

JUNE 1985

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AERO

MODELLER



MODEL
PUBLICATION

**1933 GORDON
LIGHT WAKEFIELD**
Vintage Rubber Model Plans



MODEL AIRSHIPS
That Really Fly
BUILD IT TONIGHT
Firefly Simple Rubber Power

MINI POWERTOOLS
More Scope in your Workshop



MAP Events at Old Warden -1985



GOLDEN ERA

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.



VINTAGE



R.M. FLY-IN

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 specific contests for Radio Modeller 'Trainer' 'Aerobat' and Porterfield 'Collegiate' designs.



SCALE WEEKEND

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.



DISPLAY TEAMS CONTEST

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

JUNE 1985

Issue 593

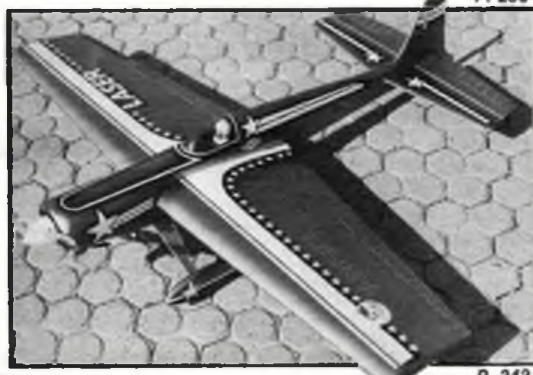
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AERO

MODELLER



P. 296



P. 342

Publisher Tony Dowdeswell
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Cover:
 'Miss America' from the golden days of the early Wakelield Trophy competitions. Vic Smeed's reconstruction (P. 296) of this delicate model is an insight on how a lightweight model should be built. Insert: one of Black and Decker's 'Minicraft' range of power tools reviewed in this issue (P.302)

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Other MAP Hobby Titles:

Clocks - Military Modelling - Model Boats - Model Cars - Model Engineer - Radio Control Models & Electronics - Radio Modeller - Scale Models International - Your Model Railway



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June 1985

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HANGAR DOORS

Support Your Teams...

1985 sees World and European Championships taking place in Australia, Belgium, Switzerland and America to name just a few. Great Britain hopefully will send teams to most if not all of these countries (including a team to Manchester for our own European C/L Champs).

The cost of travel for these teams is not met by any central body and the competitors often have to find the bulk of the fare for themselves. This is obviously not a very satisfactory state of affairs as it must mean on occasion that someone who should be in the team - is not, simply because he cannot afford the fare...

The SMAE have had a 'Team Support Fund' for some time and contributions however small are always gratefully received... now there is a special sticker for those that donate a minimum of £1.00. The sticker is a 4½ ins. diameter, so send a sae large enough to take this when you send your donation to: Team Support Fund, SMAE, Kimberley House,

other, even sport fliers have been known to carry a stopwatch... many 'competition fliers' know in their hearts that their chances of winning a major event are slim. It does not stop them from enjoying that surge of hope (and adrenalin) as their model circles up in a thermal...

Your typical 'pot-hunter' has to have an edge of confidence and technical expertise... that is what makes him stand out from the rest of us... would our 'someone' have us all plodding along the same muddy path?

Of course it is 'personal' and great that you have beaten the rest of the Country, Continent or World... but often it is the 'team' that has made this possible. Stand there on the winner's rostrum and hear YOUR National Anthem playing over the loudspeakers. Try to stop the tears running down your cheeks as YOUR Union Jack is slowly raised to honour not just you but YOUR Country... we could do with a few more of these 'super-egotists'!



Handsome sticker that those supporting our teams for World Champs will be sporting on model boxes this year... see Support Your Teams.

Vaughan Way, Leicester LE1 4SE.

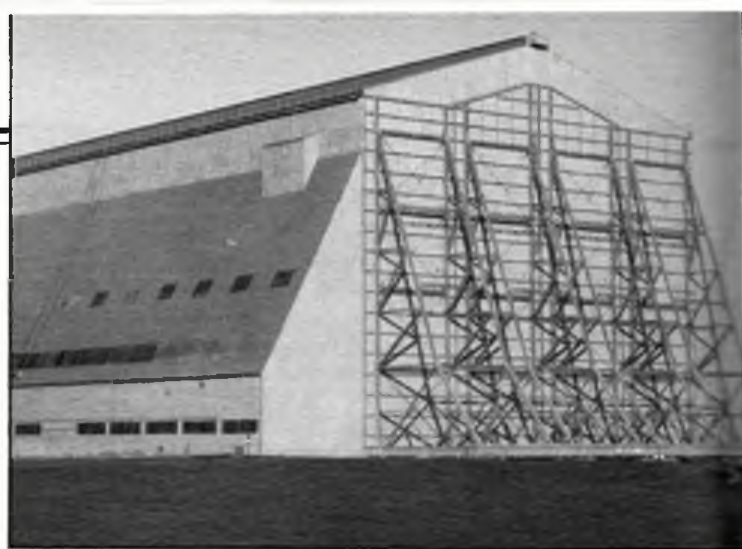
Someone wrote to *Aeromodeller* recently to say that "...competition fliers are just super-egotists and compete purely for personal glory with no thought other than how many cups they can win... why should I help them in any way whatsoever..."

That 'someone' is entitled to his opinions of course, but we think, does not see the wood for the trees! Most human beings are competitive in some way or

That £1.85...

Needless to say we have had many letters sent to *Aeromodeller* concerning our recent cover price increase of (gulp!)...60p. Some say they will not buy another copy at this price, some that they will only get it when there is an article they particularly want to read and a pleasantly large number of writers vow to stick with us whatever...

To the first group we can only wish 'bon voyage' and say that we enjoyed their company whilst



A very apt picture for Hangar Doors, variations of which have been seen in this position in the past! The excuse this time is to draw the attention of all indoor modellers to Indoor Update below...

they sailed alongside us. The second group poses a more difficult problem, as it is a sad fact of life that one cannot please all of the people all of the time and in this case if we are not able to tempt you for a month of two - your newsagent will stock less copies and there will not be one there for you to browse through at all!

The third group appears to be even more difficult to cope with! Many of these readers couple their 'oaths of allegiance' with detailed suggestions on how they think *Aeromodeller* could boost its sales and increase the interest of its contents.

It is at this point that the issue becomes a little confused. *Aeromodeller* basically tries to cover all aspects of the hobby other than radio control, plus the odd item that we think will be interesting to read about regardless of your prime interest. This is quite a wide field to cover... think about it - all those different classes of free flight, control line, scale, indoor and general sport models.

The confusion arises when letter after letter is opened and each suggests quite opposite views on what that reader would like to see between the covers! One likes competitions and vintage, another says too much vintage, too much on competitions and not enough for the beginner. Yet another suggests that we should cater more for the advanced modeller (technically that is - not his age). We do try to balance our contents to give a useful diet to all classes and interests but for all that, are always willing (and eager!) to receive input. Either as criticism (good or bad) or in the form of articles, photographs or plans.

The extra pages now granted to us should allow for a wider choice of topics each month. If they do not suit you or even if they do... tell us. It is not possible to satisfy everyone all the time but we do take note of everything.

Finally, a 'thank you' to all those readers who took the time

to write to us. The number of letters is really too great for us to answer them all individually. Many were long and full of constructive suggestions which we will remember as we plan for the future.

Club in the South

No not a holiday resort under palm trees! But a free flight club of long standing that feels we have not mentioned them for some time and wants a mention in THE 'mag' for real aeromodellers!

Joking apart Croydon and District Aeronautical Club has a lot going for it with a wealth of national and international flying experience within its membership. They have members from all over the South of England but are always willing to welcome fellow free flight competition enthusiasts.

If you want to know more of CDAC then contact: Bryan Spooner on 01-660 7954 or Don Thomson on 01-998 9472.

Indoor Update

Last month we mentioned that the SMAE Indoor Technical Committee had managed to secure the use of No 2 Shed at Cardington for a series of Indoor Meetings this year (see What's On). They have now also arranged for the occasional use of No 1 Shed.

As stated before it is very important you inform Laurie Barr on 0628 25595 if you wish to attend any of these meetings... now when you phone him you can find out which Shed is being used at the same time!

Index

Don't know where to find Aircraft Described No. 261? What about that plan for a beginner's control line trainer 'Harty', no 'Hamble', no you know... HARRIER, yes that's it... but what issue was it in?

Aeromodeller Index for 1984 will solve most of these problems for you. Write in and get your copy NOW, of course like everything else... it costs money (unless you have a subscription

that is, hint, hint) but in a years time when you may have forgotten which issue was which – it may well prove to be worth its weight in... (*Aeromodellers?*).

Aeromodeller Index is available from *Aeromodeller Plans Service*, Argus Specialist Publications Ltd., Wolsey House, Wolsey Road, Hemel Hempstead, Herts HP2 4SS. Cost £1.25 including post and packing.

More winners...

Two Telco CO₂ motors are now winging their wing to our latest competition winners.

Mr. B.V. Sealy of Rye, Sussex and Mr. D.G. Keeble of Ipswich, Suffolk were the first two names out of the bag, big bag it was too – must be thousands of potential CO₂ fliers out there... we will have to publish some more designs...

Well done Mr. Sealey and Mr. Keeble we hope you have a fizzing time – thanks too, to *Micro-Mold Ltd.*, who so kindly provided the prizes.

Diesel corrosion

Derek Giles of the Buckaneers Model Club has made quite a

number of *Mills* replica engines over the past year or so, both 0.75 and 1.3cc versions and even a special "Mini-Mills" half the usual size. Materials used have to all intents and purposes been the same as those used in the original motors so the following cannot really be laid at the door of wrong material selection.

Just prior to running one of his replicas, Derek noticed that the compression was rather less than it should have been and on further examination he found that the ferrous parts of the engine were quite badly corroded.

Investigation leads him to suppose that the use of Ignition Improving Agent as an alternative to the difficult to obtain Amyl Nitrate could well be the answer. The comparatively cool running *Mills* motor just does not get hot enough to boil away the acid by-products of the combustion process which remain trapped inside the motor where they proceed to do their worst.

The answer is to *thoroughly* flush out the engine with a water displacing agent such as *WD 40* followed by treatment with good quality lubricating oil.

What's On

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 665381. SMAE Members only. Contest Licence required.

June 2
CARDINGTON INDOOR MEETING
Comps: EZB, F1D, 35cm, Open Microfilm (all index), AGM Pairs, Trophy. 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 DAM CONTROL LINE GALA
Comps: Stunt, FAI Combat, Slow A Combat. Contact: S Wadkin, 5 Brockland Hill, Hampstead, London NW 11.

June 2
SMAE S.E. AREA R/C FUN-FLY DAY
Venue: Ardingly College, Sussex. Contact: Norman Couling, 7 The Green Walk, Willingdon, Eastbourne, East Sussex BN22 0RB.

June 2
THREE KINGS CONTROL LINE SPORT AND VINTAGE DAY
Venue: Old Croydon Aerodrome. Contact: Derek Bird. Tel: 01-874 6394. Vintage Stunt (pre 1956), 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
R/C THERMAL CROSS COUNTRY
Venue: Ashdown Forest, Sussex. Contact: Norman Couling, 7 The Green Walk, Willingdon, Eastbourne East Essex BN22 0RB.

June 9
SMAE 4th AREA FREE FLIGHT EVENT
Comps: CdH, 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, CdH Sunday). Venue: RAF Barkston Heath. Contact: Brian Baines, 2 Church Walk, Metheringham, Lincs LN4 3HA. Tel: 0526 21458. Start 100 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 MFC FREE FLIGHT RALLY
Comps: A1, CdH (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, CdH, HLG.

June 23
BLACKBURN & DMAC SUMMER FLY-IN
Venue: Witton Country Park, Blackburn, Lancs. Contact: Ray Stoll, 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 Fairmond. 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 7
SMAE S.E. AREA R/C SCALE FLY-IN
Venue: Ardingly College, Sussex. Contact: Norman Couling, 7 The Green Walk, Willingdon, Eastbourne, East Sussex BN22 0RB.

July 13-14
CLAPA CHAMPIONSHIPS
Comps: F2B (CLAPA members only), Open Novice Stunt, Open Carrier (Profile & Scale), Open Scale. Venue: Essex Show Ground. Contact: P Burgess, 42 Blunts Hall Road, Witham, Essex. Tel: 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: Graveny, Nr Seasalter, Kent. Contact: D R Austin, 4 Wykeham Road, Sillingbourne, Kent. Tel: 0795 27008. Write for details and pre entry.

July 20-21
SMAE INDOOR NATIONALS
Comps: Saturday - EZB (Houliberg 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, CO, Duration, Pennyplane etc. Names and addresses together with car reg. number – MUST be registered before the event.

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

July 21
SMAE VINTAGE & LARGE MODEL FLY-IN
Venue: Barcombe, Nr Lewes, Sussex. Contact: Norman Couling, 7 The Green Walk, Willingdon, Eastbourne, East Sussex BN22 0RB.

July 21
WHARFEDALE CLASS 'A' DIESEL COMBAT
Venue: Dewsbury. Contact: Jeff Smith 45, Denton Avenue, Leeds. West Yorkshire LS8 1LE. Tel: 0532 663432.

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
WHARFEDALE 1000 CLASS 'B' TEAM RACE
Venue: RAF Dishforth. Contact: Jeff Smith, 45, Denton Avenue, Leeds. West Yorks LS8 1LE. Tel: 0532 66342.

August 4
DOXFORD MILITARY PAGEANT AND FLYING DISPLAY
Venue: Imperial War Museum Duxford. Tel: 0223 833863. 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, Aeroplane, 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, 25, 26
LONDON AREA FREE FLIGHT GALA
Comps: A1, CdH, 1/2A, HLG, F1B, F1C, SOP, OG, OR, OP, Vintage. Venue: Training Area 9, Salisbury Plain. Contact: Ian Bracken, 1 Didsbury House, Minkard Walk, Andover Estate, Hornsey Road, London N7 7RT. Send for entry forms. Camping £3.00 per night per tent etc. Closing date for camping 1st July.

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.



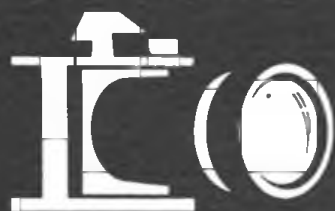


PHOTO PRIZE

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.



THAT OLD SAYING "Spoiling the ship for a ha'porth (or bearing in mind decimalization!) a pennyworth of tar", is as true as ever it was. Experienced aeromodellers know that 'short cuts', or the smallest amount of carelessness in building a model car, (and probably will!) spell disaster. Certainly there is NO evidence of spoiling the model for want of care, in this month's model masterpieces.

Photo 1

Flair Phil finds it hardly surprising that this Sopwith F.1 'Camel' has won many 'stand-off' scale events. Built and flown by an obvious master of the radio control scale model, it comes from Mr. John Tidey of New South Wales, Australia. It also found the English air to its liking being flown at Old Warden in 1980. Power: Webra 61. four channel Futaba R.C.

Photo 2

There is no doubt you cannot keep a good 'Spitfire' down! The point is proved by these two fine flying 'Spits' (A Mk II in the background and Mk IX in the foreground). Sent by Peter Mills of North Shields, Tyne and Wear, they are each powered by a Merco 61. Span is 60in Weight 9lbs. The designer is, of course, Mike Reeves.



Photo 3 Winner

Described by its designer Michael Parkinson of Lancs as a *Private venture* ducted fan delta, this impressive model is based on the 'Mirage' series of fighters. A fine piece of craftsmanship, it is powered by an OPS rear exhaust rear induction engine, driving a home made aluminium fan. Well Michael, your 'private venture' has paid off, winning this month's prize! Good luck — and good flying.

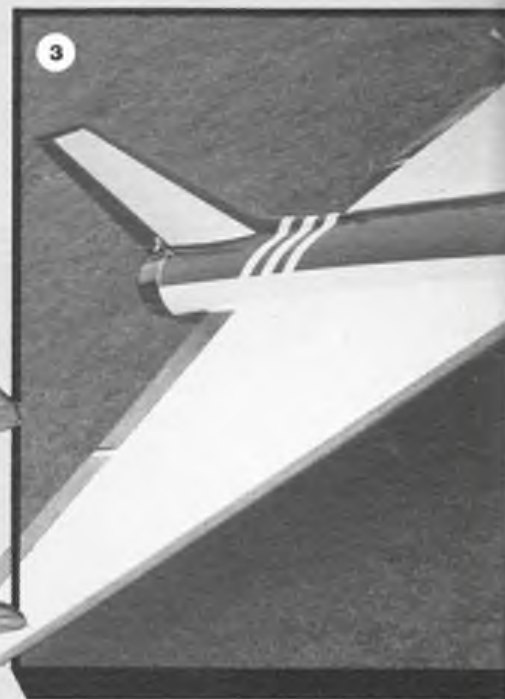


Photo 4

In the autumn of 1903, the famous pioneer Dr. Samuel Pierpont Langley failed to get his full scale 'Aerodrome', airborne. Happily success has attended this peanut size model of Langley's 'Aerodrome', sent by Al Backstrom of Texas U.S.A. Built from a Nowlen Aero Kit, Al says "It is a nice flyer, and graceful in flight". A model after Fliar Phil's own heart. Al...may it long continue to grace Texan skies!



Photo 5

Flair Phil now presents a fine 'portrait' for vintage flyers immediately recognised as the Keil Kraft 'Falcon', (designed by Ben Shereshaw in 1937, and originally called the 'Cloud Cruiser'). The photo was taken by Alan Holmes Junior of Orrell, near Wigan. Built and flown by Eliot Horwich of Chorlton, it has won a number of Vintage events. An interesting note - the engine is the magneto equipped Gerald Smith 10cc 'Skylark'. Fine photo - thanks Alan.

Photo 6

'A real eye-full of fighting aeroplane', could well describe this photo of a Boeing B 17G. It is actually a control line model built with an expert's attention to detail. The photo comes from Peter Miller of Sudbury, Suffolk. The model is standing on the actual aerodrome, used by the full size B 17's in W.W. II: span 62in. Power four G-Mark .12cu.in. twin cylinder engines. Your low camera angle gives that 'for real' look Peter.



Photo 7

In our first photo, from Mr. R. Shallcross of Grays, Essex, no effort has been spared to produce this fine flying replica of a 'Great Lakes Special'. From a *Sterling Kit*, originally for rubber power, it now has a Cox 'Pee Wee' up front. The carefully applied trim adds much to an already attractive biplane. Nice camera work too Mr. Shallcross!

That 'ties up' for now folks! More model gems next month.



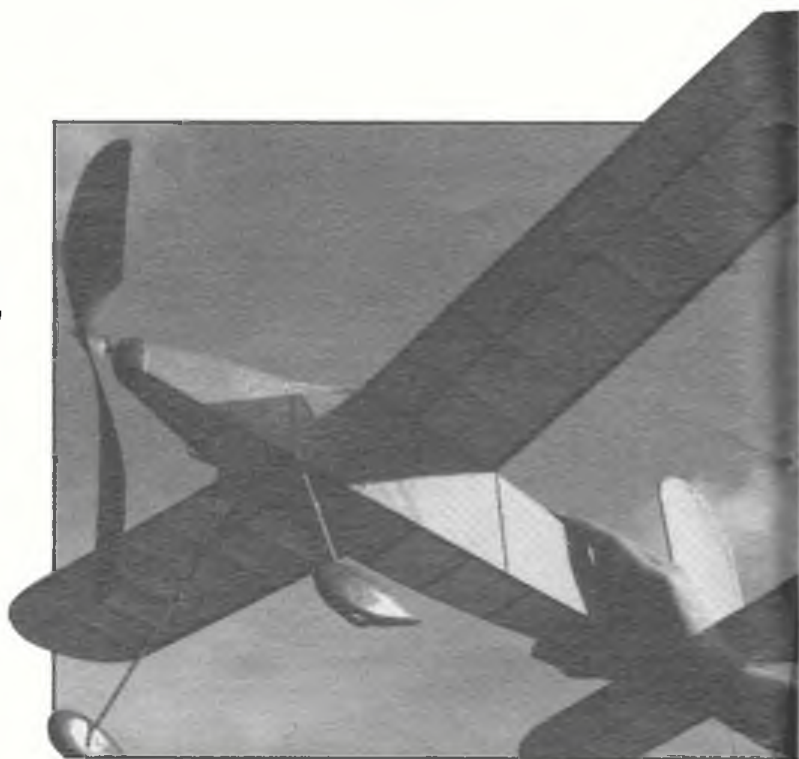
Remember folks, this is YOUR feature and Flair Phil needs YOUR photos to keep it going!

BEFORE 1934 the Wakefield Trophy called for a 'steering flight' which had to be achieved before the scoring duration flight. Models had to cross a line 200 yards away. No motor change was allowed - you finished the day with the same rubber used from the start. Getting a successful steering flight first or second go therefore had the double advantage of fatiguing the motor less and giving it longer to recover before the duration flight.

At Fairey's aerodrome in 1933 conditions were fairly good, with relatively little drift and low humidity. Many of the British entries made the steering qualifier on the first or second flight, but the sole foreign entry, Gordon Light's 'Miss America', was trimmed to fly in large circles. It had a motor stick, which prevented thrust line adjustment, and a large fin fixed for half its chord at the root and no trim tabs.

Flown proxy by James Pelly-Fry, it was reluctant to allow itself to be persuaded over the line, but on 25 per cent turns it made several 2 minute plus flights while attempting to do so! Its duration performance led to spectators favouring it to win.

Gordon Light's Wakefield was light indeed with an all up weight of only 1.9 oz! Original used 1/16in. longerons in the fuselage and the tissue was water shrunk - no dope...



Gordon Light's

'Miss America'

Vic Smeed's re-construction of this American contender for the 1933 Wakefield Trophy.

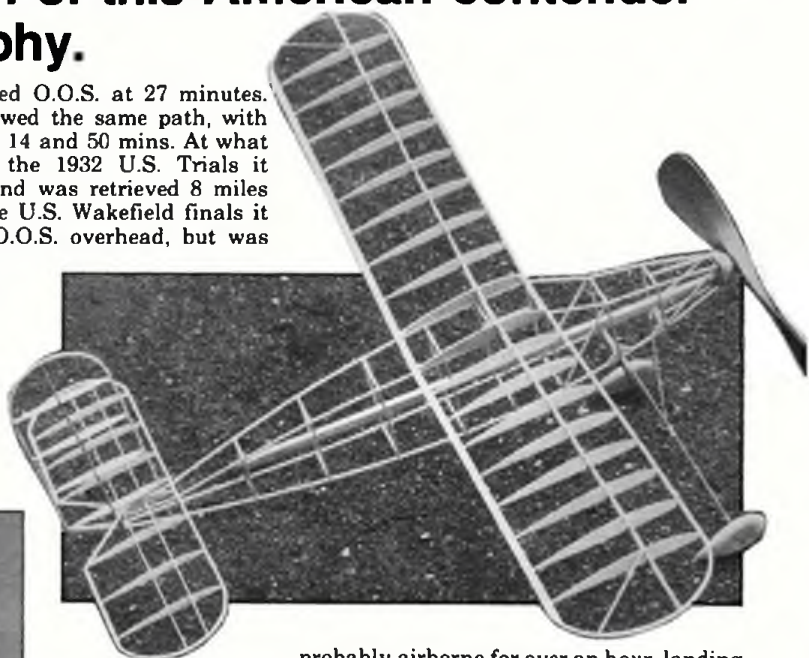
Eventually it made the qualifier but by this time the motor was very tired. In the duration part, its flight was about 2½ mins., only a second or so behind winner Tony Phillips.

In 1934 the model was proxy flown by the late Stan Rushbrooke, but was crashed and virtually written off without returning a score; largely, one suspects, because of the effect of drizzle on the model, which was built for the warm and buoyant air so frequently encountered in the U.S.A.

The design originated in 1931 and the first

model disappeared O.O.S. at 27 minutes. Five others followed the same path, with times of between 14 and 50 mins. At what were effectively the 1932 U.S. Trials it recorded 25:32 and was retrieved 8 miles away, and in the U.S. Wakefield finals it won with 7:52 O.O.S. overhead, but was

Vic Smeed's replica is still a lightweight but replaces the original 1/16in. longerons with 3/32in. (chicken...Ed!) also in deference to British weather the tissue has been doped...but only lightly!



Although with slightly stronger construction, the replica still retains the motor stick (built up box of 1/16in. sheet) intended to take the tension of the fully wound motor - just insure the rear end of the stick is positively retained in the model!

probably airborne for over an hour, landing 6 miles away, three of which were over open water! Even allowing for the American practice of the timekeepers following the model, as opposed to the British system of timing from the launch point, this is an impressive record.

By 1935 the 4 oz rule had come in and Gordon Light's entry was bigger and stronger, but similar in many respects.



Aeromodeller

There was always the odd point of confusion in the rules (remember that this was the first class flown widely internationally and was thus pioneering rules) one such point being that the centre-section of the wing was counted as part of the wing area, a point not always realised; the centre section covering had to be removed from the 1935 version, in order to meet the area restriction. At least, so the story went!

These two models, perhaps particularly the 1933 one, had a significant influence on future model development. The 1933 machine was the first really lightweight model most people had seen and, perhaps even more remarkable, it had a cabin! It wasn't necessarily the first model with a cabin but it was the first famous rubber

Right, close-up of the light, flexible undercarriage structure - bamboo, still takes some beating (!) in areas such as this ... Left below, very simple free wheel mechanism is used as seen here, propeller is held on by simply slipping a piece of rubber or plastic tube (choose a good light fit...) over the prop shaft.



model to have one. Die-hards could see no point (it was conceded that it helped engagement of the rear clip of the motor stick, though a small open panel by the clip would have done) but in the full-size world the first high wing cabin monoplanes had started to encroach on the open cockpit tradition in the late 1920s and the majority of modellers seemed to like this 'nod' to full-size progress.

A look at the proportion of subsequent designs, especially kits, which embodied a simple cabin on an otherwise pure duration design appears to confirm this. Certainly both the 1933 and 1935 designs had a considerable influence on members of the local clubs with which I was associated.

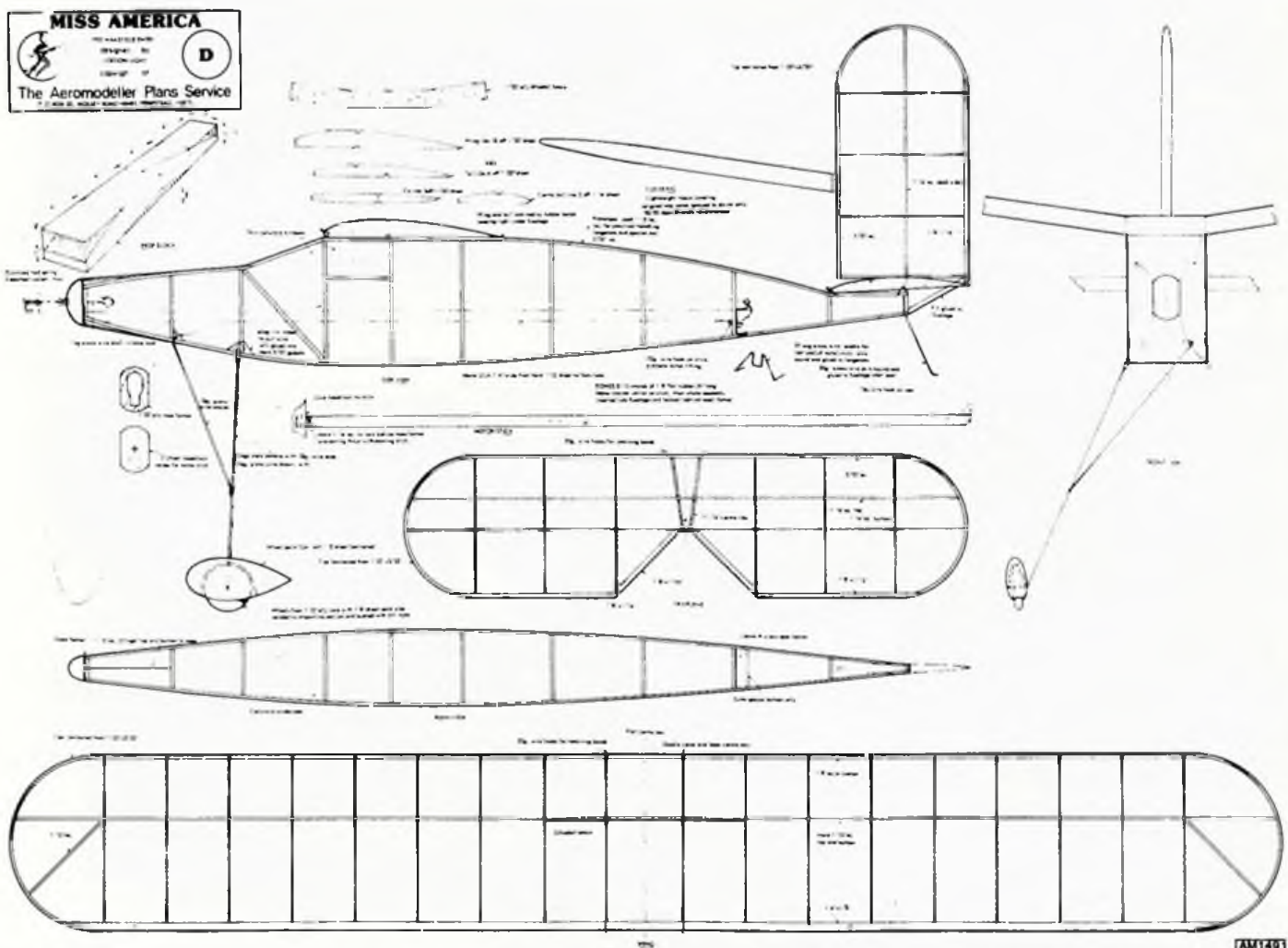
Structurally, the 1933 model was too light

for average British conditions, as perhaps shown by its good performance at Fairey's and its demise at Warwick. The builder used gentle steam shrinking on the Jap tissue but no dope at all, with results that can be imagined on a wet day; it was possibly this that led to the unkind comment "A paper bag"!

Although very small compared with Wakefields from 1935 on (the fuselage was only a little over 24 in. long) the flying weight of 1.9 ozs. indicates how lightly it was built. Most of it was 1/16in. square - fuselage, wing spars etc - even the wing and tail tips were steamed 1/16 in. sq. balsa. The motor was either 6 or 8 strands of 1/8 in. flat turning a huge 17 or 18 in. prop.

It must have seemed like something from

Full size copies of the one fifth scale plan below will be available for a limited period from Aeromodeller Plans Service, Wolsey House, Wolsey Road, Hemel Hempstead, Herts HP2 4SS. Cost £2.30 plus 50p postage and packing. Please quote plan number AM 1491.





Vic managed to find this original 15in. Chauviere propeller to compliment his 'Miss America'. The original used one of unusually large 17 inch diameter.

outer space to those holding the entrenched attitude that to fly in Britain you had to use ply, spruce and silk. This attitude was to persist among other designers for several more years, despite the obvious success of balsa models.

