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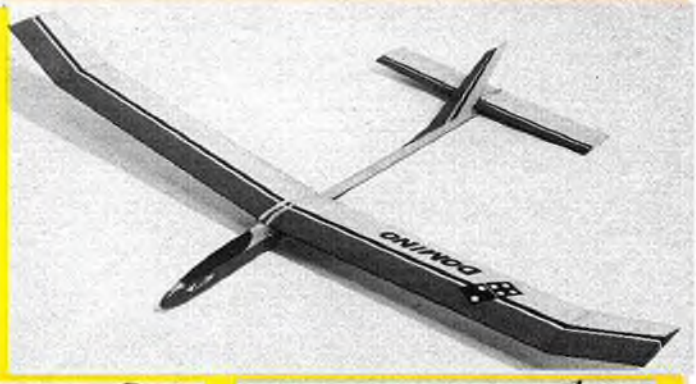

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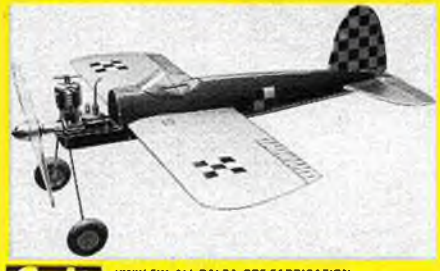

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Aeromodeller

MARCH 1982

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Graphics LORNA CULLEN

MAP MODEL DIVISION MAGAZINE

Advertisement Director M. GRAY
Managing Director RON MOULTON

Comment

WITH THE snow as thick as we have seen it in years, plus a rail strike, the attendance at this year's Model Engineer Exhibition didn't get off to such a good start. Nevertheless this was rectified towards the end of the week when on the Saturday we had a record number of over 11,000 visitors.

For the first time in 51 years, cups went to three overseas entries: The Aeromodeller Cup was awarded to Juri Ablamsky, member of the 1981 Russian World Champs Team. His F1C power model was brought back from Spain by our own World Champ team member Ken Faux. Incidentally apart from the superbly made timer mechanism and beautifully cowled motor, the Russian model's wing had been sliced down its complete span and reset to increase the aerofoil camber! No doubt this model had been used to develop his top contest design.

For me one of the most memorable moments of the show was to hear and see Lew Blackmore's quarter scale Bentley BR2 rotary aero engine run. The motor was run for a few minutes each hour, and every time I managed to see it the starting was identical, three turns to suck in three more to distribute the mixture, switch on and one or two flips of the prop and away she ran, sounding just like the real thing although surprisingly quiet. Lew Blackmore won the Duke of Edinburgh Challenge Trophy which goes back with him to Australia for the year. I must say I am looking forward to seeing Barry Hare's one fifth scale Rolls Royce Merlin run, which should take place at next year's show.

Derek Farman and a group of his students from Stalham High School put on a fine display of RTP models on Monday 11 as can be seen from the pictorial view of the exhibition on page 124.

It was good to see such an enthusiastic group of youngsters come all the way from Norfolk; many thanks from all of us. SAM (Society of Antique Modellers) also put on a good show; in fact unless Dave Baker had not been put in irons, the whole show would have been Vintage models. This year's lecture programme was the best ever — the problem is finding time to take them all in!

Editor

Contents

On the Cover

John and Simon Billam getting their models in order at the 1981 Aeromodeller Coupe d'Hiver which was held at RAF Henlow. With luck we should be able to use this fine site for this year's Coupe.

Volume 47 Issue 554

Next Month

We continue the series by Alan Dorrell on how to fly C/L Stunt with an APS plan of his 'Centurion.' Ron Moulton will be writing all about kites which will include a plan. 'Gadget Review,' an old time favourite will be re-introduced, plus all our regular columns. On sale March 19, 1982.

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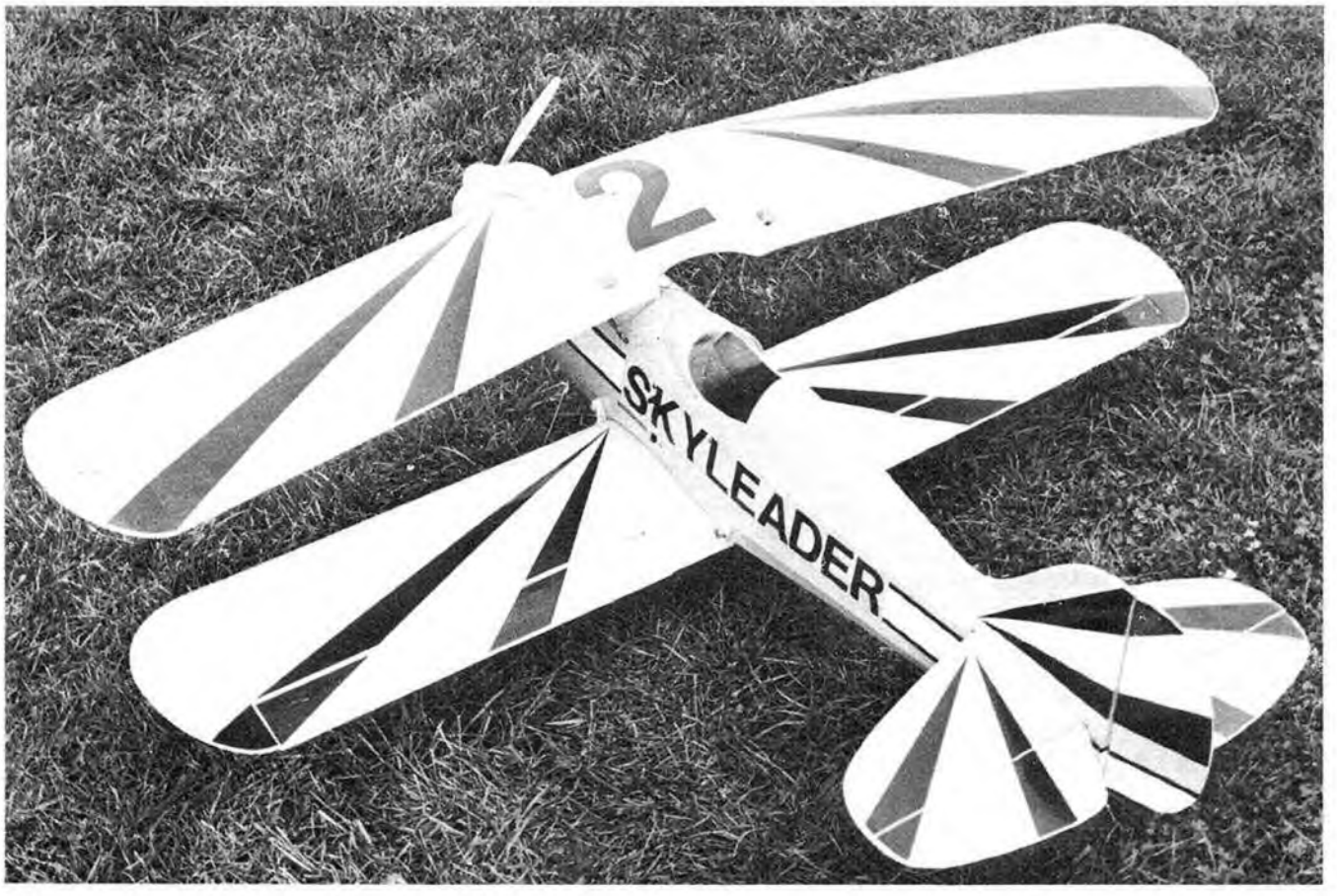

Biplanes have a particular attraction — free-flight, radio-controlled, or even control-line stunt. Lots of wing area in a small overall 'package' size. Bags of manoeuvrability at moderate flying speeds — which makes them more realistic in the air. Scope for scale or freelance designs.

Any snags? Yes, there are a few. Torque is one problem because of the smaller span compared with a monoplane of the same wing area. That is most likely to show up on free-flight biplanes — when the simple answer is use of a fairly generous dihedral angle. You don't want too much dihedral on an R/C model though, otherwise the effectiveness of ailerons will be reduced. But with control available all the time you can stick to 'scale' dihedral. (A good reason, incidentally, for adopting R/C for scale bipes rather than building them as free-flight models).

More important — keep the airframe weight down as much as possible. Built-up balsa construction throughout. Many an R/C bipe — particularly in smaller sizes — has turned out too heavy with foam wings, resulting in a glide like a brick. (But there have been the exceptions!)

Most of the problems are structural, in fact. Like how to mount the upper wing. Don't fix it rigidly. Use wire struts — or a sleek pylon on a freelance design — and make it knock-off. Avoid using interplane struts, unless it's a scale model. In the latter case, make them knock-apart in a crash. You don't *need* interplane struts for strength on a model bipe.

Throughout use the best Balsa available. Not only for reliable strength, but also to keep weight down by using small spar sizes, etc. *Light* sheet if you are going to plank the fuselage. And a built-up tail is lighter than an all-sheet (or foam) one. Solarbo Balsa throughout, in fact.

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5. Modelling knife.
6. Wheels (3).
7. Wheel retainers
8. Pre-cut engine mount
9. Engine mounting bolts & screws
10. Set of downthrust wedges (1°, 2° & 3° for larger engines)
11. Die-cut hinges
12. Throttle cable and outer.
13. Throttle cable links
14. Pushrods plus 2 adjustable and 2 static connectors
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16. Pre formed undercarriage.
17. Undercarriage bolts & clamps
18. Sandpaper.
19. Spinner suitable for use with electric starter
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21. Fuel Tubing
22. Rudder and elevator horns
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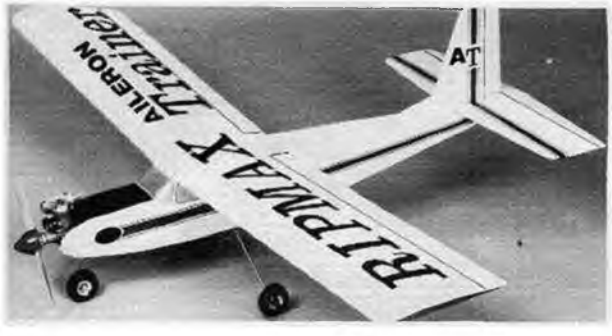

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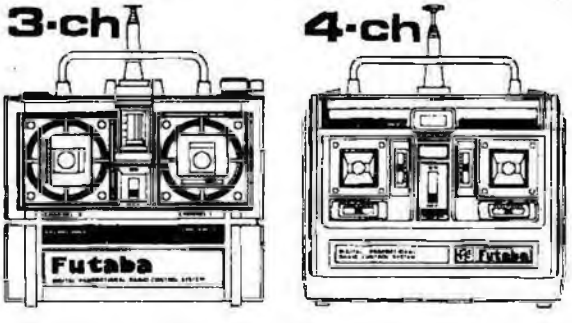
Nicad conversion for above includes Nicads & Charger.



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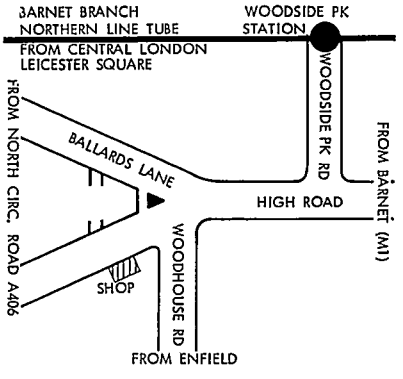

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Diamond Jubilee for SMAE

Although model aircraft flying was already established before the formation of the Society of Model and Aeronautical Engineers, the hobby would never have developed as it is today without the organisation of the Society. As can be seen from the calendar below and the columns on this page, we have a wealth of experience (60 years in fact) and organisation ability going for us, which has set the standard for others to follow and continues to play its part at home and abroad. We all wish that it may long do so and all success for the coming years.

Power site lost through delay and legal technicality

In the first known model flying case involving a Noise Nuisance Notice served under the Control of Pollution Act a good private site was lost due mainly to the S.M.A.E. being brought into the case too late. The details are important for other possible cases in the future.

A private model flying site on a farmer's land in Essex easily met the distance conditions detailed in the Department of Environment Draft Noise Code and the clubs using it had good rules to ensure the models did not exceed 80dB(A) at 7 metres. Flying was virtually confined to Sunday only.

There were few known complaints about the model flying and these only came from one complainant. The site was also used several times each summer by Auto-Cross clubs and it is fairly clear that this was the main source of noise complaints. The farmer also seems to have been having a running battle with the local authority on several other issues.

Without any consultation the local authority served a Notice on the farmer requiring him to stop the model flying on the ground that it would cause a noise nuisance. The farmer appealed *but his grounds of appeal were not co-ordinated with the model flyers or the S.M.A.E.* and did not challenge the contention that a noise nuisance would occur.

Accordingly when it came before the magistrates the S.M.A.E., in the person of the Flying Site Liaison Officer, had its hands tied because the noise nuisance issue could not be raised. The actual appeal grounds were in fact somewhat weak and it was no surprise to see the appeal on those grounds dismissed.

The important point to note is that once the appeal loses there is no second chance.

The lessons to be learnt from the case are:

(a) *Let the S.M.A.E. know as early as possible of any difficulties or anticipated difficulties.*

(b) *Keep in close contact with your site landlord and make sure he lets you know if anything is afoot, e.g. complaints.*

(c) *Try to head off complaints before they get to the stage of legal steps. Contact the S.M.A.E. for advice on this.*

(d) If a Notice of any sort concerning noise or model flying is served on the farmer or your club contact the S.M.A.E. immediately *and do not appeal until S.M.A.E. advice is given. Act quickly, there is only a limited time for some appeals.*

1981 Season — Cardington

The past season has been a difficult one for the S.M.A.E. indoor committee due, principally, to an unprecedented rise in the cost of using Cardington. The decision to share the cost over those attending on the day, not unnaturally caused criticism, as on some occasions the joint travelling/flying costs were prohibitively high. Last season's experience has helped the S.M.A.E. to make future plans and they earnestly hope that the 1981 support received, will be available *and* more widespread for 1982. It is, by general agreement, that Cardington is held to be one of the world's finest indoor sites, and we must do all we can to maintain its use.

The model trade gave generous support during 1981, contributors were Humbrol Ltd., Modellers Den, Solarbo Ltd., Micro-Mold Ltd, Sams Models, and also committee members.

SMAE PROVISIONAL CONTEST CALENDAR 1982

February 7	**Indoor** HLG/EZB/Rubber/CO_2 Scale.
March 14	**F/F** 1st Area Centralised — FIA KFMAA Cup and Plugge O/R — O/P Frog Senior Trophy **Area Venue.**
March 21	**R/C** Aerobatics **RAF Scampton** GF.
March 21	**R/C** Pylon (FAI) **Fulbeck** KH.
March 28	**T/S** F3B League.
April 10-12	**F/F** Euro. Champs Trials — FIA, FIB, FIC (7 rounds — 10/11th — O/R/G/P — 12th **Hemswell** AJ.
April 11	**C/L** 1st Centralised AE.
April 18	**Indoor** Scale.
April 25	**R/C** Aerobatic (FAI) **Hemswell** GF.
April 25	**F/F** 2nd Area Centralised FIC Halfax Trophy and Plugge O/G. O/R Gamage Cup.
April 25	**R/C** Pylon (FAI).
May 2	**Indoor Cardington** LB.
May 2/3	**F/F — T/S** RAFMAA/SMAE **Barkston/Cranwell.**
May 1/2 or or 2/3	**Scale** World Champ. Team Trials R/C Standoff, R/C and C/L Super Scale **RAF Witton.**
May 9	**C/L** 2nd Centralised **North Weald** AE.
May 9	**T/S** F3B League.
May 9	**F/F** 3rd Centralised FIB Weston Cup and Plugge O/G O/P White Trophy.
May 23	**Scale** R/C Stand-off **Wroughton**
May 23	**Scale** C/L Stand-off **Rissington.**
May 23	**R/C** Pylon (FAI) **Fulbeck** KH.
May 29-31	**F/F** Nationals **Barkston Heath.**
June 6	**Indoor Cardington** LB.
June 13	**C/L** 3rd Centralised **Three Sisters** AE.
June 13	**F/F** 4th Area Centralised — Team Glider ME Cup and and Plugge. FIC Astral Trophy C.d'H **Area Venue.**
June 20	**Indoor.**
June 20	**R/C** Aerobatics (FAI) **West Raynham** GF.
June 20	**R/C** Pylon (FAI) **Fulbeck** KH.
June 27	**T/S** F3B League.
June 27	**F/F** Centralised Mini A1 ½A Power, C.d'H, HLG CO_2 **Beaulieu** AJ.
July 4	**Indoor Cardington** LB.
July 10/11	**R/C** Open International Pylon Racing F3D **Harewood House** KH.
July 18	**R/C** Aerobatics (FAI) **Barkston Heath** GF.
July 18	**F/F** Club Champs. O/R, O/G, O/P Club Champ Cup **Everleigh** AJ.
July 18	**Scale** Summer Meeting C/L and R/C Stand off **Abingdon.**
July 20	**Indoor** Cardigan LB.
July 25	**C/L** 4th Centralised **Barkston Heath** AE.
July 25	**T/S** F3B League.
August 1	**F/F** Centralised Mini A1-½A Power C.d'H, HLG CO_2 **Driffield** AJ.
August 8	**Indoor Cardigan** LB.
August 8	**R/C** Pylon (FAI) **Fulbeck** KH.
August 28-30	**Indoor Cardington** LB.
Aug. 28-30	**R/C C/L** NATIONALS
Sept. 5	**F/F** 5th Centralised — Team Power (Keil Cup and **Plugge) FIB (Gutteridge Cup) A1 Area Venue.**
Sept. 12	**R/C** Aerobatic (FAI) **RAF Wroughton Swindon** GF.
Sept. 12	**T/S** 1st Team Trial.
Sept. 12	**Indoor Cardington** LB.
Sept. 18/19	**F/F** 1st 1983 World Champ. Team Trials FIA FIB FIC 7 rounds **Sculthorpe** AJ.
Sept. 26	**T/S** 2nd Team Trial.
Sept. 26	**R/C** Pylon (FAI) **Fullbeck** KH.
Sept. 26	**F/F** 6th Area Centralised — Team Rubber (Farrow Shield and Plugge) FIA (SMAE Cup) ½A Power **Area Venue.**
October 3	**R/C** Aerobatic (FAI) **Bulford Camp** GF.
October 3	**F/F and F/F Scale** Southern Gala — O/P Short Cup O/R — Flight Cup — O/G Pilcher Cup. **R/C C/L** ½A Power — Quick Start Trophy C.d'H HLG A1. Ripmax Cup A1 Glider Ripmax Trophy R/C Stand off Scale, Power and Rubber F/F Scale C/L Aerobatic R/C Aerobatic.
October 10	**F/F** Northern Gala O/P Hamley Trophy O/R Caton Trophy, O/G CM Cup. (A1 C.d'H Vintage Northern Events **Church Fenton.**
October 17	**Indoor Cardington** LB.
October 17	**T/S** F3B League.
October 23/24	**F/F** 2nd WC Team Trials — 1983 WC. FIA FIB FIC Restricted Entry.
November 6/7	**F/F** Provisional date for 1983 World Champ Team Trails FIA FIB FIC.

What's Happening?

April 4
PETERBOROUGH MFC COMPETITION 1st ROUND CLASS A BRITISH DIESEL COMBAT CHAMPS. Venue: Peterborough Embankment. Contact: Brian Waterland, Tel: Market Deeping 343722.
April 11/12
SYWELL R/C EXPO
April 11/12
EASTER HOT-AIR BALLOON EVENT — Balloon Races, parachuting, microlite aircraft, kites and other aerobatic activities. Venue: Holker Hall, Cark-in-Cartmel, Cumbria. For further information: The Manager, Tel:(044 853)328.
May 1/2
MUNSTER R/C CHAMPS. Venue: Waterfall, Co. Cork. Contact: K. Townsend, Beechwood, Church Lane, Greystones, Co. Wicklow.
May 2
1ST ELLIOTT RALLY *FAI TEAMRACE, ½A TEAMRACE, GOODYEAR TEAMRACE, CARRIER, AEROBATICS, SPEED.* Venue: Marconi Avionics, Rochester, Kent. Contact: Peter O'Neill. Tel: Sevenoaks 57899.
May 2/3
SPRING MODEL AIRCRAFT RALLY AND FLY-IN — Best All-round Model, Best Scale Model, Best Sports Model, Best Bi-plane, Best Helicopter, Best Multi-Engined Model, 'Tree Tops' award. Venue: Holker Hall and Park, Cark-in-Cartmel, Grange-over-Sands, Cumbria. Contact: Tel: No. (044 853) 328.
May 15/16
7th SANDOWN PARK SYMPOSIUM — Sandown Park.
May 16
PETERBOROUGH MFC COMPETITION *2nd ROUND CLASS A BRITISH DIESEL COMBAT CHAMPS.* Venue: Peterborough Embankment. Contact: Brian Waterland, Market Deeping 343722.
May 22/23
IRISH THERAL SOARING NATS. Venue: Mallusk, Co. Antrim. Contact: K. Townsend, Beechwood, Church Lane, Greystones, Co. Wicklow.
May 22/23
3 SISTERS INTERNATIONAL *F2A, F2B, F2C, F2D.* Contact: Gordon Isles. Tel. Prestbury 48196.
June 4/6
MK MODEL SHOW Venue: Middleton Hall, Milton Keynes.
June 5/6
ULSTER R/C CHAMPS. Venue: Nutts Corner, Co. Antrim. Contact: K. Townsend, Beechwood, Church Lane, Greystones, Co. Wicklow.
June 12/13
LEINSTER R/C CHAMPS. Venue: Fairhouse, Co. Dublin. Contact: K. Townsend, Beechwood, Church Lane, Greystones, Co. Wicklow.
June 19/20
SCALE DAYS. Venue: Old Warden.
June 20
LEINSTER C/L CHAMPS. Venue: Blackrock, Co. Dublin. Contact: J. Molloy, 57 Auburn Road, Dun Laoire, Co. Dublin.
June 26/27
CONNAUGHT R/C CHAMPS. Venue: Shannon, Co. Clare. Contact: K. Townsend, Beechwood, Church Lane, Greystones, Co. Wicklow.

June 27
PETERBOROUGH MFC COMPETITION *½ COMBAT.* Venue: Peterborough Embankment. Contact: Brian Katerland. Tel: Market Deeping 343722.
July 4
DUNLOP CONTESTS. Venue: Old Warden.

EVENTS

April 3/4
READING SOCIETY OF MODEL ENGINEERS EXHIBITION. Working models, layouts, stationery engines, traction engines, aircraft, boats and cars. Venue: The Hexagon, Civic Centre, Reading. Contact: A. B. Milne, 39 Springhill Road, Goring-on-Thames, Reading RG8 0BY.
May 22/23
MODEL CRAFT AND COUNTRY SHOW — Venue: RAS Stoneleigh.

FÉDÉRATION AÉRONAUTIQUE INTERNATIONALE 1981 CIAM PLENARY MEETING (PARIS)

THE 1981 CIAM PLENARY MEETING (PARIS)

Like most sports, model flying has an international organisation to help you, the everyday model flyer. The Fédération Aeronautique Internationale is the air sports equivalent of the International Olympic Committee, though luckily its activities are not fraught with quite the same international political wrangles. The FAI with headquarters in Paris, is responsible internationally for gliding, parachuting, hang gliding, aerobatics, micro-lights and model flying. In our own discipline it has expertise from around 40 nations to call on to advise on such matters as safety, noise, R/C frequencies, and so on, as well as on competition matters.

In Britain the SMAE represents all model flyers and is appointed by the Royal Aero Club to send a delegate to the annual Plenary Meetings of the FAI's Commission Internationale d'Aero-Modellisme. One big advantage that we all gain from this is that many of the problems that we meet in Britain have often already been solved in other countries; we share their experience without having to start from scratch. Our own delegate, Peter Freebrey, has wide experience in C/L, R/C and F/F, has been a chairman of the CIAM's C/L technical committee, is one of the CIAM's vice-presidents and a Fellow of the SMAE.

Meeting in Paris at the beginning of December, the 31 national delegates to the FAI's Commission Internationale d'Aeromodellisme (CIAM) had a long agenda concerning all aspects of model flying regulations. Great Britain's delegate Pete Freebrey represented the interests of our own model flyers. Great Britain also provides chairmen for three of the technical sub-committees — scale, R/C pylon racing and free-flight in the persons of Dennis Thumpston, Dave Day and Ian Kaynes. Former R/C co-ordinating chairman Chris Olsen was left jobless, after the meeting decided that the various specialist R/C groups should become full technical committees of CIAM.

World Champs

In view of the general dissatisfaction with the organisation of the R/C Aerobatics Championships in Mexico (and the F/F Champs in Spain), it was unfortunate that delegates from neither country were present when the jury reports of the events were discussed. One outcome was a strong recommendation that site approval for a World Champs should be subject to the satisfactory organisation of a similar contest on the site during the previous year. For the F/F Champs at Burgos, criticism was made of the small size of the airfield, the provision by the organisers of misleading information on the wind strengths, the unsuitable retrieving conditions outside the field, the unrealistic processing timetable, unsuitable measuring equipment, late starting and totally inadquate communications during the event.

In view of this, the choice of the host country for the 1983 F/F Championships is hardly surprising. Free-flight is clearly alive and very well internationally, for no less than four nations tabled offers to run the event. Australia and Argentina, who offered last year, were joined by Austria and Israel (with a site in the Negev Desert), and the meeting decided on Wiener Neustadt, where three previous F/F Championships have been run as the venue from August 1 to 7, 1983.

The **1982 F1D Indoor Championships** will be at Slanic, Rumania from September 22-26.

Scale Championships are split between USSR and USA with the 1982 F4B C/L Scale at Kiev from August 24-31 and F4C R/C Scale at Reno, Nevada June 13-19.

1982 Control Line Championships for F2A, F2B, F2C and F2D are to be in Sweden from July 20-26.

Award for achievement

Tom Køster of Denmark was awarded the Alphonse Penaud Diplome in recognition of his outstanding achievement in winning all three outdoor F/F World Champs, the most recent while proxy flying Per Grunnet's F1A entry at Taft.

Records

1981 has also been an active year for record-breakers, 42 new records being approved from the 48 claimed. It is hoped to feature some of these 'ultimate aircraft' in this magazine soon.

Silencing

Proposals from the CIAM Noise committee to impose a blanket decibel limit on all types of model (in spite of the fact that *persistent*, rather than loud, noise is what causes complaints, and this is best limited by running time restrictions) were defeated when it transpired that last year's committee chairman had not sent the discussion material to all the CIAM technical committee chairmen before submitting the proposals!

Free Flight

There were few drastic changes of free-flight rules, the most controversial ones (the change in F1C loading rules, removal of the 20 second attempt, abolition of the three model limit, and automatic participation of the top three flyers at World Champs in the following one) were either referred to the F/F sub-committee or withdrawn. However, the starting positions for FAI contests will in future be ten, rather than five, metres apart, and can be marked with ground level markers, instead of poles, allowing the 'discs on a rope' system used so well at Taft. Each country and the reigning champion, if not a member of his national team, is allotted a starting position for each round by draw.

The requirement to weigh models before each flight has been abolished. A F/F contest may be interrupted if the wind exceeds nine, rather than the present 12, metres/second, or if the prevailing conditions are such that they may lead to unacceptable sporting results. Instead of actual FAI processing stickers, models may now carry markings to the same pattern of the stickers must be applied to the separate parts, and a competitor has the right to present further models for processing up to one hour before the start of a contest, in case of loss or damage after official checking.

There is a re-write of the attempt rule so 3.1.5.(e) now reads: During towing the model or the launching cable collides with another model or launching cable (line-crossing) and the model is released within one minute of the line-crossing. 3.1.6. now reads: An attempt may be repeated when during the flight the model collides with another airborne model or towline or with a person when being launched.

For F1E F/F slope soaring contests the contest will be run in rounds in future, and a comprehensive package of rules was accepted, proposed by the UK's magnet steering enthusiasts.

Except for changes for safety reasons, alterations approved at this CIAM meeting are effective from January 1, 1983.

Control Line

There were many detail alterations to the Sporting Code arising from the various proposals on the agenda; but apart from the adoption of a revised set of combat rules (**F2D**) which we reproduce in full in this feature, the rule changes are not extensive and do not materially affect model specifications.

Two immediate changes, effective January '82, relate to **Combat**. They are in connection with the flying lines which must now be multi-strand, of a minimum diameter of 0.339mm. The current regulation requires 0.289mm. In practice this means 0.30 and the new diameter will become 0.35mm. Laystrate is acceptable. Other changes come into effect from January 1, 1983.

