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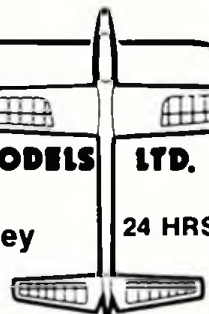
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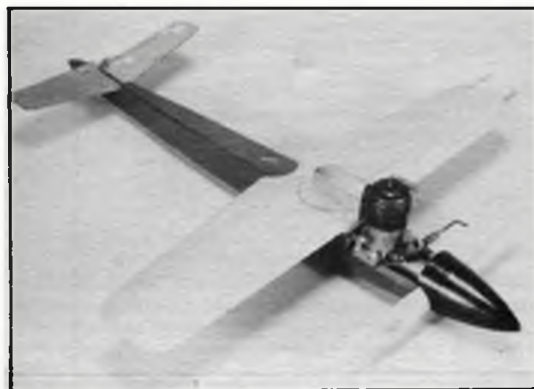
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AERO

MODELLER



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Cover:
The Hanriot HD-1 was a latecomer to the 1914-18 war and is not as well known as some Sopwiths or Fokkers. Quite large numbers were produced and it was claimed to be a fine flyer. The model shown here was made by Charles Newman to a similar scale to this month's full size plan by Bill Dennis.

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HANGAR DOORS

Alternative F/F Nats?

The August Bank Holiday is rightly the preserve of the Radio Control and Control Line (not to mention Scale!) British Nationals... but many Free Flight modellers also like to have something to occupy their minds and expertise at this time of the year...

The London Area Free Flight Gala may well be what they are looking for. This will be held on Salisbury Plain at Training Area 9 on 24th, 25th and 26th August. For the events to be flown look at What's On. A camp-site has been found and somewhat superior to the usual site offered on such occasions too... would you believe hot and cold running water, showers, razor points and even a sink for washing-up (what's wrong with eating your chips out of the bag?).

Closing date for pre-entry (its cheaper that way) is 1st August BUT if you also want to camp, final date for bookings is 1st July so write NOW to Ian Bracken for your entry forms: 1 Didbin House, Mingard Walk, Andover Estate, Hornsey Road, London N7 7RT.

Largest ever...

Plans are now well advanced for the 1985 International Air Tattoo. Recognised as the World's premier military air display, IAT 85 will include a seven hour international flying display and the largest exhibition of military and civil aircraft ever

seen in the UK. The proceeds of the event, to be held at RAF Fairford, Gloucestershire during the weekend of 13th and 14th July, will go to the Royal Air Force Benevolent Fund.

Make it a family 'day out'. Not just for those keen on aviation, IAT 85 will also include craft displays, souvenir shops, displays of traction engines, military equipment, arena displays and a fairground. Truly something for everyone, make a note in your diary NOW...

Electronic breakthrough Plessey sponsors Peanuts...

HMS Daedalus, Lee-on-Solent, has been the site for a number of successful indoor meetings organised by the SMAE Southern Area over the past year. The 'All Scale Day' on 24th March produced another great day's flying. Peanut, Open Rubber and CO₂ all had a good entry with a large variety of models on view. The organisers were particularly fortunate to have the backing and sponsorship of Plessey (Westleigh), to whom, they and all those flying would wish to extend their thanks.

It is always good news to hear that aeromodelling can still grasp the imagination and support from such companies as Plessey. It is this sort of awareness that has in the past, been the trigger for some individuals to channel their



Judges Ron Souch and Derek Knight hard at work during the 'All Scale Day' at HMS Daedalus. This venue is fast becoming a 'must' for the indoor modellers 'down south'. This event on March 24th attracted the sponsorship of electronics giant Plessey... perhaps they are anticipating super miniature guidance systems at future indoor meetings...

careers into aviation, to the gain not only of the sport of aeromodelling but the aerospace industry as a whole.

Team UK...OK

Our Thermal Soaring (F3B) Team have won First Team place at the World Championships in Australia. Congratulations to Dave Worrall, Stuart Blanchard and Dave Dyer. Coming into the last day's flying, Dave Worrall was in first place but in the last round was pipped to the post by reigning World Champion, Ralph Decker (West Germany). Still, even a Silver Medal at this level is something to shout about and coupled with the Team's 'Gold' that little group of 'pommies' must have been really riding high. Well done...UK...OK...

After Amerongen...

A number of UK fliers will compete at the International Combat and Aerobatics Competition at Amerongen in Holland. One week after this event is

another, also in Holland, the - Almere Combat International - combat fliers could have quite an interesting holiday! Here is the information:-

Date: 10, 11th August
Place: Almere (ZIJP), Kemphaanweg, The Netherlands
Class: F2D - to FAI Rules
Entry: Open to all who have a valid FAI Sporting Licence
Fee: 12.50 Dutch Guilders
Pre-entry: Vital - limited to 50 competitors
Closing date: 21st July
Payment: Only entries with payment accepted. Please pay by International Money Order
Prizes: Prizes are a cash percentage of the total entry fee
Start: 10.00 Hrs on 10th August
Bar-B-Q: Saturday night - 17.50 Guilders
Camping: On site
Supporters: Free
Information: Call Fred Meijer on (0)3240 19101 (in Holland) or write to Langshof 75, 1353 GH Almere Haven, The Netherlands.

Prizes for Human Power

Milton Keynes will be the centre on August 31st and September 1st for a Festival of Human Power sponsored by Zapple, a new non-alcoholic, sparkling apple drink. Large money prizes are to be awarded for contestants on land, water



Left, a KC135 USAF tanker together with a KC10 tanker (above left), these aircraft may be at the International Air Tattoo, RAF Fairford, 13-14th July - this year's theme is 'Skytanker 85'. We've heard of 'Vintage Meets' and 'Indoor Meets'... can you imagine a 'Skytanker Meet'...

and in the air. £2,750 prize money is allocated to winged bicycles or any human powered flying machines. Launch will be assisted by a 60cm ramp for take off. Seems like an ideal challenge for aeromodellers inspired by our May issue and the description of human powered aircraft.

SMAE Musical Chairs

Dave Goodwin, SMAE chairman since 1981, and the man at the helm during the big membership increase following the 100% SMAE-affiliation policy for clubs, has had to resign due to health problems. Everyone will want to thank Dave for filling the

flyers", says Ron, "and we can learn a lot from each other."

The vice-chairman's post has been taken on by former RAFMAA representative Tom Whittle, who has also had several years experience on the Council of SMAE.

European Control Line Championships

With almost 200 Competitors from 20 Nations already entered, the 1985 European Control-Line Championships are the biggest F.A.I. International Flying event



Speeds of up to over-50 mph have been achieved by the streamlined cycles made by the Human-Powered Vehicle Association, among them quite a few aeromodellers. Now a new challenge has been made for pedal-power flying machines to fly at the Zapple sponsored meeting at Milton Keynes in August. Here are some of the mechanical wonders at a press show in the Barbican, London. See text for further information.

post, and wish him a rapid return to the flying field.

Dave's place has been taken by former vice-chairman Ron McCann who is a Sevenoaks club member, with over 50 years model flying behind him. Ron's priorities include helping to remove the 'us-and-them' divisions that still persist in some sections of our sport, whether between contest and non-contest flyers, vintage and 'state of the art', radio and free-flight or anything else. "We are all model

Below, Ron McCann the new SMAE Chairman has many years of aeromodelling and committee experience to put to good use for the aeromodeller... welcome to the hot seat Ron!



to be run in Britain. The venue is the fine Three Sisters site at Ashton-in-Makerfield, Nr. Wigan and the contest flying will be on the 10th-12th July with practice flying on the 9th July.

The event is of course being run for the FAI by the S.M.A.E. and is being generously supported by Greater Manchester Council.

You can see Europe's top Flyer's in action, and there are big discounts for SMAE members. Gate entry is £1:50 per day (half price under 16) and a free souvenir programme is included; SMAE members with current membership cards can spectate for all three days for a single £1:50.

Though the British Team has not been picked as we go to press, one of the highlights will be Team-Race, with European Champions Kuznetsov/Kramarenko of the USSR as well as World Champions, Colin Brown and Steve Smith of the U.K. likely entrants.

Add to this the three World beating Hungarian Speed Flyers: Molnar, Mult and Szegedi and Three Sisters is a must for your diary...

Emil Rumpel

Emil Rumpel passed away on March 17th after a serious illness, at the early age of 45. World Champion in 1976 and European Champion in 1975 and 1977, Emil and the German team he inspired, dominated FAI speed flying in the latter half of the seventies. As those who follow this exacting class of flying know...the record book tells only part of Emil's legacy.

Throughout his flying career he was always willing to discuss his ideas with other competitors in order that they might improve their own performance. It was directly due to his willingness to share his hard won experience that enabled competitors throughout Europe and indeed the World, to make the quantum leap in performance from the 230 kph to the 250 kph that became the standard of the late seventies.

He was a brilliant engineer and modeller; the centrifugal switch; long inboard wing to reduce line drag; thin aluminium covered wings and tail to improve rigidity; were all products of his innovative mind. His clean epoxy covered wooden models were a joy to behold for their accuracy of construction; amazingly he could build one of these in a weekend.

However it was his generosity of spirit, his willingness to guide others; an attitude all too rare in competition, that set Emil apart from others and won him the respect and friendship he enjoyed. He will be sadly missed and our sympathies go to his wife Karin and children Gabriele and Claudia.

Jim McCann

Aeromodelling lost a friend when Jim McCann died suddenly on March 5th 1985 at the age of 54 years. Although Jim was a free flight flyer, he was well known throughout modelling mainly through his articles on various aspects of construction techniques.

His earliest article appearing in Northern Area News in 1962 on the use of Melinex. This formed the basis for a similar article published in the Aeromodeller Annual 1963-64. He also had articles published on canards in Aeromodeller in 1963 and on tailless power models in 1971. However, the article which brought him the widest reputation was, undoubtedly, the one on the moulding of carbon-fibre propellers published in

1972 in Aeromodeller. There seems little doubt that this article was a revelation. The technique, developed by Jim, using the then new wonder material has had a major influence on the construction of power propellers. Certainly, no one contemplating moulding propellers would do so without referring to this, and the updated article published in 1983, the definitive paper on the subject. He also made carbon-fibre propellers to order and said that by 1983 he had produced over 10,000 in total. Many championship performances in control-line and R/C were by models which featured his propellers.

Jim McCann was well known also, in his chosen branch of the sport, free flight power. He was a superb builder and his models were always beautifully finished. He was also a brilliant innovator and liked designing and making intricate mechanisms. Present him with a problem and he would produce a practical working solution. Most of the long time free flight flyers will remember Jim flying in the Northern Area in the early 60's before he moved back to his native North East. Others will remember him flying in the many contests throughout Britain in the 60's and early 70's where he championed the cause of high thrust line power models. Perhaps his best performance was at the Trials for the 1972 European Power Championships, where in a very windy contest he won, dropping one second from an early D.T. Whilst power flying was his first love, he did fly other classes. Canards and tailless models satisfied his innovative curiosity but he also flew Open Rubber on a serious competitive basis. He even produced a Wakefield but, of course, it had to be high thrust line. Jim did very little flying after 1975 but always retained his keen interest in free flight.

Jim McCann was a pharmacist by profession but in the middle 70's moved into industrial chemistry specialising in corrosion prevention. His research into this field led to improvements to a well known wax-based car body rust preventative. Our sympathy goes to his wife, Mavis, and his two sons, Alistair and Andrew and we are sure that all those who knew him will remember him as an outstanding modeller and a warm hearted friend.

What's On

June 22-23

AEROMODELLER SCALE WEEKEND
Venue: Old Warden, Nr Biggleswade.
Contact: Aeromodeller Tel: 0442 41221.

June 23

THE OXFORD MFC FREE FLIGHT RALLY
Comps: A1, Cd'H (in rounds) Vintage (rubber and glider combined), HLG, Rubber Scale Duration. Venue: Port Meadow, Oxford. Contact: Andy Crisp, 30 Portland Road, Summertown, Oxford. Tel: Oxford 53800. No power models to be flown. Champagne Fly Offs on Saturday 22nd June at 1900 Hrs for A1, Cd'H, HLG.

June 23

BLACKBURN & DMAC SUMMER FLY-IN
Venue: Wotton Country Park, Blackburn, Lancs. Contact: Ray Stott, Adelaide Street, Crawshawbooth, Rossendale, Lancs BB4 8PW. Scale, Semi-Scale or unusual model rally, a fun day for all. Good prizes, small entry fee on day.

June 29-30

THREE SISTERS CONTROL LINE GALA
Comps: F2A, F2C, F2D, Stunt, Novice Stunt, Goodyear, Class 2 Goodyear, Mini Goodyear, 1/2A TR, Diesel Combat, Open Speed (inc. jet), Mercury Midge Speed. Venue: Three Sisters, Manchester. Contact: Pete Farmond, Tel: Wigan 34068. Start: Saturday 1230 hrs; Sunday 0930 hrs. Phone for further details.

June 30

CROOKHAM GALA
Comps: OG, OR, OP, Allin FAI. Venue: Beaulieu C-14 Airfield. Contact: Steve Marriott, Tel: 042 877366.

June 30

CARDINGTON INDOOR MEETING
Comps: EZB, F1D, 35cm, Open Microfilm (all index); Scale. Venue: Cardington, Beds. Contact: Laurie Barr, 4 Hasting Close, Bray, Berks. Tel: 0628 25595. Names and addresses together with car reg number - MUST be registered before the event.

June 30

TYNEMOUTH MAC FREE FLIGHT RALLY
Comps: F1A (5 flights, no rounds), OR, OP, HLG, Combined Mini, Vintage. Venue: Albemarle Barracks, Contact: Tony Brown, 32 Clayworth Road, Brunton Park, Newcastle upon Tyne NE3 5AB. Tel: 0632 362155. Admission by pass ONLY. Start 1000 hrs (silent classes), 1100 hrs (power). Phone evening 28/29 for confirmation.

July 7

RADIO MODELLER FUN FLY-IN
Venue: Old Warden, Nr Biggleswade.
Contact: Radio Modeller, Tel: 0442 41221.

July 7

SMAE S.E. AREA R/C SCALE FLY-IN
Venue: Ardingly College, Sussex. Contact: Norman Couling, 7 The Green Walk, Willington, Eastbourne, East Sussex, BN22 0RB.

July 13-14

CLAPA CHAMPIONSHIPS
Comps: F2B (CLAPA members only), Open Novice Stunt, Open Carrier (Profile & Scale), Open Scale. Venue: Essex Show Ground, Contact: P. Burgess, 42 Blunts Hall Road, Witham, Essex. Tel: 0378 516881. All events Pre-entry only. Send SAE for entry form. Camping site from Friday pm.

July 13-14

YORKSHIRE SCALE MODELLING WEEKEND
Venue: Newby Hall, Ripon. Contact: Robert Thorn, 22 Chatsworth Place, Harrogate, N Yorks. Various modelling competitions including helicopters, control line, boats, off road racing and model railways and wargaming.

July 14

CANTERBURY PILGRIMS AIR SHOW
Venue: Graveny, Nr Seasalter, Kent. Contact: D R Austin, 4 Wykeham Road, Sittingbourne, Kent. Tel: 0795 27008. Write for details and pre entry.

July 20-21

SMAE INDOOR NATIONALS

July 21

OLD WARDEN SVAS OPEN DAY

July 21

SMAE VINTAGE & LARGE MODEL FLY-IN

July 21

WHARFEDALE CLASS 'A' DIESEL COMBAT

July 28

FACTT OPEN THERMAL COMPETITION

August 3-4

WOODVALE INTERNATIONAL RALLY

August 4

DUXFORD MILITARY PAGEANT AND FLYING DISPLAY

August 11

CARDINGTON INDOOR MEETING

August 11

THREE KINGS CONTROL LINE CARRIER DAY

August 11

SAA CONTROL LINE RACING

August 17-18

AEROMODELLER VINTAGE WEEKEND

August 17-18

PLUMPTON MODEL SHOW

August 24-25

CARDINGTON INDOOR MEETING

August 24,25,26

LONDON AREA FREE FLIGHT GALA

August 24-26

SMAE CONTROL LINE, SCALE AND RADIO CONTROL BRITISH NATIONAL CHAMPIONSHIPS

September 1

SMAE 5th AREA FREE FLIGHT EVENT

September 8

OLD WARDEN SVAS SILENT DAY

September 15

CARDINGTON INDOOR MEETING

September 15

DISPLAY TEAM CONTEST

September 15

DUXFORD FLYING DISPLAY

September 15

SMAE TOWNER TROPHY FOR THERMAL SOARING

September 22

SMAE 6th AREA FREE FLIGHT EVENT

September 22

RAF SWANTON MORLEY MAC INDOOR FLY-FOR-FUN

September 22

SHEFFIELD VINTAGE COMP

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S90	
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All systems go

April 3rd, 10.30 hrs, Luton Airport, *Britannia Airways* Flight AM 001, rolls smoothly (well there were a few bumps - even Luton peri-track - isn't that smooth...) from the hangars to runway 17. Ground checks complete, the controls are in the capable (!) hands of Richard Bail - *Aeromodeller's* prize winner in our Flight Simulator Competition.

So far, so good - we didn't hit the grass once! This was the beginning of an exciting two hours at the controls of a *Britannia Airways* 'Boeing 767'. The simulator consists of a roomful of computers and varied electronic gubbins and of course the 'mock up' flight deck supported on six hydraulic jacks.

Right, Richard Bail (on the left), winner of our December competition, with Geoff Bryant of *Britannia Airways* who masterminded our two hour flight in the Boeing 767 simulator. They are standing in front of the 'mobile' room that houses the flight deck. Below right, and this is how the flight deck looks from ground level... six powerful hydraulic rams control the attitude and movement giving an incredibly 'real' feeling to the passengers...



Aeromodeller's

WINNER!

Britannia Airways Flight Simulator wins outright!



Left, initial briefing for Richard in the pilot's seat, *Aeromodeller* editor Pete Freebrey looks on somewhat apprehensively, wondering if parachutes will be issued before take-off! Although the number of controls and indicators is still bewildering they have been reduced dramatically by the introduction of multi function displays driven by the various on-board computers.

'Mock-up' is hardly appropriate terminology as most of the components are 'one for one' replacements for the real article! Today's modern airliner is crammed full of electronic aids, with the in flight computer a device that has to be seen to be believed.

It has almost got to the stage where a pilot can dial in his present location, followed by his intended destination; sit back and let the aircraft fly itself from hanger to hangar!

Although your editor had read of these advances that have occurred since the days of Bleriot, it was still quite a shock to actually find them in daily use by *Britannia*.

Up into the blue...

Winner, Richard, seemed to have more than a working knowledge of what was to be found within reach of the pilot's seat and took to the '767' like a duck to water! Under the expert guidance of Geoff Bryant (who normally oversees the simulator training programme), Richard had us in the air and on our way...

Three synchronized projectors provide a 160 degree panoramic view of what can be seen from the flight deck - even to the occasional aircraft flying straight towards us on an interception course! That certainly provides one way of checking whether would



be pilots are looking out of the windows in addition to checking all those fancy displays!

Having been put in a holding pattern around our destination, we came in on final approach... a little high but finally a perfect touchdown, sadly the combination of crosswind and a little enthusiastic oversteer had us onto the grass... with the local fire engines screaming towards AM 001!

Down in one piece

The beauty of the system came to our rescue - a few switches thrown and time was halted... reversed... and stopped. The second time round, Richard showed us that one hour's 'hands' on' experience is worth ten hours of reading the manuals...

Altogether a most educational experience. The *Rediffusion* 'Flight Simulator' performed perfectly with those six hydraulic supports truthfully reproducing all the physical sensations that you would expect - from the tiniest bump on the runway to the 'G' force pressure into the back of the seat as the '767' points its nose and accelerates up to the clouds.

M.A.P. would like to thank *Britannia Airways* both for the offer of the prize and also for the opportunity given to the editorial staff to accompany our intrepid pilot.

We forgot to see if the 'Boeing 767' would loop...



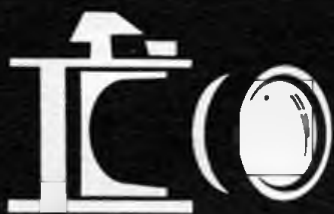


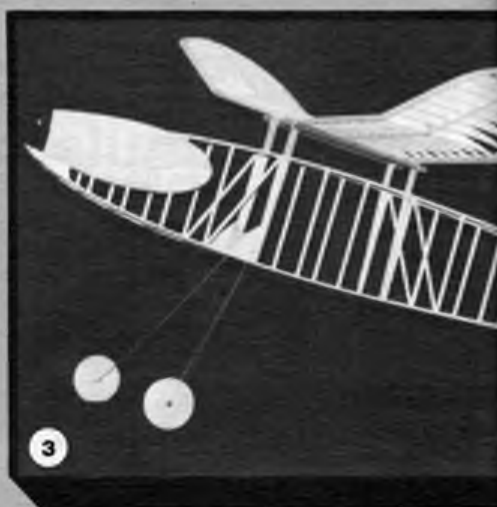
PHOTO PRIZE

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.



HAVING JUST LANDED, the enthusiastic pilot seeing a Chinaman sitting under a tree, dashed up and said: 'great flight — saved TWO HOURS!' The Chinaman, quite unmoved said "Well, what are you going to do with them?" One nonplussed pilot! IF, however, the pilot had been an aeromodeller, he would undoubtedly reply "Find a field, and trim-out my free flight job". Enough of philosophy! — here are this month's photo masterpieces.

Photo 1

We 'take-off' with a rare and unusual subject for a scale model — the *Saunders Roe S.R. 1A* flying boat fighter. The photo comes from Dr. M.J. Mellor of The Hollow, Wykin Village, Hinckly, Leicester LE10 3EF from an original *Jetex* plan using two *Jetex* 50's. It has not been flown, due to the lack of the aforementioned *Jetex* 50's. If any kind reader possesses two serviceable '50's' Dr. Mellor says "I am open to offers"...

Photo 2

No doubt dear reader you are thinking "That's a fine Lancaster but with those four engines it must be a bit of a handful on the R/C transmitter!" NO Problem(!), because this remarkable 'Lanc' is RUBBER powered! It is the inspired work of Dennis

Norman. The photo comes from one of America's top ranking aeromodellers — Bill Hannan of Escondido, California. Many thanks Bill and please congratulate cameraman Frank Scott!

Photo 3

There is no doubt that a superbly constructed uncovered model has an aesthetic quality all of its own. An example is this 'Gutteridge Trophy winner' masterfully photographed by Mr. C. Davis and belonging to Mr. I. Granger of Kirkcaldy, Fife, Scotland. Original construction from an A.P.S. plan. Now covered, Mr. Granger says "Flies well, with a load of rubber". Good comment Mr. Granger.



Aeromodeller



Photo 4 Winner

Fliar Phil receives many impressive photographs. But every so often one arrives which has that extra 'dramatic quality'. This 'in flight' photo with the model caught against that backcloth of the aeromodellers old enemy TREES, certainly is dramatic. It is Dave Boddington's 58in. span R/C 'Bi-Stormer'. Built by Peter Wenman and skilfully flown by Ken Barker - photo comes from Mr. R.W. Dawes of Amersham, Bucks. Will Mr. Dawes please step forward for his prize...

Photo 5

Now something different: PAPER models! The photo was sent by Norman Peacock of Wirral, Merseyside. Norman has used a design of the 'thirties', by W. Rigby ('Senior Citizen' aeromodellers may remember him...). The small (12in. span) rubber powered 'Swallow', is constructed entirely from paper (except prop, wheels and motor peg). The 'Super Swallow' (36in. span) is 'Dart' powered and has minimal internal balsa/ply structure. Nowadays when we almost need a mortgage for two sheets of 1/8th balsa, Norman's PAPER models are really something!

Photo 6

May be you cannot see them - but this 48in. span *Fokker 'Eindecker'* (a Dave Boddington plan) has a G-Mark five

cylinder radial engine. From Barry Measom of London. Barry says "It is a lovely little motor - but expensive on glo-plugs!" Needs 15 amps to start it. Barry uses a 2 volt cell from a milk float! Super model Barry!

Photo 7

Still with W.W.1 aircraft; here is another popular aircraft with scale buffs - the *Nieuport 17C* fighter. From Mr. P. Kent of Gateacre. Built from a V.K. Kit, it weighs 4lb. 4ozs. Power : OS 40FS. *Futaba* four channel radio. Finely detailed with home made wheels! F.P.'s thanks Mr. Kent - a most attractive photo.

Keep Flying 'em and photographing 'em FP is with you!



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

there is still no real need or pressure for change.

With such a long period of stability it may be reasonably assumed that F1A model design would become progressively stagnant ie. models looking very much alike. This has not been the case and hopefully this short article will illustrate the considerable variation in model design that has occurred over the thirty year period.

shown here may be analysed to give us what are effectively constant design parameters.

A design survey spanning a period of thirty years condensed into a few pages of text is bound to be superficial. A full and detailed coverage of the topic would require the equivalent of a thesis. The task of choosing twelve designs from the many thousands that have been published is quite daunting, and may be compared to that faced by the many individuals interviewed by Roy Plumley to select their ten favourite records to take with them to a deserted island.

How does one select so few from so many? As an aside, a possible interesting feature for future issues of *Aeromodeller* could centre around aeromodelling celebrities selecting their five or ten favourite model designs and explaining the reasons for their choice... how about it editor?... how about it readers?

Most of the models presented here were chosen because they either won or placed highly in International championship events and consequently in some way influenced the design of models that followed. Other authors would undoubtedly select a different twelve to satisfy these same criteria which fortunately reflects the healthy lack of uniformity still prevalent in today's aeromodelling scene: each aeromodelling specialist thinks he knows best...

Why the survey...

Always a good question... *Firstly*, as mentioned above, it will be used to produce a simple design formula (the constant design parameters) for use by the less experienced and indeed the experienced modeller.

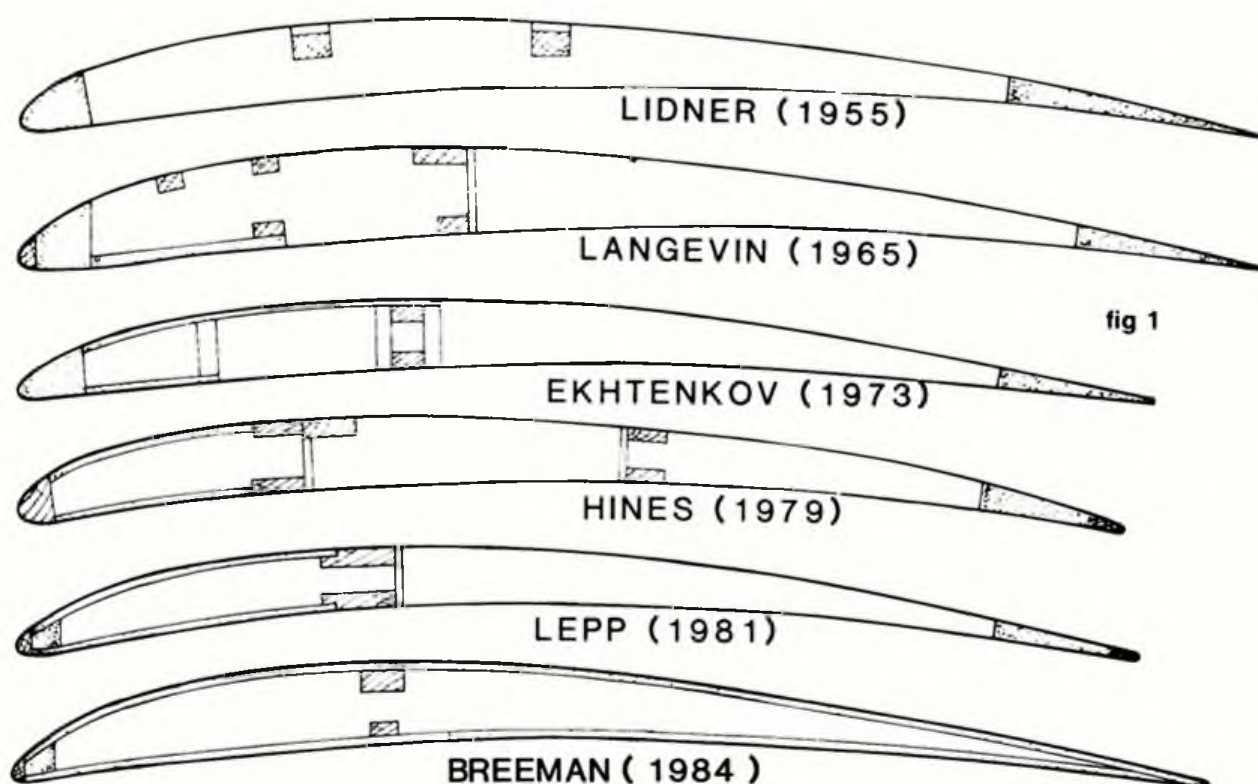
Secondly, it shows a chronological development of F1A design which should be of interest to all readers, but in particular, to those who are not familiar with the F1A

International (F1A) GLIDERS

Expert glider flyer Tony Cordes, reviews thirty years of A2 gliders to find what features make a winning design.

THE F1A GLIDER is virtually unique amongst the international model classes controlled by the Federation Aeronautique Internationale (FAI) in that its specification has not been altered since 1955 and in spite of many technical advances made over the intervening years

Further, there is no real indication that present day models have or are becoming stereotyped and several different approaches are evident. In a future issue of *Aeromodeller* however, an article using this survey as a basis will indicate that the variation in design illustrated by the models



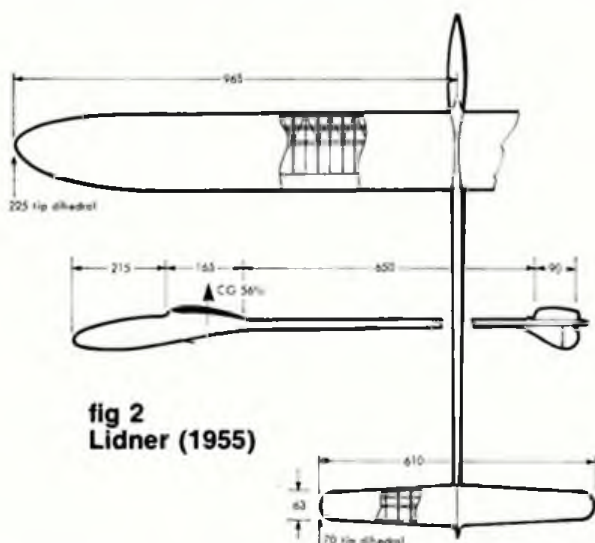


fig 2
Lidner (1955)

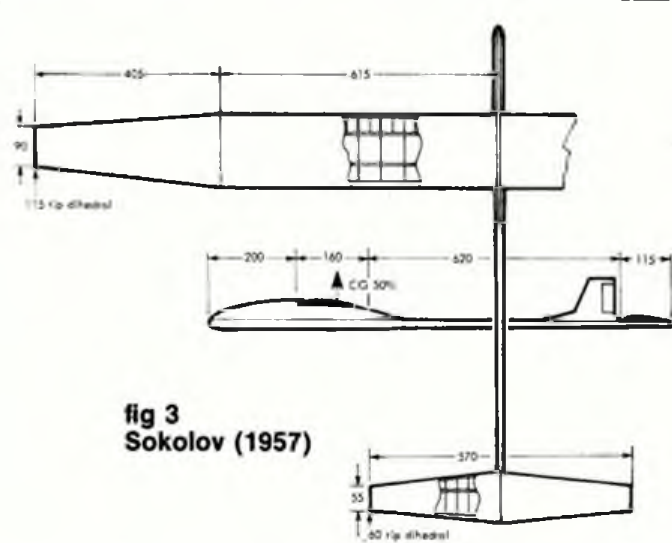


fig 3
Sokolov (1957)

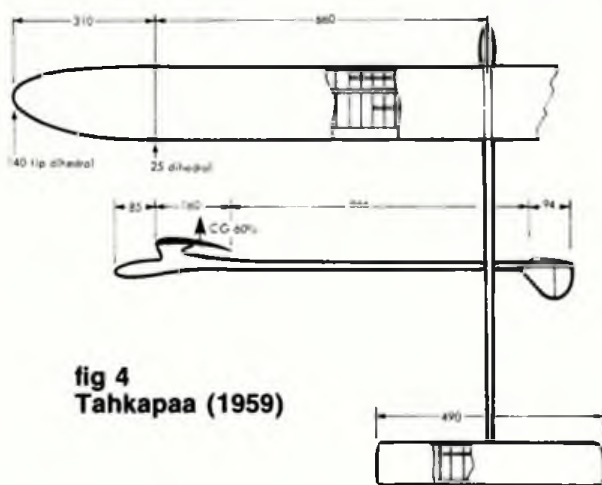


fig 4
Tahkapaa (1959)

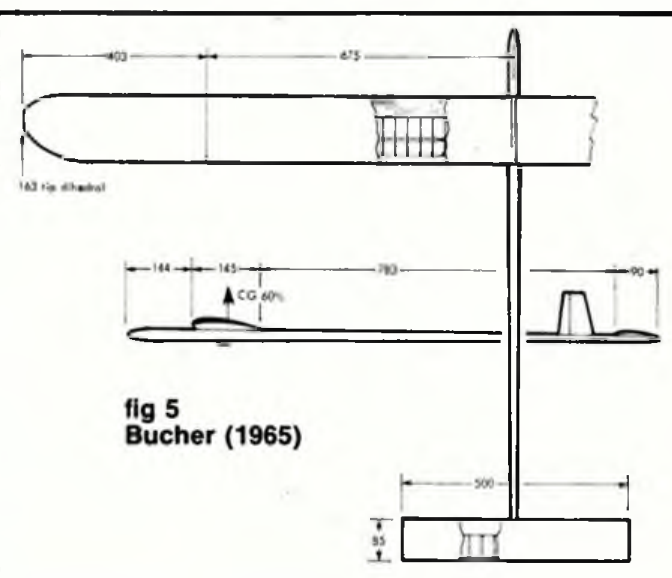


fig 5
Bucher (1965)

class or those who are too young to have been around when these famous models were published for the first time.

