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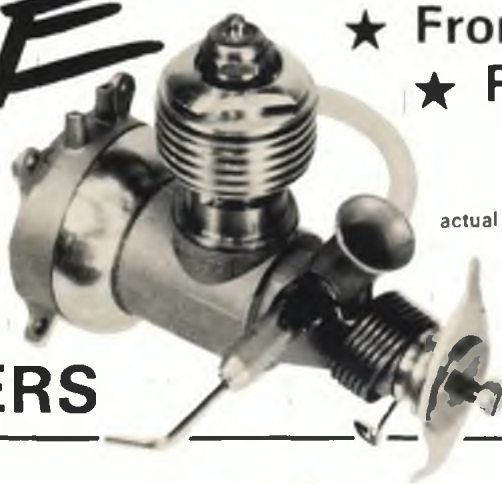

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December 1977 Volume XLII No. 503

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The Editor and Staff of AeroModeller send seasonal greetings and best wishes for a happy and prosperous New Year to all our readers.

on the cover

The truly distinctive Sorrell Hiperbipe is captured by Ron Moulton's lens as it is displayed at Abbotsford, British Columbia, Canada. This aircraft, which is featured in our 'Aircraft Described' series on pages 704/6 would make a superb subject for modelling, whether your interests lie in Peanut scale or multi-function radio control.

next month

Full size plans for a rather different - and distinctly seasonal - type of craft, plus thoughts on rubber motors form just two features of the January issue, on sale 16th December. In addition there will be plenty of news, views and reviews on all aero-modelling topics - order your copy now for a good informative 'read'

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47th Model Engineer Exhibition

& 2nd Woodworker Show

Wembley Conference Centre
January 5-14th (including Sunday 8th)
10 a.m. – 8 p.m.
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Each sector, whether it be model engineering or model aircraft, model boats, woodworking, gem craft or military modelling is located in clearly defined parts of the building, making it easy to find one's way around the Exhibition.
There will be a model boating pool, an aeroplane flying circle, a model car track and a live steam track plus lectures and demonstrations every day in the lecture theatres.

The Exhibition will be open throughout the weekend of Jan 7th – 8th. Admission 75p, children over 5 and still at school 50p., all incl. VAT. Advance and party tickets available on all days except Saturday 7th Jan. Single price for small parties up to10: Adults 65p, children 30p. Parties of more than 10: Adults 60p, children 25p. Teacher in charge of parties free in ratio one per ten in party. Visitors arriving after 7 p.m. entitled to entry at adults 50p, children 30p.

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On the right are listed the standard production sizes of Solarbo Balsa. We have picked out five different sizes of STRIP (marked A, B, C, D and E); and five different sizes of SHEET (marked F, G, H, J and K). All are popular sizes, and we invite you to put them in ORDER OF POPULARITY.

For example, if you think 1/8 x 1/8 strip is the most popular of the five marked strip sizes, put A in box 1 *alongside* STRIP in the coupon below; then your choice of the next most popular strip size in box 2, and so on down to box 5.

Then enter in order your choice of SHEET sizes in the second row of boxes.

Remember, the order wanted is only that of the *five* strip and *five* sheet sizes marked. All the other sizes shown in the list do not count in the FIRST PART of this contest (but you need to refer to them for completing the second part).

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That is what the other 'box' is for. Fill in FIVE sizes not already in our list of standard production sizes. These can be all strip sizes, all sheet sizes, shaped sections or a mixture of them all. But, please, a total of FIVE additional sizes only.

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	3/32x3/32	4p
B	1/8 x1/8	4½p
	x3/16	5p
C	x1/4	7p
	x3/8	8p
D	x1/2	10p
	3/16x3/16	7p
	x1/4	8p
	x1/2	12p
E	1/4 x1/4	9p
	x3/8	12p
	x1/2	13p
	x1	20p
	3/8 x3/8	13p
	1/2 x1/2	18p
	x1	32p
	3/4 x3/4	37p
	SHEET...36" long	
	Size	Each *
	1/32x2	14p
	x3	22p
	x4	33p
	1/16x2	15p
F	x3	24p
G	x4	38p
	3/32x2	17p
	x3	29p
	x4	45p
	1/8 x2	19p
H	x3	32p
	x4	50p
	3/16x2	23p
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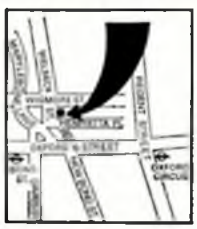

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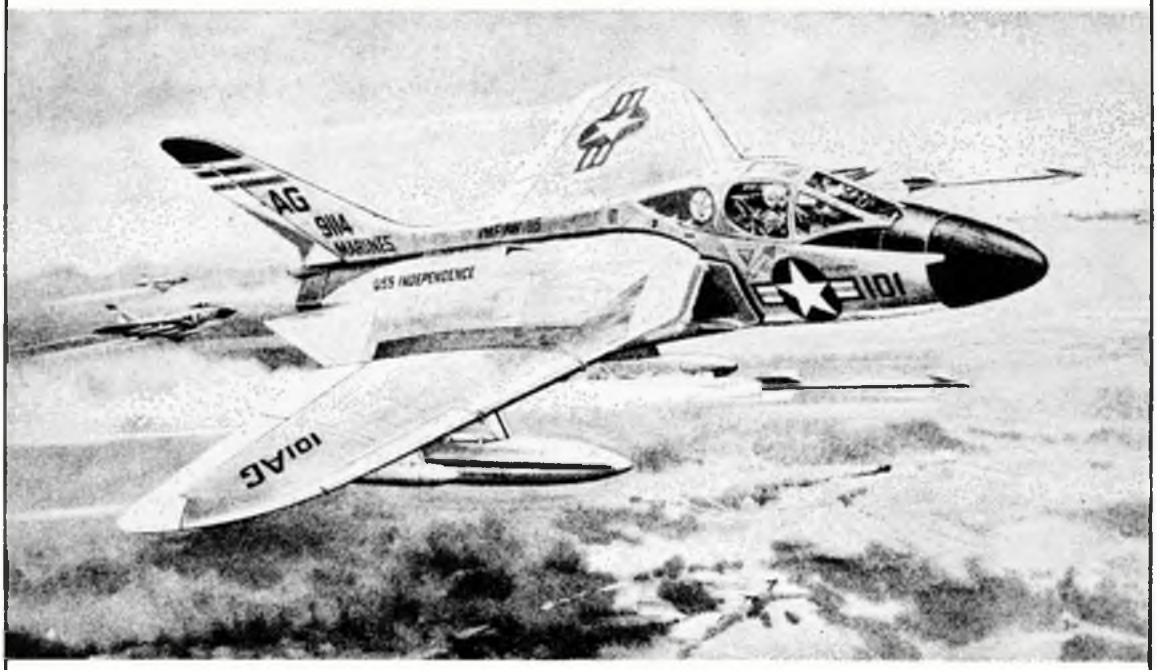

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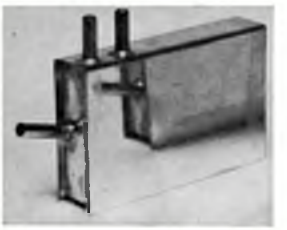

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CLARA NEWS. Membership of the *Control Line Aircraft Racing Association* now stands at over 100 – a high proportion being foreign flyers. Their lively informative newsletter 'de-CLARAtion' is published every 6-8 weeks and is packed full of information appertaining to all forms of team racing. Mainstay of the operation until now has been Graham Bryant but an overseas business assignment means that he has had to stand down – at least until March 1978. Meanwhile, Dave Clarkson has stepped into the breach, and thus all correspondence should be addressed to him at 31 Conway Road, Cheadle Hulme, Cheshire.

If you are interested in C/L racing and have not yet joined (you will never learn what 'Luigi Venturi' has to say if you don't!) then send £2.00 for membership. Overseas readers will unfortunately have to pay greater annual subscription rates due to the high cost of postage. Those with a European address should send £3.50 while those with non-European addresses will have to part with £5. Worth it though.

SEQUEL to the 'Model Found' notice in the November issue. It seems that a character known to all as 'Harry', ex-Chairman of the Southend Radio Control Flying Club, had launched his R/C model which proceeded to climb away as usual in a turning flight pattern. All went well for a few minutes, until Harry decided to turn to the right. No luck! Panic . . . he had neglected to switch the receiver on, and his model had in fact been flying free-flight. With the model last seen heading out to sea, the future looked bleak. However, news of our mention that someone had found just such a model floating in the Thames Estuary reached Harry, and he is now re-united with the model. That foreign transfer on the wing tip? Friends visiting that weekend from the Belgian Limburger Vliegers club had just presented it to him!

THE 1978 MODEL ENGINEER EXHIBITION will be officially opened by Earl Mountbatten of Burma on 5th January – a special honour for all model enthusiasts, and indeed the first Royal opening for some 26 years. The Exhibition which runs continuously from 5th–14th January (including Sunday 8th) will again be at the Wembley Conference Centre and promises to be the finest ever staged.

As is now traditional, electric round-the-pole flying will be featured – and readers are invited to bring their own models and fly them. However, the circuit has been moved to a different part of the Centre, and the ceiling height is restricted, thus prohibiting aerobatics. Nevertheless, the 15 foot radius circle will provide plenty of fun for scale, sport or combat enthusiasts alike – and there will be valuable prizes for the best Senior and Junior scale models flown.

This year there will be set periods throughout each day scheduled for electric R/C cars who will be sharing the same circuit – so it is advisable for all those wishing to fly to advise the Editor in advance of the day of their intended visit. Those who prebook will be given priority. The circuit does get busy – so please make sure that your model is ready to fly and refrain from bringing models that require a complete pylon re-wiring job. We will be using the trusty Harry Butler (Models) equipment – complete down to that concern's miniature 2 pin plug for model connection – so please be prepared.

US INDOOR team for the Romanian World Championships in 1978 will consist of Jim Richmond (40:23+ 42:06), Bill Hulbert (36:58+36:44) and Don Domina (36:30+37:47). That flight of 42 minutes 6 seconds by Jim Richmond (9th in 1976) looks like being a new World Record for models under the current FAI rules, and represents a tremendous achievement.

MODELLING HOLIDAY SUCCESS. More than 2,000 modellers and families attended a week of continuous modelling activity at Pontins Holiday Camp at Brean Sands, Burnham-on-Sea, Somerset in October – a venture which was staged in association with Model and Allied Publications Ltd. Not only were modellers of every calling able to follow their particular hobby, they could also learn just what it is that interests enthusiasts for different subjects. In the evenings, the traditional Pontins' entertainments were available to all in the form of dances, cabaret acts and games.

In all, an overwhelming success – its popularity being underlined by the fact that already two more such off-peak holidays are under consideration for 1978, with half of the first one already sold!

PLANS HANDBOOKS. Stocks of these ever popular catalogues for *AeroModeller* Plans and Scale Drawings are temporarily exhausted. A new, revised and updated catalogue is in the process of being produced, and should be available around mid-December.

DATE for Rally organisers in future has been announced by the Secretary of State for Employment – albeit unwittingly – when he stated that from 1979 the first Monday in May will be the official May Day Bank Holiday in England, Wales and N. Ireland. The Scots already enjoy this Bank Holiday, but not to lose advantage, the Secretary of State for Scotland has said that from 1978 the last Monday in May will be designated a Holiday for Scotland. All we need now is for enterprising organisers to set up events to use the long weekend.

Recently retired from the Editorship of our sister journal Model Engineer, Martin Evans has just produced another book on his favourite subject. 'Model Engineering' (published by Pitmans, and retailing at £7.95) is a superbly produced and printed volume, aimed mainly at the novice, and giving clear advice and information on all related topics. In addition there are many excellent pictures of model subjects - from traditional 'locos' to Romany caravans.

RTP 4

a quartet of designs for electric round-the-pole flying by Sandy Evans

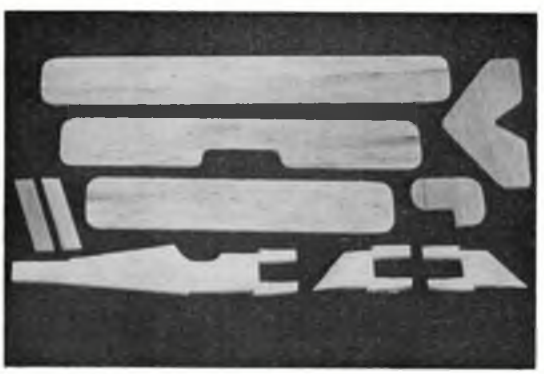
The original models were designed for use in a school club, so with this in mind the model club of the Campion School, Bugbrooke, Northants was approached to appraise the aircraft. The start of a new term brought forward an intake of 11-12 year old pupils with no prior knowledge of RTP flying. However, several versions of each model were successfully built and flown as may be seen in this picture. Several options are shown on the plans, but in general, the youngsters preferred the wing mounted undercarriage as this proved easier to fit, and the fuselage tether hook gave far better control over trimming than the wing tip tether.

THE IDEA of forming a school electric RTP club gelled following reading various articles on the subject, and due to the interest many of the boys expressed in such an activity, coupled to their desire to design and manufacture their own model aeroplanes.

Having had a keen interest in aircraft all my life, I really needed very little stimulus to start looking into the possibilities that were open to us. With access to the school hall until well into the evenings, and consequently no need to be concerned with weather variations, it was natural to settle for the RTP concept. The equipment used in our first attempts were a pole made from dowel and copper tubing, a much repaired Keil Kraft *Pixie* the motor from an old racing slot car and a twelve volt transformer. This combination of antique and superannuated equipment, when wired and fixed together actually, to my amazement, put the *Pixie* into the air!

This success led to the mass production of small, flying-scale models built by the boys – the trouble was that they all wanted to fly their aeroplanes at the same time as each other, and it rapidly became clear that our basic arrangement was not adequate for the demands being put upon it.

A set of parts for the Triplane version reveals the small amount of work necessary. These models form an ideal introduction to aeromodelling - success is virtually guaranteed.



It was about this time that I made my first contact with Harry Butler (Models). This was at the Model Engineer Exhibition and it was he who put me onto the right lines that, finally, solved all of our problems. With financial help from the school, and Mr Butler's advice, we were able to purchase two dual head poles, the correct tether wires and, most importantly of all, a transformer that gave the required voltage. With this equipment we had an arrangement that consisted of two 15ft radius flying circles, each able to handle two models simultaneously, thus solving the problem of boys having to wait to fly their planes.

The boys, of course, soon became bored with flying their scale models round and round in circles, so combat flying arrived on the scene – not that they had any desire to cut streamers from their opponent's aircraft . . . they flew them until all that would be left was a pile of balsa-wood splinters! My task, during these early days of combat flying, consisted of setting up the equipment and spending large amounts of time (and a fair amount of money) keeping them supplied with models. Many and various were the kits we tried; some giving better service than others, but all having the same disadvantage of being too expensive.

With many of the boys wishing to take part, not only in the flying but also in the building of the models, it became clear that unless an economical solution was arrived at very quickly, the club would end before it had hardly begun. We needed a cheap, easily constructed stunt fighter to be used by boys with no special gifts in either craft skills, or model control and manipulation. We had also decided, by this time, that most of our models were too large, creating the problem of easy and rapid destruction as the boys never missed when combat flying, and subsequently problems arose as to where to find enough space to store the remains.

Experiments started with models having wing spans of no more than 12ins. The first attempt was to scale down the profile models of the Spitfire and Messerschmitt,

Motors may be mounted upright or on their side - but make sure that air is able to flow through the metal 'can' to cool the armature and prevent premature motor failure. See plans for details.

fitting them with Mabuchi FT 26D motors. The resultant model was only a partial success, flying well in fixed, level circuits but not responding quickly enough to voltage variations through the hand controller. To give better dive and climb performance the second attempt was a biplane, again of 12in. wing span, and once more fitted with a Mabuchi FT 26D motor. This model was extremely manoeuvrable. responding well to voltage changes, having a very rapid climb and dive that were controllable – both essential qualities for the type of model that we were envisaging.

The true test of whether we had a workbable design was to allow the boys to fly the biplane. Unfortunately (or so we thought at the time) the first boy-controlled flight met with an accident. The model went into a very steep and rapid climb colliding with the ceiling of the hall we were using for our club activities, separating the top wing from the fuselage. One of the boys launched the remains, we having walked away for a wound licking session. To my astonishment the resultant monoplane performed even better than its progenitor, being much more controllable in flight while still retaining its climb and dive capabilities. Our search was over; I had the 'plane' and at a few pence per unit, an unbeatable bargain!

The success of the venture led us to develop the monoplane and, after further experiment, we now have the example shown in the plans. Development also was carried out on the biplane: this model is, with trimming, capable of being fully aerobatic and will loop as well as perform all the usually required feats of such an aeroplane.

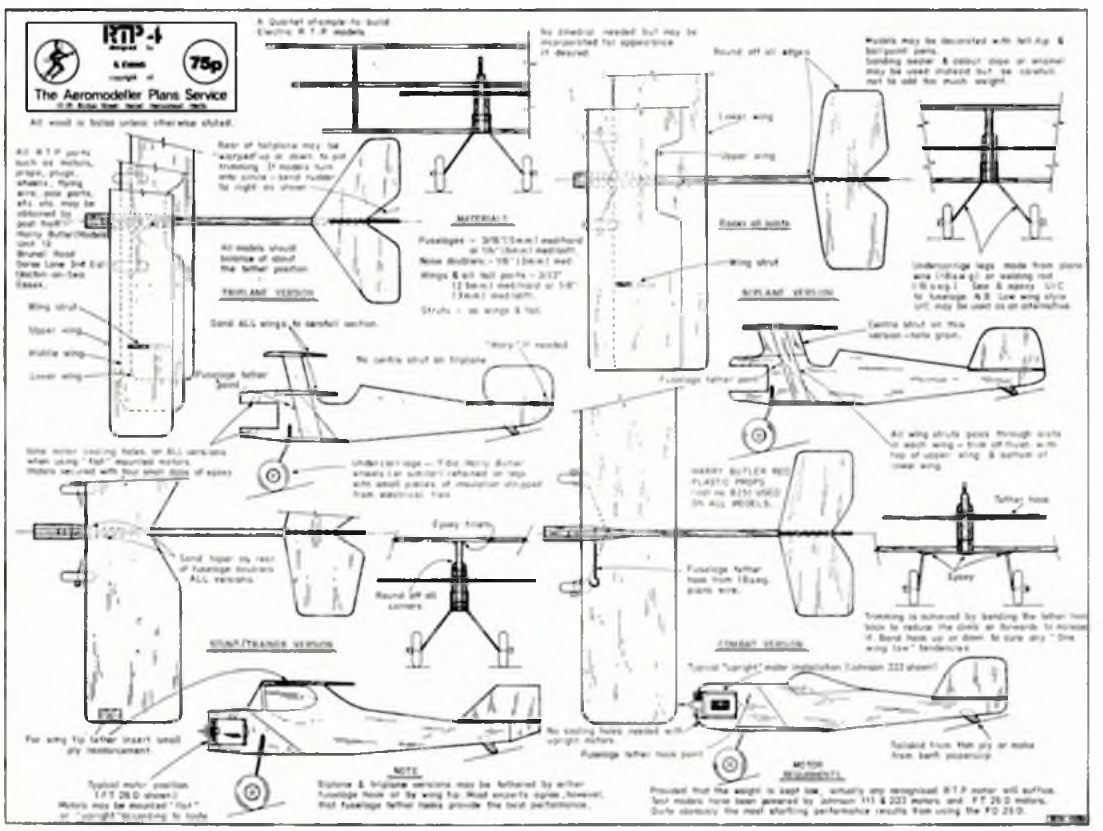
Construction

Lay tracing paper over the plans and carefully copy out all the parts. Then, pin to the balsa wood with carbon paper in between, and draw around them to transfer the shapes to the wood. Use a sharp balsa knife to cut out all the parts.

Sand doublers to shape, and glue in position on the fuselage. Shape the wings to an airfoil section; likewise sand down the tailplane and fin. When the cement holding the doublers to the fuselage has fully set, sand down all the rough edges on the fuselage.

continued on page 730

FULL SIZE COPIES OF THIS 1/6TH SCALE REPRODUCTION ARE AVAILABLE AS PLAN NO. RTP 1329, PRICE 90P (INCLUSIVE OF POSTAGE AND VAT) FROM AEROMODELLER PLANS SERVICE, PO BOX 35, BRIDGE STREET, HEMEL HEMPSTEAD, HERTS HP1 1EE.