Forty penalty points will be awarded if a model is launched before the signal to launch is given. Previously this required elimination from the heat. Another interesting change is that in the event of a model flying away, with or without the lines and handle, the air time ceases at the instant of such a flyaway. This of course affects the regulation which awards a point for each whole second that the model is airborne. Concerning points, it was decided that where there is a near-tie with a difference between the contestants of five points or less, these shall be considered as equal time.

The jury and organisers' guide is to have clarification defining the Circle Marshall as the official whose position during the heat is just outside the centre circle. Of special benefit to those who have to run events in inclement weather, the organisers' guide will have a new paragraph stating that before the beginning of official events the promoter shall run a test combat to determine the quality of the streamer. It must be emphasised that these changes apply to the existing (1979) general regulations in the Sporting Code and are not all incorporated in the re-expressed combat regulations which follow.

While there were apparently no requirements for rule changes in **Control Line Aerobatics**, there are subtle alterations to **Team Race**.

All concern landings, and the handling of the model during the pit stop. Quite how the required heights are going to be measured is not explained, but the jury guide is to contain a recommendation that when overtaking a model on the ground for a pit stop, the model in flight must be at least 0.5m high. Similarly the Sporting Code is to incorporate a rule requiring that when the mechanic catches the model, the wingtips of the model must be kept lower than 0.25m off the ground. Failure to observe these critical altitudes will result in warnings. Appropriate additions have now been made to the Sporting Code in the team race warnings section. For example if a model landing close (approximately half a segment behind) another landing model does not fly higher than the now required half metre and a collision occurs then that team will be eliminated from the heat. Also if during the pit stop and catching of a model, which at the same time is being overtaken by another model, the mechanic lifts the wingtip higher than the quarter metre off the ground and causes a collision, he similarly will cause his team to be eliminated from the heat. Additionally if a model runs into another pitting area and causes a collision with a model already pitting in that area, then that too will require elimination from the heat — tough measures!

Radio controlled guides

An important decision which will be welcomed in **Thermal Soaring**, is that for a World Championships a minimum of five full rounds must be flown so that the event is now a 15 flight contest. Most important change concerns the speed task which is now doubled in distance.

Other changes to hand operated pulley launching, line breaking strain and the position of the pilot and helper during the competition are detailed in our sister magazine RCM&E.

Slope Soaring regulations are back in the news. A set of draft rules for a Slope Soaring Speed event have been referred to the Sub-Committee for consideration.

Flying Scale

Class F4B Control Line Flying Scale is affected by the change of general characteristics which allow the model to be up to 6kg and it is noted that this weight is now *without* fuel. It was also encouraging to see that the optional demonstrations in the contest flight now include two flight functions of the contestant's own choice. One chosen function was always permitted in addition to the standard list of options; but now the use of two options will permit other variations which were not considered.

Radio Controlled Flying Scale similarly allows one extra contestant's chosen flight function which will be welcome, also the increase of engine capacity up to 15cm3 *if* the engine is a four stroke.

One other change is that the size of the landing circle for RC Scale is increased from 25m to 35m diameter and the K factor for landing outside the circle is improved from K = 4 to K = 6. Additions to the rules concerning use of flaps and retractable landing gear are detailed in our sister magazine RCM&E.

RC Aerobatics

These are the subject of a separate report by Ken Banks appearing in RCM&E together with an illustration of the turnaround system for the continuous flight pattern.

FAI COMBAT (Class F2D) RULES —

4.4.1 Definition of a combat event

A combat event is a contest during which eliminating heats are followed by semi-finals and a final in which two models are flown at the same time in the same circle for a predetermined time, the object being to cut a streamer attached on the longitudinal centre line of the opponent's model, points being awarded for each cut taken.

4.4.2 Definitions

(a) A combat model is a model aeroplane in which the propulsion energy is provided by a piston motor(s) and in which the lift is obtained by aerodynamic forces acting on the supporting surfaces which must remain fixed (except for control surfaces) during flight.

(b) The longitudinal centre line shall be defined as the axis of the propeller in the case of a single engined model and the axis of symmetry in the case of a multi-engined model.

4.4.3 Combat site

A combat site must consist of two concentric circles which shall be marked on the ground:

(a) the flight circle, radius 20 metres;

(b) the centre (piloting) circle, radius 3 metres;

The circles must be laid out on grass.

4.4.4 Competitor

The pilot, who shall be the entrant and known as the competitor, may employ a maximum of two mechanics in any one bout. (In exceptional circumstances of wet or extremely windy weather, an additional helper may be used as a streamer holder and must perform no other function for the duration of that combat period). For World and Continental Championships the helper (a maximum of six) other than team members or the team manager, must be registered for no more than one national team from the beginning of the competition through to the close. During active combat periods the mechanic(s) must wear protective headgear fitted with an effective retaining strap.

4.4.5 Characteristics of a combat model

Maximum surface area: 150sq. decimetres.

Maximum weight: 5 kilogrammes.

Maximum loading: 100 grammes/sq. decimetre.

Maximum swept volume of motor(s): 2.5cc.

The model shall not carry any artificial aid intended to assist the cutting of the streamers.

The model shall be equipped with a device specially designed to retain the streamer which shall be fitted on the longitudinal centre line and sufficiently strong so that the streamer shall not become detached under normal flying conditions.

4.4.6 Controls — technical verification

(a) Line length: the length of the control lines must be 15.92 +/- 0.04 metres. It is measured from the axis of the control handle to the longitudinal centre line.

(b) Control system: two multi-strand control lines of a minimum diameter of 0.339mm must be used. No free ends capable of entangling an opponent's lines shall be permitted.

(c) Line tests: before each heat any sets of lines which may be used shall be checked for length. A pull test shall be applied to the assembled control lines, model(s) and handle(s) to be used in that heat equal to 20 times the weight of the model in flying order. A similar pull test shall be applied to any spare sets of lines which may be used. Additionally a pull test shall be applied to the assembled model(s), lines, handle(s) equal to 20 times the model weight.

4.4.7 Number of models

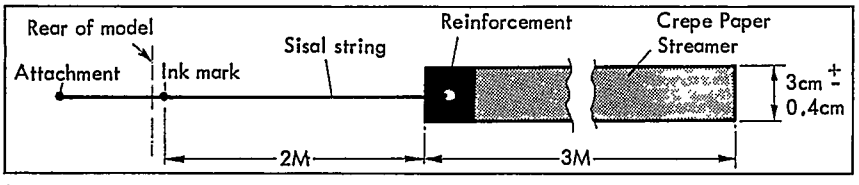
(a) A competitor may have processed a maximum number of models equal to twice the number of bouts a competitor may have to fly (excluding re-flights). Only one processing certificate is required for each design of model presented by each competitor.

(b) Each contestant shall be permitted a maximum of two models in each combat period. If the reserve is used, the streamer or its remaining parts must be transferred to the reserve model. Handle plus lines for the reserve must be placed just outside the centre circle.

4.4.8 Streamer

The streamer shall consist of a crepe or similar toughened paper streamer three metres long and 3cm wide (plus or minus 0.4cm), fixed to a sisal string of 2.5 metres minimum length. There shall be a clearly visible ink mark two metres from the junction of the string and streamer. All streamers must be of the same length.

The streamer shall be attached to the model in such a way that the ink mark is level with, or behind, the rearmost portion of the model (see sketch below).



The colour of the streamer must be different for each model in the heat.

Each pilot/pit crew shall be issued with a second streamer at the start of the bout, to be used if required. This streamer shall be returned to the organiser if it remains unused.

4.4.9 Method of starting

(a) All signals shall be both acoustic and visual.

(b) During the starting period the launching positions must be separated by at least a quarter of a lap. The first named competitor in the draw shall have the choice of streamer colour and the other the choice of starting position.

(c) The motor(s) must be started by flicking the propeller by hand.

(d) A first signal, given by the centre marshal, shall signify the beginning of the 60 seconds period when the mechanic(s) or the pilot have the opportunity to start, run and adjust their motors.

(e) A second signal, given by the circle marshal, shall signify the beginning of the combat period on or after which the models may be launched.

(f) From the moment the centre marshal has given the signal to launch the contest lasts for four minutes.

(g) When the centre marshal is satisfied that each model has completed two level laps, anti-clockwise, separated by approximately half a lap, he will give a signal that the combat may

commence.

(h) Combat may begin after a restart signal from th circle marshal following an interruption when one or both models have been grounded. This signal shall be given as soon as the circle marshall is satisfied that there is approximately half a lap separation between the two models.

4.4.10 Termination of the contest

(a) The circle marshal shall give an intermittent signal to terminate the contest four minutes after the signal to launch, i.e. five minutes after the first signal to run and adjust motors.

(b) The same signal shall be given if the contest has to be terminated due to disqualification of one or both contestants or for any other reason.

4.4.11 Method of scoring

(a) Scoring shall commence from the signal to launch and continue for the four minute period.

(b) 100 points shall be awarded for each distinct cut off the opponent's streamer. There is a cut each time the model, propeller or lines, flies through the opponent's streamer resulting in paper particle(s) becoming detached from the streamer.

(c) A cut must contain at least one part of the paper streamer. A cut that contains string alone will not count.

(d) Should the string become detached from the model whilst airborne the competitor shall be penalised by 100 points and must immediately on a signal from the circle marshal land and replace the streamer. Ground time will be counted from the moment of such a signal being given.

(e) One point shall be awarded for each whole second that a model is airborne during the four minute period.

(f) Each whole second of stay on the ground of the model shall be penalised by one point. In the case of a model flyaway, with or without lines, this ground time shall commence from the moment of such flyaway (see 4.4.12 (b)).

g. Each warnable offence (see 4.4.14) shall be penalised by the deduction of 40 points from the competitor's score.

(h) Should the mechanic(s) damage the streamer, or the model cut its own streamer, whilst the model is on the ground the mechanic(s) must replace it with a new streamer. If they launch the model without so replacing it the competitor shall be penalised by 100 points plus one point for each second the model is airborne with the damaged streamer.

4.4.12 Attempts

Only one attempt will normally be allowed to complete a combat bout except for when:

(a) a streamer breaks or fails to unfurl from the rolled state.

(b) in the event of a model flyaway, as a result of the lines having been severed by his opponent's model, in which the airplane and streamer may not be retrievable due to the distance flown. (The affected pilot/crew may elect to use a new full length streamer instead in which case they shall not be entitled to a further attempt).

For these exceptions the jury will grant a further attempt to complete the bout.

4.4.13 Conduct

A pilot must remain inside the centre circle except at the moment of release. During the combat period each competitor (and his pit crew) shall be watched by at least one member of the jury specifically assigned to him. In addition, the Circle Marshal, to ensure that they behave in a fair manner according to the rules.

If a model lands or is damaged within the five minute period, the mechanic(s)/pilot may choose to use any combination of lines and model provided rules 4.4.5, 4.4.6, 4.4.7 and 4.4.8 are complied with.

After a mid-air collision the heat shall continue as if both models had landed, subject to articles 4.4.15(c), (f), (l), (m) and (n).

4.4.14 Offences

The following are warnable offences and shall attract the appropriate penalties (4.4.11 (g)).

(a) If a pilot unintentionally leaves the centre circle whilst his model is airborne.

(b) If the mechanics enter the flying circle at an oblique angle or cut across the flying circle to reach a downed model. One penalty only will be incurred for each offence even if more than one mechanic is involved.

(c) If the mechanic(s)/pilot do not immediately, or after a line disentanglement, withdraw a grounded model to outside the 20 metre circle prior to servicing it.

(d) Early landers.

4.4.15 Cancellation of the flight

An entrant will be eliminated from the heat and his opponent declared the winner if:

(a) He deliberately attacks the streamer of his opponent's model prior to the centre marshal's signal to commence.

(b) His model fails to become airborne within two minutes of the signal to launch.

(c) He attempts to fly a model which cannot remain airborne under its own power or under full control of the pilot.

(d) He interferes with his opponent or forces his opponent to leave the centre circle.

(e) He deliberately flies in a dangerous manner.

(f) He leaves the lines or any of his models, which at that moment are not airborne, in the centre circle.

(g) His model is launched before the signal to do so is given.

(h) He attacks his opponent's streamer without his own, or the remaining parts, attached to his model.

(i) He is not present at his allotted flight time, unless he has the express permission of the circle marshal.

(j) He leaves the centre circle, intentionally whilst his model is flying, or without informing his opponent of his intention to do so when his model is grounded.

(k) He deliberately leaves the centre circle, for a purpose other than to pick up the lines of his reserve model or to allow his model to be serviced, without wearing protective headgear.

(l) He flies in such a manner as to inhibit his opponent, or his opponent's pit crew, from clearing any line entanglement,

(m) He flies other than level in an anti-clockwise direction when only his model is airborne and there is no line entanglement.

(n) He fails to clear any line tangle prior to launching his reserve model unless both he and his opponent have informed the circle marshal that they have agreed to continue to bout without clearing the line tangle. In this event the circle marshal must agree to the contribution, only doing so when he is satisfied that it is safe to continue.

(o) For any other flagrant breach of the rules.

(p) Release handle while model is in flight.

4.4.16 Classification

(a) The contest shall be run as a knock-out tournament.

(b) The contestant who obtains the greater score in points in each heat will be the winner.

(c) A competitor will only be eliminated from the competition when he has lost two bouts, providing that eight or more competitors will remain in the contest at the end of the round.

(d) Early rounds — Each round will be drawn from the competitors remaining in the competition, subject to 4.4.16(l), the first competitor to be drawn will receive a bye should there be an odd number of competitors remaining in the competition. This continues until the next round could leave less than eight competitors in the competition.

(e) Elimination round — At this stage an eliminating round will be flown, if required to reduce the number of competitors to eight. This round will be drawn firstly from those competitors who have already lost a bout and only if required from those who have lost none. In this eliminating round all competitors will be treated as equals the losers in this round being eliminated from event.

(f) last eight — When only eight competitors remain the event shall be run as a straight knock out event the winners of each bout progressing to the next round.

(g) In the event of a tie, the heat shall be re-flown. A bout shall be considered a tie if the difference in the scores is less than 11 points.

(h) The final placing of the finalist is established solely on the results of their flights in the final. The remaining two semi-finalists will be matched against each other in a deciding flight for the third place.

(i) Competitors of the same nationality should be drawn apart for as many rounds as possible.

4.4.17 International classification

(a) Each round, including the eliminator of one was required, will be numbered in reverse numerical sequence, beginning with the final as number 1; the semi-finals as round number 2 etc.

(b) Each entrant will obtain a score according to the round in which he was dismissed. Thus the winner of the final obtains a score of 0 (zero), the loser of the final will obtain a score of 1; the losers of the semi-finals each a score of 2; those of the quarter-finals 3; etc.

(c) The scores so obtained will be added for the three participants of each nation.

(d) Nations shall be classified according to the score obtained as in paragraph 4.4.17(c) above, the lowest score becoming highest in position.

4.4.18 Judges and timekeepers

The organiser shall appoint a panel of three CIAM approved judges, (for open International only one needs be CIAM approved), and who shall be of at least two different nationalities. The judges must have at least one language in common. Two timekeepers/scorers shall be allotted to each competitor.

Militky-Brditschka MBE-1

FRED MILITKY helped shape the hobby of radio control model aircraft as we know it today. Never an exponent of 'performance' designs, he did, however, as chief designer for the Graupner Company in West Germany, set the standard of excellence in designs for the average 'Sunday flier,' with a long line of kitted designs built and successfully flown throughout the world.

Yet for all his efforts in producing models for the masses, Fred enjoyed innovation and as long ago as the late 1950's was developing electric powered free flight models, a line of experiment which resulted in the little *Graupner Silentius* using Swiss 'Micromax' motor and salt water batteries.

A decade later, Fred was again into electric model flight, on a bigger scale this time for radio control, culminating in his kitted *Hi-Fly* design.

But Fred had even bigger ideas — why not an electric powered man carrying aircraft?

A suitable power plant was found in the Bosch KM77/2A13A, an 80 volt working 8-10kW motor offering 13 horsepower when coupled to a 24Ah VARTA FP25 sintered-cell Ni-Cad battery.

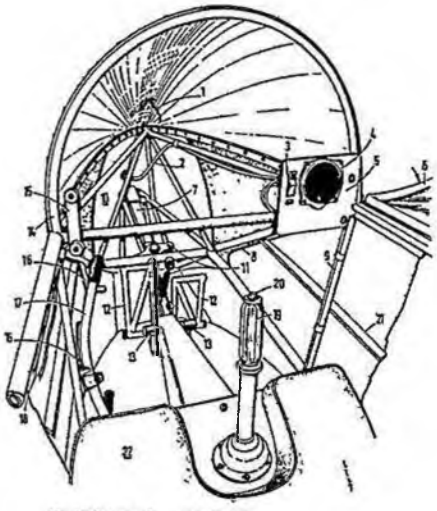
Electric motors alone, like broomsticks, don't make good flying machines and a search for a suitable airframe for conversion settled on the Austrian HB-3 motor glider, which designer Heinz Brditschka made available for conversion.

In fact, conversion proved minimal, necessitating only substitution of the electric power system, coupled to a two-blade Hoffman pusher propeller via vee-belt geared transmission to run at 2,400rpm. Penalty of the conversion was an additional 132lb of all-up weight.

Resulting conversion was the MBE-1 (Militky Brditschka Electric One), successfully test flown at Wels, Austria, on October 21, 1973. This first ever solely electric powered flight of a manned, heavier than air craft was a total success, the machine climbing to 985 feet and landing after a total air time of 9:58 after consuming about half the available battery charge.

On subsequent flights the MBE-1 was taken to 1,245 feet on flights of better than 12 minutes without completely draining the batteries.

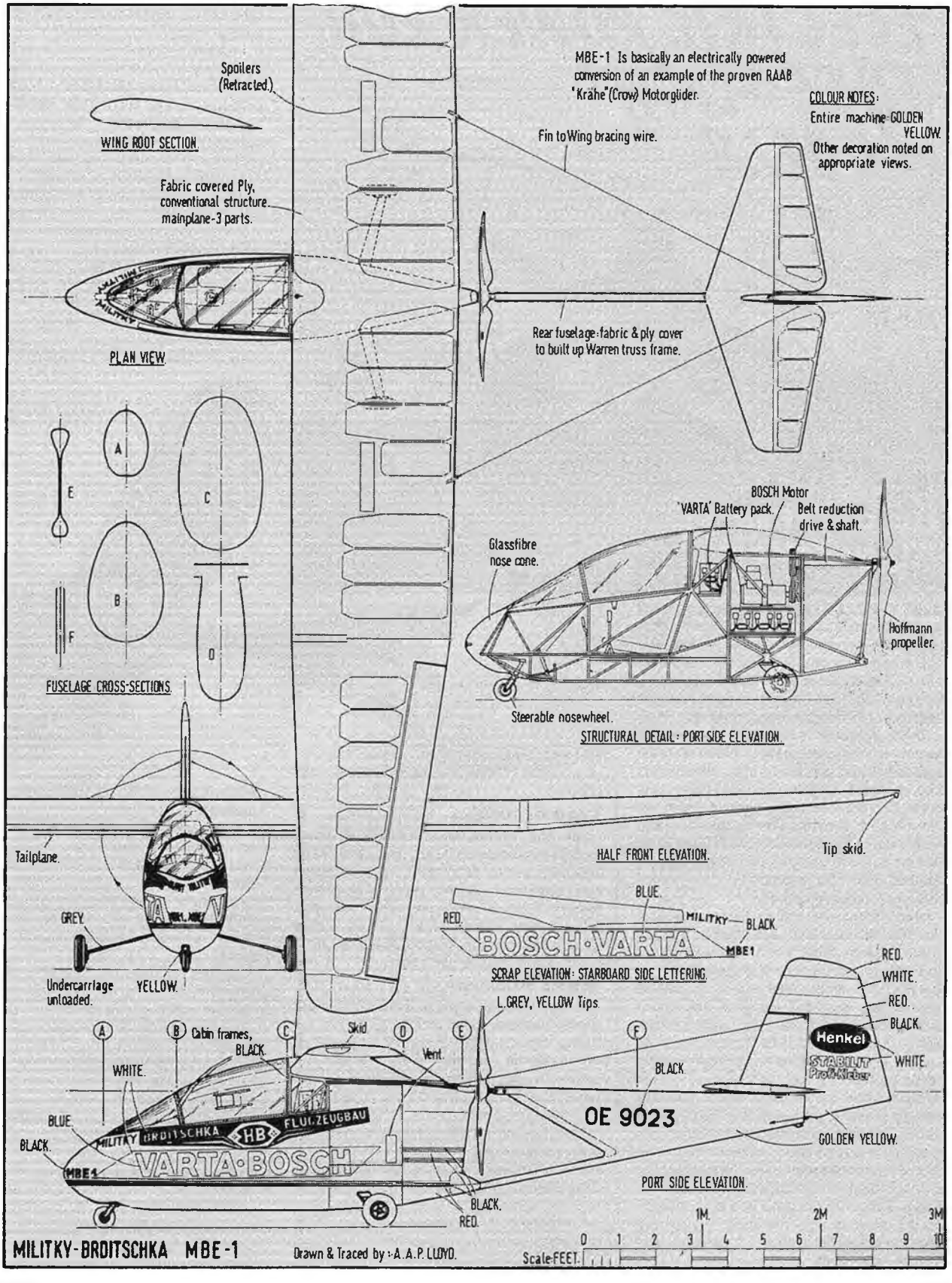
Others have now taken up the challenge of electric power for man carrying aircraft, with solar cell energy source the subject of current experiment, but the MBE-1, the first of its kind, is assured a place in aviation history, along with designer Fred Militky.



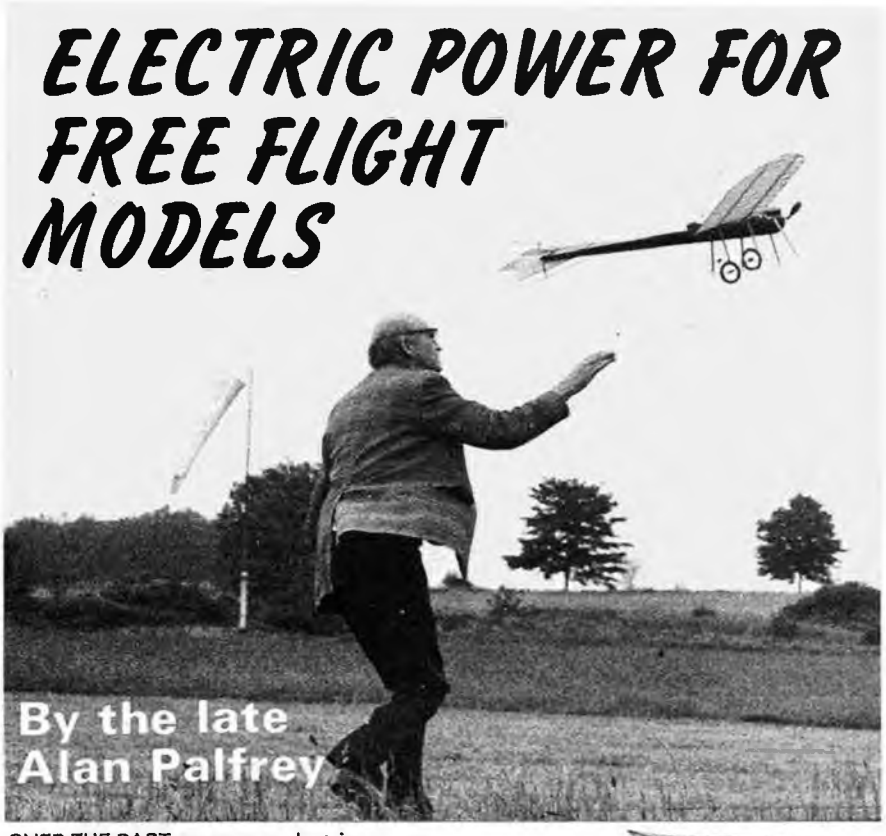
1. Wool tuft (indicates yaw)
2. ASI Tube from nose cone.
3. Motor On-Off switch.
4. Airspeed indicator.
5. Instrument panel.
6. Sideways hinging canopy.
7. Fibreglass nosewheel damper.
8. Fibreglass nose cone to here.
9. Switch cable to motor.
10. Tubes fairing to nose cone.
11. Nosewheel steering linkage.
12. Rudder pedals.
13. Mainwheel brakes.
14. Windscreen frame.
15. Spare panel lugs.
16. Detents for spoiler lever.
17. Spoiler deploying lever.
18. R.I. Wiring.
19. Control column.
20. R.I. Switch.
21. Wood longerons.
22. Seat.

Cockpit detail, MBE-1.

Left: Bosch motor and reduction belt drive installation with Varta batteries below and behind motor. Below: Fred Militky with his electric powered model 'Hi-Fly,' the starting point of his full-size project.



ELECTRIC POWER FOR FREE FLIGHT MODELS



By the late Alan Palfrey

OVER THE PAST year or so, electric power for radio-controlled model aircraft has become quite popular, and it is getting to be a common sight on the flying field to see an electrically assisted R/C glider overhead. Not so with free-flight however; electric models are conspicuous only by their absence. I think this is a great pity because particularly for scale models, electric power does have some considerable advantages and in some respects is an easier proposition than for radio-control, with its demands for ever increasing duration and weight carrying capabilities. The flight of an electric scale model can be extraordinarily realistic and the possibilities for multi-engined types are endless.

I don't know why the situation should be like this, perhaps it reflects the fact that up to the present there are only a few power units designed for free flight available on the British market. There is of course no reason why a motor designed for radio-control use should not be used for free flight. Smaller batteries could then be carried and the overall cost and weight would be less.

Having had some experience over the past few years with electric flying-scale models, at first with modified motors, not specifically designed for model aircraft and then with commercial units, I have found it to be an ideal form of power for this type of model. This article is intended to put people 'in the picture' and hopefully encourage some to try electric flight. I am sure that anyone who does will not regret it and if demand for improved units can be stimulated, maybe the manufacturers will oblige.

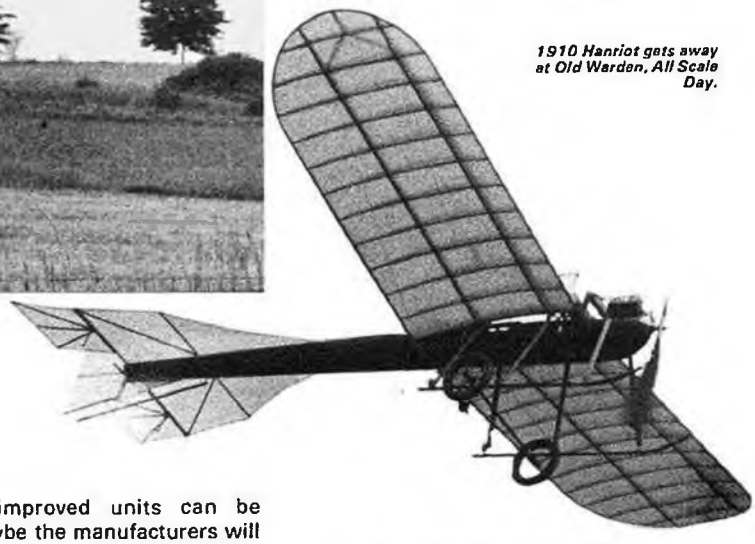
Type of model

For the actual construction of scale models I could do no better than refer to the excellent series of articles by Eric Coates that appeared in the Aeromodellers of March 1971 to February 1972. In this respect the construction should follow rubber rather than engine-powered practice to keep the weight down.

Short History

It may surprise some to learn that electric power has been used in the past for full size flying, albeit lighter-than-air machines; in other words airships. The earliest use seems to have been in 1883 in France when the Tissandier brothers constructed an electric airship that achieved some rather limited success. In those days the steam engine reigned supreme for land and water transport, but although Henson and Stringfellow had designed a light steam engine for aircraft, the dangers of hanging a furnance under a flimsy container full of hydrogen were only too evident. The petrol engine was then in its infancy but electric motors were fairly well advanced so it was natural for the early airship designers to turn to this form of power. The Tissandiers' airship motor was supplied with current from a battery of bichromate of potash cells. These are primary cells, i.e. not rechargeable, and have electrodes of zinc and carbon in an electrolyte consisting of potassium bichromate dissolved in dilute sulphuric acid. Voltage is 2 volts per cell, high for a primary cell, and but for the inconvenience of the acid and the fact that the zinc gradually dissolves, even when the battery is not in use, unless it is removed from the acid, a developed form might even be suitable for model flight.

