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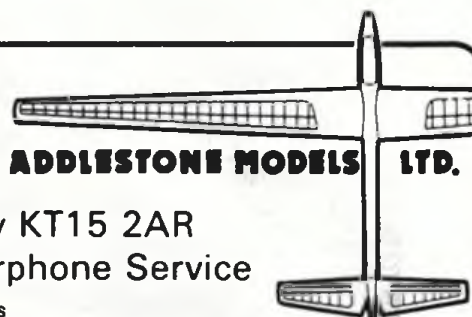


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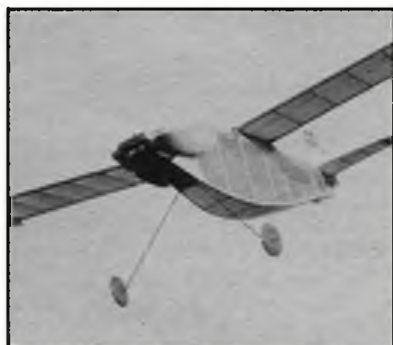
AERO MODELLER

March 1985

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Cover:
The P-51D 'Mustang' has always been a favourite with modellers, not only for its basic silhouette which combines that unusual combination of grace and power, but also for the many variants produced with attractive markings and colours. This Modelhub profile scale control line version (reviewed page 116) was built by Ian Peacock and the airbrushed finish created by the simple use of a few home made stencils

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March 1985

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HANGAR DOORS

Price increase next month

No one likes a price increase – we're unanimous on that one, to be sure. *Aeromodeller* remains Britain's only regular monthly general aeromodelling magazine. Others jump gaily on the bandwagon of radio control, but only *Aeromodeller* and *Argus Specialist Publications Limited* maintain a regular publishing presence in a field which has long since ceased to offer any publisher a positive financial return – its a service to a readership as part of a larger modelling scene.

Magazines gather revenue from both cover price and advertisement space sales and no general newstand magazine can maintain a cover price close in current terms around the £1.00 mark without healthy advertisement support and we're

sure it will not have gone unnoticed that the general emphasis of our model trade on the radio control end of the aeromodelling hobby has left *Aeromodeller* magazine sparsely supported in advertisement terms – which in fact emphasises that general aeromodelling is now the minority interest when compared to radio control.

Faced with this situation there is a limit to how much money any publisher is prepared to metaphorically pin to every copy he sells and for this reason, from April '85 edition, *Aeromodeller* will cost £1.85. Yeauch!

Expensive yes, but we will at the same time be giving more for your money and April edition will increase from 52 pages to 68 – a bigger reading package with which we plan to keep you well entertained – hang with us for April issue and see for yourself!



everyone. If our French is up to it, it also has working R/C aircraft demonstrations (helicopters). Could be quite an outing, it's also pretty popular having had over 120,000 visitors last year... Now about that club outing!

Jumble ... Jumble

The Fleet Air Arm Museum at the Royal Naval Air Station, Yeovilton, Somerset, are all set for yet another of their Aero Jumbles. That in 1983 was such a success that this year it will be an *Aero Jumble Weekend* (27th, 28th April). The event takes place alongside the Museum so not only do you have the chance of buying selling or swapping anything with an aviation interest, but you also get to see the Museum for the same cost. Just some of the things on offer will be Aviation Books and magazines, aviation parts, relics, clothing, videos, models, kits, radio control, airband radios, hang gliders – last year someone sold a *Rutan 'Quickie' Q2* for £9,000 – get out your diary and make a date. If you want to sell, a stand (covered) will cost you as little as £25.00 for the two days – phone 0935 84565 to see if there are any left!

Alternative Power Source

Those of you who are members of *SAM 35* (Society of Antique Modellers, the society for active Vintage fliers) will already have this information from their own publication – but for others not so lucky ... The Christmas issue of *'SAM 35 Speaks'* had a very interesting article on an alternative fuel (gas) for CO₂ motors – Nitrous Oxide (NO₂). Apparently this gas comes in similar bottles to CO₂ and is used for making whipped cream! It is also known as 'laughing gas' and was used as an anaesthetic by dentists! The article describes some simple tests that were carried out to compare the two gases and although they were not conclusive, it did seem that NO₂ gave marginally more consistent runs and that the length of run was slightly longer (up to 25-30%) on the first three charges. This might not be a

fantastic technical breakthrough, but may well be worth following up with a few trials yourself ... NO₂ bottles are available from *Boots Cookshops*. Those interested in finding out more about *SAM* should contact their membership secretary, Peter Michel, 56 Lynwood Grove, Orpington, Kent. Membership for 1985 costs £9.00 (£12.00 for overseas members) and includes your subscription to their excellent regular magazine *'SAM 35 Speaks'*.

Calendar Dates

Aeromodeller is always happy to publish notices for competitions, exhibitions, fly-for-fun days, air shows – in fact anything that will be of interest to the aeromodeller.

What's On is a regular feature and is kept up-to-date and as accurate as possible. But please remember that 'going to press' is not an overnight affair, the whole operation takes several weeks, so let us know your dates as early as you can and we will do our best. We need to know at the minimum:

- 1) What is the event(s)
- 2) When it will take place
- 3) Where it will take place
- 4) Who is the contact person

Item 4) is most important, we will *only* publish events that have the name and address (or preferably telephone number) of someone who can give up-to-date information about the event. And if you spot a mistake don't just groan ... write or 'phone *Aeromodeller*, we might not be able to magically change what is already printed, but at least you will embarrass the Editor – who will hopefully be more careful in the future ... Clubs and Areas who send us their calendars often forget about the contact person – you may know its 'old Sid', but unfortunately the rest of us are not clairvoyant!

International Aeromodelling

The *FAI* (Federation Aéronautique Internationale) is the body that administers, controls and records all official sporting aviation international competition and records. One part of the



The indoor flying session at this year's Model Engineer Exhibition was as popular as ever. Not only were indoor models of conventional appearance demonstrated, but the audience (left) were invited to participate in 'paper dart' competitions! Below left, Reg Parham takes time off from lecturing to demonstrate this minute indoor lightweight.

French M.E.?

The *Model Engineer Exhibition* is over, you will have to wait for nearly a year before there is anything like it ... or do you? The *M.E. Exhibition* has lead the field for more years than most of us can remember and each year people travel from all over the world to visit and enjoy the wide variety of models and attractions it offers. Well, if you feel like travelling, there appears to be a pretty good French equivalent taking place in Paris in the Spring (30th March - 8th April 1985) – Why not treat yourself and the family to a Spring break and visit the *6th Salon International de la Maquette et du Model Reduit* 1985.

Like the *M.E.* it has a live steam track, boat pool, hundreds of models to see – something for





FAI has the responsibility for model aircraft and space modelling. Member nations of the *FAI* with interest in these, meet once a year in Paris to discuss international rule changes and competitions.

The last meeting was held at the beginning of December and was attended by several officials from Great Britain. There is at present a freeze on international rule changes (there is a four cycle and we are at present in the middle of this), except for those that may be clearly seen as affecting safety or are simply clarifications of existing rules. There were no proposals that would immediately effect the F/F rules, whilst in C/L: *FAI* Combat F2D must now use unspliced lines of a diameter no less than 0.385mm, these for safety reasons. There were a number of clarifications within the R/C and Scale rules. We will endeavour to cover the latter in a future 'Scale Matters'. There were in all some 16 pages of closely typed proposals dealt with! The year that rule changes proper come into effect will be 1989 so 1988 is going to be a busy year learning all the proposals that have been passed, but then forgotten for a few years! There was considerable discussion on the cost of entering World Championships so much so that the offer from the Netherlands to hold F3A (R/C Aerobatics) was rejected completely and that for F/F from Yugoslavia held in abeyance pending the organisers agreeing to a basic entry fee of £100. Talk of making the World Championships a three year cycle was firmly rejected in favour of keeping a two year cycle perhaps with some slight alteration to actual content, to accommodate the new World Champs classes of Pylon and Helicopter.

SMAE Snippets Handbooks and Rulebooks

All members should have received the Member's Handbook, explaining the

workings of the *SMAE*, its services to members, safety codes, insurance, achievement schemes, noise policy, display flying, frequencies, and giving an index of contest rules. If you've not had yours, first check with your club secretary, who is the vital link between the Society and you, and then write to the Leicester office, quoting your membership number and enclosing an A5-size s.a.e. Handbooks are free to all members.

As you can imagine, to cover control-line, radio-control power, R/C soaring, scale, free-flight and indoor contest rules together would require a pretty thick and unnecessarily expensive rule-book, so the various sections are separate. Each part costs £1.50, but, again, please remember the A5-size s.a.e. However, if you have a competition licence, rule books are free, which makes the licence even more of a good bargain. To save costs, please ask only for the part that interests you, and note that electroflight is included with the R/C glider part, and indoor non-scale with free-flight.

Well Done, BARCS

One of the final model aviation events of 1984 was the *Royal Aero Club's* awards presentation, in the highly-appropriate setting of the aeronautical gallery of the Science Museum in London in December. Along with medals and diplomas for people involved with ballooning, parachuting, aerobatics and gliding, members of *BARCS* were on hand to see their chairman, Chris Tompkins, receive the *FAI's* 'Honorary Group Diploma'. In the shadow of Alcock and Brown's *Vickers 'Vimy'* and under the pioneering *Gloster E 28/39* jet, *SMAE* Council members who had nominated *BARCS* for the Diploma for their services to R/C soaring, joined the rest of the *Royal Aero Club's* member organisations in congratulating them on their honour.

Small screen aeromodelling! Ulster Television have recently been filming for a modelling series to be shown on Channel 4 later in the year. Included in the programme on aeromodelling will be control line and radio control aircraft and, if the opportunity permits, free flight models. If the series proves to be successful it is hoped to have a follow-up series dealing with all aspects of the hobby of aeromodelling in greater detail.

Pictured left is Bob Symes, presenter of the series, interviewing Ian Peacock about his electric powered Piper 'Cherokee' (featured on the cover of the August *Aeromodeller*) and far left, the filming of a control line combat session. The latter experience proved to be a great test of the agility of the camera crew, but they were rewarded with a spectacular mid-air collision!

SMAE Videos

The *SMAE* has had a range of 16mm. films for a number of years which many clubs have enjoyed, and they are now beginning to show their age, thanks in part to the neolithic projectors and neanderthal operators using them. A stamped addressed envelope to the Leicester Office will bring you a list of the VHS videos on model and manned aviation subjects that are now available at a small hire charge from the Society as part of its membership service.

Contest Members' Newletters

By now everyone who had a 1984 competitor's licence should have received the first 1985 newsletter, which includes the contest calendar; as well as *SMAE*-organised events this covers a number of club, Area and regionally-run ones too. It is hoped that 1985 will see some commercial support for this publication, with one major company having offered to sponsor it already. If you have

missed your copy of the first '85 one, please quote your membership number when you write to the Leicester office to get yours. The absence of news from indoor and radio soaring technical committees is due to a human inertia problem, not to any censorship by the *SMAE* competition secretary, Kath Watson, if she does not get the information she cannot publish it.

Any Ideas?

If there are any topics or aspects of *SMAE* policy that you would like to see covered in these pages, please drop a line to the PRO, Martin Dilly, care of the Leicester office. Over the past year the Society does seem to have created a lot of confidence, and won the support of many of the everyday flyers who had perhaps not realised the extent of its work for them, but if you have any queries or suggestions that you think might be of interest to other readers, do pass them on please. After all, it's *your* Society.

What's On. . .

Mar 3	SLAITHWAITE LOW CEILING INDOOR MEETING E2B, HLG, PND, SCALE Venue: Slaitwaite. Contact: Bernard Hunt. Tel: 0484 862353. Rules from J. O'Donnell 061-427 3711	April 21	Peterborough. Contact: Brian Waterland. Tel: 0778 343722.
Mar 3	SAMS INDOOR EVENT Peanut, E2B, HLG, CO, OPEN - FLY FOR FUN. Venue: Watford Leisure Centre. Contact: SAMS. Tel: 0438 832011	April 21	LARGE MODEL SPECTACULAR Venue: Old Warden, Biggleswade. Contact: Radio Modeller. Tel: 0442 41221. Watch large models in spectacular flight: come and fly yours.
Mar 10	SMAE 1st AREA MEETING F/F O/R, O/P, F1A (KMAA, Plugge) Venue: Local Area Venues. Contact: Area Comp Secs or SMAE 0533 58500	April 28	S.A.A. CONTROL LINE RACING - GOODYEAR, CLASS II, 1/2 ATR. Venue: Newhouse. Contact: R. Thorpe. Tel: 08988 5516.
Mar 24	SOUTHERN AREA - INDOOR ALL SCALE DAY PEANUT, OPEN SCALE - FLY FOR FUN Venue: H.M.S. Daedalus. Contact: M. Leach. Tel: Emworth (Hants) 5384. Flying times 1300-1800 hrs. Must register at least one week before event	May 5/6	S.M.A.E. INDOOR SCALE NATIONALS PEANUT, OPEN RUBBER, CO. Venue: Alumwell Centre, Walsall. Contact: Doug Sheppard, 13 Luckington Road, Monks Park, Bristol BS7 0VT. Pre-entry only registration 50p, each event £2.00, non competitors £1.00. Send SAE for entry forms.
Mar 24	S.A.A. CONTROL LINE RACING - GOODYEAR, CLASS II, 1/2 ATR Venue: Newhouse. Contact: R. Thorpe. Tel: 08988 5516	May 19	FUN FLY IN AT HOLKER Venue: Holker Hall, Cark-in-Carmel, Grange-over-sands, Cumbria, LA11 7PL. Contact: Carolyn Johnson. Tel: 044853 328. Fun competitions, camping - Write for entry forms, details and costs.
Mar 31	SHEFFIELD C.L.A.M.S. CONTROL LINE GALA FAI TR, GOODYEAR. Venue: R.A.F. Lindholme. Contact: John James. Tel: 0709 588476. This year the event is sponsored by the RAF Fittingley Model Club.	May 26, 26, 27	GOLDEN ERA MODEL FESTIVAL Venue: Old Warden Biggleswade. Contact: Radio Modeller. Tel: 0442 41221. For model designs of the 1920's-30's. Period costumes encouraged!
April 3	THE GRANTHAM GRAND PRIX - OR, OP, OG, HLG COMBINED FAI. Venue: RAF Barkston Heath. Contact: Phil Bell. Tel: 0332 865381.	June 22/23	BRITISH NATIONAL FREE FLIGHT CHAMPIONSHIPS. Venue: RAF Barkston Heath. Contact: S.M.A.E. Tel: 0533 58500. All normal F/F classes, camping etc.
April 14	Peterborough Diesel Combat Comp. Venue: The Embankment.		AEROMODELLER SCALE WEEKEND Venue: Old Warden, Biggleswade. Contact: Aeromodeller. Tel: 0442 41221



PHOTO PRIZE

Model News With Fliar Phil

Now Wood for Winners

100 Sheets of balsa, nearly 200 lengths of strip wood — some 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.



The month of March will soon be with us. Impatient to get our latest creation airborne, we aeromodellers, in common with the rest of the population, will most likely be suffering from the wind. Not, of course, the kind that a dose of bismuth will cure! However, calmer days are coming. Meanwhile, here is this month's selection from the Model News front.

Photo 1

Teenagers get blamed for a lot these days! But if they are aeromodellers they get a pat on the back! Richard Waddington of West Yorkshire (who is 16) flew his rubber-powered 26in span Piper 'Cub' into second place at last year's 'Nats'. Built from a free Aeromodeller plan. Photo sent by Mr Waddington (Richard's dad) who commented, "What a good advert for AM's free plans". Absolutely Mr. 'W'!

Photo 2

A 'flight back in time' with this fine photo of a 1951 Mercury 'Skyjeep', span 44in. Power: 1948 Mills 1.3cc. Sent to Fliar Phil by Roger Sherlock of Southampton. Longest flight 13.5 mins. on a 17 sec. motor run. Roger adds, "the model had a long life (1952-63), and is now being restored". Good luck with the restoration of a truly 'old faithful' Roger.

Photo 3

And now for 'something completely different'! The Arkansas Traveller. (Another model from 'way back'.) Designed by H.A. Thomas in the early forties, it is what is termed as an 'Old Class 'C' team racer'. Built and flown by Alan Holmes Junior of Wigan. Alan says, "The engine is a Replica Orwick 73". On 60-70ft. lines it readily achieves over 100mph - and that Alan is going some!





Photo 4

Graceful lines - and speed were built-in to the U.S.N. *Curtiss C.R.3*. The same applies to this very fine model belonging to Ray Tassall. Syd Tyson of Workington, Cumbria who sent F.P. the photo, describes himself, "as an old timer, just returned to the model scene". Finding inspiration no doubt from models like Ray's *Curtiss C.R.3*. The World of Model Aviation welcomes your return Syd.

Photo 5 WINNER

Flair Phil has seen many excellent photos of scale models - but this *Northrop F5G 'Tigershark'* must certainly rank with the best! Superbly designed and built by John Richards of the Civil Service Model Aeroplane Club. Praise also to Mr P.J.M. Ford of Ipswich for this fine 'portrait'. Mr Ford mentions that this was only John's second ducted fan model. It just has to be this month's winner!

Photo 6

'Have indoor rubber-powered model - will fly!' Not an advert in *Aeromodeller* - but certainly an indoor scale model that does fly! Best flight to date 52 secs. R.O.G. This finely modelled *Focke Wulf F.W. 159.V2*



comes from Timo Heinonen of Jyväskylä, Finland. You are quite right Timo - this aircraft has not appeared in model form very often. Flair Phil wonders why. Span 27in weight 29 grammes.

Photo 7

As you say Dereck Woodward, of Truro, Cornwall: "If Flair Phil wants the unusual - this is it!" It is Squadron Leader Nick Astley-Cooper's swing-wing model. As the wheels retract, the wings swing right back to parallel the tailplane. The sequence being reversed as the wings come forward - a smooth and reliable system. Span 36in, 4 channel R/C Power O.S. 15, pusher. Thanks Dereck - and congrats to Sqdn/Ldr. Astley-Cooper.

Remember folks, this is YOUR feature and Flair Phil needs YOUR photos to keep it going!



VINTAGE CORNER

WITH ALEX IMRIE

Readers' Letters

The original purpose of this column was to tell readers what was happening around the country in the field of aeromodelling that is now known as 'Vintage'. To this end input from the readers themselves is a necessity, and we welcome letters from enthusiasts on any vintage topic.

During the last few months, space in 'Vintage Corner' has been at a premium due coverage of other events and readers' input has been rather neglected. However, over the period some material has come in and a selection of this is presented below. If you have any ideas, find an old engine or model that requires identification, want to tell of a model built, or merely complain about 'Vintage Corner' content, do write in, we will use your contribution (*I thought I had some say...Ed*).

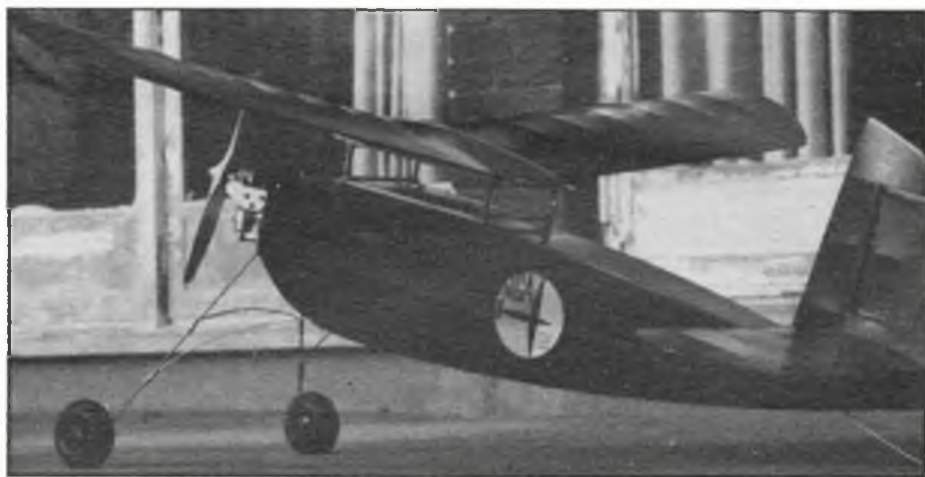
Wasp

Peter Lyes of Chelmsford writes: "I wonder if a full-size plan is available, as I find scaling-up the page plan (July 1981 Vintage Corner) rather difficult? Can you also tell me what the shaded area on the plan is, as there is no indication of what the dimensions and materials are? Does the original 'Elf' engine have to be used for it to pass as a true vintage model?"

The 'Wasp' was originally described in the April 1938 *Aeromodeller* and full building instructions were given. Our use of the drawing only, in the third 'Vintage Corner' was thought sufficient for experienced modellers to use to construct a replica. Yet, one wonders how many other enthusiasts experienced the same difficulties as Peter?

It is only possible to briefly answer the points that Peter raises, and there might very well be justification in producing an article on scaling-up plans for modellers who are not endowed with draughting experience. MAP do not supply full-size 'Wasp' drawings and it is not known whether any are available from other vintage plans houses in this country.

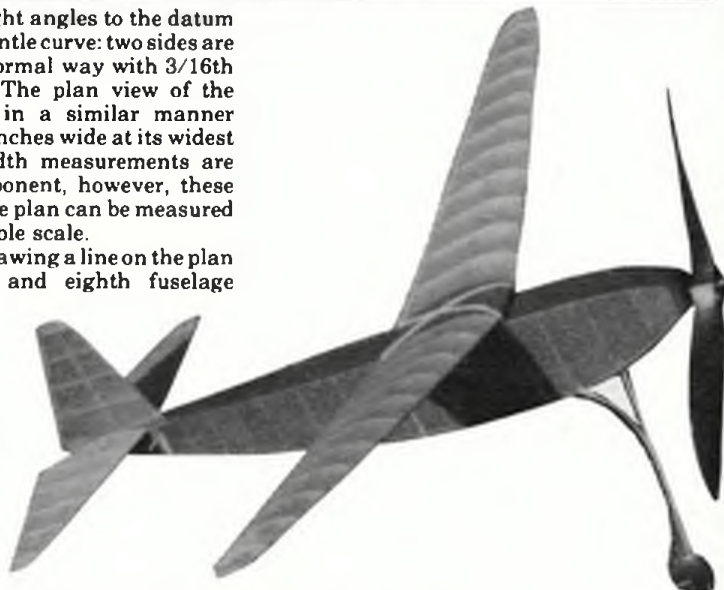
A datum line is provided on the drawing of the fuselage and the measurements of both verticals and spacers are given. Draw the datum, plot the points from the



measurements at right angles to the datum and join them in a gentle curve: two sides are then made in the normal way with 3/16th inch square balsa. The plan view of the fuselage is drawn in a similar manner noting that it is 3 1/2 inches wide at its widest point. No other width measurements are given for this component, however, these and other parts of the plan can be measured by means of a suitable scale.

This is made by drawing a line on the plan between the fifth and eighth fuselage

Ron Randall's Veron 'Eagle', fitted with a pre-war J W Kenworthy 17 inch diameter propeller (see text).



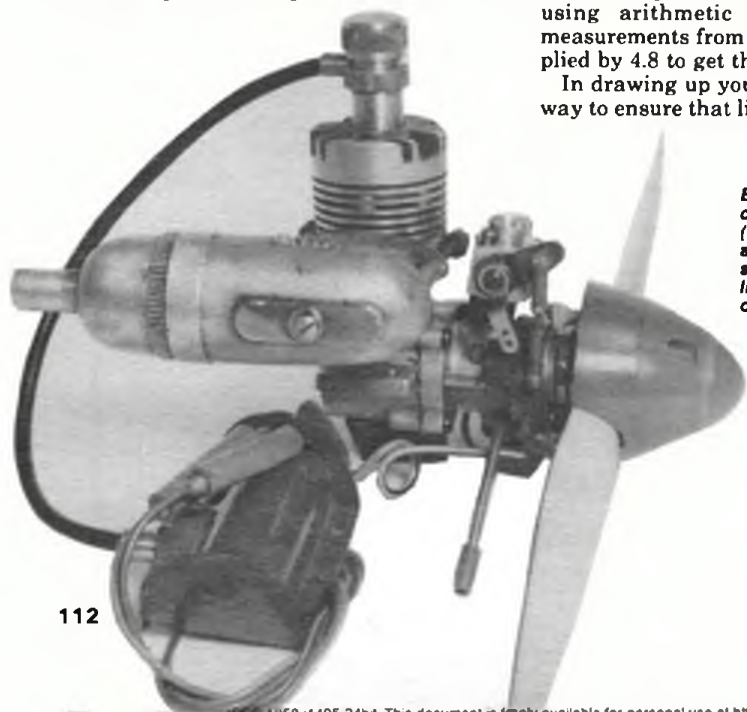
station measurements, this will be 2 1/32 inches long and represents 9 3/4 inches on the full-size drawing. Subdivide the scale in order that measurements taken from the plan by dividers can be easily converted to the size required on the full-size model! Or, using arithmetic or a calculator, all measurements from the plan must be multiplied by 4.8 to get the model size.

