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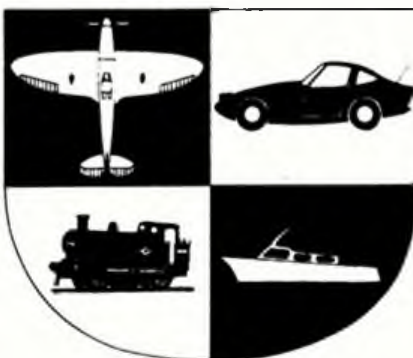
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MAY 1985

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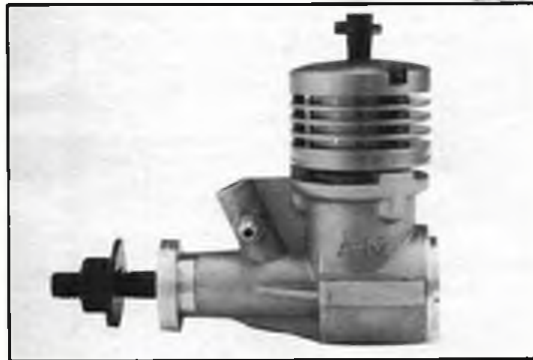
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Cover:
The Veron 'Dart Kitten' may be built for rubber or CO₂ power. Seen here as kit and as a finished model. Bill Dennis reviews what you get in the box on page 246. The 'Dart Kitten' is one of four scale models in this series from Veron - the others are:- Aeronca 'Collegian', Piper 'Vagabond' and the Ryan 'NYP', all of about 25 in. wingspan.

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HANGAR DOORS

Sandown Symposium

This year 11th and 12th May sees the tenth show to be held at Sandown Park Racecourse, previous events were held at Kempton Park Racecourse and prior to that at the Brooklands Technical College - where it all started in 1967.

Elmbridge Model Club who organise this yearly extravaganza for the modeller have from the very first, bent every effort to make this show an attractive offering to the modeller and his family.

Active displays cover Aircraft, Boats, Cars and Railway Layouts. The aircraft displays include a number of *star* attractions with World Aerobatic Champion - Hanno Prettnier, the 'Kalt' Helicopter Display from Japan, Ewald Heim (European Helicopter Champion) and Len Mount (British National Helicopter Champion). In fact so many manufacturers display teams will be buzzing around it is difficult to select some to mention here!

Control Line flying displays will demonstrate combat and precision aerobatics - there will even be sessions where the public can 'have a go', under tuition from the Club's own 'Champions'.

The Boat Pool will be in almost continuous use with Trade and Club models of all kinds from Yachts to Submarines - no torpedoes!

R/C Cars will be in their element with contests each day and *Richard Kohnstam* (importers of *Tamiya* products) will be running the first round of the *Tamiya Off Road National Championships*, which together with their display team and the *MacGregor* Car Display Team should keep car fanatics fully occupied throughout the entire weekend!

If you have time between watching all the above, there are dozens of trade stands that should enable you to see just about anything that is anything in modelling... Leaves you quite breathless doesn't it?

Echos from the past...

Not so much an echo, more a roar... Johnny Hall, exponent of the control line jet model since 'ye olde days at Fairlop' is on the move (*Dynajet* powered?)

There seems to be a growing interest in this form of circulatory power up at Three Sisters control line site, near Manchester. Johnny is encouraging fellow jetsters to wake up and follow his lead back to Dyna... power... any takers?

Carl Goldberg

Creator of the free flight pylon model, pioneer of high quality kitting, perfectionist among craftsmen, Carl Goldberg succumbed on 28th January to a blood disorder. The irony is that this great, most meticulous and cautious man should suffer the penalty of polluted blood. His bypass operation in 1981 had left him weakened and accurate diagnosis of the problem came too late. We understand that his family are being open about his experience in order to warn others. Carl, the quiet, perpetual full time aeromodeller was 72. From 1928 when he won his first Nats award, the thirties, when he led the Indoor duration events and created the famous 10ft. 'Valkyrie' (with each rib built up like a fuselage side) he opened a hobbyshop and joined Comet Model Airplane & Supply Co. on 29th St. Chicago, to enter the kit business as chief designer.

His influence was world wide. 'Zipper' started so many on the road to contest success it was indirectly responsible for limiting rule changes. Then came the elegant 'Sailplane', a 78 inch beauty, revered in memory (especially for the original \$5.95 kit price) all with retractable landing gear. The 'Interceptor' followed as a simple lightweight and Comet kits were recognisable among the best for design, and value. In 1947 he joined Toplite, creating the 'Cumulus', 'Rascal' and dozens of 'Jigtime' beginners models. It took Carl many more years to reach his goal but in '55 he became his own boss, trading under his own name as CG or Carl Goldberg Models. Ever his favourite, the 'Shoestring' racer was his first independent kit and it is significant that an R/C version is still in the range. 'Ranger' was another favourite name that has persisted along with 'Skylane', 'Skylark' and 'Falcon'. He returned to free flight as if to show 'em how with 'Viking', and then diversified into accessories including of course, retract gear, his trademark of the 30's. Jet glues, Scale R/C, balsa, 'E - Z' linkages and nylon R/C accessories built up the substantial business.

Approaching retirement and a move to warmth in California near his son, Carl's proudest achievement must have been the flight of 'Liberty Bell', a Sr. Falcon which crossed the U.S.A. from East to West in '75, flown in stages by Bob and Doris Rich, Carl's lifelong associates.



Carl Goldberg will be remembered for a seemingly endless range of aircraft and accessories that have caught the imagination of aeromodellers worldwide.

Covering films, spinners, airwheels and then the 'Gentle Lady' appeared to complete Carl's repertoire. The 'Lady' could not have been better named for it has been one of the most forgiving and influential models in spite of its simplicity. Some would have said it was dedicated to Beth, Carl's partner at home and in business at all times to whom we extend our deepest sympathies.

Modellers tribute to Jean Magniette

During 1983 British Free Flight modellers were saddened by the news of the death of Jean Magniette the guiding hand and inspiration behind the now, sadly defunct series of Pierre Trebod contests.

At the 1983 Vol Libre due Poitou event it was learnt that the French Fliers were intending to present to Jean's family a tribute plaque to Jean for placement on his grave in accordance with French custom. The idea arose during conversations between British and French fliers that the British modellers might similarly mark their respect for Jean and appreciation for the vast amount of pleasure that so many of them had experienced over the years attending the Pierre Trebod.

World Records

It must have been a dream for all of us at sometime - to break a world record. Usually it stays that - a dream - but someone has got to do it... why not you. Records are broken nearly every year and the latest list of the *FAI* Model Airplane World Records has just been circulated. If you want a copy of these, write to *Aeromodeller* and enclose a s.a.e. (9in. x 4 in.) and we will send you them. No details of the models are given - just the record number, class, name, date and the record time/distance, etc.

You may well need an International Sporting Code if you want to attempt one yourself as there are various rules/conditions that have to be followed. If you are a *SMAE* member more details on these can be had from the *SMAE* General Secretary at the Leicester office.

Following French custom this tribute was presented to the family of Jean Magniette by British modellers in respect of his work for model aviation and the Pierre Trebod contests in particular.



Foreign pals...

Occasionally we get calls for help from aeromodellers who are often building and flying models literally by themselves. Often in cases like this, the modeller simply needs to talk to others of a like interest. Our normal response is to give the *SMAE's* address, as they have member clubs scattered all over the country and there is usually one close by the poor unfortunate lone modeller. *SMAE, Kimberley House, Vaughan Road, Leicester, LE1 4SE.*

When we have cries for help from abroad it is more difficult... One chance here, is to correspond with modellers from this country. Two such follow, how about sharpening up that old

quill and putting pen to paper... Jan Dobrzyniak, 94-004 Lodz, ul Kusocinshiego 68/, 4, bl 149, Poland - is interested in 1970-1982 *Aeromodellers*. Roberto Casale, Via Zancarini 17, 21019 Somma Lombardo (VA), Italy - is 12 years old and would like to correspond with someone of his age.

Cardington 1985

The *SMAE* Indoor Technical Committee are pleased (perhaps relieved may be a better word!) to tell us that Cardington No. 2 (Fire Research) Shed will be available for indoor flying in 1985. However there are certain conditions that *must* be adhered to:

- 1) All people wishing to attend, whether to fly or just to watch *must* send details of name, address and car registration number to Laurie Barr, 4 Hasting Close, Bray, Berks for notification to Fire Research.

These details must be received *at least* two weeks before the date of the meeting - otherwise entry cannot be guaranteed.

- 2) No. 2 Shed contains a lot of valuable equipment - *please* help the technical committee by ensuring that this is not endangered in any way. It is possible that No. 1 Shed may be available at some time this year so watch this space for future updates. Those events already on the calendar for this year are listed in What's On (over the page).

New Club

It is always nice to hear that new aeromodelling clubs are still appearing and to *Aeromodeller* at least, even more encouraging, when they are predominantly control line or free flight. We have nothing against R/C and of course many of our readers

indulge in flying with sticks in their hands... but still get more of a kick when retrieving a model safely from that tree downwind - than from flying around the club field for five minutes performing a flight pattern that varies little from all those performed over the last year! Perhaps we are masochists - challenging the gods yet one more time to take our previous creation away from us... either by total disintegration or up, up to that great flying field in the sky...

Back to earth we find that a new club has been formed - principally for control line - in the Manchester area, the Three Sisters model aircraft club. With the magnificent Three Sisters control line site as their base, they should have a good future in front of them. Not many clubs can boast three tarmac circles, two grass circles *and* the luxury of a toilet block!

Fees are a reasonable £5.00

for a flying pass and £1.00 for club membership - all flyers must be members of the *SMAE*. Meetings are held at the Visitors Centre on the site on the last Friday of the month at 7:30p.m. Enquiries to Pete Farimond on Wigan 34068.

Paul Runge

America lost another pioneer on 30th January in Paul Runge, the man who put Higginsville, Missouri on the world map, founder of the first R/C magazine in "Grid Leaks" and originator of the radio control equipment kit.

Paul was first associated in R/C through Aero Modeller in the 50's. A keen correspondent, he following the Ives, Hill and Boys contributions closely and introduced "Galloping Ghost" systems as a practical form of proportional when all else was bang, bang and trust to luck.

Who remembers Marcytone, or the first Kraft Superhet? From those early days Paul has maintained a world wide supply service of selected radio components and kits which have provided inspiration for innumerable thousands and in particular, has supported the lone hand, small field flyer, the grass roots people of model flying.

We will remember...

Flight Simulator Winner

In December, *Aeromodeller* ran a competition with first prize being an opportunity to 'fly' a Boeing 767 at the controls of a *Britannia Airways* Flight Simulator. The winner was Richard Bail of St. Neots. The prize will be 'collected' in the near future when *Britannia Airways* will have Richard in a 'holding pattern' at their Luton Airport base.

Aeromodeller will be on hand with a set of flight manuals to offer verbal assistance in the event of unexpected Manoeuvres... we wonder if you can 'bunt' a 767...

1960

RADIO CONTROL MODELS & ELECTRONICS

RCMEE

Silver Jubilee

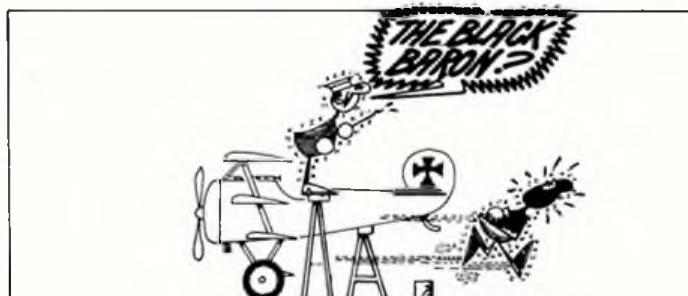
1985

25 YEARS OF THE BEST IN R/C MODELLING



Our younger sister magazine Radio Control Models and Electronics is celebrating 25 years of publication this May and as part of the celebratory issue is offering a free self adhesive commemorative decal to readers. The issue includes a full size pull out plan plus full colour plans feature for 1/8 scale Albatros DIII biplane.

THE RED BARON FLIES AGAIN...



What's On

April 14 PETERBOROUGH DIESEL COMBAT COMP

Venue: The Embankment, Peterborough.
Contact: B Waterland. Tel: 0778 343722.

**April 21
CONTROL LINE SCALE COMPETITION**
Comps: F4B, Stunt, Novice Stunt. Venue: Broomwade Sports & Social Club, Hughenden Road, High Wycombe, Bucks. Contact: Ron Truelove. Tel: 08697 678. Silencers and Insurance required.

**April 21
LARGE MODEL SPECTACULAR**
Venue: Old Warden, Nr Biggleswade.
Contact: Radio Modeller. Tel: 0442 41221.
Watch large models in spectacular flight, come and fly yours.

**April 21
NUNEATON MASSTUNT CONTROL LINE EVENT**
Comps: F2B, Novice Stunt. Venue: Haunchwood Sports Ground, Stockingford, Nuneaton. Contact: P. Illiffe. Tel: Nuneaton 328848.

**April 21
SAA CONTROL LINE RACING**
Comps: Goodyear, Class 2, 1/2A TR. Venue: Newhouse. Contact: R Thorpe. Tel: 06988 5516.

**April 21
THE GRANTHAM GRAND PRIX**
Comps: Free Flight - OR, OP, OG, HLG, Combined FAI Control Line - FAI TR, 1/2A TR, Goodyear. Venue: Barkston Heath. Contact: Free Flight - Phil Ball 0332 665361. Control Line - Dave Campbell 0455 611724. Trophies for OR, OP, HLG and first prizes of engraved Crystal Goblets!

**April 28
ELLIOT CONTROL LINE RALLY**
Comps: FAI, TR, Goodyear, 1/2A TR, B TR. Venue: Elliots, Rochester. Contact: Gordon Yeldham, 9 Willingdale Way, Thorpe Bay, Essex.

**April 28
SMAE FREE FLIGHT SPRING MEETING**
Comps: A1, Cd/H, 1/2A, CO₂, HLG, Vintage, Slow Open Power. Venue: RAF Barkston Heath. Contact: Phil Ball. Tel: 0332 665361. SMAE Members only. Competition Licence required.

**April 28
SMAE SCALE INDOOR NATIONALS**
Comps: Peanut, Open Rubber, CO₂. Venue: Alumwell Centre, Walsall. Contact: Doug Sheppard, 13 Luckington Road, Monks Park, Bristol BS7 0VT. Pre-entry only: registration 50p, each event £2.00. Non competitors £1.00. Send SAE for entry forms.

**May 5-6
FUN FLY IN AT HOLKER**
Venue: Holker Hall, Carnk-in-Cartmel, Grange-over-Sands, Cumbria LA11 7PL. Contact: Carolyn Johnson. Tel: 044-853 328. Fun competitions, camping - write for entry forms, details and costs.

**May 6
THREE KINGS CONTROL LINE FLY-IN**
Venue: Old Croydon Aerodrome. Contact: Derek Bird. Tel: 01-874 6394. Fly-in for Scale and Profile - Silencers essential.

**May 12
SMAE 3rd AREA FREE FLIGHT EVENT**
Comps: OG, OP, F1B (Plugge). Venue: Area Venues. Contact: Local Area Comp Sec. OR SMAE on 0533 58500. SMAE Members only: Competition Licence required.

**May 12
BARCS LEAGUE OPEN THERMAL COMP**
Venue: Springfield Park, Kidderminster. Contact: Andrew Jones, 4 Lyndhurst Drive, Kidderminster, Worcs. Entry Fee £2.00. Insurance required.

**May 12
VINTAGE CONTROL LINE RALLY**
Venue: Rubery Hill Hospital, Rubery, Nr. Birmingham. Contact: Peter Martin. Tel: 021-444 7964. General flying for all SAM 35 and SMAE members. Fly Comps to SAM 35 rules.

**May 19
CARDINGTON INDOOR MEETING**
Comps: 'All in' (Index). Venue: Cardington Beds. Contact: Laurie Barr, 4 Hasting Close, Bray, Berks. Tel: 0628 25595. Names and addresses together with car reg. number - MUST be registered before the event.

**May 18-19
LEISURE LAKES MODEL CLUB 1985 SEAPLANE EVENT**
Venue: Mere Brow, Tarlton, Lancashire. Contact: E A Johnson, 35 Holmwood Gardens, Formby, Merseyside L37 1NH. Tel: Formby 73496. Fly for fun competitions, entry to the Leisure Lakes area £2.00. Camping at modest rates: Write for more details.

**May 19
GOLDEN ERA MODEL FESTIVAL**
Venue: Old Warden, Nr Biggleswade. Contact: Radio Modeller. Tel: 0442 41221. For model designs of the 1920s - 1930s. Period costume is encouraged!

**May 19
SAA CONTROL LINE RACING**
Comps: Goodyear, Class 2, 1/2A TR. Venue: Newhouse. Contact: R Thorpe. Tel: 06988 5516.

**May 25-27
SMAE FREE FLIGHT BRITISH NATIONAL CHAMPIONSHIPS**
Venue: RAF Barkston Heath. Contact: Phil Ball. Tel: 0332 665361. SMAE Members only: Contest Licence required.

**June 2
CARDINGTON INDOOR MEETING**
Comps: EZB, F1D, 35cm, Open Microfilm (all Index); Scale. Venue: Cardington, Beds. Contact: Laurie Barr, 4 Hasting Close, Bray, Berks. Tel: 0628 25595. Name and addresses together with car reg. number - MUST be registered before the event.

**June 2
FINCHLEY DMAC CONTROL LINE GALA**
Comps: Stunt, FAI Combat, Slow A Combat. Contact: S Wadkin, 5 Brockland Hill, Hampstead, London NW 11.

**June 2
THREE KINGS CONTROL LINE SPORT AND VINTAGE DAY**
Venue: Old Croydon Aerodrome. Contact: Derek Bird. Tel: 01-874 6394. Vintage Stunt (pre 1958). Midge speed event to SAM rules also Fly-for-fun: Silencers essential.

**June 2
WALSALL MAC FREE FLIGHT SCALE AND VINTAGE FUN FLY**
Venue: Walsall Airport, Aldridge, West Midlands. Contact: Malcolm Taylor, 'Malden', 270 Walsall Road, Great Wyrley, Staffs WS6 6DN. Tel: 0922 415316. Send SAE for details.

**June 9
SMAE 4th AREA FREE FLIGHT EVENT**
Comps: Cd/H, F1C, Team Glider (Plugge). Venue: Area Venues. Contact: Local Area Comp Sec. OR SMAE on 0533 58500. SMAE Members only: Competition Licence required.

**June 9
SMAE SCALE DAY**
Comps: RC, CL, FF. Venue: Amesbury. Contact: Vic Willson. Tel: Reading 471964.

**June 15-16
RAFMAA-SMAE THURSTON TROPHY FREE FLIGHT COMPETITION**
Comps: F1A, F1B, F1C, (1/2A, A1, Cd/H: Sunday). Venue: RAF Barkston Heath. Contact: Brian Baines, 2 Church Walk, Metheringham, Lincs LN4 3HA. Tel: 0526 21458. Start 1100 hrs on 15th: Champagne fly-off for FAI events on Saturday. Camping on airfield Saturday night. Pre-entry £1.50 per event, send SAE.

**June 16
SAA CONTROL LINE RACING**
Comps: Goodyear, Class 2, 1/2A TR. Venue: Newhouse. Contact: R Thorpe. Tel: 06988 5516.

**June 22-23
AEROMODELLER SCALE WEEKEND**
Venue: Old Warden, Nr Biggleswade. Contact: Aeromodeller. Tel: 0442 41221.

**June 23
THE OXFORD MFHC FREE FLIGHT RALLY**
Comps: A1, Cd/H (in rounds). Vintage (Rubber and glider combined). HLG, Rubber Scale Duration. Venue: Port Meadow, Oxford. Contact: Andy Crisp, 30 Portland Road, Summertown, Oxford. Tel: Oxford 53800. No power models to be flown. Champagne Fly Offs on Saturday 22nd June at 1900 Hrs for A1, Cd/H, HLG.

**June 23
BLACKBURN & DMAC SUMMER FLY-IN**
Venue: Witton Country Park, Blackburn, Lancs. Contact: Ray Stott, Adelaide Street, Crawshawbooth, Rossendale, Lancs BB4 8PW. Scale, Semi-Scale or unusual model rally, a fun day for all. Good prizes, small entry fee on day.

**June 29-30
THREE SISTERS CONTROL LINE GALA**
Comps: F2A, F2C, F2D, Stunt, Novice Stunt, Goodyear, Class 2 Goodyear, Mini Goodyear, 1/2A TR, Diesel Combat, Open Speed (inc. jet), Mercury Midge Speed. Venue: Three Sisters, Manchester. Contact: Pete Farimond. Tel: Wigan 34068. Start: Saturday 1230 hrs; Sunday 0930 hrs. Phone for further details.

**June 30
CARDINGTON INDOOR MEETING**
Comps: EZB, F1D, 35cm, Open Microfilm (all Index); Scale. Venue: Cardington, Beds. Contact: Laurie Barr, 4 Hasting Close, Bray, Berks. Tel: 0628 25595. Names and addresses together with car reg. number - MUST be registered before the event.

**June 30
TYNEMOUTH MAC FREE FLIGHT RALLY**
Comps: F1A (5 flights, no rounds), OR, OP, HLG, Combined Mini, Vintage. Venue: Albemarle Barracks. Contact: Tony Brown, 32 Clayworth Road, Brunton Park, Newcastle upon Tyne NE3 5AB. Tel: 0632 362155. Admission by pass ONLY. Start 1000 hrs (silent classes), 1100 hrs (power). Phone evening 28/29 for confirmation.

**July 7
RADIO MODELLER FUN FLY-IN**
Venue: Old Warden, Nr Biggleswade. Contact: Radio Modeller. Tel: 0442 41221.

**July 13-14
CLAPA CHAMPIONSHIPS**
Comps: F2B (CLAPA members only), Open Novice Stunt, Open Carrier (Profile & Scale), Open Scale. Venue: Essex Show Ground. Contact: P. Burgess, 42 Blunts Hall Road, Witham, Essex. Tel: 0376 516881. All events Pre-entry only. Send SAE for entry form. Camping site from Friday pm.

**July 13-14
YORKSHIRE SCALE MODELLING WEEKEND**
Venue: Newby Hall, Ripon. Contact: Robert Thorn, 22 Chatsworth Place, Harrogate, N Yorks. Various modelling competitions including helicopters, control line, boats, off road racing and model railways and wargaming.

**July 14
CANTERBURY PILGRIMS AIR SHOW**
Venue: Greveny, Nr Seasalter, Kent. Contact: D R Austin, 4 Wykeham Road, Sittingbourne, Kent. Tel: 0795 27008. Write for details and pre entry.

**July 20-21
SMAE INDOOR NATIONALS**
Comps: Saturday - EZB (Houlberg Trophy), 'Heavies' (Index). Sunday - F1D (Aeromodeller Trophy & Euro Team Trials), EZB (Index). Venue: Cardington, Beds. Contact: Laurie Barr, 4 Hasting Close, Bray, Berks. Tel: 0628 25595. SMAE Comp Licence required for Trophy events. 'Heavies' are: Peanut Duration, CO₂ Duration, Pennyplane etc. Names and addresses together with car reg. number - MUST be registered before the event.

**July 21
OLD WARDEN SVAS OPEN DAY**
Venue: Old Warden, Nr Biggleswade. Comps: Vintage CL Scale. Contact: M Staples. Tel: 0223 241978. Vintage models, all welcome especially FF and CL.

**July 28
FACCT OPEN THERMAL COMPETITION**
Venue: RAF Weston on the Green. Contact: N Webb, 13 East Street, Fritwell, Nr Bicester, Oxon OX6 9PX. Also for BARCS League: Entry £2.00: Send SAE and frequencies: SMAE Members ONLY.

**August 3-4
WOODVALE INTERNATIONAL RALLY**
Venue: RAF Woodvale, Nr Southport. Contact: John Armstrong, 71A Client Avenue, Maghull, Liverpool. Tel: 051-526 6857. Write for details of competitions, entry forms, camping etc.

**August 4
DUXFORD MILITARY PAGEANT AND FLYING DISPLAY**
Venue: Imperial War Museum Duxford. Tel: 0223 833963. Adults £3.00, Children, OAPs £1.50.

**August 11
CARDINGTON INDOOR MEETING**
Comps: 'All in' (Index). SAM Fly-In. Venue: Cardington, Beds. Contact: Laurie Barr, 4 Hasting Close, Bray, Berks. Tel: 0628 25595. Names and addresses together with car reg. number - MUST be registered before the event.

**August 11
THREE KINGS CONTROL LINE CARRIER DAY**
Comps: Scale and 40 Profile. Venue: Old Croydon Aerodrome. Contact: Derek Bird. Tel: 01-874 6394. Silencers essential.

**August 11
SAA CONTROL LINE RACING**
Comps: Goodyear, Class 2, 1/2A TR. Venue: Newhouse. Contact: R Thorpe. Tel: 06988 5516.

**August 17-18
AEROMODELLER VINTAGE WEEKEND**
Venue: Old Warden, Nr Biggleswade. Contact: Aeromodeller. Tel: 0442 41221.

**August 17-18
PLUMPTON MODEL SHOW**
Venue: Plumpton Race Course. Contact: Dave Bishop, DB Sound, 17 The Square, Tatsfield, Kent. 300 mph Dutch Jets, Helicopter rides, Aeroplanes, Cars, Boats, Rockets, Microlights, Live steam trains - Fun for the whole family. Camp or Caravan - £15.00 (if pre booked).

**August 24-25
CARDINGTON INDOOR MEETING**
Comps: F1D World Champs Team Trials. Venue: Cardington, Beds. Contact: Laurie Barr, 4 Hasting Close, Bray, Berks. Tel: 0628 25595. SMAE Comp Licence required. Names and addresses together with car reg. number - MUST be registered before the event.

**August 24-26
SMAE CONTROL LINE, SCALE AND RADIO CONTROL BRITISH NATIONAL CHAMPIONSHIPS**
Venue: RAF Barkston Heath. Contact: SMAE Comp Sec. Tel: 0533 58500 or 0533 412368. SMAE Members only: Contest Licence required.

**September 1
SMAE 5th AREA FREE FLIGHT EVENT**
Comps: A1, F1B, Team Power (Plugge). Venue: Area Venues. Contact: Local Area Comp Sec. OR SMAE on 0533 58500. SMAE Members only: Competition Licence required.

**September 8
OLD WARDEN SVAS SILENT DAY**
Venue: Old Warden, Nr Biggleswade. Contact: M Staples. Tel: 0223 241978. All welcome but NO IC engines in any form.

**September 15
CARDINGTON INDOOR MEETING**
Comps: EZB, F1D, 35cm, Open Microfilm (all Index); Scale. Venue: Cardington, Beds. Contact: Laurie Barr, 4 Hasting Close, Bray, Berks. Tel: 0628 25595. Names and addresses together with car reg. number - MUST be registered before the event.

**September 15
DISPLAY TEAM CONTEST**
Venue: Old Warden, Nr Biggleswade. Contact: Radio Modeller. Tel: 0442 41221. For teams of three or more models - flying a 20 minute display.

**September 15
DUXFORD FLYING DISPLAY**
Venue: Imperial War Museum Duxford. Tel: 0223 833963. From vintage biplanes to modern jets. Adults £3.00, Children, OAPs £1.50.

**September 22
SMAE 6th AREA FREE FLIGHT EVENT**
Comps: 1/2A, F1A, Team Rubber (Plugge). Venue: Area Venues. Contact: Local Area Comp Sec. OR SMAE on 0533 58500. SMAE Members only: Competition Licence required.

**September 22
RAF SWANTON MORLEY MAC INDOOR FLY-FOR-FUN**
Comps: Battle of Britain Scale for rubber or CO₂. Venue: RAF Swanton Morley, Dereham, Norfolk. Contact: Chief Technician Jim Worner. Tel: Swanton Morley 281 (ext. 384). Fly-for-fun: phone for full details.

**September 22
SHEFFIELD VINTAGE COMP**
Venue: Sheffield Flying site off A 618. Contact: Dave Hanson, 23 Meadowhead, Sheffield S8 7UA. Insurance required: Spectators welcome.

**September 22
THREE KINGS CONTROL LINE SCALE DAY**
Comps: Scale and Profile. Venue: Old Croydon Aerodrome. Contact: Derek Bird. Tel: 01-874 6394. Silencers essential.

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S29 Ring R/C w/m	£44.50	X61 RE TST R/C	£102.31
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X40 ABC F.I. R/C RE	£59.11	S2000 — 25 F.I. R/C	£105.00
X40 ABC R.I. RE Speed	£49.50	S3000 4T 4 cycle	£195.00

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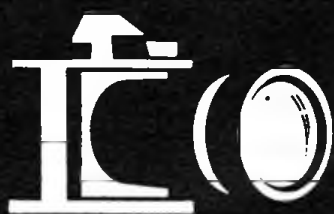


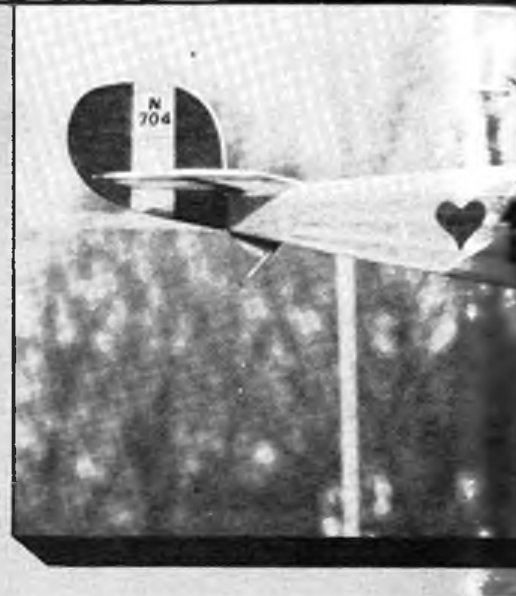
PHOTO PRIZE

Model News With Fliar Phil

Now Wood for Winners

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

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



T.V. QUIZ GAMES seem all the rage — so herewith Fliar Phil's own "Instant Aeromodelling Quiz"! How are aerobods concerned with inspiration, perspiration, and trepidation? Well folks don't over-tax the grey matter. Inspiration comes from that 'own design' or plan, perspiration from assembling 'the bits' and trepidation — when you first launch that new job! Got it? Good — full marks! Full marks also to this month's fine entries.

Photo 1

With such an abundance of struts to cope with, the Fieseler 'Storch' is not the easiest of aircraft to model. However, Fred Barnsley of Birmingham has done a superb job of modelling the fourth prototype (which just flew in January 1937) of this interesting aeroplane. Fred's model spans 93 in. weight 13½ lbs. Power: O.S. 90 four stroke. Radio: Sanwa 'Black Custom' with seven servos.

Photo 2

It always gives Fliar Phil an 'extra kick' when he receives a photo of an 'own design' model. Such as this one from Riccardo de Felice of Edinburgh called 'The Goose', the model displays simple, clean, and aerodynamically efficient lines, (always the qualities essential to a good design). Powered by two O.S. 25 engines driving 9 x 6 in props. with JR Radio Control. Riccardo (who is 14) says it flies well, even on one engine.



Photo 3

It was good to learn from Klaus Jorge Hammerschmidt of Aachen West Germany that his club (usually devoted to FAI free flight) has caught the 'CO₂ bug'. As proof Klaus sent Fliar Phil this CO₂ powered Nieuport 17 of W W 1. Built by H. Fenn, weight is 43 grams (including motor), span 400 mm, power: Telco 'Turbotank 3000' Jorge says they build CO₂ models for duration and FUN. There are no better reasons Jorge!

Photo 4

Fliar Phil does not receive many 'in flight' pic's. This 'formation take-off' by two 'Cruiser Pup Mk IV's' is unique, it comes from Vic Dubery (a name well known and much respected - especially by us 'mature' aeromodellers). Vic, who lives in Surrey writes, "On a subsequent launch (the 'pilots' are Peter Michel and Vic), both models caught a thermal and disappeared after 33 minutes!" Thanks to you Vic - AND to Grace Scrutton for the photography.

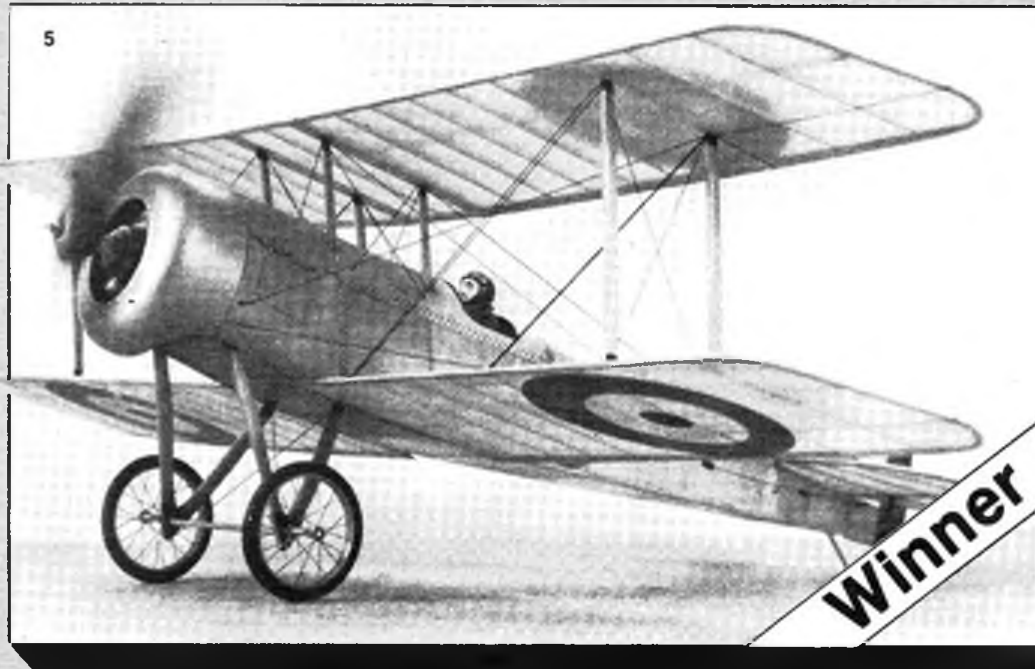
Photo 5 Winner

With the engine running this model of a 1916 Bristol 'Scout' is about to taxi, prior to take-off. A fine action photo, which also shows the excellent workmanship in this Peanut, from David Banks of London. Weight 16 grams. Flight performance 25-30 secs. Incidentally, David built those 1 in. dia. wheels himself. The pair weigh less than one gram! The bundle of balsa wood you will be receiving will weigh a little more than that David! Congratulations...