The next airship development was that of Renard and Krebs, also in France. Their dirigible 'La France', running on a 9 HP electric motor supplied from special chromium-chloride cells invented by Captain Krebs, in 1884 made the first ever



1910 Hanriot gets away at Old Warden, All Scale Day.

out and home flight, giving quite a boost to aviation in general.

Of course the use of electricity was only an interim measure until petrol engines were sufficiently developed for airship use; the available electric power plants would have been far too heavy for aeroplanes. It is only recently that a full-sized aeroplane has made sustained flights under electric power.

In this country, the late Col. Taplin was first off the mark with his electric 'Radio Queen' running on silver-zinc batteries. There was also a Japanese ready-made model on sale for a short time, that ran on water-activated cells. These have extremely high power for their weight but being manufactured for very specialised applications are virtually unobtainable by the general public. It was probably this that killed the Japanese model.

The second breakthrough that made electric flight thoroughly practical came about fairly recently. This was the introduction of the sintered-plate nickel-cadmium cells. These cells with their fantastic power output made possible

electric units with power-to-weight ratios approaching those of the average diesel. Almost as important from a model standpoint was the fact that they could be recharged in a matter of minutes on the flying-ground.

This brings us up to the present when there are two motors on the British market suitable for models of around 35in. span — the Mabuchi A1 available from Ripmax price £3.15 and the Astro Flight .02 available from Micro-Mold price £5.88.

Note: also available now from Micro-Mold are the Mabuchi 380S and 385S which are also suitable for free flight models. Ed.

Advantages

Compared with rubber power, electric has far better weight distribution, most important with rotary or radial engined prototypes, which invariably turn out to be tail heavy with rubber power, and longer duration of motor run. This last point should perhaps be qualified by saying that it applies to the average model suitable for outdoor flying. I appreciate that by means of very light construction, the duration of a rubber powered scale model may be increased, but this type of model is then only really suitable for dead calm conditions.

Multi Engined Scale Models

The one type of model where I believe electric power scores over all other systems is multi-engined scale. Electric power has two very great advantages here; the danger of a motor cutting prematurely, which can lead to a fatal spiral dive is eliminated, as is also the difficulty of starting a number of diesel or glow plug engines. Because all electric motors may run of a common battery, they will all stop together when the battery is exhausted, and a single switch can be arranged to start all motors simultaneously. Incidentally, synchronisation may be checked by viewing one propeller edgewise on through the disc of another. If the motors are running at nearly equal speeds, the first propeller will appear to be stationery or rotating only slowly. This condition indicates well matched motors.

The ease with which multi-engined aircraft may be modelled using electric power opens up a whole new range of interesting subjects. Even a Dornier DoX is possible (if your pocket can stand it!) Imagine trying to start 12 diesels before a flight! One advantage of multi-engined models is that generally the full-sized aircraft has been designed for stability rather than manoeuvrability, so that the scale model will usually fly with scale surfaces, aerofoil section, and dihedral.

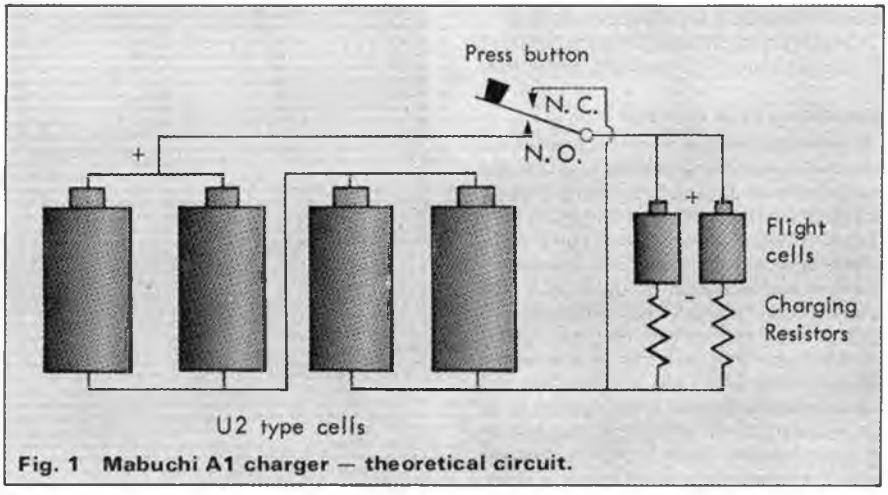


Fig. 1 Mabuchi A1 charger — theoretical circuit.

Mabuchi A1

The 4½in. diameter propeller is mounted in a plastic spinner which is a tight fit on the armature shaft. The shaft is lightly splined to ensure a positive drive.

Batteries consist of two 100 mAH fast recharge nickel cadmium cells contained in a plastic housing which also forms the motor mount. The cells are not welded together but contact is made by pressure from a coil spring in the usual 'torch' fashion. The motor has a plastic casing which is a snap-on fit on the battery container which in turn slots onto a plastic mount designed to be attached by self-tapping screws to fuselage cross-members. These should be of hardwood or ply. The whole unit may be quickly detached from the model by sliding it off the mount. An ingenious form of switching is used. A contact on the motor casing makes with one on the battery container. The whole motor assembly may be rotated by a lever fixed to the casing to bring the contacts together or apart saving the weight of a switch. I found that operating the lever did throw rather a load on the mounting screws and would suggest that some side support be given to the battery container.

Charging

A special charging unit is supplied for the flight battery but the motor may be purchased separately if other charging arrangements are to be used (see later).

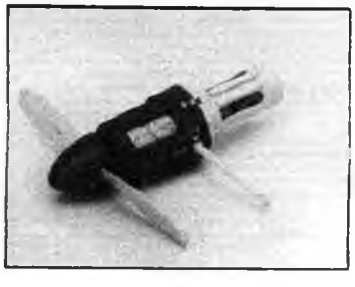
The standard method of charging is to first remove the two cells from the power unit by detaching the motor when they may be dropped out. They are then transferred to the charger which has two recesses for them. The power supply is four U2 dry cells contained in the charger and the current is switched on by a press-button on the lid. **Fig. 1** shows the charging circuit and if the connections are traced out, it should be apparent that the two flight cells are charged in parallel from the U2 cells which are connected in a series/parallel arrangement. Each flight cell has a series resistor to limit the current to a safe value. I made the charging current to be about 1 amp with fresh batteries, which bears out the stipulated charging time of up to 5 minutes. Complete discharge before charge is done automatically as soon as the cells are transferred to the charger by the normally closed contact of the press-button which connects a circuit via the series resistors. Of course this means that the cells must be removed from the charger before the press-button is released or they will be discharged.

This simple method of charging is good for the youngster or beginner but it must be admitted that holding the press-button down for 5 minutes can be rather tedious. The cells may be charged at 1½ amps without harm, and consequently the time could be shorter.

Tests of the Mabuchi Unit

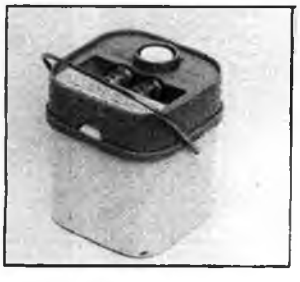
To return to the unit itself, I had been rather sceptical about the power of a direct drive unit, having found step-down gearing and a larger propeller to be necessary for maximum power. This is of course true, a large propeller 'bites' the air better than a small one, which is one reason why the Wright Bros. were successful with a small 12 HP motor and step down chain drives to large propellers.

There are pros and cons however as with everything and the power of the Mabuchi A1 is by no means negligible in its standard form, and it can be given a boost as described later. Of course some weight and friction is saved by the absence of gearing and there is no doubt that the beautifully



Left: Mabuchi A1 unit. Note the unit. Note the switch lever on the side.

Right: Mabuchi A1 charger unit, holds two U2 batteries which give a 1 amp charge by depressing the button on top for five minutes.



smooth running is an attractive feature.

A bench check showed thrust to be about 1¼ ozs. for around 30 seconds useful run.

Boosting the power

The thrust developed, pointed to an all-up weight of about 5 ozs. and my first thought was to try a smaller version of my Hanriot Monoplane which had been flying well with a modified RE 36 motor running on 6 volts.

This approach was not so successful however and although all-up weight was only 4½ ozs. the model had practically no climb at all. I rather think that the trouble was too much drag, as certainly the weight was not excessive. I am not sure that the deeply undercambered wing section is all that efficient for an electric model, and on my next model I used a slightly thinned Clark Y section with much better results, though to be fair this was not entirely due to the wing section. This model is a Nieuport "Nighthawk" of 21in. span and 4½ozs. total weight.

After my experience with the Hanriot I decided to increase the voltage by adding another cell making 3 in all. The Mabuchi accepts the extra voltage without harm, and really does "motor," developing over 1½ozs. static thrust.

A small modification made to the propeller also helps boost the performance. The standard propeller has thickened tips, presumably to prevent small fingers being cut if they come into contact with the rotating blades. However it is really less dangerous than a small glow-motor and these tips must reduce the revs. I therefore carefully filed each tip to a tapering profile, continuing the blade section to the end and polished with fine sandpaper.

A useful point in connection with the propeller is that the bush of the spinner is a tight fit in the boss of a Keil Kraft 6×4 nylon propeller. This is the propeller shown in the photos of the model; it was fitted during the initial trimming stage but has since been replaced with the original propeller. On the basis of a bench test it appeared to give increased thrust and would be worth investigating further. The propeller assembly is easily removed by prising off with a screwdriver between the motor casing and the rear of the spinner.

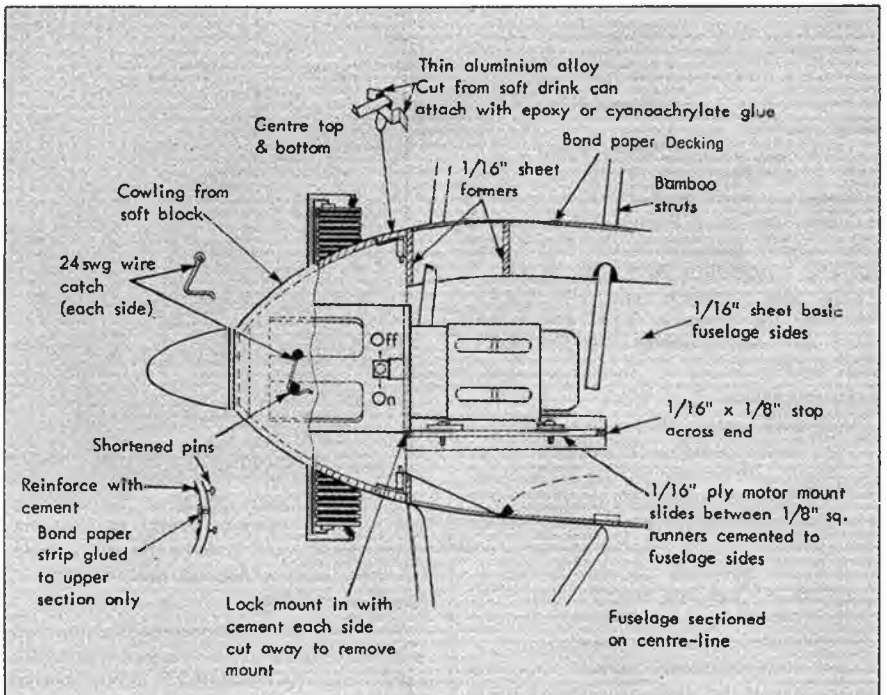


Fig. 2 Motor mount arrangement in the Nieuport Nighthawk.

Installation in the Nieuport 'Nighthawk'

With the soldered-in battery it is no longer possible to use the standard charging arrangement or to slide the unit off the mount for removal. I therefore made the entire 'electrics' as a unit with the motor mount screwed to a piece of 1/16in. ply that slides into the fuselage between runners of 1/8in. square balsa cemented to the inner surfaces of the fuselage sides. The battery is taped to a length of 1/8in. × ½in. hard balsa cemented to the ply and extending down the fuselage so that the position of the battery may be varied. The cowling, carrying the dummy radial engine cylinders was made in two sections, an upper and a lower, which clip in place around the motor. **Fig. 2.**

By making the cowling easily detachable it is possible to use the standard battery and charging arrangement if desired. For charging the battery in-situ a miniature jack and matching plug was used. The jack was mounted on the nose between two of the dummy cylinders. A wiring diagram of the unit is given in **Fig. 3.**

Flying the Nieuport

After some initial trimming problems involving the wing incidence and rudder, the Nieuport has proved to be a good and stable flyer. It climbs in a wide left-hand circle for about 30 seconds then levels off for a cruise and glide down. The glide is reasonably good for such a small model, and is helped by the small amount of charge left in the battery. It has scale surfaces and practically scale dihedral, in fact the only non-scale thing about it is its uncanny quietness but at least the public have nothing to complain about! Duration is about 1 minute for a 3 minute charge at 1½ amps (less than the maximum).

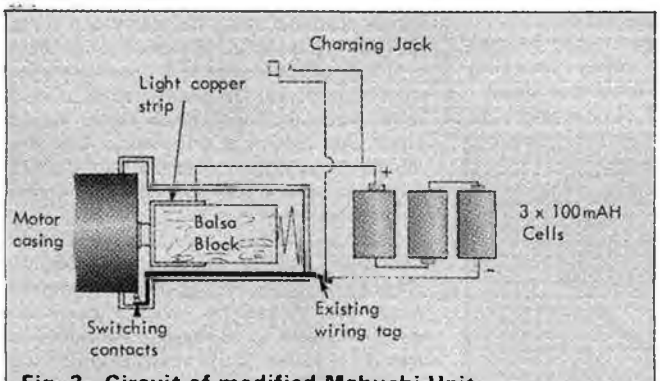
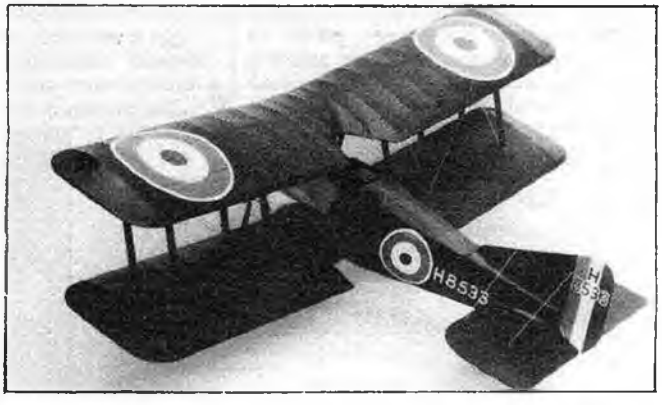
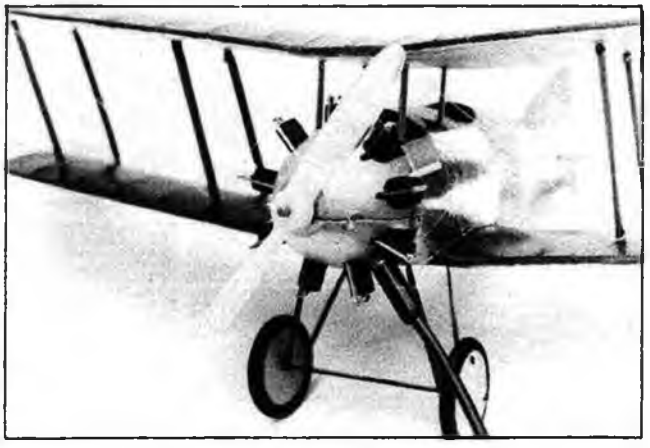


Fig. 3 Circuit of modified Mabuchi Unit.



21in. span Nieuport 'Nighthawk' with Mabuchi A1 unit fitted.

The author's 25in. span Bristol Scout fitted with very nice Peck Polymer scale spoked wheels.



Fine engine detail of the author's Nieuport Nighthawk which illustrates the fine engine detail made possible with electric power. Note the charging lead inserted at the bottom of the engine cowl.

Suitable models for the Mabuchi

Maximum duration would only be obtained with a clean design and a lower wing loading. Although a model biplane has a relatively large wing area, for stability reasons the lower wing is not operating at its most efficient incidence and interference effects also limit wing efficiency. For greatest duration a powered-glider type is required, and I think is possible that the Mabuchi A1 would fly a model of this type on two AA size nickel cadmium cells. (pencell size). One could expect 2½ minutes maximum motor run with these cells (30 amp — minutes) but the model would need to be as light as possible with an efficient high aspect ratio wing.

For more modest durations, but still over the minute mark, one could hardly go wrong with a high-wing cabin model as a first attempt. There are plenty of kit models about 25in. to 36in. span designed for rubber power which could easily be modified to take the Mabuchi. The one essential is to keep it light. For the Mabuchi running on its standard twin cells, total weight should be kept down to 5 ozs. On three cells it would probably lift a total weight of 6 ozs.

Installation shouldn't present much of a problem. If using the standard charging arrangement it will be necessary for the motor itself to be clear of the fuselage nose so that it may be snapped off sideways for removal. If the model is a sports type, the motor may then be left uncowled.

Battery checking and connections

Finally a note on checking the cells in the flight battery may be of help. If the motor loses power it is almost 100% certain that the trouble will be due to one of the cells. Now one could find the faulty one by substituting a known good cell for each in turn, but with a welded assembly this is obviously impractical. However, by use of a voltmeter the cells are easily checked in situ. The voltmeter need only be an inexpensive one. A visit to a shop selling surplus electrical gear will usually yield something for a nominal sum. A meter with a lower voltage range, say 0-5 volts would be suitable, but the exact range is immaterial as long as one to two volts can be read clearly.

To check the battery it should first be fully charged and the voltmeter connected across the first cell, positive to negative. The motor is now switched on while watching the voltmeter. Two pairs of hands needed here! If the cell is O.K. the voltage will not change much at the instant of switching on. It will probably drop slightly, but provided it doesn't go much below 1 volt the cell may be considered satisfactory. A faulty cell will show an immediate large voltage drop, perhaps even negative, shown by the needle 'kicking back' against its stop. A cell in this condition must be discarded, it is worse than useless. Better results would be had by short-circuiting it! Check each cell in turn, recharging if necessary between tests.

If the cell is in a welded assembly it must be carefully broken free of the other cells. The replacement cell will need to be connected by soldered wire leads. 20 SWG tinned copper wire would be suitable, or 5 amp flex.

The trick of soldering to the cell body and positive cap is to use a large, hot iron and an active flux such as 'Fluxite'. With a hot iron the connection can be made quickly before the heat has time to flow into the cell interior and do damage. I use a non-electric iron which I heat with a blowlamp. A powerful electric iron would be satisfactory but it is no use trying to use a 15 watt iron or even a 25 watt one. Clean any plating off the cell beforehand with a file or emery cloth.

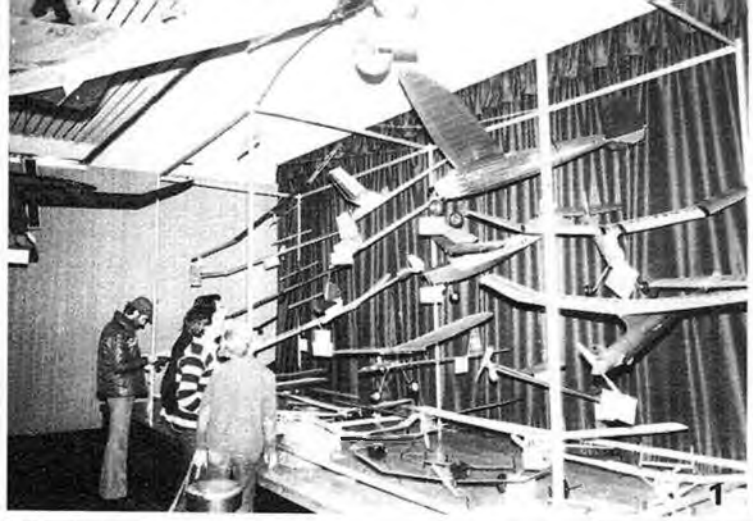
Astro .02 Motor

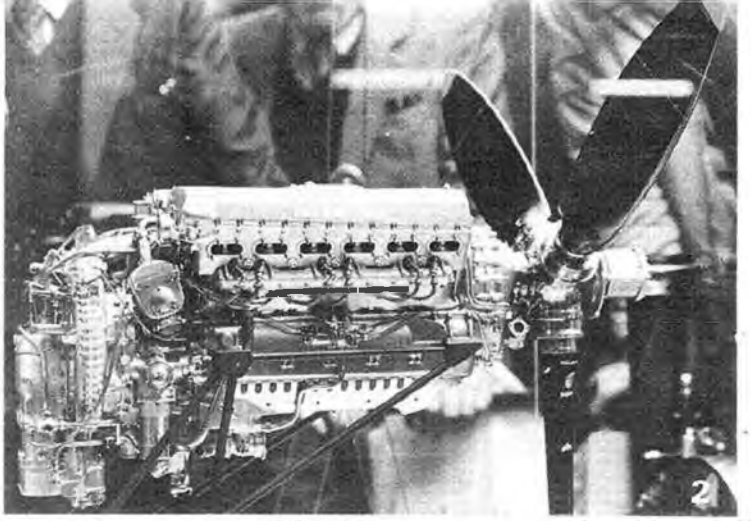
The motor weighs 55 grams bare and is 1$\frac{3}{32}$in. diameter × 1¼in. long, plus a 1in. long propeller shaft. The output is equivalent to a Cox .02 glow motor when running from a 4.8v 500mA vented nicad power pack. Astro Flight produce a specially small size battery pack, 1$\frac{3}{16}$in. × 1$\frac{3}{16}$in. × 1$\frac{3}{16}$in. long that weighs 63 grams.

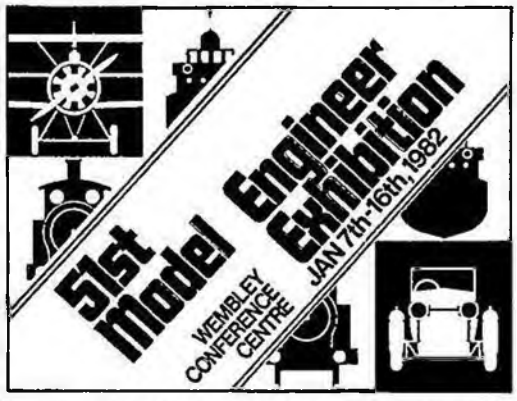
There is also a reduction drive unit that can be bolted onto the front of the motor case. This consists of a plastic housing which has a ball race bearing output shaft, two pulleys and a flexible belt drive. Using this reduction unit would allow much larger propellers than the 5¼ × 3 or 6 × 3 recommended for direct drive.

N.B. The late Alan Palfrey did not research the potential of this motor, but we will be producing a suitable design in the future. The makers recommend models between 220 to 250 sq. inches and an all-up weight of under 12 ozs ready to fly.

Propellers on writer's Airspeed 'Ferry' (this used 'monogram' motors) are almost exact scale.







1. *General view of the Free Flight section.*

2. *Barry Hare's Merlin XX 1/5th scale. 6,000 hours of work, fully variable pitch airscrew, turbo-charger works but is superfluous; will fire up in '82 and probably use gas cooling. Scale magneto and plugs using platinum points. Truly a superb piece of engineering.*

3. *Semi Scale Spitfire Mk.2A built by S. A. Newton.*

4. *Winner of the Duke Edinburgh Challenge Trophy, Lew Blackmore's (Australia) Bentley BR2 rotary engine, running at less than full power at the ME due to fears that it would pull free from its mount. The sound and obvious power was truly amazing.*

5. *John Aris of the Model Centre, Hemel Hempstead, holds Robert Millinship's R/C 1931 Supermarine S6B. Glassfibre construction and excellent simulated metal finish including rivets and other fine details. This model flew in the 1981 Schneider event at Calshot Spit, which celebrated the 50th Anniversary of the full size competition. Winner of the RCM&E Cup.*

6. *R/C semi-scale Fokker Eindekker by John Palmer, made from a Radio Modeller plan.*

7. *This 1/8th scale R/C Hansa Brandenburg W33 by John Palmer had a most convincing weathered finish. Powered by an Enya 60 motor.*

8. *Nieuport 11 ('Babe') built from an American Lew Proctor kit. 1/2th scale and featured full size structure. Powered by a seven cylinder (Technopower) four stroke radial engine. Built by Terry Bridle.*

9. *Another large model by Terry Bridle, a 1/3rd scale Stolp Starlet which is powered by an OS Gemini twin four stroke motor. Scaled up from the RM 1/4 scale plans.*

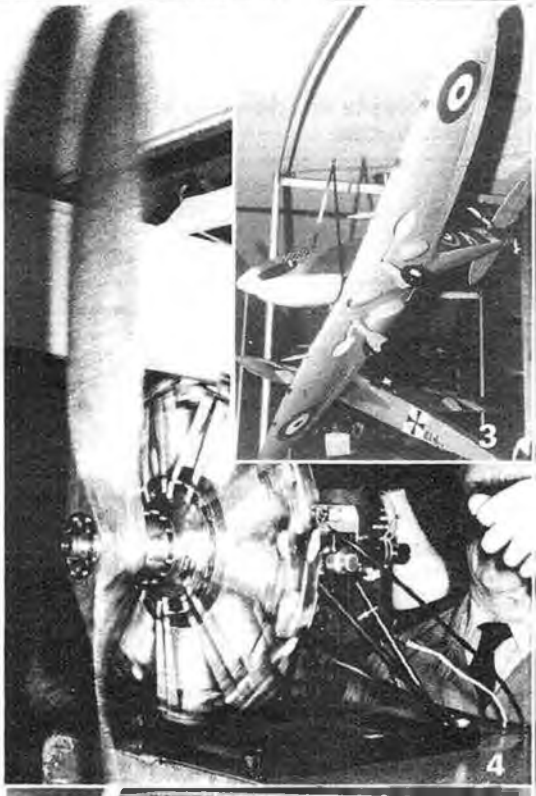
10. *Double size Miss Vintage by Stewart Owen Solomon, powered by a 15cc OHV four stroke motor.*

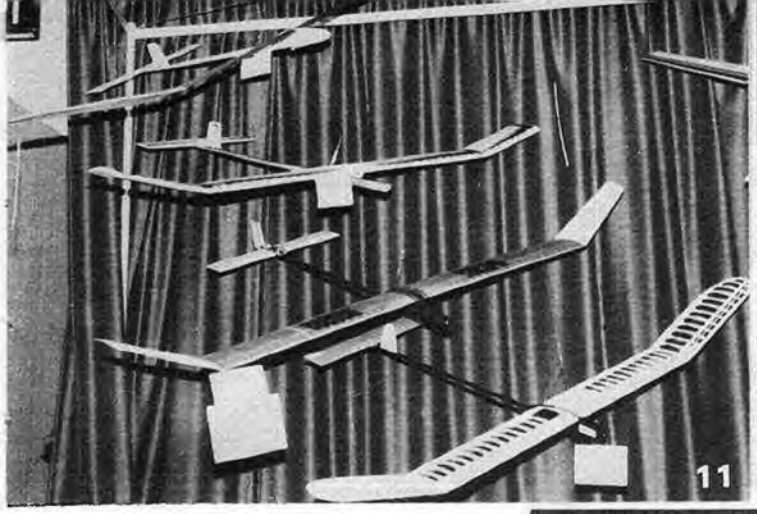
11. *Four of the international F1A competition gliders on display by Martin Gregorif, Rex Woodruffe, Martin Dilly and Mike Fantham.*

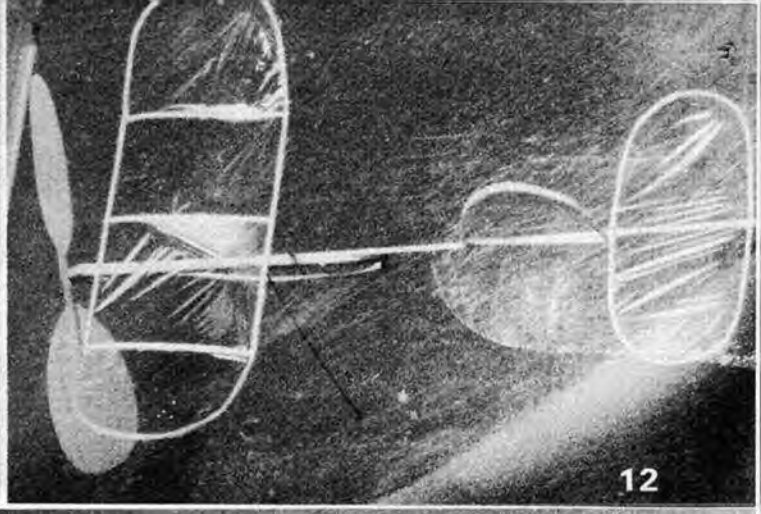
12. *The world's smallest flying model! Built by Mike Fantham, the model fits into a case 200mm×200mm×200mm with plenty of space to spare. Seen here nearly twice size.*