In drawing up your full-size plan, a good way to ensure that lines are at 90 degrees to

the datum or other constructional line, is to scribe a line on your plastic triangle (45 degree type), use a square held tightly against the base. The vertical dropped from the apex must bisect the base line exactly in the centre, then use these marks to line up the triangle on the constructional line. The shaded areas on the plan on the flying surfaces were 1/64in. sheet balsa but if this is difficult to obtain, sanded 1/32in. sheet can be used.

The shaded portion on the forward fuselage was 1 millimetre three-ply. Dimensions for all these parts can be deduced using the scale mentioned above. The wood sizes for the leading edge, trailing edge and spars can be taken from the full-size sections, all ribs are 1/64in. balsa.

Regarding a suitable engine: 'Elfs' are museum pieces nowadays, so 'Wasps' are flown with any suitable small engine. In the July article there were photos of 'Wasps' fitted with the Frog 1.75cc petrol engine and with the Frog 100 diesel. It should be noted that a vintage model can be flown with any engine, only in competition work might the question arise whether or not an engine 'qualifies'. This query in modellers' minds comes from knowledge of SAM contests in America, where engines must be adjudged



Enya 45 Ignition conversion by J Taylor (see text). The 3.6 volt coil and screened HT lead and sparking plug ensures interference-free radio operation.

as 'of vintage type' in order to be allowed entry. Up to the present in this country, no similar rules have been insisted upon. Of course, if you power your 'Wasp' with a glow plug engine you may not be allowed to compete in an ignition or diesel event but for general fun flying 'anything goes'.

In any case it looks like Peter will put a *Frog 100* diesel engine in his model, since in his letter he goes on to say, "...A friend of mine found a *Frog 100* diesel in the ground while digging in his garden where his shed

Left, SAM 35 member Gotthelf Weldermann of Erlangen, Western Germany made this 'Wasp' while resident in UK, he used the 'Elf' type engine mounting for the Mills .75 diesel.

"...Unfortunately with only a few exceptions most of the engines have now been sold! There must be a few collectors with friends at MAP who get advance information!"

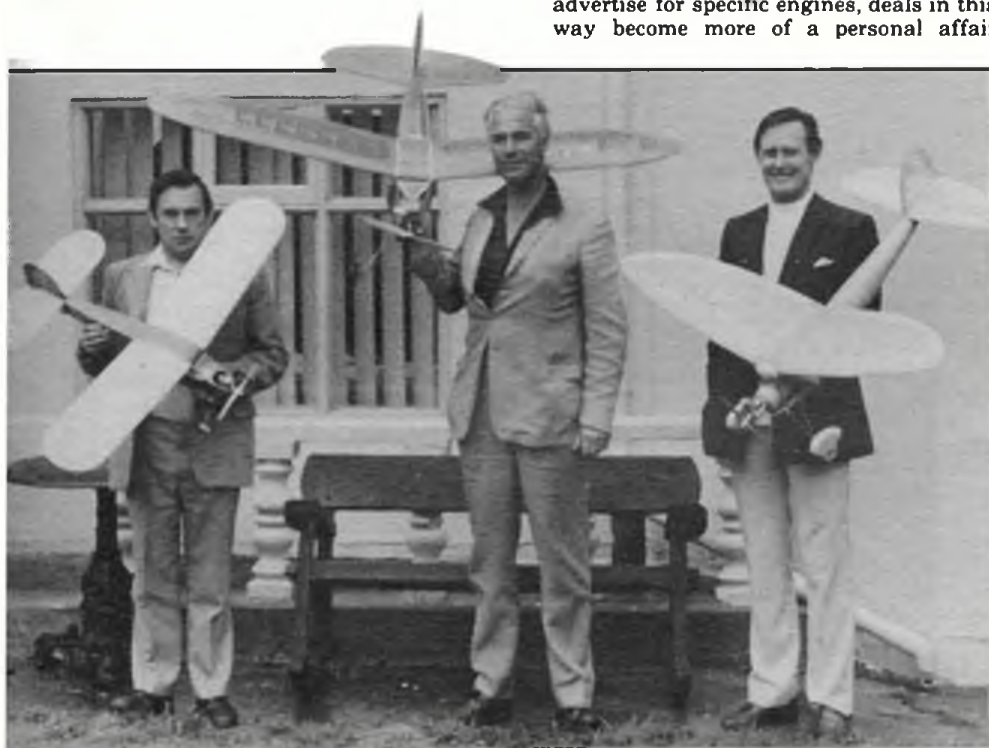
I can personally refute this allegation and readers might like to know that the advertisement pages are not seen by the editorial staff until the finished magazine arrives from the printers! Another factor that never ceases to amaze me is that certain outlets for the magazine get their supply well before official publication date and to my knowledge a certain London model shop often has this magazine on sale before any have been received at MAP!

Instead of writing in reply to advertisements, a better bet might be to advertise for specific engines, deals in this way become more of a personal affair

currently converting *Merco 61* and *OS 120* Four stroke engines that result in clean running engines with a very large range of speeds from full rpm to very slow tickover. The engine illustrated is an *Enya 45* with coupled R/C throttle, automatic advance and retard contact breaker and also a manual over-ride spark control. The *KLG* plug is fully screened and a 3.6 volt coil does not cause any radio interference problems. This engine uses petrol mixture of a 10 to 1 ratio, is fitted with 120 degree cams and from a gentle tick-over goes smoothly to over 8000 rpm. Readers interested in this service should contact Mr Taylor direct, whose telephone number is Hull 860830.

IOM Vintage

Peter Fisher of *Performance Kits* tells us of 'goings on' in the Isle of Man. He enjoyed himself at Old Warden on 'Vintage Day' last year flying his six year old 2/3 full-size *Cloud 'Airmaster'* powered by a *Mills 1.3* diesel, and writes: 'John Kemp and Tony Penhall recently spent a week with me here at Woodland Towers and we had two perfect days on Jurby aerodrome, flying the models shown in the photograph. This is arguably the finest free flight flying site in the world, the runways are over half a mile long and in excellent repair, the grass cut, and Snaefell and other mountains form the backdrop to the scene. All the models made too many flights to enumerate, John's 'Cymric' with *Amco .87* diesel, my *Drome 'Conquest'* powered by a 'May Rocket' .45 cu in petrol engine, and Tony's *Mills 1.3 Mk I* diesel powered *Bowden 'Swallow'*. The only damage, if you can call it that, was that John wore out the bushing on the wheels of the 'Cymric', due to the many perfect landings on the 'drome! 'Conquest' has wheels in a similar state, for the same reason! I am currently working on a new



Isle of Man fliers. Left to right, John Kemp ('Cymric'), Peter Fisher (Drome 'Conquest') and Tony Penhall (Bowden 'Swallow') (see text).

used to stand, he gave me this and another friend, Mick Rudkin cleaned it up for me. The tank had obviously been held in a vice, as the back was forced in and the sides also. The drive washer had been eaten away, probably by pliers and the needle valve was missing. Other than that the engine is in good condition, it fires on a prime and when Mick has finished it, it should run very well and suit the 'Wasp'..."

Advertised Vintage Engines

Don Baker of Solihull who told us of his 'Stentorian' in the June 1983 'Vintage Corner' writes, "...since then I have been trying to get a vintage engine for it and have answered several dozen 'For Sale' ads in various magazines but 99% of these engines are sold before the magazines are published...obviously you have a mole in the Advertisement Department! Antique engines, are now, I am sorry to say, big business. Dealers are cornering the market, collectors or those wishing to fly a vintage plane and engine cannot pay the silly prices being asked." Don encloses a reply from an Eastleigh model shop that says

without the risk of competition and are more likely to lead to a successful purchase.

Ignition Conversion

Glow to spark ignition engine conversions are now undertaken by a number of competent engineers and the latest to advise us of his progress in this direction is J Taylor of 88 Hull Road, Woodmansey, Near Beverley, North Humberside HU17 0TH who is

R/C Vintage Style 'Mabel's Dream' powered by an OK 'Twin' was seen at Old Warden last year. Here is the 55 inch span prototype in 1965 held aloft by its designer, a youthful Jim Shelley.



'Vintage Style' model which I have just designed for the 'Dart' .5cc diesel. John Kemp and a local modeller, C Staples will be building this model and we hope to have them in the air at Old Warden in 1985. It is called the 'Aspis', being a small musical dragon."

Peter's description of Jurby, which was a wartime RAF aerodrome fairly makes our mouth water and we wonder if he is holding a vintage meeting there this year? Sounds a great place to hold those vintage free flight ROG events.

Jetex

The first model aeroplane powered by *Jetex* flew on 18 October 1947 and *Jetex* was first shown to the public at the British Industries Fair on 3 May 1948. Despite this revolutionary torque free simple method of powering models, its acceptance by British power modellers was not immediate and it took some time to gain popularity. However, by 1950 it was 'going like a bomb', especially being popular in America and on the Continent.

The slow start that *Jetex* experienced on its introduction is being repeated in its vintage revival, although this is probably now due to scarcity of certain items especially igniter wick. However, there are a few stalwarts determined to keep the *Jetex* flag flying, and one of these is Mike Wilson from Enfield, who for the last few years has had *Jetex* powered models with him at the Old Warden Vintage Days.

In a recent letter Mike writes: "Some of the *Jetex* enthusiasts have told me of their disappointment that this form of power never receives any mention in 'Vintage Corner'. Even after our numerous flights at last year's 'Vintage Day' meeting, where we tried to put on a varied *Jetex* display, no mention of our activities was made in the report of that meeting".

I apologise to Mike for this omission, but being a one-man band I cannot see everything going on at Old Warden and would ask him or any other *Jetex* fan to let



Above, Ron Swindon of Darlington has unearthed this mid-1930s low-wing Wakefield named 'Balza III', unfortunately without propeller. It was given to his club in the 1950s, can any reader provide information on this old timer and/or its designer/builder?

me have some details of happenings in this field in order to make the readership aware of developments. Another would-be *Jetex* fan is Jon Clements, PO Box 637, Greenhills, Metro Manila, Philippines, previously from the East Midlands area, he writes:

"On a recent trip to the UK I acquired a 'Scorpion' motor plus "50" and "35" units; the latter two appear non-operational due to corrosion etc. Also included was some fuel, washers etc, but what I now need is some igniter wick, and more importantly, advice! There is plenty of R/C activity in the Philippines but no vintage that I am aware of. I do have a kit for the 'Junior 60', so when completed this might be a first here."

Can anyone tell Jon about *Jetex*? Is anyone sitting on *Jetex* components, especially fuel and igniter wick that these chaps could put to good use? Frank Gardner keeps the SAM 35 membership up to date with *Jetex* in his 'Jetstream' column in *SAM 35 Speaks*, so at least followers of this



Right, Jim Ogg with 'Powerhouse' shows how they retrieve them in California. Tall may not have Snaefell in the background but think of all that sunshine!



Left, Jack Humphreys' designed 'Sporty' (described February 1950 *Aeromodeller*) by Howard Gostellaw in Australia. Plans for this popular model are still available from MAP as, PET/367 price £2.30: plus 50p postage.

discipline have a common meeting ground.

Last year Frank commented on an electrical system of ignition that was being used in America but I have no further information on the development of this. A foolproof system of ignition is needed, since even in its heyday cracked *Jetex* wick caused faulty starts and the crumbly condition of this item today has considerably exacerbated the problem.

Veron Eagle

Ron Randall of Coventry keeps this column supplied with information on his models ('Dorland', May 1984; 'Diasphere', January 1984) and now writes about his Veron 'Eagle', which is one of a series of models that he is building again 'second time around'. Ron writes:

"I have always had a soft spot for the 'Eagle' because, although basically it is just another slab sided duration model, it does have a certain finesse of line which gives it a rather delicate elegance that tends to set it apart from its contemporaries. I had not seen one around on the vintage scene and spent 18 months or so ferreting out a copy of the plan, which seemed elusive. Murphy's Law would have it that as soon as I got one — Phil Smith published his plan for it!

However, my model was built to an original plan and is a true Veron 'Eagle' as opposed to a 'Smith Eagle'. There are minor differences, the most noticeable one being in the undercarriage. Phil's 'Eagle' has its undercarriage on backwards, so to speak, with the wire brace to the front and uses 1½

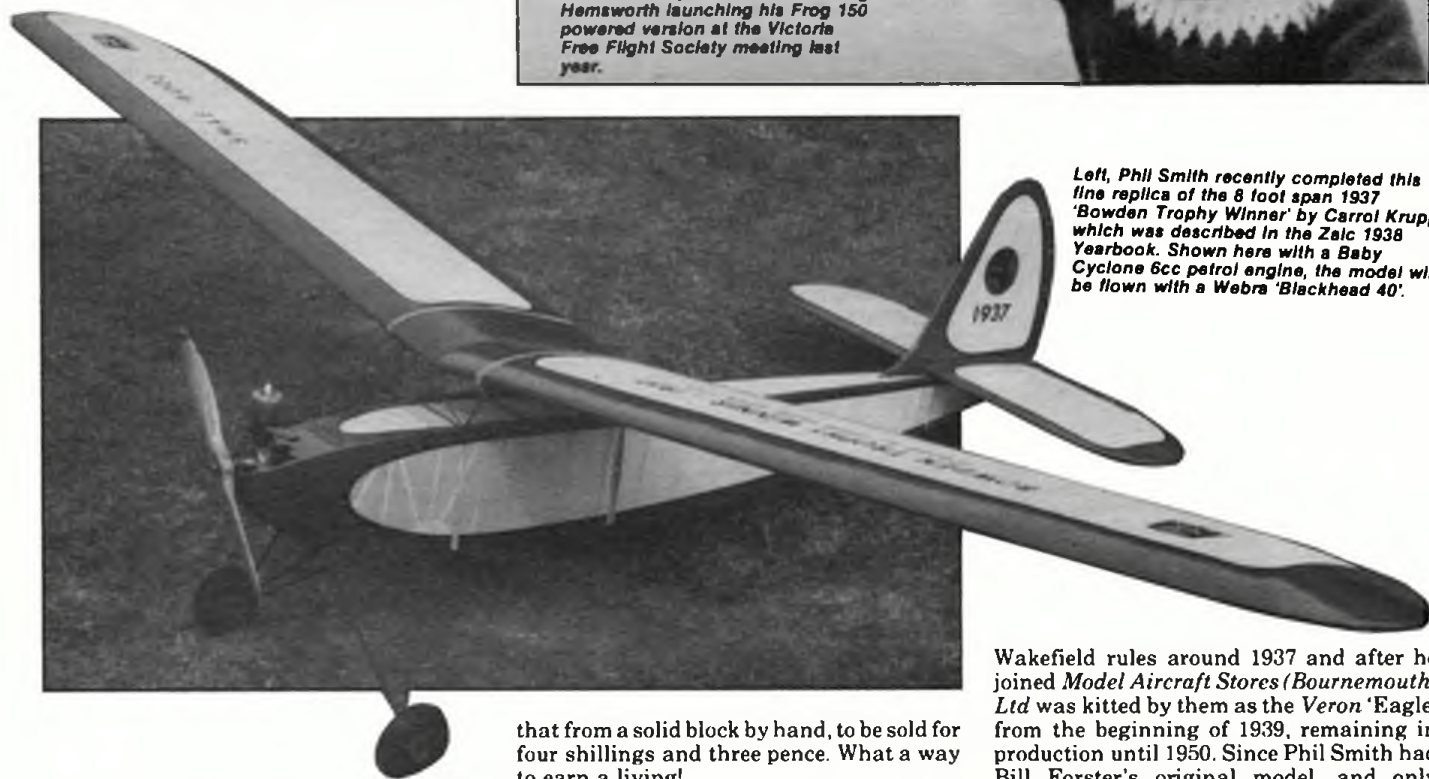


Right, Pete Neate designed 'Hi-Ball' (described October 1947 *Aeromodeller*) 'Down Under'. Craig Hemsworth launching his Frog 150 powered version at the Victoria Free Flight Society meeting last year.

life I would be pleased to hear from them. It seems a pity to have the genuine article and not be able to use it."

Ron's letter ends on an amusing note, as a PS he explains that a deleted part of his letter had "...originally referred to a bit about when I once 'doped' a wing with rubber lubricant, but on reading it through it sounded so ludicrous that I am afraid I would have been accused of making it up — which I didn't — so I decided to omit it."

The 'Eagle' was designed by W J Forster of the Liverpool MFC to the old 4 oz



Left, Phil Smith recently completed this fine replica of the 8 foot span 1937 'Bowden Trophy Winner' by Carrol Krupp which was described in the Zalc 1938 Yearbook. Shown here with a Baby Cyclone 6cc petrol engine, the model will be flown with a Webra 'Blackhead 40'.

inch diameter wheels. The Veron 'Eagle' has 2 inch diameter wheels and the wire brace in the more conventional position at the rear. Otherwise they are more or less the same.

As with all my vintage models, I tried to make it as authentic as possible and to this end all the fittings, aircrew, wheels, ballrace and even the 'Run-True' bobbins are originals. The aircrew is another from J W Kenworthy, a 17 inch diameter 'Super Duration' type and is, if anything, more aesthetically pleasing than the 'Chauviere' used on the 'Diasphere'. It has a most elegant scimitar shape in side view and was no doubt made from a block at least 50% thicker than normal. It is quite flexible being only about 1/16 inch thick all over, indeed it is so thin that before I covered it, you could actually hold it up to a strong light and see light through it! Imagine carving

that from a solid block by hand, to be sold for four shillings and three pence. What a way to earn a living!

I do have just a few sheets of genuine pre-war 'Jap' tissue and as part of this 100% authentic approach I decided to use some on the 'Eagle', here I am afraid I came to grief. The trouble with 45 year old tissue is that it will insist on behaving as if it is 45 years old, in fact it seems quite 'dead'. Nothing I could do would make it shrink. Ironing before covering, water shrinking, shrinking dope, even water shrinking after doping, which sometimes works, but to no avail, I just could not remove the wrinkles. I think that I spent more time trying to cover the thing than it actually took me to build it.

In the course of this cover/strip/re-cover process, the colour scheme changed from blue/green to blue/yellow to yellow/dark blue. I finally had to admit defeat and it is now covered in modern blue/orange tissue — 'Jap' of course. So if anyone has any ideas on how to bring ancient 'dead' tissue back to

Wakefield rules around 1937 and after he joined *Model Aircraft Stores (Bournemouth) Ltd* was kitted by them as the Veron 'Eagle' from the beginning of 1939, remaining in production until 1950. Since Phil Smith had Bill Forster's original model, and only recently gave this into the care of Alwyn Greenhalgh, the apparent discrepancies that Ron mentions should be capable of being resolved, perhaps Phil would care to comment on this?

I built one myself in 1942. When Frank Royle's Edinburgh model shop manager, W A Hogg, showed me his beautifully built example that had recently won several awards, I weakened, and parted with the eighteen and four pence (92p) that the kit then cost! (The manufacturer made good use of Hogg's success: see full page *Aeromodeller* adverts in August, September and October 1942 issues.)

Plans for this model, including rib photostats to make that elegant highly tapered wing, cost £2.50p post free from Phil Smith at 32 Verwood Crescent, Southbourne, Bournemouth, Dorset BH6 4JE.



Modelhob

P51D MUSTANG

Ian Peacock reviews a profile scale control liner from Micro Mold

AS I SIT DOWN to pen these words it is over a year since I produced the first part of the 'Profile Scale' series. In that first part, it was upsetting to have to state that few of the foreign kits in this category were available via the British Importers (of course one can always shop by mail order — even abroad!).

Regrettably as the time has passed little alteration to the status quo is apparent. However there is a glimmer of hope, *Micro-Mold* now import the *Modelhob* range of aircraft kits. This range of Spanish made models covers the whole aeromodelling spectrum from free-flight rubber, through control-line to radio control. Sitting fair square in the middle is — would you believe — a Profile Scale control-liner!

The P51D 'Mustang' is one of those aircraft over which the aviation historians wax lyrical and indeed with some justification, for it served in virtually every

Virtually all the parts are pre-cut, ply parts and wing ribs being die-cut. Good quality accessories are provided although the odd one or two are somewhat unusual. (More of this later). The plan is not one of the usual die-line prints with which we are all familiar but is nicely printed on good quality paper.

Plan layout is quite conventional and easy to understand with instructions and copious building and flying notes, all in Spanish! Fortunately for you, English notes are now included. The pictorial part of the plan is extremely well executed and should not baffle any with just a modicum of experience.

The plan is double sided, with the wing on one side and fuselage and tail on the other. Incidentally, full colour detail and panel lines are shown on the plan, which in

Above right and left, port and starboard views of the Modelhob P51D 'Mustang'. With Ian's simple but effective paint scheme this profile fuselage model looks really great in the air - very good value at £13.55



The goody pack is very comprehensive, containing all the necessary nuts and bolts, bellcrank, wire, wheels, horns and even the lead tip weight. Unusual is the inclusion of a plastic fuel tank. This item, reminiscent of the traditional style C/L Team Race tank is moulded in nylon, complete with filler pipe, vent and feed pipe, and is a beautifully made item. No mounting lugs were moulded in and a strip of tin plate is provided to make a fixing strap.

All in all a very comprehensive and well packaged kit!

Construction

Modellers have their own ways of attacking a new project and I invariably start with the wings. These are built in two halves and slot through holes in the fuselage utilising the undercarriage block as a joining brace. The die-cutting of the wing ribs was a bit suspect and gentle persuasion with a balsa knife was needed to get them to separate cleanly from the sheet. Some ribs have 'feet' on them to aid straight and warp-free construction and these should NOT be cut off until wing assembly is complete.

The wing section is thin by aerobatics standard and only semi-symmetrical, whilst wing structure is traditional with upper and lower spars, L.E. and T.E. No problems should be encountered producing left and right hand panels. The undercarriage (U/C) block requires drilling to take the U/C legs and then the wings can be put on one side.

The fuselage follows traditional pattern with hardwood bearers let into slots pre-cut in the sheet fuselage profile and faced both sides with plywood.

theatre of the War with great success and appeared in many and varied colours. Its popularity makes it a natural for the model enthusiast and there have been many plans published and kits produced.

Modelhob is a relatively new name to the U.K. Market and if their 'Mustang' is anything to go by, the entire range is worthy of investigation. Opening the box one is struck by the traditional approach to kit manufacture that almost smacks of old fashioned, yet a number of modern and innovative ideas become apparent leaving the impression that the designers are smart enough to capitalise on the advantages of both new and established techniques.

conjunction with the excellent box lid artwork allows one to produce a colourful model. Finally, on the subject of the plan, a full checklist of parts is provided in numbered sequence (in Spanish!). However one doesn't have to be bi-lingual to figure out where all the bits and pieces fit.

An excellent set of transfers are included but when I came to use them I found that they were of the self-adhesive vinyl type. I'm forced to confess that these are some of the finest examples of vinyl stickers that I have ever seen. They are very thin and well printed but not pre-cut.



Unusually the fuselage blank has separate top and bottom halves — split along the wing spar position, join the wing panels together first and slot top and bottom fuselage sections over the finished wing. Alternatively one could finish the fuselage first and assemble wing panels from each side of the fuselage. Either route appears to be equally practical and effective. Tailplane parts are cut from sheet and need only sanding to section. Elevators on a P51 are separate and therefore require a wire elevator joiner (provided in the apparently bottomless goody bag!)

Elevator hinges are by the time honoured method of cloth tape fitted 'over and under' the tailplane and elevator.

The cloth tape is provided but the eagle-eyed amongst you will notice that out of personal preference (and with *no* disrespect to *Modelhob*), I chose the alternative method of sewing.

Final assembly consists of fitting wings and fuselage together and adding the tail feathers (remembering to fit the rudder slightly offset — about 3/8in and not actually shown on the plan).

Wing covering is a matter of taste. As is usual in kits of this nature, tissue is provided and of course this is quite adequate,



providing a light and rigid surface. However for the rigours of rough and tumble control-line flying it is perhaps a bit prone to being punctured and to this end lightweight nylon is perhaps the best alternative. The airframe/engine combination can cope with an extra ounce or two (but don't go too mad!) and little performance loss will be evident. Wing covering is tricky at the root, as one has only the thickness of the root rib to which to stick the nylon. A sheet covered centre section more common to this type of model would have provided a greater sticking area.