AIRCRAFT DESCRIBED No. 233

SORRELL HIPERBIPE

Described by Ron Moulton, drawn by A. A. P. Lloyd

THE IDEA of utilising fuselage bulk as a lifting surface is not new, nor is negative stagger, or full span flap/ailerons, or composite construction. But throw this combination of less orthodox approaches together in a home built design like the Sorrell SNS-7 and the result is something that takes a while to get used to. We saw it perform at the Abbotsford Air Show and it rates along with the Colomban *Cri-Cri* and Rutan *VariEze* as a showstopper.

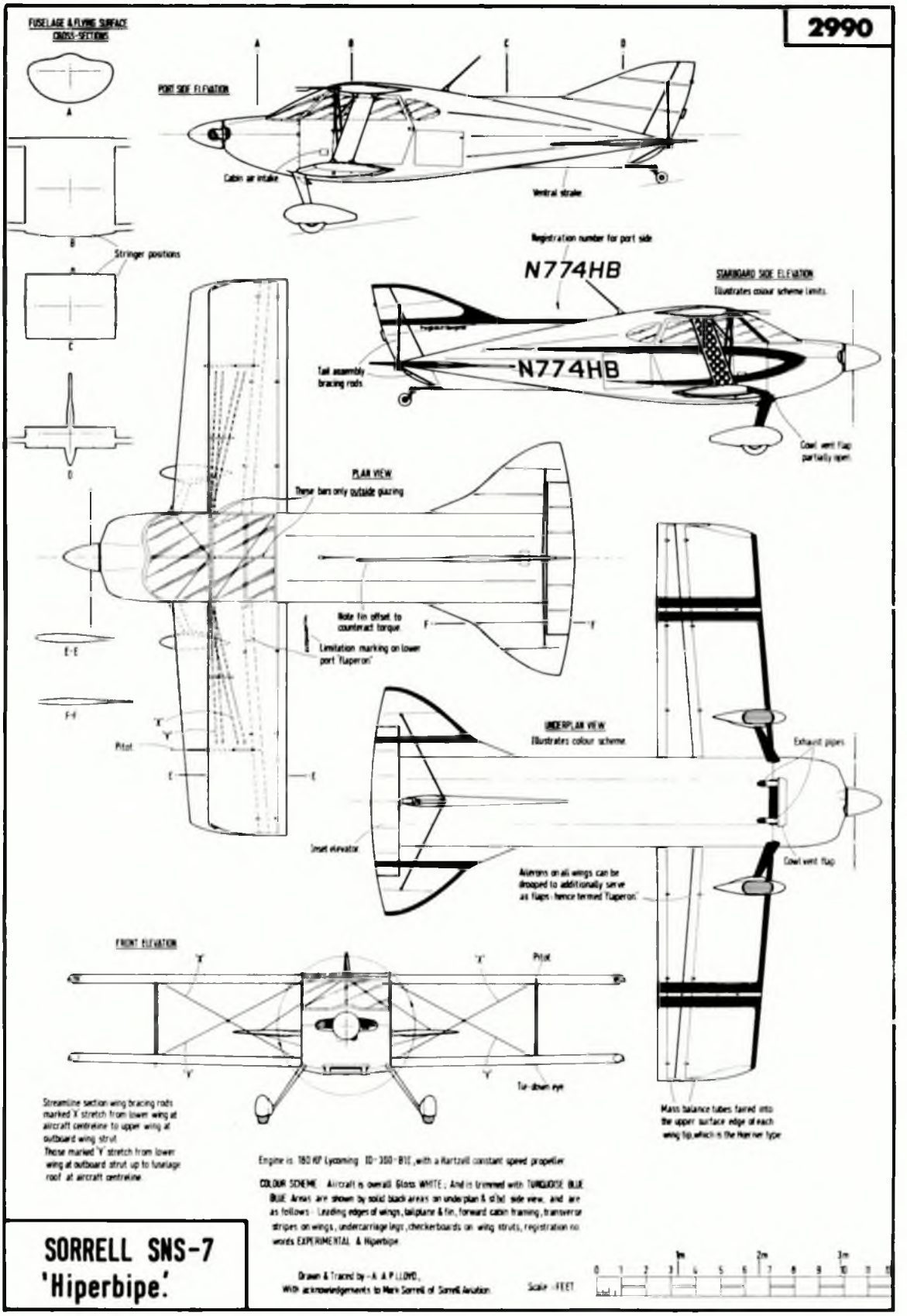
Each of its features has purpose. The slab of an aerofoil fuselage is as wide as a car, so the seating is decidedly more roomy than average. It is easily made, with tack-welded steel tube sides separated by constant length crossbraces, and it feathers down to the powerful elevator which acts like a deflector. Tail surfaces are ogival delta, curvy in outline and somewhat plain in the way they butt to the fuselage. One might have expected deep fairings, but Mark Sorrell assured us they are not needed. The wings follow the traditional 'swept and straight' pattern, only upside down! The forward (lower) wing is the swept one, and it fits snugly out of the way for easy door access while the straight (top) wing has a transparent centre to form the large cabin roof. Unlike the rest of the airframe the wings are wooden, with ply ribs wrapped by an ⅛in. mahogany ply skin. Symmetrical and thin, they are clean as a whistle and having the top surface extend over the lower allows the fabric to form its own concave tip section. Flaperons run from fuselage to tip on all panels. Each has a torque tube leading edge so that leverage is direct and all four control surfaces can be drooped while still permitting aileron action. It is this feature that makes the Hiperbipe an aerobatic tourer with docile landing speeds and short field characteristics. Spring steel rod landing gear and sleek spats couple with a very neat cowl to complete what has already become a 'modeller's subject' for scale flying.

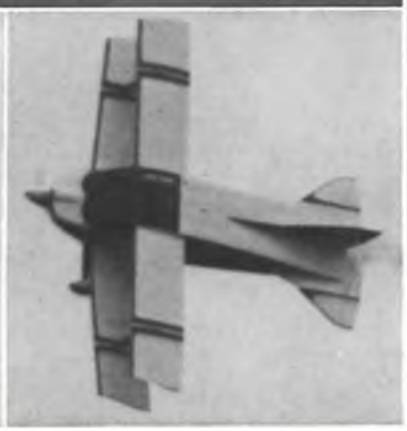
As an aerobatic mount, it has few peers. Mark showed us vertical rolls, the famous Lomcevak, prolonged inverted and loops with a snap roll at the top. For the tail slide and stall turn it pours smoke to show a perfect pattern. Its shape makes it the talk of any show, and its performance confounds any critic.

Hobie Sorrell designed the Hiperbipe (HIGH PERformance BIPElane) in '73 when with sons John Mark, and Tim, he formed Sorrell Aviation. That year the SNS-6 won the *Outstanding New Design* award at Oshkosh and

Heading, the simple yet effective tip curvature is achieved by having fabric find its own shape between extended top, and clipped lower ply covering. Wings are very clean, as also seen at right with flaperons down for slow landing. There are no external horns, as torque tubes are controlled with fuselage. Mass balances fair into tip profile when neutral.

REPRINTS OF THIS FEATURE, PLUS 1/24TH SCALE DYE-LINE PRINTS ARE AVAILABLE AS PLAN PACK 2990, PRICE 35P PLUS 10P POSTAGE FROM AERO-MODELLER PLANS SERVICE, P.O. BOX 35, BRIDGE STREET, HEMEL HEMPSTEAD, HERTS HP1 1EE.





The tooled leather seats and wall trim together with the plush fabric lining and superb mahogany veneered instrument panel, combine to make the Hiperbipe a very comfortable and roomy tourer - more akin to the interior of a luxury limousine. Flight shots of a stall-turn and knife-edge pass show the large untapered fuselage and general straight-line styling.

ar from resting on their laurels they set about improvements for the SNS-7.

Seldom has a home built prototype made such an impact in a scene where the radical or unorthodox approach is the norm. One can so easily find home built aeroplanes at the EAA fly-ins which are bizarre to the point of being just deliberately 'different'. But the Hiperbipe is in a class of its own. It rivals the Pitts for aerobatics, tours better than a commercial 180 'spamcan', is more comfortable than a quality car, and is better made than even those glossy 'specials'. Only the steerable tail wheel is incongruous but that's an essential for the excellent ground handling.

All of which adds up to a DGA (Darned Good Airplane) in the American vernacular, which has already attracted scale modellers and kit manufacturers.

The original colour scheme of gloss white with turquoise blue trim and registration is not the easiest to reproduce in small scale pin striping, nor are the streamline wires simple for the purist but otherwise it's a perfect subject for points scoring in scale competitions.

SPECIFICATION

Span;	22ft 10in	*Cruise;*	150 mph
Chord;	3ft 3·9in	*Max level speed;*	172 mph
Area;	150 sq.ft	*Stall (with flaps);*	49 mph
Length OA;	20ft 10in	*Ceiling;*	20,000ft
Tailspan;	9ft 5in	*Take off run (S/L);*	400ft
Propeller;	6ft 4in dia	*Landing run;*	595ft
Wheeltrack;	7ft 1in	*Range;*	502 miles
Weight;	1236lbs		

The port-side carries the door, which fits so well it is very hard to detect! Tubular landing gear legs are cleverly faired over while the use of a long spinner suits the clean, smooth, cowling lines. Excellent all-round visibility is available, thanks to the fact that the narrow chord lower wing obscures only a small zone. All the glazing is tinted black for anti-dazzle purposes.

topical twists

by 'Pylonius'
Illustrated by Sherry

Plane Speaking

One of the most depressing aspects of aeromodelling today is how sedate and uncontroversial it has all become: the trade-fed hordes accepting the rich and glutinous commercial fare with only an occasional hiccough to punctuate the boring succession of satisfied grunts. All are narcoticised with liberal injections of glistening 'goodies'; most of them to the point where the actual flying is just too much of an effort. It is safer and perhaps wiser, they feel, to sit at home and gloat over the electronic and plastic wonder of it all rather than to goad an already infuriated public into even more violent reaction. Do not ask for whom the decibel tolls, it tolls for thee.

Where, we may ask, are the fierce hobbyists riding wildly across the scene on their rampaging hobby horses, or the hair-shirted protagonist ready to lay down his reputation on the shape of a fin or a few disputed inches of propeller pitch? And where are the new heroes to replace the fading few? The new O. Winnalls uprist? The only names that now blazon forth are those on the adverts. It is not now so-and-so's design but a Whacko Product Glider. And if there is no individual voice crying in the wilderness it is because there is no more wilderness to cry in – or fly in come to that.

You can say the most outrageous, provocative things without getting as much as a nibble of protest in return. It is all very depressing; just one grey sea of apathy with not a single pirate flag a-showing. All you now get is pap both inside the wing and out, and the level of discussion is as plastic as the reddi-made fuselage. It is enough to make you take up hang gliding. At least you would be breaking new ground, if not that neck you have been sticking out for no good reason.

Where at one time the pundits would argue on such deathless issues as dihedral versus polyhedral (most people now would take it to be a Welsh family quarrel) they now coolly debate the merits of the latest radio equipment and what's new in glass fibre components. If, on the flying field, you see a remarkable piece of gadgetry, the proud owner will not tell you how he devised it in the workshop but from what source of supply he shrewdly obtained it.

We sigh for the days when the result sheets proclaimed the name of the model, be it a skittish *Fatso* or a lofty *Icarus*, instead of whether it be R/C, I/C, FIB or FIC, and when the initials 'O.D.' meant 'own design' and not the winner of the contest. The only exception is the vintage contest, but it makes you wonder how the vintage flyer of the future will nostalgically describe his FIB. It is hard to give a name to something that is just an assemblage of parts rather than a completely individualised concept. How successful or otherwise you become today is largely a matter of how you put things together.

No Joke, Folk

When I started in aeromodelling I had little more than the clothes I stood up in (though after a liberal coating of cement they could stand up for themselves) and I was attracted to the hobby by the household nature of the tools and equipment needs – razor blades, drawing pins, greaseproof paper and other bits and pieces you do not necessarily have to pay for. The only essential piece of gear that involved any sort of expense was the building board, but as this was when wood was still wood and not yet a scarce commercial resource, the outlay was, even so, quite modest. It is true that a few people owned such exotic instruments as soldering irons and drills, but generally we were happy to operate on a corner of the kitchen table and still leave room for the family supper. There is even more room now, if still required, for as food has also become a scarce commercial resource, the average family can no longer afford supper.

But all the wonderful simplicity has gone. If you now want to be a true hobbyist rather than a toy shop patron you have to introduce into the household some of the more advanced technology:

"*Now, what've you done with me oxy butane soldering iron?*"

"*It's safe enough, and you don't have to use that sort of language. You left it in the bathroom as usual, and now the lavatory seat has got two holes in it.*"

Then there are the vertical drills. All very scientific, but when it comes to putting daylight through anything I belong to the old, primitive school of gougers. Nothing I find more absorbing than a half hour's steady gouging – a way of working a lot of aggression out of the system. Give me a drill and I'll be all over the place, with more perforations per square inch than a tea bag.

We can only sigh for the great heyday of balsa and tissue modelling when the production of simple but ingenious flying machines became something of a folk art, and now we all weep to see the old artisan skills being swept away by intrusive mechanised methods, and doing it so expensively.

Foam is the Spur

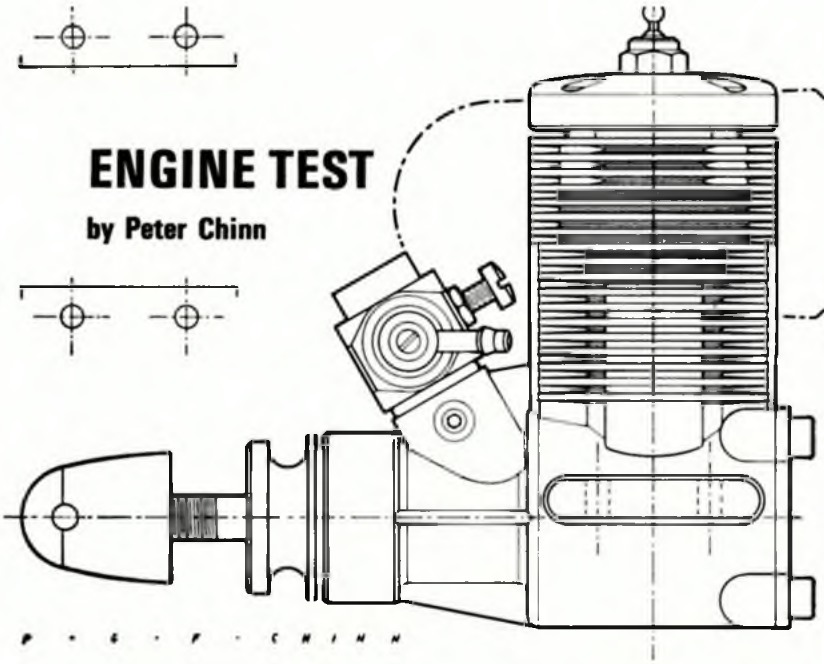
There is nothing designed to give you a greater inferiority complex than the parade of huge, super models that keep looming aggressively at you from the pages of the model journals. When we compare our seven ounce weakling products to these beefy, bulging monsters it is like having sand kicked in your face by the beach bully. What you get the urge to do, figuratively speaking, is to send away for your own set of model muscles, and you picture yourself standing proudly by your magnificent, airfield clearing, 12ft multi, surrounded by bikini beauties clamouring to pose with it, while the 6ft span nonentities look on in envy.

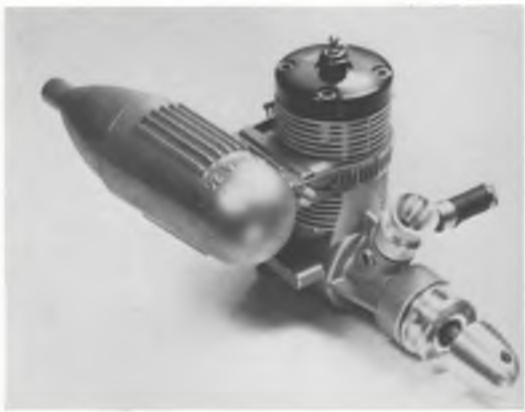
That is the general picture, but I begin to have my suspicions. For instance, you never actually see these super models on the flying field, let alone above it. It could be that they are all clever mockups, calculated to excite our envy and to arouse our competitive spirit, so that we rush out to buy the biggest and glossiest kit we can find, plus a couple of sledgehammers to knock out the end wall of the kitchen.

Then you come to open your Atlas kit, to find what? Only cardboard and foam; what all the best models are being made of these days. It is rather like those old movie sets of Babylon – all lath and plaster. Possibly if one of those super models were to get airborne it would just dissolve in a shower of paper and plastic crumbs.

ENGINE TEST

by Peter Chinn





WEBRA SPEED–20

SPECIFICATION

Type: Single-cylinder, air-cooled, glowplug-ignition, Schnuerle-scavenged two-stroke with crankshaft rotary-valve and twin ball bearings. Standard venturi and jet assembly interchangeable with throttle type carburettor. Silencer extra.
Bore: 16·5mm (0·6496in.)
Stroke: 16·0mm (0·6299in.)
Swept Volume: 3·421cc (0·2088cu.in.)
Stroke/Bore Ratio: 0·970:1
Measured Nominal Compression Ratio: 9:1
Checked Weights: 219g - 7·7oz (std intake, less silencer)
262g - 9·2oz (std intake, + silencer)
235g - 8·3oz (TN·20 carb, no silencer)
278g - 9·8oz (TN·20 carb, with silencer)

GENERAL STRUCTURAL DATA

Pressure die-cast aluminium alloy one-piece *crankcase/cylinder-casing/main-bearing housing* with detachable *backplate*. Hardened and ground counterbalanced *crankshaft* with 12mm o.d. main journal, 9·2mm i.d. gas passage, 5mm o.d. crankpin, 7mm o.d. front journal and 6mm o.d. propshaft length with M6×1·0 thread. Shaft carried in one 12×24mm 10-ball steel caged *ball journal bearing* at rear and one 7×19mm 8-ball brass caged *ball journal bearing* at front. Drop-in hardened steel *cylinder liner*. Lapped cast-iron *piston* with flat crown and plain skirt and fitted with 4mm solid *gudgeon-pin*. Forged aluminium alloy unbushed *connecting-rod* with oil slits at both ends. Plain non-finned machined aluminium alloy *cylinder-head* with black anodised finish and tied to cylinder with four 3·5mm Allen cap screws. Machined aluminium alloy *prop driver* fitted to shaft with steel split tapered collet. Machined aluminium alloy *spinner nut*. Webra TN·20 *carburettor* having machined aluminium body, steel throttle barrel and separate low-speed mixture adjustment. Carburettor interchangeable with machined aluminium alloy *venturi intake* having brass needle-valve and jet assembly.

TEST CONDITIONS

Running time prior to test: Approx 1 hour.
Fuel used: 5 per cent nitromethane, 20 per cent castor oil, 75 per cent methanol.
Glowplugs used: Webra long-reach, as supplied.
Air temperature: 19°C (66°F).
Barometric pressure: 1020mb (30·12in.Hg).
Silencer: Webra-20 expansion chamber, P/N 1100/13. Outlet area 25sq.mm.

THIS NEW MOTOR was first announced in February this year as the replacement for the Webra Glo-Star (more recently also known as the Webra 20) which first went into production at the Berlin Webra factory in 1964. The Speed-20 has the same bore and stroke as the Glo-Star and, like the older engine, has twin ball-bearings but, in practically all other respects, it bears little resemblance to its predecessor.

As its name suggests, this new model comes from the Webra company's Austrian factory at Enzesfield where the Webra Speed 40 and Speed 61 R/C engines are made. Like these bigger models, it is a modern Schnuerle scavenged design and, with its full-length cylinder finning, is easily recognised as a member of the Webra-Speed family. In general design it is closest to the Speed 40, using, as it does, a one-piece body casting (instead of one with a detachable front end like the Speed 61 motors) and in having the carburettor interchangeable with a simple machined venturi having a side mounted jet assembly for use where a throttle is unnecessary. This actually is the *only* difference between the standard and R/C versions of the engine.