Thirdly, it gives a good excuse to publish the drawings of twelve models in a single issue of *Aeromodeller* which may provoke food for thought to the newcomer and stimulate his or her interest in the class.

The design of an F1A model may be conveniently considered in two separate parts. Firstly, the outline of the model which pictorially describes the proportions of the model including the wing plan form, moment arm, size and shape of tail plane etc. referred to as the external detail and secondly the detail of the structure, materials used, hook technology etc. referred to as the internal detail. This survey concentrates on the first category although the wing sections given in figure 1 do indicate to a degree, the wing structure used.

External design has not resulted in any significant improvement in the flying performance of F1A models. The term *flying performance* used here refers to the ability of a model to fly for three minutes or more from a fifty metre tow line in effectively neutral air. It is very likely that the glide or still air performance of designs such as Lidner's in 1955 (fig. 2) is virtually the same as that of Ekhtenkov in 1973 (fig. 9) or Breeman in 1984 (fig. 13).

The factors which have measurably improved performance have been independent of external design and the two most significant of these are the introduction and use of clockwork dethermaliser timers and the introduction and use of circle tow techniques. It may be argued therefore, that external design follows fashion and that fashion is established by success of a particular model at say, World Championship level.

The external design, in simple terms, can be relatively straightforward provided that simple criteria are followed. This will be dealt with in more detail in the next article. The remainder of this article is concerned with describing the twelve models that are illustrated.

1950s

Scrutiny of the drawings (figs. 2-13) will quickly show that quite a variation in shape and proportion is apparent. The first model (fig. 2) is the model that Lidner used to win the 1955 World Championships. Lidner at

that time, along with his colleague Hacklinger, was very concerned with the theoretical approach to design for performance and the model shown had indeed a very good performance.

The model did set a pattern of design which is apparent today in that it had a slim circular rear end to a pod and boom style fuselage and a relatively high wing aspect ratio of fourteen to one. The elliptical tipped wings used, became very popular over the next ten years on all classes of free flight models.

Lidner has become famous not only for this win which was his second in succession at World Championship level, a feat which to date has never been repeated in F1A, but also because of his use of tactics in the flying field.

He used prolonged tows even though limited in this technique by the use of a fuse dethermaliser. He also is credited with the first successful use of wing warps as a trimming device on gliders, even though the warps he used were dissimilar to those commonly used today. A development of his design approach is shown in figure 4. This drawing is of Tahkapaa's model of 1959 which although it did not win the World Championship, at least made the fly-off. It is included in this selection of models simply

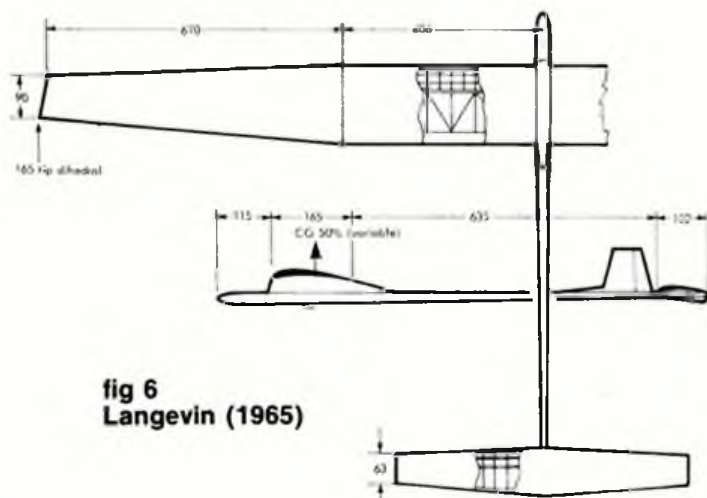


fig 6
Langevin (1965)

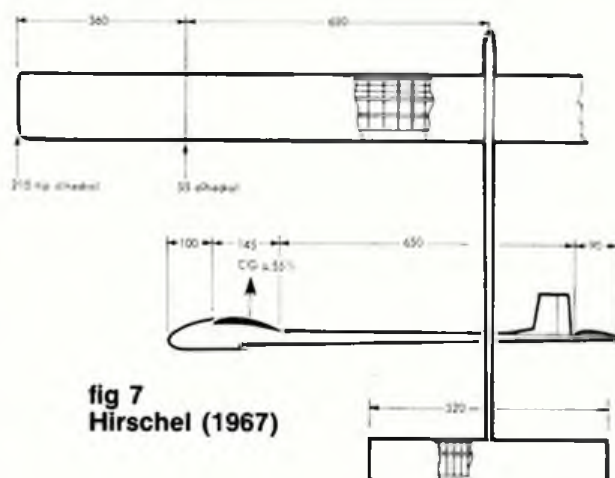


fig 7
Hirschel (1967)

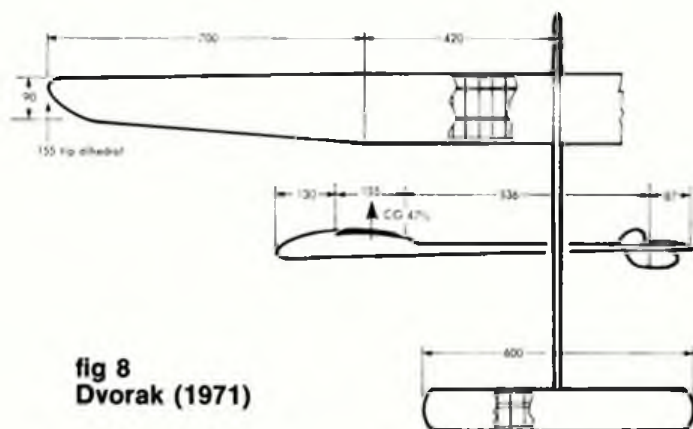


fig 8
Dvorak (1971)



fig 9
Ekhtenkov (1973)

because in the opinion of the author it was a most beautiful model.

Figure 3 shows Sokolov's model of 1957. This model placed second in the World Championships that year and two years later was second again. Although not shown here, both of the winner's models used elliptical tipped wing profiles. It is interesting how history has repeated itself in that another famous Russian, Lepp, has also placed second twice in more recent Championships. Sokolov's model may be considered the grandfather of the present Russian style of glider which has proved and still is proving to be a very successful approach indeed. Many of today's models may be simply described as 'straight taper tipped Russian style', and all have their roots in Sokolov's design.

1960s

The winner of the 1965 World Championship, by Bucher, is shown in figure 5. This model is included because it represents a successful version of a style of model used by Woodhouse, ('Wichita', APS Plan number G 1280), O'Donnell and later, to a certain degree, by Drew ('Lively Lady', APS Plan number G 1073) the winner in 1969. The present exponent of this style of

design, used with much success, is Fantham.

The early nineteen-sixties saw the introduction of clockwork dethermaliser timers and immediately a new dimension in glider flying was possible. Prolonged tows could be made with no time limit because the timer remained switched off until the moment of launch and so the risk of early D/T's or excessively long flights prevalent with fuses was removed.

The use of clockwork D/T timers in turn focussed attention to the tow hook. It became important to ensure that during a prolonged tow the towline did not accidentally fall off and so a variety of latches or ring locks appeared. The ultimate development of hooks was to follow later from the Russians.

Also from the year 1965, figure 6 shows a design by Langevin. It is included because it is the first published model displaying the long tapered tip style of wing which was later used with success by Dvorak to win the World Championship of 1971. Some modellers are still using the approach of a longer tip and the most modern of this style to achieve success was the winner of the 1979 World Championship, Grunnet.

Figure 7 shows what must be the simplest design to win a World Championship. The

model was by Hirschel and the design formed the basis of an approach used by the East German school and proved relatively popular for the next seven or eight years, following Hirschel's win at the 1967 championships. This model reproduced exactly as it is shown but fitted with a circle tow hook could even now, prove very successful in present day competition.

1970s

Figure 8 shows Dvorak's 1971 winner. He won a two way fly-off by virtue of his zoom launch. The model at that time was not fitted with a circle tow hook but the use of wing warps similar to those used many years earlier by Lidner permitted a trim which resulted in a high zoom launch. The wings were strong and flexible.

It is significant that this was the last model to win a World Championship not employing a circle tow hook. Circle tow hooks as we know them today, made their appearance for the first time in the 1969 World Championships. The basic design of these hooks is attributed to the Russian, Lepp, and they are often referred to as 'Russian Hooks'.

Coming now to more recent times, figure 10 shows Abadijev's 1977 World

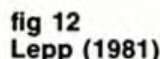
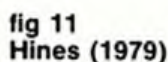
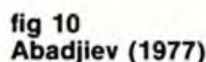
Figure 11 shows a very modern looking design indeed by Hines. It placed third in the 1979 World Championship but is included because of the manner in which its design was conceived. Hines selected several better known F1A designs and having charted their dimensions then produced his own external design based on an averaging of these figures. This obviously amounts to a similar approach to that suggested by the author to be covered in the next article. Hine's model was appropriately named 'Mean Machine'.

In conclusion, it is worth commenting that any design process must include a thorough survey of what the opposition are doing. It is very important that one's own personal approach includes taking careful note of what is currently successful. Although this article does not survey the 'present state of the art' in terms of design, it at least does indicate hopefully how interesting, looking at other designs can be...

Part 2 will include Tony Cordes analysis of these designs and the conclusions to be drawn in designing your own.

1980s

Breeman's design shown in figure 13 concludes those selected and is included



VINTAGE CORNER

WITH ALEX IMRIE

Carl Goldberg

Mention was made in Hangar Doors in the May issue of the death of Carl Goldberg on 28th January at the age of 72, and a brief account was given of some of his modelling highlights. However, it is felt that more details of the impact made on the vintage period by this aeromodelling giant should be given, since, if ever a man made an impression on this hobby of ours it was Carl Goldberg.

Born in the Bronx, New York on 27th October 1912, his model interests were aroused by an article in the *American Boy* magazine of January 1928. He built the model described using ordinary domestic materials, and the flight time was all of 12 seconds.

He joined the *Aeroplane Model League of America* (AMLA) and was one of the 259 contestants to enter the first US Nationals Meet to be sponsored. This took place at Detroit between June 28th and 30th later the same year and Carl's twin-pusher did 28 seconds, which caused him to get a mention in the results.

However, more important than the mention of his own name in the results was the chance to see other modellers' efforts and Carl took particular attention of Aram Abgarian's indoor tractor which won the 'Stout Indoor Event' with a seemingly amazing time of 5 minutes 53.6 seconds, and it was this experience that decided him to take up indoor models.

Success soon came his way when he won \$2.50 for being 'last man down' at Ossining, New York in October 1928 when his first indoor tractor model flew outdoors to win with a time of 81 seconds.

He was second in the 1930 Nationals, and was greatly disappointed in 1932, when at Atlantic City he only managed third place. By 1934 he had 6 years experience of indoor models, had entered some 30 major contests and placed in 26 of them. At Akron that year, flying in the 180 feet high Goodyear Airship Hangar he made a World's Record of 22 minutes 59.4 seconds and details of this model were published in June 1935 *Model Airplane News*.

In 1935 he again put up a World Record when his model did 23 minutes 29.4 seconds and won the Springfield Trophy. This machine was similar to the previous year's

Right, photo taken by Joe Ott on August 4th 1938 at the Midwest States Contest, showing from left to right, Frank Nekimken, Carl Goldberg and Richard Obarski. The 'Zipper' is an early version of 48 inches span with a diamond fuselage and was Obarski's first gas model, he won the event with a flight of 6 minutes 55 seconds on a 30 seconds engine run! (See text).



Left, another Texaco departure at Bong, and another reminder of Carl Goldberg's craft. Ten foot span 'Valkyrie' for which details of power unit and builder are unknown.

winner and was of tractor configuration with a 40 in. wingspan having an area of 148 sq. ins. The tail boom was 12 inches on the standard 15 in. motor stick and the 16 in. diameter propeller was driven by a 20 in. loop of 3/32 by 1/30 rubber. 2000 turns were sufficient for a 22 minutes flight, although the motor would stand 2500 turns.

On the record flight, 11 minutes after launch a height of 150 feet was reached, and by the time the model had descended to thirty feet, all the propulsive effort had gone, the effective rpm was calculated to have been 92. The material costs for this particular model were considered to have been 30 cents!

Carl moved to Chicago in 1935 and of course, joined the Chicago Aeronauts and very soon his indoor influence on other club

members made itself felt as the standing of the club at this type of flying increased greatly.

However, at this time, there was another kind of activity that attracted much attention... with the availability of practical petrol (gas) engines. From early 1936 Carl investigated the possibilities of building a super streamlined model for the Bunch 'Mighty Midget' engine.

The result was the 10 ft. span 'Valkyrie', a lightweight model with a parasol wing on a so-called 'pylon'. This model was the outcome of close teamwork between Goldberg, Vacco, Ritzenthaler and Nekimken. First flown in March 1937 using the 'Mighty Midget', later a 'Gwin-Aero' was used and finally a Brown 'Junior' was fitted.

This model made a total of 28 flights before flying away 53 minutes OOS at the 1937 Nationals on July 11th at Detroit to take Second Place. The 'Valkyrie' was never found and it bore with it into the Canadian Bush, Veron Boehle's new Brown 'Junior' which he had just loaned to Carl! Needless to say Boehle soon had a new replacement engine.

Fortunately, full information on the model had been retained and it was described in *Air Trails* for September and October 1938. However, before this when the adoption of the 30 seconds engine run was made for the 1938 contests, Carl had realised that the big models' competition days were over, and that a small high-powered model with a rapid rate of climb was the answer. The Gas Model Aeronauts of Chicago held a contest for such models

Dick Stouffer shot of an enlarged 'Diamond Zipper' powered by OS 60 four-stroke and using Kraft R/C taking-off at Bong in the Texaco event at last years SAM Champs. Model weighed 6 1/2 lbs and was flown by Dave Schooley from Windsor, Ontario.





Left, big stuff! Alan Crompton launches his 'Leprechaun' sailplane at Warwick last year. The 103 inch span design is still available from Aeromodeller Plans Service as G/370 price £6.00p plus 60p postage.

early in 1938 stipulating that the maximum wingspan allowed was 54 in.

Carl Goldberg won this event with a model powered by a large Forster engine developing 1/3 hp (this engine named 'Little Hercules' later became known as the Forster

99 and had a capacity of 16.2cc) thus proving conclusively that his model aerodynamics could handle high power in a stable and safe manner.

He now began work on a new design that he had been considering over the previous

six months. This machine incorporated all the stability lessons learned from the indoor models and he collaborated with Alvin Anderson who had a more extensive experience of outdoor models than Carl.

For the ultimate in performance he wanted a light model (the wing loading rule in force at the time stipulated a minimum loading of 10 oz. per sq. ft.) powered by the 1/4 hp 'Dennymite' engine. When the model emerged it was a four feet span high wing machine, having a lifting tailplane with an area one third of the wing area, and used what became known as the Goldberg G-5 aerofoil section.

The most unusual feature of the model (although 'Valkyrie' had also employed it) was the unusually high wing mounting, the reason for which Carl explained: "The great question, of course, was how to handle the tremendous engine torque on such a small span, and how to have sufficient reserve stability so that small adjustments would not affect the flight to any great extent. This was solved by simply raising the wing about six inches above the centre of the fuselage and using a fair amount of polyhedral."

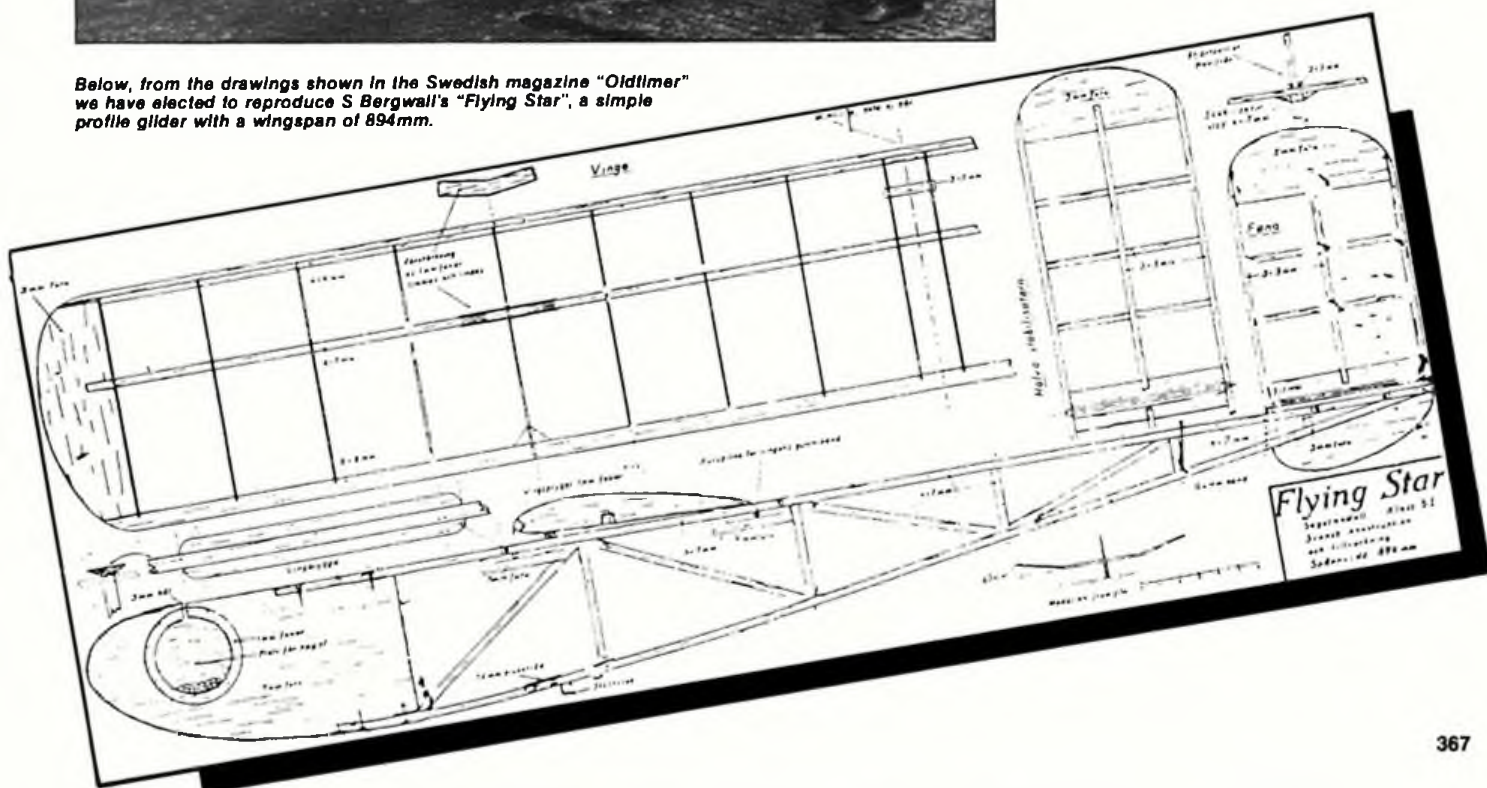
The models (Anderson also built one) were actually finished on the field at the 1938 Nationals at Detroit, and while nothing of note was done on that occasion, some test flights later, moving the Centre of Gravity aft and setting the tailplane to half a degree negative gave the desired results of 2000 feet per minute rates of climb.

Dick Obarski, a rubber modeller, built the model, which was now known as the 'Zipper', as his first attempt at power modelling. He finished the model at the Midwestern States meeting, entered the power event later on the same day and won



Left, the Humphreys' 'Valkyries' are well known to UK vintage modellers. This is Ann's model and she holds, while husband Jack cranks-up the Ohlsson 60 ignition motor.

Below, from the drawings shown in the Swedish magazine "Oldtimer" we have elected to reproduce S Bergwall's "Flying Star", a simple profile glider with a wingspan of 894mm.



first place. This was the first of what was to be a long line of successes for the 'Zipper', and in eleven contests the model won nine first places and two second places in the hands of Carl Goldberg, Alvin Anderson, Bernard McShane and Obarski.

Just how revolutionary all this was can only be appreciated when one remembers that it opposed the Centre of Lateral Area (CLA) location theories held until this time, Carl was able to state that the higher the wing above the Centre of Gravity so the more stable the flight, also the high CLA contributed to the stability.

Without doubt, the model's consistent contest success was due to the reliability built into the design by keying all flying surfaces to the fuselage and thus preventing inadvertent movement, yet retaining knock-off ability with rubber bands. By making the ignition components easily removable for inspection on a tray fixed to the motor bulkhead, wiring could be inspected and batteries replaced with ease. This accessibility paid off in the heat of competition on many occasions.

So the 'Zipper' type design exposed many false notions about stability, it taught correct aerodynamics and structural design, was easier to transport to and from the flying field and was stronger than conventional models and as Carl Goldberg himself said "...its performance was a model builder's dream." The pylon craze swept America, the 'Zipper' was kitted by Comet, who also produced a smaller version named 'Mercury'.

In this country the pylon concept was just being introduced when we had to turn to sterner things than power models and it was not until after the war that this type of model began to make an impression here, my personal favourites in the late forties being the 'Slicker' series by Bill Dean.

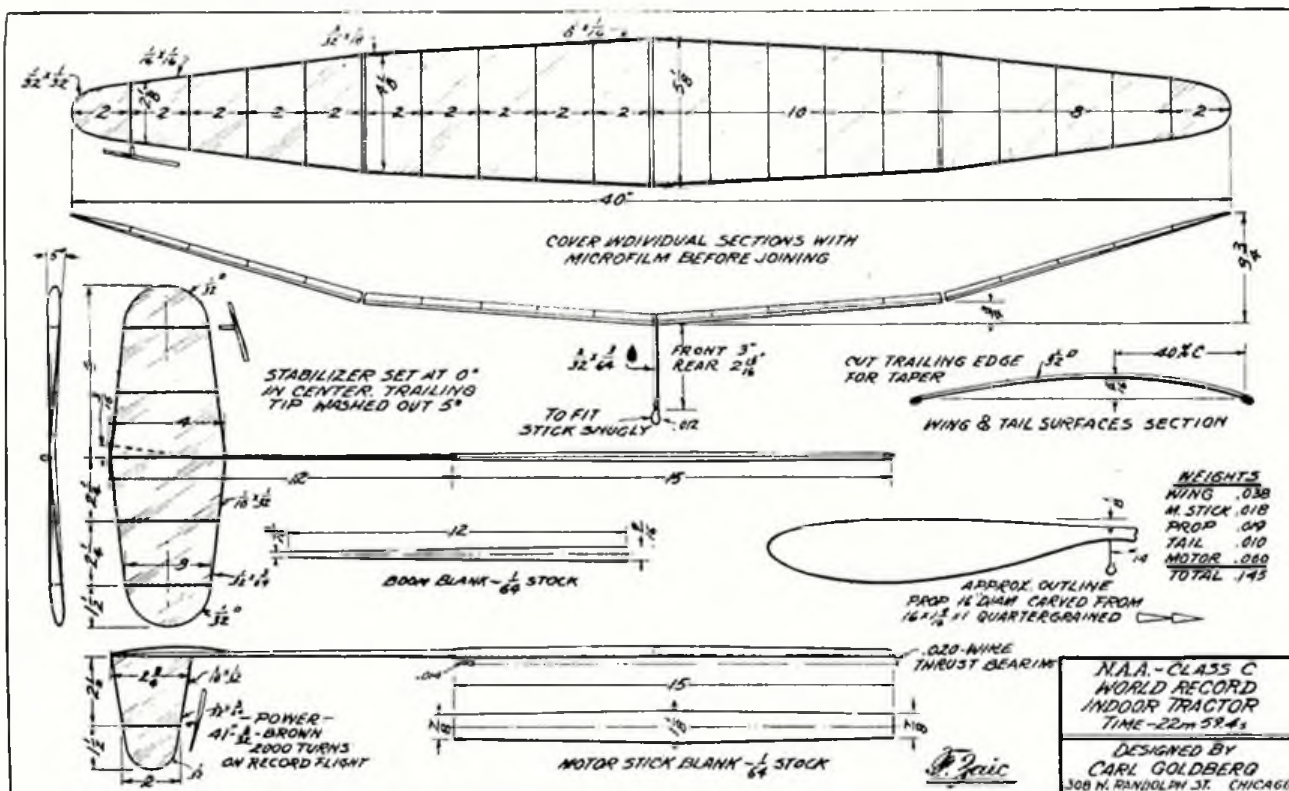
Right, Vic Dubery demonstrates the use of a winding stooze with his attractive little SE 5 at Old Warden. The 'SE', ever a modellers' favourite is painted with a blue nose and fuselage band to represent Billy Bishop's machine in 60 Squadron.



Carl Goldberg gave us many other things and one could write at length about the development of his 'Clipper', a high performing cabin model that used a half size 'Valkyrie' wing, his fabulous 'Sailplane', really a cleaned up 'Zipper' with retractable mono-leg undercarriage with a span of 78 inches more suited to the hot 10cc engines then appearing. His 'Interceptor' which had an even higher pylon, that represented two and one half years of designing and testing to combine ideals of performance and simplicity (it went up 1600 feet per minute on an Ohlsson 19!).

Despite many designs in a lifetime of modelling, I consider that his greatest

Left, Sebastian Robinson of Glasgow, launching his GH 27B, a dual-purpose model designed by GWW Harris and described in January 1948 Aeromodeller. After some good flying (it once did 6 minutes 25 seconds on 525 turns) it was lost last year in the Old Warden jungle!



contribution to model aeronautics remains the 'Zipper'... a revolution in the sky!

50th Wakefield Anniversary

Colin Watts, Competition Secretary of SAM 35 is organising the Wakefield competitions to be held at RAE Cardington near Bedford on 4th August 1985 to commemorate the 1935 Wakefield Competition which was held at Fairey's Great West Aerodrome on the same date

Vintage Abroad...

Most European countries have responded to the vintage urge and as was to be expected Holland too has joined this happy throng. Cor Burger, who is a SAM 35 member has been a modeller since 1939, he has now retired from working for the large Fokker concern and during the last three years he has been engaged as a volunteer in the library of the Aviodome which houses the Dutch National Aerospace Museum at

1930 to 1950 (*this is the period of interest, needless to say older and younger modellers will be most welcome...Ed*). Prices are 'all in' and include meals from supper on 10th August to breakfast on Wednesday 14th August.

Simple room (takes four)	168 Fl each
Double room	193 Fl each
Single room	241 Fl each
Caravan (electricity extra)	125 Fl each
Tented accommodation (provide your own sleeping bag)	140 Fl each
approximately 4.30 Fl (Dutch Guilders) = £1.00	

Apart from meals and accommodation the above prices include use of the workshop and sportfield as well as entry into various activities that have been organised for this aeromodelling camp". Anyone wishing to attend will doubtless require more information and they should contact C J Burger, Boksdoornlaan 20 1185 EC Amstelveen, Holland. (Tel. 020-452048) who will be pleased to assist with more details.

Left, two versions of the Kelikraft 'Scout' control-line model seen at Old Warden. Cowled and uncowed, closed and open, either version makes an attractive model of this 20 inch span biplane.



fifty years ago.

As at Warwick last year there will be different classes of competition encompassing the Wakefield rules until 1954. Various other events will take place, details of which will be made known either in next month's issue or via the SAM 35 magazine. Please note that to compete fliers must be members of both the SMAE and SAM 35. Interested readers should contact Colin direct at 29 Marchmount Road, Wylde Green, Sutton Coldfield, West Midlands enclosing an SAE.

Note that this is the last of the Wakefield 50th Anniversary meetings to be held in UK, the others commemorating 1936, 1937 and 1939 will be held in the USA, while that for 1938 should ideally be at a French venue...

To take-in this event and the Indoor Meeting at the same venue on the following weekend, as well as the two day Aeromodeller Vintage weekend on August 17th, 18th at Old Warden, a large number of 'Big Noises' from the US 'Old Timer Scene' are being imported... Although the final list is not to hand this group may include Joe Beshar, Sal Taibi, Danny Sheelds, John Pond, Don Garafallo, Bert Stiegler, Larry Priest, Alan Richardson, Woody Woodman, Karl Hatrak, Herbert Lacey, Ken Skyora and many others.

There will be ample opportunity during their stay to meet these enthusiasts and extend our hospitality to them. Doubtless they will appreciate being accompanied to places like the RAF Museum, Imperial War Museum Duxford, Shuttleworth Collection etc as well as attending any impromptu flying meetings anyone can find time and space to organise. Lets make them really welcome, after all, they are coming a long way just to be in on our vintage scene.

Right, another Stouffer shot at Bong. Woody Bartell tuning the Super Cyclone in his 'Powerhouse' before release in Fuel Allotment. Model last seen locked in a powerful thermal heading for Lake Michigan!



Amsterdam on Schipol Airport.

Cor has utilised this association to search out vintage contacts as related in his letter:-

"During the last three years I have tried to collect vintage models, and last year I contacted the KRO Broadcasting Company and managed to get one hour of transmission time to talk about old time modelling and ask for old material. Approximately 60 people responded to this appeal, most of them answering, by phoning in. The result was the loan of some Wakefield models built before the war during the 1937-1938 period by our own Wakefield Team members. Using these models along with other models and plans etc it was possible to make an exhibition of Old Timers in the Aviodome, and this show terminates in August this year.

Because of the interest generated by the exhibition it is planned to hold an Old Timer Modelling Camp from 10th to 14th August, and we do hope that we will be able to welcome some SAM 35 members to this special function. Herewith are some details of accommodation from a leaflet prepared by the KNVVL (Royal Netherlands Aeronautical Association) whose 50th Jubilee year it is. So this is a call to all aeromodellers, both young and old from

Vintage R/C

World Electronics a subsidiary of World Engines of Watford inform us of a 35 MHz FM single channel system, that they are about to produce as a small initial batch. The transmitter will be small and simple, contained in a metal case approx. 6 by 4 by 2 inches, sporting a telescopic aerial of 49 inches in length.

The receiver weighing only one ounce measures approx. 1½ by 1 inch and will work ancient items like rubber-driven escapements or motorised servos including those of the Bellamatic type. Power is from a 100 ma nicad weighing 1¼ ounces and control is via push button, but manual pulse or even 'joystick' control for Galloping Ghost can be fitted.

The prototype gear is presently being flown with success using a Bellamatic servo. The range is greatly increased and with more current available to the actuator, the system is much more reliable than comparable gear from the old days.

In fact, ideally suited to the control of vintage models where the occasional application of rudder will keep that dream 'free flight' ship out of the trees! We await more details especially price and availability with interest...

Left, Carl Goldberg's 1934 Indoor, tractor record breaker, reproduced from Model Airplane News June 1985.

SCALE MATTERS

SMAE Indoor Scale Nationals Alumwell Centre Walsall — April 28th Report by Bill Dennis

I am rapidly scribbling this column on the evening after the contest in order to meet the *Aeromodeller* deadline so let us hope all my notes are accurate and readable!

What a marvellous meeting this was - by far the best Indoor Nationals I have attended. Four weeks before, there was some concern over the low entries at that stage and I think the background to this is worth going into. Under the new system, SMAE members who fly in SMAE contests are supposed to have a Competition Licence, which costs an extra £10, its function is to supplement cost incurred by the SMAE's contest involvement.

This is an admirable idea, but it is becoming clear that it is being implemented in an odd way. As well as flying scale, I also dabble in duration and yet have never been asked to show my licence. Apparently, events organised by Areas do not always need a Licence. This was brought home to me in the recent SMAE Newsletter where the advertisement for the SMAE Southern

Open Rubber: The first model to catch my eye during the practice session was Reg Boor's A.W. 'Argosy'. The subject aircraft, G-EBLF, was the same one I have built for diecasts, but finished in its all silver scheme. I had also considered this one for indoor, since it has a very long nose allowing a long motor to be used. Reg's model unfortunately did not qualify as it seemed underpowered and turned tightly, but it showed much promise.

Last year, Barry Pursglove's DH 34 was also underpowered, but this time out, it was going really well after a rather short take-off. John Blagg was having a bad time with his *Lea Richards*. 'Annular Monoplane', which was flying exactly how one would



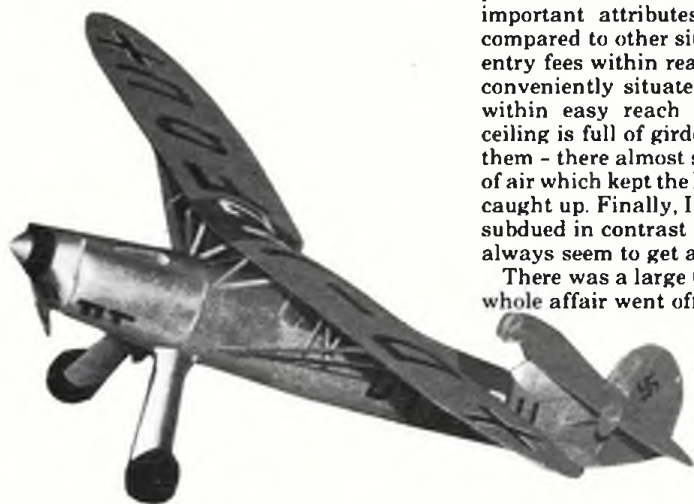
Group shot of some of those competing at this year's Indoor Scale Nationals at the Alumwell Centre, Walsall. The aircraft in this shot alone, give some idea of today's interest and high standard in these classes.

Alumwell Sports Centre does not have the plush decor of some sites, but it has several important attributes. Firstly, it is cheap compared to other sites and this helps keep entry fees within reason. Second, it is very conveniently situated just off the M6, and within easy reach for most people. The ceiling is full of girders, but few models hit them - there almost seemed to be a cushion of air which kept the high fliers from getting caught up. Finally, I find the lighting quite subdued in contrast to some places where I always seem to get a headache!

