

NOVEMBER 1977

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Aero Modeller



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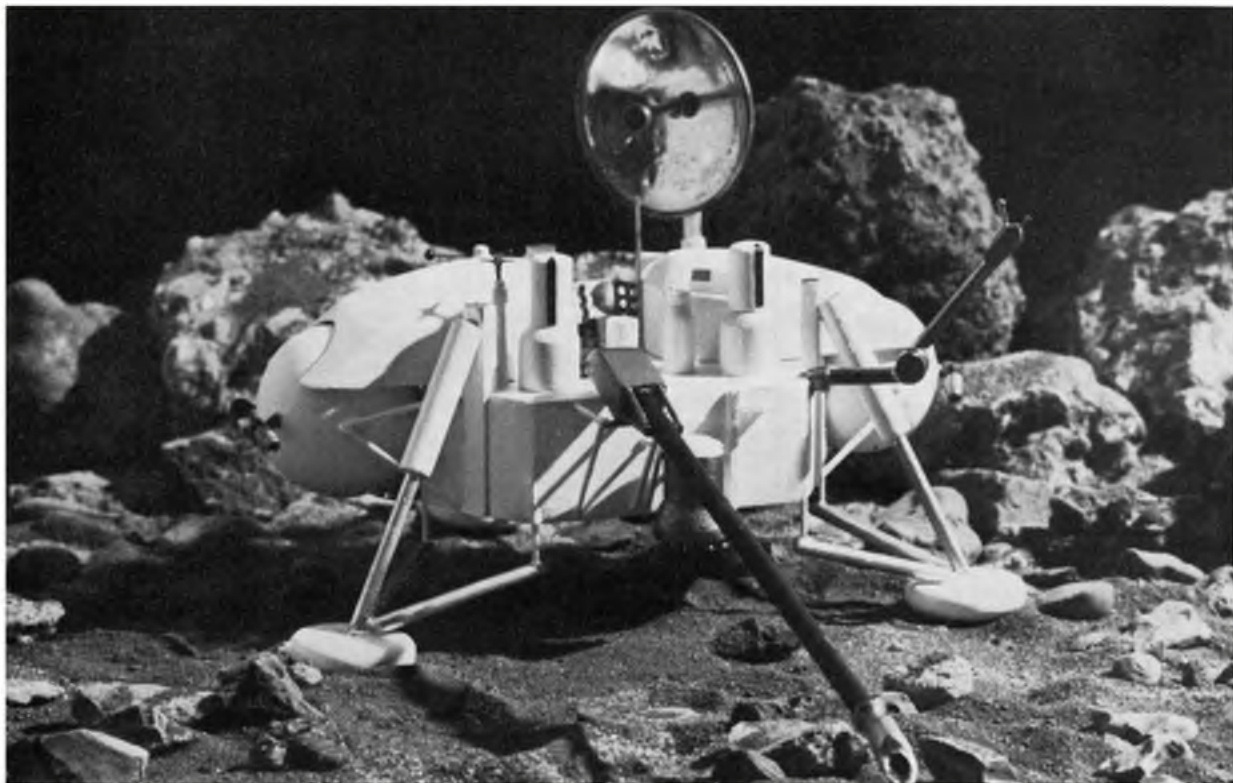
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KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

Aero Modeller

INCORPORATING
MODEL AIRCRAFT

November 1977

Volume XLII No. 502

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HOBBY MAGAZINE



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Comment

The Aeronautical Society, which has administered the famous Kremer Competitions for man powered flight, has announced that the £50,000 prize for the first flight around a figure of eight course has been won at last. The winner is Dr Paul MacCready of California, whose aircraft was flown by Bryan Allen. Paul MacCready is well known as a participant in World Gliding Championships, and before that was a National Champion in the AMA, specialising in free flight models. He will be invited to the Society for a formal presentation later this year. His *Gossamer Condor* is model-influenced in many ways, being very light (77lbs for almost 800sq.ft wing area,) and uses warp control for turns. It covered the Kremer course in 6:22.

There are still two smaller prizes outstanding. One is for Commonwealth entrants, and is for the first second and third flights around a slalom course. The other is for the first flight of at least three minutes duration by a UK competitor.

Henry Kremer has felt that these smaller prizes may not provide sufficient spur for further endeavours and, with great generosity, is again offering prize money. There is to be a second prize of £10,000 for the first non United States national to complete the Kremer figure of eight course. The Royal Aeronautical Society will continue to administer the prizes as before.

on the cover

Ron Brand cranks the handle of the mechanical starter while Henri Borer pushes the Rossi 15 engine's spinner into the rubber cone to fire-up Dutchman Bas Buser's speed entry at the Belgian-hosted European C/JL Championships. Bas achieved a speed of 244.4 km/hr - sufficient for fifth place.

next month

The traditional bumper 'Christmas' issue - with no less than three full size plans! These are for a 1/4A combat design, an attractive CO₂ powered free flight scale aircraft, and also a simple rubber powered 'stick' model - all perfect for the sports enthusiast. In addition there will be accurate preview scale drawings and feature on the Sorrell SNS-7 Hyperbiplane - a full-size subject with ample scope for modelling! All this and more - including a test for the Cox 15 engine - in the December issue, on sale 18th November.

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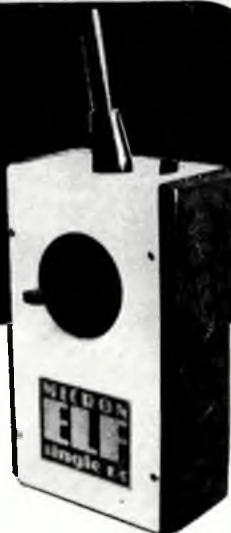
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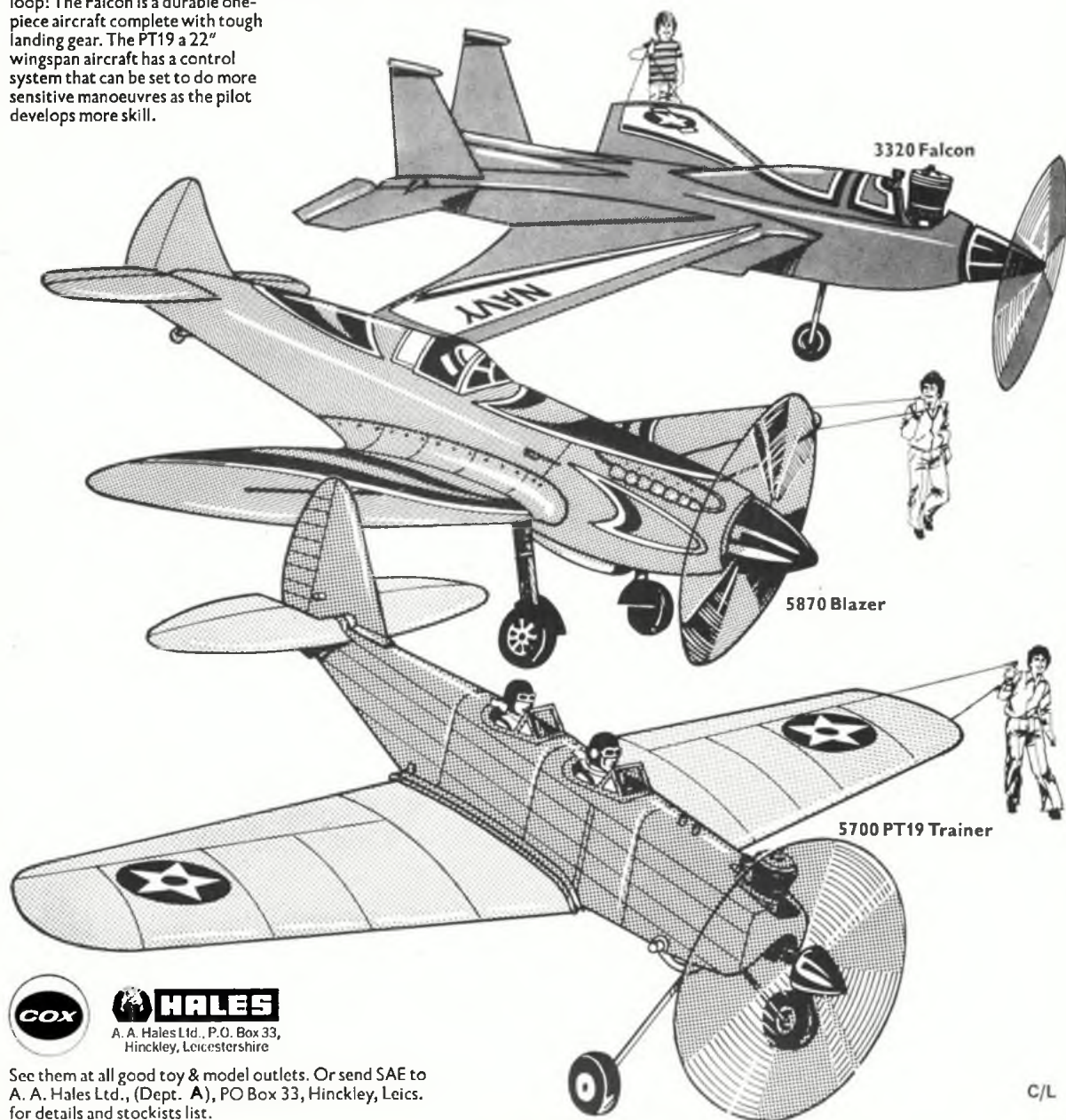
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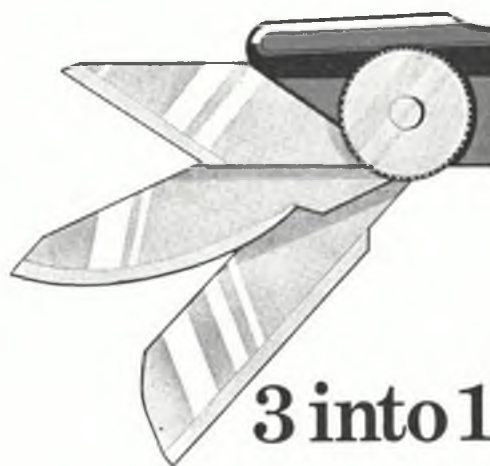
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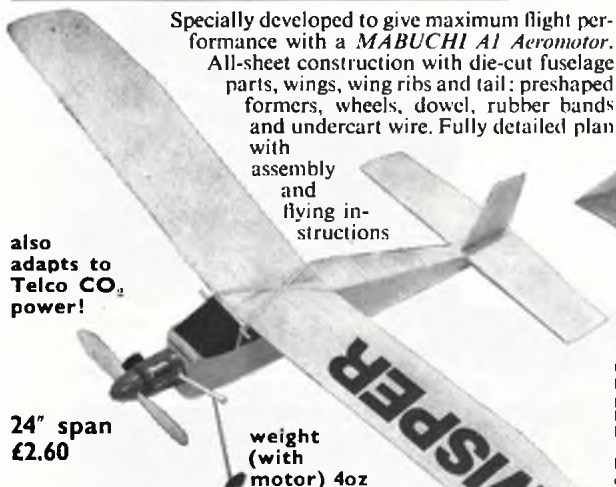
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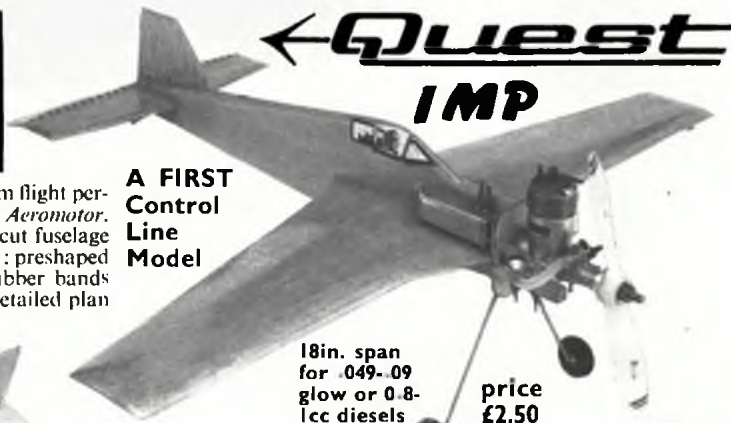
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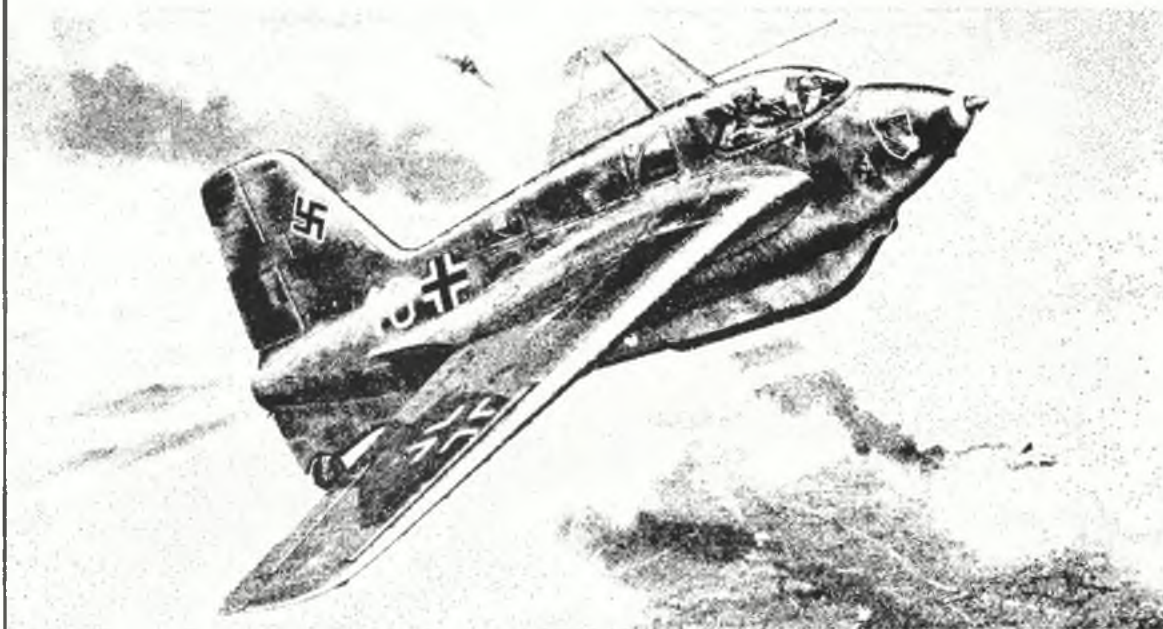
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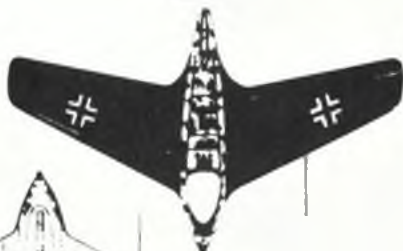
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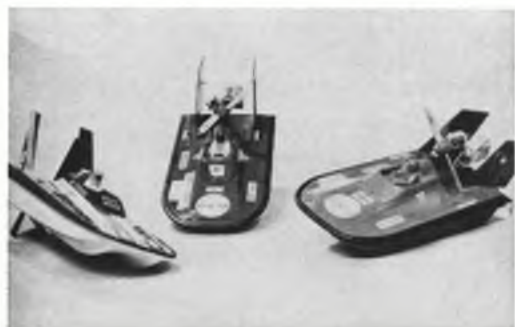
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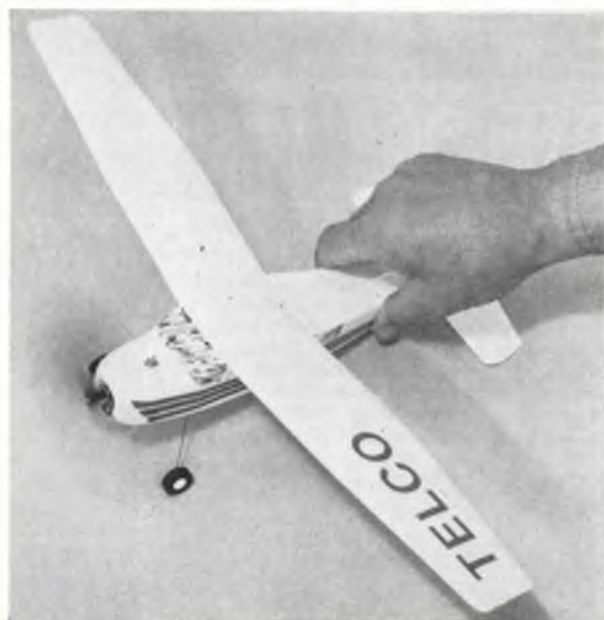
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Heard at the HANGAR DOORS

THE HONOUR of the first Lindbergh Professorship of Aero Space History at the National Air and Space Museum, Washington, D.C. has gone to Charles Gibbs-Smith, the eminent British historian. Charles Gibbs-Smith is at present a Research Fellow in the Science Museum, London. Throughout his long career, he has written many books on early aeronautics and has become recognised as the leading authority on the Wright Bros.

NEW SMAE AWARD SCHEME. With the current popularity (mania?) throughout the World for establishing all sorts of records, the SMAE has announced a new scheme, open to all model flyers, to encourage achievements which somehow "further aero-modelling". This phrase is left deliberately vague in order to allow its widest interpretation.

Now, any UK citizen, flying anywhere in the World, who makes what he/she considers to be an outstanding flight (or series of flights) of any nature is invited to send full details to the SMAE Records Officer (D. Stapleton, 21 Ravensbourne Drive, Chelmsford, Essex CM1 2SJ) within one calendar month of the flight. An independent witness must confirm these details.

All claims will be acknowledged and those who are chosen for the award will be announced at the SMAE's annual Dinner and Prize-giving ceremony. It is stressed that this new scheme is in addition to the more formal U.K. Records system, and does not replace it.

DIARY DATE for Coupe d'Hiver enthusiasts is December 4th, when once again the *AeroModeller International* will be held at R. A. F. Halton. In keeping with the original Model Reduit D'Avion concept, there will be a contest run to the 'French rules' (i.e. 100 gram models, three flights) as well as an event to FAI rules (80 gram/5 flights). Further details next month – or send an S.A.E. for a pre-entry form.

READERS of the MAP quarterly trade-only newspaper, *Model Hobby Trader*, should note that the Summer edition contains an unfortunately worded paragraph. The relevant piece details that nitromethane is a solvent for Cyano-acrylate adhesives – but it could be read to infer that this chemical is safe to use in the event of

eye-contact. We emphasise that nitro-methane should *never* be used in such circumstances – in fact the eye has its own natural protective solutions. Incidentally, should accidental skin-bonding occur when using these adhesives, the best home-treatment is to use hot soapy water and a blunt instrument such as a spoon to part the contact. Do not panic – just slowly peel the joint apart. In more serious circumstances, utilise the hospital services – do not attempt 'do-it-yourself' doctoring, even if you think you know of a solvent.

Retailers, distributors or manufacturers who have not yet seen the Summer issue of M.H.T. can obtain a copy on application to our editorial offices.

AVOIDABLE TRAGEDY. While taking part in an organised control-line flying display at Winsford, Cheshire, a 14-year old boy was killed in August when his model made contact with overhead power cables. A few days later we learned of a similar accident in New Zealand, when a control line flyer received very severe burns as his model flew within 25 feet of high voltage, overhead power cables.

How often must we repeat the warning – NEVER fly anywhere near power lines? Direct contact is not necessary to cause injury or death – and in damp conditions, these cables are even more lethal. Kite flyers too should be warned – a nylon or damp string makes a perfect conductor. Take care, use your eyes and commonsense.

FOUND. Whilst sailing up the Thames Estuary, near Gravesend, Mr J. Thurston of 50A, The Ridgeway, Sutton, Surrey, found a low wing R/C model of about five feet span, with approximately a 10cc engine fitted, floating in the water. It sports a foreign transfer on one wing tip which could well be Dutch. Is it yours? If so, write to Mr Thurston with a good description of the model.

LAST CHANCE to see historic flying at the Shuttleworth Collection at Old Warden near Biggleswade, Bedfordshire this year occurs on Sunday October 30th. There will be World War 1 aircraft airborne, as well as demonstrations by the more modern Fairey Britten-Norman Islander and Trilander, plus aerobatics courtesy

of a Pitts Special. The airfield will open at 11.00am, and the flying should close by 4.00pm.

COPYRIGHT and the model maker. Where Copyright is shown to exist in a plan or sculpture, the owner of the copyright has a monopoly in the reproduction of that plan or sculpture either in two or three dimensional form. A person infringing that monopoly may find himself liable to be sued for damages and for an injunction to prevent that infringement being continued.

The present law in England is that Copyright in a manufactured article exists not in the article itself but in the original drawings or carvings from which the article is later made.

A Barrister specialising in Copyright matters recently expressed the view that a wooden plug hand carved by an aero modeller from which moulds were to be made for the reproduction of glass fibre fuselages would constitute a "sculpture". He therefore concluded that any unauthorised copying of fuselages made from such a mould would constitute an infringement of the artistic copyright in the original plug.

The essence of copyright infringement is the copying of the original work of another. Each case must be looked at individually but the moral is clear. Before reproducing another's work first seek permission of the owner of that work. Otherwise you may find yourself involved in legal proceedings.

A poster that really means what it says – and now being displayed by the Electricity Board.



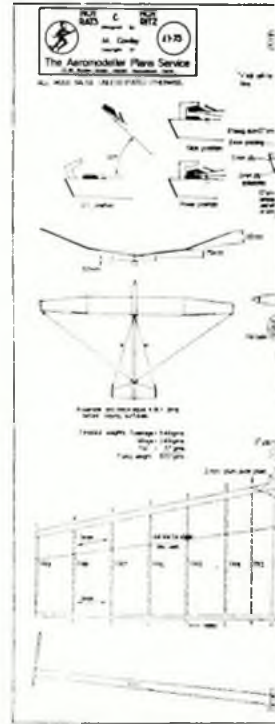


HOT RATS and HOT RITZ

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Full size copies of this 1/8th scale reproduction are available as Plan No. PET 1324, price £1.90 (inclusive of postage and VAT) from Aero Modeller Plans Service, P.O. Box 35, Bridge Street, Hemel Hempstead, Herts. HP1 1EE.