As an aside, I prefer to cover a wing tip-to-tip with nylon in one piece as this affords the greatest strength when the inevitable unplanned contact with terra-firma takes place. Too often I've seen models shed wings when covered in two halves either side of the fuselage. However in this case I stuck to the recommended method pinning my faith in the fact that there is a 1/2in x 3/8in hardwood U/C spar running from one wing, through the fuselage into the other wing, which should, *in theory*, hold everything together!

Finishing is largely a matter of choice, many preferring the tissue, dope and sanding sealer route, others, like me, are well into modern techniques and use *Hobbypoxy* finishing resin or similar. Either way the finished paint job can make or mar a model. None so much as with 'profile' types such as this. Whichever route is chosen, it is worth taking a little time and trouble to get the surface right. I used two coats of *Hobbypoxy*, rubbed down lightly between coats, followed by a coat of grey car primer to show up any flaws; final finish was a single spray coat *Humbrol* silver dope.

Detail work was particularly easy as all the markings, colours, panel lines, etc., are drawn onto the plan. Being somewhat idle by nature and not wishing to measure out all of these lines, I simply produced photocopies of the relevant parts of the plan and cut up the copies to make stencils for use with the ubiquitous airbrush and presto! — instant panelling.

The addition of the 'peel-and-press' markings and serial numbers produces a quite eye-catching effect.

Odds and ends can now be fitted and where necessary, final paint touch-up carried out. Bellcrank and mount can be fitted (you *did* remember to drill all the holes through the fuselage for bellcrank, engine and tank mounting *before* fitting wing and tail — didn't you?) The elevator horn requires bending from a pre-cut aluminium blank supplied and the push rod making up.

Undercarriage legs (pre-bent) and wheels are provided as are the leg retaining plates and screws. The tail wheel is a little unusual in that it is made from plywood with ply doors. As I fly over tarmac a lot I figured that this type of tail wheel would soon wear, so I substituted a wheel on a piano wire leg. Finally a coat of fuel proofer finishes off the entire model. I used *'Ripmax'* 'Tufkote' but any suitable brand will do.

In fact virtually any current 2.5cc motor will do, I tend to favour the diesel rather than a glow. Not that I have anything against glow motors, but the apparent simplicity of the diesel lends itself to control-line flying and does remove the need for the over-crowded, tool box with which we have all become accustomed.

Probably the best established motor in this category is the P.A.W. These engines seem to have been around since I was in short trousers and there can be few of us who have not owned at least one over the years.

Current prices make these motors extremely competitive and many a novice will cut his teeth, courtesy of the Eifflaender family.

I'm fortunate enough to have a PAW 2.49 that fills the space allocated in the nose of the *'Mustang'* as if made for it.

Flying the P51 held no surprises, despite a slight warp that had crept into the inboard wing during construction (none of us are perfect!)

Line tension is good and virtually any 2.5 would suffice. In fact some of the hot 1.7cc motors (OS 10 Schneurle for example) would be sufficient. Aerobatic performance is limited as might be expected, for the wing is more scale in outline than would be required of a good stunter, resulting in less area and with an asymmetric section to boot! However loops and figures of eight are possible with care and so is inverted flight.

One should not really expect to attempt perfect squares and four leaf clovers with a

model of this type. Without a doubt, the model *looks* like a *'Mustang'* in the air!

One can say that the *'Modelhob'* P51D *'Mustang'* is an honest kit with well thought out details, good wood selection, above average fixtures and fittings and is certainly not over priced. It's flying characteristics are more than satisfactory, and should be within the scope of anyone with even a modest amount of experience.

Postscript

Prolonged flying has shown up a couple of small weaknesses, one concerns the tank. If aerobatics are to be considered, then a small stunt 'wedge' type of fuel tank should be substituted for the excellent moulded nylon tank. Loops, bunts and figures of 8 can be safely accomplished relying on the fuel in the 'line', prolonged inverted flight is not on. The other matter is a bit serious and concerns the undercarriage. The U/C is mounted R/C fashion in a grooved hardwood block, and the first suspect landing (rough — but not so rough that one might expect damage!) ripped the U/C out of the wing. This is not the first commercial kit to feature this type of U/C and I have had similar trouble with others. In this case the 'twisting' or 'torsion' effect simply split the



After initial flights, the original undercarriage mounting was modified to use a plywood plate giving a greater length of support than the original hardwood block (see text).

grooved hardwood block along its entire length and loosened the block in the wing ribs.

However, a review kit is a review kit and one should *not* tamper with the design *beforehand* but give the manufacturer the benefit of the doubt and *build straight from the plan*. As the photo shows, the suspect mount was sawn off and replaced with a flat plywood plate supported front and rear by the leading edge and spar respectively. The torsion bar U/C leg goes *back* along this plate, over some 3in.

The piano wire leg was sewn into position, the sewing being liberally smeared with P.V.A. glue, and the entire plate glued into place. In the interest of weight, the ply plate may have lightening holes drilled in it or even the entire centre removed.

The wing was re-covered, re-doped and sprayed and looks as good as new. No amount of rough handling will dislodge this undercarriage!

Please don't think that this is a *serious* design error, it is a small point but one that is strongly recommended right from the outset. It no way detracts from the value of the *'Modelhob'* kit, it simply is offered as a method of P.A.L. (Pro longing active life!)





Above, last year's winner of the 80gm class, John Walker, did not fare so well in 80 gm, but managed a creditable 5th place in 100 gm. Right, power fliers Pete Harris and Stafford Screen trying to work out where the 'glow lead' fits!



COUPE D'HIVER '84 INTERNATIONAL

2nd December 1984, the tenth anniversary for this popular 'winter cup'

TEN YEARS of *Aeromodeller* 'Coupe D'Hiver Internationals', you would think that by now we could run and organise this competition blindfold. Unfortunately, an *Amber Alert* which had been in force for a few days at R.A.F. Henlow, put a slight spanner in the works for all too many who attempted to enter the aerodrome early on the 2nd December. For some reason the editor of *Aeromodeller* and two other cars sailed through the main entrance with the barest stop, smile and a quick chat about the day's event - Must have honest faces ...

Having got to the control tower, our 'onest ed wondered where all the crowds had got to - what had he said in the latest issue that had caused such a boycott? Five minutes later Tony Dowdeswell appeared and told the throng (all three cars!) that 'control' would have to be sited the other side of the field - off go our little cortege, to hide themselves even deeper into R.A.F.

Henlow's green and grassy grounds. Once across, the R.A.F. police appeared as if by magic and went into a deep and secret conflag with our publisher, Mr D. Still no sign of any other competitors - our ed was now wondering what date had been published in *What's On*, it's not often wrong but we all know Murphy's Law, and Gremlins are not yet extinct...

Suddenly, Mr. D. is driven off by the R.A.F. police - is this really happening, what was Mr. D. doing at 2.40p.m. on the 14th... Time passes and we move as instructed to the hardstanding alongside a rather lonely looking hangar. It's almost time to start the comp - with eight people? Suddenly in the distance can be seen a long black line - can it be, yes ... customers!

Not happy customers for minute! Many had been waiting for sometime! Someone had blundered ... what had happened will probably never be known, perhaps one day when someone's diaries are published ...

At last the editor breathes again ... mind you he looks that colour normally! To the sound of "get your entries in 'ere", the tenth *Aeromodeller* 'Coupe D'Hiver International' got under way.

The weather was overcast with occasional rain squalls, not very warm and the wind was fair to moderate - not exactly the most ideal weather, but times quickly started to be recorded. Tony Dowdeswell and Fran Freebrey manned the control van and although some 100 odd entries actually recorded times, these were spread fairly evenly over the day and they never completely lost control of the situation!

Although there were certainly thermals around, they were not very obvious and not very strong. In the 80 gm class only six people got maxes (120 secs) in both of the first two flights. The 100 gm class fared even worse with only five competitors getting a max on the first flight and none on the second. Only one person got two maxes in



Right, Geoff Clarke's 'Albass' slowing extra dihedral? Left, T. Beaumont had poor times this year - perhaps he got that D/T fuse going too well!





Left, 80 gm winner, John Bailey finds time to help Steve Philpott nearly score a max on his last flight. Right, Dave Hipperson and helpers shelter from the elements before Dave (below right) launches for a max.



Right, regular visitor and contestant John White shows off his 'canard coupe'... the weather prevented it showing its paces. Below right, the quietest shaft run this year was recorded when Jon Fletcher (Australia) 'landed' seconds after launch.



100 gm and that was Dave Hipperson, the eventual winner.

Most unfortunate competitor was D. Neil in 80 gm class, who was the only person to manage a full house after the third flight, unfortunately the final two flights let him down to an unlucky 13th position. With Mr. Neil's unlucky fourth flight where he dropped 39 secs, seven competitors were left with only 15 seconds separating them, two of these John Cooper and John Bailey with only four seconds between them. With the weather now deteriorating both Johns showed their mettle (some dare say luck) in both, by scoring a max, leaving John Bailey the winner.

With the rather depressing weather, most if not all, were quite relieved that it was all over. Trophies and prizes were presented in the R.A.F.'s gymnasium by Ron Moulton and Tony Dowdeswell - M.A.P.'s top brass on site! Ron had had the unenviable task of manning the entry gate for hours on end.

The Bernard Boutillier Trophy awarded to the winner of the 100 gm class went back to Dave Hipperson for the second year running and the Aeromodeller Trophy for the 80 gm class was presented to John Bailey. As is the tradition, prizes were then presented to everyone - even if it were only last month's Aeromodeller! Our thanks to Argus Books, Humbrol, MAP, MicroMold and Sun Lane Engineering, who so generously supported the Coupe International. I'm sure all there would like to add their thanks, to ours, to the Commanding Officer of R.A.F. Henlow for his permission to hold this popular event on his station. Let's hope we do not pose such a problem to the R.A.F. police next year ...



Results:

80gm - Aeromodeller Trophy

Name	Time
1. J. Bailey	574
2. John Cooper	570
3. R.W. Paveley	562
4. J.B. Spooner	543
5. M. Chilton	541
6. A. Crisp	541
7. D.R. Morley	540
8. Dave Hipperson	534
9. R. Elliott	524
10. A.C. Gibbs	522
11. G. Ferer	519
12. S. Philpott	511
13. D. Neil	510
14. B. Rowe	507
15. Ian Davitt	506
16. Bernard Aslett	506
17. Victor Dubery	505
18. John O'Donnell (Proxy for Frank Monts, USA)	505
19. Dennis Davitt	497
20. Stafford Screen	493
21. B. Lewis	489
22. G. Neil	487
23. M. Dilly	484
24. John Dyer	486
25. Jessica Nash	483
26. Mark Benns	482
27. J. Walker	481
28. M.E. Francis	470
29. Peter Harris	468

100gm - Bernard Boutillier Trophy

Name	Time
1. Dave Hipperson	351
2. Trevor Grey	327
3. M. Chilton	325
4. John O'Donnell	314
5. Jonathan Walker	313
6. M. Richardson	313
7. A. Crisp	312
8. Dave Greaves	310
9. A.R. Wells	300
10. R. Moore	293
11. G. Ferer	288
12. C. Shepherd	280
13. Ken Fordham	254
14. John Cooper	249
15. P. Lumaden	248
16. D.R. Morley	242
17. Eric Hawthorne	239
18. R. Chilton	228
19. C. Philpott	221
20. A. Crisp	220
21. Roy Miller	213
22. D.C. Roach	190
23. M. Dilly	151
24. C.D.J. Strachan	148
25. L. Ranson	144
26. T.N. Beaumont	116
27. G.M. Hannah	113
28. N.J. Beaumont	96
29. John White	90

SCALE MATTERS

Free Flight with Bill Dennis

Indoor Rubber Scale

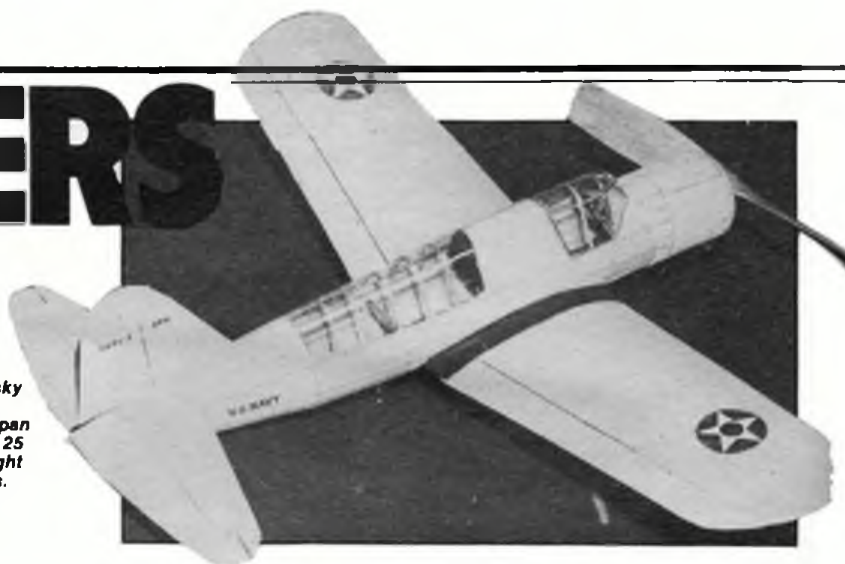
I think we are long overdue for some practical hints and tips aimed at the newcomer to indoor scale, whether he be an outdoor type who wants to come in from the cold, or an indoor modeller who wants to know why his aeroplanes don't fly like Butch Hadland's!

Although he is currently very busy, Mike Hetherington has kindly scribbled some notes derived from his vast experience and I have assembled them into this 'ghosted' article. Indoor scale flying has increased in popularity enormously over the last 10 years and now it is the most popular of all scale classes. You do not have to look far for the reason, which is guaranteed good weather for what is predominantly a winter activity. Most models fall into one or other of the contest categories, even if they are not intended for contest work.

The two SMAE events are *Peanut* and *Open Rubber*. Of these, Peanut has always been the most popular, probably because it attracts people who are not usually scale modellers. In this class, static marks are awarded for certain fixed criteria, so that it is possible to estimate how many marks a subject will attract before you have built it. Flying performance is judged solely on duration and models must have a wingspan of 13in or less.

The open class has no restrictions other than a maximum weight of 85g and is judged like all other scale contests, i.e. it is the realism of the flight rather than duration that matters. For a first indoor model, the larger type is preferable to the peanut as it is easier to build and less tricky

Vought-Sikorsky
OS2U
'Kingfisher'. Span
18ins., weight 25
gms - best flight
so far: 50 secs.
Built by Timo
Helonen,
Finland.



to trim. Perhaps the best starting point is one of the *Keil Kraft* or *Veron* kits, but using your own wood and propeller.

Mike has pinpointed four areas to watch when building your model:

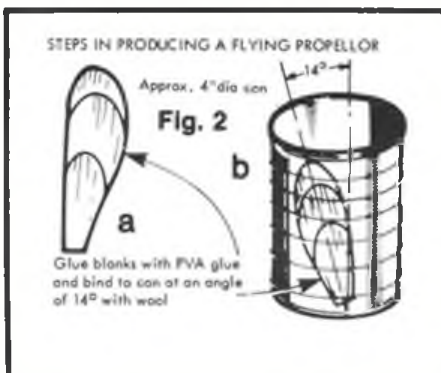
(a) **Weight:** low weight, or rather wing loading, is of paramount importance for the indoor model, as it equates directly with duration and flying speed. Excess weight begins with wrong balsa size and selection and ends with too much dope and paint. You can get specially selected lightweight wood, but it is very expensive and not really necessary for scale models. Most models can be built from 'model shop' balsa of 1/32in

vital - don't forget that the smaller a model is, the more critical are the adjustments. Lightweight 'Jap' tissue is recommended and is available from *SAMS* or *Mike Woodhouse*. On an outdoor model, water shrinking will magically remove creases, but we cannot do this with lightweight indoor structures. Iron the tissue and keep it flat, then apply it as smooth as possible and lightly steam it to tighten it up, pinning down to dry. Well thinned banana oil is preferable to shrinking dope... thin it even more for the tail.

If applying a coloured finish, use an airbrush, as brushed on paint will be too heavy. An alternative is to use car aerosols, if available, in the correct colour.

(c) **Nose bearings:** to get repeatable flights on these small models, it is essential that the prop shaft does not wobble in the bearing and that the noseblock fits accurately and always in the same position. Another problem with all rubber scale models is that altering the thrust line with packing doesn't do much for a scale outline - Fig. 1 shows a type of bearing which fits the bill and hopefully is self explanatory! The rear part can be moved about during trimming and later glued in place.

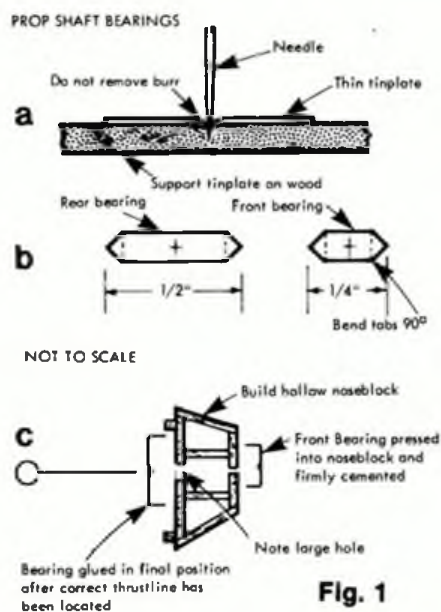
(d) **Propeller and motor:** indoor models do not normally glide 'deadstick' and so to get long flights you need to put lots of turns on a long thin motor. Thin motors will only fly light models and need propellers with generous blade area. Plastic propellers are available but they are heavier and less efficient than a home-made one. The diagrams in Fig. 2 show the sequence for producing laminated propellers. Three blanks for each blade are soaked in water, glued with PVA and bound with wool to a suitable can at an angle of 14°. When totally dry, the blades are sanded to a straight taper from root to tip, and then the airfoil section sanded in. Much of this sanding can be done



and 1/16in thickness if it is chosen carefully. Sand it with very fine glasspaper on a block and then strip it with a steel rule and razor blade - not a modelling knife. Take several cuts to go through the sheet, otherwise bent strips will result. One good wheeze is to use tapered strips to get stronger and/or lighter structures. For example, a 1/8in x 1/16in wingspar can be replaced by 5/32in x 3/32in to better effect, but remember to strip from alternative ends to ensure similar grain direction.

(b) **Covering:** warp-free flying surfaces are

A super flier for Peanut is this Taylorcraft 'Cub', built by Doug Hunt and weighing only 10 grams.



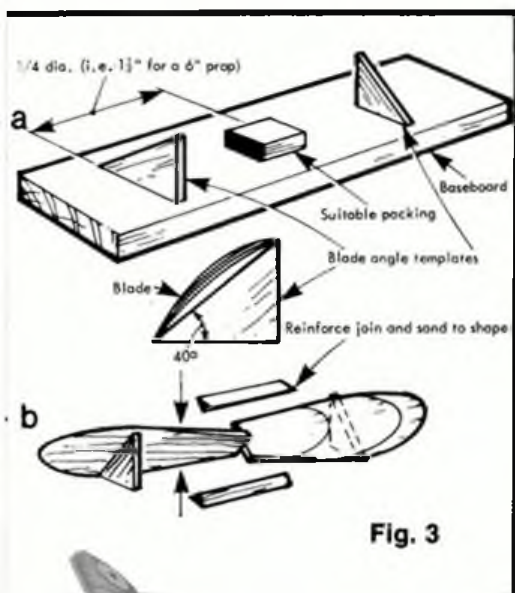
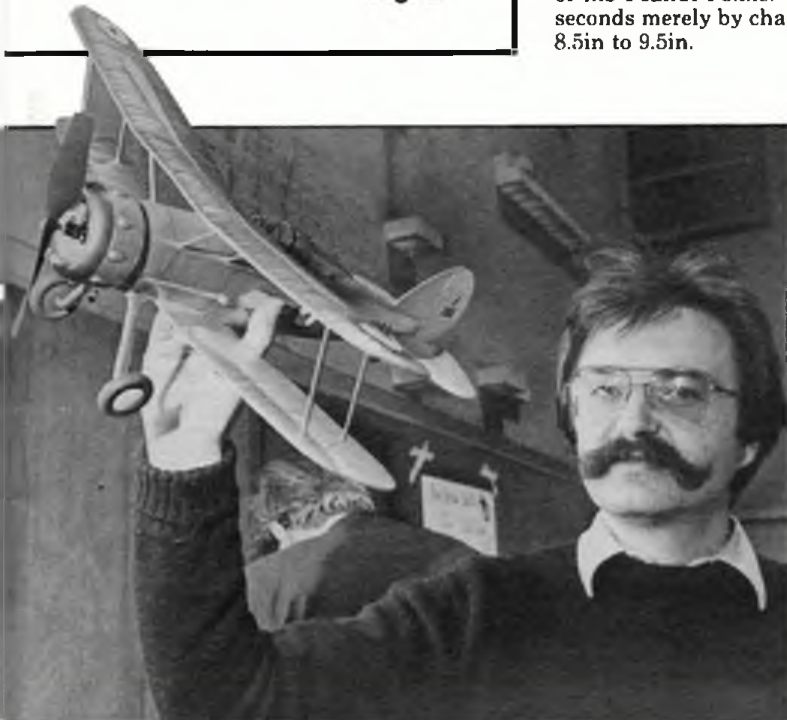


Fig. 3



Seen last year at Walsall during the Indoor Nationals was this magnificent CO₂ powered Gloster 'Gladiator', built from an APS plan by Paul Briggs.

with the blank held against the can for support.

A simple jig is required for joining the blades (Fig. 3). An angle of 40° will give a pitch of 8in on a 6in prop. Triangular pieces of balsa are used to join the blades and are sanded to a smooth shape. At this stage it is convenient to drill the hole for the shaft.

Rubber can be purchased from SAMS in a multitude of widths, but 1/32in, 1/16in and 1/8in will cover most needs for scale. Rubber strippers are available, but very expensive. Getting the right motor size is a matter of experimentation but a good starting point is a motor which is 20% of the airframe weight, arranged as a single loop twice the distance between the shaft and rear peg. Try and arrange things so that the model lands with some turns left on the motor.

Altering the pitch of the propeller is another technique for increasing duration - for example, Mike increased the flight time of his Peanut Fokker DVIII from 50 to 70 seconds merely by changing the pitch from 8.5in to 9.5in.

When building a new type of model, I always find it useful to study other people's aeroplanes to see what wood sizes, etc., they use. The accompanying table shows the salient features of two of Mike's models which will serve as guidelines if this is your first attempt at indoor. I must admit some of the wood sizes seem frighteningly thin to me!

Finally, if you get serious about indoor, you will find a beam balance very useful for weighing components, allowing you to reject those that are overweight. A simple home-made balance is shown in Fig. 4 and can be made in 2 or 3 hours. Individual weights are made from copper wire trimmed to the exact weight with a pair of snips. If you do not have access to an analytical balance, a friendly chemist will probably make one or two weights for you, and you can use these to make more. Start with one gram and make several more using the balance. Then hang a one gram on the weighing end and a one gram on the 0.9g division. Trim some wire to balance on the 1.0 division, this will weigh 0.1g, enabling components to be weighed to sufficient accuracy for our purposes. Colour code the weights before trimming to size, and keep them in a safe box!

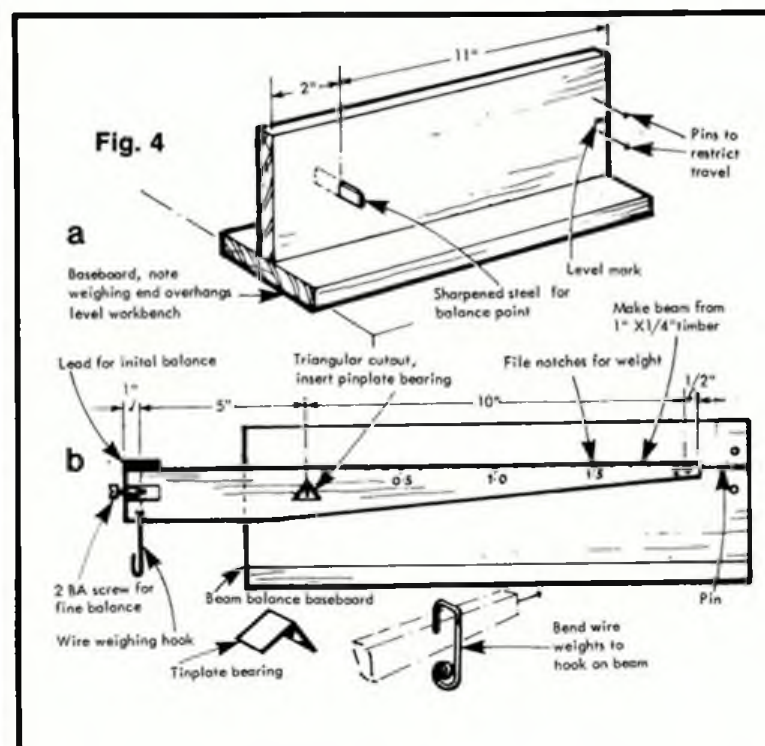
Documentation

Recently I received a catalogue from a company called *Scale Model Research*, which lists documentation packs on over 600 subjects. Each pack contains a 3-view and between 3 and 65 colour photos and details of each are given in the catalogue. The range covered is wide but is predominantly American and post-WWII. A lot of the earlier types are either replicas or in museums and as such would be of interest mainly for the detail shots rather than their historical background. The catalogue is \$2.00 and is available from *Scale Model Research* 418E Oceanfront 'B', Newport Beach, California 92661, USA.