There was a large team of judges and the whole affair went off very smoothly.

expect a lavatory seat to fly!

The choice of subjects was very wide. Richard Granger had an enormous *Fokker FII* at around 3ft. span, but it hit the scales at well over the limit and so had to be



Area Spring Gala specifically pointed out that people did not need a licence.

Several indoor flyers had said to the National's organiser Doug Sheppard that they could enter so many Area meetings without the licence, that they would not pay £10 just to fly at the Nationals! As I said, I agree with the licence idea, but I have a suspicion that the licence holders are carrying a lot of freeloaders on their backs...

The good news is that by the day of the event, the entries were quite healthy and a very high percentage of these flew. The

Above left, Mike Hetherington's delightful paper creations are well known and this geared 'Stosser' made the best flight of the day in Open Rubber. Right, Mike in relaxed 'take off posture', about to coax the 'Stosser' into another fine flight.





Left, could this be the new 'Lacy'? Major Lindsey Smith launches one of his series of 'Zippy Sports'.

disqualified. Barry Hetherington seemed to have an endless supply of Bellanca 'Aircruisers' for each class, and they all flew the same way. Last year's winner David Wolstenholme was again flying with the 'Widgeon' but it was performing badly this time round.

While most of the models qualified, very few of them performed well in all of the marked stages of the flight and there is no doubt that it is very difficult to trim them to do this. Take-offs were very often fast and on a curved path, going into a tight fast turn which might slow down to a more realistic speed later on. Perhaps the most extreme example of this was Mark Hinton's *Santos Dumont* which shot off at colossal speed, which would certainly have torn the wings off the original, only to settle down into its familiar extremely slow cruise at great height - I think the original only 'hopped'.

For my money, the most impressive model was Mike Hetherington's 'Stosser'. This is a new version, intermediate on size between his peanut model and his familiar outdoor model. Again made of paper, it is fitted with a gearbox and made the best and smoothest flight by a considerable margin. The model was, I estimate, about 28 in. span but weighed only one ounce.

I gave the wing a little squeeze (don't tell Mike) and can report that the paper Mike used is very thin indeed which makes the totally convincing appearance of the model all the more remarkable. The drawback with this technique is that you cannot produce double curvature (such as on 'Stosser' fuselages!)

Below, John Greenland checks his watch, Barrie Hotham sorts his papers and Bill Dennis looks a little sceptical as John Blagg prepares his 'Lee Richards'!



Right, another man who likes building the same model to different scales... Richard Granger holding his Peanut and Open versions of the Fokker FII, sadly the latter was outside the weight limit...



Hopefully Mike is going to do an article for us on this aeronautical origami, including a full size plan. I thought the 'Stosser' was going to be the winner, but it was beaten by the smallest of margins by Butch Hadland's 'Lacey', which gained the highest static score.

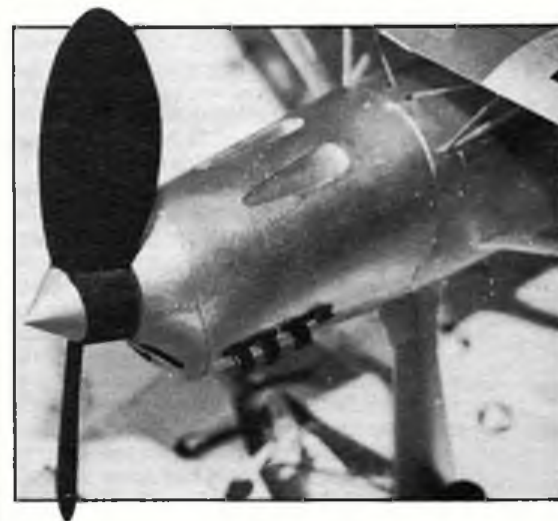
In the static section, the judges reported that the overall standard of documentation was similar to last year, i.e. poor and the accuracy of many of the models was low, leaving great scope for improvement...

Peanut: The flight judges had a welcome rest while the Peanut contest took place. Mark Hinton won again with his *Santos*

Dumont BIS 14 which is certainly capable of staying up a very long time. However, the model which everyone was watching was Paul Brigg's *Roe 'Triplane'* which had three of everything and placed first on the static list. Paul tied with Mike Hetherington, but they decided to spin a coin for 2nd place

rather than go to a fly-off, which Mike would undoubtedly have won.

Looking through the list of models, there does not seem to be many new examples which I think indicates a certain stagnation. Certainly the other two events have gained in prestige at the expense of Peanut, and the choice of subject is certainly



Above, close up of nose detail on Mike Hetherington's paper 'Stosser'.

wider, which is strange since no bonuses are given!

CO./Electric: We are still waiting to see the first electric powered model. Again, many models were experiencing difficulty in achieving 20 seconds, while others seemed to have plenty in hand.



John Blagg was flying his familiar *Breda Pensuti* biplane. On each crash the pilot leapt out of the cockpit to land several feet away, and I can't say I blame him! Another handful was Michael Smith's *Handasyde* monoplane, which I believe was a lightplane built for the Lympe trials in the 20's. It looks like it has spent the night in a trouser press and the very short undercarriage necessitated a little four blade propeller. At the start, it looked a complete no hopper, sideslipping into the floor at the merest hint of a stall or turn, but gradually it improved until - after the contest it was flying up near the ceiling and did in fact perform a perfect figure 8!

Andy Sephton did some very nice take offs with his *Blackburn* and the pilot's scarf flapping in the breeze was a nice touch. Unfortunately he ran out of attempts getting the cruise right, and the flight score didn't do it justice. Another common fault with models of these old aircraft, is that they were not transparent, but almost opaque.

The model with apparently the most potential was Charlie Newman's *Hanriot*. This is the same size as my own which appears elsewhere in this issue, but is rather better made! It features an undercambered wing section and all the riblets and is finished in the multi-coloured Belgian markings. Most interesting was the cowling which Charlie produced in his home-made Vac-Form. He explained this to me, but all I took in was that it involved a vacuum cleaner! I'm hoping he can be persuaded to give us a fuller description, because the results are marvellous.

A characteristic of the method is that while the rear edge of the radial cowling is quite thick, giving useful strength and ballast on this model, the leading edge is very thin and realistic. Unfortunately the motor inside this cowling was icing up and prevented the model from qualifying.

Another apparent no hopper was Harry Perrens' 'Widgeon' which had spent most of the day circling around with one wheel firmly stuck to the floor. However, Harry must have done something dramatic because its last flight was excellent right up in the rafters and at scale speed too.

Again, as with the rubber class, many of the flight patterns of the CO₂ models left a lot to be desired with fast tight turns at low altitude being common.

Geoff Spencer won the event with a peanut sized 'Tiger Moth' powered by the tiny *Brown 'Campus'* motor. In the static

Above, three harassed static scale judges desperately trying to work out their 'K' factors? International Scale Sub-Committee Chairman Dennis Thompson in the middle of it...as usual. Right, Mark Hinton prepares to launch his 'Santos Dumont' for yet another excellent flight.



section it would have suffered through its drawn on surfaces and inaccurate wing tips - very common on 'Tigers'. However, the flight pattern was near perfection, with perhaps just a little too much speed... It was in fact rather like an outdoor model, with a dead straight take off and climb-out, a wide circle, and straightening again for the landing. Too many of the others took off, flew and landed on the turn.

Two things occurred to me as being suitable for possible rule change... The single 'realism in flight' section really needs splitting into 'critical climb' and 'cruise' since these two phases were usually very different, being 'awful' and 'good' in that order.

Secondly, I have thought for a long time that some bonus should be given for the more complex model in the static section. At

the moment, the sensible thing to do is build a model of a subject with as little detail or complication as possible, so that the chance of error is low. Happily, most modellers are building models for their interest, which is why we are still getting 'Argosies' and 'Bleriot's'.

At the lengthy prizegiving, Doug Sheppard thanked all the officials and I'm sure the competitors would wish to thank Doug for his efforts in organising this very

successful meeting. I look forward to next year.

August Nationals

I have mentioned before that, following last year's successful impromptu CO₂ Scale competition at the outdoor Nationals, there will be an official event (i.e. more expensive, but with SMAE plaques!). Due to an oversight by the Scale Committee, it has been omitted from the Nationals entry form which appeared - remarkably early - in the last SMAE Contest Newsletter. As a result, the committee have decided to make it 'entry on the day' so be prepared to stump up the registration (unless you're already entered for the other events) and entry fees. Don't forget you can also enter a CO₂ model in the 'Power' event, but it will need to qualify at 30 seconds - should be a piece of cake!

Results

Open Rubber (18 entries 17 flew)

	Model	Static	Flight	Total
1.	R. Hadland	1012	932	1944
2.	M. Hetherington	922	1020	1942
3.	G. Hannah	670	910	1580
4.	B. Pursglove	624	930	1554
5.	M. Hinton	880	621	1501
6.	P. Briggs	902	516	1418

CO₂/Electric (18 entries 14 flew)

1.	G. Spencer	D.H. 82A	725	1065	1790
2.	H. Perrens	Westland 'Widgeon'	839	782	1631
3.	R. Hadland	'Mr Mulligan'	939	608	1547
4.	M. Staples	Bristol 'Scout'	1004	505	1509
5.	L. Smith	Fairchild 'Argus'	640	849	1489
6.	P. Siddal	Bleriot XI	1043	354	1397

Peanut (25 entries 20 flew)

Team (25 entries 20 new)		Position	Position	
1.	M. Hinton	'14 BIS'	5	1 6
2.	P. Briggs	Roe 1 'Triplane'	1	11 12
3.	M. Hetherington	Fokker DVIII	9	3 12
4.	R. Hadland	Moreau Saulnier M	10	5 15
5.	L. Smith	Curtiss CR3	3	13 16

The mercurial 'Midge'

One of the most appealing facets of Vintage aeromodelling is that all kinds of model that were never particularly popular in their day suddenly become fashionable. The *Mercury 'Midge'* speed model is currently undergoing such a renaissance, prompted in no small measure by Andy Brough's SAM 35 competition for this design at the last *Aeromodeller Vintage Day*, where nine 'Midges' battled against the stopwatch (with more on the sidelines).

The number of subsequent requests for copies of the plan leaves this writer in no doubt that even more 'Midges' will take part in 1985; and other 'Midge Speed' events are beginning to appear on the calendar. At club level, all that is needed for a great afternoon's entertainment is two modellers, two 'Midges' and a stopwatch - so why not have a go?

The key reason for even considering a 1950-designed speed model is, of course, fun. Many features of the 'Midge' will be looked upon with amusement by today's speed enthusiast; but for healthy competition with minimal outlay - including the attractive rule that only unmodified engines are permitted - it cannot be beaten.

And if you'd like a target, there's always the 1950 record of 80mph to aim at... But before getting on with looking at the 'Midge' today (particularly to encourage the younger enthusiast), there's room for a historical word or two.

The *Mercury 'Midge'* was first advertised in mid-1950. A prototype, flown by Cyril Shaw of the Zombies club, had been victorious in the Class 1 Speed competitions

at the South Eastern Area Championships (72mph) and the West Essex Gala (75.4mph); and by the end of that year much was being made of these achievements in *Mercury's* advertisements for this five-and-sixpenny (27½p!) kit.

The fact that it was the only entrant in the West Essex event was left for the enthusiast to find out for himself! The 'Midge' remained in production for many years; and the diligent hunter may find the odd kit or two still lurking on model shop shelves. If not, copies of the plan and instructions can be

7. Two attempts allowed per flight. An attempt may be called if the engine lasts for one lap only!
8. Models may fly clockwise or anti-clockwise.

Which engine?

Under these rules, almost any plain-bearing 1.5cc diesel is eligible. A change in the rules for 1985 means that the PAW 149 'Contest' is no longer eligible (its Schneurle

The 'Midge' is simple to build but as with most models, to be competitive, care must be taken to balance light weight with adequate strength...



porting being deemed too *modern* for this Vintage class). The standard PAW 149 DS may well be many enthusiasts' automatic first choice, as it is certainly the most powerful of the permitted engines (being capable of 0.175 bhp at 17,000 rpm, according to the original *Aeromodeller* 'Engine Test').

However, the PAW is a relatively stocky

Mercury MIDGE

Like a phoenix from the ashes the 'Midge' thought to be extinct for years, is now enjoying a great popularity amongst Vintage control line flyers. Geoff Clarke explains how to build and fly a winner

Rear end of 'Midge' is an area that needs modification, the general feeling being that the elevator should be increased in area by 100% - compare with original plan overleaf.

supplied (at cost) by the writer. In any case, there are a few recommended modifications, which we'll examine after a reminder of the SAM 35 'Midge Speed' rules.

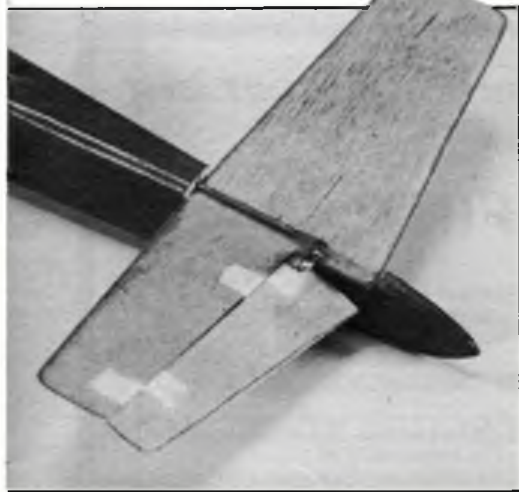
Rules

1. Model to comply with the drawing; fuselage sides and tail may be reinforced or constructed from ply. Double-sized elevator and flexible leadouts are permitted.
2. Engines must be plain-bearing diesels of 1.5cc. Any motor designed before Dec. 1950 is eligible, plus the following: DC 'Sabre'; PAW DS only (NO Schneurle PAWs for 1985); ME Snipe; Frog 150; JB Atom; AM 15.
3. Line length to be 35ft from centre of handle to centre line of model.
4. Lines to be lightweight *Laystrate* (0.015in. stranded).
5. Times to be taken over six laps (¼ mile). Timing starts on signal from pilot.
6. Speed calculated from the better of two flights.

engine, and at 3.5oz. it is over one ounce heavier than the lightest choice, the *Allbon 'Javelin'*; and a 'PAW-Midge' will require more tail ballast than any other. Luckily, some of this tail weight may be usefully translated into more-robust fuselage and tail construction, of which more anon.

The newly introduced AM 15 is another readily-available possibility, and it is lighter than the PAW - but less powerful (0.152 bhp at 14,000 rpm was claimed for the original in 1958). Earlier motors, such as the *Elfin* 1.49 raise the problem of spares availability, but are lighter, and may well give the currently produced engines a run for their money.

The Old Warden event was won by a 'Javelin' powered 'Midge', which was timed at 75.6 mph. An intriguing possibility is the blue-head *Frog* 150R of 1958. This is a motor with past successes as a ½A Team Race to its credit. A DC 'Sabre', JB 'Atom' or ME 'Snipe' would have to do very well against the above engines - but perhaps someone will try?



Building the 'Midge'

No-one could say that the 'Midge' is a complicated model, but it is a bit fiddly in places, and care is needed. If the control linkage is not absolutely smooth and free (this is not the same as *sloppy*) a crash is inevitable! Make sure the pushrod doesn't foul on the top of the fuel tank; find out *before* epoxying the wing to the fuselage... Once the tank is in, it's there for keeps, so you have to try to get it right first time. It will help to angle it so that the outer rear corner projects a bit further away from the centre line (effectively creating a 'wedge' when viewed from above) but there isn't much room! Chamfering the vents so that they face the airstream goes some way towards preventing siphoning problems but the model really cries out for a uniflow tank...

As designed, the fuselage is terribly fragile and is not really man enough for the rough and tumble of a typical 'Midge' arrival (I nearly said *landing*). However, the chances are, that you will need a touch of tail weight, whatever engine is fitted, so toughen the fuselage up a bit instead of adding lead!

I made the fuselage sides on mine from a lamination of 1/32in. balsa and 1/32in. ply (the ply outermost), but others recommend going to 1/16in. ply. A 1/32in. ply tail is a must; and to improve elevator response it is *essential* to double the chord of the elevator.

Do this by cutting further into the basic outline, *not* by tacking on an extra piece. The various grooves and rebates in the wing are tedious to make accurately, but over-enthusiastic use of the balsa knife will result in a weak structure, particularly at the outboard wing/fuselage junction; so take your time.

If you are confident of your ability to make a good job of this part of the construction, you could save some weight - where it can be spared - by making the wing from a soft 1/4in. sheet blank with a very hard 1/4in. sq. leading edge. Flexible leadouts are permitted, but I haven't tried them.

Further weight would be saved by their adoption, but against this, line connectors would have to be used. Anyone who chooses to fit a circular bellcrank is probably going too far!

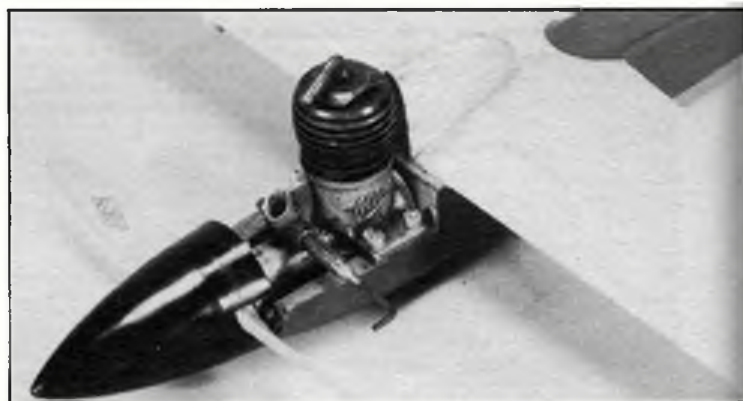
Flying!

A standard C/L handle will do, but a custom-built handle with closer line spacing - say 60mm - will probably make for

smoother flying. A look through past *Aeromodellers* will give much guidance on how to make one; or an SAE to this writer will get you the information. Don't be put off - it's easy to fret an outline from 2mm aluminium or dural sheet, and add hardwood both sides for a comfortable grip. Mark the Up line on the *handle* and the *model*. You can't be *too* careful...

Practice is important. For a start, you can try out a variety of props. Wooden propellers (meant for larger racing glows) can be tricky. I have seen them break under the stress induced when starting. Very good results have been obtained with the Graupner grey 6 x 6 nylon prop, which is fairly thin, strong, and flexible enough not to break on every arrival (I nearly said *landing* again). They are also easily available.

The end that makes the difference! As with many classes of competition, engine power is a critical consideration but with such a small, light model as the 'Midge', there may have to be a compromise between high bhp and the actual weight of an engine being considered...



With this prop, speeds of 70-75mph should be achieved - a good starting point. It might also be worth experimenting with cut-down 7 x 6 Graupner or Taipan props.

Specialist glass-fibre props in 1/2A sizes are also available from time to time, but these are expensive (and fragile). Nevertheless, if you persevere towards higher goals, a higher-pitch prop will be needed - perhaps 6 1/2in. or even 7in. pitch, cutting down on the diameter to keep the revs up; but by then you may either encounter starting difficulties, or will win every 'Midge Speed' competition you enter!

Just for the record, my first test flights with an Allbon 'Javelin'-powered 'Midge' - a good 'Javelin', it must be admitted - gave the following results:

First flight: 60mph (7 x 6 Tornado)

Second flight: 64mph (same prop, better engine run)

Third flight: 68mph (6 x 5 Graupner)

Fourth flight: 71mph (6 x 6 Graupner)

All efforts after that went into optimising the engine run and improving piloting ability (considerable work remains to be done in this area!).

Various charts and gadgets exist to help you calculate model speed, but the formula

Speed = 900

T

will give the speed in mph over six laps, where 'T' is the time in seconds to achieve this distance. This only applies for 35ft lines. A doddle to work out if you've got a calculator, but don't forget to include the first lap!

My only advice to anyone thinking of entering a 'Midge' competition is to have a practice run or two the day before, to get all the preparation out of the way ahead of

time. You should aim to be able to 'turn up and fly' at the comp (I am speaking from the "don't do as I do, do as I say" point of view). And good luck!

The prize awaiting the Vintage Day winner is the magnificent Lancaster Cup, originally awarded 'for annual speed competition' to the Lancashire MAS in 1935 by G.W. Greenhalgh (father of Alwyn Greenhalgh, the SMAE Historian). Dormant from 1940 until last year, it has now been engraved with the legend "Represented by Mrs. E. Greenhalgh, 1985".

Details of this and other 'Midge' competitions will appear in future editions of *SAM 35 Speaks*, the journal of the *Society of Antique Modellers* in this country (hint, hint). I would love to hear from you if you are building a 'Midge', or fancy a go. My address is:

5 Woodside Road, Sutton, Surrey.

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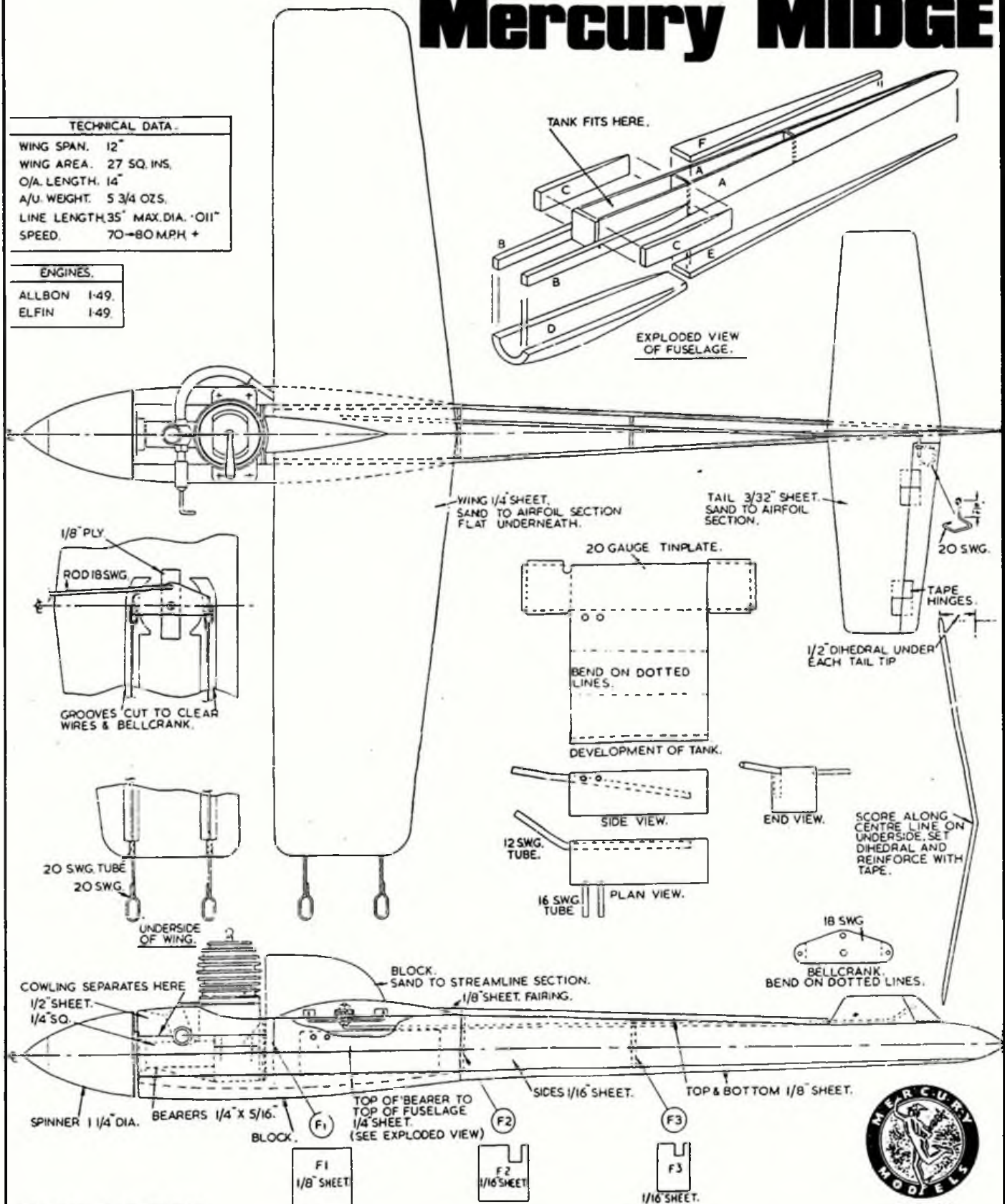
Mercury MIDGE

TECHNICAL DATA.

WING SPAN. 12"
WING AREA. 27 SQ. INS.
O/A. LENGTH. 14"
A/U. WEIGHT. 5 3/4 OZS.
LINE LENGTH 35" MAX. DIA. .011"
SPEED. 70-80 MPH +

ENGINES.

ALLBON 1-49.
ELFIN 1-49.



DESIGNED BY CYRIL SHAW,
DRAWN &
TRACED BY RON YOUNG.

MANUFACTURED IN ENGLAND BY MERCURY MODEL AIRCRAFT SUPPLIES LTD. LONDON N7. DESIGN COPYRIGHT BY MERCURY MODELS

These original Mercury 'Midge' plans are reproduced with the kind permission of Amerang Ltd., who are at this moment actively working on reintroducing a kit for this model - just goes to show what popular demand can achieve...

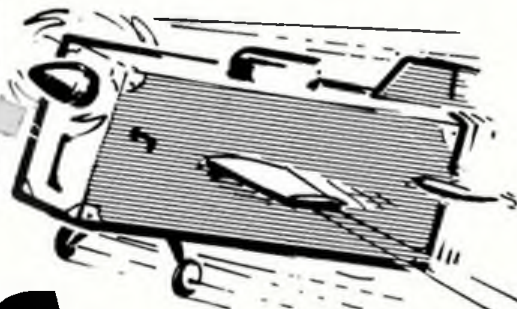




Dave's model boxes do not just hold his models. There is perhaps not enough room for the kitchen sink but everything for a good days flying packs neatly away into this one!

for the plywood boards, some very long cutting lengths are involved and such are all but impossible to do at home with acceptable accuracy.

Whilst Ramin stripwood is about the strongest and cheapest available in suitable sizes, it is very easy to split with consequent undesirable results. Therefore glued, not nailed, joints of ply to strip are required. *Evostick 'Resin W'* is ideal for these joints as well as being just about the cheapest wood glue obtainable.



Racing Boxes

Protect those models, build a custom special box for your control line racers — Dave Clarkson tells you how

BECAUSE TEAM RACE MODELS are relatively small, and therefore fit inside cars with ease, you would think that boxes to contain them are far from essential. Yet a visit to any contest will show that a significant number of team race competitors do use model boxes. Why is this?

Security is the answer: security from pets and kids at home; security from damage in transit in the car; security from the weather and feet on the flying field. You only need to have your precious model damaged *once* to know that you need a model box.

Few of us have much time or money to spare and so a model box must be as cheap and easy to build as possible. It must also be big enough to hold your models and gear; be strong enough to protect them from damage in the home, in the car and on the field. It must be light enough that it is easy to carry when fully packed and so designed as to enable easy and quick access to any of its contents. Finally a model box should be durable enough to survive for years withstanding rough handling, oil, water and it's contents.

For the last couple of seasons I have used two model boxes and they have survived well and show promise of surviving for quite a few years to come. The first box takes two Goodyear models and the second takes two team racers (FAI 'wings' or 1/2A — TR's).

Each took just a few hours of building time and at present day prices, the materials for the Goodyear box cost less than £20 and those for the TR box cost less than £15. Not much compared with the true cost of their

contents. This article gives the designs and construction notes for these boxes and I hope you will find it to be of use when you too come to realise that a box is essential.

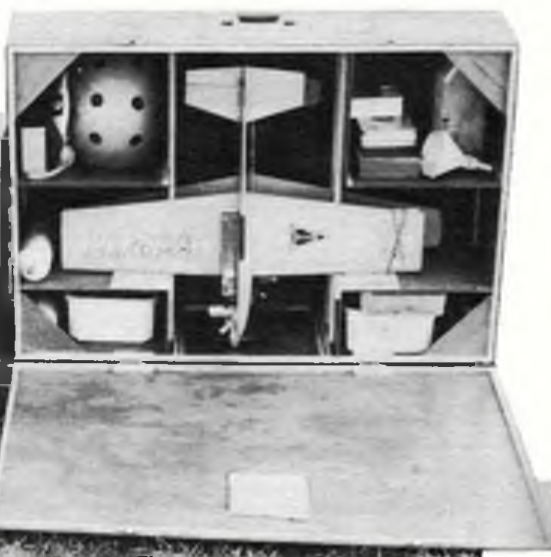
Both boxes are based on the use of a 9mm sq. Ramin frame covered in 4mm thick 'interior' plywood. These are about the smallest sizes consistent with adequate strength and durability. They are available in convenient sizes from DIY warehouses and the designs I present here have been worked out to make maximum use of standard sizes of these materials.

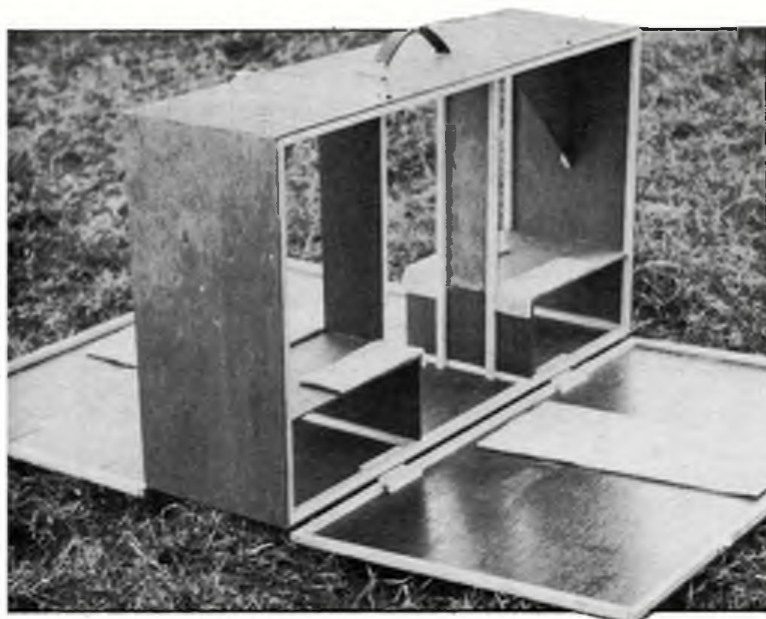
It is essential to purchase your plywood from an outlet with a free cutting service for, as you will see from the cutting guides given

I borrowed about one dozen 100mm board clips from the office to use as clamps to hold the strips to the plywood whilst the glue was setting and would recommend this method. Because only 9mm sq. Ramin strip is used, local reinforcement with a backing strip of 9mm sq. Ramin scrap is required where the screws will go for the hinges, catches and handles to give enough wood depth to contain the screws. Again because of the ease with which Ramin strip splits, all screw holes *must* be pre-drilled to avoid overstressing the wood.

Because 'interior' quality plywood is specified (only because it is cheaper than the 'exterior' quality) and because for reasons of cheapness and ease of use, a non-waterproof glue is specified. The box must be painted *thoroughly* inside and out to give

Built along similar lines these two boxes enable the Clarkson 'team' to compete in several classes with reasonable certainty of at least starting with undamaged models.





Access from both sides on this 'Goddear' box shows a typical aeromodeller's ingenuity having been bought to bear at the design stages...

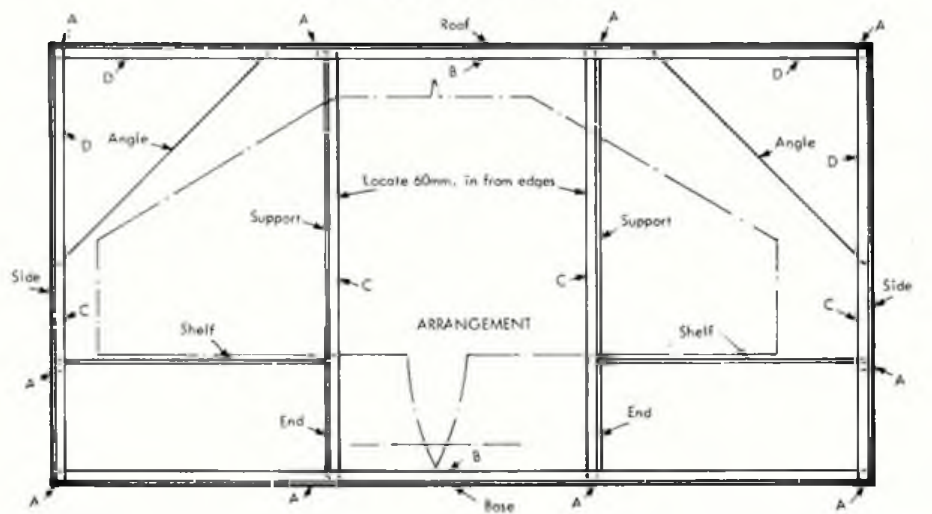
ply boards may not be millimetre accurate. Therefore the Ramin strips should be cut to length as you need them using the actual place where it is to fit to determine its length. It is essential to get these strip lengths *exactly* correct for a strong and durable box to result.

Finally, it should not be forgotten that the purpose of a model box is to prevent accidental damage to your models. This means that no rough surfaces should contact the models when they are in place. Ideal for this task are off-cuts of polyurethane foam sheet, glued with impact adhesive to the appropriate places in your painted box.

It also means that the catches holding the lids closed should do so *securely* and preclude the possibility of accidental opening. I have found small 'case catches' manufactured by *Cheney* quite adequate for this task but if you want to add locks then this would be a good idea especially if security of contents is important.

