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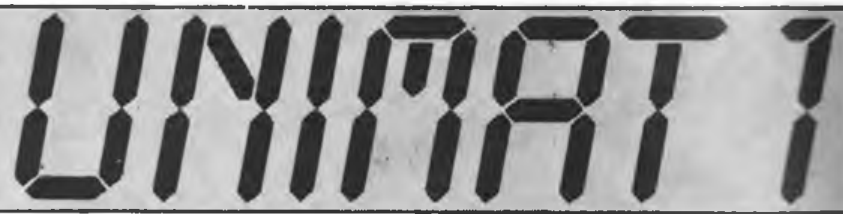
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AERO MODELLER

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HANGAR DOORS

Towards an ultimate?

Elsewhere in this issue Martyn Cowley reports on what may well be the next leap forward in competition Power model development - the advent of the moulded-composite model. Martyn describes the complexity of Thomas Koster's latest craft to incorporate these techniques which, although time-consuming to set up, result in the ability rapidly to duplicate spare or replacement components, all of equal accuracy. Surely the competition flier's dream? The process might work well at Team level. Imagine a country entering with a full complement of identical models. Such a prospect may well not be far away. At the recent CIAM Plenary meeting in Paris, the builder-of-the-model rule, which West Germany had proposed dropping, was only narrowly retained after eleven votes for the proposal, ten against and four abstentions (there being no absolute majority in favour as a result).

And what if the components are to be sold commercially? After all, today's flier can buy ready-made prop assemblies, fuselage tubes, and more besides; and he may pay for someone else to tune his engine. Where does building stop and assembly begin? Or is it coming true at last - is competition flying about to convert merely to a test of the individual, rather than of man and model together?

Right: Not so much Hangar Doors - more Office Window, actually. On its first day of passenger-carrying service, British Caledonian's Skyship passed over our offices in driving rain and low cloud. Must have been a detour - we haven't seen it since! Below: Build a Malmstrom design for August (see text).



Perhaps Trials may one day consist of selection of members according to their ability to handle a previously-nominated national design... What's your view?

Go flying at Cardington!

Seeking a change of pace - or even, in the awful weather so far this year, the chance to do some flying at all? If so, why not consider a spot of Indoor? For encouragement, here's a timely message from Bob Bailey, Chairman of the SMAE Indoor Committee, to whom we now hand the controls:

Your Technical Committee is aiming to provide a series of events to make the best use of the magnificent and huge venue at Cardington. For those who have never been there, it is literally enormous, measuring 900ft

(almost 300 metres) by 250ft (75m) and is five times higher than the average sports hall ceiling. The floor area is big enough to fit in at least ten large sports halls, and the site is the envy of Indoor fliers everywhere.

'We in the UK are very fortunate in having such a hangar but at the moment it is sadly underused, for we can quite easily accommodate at least twice as many people as actually turn up regularly.

'To correct what may be a popularly-held impression, the flying at Cardington is not solely competition oriented! We wish to encourage flying for fun; there is plenty of room and any potential clash can easily be avoided. How many of you Scale fans have found that the average sports hall just isn't big enough?

'Charges (at present around

£3.00 per flier) may be a bit higher than for meetings held elsewhere but because of all the room you may fly at any time during the day - usually at least seven hours are available - without segregation. Much better value for money! Come along and help to strengthen even further the Indoor movement in the UK...'

Meetings are listed in 'What's On'; if you wish to attend please send your name, address and car number to either of the following gentlemen at least a week before your first meeting: Bob Bailey, 162 York Road, Stevenage, Herts SG1 4HQ; or Laurie Barr, 4 Hastings Close, Bray, Berks.

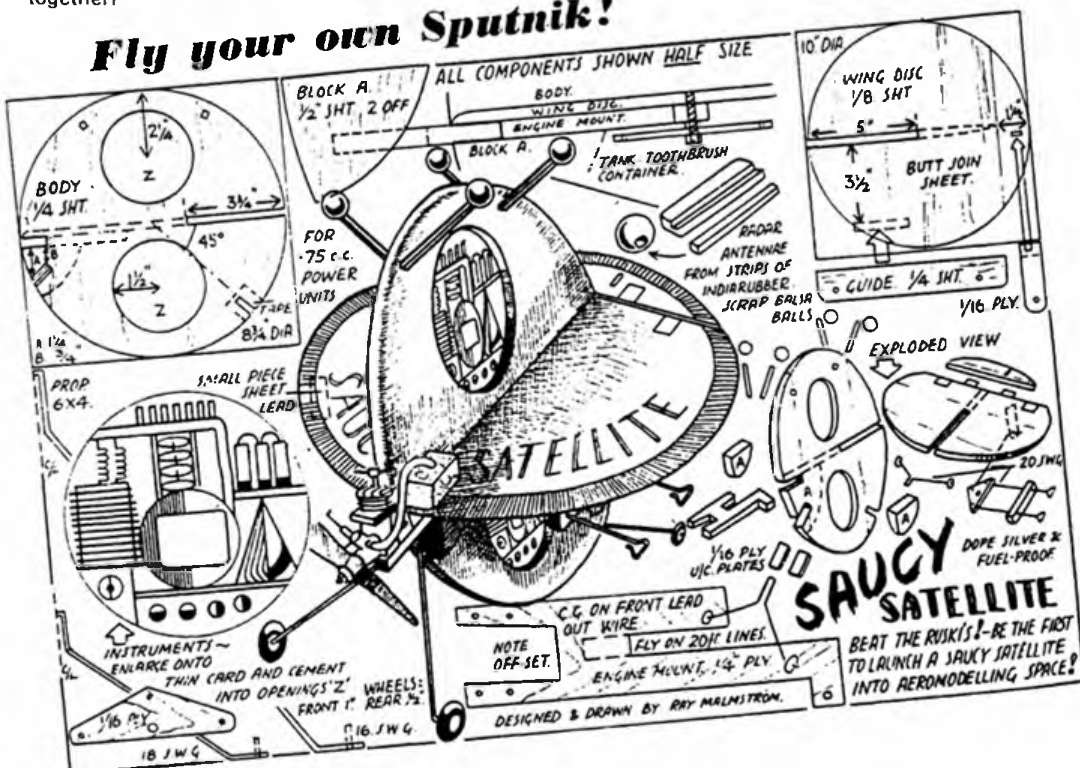
Any timekeepers out there?

Leading from the above item, we have to report that volunteers are needed at Cardington (August 22-26) for timekeeping at the Indoor World Championships. Accommodation can be arranged; remuneration not yet known, but to be confirmed ere long. If you could do this job, contact George Lynn at 2 Salisbury Avenue, Cheltenham, Glos GL51 5BS.

Malmstrom maelstrom

Let's remind you that on Sunday, 17th August, as part of the Vintage Weekend celebrations at Old Warden - you are going, aren't you? - there will be a Flier Phil Fun Fly-In (any teeth now on the deck may be retrieved at this point). Ray Malmstrom himself intends to prow! about, awarding special badges to everyone he sees with one of his designs. There is also a trophy for the enthusiast who, in Ray's view, is enjoying himself most and is giving most pleasure to those around him. Let's see a kaleidoscope of those space oddities and fun flyers! Don't know what to build? Dennis Sharman (phone

Fly your own Sputnik!



West Wrating 477) and Peter Hoskinson (Cambridge 355873), both of Ray's club, the Impington Village College MAC, have reference lists. Or maybe we can help at *Aeromodeller*. As an appetiser, we print here a reduced plan of the Saucy Satellite. Just a thought - if you attempted to stunt schedule with it, would that make it a 'Zig Zag Sputnik'? All right, we're going now...

Fancy a flight in a Tiger?

...or a Chipmunk, or a Rapide? If so, zip along to Duxford and that's just what you can do, for this is the home of the Russavia Collection, 'the only aircraft collection where you can fly in the exhibits'. Force behind the project, now in its fourth season of providing vintage passenger flights, is Mike Russell, son of D A Russell - a name familiar to many long-time *Aeromodeller* readers. The Russavia Tiger, appropriately registered G-MOTH, has been lovingly built from components of sixty-two (yes, sixty-two) other DH 82s and represents K-2567, the first Tiger to enter RAF service.

Passengers in all craft are given safety information sheets; that for the Tiger, besides containing the helpful and obvious stuff, like the instruction not to touch the safety harness in flight, features this passage from the section on Emergency Landing:

'If the aircraft comes to rest INVERTED, either wait for assistance, or support your weight on one hand above your head BEFORE RELEASING HARNESS, OTHERWISE YOU MAY FALL AND INJURE YOUR HEAD OR NECK...' In other words, in the language of Snoopy and his pals, BONK...

Seriously though, this sounds worth a try. Do send for a flight tariff to Russavia's office at Henham, Bishops Stortford, Herts. Tiger and Chipmunk seats are £25.00 a time; a flight in the Rapide will cost you £9.00. This season is well under way; flying is on Saturdays, Sundays and most Bank Holidays until November 2nd - but check first, in case the craft of your choice happens to be away on other business.

SAM 35 Wakefield event

We have just received news that the 1986 SAM 35 Wakefield Anniversary Event will take place at RAF Barkston Heath on July 6th. At the time of going to press there is no written confirmation to hand, so intending participants are advised first to check with Colin Watts on 021 373 3029.

If the competitions are run to the same format as last year, there will be two Vintage Wakefield classes, 8oz and 4oz, with (presumably) a scattering of other, sideshow events too. Those who took part in '85 will need no reminding that the odds must be in favour of good weather this time - or will Barkston once again live up to its reputation as the Blasted Heath?

Fun-flying at the August Nats

It seems a bit odd to be writing about the August Nationals before the Whitsun F/F meeting has taken place, but now's the time to remind you that what is generally known as the 'R/C, C/L and Scale Nats' takes place on August 23, 24 and 25th. Barkston Heath is the venue for all but the R/C 'silent' comps; that is, Thermal Soaring and

Electro Flight, which are to be held just up the road at Cranwell. Vintage will feature in the control line programme for the first time - and we hear that there may well be an attempt on a C/L record or two... A large number of entries throughout is expected, particularly since the Competition Licence was abolished late last year; and don't forget, there will be trade stands, demonstrations and much more besides.

Indeed, there are a couple of events particularly for the fun flier. Argus Specialist Publications (yes, us) will be supporting an Ebenezer Fly-in on the Saturday evening (all variants allowed, and even craft of similar type may take part) and a night-time F/F Scramble, open to all sports models, on Sunday evening. Meeting point will be the perimeter track in front of the Control Tower at 6.30pm on Saturday and at 8.30pm on Sunday. Anyone seen fixing glow-worms to his model for the latter event will be reported to the RSPCA.

Competitors' camping/caravanning permits cost £6.00 (non-competitors must pay £7.00); they are available from the SMAE at Kimberley House, Vaughan Way, Leicester LE1 4SE. Any queries? Contact the '86 Nationals PRO, Neil Lunam, on 051 648 2947.

Venue change

Dennis Davitt, SMAE Northern Area Committee member (and active F/F participant) has passed on the news that the Area no longer have the use of Lindholme for free-flight events. In consequence, the following meetings will now be held at Driffield, not at Lindholme as previously advertised:

14 Sept	Northern Gala
19 Oct	FAI Rally
16 Nov	Falcons Gala

Do pass the word around; if you know someone who might be thinking of attending don't assume he knows - he may not...

Oh dear

There's nothing else to be said; we owe an apology to Andy Crisp and the members of the Oxford MFC. Having published - correctly - in the May issue the date alteration to their F/F Rally (the date was moved to avoid a clash with the RAFMAA Champs) there it was, wrong again, in last month's What's On. We hope not too many of you were inconvenienced.

'What's a rivalling stooge?' we were asked, a propos of our caption to a shot of Emmanuel Fillon at the French Coupe d'Hiver contest (May *Aeromodeller*). No - it's not a secret weapon; 'winding stooge' was meant. Most notable of the one or two errors which crept into the June issue was the appearance of the words 'Data A1' (an instruction to the printer) as part of the title to the drawing of Reiner Hoffsass' Espada F1B. Very mysterious. Perhaps we can leave aside the occasional misplaced comma or two without comment.

Lastly, Geoff Kenyon has written to put us right - the CO₂ Comet pictured in the April Hangar Doors was his own work, and not that of Gordon Seymour. Our apologies to both enthusiasts.



Left: It was a wet day... the 1985 SAM 35 Wakefield Anniversary Event at Barkston Heath, that is. Ask Ron Brownson, seen here preparing his model. Right: Not Russia's Tiger Moth, but the unique Sea Tiger, seen some eight years ago. We take the opportunity to correct misleading information published elsewhere - here's proof that the craft was finished in maroon later, rather than earlier, in its career.



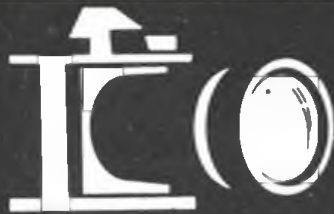


PHOTO PRIZE

Model News With Fliar Phil

Wood for the Winner

100 Sheets of balsa, nearly 200 lengths of strip wood — a great prize!

All you have to do is send Fliar Phil your photograph - good quality black and white or colour prints will do, with your name and address plus details of the model, its construction, etc., on the back. Post your entries to Aeromodeller Photo-Prize Feature, P.O. Box 35, Wolsey House, Wolsey Road, Hemel Hempstead, Herts HP2 4SS. Photos will be returned after publication.



AEROMODELLING CAN BE a technical hobby - *BUT* it's not necessarily so. On the cover of his latest (and most inspiring) book, 'Models and Musings', Fliar Phil's old buddy Bill Hannan has put: "Low in technology, but high in FUN". Without a doubt, simple models (low technology) can give just as much satisfaction and fun (maybe more) as complicated 'high tech' jobs, so if you feel you are not getting the aeromodelling fun you should - perhaps a change of 'tech' will help. Now to this month's 'high' fliers...

Photo 1: WINNER

The first Vickers Supermarine Walrus

model to grace this feature! The famous WWII 'Shagbat' did yeoman service - often giving air cover to our convoys. This superbly modelled 'Shagbat' is the work of Pete Scorey of Harpenden, Herts. Pete belongs to the SVAS Model Group, Old Warden. A fine model - fine photograph - a sure recipe for a winner. Your Walrus brings home the bacon (sorry - balsawood), Pete!

Photo 2

The Curtiss JN-4, affectionately known as the 'Jenny', was a favourite aeroplane of yesteryear. This fine 1/24th scale model comes from Al Backstrom of Texas, USA.

All-sheet balsa construction is employed, and power is a Telco CO₂. Al writes: "It has been a bit of a chore to get it flying properly. Now it is flying, it is lovely in the air". It must be, Al. Congratulations!

Photo 3

All the way from Orebro, Sweden comes this Peanut clipped-wing Piper J3 Cub built from a Peck Polymer kit by Lars Linden. The photo was sent to F.P. by Sven-Olov Linden, who rightly says "The model is good to look at AND a good flyer". F.P.'s comment: "With its propeller spinning realistically the Cub appears just about to start its take-off run. Sven-Olav!"

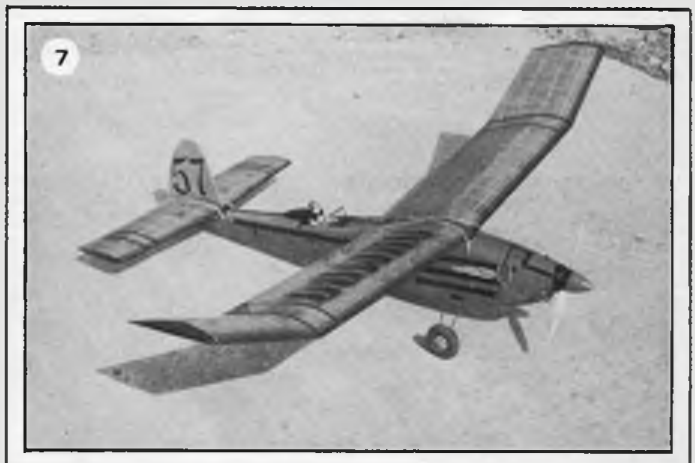


Photo 4

Photos of full size aircraft are obviously not eligible for this feature, but this flying shot of a D.H. Mosquito model could easily deceive the most eagle-eyed aircraft enthusiast. It comes from Stephen Smith of St Helens, Merseyside. Stephen says "It took 9 months to build. Span is 66 ins. and power is by two. Four-channel R/C is fitted." Sad footnote! A 'high-tech' fault (servo failure) wrote-off this fine model. F.P.'s commiserations, Stephen!"

Photo 5

Another fine example of the aeromodellers art. An 'own design' ducted

fan F/F semi-scale MIG-15 from the stable of that master of the ducted fan model, Mr. M Eyre of Epsom, Surrey. He gives the following details: Original power was a Frog 80, now replaced with a Cox T.D.049. The fuselage is all-ply and the wings are knock-off. Span is 20 ins and weight is nine ounces. Performance: fast and stable with reasonable glide. One of your best, Mr. Eyre.

Photo 6

And now one of those straightforward models, that always keep up - and never let you DOWN! A fine design - this 'Shrimp' was built by Norman Peacock of Gayton, Wirral, Merseyside. Powered with a Telco

Turbotank 3000 it seems eager to get aloft - and stay there! Maybe not too high in technology, but just full of flying fun.

Photo 7

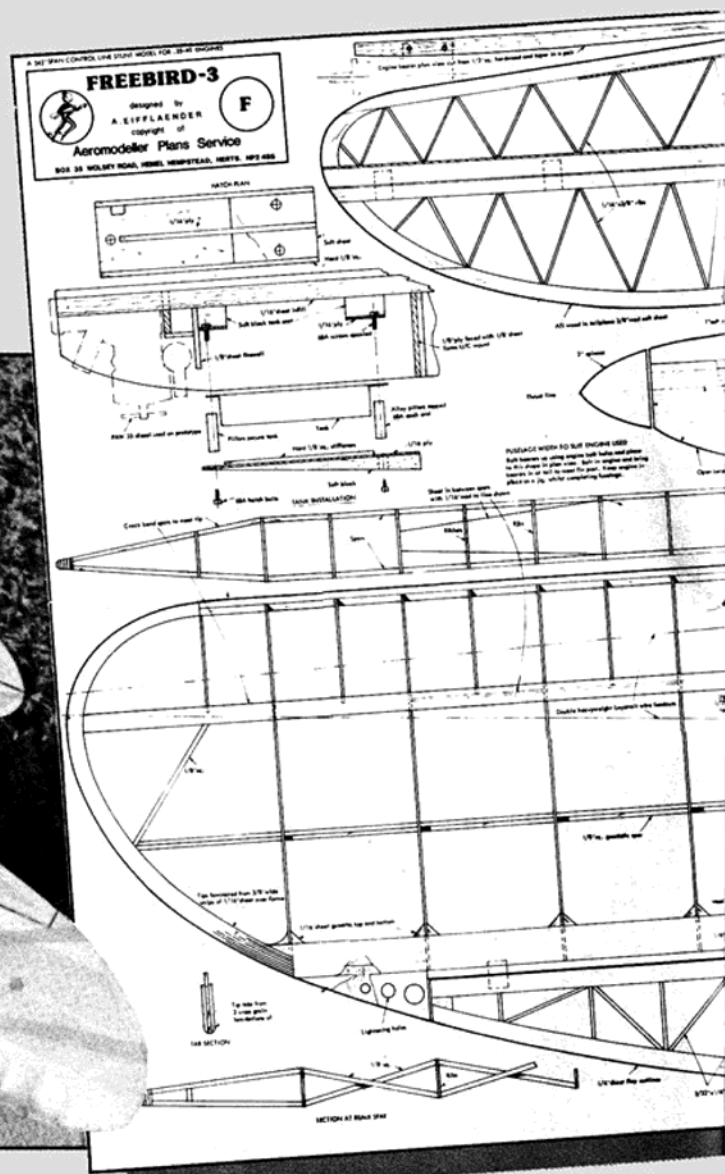
This very elegant F/F model was designed and built in 1960 by Colin Read of Coventry, West Midlands. Span is 60 in. and it's powered by a Taifun 2.5cc diesel. Colin mentioned in his notes that it was the result of many years' experience in this type of model - hence the 57 (varieties!) on the fin! Well Colin, whatever your model's ancestry was, it is every inch a flier...

Keep your photos coming!



Build the Gold Trophy Winner **FREEBIRD 3** by 1985 Nationals Stunt Champion Tony Eifflaender

Fast, smooth and sensational - that's the first diesel-powered Gold Trophy aerobatic winner since 1958. Full details here - build one and beat the designer. . .



AS MOST OF YOU KNOW I am the bod in the stunt circle with a different model, engine and smell! My current stunter, with which I won the Gold Trophy in 1985, is presented here.

Freebird 3 is a development of a 15oz. Peacemaker I built in 1975. This light Peacemaker had the CG 1in. from the leading edge, which gave rock steady level flight, and the light wing loading gave it a good smooth aerobatic performance. This simple theory has been improved upon over many models and in 1985 culminated in Freebird 3.

Keep the weight down below 50oz. and a top class model should be yours.

The general increase in model size meant that my trusty PAW 19 DS had to be replaced by a more powerful engine, so into life came the PAW 29 and 35 DS engines. Through a modern design approach those old, large diesel vices were ironed out, and the flat torque curve of these engines makes them excellent stunt motors. However, if you do not want to run a diesel in Freebird 3 any .35 to .46 cu.in. motor will be adequate.

Construction

Freebird is quite a simple model to build, but most of the hardware will have to be home-made. While not the ideal model for the novice builder, if you have built C/L models before it should provide few problems.

I usually start construction with the fuselage although this is not essential. First cut the bearers to length, shape the front as on the plan, then drill the engine mounting holes as required. Next bolt the bearers together, using the engine mounting holes, and shape as shown on the plan. This full-length type bearer may seem a little excessive, but one is rewarded with a very strong, rigid and durable fuselage.

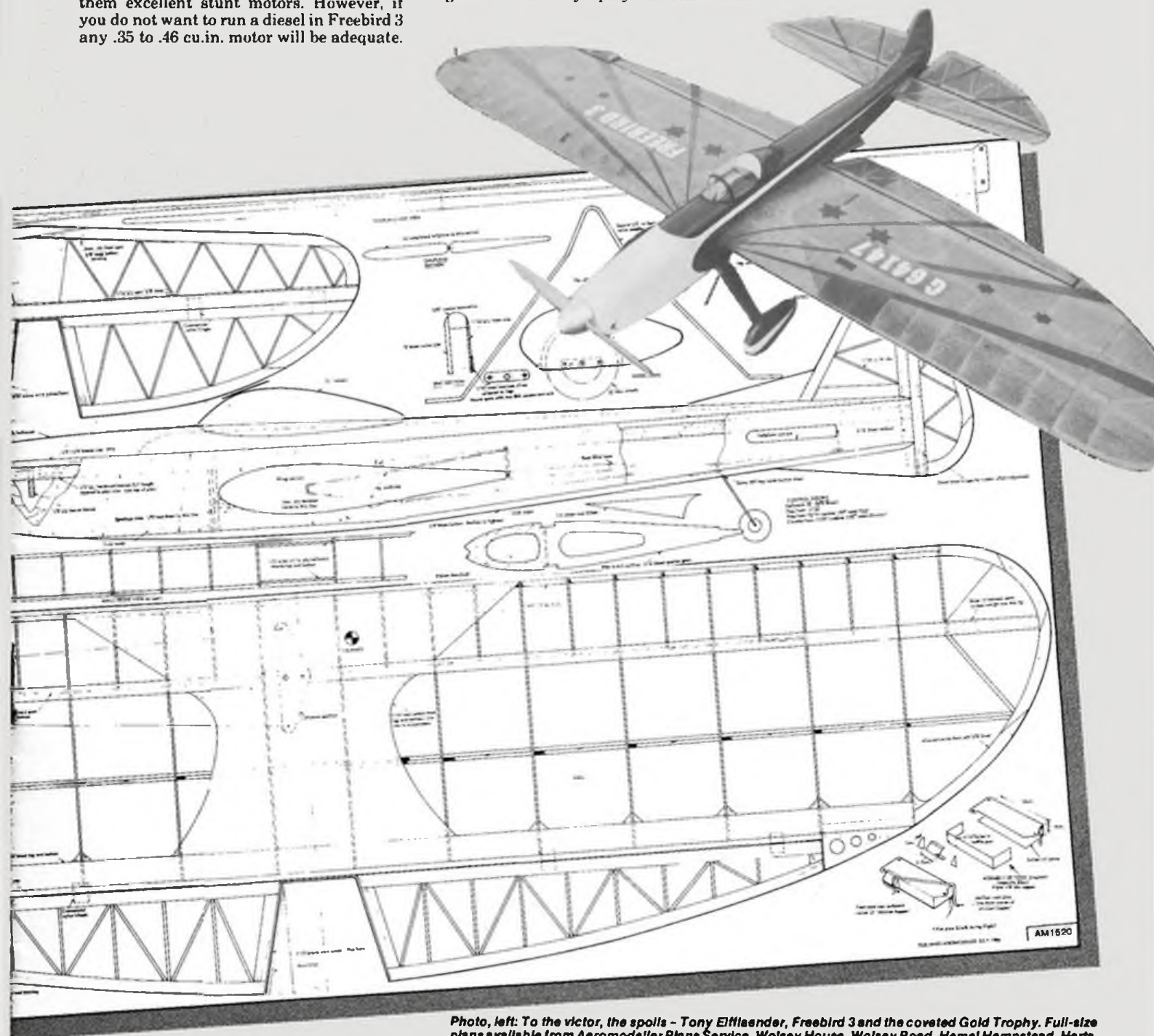
Now cut out the fuselage sides and glue the $\frac{1}{4} \times \frac{1}{8}$ in. cap strip to the fuselage side. When dry add the bearers directly underneath followed (when dry) by the ply doublers. Now bolt the fuselage sides to the engine so that they splay out rearwards.

Using a piece of scrap balsa as a tailpost pull the fuselage side together and glue, checking for symmetry.

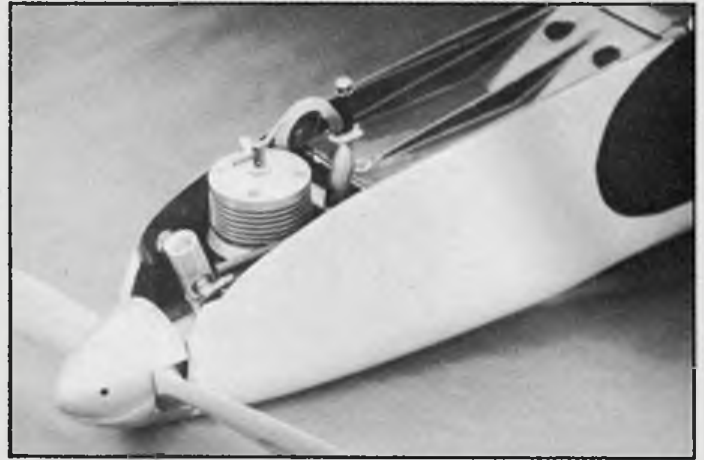
Now construct formers 1 and 2, not forgetting to measure them from the basic fuselage; add undercart to former 2 and glue in place. At this point don't be tempted to remove the engine as the pre-stressed fuselage may spring apart - wait until the wing is glued in place.

Wing

First cut out the wing and half ribs. I use the sandwich method. Hollow out if desired. Build the wing in the traditional way, flat on the board adding all leading and trailing edges and spars before lifting the basic airframe. Next I add the tips: these can be of laminated or sheet construction; both are shown on the plan. Then fit bellcrank and add sheeting to the centre sections. At this



Photo, left: To the victor, the spoils - Tony Effleander, Freebird 3 and the coveted Gold Trophy. Full-size plans available from Aeromodeller Plans Service, Wolsey House, Wolsey Road, Hemel Hempstead, Herts. HP2 4SS, price £4.00 plus 55p postage. Quote plan number AM1520 when ordering.



point I dry fit the wing to the fuselage by sliding the wing carefully through the fuselage. Now fabricate the flap horn and glue in place on the rear of the wing. Cut slots in the fuselage so the flap horn can be pushed through. Glue wing in place with 24-hour epoxy, not forgetting to check for alignment.

Tailplane and flaps

These items are of straightforward construction. The tailplane has two plywood spars to retain rigidity while allowing taper and section to be sanded onto them as shown. I join all moving surfaces with commercial plastic hinges although nylon ones will suffice. Now add elevator horn to tailplane and assemble the complete unit in the fuselage, checking for squareness with the wing.