Model Specifications - Fokker DVIII

	Open Version - 16in Span	Peanut - 13in Span
Fuselage	1/16in and 1/32in square	1/24 tapered to 1/32
Wing	LE & TE 1/16in x 5/64in	LE & TE 1/16in x 1/32in
	Spar 3/16in x 1/32in	Spar 1/32in full depth
	1/16in x 1/32in	
Tail Surfaces	1/32in square	1/32in square
Wheels	Polystyrene	Polystyrene
Cowling	Polystyrene on 1/32in sheet former	Tissue papier maché
Propeller	6 5/8in x 8in	5 1/4in x 9 1/2in
	Blades 1 1/4 in wide	Blades 1.1in wide
	3/32in x 1/16in	1/16in x 1/32in
Struts		
Weights:		
Airframe	5.5g	3.5g
Prop/cowl	2.4	1.7
Rubber	2.1	1.2
Total	10.0	6.4

Thin wire axles are fixed centre only, to give springing.



Free Flight with Jim Latham

Anti Warp...

This method of wing construction arose from a discussion on the ways of preventing lightly constructed wings warping upwards when built with conventional lower spar and rib arrangements. The general opinion was that the only cure was to incorporate a spar on the upper surface of the wing, which, for a scale model was unthinkable.

Further thought showed that there is a mechanical reason for the upward warp. With a spar on the lower surface of the wing in compression, and the tissue on the upper surface in tension the wing must adopt an upward curve. One pushes, the other pulls and however strong one makes the spars the wing will warp upwards, if not immediately then as time goes by.

Earlier experiments in lightweight construction had featured a wing with built up ribs and internal spars. This was abandoned due to excess weight. Re-examination showed that weight could be saved and that the spars were almost in the optimum position i.e. almost central with both surfaces of tissue pulling with almost equal strength. The greater curvature of the upper surface of the wing prevents total equality but this method seems nearer the



Another model from friend Timo Heinonen, this time a Peanut Scale Arado Ar 81 V3. Span 13ins., weight 12 gms, best flight: 45 secs. A three-view can be found in "War Planes of the Third Reich" by William Green.

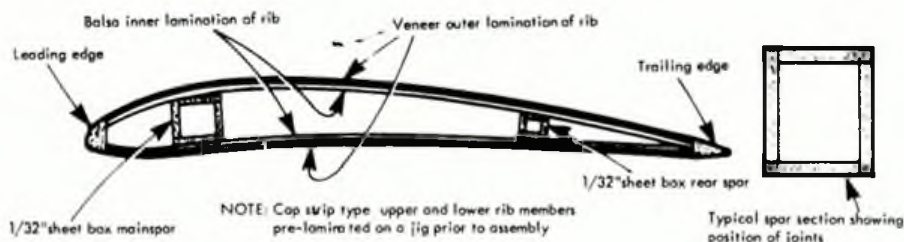
N.B. Upwards indicates load in normal flight, Downwards indicates load in inverted flight.

Both wings were covered with jap tissue and water shrunk. The normal wing was weighted down while drying as normal but the test wing was left to its own devices. It warped! After the language and the temper had cooled down, the wing was re-wet and weighted down to dry thoroughly. When the weights were removed it was found that the normal wing had assumed the customary

Construction of the box spars on a small scale is surprisingly easy. Balsa sheet 1/32" it was stripped to a suitable size (This depends on the section of the wing and the position of the spar in the wing). A sheet of balsa was pinned down over a non-stick surface and two strips which were stuck with non-shrinking glue were pinned and weighted against the right angle of the balsa sheet. The process was repeated and the two halves were glued together when thoroughly dry. A touch of sandpaper completes the job. Other shapes can be used, triangular, L shaped or round. If using built up spars on a larger model I would suggest that they be built around a former. What about a Warren girder or geodetic spar for the really big stuff.

Ribs can be made by cutting a blank in a block of wood, gluing them up in sheets and then slitting to size or making them individually. After experiments with the block method I settled for the individual style because my bandsaw does not cut true. A sheet of plastic was cut to shape and thin strips of veneer/balsa or balsa/balsa were glued and squeezed up between the upper and lower sections using pins to hold things together. To speed up production I made up six jigs and mounted them on a board. If using P.V.A. type glues allow overnight drying. Before removing from jig trim up the L.E. to size and leave the T.E. oversize.

Wings are made by pinning down the L.E. and T.E. and fitting the wing tips etc. Cut the lower ribs to size and glue in using a minimum of glue with no blobs on the upper surface as this will affect the fitting of the upper ribs. Glue the spars on to the lower ribs and add the upper ribs weighting them down if necessary. Carry on by sanding the wing in the normal manner. Not the final solution to the warp problem but a step along the way...



mechanical ideal. While looking for this ideal, why not hollow spars?

Another wing was made with ribs made from two strips of 1/64" in veneer laminated to shape to form the upper and lower rib section and hollow spars from 1/32" in balsa glued to form a hollow square tube. Very stiff but 1 gram heavier than a similar wing of conventional construction (the lower wing of a 17 1/2" in wing span *Sopwith 'Camel'*). Yet another wing was made (upper, also *Sopwith 'Camel'*) using lighter veneers laminated with balsa and the weight was down to a difference of five matchsticks heavier than the conventionally constructed wing which weighed in at 3 1/2 grams. Apart from the ribs and spars the construction of the wings was as similar as possible. Distortion tests were carried out on both wings before covering. Both wings were supported at the tips and weights were applied to the centre section until it touched the surface.

Normal wing.	21 grams (0.74 ozs.) upwards
	23 grams (0.81 ozs.) downwards
Test Wing	46 grams (1.62 ozs.) upwards
	35 grams (1.23 ozs.) downwards

upward curve while the test wing had only slight warps along the T.E. but was otherwise flat. The reason for the warping when unweighted was assumed to be caused by the dampness affecting the spars by softening the balsa. Both wings have been left in a warm room for over ten days and they remain in the same condition. The same distortion tests were carried out.

Normal wing	26 grams (0.9 ozs.) Upwards
	110 grams (3.8 ozs.) downwards
Test wing	82 grams (2.9 ozs.) upwards
	85 grams (3.0 ozs.) downwards

Note the difference in distortion weights between the wings upwards and downwards

This Antoinette was built by Gordon Hannah for Open Rubber Scale - Gordon is still perfecting the flight pattern!



THE DART

31 years of double top diesel history O F W (Pete) Fisher reviews the Dart story

ALLAN ALLBON, who produced his first diesel, the 2.8 cc Allbon side-port, at the Old Forge, Cople, Beds, subsequently manufactured the 'Javelin', 'Spitfire' and 'Dart' at the Allbon Engineering Co., in Sunbury in 1950-53. In 1953 the Allbon 'Dart' retailed at £3. 4s. 2d., including Purchase Tax. Shortly after this, Allbon Engineering was amalgamated with Davis-Charlton Limited in Barnoldswick and the above engines continued in production, together with the D C 350 diesel, which Mr Davies was manufacturing. The Barnoldswick factory employed about 30 workers.

In about 1957, Davies-Charlton Limited, with Allan Allbon as chief designer, moved to the Isle of Man into a new 12,000 sq. ft. factory at Hills Meadow; and they also operated a neighbouring factory of about 4,000 sq. ft., which was entirely used for model aero engine production. In about 1969, D-C Limited were operating all three



A 'Dart' line-up over the years, early model on the left. Spinners were not 'standard' with all motors.

April 1983. The old Davies-Charlton factory being sold. In 1984, Dav-Cal Limited moved to a new works, at the Loop in Douglas, where it is located today.

Allan Allbon left D-C Limited and in 1959 formed Allbon-Saunders Limited in Milton, Nr. Abingdon, where he produced the excellent AS 55 diesels until 1964. This firm is still very much operative, but sadly is no longer involved with engine production. It is

main 'Dart' variants.

No. 1, the Allbon 'Dart' has a readily identified large diameter drive plate. The spinners, featured in the photo, were supplied as an extra, when new, except for the 'Dart Special' which has an anodised gold spinner as supplied. The P K 'Dart Special' was introduced in December 1982.

The differing cylinder head fin profiles are due to the various lathes used in their manufacture. The earliest engines were made using Capstan lathes; Davis-Charlton then used Cam-Auto types, and these could

have many tools fitted to the tool posts. When the works changed to Plug-bored Controlled Autos, only four tools could be fitted simultaneously to the tool posts, and thus a change of head profile became necessary.

The early Allbon 'Darts' all had green anodised heads, the Davis-Charlton and Dav-Cal models using red. A few Davies-Charlton made 'Darts' had a pink head, and Dave, the current works manager at Dav-Cal told me that Mr. Davies had a personal preference for these, which were first produced on a whim...

During the peak production of Davies-Charlton in the old factory, between 120-300 engines, of all types, were produced per day and every engine underwent a stringent pre-delivery test programme. The engines were firstly started using an air driven starter and then started at least four times by hand. When the correct setting had been determined, the end of the compression screw was filed, so that it was in the correct position, relative to the stop-pin in the head. Finally, they were washed in paraffin, before packing. Dav-Cal adopt a similar procedure today and all engines are hand started before despatch. Dav-Cal recommend D-C 6 x 4 prop for general sports flying and easy handling of the 'Dart'. At their peak production, 20 workers were employed in the final assembly and test department.

In conclusion, I would like to thank Mr. Bill Callow, the current Managing Director of Dav-Cal Limited for the invaluable information which has made this brief article possible and also to thank him for his help in the restoration of our works museum 'Dart' engines, as illustrated. It is hoped that the D-C 'Dart' and P K 'Dart Special' will find appreciative homes for long into the future. The 'Dart' is perhaps the worlds longest running production model aero engine, surely 31 years is a record!



Rear view of motors shown above, showing tank detail changes over the years.

factories, totalling about 31,000 sq. ft., and employing 140 workers. During this time they were probably the largest engineering company on the Island.

In 1972 the Barnoldswick factory, which had been doing sub-contract precision engineering work, was closed, and about 1974 the engines were moved to the large main factory of 21,000 sq. ft. at Hills Meadow. The lucrative sub-contract work for Rolls Royce and others terminated; so that by 1977, the D-C range of engines was the sole product of this works.

Following the demise of Mr. Davies; the works manager, Mr. Bill Callow, took over the production of all D-C engines, and a new company, Dav-Cal Limited was formed in

celebrating its 25th year this summer. Performance Kits, who distributed the AS 55 to the model trade, were their first customers; and were pleased to be able to supply them with an original Allbon 'Dart' for their 25th anniversary Open Day.

At the time of writing Dav-Cal Limited are still making 'Dart' and P K 'Dart Special' engines, but in much smaller numbers than in the past. The last P K 'Dart Special' engine sold was serial number 97 and there is a long waiting list for this motor and also for the standard D-C 'Dart', the latest of a long line.

The top photograph, shows the 'Dart Collection' from left to right, and No. 1 to No. 6. The following chart identifies the

'Dart' variants

Type	Head Shape	Colour	Crankcase	Venturi	Tank	Needle Valve
1. Allbon	Barrel Fins	Green	Natural Gloss	Reamed	Small clear	Brass
2. Davies-Charlton	Barrel Fins	Pink	Natural Gloss	Reamed	Alloy/3 Vents	Alloy
3. Davies-Charlton	Barrel Fins	Red	Vapour Blue	Reamed	Alloy/3 Vents	Alloy
4. Davies-Charlton	Parallel Fins	Pink	Vapour Blue	As cast	Alloy/2 Holes	Alloy
5. Dav-Cal Limited	Parallel Fins	Red	Vapour Blue	As cast	Nylon/2 Holes	Alloy
6. P K 'Special'	Parallel Fins	Gold	Blue Anodised	As cast	Alloy or Nylon/2 Holes	Alloy

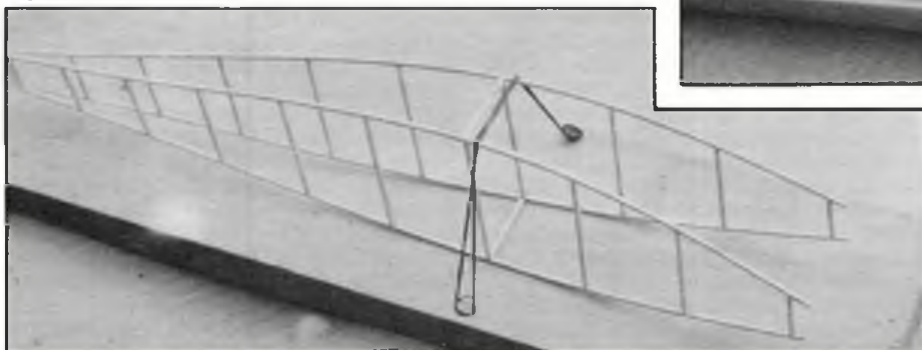
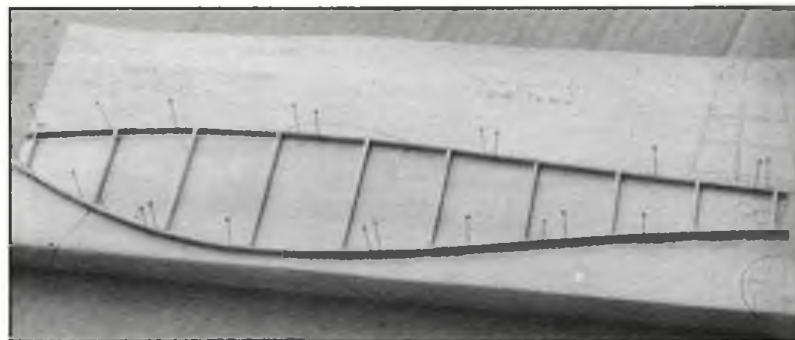
'Spar-es', on the glide. This neat model from 1945 even featured a folding propeller assembly.

BACK IN THE LATE 1940s there used to be an annual publication by the Swedish magazine *Hobbyboken* which included aircraft, boats and cars; many of the aircraft were from the Scandinavian countries but there were also Russian, Dutch, Swiss and other countries' models sketched as simplified three views. Looking through the 1945 issue one simple looking model caught our eye, but it was soon seen to be a small one and the page was turned. However, the image wouldn't go away and we looked it out three or four times before it was realised that it could prove an excellent subject for a vintage one-design event...

Its advantages seemed to be that it was unquestionably vintage and it was simple, cheap and small — under 24 in. span — which could appeal to those who build half-size Wakefields and small scale type rubber models, but it also had a two blade folding prop (8 in. dia!) and the very brief comments were that it had a rapid climb and a good glide, so it might also prove an amusing diversion for those of competition inclination. Remembering the little Club series of models, 'Whitewings', 'Bluebird' etc., and how well they flew in 1938/9, we succumbed!

The original model was constructed (and, presumably, designed) by Aage Peterson of Denmark and the drawing published suggested the position of structural members but with no guidance on material sizes. It also shows a slightly sectioned lifting tail, but the accompanying notes definitely say tailplane section neutral and wing section 'Clark Y style'. There is too, slight discrepancy between fuselage length

Fuselage constructional steps — note pins not through small section longerons. Below, simple system to ensure square fuselage.



as drawn and as stated, so the drawing has been followed in this respect, although the model photographed has been built with a flat plate tailplane, i.e. neutral as in the notes, after examination of another larger model by the same builder.

As far as material sizes are concerned, we have drawn what seem reasonable, although there is no reason why the fuselage should not be from 3/32in. sq.

(2mm nominal) instead of 1/16 sq. (1½mm) if preferred. The wing ribs are 1/16 in. sheet sanded to about 1mm., which seems more likely than 1/32 in. sheet, and the nose has been panelled with the same. One other querable area is the wing attachment, but the system shown was not unusual at the time and is better than trying to fumble the wing through a band stretched round the fuselage. In view of the very narrow tail end,

the last side bays were left uncovered for access to the rear hook; tissue would soon split from contact with the rubber.

By this time the model had been mentioned to SAM 35 enthusiasts (we understand, having provided a copy of the plan, that an example was flying in the U.S.A. before ours was covered!) and since there was a lot of interest shown, SAM 35 have offered to run a competition at either Halton or Old Warden in August for all comers. Publishing the full size plan in the magazine gives everyone the opportunity of tackling a simple vintage model and bringing it along to fly; more details of the competition will follow, but there will certainly be a prize for the highest scoring junior in addition to senior prizes.

Construction

There is nothing unusual about the basic structure, though one or two details may be slightly non-standard, for example the tail

SPAR~ES

Vic Smeed travels back in time to find this Danish vintage gem

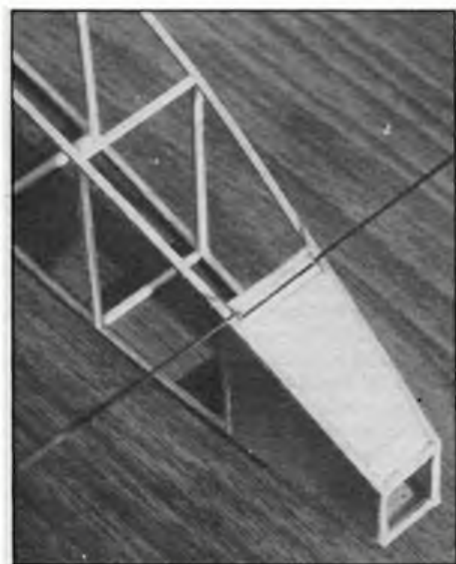
end of the fuselage and rear hook. The sub-fin and wing end-plates are best attached after covering and the tailplane and fin can be lightly cemented in place after covering, or if a D/T is felt desirable, the fin can be cemented to the tailplane of the unit held on with rubber bands to tip in the normal way.

Opinions seem to vary on 'build one fuselage side over the other'. Until recently this has always meant pinning down the longerons in pairs and cutting and fitting pairs of spacers. However, some present day builders appear to build a single side, then build a second over the top of the first. No doubt the end result is similar but the older way makes it easier to produce matched sides, since the longerons may be matched for curve and both pinned down at once; the spacers are usually cut consecutively off a strip and are likely to match closely for hardness and weight. Sides built in this way do tend to stick together but gentle wiggling

with a double edged (i.e. thin) razor blade, approaching the joint from all directions, easily separates them without requiring any force to speak of, so cut fingers should not be a problem.

Assembling the sides to make a truly square framework can be helped by cutting two postcard formers, by pinning the sides vertically over the plan and blocking them with bits of wood or books to hold them square while the first cross-spacers dry, or by leaving the sternpost stuck and opening the sides to the widest point before pinning down. If a weak rubber band is passed over the fuselage, strung between two drawing pins in the building board, easing the band one way or the other will influence the angle of the sides and a set square can be used to check that they are vertical. Only very light tension should be used and it is as well to draw the nose ends in with a weak rubber band, or by blocking them, before the cement is completely dry. Adding the rest of the spacers is then easy.

At the tail, the rear hook must be bent to shape and positioned before the soft 1/8 in. 'fashion piece' is cemented on. The sub-fin should wait until after covering. There was no guidance on the original small drawing

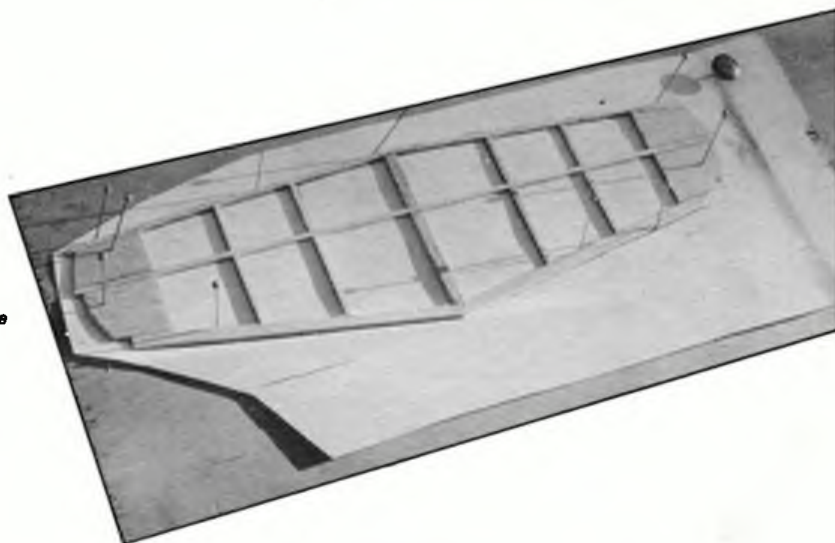


Above, note panelling of nose is 'flush', although 'Spar-es' is a lightweight model the undercarriage must be glued firmly into place at this stage.

but it seems reasonable to fill the nose panels with very light 1/16 in. sheet since this is the most handled area. The undercarriage is bent up as sketched and cemented between two pieces of fairly hard 1/16 in. which when dry are trimmed to a neat fit and cemented in place in the fuselage. Wheel diameter scales to 1 1/2 in. and two cross grained discs of 1/16 in. balsa with a celluloid or aluminium tube bush would be suitable, though no-one would object to commercial 1 in. lightweight wheels, which look quite attractive on this type of model.

The wing fixing shown makes use of 1/16 x 1/4 in. strip which is drilled for 1/16 in. or thinner dowels or bamboo strips. There is no need to pre-drill a lot of holes since repositioning the dowels can be left until the trimming flights; the dowels too can be left in place once trimmed, ensuring that the wing is always replaced in the right spot. Just be careful they don't puncture other components when packing the model for transit.

Flat plate tailplane construction is quite conventional but make sure all components are a perfect fit to minimise the chances of warping later.

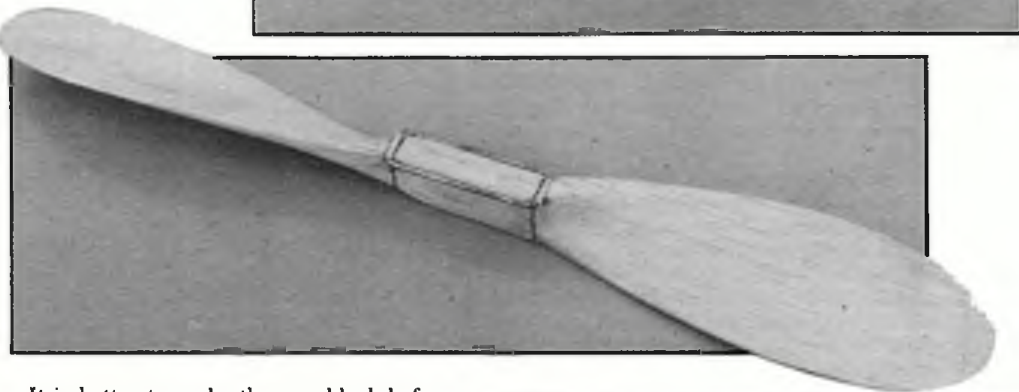


Wing construction is conventional apart from adding the endplates after covering, which actually simplifies the wing since there is no tip shaping. The finished wing is quite strong even if soft ribs and a softish leading edge are used. Similarly, the tail surfaces are conventional and the only points to watch are that the tip grain direction is parallel to the airflow (less likely to produce warp problems) and that the tissue on one side doesn't sag into contact with the opposite side when wetted with water, steam or dope. If the tissue is neatly applied and thumbbed smooth, water or steam shrinking is best avoided and one thin coat of dope should suffice.

not a big job. Folding props are best carved in one piece, partially cut through, the hinge 'mechanism' installed, then the cut completed. In this way they should always run true under power even if they don't fold exactly in the place required! A prop which folds exactly is nice but it is more important to have it efficient when under power.

