example, the camp site will feature a 24-hour control and information service, a creche facility, security patrols and daily deliveries of basic groceries, while a licensed bar, trade stands, snack bars, ice-cream stands will be available on the airfield itself.

The Championships will be divided into two separate weekends. First on 20/21st August will be the Free Flight events (both FAI and Open classes of rubber, glider and power plus A/I glider, 1/4A power, Coupe d'Hiver, hand-launched glider, vintage, tail-less, Women's Cup, Frog Junior Trophy, scale and Junior kit) as well as Radio Control gliders (Open thermal soaring, FAI thermal soaring and 100in. span class).

The following three-day weekend of 27/29th August will see Radio Control events for aerobatics, pylon racing and scale, plus Control Line contests for aerobatics, 1/4A, FAI, Class B and Goodyear team racing, combat, carrier, speed, scale, novice/Junior stunt and Mini Goodyear.

Venue for these action packed days



The new mayor of the town of Sudbury in Suffolk is Fred Taylor, pictured above with his wife and his control line Mercury Monarch stunter. A member of the Sudbury Model Flying Club, His Worship will be able to do much to improve the image of the sport in that area. Photo courtesy of the East Anglian Daily Times.

will be RAF Little Rissington which lies some 8 miles NNW of Burford, Gloucestershire.

JUNIOR EVENTS. As mentioned above, there will be a number of events for Juniors at this year's Nationals and we have been asked to point out a few rule changes, namely:

1/4A Combat rules as per June 1977 issue *AeroModeller* but line length to be 35 feet.

Junior Kit - Any glider or rubber powered free flight model may be employed provided that it has been built by the contestants from a commercially available kit. The only restriction concerns gliders where the manufacturers stated wingspan must not exceed 50in. The models must also be built according to plan, the only modifications permissible being the addition of a dethermaliser and in the case of gliders, provision of an auto rudder.

Mini Goodyear - The event is to be flown over grass so an undercarriage is now optional. *Either* the mechanic or pilot must be under 16 years of age. Maximum fuel capacity is 10cc and commercial tanks are preferred - as are plain bearing engines of 1.5cc maximum displacement. Line length will be 41ft. 11ins. More details of all these events next month.

DREAM HOLIDAY? Pontins, in association with Model and Allied Publications, are organising a *National Model Makers Festival* to be held at their Brean Sands Holiday Village at Burnham-on-Sea, Somerset. From 15th-22nd October all types of modelling enthusiasts, whether interested in aircraft, boats, cars, militaria, live steam, ships or model engineering are

invited to attend this Festival where among the many attractions are planned competitions, exhibitions, demonstrations, talks and film shows of your favourite pastime. Perhaps the greatest advantage of all is the opportunity to discuss your pet subject with fellow enthusiasts during the day, while always at your convenience are all the well-known Pontins attractions of amusements, self-service restaurants, licensed bars, supermarkets etc. Enjoy yourself and give your family a treat too - every evening there will be dancing and live entertainment for those who desire such activities.

Cost of this Autumn break? Remarkably cheap - the tariff for one self-catering chalet for a whole week is just £26, and that is for up to three persons. A further £6 is charged for each additional person sharing the chalet - to those prices must be added the inevitable VAT. For further details, and a reservation form, write to Pontins Brean Sands Holiday Village, Burnham-on-Sea, Somerset TA8 2RJ. Tel: Brean Down 203.

INTERNATIONAL COMBAT CONTEST to be organised once again by the Alfreton and District MAC will this year take place on 20/21st August at Donington Park, Castle Donington, famous for its racing circuit and museum of motor racing. Entry fee for competitors is £6 (£2.50 for supporters) and this includes a free Saturday evening meal, camping facilities and bar - plus of course, the opportunity to fly in a really well organised event, with truly worthwhile prizes. Details and/or entries available from D. Degg, 31 Stretton Lane, Higham, Nr Alfreton, Derbyshire.



Backwards and sideways

— or, why not build an unorthodox model asks enthusiast Sebastian Robinson?

This 48½ in. span canard uses an engine of around 0.75cc for power

HYSTERON PROTERON

I LIKE unorthodox models. The shape of a tailless model circling overhead (resembling something between a bat and a heraldic dragon), the duck-like flight of a canard with its wings at the back and body stretched out in front like its namesake, the sheer oddity of an annular-wing machine (the impression of an APS *Ace of Diamonds* is so unfamiliar, that at first the eye tries to 'read' it as a biplane); all have a curious attraction, and all raise their own special problems of building and trimming. I long ago recognised my own limitations: too banana-fingered to build scale models, too uncompetitive for contests, too poor for radio (which in any case is magic, and involves selling your soul to the Devil); but free-flight oddities are within my capacity and inclination. This article has two aims: to try and make contact with other builders of unorthodox models, and to describe briefly some lines upon which I have been working.

From what I have observed at the last four Nationals, there is a fair number of modellers who fly for amusement

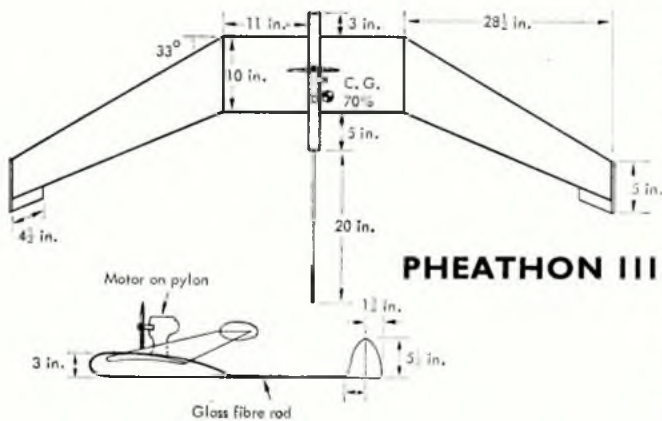
a wide variety of curiosities: *Flying Washboards*, saucers, deltas, *Windbags*, McCutchen machines, *Flying Octagons*, rotorplanes and so on. In proportion to the total number of modellers, though, they are few – and statistically insignificant compared with the customers for plastic kits, multi radio gear and snap-together, fly-tonight prefabrications. How many kit designs for unorthodox models can you name? Because unorthodox enthusiasts are spread so thin over the country, it must be harder for them to make contact with one another, exchange ideas and designs and compare layouts. It has occurred to me that there might be a point in starting an informal corresponding society, whose aim would be to provide a common address to which they could write, and through which they could be put in touch with others of similar interests. This arrangement would not involve anything as formal as a club (though there might possibly be an occasional newsletter) but would be primarily intended to collect and pass on information to those interested. If anyone



FULL SIZE COPIES OF THIS 1/8TH SCALE REPRODUCTION ARE AVAILABLE AS PLAN NO. U1316, PRICE £1.50 (INCLUSIVE OF POSTAGE AND VAT) FROM AERO-MODELLER PLANS SERVICE, PO BOX 35, HEMEL HEMPSTEAD, HERTS HP1 1EE.

Heading picture shows the designer with Hysteron Proteron (which incidentally is Greek for 'back to front') – a good, stable layout despite its unorthodox appearance. At left he compares his design with the Aero-Modeller Plans Service classic 'Ace of Diamonds' – still available as Order No. U707X, price 95p including post. Unconventional craft such as these put the 'fun' back into flying. Can cause quite a stir at the club flying field too!





PHEATHON III

Wing is two piece with one 16swg aluminium vertical tongue and rear 14swg piano wire joiner. Ribs spaced at 1 1/2 in intervals, slotted onto full-depth mainspar with riblets between each pair of ribs. Airfoil at centre section is Isaacson 64009, but Clark Y at tips. Plug-in wing tips. Dihedral (at leading edge) is 2 1/2 in. The fuselage consists of a sheet balsa box with Ronytube A/I size boom - which vibrates in sympathy with the PAW 1.49 mounted on the pylon! All up weight (including repairs!) is 23 1/2 ounces.

thinks the idea of such a group worth taking up, he may like to write to me at: 22 Athole Gardens, Glasgow G12 9BB, Scotland.

My own recent flying has mainly involved tailless and canard designs; the results, while unsystematic, may perhaps suggest some lines of approach.

Tailless

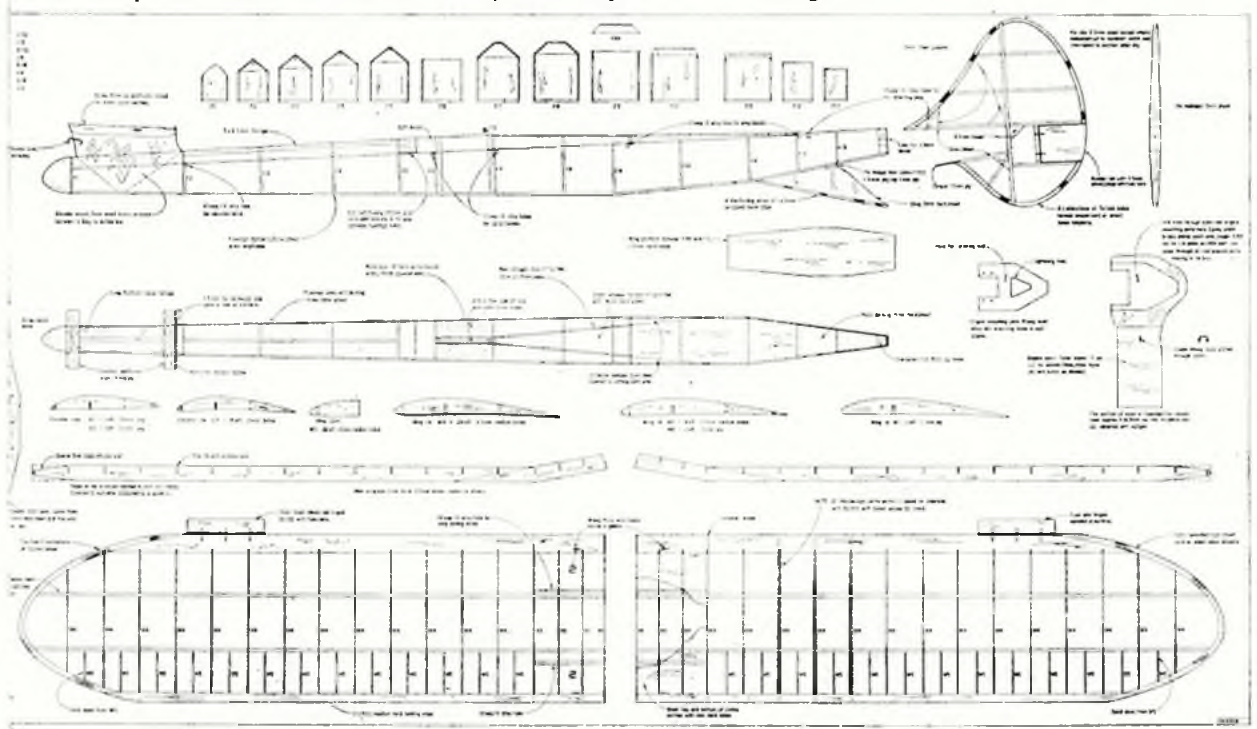
About four years ago I re-read F. C. Smith's *Tailless Creations* published in the January 1955 *AeroModeller*. The main features of the *Southern Cross MFC* layout he originated were a short, flat, very low aspect ratio centre-section with long, tapered and dihedralled tips swept back about 30° at the leading edge, and progressive washout of the tips from 0° at the dihedral break to -10° at the extremity. The latter feature being achieved by blocking up the trailing edge at a constant height above the building board and leaving the taper to provide the increasing twist.

I decided to try this approach on a power model (the *Southern Cross* club designs had all been gliders) and produced *Phaethon Mark I* - the name, like the shape, is a



The author displays his Nietoperz and Phaethon III (right) tailless models - the latter being detailed in the accompanying sketch.

derivative of Smith's *Pheon*. So far, there have been three of them, powered either by a Doonside Mills or by a PAW 1.49 on a short pylon at, or just in front of, the centre of gravity. All have similar proportions, the accompanying sketch of *Mark III* being typical. Wingspans vary from 80 in to 91 in; *Marks I* and *II* use sheet box leading edges and are covered in Solarfilm, while *Mark III* substitutes riblets and tissue in an (unsuccessful) attempt to save weight.





Another view of Phaethon III (see drawing on previous page) which has provided many instructive flights. It features easily adjustable wing incidence, using the idea sketched in Figure 1 below - a device which could prove interesting fitted to all sorts of models. Interested in unorthodox models - and prepared to write to fellow enthusiasts? Then take up the author's invitation and write to him with your views on establishing an informal corresponding society.

After a fair amount of flying, I have a few general comments on these designs, namely:

1. Flight is pretty stable, though directionally neutral - the only way to avoid a wandering trim seems to be a large fin at the end of a long boom. (*Mark I*, which had a big all-moving fin, but on a short moment fuselage, would fly figure '8s' under power.) *Phaethons* will hold a lot of bank; even at a 70-80° angle they lose height only slowly.
2. The only vicious tendency is an occasional stall. *Mark I* did this twice, when apparently trimmed out: once in a series of steadily-increasing stalls from about 200 feet (unfortunately, the ground occurred at just the wrong phase of the final stall), the second time a very sharp whip-stall at low altitude when flying fast downwind. The pronounced tip taper (useful for reducing mass outboard) may have something to do with this; *Mark IV* is likely to have the tip chord increased to 7in.
3. Both *Marks I* and *II* have snapped off their tip panels immediately outboard of the dihedral break in heavy landings (or worse), while *Mark III* has split tissue at this point (the use of a soft alloy tongue and thin wire joiner means that the wings can flex forward on impact, while the stiff 12 swg dowels of earlier *Marks* transmitted the shock to the structure). The only complete answer is tongue-and-box tips that can pivot forward; a three-piece wing would also be easier to carry.
4. Apart from the standard elevons and rudder, I use a screw-operated incidence trimmer which enables the angle of the wing to be adjusted relative to the thrustline. On *Mark III*, this consists of an 0.025in brass box (with 1.5mm plywood ends epoxied on) mounted across the fuselage with a 1.25in long slot in either side. Running from top to bottom of the box is a long nylon bolt (as used for wing fixing on R/C models), on which runs a nut soldered to a 'slider', bent up out of thin brass. On top of the box is soldered a brass 'spider'; this fits over the head of the bolt to prevent its moving relative to the box and has a hole in the centre for a screwdriver. The wing tongue is pushed through the slider, so that turning the bolt makes the wing leading edge move up or down (the wing pivoting on the rear dowel). A pointer on the wing leading edge and a scale on the fuselage side enables you to 'dial in' the incidence required.

To prevent the slider wobbling in the slots, small brass brackets should be soldered to it at the points shown in Figure 1. (A simpler way of retaining the bolt would be to drill a hole through it below the

bottom of the box and insert a wire peg or a split pin - but this could weaken the bolt and cause fracture.)

5. The pylon set-up, while working well with small engines, seems less suitable for the PAW unit. *Mark III* has shown a tendency to climb steeply for the first ten seconds and then 'fall off' and fly in a tight bank, slowly losing height until the motor cuts. This may result from an over-flexible pylon, the level of the thrustline, or other causes. I am building a new fuselage with shoulder wing, downthrust and a stiffer boom to see if this helps.

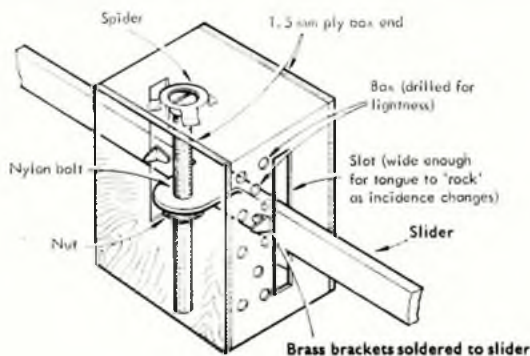
Canards - Hysteron Proteron

After building and flying a couple of *Pegasuses* (which flew charmingly, while proving that you can stall a canard if you're ham-handed enough) I decided to design my own, and arrived at *Hysteron Proteron* (which is Greek for back-to-front).

To avoid the fiddly trimming of a too-small model, I decided on a wingspan of 48in for a Doonside Mills to give a reasonably brisk powered glider. The other areas and proportions were worked out from Henry Cole's formulae for canards - as published by *AeroModeller* in a design series in the early 1950s. Initial testing (including a 150-foot spiral dive into, fortunately, a bog) resulted in considerable re-design, including enlargement of the elevator - whose section was changed from flat-bottomed to SI 64009 - the addition of a skeg to increase fin area, lowering of the engine pylon and the addition of aileron tabs. The result is a very safe and tractable model with a fair rate of climb, a slow, floating glide and considerable stability in wind (as proved at the 1975 Nationals).

Figure 1
Variable incidence adjuster

continued on page 423



RACING NEWS

by Dave Clarkson

VIEWPOINT - GOODYEAR STARTS

GREAT FOR the spectators, isn't it? Everyone gathered in the centre-circle as the countdown proceeds and then on 'go' the pitmen sprint out and the race is on. Yeh! Great for the spectators, especially if one of the pitmen falls over, but not so good for the competitors or, in my view, the greater interests of our sport. I do not have to recite 'near-misses' or even go into the potential dangers in gory detail for the sane to realise that the 'Le Mans' start in Goodyear just has to go - *Ben It Before Someone Gets Hurt, Not After*. Just about every country in the world has quietly buried the 'Le Mans' start (instead, thankfully, of burying a pitman), so are we not well overdue for this move too?

PRESSURE RE-FUELLING GLOW-GOODYEAR TANKS

As an alternative to difficult-to-buy and sometimes troublesome-in-use DON's 'Quickfill' valves on glow powered Goodyear tanks of the crankcase pressurised variety, over the 1976 contest season and during this last winter, quite a few teams have been experimenting with pressure re-fuelling systems. Basically all that is necessary is to substitute a tank filler valve and a Schraeder vent valve for the 'Quickfill', and use a normal FAI team race style pressure re-fueller instead of the squash bottle. Since many Goodyear teams fly FAI and already have pressure re-fuellers, the experi-

control and therefore improved re-starts. Obviously by varying the stage when the fuel shut-off is opened and/or when the vent valve is released with respect to when the filling valve is removed, the motor prime can be varied predictably between wide limits - with practice to find how to get the precise optimum prime, re-starts have got to be improved.

Clearly the way forward for pressure re-fuelling glow-Goodyears is for a high-flow tank valve to become available. At the North-East Area Competition early this year I saw the team of Hutchinson/Daly pressure re-fuelling a 60cc tank in only 2-3 seconds total, using a standard re-fueller, but with a prototype 'high-flow' tank valve. Let us hope that these 'high-flow' tank valves become available, for then the case for pressure re-fuelling tanks will be an open-and-shut one.

What's that I hear? Goodyear is getting too complex for newcomers? You can say that about every single competitive event in the SMAE Rulebook. Model flying is a serious sport not, in my humble opinion, anything like the 'playing with toys' image that some decay yet seemingly plead for. If an event is not 'difficult' then in my book, there is no attraction in it - no targets to aim for, no discoveries to make, no real achievements to be attained.

MAKE IT EASY - Undercarriage for Profile Fuselages

This one applies particularly to profile fuselages of the shallow variety as found on most Rat-Racers. Putting undercarriages on such profile fuselages is always a bit awkward, especially if a side cheek is employed and a really neat job is desired. The method described is about the simplest I know of, and I have used it successfully on big '40' powered Rats as well as the 2-5cc versions, plus numerous profile stunter models.

The basic principle is to form 'screw threads' on the necessary two undercart legs by winding fuse-wire onto the legs and then soldering these windings into place. Holes are then drilled vertically upwards into the fuselage for the legs slightly over-size, i.e. for 10 swg leg use $\frac{1}{16}$ in drill, 12 swg leg use $\frac{1}{8}$ in drill, 14 swg leg use $\frac{1}{4}$ in drill.

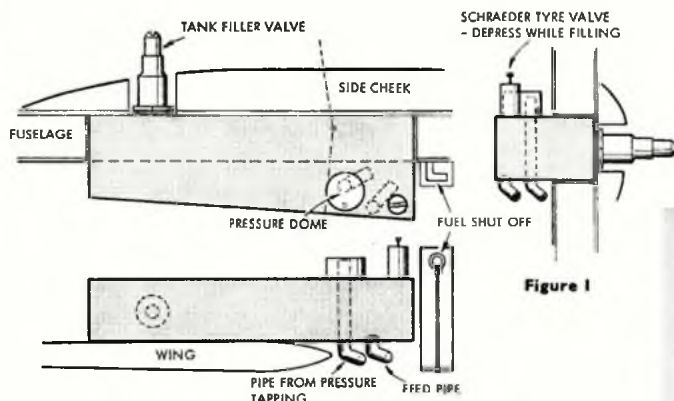


Figure 1

ments have been easy to perform and have resulted in at least three teams from the *Norwest* club adopting pressure re-fuelling as standard for this contest season - namely Rosser/Rosser, Daly/Howard and Hutchinson/Daly. The most popular tank arrangement currently adopted is shown in Figure 1.

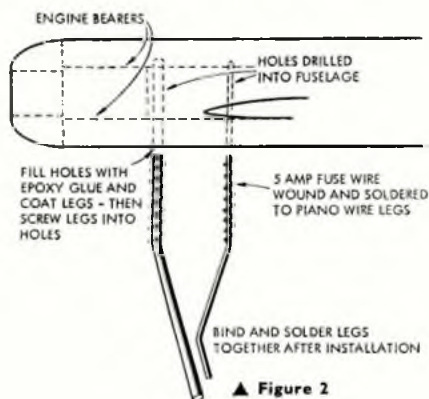
Note that this is arranged for two-handed operation i.e. one hand on the filler and one on the vent or, alternatively, first finger on the filler and thumb on the vent for left-handed operation. All the systems I have seen have featured a *North West Model Supplies* tank valve and these have proved pressure-tight, i.e. do not leak tank pressure when the motor is working. Similarly, venting via a Schraeder tyre valve works very well.

So the pressure re-fuelling alternative to the 'Quickfill' exists and has proved reliable, but is pressure re-fuelling *better* than using a 'Quickfill'? The answer so far is just 'yes'. Using a standard tank valve, it takes around 5-8 seconds to push 55cc of fuel into the tank, using re-fuelling pressures as high as 15 psi (the maximum most normal pressure re-fuellers manage). This is at least 2-3 seconds *slower* than with a squash-bottle via a 'Quickfill'. However, time-loss balances out because there is no bottle to transfer, put down etc. The 'plus' side of pressure re-fuelling is said by at least one of the users to lie in the direction of improved motor prime

A very neat gadget from the manufacturers of Glo-Bee glow plugs is this self-contained starter battery. Inside the neat moulded plastic case is a sealed 2 volt lead-acid battery. Connect leads to your glow plug and move the lever under the meter to suit your needs. *Wet plug? Increase the current. Charger in foreground is specially designed for this battery.* Straps to the arm very easily for racing enthusiasts - used very successfully by our Columnist when establishing his Goodyear record. Now for the bad news - not available in the UK! Interested? Then write to the Fusite Division, Emerson Electric Co, 6000 Fernview Avenue, Cincinnati, Ohio 45212, and tell 'em you want a 'Fire Plug'.



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▲ Figure 2

Epoxy glue is then run into the holes and coated onto the under-carriage legs and the legs 'screwed' home. Once the epoxy has set, the two legs are bound and soldered together and the wheel installed. If undercart replacement or removal is ever necessary, all that is required is to melt off the solder holding the leg binding together and then unscrew the separated legs. *Figure 2* shows how.

Unless you have a 'monster' soldering iron (my 160 watt iron is just enough), you will only succeed in 'blobbing' solder onto the leg windings. Do this, and then hold the leg with the windings in the flames of a gas-ring or gas-torch. A few seconds will see the solder run evenly all over the windings if you have, prior to holding in the flames, immersed the windings in the traditional *Baker's Fluid* soldering flux.

As a general rule, leg sizes should be 12 swg for model weights under 16oz and 10 swg for heavier models. A 14 swg support leg should be enough for any model.