The removable motor stick idea was thought clever in that it allowed winding outside, but it did not catch on. Trimming without being able to adjust down and side thrust is more complicated, and the stick severely reduces the effective clearance inside so that if the motor does thrash a bit it is more likely to damage the tissue, if not the structure.

Using 1/8 in. longerons and letting the fuselage take the compression load was far more popular; perhaps rubber quality was more consistent and bursts less frequent.

Ironically, while British modellers developed 'L' and 'T' section balsa for more efficient structures the American moved to 1/8 in sq. longerons, with many more spacers than were usually seen in the U.K. even on small (30-32 in.) models. Perhaps they used softer and lighter balsa.

A basic drawing and related facts about the earlier Gordon Light were produced by Pelly-Fry for *Model Engineer* in 1933 and full size drawings were made from this information to build the model illustrated. There are some minor changes (sorry, purists!) but the only really noticeable one is that a mixture of cowardice and practicality dictated the use of 3/32 in. sq. for the fuselage instead of 1/16 in. sq.. This means that if necessary the motor stick could be dispensed with and two motor peg plates installed to convert to conventional rubber installation.

The nose has a 8 mm ply former instead of a steamed 1/16 x 1/32 in bamboo rim, the flying surface tips are laminated instead of plain steamed 1/16 sq., a 0.8mm dihedral brace was used and the undercarriage fitting was altered. On the original the bamboo legs plugged into rubber tubes glued to the fuselage and the crossed bamboo struts had wire hooks engaging wire eyes bound to the longerons. As built, wire stubs have been fitted to legs and struts, plugging into aluminium tubes in the fuselage. A 15in. prop has been used so far (it can be changed in seconds) and a latch freewheel fitted as being kinder to the prop than the spring type.

On the model sent over in 1933, an unusually large prop was used - 17 in. dia. - and from photographs it appears to have been of the swept-back appearance favoured

by rubber fliers in the U.S. in the 1930s. The shape was achieved by cutting all the taper off the blank tips on the foreside, whereas English practice with carved props was to take equal taper off front and back. A blank 18 in x 1 7/8 in. x 1 1/4 in. was used for the original 17in. prop.

The designer stated that reasonable flights could be achieved with any prop from 10 in. up and the blank shown on the drawing is for a 16 in. American style prop of moderate pitch; the dihedral on the model is modest to modern eyes and a high pitch prop could introduce trimming problems, especially with a fixed thrust line. The model in the photographs uses a 15 in. Chauviere prop dating from 1936.

Apart from these fairly modest alterations the model is built 'as per' although it must be confessed that the tissue (1937 Jap) was given a thin coat of dope. It still slackens badly in damp conditions! With a four strand 1/4 in. motor only a little longer than the motor stick it came out half an ounce heavier than the original and on a warm calm day is a real floater, needing no alteration or trimming to make satisfying flights.

Two short flights were made at the 1984 Warwick meeting but it was unfortunately far too windy and minor damage to a wing was sustained. Subsequent trials indicate that six strands will give a much faster climb but a parachute or pop up wing d.t. will have to be fitted!

Incidentally, Gordon Light is, we understand, still active in the U.S.A. and we had the pleasure of a few minutes reminiscence with James Pelly-Fry at the 1985 M.E. Exhibition - 52 years after this model flew in Britain.



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SCALE MATTERS

Control Line with Vic Willson

Choice of Subject

The choice of subject when considering a Control Line Scale model is enormous, perhaps even unlimited, however although there is an almost endless range of full size prototypes to choose from (and they could all be made to fly) certain practical considerations *must* be taken into account and thus the field is limited somewhat.

Firstly there is the mode of power of the full size subject ie propeller or jet.

Jets

Although there have been a few *scalish* models powered by pulse jets they cannot be considered seriously for powering a practical scale model due to their excessive noise, heat and difficulty of operation, not to mention non-availability and insurance problems.

Jetex (no longer available) lacks the necessary power and duration for control line use and to date no commercially viable model turbo jet has been developed.

dabbled with a very basic system using two OS 20s to power a 50in. span semi-scale model of the *Northrop A9*.

The beauty of this design being the large diameter short ducts which optimised the available thrust. This model performed far better than expected and deserved following up with the projected S3A 'Viking' powered by two HP 40's, however as with so many of my projects this one did not get beyond the

Above, Sopwith '1½ Strutter' from Aeromodelleur Plans Service (C/L 651), 48 in. span originally intended for 3.5 to 5cc diesels. Below left, Bernard Sexton's 'Art Chester Jeep' nears completion, 37 in. wingspan and will probably be powered by an HB 20.

undercarriage and this type of model flying round with the wheels permanently hanging down rather defeats the scale modeller's purpose of reproducing the real thing in miniature.

With the currently available ducted fan units and specially developed engines a scale jet model is quite feasible and it just awaits someone with the necessary resources to produce such a model.

There are some superb subjects waiting to be modelled equally as attractive as a lot of the propeller driven types, for instance the *Hawker 'Hunter'* is in my opinion one of the all time greats as far as aircraft shapes are concerned and ranks alongside the 'Spitfire' in this respect.

Propeller driven

Almost all the control line scale models currently seen are of propeller driven aircraft mostly from the 1914-1945 period, although occasionally models of very early types (such as the *Blackburn 'Monoplane'*, *Avro 'Trianon'* etc) are seen and a sprinkling of more modern types (*Cessna*, *Piper* etc.)

My personal preference is for low wing monoplanes of the Second World War period, which I think have a layout emin-

This leaves only one means of powering a scale jet model with any kind of realism - the ducted fan. So far this mode of power for control line models has been neglected although I have seen a large 'Meteor 8' and a smaller 'Super Sabre' flown successfully with this type of propulsion. These models were produced around ten years ago and did not have the advantage of the more recent developments that have taken place due to their popularity in Radio Control. I also

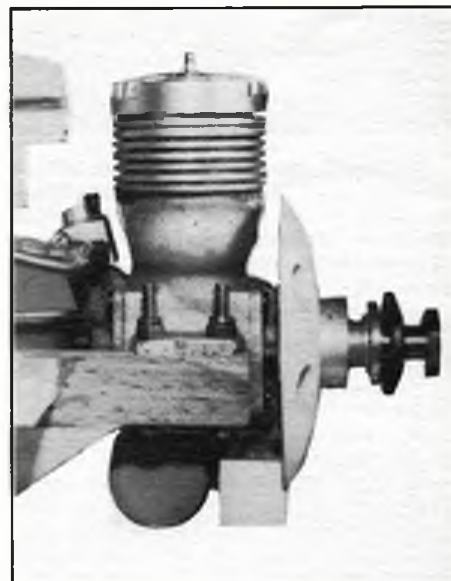
drawing board. One further possibility but hardly one to be considered by the true scale enthusiast is to fit a propeller, as either pusher or tractor, to a jet model. This is quite a practical solution for sport flying and is the simplest method of all to produce a model of your favourite jet aircraft.

One further point to be borne in mind is that all jet aircraft feature a retractable

Below, the mounting of the MVVS 35 in Bernard's Laird LC-DE, likely to be replaced with an OS 40 for the test flight.



Left, Bernard Sexton showing the distinctive plan form of his 'Art Chester Jeep' (see Pipe Dreams...).



ently suitable for control line and can be made to fly in a fairly realistic manner. Small biplanes howling round at supersonic speeds hark back to the fifties when most control line scale models were powered by 2.5-3.5 cc diesels and had no throttle fitted.

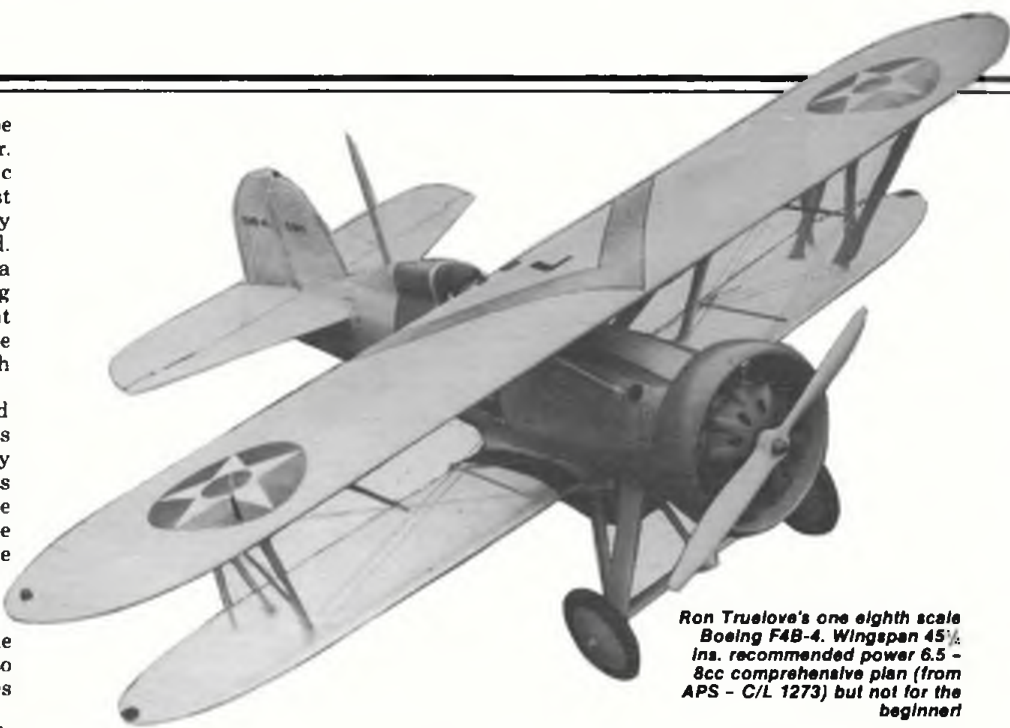
However, if the weight is kept to a minimum by careful wood selection, strong but lightweight structures and with a light sprayed finish, an early biplane for instance can be flown slowly and realistically with intelligent use of the throttle.

Multi engined models also lend themselves to control line operation as asymmetric power is normally quite easily controlled on this type of model due to its inherent lateral stability and therefore the all working, bomb dropping, retractable undercarriage, 'Lancaster' is quite reasonable for the experienced modeller.

Other considerations

Having decided on jet or propeller, single engine or multi, we must next take into consideration some outside influences before making a final choice.

If you are lucky enough to have a smooth tarmac surface to fly from, that will take 60-70ft lines, then models with delicate retracting undercarriages can be seriously considered. If like most of us you fly from a grass field then a sturdy fixed undercarriage will be necessary, or even perhaps no undercarriage at all! This last option although initially attractive, means that two of the most satisfying facets of flying a control line scale model are lost i.e. take-off and landing.



Ron Truelove's one eighth scale Boeing F4B-4. Wingspan 45 1/4 ins. recommended power 6.5 - 8cc comprehensive plan (from APS - C/L 1273) but not for the beginner

own which I hope to deal with in detail in a future article.

The most important items are some large, good quality photographs, of the whole aircraft, preferably showing the outlines of the major shapes i.e. fuselage, wings tail etc. and most important: a *three view drawing*. Dozens of detail shots of parts of the aircraft are all very well, if you are building a fully detailed model for the World Championships, but if the basic shapes and

and sixties and were originally powered by unthrottled diesel engines using a basic two-line control system.

A couple of designs stand out as well tried practical models, firstly a fairly straightforward project would be the Sopwith '1 1/2 Strutter' (APS plan CL/651) with a span of 48 in. (1219 mm). This model although recommended for 3.5-5cc engines will take a 10cc throttled glow motor and in this form will loop quite easily. It is a model that is equally well at home on grass or tarmac and there is ample documentation to authenticate the model if necessary.

The other model that comes to mind is a stage on from the 'Strutter' and is Ron Truelove's Boeing F4B-4 (APS plan CL/1273). This is a fairly recent plan for a 45 1/4 in (1149 mm) span model designed for 6.5-8cc engines and is very comprehensive, showing rib for rib construction and finishing details. The original model won several competitions and is a subject for those who enjoy building as much as flying.

A further choice is to convert one of the many plans or kits designed for Radio

Below and below right, another model from Bernard Sexton's prolific collection, this time a profile scale Raab Katzenstein RK-25. Wingspan is 36 ins and proposed power plant a Cox 09 'Medallion'.



A smooth three point landing with a heavily loaded model, on a blustery day, is one of life's more satisfying experiences! So the choice has narrowed and no doubt there are many other considerations that you can think of. The size of the model may be determined by the size of your building board or the interior of your car, but here the two piece model may be the answer...

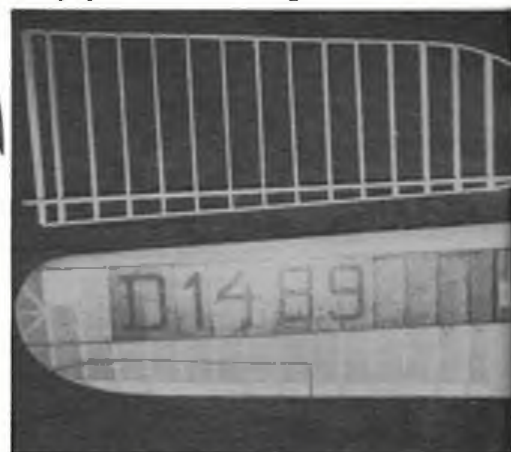
Where to start

Whatever your standard of modelling, if you are going to build a scale model you will need some reference material for shape, proportion, colour and markings etc. If the model is intended for competition then some of this material will eventually be used for documentation. But this is a subject on its

proportions are inaccurate then any amount of detail will not make the finished model look realistic.

The quickest way of producing a scale model is to use a commercially available plan or kit, but here the choice of control line scale kits is very limited (some would even say that there are no truly scale kits). A study of the *Aeromodeller* range of plans for this class of model will show that almost without exception they are designed to a scale resulting in single engined monoplanes in the 30-40ins. span range, single engined biplanes in the 20-30ins. range and multi engined models of 40-50ins. span.

Most of these designs date from the fifties



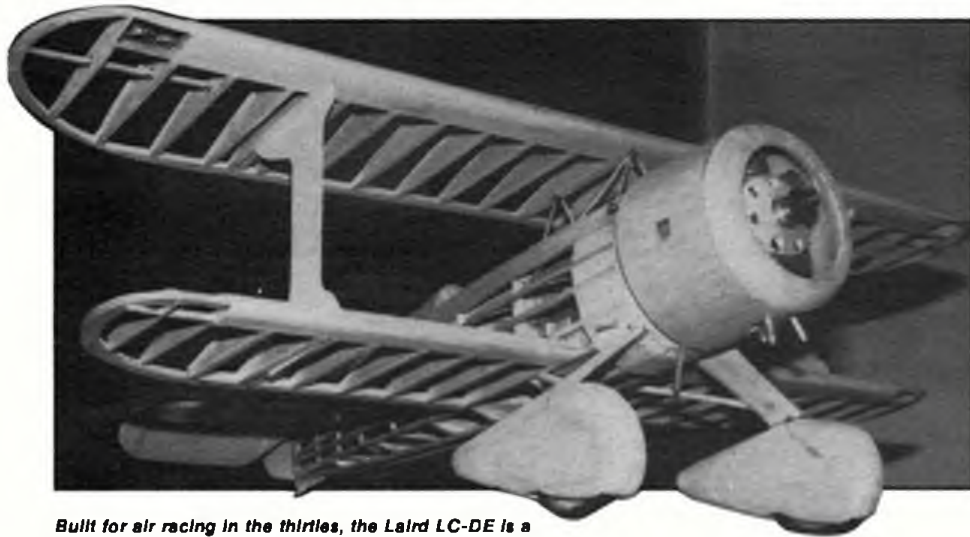
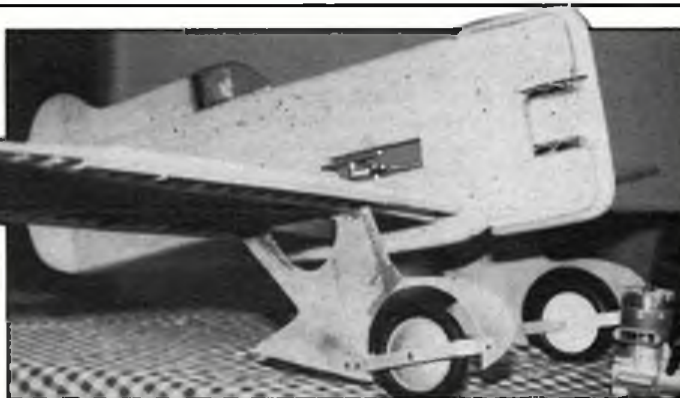
Control. These are usually to a larger scale (1/6th or 1/7th typically) and designed to be powered by 8-10cc (0.40-0.60 cu. ins.) glow plug engines. These designs are usually around 60 in. wing span for a monoplane and slightly less for biplane subjects.

The fact that they were developed for Radio Control is not a drawback and in fact dual purpose models that can be flown R/C

as well as C/L are not unknown, but that again is a subject beyond this present article. Basically all that is required is to plan the bellcrank position, lead outs, pushrods etc., retain the moving surfaces i.e. ailerons and rudder (the elevator will be used in the conventional manner of course).

The ailerons and rudder can then be used for trimming to obtain the best compromise between line tension and drag. Particularly recommended are the range of plans available from MAP, Brian Taylor and Dennis Bryant. The latter two have a selection of mainly World War II types to a consistently high standard of accuracy, which are very simply converted for control

Another profile scale control liner under construction - the chunky lines of the Gee Bee 'Model Z' should make interesting flying in windy conditions...



Built for air racing in the thirties, the Laird LC-DE is a seldom seen subject. This 39 in wingspan version is modelled on an original built for Howard 'Johnny' Johnson...

line operation. The vast range of kits for R/C models covers the whole spectrum from multi-aerobatic models described as 'Scale' to truly accurate offerings such as the Fournier RF4 by Mick Reeves Models. A scan through one of the R/C modelling magazines will reveal many interesting subjects.

If your choice is an obscure one, and due to the inherent stability of the C/L model 'odd ball' subjects become more attractive, then there will probably be no choice but to scale up a small three-view plan or tone drawing (i.e. profile) and then design your own structure.

Pipe dreams into reality

As an example of the variety of subjects for control line scale I recently paid a visit to that prolific modeller Bernard Sexton and was treated to the sight of a collection of projects which represent a supreme effort of scale modelling, having all been built during the past few months.

Fistly, the model nearest completion. This is a 37 in. span replica of the 'Art Chester Jeep' 'an American' Goodyear pylon racer powered by a throttled HB 20 and using a Williams bellcrank and three-line control system. The airframe weight, tissue covered and unpainted is 1 lb. 10 oz., it will however be covered in silk over the tissue before painting, and should look very attractive in the original green and cream colour scheme.

The engine fits very neatly in the deep cowl and a Du Bro exhaust manifold is linked to some aluminium tubing to exit in the scale position.

Next in line is a very impressive model of

the Laird LC - DE (Serial No. 190) single seater biplane, built for air-racing during the thirties for Howard 'Johnny' Johnson.

This is a larger model than the 'Jeep', with 39in. wingspan, 31½in. long and the uncovered airframe weight (with engine, tank and silencer) is 2lbs. 12oz. An MVVS35 is installed at present but Bernard plans to replace this with an OS 40 before the model is test flown. Once again the trusty Williams bellcrank is used and a home made exhaust system has been tailored to fit inside the cowl with exit pipes in the scale position.

The construction used is more robust than that of the 'Jeep', utilising beech engine bearers running through to the fourth fuselage former and this together with the undercarriage bracing and wing cabane structure concentrates the main loads into this well braced area.

Although some photographs of the aircraft are available the three-view drawing was a problem and eventually a peanut plan (from *Model Builder* magazine) was scaled up; unconventional but effective!

As if these two projects were not enough I was then shown two more control line models and a free flight model. I generally find profile models difficult to equate with scale modelling but in the case of the next model. I was quite impressed...

The 'Art Chester Jeep' will use a Williams bellcrank and three line control, engine fits neatly in the deep cowl. Covering shown here is tissue - this will be covered in silk in due course.



The aircraft is the little known Raab-Katzenstein RK-25, built in 1928 for the 1929 Europaflug (a two week European flying tour). As can be seen in the photograph this is a two seat low wing aircraft of very clean lines for its era.

The model is 36in. span and 24½in. long, powered by a Cox 09 'Medallion' and controlled with a two-line bellcrank. The airframe is covered in Jap tissue over *Modelspan* and all the markings, registration numbers and letters, cheat lines etc are all tissue - no paint has been used at all. Even the propeller laminations are tissue strips!

The weight is a little over 1lb. and a good flight performance is to be expected. Another profile model is the Gee Bee 'Model Z' which at 35½in. span and 21½in. long appears to have almost as much fuselage side area as wing area. This should provide some exciting moments when flown in windy conditions and developments will be watched with eager anticipation...

Finally, a free flight model that should not strictly speaking be included in this article, however as it is being built by a scale enthusiast I think that it deserves a mention. The subject aircraft is the Avro 'Type G' which was the world's first cabin biplane. It was powered by a 60 HP Green engine and flew in the 'Military Aircraft Competition' at Larkhill in August 1912.

Two further claims to fame for this fragile looking machine are that it recovered from a spin (only the second aircraft to achieve this) and during a flight to Upavon, H.V. Roe flew as a passenger in the cabin and typed the first letter in flight (presumably his last will and testament)!

The model is 25in. long and 28½in. span designed for rubber power via a home made gearbox with a 2.5:1 reduction ratio, although the possibility of CO₂ power using a Cox .010 with Davis conversion has not been ruled out. The gearbox is constructed from plywood using brass bushes for the shafts and gears available from *Ballards* for RTP models.

Events Calendar

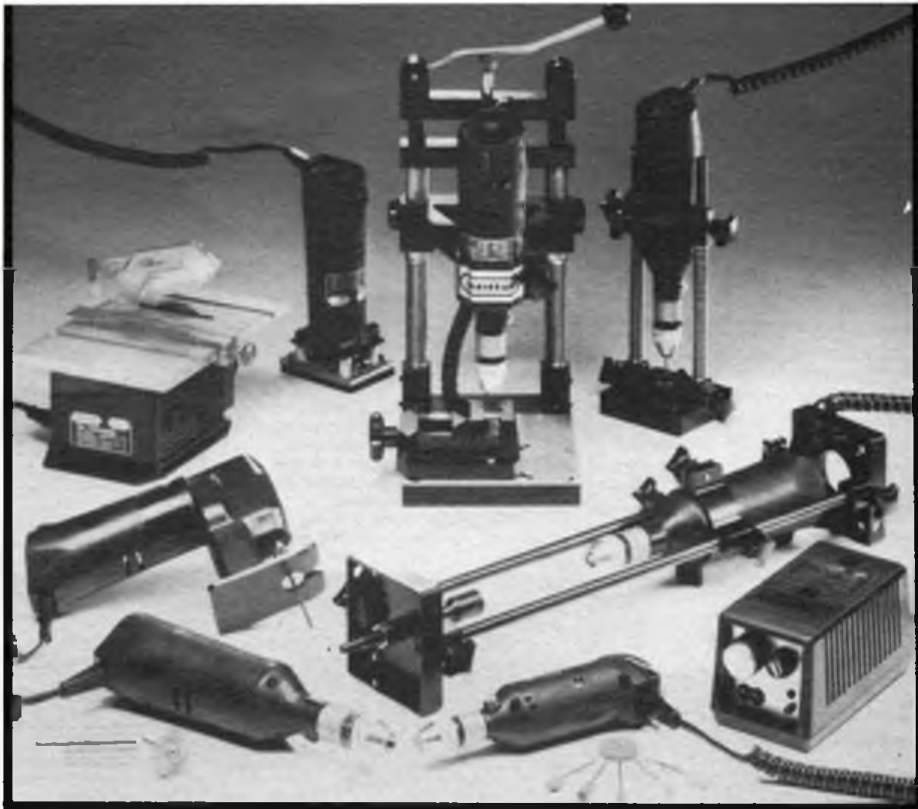
The Scale day at RAF Abingdon, Oxon listed provisionally for July 7th in the April issue is now confirmed. See you there?



THERE CAN BE LITTLE DOUBT in anyone's mind, that the face of aeromodelling has changed drastically since the oiled silk and bamboo days. Today, despite the current urge to recreate those by-gone days, much high technology exists in our chosen hobby. Radio, of course has seen an increasing dependance upon modern technology but even in free flight and control-line, enormous strides have been taken in materials and design. Not only the materials that we use, but also the tools with which we work these materials, have tended to move into the modern era.

Of course, it can be argued that it is still possible to produce a winning model from only the most basic of hand tools, but it cannot be denied that many of us now use sophisticated equipment. Power tools in particular have come to the fore and there can be few of us who do not own an electric drill.

As more and more of us move that way, it might seem prudent at this point in time to consider just a few of the popular ranges of equipment. Before anyone reaches for pen and paper, however, to state that I've omitted their favourite Smiths and Bloggs



Mini Powertools

Ian Peacock takes an introductory look at power tools found in the modern modeller's workshop.

- in the workshop

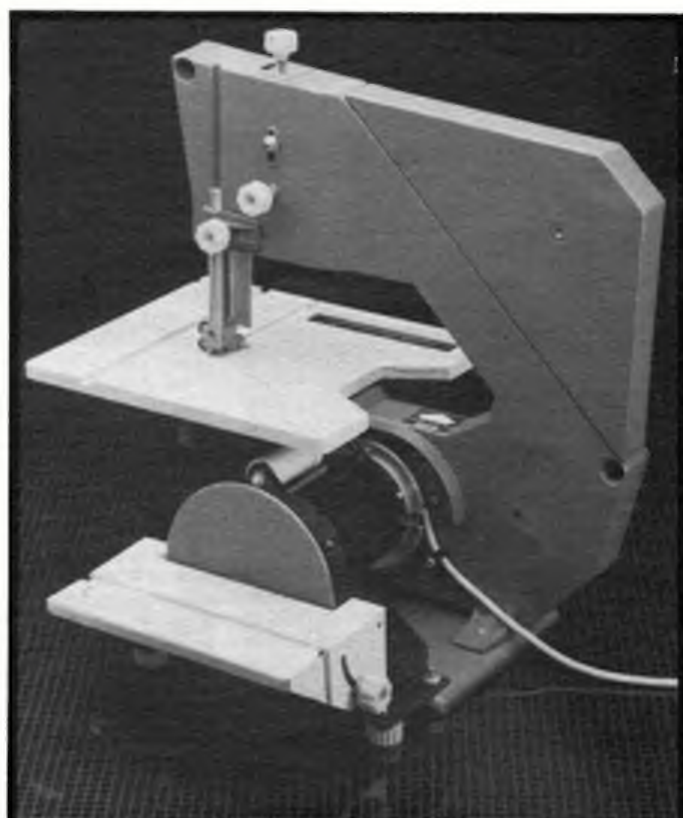
patent saw/drill, etc let me state right away that this is not intended to be an exhaustive list of current and past manufacturers, but rather a brief resume of a couple of the more popular ranges available. Furthermore, these ranges are widely available through model shops, tool shops and specialist mail order houses, and have been subject to considerable use (not to mention abuse) at the hands of the author.

Mini Tools

The mini-drill, operating usually from a low voltage D.C. source (batteries or transformer/rectifier unit) has been with us for a considerable time. Some names such as *Expo* and *Precision Petite* have been around long enough to be almost household names. More recently, however, other well known companies have ventured into this field. Most notable is the name of *Black and Decker* whose name is a 'standard' in the field of D.I.Y. tools.

The majority of these tools revolve(!) around the universally accepted and well proven 540 type motor. To the uninitiated (or to anyone who has never built and R/C car or buggy) the 540 type motor has, for many years been the 'standard' motor

Above, the Black and Decker 'Minicraft' range of power tools all run on a low voltage and offer quite a selection to choose from! Right, the Burgess Power Tools 'BK3 Plus' although not at a price to buy out of your pocket money offers facilities that make it worth saving up for!



for the majority of $\frac{1}{12}$ th scale cars and $\frac{1}{10}$ th scale buggies. It has also been frequently used in the model boat field and that of electric flight. MFA's 'Hummingbird' motors are of this basic type.

These motors offer a good power output on a range of D.C. voltages from about 6v up to about 18v. Much over 18 volts will bring about accelerated failure and so the majority of mini tools operate at around 9v - 12v. A byproduct of the D.C. supply requirement is that these tools are portable! Therefore, there is no reason why they cannot be taken with one, when visiting the flying field, operating them from a car battery for on field repairs or modifications.

However, back in ones workshop/spare room/backshed or even kitchen table, 12 volts D.C. is not customarily available.

power. They are therefore better suited to the less demanding work. They usually have a smaller chuck or collet system restricting the capacity to, say drills of $\frac{1}{8}$ in. diameter (3mm) or less. This does not, of course, render them useless. On the contrary being smaller in overall size, they are often easier to use, say, inside a fuselage, where space is severely restricted.

More recently the introduction of the German 'Minicraft' range to the U.K. by Black and Decker has vastly increased the type of motor driven power tool to the modeller. The majority of these new tools

nucleus of the low voltage power workshop for many years to come. Furthermore, they are now widely available from most good model shops since Flair Products undertook the distribution on behalf of B & D.

There are four drills in the range. The two smaller units being 40 watts power rating yet retaining the availability to rev at some 20,000 r.p.m. The smallest is the 'Prince', with a set of 3 collets and offering up to 2.4 mm dia capacity. The 'Topi' is the other 40 watt model but this features a fully variable keyless chuck of 3.2 mm capacity. Next up is the 'Impala'. Slightly larger and more powerful at 60 watts, this too features the 3.2mm chuck.

Top of the range is the 'Buffalo', with the chuck shaft supported in ballraces. Power is a full 100 watts at around 17,000 revs per minute. Having a bit more go, it can handle bigger jobs and comes equipped with a slightly larger keyless chuck of 6mm ($\frac{1}{4}$ in) capacity. However one must not get carried away, for although this is quite a powerful gadget one cannot expect to smash a $\frac{1}{4}$ in hole through $\frac{1}{2}$ in mild steel in just a few seconds!

There are a considerable number of useful 'goodies' available to use with these drills in terms of circular saws, grinders, polishers, routers, sanders etc. etc. and it might pay to make broad hints as birthdays or anniversaries approach, for these drills are available not only individually but in varying 'gift sets' containing various cross sections of accessories. The car care kit for instance contains not only 8 accessories but also has an adaptor to enable the drill to be plugged into a cigarette lighter socket.

The 100 watt unit is the prime mover for the remainder of the range of tools starting with the Jigsaw. This unit is a miniature replica of the hand held jigsaws more commonly encountered in D.I.Y. shops. The integral gearbox provides 5000 strokes per minute and the blade is narrow enough to allow quite delicate and fancy scroll work.

