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AERO MODELLER



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Cover: One of the stars at the '88 Nationals was Barry Hetherington's splendid Dewoitine 510. After qualifying on the central motor all three props were wound for a fine ROG and majestic flight to win in Rubber Scale. Barry's Nationals CO₂ choice, his Stinson Model U, is our full-size plan this month.

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HANGAR DOORS



Participants at the C/L Nationals were treated to the growl of six Merlins as the unmistakable shapes of the RAF Memorial Flight's Spitfire, Lancaster and Hurricane flew past as an appetiser to the prizegiving.

R/C F/F?

Thomas Koster's R/C-dethermalised F1C model flown at the World Champs in Thouars has aroused speculation as to the validity of such a combination; indeed, Dave Hipperson comments in this very issue. Now we hear from Joe Beshar that the AMA have formulated rules for a combined R/C and F/F Vintage class to be 'flown together and as one', to quote from the official notice. Here's how it will work.

A radio-controlled engine run is allowed, the model then free-flying until the decision is taken to dethermalise. If any control is exercised before the D/T is triggered the flight is automatically terminated at that point. Thus the 'endurance' part of the flight is uncontrolled. Engine runs are limited to twenty seconds (original ignition motors), seventeen seconds (replica ignition) and fourteen seconds (cross-scavenged modern engines converted to ignition). The familiar Stateside Old Timer category of pre-1943

designs has been chosen for this R/C F/F combination which will be tried at the 1988 US Nats at Virginia Beach. Stated motive is 'to survive the lack of Free Flight fields...'

We can provide copies of the full rules for a large SAE but the main point is - would such a class be acceptable in the UK? Has anyone tried it? And will we see a new FAI class encompassing R/C and F/F in the future? Your views, please.

Indoor announcements

The British F1D team for the '88 World Champs has now been selected. Best-of-three-flights analysis after the concluding Trials mean that Bernard Hunt, Derl Morley and Laurie Barr will be flying at Johnson City, Tennessee, USA next June. (Looks like Derl is going to have a busy year!). But a Team Manager is needed. Any volunteers? The appointment will be made at the next Tech. Committee meeting in January; interested parties may

contact Bob Bailey at 162 York Road, Stevenage, Herts SG1 4HQ.

Trials news

After the second 'Eurochamps' F/F Trials (report next issue) we can hurriedly confirm that the British Teams for next year are as follows:

F1A: Mike Fantham, John Cuthbert and Andy Crisp;

F1B: Ron Pollard, Derl Morley and Mick Chilton;

and F1C: Stafford Screen, Alan Jack and Pete Watson.

A new name in each team - and a reward for perseverance. Well done!

Merry M.E.

More Model Engineer Exhibition news. The Free-Flight Forum (already something of a Wembley tradition) will take place at 2.30 on Saturday, 2nd January. Provisionally scheduled are talks from Andy Crisp, Mike Evatt,

John O'Donnell, Dave Pymm, Michael Warren and Mike Woodhouse. Topics vary from chuck gliders to Team selection, Indoor propellers to thermal detection. Films are also promised!

Make a date, now. And don't miss the DPR Model Flying Championships on Day One, 1st January. Super prizes! All this in addition to full sideshow displays from SAM 35, SMAE and others; plus the chance to see award-winning craft from a variety of disciplines, aeromodelling and otherwise. See you there!

Angela and Gerry go trimming...

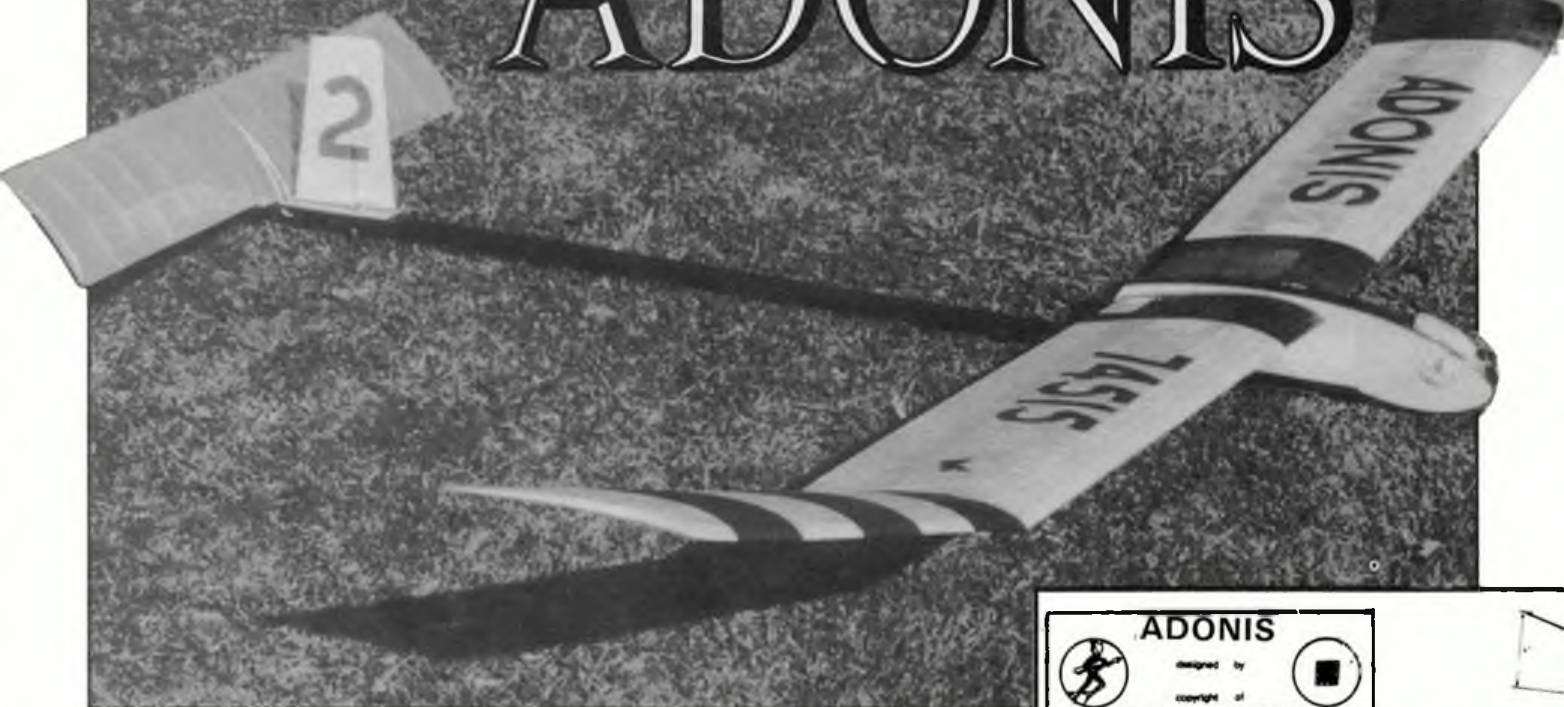
Had you been listening to Angela Rippon's late night show on Radio Two a while ago you may have been startled when she announced that during the previous afternoon she had gone flying Wakefields with Gerry Pink! She proved the point by playing an interview she had with Gerry where he was heard



Left: You are going, aren't you? Don't miss it! Below: Pity there isn't a World Champs for Mini-Goodyear. This bunch would put up a fight. Nats finalists were MacNamara/Hodson, Higgins/Horwood (eventual winners) and Jones/Darke. Special congratulations to the junior fliers who performed most enthusiastically.



ADONIS



This stylish F1A displayed lots of potential at the Nationals. Over to Geoffrey Archer for the reasoning behind the project

ADONIS WAS conceived out of an idea to create a model capable of performing respectably in an 'average' contest with the minimum amount of practice necessary on the part of the flyer. Although aeromodelling is thoroughly in my blood, I have relatively few opportunities to fly, especially at all-day rallies...

The model has achieved all that it was assigned to do in most cases better than expected. In particular, its thermalling abilities can only be described as outstanding. I have not bothered to incorporate a circular tow system, but in most cases this is no real disadvantage except in very still conditions.

To help you understand how the design came about, here is some background. I started modelling at ten years of age and have always concentrated on free-flight. Adonis is the product of an eight-year rest from the hobby, or more truthfully, this amount of time with no flying and building, but with brain still thoroughly involved. My 'second beginning' came in

1977. Now having a young family, I found that time was scarce, so in order to give my family the fairest deal, my modelling had to be concise and effective. To achieve the best results I considered it essential to set about the design of my new contest A/2 as one would design a piece of engineering machinery - by understanding first what the model had to do and then establishing the design criteria.

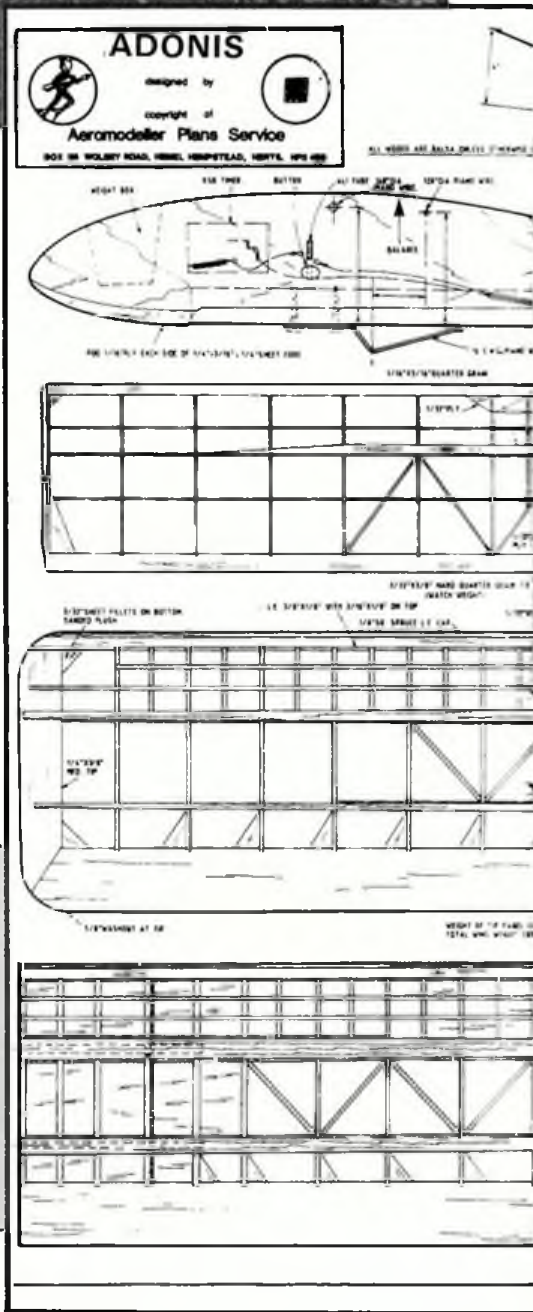
I will now explain the principles as I believe that even the most experienced modellers sometimes miss this fundamental reasoning.

Design considerations

My design criteria for Mk. 1 Adonis were as follows:

- Objectives**
- 1 Model had to thermal freely, and...
 - 2 ... perform well without circular tow (circle tow requires practice); must centre thermals early
 - 3 Good glide performance
 - 4 Model robustness; to be capable of withstanding most weather conditions without breakage; also to last a long time and maintain trim.

Full-size plans of Adonis are available from ASP Plans Service, 9 Hall Road, Maylands Wood Industrial Estate, Hemel Hempstead, Herts HP2 7BH. Price is £3.80 including postage; please quote AM 1557 when ordering. Ronytubes for the fuselage are supplied by Ron Pollard, 23 Ivy Road, Newcastle-upon-Tyne NE6 4PO.



Requirements to achieve objectives

1 Thermalling - The model must bank easily and not fly on 'railway lines'; the dihedral system is thus of prime importance. The mechanics of turning the model are critical.

This meant:

Necessary features:

- 1.1 Polyhedral wings
- 1.2 Large wing tips to support trim
- 1.3 Turn to be achieved by warps and all-moving fin (this does not tighten turn as model speeds up).

2 To perform without circle tow

This is again a function of dihedral and general trim. Model must indicate clearly the difference between a gust of wind and thermals when towing. The wing section plays a part here. The choice is a compromise to accommodate other criteria.

Necessary features: similar to above; reasonable tip washout prevents tip stalling on the line.

3 Glide performance

Most consider this to be of prime importance. It is not! What's the use of a

good glide if your model flies through weak lift? Also, a light model does not guarantee a good glide; remember, mass is relative to velocity. Velocity is fundamental to the creation of lift over an aerofoil. Adonis Mk.1 weighs 19oz. and glides very well. Mk.2 (as featured here) was designed to weigh slightly less at 17-18 oz.

Necessary features:

- 3.1 Good accurate building, clean and tidy presentation
- 3.2 Do not make one trim feature fight another
- 3.3 Understand the principles of lift in model aeroplanes. Most important: do not use a section just because everyone else does - think about your choice and how it will give its best performance
- 3.4 Think about your wing construction - can you improve the wing's performance by building in special features? There are some in Adonis; maybe you can find them!

4 Robustness - make sure you think very hard about this! Adonis is not for the fainthearted to build, but I can tell you it is worth every effort.

Necessary features

- 4.1 Wings must not warp when stored or

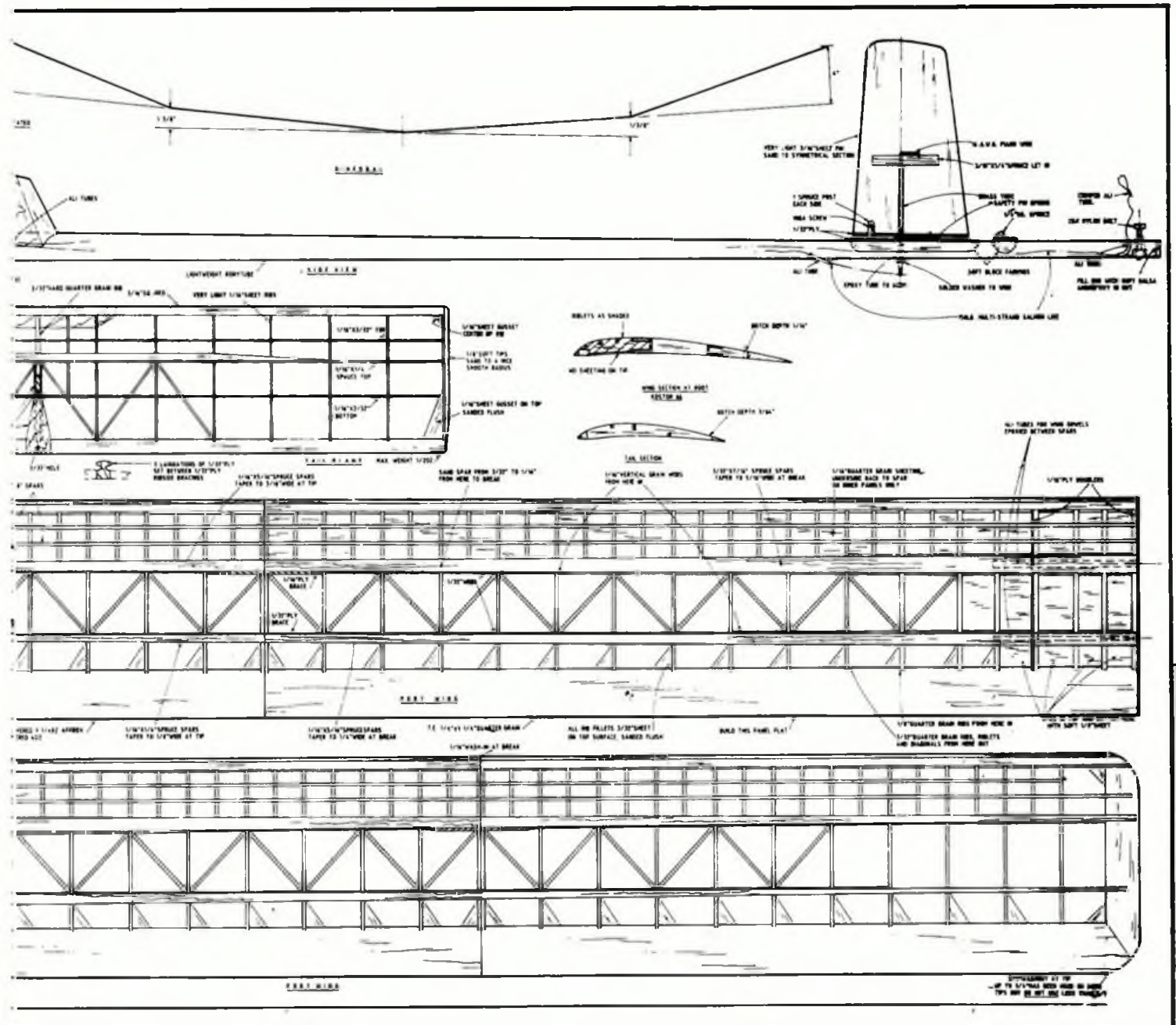
when on a sunny airfield. They must bend, but in a controlled manner. Adonis' wings are very strong, and as you will see, are designed to bend progressively. The wing dowels in Mk. 1 were too flexible. Those in Mk. 2 are enormous and do not bend, so here as you will see the design accommodates this.

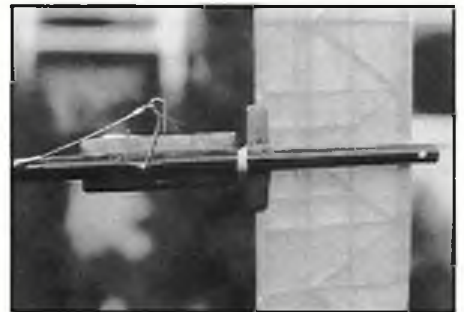
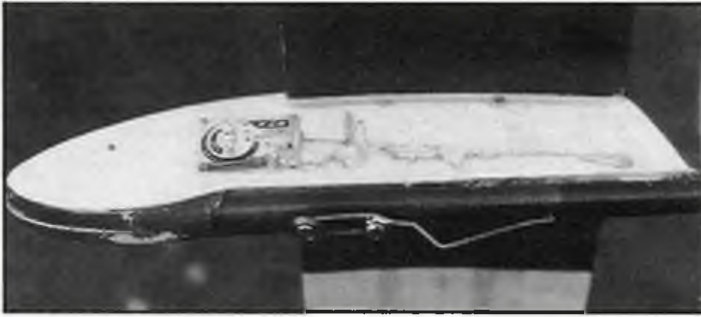
You may have found the above controversial and presumptuous, but it is meant to help in good faith...

Having made a list of criteria and design features, the next stage is a layout plan. I usually only make a 'layout', not a detailed plan, so producing the drawing for this article was painful!

Next come templates for wing and tail sections - including 'female' templates for the leading and trailing edges. These are fashioned to the true section before notching out spar slots. Accuracy is vital!

At this stage, I had at least analysed what I was looking for. Results proved it was very worthwhile, for Adonis is a very good performer. In the hands of a well-practiced flyer it will outperform most. I only manage to fly at one or two contests a year; once at the Nationals when during the seven rounds I achieve four or five maxes, usually early on before my fitness





Top left: Timer details, simple towhook and nose-skid shown here. Top right: Fuselage pod with wings detached and timer linkages disconnected. Above: All-moving fin and warp-resistant tailplane are features of the Adonis. Above right: Auto-rudder linkage details. Right: Substantial fin platform allows space for adjustment screw housings. Below: All the bits ready to-go! Adonis has shown the capability to be among the winners - could this be you?



fails. My good friend and neighbour, Mike Page, endorses all of these comments and states that having given you all the plan, I will now lose what advantages I had. But at least I should have encouraged those that are put off by the experts. Adonis will climb through a stack of models, experts' or not, like an express train.

Now for putting it together: wings first

Wood choice is very important. Always use the lightest grade at the tips and the most dense at the root. Cut the ribs and grade them; then make spares and sand as plan, using a micrometer for accurate thickness taper. Build all panels flat to start with. This ensures sectional accuracy. Sand leading and trailing edges to the female

templates. I always sand the leading edge after assembly to achieve neat transition to ribs and centre panel undersheeting.

For covering the wing I use Mike Woodhouse's 'heavy' tissue with the smooth side outermost on the lower surface and the rough side outermost on the top of the wing. Six coats of 50% dope/thinners are used; warps are coaxed at 'coat No. 4' using a good hairdryer.

Important. Do not alter the warps as stated. They are a vital part of the trim concept.

As for the rest...

While the tail must be light, it must also be strong enough to resist unwanted warps. The design as shown does a fair job but

remember to choose a nice light piece of spruce for the centre spar.

The fuselage is relatively straightforward. The all-moving fin is essential. A very safe turn trim is the result. Some thermals will cause the model to tighten its turn, but it won't spiral in; instead it just stands on a wing tip and goes up.

All that is left is the trimming. If you build as per plan, this will be simple; just don't make the glide turn too tight to start with. What looks right usually is.

I shall continue to develop the design. Maybe one day I shall try circle tow. Adonis number three will be built this winter. This may not be Mk. 3; how's that for confidence!

If you have any problems, I will only be too pleased to help, so drop me a line via *Aeromodeller*. Enjoy your modelling; and remember, always question your motives and analyse the objective...



BLUE DRAGON

Resurrected!

C. E. Bowden's pioneer model has been readied for flight again. Alwyn Greenhalgh explains how he set about the task

AT THE Northern Gala meeting held at Barton Airport, near Manchester, during the summer of 1936 the occasion was graced by the attendance of a number of prominent aeromodellers from south of Watford. One such was Captain C.E. Bowden who brought along his Blue Dragon, the petrol-driven model which held the 1934 record for endurance. At this time, petrol models in the north were very few and the Blue Dragon created a great deal of interest. The only petrol model in the Lancashire Club was at this time under construction by Frank Charles. This was a handsome low-wing monoplane of six feet span, with an oval fuselage and huge spats. The model was never finished because Frank tragically died in a gliding accident later in the year.

Captain Bowden was prevailed upon to fly the Blue Dragon but he declined

because of the fairly high windspeed (not unusual at Northern meetings). Nevertheless he did glide the model which rose at an angle of about thirty degrees, stalled and landed on its port wingtip breaking the wing about a foot from the tip. How do I know all this? I was there!

Much later

The next time I saw the Blue Dragon was when I visited Lieut. Colonel Bowden in 1962. The model was in a badly-damaged condition and he was building a replica which was intended for radio-assisted flight using as many of the original parts as possible.

Colonel Bowden died in 1984 and his vast collection of models was sold. I was fortunate to acquire the remains of the Blue Dragon which consisted of the fuselage, the mainplane and the engine.

The fuselage was clearly the original but some doubt existed regarding the mainplane. The one that passed into my care was fitted with slots and was covered with sheet balsa at the leading and trailing edges, but these were not features of the original. After stripping off the remnants of the white-painted fabric, the edges of the ribs were found to have retained a previous, correct, silver finish which was also evident after removal of the balsa sheeting. The leading and trailing edge members also showed signs of a silver finish. This certainly seemed proof of originality - something that was confirmed by the visible repair to the spar one foot in from the port wingtip (after the damage caused in 1936). The slots and sheeting had been added as modifications, of which C.E. Bowden was very fond. The mainplane was stripped of all covering and sheeting and copious amounts of plastic wood were removed from various repaired areas in the centre sections of the two halves. All other repairs were removed.

The fuselage was next surveyed. After cleaning out years of accumulated dust, the fabric was carefully removed.

One of the problems in the restoration of a model, particularly an aircraft, is to determine its original colours. Most people know that the Blue Dragon had a blue fuselage and silver surfaces but what shade of blue - and what was the colour of the markings? The forward end of the

fuselage had been re-covered, presumably after damage but the new fabric had been applied directly on top of the old. The two layers were removed together and when parted, the original blue finish could be seen well-preserved on the first layer. Moreover, the markings were in gold and not in white as had been thought.

The empennage was missing but Colonel Bowden had, some years previously, given me some reduced-scale drawings of the Blue Dragon which contained all details of the tailplane and fin. In addition, from a number of excellent photographs of the model in different attitudes, particularly one of the model directly overhead and another showing a good side view, it was a simple matter to check their dimensions and structure.

Other structural details were verified from contemporary articles in the model technical press. All was now set for the restoration of the airframe.

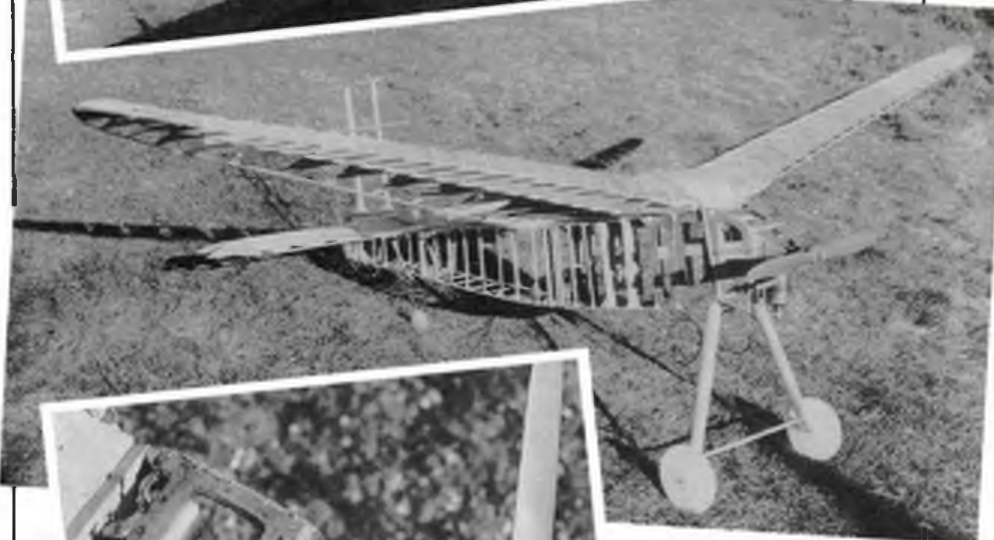
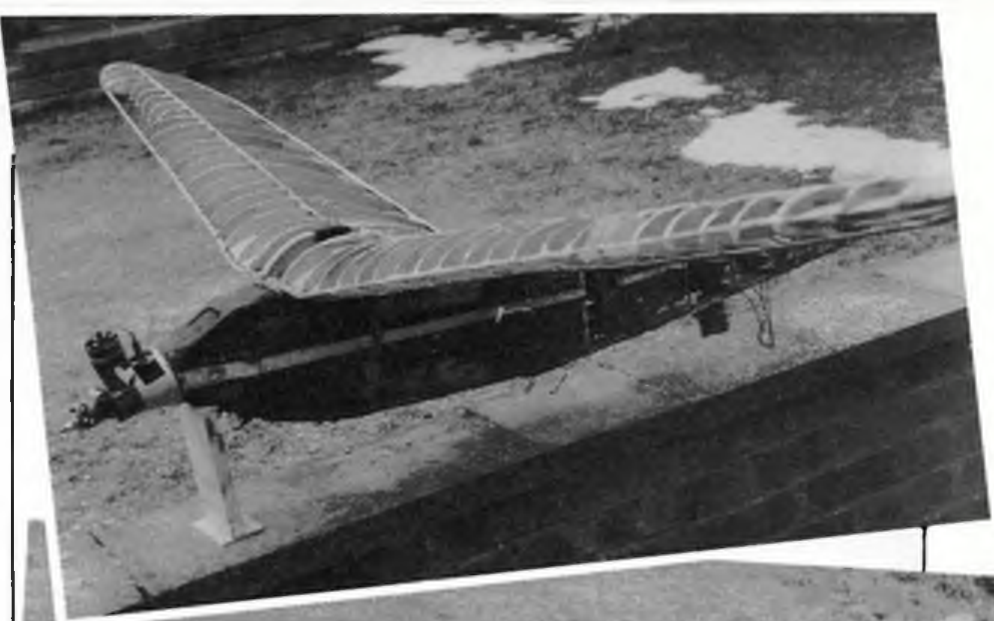
Restoration begins!