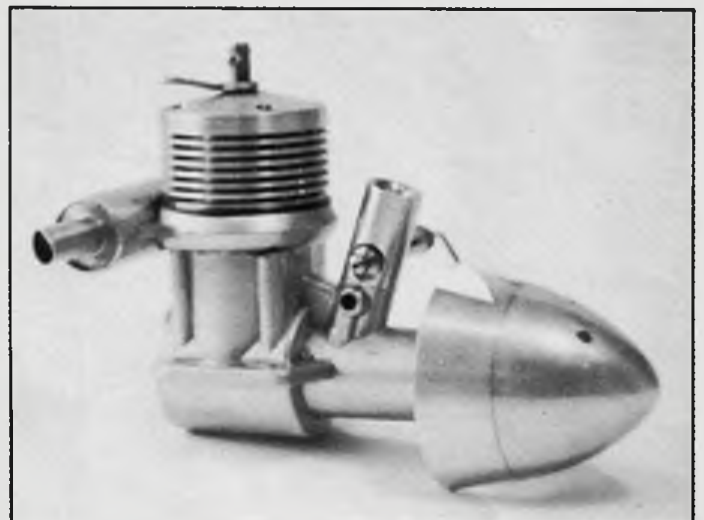
When dry add the two pushrods which are made from 14 s.w.g. wire strengthened with hard balsa to prevent buckling. Make sure that the bellcrank is at neutral when this is done so equal up and down movement is achieved. When sure all controls are complete and free to operate, grease all moving parts. Now add top and bottom deckings and sand the model to shape.

When the fuselage is complete add the tail fin and rudder, not forgetting the brass or tin hinges which allow the offset to be altered during trimming.

Finishing

Gently sand the complete airframe and apply two coats of sanding sealer to the fuselage, sanding between coats. Cover the wings in heavyweight tissue; the fuselage flaps, tailplane and fin in lightweight

Top and above right: Engine bay details to help the builder. Note deflector on tank cover. Installation is very compact. Right: Pedigree powerhouse - the PAW 35 of Eiffelaender manufacture. Truly, diesel rules. . .



tissue. Give the whole airframe enough coats of 50% dope, 50% thinners mixture to seal the tissue. Then add colour and trim to taste. I usually prefer car touch-up cans as they are easy to use and give a large colour selection.

When the colour dope is dry, give the whole model two coats of fuel proofer, preferably sprayed on.

Flying

When the engine and tank have been installed, check the CG is within 1/2 in. of that shown on the plan. If not, add ballast to correct.

Fly first on 64ft. of light Laystrate and check that the model flies bolt upright and inverted without bias. Adjust as necessary with the trim tab on the outboard wing. Next, using weight box and rudder, add tip

weight and rudder offset so there is ample line tension in high manoeuvres. When the optimum rudder offset has been established, glue in place.

Finally, adjust the CG to suit your flying style so you can execute a square corner without bounce on the recovery. A last word on propellers. Most people who use glows operate on a 11 in. x 6 in. propeller, but if you use a large diesel try propellers of 11 in. dia. and 7, 7 1/2 or even 8 in. pitch to use all the diesel's torque to advantage. The best propeller I have found to suit the PAW 29 DS is the Puncilio Airflow 11 x 6 in. The PAW 35 DS prefers the higher pitch Airflow 11 x 7 1/2 in.

If anyone requires more information come to one of the many stunt competitions and have a chat. Spectators are always welcome. You never know - you might even enter your Freebird 3. . .



An excellent meeting, bigger and better than ever – that's the verdict of our reporter, Bill Dennis



The 1986 INDOOR SCALE NATIONALS

ONCE AGAIN I AM WRITING this report on the evening of the competition in order to meet the deadline, so please excuse any mistakes or omissions. Held again at the Alumwell Sports Centre Walsall, the Indoor Nationals attracted record entries and the overall quality and quantity of models was better than ever. I was competing for the first time, and as I have had practically no experience of flying indoors I decided to get there early, with a view to doing some timing in an empty hall. No such luck! At 9.30 the place was practically full, with hardly a free yard of wall free against which to set up shop.

Open Rubber

The first event was Open Rubber, in which the outstanding performances were by Nick Peppiatt's Bristol, which has been around for many years, and Barry Pursglove's DH34. Dick Granger's Microplane Veloz, which when seen approaching is to all intents and purposes an Avro Baby, was very light and perhaps a little too slow. I must admit I did not see too much of this class since I was busy with my Avro Avian. This was a new, 'lighter' version which turned out one gram heavier than its predecessor, but more accurate. It flew quite well, but hit the ceiling causing minor damage. A longer motor would have kept it lower and extended the landing a little. Nevertheless, its clear margin in the static section made me the proud winner of the Hotham trophy; a victory over Pete Frostick's Buhl Pup.

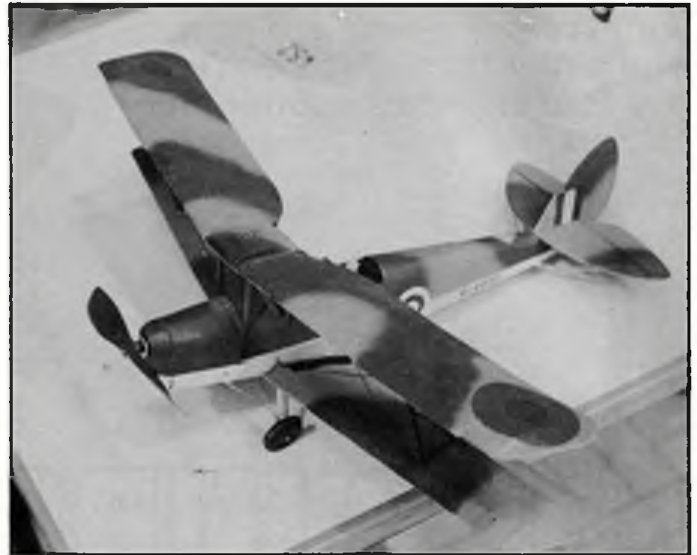
Analysis of the scores shows an increase of competitiveness near the top by com-

Heading photo: Doug Sheppard's exquisite red and green DH60 for CO₂ power is a past winner. Above and right: two most interesting models on display were the large rubber Hurricane and Lancaster by Paul Briggs

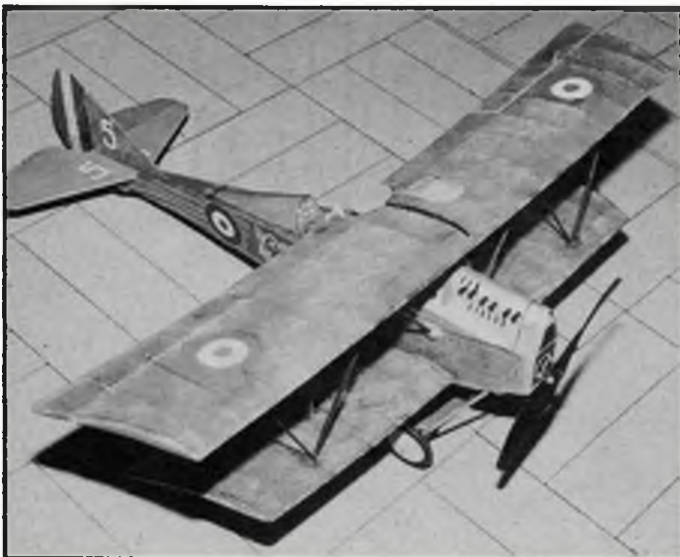




This DH Fox Moth in Guards livery of red, blue and silver is the colourful work of Geoff Spencer. Brown CO₂ power.



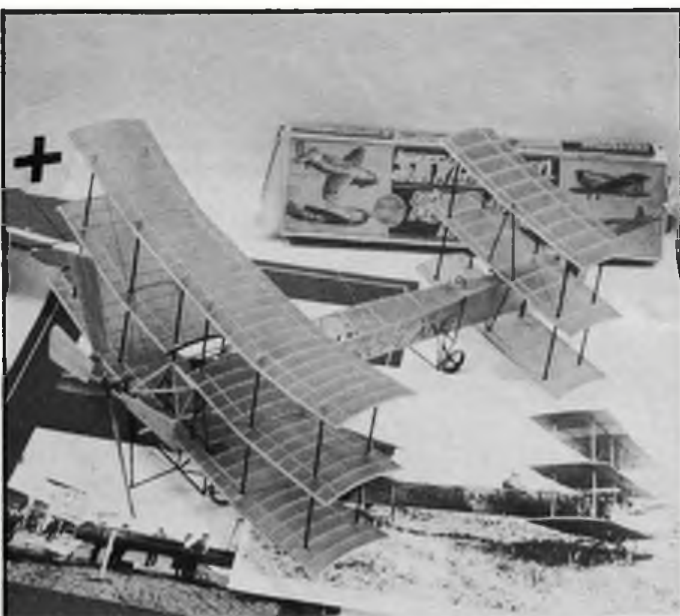
Also for CO₂, but equipped with a Telco (note filler in rear cockpit) is P. Smart's Tiger Moth which placed 7th in its class.



Mike Hall's Telco-powered Ansaldo SVA4 is a lesson in painstaking brushwork; that fuselage insignia is not for the faint-hearted!



Gordon Hannah's charming Bristol Brownie, 8th in Open Rubber. Wingtip weight is a useful trimming dodge much underrated by non-Indoor flyers.

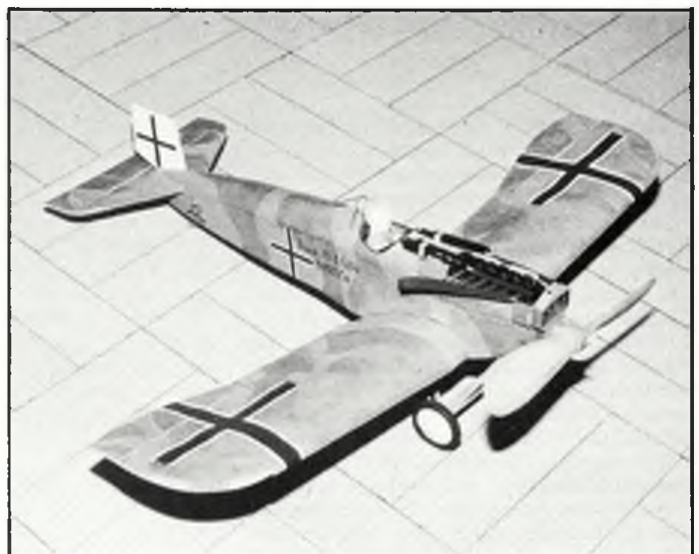


Another masterpiece by Paul Briggs - this Avro Triplane will also be familiar to visitors to the last M.E. Exhibition. Right: No-It's not a DH53! Lindsay Smith holds his Crawford Monoplane.





Largest craft present was this Sopwith 1 1/2-Strutter for CO₂ by M. Leach, which put up the best flight in its class.



Seen before in these pages but always worth another look - Mike Hetherington's Junkers D1 is of paper construction.



Looking at its lubricant is Ray Johnson's Gloucestershire Gannet, winner of the Aeroplane Monthly Trophy. Plans to be published in Aeromodeller.



The Avro 504N is a favourite of Charlie Newman. This is his Telco powered version; 6th in CO₂.



And here is a DH Humming Bird! Lindsay Smith's version is finished in 'Shuttleworth' colours. Compare with the same builder's Crawford Monoplane, opposite.



The Avro Av1s is a good subject for flying scale, but, surprisingly, is seldom seen. David Wolstenholme's is modelled in 1926 'Limpne' form.

parison with previous years, although it struck me that many models looked totally untested.

CO₂

This remains a difficult class for most competitors. Although it was warm, I was told that the humidity was a problem this year, with icing up being very common. Why should this be so? I thought this trouble was due to the excess throttle necessary in a heavy model, but here, if anything, it seemed to affect the smaller ones. Indeed, the best performance seen was from M. Leach's Sopwith 1½ Strutter - by far the largest craft present. Its slow flight was totally realistic, and could hardly be bettered. Unfortunately its finish let it down a little.

I particularly liked Barry Hetherington's floatplane Bellanca, although the take-offs were a little sharp. So too were those of Charlie Newman's Avro 504N which roared off at terrific speed before settling into a slower cruise. This pattern of two distinct phases in the flight was common, and must be due to these heavily loaded models needing high power to get away.

Another very large model was Gordon Hannah's Storch which flew endlessly on the power of a standard Telco while other competitors were running off to the lavatory with their models, presumably to warn the tanks under the hand driers! The event was won by Nick Peppiatt's Tabloid, just ahead of previous winner Geoff Spencer's Tiger Moth.

The Open Rubber and CO₂ are by no means 'closed shops'. Anyone who builds his model with more than a passing glance at his documentation, and trims it out before the event, stands an excellent chance of placing. I would have thought this would encourage even greater interest; nevertheless the number of models entered each year remains high, particularly in rubber.

Peanut

I have never understood the appeal of Peanut; a scale class that is scored on flight duration seems very odd. There is something wrong when models like Paul Briggs' Bleriot, or Mike Hetherington's Fokker DVIII do not win. This was brought home to me when my Halberstadt gained a higher static placing than either of the above models, in spite of not being in the same league in either quality or complexity. What can be done with this class? Perhaps the answer is greatly to increase the marks at the top end of each static section. Or perhaps the real answer is that few people care - entries fall each year and the same old models keep appearing...

The Aeroplane Monthly Trophy took the form of a superb framed painting of a Hawker Cygnet, which was won by Ray Johnson's Gloucestershire Gannet.

There were relatively few eligible models for this award due to the short notice given, but I am sure there will be more next year.

As usual, for every model seen in competition there were two on the sidelines, and these inevitably get missed out in a report like this. However, two did catch my eye; the first was a delightful Fox Moth by Geoff Spencer in red/blue/silver livery and fitted with a Brown Campus CO₂ motor. The other was a large Bristol Fighter, again for CO₂ and converted from the APS rubber scale plan. The model was very light and flew beautifully; the secret with CO₂ would

Right:
Congratulations!
Richard Riding,
editor of *Aeroplane Monthly*, hands over yet another prize to Nick Peppiatt (first in CO₂, 2nd in Peanut and 3rd in Open Rubber). Below: the *Aeroplane Monthly* prize, which has encouraged at least one visitor to attempt a Hawker Cygnet for next year...



seem to be to find a good motor and put it in a large model with low wing loading. It sounds obvious, but it doesn't seem to catch on! (Steve Philpott's article in this issue on improvements to the CO₂ motor might be of interest here...Ed).

Mention must be made of other happenings. Unfortunately I was unable to get to the three talks by Paul Briggs, Mike Hetherington and Ian Peacock, but by all accounts they were well attended and very well received. This was a very good idea, the only drawback being that many, like me, were involved in flying and hence pushed for time.

The static display organised by Paul Briggs was absolutely magnificent, and had taken an age to set up. I am sure that all present would join me in thanking everyone involved in the organisation, from Doug Sheppard downwards. I certainly left with the determination to return next year (with a new model) and I hope others did too.

Finally, I should mention that one Mr. Van Geffen was busy making a video of the event, with many interviews and close-ups of models, and much flying. A copy will go to



the SMAE and will presumably be available for hire by clubs. Alternatively, you can buy your own for £13.95 (inclusive of postage) from 180 Verity Crescent, Canford Heath, Poole, Dorset BH17 7TZ. Running time is approximately 1½ hours. Please state the format you require.

1986 Indoor Scale Nats - Results

Open Rubber (10 qualified)		Flight	Static	Total
1. W Dennis	Avro Avian Monoplane	918	1142	2060
2. P Frostick	Buhl Pup	1034	984	2018
3. N Peppiatt	Bristol Mailplane	1086	854	1940
4. M Hinton	Santos Dumont	1142	710	1852
5. B Pursglove	D.H.34	1064	725	1789
6. M Metcalfe	Taylorcraft	970	759	1729
7. B Hetherington	Stinson Trimotor	850	655	1505
8. G Hannah	Bristol Brownie	734	704	1438
9. R.B. Granger	Microplane Veloz	986	449	1435
10. K. Bates	Piper Cub	456	737	1193

CO₂ (9 qualified)

1. N. Peppiatt	Sopwith Tabloid	1036	1073	2109
2. G. Spencer	Tiger Moth	1039	911	1950
3. M. Leach	Sopwith 1½ Strutter	1148	682	1830
4. B. Hetherington	Bellanca Aircruiser	900	907	1807
5. G. Hannah	Storch	838	914	1752
6. C. Newman	Avro 504N	656	1051	1707
7. P. Smart	Tiger Moth	773	830	1603
8. D. Woodward	Sopwith Pup	810	764	1580
9. B. Hadland	Mr. Mulligan	432	1112	1544

Peanut (16 flew)

		Flight Position	Static Position	Total
1. M. Hinton	Santos Dumont	1	2	3
2. N. Peppiatt	Farman Moustique	3	8	11
3. R. Johnson	Gloucestershire Gannet	9	3	12
4. P. Briggs	Bleriot Parasol	6	7	13
J. Blagg	Currie Wot	12	1	13
M. Hetherington	Fokker DVIII	4	9	13
P. Lee	Lacey	2	11	13
8. W. Dennis	Halberstadt DII	13	4	17
9. D. Wolstenholme	Aircamper	4	18	22
10. R. Granger	Genagobie	8	12	20



READERS' LETTERS

Opinion, controversy, praise... what's on your mind? Don't keep it secret - let's all hear what you have to say

Finance for teams abroad

Dear Sir,

Mr Dilly has written in the February issue of *Aeromodeller* on the long-standing subject of finance for SMAE International Teams. This has been a problem since the SMAE introduced the Wakefield event, and the difficulties have been compounded in post-war years after the introduction of further competition classes which have demanded additional funds.

This situation could be resolved by imposing a levy on each SMAE member. Mr Dilly has indicated that a sum of £1.00 per member would provide the funds. However, not every member would respond to the request, and in past years SMAE officials have resorted to methods of raising money which give the subscriber some chance of a prize. Raffles have been one method, but this has not met with the success anticipated.

One of the most recent ways to raise money has been to increase the cost of competition entries. I am not sure of the facts, but certainly - to a layman - there appears to have been a sharp increase in the cost of flying at the Nationals during the early 80s. This was the subject of much comment; and the result was that many who habitually attended the Nationals to fly in a couple of events just for the pleasure of competing have been driven away. Mr Dilly is right in saying that "model flying is fun", and to those who have experienced it "contest model flying is also fun", but high fees reduce entries to a dedicated few. The loss of members has obviously been a matter of concern to SMAE officials. It is clear that some revision of policy was implemented in 1985 to reduce the cost of membership and to abolish the contest licence, with a resulting increase in numbers.

This can be compared to a commercial operation where any company intending to remain in business will carry out market research to decide on the optimum 'mark-up' of the goods to be sold. Fortunes have been made when a low selling price has resulted in a high volume of sales. Equally, companies have been wiped off the commercial map if the price is too low...

Each individual will have his own thoughts on the matter. There will be a percentage of SMAE members who will pay their subscriptions and a levy for an International Team fund come hell or high water. Then there is a larger percentage, who may be ex-free-flight enthusiasts and who still find International classes interesting, but who may not be sympathetic to the idea. By far the largest number are not in the least interested in International Teams, but are simply motivated to a spot of flying in the summer, when light winds and sun bring them out.

This situation has always prevailed. In previous years many Rallies were organised, either for fun or as a method of raising funds; the Northern Heights, All Herts, Woodford and Yorkshire Evening News events, for example. The profit or loss depended on the weather; and obviously, a

suitable venue and willing volunteers were required. On a smaller scale, my club, the Timperley MFC, held an R/C Thermal Soaring contest last winter on a very wet and muddy farmer's field to raise funds for the Thermal Soaring team. At the same time a chuck glider event was held - this attracted entries from both R/C and F/F enthusiasts. Whilst the profit was modest, the meeting created a lot of local interest and the number of entries was surprisingly high. The point about such a 'small' event is that the average modeller will attend and pay for a contest entry provided that the organisers do not overcharge. Money given in entry fees, if used to fund an International team, should be considered money well spent. The response to such a contest should be compared to a request for a levy, which may be placed in similar category to begging.

To summarise:

1. In order to raise funds, offer the contributor some potential reward, perhaps entry in a contest or a prize in a draw.
2. Do not overcharge; choose a sum which most will have as loose change in their pockets.
3. The possibility of individual clubs holding small events at small-field sites should be considered. If such 'fun' events were to be held throughout the UK there might be enough money generated to meet the perennial cash flow problems of the SMAE.

Perhaps these comments will stimulate some new thinking.

Lymm, Cheshire. **Brian Faulkner**

Youngsters and aeromodelling

Dear Sir,

I feel, as a teacher of Design and Technology, that I must reply to the letter from Len Auckland published in the May issue of *Aeromodeller*. We do cover a wider range of materials, but has not a wider range of materials appeared on the aeromodelling scene in the last decade? Is it wrong to bring technical education up to date? Mr Auckland's remarks about "little or no importance given to handicraft skills" are an insult to teachers and pupils alike. As an assistant examiner, I have seen many pieces of 'O' level and CSE practical work made to the highest possible standards, not just from a given drawing, but as a result of much original thinking and design analysis. If so much is wrong with the teaching profession, Mr Auckland, why don't you join us and help to put things right - or perhaps the pay and conditions are not to your liking?

The fact is that thirty, twenty, even ten years ago, there were less hobbies and interests available than now. With the wider choice, there is bound to be dilution of numbers of youngsters starting aeromodelling - and even then they will tend to go for radio control because real aircraft have controls and do not fly tethered by wires; nor are they allowed to fly 'free'. Radio control gives the best approximation

to a real aeroplane.

You can lead a horse to water but you cannot make it drink if it doesn't want to. Many of us - and by 'us' I mean teachers, modellers, clubs, cadet groups, the model trade and model show organisers - do bring aeromodelling to the attention of young people. I know that several youngsters who have passed through my hands have retained an interest in modelling - many others have found girls, cars, computers, motorcycles and so on far more exciting; and good luck to them if they have found an interest that suits them.

Please excuse the standard of hand-writing...

Heathfield,
East Sussex.

Bernard Seale

Fast Phred warning

Dear Sir,

In the April 1986 issue of *Aeromodeller* you feature 'Fast Phred' by Jim Woodside. Safety warnings are included; however, these do not seem to add up when the figures quoted are studied.

"Speeds in the high eighties": for safety, take the maximum speed as 100mph, or, say, 150 ft/sec.

The acceleration due to rotating in a circle is v^2/r . In this case, with the quoted line length of ten feet, the acceleration is $150^2/10$, which is 2250 ft/sec². Now this is 75 times the acceleration due to gravity (32 ft/sec²), so the suggested 20g pull test is not going to prevent models from breaking the lines and causing injury.

I think a strong warning should be published as soon as possible, especially as the model and system look so attractive.

Clarinbridge,
Co. Galway

Tony Scanlan

Help wanted

Dear Sir,

I am having trouble assembling two pieces of an ABS cowl on my quarter-scale model of the Fairchild 22. The instructions say to use Acetone, but I have found this to be useless. Could you suggest another substance?

Also, I am looking for information on the Fairchild 22 itself. I have already been in touch with aviation magazines, museums, specialist bookshops - and I have twice written to the Fairchild company in the USA, but without reply. If you could help me with any details about the aircraft I would be most grateful. All I know about it at the moment is that it is a high-wing monoplane with tandem open cockpits, and that it was produced in the Thirties.

Athenry,
Co. Galway

John Lally

(The answer to the problem of joining ABS may be found in your nearest DIY store; go for an adhesive named Osma, which is meant for work on rainwater piping. If anyone can help with Fairchild 22 gen, references will be forwarded. Ed).

F1C Power Technicalities

Camera in hand, Martyn Cowley takes the lid off the Power Scene at the 1985 World Championships

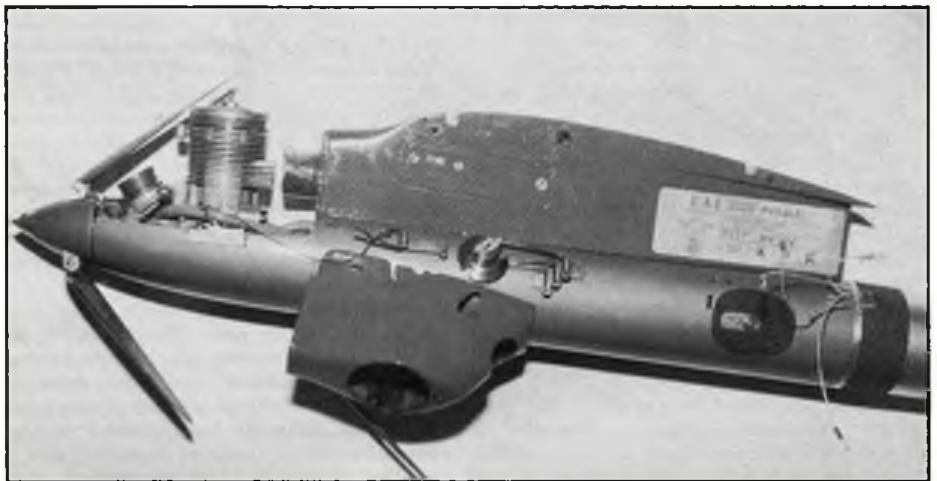
Nikolay Nakonetchny's HH-23

The winning model of new World Champion Nikolay Nakonetchny is truly representative of the latest state of the art design in F1C power models. The rigours of actually winning a Championship and the need for consistency often means this is not the case. What is, then, all the more remarkable about all the Russian power models is that they have now combined extremes of constructions and flight performance with a high degree of reliability.

Looking back only a few years to previous Championships, the models look quite old fashioned when compared with today's sleek, stretched designs.

Following the leadership of respected veteran power flyer Eugeny Verbitsky, a new generation of Russian model was born for the 80s. Wings constructed from balsa sheet skinned with hard aluminium foil produced an extremely torsionally-stiff structure which allowed the use of thin undercambered airfoils and huge high aspect ratio wings not previously associated with fast flying power models. Further aerodynamic refinements included reducing tail areas to 4.7dm² (74in.sq.) coupled with a long fuselage moment arm of 900mm (35.4in), this being made possible by improvements in stiffer tubular tailboom structures. These construction methods were detailed on p. 181-184 of the April 1982 *Aeromodeller*. This allowed wing area to be maximised without sacrificing glide stability and is combined with shallow polyhedral layout. Drag on these models is minimised by meticulous detailing to VIT and auto rudder actuating mechanisms, clean wing and tail mounts, fully cowled motors with ducted exhaust and the last detail - folding propeller blades.

Left: Tail of Nikolay's model shows the high tail mount to allow positive incidence movement for bunt transition to glide. Centre and right: Close-up detail of scissor action trailing edge platform which folds down to activate bunt.



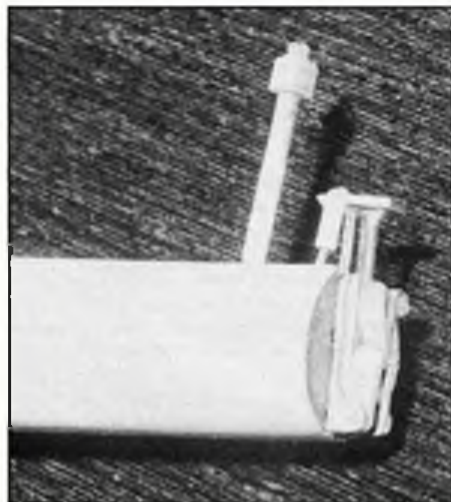
Business end of the top model: with streamlined cowl removed and put aside, the new OMN-25 used by World Champion Nikolay Nakonetchny is revealed.

Having totally redesigned almost every piece of the modern power model, the ultimate step was to rethink the flight trim itself. Transition from a very fast near-vertical climb was achieved by bunting the model using a short period of positive incidence of the tailplane before it moves to the glide trim. When done correctly the upward momentum is converted into additional altitude as the model slows down to glide speed. At their first appearance at the 1980 European Champs, Nikolay performed flawlessly with his HH-17 model to win the event in the 7 minute fly off round, with team mate Mozinski 3rd.