THESE are the models that gave me my first British Team place in a power class, going on to max out at the World Champs, max out and win the *Pierre Trebod International*, and win the 1977 British Nationals. Until this year I suppose I was a glider flyer, although years of combat flying have taught me how to handle engines, and get those all-important first flick starts. So any model that can be built and trimmed at the last moment to produce such scores must make it the ideal choice for anyone who always fancied a "hot" FAI power model, yet felt it too difficult. I do not get much spare time for building, and therefore, most of the design decisions were based on the easiest, rather than theoretically the best, solution. My British team place put me in the embarrassing position of having to build two more models (to complete the required three) and I was unable to start construction until a mere month before the Championships. When staying up until 2 o'clock some mornings building, I would often read Erno Fridges article in the January '64 *AeroModeller*, saying he had only completed his winning model two weeks before that Championships. Mine were completed in my tent in Denmark on the Wednesday, trimmed on the practice day and flown on the Sunday! An unlucky stall which mysteriously developed towards the

end of my 3:42 fly-off flight robbed me of a certain 4:00 round max, and ended my hopes at the World Champs. Since then I have been luckier

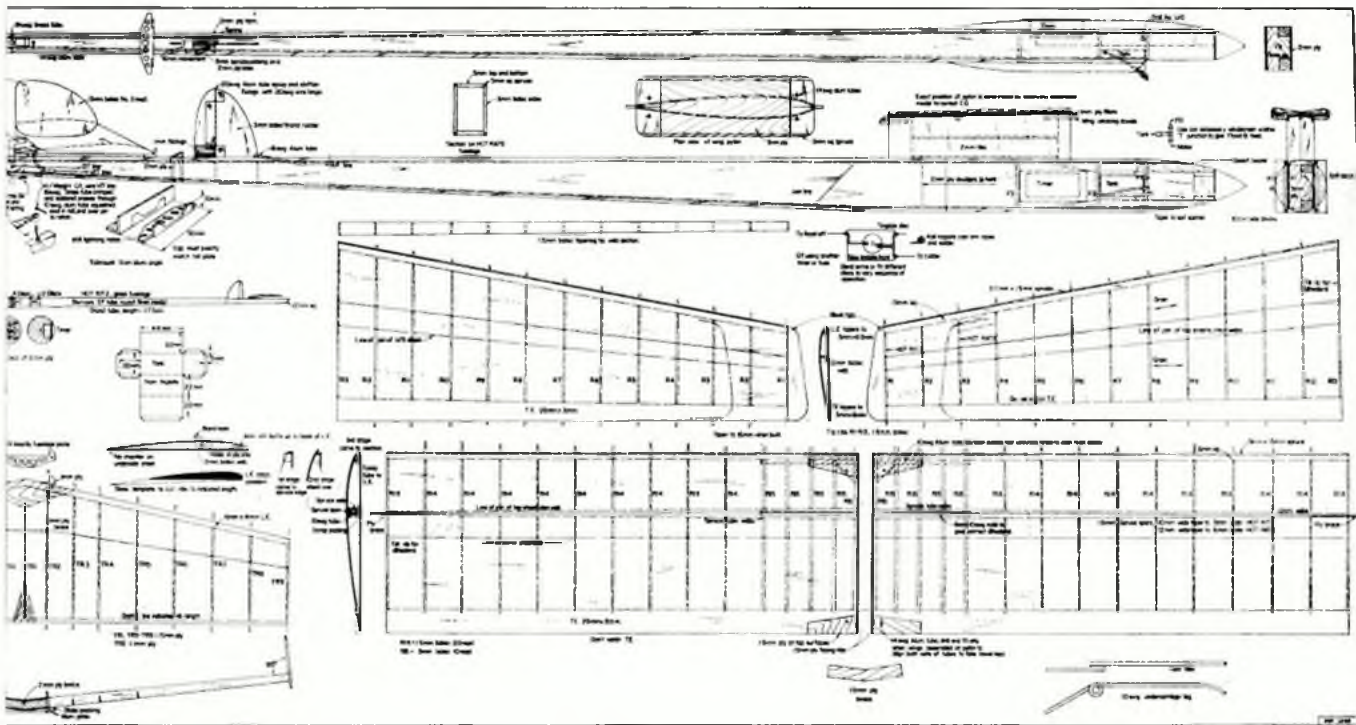
My first inspiration came when watching the fabulous, fast, high climbing FIC power models at the '73 World Champs and Trebod, and I decided then that I must have a go myself, and get that adrenalin flowing. *Hot Rats* was drawn up in 1975 along the Danish triple-fin layout favoured by Koster, using details from the Phil Ireland and Ken Faux stables. Not wishing to 'plant' my precious model, I aimed for accuracy and consistency by keying all moving and non-moving surfaces, and wishing to build only the airframe, I chose to buy-in standard hardware such as Collins pans, Burrows G.F. fuselage tube, Kretschmer props, Screen brakes and Seelig timer. That's half the model for a start! Wing sections were flat bottomed hence no jigs required. Construction was all balsa, needing no advanced techniques. No machine shop facilities were needed – just a simple file and hacksaw for two parts. No glass fibre work because it is too messy and covering is by simple, heat-shrink plastic film – iron it on and go straight out and fly it! I just could not bear the thought of the weight of all that dope, soaking into those acres of sheet balsa.

The original *Hot Rats* '75 was envisaged as my FIC trainer – well it taught me to fly, using a Super Tigre engine and balsa fuselage. The same model was later fitted with a Rossi to deal with the new 7 second motor run rule, and later fitted with a glass fuselage for the Trials. The weight by now was 910 grams – 160 grams overweight! Yet that was the only model I had for the Trials, and it got me the team place. The two recent *Hot Ritz* '77 models had more wing area; knowing that I still would not be able to build it down to weight, at least I could keep the wing loading low.

Some useful addresses:

- Propellers** – Peter Kretschmer, 8901 Bobbingen, Freidenstr 11, W. Germany Price 6D.M.
- Engine pans** – Roy Collins, 19 Highfield Rd., Hornchurch, Essex or at contests Price £2.00





- Engine brake** – Stafford Screen, 66 Stevens Road, Wollescote, Stourbridge, W. Midlands or at contests. Price £2.00
- Timer** – Hans Seelig, 893 Schwabmunchen, Mitterfeldstr 1, W. Germany Price 37 D.M.
– FFN, Ian Kaynes, 2 Alexandra Close, Netley St., Farnborough, Hants. Price £9.00
- Fuselage** – Ray Monks – Occasional batches available at contests. Price £3.00
– Laurie Burrow, 30 Arran Rd., Catford, London. Price £3.00
– Ronytube, 23 Ivy Rd., Newcastle-on-Tyne plus £1 post (0632-623735)

Wings

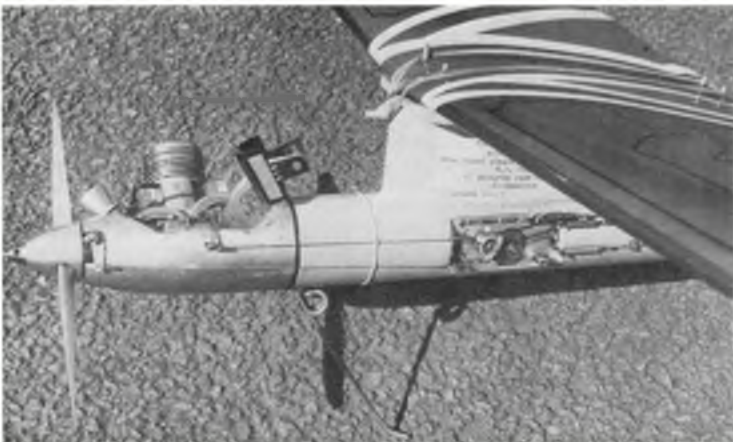
Start by butt joining 100mm wide sheets into 200mm panels. Use 18gm sheets for centre and 10gm for tips. Cut

into panel sizes allowing 12mm extra chord on top surface to allow for curvature. Use 18gm off-cuts for centre ribs and pylon and 10gm sheet for tip and tail ribs. Cut away segments for 1.5mm gussets let in at centre, pin flat over plan and PVA the LE strips, tapered spar and TE directly onto sheet. Weight flat. When dry, pack up to required warp and PVA ribs in place; notch each rib to fit spar, adding webs to exactly space next rib position. Lay top spar over ribs and notch accordingly. Epoxy tubes in place with centre panels side by side, using straight rods to align while drying, fill in with spruce webs. Finally carve LE halfway, down to spruce, and PVA top sheet on, binding surface down with $\frac{1}{4}$ in. flat rubber strip, wrapped around wing and 200mm chord building board. Lastly carve and sand to section and add tips and ply band support but fit aluminium tubes later.

Tailplane

This is built in a similar fashion to the wing, using 75mm sheets weighing 7gm. or under. Cut out the fins, which are best fitted *after* the tail is covered. I used Solarfilm on all

Below is the 'sharp end' of a glass fibre rod fuselaged example. Note the line from the Seelig timer to the Stafford Screen brake and flood-off trap bolted to lug of motor – small Bulldog clip to shut off pressure line while starting prevents premature flooding. At right: how's that for a vertical launch! When trimmed correctly the model just continues upwards with no rolling or turning.



Aero Modeller

my models, make sure that it is fully shrunk, and stuck down to the entire surface area i.e. it should *not* balloon up when re-heated. Any decoration, SMAE numbers etc. can be written directly onto the balsa with a felt tip pen and transfers applied, before covering with see-through film. No doping is required if you film the model.

Fuselage

Epoxy bearers to 3mm ply formers to suit motor, splice fuselage sides and top, then cut to shape. Add 3mm sq. spruce longerons to edges of sides and 1.5mm ply doublers and D/T arm support to inside faces. Cut timer hole. Pin left hand fuselage side flat then add bearer assembly, followed by top and bottom sheet glued only towards front half. Fit tube outlets and run heavyweight Laystrate control line wire lines inside the fuselage, front to back for A/R, VIT and D/T at this stage, before adding the second side and pulling together at rear. Sight along to check straightness.

Meanwhile, make all hardware. Solder tank with lapped seams so that it will not split under pressure. The 3mm thick aluminium D/T arm is bushed with 18swg brass tube – push fitted and epoxied. For the fin and auto rudder use an aluminium tube wire hinge, and *not* a less consistent cloth or sewn version! Bend the U/C leg and make the tail mount and stop to be accurate fits. Allow 45° D/T movement. Assemble pylon and wing platform.

Drill bearers with 2.5mm diameter holes and screw engine bolts in. Add 9mm side cheek and blocks between bearers, then sand fuselage to shape. Fit fin and rudder, VIT line tube and D/T arm, using 18 swg pin hinge. Crimp 16 swg brass tube onto stranded wire line to make loops, and solder. Draw parallel lines 150mm apart and align the tail mount on one, and tail TE on other, and epoxy together using balsa wedges to achieve equal dihedral under each tail tip. Add tail fins.

Epoxy the tail stop onto the fuselage and strap tail on, measuring from front of fuselage to each tip, adjusting skew until accurately aligned. Epoxy U/C leg and tank in place, bolt in motor and prop and timer. Strap completed tail on, then strap completed wing onto pylon, ready to balance model. To allow for weight of paint, I strap a 20gm weight halfway along fuselage, then strap wing/pylon to rest of model and adjust its position until the correct balance point is achieved. Mark this position and epoxy the pylon on to the fuselage – reinforce joint with nylon or chiffon strips. Finally rubber band the wings on, and skew until equidistant from each tip to rear of fuselage then drill through both wing and pylon before removing and fitting 14swg aluminium tube for keying pegs.

Remove hardware, tissue cover and finish with two part epoxy. When refitting hardware, use silicon bath sealer to fit timer and prevent engine oil slowing the mechanism.

Those using glass fibre tubes simply cut out 6mm ply discs as shown, fitting the tank internally. Use slow setting epoxy and clean the surfaces well first. Drill or radius all cuts into the GF tube to avoid splitting. Butt join the pylon as usual and make other parts as above. Glass is quicker and stronger, although much more difficult to repair and definitely heavier. My next models will revert back to balsa, using alloy motor pans to mount the engine and shorten nose.

Trimming Preparation

Before you even consider flying, re-check the CG position and wing warps. Correct as necessary. Use 4.5mm wash out for each wing tip, 3mm wash-in for right centre panel; left centre panel and tail are flat. Twist in front of electric fire to correct. Lay assembled model with fuselage top parallel to table top and measure up to LE and TE's. Wing should have plus 6mm incidence, tail plus 1.5mm for power, minus 4.5mm for glide. The auto rudder is straight



Close up of timer reveals (front) flood-off and brake lines, and (rear) dethermaliser, rudder and variable incidence lines. Note use of 'pre-flight' check list, pasted onto model next to (essential) address label.

for power, 3-6mm **RIGHT** for glide. Always use same quantity and size of bands on wing or tail; four 25 x 1.5mm sq. for tail, and four 75 x 3mm flat for the wing – well stretched. Pull tail and A/R down to power setting on timer, then push TE of each away from its stop. If it does not *snap* back onto its stop, the lines are too slack and your model will eventually crash due to inconsistent settings! Similarly the wing should be impossible to lift off the pylon once banded on. Finally run several tank fills through the motor, checking timer runs and clean floods offs. Everything must work 200% reliably – find out now and avoid your first crash.

Test Flying

Calm weather and long grass is traditional, so hand launch to achieve a long flat gentle *right* turning glide. Yes they do glide fast, don't they! I do not usually try test gliding on the power setting, providing the above geometry has been checked.

At last the time has come; after all the building and preparation arrives the moment of truth when all you can do is let go, step back and enjoy it. If you can make one flight and survive, you can do it again and get the ship trimmed. Set the timer for a genuine 1-1½ sec. with **NO** A/R or VIT and to dethermalise ½ sec. after the motor cuts. Those using a fuse D/T connect the line to the VIT timer arm for now. A last test run to time that flood off – I use a Top Flite 7 x 4in. nylon prop to slow things down a bit on 25% castor fuel while trimming. Remember to tank up for each flight to avoid a non-flood off, and visually re-double check everything, especially that the tail and rudder are on power setting before **EVERY** flight. This may sound boring, but it really is a game of no mistakes.

Now for that first launch; give the model a steady push, nose pointing 70° vertically up. The model should climb absolutely dead straight, no veering or rolling, looping or diving, and D/T back at your feet. I hope so too. Use 1mm ply shims as required to keep it flying straight and true. Re-fly until satisfied, before progressing to 2, 2½, 3 etc., seconds motor run. Take your time and make sure it was not a bad launch that gave you your last flight pattern. Too gentle a launch may cause the model to virtually stall and go away flat and fast; provided you have not 'planted' the model, throw it harder next time.

As the model progresses up to 7 sec., runs, delay the D/T to 1-1½ secs., to avoid stress on wings after the motor cuts. Once up to 7 seconds, and plenty of altitude, start bringing the auto rudder in as the motor cuts with VIT into glide setting 1-2 sec., later, still on short D/T's until glide is sorted. Experiment with A/R timing to bring nose round, and VIT setting to avoid initial stalls and achieve the best pull outs. All you have to do then is think about throwing it in a thermal because that also helps!

LATEST ENGINE NEWS

by Peter Chinn

Enya 19-VBB-TV Tested

THE ONLY difference between the Enya 19-VBB and Enya 19-VBB-TV is that the latter is fitted with a throttle type carburettor (hence "TV", for "throttle-valve") in place of the standard engine's venturi insert and spraybar assembly. The 19V-BB is actually supplied with two inserts; one for general free-flight and control-line use and having a 7.3 mm.dia. choke, and the other, having a 6.8 mm choke, for control-line stunt. The 19V-BB-TV has a barrel throttle carb with airbleed type low-speed mixture adjustment and is intended for radio-control, or control-line models equipped with a third line throttle control.

The standard free-flight/control-line version of this engine has already been dealt with in a past *AeroModeller Engine Test* feature. Therefore, in view of the close similarity of the two engines, it was decided not to devote a full Engine Test report to the TV version, but to present our findings in condensed form in *Latest Engine News* instead.

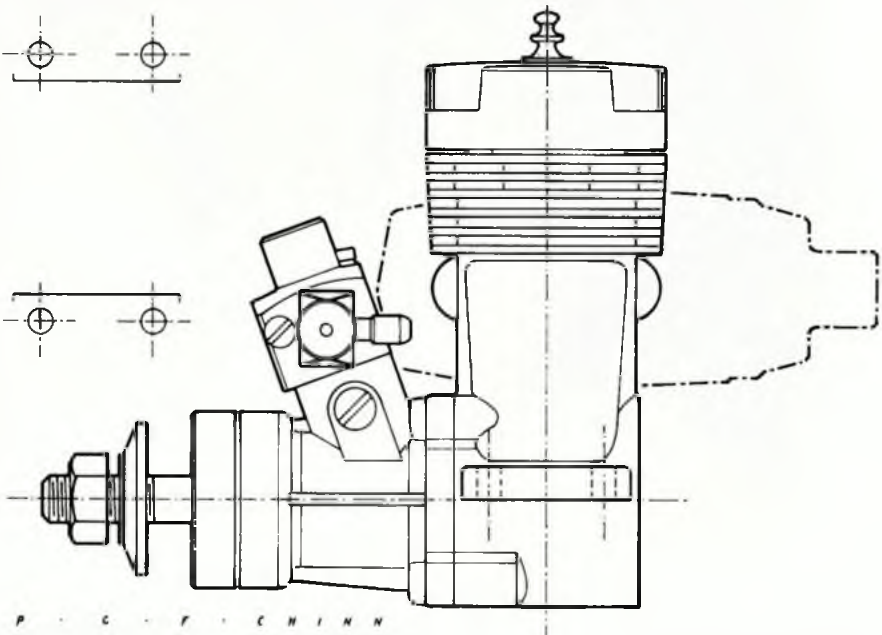
The Enya carburettor fitted to the TV version of the 19-VBB has a ground steel barrel rotating in a machined aluminium body like other Enya carbs. The choke i.d. (4.6 mm) is smaller than that of either of the standard venturi inserts, but this does *not* mean that its effective choke area is smaller, for the simple reason that instead of having a spraybar extending the full width of the choke, it has a short, threaded jet tube which just protrudes into it from the left side. In the standard engine, the smaller of the two venturi inserts gives an effective choke area of approximately 11sq.mm and the larger one 14sq.mm. The effective choke area of the TV carb is approximately 13sq.mm, although this can be varied by slackening the locknut securing the needle-valve to the carb body and screwing the jet tube in or out. It is actually possible to adjust the effective choke area between about 10sq.mm

Featured earlier in its standard FF/CL version in A.M. 'Engine Test' series, this throttle equipped "TV" version of Enya 19-VBB confirmed, on test, previous favourable impressions. Engine has twin ball bearings, is sturdily made and well finished. Notable for good performance on "usable" props and excellent handling.

and 15sq.mm to give the user the choice of opting for maximum fuel draw or maximum power.

One would expect that, with a choke area of 13sq.mm (as delivered), the TV version of the engine would be fairly close to the power output of the standard engine when fitted with the larger of the two venturi inserts and

this was confirmed by our tests. Using the same fuel (5 per cent nitromethane) the 19-VBB-TV indicated a gross output (i.e. less silencer) of just over 0.33bhp at 13,500rpm and a shade less than 0.30bhp at approx 12,300rpm when the appropriate Enya expansion chamber silencer was fitted. This compares with our





The Glo-Bee "Fire-Plug", the complete 'glowplug power-source' - built in rheostat enables current to be varied to suit all types of plug. Although Fusite Glo-Bee glow-plugs are imported by both Irvine Engines and Ripmax Ltd., neither concern at present have plans to import the accessories illustrated on these pages. Further details may be obtained from Fusite Division, Emerson Electric Co., 6000 Fernview Avenue, Cincinnati, Ohio 45212, U.S.A.

earlier test figures of 0.34bhp at slightly more than 14,000 and just over 0.30bhp at 12,500 for the FF/CL version with 7.3mm venturi. It may be recalled that we also tried the standard motor with the small (6.8mm) venturi and silencer and this reduced output to slightly below 0.29bhp and the peaking speed to just short of 12,000rpm.

Some checks on prop revs with the silencer added and, of course, still using the same 5 per cent nitro-methane fuel mixture, yielded 9,750 rpm on a 9 x 6 Top Flite maple, 10,600 on a Taipan glassfibre-nylon, 11,000 on a 9 x 4 Tornado nylon, 11,200 on a 9 x 4 Top Flite nylon, 12,200 on a 9 x 4 Taipan glassfibre-nylon and 12,400 on an 8 x 6 Power-Prop wood. There is obviously no point in propping the engine for higher speeds than these in view of the fact that, on the last two props for example, the engine will unwind to a speed beyond its peak anyway.

As with the 19-VBB tested earlier, general handling and running quali-

ties were exemplary. The engine was thoroughly well mannered: quick starting and docile on props down to 8 x 4 and smooth running over a wide speed range.

The throttle also worked well and, with minor adjustment, we were able to get the 19-VBB-TV to idle quite reliably as low as 2,200rpm on a Taipan 9 x 4 glassfibre-nylon.

To briefly recap, for the benefit of those who did not read the earlier Engine Test report, the 19-VBB is a twin ball bearing motor with shaft rotary-valve induction and a deflector piston running in a conventional crossflow scavenged cylinder. In the traditional Enya manner, a separate front housing bolts onto the crankcase casting which also embraces the cylinder jacket and integral crankcase backplate. The ringless piston is of cast-iron, lapped to fit a drop-in hardened steel cylinder sleeve. The crankshaft is generously proportioned, with a 12mm main journal which runs in a special 12 x 21mm ball bearing. This is supplemented by a

$\frac{1}{4} \times \frac{1}{8}$ in ball bearing at the front. The connecting-rod has a bronze bushed big end and is coupled to the piston with a fully floating 4mm o.d. tubular gudgeon-pin equipped with brass pads.

The 19-VBB has a bore and stroke of 16.6 x 15.0mm, giving a swept volume of 3.246cc or 0.1981cu.in. Checked nominal compression ratio of our test motor was 8.5:1 and the engine scaled 6.4oz bare or 7.9oz with Enya silencer.

Glo-Bee "Fire-Plug"

As has been mentioned before in these columns, a valued piece of our test equipment, ever since we began testing early examples of glowplug engines, has been a variable resistance on the 2 volt lead-acid cell always used as a power source for the glowplug, thereby enabling the current to be exactly matched to the requirements of the plug. Over the years we often wondered why someone did not market such a device but last year the American Emerson Electric Com-

Glo-Bee 120 volt AC, 250-MA charger for use with both the "Fire-Plug" and "Stinger" accessories.

New Glo-Bee "Stinger" is an electric starter for Half-A-engines. It contains two rechargeable sealed lead-acid cells.



pany did so through their Fusite Division, already known to model enthusiasts for their "Glo-Bee" glow-plugs.

Actually, Emerson took the idea further. Their "Fire-Plug", as it is called, not only incorporates a variable resistance, but also an ammeter, the whole assembly (rechargeable 2-volt 5 ampere/hour sealed lead acid battery, rheostat, 0-10 amp edge-reading ammeter and fuse) being enclosed in a 6in x 2in dia moulded red polypropylene case. All one has to do is to hook up one's plug lead to the two screw terminals on the top of the case and, having removed the glow-plug, to then adjust the rheostat lever to produce the required glow at the plug. It can save an awful lot of frustration when using different plugs.

Glo-Bee "Stinger"

This recent addition to the Glo-Bee range of accessories is a completely self-contained electric starter for baby engines of up to "Half-A" class capacity - i.e. .05cu.in or 0.8cc. Instead of having to be connected to a separate 6 or 12 volt accumulator, the "Stinger", which is about the same size overall as a 3-cell flashlight, contains its own rechargeable power source consisting of two 2 volt 2.5 Ah sealed lead-acid cells. These drive a special high torque motor at approximately 5,000rpm under load and are said to give about 100 starts between charges. The starter has ball thrust bearings and a resilient drive-cup to suit different sized spinner nuts, etc.

The Stinger starter is enclosed in a fluted cylindrical case, 1½in dia x 11½in long. It weighs 28oz.

Glo-Bee "Buzzbee"

The latest addition to the Glo-Bee product range is an audio tachometer. The main advantage of this, compared with other types of tachometer, is that it enables the approximate rpm to be checked while the model is actually in flight, thereby enabling the modeller to determine how much his engine "unloads" in the air which, in turn, will enable him, if he wishes, to match his prop more closely to the engine's power curve.

The appropriately named Buzzbee does this by emitting a note, the pitch of which is adjustable over a range of approximately 40 to 600 cycles per second by means of a knob on the front of the case. Surrounding the knob there is a scale calibrated up to 36,000rpm in steps of 1,000. To check engine speed, the instrument is switched on and the knob adjusted so that its note matches that of the engine. The rpm is then read off by

EBick Audio Tachometer reads in-flight rpm. Microphone picks up engine note and indicates revs on meter calibrated 10,000 to 30,000 rpm. New Glo-Bee "Buzzbee" (below) also checks rpm in flight. Device emits a note which, when adjusted to match engine note, indicates rpm.



checking the knob pointer position against the speed scale.

EBick Audio Tachometer

Just a few weeks before the Buzzbee was announced, an audio tachometer of a different type reached us from Japan. Instead of emitting an audible tone, the EBick Audio Tachometer picks up the engine's exhaust note via a small built-in microphone and registers its frequency directly on a large meter which is calibrated in rpm from 10,000 to 30,000 and at intervals of 500rpm. It has the advantage that it requires no tuning: one simply switches it on, aims it in the general direction of the model and it gives an immediate reading. The microphone, obviously, also picks up extraneous noises, including speech, which may make the needle swing and there is also wind and Doppler effect to be taken into consideration, but it can be a very useful tool when used intelligently. For C/L use it would clearly be best to take readings from the centre of the circle.

For accurate engine testing in the workshop (e.g. A.M. Engine Tests) neither of these audio tachometers can be regarded as a substitute for quality laboratory instruments (which should be capable of reading to within 100rpm and with an accuracy of not less than 0.5 per cent) but, as a means of determining (by checking both ground rpm and then in-flight rpm) the extent to which rpm builds up on different props, these audio tachs clearly have a place, particularly



for the contest flyer. Compared with low-priced photocell tachometers (most of which are not accurate to closer than 3 per cent) they have the added advantage of being usable under poor light conditions.