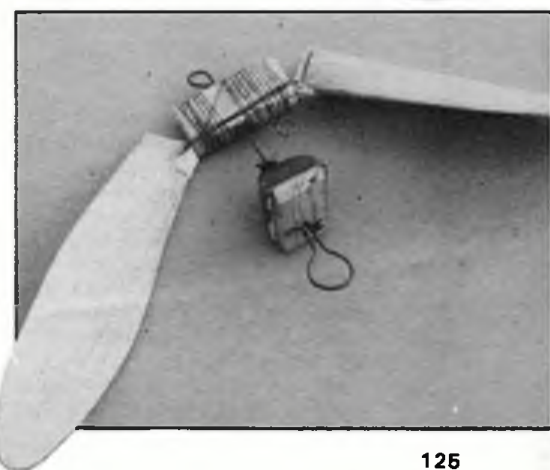
Mark out a block of 1/2 x 1 in. medium balsa as drawn and saw the blank out as accurately as you can. Sand it to the lines, it may seem silly, since the sanded surfaces will be carved away, but well begun is half done and an accurate blank makes an accurate prop easy! Carve the back of each blade first, sanding concave by wrapping

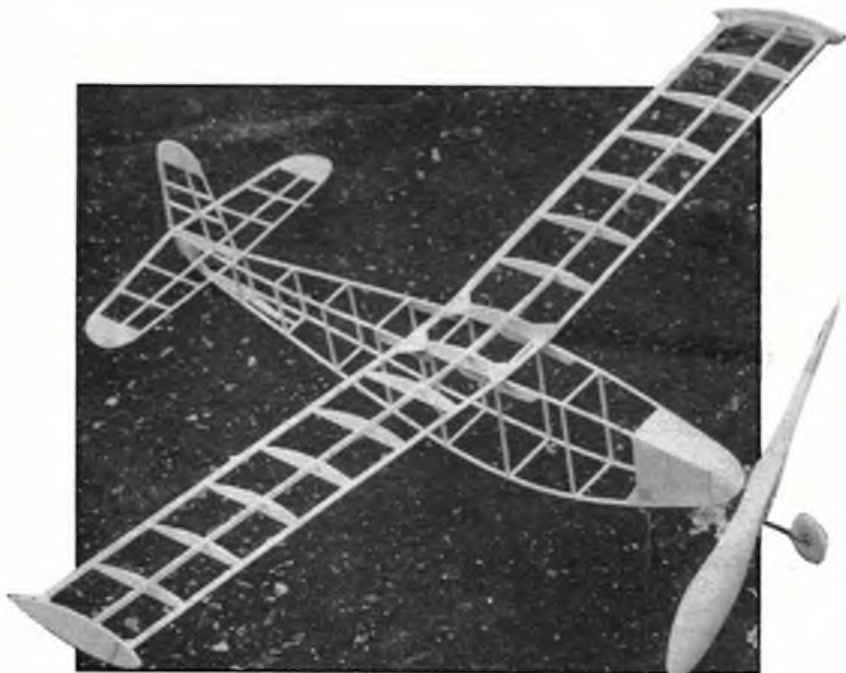
Right and below, three stages in the production of the folding propeller - don't forget to put the hinge at the back of the blades! The drawings on the plan should make this assembly easy to produce - much better than the plastic variety.



It is better to make the noseblock before covering the fuselage, as it can be lightly sanded to finished shape while held in place on the nose without fear of damaging the tissue. Use a fairly hard block or laminate it from hardish 1/8 in. sheet; soft block allows the bush or bushes to move and the wire or screw for the stop can work loose. Use a lightweight brass bush if available, or a length of brass tube epoxied in, or a cup washer epoxied in front and behind, using a scrap length of wire to ensure alignment. Incidentally, we always pass a file over the hole in a cup washer to remove any burr from the convex side.

It would be entirely possible to fly the model with a commercial plastic free-wheeling prop, but carving a prop this size is





Left, ready for covering but go easy on the dope with this lightweight structure. Below, 'Spar-es' ready to take on all comers at this year's SAM 35' one design competition'.

fine glasspaper round a small plastic bottle or pill container about 1 in. diameter. Hold a ruler across at the half blade point and check that it shows a fair curve with about 1/16 in. undercamber. Do not carve the centre part, which should remain rectangular and do not thin the roots of the blades excessively.

When satisfied that the blade backs match and are ready for final sanding, turn the blank over and carve the front surfaces. These will of course be cambered (convex) and the curve should be a little stronger, allowing for the concavity of the backs and also for the blades being slightly thicker along the centre line than at the edges. On this size prop a thin, flattish crescent section seems to work best; in any event, it would be very difficult to sand in an accurate airfoil section. By sighting from the tip the evenness of the curve and any bumps of hollows can be checked.

Make a paper template of the blade shape, although this can only be used as a guide to general character and, most importantly to check that both blades are the same. Sand away the corners and adjust the section by light sanding of the front faces to produce a 'sharp' edge all round. Apply clear dope or sanding sealer and sand to a reasonable finish.

Now mark accurately the 'cut lines' for folding and cut from the rear face to about halfway through. Use a really sharp blade and a slicing action to produce a clean cut without tearing the grain. The balance of probability is that the original model used square hinges; skewed ones appeared later to allow the blade(s) to fold flat on the fuselage side but most early folders were square, the blades folding straight back and usually inducing a right turn when folded. The hinges varied considerably but always have to be at or near the back of the blade for obvious reasons.

Cut a small channel across each blade root, using the cut just made as one side. A round needle file or the fold of a piece of fine glasspaper can be used to adjust the channel to the right size to accept a stub of aluminium (or brass or even celluloid) tube, 20 swg. i.d., so that it lies flush with the surface. Roughen the tube surface, or roll it in one layer of glued tissue and cement or epoxy into the channel, avoiding cementing to the prop hub if possible.

Form the two wire arms drawn and check that the bent-over ends fit neatly into the

tubes. Cement and bind them to the hub with the ends engaged. When dry, cut through the remaining part of the blade root and the blades should fold. Cut a narrow strip of wet and dry paper or fine glasspaper, and work it through the hinge to take a fraction off the hub end, towards the rear. Now cut a strip of thin silk or nylon (a piece from discarded tights would do) and cement it across the mating face of the blade, round the corner and 1/4 in. up the back of the blade, rubbing cement in well. This reinforces the heel of the blade and the tube joint, which does after all take all the centrifugal force of the blade.

Check that both blades fold freely and are in identical positions when extended. A paper washer cemented to the root or a gentle wipe with a fine file or manicure board across the mating surfaces, should



be used to ensure that they return to the same 'as carved' position. Once satisfied, balance the prop by either sanding the heavier blade or using more coats of sealer on the lighter blade, but do not allow dope or sealer to interfere with its totally free folding.

Bend the rubber hook with an extension as shown, slip the shaft through the noseblock, fit a cup washer and follow it with a light spring. Tiny coil springs are used for brush pressure on small electric

motors and in some cigarette lighters, or can be wound from the thinnest piano wire you can obtain (20-30 swg) or a hairpin spring can be used as sketched. The spring should just be long/strong enough to push the propeller forward when the tension comes off the motor, so that the hook extension hits a stop made from a wire or screw in the back of the noseblock.

Form the front of the shaft into a winding loop and turn the end back to be cemented in the hub, using the play of the spring to allow enough room to make the bends. Bind the shaft to the hub. Now, with the hub horizontal mark the position of the hook extension and either force in a piece of wire or drive in a tiny screw so that the extension stops against it when the shaft is pushed forward by the spring. A screw is preferable since it allows a little adjustment, but the extension can also be bent slightly. The prop should now stop in the same place every time.

Cover both front and rear hooks with rubber or plastic sleeving which can be stripped from a scrap piece of electrical flex; valve rubber used to be specified but cycle valves are different today and the rubber tubing may not be available. The original model apparently used ten strands (five loops) of 1 x 4 mm rubber but four strands of 1/4 x 1/24 in. is a good starting point, or 8 of 1/8 in. if you can get it. The motor can be 16-18 in. long.

Use lightweight tissue, Jap if available, to cover the entire model and lightly watershrink wing and fuselage, pinning the former down on greaseproof paper or film once shrinking starts. Apply two coats of thinned clear dope (one on the tail surfaces) and again take precautions against warps. Leave to dry out, pinned down with weights, for several hours, preferably in a warm dry atmosphere. You may wish to also cover the subfin and wing endplates. Cement these in place and the fin to the tailplane but only when everything is dry. Even if the tail unit is to be cemented on later, it is worth making initial flights with it rubber banded in place,

so either cut a little notch halfway round the 1/8 in. fuselage endpiece or make a pinhole and cement in a bamboo splinter.

Drill for, and insert the wing dowels in a mid-position and assemble the model. Put enough turns on the motor to take up the slack — you need to check the prop-stop anyway. Balance slightly nose-down at the mainspar position and hand glide in the usual way. Drill new holes and move the wing as necessary or trim with packing to raise the leading edge. Once gliding reasonably, apply a few turns; slight right rudder will probably be needed, but mark the position. Aim for a wide climbing circle as the folded prop will tighten up any right turn on the glide. Use slight right sidethrust and downthrust as necessary as power is increased. And do put your name and address on the model — even little ones like this can easily fly O.O.S!





Derek Mason's simple and direct approach to 1.5 cc Combat

A COMBAT WING is the type of model which can not be unique, as they are much of a muchness. 'Gotcha' is basically a simplified construction of a 'Spirogiro' with an 'Orcrest' tailplane and a 'Warlock's' size but still keeping the moment arm and looks of a 'Spirogiro'!

When I eventually set knife to balsa wood it went together quickly. The joiner between the wing and tailplane is a lamination of one piece of 1/8in and two of 1/16in this helps to keep the tailplane level when gluing in position.

For the tank I used a Kodak cine film canister because all the commercially available tanks I looked at were an inch

Below, with the engine this close to the wing, you must keep the back end as light as possible. Far below, a jubilant pilot after the first proving flight.



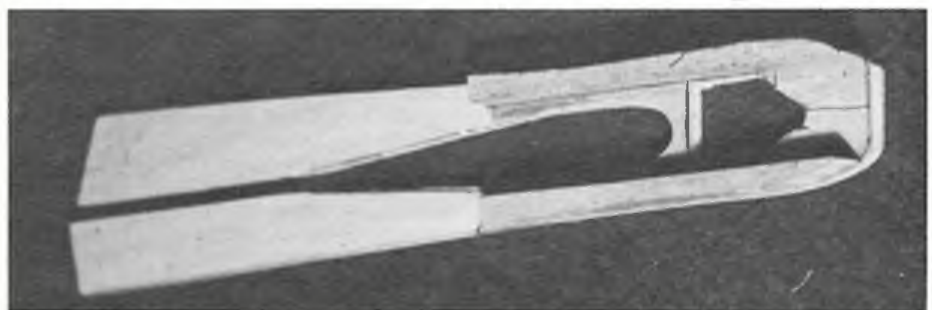
Above, simple lines of the finished, no frills, functional 'Gotcha'. Below, centre section 'works' showing Kodak cine film cannister tank - similar tank could be made from tin-plate.



thick and I required my tank to be totally enclosed in the wing.

The bellcrank is a standard 2in one. For leadouts I used a piece of 14 S.W.G. piano wire 'joggled' at one end (see plan) and connected to the bellcrank. 7 strand laystraight is bound with fuse wire and soldered to the piano wire, the leadouts are then threaded through the ribs and then through brass leadout guides glued to the wing tip.

I decided to cover my combat wing in Solarfilm for lightness and to obtain a smooth surface. After this was completed I cut a 1/8 in to 1/4 in wide piece of Solarfilm away from the centre section and glued the fuselage to the bare wood. The fuselage was tissue and fuel proofed with 'Tuff Cote'.



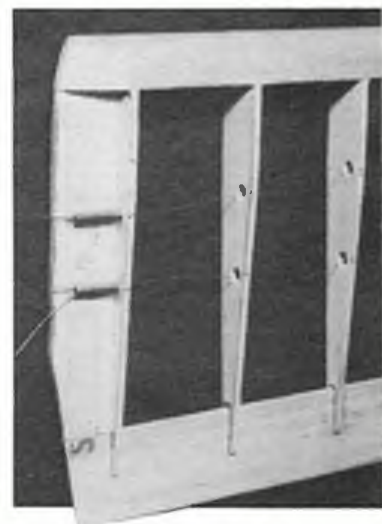
Flying

After posing for the photographs(!) I could get down to the business of flying the machine (the best bit). After laying out the lines and filling the tank the motor was started and the model took to the sky. I found that it flew with no problems at all. If the motor should stop above your head don't panic, this model will flatten out and glide back to the end of the lines - a characteristic of the 'Spirogiro'.

On the models second outing I discovered that it could out-fly a black headed gull as the bird tried to attack the model three times in one flight and very nearly got carved up ...



Right, leadouts pass through brass tube bushes - make sure these are well epoxied in place! Note ultra simple wing section! Below, fuselage/fins, could not use much less wood...



Ben Buckle Kits HEPCAT

vintage cream shade with the nose contrasted in pale blue.

The first flights were completed using the replica *Mills Mk I*. This is a finely made reproduction motor with good running qualities. However, it was obvious that the motor, running at 5,800 r.p.m. was not producing enough power to make the 2 1/4 lb. model climb quickly. The next weekend saw a PAW 1.49 'Contest' fitted, which, if anything, was giving too much power! The model climbed like a rocket. Decreasing the

Jim Woodside reviews a popular vintage model

THE APPEARANCE of 'Hepcat' came as the last piece in a saga of collection over a three year period. The first item was a replica *Mills Mk I* bought at the 1982 Nats. Second piece was a four channel *Futaba* radio control set bought at a competitive price at my local shop. Having fancied my hand at radio assist vintage for some time, the *Buckle* kit proved the final irresistible link.

At the time of building this model I had never flown any sort of R/C model and so this review is also a partial diary of new experience. Having spent years in control line team race, where very few proprietary items exist, I am impressed by the range of knick-knacks available in the 'lucky bags' hanging in the shops. They certainly make life easier and keep building time to a minimum.

'Hepcat' arrives in a very compact box - so much so it can be very embarrassing to re-pack the contents after the usual pre-purchase inspection! The plan is a clear dyeline drawing copied from the 1948 original but with the necessary R/C control surfaces and linkage systems inked in. No separate instruction sheet comes with the



Above, the attractive lines of the 'Hepcat' have led to thousands being built over the years. Jim's version has R/C assist. Below, the original *Mills Mk I* found the going a little difficult with 2 1/4 lbs. to pull around, so a modern PAW 1.49 took over. The K.K. tank is epoxied to a shelf resting on the bearers.

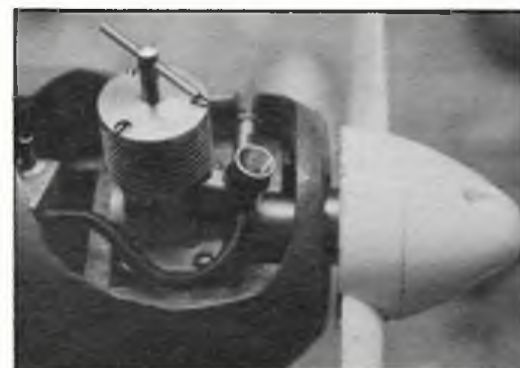
some care should be taken in selecting four pieces of the same hardness in order that the fuselage sides will bend equally when drawn together. Although not shown on the plan I took the advice of an experienced modeller to insert wooden pegs through the sides and into cross-members. Cocktail sticks are ideal for this purpose and cyno glue is so penetrative that the insertion stage can be done dry.

The plan indicates that the engine bearers be spaced to suit your chosen engine. However, I chose to build them into the front end as far apart as possible. This allows a variety of engines to be mounted in the model; the engine being bolted to a 1/8 in. thick paxolin plate. Just as well - as the original engine in the 'Hepcat' had to be changed for a more powerful motor in order to cope with the extra weight of the radio equipment.

The wings are straight forward in their construction as, being flat-bottomed, they can be built directly on the board. The ribs are accurately cut and are a snug fit on the main 3/4 in. x 1/4 in. spar. If one uses cyano the complete wing could be assembled in under two hours including sanding the tips.

Having built the tail and fin directly over the plan it is time to assemble the uncovered structure and fit the control connections. The plan shows a very neat concealed system of linkages which enhances the illusion of being a free-flight model. I must admit though that I used the simpler but less attractive looking system of *Sullivan* 'Golden Rods.'

The final stage in the construction was another first for me - the use of iron-on, heat shrink covering. Again I took the advice of experienced R.C. modellers and used *Solartex* as being the easiest to use. The advice proved sound. In fact I would go further and say it must rate as the easiest covering method I have used - neat, clean and no smells. 'Hepcat' was covered in the



incidence of the wing, allied to extra downthrust on the engine cured these excesses... 'Hepcat' now climbs in wide left-hand circles, reaching several hundred feet on a 10 x 4 prop., before the 7 1/2 c.c. *Keil Kraft* team race tank runs dry.

The glide is a delight, for the novice, is an excellent trainer as it gives plenty of time to react to changes of heading. Control inputs are really only needed to bring the model back to the desired landing place as it loses height. So far 'Hepcat' has had about twenty flights and we seem to have reached some understanding whereby I have not confused it enough to crash nor has it, on its part, played any nasty tricks on me. I would like to extend my thanks to *Chris Martindale* and *Frank Dowling* for seeing me through those first critical flights.

For my part, the first introduction to R/C has, so far, been a happy one. I am now looking forward to building one of the larger vintage models in the *Buckle* range, with the added complication of a throttled four-stroke.

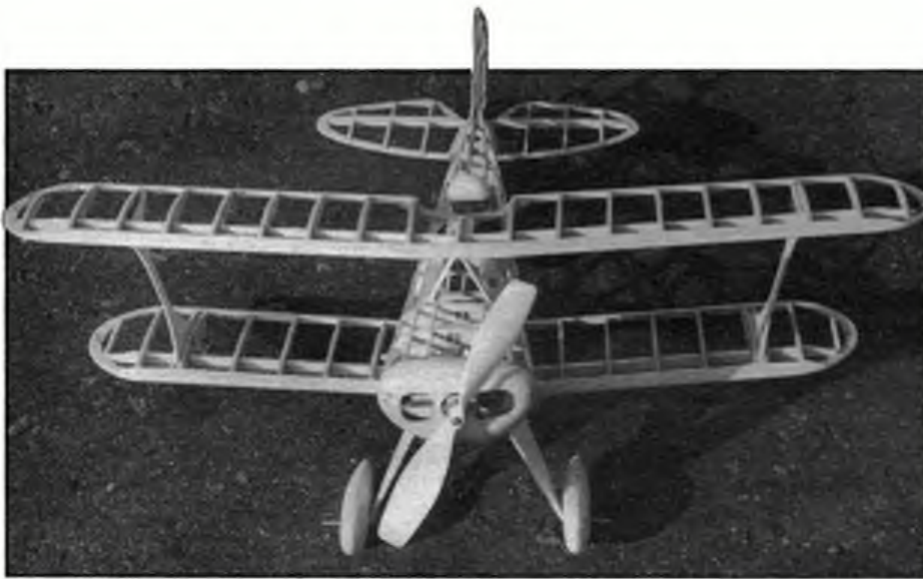
'Hepcat' £17.50 from model shops. *Replica Mills Mk I*, details of price and availability from: *Attachport*, *Water Lane*, *Frisby-on-the-Wreake*, *Leics*. PAW 1.49: About £17.50 from model shops.



The 48in. span 'Hepcat', shown here with *Replica Mills Mk I* 1.3 cc engine, fine for free flight, but not so ideal with the added weight of R/C gear.

kit, a fact which I think is a weakness. Even experienced builders like to have the reassurance of a brief outline and novices could well be thrown by not having some guidance. This apart, the 'Hepcat' is in fact very easy to build.

The fuselage construction follows the time honoured technique of building two identical sides - one on top of the other - later joined by cross-members. Basic construction is in 3/16in. square strip and



Left and below, for the more experienced, the Harry Butler 'Pitts Special' makes a good CO₂ free flight conversion. The model is not a lightweight and might benefit from an extra tank. Note (below) the bent paper air duct to carry warm air over the tank.



DESPITE THE FACT that the CO₂ boom seems to have passed by, there exists today a wider choice of models than even into which one can drop a *Telco* or similar motor. The 'ready-to-fly' foamies can still be found in the odd shop or two but in general are no longer in production. However, the passage of time has seen a drastic increase in the available plans for the enthusiast.

To the beginner however, these seem, at best, a little off-putting, and at worst, can be a definite 'turn off'.

Initially a novice to the CO₂ scene would benefit from installing their motors in simple models, kits even, until they find that there is nothing difficult in handling this type of power unit. Virtually any small free flight model of the 18in-24in span size will convert readily to CO₂, and both scale and sports types are suited. Many, will lean toward the scale subject, for most modellers have an affinity with 'the real thing'. CO₂ produces the ideal answer to the small scale model, providing a more consistent power run than the usual rubber motor. Without a 'ready-to-fly' as a stepping stone, the CO₂ beginner is well recommended to try one of the die-cut, ready coloured, all sheet balsa kits as a starting point.

Old established model sources such as *Veron* and *Keil Kraft*, not to mention *Lindoe*, still produce this type of kit and are simple in structure. Also of excellent quality and well worth trying are the *Micro-Mold* trio produced expressly for the *Telco* motor. Although they are not ready coloured, their simple construction and faultless flying performance make them another good place to start. In general terms, particularly if one has only limited experience of trimming free flight models, the high wing cabin model of the *Cessna*, *Piper*, variety is a better starting point in spite of the obvious attractions of the *Lindoe* 'Spitfire' and 'Messerschmitt' (that is not to say that the low wing fighters don't fly — on the contrary, for an all sheet model, they fly very well — but they are a bit more tricky to trim out and a little practise on a high wing model first will definitely help). For this 'all sheet' approach, only limited adaption is needed, concerning predominantly the fitting of an extra former on which to mount the motor. This former can be hard balsa or thin plywood and does not need to be an exact replica of the fuselage cross section.

Practice has shown that a rectangle of, say, 1/16 in. ply mounted across the fuselage from side to side is quite adequate.

Small fixing screws (either wood screws or 10BA nuts and bolts) will hold the motor to this plywood which is then 'wedged' across the fuselage far enough back from the nose to get the propeller in just the right place. The ply plate should be fitted to cause the motor to point down by typically 4° (when viewed from the side) and skewed sideways to produce 4° *right* thrust when viewed from above. These figures are not overly critical on this type of model, but as one progresses there may be the need to look more closely at *right* and *down* thrust from model to model

GAS ENGINES

~THE UPS AND DOWNS

Ian Peacock talks about models to build for CO₂ engines

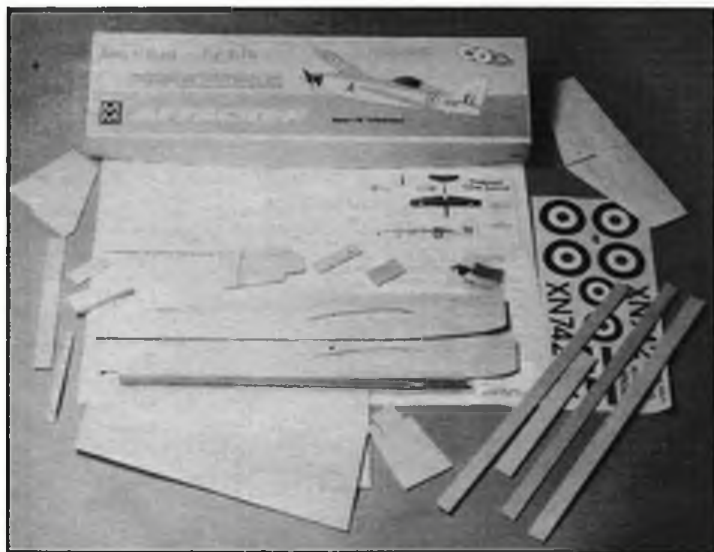
and adjust these angles to get the best flight performance.

If need be, the ply plate can be raised or lowered within the fuselage to enable the prop to *appear* central with the nose of the model. When satisfied with the motor position, glue the plate in place on the fuselage sides. A small fillet of glue is usually sufficient but 1/8 in. square balsa reinforcement may be fitted if it is thought necessary.

It pays not to be too excessive with this fixing, for once again, experience has shown that in a bump, it is better for this false bulkhead to break loose rather than damage the motor. Other modifications are the mounting of the charging nozzle if required and the siting of the tank. Some followers of CO₂ prefer to leave the charging nozzle hanging free, supporting it between first and second finger when charging (quite a lot of push is needed to overcome pressure when charging and this nozzle *must* have good

support). My preference, for what it's worth, is to surface mount the nozzle on a small strip of 1/16 in. ply at some local strong point. (Across the underside of the fuselage butted up to the former carrying the undercarriage is a good place, for it is a localised high strength area).