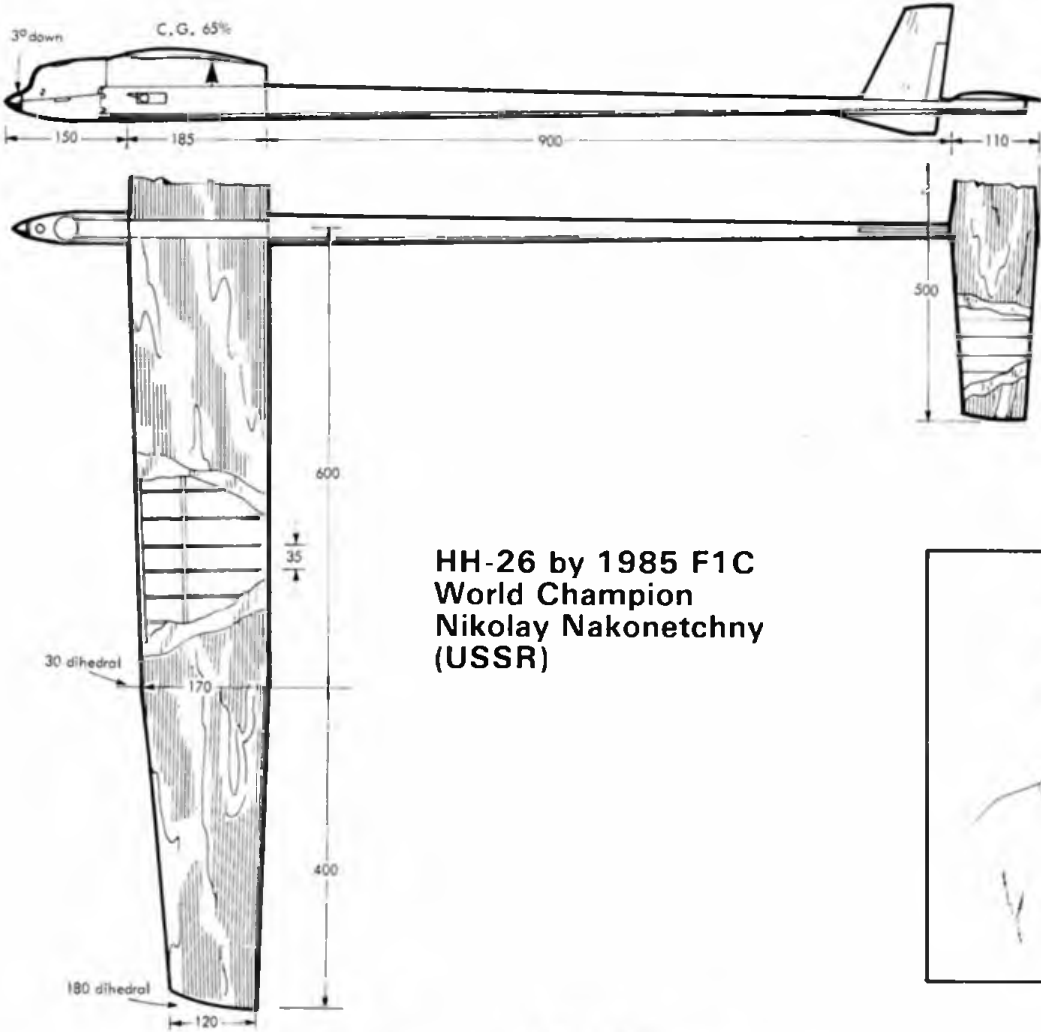
Other successes followed. Nikolay was 3rd at the '85 Euro Champs, while Eugeny Verbitsky narrowly placed 2nd at the '81 World Champs in Spain and was himself European Champion in 1984 at Livno.

The development of the Russian F1C has certainly been a team effort and now, at last, Nikolay Nakonetchny has become the first Russian F1C World Champion. The wings on his HH-23 weigh only 180 gms (6.35oz); surprisingly light for surfaces of 2m span (78.8in) with a 6.5% thick airfoil. The transition uses a 1/2-second delay after the motor cuts before the tailplane moves to bunt the model. The bunt is held for one second before the tail moves to glide trim just as the autorudder is actuated.

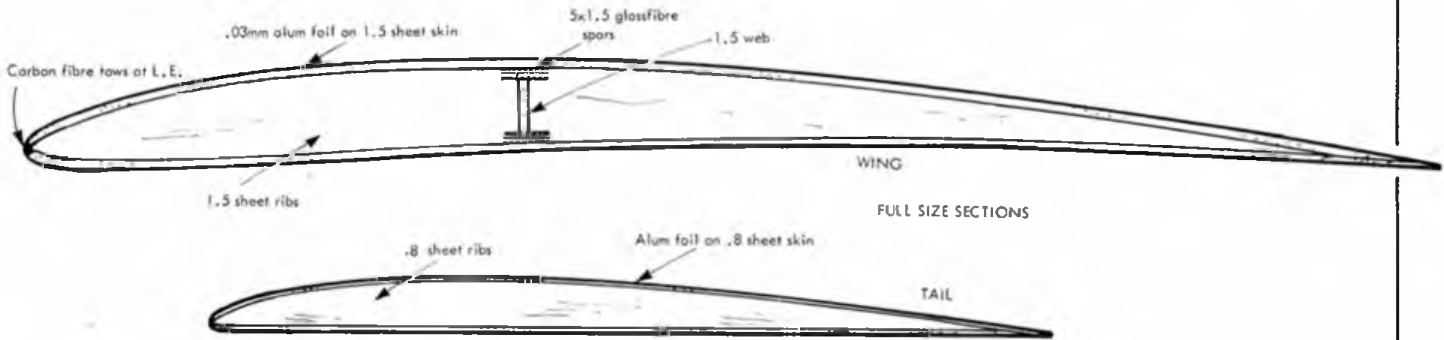
Nakonetchny's model was powered with the new Russian motor, the OMN 25, which has been developed by Onufrienko of F2C fame, Muhin (also on the F1C team) and Nakonetchny himself. The motor has front induction, a rear facing exhaust with a square, finned outlet and it is fitted with a friction coil spring prop brake. Muhin also



Scale 1:10



**HH-26 by 1985 F1C
World Champion
Nikolay Nakonetchny
(USSR)**



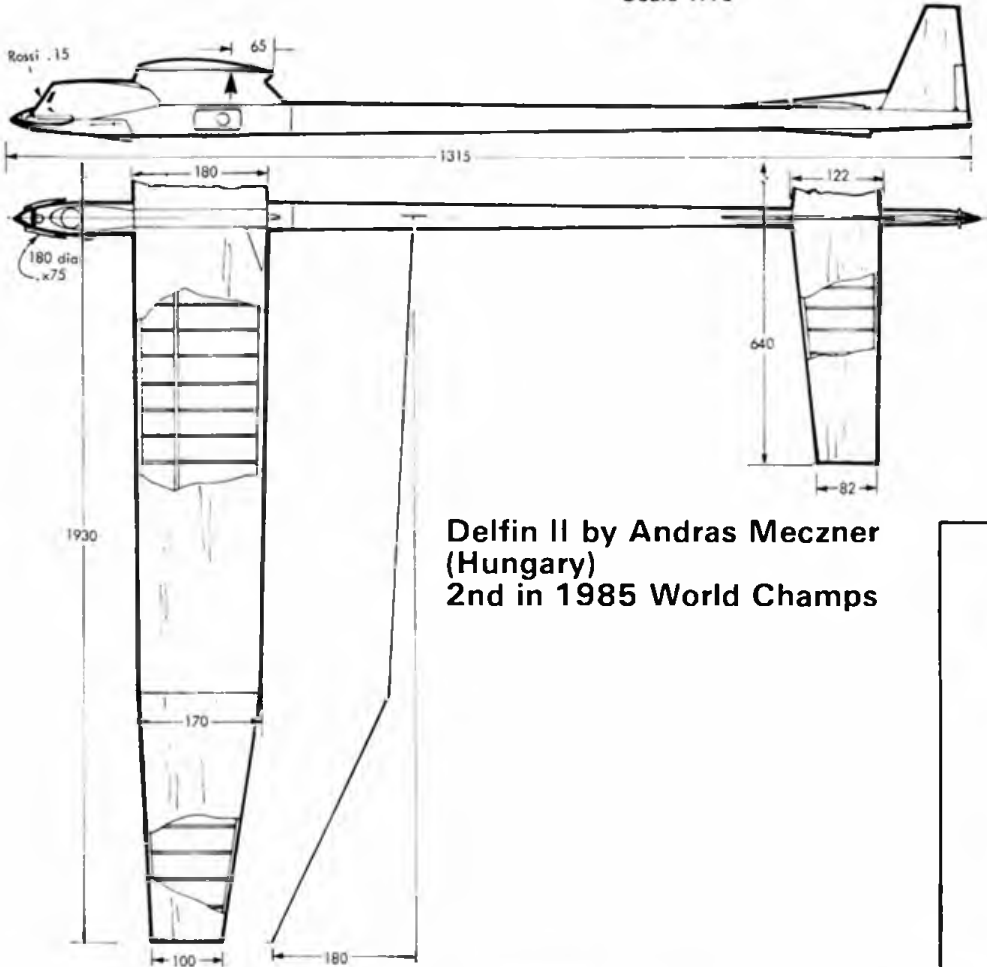
Championship motor - the custom built OMN-25 by Onufrienko, Muhin and Nakonetchny. Note coil spring prop brake behind folding carbon fibre propeller.

used OMNs although Verbitsky used a Rossi with his own machined internal parts. Why were the Russian models so superior to most others at Livno? Certainly their motors were good but I suspect the sheer rigidity of their models gave far greater benefits than most fliers realise.

Chinese F1C models

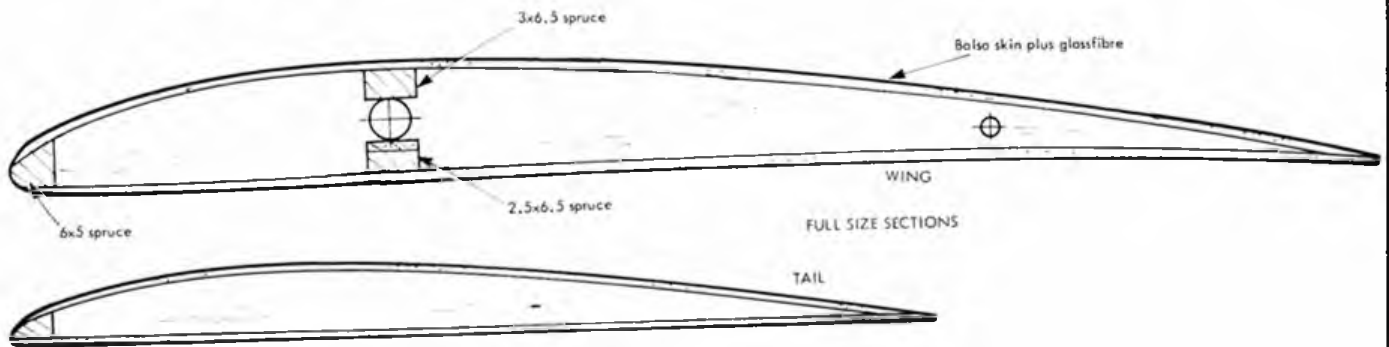
If the Russians were the team to beat, then the Chinese were the team most likely to do so. The generic Chinese F1C design, although slightly different in layout and construction, also represented a concrete effort to produce an ultimate design. They learned quickly from the Russians in '81 and produced similar two-metre-plus (80in) span models for Australia in '83. The primary developments are: built up D-box wing tips on centre panels, covered with aluminium

Scale 1:10



Engine: Rossi 15
Prop: 7x3 Meczner
Timer: Seelig 6 function
Wing Area: 31dm²
Tail Area: 6.5dm²
Weight: 790gm

**Delfin II by Andras Meczner (Hungary)
 2nd in 1985 World Champs**



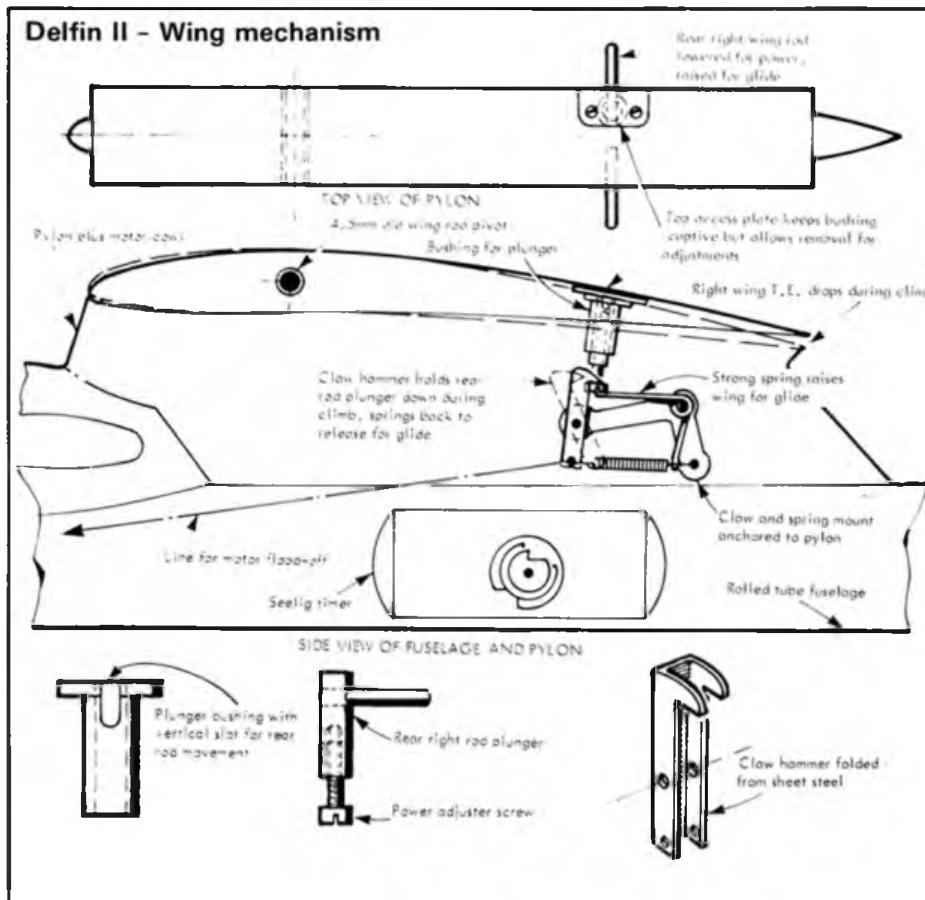
Looks pleased, doesn't he! Andras Meczner, F1C runner-up, at the prize-giving ceremony. Details of his model above and opposite page, top.

foil skinned balsa; and generally shorter moment arms of about 77mm (30in) with consequently larger tailplanes of 6.6dm² (102in²).

North Korean flappers

The flapped wing concept was promoted in the early '70s, primarily by fliers like Thomas Koster and Eugene Verbitsky. Since then, although many others have tried, the full potential of this approach has not been realised, primarily because of the consistency problems of flying a more complex model. Returning to World Championships competition after an eight year absence, the North Korean team surprised everyone by all being equipped with flappers.

To recap on the theory: a flapped wing allows less drag during the climb when the camber is reduced, resulting in higher altitude; after transition to glide, the flap is dropped, producing a higher-cambered wing



improve accuracy and ease of duplication and above all, produce lightweight consistent models.

The wings are assembled from pre-moulded upper and lower surface shells, laid up in cambered moulds from a sandwich of 1mm (1/25in) thick Rohacell Polymethacrylimide foam faced both sides with 27 gms/m² (3/4oz/yd²) glass cloth and 799 style long cure epoxy from Urs Schaller. The main spar is a pre-cast I-Beam with upper cap tapering from .9 x 10mm (.035 x .4in) to .4 x 5mm (.016 x .2in). The lower cap tapers from .6 x 8mm (.023 x .30) to .3 x 5mm (.012 x .2in) with a vertical web 4mm (.016in) at the root and .2mm (.008in) at the tip. This web has a tubular wing joiner socket moulded in at the root to accept a 5.5mm (.2in) diameter steel rod. The wing is assembled to produce a hollow ribless structure for a total weight of 95 gms (3.35oz) per half (unpainted). Due to early problems with surface porosity, Thomas now sprays the moulds with white acrylic before lay-up to produce a mirror finish pre-painted wing surface; this adds 25 gms (.9oz) to the weight. The tailplane is similarly constructed and weighs 30 gms (1.5 oz), which Thomas feels is still too much...

The tailboom is laid up from 2 plies of epoxy pre-preg carbon cloth 300gm/m² (8.8oz/yd²) with fibres 80% to 20% warp and fill to give a finished weight of 39-40 grms (1.4oz). The front end is an integral assembly including cowling, pylon, fuselage and timer mount, exhaust duct, etc, made from 500 grm/m² (14.7 oz/yd²) 50/50 pre preg. Other details, such as central ribs

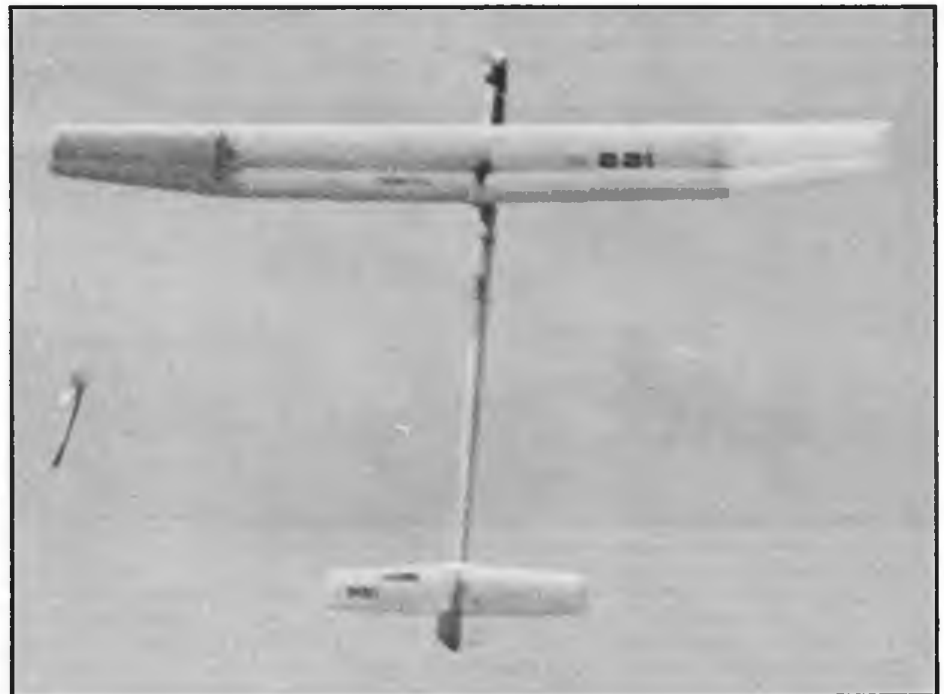
than any power model could reasonably climb with in order to give more duration on the glide. The main practical problem is that the hinge line itself is a major source of drag, and the chordwise separation also reduces structural integrity.

Unhappily, the North Koreans were poorly equipped in the engine department. Flying with old Rossi MkIIs which were clearly well worn and down on power, their climb rates were noticeably amongst the slowest at the Championships. However, despite this handicap they comfortably achieved 21 straight maxes, with King and Kim placing 3rd and 6th as a testament to the superb glide performance of their models.

Their wings were constructed in the traditional manner with balsa ribs and spruce stripwood. Leading edge was 3 x 7mm (1/8 x 1/4in); two twin spars of 2 x 4mm (3/32 x 3/16in) and two vertical webs 1.5 x 12mm (1/16 x 1/2in) closed the section each side of the hinge lines. The wings were covered with 1mm (1/25in) balsa and lightweight glass cloth, 27gm/mm² (3/4oz/yd²) and the flap was hinged at 62%. The advantage of modern construction methods to offset the structural disadvantages of flappers may yet lead to the re-acceptance of this type of model. The North Koreans certainly proved that they can be flown reliably and very competitively.

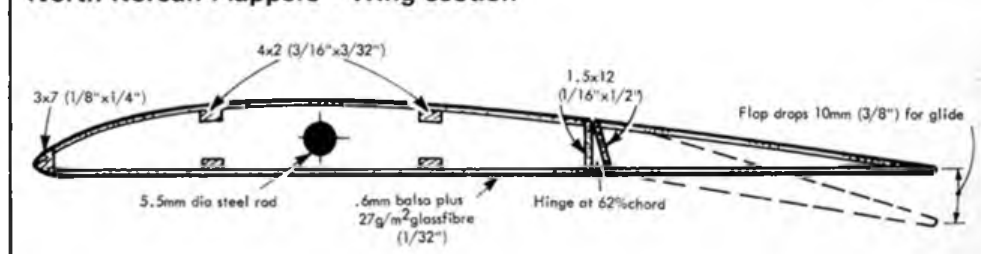
Thomas Koster's Excalibur

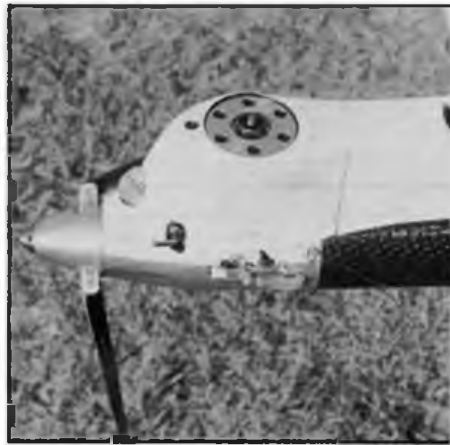
Denmark's Thomas Koster has always been an innovative leader, particularly with his F1C models. His latest Excalibur is typical of his unceasing quest for new technology and advancements in model design and construction. The airframes are completely made from moulded composite parts in an attempt to reduce building time,



Above: Up and away... Camber-changing wing flaps were used by all North Koreans. Despite poor motors, they finished 3rd and 6th thanks to superior glide. Flap details appear below (see text).

North Korean Flappers - Wing section





Left: Denmark's Thomas Koster again pushed forward the frontier of design with his all-composite moulded Excalibur which used ribless shell construction. Centre: Nose detail of Excalibur shows lightly-cowled motor with exhaust ducted to top of pylon.

Finland's Ossi Kilpelainen with elliptical dihedral wing, moulded from foam and kevlar - anything is possible with composites...

for wing, tailplane and all moving fin, and the tail mount are also moulded. In all, a total of 40 moulds are used for this incredible model. Thomas can lay up parts for a whole aircraft in just one weekend; circumstances left him with just two weeks to go before the Championships. The parts are so accurate, he can take any left wing and match it to any right wing.

Thomas Koster gives us an insight into the exciting potential of new materials and construction methods for models. Although such an effort is probably beyond the endurance of most individual modellers, there is the opportunity for groups, clubs, or even nations to combine their talents into making moulds rather than models. Everyone could benefit from the greatly reduced building time for the actual model. Certainly the Russians, Chinese and North

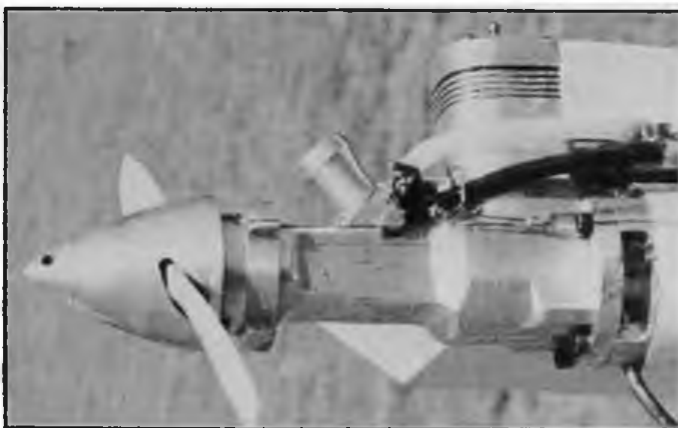
Koreans have already adopted what is essentially a one-model approach to F1C, the most complex of the FAI Free Flight events. Interestingly, the FAI have now tabled a proposal at the forthcoming CIAM Meeting to drop the 'builder of the model' rule. If passed, this would doubtless open up free flight competitions to a wider audience, as outlined above, and could lead to a healthy growth in entries. (As presented, the proposal was just defeated. Ed).

Ken Phair's Gurney flapped props

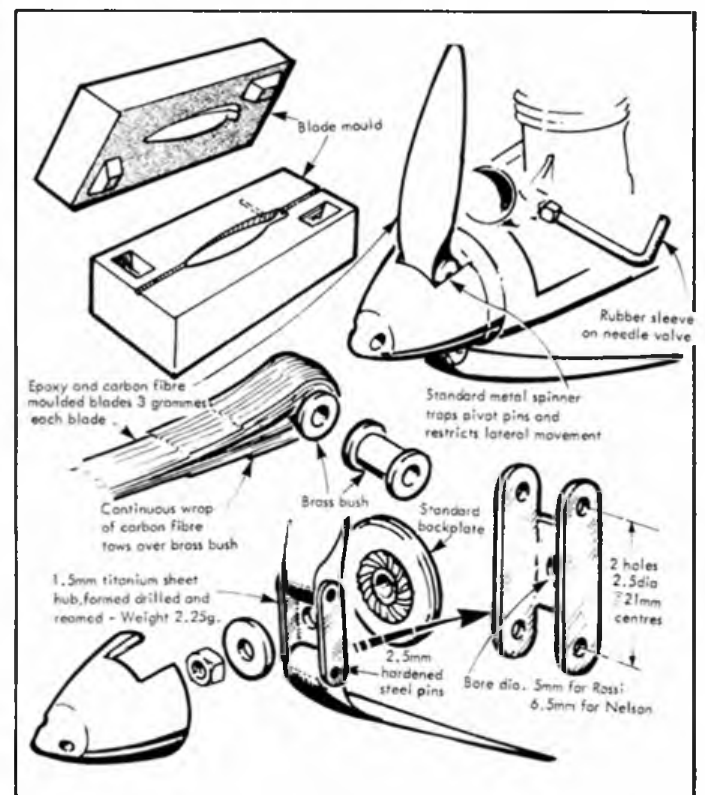
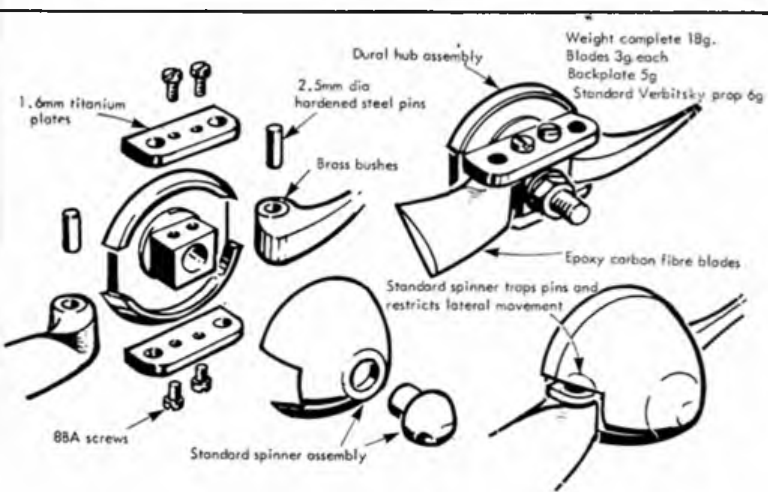
US Team member Ken Phair is well known for his advanced flapped-wing designs of the 70s which he developed in conjunction with clubmate Bill Gieskieng. At Livno, Ken's motors were fitted with single bladed props - with a big difference.

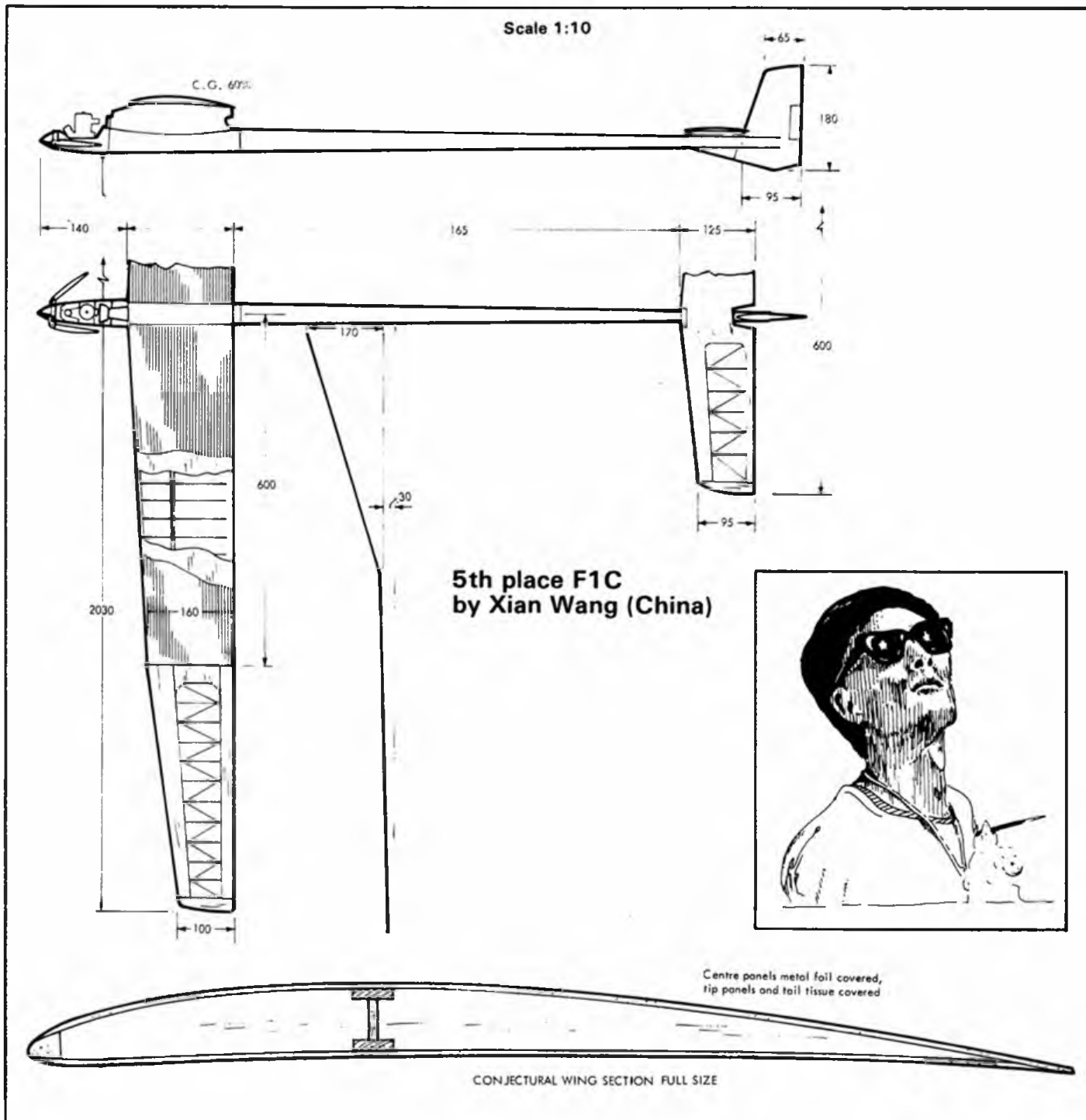
Bill has always been fascinated with the Gurney flap (the name comes from its adoption on Dan Gurney's Indy cars) which is in model form, a 90° flap under the TE. This can result in the production of higher lift from a given airfoil. Bill has experimented with these on all manner of models from indoor and outdoor HLG's to 1/2A power models; and has now progressed to F1C propellers.