Photo 6

From any angle this model would arouse admiration although, perhaps quite a few aerobods would find it difficult to identify. It is a Robin 'Alfa 2000', from a Howard Blackwell kit by Mr K W Holmes of Sittingbourne, Kent. Powered by an O.S. 60, it has working flaps and quoting Mr. Holmes "flies like a dream". Pleasant dreams Mr. Holmes!

5



7



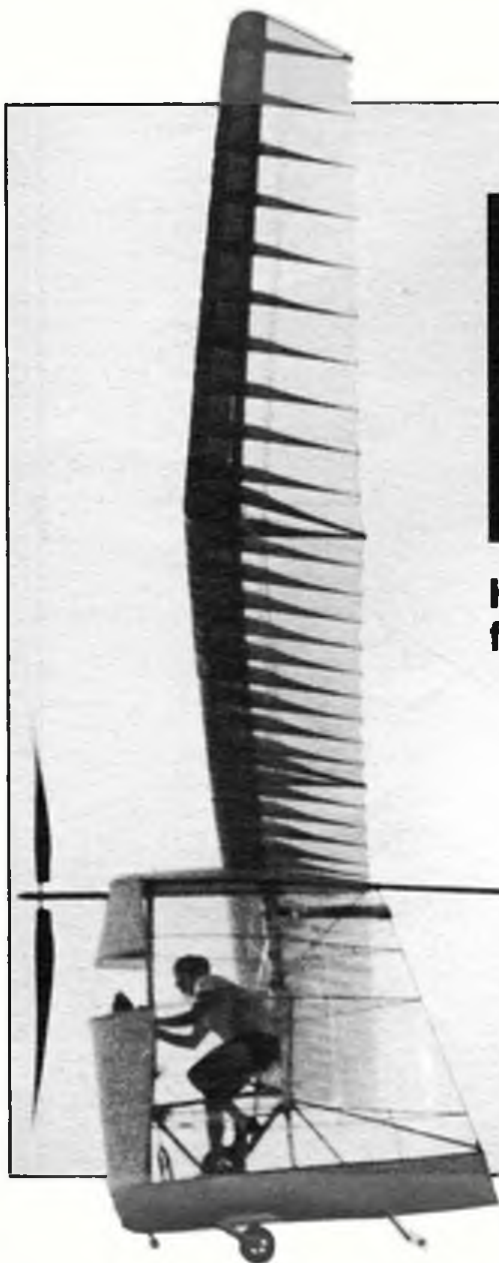
Photo 7

The Bell 'Airacobra' of World War II never made the 'outstanding fighters' category - but it offers a most interesting modelling subject. Created by Barry Meason of London from a Top Flite kit, span is 63 in, power: Merco 61, weight: 7 lbs. A superb flyer. Barry says "It was my favourite model. Must build another one day." Great idea Barry - why not? So snap that snappy job! and snap up a spot in this feature!

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

MUSCLE HUSTLE!

Hans Gremmer and Ron Moulton review the fall of Man Powered Flight records in 1984



Above 'Monarch' (man powered but with stored energy) winner of the first award in the Kremer speed prize before modification to the nacelle and addition of ailerons which improved lateral control. Reduction of height and movement of wheel avoided the nose-overs which happened all too frequently with this first version. Supplementary power from a Geist 60/28 electric motor.

AEROMODELLERS have captured four valuable prizes awarded by the Royal Aeronautical Society for achievement in Man Powered Flight. Much of their success is directly due to experience in the lightweight structures and the low speed flight regime demanded by free flight competitions.

Unfettered by engineering convention, and using techniques more associated with modelling than with full size aviation, three teams made outstanding flights in 1984, and there is every expectation that faster speeds will be recorded in 1985.

World Speed Competition

On 26th April 1983 Henry Kremer donated £100,000 for award to the winners of a new challenge, devised to develop smaller and more robust aircraft, capable of flight in excess of 20 mph. (*Aeromodeller* August 1983 p. 366).

Regulations specified flight around three turning points with a perimeter of 1500 m. The first to fly the course (giving a nominal flight distance of one mile) in a time of less than 3 minutes, and to demonstrate flight around the course in the opposite direction untimed, would receive £20,000. Each successive claim, improving the previous time by at least 5% would receive £5,000.

Additionally, entrants were given the



An historic moment as the 'Bionic Bat' crosses the starting line at Shafter, California on what was to be the first under 3 minute flight around the 1500 m. triangle. Unfortunately for Parker MacCready it was disqualified on technical grounds.

option of storing the crew energy for a period not exceeding 10 minutes, immediately prior to take-off. Whatever energy storage system was chosen, it had to be uncharged prior to the 10 minute storage period.

Official entries were submitted by Dr. Paul MacCready and John Langford of M.I.T. in the U.S.A. within days of announcement and the first two aircraft were made in three months, ready to test by the end of July 1983. On 23rd September, the MIT 'Monarch' crashed during an attempt.

Two days later, the MacCready 'Bionic Bat' was observed on a flight of 2 mins. 38.69 secs. and this was submitted as a claim for first prize.

After study of the data, and reference to expert consultants on NiCad batteries, the R.Ae.S. disallowed the claim. The entrants had chosen as a 'Zero' energy level, the condition of 30 volts for the 24 cells in series as measured when drawing approx 1.0 Amperes. This was not accepted as being 'uncharged' and to clarify the regulation, a

Any subsequent claimant would be required to make a flight within 2 minutes 35.12 seconds.

Figure of Eight Flight

In Europe, interest had been shown by Swiss and German modellers. Gunter Rochelt, an industrial designer and regular Wakefield contest flier, had started late but with the experience of his solar powered canard 'Solair', built his 'Musculair' within three months. His first aim was not for speed: but to win the outstanding Figure of Eight prize before the closing date at the end of June 1984.

The major difficulty was that of sustaining flight over the distance, involving turns in either direction around two markers half a mile apart. This had eluded all entrants up to and for long after the famous 'Gossamer Condor' flight in August '77.

Project leader Martyn Cowley and Sam Duran (on knees) readying the stored energy drive in 'Bionic Bat'. Motor is an Astro 40 used both for generator and drive from a 16 cell pack. In flight, the 'Bat's' concentric prop is distinctive. It is also smaller than others at 7ft. 6ins. dia.



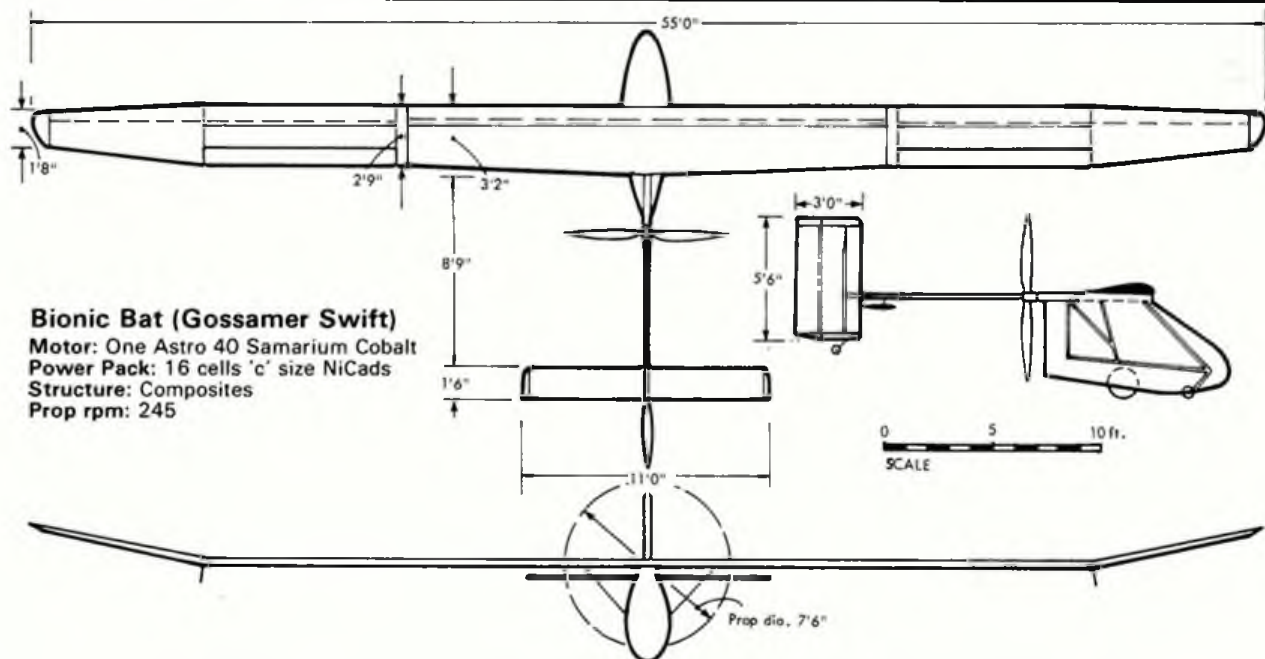
Flown by Holger Rochelt, the 'Musculair' took off from Neubiberg/Munich aerodrome at 21.33 on 19th June, 1984 and completed the course as marked by red balloons, in 4 minutes 5 seconds.

Gunter Rochelt's entry was officially observed by representatives of the Deutscher Aero Club and video recorded. It was an incredible achievement and inspired Rochelt to greater things.

Only two pilots have ever succeeded in completing the course, Bryan Allen and Holger Rochelt. The aircraft they flew had only two similarities. They were each extremely light and used pusher propellers. In all other respects they reflected the extremes in diversity of design for man powered flight which have been inspired by the generosity of Henry Kremer.

Musculair

Following the Figure of Eight, Rochelt tried installation of an electric system for stored energy but discarded it as a wasteful impediment. He had proved how well the 'Musculair' would fly, and its low profile drag (having no external bracing) and very efficient wing gave it every chance of overtaking speed achievements in America.



Kremer World Speed Competitions Performance in claims.

Claimant	Flight Date	Target	Actual	Km/hr	MPH
1. MIT	11.5.84	180	175.72	30.73	19.1
2. MacCready	18.7.84	166.94	163.28	33.07	20.56
3. Rochelt	21.8.84	155.12	151.38	35.67	22.17
4. MacCready	2.12.84	143.81	143.08	37.73	23.45

Gunter and Holger Rochelt profile cut the Wortmann section from a block of Styrodur with hot wire which was then sliced into ribs (far right) for the 'Musculair'. The section (see overleaf) is FX76MP to 16 percent thickness and differs considerably from the Lissaman used by competitors.



By 3rd August he thought he'd done it - and phoned MacCready to tell him the news, - only to discover that he was beaten by Parker's flight of 2:43.28 on 18th July. Undaunted, Gunter persisted. He reduced the tail area by 50% and progressively improved until on 21st August, a best time of 2:31.38 gave him the 3rd prize of £5,000.

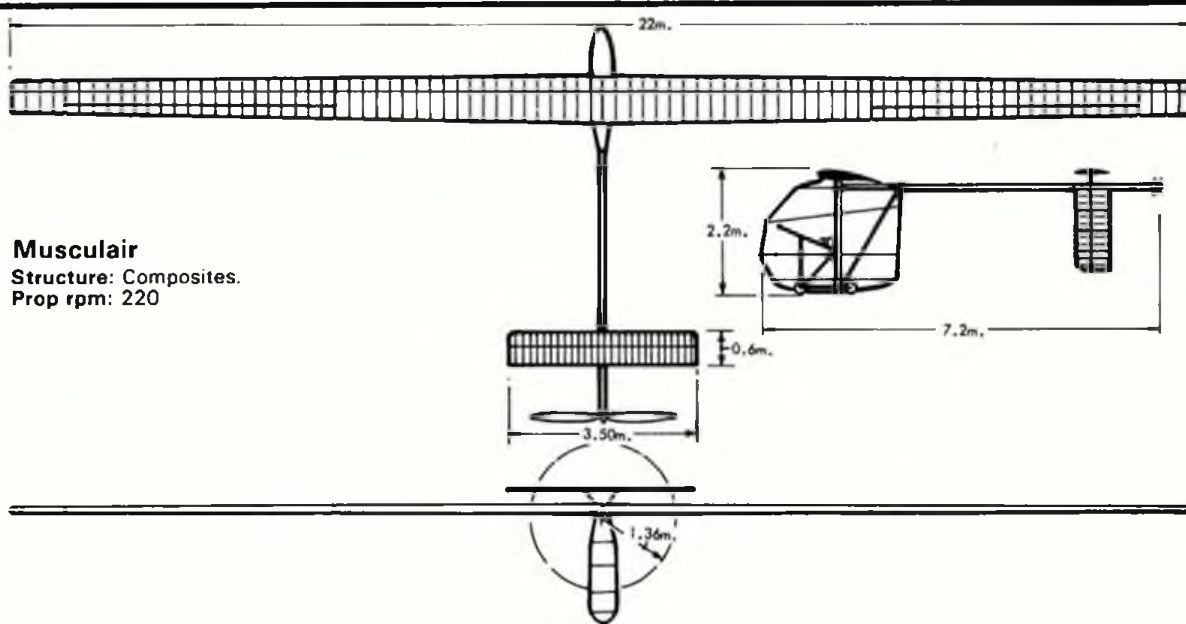
This machine is well worthy of extra study. It is likely to be kitted, and will be demonstrated through 1985, including at the Human Powered Vehicle Festival at Milton Keynes, August 31st. In creating the refined detail, the Rochelts were assisted by

scientifically competent people. One was Dr. Ing. Heinz Eder of Munich, well known as an active F1E magnet-flier. The propeller was developed by Ing. Ernst Schöberl, of Norimberg, a specialist in propeller aerodynamics and best known in model flying circles as a prominent Wakefield flier. The wing profile came from the famous aerodynamicist, Prof. Wortmann, of Stuttgart, who had tailored a special airfoil for man-powered aircraft some years ago, - a profile which would be very forgiving of inaccuracies and would maintain laminar flow in spite of deformations.



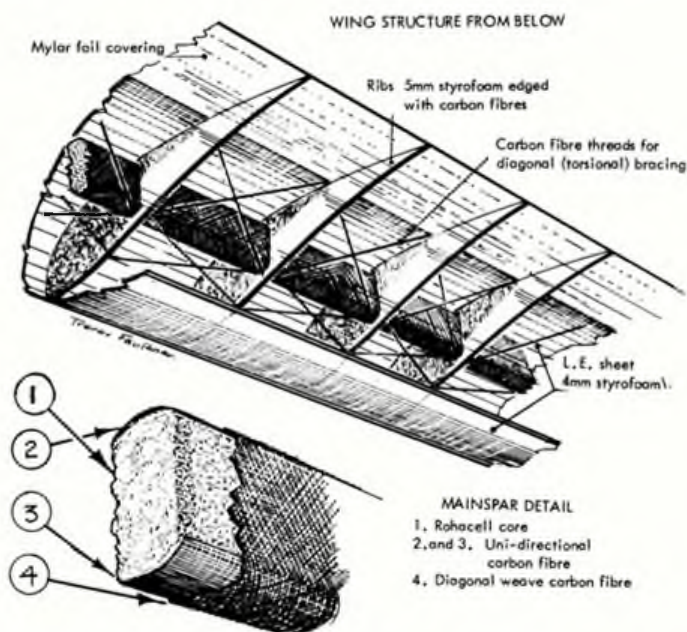
Wortmann recommended that the wing be covered with Styropor sheet 20% back on the lower surface and 66% of the upper surface. They were concerned that the imperfections of the plastic would induce drag but tests by Dieter Althaus in the laminar tunnel at Stuttgart showed that the 'orange skin' effect gave a benefit of 10% less drag than that of a smooth surface!

Another interesting facet of the wing was that although the very light spar (8 kg) took care of all vertical loads (on one flight Holger was taken to 140 ft. in a thermal and had to force out!), it was not torsionally resistant. A solution was to incorporate carbon fibre tows, or rovings in diagonal bracing. Apart from the very efficient wing,



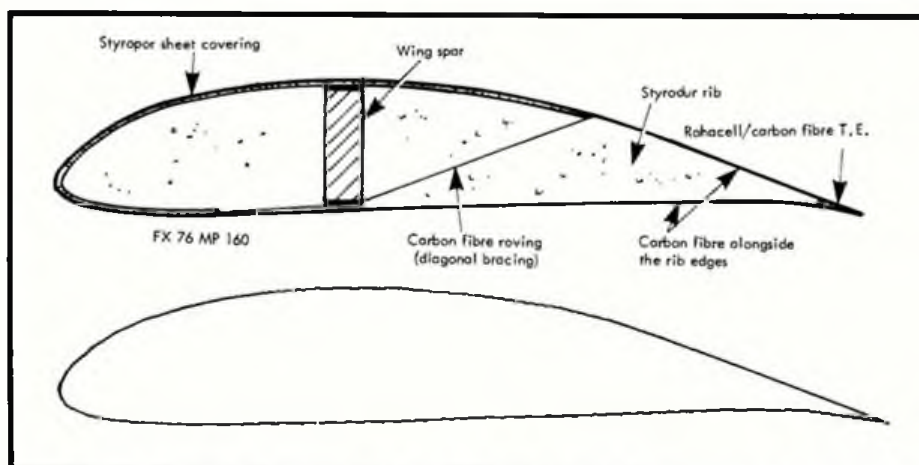
Musculair

Structure: Composites.
Prop rpm: 220



the drive mechanism via special cycle chain and the 8ft 11ins. prop are perfect examples of model makers' workmanship extended to full-scale. The prop can fold, is of variable pitch and is driven by a man-made carbon fibre tube-shaft almost 20ft long. Rochelt was convinced that a propeller at the extreme rear would accelerate airflow off the tail surfaces and thus improve control effectiveness. The record appears to have proved the point.

Design development and construction of both the 'Monarch' and 'Bionic Bat' are no less interesting but space precludes any detailed description here. Papers on these projects will eventually be published by the Royal Aeronautical Society - and any interested competitors for the Kremer prizes should apply to: Hon. Sec. MPAG, RAeS, 4 Hamilton Place



FX76MP section has foam sheet covering for two thirds of upper surface. Uneven orange peel effect actually reduced drag factor. See sketch by Trevor Faulkner from Hans Gremmer's notes for structural detail. Chord (and thickness) tapers from 900 mm (16%) at root to 600 mm (12%) at tips.

Musculair I by Günter Rochelt

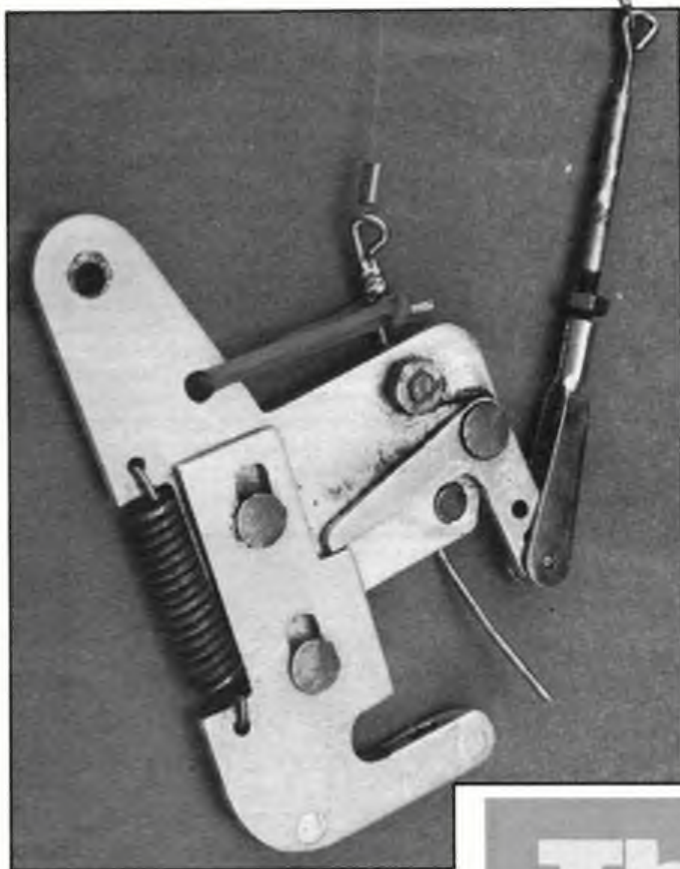
Material:	Sigri Carbon, Rohacell, Bakelite L20, Styrodur
Profile:	Wortmann FX 76 MP (=Man Power) 160/140
Wing Span:	22 m (72.17 ft)
Length:	7.2 m (23.62 ft)
Weight:	28 kg (61.72 lbs)
Aspect ratio:	1 : 30
Carrying surface:	16 m ²
Speed:	7.2 - 10.5 m/s (16-23mph)
Glide Ratio:	1:38

Note 6 piece-wing and rib-spacing 25 cm.



Two photos by Dr. H. Eder typify the excellent flight capability of 'Musculair', above making the historic Figure of Eight and below, demonstrating at an airshow from a simple take off strip laid over grass before a most appreciative crowd.





The Cordes' tow hook viewed from the port side. Simple design with a minimum of moving parts make this a worthwhile project for any competent modeller. Main material is 1.6mm dural sheet - the tools required will be found in most modeller's workshops.

tow, zoom launch, timer start and glide setting. It may be readily adapted to include the remaining two functions but since I have to date not required them, no detail is given here.

The variations in design, sophistication and operation of circle tow hooks is enormous, in fact, it may be considered personal, each hook being adapted to suit an individual's needs. As I explained in my article Experts Forum (published in the *Aeromodeller* July 1984), my philosophy is one of simplification where possible and this approach has led to the design of hook presented in this article.

Apart from the auto-rudder connecting line I have discarded the use of screw adjusters. This has considerably simplified the manufacture and results in a slim light-weight hook but it may be considered at a disadvantage on the flying field when trim adjustments certainly take longer to do. The design has been well tested since I have been using it over the last four years and my original hooks are still being used in my current models and as yet are showing no signs of wear and tear.

No sophisticated tools or machinery are needed to make this hook and established modellers should already have most of the tools required. The materials and parts used, are all readily available at model

Why not add a multi-function tow hook to your glider... Tony Cordes explains how.

Introduction

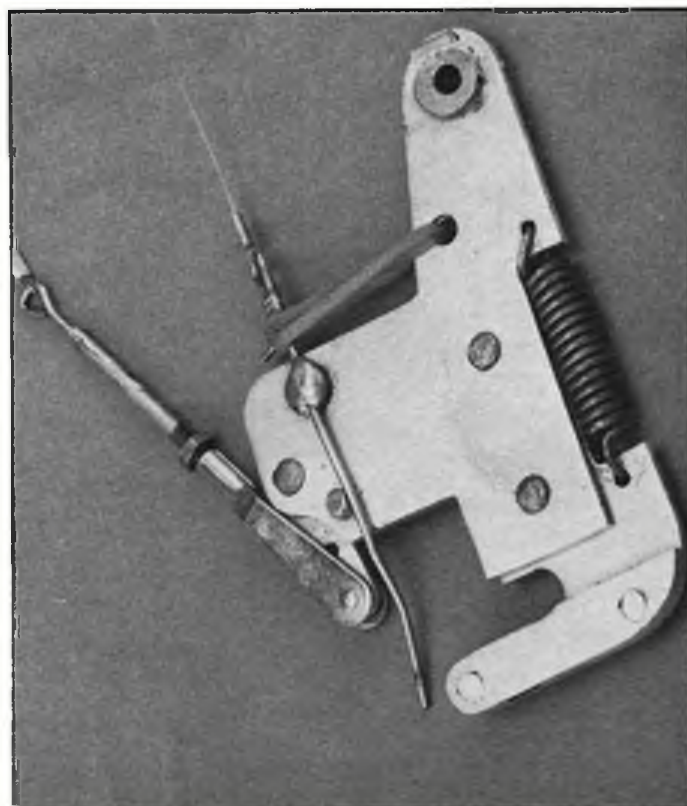
In glider competition flying, circle towing is now accepted as the norm rather than the exception. The techniques of circle towing are well established and a newcomer to glider flying with helpful tuition can quickly become quite proficient. Several good articles have already been published on the techniques involved in circle towing, but very little, other than drawings, has been published specifically describing the construction and operation of a circle tow-hook, which after all, forms the basis of circle towing.

Circle tow-hooks may be classified in a simple way by the number of *functions* they can perform. The basic functions may be described as:

1 straight tow; 2 circle tow; 3 zoom launch; 4 glide setting; 5 timer start. Two further functions, namely delayed rudder and tail auto incidence adjustment may be added. The simplest circle tow-hooks have three functions, ie, straight tow, circle tow, and glide setting and the most complex have all seven functions.

The hook presented in this article falls as it were, in the middle of the range and is a five function hook ie. straight tow, circle

With this view from the starboard side you have now seen all there is to see of this multi function tow hook. There are no hidden moving parts to confuse you and over the page are full size patterns for you to work from... better get sawing now and gain the benefits in this season's flying...



The CORDES' TOW HOOK

shops, DIY shops or engineering suppliers.

To make a first class job of this hook requires some competence in engineering skills. Unfortunately, space does not permit a full description of the engineering skills required but anyone with modelling experience should with care, achieve good results. Just remember that before any task is attempted...think carefully what is required and how it is going to be done; rushing in without care can lead to the ruination of previous work and the need to start again.

Construction

During construction, the reader should continually refer to the drawings as published. Fig. 1 shows the complete assembly of the hook and the parts required for that assembly. All these parts are made from 1.6 mm thick aluminium alloy (Dural or equivalent).

Start by photocopying or tracing the parts 1-5 shown in Fig. 1, carefully cut out paper patterns and stick them to the aluminium alloy plate. Drill the holes as follows referring to Fig. 1.

Holes marked A are 6 BA clearance (3mm diameter), Holes marked B are 6BA tapping size (2.3mm diameter), Hole marked C is 8 BA tapping size (1.8 mm diameter) and Holes marked D are 1.6mm diameter.

Using 6 BA and 8 BA taps as appropriate, tap the holes marked B and C (for the non-engineers this process should be done using parafin or WD40 as a lubricant, and the rotation of the tap reversed frequently to clear the cut metal otherwise the tap may be easily snapped). The first stage is completed

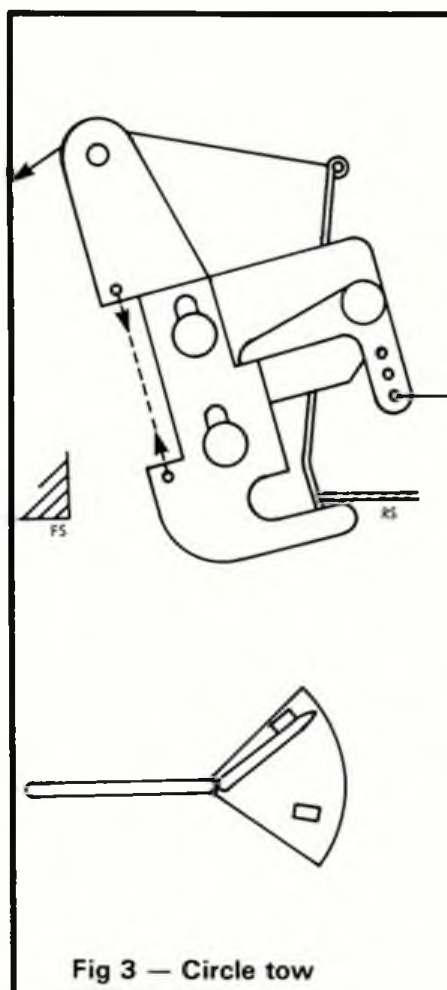


Fig 3 — Circle tow

by cutting out and shaping parts 1-5 as accurately as possible. Take care to slot parts 2 and 4 to take the latch and ensure that they align with each other.

Using a small round file complete the vertical slots (shown by dotted lines in Fig. 1) in part 2. Using 1.6 mm diameter aluminium or steel rod (16 gauge welding rod or even a 10 BA bolt) rivet part 4 to part 2 and complete the shaping of part 4. (For the non-engineers when riveting, slightly countersink the holes in which the rivets fit and using a small round-headed hammer tap *i.e.* not strong blows, the rivet until the ends are bowed over. It is better to progress slowly than to flatten or distort the parts thus necessitating a fresh start). As an alternative, parts 2 and 4 may be joined using 8 BA bolts.

Using 6 BA cheese headed brass bolts, assemble part 2 to part 1 and file all mating edges to make them flush. Slacken the bolts approximately half a turn and ensure that parts 1 and 2 move freely and smoothly in a vertical line, filing the slots in 2 appropriately if required. Cut the bolts to length *i.e.* so that they protrude approximately 0.5 mm from the rear surface and rivet them over. Proceed carefully so that the plates do not jam but can move freely up and down. When complete, the brass heads can be filed down until they are approximately 0.5 mm thick.

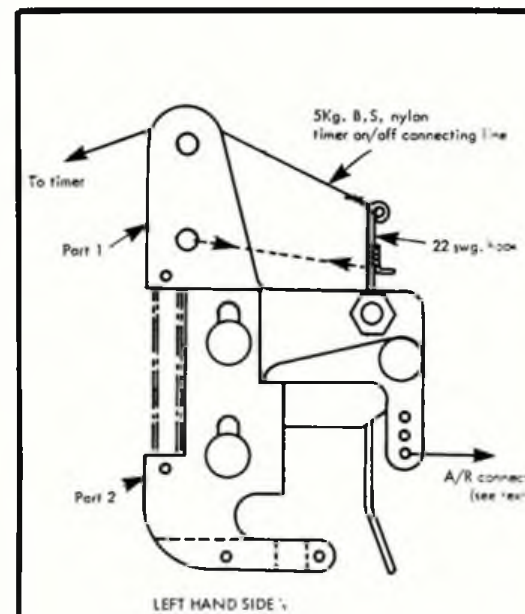
Repeat the above procedure and attach the cam (part 3) to the main frame of the hook and ensure that the fit is tight enough so that the cam does not jump over its seating on part 2.

Bend the latch from 18 swg wire as shown

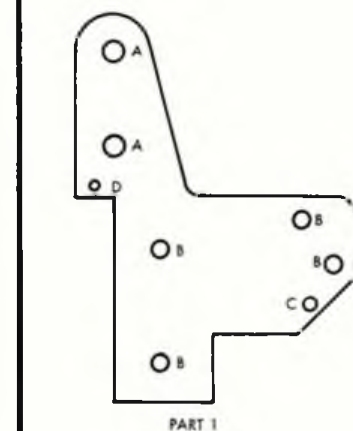
in Fig. 1 and bind and solder the small 22 swg wire 'L' shaped hook to it. Screw a 6 BA cheese headed brass screw which will act as the latch pivot into the main frame of the hook. Line up the bolt head slot so that it is vertical and then solder the wire into the slot ensuring that the latch is positioned as on the assembly drawing. Attach the nut to the other side, trim the bolt to length and rivet over so that the latch moves freely but does not rock to the extent that it will override the latch stop.

Screw in the 8 BA brass latch stop bolt and rivet over the back. File this back surface flat so that the cam movement is not impeded. Finally, cut the latch stop to length as shown on the assembly diagram.

Using Araldite or Cyanoacrylate attach part 5 to the main frame, using a 6 BA nut and bolt to hold it into place while the glue



LEFT HAND SIDE



PART 1

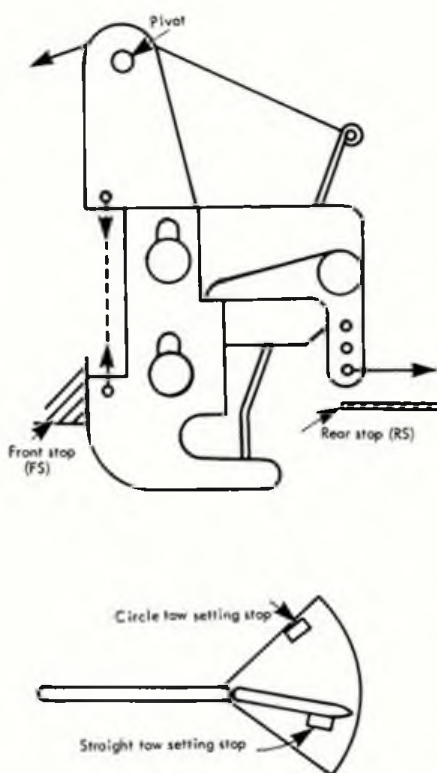


Fig 2 — Straight tow

dries. Shape a short length of 18 swg aluminium tubing and glue in place as shown on the assembly drawing. Ensure that this tubing remains clear so that the nylon line connecting the latch and the D/T timer moves freely inside it.

The mainspring has now to be connected to the hook. A suitable spring may be specified as follows: maximum outside diameter of 5 mm with a spring stiffness of approximately 3 lbs per mm and length of at least 25 mm. When such a spring has been found, purchase sufficient of them to enable trial and error attempts to produce a spring in the hook which requires a pull of 10-12 lbs to bottom the hook. Final adjustment of the 'unlatched tension' is achieved by trimming the length of the latch wire. An unlatch tension of approximately 7 lbs is most common.