Finally, the tank can be supported by a couple of pieces of 3/32 in. sq. balsa strip to stop it flopping about. The best all-round position for the tank appears to be just in front of the model's point of balance, approximately on the leading edge of the wing. This gives a slightly nose heavy situation *when the tank is full* and the correct balance when empty. The reason for this is obvious when one considers that the initial burst of power from a CO₂ motor is quite high, dropping back to a steady cruise and finally tapering off until it stops. The initial power burst will produce good acceleration and a power 'zoom' that can easily lead to a stall condition. (When one is

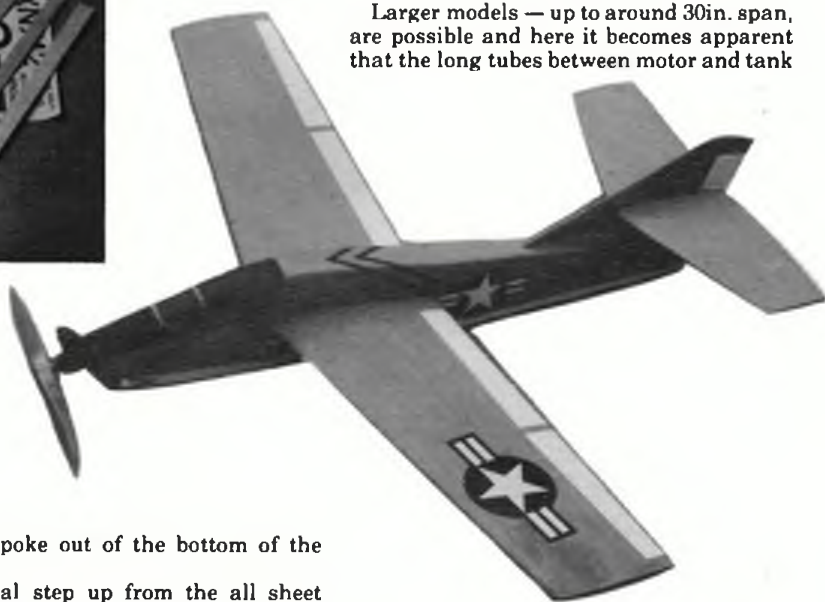


Simple all sheet kits for CO₂ power are available from Micro-Mold. On the left, the contents of the 'Attacker' kit. Below, completed model of the 'Skyranger'.

thin strips of wood (longerons, spars, etc.), die-cut formers and ribs and tissue covered. Greater care will need to be taken in producing this sort of structure to ensure that an accurate model results.

Tissue covered open frame structures will produce a good weight saving over the all sheet models and flight duration/performance should improve pro-rata. Motor fitting is exactly the same as with the previous models and no real trouble should be experienced in this area.

Larger models — up to around 30in. span, are possible and here it becomes apparent that the long tubes between motor and tank

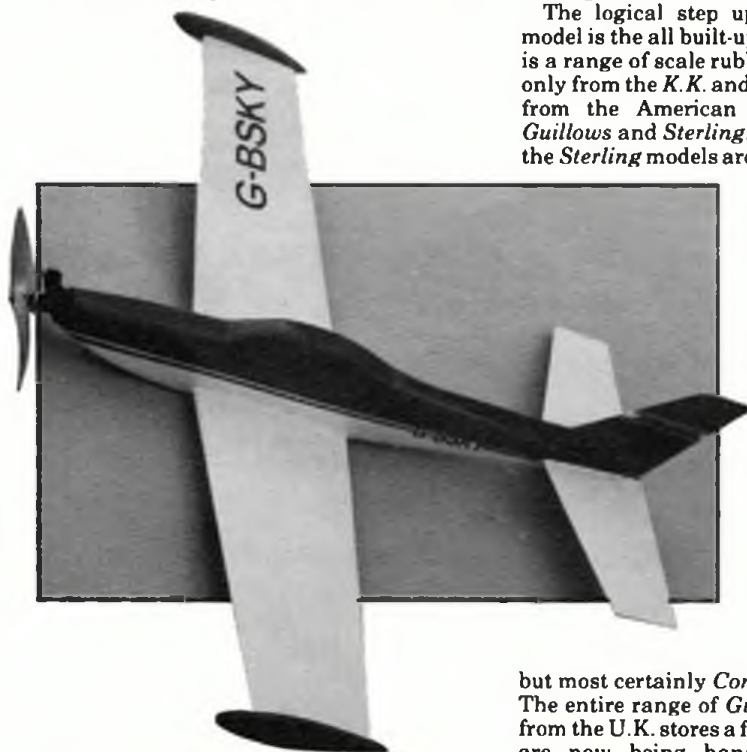


good at trimming, one can apply rudder to kill the stall resulting in a steep climbing turn that flattens out as the power drops off — but this is for the more experienced!)

With a slightly forward balance point as mentioned, a steady climb will result without the tendency to zoom and as the power drops off and the balance point moves back, normal glide conditions are achieved. Good ventilation is not a necessity with CO₂ models but it does help, particularly in inclement weather. Airflow past the cylinder fins helps to 'warm' the motor and

allowed to poke out of the bottom of the fuselage.

The logical step up from the all sheet model is the all built-up variety. Again there is a range of scale rubber kits available, not only from the K.K. and Veron stable but also from the American equivalents, *Comet*, *Guillows* and *Sterling*. I'm not sure whether the *Sterling* models are available in the U.K.



The third in the range of Micro-Mold 'all sheeters' is the 'Starhawk', the kits go together easily and are supplied with an easy to follow instruction sheet. Wingspan of all three is 19ins.

and, tank and filler allows a more flexible installation. Surplus length of tube is easily 'lost' by making a coil of the tube around the end of a pencil. In practice this coil should not be any smaller than about 1/4 in-5/16in diameter. Watch out for an unrequired weight build-up on this type of model, too much paint applied (and we do all love to paint scale jobs — don't we?) will negate the structural weight saving. This perhaps is the ideal place to use one's airbrush — but that is really a different story!

What perhaps is not immediately obvious, is that twin and multi engine subjects lend themselves to CO₂ power. Twin-engined free flight has always been the realm of the expert due to the problems of trimming the model for asymmetric power during a 'one engine out' situation. This problem vanishes completely with CO₂ for one simply runs both engines from a common tank! Therefore, once the motor revs have been established as equal by adjusting the 'throttle' settings, both motors will die off equally as the gas runs out, removing all 'twin engine' trimming problems.

Sometime ago Telco produced twin engine tank assemblies. That is to say, two tanks, each with an individual feed to the motors, had their filler pipe coupled to a common filler valve. This was successfully flown in a *Harry Butler* 'Islander' (now available from *Ballards* of Tunbridge Wells). However as all Telco parts are available as spares, it should not be beyond the enthusiast with a soldering iron to 'plumb-together' any combination of tank/motor/filler components to suit the project in hand (fig 1). In fact a twin tank system can easily be made for a single motor to increase flight duration.

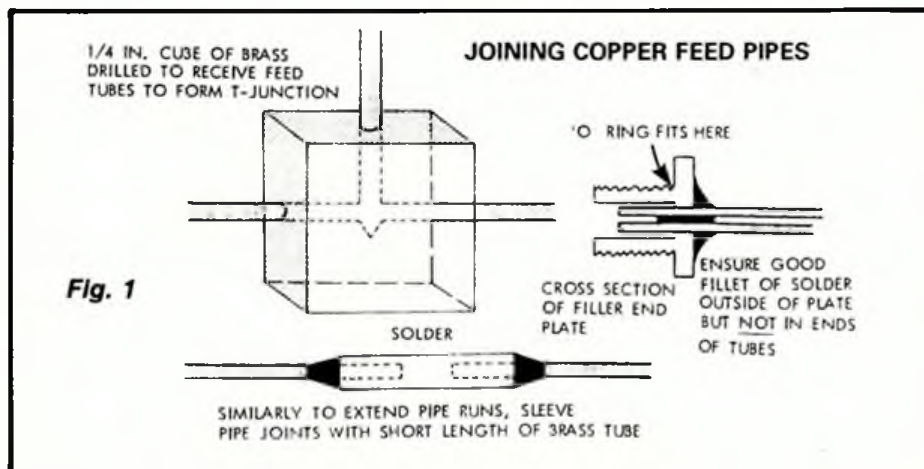
Making up specialist systems of this nature, or even repairing damaged pipes is not a job for the fumble-fingered. Disassemble all the parts (fig 2) and remove

prevent premature freezing. Much better, however, is to warm the tank. Some enthusiasts mount the tank in a hollowed out block of expanded styrene foam, figuring that the insulation properties of the foam will stop the tank from getting cold. Whilst this approach has practical merit, it also prevents the tank from warming up quickly between flights!

More practical is to arrange for ambient airflow to pass over the tank. This can be done with simple flow guides cut from paper and stuck inside the fuselage but on simple models the bottom of the tank can simply be

but most certainly *Comet* and *Guillows* are! The entire range of *Guillows* kits vanished from the U.K. stores a few years ago but they are now being handled exclusively by *Richard Kohnstam* and can be found in virtually every British model shop. For the beginner, I would recommend the American products if only for the fact that they feature die-cut parts and as such may be considered easier to handle. I've personally (and with not a little help from my friends) converted a large number of these kits to CO₂ together with others from the, perhaps, not so well known manufacturers.

Structurally, these models may be considered very traditional — although to the beginner, this statement is almost irrelevant! Mostly they are assembled from

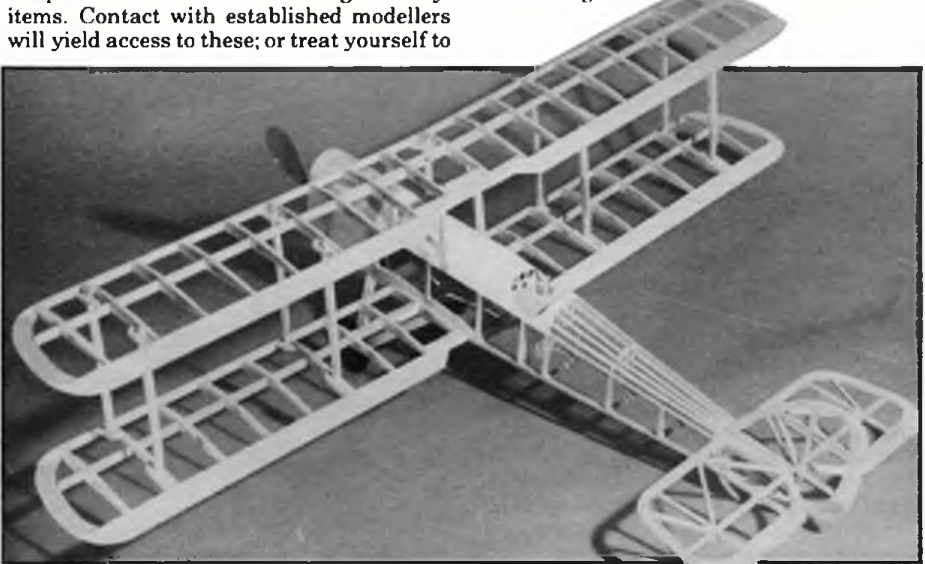


all the sealing rings (they will melt if you don't!) Ensure that all parts are scrupulously clean and use good quality resin cored solder. The biggest snag is tube blocking. This can be overcome by inserting a bristle from a stiff pig's bristle paint brush up inside the open end of the tube. This will stop molten solder from being drawn into the open end of the tube by capillary action.

From the experience gained with kit models, it is a simple step to progress to building from plans. *Aeromodeller* has published many suitable designs, both in the plans handbook and as free 'give-away' items. Contact with established modellers will yield access to these; or treat yourself to

a copy of the *Aeromodeller Plans Handbook* — a veritable mine of information.

The only real difference with building from plans is the extra time taken to trace off all the parts and cut them out. However the bonus is that one can carefully choose one's own grade of balsa with the inevitable reduction in airframe weight. Transferring component shapes from the plan to the wood can be done with a ball pen and tracing paper, carbon paper or by photocopying the relevant part of the plan and ironing it, face down onto the wood, with a domestic smoothing iron.



Above and left, for the scale enthusiast the Comet kit of the DH 9. Note filler nozzle in cockpit and that cowl has to be removed to adjust motor settings.

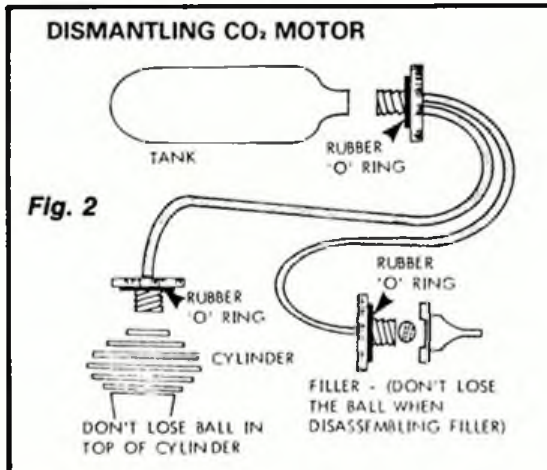
Cutting out the delicate parts requires only a little more skill tempered with a degree of caution. Old fashioned carbon steel razor blades still make the best tools for this sort of work and small files may be pressed into service for the removal of the 'notches' in formers and ribs (fig 3).

Apart from the choice of scale plans expressly designed for CO₂ (and a goodly selection of sport model plans) virtually any rubber driven free flight model plan of around the 24in-30in can be adapted. Simply follow the same basic steps with the motor mount etc. and the result will be well worthwhile.

So far it has been presupposed that CO₂ power is only for free flight, and whilst this is an accepted generality, it is far from the truth. Some years ago a young colleague was persuaded to convert a successful

electric RTP 'Beaufighter' to CO₂ control-line no less!

Regrettably this youngster is no longer with us, having been killed in an air crash, but not before he had astounded everybody at the M.E. Exhibition at Wembley. Laying out the lines at the R.T.P. circuit, few twigged that it was anything other than tethered flight, until Martin calmly walked over to the handle and flew the beast. The greatest amusement however was caused by the security men who insisted that they stood by with CO₂ fire extinguishers "In case the motors back-fired and caught alight!"

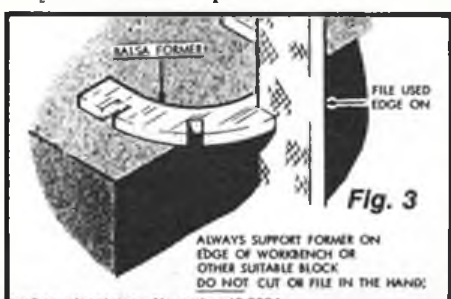


Since then we have constructed a control line B17 'Flying Fortress' (from the *Sterling* kit) with four *Telco* motors. Each has its own *Telco* gas tank mounted behind the motor (in the nacelle) in the conventional manner. However each of the four tanks is then plumbed into a larger tank in the main fuselage (large tanks are made by Bill Brown in the States — but are very difficult to find in the U.K. — once again shopping by mail for these specialised items seems the only way!) This larger tank is then fed by a single charging nozzle. Engine run is in the order of 4 minutes total of which the last 1½ minutes produces a powered descent and taxi.

Other C/L conversions should be possible and even aerobatics is not out of the question. *Harry Butler's* 'Pitts Special' (available from *Ballards*) makes a very exciting to fly (if tricky to trim) free flight CO₂ model yet I've seen Harry loop it on 16ft R.T.P. electric lines. Fitted out with one of the more potent CO₂ motors such as the *Telco* 'Turbotank', the 'Pitts' might be aerobatic as a control line project.

Neither has R/C been overlooked, several of us, including *Micro-Mold's* Roy Scott, have flown CO₂ R/C but it must be stressed that the low power of CO₂ motors prohibits all but the very lightest of R/C equipment and even then, flight durations are short. So much then for a resume of what has gone before and what, of course, is still very valid.

After all, one has to learn to walk before one starts to run!! However the newer motors ('Turbotank' types) have opened new avenues and time and Editor permitting we will be back shortly with more news of CO₂ ... watch this space!



THIS RALLY WAS HELD on the 14th October at Barkston Heath airfield, some six miles east of the city of Grantham. It attracted some 200 modellers from as far afield as Kent and Cheshire.

The '3F' day was organised to encourage the Society's enthusiastic sports flyers to gather with their friends and families for a day of carefree model flying and gossip. Thanks must go to those on the 'Midland Area' committee who organised the events on the day and for the preparation of the

Right, third place in the Midland Area Vintage event, Terry Dilks with highly competitive 'Challenger' - managed 5:35 in the six man fly-off.



Left, A. Hall with his winning model in Slow Open Power - an A.M. 25 powered 'Dixielander'. This design must surely be one of the most long lasting free flight power designs ever!



Rossi 65. Roger was the guy who had the mid-air collision with what was believed to be a small 'Cessna'. The 'Cessna' took off in a fast climb just as Roger was making a fast pass at about 70 ft. up., the 'Cessna' flew straight through Roger's 'Curare' Rossi 65 prop at full revs. The 'Cessna' model and radio gear was completely shredded leaving only the engine hurtling through the air; the 'Curare' landed with only a broken prop.

Fly for Fun Day

Gery Ferer and Brian Perks bring you some happy memories of last October's SMAE Midland Area '3F' day

SMAE prize plaques. These were awarded for the 'best model', 'best flyer' and 'best junior performance', for any type of model flown in R/C, C/L and F/F classes. The judging was carried out in an informal way by the judges wandering around the different groups and picking the winners. This was well received by all the various modellers as being exactly what was needed to encourage sport flying rallies with a relaxed fun-day atmosphere. Several of the clubs have reported back to the organisers saying "it was exactly what they wanted".

The Nottingham MFC used the day, as advertised, to hold their club competitions which attracted a good few of their members. SAM also arrived to put on a Vintage Wakefield competition run by Chris Hawke.

The day started with a moderate wind, which grounded a lot of F/F models, this increased around mid-day, but by early afternoon dropped off to allow most models to take to the air. Air conditions were dry and sunny which provided a lot of good lift for those F/F comp loonies!

The following F/F vintage report was taken, by permission, from Phil Siddall's Grantham club Newsletter which read: "There was some good competitive flying in the SMAE Vintage class event. Russell Peers produced a fly-off time of 6:59 from his trusty 'Lanzo', holding off the challenges of Phil Ball and Terry Dilks. Three other models made the fly-off, A. Hall with his

Frog 500 'San de Hogan', D. Dent flying a 'Sunspot' glider and B.M. Perks with yet another 'Challenger'. Both the power and glider models looked very Vintage in action, the 'Sunspot' even using a parachute D/T. Keith Harris was getting very good flights from his K.K. 'Bandit', while Mr. Wallace of Nuneaton had two different sizes of 'Simplex' in the air almost continuously. His son Carl won the junior trophy with many fine flights from a neatly built Mercury 'Matador'. Best flight went to Mick Bates from Nuneaton (again) with his 'Tomboy'; this model had managed a 21 mile flight from Barkston Heath! (See report in November issue of *Aeromodeller*). Best model award went to J. Spencer of Nottingham with a very appealing 1/2 size Comet 'Clipper' scaled down from a *Model Builder* plan. In spite of the model never being flown before it was quickly trimmed in the windy conditions and put in many attractive flights; powered by a Kalper 0.32 diesel."

The day saw a good R/C turn out, with the following clubs enjoying the opportunity to get together - Larks, Leicester MFC, Grantham, Rutland Flyers, and it was good to see Market Harborough MFC there - one of the oldest clubs in the country. Eric Bradley and Roger Reedman of Harborough said "that they were looking forward to next year's rally". Eric was flying a very fine 1/4 scale 25cc glow motor powered 'Laser 200' and Roger with his 'Curare' powered with a



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Both guys accepted the accident in the spirit of the day.

Don Stothers took first prize, flying his well designed 'Jabberwok', a model which he markets as a kit on a part-time basis. Two well-known ducted fan flyers, Peter and Paul Thorpe put on an impressive display, Peter flying a 'Meteor' and Paul his converted 'Hawk'. The majority of models were scale and extremely well built ones at that. Six of these models, all bi-planes, were seen at one time to take-off together - an impressive sight. C. Southey's perfect scale replica of a Piper 'Cub', in looks and flight, took 'best flight' trophy.

The C/L wire flyers had a reasonable gathering with a four-year-old, Catherine Henson assisted by her father Tom, seen flying a combat model with dexterity which made her the 'best flight' winner and her father took 'best model award'. His model 'Tony' was extremely well presented. Darren Walker took 'best junior' trophy with an impressive performance of control line flying.

The F/F events were managed by Gery Ferer, and attracted many well known flyers; such as J. O'Donnell, M. Dilly, J. Carter and others, with the competitions being aimed at the mini-classes A1, CDH, but also including Slow Power and Vintage Duration which seemed appropriate! This event being won with G. Fuller's 'Dixielander' flown by A. Hall and powered with an AM25. The Slow Power class of model can be selected from many of the older competition models since it requires no gadgets, except for an engine timer and D/T (normally fuse), and provides the opportunity to explore the more readily available engines. A 10 sec. motor run is

allowed for glow motors with a 12 sec. run for diesels. Perhaps next year will see more club flyers having-a-go with a vintage power job.

Because of the moderate wind the maximum flight time in the F/F comps was set at 2:30 mins. which was just about right for the day, and gave some idea of the effect of the new rule for SMAE Aera-centralised contests, recently passed by Council. All-in-all, the F/F boys enjoyed a good day and most flight times were well above average.

As hoped for by the Midland Area, the response to this type of rally was well received by the 'sports flyer' who by definition wants to fly his model without being organised. The good weather made it possible for all those who went to Barkston, and supported the rally, to bring back some of the old 'gala nostalgia' and that important ingredient 'atmosphere'. One radio flyer was definitely heard to say "What about a two day event next year".



Informal Contest Winners

Free Flight

Best model J. Spencer - Notts, 1/2 size Comet 'Clipper'
Best flight M. Bates - Nuneaton, 'Tomboy'
Best junior Carl Wallace - Nuneaton, 'Matador'

Control Line

Best model T. Henson Grantham, 'Tony', semi scale
Best flight Catherine Henson - aged 4, flew 'Warlord' with T. Henson
Best junior Darren Walker - Grantham

Radio

Best model Don Stothers - Grantham, 'Jabberwok'
Best flight C. Southey M.A.D., Piper Cub
Best junior C. Selvey-Willars - Market Harborough Glider

Left, youngest aeromodeller in control line at the moment is Catherine Henson (aged 4). She won the 'Best Flight' in the informal control line comps with a 'Warlord' ... heaven help Vernon Hunt in a few years time! Above, always active competitor from Falcons club John Carter, seen here with his Slow Open Power entry, came 2nd with 2:46 in the fly-off.

AT THE LAUNCH PAD

with John Wheddon

Model Rocket Competitions

As the sport became popular in North America and Europe it was inevitable that the obvious question about 'how high?' would develop into a series of competitions. The framework of rules was established quite quickly and the first international competition took place in Dubnica, Czechoslovakia during 1966. In 1972 the first World Championships were staged in



Yugoslavia when nine countries were represented. On that occasion the gold medals were shared between Romania, Czechoslovakia and Egypt. The sixth World Championships takes place in Bulgaria this year, during August, so it is appropriate to discuss exactly what model rocketry competitions are all about. Broadly speaking there are three main types of competition, all of which are sub-divided according to the class of engine chosen. The competitions are for Altitude, Duration and Scale Models.

Altitude

The object of Altitude competitions is quite simple - build and launch a model which will fly higher than anyone else's; given a

Right, 1983 Scale World Champion, Mieczyslaw Twardowski (Poland) with 'Saturn 1b' with which he took 2nd place at '84 European Champs in Roumania. Left, Marcel Hurta (Czechoslovakia) with imposing model of French 'Arlane'. Uses two 20 Ns engines and has clear circular plastic fin to increase stability. Below: Jaroslav Stepanek with R/C Boost Glider uses simple magnetic actuator.



particular engine class. The organisers provide some form of altitude tracking apparatus which usually consists of at least two theodolites arranged around the launch site. A team of nimble-fingered calculator operators convert the measured angles into actual height. The trackers are usually quite adept in the use of the theodolite, but the responsibility for ensuring a good track rests with the competitor. He must provide a rocket which is easily visible and will follow a predictable trajectory.

Payload

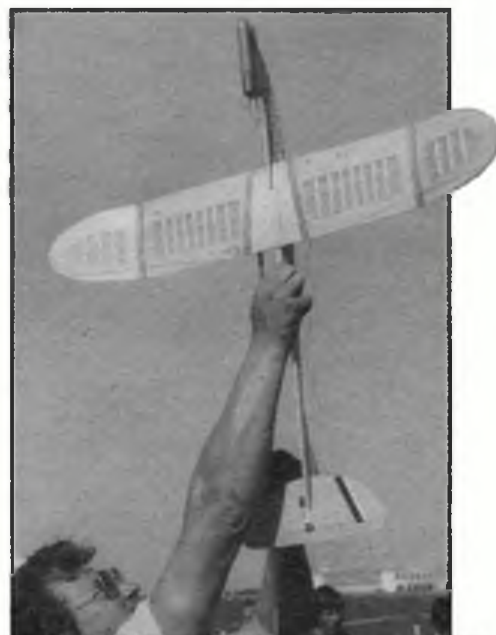
This is an altitude competition for models which carry one or more standard 28 gram payload weights. The diameter of the weight is set at $19.1\text{mm} \pm 0.1\text{mm}$ which is inconveniently slightly larger than the most common engine diameter!