The main difference between the Speed 20 and its bigger brothers is in its use of a lapped cast-iron piston instead of a ringed aluminium one. Cylinder porting follows the usual Schnuerle pattern with the fore and aft transfer ports (angled approximately 20° upwards as well as away from the exhaust) supplemented by a steeply inclined (20° to the cylinder axis) third port diametrically opposite the exhaust. The exhausted port opens at 75° before BDC, leading the main transfer by approximately 14° and the third port by 16°. The combustion chamber shape follows the now widely used bowl-and-squishband pattern, the head having a sloped squishband, 2·6mm wide, surrounding an 11·3mm diameter bowl.

Like other recent high performance engines in the 3·5cc class, the Speed 20 has a 12mm o.d. crankshaft but this is noted for its exceptionally large bore gas passage of 9·2mm i.d. Gas is fed through a rectangular rotary valve port that remains open for 190° of crank angle, closing at 50° ATDC.

The Webra-20 silencer is a conventional pressure diecast aluminium alloy expansion chamber. It has a

volume of approximately 40cc and an outlet area of 25sq.mm. It has a screw-in brass outlet nipple at the rear of the entry duct for the purpose of pressurising the fuel tank and is secured to the engine with a Serratus worm-drive hose-clip type strap.

Performance

Our test motor came direct from the manufacturer prior to its release in export markets. The German leaflet accompanying the engine recommended a fuel containing between 3 and 5 per cent nitromethane and 20 to 25 per cent lubricant. After running-in on a 75/25 methanol/castor oil blend, the engine was tested on our standard 5% nitromethane test mixture.

All performance testing was carried out with the Webra TN-20 carburettor fitted. This is a smaller version of the well-known Webra TN carb as used by various Webra 61 and 40 engines over the past ten years. In the form used for the Speed 20, it has a quite large effective choke area of some 17sq.mm. When the standard venturi is fitted, the effective choke area is increased to about 21sq.mm, although this can be varied between about 14sq.mm and 23sq.mm, depending on the position of the jet tube which can be screwed in or out, thereby varying the balance of fuel suction versus power output. It may be assumed, therefore, that with the jet located for maximum power, the performance with the standard venturi will be slightly better than with the TN carb. We estimate that the peak brake-horsepower would be increased by up to 5%.

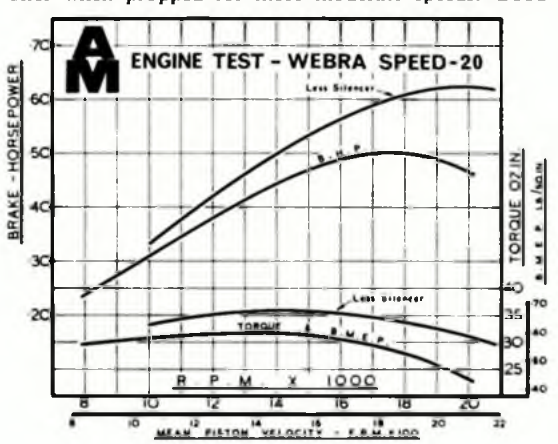
The Speed 20's overall handling and running qualities were very good. The engine started easily by hand on all appropriately sized props and the throttle worked well with (after adjustment) safe idling down to as low as 2400 rpm. There was a slight power loss on warming up when the Webra was loaded for speeds below about 14,000 rpm but at higher speeds the engine became steadier. Although the Speed 20's cast-iron piston is not as light as some, vibration levels were no more than average for glow motors of similar displacement.

According to Webra advertisements, the Speed 20 develops its maximum power at around 16,000 to 16,500 rpm. Our tests indicated that the engine's peaking speed was far higher than this. Even with the silencer fitted, our sample was peaking at between 17,500 and 18,000 rpm. With the silencer removed, the peak was reached at just on 20,000 rpm. The Speed 20, in fact, is essentially a high speed unit. Maximum torque on test was shown at around 13,000 to 14,000 and although, even at these speeds, performance is far in excess of the levels obtainable with the old Glo-Star, it is only when the engine is allowed to unload to speeds above 16,000 rpm (with silencer) or 18,000 (less silencer) that its true potential will be revealed.

This is not to say that the Speed 20 has nothing to offer when propped for more moderate speeds. Good performance is available on a wide variety of props as the prop rpm figures obtained will confirm. These included 10,800 on a 9×6 Taipan glassfibre-nylon, 11,200 on a 10×4 Taipan, 11,700 on a 9×4 Tornado nylon, 12,200 on a 9×4 Top Flite nylon, 13,600 on a 9×4 Taipan, 13,400 on an 8×6 Taipan, 14,200 on an 8×6 Power Prop wood, 14,300 on a 9×4 Taipan cropped to 8¼in.dia, 14,900 on a 9×4 Taipan cropped to 8¼in.dia, 16,200 on a 7×6 Taipan, 16,600 on an 8×4 Taipan and 17,500 on an 8×4 Cox. All these figures were obtained while using the Webra 20 silencer which, incidentally, is quite effective, at a cost of between 500 and 1100 rpm on the props mentioned. (Incidentally, a slightly longer propshaft, offering more threads, would be better for use with the thicker hubs of 6in pitch props.)

For purposes of comparison with other engines of around ·20cu in previously tested, the Speed 20 was dynamometer tested both with and without its silencer and, as the curves show, a gross output of over 0·62 bhp at 20,000 rpm was recorded in the open-exhaust condition. This is very good indeed. It is well over twice the power output obtained with the original Glo-Star of the same displacement and is about 75% above typical 'sport ·19' levels of performance. Admittedly, the Speed 20 is only one of four new Schnuerle scavenged high performance 3·5cc class engines (a class that has recently begun to develop rapidly as a result of the demands of R/C model car racing) at least one of which is known to have even higher performance but, so far as the AM Engine Test series is concerned, the Speed 20 is the most powerful 3·5cc unit featured to date.

Power/Weight Ratio (as tested):
0·82 bhp/lb (with silencer)
1·20 bhp/lb (less silencer)
Specific Output (as tested):
146 bhp/litre (with silencer)
183 bhp/litre (less silencer)



THE FREE FLIGHT SCENE

this month:

MIKE FANTHAM

John O'Donnell looks on as an interested flyer examines his new A/2, which features a 6in. chord, silk and Modelspan tissue covered wing and melinex covered tail.

MIKE FANTHAM'S HAND LAUNCHED GLIDER

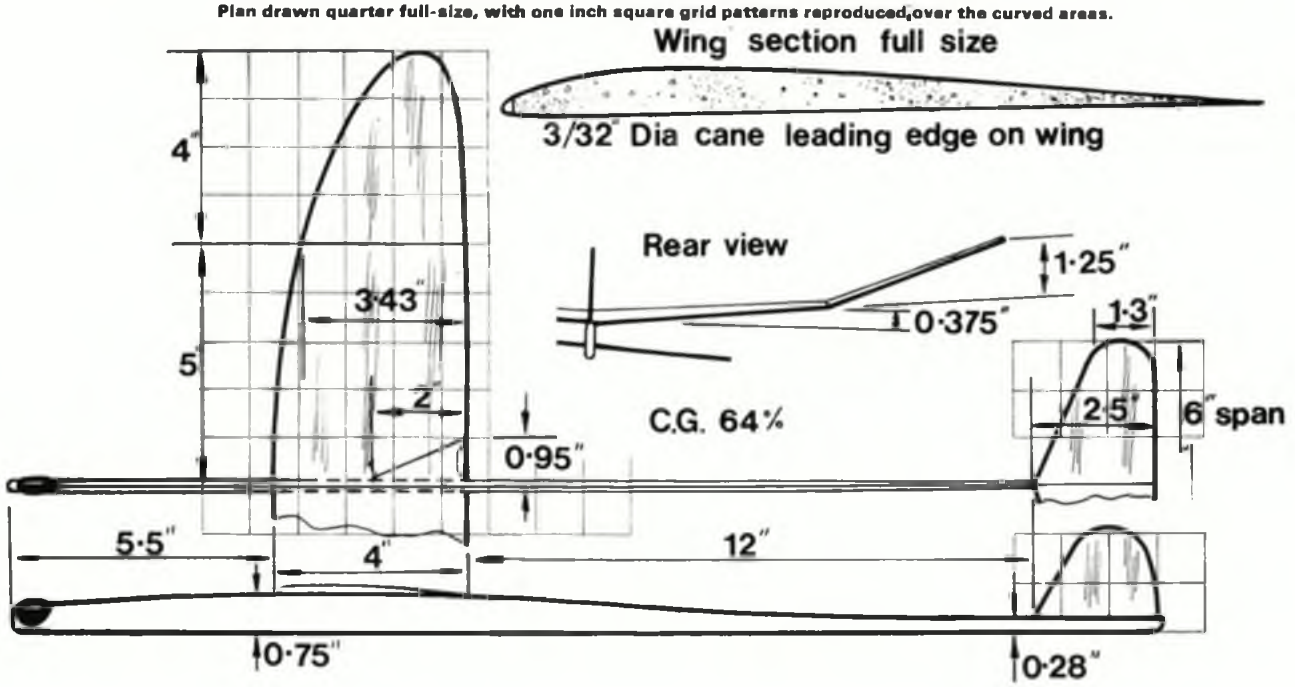
This is the model which took second place at the Outdoor Nationals, reported last month – it also has two Indoor Nats third places to its credit. The design owes quite a lot to Tony Slater's *Starmi* which is an APS plan, published in the December 1967 *AeroModeller*. That's ten years' development for you! When everything is just right I can do about 58 seconds with this model indoors, but times are usually 50-55 seconds. I had an amazing series of test flights at Cardington with five consecutive 60 second plus flights, the best being 65·5 seconds, but these must have been in 'lift'.

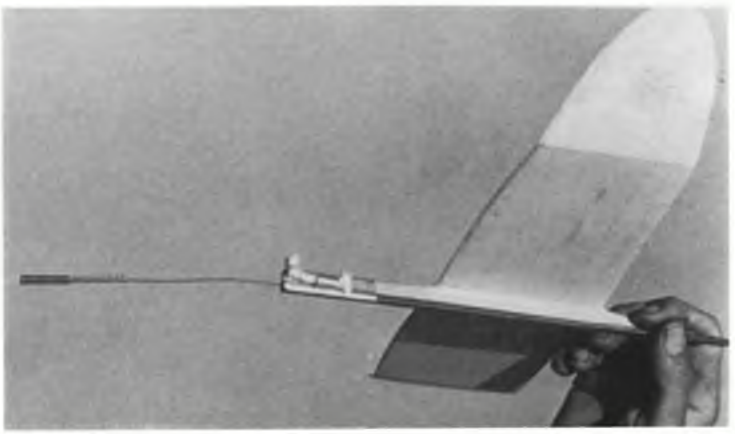
The flying surfaces are from light quarter grain balsa with $\frac{1}{32}$in for the wing and $\frac{1}{16}$in. for the tail surfaces. The fuselage is from $\frac{1}{16}$in. straight grain medium hard balsa tapered to $\frac{5}{32}$in. at the tail leading edge. The surfaces are rigged with the flat lower surfaces parallel, i.e. 0°–0°. The tail section is similar to the wing and the fin has a symmetrical aerofoil. The fin is set with about 1–1$\frac{1}{2}$° offset to give a left glide turn. The tail is tilted parallel to the left inner wing panel again for left turn. The finger grip fitted to the right wing root is from $\frac{1}{4}$in. medium balsa and shaped for a snug fit on the forefinger of the right hand. This model weighs 0·85oz and is finished with two coats of 50% sanding sealer–50% thinners on the fuselage and tail surfaces, with three on the wing. The model is intended mainly for indoor use and has light finish and no dethermaliser fitted – stronger flyers can use larger models than this. The world record is held by a 22in. span model flown by American Ron Wittmann.

HAND LAUNCH GLIDER DETHERMALISERS

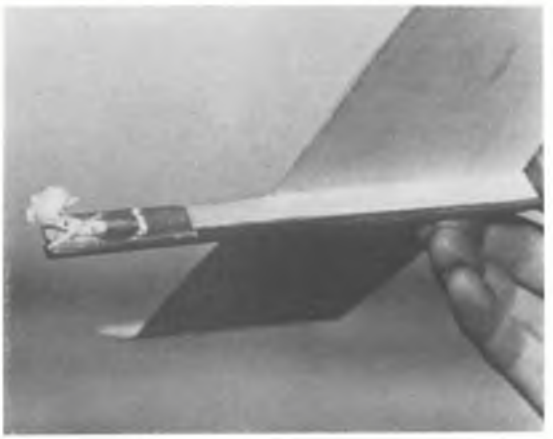
Most types of free flight model have settled down to using a tip up tail device to increase the rate of descent and bring the model down from upcurrents or thermals which would otherwise carry them away. The position with hand launched gliders is not so clear because the weight and complexity is a problem on these relatively small and light models. Dethermaliser timers of the clockwork type are too heavy at 0·75oz for a model which is probably less than 2oz in most cases (mine are usually around 1–1$\frac{1}{2}$oz for outdoor use). Tip up tails of the normal type are not practical because of the problem of making a sufficiently rigid mount/hinge system that is very light; the last thing we need is excess weight at the tail end since more nose ballast must be added to balance it. Tip up tails become practical if the hinge is extended to be a large proportion of the tail span. A set-up of this type is shown on the photograph of Bob Boyer's model from California. In this case the rear 2/3 of the tail pops up on a full span tape hinge which is stuck to the top surface. The tape is thicker than ordinary *Sellotape* and I believe it may be Vinyl. Two layers of *Sellotape* would probably do well as. I have examined the model, which was brought back from an American trip by clubmate Kevin Brown, and the joint seems quite satisfactory and rigid. Pop-up force is provided by a torsion spring wire which bears on a ply strip beneath the tail, and this also provides a bearing for the incidence screw. The system is timed by a fuse which is fitted at the nose (see *Figure 1*).

Plan drawn quarter full-size, with one inch square grid patterns reproduced over the curved areas.





Another type of chuck glider D/T system and one which is new to me was seen at the Southern Gala on a model by Dave Knibbs of the Falcons Club. The best way to describe it is as a 'pop-out noseweight', and its effect is to move the centre of gravity forward and cause a steeper glide or spiral dive. The effect is controlled by changing the distance that the CG moves; the further, the more violent the manoeuvre! The weight is mounted on a piece of tennis racquet gut, and it is important that this should be rigid enough to hold the weight away from the nose and not just let it hang down. A stop is provided by a nut which is a wedge fit inside the fuselage tube and the end of the gut is melted into a lump, large enough to prevent it from coming right out. The force of the spring acting against the nut inside the tube pushes the weight out. A rubber band and fuse retain it in the normal flight position.



Above left is the rear-end of Bob Boyer's chuck glider. The pop-up tail dethermaliser has a vinyl tape hinge and screw incidence adjustment. See text for details. Pictures above show the pop-out nose weight dethermaliser used by Falcons member Dave Knibbs on his chuckie - or rather hand launched glider if you prefer to be more polite! Nice to see the good old fashioned D/T fuse being employed on these more refined projectiles.

Figure 1. Bob Boyer's chuck glider D/T - nose of model shown.

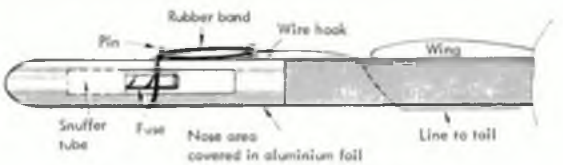
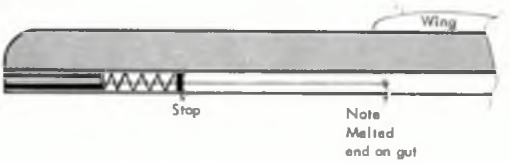
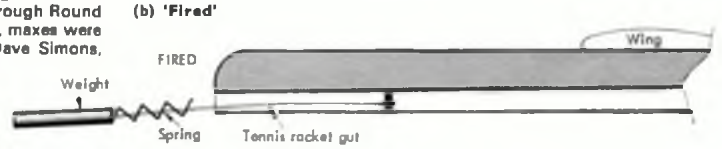


Figure 2. Dave Knibb's chuck glider D/T - nose of model shown.

(a) 'Loaded'



(b) 'Fired'



INDOOR CHUCK GLIDER CONTESTS IN 1978

In order to try and get some more interest in indoor chuck glider flying, four members of the Richmond Club, including myself, have been thinking of holding a series of contests at Cardington next year . . . if it is available. The idea is to run a series of, say, four contests with a flyer's best three results to count toward an overall Trophy which will be donated, possibly by an American Hand Launch Flyer or Flyers. We have a tentative promise of some support toward prizes from the trade too. Contests would be run in categories with Novice and Junior classes, as well as 'Open'.

It is important to note that in spite of the vast size of the Shed at Cardington, it is still quite easy to hit the walls with an untrimmed model. I would strongly advise any flyer who is serious about this event to get models fully trimmed on a calm day before attempting to fly in the Shed as models can easily be lost and broken in the side girders. The shed is about 150 feet wide so you should be able to fly within an area about the size of a football pitch without the model going over the boundary. When you can do that consistently by always launching from the same spot and in the same direction, you will be ready for the real thing.

So watch this space. Select some wood and get ready to build and train for next year. More news next month . . .

9TH EIFFEL POKAL – *Zulprich, West Germany, 27th–28th August – reported by Steve Marriott*

Fancy the prospect of an International competition for around £30 – including travel, food and entry fees? The idea was sown by German friends flying at the British Nationals – just one week before the contest in question. Two days later we received entry forms, and so the Friday of that week saw Messrs Faux, Hawkins, Simons and Mariott hurriedly packing to catch the night boat to France.

Following a mildly uncomfortable night's camping we arrived at the field near Bonn early next day. With the usual Continental practice of an afternoon start for their two day competition (three rounds on Saturday, four on Sunday) we spent the blissfully sunny morning sorting out our untrimmed models! The flying site proved to be a football pitch sized square with a wooden clubhouse, surrounded by maize fields and harvested corn fields. Although this made for hard work towing, retrieving was relatively easy.

We all made a good start in Round 1 once the organisers had decided on a position for the line. However, halfway through Round 2 the weather deteriorated and in the ensuing showers, maxes were harder to find. At the end of the day's flying only Dave Simons,

At left is a helper preparing to launch Hermann Motsch's A/2 for the final fly-off round at the Eiffel Pokal International - he placed second, dropping 36 seconds. Above may be seen the contents of the 'GB' car - namely (l to r) Messrs Simons, Hawkins, Faux and Marriot.

visiting from Australia for the World Champs, still had a full score among the GB Car, and so in the evening thunderstorm we retired to celebrate/commiserate with the Celle club gang in the local beer and schnitzel house.

Sunday dawned flat, calm and sunny. Preliminary cantering with a glider showed that at 8 am no precise wind direction could be found and as a result, the first round of the day saw a few tow-ins as the more unfit competitors ran out of steam (must cut down on beer consumption!). Maxes however were easy, and as the breeze picked up, strong thermals were marked by circling buzzards under well defined cloud formations.

At the end of Round 7 (around 2.30 pm) the fly-offs were limited to Power and Glider – Wakefield, as in the World Champs, proving too difficult for anyone to manage a full score. The standard of flying was nevertheless very high in this class.

In Power only two flyers, Heidemann and Ingenberg were left in the fly-off and which Thomas Heidemann eventually won by a narrow margin.

Glider was the most interesting with five still going; of these, most notable throughout was Hermann Motch whose recent success *Pierre Trebod* made him favourite. This was not to be, and with four of the five flyers still trying for five minutes, only Muller finally emerged unscathed. Motch was second and Dave Simons third. Dave's seven maxes were interspersed with plenty of near catastrophies and rapid repairs to his one model using 'Cyno' to keept it flying.

Generous prizes, contrasting very noticeably with the SMAE plaques on view for our German friends the previous week at our Nationals, were awarded down to fifth place and a superb team prize was also available for, may I suggest, a concerted effort by more GB flyers next year.