The fuselage was first dealt with. A build-up of plastic wood, when removed from the nose, revealed the original nose bulkhead. The longerons were found to be birch, 1/8th inch square, as were most of the uprights and spacers. All sections of the damaged longerons were replaced, new material being spliced in. Each longeron was dealt with in turn in order to maintain the integrity of the fuselage. When all four longerons had been repaired, all uprights and spacers which had been removed or were missing were replaced and the gussets at each joint were renewed. The first three side bays at the nose had 1/8in. 3-ply inserts fitted and these had been 'sewn' in and glued. These inserts were carefully removed, cleaned up and 'resewn' in, then reglued in original fashion. The bottom of the fuselage as far as the battery bay was recovered with 1mm plywood, the original having been badly damaged. The nose bulkhead was also replaced.

The undercarriage was past any further use, even in supporting the model statically. A new one was fitted, the attachments being strengthened with stainless steel clips bolted to the fuselage. Having decided to return the model to its 'as built' state, I cut a pair of wheels from 1/8in. 3-ply. The wheel hubs are from the same material and there is a brass bush forming the bearing in each. In some of the books in which the model is described the wheel diameter is given as four inches but this alludes to the balloon-tyred wheels fitted later. The original wheels were five inches diameter and fabric-covered.

A new tailplane and fin were constructed. The only variation from the original is in the fin, where the jiggling members used in its building have been left in to provide a little additional strength. The fin outline is 16swg piano wire and the ribs are cut from 1/16in. sheet balsa, as are the tailplane ribs. The tailplane leading and trailing edges and spars are 1/8in. spruce and the tips 16swg piano wire. As an aside, it is interesting that when Colonel Bowden ordered wire, it is said that he asked for 'thick' or 'thin' wire, the former being 10swg, the latter 16swg.

The mainplanes had already been stripped and all repairs removed. It was found necessary to renew the two inboard ribs in each half because the 1/8in. plywood from which they had been made



Top photo shows Blue Dragon soon after restoration began in 1985. The complete airframe is seen above, with the engine bay at left; note the 'sewn-in' plywood panels. Heading photographs on previous page show Alwyn with pristine model and (inset) Blue Dragon in original trim.

had separated and split. All other ribs were from 1/8in. balsa sheet. These were repaired as necessary, those in way of the slots being rebuilt because slots were not a feature of the model as originally built. Where new pieces in the leading and trailing edges and spars were needed they were inserted by splicing, the splices being of the ratio 1 in 12, this being the optimum for strength of such glued joints.

The original method of joining the two halves of the mainplane was by binding thin string round hooks located in each at the leading edge, spar and trailing edge. The halves were registered by means of three projections in one mating with holes in the other. Lift loads in the mainplane were offset by the rubber bands holding it onto the fuselage. This means of assembly is very dubious so three metal tubes were

let into each root and the mainplane halves joined with half-inch-diameter dowels. The hooks and string have been retained for authenticity and serve to hold the halves firmly together.

The airframe was assembled and rigging and symmetry checks performed. Little adjustment was needed; the airframe could now be covered.

Covering and detail work

The original covering material was a light cotton fabric, but this is no longer manufactured. A nylon fabric of similar weight and similar but closer weave was obtained after some searching. Covering the fuselage and empennage was quite straightforward but the mainplane halves presented a problem. It was the depth of the wing section combined with the bend

at the dihedral angle on the top surface which made it very difficult to cover using one piece of material only for the whole of each half of the mainplane. The fabric used originally was of a more open weave which would have made application easier. The fabric needed to be sewn to the rib at the dihedral angle and to each rib on the lower surfaces because of the undercamber. Great care had to be exercised in maintaining the warp and weft of the fabric exactly, spanwise and chordwise respectively, to eliminate any tendency of the light structures to warp when doped. After doping, the coloured finish was applied, silver on the flying surfaces and undercarriage members and the correct shade of blue on the fuselage and wheels. In order to achieve a more contemporary appearance after spraying the cellulose paint it was immediately brushed, leaving a somewhat 'Bowden-type' finish. The fuselage decoration was next added in gold lettering and strip.

The airframe being now completed, attention was turned towards details. The fuel tank is mounted behind the 'windscreen', at the top of the fuselage. The original tank, which was a proprietary item purchased from A. E. Jones, was fitted with a shut-off valve and filter, the filter cap having a vent pipe protruding from it. An identical tank had been fitted in Colonel Bowden's powerboat Jildi-Junior which I had already restored to operation status; so having this pattern, a replica tank was easily made from brass shim. The vent pipe has been made detachable because it could be battered by the mainplane if moved forward by a heavy landing, tearing the tank from its mounting (this appeared to have occurred on a previous occasion).

The flight timer was made up from an Eastman-Kodak delayed-action camera timer of air-bleed type, the knob of which was arranged to operate a push-pull electrical switch. A timer was found amongst the Colonel's effects. Only the rubber washer needed renewing to bring it up to scratch. However it took some time to find the correct type of switch but eventually one was found in a junk-box at a 'car boot' sale. The timer and switch were mounted on an aluminium plate, the assembly then being bolted on the top of the fuselage abaft the mainplane.

The ignition coil was somewhat *hors de combat* so a new one was fitted, sited on the rear face of the first main bulkhead. The battery-box was renewed and made to a size which would accommodate four AA nicads. Access to the batteries is through a door on the port side of the fuselage. The electrical wiring was next installed but not connected at this stage. An engine mounting plate was made from 1/16th inch duralumin.

Motor matters

Now let us turn to the Atom Minor engine. This was mounted on a light alloy casting and did not look in the best of health. The crankcase backplate had been removed and the mounting adapted as a substitute. A new backplate was made in order to return the engine to its former state. The carburettor, which was of the Rankine type, had replaced the Westbury version fitted when Edgar T. Westbury made the engine. The Colonel had been corresponding with Rankine after meeting him when stationed in Scotland and the



result of this was the modification of the Atom Minor engine in the boat Jildi-Junior - which was carried over to the Atom Minor in the Blue Dragon. New bolting was made and fitted after reworking all the tapped holes in the engine. After inspection and refurbishing the components as necessary, the engine was reassembled with gaskets (made from stiff paper coated with shellac) and a new copper cylinder-head gasket.

Only the contact-breaker now needed attention. The propeller hub is mounted on a tapered portion at the front end of the crankshaft, forced on by a nut on the threaded end of the shaft. The contact-breaker cam ring is attached to the rear of the hub by two set screws and the centre hole is a close fit on the parallel portion of the crankshaft. The fit of the hub on its taper had, no doubt, deteriorated and to alleviate this a shim had been fitted over the taper; but it had moved at some time during fitting up to a position in the central hold in the cam ring and on



Top of page: Another view of the blue, gold and silver craft, ready now for trials. **Above:** The name plate reads 'C.E. Bowden, 1933'.

tightening the nut the ring had split at its point of minimum cross-section. A new cam ring was made from Inconel which did not need case hardening. The contact-breaker points were stoned to shape and all insulation bushes and washers renewed. The fitting of the contact-breaker and the timing of ignition completed the engine.

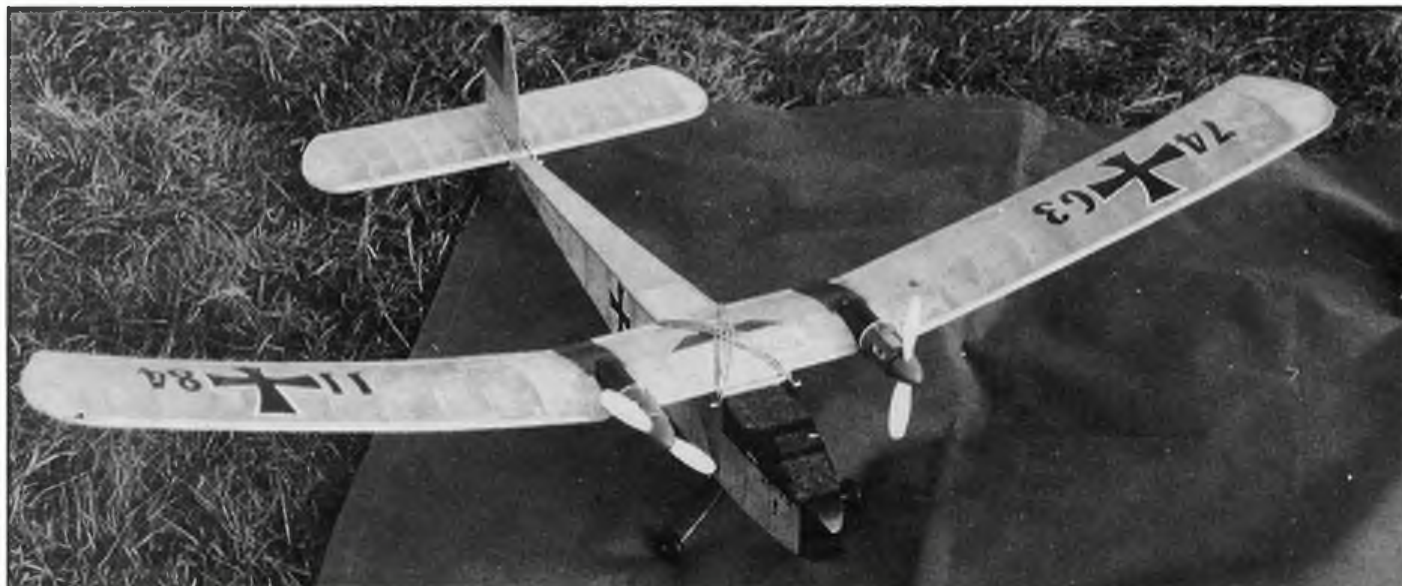
A engine test-bed was made and arranged so that the engine, fuel tank and coil were in their relative places as when installed in the airframe. The actual fuel pipe and high-tension lead were used for the test. The foregoing rehearsal is essential in order to ensure success when fitted in the model. The 10mm short-reach sparking plug was cleaned, points adjusted and the washer checked. The first item to note is that the battery is fully

charged and serviceable and that all electrical wiring is sound - even on a test bench this is essential; no 'lash-up' will suffice. With the plug out of the engine and laid on the top of the cylinder with the high tension lead connected, the ignition was switched on and the propeller rotated. A nice spark showed that the system was in order and the plug was fitted and tightened. The next step was to fill the tank with 2-stroke petrol mixture. This should be done only after completion of ignition checks because of safety aspects where petrol is about. It was gratifying to see the carburettor float rise on opening the fuel tank valve, then to note that there was no overspill of fuel, which showed that the float valve was working properly. After setting the ignition to a much retarded position, the test propeller was pulled over to check for free rotation; then the carburettor was flooded by means of the 'tickler' on the float chamber. After a few flicks a most satisfactory bang emanated from the exhaust pipe. The throttle was then set to the half-open position and on the next flick the engine started, running for a few seconds on the priming fuel. After a little experiment the correct setting for the jet adjustment was found, then that of the ignition. Subsequent runs proved the engine at all throttle settings. The original propeller, which had been cleaned and rebalanced, was fitted in place of the test fan. This propeller, which is made from an electron (magnesium alloy) casting, has very sharp edges which precluded its safe use until the engine starting characteristics had been established. A final check run was made, after which the engine was removed from the test bed and refitted to its mounting plate with the requisite degree of downthrust.

The ignition coil and fuel tank were removed from the test bed and refitted in the fuselage. All electrical wiring was connected up and the engine attached by means of a spring on each side of the fuselage engaging with hooks on the mounting plate. In order to gain access to all components and wiring, discreet removable hatches have been arranged in the fuselage.

To the future...

And so, after some twenty months, the Blue Dragon is once more complete and serviceable. At a suitable location and in a favourable climate full flight trials will be made, but test glides which augur well for powered flight have already taken place with an equivalent engine mass fitted.



I'M IN CHARGE

The recently published three-part feature *Electrifying Experiences* by Roy Ashby caused a great deal of interest amongst F/F enthusiasts keen to learn more about other individuals' progress with electric power. In particular, mention of the Zweiflei twin for Mabuchi A-1 units (*Electrifying P.S.*, *Aeromodeller*, January 1987) prompted much response. Could we, came the question, provide more details? And so, despite the scarcity of the A-1 motor system nowadays, we present the designer's own account of twin electric 'Zweiflying' in the hope that it encourages others to try similar experiments - especially as over-the-counter provision of new, ready-to-use, R/C buggy-inspired flight units seems imminent. Twin F/F subjects are ideal candidates for electric power - so think ahead... GC.

Mabuchi Models

I THINK THAT IT WAS the article 'Electric Power' in the December 1975 *Aeromodeller* which sparked off my interest in this form of power free-flight in general - and in the Mabuchi A-1 motor in particular. Having not long returned from six years' working abroad, and having unloaded most of my aeromodelling equipment back in 1969, I was eager to find some method of getting back into action in the quickest way possible. The Mabuchi A-1, which was then being extensively advertised, seemed to offer the ideal road to this goal.

Over the past ten years or so I have designed and built a considerable number of such models, including a canard, with varying degrees of success. The only out-and-out failure was a flying-wing which was scaled up and modified from a chuck-glider design in a foreign magazine. An exception to my 'own-design' rule was the modification of a Keil Kraft Senator, which had become too battered for its rubber-powered role. This flew reasonably well (indeed, it is still more or less in one

Experiments with a F/F electric twin recounted by Ian James

piece) but it seemed a little too bulky for the power available.

The above does not infer that I possess any great ability as a designer; rather, it indicates how well the A-1 lends itself to own-design work and, in general, how forgiving it is of vagaries in design! This must be the case as, over the past decade, I have lost three motors in fly-aways, all in widely varying and experimental craft, including the first I ever owned in the first electric model I designed. Indeed, a few years ago I was lucky enough to have a model - now finally lost forever - returned to me from a dozen or more miles away from the flying field. Since that time I have tried to remember that simple device known as a D/T!

What is more, Mabuchi A-1 powered models fly so gently that none of my designs has ever been damaged beyond repair. Unless they are lost, stray or are stolen they survive! Unfortunately, the supply of this motor is now, at the best of times, sporadic and spares are limited. Nevertheless, the agents, Ripmax, maintain availability whenever possible and suitable nicads are readily obtainable from other sources.

The Zweiflei Twin

Since 1981 my club, the Walsall MAC, has held an annual contest for own-design models, a denomination which covers all types of aircraft except, of course, scale. Up to the present time this event, which has

enjoyed considerable popularity with our members, has produced many interesting entries from the free-flight and radio-control fraternities. Control-line, once very strongly represented in our ranks now appears to be in the doldrums.

It was for this contest that I designed and built the Zweiflei in 1984. My tongue was in cheek and fingers were crossed (*it doesn't show in the construction: GC*) as I was certain that a twin-motored free-flyer would present me with all sorts of problems. After all, hadn't I read as much during the forty years since I began to absorb *Aeromodeller*, *Model Aircraft* and other aeromodelling magazines? Here, I felt, was one model which would run counter to my experience with those Mabuchi A-1 models which flew so gently that they never suffered irreparable damage. Model weight (the A-1 is rather heavy for its power output) and the speed of a twin would surely combine fatally to produce a model which would live dangerously and briefly rather than gloriously...

As things turned out the Zweiflei, although it had no success in the 1984 contest, proved to be a stable flier almost from the word go. Apart from requiring a bit of packing here and there it flew off the proverbial drawing-board. However, optimum performance took longer to achieve; it was finally reached through the use of better-charging batteries - Size D Duracells - and progressive and surprising increases in wing and tailplane packing.

When all the above factors are in harmony the Zweiflei will turn in very pleasing flights of a minute or more, and it will even attempt to catch thermals in the right conditions. Two A-1s and their nicads do constitute quite a load, however, and the model is slow but stable in flight, rather resembling an economy version of the Messerschmitt Me323 Gigant.

The original Zweiflei, after two years of fairly constant use, is now a tissue-scarred

veteran; but to its credit it has suffered severe structural damage only once. This did not occur in a crash but when the model was blown about on the ground after landing, the starboard outer wing panel breaking near the dihedral joint. Otherwise it has survived encounters with the infamous wood at Old Warden, the vicious thistles of Oxford's Port Meadow and one of the jumps on Warwick racecourse, amongst other obstacles.

The design is tough and weight could perhaps be saved here and there in any future version. It is also amenable to modification as Adrian Culf has shown with his very attractive Zweiflei Mk II which has tapered outer wing panels, twin fins and other alterations from the original (see p.77 of the February 1987 *Aeromodeller*).

Oh yes, the Zweiflei will ROG. I was able to prove this at Barkston Heath when I attended the SMAE Midland Area Fly for Fun Rally in 1986. The take-off is after the style of an ancient airliner, long and slow with a pronounced, but not hazardous, swing to the left. Had my charging batteries been a little livelier that day I might now be able to say the same of that ROG!

Perhaps you fancy trying Zweiflei — maybe to suit your own experiments with electric flight. If so — here are a few notes on building and flying.

The fuselage is simplicity itself. In fact, I have been accused of being under the influence of the K.K. Senator when I designed it! It is built almost entirely of 1/8x1/8in. medium-hard balsa; all material sizes are given on the drawing.

The undercarriage is of 16swg wire and the tailwheel is mounted on 18swg. The U/C former is bound to the first set of diagonals in the fuselage and the space between these then sheeted in with 1/8in. balsa. Likewise, the triangular areas behind these diagonals are filled in with 1/8in. sheet. These reinforcements protect an area which undoubtedly receives quite a pounding. At the point where the undercarriage legs emerge from the fuselage there is a crosspiece of 1/8in.x1/2in. balsa. The tailwheel leg is epoxied to a strip of the same material cemented between the cross-pieces. I used wheels of 1in. and 1/2in. diameter for the main u/c and tailwheel respectively just because I had them in stock, but wheels of any other reasonable sizes will fill the bill.

For greater strength the noseblock is backed with 1/8in. sheet between the fuselage sides and the first spacers. Similarly, the first bay of the fuselage is sheeted in at the top, between the sub-longerons, and at the sides and bottom.

Use stout dowel for the wing and tail fixing. I suggest 3/32in. diameter bamboo. The rearmost tail-fixing is a large, strong pin epoxied in position. The tailplane mount is shown at a pronounced negative incidence. Believe me, this is necessary and it will save using an ugly piece of 3/16in. packing. The 1/8in. positive incidence packing found necessary for the wing is shown built into the fuselage but is not so obvious on the plan.

Finally, the cabin area of the top of the fuselage between the wing mount and the noseblock was originally glazed down to the horizontal sub-longerons. The first awkward landing under power revealed this to be a mistake as, when the wing

slewed, one of the props chewed into it. This area is now sheeted with 1/32in. balsa and covered with black tissue.

The wing is a relatively simple structure but, as shown on the drawings, it has been slightly modified.

The original had motor nacelles made from R/C glider boom offcuts culled from a kit which a friend of mine was making at just the right moment back in 1984. (This plastic tube turned out to be French roach pole!). In spite of its very slight taper this accepted the Mabuchi A-1 battery cage as if it had been intended for the job. At that time these battery cages were available as spares and so two were epoxied permanently in position. As the spare is no longer available, we have another reason for the modification. In any case, this tube is quite expensive to buy if all you require is a total length of three inches!

The alignment of the two motors is obviously of paramount importance and I would suggest that the method of mounting shown should be used rather than the standard Mabuchi A-1 motor mounts. To use the latter would require the leading-edge cut-outs to be much wider, and complications in construction would be introduced.


To avoid other snags the original angle formed between motors and wings has been maintained.

More Zweiflei gen overleaf...

Heading: The Zweiflei twin showing original plastic tube motor mounts and sheeted cabin area. A fine performer! Below: The author and his Zweiflei one freezing afternoon. Ian is feeling the temperature but the model looks happy enough! Right: A reminder of Mabuchi A1 advertising. Units may still be found - if you search...



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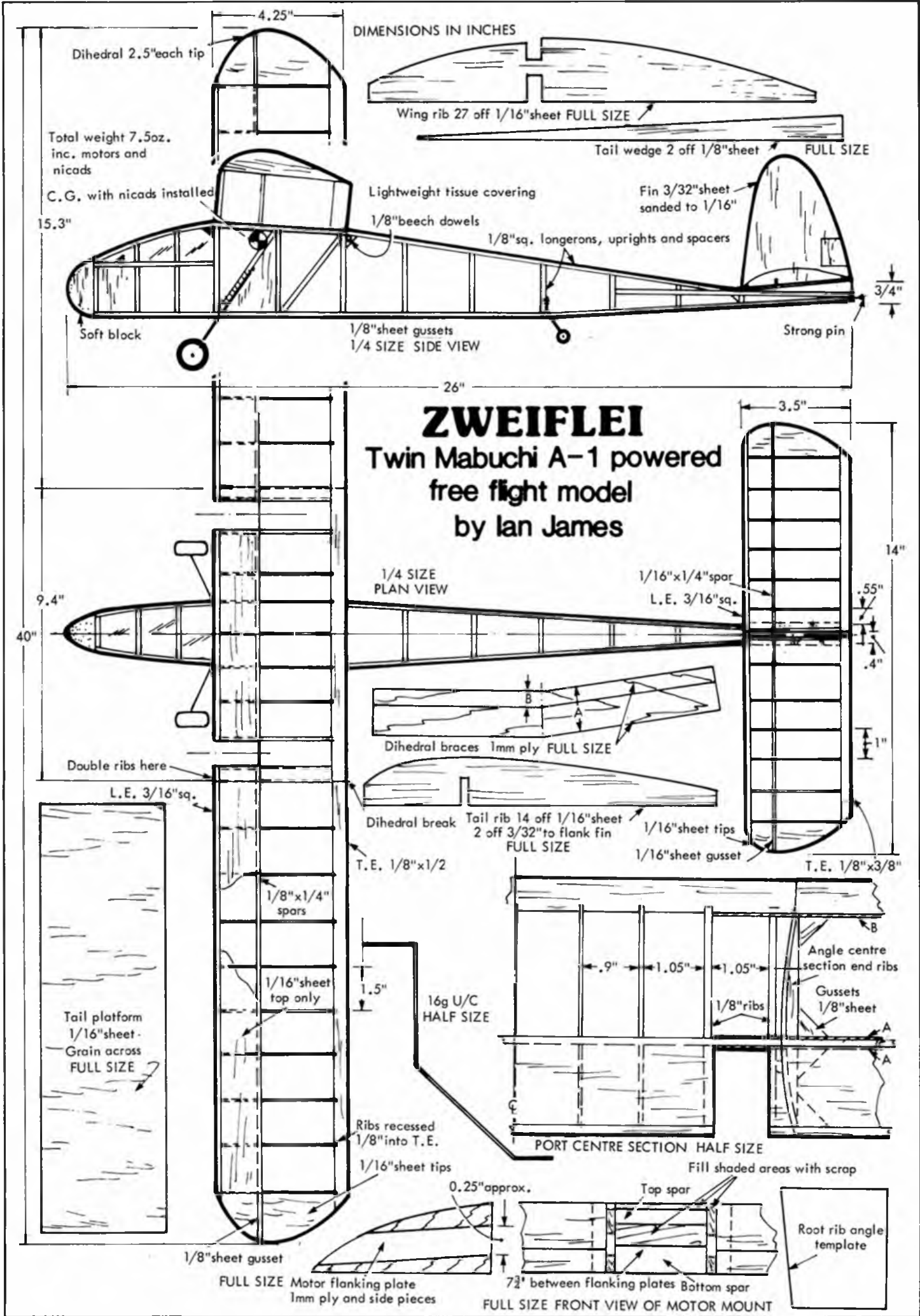