Duration

It was quickly realised that the apparatus and level of organisation required to conduct altitude competitions could prove to be a problem for smaller clubs and so it was reasoned that total flight time from launch to touch-down under its parachute or streamer would be an easier way of estimating the height achieved by a rocket. Streamer Duration is a deceptively simple competition where streamers, made from any material, but with a length to width ratio of 10:1 are used for recovery. Parachute Duration presents the flier with even more agonising choices. A small parachute can be launched to a high altitude but will the timekeepers be able to keep it in sight? Conversely a large parachute will be more visible, but it will probably be heavier and

the launch rocket will also require a larger diameter body tube. So the choice is visibility versus altitude, and wind conditions on the day introduce yet another variable into the equation.

In duration competitions the best total time for three flights decides the winner. It was soon realised that thermals play an important part in rocketry, as in model aircraft. So the idea of a maximum flight time was borrowed from the free-flight aircraft rules. The maximum time varies according to the class of model and engine size. Boost-gliders, discussed in a previous article, are also flown in duration style competitions, with and without radio control. The current rules are rather loose on the subject of radio, stating that it may be fitted to maintain the model's flight path 'in





Right, another World Champion, Angel Jankov (Bulgaria) seen here at '84 Roumanian Euro Champs with R/C Boost Glider - note special supports for wings on launcher. Above, Angel's model takes off for a max ...



the vicinity of the launch site'.

Helicopter Duration or Rotor Recovery is a very interesting competition (not presently recognised internationally) for models which deploy rotor blades for recovery. Popular in the United States this class produces some ingenious answers to a tricky task.

Scale

Scale models are regarded by many as the ultimate in model rocketry. The rules allow considerable choice of subjects as models of any guided missile, rocket or space vehicle are permitted. This simple rule has resulted in an interesting variety of models ranging from 1/100th scale 'Saturn V Apollo'

launchers to rocket planes such as the Douglas 'Skyrocket' and the WW2 Bachem 'Natter' rocket-fighter. Considerable emphasis is placed upon the competitor supplying comprehensive substantiating data as proof of scale and there are actually points awarded for the quality of this material. Scale rocket competitions are conducted in a similar way as the model aircraft equivalent. The models are first judged on scale merit, quality, workmanship and difficulty, followed by a launch demonstration where the flight qualities, realism and safe recovery are marked.

Scale Altitude is an altitude event for scale models where models are first judged for scale qualities and are then tracked to measure achieved height in the same way as a standard altitude class competition. One point for each metre of altitude is added to the score awarded during the static judging and the winning model is the one with the highest total.

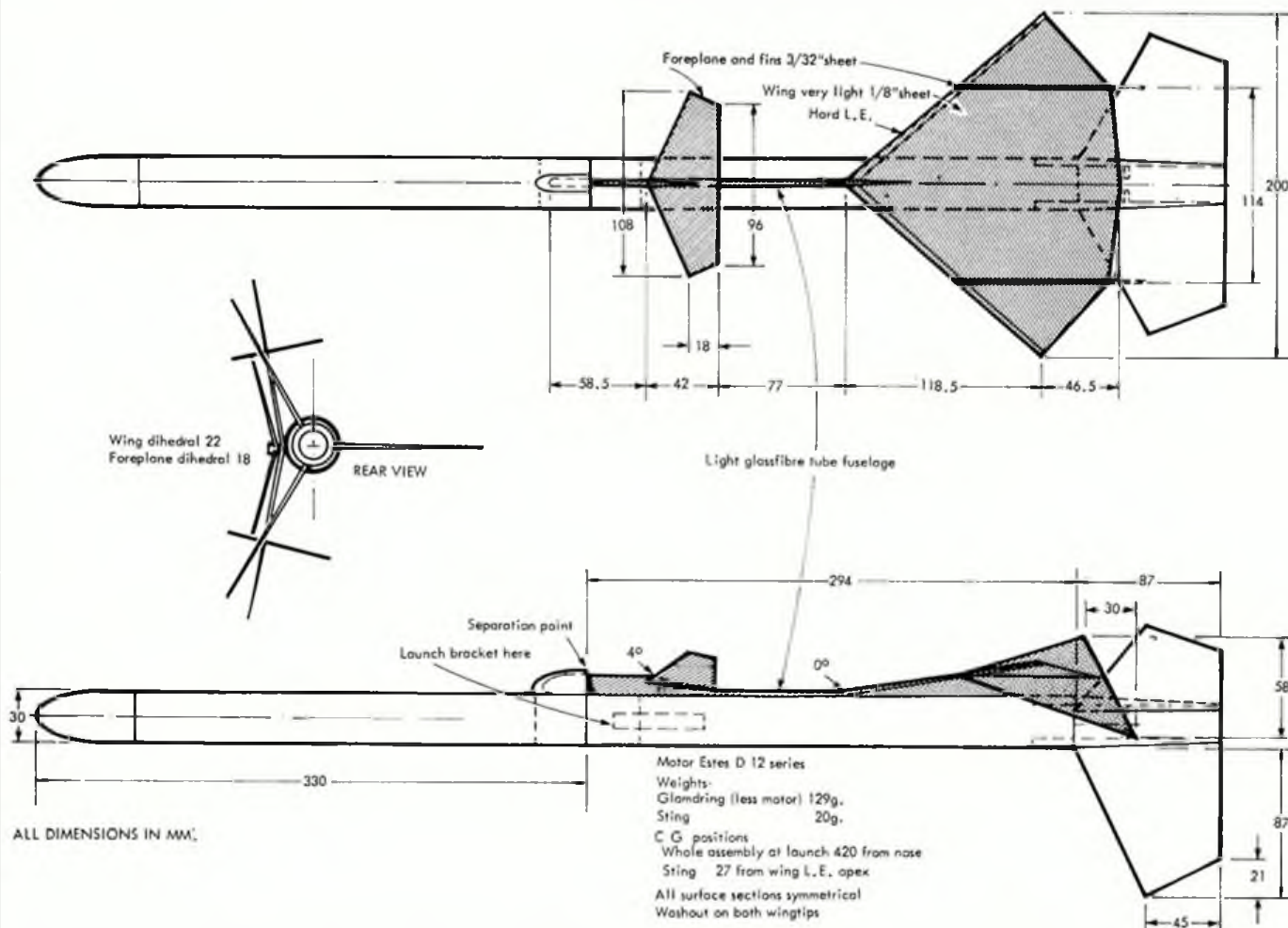
Rocketry competitions are notable for the great spirit of friendliness between contestants from the many countries taking part. People are always willing to share ideas and to assist each other. In particular, British teams have received tremendous help from friends in the United States and Czechoslovakia. Anyone who is interested in finding out more about our plans for the 1985 World Championships should contact the writer via the Aeromodeller offices.



Glamdring & Sting

by P.D. Freebrey
Scale 1:4

A parasite boost glider can be a very sure-fire method of getting good height and certain separation of the booster from the glider. Canard configuration of glider keeps 'centre of pressure' to the rear. Unfortunately, the other side of the coin is that the glider is small and not terribly efficient! So visibility is a problem. The weight of the launch vehicle would be put to better use in increasing the area of the glider - see the other photos this month. Separation is just fore of the glider nose (which is retained in 'dog kennel') and the swept back underfins 'lock' onto the launcher main fins. Good reliable layout, but unlikely now to achieve the Silver medal it got 'way back when'.





Early days! The shapes give away the vintage - 1947 at the St. Alban's 'Cement Squeezers' All-Herts Rally, Radlett. This group of early control-liners were to influence rapid progress and include Den Allen's 'Thunderbug', Mick Guest's 'DynaJet' and Ron Moulton's 'Voetsak'.

The only engine I had that I thought would emulate the power of an ED 'Comp Special' or '2.49' was a PAW 1.5 c.c., but not the weight... I had to add a very large lump of lead to the nose!

So to the field, the 7 x 6 in. prop. seemed ridiculous for the model but it suited the PAW. After half a lap the 'Kan Doo' just managed to get airborne and some laps later I even managed to loop and fly inverted but bunt it would not! All this frenzied activity, at about 35 m.p.h. took place on 40 ft. lines,

Mind the Lines—

A vintage title for a vintage column — Andy Brough reports on Vintage Control Line happenings.

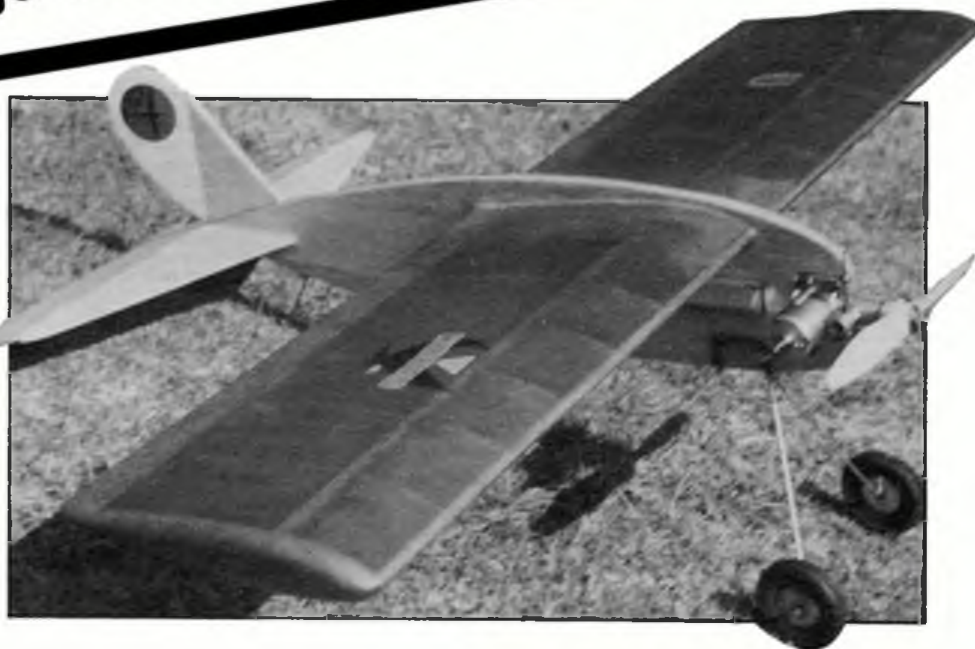
Rubery fun...

A major aspect of the vintage movement is that one looks forward with great anticipation to the many events held, not with nervous excitement as to whether one is going to win or not, but rather to meet up with friends from around the country. To see what models they've brought along, chat and above all fly. So it was in October that I attended a vintage control line rally at Rubery Hill, Birmingham organised by Peter Martin. I didn't count the number of models present, but with 3 circles going most of the day some 20 - 30 models must have been airborne. The accent was on fly-for-fun, but a 'Midge' comp and a Vintage Stunt comp were also organised.

The winner of the Stunt comp was Mick Taylor flying a 'Hot Rock', as at Old Warden; second, Ron Prentice-'Stunt-wagon'; third, Andy Brough-'Juggler' and lastly Ray Gordon with an 'Ambassador'.

The 'Midge' comp had a fairly high attrition rate as Ron Prentice's model separated in flight, the bottom of the fuselage complete with engine looked just like a wooden speed pan! Gordon Counsell's broke as it landed and that of poor old Peter Martin (one of three he brought along) had a wing came off as we tried to start the 'Javelin'. Winner was Mick Taylor at 69.5 m.p.h., second Peter Martin 53 m.p.h. and third Mike Downing at 49.5 m.p.h.

One interesting point about the stunt judging was the scoring system. Points were awarded in three grades for each manoeuvre, i.e. poor, good and very good and marks apportioned accordingly. The scores from the two circles for each pilot were almost identical and was judged most



satisfactorily by all concerned.

Apart from the above comps there was a lot of flying and chatting and all agreed that it was a great day out. Thanks Peter...

Doesn't Doo!

With only a few weeks to go before Vintage Day and not a new vintage control liner in sight, I looked around for a quick-to-build model. Now, one model that has always fascinated me is Peter Cock's 'Kan Doo'. I know that this model is 'old hat', as so many were built in the late 70s, but I had to experience trying to fly one for myself...

The 1976 April *Aeromodeller* provided me with a 1/4 scale drawing which was soon scaled up. It was obvious that the 1/4 in. ply fuselage would be far too heavy, so I made one out of 1/8 in. ply fretted out at the tail end as much as possible and then skinned it both sides with 1/16 in. balsa.

Above, Andy's 'Kan Doo' sporting the P.A.W. 1.49. Right, to save you all writing in to purchase copies of April '76 *Aeromodeller* (which we haven't got!) here are the 1:4 scale drawings of Pete Cock's 'Kan Doo'.

whereas the original flew on 50 I believe.

So more power said he... out came the 1.5 and in went a healthy example of an *Elfin* 2.49, which by the way weighs the same as a PAW 1.5. In this state I took the 'Kan Doo' to Old Warden, fitted with an 8 x 6 in. prop and the *Elfin* going flat out it leaped into the air after half a lap, looped, flew inverted, but would it bunt... would it heck! Also the air speed was about the same as with the PAW. I can only assume that the extra thrust of the *Elfin* was completely negated by the drag of the model.

Next project is to fit a PAW 2.5 and if that fails a 29!! If you have any solutions, don't hesitate to drop me a line. Notwithstanding

all this, what about a 'Kan Doo' contest next year?

Scaled down C/L?

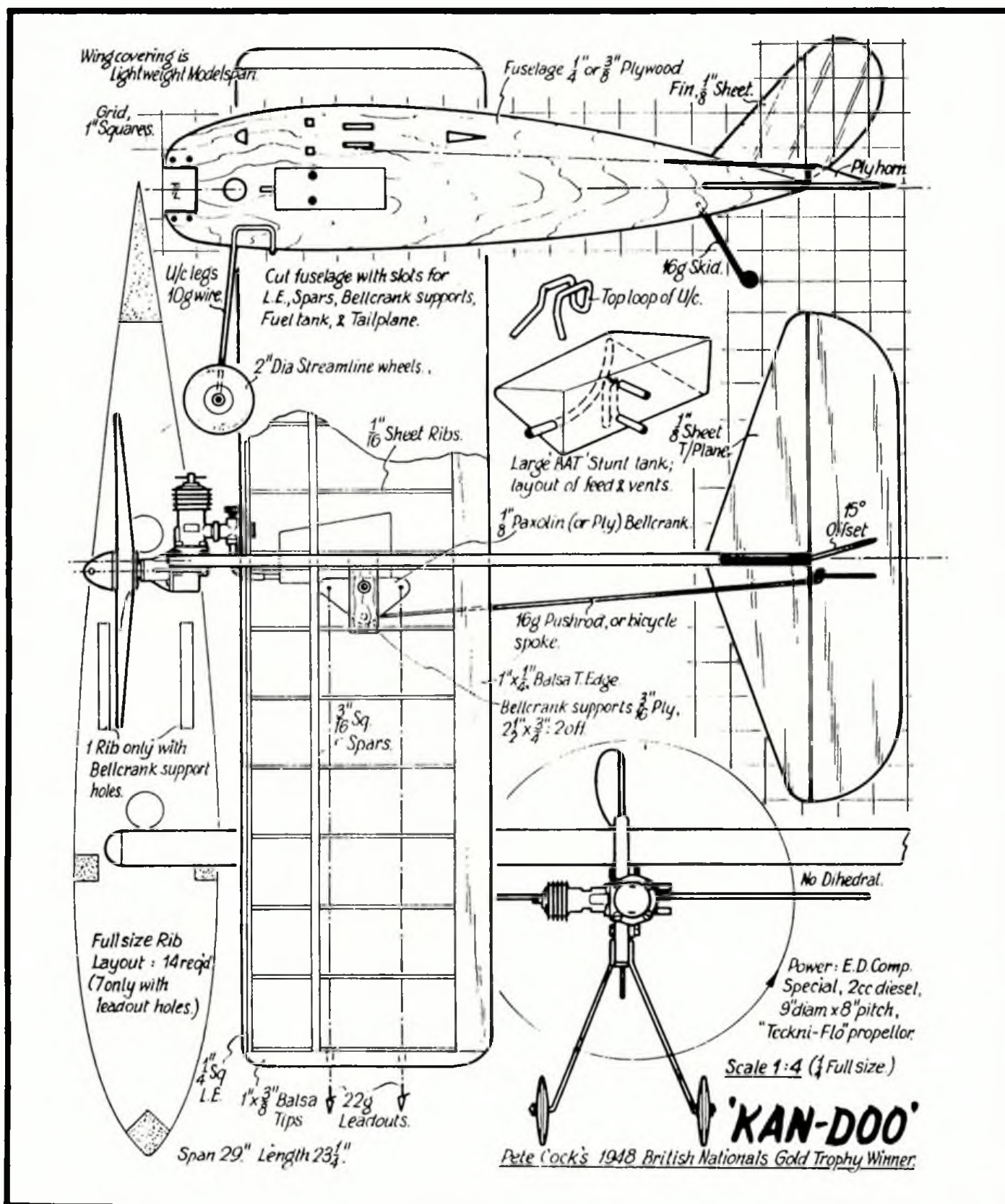
One feature of the vintage scene particularly with R/C assist and CO₂ is to scale old designs up or down but I haven't seen any scaled control line models yet! I'm a bit of a purist at heart but since my firm bought a photocopier that will enlarge and

reduce, many happy hours (hope nobody at work sees this) have been spent enlarging and reducing plans. How about a 10c.c. twice size 'Kan Doo', I can assure you that it's very large! This activity seems to be accepted in R/C circles why not control line circles?

SAM 35

Now, I know you all read Alex Imrie's column, 'Vintage Corner', and you've heard

of SAM 35, but I can't stress how great the club is. Yes, club is the best way to describe it, because even though the membership is scattered all over the country we all get to know each other at the various events and through the magazine 'SAM 35 Speaks' (advert!). Peter Michel is the man to contact at 56, Lynwood Grove, Orpington, Kent and £9 the price for 1 year's membership including the magazine. Join today!



KEY

- A Rubber motor
- B Rubber motor
- C Front prop
- D Rear prop
- E Main prop shaft
- F Tubing
- G Spur gears
- H Thrust bearings

A freewheel unit may be fitted here as described in the text.

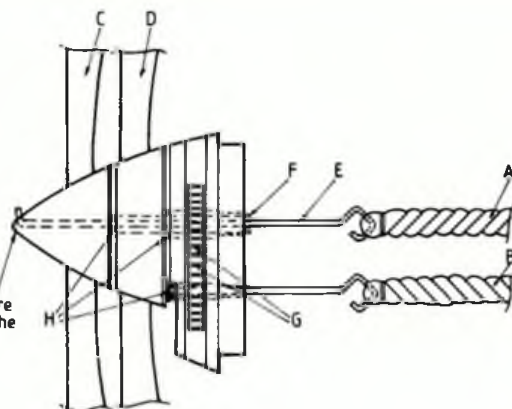


Fig. 1

to build, but is probably the lightest because all gears are completely done away with. Referring to fig. 3 the operation is as follows. The rubber motor is housed in a tube 'C' and the front propeller 'A' is driven in the normal fashion. The tube is so arranged as to allow it to revolve freely within the fuselage. The rear propeller 'B' is fixed to this tube and is driven from the rear end of the motor through the freewheel unit in the opposite direction to the front propeller. In this case the freewheel unit disengages both propellers instead of just the front one as in the previous methods. To wind the motor the whole unit is removed from the fuselage through the nose, then holding the propellers, the motor can be stretch wound by removing the motor 'peg' from the tube in the same manner as a nose block is removed from a fuselage on a standard model. It may be said that this method is just as heavy as the previous ones described, but the point is that the tube takes all of the strain of the motor, so the fuselage can be of lightweight construction. The main disadvantage I can see with this arrangement is the fact that the motor will unwind twice as fast than if it were fixed at one end as in the previous methods.

So as you can see all of the arrangements described here have their advantages and disadvantages.

Some experimentation with different propellers may prove interesting. For instance, because the rear propeller is working in the slip stream of the front one, should the rear propeller be of a slightly coarser pitch or perhaps the same pitch but slightly larger in diameter?

I hope this short article stirs some interest in this subject as the original articles did with me when I first saw them.

Contra Rotating Propellers

G M Simmons looks at several ways to solve this tricky operation

ONE DAY while reading through some old model magazines, I came across a couple of articles concerning this subject. Intrigued, I decided to find out a bit more about this unusual solution to counteracting the 'Torque Reaction', which is normally achieved by careful thrust line adjustments. For those, who like myself, are too young to remember or perhaps just didn't see the aforementioned articles first time around, I shall attempt to describe a few of the arrangements used, although there are probably others not mentioned here.

The first, being the most simple, can be seen in fig. 1. There are two rubber motors 'A' and 'B'. Motor 'A' drives the front propeller 'C' in the usual manner whereas motor 'B' drives the rear propeller 'D' via a pair of spur gears. This is made possible because propeller 'D' is fitted to a piece of tubing 'F' which runs on the main propeller shaft 'E'.

The main drawback with this system, although simple, is the weight. The second 'motor' adds considerably to the all-up-weight of a model.

The second system shown, overcomes this problem to a certain extent. It makes the second motor unnecessary. This is achieved by the use of bevel gears, (instead of the spur gears used previously) in the manner shown in fig. 2.

Referring to the diagram, it works in the following way. The motor drives the front propeller 'A' as normal, but also drives the rear propeller 'B' through the gear train. Propeller 'B' is fitted to a piece of tubing and revolves around the main propeller shaft, as in the previous arrangement.

A freewheel unit may be fitted to both of these systems which would disengage the front propeller after the rubber motors have run out.

The third method is the most complicated

KEY

- A Front prop
- B Rear prop
- C Bevel gears
- D Thrust bearings

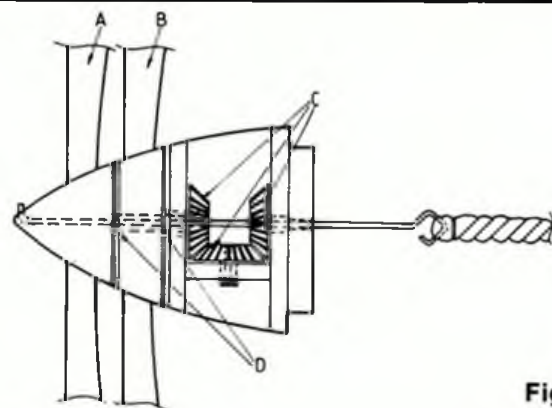


Fig. 2

KEY

- A Front prop
- B Rear prop
- C Tube
- D Motor peg
- E Freewheel unit
- F Shim bearing (rear)
- G Thrust bearings
- H Shim bearing (front)

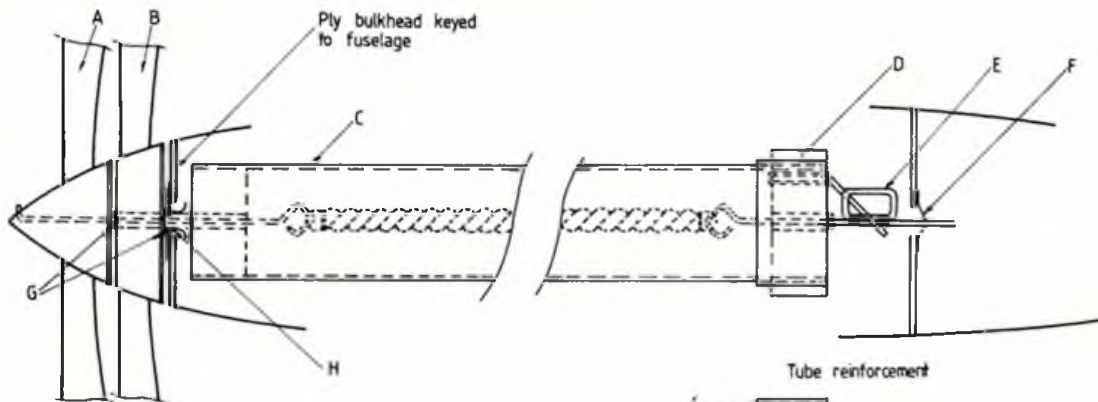
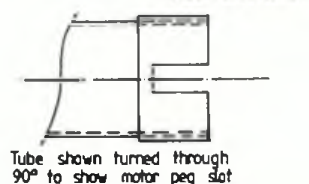


Fig. 3



Tube shown turned through 90° to show motor peg slot



Mighty Mini Vise?