Our final conclusion, over more beer and schnitzels was that this was a competition which next year, the 10th and therefore special *Eiffel Pokal*, deserves another visit particularly in view of the welcome we received from the contest organisers and other flyers.

F1A (*56 flew*) 1. Muller (W Germany) M+240+300+300; 2. Motsch (W Germany) M+240+300+264; 3. Simons (Australia) M+240+300+228; 4. Kiehnle (W Germany) M+240+12; 5. Maiworm (W Germany) M+94. **F1B** (*15 flew*) 1. Nimptsch (W Germany) 1251; 2. Wagner (S Africa) 1249; 3. Schlesinger (W Germany) 1241; 8. Marriott (GB) 1145. **F1C** (*13 flew*) 1. Heidemann (W Germany) M+231; 2. Imgenberg (W Germany) M+201; 3. Borczewski (W Germany) 1206; 6. Faux (GB) 1097.

1978 INDOOR TEAM TRIALS – *RAE Cardington, 27–29th August – Reported by Bob Bailey*

August Bank Holiday Saturday was set aside for practice and proved cool and rather soggy, but there was a surprising amount of good air about. Many flew with half length motors and suitably ballasted models to aid trimming and comparative evaluation, since such flights last nominally half as long as those on full motors. However the transition back to 'full' motors is not easy – much flying on each is required to accurately correlate data.

Dave Pymm made over 20 and Ray Monks 19+ minutes with these half motors, so we were all wondering! Ron Green's new model went up and down in lift, had to be steered four times and landed with not one single turn left on the (full) motor – 39:20. Having achieved over 38 minutes the week before, he was not unhappy! I concentrated on getting some hasty rebuilds trimmed, which seemed satisfactory.

For the first contest day, the weather outside was good and conditions improved rapidly as Round 1 approached (12 to 3 pm). Laurie Barr quickly set the pace with a comfortable 35:15; many scored 30-32 minutes but hang ups caused headaches for many – self included. Colin (our favourite rigger) rescued my model, took off the motor and glided the model down – a brilliant achievement. Model safe with only two small holes – I was most grateful.

In the second round (2 to 4 pm) Laurie ensured himself a team place with 38:37 – no way could three others beat 73 minutes so the fight was really on for the remaining two places. Ron managed 33:51 while I made 33:49 after playing very safe this time (100 fewer turns and less torque to ensure missing the roof) while Derl Morley was well set with 35:26 from his model featuring an enormous (23in. dia) prop which revved so slowly.

Geoff Lefever's model seemed hell bent on drilling a hole through the roof, and hung up at 7 minutes. His model was rescued but the wing was badly damaged. With Steve Bennett's enthusiastic help and encouragement Geoff's wing was repaired accurately enough to fly well – a great bit of teamwork.

The third round (4 to 6 pm) warmed up a bit more – both tempera-

Dave Hipperson won the Flight Cup for Open Rubber at the Southern Gala - here he fits the prop prior to winning the 1976 event with the same model. Tony Young assists.

ture and contest-wise when Bernard Aslett achieved his best yet with 34:02. I went for more turns again and only just managed to keep the model clear for 36:15 – my own personal best. However, when Derl's model landed at 35:18 he relegated me to third by some 40 seconds. Laurie put his best model away, then promptly made 35:17 with a spare! In all, some 21 flights over 30 minutes were recorded on that day.

The weather for the all-important second contest day was better – promising even more. When Round 4 was well under way, a half hour's warning was given for opening the doors thus preventing some, including myself, from flying (34 mins+ required to improve). Various problems meant that it was not possible to shut the doors until 3.45 pm. Flying recommenced at 4 pm with both Rounds 4 and 5 to be completed by 5.30 pm, and Round 6 flights between 5.30 and 7.00 pm – rather a rush.

John Blount suffered the misfortune of having his model caught by someone else's balloon line, which then had two models on – his first flight was spoilt but he managed to grab the line and extricate both models. My fourth round flight was irritatingly short at 33:35 when apparently set for somewhat more (blame the air – it hadn't settled down).

After numerous problems, and rebuilding one fuselage out of two broken ones, Ron Green made a magnificent 36:57 in Round 5 to give him second place. Further disaster struck when the door had to be opened again at 6.40 pm. I tried very hard to get a last flight in and somehow hoped that the doors would not be opened but they were, right on time – and while my model was up in the roof. It got sucked towards the doors and nearly made it outside but disintegrated rapidly in the process and was impaled on a cross tie. The doors opened without any reminder warnings and wiped out a lot of models which had not been packed away. Poor Geoff Lefever was left with no flying surfaces whatsoever and several others suffered too – a very unfortunate end to a tremendous contest where 48 seconds separated 2nd–4th. Ironically my score of 70:04 would have sufficed for 4th at the last World Championships! A clear demonstration of just how much strength in depth GB has in FAI microfilm; our standard of flying has improved enormously in the last two years.

1.	Laurie Barr	St Albans	38:37+35:17=73:54
2.	Ron Green	St Albans	33:51+36:57=70:48
3.	Darl Morley	Grantham	35:26+35:18=70:44
4.	Bob Bailey	St Albans	33:49+36:15=70:04

15 Entries, 14 Scores

SMAE SOUTHERN GALA – *RAF Odiham, 11th September*

The weather forecast expected windy conditions, and this must help to explain the difference in numbers between the pre-entries and those who actually arrived and flew. As it turned out conditions were very pleasant with the wind never exceeding about 10 mph, and few flights outside the field.

Gary Madelin was flying in Open Glider after his recent Nationals win in A/2, but dropped a flight and missed the fly-off. He decided to fly A/1 but he discovered that he had left the wings at home! The solution? Easy . . . just drive 80 miles in an hour and a half to get them. Then do five maxes and get second place in the fly-off! In contrast, John O'Donnell travelled down from Manchester to have an uncharacteristically bad day. He was flying his new A/2, *Stowaway Mark 3*, in Open Glider, but dropped his first flight. In rubber he threw his open model into one of the biggest 'holes' I have ever seen and after a normal-looking climb to about 200 feet the model descended rapidly *under power* to have the propeller fold at about 50 feet! The final score 2:08! To add insult to injury, in A/1 John's foam core balsa-sheeted wing glider went off in straight stalls on the second flight, ending his chances in that event too.

Fortunately, Tony Cordes, John's clubmate and travelling companion, made their journey worthwhile by winning both the glider events. He won the A/1 fly-off with a useful flight in weak lift and took open glider with a 9:51 flight out of sight which cost him an A/2. In the Open fly-off, Pete Stewart started the action with a circle tow upwind and a flight which appeared to be 'in something' to start with but didn't tempt anyone else to have a go. Soon Martin Dilly started circle towing off to one side and I decided to do the same, thinking that any lift that was around would be weak, best detected by circle towing and best used with a zoom launch. It worked, I found the lift, but it was quite strong and my climbing model was soon joined by the rest of the field! Of the four of us who held the thermal, Bryan Spooner landed at 4:34 while Tony Cordes was holding height at about 300 feet. My model did not have enough D/T and came down from 600 feet into third place. Pete Bayram, the National's Open Glider winner, did the same trick about a minute later for second spot. Tony Cordes had about 15 minutes set on his *modified* timer and went OOS still flying. Well done Tony; Pete and I had better modify our timers too!

Laurie Barr gained his fourth consecutive indoor team place at the Trials held at Cardington. He heads a particularly strong British team.

Julian Hopper won both power events by clear margins. He dominated the Open fly-off with a great 7:16 from his '40' model and his 6:55 in '½A' was almost four minutes better than the next score. This should help to make up for his disappointment at the Nats.

The rubber events might have seen a double victor too but Open winner, Dave Hipperson, could only manage second place to Martin Dilly in Coupe d'Hiver. The timekeepers saw Dave's Open fly-off for 6:57 to give him yet another win in the *Flight Cup*. The model Dave used is a 300sq.in. wing job built in August 1965. He later told me its contest record. All its 14 contest flights have been fly-offs with only one less than six minutes. It has taken the *Flight Cup* four times, in 1969, 1970, 1976 and 1977 and this year's 6:57 is its third *worst* flight to date. Impressive!

The contest closed with the award of plaques to the winners by SMAE Vice-Chairman, John Jones. Amid the usual good-natured banter, John pointed out that he thought that the most important award of the day was the one for the top Junior, which went to Chris Parry. So come on you Juniors – let's see more of you on the flying fields.

Open Rubber (*31 entries, 18 flew – 6 in fly-off*) 1. D. Hipperson (Croydon) M+6:57; 2. T. Gray (Brighton) M+6:13; 3. T. Gray (St Albans) M+5:16. **Open Glider** (*54 entries, 37 flew – 12 in fly-off*) 1. A. Cordes (Whitefield) M+9:51; 2. P. Bayram (Richmond) M+6:52; 3. M. Fantham (Richmond) M+5:44. **Open Power** (*27 entries, 13 flew – 6 in fly-off*) 1. J. Hopper (Stanstead) M+7:16; 2. B. Peers (Falcons) M+4:32; 3. L. Burrows (Blackheath) M+4:15. **Coupe d'Hiver** (*11 entries, 6 flew*) 1. M. Dilly (Croydon) 10:00; 2. D. Hipperson (Croydon) 8:45; 3. I. Kaynes (Croydon) 5:12. **A/1 Glider** (*30 entries, 22 flew*) 1. A. Cordes (Whitefield) 10:00+3:47; 2. G. Madelin (Crookham) 10:00+3:24; 3. E. Tyson (Swindon) 9:58. **½A Power** (*28 entries, 15 flew – 5 in fly-off*) 1. J. Hopper (Stanstead) M+6:55; 2. P. Harris (Birmingham) M+3:05; 3. J. Fletcher (St Albans) M+2:57. **Hand Launch Glider** (*22 entries, 13 flew – best 5 of 9×1 min*) 1. J. Tipper (Lee Bees) 4:55; 2. P. Davies (Richmond) 4:54; 3. D. Mason (Lee Bees) 4:54.

TAILPIECE

After the Editor's caption to picture 4 on page 659 of the November issue; perhaps the man from the North who won a Nationals event will always be known as "Jones the vintage"!

Merry Christmas to all our readers from *Free Flight Scene*.

3 Full Size Plans : 3 Full

WAR-LOCK

Very strong and highly manoeuvreable ½A class combat model by RICHARD EVANS

'WARLOCK' has been around for a few years now and like my *Spirogyra* owes something to the *APS Ruteress* in terms of fuselage construction and appearance.

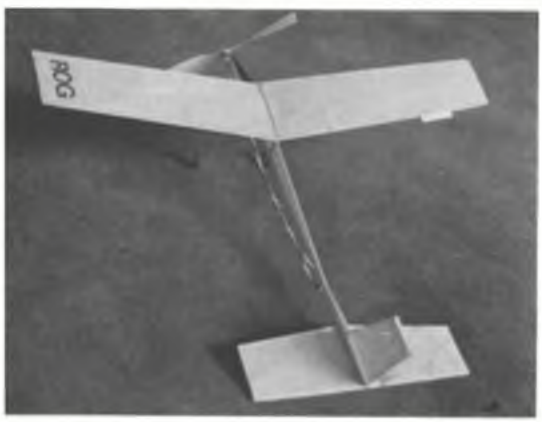
There is basically nothing new in the model, but I am sure that it will provide the builder with something more than the average sport/combat model. Flown on 40 foot lines it has a sprightly performance, reacting quickly to elevator movement. The most impressive version ever was that powered by a Cox TD09 glow engine and was ideal for toning up reflexes in preparation to flying FAI 2·5cc combat, due to its very high speed! However a PAW 1·49cc diesel or similar will provide an admirable power source.

Construction should provide no problems as long as one has some previous experience of control line

MINI-MORANE by W. D. BINNS

Delightful semi-scale free flighter for CO_2 power

THE FRENCH Morane Saulnier type 'L' Parasol was designed in 1913 and subsequently saw much service in the first 18 months of World War I where it proved popular with the pilots being, for its time, fast and manoeuvrable. Perhaps it is best remembered for two of its renowned pilots – Roland Garros and Lt Warneford. It was Garros who fitted an 8mm Hotchkiss atop of the fuselage and then arranged to fire, with great accuracy, through the propeller arc, using steel wedges bolted to the rear face of the prop to prevent damage to that rather important piece of equipment. He thus preceded the use of interrupter gear and proved most successful until his capture following a forced landing. Lt Warneford is best remembered for his successful bombing and subsequent mid-air destruction of Zeppelin LZ37 for which he was awarded the Victoria Cross.



GYM DANDY ROG

ultra simple rubber 'stick' design by DAVE LINSTRUM

THESE DAYS, when it's back to basics and aeromodellers feel the need to put the fun back into flying, there is real merit in reviving the '30s style, rise-off-ground (ROG) type rubber model. The author is not quite enough of a Vintage specimen to have flown one in that decade, but was introduced to this type of model in the late '40s via the *Jasco* ROG, designed by the venerable Frank Zaic. Dozens of these fun flyers were built – often with mods – and the key to good performance proved to be the adjustable trim tabs on the flying surfaces. These are essential to using the model as a learning tool – misadjustment of the tabs provides some instant lessons in aerodynamic

Size Plans : 3 Full Size Plans : 3 Full Size

models. Also bear the following points in mind. All wood in this aircraft should be soft and light, with the exception of the wing leading edge, which needs to be somewhat more resilient. If you tend to hit the ground a lot, consider employing some spruce strengthening in the middle!

The fuselage/tail unit can be built complete before fixing to the wing. Check that it is not angled up or down when slotted in place, or else the performance will suffer.

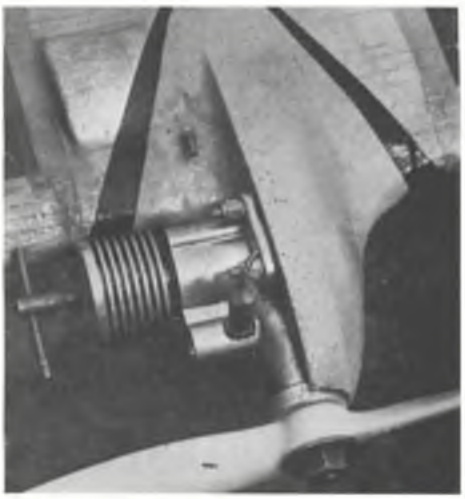
The engine pod can be finished in one of two ways. Either epoxy in place and then cover with gauze bandage and thick dope, or cover with nylon when separate from the wing, and then epoxy in place. There is little difference in strength between these two methods.

Cover tail surfaces, fuselage and centre section with lightweight tissue and the wings with nylon or plastic iron-on film. Obviously the nylon model will be stronger, but probably not quite such a good performer – the choice is up to you.

All up weight should come to no more than 9oz. If lighter, then so much the better, but if heavier check that the CG is still in the proper place. Remedy with lead ballast if necessary.

Elevator movement can be quite critical on this type of model, so use a nylon horn with several holes so that you can vary the up and down movement, and thus trim the model for maximum performance without stalling.

Models of this size are often dismissed as being incapable of anything more than a very wide figure of eight. If you build a *Warlock* you will disprove that theory *very* quickly, and also find it possible to invent many new manoeuvres of your own.



Having previously built four variously sized models of the Morane – all of which proved exceptionally reliable flyers – this design seemed a 'natural' for CO_2 power. Construction is quite straightforward; the outline is to scale except for the tailplane and fin. A Telco engine provided more than adequate power and as the prototype proved rather noneheavy, it would appear that a lot more fine detail could be added – see AeroModeller Plan Pack 2865, price 35p plus 10p postage.

Fuselage

Build two basic fuselage sides from 2mm. sq balsa, dampening the longerons so that they take a permanent 'set'. When quite dry, join together with spacers and formers F1, F2 and two F3s. Now bend up the cabane struts and notch the fuselage to accept the lower part of the struts along the outside of the longerons. Laminate the thrust button from 1·5mm ply and medium balsa, taper off and cement to F1.

Bolt the engine in place, epoxy the nuts to the rear of F1, then remove again. Add the 1mm nose sheeting – it is easier to cut the holes for the cockpit and CO_2 tank first. Next build up the cowl using epoxy, reinforcing joints with ¼in. wide nylon strips.

Cross bracing consists of cotton retained with blobs of balsa cement. Covering (lightweight tissue) should now be added. The fabric of the original is easily duplicated by water shrinking the white tissue with dyed water – a little mustard mixed with coffee produced a realistic dirty brownish yellow! Apply three coats of 50/50 thinned dope.

Now cut a slot for the tailplane, then solder up the axle, wing runners, cross bracing wires and tailskid. Bolt the engine in place once again and instal the tank. Excess copper pipe length can be 'lost' by coiling it. Strip the filler cap and solder it to the rear cabane strut as shown, and reassemble.

The front bay and cowl should be painted silver, cockpit edges and cowl interior black. Numerals and step are black. Cabane struts are faired in with thin paper and also coloured black. Roundels were handpainted on the original, while the outline to the front bay panels was achieved with 1·5mm strips of tissue painted black. Likewise the 'Morane' motif on the cowl. My pilot started life as a plastic toy Viking . . .

Tailplane and Fin

Cut from 1·5mm medium-soft sheet and add the anti-warp strips. Sand to approximate airfoil, give one coat of banana oil and sand lightly. Cover with lightweight tissue and dye-

continued overleaf

reactions! Once the bizarre manoeuvres are ironed out, the tabs allow trimming for optimum endurance. The proportions of *Gym Dandy* and certain structural concepts were inspired by good friend and fun flyer John Aldenkamp of San Diego, and naturally, the trim tabs are prominently featured.

Gym Dandy is not only (we think) stylish and racy looking, it is also extremely easy and quick to build, and flies like a dream on a loop of ordinary rubber (no contest stuff needed). It can be flown indoors or outdoors on calm days, but is subject to flyaways as it is not fitted with a dethermaliser. One alternative is to fly in the evening in a car park or street, with the model lifting off the tarmac and circling up toward the street light like a moth. This night flying is a surrealistic experience . . .

How about building this little bird? Materials include a minimal amount of balsa strip and sheet (a real benefit at today's prices) a plastic prop from a *North Pacific* ready to fly model available at any model shop (or from *Peck*) and some 20 swg diameter piano wire, light modelling tissue and a few bits and pieces. Use aliphatic resin or PVA glue only to avoid warps.

A flat building board about 12 × 24in will suffice – you should be able to stick pins in it easily. Do not stick them through the strip wood, but on either side in an 'X' fashion. Pin holes make weak spots in this balsa strip. Soft wallboard or a basswood draughting board is ideal. Tape the plans to the board and cover with thin polythene which prevents parts from being glued to it. A balsa knife with a new blade is ideal for slicing the ribs and all other cutting. Pliers will be required to bend the undercarriage and rubber hooks (the original prop shaft is cut to remove the plastic bearing) and modelling pins are needed in abundance.

Flying Surfaces

Build these first so they can dry while you fiddle with the details of fuselage

continued overleaf

MINI-MORANE

continued from previous page

watershrink as before. Apply two coats of 50/50 dope and thinners, then paint and number the fin. Do not cement the tailplane in place – when the fin is cemented in place, it holds the tailplane as well.

Wings
Cut out all the ribs. Pack up the bottom spars and the front portion of the trailing edge, and cement up the whole wing in one piece. Cut the top spars and nick the LE and TE, and bend-in 12mm dihedral under each tip. Cement in D1 and D2.

Cover and dye, giving three coats of 50/50 dope and thinners. Paint in the roundels. Glue in the top cabane, then glue loops of thread rigging to the spots indicated on top of the wing, and connect them through the cabane by very small loops of shirring elastic – this will tension them. I did not attempt the underside rigging!

Flying
The prototype weighed exactly 2oz and was a little nose-heavy. For initial test flights, pick the traditional long grass and calm day combination. I reduced the standard airscrew to 5in. diameter with rounded off tips, and established engine settings at home on a test bench – aiming for a 30 second motor run. It takes patience and several Sparklet bulbs . . .

The *Mini-Morane* circles to the left and will fly quite happily in a medium breeze and recover from bad launches without trouble. After more than 50 flights the original has not even suffered split tissue, due to its delightful habit of bouncing, not crashing. She has very little glide due mainly to the high drag, but a warm day will result in flights of around the minute mark. The hotter the weather the better the engine performs – so beware and add a name/address label!