Construction is straightforward as long as it is done in the right order. The first thing to do is completely frame the lids and sides including the cross-members ('A' strips) for the sides. These cross-members must be located very accurately and this is best done using the 'walls' and 'ends' as guides. The

FAI Wing/1/2A — TR Box



F.A.I. Wing/1/2A

Materials

- 1 5 x 2 ft 4mm interior ply.
- 1 3 x 2 ft 4mm interior ply
- 6 2.4m 9mm sq. Ramin
- 1 Cheney case handle
- 4 Cheney case catches
- 4 2in. brass butt hinges
- 1 125 ml Resin W. glue
- 1 500ml Ronseal Outdoor

Strip dimensions

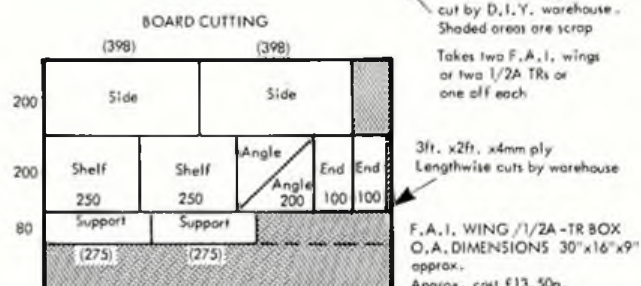
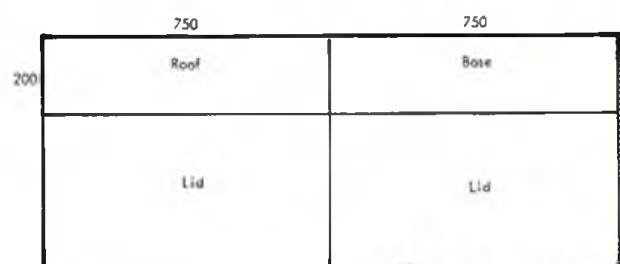
- A 10 off 182 mm
- B 4 off 724 mm
- C 8 off 398 mm
- D 4 off 190 mm
- plus for lids
- 4 off 750 mm
- 4 off 388 mm
- plus for mounts
- handle 6 off 40 mm
- hinges 8 off 75 mm
- catches 4 off 25 mm

it durability. It is inevitable that fuel will get splashed at some time onto the box so it is essential that the paint must be fuel-proof as well as water-proof.

For me these considerations dictated three coats of *Ronseal* 'outdoor Polyurethane' (clear) on all external surfaces and two coats on the internal surfaces. Already after a couple of seasons use, the finish of my two boxes is starting to look 'tatty'. Therefore, what I describe should be regarded as being the minimum and one more coat inside and outside would be a good idea.

Painting the box is the most time consuming and arduous part of the construction but is essential to give a durable result so please do not skimp on finishing despite the annoyance of it all. To do the job properly and most easily, painting should be done before the hinges, catches and handle are screwed in place.

In cutting the Ramin strips to length, it should be realised that the lengths I have quoted are approximate. This is because these strips are only of nominal width and depth and also because despite the efforts of your DIY warehouse cutting machine - operator, the - 'as-cut' dimensions of the



N.B. Dimensions in brackets () to be checked to ensure compatibility with other parts

5ft. x2ft. 4mm ply cut by D.I.Y. warehouse. Shaded areas are scrap. Takes two F.A.I. wings or two 1/2A TRs or one of each

3ft. x2ft. 4mm ply Lengthwise cuts by warehouse

F.A.I. WING /1/2A -TR BOX O.A. DIMENSIONS 30"x16"x9" approx. Approx. cost £13.50p.



roof and base are now framed noting that the edging strips ('B' strips) terminate 13mm (the thickness of the framed sides) from the ends, the cross-members should be located using the shelves as guides noting that these will overlap the cross-members on the sides.

Now the roof, base and sides can be glued together on a flat surface using a lid to check the corner angles and sticky tape to pull together the glueing joints. The assembly is as yet, not strong so the 'angles' should be glued in place overlapping the inside

surfaces of the edging strips before further handling is attempted.

The next step is to glue the central 'C' strips to the centre sides of the cross-members on the roof and base noting that these 'C' strips are located with their outer edges, as noted on the plans, displaced in from the box edges. Finally the insides can be added in order...end/shelf (then wall/shelf for the Goodyear box) and last of all, the supports.

Some of you will be asking why these boxes are box shaped and not model shaped

Goodyear

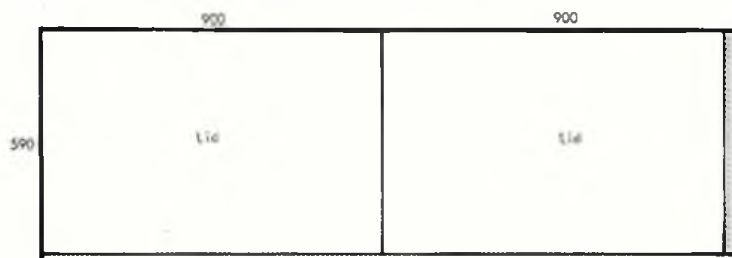
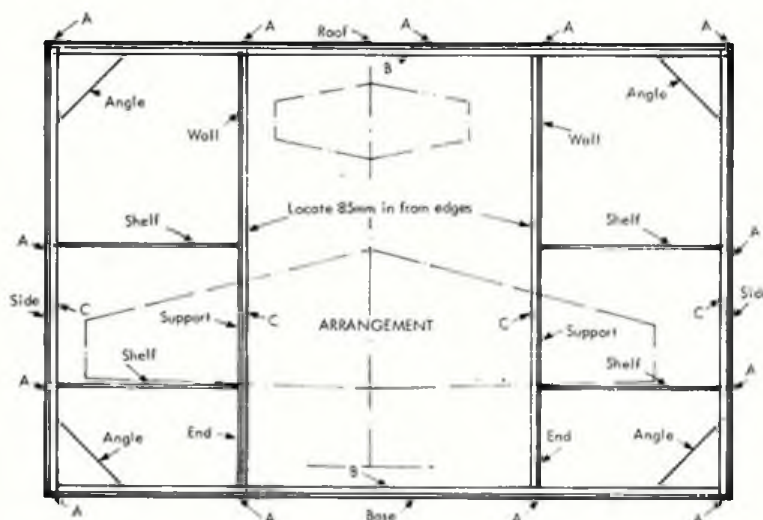
Materials

- 1 6 x 2 ft 4 mm interior plywood
- 2 4 x 2 ft 4 mm interior plywood
- 8 2.4m 9mm sq Ramin strip
- 1 Cheney case handle
- 4 Cheney case catches
- 2 in Brass butt hinges
- 1 125 ml Resin W Glue
- 1 500ml Ronseal Outdoor

Strip Dimensions

- A 12 off 232 mm
- B 4 off 874 mm
- C 8 off 582 mm
- plus for lids
- 4 off 900 mm
- 4 off 572 mm
- plus for mounts
- handle 6 off 40 mm
- hinges 8 off 75 mm
- catches 4 off 25 mm

Goodyear Box

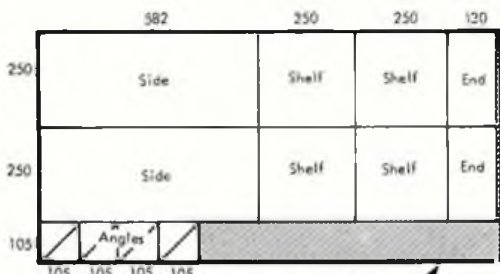


Cutting guide 6ft. x 2ft. x 4mm.ply

BOARD CUTTING GUIDES

Shaded areas are scrap

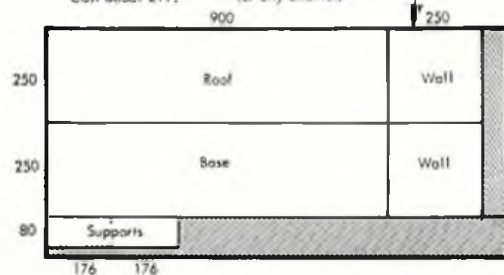
ALL DIMENSIONS ARE NETT AND IN MM.



Cutting guides 4ft. x 2ft. of 4mm ply

O.A. DIMENSIONS

36"x24"x11" approx. Takes two Goodyears (or any smaller)
Cost about £19.



From this picture one can get some idea of how the external dimensions were originally determined! You had better check the size of your car before applying power to the saw! Presumably Dave is not planning on buying a Mini...

when the majority of the team race boxes in use are model shaped. The answer is that, because only 90° angles are involved, box shaped boxes are easier to construct. They also take up no more space, consume no more wood and yet have more carrying space for a given set of overall dimensions. This point about carrying capacity is important, for until you try to pack your models and gear into your box, you may not have thought about how much stuff you need with you. My boxes are doing the job for me...I hope this article will help you to... get boxed!



SHOP TALK

NEW MODEL HOBBY PRODUCTS REVIEWED



Making life easier...

Last month we reported on DPR Models new range of kits that included beginners gliders and rubber powered models – not to mention the control-line trainers for O49 engines. All these kits feature ease of assembly and appear to be very good value for money.

This month we have two more items from DPR Models that should make things easier for everyone who is starting out with rubber power... One question we get asked at fairly regular intervals is "where do we get the rubber strip to put in our model?". If you want good quality strip in any quantity the answer is SAMS (see classifieds)... BUT now we hope to get a smaller number of calls because some model shops will be stocking DPR Models' Cosmo 'Rubber String'! Yes that's what it says on the box! The strip (string!) packaged in each box, is of reasonable quality and is long enough for to make up one or more motors for the smaller 'fun model'.

Don't forget, that your motors will last longer and will take those few extra turns if they are

properly lubricated. A visit to the chemists for a small bottle of caster oil, will keep you in 'lube' for hundreds of motors, as only a drop or two is required for each motor. – tie any knots in the rubber first!

Why wear out your fingers when you could be using a Cosmo 'Speedy Winder'... This 5:1 ratio winder also comes via DPR Models – is easy to use, winds up those rubber motors quickly and is inexpensive; look out for them in your model shop.

Price of the Cosmo rubber strip is 95p and the Speedy Winder £1.95.

Good motor for Stunt

The latest OS 40 FP looks like it may find favour in the 'Stunt Circle'. It seems to combine those qualities liked by the aerobatic community – good power to weight ratio. Claus Maikis ('From the Handle') hints that this may well be a motor worth looking at and next month's *Aeromodeller* has Mike Billinton putting it, through its paces in 'Engine Test'. Could this motor help you win the 'Gold' at the Control Line British Nationals? Check it out and see... Price to be announced. O.S. engines are distributed by O.S. Products of New Southgate.

Presentation is important

That 'special model' may need something a little better than a printed label when you are displaying it at the club exhibition. Eagle Studios will engrave a gilt coloured anodised aluminium nameplate for only £1.20 (plus 10% post and packing). These come in three standard sizes: 3in by 5/8in., 2in. by 5/8in. and 3in. by 1/4in. (other sizes can be cut to order). The first two can have three lines of engraving (up to 10 characters per inch on each line). The price includes engraving and the nameplates have a self adhesive backing. Not only would solid scale models be enhanced



Above left, DPR Models neat 5:1 winder is a must at this low price. Above, rubber motors available off the shelf...another useful item from DPR.



Above, interesting scale kit distributed by Amerang Ltd., for a 'Clipped Wing Piper Cub', the box alone is a powerful inducement to buy and build...

by such a smart addition but so would that old model box... Eagle Studios are at: 4, Moorland Road, Boxmoor Hemel Hempstead Herts HP1 1NQ. Their telephone number is 0042 61503. Don't forget to print what you want engraved clearly – nameplates cannot be re-engraved!

Not beginner's Scale...

An interesting small scale rubber powered model from Amerang (manufacturers of the 'Veron' and 'Keil Kraft' scale series) is this imported oriental kit of a 'Clipped Wing Piper Cub J3'. The box reminds us that this kit is not for beginners and at the same time tempts the builder with pictures of the uncovered and finished model – very difficult to restrain oneself from immediately buying the kit! Initial inspection of the contents confirms the feeling of a well thought out design – there is even pre-printed tissue to suit the colour pattern of the model shown on the box!

A convertible gearbox is included and we would not be at all surprised to see CO₂ conversions flying around this summer... Cost of the kit is £10.99 – scale freaks keep your eyes open and look for a future issue of *Aeromodeller* for an in depth review of how we got on with building and flying our 'Piper Cub'...

New tanks for old

Micro-Mold are now importing a new range of control-line fuel tanks. They are made of moulded nylon and three sizes are available at present: J-FT 351 10cc '1/2A' Rectangular at 60p; J-FT352 20cc. 'A' Rectangular at 64p and the J-FT 353 50cc. 'B' wedges at 88p. Samples seen so far look pretty sturdy and should outlast several models! At least the vent and feed tubes cannot come unsoldered...

Also new from Micro Mold is a small 40mm rubber tyred metal wheel: OW 46 40mm at 52p. These are well made items – three of these could very well provide the basis for a simple drop-off undercarriage... just the thing for that 'Midge' speed model you are going to build for *Aeromodeller* Vintage Days... Check them out at your local Micro Mold stockist.

Below, useful range of unbreakable (?) nylon control line tanks from Micro-Mold. Right, also from Micro-Mold inexpensive good quality rubber tyred metal wheels.

Latest 40 from O.S. Is this FP version...see next month's *Aeromodeller* for Mike Billinton's Engine Test.



THIS VERY SIMPLE and straightforward model was designed and built in less than a week. It was intended to be flown outdoors, but careful wood selection may make it suitable for indoors. I used cyano glue throughout, which speeded up assembly a great deal. The metal to wood joints in the undercarriage and cabane were reinforced with cyano and baking powder. I said it was a quick model, so let's get started...

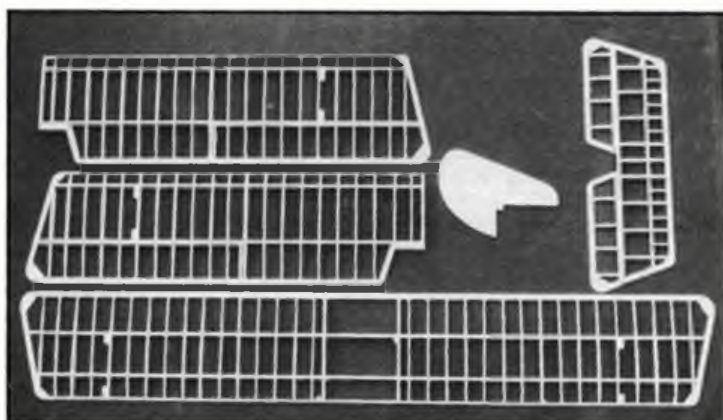
Fuselage

Build the basic sides from 1/16in. square and assemble over the plan - this is made easy by the straight top longeron. Note that



Hanriot HD-1

A good choice for a first CO₂ free flight scale model by Bill Dennis



Above, same scale but built to his own plans, Charles Newman's Belgian version of the Hanriot H.D.1. - gaudy it might be but very impressive... Charles has some vac formed cowlings for the Hanriot see plan for details. Left, as can be seen here, this model has very simple lines and construction... should prove a good first CO₂ scale model.

the side view is slightly over-long to compensate for the taper. Make up F1 and the engine mount, and also a former for moulding the cowlings. This is made from papier mâché as described recently for the CO₂ Sopwith "Pup" (*Aeromodeller* October 1984). Attach the undercarriage and cabanes, followed by the top decking formers which have the same radius as F1. Glue 1/32 in. blanks in place for the rear top decking and carefully sand to shape with a long sanding block. When satisfied, glue the five 1/32 in. sq. basswood stringers in place.

Tape a piece of writing paper down flat and give it two coats of dope. Develop the shapes of the forward top and side decking with tracing paper, transfer to the notepaper and test for fit. Glue in place after covering.

Below, this view of the fuselage emphasises the simple outline of the Hanriot HD-1 - in Aeromodeller's opinion an under-rated model for the novice scale flier. Right, Bill Dennis' completed, but uncovered version - looks great in flight

Wing and Tail

To save weight, every other rib is cut down to the pattern shown. The lower wings are flat and built as one piece. Lengths of 22 swg wire are epoxied across the centre section to give strength in this one-piece model.

The simulated ailerons are well worth doing, and very easy. In my view, these are essential for realism in a scale model - more so than the correct number of ribs, etc. With a sharp knife, cut a rebate 3/32 in. wide by 1/32 in. deep in each rib, and drop in the two 1/32 in. sq. basswood strips with a 1/32 in. gap between.

The tailplane is built with 1/8 in. x 1/32 in. blank ribs, sanded to section in situ. I have already referred to the *long* fuselage, please note that the rudder is shown with its correct shape and position!

Finishing

Install the motor with approx. 1° down and 2° right thrust. Cover the model with lightweight jap tissue, steam it taught, and give three coats of thinned dope, adding the paper headrest.

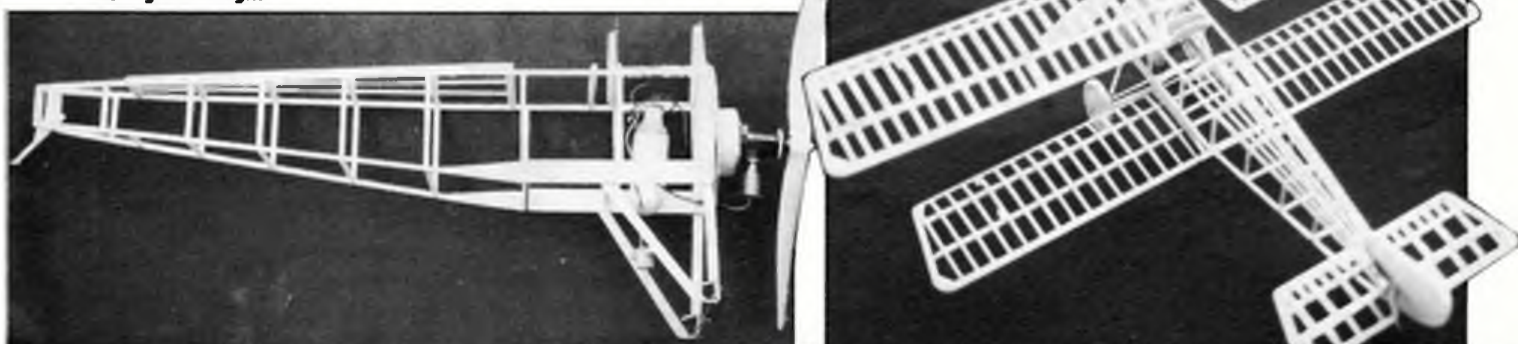
It is easiest to decorate the model before assembly. You have a choice of colour schemes. In fact there is a pristine example in the RAF Museum in Belgian camouflage, but I find this rather gaudy (not to say time-consuming to reproduce!). I chose the Italian scheme of all-aluminium with red, white and green markings. I used aerosol car paint for the aluminium, giving a light and opaque finish in minutes.

Begin assembly by slotting the lower fuselage to take the wing spars. Check for incidence and alignment and glue the lower wing in place. Make some temporary jigs to hold the upper and lower tips apart equally and glue the top wing to the cabane with a slower setting glue. Make up four interplane struts, trim to the exact length and glue in place.

Trimming

This should present no problem but check for warps and thrustline first. Find some longish grass because one-piece models are vulnerable until the trim is sorted out! On my model, the elevators were fixed, so I made adjustments with nose weight - no rudder deflections were necessary.

References used were the APS drawing and Profile No. 109. The outline shapes are I hope, accurate, and a little detailing should produce a useful competition model.



'AGRO' WAS INSPIRED by a combination of features that are common to most American military ground attack aircraft, very functional yet at the same time having crisp and pleasing outlines. A small rubber powered model that was slightly different with an aggressive look about it was required and this was the outcome, hence the name.

The original model was only 17 inches wing span with a four-bladed propeller to give it that realistic turboprop look but this proved to be very vulnerable even though the model flew well. The extra blade area of the propeller tended to lower the propeller revs which gave the model a very sedate flying pattern without much of a climb. Because it looked so good in the air I decided to build a slightly larger version to suit a 7 inch commercial plastic propeller and 'Agro II' was the outcome.

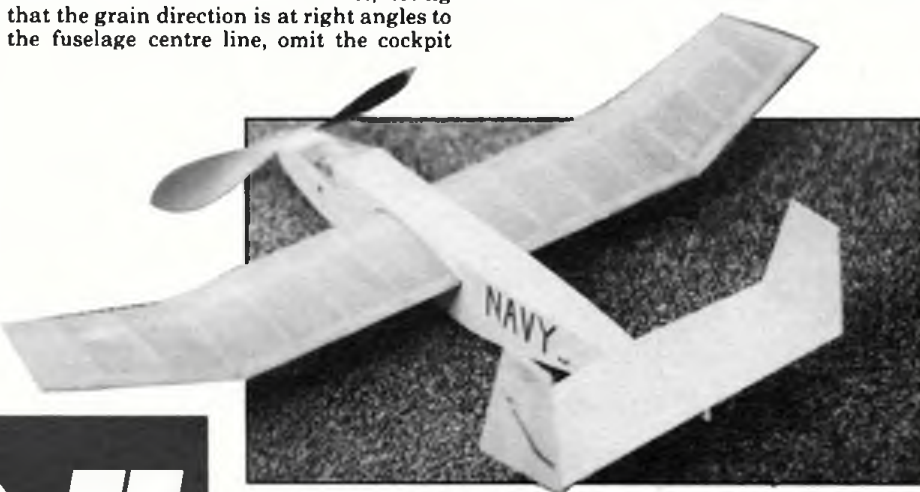
It uses the same type of construction as its predecessor but its performance is improved. Don't be put off by the 1/32in sheet fuselage as it is quite strong yet very light but do choose a good straight grained

dry, cement the other fuselage side into position on the formers and once again check that everything is square. Bring the tail end together and cement. Hold the tail end together with a pin or adhesive tape and check by viewing from the rear that both fuselage sides have the same amount of curve (models with banana shaped fuselages are hard to trim).

The top and bottom of the fuselage can now be sheeted with 1/32 in. sheet, noting that the grain direction is at right angles to the fuselage centre line, omit the cockpit

for warps (steam out if necessary). When each wing section is complete final assembly can take place. Carefully ease the wing centre section through the fuselage wing slot making sure that the tissue covering does not tear!

When positioned centrally run a cement fillet along the underside of the wing root where it joins the fuselage side. When the wing centre section is secure the wing tips can now be cemented onto the end of the



Despite its name, 'Agro II' is no trouble to fly. Its racy lines looking exceptionally smart in the air. It proved to be stable in flight pattern with a good glide, so sort out the small amount of balsa to build one now...

AGRO II

Another smart but simple flyer from Richard Preston

medium weight sheet. With a semi-scale model of this type, decoration is very important and a few markings on the fuselage and fins such as the force to which it belongs, squadron markings and numbers, fin flashers and ejector seat triangles all add up to making a very attractive model without adding much extra weight. Construction is very straightforward with only the wing building and assembly being slightly different so let's get started...

Construction

After having marked and cut out all the individual parts, using whichever method is preferred, put the wing and tailplane components to one side and start the fuselage assembly, don't forget to cut out the wing seat slots in the fuselage sides. Cement the rear motor peg 1/16 in. doublers into position on the fuselage sides and the 1/32in. sheet nose doublers which go between formers F1A and F2 making sure they are on the inner sides of the fuselage (left and right).

Cement the 1/16in. strips to formers F2 and F3. Cement formers F1A, F2 and F3 onto one fuselage side where shown, making sure they are square. When the formers are

area, tailplane position and a small area below the rubber motor peg. Using the template mark out and cut the acetate windscreen and cement into position.

Make up the noseblock, ensuring that the nosebush holes in formers F1 and F1B line up when cemented together. Position the noseblock onto the fuselage nose making sure that the rear of the noseblock (F1B) is a snug fit in former F1A. Sand nose section to shape followed by the fuselage corners to remove rough edges. Cement tailplane in position making sure it is square; when dry, cement the two fins into position on the ends of the tailplane.

Pin the wing centre-section trailing edge onto the plan, followed by the lower main spar. Cement all the wing ribs into position followed by the upper main spar and leading edge. Build the wing tip sections in the same way as the centre section noting that the upper main spar only goes as far as rib W3 and that the inboard rib W1 is angled using the dihedral template to give the correct wing tip dihedral.

When all three wing sections are dry remove them from the plan and carefully sand the leading and trailing edges to shape, any excess cement blobs can also be removed! Carefully push the wing centre section through the rib shaped wing slot in the fuselage to check for fit. When a good clearance fit has been obtained the three wing sections can now be covered separately with lightweight tissue. Do not cement the wing sections together at this stage.

Shrink the tissue using thinned dope (60/40 ratio of dope to thinners) - watch out

centre section, check that the dihedral angles are equal.

Make up the rubber motor loop ensuring that the knot is secure before lubricating the motor. Install the motor and propeller/nosebush assembly. Assembly is now complete. Balance the model at the centre of gravity position adding modelling clay to the nose or tail if necessary. Check that the wings, tailplane and fins are all square to the fuselage.

Trimming and flying

Choose a calm day for initial flights. Gently test glide the model over grass, if it nose dives into the ground check the balance position, if it is nose heavy add a small piece of modelling clay to the rear fuselage under the tailplane. If the balance is correct then carefully bend up the trailing edge of the tailplane (or cement on a small paper trim tab).

If the model stalls on the glide then repeat the balance check and add weight to the nose if necessary. When a satisfactory glide has been achieved wind on about 50 turns to the motor. Launch the model straight ahead at shoulder height and observe the flight pattern. If the model climbs steeply and then stalls add some scrap 1/32in. sheet packing behind the top of the nose former F1 to increase the downthrust angle.

Continue with powered flights using the above trimming methods to produce nice smooth flights. The model can be trimmed to fly in right handed turns by carefully bending one of the fins and giving the noseblock a small amount of right thrust. Gradually increase the number of turns up to a maximum of 350, this can be increased to about 500 turns using the stretch winding method.

Finally, I have come to the conclusion that the model's name is not consistent with its performance as it has very good flying manners, it is stable, it has a good glide and it looks very realistic when flying so why not get out of the building rut and try something slightly different, I don't think you will be disappointed...



THIS INTERESTING free flight helicopter, by well known French designer Emmanuel Fillon, seemed too good to miss... The drawings are shown full size for you - the more experimental modeller, to start building right away - or as food for thought, should you wish to choose your own full-size subject to miniaturise.

The model

The Peanut Scale model appears to be based on the *Bell-Hughy 'Cobra'* - a slim machine, well suited to modelling (our radio control compatriots used the 'Cobra' in the days when R/C 'chopper' flying began).

It uses simple rubber power, but unlike the

Rotor head

The gimbal mounted rotor can rock freely, so that the tips may rise and fall and the blades (which are rigidly fixed together) can change their angle of attack relative to the flight path.

Without going deeply into the theory of helicopter flight, it is essential that the rotor disc (path of the blades) is tilted in the direction of horizontal flight (forward for forward flight, or to combat a breeze) and, in this case, to one side to promote circling flight (when combined with tail rotor effort).

What stops the blades flapping about? There are a pair of small weights on a rod called a "flybar" set at 90° to the blades (in

Ballast and balance

Initially the model should be balanced exactly on the rotor shaft. Small pieces of plasticene can be added to either or both landing skids to tilt the whole model in the direction required for cruise.

It is essential that the main rotor is perfectly balanced in all planes - spin it freely in the horizontal and vertical axis to test... The coning angle of the blades (dihedral to you fixed wing types) must bring their tips up to balance the root ends which are below their pivot, each blade must be the same weight (add dope or plastic tape to the lighter one) and the flybar weights must be the same.

When all is correctly set up, there should be little or no vibration - vibration makes trimming of even R/C choppers difficult or impossible, so give yourself a chance with this one.



Left, Emmanuel Fillon has produced many plans for Peanut models of all types, these surely must rank among the most interesting. Not only for being helicopters but also for the detailed thought that has gone into the design. The model at the top is featured as our full size plan and appears to be based on the Bell-Hughy 'Cobra'.



Above, two shots to prove that working Peanut Helicopters are feasible. We look forward to hearing 'your' comments and seeing 'your' pictures in Photo Prize...

Un Helico

Fascinating full size plans for a Peanut Helicopter by French master-modeller Emmanuel Fillon

traditional direct drive 'stick and rotor' duration models, has a gearbox to divide the power between main and tail rotor in the correct ratio.

Drive system

Power is transmitted from the gearbox via spring drives and shafts. Each spring has a loose curved guide wire *inside*, to prevent the springs kinking under stress. Do not, however, expect to wind the rubber via the rotors, this might strain the transmission. A locking pin has to be inserted via plastic tubes in the fuselage through a loop in the drive shaft.

This holds the rotors still and provides a safe hold, whilst winding is done from the noseblock end. Once wound, the notch in the nose block engages with the fuselage and restrains this against rotation, so that all is locked up until the moment of launch, when the locking pin is withdrawn.

plan view). Their job is to maintain the angle of attack relative to the rotor disc.

In a full-size machine or R/C model, control is exercised by tilting the path of these weights (which controls the path of the blades) by means of a swash plate. This model relies on a slight tilt, for cruising, rather than pure vertical climb. Any R/C flier will tell you that it is easier to control a model like this - Hovering is more difficult. The best trim for this model is a slow circle.

Torque

The tail rotor has adjustable pitch, which must be set by trial and error to combat torque. It pushes the tail to the right *against* torque - coarse pitch should cause LEFT yaw; fine pitch, RIGHT yaw. The main rotor shaft is inclined to the left, to give a left circle, so use slightly coarse pitch. If Right yaw is combined with Left rotor 'tilt', then the model would be difficult to trim.

Construction tips

That fuselage has to be feather light - it needs patience when hollowing out after shaping the outside. Hold it up to the light to judge the remaining thickness. If a hot wire cutter is used; err on the cooler side, otherwise a thick skin of melted expanded polystyrene will negate the weight saving - the material is not actually removed merely re-formed in a more solid form.

Readers may like to use a 1/32in. or 1/64in. balsa box fuselage of more angular form, but try to keep the whole model down to under 25grams (less rubber).

ENGINE TEST

P.A.W. 29: Mike Billinton enjoys testing one of Britain's BIG diesels.

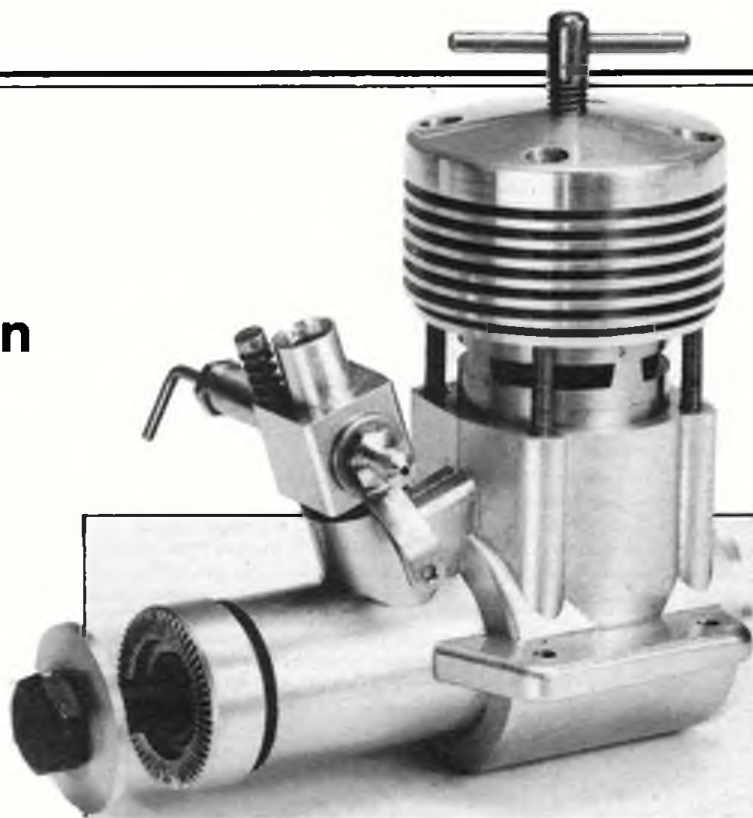
THIS LARGEST but one of the PAW range appeared two years ago, with the overbored 0.35 cu. in. (5.7cc) engine following a year later. Designed initially by Tony Eifflaender for control line stunt use, the new 29's popularity has now extended into the very natural area of Vintage model flying. The broad-ranging use to which this engine is being put, makes it a proper subject for review within these columns.

Constructed to the now very familiar and unique Eifflaender style, this large cylinder diesel presents a strong functional appearance which, for the less hardy, might be the cause of some apprehensions at the thought of getting to grips with it. In practice, during this test at least, the PAW 29 was a delightfully co-operative performer and, with variable compression, again showed what a super method of ignition control we modellers' uniquely have to hand.