Cutting capacity is quoted as 10 mm ($\frac{3}{8}$ in) in wood but in practise it starts to complain a bit on plywood much over $\frac{1}{4}$ in. thick. However soft balsa of up to 1 in. thick is quite manageable. Soft metal, dural, brass etc is possible provided that one does not try to overdo it. 10 SWG Dural u/c blanks were successfully cut by just taking

Above, some of the fine range of drills, routers, grinders, polishers and cutters that are available for the Precision Petite range of mini power drills.

What is needed here is either a) a suitable 12 volt battery or b) a mains driven power source. Whatever you do **NEVER** connect one of this style of tool directly to the mains! (There are mains driven mini tools and they are extremely valid. However it is hoped that these will form the subject of a future tool article.)

12 volt batteries (i.e. three 4.5v flat cells) are suitable but best avoided due to the current taken by the motor and the constant cost of replacement. Rechargeable cells are better financially and technically, with 12v motor cycle batteries or Nickel Cadmium cells being top of the list. Two ex-buggy Ni-Cads in series would be a good choice.

However, in a well equipped workshop it is more likely that a mains driven transformer/rectifier unit will offer the best solution. Many of these are produced expressly for mini tools, both of the fixed 12 volt type and of the more complicated variable voltage types. Whilst a little more expensive, a fully variable voltage, makes for greater versatility in the use of the tool.

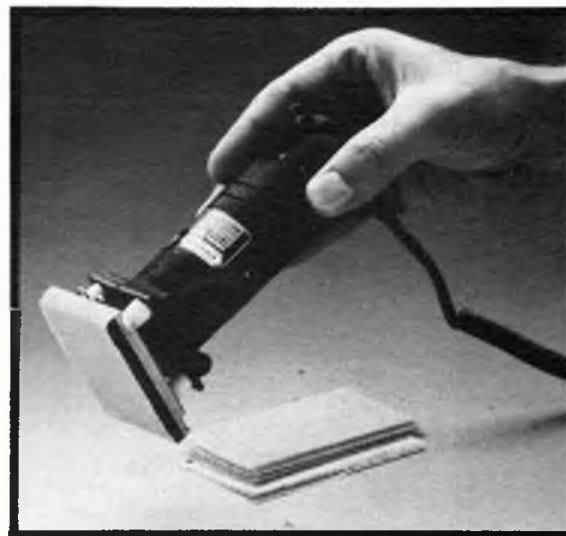
Some of the smaller mini tools make use of the baby brother of the 540; they operate on the same voltage but have less

Above, the Precision Petite drills may be purchased with many different accessories (or none at all...). The package seen here includes mains transformer, drill stand and flexible drive, not to mention a range of drills, grinders etc.

make use of the Johnson, 540 type, motor as their motive power, but they now open up much wider scope than just drilling (or other drill orientated functions such as routing, polishing etc).

Perhaps this is the point to pause and look at this range of tools one by one for they or similar models are destined to form the

Below, at first sight you may be forgiven for thinking that this miniature orbital sander is a toy... far from it, many modellers have found them extremely useful...



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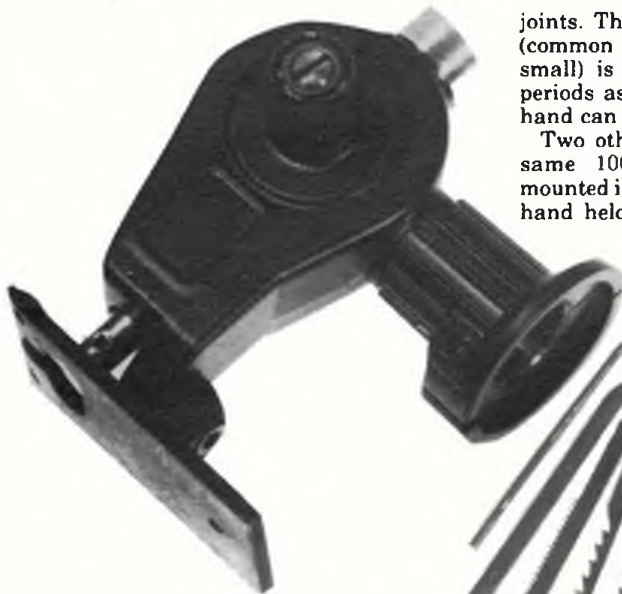
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Above, this picture is probably larger than life size! It is a jig-saw attachment for the diminutive Precision Petite power drill...

time over it and not trying to do it all at once! Remember - there is only 100 watts of power available.

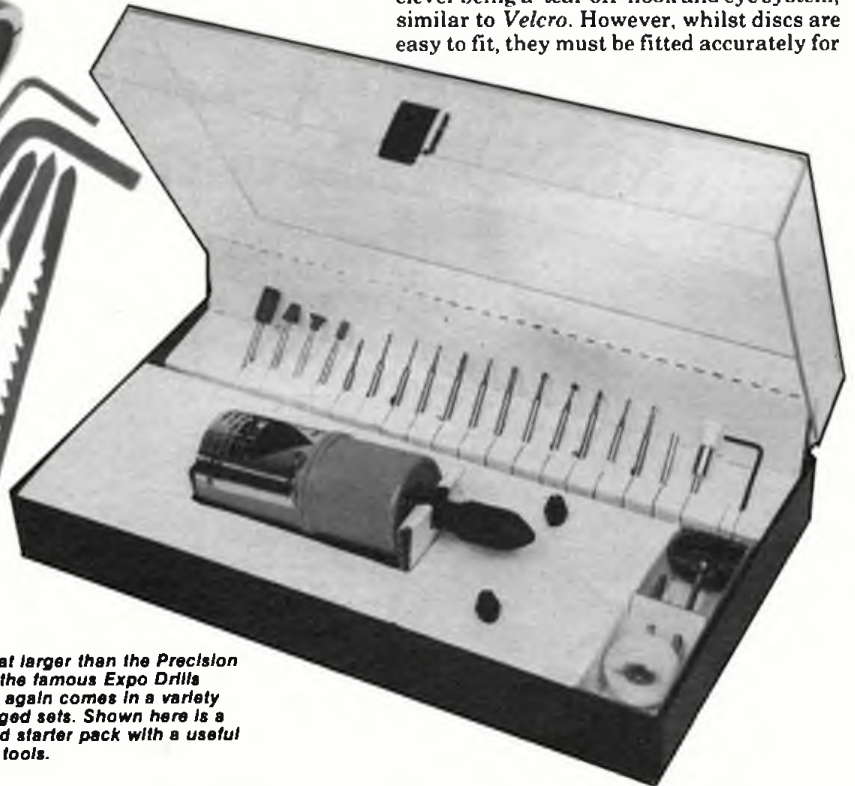
Still on the same basic body, is the orbital sander, again a miniature replica of D.I.Y. tools. Its small size makes it ideal for model making but, like most powered sanders, it is all too easy to remove *too much too quickly*. It was found to work well in awkward situations due to its small dimensions yet did not balk at heavier work, such as sanding the glass/resin layer on foam wing

joints. The only slight area of complaint, (common to all orbital sanders, large or small) is that one cannot work for long periods as the vibration is high and one's hand can only stand so much at one time.

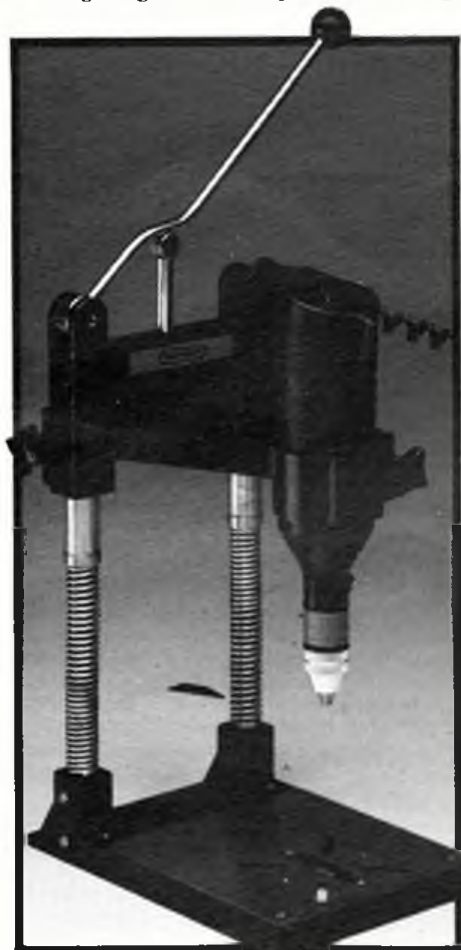
Two other most useful tools employ the same 100 watt 540 style motor but mounted in bench type tools rather than the hand held variety. The first of these is a

Having cut one's wood, it will usually require sanding! Here comes the final 'goody' in the range - a bench mounted disc sander. Not surprisingly, the sander looks like a small version of its larger brothers, and like the saw, rotates at about 17,000 rpm and is best screwed down when in use.

It features a calibrated rest and has a 77 mm diameter disc. The disc fixing method is clever being a 'tear-off' hook and eye system, similar to *Velcro*. However, whilst discs are easy to fit, they must be fitted accurately for



Somewhat larger than the Precision Petite is the famous Expo Drills minidrill, again comes in a variety of packaged sets. Shown here is a very good starter pack with a useful range of tools.



circular saw. Like most saws it features a blade guard on the grounds of safety and is equipped with parallel and bevel guides to ensure accurate cutting. Normal operating speeds at the full 12 volts are around 17,000 revs/min. which is fine for balsa (up to about 1/4 in. thick) or thin ply but it makes hard work of ply from 1/8 in. up.

It was found to cut clean and straight with little wastage and was ideal for stripping spars, longerons etc from sheet stock. Apart from the standard saw wheel, a diamond tipped wheel is available as an extra and when suitably slowed down (via the variable power unit!) this wheel is capable of cutting (if somewhat slowly) quite hard materials like piano wire. Because of its design this unit really would benefit from being screwed down to the bench when in use.

Left, 'Minicraft' drills may be fitted to this useful and reasonably substantial drill press - Ideal for drilling vertical holes in engine bearers! Right, up in size (and power) from the Precision Petite and Expo Drills this Minicraft drill offers a larger chuck and whilst it may not be used in such a confined space as the others, is still small enough to be REALLY useful...

at 17,000 rpm, out of balance discs cause considerable vibration. Like the orbital sander, care should be exercised using this machine for it is ever so easy to take too much material off too quickly, even to the extent of sanding the ends of one's fingers.

As stated earlier, for workshop use, a transformer/rectifier unit is preferable and not surprisingly in a complete range such as this; B & D offer two such units, one at a fixed 12 volts and one fully variable. The variable unit is almost twice the price of the fixed voltage supply, but if one is considering setting up a system from these 'Minicraft' units, it is probably worth the extra for the flexibility that this offers.

There are a lot of other useful goodies on offer that, in the correct circumstances can extend the versatility of these mini systems. Drill stand - turns the hand drill into the



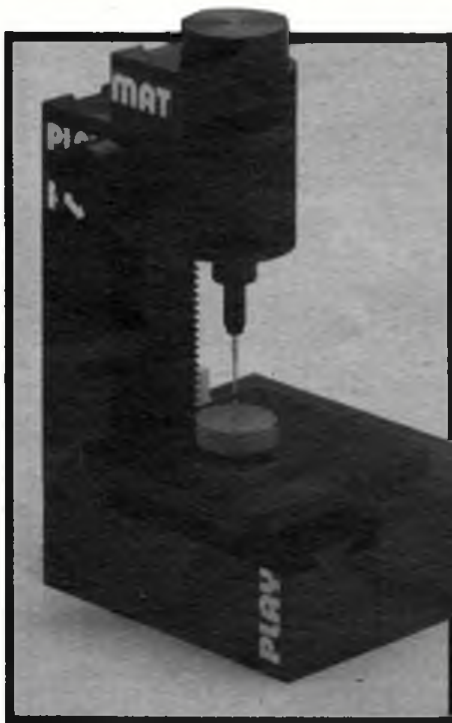
vertical drill. Lathe attachment - allows turning in wood and soft metals. Router - useful for groove and slot cutting. Flexible shafts - increases the flexibility (?) of the drill systems. In fact in terms of mini tools, the modeller has a wide range of tools and accessories to choose from.

Maxi Tools

At the opposite end of the world as far as tool design goes is another household name - Burgess. Like *Black and Decker*, *Burgess Power Tools* have been around for simply ages, their tools having firmly stood the test of time. Although the range is vast, as we will see, probably the best known of all the *Burgess* tools is the 'BK 3' bandsaw. Developed over a number of years (from earlier models like the 'BBS 20' that I have used since 1975) It has now emerged as one of the tools for the serious model enthusiast.

The 'BK 3 Plus' is even better; incorporating, as it does, many extras and could have been made with modellers in mind.

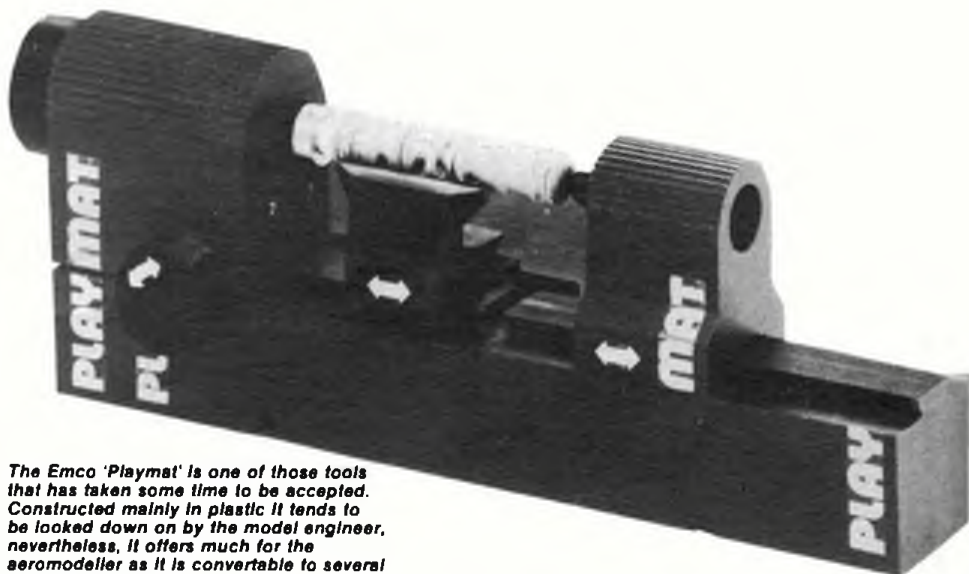
Below, the Emco 'Playmat' seen here in its 'drilling mode', straightforward controls make it exceptionally easy to use.



In fact it has been designed more for the D.I.Y. enthusiast but with construction more in line with current industrial practice. It is mains powered and features a motor of sufficient power that it is unlikely to ever encounter model making problems that it cannot overcome.

The prime concern with a bandsaw is its throat and depth the 'BK 3' has a 12 in. throat and a 3 in. depth of cut. It has two blade speeds, High at 1300 ft/minute, suitable for general purpose work and low at 350 ft/minute, suitable for metal cutting. The table to the saw is a full 12 in. x 14 in. and can be tilted against a graduated scale from zero to 45°.

Part of the standard package of



The Emco 'Playmat' is one of those tools that has taken some time to be accepted. Constructed mainly in plastic it tends to be looked down on by the model engineer, nevertheless, it offers much for the aeromodeller as it is convertible to several machines as the pictures on this page demonstrate.

accessories is a straight-edge cutting guide and a mitre fence. The 'BK 3 Plus' has additional optional features not usually seen in a bandsaw of this cost, namely it can be converted to either a jigsaw or a fret-saw. This attachment provides a maximum depth of cut of about 1 1/4 in. with a cutting stroke of just over 1 1/2 in.

This offers the user the two major alternatives to a bandsaw in one unit, and in one fell swoop, removes the prime criticism of this type of saw. - i.e. that one cannot cut inside holes! Set up as a fret-saw the blade is supported top and bottom, just like a conventional fret-saw, and the narrow blade offers the option of cutting round very tight corners.

Below, probably its most useful mode - the Playmat can be used as a jig-saw, cutting ply up to 3/16 in. thick, it also has an extremely useful (if rather small) disc sander - ideal for sanding ply templates and formers to size.



The jigsaw fitting, supports the blade at only one end with the hollow ground blade performing as a conventional jigsaw. Another standard accessory from Burgess for the 'BK 3 Plus' is a circle cutter. It enables perfect circles to be cut over and over with amazing ease. It really is the cat's whiskers for cutting out reels for storing C/L wire! The 'BK 3' is the basic bandsaw but *all* of these extra fittings come complete with the 'BK 3 Plus'. The whole saw is supported in vibration cushioning feet and is remarkably quiet in its operation.

Best bit last. .

Probably the greatest step forward from the old BBS20 series has been the incorporation of a sanding disc. Fitted

directly to the rear of the drive motor is a full 7 in. diameter sanding disc, complete with adjustable table. The size and power of the motor is such that balsa can be made to disappear in micro seconds! Watch the fingers carefully for more here, than with the 'Minicraft' sander, one can rapidly loose the odd finger nail or two!

Like most modern bandsaws the 'BK 3 Plus' can be fitted with varying blades. The General Purpose blade, as its name implies, is fine for most modelling jobs but fine toothed blades are offered for cutting metal and it was found that this blade fairly sped through the 10 swg Dural used as a test piece.

Furthermore, one can obtain a sanding belt to fit in place of the blade. Such a narrow belt can be extremely helpful when trying to sand small pieces or large pieces with small cutouts. The quality and versatility of this unit belies its expense and I, for one, would venture to suggest that once purchased, it would keep you going for life.

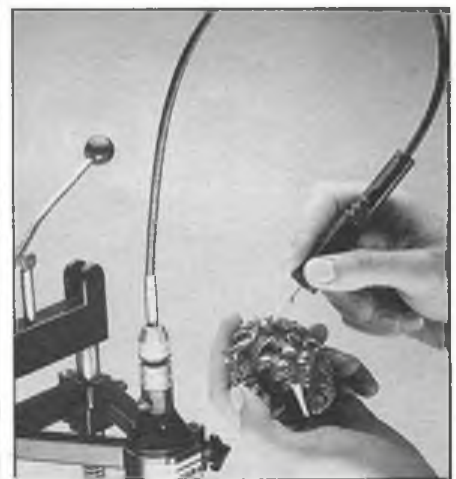
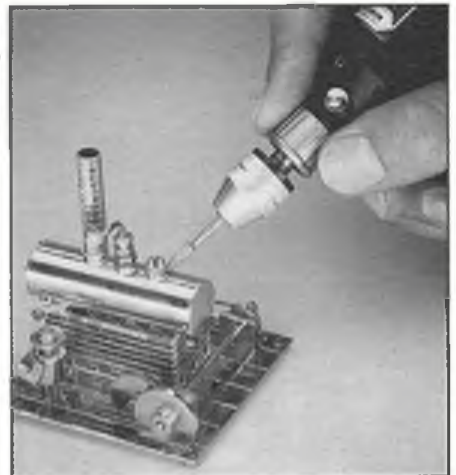
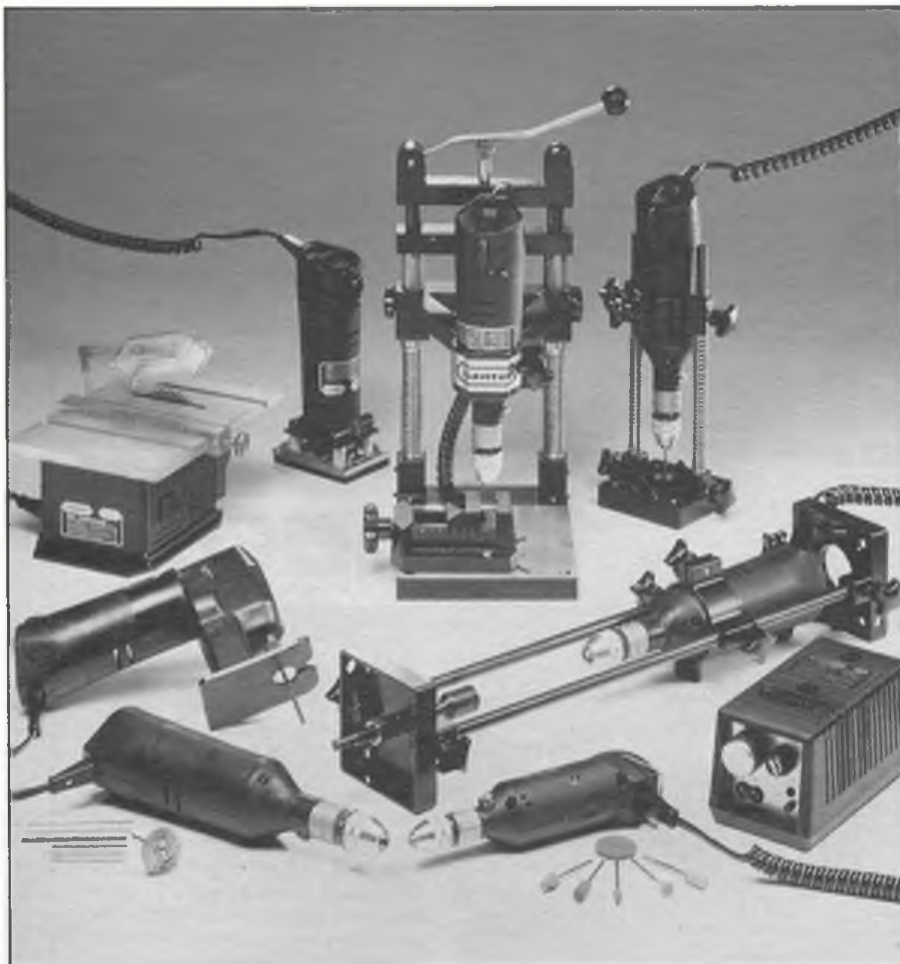
Although we have dealt with just a few of the small power tools available to the modeller - there are now many on the market that could make operations at the workbench easier and quicker. You can even get a simple lathe/jigsaw/pillar drill (the EMCO Playmat) for under £50:00! Move into the motorised age, you could find it addictive...



Behrendt

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AIRSHIPS have fascinated me for many years now, but it wasn't until about seven years ago that I began to experiment with working model airships.

The initial reason for building them was partly for the sheer pleasure of owning and flying my own aircraft and also to gain some idea of what it must have been like to operate these craft back in their heyday, between 1920 and 1937.

Unlike most other forms of historic transport there is very little to be found on airships in museums or archives etc. You might be lucky enough to find a few photographs, a brief description, or the odd piece of girder here and there but no hard evidence. There is nowhere in the world where you can go and clamber aboard a real Zeppelin or one of the early Italian military ships to see how they were actually put together. Faced with this prospect I was determined to have a go at building my own airship. Many hours of research preceeded my first attempt.

The first barrier was locating a suitable lifting gas, the second was finding a gasproof envelope material. These having been found the next problem was to build in a lightweight gondola and power source.

'Phoenix-1' became the result of these early endeavours. Powered by a small



MODEL AIRSHIPS

~one man's approach

Nick Wells spends most of his waking hours thinking of airships...



electric motor and wooden propeller (homemade) she was 7ft long by 2ft wide. The rudders and elevators were preset before launch and having been trimmed with lead ballast she was guided around at the end of a nylon line. 'Phoenix-1' wasn't the most elegant of dirigibles but I learnt a good deal from those early flights and went on to build 'Europa'.

Measuring 8ft by 2.5ft, 'Europa' held about 18 cu. ft. of gas and like the previous ship had an envelope made of a thin ICI polythene material glued together at the seams. The car and fins were of balsa covered in doped tissue. Two Mabuchi electric motors were supplied from a battery on the ground and the ship was intended to fly RTP using a nose and stern line to the pole top swivel. However the lines kept tangling up as the ship bounced around in the breeze and the whole set up was a complete failure!

I did learn that superheating of the gas creates quite alarming differences in the hull pressure and that any future models would require a proper fully automatic gas

Above, Nick 'leads out' the 30ft. long 'Airspeed-5' prior to, left, tethering his floating friend to the mooring mast.

valve. Engine power was also still way below that needed for a R/C ship. The large amount of drag created by the hull being one of the main downfalls of airships. Both previous models were inflated with Hydrogen gas.

The third model was a copy of the 'Sea Scout' class of non-rigid used in the first world war for ASW work. The envelope was again made of a polythene film glued and heat treated along the seams. 'SSZ-77' was by no means successful due to a leaky envelope, faulty gas valve and low maximum speed (about 10mph). Only one flight was made with this model before she was dismantled to reclaim the radio gear for another ship...

Her main drawback was the limited endurance of the electric motors. Obviously on flights of longer duration, the battery charge slowly fell and so did the motor rev's, leaving 'G-1' at the mercy of any strong breeze that might, and very often did, blow

Just a big plastic bag! Prior to initial tests there is always the nagging doubt about the security of all those seams...



At last in 1981 I had my first real success with 'G-1'. This model is a copy of the US Navy's ASW and convoy patrol blimps used in the Second World War to great advantage. Once more balsa is used for the car and stabilisers but for the covering material; cling film is stretched taught and glued onto the frames. This saved a substantial amount of weight, a prime factor to consider in airship construction. Containing 60 cu. ft. of Helium, 'G-1' stands 13ft. long by 3ft. wide with an envelope of metallised *Melinex*. Six panels or gores of *Melinex* are glued and heat sealed edge to edge with strips of the same material.

An automatic gas valve is located on top of the hull to disperse any overpressure. On the nose a small reinforced cone and mooring ring allow the model to dock to a masthead swivel. The car contains the elevator and rudder servos, receiver, batteries, electric motors and ballast. A well sprung landing wheel attached to the underside of the car provides protection against heavy landings and gives the craft a taxiing capability.

To distribute the weight of the gondola and to avoid distortion of the hull under load. 16 nylon lines run from four mounting points on the roof up to two seven foot long catenary curtains, glued inside the top half of the hull.

'G-1', took off on her maiden flight on a summer's evening in July, 1981 and immediately began to prove herself a very controllable airship. I think the term used is 'a nippy little mover' albeit at just 15mph! With upper and lower rudders hard over and at full speed the model had a turning circle of about 90ft. Climb and descent were also quite responsive and good results were obtained with no more than 20 degrees on the elevators either way.



So far...so good, the only 'hissing' to be heard is that of the Helium filling the craft. A cheaper grade of Impure Helium is normally used for airships of this type.

up. The model was flown with a 40ft stern line for retrieval purposes!

After a number of very instructive and pleasurable flights, 'G-1' was put into storage in Nov. 1981.

An airship's worst enemy is the weather, building one strong enough and powerful enough to combat it is not the easiest thing in the world to do. I tried to design the most recent model, 'Airspeed-5', to operate efficiently in reasonably bad weather conditions. The one thing the critics always say that they can't do...

Although it has the same hull shape and

volume as 'G-1', the material used this time is metallised nylon (24 micron) heat sealed together. This type of film has exceptionally good gas retention qualities and the ship needs only a small top up once a week. Gas purity is also maintained at a high percentage.

Again the gondola is suspended from two catenary curtains spaced slightly wider this time inside the envelope. The gondola dimensions are: length 24 inches; height 5.5 inches; width 7.5 inches.

Its basic construction is balsa frames joined by spruce stringers, with sheet balsa floor and roof. The two engines are mounted either side of a Duralumin spar. This is bolted where it passes through the gondola to two plywood bulkheads. Balsa is fixed to this to create an aerofoil section and form the engine pods.

All the main controls, fuel tanks etc, are enclosed within the car and are accessible through the car doors either side. The radio gear is a *Sanwa* four channel system with the following functions:-

Rudder, Elevators, Throttles, Gas valve.

The car is now covered in plastic sheeting and *Solarfilm* (original skin was cling film). Power comes from two *Enya* 049's, each swinging a 6 x 3 in. prop. At full throttle they drive the ship through the air at around 25 mph. Fuel tank capacity gives a max endurance of 20 mins and a safe flight time of 15 mins.

The control surfaces are mainly balsa but the elevators themselves are bigger than 'G-

1' with a surface area of 0.57 sq ft each. The fins are *Solarfilm* covered and detachable. As with the full size non-rigids, they are braced onto the envelope using patches and wires. The cruciform arrangement is conventional and gives better stability.

On top of the envelope amidships is a gas valve operated from a micro-servo inside the hull. This gives the obvious added safety feature that in the unlikely event of a total 'engine out' situation, the model can still be brought down quite quickly. The servo can also be adjusted to allow opening of the valve at a variety of pressure settings.

During a power failure with the radio control, the servos jam with rudder hard to starboard, elevators full up and valve fully open. This brings the craft down in a slow spiral with engines on tick over.

Control to the elevators and rudder is via closed loop systems using 20 lb. nylon line. On leaving the servo arms the lines run out through the rear of the gondola and via plastic tubes up around the belly of the hull and out to the elevator horns. Those to the rudder run straight out beneath the envelope and through wire eyelets on the fin to the surface itself. On the nose is a fibreglass cone which incorporates a small metal boss for fitment into the mooring swivel on the mast. I frequently moor the model in this way when caught outside in bad weather. It really is the best possible way to tether an airship as it allows the craft to 'vane' freely with the wind. Any attempt

Above, 'Airspeed-5' gassed up and ready for the next stage note the rigging wires holding empenage in position. Below, two Enya .049's attached to the 'car' can drive 'Airspeed-5' at about 20 m.p.h.



found on frosty winter nights will again increase the lift of the Helium. One reason why the Zeppelins preferred to attack on such nights - as their bomb load could be greater. Conversely, surrounding warm air and low pressure will decrease lift, as of course will flying a 'warm' ship through cold air.

- 3) This done the engines are primed and run up on what I call 'starting blocks'. Simply some wooden fixtures on a box that hold the gondola and engine pods, raising them up to a comfortable height for access and hand starting. Once tuned together the engines are throttled back.

Finally after checking the controls the ship is released from the blocks and cast off.

The main objective now is to get clear of the ground, trees, houses etc and into clear air quickly. Having gained cruising height - about 50ft, I usually throttle back as the extra power isn't required. Like some of the 'heavier-than-air' enthusiasts amongst readers will appreciate, there is a certain quickening of the pulse when taking on the

to restrict it's movement, as with a sea going vessel, is usually detrimental to the hull structure. A 10ft stern line is provided for landing and a lighting circuit was built for the ship but has yet to be installed.

Test flights were made inside one of the big hangars at West Malling aerodrome, but once I was satisfied with her performance the following flights were all made outside.

Preparation for launch is fairly straightforward and normally consists of the following:-

- 1) The model is laid out and inflated on a small groundsheet. This takes about 15mins. and has to be done out of the wind.
- 2) Fuel tanks are filled using a hand pump. The ship is then trimmed and weighed off. This requires the addition of lead ballast to ensure the ship is on an even keel and is neither too 'light' nor too 'heavy'. However, 'Airspeed-5' can fly with up to 6oz overweight using dynamic lift. Obviously as fuel is burnt she will become progressively lighter. Airships fly better when heavy and 'A-5' takes full advantage of this. Weather conditions also affect how much she will lift on any given day. For instance, on a sunny day the gas will be warmed up and will expand. This is 'superheating' and it will also occur during high speed climbs or dives. High barometric pressure, such as

Right, clearer view of the 'car' and positioning of the two engines, each driving a 6in. x 3in. propeller. Far right, drawings of one of Nick's latest airships, 'Airspeed-6'. Scale as shown here is approximately 50:1.



elements with such a craft you've built yourself.