1ST SMAE CENTRALISED C/L MEETING - RAF Barkston Heath, 10th April

Thanks to the efforts of Jo Halman, SMAE Secretary, just about everyone who needed to know the venue was informed by post of this in lieu of pre-publicising via mass-circulation magazines, newsletters etc. Thanks Jo! Like many previous runnings of this meeting, we suffered 'interesting' weather - snow, hail and rain all in the space of a few hours. However, the absence of wind made the weather just unpleasant as opposed to really nasty as experienced in previous years. FAI and Class B team race were run with little assistance by Bob Horwood, SMAE C/L Committee Chairman (what a worker!) and few were heard to object when the advertised 3/4 A-T/R event didn't happen. The 'Wharfedale' height marker helped us to fly at legal height, but a loud-hailer to issue warnings would have been useful - the CLAPA people running 'Stunt' used one, so why not T/R too, especially when the £1 event entry fee is considered?

FAI Team Race

The heats, reassuringly, saw the three teams selected for the European Champs this year way out in front with their Bugls. Not Rossi weather though, for none of the Rossi operators got below 4:30. Noteworthy was the Nelson 15D of Smith/Yeldham which showed competitive speed and an impressive range of comfortably over 40 laps, and for one tank of 56 laps - very promising for its first outing.

In the semis, the Bugls of Heaton/Ross and Smith/Fry continued

Latest FAI class team race propeller to be launched is this item, developed and made by Mick and Ron Tribe, giving them 22 seconds/10 laps with 37-38 laps on their Bugl powered racer. Nicely moulded in epoxy and glass fibre strands, the prop is marketed by DES (Model Components) - address in Classifieds - and retails at a very modest £1.50.



to dominate, but that of Davies/Broadhead 'went off' letting the improving Bugl of Sutherland/Woodside into the final with a 4:30 best semi. This team got their revenge for missing the '75 Utrecht semis by 0.6 seconds for the new pairing of Clarkson/Bingham made 4:31 twice in the semis.

The final was incident free and pretty quick. The looks on the faces of Derek Heaton and Steve Smith told just how much Steve Smith likes his 'Elton John' flying boots, and just how much Derek doesn't like them!

		Best Heat	Best Semi	Final
1. Heaton/Ross	Bugl	4:12	4:11	8:27
2. Smith/Fry	Bugl	4:14	4:23	8:50
3. Sutherland/Woodside	Bugl	4:33	4:30	9:13
4. Davies/Broadhead	Bugl	4:16	4:35	
5. Clarkson/Bingham	Rossi FI	4:31	4:31	
6. Smith/Yeldham	Nelson	4:32		

The semi's 'cut time' was 4:36, a high standard for so early in the season and, considering the unhelpful weather, indicating some really fast racing to come this year.

Class B Team Race

Perhaps not surprisingly considering the time of the year and the weather, there was a small entry of just eight. Motors used were interesting, with Taylor/McGladdery and Everitt Cooke using pipe-timed OPS 29 RVs on pipes, Coe Salisbury and Nixon/Campbell using OPS 29 TRS (FIs) and Heaton/Ross with their Ross Special RV Schneurle rear-exhaust motor; the rest using various STs both FI and RV. As things turned out, the Schneurle motors did not dominate, with the top honours going to the really impressive ST G21/29 FI ABC of Gardner/Wilson as the results show:

		Best Heat	Final
1. Gardner/Wilson	ST 29 FI ABC	3:57	7:29
2. Nixon/Campbell	OPS 29 TRS	3:56	7:52
3. Sutherland/Woodside	ST 29 RV ABC	4:02	

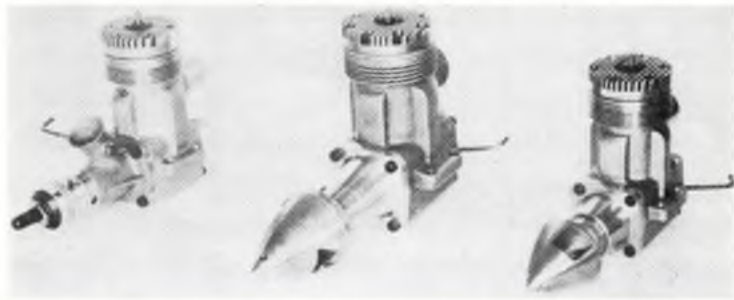
The winning time is a quick one and must be a candidate for replacing the current 'Imperial Rules' 6:41 final record in the SMAE record book. Both first and third used McCann 8x8 carbon fibre props, and sounded most happy on them.

GOODIES DIRECTORY - North West Model Supplies

Over the years in this 'Goodies Directory' have appeared just about all of the foreign suppliers of team race bits as well as most of the British ones. It may therefore seem to have been odd that the

TWA engines are back again! Performance Model Parts Inc displayed these engines at the Toledo R/C show: originally designed by C/L speed flyers Bill Wisniewski and Roger Theobald, and produced by Clary/Wisniewski, they have undergone a further 21 years of development and refinement and are once more offered for sale.

Various capacities and options are provided - 29s and 40s; 36 Combat, 36 Profile Carrier Special, 61 R/C aerobatics and 61/65 speed with front or rear intakes and rear exhausts. Prices range from \$75 to \$225. Same company also offer ABC piston/liner sets with heavy duty con rods/crankshafts for a range of other high performance engines. Write to them at 1015 S.6th St, Minneapolis, Minn. 55415, USA.



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source of 'bits' I use has never been, up till now publicised here!

The goodies sold under the 'North West Model Supplies' banner are probably the most popular in the UK and are now increasingly finding favour abroad. The reason being that they *work*: they may not be the lightest or most compact or most elegant, but they really do work and work reliably. I use them all and have done for some years now – enough of a recommendation?

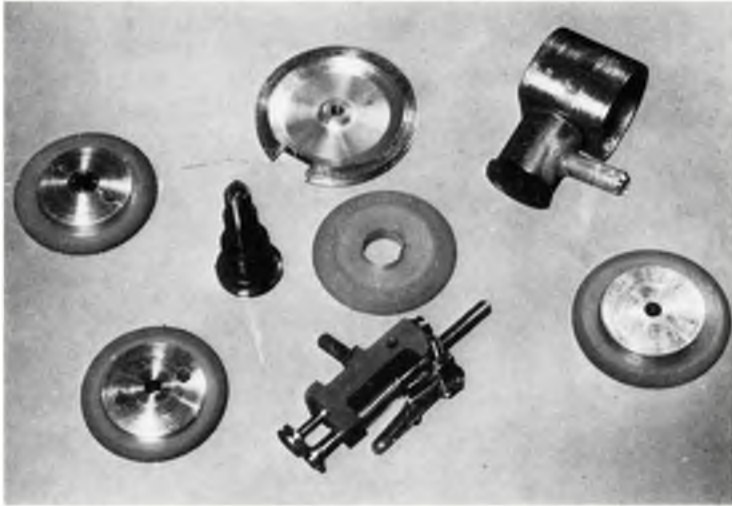
Reproduced below is the current list of items available. The prices are omitted because 'North West Model Supplies' quote in and will accept various currencies. However, an SAE or International Reply Coupon to: North West Model Supplies, 579 Rooley Moor Road, Rochdale, Lancashire, will get you a current price list in the currency most appropriate to you.

Besides the items listed and illustrated in the photos, available shortly will be a most competitively priced pitch-gauge. This item is of the conventional, direct-reading type (no conversion tables necessary so errors are confined to direct errors) but uniquely calibrated in both metric and imperial units and with a rectilinear scale with uniform spacings making for very easy reading. I hope that this new pitch-gauge will be illustrated in the next edition of this 'Goodies Directory'.

'North West Model Supplies' have told me that all items are normally supplied by return from stock. However, since the machined items are made in short-batch production runs, a flood of orders may result in delays if currently held stocks are exhausted. If stocks do become exhausted, it is hoped that customers will be patient and wait for the next production run(s) of the item(s) they need. All items are nicely packaged in sealed plastic envelopes with machined items pre-oiled so as to prevent deterioration in storage.



Above is team-race fuel cut-off marketed by North West Model Supplies. This is soldered to the underside of the tank so that fuel enters the valve via the hole on the top of the body. Shut-off rod and actuating rod are at left, the re-set rod protrudes at right. Unit features an internal 'O' ring seal and external 'Delrin' seal bush. Trip wire from bellcrank connects to the arm at rear - operates on down elevator control. At right are seen other products from this concern. Top row reveals FAI slimline wheel, circular bellcrank and finger re-fuelling valve, with tank filler valve and spare tyre in centre and FAI/B wheel, shut-off and Goodyear wheel below.



Item	Comments
Teamrace Fuel Cut-off	Double sealed to ensure no leaks
Finger valve	Disassembly easy for cleaning
Tank Filler Valve	'O' ringed to ensure no leaks. Disassembly easy for cleaning.
Circular Bellcrank	1 1/2 in od with 3/8 in dia pivot hole.
Slimline FAI Teamrace Wheel	About the slimmest wheel around. Steel bushed bearing for long life.
FAI & Class B T/R Wheel	Normal width wheel for longer life and/or heavier duty.
Goodyear Racing Wheel	Unitary hub all in aluminium.
Spare Tyre (state wheel)	Same extremely hardwearing urethane rubber used as for wheels.
0.6oz.sq.yd Glass Cloth	Unbeatable quality and weight.
100ml Combat Syringe	With two alternative nozzle diameters and spare rubber piston seal supplied.
C/L Wire Eyelets FAI & Goodyear	Machined from brass 3/8 in dia.
C/L Wire Eyelets Class 'B'	Machined from brass 1/2 in dia.
Howard 182 x 185 FAI G/F Prop Howard 175 x 130 Goodyear G/F Prop	Polyester resin for no temperature or plasticity problems. Supplied as de-flashed raw mouldings which are transparent for fault detection.
Rossi TR Carb Insulator	Machined in Delrin. Tapped 1/2 in x 32 tpi to accept venturi.
TR Venturis in range 3.2 to 3.8mm id	Peripheral jetted, screwed 1/2 in x 32 tpi. Available in 0.1mm steps.
Rossi Extension Prop Driver & Sleeve Nut	Replaces Rossi item. 16mm long. Sleeve nut meets 'Safety Nut' rules.

FAI SPEED

by Dave Smith



THE FOLLOWING for FAI speed flying in Great Britain is unfortunately in the minority at present. This in itself is a deterrent, as very little information is ever published on the subject, and thus no encouragement is ever offered to the would-be beginner to this class.

We all know for instance that it is easier to roll out the lines connected to a team racer/Goodyear model, start the motor and take off – but when it comes to a speed model there is a completely different technique. In the following paragraphs I have tried, briefly to cover every aspect concerned with FAI Speed in an effort to encourage any would-be enthusiast.

When I first started I was amazed at the amount of equipment needed to fly speed, but with careful planning one can soon get organised. I now only carry one field box/mechanical starter and one box left in the car containing fuel, spare props etc.

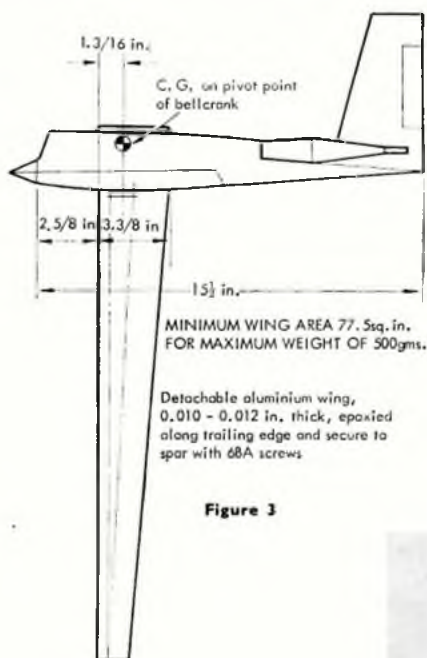


Figure 3

The author's asymmetric FAI class speed model (also seen in heading picture) resting in its take-off dolly, as drawn in Figure 5. This type of model 'grooves' well in flight, but can be touchy on take-off, so be prepared! Note lead weight securely retained to outboard leg of dolly to aid tracking on the ground.

Model Design

At the moment we are definitely in the asymmetric-sidewinder era. These models are very easy to fly as they 'groove' very well during the run, but can be a little tricky on take-off – Figure 3 shows the basic planform for a sidewinder model using a front induction motor. Remember that if you decided to use a rear induction motor, then they work best laying inboard.

If you do not like sidewinder designs and prefer the conventional type of model, then I would recommend the *Devil* which is available from *AeroModeller Plans Service*, as plan no. CL 749, price 85p inclusive of postage. But do remember to move the wing back, as the extra weight of the tuned pipe will make the model tail heavy – the original model was designed before the introduction of these fittings.

There is also the West German *Kingfisher* design should you prefer an asymmetric model incorporating an upright engine, also available from the same source – plan no. CL 1259, price 70p. A strong, lightweight, well constructed model with a reasonable finish will suffice, although careful carving and setting up of wings and tailplane will aid a smooth flight.

Tank Design

Uniflow tanks seem to work best for FAI speed. They are quite easy to make and give a really consistent run. I always insulate my tanks with synthetic rubber or foam rubber to prevent foaming of fuel in flight, although I know of many competitors who do not use any form of insulation and yet still get very good results! See Figure 4.

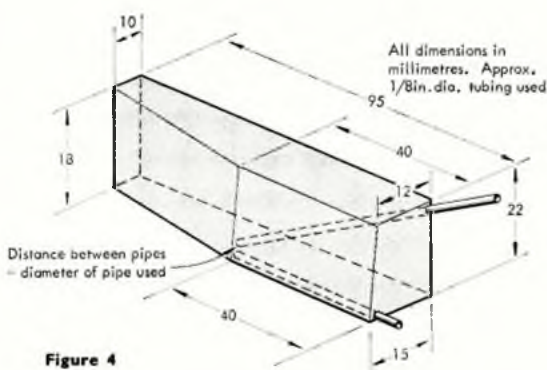
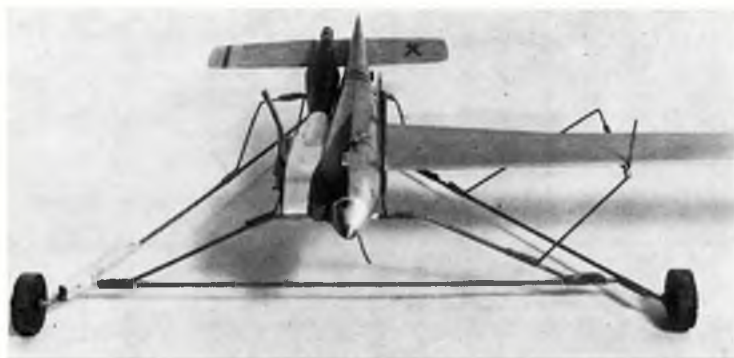


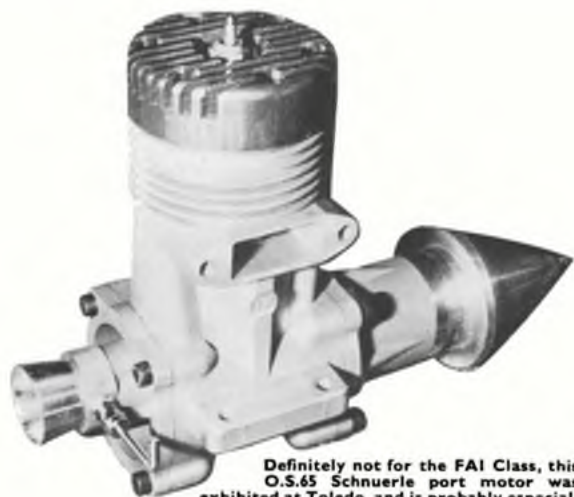
Figure 4

Motors Available

To drag two 0.4mm (0.0158in dia) lines round on straight fuel (75/25 or 80/20 methanol/oil mix) requires an awful lot of power. Undoubtedly the front induction Rossi 15 is in a class of its own at the moment, but still requires a lot of skill to match propeller/model/tank to record high speed runs. The newly introduced Cox 15 F1 Conquest and the one piece crankcase Super Tigre X15 RV have yet to topple the Rossi, but these motors are also rather expensive. For an absolute beginner I would recommend the Kosmic 15 RV speed motor which is available at a reasonable price. Although not



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Definitely not for the FAI Class, this O.S. 65 Schnuerle port motor was exhibited at Toledo, and is probably especially made for the U.S. speed market (plus of course Australia who also allow this big engine). An interesting departure for O.S. who presumably have based this around their very powerful R/C aerobatics engine.

as powerful as the other motors (it will never win a contest) it offers a sound training ground in operating a piped 2½cc motor on FAI fuel. Alternately, one could try the Japanese HGK 15 RV motor but I have never used one myself, and cannot comment on this particular engine.

Although expensive, the Rossi one piece head insert is far superior to any separate glow-plugged head: I have found an increase of up to 2,500rpm. However for training flights I have used an old Rossi head drilled out and tapped for a standard glow plug: this keeps down costs whilst enabling one to fit the proper head when attempting a good run.

Running-in any of these racing engines must be done correctly, otherwise full power will never be realised: this is my rough guide for running in a piped motor. Firstly, mount the engine onto a sturdy test stand and connect the motor to a large fuel tank. Set the tuned pipe (300mm head to end of pipe for a Rossi 15). Attach a Bartels 7 x 3½ in glass fibre prop and run for one hour on a 70/30 methanol-castor oil mix, making sure that the needle is set on the rich side, but that the motor is still running fast. This will enable the piston to work harder but keep cool. Change over to a 80/20 fuel for a further 30 minutes at least. Now you are ready to go out and fly!

Available Propellers

This is a science all of its own; only continually thinning down and modifying props plus flying will enable you to find the best compromise for your particular model/motor/tank set-up.

The easiest way to go well is to buy the currently available carbon fibre props, as these can be immediately attached to the motor and flown. Wooden propellers usually need to be cut down and thinned before use, but they are much cheaper than their carbon fibre

rivals. With the thick lines used in FAI speed, a rough guide would be as follows. For a rear valve motor use a 5½ in diameter by 6 in to 6½ in pitch. A front induction motor will normally turn more pitch i.e. still 5½ in diameter, but 6½ to 7 in pitch. Obviously a pitch gauge is a must, but they are rather expensive to buy. (They are not impossible to make yourself. I made mine out of a piece of perspex and obechi one evening.)

Dolly Design

Normal logic applies here i.e. low CG with the main wheels in front of the motor, and track the dolly to run out of the circle slightly. Many people use rubber wheels with tape wrapped round the inner wheel, but I have always used wooden wheels – with pressed nylon bushes – and a team race wheel at the rear (shedding a rear tyre during take-off is not very pleasant, and normally makes the dolly cartwheel). The wooden wheels on the front slide over the tarmac thus preventing the dolly from tipping over during take off. A sketch of my dolly is shown in Figure 5.

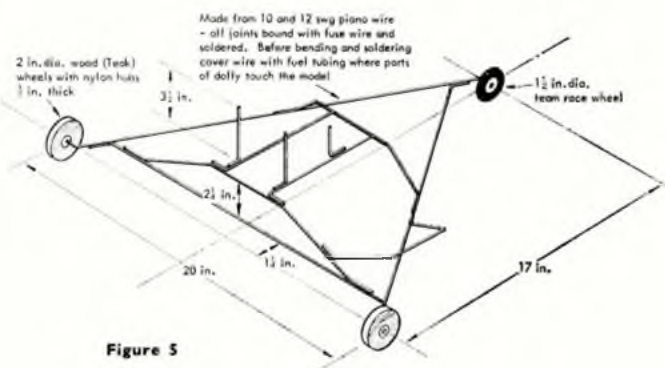


Figure 5

Models in Transit

There can be nothing more frustrating than to have driven 100 miles plus to a contest only to find on arrival, that the wife has sat on the model! Common practice with international competitors is to construct a box, normally of plywood, and painted. If you are going to fly abroad such a box is a 'must', in fact I use my model box for every meeting as it makes for easy packing in the car and of course completely protects the models. As a guide, my own box measures 27 in x 23 in x 4 in deep. Constructed from 16 swg aluminium it will comfortably carry three models of the asymmetric type which use detachable wings.

Flying

There can be no substitute for a lot of practising to be able to succeed at this event, especially in trying to discover just what prop and pipe length to use to extract the best performance. Remember on cold damp days the FAI flyer cannot add nitro to boost his revs as can the 'open' boys. That'll wind them up!

Rumours that the trusty (and essential) 2 volt battery was 'unobtainable' proved false, we are glad to say. These three units are all available from Ripmax stockists and are in good supply. Who starts these rumours? However, if you are searching for that old favourite Varley dry battery, you may not be so lucky...





THE FREE FLIGHT SCENE

This month: Mike Fantham

Joe Barnes launches his Wakefield under the watchful eye of son Dave. Mike Duce (left) the winner at the SMAE Spring two-day FAI meet is about to follow suit.

'AEROFOILS FOR AEROMODELLERS' – A REVIEW

This book, written by Martyn Pressnell and published by Pitmans, deals with aerofoils for all types of models, but it is no surprise to find a bias toward Free Flight and Thermal Soaring glider profiles in view of the author's background in F/F competition work.

In the introduction, the book goes into the theory of aerofoils in a straightforward way, and discusses the effects of boundary layer flow, Reynolds number, aspect ratio, wing planform and flaps. Lift and drag curves are shown for a small number of aerofoils at Reynolds numbers appropriate to model speeds; these form a useful guide to the variations which occur with changing scale effect. This aerodynamic data is not very comprehensive and is mostly from test reports between twenty and sixty years old – clearly in the modern commercial world, money is just not available for something as esoteric as model aerofoil research! Wind tunnels are not the only testing method available however, and Martyn mentions the work of Allnut and Kaczanowski first reported in the 1970-71 *AeroModeller Annual*. The latter used statistical analysis to find the significance of thickness, aspect ratio, camber and position of maximum camber in predicting the duration of A/2 gliders.

The book gives sample calculations for A/2 and thermal soaring R/C gliders. The A/2 calculation takes account of the variation of maximum lift coefficient with Reynold's number, and leads to interesting results showing an optimum aspect ratio for the example rectangular wing glider which is surprisingly close to the current 'average' model, and predicts a duration of 2 minutes 32 seconds. I

had a quick check through the example and although one is referred to the wrong graph at one point and the arithmetic of the intermediate steps seems confused, the resulting duration is correct under the given assumptions. It will be interesting to follow the work through in detail when time permits.

The main section of the book consists of 83 sheets of aerofoils plotted out on a computer driven drum plotter. The index of plotted sections gives a guide to model type applicability and there is a page of suggested structures for various classes of aircraft. Forty-seven aerofoils are drawn and chord lengths offered vary from a high of 250mm for some of the radio controlled power and glider sections, to a low of 80mm for some of the free flight duration profiles. The sections are plotted in 5mm or 10mm steps of chord length over a range that will be useful for models to which the aerofoil is applicable. For example the A/2 glider section Benedek 6356B is offered as 12 plots in chords from 200mm to 90mm. The widely used NACA 6409 is given in six chords from 250mm to 200mm (10mm steps) and 15 chords from 160mm to 90mm (5mm steps).

Some of the sections are also drawn in 'skimmed' versions with 1.5mm or 0.8mm removed from both surfaces of the aerofoil. Sections appropriate to F/F Power and Radio Control are plotted with 1.5mm 'skimmed' from the profile while three of the rubber driven model sections are 'skimmed' by 0.8mm.

Another variation offered is the 'blended' plot in which the section changes smoothly from one aerofoil to another with a reduced chord and different section. These plots are intended for use on tapered wing panels. 'Blended' plots are available for five of the



Left: Andy Crisp, 1977 Glider Team member, launches his FAI power model, which was being flown to try and gain some points towards the Senior Championship, but the Oliver Tiger diesel is no match for a Rossi glow! Below is Martyn Pressnell's book, subject of the Review on these pages. Although there is a F/F and R/C Glider Bias, sections suitable for R/C Power and C/L Aerobatics are also detailed.



47 aerofoils. Plots for three of these start from the normal section and change to a thicker flat bottom version with a smaller chord. For example, Hagel's FAI power section is plotted varying from a 'straight' 190mm chord section to a 140mm flat bottom version in eleven 5mm steps. Two of the 'blended' plots give the change of one section to another. Eppler 385 at 250mm chord changes to Eppler 387 at 180mm chord in 10mm steps and NACA 6409 changes to NACA 2409 in the same way. All the 'blended' plots are also plotted 'skimmed'.