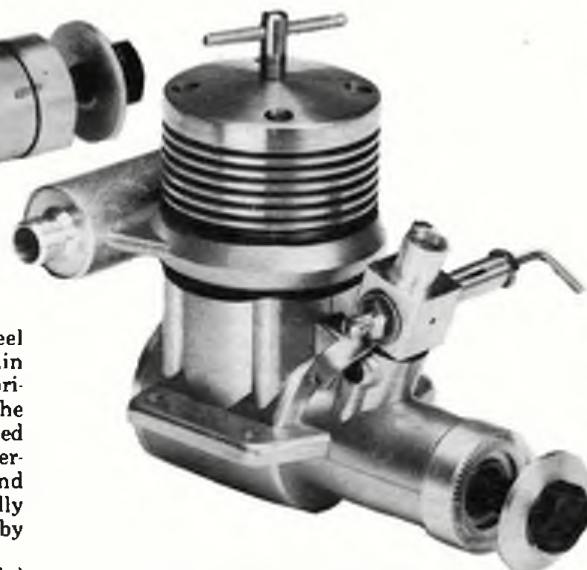
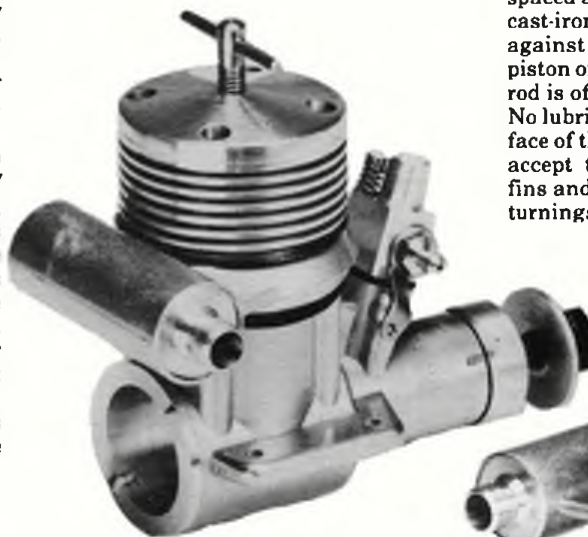
In design and mechanical layout, the 0.29 is directly in line with the smaller PAW diesels (0.8, 1.0, 1.5, 2.5, and 3.2cc.), and so, unless some version of 'scale effect' comes into play around 3½cc upwards, there seemed little chance of problems with this larger '5cc' engine. In fact though, the manufacturer admitted to some initial uncertainty as to the viability of the larger size - but the engine's subsequent popularity has confounded those doubts.

The aluminium alloy crankcase continues with the wide and lengthy supportive

Right, only slightly larger than life, this photograph gives some idea of the PAW 29's size...this is a big diesel and not the largest in the range either. The PAW 35 (as well as the 29) is used by one of the U.K.'s top control line stunt men: Tony Eifflaender.



milled within the liner wall) also equipped around bore circumference. The grey cast-iron piston has a flat top and operates against the flat squish banded contra-piston of a similar material. The connecting-rod is of high duty aluminium alloy (HE15). No lubrication holes are provided. The inner face of the big-end is heavily countersunk to accept the crankpin radius. The cylinder fins and cylinder head are aluminium alloy turnings, which accept four long screws



bearing lugs, with a hardened steel crankshaft running directly in the plain bore bearing of the casing. The good lubricating quality of diesel fuels enhances the lifespan of this method. The short rugged crank itself has heavily radiused intersections between crankpin, web and mainshaft, and these contribute markedly to PAW reliability. Propeller fixing is by tapered driver and crank nose.

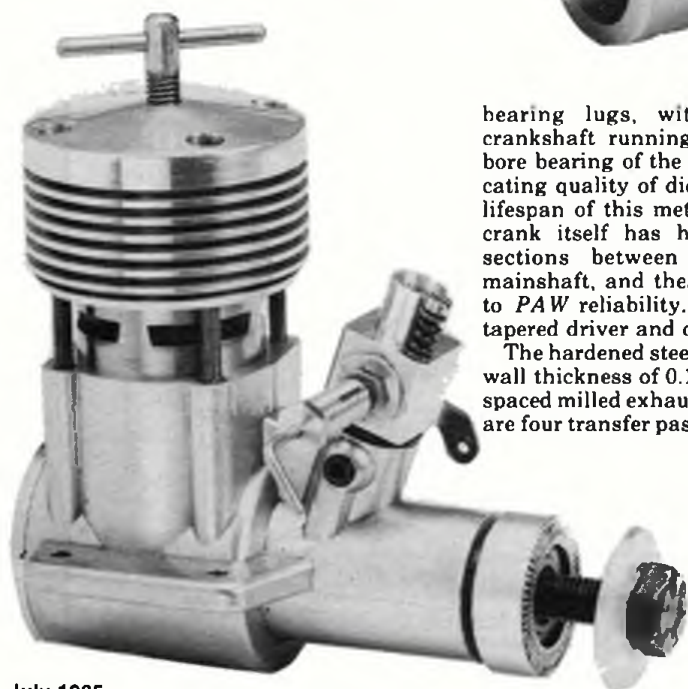
The hardened steel liner has a substantial wall thickness of 0.131in. with four equally spaced milled exhaust ports. Similarly there are four transfer passages/ports (internally

R/C Throttle is fitted as standard and proved to be versatile in use, giving good idling performance. This venturi is easily removed should you wish to fit an alternative for control line stunt operation.

Above and above left, two views of the PAW 29 with the recommended silencer fitted. This may be fitted without dismantling the engine and may be aligned in several directions.

which clamp head, fins, liner and crankcase, firmly together.

The carburettor is also an aluminium alloy turning, with a brass R/C throttle. Idle control is by a small hole air bleed with a normal adjustable throttle stop provided. The silencer is an aluminium casting and is effectively simple in fitment and very flexible as to positioning. Agreeably also, its



removal and fitment does not disturb the cylinder liner. The outlet size is 1/4 in. inside diameter and is machined externally in nipple style to allow the easy fitment of a length of flexible tubing, leading fuel residue outside the confines of the model.

Initial running

The very pleasant handling qualities mentioned earlier were far from the writer's mind at the first attempt at starting. Even though each PAW is factory run before despatch, the combination of cold engine and cool temperature with some uncertainty as to the settings, all led to an unexpected delay and failure to obtain a start.

An attempt to use a mechanical starter fared no better because the pressure required just pushed the easily floating crankshaft and propeller driver backwards against crankcase housing to increase

readings also commenced in that low rpm area - at which point compression had to be considerably 'backed-off' by at least 3/4 turn. In view of the exemplary hand-starting just experienced, it was decided to continue in this way throughout the torque tests proper.

In pursuit of interesting information, fuel consumption figures were also obtained in Open exhaust and Silencer formats - over the whole rpm range. As expected, these confirmed the usual connection between fuel consumption and power output. Disposition of torque across the rpm scale indicates firstly, how well the ability to retard ignition contributes towards the good results at markedly low rpm. Secondly, how the PAW's relatively conservative 'sports' timings place a gradual restriction on higher rpm performance.

It's probably safe to say that we will not see too many 'Glow' engines of 5cc. capacity

hanging on to an 18in x 6in propeller! - Even the 'Glow' four stroke of 10cc. has some difficulty in that task...

Power Test 2, PAW silencer, D2000 fuel: This practical, easy to fit device was installed using the two thin rubber washers provided. Retracing the several standard propeller rpm steps showed reductions of 150 to 600 rpm depending on size. This situation was confirmed by the subsequent torque readings with the silencer fitted. For virtually all normal use up to 10,000 rpm the power differences are not likely to have much effect, and in any case the use of the silencer must result in much cleaner models.

Idling performance

The common view of R/C carburettors and the Diesel is that they are not that well matched. Well then, the PAW 29 does not fit in with this pattern. Even before tinkering with fuel and compression settings the following idling on silencer figures were easy to achieve:

10 x 6	MK	3,730
12 x 6	Graupner	2,897
14 x 6	Zinger	2,400

This followed maximum rpm running - using optimum compression and fuel settings for that condition. However, idling duration was limited to around 25 seconds maximum before the engine swiftly richened-up to the point of stopping. If, on the other hand the engine was operated at maximum throttle but in a slightly over-compressed condition and with fuel setting slightly lean, then the resulting idling became even steadier and now of continuous duration.



As can be seen here, the PAW 29 is of rugged construction with the extended mounting lugs giving additional crankcase support and also providing a larger bearing surface to the engine bearers/plate.

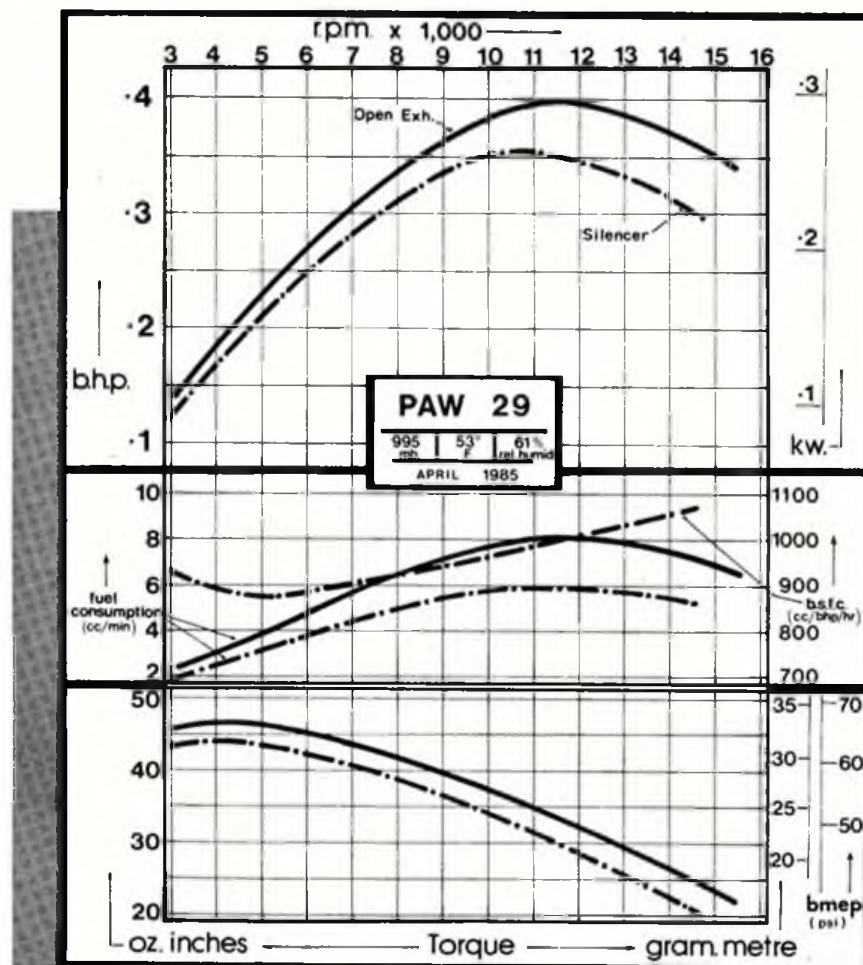
friction, which then prevented the meaningful 'bounce' which signals imminent starting.

This all seemed a bit silly, because on reflection PAW's have been around and starting well, long before mechanical starters came on the scene. So, in a change of tack, it was decided to abandon temporarily the 10in x 6in medium sized prop being used to ensure light loadings in the first few seconds running. The replacement was the quite heavy 12in x 6in Graupner reinforced nylon propeller; the thinking being to revert hopefully to successful hand-starting, and at least establish settings, albeit at maybe very low rpm - and, that the prop's high inertia would force a start... It was a little embarrassing though, to have the engine in such a controlling position!

Subsequent events were indeed graceful by comparison. Instant starting occurred two flicks after the large propeller had been fitted, and returning to that 10in x 6in propeller immediately afterwards showed all previous doubts to have been pointless. Even a light 9in x 4in Zinger (at 12,850 rpm rotating some way past the engine's peak) allowed easy starting - in this case though, swiftness of flick was very necessary!

At the other end of the scale, the largest propeller used was a 16in x 5in Zinger (4,880 rpm). Subsequently the manufacturer advised that one of the earlier factory checks of mechanical strength had been a two hour run on a massive 18in x 6in Zinger - in the 3,000 rpm, area - and with no adverse consequences.

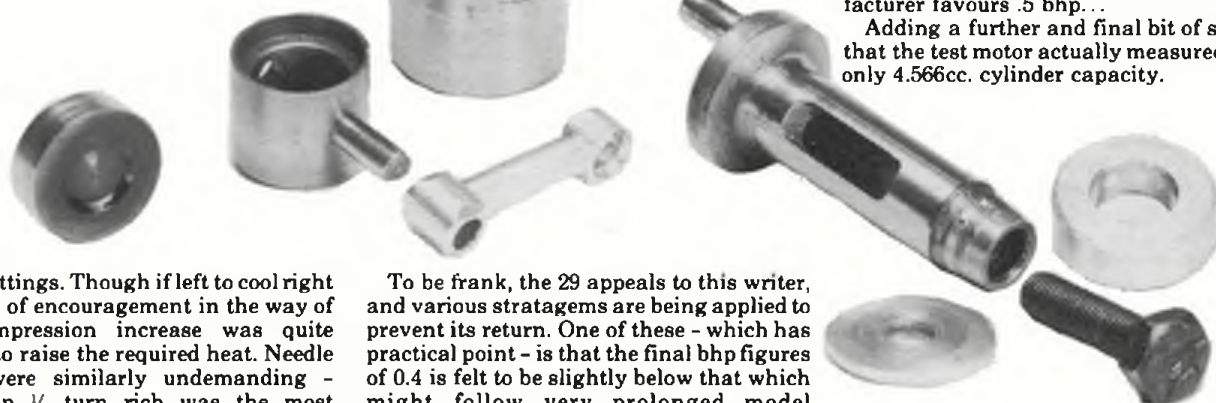
Power Test 1, Open Exhaust, Model Technics D2000 fuel: Coincidentally, torque



Starting

So good was the starting following the rather strained first attempt, that very little experimentation was subsequently undertaken to find the 'best' setting. It seemed unnecessary because the 29 was happy to start at almost any previous

Internal components follow the general rugged pattern, and with an all up weight of just over nine ounces this motor should see much use in vintage R/C assiat.



running settings. Though if left to cool right down a bit of encouragement in the way of slight compression increase was quite sufficient to raise the required heat. Needle settings were similarly undemanding - opening up 1/2 turn rich was the most required at any time.

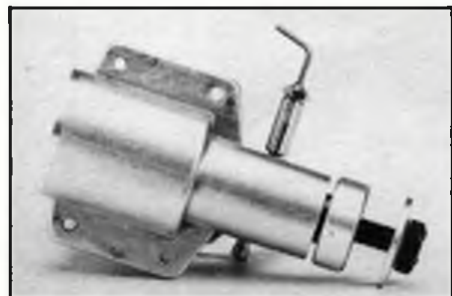
To be frank, the 29 appeals to this writer, and various stratagems are being applied to prevent its return. One of these - which has practical point - is that the final bhp figures of 0.4 is felt to be slightly below that which might follow very prolonged model operations. This particular engine had a total of no more than two hours during the test, and the manufacturer is of the strong

opinion that the picture may well change after several hours of hard and varied use (ie not just running it solidly for a further 10 hours or so). So, to assess the point this particular motor is to be put to work in the suggested way - after which a follow-up test will be made. This could be several months away... The writer's bet is for a possible increase up to .43 bhp. The manufacturer favours .5 bhp...

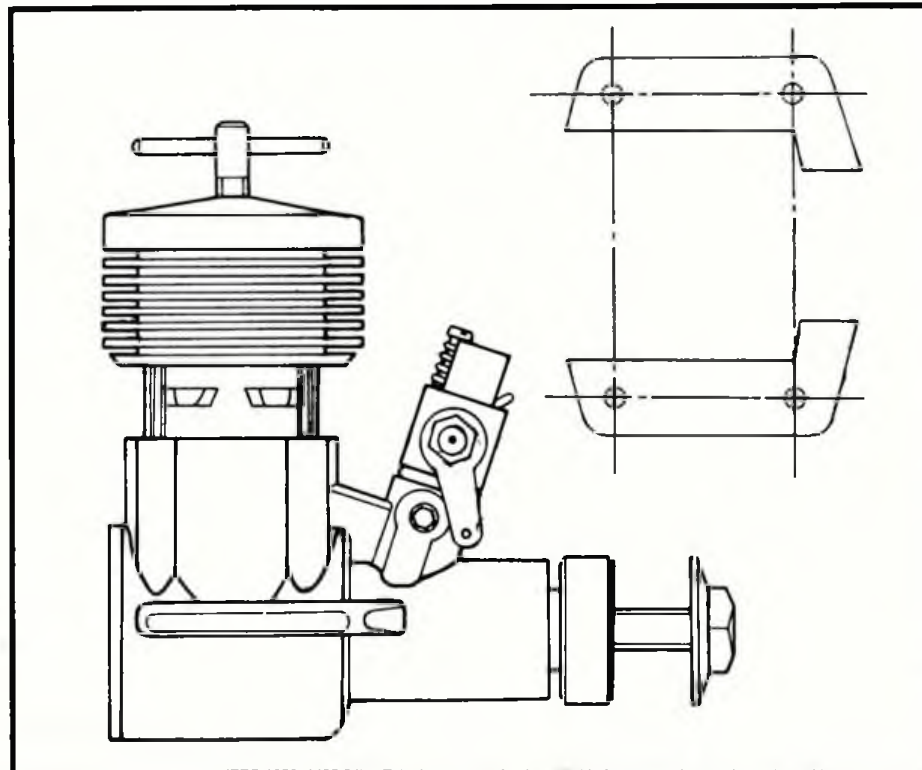
Adding a further and final bit of spice; is that the test motor actually measured out to only 4.566cc. cylinder capacity.

Final comments

Though lacking the extreme sophistication of appearance of much modern machinery, the PAW 29 is one of those very 'honest' engines, and continues to give extraordinary value for money - quite apart, that is, from the considerable convenience of 'no plug - no batteries - therefore even less costs'.



Above, our usual practice of showing exact size photos founded this month with the size of the PAW 29! Instead we offer exact half size photos! Full size drawings below should enable you to plan your model prior to purchase of the real thing...



PAW 29 R/C Diesel Dimensions & Weights:

Capacity	- 2786 cu. in (4 566cc.)
Bore	- 739 in (18.77mm)
Stroke	- 651 in (16.5mm nominal)
Stroke-Bore ratio	- 88:1
Timing Periods	- Exhaust - 145°
	- Transfer - 135°
	- Front Induction - Opens
	- 66°ABDC/Closes 24° ATDC/Total
	- 138°
Squish band width	- 16 in (4.0mm.)
Squish band angle	- 3°
Crankshaft dia	- 500 in (12.7mm)
Crankshaft bore	- 313 in (5/16 in nominal)
Crankpin dia	- 2183 in (7/32 in nominal)
Crank nose thread	- 246 in x 28 TPI (1/2 UNF)
Gudgeon pin dia	- 1875 in (3/16 in.)
Con-rod centres	- 1.13 in (28.7 mm)
Mounting holes	- 92 in x 1.52 in with 116 in holes
	(clears 6BA & 3mm)
Width between bearers	- 1.2 in (30.5mm)
Width	- 1.90 in (48.26 mm)
Height	- 2.99 in (76 mm)
Length	- 2.86 in (72.6 mm)
Frontal area	- 3.57 sq in
Weight	- 9.6 ozs (with silencer of 6 oz) (.27
	Kilo total)

Performance:

Max bhp	- 0.40 at 11,220 rpm (open exhaust)	
	- 0.36 at 10,700 rpm (Silencer)	
Max Torque	- 47 oz in at 4,600 rpm (Open Exhaust)	
	- 44 oz in at 4,100 rpm (Silencer)	
Rpm on standard propellers:	Open Exhaust	Silencer
16 x 5 Zinger wood	4,880	4,600
14 x 6 Zinger		4,974
14 x 8 Airflow wood	5,449	5,178
13 x 6 Topflite M wood	6,644	6,390
13 x 6 MK glass nylon	7,029	6,804
12 x 6 Graupner nylon	7,168	6,984
11 x 7 Zinger wood	8,264	7,835
10 x 8 Ripmax wood	8,630	8,254
11 x 5 Topflite M wood	9,044	8,711
10 x 6 MK glass nylon	9,765	9,326
9 x 6 Master nylon	11,190	10,820
9 x 4 Zinger wood	12,840	12,240

Performance Equivalents:

BHP/cu. in	- 1.43
BHP/cc	- 0.87
Oz.in./cu in	- 168.7
Oz. in/cc	- 10.3
Gm. metre/cc	- 7.3
BHP/lb	- 71
BHP/Kilo	- 1.57
BHP/sq in	- 112
Frontal area	- 112

Manufacturer:

Progress Aero Works,
Park Mill,
Hobson St.,
Macclesfield, SK11 8BE



FROM THE HANDLE

CONTROL LINE NEWS

Racing with Jim Woodside

Construction

Dave Campbell's Kevlar/Carbon Fuselage Shells for F.A.I. Teamracers: Two of the models which Derek Heaton and I took to the World Championships in 1984 were built around the moulded fuselage shells made by master builder Dave Campbell. Hence this article is more than just a product announcement. I can honestly say that they can yield a model of elegance, sophistication and predictable weight.

The photographs show the first model under construction (*Nelson* powered in this instance) and the shells are in *Kevlar* only. The latest versions have sections of carbon cloth or tows at strategic points to aid rigidity. The second model was built around the six bolt *Cipolla* engine; a combination which can yield 18.2/10 airspeed.

So what are the advantages of this type of construction over a conventional wooden fuselage, often incorporating a metal engine pan:

1. very clean shape with a ready made smooth surface
2. great strength
3. totally fuel proof construction - hence no gain in weight
4. predictable weight and more reproducible performance

And the drawbacks:

1. the need for some jigs to aid accurate assembly
2. some engines will need to have the upper surface of their lugs machined to allow for inverted mounting
3. investment in suitable epoxies and micro-balloons for assembly
4. fairly high purchase price

I perhaps should say that the building time is no less than conventional construction and that some quantity of expertise is needed in their assembly. However I can wholeheartedly recommend this set as one of the best quality items offered to the serious FAI racer in recent years.

Dave can supply the following items:

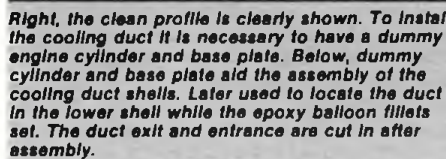
1. *Kevlar* - carbon F2C fuselages
2. Machined mount for the above to suit *Nelson* - *Cipolla* motors.
3. Partly assemble the items for an extra fee to avoid the use of jigs.

1984 Australian Nationals

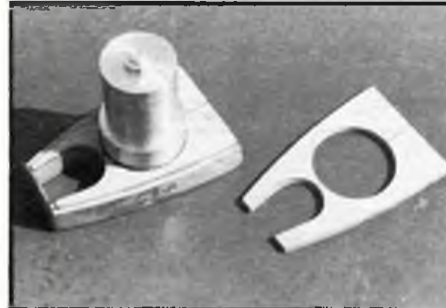
This 38th running of the Champs were held at Mandurah near Perth, Western Australia 30th Dec-5th Jan. To your scribe, who wrote this on a day when the snow was banked against the window, the site sounded ideal, a seaside location with temperatures in the eighties (°F). However the news from the trenches was that each day blew up a gale of wind and air-born sand was a problem. Support was not good,



Left, the four basic units, being top and bottom shells, cooling duct and engine cover. The kit also includes a cockpit which accepts the Mercury FAI pilot head.



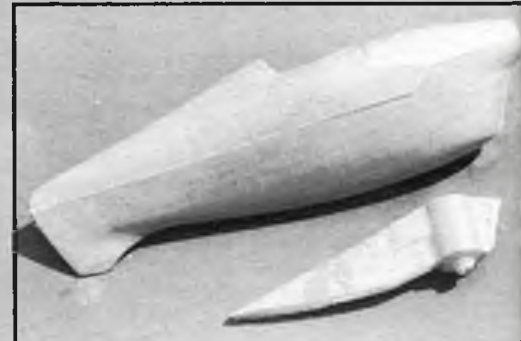
Right, the clean profile is clearly shown. To install the cooling duct it is necessary to have a dummy engine cylinder and base plate. Below, dummy cylinder and base plate aid the assembly of the cooling duct shells. Later used to locate the duct in the lower shell while the epoxy balloon fillets set. The duct exit and entrance are cut in after assembly.



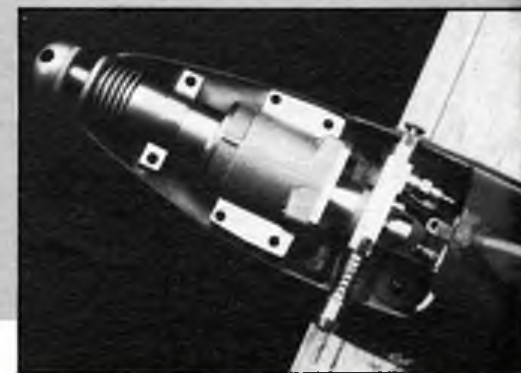
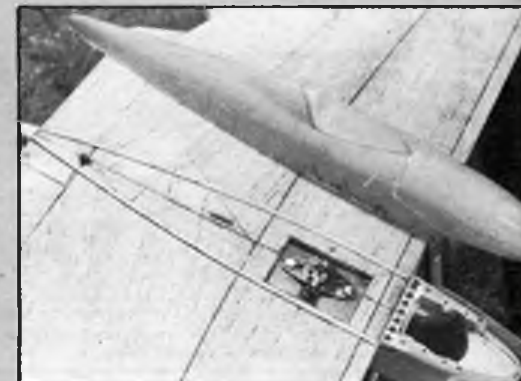
Below, the lower shell is placed on its rails. The cooling duct is now open at both ends and access for the compression screw has also been made. The 1/16 in titanium U.C. leg is a rigid fixture being bonded to a ply member glued to the wing and duct.



Right shows the *Cipolla* engine version. This engine is designed for direct fuselage mounting. Six steel pillars are mounted through 1/8 in fibreglass board and the unit bonded in place. Just visible is the edge of the tank which is a snug fit under the rear upper shell. Surgical forceps are a must to install lines, connect tubing and shut off trip.



Below, the fuselage top view is drawn onto the wing top and bottom balsa guide rails cyanosed in place. The lower shell complete with U.C., 1/4in. ply plate and 1/4 in dural engine mount is cyanosed into place. Later large fillets of epoxy microballoons will fix the shells in place. The shading on the upper shell indicates where material has to be removed to allow it to sit cleanly onto the wings. Note that the button bellcrank is using the closed loop system. The black spanwise lines in the CB 14 wing are carbon spars. The wing itself is covered in glasscloth and epoxy resin.



Results

F.A.I. Team Race				
1. Lumsden/Wilson	Victoria	3:39	8:20	
2. Lumsden/Randall	Victoria	4:14	8:27	
Nugent/Nugent	Victoria	4:14		D.N.F.

Open Rat Race (40 cu.in.)

1. Hunting/Hunting	2:38	5:12
2. Wilson/Lumsden	2:57	5:33
3. Butkevicius/Bellis	-	99 laps
4. Turna/Gillot	2:20	45 laps

Open Combat

1. B. Bellis	Western Australia
2. R. Bellis	Western Australia
3. G. Turna	Western Australia

F.A.I. Combat

1. B. Greeve	Western Australia
2. B. Randall	Victoria
3. A. Heath	N.S.W.



Above, Theo Georgiadis (L) and Dennis Prior with CB 14 FAI model. British racers will remember the impact they made at the 1978 World Champs in England. Their equipment is always immaculate in execution and preparation.

Below, G. Turna's Control Line Seaplane - an event unique to the Australian Nats?



North of the Border

Thanks to keen men Ron Thorpe and Alan Pegg for their Scottish news. Via them I am glad to be able to report that the revival of Northern interest continues. Both Ron and Alan are anxious to maintain the support for Class II Goodyear. In respect of this there is no intention to change any of the class rules; simple models and cheap engines. Additionally $\frac{1}{2}$ A Team Race will be held at each meeting to help encourage interest in this pleasant class. It is worth remembering that $\frac{1}{2}$ A was initially intended to be the 'stepping stone' class to F.A.I. and 'B'. See 'What's On' for any forthcoming contests.

It is also worth mentioning that Ron carries supplies of *Visionregal* props which can be bought at contests. Details and late information can be had by telephoning: Larkhall (069 888) 4554 or 5516.

Flemming Jensen Racing Props.

A note from Denmark announces that this excellent range of glass-carbon racing props has been withdrawn from production owing to the pressure of work in Flemming's full time job. However, those in need are reminded that props are available from *Visionregal*, *Shadow Racing* and *Les Boltenhagen*. Addresses have all appeared in fairly recent editions of this column...

Famous Quotes No. 1

Mac Grimmet in *Model Aircraft*, November 1958: Mac designed an early combat ship with a wing, tail, bubble canopy and replica pilot. I am told that it flew well and was one of the influential models of its day. In the article accompanying the plan he said: "Quickly a word about the tailless or flying wing model in relation to its use in combat flying. Personally, I do not think the wing has a secure future in this type of flying"...

Stunt with Claus Maikis

On the Horns of a Dilemma

Have you ever had an aircraft which turns better one way than the other? Many articles on trimming stunt ships have covered this problem with authors recommending bending of the flaps until you get satisfying flight characteristics. This is completely correct...if you don't have access to the control system of your stunter, this is the only cure for your problem. Most stunt ships are one piece models, so you have no other choice.

This cure is not an exact solution for the problem, but it may be sufficient to make your aircraft flyable. In most cases only minor corrections will be necessary, so you won't have to solve one problem by raising another. Nevertheless, if you haven't found out what caused this unwanted behaviour you might build your next model the same way as you did your last and you might then have the same results. Let's not talk about building errors like crooked fuselages, incorrect angles of flying surfaces, warps etc. but just a look at the design of the control system.

Aircraft with detachable wings are - slowly but steadily - getting more popular. On these ships one of several advantages is that we have access to the flap horn. This allows us to change and trim the neutral setting, flap deflection rate, sometimes even elevator deflection rate, and elevator to flap deflection ratio.

Some years ago, a new model of mine needed so much flap bending that I got curious about the reason. Since it was a

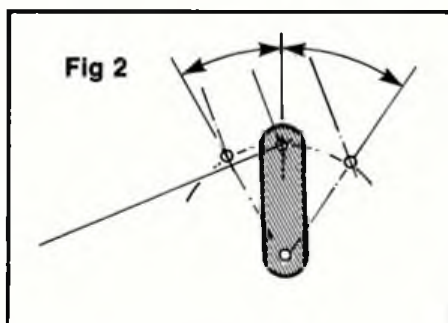
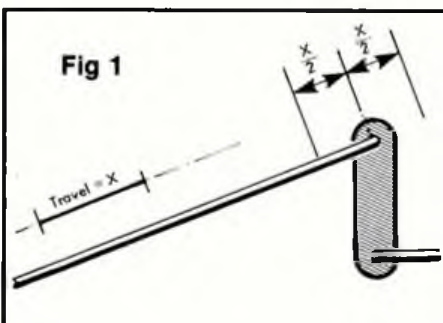
'detachable everything' stunter. I took a close look at the control system. Still not understanding the problem, I made a drawing of my control system and 'imitated' the controls with some pieces of wire and cardboard and suddenly the light dawned...

Using conventionally designed wings the pushrod leads from the bellcrank - which is usually mounted at about the (vertical) centreline of the wing - to the flap horn. The vertical distance between the two attachment points is about one inch. Depending in bellcrank design and dimension, we have a certain pushrod travel ($\times$); half of this dimension is used for up, half is used for down ($\frac{\times}{2}$). Fig. 1 shows this arrangement. We don't need to delve deeply into mathematics...just make a drawing. We'll easily see what happens if we move the pushrod (the 'wire and cardboard' control system will show it even better). Despite the same travel in both directions we have more horn deflection - thus flap deflection - on 'pushing' (Fig. 2).

I'm well aware that the difference in deflection is not that much, since the angle of the pushrod is smaller in reality. I've made the drawing that way because it's much more obvious and it's much easier to see, even without measuring!

The solution to the problem is easy. The horn has to be installed so that it is at right angles to the pushrod, i.e. at 90° to the direction of movement. This can easily be found if we draw the bellcrank and horn location on our plan. We connect the bellcrank centre with the intended location of our horn hole with a line, and we've got the pushrod angle, as shown in Fig. 3. Now we bend our flap horn - or make our own according to the drawing.

Basically the same goes for the elevator horn. But since the angle of the elevator pushrod is much smaller, horn alteration is



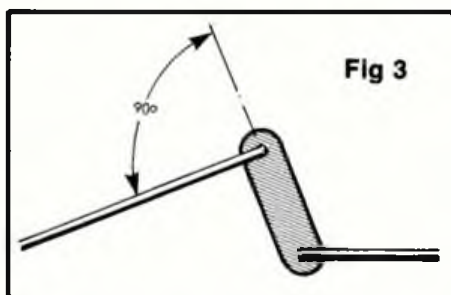


Fig 3

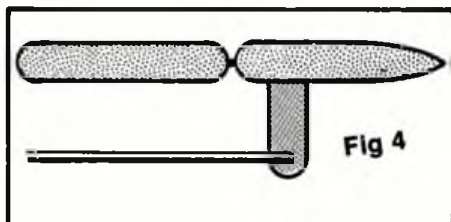


Fig 4

not so drastic. I always have some building inaccuracies in two part elevators. So I usually bend the elevators after installation!

There are a number of designs with a sheet tailplane. Some kit manufacturers don't care about such subtle details, or the plan does not show such detailed information. At the first look the problem may seem of a different kind, but basically it's the same phenomenon. I'm talking about poorly designed or installed elevator horns.

Often these are made as shown in Fig. 4. This installation has the same effect as an angled pushrod. The hole of the horn is not in the same vertical plane as the hinge axis of the elevator. In a simple drawing (Fig. 5) we can see again the pushrod travel ($\frac{x}{2}$, both sides of neutral) and the arc which is described by the horn hole.

It is clearly seen how the elevator is deflected more 'up' than 'down' (Fig. 6). There are places where this situation is desirable, for instance in the aileron

deflection of R/C aircraft. In a control line aerobatic aircraft, there is no other choice than to have equal deflection either way. To achieve this, we have to arrange our horns as shown in Fig. 7. Good R/C plastic horns are designed to cater for these problems and I like to use these horns in my smaller models.

If the elevator horn is mounted in an even more rearward position, another problem can arise. In Fig. 8, the hole location of the horn is well back from the hinge line in neutral position. When the pushrod is moved backwards, the hole soon comes to a point from where it cannot move farther backwards, even though there is still more pushrod travel available...elevator deflection stops here. This is usually the point where we fly a 'nine' instead of a loop, with well known results!