On calmer days though, LTA is one of the few forms of flying where you can relax, sit back, open a can and leave the 'old gal' to fly herself. The model has been flown out to a radius of 0.75 miles and to an altitude of 300ft. During one flight over Folkestone cliffs, one engine stopped in winds gusting over 20mph, but the ship was steered back to the mast, upwind, with no trouble whatsoever.

Landing is really quite simple. The airship is either made to drop into the hands of the ground crew, or is steered so that the stern line is caught on a low approach at reduced speed.

Since August 1982, 'Airspeed-5' has been airborne on numerous occasions including visits to local fêtes and airshows etc. Most of the pictures you may have seen, were taken during a visit to Shorncliffe Barracks, Folkestone made possible by kind permission of the C.O. and Capt. Mike Rentell of the Infantry JNR Leaders Regt. The Regiment has it's own model club workshop and boasts a wide range of R/C aircraft.

In my view 'A-5' is the smallest viable craft for safe outdoor use but I hope to build a much larger one for photographic and



With model airships, weight could well be critical - there is only room for so much gas in the bag - so while some internal detail is provided in the gondola...weight precludes too much detail...

advertising work in the near future. This ship would have ducted fans, vectored thrust, ballonets and navigation lights for night-time operation!

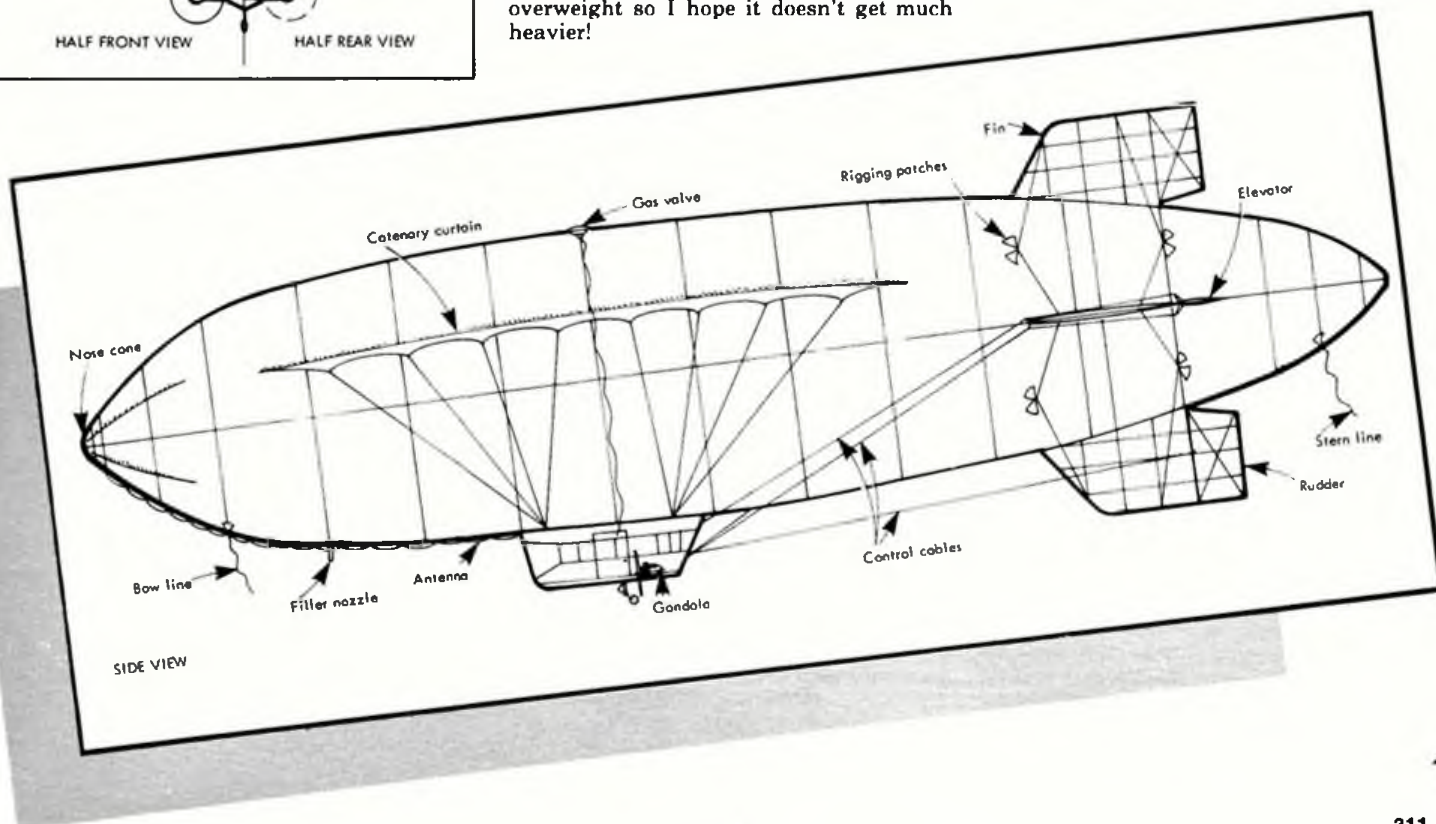
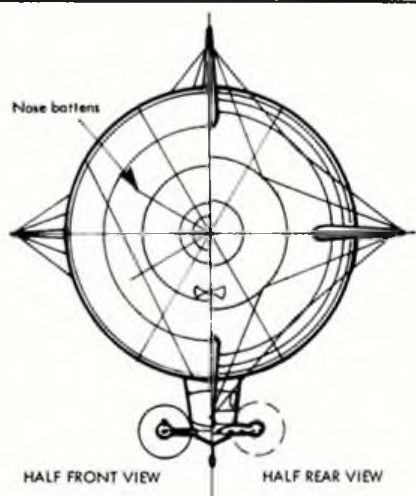
At the moment I'm half way through construction of a 20ft replica of the 'R-100'. The framework is mainly of 1/32 balsa girders, triangular in cross section and plywood for more highly stressed areas such as the engine mountings. The original flew to Montreal and back using 6 Rolls Royce 'Condor' engines. My model will use three Enya 049's with dummy propellers for the remainder. Four gas cells will each have their own valve opened by small electric motors. A micro servo will trigger them to open and close simultaneously. The entire framework is braced with 10lb breaking strain nylon line and will be covered in cling film or 12 micron metallised Melinex. The total volume is 134 cu. ft., enough to lift nearly 7lbs but at present the model is 6.5oz overweight so I hope it doesn't get much heavier!

I originally intended to moor the airship with each of the three engine cars sitting at the corners of a 'T' shaped trolley that would be free to swing around a stub mast, but this will have to be tried out first. If all goes well maiden flight is scheduled for Dec. '85, barring accidents of course.

There are three other individuals in the UK that have flown model airships and there are several others to be found in the USA, Germany, France, Australia, Switzerland and Japan.

Two of my colleagues in the Airship Association are at present busy on designs for Hot-airships, a radical departure from conventional airship technology but a lot cheaper to fly.

Lets hope many more will appear in the near future and if anybody knows of the existence of other models I would very much like to hear from them.



VINTAGE CORNER

WITH ALEX IMRIE

Old Timer Comes Of Age

Although it is only 20 years since the initials SAM began to draw attention to themselves, the Old Timer movement had been in existence for a good 12 months previous to this. I consider its true birth to have been co-incidental with the appearance of the John Pond column 'Gas N' Oil' in the March/April 1964 issue of the *Engine Collectors' Journal*.

Birth, in this context being taken to mean a substantial following of modellers, all having a serious interest in Old Time models. The machinery part of the organisation was to take a number of years to get right, and rules would be haggled over for a long time to come!

Of course, there had been Old Timer activity even before this date, and it might interest the readership to learn something of the origins of this pursuit that has become so popular in the last few years in this country.

The model designs from the late 1930s and the 1940s possessed a special appeal to the modellers who remembered them, either as



Above, this photograph appeared in the very first issue of *Aero Modeller* in November 1935. We title it "Rainy day in Manchester". The only event possible because of the weather during Lancashire MAS Open Day at Barton Airport in 1935 was the Concours d'Elegance. C S Rushbrooke's "Mayfly" was 1st in the Duration Class, his Supermarine S6B, 2nd in Scale. The DH "Comet" by F Hempall was 1st in Scale, and J W Kenworthy's "Conqueror II" was 2nd in Duration. Note Frank Zalc's 1934 (Warwick) Wakefield.

that its selection had nothing to do with the date of outbreak of war of twelve months earlier. Although this obviously signified a change in the hobby fortunes for many, the cut off date decided upon in 1962, was brought about merely because eligible designs had to be at least 20 years old!

The old timer craze spread like wildfire, and it seemed that in no time at all, every club was holding its own Old Timer contest. With such a vast following, it was obvious that some organisation would be necessary to control the movement, and first thoughts concerned the official acceptance of the Old Timer as a specific class of model.

Left, seen at the 1949 Nationals. Dennis Allen of West Essex with his "Dumbo", Anderson "Spitfire" powered R/C model, note aerial taped to port wing leading edge. Before the competition the model had been a consistent performer, but it developed radio trouble and "...was last seen describing beautifully steady circles in the distance."



magazine illustrations of models unattainable at the time because of lack of funds, or as objects that had actually been enjoyed.

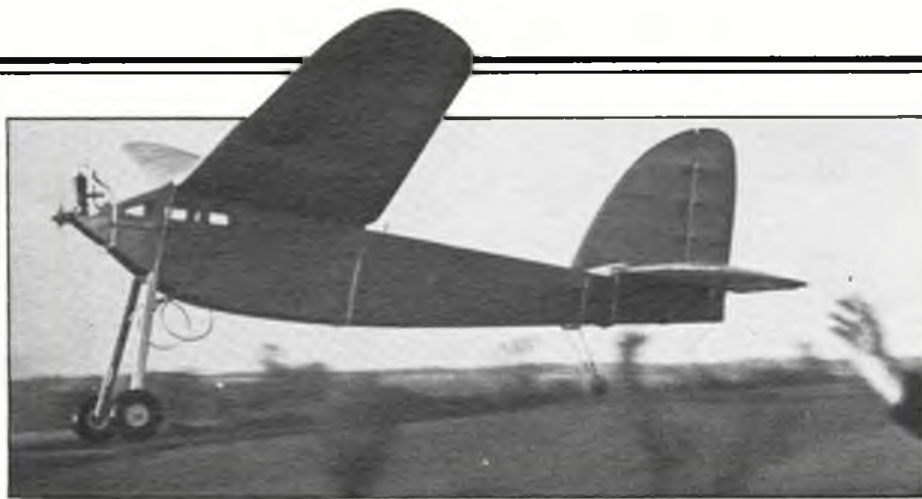
This nostalgia did not fade and through the 1950s into the early 1960s, the sight of an old model, maybe one fitted with a spark ignition engine, was enough to quicken the pulses of many modellers...who, advancing with the times into other realms of modelling realised that although they had forsaken the old timers they certainly had not forgotten them.

So the old timer interest was there, latent, ready for release. In 1962 two model clubs in Northern California hit on the idea of holding an 'Old Timer' contest. They were swamped with applications from would-be competitors, and the rules that were necessary for such a contest only emerged after much discussion, these laying down a latest design date of December 1942.

This date was to provide an ideal cut-off in defining what an old time design was in the USA, and it might interest readers to know

Right, a youthful Ron Moulton can be seen behind Henry Nicholls, who is adjusting the power of the Anderson "Spitfire" in his 9 foot span radio model before taxiing demonstration at the C/L Championships at Dover on Easter Monday 1949. Joe Deniz is holding the model which was a flying test-bed for R/C equipment.





R/C were the combination of Cabin and Pylon models in Old Timer, use of glow engines as well as ignition in Antique, some weight rules and the fact that it was permissible to scale up or scale down, an approved design.

It seemed that the all powerful R/C weapon brought about these changes,

Left, Tony Penhall launches his replica "Blue Dragon". More detailed information recently obtained is being put to good use in a rebuild and we look forward to seeing this copy of CEB's famous record holder in action during the year.

To present this, the *Antique Model Association* was formed, but the unfortunate choice of initials led to confusion with the 'other' *AMA (Academy of Model Aeronautics)* which was the official body governing the model aircraft hobby in the USA. A new title was sought, which eventually resulted in adopting the name *Society of Antique Modellers (SAM)* and this first appeared in print in May 1965.

At this time active old time modellers voted in multiple choice style for specific items of SAM Rules and these were finally drawn up in mid 1966, having been in use and circulation in previous Old Timer competitions.

These stipulated what Antique and Old Timer meant (detailed below). They

Right, this is "Aspla" (Small Musical Dragon) designed by Peter Fisher and produced by his Performance Kits for the .5cc DC "Dart". Prototype example of this Vintage Style model will be flown at the Aeromodeller Vintage Weekend Meeting at Old Warden.



Above, reader Brian Springhall made this 11 inch high model of Hamish B McGillcuddy complete with a 6 inch span "Cutty Sark" Wakefield! See text for more on McGillcuddy.

restricted unreasonable modifications to the old designs and created model classes A, B and C for engine displacement sizes.

In the light of experience these rules were altered and modified over the next few years to produce the expanded SAM Rules that exist today.

The original SAM aim was to generate

interest and increase participation in the sport of competition flying of free flight model aircraft of vintage design. This sport was intended to be casual and enjoyable for both competitor and spectator and did not aim at improving the old designs in any way. "To enjoy that which was - in the way it was", readily sums up the basic concept.

It was necessary to form two classifications of the vintage model designs that had revolutionised free flight competition in their day and these were named *Antique* if the model had been designed, kitted or had plans published before December 31st 1938, and *Old Timer* if the model had been designed, kitted or had plans published before December 31st 1942.

It is worth pointing out that the name of the game was *competition*, and it was because of the competitive nature of the flying that special rules were laid down. These further sub-divided the two basic SAM classes of model.

Antique models could be flown in 'Fuel Allotment', where a specific amount of fuel was allowed depending on the weight of the model, which had to be at least 6 feet wingspan; and '30 Second Antique' where no size limitations were laid down. Additionally all Antique models were powered by spark ignition engines where the only fuel allowed was gasoline.

Old Timer models were of necessity, divided into two main classes, *Pylon* and *Cabin*, and events were flown off in these under A, B and C engine displacement sizes. There was also Old Timer Rubber, sub-divided into *Cabin* and *Stick*. Finally a category for Special Events existed and this encompassed all deviations from the above laid down basic requirements.

It was in this field that Scale, Texaco, Post-1942, Replica .20, Half-Scale, and R/C existed. The main changes brought about by

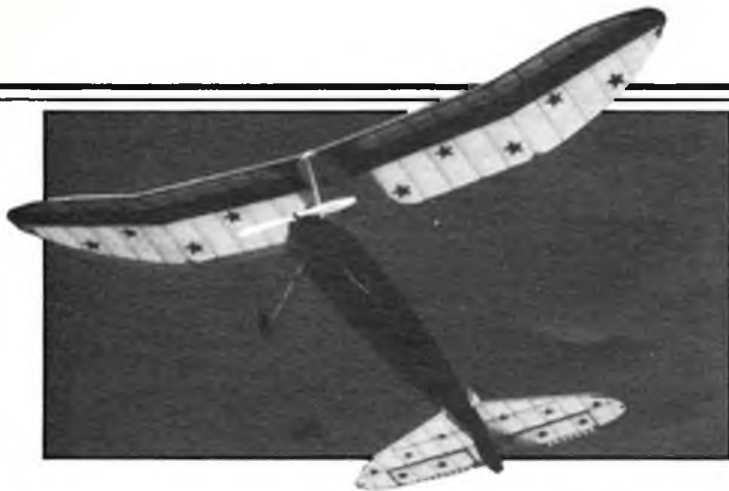
whereas the non-radio contingent just got on with the job in hand, the rigid adherence to the old designs, made and flown as they used to be, and this was probably the beginning of authenticity, the 'us and them' syndrome! Naturally with the passage of time some changes were made, and it is interesting to note that in the last SAM Champs there were 10 R/C events compared to 22 Free Flight events.

So the emphasis in the USA is still on free flight, of course, now there are classes for Twin-pusher, O&R 19 - 23 Cabin, Rubber Scale, Nostalgia, Compressed-Air, Hand Launch Glider, Gas Scale, Slag Engines and Jimmy Allen Rubber. Radio Control, the 'Special Event' from all those years ago now has a few additional classes, and it is well worth while remembering that the full title is Radio Control Assist. The emphasis should be on *Assist*, since originally the Old timer R/C models were flown as Old Timer models with the merest tweak of the radio controls to bring back an errant model.

I think that the most important feature of the whole Old Timer movement in the USA is the fact that after 21 years the design cut-off dates are still the same, no attempt having been made to extend or modify these. The machinery of SAM caters for later day interests by having the 'Special Event' clause, which can be used to accommodate any peripheral desires.

Is Vintage Too Vague?

Nowadays every model magazine seems to be running a vintage column, however, it is interesting to note that individual writers all have their own interpretation of what vintage actually is. This results in a very confusing picture being presented to any enthusiast who might be hovering on the fringe and who wants to enter the highly popular vintage scene.



Left, more Stouffer art! Photos on these two pages from Dick Stouffer (USA). "Diamond Zipper" by Chuck Schooley from Ontario gliding in to land.

marked increase in the number of vintage modellers in recent years. Their upbringing had been such that they were often well aware of the stresses involved in both 'g' and engine power.

They 'beefed-up' structures accordingly and were not slow to reduce dihedral to improve handling. The aerofoil section was frequently changed, getting rid of that

Having looked at the origins of the Old Timer game in the USA, it may be advantageous to look at this thing in UK called *Vintage*. It only seems like yesterday when the active vintage fliers at a meeting could be counted on the fingers of one hand, well, maybe two hands at the most!

Now vintage has a sound grip on many enthusiasts who never ever thought that they might one day become vintage fans. Their numbers increase steadily, and this high percentage interest is reflected in the adverts of materials suppliers in the Model Press, so there is no doubt about its popularity.

In this country there has always been a nucleus of modellers flying vintage models, some never really 'went modern', but just kept on making the types that appealed to them like 'Quakers', 'Junior 60s' and 'Buccaneers', then one day they found that far from being classed as out-of-date 'nuts', they were back in fashion again!

While there was some activity in different parts of the country, the efforts of the West Bristol Club should be particularly mentioned, since much of our early vintage emphasis came from members and associates of that club.



Above, Bob Moulton launching his Korda "Dethermalizer" at last year's SAM Champs at Bong. Note the take-off mat and obvious good weather. The "Dethermalizer" is a classic of its type - a pleasure to build and fly and puts many of today's "beginner's models to shame..."

This then, was vintage, re-living the type of model flying from some 20 years before. However, since the models tended to fly away, it was natural with the availability of practical radio control, that this should be fitted in some cases, being initially confined to rudder with a throttle control if the type of engine allowed.

A completely different approach was used

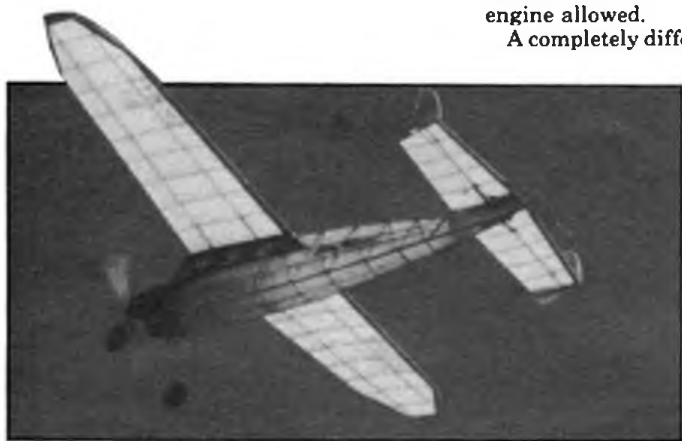
dreaded undercamber that was irritating to cover and gave long floating hold-offs when trying to land. Weight had never really worried the R/C men so plenty of epoxy and fibreglass went into structures that were originally only balsa and bamboo paper.

Using film saved all the tiresome doping, so it was a natural choice for covering. Despite the beautifully built examples that emerged, the models did not look right, with all the synthetic finishes they did not smell right either, and they certainly did not fly right. (This is said with due apologies to the present day R/C men who are now really trying to present the vintage model in a truer setting than hitherto.)

One is reluctant to mention engines, yet it was in this area that the greatest differences between the lower numbers of free flight vintage fliers and the multitude of R/C vintage men was most marked. The same illness that affected the radio vintage model was also inflicted on the so-called Replica Engine, which had to be improved, and modified until it was claimed to be better than the original.

I don't think that we really want this approach at all, in any case what was wrong with the original engine? I have never yet seen a replica engine made exactly like the original. Why? Present day 'know-how' must be capable of making an exact replica of any old engine...such a copy should be indistinguishable from the original, not like some seen that bear little resemblance to the prototype.

When the first rumblings of interest in old time models were heard in this country, the SMAE introduced the 'Vintage Class' of model for competition work and defined that such models should have been designed,



Left, Ken Hinton from Bury St Edmunds a keen Vintage flier has long and often carried the U.K. flag to the SAM Champs, seen here is his "Baby Corsair" doing it's stuff, climbing gracefully into those blue American skies.

These free flight vintage modellers of some 20 years ago built their models as the plans dictated and their creations were made as close as possible to the old designs. Any changes (and they were few) that they may have made from the published plans, almost caused them sleepless nights, they really did strive to put an exact replica of the old model into the air in the way it used to be.

Models were fitted with the nearest engine to that used by the original design, that their luck and finances could produce and was mostly flown for fun, although some competitions were indulged in from time to time.

by the then existing R/C modellers who turned to vintage some eight years ago when searching for something different to fly their radio gear in. That individual traits would manifest themselves in constructional techniques, material substitution etc., and produce a general 'improvement' of the old models was to be expected when these modellers were let loose on 50 year old designs.

Of course, in vintage eyes, no improvement was ever needed! These new fellows, were however, a different breed of enthusiast, they were attracted en-masse and they have been responsible for the

Below, rubber at Bong. Joe Barrette with his "Johnson" cabin model, an unusual Wakefield, note single-bladed folding prop.



Above, always popular free flight cabin model in and out of competition is the "So Long", seen here at Bong fitted with Forster 29 Ignition engine, doing a nice 'rise off ground' for its builder Bob Edelstein.

kitted or otherwise published before 31st December 1950.

It was for this reason when the vintage movement 'took-off' and sufficient interest warranted forming the 35th Chapter of SAM, that the SMAE ruling and the name of *Vintage* were adopted. This was unfortunate since Vintage is such a vague word that 'anything old' seems to fill the bill, and this lack of definition has continually played havoc with our cut-off date!

The original SAM Rules specified 'Special Events' classifications, and this can be used to accommodate any particular interest that might manifest itself. We in this country make periodic attacks on our Vintage cut-off date of 31st December 1950, and offer all sorts of ideas and reasons why this should be moved. Different disciplines produce justification to extend the cut-off date to suit their own particular interest and a more general campaign is afoot that feels that eventually the interest of the younger modeller will have to be catered for, and that this should see an advancement of the cut-off date.

Many groups of modellers put forward sound argument that models from the 1950s should be considered as Vintage...they already have their foot in the door and we have Wakefield cut-off in 1953 to suit rule changes in that type of model, Aerobatic R/C to 31st December 1961 simply because there were not many aerobatic R/C models around in the laid down vintage period, and control line also using a sliding upper limit to accommodate mid-1950s types...my reasoning is that the cut-off date for Vintage in UK should remain unchanged (our slice of the cake has already eight years more of 'Golden Age' designs compared to our American cousins...they don't press for

advancing their cut-off dates, nor should we).

I think that a ten year spacing seems a good idea to segregate classes whatever the names used - they are all historical - so names belonging to the past would be appropriate - remember the aim - to enjoy again that what was. Let's think that way and not worry ourselves with trying to improve or change too much with that excellent excuse, 'present day experience and materials!' Someone has already suggested Classic, so we could have Classic 1 for pre-1961, Classic 2 for pre-1971, just an idea, and it is not mine, seems a good thought, but let Vintage stop at 31st December 1950 (*What do you think...Ed*).

I Remember McGillicuddy

Joe Maxwell of Stirling has kindly submitted the following reminder of this amusing character and his creator. It was originally written for the Scottish Aeromodelling Association's Newsletter some years ago.

"Humorous stories about a crafty old Scotsman with the unlikely name of McGillicuddy appearing in that superior English journal the *Aeromodeller*! Such a thing is inconceivable today (*don't you believe it...Ed*), yet it did happen. Hamish B McGillicuddy, according to his faithful chronicler Robert Jamieson, was president of the Auchengargle MAC, where his fellow members included such characters as M T McSwindle and Thermal McGraw - not forgetting Drambuie the tame seagull.

Usually they were deadly rivals on the club's flying field, but occasionally they got together to outwit the neighbouring clubs at Teuchle Toorie and Muckle Mire. Incredibly, 18 of these stories were published in *Aeromodeller* between 1942 and 1946.

There was even a McGillicuddy's *Year Book* with a different story for each month. The prolific author was Donald Robert Jamieson McDougall who used his middle names as a pen name. Don was at one time a stalwart of the Greenock MAC, and later became manager of the Model Aerodrome branch in Glasgow. Thus he was not only a good story teller but also knew his subject, and the yarns reflected the existing state of the art.

As a sample of his style, the following extract is taken from one of my favourite stories. In it McGillicuddy deserts his club and travels to London to join the staff of the "Aeroyodeller".

"The Maestro must have sensed my nervousness as we stood outside the palatial offices of the "Aeroyodeller". He gave me an encouraging slap on the back.

"Tuts", he said "What are you feared for? They are only folk the same as us. Britain's hardy sons! Where's that pioneering spirit that would put on full turns in a gale? Come on!"

...Around the walls were a series of large mural paintings by C Snoopert Doore, depicting aeromodelling through the ages. The Maestro was particularly impressed by the exquisite grouping of "William the Conqueror winning the Wakefield, 1066" and the harsh dramatic colouring of "Bruce lifts the Clyde Model Dockyard Trophy, Bannockburn, 1314".

The mention of Snoopert Doore highlights another feature of these stories. Real-life aeromodellers, their names thinly disguised, mingled with the fictitious characters. In this case it was C Rupert Moore a well known flying scale fan and artist. I had the doubtful honour of being included in some of the stories as "J M Haxwell", though my contributions seemed to consist mainly of trying to expound the views of the "Glasgow boys".

So the McGillicuddy stories remain an odd phenomenon of our hobby, but it is sobering to think that perhaps the most famous Scottish aeromodeller of all time was a fictional one".

Well, I remember McGillicuddy too, and met D R J McDougall in 1947 when I worked for the Edinburgh model shop *Harburn Hobbies*, he was at that time agent for the *Clan Scottish* diesel which we stocked. Does anyone know the whereabouts of Don McDougall today? It would be one for the book if contact could be regained, who knows, maybe he could be persuaded to bring McGillicuddy back...as a vintage enthusiast!

Class C Pylon R/C Ignition: Dick Huang, Fort Worth Texas (with transmitter in background). "Kerswap" a Gil Morris design with Torpedo .32. hand launched by "Pit Crew".



THIS IS NOT a glider for the raw beginner, rather a forth or fifth model, once a little experience has been gained both in basic construction techniques and in trimming. 'Mimi' has been in existence, in one reincarnation or another for over ten years. All of them bar one, have given what I would put at the top of the list of desired model characteristics - consistency.

The rogue among the family was a fibreglass boom version that *looked* beautiful but due to a too small diameter boom, proved quite unreliable. Even the

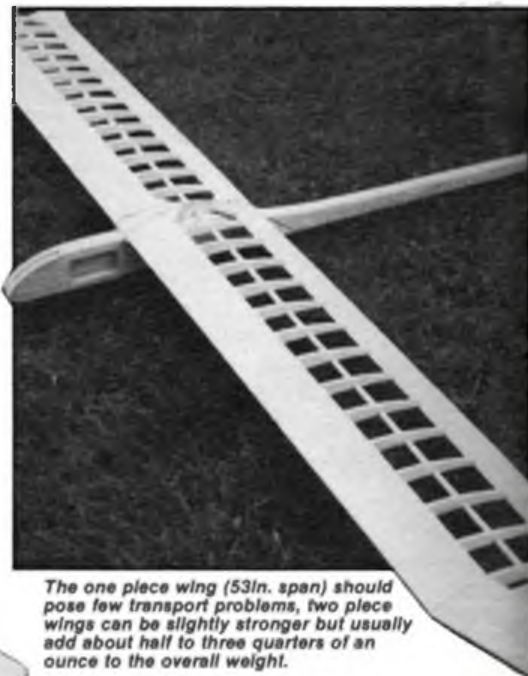
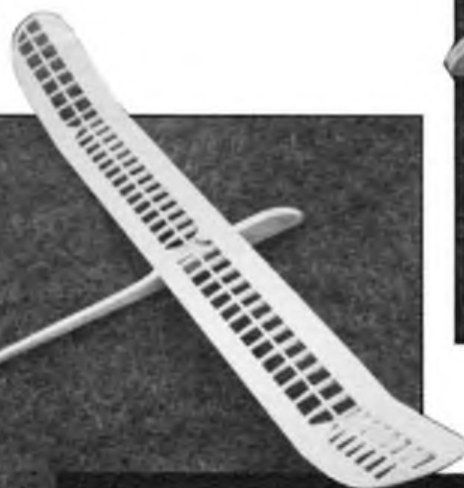
recover from turbulence or even a poor launch release that stalls the model off the line.

'Mimi' is designed to have a right turning glide circle. This is because I am right-handed. When towing up, I find it much easier to steer the model and generally keep an eye on things when looking over my right

Simple lines of 'Mimi' do not stress its 'thermal catching' ability...never fly without a dethermaliser! Slim balsa box boom will stand usual rough and tumble of contest flying but try to avoid towing in on the line...

tension in the auto-rudder line pulled the rear end out of true! Goodness knows what happened when it flew in turbulent, gusty air... the front end certainly was not travelling in the same direction as the back end!

The model specifications for A1 gliders



The one piece wing (53in. span) should pose few transport problems, two piece wings can be slightly stronger but usually add about half to three quarters of an ounce to the overall weight.

MIMI

A high performance 53 inch A/1 Glider with straightforward construction by Pete Freebrey.

Left, the wingtips are made from laminated sheet balsa and have a very blunt cross-section. Various tip shapes were tried with little discernable difference to performance...so the easiest to construct has become the norm. Below, fuselage and tailplane ready for covering...