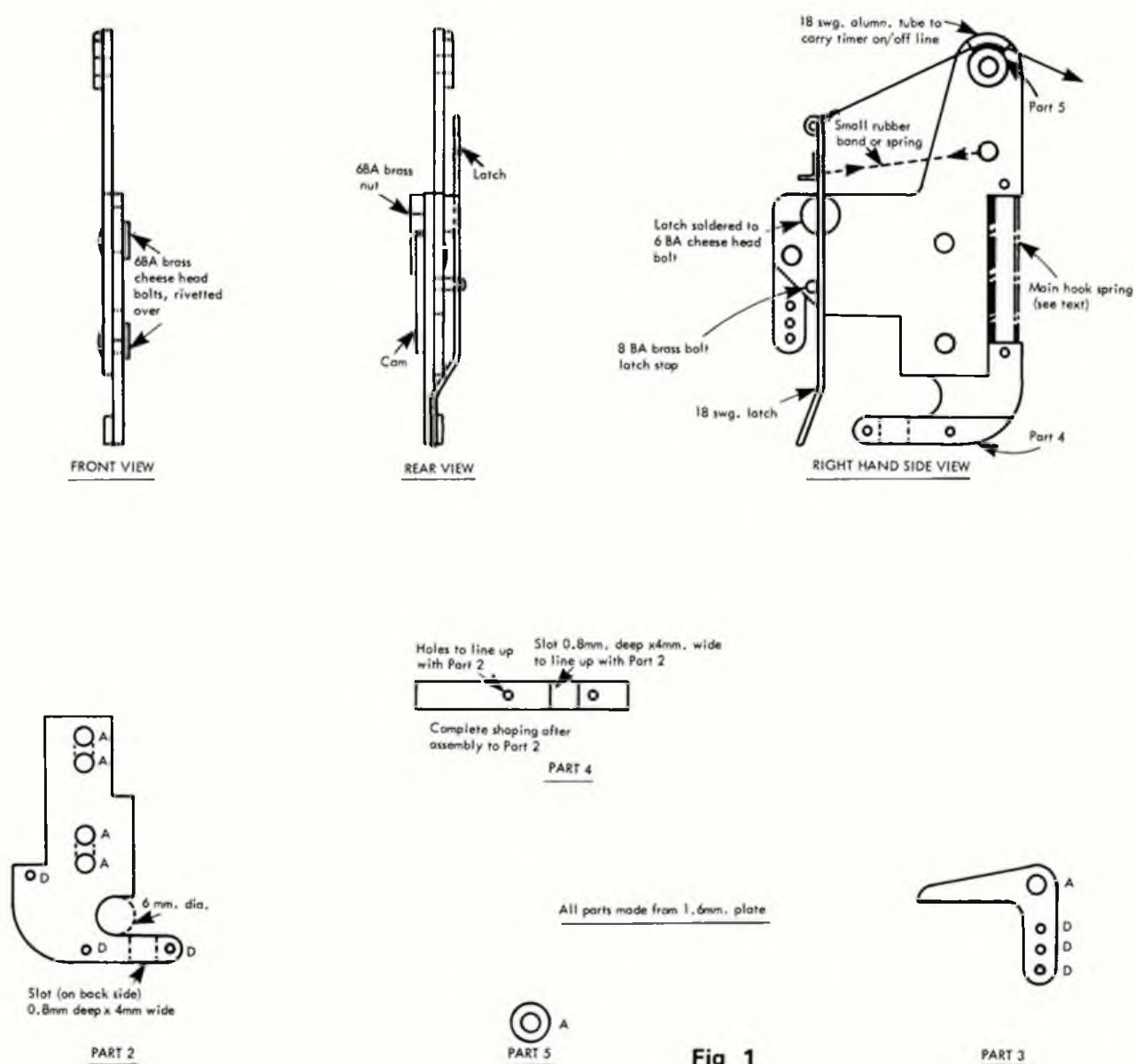
The fitting and adjustment of the spring may be a lengthy process initially but once the number of coils required has been determined then any future alterations in the hook tension are easily achieved: to increase the tension remove a coil from the spring and to reduce the tension, use a fresh spring and cut it one coil longer and so on.

The construction of the hook is completed by attaching a 12 mm small rubber band between the latch hook and the hole in the main frame as indicated in Fig. 1. If preferred, a small chuck spring or similar may be used but it is important to remember that whatever is used must be strong enough to enable the latch to be held hard against the latch stop. Failure to do this will result in variable rudder settings when the hook is installed in to the model.

Operation and installation

I feel that describing how the hook works is important as it will in turn help to determine how the builder will install the hook in an aeroplane. Refer to Figs. 2-5 which show the hook position (above) relating to the rudder setting (below) in each case of: (2) straight tow (3) circle tow (4) zoom launch and timer start and (5) glide setting. Geometrically speaking five things remain fixed since they are part of the aeroplane and not the hook. They are the hook pivot, the front stop (FS), the rear stop (RS) and the stops for the rudder settings of straight tow and circle tow.

The front stop should be positioned so that the front edge of the hook is vertical. The location of the front stop and hence, also the hook pivot, relative to the centre of gravity should be determined by using a



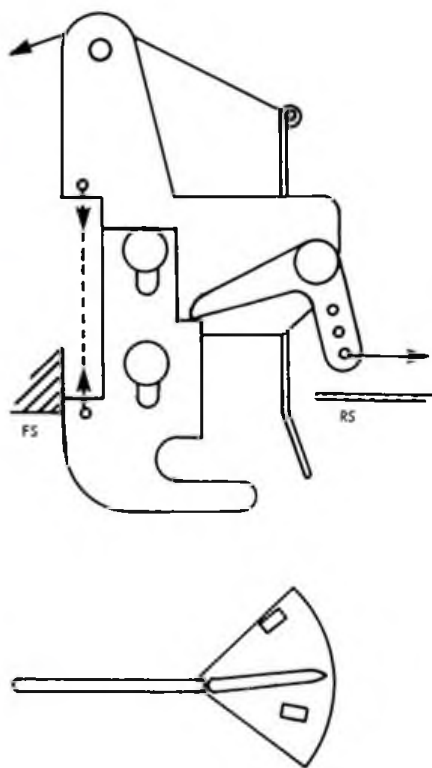


Fig 4 — Zoom launch, Timer Start

conventional straight hook during initial test flights of the aeroplane (see articles by John Cooper on Circle Tow techniques). Also during these tests the settings for the straight tow rudder and the glide rudder can be fairly well established.

Fig. 2 shows the hook in a straight tow mode. The latch is locked forward retaining the tow line ring (not shown for clarity) and simultaneously pulling rearward the connecting line to the timer so that the timer is switched off. The auto rudder line must be

adjusted so that its length just allows the rudder to firmly come up against the tow setting stop when the hook is in this forward position. As I mentioned earlier this line is the only component with a screw thread adjustment for length. To achieve this I use a small *Kavan* radio control linkage.

Fig. 3 shows the hook in the circle tow mode. Obviously the latch is still locked and the timer switched off. The latch itself comes

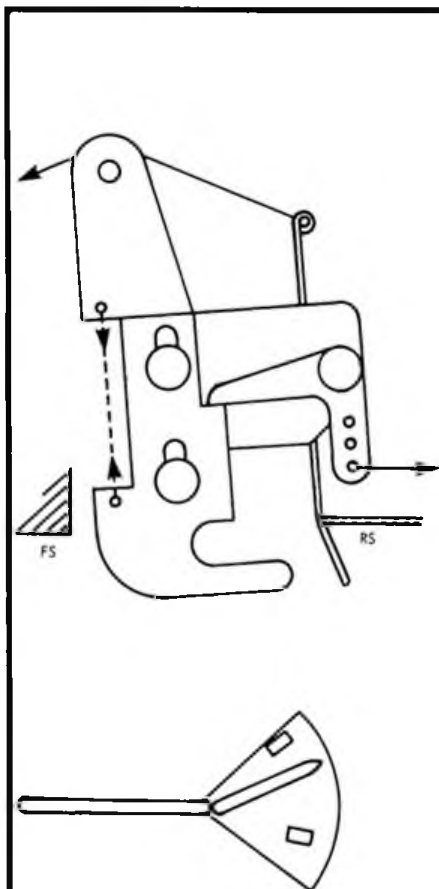


Fig 5 — Glide.

up against the rear stop (RS) which is located as described below. Readers may be assured that the setting of this rear stop is always such that it allows for ample rotational movement of the hook to permit the rudder to move across to the circle tow rudder stop. This stop is set up initially so that the rudder setting relative to the centre line of the fuselage is about twice that required for the glide setting. Final adjustment can only be made after a complete series of flight tests.

Fig. 4 shows the zoom launch and timer start mode. Here the tension in the tow line has been increased by accelerating the aeroplane so that the hook is opened (bottomed) and the latch rotates against its stop on the hook main frame and the timer start connecting line moves forward allowing the timer to start. Simultaneously, the hook being in an open position permits the cam to rotate so that a little rudder movement occurs so putting the aeroplane into a climb turn situation, and of course, the tow line is released.

I have found that the zoom rudder setting is the most critical of all the rudder settings and so it is essential for a screw thread adjustment to be used as mentioned. Coarse adjustment is achieved by movement of the auto rudder connecting line along the series of holes in the cam but in the end it is almost certain that fine adjustment using the screw thread will be required.

Fig. 5 shows the glide setting mode. The positioning of the rudder for glide has already been determined, and so the rear stop is simply adjusted to give this setting. I use a very elementary method to achieve rudder setting adjustment. A 1mm thick aluminium plate is simply attached to the bottom of the fuselage with insulating tape. Insulating tape is available in many colours and so a match with the finish of the model is nearly always possible. Although it seems crude, the method works extremely successfully.

Finally, readers must be warned that in general whenever an adjustment is made for an individual rudder setting then before the next flight is made all rudder settings should be checked by operating the hook and adjustments made if required to return the other settings to their original positions. It is wise therefore to always mark the rudder settings for reference purposes.



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SCALE MATTERS

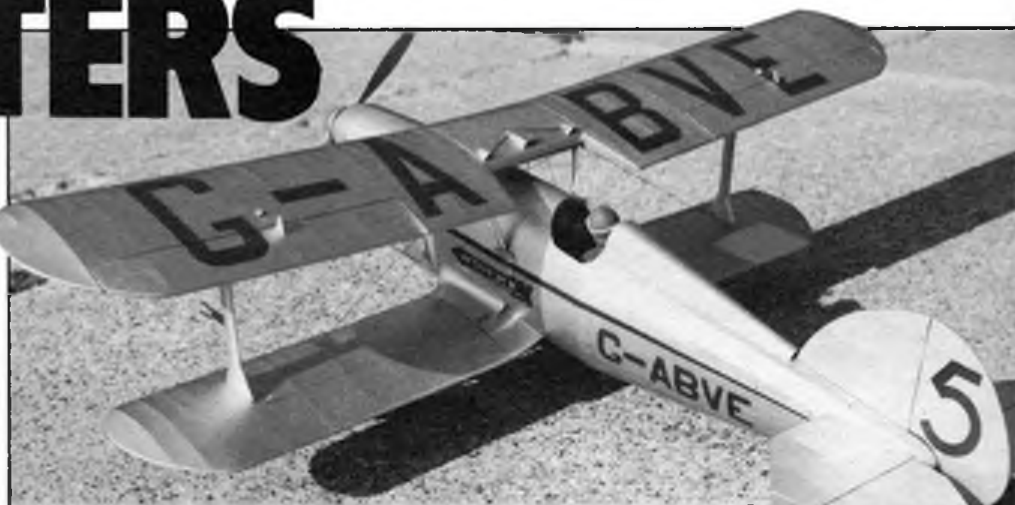
Free Flight with Bill Dennis

Pendulums

I would welcome correspondence from those with practical experience of pendulums for scale models. For the uninitiated, pendulum control was very popular in the 50s, and many APS plans of the period feature one, sometimes for no apparent reason. The system relies on the fact that a pendulum mounted in the fuselage will hang vertically, no matter what the attitude of the model, and by connecting it to one of the control surfaces (or even the engine) corrective action can be exerted to steer the model.

John Simmance's APS *Sopwith 'Snipe'* featured a comprehensive control system linking all the surfaces to one pendulum, but I regret I never saw this one fly. A selection of pendulum arrangements is reproduced in Figs. 1 and 2 from Ron Moulton's 'Flying Scale Models'.

I am sceptical of such devices by and large and would only be tempted to use one on a subject with little or no dihedral. Problems of small tails are not as severe as people



This Arrow Active by Fernando Ramos is powered by a Taitun 1 cc diesel, covered with Solarflex and fitted with pendulum ailerons (of course!) The quality of construction is self evident and it flies well.

imagine and can be overcome by building the model larger, while a subject with minimal fin/rudder area is best left alone, full stop.

At first glance the pendulum is a splendid idea, but difficulties arise over the inertia of the pendulum when the model accelerates, decelerates or turns tightly. For example, consider what will happen when hand launching a model with elevator control and the rearward swing of the pendulum gives full 'down'...

The only type of pendulum system I have seen in action has been linked to the elevator. In fact the first scale model I saw fly was John Palmer's *Nieuport*, and at the time I remember thinking that here was a perfectly stable model being slightly upset by its pendulum, as it proceeded in a safe wide turn, gently 'porpoising' as the elevator overcorrected. Vic Driscoll's 'Wapiti' showed an erratic flight path in gusty conditions and was once seen at Old Warden to suddenly nose dive, when the pendulum 'hung up'.

I have referred previously to the only convincing display of a pendulum that I have seen - a *Fokker DR I* at Old Warden one year. This model had zero dihedral and

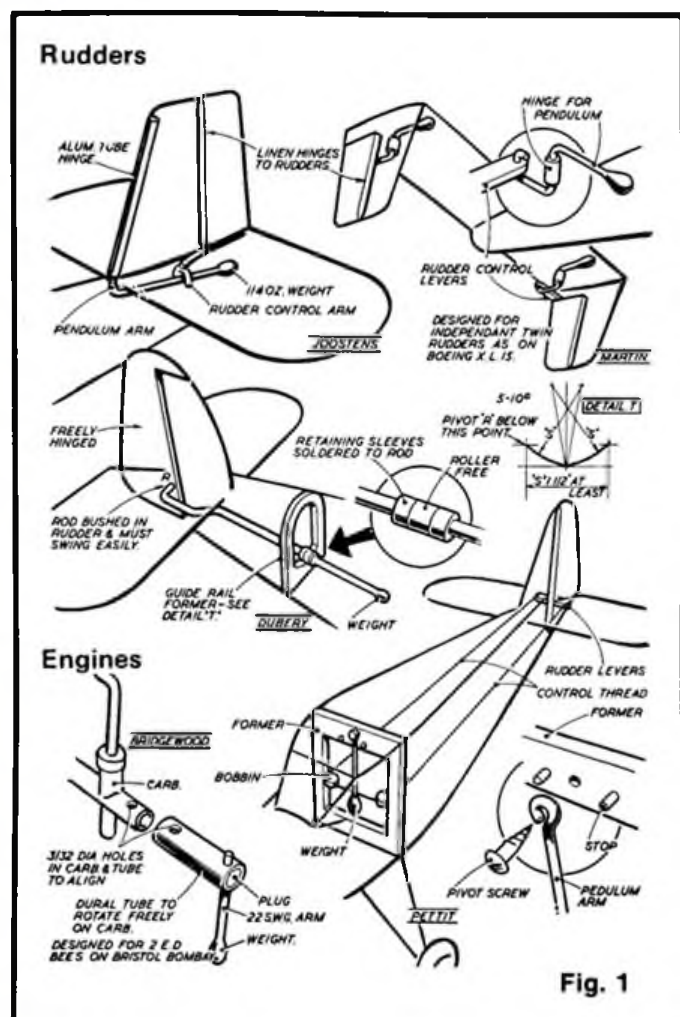


Fig. 1

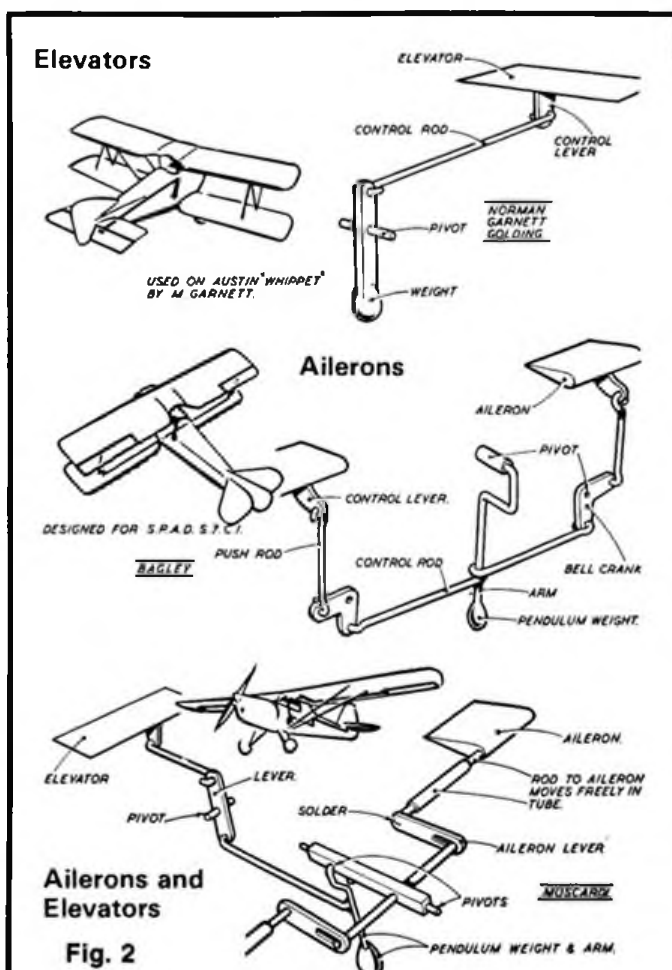


Fig. 2

was heavy and fast. Following a hand launch, it climbed steeply and each time it appeared to be entering a tight turn, the elevator kicked the nose up again into a safe climb - very impressive.

Aileron control interests me most, but it is more difficult to arrange...especially with knock-off wings, and I have never seen an example. I correspond with Fernando Ramos who writes the scale column for the U.S. *Model Builder* magazine and he is so committed to aileron control that he fits a pendulum to every model, no matter how inherently stable, because of a previous failure with an *Auro 504K*. To my mind, if a 504K won't fly without a pendulum, there is something wrong with the model, not the subject, but that is another matter...

advantage so that the pendulum exerts a force that will not be overcome by airflow. I don't know...do you?

CO₂

I had some response after my statement of surprise at the low durations (under 20 secs) achieved by CO₂ scale models at the Indoor and Outdoor Nationals. Gordon Cox sent details of his 'Walrus' (*Telco 6000*) which is 20 in span with 117 sq. ins area and weighs 96 g. and his 'Hornet Moth' (standard *Telco*), 20 in, 86 sq. in. and 64 g. Both models are capable of over 40 sec. Doug Sheppard has a *DH 60 'Cirrus Moth'*, which he found too much at 110 sq. in. and 67 grams for a standard *Telco*. Doug stresses the importance of building light enough to

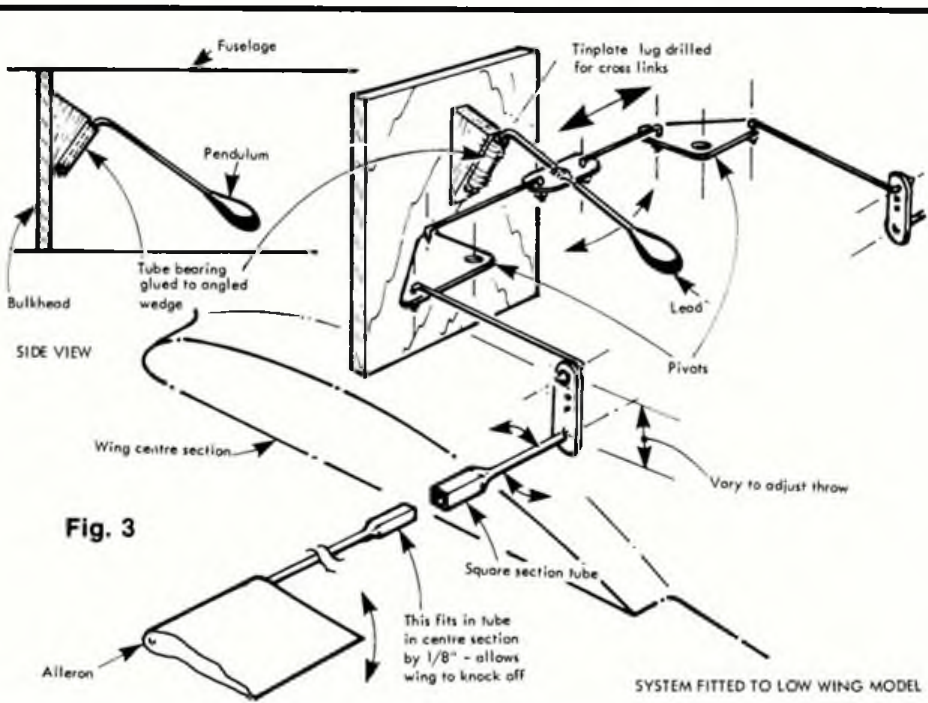


An Albatros B II by Gary Sunderland (Australia) to 1/8 scale. The fuselage is built from a laminion of 1/32 in. balsa and thin veneer.

Gary states that the same wood sizes can be used as for smaller (50 in) models, with a correspondingly low wing loading, and very realistic flight. This is no doubt true, as those who have seen large models perform - the *Bristol F2B* and *BE 2C* of Michael Smith and Tony Creedy spring to mind, as do the giants that Jack Jansen flies.

The drawback is practicality. In normal use these models are quite flexible and can take the rough and tumble of flying but a more severe crash will incur damage where a smaller model may emerge unscathed. I have watched Eric Coates' *DH 9A* for 12 years now and seen it fly into fences, cars, people and hangars and still it survives! I think a model of between 45 and 50 ins. is the best compromise between flying performance and ruggedness.

Gary included a sketch of his system of rigging biplanes shown in Fig. 5. It looks very realistic, although there is no apparent provision for the struts to move in a crash.



Fernando also states that the slight rocking of the wings as the pendulum acts, adds another dimension to flight realism. His system is slightly different to that we may be used to and is shown on Fig. 3. Note that the pendulum does not hang vertically but at a shallow angle. I did in fact build a simple flying test bed model, but it got flattened while moving house and was never tried out. However, a characteristic of the system was that when the model was banked over, the pendulum would crash over to full deflection and not move again until full opposite bank was applied.

This would be exacerbated if the nose was down, bringing the pendulum almost horizontal. It seemed like a sort of free flight single channel 'bang/bang' system, with no intermediate positions and did not inspire much confidence, but it must be said that it has been used in the USA to good effect.

If installing a system myself, and I'd like to try it one day, I think I would revert to a vertical pendulum Fig. 4. but I would like to know the answers to one or two questions, such as a) how much deflection, b) should the ailerons go up and down, or up and level, c) should the system be almost neutrally balanced and be subject to aerodynamic damping, or have a good mechanical

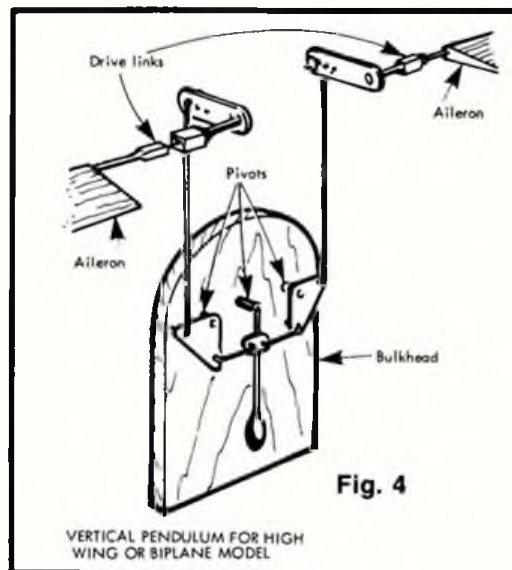
enable the motor to be run at moderate revs, otherwise icing-up can be quite a problem.

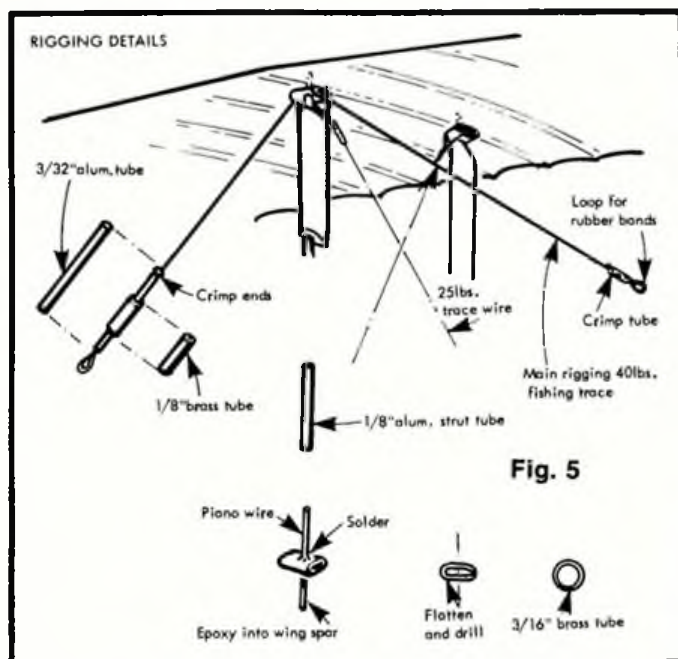
If your problem is low duration, then it is too big and heavy or your motor is below par. You can save the situation by fitting twin tanks, although a recent article in the *SAM* magazine described plumbing problems whereby only the first tank received a liquid fill, so reducing the benefits. A better way, eliminating the weight of some surplus tube, is to fit a larger tank, a range of which is available from *SAMS* (see Classifieds p.286). These are designed for the American *Brown* motor, but I'm sure they can be adapted.

Don't forget that there will be a CO₂ scale event at the August Nationals. So start building now...

Scale 'Down Under'

I have received a long and detailed letter from Gary Sunderland in Australia, who has returned to aeromodeling after thirty years and has taken up free flight scale of all things! Gary included a group of photographs, some of which are a little blurred but the better ones are reproduced here. The models are large - between 65 in. and 70 in. span - and powered by *PAW 2.5's* in the main.





This free flight BE 2c by Gary Sunderland is one eighth scale, with a 2.5 cc Taipan diesel and working controls. Placed third at the Australian Nationals.



Contests

Several people have expressed their interest in entering scale contests, but say they do not know how to go about it, so perhaps if I spend a few lines on the subject we will be inundated with models this year!

There are quite a few events in the calendar this season (see April Scale Matters) I will deal only with the SMAE contests, but there are one or two others run by clubs, for which the organisers issue their own information.

Firstly, you must be an SMAE member (£5, including insurance) with a SMAE Competition Licence (£10). This licence is needed to enter all SMAE events of whatever discipline, and it entitles you to a free copy of the revised scale rulebook from the SMAE Offices. Entry fees are normally £2 per event, but a little more for the Nationals. With the exception of the latter, all the SMAE free flight and control line scale events are 'entry on the day'. There will usually be a telephone number listed on the contest calendar and it is worth phoning the contact man in case of last minute changes.

Another shot of John Blagg's Blackburn 'Blackburn' now equipped with twin tanks for extra duration. Model weighs approx 100 g and is undoubtedly bulky, but flies well.

Try and get to the meetings by 10 am. If it is a 'scale only' meeting (e.g. Abingdon, Amesbury) you will have no difficulty finding your event, but where scale is one of several disciplines being run (e.g. Odiham Spring Gala) we are usually to be found near the free flight duration boys.

Find the Contest Director and make your

entry - he will want to know how many customers he has as soon as possible and hold a quick briefing meeting before flying. There is no rigid format: if the weather is good he will want to start flying early and do the static judging in the afternoon, but this will be reversed if the wind is too strong. The Nationals are run more tightly since we have to fit in with the radio control fliers who use our runways. Here, flying takes place in the evening or early morning when good conditions are the rule rather than the exception.

There are three outdoor free flight scale classes - power, rubber and CO₂. The rules are similar for all three, but the qualifying flying times are 30 secs for power, and 20 secs for rubber and CO₂. Rubber and power events are held at each meeting where free flight is flown (given sufficient entries) but CO₂ at the moment is only held at the Nationals. However, CO₂ models can be flown in power events *but* subject to the 30 second qualifying time.

By the time this appears, the next outdoor meeting will be at Amesbury - a grassy airfield where the emphasis will be on sport flying. See you there?



Kit Review

Veron DART KITTEN

Bill Dennis takes a look at this 26½ inch span scale model for rubber or CO₂ power.



ABOUT A YEAR AGO, Veron introduced a range of small scale kits for rubber power, convertible to CO₂. The four kits are for the Aeronca 'Collegian', Piper 'Vagabond', Ryan 'N Y P' and 'Dart Kitten', all being around 25in. span. As new free flight scale kits are a rarity, I thought a review might be in order.

The Ryan and the 'Dart' were, to me, the more interesting of the subjects, but the non-scale dihedral on the former decided me in favour of the 'Kitten'. Another factor was that some years ago I had built the A P S version (now on the 'X' list) which proved an extremely stable flier with Cox 020 power.

Finished model (less windscreen) gives a pleasing final product, greatly enhanced by attention to paint scheme and markings.

stripwood but there was insufficient trailing edge section. Two diecut sheets were of the hardest balsa I have ever seen, but the die-cutting was quite crisp and the parts came away easily. The parts are not identified, but this poses no real problem.

Accessories include the familiar black plastic wheels and propeller, ample white Modelspan tissue, a vac-formed nose cowl, the ubiquitous large rubber band (I'd love to see Dave Hipperson do a torque-test!) and a deformed cup washer. There are no transfers.

The plan is very clear and well laid out and the instruction sheet is well detailed, except for the part that deals with flying. The design of the model is simple and straightforward and the beginner with one or two previous efforts behind him will have no difficulty with this one. The wing is conventional, with shaped leading and trailing edges, ribs, and two spars, while the

fuselage is all sheet, with no less than eleven formers.

As I have said, the structure is very easy and of course the building part is the first hurdle the beginner has to overcome. However, the wood sizes are generous to say the least, and even with careful wood selection, a fairly heavy model would result. Unfortunately, the sheet wood in this kit was very hard and heavy. Perhaps the reason for this is that hard wood 'die-cuts' better, but if this is the price we have to pay, I would rather see printed parts on decent sheetwood. Just for interest, I put all the components in the balance - 2½ oz. before I started, with every likelihood of considerable nose weight being needed.

For those who might consider this a suitable contest model, I compared the plan with the A P S three view. The wing shape is accurate with the exception of the tips. The tailplane has been enlarged, but the fin/rudder are spot on. The biggest errors are in the fuselage, which is too shallow, and the nose elongated. However, the overall effect looks quite good and the wing span of 67 cm. makes it eligible for outdoor SMAE contests.

Tail end first...

I began construction with the tail surfaces. The fin and rudder are 1/16in. sheet, but mine were of such extreme hardness and weight that I used them as templates to cut replacements. The tailplane is 1/16 in. sheet, with the elevators built integrally. There was no diecut part for the tail, so I cut it from one of the sheets supplied for the fuselage decking. I found the reference to tail-end lightness highly ironic!

I sent for the kit mail order, so it was a completely standard item. The carton is rather flimsy, and was slightly crushed during the journey, but with no damage to the contents. There is a colour photograph of the finished model in an attractive red/silver scheme, plus references to the conversion potential for the three Telco CO₂ motor variants.

Inside, there was a bundle of good



Wings

Having got that out of the way, I began the wings. These are in three sections - a wide centre and two outer panels. I built the port panel first, starting by slotting the 1/2in. x 3/16in. trailing edge for the ribs, and pinning it down. The plan shows the pre-shaped 1/4in. leading edge also slotted for the ribs, but I did not do this, considering it unnecessary. The ribs were therefore over-long, so each was carefully shortened to meet accurately with the leading edge and also the rear spar.

With the ribs loosely in place, the leading edge was held against them with pins - the curved lower surface making this rather difficult. The root rib is glued in at an angle, using a diecut template supplied. The forward spar was added, while the rear was glued in later after the structure was removed from the plan. The centre section was built in the same way, but the trailing edge was missing, so I made it up by joining the outer panel offcuts with a scarf-joint. The spar slots in all ribs were oversize, but this made up for slight differences in positioning.

Having sanded each panel to a state ready for covering, they were assembled by simple butt-joints at the root ribs. Numerous gussets are shown on the plan, but as the wing seemed very strong, I omitted them. The undercarriage legs are simple bent wire shapes glued to the centre section front spar and reinforced with scrap 1/4in. x 1/16in. strip.

Fuselage

I then began work on the fuselage. There are two very hard sides joined by a number of formers which locate in slots. The widest former, F3, is glued at right angles to one side and then the second side added, spaced front and rear to be parallel with the other. The remaining formers were then added, first working toward the tail, and then the nose, building 'in the air'. Because the two sides were equally hard, a symmetrical structure was easily obtained. The only difficulty encountered was in drawing the extreme front together at F1.

When set, the upper and lower decking were added. The rear top decking parts were diecut, but needed a fair amount of trimming and chamfering to fit.

The holes for the rear motor peg seemed to be placed rather far forward, and anticipating that much rubber would be needed, I moved them 2in. rearward. I then turned to the nose assembly and cut the vac-formed cowl parts out with scissors, finally shaping them with a sanding block. A reinforcing former is glued inside and an extra front part glued on. The resulting two-

layered nose section has to be carefully cut away to make a round hole for the nose button. There is no way of adjusting the thrust line with this method.

I had already decided to leave attachment of the cowl until last, since I was not sure what clear dope would do to it, and I now intended to fix it lightly and shave the rear face for any thrustline adjustments. (See conclusions).

The motor hook was bent to a shape small enough to pass through the nose and bushed with a little plastic tubing. I did not use the single, deformed cup washer, but relied on the hard plastic to provide a sufficiently good bearing surface. The hole in the propeller was too small and had to be drilled out.

Prior to covering, the fuselage was given a vigorous sanding to remove a little weight from the back end.

Finishing

The whole structure was given a coat of dope, sanded smooth, and the tissue applied using thinners to soften the dope. Two coats of 60/40 dope; thinners were applied, with one extra coat on the fuselage. The instructions say not to cover the fuselage, but I feel that a lot of dope/sanding sealer would be needed to seal the grain.

The instructions call for the wing to be glued in place, but I did not fancy this at all. Instead, I fitted two 1/16in. diameter dowels to allow the wing to be held with elastic bands. Looking ahead to the inevitable cartwheel landings, I covered the wing seat aperture with thin card to prevent the fuselage sides breaking the tissue which covers the centre section.

I did in fact trim the model before applying the decorations, but for the sake of continuity, I will deal with the painting first. Not having any colour documentation, I followed the scheme shown on the box. The wings and tail were given a light dusting of aluminium from a car aerosol, and red dope was applied to the fuselage. Registration letters were cut from *Trimfilm* - sheets of solid transfer colour available from

Hannants of Lowestoft. The fuselage registrations are shown in full on the plan, but only part of the wing letters - the missing ones are easily developed on squared paper to the same proportions.

After a few details were added and motor installed, the model weighed 2 1/2 ozs., but one ounce of ballast was needed in the nose for balance. The instructions refer to the 14in. loop of rubber supplied, but it was nothing like this long, and all it could produce was an elongated glide. I replaced it with a loop of 1/4in. *FAI Supplies* rubber with better results. Since the elevators are fixed, fore and aft, trim was adjusted with nose weight and down thrust.

I had taken the precaution of steaming in 1/16in. washout on each wing panel and the model showed good stability on a left turn - right turns, however, always tightened up into a crash. The model looks good in the air, but the combination of over weight and low drag means a fast flying model.

Conclusions

From the start I had misgivings about the weight of this model. The structure is designed like a control liner, and wood selection is dire. Nevertheless, I was pleasantly surprised by the flying performance, even though durations are not spectacular. I have made a list of modifications which could be made to get a much lighter model, mainly by reducing the nose ballast.

1. Use die-cut parts as templates and cut replacements from light wood.
2. Replace fin/rudder with built up structure.
3. Make ribs and fuselage decking from 1/32in. sheet.