13. *Wing Commander J. F. Mandeville's beautifully built RTP Tiger Moth.*

14. *Aeromodeller Cup Winner F1C power model by Juri Ablamskiy, member of the USSR World Champs Team.*







15. *Ken Faux holding the Aeromodeller Cup. Ken brought Juri Ablamskiy's model back from the World Champs held at Burgos, Spain, in August '81 (see November 1981 issue of Aeromodeller).*

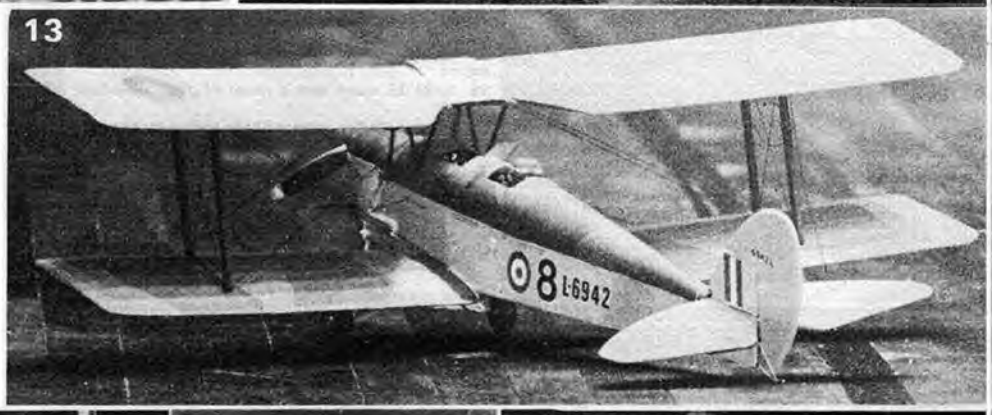
16. *Peter Shires built this unusual Cunliffe Owen for RTP. The model was scaled up from a three view plan seen in an Airfix annual. The full-size USA plane was made in the mid 30s with a view to carrying passengers or cargo but never entered production because of the war.*

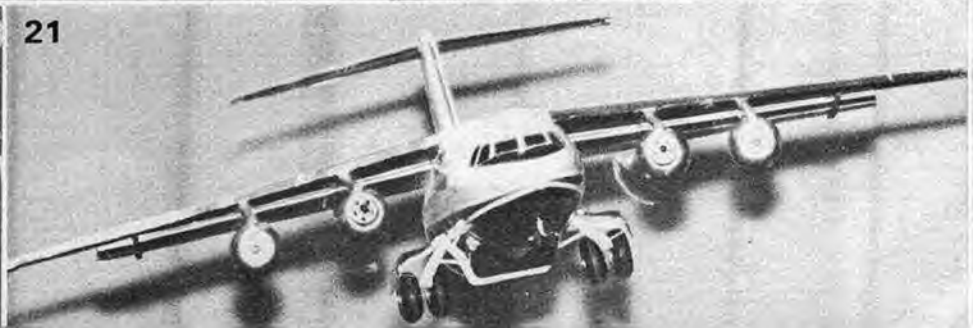
17. *Beautifully built Sopwith Tabloid by Mick Staples, powered by a Telco Turbobank CO_2 motor, span 440mm.*

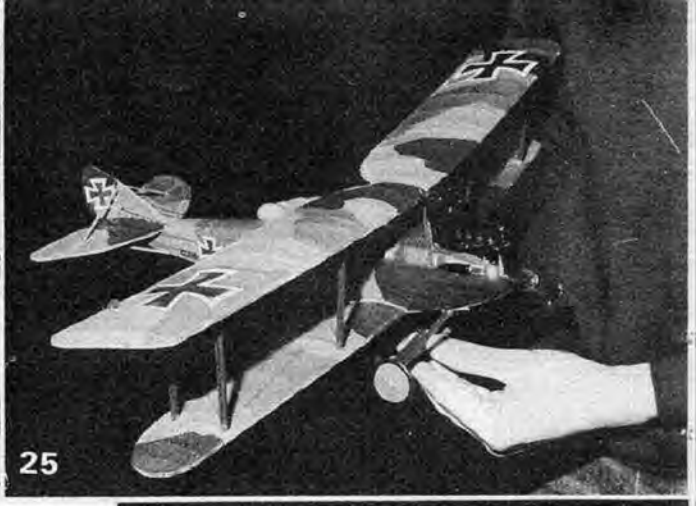
18/19. *Derek Farman and his students from Stalham High School put on a good show of RTP models. The DH2 Buffalo and DH4 were built by Derek.*

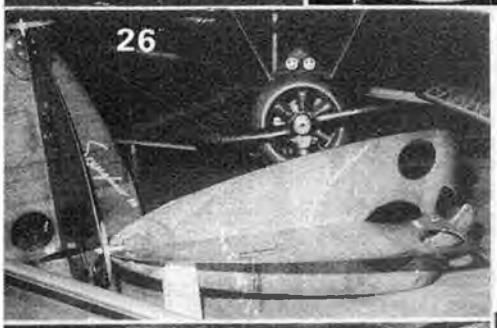
20. *1:18 scale rubber powered Westland Wizard, own design by Richard Falconer.*

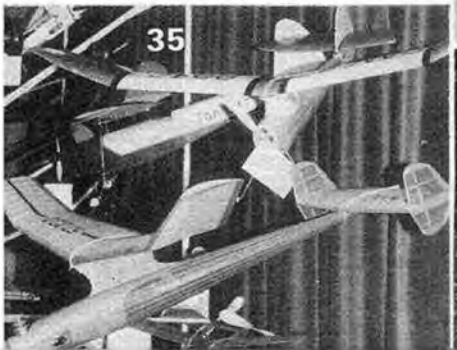
21. *Martin Tuck's RTP BAe146 flew superbly. The plan for this model was published in the July 1981 issue of Aeromodeller.*











22. *Mike Fantham with his F1A glider.*

23. *Neil Power from Leicester built this 10in. span Fokker Triplane for RTP which flew very well.*

24. *Adrian Jones of the Hemel Hempstead Club had some good RTP flights with his Pitts.*

25. *Very nice RTP Rumpler C5 built by David Timson lacked power at first, but after trimming down the prop, he had many good flights.*

26. *Interesting control line stunt models by Robert Dulake; these will be featured in Aeromodeller later this year.*

27. *Martin Tuck built this superb BAe125 RTP model especially for the ME Show, but unfortunately it just didn't have enough power to fly on the length of line we were using.*

28. *'The Answer' 1938 American vintage design by Gordon Manning - this example built by Brian Welch.*

29. *Ming Tay with his Mick Farthing lightweight glider of '43 vintage.*

30. *Stalham High School student Tao Notman built this interesting REP2 bis for RTP flying.*

31/32. *Dave Baker, top line Vintage enthusiast, entered these large models; a 9ft. span Gool and an 8ft. span scale 'Bullpup' powered by a Brown Junior petrol engine.*

33. *SAM 35 stand with a range of good Wakefield models.*

34. *Stephen Sadler, winner of the plaque for the best RTP flying model, with his Martyn-Handasyde No. 3.*

35. *Slim Jim 1949 vintage pylon model powered by a Frog 500 glow engine. Features clockwork fuel cut-off; built by Brian Yearley.*

36. *Derek Farman's 'Heyford,' twin electric powered RTP model.*

SCALE MATTERS

by Alan Callaghan

MAGAZINES DEALING with aircraft more often than not are published on the strength of their photographic content from historical archives and modern contributions together with carefully researched written factual data and occasional coloured renderings. How gratifying it is then to see a new one appear which is going to specialise also in the production of accurate and comprehensive scale drawings, and is therefore aimed very clearly at the model builder as much as the general aircraft enthusiast.

Many readers will have seen the new 'Planes' magazine published by Vintage Aviation Publications Ltd., the first two issues of which have been available since November. Published quarterly, the magazines will include in each issue several scale drawings by Alfred Granger, whose 'Dataplan' booklets on the *Armstrong Whitworth Siskin, Hawker Woodcock/Danecock* and *Bristol Bulldog* are excellent reference works for the scale builder. The drawings in 'Planes' have featured to date a number of rather special versions of well known aircraft, i.e. the *DH Mosquito NF.XV*, the *Avro York C11*, the *Spitfire V* with 170 gallon drop tank, as well as the unusual such as the Westland PV4 mid-engined biplane designated as a possible replacement for the Bulldog. Drawn to 1/72nd scale where the confines of the page format allow, the plans are highly detailed and are accompanied by many photo references. If future issues continue the standards set by the first two, then the magazine will prove to be a very valuable reference source for all types of modelling projects be they civil, military, ancient or modern, and could be well worth turning to should your needs remain unfulfilled by MAP's own vast range of scale drawings, of course! One tiny gem of gen featured on page 38 of issue No. 2 is a very rare air-to-air shot of the underside of a *Bristol Monoplane* which sheds much light on the true shape of the wing roots, the downward vision panels, the location of the wing markings, rigging attachment points, and tailplane bracing struts. Thus is provided another little piece of the accurate documentation jigsaw puzzle.

Continuing with the *Bristol Monoplane*: a neatly built version of the M1A prototype is one of the latest from the building board of David Deadman. The model is to 1:18 scale which works out at 600mm (23½in.) span and is powered by a Brown Junior Twin CO_2 motor. Those familiar with the subject will know that the monoplane features a very short nose moment arm and consequently poses a number of problems with regard to C.G. location. To help overcome these, David made great efforts to build the rear fuselage and tailplane as light as possible. All formers behind the wing roots are in fact laminated rings of 1/32in. balsa, and very carefully chosen wood was used for the stringers and tailplane members. The engine cowling and spinner are acetate mouldings and therein lies an additional problem. If the cowl and spinner are carefully built with the correct gap as used to admit air on the full-size engine, there is no way of varying the motor thrustline for flight trimming purposes without some misalignment showing or even having the spinner fouling the cowl. An alternative is to offset the entire cowl and motor assembly but this too, would be noticeably wrong. David has elected to build the nose unit accurate to scale and trust that the trimming problems may be solved by the settings of the flying surfaces together with a C.G. well forward. Let no-one be deceived into thinking that this attractive subject is an easy one!

Further weight reductions have been achieved by using sliced wing ribs, and the all-up weight comes out at 70gms. The colour scheme is natural linen with grey painted cowl panels.

A stablemate in the same scale and for the same power plant is a *Sopwith/Blackburn Baby* which works out at 460mm (18in.) span. The weight of this one is up to 85gms (3oz.) ready to fly, but this is not really excessive considering that the wings and undercarriage are all 'knock off-able' in the interests of crash resistance. The floats were carved from polystyrene foam and veneered with wood stained 1/64in. balsa. Rigging wires hold the model together and with the red/white checkerboard cowling, factory badges, and natural timber floats, the *Baby* makes a very colourful little subject as far as British WWI aircraft go. Flying performance is much better than expected despite the enormous aerodynamic drag caused by the large loats. The advent of the CO_2 motor has made models such as these two very viable outdoor FF scale subjects. What a sight it would be if, like the rubber scale models built to a constant 1:20 scale occasionally detailed here from Czechoslovakia, a large selection of some of the more unusual WWI types were to be built to a suitable scale such as 1:18, and congregated at the Old Warden Scale Days this year! Food for thought.

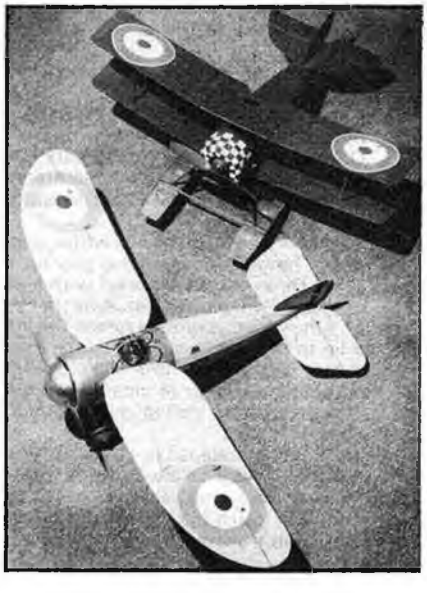
Bristol M1A Monoplane and Sopwith/Blackburn Baby are built to 1:18 scale by David Deadman for Brown Junior CO_2 Twin power. Motor is interchangeable.

Contest News

Encouraged by your letters following the note on FF scale contests in this column, Bill Dennis has confirmed that there will be events for FF power and rubber scale at the Spring Gala at RAF Odiham on April 25th. These events have been abandoned in recent years due to lack of support despite the dozens of known scale flyers who live within reasonable travelling distance of this venue. Your support is needed so why not come along? Pre-entry to Norman Couling (see contest calendar p.147) is £1.00, although field entries at double this amount will be accepted on the day.

Also confirmed at the time of writing are the Indoor Scale Nationals which will be at Middleton Hall in the Milton Keynes Shopping Centre from 10.00 am to 6.00 pm on April 18th. To try to cut down on the enormous static judging task that this event has generated in previous years, Barrie Hotham as Contest Director has decided to ask for pre-entries to the three main contests: Open Rubber, CO_2 and Peanut. Sport flying will be welcome on the day for non-competitive flyers but if you intend to compete, send an SAE to Barrie at: 46 South Park Avenue, Mansfield, Notts., and you will receive full details of the meeting.

Middleton Hall is much bigger than most sports halls but the floor is marble and the walls plate glass, so do get that model trimmed beforehand!

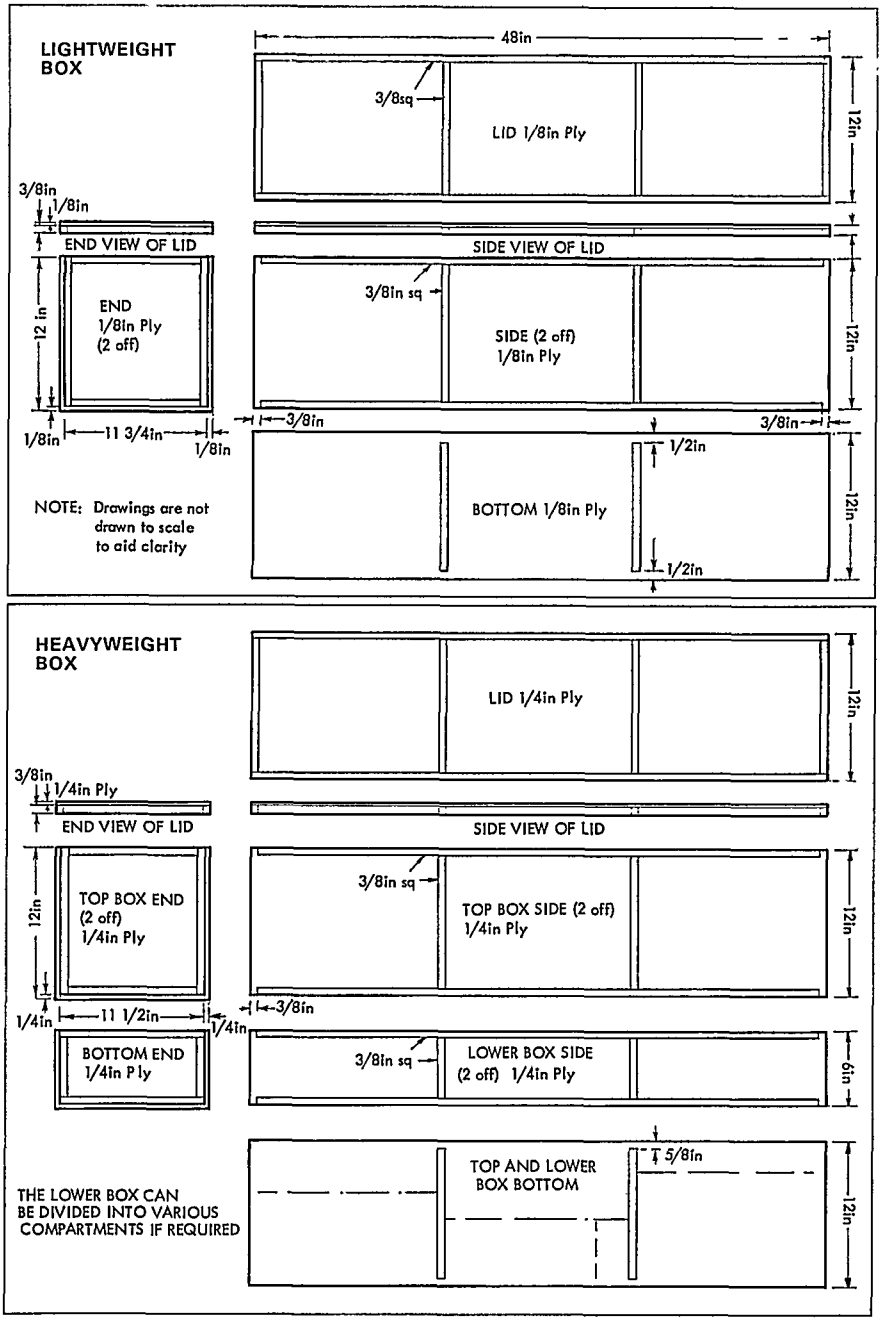


Model Boxes

By Mike Woodhouse

MANY AEROMODELLERS spend a considerable amount of time and effort producing immaculate models, but seem to stop short by just producing the model. It is easy enough to inflict untold harm to your favourite model on a windly flying day, so why risk unnecessary hazards in reaching the field?

It takes only a short while to produce a box that will protect your models from all sorts of harm and will last for years. Had it not been for the rather substantial box that I took to Bulgaria, the models would never have made the journey in safety. It is unbelievable how far a Yugoslav porter can throw a model box! The two boxes shown here are alternatives or extremes that can be built; neither took me more than a couple of evenings to produce and provided the tips outlined here are followed, you too can have an instant box.



Lightweight box

This box is designed to safely transport models via the back seat or the boot of a car, not being subjected to heavy stress and strain.

General construction points

1. Sides, top, bottom and ends from 1/8in. ply, cheap quality. Buy it from a DIY shop, cut to exact size.
2. All strip from 3/8in. □ ramin.
3. All joints glued with PVA and held with panel pins.

Construction:

1. Commence construction by gluing and pinning the splines to the two sides as drawn. Note the correct allowance for the thickness of the bottom and other spline.
2. Produce the ends and bottom in a similar way.
3. Assemble all panels together and if you have been careful they will fit. If all is OK, glue and pin the box together.
4. Manufacture lid in a similar manner, carefully checking the size is compatible with the box.
5. The lid is hinged to the box with a strip of piano hinge, the resulting gap on the other three edges is sealed with a strip of 1/2in. × 1/8in. pinned flat. A further strip of 1/2in. × 1/8in. is pinned inside the lid as a lip to the box.
6. A stay is added to one end to prevent the lid opening too far or closing suddenly. The lid is held closed by a couple of screw on clips.
7. To finish, a collapsible suitcase handle is added as are screw on corner protectors and four small feet.
8. The final touch is to adorn the creation with club transfers and polyurethane.

Heavyweight box

This box is intended to be indestructible and to carry all the models and ancillary equipment in one and avoid a sundry collection of items being transported separately.

General construction points

1. All plywood is 1/4in. thickness, again bought out to size.
2. As for the lightweight box 3/8in. ramin splines are glued and pinned.

Construction:

Basically as for the lightweight box with the following difference.

1. Now its two boxes sitting on top of each other and a lid.
2. The sections and lid are not hinged but are all held together by clips, three to each section each side, a total of 12 clips in all.
3. An additional refinement is to add wheels at one end and a further strap handle to the other end and wheel it along like a golf trolley!
4. The bottom box is easily divided into compartments as required.

Last point, if you only use one box, the second offers a choice in that either box can be used complete or without the bottom equipment section as the need demands.

Wakefield (F1B) Technology

BY MARTYN COWLEY

Winning the famous Lord Wakefield trophy, regarded as the premiere World Championship event, was a tremendous individual achievement for West Germany's Lothar Doring. Despite the handicap of an injured leg, Lothar flew single-handed, paying meticulous attention to model preparation, and using his own judgement to interpret the readings of his two thermal detectors each reading temperature and wind speed, before deciding when to fly. The German team all flew as individuals — the other members not trusting Lothar's machine!

Thermal Detecting

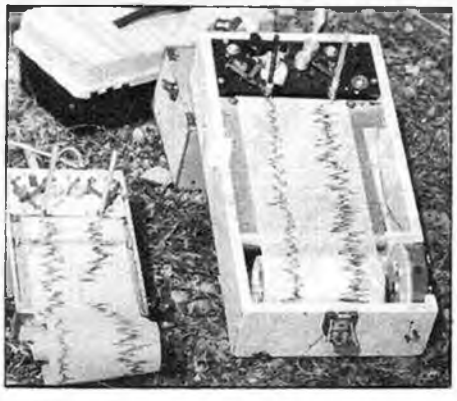
A double thermal detector was also used by Israel's Itzhak Ben-Itzhak to secure victory in 1979, this time he and Herzberg both dropped only their fourth flights! Lothar has developed the temperature/wind meter now for 10 years, the breakthrough being the duplicate equipment positioned 50m upwind, feeding back information for comparison to the launch point. Extensive use has shown the need to identify a stable pattern of thermal movements. Typically Lothar will look for a reduction in wind speed for 5 minutes before a big thermal, without any big gusts for 3 minutes before launch and during this time a gradual temperature rise during the last 2 minutes. Then the wind velocity must fall and the temperature rise to indicate the thermal and the moment of decision to launch. The final signal is to wait for the wind to increase at the front detector marking the upwind edge of the thermal. With this equipment 50m upwind, the model can now be released, still in calm air but at the top edge of the lift.

Lothar admits the system is not infallible, his 5th round flight missed the thermal and D'ted with just 10m altitude, all the other flights including the winning fly-offs, were very high indeed.

Espada '81

The model used by Lothar, *Espada,* originally designed by Reiner Hofsass, was prophetically published in detail in Free Flight Scene February 1981, p.89, reported by Martin Dilly. The only additional information relates to the actual pitch distribution of the propeller blade designed in conjunction with Gunter Klenke using the Theordorsen method: *(See table below).*

Victorious Lothar Doring holds high the famous Wakefield Trophy. Below: Doring's two twin chart recorders plot temperature and wind speed for comparison, pens moved by R/C servo motors. Below right: 3-D turbulator cut into leading edge of solid balsa wing on winning Wakefield (see p.89 Feb. '81 issue for full details).



New Pirelli

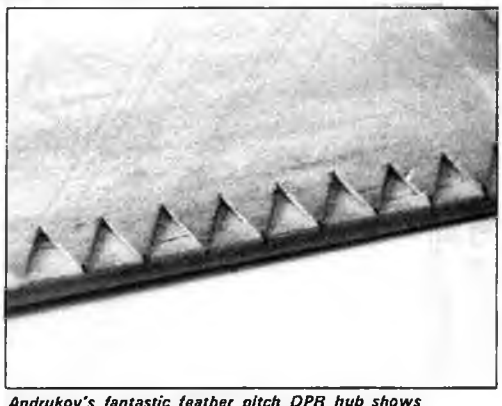
Just two weeks before the Championships, a new batch of 1981 Pirelli arrived. Lothar who is also a National Indoor Champion, measured the energy storage capability and found it to be as good as the orange Pirelli used by indoor flyers. The new rubber which is brown was in fact the highest energy rubber Lothar had ever tested! When made up for a 40gram, 16 strand motor, the length at 47cm was too long for his models, so he stripped it on an indoor cutter from 6 x 1mm to approximately 3 x 1mm. Motors were then made into 32 or 34 strands (unequal depending on left or right side of cutter) and this gave 33-35 second power from 360-380 turns. Prospects for other flyers sound good with the news of more top quality rubber now available.

Russian Models

Sensation of the meeting, if not the result sheets, were the rocket like climbs of the Russian Wakefield team who used Delayed Propeller Release on some models. Only picking bad air or consistency problems let them down, with models and flight trim that were otherwise possibly the best on the field. No doubt the thin wing section designs, rubber and propeller combination accounted for the high rate of climb, but the DPR certainly added spectacle to the launch with faultless operation.

Feather Pitch DPR

Delay Prop Release allows a fully wound model to be javelin launched to a height of about 30ft before the timer starts the propellor powered by the limited 40 grms of rubber. The idea is not new and several models have employed this principle over the years. Where the Russian models did appear unique however was their solution to the problem of starting long propellers that normally fold under the wing of a short nose model. Others have used partly folded configurations with blades just clear of leading edge for launch. The Russians held the propeller extended to full diameter but with blades temporarily twisted to feathered flat pitch to reduce drag.

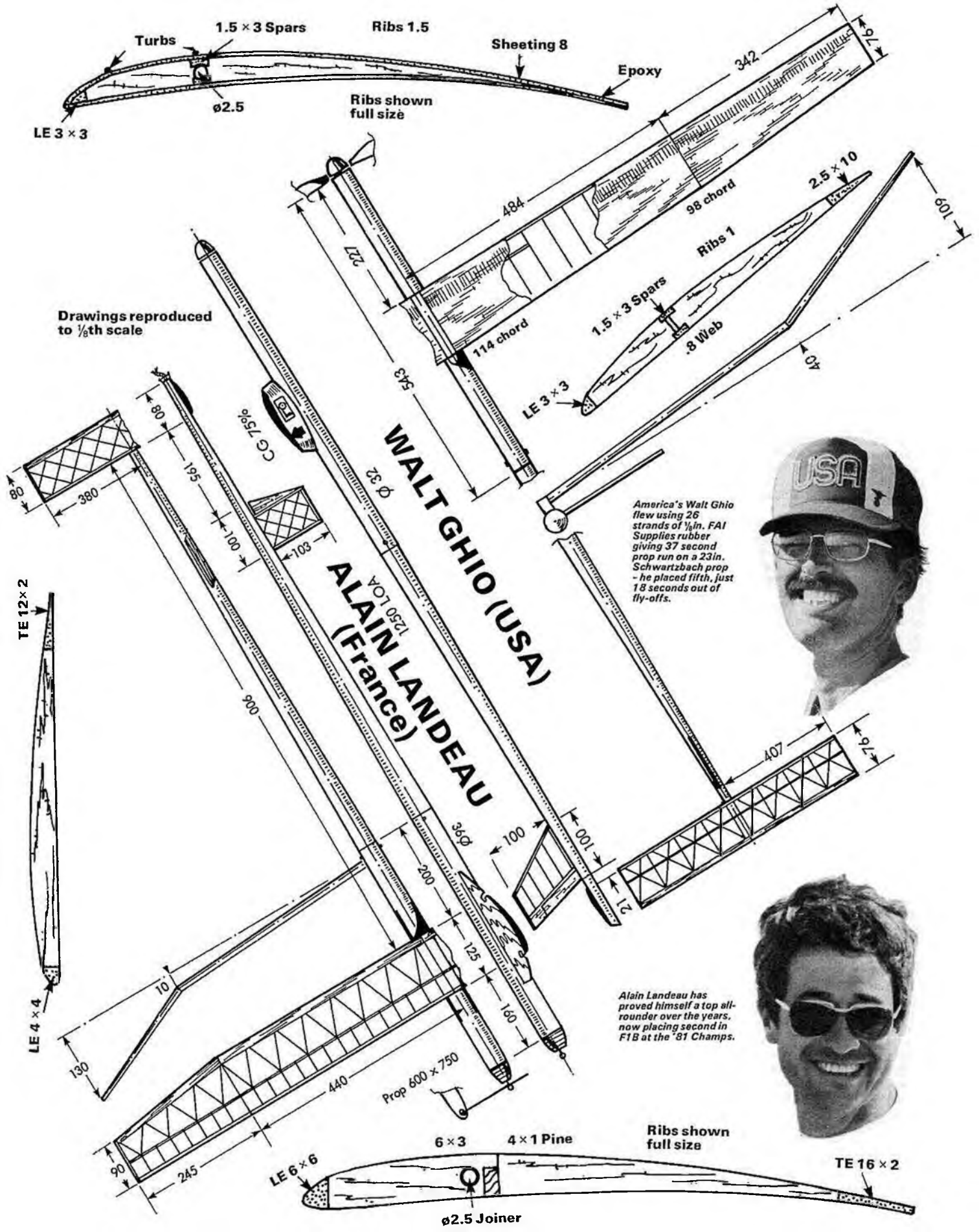


Andrukov's fantastic feather pitch DPR hub shows blade twisted back with arm engaged on stop. Pin in L-shaped slot connects to timer for delayed release.