Construction

Wings: The ribs are cut out by whatever method you find easiest. I use an accurate ply template with two pins pushed through to protrude by 1/16in., the tops cut off and epoxy holds them in place (as was described by John Godden for 'Early Knight' last month). This enables you to manoeuvre the sheet of balsa you are cutting without worrying that the template may have moved in the process.

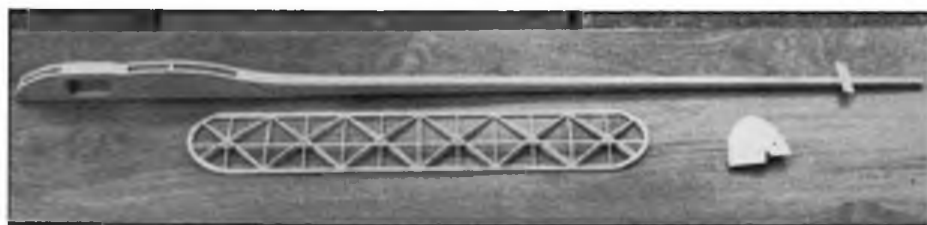
Search out some good quarter grain balsa sheet for all ribs (wing and tail). I use wood that weighs about 10-12 grams per sheet for the centre section and about 7-8 grams for the tips.

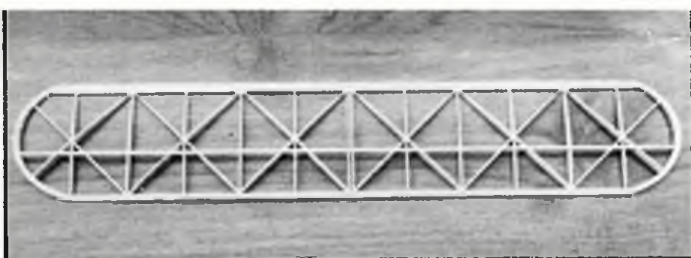
The trailing edge is pretty massive in section so again take care not to use anything too heavy! Try to find some that is

are unlike most other classes, in that they are relatively easy to build to. Unless you go mad with your wood selection you should easily build this model to within the minimum weight limit. That does not alter the fact that you must take care in selecting light, stiff wood for wingtips and more especially the fin and tailplane.

'Mimi' has a fairly long moment arm, so the effect of any extra weight at the tail end, not only means more weight in the nose to achieve the correct balance point. BUT also increases 'the moments of inertia' which in turn affects how quickly the model can

shoulder! If you are left handed you may find it wiser to reverse the operation of auto-rudder etc. (if you do this - remember to build the wash-out into the opposite wing tip too!).





Tailplane construction looks a little daunting but once into the swing is in fact not difficult you just need nimble fingers and slow setting glue!

straight, you do not want to *build* in unnecessary warps! The same applies to the leading edge.

To build the wings over the plan you will either have to cut up the plan and carefully align the two halves (put your head down to the plan level and look along the trailing edge to ensure you have got everything straight). Alternatively, as the wing has a parallel chord you can quite simply draw your own plan on a piece of old (not used!) wallpaper etc).

If you put the leading and trailing edges over the 'proper plan' all you need to do is mark the rib positions on the wood, then your 'building plan' only needs five lines drawn on it! The front and back, and three lines (at right angles) for the centre rib and the first tip rib on each side.

Start with the centre section and take care to 'prop-up' the front of the trailing edge to match the wingsection. Glue in all the ribs using PVA glue, if you have a known straight piece of wood (ruler?), check as you go that the top of all ribs are level. Glue in the top spar making sure that you do not press the ribs out of position when so doing.

Leave to dry, remove from the building board and glue in the bottom spar. Trim the leading edge so that the wing sheeting will lie smoothly over it and follow the correct section. Pin the wing back on your building board and check that the sheeting will butt up against the ribs correctly (there may be the odd bit of glue to trim away).

The wing sheeting should be very light straight grained balsa of about 10 grams per sheet. I usually 'waft' the sheet in the steam of a boiling kettle briefly before attaching to the structure. Steam one side only and it will form a gentle curve across the grain. Putting this 'set' in the sheet means that it is not providing an opposing force to being glued around the curve of the section and is one less area that may cause unwanted warps!

Make up the 'tip ribs' from four or five laminations of soft 1/16in. sheet stuck with PVA. Either stick pins (lots of them) into the plan and form the tips around them or cut a fairly thick template and use that. Make the laminations wide enough so that both 'tip ribs' are made in the one operation.

Now build the wing tips in a similar fashion to the centre panel. Not forgetting to prop up the trailing edge for the port wing at the extreme tip by 1/4 in. to build in the required washout. Do not trim away the leading or trailing edges until you have installed the bottom spar and then only after the glue has set. Offer up your 'tip ribs' and trim leading and trailing edges to suit.

With the 'tip ribs' in place you must trim them to allow for the wing sheeting. Trim the rest of the 'tip ribs' when all glue has finally set. To achieve the correct dihedral, I hold the wing tip firmly against the bench with the root just at the edge of the bench and sand in the angle (with frequent checks!) using a large sanding block.



Left, fuselage front end with cut-out for KSB D/T timer. Weight box size might be marginal in size if the back end is heavy! Below, tail end must be light - with this geodetic structure use the lightest quarter grain you can find for the ribs...

Epoxy the tips to the centre panel, all gussets are full depth very soft block balsa and I have never found it necessary to use additional dihedral braces. When the wing construction is finished sand all surfaces carefully (this is where you find all those poor joints!). Give one coat of thinned sanding sealer, sand lightly and you are ready for covering.

Tailplane: This looks complicated but is not...really...Start by making the laminated tips. Then lay out and glue the tips to the trailing and leading edges. If you look carefully at the plan you will see that six diagonal and the two centre ribs are not 'cut'. Glue these in position, followed by the remaining 'cut' diagonal ribs. Now trim and fit the square ribs. Using a rule and either a very sharp knife or thin file - cut the spar slots in the diagonal ribs...fit the spar and you are home and dry!

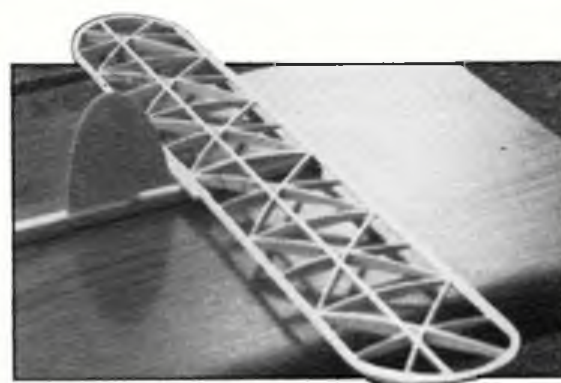
Fuselage: Construction is fairly straight-forward, cut the tapering top and bottom pieces first. Try to use a good metal straight-edge to cut against and because balsa itself has certain stresses within it - *cut oversize*. You may then find what you thought was a perfectly straight cut is curving before your very eyes! If this can *not* be corrected after two trimming cuts - chuck it away and start again...

Glue fuselage stiffener (piece 'A') together with formers to the bottom 'side' checking that they are all vertical. With this assembly pinned carefully to the bench (straight from front to back!). Add the top (rear of wing) and sides. Only when this has *thoroughly* set can the structure be unpinned from the bench. Now add 1/64in. ply doublers, when set, a pin may be pushed through the side to locate correct position for timer cutout.

Temporarily install timer and glue in balsa block 'B'. Nose block may be from hardwood or cast in situ using lead powder loaded resin (use masking tape around nose for mold). Weight box cover is only 'tacked' in place until model is finished and correct balance achieved.

The wing seating is 1/32in. ply and although wider seatings have been tried, the size shown has proved perfectly satisfactory. The tow hook I use, is filed from 1/8in. Dural and 'pinned' through the fuselage sides, but 16 swg piano wire is probably easier to deal with!

I use narrow 16 swg Dural, bent and tapped for 8 BA nylon screws for a rudder stop. Auto-rudder lines are external for ease of maintenance and pass through 18 swg aluminium alloy tubes. The auto-rudder and timer start mechanism is foolproof (so far!)



and consists of a vertical tube (or single hole dress button) epoxied to the fuselage.

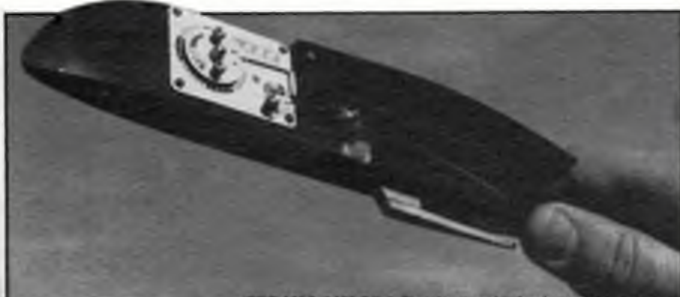
Through this passes a very thick piece of nylon (tennis racquet string) attached to the tow-line. Very small split rings are tied to the auto-rudder and timer start lines, slipped over the nylon and released when the tow hook is disengaged.

Covering: Wings and fuselage are covered in lightweight *Modelspan* or equivalent and the tailplane and fin in light Jap tissue. Use thinned dope (50/50 dope/thinners) and do not try to get a super glossy finish! Two or three coats on the tail and three or four on the rest. (the number of coats is a bit uncertain as it depends so much on the quality of tissue used).

Trimming: If you are using a DT timer then once the balance point is adjusted correctly, start towing up with a 5-10 second DT and see what happens! Extend the time when you are certain nothing ghastly is going to occur. Adjust trim by raising the leading or trailing edge of the tailplane with 1/64 ply shims (stuck on; not just left there to fall out later!). Turning circle should be around 100ft diameter and should 'bump' and tighten up when a thermal is found. Needless to say this model **MUST** have your name and address clearly marked on it...



Below left and right, two versions of 'Mimi' displaying slight differences introduced by different builders! Long tow hook on the left also incorporates a phosphor bronze shim leaf spring to retain tow line...



MIND THE LINES

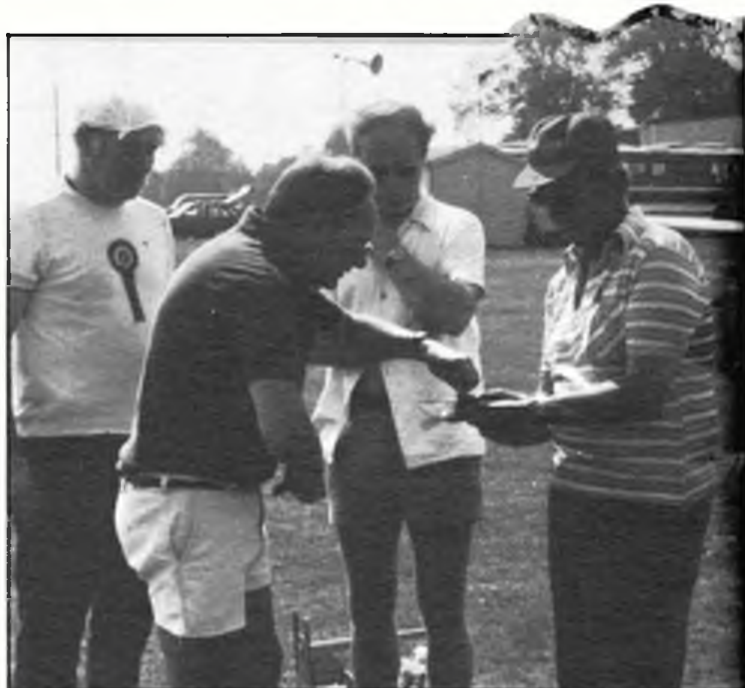
with Andy Brough

More Rubery Fun

One of the nicest things about writing a column is receiving letters from like minded enthusiasts. One such letter came from Peter Martin, who organised the Birmingham control line rally last October, saying that he is also organizing two such rallies *this* year.

The venue will be the same, in the Rubery Hill Hospital grounds, the dates being the

Right, Obviously a very serious business, this vintage speed lark... Ron Prentice, seen here at Old Warden, tuning his AM 15 powered 'Midge' at last year's Vintage Day. Below right, "Excuse me, 'mind the lines'" — Andy Brough holding Geoff Clarke's Allbon 'Javelin' powered 'Midge'.



Left, a collection of 'Stoo Plates' all powered by that vintage diesel work horse... the Mills 1.3. Plans for the 'Stoo Plate' were published in one of those sought after Ian Allen publications of 1950 — has always been a favourite amongst modellers of the unusual.



8th May and 9th October starting at 10.00am. The formula will be the same as last year with the accent on fun but with 'Midge' speed, and stunt events for those who like some competitions.

Inverted Midges

I also received a letter from down under from one Peter Enright who read my piece about the 'Midge' Event on Vintage Day last year. He was very interested in the idea of a diesel speed model and so a plan was duly dispatched — what have I started? Talking of 'Midges', it may be of interest to say how the idea for the event came about.

As secretary of the Whitefield Club I am responsible for looking after the Club's cups and occasionally cleaning them, and it was whilst doing this annual chore that I hit upon the idea of finding a suitable competition for at least one of them, hence reducing the amount of cleaning!

So, starting with the biggest I found that it was originally donated to the Lancashire Model Aircraft Society, by C. Greenhalgh, for a speed event (presumably rubber powered models in the 1930s!) The L.M.A.S.'s assets were inherited by the Whitefield Club in the early 40's and the cups have been in various secretary's lofts or workshops ever since. The only vintage speed model plan I had was of the *Mercury 'Midge'*, so that was it...

It just goes to show if you have an idea, don't wait for others to do something about

it, you decide on the rules, the time and the place and get on with it! I should like to mention that the 'Midge' Event on Vintage Day this year will again be for the 'Lancastria' trophy, Alwyn Greenhalgh having kindly had the cup re-furbished and re-engraved and hopefully his mother will present the cup — fifty years after its original presentation.

Did Doo

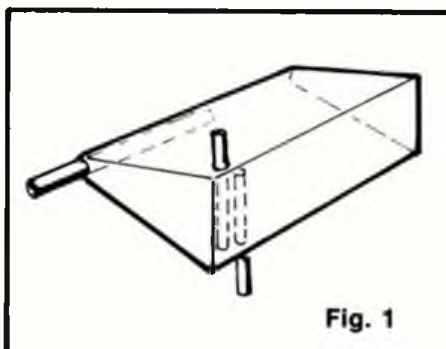
Mr. D. Young writes that in 1948 one had to use the motors available, Anderson Spitfires etc. being very expensive, and that meant the E.D.s and Mills. The sort of props used were 10in to 11in diameter, very low in pitch 4/5 or 6in at the outside, but with large area blades, this combination giving a high 'low speed' thrust. At these slow airspeeds

the technique was to very gently guide the model using the whole arm, thinking and acting slowly!

I am assured that with a 9 or 10in x 4in prop on a P.A.W. 15 a 'KanDoo' will hunt but I'm afraid Mr. Young's letter came too late as I've had the saw blade to the front of the 'KanDoo' and a P.A.W. 25 is now installed complete with a 9 x 6 prop and silencer, in place of the 1.5 and 2oz of lead! With a bit of luck I'll tell you how it flies next month.

Fuel Tanks for Vintage Stunters

I'm afraid this is one area where I will always depart from the tank shown on the plan. The early tank designs were poor, usually a simple wedge (fig. 1) with a feed pipe plus filler pipe and an overflow pipe coming in from the opposite face allowing the model to fly inverted and the wedge shape enabling the fuel to be used up.



There are many disadvantages to this system, the wedge shape takes up a space of about twice its apparent capacity and the vertical pipes tend to suck fuel out of the tank into the air stream.

The first point can be overcome by making a rectangular tank which has a small wedge at the outside and the second point by bending or angling the pipes forward to give a slight increase in pressure from the airflow.

My preference is to make a rectangular tank, the reason being that every joint can be lapped to produce a tank that will never split, especially important if using a diesel as they cause more vibration than glows, and with vintage designs the tank compartment always seems too small. So a rectangular tank will efficiently use the space. The tank I use is shown below in fig. 2.

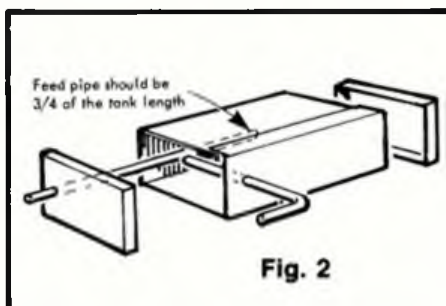


Fig. 2

Make the box and solder one end on, then punch through (never drill as punching leaves a cavity for the solder) one end and solder in the feed pipe, you can also solder the other end of the feed pipe to the tank side which makes it very secure. Only one vent/filler pipe is needed and connected to the silencer if pressure is used. The advantage of only one pipe is that you can't forget to block off the filler pipe, or if on pressure, forget to clip the tube to the silencer and so fill it with fuel!

The tank works on the 'Marriot bottle principle' giving a constant head through nearly all the flight tending to speed up in the last few laps as the vent pipe is uncovered. A useful feature is being able to tell when your motor is going to stop. Two important points to remember. One, if using a diesel the tank can be nearly half the capacity of a glow and two, diesel fuel will

expand silicone tubing so use neoprene (the one with the red stripe down it).

Before we leave the subject of fuel tanks one other popular tank should be mentioned, namely the balloon (Fig. 3). This was first advocated by Jim Walker back in 1947. Basically the balloon is tied tightly at its neck around the fuel feed pipe so that no air can enter the balloon.

The tube runs straight from the spraybar to the bottom of the balloon, a vee being cut in the tube so the collapsing balloon will not cut off the fuel supply. When full it is essential that all the air is excluded by holding both ends of the tube uppermost and squeezing until only fuel comes out. As there is no air in the tank the mixture will remain constant and give an even run through the manoeuvres.

The main problem is one of finding suitable balloons not affected by the fuel so if anyone knows of a source, please tell us as it would save what for me is a chore, that of soldering a tank.

Three Sisters Gala

John Noble wrote to say that the Three Sisters Gala on the 29th and 30th June will include vintage speed and stunt.

The speed rules are as follows:

1. Cut off date 31/12/1952
equipped with appropriate motor - % of record (UK) as at 31/12/52.
3. If using a newer motor (various series of ETA's will give problems!) then % of current record for the class of motor.
4. Two 'Midge' classes will be in force, one as per SAM rules, the other, any 1.5cc diesel (on 42ft lines).
5. The vintage stunt will be as per SAM rules. Grass or tarmac circles will be available and as this facility has a permanent FAI cage one can fly any size of speed model including Jets!

I've flown at Three Sisters many times, it really is a great layout with three tarmac circles and a grass area, it definitely is worth the effort to attend. More details can be obtained from Peter Farimond on Wigan 34068. See you next month.

Flying a 'Yoicks' is not that difficult but here Don Burgess seems to be performing a few limbering exercises before taking the handle...

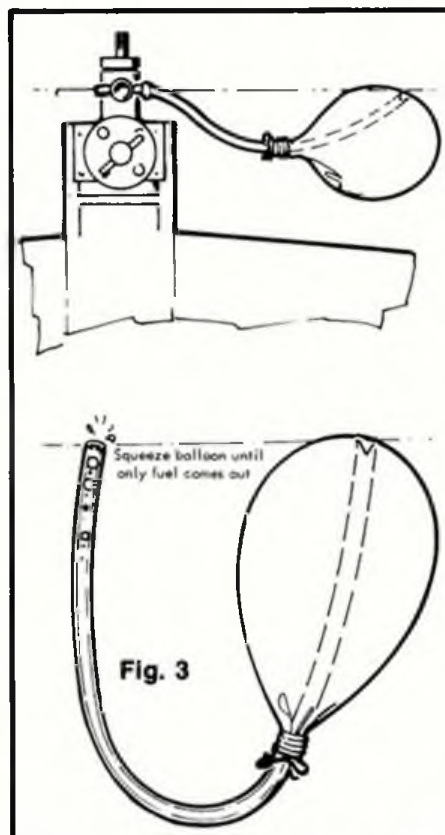


Fig. 3



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FI	Front Induction
RI	Rear Induction
W M	With Silencer
SE	Side Exhaust

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Bull Ring 46 F.I. R/C w/m	£55.20
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S75	£86.75
S90	
S2000 F.I. R/C	£92.85
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S3000	

RE	Rear Exhaust
TS	Transfers Schnuerle Port
TST	Transfer Super Tigre Port
ABC	Chromed Brass Sleeve

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ENGINE NEWS

WITH
PETER
CHINN

Metric v. Imperial

A few months ago, from a reader in Yorkshire, we had a letter which raised a point that has undoubtedly puzzled many newcomers to the hobby. It ran as follows:

"Dear Mr. Chinn, I have been reading the Aeromodeller for over a year now and I still have trouble remembering the conversion factor from cubic inches to cubic centimetres.

"Considering that (a) we are supposed to have gone metric, (b) other dimensions in the Aeromodeller often are metric and (c) all engines used to be given in c.c. - or litres for cars - I am amazed and saddened by this retrograde step.

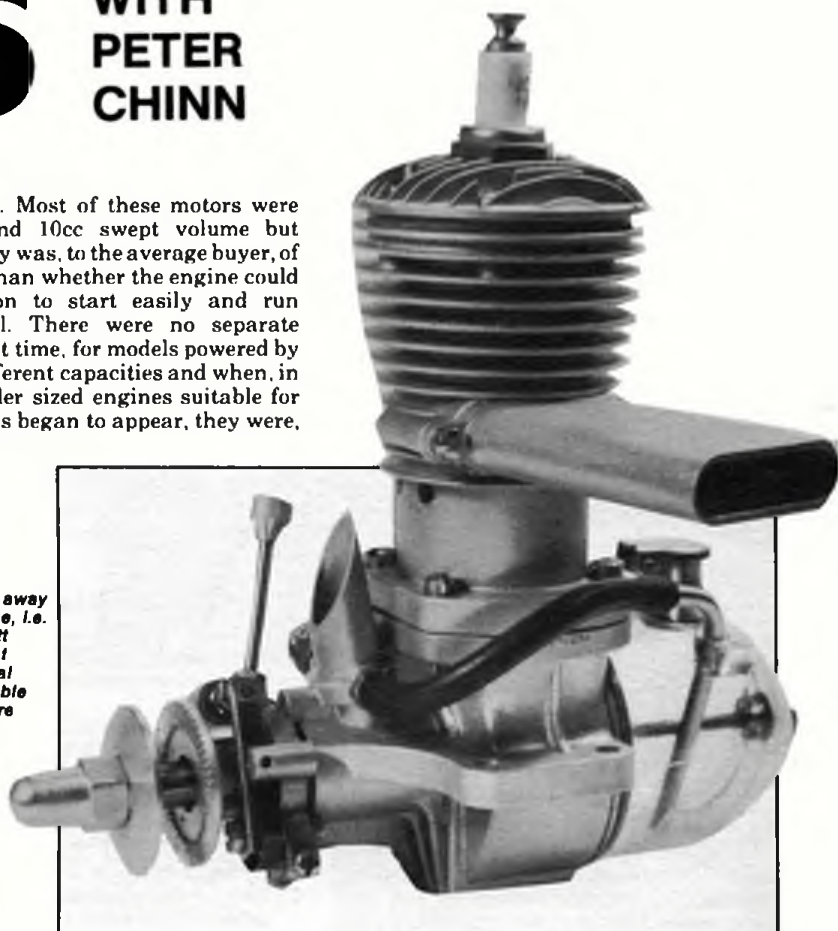
"When did it happen? Why? Can you do anything to 'put it back the way it wuz?' (Like quoting c.c. as well, for starters.) Yours truly, E.S. Colley."

To anyone who has come recently to power modelling and especially someone who has been educated to think metric, the practice of classifying model engines by Imperial measurement may seem a bit out of place, but, in fact, it is very much a tradition and one that has so far resisted all attempts to change it.

In the very earliest days of commercial model aircraft engine manufacture, engines tended to be given names only, e.g. Brown Junior, Baby Cyclone, Gwin-Aero, Ohlsson

Gold-Seal, etc. Most of these motors were between 6 and 10cc swept volume but actual capacity was, to the average buyer, of less concern than whether the engine could be relied upon to start easily and run tolerably well. There were no separate classes, at that time, for models powered by engines of different capacities and when, in 1937-38, smaller sized engines suitable for smaller models began to appear, they were,

One thing gives away the 1984 Cyclone, i.e. its excellent matt finish investment castings. Original model used tumble polished pressure diecastings.



as a group, simply referred to as 'small bore' engines. 'Small bore' generally meant a cylinder bore of less than $\frac{1}{4}$ in.

Within a year or two, however, the rapidly increasing popularity of i.c. engined model aircraft in the United States (where the vast majority of model aircraft motors were manufactured and where an expanding range of different sized engines were now on offer) made it necessary for separate competition classes to be established, according to engine size.

Because manufacturers in the United States worked to Imperial measurement, it was natural to quote engine size in cubic inches or, to be more accurate, decimals of a cubic inch. Thus, the Ohlsson '.60' had a

bore and stroke of $15/16$ in x $7/8$ in., giving a swept volume of 0.604 cu.in. (or just under 9.9 cc), while the Forster '.29' had a bore and stroke of 0.750 in. x 0.672 in. for a volume of 0.297 cu. in. (4.86 cc) and the Bantam '.19' a bore and stroke of 0.656 in. x 0.590 in. for a capacity of 0.199 cu. in. (3.27cc). The original American groupings (later modified) were Class A for engines of up to 0.20 cu. in., Class B for engines up to 0.30 cu. in. and Class C for all engines over .30 cu. in.

In the U.K., however, it was not unusual, because of our familiarity with cubic centimetres as a way of referring to motor-cycle and car engine sizes, to also look at model engines in equivalent c.c. sizes. When model engine manufacture was resumed in the U.K. after the war, most manufacturers, especially those who began making the new compression-ignition, or so-called 'diesel' type engine that had originated on the Continent, tended to designate their engines in c.c. sizes, even though the machinists who made them still worked in Imperial measurements. Thus we had the Mills '1.3', the Elfin '1.8' and the Eta '5'. The SMAE also adopted metric engine classifications: 2.5cc, 5cc and 10cc, later extended to include 1.5cc and 3.5cc categories. The international body, the FAI, has, of course, always used metric classifications.

The American influence, nevertheless, was extremely strong. The best American engines, at that time, were far and away superior to most British and Continental products and names like Dooling 61 and McCoy 29 became synonymous with



The Super Cyclone GR Series engine first appeared 45 years ago. This excellent and faithful replica was put into production in the U.S.A. last year.

advanced design and exciting performance. The Americans, who had not been over-impressed with diesels, had introduced, instead, a lighter and simpler alternative to spark ignition, namely, the glowplug.

This form of ignition, in conjunction with alcohol-based fuels, was well suited to freely-ported high-revving American engines and, when British and other manufacturers began making glowplug engines, they also opted for American-sounding designations - no doubt to help identify their new products with American style performance. As a result, we had the British Eta 19 and 29 and Yulon 30, 29 and 49, the French Micron 29 and 60 and the Japanese O.S. 64 and 29, to name but a few.

As the popularity of glowplug engines increased during the Fifties and Sixties, so the number of engines carrying a cubic inch identification rose and, despite the fact that the majority of the world's engines are now manufactured in 'metric countries' and to metric dimensions, the practice of using Imperial measurement to identify various models has not only continued but has actually gained in popularity.

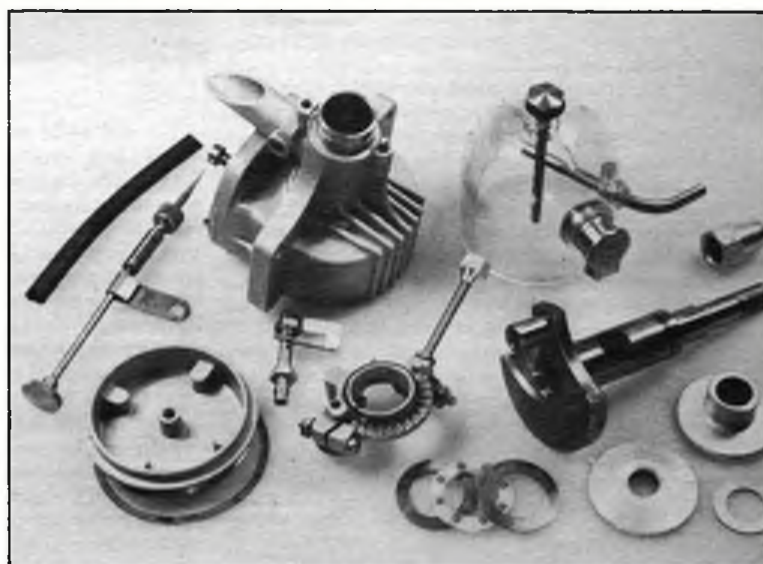
In all the major model engine producing countries, e.g. Japan, U.S.A., Germany, Italy, France and the U.K., most, if not all, engines are now named according to their displacement in Imperial units, even

'40'. By the same token, the new '21', '29' and '35' models became '3.5cc', '4.9cc' and '5.8cc'. But this move by K&B has not been the signal for other manufacturers to follow suit and it looks very much as though cubic inches are here to stay for quite a while yet.

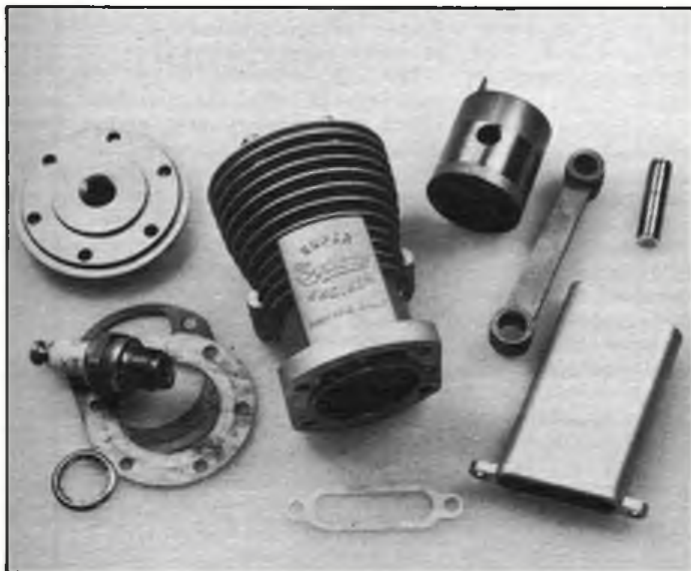
The 'conversion factor' mentioned by our correspondent, for converting cubic inches to cubic centimetres, is 16.3871. However, it must always be remembered, when an engine is quoted as a '19' or a '40', for example, that these are purely nominal figures. To arrive at the correct displacement figure in cubic centimetres it is necessary to know the engine's bore and stroke.

For example, a commonly used bore and stroke combination for a 10cc class engine is 24 x 22 mm which works out at 9.9526cc or 0.6073 cu. in and such engines are commonly known both as '60' and '61' sizes.