The computer programme that Martyn Pressnell used to plot the sections at Hatfield Polytechnic has the drawback that all sections come out with a sharp leading which must be rounded by hand unless the section is supposed to be sharp. This could be avoided in the programme even where a nose radius is not published with the ordinates. The programme seems not to have any of the 'smoothing' effects which one employs naturally with a French curve when plotting by hand and this gives some of the plots a slightly lumpy appearance. The use of a digital drum plotter to draw the sections means that the lines have a slightly 'shaky' appearance but this does not mean they are inaccurate since the mean line follows the profile and no overall error need be present.

I checked some of the plots and found the normal aerofoils as accurate as could be plotted by hand. I noticed a couple of errors: the upper surface of Koster 66 on sheet 50 has a distinct dip at 25% chord and is low by about 0.3% of the chord from a smooth curve, I doubt that this was intended by Koster. The upper surface of Kaczanowski GF6 on sheet 48 is about 0.5% of the chord low at the 1.25% chord station compared to two other sources of data. The section headed Benedek 8535B2 on sheets 7 and 8 is in fact 8353 B2.

I checked the skimmed version of the 8353B2 with the standard version and found the 1.5mm skim accurate over the upper surface aft of about 30% chord and over the lower surface aft of 10% chord. Forward of these stations the skim was too thick exceeding 2mm forward of 5% chord on the upper surface. These errors seem typical of the skimmed versions. A check of the blended Eppler 385 to Eppler 387 showed both ends to be accurate with a smooth blend between the two.

I feel that the book could usefully have included the actual co-ordinates from which the aerofoils are plotted. I know that these are available elsewhere but inclusion would enable chord lengths, blends and taper ratios not available in the book to be plotted. In desperation one could however scale the sections from the pages. The co-ordinates for all but four of the sections appear in John Malkin's book *Airfoil Sections* and this was used in my checks. The Malkin book also includes the kink in the top of 'Koster 66' as mentioned above.

The new book is, as far as I know, unique in providing a broad collection of full size aerofoils for easy visual selection and should provide the aeromodeller, equipped with a soft pencil and rubber, with hours of creative doodling as he tries out tentative structural layouts in his favourite wing sections. Measuring 11in x 8½in, the 208 page book retails at £4.95 (soft covers).

CROYDON FREE FLIGHT RALLY - Bassingbourn, 1st May

Conditions during the morning were very pleasant with a 5-10mph North-East breeze and sunshine at the start changing slowly to overcast conditions with even less wind by lunchtime.

With such good weather, several people were tempted to fly more than one class: I tried to fly three, with hopes of satisfying my ambition of doing the 'treble treble', making three maxes in Open rubber glider and power. I started as soon as the contest began at 10am and had three progressively less stalling rubber flights, all maxes though! I then entered glider at about 11.30am, having had a quick check flight with my A/2, and found conditions a bit flat during a 15 minute circle tow to try and find my first thermal. Eventually my legs gave out and I had to tow back to the ground. The second attempt was almost as tiring but produced a weak thermal and max as did the next flight. For the third and final flight, Brian Baines was circle towing up wind for a test flight and soon towed into a good thermal. I think he realised I was watching and tried to circle in the thermal without 'giving it away', but the rapidly circling model, tight towline and Brian at full stretch on tip toe were signs enough, and I launched for a max, while Brian hung on grimly to his model!

Having finished Rubber and Glider, I got the Power model out. More than one eyebrow was raised at this stage since I do not fly power very often, this was clearly demonstrated as it took over an hour to get a decent pattern! During this period the variable incidence tail (VIT) stuck-on for one flight, and the tail trailing edge failed to move to the glide trim position when the engine stopped, causing a spiral dive. The model landed heavily and the



Brian Baines, A/2 winner at the two-day FAI meet - that bicycle had plenty of use retrieving seven maxes during the weekend.

wing flew off without damage. I arrived at the scene and picked up the fuselage at which point the tail went up to the dethermalised (D/T) position, and all evidence of any fault had gone. **WRONG!** I *should* have resisted the temptation to grab the model *'to see if it is OK'* and instead had a long close look without disturbing it, in an effort to spot the 'hang up'. We must try to remember this next time a model crashes in that kind of circumstance.

However, I digress. After several checks of the systems with the motor running the mystery fault could not be reproduced, check flying was complete and I entered. This was the signal for a rain shower to begin and thus a good time to eat lunch.

Meanwhile other competitors had been scoring maxes in all events at a great rate in ideal conditions. Open rubber had only two non-max flights on the board. Re-entry was allowed and widely used with one ½A power flyer ending up with no less than five entries. Two of the eventual winners got there on their second entries and one on his third!

After the rain, a move was required due to the drift changing, but as soon as we were established at the new site a further drift change meant another short move when models started landing in the young crops. Less than an hour passed before the wind suddenly increased to about 15 mph sending us back to our original site by about 4 o'clock; we had plenty of practice at packing and unpacking the models and equipment! Conditions were now very poor by comparison with the morning although they were still quite flyable as Pete Bayram demonstrated getting a third max from his American kit A/2 *Dragmaster* with which he has done quite well recently.

During this time I had been having trouble with my power model: a slight repair and two split fuel lines kept me grounded till about 5 o'clock when I made a thermal max after a mis-launch and over-run. Martin Dilly kindly retrieved the model very quickly for me, but on the second attempt the engine faltered after a couple of seconds, the nose dropped, the engine picked up and the model went in under power. Fortunately, apart from one damaged wing panel the model survived. My inexperience was definitely showing as I hid the bits in the car! A later inspection revealed yet another split in the fuel system, this time in the pipe which seals the pressurised



Above: meanwhile, at the other end of the towline, Bryan Spooner (appointed British team manager for the 1977 World Champs) complains of the cold as he waits to launch Brian Baines' A/2 for the winning flight. At right is Mike Duce, winner of the Wakefield event at Sculthorpe, who looks relieved that it is all over.



tank, and this could well explain the problem. Who said something about preparation?

The fly-offs got under way as soon as the contest closed at 6 o'clock, with the wind dropping to 10 mph or less. The Mini Classes were flown first and John Williams of Stanstead made a useful 3:40 to win A/1, but ½A and Coupe d'Hiver were won, with scores of more than twice as much, by Ray Paveley and Mike Bull respectively. I did not see these flights as I was preparing models for later fly-offs. I did see the Open Power models go away with Pete Harris looking the winner from the start, flying what looked like the model pictured in the May *AeroModeller*. Ken Faux had a very short run from his FAI model. Fred Chilton went left and did not get very high but Stafford Screen had a good pattern and smooth flight for second place.

Open glider was next and brought a win for Tony Young, making a rare appearance and flying an A/2. There was one thermal during the 15 minute period, marked by Pete Stewart who ended up in fourth place. Open rubber was last and 11 people could be counted cranking the turns onto their motors for the all or nothing final flight. It must have been very frustrating for Dave Hipperson, the organiser of the contest and a keen Open rubber flyer, to have to 'sit this one out'. I got my model away fully wound for a lovely flight of 7:42 which was timed back to the ground only to find Chris Batty had done 9:01 to win. Chris used the model which has gone so well for him recently and won the 1976 Nationals. He admitted to having had some thermal assistance as the model did not go very high, but held up with a very good glide before coming slowly down about two fields off the 'drome. Great flight.

The prizegiving, which was a redistribution of the entry fees, concluded an interesting and enjoyable day.

Open Rubber (11 entries, 9 in fly-off, 3 x 3 mins) – 1. C. Batty (Bristol & W) M+9:01; 2. M. Fantham (Richmond) M+7:42; 3. T. Gray (St Albans) M+6:20. **Open Glider** (23 entries, 13 in fly-off, 3 x 3 mins) – 1. A. Young (Croydon) M+6:05; 2. B. Baines (RAFMAA) M+5:17; 3. A. Cordes (Whitefield) M+5:06. **Open Power** (10 entries, 4 in fly-off, 3 x 3 mins) – 1. P. R. Harris (Birmingham) M+5:22; 2. S. Screen (Birmingham) M+5:04; 3. F. Chilton (Crookham) M+3:19. **A/1 Glider** (9 entries, 5 x 2 mins) – 1. J. Williams (Stanstead) 10:00+3:40; 2. G. Madelin (Crookham) 10:00+1:30; 3. R. Miller (Northwood) 8:28. **Coupe d'Hiver** (12 entries, 5 x 2 mins) – 1. R. Paveley (Anglia) 10:00+7:32; 2. M. Sanderson (Grimsby) 10:00+1:30; 3. J. O'Donnell (Whitefield) 9:47. **½A Power** (10 entries, 3 in fly-off, 5 x 2 mins) – 1. M. Bull (Stanstead) M+7:40; 2. J. Fletcher (St Albans) M+2:52; 3. R. Paveley (Anglia) M+1:47.

SMAE SPRING TWO-DAY FAI MEETING – USAF Sculthorpe April 16/17th 1977

This event was run by Dave Hipperson of the SMAE Free Flight Sub-committee, ably assisted by his wife Sue. All SMAE Free Flight contests this season have a nominated competition director instead of being run by the whole committee as tended to happen last season, although this means that a keen flyer must 'miss' at least one contest.

The contest started at 10 am and was flown in a Glider, Rubber, Power sequence giving seven 40 minute rounds for each class. The Saturday morning was bright with a 15-20mph wind blowing almost straight down the main runway. The large size of USAF Sculthorpe once again proved useful as the fair breeze was taking models over a mile when they achieved the required three minute maximum time.

Glider got off to a shaky start with only a third of the entry scoring max. Some people were finding the wind embarrassing on the line, with weaving and unintentional circle towing to be seen during the gusts. A strong wind certainly is the greatest test of tow stability requiring a good stiff wing. However, poor conditions usually mean that flyers bring out their oldest models which are often the weakest and most flexible with 'tired' structures and floppy tissue covering! You have more chance of success if you are prepared to risk your best model in poor conditions. Late in the first round, Mike Warren of the Richmond club ran into trouble on tow and landed with the line still attached for an 'attempt'. The model proved to be unflyable and a reserved model was needed but the two minutes remaining in the round only gave enough time to run the 200 yards back to the cars and half assemble another glider. Score zero!

A similar thing happened to Wakefield team member Pete Williams at the end of the first Wakefield round. With conditions being poor Pete could not decide whether or not to fly, having to weigh 'saving the models' against 'flying a model in the wind to get some practice'. He decided to fly his number four model in the last ten minutes of the round and duly wound up and waited on the start line. With only a few minutes remaining, Pete noticed one of the prop blade retainers was missing (when a blade fell off in his hand!) and with his other models two hundred yards away in the model box, the flight had to be abandoned. Score zero!

The moral here is obvious: If you are allowed more than one model, have it prepared and have it with you at the start line especially if the contest is in rounds. It could be argued that having spare models lying about in the hurly burly of a contest leaves them prone to damage or a soaking if it rains suddenly; you will have to decide the priorities yourselves.

Getting back to the contest proper, the first Wakefield round had produced only five maxes from the 22 flights but none of these made one of the three maxes in the second round. Ron Pollard might have done, but his model had the tail go to the dethermalised position a few seconds after launch and the model wallowed its way to a 31 second flight. Some great team work was seen when Mike Evatt's model crashed on the runway snapping off the rear fuselage and wrecking both prop blades. No spare model was available so four of the Biggles Free Flight Team were soon crowded round the model; cyano-acrylate glue was used for the rear fuselage new prop blades were found and fitted and the team reassembled the model as Mike wound up with only a short time left in the round. Unfortunately after all that effort the prop jammed on launch and the model crashed on the runway again!

The most consistent flying of the first day was seen in power where the top seven of the 11 flyers were still in the same minute by the evening. By that time, four flights in each class had been completed but only Brian Baines in glider had a full score of 12:00 minutes. Power leader Stafford Screen had dropped 36 seconds and Ivan Taylor of the Falcons Club was 1:14 short of a full score at the head of the Wakefield results. I expect most people were as glad as I was to get out of the cold wind and get some hot food. I would guess that I was not the only one to have a few repairs to do as well!

On arrival at the airfield on the Sunday morning we found the wind had gone from South West to North and reduced to about 10-15 mph. Although overcast and cool, the weather for the first rounds was the best we saw all weekend but the wind increased to 15-20 mph and turned to North-East forcing a move to a different part of the field. It takes more than a cold overcast sky with a stiff breeze to hold some people back however, and Brian Baines continued to max and win the contest; another good performance

from one of our most consistent A/2 flyers. Brian had lost a model on the Saturday but it had been picked up six miles away and reported to his home in time for him to collect it on the way to the field the next day.

In Wakefield, Mike Duce maxed in both the last two rounds to beat Ivan Taylor by five seconds. Ivan's is a name I have not noticed before but with flying like this we are sure to see him in the results again. John O'Donnell flew the delayed prop release (DPR) model he has been using for some time now, into third place. Most people admit to being impressed by it, but few have persisted with their own attempt to employ this technique.

Stafford Screen recorded a very uncharacteristic 23 second flight in round 6 of the power contest due, he said, to a kinked VIT wire holding the tail in the power position for a very steep 'glide'. By the start of round 7 it was clear that Laurie Burrows needed only 2:10 to win. Laurie had left a model downwind after round 6 and had to use a reserve for round 7. He took his time and check flew the model before having several test engine runs to make sure he would not exceed the permitted seven seconds. Laurie finally launched his model for a good run and pattern into a large thermal which gave a nine minute flight, slight overkill!

The contest closed with the distribution of plaques on the field. This is happening at all SMAE Free Flight contests this year, the self adhesive plates with the engraved details are posted later.

F1A Glider (47 entries, 35 flew, 7x3 mins) – 1. B. Baines (RAFMAA) 21:00; 2. P. Williams (Richmond) 20:02; 3. G. Madelin (Crookham) 19:50; 4. M. Fantham (Richmond) 18:50; 5. M. Gilmore (RAFMAA) 18:15; 6. J. Hanson (Liverpool) 18:14; **F1B Wakefield (31 entries, 22 flew, 7x3 mins)** – 1. M. Duce (Liverpool) 18:19; 2. I. Taylor (Falcons) 18:14; 3. J. O'Donnell (Whitefield) 17:41; 4. J. Barnes (Liverpool) 16:55; 5. S. Marriott (Biggles) 16:54; 6. J. Cooper (Biggles) 16:29; **F1C Power (73 entries, 11 flew, 7x3 mins)** – 1. L. Burrows (Blackheath) 20:05; 2. F. Chilton (Crookham) 19:14; 3. R. Baggott (Birmingham) 19:04; 4. K. Faux (St Albans) 18:22; 5. R. Monks (Birmingham) 16:55; 6. S. Screen (Birmingham) 16:46.

BIGGLES GRAND APRIL SHOWER DEFYING EXTRA-GANZA – Bassingbourn, 24th April 1977

The billing for this contest should have been the *Biggles April Gale Defying Extravaganza*, as strong winds were the order of the day and reduced the number of entries significantly; the one cheery note being plenty of bright sunshine.

Due to the weather conditions and farmer trouble, the decision was made to fly the 'Open' events on a reduced maximum of 2½ minutes and also from a line, similar to FAI practice; this was an attempt to keep competitors as near to the upwind boundary as possible. Chuck glider was also flown from a box in accordance with SMAE rules.

Although attendance for this much awaited event was high, most people felt that it was prudent to limit their morning flying to

John Blagg slips the winding tube out of his Manhattan Cabin model, which has double surfaced wings, Fulton Hungerford wheels, triangular rear fuselage and bamboo undercarriage legs.



chuck glider in the hope that the wind would drop later in the day. 'Chuckie' proved to be a closely fought battle with only five seconds separating the top three places.

There were also several experimental features in the organisation of the contest. The use of one flight card for all events reduced the number of cards needed for the benefit of competitors and organisers. Results were duplicated and handed out to the assembled throng before the prizegiving ceremony.

In addition the prizes were a change from the usual as winners received bottles of champagne and specially minted Biggles medallions, whilst mounted on the champions' rostrum! Let's hope they defy both showers and wind at the *Biggles Autumn Leaf Dodging Spectacular*!

Open Glider (7 entries) – 1. D. Barnes 6:58; 2. L. Moore 5:49; 3. N. Parry 5:45; **Open Rubber (3 entries)** – 1. W. Nelson 5:00; 2. J. Holt 4:07; 3. P. Ball 1:43; **Open Power (2 entries)** – 1. T. Payne 7:30; 2. R. Moore 6:16; **A/1 (5 entries)** – 1. M. Cowley 4:24; 2. J. Williams 3:26; 3. G. Madelin 3:17; **CDH (3 entries)** – 1. M. Ribbs 5:37; 2. S. Marriott 3:12; 3. R. Moore 2:27; **3A (2 entries)** – 1. D. Pepperill 7:17; 2. J. Fletcher 6:19; **HLG (15 entries)** – 1. M. Bull 4:03; 2. M. Cowley 4:00; 3. A. Billam 3:58; **Junior** – 1. C. Parry (4th A/1); 2. C. Jeffreys (12th Chuck); 3. M. Simkins (7th Glider).

SMAE NOVICE/EXPERT EZB – RAE Cardington, 24th April by Bob Bailey

This, the first 'proper' indoor event of the season, saw a welcome return to the Shed for the regular enthusiasts – it was six months previously when the last event was held, an awfully long time or so it seemed!

The weather outside was very windy, and it was consequently somewhat noisy inside. Problems were expected with drift and turbulence but these were not evident except at low level. Although rather cold to start with, the conditions improved as the day went on.

Due to the Cardington Exhibition the following weekend, the Shed was unbelievably cluttered with balloons, kites and wires. It was thought that these would present a lot of difficulty but despite only a rather small launch space being available, not many flights were spoiled by the obstacles. The notable exception was Roger Melville's best flight which slid down a kite line for 20-30 feet, costing him at least 30 seconds, although the results show that this did not matter in the end.

Most of the regulars were busy getting their models sorted out and then the contest got under way, it became clear that 15 minutes per flight would be needed to get anywhere. Dave Pymm's new model (0.8 grams!) stirred things up somewhat with a practice flight of 18:46 to the amazement of all. I started off with a 15:03 to set the pace after the first flight failed due to a bunch stopping the propeller at 9:45 when just under the catwalk; 16 mins+ would have been possible, but such is life!

The very windy conditions persuaded Bob Wells to come and see what was going on and Geoff Lefever lent him an EZB to try out. During the afternoon Dave Pymm really showed what this model could do, the climb ending 20ft under the catwalk. Everyone stood round in a circle to avoid disturbing the model as it came down, 20 minutes, yes or no? – Yes! A super flight of 20:07 (a new World Record?) brought a well deserved round of applause reminiscent of Bud Romak's winning flight at the World Champs. This naturally was a winning flight for Dave – by a large margin.

Ron Green nearly pipped me into third place but ran out of turns before he expected to; he had rubber problems (thought it was good but it wasn't). Roger Melville hung up on his 5th, retrieved from the catwalk and made a better job of the 6th to take second place right at the end of the day.

A very exciting contest. The Novice event went to Graham Walker of Birmingham, with some very good flying around the 14 minute mark. Second place went to Mike Newman from St Albans with his first EZB – a very fine performance considering he hadn't done much modelling before this year!

Laurie Barr decided at an early stage that he wasn't going to be competitive and didn't enter – which surprised not a few. He said it was the first time he hadn't placed in an indoor contest (such is his consistency in flying!!) A great day, much enjoyed by all.

Dave Pymm's model featured the usual very large propeller with very low rpm – details will follow in my next article so watch this space!

Last but by no means least, the top Junior place went to Graham Davitt from Leeds with some excellent times of well over 11 minutes; unfortunately he wasn't eligible for the Novice event, otherwise he would have been second.

Scale Matters

by Alan Callaghan

A selection of rubber powered German WWI aircraft made by Czechoslovakian modellers. The Rumpler is the handiwork of Jan Dekanik, whilst the Fokker DVI is by the Junior Champion Antony Alferi.



REGULAR READERS of predecessor Eric Coates' *Flying Scale Column* will remember the occasional batch of photographs contributed by Ing. Lubomir Koutny of Brno, Czechoslovakia. Another selection of prints arrived recently of models that fared well during the 1976 season of contests and I was very pleased to be able to examine these at close quarters. Remembering our marvellous summer last year, which at times made me wish I were at the North Pole as an escape from the relentless heat, I now realise that not everyone had it so good when Ing Koutny mentions that their weather – usually ideal for flying free flight models – was particularly bad. This being so, a fair amount of indoor flying (including Peanut) took place in a large hall in Brno. One of the most successful modellers, Joseph Zaiser, has a unique approach to the subject in that he built no less than six full sets of components for none other than our old pal, the *Lacey M10*. From these he selected all of the lightest

parts and assembled them together into one model, with the result that his contest flights are consistently in the 100-120 second region. This is certainly a dedicated enthusiast's technique, but I wonder what became of the other five models?

It seems that military subjects are the most popular, due, no doubt, to the relative ease of obtaining drawings, colour schemes, and other relevant information. With one exception all of the photos are of rubber models varying from about 16 to 24 inches wingspan. Shown in its bare framework is a nicely-built and highly detailed *Sopwith Triplane* by Fr. Barta which appears to be diesel-powered, and includes moulded plastic wheels and cowling.

One feature that stands out both from previous pictures of rubber models as well as from these latest ones, are the very efficient looking propellers used. A decent prop accounts for at least 50 per cent of the success of a rubber scale model, and Lubomir Koutny and his fellow

enthusiasts certainly seem to get it right since the models fly very well despite the fact that really top class materials such as Pirelli are very difficult to obtain.

The props themselves appear to have blades with undercambered sections moulded from $\frac{1}{2}$ in or $\frac{1}{4}$ in plywood and set into hard balsa hubs. A unique model of the *Dornier Do 335* by L. Kunert has twin motors with the rear one driving a very coarse pitched three-blader, which turns in the opposite direction to the front prop. There must be some very interesting torque reactions going on, or do they cancel each other out? However, the model can climb to a height of 50 metres and must be quite spectacular. An *Aircobra* by Zdenek Vavra sports an enormous three-bladed prop – again of relatively coarse pitch – and is capable of one-minute flights.

The apparently large *Sablatnik SF4* triplane seaplane by Lubomir himself features a fine-bladed prop of over one third the wingspan in length, but no details are given of how well the model performs. From the same stable I found particularly interesting a rare *Zlin XIII* built to about 16 in wingspan.

The monocoque fuselage models all feature stringers spaced very close together and glued to the outside edges of the formers only, and not let in as is the usual technique. This means that the stringers can assume



Built by our correspondent Lubomir Koutny himself, this *Sablatnik SF4* seaplane won the Trnava WWI scale contest. Many of the Czech modellers favour such very ambitious prototypes – must be quite something to see these rubber powered craft fly.

perfectly natural curves without undulating up and down as they would if forced to comply with misaligned notches. The overall result is an extremely smooth surface that maintains the character of the fuselage quite well.

All the aircraft shown appear to be covered in coloured tissues giving a somewhat translucent effect, but which is certainly attractive. The emphasis is obviously on the flying side with these particular models and this is, after all, what it is all about. I hope we can look forward to another set of pictures next year, but it would be interesting to have some exact details of model dimensions and weights next time.

* * *

Barrie Hotham writes to say that the *Midland Area Indoor Meeting* held at Kimberley Sports Centre on 26th March turned out to be very successful. It is encouraging to see that more people are making use of the many sports centres situated around the country for model flying events. It has been my experience that once the managers of these centres have had it shown to them that certain branches of aeromodelling can be quiet, clean, educative and very entertaining, they can be very receptive indeed. This was amply demonstrated at the indoor meeting held at the Crofton Leisure Centre in London when halfway through the evening a gentleman disappeared into a room adjoining the hall and emerged wheeling a trolley loaded with Videotape equipment: it was possible to see an action replay of your dubious launching technique! The snag was that when a model flew past the ceiling lights, the camera could not quite cope with the extreme contrast created and the picture was

completely lost in a blurred and flared image. Also, small models are extremely difficult to follow with a camera – it is not too difficult keeping it in the view finder, but keeping it in focus at the same time is something else. Try it the next time you see a Peanut model being flown!