GYM DANDY

continued from previous page

and gear. Cut the outline for the fin and tail to length and pin down. Cut ribs to fit and glue in place.

Wing ribs are sliced from a 75mm length of 50mm wide, 1·5mm sheet, quarter grain if possible. An aluminium, tin or ply pattern is needed to guide the knife in slicing the curve. Press the template against the rib blank, make a cut, move down an estimated 1·5mm ($\frac{1}{16}$in) and cut again along the curve. Presto! You have a nice curved rib – slice eight more. Then pin down edges of wing after bevelling joint at centre for dihedral (add later) and begin to fit ribs. Trim to length from rear. Glue in all except the rib at the centre. When glue is dry, prop up one wingtip 100mm and glue joints at centre. Add the centre rib, angling to bisect the dihedral angle. Allow to dry thoroughly before removing from board.

Fuselage
Cut the motor stick to length from rock-hard strip and taper the rear as shown. Cut the triangular keel from light balsa and add doublers at wing mount. Glue keel to stick, centering on top. Add 2mm.sq hard scrap as a spacer for the aluminium tube shaft bearing. Glue well and wrap with fine Terylene thread. Add a glue skin over this assembly as it takes a lot of stress. Bend the rear motor hook and take-off gear from piano wire, carefully following pattern for the latter. Add these items and glue/thread wrap. The gear clamps over the front wing mount doubler. Now add the plastic wheels and a drop of epoxy to axle as a keeper for each. Bend a new prop shaft, insert in bearing, then add a small washer or bead, the prop, and bend the end over to fit free wheeler hub on the North Pacific prop.

Covering
This must be accomplished dry, with tissue cut slightly oversize for each surface – but cover one side only. We have found that aliphatic resin or white glue (PVA) which has been thinned 50/50 with water and applied with a small brush makes an excellent adhesive for covering. Put a dab at each end of the tail, lay tissue in place, then peel back to apply glue to outline. Do the fin in one pass. The wing must be covered in two pieces, with a slight overlap at the centre. When dry, trim off excess tissue with a sharp razor blade, or by sanding the edge with an emery fingernail board. This method of finishing ensures that there are no cuts in the fragile outlines – simply draw the emery board along the edge while holding tissue taut. Do not watershrink or dope the tissue. If you do, the surfaces will be as warped as a potato crisp! Do not tissue cover the fuselage.

Assembly
Glue the tailplane to the bottom of the motor stick, noting that the taper gives the correct decalage. Add the fin to the top of stick along with the small dorsal fin. Do not offset fin, any turn is achieved via trim tab. Ensure that fin is at right angles to tailplane. Glue the wing to the keel at the doublers. Prop up tips so that wing sits square on body as seen from front. Using a black felt pen or black dope, simulate a cockpit on the balsa keel. Add thick paper trim tabs to the fin and starboard (right) wing. We found that tabs on the tail and port wing were not necessary, but use them if you wish. Tie a tight square knot in a 29in. length of 3mm flat rubber to make the motor. Affix this to the propshaft and rear hook. Now balance the model as shown on the plan – this forward CG position is important for stability. If necessary, add dabs of Plasticene to nose to balance.

Flying
Bend the wing trim tab up about 3mm and fin tab left about 3mm for initial adjustment. Make sure no thrustline turn has been built into prop bearing; if it has, cut loose and re-glue. This model is wound from the rear and normally a helper is needed. Have your assistant hold the propshaft between thumb and index finger while you unhook rear of motor and attach to hook of a geared winder, or even a hook held in a hand drill. Stretch motor out three times its slack length and put on about 800 turns while moving in. When winder hook is near the model, grasp motor near the hook and let the winder unwind. This will result in a small loop that can easily be attached to the rear hook when the winder hook is removed.

There is no point in hand launching an ROG (or test gliding either) so grasp the prop tip in one hand, the keel in the other, and let it take off from the ground! Adjust for a 30ft diameter circle, then increase the number of turns for longer flights.

Have fun!

'ROG' – rise off ground – is the name of the game and Gym Dandy performs that task well. Models of this type provide a good lesson in the art of trimming.

BOOK REVIEWS
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COMBAT AIRCRAFT of WW2 ed. *Weal/Weal/Barber, published by Arms & Armour Press, Hardbound.* 230 *x* 350*mm.* 230 *pages, incl.* 80 *colour plates.* £9.95.

Directory style statistical tabulation of over 800 airplanes with over 100 of these separately detailed in full colour, with specially chosen unusual schemes plus line side views of many more types but not one single photograph! A mammoth effort that sort of encapsulates a whole decade of 'Janes' because inevitably there are aeroplanes that spread from 1935 to 1945, each with the dimensions, performance, armament, crew, variants etc. given telegraphically, plus remarks. For the colour plates, the reader has a separated explanation of each. Unhappily, the colours are very much the super-clean picture book style despite very fine airbrush work by the artist John Weal, and as a result, some colour tones are removed from the original effect, such as the Ocean Grey, Ident. Blue, Olive Drab areas. Restoring the balance are some of the finest reproductions of Luftwaffe colours we've ever seen printed, and a most commendable effort to provide schemes that are not in any way 'ordinary'. It's nice to see Rupert C. Moore's insistence (against the opinion of many pundits) that the codes of 617 Squadron's Grand Slam Lancasters were reversed, is verified here, and that the Soviet I-15, TB-3, TB-7 and the great but little appreciated Yak-3 (9?) are selected. Here's a coffee table book that works. It will earn its keep quickly for the modest £9.95, and we'd stick our necks out and say it's a bargain which will be an on-going favourite everywhere (simultaneous publishing in Australia, Canada, USA, Spain and Germany).

PROPELLER MAKING FOR THE AMATEUR by *Eric Clutton*, 52 *pages*, 145 *x* 205*mm with card cover.* £2 *from the author.*

Eric Clutton and FRED need no introduction. The aeromodelling schoolteacher and his flying runabout with its colourful German WWI lozenge camouflage are seen at the home-built aircraft rallies everywhere. Now Eric, the most ardent of do-it-himself aeroplane makers, has set out to show how easy it is to carve a 56 x 28in. prop for your VW. Not surprisingly, it reads very much like aeromodelling on a larger (fullsize) scale, using more sophisticated methods, and here is where the aeromodeller can learn a thing or two. Eric explains the whole sequence from design to repairs, and winds up with a quote based on the legendary McGillicuddy stories.

'When carving props, take time, I beg;
Don't make them like a dog's hindleg.
When sweetly smooth and polished high,
The better will your aeroplane fly.'

Which just about sums up the real usefulness of this handbook written from the heart of someone with a special gift for simple explanation.

MAKING & FLYING KITES by *Lloyd/Mitchell/Thomas published by Beaver Books,* 110 *pages,* 128 *x* 198*mm paperback,* 50*p.*

This is a reprint of the earlier hardbound edition, published by John Murray but at such a low price! Some of the clangers remain uncorrected, worst of which is the 'Marconi Kite' which was not developed by Marconi as stated, but by W. Mack Angus, based on the studding sail rig of the clipper ship, *Flying Cloud*, and called the 'Marconi Rig'. Moreover, as drawn it is back to front, and needs 2 more bridle lines so beware and don't attempt to make it as shown! Otherwise the 15 designs which *will* work are drawn and described in simple terms, sufficient to guide any would-be kiteflyer on the right lines while the introductory chapters give a fair summary of the origins, materials, aerodynamics and techniques of kite flying. Excellent value, it will help swell the numbers of kite enthusiasts now forming the British Kite Flying Association (details from the *Aero-Modeller* offices).

GOLDEN WINGS AEROMODELLER MODEL CLUB

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

'Peter' is a beginner's glider kit from the Pilot range, now being imported by Irvine Engines. It has a wingspan of 42¼in. and features very straightforward construction. All ribs are die cut as are the plywood fuselage parts. Retail price is £5.50.

One of the best 'tips' of all is to purchase a razor blade plane, such as this 'Zip' plane. Using razor blades as the cutting edge, it is an essential part of any modeller's workshop - being perfect for shaping solid balsa wings, leading edges etc.

SOMETIMES it is all too easy to take for granted simple tips and home-made gadgets, forgetting that many people with less experience of the hobby may not be aware of their existence. So the following 'good ideas' are presented to help just those people – with apologies to those who have heard it all before!

• • •

Plastic film covering, such as *Humbrol Flitespan, Solarfilm, Kwikcote*, etc, certainly has its uses, especially for control line models, but you may have been less pleased if you use a diesel engine. This type of fuel tends to make the covering slacken-off considerably after a short period – and while the film can be re-tautened with the iron or hot air gun used to shrink it initially there is another solution. Spray the model with a household polish such as Pledge, then rub over with a cloth in the usual manner. This thin layer of wax will seal the plastic film from the harmful effects of the diesel fuel. Repeat after every flying session. Glow fuel of course does not affect the plastic – but it is always best to run a small brush loaded with fuel proofer along the exposed edges of film (such as where it is overlapped at the trailing edges etc). This prevents the fuel from attacking the adhesive and causing the film to 'lift'.

Incidentally, while talking about plastic film, remember that the clear polythene backing sheet is ideal for protecting plans from glue – and as it is normally thrown away, this is a good 'free' source!

• • •

A real oldie – but nonetheless useful, almost essential, accessory is a 'squash bottle'. If you have ever spent ages filling your fuel tank from a standard metal can, then you will really welcome a system that does the job in seconds – and at no cost! Just take an old polythene bottle (those used for washing up liquid or hair shampoo are ideal), wash out thoroughly, then push an old fuel can spout through the plastic cap. It may be necessary to file down the base of the spout a little, or to enlarge the hole in the bottle's top, but it is only the work of seconds. A piece of fuel tubing from the spout and quick refills are the order of the day!

• • •

Just made your own fuel tank from tinplate? Before you install it in the model, you must check it for leaks. The 'traditional' way is to seal off two vents, then blow down the third while submerging the tank in a saucepan of water. This works as leaks will be shown up by a trail of bubbles, but it can be difficult to see the exact position of the leak, and you will get very red-faced as you blow down the tube!

Easy solution is to let science do the work for you. Seal off two vents by connecting together with a length of fuel tubing, then seal the remaining pipe by another piece of fuel tubing blocked off with a matchstick. Fill your saucepan with *hot* water – then add the tank. Keep it submerged by holding down with a kitchen fork or similar. If you see tell tale bubbles, rotate the tank until you can see the exact point of the leak.

Incidentally, relying on the expansion of the heated air within the tank exerts far more pressure than you can provide while making a Li-Lo pump impression, so it's a better check too.

• • •

Just finished your model and have applied a base coat of colour before adding the trim? Naturally, it is best to use masking tape to achieve a neat job – unless you are really experienced and have an air-brush handy.

Masking tape can be obtained from car accessory shops and is ideal as it is 'low tack', i.e. when removed, the adhesive used will not pull the paint away with it. Normal office type clear adhesive tape *can* be used, but the adhesive is very strong, so pull it through your fingers a few times before applying. This means that the natural oils in your skin are transferred to the tape's adhesive, and greatly reduce its effectiveness. As a precaution, when removing the tape, double it back on itself and pull slowly – never pull the tape at 90° to the paint surface or it is almost certain to lift.

Before applying the trim colour, it is traditional to run a very thin brush charged with clear dope along the edges of the tape. This is done so that should the dope 'creep' under the tape it will be clear and not show – this coat will then form a perfect seal to the tape. However, only use this tip if the base colour is *cellulose*, not enamel.

An alternative is to run a brush load of the base colour along the edge of the tape – any creep will not show, and it saves having to clean the brush again. This idea works even better with spray paint, as there will not even be a suspicion of a 'hard' paint line that the brush tends to create. Give it a try – it works!

Dear John Bridge,

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

NAME IN FULL.....

ADDRESS .....

.....

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

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

.....

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

12/77 15p in the £1 Rebate plan purchase coupon for Golden Wing Members G.W. No.....

SPEED

by Martin Radcliffe

I'D LIKE to start this report by giving details of what must be the largest margin by which a speed record has ever been broken. At the Barkston Heath SMAE Centralised meeting of 19th June, Paul Eisner of the Feltham Club exceeded the existing Open 2·5cc British record by 21 mph. His speed of 183·36 mph from a steel lined Rossi 15 FI not only beats the 2½cc record, but is 5 mph over the 6cc record, and is 3 mph faster than the World record! Unfortunately a World record cannot be claimed as prior notice has to be given of the attempt and the pilot must use a handle with a cross piece – not easy when going round the pylon once every 1·2 seconds! Paul is practising for the World record by flying a Goodyear racer in the pylon, with the required handle on 20 foot lines to get the rotational speed up. We all wish him good luck.

At the previous meeting, Paul had won with a record flight of 169 mph. This however was disallowed as the engine was subsequently found to be oversize at 2·503cc! This was actually rather fortunate, as when he fitted a smaller shaft to get below 2·5cc he stumbled on what seems to be a well known 'secret'. It appears that if your Rossi is getting tired and listless it can sometimes be regenerated by fitting a new shaft.

Paul's model is of the side-winder asymmetric type with the cylinder head outboard. It was flown on two 0·3mm wires grouped together over the last two-thirds of the line length. This is the first British record to fall to groupers, in fact after two years he is the only person who has really been successful with them. The wires are stored on a reel made from two LP records (Sandie Shaw plus Marianne Faithful – no record breaker jokes please!) sandwiching a large diameter core. The fuel was 50% nitro, 32% Methanol and 18% ML 70 oil, and the propeller a 6 x 8in. Punctilio carved to 150 x 210mm (roughly 6 x 8¼in.). The pipe length was 298mm from plug to end of pipe, there was no insert in the tailpipe, the fuel supply being suction fed. The glow head was a No. 4 Rossi with 28 thou (!) clearance over the piston at TDC.

At the same meeting Pete Halman broke the British FAI record with 147 mph to come second, and Chris Noakes, visiting from Australia, broke the Aussie FAI record with a flight of 137 mph – well done. Also J. Alcock put in the fastest Novice 40 flight so far at 140 mph. Quite a few people have built Novice 40 models, though not many seem to put in official flights being content in the main to practise and gain experience. Hammond and Williams appear to be the fastest in practice so far having done 153 mph with their model (150 mph is taken as 100 per cent of the record for handicap purposes in the first year of Class 40N).

Success has at last come the way of Owen Warboys and Ian Skinner of Christchurch DMAC, at the Woodford Rally on 10th July. They deserve a medal for keenness anyhow, they had to travel 300 miles to this competition! Ian has been struggling all year to make his OPS 29 run lean (I should have such problems!) and finally made it just as Cyril Smith MP arrived at the circle on his tour of the airfield. The flight of 174 mph was just 4 mph short of the British 5cc record and good enough for third place. Ian's model is beautifully made out of Jellutong (pattern makers' wood) with elliptical wings and natural finish. Owen Warboys was second with a flight of 185 mph out of his OPS 60 with a mini-pipe. Owen was using a fuel with 18% ML 70 oil 12% Propylene Oxide and 70% Nitro with an 8½ x 10½in. Punctilio propeller in an all-or-nothing flight which burnt a hole in the piston! Paul Eisner saved us 60 flyers further embarrassment by 'only' doing 169 mph with his Rossi 15 to win this competition.

Owen Warboys has always had a panache for putting good ideas into practice and at Woodford we were all exposed to his latest effort, which is a fully piped OPS60 running on a pen bladder fed through a centrifugal valve of home made construction, consisting of a weighted swinging arm, which increases the amount of fuel fed to the motor from the high pressure bladder as the speed of the model builds up. It actually works too, although it is a bit inconsistent at the moment. I've only ever heard of one other model using the same arrangement successfully – that belonged to Roselle and Frye in the States and they did over 200 mph with it at the time, so we could be in for something spectacular here when he gets it to work. Incidentally, Owen flies his model the wrong way round (clockwise) so that he can fly with the Stanzel monoline handle in his stronger right hand. A good idea, but more difficult than it seems when you are used to going the other way!

• • • •

While flying in the aerobatics event at Bochum (17th–18th September), *AeroModeller* columnist Glen Alison also took a peep at the FAI speed circle, where he reports Switzerland's Louis Bilat was the surprise winner with speeds of 246,248 and 250 km/hr. His equipment is very similar to that of European and World Champion Emil Rumpel, but these speeds were his personal best under the current rules – he attributes his success to the new Bartels glass fibre propeller, which is moulded from an original Rumpel-modified Punctilio wood item. In second place (best speed 248 km/hr) was Jurgen Lenzen, just ahead of fellow club mate Emil Rumpel at 246 km/hr. It's close at the top! Emil was out of luck – his prop broke as the model left the dolly, then a crack was discovered in the pipe. Highest placed British pilot proved to be Gordon Isles, recording 236 km/hr.

RACING

by Dave Clarkson

NOISE FROM C/L COMPETITION MODELS

In all of the discussions that have happened both centrally and around the country concerning the impending Code of Practice for noise, hard facts have been noticeably absent. So here are some typical noise test results: results determined using the equipment and method specified in the first draft of the DoE Code. The figures given are the arithmetic averages of front, back, side and opposite side readings, with both model and meter horizontal at 1·2 metres above ground and separated by 7 metres.

FAI Combat

1. Super Tigre G.15 FI glow, Solarfilm covered model, 7×4in. Tornado nylon prop, motor open exhaust — 94 dBA
2. Super Tigre G.15 FI glow, Solarfilm covered model, 7×4in. Tornado nylon prop, closed front ST silencer — 94 dBA

Two new items added to the specialist list of 'goodies' by Steve Blake of Maple Models. Below is a 3-line bellcrank closely based on the system pioneered by Mick Reeves, providing first class control over the throttle without need of a special handle. Cast in metal this retails at £1.99. At bottom is a pair of universal cast metal engine mount brackets - very light and can cope with engines up to 10cc. Provides a very compact installation for 70p.

3. Super Tigre G.20/15 glow, foam model, 7×4in. Tornado nylon prop, motor open exhaust .. .. 93 dBA
4. MVVS D7 diesel, nylon covered model, 8×6in. Keil Kraft nylon prop, motor open exhaust .. .. 85 dBA

Goodyear

1. Super Tigre X-21 glow, all-wood *Lil Quickie*, 7×6in. Taipan nylon prop, ED 'Power Pipe' fitted .. 84 dBA
2. Cox Conquest 15 glow, all-wood *Ol' Blue*, 6½×5¼in. GF prop, motor open exhaust .. .. .. 90 dBA
3. OPS 3·5 glow, all-wood *Lil' Quickie*, 6¾×5½in. GF prop, motor open exhaust .. .. .. 98 dBA

FAI Team Race

1. K&B 15 diesel (conv.), all-wood model, 7×6in. Taipan nylon prop, motor open exhaust .. .. 78 dBA
2. Rossi 15 FI diesel (conv.), all-wood model, 7×7¼in. GF prop, motor open exhaust .. .. .. 81 dBA

FAI Aerobatics

1. Merco 49, tissue covered *Nimbus*, 11×6in. wooden prop, Merco 35 silencer fitted .. .. .. 76 dBA

No 'tricks' (like super-rich settings) were employed to give false results while the meter operator was highly competent and, if anything, hostile. Whilst it is dangerous to draw hard-and-fast conclusions from such a limited number of readings as these, I am sure all of us can draw some tentative conclusions. My own, for obvious reasons, are confined to C/L racing models:

— Open exhaust 3·5cc Goodyear glows are in trouble but 2·5cc glows fitted with an ED 'Power Pipe' for Goodyear may well meet the Code requirements, with little or no performance penalty (maybe some gain).
— Open exhaust FAI Team Racers just about meet the Code requirements. (The Rossi T/R result refers to my own model which many would acknowledge to be one of the noisiest around).
— Even if fitted with unmodified commercial mufflers or tuned-pipe mufflers, Class B models are in trouble, but it is probable that open exhaust ½A racers will meet Code requirements comfortably.