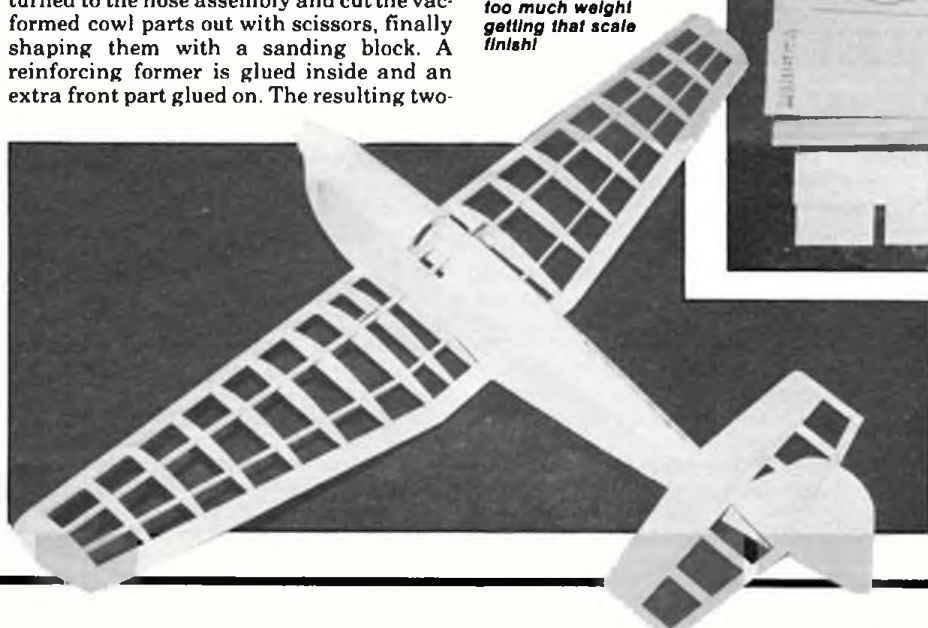
Finally, another useful modification is to make the nose cowling detachable. Getting the motor through a 1/4in. hole in the front is not easy, so I made yet another former to the shape of the cowl to act as a plug, and glued it to F1. Thrust line changes were made by shaving away the appropriate side of the cowling. With the model and motor

Right, what you get in the box, the crisp die cutting is obvious even in this small photo. Below, 'Dart Kitten' prior to covering displays sensible structure but as with all scale models, you must take care not to add too much weight getting that scale finish!



adjusted to come down with turns left, the cowl will be held in place by rubber tension.

I may eventually do a CO₂ conversion, and there should be little weight penalty since one is merely exchanging the motor for plasticine. Nevertheless, I fear the model may still be a little heavy for CO₂. I would also like to try an entirely new, lightweight version for indoor. If I ever get around to this, I shall report in due course...



VINTAGE CORNER

WITH ALEX IMRIE

Wakefield Gears

Some of our vintage rubber men had gear trouble last year when trying to make-up return-gear systems for models like Ellila's 1950 Wakefield Winner, and if they have not lost interest in the subject, they might care to look at the gear set produced in Sweden that is shown in the accompanying photo.

This is based on the 'Thomas E Murphy Wakefield Gears' described in the 1951-52 *Frank Zaic* 'Yearbook' which description commences with: "The first requisite of an



Above, quality return gear unit made in steel and aluminium by oldtimer-modeller Thomas Sigurdson from Sweden, just the job for that 'Ellila Wakefield'! (See text). Left, Another Stouffer shot: Bruce Norman hand launching his Ohlsson 23 powered "So Long" a Bill Englehardt design that was described in *Air Trails*, January 1941. This is one of the hottest machines in Class B Free Flight Cabin. Below, John Tidey, Secretary of SAM-Australia, sends this photo of his 6 feet span Modelcraft 'Spook', not a common model, due possibly to

(neatly) then than now."

It would appear that for this task Tinman's solder is not only preferable, it is essential. Soft solders are termed common, medium, and fine, according to the tin content, those containing the most lead being the cheapest. Fine or 'best' solder is used for soldering tin-plate, brass, steel etc in industry, does anyone know where the small amounts that the average aeromodeller would need can be purchased? Plumber's soft 'common' solder comprising two parts of lead to one part of tin, is no better than multicore for our purposes here, and should be avoided in 'high-stress' areas.

that gull wing structure pulling the weak hearted off! Model is powered by a Brown 'Junior'.

efficient gear installation is a mounting that will not flex under load thereby causing binding of gears and excess friction... Ball thrust bearings are a necessity... These points have been kept very much in mind with this product, made in an outstandingly fine manner by Thomas Sigurdson, Myrvägen 12, S-902 32 Umeå, Sweden. The set is a true engineering job. Look at that square section gear post with lightening holes, I'll eat my hat if that flexes even under the strain of 20 strands of 1/4 inch FAI rubber on full turns. Good things are never cheap, and especially with an important item like this it pays to have quality. Price per set is £12.50p plus postage.

Soldered Joints

In this column in August 1982 reference was made to the difficulty of soldering gears and some instructions emanating from the late C Rupert Moore were given. We cannot improve on these and the mention that Baker's Fluid should be used as a flux and Tinman's solder being preferable to resin-core are still salient points. Also junctions of shafts and gears were always wound with fuse wire and soldered solid to produce joints that never 'let go' even with heavy motors.

Naturally some modellers who adopted this technique, and still had gears 'let go' must have been disillusioned. One of these



was Simeon G Bull from Canterbury who had trouble with 'Jackdaw' gears, he recently told of some experiments: "... Since then I have solved my problem by silver soldering every darned thing. It is a bit fraught and requires lots of heat sinks, followed by some very cunning wire bending but at least it is solid! However, poking around at the bottom of a junk box the other day I came across a 3 inch length of 35 year old solder. I did a couple of (very unscientific) tests - melting point and shear, and established, to my own satisfaction, that the old stuff is a LOT harder than modern multicore.

Could this be the reason why even the 'best' joints sometimes 'let go'? I suspect that it is, as well as being the answer to why soldering was more difficult to do properly

Electric Fans...

Those of you who use this form of power, especially via the Mabuchi A-1 motor, might be interested to hear that batteries are available from *Technicad Limited*, 20/22 Poole Hill, Bournemouth, BH2 5PS.

Sugarfoot

PET/381X: Price Code D: This is a high performance contest pylon model of 48 inches wingspan designed by J R Stainer and was described in June 1950 *Aeromodeller*. It utilises a mono leg undercarriage relying on the widely placed twin rudders for ground stability. The end result of a number of models built in 1948, the combination of the high pylon and the large powerful lifting tailplane gave the



Above, John Stainer with his 58 inch span version of 'Sugarfoot'. This model powered by the Arden .199 fitted out as a floatplane broke the British Floatplane Record on 14th August 1949 (See text).

model a fast climb with a rapid recovery when the engine cut.

The average still-air ratio was about 12:1, and the model won the East Kent Rally in April 1949, was 8th in the Coronation Cup when it did 131 seconds on a 9 seconds engine run, and on one occasion the model landed some 11 miles away from the launching site when an 8 minute 35 seconds



Left, SMAE Certificate for the Floatplane Record set by 'Sugarfoot' of 2 minutes 59.4 seconds. Below, John Stainer's club voted him Champion of the Year and awarded him this attractive shield showing 'Sugarfoot' over heraldic water!

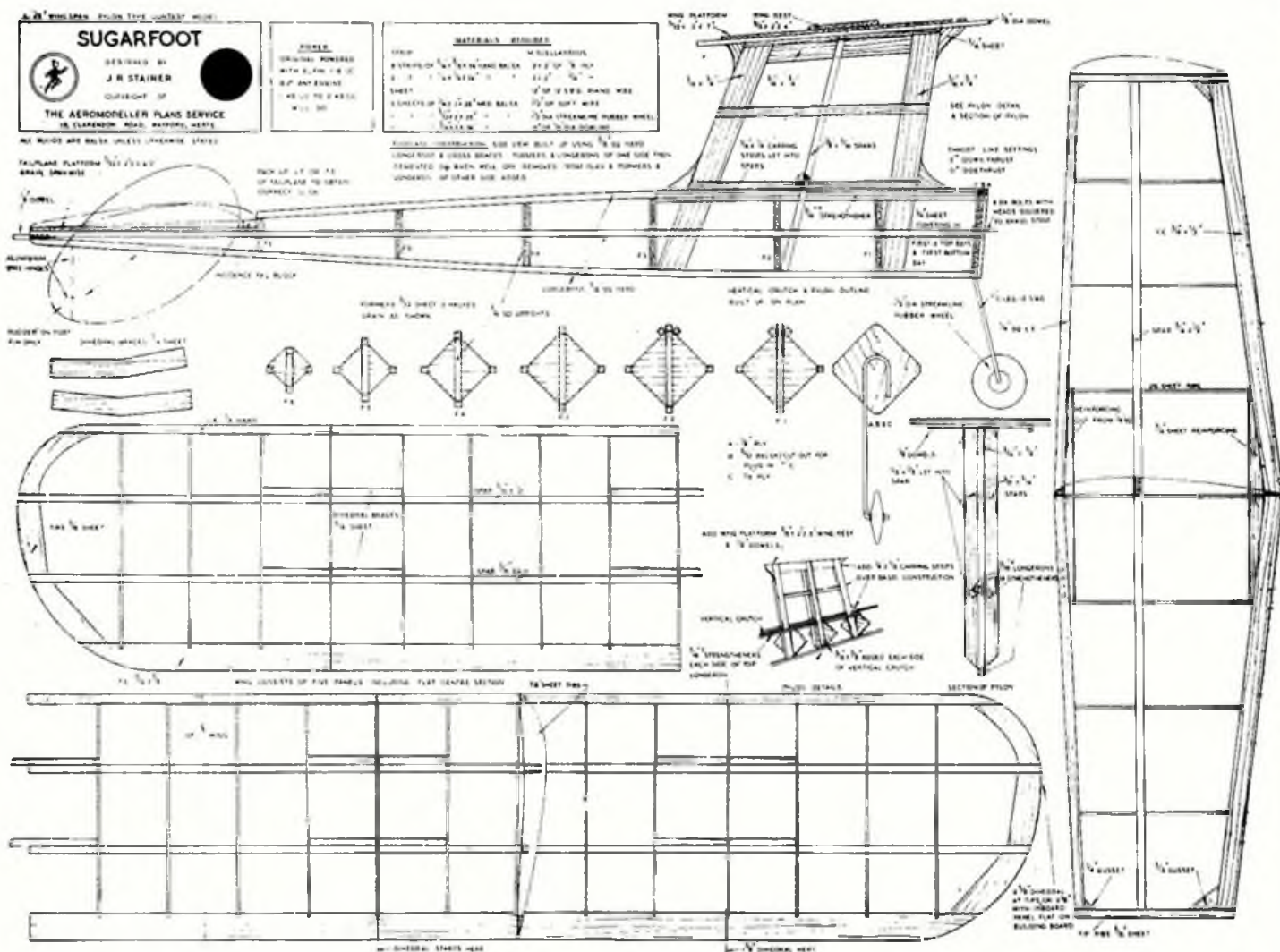


flight resulted from an 11 seconds engine run. So this is a hot ship, why don't you try one, and put some pep into your Vintage?

Construction is straightforward, the diamond section fuselage being built on a vertical crutch: a pop-up dethermalizer is recommended where the tailplane is allowed to rise at an angle of 35 degrees, operated either by timer or fuse. Use any 2cc diesel or

glow engine, but the design can be enlarged to 60 inches span for engines like the Amco 3.5cc diesel or reduced to 36 inches span for the ED 'Bee' or Mills .75.

John Stainer used a modified 'Sugarfoot' with 58 inches span powered by a glow-plugged Arden .199 driving a single bladed



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propeller fitted with a three float under-carriage to break the British Power Floatplane Record which he did to the tune of 2 minutes 59.4 seconds on 14th August 1949.

The observant amongst you will notice that the plan does not show any aerofoil section! To be honest I did not notice this omission either until John pointed it out to me! Anyway all is not lost since the section is known, this being a so-called 'turbulent' section with a pointed leading edge having its maximum depth at 30% of the chord, heavily undercambered with the section's maximum thickness being approx 12%.

By comparing a re-construction of this section that John has kindly made for us it is found to be very close to G-6 10B or MVA-173. Although no sections are provided for the tapering tailplane this should not present any difficulties, the section is flat bottomed and appears to be of the thinned Clark Y type.

Frog Get-together

In 'Vintage Corner' February 1982 I gave two meanings of the *Frog* trade name, both, it would appear were incorrect, which when first introduced meant "Fly Right Off Ground", since this is the wording that is used in one of the very first advertisements for the *Frog* 'Interceptor' in 1932.

Frog products played a big part in the developing model aircraft scene in the 1930s and 1940s, so it is hardly surprising that in the present day wave of vintage interest, a growing number of enthusiasts are devoting time to collecting and researching *Frog* model aeroplanes, both the ready-to-fly variety and models made from the fondly remembered well turned out kits.

Mike Wilson of 126 Birkbeck Road, Enfield, Middx. EN2 0EB (Tel. 01-366-7981) would like to hear from any *Frog* enthusiast with the object of arranging a 'get-together' at Old Warden during the Golden Era Model Festival Meeting on Sunday 19th May. No competitions are planned at this stage, the idea being that as many different types of *Frog* model aeroplane as possible are brought together on one day.

If interest warrants, a repeat performance (with possible competitions) will be held during the Aeromodeller Vintage Weekend 17/18th August. This is a good cause, so readers with ANY kind of *Frog* flying model, please get in touch with Mike.

The tooling cost of the *Frog* 'Puss Moth' was £3290 in November 1933, this 18½ inch span model by International Model Aircraft was a good performer. Mike Wilson from Enfield owns this example and he is keen to hear from other *Frog* enthusiasts (see text).



Still More Plans!

Our Plans Handbook No 1 - Aeromodeller, draws the reader's attention to the fact that there are many vintage designs in the Aeromodeller Plans range other than those listed and modellers seeking a particular favourite are invited to write in and ask for possible help. Here is a list of some designs from 1950 that are still available.

REBEL by R Twomey: An out of the rut power duration model of 54 inch span with attractive lines for 2cc diesel engines: PET/394X : Price Code D

WITCH MK 1 by G Woolls: A shoulder-wing streamline slab-sided Wakefield of 45 inches span, flights average over three minutes: D/371X: Price code D.

NORDIC TERN by RFL Gosling: A reduced version of 'Tern II' by an expert, giving a 66 inch span FAI sailplane to A2 specifications: D/374X : Price code E.

FLASH by J G Carter: Class III British Speed Record Holder (99.4mph) control-line model for the McCoy 19 or Amco 3.5: CL/375X : Price code D.

THERMAL QUEEN by R Jessop: Enlarged version of the designer's Wakefield model to 54 inch span for Queen's Cup specifications: D/378X : Price code D.

HOVERKING by P Gilbert: A 72 inch span slope soarer by the designer of 'Thunderking' the 1949 Nationals Winner: G/379X : Price code E.

MAN-O-WAR by R G Moulton: A 26½ inch

wingspan control-line team racer designed for the DeLong 30 petrol engine: CL/383X : Price code D.

LAZYBONES III by N G Taylor: British Class VI Speed control-line record holder with 132.4 mph used McCoy 60 engine: CL/387X : Price code D.

WALTHER RUBBER by R Scott: A good performing 29½ inch wingspan beginner's rubber parasol model with diamond fuselage: D/390X : Price code D.

METEOR by K Muscutt: A 38 inch wingspan high speed stunt control-line model with coupled flaps for square bunts!: CL/397X: Price code F.

PEGASUS by G H Harrison: A 34 inch wingspan canard rubber model, reluctant to stall and has a fine floating glide: U/396X : Price code D.

SATU by J M G Bennett: A 60 inch wingspan sailplane of clean design and

simple construction one of the best British A2 designs: G/400X : Price code D.

HELIDES 7 by R A Grasmeder: Simple 37½ inch wingspan contest power duration model for the Mills 1.3 diesel: PET/401X : Price code D.

Time passes...

When the model aeroplane hobby really 'took-off' in the 1930s, there were a number of young men who quickly drew attention to themselves because of the sheer quality of their contributions, whether this was in designing, draughting, building or flying their creations. These giants, mostly brought to our attention via the pages of the old model magazines, we seldom if ever had the pleasure of actually meeting in person, yet we have held such an intimate allegiance with them and their work over the years, that when they pass on their loss is the keener felt. So it is with E J Weathers and Paul Plecan, both of whom will be remembered for as long as this aeromodelling thing lasts.

Elbert J Weathers known as Joe to his close friends, died at his work following a heart attack on December 6th 1984 at the age of 68 years. He started building models around 1930 and progressed through all types, making *Cleveland* kits and designing his own flying scale rubber models, many of which were published in *Model Airplane News* and *Flying Aces*.



Above, a recent photograph of Paul Plecan with his 'Tornado' model made in 1938, but not described until April 1946 when the plans appeared in *Model Airplane News* (see text).

He became a distributor for *Elf* motors and advertised this fact by not only powering his early models like 'Miss San Diego' and 'Tubby' with this engine but also causing the fuselage sides to be suitably inscribed.

His power models all had good looks and resembled full-size aircraft, 'Winged Victory' (described in *MAN* Sept/Oct 1937) and 'Westerner' (described in *MAN* May/June 1938) being especially beautifully proportioned. His most controversial model was, without doubt, the 78 inch wingspan gull-winged 'Mystery Man', (described in *Air Trails* June/July 1939) which, although accused of dropping its undercarriage on take-off, did not in fact do so. According to Weathers the model rose off the landing gear which remained on the ground!

After the war during which he served as an engineer with North American Aviation Inc. he produced the 'Pacifcoaster' (described in Bill Winter's 'Model Aircraft Plan Book') a precision type of only 5 feet wingspan powered by the *Orwick* 64, as a free flight cabin model its performance must have been "something like"! The 'Pacifcoaster' was later kitted by Harry Fosbury of Portland, and EJW built a flying prototype from the kit in 1948/49.

His last model seems to have been the towline sailplane named 'Tomorrow' in

1952, gliders being another strong interest, Elbert designed and built a highly successful glider in 1933, and found its performance so good that over the years he made four models to this design. It was described in the 1938 *Zaic Yearbook* also in *Flying Aces* for August 1939, this 30 inch span simple model returned some very good flights of around 30 minutes duration from a 100 feet towline.

EJW had been an original member of the San Diego Aeronauts, which was a hotbed of gas modellers, most of whom were never addicted to the pylon layout, hence all those realistic looking models! In later years he was elected to the membership of SAM 41 which was a resurrection of his old SDA.

In recent years pressure of business (he was chief engineer of the *National Cash Register Company* in San Diego) did not



A youthful Elbert J. Weathers who first caused attention to be focussed on the 'dropping of parts in flight' clause with his take-off dolly flitted 'Mystery Man' in 1939. (See text).

allow him to participate in modelling, and he gave his original 'Pacifcoaster' to the *AMA* Museum, also making a number of his original drawings available to John Pond, so at least most of his famous designs have been preserved for posterity.

Many years ago when asked about beginners to the hobby he advocated that newcomers should watch experienced builders to get the hang of things before tackling building themselves. He suggested starting with an all balsa glider or an ROG, advancing rapidly (without rushing any model) through the various branches of modelling.

Finally he said that no really young boy should be allowed to 'take the plunge' by

making a gas model as his first project, this was not good for the boy or for any others who might happen to be around where he was attempting to operate it!

Paul Plecan: Also a victim of a heart attack, Paul Plecan died on December 9th 1984 at an undisclosed age. He was a Ukrainian emigrant to the USA in the 1920s, who found an outlet to his aviation interests in modelling and drawing.

There is quite an art in putting a design on paper, and not all draughtsmen have it, but Paul seemed to have this ability right from the start and from the mid-1930s his work was being used in magazines like *Flying Aces* and *Air Trails*.

He probably contributed more drawings to the hobby than any other illustrator, and it is said that at the time of his death he had drawn a total of over 5000 model plans. He did most of the fine drawings in the large sized *Air Trails* magazines, and in the 1940/41 period there was hardly an issue that did not have a contribution from him.

Not only did he draw other peoples' designs, Paul was also a highly skilled designer and modeller himself. He liked the small gas model and considered that it would appeal to more modellers than the larger models then current, because of its low cost. One of his first for the *Elf* engine was the *Flying Aces* 'Gas Flea' of 36 inches wingspan described in that magazine in December 1937, and this tiny model only cost, less engine, \$2.00 (10 shillings or 50p at the then rates of exchange!).

He went even smaller when he designed the 'Tornado' for the original sand cast *Bantam* .16 engine this model being only of 30 inches wingspan. Other models followed and some of these are vintage favourites today, especially his 60 inch wingspan 'Simplex' which was first described in the February 1941 *Air Trails*.

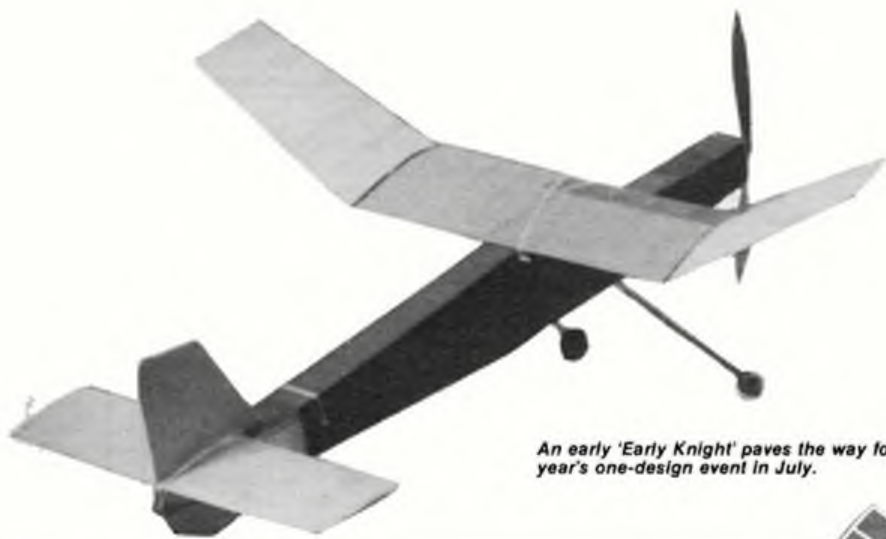
This model was built and drawn at high speed to meet an 'impossible' deadline, but again cost was a factor Paul kept in mind and 'Simplex' cost only \$2.50 (12 and 1/2 shillings or 62.5p) less timer and engine. It flew so well that he lost it on its first day out when it did 33 minutes on a 15 seconds engine run!

During hostilities he was at first in the US Signal Corps, but eventually managed to transfer to the Air Corps where he finished the war as an air gunner on B-24 and B-29 bombers. His military service did not stop his modelling and one of the rubber models that he made 'under trying conditions' had a dummy *Curtiss* P-40 nose intake suitably decorated with shark's mouth insignia and was named 'Tiger Puss'!

He carried on where he had left off after the war and his art is such an indispensable part of the vintage scene that many old timer designs flying today were first drawn by Paul Plecan. Recently he had been producing kit plans for *Top-Flite* kits, he also had drawn the fine wall charts of Famous Free-Flight Models and was issuing his own Plan Packets of interesting prototypes showing 30 inch (approx.) span rubber models in full detail well capable of being enlarged (or reduced) to suit personal modellers' appetites. Hopefully these Plan Packets at \$5.00 each will continue to be available from some source for a long time. As Bill Winter has already said "Paul Plecan was an original. He was there THEN."



This Vought 'Corsair' V-65 was made from a 3/4 inch scale Cleveland kit in the early 1930s by Elbert J. Weathers (see text).



An early 'Early Knight' paves the way for this year's one-design event in July.

Early KNIGHT

A 36 inch wingspan, rubber powered model for the novice by John Godden

THIS MODEL was designed several years ago, with the aim of providing club members - many new to the hobby and several with little or no experience of rubber models, - with a suitable aeroplane to fly in the Club small field events. All examples built so far have flown with a minimum of trimming (if any), and though duration times of the majority have not been very high, all builders of the model have been extremely satisfied with the result of their efforts. In fact unknown to me, it has been decided to hold a one model competition this year for the model, although I don't know what form the event will take (July 21st, Morely DMAC Silent and Vintage meeting...Ed)

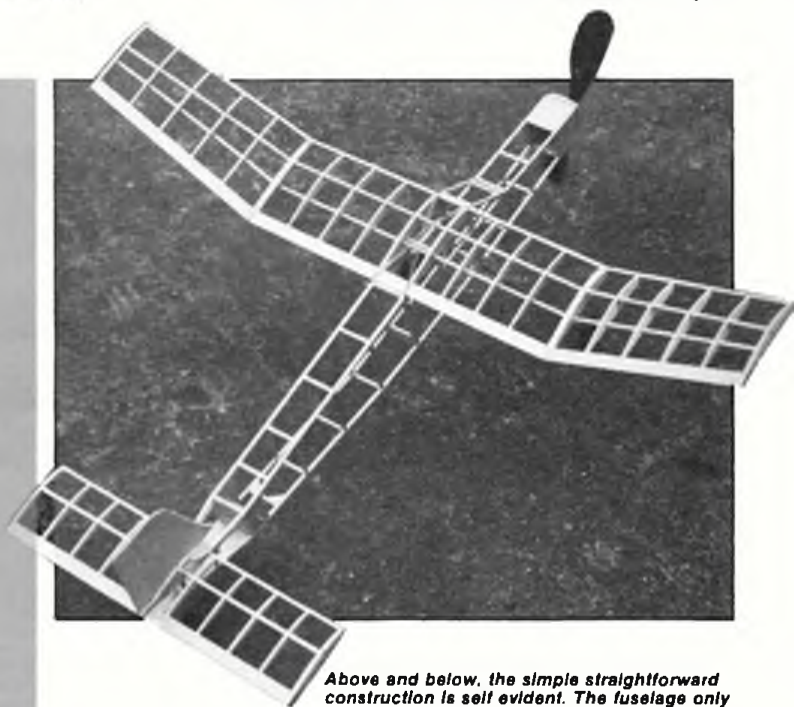
Construction should provide few problems for anyone who has the ability to cut 1/8in. square balsa reasonably accurately at right angles, and can bend 18 s.w.g. wire - used in preference to 16 s.w.g. wire because of the latter's resistance to accurate bending by novices, especially the younger, hence weaker hands of these hopefully experts of the future. I know an 18 s.w.g. prop shaft bends easily in a hard landing, but similarly it can be easily straightened sufficiently to not unduly impair model performance, and anyway a

bent shaft is preferable to a broken propeller!

Inspection of the plan shows that nowhere is it required to actually *bend* any wood component. All fuselage longerons being perfectly straight, with changes in direction being formed by *cracking* and cementing. This technique is not generally accepted practice, but quite satisfactory

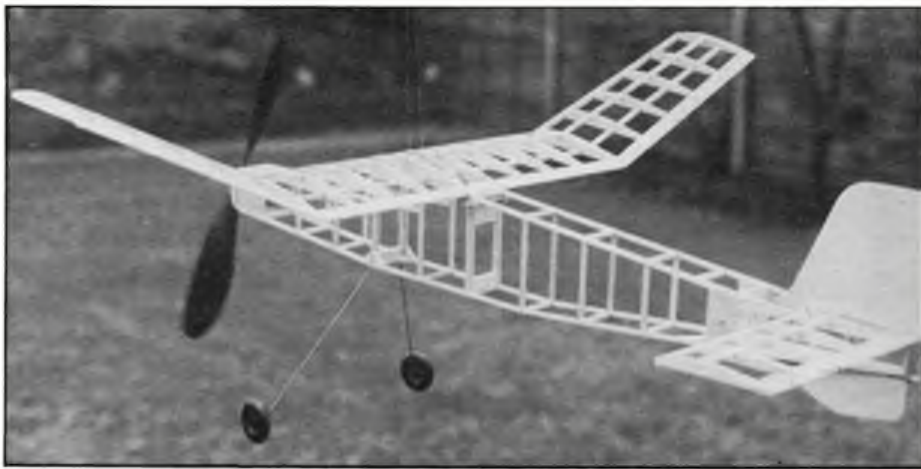
on a model of this size using generous wood sizes. Similarly the unusual sequence used for the wing construction would suggest a weakness at the dihedral joints, but this fear is unfounded, and the difficulty of covering a conventionally constructed wing is removed.

So, now I've whetted your appetite (or young brother's, sister's, son's, daughter's dad's, mum's, etc.) ... the material requirements, which in general can be obtained from most model shops. The only problem items may be the 12in. *Keil Kraft* plastic propeller, the 1 1/2in. plastic wheels and the 1/4in. rubber, but a peruse through the *Aeromodeller* advertisements should result in success, but do make sure you



Above and below, the simple straightforward construction is self evident. The fuselage only tapers from just in front of the tailplane - should be no twisted fuzs here...

obtain the grey *FAI Supplies* rubber and not the off-white strip sold in some shops. (Should only 3/16in. wide rubber be available, then purchase 7 or 8 yards and make-up into 8 strands instead of 6 strands of 1/4 ins.) Wood selection is not critical, although medium grade balsa is much easier to cut and work with than the harder wood stocked in many shops. I can recommend the quality of wood sold by *The Balsa Cabin*, but postage costs may result in a high final price unless a fair quantity is being purchased.





In the hands of the novice 'Early Knight' proves a docile introduction to rubber duration. A point to please the younger modeller are the impressive take offs.

Construction

Actual construction is very straightforward, but a few general notes will help to ensure accuracy and strength of the completed model, plus being valid for many other built-up structure airframes. The fuselage consists of two identical sides, both built together directly over the plan, ensuring the following points - use a flat board at least the length of the fuselage, and with a surface soft enough to accept pins (dressmaker's pins or special modelling pins may be used), always place a sheet of greaseproof paper or polythene on top of the plan to prevent the structure sticking to the plan, and tape or pin both plan and its protective covering to the building board making sure that both are taut and free from wrinkles or creases. Attempt to select four lengths of balsa of equal hardness for

the longerons and cut the bottom longerons to just *over-length*, then mark the exact positions of the two *kinks* and cut halfway through, crack, and cement (see fig. 1).

Immediately prior to pinning over the plan using pins pushed into the building board vertically either side of the balsa (not through it see fig. 2), the top longerons are similarly pinned to the board. Except that they are made from three separate lengths each, the centre pieces being cut to exact length before fitting. All vertical spacers are then cut and cemented into position, followed by the windshield angled fronts, rear 1/8 in. sheet motor anchorage, front side sheeting, gussets, etc.

The adhesive is a matter of choice, but either balsa cement or any popular PVA type of glue is quite satisfactory for all purposes other than for the tissue covering. The sides should then be left to dry, preferably overnight, meanwhile, the four fuselage formers and main top and bottom spacers can be prepared, making sure that all spacers, and F2, F3 and F4 are exactly the same width.

After removing the fuselage sides from the plan, it is advisable to drill the rear motor anchorage and wing and tail fixing dowel holes. Trim the fuselage to exact length and lightly sand the units prior to splitting into the separate sides, using a sharp, long bladed balsa knife or similar - any roughness on the insides may then be removed.

Since the sides are straight and parallel from the front, right back as far as the rear motor anchorage, joining them together is relatively straightforward, simply place one side onto the building board (or other flat surface), and weight down using small pliers, spanners, etc., and cement formers F2, F3 and F4 in position, taking great care that they remain upright until the cement sets - (see fig. No. 3).

The other side is then accurately cemented in place onto the three formers and suitably weighted, after which all the spacers as far back as F4, and top and bottom nose sheeting are cemented in place. When dry, lift from board, *crack* all four longerons immediately behind F4 and draw rear of fuselage together and cement, holding together with a spring clothes peg or rubber band.

Fit remaining top spacer (at tailplane leading edge) and bottom 1/8in. sheet infill between F4 and rear of fuselage. Insert any remaining gussets, etc. and plywood former F1 before sanding the structure smooth. To complete ready for covering fit 1/8in. sheet

Fig. 3

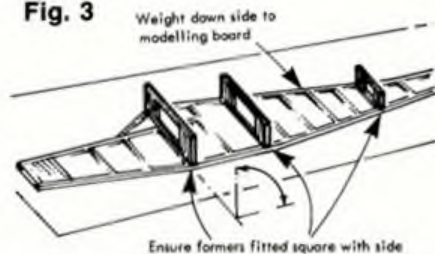
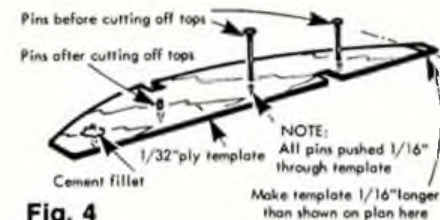


Fig. 4



underfin and fix 18 s.w.g. undercarriage to appropriate spacers and F2 with cotton and cement. (The wing and tail fixing dowels are best fitted after the fuselage is covered and doped).

Wing and tail are constructed in the same way, except that the wing comprises three separate parts, the starting point for both being the cutting of the rib templates, from 1/32in. plywood. Using the plan, place the wing rib centre section over the plywood with a sheet of carbon paper in between and mark round the rib outline using a hard pencil - mark the spar positions and leading and trailing edge positions, but allow an extra 1/16in. at the rear of the rib for letting into the trailing edge.

Cut accurately round this outline and use sandpaper to obtain a smooth outline, check that the spar slots will accept 1/8in. square with a small amount of free movement (the resultant balsa rib will have a slightly smaller spar slot). Finally push three or four pins through the template (see fig. 4), cut off all but about 1/8in. of the top of the pin, and fillet this small protrusion of pin with cement.

'Early Knight' flew so well at last years Leeds DMFC Golden Jubilee Gala that Morely DMAC are running a one-design competition for it at their event at Heath Common, Wakefield - on July 21st.