Andrukov's Mechanism

This feat of engineering genius was achieved on Alexander Andrukov's model by having each blade able to pivot in pitch on a radial axis, due to a neat internal retaining sleeve. Each blade is held in normal flight pitch by a strong spring, but a rear facing arm can swing back flattening pitch to engage on stops on the hub unit to hold feathered pitch. To lock the whole assembly, a timer operated pin prevents the

Radius Index	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.95	1.00
Pitch in mm	607	638	668	700	723	743	755	738	720	698



America's Walt Ghio flew using 26 strands of 1/8in. FAI Supplies rubber giving 37 second prop run on a 23in. Schwartzbach prop – he placed fifth, just 18 seconds out of fly-offs.

Alain Landeau has proved himself a top all-rounder over the years, now placing second in F1B at the '81 Champs.

Gerard Pierre-Bes, France, third individual, helped his country run away with team prize, flying his Trident design.

Ribs 1.5

Turb ø1

3 × 3 Spruce

2 ×2

Ribs shown full size

5 ×5

8 ×3

80

375

Drawings reproduced to ⅛th scale

125

70

20

110 Chord

275

520

730

PIERRE-BES (France)

125

100

Prop Ø 620 × 830

485

Ø 30

CG 68%

Prop 540 × 700

520

245

53.6% CG

Timer

α 2°

Lü JIFA (China)

125

100

70

120

20

LOA 1190

Lu Jiffa, China, placed 14th in the 1981 World F1B Championships, the top placed Chinese entrant.

LE 3 × 3

3 × 1.5

1.5 × 9

440

228

90

460

80

20

105

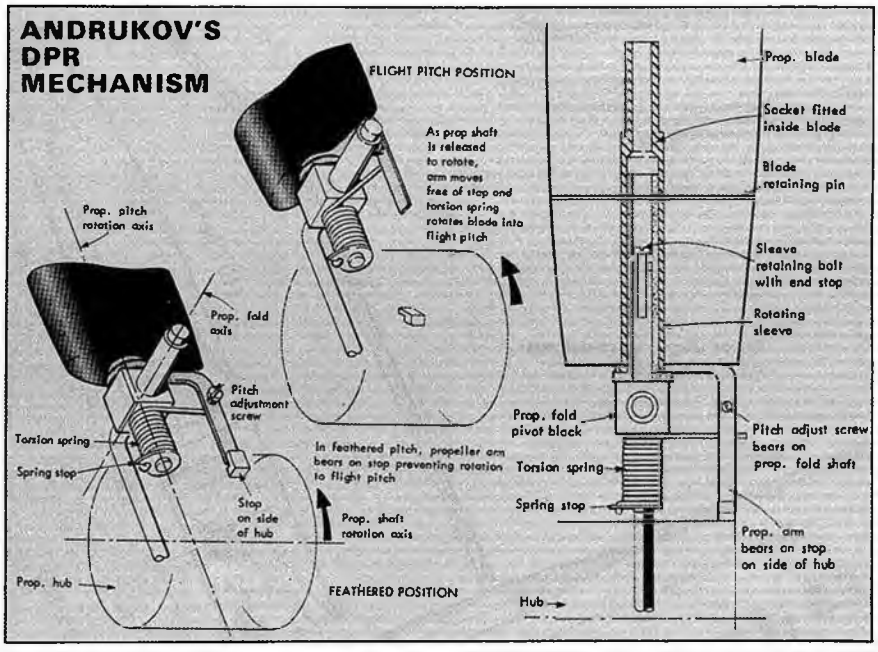
Ribs shown full size

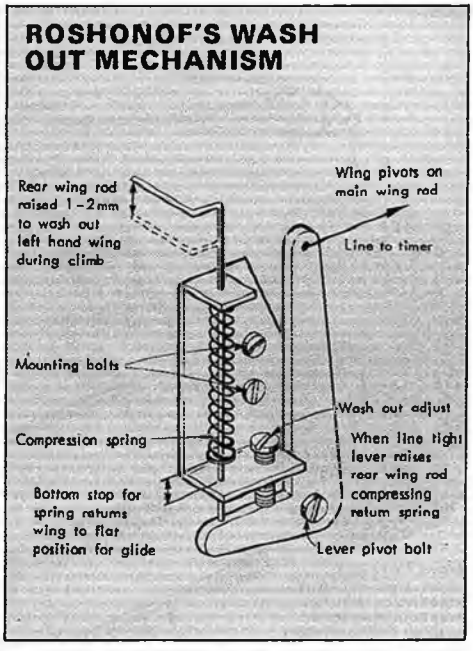
4.5 × 2

3 × 1

TE 13 × 2

LE 5 × 5





propeller rotating with a reverse montreal stop principle. When the pin releases the propeller, the first few degrees of angular rotation allows the propeller arms to move free of the stops and the spring loaded blades snap into correct pitch. As a further refinement, the timer activated pin bears on a sprung ratchet inside the propeller hub, which prevents forward rotation, but allows backward rotation. This permits the addition of hand turns after the prop assembly has been fitted to the fully wound motor, to help keep the torque up while waiting for lift! The whole unit bears the unmistakable hallmark of ingenuity and superb craftsmanship.

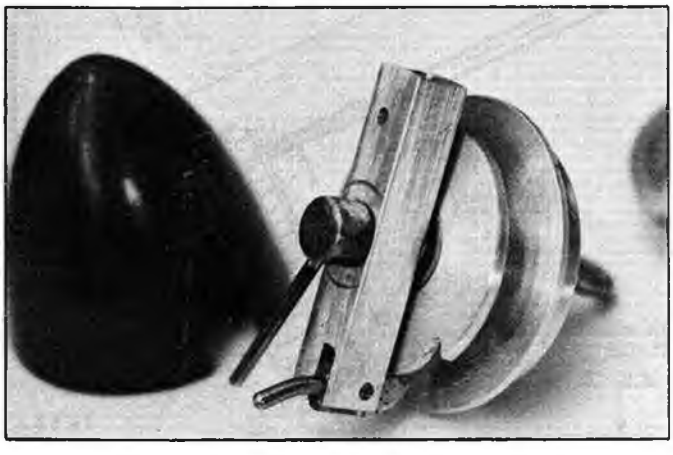
DPR Advantages?

The models use 1-2mm wash-out in the left tip, and the timer starts the propeller after a 1 second delay, with VIT and AR functions coming in at 4 seconds for a total motor run of about 35 seconds. There are clearly two points of view with DPRs because the total energy available — rubber storage plus javelin launch — are present and equal whether the props start at ground level or at the apparently advantageous height of 30ft. The real advantage can only come from one or two turns lost with a conventional launch, or more likely with the greater ease for a competitor to make his run up and put full weight behind the throw (assuming the structure permits this) while the propeller is stopped. Theoretical discussions aside, the Russians clearly demonstrated a reliable and impressive technique, but the final proof will require the kind of still air performance not possible to assess at these windy champs.

Gadgets

Generally speaking there appeared to be an increasing trend for more people to use timer operated VIT to control the initial power burst up to about 4 seconds. This allows models to be trimmed with a more forward C.G. which allows greater wing incidence for the remaining climb and glide which may be an advantage, particularly for stability in such rough, windy weather. The Chinese had models equipped with a 6°-7 second VIT movement. The tail lifted on various shaped cams, giving quick or slow movement or even a series of steps. Victor Roshonov had a variation of the power flyers wing twist mechanism which allowed the left wing panel to be washed out during climb, returning to a flat wing with less drag for the glide.

Right: miniature tissue paper kites flown by Morai, acted as highly visible thermal and wind shift indicator for Japanese team who placed fifth. Below left: new prop stop design from Archangel Arnesto, Argentina, has sprung rocker engaging in peripheral notch. Setting lever protrudes from spinner cone for dual role prop hold.



Timer activated spring plunger (rear) raises rear wing rod to washout left wing Roshonov's model. Front sprung pin holds timer start lever.

Mick Reeves Models

SNIPE TRAINER

John Stroud reviews new two channel R/C Glider

WHEN THE EDITOR asked me to review the *Snipe* kit, I tried to recall the last time I built a model from a kit. I can only remember one in the last ten years so I eagerly accepted the chance to get an attractive model the easy way.

The Snipe is a Mick Reeves Models production and is distributed by Ripmax. It comes in two versions and from the information on the box it seemed the only difference between the *Snipe* and *Super Snipe* is 1.815 metre span and 1.966 metre span respectively. Closer inspection revealed the smaller model, which I was given to make, has a one piece wing whereas the *Super Snipe* has a two piece wing. Showing great restraint I made the one piece wing because the whole point was for me to make the model as per the instructions. Later I found the one piece wing will go in a Mini passenger compartment so perhaps it is not important. Given a free hand I would have modified it to two pieces to fit into my own car boot.

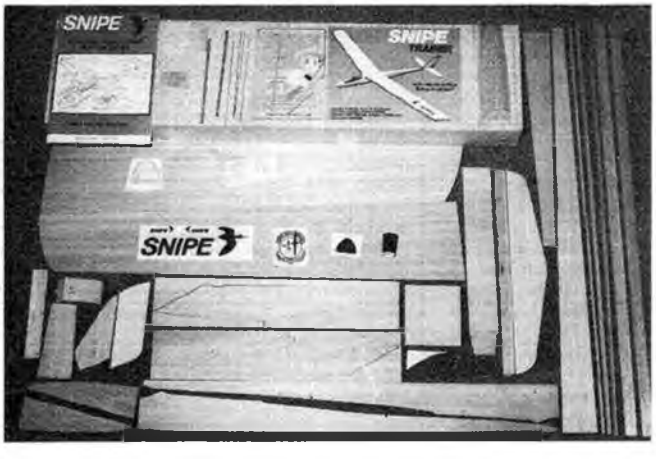
Inside the box is a set of veneered foam wings, the balsa and ply cut out to make the fuselage and various other necessary bits and pieces. As is common practice the kit contains no covering material, glue or paint. All the wood is of good quality and the cut-out parts have been cleanly and accurately made. Because the fuselage is built up, the model is not as prefabricated as some on the market, although even a raw beginner should have no difficulty in making the model. The instructions are very well written and illustrated with 42 excellent photographs.

The wings are nicely shaped and covered with veneer. Mine had two small cracks in the veneer which were caused by drying out. A little filler in the crack and a light rub over with sandpaper, was all that was required. The leading and trailing edges come partly shaped and are glued to the wing as supplied. They can be held in place by sticky tape or rubber bands. Sanding to shape is completed when they are dry and the tips added. It is advised that the centre joint should be left for a few days to set as PVA glue cannot dry off through polystyrene. I set mine up in the spare bedroom and left it three days. The wing joiner strips take a lot of strain, so it is important to make a very careful job of fitting them.

The fuselage has substantial 3mm ply doublers and should prove very strong in service. Making one fuselage side over the other helps to make sure only one of each 'hand' is assembled. All the parts fit together easily and mine needed no trimming or adjustment. (I did spend some time trying to fit former 9 in place of former 6!) In my kit, both wing dowels were the same length. This seemed correct for the rear dowel but far too short for the front one. I assumed it was a packing error and fitted one 20mm longer. I was very tempted to leave off the bottom of the fuselage until the control rods were fitted but again, I stuck to the instructions and finished the construction without the control rods in place. With the tailplane and fin fitted, only the minimum of shaping and sanding is needed before the model is ready for covering. I covered mine in iron-on film and applied some of the trim tape provided. As it is intended to use a power pod I also gave some areas a coat of fuel proofer.

The radio installation was quite straight-

Continued on page 153



Components of the kit include: hardwood veneer foam wings and all other parts pre-cut in balsa and ply. The kit does not contain covering material, glue or paint but trim tape is provided.

Crude but effective pylon engine pod fitted with a G-mark .06 which gives ample power for the model.

By Alan Dorrell
Part I

The author's own design 'NAIAD'. The original was built in 1963. This model with little modification is No. 6, powered with a seven year old Merco 35.

LEARNING TO FLY CONTROL LINE STUNT

A series of articles starting with the basic principles and design requirements, ending with a well-proven design for the beginner.

WHAT IS THIS 'Stunt' that so fascinates me and others like me? It is the short term for Precision-Control-Line-Aerobatics, a form of model flying in which a control-line model is made to perform a predetermined schedule or pattern of aerobatic manoeuvres in the looping plane. Precision is the key, as these manoeuvres are based not only upon both conventional and inverted loops, but also on 'figures of eight' in different modes, 'inverted' flying, and 'square' and 'triangular' figures. Precision not only in the correct formation and superimposition of these figures but also in the height and angular limits within which they must be performed i.e. the bottom portion of the lower level flying should be at shoulder height (5ft. altitude) with a model that is flying some 60 to 70 ft away from the pilot.

If you have not been fortunate enough to actually see the magnificent flying skills of World Championship class flyers, you have possibly seen the reports of the events in *Aeromodeller* with accompanying photographs that leave no doubt as to the inherently attractive appearance of the models used for this particular form of flying. For many, oneof the chief attractions of stunt has always been the elegance of the models used by its leading exponents. Models which, until the advent of reliable radio control, often represented the ultimate in model building skills and which used a configuration closely in keeping with accepted conventions of what 'real' aeroplanes look like.

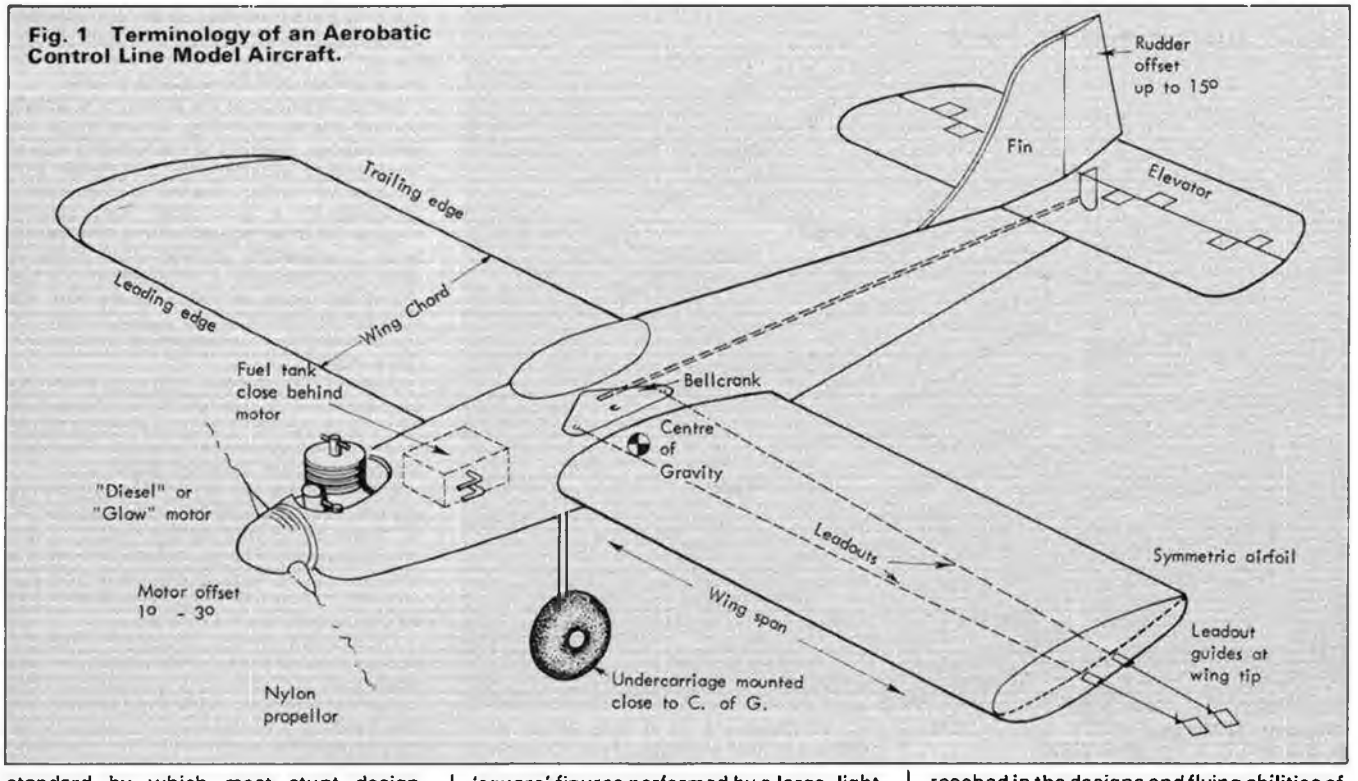
I pride myself on being a 'doer', not a spectator. The attractions for me are as follows. (1) I like building model aircraft. (2) I like to fly model aircraft. (3) I like my models to be recognisable as aeroplanes in miniature with specific flying capabilities. (4) I love the challenge of mastering a set of skills to prove I am as good as, if not better than the other person. (5) I love the actual sensation of being 'in control'. (6) I hate the idea of my creation being expendable. These then, are some of the aspects of stunt that I find desirable. Years ago I entered contests, I may do so again. Nowadays I fly nearly every weekend with my local club, three or four flights in the C/L circle, between waiting for my frequency peg to become available at the R/C pits. Control line stunt can be a cheap form of modelling. Apart from initial costs a stunter can last a very long time, only requiring a supply of fuel. Some of my stunters still use engines bought a dozen years ago.

Perhaps I have begun to interest you in stunt. Perhaps you see, as I do, some of its advantages. Control-line, noise problems apart, can be flown in relatively confined spaces. A challenge to one's personal skills in both building and flying has to be met. Once this challenge has been initially overcome, the models are durable and long lasting. Like all challenges however, there is no instant solution to success.

There is always some one who wishes to commence his aeromodelling career with that super-scale 'Spitfire' or 'Lancaster' or jet propelled 'English Electric Lightning' with fully operating controls, etc. 'Tis so in stunt. If you have studied the pages of *Aeromodeller* during the past years you will have seen designs for control-line aerobatic models such as Compostella's 'Tango' and Peter Tindal's 'Chipmunk' as well as an article by Al Rabe as to how he developed his fantastic 'Mustangs'. Go ahead, be fascinated, envious, encouraged, frustrated, or whatever, but file them in the back of your mind. They are the products of dedicated top line aerobatic champions. Bear with me a while and I will endeavour to describe a relatively painless way to learn aerobatics.

During the late fifties and early sixties, stunt as we know it today reached a pinnacle here in the United Kingdom. Ever since the late Nevilles 'Jim' Walker, patented his system for a powered model aircraft to be controlled by means of a handle connected by two lines, to a bellcrank inside the model, that altered the position of the elevators, flyers have used it as a means to perform aerobatics. Jim Walker's patent was granted in 1940 and by the end of the decade, particularly in the U.S.A., stunt was virtually as we know it today. A model design called the 'Nobler' was published in 1949 and remains the

Fig. 1 Terminology of an Aerobatic Control Line Model Aircraft.



standard by which most stunt design criteria is set, to this day. Due to the war years, in this country, preventing the flying of engine powered model aircraft, stunt progress lagged behind the U.S.A. until in 1957, a noted Californian exponent, Bob Palmer made an ambassadorial visit to this country with his original 'Thunderbird'. For the first time, many British modellers saw 'square' figures performed by a large, light, moderately powered, slow flying, model aircraft, fitted with large flaps. The 6cc (35) glo-motor which powered it, switched from a four stroke run in straight and level flight, to a more powerful two stroke as the model entered the various manoeuvres, all without any extra controls.

The next half dozen years saw a pinnacle reached in the designs and flying abilities of such British modellers as Ray Brown, Dave Platt, Tom Jolley, Flt.Lt. 'Doc' Hawkins, John Perry, Dave Day, Ken Day and others, culminating in the superb semi-scale designs and magnificent flying abilities of Frank Warburton Jnr. It was during these years that I was attracted to, first control-line flying and then, of course, to aerobatics. After my first, and almost inevitable mistake, (I built a scale 'bipe' as my first C/L aeroplane), I learnt how to fly 'round and round' on simple profile models, easily repairable, with a basic form of undercarriage. So far, so good. Then came a succession of 6cc powered stunters, a 'Calamity Jane,' one of John Perry's old modified 'Thunderbirds,' a Frog 'Aerobat,' a Mercury 'Monarch,' another 'Thunderbird,' Charles Mackey's 'Lark,' a couple of 'Dongus' combat designs. All of these flew successfully, while I stuck to 'round and round.' The moment however, that I raised my wrist to try a loop it seemed inevitable that each model was to meet its doom. Eventually, I listened to the words of advice that were being offered to me. "Forget the glamourous stunters," they said, "build a model like a free flighter. Hold the wing on with rubber bands. Make it like a box. Look back a year or two, to the old designs."

To cut a long story short, this advice I took. Within a few months, I had built a series of crude looking trainers. I called them 'Spartans'. No. 1 had a thick, broad wing and mushed around slowly on a PAW 2.49. No. 2 was nippier but by now I could fly inverted and do outside loops. No. 3 I prettied up and the old 'Model Aircraft'

David Kirkpatrick (Loughborough MAC) with his 'Nobler' built from Top Flite kit. This design by George Aldrich is over 30 years old. (Merco 35).

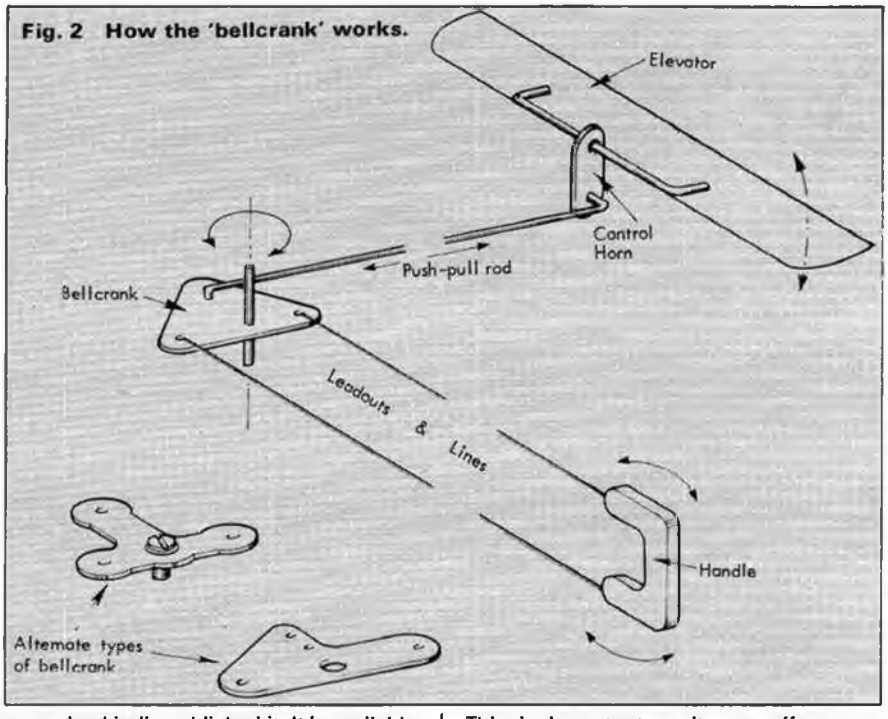


Fig. 2 How the 'bellcrank' works.

magazine kindly published it. It is available in the M.A.P. X list (M.A.378X).

Within a year I was able to fly a resemblance of the full aerobatic pattern with models like a new 'Thunderbird', 'Phoenician' and the Mercury 'Crusader'. By then I was designing my own nulli secundis (second-to-none) which I called 'Naiad'. Sixteen years later I am flying my sixth 'Naiad' variant and building my seventh.

Back to those early sixties, however, after those few years of general enthusiasm, stunt hit the doldrums for a while. Enthusiasts continued to build and fly and compete, but events seemed few and far between. Stunt received no overt publicity and certainly little technical progress was evident. I believe it is safe to assume that the attractions of R/C were, in part, responsible for this state of affairs. Happily, recent years have seen a tremendous surge in interest. The formation of the Control Line Aerobatics Pilot's Association (C.L.A.P.A.) here in the U.K., following similar lines to America's Precision Aircraft Model Pilot's Association (P.A.M.P.A.)., organisations catering exclusively for 'Stuntists' interests, issuing regular newsletters giving hints, tips and news on the subject, have helped keep the ball rolling. After a couple of years in which CLAPA encouraged a tremendous increase in events, in which novices and juniors could compete, as well as open events for experts, also stunt 'fly-ins', some two hundred members belong to CLAPA. However, the original novices and juniors have improved their skills, or have grown up, so new blood is needed to keep the ranks filled. How about you?

For argument's sake, I am going to assume that you have already learnt to fly control-line, if you have been wise, with some form of trainer. What do you know about the model you have been using? Did you build it yourself, or is it a ready-made? This is important as it may affect your progress in the next stage. If you have made your first control-line plane yourself, I would guess from a kit, and you have succeeded in flying it, then you are aware of the basic technology and are on the way to being a competent model builder, as well as a flyer. If however, your first flying successes were achieved with a plastic, ready-to-fly aeroplane, such as the Cox models, and I intend no disrespect towards these cleverly engineered designs, your building techniques and possibly your knowledge of C/L terminology may be zero.

Due to the abilities of the manufacturers, the plastic ready-to-fly control-line aeroplane is a perfect model FOR ITS PURPOSE. It is rugged, its wing, fuselage and tailplane will be perfectly aligned and free from warps. It should have an easy to start engine, and foolproof instructions on how to fly it. It should stand up to a fair amount of pilot error, i.e. the inevitable crash. To learn to fly stunts, it is essential for your next model to have these same characteristics. Let me say quite categorically, that while you are learning aerobatics, YOU WILL CRASH. So you must forget about sleek, scale-like models for a while. You will not be able to go out and buy ready made aerobatic trainers. Some of the RTP's will do simple manoeuvres, such as wing-overs, perhaps a loop, but that will be the limit of their abilities. And yours. To successfully learn stunt, you will have to build your own model from scratch. Accuracy, and freedom from unwanted warps is essential for the successful flying capabilities of any aircraft, model or full-size. So that is your first criteria. For your trainer, ruggedness, the ability to withstand the inevitable crash damage, or to be easily repairable. Cheapness; I hope these notes are being read, learned and digested by those younger modellers, for whom much of it is intended, whose concern will be for economy. Many of us have mastered aerobatics by 'consuming' one aeroplane after another. If you follow my methods you will achieve success both more quickly and more economically.

Let us first look at the sketch of a simple control-line stunter (**Fig. 1**) and check the terminology, starting at the forward end of the fuselage with the engine or motor. This is always either diesel (compression ignition), or a glow-plug, reciprocating engine. No other power-source has, as yet, been successfully utilised. This motor is often mounted with a small amount (1° — 3°) of out-thrust, or off-set away from the pilot to help increase the pull or tension on the control-lines for maximum response on the controls.

Behind the motor, but as close as possible to it, is the fuel tank. The tank is cleverly designed to ensure a constant fuel flow throughout all manoeuvres. There are many variations, of which more anon.

Sufficient to say that there are wedge shapes, relying on centrifugal force, 'clank' or 'clunk' tanks with moving fuel pick-ups, and pressure-fed tanks, either air or engine pressure being used. Before panic sets in, I can assure you that most types of tank can be purchased ready to install.

On a typical stunter, motor and fuel tank occupy most of the fuselage, forward of the leading edge of the wing and gives us the 'nose moment arm'. As with all aircraft, it is the movement of the wing through the air that causes the model to fly. The surprising thing about an aerobatic model (the same is true in R/C), is that the airfoil section of the wing is symmetrical. That is, the curve of the wing-ribs (if used) is exactly the same on the underside of the wing, as it is on the top surface. This of course, enables the model to be flown just as smoothly upside down (inverted) as the 'normal' way up. The front edge of the wing is the 'leading edge', the rear, the 'trailing edge', the distance between is the 'wing chord'. The distance from wing tip to wing tip is the 'span' and sometimes you will again be surprised to find that some designs have one half span slightly longer than the other. I will discuss the whys and wherefores of these seeming anomalies in a later part of this article. Using simple arithmetic, if we multiply the chord by the span we will know the 'wing area'. When we know the total weight of our model, (less fuel), we can find the 'wing loading' per unit of wing area (usually oz./sq. ft.). This may not seem important now, but when you graduate to 'expert' aerobatics, even merely for pleasure flying, it will help you recognise the potential of your aircraft. You will also notice that the wing is flat along its span in most cases. It lacks 'dihedral'. This again is said to be an aid to inverted flying, but in truth, a little dihedral is not objectionable and can make a model more realistic in appearance. However, it makes construction more complicated and should be avoided on beginners models.