Seen for the first time in the United States at the Western International Pylon Racing Championships sponsored by *Model Airplane News*, the EBick audio tachometer brought over by the Japanese team apparently attracted considerable interest and we gather that these tachs are now to be distributed in the US. Whether they will also be taken up by a UK agency is not known. The sole exporters are the S. Kosaka Corporation, PO Box 10, Abeno, Osaka, Japan.

K&B 5.8cc (0.353 cu. in.) is bored-out version of recently introduced K&B 4.9cc (0.298 cu. in.) engine fully described in July "Latest Engine News", but is supplied with optional smaller bore (27 sq. mm.) venturi insert for "slow combat" "slow rat-racing" class events. Bore increased to 0.790 in. Weight slightly reduced to 11.9 oz.





"Mister Mulligan"

OPEN THE BOX, and the first reaction is – what wonderful wood! Unfortunately, the next reaction is – what diabolical die-cutting! However, some careful work with a balsa knife and a tube of cement soon produced an acceptable set of sheet parts, and construction thus commenced. A noteworthy point on the plan is that both fuselage sides are shown separately to cater for the side window layouts being slightly different. The fact that the resulting sides are not quite identical in outline is probably due to printing problems! This is easily corrected, of course, but the moral is – never take *anything* for granted.

The fuselage does go together very nicely and results in a surprisingly rigid structure. It is necessary to cut out notches in the bottom formers at each stringer location – a rather tedious operation which was avoided by making the former $\frac{1}{8}$ in. smaller all round, and gluing the stringers on to the edge. This also ensures that the formers do not cause 'bumps' in the covering.

One minor criticism of the fuselage structure is that there is no provision for making the sheeting around the front formers flush with the stringers. The instructions state that the rear edge of the sheeting should be bevelled to blend in, but in the writer's opinion, this was far from satisfactory, so each stringer was cut away from F3 and raised to the level of the sheeting. Incidentally, there was insufficient $\frac{1}{2}$ in. sheet in the kit to sheet the various parts in the manner instructed. However, this can be overcome by sheeting the cowl in three pieces instead of four as instructed. There were no problems with the remainder of the kit, the undercarriage and strut assemblies being fiddly but by no means difficult.

Covering of the model required some careful thought. The bottom of the wing was covered first, and the wing then attached to the fuselage using epoxy to avoid warping. The top stringers were then added and the remainder of the wing and fuselage covered. After covering the tail-plane and fin, these too were epoxied in place. The tissue was then watershrunk and the undercarriage and struts added, again using epoxy to avoid deforming the covering. One advantage of an aeroplane with struts is that they can be used to remove any warps that might appear during construction!

Finally, the entire model was given one coat of thinned clear dope, and the transfers, etc., added. Panel lines were put on with a 0.4mm Rapidograph pen. Rubber motors were then made up from Keil Kraft 'white' strip – nothing exotic was used.

Flying was carried out with the plastic prop supplied, and four strands of $\frac{1}{16}$ in. flat rubber. In this form, a small

KIT REVIEWS by Dave Day

SIG "Classic Series"

MISTER MULLIGAN and MONOCOUCPE

The American SIG kits are imported into the U.K. by H. J. Nicholls and Son Ltd., of 308 Holloway Road, London, N7 6NP. Both the 20in. span 'Mister Mulligan' (left) and the 23in. span 'Monocoupe' (below) retail at £3.25 apiece.



piece of lead was required in the nose to obtain the specified CG position. The trim was just about perfect with no other modifications being necessary to give gentle left turns under power and slightly wider turns on the glide. The model was, however, somewhat underpowered and did not gain much height. Flight times were around 15-20 seconds.

The next stage was to make a "contest prop" as detailed on the plan but for which parts were not supplied in the kit. This has curved $\frac{1}{8}$ in. ply blades formed by the traditional means of soaking in water, binding to a 3in. diameter former (small coffee bottle) and baking in the oven. The resulting rather cumbersome device is fitted with a motor tensioner to allow the use of much longer motors. In fact, this propeller makes the model so nose heavy that a much longer motor is needed to bring the C.G. back to a reasonable position!

The specified motor for this propeller is four strands of $\frac{1}{16}$ in. flat. All of this meant that the model now weighed roughly twice that it did before! The performance was spectacular to say the least, but hardly scale-like. Flight times now around 40-50 seconds and the trim was very touchy. In search of a compromise, the plastic prop was returned to with a loop of $\frac{1}{16}$ in. flat rubber. This gives fairly realistic flights of around 25 seconds. To anyone contemplating building this kit, I would very much recommend them to try CO₂ power as I feel that this would be just about perfect for this model. If you should decide to build the rubber version, however, I'm sure that you will not regret it. Altogether a most excellent kit which is only slightly marred by one or two very small details.

Monocoupe

WHEN I FIRST saw the American SIG kits or the *Mr Mulligan* and *Monocoupe* and decided that I wanted to build *both* of them, it was fairly obvious that the relatively simple "Mr Mulligan" should be tackled first. This would prepare me for the much more complex "Monocoupe" which has a construction that is much closer to scale. As all the writer's toy aeroplane projects of recent years have been more akin to carpentry than anything else, I wanted the return to *real* aeromodelling to be as painless as possible. Unfortunately, in between one and t'other I discovered Cyanoacrylates! Don't get me wrong, Cyanowatsits are great, but it's almost impossible to use too little of the stuff, and if you are a fumble fingers like me you invariably wind up using too much. This together with the very generous wood sizes in the *Monocoupe* kit lead to the model being much heavier than I would have liked. Anyway, that's my excuse and I'm sticking to it!

One more thing before we get on with the kit is that I decided to power the model with a Telco CO₂ motor. In retrospect, I should add that if I had paid more attention to Eric Coates' articles on this motor in previous *Aero-Modellers*, I would almost certainly have decided that the model was too large for it.

So back to the kit. This, like the *Mr Mulligan*, was notable for the high quality of the wood and the low quality of the die-cutting. On the $\frac{1}{32}$ in. sheet parts in particular, the wood was in some cases quite badly crushed across the grain, yet along the grain it was only partly cut through. Luckily, the most badly affected parts were those for sheeting the front of the fuselage and these were somewhat oversize.

The basic fuselage structure has $\frac{3}{32}$ in. square longerons and cross pieces. The longerons have a rather tricky double curvature which captures the character of the original rather well, but is very difficult to get right and still finish up with a symmetrical fuselage! Curved formers are then added to the sides, top and bottom of the structure. One small problem here was that the side formers are not symmetrical, and there is no indication as to which way up they should be fitted. Parts DS obviously should have the bulkier part of the curve at the bottom, whereas parts CS would seem to need fitting with the bulkier part at the top. After fitting the wire undercarriage parts, side stringers of $\frac{1}{16}$ in. x $\frac{1}{8}$ in. and top and bottom stringers of $\frac{1}{8}$ in. square are added. The nose and cabin area are then sheeted with $\frac{1}{32}$ in. sheet all of which produces a very rigid structure, but seems to be all rather hefty for a 24in. span model.

At this point the Telco motor was fitted by bolting it to a piece of $\frac{1}{8}$ in. ply glued between the front uprights of the basic fuselage. The tank was located below the leading edge of the wing with its bottom end held by a piece of sheet glued between two formers, the top end being restrained by the copper pipes. The filling valve (and this was to be a major mistake!) was built into the bottom of the fuselage between the undercarriage legs. I did not



want the valve hanging outside the model so I bolted it to a small piece of $\frac{1}{8}$ in. ply epoxied between two bottom formers, with just the spout protruding from the bottom sheeting. Unfortunately, after being fitted (and after the fuselage had been covered) the filler began to leak, and it was necessary to cut open the model to fit a replacement!

By careful bending of the copper pipe at the cylinder head and careful hollowing of the cowl, the motor was completely enclosed. The throttle adjustment is concealed inside the noseblock which is removeable as on the rubber powered version.

The cowl and wheel fairings are built up in the time honoured manner using numerous laminations of $\frac{1}{32}$ in. sheet, and blocks are supplied for carving the fairings at the top of the u/c legs. All of this wood is of a much harder quality than I would have chosen for this job (my only criticism of the wood). At this stage, I was beginning to worry about the weight, but as the motor/fuselage unit seemed to be very nose heavy, and as the Telco unit is fairly light, I managed to convince myself that it was all an illusion (relativity, and all that).

The tail unit is constructed from $\frac{1}{8}$ in. square and $\frac{1}{8}$ in. sheet parts in the usual manner, and presents no problems. As I like building wings, these were left until last (things get finished much quicker that way). Scale rib spacing is used with the majority of the ribs from $\frac{1}{32}$ in. sheet and with $\frac{1}{8}$ in. ribs at the root and at strut locations. However, the leading and trailing edge sizes - $\frac{1}{16}$ in. x $\frac{1}{32}$ in. and $\frac{1}{16}$ in. x $\frac{1}{32}$ in. respectively - again seem rather excessive when coupled with two $\frac{1}{16}$ in. x $\frac{1}{8}$ in. spars and $\frac{1}{32}$ in. L.E. sheeting! Despite this, the finished product is certainly very pretty, and well worth the effort.

Covering was not as tricky as expected. In fact, it is possible to cover the curvaceous fuselage with four pieces of tissue. In order to keep a uniform colour on the fuselage and undercarriage, the u/c was covered with tissue. This bit was rather tricky and, on a model of this size was probably as heavy as one coat of coloured dope. The struts too were covered with tissue (well, I always was a glutton for punishment), although it did occur to me later that these could easily have been coloured with a felt pen. This method was tried on the tailplane struts, and proved quite effective. All tissue covering on the open areas was water shrunk and the entire model given one coat of well thinned clear dope.

continued on page 651



Letters to a young modeller

Dear Simon,

I very much enjoyed reading your last letter. The comments about the lad with the Ready to Fly (RTF) control line job were very funny, but I feel that I ought to pop in a warning about feeling, if I dare mention it, a little bit smug!

You see, the difficulties that youngster was having seem enormous unless someone else with real know-how comes along and is good enough to help in the right way. There's not much point in approaching someone struggling away and feeling a bit embarrassed because everyone seems to be watching him and opening a conversation with "You'll never do it that way give it here, I'll show you." Most youngsters worth their salt are not going to respond to that one! So it's much better to lead off with a rather more encouraging remark . . . "that's a nice looking job/well-built model/smart colour scheme . . . etc.", then if the identity of the model is known, the use of the correct name and/or manufacturer establishes that at least the onlooker knows something about models.

I remember our local model-shop proprietor describing the return of a small boy with a small glow motor which 'wouldn't go'. After all the questions about the prop, the battery, the plug, etc., the question of fuel came up. "Oh", says the youngster, "do you have to put fuel in 'em?". Now this really underlines the plight of many (and not only youngsters), taking up modelling for the first time. As these people are really as important as the most successful competition modeller, if only in terms of another statistical unit to back up the claims of the movement for consideration in terms of space and social value, it's up to all of us to give them a helping hand wherever possible.

It was good to hear that the old Christmas stocking contained some interesting bits and pieces. Of course you've now reached the stage of building up a stock of tools and materials that you know are likely to prove useful. It's so nice to be able to go to your own stock for the odd small item rather than having to make a trip to the nearest specialist shop. And talking of specialist shops, may I offer a spot of money-saving type advice?

Nowadays, packaging has become a major industry . . . sometimes the packet seems to cost more than the value of the goods it contains, particularly if only small quantities are bought. If you look at so

many of the 'rack-packs' you will notice that small brass nuts and bolts often feature quite largely, and there's no doubt that their value to a modeller is considerable. Now look at the variety of electrical fittings in the normal household, from the washing machine to the simple light-socket. (Hold it! I'm not suggesting a dismantling process in aid of the Model-box Charity.) Just a reminder that when something breaks or is replaced, it is advantageous to retain the unwanted bits, and strip them down in search of nuts, washers, bolts, clips or whatever fittings take your fancy. At the same time, you will be giving yourself a good practical grounding in how things are put together . . . the fields of both design and production engineering. I recall making quite a passable winch many years ago, the shafts and bearings of which came from a wrecked pedal tricycle rescued from a ditch.

Your difficulties with D/T fuse are a case in point; I always order from the local ironmonger and buy a complete hank of lamp wick of the right size. You see, no-one makes 'D/T fuse', but someone buys up lamp wick, cuts it up, loops it, 'christens' it with a printed slip . . . and it's yours for twice the price! I think we are about to embark on a period during which it will pay to shop around for bargains even in the model world, and I am sure that you are past the stage of buying an article because of the pretty picture on the box lid.

The Club's Winter Programme of talks and demonstrations was very popular; most evenings it was 'standing room only', and now we have reached the 70 member stage, the Club Room warms up very quickly. It's a pity that you do not have an 'all groups' Club in the neighbourhood, I agree, but here is what you can always do. First, read as much as possible about the hobby; it won't all make sense at first, but later the loose ends will get tied up. Second, find out if the School has a member of staff willing to help or even organise a School Club. Third, drop me a line if you've run up against a snag, and last (but not in order of importance), drop a line to the *AeroModeller*, with an SAE for their reply. The help is there, once you know how to get within striking distance.

Let me know how the latest project is faring; I'd be most interested.

Yours as ever,
Uncle Bob

Dear Simon,

Well, you really took me at my word . . . and what very good questions those in your last letter were. So, let me get started with some hopefully helpful answers.

First, the question of holding-down bands; the choice between one big one stretched less compared with one or more thinner ones stretched to near breaking point. Well now, big ones don't tend to cut into wing and tail leading and trailing edges so much . . . but you guard against that anyhow, I'm sure, with wire or hard-wood strips. They also 'give' more easily (perhaps under flight conditions too, if they're not quite tight enough), and do not, certainly, break so easily. However, they are more expensive, they can be very bulky and prevent accurate seating of flying surfaces as a result, they weigh more (this *might* matter), and they certainly do not seem to look as neat to me as a narrower type. Having reviewed the possible virtues and vices, I think we are in a position to make comment. On the

tailplane of any model up to and including A/2 size, narrow bands have my vote. On wings, you can use bands up to 1/16 in wide on the larger models with sturdy structures to withstand the compressive effects, but be sure that the dowels are long enough to accommodate the entire width of the band. On an A/1, I would consider 3/16 in wide bands about ideal.

Glad to notice that you are using your wood-work lessons to advantage, and that you have official approval to make a field-box, and that the lesson dealing with wood defects rang a bell. Yes, indeed, you can use 'winding strips' for checking warps, etc. I have included a sketch, with a warning, as dihedral wings are a special case. This ties up very neatly with the question on alignment, because the wing which is skewed forward (assuming dihedral is present) acts as though its angle of attack is greater than that of the opposite wing. This gives greater lift, and therefore a turn away

Continued overleaf

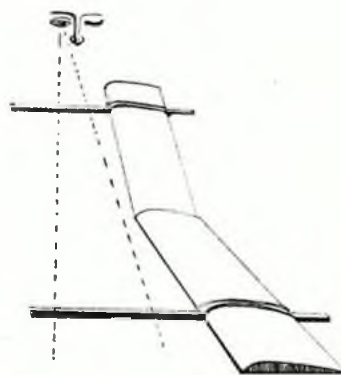
from the forward swept wing (ie left wing forward, right turning tendency). You can check your wing's alignment easily enough with thread before cementing keys in position for accurate registering of flying surfaces.

Now, self launching; this is quite unnerving at first to some people, and yet is not terribly difficult given the right conditions. These are: a steady breeze (not turbulent or gusting for first attempts), soft ground area at the launch point if things go wrong, and a reliable winch which will not be inclined to throw its line or jam at an inconvenient moment. My procedure is as follows. Holding the model in the right hand, the winch in the left, the towing ring and other fittings are linked as usual. The first finger of the left hand acts as a brake on the winch spool, and allows the line to be given an amount of tension from winch to model. (You will need this as, instead of throwing or launching the model with the right hand, you allow it to fly from this hand, pulled by the line. A slack line will not 'pull', of course.) Now, face into wind, get the model's nose up, and wings level. Hold your left hand low, maintaining tension. Begin to run forward into wind, letting the model lift from your right hand. At the same time, allow the model to pull the tow-line from the winch, still keeping a slight braking effect with the finger to maintain line tension. Keep an eye on the glider, ready to release line tension should things begin to go wrong (hence the choice of a soft area for first attempts!)

As the model gains height with the release of an increasing amount of line, the worst is over. Keep on moving forward at the required speed to exert a reasonable pull on the line, so preventing a premature release due to sudden slackening. Now it's just like the towing you have done so often with me, and it's even better exercise.

Finally, ballast. As you probably realise, some models have to be flown weighing no less than a particular amount. Most people building such 'Formula' models tend to build slightly under weight as, with age and repairs, the weight will tend to increase. If, therefore, a non-essential weight can be added, at first to reach the required minimum, and later to be removed by stages as total weight exceeds the limit, the model can be kept at a constant flying weight with the minimum inconvenience.

So, if you ever intend to build a 'Formula' model,



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bear this in mind; try to build light, and decide how the ballast is going to be added and then modified as time goes by. The best area is, of course, at the centre of gravity, or rather on a line through it, vertically projected. The lower the ballast is placed, the better, as this increases stability. Make sure that any ballast is firmly fixed (masking tape is very useful), and is secured to something that will not detach itself to cause structural damage should the model dive-in during trimming.

Some models do use ballast to increase flying speed; this method is reserved mainly for gliders in order to improve their chances of progression against head winds; the same principles apply here, if the incidence setting and CG position are to remain the same... but a surprising amount of weight has to be added to gain a notable increment in speed (I have used ballast heavier than the bare model on occasions when conditions were bad.)

However, that is another story; my advice to you is to fly in less testing conditions, gain experience gradually, and ENJOY IT.

With all the best, from your affectionate

Uncle Bob

KIT REVIEWS

Continued from page 649

After applying the various transfers and adding panel lines etc., with a Rapidograph pen, the model was assembled, using epoxy to avoid distortion. Now, at last, it could be weighed. Help! - 2½ ounces and still nose heavy. A small amount of lead was added to the tail to bring the CG to the point shown on the plan and this brought the weight up to a little under 2½ ounces.

Some time elapsed before a suitably calm evening appeared for test flights, so I became somewhat impatient and eventually ventured out on an evening which was rather on the chilly side for good CO₂ performance, and a little breezy too. Test glides showed the model to be very under-elevated (perhaps it was nose heavy!) and a judicious amount of up elevator was bent into the tailplane until an acceptable, but rather fast, glide was obtained. Now for the moment of truth. A charge from a half empty Sparklet bulb, and the model was away into a tight, steeply banked, left hand circuit and managing to maintain height! Back to the tail bending to add some right rudder, and the next

attempt produced a much safer gentle left power turn and a gain in height. Feeling much better, I spent the remaining time until dark making short flights to improve the trim. However, one flight attempted on a nearly new bulb produced a moment of panic with the model climbing steadily and disappearing into the gathering gloom.

One thing which was impressive about the model was its considerable stability in what were relatively windy conditions. The rather high flying speed may have contributed to this. I have no doubt that with a little effort (and rather more sense) it would be quite possible to build the model down to around 1½ ounces which would produce a very good flying performance by any standards. Anyone who wants to try should keep the following points in mind:

- Use balsa cement.
- Put the tank on the CG. Mine was under the front decking in order to have an uncluttered cabin.
- Make *everything* as light as possible and do not be tempted to add extra detail etc. to the tail to compensate for expected nose heaviness.

So, in conclusion, an excellent kit which can survive much abuse and still produce a very stable flyer. And, it's so pretty.



PT-108 A neat little design for CO₂ power from the drawing board of Jack Headley

THE ARRIVAL of the new generation CO₂ engines in the model shops coincided with the arrival of myself in England for a summer holiday visit, so after recovering from jet lag, and remembering to drive on the 'wrong' side of the road, I lost no time in scurrying to the nearest purveyor of balsa wood and purchasing one of those items.

Later on, back at home in California, and after recovering from reverse jet lag, and remembering to drive on the right side of the street, I got around to opening up the box and admiring my new toy for a while, after which the question arose, what to build for it?

Clearly, a lightweight model would be required to use the engine to its best advantage, so I sketched out a smallish model, but before beginning to cut balsa I decided to do a few engine runs first, to really see what the power felt like. I bolted the engine to a block of wood, clamped this in the vice, and ran a few cylinders of gas through it. This turned out to be very instructive, if, like myself, you have never run a CO₂ engine before. It is good experience in filling the tank, and setting the throttle, which, as Eric Coates writing in *AeroModeller* noted on the Telco, was better done with a pair of pliers than the tool supplied.

These bench runs showed the power level to be higher than I expected, and thus a more robust model could be

used, so the initial design scribbles were revised, and the result is the model you see here. The shape is based, very loosely, on the Livesey D.L.5.

Wings

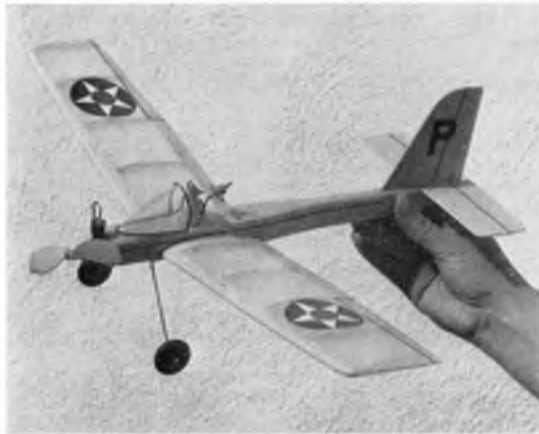
Construction begins with the wings. The plans show the starboard (right) wing, so start by building this one. Cut and sand the leading and trailing edge pieces, plus the wing tips to roughly the final shape, then pin one set down to the plan. Try to make both sets of L.E. and T.E. pieces of equal weight by using similar pieces of wood initially.

Glue into place all the wing ribs except the two inner ones, and leave to dry. When dry, remove the frame from the plan and repeat for the port (left) wing. You can do this on the same plan by reversing the position of the leading and trailing edge pieces, i.e., pin down the leading edge where the trailing edge should be, and vice versa. When both basic wing panels are finished they can be joined together. Bevel the ends of the L.E. and T.E. to the angle shown on the template, then pin one wing down to the building board (flat), and prop up the end of the other panel 3in, and check that the bevel joints are good. If not, sand as required, then glue the two panels together, together with the $\frac{1}{2}$ in plywood wing brace, and the remaining wing ribs.

After all this cementing has dried, remove the wing from the building board and sand to the final shape. Add the $\frac{1}{2}$ in. sheeting top and bottom at the centre section, then make a final pass with the sanding block over this area, and the wing is built. Cover with Jap or lightweight tissue, water shrink, and then brush on a couple of coats of thin clear dope.

Fuselage

Begin by cutting out the bottom shape, then make another one the same size for the fuselage top. Pin the bottom onto the plan, then glue into place the four F1 formers. One of these goes at the front end, two, separated by F2 (do not put this in yet!), just in front of the wing, and one behind the wing. Now the wing itself is installed. Place the complete wing onto this bottom sheet, prop it up evenly, and measure how far it is above the fuselage edge, it should be about $\frac{1}{8}$ in. Cut a couple of slivers of $\frac{1}{8}$ in. sheet 3in. long, and the measured height, then cement these between the last two F1's as the wing runners. Sounds complicated, but



it's really easy, and this does get the wings aligned correctly.

Now cement the wings into place on top of these runners, then fill in the fuselage sides around them with $\frac{1}{8}$ in. sheet, and add all the remaining fuselage side pieces. Cement the fuselage top into place. While all this is setting up make the fin and the tailplane from $\frac{1}{8}$ in. sheet, sand, then glue into place onto the body. The fin should fit into a slot cut into the fuselage top. Make sure everything is lined up correctly before the cement dries.

You might have noticed that the fin on our drawing is somewhat smaller than that shown on the photos. The photos were actually taken just after the model had been completed, to take full advantage of a rare calm and sunny day. After I had done a little flying I realised that the fin was actually a little oversize, and so a little surgery was performed in the true flying field style.

Remove the model from the building board, and sand the fuselage lightly all over, rounding off all the square edges in the process.

Make the undercarriage from 18swg piano wire plus a couple of lightweight plastic wheels, and trim former F2 to fit inside the top rectangular section. Cut a slot in the bottom fuselage sheet between the second and third F1 frames, and cement the U/C into this, locking it in place with F2. Make the firewall (should it be called this for a CO₂ engine?) and cement it to the front of the fuselage. When this is dry, drill holes for the engine bolts, and also cut away the lower $\frac{1}{8}$ in. sheet behind the nose former so that the nuts can be put on these bolts. Leave this access hole open. Cut a big hole for the gas tank through the fuselage and wing, the tank should be a good push fit into this hole. A wee drop of Cyano-acrylate glue (or epoxy) is used to hold the tank in place finally.