While on the subject of elevator horns - an additional hint...Tailplanes of modern big stunters have increased in thickness, sometimes to 1 inch. When building our stab and trying to provide enough clearance for the fully deflected horn, we usually have to file a deep groove into the trailing edge of the stab. This is the point where there will be most stress. In order not to weaken this area more than necessary I make my horns with a crooked shape. The horn wire is located near the forward edge. I leave enough area behind the wire to get a good (silver!) solder connection. The shape of the 'crook' depends on the thickness of the stab. As shown in Fig. 9, less material has to be taken off the stab trailing edge for the same horn deflection as compared to a straight horn.

I'm surely not the first one who stressed his internal computer with such thoughts. Many many years ago a certain Mr. Southwick of the USA (then stunt team member) designed his 'Skylark', which was later kitted by *Sterling*. In his plans he showed such an improved horn installation which - at the time - I didn't take any notice of (perhaps I should better say, I didn't understand it!) With more experience and

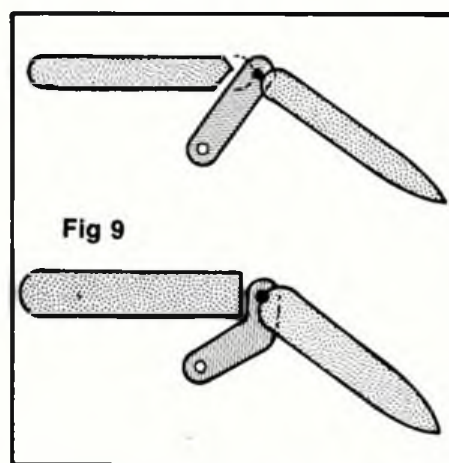


Fig 9

improved flying skills you come to the point where you are very thankful for even a subtle improvement in model performance. Otherwise my 'Jack in the Box' stunter would still be flying different size inside and outside loops...

Motive Power

Control line aerobatic flyers aren't very often presented with new engines. The usual horse power race so well known in RC circles (circles?) surely produces extremely powerful engines. While there is no true necessity for a high specific power output - RC sport flyers as well as control line stunt flyers simply switch to a bigger motor - the competition among engine manufacturers seems to force them to design high revving engines which are neither suitable for RC sport flying nor for control line stunt.

So, I was surprised to hear that OS offers a new sport type 35 size engine. The well known OS 35 is one of the best stunt engines available. Along with other excellent 35s (such as *Enya*, *Super Tigre*) it has lost part of its widespread use due to the increased popularity of bigger aircraft, thus bigger engines.

Nevertheless I feel 35 size engines and airplanes are fully competitive. The OS 35 is the lightest engine of that size. Installed in a lightweight 'Nobler' size aeroplane it is still one of the best buys if you choose a model of that size.

The horse power figure in the *Graupner* catalogue says 0.5 hp for the old engine. For the new one a figure of 0.8 is given. This is a level normally known for 40 engines. Weight is 245 gram. This is not light for a 35. But if power is more like that of a 40, power to weight ratio (the only thing we stunt flyers are interested in...) should be unequalled by most other makes.

Since the 35 class is one of my favourite engine sizes, I acquired the new OS 35 FP as soon as I could get hold of one. And as soon as weather permitted I ran a comparison test with some of my other stunt engines.

I feel it extremely difficult to compare stunt engines. What is the criterion? Peak horse power? Surely not. We never reach it with our huge propellers. To compare objectively, you should use basic test conditions. Revolutions with a given prop? Everybody uses another prop and individual props differ quite a lot in dimensions and shape. Performance with a given carburettor diameter? This depends on props size, muffler type, fuel brand etc. etc. Where to begin?

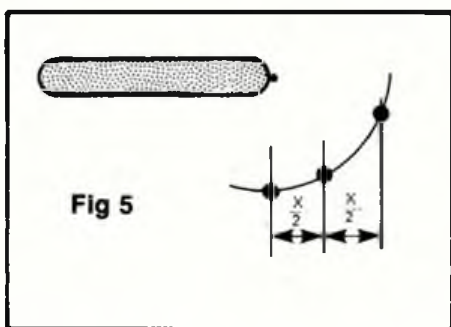


Fig 5

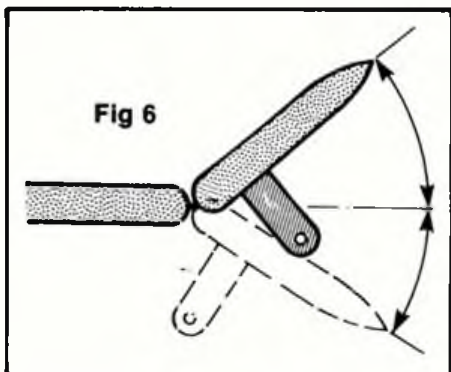


Fig 6

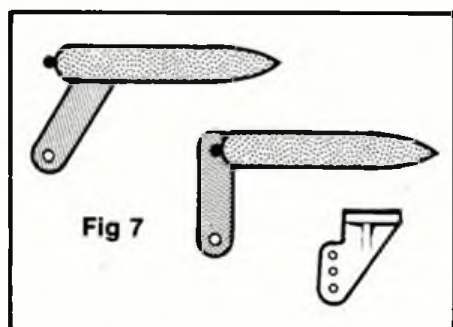


Fig 7

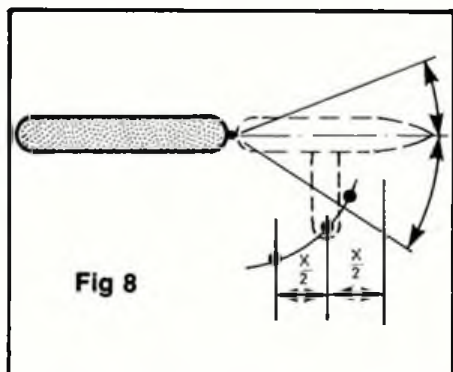
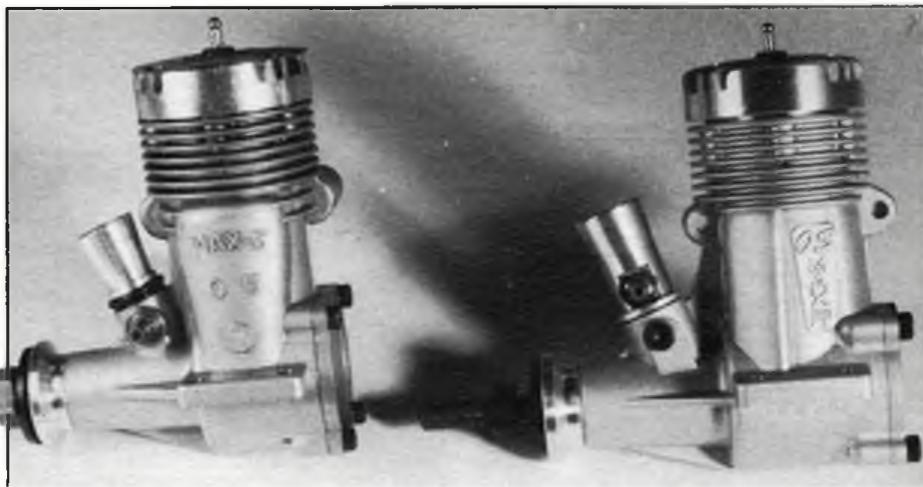
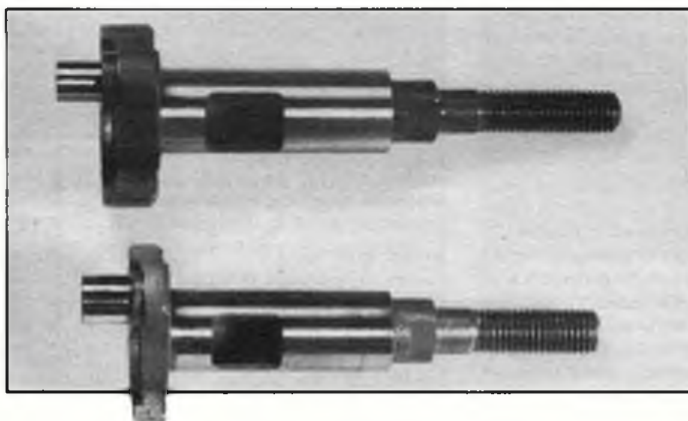


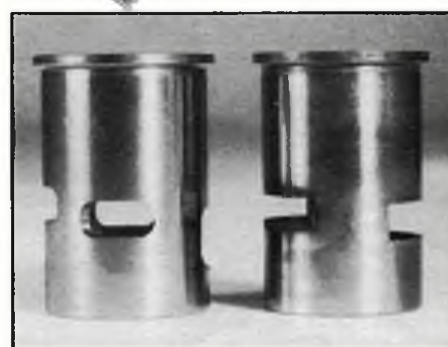
Fig 8



Below, crankcase width is slightly increased - old model 30mm, new type 31mm. Mounting hole dimensions are the same.



Left, the new crankshaft (top) with the heavier crank web. The conrod has bronze bushings at both ends now. Right, new liner with typical Schnuerle ports at left has much less conservative timing (you can easily check by holding a straightedge across the picture). Above, the new OS 35 FP has almost the same height and width, but is about 1 cm longer. (about 5mm in front, about 4mm at the rear.)



I feel the only possible way to make a statement is to compare the new motor with several well known engines with which you are very familiar. From experience you choose a suitable venturi, fuel, plug and propeller. I had a suitable venturi which needed only some turning down to get the right outer diameter. The inner diameter is 6.2mm (for comparison: my OS 35 has 6mm, Super Tigre 35 has 6.5mm, OS 40 (non Schnuerle) 6mm. I used typical 35 and 40 prop sizes: 10 x 6, 11 x 6 and - to get an impression about torque - a 12 x 6. Weather was relatively mild for that time of the year (March), but turned from slight drizzle to heavy snow showers. Cold fingers and toes stopped the test runs! The results were astonishing...

	10 x 6	11 x 6	12 x 6
Fox 35	10400		
OS 35	10500	9200	7200
OS 40	11600	9600	7600
OS 35 FP	11000	9800	9200

I use the Fox in all my tests, because I've run it and checked its rpm so often, it is an indication of the weather conditions. This time its rpm were a bit slow, about 200 below normal perhaps. I must add that the figure for the OS 35 FP on 10 x 6 - 11000 - is perhaps a little doubtful. This might be a checking error.

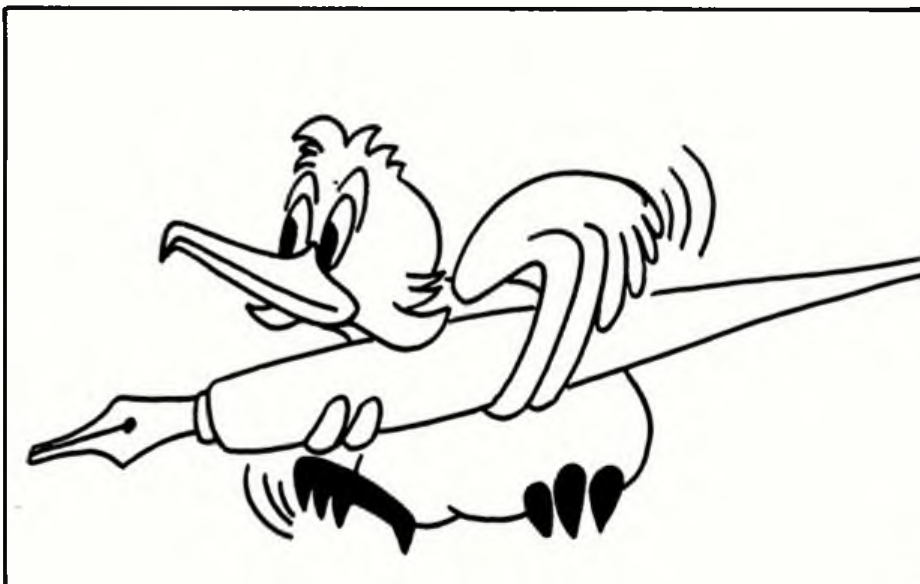
While normal size prop speeds were impressive enough, what surprised me most were the recorded rpm with prop sizes not normally used with 35s. I do not intend to use such a prop on this engine when flying. But this figure tells you what to expect from torque. While the other motors from 11 x 6 to 12 x 6 fell down 2000 rpm, the 'FP' just lost 600 rpm!

This indicates the possibility of using large props, especially, large three blade props which I prefer over the two blade equivalents. Most of all, you can build a bigger aircraft. A model size normally suitable for a 40 engine should be the correct frame for this 35. Since it is much lighter than each 40... you've already saved at least one ounce!

A suitable silencer is offered for this engine. The American importer also offers a remote needle valve, mounted via a metal sheet support on the back plate - interesting for those who now and then stick their fingers through the propeller. Also, the price

is a very strong argument for the OS 35 FP. You'll have a hard time to find another control line stunt engine that light, that powerful and that cheap!

As mentioned above, we stunt flyers are only interested in high power in a lightweight package. From this viewpoint, the new OS 40 FP should be a still better choice. Both engines have the same size and weight - obviously they have the same crankcase. Seems I will have to build stunter to find out the running characteristics of this engine. Perhaps Mike Billinton will do us a favour and run one of his superb tests on the OS 40 FP? How about it, Mike? (see next months Aeromodeller...Ed).



FREE FLIGHT SCENE

with Dave Hipperson

Boron Fibre

This material is being experimented with a little more now in lightweight construction but perhaps not everybody knows just how sensational its specification is. It certainly surprised me to discover that it was slightly lighter than aluminium yet $6\frac{1}{2}$ times its strength.

It has also six times the stiffness to weight ratio of tool steel. This makes it very extraordinary indeed - in fact the strongest material known. A thread of Boron four thou in diameter - which is the only size available at modelling sources - is equal in tensile strength to a piece of 20 thou piano wire, yet remember that thread weighs less than it would if it were a thread of aluminium!

The immediate modelling applications, and where the material has already facilitated quite radical design improvements, are understandably indoors. Single strands of Boron have proved capable of withstanding torsion and bending loads on microfilm model motor sticks normally resisted by complicated and vulnerable bracing.

Single strands glued strategically to wing posts, compression ribs etc increase strength enormously at negligible weight. It

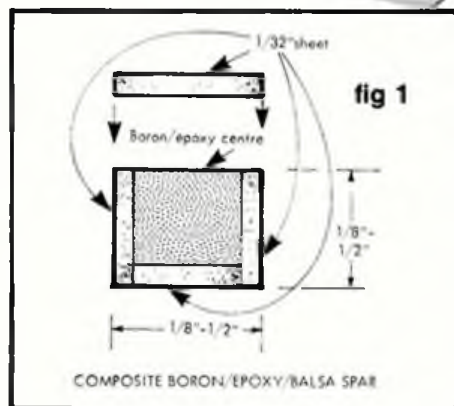
might in fact be true to say than unless you are very careful the glue weighs more than the Boron...

Choice of adhesives is no problem however, as cyano, epoxy or balsa cement will stick the stuff. It has been found to expand and contract with temperature at rather different rates to balsa (ie not much, where balsa does quite a lot) and what is more, it is less affected by humidity changes than balsa so it might be wise to think about design and remember to balance its use much in the way you might balance the spars on the top and bottom surface of a wing.

Composite spars certainly become a possibility. For instance the required cross section and if necessary a taper, can be built in the form of an open topped mould from soft $1/32$ in balsa then filled with strands of boron and slow curing epoxy resin. When set the final fourth surface can be glued on and there, to all intents and purposes, you have a Boron/epoxy spar but with a balsa surface which will adhere easily to balsa ribs (fig 1). On a multi spar wing with typical $1/16$ in $\times$ $1/8$ in sections these could now be cut from light sheet and reinforced before assembly with a strand cemented in to no more than a scratch on the top and bottom edge. A



The return of a classic - the 'Ramrod' This is a 600 inch version by Fred Barnsley built from an original kit and destined for Slow Open Power.



complete wing with such a six spar arrangement could in consequence be made substantially lighter.

Three foot of hard, shop bought, $1/16$ in $\times$ $1/8$ in weighs 1 gram. The same length cut from sheet could be as light as 0.33 grams. Supposing a span of 50in and a design that calls for six spars the total length will be 300in and at 1 gram per 36in that is 8.33 grams for the spars. Finished weight for a wing of this specification would probably be in the region of 30 grams.

Replace the spars with light sheet and total spar weight comes down to 2.77 grams. A Boron thread top and bottom, (600ins) of Boron, at 0.0000173 oz per inch, is 0.01038 oz or 0.3 grams of Boron. Boron plus spars



Tony Smith right in the 'groove' at the Easter meeting releases 'Super Nog' on final max. His enormous fly-off flight later won Open Power.

would then weigh 3.07 grams plus glue of course. Certainly it looks like a potential saving of 5 grams for that wing; even if Boron reinforcement was necessary on all the spars, which it probably wouldn't be. Quite a saving on a 30 gram component!

Probably the scope is even greater in rubber model fuselages (super light diagonal longerons and pure Boron thread bracing) although I wouldn't fancy any of it getting into the rubber. A word of warning here. It is very brittle, and very fine, and quite difficult to see at times. Don't allow fragments to escape into clothes or carpets as they will penetrate bare skin very easily. With the splinters very difficult to remove without breaking. Be particularly careful if you have animals or young children about the place - in the same way as you would with the cyano.

There are currently two sources of Boron and incidentally both offer very interesting catalogues of other useful bits and pieces. They are SAMS - 2 The Drive, Blackmore End, Wheathamstead, Herts. (from whom much of the above gen comes), who offer it at 100ft for £5 plus 50p postage (larger quantities up to 2000ft at large bulk discounts) and Mike Woodhouse - 12 Marston Lane, Norwich, Norfolk NR4 6LZ - 100ft for £6.50 post free; bulk discounts on 500ft. In all cases diameter is 0.004in.

Detachable fins

A practical way around that bulky transportation problem inherent with integral tail/fin assemblies popular on most vintage models is to construct a detachable fin using pegs and paper tubes. Such modifications are accepted under SMAE rules as 'local sheeting' see rule 3.17.4 para (d).

The base of the fin requires a little reinforcement and the centre of the tailplane must be sheeted top and bottom between two ribs. A couple of turns of thin 'copy' paper glued around a 14swg mandril and slid off whilst still wet will form ideal tubes which can then be glued (cyano)

vertically through suitably positioned holes in the 1/32in sheet.

Slightly oversize holes can then be drilled in the fin structure to line up with the tubes and accept 1/16in diameter round bamboo dowels. The fin is offered up to the tail and the dowels pushed through the fin down into the paper tubes and the complete assembly adjusted for alignment.

This dry set-up can then be tacked in position with tiny drops of cyano on the dowels from above (inside the fin). Be careful to use very small drops - a drop on the end of a pin will suffice - as too much...and the cyano runs down into the paper tube and you are back to a non-detachable fin again! Of course after tacking, the fin is removed and larger quantities of glue can be used to finally secure the pegs.

In the unlikely event of the peg to tube fit being so perfect that the fin falls out easily, a little dope or even tissue doped around the pegs will restore a tight fit. Tiny wire hooks can be added for tail hold down and dethermaliser bands.

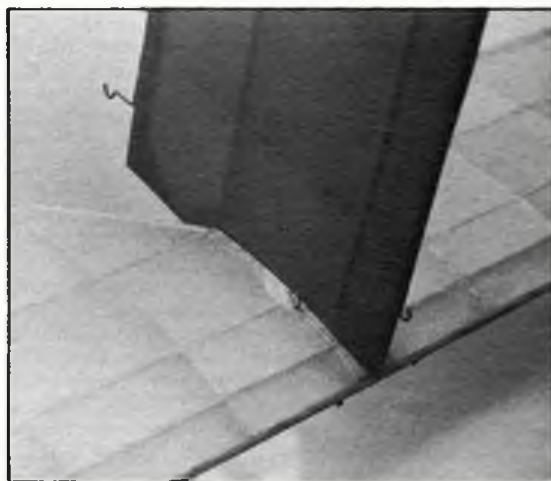
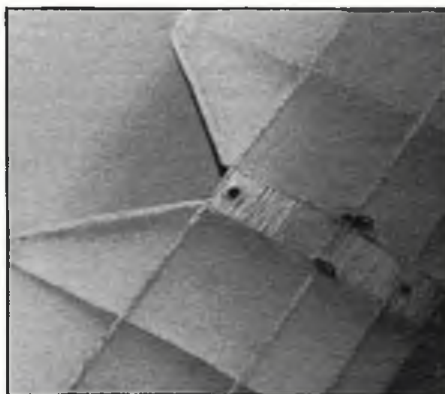
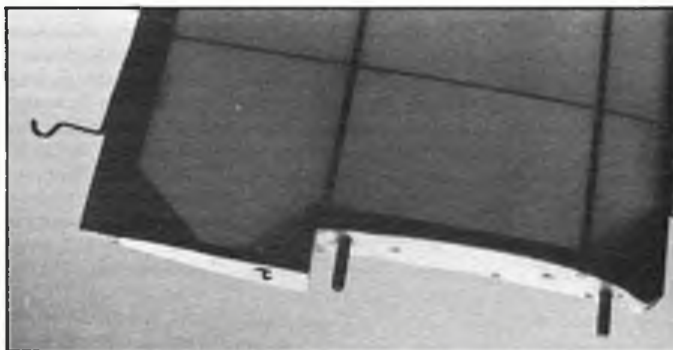
The most time consuming bit to this dodge is shaping the bottom of the fin to precisely resemble the top surface of the tail section for a snug and neat final assembly. It is all worth it...for the savings in transportation damage and of course the convenience of being able to store both surfaces flat and thus more easily control and measure warps.

Questions and answers

There are undoubtedly people reading this section every month that know little of Free Flight and would like to know more. You may be considering your first model or changing over from another class - there have been some notable converts like that lately...

Perhaps you flew Free Flight years ago and are coming back to it. Whatever the reason, you will undoubtedly have questions, and unless you are already a member of a Free Flight club, may have no one to

These three photographs clearly show Dave Hipperson's ideas for detachable fins (see text). Note small extent of centre section sheeting to accept paper tubes, bamboo dowels in fin and neat wire hooks for rubber band attachment.



ask. I am no expert on every form of Free Flight but I do know all the people that are.

If you have a query on building, trimming or flying let me know either through Aeromodeller office or direct to 35 Anthony Road, Boreham Wood, Herts WD6 4NF, enclosing an SAE.

I will endeavour either to answer the problem direct, find the answer for you, or if its really complicated pass the letter on to someone willing to answer it for you. This will allow us to help you direct and in doing so, you will be helping us to discover the subjects that give the most problems so that in time we can run special features on them.

So although we may draw on your questions for future material you will of course be contacted direct with your answers - you will not have to wait for the magazine to appear.

Never forget however, the quickest way of all for making progress...is to have a bash at building something and come out and try it - preferably at a contest. Nothing teaches faster than experience.

SMAE 2nd Area Centralised... 24.3.85

There was none of the customary gale for 'Gamage Day' - instead, all areas had at least some flyable weather. This premier rubber event produced one of its largest flyoffs, with those at Barkston Heath taking all but three of the top thirteen slots.

Most of the dozen that flew-off there, launched into good air after a virtually flat calm late afternoon. So calm in fact that Sharp the winner, didn't even start his qualifying flights until past 4pm. Those earliest away faired best with places falling virtually in the order of launches. Sharp didn't have it all his own way however as his model was lost on the roof of a hangar. Second and third places were close and both taken by 'Skywalker 130s' - neither of them mine! Ian MacDonald in virtually the same air as Sharp but leaving enough of a gap for

Ian Davitt to squeeze in. He flew at Drifffield and was the only person there to contact lift, sadly disappearing a little too early, and still well up.

F1C provided Screen with the first of his expected series of wins in this class although Harris made it a contest. Their flyoffs travelled no further than a few hundred yards! Encouraging to see that the other UK Team Member, Roy Collins flying at Sculthorpe, isn't pulling his punches this season either. He was 3rd and would have done better had he not risked a last minute adjustment which pushed his model left on power. Fred Chilton's (4th place) at Beaulieu was rewarded too, as thanks to this, his club now leads the Plugge.

Glider successes were spread around the Country. Nicholson's 6 minute plus winner being taken at Rufford - a local site for him to which he and a few Liverpool clubmates have access. At Beaulieu, Edge 'blew it' with a flight that could have won, but his model glided dead straight...It must have been good air to still score almost 4 minutes!

Alan Jack's 3rd taken in the cold and drizzly North East was only a part of his day's effort. He also qualified in Rubber and placed 8th in F1C with little more than trimming flights from his third reserve model...

Results

Open Glider - no trophy - 62 flew - 15 flew off		
1 B. Nicholson	Liverpool	7 30 + 6 05
2 C. Edge	Crookham	7 30 + 3 43
3 A. Jack	Tynemouth	7 30 + 3 42
4 C. Sharman	B & W	7 30 + 3 22
5 J. Cooper	Biggles	7 30 + 3 20
6 R. Audley	B & W	7 30 + 3 00

Open Rubber - Gamage Cup - 48 flew - 29 flew off		
1 G. Sharp	Croydon	7 30 + 8 43
2 I. Davitt	Morley	7 30 + 8 23
3 I. McDonald	Biggles	7 30 + 8 15
4 J. Carter	Falcons	7 30 + 8 00
5 M. Chilton	E.P.S.	7 30 + 7 49

FAI Power (F1C) - Halifax Trophy 23 flew - 4 flew off		
1 S. Screen	Birmingham	12 30 + 5 19
2 P. Harris	Birmingham	12 30 + 4 18
3 R. Collins	Anglia	12 30 + 4 08

Plugge Positions: after two events	
Crookham	401
Birmingham	371
Biggles	371
Anglia	360
Ylugs	334



The last launch for a max on Gamage Day. Ian McDonald launches one of the two 'Skywalker 130s' seen at the event. This same model went on to take 3rd place in the fly-off.

SMAE Easter meeting... Salisbury Plain

The ground officially designated Training Area No. 9 must be the largest flying site to which we currently have access. At Easter before the grass has grown long, chasing on foot and locating models is a simple matter. Consequently it was a little surprising to see a smaller than expected attendance.

The first day's Open classes had pleasant sunny periods with wind rarely over 15mph. Very much a fly-off contest. These took place in calmer conditions still, soon after 6pm. Screen's opening power climb was quite the highest and most perfect 9.3 second trajectory I have ever seen. It was quickly followed by Tony Smith's 'Super Nog' in characteristic fast rolling trim but to a slightly lesser altitude. Both these glided off in buoyant air whilst the other qualifiers followed.

Ultimately Screen's model dt'd at 7:30 still in sight. Smith claims to have set a fuse of around 12 minutes but it never functioned. His model was seen for nearly that time by the officials but Tony chasing on foot, watched it down for over 20 minutes.

In contrast to this the glider fly-off which went next benefited those that flew late, although Williams, first away, hooked good air for well over 5 minutes. Drift had reduced considerably and another patch of lift built up again towards the end of the period.

Gary Madelin had marked good air for Tony Le Vey, John Cuthbert launching last on his own. All models were in lift and eventual times reflect how long their d.t. timers would run. It was open to timer failure to win the event handsomely for someone - it didn't happen...

Rubber however was a fly-over for the two with the presence of mind to observe what was happening in glider and be ready fully wound when the hooter blew. Thus Peers and Hipperson launched almost simultaneously into the slowly drifting tail of the glider lift and climbed quickly.

Some glide stalling was enough to drop Hipperson out of the best air and Peers topped the list. The lull soon passed and the fresh breeze that picked up as darkness fell signalled the start of worsening weather for the following day.

FAI run on Sunday started under a thick fast moving over-cast with heavy drizzle. The low cloud cost Screen his first round flight in F1C when his model disappeared at the top of the climb. He declined to fly another model thus leaving the field more open than usual. By the 2nd round the wind had freshened to over 20 mph but the rain had eased.

Wakefields were having less trouble than might have been expected, flying as they were down a slope then up another, some 600 yards distant. Gliders did suffer however and many were the wild circles, tow-ins and wing folds as the wind rose still further to gale force by early afternoon and the heavy showers returned.

Pete Watson ruined an unblemished score on his last flight in F1C, launching before an approaching downpour but into rapidly sinking air. This left John Bailey top, despite an early dt on his second flight which almost had him retiring! Ray Moore's total was well down but sufficient not to need his last flight.

Fantham appeared very much in control

of glider. His score goes a long way to dismissing those that have rated him a threat only in calm weather. Even John Cooper, in hot pursuit all day, wrecked at least one model comprehensively.

Up until the last flight in F1B, Uden and Hipperson had somehow managed the same score - just 27 seconds down, so maxes could have forced a fly-off. Hipperson's last flight climbed well but dropped fast on the glide leaving Uden needing only two minutes to win. He released in a comparative lull, a mere 25mph and was seen to well exceed the max.

The persistent rain set in again immediately after to soak all that attended the prize-giving. Hopefully we will be able to schedule more events on this site early in the year in future - the area is full of overnight accommodation so multi-day events should be no problem either. This was at least one of the warmest Easter meetings I can remember...

Results

Open Glider (7 flew off)			
1 T. Le Vey	North Yorks	9.00	6.50
2 J. Cuthbert	Grantham	9.00	6.14
3 W. Colledge	Birmingham	9.00	6.08
Open Rubber (4 flew off)			
1 R. Peers	Falcons	9.00	7.45
2 D. Hipperson	Grantham	9.00	7.20
3 M. Howick	East Grinstead	9.00	5.52
Open Power (5 flew off)			
1 A.T. Smith	BAC	9.00	11.18
2 S. Screen	Birmingham	9.00	8.35
3 R. Baggott	Birmingham	9.00	8.28
F1A Glider (All FAI - 2.30 max x 5 flights)			
1 M. Fantham	Richmond	10.37	
2 J. Cooper	Biggles	9.69	
3 A. Crisp	Biggles	9.12	
F1B Rubber			
1 P. Uden	Crookham	12.03	
2 D. Hipperson	Grantham	11.32	
3 A. Wells	Anglia	10.46	
F1C Power			
1 J. Bailey	Biggles	12.07	
2 P. Watson	Birmingham	11.43	
3 R. Moore	Biggles	9.08	

John Cuthbert's 'Uprising' A2

It wasn't until I actually asked John for details of this design that I discovered he was a relatively recent convert to Free Flight. Control line Combat and Team Race were his tastes until '79 when he attended the *Aeromodelleur Coupe* event at Halton and flew his first ever Free Flight models - a 'Garricoupe' and 'Swallow' built specially for the occasion. Despite the windy day and an indifferent performance he was hooked!

His main interest almost immediately swung to glider and this design came about through repeated experimentation often

with other people's basic design ideas. He started with a 'Flashback' which proved encouraging because it worked...and from then on his developments often featured the multi-spar wing structure found on this and the 'Pink Elephant' design.

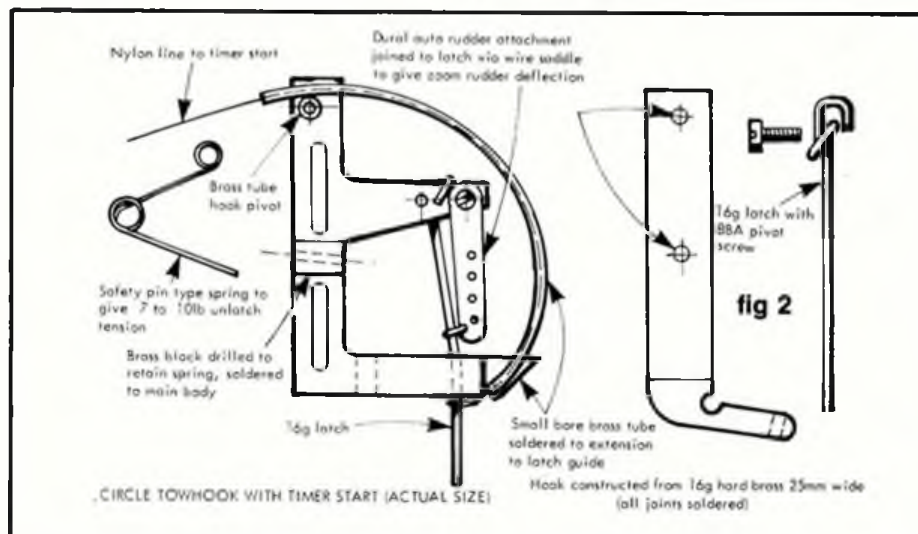
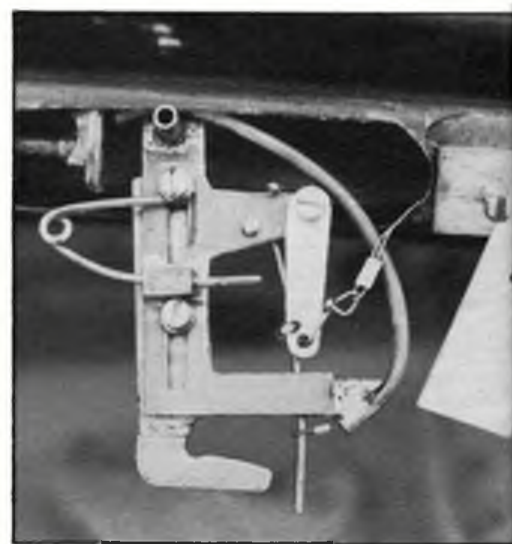
In fact he still has a healthy respect for the thermal riding ability of such wings. As have many others, John built a version of the famous Lepp 'AL 33' for the '83 season and was sufficiently impressed with its towing and glide...to produce his 'Uprising' - a compromise between the 'AL 33' performance design and the more conventional British type.

John's views on both flying technique and wing section selection are wise for someone who has been flying contest free flight for such a short time. Quite obviously lessons learnt in the Control Line circle apply equally to both spheres.