Small clamping mechanisms come in all forms, and the latest to arrive on the editorial desk is a 'Mini Vise' from Media Marketing Inc. It fits in a box 7cms. x 8.8cms., so it certainly classifies as a 'mini'. Principle material for its construction is plastic and it is intended to be mounted upon any handy smooth surface. The 'Mini Vise' has a suction grip base, operated by a locking lever. Jaws are 3.8cms. x 1.0cm. with a horizontal 'V' groove to facilitate gripping cylindrical objects (brass tube, dowel, etc.). The jaws have soft aluminium clams to protect the plastic faces. The clamping screw is also plastic with a 'wing' nut head. Maximum usable distance between the jaws is about 2.5cms. and considering the plastic construction there is relatively little play on the moveable face. The 'Mini Vise' can only be considered for very light work, but could well prove a useful device to have on hand when soldering or working with small bore tube, etc. The 'Mini Vise' can be ordered by mail order from Media Marketing Inc (Model Tools), Freepost, St. Albans, Herts. AL3 5BR. Cost including post, packing and V.A.T. is £4.99.

Easy glow ...

MacGregor Industries seem to specialise in items that make life easier for us lazy modellers. One of their latest gadgets is the Nissin 'Lock-Starter'. This little device (100mm long, max diam 24mm) consists of a nickel cadmium cell (NiCad) and a spring loaded fitting, to attach it



Left, drawing of the 'Mini Vise', will attach to any smooth surface. Above the latest Aeromodeller Plans Handbook - out now!

to a standard glow plug - who wants battery leads! The 'Lock' of 'Lock-Starter' also indicates that the device will 'lock-on' to the plug, leaving you two hands to deal with the model and engine. Coming with the 'Lock-Starter' are several charging leads allowing you to charge-up the NiCad either from a 12 volt car battery, a MacGregor 'J R' Radio Control transmitter charger or a further lead that enables you to use a charger of your own choice. The 'Lock-Starter' certainly reduces the amount you would have to carry around with you and the single NiCad with a nominal voltage of 1.2 volts should be sufficient to start a glow engine, provided your fuel settings are correct and you do not flood the engine too often. As with other MacGregor Industries items, these should be widely available from most model shops. Cost of the system is not cheap, but think of the convenience. Lock-Starter, £10; J R and 12 v charging leads (Pt. Nos. 4161, 4160) £4.95; plain wire ended charging lead (Pt. No. 4162) £1.50.

Plans Handbooks...

Why not replace your dog-eared 'Plans Handbooks' with the nice new issue... As most of you will know the Aeromodeller Plans Service has thousands of plans in his range, covering models of all types and sizes.

As with nearly everything else in this day and age, plans prices have had to increase slightly - the new Aeromodeller Plans Handbook No. 1 has the latest prices and some of the oldest models (Vintage... hint, hint!).

Price is £1.25 - look in your model shop for its arrival. If you can't wait that long send £1.55 to Plans Service, Wolsey House, Wolsey Road, Hemel Hempstead, Herts., HP2 4SS, and we will mail you one just as quickly as we can...

Charging around...

There is no doubt that today's modeller uses electricity in many ways and from many sources. Most of us have rechargeable batteries of some sort in regular use. These could be either Ni-Cads in radio control gear, an electric free flight model or as suggested only a few months back in Aeromodeller - electric control line. All these batteries (of the rechargeable sort) require some means to charge them. Various systems are on the market, but one range that has recently come through our offices is that of West German origin distributed by Powermax. This is the 'Titan' range of chargers. They must cover almost every possibility you can possibly think of! From simple multi-output constant current (22, 50, 150 and 500 mA) to fast charges with built-in timers - with or without electronic sensing...

fuse in the normal 13A style plug.

Prices of 'Titan' chargers are as follows: Mains Fast Charger Model 689 Electronic £56.10, Mains Mini Charger, 5 outputs 22 to 100 mA simultaneously, Model 333 £19.10, Timed Mains Fast Charger, 1.4 amp plus 2 trickle outputs Model 688 £28.50, 12 volt Fast Charger 2-7 cells with timer (8 cell with vehicle engine running) Model 555 £54.20, Mains Universal inc. Fast Charge (max 750 mA) with timer Model 222 £43.50. Available through Powermax stockists.

F/F, Vintage, Indoor...

SAMS of Wheathampstead always seem to have a steady stream of 'goodies' for us to tell you about! The latest batch includes Walt Mooney's latest Bag (no. 5) of Peanuts, thirteen peanuts and two others for only £3.99. Plans include BD-8 low wing mono-plane, the Australian Starlet CJ-1, a fascinating CO₂ pusher powered ultra-lite, the Hovey 'Wing Ding', the 'V' tailed 'Honey Bee' and nine others... SAMS also have the Frank Zaic Index, which is simply a slim booklet containing copies of the Indices from all of the 'Frank Zaic Yearbooks'. Although it does not tell you what each model is, it is nevertheless a very useful reference and every vintage flyer should have one - cost £1.00 plus a 9in. x 7in. stamped addressed envelope. In stock for



Above, the Lock-Starter with its three possible charging leads, not cheap but very convenient. Left, some of the 'Titan' range of battery chargers.

The 'Titan' chargers come with very comprehensive instructions giving methods of calculating times and in some instances, data tables giving charging times under differing conditions. As the mains powered chargers do not have a fuse incorporated, and they are designed for use with continental mains sockets, it would be wise to have a 3 amp

the indoor modeller are two grades of 1/64in. balsa: one is not selected but is indoor quality - 12ins. x 2ins. nominal, at 45p per sheet, the other is selected B/C grain and is ideal for 'Flyrods' - 18ins. x 1 1/4in nominal and is £1.00 per sheet. All the above are available from SAMS, 2 The Drive, Blackmore End, Wheathampstead, Herts. Don't forget to add 15% to your order for post and packing.



FROM THE HANDLE

CONTROL LINE NEWS

Racing with Jim Woodside

Review of the 1984 Racing Season

The pinnacle of the 1984 racing season in fact played no part in determining the outcome of the U K league tables. I refer, of course, to the fine achievement of Steve Smith and Colin Brown in winning the F2C World Championships. It was in fact twenty years since Dick Place and Don Haworth last won the honour of this title for the United Kingdom. These events have already been reported elsewhere so I will restrict my remarks here to adding the sincere congratulations of the racing fraternity.

I think the main feature of the 1984 events was just how keenly they were contested - as close as 1½ points over a complete season. All the four classes showed an increase in the number of events flown but a slight decrease in the actual number of teams. This steady decline in the number of teams with each passing year remains, in my opinion, a constant worry and I am by no means confident that the trend can be halted, let alone reversed. I can only ask that each of you try to encourage any interested bodies who you might know and who are currently in other areas of our hobby.

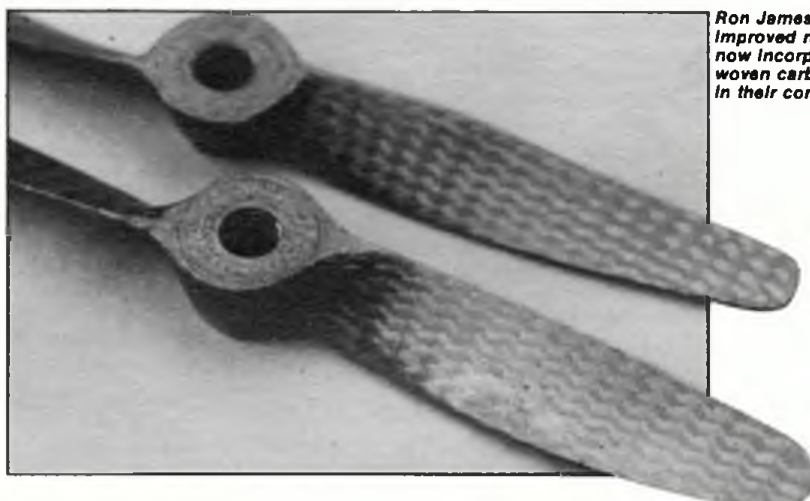
Goodyear

As usual Goodyear had the most events (19) and the most competitors (42 teams). This class was the most closely contested, with Clarkson-Needham just besting Scotland's Pegg-Thorpe by a mere 1½ points. It is worth noting, though, that the Scots amassed all their points as a team, while Ed Needham did have several temporary couplings on days when Dave was absent on business. As many teams compete in both Class II and Open Goodyear all points gained count towards a single championship.

In Open Goodyear the Rossi Mk's II and III have remained dominant, with the Nelson a close second. The word at the moment is that Rossis have become almost un-obtainable and so other engines like the Nelson, U S E and converted OPS may be more common next year. Running the Rossi on pressure fed fuel systems has enabled some teams to unleash enough power, when allied to slick technique, to turn in times which would be creditable in FAI team race.

1. Clarkson-Needham*	- Stockport	72½
2. Pegg-Thorpe	- Hamilton	71
3. Schofield-Millar	- Horseshoe Pub	40
4. Andrews-Horwood	- Bristol	39½
5. Catlow-Jephcott	- Loughborough	16

* Nationals Champions



Ron James 'Visionregal' improved racing props, now incorporating woven carbon fibre cloth in their construction.

Class 'B' Team race

Four events and twelve teams showed a marked improvement over '83. The OPS 29 remains 'the engine' being flown in conventional style models. Certainly the Silver Anniversary of the Wharfedale-Rufforth '1000' gave 'B' a much needed fillip. Let's hope it continues.

1. Wilson-Gardner	-Novos	14
2. Sladdin-Campbell	-Novos Grantham	10
3. Allcock-Myszka	-Bilston	6*
4. Sadler-Russell	-Feltham	6
5. Horton-Haworth	-Wharfedale	4

* National Champions

1/2A Team race

This event has seen the most dramatic increase in performance of any class this last season. The reason for this is the greatly enhanced power available in a small number of specialist engines. In the case of Horton-Haworth this led to a 3:24 heat time with a performance of 103 mph for 55 laps per tank! Clarkson-Needham hold the final record in 7:34 using a much modified Sesqui. Near the end of the season Heaton-Woodside put in some fast times using an FMV on loan from Rob Metkemeijer. Still the third and fifth place teams used Oliver 'Schnuerle Cubs' to good effect putting in strings of times below 3:50.

1. Clarkson-Needham	-Stockport	41
2. Horton-Haworth	-Wharfedale	32*
3. Hill-Metcalf	-S C L A M S	26
4. Heaton-Woodside	-Sharston	16
5. James-Campbell	-Grantham	8

* Nationals Champions

Champs. They also took third place in the UK league despite competing in only six events as well as an un-equalled sixth consecutive winning of the British Nationals. Quite some year! First and second places were slugged out between two teams from the newly revived Novocastrian Club. Old hand Malcolm Ross teamed up with Martin Sladdin to win the league at the first time of asking from Ian Gardner and Dick Wilson. Again a close result with the winning margin being only 2½ points.

The most numerous used engine remained the Nelson, but the honour of the fastest race went to Hill-Metcalf who put in a 3:29 using a Cipolla.

1. Sladdin-Ross	-Novos	54
2. Wilson-Gardner	-Novos	51½
3. Smith-Brown	-Feltham	31½
4. Hill-Metcalf	-S C L A M S	20
5. Heaton-Woodside	-Sharston	14

* Nationals Champions

When all these points are gathered together the best all-rounders and clubs turned out to be:

All-rounders		
1. Clarkson-Needham		120½
2. Wilson-Gardner		72½
3. Pegg-Thorpe		71
4. Sladdin-Ross		66
5. Hill-Metcalf		48

Best Clubs		
1. Novocastra		157
2. Stockport		138½
3. Hamilton		101
4. Feltham		78½
5. Wharfedale		64
6. Horseshoe Pub		

FAI Team race

The 'blue-ribbon' event was fought out over fifteen events by thirty-two teams. Mention has already been made of Smith-Brown's winning of the 1984 World

I just had to include the sixth place club. A refreshing change of name! Finally congratulations to the winners and, of course, our sincere thanks to John Horton for his unstinting efforts in compiling his fascinating lists.

Visionregal Racing Props

I have previously made mention of these fine props made by Ron James. Available now are the 'Series II' props in carbon. The major improvement can easily be seen in the photograph - woven carbon cloth is now used in the rear face of the blades. This seems to greatly improve the prop's rigidity - even over their previous high standard. I give these props the strongest personal recommendation. A wide range is available to suit most racing classes and prices are most reasonable. FAI and Goodyear sizes are currently about £4 each plus postage. Full details and orders to: *Visionregal, 21 Rochester Crescent, Hoo, Rochester, Kent, ME3 9JH.*

Engine News

Engines from both ends of the spectrum have recently come onto the market and they will be of particular interest to devotees of the popular British events of diesel combat, Open, Class II and Mini Goodyear.

U S E 15D

The glowplug version of this Dutch made engine first appeared about eighteen

months ago and was aimed particularly at free-flight power and FAI combat fliers. At that time interest was expressed in a possible diesel version as the twin features of an AAC piston liner in a lightweight case was a very attractive proposition. The factory have now made some changes to cope with the extra stresses imposed by compression ignition. Chief amongst these is a stronger crankshaft. The accompanying photograph shows that the engine retains the desirable integral liner and that the cylinder head appears to be a push-pull item similar to the *F M V* team race engines.

A piece of gossip to keep you interested, is that *PAW* are investigating the availability of suitable 12mm I D bearings in order to produce smallish numbers of a 2.5 B B for the diesel combat brigade. The expected price is likely to be £25-£28.

Speed with Dick McGladdery

Support for speed flying was moderately healthy in '84, but some new faces would not go amiss! The 'Formula' and 'Novice' classes provide an ideal introduction to speed, since they were conceived to exploit the excellent '40' and '21' motors currently available and the more extravagant features of the open classes are excluded by stipulation of two-line control using wires of a fixed minimum size. The last provision excludes monoline and groupers which require a degree of skill that newcomers are unlikely to possess, but there's still plenty of

qualify as the former, an entrant must not previously have scored higher than 80% of handicap in an official competition (except in the Novice class). If, as can and has happened, a Novice wins an event on handicap, he is allowed only one more calendar year as a Novice - thereafter he is reckoned a 'big boy' and must fly Formula with the same model or try another non-Novice class.

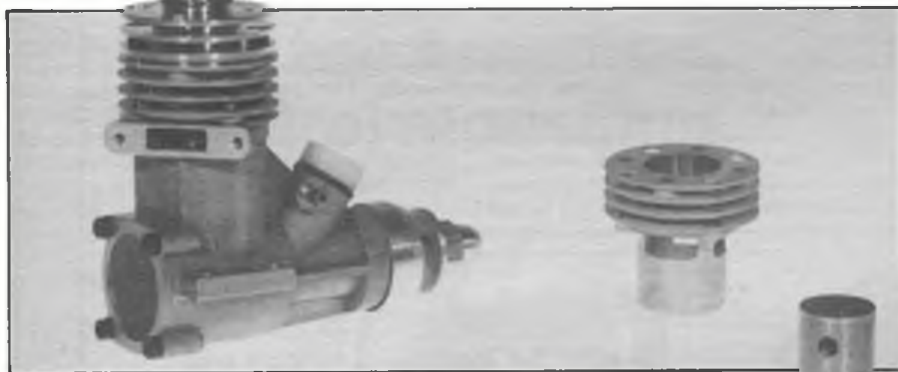
In 1983, we had the rather strange situation wherein the 21N record was higher than that for F.21. The perpetrator of this paradox was Dave Brewin, flying a sidewinder asymmetric model powered by a *K & B* 21 on tuned pipe and suction fuel system, advised and abetted by yours truly and Bob Gibbs of Feltham club. It was decided that the 'F' record should at least equate with 'N', so for '84 the handicap record for both was set at Dave's 153.33 m.p.h.

Peter Halman restored some sanity to the situation by raising the F.21 record to 155.35 m.p.h. at the 1st Bicester Speedcom event in May last year but that naughty boy Brewin nearly scuppered the system again at the Nationals with a spanking 159.9 m.p.h. However, his engine was found to be a whisker oversize, so the time could not be allowed! At the next following event, Peter Halman improved on his earlier record to set a handicap speed for F.21 in '85 of 156.54 m.p.h. (Dave could not make it to this meeting due to business commitments). His approach is broadly similar to Dave's, but the motor is set up with FAI type trimming, and it seems this is only workable if straight methanol-castor fuel is used - nitro seems counter-productive.

Looking forward to '85, Dave Brewin is well placed for a year of happy hunting in the F.21 class - all he needs is a standard-throw crankshaft and he should be perfectly capable to repeating or bettering his Nationals speed, which will scoop him the record and he should be able to bag handfuls of handicap wins into the bargain.

Bilston club in the persons of Frank Chambers and Graham Bryant provided steadily improving opposition to Peter and Dave all through '84, and hopefully will continue in '85. Frank rounded off his year with an official 155.03 m.p.h. which would have netted him the F.21 record but that was stolen by Pete H. at the same meeting with his 156.54!

Again looking to '85, the initial intake of novices have mostly promoted themselves out of 21N, the record/handicap for this class is not outrageously high, so how about some of those new faces...



The latest 'hot' 2.5cc motor from Holland? The U S E 15 D now has stronger crankshaft to cope with compression ignition.

months ago and was aimed particularly at free-flight power and FAI combat fliers. At that time interest was expressed in a possible diesel version as the twin features of an AAC piston liner in a lightweight case was a very attractive proposition. The factory have now made some changes to cope with the extra stresses imposed by compression ignition. Chief amongst these is a stronger crankshaft. The accompanying photograph shows that the engine retains the desirable integral liner and that the cylinder head appears to be a push-pull item similar to the *F M V* team race engines.

I for one will be interested to follow this engine's progress. The price, including postage is 362 Fl: *U S E, Floridadreef 17, 3565 AM Utrecht, Holland.*

P A W DS3 Series

These are the latest versions in the long line of 1.5 and 2.5cc diesels to come from the *Progress Aero Works*. Essentially the DS3 is the same engine as the preceeding series - radially ported liner in a plain bearing case. The latest version incorporates a neat change in the venturi. It is now possible to change the venturi simply by loosening two set screws. This is a very useful feature for T.R. types who need to vary the throat diameter to suit changing conditions. Certainly these engines continue the *PAW*

scope for ingenuity and individualism in design of the model.

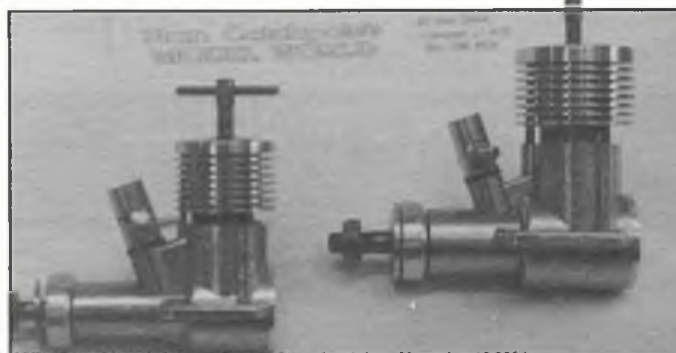
As with other classes, Formula and Novice ('F' and 'N') classes are handicapped for competition purposes against the previous year's National record, so that it is perfectly possible to obtain high placings in direct competition with 'open' models. The essentials of the regulations for the 'F' and 'N' classes are in Table I

There used to be a 40N class in addition, but this was allowed to lapse when F.40 was introduced. It could be revived if support was forthcoming, but 21N is more sensible for novices in many obvious respects.

'Novice' differs from 'Formula' in that to

			Table I	
Class	Motor Size	Wires	Wire Length	'84 Record
21N	2.51-3.50 cc	2 x 0.4 mm (2 x 0.016 in.)	15.92M (52ft. 2 3/4 in.)	153.43 m.p.h.
F.21	Ditto	Ditto	Ditto	156.54 m.p.h.
F.40	5.01-7.00 cc	2 x 0.45 mm (2 x 0.018 in.)	19.90 M (65ft. 3 3/4 in.)	172.74 m.p.h.

Home-grown favourites from Progress Aero Works the PAW DS 3 series 1.49 and 2.49 cc.



Speed with Paul Rietbergen

Dutch Speed view...

Speed this year was a rather conventional and conservative affair at the World Championships.

Technically speaking, a very few innovations had been made by just a small number of pilots. From the conventional motor with ABC piston and liner few alterations were actually flown in the competition and just a few new ideas seem to have been tried out in the past two years since Oxeölsund.

Mentionable are two different kinds of approach to "close the gap" between the Hungarians, who set such a devastating example at the last championships, and the rest of us, who mostly feel belonging to a different class of model aviation... Inferior that is...

Pipes: Anyone can buy a new Rossi 15 with a few new pipes, but one will immediately find out that something's lacking. That something will invariably be found in the shape of the commercially available tuned-pipes. So some people got to work on making their own to their own ideas, using all sorts of materials. Swiss flyer Otto Urban made a large assortment of pipes consisting of glass-cloth and epoxy to be able to change the shape of the diverging and converging cones more or less easily.

British flyers concentrated on hot-welding steel pipes, that didn't have the

advantages of being easily convertable, but did possess the strength so clearly lacking in certain commercially available products.

American speed flyer Carl Dodge perfected the technique of making finely threaded alloy-cum-brass pipes consisting of three parts that were literally screwed together, thus enabling him to make very fast on the spot changes in pipe-shapes. This technique, by the way, was also used by the Hungarians in 1978 to get their current shapes of tuned pipes.

Other pilots concentrated on converting existing commercially available products, mostly centered around varying the shape of the converging cone and the diameter and the length of the tail pipe.

Pistons and liners: As the critical settings on ABC liners in cold weather are something a speed flyer would rather not like to be reminded of, one would expect a somewhat different approach to liners. As the situation was in the past two years, only German and Dutch speed flyers with some history in team racing tried their luck with AAC liners. Most prominent in this being Ingo Schmidt of Germany, who was flying an integrally finned liner made from aluminium, a rather common sight in team racing these days, on a Rossi engine.

Props: Everybody had been working on propellers. Though some of the designs used were remarkably similar to the ones used on turbo-prop short-distance airliners, they apparently lacked the appreciation of the fact that those airliners fly about three times as fast as our models and are, therefore, in a totally different development area. The more successful propellers looked

like being copies of the *de Havilland* and *Fokker* 1930 handbooks on propellers.

Most propellers were made of carbon and glassfibre, resulting as known in a rather stiff and strong combination.

The Hungarians were still using wooden propellers, with the added advantage, as Bill Wisniewski put it, that the flexibility of the wood washes out the extremely high pitch at high revs, resulting in the pipe staying on song and the loading of the engine to be less demanding. Some American pilots used *Kevlar* bonded by epoxy to get the same effect, though somewhat hindered by space-aged tip-shapes that clearly had been influenced by turbo-prop developments!

Fuel systems: Fuel systems were used at random, as is usual at World Champs. Although most of the Continental pilots preferred CFS systems, most of the other entrants used suction-feed, with, of course, the Americans as the general odd-men out using pipe-pressure (Carl Dodge) and as they called it "some sort of pressure system" (Schuette and Sparr).

This year the fuel systems used didn't give me the feeling that one was better than the other. It just seems to be a matter of the choice you make and the amount of work you are able to put in to it.

Sometimes as a competitor I feel rather down about the obvious facilities the Eastern bloc pilots get for flying their planes. I'm convinced that a team effort in Holland will work just as well on a spare-time basis as their system does on its current basis. Next year...





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P2L WILGA 36 by **P. Hayward**. Very stable 1/12th version of the Polish glider tug, this 36 in. (914 mm) span model's high wing and large tail is an ideal Free-Flight layout. Uses 0.5-0.8cc engines
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SOPWITH CAMEL by **D. M. Collin**. Fine flying, 28 in. (711mm) span version of the WW1 favourite. This 1/12th scale, free flight model is designed for 0.5-0.8 cc engines.
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HANDLEY PAGE H.P.42 by **Cpl. S. Newton**. The famous *Hannibal* airliner. Very detailed drawing for this 65 in. (1651mm) span model uses two 0.8-1cc engines.
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BRISTOL BULLDOG by **P. J. Allnutt**. A 1/12th scale model which uses some spruce and ply in its rib for rib, stringer for stringer construction. Full colourings and markings. Canadian competition winner. Span 33 1/2 in. (857mm). Engines 1-1.5 cc.
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B.E.2a by **K. McDonough**. Lightweight and with large wing area, this 1/12th scale 40 1/2 in. (1035mm) model flies slowly. Detailed plan includes gun and camera! Power with 0.8-1cc motor.
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SOPWITH SWALLOW by **John Darnell**. A 1/8th scale version of a little-known 1918 fighter. Span 41 in. (1041mm), it is fine for the beginner scale enthusiast.
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AUSTER A.O.P.9 By **R. G. Moulton**. 36in. (914mm) span version with all sheet fuselage and tail assembly simple wings. Flies like the real thing, aerobatics or sport flying with 0.5-0.8cc engines.
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A vintage CL model from 1948 presented in MIND THE LINES

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