Sand all over again lightly, then dope the fuselage, also lightly, after which the wind shield, made from a scrap of celluloid, or the aft end of an old canopy, is glued in place. Trim as required, then install the engine and tank, taking care not to kink the piping.

I left the filler nozzle floating free behind the tank, rather than providing a hard point on the fuselage. This makes the model a bit lighter, and it really doesn't look that bad.



Flying

The flying characteristics are very similar to a well powered rubber model of the same sort of size: a quick burst of power to gain some height, followed by a cruise and then a reasonable glide back. It's not too good to try for ultimate performance as this is a pretty small model, and can get lost quickly if it flies too far away (the voice of experience speaks). The glide is not that of a floater, so do not spend too much time hand launching into that fabled long grass before trying some power flights!

Make the first flights with the throttle set at about half past two, and with $\frac{1}{8}$ in. downthrust, using a gas charge only, and trim as per the normal rubber model. Our first prototype did a lot of crashing around until we found the best way to fly it, but the damage done was almost nil, due to the semi-rugged construction, so never be afraid to experiment.

After the basic trim is sorted out open up the throttle as required, you will be quite surprised at the performance!

FULL SIZE PLANS OVERLEAF ►

WHAT'S IT ALL ABOUT?

THE NEW 'why and how to join' folder produced by the *Society of Model Aeronautical Engineers* makes very interesting reading. It reveals facts of the Society's activities which are unknown to many of us or taken for granted by others.

A particularly interesting feature of the folder is a list of reasons why some modellers have joined the SMAE. We feel others may be interested in them, so they are reproduced here: to help you become a better and safer flyer; to help you meet people of similar interests; to give you the opportunity to gain knowledge of new techniques and discuss them with the flyers at international, national and local meetings; to keep yourself more fully informed on model flying activities, through the regular newsletter; to allow you to go to the majority of SMAE competitions as a

spectator; to ensure model flying gains a stronger national voice; to make sure your views are made known to local government; to help protect public flying sites and gain new ones; to be able to get advice when confronted by problems with planning permission, bye-laws, radio interference, the new Code of Practice on Model Aircraft Noise, etc; to negotiate, for you, with the Council of Europe, the Home Office, Department of the Environment, Ministry of Defence, public bodies, local authorities, Sports Council, Central Council for Physical Recreation etc; to insure your future model flying rights; to help you negotiate Ministry of Defence property for flying sites; to help oppose unreasonable legislation; to convince the Government that we should be recognised as a sport, thus ensuring proper facilities;

to obtain details about clubs in your area or where you are visiting; to enter competitions; to give you a chance to travel abroad as a representative of the United Kingdom.

It is also pointed out in the folder that faced with a nation of unions, action groups and other bodies, the average modeller can no longer expect to follow his model flying solely as an individual. At some time there will be somebody, somewhere, who may object or with whom there will be a need to liaise! (Quite obviously it makes sense to join the 'model flyers' national body, the SMAE - Now).

If you want copies of the four page folder please contact the SMAE Secretary, Jo Halman, 18 Walcot Avenue, Luton, Bedfordshire; telephone 0582-414678.

COVER
CENTER-
SECTION
WITH 1/32"
SHEET TOP
AND BOTTOM

TYPICAL
WING RIB

LEADING EDGE 1/4" x 1/2"

ALL WING RIB

right w

TEMPLATE FOR
L.E. AND T.E.
ANGLES

TRAILING EDGE 1/8" x 1/2"

"FIREWALL" 1/32" PLY

WING BRACE 1/32" PLY

CELLULOID CANOPY

LEAVE FILLER NOZZLE
FLOATING FREE

LEAVE OPEN
FOR ACCESS
TO ENGINE
BOLTS

BALANCE HERE

F1

F1

F2

F1

1" DIAMETER WHEELS

MAKE HOLE IN FUSELAGE HERE

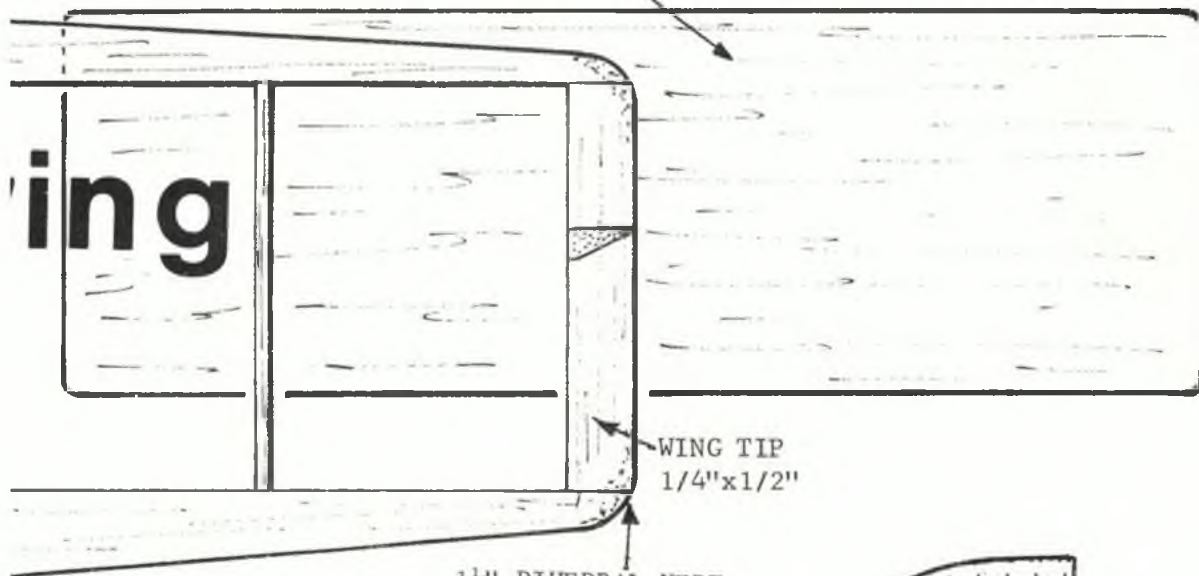
★ PLANS ARE FULL SIZE ★

PUSH FIT FOR GAS TANK

S 1/16" SHEET

TAILPLANE 1/16" SHEET

Handwritten signature 1571

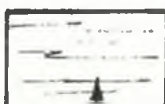


1 1/2" DIHEDRAL HERE

FIN AND RUDDER 1/16" SHEET



FRAME F1
1/16" SHEET



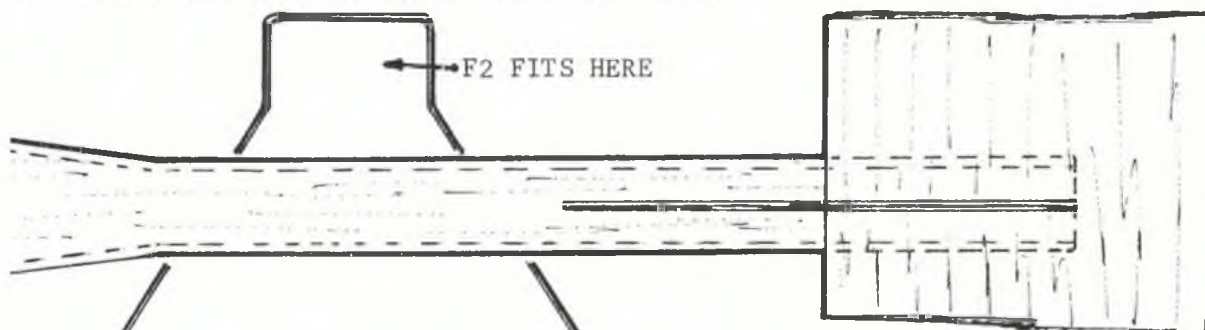
FRAME F2
1/16" SHEET



TRIM TAB

1/32" SHEET HERE

ELAGE TOP, BOTTOM , AND SIDES ALL 1/16" SHEET



F2 FITS HERE

U/C , BEND UP FROM 18 SWG WIRE

COVER WINGS WITH TISSUE, DOPE
ALL OTHER PARTS OF MODEL SPARINGLY

★ ★ ★ ★ ★ ★ ★ ★ ★ ★
PT-108 ★ ★
★ ★ ★ ★ ★ ★ ★ ★ ★ ★

topical twists

by 'Pylonius'

Illustrated by Sherry



Identi-Model

When I look at the World Champs scene I conjure up a somewhat forbidding vision of what goes on, or rather what has gone on, behind all the gloss and glamour, focussing on the hard, painstaking work that makes up into these faultlessly produced models. Think of the hours of eye straining toil that lurk under that perfectly coned spinner or that precision piece of timing mechanism – something that would give even a seasoned watchmaker a severe attack of migraine. Then just imagine all those hundreds of modellers of all nationalities crouching in their various sweat pits through all those good-grief-is-it-twelve-o'clock-already, nerve straining, energy draining stints. Some, working in the spacious, well equipped state workshop would not perhaps find things quite as onerous as the typical British modeller getting a wifely nag for hogging the kitchen table for the whole of the evening, although it could be somewhat offputting to have a production apparatchik breathing down your neck.

Thinking, then, of all the finger aching work that goes into the production of just one individualised model you can easily see why the plastic and polystyrene kit tycoons do such good business among those who want to get full value from their colour tellies. It was all so much easier back in the steam radio only days when you could laugh at Charlie Chester and cut a nifty rib at one and the same time, but try carving a prop with one eye on 'The Sweeney' and you're liable to finish up in the meat wagon. Our exciting television could be a contest disadvantage, for if the programmes are all about Stakhavonite output and classical ballet it is easier to put in those extra hours on fitting VIT on your FIB. One model of which I am particularly proud, though no world beater, was the result of bravely sacrificing six episodes of 'Charlie's Angels' and some of the gorier parts of 'I Claudius', compensated only by missing out on four Bette Davis films.

Coming back to the World Champs. From a quick survey of the models it would seem there is nothing new under the sun, or even under the Sun Dong Sik. Whether built on specialised bench or kitchen table, they are hardly a whisker apart in design layout, and all are capable of an effortless max, given neutral or at least non-hostile air. But here, it seems, the usual air detecting gadgets were giving the most dubious results. The famous British bubbles were so much rising damp, and the fact that mylar strip has only one finger did not stop it making the most derisory gestures at the sub-maxing flyers.

What won the day was highly specialised team work. Good as we British have become at joint air sniffing operations we are not yet equipped to harness the collectivised thermal to the National glory. It is all to do with our easy going history. The beginning of all this FI this and FI that international flying was the Wakefield event, very British, to be won by the highly gifted individual, and if there was anything close knit about our teams in the old days it was just their fairisle pullovers. It is true that our lads are now paraded along with the other regimented hosts in track suit uniforms, but perhaps we are still look-

ing just a wee bit selfishly to the big pot on the home sideboard rather than the writing up of the name of the Motherland in wreaths of glory.

Bore War

A recent opinion on the state of contest flying today makes for gloomy reading. There appears to be no room now for the inspired amateur or the wizard whiz kid, and if there are any chuck-it-and-hope enthusiasts ready to do their agricultural stunts with the sharp ends of their models they would be well advised to take up full time farming. And since much of this goes on on disused airfields they would feel quite at home. What you need now to win contests, or even to get a British style 16th place, is utter dedication to the elimination of those off-beat things that bring such variety and excitement to the flying field, such as wobbly wings, detachable engines and intermittent working radios. For, we are told, contests are no longer won by the brilliant new design or the development of some super technical gimmick, but by seeing that it is the other chap who makes the contest losing mistakes.

Model design – if the term is still valid – has become so stratified that model owners put their names and addresses on their models not so much in case they get lost, but so that they know who owns which model. Even at that mistakes can occur, and even as he is winding up the flyer may be puzzled by that bit of noseblock packing, being sure he had put it on the other side. Thus, with the models much the same and the conditions identical, then, given a thermal or two, the only margin for winning lies in the silly billy belt; the goofs and clangers to which we are subject to a lesser or greater degree. This has led to a sinister air of efficiency entering our once carefree flying fields. Instead of the old army surplus bag full of bits and pieces we see special compartmented carrying cases with bands, pins, and other paraphernalia laid out like a kit inspection. Then there are all the boring routines of checking and rechecking, new rubber motors for each flight and other tedious, non-fun practices. The modern rally is more like a surgical operation than a social get-together.

Another blow at the old style individualism is the way the medals come with organised team work. How often do we see the competitor disappear with his team, including the timekeeper, to a distant corner of the field and return triumphant with a clutch of maxes. Look at any star model flyer in action and you will see him place his field just like the captain of a cricket team. The tame timekeeper together with the winder or puller up helper will be in the slips, as it were, ready to be tactically moved to any part of the field, while downwind the longstops are poised for a speedy retrieve. Some teams even have their own bubble machine on hand complete with experienced operator. Be an old style individualist or 'lone hand' and you are up against an octopus style opposition, but given luck you may get one flight in during the day – it all depends on the sort of charm you can project, or if someone with a stopwatch happens to take pity on you.

BRITISH NATIONAL CHAMPIONSHIPS – 1977

LITTLE RISSINGTON AIRFIELD
AUGUST 20th-21st and AUGUST 27th-29th

THE EDITORIAL published in the October issue showed our approval of the SMAE's decision to split the 'Nats' into two separate meetings on different dates. At one time we would have opposed this move strongly on the ground that it would spoil the 'Jamboree' atmosphere, and would tend to drive even further the sad 'wedge' between the followers of the three main categories.

By featuring the free flight and radio control thermal soarers on one weekend with the powered R/C and control line contests on the next (taking advantage of the Bank Holiday Monday also) – and featuring both 'halves' of the meeting at the same venue, virtually all parties were appeased.

The R/C thermal soarers, who have rightly felt 'left out' of previous Nationals had the full 'Nats' atmosphere with the public and trade in attendance, while the free fliers had virtually free reign over Little Rissington's large airfield – although Army parascending operations did restrict this to some extent. Likewise the following weekend saw three days of intense activity along the runways with the powered R/C events and C/L competitions unhindered by the threat of wayward models landing in their area – or their blinkered owners chafing hard on cycles.

Perhaps a little atmosphere was lost – but those who enjoy controlled as well as uncontrolled flying could speculate or compete at both Nationals – thus the advantages most certainly outweighed the disadvantages.

A further plus factor to the success of the meeting was the first class organisation. If there were behind the scenes disasters then we certainly were not aware of them, and it must rate as one of the best ever meetings in that respect. Helping to achieve this effect was the superb layout of the control-line events. C/L Committee Chairman Bob Horwood, together with Mike Billinton and Owen Warboys had put in a tremendous effort to provide two circles surrounded by safety netting, strung from scaffolding

towers. One was used for speed events, the other for racing – the latter being strictly supervised by a three-man jury sitting on an elevated platform. For once the general public could clearly see where the contests were being held – and the fenced-off circles really provided a first class 'focus' point for the crowds, as well as safety. No doubt this accounts for the high percentage of the public (who attended in record numbers) around this part of the airfield.

Following this praise for the SMAE, it is sad to have to relate the antics of the mindless few – the vandals who tried to destroy the hard work of the C/L sub committee by tearing down and stealing the National flags from the scaffold towers.

Let's hope that they are proud of their 'achievement' – and take up some other form of past-time.

FREE FLIGHT

reported by Bob Bailey, Martin Dilly and Mike Fantham

These contests were run by John Cooper, Chairman of the SMAE Free Flight Sub Committee, who seemed to spend his whole weekend in the back of the control van recording scores with only occasional help. The Sub-Committee had decided to run a very full programme of twelve events over the two days with an early start on both days for the FAI events. A decision from the army, who control the field, forced a late change to a schedule giving a 9.30am start on both days, and reducing the FAI rounds from an already short thirty minutes to twenty-five on the first day, and twenty on the second. It is to be hoped that the later start time was not imposed because of misconceptions about the noise of the models, since many free-flight models are of course silent rubber-driven or glider models. The lost early mornings may also have provided a better test of model performance with relatively thermal-free conditions. The apprehension about the hectic

schedule failed to be eased by the poor conditions at the start of the first FAI round at 9.30am on the Saturday. Visibility was bad and a persistent drizzle was being driven by a 10 mph wind; gliders on tow looked distinctly grey at the top of the 50 metre tow lines.

This visibility problem was one felt by all classes for various reasons; in the case of A/2s and Wakefields the altitude reached was rarely putting models into the cloud, but although there were times of around 2½ to 3 minutes managed by the aircraft, seeing them for this time was another story, even with binoculars. F1C flyer Martyn Cowley discovered the problem his class faced early on, while making a check flight on a five second engine run; finding that even this shortened power run put his aircraft into the low overcast, he went to contest control to suggest that the round be cancelled, only to discover that the starting hooter had already sounded and people had returned scores. Armed with his knowledge of the cloudbase, Martyn set his run to four seconds and thus kept in sight of the time-keeper when the engine cut, unlike several other models with equal or greater potential which, once having vanished into the cloud under power, could never be re-acquired visually. Martyn's eventual win came a month after his Trebod success and his 2:17 first flight, against the very much shorter times that other flyers managed using longer runs on the vital first round must have helped him a lot in this. Second place in F1C went to Birmingham's Pete Harris, with a model three years old and beginning to show it; Pete used a home made fibre-glass prop-brake and a fuse dethermaliser. Four rounds of FAI were scheduled to be flown on the first day.

With both Open and the FAI classes spread over both days, the problem facing Open flyers was whether to gamble on an improvement in weather on the Sunday or to fly on the Saturday afternoon and hope things deteriorated on the second day. It appeared that most people were opting for the first choice, certainly in the case of glider flyers: when the drizzle stopped at around midday and the wind calmed to almost zero by the end of the FAI session on Saturday, activity in the classes became intense.

JA Power

A considerable assortment of sizes of model was employed, ranging from the fast 180 sq. in. wing and tight climb approach, to the 300 sq. in. wing on Pete Bayram's *Orbiter*. Total entry was enormous (70+) but just six made it to the fly-off: Dave Hipperson flying a *Sloworm*, Bob Wells with a smallish model with quite a large underfin area, John Buskell with a modified *Sloworm*, Trevor Payne with a *JA Train*, Ewan Jones with his usual tapered tip design and Jon Fletcher, flying the model shown in *F/F Scene* early this year.



Peter Harris (Birmingham) placed second in FAI power, flying a 3 year old model. Uses home-made glass fibre prop brake



Junior Kit (rubber) winners with their prizes (l to r) 1st. C. Edwards (Darlington) 2nd S. Nixon (Birmingham) 3rd P. Anderson (Tynemouth) 4th J. Moulton (Watford) 5th N. Nixon (Birmingham) all holding their models after a great day.

Hipperson and Wells were away early, but both were down for under two minutes in spite of good power patterns and transition. Jon Fletcher got a good climb but went slightly left at the top; the model rolled out with little loss of height and he was clearly away to a good time. Trevor Payne's *4 Train*, weighing 5½ ounces with Cox TD turning a 5½ x 4in. Top Flite on 40% nitro had a very good climb, but picked up a stall on the glide, landing at 2:17 to put him in second place. Jon's time of 2:32 gave him the contest, the model using a 5½ x 3in. Top Flite swung, by a TD on 30% nitro, giving 21,000 rpm on the ground.

Although not placing high in the ½A results, Pete Buskell was flying an interesting T-tailed model, powered with a TD-051; using VIT and auto-rudder the model has a sheet-topped wing and a fuselage carved from solid balsa to a wall thickness of 3/32in. tapering to 1/16in. at the tail.

Coupe d'Hiver

In spite of the calm conditions for the Coupe event, it was a smallish model, rather than a Matherat-floater that won the day for Croydon's Dave Hipperson, after St Albans' Bruce Rowe dropped 20 seconds on one flight. Apart from Ian Dowsett and Martin Dilly flying large area models (the latter having developed a stubborn stall build-up problem that kept its times down around 1½ minutes from its 40 second prop run) most British flyers in this class are still flying models with shortish prop runs of under 30 seconds. The fact that, even using thermistors and bubble machines, only one person managed to max out in almost ideal Coupe conditions must point to something in the way of model design in Britain!

A/1 Glider

With no very marked lift during the Saturday afternoon it is hardly surprising that no full houses were recorded in this class, but the closeness of the results shows in the top three, separated by only five seconds. Up till ten minutes before the end of the contest 14 year old Chris Parry of Biggles led the field with a creditable 9:45, but then Tony Cordes, who started flying at 5pm with only 2½ hours left to complete his flights, pipped Chris to the post, flying a sturdy model using an offset hook that gave a useful height gain on launch. All Tony's flights were in pretty dead air, and he launched under models that appeared to be sinking less quickly than the rest.

Hand Launched Glider

Good air at low altitude, combined with very low drift enabled Phil Ball, and probably others too, to get three consecutive maxes in the same patch of lift. Phil was maxing easily using a large (22 x 4½in. wing) heavy model of 40 grams, that had a very consistent rolling climb, but must have dropped a flight to put him in overall third place. Flying the same model he uses in the Shed at Cardington, Mike Fantham was singularly unlucky in dropping one second, with a very competitive model that manages 55 sec., indoors where the lift is minimal. Most unusual HLG at the Nats was that of Steve Philpott; he used wings that unfolded to twice the area at the top of the climb, timing of wing fold, VIT and auto-rudder all being controlled by an Elmic airhydraulic timer. The idea was originated three years ago by Dave Pym, and is still under evaluation to assess its potential.

Overall winner Chris Edge from Welland Valley was the only one to manage five maxes and used a *Hi-Flip* design from *Model Airplane News*, with a spruce fuselage and swept-back tapered leading edge tip layout with the normal wedge airfoil. Another model he was flying, but not on his scoring flights, had an elliptical wing planform with a variable camber wing. This employed Sellotape hinges on the lower surface, which provided enough inherent springiness to give a 'blow back', camber reducing effect on an energetic launch, dropping to give a more cambered airfoil as the airspeed declined.

FAI

The last three rounds of the FAI contest were flown on the Sunday morning starting at 9.30. With rounds cut to twenty minutes it was fortunate that the wind did not exceed 10mph for this part of the event. The problem with the round times was not just that they were short, although if you had to share the round with another flyer (i.e. time for each other) you had less than ten minutes. More of a problem arises from the fact that the rounds are consecutive and even if you are only flying one class there is only a forty minute gap for retrieving. Those who tried to fly two classes found this soon after the start.

The poor visibility, especially in the first round, had led to much ill feeling when some scored maxes and others had flights at least that long time for less than a minute! "Seeing" conditions were certainly patchy as I (M.F.) timed one glider for 3½ minutes without trouble, only to have my own flight which went further clocked off

for less than half that time. Several fliers felt that the event should have been suspended, but the crowded schedule and the fact that some had already flown were factors in the decision to fly all the rounds on time, except for the second power round which was cancelled... these models caused the most "trouble" with some going into the low cloud under power.

Gary Madelin of the Crookham Club added the A/2 victory to his other recent success with a fine display of glider flying. Gary used a 143mm chord model with a 7.3% thick wing section and a 4.95 sq. dm. tailplane. The model was published in the December '72 issue of *Free Flight News*. Detailed changes since then include removal of the carved Høerner tips and taper of the outer trailing edges to 16mm at the tip. Both these "mods" are due to those areas being "cleaned up" after constant runway induced damage. The fuselage nose is also deeper by virtue of a downward extension piece forward of the tow hook to protect same. Straight tow is employed and Gary is so proud of his hooks made from 14swg piano wire (sprung against the fuselage for ring retention) that he jokes about selling them in little plastic bags for £2.50. The model weighs 16½ oz. (470gm) and can "only" make 2 minutes in still air, but will max with the slightest encouragement. A good thermal model flown by a deserving winner. Andy Crisp was second, obviously on form after the World Championships, and Mick Page was third.

Wakefield winner Dave Hipperson flew a straightforward model that has no gadgets and is now looking quite old. One unusual feature is the length of the motor run, some fifty seconds which still gives an effective climb although it must be more prone to disturbance by rough air than most others. Dave's *Wake* win came the day after his Coupe d'Hiver success; pity he could not have "done the treble" by winning Open Rubber as well.