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A1 AEROMOTOR UNIT	£2.40
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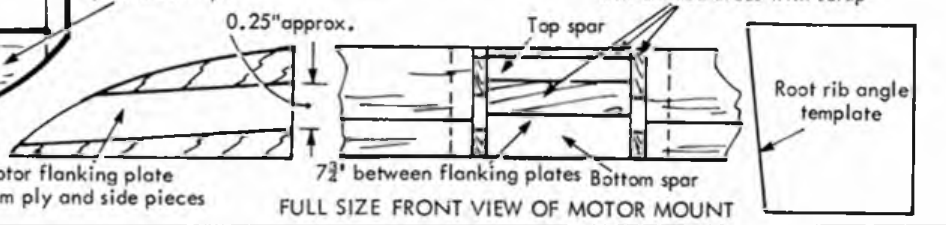
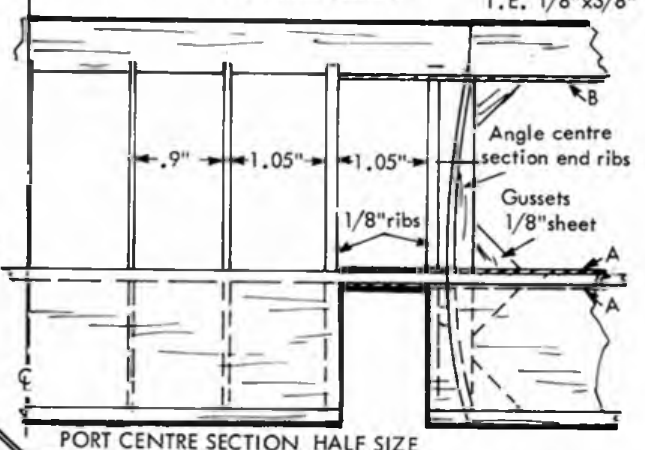
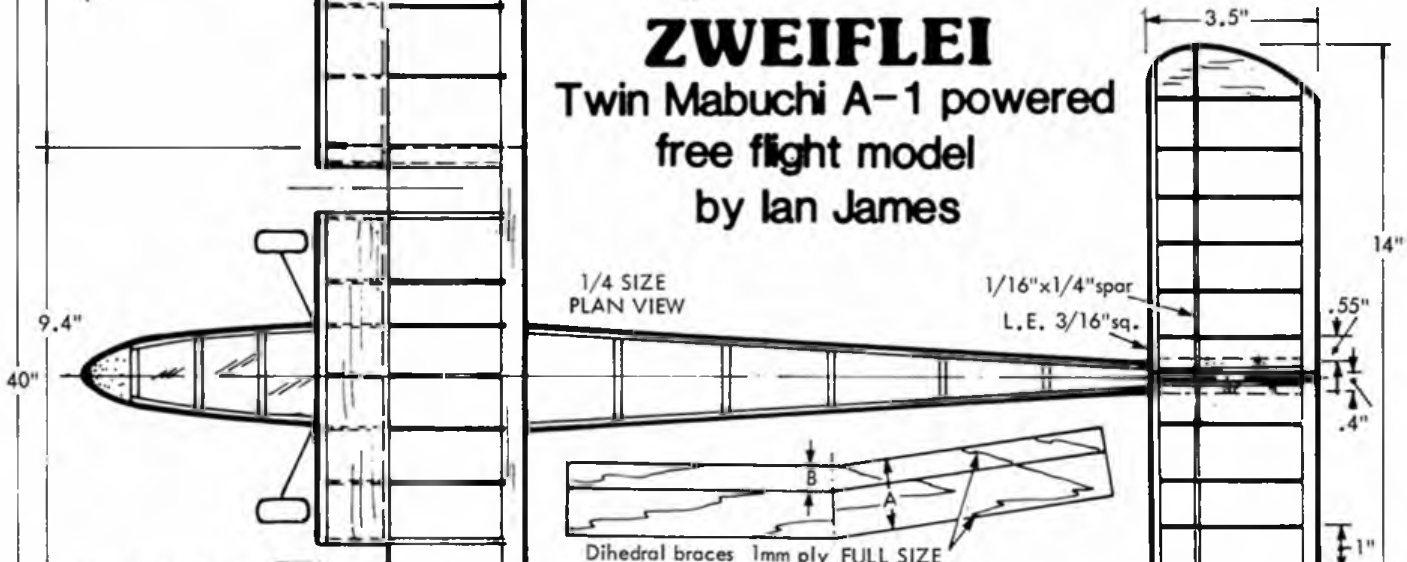
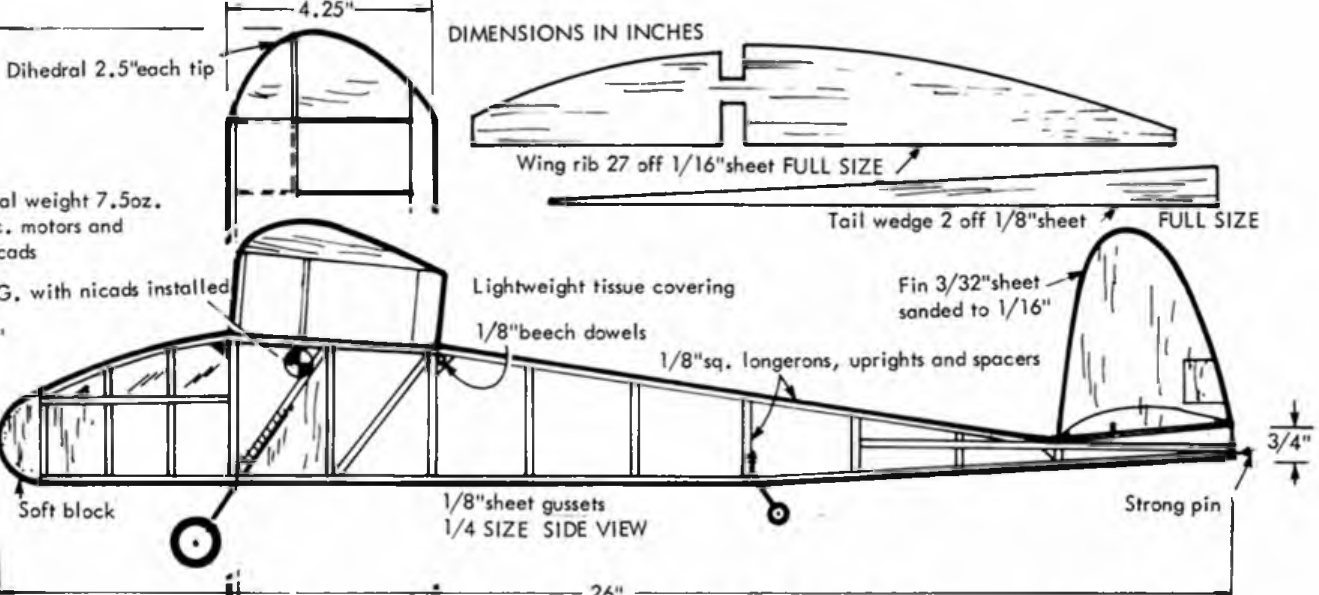
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AT YOUR MODEL SHOP!



ZWEIFLEI

Twin Mabuchi A-1 powered free flight model by Ian James





I must stress that it is most important not to make the battery cage fit too tightly between the ply riblets which flank it as this will cause distortion, making it difficult to insert and extract the nicads and, even worse, preventing a good contact between these batteries. What follows is a cardinal rule:

The non-distortion of the battery cage is a vital rule to follow in Mabuchi A-1 powered models, even when using the conventional mounts.

However, the lugs on the battery cage may be fitted tightly between the top and bottom of the 'slide'. These lugs are approximately 1/4in. wide. Nevertheless, to allow for slight variations in this dimension, the cages and the slide pieces should be fitted individually before the latter are exposed to the 1mm ply flanking plates. Use *dry soap* to lubricate the slide if necessary but, to avoid wear, the battery cages should be removed from the slide as seldom as possible. They should, at least, remain in the wing during any flying session.

If you are lucky enough to locate a source of spare A-1 battery cages ignore the foregoing paragraph entirely and epoxy two of them permanently in position. Oh

yes, and please let the writer have details of said source!

The second modification is the sheeting of the leading-edge of the outer panels to obviate the elliptical dihedral which marred the appearance, if not the performance, of the original Zweifler. I should have done this in the first place but I was concerned, needlessly as it turned out, about model weight, which proved to be 7.5oz with motors and nicads in place.

It is also vital that the wings be keyed in correct alignment with the fuselage. I suggest that split dowel be used for the purpose and located on suitably strengthened areas beneath the wing.

Tail and Fin construction is entirely straightforward, requiring no special explanation.

Top: Charging one set of nicads before flight. Just visible is the wire rod which locks the charging button 'down', allowing 'hands-off' operation. Below: Away it goes! Zweifler is launched into the wintry air of Walsall Airport on 3rd March this year. Photos: George Beeson.

Right: Shape of things to come? This power package, from the latest Union R/C kits, is soon to be available separately. Watch for news . . .

Flying Zweifler presents few, if any, problems. With nicads installed the model should balance on the wing spar. As described and drawn it should fly without any preliminaries. However, if you wish to indulge in a session of test-gliding, select the mythical long grass on the legendary calm day and follow the usual procedure, with nicads installed of course!

Zweifler almost invariably turns to the left under power but wind or turbulence have sometimes caused it to do otherwise. A one-inch-square trim tab near the base of the fins prevents the left turn from becoming dangerous, but it should be used with care, and only very slight deflections tried.

Do not attempt to obtain tight circling flight from this design. It doesn't like it! Zweifler is basically a sedate, fun flier best left to its own devices.

I have found that the following method is best for hand-launching. First of all, remove the switch-arms from the motors as, on this model at least, they are awkward and ugly. It is a simple matter to start the A-1 by twisting the body of the motor. Determine which of the motors has the longer power run for the same five-minute charge, and install it on the starboard side. Always use the same set of nicads with each motor. Motors and their battery cages may be identified with a marker pen.

The model may be held in the left or right hand for launching. The starboard motor should be started first by reaching across the wing with the other hand. The port motor is then switched on as quickly as possible, the idea behind this operation being to achieve a near-simultaneous cut-out. Mind you, even when this does not happen I have rarely seen the Zweifler seriously affected by asymmetric thrust. As a right turn seems not to suit my particular Zweifler the above has been found to be the better course of action.

When switching on the motors do avoid contact with the propellers as the A-1 has more than enough power to inflict a painful rap! Hand-launching should be gentle but positive and the Zweifler will very soon pick up its correct flying speed.

Should you decide to build this model, or some variation on the original stark, Teutonic theme, may I wish you many happy flights and obstacle-free landings.



FROM THE HANDLE

Wire whys and wherefores unravelled by Claus Maikis

Every chain is just as strong as its weakest link. The link between our hand and our airplane is the control lines. So much depends on their proper function that they deserve special attention. When looking at this topic we can consider several aspects. The most important points are the intended use (for which kind of model); the types of lines available; quality; rules which govern selection (if any); treatment, care and accessories.

The intended use dictates the type and size of the lines. To give advice about line diameter is difficult because application of the lines may vary considerably, but as we're talking about stunt airplanes here, some basic guide may be given. Since American-made products are widely used I'll use their gauge system. Roughly we can set the following classification:

Engine displacement	Line diameter
up to 0.09	008
up to 10.25	012
up to 25.45	015
up to 45.60	018

Experienced stunt flyers may not always choose to fit in with this classification. These pilots try to use the smallest diameter possible; thick, heavy lines spoil the performance of the airplane. They know from experience how far they

can go. Their choice depends on the type of airplane, type of flying, and special precautions they give to their equipment. Also, rules can dictate the choice of lines if you fly in a competition class.

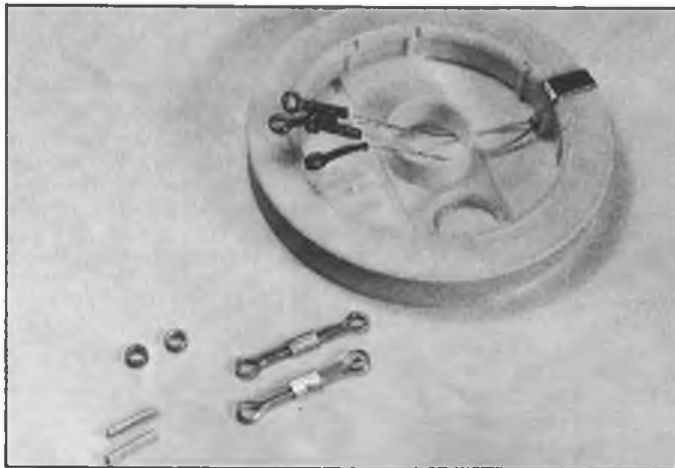
What's your line?

The type of the lines to choose is crucial. Basically we have three varieties: thread, solid or single-strand lines and multi-strand cables. Thread or terylene lines are usually sold with those ready-made plastic models. By all means - forget them! To use them is to invite disaster. They are so flexible that precise control is impossible. Solid lines are made of piano wire. They are made in a wide range of sizes giving a great choice of diameters and lengths. Stunt flyers don't like them very much because of their particular characteristics. Piano wire has a natural spring action and (especially after being stored for a long time on a spool) it wants to curl when removed. It won't lay straight and flat on the ground by itself. Stranded cable has a spring action too, but to a much lesser extent.

Since we're flying numerous manoeuvres the lines are crossed and twisted several times. In this situation the lines have to slide along each other. The

friction of stranded cable is much less because there's less area in contact. In rain, where the adhesion of the water adds to the friction, single-strand lines can be dangerous. Lower grade steel wire as well as the 'tinned' variety can be soldered. Stainless steel doesn't take solder.

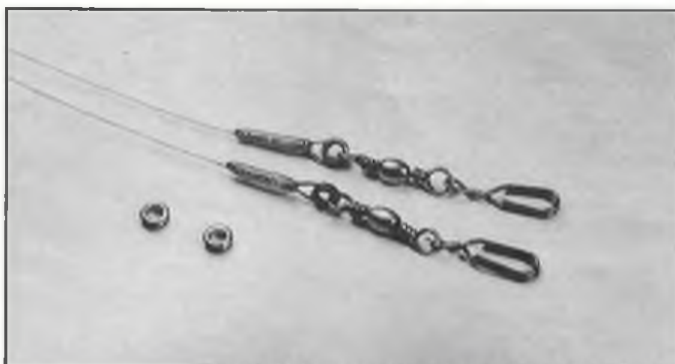
Quality is an aspect we usually don't bother about when we buy our lines in the model shop. We hope the manufacturer has taken care of this. With the price of this essential equipment getting disproportionately higher and higher it might be interesting to look for cheaper sources. In particular, the combat flyers - who get through lines at an astonishing rate - have found ways to fulfil their needs. These lines can be used for stunt flying too, of course. Some information about the quality of the product in question should be known. The given load is only one part we should consider. Higher tensile strength means a wire which is more brittle. This wire breaks when it's bent; at the least it will lose some strength. A slight bend may cause a loss of around 10% strength; with a right angle bend the figure is 15% and a 'pointed' kink may mean the loss is 25%. Refined steel has lower tensile strength, but is more flexible and can be bent in tighter radii. This is especially important for making our end loops. Wires and cables are usually sold on big spools holding thousands of metres. It's wise to buy the whole lot for several flyers or for a club. When choosing the diameter of cables we have to consider that



Above: A 'ready-to-use' set of lines plus reel. Claus immediately cuts off the ends and makes his own replacements. Lines with 'open' ends are delivered with connectors, short lengths of aluminium tube and eyelets (foreground). Below: The type of connector preferred by Claus (at the handle end, that is). Eyelets are cut open for fitting; clips are home-made. Note the very tight copper wire wrapping covered with epoxy.



Above: A variety of swivels. Load limits are sometimes given - if not, check with a spring balance, advises Claus, who adds 'swivels used for sharks should suit our needs!'. To be fair, we should point out that not everyone favours swivels. Pros and cons, please... Below: The reel thing! Commercial reel at left is dwarfed by home-made spool (centre) painted to match the model, and metal wheel rim. The bigger the better!





Ian Russell visited the '86 US Nats - here are a couple of snippets from the stunt circle. Stylish tail, above, belongs to Dombrowski's Lacemaker; Tom Dixon's Merco 61-powered Big T-Bird at right presents more familiar lines.



the nominal figure is the outer diameter. The actual section area is proportionally smaller, of course. Furthermore, a nominated load applies only for a straight length. As mentioned, we lose some strength in the attachment loops, which should be taken into account. For safety purposes a 200% margin is generally accepted.

Rules don't come into the sport flier's compass. Since the recommendations are based on experience, he's well advised to follow them, though. In some countries there are line size rules. Here the choice of lines is restricted if we want to enter competition. For example, the Americans have to live with strict thickness rules which are related to the engine capacity. This is such an influence that American pilots sometimes go to a smaller engine size in order to avoid unnecessarily heavy lines. Thank goodness the FAI requires only a pull test. Our control system is checked with a load of 15 times the model weight (but not higher than 20 kilograms). This is a good rule, and within its limit we use what we find practical and acceptable.

Careful treatment

Treatment is a factor which can influence the choice of lines. There are different ways to make a set. Whether we prefer to bind, solder or glue the ends will determine a certain type or brand. Binding shouldn't be used for anything but the smallest models. There's just too high a risk of losing overmuch strength in tight knots. Soldering is a safe connection but has one serious drawback. We create a thick, stiff part which suddenly changes section at the thin line itself. This is a dangerous point where the line can easily bend or kink. When lines break it's usually here. The best treatment of the line end is tight wrapping of the line back upon itself (for solid lines only) or with thin copper wire (on solid or stranded lines). When secured with epoxy this way of fixing is generally accepted as the best. There's also a quick-and-easy fixing method by means of a crimped tube. I don't like it at all. If you must use it, crimp only multi-stranded lines, not single-strand lines which might slip out of the tube.

We never can take enough care when handling our lines. In everyday flying they're highly stressed (especially with larger airplanes), tortured by spectators' feet or pulled along the ground. We should try to avoid this as far as possible. I always look for a place to unroll my lines with the least risk of dirt and danger. Before each flight the lines are cleaned with a rag. On dirty ground this is an absolute must.

Even humid, dirty air can soil the lines. At the end of the day lines should be thoroughly cleaned, preferably with household cleaning solvent or some kind of alcohol. When sliding the lines through our hand, this is a good opportunity to check for any kinks, which may be easily detected this way. If there's any doubt about the condition of our lines we throw them away (please, not on the flying field). A new set of lines is certainly cheaper than a new airplane. When flying alone, I have to bring my model back to the starting point. This is a situation where the lines usually slide over the ground. On a tarmac surface with dirt, bits of gravel and gaps here and there this is extremely dangerous. I use a handle keeper, that is, a small pylon which keeps my handle off the ground. Keeping the lines tight, I carry my airplane around the circle, watching that the lines don't touch the ground. Before a flying session the line ends, loops and the swivels or hooks must be checked. I don't always practice what I preach - but I do in this case!

Clips and cables

What brands of control lines can we buy? On the 'Isle' - Britain, in other words - Laystrate is certainly the most popular product. I'm not especially enthusiastic about these lines, for they don't lay quite as 'strate' as the name implies. The three-strand version seems more stiff than we stunt flyers would prefer. Another source is the SIG company (at 401-7S Front St., Monetzuma, Iowa 50171, USA) who carry a good selection; but in my experience, the biggest choice and best quality are offered by the Sullivan company. These lines are not exactly inexpensive. I don't recommend buying the 'instant use' cables with their ready-made ends (you have learned that I don't trust the crimped-tube method, anyway). I order the package without fixed ends (which is cheaper) and make my own connections. Clips are supplied, but I use my own. For even cheaper sources contact your fellow combat fliers. They buy lines in kilometres, so they get a fair price! We also need some accessories. For those who use swivels the modelling industry has not much to offer. These items can easily be found in fishing shops. They stock a wide selection, including those heavy duty samples so necessary for larger airplanes. Not all swivels are suitable for our purpose. Check the load limits quoted. If in doubt, use a spring balance to find out whether the product meets your demand. Another nice item are small eyelets. Because of the risk involved in bending the line, I always include eyelets as

connectors. What else do we need? I don't like the reels on which the lines are sold. I make my own with at least 6in. diameter. A nice idea is to use the rim of a wheel from your pram.

(Your editor has seen more than one accident caused by swivel breakage. Other forms of connector are available - your comments, please. GC).

Connect up!

Now we've got to manufacture a set of lines. Let me explain my method. I've never ever broken a line, so this method may work just as well for you. First I decide on the exact length. This is especially important on the continent where we have circles of smaller radius than a maximum line length. I want to fly on lines as long as possible so I don't waste a single inch. To the exact length I add 6in; that's 3in. on each end for the connections. The two 'open' ends are made first, held by a hook or a screwdriver, then the lines are rolled off the reel and cut to identical length. During preparation your lines are fixed and clamped to a board so that the end is pulled tight. This is necessary for clean work and tight wrapping. The last three inches are bent around the eyelet and held tightly back against the line. Fine copper wire is now wrapped very tightly around each wire, beginning near the eyelet for about one inch. Now the remaining two inches is bent back through the eyelet, and held close to the already-bound portion. Work back to the eyelet to finish the wrapping. When making the second bend, be careful to ensure that the second loop is as tight as the first one, or the load will be taken by just one loop. If applied properly, this wrapping alone will seem to hold quite well; but it is not sufficient. A slow-drying epoxy is carefully added; be sure to make a nice transition from this part of the bare line to prevent future kinks. Now you may wonder how I got the eyelets into the swivels. Actually I cut them open, insert them, then pinch up together and close with solder. Since the line loop is very tight, the eyelets don't rotate. I don't use swivels at the 'model' end of the line, only near the handle. On the other end I bend my own clips, so I don't have to cut the eyelet here.

Another solution involves filing open at one side a piece of copper or aluminium tube, then bending it around a tube so that the ends come together. Eyelets are hard to find, so this is an excellent substitute. As a final touch, I mark both ends of one line with red paint; this will become the 'up' line and this helps to avoid problems caused by muddling which is which.

To draw the line now, let me close with the Vintage fliers' exhortation - 'Mind the lines!'

SCALE MATTERS

Bill Dennis embarks on two new projects and we look at some overseas masterpieces

IN RECENT months I have been enjoying the benefit of what is euphemistically known these days as 'increased leisure time', and I have used some of it to build two new diesel-powered models which I have wanted to attempt for some time. Both models are from WWI and are around 40ins. span, but that is where the comparisons end because their ultimate weight, power, flying speed and accuracy (!) will probably differ by a factor of 4.

The first model is a 1:12 scale BE2e, destined for a Mills .75, and, like my Hawk Moth, it is intended to be a lightweight model for good-weather flying. While the BE is by no means an original choice, it is one of my favourites, with some nice detailing to be done (the camera, for example). Also, I venture to suggest that no-one has really done it justice as a F/F model, and I wanted to try out some new techniques (for me) aimed at greatly improving realism.

The R/C scale modellers have for some time used aluminium tubing for wing trailing edges in order to get the correct, narrow effect at this point, and on his latest (after 15 years) F/F model, Eric Coates has used the same method on both wings and tail. I was a little doubtful about how practical this would be in the rough and tumble of F/F, but Eric's Austin Whippet appears to be standing up well. I had already built the BE wings, but was able to convert the tips and tail surfaces.

I used 22swg aluminium tube - as



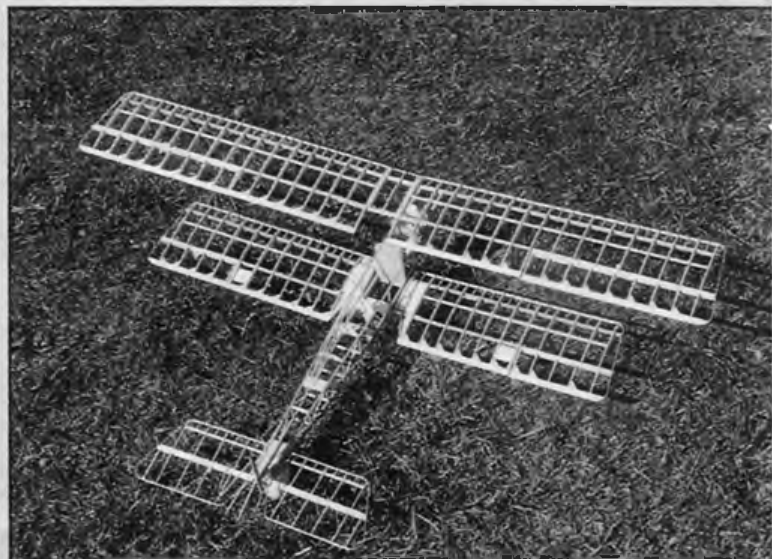
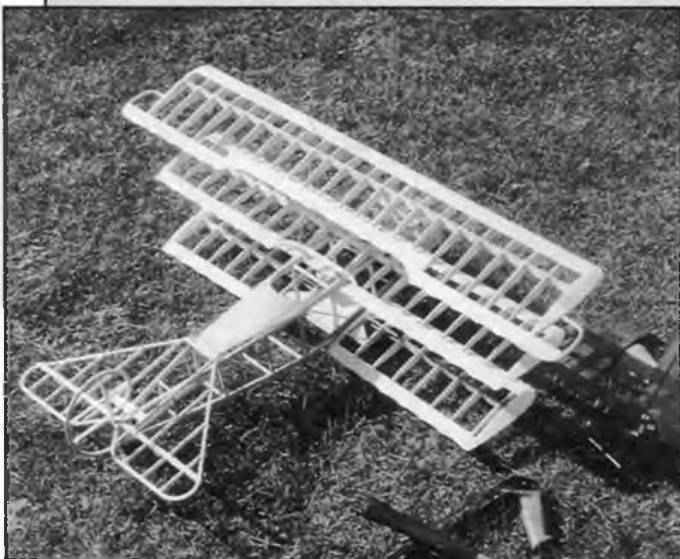
Eva Koutny holds husband Lubomir's fine Bf 109F. Built to the usual Czechoslovakian choice of 1/20 scale this 32gm contest winner flies for eighty seconds.

straight as possible. The first step is to carefully bend it around the relevant template cut from hard 1/16 sheet, taking care to keep all bends in the same plane. The tube will spring back somewhat when you take it off, so now you must use a selection of round formers - bottles, tins etc - in order to develop the correct shape. It is essential to get this right as you do not want to build in any stresses by forcing the tube to conform during construction.

Assembly is easy and quick. Use hard wood for spars and ribs, and make good fits between wood and tube with a round needle file. The procedure for, say, the elevator is to pin down the spar, glue the

tube outline to it with suitable packing all round to maintain the symmetrical section, and then slot in the ribs. Use cyano with some baking powder to reinforce. Very careful sanding will give you the 'full-size' effect of rib capping extending above and below the trailing edge member.

On lifting the structure from the plan you will see how rigid and strong this method is, in spite of the alarming lack of cross-section in the material. I have no doubt that when covered it will be extremely resistant to warping, which usually occurs following any attempt to get a similarly fine edge with wood. Additionally it is more satisfying to work at a more scale-like technique. The only possible drawback I can foresee is that any direct impact may bend the tube. If this bend is at right angles to the flying surface it could probably be straightened,



but an indentation may be more difficult.