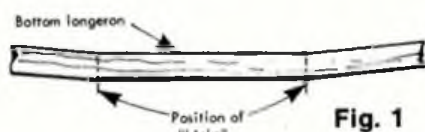


Fig. 1



Fig. 2

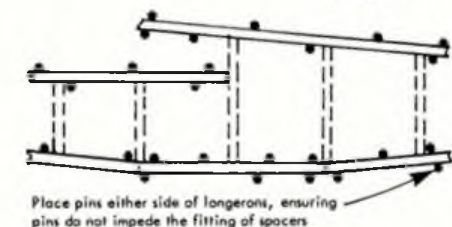


Fig. 5

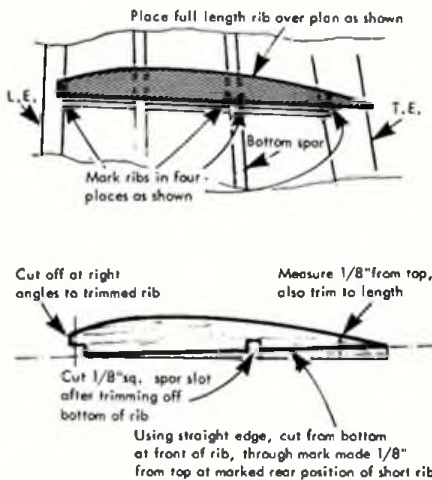


Fig. 6

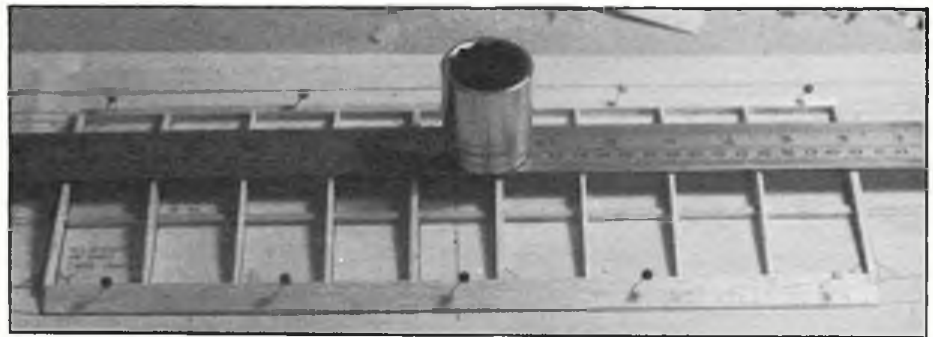
The tailplane rib is made exactly the same as that for the wing except that only one spar slot is cut. To make ribs from these templates is simple and accurate, simply place the template on the 1/16in. or 1/8in. sheet balsa in the required position, press down to ensure the pins are fully inserted in the balsa, and using a sharp balsa knife, cut round the template leaving the spar slots until last.

The wing tip ribs are slightly more difficult, but can all be cut using the wing rib template, simply cut eight ribs off 1/16in. sheet and two off 1/8in. sheet, but *do not* cut any spar slots. Then with reference to fig. 5, measure off total length of rib from plan, and also position of bottom spar slot, noting that the rib is positioned with its front edge approximately 1/32in. forward of the rear edge of the L/E. Then, trim off bottom of rib, cut to length, ensuring front rib is cut at 90° to rib base, and cut 1/8in. bottom spar slot, all as shown in fig. 6. All that remains then, is to place rib template over trimmed rib, ensuring that the front of both template and rib coincide, and cut top spar slot.

Construction of flying surfaces proper can now be started, by cutting leading and trailing edge components to exact length, making sure that wing pieces are cut at the correct angle at the dihedral joints using the dihedral template which can be made from any scrap piece of sheet or card. The trailing edge pieces are then marked off on the plan and slotted 1/16in. deep so that the rear of the ribs are a *snug* fit in the slots.

Then, as for the fuselage sides, using polythene or greaseproof paper over the plan, the wing centre section L/E and T/E can be pinned down - only this time, the wood is of sufficient size for the pins to be pushed through the wood rather than either side. The ribs are then cemented in position making sure they fit down to the plan, weight down if necessary - and use the template for the dihedral joint 1/8in. ribs, it being rather important that these ribs are set at the correct angle, since these ribs determine the dihedral angle of the tips.

When the ribs are semi-set, the top spar can be cut to length and cemented in position - should it be rather tight in the rib slots, then it is usually easier to sand the spar slightly that trim out the spar slots in the ribs. The 1/8in. sheet gussets can also be added at this stage, checking that they are a good fit before cementing in position.



Above, wing centre section under construction, steel rule and weight ensure upper spar held down into ribs whilst glue sets. Below, clothes pegs hold tips in position - check dihedral is the same for both tips.

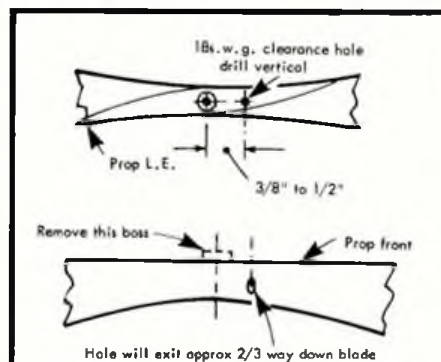
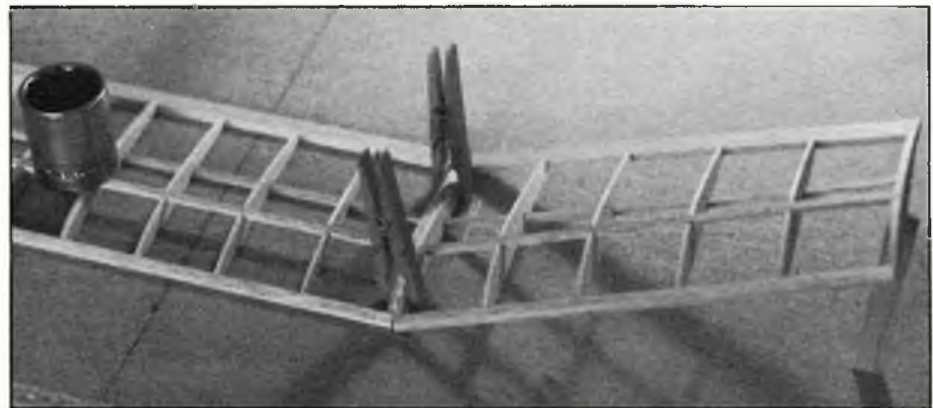


Fig. 7

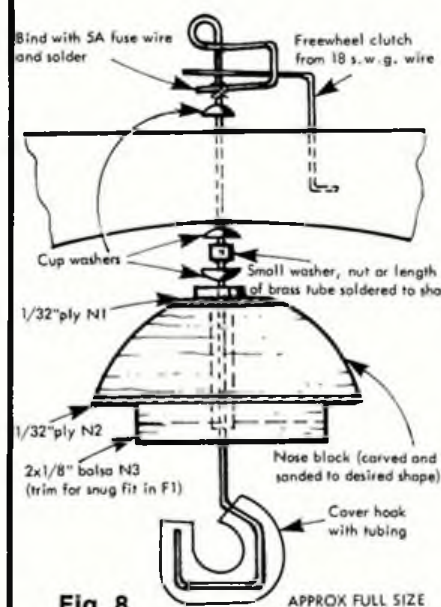


Fig. 8

When dry, the centre section can be removed from the board and the bottom spar cemented in position (the slower setting PVA glue is usually better for fitting spars, since it allows more time for positioning the spars accurately). Both tips can be constructed over the plan, using exactly the same technique as for the centre, including using the template for the dihedral joint ribs - the tip ribs are set upright the same as all the 1/16in. ribs.

After completion of the tips, with spars fitted and trimmed flush with the end ribs (if not originally cut exactly to length), a 1/8in. sheet wing tip is fitted, this simply being a tip rib, without spar cut-outs, and not cut short to fit between L/E and T/E.

The tailplane is constructed in the same way as the wing, except that it is all one piece, and does not have a bottom spar. The only point to watch, is the spacing of the two centre ribs, which is best checked by placing a couple of scrap pieces of 1/8in. sheet between them, and fitting the ribs together as a sandwich with the 1/8in. sheet between. When all flying surfaces are completely dry, the leading edges can be carved to section prior to sanding all pieces smooth, ready for covering.

The mainfin is made from two pieces of wood with the grain direction as shown on the plan, and finished by sanding smooth and rounding off L/E, T/E and top only, the bottom being recessed for the tailplane L/E, T/E and spar, until it fits nicely right down to the base of the tail - *do not* cement into position at this stage.

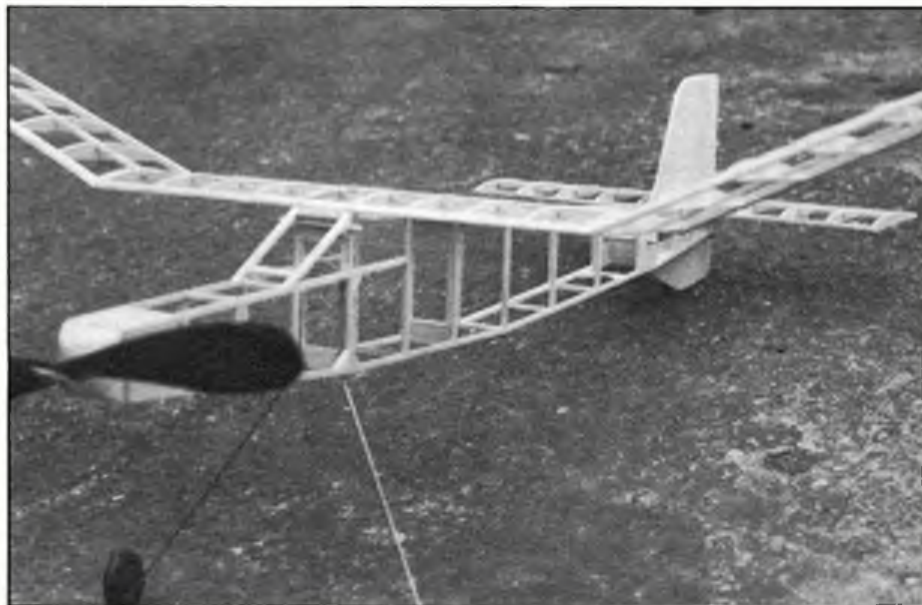
Propeller

Model structure is now complete except for the prop assembly - start by making the noseblock - if you don't have a scrap piece of 1/2in. sheet, then cut out four pieces of 1/8in. sheet to the pattern of N2, along with N1 and N2 from 1/32in. ply and two off N3 from 1/8in. sheet. These five (or eight) pieces are then all cemented together with the

grain direction of successive pieces being alternated - make sure the cut-out on N3 coincides with the respective position of F1 on the fuselage (if in doubt, make N3 without corner cutout and trim to fit when dry).

An 18 s.w.g. brass bush is used for the propshaft bearing (failing this, a length of 18 s.w.g. brass tubing will suffice), and it is advisable to epoxy this into the noseblock, after enlarging the hole through the noseblock sufficiently for the bush to screw into place. The *Keil Kraft* plastic duration propeller requires slight modification to fit a suitable freewheel clutch (see fig. 7), and after removal of the boss, requires a hole to be drilled as shown, using a suitable 18 s.w.g. clearance drill, or a short length of 18 s.w.g. wire with a square point stoned onto one end using a small oilstone or grindstone.

Start bending the propshaft at the front end - several attempts may be required before you get it right, and complete by bending the rubber motor hook (see fig. 8). The reason for the soldered washer between



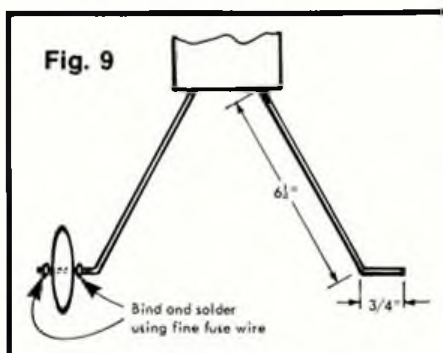
Far above, structure complete and ready for covering note good size 'hole' for easy installation of motor in formers and gussets by undercarriage mounting. Above, Overkill? - Sturdy support to enable the lone flier to wind up 'Early Knight' without a helper to hold the model.

the prop and noseblock is to allow a minimum friction propeller freewheel action on the glide, but if you doubt your ability to solder, this may be omitted at a slight detriment to model performance. At this stage, the undercarriage axles can be bent, and the wheels fitted as shown in fig. 9.

Covering

The model is now ready for tissue covering with either *Modelspan* or the new alternative tissue by *The Balsa Cabin*, if this is your first attempt at covering open structures with tissue I would strongly advise the use of tissue paste as an adhesive and to start on the fuselage and wing centre panel which are both covered with heavyweight tissue. The fuselage uses five pieces, two for the top, one for each side and the bottom, each piece being cut approximately $\frac{1}{8}$ in. to 1in. oversize all round. Starting with the sides, paste is spread round the outside edge of the area to be covered, plus a few spacers etc., and then the tissue is laid down over the frame and starting from the centre using both hands, the tissue is pulled taut and stuck to the framework with the thumbs. (see fig. 10).

From the centre, work outward towards each end in turn, after which, trim off flush with the edge all the way round, using single edge razor or balsa knife fitted with a new blade. Repeat for the other side, top and bottom (I find it pays to wait a short time for the paste to go off between covering each section, using the time to cut-out tissue and cover sections of other pieces).



Each of the wing pieces and tailplane require two pieces of tissue, the top surface in each case being covered first, with the paste being applied to L/E, T/E and all $\frac{1}{8}$ in. sheet ribs. After applying tissue to the top surfaces, the tissue is trimmed flush with the edge on T/E and both ends, but approx. $\frac{3}{16}$ in. - $\frac{1}{4}$ in. is left to overlap

onto the underside of the L/E prior to covering the bottom of the flying surfaces - the tissue on these surfaces being trimmed off flush all the way round.

If desired, the wing and tail tips, and both fins can also be covered in lightweight tissue simply by smearing the entire sheet surface with paste and working the tissue onto the surface using the thumbs, and trimming off round the edges as previously.

Once the paste has completely set, then wing and tail dowels can be cemented in place, wing tips cemented to centre panels. (For these two joints it is advisable to thinly smear cement onto the four rib faces with the finger and allow to dry, before re-cementing and joining the pieces, holding together with the hands until the cement takes hold). The top fin can also be cemented into the tail after the tissue has been trimmed from between the two $\frac{1}{8}$ in. sheet centre ribs.

We now have something looking like a model, but don't attempt to assemble at this stage, instead, steam all tissue surfaces until they appear soggy, and leave on one side to thoroughly dry out before doping with several coats of well thinned dope (50% dope + 50% thinners). The number of coats required depends on the consistency of the thinned dope, and the quantity applied. Put two or three coats on wing tips, tailplane and fin (possibly an extra coat on the fin if left uncovered, lightly sanding, after first two coats), and three or four coats on the fuselage, wing centre panel and nose block.

Fine detail can now be added, cut windshield from thin celluloid (three pieces) and cement in place where shown - some people prefer to fit windshield before covering - neater, but more difficult. The tailplane keys, cut from split $\frac{1}{8}$ in. dia.

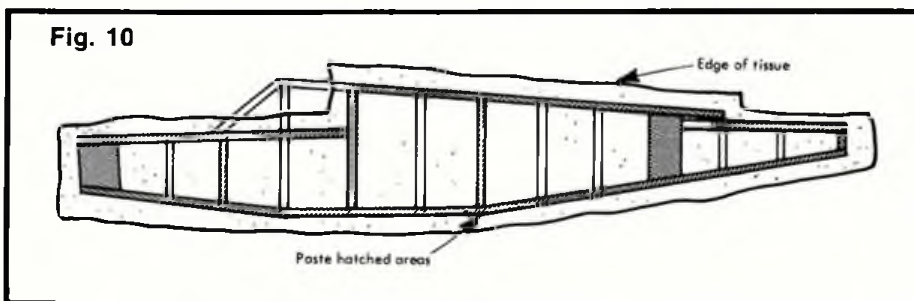
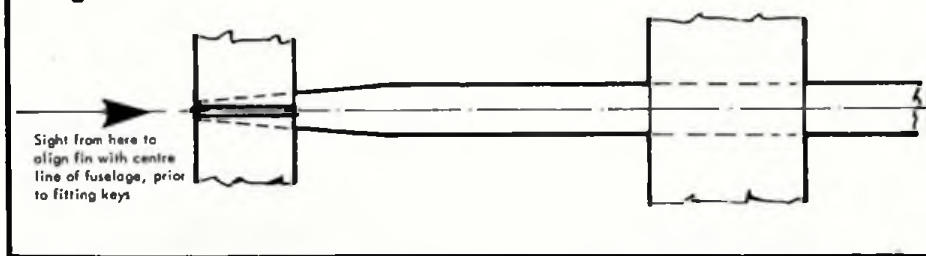


Fig. 11



hardwood dowel, can be cemented in position with the tail assembly fitted to the fuselage and aligned correctly (see figs. 11 and 12). Also, although not a high performance model, it pays to put your name, address and telephone number on the model - Ideally printed on a self-adhesive label and sealed with a smear of cement all way round the edge of the label.

Rubber Motor

All that now remains is the making of the rubber motor, assembly of model and balancing prior to flying. Much has been printed in *Aeromodeller* by that expert of rubber model flying, Dave Hipperson, on making up of rubber motors, etc., so I shall not elaborate too much on this subject.

With your five or six yards of 1/4in. flat rubber, firstly lubricate the ends with spit, tie a thumb knot at each end and pull tight, then re-spit and tie a reef knot, pulling tight upto the thumb knots, making sure during the entire process that the rubber is nicely wetted. At this point the rubber is best lubricated with either castor oil or a 50/50 mix of soft (pure) soap and glycerine - all these constituents can be obtained from *Boots Chemists*, the soft soap being sold under the name of spirit of soap (or similar).

Then form the rubber into three equal length loops (six strands), binding one end firmly with a small rubber band, leaving a small loop for fixing over the rear anchorage dowel - (see fig. 13). Then using a hand drill with hook (see fig. 14 for anti-pull out hook details) fixed in chuck, wind 20 to 25 winder turns on each long loop, with anchor end fixed over smooth hook or similar fixed firmly to bench or wall, - these turns are wound on in the normal direction, that is the drill handle is wound in the same direction as for drilling holes.

All three loops are then placed on the hook together, and allowed to unwind by winding the drill backwards some seven or eight revolutions. This end of the motor is then fitted over the rubber tubing on the prop hook and bound in position with a rubber band prior to inserting the rubber into the fuselage - the motor will still be longer than required, but not to worry. The small loop first made on the motor is then engaged by the 1/8in. dia. motor anchorage dowel which is made some 1 1/2in. longer than the width of the fuselage, and sanded smooth.

To take-up the motor slack, put some 50 or

60 hand turns on the propeller (with the clutch engaged) and allow to run off. The model is then assembled completely, ensuring that sufficient rubber bands are used on both wing and tail to prevent any movement when subjected to gusts of wind, etc. (assessed by attempting to waggle wing and tail when holding fuselage).

Now, support model under wing, either side of the fuselage and check that the model balances level fore and aft, with a finger under each wing, at a point somewhere between the two spars ... It does - well I thought it would. (If it doesn't, then plasticine will have to be used at back or front of model until it does).

The only thing now required before attempting that first flight on a calm day in the local playing field, park or football field, is a piece of 1/32in. ply, 1 1/2in. long x 1/8in. wide cemented down left hand side of F1 (when looking from rear of model), to give a little right-hand side-thrust.

Flying

So, to the flying field with willing helper to hold the model, spare pieces of 1/32in. plywood and balsa, cement and hand drill winder. For the first flight - don't bother with test gliding. I usually find this practice a waste of time - put about 40 winder turns on model, with a helper holding model and

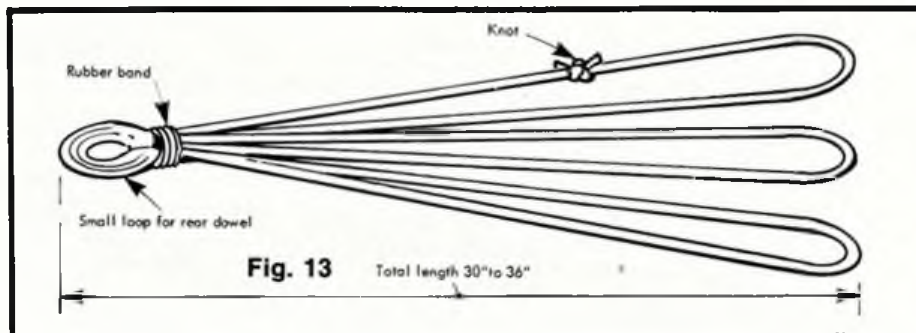
it's nose straight after launch and dives into the ground, then pack bottom of F1 with 1/32in. ply.

This procedure is continued, using a few more turns each flight once satisfactory on low turns, watching for correct climb turn (to the right) and gentle climb at each stage. Once the model can attain sufficient altitude for the motor to fully unwind in the air, then the glide can be observed. Should this prove to be straight, then a small 1/16in. sheet trim tab will have to be cemented to the top fin. (See fig. 15). (This will upset power turn, therefore if tab is fitted to turn model to right, some right thrust will have to be removed, and power trim re-checked on low turns).

If model dives or stalls on the glide, then this can be cured by adding weight to tail or nose respectively without unduly upsetting power trim, or tail T/E or L/E respectively can be packed-up 1/32in. at a time, but in this case, power trim will require re-checking, again on low turns.

So, by slightly adjusting one thing at a time, you can slowly increase turns up to the maximum suggested, or the most the size of the flying field will allow. Fine tuning of these settings will result in a model with an initial steep spiral climb of about 45° which will gradually reduce as the rubber torque diminishes, and then finally change to a rather fast and not too floaty glide for a total duration of about a minute or so, with rise off ground flights a speciality, providing a reasonably smooth surface is available.

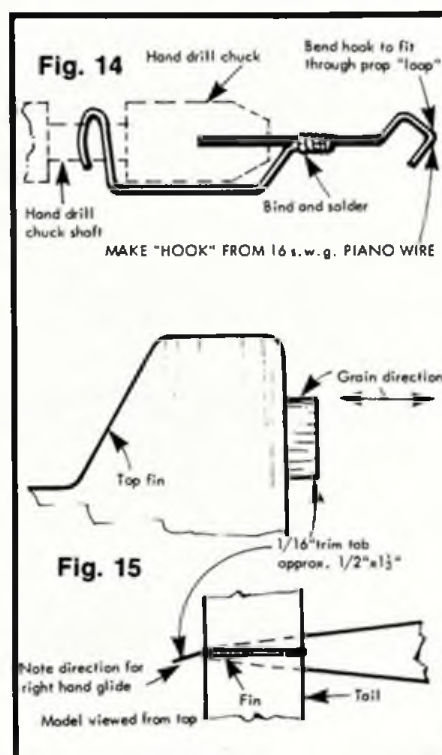
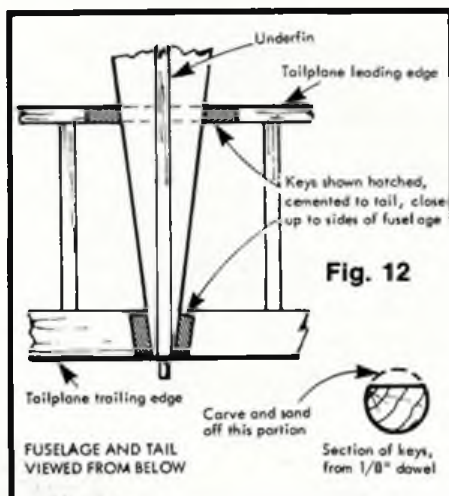
Well, there you have it, so no excuse for no one to turn up at a model meeting purely as a by-stander, timekeeper, fetcher - mite or provider of nourishment whilst dad is busy competition flying...



yourself stretch winding on the turns by walking away from model some two or three feet whilst putting on first 25% of turns, standing still whilst putting on next 25% of turns and walking slowly towards model putting on final 50% turns - making sure to engage clutch before disconnecting winder!

I know this sounds complex for putting on 40 winder turns, but the same procedure applies for putting on the maximum safe turns of about 200 or 230 with full 6 yards of rubber (assuming winder has a ratio of 33/4 or 4 to 1 chuck revolutions to handle revolutions) - the only difference being that for full turns, you walk back until there is about eight feet of rubber showing between the propeller and fuselage.

Now, with model held level at shoulder height and facing straight into the slight breeze, let go of the propeller and gently launch model forward, level, and directly into breeze. The model should turn slightly right but not be expected to gain any real altitude. If the model attempts to climb, slows down and drops it's nose, then pack top of F1 with 1/32in. ply, or, if model drops



MAP Events at Old Warden -1985



Sunday May 19th - GOLDEN ERA MODEL FESTIVAL

For scale models and vintage model designs of the 1920's and 1930's. Free flight models of this era will be accepted subject to the wind conditions, and consequent safety considerations, prevailing on the day.

Judging will be of the MAP Scale Days' format but contestants will be encouraged to dress in the manner appropriate to the period. Here is an opportunity to give a really colourful appearance to Old Warden and it does not require too much effort to find a few suitable 'togs' to wear.

Simulated air races may be organised for models in the same size/type groups. Special awards will be made for the best model/pilot combination, most evocative flying display and the best family group (in period costume). There will be no limitations on the size and weights of the models.



Old Warden Aerodrome has been the Mecca for aviation enthusiasts for many years. For the modeller the pictures conjured up by the mention of OW are of the Superb Scale Days and the Vintage meetings. Now, in association with the Shuttleworth Trust, MAP (Argus Specialist Publications Ltd) are organising a series of events throughout the summer months.

Pre-entry for these events is not required but proof of insurance - and CAA Exemption certificates for large models - will be required on the day. All legal frequencies will be allowed and the flying programme arranged to give adequate separation of frequencies.

Entry to the airfield - including entrance to the museum - is £1.50, children and OAP's £1 and parking is free. Visiting pilots (full size aircraft) are by prior permission only. Camping facilities are available on an adjacent site at a cost of £3.00 per night - book in at the museum shop on arrival. Commentary, except for the Vintage Weekend, is by D.B. Sound.



Saturday and Sunday 22/23rd June - AEROMODELLER SCALE WEEKEND

No need to explain what this event is all about! Acknowledged as the premier scale event for model aircraft, the Aeromodeller Scale Weekend attracts visitors from all over the world. The friendly atmosphere created at the meeting has been continued since the first event in the early 1970's, in spite of the need for stricter flying discipline and transmitter control. Nowhere else could you find such a fantastic array of free flight, control line and radio control scale models. All types of flying scale models are welcomed at this event.

Sunday July 7th - RADIO MODELLER FLY-IN

A chance for the sports enthusiast to have their day. Although it will be a general open fun-fly day, the emphasis will be on simple competitions for young modellers with a specific contests for Radio Modeller 'Trainer' 'Aerobal' and Porterfield 'Collegiate' designs.



Saturday and Sunday 17/18th August - VINTAGE WEEKEND

Another established MAP favourite, only this year for two days. The extension to two days have been made because of the incredible response to last years 'Vintage Day' and to give modellers a better chance to fly - and see other models in operation.

Sunday 15th September - DISPLAY TEAM CONTEST

No competitions have previously been held in this country for team displays. Contestants (groups of three or more modellers and models) will be allocated a specific demonstration time, say 20 minutes, in which to perform their display. The criterion for the contest would be totally based on public entertainment and it is envisaged that the types of display would include: Formation aerobatics, WW1 combat, bombing/dog fighting sequences, air display routines and air races. Judging would take into consideration the complete package, i.e. presentation, commentary and entertainment value.

MAP (Argus Specialist Publications Ltd) - The hobby magazines that serve the modeller. Come and meet us at Old Warden, Bedfordshire

FREE FLIGHT SCENE

with Dave Hipperson

SMAE Open Vintage Meeting Barkston Heath — 17.2.85.

This year's SMAE 'opener' attracted more people than usual from the North, where conditions had been encouraging for a few days prior to the event. Those travelling from London were relieved to find milder and calmer conditions prevailing at Barkston than they had left at home. Drift never exceeded 10mph; often a lot less despite confident pessimism from the local met. office to the effect that it was to be a cold and very windy day!

Open Power was the only poorly supported class. Interesting to compare this with the numbers entering Slow Open — more than double. Past winners in this had to make way on this occasion for a slightly enlarged 'Sloworm' from Dave Hipperson originally planned as a reserve to the 09 model published last year.

He greeted his first power win for 20 years with as much surprise as delight. The remainder of the programme required flyoffs and these were held late enough to benefit from low drift and steady air but still good light. All flights were seen down.

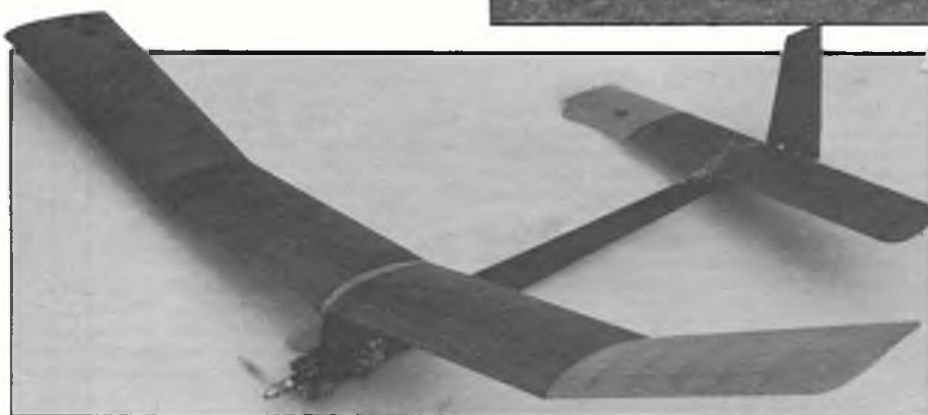
Russell Peers comfortably eclipsed the field in Open Power for the third consecutive year. Stafford Screen flying an FAI model and Trevor Payne his distinctive fluorescent green Open 'Forte' were no

ready won Open Rubber was putting the finishing touches to an extraordinary day with another win — this time in Vintage when 6 minutes plus ousted Dennis Davitt also flying a 'Lanzo'. A day well run by FFTC's John Cuthbert but one must question the wisdom of the CD flying in the event. It must hinder impartial decision making.



Above, Walt Hodgkinson launches in Open Rubber at February SMAE meeting. Out of luck on first flight.

Right, P. Gibbons of the Peterborough club flew this almost standard 'Dixie' — Cox 'Medallion' powered, in Slow Open. He unfortunately had motor trouble on this flight.



Above, winning Slow Open Power model. Appropriately a "Sloworm" Mk 31. Bigger than the original designs with 265 sq. inch wing, larger tail and fin.

match for the 'Woodpecker'. Perhaps Trevor was using a reserve because earlier in the day he had spectacularly demolished a model with an aerial wing-fold under power.

Tony Cordes, reminded this reporter a few minutes before the Glider flyoff, that there was *always* some lift, no matter how calm and cold. He proved it with a flight of nearly 4 minutes. This topped the Glider list and at the same time Dave Hipperson who had al-

Results

Open Glider — (8 flew)

1. A. Cordes	Birmingham	9:00 + 3:57
2. J. Flynn	Liverpool	9:00 + 2:45
3. J. Cuthbert	Grantham	9:00 + 2:25

Open Rubber — (11 flew)

1. D. Hipperson	Grantham	9:00 + 7:52
2. D. Morley	C/M	9:00 + 7:20
3. J. Carter	Falcons	9:00 + 6:05

Open Power — (4 flew)

1. R. Peers	Falcons	9:00 + 6:46
2. T. Payne	Biggles	9:00 + 5:39
3. S. Screen	Birmingham	9:00 + 5:01

Vintage — (11 flew)

1. D. Hipperson	Grantham	9:00 + 6:06
2. D. Davitt	Leeds	9:00 + 3:55
3. T. Dicks	Falcons	9:00 + 2:20

Slow Open Power — (10 flew)

1. D. Hipperson	Grantham	8:43
2. S. Fielding	Morley	7:44
3. M. Gilmore	Grantham	6:38

The SMAE Rule Book

After years of amendments and additions the *SMAE* are treating us to a new and streamlined rule book covering Free Flight and Indoor. Most of the changes concern simplification and rationalisation rather than alteration of content.

Hopefully it will now be easier and hence quicker to turn up the relevant rules for reference when required. For instance the two pages previously devoted to explaining



Left, Terry Dobson making a return to aeromodelling after a 20 year lay off. Still has many of the models he flew then. Above, tidy trim flight in Open Rubber from Gordon Beal, but didn't fly in the competition.

how to use binoculars have now been thankfully scrapped and much of the repetition elsewhere avoided.

It is noticeable that the well intentioned but rather unworkable rule threatening those that flew upwind of an FAI flight line with disqualification has been dropped and I notice that there is still no clarification of how many models are allowable at the new flexibly run Trials events.

Vintage purists will also cringe at the addition of a new rule specifically allowing tubulators as long as they are of a type known to have been published prior to January 1951. This will inevitably lead to certain models now clearly legal for *SMAE* events being ineligible for *SAM* events as well as vice-versa as has been the case for some time regarding prop pitch and size.

These new bang up to the minute rules are available from *SMAE* Head Office in Leicester. There is a cover price of £1.50 but that only applies to those who do not purchase a Competition Licence. I did... and got mine free. To all those contemplating flying in *SMAE* events this year the Rule Book is essential reading. Get one and have it with you at contests. Better still learn the

bits that are relevant to your class — particularly glider flyers!

Remember when sending off to the *SMAE* please enclose an SAE of at least 9in x 6in if you don't want it folded.

The SMAE Lectures

Earlier this year as part of the *Model Engineer Exhibition* Mike Fantham and Martin Dilly, on behalf of the *SMAE*, organised an experimental series of lectures from half a dozen of our leading free fliers. Although coincident with New Years Day and little advertised they attracted a considerable audience and proved informative and amusing.

If any criticism were to be levelled it would have been that they were rather too short — allowing each presenter little over 20 minutes when most had subjects deserving of twice that time. However, it was never dull.

A well thought out talk by Ian Kaynes on the whys and wherefores of wing flutter and some revealing background by Mike Fantham as to his contest technique and philosophy were amongst the high points of

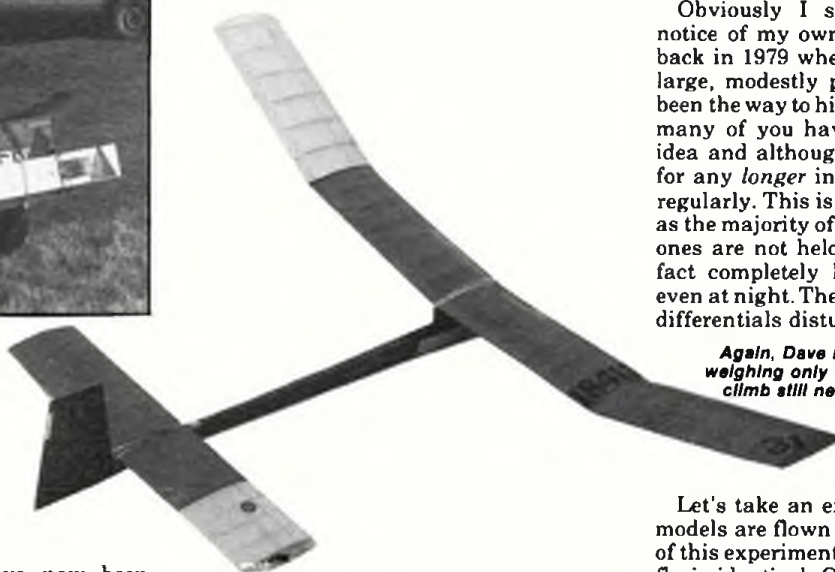
lightweight is made up from just tissue and dope!