About one third of the chord behind the leading edge of the wing is an imaginary, but never-the-less, extremely important position of the aircraft called the 'centre of gravity'. I have called it important, yet have been necessarily vague as to its actual position. The c of g is the point where the whole aircraft balances. Extra weight at either the nose or the tail will alter the balance, and in an aerobatic model (either

control-line or radio-control) it will increase or reduce the sensitivity of the controls. For a trainer it is essential that the aircraft be relatively nose heavy, i.e. forward c of g, as this reduces sensitivity to manageable conditions for the novice.

It is normal to expect to find the 'bellcrank' mounted, either in the centre section of the wing, or in the fuselage above or below the wing, somewhere near this centre of gravity. Normal, because this mechanism and its mounting is somewhat weighty and it is advisable to keep the heavier parts of the model as near to the c of g as possible (with the exception of the motor and fuel tank). You will however meet some designs i.e. the Wonder Wings 'Aerostar', with the bellcrank set well back. The bellcrank is a plate or moulding shaped either like a triangle, a 'T', or a combination of both. Pivoted firmly on a central boss, it transfers the movement of the two lines from the control handle via a push-rod running down the fuselage to the elevators (See **Fig. 2**). It is usual to have a pair of 'lead outs' connected permanently to the bellcrank, coming out of the side of the fuselage, or running along the inside of the wing to the wing tip. Whether, inside or outside of the wing it is necessary to pass these leadouts through some form of 'leadout guide' situated at the wing tip itself. Sophisticated designs have adjustable guides.

An 'undercarriage' is very useful if you are able to fly over closely-mown grass (I would not advise novices to fly over tarmac, etc., until they are proficient). The undercart enables you to 'take off' in your own time and get yourself comfortable in straight and level flight before tackling those first manoeuvres. But you can manage without one, if you have someone who can give reliable 'hand launches'. As before, undercarriages should be mounted as close to the c of g as possible.

To complete the wing, it may have 'flaps'. There are two sorts. The simple fixed flaps which extend the trailing edge, not only enhance the appearance of the model but are quite functional in a way in which I shall describe later. The movable flap is linked to the bellcrank so that the direction it moves in, is opposite to that of the elevator. However the movable flap should be avoided by the novice.

The distance along the fuselage from the trailing edge of the wing to the leading edge of the tail-plane is the 'tail moment'. The flaps, if fitted, have their 'chord' measured separately.

The tailcone comprises four units. The fixed horizontal portion is the 'stabiliser', the moving part is the 'elevator' which controls the attitude of the model, to shape the manoeuvres. The vertical units are the 'fin' which is fixed in line with the model, and the 'rudder' which, while usually fixed (though on some designs it is made adjustable) is often offset anything up to fifteen degrees away from the model's flight path. This is considered to be another aid to maintaining line tension. More refined designs have a carefully airfoiled fin and rudder instead.

These then are the parts of an aerobatic control-line model.

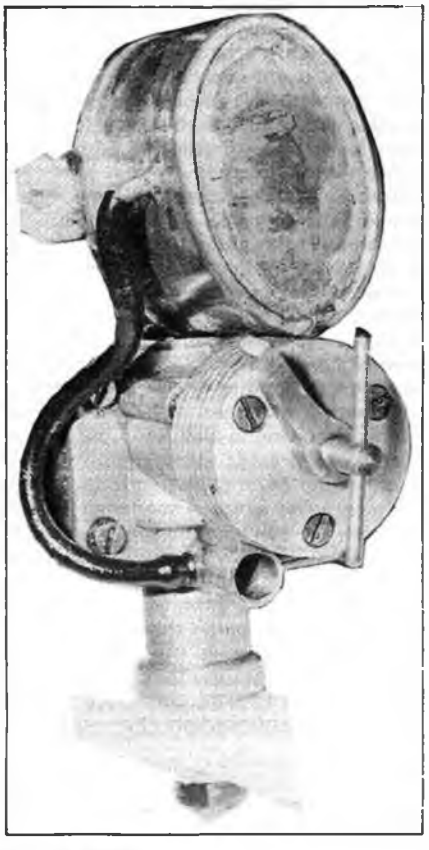
Before starting to build a model, we should decide what power plant we are going to use. Plastic RTFs use glow motors of .049cu. in. (0.8cc) capacity. While often being admirable little motors, they will only power small control-line aircraft. It is desirable to fly as large a model as conveniently possible. Many experts use .46cu. in. (about 7.75cc) motors in models of about 60in. wing span, flown on lines about 70ft. long. Besides being able to cope with wider variations in weather conditions (larger aircraft always fly better than small ones), the longer lines obviously give more sky to fly in.

I have studied what is available, enginewise, and for the purpose of this article I keep returning to those old stalwarts, the PAW 2.49 or PAW 19D diesels. Not only have they proved their ruggedness and reliability over nearly two decades, one can get spares easily, they are quite powerful and above all they are cheap. Glow motors worth considering are Fox 19 and 25 (not R/C), Thunder Tiger 20 and 25 and Flash 20 U/C. The traditional 35 (5.9cc) stunt motors, are the Fox, Merco, Super Tigre, O.S. and Enya. So, as far as I am concerned, it is back to the PAW. As an alternative, look for good secondhand motors, such as the AM 2.5 and 3.5 diesels, McCoy 19, Veco 19 and K & B 20 that will give a good account of themselves. Remember, with a diesel you will not have to bother with starter batteries.

Another reason for choosing this size of engine is, that while I consider it eminently suitable to learn stunt with, it is also of a size to build a competitive model around (see later listings) and ease your way into contest flying if you wish.

To go with your diesel engine, try one of the Micro-Mold 'mustard tin' fuel tanks. You will have to solder it together yourself as they come in 'kit' form but that should not be too much of a hardship for anyone intending to be a thorough modeller. If you are at school, perhaps some polite persuasion on the craft teacher will produce the necessary facilities. The mustard tin tank originated when control-line flyers discovered that the small oval sectioned mustard tin sold by Colemans made an ideal stunt or combat tank, when properly piped and vented. Many a tin of mustard powder was purchased for its container alone, Colemans have discontinued selling their product in these tins, but at the moment the tins are available under the Micro-Mold label. Hopefully, they took over the press when Coleman's gave it up. Micro-Mold (I have to disclaim any connection) also produce the necessary 2in. moulded nylon bellcrank and for my suggested design I would recommend one of their R/C horns. I would also recommend mounting the engine on an appropriate moulded plastic engine mount (not a cast aluminium one) instead of using the more conventional bearers.

My suggested design for your control-line aerobatic trainer is christened 'Centurion' because it is built like a tank. It can be built in two models, high wing with undercarriage, and low wing without, and will appear next month.



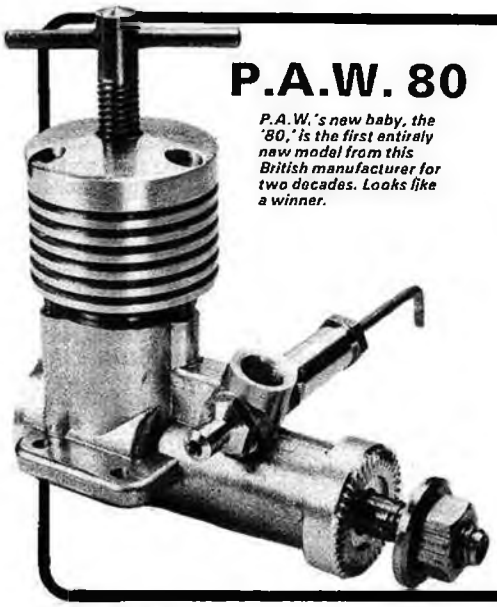
Far left: mustard tin tank mounted closely behind the engine (PAW 2.49) in the author's 'Peacemaker.' Left: A range of engine mounts and control-line bellcranks available from Micro-Mould Ltd.

Engine News

by Peter Chinn

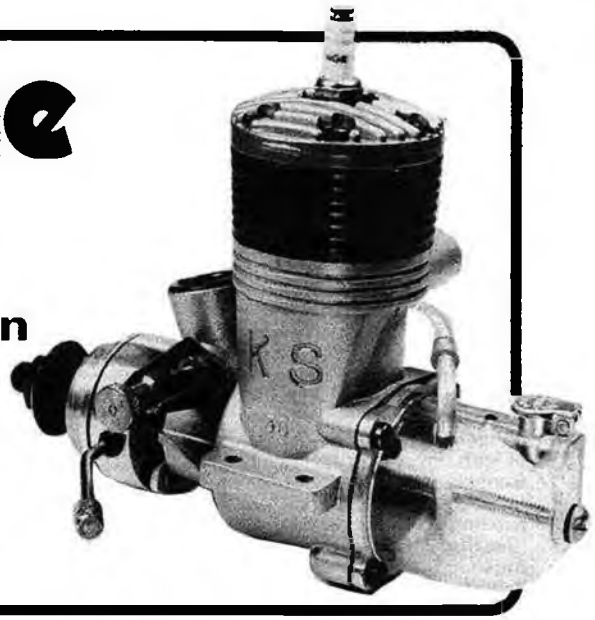
P.A.W. 80

P.A.W.'s new baby, the '80,' is the first entirely new model from this British manufacturer for two decades. Looks like a winner.



KS 35

Strictly for 'vintagents.' The American KS 35 spark ignition engine; a modern replica based on the K&B Stallion. Note authentic 1940's style 'gas tank.'



P.A.W. 80

Twenty-five years ago, a new British diesel, designed by J. G. ('Gig') Eifflaender, appeared on the market called the P.A.W. Special 2.49D. P.A.W. was a new marque, so far as engines were concerned, the makers, Progress Aero Works of Macclesfield, under the direction of the Eifflaender family, being best known, at that time, as propeller manufacturers. J. G. Eifflaender, however, had, for many years, operated the Gig Eifflaender Reboring Service, specialising in the repair and reconditioning of all types of model engines, and had also constructed a number of successful engines of his own design.

The P.A.W. 2.49 was a good engine. In fact, it still is; for the same motor, with improvements, is still being produced. Two other sizes followed the 2.49: a scaled-down 1.49cc unit in 1959 and, two years later, a bored and stroked (.190cu. in. or 3.11cc) version of the 2.49 called the 19D or Combat-Special. These, too, are still being made and deservedly so.

Now, after a lapse of twenty years, the manufacturer has added an entirely new model to the range, the smallest to date, the 0.8cc P.A.W. 80.

The engine is unmistakably P.A.W., an exactly scaled-down version of its larger brothers with radial porting and, of course, shaft rotary-valve induction. The engine tips the scales at just 67gm or 2.36oz. A detailed coverage on the P.A.W. 80 will follow shortly in these columns. Our guess is that this will be one of the most powerful 0.8cc class diesels offered to date.

KS 35 Spark-ignition Engine

We are indebted, once again, to our good friend Cliff Petty for the opportunity to take a look at another of his rare birds: a KS 35. This is an American spark-ignition conversion of the K&B Stallion 35 and is aimed at those looking for a 'late nineteen-forties' style power unit for 'vintage' models.

The Stallion 35 was first introduced back in 1963 as a mass-market, general-purpose, control-line engine. At the time, K&B were still producing their standard 'Torpedo' range (.09, .15, .19, .29, .35, .45 cu. in.) of medium-priced engines, plus the more expensive twin ball bearing 'Series 61' contest engines (.15, .29, .35). The Stallion was very similar in design to the Torpedo 35 but was of somewhat sturdier construction and considerably lower priced. After about three years, production of the Stallion was suspended while K&B directed their efforts towards satisfying the increasing demand for some of their newer engines, notably the early Torpedo 40 pylon racing engines but, in 1968, the Stallion 35 was reintroduced and then remained in production until the mid-1970s when it was superseded by the K&B 35 'Series 75'.

Basically, the Stallion 35 was a shaft rotary valve, crossflow-scavenged motor with a bronze bushed main bearing and a ringless cast-iron piston running in a leaded-steel cylinder having integral cooling fins. The pressure-diecast cylinder head was fitted with six screws, just two of which, extra long and placed fore and aft, served to tie the complete head and cylinder assembly to the pressure cast crankcase. The crankshaft had a main journal diameter of ½in. and was equipped with a separate prop stud.

Front end of KS 35. Prop driver and stud removed to show interior of contact-breaker assembly.

The Stallion origins are still just recognisable in the KS 35 but there are many external changes that give it an appearance that is very much in keeping with a petrol engine of the late forties period. In this, it is helped by the provision of a translucent backplate-mounted fuel tank, complete with authentic 'Gits' cap, as fitted to motors such as the Super-Cyclone. Also looking very much the part is the contact-breaker assembly mounted on the crankcase nose. Enclosed in a machined aluminium drum shaped housing, this is operated by a flat, ground onto the front end of the crankshaft journal, which opens and closes the points through a large rectangular slot in the main bearing. The complete assembly can be rotated, by means of an arm, through about 60 degrees to enable the ignition timing to be retarded for starting and then advanced for full power, according to load. The front end of the contact-breaker assembly is shielded by a circular cover plate that rotates with the prop driver which is shortened for the purpose. The all-important sparking plug is a Japanese NGK ME-8.

The overall appearance of the KS is helped by a matt crankcase casting finish that looks rather better than the tumbled surfaces of the original Stallion.

Two Stallion 35s were the subjects of our test reports in MODEL AIRPLANE NEWS (U.S.A.) and AEROMODELLER, the latter

appearing in the October 1968 issue. Running on a 5/25/70 mixture of nitromethane, castor oil and methanol and with the standard C/L stunt venturi insert fitted, this engine produced an output of 0.42bhp at just over 11,000rpm.

The KS could, of course, be operated on similar methanol-based fuels but not, we suspect, with the existing plastic fuel tank, upon which (if it is of the same type of material as previously used) methanol will act as a solvent. However, most users will probably want to use a petrol-based fuel anyway. A straight 3 to 1 mixture of 2-star petrol and the heaviest available motor-oil (e.g. non-multigrade SAE 50) should be very suitable.

The KS conversion adds surprisingly little extra weight to the basic Stallion 35. We checked them side-by-side: the Stallion was 249.5gms, or 8.80oz., and the KS was 267gms or 9.42oz. but, of course, actual flying weight is substantially increased by the need to add an ignition coil, condenser and battery. The engine's bore and stroke are 0.790 × 0.720 in., giving a swept volume of 0.3529 cu. in. or 5.783cc.

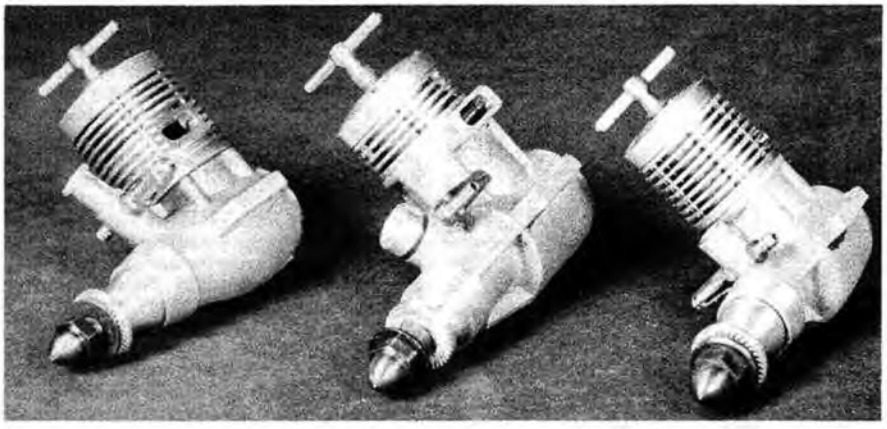
Readers' Letters

We have had a letter from John Perry of New Malden commenting on the Engine Test report on the Fox 25 in the January issue in which we said: 'The first Fox 25 was introduced in 1972 ... ' Mr. Perry writes: *'I seem to remember a Fox 25 in existence before that. In fact I think it was around 1964/5, although I don't think there were all that many produced.'*

Absolutely right. What we ought to have said was that the 1972 model was the first of the present generation of Fox 25s. The very first Fox 25, an entirely different design, was actually announced as early as 1954. It was a bored version of the second series Fox 19. The first Fox 19, for the record, was introduced a year or so earlier and was a less conventional design with a split crankcase.

Mr. Perry also puts in a plea for a 'modern vintage-type engine', i.e. a motor that would produce usable power at lower revs than today's modern high-performance units, while retaining the modern engine's more robust construction and greater reliability. This is something we will try to come back to in a future article. Meanwhile, the KS 35, just described, could be regarded as a tentative step in this direction.

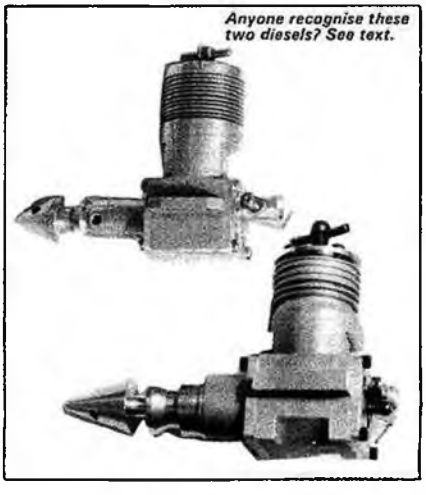
AEROMODELLER'S team-racing columnist, Jim Woodside, sent along the photo, reproduced here, of the two 2.5cc rear-induction team-race type diesels, in the hope that someone would be able to throw some light on their origin. The engines, which are the property of Jim Plaunt of San Antonio, Texas, are believed to have been made in the north of England sometime during the 1950s or 1960s. Does any reader recognise either of these two motors?



Three new Schnuerle's scavenged Olivers. Two 2.5cc units on left are prototypes. One on right is new Cub 1.5.

Several readers have asked what happened to the group photo referred to in the opening paragraph of the November 1981 *Engine News*. Sorry! By one of those unfortunate oversights it was squeezed out. For the benefit of those who got lost half-way through the 'History' item, we should also mention that five of the paragraphs in the middle appeared out of sequence. To read the article properly, remove the penultimate paragraph, column 2, page 574 and the following four paragraphs. Carry on reading from line 10, page 575, then insert removed paragraphs below the first paragraph, column 3, on page 575.

In the June 1981 *Engine News* column, we published some news of recent Oliver engine developments. A few weeks ago, we had a letter from Lynn Walters, who, as mentioned in the article, has been test flying a prototype 7cc Oliver inline twin in a 9ft. span vintage model. Lynn also has in his possession the three Schnuerle-scavenged Oliver engines shown in the photo reproduced here which was taken by the Editor when Lynn visited the editorial offices. The middle one of the three motors is the prototype of the experimental Schnuerle-scavenged Tiger 2.5 engine, an example of which, owned by Cliff Petty, was described in the June 1981 article. The engine on the right is the first of the new Schnuerle type 1.5cc Tiger-Cubs. Lynn says that it handles superbly. All we can say is that if it is better than previous Cubs, it must be good.



Anyone recognise these two diesels? See text.

The third engine is an experimental 2.5 based on the standard Mk. IV crankcase but with a lower stroke/bore ratio and, as already mentioned, Schnuerle-type porting. Lynn Walters has used this motor in several test models including a *Miss Dara* Club-20 pylon-racer in which it proved capable of outrunning Veco 19 and of holding its own against K&B Schnuerle 15, powered models.

A number of old-engine enthusiasts have asked *'What happened to the "Silhouette" feature? Has it been discontinued?'* The truth is that we have not managed to find room for it recently, but hope to bring it back again, from time to time, as space permits.

Four stroke prices are coming down. New 6.5cc O.S. FS-40 has RRP of £78. Finely made. Twin ball bearings on both crankshaft and camshaft. Fully enclosed valve gear. Weight 12oz. See February Radio Control Models & Electronics *for test report.*

FROM THE HANDLE

JIM WOODSIDE reports

The 1980 Metkemeijer T.R. Prop — Revisited

In my January column there was a feature on the Rob Metkemeijer-designed team race prop. The article ended with some pitch distribution figures, established using my home made Rumpel style gauge. Some days after the magazine appeared, Rob gave me a call at home to point out that the figures as published did not tally with his own preferred pitch distributions.

This raises a very important subject for team race addicts. The prop which was originally measured was one used by the brothers at the 1980 World Champs so there must be an inaccuracy in my gauge. Giving figures can thus be a chancy business unless we all use a gauge made by the same manufacturer. As the prospect of this is remote, the alternative is to quote pitch in degrees and minutes, which can then be converted, if necessary, into millimetres or inches of pitch. I will devote some time to this and return to the matter as soon as possible.

In the meantime, my thanks to Rob and my apologies to those of you who may have followed the figures. If anyone has an existing design for a simple gauge measuring pitch in degrees, perhaps they might contact me with details — address: 29 Calderstones Road, Liverpool 18.

Pitch distribution for Metkemeijer 1980 prop:

Station	Radial Distance from Hub in mm	Pitch in mm	Pitch in ins.
1	20	137	5.39
2	30	158	6.22
3	40	169	6.65
4	50	178	7.00
5	60	185	7.28
6	70	189	7.44
7	80	189	7.44

The Snelson TR Engine

Not a spelling error but the name given to the heavily modified Nelsons as used by many of the Dutch TR enthusiasts. The one in the photographs is actually the property of the Wakkermann-v.d. Weerd team but others are owned by the Metkemeijers, Visser-Buys and Meijer-v.d.Kroon.

After the 1978 World Championships the FMV team began work on AAC liner sets for the engine. This quickly led to making liners in which the fins were integral with the liner much in the style of a Cox glow engine. The claimed advantage is that there is better cooling and therefore more compression can be safely run.

Not everyone can obtain FMVs, BBFs or Russian engines which feature in this liner system but there are those willing to take a file to a Nelson. The first move is to cut off the Nelson case just above the exhaust port. Four bolts which bear upon the square section at the base of the fins secure the fins to the case. The cylinder head, which contains the contra-piston is secured to the finned barrel by six small diameter screws.

At the moment, performance is about the same as the standard Nelson, which perhaps points to the FMV thinking on bearing housings and set-ups to be an important factor in engine performance. However development continues and working drawings have been promised at a later date, which should delight the engine buffs.

Chrome plating service

Readers of the fine AMA magazine 'Model Aviation' will be familiar with the name Gene Hempel. For some time Gene has been writing a good practical column on control line speed flying. One of Gene's specialities has been .049 speed and his tuned pipe modified Coxs have regularly turned speeds in excess of 100mph.

In response to demand for his products, Gene has established the P&G Metal Shop. Two main services are on offer:

1. Specially prepared Cox TD 049 parts. The basis of these changes lies in chrome plating the crankshaft and honing the case to match. Also the pistons are chromed and the liner honed to match. An item of special interest is a crankshaft designed for clockwise rotation. The object of this is to prevent speed models turning in on take-off.

2. Cylinder timer chrome plating. The liners can be chromed and honed to match an existing piston or piston ring. Price is according to engine capacity.

The Cox TD 049 service certainly has much to offer our ½A free flighters and speed men. Modellers interested in any of the services should contact: P&G Metal Services, 301 North Yale Drive, Garland, Texas 75043, USA. Phone: (214) 272 5210.

Chrome charges effective January 1, 1981

ABC or steel sleeves

.000-.40 Disp	$
Chrome sleeve only	12.00
Hone sleeve only	13.00
Chrome and hone to fit	25.00
Strip chrome plate (steel only)	2.00
.401-.80 Disp.	
Chrome sleeve only	13.00
Hone sleeve only	17.00
Chrome and hone to fit	30.00
Strip chrome plate (steel only)	2.00
.801-1.00 Disp.	
Chrome and hone to fit	45.00
Chrome plate crankshaft	8.50
Chrome plate journal crank	5.50
Chrome plate piston (steel only)	7.50
Chrome plate rotor	6.50

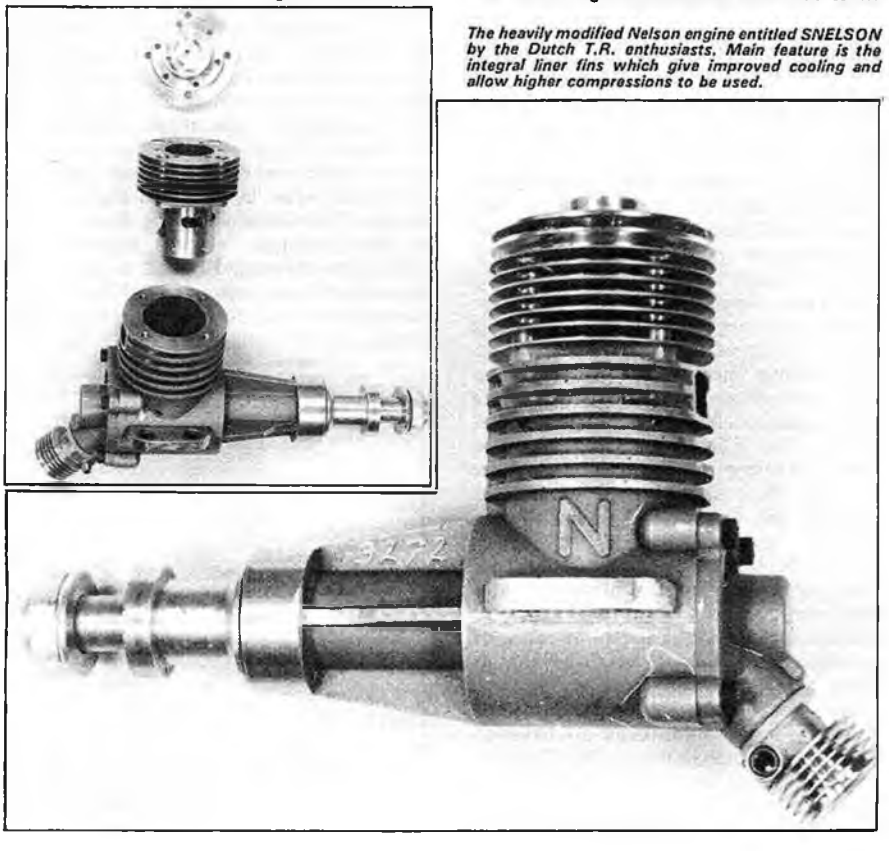
We cannot assume responsibility for problems beyond our control. Add sufficient for return airmail, postage should be included.

Goodies directory

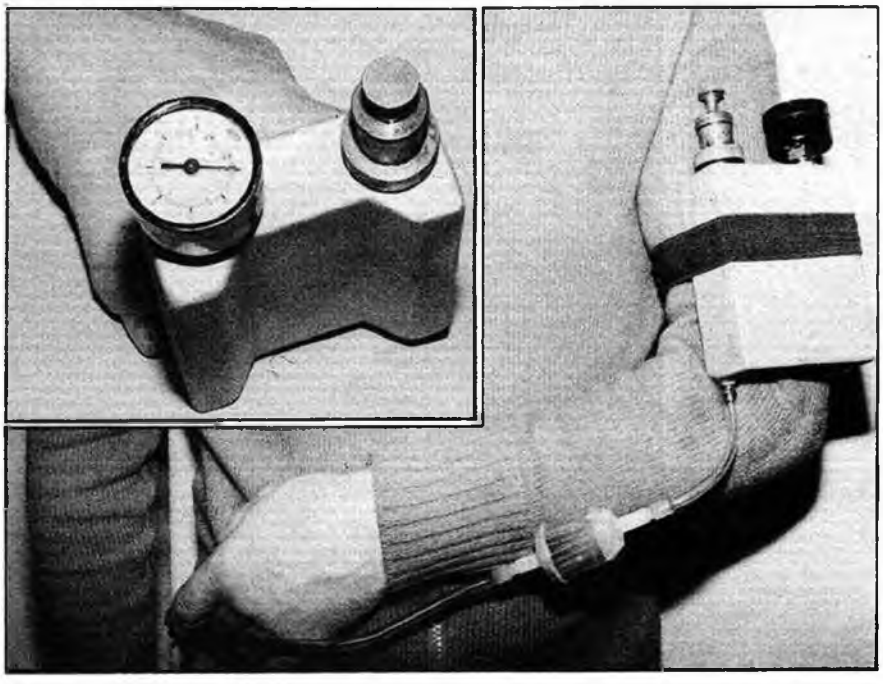
Mike Broadbent Products

1. Pressure refuelling reservoir

A casual glance around at most team



The heavily modified Nelson engine entitled SNELSON by the Dutch T.R. enthusiasts. Main feature is the integral liner fins which give improved cooling and allow higher compressions to be used.



Pressure refuelling reservoir produced by Mike Broadbent Products. As can be seen from the inset, a pump and gauge are permanently fitted to the unit. Below: another item available from Mike, this cast aluminium handle with adjustable bottom line.

racing contests will reveal pitmen wearing a motley collection of old tin cans, washer bottles etc. cobbled together with bits of hose to make a pressurised fuel reservoir. For some years now I have been the proud owner of a couple of very natty items made for me by Mike Broadbent. Although Mike has made several examples at the personal request of some teams, the reservoir has not generally been available. Like so many nowadays, Mike has lost his job to the current recession. The good of this ill wind is that some nice products are now on offer.