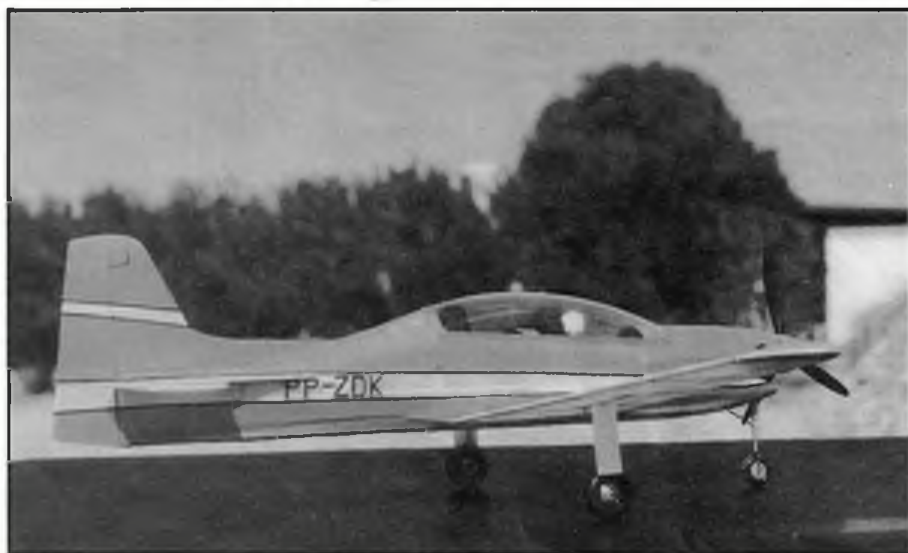
My second model is P.E. Norman's Fokker DRI, which I have been nailing together over the last two weeks. For those not familiar with Norman's designs, they were built to fly fast, with pendulum control to the elevators offering some stability to what were frequently basically unstable subjects. To cope with this approach, the models were very strong; wood sizes are hefty, with liberal use of cane, plywood and cord binding. Flying weights are quoted in pounds. I remember when first seeing the DRI plan many years ago seriously wondering for a moment whether the abbreviation M/S referred to mainspar or mild steel!

The stimulus to build this model was the new P.E. Norman Trophy to be awarded at Old Warden Scale Day. While it is not necessary to choose an actual P.E. design, I chose the DRI because I had seen one flying at Old Warden before and it had greatly impressed me.

At first I had some idea of building the model to contest standard, but a few cross-checks with a three-view showed that this would involve a complete re-design. Therefore, I limited myself to altering the undercarriage and rudder a little. I also enlarged the fuselage by about 3/8in. diameter at the front to fit the well known 'aluminium teapot' cowling - it is still a little under-scale. I didn't fancy bending cane so I substituted hard balsa laminated outlines and spruce spars, and fast setting epoxy replaced bound joints. I intend to use a PAW249, attached to the firewall with an R/C type radial mount. The model as shown weighs a pound and a half with engine, so I have another pound to play with before I reach the minimum weight!

Electric power - correction

In my review of the Knight electric power unit I referred to a variable resistor which can be used as a speed controller. I quoted a number which I read off the actual



Two Peanuts (yes, Peanuts!) from US enthusiast Dick Howard. The Grumman Mohawk at top is a brave choice and a handful to trim. Rubber motors pass through the jet exhaust and are fixed to outboard fins just below the tail. Subject has a certain brutal charm... Altogether sleeker is the red and white Tucano, below, seen with scale (non-flying) prop.

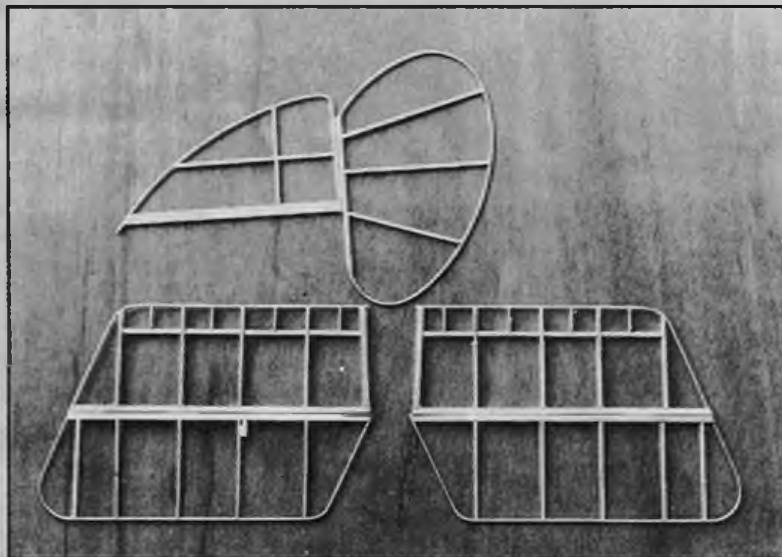
device, but it has been pointed out to me that this number is a total red-herring! The correct reference is RS (formerly Radiospares) 184423. However, Derek tells me he has been trying two other types which are better, being rated for higher current, and these are RS 186435 and 162631.

National afterthoughts

As I write, it is three weeks since the Nationals, although it seems much longer. Of all the many fine performances, three stick in mind, all of them by rubber models - the Dewoitine, Hurricane and Breguet of Messrs Hetherington, Briggs and Newman. I think this is not only because they were such unusual subjects for F/F but also because they were so realistically interpreted. The flights were brief and struggling to qualify in some cases, but that is the limitation of rubber power for serious scale models. However, while the models were in the air they looked purposeful and totally convincing. I would rather see such machines flying for twenty seconds than some sketchy lightweight flitting about for minutes on end. I must admit, however, my fingers were itching to stick a little diesel on the front of the Dewoitine!

Letter from Czechoslovakia

I have received news and more photos from Lubomir Koutny, with details of their busy indoor and outdoor programme. Apparently their best meeting is near Brno on the local airfield. The commanding officer there is very keen to encourage the modellers, and provides room for static judging, beds for guests and use of a swimming pool. I could spit!



Opposite page: Bill's new F/F Power projects, the P.E. Norman-designed Fokker Triplane and his own BE2e. Latter model employs aluminium-tube tail outlines, seen at left. Technique described in text.

Czech it out!

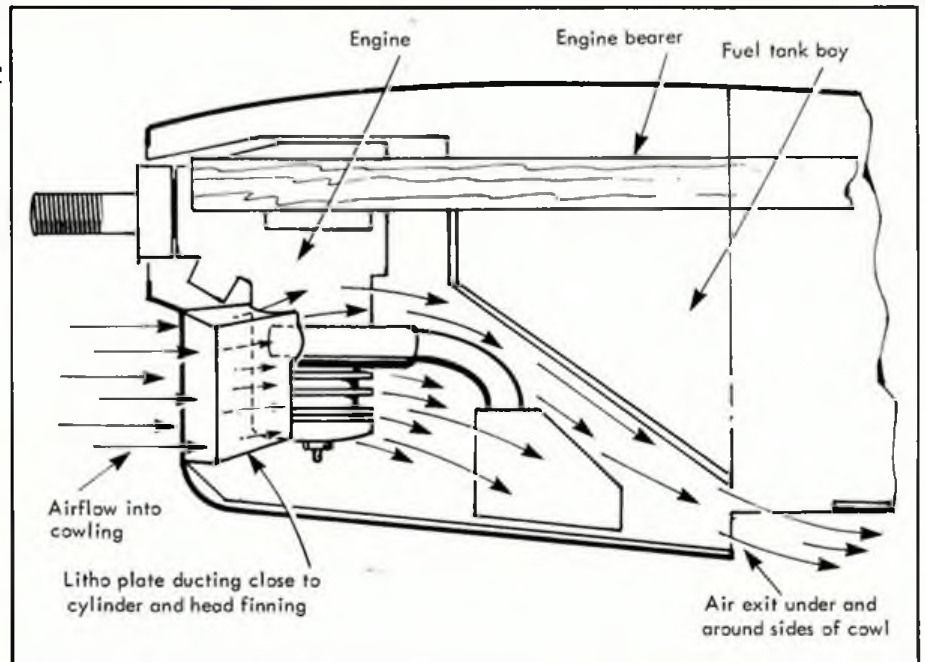
More Czechoslovakian delights. Right: Junior flyer Vladimir Kunert with his very neat Hurricane IIc night-fighter. Vladimir was second in the '87 Czech championships. Below: 1/20 scale Barracuda by Dr George Mertes is reported to fly well. Below that: This superb Ki.84 Frank is another of Vladimir Kunert's fleet. Span is 550mm (approx 22in) and weight is fifty grams.



Below: Fifteen-years-young Ivan Simonik displays his Nakajima Rufe - another unusual subject well executed. Bottom left: second-place winner at the Drnecs Memorial event at Brno was Peter Kolar's Airacobra. Below right: Modern subjects find favour too - this is Ivo Ceresnak's Pilatus PC-9.



John Roberts looks at factors governing engine selection for control-line scale



The power game

Having decided upon the type of model you want to make, the next consideration is the powerplant.

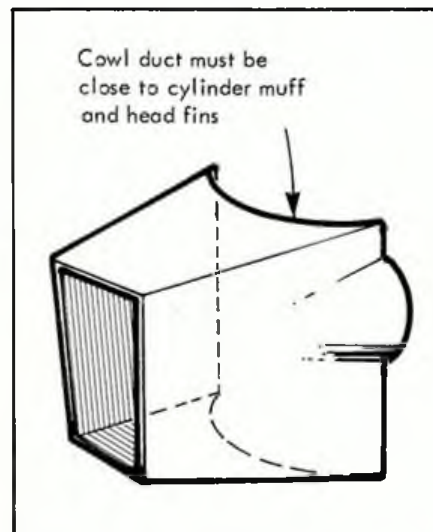
The following factors come into account:

- overall dimensions
- cooling
- power characteristics
- propeller size (full size and model)

The overall dimensions require no explaining. It is simply necessary to choose a prototype which will completely hide the model engine and exhaust system. I feel that it is criminal to make a beautiful model and then ruin it by having the exhaust hanging out of the side, belching exhaust residue down the side of one's super paint job; so choose an engine which will fit into your prototype.

Cooling is extremely important. If an engine doesn't receive ample supplies of cool air through the cylinder fins premature engine failure will occur. This can be avoided by many means. On radial engines such as those on the late 20s and 30s 'Golden Era' aircraft the air can exit through the cooling gills, which are fixed in the open position; or in the case of inline-engined prototypes careful ducting will ensure a cool engine.

The air exit is as important as the intake and as a rule of thumb it should be at



Bill Brown's fine C/L Merco 61 powered Ansaldo SVA5, lovingly built over fifteen years ago and with only a handful of flights since, treated us to a wingover at the Nats! Note aileron trim.

Drawing above shows how cooling air must pass around the engine cylinder, helped by close inlet ducting shown in detail at left.

least twice the area of the inlet. It is no use at all having a large inlet and small exit as the flow of air will be restricted causing hot gases to build up and overheat the engine.

The choice of engine is very important as the short-stroke schnuerle-ported engine, although more fuel-efficient, is not suitable for the scale model.

I place a great accent on the 'realism in flight' part of the competition, for if done convincingly the judges will be more inclined towards your latest pride and joy.

Consider the full-sized aircraft engine. This is really a very large capacity power unit with max rpm of about 2000-2800 rpm (the older rotaries even lower at 1500-1800rpm) so a high-performance engine revving at 15,000rpm just takes away that air of realism. However a long-stroke side-ported two-stroke running rich on a large prop will give a very good effect. Even better is a four-stroke, as witness the results at the 21st Scale meeting at Old Warden; first was your scribe using a Laser 90 in a 1/5th scale Bristol 77 racer (built from an Enterprise Model Services plan) and runner-up was Mick Staples with an Avro Avian powered by a willing little OS 20FS.

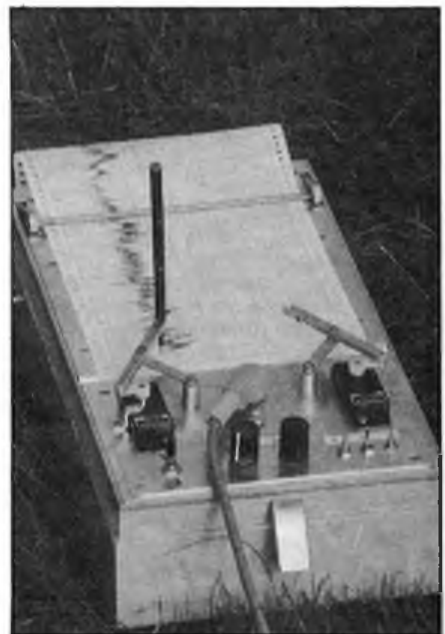
Four-strokes rev much lower and produce much more torque. My Laser 90 swings a 15 x 8 prop at about 7000rpm. This gives much more efficient thrust from the prop without cavitation occurring. On a calm day (we don't get many) the Bristol will fly at about 15 - 20 mph with the engine on only a whiff of throttle, giving immense realism with the engine firing 'once every six lamp posts' as on the full sized machine. Go to a real Vintage air display, listen carefully and you will see what I mean.

Having weighed up the options you will see that to be really effective in competitions you must build big, otherwise the required results cannot be achieved. There is always the exception to the rule such as the 40in DHC1 from the Aeromodeller plans service, which if modified to throttle control with a 3-wire bellcrank and a .19 engine will fly beautifully at near scale speed!



WORLD NEWS

Martin Dilly picks up the global pen to concentrate on a pleasant International



Variations of the Czechoslovakian Saper kit A/2 were numerous at Terlet. As described in the text, Daume (Netherlands) flew this updated version.

Holland International

National pride prevents giving a complete run-down of the results of the enjoyable Midsummernight Trophy contest at the Dutch national gliding centre at Terlet, but to give an idea of our performance Mike Woodhouse was the highest-placing of the six British flyers, with a tenth in Wakefield and I was lowest, finishing bottom in F1A. My excuse is that I did something rather terminal to a hip joint and was unable to run after four rounds; however the weather was pleasant, with some almost flat calm patches. An unusual feature was to schedule a four-minute maximum for the late evening and early morning rounds (around 9pm on the Saturday and 6am on Sunday) but it transpired that only those who had already maxed on the previous rounds actually would be credited with time over 180 seconds!

Glossing rapidly over our flying, a few technical aspects may interest you. One unusual A/1 was Hermann Jenne's Espada Wakefield. Yes, really! The noseblock and propeller had been replaced by a weighted nose, and an offset wire towhook was attached to the motor tube. The glide was good, but I suggest that energetic launches were somewhat inhibited by that solid balsa wing.

One of the West German Wakefield flyers used a modified Bosch Nicad-powered electric screwdriver to wind his motor; a counter was wisely fitted to avoid getting carried away by the ease of it all.

Sixteen years after Pavel Dvorak won the World Championships with his Saper A/2, which was kitted shortly afterwards by Igra in Czechoslovakia, the design is still flown quite a lot in Holland, albeit in modified forms. One of these was Daume's; he used a wing with a top-sheeted centre section, with silk on the lower surface to

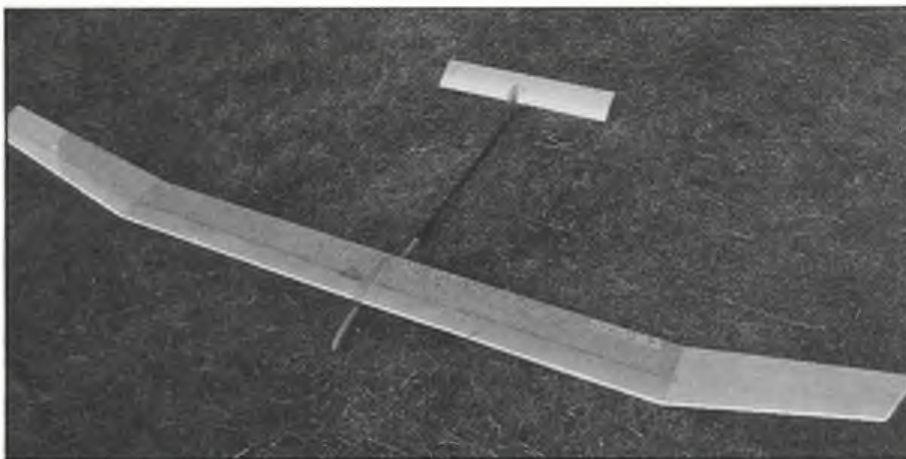
Britain's Chris Edge was present with his very neatly finished Carbon-Ate A/2. Centre: Frank Seja of West Germany used this chart recording thermistor. It employed a pair of Robbe RS-20 R/C servos as pen drives. Bottom: Ray Monks proudly displays his dual-skinned F1C.



Left: Coupe d'Hiver winner was France's Annie Besnard. Below: van Wallene's A/2 has a very stiff wing of unusual construction (see text). Bottom left: This near chart recording anemometer and thermistor by Pim Ruyter (Netherlands) also telemeters data to a remote location.

Bottom right: Secrets of van Wallene's F1A (front to rear: battery, electronic timer, radio beacon, hook-operated microswitch and towhook).

Final picture: Piggy back 'blob' aft of the wing TE on this French Coupe augments glass and kevlar motor tube to provide required cross-section.

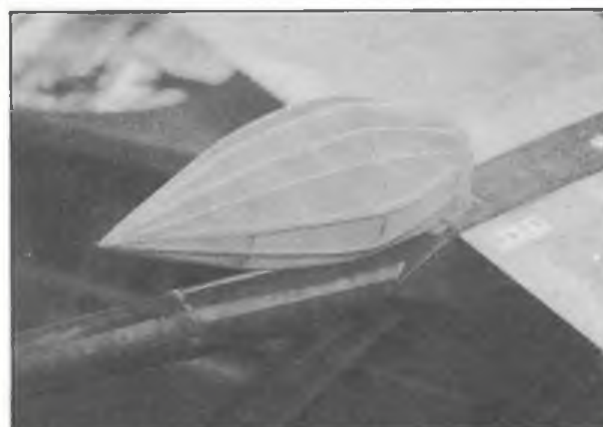
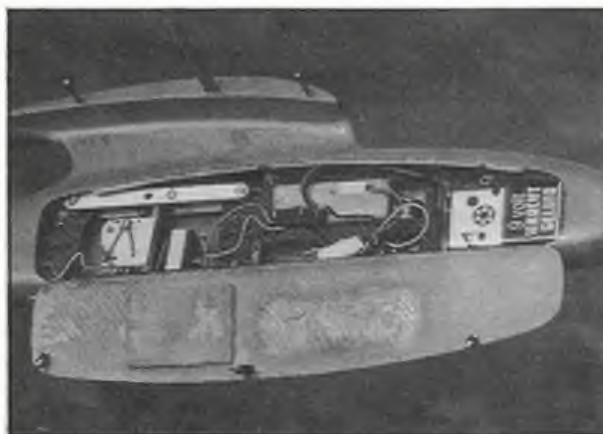


withstand the high bending loads on tow. A carbon mainspar and a carbon boom further updated the original design, which here had an impulse circle hook. I wonder why nobody imported the Saper kits into Britain: mine lasted nine years and the design, with a few alterations like a different tailplane spar set-up and laminated, rather than flat sheet wing tips would still be quite a competitive aeroplane in British contests.

Probably the most technically interesting A/2 at Terlet was Allard van Wallene's. Unlike his earlier glider wings, which used moulded upper and lower skins of sandwiched glass/foam/glass, this one used a blue foam core with 100 gm m² glass applied with its grain at forty-five degrees top and bottom. A fabricated I-beam mainspar with a thin ply web (its grain also at forty-five degrees) is dropped into the core before the glass cloth is applied with thinned epoxy resin, which also incorporates colour. The wet lay-up is overlaid with heavy-gauge PVC sheeting and clamped to cure between male and female lower and upper surface moulds. The cured wing is then trimmed at the front to accept a spruce leading edge, largely, I suspect, as a 'dong stopper'.

Allard's fuselage also revealed marvels: it used a low pylon to carry the wing, with the main towing loads taken by a 5mm joiner with a pair of thin stubs fore and aft to locate the incidence of each half. The main joiner material is used as ejector rods in plastic moulding machines; however, a warning, Chris Edge used 4.1 mm ejector rod on an A/2 he flew at Maniago and snapped it in half with an energetic tow. He admitted having 'wet-and-dried' a spot of rust on the joiner and it seems this can be enough to act as a stress-raiser to concentrate the bending loads: his wing survived... The spine of the fuselage is 1.5 mm ply with carbon either side, and the whole of the nose, back to the trailing edge is filled with various bits of equipment. NiCads, electronic timer, radio beacon transmitter, timer reset microswitch and towhook all live under a hinged lid on the right-hand side of the fuselage, but some ballast still is needed.

It seems that an identical material to the foam used in the van Wallene wing is marketed in the U.K. as Roofmate; it is used for insulation. Allard chose a modified Benedek airfoil with 6.5% camber and 6.2% thickness; a turbulator about 1/4in. back from the leading edge was used and five invigorators spread back from the high point helped to keep the air stuck to the top of the very smooth upper surface of the wing. A thick dural root rib is used and the overall weight of the wing halves is 85 grams; tips weigh twenty grams each.



Aussie Biggies

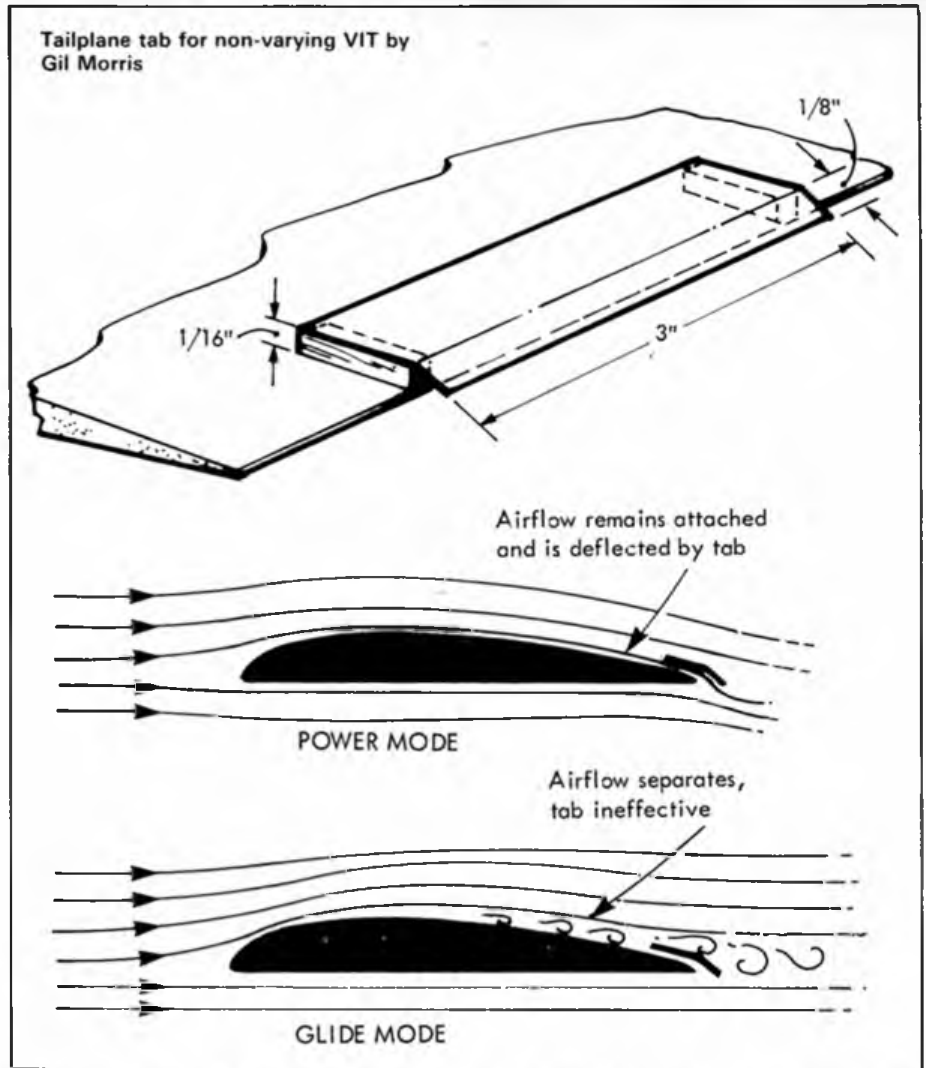
Advance notice of two major free-flight events in Australia comes from the NSW Free-Flight Society. First, the Nationals will run from 2-8th January, 1988 in the Windsor-Richmond area of the Hawksbury Valley; it includes all FAI F/F classes, including 'minis' and F1D indoor, Open events, Vintage, Scrambles, Scale, EZB, HLG and Peanut, as well as a Seaplane 'Fun-Fly'.

Then, from 1st-4th April we have the Pacific F/F Championships, run in conjunction with the 10th Trans-Tasman F/F Challenge and the Australian F/F Society Championships. The Trans-Tasman is strictly for two teams, from Australia and New Zealand, but the Pacific Champs look to me very much like an FAI Open International though I do not think the FAI has yet been notified of the event. It is for F1A, F1B and F1C in both individual and team categories, and the venue is the famed Australian ballooning site at Canowindra. Teams may only be entered by national aero clubs. Canowindra is about 376 km. south-west of Sydney and is known, unlike Goulburn, for its extremely stable weather conditions.

The contest director is Jon Fletcher, and full details of what promises to be a memorable and enjoyable event can be had from Bill East, 2/27 Sixth Avenue, Campsie, Sydney, NSW 2194, Australia.

A Non-varying VIT

Gil Morris, writing in *Model Aviation*, describes a device to give the effect of a variable incidence tailplane without the moving parts, and we present it here, in the long-established tradition of scouring the world's model flying journals for the interesting bits. Perhaps a brief explanation of the VIT might be in order for newer readers. A powered model, whether rubber- or engine-powered, operates under a dual flight regime probably unique in aviation. Basically it is a glider, and as such should fly at a high lift coefficient, but with a low rate of sink, since the idea is for the thing to stay in the air for as long as possible. However, in order to be able to stay aloft for a long time it needs to start its glide at as high an altitude as possible, but it has a limited amount of energy available to get there, either because of engine run or capacity limits, or rubber motor weight. This means that when adjusted for optimum glide, when the airspeed is low, flying the aircraft under power at high speed will cause a severe nose-up pitching tendency; this is normally compensated for by trying to make a climb follow a corkscrew path (by a combination of wing warps and



rudder), but this is a fairly inefficient solution to the problem. As an aside from one who has not flown free-flight power for ten or fifteen years, the Slow Open Power class (where surfaces must be fixed) seems to make life far harder for flyers, rather than simplifying things; use of a variable incidence tailplane and an auto-rudder enable one safely to separate the power-on and the power-off phases without the potential hazard of having an adjustment aimed at improving, say, the glide, adversely affecting the power pattern.