The other direction — the slow sink theory — suggests attention mostly to glide performance. Here an A2 is a good measure for comparison. A good one sinks at 1ft per sec. I reckon my best Coupe d'Hivers sink at perhaps only 9in per sec. so there is room for improvement on an A2. Of course the average heavily loaded fast climbing rubber model with a large drag inducing fuselage would come down on glide at nearer 2ft per sec. At least these approximations give us something to work around.

To gain appreciably therefore, we have to be flying at least as well if not better than an A2. A pure rubber powered glider...but fortunately one that does not have to be built in A2 fashion, as it will not be required to withstand all those athletic antics currently necessary at the other end of a towline! The quickest way to approach this situation would be to retain a conventional motor size (4-5 oz of rubber) and double the wing area to well over A2 without correspondingly increasing the weight of the other components or the size of the fuselage.

Obviously I should have taken more notice of my own remarks in this column back in 1979 when I suggested that a very large, modestly powered model may have been the way to higher durations. Since then many of you have experimented with the idea and although they probably don't fly for any longer in dead air they win flyoffs regularly. This is pure slow sink advantage as the majority of flyoffs even the dead calm ones are not held in liftless conditions. In fact completely liftless air rarely occurs, even at night. There are always temperature differentials disturbing the air somehow.

Again, Dave Hipperson's "Slowworm" Mk 31, weighing only 6½ oz, the glide was good but climb still needs perfecting. TD 049 power.



the evening. It is hoped that this venture will be repeated and extended in 1986 so if you have always thought that the *Model Engineer Exhibition* had little for you...then it does now.

This year they were worth the price of admission to the exhibition alone. A collection of the papers is being prepared for publication — when available I will mention it again in this column.

The Slow Sink Theory

This idea was thrown up when experiments to radically improve Open Rubber durations particularly for flyoffs proved both impractical and erratic. Super-light airframes with half the conventional weights — created models capable of high times, yes, but with fuselages almost too weak to support the motors and wings and too frail to be aired in anything but conditions of flat calm. These came too rarely. Super-lightweight development needs further advances in materials before they become a reliable contest proposition. Even Boron Fibre has its limitations when you consider what a huge percentage of a

Let's take an example. Assume that two models are flown together, and for the sake of this experiment that the air in which they fly is identical. One is a conventional fast climbing medium size machine, the other a large slow sinking and slow climbing model. To simplify the maths the fast one climbs 500ft on a 2:20 prop run then sinks on the glide at 2ft per sec. On the other hand the big model climbs to half that height and, for the sake of argument, in the same time of 2:20 but then descends at only 1ft per sec. In the hypothetical dead air both models would record durations of 6:30. That sounds fairly realistic.

Now repeat the experiment in a patch of gentle lift of say 6in per sec. with both models once again sharing this air. Both would gain the same on the climb — ie 2:20 (140 secs) x 6in = 70ft so the fast model would fold at 570ft altitude and still in the lift the descent would be slowed to 1½ft per sec. Duration from prop fold — 380 secs. The larger slow model however would have reached only 250 + 70ft = 320ft but would now be descending at only 6in per sec. in this gentle lift. Thus it would take 640 secs. to glide down.

The large model wins by the enormous margin of 260 secs. (4:20). Extending this either way towards more or less powerful lift

the large slow sinking model will always be in the air longest until of course the lift is so strong that neither model lands at all...in which case the large model wins on visibility anyway.

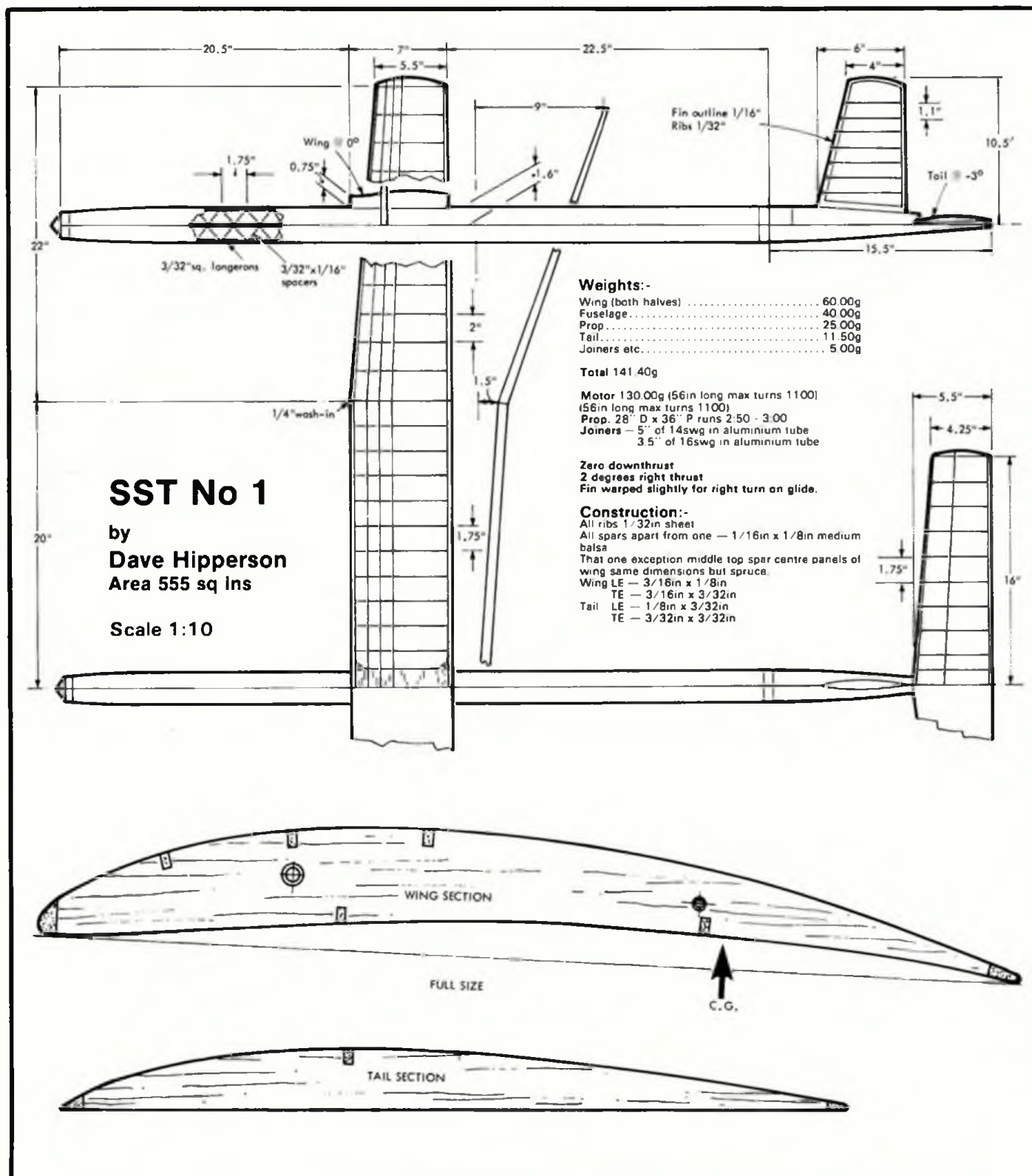
Furthermore the large model could actually use a much longer and slower run than the other arrangement. I have noticed with models of mine, of all sizes, that long slow runs tend to benefit more from lift pro-rata than short fast ones but it is unclear why. There is certainly scope for more gain there too.

SST-1 is a considerable departure for me but is still designed with various compromises to the class and concessions to personal preference too deep rooted to break with all at once! For instance after much thought I have held onto my tried and trusted *Davies* section or at least a slightly slimmed version of same. I was changing so many other things at once that I wanted something to remain constant. This way, the wings become quite easy to build light as they are thick enough to use small wood cross sections. They are not however what I

would consider to be the end of the development.

Obviously pure glider sections would be worth trying, but would of course necessitate different and probably heavier wing construction. They might lose more than they gain. The fuselage was designed as slim as possible for minimum 'head on' resistance, parasitic drag and weight but still substantial enough to withstand a highly wound good quality motor.

Fully Warren girder construction has been employed here for the first time too.



What seems to have emerged is a model of practical stiffness — not impossible to transport with the two piece wing and quite suitable for drift up to 10mph as long as turbulence is minimal.

This version made its first flights on quite a breezy evening. It was very docile and easy to trim to a safe pattern in two or three flights. It would be reasonable to expect a duplicate if made accurately to fly 'off the board'. The only problem with a near three minute prop run is finding somewhere large enough to watch all the run on full turns and still check motor distribution at prop fold and hence glide attitude.

The first such flight this model had was in the flyoff at the Northern Gala last year but it is not a policy I would recommend! Glide turn is best adjusted to be as wide as possible but still retaining a positive turn. This will of course only be possible in still conditions as any strong thermal activity has this model wandering around immediately... hopefully *into* rather than *out of* the lift.

Although last years first full turns flight of 8:17 won the Caton Trophy its second outing in the Southern Gala flyoff was more what I had intended it for. Very gentle lift supported it for over twelve minutes whereas other models flown in the same patch were down in less than seven. That didn't stop John Carter spoiling my day and pushing me down to 2nd... He too flew a very large model in a better thermal a few minutes later. He did twice the time!

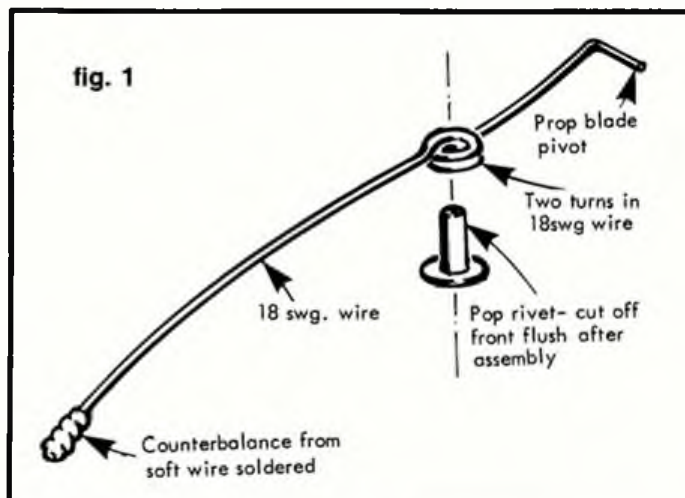


Single blade folders for CO₂ models

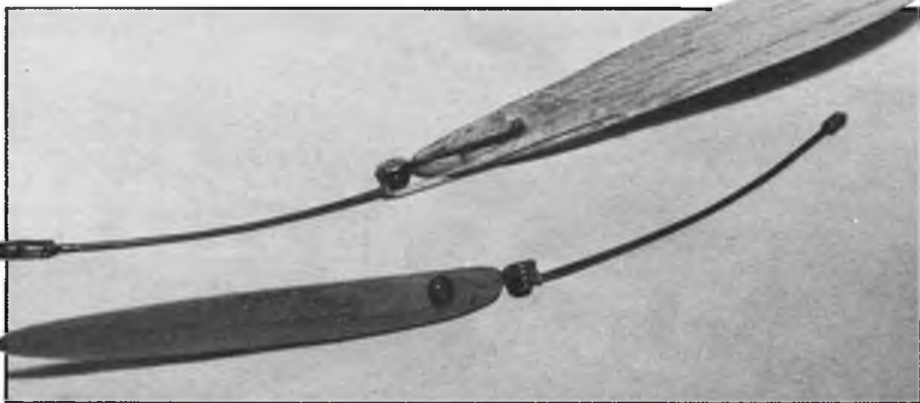
Through his experiments at Cardington Mark Croome has invented a very simple system for constructing single blade folding props for CO₂ motors. As it happens Mark's further advances with very large props and consequent long runs has now made the idea almost superfluous indoors but outdoors there is a great saving to be made. The drag effect of a dead stick 6 or 7 in solid prop is reckoned to adversely effect an FAI power model so imagine the damage to the glide of a small light CO₂ model.

Conventional 'rubber type' twin blade folders were always thought rather dicey as you never know where the motor will stop so the blades can go anywhere. Different positions change the glide turn of course but with single bladed props this effect seems much less.

My experiments showed that even with the blade untensioned the only folded position that effected trim was when the



Far left below, CO₂ Folder - 8 in. pitch x 8 in. diameter - Balsa blade - 18 swg hub formed around pop rivet. Below the same but unfolded, together with 10 in. diameter x 6 in pitch version.



blade hung underneath the fuselage. This untidy position tended to stall the model slightly, all other positions had no effect on turn but a very beneficial effect on glide performance.

Originally blades were left to flap about but a piece of shirring elastic makes a neater job and holds the blade in no matter where it folds. Even the worst place — on top of the wing — still offers far less drag than a dead stick 'twin blader'. The shirring elastic should be arranged in such a way that its pull goes through the hinge point when the blade is extended.

I thought it was very clever to do as I do on rubber models and line up the return elastic to actually go past the hinge point and so tend to hold the blade out. Very convenient for flick starts but the wind resistance on the tiny blade was insufficient to overcome this and it didn't fold!

The hub is a pop rivet (fig 1) with central pin removed. The blade yoke and counterbalance arm are bent from one piece of 18 swg. wire. The two turns that are to fit over the rivet are bent first around a mandril held in a vice. The trick here is to create a double loop with an inside diameter just less than the outside diameter of the pop rivet.

The wire assembly can then be sprung out, dropped over the rivet, released and allowed to self tighten. When you get good at this you actually need no further glue on the joint but usually run a little cyano in to make sure. The yoke can then be bent and the counterbalance arm cut to length, about 2/3rds blade size.

The flange of the rivet forms a perfect seat to screw up against the prop driver and the front of the rivet can be sawn off flush and filed smooth. The hole in the rivet is a

comfortable tolerance to allow the prop driver screw to pass through the metal hub so formed. This both protects the screw from annoying bends and is hard enough to allow the screw to be well tightened and so also reduce those occasions when the prop comes loose.

When you have the knack, hubs can be built in about the time it took you to read this. Blades are carved from conventional, if very small, 'X' blanks of either hard balsa or pine and their interchangeability allows both breakages to be replaced easily on the field and different pitch diameters to be experimented with quickly. Practical sizes that work well and behave similarly to my usual 6 x 6 in fixed bladed unit seem to be 8 x 8 in or 10 x 6 in.

As far as running is concerned, my tests have shown very smooth runs on all variations after simple static balancing. This is achieved by either soldering another short length of wire to the end of the balance arm or winding and soldering soft wire around it. Of course the aerodynamic advantages or otherwise of the single blade folder will rage forever but we are using the concept here mostly for the glide gain.

One word of warning. We have tried 20 swg and finer wire and have come up against a problem. It appears that although finer wire is strong enough to do the job, it is not rigid enough. It will flex enough when running to set up oscillations that effectively nullify the vital flywheel effect of the prop and counterbalance so necessary to maintain a CO₂ unit running. Mark and I discovered this when experimenting with super light large props for indoor work. 18swg seems the practical minimum for everything.





edge, (dimension No2). If no square wood of the correct size is available, make it up by glueing four $\frac{1}{4}$ in sq or $\frac{3}{8}$ in sq pieces together. A preshaped leading edge can be used, but it does mean the 'D' pieces on the fuselage will need to be longer to allow the shaping of their ends to fit the curve of the leading edge. Mark the rib spacing by measuring in from each end, four spaces past the tip rib. This gives the correct spacing for the centre ribs.

You can glue the ribs on now but it is better to cut a shallow slot with a saw, as it gives a better grip. Before you leave the glue to dry, check that the ribs are square to the leading edge, and are all firmly seated on the board. If they are not, warps will follow...

Two 'ST 36's' (PAW 19s) and one 'ST 27' (Enya 09) left to right; James Shackleton, Matthew Woodland and Ashley Bannon all part of the 'ST' design and testing team. Battle proved 'Peacemaker' on the deck also uses 'Mike Rolls' dope tin tank.

Two Stunt Trainers

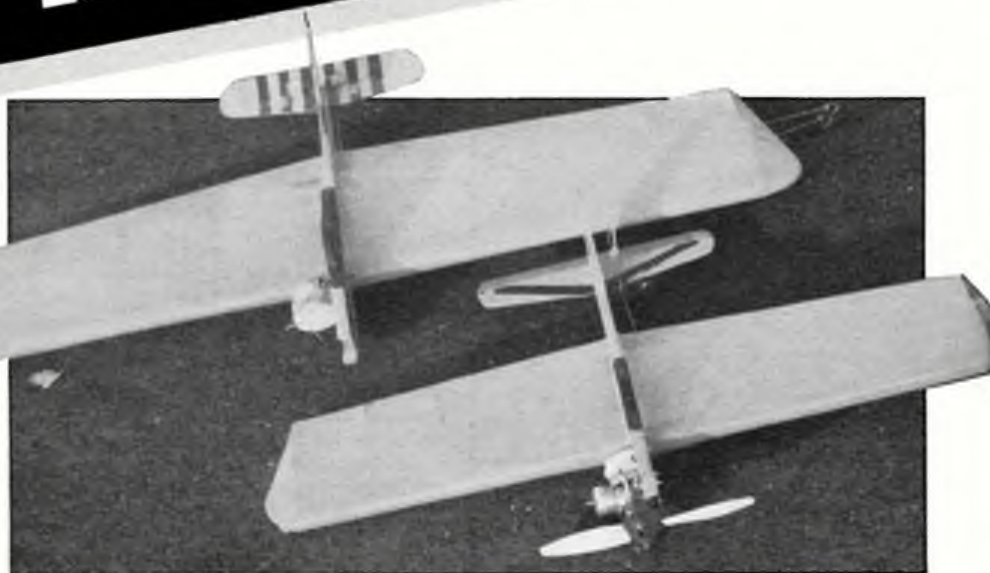
Moving on from a basic trainer? Control line stunt is easy with 'ST' family for 1.5 to 3.5 cc engines...

by Ron Williams

THE STUNT TRAINER family, ST 27 and ST 36 owe their design heritage to two very different factors. The first was a simple tough stunnable design for my beginners to progress onto, after they had mastered the basics of flying on the 'Harrier trainer, featured in the November *Aeromodeller*. The second factor was a design by Three Kings club mate Mike Rolls, which he had named P31.

The 'ST 36' is a modification of Mike's design, especially in the fuselage shape and construction, while the 'ST 27' is a $\frac{3}{4}$ size replica of the 'ST 36', to suit 1.5cc engines. The resulting models are what I call short fuselaged wings. They are capable of being flung around and when nylon or Solartex covered, can survive really harsh treatment.

The models both feature a flat aerofoil, as an aid to simple construction. The straight



Although the ST 27 is a three quarters size 'ST 36', it looks much smaller when they are seen together - either way, with a good motor, they really fly...

edged ribs allow building direct onto a flat surface, thus eliminating (well, almost), the risk of warping. The model is intended for new friends to control line flying, so it is hoped they will find it a quick, easy to make, fun model while lazy old hands will have a design they can knock up in a weekend. So, read on...

Both models are identical in building sequence, the dimensions being the difference. Select the size to suit your motor. The '27' is for 1.5cc, the '36' for 2.5 or 3.5cc. The prototypes used an Enya .09 and a PAW 1.49 on the '27', while the '36' flew with a PAW 19, and a Super Tigre G20/15D.

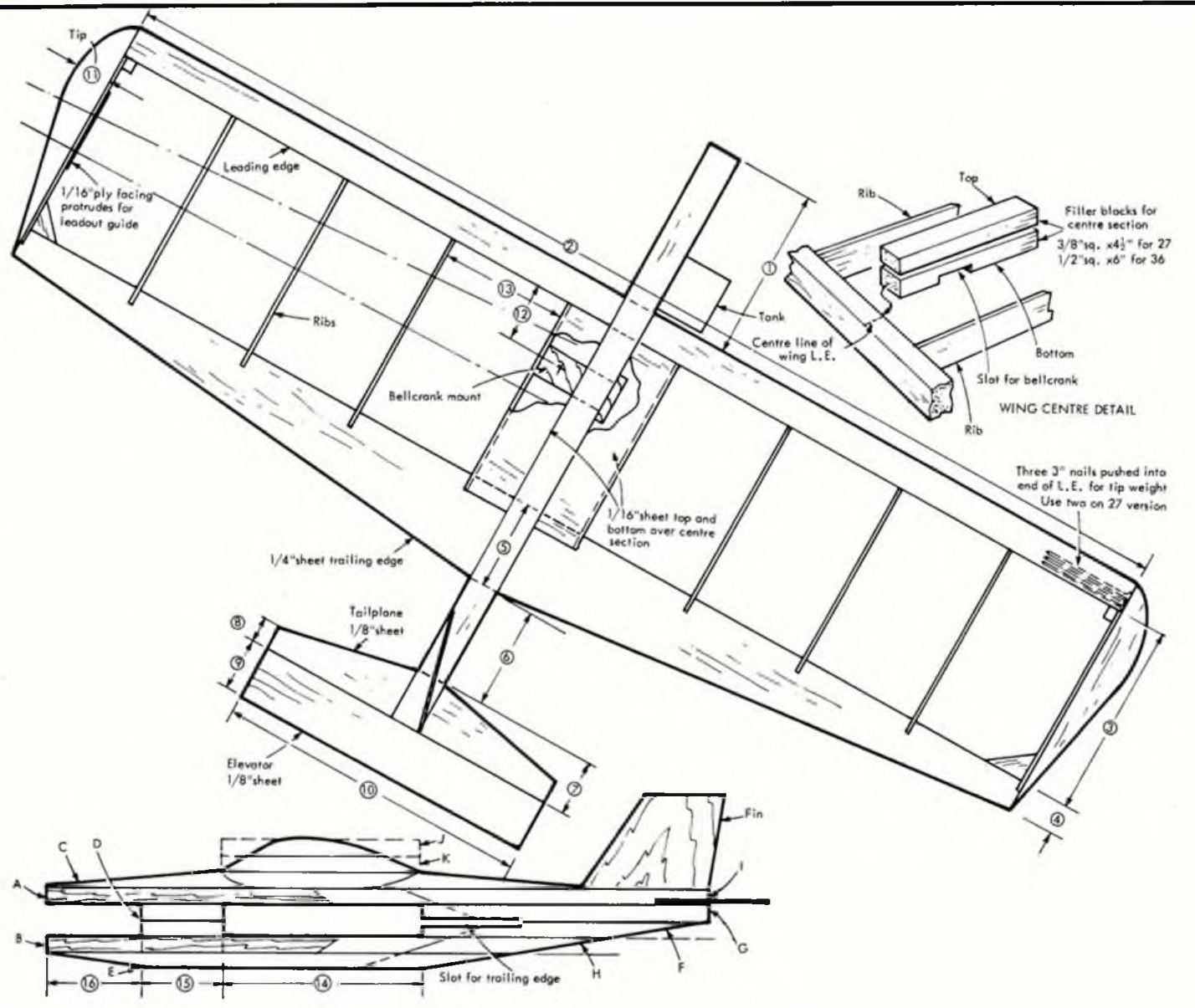
Building sequence

The wing must be built first, as the fuselage is built up around it. Start with the leading

Cut the trailing edge from $\frac{1}{4}$ in sheet, and fit to the ribs. Poke and prod till all is true and then run glue along every millimetre of contact between ribs, leading and trailing edges; not forgetting the gusset at the TE/tip rib corners and that piece of square at the LE/tip rib corners.

Cut the bellcrank mount and the two filler blocks. The exact location of the slot to fit the bellcrank can be worked out by referring to dimension No 12, which is the hole you will drill later, not the front edge! They are fitted in the wing on the centre line. This is a good time to add the wingtips...

Fuselage: The time has now come to build up the fuselage around the wing. It is made from square stock and has proved to be stronger than a more normal profile



Dimensions ST 27

All letter sizes (fuselage) $\frac{3}{8}$ ins. sq

- | | |
|--|---|
| 1. $4\frac{3}{4}$ in. | A. Hardwood $7\frac{1}{2}$ ins. |
| 2. $\frac{3}{4} \times \frac{3}{4} \times 27$ ins. | B. Hardwood $7\frac{1}{2}$ ins. |
| 3. $4\frac{1}{2}$ ins. | C. $12\frac{3}{4}$ (taper before fitting) |
| 4. $\frac{3}{4}$ in. | D. $2\frac{3}{8}$ ins. |
| 5. $2\frac{1}{4}$ ins. | E. 12 ins. (as for C) |
| 6. $1\frac{1}{8}$ ins. | F. $5\frac{1}{2}$ in. (as for C) |
| 7. $1\frac{3}{8}$ ins. | G. $5\frac{1}{2}$ ins. |
| 8. $\frac{1}{2}$ in. | H. $6\frac{1}{4}$ ins. (as for C) |
| 9. $1\frac{3}{8}$ ins. | I. $8\frac{3}{4}$ ins. |
| 10. $7\frac{1}{2}$ ins. | J. About 4 ins. cut to desired |
| 11. 1 in. max | K. cockpit shape after |
| | glueing together |
| 12. $1\frac{1}{4}$ | |
| 13. 3 ins. | |
| 14. 6 ins. | |
| 15. $2\frac{3}{8}$ ins. | |
| 16. 2 ins. | |

Dimensions ST 36

All letter sizes (fuselage) $\frac{1}{2}$ ins. sq

- | | |
|--------------------------------|--|
| 1. $5\frac{1}{4}$ ins. | A. Hardwood 12 ins. |
| 2. $1 \times 1 \times 36$ ins. | B. Hardwood 12 ins. |
| 3. 6 ins. | C. $15\frac{1}{2}$ ins. (taper before fitting) |
| 4. 1 in. | D. $2\frac{1}{2}$ in. |
| 5. 3 ins. | E. $15\frac{1}{2}$ ins. (as for C) |
| 6. $2\frac{1}{2}$ ins. | F. $7\frac{1}{4}$ ins. (as for C) |
| 7. $1\frac{3}{4}$ ins. | G. $7\frac{1}{4}$ ins. |
| 8. $\frac{3}{4}$ in. | H. $6\frac{1}{4}$ ins. (as for C) |
| 9. $1\frac{3}{4}$ ins. | I. $8\frac{3}{4}$ ins. |
| 10. 10 ins. | J. $5\frac{1}{2}$ ins. cut to desired |
| 11. $1\frac{1}{2}$ ins. max | shape |
| 12. 2 ins. | K. $6\frac{1}{2}$ in. after glueing |
| 13. 4 ins. | together |
| 14. 8 ins. | |
| 15. $2\frac{1}{2}$ in. | |
| 16. $2\frac{3}{4}$ ins. | |

fuselage. With the 'ST 27', the spacing is correct for a PAW 1.49, while the 'ST 36' is right for the 2.49, or the .19 PAW. The *Enya* .09 needed a $\frac{1}{4}$ in by $\frac{3}{8}$ in strip inbetween 'A' and 'D', 'I' and 'G', from the front of 'D' to the back of 'I', to get the bearer spacing wide enough.

Other motors may require similar strips. Study the plan and build that all important *mental* picture of how it all goes together. The points to watch are as follows:

- 1 'A' and 'B' are hardwood.
- 2 'F' and 'G' need to be recessed for the trailing edge to fit into.
- 3 'I' needs a recess for the tailplane to fit into.
- 4 Test fit all the pieces before getting the glue into action.

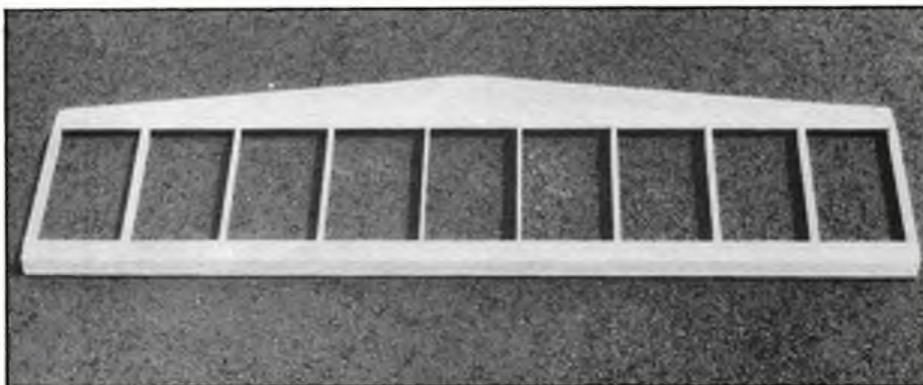
5 Wipe excess glue out of the tailplane slot. When all the glue has dried properly, trim and sand the whole assembly till all is neat and tidy. The leading edge can now be shaped. Use a balsa plane, and turn the square into a semi-circle. Up close to the fuselage you will need to hand carve where the plane can't reach.

Tailend: It is time now to see to the tail assembly. To mount the fin, cut a slot at a

Below, Ashley with the 'ST 36' has drop off undercarriage - fixed u/c adversely affects flying. Right, James with Enya 09 powered 'ST 27', uses commercial tank.



Below, the wing for all the 'ST' family uses ribs with flat top and bottom surfaces and a large chunky leading edge - quick to build - flies fine.



slight angle (right rudder) to aid line tension. The elevator can be hinged to the tailplane but do not fit this until the controls are fitted. The control layout is standard. Just remember:

- 1 Fit the 1/16in ply leadout plate.
- 2 Get dimension '12' correct.
- Drill 1/4in holes in the ribs for the leadouts and cut slots in the ribs near to the bellcrank to get free movement if needed.
- 4 Make sure the pushrod is made to give 'neutral' elevator when the bellcrank is central.

'4' above may be achieved by not glueing the tailplane until all controls are fitted, then sliding the tailplane back and forth to the ideal location. Before the centre section is sheeted in, a support strip of 1/4in balsa is needed on the fuselage, 1/16in below the line of the leading edge. (You did remember to trim 1/16 in off the two middle ribs?).

Fit the centre sheeting, grain spanwise, but don't bend it down right to the trailing edge. The gap is covered by the Solartex, and on the inboard upper wing forms an exit slot for the pushrod.

Left, cut out all parts carefully - all straight cuts, so use a steel rule to ensure accuracy - fin and tailplane seen here show the simple cutting patterns.

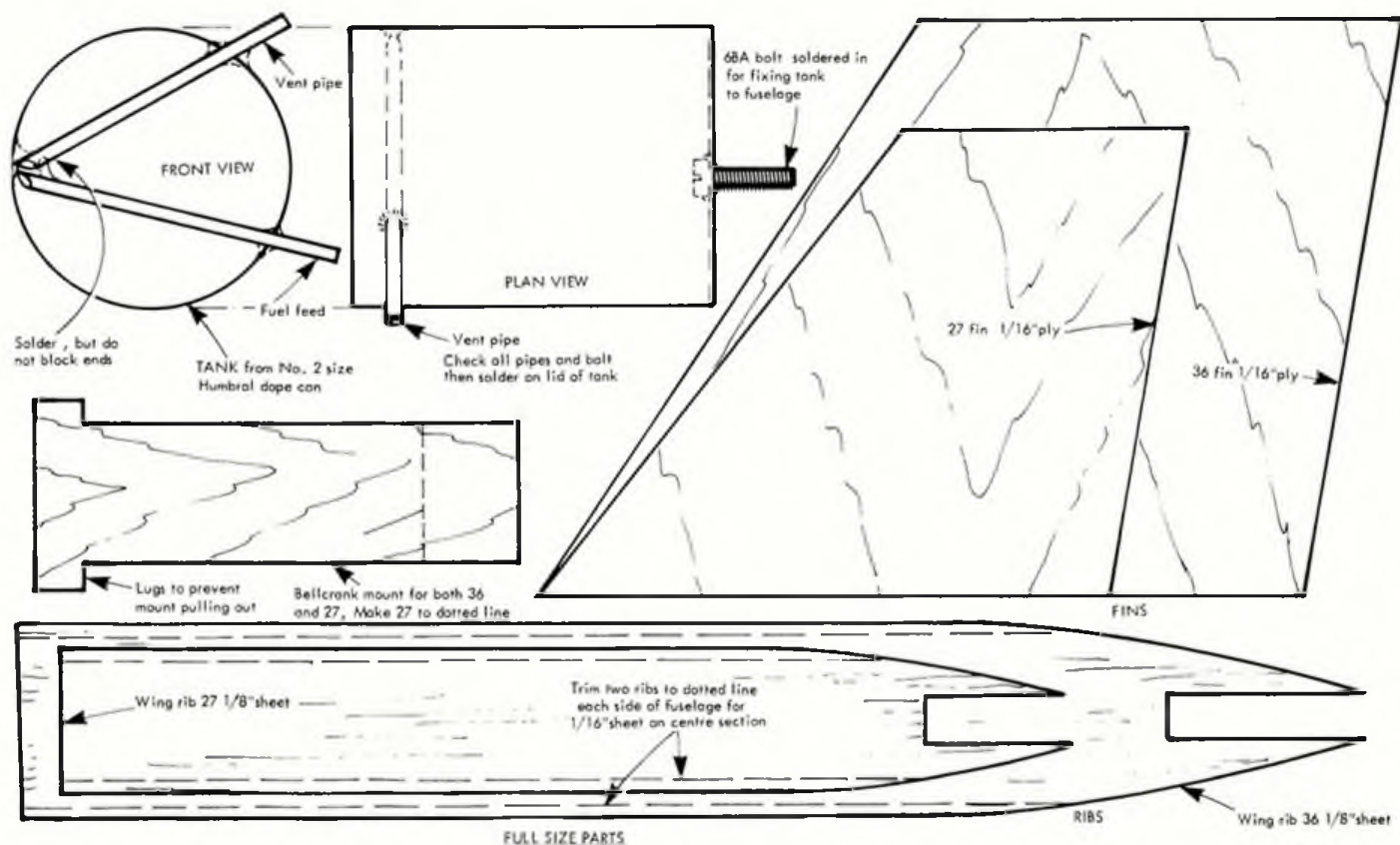


Above, this 'ST 36' uses a pre-shaped leading edge, cut parts 'D' carefully to match curve of L/E, this looks good - but try to choose a straight piece of wood!



Left, again the 'ST 36', the hand gives some idea of scale - this is no small fry - note the ply bellcrank mounting plate, ensure this is well glued in! Right, an ST 27 with customised fin and tailplane outline! Note large gussets/blocks at tips.