The single blade propellers that Ken was



Left: Latest motor from Canada's Dave Sugden features machined bar stock crankcase for long shaft and radial mount. Below, left and right: folding props available from Paul Rowledge (see text).





using incorporated a 90° TE flap with a depth of .023in. at the root, tapering to zero at the tip. Props used were 8in. diameter (turning 27,000 rpm) or 7.8in. (turning 28,000 rpm) with a pitch distribution of 2.5in. at the root, 3.0in. at 40% radius and 2.6in. at the tip. The counterbalance is a brass weight on an eyebolt which encircles the prop shaft, moulded integrally in the all-carbon-epoxy lay up. Ken has found these propellers give more thrust than any other he has tried and although he was the only competitor with such props at Livno it will be interesting to see further developments.

Motors

The Nelson 15G is now firmly established as a top competitive F1C motor with the Chinese team who have used it exclusively since '83, reportedly having ordered 500 units for their Chinese Aeromodelling

Association! The Rossi 15 MkIII also remains a favourite, probably because of modellers' longer experience at tuning this motor. However, the latest news that I have received is that the two Rossi brothers are considering separate ventures, which would lead to a second 'New Rossi' line of engines being produced! No official news has been published yet, so we will all just have to wait and see.

Meanwhile the Cox 15, which appeared a few years back, may now have a new lease of life. The original motor was never accepted as being truly World class, although many were rebuilt with Rossi parts (most notably by the late Doc Anderson) and dubbed 'Cossis'. Now John Brodbeck of K&B motors has taken over production of the motor and by incorporating improved metallurgy and better machining of conrod and piston, plus a larger rear bearing, the

new K&B Cox 15 may hold some promise for the future. It is reasonably priced at \$82.50.

Italy's Mario Rocco still favours the AD-15 which continues to be hand built in limited quantities. Mario also markets a number of F1C props of his own manufacture. Canada's Dave Sugden has also been busy with another hand built motor of his own design. One development from the motor he showed in '83 is that he has changed from a lost wax cast crankcase to one machined from bar stock. This latest motor, which weighs 177 grams ($6\frac{1}{4}$ oz) turns 28,200 rpm on a standard 178×70 mm ($7 \times 7\frac{1}{2}$ in.) Chinese-style prop.

A nice line of folding carbon fibre props is also available from Britain's Paul Rowledge. Two types of hub are available, machined or formed from titanium to suit Rossi or Nelson engines and with a choice of 4 blade styles.

Hot Hints for CO₂

Warm up your summer flying — follow Steve Philpott's advice on CO₂ motor tuning...

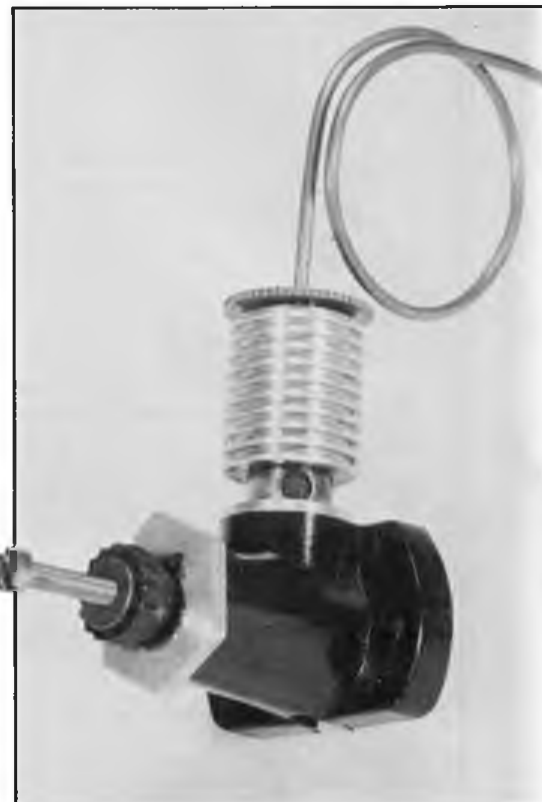
IFIRST BECAME interested in CO₂ during the winter indoor season of 1978/79 when Ron Green was selling a number of second-hand Telco motors. I treated myself to two and during the ensuing dark evenings spent many happy hours experimenting with them. Noticeably one motor was quite free and would spin readily for a couple of seconds by merely flicking the standard propeller; the other was very stiff. I must hasten to add that these motors were second-hand and of a very early type. Present day motors - as you will read later - are much better in this respect. Of the two, the freer one was definitely better but it could not match the claims on behalf of their own motors by several of the then established experts in this field. It was obvious that before I could fly competitively in duration contests I needed to improve these motors, and though model design could be considered there was

little point in producing aeroplanes until the power plants were suitably sorted. Of course, improvements to the motor partly overlapped with model development and competition experience. However, so as not to cloud the issue we will deal first purely with the motor. The story behind the model will follow.

The CO₂ motor

Whilst I realise that the method of operation of a CO₂ motor has been covered several times in this and other publications I feel it is necessary to go back to basics in order to understand the modifications and to bring to light some features of these motors about which nothing has yet been said.

The construction of the CO₂ motor is shown in Fig. 1. The body of the inlet valve is made of plastic, and has a tapered hole formed in it. Into this hole, and making a seal, fits a steel ball bearing which is dislodged by a 'pip' moulded on the plastic piston as this passes through the narrow end of the hole in the inlet valve (see fig.2). At this point CO₂ gas is fired into the cylinder from the tank and the piston is pushed downwards. The ball bearing is then forced back against the tapered hole by the pressure of the CO₂ remaining in the tank and a gas tight seal results. The piston continues its downward stroke; the CO₂ gas within the cylinder passes out through the exhaust ports and the piston rises again, during this process turning the crankshaft



Above: The Telco motor - a common sight of flying fields these days; but innovative when it first appeared. Below left: and that's all there is to it! Components shown slightly larger than full size.

to which it is connected in the conventional manner.

A number of important facts arise from this:

1. Unlike two stroke internal combustion engines the crankcase pressure is of no importance to the operation of the motor. The crankshaft can therefore be made a very free fit in its bearing.
2. To avoid wasting CO₂ the inlet valve needs to make a perfect seal so that gas cannot escape into the cylinder and pass directly through the exhaust ports when they are uncovered by the piston. Furthermore, the upward movement of the piston must not be impeded by gas leaking uncontrollably into the cylinder.
3. To make full use of the incoming gas charge the piston/cylinder seal needs not only to be perfect but there must be the minimum possible friction.

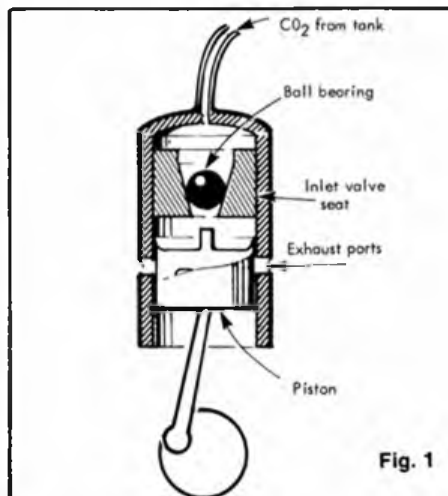
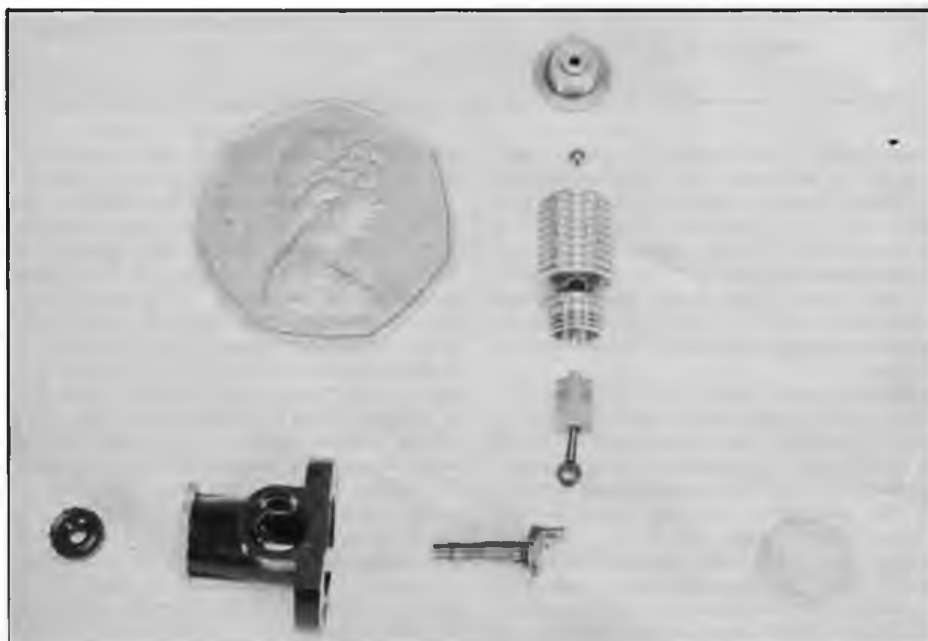


Fig. 1

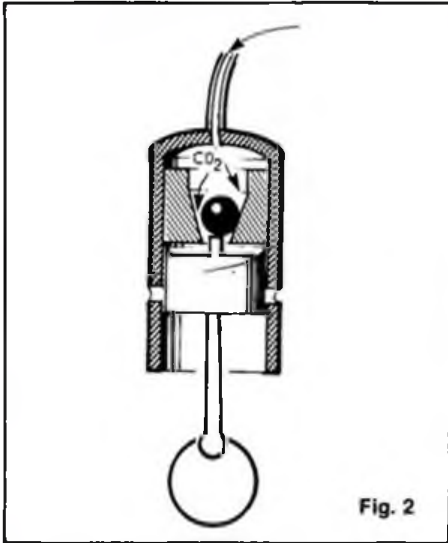


Fig. 2

Vital checks

Let us now consider modifying an actual motor. The first step is to ascertain that there are no leaks. First, visually check the pipelines, then fill the tank with a gas charge in accordance with the manufacturer's instructions and listen carefully. The slightest hissing noise indicates a leak. If the hiss disappears on slowly positioning the piston so it blocks the exhaust port, this indicates that the inlet valve is leaking, in which case replace it, or repair it, as described later. The cause of any gas escape must be found and rectified before further meaningful examination can take place.

The next stage is to run the motor on a liquid charge (or charges), having first

frozen the system by passing a liquid charge through. There are two ways to ascertain the level of performance:

1. The most convenient is to use an optical tachometer to set the steady speed of the motor to 3,000 rpm with a standard Telco propeller. On a full liquid charge a good standard motor (unmodified, without turbotank) will turn the Telco propeller at an average speed of 3,000 rpm for 1½ - 1½ minutes. The motor will start slowly, then speed up gradually after about 15 seconds to hold 3,000 rpm for about one minute before gradually slowing down and stopping when the charge is exhausted. (If a turbotank is fitted the total run is between 1¾ and two minutes).

2. Set the motor to run as slowly as possible without it stopping before the tank is empty. This should provide a total run of 5 to 6 minutes (6 to 7 minutes for a turbotank).

If the motor satisfies either of these criteria when tested under normal 'indoor' conditions there is nothing wrong with the fit of its parts and no remedial action is needed, although modifying the pipe on top of the piston and seating the inlet valve as described later are both very worthwhile modifications. But what to do if the motor is below par?

Correcting the fits

Strip down the motor, removing cylinder head, inlet valve (be careful not to lose the ball bearing), crankcase backplate, cylinder and con rod, leaving the crankshaft in place. Now vigorously flick the propeller over. It should spin very freely and continue to rotate for 2 or 3 seconds. If it does not, remove the crankshaft, clean it and the

bearing, re-assemble (using WD 40 as lubricant) and recheck. If the shaft still does not revolve freely, remove it again and apply a little fine carborundum grinding paste (sold as valve grinding paste at car accessory shops). Re-assemble and flick the propeller vigorously for half-a-minute before stripping, cleaning with cellulose thinners, lubricating, re-assembling and again checking for free rotation. Repeat as necessary, being careful to wash all the grinding paste off between tests and when finally satisfied.


Now that the shaft fit is satisfactory refit the piston and cylinder. Obviously the motor will now feel a little stiffer due to the extra friction of these parts but it should still be free and able to rotate for 1 to 1½ seconds when the propeller is given a vigorous flick. If your motor did not pass the performance test but both the crankshaft fit and piston fit appear satisfactory the piston is probably worn out and should be replaced before proceeding. If, on the other hand, the motor still feels stiff on re-assembly the next stage is to correct the piston/cylinder fit by lapping as follows:

Remove the cylinder and evenly apply a very small quantity of toothpaste (yes, toothpaste - it is a form of pumice: I find Colgate works best) to the piston, refit the cylinder and spin the propeller for a few seconds by hand. Strip off the cylinder, wipe the toothpaste from the piston and cylinder, lubricate with clock oil, reassemble and check. I would suggest that initially you do not try to get too free a fit - a slightly stiff motor will improve with running; one that is too free is useless. There are two results caused by improving the cylinder/piston fit; the most obvious being the reduction in

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friction. The other - less obvious - is the reduction in thickness of the wall of the lip making it more flexible and better able to seal against the cylinder under the pressure of the CO₂. See fig. 3.

Having reached this stage you should have the makings of a very good motor. However, if the methods of obtaining the correct fits has put you off, do not worry too much. The latest motors (at least the ones I have purchased) have all been quite useable.

There are now a couple of further modifications which can be carried out to improve performance.

Modifications

The inlet valve seal can be improved by an operation known as 'winning'. Smear the ball bearing with toothpaste, place inside the inlet valve and tap, using a suitable drift and toffee hammer, as depicted in fig. 4. The ball bearing needs to be moved (i.e. revolved slightly) after each light blow, and after about a dozen taps the ball bearing should be removed and cleaned before more toothpaste is applied and the process repeated. I find that a non-leaking inlet valve can be improved by the action of three dozen taps, whereas one that is slightly leaking can be restored after a hundred or so light blows. Before re-assembling ensure all toothpaste is removed. I generally fit a new ball bearing, lubricating sparingly with clock oil.

The final modification is the chamfering of the pip on top of the piston as shown in

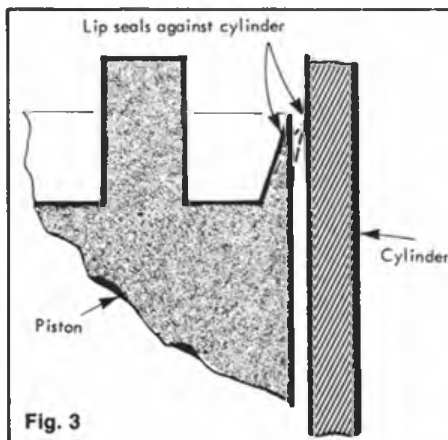


Fig. 3

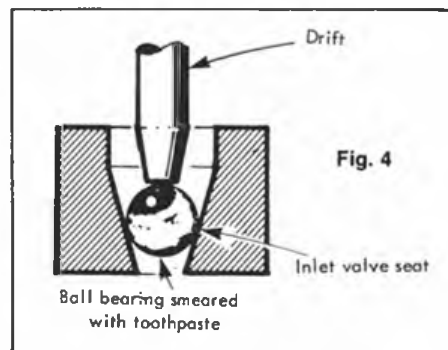


Fig. 4

fig. 5. I gently pare the pip so that the diameter at the top is approximately half that at the base. The best tool for this is a 'new' single edged razor blade. Ensure that no damage is done to the lip of the piston and remove all swarf before re-assembly. Chamfering the pip allows CO₂ gas to enter the cylinder through a larger opening, with less resistance and hence less pressure drop. Consequently the pressure within the cylinder will be higher and less gas will be needed for the same power output.

The results of this work should be a first class motor. Even if the fits were satisfactory to start with, modifications to inlet valve and piston pip will result in a smoother, quieter, and more economical motor.

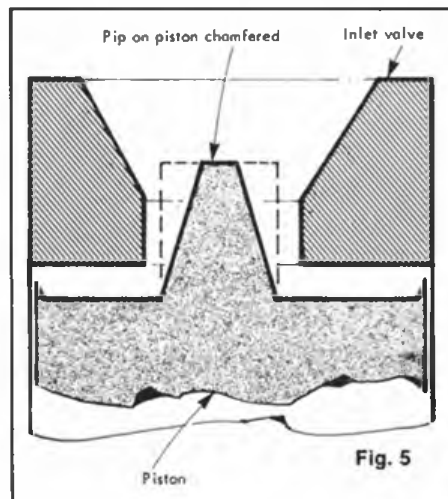
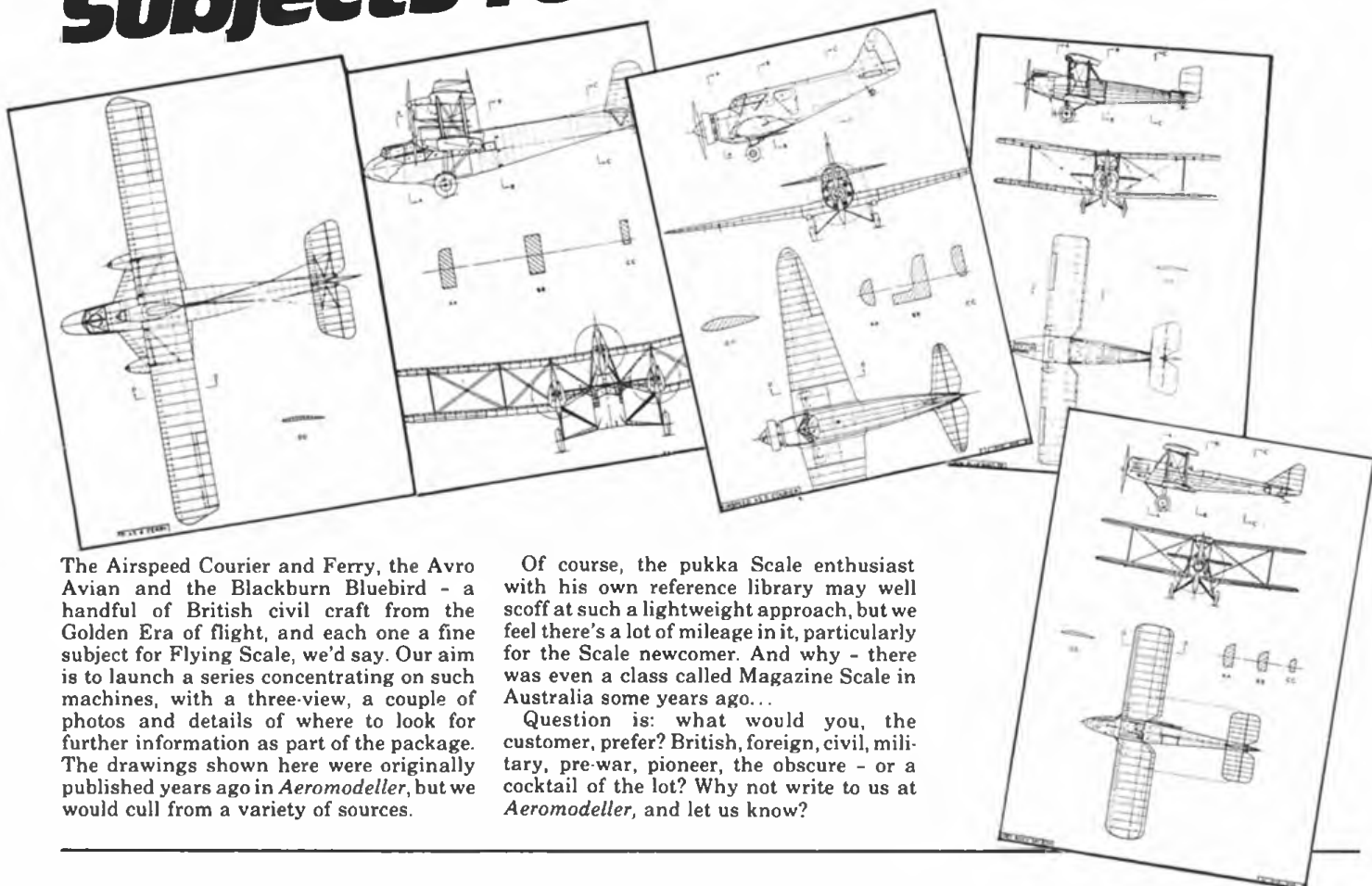


Fig. 5

Subjects for Scale?



The Airspeed Courier and Ferry, the Avro Avian and the Blackburn Bluebird - a handful of British civil craft from the Golden Era of flight, and each one a fine subject for Flying Scale, we'd say. Our aim is to launch a series concentrating on such machines, with a three-view, a couple of photos and details of where to look for further information as part of the package. The drawings shown here were originally published years ago in *Aeromodeller*, but we would cull from a variety of sources.

Of course, the pukka Scale enthusiast with his own reference library may well scoff at such a lightweight approach, but we feel there's a lot of mileage in it, particularly for the Scale newcomer. And why - there was even a class called Magazine Scale in Australia some years ago...

Question is: what would you, the customer, prefer? British, foreign, civil, military, pre-war, pioneer, the obscure - or a cocktail of the lot? Why not write to us at *Aeromodeller*, and let us know?



TELSPARK

Now build Steve Philpott's CO₂ competition winner!

Design philosophy

To explain the reasoning behind my choice of very high motor layout I need to recount experiences from many years ago with a radio controlled power-assisted sailplane. The model was a converted Keil Kraft Chief, initially powered by a Mills .75 mounted in the nose. It simply would not climb, so as I had read that a pylon mounted engine was more efficient I replaced the nose block and fitted the Mills above the wing. Performance improved and the model would climb very gently, but things improved dramatically when the pylon was reversed, thus turning it into a pusher configuration. There was nothing scientific about these tests but the results were so clear that there was no doubt in my mind about the efficiency of the arrangement.

I considered that the power output from the CO₂ motor was such that any model large enough to stay in sight and have a reasonable glide would fall into the 'powered glider' classification; hence my choice of the very high thrustline pusher layout. A quick check with my good friend John O'Donnell revealed that the relatively high CG position on his VHTL Jetex models had given no trouble.

Although this layout has been quite successful I have tried the flying surfaces on a conventional tractor fuselage with a pylon mounted wing, but whilst the calm weather performance was satisfactory (although not up to the standard of the VHTL) consistency was never good. A possible explanation is that when the conventional model 'noses up' the position of the thrust line below the wing adds to this moment, but with the thrust line above the wing the thrust moment pushes the nose down levelling off the model (see fig 1). To some extent this has been verified by building a conventional model with the

wing mounted directly on the fuselage line without a pylon and this approached the performance of the Very High Thrust Line layout.

The twin fins were an attempt to keep the prop wash off the rudder, so keeping its effect similar under power and glide and thus reducing the need for side thrust and tail tilt.

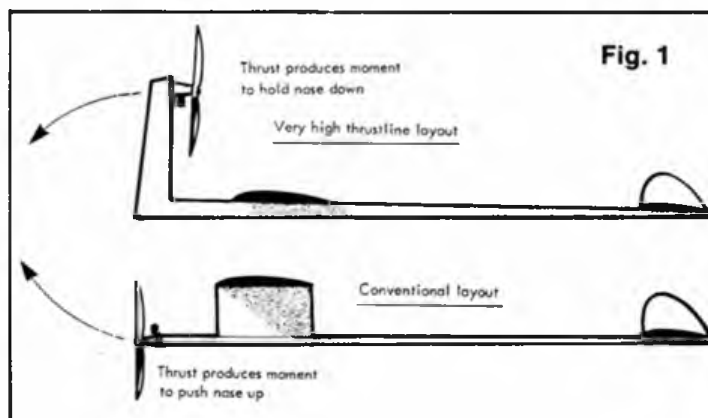
Wing

Select medium weight straight grained wood for the leading and trailing edges and spars. Preshape both the leading and trailing edge as shown and ensure that all strip used is straight. Make a ply or preferably aluminium rib template and cut out the wing ribs individually from quarter grained .8mm sheet of about 6 lb/ft³ density. The wing is built on a flat board - note that the leading and trailing edges are actually flat on the wood, not packed; and the bottom spars are put in after the structure has been removed from the board. This may seem a

little crude and whilst it is true that the aerofoil (Koster) is distorted, the only practical way of ensuring the edges follow the section is to use a cambered board. This I have done but the performance of the wing was no better. In fact, the original model was built on glass using small pieces of plasticine to hold things in place whilst the balsa cement set overnight.

The main spar is webbed one bay each side of the dihedral joints; carbon fibre dihedral braces are added to all spars and trailing edges using balsa cement, which will still set through carbon fibre and which is much lighter than epoxy. The carbon fibre dihedral brace on the centre joint of the trailing edge also acts as reinforcement to prevent the wing fixing bands digging into the wood. The leading edge joints at the dihedral breaks are reinforced with lightweight glass cloth, again applied with balsa cement. Perhaps at this stage I should mention that the size of the wing is identical to John O'Donnell's Teacher's Pet design (published in August 1978 *Aeromodeller*) but it uses a different structure and section.

Heading photo: Simple but effective lines of Telspark. Pusher-on-nose-nylon arrangement was briefly in vogue in F1C a few years ago. Nose-down moment apparently helps stability in turbulence (see diagram, right).



However, those of you who have a spare wing may wish to try it. I would be interested in the results.

Tailplane

This is built in a similar manner to the wing using slightly lighter wood. The fins are cut from quarter grain balsa and finished with banana oil or Tufkote. The rudder is fixed only to the starboard fin and the fins themselves are not attached until after covering and dopping.

Covering

The wing and tailplane of the original

were covered in jap tissue, water shrunk and given three coats of 'water consistency' dope, steaming between coats to ensure that everything remained free of twists - the exception being that the left wing tip should have 1/8 in. washout.

Fuselage

The original fuselage consisted of a rolled balsa tube with a motor pylon made from a balsa core with Rohacell side cheeks. Since some nose ballast was required these cheeks could be replaced with very light balsa. The fuselage has served very well and has lasted six years; however, a crack developed on the

pylon and this resulted in a crash in the fly-off at the 1985 Nationals. In my opinion the formers are essential. They are easily cut using tubes of different diameters sharpened to act as punches, and can be positioned in the balsa tube using a length of 1/4 in. square balsa with a pip in the end and may be glued with thin cyano fed through pin holes in the fuselage tube. The complete fuselage was covered in lightweight modelspan.

The alternative glass rod fuselage has only one contest to its credit but appears to be very satisfactory. It is interesting to note that the glass rod fuselage is lighter than the balsa one. I suspect a lighter balsa unit could be made, but whether it would last is another question.

Fig. 2 shows how the standard A/1 glass fibre rod (as purchased from Ron Pollard) should be cut to make the complete fuselage. The end of the motor pylon rod is shaped to fit the fuselage by rubbing at the correct angle on the fuselage rod, which is wrapped with sandpaper at approximately 8in. from the motor pylon ends (see photograph).