The Peanut event at Kimberley attracted 15 entrants and the adopted method of judging meant that it was the best flying models that took top placings. Bernard Aslett proved the eventual winner with his ultra-light *Ryan M-1* which although coming joint last in static had an enormous lead of 43 seconds in flying over Laurie Barr's *Fike* in second place. Since every single point counted this type of model was unbeatable on this particular occasion. Barrie mentions that the next event will have a set 'max' on flight duration to balance things out! Third place went to Trevor Crout of Bromley flying a *Piper Cub*, and top scale points went to Chris Chapman flying an *Aerobonita* built from Walt Mooney plans. I have since seen this model at Cardington and it truly is an excellent piece of work. A Junior prize was

won by Ian Davitt of Leeds with a *Nesmith Cougar*, and Ian also won a raffle for a CO₂ motor donated by Derek Jackson of *Telco*. Lucky man! With about 60 people in attendance the costs of the hall were met and trade support was greatly appreciated. It is hoped that a larger hall will be found for the next occasion which may be programmed solely as a scale meeting – good news!

* * *

It seems as though I'm not the only one who builds scale models that die hard. Last month I mentioned my F/F *Bristol MIC* which hopefully was to have a new lease of life as a C/L model. Bernard Sexton was about to give up the ghost with a C/L model of a *Wittman Bonzo D12* racer which did not quite fulfil expectations, but was persuaded by Ken Gardner of the Three Kings Club to let someone else (himself – no less!) have a try at it. With approximately four feet of fuselage and only two of wing, the *Bonzo* is not an easy subject to fly in any shape or form and in this one it habitually nosed over before lift off due to a long nose moment arm

At left, Peter Koutny displays his father's Zlin XIII which has an excellent flying performance – a very attractive subject. In complete contrast (below) is L. Kunert's Dornier 335BY push-pull aircraft. This machine reaches an altitude of 150 feet plus, and returns flight durations of between 100 and 120 seconds. Colour decoration appears to be achieved by use of dyed tissue.





coupled with a rearward undercarriage location and quite small wheels. Ken's first modification was to install a Veco 19 R C which is a very powerful motor for its size, and he then somehow managed to get the CG further back than it originally had been. This was a bit of a tricky job since a C/L model with the CG too close to the bellcrank pivot is a very entertaining piece of equipment with a lifespan usually calculated in milliseconds. The first test flights showed that Ken had got it about right, but the enormous tail moment arm together with too generous elevator movement made it very sensitive to handle. By then simply restricting the elevator travel the beast was tamed and now provides touch and go landings – a sure sign of a stable model. Since it is not by any means overpowered it flies at what is close to scale speed which for a small racing plane is obviously relatively fast.

I have often wondered about the possibility of devising a simple C/L contest for proper scale racing planes where the models would have to emulate the performance of the full size plane in the manner of a timed precision flying event, as opposed to the out-and-out racing of the normal C/L Goodyear event. There are some

Above is the Wittman Bonzo D12 racer, as built for C/L by Bernard Sexton. Wing span is just 24in. At right is Wal Cordwell, also of the Three Kings Club, with latest project, a Grumman Helldiver.

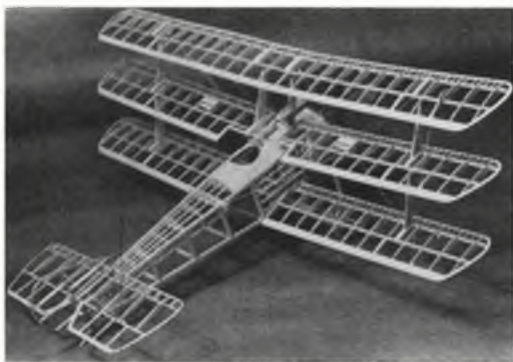


amazingly attractive aircraft amongst the ranks of contenders for such as the American Goodyear, Greve, and Thompson trophies that lose every ounce of character when reduced to a grossly simplified profile model. Lest anyone takes offence I would hasten to add that I do not decry normal C/L Goodyear as a competitive event in its own right, but would suggest that there must be other ways of flying this kind of aircraft in a way that is practicable, but with more emphasis on the model than on pure performance.

Anyone who regularly takes American magazines will be aware of the Goodyear etc events occasionally held for F F rubber models that are as much a test of endurance of man and model as of anything else. Flying these subjects in this way is, however, a good deal more difficult than it is to fly them as simple C/L models. A step further would be to base some-

thing upon our own *King's Cup Air Race* where many more aircraft types would be eligible but still on equal terms with each other when it comes to flying. Food for thought!

A new model rapidly approaching initial rollout is the latest from the building board of Wal Cordwell. This is a *Grumman Helldiver* built to a metric scale bringing it out at 57in (or 1450cm!) wingspan. Powered by a Merco 61, the model will feature retract gear, flaps, arrestor hook and throttle, with provision for fitting a working bomb system at some later date. A set of modified commercial retract gear is used with the power system being installed in the model, and switching is carried out at the handle via two insulated lines. Wal chose this subject mainly for its proportionally large, very clean wing with a very thick section, which on the model is detachable to ease transporting and storage problems. Having studied several sets of plans and plastic kits of the aircraft before starting, Wal was a little apprehensive of the 3 deg positive incidence used on the tailplane, but assuming that it must be so for a very substantial reason inherent in the original design he decided against an instinct to alter it and is faithfully keeping everything to exact scale. With all the working features plus two large cockpits to fill there is ample scope for detailed work. At the time of the photo the model weighed 4½lb less motor and tank, and hopefully will be ready for the Nats.

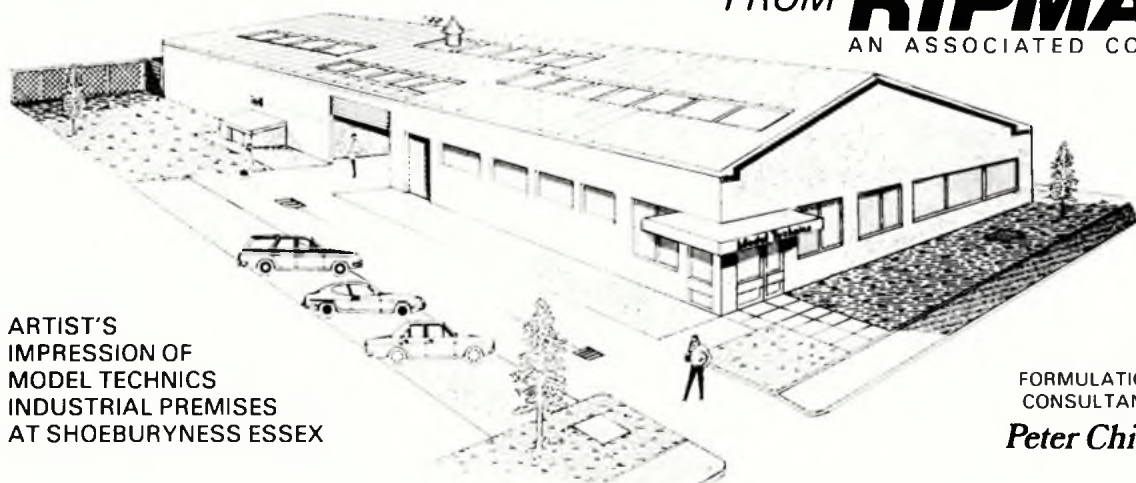


British aircraft have not been forgotten by the Czech modeller - this is Fr. Barta's nicely built example of the Sopwith Triplane but for diesel power rather than rubber. A nice example of this modeller's skill.

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The Model Technics factory at Shoeburyness has been purpose designed and built for the blending and bottling of liquid fuels. Every constituent is of selected quality and careful thought has been given to the various storage facilities to keep each liquid in perfect condition. The complete operation is free of dust since the system is almost fully enclosed and all metals and materials involved in the process have been chosen to avoid contamination from chemical or electrolytic reaction. All deliveries of constituents are tested as a matter of routine and further services are provided to fully ensure that the final products are of consistent high quality and sound technical merit.

At the very heart of our operation are specially designed and constructed machines which combine accurate measurement of flow rates with molecular blending. Molecular Blending is achieved using semi-continuous in-line mixers, of large horsepower, which shear liquids to such a high degree that molecular dispersion takes place. Fuels mixed in this way not only stay mixed for a very long time, they also do not suffer from the problems of stratification and density gradient which are frequently the cause of variations in performance.

The Directors of Model Technics are all modellers and have been mixing and testing fuels for 25 years, but, fuel technology is constantly changing, so we have a programme to test every new oil and additive that appears to have promise. We have our own test facilities, we call on the services of our formulation consultant, Peter Chinn and we also use a number of top modellers to conduct field tests for us. You can be quite sure when you buy Model Technics fuels, you are not only buying high quality, you are also buying the latest proven technology. By the way, if you believe you have discovered a 'new' additive, a better oil or a different technique we would be delighted to exchange correspondence with you.

Peter Chinn

Our FORMULATION CONSULTANT is Peter Chinn the Internationally known model engine expert and writer. He is a Contributing Editor to MODEL AIRPLANE NEWS (USA) and a regular contributor to all leading journals in the U.K. He is particularly known for his meticulous Engine Test Reports and has had over 1,000 articles on model engine subjects published in the U.K. and U.S.A. plus many that have been translated and published in other countries. He has a personal collection of approximately 800 model internal combustion engines of all types, sizes and nationalities, tracing the development of model engines from 1936 to the present day. He maintains close contact with engine manufacturers throughout the World and virtually every new model engine of note passes through his hands, usually before it appears on the market, and more than 600 of his highly regarded Test Reports have appeared in print. Peter's irreplaceable records and his exhaustive test procedures have been of inestimable value in the development of our fuels.



**STOCK
SIZES**

TINS: ¼ Litre, ½ Litre

DRUMS: 200 Litre

POLYCANS: 1 Litre, ½ Gallon, 1 Gallon

MODEL TECHNICS PRODUCTS

Most commercial model fuels are supplied in several grades because no single fuel can supply all the needs of the various types of engines. At Model Technics, we took a fresh look at the problem by collecting and analysing a mass of data on all available engines, which, together with the help of Peter Chinn and our own testing, enabled us to produce fuels to suit every engine under every operating condition.

At present, all our fuels contain Castor Oil as the basic lubricant and Synthetic Oils would only be used for additive qualities. We do believe that Synthetics will eventually have a major role to play in commercial model fuels but at the present state of the art our tests show that they do not give sufficient protection against the inevitable overlean run. Our policy is to constantly improve our products, so when Synthetics are ready for us, we will be ready for them.

The following is a resumé of our fuel ranges and should be read in conjunction with the charts below. To choose a fuel for a specific engine, use the Fuel Selection Chart.

Power Plus G-100 to G-700

This is our most expensive range of glow fuel and it is based on the use of

Nitro Methane, the traditional power additive for model engines. We produce seven blends in this range with Nitro Methane percentages of 0, 3, 6, 10, 16, 25 and 40%. These percentages have been carefully chosen to ideally suit the greatest number of engines whilst giving a linear increase in power from one blend to the next—though this will vary from one type of engine to another and any one engine will only produce a linear curve over a limited section of the range. Generally, G-100 to G-300 will be found to give the required power for 29:61 R/C engines while many 09:25 engines would benefit from the use of G-400 or G-500, and G-600 or G-700 can be used to produce extra power from small high performance engines such as the Cox Tee-Dee motors. G-700 may also be used in certain racing or competition engines where a high Nitro Methane content is specified by the manufacturer. Do not, however, use these high Nitro blends before your engine is adequately run-in on milder fuels.

Expert Mix G-100E to G-500E

Following a similar numbering system to the Power Plus range, G-100E is formulated to be equivalent to G-100, and G-200E to G-200, G-300E to G-300, etc. The Expert Mix range uses less Nitro Methane than does Power Plus but it is made equivalent with Model Technics own additives. The advantage of Expert Mix is that it produces a similar power to the corresponding Power Plus, has at least equal properties of good idling, insensitive needle adjustment and easy handling and yet is substantially cheaper. If you are looking for top quality and performance at a moderate price, use Expert Mix.

FORMULATION AND PRICE CHART

GLOW FUEL		SIZES AND PRICES (£'s)						% LUBRICANT		% ADDITIVE	
		¼ Lit	½ Lit	1 Lit	½ Gal	1 Gal	200 Lit	SPECIAL	COMMERCIAL	NITRO METHANE	VARIOUS
G-100	Power Plus	0.42	0.65	1.00	1.90	3.30	123.50	Medium	—	—	Yes
G-200	Power Plus	0.45	0.69	1.15	2.15	3.70	138.50	Medium	—	3%	Yes
G-300	Power Plus	0.49	0.79	1.30	2.50	4.35	162.50	Medium	—	6%	Yes
G-400	Power Plus	0.56	0.92	1.55	2.95	5.20	194.50	Medium	—	10%	Yes
G-500	Power Plus	0.65	1.10	1.90	3.65	6.45	242.00	Medium	—	16%	Yes
G-600	Power Plus	0.79	1.35	2.40	4.70	8.35	312.00	Medium	—	25%	Yes
G-700	Power Plus	1.05	1.80	3.25	6.50	11.50	430.00	Medium	—	40%	Yes
G-100E	Expert Mix	0.40	0.63	0.95	1.80	3.15	118.00	Medium	—	—	Yes
G-200E	Expert Mix	0.42	0.66	1.05	1.95	3.40	127.00	Medium	—	Equiv 3% NM	Yes
G-300E	Expert Mix	0.44	0.69	1.15	2.10	3.65	136.50	Medium	—	Equiv 6% NM	Yes
G-400E	Expert Mix	0.47	0.76	1.25	2.35	4.00	149.00	Medium	—	Equiv 10% NM	Yes
G-500E	Expert Mix	0.54	0.89	1.50	2.85	4.95	185.00	Medium	—	Equiv 16% NM	Yes
G-100L	Long Life	0.43	0.67	1.05	1.95	3.45	129.00	High	—	—	Yes
G-200L	Long Life	0.45	0.70	1.15	2.10	3.70	138.00	High	—	Equiv 3% NM	Yes
G-300L	Long Life	0.47	0.73	1.25	2.25	3.95	147.50	High	—	Equiv 6% NM	Yes
G-400L	Long Life	0.50	0.80	1.35	2.50	4.30	160.00	High	—	Equiv 10% NM	Yes
G-500L	Long Life	0.57	0.93	1.60	3.00	5.25	196.00	High	—	Equiv 16% NM	Yes
G-100F	FAI Contest	0.38	0.60	0.92	1.70	2.95	112.00	20%	—	—	—
G-100S	Straight	0.35	0.54	0.84	1.55	2.70	103.00	—	20%	—	—
DIESEL FUEL		SIZES AND PRICES (£'s)						% LUBRICANT		% ADDITIVE	
		¼ Lit	½ Lit	1 Lit	½ Gal	1 Gal	200 Lit	SPECIAL	COMMERCIAL	DIESEL ETHER	IGNITION AGENT
D-1000	Easy Start	0.60	0.99	1.85	—	—	—	High	—	High	Med/Low
D-2000	Sport Special	0.59	0.96	1.75	—	—	—	Medium	—	Medium	Medium
D-3000	Racing Brew	0.56	0.90	1.60	—	—	—	Low	—	Medium	Med/High
MATERIALS		SIZES AND PRICES (£'s)						RECOMMENDED PRICES			
		¼ Lit	½ Lit	1 Lit	½ Gal	1 Gal	200 Lit				
Castorlube		—	—	2.20	4.25	7.50	289.00	<p>Prices shown are those recommended for England and Wales (including I.O.W.) but due to the extremely high cost of carriage to remoter districts these prices must be increased by the following amounts for SCOTLAND:</p> <p>¼ lit 2p, ½ lit 3p, 1 lit 5p, ½ gal 10p, 1 gal 20p, 200 lit £8.</p> <p>For offshore islands and other countries (Channel Islands, I.O.M., Ireland, etc.) prices must be further increased, please ask your retailer for details.</p>			
Castorblend		—	—	1.95	3.75	6.40	258.00				
Hi-Proof Methanol		—	—	0.52	0.89	1.55	56.00				
Nitro Propane		0.94	1.65	2.95	5.90	10.40	—				
Nitro Methane		1.75	2.95	5.80	12.00	21.50	—				
50% Nitro Methane		0.95	1.60	3.00	5.95	10.95	—				
Isopropyl Nitrate		0.74	1.25	2.25	—	—	—				
Cetane Improver	NYA	NYA	NYA	—	—	—	—				
Diesel Ether	—	1.35	—	—	—	8.20	—				
Residue Remover	NYA	NYA	NYA	—	—	—	—				

Long Life G-100L to G-500L

Long Life is very similar to Expert Mix except it has a substantially higher percentage of lubricant. Long Life has been designed to fulfill three functions:

1. For the running-in of new engines.
2. To get an extra season from a well-worn engine that will no longer run consistently on a fuel of lower oil content.
3. For use as an everyday fuel by modellers who are prepared to sacrifice a very small amount of power to lengthen the life of their favourite engine. As a matter of interest, the Directors of Model Technics invariably use one of the Long Life blends for their personal modelling.

FAI Contest and Straight G-100F and G-100S

These are straight Methanol/Oil glow fuels without additives, for use in engines that have been set up specifically for such fuels—for example the Italian OPS racing engines. The FAI Contest mixture is to the standard FAI specification for International competition i.e. 80% Methanol/20% Pure Castor Oil.

Diesel Fuels D-1000 to D-3000

All three Model Technics diesel fuels contain additives that provide ignition without resort to excessively high compression ratios under light loads—most important with high speed engines—smoothing the combustion process and

lowering mechanical stresses. D-1000 Easy Start has been formulated to suit all currently available small engines up to 1.5cc, for both running-in and general use. It is also for use with larger engines as a running-in fuel, or to get that extra season from a well-worn motor. D-2000 Sport Special is for general use in engines of more than 1.5cc capacity. D-3000 Racing Brew is mainly formulated for high performance 2.5cc class diesels at speeds in excess of 14,000 rpm, so it will not necessarily increase performance in a sports type diesel.

Selected Materials

Castorlube is made from high quality lubricating castor oil and Castorblend from good commercial blends of castor. Hi-Proof Methanol is guaranteed to have negligible water content and is completely free of other harmful impurities. Nitro Propane has a reputation as an engine cruncher but with care can be used in small percentages—too much will cause overheating or pre-ignition. Nitro Methane is an excellent additive but we suggest mixing from 50% Nitro Methane whenever possible as this is better value for money material (50% Nitro Methane/50% Methanol by volume—more commonly sold as 60% Nitro Methane, but this is by weight not volume). Isopropyl Nitrate is a good diesel additive but try Model Technics Cetane Improver, we think it is better. Diesel Ether is our special grade of ether but because of its extra low flash point we cannot send it by commercial road transport. Residue Remover is a cleaner that safely removes exhaust products from models—and remember, clean models last longer.

FUEL SELECTION CHART

ENGINE MAKE AND TYPE	RUN-IN	GENERAL USE	EXTRA POWER	ENGINE MAKE AND TYPE	RUN-IN	GENERAL USE	EXTRA POWER
BERNHARDT HB 12 & 15	G-100L	G-300 G-300E G-300L	G-400/500 or E	ME HERON & SNIPE	D-1000	D-1000	
BERNHARDT HB 20 & 25	G-100L	G-200/300 or E or L	G-400 G-400E	MERCO 29, 35, 49 & 61	G-100L	G-100/200 or E or L	G-300/400 or E
BERNHARDT HB 40 & 50	G-100L	G-200 G-200E G-200L	G-400 G-400E	METEOR 40 & 60	G-100L	G-100/200 or E or L	G-300 G-300E
BERNHARDT HB 61	G-100L	G-200 G-200E G-200L	G-400 G-400E	OLIVER TIGER	D-1000	D-2000	D-3000
BERNHARDT VECO 19 & 61	G-100L	G-200 G-200E G-200L	G-400 G-400E	OPS SPEED 29, 40 & 60	G-100L	G-100F*	G-700
CIPOLLA JUNIOR	G-100L	G-300 G-300E G-300L	G-500 G-500E	OPS URSUS 60	G-100L	G-100/200 or E or L	G-300 G-300E
COX TEE DEE 010	G-400L	G-600 G-500E G-500L	G-700	OS PET 09 & MAX 10	G-100L	G-300 G-300E G-300L	G-500 G-500E
COX TEE DEE 020	G-300L	G-500/600 G-500E/L	G-700	OS MAX 10F-SR & MAX 15	G-100L	G-300/400 or E or L	G-600/700 G-500E
COX TEE DEE 049 & 051	G-200L	G-500/600 G-500E/L	G-700	OS MAX 20 & 25	G-100L	G-300 G-300E G-300L	G-500 G-500E
COX TEE DEE 09	G-100L	G-500/600 G-500E/L	G-600/700	OS MAX 25F-SR	G-100L	G-300 G-300E G-300L	G-500/600 G-500E
COX MEDALLION 049	G-200L	G-400/500 or E or L	G-600 G-500E	OS MAX 30, 35 & 40	G-100L	G-200/300 or E or L	G-400 G-400E
COX MEDALLION 09 & 15	G-100L	G-400 G-400E G-400L	G-500 G-500E	OS MAX 40 SR	G-100L	G-700	G-700
COX PEE WEE 020	G-300L	G-500 G-500E G-500L	G-600	OS MAX 40F-SR	G-100L	G-300 G-300E G-300L	G-500 G-500E
COX BABE-BEE, GOLDEN-BEE				OS MAX 60F-GP	G-100L	G-200 G-200E G-200L	G-300 G-300E
OZ & BLACK WIDOW 049s	G-200L	G-400/500 or E or L	G-500/600 G-500E	OS MAX 60F-GR	G-100L	G-300 G-300E G-300L	G-400 G-400E
COX CONQUEST 15	G-100L	G-100F*	G-700	OS MAX 60F-SR	G-100L	G-300/400 or E or L	G-500 G-500E
COX CONQUEST 15 R/C	G-100L	G-200/300 or E or L	G-500 G-500E	OS MAX 60R-SR	G-100L	G-700	G-700
DC QUICKSTART WASP	G-200L	G-300 G-300E G-300L	G-500 G-500E	OS MAX 80	G-100L	G-200/300 or E or L	G-400 G-400E
DC QUICKSTART DART, MERLIN				OS FS 60 Four-stroke	G-100L	G-200/300 or E or L	G-400 G-400E
SPIRITFIRE, SABRE & RAPIER	D-1000	D-1000		OS Graupner Wankel Rotary	G-100L	G-200L G-300L	G-300L G-400L
ED FURY, RACER, SEA OTTER,							
HUNTER, VIKING, SEA LION	D-1000	D-2000					
ENYA 09, 15 & 19	G-100L	G-300 G-300E G-300L	G-500 G-500E	ROSSI R 15 (FAI)	G-100L	G-100F*	G-700
ENYA 29, 35, 45 (lapped)	G-100L	G-200/300 or E or L	G-400/500 or E	ROSSI R 15 DIESEL	D-1000	D-2000	D-3000
ENYA 40, 45 (ringed) & 60	G-100L	G-200/300 or E or L	G-500 G-500E				
FOX 15, 19 & 25	G-100L	G-300/400 or E or L	G-600 G-500E	SUPER TIGRE G.15 & G.20: 15	G-100L	G-300 G-300E G-300L	G-700
FOX 29 & 36	G-100L	G-200/300 or E or L	G-500 G-500E	SUPER TIGRE G.20/15 DIESEL	D-1000	D-2000	D-3000
FOX STUNT 35	G-100L	G-200 G-200E G-200L	G-300 G-300E	SUPER TIGRE X 15RV SPEED	G-100L	G-100F*	G-700
FOX COMBAT SPECIAL	G-100L	G-500/600 G-500E/L	G-700	SUPER TIGRE X 15RV DIESEL	D-1000	D-3000	D-3000
FOX 40 & 45	G-100L	G-100L/200L	G-400 G-400E	SUPER TIGRE X 15FI & X 21	G-100L	G-300 G-300E G-300L	G-700
FOX 40BB & 45BB	G-100L	G-100/200 or E or L	G-500 G-500E	SUPER TIGRE G.20/23	G-100L	G-300 G-300E G-300L	G-500 G-500E
FOX EAGLE 60 & HAWK 60	G-100L	G-200 G-200E G-200L	G-500 G-500E	SUPER TIGRE X 29 & 40 SPEED	G-100L	G-100F*	G-700
FOX 78	G-100L	G-100/200 or E or L	G-500 G-500E	SUPER TIGRE G.21/35 & ST 35	G-100L	G-200 G-200E G-200L	G-400 G-400E
HIRTENBERG HP 40F & 40R	G-100L	G-100/200 or E or L	G-300/400 or E	SUPER TIGRE G.21 40 & 46	G-100L	G-300 G-300E G-300L	G-400/500 or E*
HIRTENBERG HP 40R (PYLON)	G-100L	G-100F*	G-700	SUPER TIGRE ST 51, 56 & 60	G-100L	G-200 G-200E G-200L	G-300 G-300E
HIRTENBERG HP 61F & 61R	G-100L	G-100 G-100E G-100L	G-300 G-300E	SUPER TIGRE G.60 & G.71	G-100L	G-300 G-300E G-300L	G-400/500 or E
HIRTENBERG HP 61FS	G-100L	G-200 G-200E G-200L	G-400 G-400E				
INDIAN MILLS 75	D-1000	D-1000		TAIPAN TYRO DIESEL	D-1000	D-1000	
IRVINE SPORT 40	G-100L	G-200/300 or E or L	G-400 G-400E	TAIPAN 2.5cc GLOW	G-100L	G-300 G-300E G-300L	G-600 G-500E
K&B 3.5cc & OUTBOARD	G-400L	G-400 G-400E G-400L	G-600 G-500E	TAIPAN 2.5cc DIESEL	D-1000	D-2000	
K&B 35 'Series 75'	G-100L	G-300 G-300E G-300L	G-400/500 or E	TAIPAN 3.5cc GLOW	G-100L	G-300 G-300E G-300L	G-500 G-500E
K&B TORPEDO 40F	G-100L	G-400 G-400E G-400L	G-600 G-500E	TAIPAN 40	G-100L	G-200/300 or E or L	G-400/500 or E
K&B 6.5cc SR-II (Formula 1)	G-600	G-700	G-700				
K&B 6.5cc RACING MARINE	G-600	G-700	G-700	WEBRA RECORD DIESEL	D-1000	D-1000	
K&B 61 'Series 75'	G-100L	G-300 G-300E G-300L	G-500 G-500E	WEBRA WINNER DIESEL	D-1000	D-2000	
K&B VECO 19	G-100L	G-200 G-200E G-200L	G-400 G-400E	WEBRA GLO STAR & 20	G-100L	G-200/300 or E or L	G-300/400 or E
KRAFT 61	G-100L	G-200/300 or E or L	G-400 G-400E	WEBRA BLACKHEAD 40 & 61	G-100L	G-200 G-200E G-200L	G-300/400 or E
McCOY 049	G-200L	G-400 G-400E G-400L	G-500 G-500E	WEBRA SPEED 40 & 61	G-100L	G-300 G-300E G-300L	G-400 G-400E
McCOY 19, 29, 35 & 40	G-100L	G-300 G-300E G-300L	G-500 G-500E				

*Some high performance engines may be set up for FAI contest work on straight FAI fuel. It may be necessary to change cylinder heads, head gaskets and/or tuned pipes, to enable them to be used in open contests on high nitro fuel.