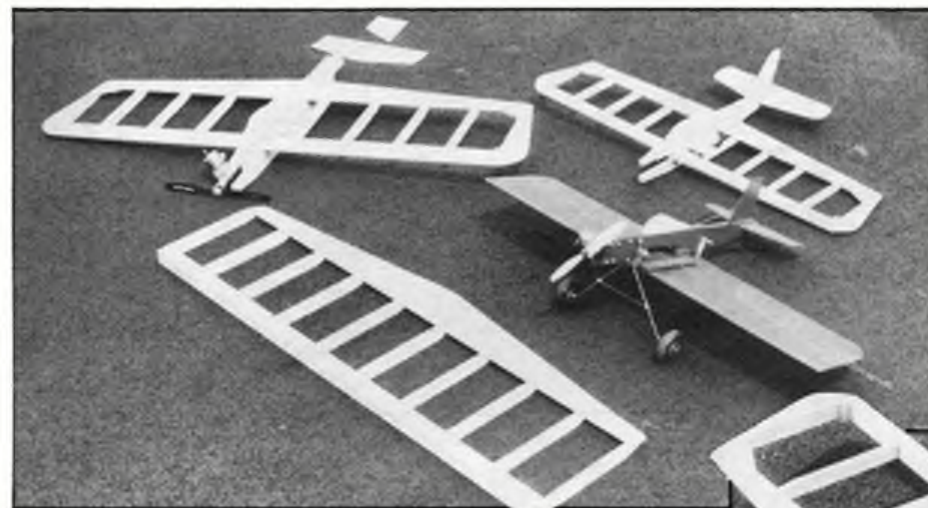




Finally

The prototypes did not use an undercarriage but the designs have been tested with monoleg, and two wheeled systems. It was found that unless the two wheeled type was drop-off, flying was affected. Right, its time to fly. Use 40ft lines for the '27', 50ft for the '36'. Get right in to it with a good fast engine run and let your 'ST' fly. You will find it eager to go but not so hot it makes you sweat! In short, is fun to fly.

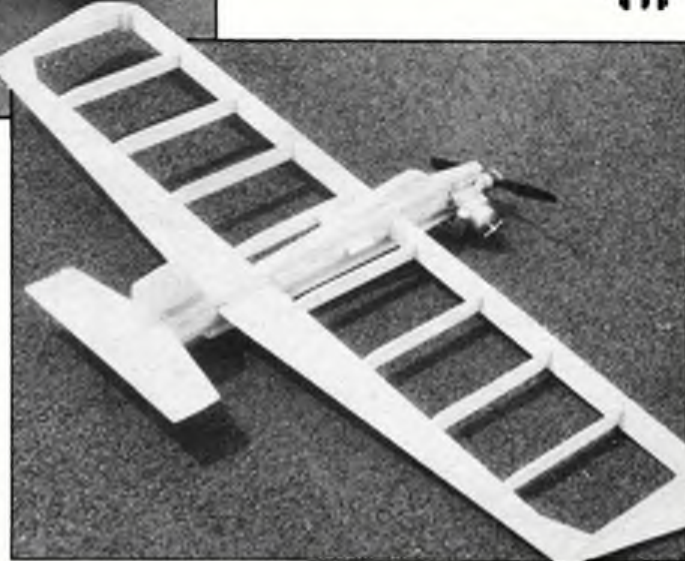
We of the design team hope you will come to be as fond of the 'ST' family as we are.



Now, before you cover the model, put in the nails that form the tipweight. The covering can be what ever you fancy. Tissue is light, so is Solarfilm, while nylon is tough, light enough, but can be hard to use. Solartex is tough, easy to use, but is heavy. However, it was used on the 'ST's' built so far, with great success.

After the fuelproof is dry, fit the motor and tank. The tank can be a Mike Rolls dope tin design (a gem of a unit for sports models), or a mustard tin unit. A small clunk tank can be used, but will need mounting on the inboard side, as there is not enough room behind the motor. You can always make your own tank, of course. The 'ST 27' can use the Mercury 1/2A combat tank.

Above, a selection of the design team's projects, uncompleted models all 'ST's' of one sort or another, the completed trainer looks a 'toughie' and goes by the designation 'T 27'. Right, an early 'ST' prototype built to check balance/looks/flying etc - flew well but later models have slightly enlarged tailplane.



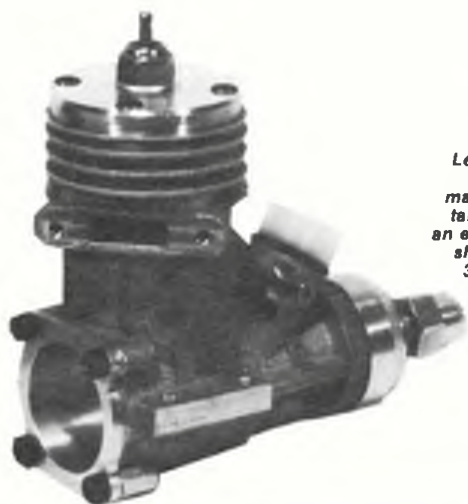
BILL BURKINSHAW DESCRIBES MODELS AT THE 1985 NUREMBERG TOY & HOBBY FAIR

IT IS SOME YEARS since we have given any significant coverage of the annual International Toy and Hobby Fair held at Nuremberg, West Germany which this year fell between February 7th and 14th. This huge show covers every aspect of the Toy and Hobby industry, the single hall *partly* devoted to Aeromodelling and similar disciplines is one of 12, each capable of swallowing the Wembley Conference Centre, home of our own Model Engineer Exhibition and hardly needing the smell of an Alka-Seltzer!

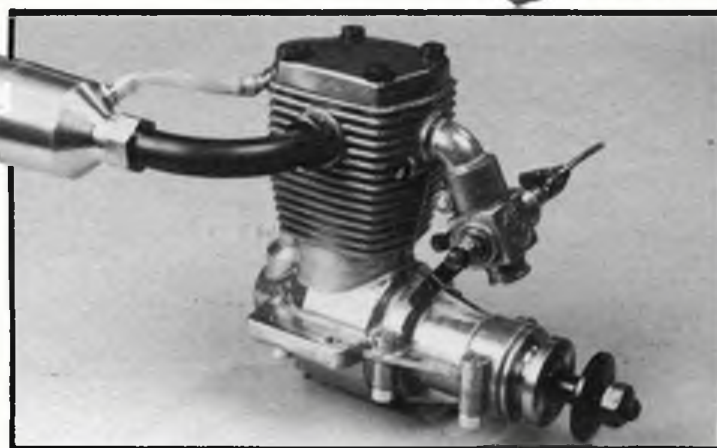
For some years, the ascendancy of Radio Control Modelling has pushed pure aeromodelling into a back seat position but there are nonetheless some interesting developments on show at major fairs such as Nuremberg. We include a range of photographs here to show what commercial products are new to the aeromodelling market and of sufficient general commercial interest to find their way to Nuremberg and hopefully onwards to us...



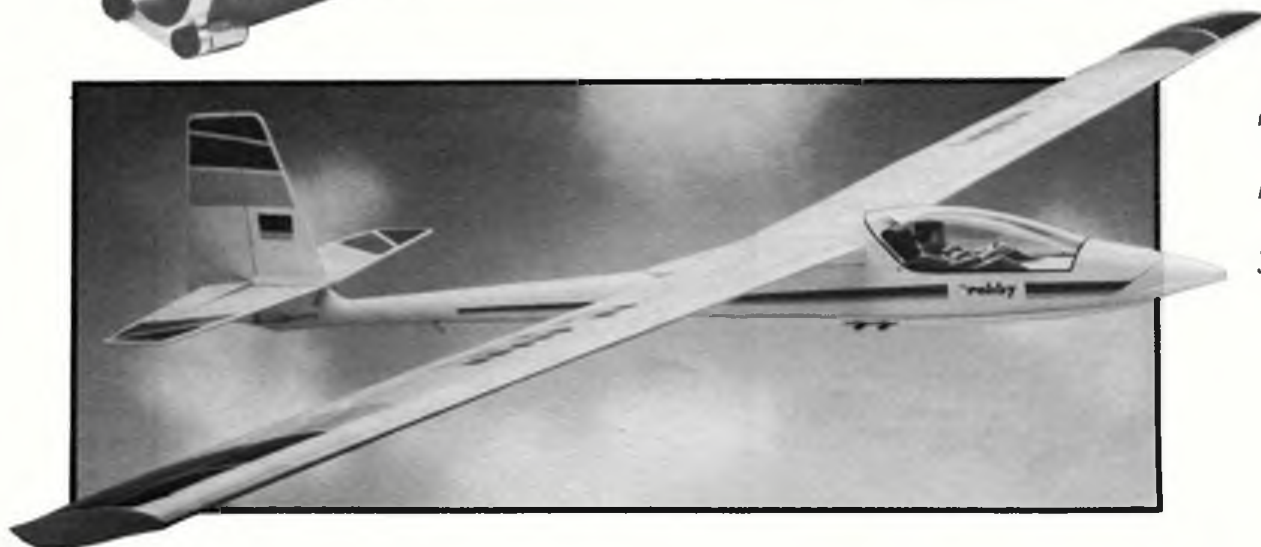
Above, latest Bantam all-foam flyer is "Spirit of St. Louis". Lindberg's famous Trans Atlantic solo mount. Dihedral needed but does not destroy familiar lines. Left, new from Super Tigre, a small size (0.11 cu. in.) stunt motor.



Left; brave effort from small Dutch manufacturer U.S.E. in taking a stand at such an expensive Fair - they showed their R/C Car 3.5 cc motor and the more familiar 2.5 cc motor shown here.

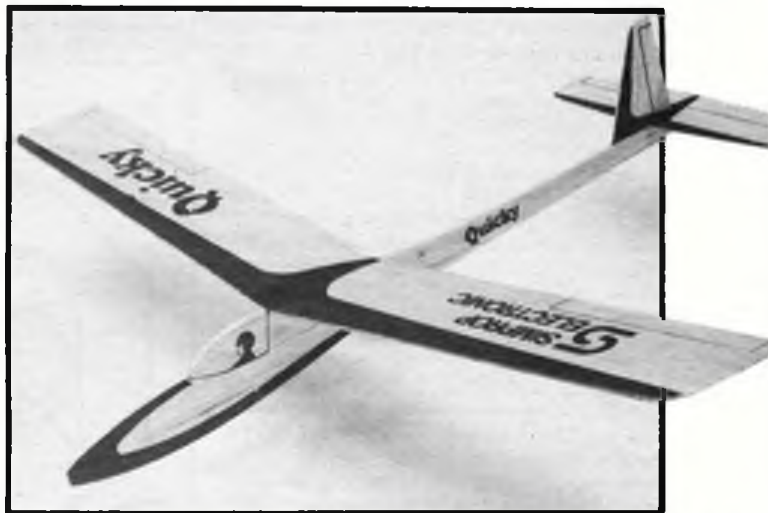
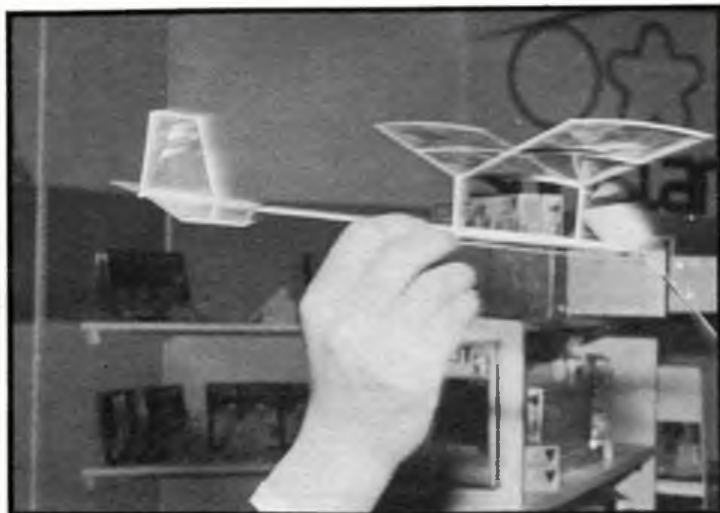
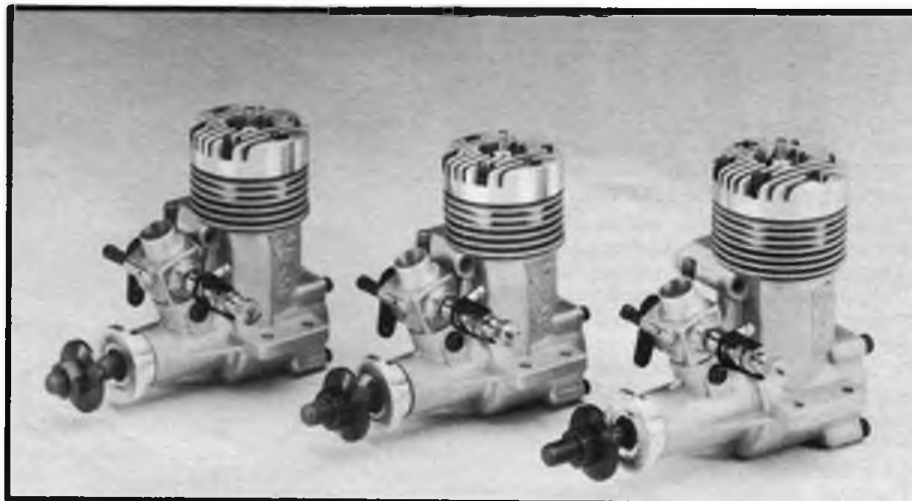


Above, although large capacity, the HP 61 VT four-stroke could find a place in stunt models. Left, Robbe of W. Germany are moving into the High Street toy shops with a range of ready to fly models starting with "Robby" a Jedelsky winged glider.



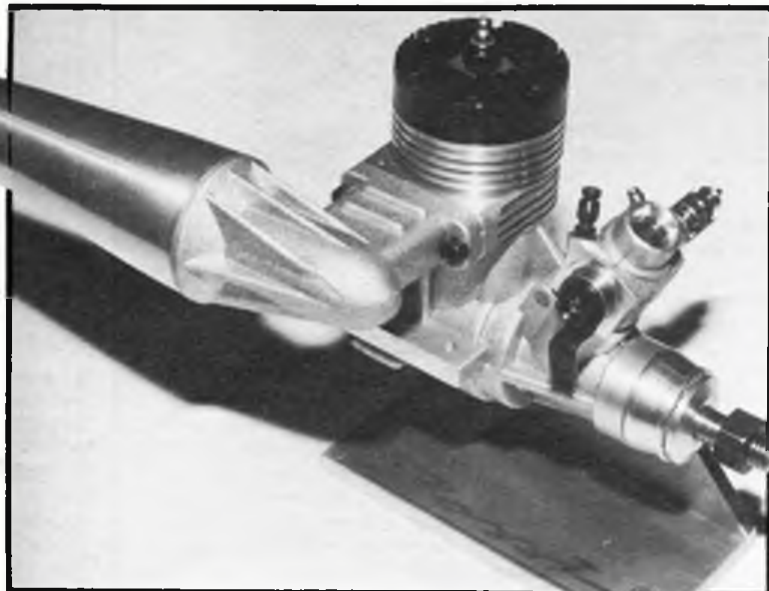


Left, latest from top Italian manufacturer Cippola; this 2.5cc motor. Right, although fitted here with R/C throttles the new O.S. "F.P." range are to be available as C/L and F/F motors.

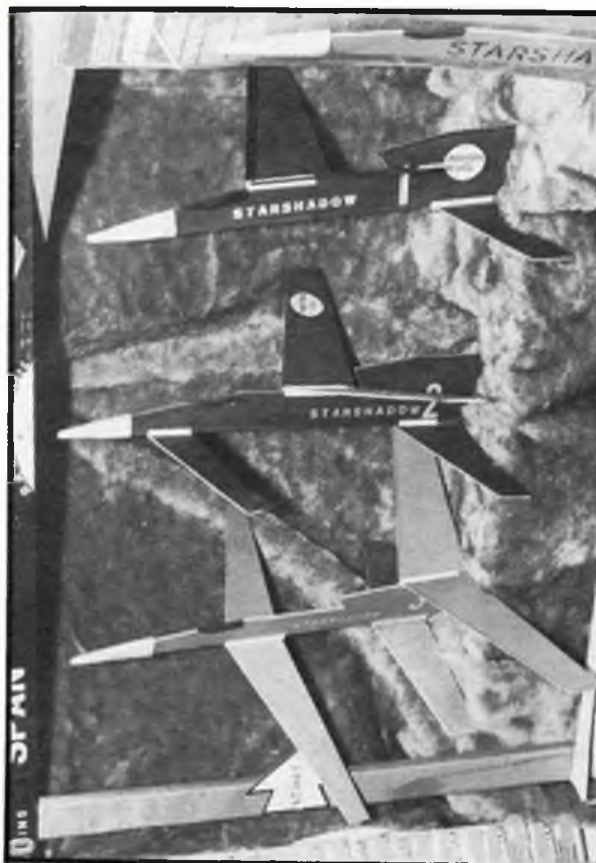


NUREMBERG

Above left, novel range of kits from the Far East included Penny Plane, E.Z.B. and Parlour flyer types. Above right, they keep on appearing from all corners of the globe, even major manufacturers such as Simprop of W. Germany seem to feel obliged to market a clip together chuckle. Right, Powermax from the U.K. displayed an intriguing range of catapult or hand launch gliders, balsa sheet but pre-covered in a self-coloured, self-adhesive fabric, they appear near unbreakable. Unusual configurations should appeal to youngsters.



Above, once again, manufacturers seem shy of displaying non-R/C versions of their engines. The Rossi 40 shown here should soon be available in non-R/C guise.



AT THE

LAUNCH PAD

with
John Wheddon

More Construction...

The awkward fact that most rockets are based upon long, thin cylinders can mean that the processes of measurement, marking out and assembly of models causes difficulty - especially the basic task of aligning and attaching fins to the body tube. A few simple jigs can easily overcome these problems and help to ensure an accurate and efficient model.

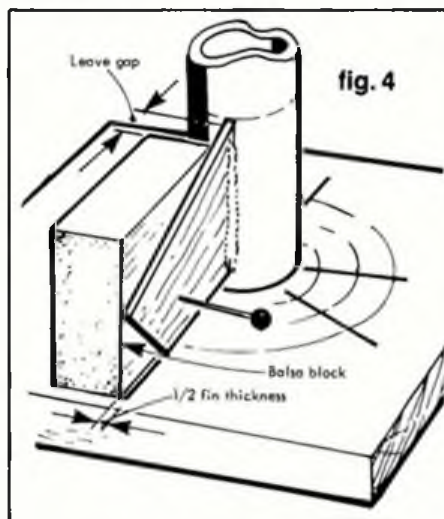
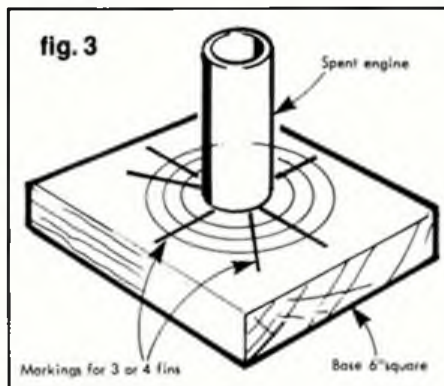
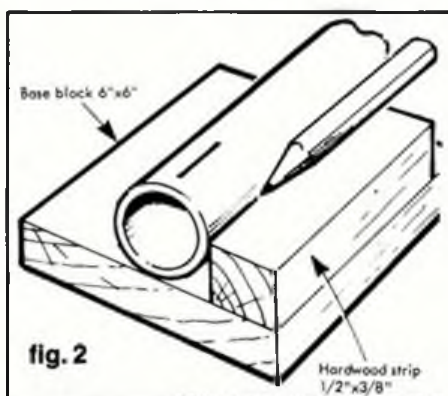
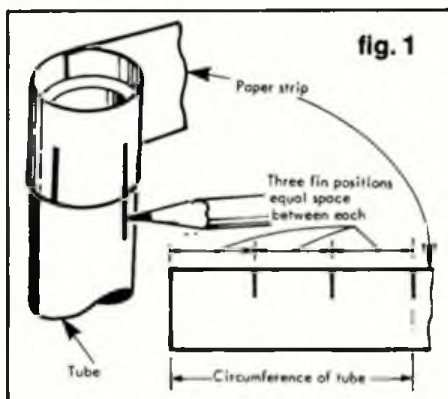
Fin Position

The first problem when beginning to assemble a model rocket is the need to accurately mark the positions of three or sometimes four, equi-spaced fins. This can be done very easily by wrapping a strip of writing paper around the body tube and carefully marking the point where the paper overlaps. When unrolled the paper provides an accurate linear measurement of the tube circumference which can be easily divided into three or four equal parts as required. Then the strip is returned to the tube and the fin positions marked off (fig. 1). The marks can be extended by placing the tube in a simple jig as shown in fig. 2 and drawing lines as required. It really is quicker to carry out than describe!

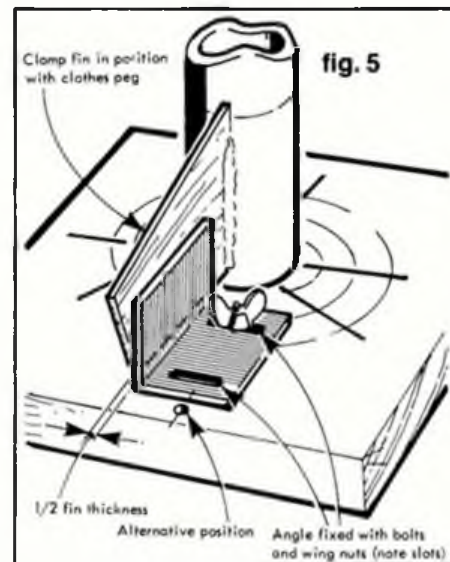
A similar method can be used to make an assembly template for complicated, scale type models which have external detail parts. A layout of the fins and details can be made on a paper sheet which is then transferred to the body tube ensuring the correct relationship of the parts to one another.

Fin Attachment

A simple assembly jig can be made using a spent engine casing glued onto a base board. The base needs to be about six inches square which is adequate for most models. Radial fin positioning lines are drawn directly on to the base and a circle equal in



This model shows the sort of detailing that might be difficult to align correctly without some form of jig (see text)



diameter to the spent engine helps in accurately positioning that part of the jig (fig. 3). Sometimes the ends of engines are not quite square as a result of the manufacturing process so care should be taken to ensure that the engine is set up accurately at right angles to the base board. The jig is completed by glueing a balsa block to the base board, parallel to one of the radial lines and leaving a gap equal to half the thickness of the fin material (fig. 4).

An adjustable fin jig can be made by replacing the balsa block with a short length of metal angle as shown in fig. 5. This jig can accommodate a wider range of body tube diameters and fin thicknesses. Instead of pinning the fin to the balsa block while the glue sets a clothes peg can be used to clamp the fin in the correct position.

A very neat fin jig was devised by Howard Kuhn of *Competition Model Rockets* (fig. 6). A short (6 in.) length of wooden moulding is slotted at one end. A fin can be located in the slot and glued into place on a previously marked body tube. The jig itself is held in position with a rubber band.

Some indication of the sort of errors which can easily occur in fin location and attachment are shown in fig. 7. A jig really is worth the small amount of effort to build it.

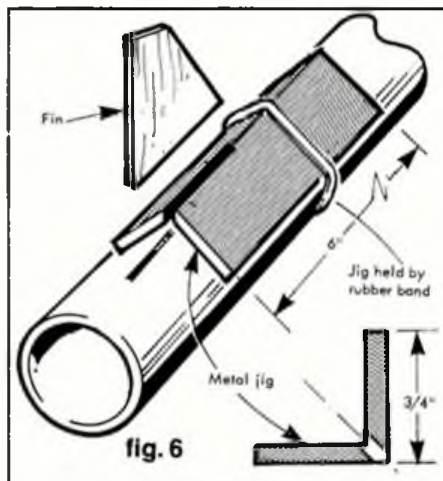
Adhesive

The most suitable type of glue for balsa and plywood fin attachment is the white PVA type which can, if necessary, be sanded. This type of glue is equally suitable

for wood or paper and is a good standard adhesive for rocketry work. Rapid setting epoxies are also very useful as - are the 'instant' isocyanate types. The latter however are very expensive and that, coupled with the care required in their use, makes them rather a luxury for everyday assembly work. The simple edge-on butt joint produced by fitting the fins as described does not produce a very sound form of construction...so it is often worthwhile, particularly on larger rockets to reinforce the joint. The easiest way to do this



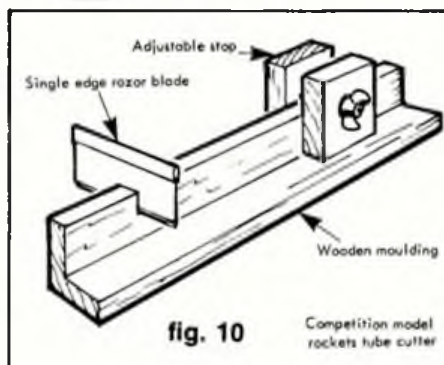
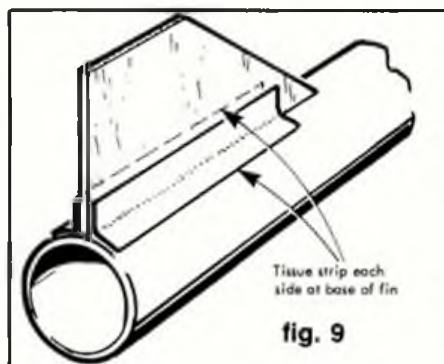
A Centuri kit of the Boeing Air Launched Cruise Missile seen at a British Space Modelling Association 'fun meet'.



is with fillets of glue (rapid epoxy) at the base of each fin (fig. 8) which can be shaped with a suitable spatula (ice lolly stick) or even one's index finger. However sticky-finger types should note that epoxy adhesives can sometimes cause skin irritation.

Another method of fin reinforcement is shown in fig. 9. Model aircraft tissue is added to the joint, using either white glue or sanding sealer/dope. On larger models the whole fin area can be tissueed which, additionally, provides a good base for painting later.

It will be noted that all of the sketches show the fins with square edges. I fit the fins



before sanding in any streamline section because I am sure it is easier to align them correctly.

Tube Cutting

Some people (your editor for example) have an uncanny and never-failing knack of cutting tubes neatly and with square ends. Not so in my case however and I find it necessary to use a tube cutter. One of the most useful tools in my collection is *Competition Model Rockets* 'Tube Cutter' shown in fig. 10. The cutter is really easy to use and produces very accurately cut body

sections. The tube is placed in the vee, pushed against the stop to control length and rotated. A little downward pressure on the razor blade produces a score in the tube which can be progressively increased until the tube is cut through.

Shock Cords

The shock cord is used to attach the nose cone to the rocket body. The cord itself can be any suitable material, not necessarily elastic although most kit models seem to contain flat, model aircraft type rubber or cotton covered shirring elastic cords. In order to reduce bulk it is convenient to use a strong thread. I use a type known as Boot Thread which is presumably produced with shoe repairs in mind. This thread is quite adequate and most important it will not *melt* when exposed to the engine ejection charge. Man-made fibres like *Terylene* and nylon should *not be used* for shock cords as they will almost certainly melt with often rather sad results.

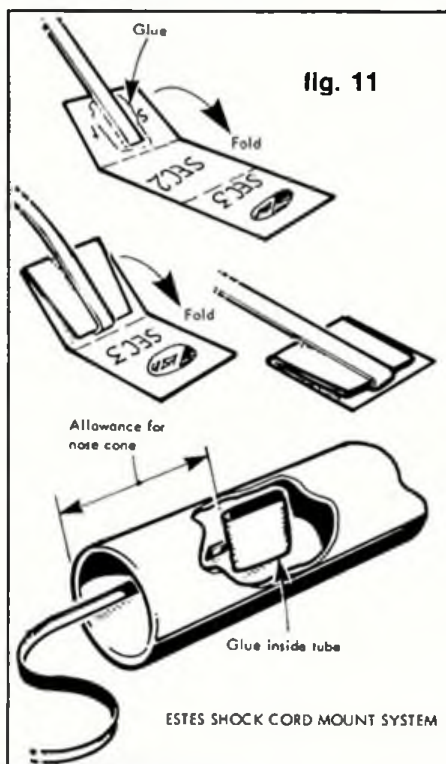
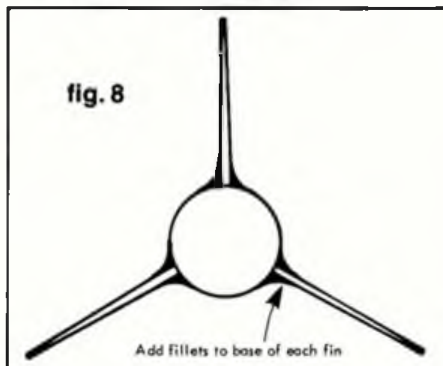
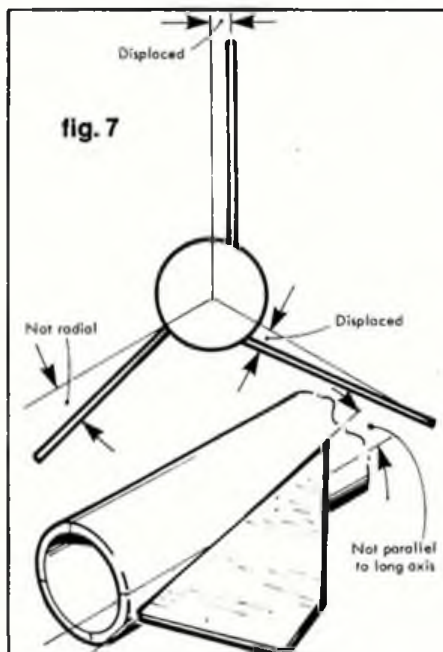
Thread-type shock cords may be attached to the inside of the body tube using a rapid setting epoxy. The main point to watch is that the attachment point must be far enough inside the tube and does not interfere with the fit of the nose cone.

Kit models contain various styles of shock cord anchors. *Estes* often use the folded paper method shown in fig. 11. The system is effective but is not really suitable for tubes smaller than 3/4in. (18 mm) diameter. The *Centuri* company produce a self adhesive foil patch which provides an effective anchor point with a smooth finish.

Whichever attachment method is used it is a very good idea to get into the habit of checking that the cord is intact and securely attached to the model before each launch.

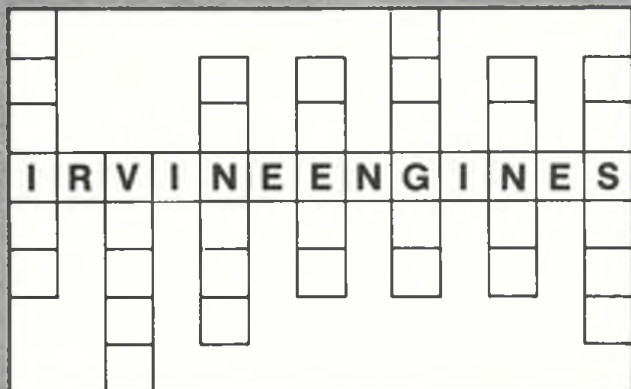
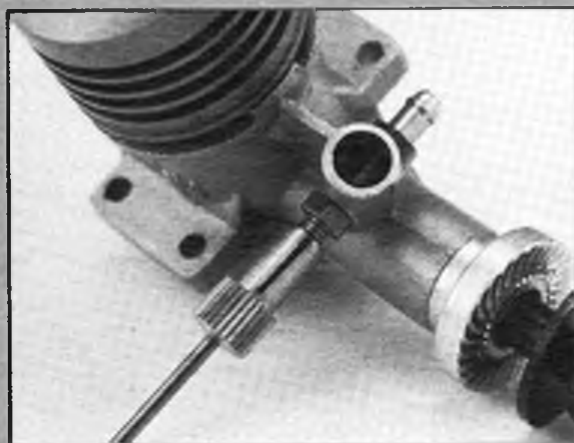
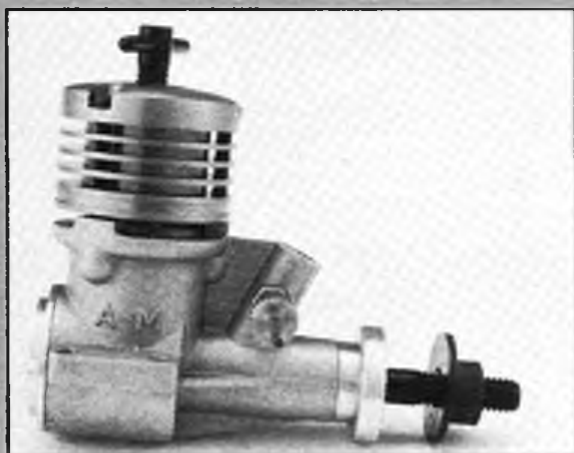
World Championships — 1985

Confirmation has been received that the 1985 World Championships for Space Models will take place at Jambol in Bulgaria between 27 August and 2 September. If anyone is interested or thinking of combining the event with a Black Sea holiday please contact the writer via the *Aeromodeller* office.





An AM 15 Engine



M15 - AM 15 - AM 15 - AM COMPETITION

AM engines were very popular from the 1950's, and were well known for reasonable power at reasonable prices. Having disappeared for a while it is indicative of their value for money that they are again being produced - this time by Forest Engineering. Irvine Engines are the distributors and they have kindly agreed to provide the prize for this month's competition. Win yourself this useful size engine by completing the simple word puzzle below - someone has to win... why not YOU!

All answers to the "find the word" puzzle can be found in the pages of this month's Aeromodeller - so get to it - read our mag then send off your entry. Just seven words to find and we've given you one vital letter for each word...

It's easy to enter, clip out your completed cross word and post it to:-

Aeromodeller Competition
A.S.P. Ltd.,
Wolsey House,
Wolsey Road,
Hemel Hempstead,
Herts. HP2 4SS.

COMPETITION RULES

1. The competition is open to all UK and Eire readers except employees of Argus Specialist Publications Ltd., their printers and distributors.
2. As long as an original cross-word from the magazine is used for each entry there is no limit to the number of entries per person. Photocopied cross-words will not be accepted.
3. All entries must be postmarked before 31st May 1985.
4. The prize will be awarded to the first correct solution drawn.
5. No correspondence will be entered into about the competition results, the judges decision is final.
6. Winners will be notified by post and the results will be published in a future issue of the magazine.



FIND THE WORD CLUES

All down - left to right

- 1) ... Test tells you about torque
- 2) ... make scale kits of about 25 in. span
- 3) ... Engineering, make replicas
- 4) Dave H. writes about the Free Flight
- 5) Not an early bird - for the novice
- 6) ... of Glasgow for all a modeller's supplies.
- 7) Just the spot for a holiday break

ENGINE TEST

A.M.10: Mike Billinton looks closely at the reintroduction of this popular motor.

BOTH NAME AND APPEARANCE of this small British diesel should be very familiar to many readers; certainly those who recall the original D.J. Allen and H.J. Nicholls cooperation in 1954 which led to the *Allen Mercury* 2½ and 3½cc diesels and the later marketing of the 1 and 1½cc units. Yet further expansion of *D.J. Allen Engineering* gave rise to the later and more famous *Merco* range of large glowplug engines.