Normal VIT systems are timer-operated so that the tailplane incidence is somewhat more positive during the climb; this reduces the lift developed at high speed and also reduces the drag from the wing. Around the time the engine is cut, the tailplane is allowed to pop up to a more negative angle appropriate for the glide phase. There may have been a bunt mode included, and probably an auto-rudder, but we can ignore these in this discussion. All this requires a little care, and a couple of triggers, along with a means of adjusting

the point at which the VIT operates with respect to the engine cut-off. Gil Morris' system avoids all this.

On top of the trailing edge of the tailplane he mounts on each side a thin aluminium strip, 3/8 x 3 in. in the case of the 375 sq. in. model he flies. This strip is raised 1/16 in. above the surface of the tailplane by a couple of chordwise balsa strips and its rear 1/8 in. is cranked down by about fifteen degrees. The effect is that at gliding speed the airflow over the upper surface has separated by the time it reaches the strips which thus have no effect. However, under power the air is moving fast enough to stay attached to the top of the tailplane and when it reaches the strips it is deflected downwards to give a nose-down pitching moment. Some trial and error may be involved in getting the deflection angle just right, and Gil warns that under very strong thermal conditions the air may speed up enough to give the same nose-down pitch on the glide; but it looks like an interesting idea and one that the Slow Open Power fans may find useful.

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TRY A TRI-MOTOR!

Barry Hetherington's classic American airliner for CO₂ is a stable, fine flier - indoors or out!

THE STINSON Trimotor Model U of 1935 upon which this model is based was the final development in a series of high-wing trimotor airliners designed specifically for the smaller American airline operators. It had cabin space for 10 passengers and a cruising speed of 121 mph.

The reasonably large wing area, long nose and mostly fabric covering make it a suitable subject to model, in addition to which it is an attractive aeroplane with the extra interest of three engines, lower stub wings and large wheel spats.

A wing span of approximately 30in. was determined as about right for CO₂ power using one motor only with freewheeling outer props, and given a full size span of 66ft, a scale of 7/16in. to 1ft. was used.

In spite of its apparently high finished weight of 95gms it is surprisingly slow in flight; and its realistic flight pattern earned it the highest flight scores in its class in both Indoor and Outdoor SMAE

Nationals in 1987. Qualifying times of 20secs plus present no problems and subject to the well-known inconsistency of CO₂ motors, durations of 20 to 40 secs are not unusual, indoors or out.

Although the model was specifically designed for use in serious competition flying to SMAE rules it incorporates only simple and inexpensive materials. For the modeller who is interested in free flight scale, the following descriptions of materials and methods will, it is hoped, assist in the construction and trimming of this particular model and perhaps other scale subjects.

Materials and methods

1. Polystyrene

Blue foam is easier to carve and sand than the more common white foam, but it is heavier. Hollowing-out is important for weight reduction: a covering of tissue will replace all the surface strength required. Contact with cellulose based substances must be avoided. PVA adhesive is ideal for gluing joints. Usefully, epoxy resin glues do not react with polystyrene.

The best and lightest finish is obtained by doped tissue covering, and prevention of damage to the foam surface is possible by using the following method:

- (a) After final shaping and sanding apply a coat of 50/50 water/PVA solution to all outer surfaces
- (b) When dry, sand again
- (c) Apply tissue using tissue paste,

- (c) cutting and stretching around compound curves. Do not be concerned about over-lapping joints: this will hardly show, but be careful to paste tissue firmly to any concave areas
 - (d) When dry, water shrink; and
 - (e) Dope; but not with a thinned mixture - apply straight from the can. Thinning encourages penetration through the tissue and prolongs drying time, allowing still further penetration and a greater chance of surface attack.
2. Contact Adhesive (Evostick)
- This is an extremely useful adhesive for the construction of scale models for the following reasons:
- (a) A relatively slow drying time but instant adhesion holds items together

STINSON MODEL U



- (b) The ability easily to part a joint at any time; and if required all traces of the glue may be removed by carefully pulling away the adhesive
- (c) Flexibility remains in the joint so that 'hingeing' joints may be used. (Note! Do not allow Evostick to contact polystyrene).

3. Covering and finishing materials

Ordinary wrapping tissue is used for covering the model. Although basically heavier than aeromodelling tissue it has the advantage of being very much more opaque, making colour spraying not essential (the Stinson featured here was clear doped only). High shrinkage is a feature, so lightly steam only - but make sure that the tissue is colour-fast (most are not) or the dye will streak. Tissues having the trade name of 'Club' are very satisfactory and a wide range of colours is available.

Finish with 50/50 dope/thinners except on foam covered areas where, as stated earlier, unthinned dope must be used.

Stick tissue to the full lengths of all ribs, stringers and framework where the intention is to give scale construction effect. This also prevents the distortion of light structures which can be caused by tissue shrinkage. For a superior (but of course heavier) finish light spraying may be used. Car aerosols are very useful and these dense tissues allow the very minimum of paint to be applied.

4. Balsa strips

Slice all strips from sheet wood. It is easier to obtain light grades of balsa in sheet form than in strip and of course any desired width of strip can be made. The model framework is generally constructed from sheet using a steel rule and sharp razor blade to cut the sections.

Building the Stinson

The basic fuselage structure is a conventional stringer-and-upright arrangement joined with cross-pieces into which is fitted the CO₂ tank and piping before the addition of the remaining structure. Scale configuration is achieved by adding the following structural details...

Carved and hollowed polystyrene blocks are glued to the nose framework, the upper block being vee-shaped to form the lower L.E. of cockpit. The cockpit roof is also of polystyrene with the inside painted matt black. Drawing ink or enamel should be used. The cockpit frames are then built up from 1/32in square, to the back of which is glued the glazing, firstly painting the frames matt black on all sides. Use Evostick for fixing the glazing, applying only the lightest trace to each frame. This arrangement gives depth to the frames and a much more realistic appearance than simply sticking glazing to the outsides. Cut a pilot base from thin card painted matt black, fix a polystyrene pilot in place and glue to the underside of the cockpit area.

Longitudinal stringers are fixed on sides, top and bottom as shown on the plan. Support top and bottom on extra cross-pieces glued between the polystyrene radiused corners. Cabin windows are framed between the longitudinal side stringers using thin card in 1/16in. wide strips radiused at the top corners. Note



that the notching of the lower support ensures that it does not show against the tissue covering. The glazing - in one strip - can then be fixed behind the frames, but again remember to paint the frames matt black beforehand.

When covering the fuselage make sure the tissue is firmly pasted to the full outline of the frames so that the glazing will finally be revealed by carefully cutting around the insides of the frames. Recessing the glazing in this way also means that the tissue may be left in place until spraying - if any - is done.

The effect of a separate cabin door is achieved by forming three 1/32in. laminations on a card template, the inner strip of 1/32in. being recessed about 1/32in below the faces of the outer strips. Paint the gap matt black and ensure that the covering is pasted to both inner and outer frames. The slot between frames is revealed, after covering, by slicing away the tissue thus producing a space between 'door' and door frame.

Radiused corners are formed from rectangular-section polystyrene fixed with PVA to top and bottom main fuselage stringers; then 'sanded to shape, smoothing into the contour formed by the upper and lower wing root fairings where they meet the fuselage.

Wings and other things

Scale construction entails a wide leading edge - to reproduce the area metal-covered on the full sized machine - and close rib spacing. The L.E. is fabricated from a

rectangular strip of polystyrene fixed with PVA to a vertical 1/32in. balsa stiffener and sanded to shape. Sliced ribs are used with separate ailerons glued in position after covering with spots of Evostick to form 'hinges'. Wing tips are laminated on card from polystyrene, hollowed out and with notepaper glued at ends to form a root 'rib'.

The tail is of laminated strip construction with ribs sanded to shape after assembly. Note the separate control surface effect. Do not attempt to hinge these surfaces - leave them rigid. It is very difficult to achieve consistent flying trim with a moveable elevator and rudder! Glue the rear fuselage polystyrene extension to the top of the tail after covering.

Next come the stub wings and undercarriage. Cut the spar, nacelle formers, root rib and front cone formers and join together in the locations shown on the plan. The u/c wires are then fixed in position with epoxy resin. Insert blocks of polystyrene between and around all the formers and carve and sand to final shapes, hollowing out as much as possible. To complete, notepaper is glued and shaped to the section of the fairing roof.

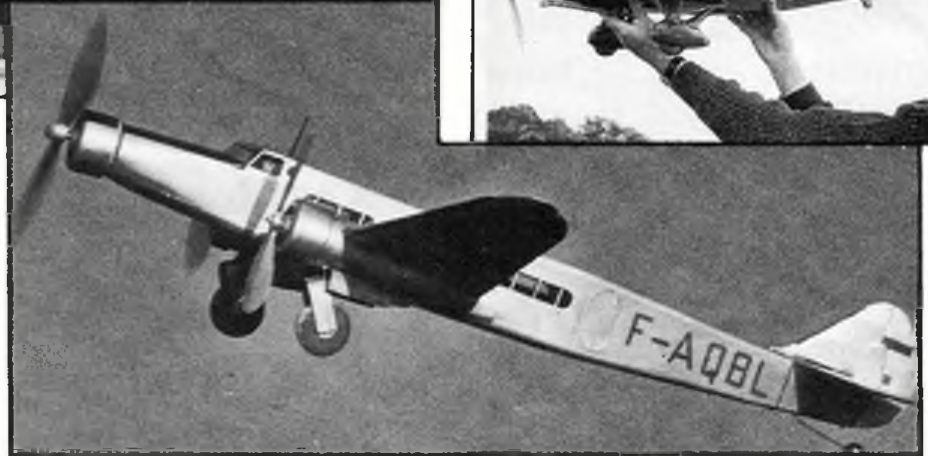
The spats and legs are carved from balsa and must be completely finished with coloured dope or enamel before assembly. Fix legs to spats with Evostick leaving the tops of the vertical legs free, i.e. just

The Model U awaits the judges' attention at the Indoor Scale Nats. 29in. airliner looks great in blue with red trim.





Far left: The prototype used a Brown Twin for power but our plans show Telco details. Use a Williams prop! Photo at left shows nifty aileron trim and unfixed filler which prevents stresses on the framework during charging. Below: Barry's larger, rubber-powered Model U is seen here at Old Warden; and his now-famous five-foot Dewoitine D510, breaks ground at Barkston Heath.



contacting the underside of the nacelles/stub wings with the rear, sloping leg held to the rear underside of the stub wing with a dab of Evostick, thus allowing the complete u/c assembly to hinge backwards for springing.

Wheels are carved from polystyrene with paper tube bearings glued in with PVA. Making wheels from polystyrene is very easy even without the use of a lathe or electric drill. Simply sand a piece of foam to the required wheel thickness and scribe a circle to the final diameter. With a sharp knife cut the circumference and then sand off the corners to form a tyre outer section. The concave effect of tyre and wheel rim is achieved by compressing the centres between finger and thumb. Paint all over with dark grey enamel and glue silver paper discs on the centres to represent the actual wheels.

Radial engines and cowlings

These structures consist of inner and outer tubes with shaped balsa rings to form the front of the cowlings. The dummy engines are made from flexible sections of 'bendy straws'. Use the larger type of straws (1/4in. diameter) which are more readily available from stores specialising in disposable catering supplies (stationers and the like usually only sell the thinner variety). Alternatively go to your local trendy pub and order 36 cocktails (there are nine cylinders per engine!). Paint each section of straw matt black and cut to length to fit between inner and outer paper tubes, spacing at 40 degrees. A very light and realistic engine will result. When constructing the main centre engine miss out a cylinder; its place will be taken by that of the CO₂ motor.

Motive power

The original model was fitted with a Brown twin-cylinder motor turning a Williams Bros propeller. A standard Telco would make a very satisfactory and much cheaper alternative; all the information given in this article and on the plan assumes that the Telco motor will be used. Substitute a Williams Bros propeller for best results. Set the CO₂ tank as far back as possible or the model may be nose heavy (a small amount of tail weight was necessary on the original). The tank is held within the fuselage by a block of sponge rubber, with the charging nozzle protruding from the underside thus preventing undue pressure being exerted on the fuselage when tank filling. For test purposes remove the main cowl with its

dummy engine to allow access for adjustments to motor speed and thrustline. When locating the CO₂ motor set the cylinder in an inverted position at an angle of 20° to the vertical i.e. in the same location as one of the lower radial engine cylinders.

Assembly and finishing

All items are covered and doped before assembly. Use Evostick for joining all the items together as this allows flexibility and time for alignment purposes, but temporarily hold the fin and rudder with a rubber band until trimming is complete.

The colour scheme used on the original was American Airways dark blue with red trim and white lettering. The construction of the scale details and trim is subject to the skill and ingenuity of the builder; on the original they were made as follows:

Red trim: a combination of paint and self adhesive vinyl. AA badges: drawing ink and Letraset letters on thin paper discs. Cabin heater: a rigid section of 1/4in. diameter 'bendy straw' plus balsa carving at one end and a piece of electric cable insulation at the other. Radio mast: balsa with very fine elasticated thread onto which is threaded small beads. Registration letters: white tissue sprayed with white cellulose and fixed in place with dope. Outboard propellers: these are scale size (make a third for static judging) built up from small-diameter straw hubs into which are glued the stubs of sheet balsa blades. The American Airways insignia was from Letraset applied to a tissue strip, the whole being fixed to fuselage with dope. For a superior finish apply letters individually and directly onto the fuselage covering. The technique for this is firstly to rub over each letter, holding it over the waxed backing sheet. This gives a partial release resulting in very little pressure being necessary when finally locating onto the fuselage covering. Lastly, the

tailwheel was made from polystyrene, with a fork from thin card glued to a small section of thin straw.

The exciting bit!

For a realistic flight pattern it is necessary to achieve the minimum take-off speed, a tail-down landing, level wings (i.e. the minimum amount of banking) and a satisfactory landing under power.

The first two are controlled by motor rpm, the second additionally by CG location and elevator incidence; and aileron trim and/or wing tip weight will achieve the desired amount of bank.

Do not attempt to test glide - a relatively heavy scale model of this size will not! Trim for left turns. Initial tests are best carried out indoors or from a smooth outside surface (and of course under those elusive calm conditions). Set the motor rpm low with approximately three degrees of downthrust and one degree 'right'. Tweak a very slight amount of left rudder and balance at about 25% of chord. Gas charge only and gradually increase motor rpm at each take-off attempt (until minimum take-off power is reached the model will simply ground loop). As the power is increased the taxiing circle will open out until the model becomes airborne. If flying indoors it may be necessary to adjust sidethrust and/or rudder to avoid wall contact.

Final flight pattern adjustment involves moving the CG rearwards without inducing a stall, and adjusting aileron trim and/or tip weight on the right wing.

Enjoy yourself with a scale Stinson!

Information sources

Model Airplane News - Wylam drawings of full-size machine. 'The Stinsons' published by Heritage Press, USA. Photographs and other material purchased directly from Heritage Press.

FREE FLIGHT SCENE

Champs, Trials and a Beatnik come under Dave

Hipperson's scrutiny this month

Rumblings from the World Champs

By now you will have read Martyn Cowley's full report of the sensational Free Flight World Champs in France - an event so well organised that it attracted praise from practically every corner. Although rather too few are capable of it themselves competitors really do appreciate tight organisation. Sometimes they cannot find the right words to thank their hosts enough. Perhaps I could presume to do it for them. The French organisation gave everyone the chance to produce their best. Simply, thanks very much.

Apart from the flying there were two historic administrative occurrences applied as 'local rules' by the FAI Jury which may well have far-reaching repercussions if allowed to germinate unchecked. Coincidentally they both arose in the power event where already the rules are stretched to breaking point.

Radio assist

Thomas Koster proposed to fly a radio-controlled model in the contest and was actually allowed to do so after the FAI Jury ruled upon this matter. His FICs were equipped with a radio-controlled D/T facility. This is very useful for small-field trimming to extend the flight when it calms, or conversely to interrupt it if the breeze picks up after the model is airborne. Not to mention the safety and model protection offered in those critical, initial trimming stages when the system can be linked to engine cut-off too. But to allow him to compete with the R/C still aboard!

The FAI Jury stated that it allowed the models to compete without implications for any later rule changes. I would suggest there certainly ought to be some rule changes - and fast! The FAI on the field limited the R/C operation to D/T after the maximum flight time had been achieved, or in the event of an over-run, prematurely only if another model was to be used for the reflight. They also added the rider that a premature D/T for any reason was the responsibility of the competitor and might be penalised. OK - who is then to say what is an R/C D/T and what might be equipment failure leading to a convenient, early operation? And what is the penalty? Moreover, what is D/T? There are many methods of D/T, which stands for 'dethermalising'; not just tipping-up the tail to super-stall. Flying straight is a way of dethermalising - so is a very tight spin or a great deal of positive incidence on the tail. How on earth could timekeepers be expected to be able to check that an R/C facility wasn't linked to a rudder, what with all the paraphernalia usually aboard one of these modern models?

This is not to suggest that Thomas Koster of all people would cheat - but look what it could let in. It was to his credit that he mentioned it at all as the FAI Sporting Code doesn't. In the FAI Code free flight is stated to be 'A flight during which there exists no physical connection.' Radio is certainly not physical. I remember Zurad, the legendary Polish Wakefield flyer, playing around with an R/C F1B for a time in the '60s but there was never any intention to use it in a contest. It may be that 'radio controlled' free flight will come eventually out of necessity but let us have it considered as a bona-fide class in its own right rather than let in by the back door. Even the Vintage boys - often maligned for their woolly attitude and interpretation of rules have this one sorted out. They call it Radio Assist!

For once I am pleased to see that the SMAE have the rule on this buttoned up already. Their definition of free flight is similar to that of the FAI but it goes on specifically to outlaw the use of transmissions to the model when in flight. The FAI could do worse than take a look at our book.

Over-ruling the timekeeper

There can be few of us who at some time have not suffered a seriously mistimed contest flight at a critical moment. I have always been under the impression that one had to accept this as a possible hazard.

After all you win some that way too when it happens to the opposition. However, in the closing stages of the FIC World Champs an alarming precedent was set when the official timekeepers, who had been found to be satisfactory all day were suddenly over-ruled. The two Russians - admittedly team-mates who had deservedly come to the top of the heap after numerous flyoff elimination rounds - were both asked to re-fly when one of their models was clocked off out of sight well up and before the max. They may have actually asked the organisation if they could re-fly. What was clear was that Verbitsky, who stood to benefit from the mis-time, was just as eager to re-fly as his team mate Strukov which in the circumstances says a great deal for his sportsmanship; but it is not this which is in question. I wonder how many mistimed competitors (and there must have been a few, even in this well run event) would have dearly loved the opportunity of a re-flight earlier in the day - or in the other two classes for that matter...

Once again the SMAE have an escape clause in their rules which allows the use of unofficial watches at the CD's discretion if the official timekeepers make a complete hash of it. But was this that much of a hash anyway? The models were not that far distant - this was not an unlimited flyoff after all. Strukov's model was very difficult to see because of its mirror finish which when viewed edge-on reflected only the background, and hence hid the model itself. This guy must have expected to get into a flyoff - why should he have been helped just because his model had an unsuitable finish? Vervitsky's had red panels and a generally less reflective finish. It's all part of contest preparation and tactics...

Pics from the World Champs. Below left: An unlucky final flight meant that Alexander Moukhine had to settle for 4th individual in F1C. Centre: Krystopher Rolycki decides tactics with the Polish team manager during the decisive seven-minute fly-off round, in which he placed 2nd. Right: Four seconds out of a flyoff place in the seventh round for Sweden's 1975 champion Lars Olofsson left him in 25th place.



The 6th Area SMAE event: 27th September

There were few complaints about the weather at the final Area event of the season. To compensate slightly for gales at the last one, Beaulieu was the most calm - almost flat calm some of the time; yet there was a very sparse attendance with only two flying in Rubber. Incredible when compared with the excesses in the rest of the country! A strong cast was expected at Merryfield where Bristol & West were defending the Plugge Cup, this time with the Open Rubber artillery. Fourteen of them flew in the Farrow Shield! They too had very calm weather helped by large bright and bouyant patches of air under a broken overcast. A dozen qualified for the flyoff, topped by Derek Wain with nearly nine minutes and Aslett with nearly eight. After that times tailed off fast. It was not quite the spectacle of last year, although enough was done to retain the Plugge for another year (but not the Farrow).

Vikings, the nearest threat to the Bristol & West bid, were 100 or more points short before the meeting and thus needed to pull

some terrific flyoffs out of the bag to make such impression. Sadly conditions at Sculthorpe were not quite so helpful with quite a breeze followed by a very cool but calmer flyoff period. Martyn Pressnell made a respectable six-minute-plus but this was greatly overshadowed by the 9:30 of Anglia's Bob Wells, which although of little use to his team effort (one man from his club had already dropped time) did at least put him at the top of the individual scores nationally.

With weather similar to Sculthorpe attendances at Barkston were enormous - some 60 in all. Three-quarters of the Rubber fliers and half the Glider competitors maxed out. The evening flyoffs were huge and launch time was crucial. Derl Morley and Russell Peers both got away early in Rubber and were in positive, good air. Of those that followed most benefitted to a degree but in some cases stability of either the air or the models was not good enough to create a challenge to the first pair. So Morley's flight with the assistance of John Walker's over-eight-minute effort and a very solid seven-and-a-half from Ray Monks meant that Birmingham, usually renowned for

their Team Power victories, took Team Rubber this time - and by a fair margin.

A little later John Cuthbert continued his tremendous end-of-season form to produce nearly 4:20 in the ten-way glider finale to top the National results and lift the SMAE Cup. Elton Drew at warmer Merryfield found enough for equal third with Colledge who was also flying at Barkston.

The 1/2A Power winner came from Driffield. Here Steve Fielding produced a spectacular three-and-a-half minute flight to top an excellent 2:50 made by Ewan Jones at Albermarle. (Hopefully we will have details of Steve's model in a forthcoming issue). The duo of Davitts also flying at Driffield were blessed with mixed fortunes. Ian died a death with his last flight in rubber; a disastrous 2:18 ruined a four-year unbroken string of maxes in this class. He made up for it with scores in 1/2A and a full house in glider although the air wasn't quite enough to challenge the leaders in the flyoff. Honours were left to Davitt Senior who with a partially trimmed big new Open Rubber model of some 560sq.in. flew a near seven-minute hop to place him in the high numbers.

The usual Birmingham contingent of Harris and Baggott had to be content with lower places than usual in 1/2A although surely the real loser must have been Pete Watson who has a terrific model. Trouble was, he D'T'd it down just one second early on the first comp flight! It was interesting to see that even on a day when most fliers found time for a second event the entry in 1/2A was very low. It would appear that the more inviting Slow Open class is becoming the usual event for the 'occasional' power flier and he is drifting away from the specialised mini class with its five flights, seven-second run and greater reliance on gadgets and engine performance.

On such a calm day it was inevitable that rubber would have a catastrophically large flyoff. Well over half the National entry qualified. What is probably worse is that the 2:30 max on this occasion enabled no less than one-third of the entry in A/2 to qualify - notwithstanding the five flights necessary!

I have since spoken to numerous entrants who admitted they would not have made it had there been the full three-minute max. Now I know we have recently heard arguments that the rules should make it as easy as possible for everyone to have a nice relaxed day; saunter out after lunch, do almost flying at all and still have a chance of fluking a win at the end of the day or at least going home feeling one has qualified for something. I would be the last person wishing to deter anyone from flying and enjoying it their way. However - massive flyoffs in a five-flight FAI glider event? What are we trying to prove? Short maxes are hardly a challenge; nor are they useful practice for those hoping to eventually rise to World competition levels. Agreed - domestic comps. are not practice first and foremost - they are events in their own right. But surely if they were a little more challenging they could at



Left: There was a strong F1B World Champs challenge from Australia's Pete Fauser in 11th place. Pete has been working hard developing a Russian-style prop hub and a portable radio remote twin chart recorder system as used by Doring and Hofsass. All photos this page by Martyn Cowley.



least help those who wish to practice to a decent standard. In a similar vein we hear from a vociferous minority that certain Open classes are 'a waste of time'. Well, in the context of World Championship performance this might well be so but these same people then seem quite happy to accept a 2:30 'easy' max for their precious FAI events. It was perhaps thankful that on this occasion relatively lift-free conditions coincided with flyoff time virtually everywhere in the country; otherwise results could have been both very silly and wasteful of models.

**6th SMAE Free Flight Area Centralised:
27th September
F1A - for SMAE Cup (to flew: 20 in flyoff)**

1	J. Cuthbert	Barkston	12:30 + 4:19
2	C. Edge	Barkston	12:30 + 4:08
3	W. Colledge	Barkston	12:30 + 4:02
4	E. Drew	Merryfield	12:30 + 4:02
5	C.P. Williams	Beaulieu	12:30 + 3:24
6	A. Cordes	Barkston	12:30 + 3:23

Team Rubber for Farrow Shield (22 full teams)

1	Birmingham 'B'	Morley, Walker, Monks	22.30 + 25.26
2	Bristol & West A	Wain, Aslett, Chapman	22.30 + 22.36
3	East Grinstead	Howick, Lea, Richardson	22.30 + 19.08
4	Falcons	Peers, Carter Dilks	22.30 + 17.52
5	Grantham A	Ball, Hipperson, Ball	22.30 + 17.29

**Open Rubber. No Trophy
(84 flew: 51 in flyoff)**

1	A. Wells	Sculthorpe	7:30 + 9:31
2	D. Wain	Merryfield	7:30 + 8:52
3	D. Morley	Barkston	7:30 + 8:47
4	R. Peers	Barkston	7:30 + 8:40
5	J. Walker	Barkston	7:30 + 8:09
6	B. Aslett	Merryfield	7:30 + 7:56

**Senior Championship points
(excluding only Team Trials)**

1	R. Peers	100.5
2	P. Watson	81
3	P. Ball	68
4	J. Cuthbert	56
5	D. Hipperson	49

1/2A Power. No trophy (20 flew: 6 in flyoff)

1	S. Fielding	Driffield	10.00 + 3:25
2	E. Jones	Albermarle	10.00 + 2:50
3	P. Harris	Barkston	10.00 + 2:32
4	R. Buskell	Beaulieu	10.00 + 2:23
5	R. Baggott	Barkston	10.00 + 2:15
6	A. Jack	Albermarle	10.00 + 2:15

Plugge Points and final positions

Bristol & West	1413
Vikings	1202
Anglia	1146
Birmingham	970
Crookham	921
Falcons	899
Biggles	795
East Grinstead	753

Plugge & Senior champions for '87

Our congratulations to Bristol & West on their retention of the Plugge Cup. This year it is also possible to congratulate the 1987 Senior Champion before the season has ended. A full analysis of both Aeromodeller and SMAE points scores in this event will appear in a couple of

months when we have all the data. However it is possible now, simply because of his unassailable lead, to announce that Russell Peers is 1987 Senior Champ. To those who have watched him in action this year this will come as little surprise. A full blow-by-blow of his season will be given in our results analysis; but what is most incredible of all (and what some of you

might have missed) is that up to and including the events reported here he failed to score SMAE Championship points on only one outing during the year. When flying CDH at the 4th Area event one rogue flight put him just out of the six.