Whilst we were measuring noise, some readings were taken with two glow powered FAI combat models airborne, and at least two FAI Team Racers being ground-run.

	background	*with models*
1. 100 metres separation	46 dBA	65 dBA
2. Numerous locations protected by trees and separated by 300-400 metres	50 dBA	51 dBA
	45 dBA	45 dBA
	45 dBA	46 dBA
	41 dBA	44 dBA
	41 dBA	44 dBA

One expert opinion based on these results is that if all of the models being operated had met the Code requirements, the 100 metre reading would have been reduced to about 52 dBA, and the more distant measurements would have revealed no detectable noise. Whilst these results are particular to one location, it would appear that application of all of the requirements of the draft DoE Code will certainly achieve the stated objective of minimising noise – for C/L models anyway.

In case the 'magic' dBA means nothing to you, quoted below are some generally accepted comparative data:

Sound Source	*dBA*	*Notes for Health*
Jet engine at 25m	140	
Rivet Gun	130	Injurious range
Propeller aircraft at 50m	120	
Rock Drill	110	
Metal working shop	100	Danger range
Heavy lorry	90	
Busy city street	80	
Private car	70	
Ordinary conversation at 1m	60	
Quiet conversation at 1m	50	
Soft music	40	Safe range
Whisper at 1m	30	
Quiet house	20	
Rustling leaf	10	

Whilst discussing noise, it seems appropriate to show the Sound Level Meter now being distributed by Ripmax. The figures quoted in the test were taken using highly sophisticated equipment, with a price tag of several thousand pounds, and thus this unit (which retails at £26.95) cannot be comparable. However, it can be very useful when determining noise levels and assessing the suitability of particular silencers for specific engines. Ideal as a piece of club equipment.

THE NELSON 15D - A TOP CLASS FAI T/R MOTOR?

The question a lot of us were asking until the evidence of the last few months. Now hard results say the answer is 'yes'. The results I am talking about are:

European Championships

			best heat
5th	Marsh/Desaucy	Belgium	4:05
6th	Dodge/Nelson	USA	4:06
American Team Trials		*best heat*	*average*
1st	Dodge/Nelson	4:02	4:04
2nd	Albritton/Joy	4:00	4:15
American Nationals		*best heat*	*final*
1st	Dodge/Nelson	4:04	8:18
British Nationals		*best heat*	
4th	Metkemeyer/ Metkemeyer	4:02	

Not fantastic results – but good; good enough to be classed as 'top class'. So as a specialist racing motor usable straight out of the box, the Bugl now has a competitor – similar potential, similar (high) price, similar 'straight out of the box' usability – the Nelson 15D. Future results will show if the Nelson is as good as the Bugl on the average, but the signs look good. What about spares and delivery? Time will tell, but think about it.

I suppose it is not entirely fair to only mention the Nelson powered results from the USA Team Trials; my copy of 'Doc' Jackson's 'Gaz' (the really *irresponsible*(!) newsletter) says Kusik/Jolly qualified in third spot using a Rossi FI with a 4:16 average just pipping Jim and Sue Plaunt with their Rossi RV who needed a 4:16 on their last flight to make the team but got a 'disq' instead for gliding 2¾ laps. Walt Perkins used yet another Nelson, this time in a retract U/C model, and placed fifth.

Almost forgot Henry also does a really high quality and very light bridged front ARM style team race pan, investment cast in magnesium. Not cheap too, but it is supplied in a finished state including a machined flat model-mating surface, and for a small extra sum, Henry will drill and tap for the motor and drill for the hold-down bolts. Two styles (short and long) are available and internal lugs are cast in for hold-down bolts in front of the motor mounts if you like mounting pans this way. Details of motor and pans are available from *Nelson Competition Engines*, 729 Valemont Drive Verona, PA 15147, USA.

INTERNATIONAL CONTEST RESULTS

This time of year seems quite a flurry of International Contests in Europe, so here goes with three of the most important:

C/L Championships of the Soviet Union

Held 750 miles west of Moscow in Minsk the capital of Byelo-Russia SSR from 10th to the 17th August (all the details I have from this Estonia to Sweden to England information transfer – so I thought I would pad what I have!)

	Round 1	*Round 2*	*Final*
1. Barkov/Surajev	4:00	3:50	8:00
2. Drats/Kuznitsov	4:02	3:58	8:05
3. Popov/Belikov	3:58	?	8:17

Fast, but not unexpected. At this contest a 5:50 heat was good enough for 26th place: reassuring, for I think 26th went somewhat faster at our Nats this year!

Bochum International 17–18 September

I think that the geographical and organisational features of this event have been described before, so I will stick to the flying. Four London T/R teams flew and *all* hit the semi's. In contrast to Utrecht,

the weather was calm and sunny – the two Spanish teams who made Bochum their Northern Expedition this year made the right choice! Perhaps a feature of this Bochum was model destruction, with both Helmich/vd Kroon and Metkemeyer/Metkemeyer making bits out of their Bugl powered models – Henry's bitsa due to internal control failure, and Rob's as a result of some 'Combat'.

The mighty Nelson 15D of the Metkemeyer's strode on as the results show.

		Heat	Semi	Final	
1. Metkemeyer Bros	*N'lands*	4:00	4:01	8:07	*Nelson*
2. Smith/Fry	*GB*	4:02	4:00*	8:13	*Bugl*
3. Gürtler/Baumgartner	*Austria*	4:15	3:59	8:45	*Bugl*
4. Tribe/Tribe	*GB*	4:10	4:05		*Bugl*
5. Bugl/Hohenburg	*Austria*	4:10	4:04		*Bugl*
6. Rudd/King	*GB*	4:16	4:23		*Rossi FI*
7. Helmich/vd Kroon	*N'lands*	4:17	–		*Bugl*
8. Parez/Siotax	*Spain*	4:17	4:34		*Rossi RV*
9. Brown/Gray	*GB*	4:34	4:34		*Bugl*

**New UK heat record*

Twenty-three entries from six countries saw the victorious 'Brits' take the team prize, despite the presence of no less than 10 Dutch teams.

Criterium Midden Nederland, Utrecht, ½–½ October

Evil weather, but evil! High winds and lashing rain on the way there had us thinking that we could have spent far less suffering the same 'fun' at Albemarle Barracks (and supposedly better beer!) but as the man said, "*when you gotta go, you gotta go!*" The weather remained daunting for the whole weekend but fortunately the wind lessened sufficiently to permit 3-up flying for the semi's and the final. All the heats were flown two-up because of the wind – a very sensible Jury decision allowing T/R to continue whilst the speed and stunt types cowered in the club house until the clock forced them out.

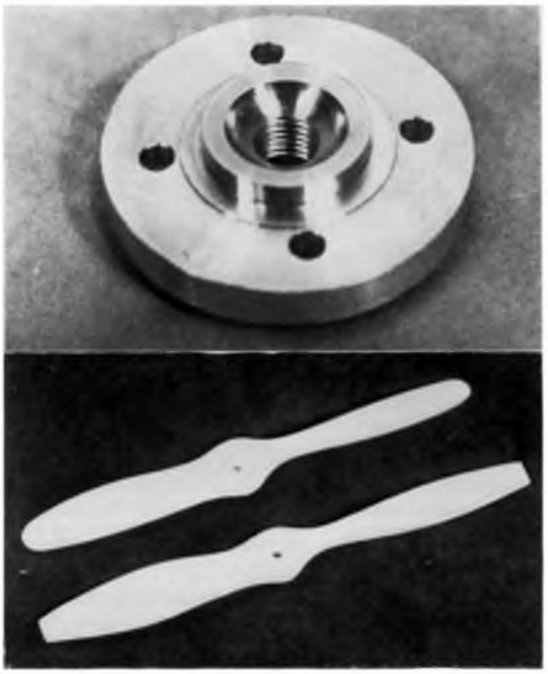
Six British teams entered and, like Bochum, four made the semi's. Again the Nelson of the Methemeyer's won out, and again the Brits were top national team – just like Bochum.

		Heat	Semi	Final	
1. Metkemeyer Bros	*N'lands*	4:04	3:59	8:18	*Nelson*
2. Mau/Geschwendtner	*Denmark*	4:06	4:07	8:43	*Bugl/*
3. Smith/Fry	*GB*	4:08	4:08	8:49	*Bugl/ Rossi FI*
4. Heaton/Ross	*GB*	4:05	4:09		*Bugl*
5. Tribe/Tribe	*GB*	4:07	4:12		*Bugl*
6. Petersen/ Geschwendtner	*Denmark*	4:14	4:13		*Bugl*
7 Bugl/Hohenburg	*Austria*	4:15	4:13		*Bugl*
8. Gray/King	*GB*	4:16	–		*Bugl*
9. March/Dessaucy	*Belgium*	4:24	–		*Nelson*
13. Clarkson/Woodside	*GB*	4:32	–		*Bugl*
29. Brown/Summerfield	*GB*	–	–		*Rossi R*

30 entries from seven countries in all.

Putting in my 'umble pie set of gnashers, I have to say that worms are quite digestable! This was the first time I had flown a Bugl in high level competition, and after years of fighting 'difficult' engines (first MVVS, then K&B, then Rossi FI) when to get a good time required really hard work and favourable circumstances, the Bugl was a delight. Easy to set, easy to warm up and easy to fly – on this acquaintance, the sweat of getting a Bugl (although now we understand, virtually all orders are up to date) seems worth the benefits if you are seriously interested in top class T/R. With absence of bad luck in the second round, a 4:12 should have resulted for Jim and I making the British showing even more respectable.

Talking of the British showing, yet again Heaton/Ross seemed hard done by. Maybe the rain got at the Utrecht electronics but the electronic times were the only times available to competitors till the end of each round of heats (or until the end of the semi's in the case of the semi's). So the known time for their first semi at the time of flying their second semi was 4:07, *not* the official (but still secret) stop-watch time of 4:09, and they flew 'safe' to preserve their equipment in the difficult conditions prevailing for their expected final. After the semi's were over, they got the bad news – too late! On the brighter side, Smith/Fry showed remarkable application. In the heats they had cracked a wing, side-lining one Bugl model leaving them with a reserve Bugl model and their Rossi model. In their first semi, the wind seemed to fold their reserve Bugl model's wing, resulting in a spectacular wipe-out (motor OK fortunately). So, down to their remaining model – unflown with a Rosai aboard, three practice tanks in the Speed circle had them into the final – ten out of ten for hard work in defeating the slings and arrows! The Tribe brothers also deserve a mention, not just for their fine result here. A stream of sub 4:10's here, at Bochum, Pecs and Bouvais earlier in the year show them to be our third best team on current form at International level – there is going to be quite a contest for the 3rd team place at our next team trials!



Ron James, winner of the Nationals Goodyear event is marketing a modified head to suit the Cox 15 which retails at £2.00. Head gaskets in 5 thou and 10 thou thicknesses are available at 35p each. Above are two versions of his 7 x 5in. glass fibre prop - at top is the unfinished blank (£1.00) and beneath it the ready-to-use version trimmed to 6¼ x 5¼in. and properly balanced - price £2.00. Important address is 21 Rochester Crescent, Hoo, Rochester, Kent ME3 9JH.

The engine that is in the news - the Nelson 15D - this being Henry's own version, flown at the European Champs.

Henry Nelson at work. Despite the overweight (by several ounces!) model that he flew at Verviers, he still recorded 4:06.

Franco Ballesio of Italy has a finish to equal that of 'American standards. The 60oz design for Super Tigre 46 power was inspired by the models of Cappi and Orsini.

A final word of praise for the T/R Jury. It must have been purgatory (or worse) to have sat in the box for 1½ days in the rain, wind and cold, and yet Jurgen Bobjerg, Ed Meijer and Dave Rudd kept at it and considering the conditions, did a remarkably good job.

AEROBATICS

by Glen Alison

YOU HAVE probably heard, but just in case some of those living out in the sticks have not, then the news is that the 1978 World Control Line Championships are being held in England. The dates are 4th to 10th August, with the main competition days, as planned at the moment, starting on Sunday 6th August and continuing until Wednesday 9th inclusive.

The site is RAF Woodvale, which is situated halfway between Liverpool and Southport on the A565. I bet it is windy up there!

Speaking of the World Championships, the USA have just held their Team Trials at Fort Gillem, Atlanta, in Georgia; this produced an interesting team. First of all, reigning World Champion Les McDonald is entering as an independent, and not part of their team, which means that his place will not count towards the team prize, but it does allow four Americans to compete. Top place in the Trials went to veteran Bob Gieseke with his familiar modified Nobler, fitted with Fox 35 and weighing 40oz (don't you wish your Nobler weight was 40oz!). Next was Al Rabe; he finally made it! His model is a semi-scale P 51 D *Mustang*, using a Super Tigre 46 bored out to 0·53cu.in. which drives a 13×6in. propeller. The plane weighs 51oz and is quite small at around 560sq.ins. wing area, but with a thick section. Surprise third place went to Bob Hunt, who is famous for the development of hollow foam wings for stunters, and runs the *Control Specialities Company* which manufactures them for almost any model. His design the *Genesis* is large at 720sq.in. wing area, but light for its size at 57oz. Bob uses a Super Tigre 46 and 12×6in. propeller. Team members for the last Championships Gene Schaffer and Bill Werwage placed 4th and 5th respectively, so did not quite make it this time.

If you want to see the best stunt flyers in the world come to Woodvale next August. It will either inspire you, or make you wan to give up!

Surprise winner of the Utrecht meet was Barile of Belgium flying a ST46 Superstar. A very conventional set-up, very well flown. Model is beautifully finished in Rolls Royce metallic Burgundy paint. He will fly in the Belgium team (with the Liber brothers) at the '78 World Champs.

PUSHROD STIFFENING

Heard from Brian Lack of Banbury the other day: he flies an HP40 powered *Nimrod* and was suffering from 'wind up' when flying consecutive inside loops in wind. This is the term used when the model tends to fly faster and faster, and the loops get larger and larger no matter how much up elevator you apply. Cause is wind pressure blowing back the elevator, and bowing or buckling the pushrod – which is usually made of piano wire. This effect is not common in outside loops (bunts) because the push rod is in direct tension and cannot bow. This can be prevented by having close fitting guides in the fuselage formers (but this can cause binding) or by using a stiffer rod in the first place, such as wooden dowel or aluminium tubes as described in April 1977 *AeroModeller*. So what do you do to improve the situation in a completed model? Well fortunately the *Nimrod* is a detachable wing design, and Brian decided to epoxy a wooden stiffener to the 14 swg wire pushrod by inserting it through the wing opening. Here's how he did it:

1. Wind a 20 swg loop around a piece of 14 swg; bend up and bind/epoxy to $\frac{3}{16}$in.sq. or $\frac{1}{4}$in.sq. spruce (ensure loop holds pushrod tight up to spruce). See *Figure 1*.
2. Thread the loop over end of the pushrod, and slide down fuselage to rear end of pushrod, then mark and cut off flap joiner.
3. Bind 'flap' end with fuse wire to pushrod. Assemble wing and check that controls are free.
4. If satisfactory unbind fuse wire, slide stiffener out and plaster a good layer of epoxy along the spruce.
5. Keep pushrod at lowest position (or highest if stiffener is OK on underside of pushrod wire) and holding spruce away from wire slide back up fuselage (see *Figure* 2) to correct position. Bring the two together, and re-bind with fuse wire to hold.
6. Stand fuselage on its nose vertically until dry, checking occasionally that surplus epoxy has not glued the pushrod to formers inside!

NINTH DUTCH INTERNATIONAL CRITERIUM – *Utrecht, 1–2nd October*

This competition is held annually to commemorate the building of the Model Centre in Utrecht, the site of last year's Control Line World Championships, and as such is held rather late in the year. This tends to restrict entries a little because of the risk of bad weather – and such was the case this year. The weather was dreadful! Gale force winds and rain spoilt the enjoyment of the whole meeting. It was decided, in fact, not to fly the first round of Stunt on the Saturday, and hope for better conditions the next day, but it was not to be. If anything, it was worse with heavy rain showers adding to the misery.

The site at Utrecht is unfortunately surrounded by trees with the result that very bad turbulence is created. This is worse for stunt flyers than just strong wind, which can be quite acceptable if it is smooth, as in the middle of a large airfield.

I had already crashed in practice due to a sudden down-draught at the bottom of a square loop which tore the wheels out of the wing, but it was relatively easy to repair in time for the competition. When the time came to fly, a total of seven refused to compete in such conditions and retired. Of those left brave (or stupid?) enough to fly, it was a matter of trying to fly 'safe' rather than attempting to perform a meaningful contest schedule.

An F-16 inspired stunter is the latest from Yves Fernandez, using the same wing and undercarriage as the Scirocco. A Czech muffler weighing just 15 grammes is bolted to the ST46.

Winner at the Bochum International was Dr Egervary flying this very functional design with Veco 50 power. No cowl is employed but the wings are detachable.

Because the first round had been abandoned it meant that both the remaining rounds would count towards the final placing, so it was all or nothing. Top placing in both these rounds went to Barile of Belgium flying his ST46 *Superstar* design. It was necessary to fly fairly fast in order to 'plough' through the turbulance, and this seemed to be the only way to success. Those who flew slowly were blown about too badly to complete manoeuvres. Second placed man Stephan Ratsch of Germany had a lightweight Fox 35 model, which he flew extremely well in the circumstances – upright engine and Solarfilm covered. Robert Petersen of Denmark flew an all yellow *Windy* design (how appropriate!), with OS40 very fast to third place. The model looks very similar to Gene Schaffer's design seen at the World Championships last year. Of the British entrants Ted Fowler was 6th and myself 4th, after crashing in the second round, neatly removing the cockpit and fin, during the cloverleaf.

TWELFTH CRITERIUM OF BOCHUM – *17–18th September*
For this competition, the weather was sunny, but cool with an occasional gusty wind. There were competitors from England, Netherlands, Belgium, France, Spain, Italy, Switzerland, Austria, Hungary and Denmark. It was a very well organised event with 19 flyers competing. The winner was Dr Egervary, who is now living in West Germany. He flew a new model of his usual simple construction with no cowl, detachable wing and powered by a Veco 50. Second was another doctor, Dr Cappi of Italy, who now intends to quit stunt flying in favour of gliders (full size!). Third placed Gerard Billon, flew his distinctive model with one centre fin, which he says likes calm weather.

A new face to the International scene was Yves Fernandez from Strasbourg, France. He had fantastic models, and was placed fifth not far behind Liber. Both models had *Scirocco* wing and undercarriage and were ST46 powered. The actual *Scirocco* has a home made tricycle undercarriage, anhedral tailplane, and uses a Tornado 3 blade prop. The other, F16 inspired, is similar and has a Czech muffler weighing only 15 grammes!

A very promising young flyer from West Germany is 18 year old Uve Kehnen. He flew a Les McDonald Stiletto design - although not finished quite like the American maestro's own model! Note the similarity between the tarmac at Utrecht and a lake . . .

Figure 1 Pushrod stiffening

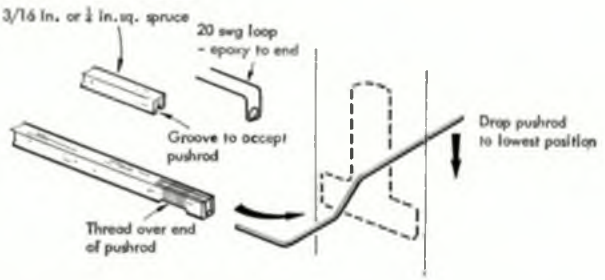


Figure 2 Sliding stiffener in place

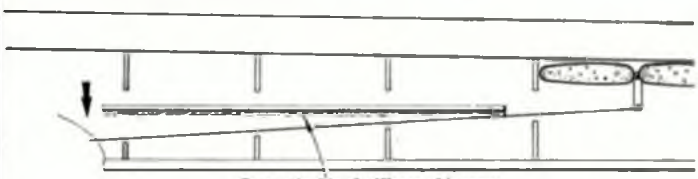
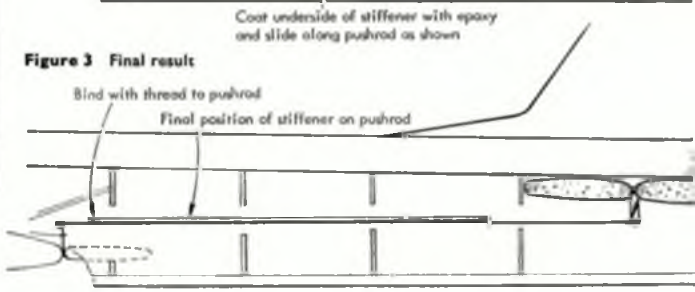


Figure 3 Final result



Tail Dragger

LIKE THE archetypal Texan, Joe Public seems to regard anything that is bigger as being *automatically* better. This same philosophy seems to apply to modellers, no doubt spurred on by seeing those huge radio controlled scale models at various flying shows.