HOW TO BUY CHEAPER

Because of the relatively high cost of freighting fuel and the expensive tins and polycans required to contain it, we have been able to work out three methods by which we can offer fuel to the modeller at reduced prices.

1. We deliver direct to your door and allow you a 10% DIRECT DELIVERY DISCOUNT. The saving is made by eliminating shop handling, but we must ask you to order a minimum of 10 gallons (can be assorted types and sizes) and to pay your retailer in advance, who will then place the order with us. When ordering 200 litre drums please arrange for a hoist or fork-lift to help off-load.
2. You call and collect your fuel from our factory at Shoeburyness and save HANDLING AND CARRIAGE CHARGES at the following rate for each container.

200 lit £14, 1 gal 50p, ½ gal 25p,
1 lit 11p, ¼ lit 7p, ⅛ lit 4p.

Also, since this is a DIRECT DELIVERY, it is additionally subject to the 10% DIRECT DELIVERY DISCOUNT. Again we must ask for a minimum order of 10 gallons and preferably please pay your retailer in advance, obtaining a receipt which we will require for our records. We can accept cash on the spot but please be prepared to give us the name of your local model shop so we can credit the sale to their account.

3. Send us or bring us your empty containers (minimum size 1 gallon) and we will fill them. We will allow you an OWN CONTAINER REBATE of:

£10 per 200 lit drum or 25p per 1 gal (minimum 10 gals).

Modellers bringing their own containers also save HANDLING AND CARRIAGE CHARGES plus 10% DIRECT DELIVERY DISCOUNT:

For example: A Modeller bringing his own 200 lit drum to be filled with G-100E Expert Mix Glow Fuel would pay as follows:

1 drum 200 lit G-100E	£118.00
less OWN CONTAINER REBATE	10.00
less HANDLING AND CARRIAGE	14.00
	£94.00
less 10% DIRECT DELIVERY	9.40
Actual Cost 200 lit	£84.60

Assuming 200 lit = 44 gal
Cost per gal = £1.92

MIXING YOUR OWN FUEL

Mixing your own fuel can be quite successful and Model Technics caters for home brewers by offering a range of selected materials but there are a number of points which should be noted.

1. Always buy good quality constituents and be particularly wary of 'cheap' methanols which can have a high water content or contain dangerous impurities. It would be a false economy indeed to make a low cost fuel that produced erratic running, corrosion or premature engine wear. And remember, an engine cutting at the wrong moment could result in the write off of a complete model with severe damage to the engine and R/C equipment.
2. Unless you have the use of a ventilated inflammables store always keep highly inflammable liquids such as pure methanol in the open. Preferably store against a wall to give shade from the sun and cover with a tarpaulin.
3. Unless you have the use of a mechanically ventilated fume cabinet always mix in the open. The fumes from most inflammable liquids are heavier than air and will flow and collect low down. Just one spark from a shoe scrape or a static discharge from a nylon sock could cause a dangerous explosion.
4. Many additives used in fuels are poisonous and the greatest care should be taken when handling a chemical of unknown toxicity. The toxicity of methanol is frequently under-estimated and this can be extremely dangerous. Methanol can be taken into the body by the inhaling of vapour or by absorption through the skin and since the effect is cumulative over long periods it is possible for the concentration to build up to cause sickness, blindness, insanity and even death. Therefore never mix methanol based fuels inside (other than in a mechanically ventilated fume cabinet) and always wash hands immediately should they become contaminated.
5. When mixing by hand, only half fill the container to allow room for movement and shake vigorously for about 20 minutes. Also, with hand mixed fuels, shake well for several minutes prior to each flying session.
6. With home mixes there is a tendency for 'small white fluffy lumps' to precipitate out of solution. They are particularly prevalent in cold weather or if the fuel has stood for some time and will be much heavier if the wrong quality of Castor has been used. Since these 'fluffy lumps' frequently cause carburettor blocking, many commercial mixers have developed additives to minimise this phenomenon, but for the modeller it is usual to disperse them with vigorous shaking or by filtering a really heavy 'invasion'.

GETTING THE BEST FROM YOUR ENGINE

Buying a new model engine is like buying a new car—the engine must be 'run in'. A properly run in engine can mean the difference between a well performing motor that will give you long and faithful service and one that can be rendered useless in a very short time.

The first essential is a mild 'cool' fuel (i.e. with little or no power additive) and a relatively high castor oil content—such as G-100L Long Life. Secondly, all early runs must be with a rich needle valve setting that will keep the engine 'four stroking' and the cylinder wall well lubricated.

It is also desirable, especially with lapped piston engines, to keep runs short with cooling periods between each. Generally, the larger engines and also the medium sized ones with lapped cast-iron pistons, require the longest running-in period. Very small engines like the Cox 049 units require the least running in. If your engine slows down when the needle valve is adjusted for maximum power, the engine requires more running in.

Do not overload a new engine with a big propeller in the mistaken belief that this is required to prevent it from 'running too fast'. The engine should be kept lightly loaded by using the recommended prop size and keeping the speed down by running on a rich

needle valve setting.

Once your engine has been run-in don't be afraid to try various fuel and glowplug combinations to get the best performance from your particular engine prop model set-up. If your engine shows signs of pre-ignition or over-heating, try a milder fuel, or a glowplug having a 'cold' rating. If, on the other hand, it loses power when the plug lead is disconnected, try a 'hotter' fuel or a hotter glowplug. Also, be prepared on a hot sunny day to use a milder fuel, and, on those cold wet days, to use a hotter fuel.

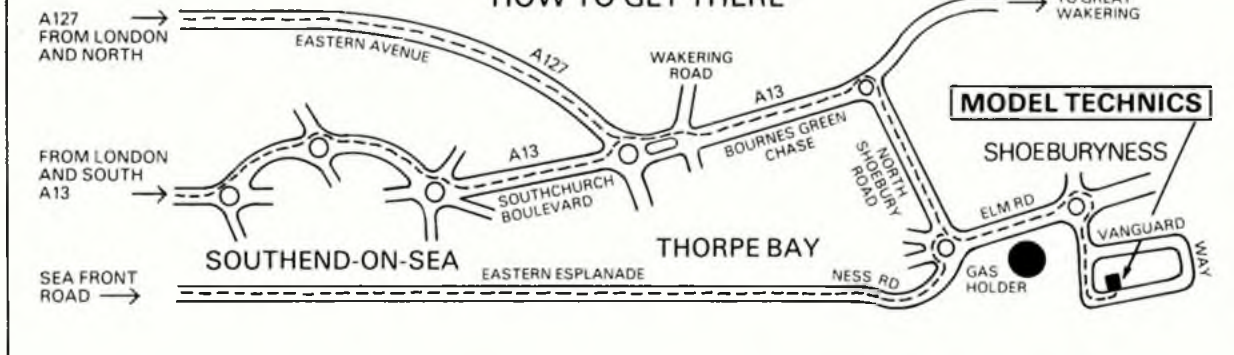
Glowplugs are known to 'age' and adversely affect the performance of a previously good set up. It is thought that this is due to the catalytic action of the platinum element being impaired by oxidation or by the build up of impurities in the pores of the element—glowplugs can 'age' very quickly in the presence of certain 're-claimed' methanols and unsuitable castor oils. If you suspect that your glowplug has outlived its useful life, try another one of the same type as a comparison. If you do have a 'duff' one, do not hoard it and perhaps fit it again later, it will not recover and can only cause you problems.

A few other do's and don'ts. Always use a filter in the

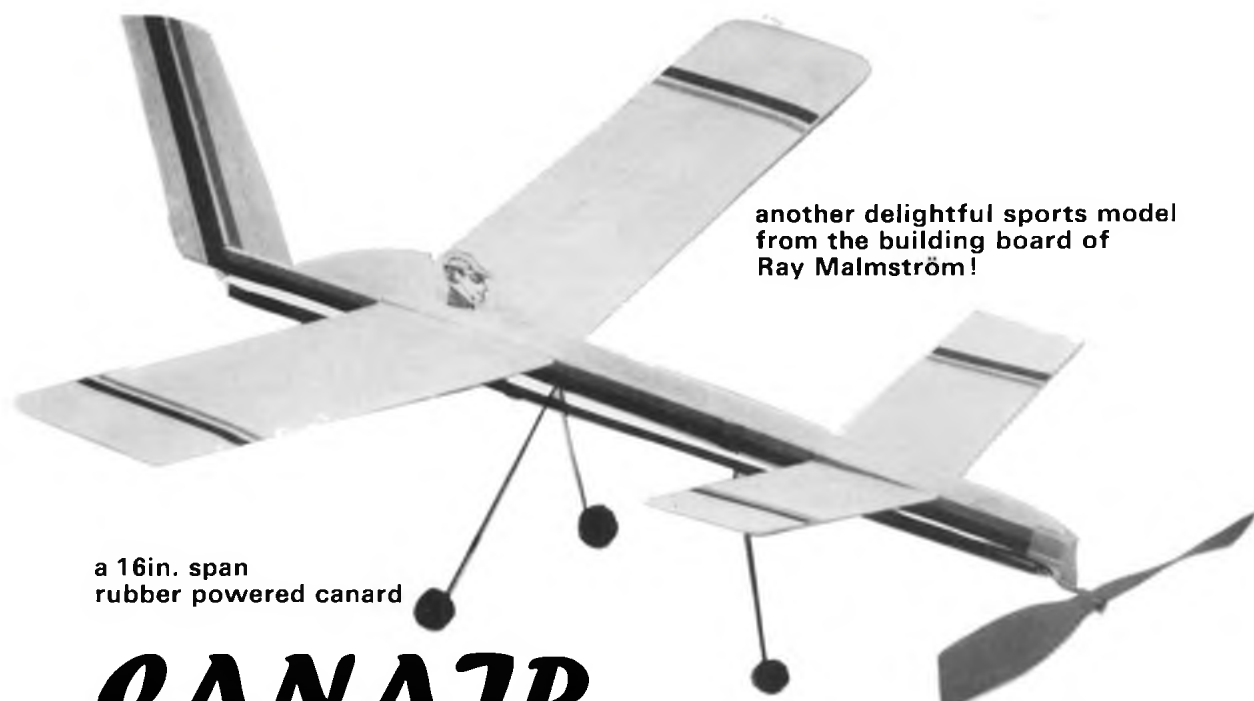
engine fuel line and keep it clean—especially when using home brews. Always balance propellers and spinners and securely fix the engine into the model—undue vibration can cause major power loss and premature wear. Occasionally check that engine screws are tight, but do not overtighten. Ensure that your glowplug accumulator is topped up and charged—the night before you want to use it. At the end of the day, squirt cycle oil into the exhaust port and carburettor and disperse around the engine by hand cranking, say ten times—this will give added protection against rusting and acidic products of combustion.

Finally, for the sake of safety, when starting or running an aircraft engine on the ground, never put yourself or onlookers in or near the plane of the disc made by the spinning propeller. Some higher power engines, due to high revs and vibration, will regularly shed blades of certain plastic props whilst almost any engine is likely to shed a blade from a damaged prop—and this can be invisible damage from a gentle nose over. Since a shed blade would be travelling at several hundred miles per hour it could obviously be lethal, so always ask spectators and helpers to keep well behind the model.

HOW TO GET THERE



Model Technics Ltd Vanguard Way Shoeburyness Essex SS3 9QY Phone: (03708) 2244



another delightful sports model
from the building board of
Ray Malmström!

a 16in. span
rubber powered canard

CANAIR

FORGIVE us for asking a personal question, but are you feeling like building a little job that is easy and quick to construct, is rather nice to look at, and flies well? If you are, may we present *Canair* – and add (may heaven help us!) you ‘canardly’ do better!

As with all small rubber powered models, the key to a good flight

edge (*Sketch 5*). Carefully sand main plane panels to section shown. Cement the panels together, raising one tip up and pinning to the main plane dihedral jig C. Reinforce the centre-section with a strip of tissue – keep main plane pinned to building board until set (*Sketch 6*). Make two cuts on trailing edge as indicated. Repeat the procedure for the front elevator,

and VAT that can’t be bad! Install a 280mm loop of well lubricated 3mm flat strip rubber between the propeller and rear motor hooks. Push a pin into the upper fuselage piece F where shown on the plan. Tie a length of thread to the pin and suspend your model. It should hang level. Our own model did not need the addition of any weight either front

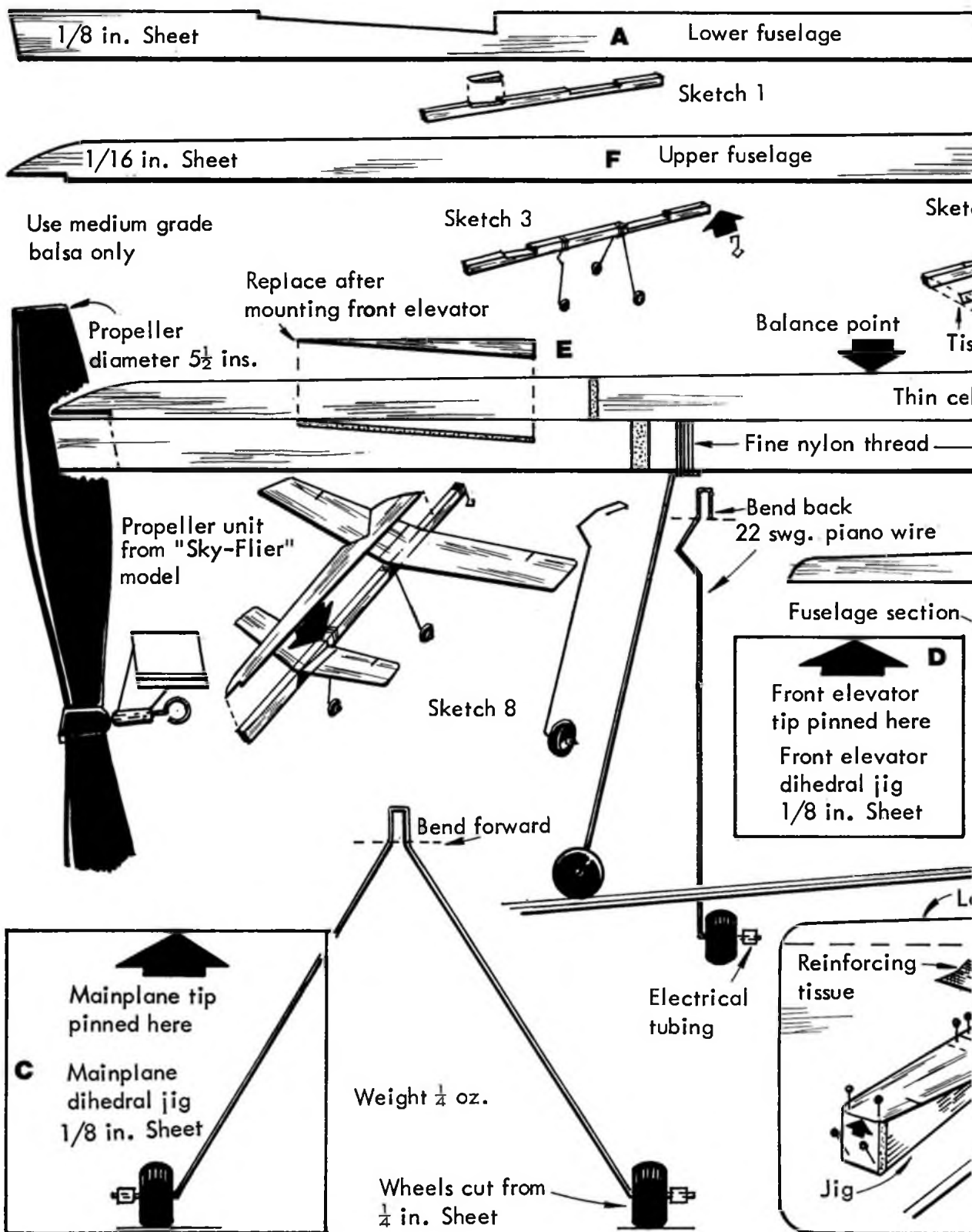
FULL SIZE PLANS OVERLEAF

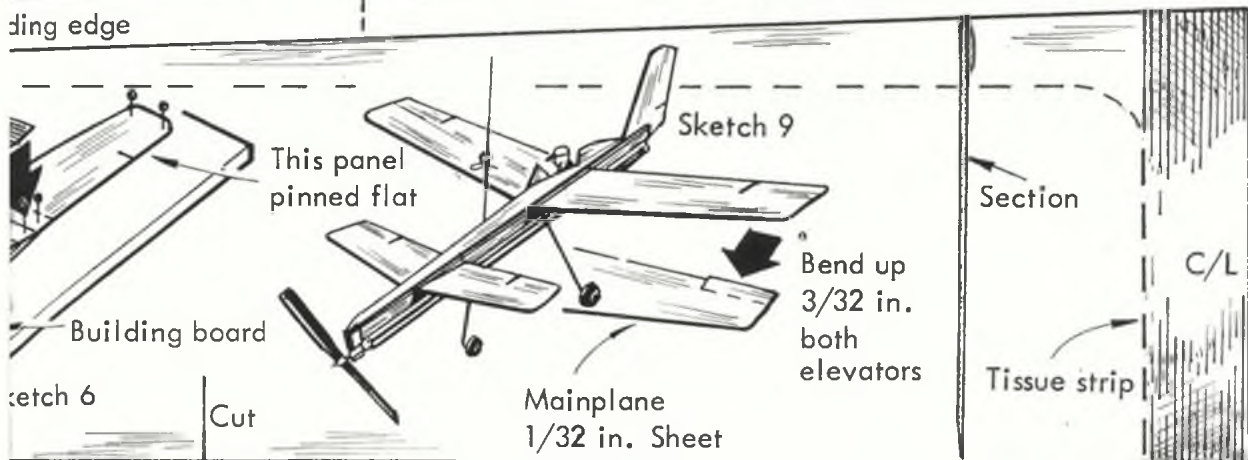
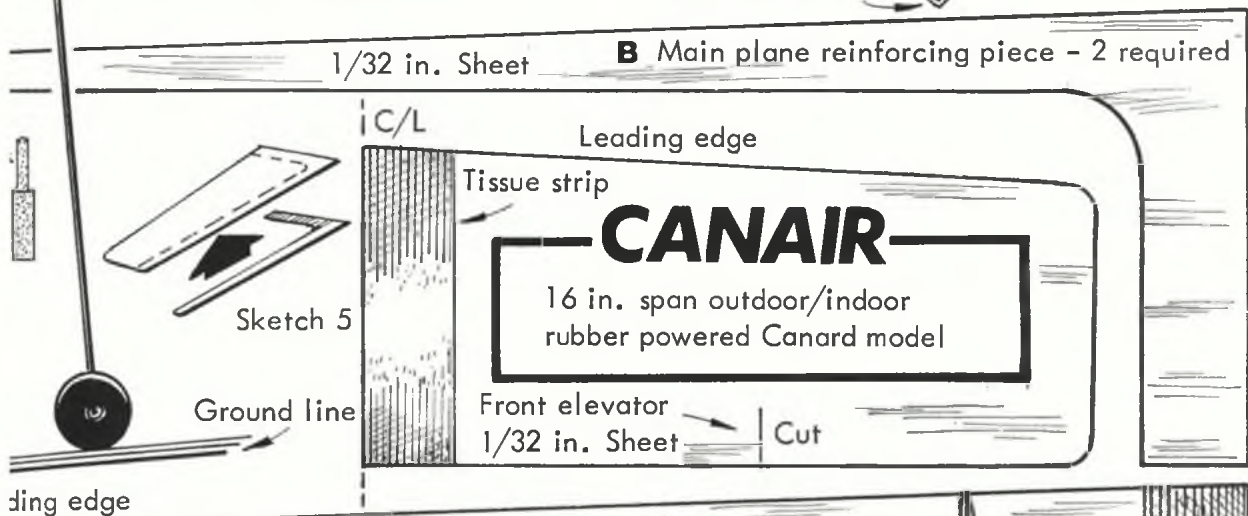
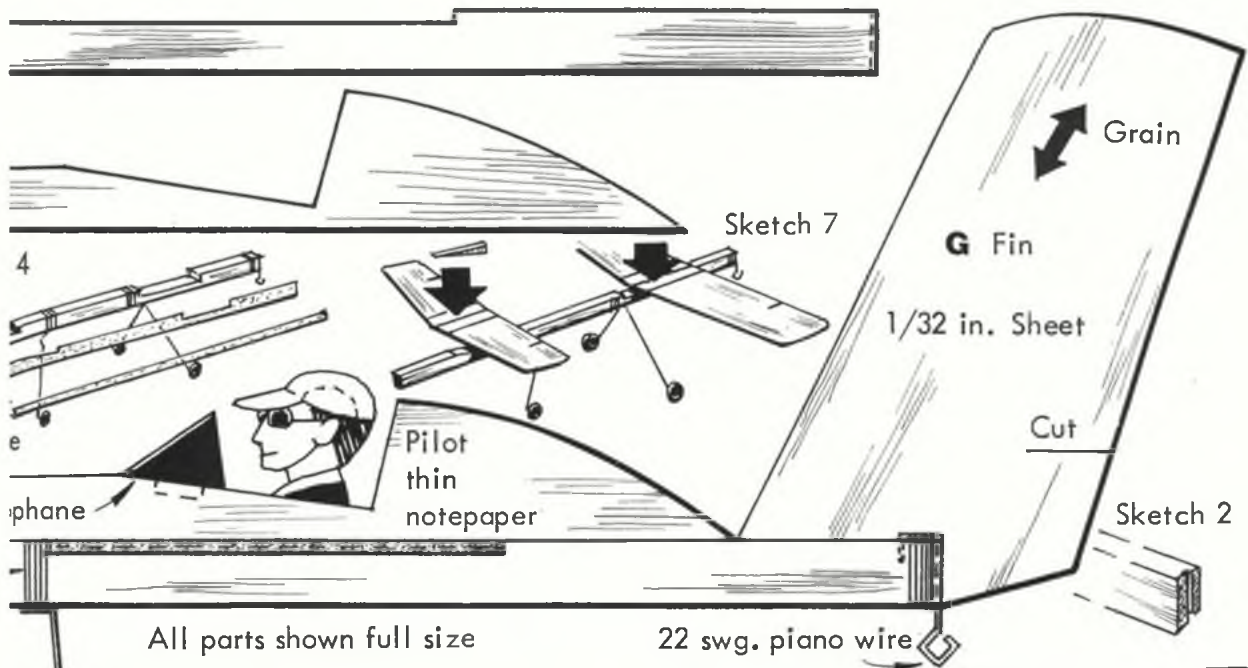
performance is – light weight. Choose medium grade balsa and very lightly sand all parts before assembly. Cut the lower fuselage (A) from 3mm sheet, noting the cut-outs for front elevator, main plane and ‘V’ cut at the rear end for the motor hook (see *Sketches 1 and 2*). Form the front and main undercarriage legs and rear motor hook from 22 swg piano wire then bind in their respective positions with fine nylon thread. Apply cement over the binding. Cut the wheels from 6mm sheet, sand to section and retain on axles with tight fitting electrical tubing (*Sketch 3*). Cut a strip of coloured tissue, and dope onto either side of the lower fuselage. Add another contrasting coloured tissue strip over the first. This tissue serves two purposes. It decorates *Canair* and adds strength to the fuselage (*Sketch 4*). Cut the mainplane panels from 1mm sheet, sand lightly and add reinforcing pieces B to the leading

using the front elevator dihedral jig D. Make shallow ‘V’ cuts on the front elevator and main plane cut-outs. Assemble front elevator and main plane to lower fuselage. Add small piece E above elevator (*Sketch 7*). Cut out upper fuselage piece F from 1.5mm sheet – sand to section. Assemble to fuselage (*Sketch 8*). Cut fin G from 1mm sheet, noting grain direction, sand very lightly, make a cut in the trailing edge and assemble to rear of fuselage. Cut windscreen from this cellophane and cement into slot in piece F. Joe, ‘the driver’, can be traced onto thin notepaper, drawn in pen and ink and coloured with felt-tip pens. Joe, of course, is optional! *Canair* uses the propeller assembly from North Pacific’s foam wing ready-to-fly *Sky Flyer* (35p from any aeromodelling shop). By using this propeller unit, you do, of course, get two models, almost for the price of one. In these days of inflation

or rear. Yours *may* need a minute quantity of weight, but if you have built as lightly as possible, and according to the plan, this is unlikely (*Sketch 9*).