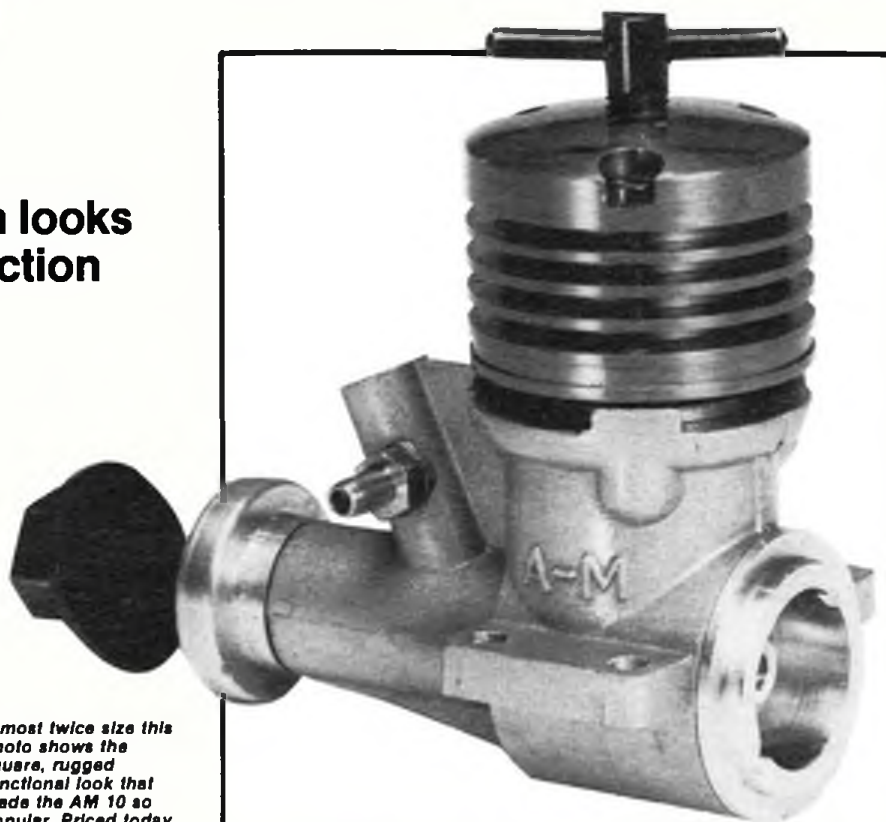
Commercial changes have inevitably followed the rise of the Japanese model engine industry, so it is pleasing (even a little nostalgic) to report that both the smaller diesels and the *Merco* range were 're-activated' during 1984 under the name of *Forest Engineering Services* - with guidance by *Merco* survivor - Reg Hills.

Production of the small 1cc and 1½cc *AM* diesels themselves was restarted in November 1984 - in the main, using original patterns and specifications. This last point is of some direct interest to this writer because of the dynamometer comparisons which could therefore be made... The *AM* 10 was tested in *Aeromodeller* during the

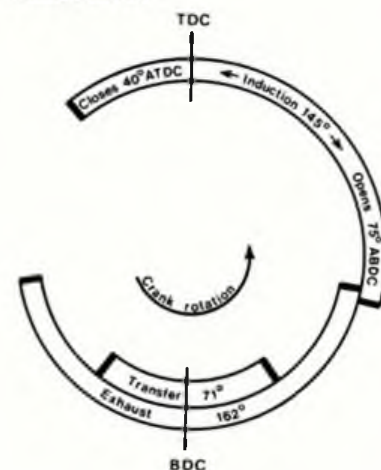
1950's by Ron Warring, and his figures were .113 bhp at 14,200 rpm (almost certainly using the Hook Eddycurrent Dynamometer), and so any figures obtained on the new 'small' dynamometer would be under close scrutiny!

Mechanical details

The variable compression two-stroke design retains the familiar radial porting layout with front induction crankshaft

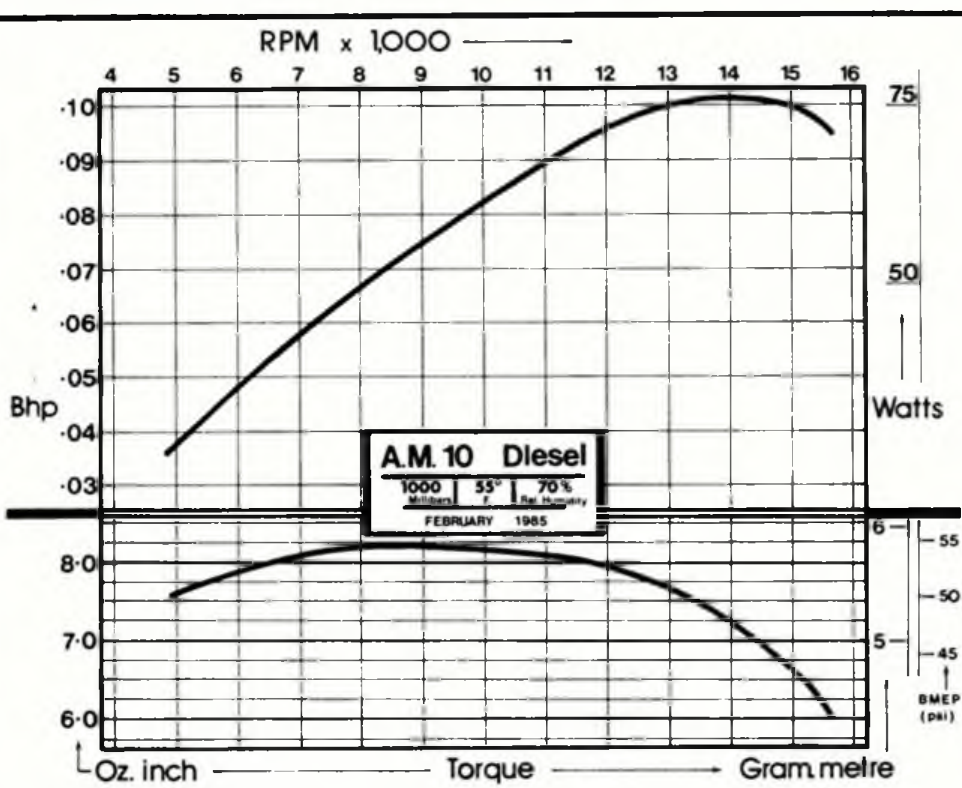


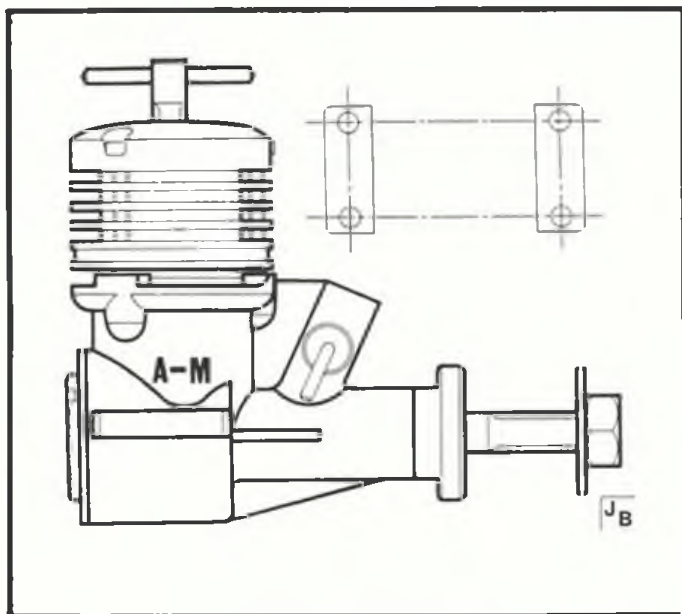
The usually short transfer period is shown in this graphic representation of the timing periods.



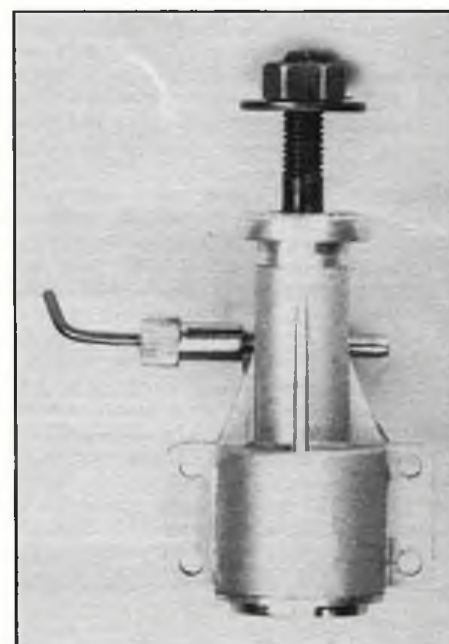
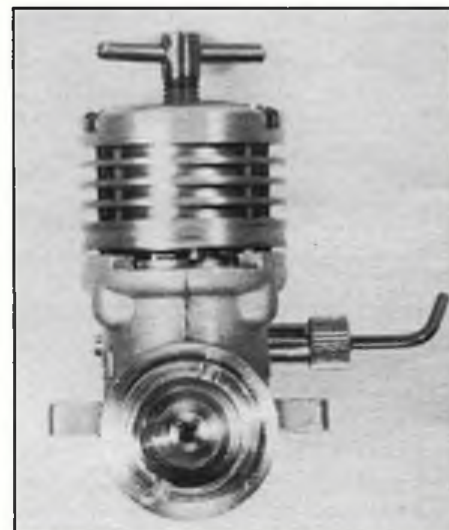
rotating in a plain bearing die-cast crankcase. Of detail interest is that cylinder/piston/contrapiston material combination has been changed from the original cast iron to that of a cyanide hardened mild steel cylinder/unhardened steel contrapiston/cast iron piston.

Compression screw has fine thread 40 tpi which more effectively prevents compression 'backing-off' at some rpm points. Cylinder is 0.1in. thick, and has timings which are an unusual combination of a high 162° exhaust (for a sports diesel) and a very low transfer of 71°. Crankshaft induction timing and throughway area are sufficiently conservative to indicate restrictions to high rpm. Connecting-rod is turned from high-duty aluminium alloy, unbushed at either end.





Left, actual size drawing giving mounting hole layout. Right and below right, also show the AM 10 full size. All AM engines had a similar appearance with size and cylinder head colour distinguishing the four original engines. The 2.5 and 3.5cc motors were not in the 'super power' class but proved reliable workhorses - sadly it is unlikely that we will see new versions of anything other than 1 and 1.5cc versions.



Maintaining the AM diesel tradition, the separate cylinder fins/jacket is a standard aluminium alloy turning, then anodised, in this case a pleasing turquoise green.

Performance

Piston/liner was initially a quite tight taper fit towards the top of the stroke, and early rpm checks, not surprisingly showed continued improvement with running time. This situation stabilised after some half an hour operation (by accumulated short one minute runs at widely spaced rpm points).

At an early stage it was felt necessary to modify the compression screw by moving

the tommy bar off centre (see photo), to give enhanced leverage to the contra-piston. Prior to this 'mod', the review engine required a fair pressure which had also placed the writer's fingers too close to a hot cylinder head! Needle control was very positive; also, like the compression screw, it was *not* affected by vibration and also gave clear indication of rpm loss when setting strayed into an over-lean position.

The AM 10 ran particularly well on rich fuel settings ($1\frac{1}{2}$ to 2 turns open from best running settings) and so, compared with some diesels, it was not as necessary to swiftly increase compression (after the



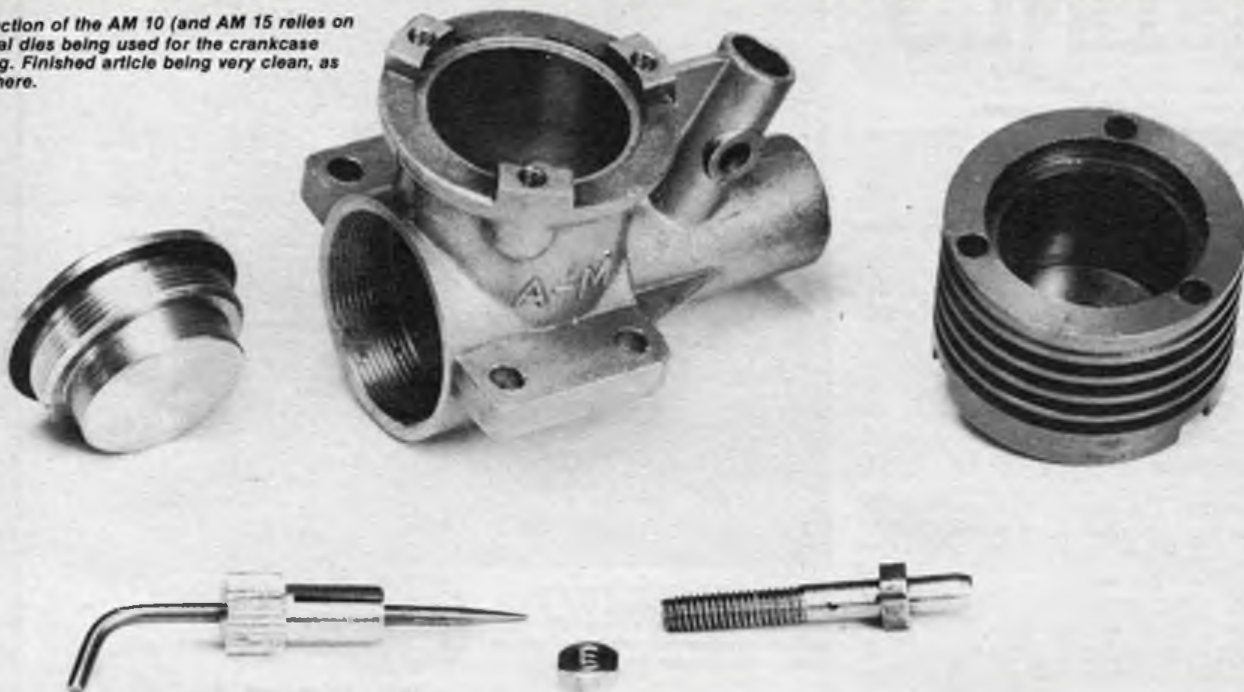
Left, on the review engine the compression screw proved to be quite hard to turn but by carefully tapping the tommy-bar it proved possible to improve matters as can be seen here. Remove the compression screw from the engine if you wish to try this, DO NOT tap (hammer) the tommy bar whilst still screwed into the cylinder head! It might be worth buying a spare (cheap enough ...) before attempting this mod!

initial prime is used up) in order to keep the motor running. A much more leisurely operation sufficed, with alternate small adjustments of compression and fuel being used to arrive at the correct maximum rpm settings. Using *Model Technics* middle of the range 'Sports/Special' diesel fuel (D2000), compression settings had to be reduced around half a turn after some 10 seconds running. This is the normal compensation for a gradually advancing 'ignition point' as engine heat increases.

Rpm figures on a range of propellers were re-checked following the main torque tests and all data indicated a slightly reduced performance compared with the Warring test - though of course *standard* propellers now have quite different names and probably differing torque absorptions for the same nominal sizes. Propellers typically in use in the 1950s were *Stant*, *Trucut* and *Frog 'Nylon'*, none of which are now in production.

During later discussions the manufacturer advised that the original AM 10 (apparently as tested by Ron Warring) was known as a Mk. 1, and had deeper transfer ports. These probably led to the creditable 1956 test result (it was above

Production of the AM 10 (and AM 15 relies on original dies being used for the crankcase casting. Finished article being very clean, as seen here.



average for that period), but they also were the cause of occasional cylinder failure due to reduction in material thickness where exhaust and transfer ports overlap. As a consequence, the current series of AM 10 engines (and the one tested here) have wisely been manufactured with the shallower transfer ports - which both explains that unusual 71° transfer timing figure and the slightly lower power level recorded. Not surprisingly the manufacturer was already aware of slight power differences between the Mk.1 and Mk. 2 engines.

An interesting by-product of the need in this design to keep exhaust and transfer ports at sensible vertical separation from each other is that the resultant higher than average, exhaust timing itself, has led to an exhaust sound level more akin to some 2cc diesels.

As a probable consequence of the very conservative transfer and induction timings, this 'Mk 2' showed a marked reluctance to operate much above 15,500 rpm - again unlike the 'Mk 1' which recorded figures up to 17,000 rpm. The sharp

decline in torque past 14,000 rpm was also in contrast with the 'Mk 1' findings.

Useful propeller sizes for free flight would seem to be in the 7 x 4 area, and 6 x 6 for sports control line (may have to be 'cut down' from the 7 x 6 size). However, as the torque curve is quite flat then quite satisfactory though pedestrian results would follow operation in the 6,000 rpm zone and where a 9 x 4 propeller would suit - though this particular size was not used during this test.

Summary

Starting throughout the test was very satisfactory, and on termination the motor was stripped down to reveal everything in good condition - piston/liner fit and compression being of sound quality (without which the rest is of little consequence in the majority of ringless engines).

Price levels of our small British diesels still make them particularly good value, and the AM 'revival' appears to continue this tradition.

Internal parts reveal no obvious weak areas - a good point for a 'rough and tumble' sports engine...



AM 10 Diesel

Dimensions & Weights:

Capacity	— 060 cu. in. (983 cc.)
Bore	— .422 in. (10.7 mm.)
Stroke	— .429 in. (10.9 mm.)
Stroke/Bore ratio	— 1.01/1
Timing Periods—Exhaust	— 162°
Transfer	— 71°
Induction	— Opens 75° ABDC
	— Closes 40° ATDC
Carb. bore	— 5mm.
Piston crown & contra-piston angle	— 14°
Crankshaft dia.	— .315 in. (8 mm.)
Crankpin dia.	— .1875 in. (3/16 in. nominal)
Crank bore	— .1730 in. (11/64 in. nominal)
Crank nose thread	— 2065 in. x 28 tpi (1 BA)
Gudgeon pin dia.	— .125 in. (1/8 in.)
Connecting rod centres	— .75 in.
Mounting holes	— 12 mm x 27 mm x 2.5 mm holes.
Width between bearers	— 21.5 mm
Height	— 2.1 in. (53.3 mm.)
Length	— 2.0 in. (50.8 mm.)
Width	— 1.3 in. (33.8 mm.)
Frontal area	— 1.7 sq. ins.
Overall weight	— 3.26 ozs. (92 grams.)

Performance:

Max. bhp	— 102 at 14,000 rpm (Open Exhaust/ D2000 fuel)
Max. Torque	— 8.2 oz. ins. at 8,300 rpm (Open Exhaust/ D2000 fuel)
Rpm on Standard propellers:	
8 x 6 Zinger	— 6,540
7 x 6 Toplite	— 8,282
8 x 4 Zinger	— 8,320
7 x 4 Master	— 10,400
6 x 3 Master	— 15,330

Performance Equivalents:

Bhp/cu. in.	— 1.7
Bhp/cc.	— 1.03
Oz. in./cu. in.	— 138
Oz. in./cc.	— 8.34
Gm./metre/cc.	— 5.95
Bhp/lb.	— 50
Bhp/kilo	— 1.1
Bhp/sq. in. frontal area	— .08

Manufacturer:

Forest Engineering Services Ltd., Unit 31 Walthamstow
Business Centre, Clifford Road, Walthamstow, London E17



MIND THE LINES

VINTAGE CONTROL LINE

with
Andy Brough

Old time stunt schedule

Last month we looked at the rules, now we shall see what we have to do! Firstly, I must explain the S.M.A.E. safety rule 4.1.3. which was mentioned last month. This applies to the jettisoning of parts in flight which is not allowed under S.M.A.E. rules but is permitted under S.A.M. to allow for drop off undercarriages, *not* engines and wings please!

1. Starting: The one minute time starts on a signal from the flyer. Electric starters are not allowed. Please note there is no overall time for the schedule.

2. Take off: The plane should roll along before lifting off (many vintage stunters fairly leap into the air). A correctly working drop-off undercarriage will get full marks, but a design with no undercarriage will forfeit all take off points (the max is only 5 points anyway).

3. Level flight: (2 laps) 6ft is normal height.

4. Climb (1):

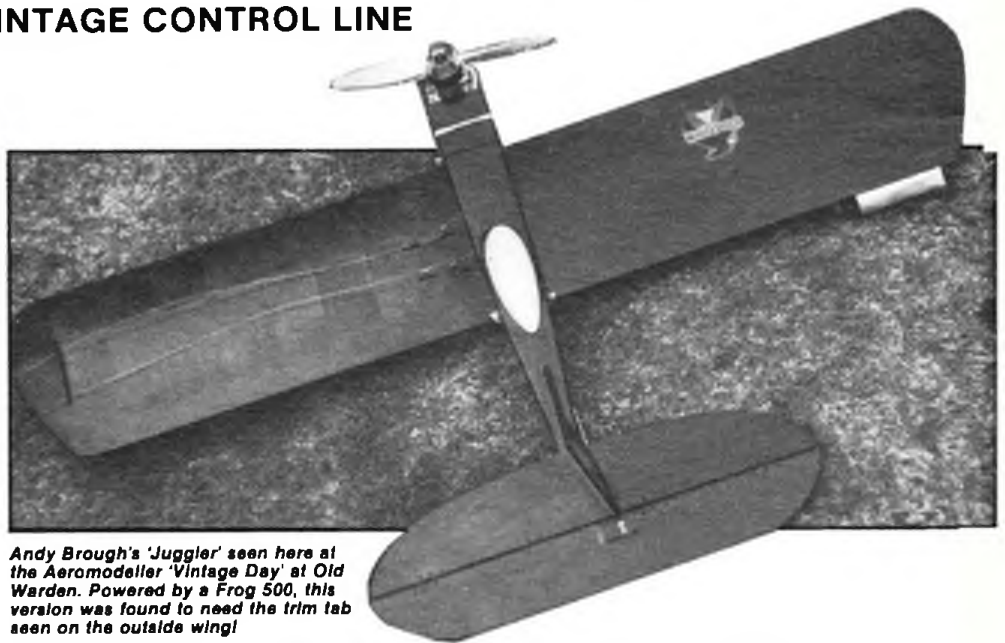
5. Dive (1):

6. Wing Over (1):

7. Inside loops (5):

8. Outside loops (5): These may be entered from 60° upright or level inverted (from a whipover).

9. Inverted flight (2 laps): May be started



Andy Brough's 'Juggler' seen here at the Aeromodeller 'Vintage Day' at Old Warden. Powered by a Frog 500, this version was found to need the trim tab seen on the outside wing!

from a whipover or a half loop from 60° Scoring begins at the end of the whipover and finishes exactly 2 laps later.

10. Horizontal Eights (3): Lazy eight but with the intersection vertical.

11. Vertical Eights (3): Can be any vertical eight you choose! i.e. lazy or entered from 45° to either inside top or outside bottom.

12. Overhead Eights (3): Lazy eight but difficult to start correctly if you're used to 'proper eights'. Start at 30° like a lazy vertical eight.

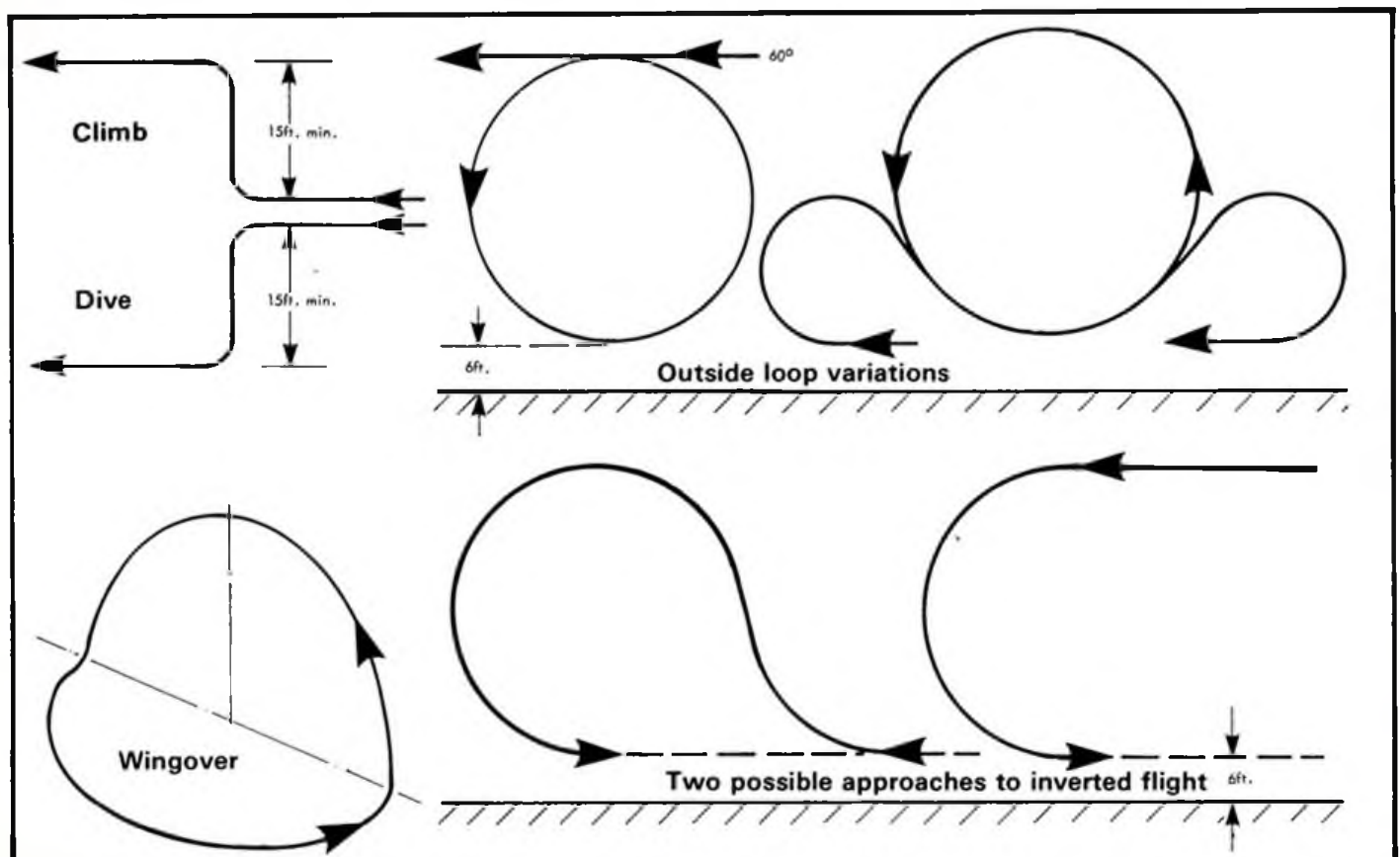
13. Square Loop (1): 60° high, 90in. wide! i.e. top is 1/4 lap inverted, so keep it level.

14. Landing Points: Awarded as follows - Nose-over 1, Rough 5, Bounce 10, Smooth 15. Don't forget you still get points with no undercarriage and what's more it shouldn't bounce!

Leave one lap between each manoeuvre.

Note: A reproduction vintage engine will get no bonus points.

Points for the manoeuvres will be awarded in respect of poor, fair, good or excellent. So there you are, start practising...





Just a few of the vintage control line models that came out into the sun at last year's 'Vintage Day' at Old Warden.

Suitable Stunters

Unlike radio control assist or free flight vintage enthusiasts who have a number of kits to choose from, there are no vintage stunter kits available...that I know of anyway. So, we have to build from plans, published as such, or old kit plans. The most obvious place to look is *APS* of course, but *SAM* members also have many kit plans and American plans available to them.

Now, in the last couple of 'Plans Handbooks No. 1', *M.A.P.* have helped us greatly by illustrating several suitable designs so let's start there:

Foxstunter: Buy a *Fox 35* and you're in business.

Happy Harold: OK. Ideal for one of the new replica *Elfins* (no extra marks though).

Ariel: Never actually seen one but looks OK.

Juggler: Took a bit of trimming (more of that later) but my own now flies well and the drop off undercart works very well.

Yoicks: *FAST* - But I've never seen one complete a schedule - perhaps the pilots hadn't got enough bottle!

Firebrand Mk4: OK

Virago: OK

Wildfire: OK

Flica: Typical Coasby, too sensitive but with C.G. moved forwards it flies well.

Meteor: Good flyer

Demon King: Excellent flyer. Mick Taylor's example flew superbly at last year's Vintage Day.

Taurus: Beautiful model - beautiful flyer.

Lil Zowie: Never seen one but looks good.

Crackerjack: Lives up to its name. It's a cracker!

Another source of two excellent designs is the 1948 *Aeromodeller Annual*, and don't

forget any plane of that vintage will get a bonus of 25 points. These are the 'Hot Rock' and the *De Bolt* 'Super Bipe'.

The *Hot Rock* is a fabulous flyer, it's hard to believe it's so old, and without flaps it also qualifies for an extra 20 points. Page 107 reveals the drawing of the *De Bolt* Super Bipe, yes, a further 10 bonus points. Also a good flyer but watch the rigging angle of the top wing i.e. should be slight negative incidence - like toe-in on a car. Of course, these two designs should really be flown in American style i.e. clockwise - just hold your handle wrong way round and think you're flying inverted!

Before we leave suitable designs I feel one more is worth mentioning. That is the 'Little Stinker' scale stunter, a *Pitts* 'Special' published in *Model Aircraft* during 1951, No. MA 98 and was also featured in the February 1980 *Aeromodeller*. The same comments about rigging angles also apply and the best advice is to read Pete Millar's article in the July 1974 issue on how to build and trim a biplane stunter.

Next time some hints on trimming, tanks and props etc.

with Bill Burkinshaw

Good memories

During the Summer of '84 I was delighted to renew a schooldays acquaintance with Len Whalley a lifelong modeller from the North West and designer of a one-time *Aeromodeller Plans Service* control-line favourite, 'Pedro'.

As our conversation progressed along the line of "do you remember this that and the other", Len mentioned that he still had a photograph of the model that first gave me total success with control-line flying, a flying wing (aren't they all?) made from the remnants of a 'Blue Pants'.

Of course once reminded of that success, all the earlier failures came flooding back prefaced by very first attempts at control-line with a *Skyleader* 'Hornet'. A class 'A'

team racer. A visit to the *Model Engineer Exhibition*, then held at the Horticultural Halls, Westminster, had resulted in the purchase of what was thought to be a rather smart looking free flight rubber model!

Just how wrong we were - Father and I that is, was revealed on the tube train back to my Grandmother's house where we country types were staying during our weekend pilgrimage up to the big city. *WE* had bought a model that needed an engine, furthermore it was a control-line model, something my father had only vaguely heard of but which looked to be really exciting to me.

Christmas was fast approaching and it looked likely that my stocking would contain a suitable motor, it did, an *E.D.* 'Bee' Mk 1.

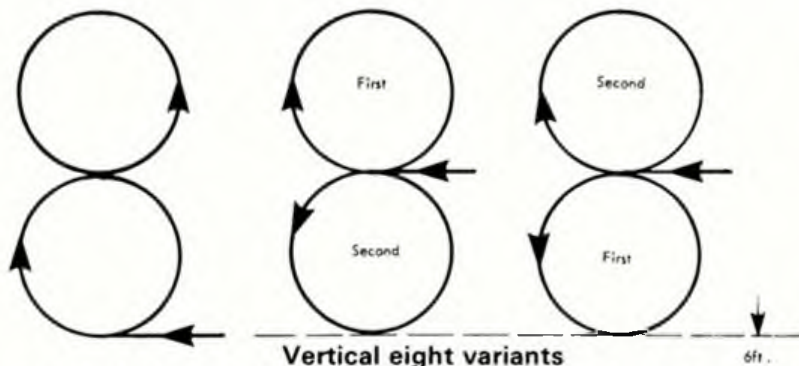
To be fair, once a few years experience had been gained and I retrieved the 'Bee' from the bottom of a drawer where it had gathered dust, the 'Bee' actually performed well. But not in my inexperienced hands that first Christmas...it really was impossible. Following at least one week's efforts at starting it by flicking the wrong way round...then finally, lengthy runs with the motor vibrating fiercely as it *oscillated*, proper runs were achieved in time but it never started easily.



'Blue Pants', designed by Henri Stouffs for 2.5 to 3.5 cc engines was a 'thick wing' stunter flown in the 1954 World Control Line Champs in Holland. Span 39 inches.

The 'Hornet', a planked fuselage open-framed, tissue covered model, finished in appropriate black and yellow tissue looked great and begged to be flown. Total inexperience resulted in 60ft *thread* lines, a very strong wind and an attempt to R.O.G. into wind - with the ensuing crash, inevitable. The control process was not really helped by total ignorance about the whole technique and a control handle lovingly turned up on father's lathe with an enormous imitation joy stick handle on top!

A new crankshaft cost 16/6d (fitted) and that crash was to be the first of many, until the gift of the 'Blue Pants' wing by Derek Brunt, still well known to scale R/C modellers in the N. West. Thinking back, that model had all the elements that guarantee success that so many so-called trainers lack - plenty of power to provide good speed and adequate line tension plus the ability to fly on long (50ft) lines and keep the number of 'Pilot' rpm down, coupled with enough manoeuvrability to pull out of some terrifying situations. A far cry from the block and sheet monstrosities - so often called trainers - that barely managed to fly in the hands of experts.



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Known as the aeromodeller's 'plan bible', the latest edition includes plans introduced in Aeromodeller over the past twelve months. Together with the 'X' list (plans from the past 45 years, but not illustrated in the handbook) there are designs to cater for all of aeromodelling tastes - from simple gliders to unorthodox creations. A special vintage models section is included for the devotees of this rapidly growing branch of the hobby.

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MODEL BOATS

1985
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Plans Handbook



No. 2 - Model Boats

The world of model boats covers Sailing craft, Yachts, Paddle steamers, Trawlers, Tugs, Launches, Warships, Submarines, Liners and Hovercraft - in addition to non-scale sports, competition and hydroplane models. Plans for all of these types - and cars too - are illustrated in the Model Boats handbook. Feature articles include advice on scaling-up plans, hull construction, engine selection and classifications for model yachts and power boats.

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APPENDIX - LINKS TO THE PLANS

The original magazine comes with one free plan (Early Knight) printed front/back on a pull out folded banner of four sheets. The banner is not included in the document.

Monarch (MIT)

Man Powered Machine presented in MUSCLE HUSTLE

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Bionic Bat (Gossamer Swift)

Man Powered Machine presented in MUSCLE HURTLE

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Musculair

Man Powered Machine presented in MUSCLE HURTLE

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Sugar Foot (from june 1950) by John Stainer

FF Power Pylon

https://outerzone.co.uk/plan_details.asp?ID=11398 ...

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Early Knight by John Godden

FF Rubber 36 wingspan Rubber Model for the Beginner

https://outerzone.co.uk/plan_details.asp?ID=9402 ...

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SST No 1 by Dave Hipperson

FF Open Rubber

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Two Stunt Trainers by Ron Williams

CL Stunters for Novice

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