Right, bottom and parts of the Super Cyclone replica. Note ball-thrust bearing and transparent petrol tank with 'Gits' cap.



Left, Super Cyclone replica top-end parts. Cylinder barrel has shrunk-in steel liner. Ringless piston is of cast-iron.



though, for international contest purposes, they are still classified by their displacement in cubic centimetres.

The general exceptions to this rule are to be found only in the East European countries such as Czechoslovakia, Hungary, Poland, East Germany and the Soviet Union.

Ironically, the only Western engine manufacturer to try to encourage the use of metric designations, has been the old-established American K&B company which, after several decades of making engines to all the popular cubic inch limits, began, in the mid nineteen-seventies, to use metric denominations for their new models. Thus, without changing the 0.840 in. x 0.720 in. bore and stroke used for many years for their '40' engines, their new high performance rear-exhaust SR-II model became a K&B 6.5cc, rather than another

As for the suggestion that we quote cubic centimetre as well as cubic inch figures, this is, in fact, invariably done when giving engine specifications in these articles.

Super-Cyclone Revived

Replicas of vintage engines are very much in the news these days, especially those being produced in the U.K. by Dunham Engineering. An outstanding example of the latter is the Dunham Replica of the American 10.6cc Orwick 64 that was featured in the December 1984 *Engine News*.

A famous contemporary of the Orwick was the Super-Cyclone, the original 1940 version of which was first announced at the end of 1939. Manufactured in Glendale, California, the Super-Cyclone was designed by Mel Anderson, one of the American model engine industry's pioneers, who, after

the war, went on to set up his own company and produce the highly regarded Anderson Spitfire engine.

The first production model Super-Cyclone was the 'G' Series which had a nominal bore and stroke of 15/16 in. x 15/16 in., for a swept volume of 0.647 cu. in. or 10.6cc but, a few months later, the cylinder bore was reduced to 29/32 in. so as to bring the engine below 10cc. The reason for this change was to make the Cyclone eligible for the tethered model racing cars then becoming popular in the U.S.A. This model was known as the 'GR' Series.

The GR Series was reintroduced soon after the war and continued in production for about five years. By this time, glowplug engines had almost completely replaced spark-ignition engines like the Cyclone. A decade or so later, however, saw the beginnings of the 'old timer' or 'vintage'

movement and there has been a steadily increasing revival of interest in old engines ever since. As a result, the Super Cyclone has been put back into limited production on three occasions by different manufacturers: in 1965 by a firm called Pesco, then in 1971 by Remco of Lakewood, Colorado and, now, by a new enterprise in Phoenix, Arizona.

In the first two instances, the engines were made with some of the original tooling and from some of the remaining stocks of parts, but the latest version, introduced last year, has been completely re-tooled. Not surprisingly, the dies for the original castings were virtually worn out and the 1984 model uses, instead, investment castings. These, however, are extremely well executed and have a better appearance than the tumble polished diecastings of the original engine.

This latest example of recalling the past does not end with the engine itself. It is actually delivered in a true replica of the original coloured display box, together with a facsimile of the original parts list and a set of 'original' yellow and red 'Super Cyclone Powered' transfers. Also included is a suitably revised instruction booklet.

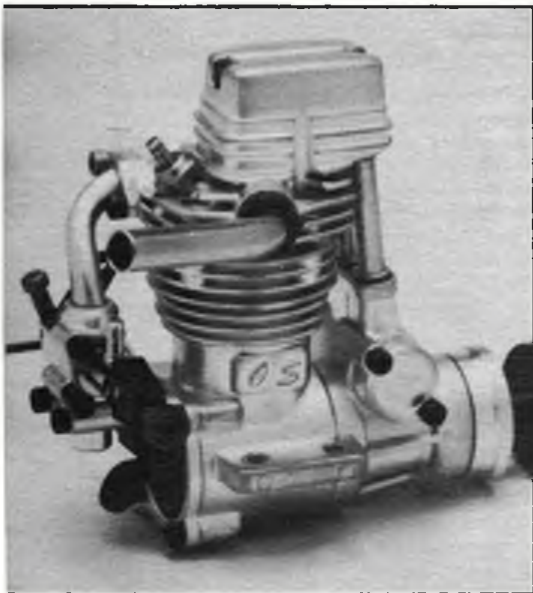
In the course of a transatlantic telephone conversation with Tom Morrison, who manufactures these replica Cyclones, we learned that his enthusiasm for model engines began in the Thirties during his

boyhood and that the Super Cyclone was a particular favourite, hence the reason why he had acquired the rights to the use of the Super Cyclone trademark and set up a new 'Super Cyclone Engines' company to revive this famous old motor.

The original Super Cyclone was somewhat in advance of its time in 1939-40, but, nevertheless, differs a good deal from typical 10cc engines of the present day. Briefly, for the benefit of readers unfamiliar with the engine, it is a shaft valve unit with a 7/16 in. crankshaft main journal running in a bronze bearing contained in a short crankcase, to which a flange-fitting, steel-lined cylinder barrel is attached with four screws. The engine is of the crossflow-scavenged type and, in the manner of other engines of the period, the baffled piston is of cast-iron. In place of the 3/8 in. Champion sparking plug fitted to the original (but no longer available) the replica has a Japanese NGK CM-6 10mm plug, re-cut to fit. Nominal compression-ratio is approximately 5.5:1.

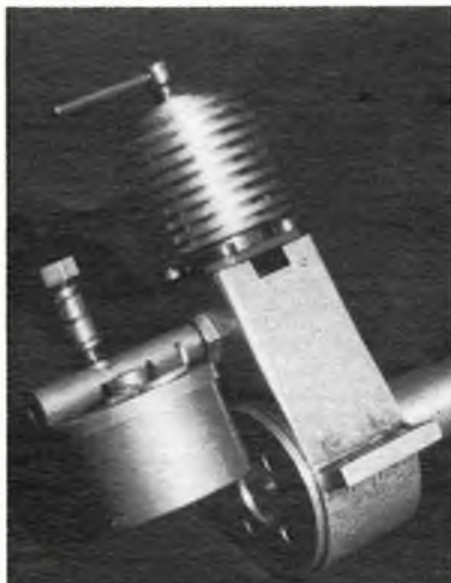
Compared with most other engines of the immediate pre-war period, the Super-Cyclone has quite generous porting. The cylinder ports consist of a large unbridged exhaust port that is uncovered for 136 degrees of crank rotation and, diametrically opposite, a large transfer port that opens for 116 degrees. By modern standards, the circular rotary-valve port is small in area but closes quite late at 50 degrees ATDC, following a 175 degree induction period.

The original Cyclone was intended for operation on a petrol/oil mixture and its amber-coloured translucent fuel tank is perfectly reproduced for the replica engine.

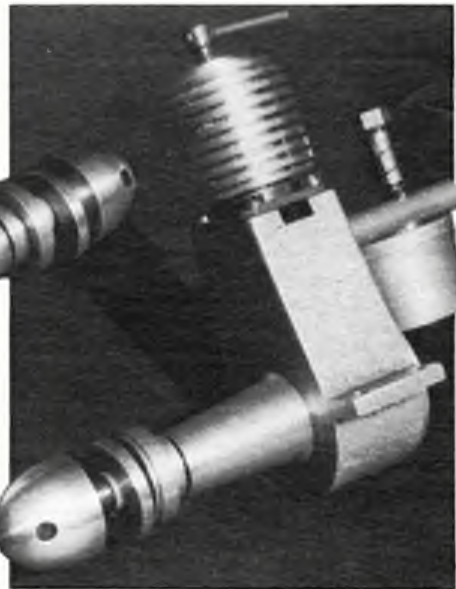


However, for running-in, the user is now recommended to use a methanol/castor-oil fuel in the interests of cooler running and, of course, the plastic tank must not be used with such a fuel.

The Super-Cyclone comes complete with a 3-volt ignition coil and a suitable condenser. The engine's open-point contact-breaker assembly is an excellent reproduction of the original. It is, of course, adjustable for spark advance (for full power) and retard (for starting).



Mystery Motor: Can anyone identify this 2cc diesel? Don't be misled by the cylinder jacket: this is not original. Looks like a Mills 1.3 Mk 1 of nearly 40 years ago but has larger cylinder bore.



We will have a few more words to say about this engine in a future article. Meanwhile, owners of old Super Cyclones may be interested to know that most of the spare parts available for the new engine will also fit previous GR Series motors. Current price-lists are obtainable, price \$1.50, from Super-Cyclone Engines, P.O. Box 10658, Phoenix, Arizona 85064, U.S.A. The complete engine, with ignition equipment, is priced at \$189.50 ex factory.

New Baby Four-Stroke

Four-stroke engines have not been featured in *Aeromodeller* very often because most of these engines are of interest only to radio-control enthusiasts, whose requirements are catered for in the R/C magazines. But some of our 'vintage' readers use four-strokes, of course, and one suspects that many more would be interested in four-strokes if manufacturers

would pause in their apparently relentless pursuit of ever larger and more powerful four-strokes and produce some smaller, less expensive ones.

The O.S. company, whose 10cc FS-60 model sparked off all the current excitement about four-strokes and whose range currently includes three splendid twin-cylinder 'Gemini' models ranging from 20cc to 40cc (to be joined in due course by a 40cc flat-four and a 50cc five-cylinder radial!), went some way towards popularising four-strokes by introducing the 6.5cc FS-40 model in 1981. This was featured in our *Engine Test* series in the October 1982 *Aeromodeller*. Now, O.S. are about to release an even smaller model, the FS-20, photos of a prototype of which are reproduced here.

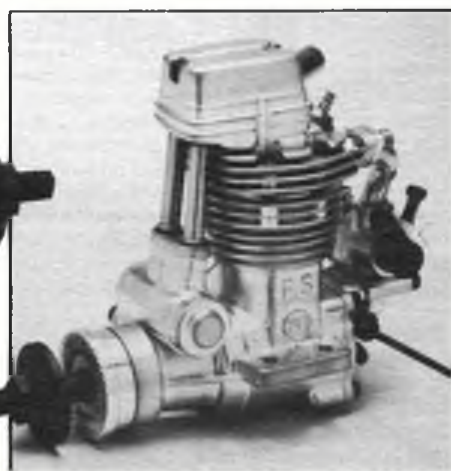
The FS-20 has a bore and stroke of 18 x 14 mm, giving a swept volume of 3.563cc or 0.2174 cu. in. This makes it just fractionally bigger than the Austrian HP VT-21. 3.463cc rotary-valve four-stroke that we featured in the December 1983 *Engine Test*.

As the photos show, the FS-20 looks very much like a scaled down FS-40 and is of conventional poppet-valve design, with a front mounted skew-gear driven camshaft and enclosed pushrods and valve rockers.

More gen when the production model becomes available.

Mystery Motor

Fellow columnist Jim Woodside sent along the photos of the 'Millsish' diesel in the hope that it might jog someone's memory. Whoever built it was surely influenced by the Mark I Mills 1.3 of 1946-7. Jim says that it has the same stroke as a Mills (nominally 0.640 in. - they varied a bit) but bore is increased from a nominal 0.400 in. to 0.498 in., increasing swept volume to just over 2.0cc. He also says that he thinks it could have been made in the Leicester area. It may be a one-off, of course, but a number 52 stamped on the case suggests it could be one of a small production batch.



O.S. Factory photographs of the new FS-20 baby four-stroke. Similar in design to the FS-40 but scaled down to 3.56 cc capacity.

Just a few strokes with a felt tip pen can transform a simple model such as Firefly...

FIREFLY

Have you got a spare evening? Then why not build this rubber powered, fast flying fun flier by Bill Burkinshaw...

LET ME START off by saying that I will take no credit for the name of this model! I called it "It" when handing "It" over to the Editor. "It" didn't seem to suit it so it had to have "It" changed, didn't it?

The Editor chose "Firefly" which whilst unlikely to set the world on fire, seems to do well enough, as the model does flit around somewhat. I do enjoy small rubber powered aeroplanes, there is more of a thrill to be had from seeing such a model turning in a respectable flight following the predicted pattern than I frequently get from R/C models. R/C models are so predictable and the equipment so safe that at times one can almost feel that it is too easy.

I have designed and built many small models such as 'Firefly' over the years but never before with all sheet balsa structure, choosing the lighter built up structures and tissue covering for the better performance this combination has to offer. But, I argued that there is no reason why quite respectable flights should not be had from an all-sheet model and if a simple project for a beginner is needed, then this model should be quite an attractive proposition.

An all balsa sheet fuselage can take a tremendous amount of rubber compared with the tissue covered varieties and can therefore develop the power needed to beat the greater weight...and be tough enough for the clumsiest of fingers to handle during winding, launching and trimming.

I used a four strand motor, generously pre-tensioned probably twice as much rubber as one would normally expect to use in a model of this size but she climbs fast and in spite of the weight does have some semblance of a glide! Giving flights in the order of 30-40 secs which is quite good for a model of this type.

Building methods

I managed to build the prototype in a couple of hours by using cyanoacrylate glue, high viscosity types such as Ripmax "Grip" are of the "Touch it you've Stuck it" speed. They add hardly any weight, won't warp the structure either but they are expensive...

Pin prick the outline of the parts through the plan onto well sanded 1/16in. balsa. Thorough sanding can take the balsa down to that 1/20in. thickness that used to be favoured by Keil Kraft for many of their kits and helps with weight control.

Cut out the parts and round off the edges of tail and wings. Drill holes for the motor peg and wing dowels. Score the fuselage sides along the lines at F2 and F3 and crack bend them slightly. Glue F2 and F3 to one side then add the second side.

Pull the sides in at the tail, glue and then pull the sides in at the front to fit F1. Note the built-in right side thrust at this point. Bend the piano-wire undercarriage to shape, sandwich this between F2 and a scrap of 1/16in. balsa. Fit the tail-skid and sheet in the top and bottom of the fuselage leaving a small panel cut-out below the motor peg for access to the rubber motor.

Cut a facing former for F1 from 1.5mm ply, remove the square section from the centre but *do not discard* this. Laminate two pieces of 1/16in. balsa with grains at right angles for a nose block, together with the small square of ply taken from the nose facing glued to the back of the sandwich (to

act as a locating key for the noseblock). Drill for a nylon nose button or a brass bush if you have one. Slip into place and sand down to conform to the nose profile.

Make two separate wing panels but before gluing the sheet wing surfaces to the ribs, hold the sheet in the steam from a boiling kettle (take care...scalds can *hurt!*). This will encourage the wood to 'bow' slightly and so follow the curve of the ribs. Hold the sheet flying surfaces down onto the ribs with clothes pegs whilst the glue dries. Prop up the wing tip with the root flush with the edge of your building board and use a block to sand the root to the correct angle for the dihedral. Glue the two panels together leaving them propped up until the glue is properly dry.

Decorate the fuselage and tail surfaces with felt tip pens before gluing the tail surfaces to the fuselage.

Trimming

As a young lad I totally failed to appreciate the vital importance of correctly balancing a model aeroplane before attempting to fly it. If you don't balance the model where it is shown on the plan, you are on your own! It doesn't matter how much weight you have to add to get the balance as show, do it.

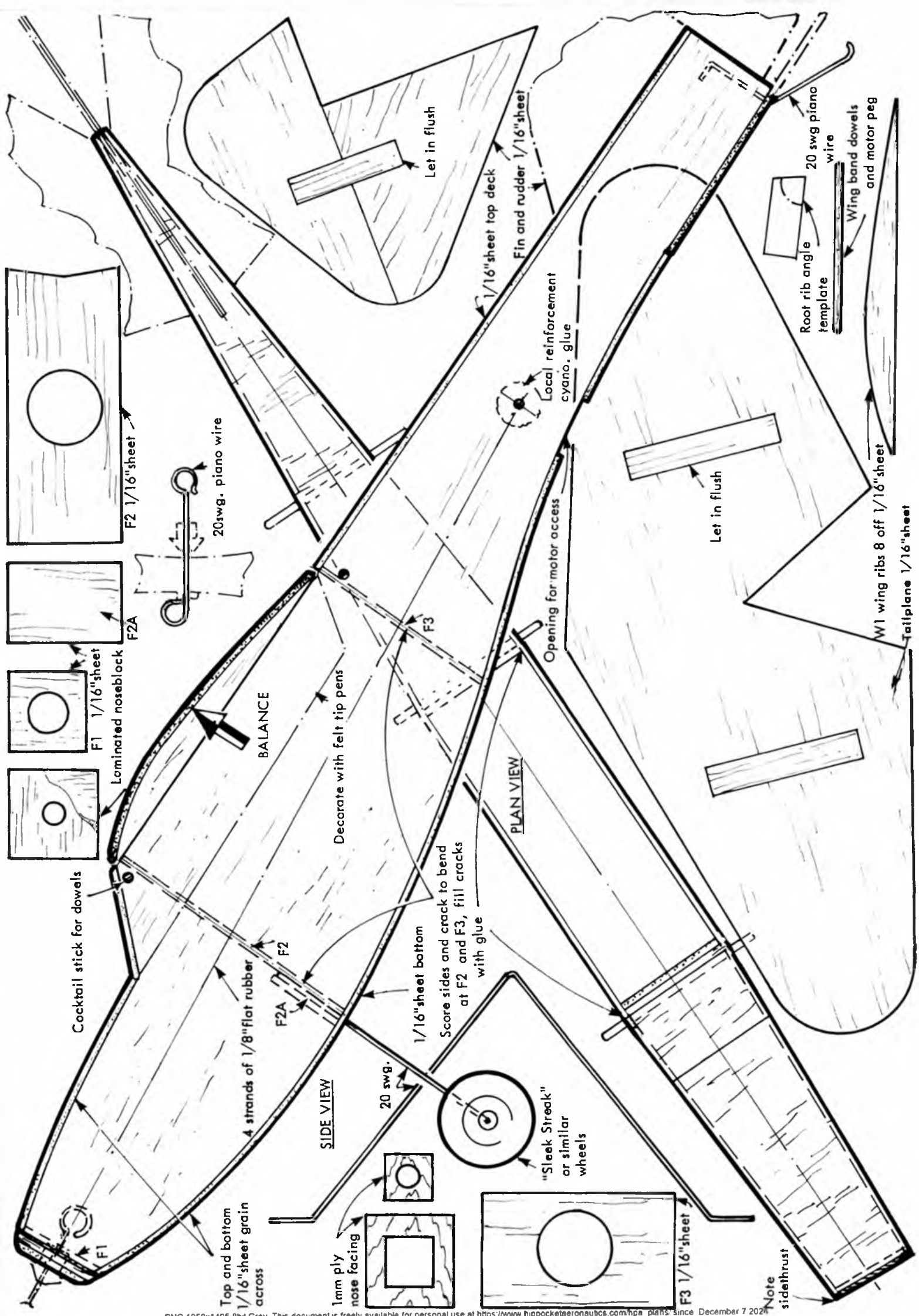
A properly balanced overweight model still has a chance of flying properly, an incorrectly balanced model will be a disaster. At the very worst, the heavy model will just fly for a very short time but it *will* fly.

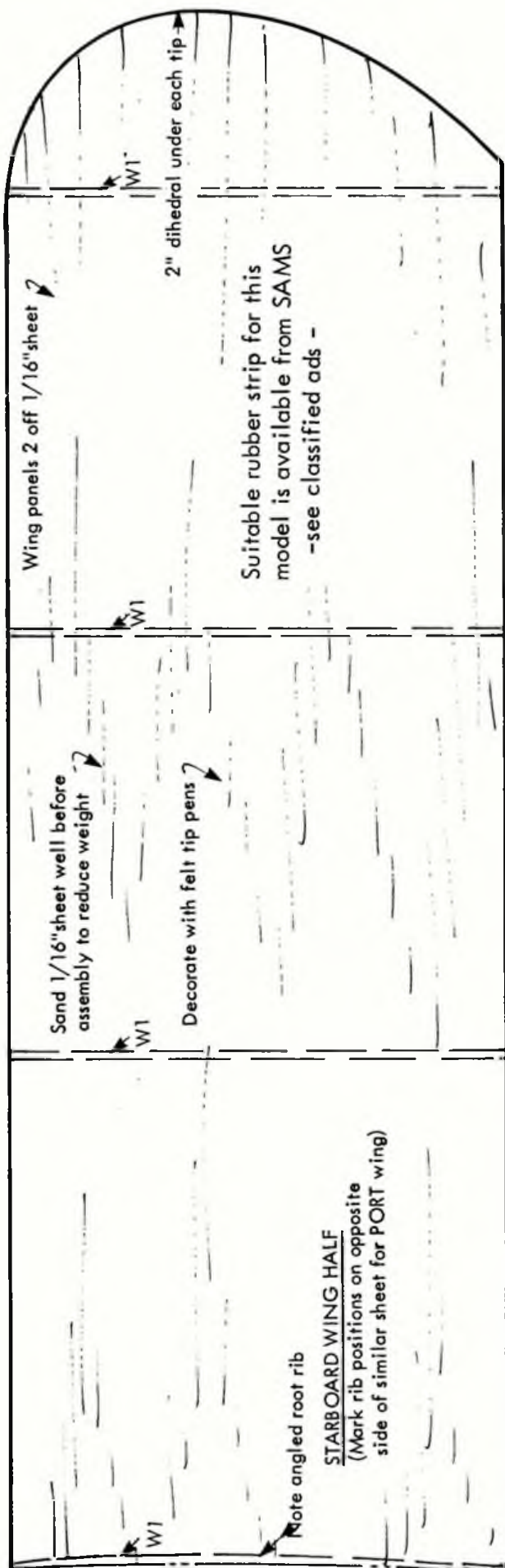
Once proper balance is achieved the motor to see what the trim is like. With the fairly gently at quite a steep angle in reality, the single surface wing generates a lot of drag.

You will need at least 100 turns on the motor to see what the trim is like, with the large motor fitted even the generous side thrust shown is not enough to give a right turn but add a little warp to the rudder (to the right of course!) and a right/right pattern will result.

The model is VERY rugged and will take all the mis-trimming you can give it until you get it right whereupon 30-40 second flights will be your reward. Maximum turns to date have been about 600 using a really good (3 times) stretch wind. Enjoy yourself...

Firefly's attractive lines could well mislead you into thinking that this is not an easy model to build...read on and see just how quick and easy construction can be.





FIREFLY

by Bill Burkinshaw



June 1985

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RADIO CONTROL AIRCRAFT

1985
£1.25

Plans Handbook



No. 4 - Radio Control Aircraft

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SCALE DRAWINGS

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Plans Handbook



No. 5 - Scale Drawings

Aviation, plus Armoured fighting vehicles and cannons. Hundreds of three view drawings of aircraft illustrated, representing one of the most complete ranges of drawings available and covering the period from the earliest days of flying to the latest jets. Many of the drawings are supplied with a reprint of the original magazine article.

AERO MODELLER

1985
£1.25

Plans Handbook



No. 1 - Aeromodeller

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.

Plans Handbooks are available from Plans Sales, MAP P.O. Box 35, Hemel Hempstead, HP2 4SS. Price of each Handbook is £1.25 plus 30p postage.

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.

SHOP TALK

NEW MODEL HOBBY PRODUCTS REVIEWED



Small scale but beautifully detailed 'Tiger Moth' from Lawrence Design Models of Warlingham, Surrey. Two versions are available together with several other designs. All in cast white metal.

Tiger Moth replica

With such a continuing interest in the *De Havilland 82A* 'Tiger Moth', it is perhaps not surprising that a rather superior 1/48th scale kit in white metal is now available from *Lawrence Designs and Models*. These kits are aimed at the aero-collector/modeller who wants accurate models to constant scale. There are two versions of the *DH 82A* available, as G-ACDC and also in its war time role as BB-726. Both versions are only available as limited editions of which only 500 will be cast.

The kits contain accurate high quality white metal castings, the 'Tiger Moth' also having etched brass details (windscreen framing etc). Full instructions for both assembly and finishing models in white metal are included. Assembly can be either with epoxy resin adhesive or for those that know what they are doing; low melting point solder. The 'Tiger Moths' when finished make very fine models and are only two of the models produced by L.D.M. Prices for the 'Tiger' kits are G-ACDC: £18.75, BB-726: £18.95, both plus 80p post

and packing from L.D.M. 37, Crewes Avenue, Warlingham, Surrey CR3 9NZ.

Dragon fire...

Although it weighs only 3kg, the 'Dragon Kit' is a complete set of equipment for brazing and welding. The temperature of its flame is up to 2,850 degrees centigrade, making this new gas-welding system suitable for many applications where an intensely hot source of heat is required.

'Dragon Kit' comprises a welding torch, pair of goggles for eye protection, brazing rods, full operating instructions, a carrier and two gas bottles. One bottle contains a Methyl Acetelene mixture and the other Oxygen: both bottles are disposable. The 'Dragon' torch is a small-scale version of the typical gas-welding torch used in industry. It is equipped with two regulator valves which can be adjusted to control the gas flows.

Particular attention to safety has been made in the design of the new welding system. In addition to the non-return discharge valve required by safety legislation in the oxygen line, a second non-return discharge valve is installed in the gas line. Oxygen and gas bottles have different threads connecting them to their discharge valves. Consequently, it is impossible to connect the wrong bottle to a supply line. Steel sheet up to 2.5 mm thick can be welded by the 'Dragon Kit', so there should be no excuse now if that quarter scale undercarriage falls apart! The 'Dragon Kit' can be obtained from *First Judge Ltd*, The Cross, Enderby, Leics LE9 5PF. Price: £49.95 including VAT and carriage.

Buy this book...

What a fascinating book is 'Line!', reminiscences of a Royal Airforce Pilot - the autobiography of Air Commodore H.F.V. Battle OBE DFC.

The Air Commodore died in 1981 with the manuscript for this book unfinished, it only covered the period 1917-1935. This manuscript was left in his will to his nephew with the hope that it would subsequently be published.

Nicholas Battle found the book well written and absorbing and quite rightly felt that there would

be a wider interest in the contents. The book has some 300 odd pages that look as though they have been reproduced directly from the original manuscript and a few pages are not as clear as they might be, although at £7.95 it has got to be good value. Size is 8ins x 10 ins and a number of photographs are also reproduced.



This fascinating autobiography by Air Commodore H.F.V. Battle OBE DFC, will prove interesting reading for anyone with an interest in the air...

The Air Commodore's views and reminiscences covering the beginnings of the RAF and the post war (WW1) years give a viewpoint that is both amusing and of historical interest, especially when considered with the wider implications of the R.A.F.'s growth from those formative years as the Royal Flying Corps. His comments on his service and the R.A.F.'s role in the Middle East between the wars being particularly noteworthy. 'Line!' will not only interest those with a mind for background history and impressions of the R.A.F. but above all offers an entertaining and absorbing 'read'. Copies of the book are available from Nicholas Battle, 3 Catherine Road, Newbury Berks at £7.95 plus £1.00 postage and packing. The book may also be ordered through booksellers quoting ISBN - 0 905392 29 9.

This Dragon's fire will easily melt steel! The Dragon kit is very complete, with everything you will need to make a start at brazing and welding! Ideal for the small workshop with the intermittent need for these services.

Aeromodeller



Just some of the new line of kits from D.P.R. Models, extending an already 'well thought of' range of kits for the beginner.



New lines from D.P.R.

D.P.R. Models are now well known for their beginners' kits that include that favourite of small chuck gliders - 'Chukkie'. There are also larger tissue covered models in their range - 'Rare Bird', a towline glider, and 'Hyper Cub' that may be powered by either rubber or by a CO₂ motor. Developing such models to be kitted to a reasonable standard is both time consuming and expensive. To increase their range would therefore seem rather a long term proposition - not so - D.P.R. have been most fortunate in finding an existing range of models from a manufacturer in Korea, that could very well have been designed by DPR themselves. Needless to say the new Cosmo models were very

quickly taken under the DPR banner and will be appearing in local model shops very soon.

The range adds a new dimension to the choice for the newcomer to aeromodelling, with models that are well pre-fabricated and look like being neat little flyers. Also included are several designs that may well make excellent second or third models to follow up on that initial interest.

Starting with an ultra simple mini glider of 30 cms span the 'Dacsae' and continuing with several simple rubber powered models of nominally 30cm, 50cm, 60cm wing span, up to the pretty well A1 size towline glider 'Solgae III'. Prices for these start at 95p for the 'Dacsae', up to only £9.95 for the 'Solgae III'.

For the first time DPR Models will also be entering the control line field with two beginners' models for .049 cu. in. (.8cc) engines, both are semi-scale and only have about 8 diecut wooden parts and utilise a novel plastic engine mount for speed of construction. The C/L -1 'Spitfire' and C/L -2 'Mustang' will retail for £6.95.

Look out for these new products in your local model shop - they should stand out with their colourful packaging...



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FREE FLIGHT SCENE

with Dave Hipperson

Effects of temperature on FAI Supplies rubber

The fact has to be faced that *Pirelli* strip just isn't going to be produced again. Consequently all my trimming during the winter was conducted on *FAI Supplies* rubber, if rather reluctantly. I would have to say though, that without direct comparison with *Pirelli* motors in the same models it was difficult to detect much difference in performance but more care had to be taken adjusting for the first *burst* of course.

However, all the time I had at the back of my mind the nagging feeling that someone if not a number of people had mentioned to me that *FAI* rubber tended to be at its worst in cold weather. The question was - what is cold and if this was so, how much more could I expect in the warm?

My trimming was being carried out between 35°F and 45°F and as I say, nothing appeared too much amiss but before the start of the season I promised myself that I would investigate the effects of the full range of temperatures likely to be encountered.

The final experiments took place on the evening before the first event in February... I am glad they did!

First I had to overcome my resistance to the different rubber and did this even before I had started flight tests with it. In brief, I used castor oil as a rubber lubricant where I had always used soap/glycerine in the past and I kept a little talcum powder handy to completely dry any ends that might require tying and I remembered to 're-lube' after running in. *FAI* rubber actually absorbs 'lube', it doesn't throw it off...not castor anyway.

The Tests

I made a start on one of those particularly cold nights this winter when the exposed end of my integral garage dropped to 38°F. I baulked at testing outdoors in sub zero, it could have put me off the whole idea!

The jig was of the same arrangement described and illustrated in *Aeromodeller* July '77 and since then, used and referred to many times.

Samples were taken at random from a number of different aged batches of *FAI Supplies* rubber and all samples were run-in before any figures were taken. Incidentally the rubber varied imperceptibly from batch to batch which at least reinforced what I had heard about it being consistent in quality. Four motors were used throughout; all nominally 6 x 1 mm. Each weighed 10 grams and was made up into 6 strands, working out between 9.5 and 10 inches long. Rather too punchy for use in my Cd'H models but a convenient sample size.

A maximum turns limit of 230 was estimated as nearing 80% of the absolute possible. This way the torque scale was never exceeded, neither were the motor samples ever over stressed nor very likely to break.

ROG's should be so easy! Sue Hipperson poses with one of husband Dave's pair of Chester Lanzo 4oz. Wakefields built and trimmed during the winter.