Ivan Taylor of the Falcons club took second place, which, added to his results at the April meeting and the French Pierre Trebod contest, gives quite a good year. Mike Woodhouse took third to make up in part for the Denmark experience; actually the weather at the start of the 'Nats' was a lot like that seen at the World Championships.

Open Glider

Most of the activity here took place on the second afternoon, when the wind was light and the lift was quite marked; it had the appearance of a decentralised Nationals with glider flyers spread all across the airfield trying to pinch each other's thermals. As usual almost all were flying A/2s in Open, apart from a few A/1s and John Boon's 1½ times *Caprice*; John is back in our sport again after a couple of years sampling the delights of motor cycle trials riding, and looking very different from the last time most of us saw him at Plovdiv. The *Caprice* weighing just over 8 ounces was proving a bit intractable on tow in the fly-off and had a little mind of its own, but for conditions like those at the Nats a large lightweight model released at the top of the line must surely be a better bet in a fly-off.

Among the other fly-off contenders were all three of the West German entrants, including the 1976 Junior Champion Beate Kappe, a seventeen year old girl, flying a neat A/2 with a home-moulded glass fibre



1. Gary Madelin won A/2 glider. Tony Cordas (2) the A/I event. Martyn Cowley (3) FAI power - see plans this issue! - and Ewan Jones (4) the Vintage. 5. Classic ROG take-off by Ken Hinton's 'Kavel-Grant Special'. 6. Open Glider winner Peter Bayram. 7. Miss Beate Kappe - last year's German Junior Champ, reached Open Glider fly-off. 8. HLG winner was Chris Edge. 9. stylish triple finned Wakefield by Barry Kershaw - placed ninth. 10. 'Ichthyornis' flown in Vintage by Don Knight. 11. A good weekend for Dave Hipperson with victories in Wakefield and Coupe d'Hiver. 12. Winner of JA - John Fletcher. 13. FAI power launch by Fred Chilton.



front end, and a Richard Schley tailboom.

With a fifteen minute period for the fly-off there was certainly little evidence of lift and although Pete Bayram's *Standard Drag-master* looked reasonable as it drifted across the waiting multitude few people were moved to launch under it. Had they done so they might have approached his 3.45 winning time, as there must have been a spot of assistance there.

Open Rubber

Probably the most unusual aircraft in the fly-off was John Berryman's, using a feathering prop. The blades are hinged along the radius at the blade leading edge; when torque is applied the flight loads hold the blades in the normal driving position in minimum pitch. As the torque decreases the pitch increases to an extremely high value the prop finally feathering and free-wheeling during the glide. Equalising the pitch on the blades is important in order to prevent the fuselage wagging in flight and reducing glide efficiency. Apart from anything else, the model looks drunk.

Ian Kaynes, in his first Open contest for ages, took fourth place using a model with a two piece wing and a very businesslike climb, while Jessica Nash dropped one flight to miss the fly-off by twenty seconds but placed 29th to comfortably take the Ladies' Cup from runner up Beate Kappe from West Germany flying Open Glider results for both this and the Frog Junior being taken on a position basis from the three Open contest results.

Open Power

In common with the other Open classes this ran through both days, outside the FAI flying times. Several people were flying big .40-powered models and at least 11 of the 19 to reach the fly-off used this size of engine. Perhaps most noteworthy were the three Tom Smith designed *Super Nogs* with their distinctive tapered high aspect ratio wings and tailplanes. Flown by Tom and his two sons Jeff and Tony, using K & B and OS .40s in cowed glass fibre pylons, all three reached the fly-off, with very fast climbs but possibly rather over-early auto-rudders, which appeared to come in well before the engine cut. The air on the Saturday was good at low level, but poor higher up, so this must have kept a few people out of the money. At fly-off time, in calmish but dull weather, Julian Hopper seemed to have lost a lot of elevation on his power pattern and 'tucked under' shedding pieces off his .40 model to record a zero score. In spite of the impressive .40 machinery about, it was Stafford Screen's Rossi-powered Open model that won, timed out of sight near the ground through binoculars at 4:47 in the misty clag that built up towards dusk at Little Rissington.

Vintage

Apart from the usual crop of elderly-looking cabin models staggering around at about head height, flown by people who specialise in the class but never seem to place in it, it was a quartet of names from the duration free-flight circle who took the honours in this event. Ewan Jones' *Mercury Mallard* looks rather as if it is stored up a tree between

each Nats, but its TD-09 certainly gives it the edge on the others and the fifteen second run puts it high enough to max comfortably. Among the other models was a nicely built *Kovel-Grant Special* by Ken Hinton of Thetford, which used an Ohlsson .23 running on glow ignition with a fuel tank made from a Tic-Tac sweet container. An interesting feature of the design was the fin structure, which consists of a laminated outline only, with no internal structure or ribs. It was certainly managing some smooth r.o.g.s and placed fifth overall. Don Knight of Wendover had a couple of interesting engines, one a replica of the Czech Atom 1.8 diesel of the mid-forties, flying in an *APS Pushy Cat*, while the other looked rather like a square crankcase Mills, but was in fact a Hobbs .75 diesel. This is a short-run private venture motor that looks very well made and was flying an *Ichthyornis* biplane.

The cold and damp of the Sunday twilight was brightened by the informal prizegiving at the back of the van where the recent innovation of presenting plaque on-the-spot at SMAE centralised contests was augmented by the addition of bottles of a fizzy substance with a gold foil wrapped wired-on cork for the winners. This rounded off what for many must have been one of the most enjoyable Nats for many a year. Even Dave Hipperson, who was caught up a tree in his shorts in a sudden cloudburst, while poking John O'Donnell's model out of the branches, brightened up considerably as he carted off a brace of bottles of bubbly.

FREE FLIGHT RESULTS

F1B Wakefield (32 flew)

1	D. Hipperson	Croydon	17:16
2	I. Taylor	Falcons	16:19
3	M. Woodhouse	Norwich	16:11
4	B. Rowe	St. Albans	16:10
5	M. Howick	East Grinstead	15:47
6	R. Elliot	Croydon	15:30

F1C Power (18 flew)

1	M. Cowley	Biggles	16:53
2	I. Harris	Birmingham	15:00
3	S. Screen	Birmingham	14:57
4	R. Baggott	Birmingham	14:50
5	J. Sayer	Darlington	13:50
6	J. Allen	Brighton	13:20

F1A Glider (70 flew)

1	G. Madelin	Crookham	19:58
2	A. Crisp	Biggles	19:48
3	M. Page	Peterborough	18:40
4	B. Baines	RAFMAA	18:04
5	J. Bailey	Bristol & West	17:20
6	M. Warren	Richmond	16:57
7	R. Miller	Northwood	16:47
8	D. Oldfield	Norwich	16:31
9	R. Inker	South Bristol	16:21
10	C. Williams	Richmond	16:13

Open Power (34 flew - 19 in flyoff)

1	S. Screen	Birmingham	M + 4:47
2	T. Smith	B.A.C.	M + 4:39
3	A. Smith	B.A.C.	M + 4:25
4	R. Baggott	Birmingham	M + 4:15
5	A. Child	Brighton	M + 4:12
6	D. Pymm	Walsall	M + 4:09
7	R. Johnson	St. Albans	M + 4:04
8	R. Peers	Falcons	M + 4:03
9	A. Jack	Tynemouth	M + 3:52
10	F. Chilton	Crookham	M + 3:46

Open Rubber (49 flew - 28 in flyoff)

1	G. Ferer	Leicester	M + 5:40
2	K. Taylor	East Grinstead	M + 5:24
3	C. Batty	Bristol & West	M + 5:16
4	I. Kaynes	Croydon	M + 4:54
5	P. Ball	Grantham	M + 4:43
6	A. Grantham	East Grinstead	M + 4:29
7	D. Wain	Bristol & West	M + 4:28
8	R. Peers	Falcons	M + 4:26
9	C. Chapman	Torbay	M + 4:25
10	A. Wells	Anglia	M + 4:22

Open Glider (125 flew - 43 in flyoff)

1	P. Bayram	Richmond	M + 3:45
2	A. Cordes	Whitefield	M + 3:34
3	G. Pink	Bristol & West	M + 2:52
4	Heipemann		M + 2:48
5	P. Scrivens	Cheltenham	M + 2:46
6	E. Jones	Tynemouth	M + 2:38
6	R. Audley	South Bristol	M + 2:38
8	G. Hart	RAFMAA	M + 2:35
9	S. Marriott	Biggles	M + 2:34
10	A. Crisp	Biggles	M + 2:32
11	M. Woodhouse		
11	J. O'Donnell	Norwich	M + 2:30
13	J. Williams	Whitefield	M + 2:30
13	J. Williams	Stanstead	M + 2:29
14	R. Baggott	Birmingham	M + 2:28
15	J. Punter	Richmond	M + 2:27

Junior Kit Contest - Rubber (8 flew)

1	C. Edwards	Darlington	5:42
2	S. Dixon	Birmingham	4:47
3	P. Anderson	Tynemouth	4:36

Junior Kit Contest - Glider (18 flew)

1	J. Walker	Birmingham	6:00 + 1:29
2	I. Hart	Walsall	6:00 + 1:21
3	S. Billam		6:00 + 1:11

Hand Launch Glider (50 flew)

1	C. Edge	Welland Valley	5:00
2	M. Fantham	Richmond	4:59
3	P. Ball	Grantham	4:53
3	E. Jones	Tynemouth	4:53
5	P. Bayram	Richmond	4:31
6	P. Davis	Richmond	4:21

A/1 Glider (56 flew)

1	A. Cordes	Whitefield	9:50
2	D. Yates	Wigan	9:46
3	C. Parry	Biggles	9:45
4	S. Marriott	Biggles	9:32
5	J. O'Donnell	Whitefield	9:08
6	S. Philpott	Whitefield	8:59

Vintage (19 flew)

1	E. Jones	Tynemouth	9:00
2	J. O'Donnell	Whitefield	8:38
3	G. Ferer	Leicester	7:39
4	K. Proctor	York	7:25

1/2A Power (39 flew, 6 in fly-off)

1	J. Fletcher	St. Albans	M + 2:32
2	T. Payne	Biggles	M + 2:17
3	E. Jones	Tynemouth	M + 2:05
4	J. Buskell	Crookham	M + 2:03
5	D. Hipperson	Croydon	M + 1:55
6	A. Wells	Anglia	M + 1:54

Coupe D'Hiver (39 flew)

1	D. Hipperson	Croydon	10:00
2	B. Rowe	St. Albans	9:40
3	S. Marriott	Biggles	8:26
4	S. Taylor	C.M.	8:09
5	I. Dowsett	Northwood	8:07
6	W. Nelson	Vulcans	8:01

Tailless (6 flew)

1	J. Pool	York	8:22
2	S. Philpott	Whitefield	4:35
3	J. Marshall	Hayes	3:21



1. Mrs Uden holds prop, while husband winds and Fred Chilton holds. 2. Another new Rohacell user is Bryan Spooner for FAI power. 3. Pete Buskell plus T-tailed A design. 4. 'J O'D' launches in rubber fly-off. 5. John Jones SMAE Vice Chairman, holds Tony Grantham's Open Rubber entry. 6. Jeff Smith went left in Open Power fly-off, made 13th. Stafford Screen (7) was luckier - he won! 8. Junior Kit Glider winners (l to r) Simon Billam, Ian Hart and Jonathan Walker. 9. Julian Hopper seconds before a mid air wing failure. 10. Dick Johnson takes banter from George Fuller, Derek Knight and Ron Draper. 11. The Super Smith family with 'Super Nogs' - namely Jeff (13th), Tom (2nd) and Tony (3rd). 12. Ivan Taylor-explains front end. 13. Junior Chris Parry reached Open Glider fly-off.



Junior Kit Contest

Generally good weather conditions helped to make this contest for standard kit-built models one of the best so far held. Not only was the administration good, but the competitors were more careful to ensure that they understood and complied with the rules exactly – no doubt the result of the unfortunate disqualification made last year, where a competitor used the fuselage of one model with the wings of another.

In the Glider event, the most popular designs proved to be the *Asteroids* and *Satellites* from the St Leonards range with several of the new Humbrol *Dragonfly* kits also to be seen. General standard of construction and flying appears to be steadily improving – the skill of the youngsters on the towline was a lesson for many a senior! More than half of the 24 entries scored at least one max and after three close-fought rounds, interrupted only by the late afternoon rainstorm, there was a three lad fly-off. First off (all were using *Asteroids*) was Simon Billam (10), followed by Ian Hart (14) and Jonathan Walker (12) and that proved to be the reverse order of finishing. Jonathan Walker making this his second successive victory – he'll have to be classified "expert"!

The Rubber event was less well supported with just 10 entries, of whom 8 flew. Although there was a scattering of maxes, there were no perfect scores. Winner C. Edwards (sporting a beard too – the Juniors are more adult each year!) beat his nearest rival S. Dixon by nearly a minute. Most

popular design was the St Leonards *Performer* – this being used by the first two but the ever popular *Senator* and a Sig *Mini-Maxer* offered a strong challenge. Some of the fliers show great potential.

Generous trade prizes were presented to the eager participants and in addition the

winner of each section received one of the magnificent Norman Foster trophies, while runners-up received Jubilee plaques. It must have been the best attended prize-giving in years, with so many keen young faces scanning the heaped table to make their choice.



Above left: feathering prop used by John Berryman helped him reach Open Rubber fly-off. **Above right:** is Tony Child and familiar Ramrod K&B 40 combination - placed 5th in Open Power.

At right: John Coker launches his AM15 powered 'Arrow Active' – beautifully made, but one stalling flight was all that was recorded due to a broken control rod. **Below left:** is Bill Dennis launching his free flight scale winning FK8. **Below right:** is a line-up of 'bipes' seen at the 'F/F Weekend' – courtesy of Eric Coates (BE12b and DH9A) and Bill Dennis (Armstrong-Whitworth FK8 and another BE12b).



SCALE

reported by Alan Callaghan

F/F Scale was to a certain degree the odd comp. out this year, due to its being held separate from all the other F/F events but along with the other scale events on the second weekend. The uncertainty that prevailed as to when and where it would take place, coupled with the fact that F/F scale fliers are naturally a somewhat elusive group (6.30am starts!) meant that not as many people as in recent years actually saw the contest flying take place.

After briefing at 6.00pm on Saturday in bright but very breezy and unstable conditions only Bill Dennis was prepared to make an official attempt to fly by 7.30, by which time no weather improvement had occurred. Everyone else, including Eric Coates – not a man known to be easily put off by poor conditions, elected to wait until 7.00am on Sunday. However Bill's single qualifying flight having taken place, meant that Round 1 of the flying was effectively over despite the fact that no-one else would try under the conditions, and the contest was technically half-finished. Sunday morning dawned bright and sunny with still a steady but lighter breeze giving generally much better conditions for the second round. First to break the ice was Bill Dennis again with his *FK-8* performing a good ROG to then fly steadily in large right-hand circuits then landing without overturning on a stretch of tarmac about twenty yards from the nearest caravan in the campsite, where most people were still sound asleep! Next away was Tony Creedy with his silver *D.H.9A*, again performing an excellent take-off and subsequent transition to glide, but then let down by a tight spiral glide to the left. The only civil aircraft entered in the form of John Coker's *Arrow Active* unfortunately refused to ROG, first tipping onto its nose and then shedding a wheel. From a second attempt by handlaunch the model developed an awkward stalling turn and made a heavy landing. The discovery of a broken con-rod in the AM 15 after retrieving the model meant that John was unable to try again.

Next on the line was Rex Oldridge with his familiar *Albatros* setting itself aside from this year's entry by virtue of its extremely flamboyant colour scheme, but the excellent take-off (this was THE year for ROG's!) and landing approach were let down by a poor transition to glide. Another *Armstrong Whitworth FK 8*, this one by Dave Clarkson and complete with bombs too, just did not seem to have enough power to cope with the conditions and was not only unwilling to take off but could barely

Control line Scale		Flight 1	Flight 2	Static	Total
1. M. Staples	<i>Fokker DVII</i>	—	619	982	1601
2. D. Ashfield	<i>Albatros DVa</i>	545	896	681	1577
3. A. Briggs	<i>D. H. Sea Hornet</i>	802	749	560	1362
4. R. Truelove	<i>Boeing F4B4</i>	676	763	627	1330
5. W. Cordwell	<i>Curtiss SB2-C3</i>	584	665	570	1235

Free Flight Scale		Flight	Static	Total
1. W. Dennis	<i>A. W FK8</i>	1240	792	2032
2. E. Coates	<i>D.H.9A</i>	1210	750	1960
3. A. Creedy	<i>D.H.9A</i>	990	575	1565
4. R. Oldridge	<i>Albatros</i>	880	672	1552

maintain altitude from a handlaunch. Following on was Eric Coates' *D.H. 9A* making no mistake with the take-off, steady turn, and bombing run, with only a tight left glide and heavy landing on the tarmac finally spoiling the attempt. Tony Creedy's second flight seemed to include the best take-off of the contest being a shorter and slower run than all the others and followed by a very realistic holding of heading for about ten seconds after lift-off, but disappointingly it was then let down by a fast and bumpy downwind landing.

Dave Clarkson gamely continued to experiment with different props and throttle settings only to have another good take off sink back to earth for a touch and go without putting in a qualifying time. Eric Coates' second flight showed no real improvement over the first, being spoilt by a poor transition and a steep glide. It was then left to Rex Oldridge to make the final flight of the contest once again with an excellent take off with the model realistically weaving gently from side to side as would the real thing in coping with a cross wind, but the model mysteriously continued to fly straight ahead to land out of sight over a rise just past the end of the runway.

Had the first round not been foreclosed the previous evening, and this session had been the first, a second round could have taken place on Sunday evening in truly excellent calm conditions. The more lightly

loaded models of Tony Creedy and Dave Clarkson would have fared better, but such is the way of contest weather. After static judging Bill Dennis's *FK 8* emerged on top and together with his top-scoring flights this made him the undisputed winner with Eric Coates not far behind. The very close third and fourth placings of Tony Creedy and Rex Oldridge respectively typified a contest where the general standard of flying was much higher than in recent years with the final result by no means a foregone conclusion on the flight-line. The only regret was that so few people actually witnessed the event, so how about including it in the programme (plus C/L Scale, too!) next year, SMAE 71

Control-line Scale was another closely-matched issue in which everyone except Wal Cordwell was flying familiar, tried and trusted models as used in previous *Knokke Trophy* events. In flying, Albert Briggs was first away with his twin throttle-equipped Oliver powered *D.H. Sea Hornet* setting the highest score of Round 1 despite one engine cutting after a bumpy touchdown. Next Mick Staples with his beautiful *Fokker DVII* failed to make a qualifying flight at his first attempt due to plug problems, and it then fell to Dennis Ashfield flying his well-known *Albatros* to perform a good ROG and easy 45 degree laps only to have a premature engine cut to spoil things. Following on came Wal with his new

Below left is the only new control-line scale model seen at the Nats – courtesy of Wal Cordwell. The 'Curtiss Helldiver' unfortunately suffered under-carriage retraction problems – and then when converted to a fixed unit, it still had take-off problems. At right is Dennis Ashfield priming the engine in his beautiful, plywood fuselaged *Albatros DVa*, which placed second. In the background is Mick Staples' winning entry – a *Fokker DVII*.



Curtiss Helldiver doing a roaring take-off with plenty of power to spare, but the retracting U/C refused to work properly with an outboard leg that would not retract inwards and an inboard leg that would not lock in the down position – both problems seemingly caused by centrifugal force. If only the pilot could have then baled out. However, after a relatively smooth but dramatically noisy landing work was put in hand to sort out the U/C while Ron Truelove, next up, put in a very smooth flight with his *Boeing F4B-4* doing easy 45 degree laps, showing good throttle control, but only to be let down by tipping the inboard wing on landing due probably to a wheel tracking alignment error.

In the second round the neatly finished *Sea Harnet* fairly scorched around, perhaps a little too fast for scale effect, but the better engine runs were offset by bumpy take-off touch and go, and landing, and surprisingly no 45 degree laps. Mick Staples then apparently having vanquished the motor gremlins flew an average flight with the motor fluffing during the high laps and then cutting out on touchdown. Not surprisingly Mick was at that stage not too happy with his performance. Dennis Ashfield then put in the next and best flight of the meeting with a truly superb landing making sure of his eventual second place. In the meantime Wal, with help from clubmate Geoff Burkett, had "rigidised" his undercarriage and looked all set for a good flight. Unfortunately the long nose and rearward U/C of the *Helldiver* cause the model to tip onto its nose before enough speed could be gained for take-off. Despite this the motor resolutely refused to stop and managed to grind about three inches off the diameter of the prop before Geoff was able to rescue it. One final attempt got the model off the ground for a fast flight only to have it nose-over again on landing. Ron Truelove's final flight of the contest surpassed his previous score by almost ninety points despite being let down by a rather bumpy landing.

After static judging, Mick Staples' *Fokker D.VII* emerged the eventual winner being way ahead of the others by 301 points on scale but with only a poor flight score to add on. Quite close behind came Dennis Ashfield, also picking points up on static and in third place Albert Briggs with the only multi of the meeting. With excellent sunny and only slightly breezy weather to fly in combined with a prime spot on the airfield, a good contest took place in a very friendly atmosphere. Perhaps next year will bring a few new faces – always welcome – or maybe a few new models!

CONTROL LINE

Goodyear

This was the first of the racing events to be run, and started at 9.30am on the Saturday, amidst a stiff wind and constant rain – great weather for flying somewhat touchy Goodyears! This combined with rather scanty equipment resulted in the event being held up for an hour at about 11am by which time only 5 heats had been flown! During the break, both the weather conditions and the equipment became more suitable for racing, and a restart at about 11.30am looked far more promising. The only reasonable time set up before the break was that of Rudd/King, and when several 'names' turned up for heats that *should* have been flown earlier a problem was

posed either to disqualify them, and incur the wrath that always follows such events, or to let them fly thus gaining a distinct advantage over those whom had flown earlier. Finally it was agreed that those whom had recorded times prior to the break could re-fly if they wished – perhaps not strictly according to the rules, but it seemed to keep everyone happy.

Standards in this event, as in all the racing classes, have improved considerably and it was soon obvious that the semis 'break time' was going to be at least as fast as in 1976, even though the conditions were far worse. The majority of fliers were employing Rossi engines but there were several Super Tigre 21s and K&B 3.5cc glows, with one K&B diesel being used by the Swedes Bengstar/Bohlin, two Taipan 19 diesel conversions flown by Heaton/Ross and Horton/Howarth, plus a really fast OPS19 by Jarvis/Needham, and a very quick Cox Conquest favoured by the long-absent from the racing scene, James/Cheeseman team. The last of these teams must be rated the most unlucky on the Saturday, for twice they entered the circle and achieved instant starts only to be left solo by some 40 laps, causing them to have no less than two re-runs, in the second of which the motor failed to start well giving them a poor time. Bengstar/Bohlin's full 3.5cc diesel sounded 'right' but was not on song whilst Heaton/Ross were having bad troubles. Fry/Smith flew their 'hairy' K&B 3.5 model once again to lead the field after the first round whilst several other times went under 4.30 in somewhat less spectacular, but no less efficient style, with Perry/Cottrell putting in a very smooth 4.20 and Green/Cunningham 4.21.

The big disappointment was the Clarkson/Bingham Aldrich Rossi on megaphone, (boy it is noisy) which in practice has been doing 120mph+ but which was not going well during the race. From this reporter's point of view the most encouraging sight during the Goodyear were the piped models which seemed to have the air-speed, but lacked the starting and consistency to be really competitive. Keep going lads, eventually you will get them working, and then the noise in the Goodyear circles may become sensible again.

The second round was in complete contrast to the first, with really hot weather and almost complete calm. Several of the models which had looked promising on the Saturday came good – notably those of Bengstar/Bohlin and James/Cheeseman, both of whom put up times easily fast enough to qualify for the semis, with 4.22 and 4.25 respectively. Once again Rudd/King gave a professional display with a somewhat elderly Super Tigre powered *Argander* to score a 4.19 whilst Clarkson/Bingham failed again to amaze when they had the motor break on the warm-up line. It is interesting to note that whilst the weather was far better on the Sunday, 4 out of the 9 semi-finalists put their qualifying times in on Saturday.

The semi-finals were held on the Monday and only 20 seconds covered the qualifying times for the semis, with a cut off time of 4.34, nearly 20 seconds faster than last year, promising some good quality racing.