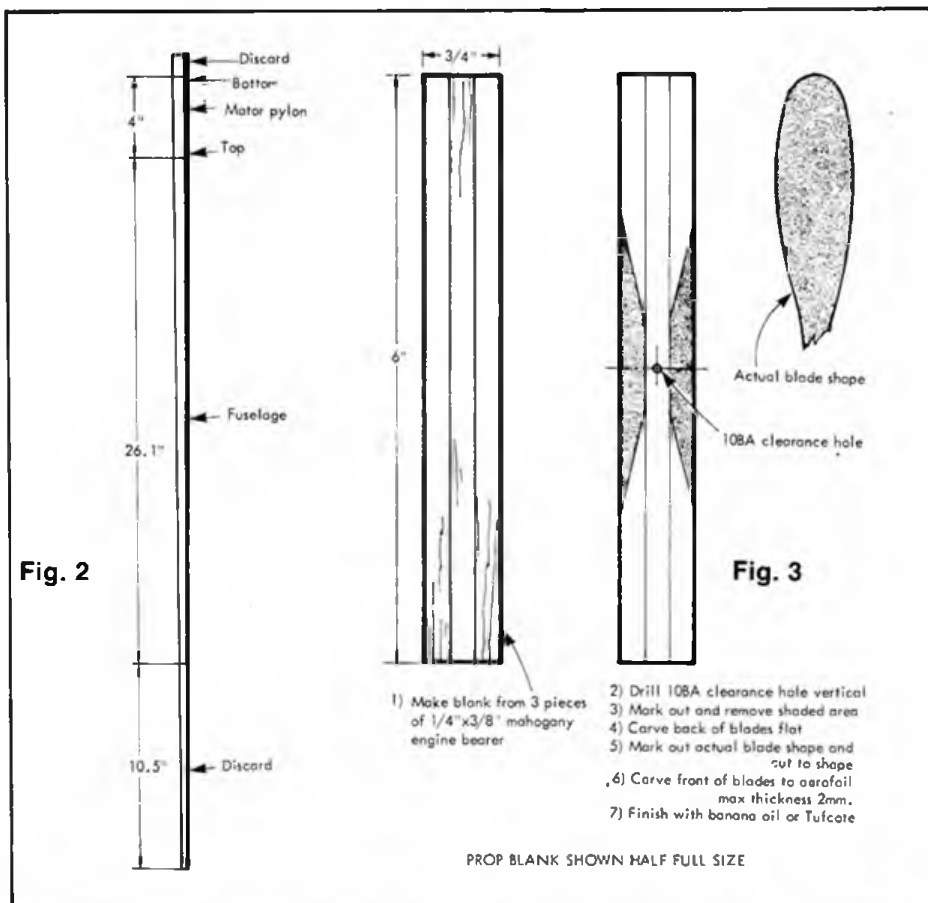
Propeller

The propeller is made from three lengths of 1/4 x 3/8 in. mahogany engine bearer. I find this makes a better propeller than the alternative of balsa with inertia weights (to give sufficient flywheel effect to keep the motor going). The block sizes are shown in Fig. 3. The underside of each blade is carved flat after drilling the centre hole. The blade shape is then cut out before the top is carved, and the whole is finally finished with banana oil or Tufkote.

Motor

In addition to the tuning I carry out, I have recently started to modify the pipework set-up by shortening the filler pipe to the extreme. The filler is now soldered onto the tank top using a brass bracket. This has the advantage that the filler is very

continued on p.434



Left: Details of how to obtain fuselage and motor pylon from an A/1 glass fibre rod. Alternative balsa fuselage also shown on plan. Below: Telspark rests between flights. Don't forget that address label!



NATSNEEZ JUNIOR



Fancy a small-field flyer? Build G.F. Elsegood's CO₂ miniature of a vintage favourite

Stocky and pugnacious, the Natsneez Junior is a docile sport flier that will take the rough and tumble of sport flying in its stride.

HAVING PURCHASED A TELCO 3000 I had to decide on a suitable model for it. The *Aeromodeller* has published many excellent design specifically for CO₂ power, but I had in mind a rugged vintage model. So out came my old *Aeromodellers* and I soon found what I was looking for in the late P.E. Norman's small petrol engined Natsneez; too big of course for a Telco, but scaled down to 20in. span (a reduction to two-thirds size) it appeared to be just right; and so it subsequently proved.

I tried to keep the construction as near as possible to the original but decided against the removable tail unit and the built-in wing slots.

Fuselage

Cut out the ply and balsa formers, bend up the 18 swg undercarriage, drill holes in former 1 and sew and glue it in place. Assemble as shown on the plan. The two 1/2 x 1/16in. strips at the sides of the fuselage are not 'original' but without them, the structure warped quite badly when covered with 1/32 sheet. The two strips should make the fuselage much more rigid and prevent this. Select two evenly matched, but not too soft, pieces of 1/32 sheet for the fuselage sides. Cut the sheet about 1/8in. oversize using a paper template to ensure reasonable accuracy. Damp the sheet, apply PVA glue liberally to the framework and place both sides in position. This is by far the trickiest part of the construction and it might be a good idea to enlist some help. I tried pinning the sheet in place; it split. Sellotape would not stick to the damp wood, so in despair I wrapped a strip of 1/4in. flat rubber round the fuselage from nose to tail using the minimum of tension to avoid damage. Fortunately this worked well; when the rubber was removed the sheet was undamaged and it had adhered firmly to the framework.

Wings

The construction is traditional and straightforward. Note that the bottom sheet does not extend back as far as the spar.

Inspiration for the project was P.E. Norman's original 31" petrol model from 1944, plans of which are still available from ASP as PET 221 (£3.25 plus 55p post and packing).

Tailplane

This is a little awkward because of the symmetrical section and taper. Make up the outline over the plan; remove when dry and fit the spar and rectangular rib strips, keeping the whole thing symmetrical. Sand the ribs to shape and finally add the 1/32 very soft sheet in four pieces.

Final assembly and finishing

Cut out the fuselage to accept the tailplane, glue on the fin and under fin and add the dowel reinforcements. Roughly carve the cowl from block or laminated 1/2in. sheet and lightly cement in place.

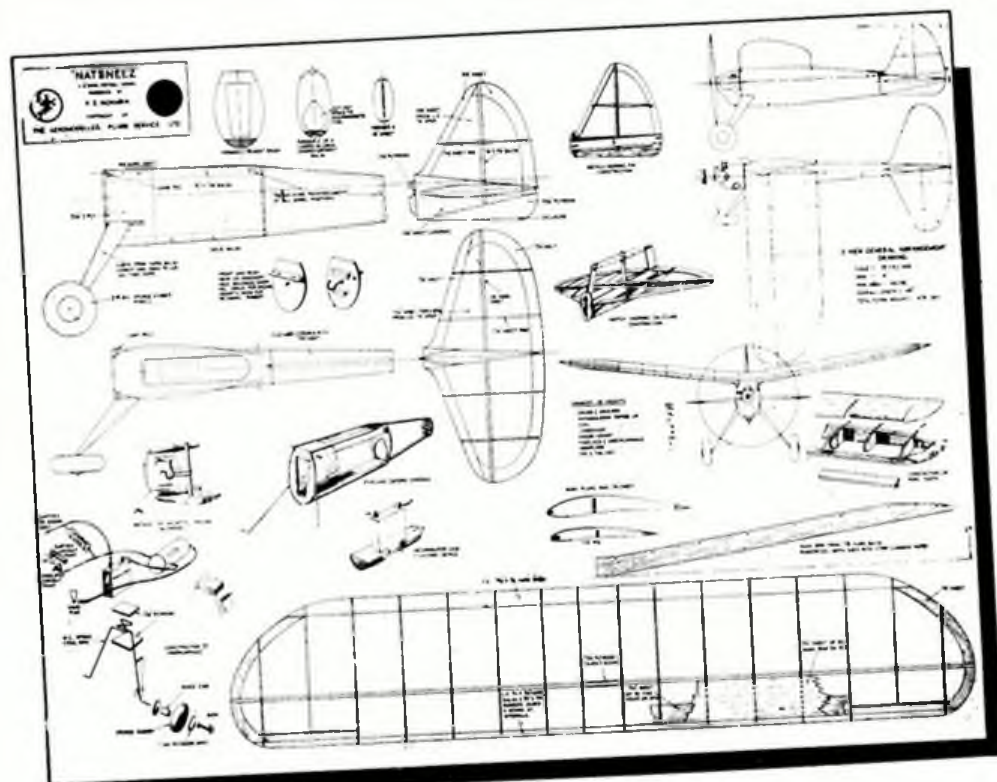
Carefully sand the fuselage and cowl to shape. When the whole model has been sanded cover with white lightweight modelspan tissue doped on. Water spray the wing, tailplane and fin and give two coats of 50/50 dope/thinners mixture. For an authentic finish, lightly spray the fuselage, fin and upper surfaces of the wings and tail silver. If suitable lightweight plastic wheels

are not available, make up the wheels as shown on the plan and paint the tyres black.

Flying

Test glide and adjust tailplane incidence or the CG position until a fast, flat glide is obtained. The original required no changes to the rigging angles shown. Now try low-powered flights. In my case, the warped fuselage mentioned earlier caused a vicious left turn, but the design is so stable that despite banking at nearly 90° the model did not spiral in. Side thrust, a little down thrust and a large trim tab on the fin cured the problem and now the model will fly equally safely in left or right hand circles.

On calm evenings it has given me much pleasure by flying serenely round in a hazard-strewn field adjoining my house. The performance is not sensational but even thirty or forty seconds can seem a long time when the drift is more than minimal and the field is small...



FREE FLIGHT SCENE

with Dave Hipperson

Head Beagle F1B by Russell Peers

Although best known for his Power successes, Russell is fast becoming very competitive with this F1B model. The prototypes were built way back in '79 and originally were fitted with VIT and AR off a KSB timer; but they came out heavy. What with timer problems and the overweight worry, all the gadgetry was scrapped and a fuse D/T added to bring them comfortably back down to weight. However, by then (around '81) clubmate Ivan Taylor was having considerable influence on everyone with his successful French style all-sheet high-aspect-ratio layouts, so Russell experimented with them too. They proved most competitive, so four or five to this spec. were built and flown, eventually with Tomy timers for D/T. Of course, once these timer units had been adopted their potential was quickly realised. Their light weight would again allow timer operated D/Ts on the early, heavy, models. It followed that Russell returned to the earlier Mk4 and 5 designs and re-equipped them with Tomy timers. A short association with prop stop operated auto rudders convinced him that they were not necessarily a good idea. Power trim tended to open up too much towards the end of the run as the air speed reduced and models exhibited a tendency to straighten up and fly out of the lift into which they had been launched. Such was the case at the '84 Nats in particular. The addition of right tail tilt coupled with little side or down thrust re-

This picture: Russell Peers flew every time in the early season Open Power events. Here he is about to clinch the Grantham Percival Trophy. Visibility problems caused him to miss out at the Pannett meeting. Below left: Disaster for Chris Strachan in Open Rubber at the Grantham Grand Prix. Sheared blades suggest an "arm in the prop job" - but what made the motor disconnect from the hook? It's all back down at the tail end!



established a good trim that maintained a constant power and glider turn. The original designs thus rigged were soon being used in preference to the French layout.

In '85 they won at Woodbury Common, the RAFMAA Thurston Trophy event, the Scottish Nationals and the London Gala on Salisbury Plain - probably the best overall F1B performance of anyone that year. However, Russell still wasn't quite happy with the early power pattern, believing he could throw the models harder (and hence gain height and reliability in wind) if he

introduced VIT. Of course, this could now be done very simply and at no weight penalty as the Tomy timers were already on board. He chanced it and actually re-set the models between the two Trials meetings at the end of last year - very risky! The hunch paid off and he came within a whisker of making the Team again - too close for comfort; 4th, just a few seconds behind me!

The model here is the latest - the Mk 12 - with a more forward CG allowing greater VIT movement of up to 1/8in. under the trailing edge of the tail. The glide and power cruise turn is trimmed in at the start with a little tab and considerable tail tilt for a positive turn throughout, and then the VIT is used for the first 4 secs to control the burst and to allow a positive hard throw with no excessive looping tendency on launch.

Grantham Grand Prix, 23/3/86

March caught up with us at this one and rather blew the event apart. It has not had a happy record with weather since its calm debut some years ago. This year really was a struggle, and very turbulent as well. Half a dozen or so tried in Open Rubber for the Open Rubber Trophy but most didn't even get away. In Power, Peers and Payne flew quite tidy patterns - goodness knows how they do it. The only other power model I saw take the air was a token flight in F1C by Ray Moore who was practicing his launch after trouble the week before. Some trial by fire!

It was gusting up to 35 mph so retrievers had plenty of opportunity to sample the downwind countryside; thankfully, this early in the season, simply miles of empty fields. Nevertheless, models were lost because of the colossal distances they were travelling. Mick Brown's total in Glider was exceptional; the runner-up lost his only maxing flight. Mike Chilton was virtually



alone in FAI, flying quite a sophisticated F1B most effectively. Both Carter and O'Donnell actually managed full scores in Rubber but not before some very long flights, particularly by O'Donnell who managed to contact lift on all three - not the day to do so. His second max was extended to something approaching six minutes and was eventually found days later over five miles from the launch point! His third flight was also mislaid and he was unable to fly-off, allowing Carter a win with a half-wound token flight that never really got away properly.

Contest Director Phil Ball, somewhat underwhelmed by entries, managed some very impressive HLG flights. He didn't seem to have a bad throw in all nine. Of course scores are now totalled from all the flights as per the new SMAE rules.

All aeromodellers know that, as a rule, the day after such a blow out is invariably warm, sunny and calm, leaving the more timid contestants wishing the contest had been a day later. However, on this occasion conditions were actually worse - much

worse. The following day Britain was swept by winds of up to 100 mph and although I would be the last person to wish such a day upon any contest it might have been interesting to see how the likes of Carter, Peers and O'Donnell, those masters of rough weather, would have coped with an actual hurricane. I bet they would have tried.

Grantham Grand Prix, 23rd March

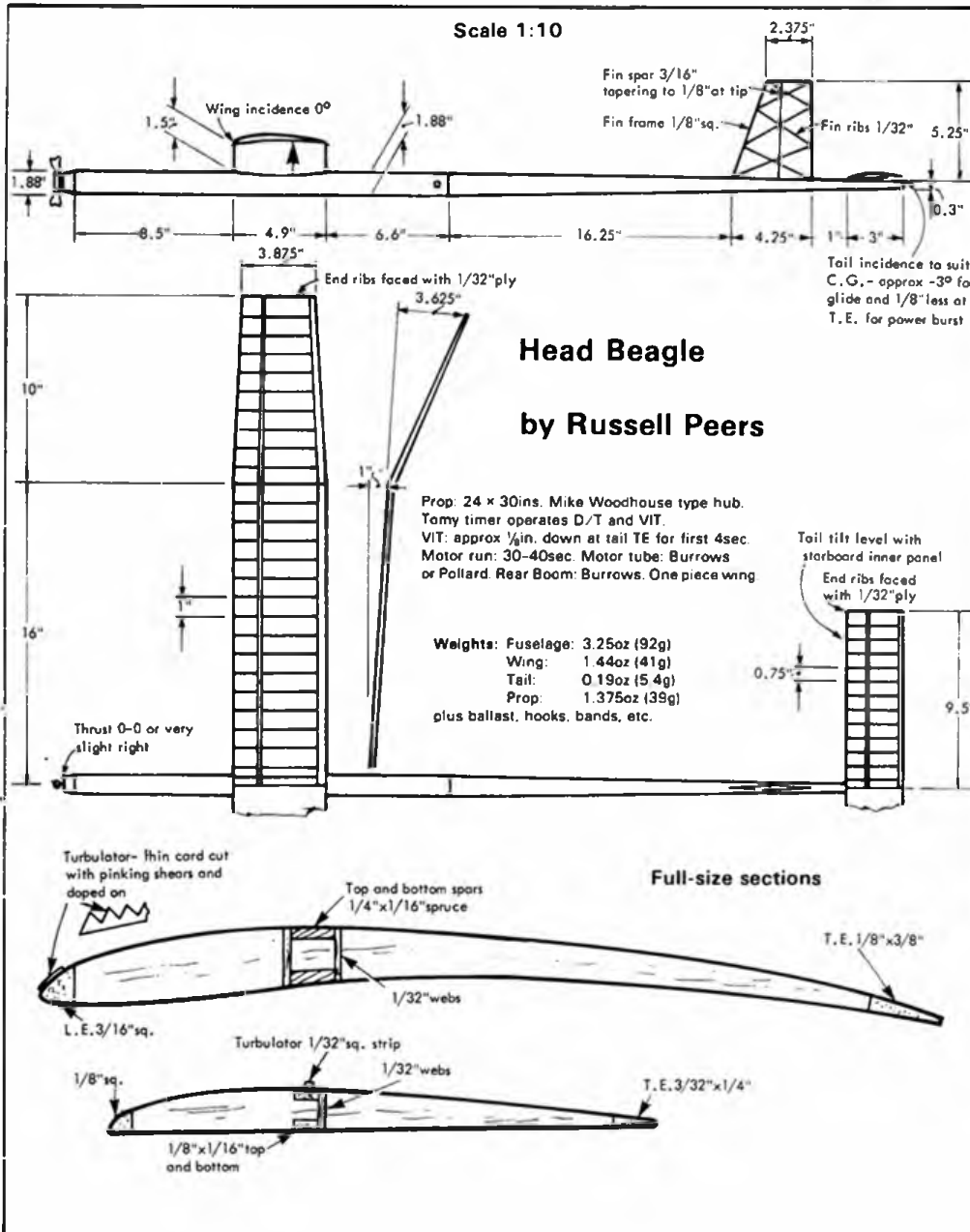
Results (all maxes 2:30)

Open Glider		
1 M Brown	Birmingham	6 27
2 T Dilks	Birmingham	5 16
Open Rubber		
1 J. Carter	Falcons	7 30 + 0 19
2 J. O'Donnell	C/M	7 30
3 A. Ball	Grantham	5 43
Open Power		
1 R. Peers	Falcons	6 55
Combined FA1		
1 M. Chilton	Birmingham	6 48
HLG		
1 P. Ball	Grantham	6 22
2 M. Page	Peterborough	4 48
3 B. Horsley	Grantham	3 55

SMAE Easter Meeting: Salisbury Plain, 29 and 30/3/86

After the discouraging weather during the preceding week (after the Grantham event) it was not unexpected to have to cope with the very worst of Easter conditions - very reminiscent of some of the notorious Tern Hill meetings run during the '60s. As a consequence both days were very poorly attended; Saturday particularly so. On this first day the numbers of those attending actually swelled during the afternoon but those flying dwindled fast. Very strong Westerlies took maxing models distances of up to two miles and during the day there were also vicious and often protracted hail storms. Power flyer Pete Watson held onto top in Glider for a long time and when John Cooper's last flight went so terribly wrong it looked like he had it wrapped up. However, things hadn't gone quite wrong enough and Pete was pipped by a mere second.

At least the Open Power men found the terrain less threatening than aerodrome



Opposite page, right: Trevor Payne gets away cleanly at blustery Grantham. This flight was unlucky to contact terrible sink on the glide. This page, top: Phil Ball's Open Rubber fly-off flight at the Easter meeting. Beautiful launch, but model stalled later on to finish second. Above: Very neat tail mount detail on Chris Edge's A2, spotted at Easter. Transparent mylar covering.



Left: The Davitts hold while John O'Donnell winds his Challenger for the Driffleld Vintage flyoff. After a clean launch the model mysteriously lightened and came in under power. Opposite, top: Chas Plant's very successful Hotspur. Essentially a competitive slow Open Power model it was slightly outgunned at the Pannett meeting, but made the fly-off. Opposite, below: Pannett winner Tom Hargreaves starts what looks to be a very large Super Tigre for his victorious flight. He cleverly D/T'd well up, just on the edge of visibility.

concrete. The top two Birmingham experts finished the day with hard earned full scores. More could have done likewise in Rubber but at least one competitor stopped when he discovered that the class would not count towards Senior Championship points because there were fewer than six participants. This illustrated rather well the claim that the idea of a minimum entry cut-off could actively discourage participants. Never have the finalists in this class more deserved their points. It was the first class to be flown off, with Carter wound for nearly the entire round waiting for the bitterly cold wind to lull. In the meantime, Ball flew but contacted very poor air, power stalled and was down in less than three minutes for the first time in many years. No token-flight win for Carter this time: when eventually he released it was into a very short calm spell, but despite this the 3:19 flight was over two miles away before it landed.

The weather actually worsened before the Power Final with a darkening sky threatening heavy rain and with both participants suffering visibly from the cold. Both models made respectable climbs but were soon swept into torrential rain. Harris' was eventually recovered in many pieces after it has hit a tree at high speed and Screen's went so far it couldn't be located until well into the following day.

Sunday's FAI events started as an almost carbon copy of the previous year's with a much more gentle and milder South-westerly bringing low cloud and heavy drizzle. Tricker lift than expected fooled a few and the low cloud put off a number of power fliers completely. In fact F1C came close to attracting no entries at all despite

the prestigious Halifax Trophy on offer. Some might argue that rather more flew for this when it was held at Area level and linked to Plugge points!

After an astonishing, almost dead calm period which coincided with the 2nd round, some gave up, believing that in such weather it would have been impossible to catch up time dropped on the first flight. However, just as quickly, the wind re-established itself in the same direction and strength as the day before, staying between 15 and 20 mph for the remainder of the contest. Pete Watson made sure of F1C with the only full score; John Bailey was potentially one second behind him but was so far in advance of 3rd that he didn't have to bother with the last flight. It was surely John Carter's weekend, though; after his victory the previous evening he persevered with a straight tow A2 after one slightly sub-standard flight to emerge a clear winner over Cooper.

Phil Ball had crept into the lead in F1B from the middle of the day despite a heart-stopping first round attempt when he mis-set his VIT system and the model bunted in on the power burst, miraculously escaping serious damage. The last round saw him contact poor air and drop 20 seconds. Foster and Woodhouse, who had both been climbing very well all day, finished off with powerful maxes and jumped into top and third places respectively. Mike Woodhouse must have been annoyed with himself over his first round clang which was brought about by a huge glide stall after a sensational climb. This meant it was Foster, returning to F1B after a couple of years' absence flying full size gliders, who took the

brand new Mick Duce Trophy which was designed and built by Brian Nicholson and funded by the late flier's Liverpool Club.

If there was anything to be learned from Easter it is that it appears Saturday is a difficult day for many to get to a contest. Even more, despite what we hear from some of the more verbal FAI flyers it is perhaps not so much that they want more events but calmer, warmer ones, even when the venue is as gigantic as Salisbury Plain. Fortunately, some of those who would normally be classed as Open fliers were on hand to persevere to the end of the FAI event! Maybe it is time that those who want to fly more (in whatever class) learn to prepare better for the conditions which prevail in the UK! We all enjoy the warm and windless Continental events; but don't expect such conditions here too often - and certainly not automatically just because it is an FAI event. Even the current FFTC have not yet mastered the art of controlling the elements although I am sure Dave Greaves would have done his best if he could. Nevertheless he still showed energetic enthusiasm for the weekend's CD-ing job. He has even gone to the trouble of borrowing the three relevant SMAE trophies so that everyone could see for what they were flying - a nice touch.

SMAE Easter Meeting: Salisbury Plain, 29th and 30th March

Results

Open Glider (7 flew)

1 J. Cooper	Biggles	6.53
2 P. Watson	Birmingham	6.52
3 A. Crisp	Biggles	6.37

Open Rubber (5 flew)

1 J. Carter	Falcons	7.30 + 3.19
2 P. Ball	Grantham	7.30 + 2.53
3 A. Ball	Grantham	7.30

Open Power (7 flew)

1 S. Screen	Birmingham	7.30 + 3.51
2 P. Harris	Birmingham	7.30 + 3.17
3 T. Payne	Biggles	6.00

FIA - KMAA Trophy (12 flew)

1 J. Carter	Falcons	11.07
2 J. Cooper	Biggles	11.00
3 C. Edge	Crookham	9.17

FIB - Mike Duce Trophy (8 flew)

1 G. Foster	RAFMAA	12.16
2 P. Ball	Grantham	12.02
3 M. Woodhouse	Vikings	11.38

FIC - Halifax Trophy (4 flew)

1 P. Watson	Birmingham	12.30
2 J. Bailey	Biggles	9.57
3 R. Moore	Biggles	8.57

Northern Area Pannett Meeting: Driffleld, 13/4/86

Open Power is alive and well and living in the North of England, it appears. The Tony Pannett Shield meeting has been a prestigious Power event for many years. Not so long ago the Jack Kay Trophy was added for Open Glider and then a Vintage award was presented by RAF Topcliffe to create today's interesting menu of events. The usually calm weather, at least for the start of the day, drew contestants from a wide area and classes filled up fast. The Morley club, running the control desk in strict shifts, set a novel but appropriate 3:30 max for all events - a bold statement against the 2:30 which is too often used.

As forecast, the pleasant start deteriorated into a dull, breezy afternoon

with falling temperatures. However, it had allowed most people to make good use of the calm morning and despite the high max there were fly-offs in all three classes. Brian Horsley had left his flights in Vintage rather late but continued doggedly into the increasing drizzle. His final max, with what looked to be a very competitive Vanstead, exceeded 5 minutes, as had done the first two, but the model could not be located in time for the fly-off.

By now it was raining in earnest and the wind was gusting up to 20 mph. Doug Bartle made a bouyant fly-off flight with his A2 and looked well set until a strong zoom launch from Philpott contacted positive lift - at least for the first few minutes of the flight. He looked the easy winner until the model began to descend, presumably having been pushed out. The flight still gained victory, but only just.

The worst of the evening's weather coincided with the Vintage fly-off, which, as is becoming increasingly common, consisted entirely of rubber models. Chris Strachan, flying his distinctive red and yellow stripped Lanzo (now backed by another even lighter version) got away promptly in good air. Those who followed were not quick enough to catch up and floundered somewhat. Even John O'Donnell had trouble when a vicious power burst on his Challenger induced a tight, steeply banked power turn which seemed to go on forever; the model never recovered and was too badly damaged to re-fly. Even these modest Vintage flights gave plenty of retrieval problems with the visibility rapidly worsening. It was this factor that went on to affect drastically the final Power result. Chas Plant's usually consistent Hotspur flattened on the climb and Colin Hickmott's game little Super Tigre powered model, which had been whistling up all day, cut

almost immediately after launch because of a timer malfunction and buried itself in the soft earth. He too declined a re-fly. Stafford Screen deliberately set a very short run but the early and hence slightly awkward pull-out robbed him of even more height after a nasty stall, so he was out of the action. Next, the big models of Peers and Hargreaves reached their full height; and Harris' model was in the same air and only a little below. All were in sight - but not for long, as almost immediately it was evident that the three of them had hooked real lift and Harris' model in particular was gaining height fast. His model disappeared first, and then Peers was unlucky to have only one of his pair of officials see what could have been a competitive score. The other timekeeper - two were insisted on by the organisers - lost it almost a minute earlier so watches were averaged. No one was quite sure whether Tom Hargreaves had planned it but just as his model's altitude became a problem in the rain clouds - he D/T'd. It must have been well under 4 minutes. The timekeepers then had little trouble in seeing the model down to the ground. Thus Tom won the coveted Pannett and was most likely the only one of the top three to find his model. The heavier rain then washed away the prizegiving - a pity after such a well run day.

Vintage/Pannett/Key Meeting: Driffield, 13th April

Results (All classes to 3:30 max)

Open Glider - Jack Key Trophy (17 flew)	
1 S. Philpott	10:30 + 4:04
2 D. Bartle	10:30 + 3:48
3 M. Cook	10:30 + 2:37

Vintage (12 flew)	
1 C. Strachan	10:30 + 3:08
2 P. Ball	10:30 + 2:24
3 T. Dilks	10:30 + 2:01

4 J. O'Donnell	10:30 + 0:14
5 B. Horsley	10:30

Open Power - Tony Pannett Shield (10 flew)

1 T. Hargreaves	10:30 + 4:20
2 R. Peers	10:30 + 4:06
3 P. Harris	10:30 + 3:26
4 S. Screen	10:30 + 2:32
5 C. Plant	10:30 + 2:18
6 C. Hickmott	10:30
= R. King	10:30

A Return to decentralisation?

Following on from my comments about the controversy surrounding timekeepers chasing models at the 2nd Area meeting it has become apparent that another recently loosened restriction also has a bearing on the matter. When coupled with the waiving of the 10 metre rule it could give some people a very unfair advantage at Area meetings.

Anyone can now apply to fly Area events on their local patch, no matter how close they might live to an existing site. In the past one had to be at least 100 miles distant (by road). Applications have to be made to the Free Flight Technical Committee, who still have the right to refuse you, of course (see Rule 2.1.2 Section 2); but already a number of new local sites have sprung up. Free Flight contestants fly against the elements first, themselves second and their fellow competitors third. There is no question of cheating here - that would be too easy. What concerns me is the quite legitimate flying on these home sites, which under the current rules could give small groups a very unfair advantage.

Already there is a strong body of opinion which holds that we should have fixed fly-off times and fly-off orders at Area events. This argument gains strength when we see the lessening organisational control that Comp Secs are wielding at official Area meetings. It works satisfactorily until fly-off time when the Comp Sec himself, who is often involved in the flying, can help himself by allocating his class the best time slot. Maybe we are stuck with that for the moment - it's a small point - but when considering the local venue with very few contestants the scope increases. Surely there is nothing stopping them from picking any moment after the end of the contest and during that entire next hour for their fly-off? What is more, as I pointed out last month, there is nothing in the rule book precluding a contestant from officially timing his own model. Waive the 10 metre rule and he can time and chase it too. The CD can waive the 10 metre rule at his discretion. Right then - who is the CD at the 'home patch' venue? Does it follow that because there is no official then the 10 metre rule must stay in force; or can any contestant present consider himself CD for the day and hence waive the rule? If they can then what on earth is to stop them waiving the rule as a matter of course, no matter what the visibility, and then free themselves to time their own flights and chase their models at the same time throughout the day and into the fly-offs. What an advantage they have when all this is put together. An hour in which to make their fly-off flight and then if there is any sort of a breeze blowing they are able to increase the time in which they can see their models by chasing off downwind with the binoculars. Surely some rules need tightening up - this isn't in the spirit of the hobby, is it?



FLY LEAVES

An occasional look at books of interest to the aeromodelling and aviation enthusiast.