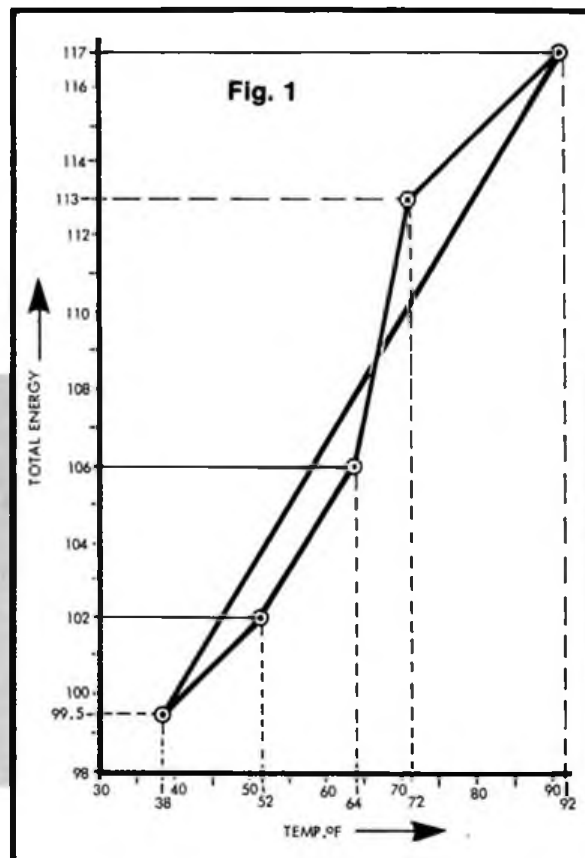
For those wishing to know the actual torque levels reached, calibrating my jig from the Bob Wilder/Woodhouse torque meter would suggest that a reading of 24 coincides with 2 oz./ins and similarly 12 would be 1oz./in but of course it wasn't actual levels I was investigating but changes, so the jig figures were used throughout.

Tests were carried out at five different temperatures in all cases allowing time for the motors to recover and the equipment and motors to stabilise to temperature. Obviously ambient air was all that could be measured so I was most popular when I took the top temperature readings... It remains to be seen how much it cost in terms of

electricity for the auxiliary heating necessary! A day or two elapsed between each of the temperature readings and during all the tests full and half units were thought sufficiently accurate.

Results

It was obvious quite soon, that as the temperature rose then so did the potential energy storage of the rubber (Fig. 1). This was expected, but the changes induced by really quite small increments of temperature were much larger than had been anticipated. What was more, peak torque was not much affected apart from, if anything, a slight decrease as temperatures increased (that is beneficial if a flat torque curve is desired...which is usually the case).



The graphs are drawn from averaged torque readings from all four motors averaged to half a unit accuracy. The tables include all the figures, the graph omits the 64°F line and illustrates only the 38°F and 92°F lines for clarity. The 92°F line represents more than a 15% improvement over the 38°F line. This would equate with the difference I would expect to find between say very good and very bad *Pirelli* at a constant temperature!

What then became of even more interest, was the relationship between temperature and total energy storage potential (the area under the graph). Fig 2 shows total energy potential plotted against temperature and to all intents and purposes it is a linear relationship. That is to say, that within the scope of my tests no detriment showed up with temperature increase...only gain. This then poses the question just how hot can you go before the relationship starts flattening off or we start blowing motors?

Similarly; rapid, repeated use, would probably be less of a problem in hot than in cold weather. These are assumptions but have their basis in previous experience when the better the rubber, of whatever make, the less it was found to be adversely effected by these two activities. Quite obviously heat improves this rubber's physical characteristics somehow, can anyone tell me how?

A question that remains uninvestigated at the moment, is: 'does *Pirelli* behave in exactly the same way'...and we just haven't noticed. If not - and I think it probably doesn't - then where does the changeover point come? Where does *FAI* actually start becoming better than *Pirelli*. As *Pirelli* becomes more a thing of the past that question will be rather academic but it is still of interest at the present time whilst hanks of *Pirelli* are still waiting to be used!

The almost straight line relationship between energy storage and temperature

Temperature effects on FAI Supplies rubber

Turns	Temp				
	38°F	52°F	64°F	72°F	92°F
230	22	20.5	20.5	21	20.5
220	14.5	14	13.5	15	14.5
210	11	11	11.5	12.5	12.5
200	8.5	9	10	10.5	11
180	6.5	7.5	8	8.5	9
160	6	6.5	7	7.5	8
140	5.5	6	6.5	7	7.5
120	5	5.5	6	6.5	7
100	5	5	5.5	6	6.5
80	4.5	5	5	5.5	6
60	4	4.5	5	5	5.5
40	4	4	4.5	4.5	5
20	3	3.5	3.5	3.5	4
0	0	0	0	0	0
Total	99.5	102	106	113	117

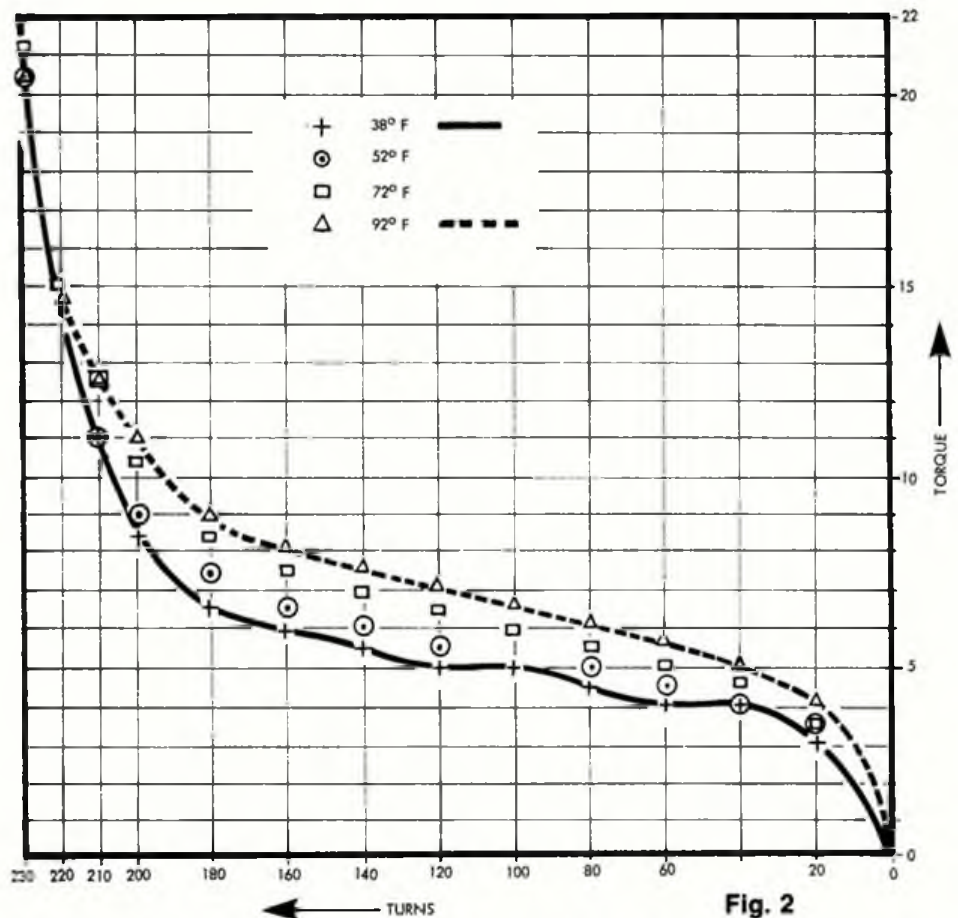


Fig. 2

Conclusions

The energy storage potential of *FAI* rubber increases with temperature. Moreover its torque signature becomes flatter and more like *Pirelli* as its energy storage potential increases. (most useful...). That might also suggest that as it tends towards *Pirelli*-like behaviour in one respect it will tend towards *Pirelli*-like behaviour in others too.

For instance holding a wound motor in high temperatures would most probably not be nearly so detrimental as holding in cold.

would suggest that motors should be used as hot as possible. Cooked deliberately in the sun even! This possibly explains why the Americans at Taft had so much success with *FAI* in their Wakefields. If the average line is ignored for the moment and the individual points on the graph (fig. 1) are examined, it appears that the steepest part is actually between 64°F and 72°F...just the average British Summer range!

Doubtless the answer for the time being, is to use *FAI* for trimming and all contest flights in anything over 60°F but those

winter comps and cool late evening flyoffs will be won on *Pirelli* until it is all exhausted.

It would be encouraging to know if there were any way of improving the low temperature characteristics of *FAI* in its manufacture...to make it more suitable for us of the colder climates. What I have discovered here will certainly save me blowing precious *Pirelli* motors needlessly in Yugoslavia this Summer when temperatures can be as high as 80°F.

Bring back the 5 minute max

Well, we are saddled with the 2:30 max for Area events at least for this year. A decision arrived at incidentally by the *SMAE* Council in a perfectly constitutional manner even though the 1984 Free Flight Technical Committee were not in favour of such a move. Whether it increases participation remains to be seen. My betting is that if it does initially the effect will quickly wear off as 2:30 becomes the norm. It is just this - 2:30 becoming the normal and expected - that bothers me most. Now Contest Directors at centralised *SMAE* and to a less important extent Club events are sure to feel that the 3 minute max should be kept for special occasions - flat calm only. I see us flying to 2:30 as a rule rather than as the exception - dreadful...

The whole point of the thing seems to have been lost. Maxes were introduced as a way of avoiding contest wins from single and probably lucky thermal flights. As a by-product they also lessened the chances of OOS flights, conserved models somewhat and introduced a reward for consistency. However as we shrink the max to such a low level, the situation becomes distorted. We go around the full circle. We approach the stage where large flyoffs will be regularly the order of the day and virtually everyone is getting a crack at winning with one (lucky) flight again.

Much of this trend has been fuelled by the growing assumption by contestants and CDs alike that the day has somehow only been a success if there was a huge flyoff! Flyoffs are being looked on as an end in themselves and they are not. They are all too often a rather arbitrary and rushed means to an end.

Surely participants come for a day's competition, not a brief formality to be 'endured' just so as to qualify for a single flight later in the evening. We must put the competitive pressure back on the contestant during the day and take some of the organisational pressure off the shoulders of the CDs, who are rarely able to cope with the demands made by a multi-class flyoff finale.

Ultimately we may reach the stage where we will not bother with the qualifying flights at all for the higher performance Open events...some already say we should actually continue to this stage. But we have tried it already with the Champagne flyoffs.

They have been found to be seriously wanting. Neither are they the answer for windy weather as was once mooted. Rather oddly they tend to attract most interest on calm evenings and only as an addition to a conventional program. They are no alternative to a proper contest - who would regularly drive long distances for a single flight...

Thirty years ago tiny sites, racecourses, like Warwick, York and Epsom were used and no one thought twice about it - the max was 5 minutes. So let us not beat about the bush...A PLEA TO CONTEST DIRECTORS - particularly at the forthcoming Nats. Remember the rules were changed so

that you could set something other than a 3 minute max at the beginning of the day. Let's have as many flown above 3 minutes as we have flown below. I did it at the '78 Nats for Open Rubber and lived to tell the tale. Give it a try.

SMAE 1st Area event - 10.3.85

When he that decides the weather singles out a Sunday for special attention it is rarely in our favour. The week prior to the 1st Area event in March and a few days immediately after, were mild and often very calm in most parts of the Country but a cold front was rustled up for the Sunday.

Its passing brought to most Areas a period of rain and strong winds for up to four hours at sometime during the flying. The North suffered worst and for longest - in contrast, the two Southern sites of Beaulieu and Ashdown escaped virtually unscathed. It is no surprise therefore to discover both a high entry at and a number of winners from, these two venues.

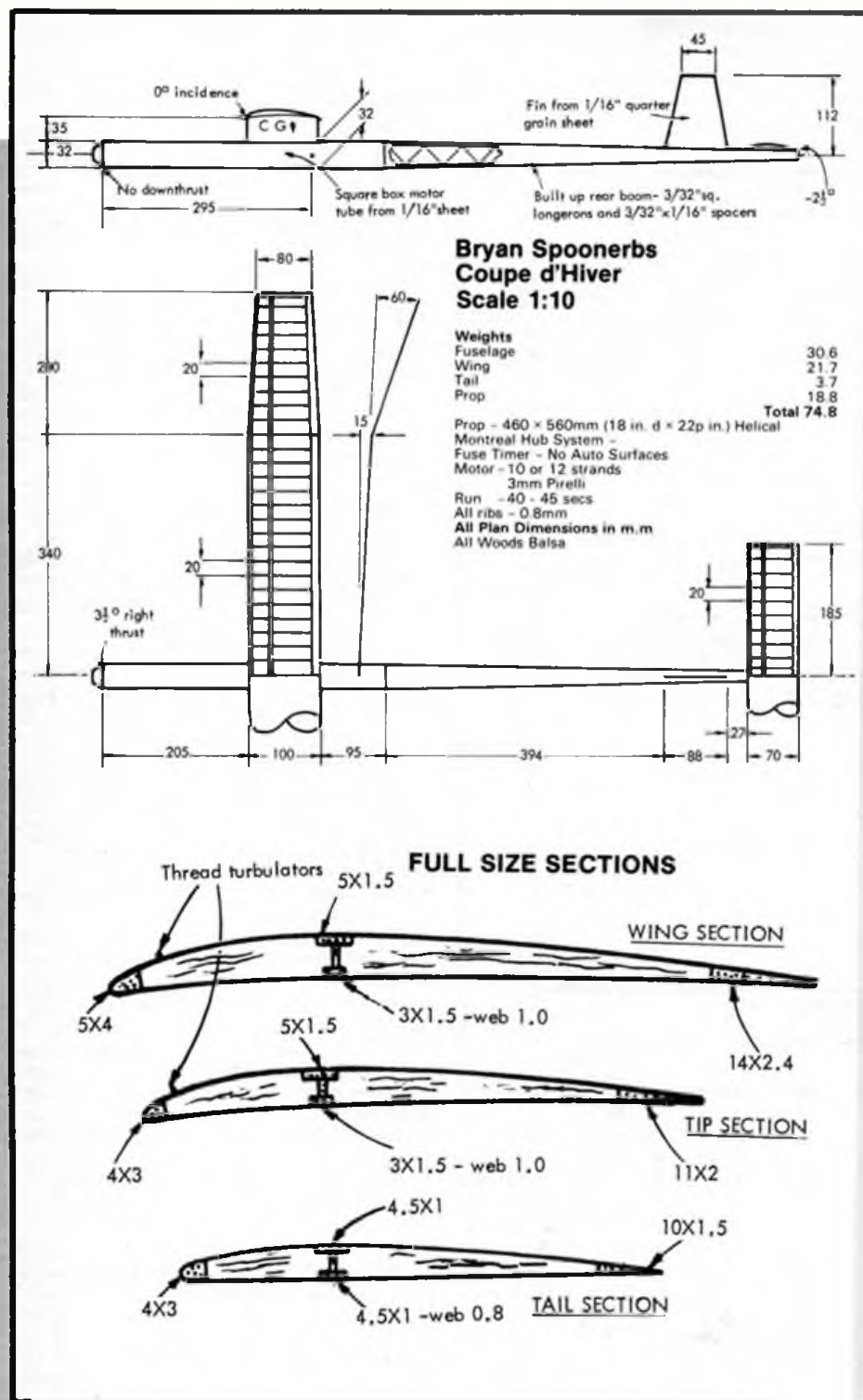
Almost two dozen flew A2s in the KMAA at Beaulieu and the resultant six out of seven top placings accounted for many of the valuable Plugge Points that put three of the Southern clubs into a healthy lead. All credit should go to Alan Jack therefore, a close second, flying at Brunton - Newcastle. He had rain till lunch, high winds until 4.30pm and reasonable if cold weather only for the last flights. No marker models to help him with his fine $3\frac{1}{2}$ minute flyoff either.

As usual Barkston accounted for the most entries but only one winner. Pete Watson continued his form of last year clearing five minutes in the Open Power flyoff for the Frog Senior Trophy. He used a conventional sized but distinctive model, flying well despite a borrowed tailplane after the original was smashed in a tree'd landing on the second max.

Julian Hopper had opted to use the vastness of Sculthorpe and got a better day, but suffered having to flyoff on his own. This may have been just enough to account for his narrow defeat. Most of the rubber flyoff occurred at Barkston too in rather cold and blustery conditions after they had had their ration of the rain belt in the middle of the day.

The winner Mike Howick flew at Ashdown however, where he took the class for the second consecutive year. He dt'd down on the threshold of visibility after he and Nigel Lee (4th) almost didn't bother. A clear spot during a period of rapidly worsening visibility coincided with flyoff time and they chanced their arms! Their perseverance was rewarded along with that of Derek Cash who also joined them and made 3rd in Open Power. This should, but probably will not, serve as a lesson to those that did not bother with the flyoff at their Area because they "didn't think they had a chance." It was hardly a day for casual participation apart from perhaps Beaulieu so it was encouraging to see such a high entry and standard. Luckily nowhere suffered rain actually at flyoff time with rather more people than usual in the fly off, thanks to the reduced max of 2:30.

Bryan Spooner's Coupe d'Hiver model has surely stood the test of time, having been flying successfully since 1978! Perhaps he has an air-conditioned room (set to wet and windy?) for his model storage!



Results

#1A (A/2) KMAA Trophy (Plugge Points) 73 flew, 8 flew off

1	M. Fantham	Richmond	12 30 - 3 41
2	A.G. Jack	Tynemouth	12 30 - 3 34
3	P.J. Bayram	Richmond	12 30 - 3 18
4	E.P. Drew	B & W	12 30 - 3 18
5	C. Sharman	B & W	12 30 - 2 31
6	D.J. Wain	B & W	12 30 - 1 48
7	S. Marriott	Crookham	12 30 - 1 41

Open Rubber 26 flew, 9 flew off

1	M. Howick	East Grinstead	7 30 - 5 16
2	D. Hipperson	Grantham	7 30 - 4 49
3	P. Ball	Grantham	7 30 - 4 26

Open Power Frog Senior 20 flew, 7 flew off

1	P. Watson	Birmingham	7 30 - 5 15
2	J. Hopper	Freebird	7 30 - 5 12
3	D. Cash	East Grinstead	7 30 - 4 18

Plugge Cup Positions after one event

Bristol & West	282
Richmond	277
Crookham	266
Biggles	227
Tynemouth	216

The best system is to send me six such envelopes at the start of the season and I will forward you the results as soon as they become available. I should hasten to add that this service extends only to Area meetings not the Nationals nor the other centralised SMAE events.

Whilst on this subject I noticed with dismay this month that only two of the returning Area competition secretaries sending in results knew what trophy their power fliers were competing for and a couple did not even know the name of the glider trophy despite actually flying in it themselves!

Granted part of the problem here may be the SMAE publicity machinery's apparent

available on receipt of an SAE or automatically to all results recipients. Hopefully then both you and the SMAE will know what you are flying for. In all cases SAEs direct to me at 35 Anthony Road, Boreham Wood, Herts. WD6 4NF.

Nowadays the Leicester Office have the relevant information near at hand when you phone them! But be patient with them as they are employed for their administrative skills and not their total knowledge of the competition scene...explain what you want to know in words of one or two syllables...Ed!

Dave Hipperson's winter output included these two identical Chesler Lanzo 40s. Wakefields both now trimmed and looking good for a whole series of 4 minutes...

Bryan Spooner's Coupe d'Hiver

Most of Bryan's activities are concentrated on the three main FAI classes and he is of course once again in the FIB team this year. He is however just as effective on the few occasions when he flies this Cd'H. The model is over six years old now, having been trimmed out at the Aero-modeller Coupe 'do' in 1978. Since then it has always finished high up the list at this premier event and I remember it being particularly impressive in the 1982 fly-off, placing 2nd in torrential rain which if I remember correctly, induced a slight glide stall. Last year he was 5th with a few seconds dropped from two flights in the poorest part of the day.

The model climbs positively throughout the run which is sometimes as long as 45 secs and although small by today's fashion at 160 sq inches it glides well on the USA-5 wing section. This incidentally has the characteristic trailing edge reflex removed and blended conventionally into the section. Substantial right thrust is necessary to overcome the left rudder used for the safe right/left trim not usually favoured in Cd'H. The model is now almost 5 grams overweight although Bryan is quick to point out that it started bang on - this increase probably being due to various repairs and lubricant soakage over the years.

See plan on opposite page

Area results Service

It may be an appropriate moment to remind readers that because I collate the results from the Area meetings on behalf of the SMAE, I am in a position to send out complete sets to whoever wants them. Just let me have an SAE of at least 9in x 4in - there is no further charge.

policy of almost total secrecy on such matters. In fact in the past, neither the Leicester office nor the Records Officer have always been able to give definitive answers to questions on the subject.

To clarify the position I am compiling a comprehensive list of SMAE events with their correct trophies. This list too will be

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WHEN IT COMES TO SOLDER, things aren't always what they seem. Soldering, or *Soft Soldering* to be more precise, has been a standard means of solidly and to all intent, permanently joining metals together for model aircraft since model aircraft began.

The question that has been raised recently is "How permanently and how strongly?" for the solders that seem at first sight to be available to modellers *now*, are not as strong as they used to be *then*. In short, our models - well those parts that are soldered together - seem to fall to pieces more readily than they used to!

Being blunt, there is nothing wrong with the solder at all, what is wrong is that if you are finding "Things ain't what they used to be" that it is more than likely your own fault for choosing the wrong flux.

The ready availability of resin flux cored solder in DIY and hardware stores has fooled a lot of people. Quite simply, the



Above: various solders are available, left, an acid cored solder for piano wire, centre solid (non-flux cored) solder with Baker's Fluid flux and right, resin cored solder - the most widely available which is as near as possible to Tinnans solder.

SOLDERING

Was solder really stronger a few years ago? Bill Burkinshaw took a look at whats available to Aeromodeller readers

solder marketed in small dispensers with a flux core is great for what it was intended for, *electronic assembly work*, but as far as aeromodelling uses are concerned, *forget it!*

Solder and flux types

Soft soldering is a comparatively simple means of joining similar and dissimilar

metals together using an alloy - the solder - having a lower melting point than either of the two metals to be joined. The term *soft solder* is usually applied to solders with comparatively low melting points that contain lead and tin.

Actual melting points vary from around 150 to 300 degrees centigrade depending on the exact proportions of Lead and Tin. Solder for electronic assembly work needs to have high electrical conductivity and sufficiently low melting point to prevent damage to delicate electronic components.

We must also be aware of the need for a flux...when metals are heated the natural oxidation that always takes place as metals are exposed to the atmosphere speeds up. Now solders do not bond to oxides so a flux is used to keep oxygen (from the atmosphere) away from the joint area, with the bonus of

lowering the surface tension of the molten solder and allowing it to flow more readily into the joint.

Once again, the fluxes used for electronic work are unsuitable, as components have almost exclusively been pre-heated by coating with a layer of tin (Tinned) or even gold or silver plated. The flux used must be of a mild and non-corrosive nature as any residue must not corrode the assembly and it may well be very difficult to remove residues without damaging the components.

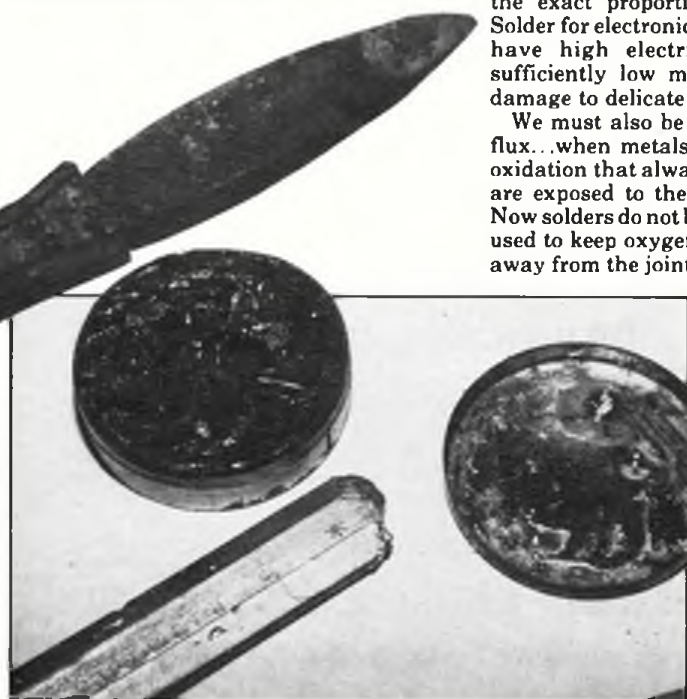
Non treated materials such as piano wire, brass sheet, steel sheet and many other materials that are used for general modelling really do need a flux that has a much fiercer action than the mild type developed for electronic assembly. The flux to be used must be an *active* flux, usually an acid of some form.

Such fluxes actively dissolve the oxides that form on the metal surface but unless washed away will continue to corrode the metals long after the joint has been finished. Certainly from the flux point of view, the standard cored solder is not suitable for our purposes.

Not what they seem...

Taking a closer look at the 'Data Sheets' available from Multicore, one of the major manufacturers of solders in the UK it will be found that in spite of initial suspicion, the "5 Core Savbit Alloy" solder widely available has almost the exact 50/50 Lead to Tin composition of the old fashioned 'Tinnans' solder that I would have recommended.

The answer to the problem then, must lie in the suitability of the flux cores of the solder, strength is the same as it ever was! There are stronger solders available from Multicore and other manufacturers, Multicore 'Sn62', 'Sn63' and 'LMP' are much higher tensile strength but 'Sn62' and 'LMP' both contain silver and are likely to be quite expensive. Even 'Plumbers' solder with its much higher melting point gives no strength benefit but with its lower tin content would be cheaper.



Left; tin of resin flux plus plumbers or tinnans solder are used to "Tin" the iron before use.

Core of the matter

If really sound joints are to be achieved with materials such as piano wire, an acid flux is *essential*. It is possible to find acid flux cored solder, *Multicore* 'ARAX 40/60' alloy should be ideal and it is produced in a range of gauges from 10-16. This solder is obtainable from K. R. Whiston, New Mills, Stockport, Cheshire who will send their catalogue on receipt of a Stamped Addressed envelope.

Right; clean the iron down to bright copper before attempting to tin.



Left; for large jobs the copper bit heated over a gas stove is still one of the best methods to use for soldering.



The alternative, and it will probably be a little cheaper, will be to buy a stick of 'Plumbers' solder from the local Builders Merchant and a tin of *Bakers Soldering Fluid*, an acid flux.

Stick solder such as 'Plumbers' solder will not be as easy to use as the more familiar thin gauge cored type, its physical bulk

makes demands on a small soldering iron that the iron cannot meet and you may find it necessary to cut small pieces off the stick before your iron will melt it.

Technique

Unless you intend to do a lot of electronic work then a good big soldering iron is a must, 60 Watts will be fine for undercarriages, fuel tanks etc. An

Left; the heated iron is plunged into the flux, coated with solder and then takes on the appearance as shown.



alternative is a good big copper bit that can be heated up over the gas stove. To solder up an undercarriage, proceed as follows.

1. Clean the piano wire parts thoroughly with emery cloth.
2. Carry out any binding operations with tinned copper wire (fuse wire).
3. Apply acid flux to the joint area.
4. Heat up and 'Tin' the soldering iron. To tin the iron it will be necessary to clean up the bit with emery cloth and *immediately* plunge the hot iron into a container holding a small blob of flux coated solder which will then melt and run all over the iron.
5. Apply the iron to the area of the joint. The iron is a heat store and sufficient time must be allowed for the heat to travel from the iron to the work, it is NOT a method of transporting molten solder to the joint.
6. When the work has reached a good heat apply the stick of solder to the joint NOT the iron. The solder should then melt and flow right through the joint. If it does not, then the joint area was not hot enough and more time must be allowed.
7. As soon as the joint has cooled, wash away *all* traces of flux from the joint.

So there you are, starting from a standpoint of "Its new, it can't be any good" a little investigation has revealed that the solder is fine and it is the flux that is at fault, if there is any fault at all. We arrive at the ready availability of an acid flux cored solder that should be readily available and ought to ensure that our models survive all but the cruellest landing.



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FROM THE HANDLE

CONTROL LINE NEWS

Racing with Jim Woodside

Rossi Engines — latest news

Rossi engines have been almost unobtainable for some months. Although rumour and reason have been rife, it is perhaps sufficient to say that the engines are back in production and available. However, the Rossi brothers are now operating from separate factories.

Ugo Rossi has a new factory with new machines to make the famous R15. Reports say that the quality is even better than before and at no increase in price. Cesare is producing a range of motors under the new banner of *Novarossi*. These include the R-09 (pictured in this column December 1984), an uprated 09, and the 21 range in various guises for marine, aero and car use.

The UK importers, *Turbofan*, are now pleased to accept orders for these first line racing motors. Specific details of price and delivery can be had by sending an s.a.e. to: *Turbofan*, 5 St. John's Road, Clevedon, Avon, BS21 7TG, or 'phone 0272 872351.

Constructional Technique

A quick look around the average aeromodeller's shop will unearth a variety of devices to hold bits of wood together while the glue sets. Typical useful items are clothes-pegs, bulldog clips and masking tape. My own contribution is the "big-foot" G-clamp illustrated in the photographs. The large fixed area and circular moveable pan, spreads clamping loads evenly and without leaving dents and marks. However, do not make a beeline to the hardware store, but head instead to the public house or at least a bar supplier. The cramps are, in fact, optic clamps used to hold bottles of spirits to bar shelves! Of course, you could always broach the subject with your favourite barmaid...

Visionregal Racing Props

Ron James' finely made props sold under the *Visionregal* brand name have been mentioned before in this column. Ron has

Beautiful stunter of Wolfgang Gromann. It's a derivative of Claus Maikis' 'Palatin' but with a conventional tail. Engine is an OS 45 with original muffler and 12 x 5 in. Graupner grey nylon propeller. Motor runs extremely smoothly with plenty of power to pull this 1700 gram aircraft.



business address: *Visionregal*, Unit 10, Pier Road Industrial Estate, Gillingham, Kent, ME7 1RJ, 'phone: 0634 578418.