His total, excluding the Trials, is a massive 100.1/2 points; some 25 points more than last year's winning total.

**Crookham Gala, Beaulieu:
4th October**

David Cox has sent us details of the goings-on at Beaulieu for this year's Crookham Gala. Clashing as it did with the SMAE Club Champs held at the other end of the country - not the host club's fault, incidentally - it attracted relatively local support. However, it had the best weather and there were flyoffs in all the Open events. It would seem that most of the numerous glider fliers present plumped for the easier option of 'three threes' against their own kind rather than take on the power models in Combined FAI. This left the way clear for Paul Bond to top the results for the third consecutive year with the only full score. The highest F1B man was a steadily-improving Pete King in third spot.

With conditions warm and calm all day there was plenty of room on the heath for three-minute maxes. What little lift there had been was dying fast by flyoff time. Rubber was first. Nigel Lee ruined his changes with a badly stalling glide. This allowed Julian Hopper's long overdue return to Rubber to be completely successful, his 6.1/2min. flight proving enough to win easily.

In Glider Audley and Stewart had launched close together to find weak lift whereas Pete Williams, flying off to one side, was in slightly more helpful air.

Julian Hopper must have felt confident again in his two-way tie for Open Power. His opponent was Paul Barrett flying a PAW powered Dixie. Although it did not climb high it found good air for a fine 3:15.

Sounds like a useful Slow Open model. It is not clear what happened to Julian's flight but if his meagre 4:30 wasn't deliberately D/T'd early then his Superjacker must have been in shocking sink.

Crookham Gala: 4th October

Open Glider (26 flew: 9 in flyoff)

1	P. Williams	9:00 + 3:34
2	R. Audley	9:00 + 3:13
3	P. Steward	9:00 + 3:11

Open Rubber (10 flew: 4 in fly off)

1	J. Hopper	9:00 + 6:38
2	N. Lee	9:00 + 4:10
3	D. Taylor	9:00 + 3:23

Open Power (4 flew: 2 in flyoff)

1	J. Hopper	9:00 + 4:39
2	P. Barrett	9:00 + 3:15
3	R. Johnson	8:23

Combined FAI (15 entries)

1	P. Bond	15.00 (F1C)
2	K. Faux	14.43 (F1V)
3	P. King	14.17 (F1B)

The fate of Beaulieu

We learn from the Beaulieu Model Flying Committee that the future use of Beaulieu Heath for free flight is very much in the balance. The New Forest Review Group is recommending that although certain sporting and leisure activities can exist inside its sphere of influence, model flying is a distinct no-no. They are suggesting that it should be phased out by 1992, or sooner if an alternative site can be found.

The main objection is that we are alleged

to be endangering the breeding habits of wild life, particularly the ground-nesting birds (a similar sort of argument gets thrown at us over Chobham Common).

I am informed that we have until end of March 1988 to reply to these claims and to make our case for continued access to this vital site. The Beaulieu Committee have asked for as many individual letters as possible to be sent to local MPs asking for support in the retention of the Heath for model flying. It would also be useful if just as many letters in a similar vein were sent to the Deputy Surveyor of the New Forest rejecting any proposals to ban model flying.

His address is: The Queens House, Lyndhurst, Hants SO34 7NF.

Your local MP can be found at the House of Commons.

It would be of particular benefit to the cause for those that travel some distance to Beaulieu to join this fight as by doing so it will be made even more obvious how important the venue is for us. Remember that great Trials last year? Let's hear from you. Bearing in mind that it is a nature conservancy argument we are up against it would be most effective to stress one's awareness of the problems and emphasise one's enjoyment of the Beaulieu environment. After all, there's not much point in having all this nature around us if we are not allowed to go and look at it. It would appear that regular free flight users of the common are very few in number (thus no threat) and the occasions when a big meeting is held are so few and far between that hardly constitutes a threat either. It needs you to help. Write now.

Midland Rally: 11th October

It was nothing short of a weather miracle - just a tiny window in an otherwise tempestuous week - that saved this annual and increasingly popular event. The Midland Fly for Fun, to give it its official title, escaped the worst and presumably this attracted numerous non-combatants who made a pleasant and attractive backdrop to the contest events. Pity they don't come out in force more often.

On the previous night, even some of the hardened contest types admitted to second thoughts whilst packing during the torrential rain and squalls that swept the country. The next morning it was flat calm in many places and everywhere was clear and dry. At Barkston itself we were greeted with a moderate south-west breeze and sunny intervals, and the conditions improved!

A novel assortment of events seemed to draw entries towards the larger classes and away from the Minis. Despite the full max, five from the dozen or so who flew in Vintage managed a perfect score. In Slow Open Power the recent argument that 40 models would soon be dominating was rather undermined. They were very much in third place. Steve Fielding turned up with a sensational OS.19 powered Beatnik, a Jim Baguley design published in the June 1960 issue of Model Aircraft. Steve's was actually built in 1970 so it's a fair veteran, but it has hardly been flown since. It executed the definitive 'two-turns vertical spiral climb' and despite an annoying over-run on what should have been a first max went on to score three more, ousting Gibbons' similarly well-adjusted Dixielander. Plans of the Beatnik model are still available from Aeromodeller as ref. MA 325X. The design was a follow-up to Jim Baguley's excellent series on Open Power models of the era which is still somewhat of a reference work. The nice touch was that Jim was actually at the contest and recognised the



Top: Steve Fielding's tremendous Baguley Beatnik which won Slow Open at the Midland Rally with a full score. Model, which was built in 1970, is now powered by an OS Max 19 turning a Taipan 8x4 prop on 30% nitro. All-up-weight is a mere 15.1/2 ounces. Above: John Godden flew this well finished Satellite in Slow Open at the same event. Below: Plans of the Beatnik are available from our Plans Service for £3.05 including postage.

Midland Rally: 11th October

A/1 Glider (8 flew)

1	J. Baguley	10.00
2	J. Carter	9.45
3	J. O'Donnell	9.37

C d'H (8 flew)

1	G. Sharp	9.31
2	D. Hipperson	8.56
3	M. Dixon	8.19

Vintage (12 flew)

1	J. O'Donnell	9.00 - 8.56	Challenger
2	R. Peers	9.00 - 8.50	Lanzo
3	D. Hipperson	9.00 - 6.21	Lanzo
4	C. Sirachan	9.00 - 5.25	Lanzo
5	T. Hall	9.00 - 3.10	San de Hogan

Slow Open Power (9 flew)

1	S. Fielding	9.00
2	P. Gibbons	8.55
3	P. Ball	6.18 - 5.26
4	P. Watson	6.18 - 3.36

Northern Gala: Driffield, 13th September

Open Glider for CMA Trophy (10 flew)

1	J. Cuthbert	7.30
2	W. Colledge	7.13
3	R. Dyer	6.53

Open Rubber for Caton Trophy (13 flew)

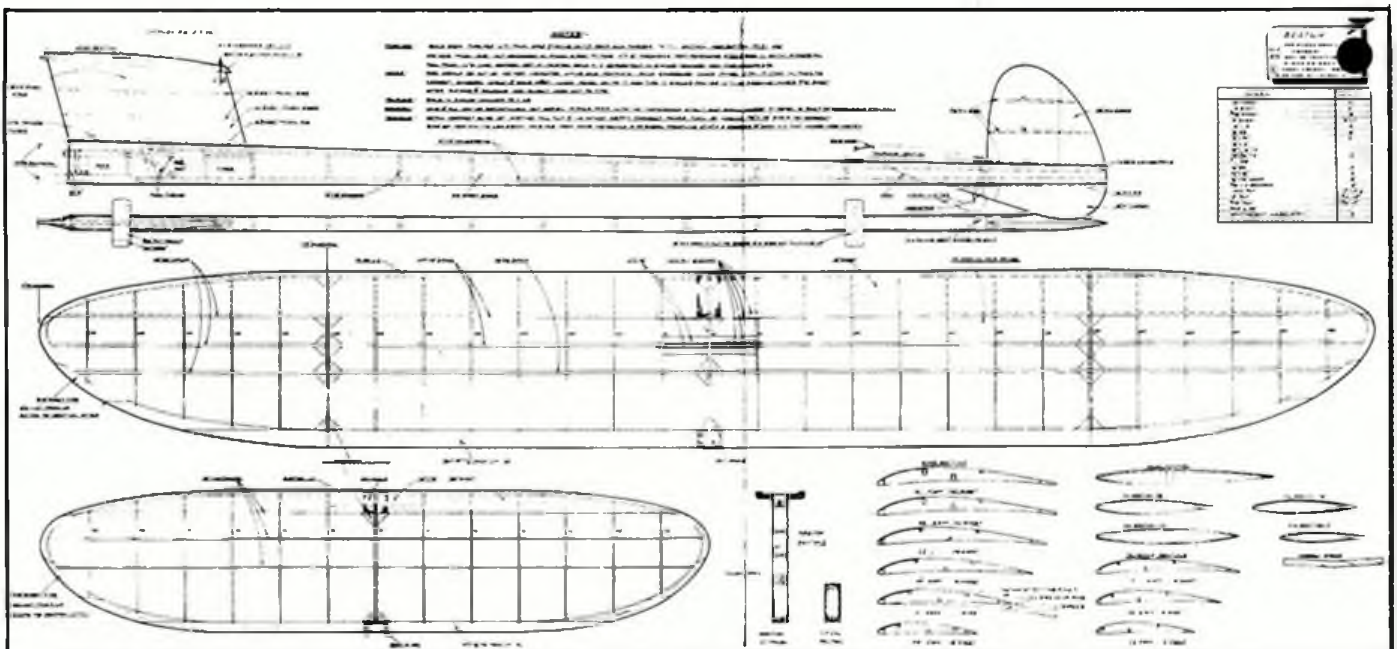
1	L. Aukland	7.30 - 7.56
2	P. Ball	7.30 - 6.08
3	A. Ball	7.30 - 6.05

Open Power for Hamley Trophy (13 flew)

1	J. Hopper	7.30 - 7.43
2	R. Peers	7.30 - 6.50
3	T. Payne	7.30 - 5.56

design immediately. He then went on to win A/1!

George Sharp made a positive job of topping CDH with a score that would have been five maxes had it not been for a sticking prop blade on the last flight. The long motor run put him in good stead, particularly on the early flights when lift was tricky. He used the model that was featured in this column some months ago - one of the best CDH models ever! He then had the good sportsmanship to assist in





Above: The old faithful Dixielander was at the Midland Rally too. Dick Staines prepares his.



Photos above show Gerry Pink's new F1B which got its first airing at the Trials. It seems to have a very long line and pennant attached - could it be that Gerry was still not sure whether it should be a glider? Very neat building is necessary when you are planning to cover with transparent mylar. Smooth job on that tail. Left: Colin Sharman, who also uses mylar on his F1A, was out of the top places after the first Trials...

the retrieval of Hipperson's final flights in the same class. The latter had started flying CIDH too late after spending nearly all day finishing off his Vintage flights. Now with only 40 minutes to close-of-contest he needed a little help and two models to squeeze in the flights! His eventual total was enough for second place despite his last three flights being wound and launched with little regard for the air.

Thus the only flyoffs were to settle Vintage and to decide an unusual tie for third place in Slow Open between Ball and Watson. Watson's model had not been looking too happy during the day although it produced more than three-and-a-half minutes in the flyoff, but this was topped by Ball's new stripey model which in bouyant air managed nearly 5:30.

Just before the close of the contest at 4pm the weather seemed to have deteriorated with thin cloud and an increasing (and chilly) wind developing - much like last year. However, as finalists prepared the wind dropped again, the sun appeared and it warmed substantially; so much so that the rubber fliers were positively itching to launch on the signal. Hipperson's Lanzo and O'Donnell's Challenger were released together right up at one edge of the drome, which had been the best place to fly from all day. Hall and Strachan chose a spot a few hundred yards across wind and Peers, also flying a Lanzo, was even further over. It appeared that only a mid-air collision could avert a clean sweep for O'Donnell and Hipperson, judging by their climb heights. They had indeed launched in positive lift. Nevertheless, right at the other edge of the drome the Peers model, although not quite so high, was gliding even better. It was

certainly a case of the best-trimmed glides making use of the air as Hipperson's model began to descend slightly underelevated, drifting downwind faster and out of the lift. O'Donnell and Peers hung on and on. When the others were down they were still battling it out circle for circle, just leaving the drome and sinking slower and slower. Both did nearly nine-minute flights; a great end to the day.

First Free-Flight Trials: Barkston Heath, 24-25th October

Nine from an eventual total of 14 flights were completed to schedule over the first weekend of the European Free Flight Team Trials. The weather for the first day at least was quite sensational. A light, cold breeze in the early morning rapidly slackened to give a near-calm afternoon under a cloudless sky. Lift was very weak but so were the patches of sink. In power and rubber it was a case of no mistakes, the standard in both being very high even though attendances were lower than one might have expected from such a prestigious event. It was certainly a case of the hard core of experts taking things very seriously. Fortunately initial nerves soon ebbed away to give even those that dropped time a very pleasant day's flying and plenty of 'performance' practice.

By the end of the first day (and 5 flights) eight contestants had unblemished totals in F1B, a dozen in F1C but only a couple in F1A. The glider fliers really had had their work cut out in the first round. Despite the civilised 10am start, lift for their allotted thirty minutes was just about non-existent. Very few of them maxed. Later in the day they were rewarded with perhaps the only real boomer when in Round 4 a cloud of models could be seen circling at many times line height.

The second day dawned much the same with a slight drift change to the south from westerly. This was to prove the undoing of many. Once again it was clear, dry and sunny but apparently colder than the 45°F or so because of the steadily increasing wind. By the second round the wind over the dreaded ridge and tree line that skirts the south edge of the aerodrome was playing havoc with the airflow.

It was not that the models themselves had much problem but lift detection both from the ground and on the line became very difficult. Overnight full scores in glider dropped away quickly to leave Andy Crisp alone on top still 'clean'. It was the eighth round that sent the leader board scattering in F1B. The turbulence was chopping up the lift into small, hardly distinguishable patches and a long cold windy spell had motors cooking and many floundering in deceptive air. Through this came magnificent flights from Chilton and Gaunt in particular and a lucky break, literally, for Ivan Taylor - probably our best international hope - who shed both blades after launching into air which turned out to be poor judging by performances of those who got away. Ivan's reflight at the end of the round contacted one of the most stable patches. Wakefield scores were thus opened up wildly.

Power was still very tight with seven fliers still riding a full house. The F1C models were coping with the ground level turbulence better than the other classes and at the height that most of them were reaching the air seemed generally smooth, if rather fast moving by this time; probably 20mph at altitude.

Having lost a model Andy Crisp was down to a very low aspect ratio reserve for the last round. It still came up trumps to maintain his unblemished score, but the top ten in glider all stayed within striking distance for those final five flights at the 2nd Trials. Some A/2 fliers who could have been in contention were rewarded with terrible scores on this flight through no fault of their technique or their models. I witnessed both Tony Cordes and Dave Oldfield make descents from the top of the line in well under a minute, such was the deceptive nature of the swirl-over from

upwind. Those circle towing down wind usually fared better. The awful air was now zig-zagging wildly across the drome bringing deceptive wind shifts.

More damage was done on the Rubber round. Pollard, who had had a few scrapers, launched a little 'left' as did quite a few others who were also duped into believing turbulence was lift. Pollard's model floundered, some climbed away; but most did less than 2.1/2 minutes. Gaunt had gone on his own very early after studying his thermistor for most of the previous glider round in an ultimately successful attempt to correlate his readings with what models were actually doing. His patience paid off with a final max and the only full score in rubber. Taylor came as close as possible by dropping a single second on this last flight and Chilton's model also dropped time despite its rocket climb unleashed when Mike's very precise twin-headed thermistor anemometer set-up said - Go!

The final round of the power session also caused a few mishaps, Ray Moore spoiling a perfect record with a launch just a fraction off to the left robbing him of the few extra feet he needed to max in the marginal air. Ray Monks also got a horrible release which probably put paid to his chances of a team place as Johnson, Jack and Screen made no mistakes. Watson on the other hand flying rather late in the round but having been his usual consistent self all day got one away slightly flat and had to watch as the model continued generally upward but rolling out of phase to finish inverted and at the most awkward of angles. Miraculously the bunt pull-out came to the rescue. The model executed a slightly left-rolling and quite tight outside loop actually to gain a little more height, right itself perfectly from its seemingly impossible attitude and glide off immediately into good air! This performance was greeted with a wry smile from the owner and spontaneous applause from all still on the flight line. Watson joined the others in the lead.

For your reporter the only sour note of the meeting came when what appeared to be an official document was distributed from the control van concerning certain restrictions being placed upon competitors who were planning to attend the Second Trials at Sculthorpe a few weeks later. Most free fliers who have heard of this venue must by now have assimilated the fact that as it is a USAF base it is subject to some pretty stringent security problems of its own. To distribute a document underlining these to the experienced nucleus of fliers who would still be in contention at the end of the first Trials was

Rule changes for '88

You will recall a few months ago we were able to bring you advanced information of the free-flight rule change proposals to be put before the SMAE Council at their annual rules meeting on 12th September. By now I should have been able to bring you the outcome of the Council's deliberations on these very important matters. However, as a result of inefficiencies in the SMAE system and, I am afraid to say, some gross incompetence somewhere along the line these proposals never reached the agenda for the meeting!

probably unnecessary. But to extend what should have been cautionary advice to threats of actual disqualification if certain orders were not obeyed left me wondering just who was making up the ground rules for this official SMAE event and just how they proposed to enforce them. Certainly not the SMAE as no such document had ever been discussed or passed by the FFTC. No, it was the local area! East Anglia, it would seem, were concerned over the use of their unique field and its possible loss if anyone misbehaved. Quite reasonable of course but they grossly overstated the case. To make matters worse, the said Area's document also had the effrontery to demand an extra 50p levy to help cover the licence fee - failure to pay which would preclude who so ever did not from entry to the field! Quite outrageous.

The Trials CD was generally unhelpful about this matter when asked whose authority sanctioned such behaviour. Moreover he actually tried to wash his hands entirely of the affair claiming he hadn't even read the contents of the document. This after giving it official sanction by distributing it to all contestants from the control van!

Perhaps thankfully, most competitors did not absorb the ramifications of the document but all to whom I pointed it out agreed with me whole-heartedly. Altogether a very confusing and unsatisfactory situation. This was sloppy

Well, that's not strictly true; after some prompting head office sent them out as an addendum but some areas quite rightly pointed out that this was too late to offer them the full circulation they required. Hence discussion was put back to the October Council meeting.

In the words of more than one who attended this gathering it was 'a shambles'. It ran on into the night and managed somehow to deal with only a fraction of the business intended; hence our rule proposals were never discussed.

This leaves us with no further time to pass or implement them for the '88 season

and unnerving behaviour from the CD, who (like me) is a member of the Free Flight Tech Committee. A further illustration, as if we needed one, of the loosening of the general standards in management of what in essence is a comparatively simple competitive hobby.

F1A (33 flew; Max score: 1620 secs)

1	A Crisp	1620
2	G Madelin	1618
3	M Farnham	1610
4	B Barnes	1601
5	J Cuthbert	1593
6	S Philpott	1578
7	D Bartle	1555
8	W Colledge	1545
9	J Carter	1542
=	R Audley	1542

F1B (23 flew)

1	P Gaunt	1620
2	I Taylor	1619
3	D Morley	1610
4	M Chilton	1591
5	R Pollard	1580
6	R Peers	1561
7	D Hipperson	1531
8	T Dilks	1494
9	B Aslett	1491
10	D Greavew	1485

F1C (16 flew)

1	R Johnson	1620
=	A Jack	1620
=	S Screen	1620
=	P Watson	1620
5	R Beggott	1613
6	R Moore	1606
7	P Harris	1598
8	R Monks	1582
9	R King	1407

and it poses a very large question mark, as if there hasn't been one for some time, over the SMAE's willingness or ability to govern Free Flight competition business effectively.

We have a Free Flight Tech Committee who had worked long and hard on those rule change ideas. Many of them were logical tidying-up details; some were rather contentious. All were due a full and democratic airing. Perhaps you would like to ask your Area delegate why they didn't get it. If the same sort of debacle isn't going to happen again next year the system needs a shake up...

London Gala: Salisbury Plain, 29, 30 & 31st August

Open Power (10 flew)

1	P Harris	9:00 + 10.42
2	R Staines	9:00 + 8.56
3	P. Watson	9:00 + 6.06

F1A (27 flew)

1	C.P. Williams	21.00 + 4.20
2	C Edge	21.00 + 4.12
3	G. Madelin	21.00 + 4.08

F1B (24 flew)

1	I Dilks	20:54
2	D Morley	20:25
3	D Greaves	20:24

F1C (12 flew)

1	S Screen	21.00 + 4.00 + 5.00 + 4.50
2	P Watson	21.00 + 4.00 + 5.00 + 4.09
3	P Chapman	21:00 + 4.00 + 5.00 + 3.42

A/1 (21 flew)

1	A Dean	10.00 + 5.45
2	J Cuthbert	10.00 + 4.49
3	K. Smith	10.00 + 4.22

C d'H (17 flew)

1	P Carter	10.00 + 4.05
2	G Ferrer	10.00 + 2.35
3	G Sharp	10.00 + 2.32

1/2A Power (12 flew)

1	S Screen	10.00 + 3.35
2	P Harris	10.00 + 3.21
3	P. Buskell	

HLG (8 flew)

1	J Buskell	8.07
2	J Tipper	7.47
3	E Burge	7.15

Vintage (4 flew)

1	J Baguley	9.00
2	B Platt	7.24
3	B. Jukes	6.52

Ladies Event (3 flew)

1	G Moore	5.49
2	S. Sharman	4.34

Top Junior

M. Chapman	10.35
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(Total score including fly off in Open Rubber)

Open Glider (16 flew)

1	J. Cuthbert	9.00 + 10.09
2	P Steward	9.00 + 7.47
3	G Hart	9.00 + 6.40

Open Rubber (14 flew)

1	P Ball	9.00 + 5.33
2	J Carter	9.00 + 4.53
3	M Chapman	9.00 + 1.35

Late presents? Fireside reading? We sample a recent selection from the aviation press



Fantastic Paper Gliders

by Michael Johnson (Penguin Books, £6.95; ISBN 0 14 010052 0)

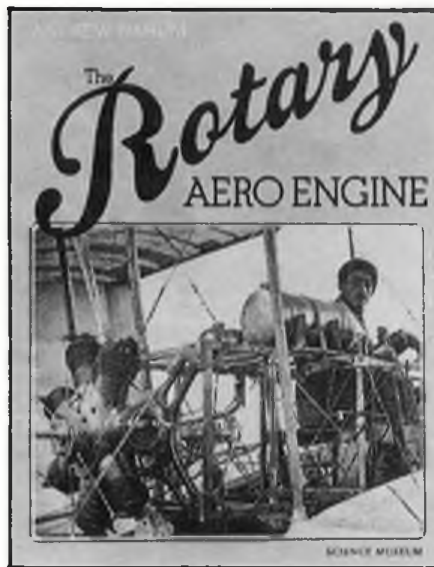
Inside this colourful cover are full instructions for sixteen gaily-printed gliders in a variety of configurations. What makes this treatment of the subject more interesting than most is that Michael Johnson is an aeromodeller – with a particular interest in A-2s – so not only are the paper planes of mostly familiar layout but they are remarkably well-engineered for flight. A multitude of neatly-fitting tabs and fillets add integrity to the relatively fragile structures and the nett results are most pleasing, as we discovered when Michael paid a recent visit to the *Aeromodeller* office with a large case full of the original models, giving us the opportunity to pass a merry half-hour of prototype evaluation! Apart from those of traditional layout there are some interesting bird-wing and slat-wing craft to try; flying wings and triangles add further spice. Incidentally, notably efficient indoors was a swept-wing tailless of almost identical layout to the APS Xernes sailplane. Models like this give considerable scope for experiment and many of the techniques may be applicable to larger models. For example, a neat system of scored fold lines give a miniature spanwise turbulating effect – but we'll hear in more detail about such translations for Michael is writing an article on this fascinating branch of aeromodelling for this magazine. Meanwhile, why not try these elegant and colourful creations for yourself? GC

The Rotary Aero Engine

by Andrew Nahum (Science Museum, £5.95; ISBN 0 11 290452 1)

A major strength of the Science Museum is

its happy philosophy of publishing useful books like this. Andrew Nahum has assembled a competent collection of text and photographs to illustrate the growth and ultimate sharp decline of this most evocative of aero powerplants. Pros and cons of the type are debated and the fundamental limitation of the rotary engine, its inability to be developed above a finite power output insufficient for post-



WWI application, is properly managed. The modeller will find great enjoyment in the photographs and drawings (motor test and salvage-yard scenes are particularly appealing) and as an appetiser for further research it could hardly be bettered at the price. GC

Aerodynamik der Motor Flugmodelle

by Jaroslav Lhonička and Jan Janovec (Verlag fuer Technik und Handwerk GmbH, Postfach 1128, 7579 Baden-Baden, West Germany)

In my experience the average German modeller takes more interest in aerodynamics than does his English counterpart, and over the years there has been an abundance of German literature on the subject. This has, however, been mainly directed towards motorless flight, doubtless because of the very great interest in gliders in that country. This book, which is a translation from the Czech into German (the original title of which I have been unable to determine) looks for a change at the aerodynamics of the power model. It should be understood that in German the term Motor Flugmodelle really means powered flying models in order to differentiate between gliders, sailplanes and the other categories which, of course, includes rubber power. This study in the main looks



at the free flight competition power model. Unless one is steeped in mathematics it is not easy to review a book on aerodynamics, especially one from the Continent, but the many diagrams and formulae are common to the subject, so modellers familiar with this fascinating work will doubtless glean a lot from the pages of this book. After all, as in the line from a well known song (on an entirely different subject) "...you don't have to know the language."