Now, doubtless the builders and operators of those 'biggies' are extremely competent persons; well able to appreciate the hazards and difficulties which are bound to occur when models are greatly increased in size. Hopefully they are equally responsible when it comes to performing before a crowd, and every safety precaution is taken. Not that large models in themselves are necessarily more dangerous than their normal sized counterparts – but there is an awful lot more hardware up there in the sky.

What really worries me is that these display teams set an example to we lesser mortals. People who do not appreciate the fact that giant-sized control surfaces need giant-sized (or rather two) servos to operate them. People who do not realise the aerodynamic stresses involved, the critical power factor and the even more critical weight factor. Are manufacturers really being responsible when they sell 'oversize' engines? Should retailers sell 15cc (or 50cc) engines? Do modellers appreciate the CAA limits regarding weight, engine capacity and wing loading? I think not, and it does worry me.

* * *

Perhaps I have an inquisitive nature – being termed 'nosey' is not at all kind – but I do enjoy glancing at the contents of other people's garages as I drive along. So often it is the garage that reveals the character of the owner. Is it neat and tidy, or a complete mess? Does it contain the, traditional 'jumble' of kids' toys, garden hose and ladder – or something rather more interesting such as a glass fibre canoe under construction, a Vincent Rapide being restored, or an old Daimler quietly appreciating?

For those new to the art of garage-watching, here are a few tips. Firstly, ignore any house where no car is parked outside, as clearly it must be contained within the garage itself, and no garage-phile would ever consider that. Make allowances for 2/3 car garages though. Secondly, choose a house where the paint is peeling and the garden overgrown – sure signs of a dedicated garage dweller. Thirdly, note whether a light is to be seen burning late at night from within. All tell-tale signs – but you still have to wait for the door to be opened to see what lies beyond.

It is interesting though. Even in our little street there is a cycling enthusiast with the full 'works' of specialist frames, wheels and cap with turned up peak. Then there is the model engineer with a lathe and milling machine nestling between the upturned flowerpots, and why, just across the road there is even a chap who makes model aeroplanes!

* * *

Leading on from the above, I always hold one particular principle close to the heart: never knock the other man's sport. Some may laugh at our cyclist friend's garb, not to mention the 'low brow' riding position, whilst others titter at the footballers hobbling home on a Saturafternoon. But not I. Perhaps it's a question of 'people living in glass houses' – although not entirely. It is just that I appreciate that the individual is deriving enjoyment from what he is doing – and the more he puts into his chosen recreation, then the more he gets out of it. Who can argue with that?

* * *

It's a funny old world. When I first started aeromodelling at the tender age of 14, the local club flying field was situated some 15 miles away. To reach it involved catching a bus to the nearest town, then a change to another company's charabanc for the remaining five miles. Alternatively, models were strapped to the trusty push-bike (a pair of free-flight wings go nicely over dropped handlebars) and pedal power was employed to traverse the countryside. Looking back, it never seemed remarkable – it was just that if you wanted to attend club night, then the journey had to be made.

Today, however, it seems that the Junior flyer wants to be mollycoddled. If the journey involved exceeds a mile his interest definitely wanes, unless father is employed as chauffeur. Unfair to our younger readers? I think not. My own club has a flying field not five miles from a large town – but a Junior is not only a rare creature, he would be unique. And yet models are flown in schools and in parks, so why the reluctance to get fully involved?

Funny thing is that as a youngster flying fields were never a problem. The field at the bottom of the garden was always available, while my similarly minded pal just happened to have 300 acres of flat, prime pastureland available, courtesy of his father who had the commonsense – or foresight – to choose farming as his profession.

* * *

Wandering around the local model emporium, I was amazed to see the wide range of accessories now available. Whilst many are aimed at the R/C market there are so many with direct application for control line and free flight. As an avid 'fiddler' I bought a few packets of assorted devices, not because I actually needed them, but because they had such *potential* for modifying into all sorts of useful gadgets. Don't ask me exactly what I have in mind, because the answer is nothing. However, I know that within that precious bundle of plastic moulding, something, somewhere, can be adapted to suit my future needs. Call it an insurance policy if you like.

Scale Matters

by Alan Callaghan

Peter Smart launches his 28in. span Handley Page Hampden which uses a pair of Telco CO_2 motors. Built with the undercarriage in the retracted position, the model flies very well in all weather conditions. In fact this photo was taken in the rain!

WITH THE 1977 outdoor flying season now almost coming to a close, I should think that many of you must be giving some thought to what might best occupy the building board during the coming winter months. In his attitude to models, the flying scale builder usually falls either within, or at the ends of, two extremes: the 'enjoy it all, fly for fun character', or the dedicated contest flyer. Despite the probable lack of trophies or plaques with which to line their bookshelves or sideboards, I feel sure that it is the former who gets the most enjoyment out of our side of the hobby, relative to the amount of effort put in. To the true contest devotee the main enjoyment comes from winning, and coming second or third is not a very agreeable experience, as is occasionally demonstrated.

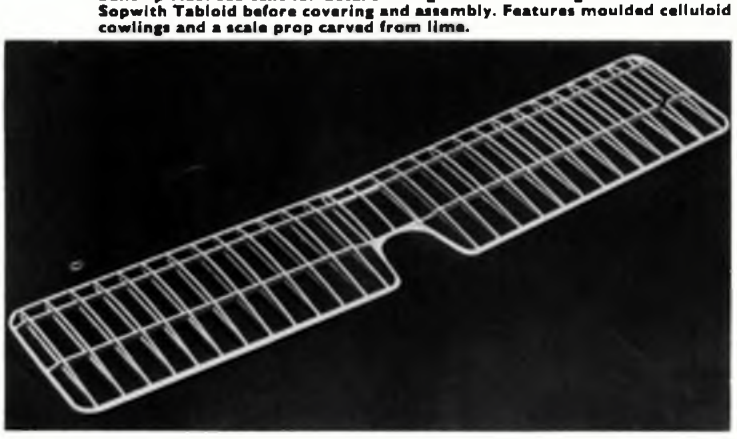
It goes without saying that it is the contest-winning model that takes the longest time to build, although there are people who can turn them out reasonably quickly to a very high standard. Attempted superscale models that have eventually been rushed and built to a premature deadline usually turn out to be quite troublesome because it is so easy to overlook basic problems like warped flying surfaces, incorrect thrustlines, excessive build-up of weight etc, in an effort to put in every last detail on the cowlings or to make sure that the pilot does not look crosseyed. My own opinion is that it is better initially *not* to think in terms of building a model specifically for one contest (eg next year's Nats). Better, at this time of year to make a concentrated effort to research and draw everything for one model while the inspiration is there. Then perhaps you can choose a relatively easy component like the tailplane or an interesting part like a dummy engine (usually left until last but always the crowning glory of a model) and go ahead and make it regardless of any possible schedule. Having got over the hurdle of actually getting the model underway in this manner, one then has the freedom to put it on one side and build something else that might take your fancy without worrying about the weeks ticking away.

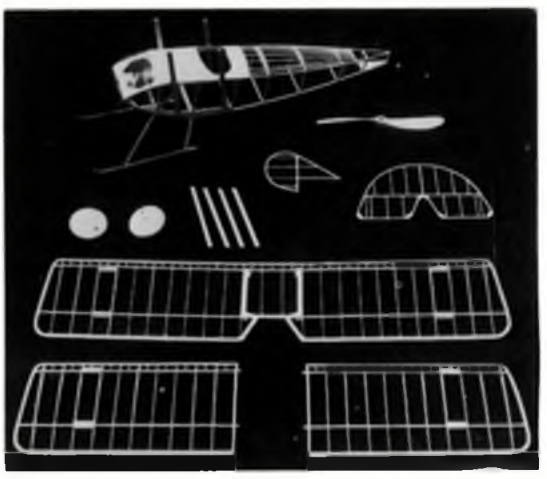
Yet another reason behind this method is that it usually takes at least twice as long as you anticipate to make *any* component of a model to a really good standard, and if everything becomes more of a straightforward chore than the relaxed, enjoyable exercise that it *should* be because of an impending flying date, then the wrong priorities must have been chosen. Relative to all of this I thought it would be worth showing this month a number of models 'naked' – as it were – on the basis that uncovered model structures can form an inspiration to get on with some building, and perhaps someone out there might be galvanised into action due to this!

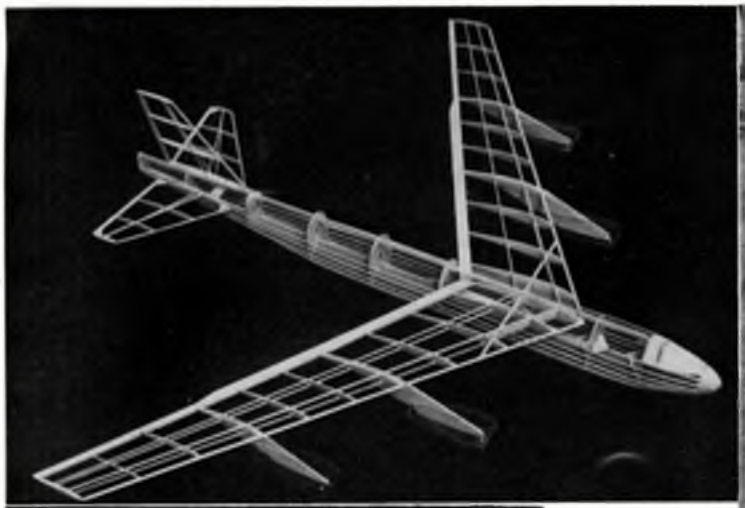
* * *

The Boeing B-52 was an out of the rut subject that I built about four years ago when it was still possible to obtain from the manufacturers the complete range of Jetex motors, including the Scorpion plus augmenter tube, the PAA-Loader plus augmenter tube, and the high-power 50 Rocket motor that could rival the Scorpion in power output but only in a very short burst. The PAA-Loader was chosen to power the B-52 and was fitted semi-recessed underneath the fuselage near the CG. The model was to 1:72 scale which brought the wingspan out at roughly 30 inches, and it weighed 2oz finished but without the motor. Obviously on a lightweight model of this kind the exact scale structure of the real aircraft cannot be simulated, but it nevertheless posed a number of interesting structural problems during building. The biggest single problems were the four double engine pods which were moulded from celluloid in eight identical top and bottom

Below is the wing for a Peanut Scale version of a Gourdou-Leseurre C1. Note built-up ribs: see text for details. Weighs 0.027oz. At right is the author's Sopwith Tabloid before covering and assembly. Features moulded celluloid cowlings and a scale prop carved from lime.







Above is the author's 1/72 scale Boeing B-52 originally for Jetex engine. At left is a Peanut Scale Westland Widgeon I featuring ultra-light construction. Bulk (?) of airframe from 1/32in.sq. At right is a line up of a very rare breed of model - control line scale! These examples were seen at the Three Kings Open Day last May.

halves, which were then glued together along a horizontal joint line. A slot was cut centrally in the top and the whole assembly slid onto tissue-covered $\frac{1}{16}$in. sheet mounts. This seemed the only sensible way to simulate the smooth streamlined pods in an ultralight structure at the time, but these days, I suppose polystyrene foam ('orrible stuff!) could be considered. The use of this, however, would only complicate the finishing method and probably just add weight in consequence. As it was the entire model was given an extremely thin coat of silver dope that covered everything really well.

The swept back wing had a markedly undercambered section at the root gradually flattening out towards the tip, and test glides (a B-52, remember!) showed it to be quite stable. The slight disadvantage of the model was that being a one-piece lightweight structure it was extremely vulnerable in all but the calmest of conditions. Knock-off wings may have been advisable but one then gets into the vicious circle of more structure=more weight=less performance. Just before I finished this model Jetex ceased trading, and while I am now in the position of wanting to fly the model which is still in reasonable condition, I am a bit reluctant to fire up my still new motor and whether the fuel and wick would still ignite easily is another question. It always seems a sad loss that nothing ever has replaced Jetex, since there are a few jets around that would make attractive subjects. They were, no doubt, rather fiddly things to operate and a one-shot disposable low power rocket would be more acceptable, but it is slightly discouraging to realise that the *only* way to fly a jet model realistically these days is to use rather pricey ducted fan units, matched motors and an R/C set.

* * *

Even from amidst modellers who are more enthusiastic builders than flyers one often hears the comment "*I hate building wings*". The only part of this process that I dislike is cutting out ribs, thus on another model built about two years ago, a Peanut scale *Gourdou-Leseurre C1* (see Vol IV, 'Fighters', *Warplanes of the First World War* series by J. M. Bruce for information) I first tried the 'sliced' rib technique (*Figure* 1) – a very quick method of building that is also very economical on material, and therefore inherently weight-saving. If carefully designed this type of wing loses nothing in terms of strength when compared with the 'normal' (in model structures, that is) technique of using full rib blanks cut from sheet. The latter method is never used on full size aircraft, and if one considers carefully enough is only really justified on models where the wing shape changes a good deal, and no two ribs are alike, as for example, on an elliptical wing that thins out gradually and the ribs are best sanded to final shape after assembly.

Being a parallel chord type, the 13in. span *Gourdou-Leseurre* wing was a natural opportunity to try out the different technique. The spars are $\frac{1}{16} \times \frac{1}{8}$in. set on edge, but on looking back $\frac{1}{16} \times \frac{1}{8}$in. would have been quite adequate because of the close rib spacing. The top halves of the ribs were $\frac{1}{16}$in. deep and cut using a thin ply template from $\frac{1}{16}$in. sheet, as were the bottom halves using a different template. For cutting, a Swann Morton scalpel was used with a brand new blade. Fitting the ribs in place was made slightly easier using an ordinary pair of tweezers but these were by no means essential. The sequence used is as follows: 1. Pin down the trailing edge over the plan. 2. Glue the lower halves to the TE using PVA glue. 3. Glue the leading edge in place using packing to achieve the correct height. 4. Fit the spars – two are normal. 5. Fit the top halves carefully trimming each to size as they go in. 6. Add tips, centre section pieces, etc. It is always wise to make a

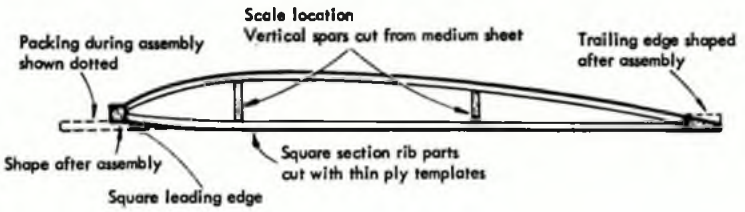


Figure 1 - Sliced rib wing construction.

few extra sets to allow for breakages. Using wood bought from the local model shop this wing weighed ·037oz as photographed, and ·093oz after covering with Jap tissue and clear doping. The finished model lives on, and the wing shows no real signs of stress after some fairly tough trimming sessions.

The same technique was used on the *Westland Widgeon I* which was built much lighter using indoor quality wood, and finished ready to fly tipped the scales at ·14oz. On this model the double-tapered wing has a single spar and ribs made of ·020in. balsa, the outlines are of $\frac{1}{32}$in.sq, and it was covered like the rest of the model in condenser paper. All the fuselage and tailplane members are also of $\frac{1}{32}$in.sq, and whilst the finished model definitely requires rather careful handling it will regularly put in one-minute flights on only a 12in. loop of ·055in. Pirelli. I think that it would realise much more performance with yet more prop/rubber experimentation, but as usual the lure of other subjects to build leaves it at this level at the moment.

Very much in contrast to the *Widgeon* is the *Sopwith Tabloid* shown in component form. Though originally built for rubber power this model now sports a CO_2 motor. The 17in. span *Tabloid* wings feature full-depth ribs (built before seeing the potential of the slicing technique!), with very hard $\frac{1}{16}$in.sq spars in scale location slotted through so as not to show on the surfaces. The strut location points were built up using $\frac{1}{32} \times \frac{1}{16}$in. scrap, and the ribs are of $\frac{1}{32}$in. sheet. The aluminium cowlings were originally simulated by celluloid mouldings, although it was eventually decided that on such a short-nosed type the use of medium-soft balsa was a better way of helping to get the CG near the right spot.

* * *

Soon after having written a piece two months ago on multi-engine F/F models, I was contacted by Peter Smart who has been working on a 28in. wingspan *Handley Page Hampden* for CO_2 power for quite some time. The news was that the model had successfully flown on tests and so we met at Croydon one drizzly Sunday morning to see the result. The two motors on this model each have their tanks mounted behind in each nacelle, but the complete plumbing system is interconnected to one filler valve. The model was built without the undercarriage which certainly made it look very good in the air. Because the tanks are mounted apart without a separate balancing header tank, each motor can vary its speed slightly independently from the other. The result of this effect is that the model begins its flight pattern turning to the left due to more power from the starboard motor, then the other motor fractionally gains enough speed to begin turning the model to the right giving an impressive smooth S-shaped pattern. As photographed the model was flying in light rain so the motors were not giving top power and flights of about twenty seconds were the norm of the day. By adding another tank (and buying a lot more Sparklet bulbs) longer flights should be no problem at all on a warm day.

The great kick from twins such as this is to hear the quiet motors gradually going in and out of perfect unison giving a throbbing effect just like the real thing. Being less brave than Peter, my own twin testing system was built into a converted KK *Pioneer* glider about a year ago before putting it into a scale model. This model is 26in. wingspan, weighs just under 2$\frac{1}{4}$oz and has regularly made flights of around one minute's duration on warm days. I mounted the tanks together in the nose with a header tank just above them connected to the filler valve. To anyone contemplating a scale twin I would recommend keeping the structure as light as possible, anything over the above quoted weight would be rather marginal in performance, and leave off the undercarriage like the Hampden. Downthrust ought not to be necessary - the *Pioneer* had three degrees *upthrust* - and do not worry about not having contra-rotating props.

* * *

Always interested in unusual scale subjects, I was pleased to receive a report from Flt-Lt G. Collins, on the RAFMAA meeting held at Cardington on 24th/25th September. With seven entries in CO_2 and 14 in Peanut, scale was quite well represented, and competition for the substantial prizes donated by Telco was fairly stiff. The most unusual entry in CO_2 must have been a Vickers Vulcan in Instone Air Lines colours. As well as being a biplane, this tubby subject also features a biplane tail, and a neat little three-inch long ladder up to the pilot's cockpit! No details of performance were given but the model certainly shows some imagination as a choice of subject.

The KK 'Pioneer' converted to twin CO_2 power is seen at left - a useful flying test-bed. Makes one minute flights regularly. Below is a very imaginative choice of prototype - a Vickers Vulcan - flown at an RAFMAA indoor meet. Unfortunately no other details are known (except that it is clearly Telco powered) - perhaps the builder would like to own-up?

CLUB NEWS

THE NATIONALS may have receded somewhat into history but is still very fresh in my memory. The people who came in the hundreds of cars that lined the tarmac at the Free Flight Meeting did not do so merely to spectate – they came to fly! And that very good intention was no better demonstrated than during one of the idyllic spells of good weather with which the meeting happily coincided. It is many years since I have seen a real swarm of models circling in the summery sky, and it was a most inspiring sight – a surety that free flight modelling was still very much alive and its adherents every bit as expert as ever.

It is nice to see in these offhand times a PRO carrying out his duties in a fulsome and conscientious manner. Thus we welcome the letter, plus the accompanying club newsletter from Mr Stuart A. C. Lodge, of the **Bath MAC**. The brevity of the newsletter is due, he informs us, to the usual exigencies of an editor's lot: the typing, copying and general preparation. However, he feels that, in a big club like Bath, which covers the whole of the model spectrum, a newsletter serves a vital, unifying purpose. So, too, it would appear, do the popular 'movement' events like the Nationals, for this year's successful display of model flying unity, has had the effect of bringing the club together – a unity which he hopes will be lasting.