Before attempting any test glides, carefully warp UP the elevators on the mainplane by approximately 2.5mm. This trim is important. Test glide over long or soft grass on a really calm day – *Canair* only weighs a quarter of an ounce, so she cannot fight a battle with half-a-gale! Obtain as straight a glide path as possible. A turn in either direction can be corrected by a tiny adjustment to the fin trailing edge. Commence power-on flights with about 150 turns. Correct any tendency to turn sharply (probably to the right) by bending the trailing edge of the fin. Increase turns with each successful flight by 25, to a maximum, with a well run-in motor of 450. Happy building – and good flying.





Testing Rubber Motors

by Dave Hipperson

DURING THE past few years, the rubber filtering into this country has proved unpredictable as to performance and behaviour. To test and examine rubber for its absolute energy can quickly become rather scientific and theoretical, but what is useful is a quick way of testing a sample before you buy a lot. This is true whatever class of model you fly – believe me the bad stuff really is to be avoided, and mistakes can be costly at today's prices. As with other commodities, do not be fooled into thinking that just because it is advertised at a high price then it is automatically worth having!

As aeromodellers, what we are looking for is rubber with the most efficient energy storage characteristics. Remember, whether rubber is good or bad, it tends to feel the same when fully wound up – in the following tests we will examine power available on the *unwind* phase. It is

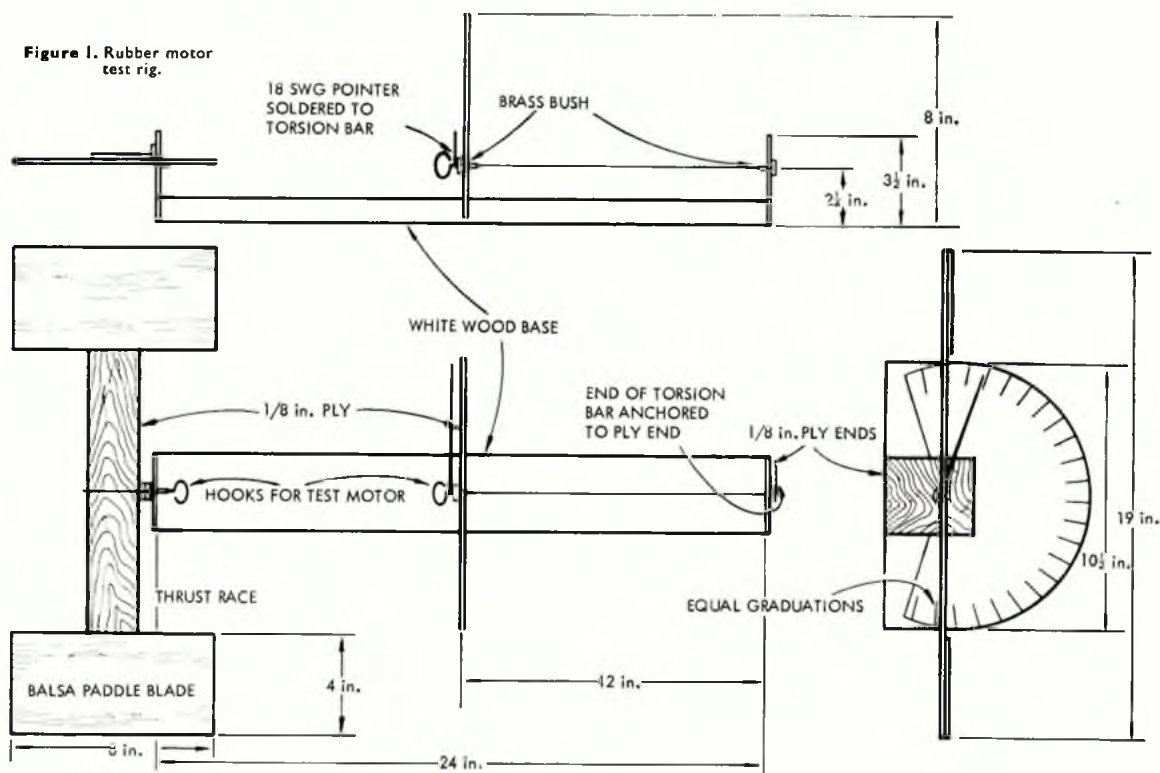
the area under the graph of turns-against-torque that bears investigation for total energy available, but the *shape* of the graph is of interest as well, as this shows us where to expect the usable power. In most cases, the centre portion (or cruise part) of the graph shows the quality of the rubber. A powerful cruise is what we are after – high peak torque is not only misleading it can actually be detrimental to model performance and ease of trimming. A perfectly steady yet high output (as produced by an i.c. engine!) is the impossible aim.

I have been using the test equipment illustrated for some years, and as can be seen it is simple and easy to build. I have arranged to test 10-gram samples because they 'eat' into the hank of rubber less, are less frightening to wind up indoors than bigger samples (particularly when you blow one!) and they also just happen to be Coupe d'Hiver size so I can

use them, should there be anything left after testing! Of course any differences in rubber quality will be magnified by testing larger pieces, but the line must be drawn somewhere.

As for the test rig, the load (in both tension and torsion) is applied to the 18 swg piano wire torsion bar: the only place any thrust friction occurs is behind the paddle. I use a cheap thrust race here – one from a curtain runner is adequate. The dimensions shown do not have to be adhered to closely; if you insist on testing larger rubber samples then the whole rig will have to be enlarged accordingly. Remember though that a stronger sample will need more than an 18 swg torsion bar – but only a small increase in diameter will make a lot of difference. The ten-gram sample sometimes gets the pointer just off the clock – and that is just how it should be.

Calibrating the dial is simply a



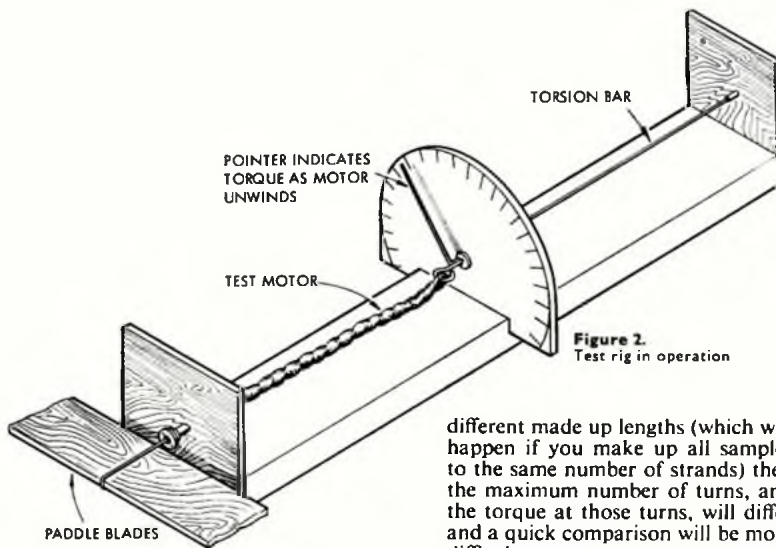


Figure 2.
Test rig in operation

matter of dividing-off the circumference with a protractor. I use 10 degree segments, but it is not critical – probably more segments would be useful as I have to estimate decimal points. The scale is simply numbered off to 24 units. Of course, if you want absolute values, then you could calibrate in oz/ins with the aid of a small spring balance applied to a fixed position along the pointer and pulled. When doing this, you will notice that the scale is linear as this is how a piece of spring steel behaves under such load – shades of Hooke's Law. Things may alter if you twist it so much that it 'knots up', but I have yet to find rubber strong enough to take me into those realms of the unknown yet! The pointer is another piece of 18 swg piano wire, soldered to the shaft just after it emerges through the dial, and of course points at zero with no load. One side of one end of the paddle is painted a bright colour, to aid observation of each revolution as it whistles around during the initial burst.

Now for the rubber itself. It is important to realise that there is a variable even though we are using a standard 10-gram sample: namely rubber *cross section*. To eliminate this variable, we must make our 10-gram sample up to as standard a length as possible. So, for these tests at least, do not be afraid to make up the 10-gram motors with odd numbers of strands to produce a standard length. When the made up lengths of the standard weight motors are as close as possible it makes for much easier comparison of the final figures – in many cases without a graph. If samples were to consist of vastly

different made up lengths (which will happen if you make up all samples to the same number of strands) then the maximum number of turns, and the torque at those turns, will differ and a quick comparison will be more difficult.

My test samples are made up as closely as possible to 11in lengths, and any extension in use is always noted, as this is often another guide to quality; as is how frequently strands break when winding repeatedly. With today's rubber a 10g, 11in long motor will probably consist of between five and seven strands. Odd

numbers are simply made by tying a small loop at each end of the strip and fiddling around with the right number of strands until all the loops are coincident – they do not have to be exact anyway.

A small neoprene covered 'S' (or at least closed-type) hook is fitted at one end and the other is looped over the neoprene covered hook located by the pointer. The test samples can then be stretch wound – the maximum stretch wind I use is about four times the original length. I have found it important to wind carefully and finish up with the S-hook lined up as closely as possible with the hook on the rear of the paddle. Coming-in with a rush, or having to pull the fully wound motor out to reach the hook have pronounced effects on peak torque. Although peak torque is not very important, it is best to try and approach it as carefully as possible. Practice will make perfect.

The winder end of the sample can be transferred to the paddle by placing a convenient rod (screw driver) through the closed hook to take the strain whilst disengaging from the winder. I use a double circle type hook which actually owes very little to an 'S'. With this I can dispense with the screw driver as a finger can

Rubber Sample	Pirelli 1970	Filatti 1974 (1)	Filatti 1974 (2)	FAI Sup. Mar '76	FAI Sup. Dec '76	FAI Sup. (random)	Pirelli 1976 (Black)	Pirelli 1977 (Brown)
Motor length:	11½in	12in	13in	12in	12½in	11in	11½in	11½in
Turns								
400	19.50		11.50	13.00	20.00		17.00	20.00
390	15.50	16.00	8.00	8.50	13.50		11.25	14.00
380	13.00	11.50	6.50	6.50	10.50		9.00	11.00
370	10.00	9.25	5.25	5.50	8.50		7.00	9.00
360	8.50	8.00	5.00	4.75	7.25		5.25	7.50
350	8.00	6.75	4.75	4.25	6.00		4.50	6.00
340	7.00	6.00	4.00	4.00	5.50		4.25	5.50
330	6.00	5.25	4.00	3.50	4.50		3.50	5.25
320	5.50	4.75	3.70	3.25	4.00	24.00	3.50	4.75
310	5.50	4.25	3.30	3.00	3.75	17.50	3.25	4.25
300	4.75	4.00	3.60	3.00	3.50	14.00	3.00	4.00
290	4.50	3.75	3.30	2.85	3.50	11.00	3.00	3.75
280	4.25	3.75	3.00	2.85	3.50	9.50	3.00	3.25
270	4.00	3.75	3.00	2.75	3.50	8.75	2.75	3.50
260	4.00	3.50	3.00	2.85	3.00	7.25	2.75	3.50
250	3.75	3.50	3.00	2.85	3.25	7.00	2.75	3.00
240	3.50	3.50	3.00	2.50	3.00	6.25	2.75	3.00
230	3.50	3.50	3.00	2.40	3.00	5.75	2.75	3.00
220	3.50	3.25	3.00	2.25	3.00	5.00	2.50	3.00
210	3.50	3.00	2.80	2.40	3.00	5.00	2.25	3.00
200	3.25	3.00	2.75	2.25	3.00	4.25	2.25	3.00
180	3.25	3.00	2.50	2.00	2.75	4.00	2.25	3.00
160	3.00	3.00	2.50	2.00	2.80	3.75	2.25	3.00
140	2.75	3.00	2.25	2.00	2.80	3.75	2.00	2.75
120	2.00	2.50	2.00	2.00	2.50	3.25	2.00	2.50
100	1.75	2.25	1.75	1.80	2.50	3.00	1.75	2.00
80	1.50	2.00	1.25	1.50	2.50	2.75	1.75	1.75
60	1.50	1.75	0.75	1.50	2.00	2.00	1.00	1.25
40	1.25	1.25	0.50	0.75	1.75	1.75	0.75	0.75
20	0.75	0.50	0.50	0.35	1.00	1.00	0.50	0.50
0	0	0	0	0	0	0	0	0

go through it to take the strain; while safe with just 10 grams of rubber, I do not think that I would like to try this trick with larger samples . . .

The motor is hooked up in this way whilst the paddle is held stationary. Now prepare to note down figures; I take a reading on run-down every 10 turns until only 200 remain in the motor, then increase the interval to one reading every 20 turns. By this time the large power absorbing paddle is revolving slowly thus enabling the observer to count the revs positively. For the first 50 or so turns at the beginning of the run down, I stop the paddle to take the readings as it revolves a little too fast to count and write down the results at the same time. From then on you can note the readings without interrupting the run. (This is to be recommended as stopping the paddle does distort the reading a little. Presumably, this action is the result of hysteresis losses after the initial burst, and so makes the readings artificially high.)

A new sample will probably not

'wind-up' well for the first couple of test runs; a break-in period is necessary. Motors should be run by *progressive* increases in turns, e.g. 150-200, 250-300 etc. However, it is still worth noting the figures, as all information is useful. On an 11in sample, I apply a maximum of 400 turns, but this will vary depending on how close your motor is to that standard length (i.e. shorter motors will take fewer turns and vice-versa; see results). For my tests I have taken Pirelli from a sample that I had left over from the early '70s. What I have referred to as 'Filati' is the more recent product from the same source in Italy as the early Pirelli, but which is distributed by *Filati Lastex Elastofibre*, a division of the parent Pirelli company. My Filati was purchased in March and July of '74. The third brand tested is sold in this country as *FAI Supplies* - the name of the firm distributing it in the USA. Its actual origin is unknown, but it certainly does not come from Italy.

The other test samples come from rubber purchased over the counter

and sold as *Pirelli*. Supplies of this come from a well known model shop recently involved in a certain controversy over rubber supplies. There is another brand currently available which is white in colour and found in many rubber kits and over model shop counters. Distributed by Keil Kraft, this rubber was not tested as we are purely discussing rubber for high performance use. Purpose of the tests is examination for total power output and the resulting shape of the graph - i.e. how much cruise power compared to peak torque etc. As you can see tests have also been carried out on certain samples to see whether repeated winding to full turns at 5 minute intervals affected performance, as has been rumoured, particularly in the case of FAI Supplies rubber. A hold test of 20 minutes has also been shown for one sample.

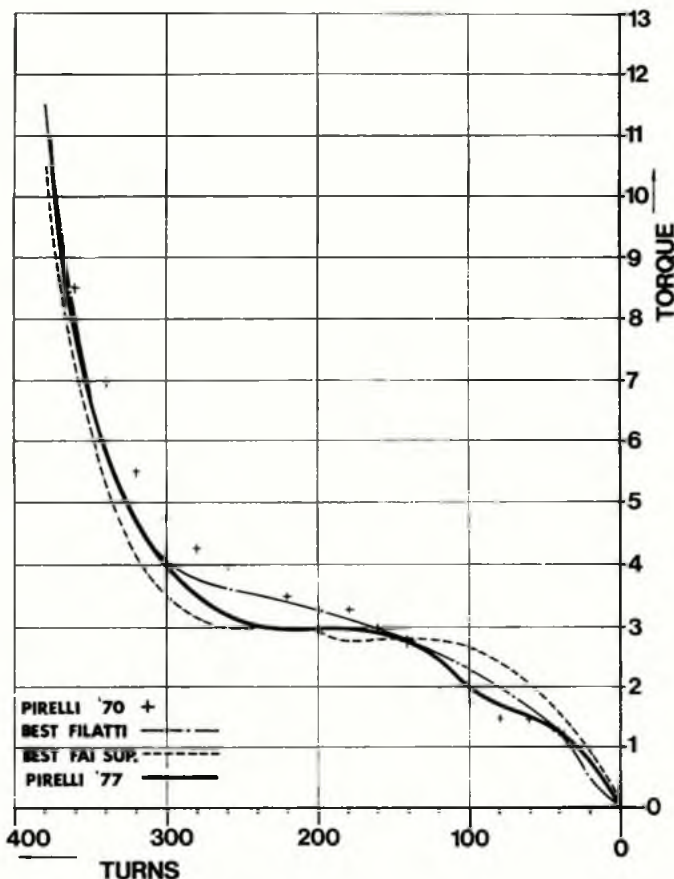
The results

The accompanying charts are a selection of some 50 or so I produced over a fortnight. Many samples were used in each type of test - the results here are typical. For the repeated wind-up tests I made the sample somewhat shorter (10in) hoping that by so increasing peak torque any fall after repeated winding would be more obvious.

The graphs have been plotted using every other co-ordinate in the tables and not starting at quite top winds, as these last two readings only show peak torque which is already explained is relatively unimportant. I have omitted the Pirelli '70 line for clarity and in the cases where points on the graph are coincident, I have shown just one point.

The best Filati tested clearly compares quite favourably with the Pirelli '70; perhaps this is a case of the rubber improving with age, as this Filati was purchased in 1974. The best FAI Supplies rubber exhibits the strongest final section, but drops from peak torque faster than the other samples. The results table shows that this was by far the best FAI Supplies tested.

The Pirelli '77 (brown) proved good without being spectacular, but interestingly enough exhibited the same poor characteristics at the end of the run as earlier supplies from the same firm - note the abrupt drop in torque at the end of the cruise. However, I believe that all the samples on the graph would be suitable for contest flying as no measurably better rubber is available at the moment. The black Pirelli of last year would compare very poorly with all of these - you can see this by looking at the charts once again.



Conclusions

Although the purpose of this article is to make it possible for the reader to duplicate my testing equipment and procedure on future batches, it is interesting to investigate the specific results and graph published.

The 'old Pirelli' comes out top as expected, but not by all that much. Filati comes in a good second. However it is obvious, mostly from the tables, that FAI Supplies rubber is erratic. It performs in a more peaky way; one sample proved very 'nasty'. This was a used motor, taken at random from someone else's batch. As you can see (Column 6) it would not accept the turns and torque deteriorated nearly as quickly as a motor that took far more turns – even peak torque was not *that* high! The owner of the motor bore out the fact that it was down on Filati during flight tests he had made.

The recent Pirelli from over the counter is just the reason for these tests! The *Black Pirelli* – available about a year ago – is obviously terrible and quite unsuitable for contest models, but the recent *Brown Pirelli* is much better and in appearance at least very like the product available 10 years ago. It may improve with keeping, but it is certainly usable now.

Rumours have proliferated as to what happens when a fully wound motor is held in this condition for a period of time. As a test I chose an arbitrary 20 minutes. Filati and FAI Supplies was used for this experiment and as you can see there is a marked drop in torque available after such a wait. More than I expected, in fact, but although slightly more marked in the case of the FAI

Rubber	HOLD TEST				REPEAT WIND-UPS			
	Filati (11½in) +20min		FAI (11½in) Supplies +20min		FAI Supplies—10in motor length +5min +5min +5min			
Turns								
400			20:00	16:00				
390	16:00	15:00	13:50	9:25				
380	11:50	9:50	10:50	7:25				
370	9:25	7:50	8:50	6:00				
360	8:00	6:00	7:25	5:00				
350	6:75	5:00	6:00	4:25				
340	6:00	5:00	5:50	4:25				
330	5:25	4:50	4:50	3:75				
320	4:75	4:00	4:00	3:50				
310	4:25	3:75	3:75	3:25				
290	3:75	3:50	3:50	3:50				
270	3:75	3:20	3:50	3:00				
260					24:50	23:00	23:50	22:50
250	3:50	3:20	3:25	3:00	18:00	17:50	17:50	17:25
230	3:50	3:25	3:00	3:00	10:00	10:25	10:00	10:75
210	3:00	3:25	3:00	3:00	8:10	8:00	7:75	7:50
180	3:00	3:00	2:75	2:50	6:00	5:75	6:00	6:00
140	3:00	3:00	2:80	2:50	5:75	5:00	5:00	4:75
100	2:75	2:75	2:50	2:30	4:75	4:25	4:25	4:50
60	2:00	2:00	2:00	2:25	3:50	3:75	3:25	3:25
20	0:75	0:75	1:00	1:00	2:00	1:75	1:50	1:25
0	0	0	0	0	0	0	0	0

Supplies it is common to both types (and all other batches tested incidentally).

Then there is the talk of FAI Supplies rubber not responding to repeated wind ups. I wound pieces at 5 minute intervals and found virtually no drop in performance. This test was repeated on all samples of FAI Supplies I had to hand (and that is most of that which has been imported into the country so far) and some I sent for myself. The results were very similar. In my case at least I can report that this lack of recovery does not exist. However the talk of it was so widespread that I can only deduce that (a) either I have a good batch or that (b) after one dodgy

batch nobody has dared try and use one motor all day! Of all the tests this is the easiest and quickest to carry out, and rubber that will not recover to full strength in 5 or 10 minutes should be avoided at all costs.