In the semis smoothness counted and those who flew consistently with good stops were the ones to do well. Fry/Smith who looked likely winners of the event in the heats came to grief for the second year

running during the semis when a plug blew, whilst the fastest were Cheeseman/James 4.15, Rudd/King 4.19 and Perry/Cottrell 4.20. So an all glow final for the first time, with Bengstar/Bohlin just failing to make it.

The Goodyear final promised to be close fought but a half missed catch resulted in Brian Perry releasing his handle, leaving Cheeseman/James and Rudd/King to fly on in a two up. Even this was spoilt when the Rudd/King team suffered a plug failure, leaving Cheeseman/James comfortable winners in a new British record time of 8.29.5.

The Novice Goodyear final was a somewhat disappointing affair with only Fitzsimmons/Dalglish looking professional to achieve a well deserved win in a good time of 9.21 whilst the novice team (1) of Eisner/Miles (with John Gray proxy flying for Paul Eisner) failed to finish when the engine began to unscrew itself from the model.

RAH

1/4A Team Race

At last something new in this class – a sleeved Webra Speedy 1.8cc diesel conversion from Bengstar/Bohlin – and all throughout the meeting this looked the motor 'most likely to' with consistently good times of around 4.10. The only team to really challenge Bengstar/Bohlin was the Tynemouth team of Wilson/Gardiner who put in a heat time of 4.12.8 but they were unable to reproduce this sort of performance later. As usual with 1/4A there was a wide range of times, and no less than 1 min 8 secs covered the semi-finalists – many people using very old models and engines, not withstanding old pitmen like Steve Harvey who has not flicked an engine for 7 years, so he says! Still he made the semis.

The finalists were Bengstar/Bohlin, Horton/Howarth and Broadhead/Davis and this time all managed to finish, but barring accidents Bengstar/Bohlin always looked the winners with much greater air-speed than either of the other teams combined with good range and stops. (For all those who say flying is easy or being a mechanic is simple, ask King/Rudd – no not a mistake, they performed in reverse roles in this event).

RAH

Class B

As usual the failure rate in 'B' was high, but in general the event lived up to the promise shown last year with no less than six teams achieving 3.40 or better. Two piped motors were in evidence – those of Sweden's Sven Pontan and our own Dick MacGladdery – both proving somewhat disappointing due to poor starting and plug troubles.

After the heats the now familiar names of Surugue/Uzan (France) led the field with a 3.22 and the only 'fast' British team was that of Heaton/Ross with a 3.32.2 from a brand new K&B 29. In the semis times became 'hairy' to say the least, as up until that time most of the heats had been two-ups and, with three models all doing about 130 mph, troubles with piloting became very noticeable. So much so that Surugue/Uzan were disqualified for dangerous flying, amid howls of protest having (unofficially) recorded a 3.19. The next fastest were Heaton/Ross 3.26, Bengstar/Bohlin 3.28, Metkemeyer/Buys 3.30, so those looked like the finalists. By this time the protests over Surugue's disqualification were so strong that the jury asked these three teams if Surugue should be allowed to fly the final



1. Sven Pontan (Sweden) with tuned pipe OPS Class B racer. 2. Men of the meeting Swedes Bengtstar Bohlin (with Class B winner). Won JA and B, placed 3rd in FAI, and reached Goodyear semis. 3. FAI team race winners - at last! Derek Heaton and Malcolm Ross look suitably pleased. 4. Irish visitor Stoo Holland (right) was impressive as ever - so were his models. 5. Novice Stunt winner Mike Fitzgerald. 6. Mini Goodyear finalists (l to r) Peter Lorrimer, Chris Langworth and David Scott. 7. Brian Perry with third placed Goodyear Rossi 15 powered 'Argand Special'. 8. Bill Gripton waves goodbye to a 'Blasta'. 9. Attractive new JA racer by Horton Haworth. 10. Novice Goodyear winners Fitzsimmons Dagleish. 11. The Smith Fry team swapped duties to fly Goodyear. Steve attending to the very rapid K&B 3.5 motor. 12. Campbell Nixon's new racer very fast for rear induction OPS 29. 13. Goodyear winners James Cheeseman used a Cassut 'Plum Crazy' powered by a Cox 15 equipped with modified head and glass fibre prop - both handwork of Ron James.





The Jarvis/Needham team flew a very quick OPS 19 powered 'Lil Quikie' Goodyear racer. Cut out problems gave them unwanted pit-stop practice – but showed how well this motor handles. Use a Howard 7 x 5 1/2 in. glass prop.

and all agreed to this reinstatement. So a good final you would think, but alas the gremlins struck again forcing Surugue to retire and Heaton/Ross to have rather too many pit stops to be competitive. This left the consistent Bengstar/Bohlin team comfortable winners of yet another disappointing race.

RAH

FAI Team Racing

The premier racing event has for many years been the FAI class and 1977 proved no exception. With entries if not falling at least static in the other classes. FAI was well up this year despite lower Continental entries than we have been used to seeing in recent times. Standards also are continually improving and this year saw an improvement of some 14 seconds in the semis 'break time', from 4:30 to about 4:16.

Looking at the entries it appeared that Continental teams could well have wiped the board again in 1977, with the only real British hopes resting on the inevitable Heaton/Ross team, and that always improving Smith/Fry team.

The first round seemed to confirm these fears, with the other top British names likely to make the semis all failing! Rudd/King smashed their model when Dave Rudd snagged his down line on another pilot Clarkson/Bingham recorded a smooth but unlikely to be good enough 4:22.0 and the Tribes somewhat disappointing with 4:19.7. Only Smith/Fry 4:08, Heaton/Ross 4:10 and Horton/Howarth 4:16.5 looked like mixing it with the Continentals such as Metkemeyer/Metkemeyer (Nelson) 4:06.6, Bengstar/Bohlin (Bohlin-K & B) 4:07.0 and

Two French Combat fliers Bernard Josien (left) and Jean Michel Fraisse. Their 'Boomerang' design seemed to perform better than most, and were really quick due to Rossi power. Fraisse won the admiration of all British fliers – looked as if he might top the results.



Barry Ensten had a very successful weekend – this 13 year old St Albans club member not only won the Junior Stunt event, he also placed third in Novice with his familiar Nobler/Fox 35 combination.

Helmich/Van der Kroon (Bugl) 4:10.0.

Round 2 saw home prospects brighten with two good times coming in the first heat with Rudd/King's 4:16.8 and Broadhead/Davis' 4:19.7. Then for some time the *status quo* was maintained until Surugue/Broad put in a 4:17.4. This looked to be it until four heats from the end when Gray/Devenish who have always had the air-speed, but never it seemed the luck, put in a 4:14.5, to be followed in the next heat by a 4:11.5 from the Tribe brothers.

From the outset of the semi-finals it looked as though three teams were out in front, with the rest grouped in a bunch with only 7 seconds covering them. Basically this is how they turned out, though Smith/Fry were unable to repeat the 4:02.5 that they had achieved in the heats, whilst the Metkemeyers managed a comfortable 4:02 with their reserve Bugl model, having run out of 5% oil fuel for the Nelson. Rudd/King managed to improve on their heat times with a 4:14.4, when a 6 secs watch error gave them a re-run after a rather poor first round semis time.

Thus the final looked to be a fast affair with the Metkemeyers, Bengstar/Bohlin in their third final of the day, and Smith/Fry. But time had run out for two of the teams literally in the case of the Metkemeyers as Bert had to leave to catch a boat home, causing them to withdraw, whilst Bengstar/Bohlin had troubles with their under-carriage making them use their somewhat unreliable second model.

The withdrawal of the Metkemeyers allowed Heaton/Ross those perennial finalists in FAI, to compete. This promised

an interesting race with Heaton/Ross slower than the other teams, but with greater range and reliability. Bengstar/Bohlin had trouble with a poor motor setting throughout the race causing Bengstar to resort to arm power, and resulting in his eventual disqualification.

The other two flew well with Smith/Fry overtaking Heaton/Ross about 5 times but having an extra stop, with all their stops being slow due to restarting problems. This left Heaton/Ross the eventual winners with a time of 8:18 and Smith/Fry second with 8:29.2. So finally the prize which has eluded Heaton/Ross for so long was theirs.

RAH

Finally, a special word of congratulations to Bengstar/Bohlin who came very close to flying in all four of the team race Finals using, in three of them, models built specially to compete in this country (Goodyear, 3A and Class B are not flown in Sweden) and winning the 3A and B finals. So specialised has team racing become that no one team has placed so well in so many events for several years.

RAH

Mini Goodyear

Aided by the excellent weather, this turned out to be a truly enjoyable event in every sense. All nineteen entrants recorded a time, with no less than seven father and son teams participating. Not a pretty sight watching the Dads puffing and panting around the circle, compared with the agile flying of the juniors in the two up heats and semis. Race times were closely spaced down the list with a semi final cut off time

Two Mini Goodyear competitors – Jeremy Wood (left) and Andrew Hamer – both 14 years old. Flewan 'El Bandito' PAW 1.49 and 'Swae Pea' Cox Tee Dee .09 respectively. Latter model is finished in glass fibre cloth applied with Humbrol Epoxycote, and has a range of 20-25 laps with narrow bore venturi.





as high as 5:59.

The all junior team of Jarret/Malton were worthy semi finalists with their AM15 powered *Shoestring*, having what seemed like a coachload of supporters to cheer them on.

The three up final was a fitting end to a perfect days racing. Fourteen year old Peter Lorrimer flew his APS *Shoestring* powered by a Frog 150 on a Tornado 7 x 6 (5:20.3). Nine year old Chris Langworth's APS *Deerfly* had an MVVS up front turning a K.K. 7 x 6 (4:50.8), while the fifteen year old pilot of the Scott/Scott duo made his Dad work hard on his Oliver powered *Deerfly's* Taipan 7 x 6 (5:29.9). All three models were evenly matched for speed but Chris Langworth's MVVS was managing over fifty laps per tank, while the Frog of Lorrimer/Schofield was more than matching the 40 lap range of Scott/Scott's Cub. Piloting was of the highest standard, all walking around very nicely and all flying very level indeed. It was the range of Langworth/Langworth which proved to be the clincher with a final time of 9:48, while Lorrimer/Schofield worked hard to record 11:08 ahead of Scott/Scott's 12:01.

One observer was a certain Mr King of *Kingcat* fame, who was pleased to donate one of his new engines to the top junior – it is nice to find a manufacturer who is interested in the youngsters. A wide range of engines were used, but of the eight semi finalists, three were PAWs, two Frog 150s, one AM 15, one MVVS 1-5 and a solitary ball race Oliver Cub.

Three entrants did have ball race motors but as the other contestants did not object they were allowed to fly. The most popular models were, understandably, from the *AeroModeller* plans range i.e. *Deerfly*, *Shoestring*, *Stinger* and *Sweet Pea*. Notable exceptions were Stubbs/Coppock's *Ginny* and the Jolly Roger Kit *El Bandito* of Brown/Brown.

BL

Speed

This contest began on the Saturday not with a bang but with a whimper! Due to excessive rain and generally cold conditions, only 2 or 3 flights were made – and the less said about Saturday the better!

Sunday however brought forth sunshine and streams of speed fliers, and this was perhaps the most hectic contest day in the history of speed flying in this country.

The most creditable performance was that of Paul Eisner who recently had an accident at work and lost the tops of his fingers on one hand. Despite flying with great discomfort, he put in a flight of 178.9mph in the Open 2.5cc class – and was only 5 mph below his pending record claim of 183.6 mph. Gordon Isles not surprisingly was top man in FAI, at 146.2 mph with Dave Smith close on his heels at

Above: that's a lot of people for a couple of small aircraft! Messrs Harrison and Cowley – winners of the Senior J A Class combat event, sponsored/organised by Wonderwings. The event proved extremely popular – nearly as many entries as FAI combat – and is worthy of adaption by rally organisers. At right is Vernon Hunt with half his best model and hastily repaired reserve used to win FAI combat.

143 mph. There is really very little to separate the top FAI fliers.

It was nice to see the contest become more international with the appearance of a group of Swedish speed fliers led by Ove Kjellberg. Mr Kjellberg flew immaculate models constructed of hardwood and using two lines with groupers. His home built 29 engine, with a tuned pipe, recorded 170.7 mph for second place in that class and his K & B fitted with a mini pipe recorded 174.7 mph in 40 class for second place also.

Dick McGladdery had a good day also. In 10cc he made his fastest flight ever of 180.4 mph to win the class. Dick is always receiving unkind remarks because of his unusual tuned pipe-come-silencer set ups, but this time the laugh was on his critics, because Dick also did 155.3 mph in the 5cc class with a similar tuned pipe silencer as on his OPS 60 set up. And the motors were quiet too . . .

Mike Billinton equalled his 40cu. in. record of 186.4 mph using the same K & B 40 mini piped motor, and his usual immaculate metal model. In the smaller classes it was Mike Gagg making his annual appearance in the speed circle after taking time off from free flight, who won .049 class with 87.7 mph. "See you again next year Mike."

There were just four entries in the Newcomers 40N Class. John Allcock equalled his pending record of 140.6 mph, only to



be finally relegated to second place on the Monday!

Monday was expected to be just as hectic as Sunday in terms of numbers of flights, but this was not so. Contest Director Ivor Roffey was waiting at 9am for the first prospective flier, but the opening flight of the day was not made until around 11am.

Pete Tribe, who made his comeback to aeromodelling 12 months ago, flew a MK II version of his futuristic asymmetrical model in the 40N class. After several attempts and a remarkable pullout from a wingover, Pete clocked 15.1 seconds to give 148.1 mph, a new record. Interest in this class is slowly becoming greater and should eventually be very competitive. Alan Lee is approaching the 1.5cc record with his flight of 111.2 mph on monoline: it must just be a matter of time before he does 120 mph. Another Swede, V. Nygren – a tall young man who looked as though he should be flying something a little larger than the .049 class – suffered line breakages during pull tests, but he recorded 85.1 mph. It is most interesting to note that speed fliers whose country only hold contests to FAI rules, are prepared to travel abroad to take part in Open speed contests.

The control line speed committee had intended to test the strength and safety of the nylon netting fence that formed the two control line arenas, by crashing a model into it at full speed. Owen Warboys had actually donated a McCoy 60 speed model

Dick McGladdery's rather basic-looking speed design features a silencer on the end of the OPS 60's tuned pipe. Nonetheless it works – combining a good performance increase with a really subdued engine note. Runs on 50% nitro prop, and spins a Taylor 8 1/2 x 10 1/2 in. glass fibre prop.



for this purpose.

The committee waited until everybody had gone home on the Monday evening and it was becoming dark at about 9pm when they carried out the test. Ivor Roffey handled the motor end, Owen Warboys the flying, and Mike Billinton directed the test. The model was flying level at about 5 feet above the ground when on the word from Mike, Owen released the handle and the model crashed into the fence. The airspeed was around 140 mph and on hitting the fence it was stopped dead. The damage to the netting was negligible and bearing in mind the velocity of a 2½ pound model hitting it at that speed, the result was much better than expected. As the model weighed twice as much as an FAI speed or team race model and as the prop was so rigid, being a 9in. x 13in. beech prop cut down to 7½in. x 13in. it was felt that no FAI model could possibly have the same impact.

By the time the experiment was completed it had become dark, so it was decided to cut the model free from the netting in the morning. When morning came it was discovered that somebody else had cut it free during the night. It had in fact been stolen. A sad end to a very important experiment.

IR

Aerobatics

With a total Gold Trophy entry of over fifty, it had previously been decided to run a two circle, two round event, which gave each competitor four flights and eliminated the usual fly-off on the final day, the best scores from each circle being added together to give the final total. There were a good number of foreigners competing, including four from France, two from Holland and one from Germany.

The contest started promptly at 9am on the Saturday in driving rain and blustery winds. The rain eased off by midday but the wind got stronger, giving conditions which caused several crashes and abandoning of manoeuvres attempted. Most pilots tried to give a safe performance, and this resulted in a lack of any outstanding flights, except perhaps for young Gerard Taieb from France, who in this his first visit to the British Nationals (with his brother Rene) certainly immediately worried a few of our top fliers.

An unfortunate incident occurred when a cyclist wandered across the stunt circle just as France's Lavalette was taking off with his large Merco 49 powered machine – the collision that followed caused damage to the engine cowling and silencer. As this was his only model he was allowed a re-flight the next morning following rapid overnight repairs.

It was unavoidable that with the flying system in use, and the number of competitors involved, that one whole round took longer than a day to complete. This meant that some fliers had one, and some had two, flights of their four on the first day, whilst others had two on the second day after one on the first. As it happened the weather was very much improved on the Sunday thus giving an advantage to the latter. It was hot and sunny with very little wind to worry about. By this stage an interesting battle was beginning to develop at the top for there was a definite risk (fear?) that the *Gold Trophy* might be won by a foreigner for the first time! Jim Mannall was plagued by a sick engine run from the old Merco for his second flight thus wasting the good

weather. Pete Tindal however took good advantage and achieved the highest score of the meeting of 1025.5. The next closest was John Lynch, also of the Dagenham club, with 988.5.

Most of the models present had been seen before and were well 'flown'. Very little of new models or designs was evident. Most original was the twin boom design by Peter van Doesburg of Holland, called *Orion*. He flew this well to place sixth. Germany's Claus Maikis flew his beautifully finished 'Palatin' design with butterfly tail, and the inevitable Super Tigre 46 – his final position was eleventh.

At this point it was discovered that a great deal of confusion existed as to how the final position could be assessed. Some thought it was scores that counted, while others thought that an aggregate of circle positions would count. However this was quickly resolved and it was the scores that mattered. Many fliers expressed dissatisfaction with the method of running the event this year, even though everyone had the opportunity of making four flights. There was no fly-off and thus no climax to the event: many results could be seen long before the flying was over. As it happened with three whole days this year, there would have been time for a fly-off, of say, the top ten on the last afternoon.

The last day was a windy one again, but at least the sun was shining. Because of the wind scores were down so it was evident that barring anything really exceptional happening, Pete Tindal would be this year's winner. Such was the case, with French fliers Lavalette and Taibe trying for the two next places.

The event was very well directed by Ted Fowler, assisted by his wife, Margaret. The hard-worked judges were Gordon Bryant and Percy Criddle in Circle 1 and Cyril Green and John Harley in Circle 2.

GA

Novice/Junior Aerobatics

This event is increasing in popularity year by year, and this time there were 20 entrants. With entry being accepted on the field the organisers do not know prior to the event just how many are going to turn up, and therefore how much time will be required to run it and with two flights each and 20 fliers it could take about seven hours to complete. So as it was scheduled for the Monday afternoon, it was necessary to run a two circle system – an aggregate of circle positions was used to decide the final results.

The weather was fine but windy and this caused many to crash, mainly due to lack of experience in flying in such conditions. Models were very varied, the most outstanding must have been by Peter Illife of Nuneaton who flew an Al Rabe *Mustang II*. It was superbly finished in metallic blue with gold trim, which proved to be Rover car paint! There were a good number of the Fox 35/*Nobler* combination in various hues and this seems to be the best way of getting started in serious stunt flying. It certainly is a known quantity which you know ought to fly well, and the rest is then up to you! There were also a few smaller models such as a *Junior Nobler* by David Scott with Oliver diesel power, and a modified Keil Kraft *Spectre* with OS 20 by Andrew Bellis.

An attractive model which unfortunately was written off in the second flight was the *Cruza* design by Bob Digweed. It featured twin fins and a tricycle undercarriage,

finished in light blue.

Mike Fitzgerald of Wharfedale flew a Merco 35 powered *Frog Attacker* (now an obsolete kit) very well, and achieved 420 points to take first position in Circle 1 and got 232 points in Circle 2 to give sixth position. The aggregate of 7 was actually the same as second placed man Roger Quilter. He had a sixth in Circle 1 and first in Circle 2, but the higher total score of Fitzgerald swung the balance in his favour. Third placed was Barry Ensten of St Albans, who was first in the Junior Classification, with his familiar red *Nobler*.

GA

FAI Combat

Although the entry of sixty was the lowest for many years, competitors from France, Holland, Ireland and Scotland brought a really international flavour to the proceedings.

The contest began promptly at 9.30am on the Saturday morning in strong winds and heavy rain. Carefully prepared wet weather streamers made bouts a possibility, although few actually took place due to the non-arrival of many competitors. By lunch time the rain had ceased and the event was running smoothly, although few (if any) bouts were noteworthy. As the weather remained dry, flying continued until 7pm with this final bout of the day producing an excellent match between Wallace of Solent and Fraisse, the strongly fancied French pilot.

Fraisse had the better of the early exchanges but took all the crepe streamer apart from the knot. Wallace replied by removing his opponent's streamer, but was it in one or two pieces? Two, said the scorers, so despite taking a second cut in the dying seconds, Fraisse was out – Wallace having much less ground time.

Sunday morning saw a complete change in the weather, sunny and calm. Shocks came thick and fast, with Bob Morgan losing to Thomas of Wanstead in a closely fought opening bout, and then less than an hour later, John Hammersley was to go the same way against Stoo Holland, taking the string while trying to talk Stoo out of a line tangle!

The fourth round began with a bout between Vernon Hunt and Richard Wilkens. On paper this looked a stunner, but Vernon took two early cuts, hit the deck and was unable to re-start his motor; he thus progressed to the quarter final to face the winner of the bout between Richard Evans and Stoo Holland.

With Richard Evans now looking 'in the groove' with glow models, he was strongly fancied to go through to the final. However Stoo must have had the 'little people' on his side because Richard removed his streamer completely within the first few seconds, leaving Stoo all the time in the world to get the necessary two cuts. The luck of the Irish?

Well known heads continued to roll in this round as Mick Lewis lost to the youngster, Landels from Penrith and Dave Wood went out to Thomas of Wanstead.

The quarter final round began at 11am on Monday morning, with the bout between Vernon Hunt and Stoo Holland. The wind was strong and good combat almost impossible, but these two experienced fliers gave a fine display. Vernon took two cuts within a minute without reply. Following a line tangle and 'prang', Vernon tried



1. Junior jA Combat finalists Stephen Miller (left) and victor Dave Scott. 2. Wilkinson & Son - Mini Goodyear racers! Harry pitted for 9 year old Robert. 3. The 'Old Firm' of Charlie Taylor & Co. actually had a new 'B' racer! 4. Pete Tindal won Gold Trophy with latest Chipmunk. 5. Ron Tribe (5) reached the FAI semis with 4:11.5, Jim Broad assists. 6. Bolton club members (l to r) David Carr, Steven Bennett and David Heaton, with latter's KK Gazelle used in jA combat. 7. John Marsh won 3.5cc Profile Carrier event. 8. Germany's Claus Maikis with yet another beautiful stunter! 9. Carrier landing winner Robin Clews. 10. Dave Willis about to launch for Cosmo's Pete Tribe. 11. Ove Kjellberg flew OD 29c.i. 12. Gerard and Rene Taieb (France) used identical models. 13. Paul Eisner won Open 2.5cc speed with Rossi and grouped lines. 14. SuperTigre X 29 speed model by Owen Warboys from Jelutong.





Derek Graystock, sixteen year old member of the Oxford club, flew this Razor Blade styled 1/2A combat model, powered by a Taipan 1.5cc glow.

desperately to restart his motor but all to no avail – however by virtue of his two cuts he became the first semi finalist.

Meanwhile Pete Tribe had been quietly creeping up on everyone almost unnoticed and in the second quarter final he defeated Mick Loughlin in a very close contest. Landels and Malone became the other semi-finalists by virtue of their victories over Thomas and Faro respectively.

The first semi-final between Vernon Hunt and Pete Tribe turned out to be a real shambles. A massive line tangle just after the start saw the pilots agree to take their spare models. In his rush to be first in the air, Pete took off with tangled lines and after the resulting crash he was unable to get a model in the air. Thus Vernon won a bout in which neither pilot had taken a cut. In the other semi final, Steve Malone had a close bout with Landels, Steve winning by just a few seconds. We could be hearing much more of Mr Landels in the future as he and his Penrith team mates seem to be really getting things together.

At 5.30pm the crowds gathered to watch the fly-off for third place. Pete Tribe was really on form in this one, and took three nice cuts without reply to place third at the 1977 Nationals.