The refueller is fabricated in 1.5mm aluminium bent into an 'arm-shaped' contour. The basic shape is then welded and sandblasted to an attractive matt finish. A pressure pump and pressure gauge are then fitted. Not the cheapest but in my opinion the best item available. Mine have been completely reliable.

Reservoir, complete with pump and pressure gauge — capacity 300cc, £20.00.

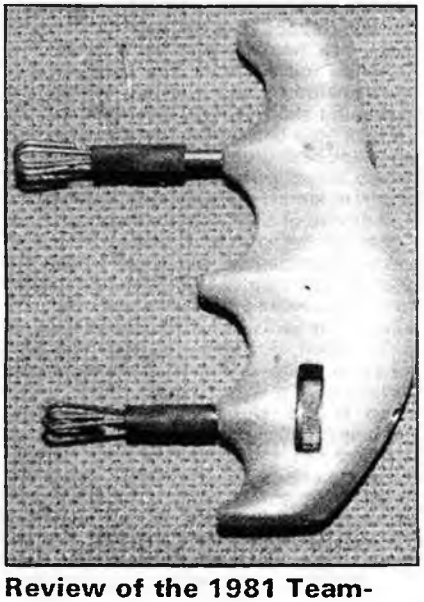
Optional large capacity fine filter. £1.00.

Postage at appropriate rates *is extra.*

Please state if the reservoir is to be worn above or below the elbow as this determines the fuel outlet point.

2. Team race handle

A goodie for the other end of the lines. Again a well made item made in cast aluminium. The close-set connectors are in 3mm silver steel with the lower one being fitted with a knurled brass adjustor. The actual handle is contoured to make a comfortable grip. Although it is nominally 'right-handed,' left-handed pilots should experience no problem. The item is finished in bright red: handle — £4.50, postage — extra at appropriate rates. Cash should be sent with orders. Delivery is anticipated at two-three weeks from receipt of order. Mike Broadbent, 5 Cassville Road, Liverpool 18. Phone: (051) 737 1559.



Review of the 1981 Team-racing season

It's rolled around again — hardly seems a year since John Horton's detailed collection of the year's racing events. No less than 32 events are collated — no mean task in itself. Still this year, John has the pleasure of seeing his own name at the top of the 'best all rounders' table.

To refresh your memory points are awarded in the following manner:

Place	Open Final	Novice Final	Trials/ M'r'th'ns
1	6	3	6
2	5	2	5
3	4	1	4
4			3
5			2
6			1

The most marked feature in the past year has been that the 'old names' do not have such a strong grip on the tables. I welcome this change as it gives some encouragement to the hopefuls. However the last year has seen the loss of at least six established teams either through retirement or splitting. As it was a total of 43 teams turned out, which might be the envy of some nations, but is still a decline over the last couple of years.

1/2A team race

Six contests (nine in '80). Although the numbers of meets dropped, the competition remains keen with new heat and final records established at the Nationals. The most interesting engine remains Rob Metkemeijer's FmV1.5 — a pity this one could not have been included in Berni Langworth's reviews of ½A engines features in the January edition. The 1982 season looks promising with several teams working on new engines and models, with the Oliver Schnuerle Cub now establishing itself as the new main choice. Do try ½A racing, especially if the budget for FAI or Goodyear is too daunting.

Goodyear team race

The second year under the 'diesel only' rule seems to confirm that the event has now stabilised itself — 40 teams competed overall with 25 teams turning out regularly.

Of this year's top five, only one featured last year — the other four have given up or split up! The main bone of contention remains the (growing) use of very expensive racing diesels which are costing in the £90-£120 bracket — hardly novice prices. Perhaps the SMAE control line subcommittee should re-examine the topic of cost limitations for Goodyear despite all the inherent problems involved.

Class B team race

Only two official events this year — one at Elliotts which was blown off and the long established Wharfedale (nee Rufforth) 1000.

FAI team race

Fifteen contests in '81 showed an increase of two over the '80 season. Twenty teams turned out on a regular basis with another ten 'casuals.' As with Goodyear, there was some movement at the top but again some notables had departed the scene — Dave Clarkson and Malcolm Ross in particular.

Steve Smith and Colin Brown flew many more domestic contests this year and won six out of the nine contests they flew to take the league by a clear 20 points — well done! The winning combination was Nelson AAC, the Smith Wing and superb flying and pitwork.

The Racing Club League

With the demise of Norwest and the falling fortunes of Stockport, there has been some movement but Wharfedale and Feltham are still there.

Club	No. of teams	Pts	Remarks
1. Wharfedale	7½	141	Best ½A
2. Feltham	6	108	Best FAI
3. Tynemouth	4	61½	Best B
4. Elliott	2½	56½	
5. Loughborough	2½	42	Best Goodyear

1/2A Team Race — Results

Team	Club	1st	2nd	3rd	Pts
1. Horton Haworth	Wharfedale	2	2	0	22
2. Heaton Woodside	Sharston/CM	0	2	1	14
3. O'Neill Bollen	Elliotts	2	0	0	12
4. Smith Yeldham	Elliotts	0	0	2	8
5. Hill Metcalf	SCLAMS	1	0	0	6

End of season team positions

Team	½A	FAI	GY	B	Grand total
1. Horton Haworth	22	13	15	5	55
2. Smith Brown	0	49	0	0	49
3. Langworth Broadhead	4	29	9	0	42
4. Wilson Gardner	5	21	0	12	38
5. Catlow Jephcott	0	0	33	0	33
6. O'Neill Bollen	12	4	16	0	32
7. Heaton Woodside	14	15½	0	0	29½
8. Fry Thorpe	0	28	0	0	28
9. Gray Haycock	0	25	0	0	25
10. Hill Metcalf	16	0	0	22	

Congratulations to John Horton and Don Haworth.

FAI Team Race Results

Team	Club	1st	2nd	3rd	Pts
1. Smith Brown	Feltham	6	1	2	49
2. Langworth Broadhead	Wharfedale	2	2	1	29
3. Fry Thorpe	Feltham	1	2	1	28
4. Gray Haycock	Feltham	0	4	1	25
5. Wilson Gardner	Tynemouth	0	2	1	21

Note: Semi finalists other than places 1-3, receive 1 point.

Goodyear Team Race Results

Team	Club	1st	2nd	3rd	Pts.
1. Catlow Jephcott	Loughborough	1	3	3	33
2. Hammersley Horne	Loughborough	2	2	0	18
3. O'Neill Bollen	Elliotts	1	2	0	16
4. Horton Haworth	Wharfedale	2	0	0	15
5. Green Malcolm	Ipswich	0	2	1	14

The positions include points from marathon events.

All Time Greats Class by Class

1/2A Team Race

1. Langworth Broadhead, Wharfedale	99½
2. Horton Haworth, Wharfedale	92½
3. Wilson Gardner, Tynemouth	53
4. Heaton Woodside, Sharston/CM	52
5. O'Neill Bollen, Elliott	45

'B' Team Race

1. Wilson Gardner, Tynemouth	130
2. Nixon Campbell, Grantham	87
3. Heaton Ross	74

Goodyear Team Race

1. Horton Haworth, Wharfedale	245
2. Jarvis Needham, Stockport	166½
3. Rudd King, Feltham	122½
4. Clarkson Woodside	89
5. Alcock Chambers, Wolves	80½

FAI Team Race

1. Smith Brown, Feltham	186
2. Langworth Broadhead, Wharfedale	162½
3. Heaton Woodside, Sharston/CM	151
4. Wilson Gardner, Tynemouth	118½
5. Horton Haworth, Wharfedale	106

Congratulations to all concerned and our thanks for John Horton for his dedication and hard work. Results please to John Horton, 10 Lawn Avenue, Burley in Wharfedale, Ilkley, West Yorks LS29 7ET.

See you all next year.

18th Coppa D'Oro, Lug o di Romagna, Italy September 13, 1981

Held in good warm conditions, this event usually produces some of the fastest times of the racing year. The Cipolla and Rossi Brothers showed that their fastest times at the Europ Champs were no accident. They both had 19.0/10 airspeed, allied with first flick pitstops. Both teams managed heats of 3:31.

In the semis these two recorded sub 3:40 times and were joined by fellow Milanese Penisi-Zena with a 3:40.

The final was a very close affair until the halfway distance when the Rossi Brothers had to change a prop. The winning margin must then be considered very close, but is nevertheless one of the fastest ever times.

It was pleasing to see long time expert Pietro Fontana in fourth place, having teamed up with one half of the Rossi-Rossi team. My thanks to Enrico Macchi for his fine report — I only wish my Italian was as good as his English.

FAI F2C International 'Coppa D'Oro 2' FA Results

		Rd.	2	Semi	2	Final	Eng.
Cipolla-Cipolla	Milan	68	3.31	3:38	—	7:13	Cipolla
Rossi-Rossi	Milan	14	3:31	3:40	3:37	7:53	Cipolla
Pennisi-Zana	Milan	4:03	3:54	3:40	3:43	8:05	Cipolla
Fontana-Rossi	Milan	3:38	—	5:44	4:35		
Fischer-Straniak	Austr.	3:40	—	—	3:47		
Macchi-Nocentini	Rome	4:06	3:45	3:58	—		

Invitation F2A

Fontana	260
Marksteiner	249
Horvath	230

Elliott MAC Control Line Contests 1981

I had a letter from Pete O'Neill the Elliott's Competition Secretary regarding the 1981 series of racing events. Three of these are held — one each in Spring, Summer and Autumn. The weather was most unkind for the first two events, the first being almost totally blown off and the second, little better. The fact that the hard working Elliott Club moved the date in order not to clash with one of the advertised events at Merryfield, Ilminster. I have heard that at one of the Merryfield contests, no organisers showed on the advertised day! Did any competitors show up? I have not heard of any results. With fewer and fewer contests available, it would seem only good sense for organisers to avoid these clashes.

The Elliott Club voice the two main concerns for 1982. **1.** Entries have been low, particularly in ½A Combat. This, when allied to the club's policy of providing trophies for all classes, means that the club is in the red. Pete would like to thank all those teams who attended, especially those who made long and expensive journeys from the North. **2.** The owners of the flying site, Marconi Avionics, are becoming more aware of security and there is a possibility of losing the use of the car park. Since the ending of the Cranfield Rally, the Elliott meets have been the only Southern contests and we must hope that they will retain the use of the Rochester site into next year and beyond.

We wish Elliotts good luck in their negotiations and a better year for 1982 with regard to the weather and number of entries.

Elliott Autumn Rally results

FAI Teamrace — eight entries

	Heat	Final
1. Smith Brown	3:40	7:30.5
2. Fry Thorpe	3:41.4	8:11
3. Smith Yeldham	3:59	8:46

Goodyear Team race

1. Andrews Horwood	4:33.6	9:17.5
2. Green Malcolm	4:28	10:39
3. Catlow Jephcott	4:24.6	Dq.

The final was stopped and re-run after a line snag incident in which the Catlow Jephcott team were disqualified.

Class B

1. Wilson Gardiner
2. Needham Banks
3. Toogood Wards

Possibly the only class B event this year had Wilson Gardiner way out in front with the model they campaigned so successfully in 1980.

ADDITIONS TO THE FAI CALENDAR 1982

May 15-16	
AUSTRIA Kraiwiesen	International Fesselflug Cup 1982, F2A, F2B, F2C
May 22-23	
UK Manchester	Three Sisters International, F2A, F2B, F2C, F2D
May 29-30	
BELGIUM Genk	International Combat Contest F2D
August 14-15	
BELGIUM Repinster	International Competition Control Line F2A, F2B, F2C
September 4-5	
BELGIUM Rixensart	7th International Combat Meeting F2D
September 11-12	
SWITZERLAND Breitenbach	4th Int. MBZ Cup 82, F2B, F2D
September 12	
ITALY Lugo	Coppa d'Oro FAI F2C, F2A, Speed 5cc-10cc
September 16-19	
BULGARIA Sofia	International Cup F2, F2A, F2B, F2C, F2D
September 24-26	
HUNGARY Salgotarjan	Nogra Cup, F2B
October 3-4	
NETHERLANDS Utrecht	Europa Cup, F2A, F2C

Find the balance point MODEL COMPETITION

The great Aeromodeller Give away contest £350 of prizes must be won

ONLY FIVE CROSSES

The January winners are:
C. J. Baker, Colchester, Essex. K. Bevington, Richmond, Surrey. Mark Stephens, St. Annes-on-Sea, Lancs. P. J. Woodfield, Shepshed, Leics. D. J. Monk, Sittingbourne, Kent.

RULES

1. The competition is FREE and open to all Aeromodeller readers.
2. The model has been erased from this picture. Use your skill and judgement to determine not just the position of the model in the picture, but its exact balance point.
3. The first ten entries with the centre of a cross nearest the correct balance point will be judged the winners of this month's prizes. If you prefer not to cut the picture from this page a same-size facsimile (photostat) is acceptable.
4. Any number of entries may be made, but each entry must be accompanied by a separate entry coupon, clipped from the page. The coupon must be the original — photocopies are not accepted.
5. Only **five** crosses per entry.
6. Entries in this March edition competition close after first post on March 18, 1982. Results will appear in Aeromodeller May 1982 edition.
7. The Editor's decision is in all cases absolutely final and no correspondence will be entered into nor responsibility accepted for late, mislaid or lost entries.
8. Employees of MAP Ltd. and their families are not eligible.

This month: five four stroke engines must be won, two Enya 40s, one OS40, two Saito 30s.

To Aeromodeller Magazine. Please accept my entry for your March 1982 "Find the Balance Point" competition. I understand the rules of the contest and accept the editor's decision as final.

Signed.....

MODEL COMPETITION, PO BOX 35, BRIDGE STREET, HEMEL HEMPSTEAD, HERTS HP1 1EE

NAME .....

ADDRESS .....

.....

.....

NB: Coupon must be original — not facsimile cop

Entry Coupon

Aeromodeller 'Find the Balance Point Contest' March '82

Free Flight Scene

DAVE HIPPERSON reports

East Anglian Wakefield Day Watton, 8/11/81

The total calm that coincided with this year's East Anglian Wakefield bonanza attracted the best ever support. Scores of beautifully turned out and trimmed vintage Wakefields flew all day. The superb creations from Yearley, Aslett and Michel in particular being the object of much admiration. The imaginative menu for the day was three classes of Wakefield, modern F1Bs, Vintage pre-'53 designs and the Ted Evans Trophy for models conforming to those brief rules that existed in '53.

First flights in all classes were to be completed by 12 noon and it was during this period that the only real lift of the day appeared attracting a number of 'clouds' of F1Bs not to mention impressive maxes from Michel and Aslett. From then on F1B was flown to three more 3-minute maxes and in rounds of its own but the two other events were grouped together and had a steadily increasing max of 4 and finally 5 minutes but few models went anywhere near the edge of the drome. This enormous max would certainly have turned the pre-'53 event around many times had there been any appreciable lift but as it was, the rules suited the conditions perfectly as 3 minutes is relatively difficult with these designs despite their power. If there was only a short time when lift appeared then the down-draughts too must have been lurking all together and waiting to spring out on John O'Donnell's second 53 rule flight to the 4 minute max. The model easily capable of 6 in still air was down in 3:14. This left only Godden and Hipperson with perfect two flight scores. ROG-ing for the third flight John Godden muffed it and spread his pretty Borderline across the runway. This prompted Hipperson who was also about to launch to remove his fuse which had been burning erratically all day and fly believing he had it wrapped up and this would be the last flight he needed. It maxed but John Godden with only a few minutes of the round left had reached for his yet unflown own design reserve. He managed two trim flights and got away at the end of the round to max and push the event to a flyoff!

Even after four rounds in F1B four had perfect scores and this flyoff was first. The eventual places reflecting the order in which the contestants flew which would suggest something was brewing and George Foster caught it. Perhaps it was a man made thermal as quite a crowd had gathered by this time. Certainly his 4:15 was magnificent to watch and it was virtually overhead for the entire time. This left the '53 flyoff and both qualifiers were winding before the start signal. Hipperson was away first with two power stalls but the model was well up when Godden released a minute and a half later. He stalled too but worse and then after a respectable and long climb a slight stall in the glide built up. He had tinkered with it since the last flight! He could not match Hipperson and was in fact down first.

Obviously the weather had made things most pleasant but it was only part of the story. After a season when contestants have often had to put up with far from ideal organisation this event was a masterpiece. The control had a sign to that effect legible at half a mile. Bob Wells, the contest director, had a PA over which he was most informative at the right time and occasionally very amusing. Rockets were fired to punctuate round times and when maxes were altered or times changed it was made absolutely clear. When the drift swung there was no panic move — he waited and it swung back. Throughout the day the six foot high score board was bang up to date and believe it or not models were weighed! There hasn't been processing of any sort at any free flight event for at least two years and moreover the impression was that the CD was there for the benefit of the contest and always had a decision ready on any query. One man and his lady can do it. What is more a man who lost more than a year's flying because of his leg injury in 1979 can still give up a day and do the whole thing so professionally. Naturally enough there was a tremendous turnout at the prizegiving. Plaques down to 3rd were augmented by substantial cash. If you have a vintage Wakefield come next year, if not start building one — it will be worth it.

Results East Anglian Wakefield Day, Walton

Vintage (Pre-'53) 15 flew (Max possible 12.00)

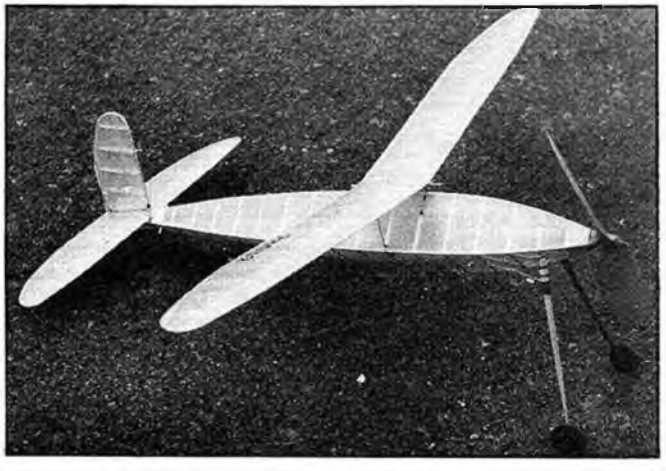
1	B. Aslett	(Chester Lanzo)	10:51
2	P. Michel	(Isis)	8:24
3	G. Hawke	('36 Copland)	7:44
4	B. Martin	(Jaguar)	7:38
5	B. Yearley	(Flying Minutes)	7:34

F1B (Current rules 3min max x 4) 21 flew

1	G. Foster	12:00 + 4:15
2	R. Miller	12:00 + 3:32
3	D. Hipperson	12:00 + 3:30
4	B. Martin	12:00 + 3:22

Ted Evans Trophy 1954 Wakes. (Max possible 12.00) 6 flew
12.00) 6 flew

1	D. Hipperson	12:00 + 6:18
2	J. Godden	12:00 + 4:30
3	J. O'Donnell	11:12



Brian Lavis Fillon Wakefield.

John Godden prepares to ROG his 54 rule own design - finished second in fly-off against Hipperson.

SMAE Free Flight Area Results Service

Last year some 50 people availed themselves of this free service but that is still vastly fewer than all those who regularly fly in SMAE Free Flight Area Events. To receive a complete result list of every Area Event throughout the year and usually within ten days, send me six self addressed envelopes of at least 9in. × 4in. with *first class* postage in place — that is 15½p. Do this at the beginning of the season (i.e. now) and you will automatically receive results throughout the year. It is not possible for me to supply results of the Nats or the other centralised events unless the SMAE make special arrangements for it. In this case you will also receive such results as well in one of your six envelopes. Send SAE's to D. Hipperson, 35 Anthony Road, Boreham Wood, Herts.

Analysis of 1981 Free Flight SMAE Results

Top 30	Name	Events	1st	2nd	3rd	Pts.
1	D. Hipperson	21	6	5	2	30
2	P. Harris	14	4	3	1	19
3	P. Ball	22	3	2	2	15
	J. Hopper	6	3	3		15
5	R. Pollard	9	3	1		11
	T. Payne	13	2	1	3	11
7	J. Cooper	19	2	2		10
	S. Philpott	10	2	2		10
	S. Screen	8	1	3	1	10
10	J. Fletcher	8	2	1	1	9
	J. Bailey	13	2	1	1	9
12	R. Peers	20	2	1		8
	C. Parry (Jnr)	14	1	2	1	8
14	M. Chilton	2	2			6
15	D. Greaves	9	1	1		5
	N. Marcus	6	1	1		5
	B. Baines	5	1	1		5
	P. Buskell	4	1	1		5
	I. Davitt	10		2	1	5
	J. O'Donnell	12		2	1	5
21	M. Fantham		1		1	4
	Jeff Smith		1		1	4
	C. Chapman		1		1	4
	J. Buskell		1		1	4
	M. Howick			2		4
	A. Jack			2		4
	R. Moore			2		4
28	C. Edge		1			3
	D. Cash		1			3
	P. Williams		1			3

This analysis takes on more significance now as the SMAE are adopting it for the basis of their Senior and Junior Championship awards in '82. That is to say he who tops it next time wins a trophy! As for '81 there was a colossal number who just won a single event and placed in nothing else. Too many to list in fact. What is a little surprising is that these included a number of accepted leaders in certain classes. Perhaps rather too much standing about talking and too little doing it? No names!

We have a more complete (events flown) tally this year and from the six at equal 15th we can see that both John O'Donnell and Ian Davitt had a fairly busy year but actually took no SMAE firsts although both came close in Open Rubber towards the end of the season — they won't need reminding! Ian was 2nd in CDH and Open Rubber at the Southern Gala after having taken third in the CDH fly off at the Northern Mini earlier in the summer. John began and ended the season with 2nds in Open Rubber at 1st Area Meeting and then the Northern Gala. His third was also at the Northern Mini but in A1.

Pete Buskell had a quiet year and only flew in four SMAE events. Nevertheless he placed in two by winning the 1/2A event at the Southern Mini and taking 2nd in CO_2 at the Southern Gala. Brian Baines was working in Scotland and at a distinct disadvantage all year having to drive enormous distances to get to any events. Thus he flew in but a handful. His 1st in A1 at the 6th Area Meeting was particularly gratifying as he was unable to take his fly off at Barkston Heath as he had to leave for Scotland. As it turned out he didn't need it! He was also 2nd in the Open Glider fly off at the 2nd Area event. Norman Marcus limited most of his activity to the South and hence flew in only six events. He won the Open Rubber fly off at the Club Champs with a four bladed prop and a massive time and supported this with 2nd in CDH at the Southern Mini at Beaulieu. Dave Greaves started the season with a near miss to take 2nd in A2 at the 1st Area event. He went on to better things at the Nats where he took 1st in Wakefield in tricky conditions.

At 14th we have a recent convert from Control Line. Mike Chilton flew only in CDH at the Nats and the 4th Area meetings — he won them both. The Nats with the only perfect score and the Area do after an interesting fly-off in which his model bettered 2½ mins. in the pouring rain.

Tying at 12th Chris Parry and Russell Peers both of whom showed their determination in windy conditions at the Northern Gala. Russell topping Open Rubber and Chris taking Open Glider. Apart from that Russell won Tailless at the Nats and had a 2nd place in the Open Rubber fly off at the Club Champs. Chris taking 2nd in A1 at the Nats (by way of his other good glider performances over that weekend became overall glider Champion at the Nats) and 3rd in the same event at the Southern Gala. He was also 2nd in Open Glider at the Southern Gala. Russell in particular flew a great deal and should have returned better than he did but he has been less active in Open Power recently mainly due to lack of suitable local trimming sites.

John Fletcher and John Bailey are together at 10th. For John Fletcher this year is a slip after last year's promising 3rd but he has flown less. Two full score 1sts in 1/2A at the Northern Mini and Southern Galas coupled with a 2nd in HLG at the same Northern meeting and a 3rd in CDH at the Southern Mini are a good return on only eight contests. John Bailey flew in more and had a particularly busy start with 1sts in FA1 Power at the Nats and A1 at the Southern Mini. His 2nd was in 1/2A Power at the same event and the 3rd was in Open Glider at the 4th Area. He flew hard for the first part of the season and very little in the latter part.

Stafford Screen flew a little less than last year but returned a high performance as usual. If he made any mistakes it was not coming to the 3rd Area event because his weather forecast said it would be unflyable! He won FA1 Power at the 2nd Area event and was of course 2nd in the Trials in the same class. His other 2nds were in Open Power at the Club Champs fly off and in the Keil Trophy which contributed to his club — Birmingham — taking the Plugge Cup from Biggles this year. He was also 3rd in 1/2A at the Mini meeting at Beaulieu. Steve Philpott tying with Stafford and John Cooper at 7th very nearly perfected CO_2 duration with wins at the Nats and the Northern Mini events. His 2nds were with his other favourite class of A1 at the 5th Area and once again the Northern Mini. Had he attended the Southern and Northern Galas he could easily have been a lot higher than this. He flew substantially less than in '80. John Cooper flew 19 events, the same as last year, but achieved results in many more. He started with an Open Rubber win at the 1st Area event after a freaky trim held the model in lift and into wind for many minutes. He also took Open Glider at the 6th Area meeting in the wind when additionally flying Open Rubber for Plugge Points and 1/2A for good measure! He was 2nd in Open Glider at the Nats and the Club Champs.

John's clubmate, Trevor Payne ties with

1981 PIERRE TREBOD WINNERS

The very happy Arno Hacken with the only perfect score in F1A after a tricky day of changing weather.

I. Zeri, the Italian that topped the F1B flyoff just before launch on the final round. Model had a particularly fine glide.

Dave Sugden away on the final decider in F1C. He gave a demonstration to many of unflappable calm.

Ron Pollard at 5th. These two went about the season in vastly differing ways and it is conceivable that they never even saw each other! Trevor won 1/2A at the Nats with the only full score and FA1 Power at the 4th Area. He was also 2nd in Open Power at the Southern Gala and placed 3rd in Open Power at the 3rd Area meeting, the Club Champs and 1/2A at the 6th Area. Thus he placed in virtually half the events in which he flew and all power — not bad. Ron on the other hand flew only nine events and won no less than three and two of them the same day. These two being Open Rubber and Open Glider at the 2nd Area meeting. He had already won the Trials in Wakefield by this time therefore the start of his season was exceptional. He was also 2nd in the Wakefield fly off at the 5th Area meeting.

Julian Hopper flew in six SMAE events — five of them Open Power. He placed no lower than 2nd and won three of them. His ultimate aim is to take all five SMAE Open Power trophies in one year — this is the closest he has ever come and a remarkable season's performance for someone who very much puts all his eggs in one basket. He was not disheartened with 2nds in the first three events of the year. He missed winning the 1st Area meeting by one second and then was just pipped at the Nats and the 3rd Area meetings. He came good at the Southern Gala to win Open Power and HLG while he had a spare moment and then topped the season by winning the last Power event at the Northern Gala. His dedication to one class has brought him to a very high standard indeed — just what competition is supposed to do. Therefore it must have been particularly hard for him to bear the news that the SMAE are withdrawing from circulation the Hamley Trophy, that he won at the Northern Gala, on the grounds that it is too fragile to present.

Equal at 3rd and down from top slot last year Phil Ball who could only win once in Open Rubber but at least he did it at the Nats. His other 1sts were in Open Glider fly off at the 3rd Area event and HLG at the Northern Mini. He was 2nd in Open Rubber at 6th Area and HLG at the Nats. He backed this up with two 3rds, one in Open Rubber at 2nd Area and the other in the CDH fly off at the 4th Area. There is little doubt that he is actually better and has better models than last year but the breaks went very much against him this time. Once again he was the busiest but didn't fly in the last two major events of the year and this could have made a difference.

Pete Harris specialises in Power like Hopper but flies all the disciplines. Two of his 1sts were in Open at 1st Area and Club Champs fly off where he actually won Open Glider as well. This double clinched the Champs for his Club — Birmingham — giving them the Club Champs on top of the Plugge! He also won 1/2A at the 6th Area event with a near perfect score in conditions that made any score quite an achievement. It is his ability in all weathers that makes him so impressive and probably one of the biggest stumbling blocks in the way of Julia Hopper ever achieving his ambitious five wins. With his FA1 models he placed 2nd at the Nats and 2nd at the 2nd Area event. His 3rd was in 1/2A at the Northern Summer Mini. A tremendous return on only 14 events but it represents a more hectic year for him than last.