The reader will not find instructions on how to produce a wonder aerofoil section or a wonder model. The aim of this book is much simpler. It presents in an interesting manner all the important factors and requirements which appear during the design of a power driven model. Comparisons are also made with full size aircraft and the existing differences between these two kinds of flying machines are brought out. The final part of the book shows that intricate calculations have become a thing of the past with present-day technology; examples are provided of computer programmes (which also cover propeller design). AI

Flugmodelltechnik, Fuehrer durch die Abteilung (Flying Models Technology - a Guide through the Section)

Published by Verlag fuer Technik und Handwerk GmbH, Fremersbergstr. 1, 7570 Baden-Baden for the Deutsches Museum, Museuminsel, 8000 Muenchen 26, West Germany

In what is possibly the first attempt to document the model aviation hobby by a national museum, the German Museum in



Munich opened its section on the technology of model flying in 1986. Now a guide to this exhibition and other related items held by the Museum has been published. This is a finely produced book with soft covers containing sections on history, materials, constructional methods, motive power, propellers, silencers, radio control, rockets and paper aeroplanes as well as detailing the models that have been chosen for the Museum's display illustrating the development of model aeronautics. Most of these models are replicas but some outstanding originals are also on view. Foremost amongst these must be the 1887 twin-pusher Drachenflieger by the Austrian Wilhelm Kress; then there is Karl-Heinz Stegmaier's famous radio controlled HE-001 of 1953 powered by the Ruppert-Boxer flat twin diesel of 8.5cc capacity whose vacuum pump operated pneumatic servos in the first multi-channel German system caused him to win ten German and two European Championships.

The motive power section of the book covers rubber, steam, compressed-air, CO₂, petrol, diesel, glowplug and pulse jet. The illustrations are excellent but unfortunately some errors are apparent in the captions which confine themselves to name of manufacturer, year of manufacture, power developed and method of induction. Many of the older engines are missing components like contact breakers and tanks, and quite often others have incorrect items fitted. In the majority of cases those surely could have been found; but it may be the Museum's policy to exhibit such items 'as received'. If this is so one would have thought that only complete and excellent examples of these engines would have been secured for such an important undertaking. After all, many still exist, not only in collections, but also in regular use by vintage enthusiasts. In this respect the pre-1950 engines appear to have been hurriedly amassed without due care or the in-depth knowledge that the subject demands.

The book's value is in the good illustrations of Continental engines, for there are examples of Russian, Czech, Austrian and German motors that are not usually found between the covers of one

book. In the historical narrative section, the lack of mention of the pioneer work done by FW Schmitz into aerofoil sections at Reynolds Numbers applicable to model aircraft is a serious omission, while the mis-statement that the Wakefield Cup contests from 1927 to the present are for stick models shows a regrettable lack of knowledge on the part of the compiler. However, for the Museum visitor this is a good guide to the exhibits and one regrets that our own National Museum has not yet seen fit to document the hobby in a similar manner. **AI**

British Civil Aircraft 1919-1972, Volume 1

by A. J. Jackson (Putnam, £20; ISBN 0 85177 808 9)

Lockheed Aircraft since 1913

by Rene J. Francillon (£24; ISBN 0 85177 805 4)

Handley Page Aircraft since 1907

by C. H. Barnes (£25; ISBN 85177 803 8)

It really is most pleasant to see these books in circulation once again, thanks to Conway Maritime Press who are the new overlords for the Putnam titles. Fundamentally, each is an indispensable volume for the aviation enthusiast. By careful study and patient cross-reference to these and other Putnam books it is possible to acquire a knowledge of aviation's links far more substantial than may be gained from any number of coffee-table publications.

Each is a reprint, but R. T. Jackson, son of the late author, has made slight amendments to British Civil Aircraft to bring the careers of some of the later craft rather more up-to-date. Of course, to revise sufficiently to take account of the many changes of ownership would mean almost a new volume. To create this was not the intention, and it must be remembered that much of the strength of the volume has always been in its treatment of the earlier

years of aviation in this country. Your reviewer has always regretted the demotion of several pre-war craft to the appendices when the series was updated to three-volume status in 1973, but this is a minor quibble given the vast amount of data on offer. The remaining two volumes in the British Civil Aircraft series will be published in 1988.

The two companies Lockheed and Handley Page could hardly be more dissimilar in character and history. Rene J. Francillon pays due credit to Lockheed's balance sheet - something which makes staggering reading. The perils of post-WWII manufacture, particularly the strategic rethinking needed after the eclipse of the piston engine in the commercial world, are graphically drawn; and the role of politics as well as economics is stressed. But the aircraft are the stars, notably the U2 and later derivations, the story of which even at 'unclassified' level is a tale to astound. This is a subject handled by someone fully at home with his task; but it would have been nice if drawings of the earlier Loughhead aircraft could have been included.

Handley Page Aircraft is the story of a company dominated by an individualist - and it is a microcosm of British aviation itself. Painstaking research has unearthed a fund of fascinating tales. Just how little was known about pre-war aircraft designs is clear from the kaleidoscopic modifications to the Type S of the mid-20s; the story of the Hermes creates suspicion that little had changed over twenty years later. And here's one for the mastermind brigade: which HP aircraft had a nosewheel tyre from a wheelbarrow? 'Aeromodelling' subjects abound; and this volume is printed to a notably higher quality than the others, although the yellow cover is a surprise.

Dust jackets of all three feature paintings by Keith Woodcock, so we can report a much better standard of artwork than on the DH and Gloster books reviewed recently. **GC**



VINTAGE CORNER

Alex Imrie updates the old-time
aeromodelling scene worldwide



THE TIME has come to catch up on miscellaneous items that have accumulated in the last few months, and to give additional information on subjects already covered, some of which have been awaiting space. The following pot-pourri is the result.

Kiwi motor

This engine was briefly described in the March 1987 column when a request was made for identification. W R Cooksey of Gisborne, NZ is now the owner. He supplies the following additional information. The engine is a Powell Wood. It was described in a three-part constructional article in the NZ Home Journal (a women's magazine!) during May/June 1936. Casting kits were available at 22/6, and completed engines

engines called Acme. As it was designed by L E Wolcott-Wood there is still some mystery about the 'Powell' in the engine name. The machining processes in the constructional notes are highly detailed and the text shows that the writer (who uses the pseudonym of Colchester) was very knowledgeable in contemporary two-stroke practice. Needless to say the engine is no longer available for trade. Bill Cooksey is retaining this jewel of New Zealand model aero engine history!

Ysvogel (Icebird)

The photograph of a youthful Dutch modeller named de Kat holding his 1947 Bowden Trophy entry published in April 1987 Vintage Corner brought not only details of the model but also established contact with the man in question, Hank L de Kat who is now resident in USA. From Holland, Cor Burger sent a three-view from the Swedish publication Hobby Boken

and gave some brief details of this 8cc petrol-powered 1710mm span beauty which could be built with ordinary dihedral or polyhedral depending on the power used. The Grant X-8 aerofoil section was specified although a completely symmetrical aerofoil section (ZS) could also be used. Hank was a member of the pre-war Rotterdam Model Aero Club. An acknowledged Wakefield expert, he says that the Icebird flew very well but comments that the Bowden Trophy rules resulted in a difficult competition. Still involved with modelling after all these years, Hank attended the last Free-Flight World Championships in France. It is hoped to obtain further information from him on the Dutch aeromodelling movement in the vintage period.

Stentorian biplane

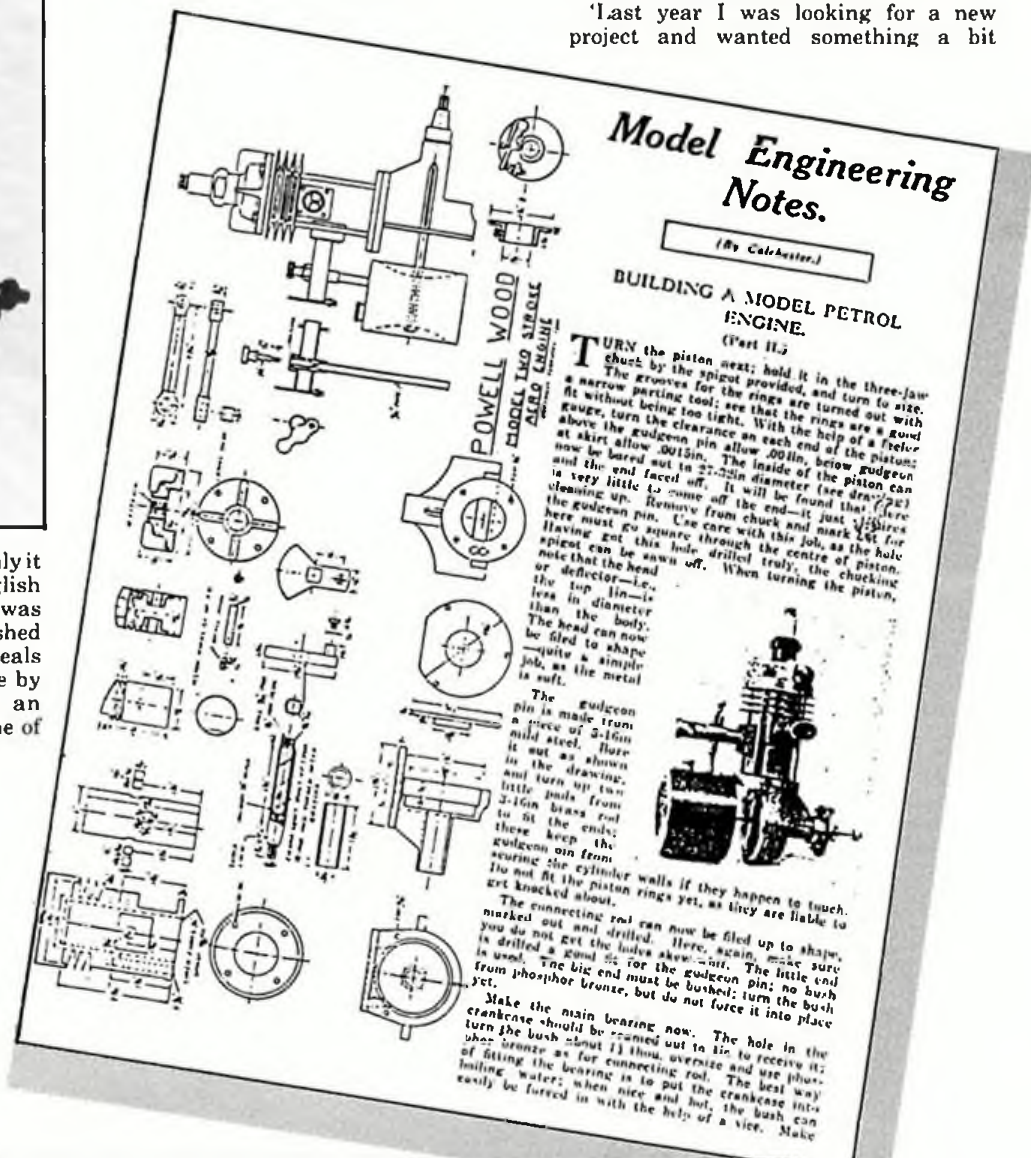
George Hunter of Harrow writes of his biplane version of this famous Phil Smith design. He tells us:

'Last year I was looking for a new project and wanted something a bit



could be purchased for £7/12/6. Initially it was thought that this engine had English origins, but Mauri Poletti of Auckland was able to identify it from the published photograph. Subsequent research reveals that this particular engine was made by Bert Dacomb of Christchurch, an enthusiast who produced his own line of

Heading: A look back to summer - Alan Banks flew this attractive Hawker Hind trainer, built from a pre-war Peerless plan, at our Golden Era day in July. Above: The 1936 New Zealand Powell-Wood petrol engine of approx 11cc which drives an 18x6in. wooden propeller at 4000rpm. Right: Blueprints were reproduced in the NZ Home Journal.



handling models of the vintage type that I have come across. I thought that Red Zephyr was good but this one is even better. The covering is "Cub Yellow" Solartex which is the nearest I could get to the original which was chrome yellow.'

George, who hails from north of the border yearns to find a Scottish design ... hoots awa' wi' ye, mon!

Hoax!

It appears that the Lledramp Flash never was! Not, at least, in the context as presented in November's Vintage Corner. The give-away was in the model's name which was the builder's name spelled backwards. This reminds me of the thirsty Scotsman Rab Noolas so often mentioned in the steam locomotive writings of 'LBSC' in Model Engineer. So there was no continental magazine descriptive article about the Flash. The model has its origin in D A Russell's large low-wing monoplane; it retains the same type of cabin top, which doubtless gave credibility to the claimed 1934 date. I like Pat Mardell's model and despite the hoax he perpetrated, I still think it a lovely machine, but, of course, it has now to be relegated to the 'vintage style' camp. Another would-be hoaxer was Mike Whittard. His model could have fooled anyone, but in conversation, when I admitted my failure to identify his roundel decorated silver doped 'breath from the past' he chickened-out, telling me that it was of his own design and only just completed... so it too falls into the 'vintage style' category. This activity certainly should keep us on our toes and might cause us to take a second look at all those previously unheard-of designs that surface from time to time!

Duplication

There are now a number of sources for vintage plans, and when one considers the effort and expense it takes to copy these onto film or draw them up from source information which is often in almost illegible condition, it is a wonder that the draughtsman does not check first to see if the plan is already available to save himself the trouble. Bearing in mind the low numbers of most plans sold in this country, if a plan is to be had elsewhere there is bound to be little financial recompense from sales. Surely it is better to concentrate on other rare plans instead, unless, of course, an already available plan is so inaccurate that a new issue is warranted. This presupposes that the new draughtsman is in possession of data not available to the earlier plan producer (this sometimes happens especially if someone jumps the gun or goes off 'half cocked'!). In few cases nowadays can there be copyright infringements when copying plans, but there just might be, so it is better to make an effort to ascertain whether the originator still retains this.

It is opportune here to air one of my standard grievances. Why is it that many re-drawn plans of vintage models depart quite radically from the original? The installation and operation of R/C is a feeble excuse; the old vintage models can



The so-called Lledramp Flash Steamer of 1934 by Pat Mardell, a vintage style beauty spoof that caught your humble servant on the hop! See text.

be radio controlled successfully without the massive beefing up, re-designing and over-powering that is now seemingly accepted as the norm.

Elmer propeller

The illustration of this nine-inch diameter 'automatic variable pitch' propeller in the June 1987 issue of Vintage Corner produced some responses. Dick Sherman reported having one in his Model Museum and was willing to bring it to UK to show us during his visit to attend Vintage Weekend. This kind offer was not taken up since our Editor (who has personal experience of operating such a propeller) was loaned one from another source. A reply from far-away Australia came from Chris Greenwood of Sunbury, Victoria and his experience seems to mirror that of other users - including our Editor's! - or is there still some reader who had success

with this device? Chris writes:

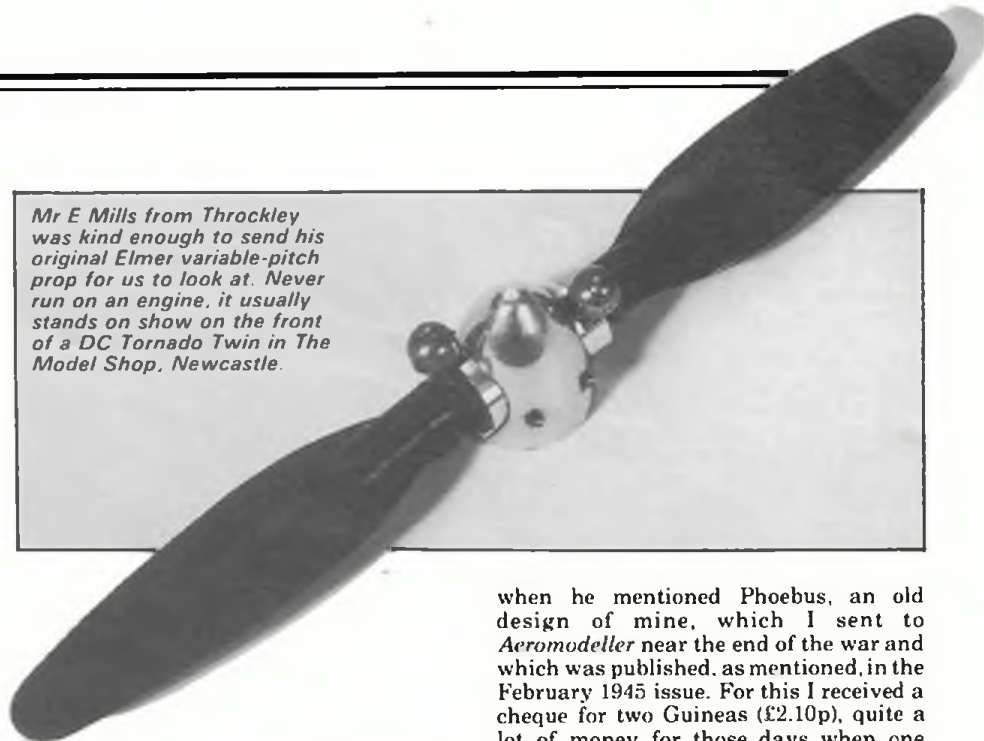
'My sample was purchased in the UK for me by a fellow RAAF aircraftsman who hitched a ride home on an RAF Hastings in, I guess, 1955. I still have the propeller, but not in its original condition and minus one bob-weight. Within a few hours of being handed the prop and having worked out how it worked, I had it fitted to a Frog 150 diesel mounted on a test stand. At the first flick, one blade broke off. Examination showed that the plastic blade was held to the hub by a shouldered metal pin, carrying a fairly coarse screw thread (over which the blade screwed) and which was hollow for lightness. Unfortunately, the root diameter of the thread and the diameter of the hole through the pin were just about the same. Perhaps if the prop had been fitted to a glow engine, or had electric starters been available, it would have run, but I doubt if

Doug Scott and his wayward Banshee which was recovered after an Old Warden fly-away by 'Biggles' as related in the Vintage Weekend report in the November issue.



the blades would have been retained. I had two new pins made up without the central hole, but I never tried to run it again. Your request caused me to dig it out of storage and I note that the pins are now covered with rust... interestingly, the diagram shown in the illustration of the constant-speeding and feathering positions is incorrect. The blade feathers trailing edge forward.' Although as mentioned in the June caption this prop is not quite vintage we would be pleased to publish any further information on it, especially details of successful use.

Mr E Mills from Throckley was kind enough to send his original Elmer variable-pitch prop for us to look at. Never run on an engine, it usually stands on show on the front of a DC Tornado Twin in The Model Shop, Newcastle.



Phoebus

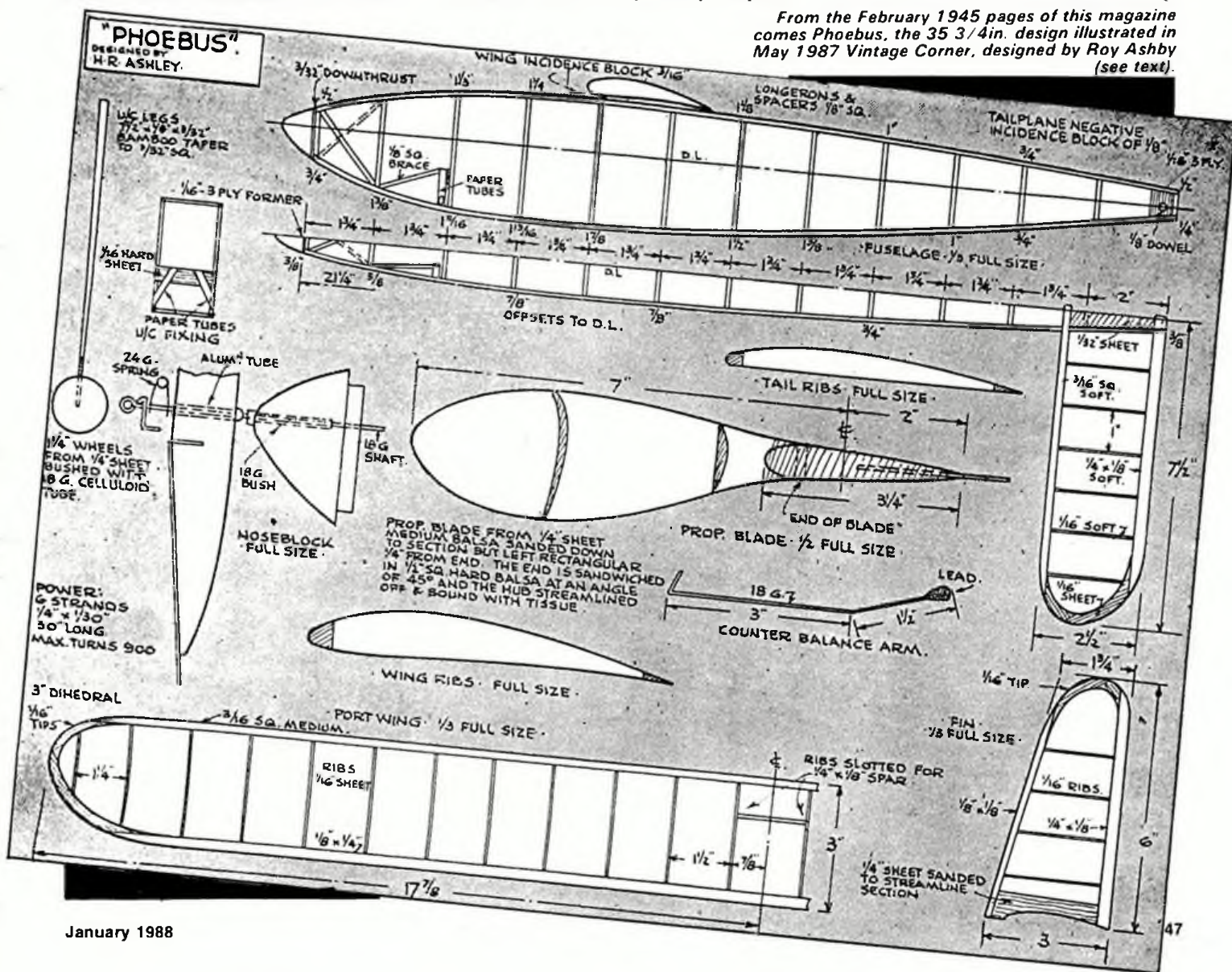
Commenting on Vintage Corner in the May 1987 Aeromodeller, H R Ashby of Rochester, Kent, the designer of Phoebus writes:

'I was browsing through May Vintage Corner the other day enjoying Derek Scales' account of his flying boats and remembered that I too was bitten by the bug and built two rubber driven twin-engine boats in the 1940s. Both flew, the first one taking-off beautifully from some shallow water in a chalk pit near my home. There is nothing quite like the sight of a flying boat, full-size or model, leaving

the water and climbing away - very satisfying indeed. Next I came to Trevor Watkins' story of his re-birth by the vintage revival and this made very interesting reading since I had quit aeromodelling after the war, but came back thirty years later due to my younger brother's efforts. Imagine my surprise

when he mentioned Phoebus, an old design of mine, which I sent to Aeromodeller near the end of the war and which was published, as mentioned, in the February 1945 issue. For this I received a cheque for two Guineas (£2.10p), quite a lot of money for those days when one remembers that a full weekly wage for a man was about £5. But to return to Phoebus: high aspect ratios were then 'in' so this model sported almost 12:1. The fuselage and fin were covered in green, wings and tailplane yellow, all being lightweight Japanese tissue. The power was six strands of 1/4 inch, 30 inches long

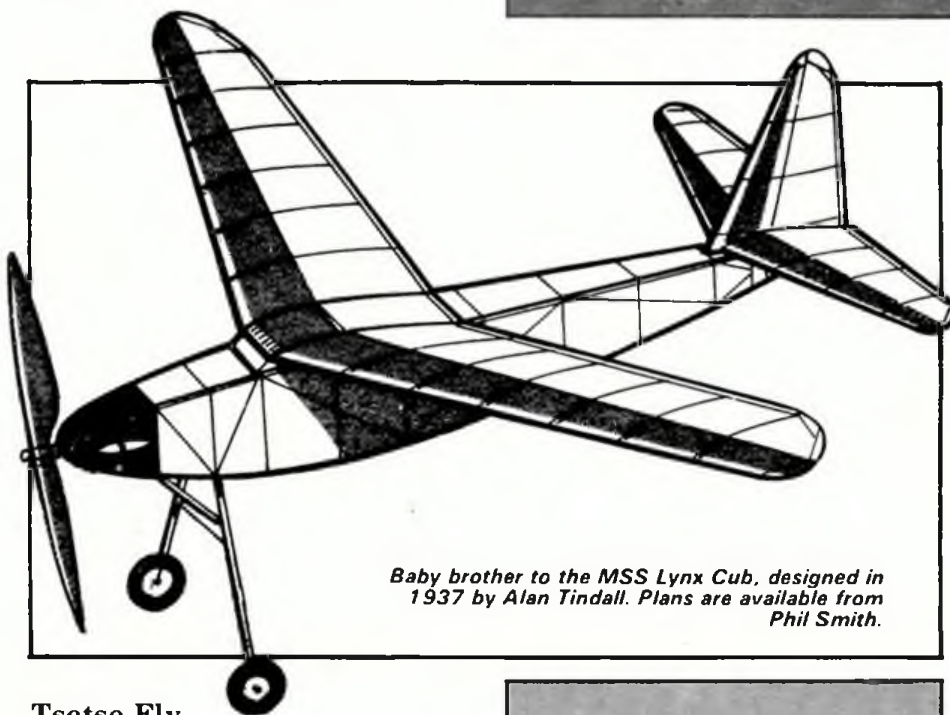
From the February 1945 pages of this magazine comes Phoebus, the 35 3/4in. design illustrated in May 1987 Vintage Corner, designed by Roy Ashby (see text).