He recognised quickly that contest results were decided more often by the air the models were flown in, than the models themselves. In fact he has a theory that if the top glider fliers swapped their models around it wouldn't alter the results much.

He may well be right but I bet there are a number of them who wouldn't agree! Hence his modifications to the original Lepp design being more towards practicality and away from ultimate performance. He hasn't much time for wing section theorists either, preferring sections that look sensible and

One photograph can often show so much more than a hundred words, especially when the subject is of a technical nature... John Cuthbert's circle tow hook - a simple workshop exercise?



perform well, rather than ones that in theory *should be* 'world beaters'. Shoaf, Benedeck and Burrows sections have all been experimented with but the section here came from a hybrid of Cenny Breemans and Per Quarnstroms.

The tow hook assembly (fig 2) is interesting, being constructed almost entirely in 16swg hard brass - 25mm widths of which seem to be fairly freely available in most model shops. This has allowed soldered

joints to replace the time consuming drilling and tapping necessary in dural constructions. Brass is stronger too, and the slight weight penalty of a few grams of no consequence particularly at this central point on the model.

John's future plans as well as model improvements and the now obligatory circle towing practice will include fixed point thermal detection from a thermistor/anemometer set-up, to allow 'straight up

and off' launching in windy conditions. If this idea works in practice the plan is then to augment it with a special model using super stiff carbon fibre reinforced wings, flat bottom section and bunt transition from the top of the line. I can't help feeling John might actually be happier flying F1C!

LATEST RESULTS

Grantham Grand Prix 21.4.85

(All events 2.30 max)
Open Glider (15 flew)
 1 J. Cuthbert Grantham 7.30 + 2.57
 2 S. Darmon Birmingham 7.30 + 2.01
 3 P. Bayram Richmond 7.20

Open Rubber (12 flew) **Open Rubber Trophy**
 1 J. O'Donnell C/M 7.30 + 3.43
 2 J. Carter Falcons 7.30 + 2.43
 3 W. Hodgkinson C/M 7.30 + 2.40

Open Power (8 flew) **Arthur Percival Trophy**
 1 P. Harris Birmingham 7.30 + 5.20
 2 R. Peers Falcons 7.30 + 3.52
 3 R. King Morley 7.30

Combined FAI (13 flew)
 1 J. Abbey Leicester (FAI) 12.30 + 3.30 + 4.59
 2 C. Sharman B & W (FAI) 12.30 + 3.30 + 3.19
 3 J. Bailey Biggles (FAI) 11.57

HLG (6 flew) (1 minute max) **Bill Fall Trophy**
 1 P. Davies Richmond 5.00 + 1.38
 2 M. Page Peterborough 5.00 + 1.15
 3 P. Ball Grantham 5.00 + 0.57

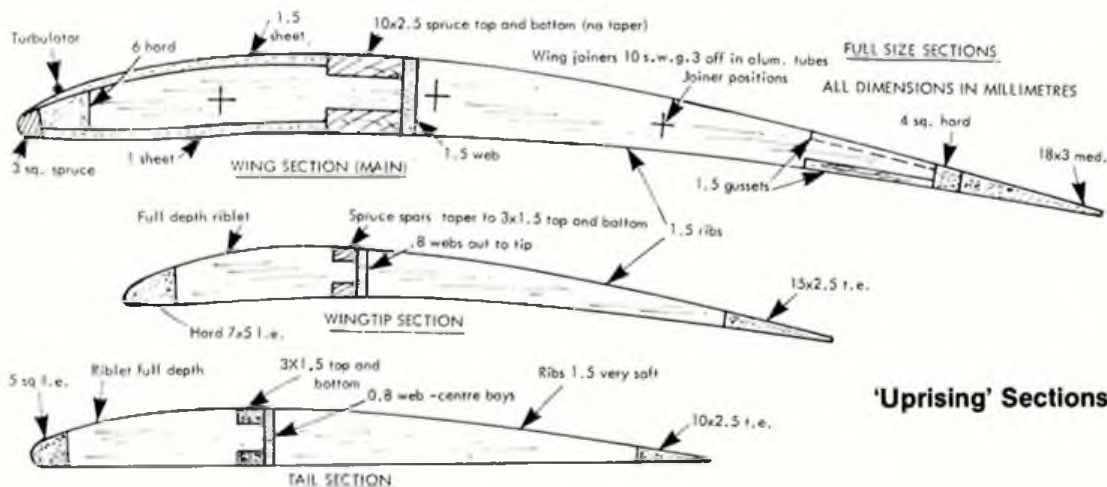
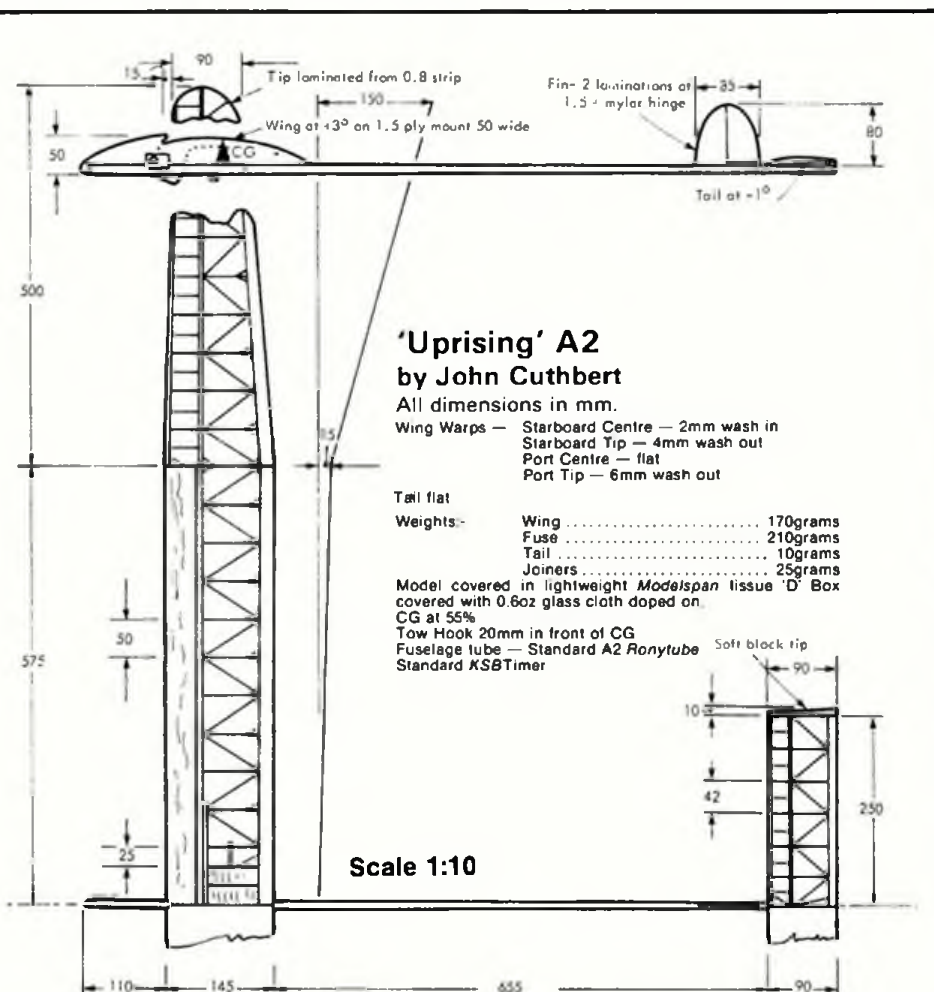
SENIOR CHAMPIONSHIP POSITIONS

D. Hipperson	Grantham	15pts
R. Peers	Falcons	6pts
M. Farnham	Richmond	6pts
S. Screen	Birmingham	6pts
P. Watson	Birmingham	5pts
M. Howick	East Grinstead	4pts
J. Cuthbert	Grantham	4pts

These positions were correct up to and including the Easter Meeting

February SMAE Open Meeting... postscript

As a postscript to the February Open Glider results, Tony Cordes has stood down from his winning position in the flyoff. His final max had been a close affair and a number of unofficial timings actually made the flight under 3 minutes. Puzzled by this and knowing the watch to be borrowed for the occasion; on returning home he checked it against a number of others at his place of work and found it to be running more than 10 seconds fast in 3 minutes! He has therefore very sportingly insisted that his last flight be reduced the appropriate amount and thus he makes no appearance now in the flyoff. Hence Joe Flynn moves up to the top and Brian Lavis comes in at 3rd with a total of 8:48.



MIND THE LINES

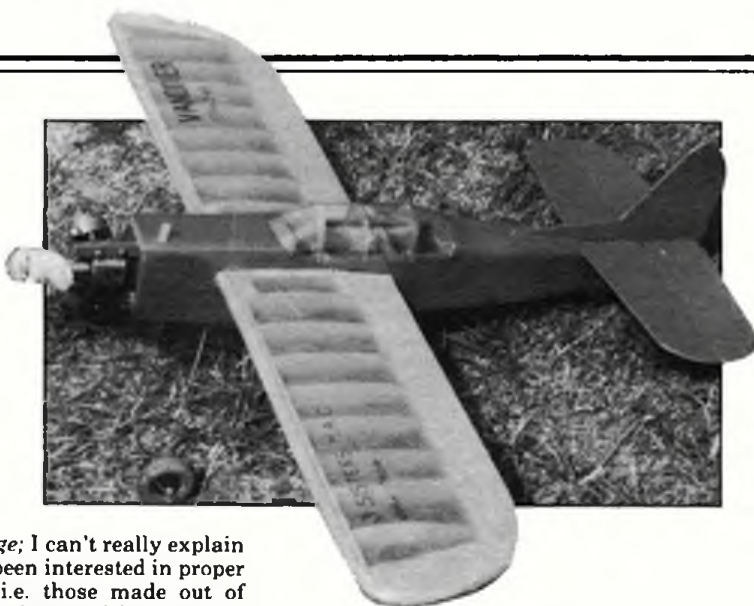
with
Andy Brough

Who is he?

It is usual for *Aeromodeller* columnists to be well known modellers, either by their contest successes or by their aircraft designs, and perhaps in the case of a vintage columnist, written by one who remembers the period in question. In fact I have had no contest successes, had no designs published and am only 34 (or will be by the time this is published).

For two years I did enter control line stunt comps and developed a series of stunt aeroplanes called 'Sumahama' but the amount of effort needed to be competitive imposed great restraints on my modelling

Right, this should bring back a few fond memories to some of the grey haired amongst us! John Noble's 1948 Frog 'Vandiver' - powered by an Eflin 2.49.



As to why *Vintage*; I can't really explain but I have always been interested in proper model aeroplanes i.e. those made out of balsa and covered in tissue or fabric, and the tremendous enthusiasm shown by vintage model builders is very infectious. There, so now you know my qualifications for writing in such an esteemed publication!

and the position of the wing is fixed by an aerofoil shaped cut-out in the fuselage bottom, the wing position is more than likely going to shift fairly easily, and each time you assemble it, the incidence may well be different. Also the wing may move side to side, so now is the time to stick blocks of wood on the top of the wing centre section at the leading and trailing edges. If these blocks are made the width of the fuselage (figs 1 and 2) internal dimensions this will cure both problems. You should stick these on with balsa cement so they will give in the case of a serious bump (fig 3), otherwise the fuselage sides may be damaged!

The amount of offset (either fin or engine...or both) should really be as indicated on the drawing but bear in mind that most vintage stunters flew at 60 to 70 mph and needed very little offset, if any at all, relying for line tension purely on speed.

To check the balance point, simply turn the model over and put a finger each side of the fuselage near to the leading edge of the wing and 'juggle' until the plane is level. I would normally balance a stunter at about 25% or chord (from the leading edge!) but I would err on the 10 to 15% side for a vintage model as they tend to be sensitive and your first flight may be very exciting!

You've no wing tip boxes or adjustable leadouts to worry about so there's nothing



Left, designed by J. Coasby the 'Taurus' is a large stunter - 68 in. wingspan for 10cc. This one was built from A.P.S. Plan CL/360 and will do the book (vintage that is) ...who's chicken then, that looks like an electric starter!

time, and was forcing me along a very narrow road. Alex Imrie's 'Vintage Corner' articles started me off on a whole new tack, I abandoned competitive flying and took to making firstly vintage control liners and then free flight models and now Radio Assist old timers.

I currently build and fly all types of models, vintage of course, and this year I have built a new 'Midge', re-furbished my 'Kandoo', built a single channel R/C 'Tomboy' (to compliment my free flight version) and am currently building a 1937 free flight "Wigdor Wasp". Rubber models and a glider are also on the horizon.

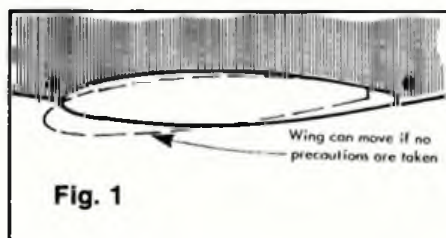


Fig. 1

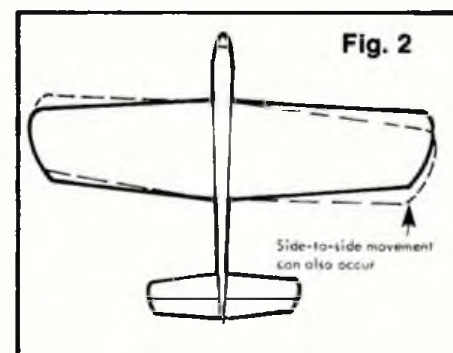
Getting the beast to fly!

It is with great trepidation that I attempt to write about trimming stunt models, especially as much has been written before, but I feel there are one or two points that are peculiar to vintage models; unless of course you build modern stunters with drop off undercarriages and elastic-banded-on wings!

The first part of trimming a model really begins at the building and covering stage, so a little more time spent ensuring the wing incidence is correct and no warps are present, will pay dividends in the end. The second part is to check again for warps, incidence and to balance the completed model to the balance point (centre of gravity) shown on the plan.

So assemble your model, place on your building board, and block up the tail to set the thrust line parallel to the board. By measuring from the board to the leading and trailing edges of both wing and tail one can check that all is parallel.

If the wings are held on by elastic bands



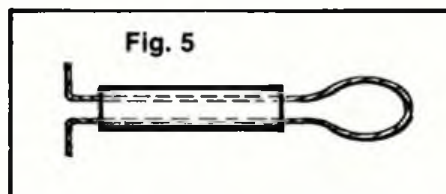
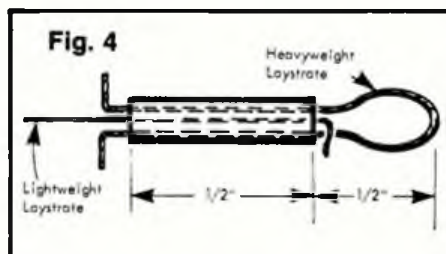
left but to fly it. If you're using a vintage engine, picking the correct prop size is really down to suck it and see and half the fun is reading original engine tests and reports to find out, but having done so how do you find an 11in x 10in or 8in x 8in today? You'll have to learn to carve one, that's how!

If a modern engine is fitted, use the prop recommended for stunt work and ignore the size shown on the plan. For the first flight

it's essential to set the engine full bat as we should assess the model's characteristics at its correct speed and not with it wallowing about. My 'Juggler' illustrated in the May issue flew with the outboard wing tip down by about 10° and up by the same amount inverted. All the ground checks showed everything to be in order and after a lot of messing about I decided the wing was flexing in flight. The 'Juggler' has a wing thickness of only 3/4in and coupled with covering it in *Solartex* it simply was not rigid enough. Tissue covering still has a lot to be said for it and may well have proved the answer. In desperation I gave the wing several coats of dope but ended up having to add a 3in long alloy trim tab to the outboard wing which cured the problem.

The next problem was loops, very large inside and almost turn on a sixpence outside loops. I almost cured this feature by packing the trailing edge of the wing by 1/16in at a time, which gradually closed up the inside loop and opened up the outside loops. As this was creating an unsightly gap I eventually stopped at 1/8in and started adding upthrust to the engine a washer at a time!

Even with all this it still flies larger inside loops than outside! I also feel the very large elevator works more effectively downwards than upwards, the tailplane being placed very high relative to the wing...it may be effected by prop wash. That's it, but remember that a big change to the prop pitch or diameter will affect the level flight due to torque reaction.



Material needed:

A length of 16 swg brass tubing

Heavy weight Laystrate

Lightweight Laystrate

Crimping pliers (available from *Radio Spares, Tandy* and DIY shops)

Now look at figure 4, firstly anneal the tubing by heating to a dull red and then quench in water to cool rapidly. Mark off at half inch intervals and cut the tube by rolling against a sharp knife. Cut off a 3in length of heavyweight Laystrate, form a loop with two equal length legs, pass the length of brass tubing over both legs, leaving approx. a 1/2in loop, bend over the free ends at 90° (fig 5). Next, feed the

lightweight Laystrate through the tube and fold the end over (fig 4).

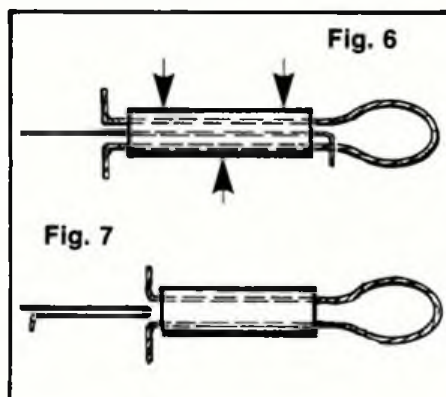
Before the next stage, you should have been practising with your crimping pliers to find the correct aperture to give a satisfactory crimp with three pieces of wire. All you need to do now is crimp three times, but with the centre crimp turned through 180° (fig 6) otherwise you end up with a banana shaped piece of brass!

Crop off the free ends and that's it. At this point you may well say: "I don't fancy the lightweight laystrate only passing through the tube once!" You can satisfy yourself and fold it double (fig 7) but I have never had a line pull through.

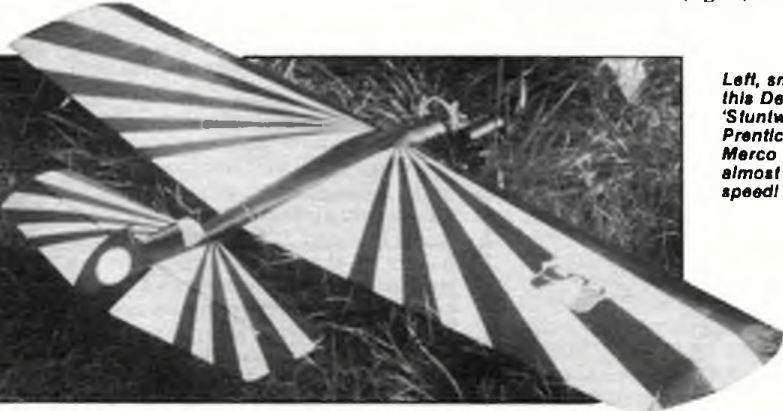
In fact I have had this connection on a tensile tester and using lightweight Laystrate the line snapped at about 80lb. What I do now is pop the loop over a nail in my garage wall and unwind the reel to about 1/2in over the required length (I have nails driven in the side of my house at 10ft intervals up to 60ft so I no longer need to measure!)

Make up an end as before, place it in the crimping pliers, grip lightly, and feed in the end of the line until the correct overall length is achieved, then squeeze. Simple eh! You'll find that you can make two lines of exactly the same length. In fact I usually make three lines and carry the spare on the reel.

As an extra bonus lines can be made up on the field, and when practised it only takes about 10 minutes.

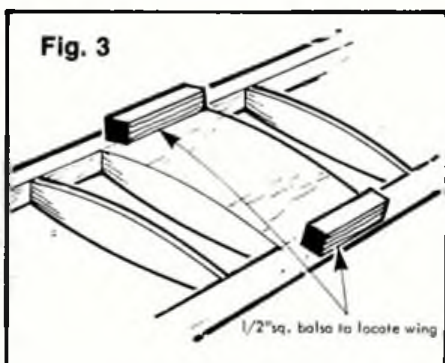


Left, smart finish on this DeBolt 'Stuntwagon' by Ron Prentice, powered by a Merco 61 II travels at almost team race speed!



"Make the Lines"

A column called 'Mind the Lines' should eventually cover the subject of actually making them! I know this subject has been well covered over the years but I feel the system I have used over the past five years is worthy of your attention. It is simple, quick and I have never had a line failure.



MIDGE: TIME/SPEED CHART 1/4 MILE

Line length: 35ft. Timing over 6 laps

TIME(sec)	M.p.h.	TIME(sec)	M.p.h.	TIME(sec)	M.p.h.	TIME(sec)	M.p.h.
10.50	85.71	12.00	75.00	13.50	66.66	15.00	60.00
10.60	84.90	12.10	74.38	13.60	66.18	15.10	59.60
10.70	84.11	12.20	73.77	13.70	65.69	15.20	59.21
10.80	83.33	12.30	73.17	13.80	65.22	15.30	58.82
10.90	82.56	12.40	72.58	13.90	64.75	15.40	58.44
11.00	81.81	12.50	72.00	14.00	64.29	15.50	58.06
11.10	81.08	12.60	71.42	14.10	63.83	15.60	57.69
11.20	80.35	12.70	70.86	14.20	63.38	15.70	57.32
11.30	79.64	12.80	70.31	14.30	62.94	15.80	56.96
11.40	78.94	12.90	69.76	14.40	62.50	15.90	56.60
11.50	78.26	13.00	69.23	14.50	62.07	16.00	56.25
11.60	77.58	13.10	68.70	14.60	61.64	16.10	55.90
11.70	76.92	13.20	68.18	14.70	61.22	16.20	55.55
11.80	76.27	13.30	67.67	14.80	60.81	16.30	55.21
11.90	75.63	13.40	67.16	14.90	60.40	16.40	54.88

THE ARTICLE on Soft Soldering in the last issue might have left a few readers with the vague feeling that they were being left in the lurch. After all, apart from suggesting that flux cored solder was just as strong as the once common tinmans variety and further suggesting that the problem lay not in the solder but in the flux, there seemed to be little hope for modellers who had made good soldered joints with the correct flux whose models *still* fell apart!

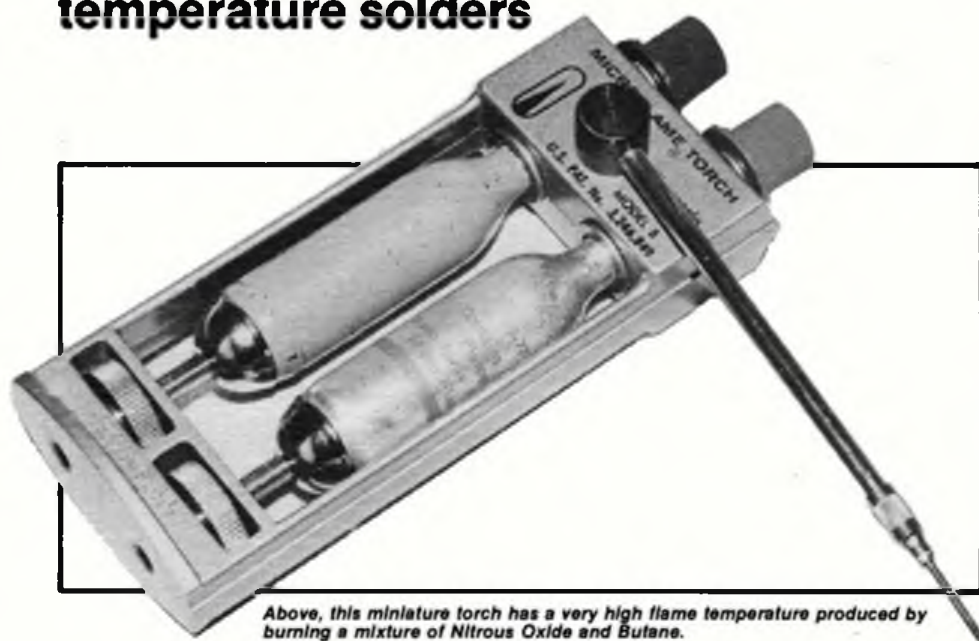
Well, there are several possible solutions, just one of which is *Hard* or *Silver* solder. Before launching into the details of silver soldering it is worth detailing a few methods that can be tried with soft solder that will

Right, a blowlamp of some description is necessary to heat the metals to be joined to a high enough temperature for Silver Soldering.



Silver Soldering

Bill Burkinshaw describes the basic techniques for joining metals with high temperature solders



Above, this miniature torch has a very high flame temperature produced by burning a mixture of Nitrous Oxide and Butane.

It is as well to be aware that piano-wire is a hardened and tempered high carbon steel wire.

The hardening and tempering process is a heat treatment which involves a two stage heating and cooling of the wire to *precise* temperatures. The high temperature involved in silver soldering will destroy the effects of this heat treatment, the wire will not be piano-wire any more in the region of the joint nor can the facilities available to the average modeller retrieve the situation.

The wire will still of course be steel and high carbon steel at that, so will be reasonably strong. If it is subjected to high stress however, it will not have the springy nature of the original and thus be more readily permanently deformed.

The silver soldering process uses a harder (stronger) soldering alloy than the tin/lead alloy used for the lower temperature technique and contains silver in varying

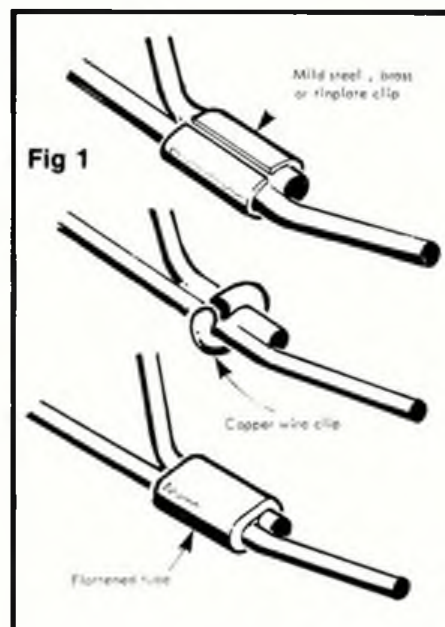


Fig 1

undoubtedly strengthen up those awkward joints.

What a bind!

First thing to try is binding the joint, not very revolutionary perhaps but there is more than one way of doing this. Simple thin wire wrapping is probably well known and tried, tinned copper wire is best for this technique, 'fuse wire' is the ideal material - you can even pick the most suitable gauge for the job in hand.

Next in line would be a short length of brass tube flattened to an oval section which has the added advantage of looking really

neat when finished. For gauges of wire that are on the large size it will be difficult to find a size of tube big enough to squeeze down to an oval section and still large enough to slide over the wires. In this case use a clip bent from either tin plate or thin mild steel sheet, or even a thickish clip bent from copper wire (See Fig. 1).

A hard solution

There may be very sound reasons that preclude the use of clips or even binding, scale requirements may dictate a very clean appearance to the joint and in this instance Silver Solder can often be the best answer.

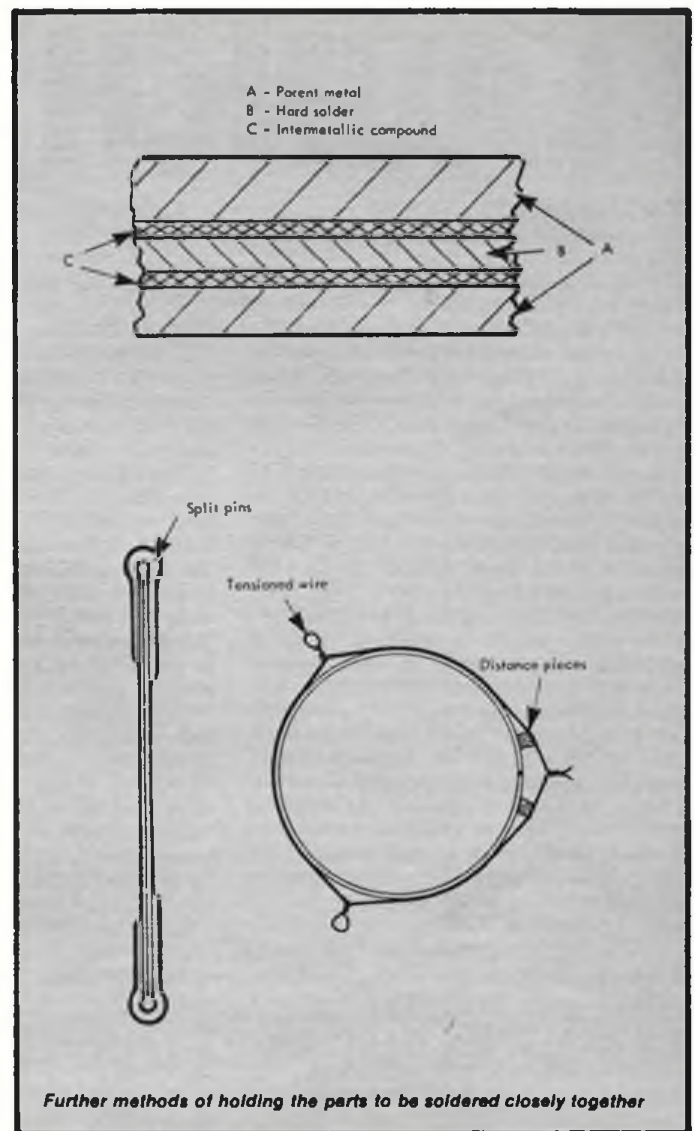
proportions to other base metals. It is thus expensive, the high silver 'Hall Mark' varieties costing virtually the same as solid silver...

A gas torch is required to provide sufficient heat, in the case of large workpieces either compressed air or even pressurised oxygen are used to further supplement the heat source. Just like soft solder, silver solder needs a flux, or at least most of the solders that modellers are likely to encounter need a flux.

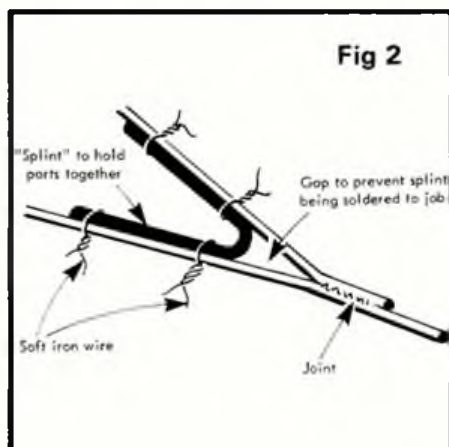
Fluxes used for soft soldering are unable to withstand the high temperatures of silver solder so a special flux based on Borax is used. If difficulty is experienced in finding branded fluxes, plain Borax may be used, commercial fluxes usually contain additives to help make removal of flux residues easier.

Silver soldering procedure runs as follows:

Below, this gas torch can be fitted with a copper soldering iron bit and it is then able to serve a dual role.



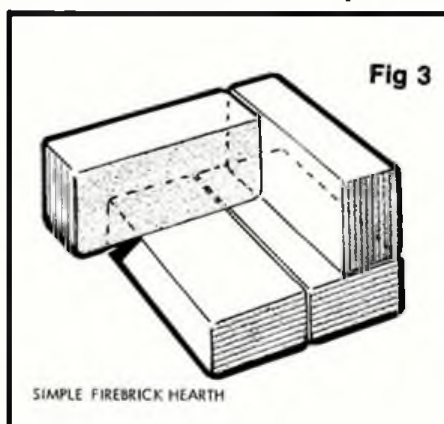
Further methods of holding the parts to be soldered closely together



1. Arrange for adequate support for the work, it will be very hot, so parts cannot be held in the fingers! It is quite usual to hold items together with soft iron binding wire or clips of some sort during the process (fig 2); positioned so that they do *not* become bonded to the job!
2. Clean the job thoroughly with emery cloth.
3. Mix the flux with water to make a thick cream and apply to the joint. Be careful here, the solder will flow to everywhere the flux is placed.

4. Cut up some tiny pieces of silver solder and apply them to the joint.
5. Heat up the joint very gently to drive off the water from the flux, take care, if the water boils too fiercely the solder will be thrown away from the joint!
6. Once the water has boiled away, fiercer heat can be used until the solder is seen to melt and flow through the joint. The job will be approaching red heat at this stage and the flux will be liquid. The molten silver solder can be seen to flow through the joint clearly if the fluxing and temperature are right.

Don't plunge the job into water whilst it is still red hot, this will harden the piano wire



to the extent that it will be really *brittle*, allow it to cool naturally. Once the job is cool it can be cleaned of flux and is ready to take the worst that you can give it!

Suppliers?

But of course, although silver solder is not available in every High Street store, there will be some stores that keep it, particularly those that have really good selections of engineering tools. Don't be afraid to ask, remember it is expensive stuff and may not be on display.

Mail order is also an easy way to get supplies, I can thoroughly recommend *K.R. Whiston of New Mills, Stockport, Cheshire...* who can also supply fluxes and binding wires. They publish an extremely interesting catalogue which is well worth sending for, it even includes details of high strength soft solder, acid flux cored solders etc.

As far as brand names are concerned, *Johnson Matthey* are probably the best known, their 'Easi-Flow' and 'Tenacity 4a' fluxes are just what is required, the latter probably being the better of the two to purchase if only one type can be afforded.

Camping Gaz International also market small packs of solder and flux to accompany their range of bottled gas appliances which can often be found in big tool shops.



AT THE LAUNCH PAD

with
John Wheddon

World Records

The Fédération Aéronautique Internationale (FAI) is the governing body for all forms of sporting aviation. Model rocketry, or in FAI terms Space Modelling, is subject to a set of international rules and as competitions have developed so a set of recognised world records has been established. Table 1 shows the records standing at 30 September 1984 in the altitude classes.

The classes referred to in the table denote engine size for the Altitude and Scale Altitude categories - the A.B.C. etc. referring to total impulse permitted. These records give a good answer to the old question of how high do they go? Or, to be more precise "How high CAN they go?"