Finally, just in case this all sounds rather depressing let me quote you the following:

"The main trouble with rubber models at the moment is rubber! Current supplies generally seem of poor quality, lacking in power or being prone to sudden catastrophic failure on considerably less than expected turns" – John O'Donnell – *Aero-Modeller*, January 1959. Nothing changes does it?

SAVED—another flying field

MEMBERS of the *Teesside Model Flying Club* and the *Guisborough Model Club* learned with some dismay, near the end of last year, that their model flying might be brought to an early end if proposed bye-laws were introduced. On learning of their plight, the North East Area officers of the SMAE were in immediate contact with SMAE Council members to seek advice. This they followed closely. As a result, they are now happy to announce that the local council has been persuaded to drop their proposed bye-law and to allow responsible model flying to continue in their parks and pleasure grounds.

If faced with the least possibility of restrictions on model flying in your

local parks or open spaces it is essential that you contact the SMAE, through your Area officers, or the secretary of the Society, at once.

Teesside Model Flying Club having followed this course of action, are once again in the happy situation of being able to continue flying freely in the Borough, together with the Guisborough Model Club, who are now in process of affiliating to the Society.

If your Club is contemplating membership of the SMAE, remember that it is a very simple process. Basically it only requires five Club members to be members of the Society to effect affiliation. Many Clubs realising the value of SMAE

affiliation have now got 100 per cent SMAE membership.

Jeff Anderson of the North East Area says in his letter that *"as a result of this successful outcome, for the two Clubs, we have been able to send cheques to the SMAE Legal Fund amounting to £40.00. This is a relatively small sum but I am hopeful that there will be more to come."*

For more details about the Society, or contributions to the SMAE Legal Fund, please contact the SMAE Secretary at 18 Walcot Avenue, Luton, Bedfordshire. Phone number Luton (0582) 414678 (during normal office hours and 7-9 pm).

topical twists

by 'Pylonius'

illustrated by Sherry



One man hand

An open letter has been appearing in the model publications and newsletters of late. Couched in imperious terms and signed by a formidable array of contest luminaries, it demands of the free flight organisers, among other things, bigger and better contests and real cash prizes.

In order to find out more about this I went in search of the organisations that have allegedly been giving the contest flyers such a miserable deal, and tracked them down to the bloke you generally find sitting at the little table sorting out the flight cards. I asked him where the rest of the organisation was located, but he modestly pointed out that he was the organisation, although he admitted that, on sunnier days, his wife came along to give him a hand. Was he the only organiser? Well, he had heard a rumour that he had a counterpart up north who did the same sort of one man job for the upper part of the country.

Yes, he'd heard about the letter, but hadn't had time to read it yet – too busy collecting in last year's cups for the next meeting. He was a bit put out by it, particularly as he did his best to give the lads a good day out. Mostly he didn't interfere with them and he hoped they wouldn't interfere with him. It is not as if he did anything nasty like applying the rules. After all, they were all allowed to bring along their own timekeepers, fly as many models as they like, and make as many flight attempts as their consciences would allow. He realised if he did try to process a model he'd probably be lynched. They should be thankful, he said. Given a decent bodyguard he could bring out the rule book and disqualify every man jack of them. Not that he wanted to do that. It was just a bit of fun, and he couldn't see why they wanted to take it seriously all of a sudden.

I could see his point. It was he who wore his kneecaps out begging for the use of airfields from baffling bureaucrats. Not the easiest thing when you come way down the list behind go-karting and charity walks. And it was he the farmers came gunning for when the model flyers did their best to increase our food imports. I wouldn't blame him if he packed up his little table and went.

Toyhood of rally

It is true that that once grand annual jamboree of modelling, the South Midland Gala, has been in decline for some time, but I am sad to learn that it is no more. It is some years since, as an integrated movement, with only one common enemy, gravity, we showed off our wares and generally hobnobbed in a great family splurge at Cranfield. And what a circus it was: such dazzling acts, such scintillating sideshows and all the fun of the flying fair. Here were convivially gathered the show-offs, the eccentrics and the collective club egos to give a bounce and vitality to the occasion which we, now living in the grey world of today, remember with fond nostalgia. Do people any more build nothing but ducted fans, ornithopters, or fleets of orange flying wings? Anyway, the once centrepiece of our model life has been going down

ever since that emblem of club togetherness, the coach, gave way to the less sociable motor car. And, sad to say, we are not the clubbable nation we once were, or only in the sense of what now may hit you in a dark alley. If two people get together to fly nowadays you might be sure the other 98 club members will be reading in the newsletter of a splendid turnout for the club gala.

What has been happening over the past decade is the painful transition of model flying from a hobby into a sport. This is now reflected in the type of model now accepted as the norm. Possibly the happiest period of our movement was the time when it was a positive achievement to get anything flying at all. The precious few seconds of recorded air time which could boast your ego to the sky were all too brief to require sophisticated forms of control or a nimble pair of legs, nor was the fledgling flight likely to impinge on any environmental sensitivity. Now that the model has become the plaything of the skies, and there is nothing much to conquer but a fear of open spaces, the gala get together of modelling skills has given way to the materialistic symposium, which is a sort of supermarket fly-in, with glistening goodies for all. The happy invention springing from modest workbench or kitchen table has been replaced by the polished product of the Toy Trade Research Laboratory. The typical model flyer no longer creates or builds: he merely assembles.

Youth at the elm

Not wishing to be taken in, I was trying to line up that article on tree happy models with April the First, for I am sure there must be a connection. If you designed a model in the odd way described it might cleverly de-tree itself, but I am sure that you would have to stick it up aloft by hand, for it would never make that height airborne. No, this is one sap who isn't rising.

Oddly enough, though, model flyers do not appear to be quite so tree conscious as they once were. It could partly be due to the unpleasant fact that half the trees in the country have been lost to Dutch Elm disease. Not that this benefits the models one bit, as the unbroken wind blows twice as hard. Even so, you do not see model flyers carting around extending ladders, climbing irons or pockets full of six inch nails as was once the case. Perhaps trees have lost that peculiar magnetism they once had for the errant model, or we are more cunning in the selection of our flying fields. Whatever the case there is no denying that the tree becomes something less than an object of poetic delight if you have a model caught up in its majestic bowers. If you were to try to design a particularly fiendish model catching device you could not improve on Nature's spring and hold clutch of tangling twiggery.

The tree problem wasn't all that bad in the old days before we retreated from the local parks and public open spaces to the distant airfields, for there were always small boys of simian agility ready to scale the dizziest heights for the odd shilling.

Latest Engine News

by Peter Chinn

Super-Tigre X.29

THIS latest rear-exhaust Super-Tigre 5cc control-line speed motor is rated by the manufacturer at 1.7bhp at 27,500rpm when fitted with the appropriate Super-Tigre X.29 tuned pipe and, since all Italian speed contests (5cc and 10cc as well as the FAI 2.5cc world championship speed class) require the use of FAI fuel, one assumes that these figures relate to the claimed performance on straight methanol/castor-oil fuel.

The X.29 is a solidly proportioned motor that uses the same casting as, and many design features of, the X.40 R/C pylon racing motor, but with the port timing amended to suit a tuned pipe exhaust system. Thus the exhaust period is extended to some 176° of crank angle. The engine is, of course, Schnuerle scavenged and, like the X.40 and other recent Super-Tigre X series motors, has an additional angled vertical transfer slot, 2mm wide, on each side, close to the main transfer ports so that, in effect, an angled vane 0.7mm thick is formed in the cylinder wall to direct gas away from the exhaust port. The main transfer ports open at 68° before bottom dead centre and the adjoining slots about 3° later, with the inclined third port opposite the exhaust opening at 64° BBDC (our measurements).

Out-of-the-rut features of ST X.29 include trumpet shaped head with unique 'remote' glowplug and specially ported cylinder liner with extra angled transfer slots.

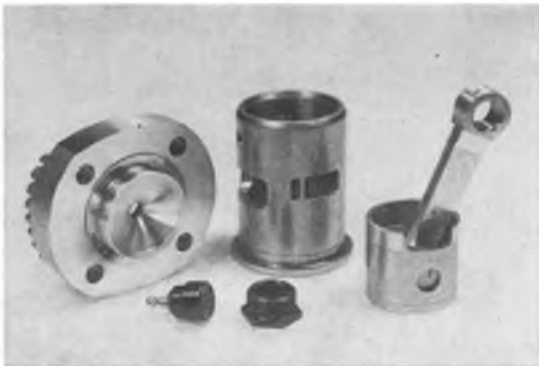
Two views of the current Super-Tigre X.29 C/L speed motor. Exhaust is timed for tuned pipe. Hefty but powerful.



The chromed-bore brass cylinder liner has a very thick wall (2.25mm) and the flat crowned ringless aluminium piston, machined from a gravity casting, is fitted with a 5mm o.d. gudgeon-pin retained by wire circlips. The pin is hollow but blind at the front end to prevent charge loss through it from the third port to the exhaust. The machined connect-

ing-rod is bronze bushed at both ends. The cylinder head is of machined bar stock with a trumpet shaped combustion chamber. It is of a type introduced on an earlier 'X' series using a special glowplug that does not break into the combustion chamber. The plug, held in place by a special nut, fits into a cavity above the chamber which has a 3mm dia central

Other parts of ST X.29 include enormously robust main casting, familiar ST counterbalanced steel valve rotor and internally balanced crankshaft.





Entirely new high performance K&B 4.9cc Schnuerle scavenged ABC 30 cu.in motor based on SR-II main casting. Four inch mini-pipe is included.

hole communicating with the plug element.

The crankshaft has a 12mm dia main journal, a 7mm dia front journal and a 6mm dia crankpin with elliptical drive spigot. The shaft has peripheral counterbalancing slots sealed off by an aluminium rim. It runs in a 28mm o.d. bearing at the rear and 19mm o.d. bearing at the front and it is fitted with a machined aluminium spinner assembly.

The rotary-valve is of typical ST design: a counterbalanced hardened steel rotor disc running on a hardened steel pin anchored in a deep back-plate. The latter has a 12mm i.d. intake boss and is equipped with a machined aluminium venturi having a 9.5mm choke. After allowing for the jet tube and needle, the measured effective choke area was 54sq.mm. Measured rotary-valve timing on the engine examined was 30° ABDC to 65° ATDC.

Like all 5cc Super-Tigres, dating back to the original G.21 of 27 years ago, the X.29 has a bore and stroke of 19 x 17mm, giving a swept volume

of 4.820cc or 0.2941cu.in. It is, however, a good deal heavier than its predecessors. Complete with spinner and exhaust stub, the example shown checked out at 360 grammes (12.7oz).

K&B 4.9cc

When K&B introduced their SR-II racing engine a couple of years ago they took the unusual step of abandoning the traditional American practice of giving the engine a cubic inch designation and adopted a metric (cubic centimetre) figure instead. Thus the engine became the K&B 6.5cc SR-II instead of K&B 40SR-II. Likewise the new K&B .21cu.in model became the K&B 3.5cc and now, two more metric displacements have been added to the range, the 4.9cc and 5.8cc 'Front Rotor' engines.

The 4.9 and 5.8 are crankshaft rotary-valve units which, with a new 6.5 Front Rotor model, are based on the rear rotary-valve SR-II's main casting and Schnuerle scavenged ABC piston/cylinder design but, of course, with new front and rear ends.

The model illustrated in our photos is the 4.9. This is intended for C/L and open F/F and comes fitted with a 9.6mm i.d. venturi which, after allowing for the jet and needle-valve, has a very generous effective choke area of some 56sq.mm. Fuel pressurisation is via the usual backplate nipple. Also supplied is a straight 4-inch mini-pipe. The exhaust period is not set up specifically for tuned pipe operation, being timed to open and close at 75° each side of BDC. The four transfer ports, consisting of two upwardly inclined ports diametrically opposite the unbridged exhaust with, angled towards them (in fact, just joining them within the bore) two side ports, are timed to open and close at 63° each side of BDC. The 4.9 liner has a very thick wall (nearly 2.8mm) which is undoubtedly helpful in initiating the desired gas flow pattern.

The flat crown ringless piston follows the SR-II design. It uses a .204in o.d. gudgeon-pin with a PTFE pad at the front only. The gudgeon-pin hole in the piston is blind at the rear to prevent charge loss through the rear exhaust port. The forged conrod is bronze bushed at both ends. The cylinder head has a dual concentric bowl shaped combustion chamber surrounding a .125in wide sloped squishband.

All the most powerful of recent 6.5cc shaft valve engines (eg Enya 40X-TV, OS40F-SR, Webra Speed 40) have used '60 size' 15mm crankshaft journals and, as one would expect, the K&B 6.5cc Front Rotor followed suit. Since the 4.9 and 5.8 have the same front end assembly as the 6.5, they now have the largest shafts and biggest gas passages (10.4mm i.d.) of any engine in their respective displacement groups. The very large rectangular valve port is open from 40° ABDC to 60° ATDC. An unusual feature is that the o.d. of

K&B 4.9 cylinder and piston assembly is basically a reduced bore version of SR-II. Head has dual concentric bowl combustion chamber.



Feature of K&B 4.9 is 15mm shaft with enormous valve port and 10.4mm bore. Rear ball bearing is aligned in crankcase barrel, not front housing.



the rear ball bearing is a slip fit in the crankcase barrel: it is not fitted to the front housing.

The measured bore of the 4.9 examined was 0.726in which, with the 0.720in stroke common to all three new shaft-valve K&B models, gives a swept volume of 0.2980cu.in or 4.884cc. The engine weighs 329 grammes (11.6oz) including exhaust stub or 345g (12.2oz) including mini-pipe.

No performance data has been released by K&B for this new model but we would not be surprised if it did not turn out to be just about the most powerful non-piped shaft valve 5cc engine to date.

Tandem Twins

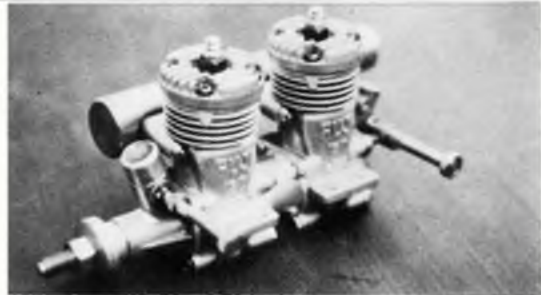
Back in the mid 1960s, an American model enthusiast, William Woodall, came up with a method of coupling engines together to make twin-cylinder units. The first of these was an inline 10cc unit based on two OS Max S30 R/C engines and was followed by others based on McCoy and K&B 19, 29 and 35 motors. Both inline alternate-firing and horizontally-opposed simultaneous firing cylinder arrangements were tried but, after experiment, the former type was chosen as offering lower idling speeds. This was undoubtedly due to the fact that the alternate firing arrangement gives two torque impulses per revolution instead of one.

A very similar idea has now been put forward by Mr D. Beale of Dunmow, Essex, using a pair of 2.5cc engines, except that, instead of retaining the crankshaft rotary-valve of the rear engine, a rear rotary disc valve assembly has been added. Mr Beale writes:

"With twin cylinder model aero-engines being so expensive nowadays at £100 plus, I thought you and, perhaps AeroModeller readers, might be interested in the inexpensive motor I have put together myself using two commercially produced single-cylinder units.



HGK 2.5cc engines come in many types: front and rear induction, side and rear exhaust, bushed bearing or BB, for piped or non-piped use, or standard or R/C. Above is a new model, the ball-bearing ISSX with rear drum valve, side exhaust and silencer.



Home-made 5cc inline twin based on two Fuji 15 engines by D. Beale. See item 'Tandem Twins'.

"The enclosed photos show how two Fuji 15-III engines have been assembled using a few special parts to produce an in-line, alternate-firing 5cc twin. The special parts produced were a new crankcase/crankshaft bearing to bridge between the front and rear

cylinders, a new crankweb to connect the front and rear shafts, two crankpin extensions and a modified D-C Rapier backplate/rotor assembly. Apart from turning the crankcase bridging piece and the crankpin extensions, the work required only simple hand tools.

"I must say I don't really see why commercial twins should be so expensive when mine only cost about £12, plus a little thought and a few hours' work. Anyway, the result is the only one of its kind that I know of using these motors, but perhaps this 'challenge' may prompt others to reveal far more noteworthy efforts."



The Japanese HGK-ISSR rear exhaust, rear rotary-valve, twin ball bearing, piped 2.5cc speed motor. Engine features a chromed bore cast aluminium cylinder. May be available in UK in due course.



"TRY ONE – you will have a surprise! Flies great; worth at least a page test report and write-up!" read the note attached to the sample received from Mike Callaghan, general manager of Ripmax Ltd. So we tried one, we were surprised (pleasantly), it did fly 'great' – and Telco's latest product certainly merits being the subject of a 'kit review'.

Actually, the term 'kit' hardly applies to this 18½ in span, semi-scale all polystyrene free flight design – as the accompanying photograph shows it is really supplied in 'knock down' form. All parts are moulded from expanded polystyrene, the Telco CO₂ motor is supplied fixed to a mount and pre-installed in one fuselage half, and the whole outfit is completely self-contained from the recharging gun down to the tiny elastic bands used to hold the fuselage halves

together.

Note that no glue is shown: none is used. Likewise paints are not employed. Assembly, which takes less than ten minutes, consists of clipping the undercarriage in place, holding the fuselage halves together with two internally strung elastic bands and retaining the wings with a piece of double-sided adhesive tape. Colour trim is adhesive backed tape – as are the 'window' pieces.

That evening saw a visit to the recreation ground under less than favourable conditions, as the breeze was quite brisk. Following instructions exactly, the tank was filled, a little right trim applied to the rudder, a tap on the prop – and away she climbed. Away into a tree actually – we never envisaged that a model of this type would penetrate the wind so well, and thus left only a 50 yard

KIT REVIEW

Telco's CESSNA 180

Spread of box contents reveals the degree of completeness achieved by Telco in this semi-scale free-flight design. Absolutely nothing extra to buy for the first few flights – then you will need a box of CO₂ capsules, available from chemists and off-licences etc at around 90p for ten.

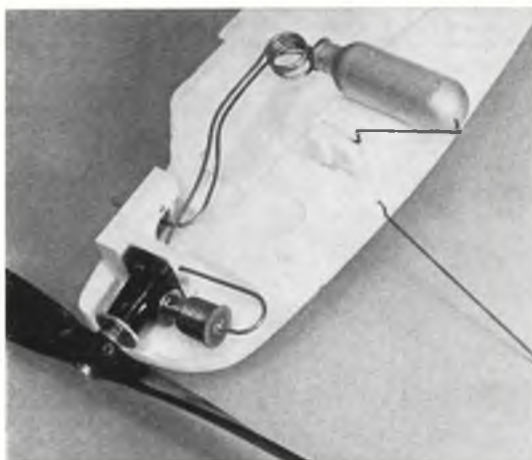
gap between ourselves and the trees. The subsequent fall to the ground revealed no damage and so flying trials began again with a renewed interest.

Many flights were made before dusk, and the overriding opinion was that here was a *true* beginner's aeroplane – one that could be assembled by anyone, and flown with an equal degree of success. It also proved strong: although a right trim is advised, our version tended to spin-in to the right as the power fell away and despite this occurring several times at a height of 60-70 feet, no damage was incurred. Clearly our's preferred a left turn: but it certainly climbed away and flew beautifully.

A bunch of young lads stopped playing football, asking to 'have a go' – and they experienced no difficulty at all in flying the device. We did find that three-quarter throttle gave a better, smoother flight: full power produced a rocket-like take-off followed by the likelihood of a power stall.

As a further test of the suitability of this design for the 'young beginner' market, a kit was thrust upon a willing eight year old – the only condition being that no 'expert' help would be given! None was needed, his sample proved equally successful.

Perfect? Not quite. We still dislike the Telco engine's throttle adjusting



At left is shown the engine and tank as supplied pre-assembled in one fuselage half – plastic engine mount/filter valve unit could be a useful accessory if supplied separately. Undercarriage wire is clamped between two snap-together plastic mouldings. Wheels are retained by more plastic mouldings. Below is shown the basic fuselage with the self-adhesive colour trim and 'windows' applied. Production kits will have neater 'glass' decoration. Note the key protruding through the fuselage to locate the wing (and the double sided tape awaiting addition of that important piece). Mis-assembly is actually impossible. Design proved very strong, but should damage ever occur, then the instructions detail repair methods.





spanner – it is very awkward to alter the setting with this tool – and the double sided tape in both kits supplied proved 'non-sticky' on one side, although this was clearly a faulty batch and not likely to be repeated in future samples.

Is £12.95 expensive for a complete, almost ready-to-fly model with engine, prop and fuel? We think not, especially as success is virtually assured – and let's face it, nothing succeeds like success. Buy your young offspring/relatives one of these and smiles not frustrations will be the result. Can you say the same about that tricky balsa-stick and tissue design you last bought him? Was it ever finished? And remember, with this model, the engine is a completely standard Telco CO₂ unit – so it may be removed and fitted into other models when you desire, without damaging the original (built without glue, remember?).

HYSTERON PROTERON

continued from page 394

Construction is quite straightforward: PVA glue was used throughout, on the original, with quick-set epoxy for wood-metal joints.

Fuselage

Cut out the sides and rectangular formers; assemble sides and formers F1-9 upside down over plan; when dry, add formers F10-13, sternpost and noseblock. Steam a curve into the bottom planking and fit; assemble elevator mount and engine pylon box and glue in position. Add F1A (in two pieces either side of elevator mount), F2A-F5A and upper stringer. Sheet decking between F2A and F5A, add soft block either side of elevator mount and carve to shape. Add F7A-F9A, rear stringers and sheet; glue in fairing blocks between F5A and F7A and carve to shape. Add incidence wedges, former F10A, wing platform and rear deck; add fin skeg and mounting box; epoxy in alloy tubes for fin dowels and wing, pylon and elevator rubber bands. Sand all over.

Pylon

Cut out ply sides and ply-balsa 'sandwich filling'; cut out, drill and smooth engine plate (very quick, using soft alloy, a hacksaw, small files and wet-and-dry paper), apply PVA glue to wooden parts and assemble with the engine plate in place. Leave under pressure for 24 hours, withdraw plate then shape and sand pylon. Drill pylon and plate for retaining bolt and epoxy nut etc as on plan. (A quickly-detachable engine mount, which can be swapped from one plane to another by unscrewing one bolt, is well worth the effort.) Epoxy in the retaining hook.

Wings

Cut out ribs and riblets; assemble mainspars and file rib slots (pin both mainspars and trailing edges together for filing). Wrap tip laminations round formers. Lay a strip of 1.5mm balsa along the front of the trailing edge; immediately in front of it a strip of 2.5mm (raising the rib tails to allow for cap strips/sheeting); lay plastic sheet

over all and pin down LE and TE. Build centre-sections first, checking carefully that dowel tubes run straight and level (a good way to do this is to assemble them in one piece and saw apart when dry). Assemble and glue the outer-section ribs on the mainspar, then glue into pinned-down LE and TE. Add rear upper spar and riblets. When dry, lay tip over end of wing and trim down ribs and spars to fit; remove from plan, glue in tip and lower rear spar. Taper down mainspar and tip ribs/riblets. Add hooks, centre-section sheet and cross-grain cap strips (these are very easy to cut and fit, and make it much easier to stick the covering to the under camber); shape LE and TE; add aileron tabs. The elevator's construction is similar to the wing.

Fin

Wrap the outline round a former; add spars/ribs, then carve and sand to section. Add peg and lower tongue; drill for retaining peg. Fit tab.

Covering

Use heavyweight tissue on the wings and fin, lightweight on elevator. Watershrink, blocking up wing trailing edge as shown on the plan to get progressive washout. Dope and fuelproof. Fuselage on original was left uncovered but finished with sanding sealer and Ripmax Tufkote.

Flying

Ballast as necessary to get the centre of gravity right (original has ½ oz lead bolted to elevator mount). Test for glide, which should be slow and flat (the stall is a corkscrew dip rather than an up/down affair), using 0.8mm ply shims to adjust the elevator incidence if necessary. Then try under power. Adjust the pylon with ply wedges to alter climb angle; control turn and bank with trim tabs. Mine turns either way quite happily. A name and address label plus a dethermaliser are desirable especially as the original has done 15½ minutes off a 42-second engine run. That time it landed just 300 yards from the launching point, but you might be less lucky . . .