Stunt with Claus Maikis

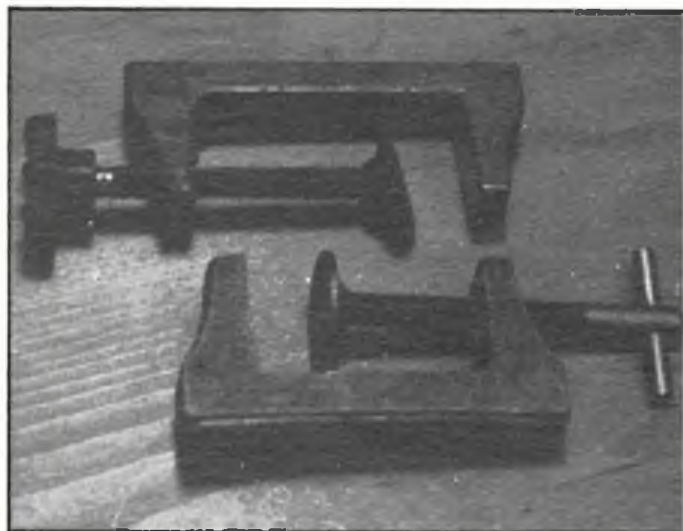
Airmail

The last World Championships, held in the United States of America, posed a problem for some members of the German stunt team. While speed and team race flyers have used boxes for their 'tiny toys'

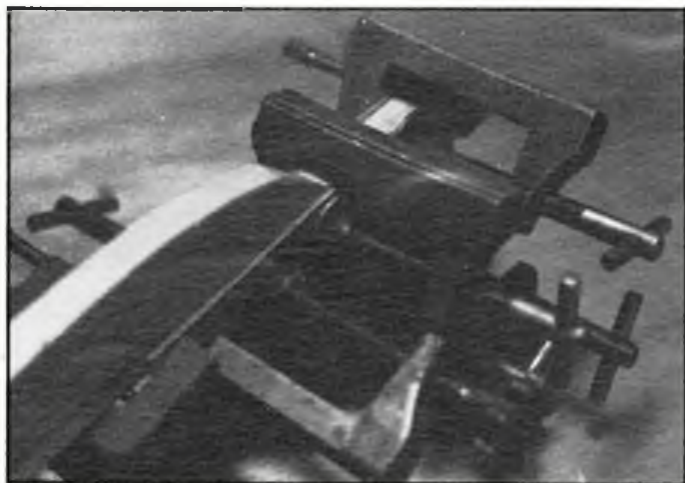
now decided to establish his own model making service, having been in this field for many years. The props will be a regular aspect of his daily work and delivery should now in fact be quicker. As well as supplying the existing range of control line and radio control props *Visionregal* will also quote on the production of customer's own designs in props and other moulding work.

Although Ron will still be available at the old address, customers should note the new

Right, novel excuse for a visit to the 'local' - Optic clamps, available from bar suppliers, make excellent G-clamps for modelling use (see Constructional Technique).

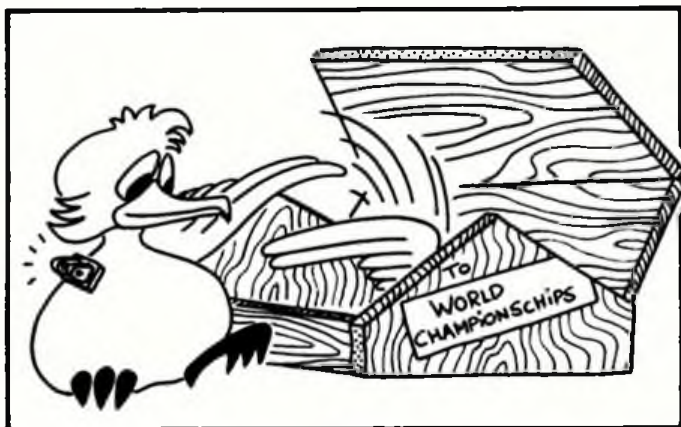


Left, a bunch of optic clamps in use, holding the ply doublers in place on an APS 'Peacemaker'.



for many years, stunt flyers have so far refused to construct packages. These airplanes have dimensions which already exceed the interior of a typical European car, let alone when enclosed in a bulky box. Most contests are usually within reach on four wheels; this was the first time that our complete team travelled on two wings. We had to build some 'furniture' to get our models transported by the airline. Since aerodynamics played a minor role our thoughts concentrated mostly on *statics* and excusable for aerobatic pilots...on *aesthetics*. The results were slightly different...

I had been to America before, so I already had a box. It's designed for one model. I built another box for my second aeroplane, but crashed the model two weeks prior to the Champs... I have a cute box for sale now!



Left, one of Claus Malkis' distinctive cartoons, hopefully more of which may be seen in *Aeromodeller*... Below, the German stunt team at the World Championships at Westover, USA in 1984. From left; Geza Egervary, Claus Malkis and Uwe Kehnen show their beautiful airplanes (in the box, that is!) near the swimming pool of the hotel.

Basically, my box is built from 3mm plywood with 10 x 15 mm pine stringers at the edges and across the long panels.

The lid is held with three hinges, it's closed with two catches. These can be locked with a key, but I've never done it. After all, if somebody wants to steal the model, he'll attract more attention carrying the model than carrying the box! There are formers cut from 5 cm styrofoam sheet. They are precisely cut to fit the different parts of the model. The formers have lower and upper parts, held in place with tape.

You can put the box in any position, even throw it, the model parts will stay in place. Of course, the box will not withstand a hard throw. You can't even sit on it. My experience - with four airline journeys now - show that such boxes are handled with sufficient care. More on that later. The box weighs about 45 kilos the dimensions are 155 x 38 x 20 cm. Of course, these dimensions are only possible if you have an airplane with detachable wing, tail, and undercarriage!

Geza Egervary's box was a little bit more roomy. It was built for two models with detachable wings, but fixed tails. It was built from thick styrofoam sheets, strengthened on the outside with flat wooden stringers. The whole thing was covered with glass cloth. At this size, it was light...at about 7 kilos. For easy handling, Geza has installed two roller shutter blind handles on both ends.

Our third team member, Uwe Kehnen had built a box with about the same side view as my box, but with double the width. It carries two airplanes, again with detachable everything. Unlike mine, his box is solid. Made from 10 mm planks, you need the better part of a complete World Championships team to carry it.



Actually, after the photo session (which took place at the hotel at the Champs) he was so exhausted that I had to keep him from falling into the swimming pool. This box is excellently suited to carry other model boxes on it's top. Of course, Uwe's models can never be destroyed..

As I said before I've never had trouble when travelling with such containers. The German Aero Club and the Lufthansa airline provided so many stickers we could have covered the whole airplane (the big one, that is!) But - its my opinion that with the stickers its just like the traffic signs: the more there are, the less people will watch it. You'd better paint your box with a crazy colour or a fancy paint scheme.

Serious stunt flyers don't like it that way, they prefer Kenyan Teak or Indonesian Mahogany, combined with antique brass hinges, locks and edge guards! Additionally I painted a 'Snoopy' - saying funny things - on my (and my team mates) boxes. Result was that laughing airline employees come to me, asking politely whether I wanted special treatment for the box, and how to do it.

With the world getting smaller every day, and Championships being held outside of Europe, a model box is a useful investment in our business. After all, it's a practical way to carry our models. So far, I've only had a problem when passing the customs barrier. When the officers ask me for the contents and I reply 'an aeroplane' some

eyebrows are raised to the cap, and some hands are lowered to the pistol. Then I open the box with a smile. With relief and amusement the officers let me pass and never check my private baggage with the smuggled Whisky!

Spare parts

Detachable models have been with us for many years. I remember an early article by Jim Mannall on his famous 'Nimrod'. Pete Tindal had the plans for his 'Chipmonk' in an American magazine, and lately Bill Draper published his 'Superhawk' in *Aeromodeller*. Aerobatic airplanes are seldom crashed in flight. Most damage is done during transportation from the workshop through the corridor, passing the automatically closing main door, packing

into and out of a tiny car (and then the whole procedure backwards).

Fighting these problems, European modellers have developed airplanes which disassemble into at least two parts, sometimes many more. One of the most interesting models I've seen lately is the one of Eric Janssen (Netherlands). If not looked at very carefully, his 'Future Sound' looks like a normal 45 size model with perhaps a little bit more span. Closer examination will show some highly interesting details. Eric, an engineer, has come to some very clever solutions, so far not seen in an aerobatic airplane.

First of all, he uses a Saito 45 four stroke engine. This may come as a surprise, since the nose of the model is rather long. A discussion with Eric showed that a four stroke engine doesn't necessarily have to be heavier than a two stroke. A four stroke engine doesn't need a silencer. At least you can add a small one which will only weigh about one third of the usual two stroke engine muffler.

The four stroke engine uses fuel, maybe one third of a similar two stroke. Since you need less fuel you can use a smaller tank which weighs less. If you replace the original throttle valve with a venturi you can save another ounce.

In Eric's case his four stroke outfit is only slightly heavier than the *Super Tigre* 46 installation which he can instal instead of the Saito. His prop is the *Graupner* grey nylon three blade 10 x 7, which he and his fellow countryman Henk de Jong favour so much. This propeller actually has less pitch than marked on the blades. After careful checking, the pitch was measured at a pitch



Eric Janssen and his nostalgic styled 'Future Sound' four stroke airplane. Eric switched to Graupner G 12 fuel (12% Nitro) to pull more power from his engine.

around 6 (less at the root and slightly more at the blade tips).

Eric has produced his own carburettor. It is a simple venturi which replaces the complicated R/C throttle with its long intake tube. Since the venturi is now placed at the cylinder head, you cannot install the tank in the traditional manner. The small tank (less than 2oz!) is quite flat and is mounted with its centre line on the venturi centre line. This installation called for a slightly modified fuselage shape in order to cover the tank.

Since four stroke engines are a little bit more sensitive to fuel delivery the tank has a pronounced *corner*, a two fold wedge, so to speak. To get the fuel pipe in the most

outward position, it is installed outside the tank, carefully soldered, the inside end carefully milled and filed to assure an undisturbed smooth fuel flow.

The most interesting parts of Eric's model are those which come off! He takes off the fin, the undercarriage and the tailwheel. The tail goes next, and after loosening two bolts he pulls off the wing. You'd better say wings, because there are two wing halves...

An aluminium tube is mounted in the fuselage. This tube fits into tubes built into the wing halves, these tubes are of glassfibre construction. A bolt from the bottom side of the wing locks it and a second, smaller tube, at the trailing edge keeps the wing from rotating. Additionally,

there is a small pin near the leading edge. The flap horn is mounted within the fuselage, it carries an outrigger on both fuselage sides which fits into a small recess with holes at the flap roots.

With all this technology, Eric has managed to build his airplane at about 1400 grams with a finish that most modellers would be proud of. He has had some problems with his *Saito*, so he flew his airplane with his *Super Tigre* 46. I understand he's waiting for a new liner for this engine. As soon as he has straightened out his problems, he'll gather up several parts, assemble an airplane and be back in the pattern wars!

C.L.A.P.A. Champs

Now in its 7th year, the Control Line Aerobatic Pilots Association Championship, originated from a request by the local division of the St. John Ambulance Brigade for a C/L model display at their annual Gala, by the Witham M.A.C. On that day however, the club was running its own Witham Cup Stunt competition and so it was suggested, that instead of a display, the club ran the event at the Gala. This was readily agreed by the organisers.

The contest was a success and the following year Pete Burgess proposed to the CLAPA committee that a CLAPA Championships be held. Jim Mannall said: "Fine, but how about making it a two day event". The St. John were then approached and they kindly agreed to the proposal and plans were laid and a cup ordered...

It was decided to add, as added spectator

interest for the Gala, C/L Carrier and Scale contests. The event was a great success and has since been enjoyed by competitors and their families alike because of the added attraction of the Gala itself which also has the Red Arrows or other aerial displays each year.

The event is held in high esteem by British Aerobatic flyers and attracts entries as high, and last year even higher, than the British Nationals.

In order to provide more flying for both spectator appeal and competitor satisfaction the event is run as a two circle event with each competitor flying two rounds in each circle, with the sum of the competitors best scores in each circle to count. The top seven then go forward to a two round single circle fly-off with their best fly-off score then being added to their preliminary round scores to decide their final position, a similar system to that used

at World Championships.

In 1984 the latter part of the contest was marred somewhat by windy conditions but the placing after round two with Bill Draper (*Enya* 45, 'Superhawk'), Barry Robinson (*Merco* 61, 'Northwind') and Tony Eiffaender (*PAW* 35, 'PAW-84') was maintained - with some juggling along the way - to give these three, final positions of 1st, 2nd and 3rd respectively.

Popular motors (outside the top three!) seemed to be the *ST* 46 and *ST* 60.

The windy conditions also affected the entry in Novice Stunt with several competitors preferring to watch rather than fly. Terry Bradley emerged the winner and joined others at the traditional prestigious prize giving - including champagne from the silver cup...no less. This year the dates are 13th, 14th July...see What's On for more information and write the dates in your diary NOW.

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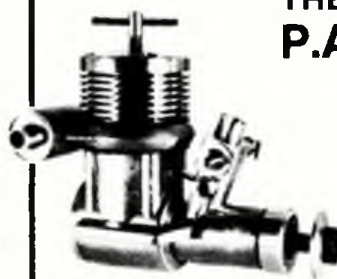
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with John Wheddon

Finishing and painting

There have been many articles in past editions of *Aeromodeller* on the subject of paint finishes and the various techniques involved in applying them. Model rockets are not really different in this respect so this article will not go into great detail - just the significant points to watch for when finishing rockets.

It is tempting to think that since rockets have only a relatively short life it is not really worth expending a lot of effort in applying a good paint scheme. Whilst I have lost a few models I also have some which are now several years old. Rockets do, inevitably, attract attention when taken out; so on balance I feel that the extra effort taken in achieving a nice finish is worthwhile.

The exterior paint finish is applied for three basic reasons. Firstly, protection - the paint system waterproofs the model and prevents the otherwise absorbent card acting like a sponge! Secondly, appearance - we like our models to look good, resembling the full size equivalent perhaps. Thirdly, performance - a well applied, smooth finish can result in lower aerodynamic drag which in turn results in a faster, higher flight.

Whatever reason we have in mind for our paint scheme it is a good idea to have some means of supporting the model whilst it is being painted. I use holders that are best described as *wands*. Harry Stine coined this term in his "Handbook of Model Rocketry" and I can't really find a better description. However, where Harry suggests the use of a rolled newspaper wand I use a more permanent method.

A spent engine casing can be glued on to a suitable length (12 - 18 inches) of wooden dowel using rapid epoxy. An extra dab of epoxy is sufficient to seal the nozzle and prevent loss of the messy, burnt charge. The small screw hook in the free end of the dowel completes the wand and allows the model to be hung up between coats of paint (fig. 1).

Models which have metal clip engine locks will be held securely on the wand by the clip. Rockets with simple push fit engine mounts need to be a tighter fit on the wand and one or two layers of adhesive tape wrapped around the engine case will suffice to prevent the model falling off during painting.

The first stage in painting the model is to properly seal the surfaces of the body tube and the grain in the wooden fins using a sanding sealer. Body tubes usually have a good finish and one or two coats of *thinned* sealer is usually sufficient to provide a good base for further painting. Each coat of sealer should be rubbed down with a fine grade sandpaper before application of the next coat and it is important when brushing on the sealer to work quickly and not go back over areas which are still wet. Messy brush marks will be the result of you do!

Many kit models contain plastic parts, including pre-formed fin assemblies. Take care not to brush cellulose-based sanding sealer on to these parts - they may MELT...

Balsa fins require more attention because several coats of sanding sealer are necessary to completely fill the grain. It is often a good idea to cover the fins of larger models with lightweight Japanese tissue. (look for advertisements in the Classifieds section). Extra care is needed when sanding between coats to avoid rubbing through the tissue - especially at the edges.

Balsa nose cones also need lots of sealing coats to remove all trace of the grain and in this case there is no short cut available with tissue covering. Also make frequent checks on the fit of the nose cone to ensure that it is not made too tight by successive coats of sealer!

For a finer rubbing down of the sealer I use a very fine grade of steel wool. I have a pack of a type called 'Silver Fleece' which has lasted for several years - using just a pinch at a time. The steel wool conforms easily to the curved surfaces of the rocket and the fin-body joint areas. It should be used with care on balsa parts because the strands can very easily catch and cut into the thin edges of a fin.

The next stage is to apply very lightly sprayed coats of flat white primer all over the model and providing that the sealer has been properly applied and rubbed down this primer forms an ideal base for subsequent coats of coloured paint.

A huge variety of colours is available in aerosol cans from motorist's DIY shops. *Car Plan* and the *Dupli-Colour* ranges include suitable white primer and fluorescent colours.

The actual colours chosen for a particular model are largely a matter of personal taste - that is until the time comes to search for a lost model! Bright, fluorescent type colours really do help in this respect. Also, as your collection of models builds up it will become easier to select the best colour model to fly on a particular day. Dark models, flown against a background of white clouds are easier to track than lighter shades for example.

Full size rockets are very expensive vehicles and each launch is usually part of a specialised scientific programme. In order to aid in the analysis of every flight the rockets are often painted with roll patterns to give a visual clue to their performance (fig. 2). High speed film of the flight can be analysed and the apparent 'movement' of the patterns provides information about the



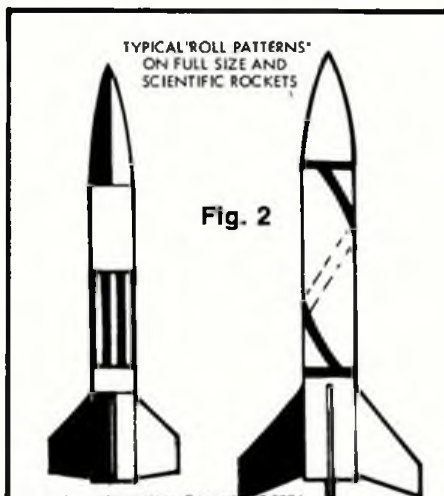
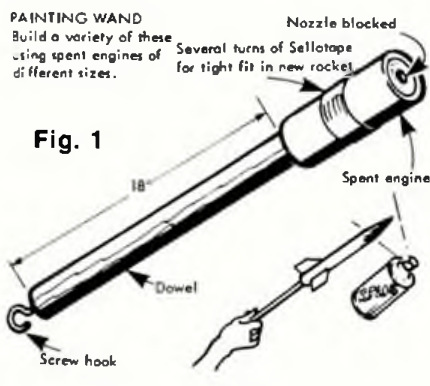
Paul Clarke's unusual model of the 'Natter' rocket fighter taking to the skies. First flight duplicated that of the original by 'arcing over' and crashing, but as can be seen here NOT with original scale damage!

rate at which the rocket spins. These patterns can be duplicated on our models and help to make them more interesting. Kit models often have transfers featuring roll patterns but when building a model from scratch it is necessary to use masking for spray painting these patterns.

After applying the lighter base colour, progress to the darker colours masking off the finished areas using masking tape and, for large areas, writing-quality paper. Do not use absorbent tissue for this task as even very light coats of spray paint quickly soak through. It is also worth finding a good quality masking tape. Many kinds are very sticky and often peel off the paint beneath when removed! *SAMS* (see classifieds in the back of the magazine) supply a tape which is very thin and much less sticky than the usual kind.

Masking and spraying does take quite a lot of practice before consistent results are obtained so it is advisable to begin with fairly simple schemes before progressing to the more complex roll patterns. Do persevere though!

For more detailed information on spray painting and advanced airbrush techniques read: Ian Peacock's book - "Airbrushing and Spray Painting Manual", published by *Argus Books*, price £6.95.



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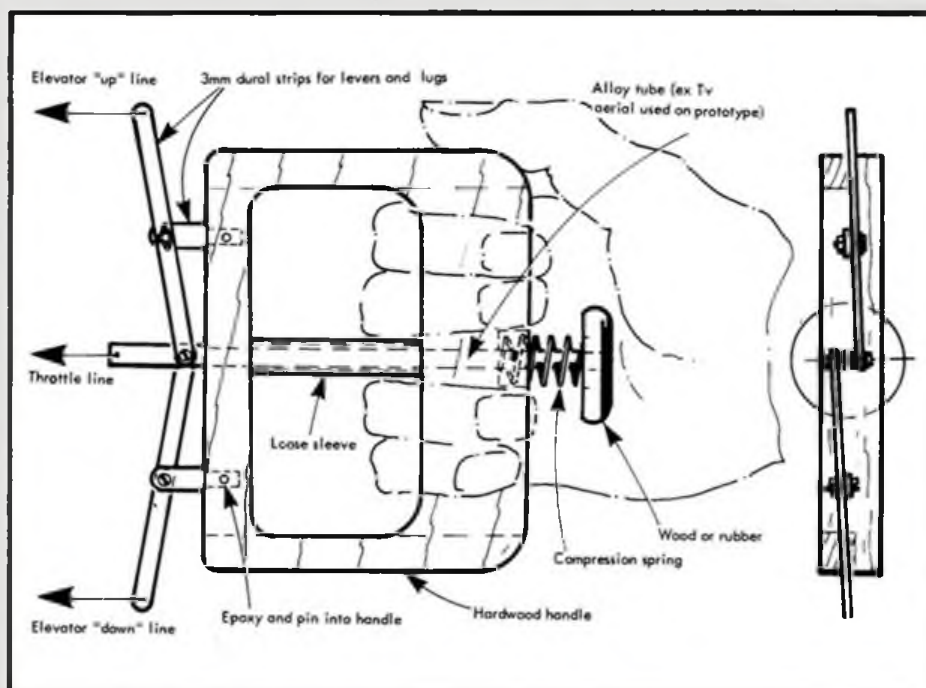
Balsa Stripper Pavlos Niazis - Italy

The balsa stripper has two interchangeable spacers, one to fit the thickness of the sheet being stripped, the other is chosen for the size of strips wanted. Constructed in hardwood and sanded smooth, the stripper can be moved over the length of balsa sheet or fixed to the work surface with the balsa sheet moving past the cutter. The stripper works with any kind of blade tried so far.

Grip Action Handle Geoff Spriggs - Lincs

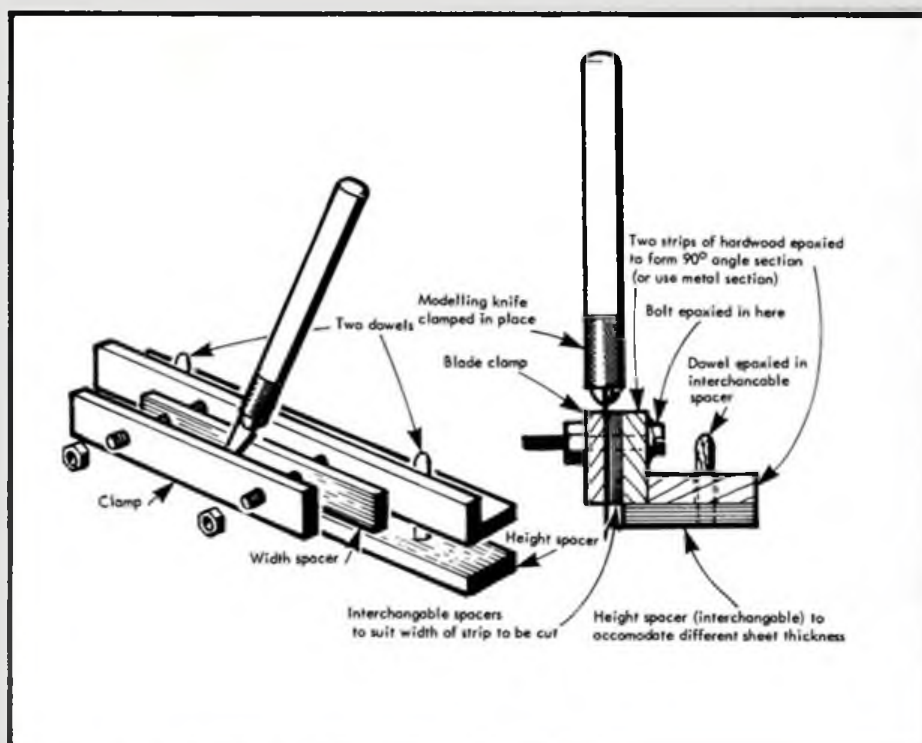
The sketch illustrates a three line control line handle which has been successfully used throughout last season. As opposed to the usual *Roberts* trigger type third line operation, the throttle line is palm operated instead of finger operated.

If the linkage within the model is arranged so that squeezing the central push knob in the palm of the hand results in full throttle, then a naturally firm grip is obtained precisely when the aircraft speed and pull is greatest. Spring loading of the push knob is not strictly necessary when using a compensating linkage in the model. The handle has worked smoothly and progressively with a 5½lbs aircraft.



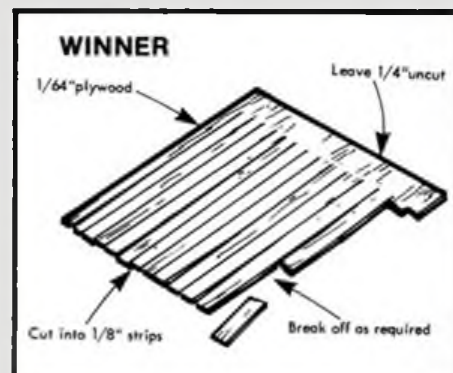
Simple fuselage bracing B. Seale - East Sussex

Open-frame fuselage constructions can be greatly strengthened/stiffened with virtually no weight penalty by cross bracing with *Keil Kraft* Terylene thread or similar, and fixing with a drop of cyano adhesive. A sewing needle is used to pull the thread through the stringers.

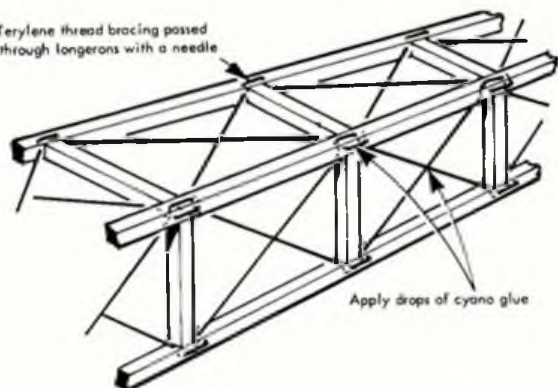


Trimming Comb P. D Michel - Orpington

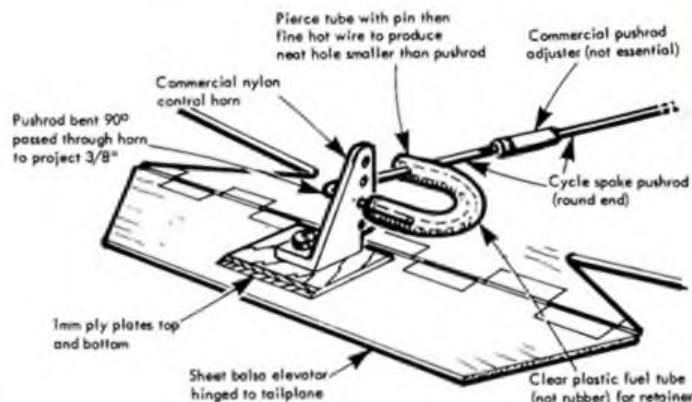
Ply veneer is ideal for trimming free flight jobs. The trouble is that if you cut it up into convenient strips it tends to get lost in the fathomless recesses of your flight box! Answer? Cut yourself a trimming comb from any suitable scrap of ply. Just snap off a length as and when you need it. Any thickness will be handy, but the bendy 1/64 in. stuff is the best for fine adjustment.



Terylene thread bracing passed through longerons with a needle



Apply drops of cyano glue

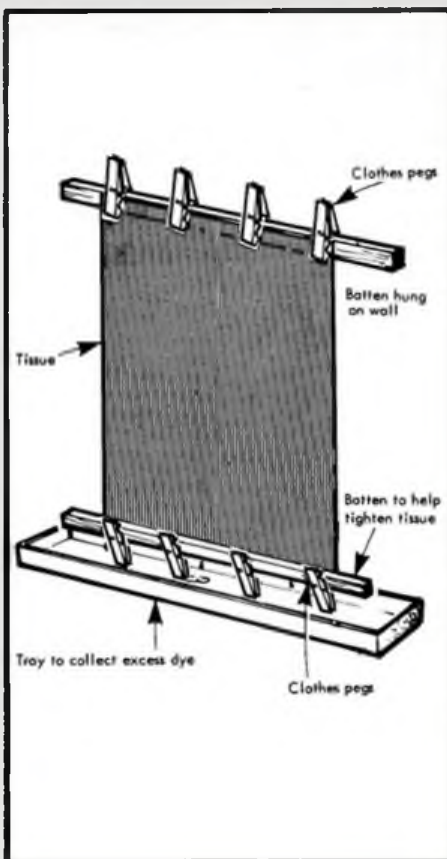


Uniform Sliced Ribs Donald H. Ross - U.S.A.

Make from plywood a double template. (A) equals the thickness of the wood from which the ribs are to be cut. Glue the templates together so that (B) is the height of a single rib.

Place the template on top of the sheet of rib wood already cut to the rib length (C). After the first cut to establish the rib curve, move the template up so that the bottom piece (D) rests against the bottom of the rib sheet and the top piece becomes the cutting guide. After each rib is cut, simply move the template up again.

With this method, all the ribs will be exactly the same. Can be used for indoor or outdoor constructions.



Coloured tissue P.F. Davies - Devon

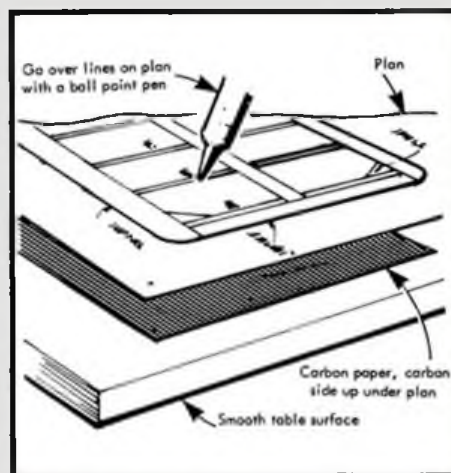
Having flown open rubber models for a number of years I have not been able to find dark coloured *Modelspan* tissue for my fuselages. I have now overcome this problem by dyeing the more readily obtainable white *Modelspan*. The process goes as follows: use cold water dye (*Dylon*) sold in small tins. Hang tissue as per drawing. Using rubber gloves sponge the tissue with the dye solution, holding free hand behind area to be sponged. Work downwards, leave to dry for 24 hours. Weight of batten keeps tissue flat i.e. no need to iron afterwards. Red, Blue and Black have proved very effective.

C/L push-rod retainer Frank Smart - Gloucester.

Illustrated is a simple, cheap, very effective push-rod retainer, it can also be used to hold the streamer string in emergencies!

The main advantage is that it won't get lost! Adjustment can be made without worrying where it is and it can be replaced quickly if the rod is knocked out in a collision. Neither will the lines get snagged on the pushrod end. If cut to the right length it can even be used as spare fuel tube!

To make the hole in the side of the plastic tube, push a pin through first, then heat up a fine piece of piano wire, this will give a clean hole which is less likely to split the tubing.



Mirror image plans A. Floyd - Merseyside

Plans all too often only show one wing half, usually the starboard side. How do you get a port wing plan to build upon. One solution is to lay out the plan on a smooth surface with a piece of carbon paper facing upwards *underneath* the plan. Simply draw neatly over your starboard (port?) wing with a ballpoint pen using a straight edge rule where necessary - hey presto, a perfect mirror image plan on the reverse side of your plan. If you use a ballpoint pen that has run out of ink, you haven't even marked the original drawing ...

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