Dave Hipperson along with Pete Harris was the only person to attend every SMAE event and the *only* person to fly at them all. He had a poor Nats probably by way of trying to fly in too many classes but to top this table he flew only one more event than last year. His success revolved around extraordinary good fortune in Wakefield and CDH where he could do no wrong apart from at the Nats. He won both Wakefield events flown at Area level something incidentally he has done before about mid-70s. He took Vintage at the Nats with a fly off and so far the only contest flight from his Lanzo Stick. He won both CDH at the Southern Mini and Southern Galas and added CO_2 at the Southern Gala between the CDH flights. His CO_2 performance elsewhere was not up to so much with 2nds in both the Nats and Southern Mini fly off's supported by a 3rd at the Northern Mini. He had emerged 2nd in Wakefield again at the end of a rather unsatisfactory Trials and placed 2nd in the CDH fly offs at the 4th Area meeting (the wet one) and the Northern Mini. His other 3rd was in Open Rubber which respresents his only SMAE placing in this his favourite event — a little of the 'Julian Hopper' is needed on this class. As with Ball's previous year's successes Dave managed something special indoors too. Here he had less difficulty with his CO_2 units and took 1st in every one of the Sparklets series and set the year's highest single flight time of 7:20. (Indoor events do not count towards this listing.)

As this will represent the SMAE Senior and Junior Champs award system in 1982 it should be pointed out that points will be awarded in the usual 3, 2, 1 arrangement except where there are less than three contestants. In the case of two — 1st will score 2, and in the case of one — 1st will score 1. It might be worth remembering that some people get very high in this list by flying excellently in only one class so that now the system favours the people that are keen in many or very good in a few events rather than the old system that actually encouraged mediocre performances in a wide range of classes.

DENNIS DAVITT REPORTS

Indoor Meeting at Slaithwaite, 13 December, 1981

This annual event was held at the Slaithwaite Leisure Centre near Huddersfield.

The main fear for the organisers was the possibility of heavy snow. Although road conditions in the North were very good, the Midlands and South already had severe wintry conditions, and the weather forecast was for these conditions to extend north. Indeed they did, with light snow commencing about 3pm and increasing to a raging blizzard by 6pm.

Despite the conditions there was a reasonable turnout of 22 competitors, who enjoyed what appeared to be a more relaxed atmosphere than usual.

All events had the competitors divided into 'A' grade and 'B' grade flyers, with prizes awarded in each grade, the idea being to further encourage the non-experts.

The first event was HLG, which attracted eight entries. Because of this low number the competitors certainly had their money's worth, with each competitor making 18 flights in the one hour competition period. The large lightweight flexible wing models again dominated the event, with Graham Davitt finishing first, Bernard Hunt second and Brian Kenny third. After having trouble with his flexi-wing model, Dave Goodwin changed to a Coot type and put in some respectable scores, not quite good enough to place in the 'A' grade. Reg Boor won 'B' grade with reasonable scores produced from his right-arm-over-the-wicket launch.

Scale (not restricted to Peanut) had an entry of nine, with John O'Donnell flying his veteran *Fike* to win, and Reg Boor improving with his new relatively large *Puss Moth* for second place. Welcome newcomers included the Horsefield brothers, of whom one secured third place in the 'A' grade flying a *Church Midwing*, and the other winning 'B' grade with his *Fokker D VIII*. The event was judged by Denis Clarkson and Jack Hardcastle, who had a long and arduous duty in the chilly hall.

Last event of the day was EZB, run to the '1.2gm' rules. Weight checks on all the models were satisfactory after some minor additions of Bluetack here and there, but it was encouraging that most of the models of even the new EZB flyers were down to weight.

With a total EZB entry of 14 it was not necessary to ration flights, but Mrs. Davitt did a meticulous job of recording scores as well as taking the entry fees and generally keeping the books straight.

To further encourage EZB newcomers, all the competitors were arranged into pairs, as well as flying individually in the 'A' or 'B' grades. Each pair was selected as one from the experts and one from the non-

B. Horsefield rebuilds the nose block on his Spitfire IX.

experts, with a rough attempt to equalise potential scores. The aim was to actively encourage the experts to help and advise their non-expert partners. It is difficult to judge the success of the trial because the increasingly bad weather forced many competitors to leave early, so breaking up several of the pairs. The experiment will be repeated (if popular) on a better day.

No steering was allowed, but was compensated for to some extent by allowing an unlimited number of flights.

The result in EZB for the singles was a win for Bernard Hunt, John O'Donnell second and Graham Davitt third, with 'B' grade won by Steve Baraclough. The pairs was won by Baraclough/Davitt, with Kenny/Whitehouse second and Hunt/Hunt third. Young newcomer Steve Baraclough was flying very impressively considering it was his first ever EZB competition, recording two flights of over seven minutes.

RESULTS

EZB
1. B. Hunt 17:59
2. J. O'Donnell 17:83
3. G. Davitt 16:18
'B' grade — S. Baraclough 14:28
Junior — Lucy Hunt 7-21

HLG
1. G. Davitt 67.4
2. B. Hunt 62.9
3. B. Kenny 56.8
'B' grade — R. Boor 40.6
Junior — J. Clarkson 11.4

EZB Pairs
1. Baraclough/Davitt 30:46
2. Kenny/Whitehouse 27:45
3. Hunt/Hunt 25:20

Scale
1. J. O'Donnell 5½pts.
2. R. Boor 7pts.
3. B. Horsfield 13pts.
'B' grade — D. Horsfield 15½pts.
Junior — A. Stennett 29½pts.

The EZB singles competition was also marred by the bad weather forcing people to leave early, with notable single flight scores of 9:47 by Deri Morley and 9:20 by Brian Kenny.

Despite the modest attendance the meeting managed to avoid a financial loss, thanks entirely to trade support from Davies-Charlton, Humbrol, Ingersoll, Modellers Den, Solarbo, Swann-Morton, Telco and Veron.

Top left: Bernard Hunt had a good day, won EZB and was second in HLG.

Top: Dave Goodwin negotiates with Dave Yates for old Aeromodeller. Hurry up Mr. Yates, he's nearly read it!

Above: an enjoyable day was had by this g(i)ggle of HLG flyers - from left to right: Messrs. Barraclough, Clarkson, Stennett and Potts.

What's Happening?

February 27
WIGAN 70 *COUPE D'HIVER & HLG.* Venue Three Sisters. Contact Peter Farrimond. Tel (0942) 34068.

February 28
INDOOR MEETING *EZB, HLG 'KEYHOLE' SCALE.* 10.00am-6.00pm Venue Wigan College of Technology, New Market Street, Wigan. Contact Dave Yates (Tel (0942) 214725)

March 7
GRANTHAM GRAND PRIX *OPEN RUBBER, GLIDER, POWER AND COMBINED FAI.* Venue Barkstone Heath. Contact Phil Ball. Tel (0332) 665361 (evenings).

March 14
1ST AREA CENTRALISED SMAE. *F1A(A2) for K&MAA CUP + PLUGGE POINTS. O/R AND O/P for Frog Senior Trophy.* Venue Area Venues.

March 28
THE TONY PANNETT TROPHY OPEN POWER, JACK KAY TROPHY, A2 GLIDER + VINTAGE DURATION. Venue Church Fenton. Contact John Godden (0532) 521002.

April 10/12
EUROPEAN TEAM TRIALS for *FAI plus O/R/G/P on 12th.* Details F/F Sub-Committee. P Farrimond. Tel (0942) 34063

April 18
BRITISH NATIONAL INDOOR SCALE MODEL FLYING CHAMPIONSHIPS AND INDOOR SCALE FLY-IN. SMAE NATIONAL COMPETITIONS FOR PEANUT SCALE, OPEN RUBBER SCALE AND CO_2/ELECTRIC SCALE. Venue Middleton Hall Shopping Precinct, Milton Keynes 10.00am-6.00pm. Pre-entry this year, SAE to Barrie Hotham, 46 South Park Avenue, Mansfield, Notts NG8 4ZPL Tel Mansfield 34127 Fee £1 per event, non-competition flyers £1 each. Closing date for entries April 1, 1982.

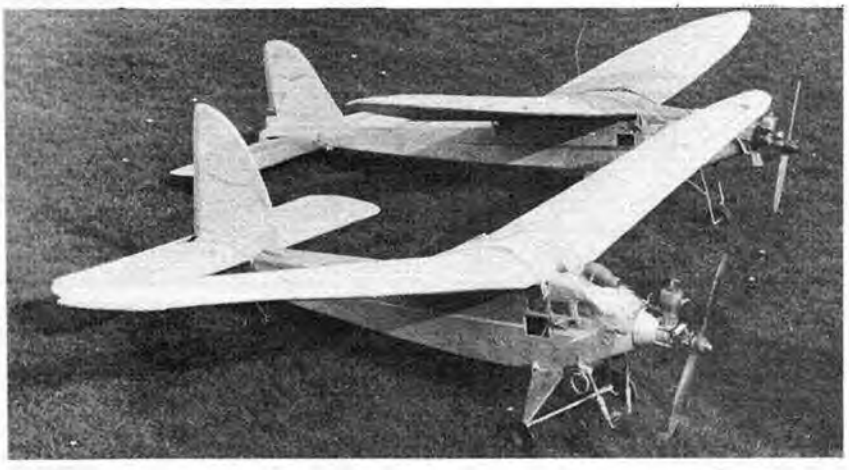
April 25
2ND AREA CENTRALISED SMAE F1C/FAI POWER] FOR HALFAX TROPHY + *PLUGGE POINTS, O/G AND O/R FOR GAMAGE CUP* Area venues

April 25
ODIHAM SPRING GALA *(usual F/F events).* Contact. N. Couling Tel (0323) 53116

Vintage Corner

THE BOWDENS

John Crampton, vice-President of the SMAE, reports on a visit to Colonel Bowden, the master of aeromodelling in the 30s.



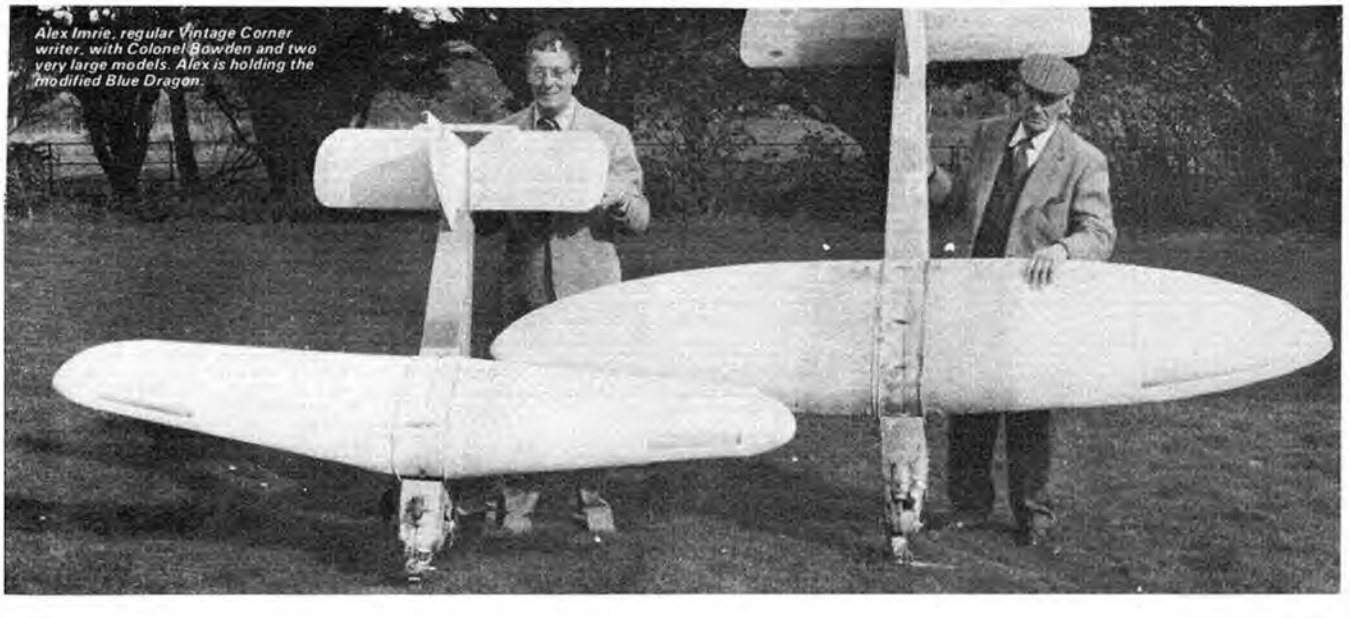
Colonel Bowden, above, and two of his models on the left.

IN 1931 I was ten years old and already a compulsive aeromodeller. On sixpence a week pocket-money severe economies had to be exercised; stiff paper and glue were my only building materials. A rise in my weekly income shortly afterwards allowed me onto the threshold of advanced technology, rubber driven propellers and powered flight. But the power curve of twisted rubber made me long for a powerplant with a constant output. And then one day in the Aeromodeller magazine I read of Colonel Bowden's huge models (or so they seemed to me) powered by miniature petrol engines. The first, I believe, was 'Kanga' and then came The Blue Dragon. The wonder of it! How I longed to meet the Colonel whose every word I read. I studied, not just looked at, the photographs of his aircraft and my enthusiasm knew no bounds when, in the mid-thirties, photographs appeared of his petrol-powered flying boat leaving the waters of Poole Harbour.

Little did I know that nearly fifty years were to pass before I was to meet Colonel Bowden — and his enchanting wife Grace (who married the Colonel when I was but three). Today Grace has the charm of another enchanting Lady, the Queen Mother. Nearly the same vintage, same super smile.

Early in 1980 I was introduced to the Colonel by another pioneer of the aeromodelling fraternity, Group Captain James Pelly-Fry DSO. Twelve months later the Colonel and his wife kindly invited me to their home, hoping the weather would permit us to fly a model or two after lunch. But on the day the weather was terrible; the rain lashed down and a storm force gale bent and shook the trees. And so, instead of flying, the Colonel showed me his collection. What a magic afternoon it turned out to be and how fortunate it was that the weather prohibited our flying because we were able to concentrate on his model aircraft, boats and (full size) motorcycles.

The number of model aircraft that the Colonel has accumulated is astonishing; they are stacked wall to wall, in room after



Alex Imrie, regular Vintage Corner writer, with Colonel Bowden and two very large models. Alex is holding the modified Blue Dragon.

The Colonel is still flying models today, but not with vintage engines as can be seen in this picture - a Merco 61 modified to a diesel and in the foreground a Canadian Quadra.

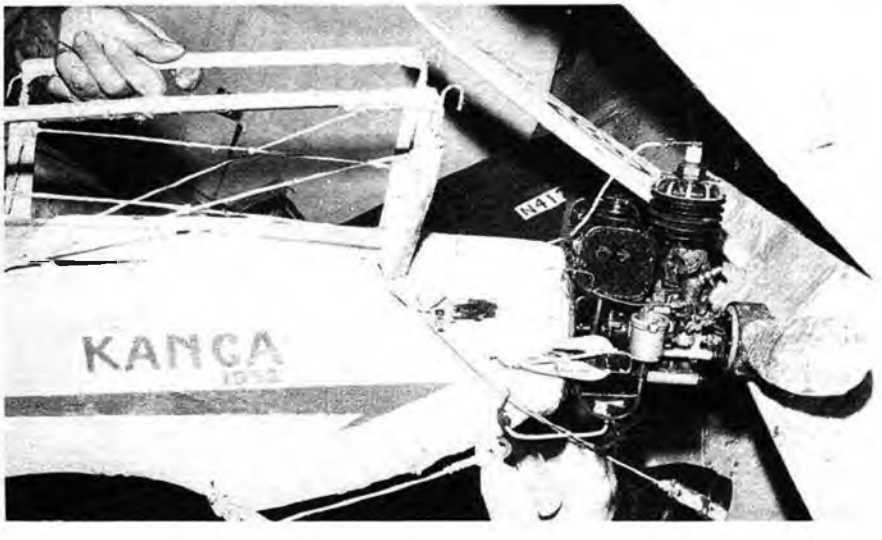
room. Floor to ceiling, in outhouses and lofts. What might once have been the butler's pantry, the gun room, the tack room, the loft above the tack room, a stable, the stable loft — all filled with model aircraft — and here and there model motor boats and yachts. And the motorcycles; a Nimbus (ever seen a four-cylinder in-line air-cooled motorcycle engine with shaft drive — and the cylinders pointing in the right way too, not East West like the modern Orientals?) A hundred mile an hour American 'Indian' and others. All beautifully kept. All lovingly described. And then, miracle, there *was* 'Kanga'. The genuine model with the original 28cc Wall engine which still runs well. This was the aircraft that R.O.G'd. (Rose Off Ground), officially observed by Pelly-Fry, from Fairey's Aerodrome (now part of London's Heathrow Airport) in 1932. We then viewed the eight foot span 'Blue Dragon' with its original 14cc Atom Minor engine, the model which flew away — out of sight — on the next record flight from Fairey's Aerodrome to be chased by the Colonel who persuaded Reginald Brie, Cierva's Chief Test Pilot, to take him aloft from nearby Hanworth in a Cierva Autogyro, the latter to look for the flyaway giant which was eventually found. This happened nearly fifty years ago. And standing beside me was Colonel Bowden holding the very same aircraft.

The whole afternoon was magic. Room after room, garden shed, outhouse, garage, loft, cupboard — study even — crammed with model aircraft. Big ones, little ones (mostly big ones) round ones, deltas, all shapes and sizes. Fascinating engines; a glow-plug Merco modified to operate as a diesel, a Canadian Quadra, three giant models each powered by a Taplin Twin, pre-last war petrol engines; the 14cc Atom Minor, the Brown Junior, a 14cc Forster, a modern 14cc Webra four-stroke, a Wankel, an O.S. four-stroke and each was the centre point of a story. The Colonel started building model aeroplanes when he was fifteen and has kept a great many of them.

Tea-time. Buttered toast with Gentleman's Relish and macaroons with a nut on top (and edible paper beneath) in Grace's Drawing Room. Chintz covered furniture, photographs of young people and not a model aeroplane in sight. (Clearly once upon a time a tiny foot had been stamped and a certain order given). And Grace, far from being sick unto death of model aeroplanes, joined in the talk especially when the personalities were mentioned. She remembers the pioneers. 'Did you', I was bold enough to ask, 'know what you were letting yourself in for when you married this officer?' *'No,'* she replied, *'I did not. More tea?'* Then again the super smile.

The Colonel has reached a mature age and yet his interest in model aeroplanes, engines, motorcycles and boats has all the vigour of youth. He still builds models. Still searches for the ideal. Still marvels at the way this one flies and wonders why that one won't. Still experiments and searches for information. Much too busy to waste time growing old.

Colonel Bowden's 1932 'Kanga.' The engine is a 28cc Wall modified by Edgar Westbury. Right: Alex Imrie is discussing various points about the engine with the Colonel. Note the rubber bands holding the engine mount in place and the large wheels, probably obtained from a local ironmonger.



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25 Years Ago March 1957

By Dave Day

Featured in a hard hitting editorial was the news that the FAI Models Commission had decided to hold World Championship events on alternate years. The Editor felt that this was "an ill-considered and unfortunate compromise calculated to reduce interest in the class of models concerned" and closed with the comment "Is it too much to hope that this FAIt accompli will be rescinded and nations allowed to choose of their own free will, according to their finances, how often, and how many, World Championships they will support?" over the years, we have seen many, unpopular, FAI decisions come to be generally accepted. Judge for yourselves in this instance.

In the 'Hangar Doors' column was news of the first indoor meeting to be held at a new venue — the Manchester Corn Exchange.

A varied selection of Plans Service introductions included a 48in. span Sopwith '1½ Strutter' for C/L Stunt (!) with 6-10cc motors, a semi-scale Dunne Tailless Biplane for F/F and .8cc power and the first of many all-wing Combat designs — the Duellist." The 'Wing' versus 'Conventional' design controversy in Combat was to continue for some years.

Scale drawings of the DH112 Venom marks FB1 and FB4 were squeezed into a two page spread in 1/72nd scale while drawings of the Fokker Dr1 Triplane to the same scale also appeared.

Featured in an article on fuel tanks ('Know your Engine' part ten) was probably the first ever published drawing of a chicken hopper tank. In this particular instance, the hopper was almost as large as the main tank and the benefits of the design must have been very small but the line of develop.

In the continuing series entitled 'Painting your Plastics', some useful information was given on mixing of scale colours from primary colours, although the final comment "add black to darken, white to lighten" could give unexpected results!

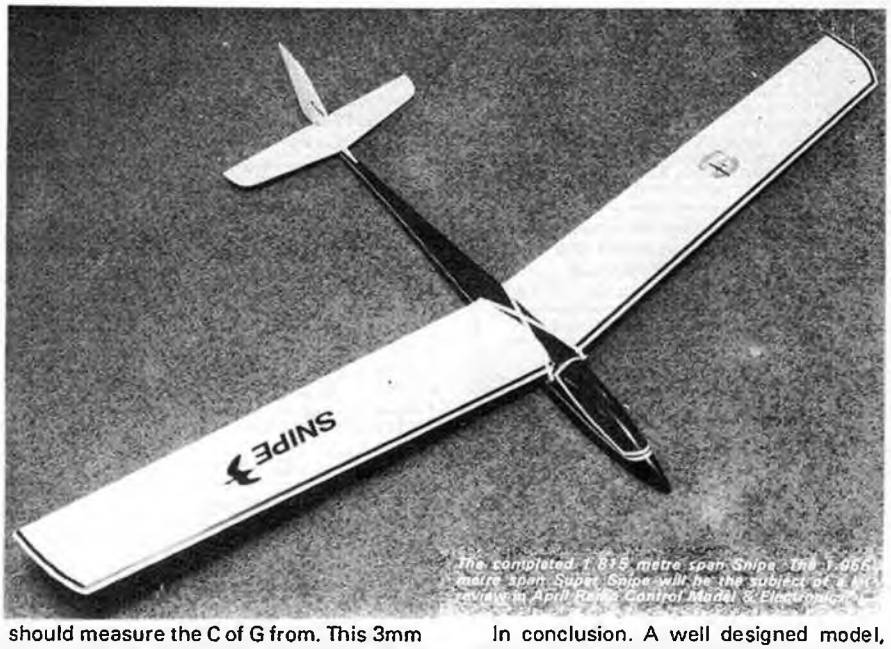
World News contained the results of the C/L Speed event at the 1956 Hungarian Nationals which took place only a few days before the uprising. We were assured that George Benedek had survived the revolution. Interestingly, this issue also contained an article on Soviet modelling!

Engine Analysis featured the new 'Frog 80' and included the comment "By no means the least of its virtues, it sells at a rock-bottom price!" Well, yes, £2.25 is much less than you pay for some engine mounts these days.

Model News contained a photo of two immaculately dressed young ladies trying to start an Amco 3.5 powered Glo-Bug. Those were the days!

Kit Review continued from page 133

forward and my fear about fitting the rods was unfounded as they can be bent a little and wangled in. The radio gear fitted is a new 5 channel 35FM Futaba, although of course, it only uses two of the channels. The FD33M servos fit side-by-side with just a little trimmed off the doubler to clear one of the arms. There is plenty of room for the rest of the radio gear. Mine needed to be put in well forward to get the C of G right. The final all-up weight came out exactly as per the specification at 900 grams. A power pod can be obtained although one is not supplied with the kit. I made up a simple one for the G-Mark .06 and then had to wait a number of weeks for suitable weather. In desperation I joined some enthusiasts on the Ivinghoe slope on a rather blustery day and persuaded one of the experienced flyers to fly my *Snipe.* Tony Smythe proved to be an ideal test pilot both in skill and experience with the site. After a total of about an hour's flying, the verdict was that if made and set up as then it flies exactly as claimed. A first-class trainer. Rudder response is not too violent and it needs all the movement of 32mm each way. Elevator response is more lively and Tony found it easy to perform a loop with the C of G in the 'experts'' position. The more forward position will no doubt give a less lively response for the novice. It is not clear from the instructions which face of former 4 one should measure the C of G from. This 3mm can make a significant difference if it means the C of G is too far back so I decided to play it safe and measure from the front face. Tony Smythe's only suggestion was that a raw beginner might appreciate an extra 15mm dihedral under each tip to give a little more stability for bluster conditions.



The completed 1.815 metre span Snipe. The 1.966 metre span Super Snipe will be the subject of a kit review in April Radio Control Model & Electronics

In conclusion. A well designed model, good-looking, easy to build and fly. The too short dowel would have caused problems if actually used by an unaided beginner otherwise there is no criticism of this excellent kit. With a price tag of only £19.95 it must be one of the best value kits on the market.

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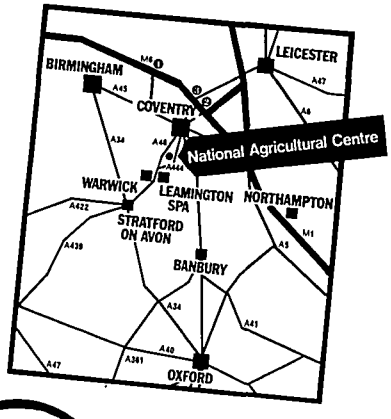


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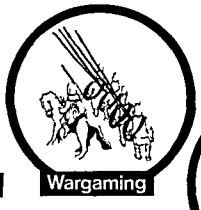
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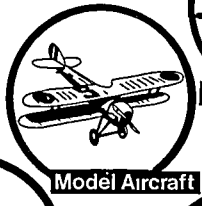
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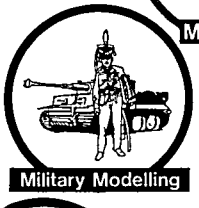
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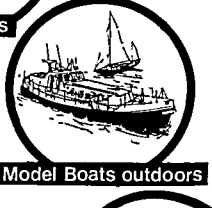
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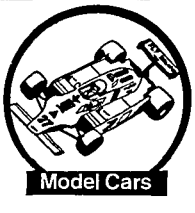
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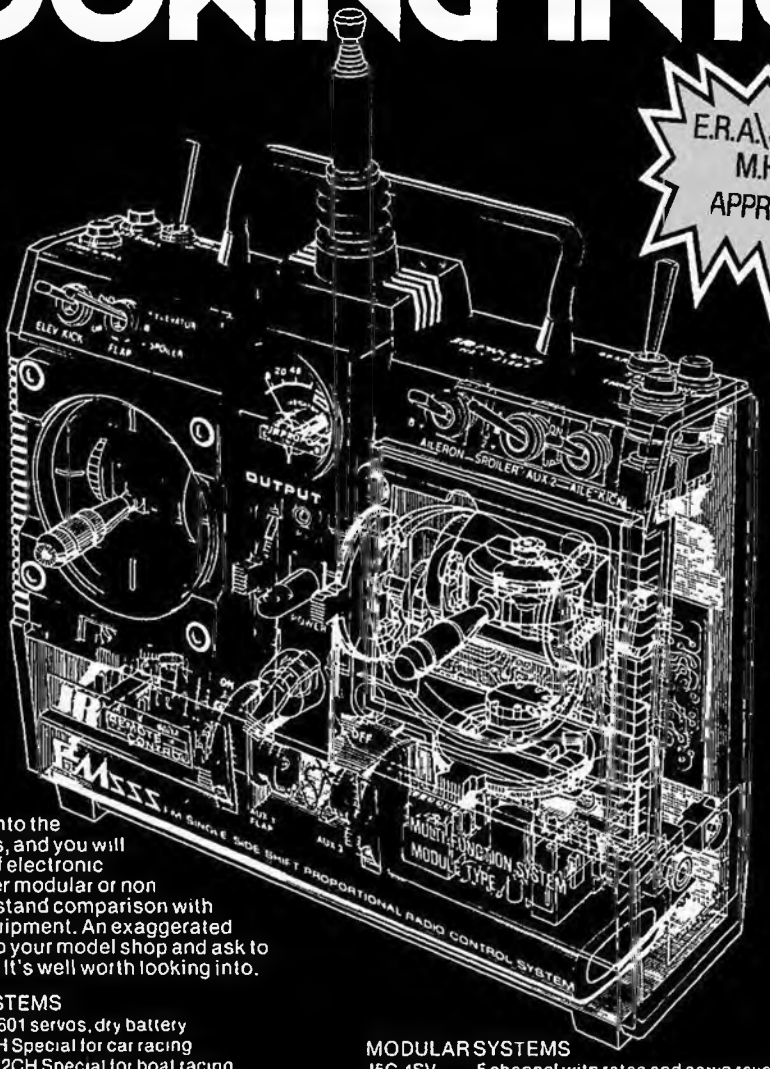

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