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

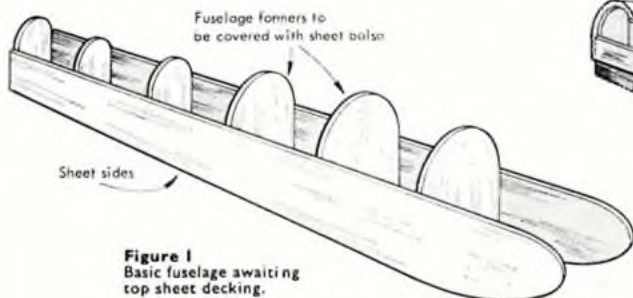


Figure 1
Basic fuselage awaiting top sheet decking.

ONE OF THE BEST things about balsa wood – as well as one of the worst! – is that so many different grades are available. You can pick up a piece of 1.5mm balsa which will easily bend across the width of the sheet, and yet will not bend end-to-end. Another from the same stock will bend in a 'U' from end-to-end, but not across the width, and yet a third will be completely stiff in all directions! Confusing isn't it, especially when you notice the different weights of each sheet, and how one may be soft and spongy, while another splits very easily. Actually, each type of wood (or rather wood grain) has its advantages and special applications and this subject will be covered more fully in a later feature.

However, for now, consider the difficulty you last had in trying to wrap a piece of sheet balsa around a curved former. The chances are that you did not have a lot of luck – either the wood split, or it pulled away from the former before the glue dried. How can this be overcome? Quite easily, when you have a few tricks up your sleeve. Take *Figure 1* as an example. Here the problem is to add a sheet top-decking to the fuselage formers – quite a common problem. The former at the rear of the fuselage has quite a small radius – too sharp a curve for the sheet to follow without cracking, even though you have chosen a piece of balsa which bends quite easily across the width of the sheet (the grain must run from front to rear for ease of bending, and for a strong, stiff, finished fuselage). The method to use is as follows:

1. Take a strip of medium-soft balsa slightly larger than required (allow say $\frac{1}{2}$ in overlap at each end minimum) and at least $\frac{3}{4}$ in wider than necessary to wrap around the widest former. Do not trim to shape!

2. Using a sponge, thoroughly dampen one side of this piece of balsa, then turn over and apply a coat of full strength clear dope to the other side. This will cause the wood to 'curl' inwards.

3. Leave for a few minutes while the dope dries, then lay the sheet over the fuselage (doped side down) and carefully bind in place with gauze bandage (*Figure 2*). Use of the bandage (approx 1in wide) will prevent the balsa from being bruised. Leave to dry.

Use metal straight edge and balsa knife to remove excess material, then remove balsa sheeting, apply glue and replace. Pin or tape in position, while glue dries

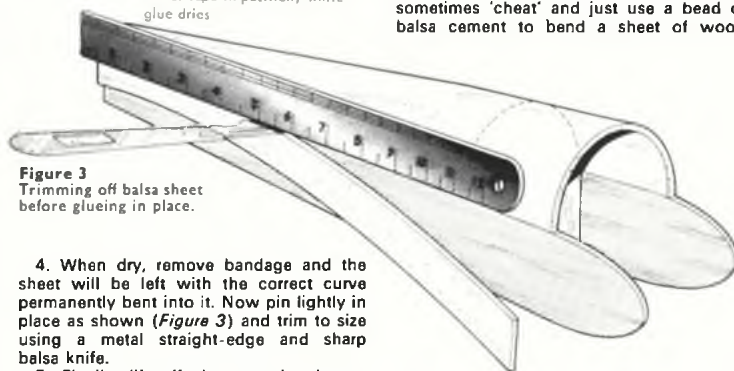


Figure 3
Trimming off balsa sheet before gluing in place.

4. When dry, remove bandage and the sheet will be left with the correct curve permanently bent into it. Now pin tightly in place as shown (*Figure 3*) and trim to size using a metal straight-edge and sharp balsa knife.

5. Finally, lift off sheet, apply glue to formers and fuselage sides and glue permanently in position.

Result is a neat, strong, rounded fuselage top. So that is how to do it – but why did

Sheet balsa, doped on the inside and dampened with water on the outside

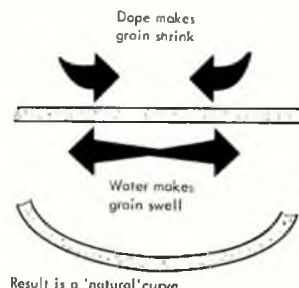
Figure 2 Treated sheet balsa held in place while water evaporates.

it work? Quite simply really – just picture a section through a piece of balsa (*Figure 4*). In order for it to bend, the top surface must compress, the lower expand – so we used water to expand (swell) the wood grain on one surface, and shrinking dope on the opposite to contract the grain – result a small radius bend is easily achieved – provided of course that a fairly soft piece of balsa wood is used in the first place.

The same technique can be used in many other ways – it is not always necessary to bind the wood while it dries, but it is best to, otherwise the sheet may become very twisted and warped. If in a rush you can sometimes 'cheat' and just use a bead of balsa cement to bend a sheet of wood

slightly – as when making an all sheet wing with concave undersurface. This works because balsa cement, like dope, shrinks on setting.

Figure 4



Dear John Bridge,

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

NAME IN FULL.....

ADDRESS.....

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

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

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

7/77 15p in the £1 Rebate plan purchase coupon for Golden Wing Members G.W. No.....

CLUB NEWS

MODEL FLYING is one of those skills which people all too often acquire the hard way: learning by mistake and catastrophe rather than by a methodical apprenticeship. It is always well to remember that a model flight is all or nothing, in that if it flies satisfactorily – not necessarily perfectly – it will make a safe landfall. If on the other hand it is badly trimmed or improperly controlled, it will sustain damage to a lesser or greater degree. And, I think that this is where the crunch comes, for the heavier and faster the model the greater the damage, and the tendency of today seems to be towards the more weighty model, particularly where there is some degree of prefabrication. And where is all this leading? Just to my firm belief that high wing loading models are strictly for the expert, and that where advice is given to the newcomer to the hobby, whether from friend or model shop, it should be in favour of the lighter loaded model, consistent, of course, with adequate strength for its purpose.

But is model flying becoming an expensive indulgence, and not the cheap hobby for all that once it was? Well, Peter Miller is the Secretary of the Sudbury MFC, and in his report he says that the control line side of the club is down, but there are a few juniors joining and persevering in spite of the high cost of modelling. This, we hope, means that model flying is still as cheap or expensive as you like to make it, but that juniors are kept relatively poor by the extended periods of education they now suffer. Monetarily speaking, the club is made attractive to the not so affluent junior – and many a senior no doubt – by the absence of club subs; all funds coming from displays given by the club. And that in spite of there being only two display fixtures last year. This year's special display booking is for Jubilee Day which, unfortunately, clashes with the *AeroModeller* Jubilee Rally at Old Warden. This hallowed site, evocative of the vintage years, will no doubt see something of the up and coming interest in vintage C/L, now catching on in the Sudbury club. Already the Secretary has got back to the early years of C/L with a 1948 kit of the Stanzel *Shark G-5*. Trouble is he can't make up his mind whether to build it or just gloat over it. Still in historic vein, Peter Stammers is working on an enlarged version of the *Spad* which he flew at last year's All Scale Day – the version is the one with the gunner in front of the prop. Coming right up to date the club has been clever enough to get one of its members, Fred Taylor, elected Mayor of Sudbury. Useful to have such an influential voice in the council affairs. New members, Aldermen or just plain citizens, welcome. Either write to Mr Miller at Red Cot, New Street, Glemsford, Sudbury, Suffolk, or look in on Friars Meadow on any Sunday morning.

A report from PRO Ron Truelove informs us that the High Wycombe DMAC is one of the largest clubs in the country, and mainly Radio. Other aspects of the hobby are covered though, as can be seen in the shock results of a club Concours d'Elegance event. There were three categories: Junior, Sport and Scale. Right away the juniors confused the issue by both entries clocking up identical points with their R/C gliders. Then many a red faced

Radio buff watched the two other sections go to control line models. First in Sport was Marco Beschizza's immaculately finished stunt job: a 67 ounce modified *Centre-fire*, with V. Collins' R/C *Unic Hawk* the runner up. The Scale winner, who collected the Frank Wright Trophy as well as the engraved shield was Ron Truelove, with his *Handley Page Hampden*, seen in flight at last year's Nationals and at the Old Warden Scale Rally. Second was Ian Hawtry's R/C *Hurricane*. The Concours event was notable for the number of well flown models competing, testament to the hard wearing nature of modern finishes.

Mr P. M. Arnould, PRO of the Ipswich Club, writes to us in some haste as his son is cleaning his bike in the

YOUR CLUB?

If your club is not listed – or if the secretary has changed recently – then please let us know and enable an accurate listing to be achieved. Amendments will be printed at the soonest opportunity.

LANCASHIRE

Avondale

A. Cheetham, School House, Sandford, Strathaven, Lancs

Blackburn A/C

R. Kinroy, 10 Tremaine Avenue, Welton, Brough, Hull

Blue Max MAS

B. Whittaker, 71 Lumsden Street, Bolton, Lancs

Liverpool & DMAA

M. Duce, 16 Windy Harbour Road, Southport, Lancs PR8 3DU

Leyland Model Aircraft Club

Chris Snape, 12 Hillbrook Road, Leyland, Preston, Lancs

PR5 1XL

Norwest

D. Heaton, 4 Carpenter Grove, Padgate, Warrington WA2 0QR, Lancs

Warrington Model Club

J. Grainger, 9 Brickhurst Way, Woolston, Warrington, Lancs

Wigan MAC

D. Yates, 15 Norley Road, Pemberton, Wigan, Lancs WN5 9XH

LEICESTERSHIRE

Aylestone District

T. K. Johnson, 17 Cyril Street, Braunstone, Leicester

Coalville MC

G. Bolton, 60 Anson Road, Shepshed, Leicester LE12 9PU

Hunters Combat Team

S. J. Bingham, 102 Evesham Road, Leicester

Leicester Area R/C Society

K. Weston, 11 Spencer Road, Lutterworth, Leicester

Leicester MAC

N. E. Kinnaird, 7 Cawsand Road, Wigston, Leicester

Long Eaton & District MAC

G. D. Rouse, 89 Sullington Road, Shepshed, Leicester

Loughborough Model Flying Club

J. Cooper, 11 Kinross Crescent, Thorpe Acre, Loughborough, Leics LE11 0UQ

Market Harborough MAC

V. Redfern, 15 Nelson Street, Market Harborough, Leicester LE16 9AX

Melton & District MAC

S. A. Saunders, 8 St Gregory's Drive, Sileby, Nr Loughborough, Leicester LE12 7QE

Welland Valley Flyers

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Contest Calendar . . .

June 19th	SMAE INDOOR MEET. General fly-in at RAE Cardington, Beds.
June 19th	SMAE 3RD CONTROL LINE MEET. FAI, ½A and Class B team race, Handicap Speed, FAI Speed, Combat, Aerobatics, Novice Stunt. Venue: RAF Barkston Heath, Nr Grantham, Lincs. (Ring Bristol 48869 to confirm.)
June 25th & 26th	SMAE (FFn) FAI INTERNATIONAL. Classes F1A, F1B, F1C. Pre-entry to J. Cooper, 6 Weston Way, Weston Favell, Northampton NN3 3BL. Tel. Northampton 42449. Entry fees: Comp Licence or SMAE Seniors 50p, Juniors 10p, Associates £1.10. Field entry double. Venue: Bircham Newton, Kings Lynn, Norfolk – confirmed.
June 26th	ELLIOT ANNUAL C/L RALLY. FAI and Goodyear T/R, Stunt. Venue: Elliot Marconi, Rochester Airport – A229 off M2 motorway. Organiser: R. James, 21 Rochester Crescent, Hoo, Rochester, Kent.
June 26th	WHARFEDALE SCALE DAY. R/C and C/L SMAE members only. Pre-entry: Ron Greenwood, 7 Shadwell Walk, Leeds LS17 6EG. Venue: RAF Rufforth.
July 3rd	YORK RALLY. F/F: Open R/G/P, All-in Mini (5 x 2 mins, K factor), A/2 (7 flights, 2 before noon, rounds after). R/C: Class 2 Scale (B & B freq.). Fly for Fun (ROYG freq.), 100in. Thermal Soaring (split freq. only). Pre-entry for scale (SAE plus 50p) to A. Barker, 1 Bramley Green, Appletree Village, York YO3 0NQ. Venue: RAF Elvington, Nr York from 10am–6pm. Director: G. Le Vey; tel: York 705647. SMAE members only.
July 3rd	FINCHLEY C/L GALA. Stunt and Combat at Glebe-lands, Summers Lane, Finchley. Pre-entry (75p) to S. P. Burns, 29 Bunn Lane, Mill Hill, London NW7. Tel: 01-906 5099.
July 3rd	S. MIDLAND AREA (SMAE)/CLAPPA STUNT COMP. C/L Stunt and Novice Stunt at Stopsley Sports Centre, Luton, Beds. Details P. Rabjohn, 47 Hillyfields, Dunstable, Beds. Tel: Dunstable 67590.
July 10th	SMAE INDOOR MEET. Beginners and Expert EZB at RAE Cardington, Beds. SMAE members only.

July 10th

WOODFORD RALLY. R/C: Class II scale (B & B freq.), Club 20 pylon racing (R, O, Y, G freq.). Pre-entry T. Hughes, 96 Queensway, Rochdale, Lancs. C/L: aerobatics, combat, FAI & Goodyear team race, h'cap speed, Formula 40 speed. F/F: scale, HLG, A/1, 80g Coupe d'Hiver, ½A power (separate events, in rounds). Guaranteed prizes, totalling £3001 Venue: Woodford airfield Nr. Bramhall, Cheshire. Information: T. Jolley 061-766 6280

July 10th

PORTSMOUTH & DMAC R/C FLY-IN. Fun events. Spot Landing, Thermal Soaring, Max Glide. From 9am. Proof of licence/insurance required. Details: R. W. Phillips, 46 Alameda Way, Purbrook, Hants. Tel: Waterbrook 4291.

July 17th

SMAE INDOOR MEET. FAI Microfilm at RAE Cardington, Beds. SMAE members only.

July 17th

LEEDS RALLY. F/F: Open R/G/P, Combined Mini, Vintage Duration, Eyeball F/F Scale. R/C: Thermal Soaring (simple 'fun' event). Details: Mike Proctor, 39 Fossway, Stamford Bridge, Nr York. Rally telephone contact T. Hargreaves: Mirfield 494485. Venue: Elvington, Yorks. SMAE members only.

July 17th

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July 17th

SOUTHAMPTON & SOUTHERN AREA (SMAE) F/F GALA. Open R/G/P, FAI Glider (5 rounds, 11am start), Combined Mini (A/1, ½A, Cd'H). Venue: Beau-lieu Common, 10am start. Information: P. Stewart, Aldershot 29735.

July 17th

LONDON AREA C/L MEET. Combat at Charville Lane, Hayes.

July 24th

SMAE CLUB CHAMPS. Open R/G/P. Venue: RAF Bircham Newton, Norfolk – not confirmed. Details: J. Cooper, Northampton 42449.

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ASHFORD R.A. THERMAL SOARING. % Slot scoring plus Ladies event (free). Send 50p pre-entry plus freq. to D. Hopkins, Broad Downs, The Street, Brook, Nr. Ashford, Kent.

hallowed sanctums of the modelling room. Speedily he tells us that the club's main interest is control line, particularly team racing. Oddly enough, for this day and age, there is no Radio representation, although it is rumoured, not too seriously, that Radio may be listed as a novelty event sometime in the future. The club, which is affiliated to the SMAE, flies at Martlesham Old Airfield; a site shared with the Ipswich Radio Club. It is not all that suitable for free flight, and for club comp purposes five flights are made throughout the year at any time and any place in each of the three classes: Power, Rubber and Glider. Models on the board and in the air at present include two Rossi *Miss San Bernadine* Goodyear racers, three Rossi T/R *Simple Sprints*, and a very smart *Hooptee Rat Racer*. On the stunt side there are *Junior Noblers*, two *Skyscrapers*, a *Supermaster* and a biplane, whilst in free flight there are a 40 powered Open, two A/2s and an Open Rubber. The club fields three C/L teams, of which the Green/Cunningham combo did well last year, going from novices in Goodyear to third place at the Nationals. Newest addition to the fold is Roger Gedge of Quest Kits, in whom they hope to rekindle the T/R bug.

A somewhat brief note from Mr L. C. Wills, Hon Secretary of the South Dorset Scale Model Society, leaves

me wishing to know more of what goes on in the club. Anyway, it meets every Wednesday, 7.30 pm at the Weymouth Youth Activities Centre, Knightsdale Road, Weymouth. Regular competitions are held and a special event every other week end. New members welcome.

An item in the *Watford Wayfarers'* newsletter to the effect that the club insurance premium has gone up to £1.50 a head (plus torso we hope) serves to remind us of the fight clubs have in keeping the subscriptions down to an acceptable level, but at £8 the *Wayfarers'* annual fee is still quite moderate, particularly so since the club has its own rented field. The beauty of the rented field is that you have only yourselves to safeguard and not the general public, too. But you have wider responsibilities at a public display, especially in windy weather, and it was experts only at Woodside on Easter Monday. What with flying saucers and helicopters doing their stuff and a very nice Concours spread, little wonder the Council organiser thought the model show one of the best exhibits. Mostly the display pilots perform only too willingly for gratis, but the newsletter suggests that they should at least be compensated for the damage sustained by the models. John Sharman, who appears to edit the newsletter, has a nice little story to tell about the show. He was standing

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by the model when a gentleman who owned a beautiful Lagonda informed him that he had an 11ft span, 40lb Messerschmitt 110 World War II fighter bomber stacked away in a garage at Fulham, and if John would like to collect it he could have it! Seems the double Super Tigre 71 powered monster was used in the *Battle of Britain* film. Duly collected the huge model turned out to be less of a monster than was feared, for in actuality it weighed but a mere 25lb, and the spread of its wings a meagre 9 feet. All in good airworthy condition though, with rivet marks, etc, well preserved, and everyone is agog to see it airborne. Not likely to be seen in the Club Spot Landing event, the latest of which was won by John Greenfield.

Wolves were to be seen roaming the wild bracken and heather covered tracts of Channock Chase, mostly looking for models, for this was nothing other than the **Wolves MAC** competing in the North West Area's Rootes Trophy Gala. Club success came with a win in Open Rubber with Colin Shepherd's *Borderline* flying to good effect, and a straight three-max victory for Brian Perry's ancient *Eureka* in Open Power. These two wins, together with third placings in Glider and Chuck, gave Wolves the *Rootes Trophy*, but were left in doubt of their success until a flight card technicality was ironed out at the next Area Committee Meeting. The well stocked club outdoor programme of club and Area events, plus a number of displays, static and activated, has its indoor counterpart with talks such as one given by Ven Venables of *Scale Modelling* and the Model of the Month league.

Nitro is, somewhat appositely, the newsletter of the Belfast MFC and its editorial extends a welcome to all interested bodies, including the *AeroModeller*. It is felt that a wide distribution of newsletters makes for better communication within the movement. Certainly a newsletter copy is one way of paying your respects to any

influential body; a nice, courteous gesture that costs very little but can bring useful returns. All of which reassures us that model flying in Northern Ireland is in good heart, and that steadfast all-rounder, Maurice Doyle, is still featured prominently in the contest results. He was the 1976 C/L Aerobatic Champion and Indoor Champion. Free flight seems to be somewhat in the doldrums, with popular interest centring on thermal soaring. For the club soaring event in April there were no less than 15 entries. Winner was Terry of NIMSA. Much of the newsletter is taken up with technical articles, but altogether a useful read.

A most definite 'thumbs down' for this column comes from Wal Cordwell in the latest issue of the *Three Kings Aeromodellers' Court Circular*. I admit I gave them rather short commons for the May issue, although over the years I have given them a fairly generous spread in recognition of the regularity with which we receive their newsletter. I may have got a bit mixed up over when and why they fly their stunt kites, but I do not think I generally represent model flyers in an immature light. Although I get the wooden spoon, there were all the glittering trophies on display at the club prizegiving; and a very impressive collection they made, with an eye catching newcomer from Alan Cunningham's subtle hand; a bright metal *Spitfire* mounted on a polished wood and perspex stand. This was awarded to the Junior with the highest *Doug Blake* points: Stewart Pearson. Alan Callaghan of previous mention won the *Doug Blake Rose Bowl*, whilst the Goodyear Shield went to Ken Gardner and Ian Black. But there are no prizes other than a chromium bed pan if you start messing about with epoxy based paints in anything but well ventilated conditions. The cautionary tale here is of someone who was unwise enough to use an

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epoxy spray in a heated garage and finished up in an intensive care unit. Personally I only build the tissue covered things and suffer no ill effects from a heady draught of old fashioned dope.

Nothing has made more of an impact on the free flight scene in recent years than Snoopy in flying helmet. I refer, of course, to the emergent **Biggles Free Flight Team**. Based in Northampton, they are to be seen flying regularly at Basinghourn where they exercise that successful admixture of expertise, enthusiasm and team spirit which has brought them so much success. But, as their annual newsletter so colourfully points out, the successes have been international as well as national, with Steve Marriott, whose novel designs have real flair, winning a gold medal in the Dutch National Championships and Andy Crisp, an Arts master, winning another at the Spanish Concurso Aeromodelismo, where the Biggles team also collected a silver placing. Much of the newsletter is made up of press cuttings, giving the group the sort of wider publicity they most certainly deserve. Also included in their roll of honour, otherwise a full list of their placings in the numerous events they entered in 1976. Apart from the record of success, it demonstrates just how busy is the life of the free flight contest modeller; there not being many free weekends during the season. Pity their April Gala coincided with one of the windiest of Spring days - they deserved better.

Model Aviation Canada, the newsletter of the MCA of Canada, is more of a magazine than a mere bulletin, and if the general content, mainly Radio, gives a clue to the present state of model flying in that transatlantic Dominion one of the articles fills in the gloomy details of the decline to a point of near extinction of free flight. There is some evidence of survival out West, presumably around Vancouver, where the model flyers are caught in a heady

updraught of enthusiasm from the Seattle area, but elsewhere the picture is grim. To give an idea of the trendy trend of things there is a write up on 'The Tournament of Champions' held at the gambling city of Las Vegas. Radio aerobatics, of course, what else. Now just after I was gloomily working out whether my weekend budget allocation of petrol could stretch to a visit to the flying field I read that the first prize in this extravaganza was a staggering 10,000 dollars. Moreover, each of the entrants got a whacking cash prize of greater or lesser degree, and after the banquet were presented with a gold coloured blazer with gold thread crest, a pewter plate and a quilt lined jacket. A far cry from our little wooden plaques and epoxy outfits.

Free flight might well be in the bread line, but has not yet died of starvation. Some sustaining fare is to be found in two brief but nicely turned out issues of *Scatter*, the journal of the **Southern California Aero Team**. There is a look ahead to the kind of model we may be flying in the future: a ducted fan pod atop a swing wing configuration. Then there are plans of three most formidable models: FIA, FIB and FIC, plus many newsy and useful items.

From *Free Flight Down Under* we learn that the Australians are to field three complete teams for the 1977 World Free Flight Championships in Denmark. What doesn't quite equate with this is the low times and poor entries both in the Nationals and another major event. Only two power models flying in the Nationals, returning seemingly chuck glider times. It may just have been the weather.

The New Zealand Newsletter of the NZMAA is well turned out as usual, but contains nothing of general interest, although full of gen valuable to the NZ modeller.

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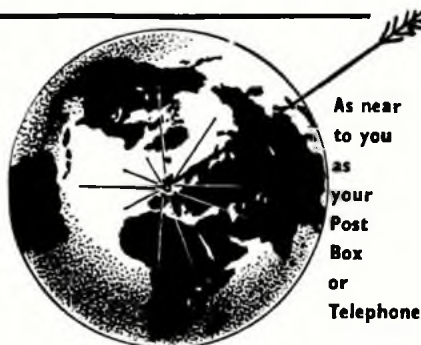
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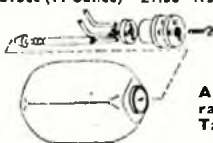


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