With this bout as an excellent warm up the crowd were expecting great things from the two finalists, Steve Malone and Vernon Hunt. It was immediately obvious to the trained eye that Vernon's model was superior in the turn, but Steve had more speed from his Rossi. Things began to warm up as Vernon cut a corner and removed half of Steve's streamer; within seconds he had removed the remaining part at the string. A line tangle followed bringing both models down. Steve was soon in the air with his spare, but Vernon's spare lines were all bound up with those on his crashed model. With just half a minute to go Vernon cleared his lines and came up

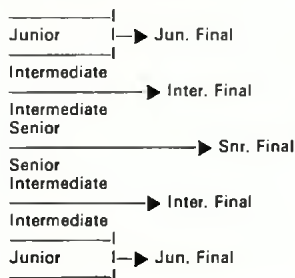
with his spare. Roles were now reversed as Steve went into the attack! Just as everyone thought Steve was about to take a cut, Vernon crashed uncharacteristically on a bunt; the final whistle followed within seconds. Congratulations to Vernon on this, his third British Championship win.

ML

1/2A Combat

It's not often that a new event combines nostalgia with its debut competition but this would be a fair description of the 1/2A Combat event. Over recent years FAI Combat has become so advanced and sophisticated that few newcomers are prepared to, or can afford to, compete and there has been a real need for an alternative combat event. It was a real joy to once more hear the quiet burbling of diesels and to see models being pulled out of the turf to be restarted and launched, just like the good old days...

Following advanced publicity in the pages of *AeroModeller*, interest and pre-entries were high with the majority of entrants in their teens and new to contest flying. The event was organised with separate finals in several age groups, and the draw is worthy of mention for being done in order of pilot's age. The youngest at the beginning and end of the draw with progressively older flyers towards the middle. Thus pilots were always matched against their equals and the further young contestants progressed through the rounds the more experienced their opponent.



Total entry 16–32–64

Most original new club in the true tradition of many names was the recently formed four strong 'Wombat Combat Team'. The contest itself produced many fine bouts and the choice of 35 foot lines gave penalty of line tension, and prevented super manoeuvrable models from dominating. Several well known FAI flyers tried their luck, notably Jim Carolan and Dave Heaton and many more spectating promised themselves a model for the near future. One of the best bouts early in the contest was one of the Junior Semi Finals between Dave Scott and Chris Simms, a very close battle of continual figure eighting and chasing which produced a three cut to two victory for Scott. He then went on to beat Simon Miller in the Junior Final, and all of them were under 14 years old! Both finalists then continued in the overall contest against older flyers.

The Intermediate Final produced a convincing win for Marc Harrison over his opponent Mick Hewlett in the under 18 class. Harrison then went on to defeat Dave Heaton, who had looked very much on form using a Keil Kraft *Gazelle* but he could not survive the one model per bout rule, and retired due to damage.

The end of the day finally brought together Marc Harrison, the intermediate champion, and Martyn Cowley, a veteran combat finalist of the pre-foam era. Cowley ended up winning by three cuts to one using a standard kit *Starlet*. Only one model was used all day, one set of lines, one propeller and 1 pint of fuel while the motor was a 10 year old E. D. Hawk! The total outlay, even allowing for a brand new PAW 149 for example, would still be well under £15. How's that for an inexpensive fun class?

Looking towards the future, response and enthusiasm was so high that further events are inevitable. The next is being organised at the Stockport Rally in six weeks on October 9th. The rules seemed to work well but care must be taken to prevent events developing into another experts class. No engine tuning would be a useful additional rule, and streamers could be reduced to 3 in. wide and 8 ft. 6 in. long to reduce the speed jump as a model loses its streamer.

A final word of thanks to our sponsors Avon Cosmetics, for providing the excellent trophies (and offering to sponsor another event next summer). Also to Mick and Brian



Nicely decorated APS 'U2' plan design built by Ken King of the Cosmo Club, flown in the Gold Trophy Aerobatic event.



A truly superbly built A1 Rabe design by Peter Illise of the Nuneaton club, sported a finish which put all other models in the shade. Placed 5th in the Novice aerobatics class.

Atkinson of the Wallingford and Oxford Model Centres, home of the $\frac{1}{2}$ A flyer, for generously donating trade prizes and lastly to *Wonder Wings* for the organisation and the original idea.

MC

Carrier Deck Landing

Once more the SMAE's *Flycatcher* was in action, and provided some interesting contest flying. Held in two rounds, one in excellent weather on the Sunday afternoon, and the other in rather less favourable conditions on the Monday morning, the opening flight of the contest by Robin Clews of Bilston MFC with his OS 40 powered Martin Mo1 proved to be the ultimate winner.

Ten competitors put in 24 flying attempts to register 18 official flights – of which 7 terminated with proper hook-up landings of varying degrees of excellence. Four *Seamews* operated, being the most popular design, the other aircraft being *Martin Mc1*, *Douglas Skyraider*, *Fairey Gannet*, *Blackburn Firebrand*, *Grumman Guardian* and one non-scale model. The *Skyraider* by Brian Perry and the Keith Garbett's *Gannet* were undoubtedly the most realistic models, both achieving good landings and placing 4th and 5th respectively in the hands of their owners.

Second place winner was Alan Sopp of Maidenhead MFC flying the Class 1 *Seamew* with which he turns up at each Nats., and regularly places in the first three. He achieved the slowest flight of the contest at 20.2 mph, the model cruising round stably on a fixed throttle setting, and trailing the outer wing downwards by virtue of its differential ailerons which operate at the hook-down setting. Third place went to Glen Sibley of Wolves MAC with his Merco 61 powered *Seamew*, producing his best ever score for a carrier flight.

There had been hopes that the magic figures of 100 mph and 500 points would be produced at this contest, but it was not to be: Robin Clews achieved the fastest

flight at 92.3 mph and the winning score of 495 points.

3½cc Profile Carrier Class

Coincidentally with the main carrier event, the 3½cc profile class being promoted by Wolves MAC was run as a tryout and four entrants flew their models, which performed reasonably well. This class is flown on 52ft 3in. lines and uses 8 laps in lieu of 7, thus, apart from scale points, the scores are comparable with the 'normal' carrier models. Winner John Marsh of Bilston MAC achieved 331 points with a good hook-up.

A. E. (Tiny) Church of Whitam MAC flew a handsome profile *Guardian* powered by an Enya 19, which also hooked-up well and scored 313 points.

Glen Sibley of Wolves MAC flew a *Grumman Bearcat* powered by an OS19 and hooked-up, but not very well and thus achieved 275 points.

Finally S. B. Perry of Wolves flying *Blackburn Skua* failed to hook-up and only achieved 188 points. However, all agreed that this class seems worthy of promotion and Wolves MAC promised to try and do just this.

SP

The control-line events were reported by Bob Horwood, Bernis Langworth, Ivor Roffey, Glen Alison, Mick Lewis, Martyn Cowley and Stan Perry. All of these enthusiasts either competed in, or officiated at the contests which they described – some even managed both! To all, many thanks – and while in the mood for showing appreciation, thank you SMAE for arranging the whole five-day show. All who attended will surely agree you did a magnificent job.

CONTROL LINE RESULTS

FAI Combat

1. V. Hunt	Alfreton
2. S. Malone	
3. P. Tribe	Cosmo
4. A. Landels	Penrith

1A Combat – Junior

1. D. Scott	Southend
2. S. Miller	Southend
3. C. Simms	
4. A. McMillan	

1A Combat – Intermediate

1. M. Harrison	
2. M. Hewlett	
3. P. Deller	Dagenham
4. A. Feaver	Dagenham

1A Combat – Senior

1. M. Cowley	Biggles
2. M. Harrison	
3. A. Feaver	Dagenham
4. M. Hewlett	

Aerobatics

1. P. Tindal	Dagenham	1973 pts
2. M. Lavalette	France	1902 pts
3. G. Taieb	France	1892 pts
4. J. Newnham	Rolls-Royce	1887 pts

Novice Aerobatics

1. M. Fitzgerald	Wharfedale	652 pts
2. R. Quilter		601 pts
3. B. Ensten	St. Albans	587 pts
4. A. Eaves		568 pts

Junior Aerobatics

1. B. Ensten	St. Albans
2. D. Scott	Southend

Speed

Class I (0-9cc)

1. M. Gagg	Wolves	87.7 mph
2. V. Nygren	Sweden	85.1 mph

Class II (1-5cc)

1. A. Lee	Sharston	111.2 mph
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Class III (2-5cc)

1. P. Eisner	Feltham	178.9 mph
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Class IV (FAI 2-5cc)

1. G. Isles	Sharston	146.2 mph
2. D. Smith	Southend	143.4 mph
3. P. Halman	Sharston	139.8 mph

Class V (5cc)

1. K. Morrissey	Sharston	173.4 mph
2. O. Kjellberg	Sweden	170.7 mph
3. R. McGladdery	Feltham	155.3 mph

Class VI N (7cc Newcomers)

1. P. Tribe		148.1 mph
2. J. Allcock		140.6 mph
3. Jones/Taylor	Rolls-Royce	136.4 mph

Class VI (7cc)

1. M. Billinton	Elliott	186.4 mph
2. O. Kjellberg	Sweden	174.7 mph
3. Powell/O'Sullivan		173.4 mph

Class VII (10cc)

1. R. McGladdery	Feltham	180.4 mph
2. M. Radcliffe	Feltham	177.5 mph
3. O. Warboys		174.7 mph

1A Team Race

1. Bengstar/Bohlin	Sweden	8:24
2. Horton/Haworth	Wharfedale	9:37
3. Broadhead/Davis	Wharfedale	9:49

FAI Team Race

1. Heaton/Ross	Norwest	8:18
2. Smith/Fry	Feltham	8:29.2
3. Bengstar/Bohlin	Sweden	Disq.

Class B Team Race

1. Bengstar/Bohlin	Sweden	7:23.8
2. Heaton/Ross	Norwest	8:43
3. Surugue/Uzan	France	Rt'd

Goodyear Team Race

1. Cheesman/James	Elliott	8:29.5
2. Rudd/King	Feltham	10:03
3. Perry/Cottrell	Wolves	Disq.

Goodyear – Novice final

1. Fitzsimmons/Daigleish	Stockport	9:21
2. Hetherington/McPeake	Tynemouth	12:35
3. Eisner/Miles	Feltham	Rt'd

Mini Goodyear

1. Langworth/Langworth	Wharfedale	9:48
2. Lorrimer/Schofield		11:08
3. Scott/Scott	Southend	12:01

Carrier Deck Landing – Open Class

1. R. Clews	Bilston	495 pts
2. A. Sopp	Maidenhead	477 pts
3. G. Sibley	Wolves	441 pts

Carrier Deck Landing – Profile Class

1. J. Marsh	Bilston	331 pts
2. A. Church	Whitam	313 pts
3. G. Sibley	Wolves	275 pts

CLUB NEWS

NICE to hear from long established clubs – and we have our first report from Jim Dobson of the **Nottingham Model Aeroclub**. With the club AGM hovering in view Mr Dobson looks back at the successes, and failures if any, of the club during the season. Well, certainly lots of successes at the various control line events, with Bill Draper's name well to the fore. Mike Chapman and Reg Lowe also feature prominently. In the same breath Jim Dobson admits to something of a failure: the club is perhaps too heavily weighted in favour of C/L, whereas a few more free flight and radio enthusiasts would add depth to the club. To some extent it is a question of geography. Wymeswold, the only reasonably free flight site, is a long way off, and

the club C/L venue is comfortably within the city limits. Naturally, the mostly C/L members were pleased with the *Control Line Aeromodeller* special, giving them plenty to mull over. Helpful, too, has been the publicity given in these columns in boosting membership. Jim Dobson has sent us along the second issue of the club newsletter. Photo-copied only because of trouble at the printers, it has yet to be displayed in its full glory. However, there is a witty and lively article by Mike Chapman, describing a visit to an Indoor meeting at Warwick University. The room was on the small side with too many opening doors, too many moving spectators, and thus much disturbed air. He well describes the embarrassment of displaying learner only tactics before an amused congregation – EZB's being not so easy. Some people, however, were putting up flights around the 7 to 8 minute mark, so things could not have been all that bad.

Vintage is very much in vogue these days. Understandably perhaps since much of our modern flying is about systems and queue forming at the take off strips rather than the pure fun that used to go in the centre of the field. Anyway, we have a letter from Don Read, of 21 Guildford Road, Farnham, Surrey GU9 9PU, Farnham 23400, who is keen on forming a vintage model aircraft association in the South of England. He sends out his appeal to all who might be interested in flying-for-fun vintage model aircraft. The object of the association would be to hold vintage fly-ins during the year, with at least one on Chobham Common – this possibly combined with a reunion of Chobham free fliers in the past. Other aims of the association would be to swap and disseminate plans and information relating to vintage models and engines – hopefully to get a few more engines out of glass cases and into models where they belong. Anyone interested should either phone Mr Read or write to him enclosing a stamped addressed envelope.

Those boisterous winds which have plagued the free flight scene all season, were unhappily, very much in attendance at the Southampton and Southern Area SMAE Gala, a report of which has been sent to us by Mr E. D. Gordon of the **Southampton MAC**. The most dispiriting aspect of such conditions is the obvious paucity of entries – many would be fliers discreetly packing away their models for another, less model risking day. So bad were the conditions that of the seven Open rubber entrants only three made a second flight and but two completing the schedule. T. Grey did well to record three maxes. Gliders came under severe attack from the wind, too, and many a fine model went out with folded wings or a damaging tow into the ground. Pete Stewart seemed, however, to master the conditions, needing but four out of the five flights to win FAI Glider with a 10:56 total. Biggest entry was for combined Mini, with nine flying. The result was in doubt until the last flight, but Pete Harris failed to get his ½A away, and it was E. Tyson who topped the list with a 9:30 total. A/1's were first and second followed by two ½A's, but where were the Coupe's? Condolences to the organisers and congratulations on all who flew or attempted to fly in such impossible conditions.

There is a nice outline drawing on the front of the **Watford Wayfarers** newsletter of a Fokker Triplane, showing to good advantage all that stacked up lifting area – even the undercart spreader is a large hunk of aerofoil. Now, I cannot help thinking aeronautically; so I wonder just how much speed was sacrificed to lift, and just why such a seemingly archaic configuration was so successful. One thing it did not have, or so we presume, was a noise problem, but if you have ambitions of building a power version of this famous plane you may well find yourself enmeshed in the complexities of the Noise Pollution Code. During tests by the Wayfarers on a model held overhead it was noticed that a considerable air turbulence noise is created

Contest Calendar . . .

October 23rd	NORTHERN AREA GALA. F/F: Open R/G/P plus supporting events. C/L: FAI T/R, Novice Stunt. R/C: Vintage, electric. 10am start at RAF Elvington, Yorks. SMAE members only. Tel. Contact: J. Walton (York 706794) or B. Judge (Cleckheaton 875976).
October 23rd	ELLIOTT STUNT COMP. Venue: Elliott Marconi, Rochester Airport, A229 off M2 motorway. Organiser: R. James, 21 Rochester Crescent, Hoo, Rochester, Kent.
October 23rd	SOUTH BRISTOL GALA. F/F: Open R/G/P, All-in FAI (5 flights – no rounds). HLG, Vintage Precision. C/L: Goodyear, Vintage (Concours plus flying) R/C: Thermal Soaring (Pre-entries to D. Bevan, 30 Begbrook Lane, Stapleton, Bristol.) Entry fees 50p/event, Juniors free. No re-entry. F/F from 09.30-15.30 hrs, fly-offs from 15.45 R/C & C/L from 10.00-16.00 hours. Information from J. Mayes, 17 Northville Road, Northville, Bristol. Venue: RAF Little Rissington, Glos.
October 30th	WHARFEDALE 1000. Class B T/R marathon. Details: John Horton, 10 Lawn Avenue, Burley-in-Wharfedale, W. Yorks. LS29 7ET.
October 30th	THREE KINGS OPEN DAY. C/L Scale, aerobatics, Carrier deck landing. Details of venue from D. Woods, (another new date!) 01-947-0752.
November 6th	NORTHERN AREA FAI GALA. F1A, F1B, F1C – 5 rounds before noon. 9am start at RAF Elvington, Yorks. SMAE members only. Contact tel: J. Walton (York 706794) or B. Judge (Cleckheaton 875976).
November 6th	SMAE INDOOR MEET. Scale and general fly-in at RAE Cardington, Beds. SMAE members only.
November 13th	RICHMOND GALA. FAI R/G/P in rounds, A/1, ½A, C d'H, HLG. 10am start at Bassingbourn Old Airfield on A14, North of Royston, Herts. SMAE members only. Contact tel: 01-736-7163.
November 20th	WHITEFIELD/ROCHDALE INDOOR MEET. EZB, HLG, Keyhole Scale, CO ₂ scale (if sufficient entries). Two halls in use from 10am-5pm. EZB hall size 55ft by 35ft by 22ft., other events in hall size 110ft by 60ft by 22ft. Good prizes. Venue: Balderstone School, Rochdale, Lancs. Details (SAE) M. Reeves, 25 Ashmount Drive, Rochdale, Lancs.
November 27th	SMAE CENTRALISED MINI MEET. A/1, ½A, C d'H, HLG. 10am start at Bassingbourn Old Airfield, on A14 North of Royston, Herts. SMAE members only. Contact tel: 01-736-7163.
December 4th	AEROMODELLER INTERNATIONAL COUPE D' HIVER. Both FAI and French rules. SAE to Editor for details/entry form. Venue: RAF Halton, near Aylesbury, Bucks.

by the wind blowing across the prop. To counteract this false reading it was found necessary to walk round the model rather than to rotate the model. Problem, though, holding a gyro-ing helicopter overhead. A lead boot job this, even if you can survive the oil and fume laden down-draught from the rotor.

From *High Flyin*, the newsletter of the Anglia MFC, we get an insight into the whys and wherefores of the lead the free flight section has acquired in the *Plugge Cup* Team Competition. For one thing it has at least four of the leading contest flyers in the country, and strong support from other team members, each with a contest winning capability. To give an idea of the strength in depth, eight members entered the *KMAA Cup* contest for A/2 Gliders. Winner was Mark Harper, who must now be considered one of the country's up and coming glider flyers. Another first place success was Roy Collins' *Halifax Trophy* win. His contest flying companion, Paul Bond, was third. Then again, at the London Area Gala back in May Ray Pavely was in great form, taking Coupe D'Hiver with five maxes plus a seven minute plus fly off. He also did a full house in A Power to come third in the fly-off. Latest outing was to Bassingbourn for the Team Glider event, where two teams were fielded. Results to come. The other main activity of the club appears to be Thermal Soaring, for which there is always a good turn out at week ends. A club competition for these Radio Gliders was held at the end of May and attracted 11 entries. Winner was S. Marden.

When, in July, His Royal Highness The Prince of Wales, visited a festival of youth in Stafford among the many leisure activities on show was aeromodelling displayed and demonstrated by juniors from Wolves MAC and Falcons FFS. One group gave an almost non-stop display of control line flying throughout the day and were the focus of much interest. The other group put on an exhibition of model building, with a number of completed models to show the nature of the end product. Prince Charles spoke to the boys, and was particularly interested in a large rubber model in course of construction. James Gough of Falcons, also brings out attention to the *Antler Trophy* and why it was thus named. Well, the trophy is for an annual inter club glider competition with the Wolves MAC. It was held earlier this year at Cannock Chase and won by the Falcons. And here is where the very apt name comes in, for Cannock Chase is the home of a large herd of fallow deer. The deer are quite tame, and if you can stand such indifference, take no notice of the model flying.

I thought I detected a few new faces flitting fitfully through the grassy wilderness of the Southern modellers last hope, Bassingbourn. And sure enough I read in Leicester MAC's August bulletin that stalwarts of the club, led by Gerry Ferer, came to do a spot of jungle fighting at the London Area Rally. Fortunately, the weather was



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ideal, and there were maxes in plenty on the day. Leicester interest centred mainly on the A/2 event, and though they didn't make the prizes Chris Grant managed fourth place and Martin Scott seventh. Coming back to last month's puzzler over the radio model that shed an aileron but carried on flying quite normally, we now get a possible answer. Well, to put it crudely, it goes on, ailerons are but glorified trim tabs, and are not over-effective as they operate at the back end of the wing where the airflow is rather turbulent. A single aileron would serve for most manoeuvres except rolls, which obviously were not tried. Adding to this, I think the point made is that loss of wing area along the trailing edge is not too critical, which is why gliders, needing to make the most of their wing area, have high aspect ratios, as, too, have man powered craft.

Clubman



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SHOP GUIDE

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AUSTRALIA

MELBOURNE 3000 Tel. 347 8029 ★
RIVERSIDE HOBBY CENTRE
16 LITTLE LATROBE STREET
9am–5.30pm Mon–Fri. 9am–12 noon Sat

LUTON Tel. 28435 ★
MAPLE MODELS
16 MAPLE ROAD
9.00am–5.30pm. Lunch 1.30pm–2.30pm
Closed Monday

AVON

BRISTOL 5 Tel. 557764 ★
AVONAIRE MODELS
351 CHURCH ROAD, ST GEORGE
9am–6pm Mon–Thurs. Late night Fri 7pm.
Half day Wed

BERKSHIRE

NEWBURY Tel: (0635) 46004 ★
TRENTS MODELS
25-26 CHEAP STREET
9am–5.30pm Mon–Sat

BRISTOL Tel. 662544
BEV'S MODELS
35 WEST STREET, BEDMINSTER
10am–6pm. Late night Fri 7pm

READING Tel. 51558 ★
READING MODELS
5 CHATHAM STREET
9am–5.30pm each weekday

BRISTOL 1 Tel. 23714
MODELLERS DEN
65 FAIRFAX STREET
Open 9am–5.30pm Mon–Sat

READING Tel. (0734) 586899 ★
TRENTS MODELS
51 BUTTS CENTRE
9am–5.30pm Mon–Sat

BEDFORDSHIRE

LUTON Tel. 23182
AEROMODELS (LUTON) LTD.
20 GORDON STREET
Open 9am–5.30pm. Closed Wed

SLOUGH Tel. Slough 39419 ★
SLOUGH RADIO CONTROL MODELS
273 HIGH STREET
Mon, Tue, Thurs & Sat 9.30am–6pm
Wed 9.30am–1pm
Fri 9.30am–8pm

LUTON Tel. 36218
TAYLOR & MCKENNA
73 ARNDALE
Open: 9am–5.30pm Mon to Thurs. 9am–6pm
Fri and Sat

AYLESBURY Tel. 85752
TAYLOR & MCKENNA LTD
46 FRIARS SQUARE
Mon–Thurs 9am–5.30pm. Fri–Sat 9am–6pm

BLETCHLEY Tel. MILTON KEYNES 70478
TAYLOR & MCKENNA LTD
16 THE CONCOURSE, BRUNEL CENTRE
Mon–Thurs 9am–5.30pm. Fri–Sat 9am–6pm

MILTON KEYNES Tel. M.K. 312553 ★
WOLVERTON MODELS & HOBBIES
26 CHURCH STREET, WOLVERTON,
MILTON KEYNES
Open: Mon–Sat 9.00am–6.00pm. Half day Wed

CAMBRIDGESHIRE

CAMBRIDGE Tel. 59620 ★
MODEL MANIA
17 KING STREET
9am–5.30pm Tues–Sat. Closed Mondays

CHANNEL ISLANDS

JERSEY Tel. Central 21993 ★
THE HOBBY CENTRE
8 COLOMBIERIE PARADE, ST HELIER
Open 9am–6pm
Closed half-day Thursday

CHESHIRE

STOCKPORT Tel. 061-480 5478
THE MODEL SHOP
280 WELLINGTON ROAD SOUTH
Open Mon–Sat 9am–5.30pm. Closed Tuesdays

CLEVELAND

MIDDLESBROUGH Tel. 211212 ★
MODEL DROME
265 LINTHORPE ROAD
9.30am–6pm. Closed Wed

CO DURHAM

DARLINGTON Tel. 69870
BANK TOP CYCLE & MODEL SHOP
BRIDGE TERRACE, YARM ROAD
Open 9.00am–5.30pm. Closed Monday

DEVON

EXETER Tel. 0392 58417 ★
EXETER MODEL CENTRE
98 SOUTH STREET
Open Monday–Saturday 9–5.30

PLYMOUTH Tel. 0752 21851
PLYMOUTH MODEL CENTRE
11 OLD TOWN STREET
9am–5.30pm Mon–Sat

PLYMOUTH Tel. (0752) 53330
RUNWAY SOUTHWEST
16 DEVENPORT ROAD
STOKE, PLYMOUTH
Mon–Sat 9am–6pm. (Late night Friday 8pm)