Your Club?

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

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A. L. Price, Abbotsholme School, Rocester, Uttoxeter, Staffs.

Mitchell Model Aircraft Club
A. Edwards, 290 Cobridge Road, Hanley, Stoke-on-Trent, ST1 1JJ, Staffs.

Spitfires MAC
E. Clutton, 92 Newland Street, Stoke-on-Trent, Staffs. ST4 2RF.

Stafford Hurricanes
D. Martin, 58 Mount Road, Stone, Staffordshire.

Tipton
A. Whorton, 148 Laxy Hill Road, Aldreidge, Staffordshire.

Wolves Model Aero Club
J. Watkins, 58 Hopton Crescent, Lyndale Park, Wednesfield Wolverhampton, Staffs.

SUFFOLK

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B. J. Austin, Priory Cottage, Priory Lane, Braiseworth, Near Eye, Suffolk, IP23 7DS.

Ipswich Model Aircraft Club
J. Green, 217 Brunswick Road, Ipswich, Suffolk, IP4 4DB.

Ipswich R/C MC
D. N. Banham, 12 Mill View Close, Woodbridge, Suffolk

Newmarket Model Aero Club
B. J. Brotherton, 6 Valley Way, Newmarket, Suffolk, CB8 0QJ.

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P. Miller, Red Cot, New Street, Glemsford, Sudbury, Suffolk, CO10 7PY.

Thetford & District R/C MFC
R. E. Emsden, 4 Pettycoat Lane, Bury St Edmunds, Suffolk

Waveney MFC
C. R. Wickham, 99 Banham Road, Beccles, Suffolk, NR34 9JP.

Much of the newsletter is taken up with a report on the fortunes and fates of members at the Free Flight Nationals. It is suggested here that the choice of that particular week end was unfortunate, but though it was true that the British weather was as capricious as ever, it was surely more flyable than many a weekend surrounding that particular date. What had a particularly marring effect, though, was the poor visibility during the early rounds of the FAI events. Models that were landing after three minute plus flights a bare half mile distance were being clocked o.o.s. at times around the minute mark, and power models were seen to go o.o.s. into low cloud on the power run. But from after lunch on the Saturday until teatime on the Sunday the weather was more or less ideal. Chris Edwards boldly entered five events, but was very much a casualty of the early mist and late rain. He put in a number of good flights, though. Ernie Furles did well in Open Glider until, that is, the rains came. John James's A/1 got stuck in one of the biggest thermals of the day, but not quite so big, it seems, as the one that bounced Andy Cox's HLG to very distant parts. Andrew Moorhouse also returned a few good flights. Concluding comment is that all would have done better had the models been on trim 'in the box'. Truth to say, though, there was not much opportunity during the breezy summer to keep models in fine contest fettle.

Next we welcome back a newsletter that has not been graced with a mention in these columns for some time: the **Buckaneers'** *The Scimitar* opens with comment on that perennial source of hope and anxiety: the flying field. The club appears to have a new and agreeable site at Woughton, and the hope is that members will use it sensibly and not upset the natives. For those members capable of weaving through goal posts, high voltage lines and other ethereal impedimenta there is a patch cut at the Leighton Rugby Club. There is also mention of sites at Tongwell, Mount Farm and Finmere. On *Pete's Page*, Pete Smoothy reminds us that all those nasty noise problems can be triumphantly bypassed by the use of electric power. The systems are improving all the time and it is now possible to get flights of between 5 and 6 minutes, and what is more, electric powered models can be safely flown from caravan sites, beaches and other off-beat places. Pete does point out, however, the need to keep the craft as light as possible to make the most of the limited power, commensurate, of course, with adequate structural strength. Coming back to the question of flying fields, the number of options open to the Buccaneers, whilst good for sound and activity dispersal, does have a certain fragmenting effect on club unity, and generally things have not been as lively as they might. I think the down beat in Radio this year is pretty universal and is perhaps an expected reaction to the crescendo of popularity it had built up to. As far as free flight is concerned, the enthusiasm is obviously there, but cooled and dampened by the over boisterous weather.

Noise problems much to the fore in the newsletter of the **Watford Wayfarers MAC**. Seems the private farm site at Chenies has got the chop. It is not only the local villagers who found the noise intolerable, the land owner and his wife did, too. Not much the model flyers could do about this situation as power model planes will always produce a certain level of noise, and they had, perforce, to reluctantly leave this site. Even so, the club is still very much involved in finding ways of reducing noise levels. Props have been thoroughly investigated, and glass filled nylon appears to come off best, with wooden propellers next, and the thumbs down, or rather fingers in the ears, to non-reinforced nylon types. A sobering outcome of the tests is the way most standard silencers come out at above the allowable limit of 80 db at 7 metres. Where models are welcome, noise notwithstanding (it even adds to the

drama) is at the public display. The Wanderers put in their last display of the season at the Dacorum Traction Engine Rally. Both public and organisers were pleased with the modellers' contribution.

Mr K. U. Coy, Chairman of the **Gainsborough MAC**, is not a happy man. At least not at the time he wrote his letter to us. For one thing there has been far too much wind about for his, or, indeed, his club's activities during this somewhat dubious summer. For another, his club has suffered a serious falling off in membership, due mainly to lack of flying space, but apathy cannot be overlooked as a contributory factor. The only flying space available comes by courtesy of a local publican, but is conditional on it not being otherwise required for such mundane purposes as cricket, football or tennis. What does not help things, either, is the lack of a local model shop; the nearest one being some 20 miles away. Now that less model flying takes place on public open spaces, the model shop is the only means of displaying the attractions of model flying to the public. What did cheer Mr Coy up was his visit to the Nationals, which he found most enjoyable. Now, while awaiting some abatement in the unending winds to try out his new pride and joy, a 52in. span, three line Spitfire, controlled flaps, throttle, and rudder trimmable in the air, it is back to the building board. Mr Coy's address, incidentally, is 12 Parksprings Road, Gainsborough, Lincolnshire DN21 1PG.

Back in circulation after a two months' lapse is the **Three Kings'** *Court Circular*. The loss of editions is attributed to an industrial dispute, in which the Chairman and Hon Sec withdrew their labour until other club members showed a bit more interest in the contributing to and preparation of the club mag. Adding fuel to the flames was the continued littering up of the club flying patch by the great unwashed, but things are now a bit brighter in this direction as a High Court order is now out and should result in the area being antiseptically cleared. New contributor to the magazine is Ken Gardner who writes zestfully of his visit to the C/L Nationals at Little Rissington. He liked the professional way the Speed and T/R circles had been caged in, even if it was only nylon netting. He was, however, disappointed at the pitiful Scale entry of only five – and one of these was a small kit. This model, he says, started off with a bit of prop grinding, did a rather hairy flight, and finished up being converted back into kit form. Regular contributor, Wal Cordwell, also has some comments to make on the Nationals Scale event, for he was one of the five entrants. Unhappily, he had the gremlins in with a vengeance, and although his *Helldiver* had stability and a good weight lifting capacity the retracting undercart wasn't behaving itself as it should and he was also plagued with electrics trouble. Hero of the day was Paul Eisner who, in spite of a serious injury to his hand earlier in the month, went on to take top place in one of the speed classes.

We see in the Sept/Oct edition of the **Sevenoaks MAC's** *Air Mail* **77**, kindly sent along by Phil Bolderman, that the club committee has decided to raise the membership level from 60 to 70, thus allowing ten lucky people to step out of the queue. This question of membership limitation can be a tricky one, with a balance to be struck between the intensity with which the members use the club amenities (the flying field in particular) and the overall burden of administration. Often clubs are stuck with large paper memberships and a largely unused flying field, and the people who put in the hard, administrative work wonder if it is worth the while. Not that I am suggesting that this is by any means the case with the Sevenoaks Club, but the problems mount as the club gets larger. One bit of extra work for the secretary or committee members these days is preparing insurance dockets for members wishing to fly on other grounds, and I notice here that the Sevenoaks club is allowing non-members to use their field on production of a valid insurance policy. Back again to the Nationals, and it was hard luck that Ian Vaus' P47 crashed on the Tuesday before, but his FW190 maintained, with the other radio models, the high standard of flying we have come to expect from the Nationals.

Your reports and newsletters welcome.

Clubman

Contest Calendar . . .

November 20th	**WHITEFIELD/ROCHDALE INDOOR MEET.** EZB, HLG, Keyhole Scale, CO_2 scale (if sufficient entries). Two halls in use from 10 am–5 pm. EZB hall size 55 × 35 × 22ft, other events in hall size 110 × 60 × 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. 10 am 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 forms. Venue: RAF Halton, near Aylesbury, Bucks.
December 11th	**N. EASTERN AREA (SMAE) INDOOR MEET.** Easy 'B', HLG, Scale (NE Area Class II rules). Novice duration. Hall size 226 × 122 × 35ft. Venue: Sporting Club of Washington. Further information from J. Anderson, 16 Cheveley Walk, Belmont, Durham DH1 2AU. Tel: Durham 68493. Hall available from 1300–1800 hours.
January 8th, 1978	**N. EASTERN AREA (SMAE) INDOOR MEET.** Details as December 11th Meet.
February 12th, 1978	**N. EASTERN AREA (SMAE) INDOOR MEET.** Details as December 11th Meet.
March 12th, 1978	**N. EASTERN AREA (SMAE) INDOOR MEET.** Details as December 11th Meet.

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continued from page 703

Carefully mark the position of the motor onto the doublers and cut out the required slot (note that the motor may be mounted with the armature cooling slots on top or at the side – the former is easier, but requires additional vent holes drilling through the fuselage. This is essential to prevent motor burn-outs).

If struts are required on your model, then mark the position of them and cut holes in the wings to accept them. Using fast setting epoxy resin (preferably) fix the wings, fin and tailplane in position. Bend the undercarriage wire to a suitable shape then sew to wing (or fuselage depending on model). Coating with epoxy resin. Fix the wheels to the undercarriage wire using the covering stripped from electrical flex.

Fix the tether hook in the position shown on the plan then, if you wish, decorate the model, using either a felt tip pen or enamel paint.

Flying

Install the motor and retain it in position either by wrapping rubber bands around the fuselage, or else use dabs of fast setting epoxy resin. Ensure that the CG is approximately in the position shown on the plan – although this is not over-critical.

Connect the model up to the fuselage tether hook (while a wing tip tether is shown as an alternative for those who insist on using this system, it is not really recommended, as the model cannot fly in a realistic attitude).

Check that the wheels rotate smoothly and that the engine runs in the right direction(!), then try a flight. If the model refuses to take off, but 'bombs' around like a racing car, then bend in a little up elevator. Should the inboard wing fly low down, then bend the tether hook down to correct it. Reverse this procedure should the outboard wing fly too low. If there is insufficient line tension then bend the tether hook backwards – or use some rudder offset. The tether hook is very useful indeed for all forms of trimming. Finally, should the outboard wing tip fly consistently high, or if the model appears consistently unstable, then add a little Plasticene to the wing tip.

Electric flying really is easy – but fun too! Once you have mastered the basic skills then there is virtually no limit to what can be achieved – provided you are blessed with a little imagination and are willing to experiment. At least it won't cost you very much in time or money . . .

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The Modellers Den

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tmd

NOTE NEW MAIL ORDER ADDRESS

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Please send your order, together with a cheque/postal order to:—
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THE MODEL SHOP (Guernsey)
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MORE PROTECTION!

MAP Insurance Scheme Now provides for £250,000 cover

To comply with constantly increasing requirements for Public Liability Insurance (as demanded by Local Authority and Government Departments), the MAP third party insurance scheme has been extended to provide £250,000 cover for 1977. This also corresponds with anticipated requirements for Society membership conditions. How can you take advantage of this offer, which embraces all forms of modelling activity, whether it be concerned with aircraft, boats, cars, etc? Simple! Just complete the form below and send it together with a remittance of £1.75, which will provide cover for one year.

This scheme applies to all new memberships and renewals accepted in 1977 (existing memberships operate on the terms applicable in 1976). Please remember that the scheme applies to *regular* readers only (those who either have a standing order placed with their newsagent/model shop, or who have a direct subscription).

To: MODEL & ALLIED PUBLICATIONS LTD,
PO Box 35, Bridge Street, Hemel Hempstead Herts.

Name (in full).....

Address.....

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There's no better balsa cement than Joy-plane.
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SAVE UP TO £22·50 Ripmax Superdeals

As a hobby, radio control modelling gives a high "satisfaction return" for money invested and the weekly sum required to continue the hobby is quite modest compared with most other sports and hobbies. However, in these times of high inflation, many would-be radio modellers are finding difficulty in accumulating the cash required to get started—i.e. to buy their first radio and model.

To help overcome this financial obstacle we have made arrangements with three major model companies to offer special RIPMAX SUPERDEALS comprising sets of radio control equipment with an aircraft or boat kit at low "starter" prices.

All models are suitable for beginners but nearly every SUPERDEAL will also appeal as a money-saving opportunity for more experienced modellers thinking of new projects.

CAMBRIA EAGLE *PLUS*

SUPER DEAL 1 — **MEDALLION COMBO** with Brick Rx/servos (normally £74.95) **£62.95**

SUPER DEAL 2 — **MEDALLION COMBO** with 2 FD22M servos (normally £78.45) **£71.95**

CAMBRIA CAPSTAN *PLUS*

SUPER DEAL 3 — **MEDALLION COMBO** with Brick Rx/servos (normally £77.95) **£65.95**

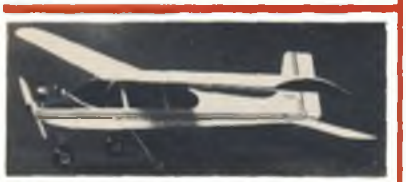
SUPER DEAL 4 — **MEDALLION COMBO** with 2 FD22M servos (normally £81.45) **£74.95**

INSTRUCTOR (Balsa wing) *PLUS*

SUPER DEAL 5 — **MEDALLION COMBO** with Brick Rx/Servos (normally £78.95) **£65.95**

SUPER DEAL 6 — **MEDALLION COMBO** with 2 FD22M servos (normally £82.45) **£74.95**

SUPER DEAL 7 — **FUTABA 4** Drycell TX & 3 FD22M servos (normally £134.45) **£115.95**



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SUPER DEAL 9 — **MEDALLION COMBO** with 2 FD22M servos (normally £86.45) **£78.95**

SUPER DEAL 10 — **FUTABA 4** Drycell Tx & 3 FD22M servos (normally £138.45) **£119.95**

CAMBRIA PIONEER *PLUS*

SUPER DEAL 11 — **MEDALLION COMBO** with Brick Rx/servos (normally £76.95) **£64.95**

SUPER DEAL 12 — **MEDALLION COMBO** with 2 FD22M servos (normally £80.45) **£73.95**

SUPER DEAL 13 — **FUTABA 4** Drycell Tx & 3 FD22M servos (normally £132.45) **£114.95**

TRADE NOTE

SUPERDEALS nos. 1 - 15 are also available direct from CAMBRIA MODELS.

SUPERDEALS nos. 16 - 23 are also available direct from MODEL AVIONICS.

CAMBRIA DRAGONFLY *PLUS*

SUPER DEAL 14 — **FUTABA 4** Drycell Tx & 4 FD22M servos (normally £154) **£132.00**

CAMBRIA TRAVELER *PLUS*

SUPER DEAL 15 — **FUTABA 4** Drycell Tx & 4 FD22M servos (normally £162.00) **£139.50**

Note: due to the fact that the Traveler is a low wing model with full aerobatic capabilities, it is recommended that beginners seek the help of an experienced pilot when first flying this model.

34" long HUNTSMAN *PLUS*

SUPER DEAL 16 — **MEDALLION COMBO** with Brick Rx/servos (normally £75.45) **£63.95**

SUPER DEAL 17 — **MEDALLION COMBO** with 2 FD22M servos (normally £78.95) **£72.95**

46" long HUNTSMAN *PLUS*

SUPER DEAL 18 — **MEDALLION COMBO** with Brick Rx/servos (normally £85.95) **£72.95**

SUPER DEAL 19 — **MEDALLION COMBO** with 2 FD22M servos (normally £89.45) **£81.95**

37" long PERKASA *PLUS*

SUPER DEAL 20 — **MEDALLION COMBO** with Brick Rx/servos (normally £81.95) **£69.95**

SUPER DEAL 21 — **MEDALLION COMBO** with 2 FD22M servos (normally £85.45) **£78.95**

49" long PERKASA *PLUS*

SUPER DEAL 22 — **MEDALLION COMBO** with Brick Rx/servos (normally £89.95) **£76.95**

SUPER DEAL 23 — **MEDALLION COMBO** with 2 FD22M servos (normally £93.45) **£85.95**

23 RIPMAX SUPERDEALS AT YOUR MODEL SHOP!!!

Please note that these offers close on 14th January, 1978

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RAF HURRICANE. READY-TO-FLY CONTROL LINE MODEL IN TOUGH PLASTIC, POWERED BY McCOY .049 GLOWMOTOR

RTP-4

designed by S. EVANS

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The Aeromodeller Plans Service

13-35 Bridge Street, Hemel Hempstead, Herts.

75p

A Quartet of simple-to-build Electric R.T.P. models

All wood is balsa unless otherwise stated.

All R.T.P. parts such as motors, props, plugs, wheels, flying wire, pole parts, etc. etc. may be obtained by post from:-
Harry Butler (Models)
Unit 13
Brunel Road
Gorse Lane Ind. Est.
Clacton-on-Sea
Essex.

Rear of tailplane may be "warped" up or down to aid trimming. If models turn into circle – bend rudder to right as shown

All models should balance at about the tether position

TRIPLANE VERSION

Wing strut
Upper wing
Middle wing
Lower wing

Sand ALL wings to aerofoil section.

"Warp" if needed

No centre strut on triplane

Fuselage tether point

Note motor cooling holes on ALL versions when using "flat" mounted motors.
Motors secured with four small dabs of epoxy

Undercarriage – 1" dia Harry Butler wheels (or similar) retained on legs with small pieces of insulation stripped from electrical flex.

Sand taper on rear of fuselage doublers ALL versions.

Epoxy fillets

Round off all corners

STUNT/TRAINER VERSION

For wing tip tether insert small ply reinforcement.

Typical motor position (FT 26 D shown)
Motors may be mounted "flat" or "upright" according to taste

MATERIALS

Fuselages :- 3/16" (5m.m.) med/hard or 1/4" (6m.m.) med/soft.
Nose doublers :- 1/8" (3m.m.) med.
Wings & all tail parts :- 3/32" (2·5m.m.) med/hard or 1/8" (3m.m.) med/soft.
Struts :- as wings & tail.

No dihedral needed but may be incorporated for appearance if desired.

Round off all edges.

Models may be decorated with felt-tip & ballpoint pens.
Sanding sealer & colour dope or enamel may be used instead but be careful not to add too much weight.

Lower wing
Upper wing

Epoxy all joints

Wing strut

BIPLANE VERSION

Undercarriage legs made from piano wire (18 s.w.g.) or welding rod (16 s.w.g.) Sew & epoxy U/C to fuselage. N.B. Low wing style U/C may be used as an alternative.

Centre strut on this version – note grain.

Fuselage tether point

All wing struts pass through slots in each wing – trim off flush with top of upper wing & bottom of lower wing.

HARRY BUTLER RED PLASTIC PROPS (cat.no. B25) USED ON ALL MODELS.

Fuselage tether hook from 18 s.w.g. piano wire.

Tether hook

Epoxy

Trimming is achieved by bending the tether hook back to reduce the climb or forwards to increase it. Bend hook up or down to cure any "One wing low" tendencies

COMBAT VERSION

Typical "upright" motor installation (Johnson 222 shown)

No cooling holes needed with upright motors

Fuselage tether hook point

Tailskid from thin ply or make from bent paperclip

NOTE

Biplane & triplane versions may be tethered by either fuselage hook or by wing tip. Most experts agree, however, that fuselage tether hooks provide the best performance.

MOTOR REQUIRMENTS

Provided that the weight is kept low, virtually any recognised R.T.P. motor will suffice. Test models have been powered by Johnson 111 & 222 motors and FT 26 D motors. Quite obviously the most startling performance results from using the FD 26 D.

RTP 1329