How to go Aeromodelling

by Les Netherton (Patrick Stephens, £9.95)

Every newcomer to our hobby, particularly if he is trying it alone, ought to keep handy a basic guide to which he can refer when difficulties arise – or, ideally, to read at leisure before starting on his first model. Here is a volume that sets out to fill this position, which, on the whole, it manages competently.

After a basic exposition on the theory of flight and a discussion of model and engine choice the bulk of the text concentrates on building and flying techniques, and it is here that the book is at its happiest. Liberal use is made of the author's own line and tone drawings, which are clear enough apart from a confusing page on airflow around wing sections. Photographs are of variable quality, many close-ups suffering from insufficient depth of field.

There is a plan of a profile Spitfire glider, but it would have been pleasant to see a dimensioned drawing of a larger model or two, particularly as there is an excellent chapter on propellers for rubber models. Nevertheless, it is realised that the aim of this book is to augment the experience of building from commercial kits and plans, and in this respect it will undoubtedly be a great success. Interestingly, although at first sight this volume appears to be of British origin, some clues point to a South African background. Recommended for the beginner; an ideal birthday present.

Building and Flying Control Line Model Aircraft

by Dick Sarpolus (Kalmbach Books, \$7.95 in the USA)

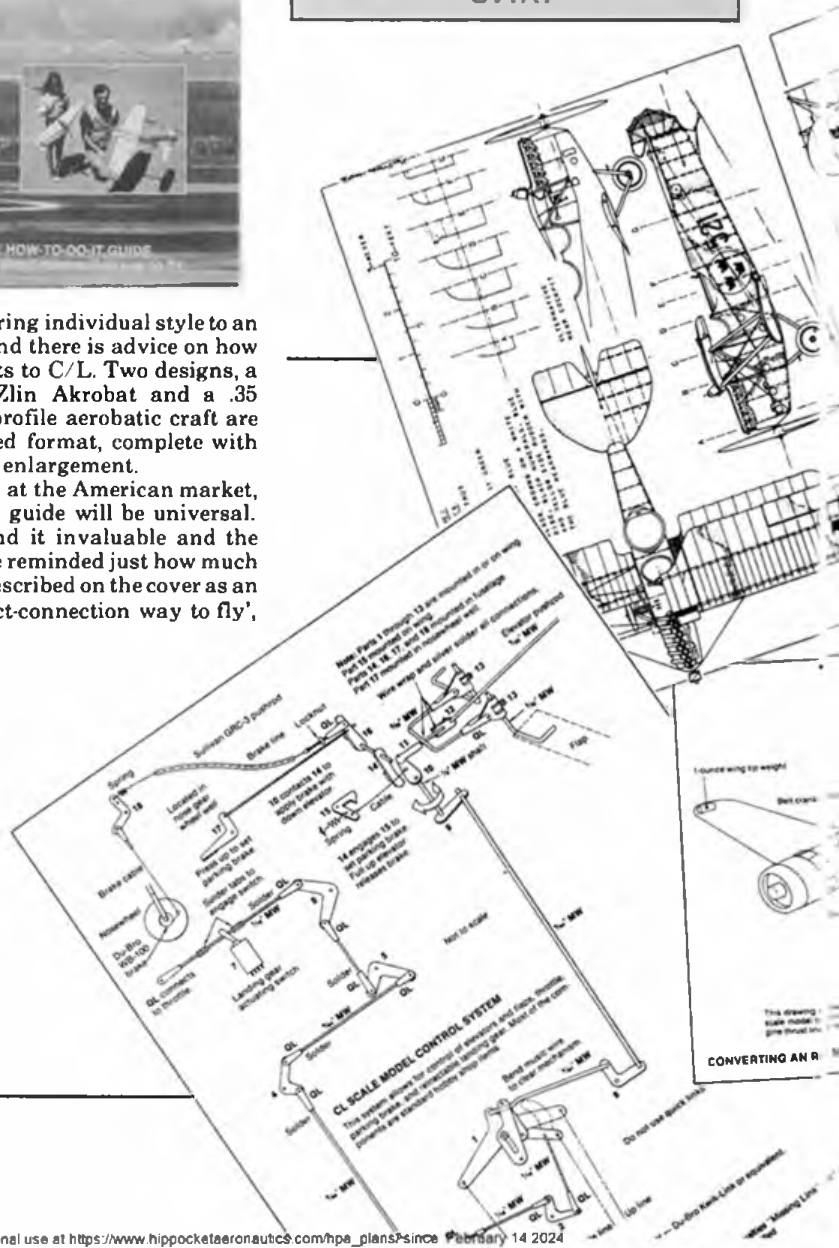
Nothing arouses enthusiasm more quickly than to share the energy of the

dedicated. On the evidence of this volume Dick Sarpolus is a true devotee of the C/L model, for the presentation is bright, uncomplicated and compelling. Quite simply, here is everything the budding control line flyer could wish to know. A full text is reinforced by crisp graphics and clear, helpful photographs. Not only are the basics of this branch of the hobby fully explained, but a variety of kits is evaluated, encouragement is given to the practice of face-lift



modifications to bring individual style to an existing design, and there is advice on how to convert R/C kits to C/L. Two designs, a 1/2A stunt/sport Zlin Akrobat and a .35 powered jet-type profile aerobatic craft are featured in reduced format, complete with scale to help with enlargement.

Although aimed at the American market, the appeal of this guide will be universal. Beginners will find it invaluable and the expert may well be reminded just how much fun control line, described on the cover as an 'inexpensive, direct-connection way to fly', really is. . .



Nimble Gliders

by Rositza Tzvetkova and Georgi Bogdanov (State Publishing House, Sofia, Bulgaria; review copy supplied by Collets, Denington Estate, Wellingborough, Northants, £3.75)

The humble paper aeroplane is the ideal children's introduction to model aerodynamics. Quick to build, easily replaced and cheap, it offers maximum enjoyment for minimum effort - and if it's colour that you want, this book has the answer. Here are fifteen gliders, each named after a bird or flying insect, gaily printed on thin card and ready to cut out and assemble. Quite a variety, too: polyhedral, swept-back and buzzard wings, T-tails and twin fins; all await the youthful experimenter. Full details of adjustments for flight are given in the translated text, and there is even a charming introductory tale which tells how a group of children are introduced to paper 'swallows', and thus to the theory of flight.

This reviewer tried a couple of the models, and reports complete success...



Old Aeroplanes

by David Ogilvy (Shire Album No. 141, £1.25)

This handy little volume is the latest in an extensive series dealing with all manner of bygone topics from Agricultural Hand Tools to the Woollen Industry. David Ogilvy's credentials are impeccable; most notably, he was joint founder of the Vintage Aeroplane Club and in later years was appointed General Manager of the Shuttleworth Collection. To condense the history of aviation into just 32 pages means that much is necessarily treated sketchily, but the picture is still a vivid one. Frequent reference is made to aircraft which may still be seen at museums and on the display circuit, although this fact may not be

immediately apparent to the lay reader. A brief section on the restoration of early craft in followed by a useful list of venues where preserved craft may be seen.

Of course, this is merely an appetiser for those who may acquire a taste for the subject; other, meatier works must then be studied. But it is just the thing for the glove compartment of the car; ideal for the youngsters to look at on the way back from Old Warden!



Swedish Air Force Trainers 1926-83

by Björn Karlstrom (Allt om Hobby, Stockholm; available from leading aviation bookshops, £7.95)

Although this volume has been available for a while, it is felt that *Aeromodeller's* readers may not be aware of it. If this is so in your case, make an effort to acquaint yourself with this absolutely delightful Pandora's box of little-known aircraft, the first in a series intended to cover the work of masterly draughtsman Karlstrom. An array of mouthwatering subjects is presented in scales of 1/72 and, rather oddly perhaps, 1/50.

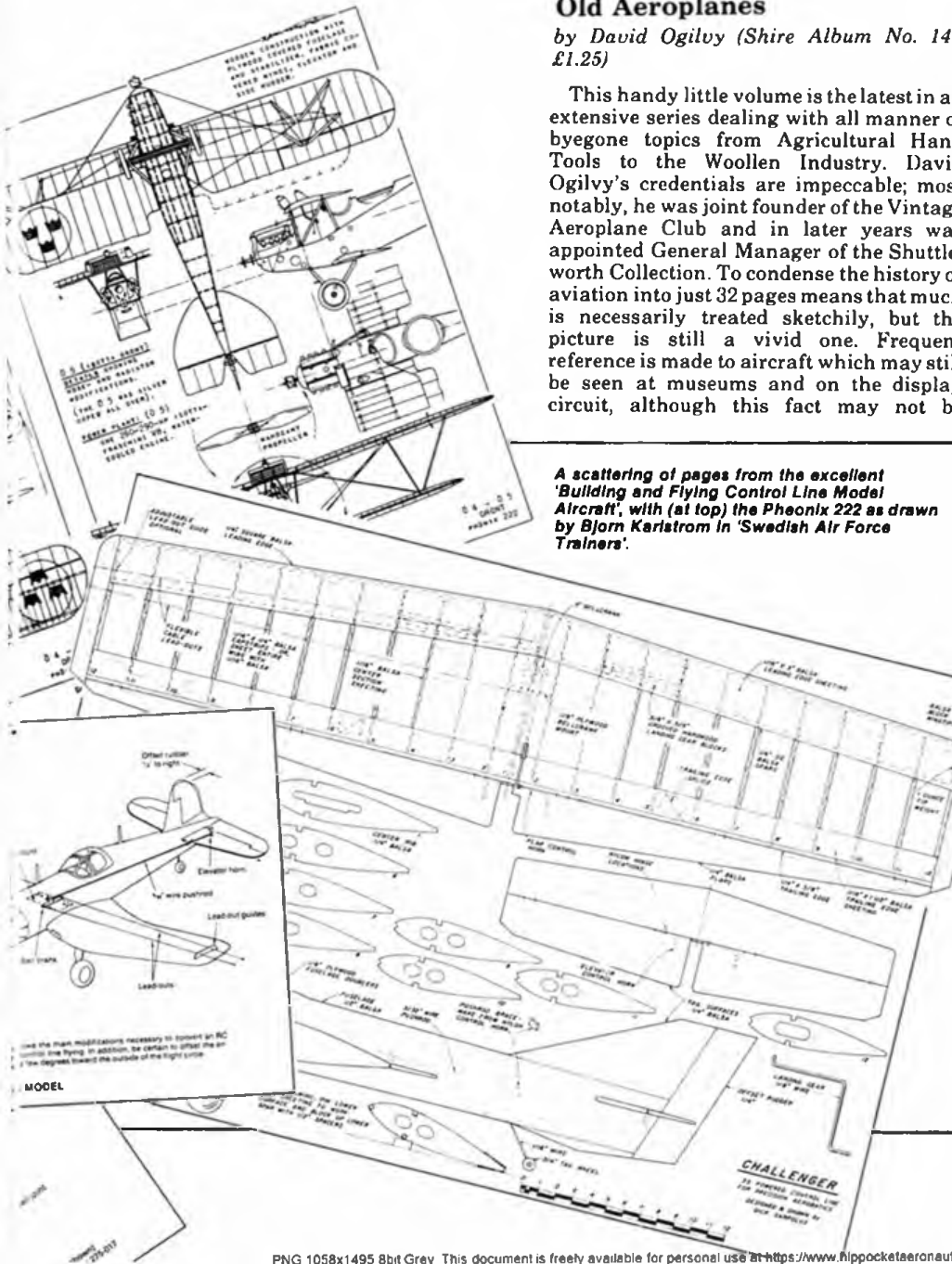
Of course, jet trainers appear in the post-war years but it is the coverage of earlier craft that will appeal most to the flying scale enthusiast.

How about an all-silver Bristol Fighter, Jupiter powered; or a truly gaudy DH60T in red and yellow?

Not esoteric enough? Try the Raab-Katzenstein RK26, Heinkel HD26 or Svenska Aero Ovningsfalken, then; each a biplane that simply demands to be built; and how they would grace any model flying meeting...

All are presented in Karlstrom's characteristically uncluttered style, with a considerable number of reasonably clear photographs to help intending builders. A compulsory addition to the bookshelves of aeromodellers who favour the unusual.

Incidentally, amongst Karlstrom's other activities is the production of a Biggles cartoon strip. It was in one of these, a few years ago, that your reviewer found the only three-view of the Cierva C.24 autogiro that he has ever seen!



VINTAGE CORNER

Take a look today at yesterday's models, with Alex Imrie as your guide

Australian 1935 Wakefields

In September 1984 this column included a letter from Jim Fullarton of Victoria, Australia on the subject of Australian entries in the 1935 Wakefield competition and provided some other information on this event. More detailed material is to hand, thanks to Jim and the Australian model magazine "Airborne", from whose pages the plans of two of the models reproduced here are taken.

The first few years of Wakefield competition had become mainly a battle between the UK and the USA, but in 1934 the SMAE, in an attempt to widen the scope of the contest, wrote to Norman Lyons, the Chief Commissioner of the Australian Model Aeroplane Association, inviting Australia to send a team to the contest and offering to provide proxy flyers if the team was unable to attend personally. Jim decided to try for the team, which because of the prevailing depression meant very definitely that the models would have to be proxy flown. He writes "...the 4 ounce requirement caused some consternation, and some of our leading flyers were to be seen with lead cable wrapped around their undercarriage legs! I realised that the way to beat this rule was to make up the weight in rubber, and opted for a longer fuselage and a bigger prop than most others were

using, though my structure was still on the heavy side."

Jim's model had one of the first diamond fuselages used in Australia, the idea stemming from a Carl Goldberg article in Model Airplane News. Another novel idea was a lifting tail, but after the model dived in on the glide Jim reverted to a symmetrical section, and did not use a lifting tail for years afterwards! He gained entry to the team but lost his model in the trials so had to burn the midnight oil in making a replacement in a week; but his effort was wasted since the ship carrying the models was delayed loading applies in Tasmania and the models did not arrive in the UK until after the Warwick meeting had taken place. The SMAE kindly laid on a consolation event but the Aussie models did not do too well in the poor UK weather conditions. In order to save expense the models were not returned to Australia; and one wonders if any of these historic machines has survived to the present day, perhaps tucked away in some forgotten attic..?

The following year Jim decided to go all out for a high power/weight ratio and used a 40 inch fuselage. At the trials his model did 15 minutes 38 seconds on its second flight although Jim considers that some of this was due to the extra visibility produced by the blimp-like fuselage. He was top man in

the team, and again it was necessary to fly the models by proxy. On this occasion they arrived in good time and were flown in the competition at Faireys Great West Aerodrome as follows: S R Crow proxy for Milton Boss, L Walker proxy for Jim Fullarton, E Chasteneuf proxy for J Danks, E Buffery proxy for J Donald, H Simmonds proxy for A Flew and Bunny Ross proxy for H J McKay. A brief account of this competition was given in the John Hamilton magazine "Wings" mentioned in the previous Vintage Corner article, but as far as can be ascertained full flight details have never been published. Gordon Light's model, proxy flown by Tommy Ives, won the event for the USA and the highest Australian placing was Milton Boss' model which averaged 1 minute 53 seconds from three flights to finish fifth. Boss' model was described in Practical Mechanics in November 1935, peculiarly without dimensions, and was there named as the Milton Special (see later).

Fullarton and McKay models

Fortunately Norman Lyons wrote weekly articles on aeromodelling in the Australian Daily Telegraph newspaper; and instalments in April and May 1935 contained details of the models that had been chosen to represent Australia in the International Wakefield Cup competition. This information has been used to construct the plans shown here. The design of Jim's machine was largely based on two ideas that have since proved to be erroneous, so it is a wonder that it flew as well as it did. Jim says: "To start with, I firmly believed that slack rubber killed power, so that the only way to carry the length of rubber I wanted was to extend the fuselage. In justification, I might add that this misapprehension seems to have lingered in some circles right to the present day. Also, the fact that the drag was increasing as the square of the length did not worry me unduly, as a very widely held belief at that time was that models flew so slowly that drag did not matter, while one school of thought actually stated that streamlining cut duration by making the model fly faster!

"The wing section came originally from one of Mr Wright's designs, and would be

Left: The Winner! Tommy Ives with Gordon Light's model which he proxy flew to victory in the 1935 Wakefield. The model did 7 minutes 20 seconds on its first flight and disappeared into the clouds, but it eventually landed on nearby Hanworth aerodrome and was returned to the competition in a Puss Moth. Right: Reg Parham (centre of picture) works on his Gordon Light replica Wakefield at Warwick during that superb meeting on 24th June 1984.





Above: The Australian Team's models at Fairys for the 1935 Wakefield Cup Competition. Proxy fliers are (left to right): L Walker, E Chasteneuf, S R Crow, Bunny Ross, H Simmonds and E Buffery. Note the similarity of A Flew's model (held by Simmonds) to that of McKay's, held by Bunny Ross. (See text). Below left: The American models with their proxy fliers; left to right, C S Rushbrooke with Frank Zalc's model, Mario Lucani with David Merton's entry and J W Kenworthy with Vernon Boehle's big slabsider. The SMAE take-off board, 20 feet long by 5 feet wide, was a gift from pioneer modeller W G Evans of the model aircraft timber supply house. Below right: We make no excuse for using this photo of Jim Fullarton's replica of his 1935 Wakefield entry again (it appeared in Vintage Corner in September 1984) since it may prove helpful to builders using the drawing included this month.

fairly close to a Gottingen 549. I don't think it would rate well as a low Reynolds Number section. Incidentally, the method of plotting the section on a graph as shown on the plans was a favourite device of Norman Lyons, being made necessary by the lack of space available in the newspaper. Research among my own records has revealed that the rib spacing on the plan of my model is incorrect: it should be $2\frac{3}{4}$ inches, not three inches as shown. This gives 14 bays between the ribs and increases the wingtip bay to $1\frac{3}{4}$ inches instead of $1\frac{1}{2}$ inches. The most striking feature of McKay's Wakefield was that great skyhook of an aerofoil section, but Mac might well have had something up his sleeve, even if it was unintentional. I refer to the grid of auxiliary spars, spaced closely around the upper

surface, which would certainly have had some effect as turbulators. Incidentally, the text (in the newspaper articles) calls for these to be inserted in short lengths between the ribs, which seems to be an extraordinary way of doing things.

"The small low-pitched propeller gave a rapid rate of climb, and although the motor run was not long, it was usually enough to get up amongst the thermals. You will search in vain for a reference to CG position on the drawings. That is because we then used a different system, with a fixed angular difference between wing and tail, usually 4 degrees, and the wing was moved back and forth to achieve glide trim. Downthrust was used, but not sidethrust, and apart from a little right rudder to counter torque, no attempt was made to get a precise flight

pattern, though the models probably finished up gliding in right hand circles. My model was black with a white tail, and I think Mac's was all black, this finish being favoured as it seemed to give the best visibility for timing."

Milton Boss model

The only clue given in the Practical Mechanics description on the size of this model is (if the plan is to scale) in the size of the propeller which is thought to have been 16 inches in diameter; at least, the block measured 16 by $2\frac{1}{2}$ by $1\frac{1}{4}$ inches, and there is little point in having a block of that length and not using all of it while carving the propeller! Therefore the propeller shown on the drawing is assumed to be half of this measurement. If this size is used as a scale



the span comes out at 40 inches, the chord is five inches and the bare fuselage length (without the nose and tail plugs) is 28 inches. Tony Penhall has drawn the model up and offers full-size plans for £3.50, but somehow he gets a span of 42 inches; however, he may very well have had more information on this model than I used on my quick 'rule of thumb' measure up! Order the plan direct from Tony at 62 Gordon Road, Little Paxton, Cambs. It will save you the tedium of enlarging; but for those of you who want to "do your own thing" some material sizes given in the description should help: 1/8th square fuselage structure, ribs 1/16th sheet, leading edge 3/16 by 1/8th, trailing edge 3/8 by 1/8th. 1/16th bamboo is used for wing tips and tail unit outlines. Note that 5/8th inch washout is built into each wing and "retained" by two diagonal struts in the structure. Power is given as 20 feet of 1/4 rubber in eight strands (four loops).

The model flew well in the Australian trials recording 239.5 seconds as an average

for three flights. In the competition at Faireys the model's best flight was 213.5 seconds.

Wakefield or not?

There was an exchange of views under this heading in the April issue, and commenting on these Mike Kemp writes that the subject really warrants tracking down the rules as published. It appears that not even the SMAE have a complete set of rules from 1928-1950. Mike has already made a start on this job and is optimistic that by the end of the year a full history can be compiled with a near certainty that all will be correct.

Bernard Aslett of Swindon, Wilts, also wrote in on this subject and comments: "...having built my first Lanzo model for the 1978 Bob Wells Wakefield Jubilee Contest, and if your Antipodean correspondent was correct, I stood to have transgressed over a longer period than most. It may be all very well for myself, or indeed anyone else

who might feel inclined, to state their opinion as to what the rules were in 1936, but what is really necessary is authoritative evidence which would transcend mere opinion. I enclose a copy of the evidence which has taken me until now to obtain..."

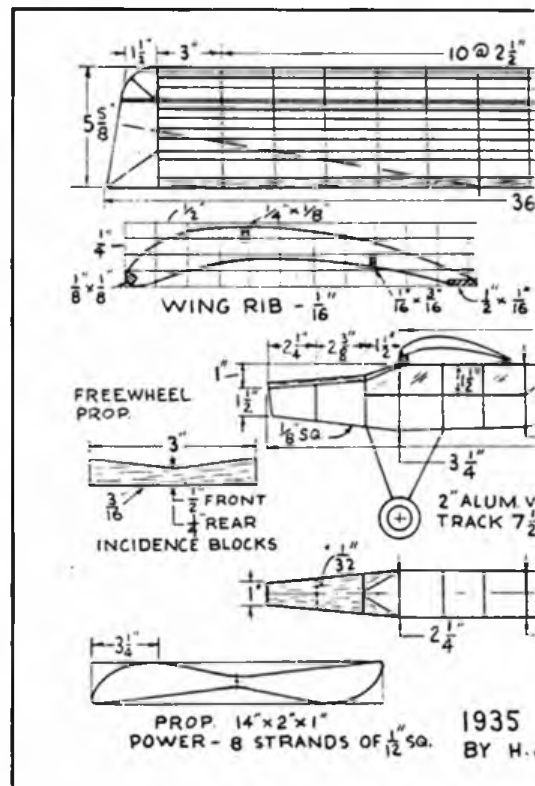
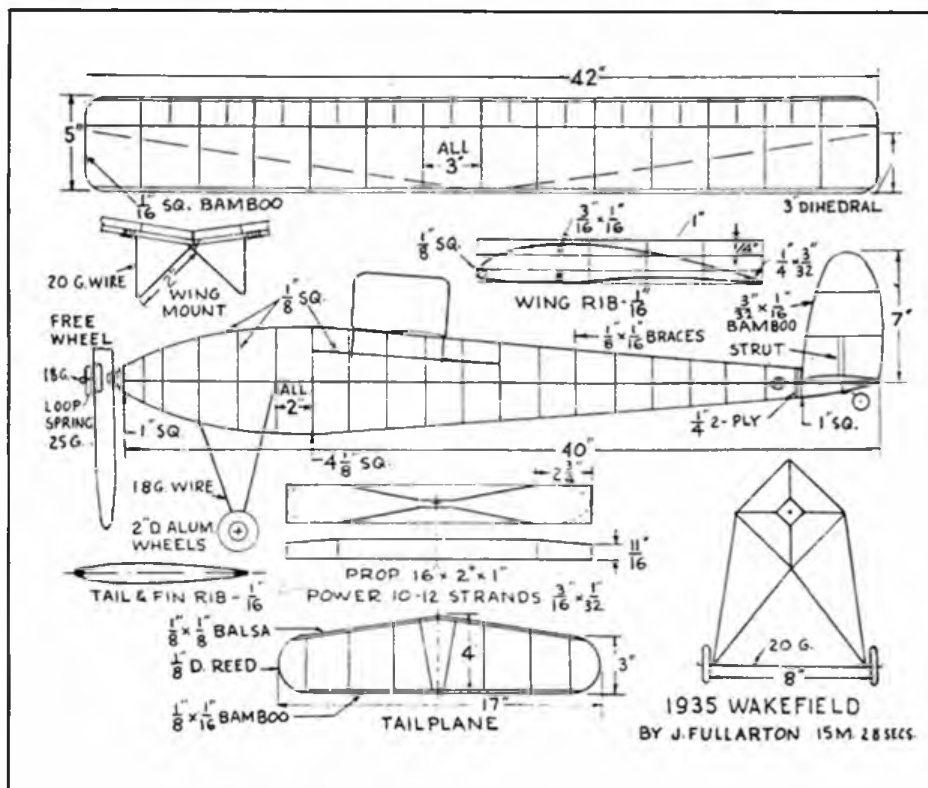
The rules Bernard brings to our attention were included in an SMAE notice in the January/February 1936 *Aero Modeller* and this points out that the rules would be as for the previous year with the exception that the total area of the main plane should now be 200 square inches with a *minus* tolerance only, of 10 square inches. Abbreviated, the rules state that the contest is for rubber-driven fuselage models; rubber motors to be concealed and fuselage/fuselages, fully covered, to conform to the formula: Minimum value of maximum cross-sectional area

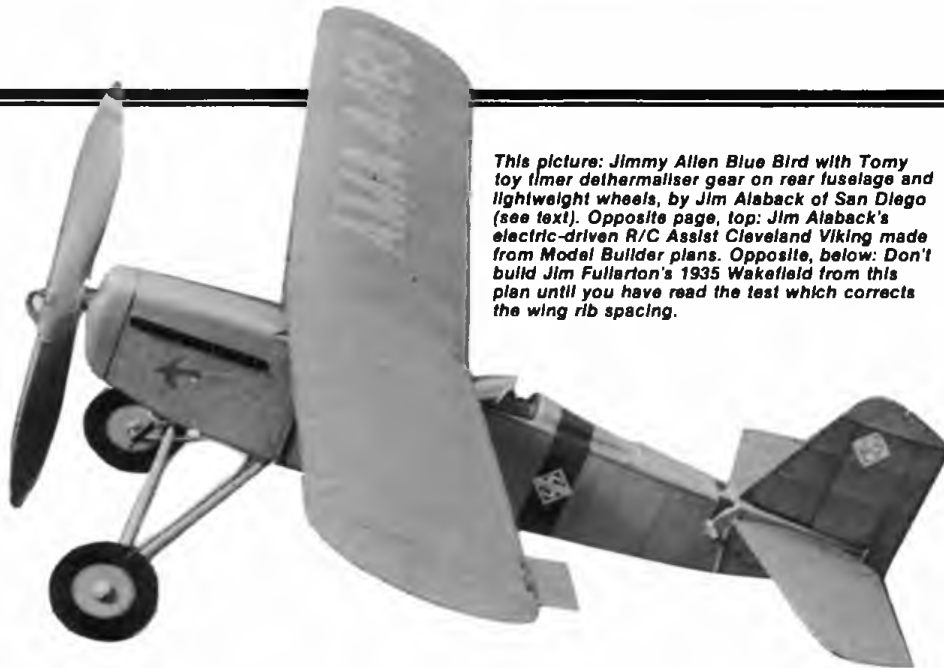
$$= (\text{Overall length of model})^2 / 100$$

The model was to weigh not less than 4 ounces; and the average duration of three attempts was to be counted. Of interest is the mention that no optical devices were to be used, and while it is understandable that the use of binoculars and telescopes were not allowed to aid the following of the model's flight, how many of us knew that sunglasses also fell into this category and were thus taboo? The undertaking of a fully documented set of rules is a very worthwhile job but it will not be easy; anyone able to provide references to published rules for the years mentioned is asked to contact Mike Kemp at The Arbour, 9 Pear Tree Lane, Rowledge, Farnham, Surrey.

First SAM 35 Postal Competition

Mike Kemp is also running the first SAM 35 Nationwide Postal Event for the Cruiser Pup and Achilles. Three flights are required over the ten day period from 11th July to





This picture: Jimmy Allen Blue Bird with Tomy toy timer dethermaliser gear on rear fuselage and lightweight wheels, by Jim Alaback of San Diego (see text). Opposite page, top: Jim Alaback's electric-driven R/C Assist Cleveland Viking made from Model Builder plans. Opposite, below: Don't build Jim Fullerton's 1935 Wakefield from this plan until you have read the test which corrects the wing rib spacing.

vintage enthusiasts for this column, but what was a steady trickle seems to have dried up altogether in these last few months. Remember, this is *your* column and although I don't need much encouragement to dig into the past and go 'all historical', the original aim of this feature was to tell readers what was currently happening in the vintage field - but if material is not submitted how can we fulfil this purpose? There are of course a number of modellers who keep us informed but these 'regulars' can almost be counted on the fingers of one hand. What is needed is a more general response, so do tell us about your latest model, engine, difficulty or success; we will use your contribution with or without photographs.