Mike Parrott's Smiffy 2 is a Frank Smith design. This R/C conversion powered by a Saito 40 four stroke is an excellent flyer. It was shown at last year's ME Exhibition. That's not a bad flying site, either...

which took 900 turns and drove a seven inch radius one-bladed propeller fitted with a freewheel device. The model flew very well with no vices, regularly turning in flights of two minutes albeit on calm days. My younger brother was then at junior school, and he asked me if he could borrow the model to demonstrate there. This he did showing ROGs to the whole school class by class, much to the delight of all and I got the model back in one piece! I hope that Trevor Watkins gets as much enjoyment from the design as I did. Thank you for Vintage Corner, a source of delight for us old 'uns.'

Thanks for your kind words Roy; and for present-day vintage modellers who might be triggered by your letter with the desire to build Phoebus we are including a reproduction of the plan this month.



Baby brother to the MSS Lynx Cub, designed in 1937 by Alan Tindall. Plans are available from Phil Smith.

Tsetse Fly

Pioneer modeller Joe Maxwell of Stirling writes:

'Many thanks for the piece on C H Grant in the July issue of *Aeromodeller*. It was obviously the result of a lot of painstaking research, and it brought back happy memories of how we used to lap up his teachings on design and aerodynamics each month in *Model Airplane News*. One thing puzzles me, though. I have read two tributes to C H Grant - yours and *Model Aviation's* - and neither of them mentions the Tsetse Fly (or Grant Wakefield). Of course you might say that Grant did so much that it is impossible to cover it all, but to my mind, the Tsetse Fly was as important in the context of rubber models as the KG was to gas. I wonder if there is some reason for this apparent omission? Recently I gave Terry Rose copies of the



Above: The pleasing aerodynamic shape of the Tsetse Fly is apparent in this shot of Vic Westcar's model at Old Warden. The broken prop was the result of a mid-air in the Wakefield Mass Launch...

pages in the June 1938 MAN which details the Tsetse Fly. He intends to redraw the plans, and include them in his Vintage Plans List. So we may hear more of this elegant Grant design in the future'.

The only reason that I did not mention Tsetse Fly in my Grant article was, being a 'petroleer', I rather got carried away in my enthusiasm for the KG! However, to make amends I am including a photograph of Vic Westcar's fine example that he flew in the Wakefield Mass Launch at Vintage Weekend. Unfortunately Vic's model was involved in one of the mid-air collisions, breaking his propeller and rendering his model *hors de combat*.

Rubber models

Phil Smith of 32 Verwood Crescent, Southbourne, Bournemouth, Dorset, BH6 4JE has now drawn up the MSS Lynx Cub - a 'Wakefield in miniature' - a 30 1/2 in. version of the MSS Lynx. Both are designs by Alan Tindall. They are offered at £2.00 each plus 25p postage. Lots of other vintage rarities appear on his lists which are well worth having.

Terry King, 65 Main St, Witchford, Cambs has drawn up the elusive C A Rippon designed 47in. Cruiser - the strut-braced low-wing cabin monoplane from *The New Model Aeroplane Manual*. A model from this plan was brought along to the recent SAM 35 AGM at Henlow and beautiful it looks too (whose was it?). I am sure that there will be a multitude of Cruisers around at this year's Vintage Weekend. Plan cost £3.00 plus 35p postage for this fine looking model. For those of you who want something different there is the Italian 'Deli 35' designed by Livio De Micheli in 1940 which won a SAM/Toscana contest at Orentano, Italy on 12 July 1987. Plans are available from the gentleman shown here holding the model, Mr Guido Fea, via Q Sella 17, 17031 Albenga (SV), Italy. The Newsletter



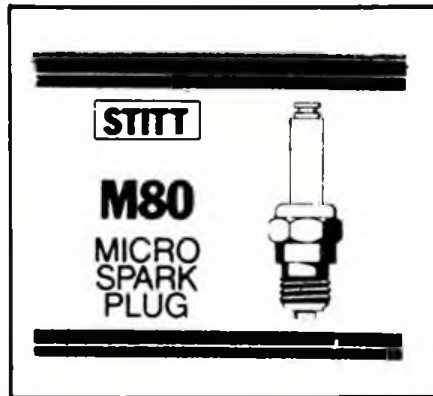
Above: Guido Fea with his Deli 35 at the SAM/Toscana contest, an event which it won last July. Observe the large vat in the background (wine or rubber lubricant?). Plans for the model are available.

Editor of SAM/Toscana, A del Chicco, did not state the price of the plan in his letter so it will mean writing to find out; an inconvenience maybe, but then good things are not always easy to come by...

One forgets that many items previously sold by model shops no longer appear to be made. I was brought up short at the SAM 35 AGM when a modeller asked me where he could get rubber lubricant! Many books state that all model shops sell this commodity so it is not worth while making your own! However, although obviously many recipes exist, the main constituents do not appear to have varied over the years. This recipe comes from a 1920 handbook... 'A good lubricant can be made from pure soft soap 4 parts, pure glycerine 2 parts, water 6 parts ... boil together to the consistency of syrup.'

Petrol

Gordon J Rae sent the photograph of the Falcon I 5cc petrol engine made from the 1066 castings set that was available just after the war. The engine was made by a Mr T Evans in 1948, and Gordon says that it is a nice running engine with a sports performance. While it is well known that production engines could vary in detail components compared to catalogue examples, this variance is naturally more marked on home-made engines from castings sets. In this Falcon the intake pipe, needle valve and spinner nut are non-standard as is the extended friction screw with knurled knob on the contact breaker. Some engines made from castings sets received so much individual treatment that examples have been seen incorporating major alterations sufficient to preclude recognition of the engine's origin! Gordon Counsell was telling me the other day that he has a Grayspec of this calibre. Ambitious model engineers often tried to improve existing designs but



Above: Gordon J. Rae's photo shows the Falcon I 5cc petrol engine resting on some of the literature that accompanied the 1066 set of castings from which the engine was made in 1948. Left: The Stitt M80 spark plug is shown here full-size. Manufactured by Stitt Spark Plug Company, PO Box 327, Conroe, Texas 77305 USA, this 1/4in. by 32 TPI plug is available in the UK. Below: Thoughts of the M.E. Exhibition - last year's SAM 35 stand. Going in '88? See you there!



despite skilful application not all of these modifications resulted in better-running engines.

A supplier of spark plugs is Roger Gulliver, Rosers Cottage, Rosers Cross, Waldron, near Heathfield, East Sussex, TN21 ORP who is presently selling the new Stitt M80 1/4 in. plug at £5.50 post free.

These plugs were manufactured at the instigation of Bert Striegler in USA who has tested and approved them, and used one in his Dunham Orwick 64 powered Sunduster when he placed 5th at the SAM Champs. I have had the opportunity to try

one of the Stitt plugs myself and found it excellent.

A thought about old plugs. Using Champion and other makes from the dim and distant past can be tricky and my experience shows that despite soaking them thoroughly in carbon tetrachloride, scrubbing furiously with an old toothbrush in clean petrol and so on I am now getting far more plug trouble with the oldies than ever I got before. There can be no doubt that these items deteriorate age; since some of my plugs are certainly over 50 years old possibly their irregularity is not to be wondered at!

Ecclesiastical excellence

VERON CARDINAL

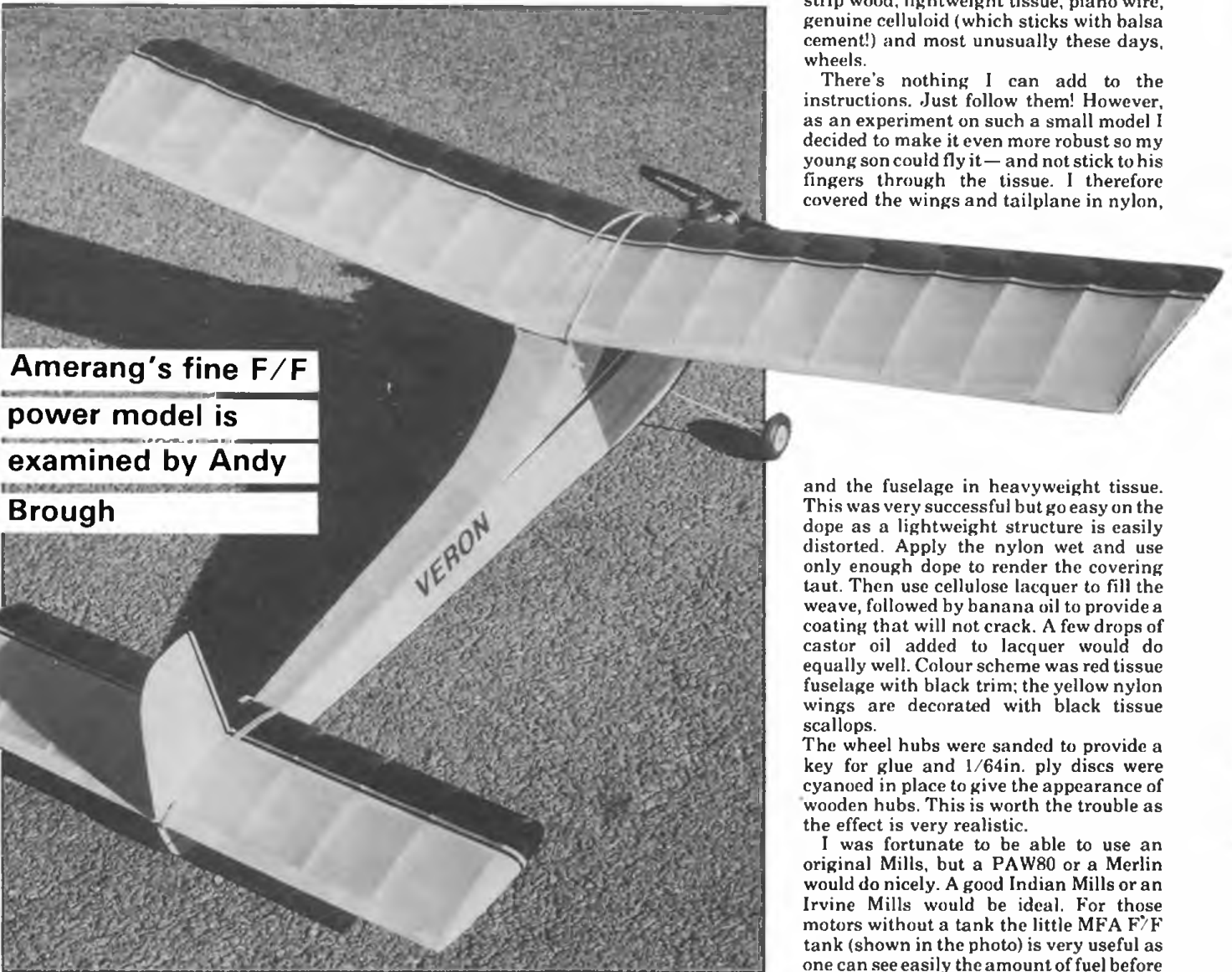
produced in 1951; the first advert I could find was in the January 1952 issue of this periodical. However, who's bothered?

Why review such an old model? Apart from its Vintage(ish) origins and probable nostalgic connections with older readers it is also a very relevant model on which to cut your teeth as a beginner to aeromodelling, F/F in particular. It's certainly a vastly cheaper route to aeromodelling satisfaction than £200 worth of trainer, radio and R/C glow motor!

Toughen up

What do we get for our £10-or-so worth of kit? To start with: a very clear and comprehensive plan and a set of instructions which are easy to follow. They must be good, because for once in my life I actually followed them! Die cut parts, strip wood, lightweight tissue, piano wire, genuine celluloid (which sticks with balsa cement!) and most unusually these days, wheels.

There's nothing I can add to the instructions. Just follow them! However, as an experiment on such a small model I decided to make it even more robust so my young son could fly it— and not stick to his fingers through the tissue. I therefore covered the wings and tailplane in nylon,



Amerang's fine F/F power model is examined by Andy Brough

and the fuselage in heavyweight tissue. This was very successful but go easy on the dope as a lightweight structure is easily distorted. Apply the nylon wet and use only enough dope to render the covering taut. Then use cellulose lacquer to fill the weave, followed by banana oil to provide a coating that will not crack. A few drops of castor oil added to lacquer would do equally well. Colour scheme was red tissue fuselage with black trim; the yellow nylon wings are decorated with black tissue scallops.

The wheel hubs were sanded to provide a key for glue and 1/64in. ply discs were cyanosed in place to give the appearance of wooden hubs. This is worth the trouble as the effect is very realistic.

I was fortunate to be able to use an original Mills, but a PAW80 or a Merlin would do nicely. A good Indian Mills or an Irvine Mills would be ideal. For those motors without a tank the little MFA F/F tank (shown in the photo) is very useful as one can see easily the amount of fuel before launching the model. All the motors mentioned are best fitted with an 8 x 4 prop; the D.C. or Topflite being my favourites.

Unusually for a F/F sports model the CG position is quite far aft, about 60% of the wing chord, but this is balanced by a large lifting section tail. Because of my choice of nylon I had to add about 1oz. of lead to the nose. The model weighed in at 11oz. instead of 8-9oz. as stated on the plan — the price paid for more robustness.

BACK IN THE late 40s and early 50s, when the diesel was king, there were many small F/F kits designed for those super little motors of the day — the Amco.87, Mills .75 and ED Bee. Who would have thought that 37 years later some of these kits would still be in production (or have been re-introduced), and that one of these motors would also be available? Currently advertised are the Veron Cardinal, Deacon, Sky Skooter and KK

Ladybird from Amerang (where's the Magna?) along with the Ben Buckle Slicker Mite, Southerner Mite and Matador. The Mills is available from India and before long Irvine will be marketing a .75 in the UK.

The subject of this review, the Veron Cardinal, is the ideal model for the newcomer to vintage F/F, as it is both cheap and a guaranteed flyer. In truth the model is not Vintage as it was first



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First sight of Phil Smith's super design - January 1952. Thousands built since...

of right side thrust shown on the plan and about 15 to 20 degrees of left rudder tab (don't panic, it's only a very small area tab). So, ensuring a slight glide to the left, now is the time to run the engine. Check that there is a sufficient amount of downthrust (1/16in. washers under the rear engine bolts should do) and get it to run reliably at medium power. With about twenty seconds of fuel to go launch about ten degrees to the right of the wind and very slightly downwards. The plane will sink a little at first and then climb to the left into wind. It will reach a safe height before its downwind circuit with the wind under its tail which will make it lose height. (Get back, aerodynamicists! GC). A couple of circuits will give enough height to reveal the true glide trim. Observe and adjust. Many happy hours can be spent trimming to get that elusive perfect flight.

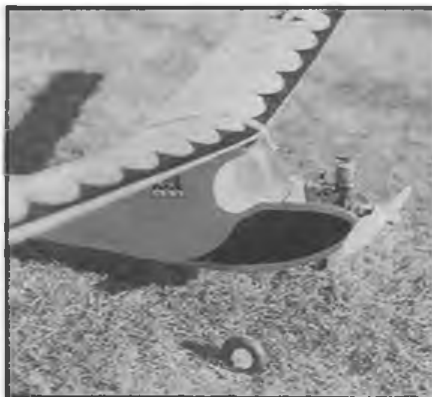
As a testament to the design, mine recently won a power/glide ratio contest with a score of 8 : 1. This was achieved because of the model's ability to keep heading into wind, thus reaching a decent height. See you on the field!

PS: Don't forget your name and address! This model will thermal...

The Veron Cardinal is produced by Amerang Ltd and is available from model shops at £10.49.

Flying hints

I departed from the instructions at the trimming stage. Assuming the CG is correct, the tailplane incidence was adjusted by packing under the trailing edge to cure a dive or stall when test gliding. I believe in a 'left power, left glide' trim in opposition to the instructions which say 'right, right'. In confined areas a left turn under power is safe because if the motor should lean out the gyroscopic forces will keep the nose of the plane up and prevent the typical nose down spiral-in of a high speed right turn. Also, a glide to the left means less flying-field area is needed as there is no transition from one direction to the other. On a calm day the model will land near the launch point! All this is achieved with the 2.1/2 to 3 degrees



The front end of Andy Brough's test model. Heading shot is of Radio Modeller editor Alec Gee's Merlin-powered version which is painted in original trim.



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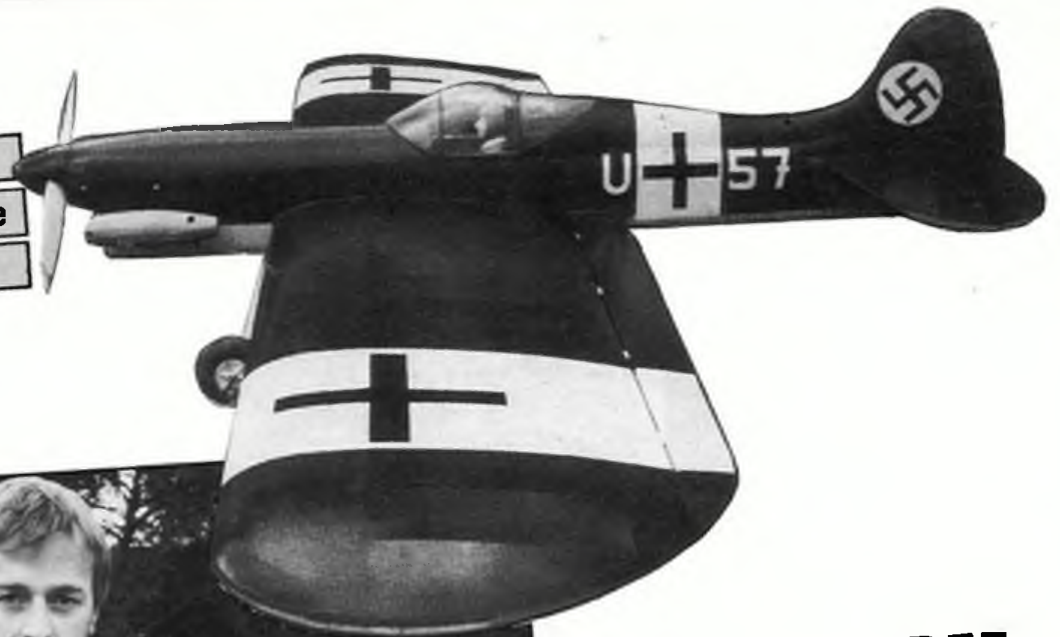
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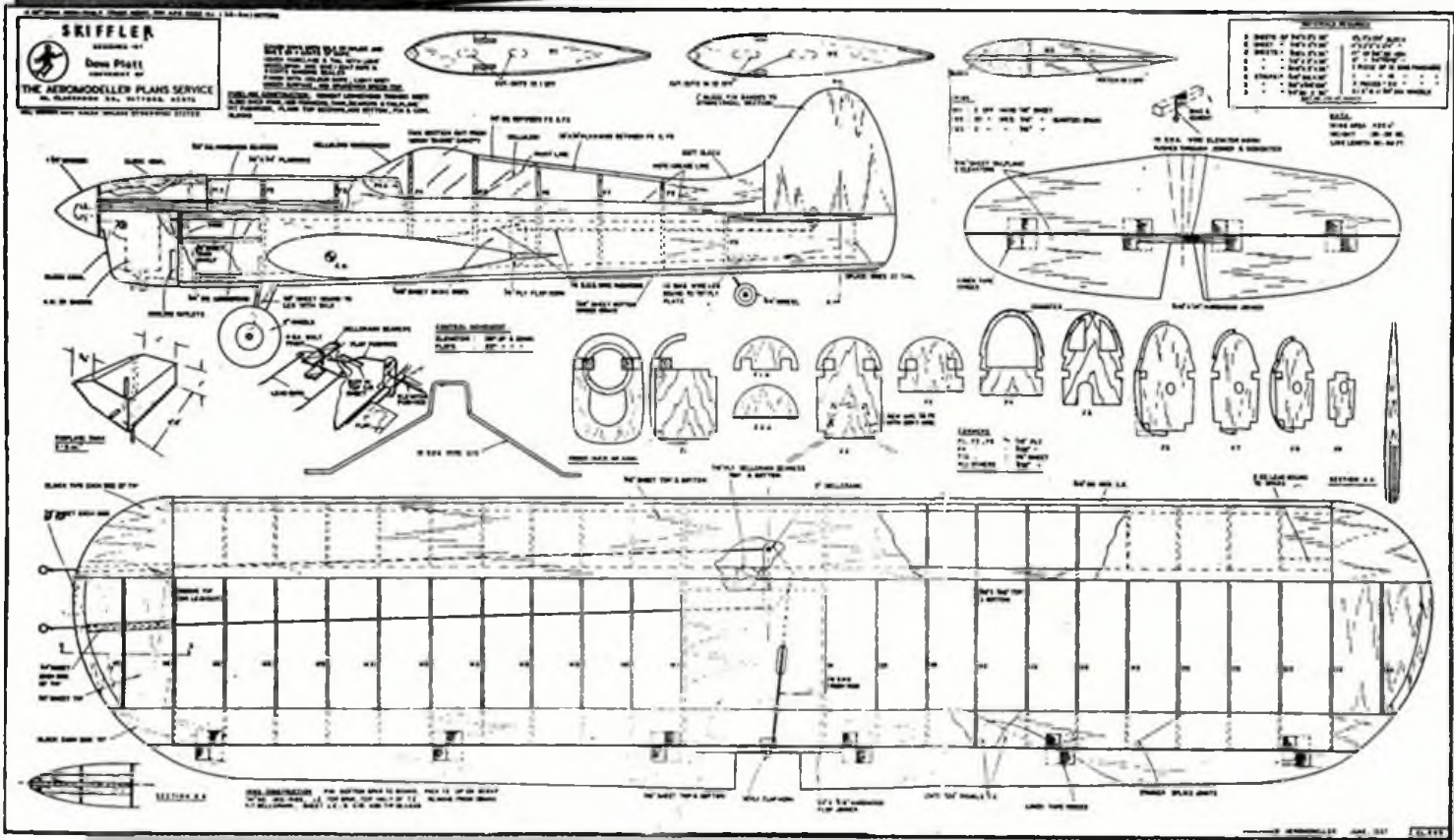
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John Munro's first updated APS favourite stunt model is an



SCOTTISH SKIFFLER

John's modifications to Dave Platt's 30-year old Heinkel-inspired design include a 48in. wing (both panels of equal span), judicious fuselage slimming, a variable line guide and weight box and adjustable rudder and trim tabs. Motivation from Aeromodeller's stunt columnists is acknowledged. Original plan, below, is available as CL 665 for £4.55 including postage. Use engines up to 5cc and circulate!



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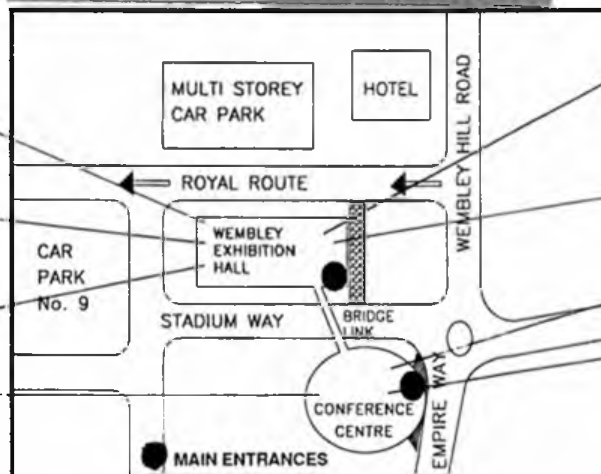
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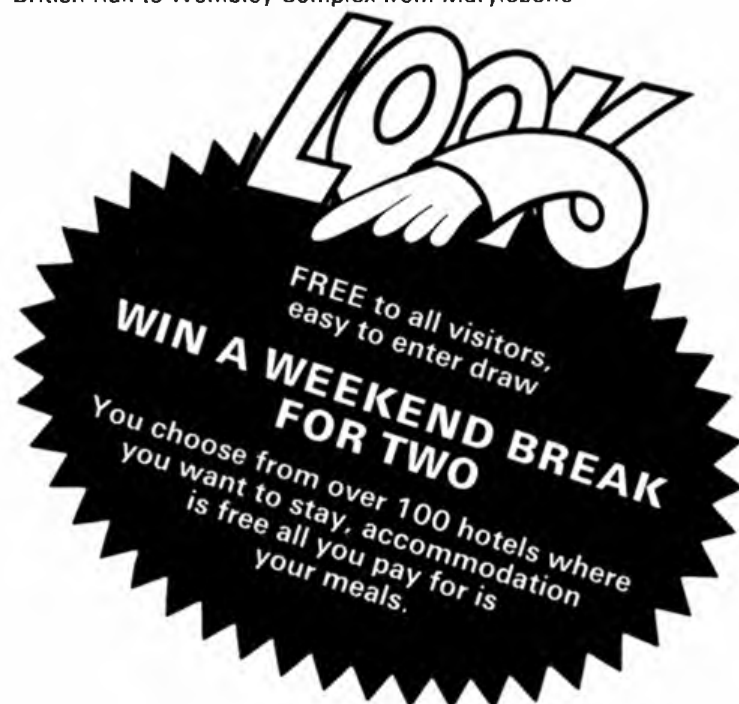
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Keilkraft gliders are designed to give top flying performance and are presented in simple to build kit forms with die cut parts.



KK001 POLARIS

KK0012 WISP



KK005 NOMAD 20½" Wingspan (52cm)



KK001 POLARIS 20" Wingspan (51cm)



KK0012 WISP 20" Wingspan (51cm)



KK003 CADET 30" Wingspan (76cm)



KK009 CONQUEST 30½" Wingspan (77cm)



KK0011 CAPRICE 51" Wingspan (130cm)

Available from all good Model, Hobby & Toy Shops

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KEILKRAFT

Appendix - Links to the plans

The original issue comes with a free plan (Stinson Trimotor) printed front/back on a pull out banner of four sheets. The banner is not included in this document.

Adonis by Aeromodeller Staff

FF Glider F1A

https://outerzone.co.uk/plan_details.asp?ID=12479 ...

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Zweiflei by Ian James

FF electric semiscale

[Document Page: 14](#)

Stinson Trimotor Model U by Barry Hetherington

FF CO2

https://outerzone.co.uk/plan_details.asp?ID=12443 ...

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Skiffler (Scottish revisited by John Munro) by Dave Platt

CL Stunt

<https://outerzone.co.uk/search/results.asp?keyword> ...

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TRY A
TRI-MOTOR

PRISTINE PIONEER

Bowden's Blue Dragon