The rulemakers have confused the issue somewhat in the case of the Payload category. In this case S2A carries *one* standard payload, S2B carries *two* and S2C has *four*. Maximum total impulse in each class is 10, 40 and 80 Newton-seconds respectively. The payloads themselves are cylindrical lead weights which weigh a minimum of 28 grams and have a minimum diameter of 19mm, inconveniently slightly larger than a standard 18mm engine!

Kits

The two major American manufacturers *Centuri* and *Estes* produce a wide range of kits designed to appeal to a very broad cross section of modellers. The most simple type 'designed for an absolute beginner' is the *Estes 'Alpha'*. The contents of an 'Alpha' kit are shown in the photograph and include moulded plastic fin and nose cone assemblies, authentic roll-pattern transfers and a 12 inch parachute.

The body tube is pre-finished, requiring no sealing or additional painting. Assembling is really very simple and a novice rocketeer should be rewarded with a

virtually indestructible model which *works*. The most serious possibility with the 'Alpha' is the very real prospect of it floating away on its parachute in a thermal!

Black Witch

The difficulties experienced in obtaining supplies of American material, especially during the recent plunge of Sterling against the Dollar, prompted Stuart Lodge to design and build 'Black Witch'. The idea behind the design being to use British materials throughout. Careful scrutiny of various cardboard tubes around the office and kitchen produced suitable body tubes and if we forgive Stuart the balsawood from Ecuador it must be said that the design aims were achieved very well indeed. 'Black Witch' is a large model, suitable for engines in the 'D' class, and every effort should be made to keep lift-off weight to around 200g.

Construction begins by selecting the two body tubes; in the original, one was the 'inner' of a roll of kitchen wrap, the other the 'inner' of a roll of drawing paper. The important aspect of the selection is that the wall thickness should be 1mm or less to minimise weight, equally, the tubes should be in good condition and longitudinally straight.

The tubes are cut to the lengths shown on the drawings and the smaller diameter tube is wrapped with paper until it is a firm sliding fit in the larger tube, the paper packing is glued in place with PVA glue and the tubes joined co-axially, ensuring accuracy.

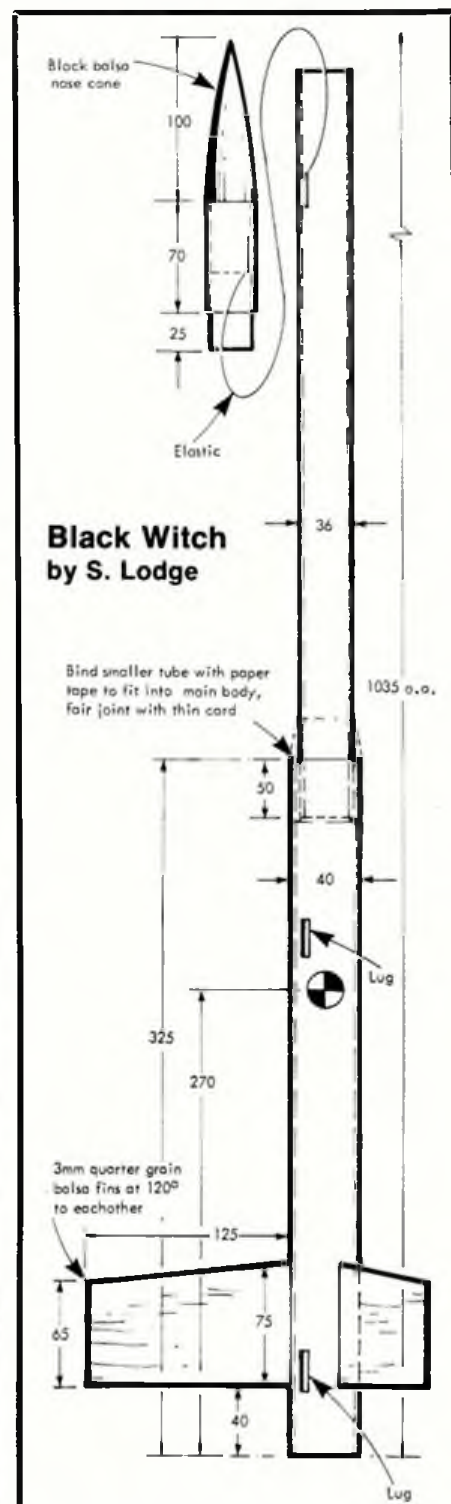
The block balsa is then roughly shaped to fit atop the smaller diameter tube and glued in place; when the glue is set, carefully carve and sand the balsa nose cone taking care to ensure symmetry. The three tail fins are cut from the 3mm balsa sheet, (make identical), sanded smooth and then tissue covered.

The joined body tubes should be lightly sanded, which will produce a 'fuzz' which a coat of clear dope will stiffen. The result

should be sanded down using fine sandpaper and the step at the tube junction should be faired using a strip of waste card and glued in place.

The whole should be covered in lightweight tissue (doped on and sanded smooth). Two coats of sanding sealer, followed by light sanding should give a good finish, although it is unlikely that you will lose the 'spirals' in the tubes altogether.

The same filling/sanding process should



Right, contents of the Estes 'Alpha', beginner's model rocket kit. Only the most minimal of modelling experience is required to construct this kit as the nose cone and fins are supplied as neat clean injection mouldings. The engine is held in position by a small spring steel clip, so the chances of a successful first flight are high! Above right is a complete 'Alpha' in the foreground! Behind it is a 'Maxi Alpha' for 'D' or 'F' engines! The other model illustrated is the Estes 'Astro Cam 110' this kit includes the parts to make a small camera with which to take aerial photos!





Category	Class	Record	Holder	Country	Date set
Altitude	S1A	681m	S. Ilin	USSR	23.04.84
	S1B	1160m	A. Miturev	USSR	23.04.84
	S1C	1101m	D. Larson	USA	29.11.75
	S1D	1255m	R. Johnson	USA	27.09.81
Payload	S2A	701m	E. Tschistov	USSR	24.10.80
	S2B	1208m	D. Larson	USA	23.05.76
	S2C	1183m	R. Johnson	USA	27.09.81
Scale Altitude	S5A	387m	E. Tschistov	USSR	24.10.80
	S5B	710m	T. Tartar	CSSR	17.09.82
	S5C	1153m	V. Kuzmin	USSR	23.04.84
	S5D	1105m	P. Horacek	CSSR	21.06.81
	S5F	1003m	J. Adl	CSSR	26.06.82

Table 1 - World Records at 30-9-84

be followed with the fins and these should be mounted on the lower body tube at 120° intervals. The launch lugs should be mounted where shown. The best method of attaching seems to be to initially use cyanoacrylate adhesive for positive location, backed up by successive fillets of PVA glue.

The nose unit may now be cut from the forward region of the model; using a sharp scalpel. Into the detached nose unit glue a piece of scrap tube to enable positive location of the nose cone unit on the finished model. 30cm of shock-cord elastic is used to join the cone to the body.

Engine installation was covered in the April issue of *Aeromodeller* and here, care must be taken to find an engine mount tube of the right size to suit the 'D' (or 'F') type motor to be used.

With a motor mounted at the tail of the Black Witch and a full complement of recovery items inserted at the top end, the model may be trim tested by 'swinging' in the usual way; the original required the absolute minimum of ballast to the nose cone.

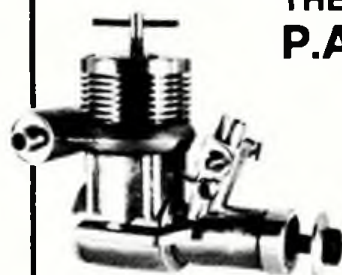
For the test flights use a single 18in. parachute (with sufficient flame proof wadding), as this will deliver the 'Witch' reasonably quickly to earth with minimal drift. Lift off should be rapid and impressive with the altitude obtained being dependent on the all up weight of the rocket.

During the design it was thought wise to incorporate a heavy duty launch lug. (in fact a slice of *Bic* ball-point pen case!) and to utilise an 8 s.w.g. piano wire launch rod for best lift-off results. On calmer days one might want to try large parachute diameters or even multiple canopies for greater duration...

Could the design be improved and better performances obtained? Obviously, the selection of high quality body tubes notably those marketed by *Estes* would reduce all-up weight materially and produce a higher flying rocket, but, in the case of the original would have voided the design criteria of producing a 'home grown' model. No doubt esoteric fin shapes might also have yielded a few more feet of altitude, but again the simplistic parameters of the concept would have been compromised.



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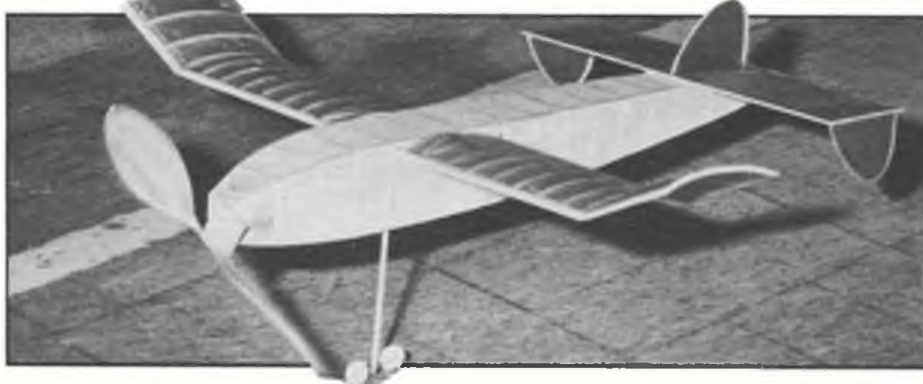
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THE VERY TITLE of this series of meetings is significant. It underlines the fact that the meetings were an independent venture, run by a handful of enthusiasts - without Area or SMAE backing. Whilst surprising at first glance, this arrangement has its advantages in that the organisers provide what they think fit and stand or fall on their own efforts. That this policy works is evident from the past dozen years, when there has been a series of low ceiling events every winter.

Planning and organisation are necessary, even though the pattern is by now well established. Five meetings, one per month, with the same events and specifications throughout, are the basis for the programme. This means that prospective participants know what to expect and that it is worth building special models.

The venues used are quite conventional sports halls. Presumably sized to accommodate badminton and the like, 25 foot height and 60 feet width are almost standard! Although this size is sufficient for real flying, it hardly permits the unrestrained flying of all types of model at the same time, hence the various classes need their own periods and this demands real organisation. This winter both Dennis Davitt and Brian Kenny gave up a day's flying to be full time Contest Directors.

Over the years the models have out-grown the facilities and this has inevitably led to various attempts to restrict performance. Chuck Glider now has size and weight limitations, whilst Easy B has the very novel arrangement of allowing the flier the



worth some study. Participation has declined somewhat compared with the past year or two but nevertheless the contests were hard fought and well worthwhile.

Treating the five meetings in chronological order would probably involve much repetition. So it might well be better to report by the various categories!

Above, Reg Boor's Peanut Duration model on final approach having dislodged its nose block after nudging the 25ft high ceiling. Photographs shown here are by Graham Davitt and John O'Donnell.

North of England Low~Ceiling Indoor Flying

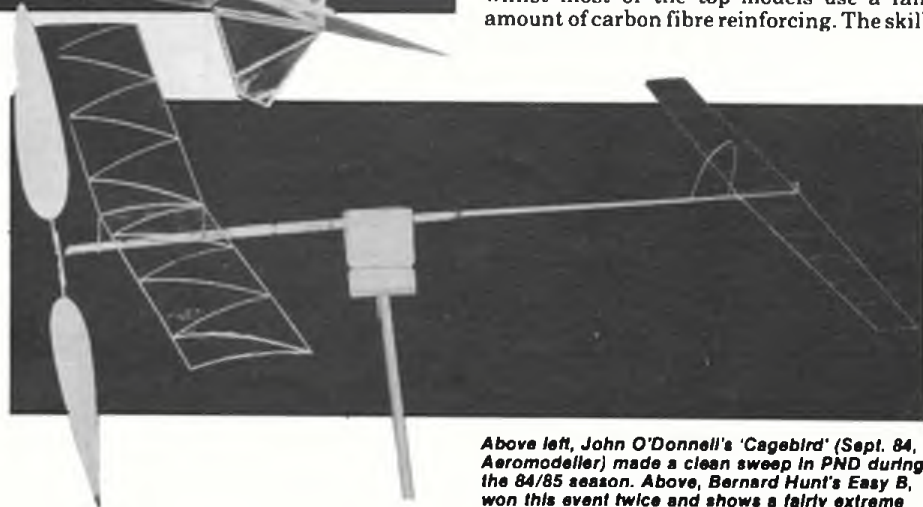


John O'Donnell looks back over a successful season's flying

Chuck glider saw Bob Bailey top the first two events and comfortably clear half a minute under a 25 foot ceiling! This was well ahead of the opposition and was not matched by other winners. Designs have followed the flexible wing, small tail style whilst most of the top models use a fair amount of carbon fibre reinforcing. The skill

choice of flying either with ballast (and very little rubber) or without. Since the latter is obviously far easier, a seven minute max is applied. The implications are interesting to say the least. The experts can win since their full score counts - But they really have to *work* to clear seven minutes. The relative novice can 'push' them, and indeed has placed on a number of occasions. Scale is run to a simple points system, based on placings in static and duration, no size limitations having been found necessary. The real success story of the last two winters has, however, been Peanut Duration - a non-scale class specially devised to bridge the gap between scale and duration - and hopefully appeal to the 'club flier'.

As these rules really do work, they are



Above left, John O'Donnell's 'Cagebird' (Sept. 84, Aeromodeller) made a clean sweep in PND during the 84/85 season. Above, Bernard Hunt's Easy B, won this event twice and shows a fairly extreme approach to this class.

is in getting the throw just right, so the peak of the climb and the transition to glide occur just below the ceiling and with the model positioned so that its glide circle fits *inside* the hall!

PND saw a clean sweep by the writer's 'Cagebird' - exactly as per the constructional article in the September issue. Extra duration has come from the use of longer motors - now approaching 30

Both Bernard and Derl cleared the eight minute hurdle flying with 'half motors' (i.e. 0.6g rubber and similar ballast) - an amazing performance under the available ceiling. Paradoxically the highest scores came on the coldest day - with everyone flying in overcoats and still shivering!

Nevertheless the rules worked well as Brian Bibby, Henry Tubbs and Bernard Aslett all placed with two seven minute maxs'. Bernard claiming a tactical victory when he realised that scores were low, abandoned his attempt with a ballasted model, and logged two easy maxs right at the end of the afternoon. Other C.D.'s subsequently insisted that the flier was

- the blades. Solid wood construction only.
d) Motor stick and tail boom to be solid construction only.
e) Minimum weight without rubber 1.2g
f) Wood bracing may be used.
g) Any covering material allowed.
2) EITHER: Any rubber weight. Flight times have a 7 minute maximum.
OR: Rubber max weight 0.6 g
Ballast in the form of a spacer between rubber and rear hook 0.6 g minimum
No maximum flight time.
3) Total of best 2 from 6 flights.

Indoor Hand Launched Glider

- 1) Wing span 13" max., wing area 35 sq. in.s max.
Overall length 13" max.
Tail span 6 1/2" max.
All-up weight 3 g minimum.

Peanut Duration

- 1) a) Rubber powered monoplanes only.
b) Wing span 13" max projected. Wing chord 2 1/2" max.
c) Tail span 7" max. Tail area 14 sq. ins. max.



Left, Reg Boor got first place in Scale at the January meeting with this rather smart version of the P51 'Mustang'.



Dennis Davitt looking understandably pleased, having won by a margin of only two seconds at the December meeting. Note microfilm covered wing but tissue covered tailplane.

inches. Derl Morley provided early opposition with a slabside, wing on top design. However the real threat was presented by Bernard Hunt who put more effort into a variable pitch propeller - but never got it quite right. If this does prove 'the way to go' then it might well need 'ruling out' - for the good of the event.

The new scale rule that winning models could not be re-entered caused some controversy - and was certainly disliked in some quarters. However it did not prevent both Dave Horsefield and Reg Boor from winning twice apiece - with different models of course. Perhaps I got the best of everything - with four second places from my ancient but usually reliable 'Fike'. Undoubtedly the way to win is to have a better balance between static and flying.

Final event was Easy B in every sense - being flown last at each meeting. Entries for the first two events were double those for the last three - for no apparent reason. Dennis Davitt was not able to repeat his previous winters 'clean up' - but he did win this category at two meetings. The other double winner was Bernard Hunt, whilst Derl Morley was top at the middle meeting.

'stuck' with his initial choice!

All in all those involved have considered the programme very rewarding - those who attended have expressed appreciation (even at the prizes) and the C.D.'s might even 'do it again'. The only 'fly in the ointment' has been the lower numbers attending - and it is the customers who pay for the rent! So get out that balsa, tissue and glue and join in next winter. 'Low Ceiling' events are not only competitive - they can be fun....

Rules

Easy B rubber powered duration models.

- 1) Current model specification i.e. Rule 3 22.2 in the SMAE Rulebook:
a) Wing maximum projected span 18" max chord 3" monoplane only
b) Tail area 30 sq. ins. maximum. Wing and tail to have straight line outlines.
c) Prop max diameter 14". No variable pitch or flaring mechanisms; spar to be at 50% $\pm$ 10% all the way along

- d) Overall length, including propeller 13" max.
e) Propeller 6" diameter max.
f) Cross-section of fuselage 2 sq. ins. minimum.
g) Airframe weight (without rubber) 4 g minimum.
h) Two wheel undercarriage required. Flights must r.o.g.
2) Total of best 2 from 6 flights.

Scale

- 1) a) Rubber power only.
b) No limitations on size or weight.
2) Scoring will be on a points basis as follows:
Static realism as decided by judges and using any documentation provided by the entrant. 1st place = 1 point, 2nd place = 2 points, etc.
Flight Duration being the total of the best two flights, one of which must be r.o.g. 1st place = 1 point, 2nd place = 2 points etc.
The total of a model's points will determine the results.
3) In the case of a tied places in any section, points will be averaged i.e. a two-way tie for 3rd place will be considered as a sharing of 3rd and 4th place and the models awarded 3 1/2 points each.
4) Ties in overall scores will be decided by the higher r.o.g. duration flight.
5) Scale models that win a contest during the 1984-85 winter will not be allowed to enter the remainder.

NORTH OF ENGLAND LOW-CEILING INDOOR FLYING WINTER 1984-85

25 NOV 1984

1 R Bailey 62.3
2 B Hunt 55
3 W Murray 53.6

PEANUT DURATION

1 J O'Donnell 5.26
2 D Morley 5.04
3 B Kenny 5.01

SCALE

1 D Horsefield SE5 3 1/2
2 J O'Donnell Fike 6
3 A Crompton Baby Ace 6 1/2
EASY B
3 B Hunt 15.40
2 D Morley 14.24
3 B Bibby 14.00

16 DEC 1984

62.3 R Bailey
55 B Hunt
53.6 G Davitt

5.26 J O'Donnell
5.04 D Morley
5.01 W Murray

3 1/2 A Crompton Baby Ace
6 W Murray Sparrow
6 1/2 D Horsefield B. Scout

D Davitt 15.40
B Aslett 14.24
G Davitt 14.00

13 JAN 1985

60.7 D Morley
58.3 R Green
56.6 G Davitt

5.52 J O'Donnell
5.32 B Hunt
4.65 D Morley

6+ 48 R Boor P51
6+ 25 J O'Donnell Fike
9+ 25 B Horsefield Fike

14.02 D Morley
14.00 B Hunt
13.39 H Tubbs

10 FEB 1985

57.2 B Hunt
56.5 W Murray
55.5 D Morley

6.37 J O'Donnell
6.31 B Hunt
5.51 W Murray

6 D Horsefield B. Scout
8 J O'Donnell Fike
9+ 29 M Colling Bleriot

15.53 B Hunt
14.57 D Morley
14.00 J O'Donnell

3 MARCH 1985

57.5 B Hunt
56.1 R Boor
54.8 W Murray

6.06 J O'Donnell
5.38 B Hunt
5.27 H Tubbs

7 R Boor He 113
8+ 113 J O'Donnell Fike
8+ 48 D Kerswell Piper Pacer

16.18 D Davitt
16.17 H Tubbs
14.20 J O'Donnell

52
51.8
50.8

6.16
5.57
4.25

8
9+ 115
9+ 5

14.59
14.00
13.34



Curator, Co. Hurst Bowers, with a treasured possession, the actual Gordon Light Wakelield of 1935! It has all the original markings and was kept in its unusually shaped box safely now for 50 years!

and, as it happened, a development area which was to become an investment in itself. The budget was a forbidding million dollars, - way beyond their immediate reach; but a challenge to achieve a golden ambition shared by the membership, and the American model trade.

A building fund was established with a goal of \$160,000 in tax deductible donations. Within a year that target was beaten handsomely as receipts shot to \$210,000 by February 1983. Contributions rolled in continuously and by the time the building was completed, the trade, and members had raised \$300,000 so that the loan could be reduced to \$860,000. In fact, as building progressed the actual cost escalated to a million and a quarter dollars so the generosity of the donors was a timely safeguard.

Design of the building also came out of the membership. John Hunton offered his architectural services. John Clemens made a card mock-up model in his hospital bed. Meanwhile the headquarters team in 815, Fifteenth Street NW, Washington had to deal with construction problems in a world far removed from normal experience. Legal requirements, contracts, agreements, deeds, appraisals and certificates were just part of the burden borne happily as they left the

Ron never thought he'd ever see the F.A.S.T. club racers of '49 which inspired the beginning of Team Racing in the U.K. Thanks to the Williams Bros. and Russ Barrera's collection, these racers are now preserved for posterity.



National Aeromodelling Centre - U.S.A.

Behind every model activity there has to be an organisation to take care of matters removed from balsa, glue, rubber or engines. Biggest of all is A.M.A. now in its own building at Washington. Ron Moulton takes an inside view...

AMA, the Academy of Model Aeronautics will break its own world record this summer when it registers the 100,000th member of 1985. This single fact identifies AMA as the largest organization anywhere in aviation, and one which has established its independence through the sheer hard work of a dedicated staff and a clear thinking council of volunteer officials.

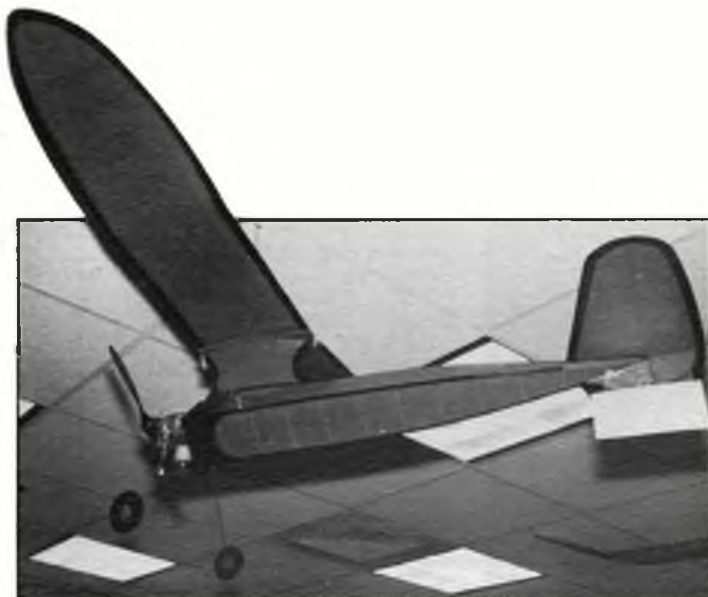
Always affiliated to the NAA (National Aeronautics Association), it began as an NAA junior membership plan as early as 1932 but the official launch came in 1935 at the Nats when it was proposed to form the AMA the following year at Detroit, so in 1986 they'll celebrate their 50th year. It will be a Golden Anniversary with a special meaning for they are now in their very own building - specially designed to suit their purpose by an aeromodelling architect.

For years, AMA had occupied offices alongside NAA in downtown Washington DC, an area with annual increases in valuation and consequent growth of overhead costs for the tenants. Came time for decision and the AMA Council boldly looked for land on which to build.

They chose Reston, on the outskirts of the city, close to Dulles airport, easy to reach

Kits from the past. Comet, A-J, Berkeley, Megow, Stanzel, Cleveland and early control line and radio control equipment are displayed along one wall in protective glass cases.





Discovered in Irma Hillegas' basement, after 40 years of storage, restored by Matthew Basta and delivered to AMA by Joe Elgin, this is Dick Korda's 1938 answer to the 'Zipper' with its original Brown Jr. engine.

AMA's model museum covers from 1920's to the 80's, brings back floods of memory to visitors and an impression of enormous variety for the newcomer.

role of tenancy for developing ownership.

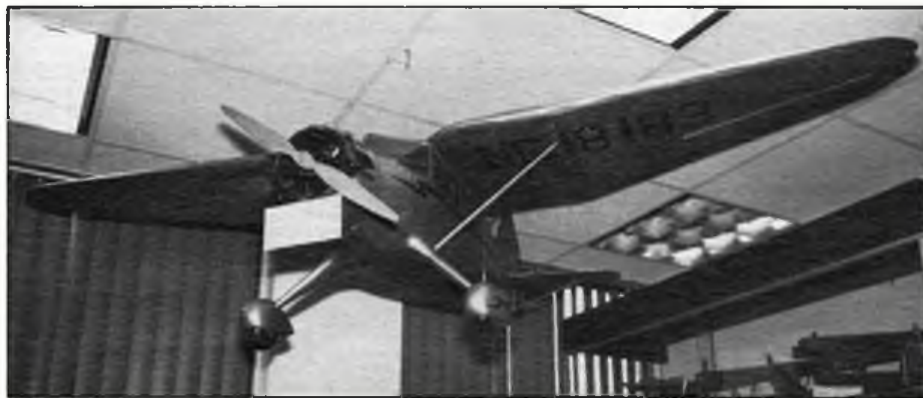
The move came on February 19th 1984 and the first AMA Council meeting took place a month later at Reston. Installations were completed by the official opening on September 24th when AMA hosted a crowd of personalities for a memorable celebration. They were able to witness the creation of a castle in the air, a unique and very solid tribute to the past in its model museum, and a visionary approach to the future as the National Aeromodeling Centre.

On our way to the Toledo Expo this March, Tony Dowdeswell and I diverted to Dulles for a few pleasant hours so that we could see AMA HQ and its many operations.

Entry from a large parking forecourt, just off a main highway, takes one past the Wall of Honor and the many donor plaques to reception, and a latchgate to restrain any natural impulse to burst through to the galaxy of models. From the outside, it's little more than a widespread low line business building with typical brick facings and corrugated roof overhang. But once inside! It's a cavern, landscaped into the hillock, and deep, so that once ticketed with a visitor badge and free to roam, you reach a gallery that stretches round 240 degrees of the upper floor. Nearest likeness is the Greenwich Room at the Wembley Conference Centre, but this seems even bigger, and at each point around the periphery there's an open plan office.



The Stinson 'Reliant' that inspired millions. Here it is, the actual subject of all those Cleveland Kit advertisements, among many other famous C-D models.



First impressions are those of size and volume, next, that of pristine newness in all the furnishings and then it dawns on a refugee from British offices that a cathedral silence dims everything into an atmosphere of peaceful contentedness. The true reason is quickly revealed on a tour of the office areas. Everything but everything is electronic. There must be at least half a dozen micro's and associated word processors, terminals and their silent keyboards.

John Worth proudly showed us the departments; Special Services, Memberships, Accounts, the Council chamber where the Nation meets to decide AMA's future. "Model Aviation" editorial where long serving Carl Wheeley and his team mastermind a monthly 174 page issue and particularly, the space where soon there'll be a new computer of massive capacity to take care of memberships and so remove AMA's last dependence on outside sources.

We asked Carl Maroney of Special Services to turn up a few facts on his

microterminal. At that moment they had 1880 clubs on register. "How many with newsletters?" we asked tongue in cheek. No problem - over 1,000 of them - and if we needed addresses, or city lists -, alphabetical order by State or almost any other miniscule fact, it could be keyed up.

Hearing that at the time of our visit, AMA was being challenged over its F3B team representation we asked Geoff Styles the PR Director about litigation in general - and he obliged by showing all the current detail of insurance claims and their process on his screen, it was quite a tally as one might expect from this huge Nation.

Doug Pratt of Special Projects took us right into the 90's with his briefcase computer. He'd just fixed the interface for printout, then later, spent his travel time with us on the way to Toledo punching out a report that he fed back to Reston by phone



A quizmaster could have a field day with the range of models in AMA's collection. They include all the pulse jets, most of the early engines and famous firsts.

When Bob Copland donated his famous Wakefield to Chel Lanzo all those years back, he could never have envisaged it becoming a British flagship among famous US prototypes at AMA HQ.

link in mere moments. Electronic mail shrinks time and distance with mind blowing simplicity.

Office efficiencies like this can only function effectively through adequate brainpower, and it doesn't take the visitor long to observe that AMA's executive is not only dedicated to the Academy but also very qualified to deal with all the complexities of



Dedication plaques in the entry hall for donors to the building fund include all the famous names in U.S. modelling circles, manufacturers, dealers, clubs and individuals to whom the building was a golden dream come true.

classes for *non* RC models!

From the upper offices, the central well is viewed as one enormous vintage model exhibit. On the lower level, Hurst Bowers, curator and tireless enthusiast admitted the building was already too small! Generosity has produced a priceless collection of famous models, kits, engines and equipment. Russ Barrera's museum has been incorporated, individuals have given their precious originals.

Here are Lanzo's 1937 Nats winner, Konefes' "Buzzard Bombshell", George Meyers' "Little Toot", Ed Packard's inimitable *Cleveland* scale designs, Struck's "New Ruler," Goldberg's, "Sailplane", Taibi's "Brooklyn Dodger", Korda's first pylon model, Williams Bros FAST racers, Zaic, Light, Grant, Effinger, Winter, Good *et al.* Neck cricking chandeliers of models get one guessing, and flushing out old memories.

Kits remind one of happy days with *Monoline*, *Walker* and *de Bolt* control line models. Reed gear and escapements compare with today's black box radio. The engines are even more romantic in recall, no wonder this Museum has weekend tours and a steady stream of visitors who find a way of travelling across America via Dulles Airport!

We haven't touched the sales section with its patches, T-shirts and badges, the film library (video on the way) and the other lads and lassies who make up the AMA



a huge membership. This is specially evident in Vince Mankowski's task of Nats. General Manager to which is now attached the FAI Pylon Championships. AMA Nats range of activities seems limitless in spite of the statistic that 78.5% of the members state RC is their primary interest. On our count, the Nats includes no less than 70 separate

headquarters family, nor the outside admin. through eleven district Vice Presidents, and the President, John Grigg, and his VP, Jim McNeill. They're all vital to the BIG operation, responsible for sustaining a democratic situation in the face of cosmopolitan turbulence, - unlike anywhere else in the World.



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D.H. 80A PUSS MOTH by J. M. Greenland An accurate replica with a scale area tailplane. Excellent performance. Span 30 in. (762mm). FSR/266 Price £2.30



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. FSP/721 Price £4.40



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SOPWITH TABLOID by K. McDonough. A diminutive 1/12th model, span 25 1/2 in. (648mm). For .3 to .8 cc motors. FSP/810 Price £3.60



SOPWITH CAMEL by D. M. Collin Fine flying, 28 in. (711mm) span version of the WWI favourite. This 1/12th scale, free flight model is designed for 0.5-0.8 cc engines. FSP/1143 Price £1.80



BLACKBURN 1912 MONOPLANE by A. M. Finucane. 1/8th scale, 48 in. (1219mm) span, pioneer monoplane; flies as well as its modern counterparts with 0.8-1 cc motor. FSP/667 Price £4.40



JODEL D9-8EBE by Hoh Fang-Chiun Neat replica of famous French light plane with fixed rudder. Detachable 38 1/2 in. (978mm) span wing, super flyer. 0.5-0.8 cc motors. FSP/691 Price £2.30



SUPERMARINE SPARROW by G. F. Elsegood. 1/12th scale of 1920's light racing aircraft designed by R. J. Mitchell; 34 in. (864mm) span model features scale rib spacing and pendulum rudder/aileron controls. For 0.3-0.5 cc motors. FSP/1408 Price £1.80



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. FSP/625 Price £3.60

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P-51D MUSTANG by C. Chapman. The famous WW2 American fighter at 26 in. (660mm) span is a faultless performer. FSR/1441 Price £2.30



DORNIER 27 by D. Garrett A 27 in. (686mm) span model of modern German light plane. Plans include modifications to take .3-.75 cc engines. FSR/796 Price £2.30



Appendix: Links to the plans

£1.85

The original issue comes with three free plans (Hanriot, Helico, Agro) printed front/back on a pull out banner of four sheets. The banner is not included in the document.

Flying Star by S. Bergwall

FF Glider from the Swedish Magazine 'Oldtimer'. Presented in VINTAGE CORNER

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Indoor tractor record breaker from 1934 by Carl Goldberg

Presented in VINTAGE CORNER

[Document Page: 16](#)

Mercury Midge by Cyril Shaw; Ron Young

CL Model for SAM midge speed rules

[Document Page: 23](#)

Hanriot HD1 by Bill Dennis

FF CO2 Scale model

[https://outerzone.co.uk/plan_details.asp?ID=1866 ...](https://outerzone.co.uk/plan_details.asp?ID=1866)

[Document Page: 28](#)

Agro II by Richard Preston

Full size plans for simple fun flyer for Rubber power

[https://www.hippocketaeronautics.com/hpa_plans/det ...](https://www.hippocketaeronautics.com/hpa_plans/det...)

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Un Helico by Emmanuel Fillon

FF Peanut Rubber Helicopter

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Uprising A2 by John Cuthbert

FF A2 glider. Presented in FREE FLIGHT SCENE

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Black Witch by S. Lodge

Rocket presented in AT THE LAUNCH PAD

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