Heard from Jim Alaback of San Diego the other day. Apart from having complimentary things to say about Vintage Corner he also related something of his recent activities, writing: "I've been working off-and-on for over a year on an electric-powered R/C assist Cleveland Viking from plans in Model Builder (January 1985). It is my first ever electric and my first R/C since vacuum-tube-and-rubber-escapement days. Since taking the enclosed photo I have started covering the model, and that's another first since I am using an iron-on covering (Micafilm on the wing and tail and, probably, Coverite on the fuselage). I feel like a thoroughly modern fellow, although I may have been 10 to 15 years late in getting here! Since I lost the Buccaneer last summer (never had any word on it, although it had all official ID on it) I have resolved to use radio assist or a dethermalizer on my

Below centre: H. J. McKay's 1935 design with multi-spar wing was apparently the basis for A. Flaw's model, shown in main picture on previous page. Below: the undimensioned Practical Mechanics drawing of M Boss' model (see text). This craft was proxy flown by S R Crow, who had just raised his own British rubber-driven autogyro record to 37 seconds.

21st July inclusive, the max being 1 minute 30 seconds. No excuse now for weekend, shift, evening and other workers not to enter! Entry costs 51p (3 stamps) plus SAE to Mike at the address above for full set of rules.

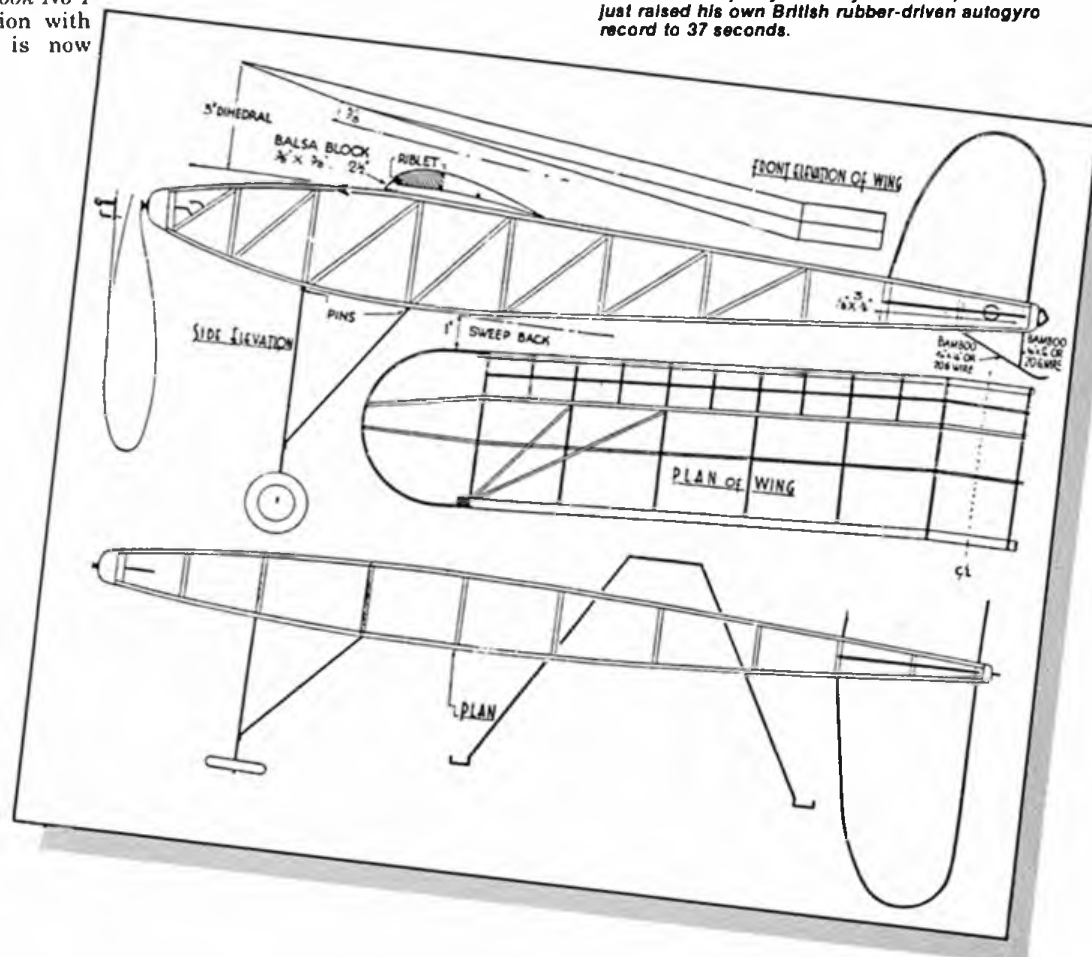
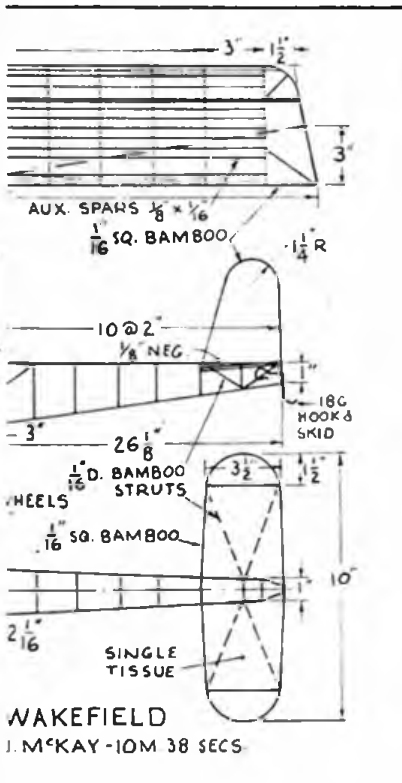
What to build?

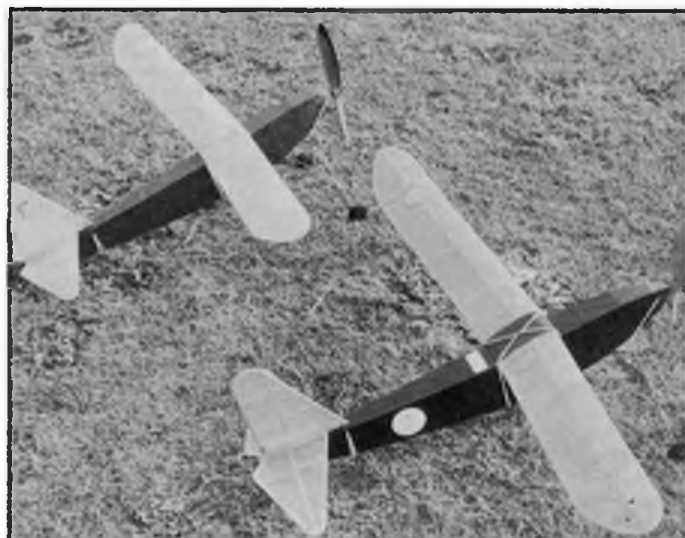
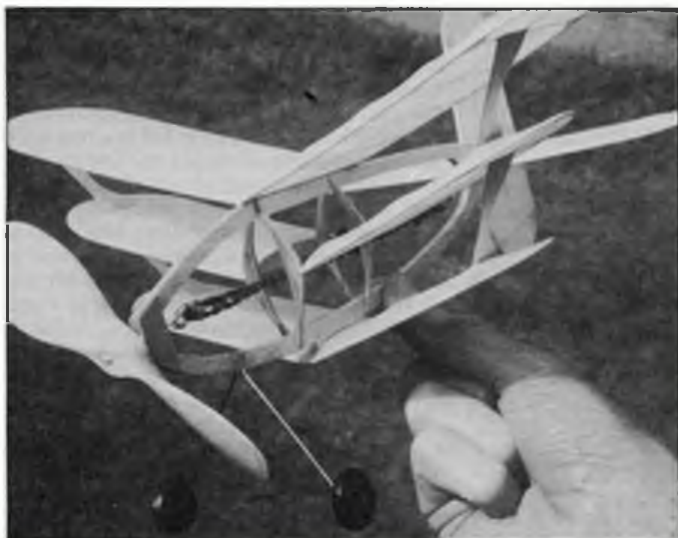
It is a fact that many of the younger newcomers to the vintage modelling scene are undecided on what model to make. Showing them a list of various plans that are available seldom helps, since unlike previous generations of vintage modellers they do not know what the names from yesteryear represent. An illustrated list would be helpful, but the final word must come from the enthusiast himself. Plans there are a-plenty and it is suggested that would-be vintage fliers obtain a copy of the *ASP Model Aircraft Plans Handbook No 1* which has a large vintage section with illustrations. The 1986 edition is now

available at £1.25p plus postage, but the price of this Handbook will be deducted from the bill of your first order using the specially printed order form in the Handbook. Various other advertisers produce illustrated catalogues or leaflets of their plans or kits and these are well worth study. There is no substitute for seeing built-up examples of the models themselves, so interested modellers must give attendance at vintage meetings a high priority. Additionally, since SAM 35 devotes itself to the whole subject, membership of that organisation becomes a must. See the March Vintage Corner for full details of how to join this 'Fly-for-Fun' brigade.

Readers' input

There has never actually been a deluge of letters, photos, or other information from





models wherever feasible. (The loss of this model was reported in the March instalment of *Vintage Corner: AD*). To that end I adapted a Tomy toy timer for use on my Jimmy Allen Blue Bird. To compensate for the added weight I made up some 'Low-Cal' wheels which have worked out very well. They more than saved the timer weight and have proved surprisingly sturdy. The wheel discs are cut from 1/32nd inch thick plywood with six 3/4 inch diameter lightening holes in each. The hub/axle is a hardwood nose button glued in place. I

covered the wheels with some gift-wrapping paper with a metallised silver finish. I then painted on the tires with Floquil model railroad paint in their 'Grimy Black' colour, which gives a most rubber-like appearance. The finished pair of wheels weigh 0.24 oz, a saving of 0.4 oz over the original balsa wheels (The dethermaliser system had added 0.26 oz)."

Readers are referred to *Vintage Corner*, April 1985, for a brief description of a Jimmy Allen model and a sight of Jim with his model - and the original wheels.

Oxford MFC Dreaming Spires Gala

A relaxed, informed day for 'silent' models only is planned for the 27th July at that ideal free flight site, Port Meadow, Oxford (10am start). Vintage classes will be: Wakefield (pre-1951 designs); Lightweight Rubber, for models having both folding and freewheel props (pre-1952 designs maximum span 36 inches); and Glider (maximum size A2 formula; pre-1952 designs). There will be four flights per event, with a fly-off if necessary, and the max in rubber will be 3 mins (weather permitting). Late entries can be accepted since flying will not be in rounds. Entry is £1.50 per event, and there will be prizes down to third place. In parallel to vintage will be a free flight Scale competition for all classes including power up to 1.5cc; Twin Rubber; and a highly informal mass launch event. Only basic scale documentation is needed; and not even that for the mass launch. Vintage Scale models will be especially welcome. Please note the restriction on power models. None are to be run or flown unless Scale. Entry can be on the day, but some notification of attendance would be appreciated. Full information from Charlie Newman, 37 Crown Road, Wheatley, Oxon, OX9 1UJ on receipt of an SAE, or phone 086 77 3020. Also, please note that cars must be left in the car park which is some 800 yards from the flying site. Support this meeting if you can and help it to become an annual event.

Top left: Ron Randall of Coventry made this fine Malmström 'Tom-Tit' triplane from plans in May 1943 Aeromodeller. Top right: Two Wrens seen last year at Old Warden Vintage Weekend, built from plans in September 1939 Aero Modeller; unfortunately we have mislaid the builders' names... Left: Bill Dean winds the prototype KK Gipsy in the 1949 Wakefield Trials. Who is that holding the model? Below: Bill Dean also designed the handsome 23Inch AM Cabin Duration Model, described in the August 1941 Aero Modeller. This version is held at Old Warden by an unidentified enthusiast.



It's enough to give you...

THE PIPISTRELLE

Don't let the thought of 'twins' drive you bats — build one of these and enter Charlie Newman's fun contest

AS A FOLLOW-UP to his article on twin rubber scale models in the September 1985 issue of *Aeromodeller*, Charlie Newman will be running a one-model contest for his Pipistrelle twin rubber sports design at Old Warden on the 7th September. Models should be built straight off the plan and fitted with commercial plastic props. Any props of 7 - 8 in. diameter will fit, but wooden or folding props will *not* be permitted.

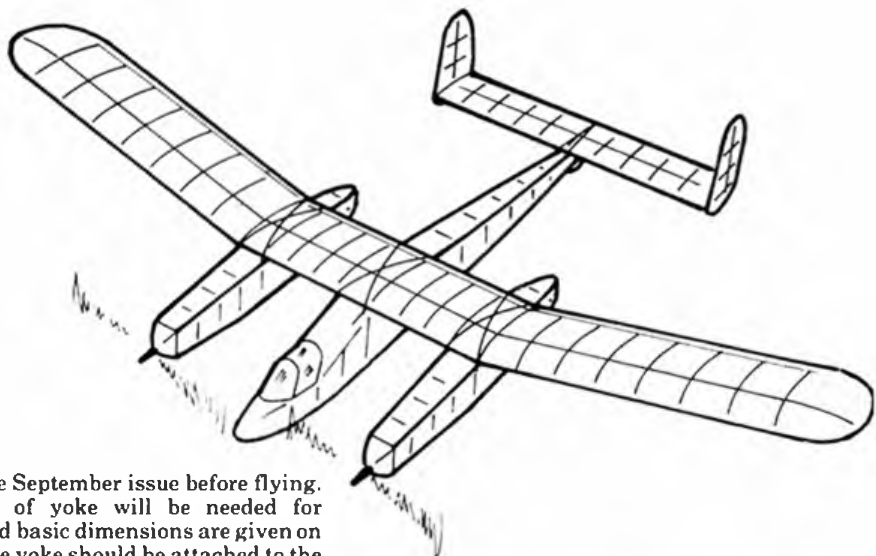
The contest itself will be a straight duration competition, scores being the total of three flights. There will be no rounds or maximums. In the event of a tie, the competitors concerned will fly off against each other at the end of the day. Prizes will be awarded down to third place. Entry will be on the day, at the entrance to the flying field by the control hut. The entry fee will be 50p.

Anyone who can turn out an Achilles or Ajax successfully will have no trouble building Pipistrelle. However, a few hints should help you on your way. Firstly, be careful to match sets of longerons for the fuselage and nacelles; choose medium grade stock that can be bent, as the lower longerons have quite a tight upwards turn that must be steamed in *fully* before building the sides or they will distort badly when lifted from the board. The same is true of the lower fuselage longerons. Build both fuselages and nacelles upside down over the plans when joining the sides. In each case, set up the parallel centre sections first and allow to dry thoroughly before proceeding. The rest of the airframe is very straightforward. Keep the tail light however, to avoid ballasting the nose.

Ideally, refer to the twin rubber scale

article in the September issue before flying. Some form of yoke will be needed for winding, and basic dimensions are given on the plan. The yoke should be attached to the winding jig of your choice (the wife??!). Before flying, check that the model balances level when viewed from the front, ballasting the higher wingtip if badly unbalanced. Load model with rubber and test glide. The original needed only a slight adjustment to the tail incidence. Start power flying once the glide is satisfactory and *both* freewheels have been proved to work as they should. Initially, try 150 - 200 turns and launch smartly. With both props turning the same way, Pipistrelle flies naturally to the left under power, but quite gently so. As you work up the turns, continue to check that the freewheels are working properly. This machine will climb well and get high, so the effect of one jammed freewheel will be a small heap of broken 3/32in. square. Pay particular care on this point.

The plans are available from SAMS Mail Order, 2 The Drive, Blackmore End, Wheatthampstead, Herts AL4 8LF; price £2.75 including post and packing. SAMS can also provide a 'Pipistrelle pack' consisting of plan, props, cup washers, rubber and lube for £6.18 inclusive.



Straightforward construction and attractive lines are shown in the heading drawing and underside view, above.

Back issues of September '85 *Aeromodeller* are still available from ASP, P.O. Box 35, Wolsey House, Wolsey Road, Hemel Hempstead, Herts HP2 4SS.

Anyone requiring further information re the contest or the Pipistrelle itself should contact Charlie Newman at 37 Crown Road, Wheatley, Oxon OX9 1UJ, or phone 086 77 3020.



Plastic props only are permitted for the Pipistrelle competition. Balance them carefully - it makes all the difference...



A simple yoke takes the strain out of winding. Long nacelles allow a reasonable amount of rubber and thus good duration.

FROM THE HANDLE

A variety of Stunt topics investigated by Claus Maikis

New kit

We call America the country of unlimited possibilities. Where else do you suppose a manufacturer would offer a new control line stunt model kit, and a competitive design at that! The SIG company, well known by now for their faithful support of the more serious flier, have produced a line of up-market kits, including the Twister (which I rate as the best profile model in current production), the Chipmunk, and many others. Obviously the success of these kits has encouraged SIG to go one step further, and the announcement of this modern stunter is the result. Judging from the specifications this should be an airplane suited to the latest trends and aerobatic requirements.

Designed by Mike Pratt, the model has a wingspan of 60ins. and is intended for .40 to .60 engines. The picture shows a conventional shape with turtle deck, similar in appearance to Marc Lavalette's Panter, for instance. The kit features modern construction with foam cored wing and foam stabilizer. A lot of thought must have gone into the design. There's a most complete hardware package including such elitist items as a graphite pushrod, adjustable lead out guide and metal control horns.

Never would I have imagined that a manufacturer would bring out such a kit, these days! It sells for seventy-six dollars, which at first glance seems quite a price. However, if you look at the price of similarly-sized models - and considering that R/C models will probably sell much better - that price is surely acceptable. If the model fulfils what the kit promises, we will end up with an airplane which can satisfy the greatest ambitions of the dedicated aerobatic pilot.

Almost forgot to mention the name. How about *MAGNUM*!?



This picture: Elegant lines of the Magnum, SIG's new stunter. Will we see it on sale in this country? Below: the kit of the future? Absolutely no effort required - at any stage. . .

Make your (engine) choice

In recent years, engine choice has become a more dominant aspect in stunt flying. There was a time when this didn't give us headaches. Any of the larger capacity examples were acceptable. While the Foxes and Maxes were popular, a wide range of other makes was available, even if not all were considered by stunt flyers. Engine choice was no problem.

The situation has changed. The market offers a wider than ever choice of excellent products. Alas - the number of engines suitable for control line aerobatics is decreasing steadily. It's interesting to see a trend among top flyers - who usually demand high technology - to turn their attention to twenty-year-old designs. Clearly modern technology doesn't always follow common sense; instead, it seems to be subject to the fashion of the moment! The masses want to have the engine of the world champion (R/C, that is!), and the manufacturers hurry to satisfy this

demand. Now everybody is proud to possess an engine he really doesn't need! The engine which is really needed - isn't produced. That's our dilemma.

Many different types of engines have been tried in recent years. Some have been used with considerable success, even at world championship status - remember Bob Hunt and his OS 40 FSR? What the enthusiasts concerned did to achieve these results (extensive modifications to the engines, only feasible for master machinists to carry out) never became generally known, and their victories caused a boom which the engines never deserved. Only slowly does it start to dawn what we stunt fliers should look for.

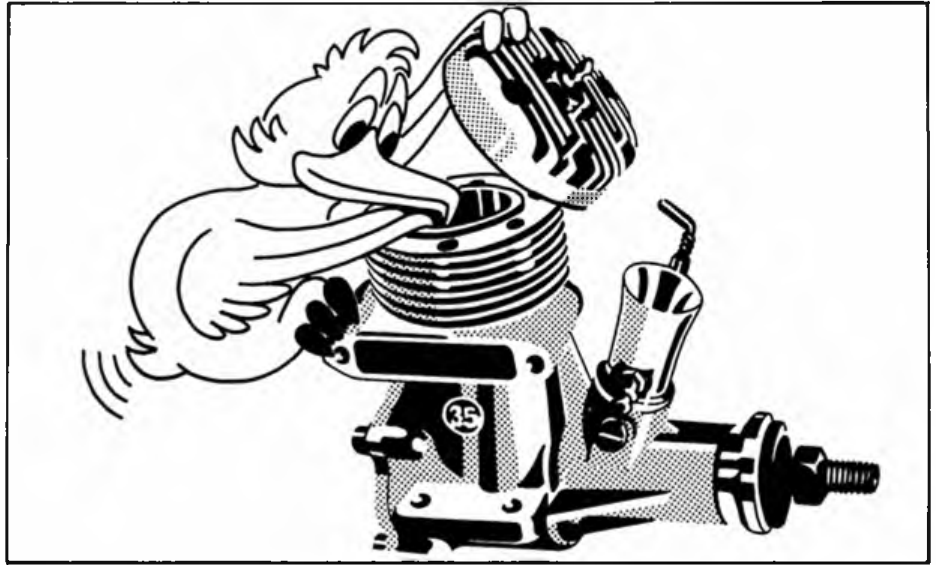
This trend has been in existence for about as many years as the Super Tigre G21/46 has been used. When it became a popular stunt engine it was well beyond its best years (it was born around 1962). The same is true with the Super Tigre ST 60. I had built my first ST 60 ship in '75, and the current trend among American top flyers in using this engine would appear to be pure nostalgia; the ST 60 appeared in '64.

When there are innumerable powerful brands on the market, there must be a special reason why stunt fliers prefer a certain make. Naturally, one criterion is power. But since there are much more powerful engines than the Super Tigre, this cannot be the prime reason. Much more than in other modelling categories, weight is an important factor. There is no need to explain this! But what I think is the most important aspect is the running characteristic of the motor. I suppose that every possible engine on the market has been tried. When a preference for just a few examples has developed, they must have something in common. Many an engine tuner has tried the more modern engines. When he had arrived at the demanded level, he'd almost always gone the same way as the others. The key to success seems to be modest port timing.



It is my own experience which leads me to this way of thinking. Another with the same view is Stan Powell of America, who expressed his ideas on this topic in the 'Stunt News' newspaper many years ago. Recently, some correspondence with Tom Dixon (he's one of the better aerobatic pilots in America) brought up some concrete results. Tom did a lot of work with the new OS FP series engines. What he found out worked with a few other makes too. Tom increased the transfer port timing, but this is not the answer in itself. What must be done is to *decrease* the difference in timing between exhaust and transfer ports. 10 to 15 degrees should be acceptable. If the difference is greater, the engine will 'run away' as Tom puts it, i.e. after two-stroking it won't go back to a four-stroke. For example, the new OS 40 FP has a difference of 26 degrees (the transfer port opens 13 degrees after the exhaust port has opened). Tom suggests cutting off the top of the transfer port(s) by about half the difference between exhaust and transfer ports. Personally I don't feel very competent about this kind of work, since (according to Tom) it boils down to grinding away 0.015 ins! I'd prefer to have it done by an engine expert; but if you know somebody who can do this, engine selection might be easier for you.

This reminded me of some experiences with different motors. Among my collection there was an HP 40 and an OS 40 FSR, too. I never liked these engines. They didn't start as well as my ST 46, and they didn't run as smoothly. Some of our Austrian friends have been flying the HP for many years now. Performance is adequate, of course - but the sound! An offence to my musical ear! Recently, my friend Geza Egervary has tried the Como 51. This engine seemed to be an excellent choice for stunt flying; it is powerful, of compact size (not much bigger than the ST 46) and is light for a 50 (it weighs 310 grams). This engine has been tested by Mike Billinton (*Aeromodeller*, April '85). If I understand right, Mike reports some 'ragged' running and difficulty with setting the needle for our required speed range. Now Mike had the new Schnuerle version. Geza Egervary has the 'traditional' crossflow type. Geza's engine has a 5mm diameter venturi (Mike's was 4.4mm). Geza confirmed the ragged running; actually, his engine just *wouldn't* run slowly. If he opened the needle to get an acceptable lap time, the engine died. It is in my workshop now for some test runs with different venturi diameters. Anyway, some thoughts arose concerning port timing.



While on the subject, I was curious enough to check a few motors. In turn they were mounted on my test bench, with ripped-off cylinder head and back plate. A degree wheel and a strong pocket lamp helped to measure port timing. I'd like to add that my method isn't absolutely correct; but when I compared my results with some older Peter Chinn engine tests, I came out within one or two degrees. I think that's close enough for comparison purposes. While the results show that port timing is not the *sole* influence on running characteristics, these figures surely help in classifying the engine 'to be or not to be' a good stunt engine.

The measured results are interesting. It is obvious that all the engines which are well accepted among stunt fliers have one thing in common - a small difference between exhaust and transfer port timing. The more popular engines have a more moderate induction period, too. With the exception of the Fox 35, all good aerobatic engines have a difference between exhaust opening and transfer opening of no more than eight degrees. This bigger the difference, the less likely the engine is suitable for our purpose. This may explain Geza Egervary's problems and Mike Billinton's findings with the Como, for example. Tom Dixon thinks that this is the key feature which makes for a good stunt engine. He says his engines which were modified to this end, with enlarged transfer ports don't behave like Schnuerle engines any more, and they don't sound like them either!

As I mentioned before, an engine expert may turn a half-way suitable motor into an outstanding stunt engine. But that doesn't help the average stunt fliers who need good aerobatic characteristics right out of the box. I must admit that I prefer engines that will do this, too. To prevent an unnecessary expense one should at least partly know what to expect from an engine. This is the point where I have another request to make of Mike Billinton. Mike, can you please add the port timing figures to your excellent reports? I feel unable to buy engines just to measure a few angles and then to realise: oh, it's a racing engine!

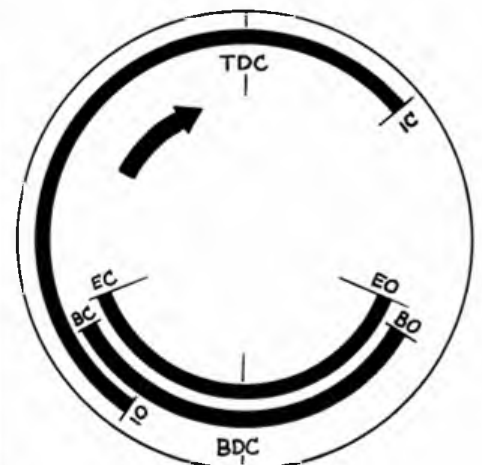
A noise annoys

This is an old title, taken from *aeromodeller* some twenty years ago. Since the topic isn't obsolete today, I've run a few tests using the new OS 40 HP engine. By lucky coincidence I was able to check this engine with the original muffler, and to compare it with other engines. The new OS mufflers are

Below: A sample timing disc, that of the ST46. EO and EC mean Exhaust Opens and Exhaust Closes; BO and BC mean Bypass (i.e. transfer) Opens and Bypass Closes; IO and IC mean Induction Opens and Induction Closes. TDC and BDC are, of course, piston Top Dead Centre and Bottom Dead Centre.

Engines for stunt: Port timing in degrees

	Induction	Exhaust	Transfer	Difference
Fox 35	169	132	118	7
OS 35	174	120	100	10
OS 35 FP	178	140	118	12
HP 40	200	136	120	8
Enya 45	188	132	118	8
OS 40 FSR	195	144	120	12
OS 45 FSR	195	144	124	10
ST 46	186	136	120	8
Merco 49	180	134	110	12
Como 51	196	148	124	12
ST 60	190	136	120	8



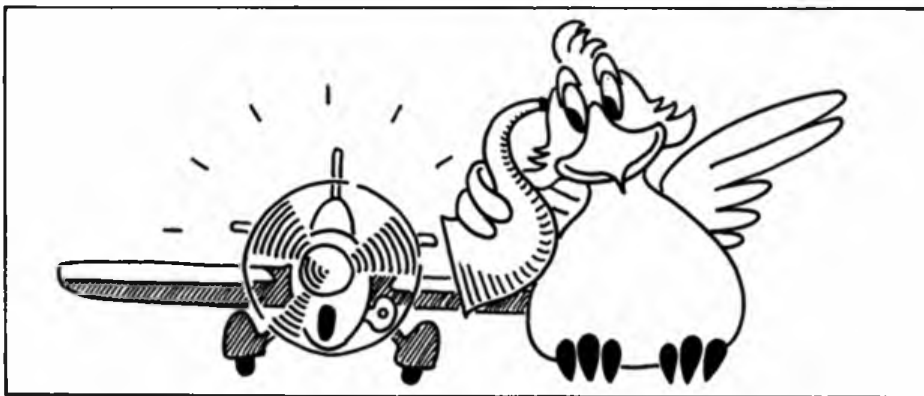
cleverly designed items. There's a basic body which consists of a front and rear part. Both are held together by a long bolt. The rear part can be rotated to point the exhaust pipe in any wanted direction. If you're concerned about noise, you have the choice of fitting an extension which increases the muffler volume considerably. In addition, there's a perforated disc which fits between the front part and the extension. A second, longer bolt holds everything together. The muffler cannot be called elegant. The aesthete may not find it an easy task to mount the muffler - especially in its long version - on his motor, and thence his aeroplane! Even when this barrier has been overcome, there's still the weight. Weighing that muffler turned me pale. 72 grams for the short version and a full 94 grams (gasp!) for the long unit isn't exactly friendly towards aerobatic models...