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

TORBAY Tel. 0803 521767
MANSEL'S MODELS ★
PALACE AVENUE, PAIGNTON
Open 9.15am-5.30pm Mon-Sat inclusive
Half day Wed

SOUTHAMPTON Tel. Eastleigh 617849
EASTLEIGH MODEL CENTRE
2a HIGH STREET, EASTLEIGH
Open 9am-6pm. Half day Wed

KOWLOON Tel. 3-800155
SCIENTIFIC HOBBIES LTD ★
185-D PRINCE EDWARD ROAD
Open 10am-8pm
Sunday Closed

TORQUAY Tel. 27764
TORBAY MODEL SUPPLIES LTD ★
59 VICTORIA ROAD, ELLACOMBE
Open 9.15am-12.45pm and 2.15pm-5.45pm
Half day Wed

SOUTHAMPTON Tel. 25919
HOBBY LOBBY LTD ★
52 COMMERCIAL ROAD
Open 9.30am-5.30pm Mon-Fri
Sat 9.30am-5pm

HONG KONG Tel. 3-684184
WINNING MODEL & HOBBY SUPPLIES
2a AUSTIN AVENUE
KOWLOON, HONG KONG
Open 10am-7pm. Closed Sun

DORSET

BORNEMOUTH Tel. 763480
WESTBOURNE MODEL CENTRE
59 SEAMOR ROAD, WESTBOURNE
9am-5.30pm Mon, Tues, Thurs, Sat.
9am-7.30pm Fri. Closed Wed

SOUTHAMPTON Tel. 29223
SOLENT MODELS LTD ★
60 OXFORD STREET SOI IDL
Open Mon-Sat 9.30am-6pm
Fri 9.30am-7.30pm

KENT

BROMLEY Tel. 01-460 0818
AVICRAFT LTD ★
6 CHATTERTON ROAD
10am-6pm (not closed for lunch) except
Wed 10am-1pm

BOURNEMOUTH Tel. Northbourne 4170
J. & H. MODELS ★
1288 WIMBORNE ROAD, NORTHBOURNE
Mon-Thurs 9am-5.30pm. Fri 9am-6.30pm
Sat 9am-6pm. Half day Weds

HEREFORDSHIRE

HEREFORD Tel. (0432) 4152
FRED PERKINS LTD ★
48c COMMERCIAL ROAD
Open 9am-5.30pm. Half day Thurs

CANTERBURY Tel. 69888
THE MODEL SHOP ★
83 NORTHGATE CTI 1BA
Open 9am-5.30pm inc. Sat
Closed all day Thursday

ESSEX

BRENTWOOD Tel. Brentwood 226787
ARNOLDS GIFT SHOP
4 High Street
Open: 9am-6pm. Half day Thursday

HERTFORDSHIRE

HATFIELD Tel. 63404
DESIGN AND HOBBIES ★
5 MANOR PARADE
Open 9.30am-6.30pm (Thurs 7.30pm)
Half day Wed

MAIDSTONE Tel. 51719
THE MODEL SHOP ★
19-23 UPPER STONE STREET
Open 9.30am-1pm, 2.30pm-5.30pm
Closed all day Wed

WICKFORD Tel. (037 44) 2621
WICKFORD MODEL EXCHANGE ★
ST PETERS TERRACE, LONDON ROAD
Open 9am-7pm Mon, Thurs, Fri, Sat.
10am-1pm Sun

HEMEL HEMPSTEAD Tel. 53691
TAYLOR & MCKENNA LTD
203 MARLOWE
Mon-Thurs 9am-5.30pm, Fri-Sat 9am-6pm

NEW ASH GREEN Tel. 0474 872136
THE HOBBY HOUSE
10 UPPER STREET NORTH
Open 9am-5.30pm. Closed Mon

WOODFORD BRIDGE Tel. 01-504 3602
ARNOLD'S GIFT SHOP ★
656 CHIGWELL ROAD
Open 9am-6pm Mon-Sat. Closed Wed

HERTFORD Tel. 50101
MODELLERS WORLD
17 RAILWAY STREET
Open 9.30am-6.00pm
Late Night Friday 7.30pm
Closed Monday

SWANLEY Tel. 67457
SWANLEY MODEL CENTRE ★
(Formerly H & J Electronics)
39 HIGH STREET
Open 9.30am-6pm. Half day Wed

HAMPSHIRE

ANDOVER Tel. 61307
RADIO CONTROL SUPPLIES ★
1a UNION STREET
Open 9am-6pm. Fri 9am-8pm

LEITCHWORTH Tel. Letchworth 73263
REDHILL MODEL SUPPLIES
62 LEYS AVENUE
10am-6pm. Thurs open till 7.30pm. Closed all
day Wed

TUNBRIDGE WELLS Tel. 36689
E. M. MODELS ★
42 CAMDEN ROAD
Mon-Sat 9am-5.30pm. Closed Wed

FAREHAM Tel. 4136
G. M. H. BUNCE & CO LTD ★
206 WEST STREET
Open 9am-5.30pm. Closed Wed

ST ALBANS Tel. 53954
SAMS
12 HATFIELD ROAD
Mon-Fri 9am-6pm Sat 9am-5.30pm

LANCASHIRE

BURNLEY Tel. 23983
A.D. MODEL SUPPLIES ★
22 PLUMBE STREET
10am-6pm Mon-Fri. Sat 9am-5.30pm

HONG KONG

FORTSMOUTH Tel. 25049
RAY BROWN MODELS ★
10 KINGSTON ROAD
Mon 9am-6pm, Tues 10am-5.30pm,
Thurs 10am-6pm, Fri 9am-6pm
Sat 9am-5.30pm. Lunch 1.30pm-2.30pm

HONG KONG Tel. 3-680507
RADAR CO LTD ★
3 OBSERVATORY ROAD, TSIMSHATSUI
KOWLOON
Open 10am-7pm. Closed Sundays

BURY Tel. 061-764 5787
M & T ELECTRONICS ★
(NORMAN McFARLAND)
52/54 BOND STREET
10am-6pm. Thursdays till 8pm. Closed Tues

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LONDON NORTH

FARNWORTH Tel. 0204 74688
JOYCRAFT
3 BOLTON ROAD, MOSES GATE
Open Mon-Sat 9am-6.30pm
Closed all day Wednesday

CAMDEN TOWN Tel. 01-485 1818
AERONAUTICAL MODELS ★
39 PARKWAY, NW1
9.15am-5.30pm Tues-Fri. 9.15am-5pm Sat.
Closed all day Mon

HARLINGTON Tel. 01-897 2326
RADIO CONTROL MODEL CENTRE ★
214 HIGH STREET
Mon, Tues, Thurs, Sat, 9am-6.30pm
Fri 9am-8.30pm. Wed closed all day

LEIGH Tel. Leigh 677152
LEIGH MODEL CENTRE ★
4 QUEEN STREET
Mon-Sat 9am-6pm. Wednesday 9am-1pm

LONDON Tel. 01-607 4272
HENRY J. NICHOLLS & SON LTD ★
308 HOLLOWAY ROAD, N7
Monday to Friday 9am-6pm
Saturday 9am-5.30pm

HARROW Tel. 01-863 9788
THE MODEL SHOP ★
190-194 STATION ROAD
9.30am-6pm Mon-Sat. Half day Wed 1pm

LIVERPOOL Tel. 051-709 8039
STAN CATCHPOLES MODEL WORLD ★
85 BOLD STREET
9.30am-5.30pm. Six days

NORTH FINCHLEY Tel. 01-445 6531
MICHAEL'S MODELS ★
646-648 HIGH ROAD, N12
Open Mon-Sat 9.00am-6.00pm

ISLEWORTH Tel. 01-560 0473
RADIO CONTROL SUPPLIES ★
581 LONDON ROAD
Open 9am-6pm. Fri 9am-8pm

MANCHESTER Tel. 061-834 3972
THE MODEL SHOP (MANCHESTER)
209 DEANS GATE
Mon-Fri 9.30am-6pm. Sat 9.00am-5pm

MILL HILL Tel. 01-959 2877
H. A. BLUNT & SONS LTD. ★
133 THE BROADWAY
NW7 4RN
Open: 9am-6.30pm Mon-Fri
9am-6pm Sat

KENTON Tel. 01-204 9867
HOBBIES AND MODELS
217/219 STREATFIELD ROAD
QUEENSBURY CIRCLE
Open 9am-6pm. Thurs 9am-8pm
Closed all day Wed

MANCHESTER Tel. 061-794 4084
LISTERS MODEL SUPPLIES
285 EAST LANCASHIRE ROAD, SWINTON
Closed all day Wed. Open Sun 10.30am-1pm

ELTHAM Tel. 01-850 4324
ELTHAM MODELS ★
54 WELL HALL ROAD SE9
Mon-Sat 10am-5.30pm. Closed Thurs

AYLSHAM Tel. 3145
THE MODEL SHOP
PENFOLD STREET
9.00am-5.00pm Mon-Sat
Half day Wed 12.30pm

WIGAN Tel. 45683
G. FORSHAW & SON
58 MARKET STREET
Open 9.15am-5.45pm. Early Closing Wed

LEWISHAM Tel. 01-852 2637
LEWISHAM MODEL CENTRE ★
45 LEE HIGH ROAD, SE13
Mon-Sat Closed 6pm. Thurs Closed 1pm

KINGS LYNN Tel. 63164
BARNEY'S MODEL SHOP
SOUTH EVERARD STREET
Open 9am-6pm

LEICESTERSHIRE

NINCKLEY Tel. 30952
PUNCTILIO MODEL SPOT ★
6 WATERLOO ROAD
Open: Mon 9.15am-7pm. Tues 2pm-7pm.
Wed & Thurs 5.30pm-7pm. Fri 9.15am-7pm.
Sat 9.15am-5pm

LONDON Tel. 01-228 6319
E. F. RUSS ★
101 BATTERSEA RISE, SW11
Open Fri till 7pm. Other days 9am-6pm. Early
closing Wed 1pm

NORWICH Tel. 0603 42515
GALAXY MODELS ★
88 Catton Grove Road,
Open 6 days a week

LEICESTER Tel. 544529
RADIO CONTROL SUPPLIES ★
52a LONDON ROAD
Open 9am-6pm. Fri 9am-8pm

LONDON Tel. 01-520 7397
ARNOLD'S GIFT SHOP
132-134 HOE STREET, E17
Open 9am-6pm Mon-Sat. Closed Wed

NORTHAMPTON Tel. 31223
THE MODEL SHOP ★
230 WELLINGBOROUGH ROAD
Open 9am-6pm. Half day Thurs

LINCOLNSHIRE

LINCOLN Tel. 25907
MODEL CENTRE ★
24 NEWLAND
10am-5.30pm. Closed all day Wed

PLAISTOW Tel. 01-472 2471
A. G. HERMITE ★
633 BARKING ROAD, E13
Open 9am-6pm. Closed all day Thurs

NORTHAMPTON Tel. 27726
TAYLOR & McKENNA LTD
41-43 PRINCES WALK
GROSVENOR CENTRE
Mon-Thurs 9am-5.30pm. Fri-Sat 9am-6pm

STAMFORD Tel. 4524
SPORTS & HOBBIES ★
4 ALL SAINTS STREET
Open 9am-5.30pm. Half day Thurs

EASTCOTE Tel. 01-866 7631
LANCASTER MODEL CRAFT ★
217 FIELD END ROAD
Mon-Thurs 9am-6pm. Fri 9am-7pm
Early Closing Wed

WELLINGBOROUGH
Tel. Wellingborough 226263
D. B. MODELS ★
17 SILVER STREET
Open 10am-6pm Mon-Sat

MIDDLESEX

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NORTHUMBERLAND

NEWCASTLE UPON TYNE Tel. 22016
THE MODEL SHOP ★
18 BLENHEIM STREET
Mon-Fri 9am-5.30pm. Sat 9am-6pm
Closed Wed all day

STAFFORD Tel. 3420
JOHN W. BAGNALL LTD. ★
18 SALTER STREET
9am-5.30pm. Closed all day Wed

SUSSEX

BRIGHTON Tel. 418225
HARRY BROOKS ★
15 VICTORIA ROAD, PORTSLADE
Open every day except Sun 8.30am-5.45pm
(no half day)

NOTTINGHAMSHIRE

NOTTINGHAM Tel. 50273
GEE DEE MODELS LTD ★
19-21 HEATHCOTE ST. OFF GOOSEGATE
Open 9.30am-5.30pm. Early closing Thurs

STOKE-ON-TRENT Tel. 263574
JOHN W. BAGNALL LTD. ★
30 PICCADILLY, HANLEY
9am-5.30pm. Closed all day Thurs

CHICHESTER Tel. 83592
PLANET MODELS & HANDICRAFTS ★
108 THE HORNET
Open 9am-1pm and 2pm-6pm. Closed Thurs

SUTTON-IN-ASHFIELD Tel. 58157
MODELLERS CORNER ★
146 OUTRAM STREET
Open: Mon-Fri 9am-8pm
Sat 9am-6pm
Half day Wed (1pm)

WOLVERHAMPTON Tel. 26709
WOLVERHAMPTON MODELS & ★
HOBBIES
BELL ST. MANDERS CENTRE
9am-5.30pm Mon-Sat. Early Closing Thursday

CRAWLEY Tel. 21921
HEATHER CRAFT ★
60 HIGH STREET
9am-5.30pm Mon-Sat. Half day Wednesday

WORKSOP Tel. 2855
RUSSELL MODELS ★
MODEL CENTRE, RYTON STREET
Closed all day Thursday

SUFFOLK

IPSWICH Tel. 51195
BOWMANS OF IPSWICH ★
37/39 UPPER ORWELL STREET
Open 9am-5.30pm Mon-Sat
Early closing Wed

HORSHAM Tel. 61533
MODEL CORNER ★
30 NORTH STREET
Open 9am-5.30pm Mon-Sat. Closed Thursday
afternoons

OXFORDSHIRE

ABINGDON Tel. 21927
F. KNIGHT & SON ★
44 BATH STREET
Open 8.30am-1pm/2pm-5.30pm. Late night
Fri 6pm. Closed all day Thurs

IPSWICH Tel. 79279
GALAXY MODELS ★
160 FELIXSTOWE ROAD
Open 6 days a week

WORTHING Tel. 207525
SUSSEX MODEL CENTRE ★
10 TEVILLE GATE
9am-5.30pm. Open six days a week. Monday to
Saturday

OXFORD Tel. 42407
HOWES MODEL SHOP ★
9-10 BROAD STREET
Open 8.45am-5.30pm. 6 day week

SURREY

ADDLESTONE Tel. Waybridge 45440
ADDLESTONE MODELS LTD ★
63 STATION ROAD
Open 9am-6pm. Closed all day Wednesday.
Late night Friday 6.30pm

WALES

CARDIFF Tel. 29065
BUD MORGAN ★
22 CASTLE ARCADE
SOUTH GLAMORGAN CFI 2BW
9am-5.30pm. Early closing Wed 9am-1pm

SCOTLAND

GLASGOW Tel. 041-632 8326
RIDDELL BROS ★
61 MOUNT ANNAN DRIVE
Open 9am-6pm.
Closed Tuesdays

GRAYSHOTT Tel. Hindhead 6135
GRAYSHOTT MODELS ★
5 HEADLEY ROAD, HINDHEAD
Mon-Sat 9.00am-5.30pm
Early Closing Wed

CARDIFF Tel. 31367
RYALL & WALTERS RADIO MODELS ★
34 LLANDAFF ROAD
Open 9am-12.30pm/1.30pm-5.30pm Monday
8pm. Closed Wed

SOMERSET

BRIDGWATER Tel. 3632
R.M. TOYS AND MODELS ★
36 ST. JOHN STREET
Open 9am-5.30pm. Half day Thurs

HORLEY Tel. 2412
HORLEY MODELS ★
91 VICTORIA ROAD
9.15am-5.30pm
Closed Wed

CWMBRAN Tel. 66727
THE HOBBIES SHOP ★
32 THE PARADE (on the balcony), GWENT
9.30am-5.30pm. Half day Wed
Open late Fri, 7pm

MINEHEAD Tel. 2516
OASIS MODELS ★
44A THE AVENUE
9am to 6pm, 10pm Fridays. Will open Sun by
request

KINGSTON on THAMES Tel. 01-546 4488
MICK CHARLES MODELS ★
180 LONDON ROAD
Mon, Tues, Thurs, 9.30am-6.30pm
Wed 9.30am-1pm. Fri, Sat 9.30am-9pm

FLINT Tel. 3123
FLINT MODELS ★
5-9 CHURCH STREET
Open five days 9am-5.30pm. Closed all day
Wednesday

STAFFORDSHIRE

BURTON-ON-TRENT Tel. 64240
J. & N. MODELS ★
22 DERBY STREET
Open 9am-5.30pm. Closed Wed

WOKING Tel. 66493
WOKING MODELS ★
9 GOLDSWORTH ROAD
Open 9am-6pm Mon-Sat. Closed Wed after-
noon

NEWPORT Tel. 65061
MAKE A MODEL ★
123 COMMERCIAL STREET
Mon to Sat 9am-5.30pm
Late Friday - 8pm

KINDLY MENTION 'AEROMODELLER' WHEN REPLYING TO ADVERTISEMENTS

SWANSEA Tel. (0792) 52877
SWANSEA MODELS & HOBBIES ★
 11 SHOPPERS WALK, OXFORD STREET
 GLAMORGAN
 Mon, Tues, Wed, 9.30am-5.30pm, Thurs,
 9.30am-1pm, Fri and Sat 9.30am-6pm

QUINTON Tel. 021-422 1000
HOBBY SPOT ★
 280 HAGLEY ROAD WEST
 Weekdays 9.30am-6.30pm, Sat 9.30am-5.30pm
 Wed closed

HUDDERSFIELD Tel. 45570
WEST YORKS MODELS ★
 61 WAKEFIELD ROAD
 Mon-Sat 9.30am-5.30pm
 Closed all day Wednesday

WARWICKSHIRE

BIRMINGHAM 10 Tel. 021-772 4917
BOB'S MODELS ★
 520-522 COVENTRY ROAD, SMALL HEATH
 Open 9.45am-6.30pm, Early closing Wed
 1.30pm

YORKSHIRE

BARNLEY Tel. 6222
DON VALLEY SPORTS
 28 DONCASTER ROAD
 Open 9am-5.30pm Mon-Sat
 Closed Thursday

LEEDS Tel. 646117
FLYING MODELS ★
 88 CROSSGATES ROAD, CROSSGATES
 Mon-Sat 6am-6pm, Sun 8am-1pm

BIRMINGHAM Tel. 021-444 2369
PEARCE'S NEWSAGENTS & MODEL
SUPPLIES
 8 YORK ROAD, KINGS HEATH
 Open Mon-Fri 8am-6.30pm, Sat 8am-7pm
 Sun 8am-1.30pm

BATLEY Tel. 479300
BOBS MODELS (BATLEY) ★
 4 OXFORD STREET, MOUNT PLEASANT
 Open: Mon-Thurs 9am-6pm, Fri 9am-7pm,
 Sat 9am-5.30pm, Closed all day Tuesday

LEEDS Tel. 457891
THE MODEL SHOP (LEEDS) LTD ★
 38 MERRION STREET
 Open 9am-5.45pm Half day Wed

BIRMINGHAM Tel. 021-554 5569
MODEL MECCA
 (G. I. & N. ROWAND)
 204 WHITTON ROAD
 Open 9am-6.30pm, Wed 9am-1.30pm
 Sat 9am-6pm

BRADFORD 8 Tel. 26186
MODEL DROME ★
 182 MANNINGHAM LANE
 9.30am-5.45pm, Closed Wed

OTLEY Tel. 56334
H. & S. CLIFF
FLYING MODELS
 57 GAY LANE
 Mon-Sat 6am-6pm

SOLI HULL Tel. 021-744 3374
SHIRLEY MODEL SUPPLIES
 62 STRATFORD ROAD, SHIRLEY
 9am-6pm Mon-Sat

DONCASTER Tel. 62524
B. CUTTRISS & SONS
 40 DUKE STREET
 Open 9am-5.30pm, Closed all day Thurs

YORK Tel. 0904-34281
YORK MODEL CENTRE ★
 17 DAVYGATE CENTRE, DAVYGATE
 Open Mon-Sat 9.00am-6.00pm
 No half day

WILTSHIRE

SWINDON Tel. 26878
SWINDON MODEL CENTRE ★
 2 CIVIC CENTRE, THEATRE SQUARE
 (Next to Wyvern Theatre)
 Open daily 9am-5.30pm
 Open all day Wednesday

DONCASTER Tel. 20767
SOUTH YORKSHIRE MODEL SUPPLIES ★
 313 BENTLEY RD, BENTLEY
 Mon, Tue, Wed, Sat 10am-6pm
 10am-8pm Friday, Closed Thurs

YORK Tel. 23704
YORK MODELS LTD ★
 69 EAST PARADE, HEWORTH
 Open 9am-5.30pm, Closed all day Wednesday

WORCESTERSHIRE

EVESHAM Tel. 45828
P. & R. MODELS ★
 8 VINE MEWS
 Mon, Tues, Thurs, Fri, Sat, 9.15am-6pm
 Closed all day Wed

**You can buy with confidence from the shops in
 this Shop Guide.** • Shops offering mail order are denoted by an asterisk

Make it legal . . .

get your R/C Licence

Just in case some newcomers to the hobby are not aware
 operation of radio control equipment requires a licence. This
 costs just £2.40 and covers a five-year period.

Licence application forms are available from:
The Home Office, Radio Regulatory Dept.,
Waterloo Bridge House,
Waterloo Road,
London S.E.1.



IMPORTANT: CHANGES OF ADDRESS

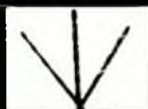
FOR OFFICERS OF THE SOCIETY OF MODEL AERONAUTICAL ENGINEERS

Hon. Secretary: Mrs. J. Halman,
 18 Walcot Avenue,
 Luton,
 Beds.
 Tel: Luton 414678

Membership Secretary: Mrs. M. Horwood,
 21 Burghley Road,
 St. Andrews,
 Bristol,
 Tel: Bristol 48869

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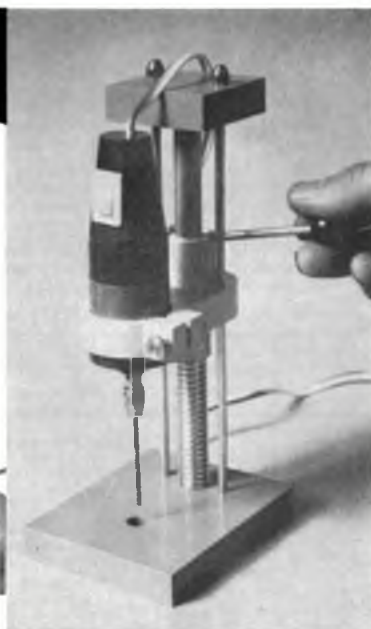
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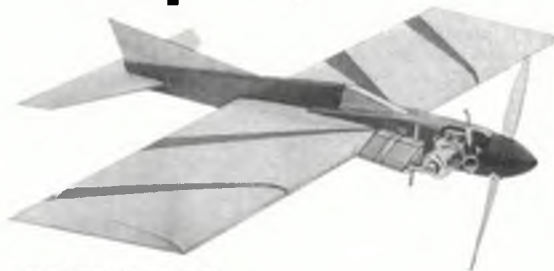
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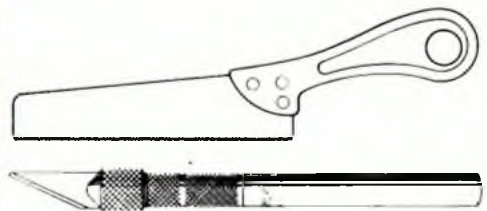
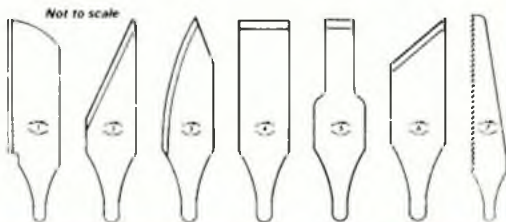
Contains the Craft Knife, complete with No. 2 Blade and Blades Nos. 2, 3, 5 and 6.

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For ease of identification this diagram is colour-coded:

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