In order to get an objective result, the engines were tested several times and compared with other motors. Testing on the bench may not be ideal, since the results cannot be compared with official results which are measured with the airplane one metre from the ground. Nevertheless, a 'bench' comparison test is better than no test at all. For my purpose I took an OS Max 35 with original silencer, and the OS 40 four stroke engine. To be precise, the sound level was measured from two distances. Perhaps it's not generally known that noise level is influenced by the propeller, airframe, cowling, method of mounting, and so on. This means that a comparison made at close range may give different results than one measured at a greater distance. Here, the measurements were taken at distances of one and seven metres. To get realistic results the engines were operated at 8000rpm. That's about the speed we normally use, and it's where the four stroke/two stroke break takes place. The results were quite interesting:

Silencer	dB at a distance of	
	1m	7m
OS Max 35 original	94	71
OS 40 FP short version	90	74
OS 40 FP long version	88	71
OS FS 40 none	86	71

To get an idea of how much power the silencer will absorb, another test was carried out. I ran my OS Max 35 with original muffler, and the new OS 40FP with its muffler in

Right: Component parts of the new OS silencer, showing the perforated baffle, extension sleeve and alternative assembly bolts. Below: music is in the ear of the beholder...



short and long configurations. The quoted figures were obtained with two different propellers in order to keep the revolutions in a comparable range. Each figure is the best possible result. Essentially I expected the long silencer to absorb more power - after all, the engine is quieter. Surprisingly though, I didn't notice any performance difference. Of course, this means that the long muffler is the recommended choice. If you can afford the additional weight, you should use it.

One additional problem arose during testing. My own engines have a stunt venturi while the OS 40 FP had to be checked with the throttle valve fixed in the open position. You'll have to forgive me when I don't produce an extra venturi for each tested motor! To find out any possible difference between these two types of carburettor, we first measure the diameter, which is the same on both engines. Sub-

tracting the spraybar area, my own venturi has an open area of 22mm². For the R/C throttle, the figure is 16mm². Then a comparison test is run:

	Venturi	Throttle
OS 40 FP	10600 rpm	10600 rpm
11 x 6 prop		

Interesting, isn't it? With the smaller venturi area the engine still gives the same output as with the larger throttle area. This doesn't indicate a well shaped carburettor... Anyway, this test told me that other test results were not influenced by carburettor area and shape.

I'm still waiting for the day when the final *real* test can be run - in flight! Last winter a model was built which will serve as a 'noise' test bed for various engines. As this is written, we are at the end of February, and the only thing which has been tested so far is the weather. Results; *prohibitive!*



Coming soon...



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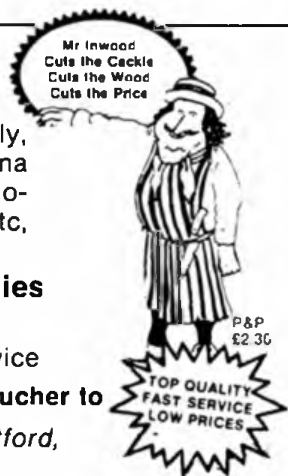
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Out of the Archives

From time to time we dip into Aeromodeller's files to come up with the unusual, the quirky and the mind-boggling.



THIS SUPERB R/C Franklin Sport biplane, which dates from the mid-sixties, was the work of Norman Scuderin - a Cleveland, Ohio enthusiast who needs no lessons in constructional technique. This was also the opinion of the judges at the 1965 Buffalo R/C Conference, for the model gained the premier award in the scale category there.

How Norman came to build the Franklin Sport is illuminating. His account may well cause engine collectors to weep, though...

"To be completely scale with my latest effort I wished to use a scale engine, rather than a dummy engine built around a standard two cycle model engine. This limited me to the use of a Morton M5 which is a scale model of the La Blond five cylinder radial. I was lucky enough to get two of these engines, one new and one used. The used

engine will be used for spare parts. Now with the engine decided upon, I began a search for a suitable aircraft that used the La Blond engine to model.

"In checking several 1930 vintage aircraft at various airports around the state, it was found that the Morton engine resembled the Velie M5 engine much more closely than the La Blond that it is supposedly modelled after...so I began to search out a Velie powered plane to model. The best drawings I could find were of the Franklin Sport, published in the April 1963 issue of Model Airplane News. All I had to do was come up with a set of model drawings..."

Longerons and wing structure were beefed up slightly to suit a flying model, but fidelity to scale was retained as much as possible. Aerofoil sections were unchanged;

and struts and flying wires were fully functional. Rigging the model, by means of all those turnbuckles, reportedly took several hours. Ailerons were actuated by a scale torque tube and cable system, and even the windscreen attachment clips were as per full-size. Weight of the uncovered model was 5½ lbs; one wonders if this might have been too much for the Morton M5.

If it is permitted to criticise such a masterpiece of the builders' art, it might be said that there seems to be little flexibility in the structure; any other than featherlight landings could have meant considerable work afterwards - re-rigging, if nothing more serious. But did the craft ever take the air? Detective work proceeds.

And oh! for more photographs of this calibre...



MIND THE LINES

with
Andy Brough

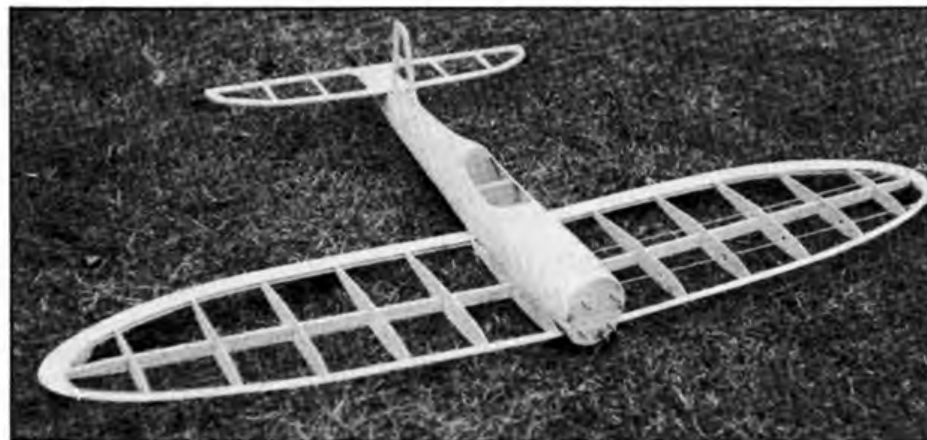
In April I left you all minus a column for a couple of months; well, that didn't really happen, of course, as Ron Prentice and I arranged to keep the flag flying, or in our case the lines taught! Now you've got two people to write to, so with your winter projects complete how about some details and pictures, news of events, and so on...

As for myself, I managed to find my balsa knife; and the first subject for its attention was the aeroplane I learnt to stunt with - the 'Peacemaker'. Although not vintage by definition it's certainly classic in design and performance; and there are countless people who, like myself, learned to fly manoeuvres with it. I remember when I built it, so determined was I to learn to fly the Novice Schedule, that expecting write offs or at least major repairs I cut out the parts to make three models; but in the event only one was built and it survived! Its unusual strong but light wing construction, with full depth 1/8in. spar and an effective reflex section as a result of large fixed flaps provided an impressive stuntability without the complication of coupled linkages. The number of engines that had been fitted during the life of my Peacemaker (McCoy 19, Thunder Tiger 25, PAW 2.5 and OS 25R/C) and the 3-line control experimented with had all taken their toll. However the faithful PAW 2.5 is now re-installed, and the Peacemaker is once more in pristine condition and ready to go. The design, by George Aldrich of 'Nobler' fame, appeared in the February 1958 *Aeromodeller*. (Plan still available from APS as CL687, price £3.35 plus 55p postage).

The majority of my balsa whittling time has been spent building a Ron Prentice (who?) Marlin kit. This is definitely a model for those who like building, especially when it gets to planking the fuselage. I won't mention any more as I am writing a review to be published shortly, but the photo should whet your appetite.

Other models built during your columnist's rest period were the Hepcat for two channel R/C, Cardinal F/F, a Slow Open Power model (for an AM25) and a Simplex 60, also F/F, with Dunham Viking spark motor. Haven't we been busy! Hope you have, too.

Nearly built - the Mercury Marlin from a Ron Prentice kit. Lots of fuselage planking, but the elegant model is worth the effort.



Nats, 1948

Reading Ron's comments on his early days of flying and the first Gold Trophy event prompted me to look up the Nationals report of 1948. This event was held at Sywell Aerodrome, Northampton and attracted some 1700 entries with 67 in the Gold Trophy, although a combination of the experts of the day and a tricky wind thinned this out to less than a score (that's 20, for the benefit of the metricated types!). All the famous names were there: Henry J. Nicholls (of Mercury fame), Dennis Allen (AM and, later, Merco), Mike Booth, Ron Moulton and Pete Cock with his Kandoo (I've heard that name somewhere before...).

The schedule was simple in those days, consisting of take off, level flight, climb, dive, wingover and - I think - inside loop.

Let's see what D.J. Laidlaw-Dickson had to say about Mike Booth's flight: "Mike Booth of the Zombies followed with the 'Barge' powered by an ED Comp Special, and treated spectators to the full works, including inverted flying and figure eights in addition to minimum requirements. After this hardly an elimination passed without the entrant putting in some extras. By the time some dozen had been through their paces there was a complete lack of enthusiasm amongst the outsiders who sadly put away their models, confident that they were outclassed, and sat down at the feet of the masters, and, unfortunately in all too many instances on their lines in the absence of any official 'line pits'." (a case of Mind the Lines: ACB).

Pete Cock's winning model, the now famous Kandoo has often been described, but the flight itself rather less so: "A shock headed bespectacled young man, evidently



Heading photo: Charlie Crawley's delightful Mills-powered Veron Speedee. Above: New from Dunham, the 'replica' Oliver Battleaxe.

conscious of the crowd, his flying stance was awkward and his ED Comp. Special powered model (actually an ED Mk II, I believe: ACB) came in at once. Re-starting, he came again and seemed to shed his gawkiness with a remarkable display of normal and inverted flying including five inside loops and two outside loops from the inverted position. It was noted that his hand was not turned for inversion but controls reversed with cross lines, a style approved by the best American Masters. Marking was difficult as in all he had several stops and re-starts so it was not until some time after completion of his set pattern that it was realised that he had passed Dennis Allen with 385 points, and become the first British Control Line Champion." A far cry from the last Gold Trophy winning flight I saw; that of Tony Eifflander in 1985 with his PAW 35 powered model, which incidentally would not look out of place in a gathering of vintage stunters. Its clear tissue elliptical wings and 50s appearance make it stand out as a beautiful model (we know - it's in this issue! Ed).

Anyway, I think Pete Cock was a braver man than me as I fly my Kandoo with fear and trepidation, even on a calm day.

Model of the month

One of Dick Maybury's hopes is to get as many folk as possible flying speed, so he has been searching for the ideal trainer. Maybe I have found the answer whilst looking through the back issues, for near to the '48 Nats report I spotted Walter Musciano's Tyro Trainer speed model. Not perhaps what Dick had in mind, as the Tyro is a biplane!

Walter designed it for his cousin as a

TELESPARK

continued from p.406

firmly fixed, which improves charging, and the bracket also supports the supply pipe to the motor (see photograph). The excess pipe to the motor is formed into a neat coil on the right-hand side of the motor pylon.

Trim

Ensure that the centre of gravity is as

shown and use plywood shims under the tailplane to obtain a flat glide with a slight right turn. First power flights should be on a gas charge only but with the motor set to give a run of about 1½ minutes on the propeller described.

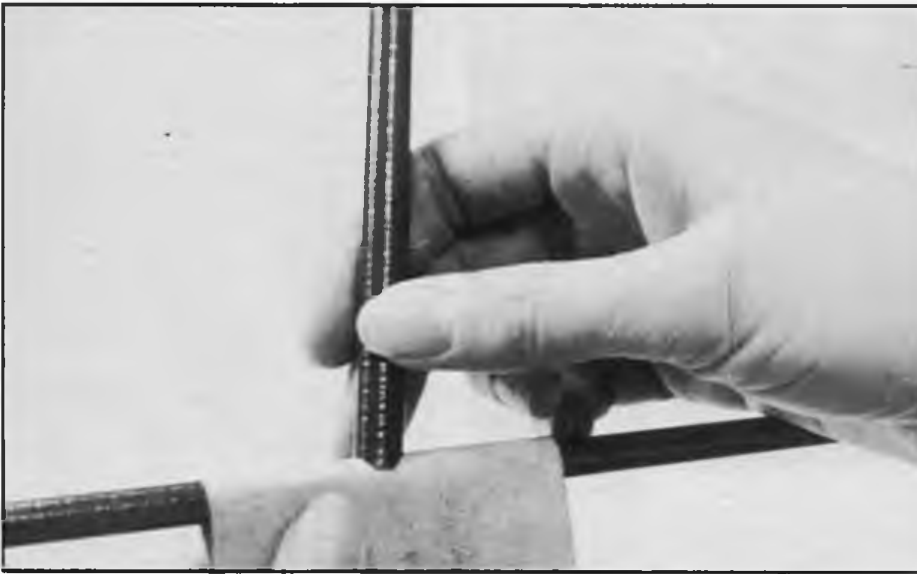
Final trim should be right hand circles of about 60ft on both the climb and glide.

Future developments

The layout is ideally suited to small folding propellers and I feel it could be lightened considerably, especially for a model meant for fly-offs. My experiment-

ation has been slowed by the need to work on A/2s for the World and European Championships; however, my friend Angus Tennant has built a folding-prop model identical in planform which is covered in mylar and weighs considerably less than the figures quoted here. I have witnessed this model fly and it is very impressive...

Photos from top left, clockwise: How to ensure a good fuselage/pylon fit; alternative Telcotank layout (filler valve is protected by angle of tank); normal tank mounting; close-up of modified filler fixed to tank top with brass bracket.



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What's on... lots more's on!

21-22nd June THE OXFORD M.F.C. FREE FLIGHT RALLY.

At Port Meadow, Wolvercote, Oxford. Classes A1 Glider, Coupe d'Hiver in rounds starting at 10.00am. Hand Launched Glider and Vintage - no rounds. N.B. Vintage is rubber and glider combined, span limit on rudder 36in. No power models to be flown. Contact: Andrew Crisp 30 Portland Road, Summertown, Oxford.

21-22nd June ASP SCALE WEEKEND

Venue: Old Warden Airfield, Biggleswade, Beds. The scale pilgrimage! Contact: 0442 41221.

**22nd June
BLACKBURN & DMAC SUMMER FLY-IN**
Scale/semi-scale or unusual model rally. Excellent prizes. Entry £1.00. 10.00am start. Venue: Wifton Country Park Blackburn. Contact: Michael Winder, 27, Belgrave Rd. Darwen Blackburn Lancs BB2 2RP.

**22nd June
PETERBOROUGH MFC.**
Class: Diesel A' Combat. Venue: The Embankment, Peterborough. Contact: Mick Taylor. Tel: 0733 204484.

**28/29th June
THREE SISTERS C/L GALA**
Comps: FAI T/R, Goodyear, Stunt. Class 2 Goodyear, Novice Stunt, Diesel Combat (Mainstream Trophy), Vintage T/R A & B, FAI Combat, Open Speed (inc. Jet), Mercury Midge Speed. Contact: John Noble. Tel: 061 790 4056. Events start 12.30pm Sat. 9.00am Sun.

**29th June
PAISLEY TROPHY**
Class: Open F/F. Venue: Newbigging, Nr Carnwath. Contact: Ron Sabey. Tel: 0698 429170.

**29th June
C/L AEROBATICS, OPEN AND NOVICE**
Includes the Chiltern Cup. Venue: Slip End, Luton. Contact: R. Landon. Tel: 05271 3472.

**6th July
SMAE INDOOR ALL-IN INDEX EVENT**
Venue: Cardington. Contact: F/F Tech Committee, via 0533 58500.

**6th July
SAM 35 WAKEFIELD ANNIVERSARY EVENT**
Venue: Barkston Heath. Contact: Colin Watts on 021 373 3029 for confirmation and news of other comps besides 40z and 80z Wakefield.

**6th July
PETERBOROUGH MFC**
Classes: C/L Stunt and Midge Speed. Venue: The Embankment, Peterborough. Contact: Mick Taylor. Tel: 0733 204484. SAM 35 Rules.

**6th July
WALSALL M.A.C. VINTAGE DAY**
Comps: R/C Assist and F/F. Venue: Walsall Airport, Bostly Lane, Aldridge, Walsall, West Midlands. Contact: Jim Shelley. Tel: 0922 28553.

**6th July
ASP MODEL HELICOPTER FLY-IN AND SILENT FLIGHT DAY**
Venue: Old Warden Airfield, Biggleswade, Beds. Contact: 0442 41221.

**12/13th July
C.L.A.P.A. CHAMPIONSHIPS**
Comps: Open Novice Stunt, Profile and Scale Carrier, C/L Scale (C.L.A.P.A. members only). Venue: Essex Show Ground, Nr Braintree. Contact: Pete Burgess. Tel: 0376 516881. Camping available. Pre-entry from Pete at 42 Blunts Hall Road, Witham, Essex CM8 1LY.

**12-13th July
YORKSHIRE MODELLERS' WEEKEND**
Comps: Mini Goodyear (separate Junior prize), Class A T/R, Diesel Combat. Venue: Newby Hall, near Ripon, N. Yorks. Contact: J. Holman. Tel: Harrogate 866098(W). Ripon 2898(H).

**13th July
SAA C/L TEAM RACE**
Comp: Open Goodyear, Class II Goodyear, FAI. Venue: Newhouse. Contact: Neil Munro. Tel: 0875 340026.

**13th July
NORTH LONDON MFC VINTAGE DAY.**
R/C only (no free flight) Vintage character models Barbecue will be available - bring own food. Contact: Richard Barley, 44 Orchard Avenue, Berkhamsted, Herts HP4 3LS.

**13th July
MORLEY MINI & VINTAGE MEETING**
Sponsored by Finlux T.V.
Events: Coupe d'Hiver and A/1 Glider; P30 Rubber Duration; Silent Vintage (no Power models) with Rubber models restricted to Wakefield size or less, Gliders to Nordic or less, 250ft. line, Dart powered Slow Open (plain bearing diesels only up to 0.8cc). Venue: Heath Common, near Wakefield. Contact: Steve Fielding. Tel: 0274 493080.

**13th July
S.E. AREA R/C SCALE DAY.**
Ardingly, Nr Haywards Heath, Sussex. Details S.A.E. to N. Couling, 7 The Green Walk, Willingdon, Eastbourne, East Sussex.

**20th July
SMAE INDOOR ALL-IN INDEX EVENT**
Venue: Cardington. Contact: SMAE Indoor Tech Committee, via 0533 58500.

**20th July
WHARFEDALE CLASS A COMBAT**
Venue: Dewsbury. Contact: Jeff Smith Tel: 0532 663432.

**20th July
SHUTTLEWORTH MODEL GROUP FLY FOR FUN OPEN DAY.**
Venue: Old Warden Aerodrome Biggleswade, Beds. SG18. Gates open at 9.00 am. Contact: M.S.F. Staples 11, Whitehill Road, Cambridge CB5 8LT.

**20th July
BLACKPOOL AND FYLDE RCMS R/C SCALE FLY-IN**
Low-key competition. All scale models welcome. Venue: Club site, next to Blackpool Zoo (bring the family!). Contact: Chris Bromley. Tel: Blackpool 25080.

**27th July
F.A.C.C.T. BARCS LEAGUE**
Comp: R/C Thermal Soaring. Venue: RAF Weston-on-the-Green. Contact: N.G. Webb, The Bungalow, 13 East Street, Fritwell, Oxon OX6 9PX. Pre-entry £2.00 plus s.a.e. plus frequency details.

**27th July
ABERYSTWYTH FLY FOR FUN EVENT**
Venue: Plas Crig playing field. For full details contact: R. J. Edwards. Tel: 0654 2882.

**27th July
RAF ALCONBURY 1986 AIRSHOW.**
Full-size flying programme. Contact Public Affairs Division, RAF Alconbury, Huntingdon, Cambridgeshire (Tel: Huntingdon 52131 ex. 2174/2125).

**27 July
OXFORD MFC DREAMING SPIRES F/F SCALE - SILENT VINTAGE GALA**
Comps: Open Rubber (15in span plus), CO₂, Power/Electric (max 1.5cc), Twin Rubber Scale and also Mass Launch. Vintage: Wakefield (Pre '51). Lightweight, Folding Prop, Lightweight Freewheel and Glider. Venue: Port Meadow, Oxford. Contact: C. Newman. Tel: 086 77 3020. Note: Absolutely no diesel/glow powered models permitted - other than those entered in the F/F Scale event.

**10th August
SMAE INDOOR FLY-IN AND TEAM PRACTICE**
Venue: Cardington. Contact: SMAE Indoor Tech Committee, via 0533 58500.

**10th August
THREE KINGS CARRIER DAY**
Scale and profile. Silencers essential. Contact: Derek Bird. Tel: 01-874 6394.

**August 16-17th
ANNUAL MODEL SHOW AT PLUMPTON RACECOURSE.**
300mph Dutch pulse jets, parachutists, planes, cars, boats, trains, traction engines, space rockets, junior comps, camping, live entertainment, helicopter rides, children's fairground, videos, bar, refreshments, lectures, special ladies entertainment, trade stands, etc. Contact: Dave Bishop, DB Sound, 17 The Square, Tatsfield, Nr Westerham, Kent TN16 2AS (tel: Tatsfield 77550).

**16-17th August
SCOTTISH FREE FLIGHT NATIONALS.**
Classes: FA1, Open Mini and Vintage. Venue: Newbigging, Nr Carnwath. Contact: Ron Sabey. Tel: 0698 429170.

**16-17th August
ASP VINTAGE WEEKEND**
Venue: Old Warden Airfield, Biggleswade, Beds. Vintage fliers - miss this at your peril! Contact: 0442 41221.

**23-25th August
1986 SMAE NATIONAL R/C AND C/L NATIONALS**
Venue: RAF Barkston Heath. Contact: SMAE, Kimberley House, Vaughan Way, Leicester LE1 4SE.

**24-25th August
NORTH LAKES RADIO CONTROL SOARING ASSOCIATION SOAR-IN**
Venue: Club site. Meeting place: Castle Inn car park, 8 miles north of Keswick on the A591. Insurance cover needed. Contact: D.S. Atkinson. Tel: Kirkbride 51822.

**24th-26th August
INDOOR WORLD CHAMPIONSHIPS**
Venue: Cardington. Contact: SMAE Indoor Tech Committee, via 0533 58500.

**30th and 31st August
INDOOR EVENTS FOR OPEN INTERNATIONAL AFTER WORLD CHAMPS**
Venue: Cardington Comps: EZB; Peanut Duration; Manhattan 4gm and 6gm; CO₂ Duration; Novice Pennyplane. No wire bracing of flying surfaces permitted in EZB. Also Houlberg Trophy for EZB (SMAE contest); and a Scale contest. All above comps on 30th August. The following on 31st August: F1D, 35cm and Open Microfilm; F1D for Aeromodeller Trophy (SMAE contest). Contact: SMAE Indoor Tech Committee via 0533 58500.

**7th September
STEEL TROPHY**
Class: F/F FA1. Venue: Newbigging, Nr Carnwath. Contact: Ron Sabey. Tel: 0698 429170.

**7th September
MEON VALLEY SOARING ASSOC. OPEN EVENTS. CROSS COUNTRY.**
Venue: Butser Hill, Petersfield, Hants. Contact: Ken Sapsed. Tel: 0705 453688. Entry fees: £2.00 non-members, £1.00 members. Frequencies: 35 Mhz, even numbers only, two sets of crystals.

**September 7th
SHUTTLEWORTH MODEL GROUP SILENT DAY**
at Old Warden Aerodrome, Biggleswade, Beds. All welcome but no I.C. engines to be run. Contact: M.S.F. Staples, 11, Whitehill - Road, Cambridge CB5 8LT.

**14th September
"TOWNER TROPHY" R/C Thermal Soaring.**
Golden Cross, East Sussex. Details S.A.E. to N. Couling, 7 The Green Walk, Willingdon, Eastbourne, East Sussex.

**14th September
C/L AEROBATICS, OPEN AND NOVICE**
Includes the Doug Blake Trophy. Venue: Slip End, Luton. Contact: Glen Alison. Tel: 0923 772675.

**14th September
ASP FOUR STROKE FLY-IN**
Venue: Old Warden Airfield, Biggleswade, Beds. Contact: 0442 41221.

**14th September
SMAE NORTHERN GALA**
Venue: Driffield (N.B. venue change from Lindholme) for F/F events. C/L events at RAF Dishforth. Contact: R. Hoff. Tel: 0742 732582.

**21st September
WHARFEDALE 1000 CLASS B T/R**
Venue: RAF Dishforth. Contact: Jeff Smith. Tel: 0532 663432.

**14th September
ST ALBANS MAC VINTAGE FLY-FOR-FUN DAY**
R/C or small free-flight. Venue: new club site at Bulls Mill on the A602 out of Hertford. 10am-6pm. Contact: Steve Payne. Tel: St Albans 34267.

**21st September
SMAE "SOUTHERN GALA" (SMAE Members only) at RAF Odiham, Hants. F/F, R/C Scale, Vintage F/F, Helicopter and R/C aerobatic. Details S.A.E. to N. Couling, 7 The Green Walk, Willingdon, Eastbourne, East Sussex.**

**21 September
SHEFFIELD JUNIOR 60 AND FLYING FIFTEEN COMP**
Flying Fifteen to SAM 35 rules. Any radio and engine may be used in Junior 60 comp. Venue: One mile from entrance to Rother Valley Country Park on A618. 10am start. SAM or SMAE insurance required. Contact: Dave Hanson. Tel: 0742 740316.

**21st September
THREE KINGS SCALE DAY**
C/L scale and Profile. Silencers essential. Venue: Old Croydon Aerodrome. Contact: Derek Bird. Tel: 01 874 6394.

**28th September
SOUTH MIDLANDS AREA BARCS LEAGUE**
Comp: R/C Thermal Soaring. Venue: RAF Weston-on-the-Green. Contact: J.H. Shaw, 'Alvere', Witney Road, Freeland, Oxon OX7 2HQ. Tel: 0993 891350. SMAE members only. Pre-entry £2.00 plus s.a.e. plus frequency details.

**28th September
1986 LYMPNE TRIALS**
Scale Rubber and CO₂ models of Lypmne Trials craft as described in Aeroplane Monthly. Miami rules plus precision. Venue: Watford Leisure Centre. 10am start. Contact: Butch Hadland. Tel: Windsor 855359 (W), 0628 72402(H). Event sponsored by SAMS.

**28th September
ST ALBANS MAC ELECTRIC FLIGHT FLY-IN**
Venue: new club site at Bulls Mill on the A602 out of Hertford. Contact: Albert Botterill. Tel: St Albans 59789.

**5th October
S.E. AREA SMAE "LONG MAN" SLOPE SOARING**
Details s.a.e. to A. Lawson-Wood, 4 Cumberland Walk, Tunbridge Wells, Kent.

**5th October
EASTBOURNE CLUB VINTAGE DAY (R/C only).**
Golden Cross, East Sussex. Details from S. Coombs, 7 Petworth Place, Hampden Park, Eastbourne, East Sussex.

**5th October
SOUTH BIRMINGHAM VINTAGE C/L RALLY**
General flying for all SAM 35 and SMAE members. Fun comps to SAM 35 rules. Presented by South Birmingham MFC, SAM 35 and University of Birmingham Model Engineering Society. Venue: Rubery Hill Hospital, near Birmingham. Contact: Peter Martin. Tel: 021 444 7964.

**19th October
PETERBOROUGH MFC**
Class: Diesel A' Combat. Venue: The Embankment, Peterborough. Contact: Mick Taylor. Tel: 0733 204484.

**19th October
FAI RALLY**
Venue: Driffield for F/F, RAF Dishforth for C/L. Contact: D. Davitt. Tel: 0532 675433.

**16th November
FALCONS GALA**
Venue: Driffield. Contact: R. Peers. Tel: 0270 80893.

**1st-6th January 1986
1986 MODEL ENGINEER EXHIBITION**
Venue: Wembley Conference Centre. It's not too soon to start thinking about entering a model for one of the competition classes at the M.E. Exhibition. Let's see plenty of flying model aircraft - scale and non-scale - to augment all the other representatives of the modellers' craft. Watch for announcements in Aero-modeller...

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Cardinal 35".....10.49
Deacon 52".....18.99
Sky Skooter 48".....17.49

MERCURY GLIDERS

Tiger Moth.....14.99
DPR
Rare Bird.....7.50
Hypercub.....11.95

New 1986 Aero Models/R.C. Handbook.....1.85
Basic Aeromodelling.....5.95
Above inc P&P
Arden Units.....2.00
6" Balsa Props.....0.85
30 Sec. Timer.....6.95
Control Line Handle.....1.92
Control Line Connectors (2).....0.54

APPENDIX - Links to the plans

The original issue comes with two free plans (Telspark, Natsneez Junior) printed front/back on a pull out banner of four sheets. The banner is not included in the document.

Freebird 3 by Tony Eifflander

CL Stunt

No free available plan found

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Telspark by Steve Philpott

FF Power CO2

https://www.hippocketaeronautics.com/hpa_plans/det...

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Natsneez Junior by G.F. Elsegood

FF Power CO2

https://outerzone.co.uk/plan_details.asp?ID=3302...

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The Tyro Trainer by W.Musciano

CL speed model (1948)

https://outerzone.co.uk/plan_details.asp?ID=2204...

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