

JUNE 1983 75p
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MODEL
MAGAZINE

Aero modeller



**PROFILE SCALE
CONTROL LINE PLANS**

**SOPWITH TRIPLANE
FOR CO₂ POWER**

All Roads Lead To Stoneleigh



**WEEKEND BANK HOLIDAY
MAY 28-29-30**

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 for all the family**

JUNE 1983

Editorial Director **TONY DOWDESWELL**
Graphics **LORNA CULLEN**

Aero modeller



MODEL DIVISION MAGAZINE

Advertisement Director **M. GRAY**
Managing Director **RON MOULTON**

Comment

After some 40 years appearance in its standard format of Crown Quarto size — with occasional variations, your favourite magazine will take on a new mantle as of next month. Wartime controls on paper supply enforced reduction from the original large size Aeromodeller in 1942. None of us could possibly have foreseen how long that restraint would apply. In fact there are very few periodicals around the whole world that can claim such consistency. Our own row of 40 well thumbed 10 inch volumes speaks for itself. A wealth of modelling knowledge and historical record are locked in those thousands of pages. But, as you the

readers, have so clearly requested, now is the time for change. From July issue, we introduce a new logo with the much larger A4 format. Every issue will have fold out full size plans for a popular design and the 40 per cent extra page area will be fully utilised to bring out all those features which our recent survey indicated as your particular favourites. In the words of Tennyson its a case of "Ring out the old, ring in the new" albeit in mid-year. We're sure you'll like it, even though the changes oblige a 20 pence adjustment to the cover price. Our aim is to provide value for the aeromodelling enthusiast and to encourage expansion rather than contraction of a wonderful hobby. With your collaboration and support, we start a new era in just four weeks' time. Let's ROG together.



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ON THE COVER

Part II of Ian Peacock's article 'Profile C/L Scale' (page 252) this month includes plans for these four designs: A Seafire, Firefly, Seafury and a Wyvern Royal Navy 'Invasion' colour scheme strikes an air of realism on these simple models built by the Peacock juniors



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ANOTHER SCALE MILESTONE

CHECK THE CONTENTS.

How did they fly? Peter Russell extends his world famous 'Straight & Level' column from RCM&E into his special account of how the real machines were handled, and what the modeller ought to do to emulate them.

Doing it Dirty Russ Woodcock whose Westland Whigson is already greatly admired ever since it first appeared in Australia, tells how to apply authentic weathering and discoloring.

Do get into a flap! Brian Taylor, ace of all classes in the R.C. Scale tells how he considers flaps as essential as all other model controls. Used to augment lift, or to aid low-speed control Brian describes all the configurations.

Suitcase Scale by David Boddington. The trend yet to come! Established in Japan and USA the teeny scale mini model is going to be the latest thing through 1983-4. There is a table of Plan Titles and Kits from Veron, KK, Meritury, Gullow, Spring, Comet, Golden Age, and Philre plus inspiring photos and sketches.

Researching a Fullsize Aircraft David Boddington steers the reader who wants to be totally original and build a special piece of subject. Sorting out library information, searching for an example of the aircraft, producing drawings, measuring and photographing.

Engines for Scale Arrival in force of the four stroke and the gearbox two stroke has opened up innumerable possibilities. This is a pictorial round up of the latest engine types.

Silent Scale Switch to Sailplanes in David Boddington. The scale sailplane introduces a wide range of subtleties from pioneering wing to ultra modern glass fibre wonders. Selection of the type is aided with three view drawings.

Structural integrity is a chapter which is overdue. Too much is taken for granted in model construction. All possible materials, balsa, glass fibre, open framework, sheet-rod components, metal, etc. are included.

Auxiliary Controls Increasing complexity of the top level R.C. outfit makes possible all these auxiliary devices from operation of bomb doors to use of flaps or even folding wings. This chapter introduces the experimental controls with 1x adjustment for all kinds of extras.

Where to find it? The great quest which so many find baffling. Here's a breakdown of where to go for plan arrangement, Decals, prints, Hardwoods, Foamplastic, Rarer adhesives, Glass reinforced Plastics, Vapourforming, Polyethylene, Nylon, Rubber, Alloys, Springs, Nuts and Bolts etc. etc.

Cockpits are always the missing link in even the most detailed of scale models so this pictorial section will be of special interest.

Kit Clues looks up the story behind kit production, the how and why of subtle selection, the reasuring of components, contents, or plan packs and the way one should tackle the building.

Scale Flying All the charm of radio controlled scale models emerges in full blossom at the major rallies, such as the MAP Scale weekend each June at Old Vardis and the meetings at Birkby, Sweden, Kitchener and Sydney.

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People said it was a practical impossibility and in fact it took a team of eight specialists, all modellers, led by Jerry Jackman of Newbury club all of eight years to perfect a model gas turbine jet engine and get it to a flyable state. Painstaking and methodical effort, a dogged refusal to be deterred by the periodic failures and setbacks were finally rewarded on March 20 at R.A.F. Greenham Common during an engine running session and general ground handling test of the twin boom, specially designed test aircraft went so well that Jerry Jackman simply lifted the radio controlled 'Bar-Jay' off at only 60% power and did two faultless circuits and a perfect touch-down.

The engine, which runs on liquid propane is a tremendous achievement — British through and through, we might add — and a full story appears in June issue of Radio Control Models & Electronics magazine, now on sale.

Strong-arm Stuff

DPR Chuckie Championship Finals will be held at Middleton Hall, Milton Keynes on the 16th October, 1983. The day will start at 10am and it is also hoped that there will be a full range of Scale, EZB and other indoor types flying on the day.

Stitch-up at the Fleet Air Arm Museum

Needlework oddly enough was one of the skills in demand in the restoration of the Fleet Air Arm Museum's Gloster Sea Gladiator — last of the biplane fighters, best remembered for the air defence of the Island of Malta G.C. during World War 2.

Work on the Sea Gladiator, restored to static exhibition standard was undertaken by craftsmen of the "Friends of the F.A.A. Museum" and the needlework was necessary in applying the Seconite fabric covering which replaced the original Irish Linen and heat-shrinks into place much like modellers' iron-on type covering materials.



Right: Gerry Jackman and his team with their Gas Turbine dream come true. Below: the gas turbine engine with all covers removed showing the mounting and interconnecting pipework etc. About 6lb of static thrust is produced.



The assembly of the complete airframe could not have been achieved without component donations from outside sources, which included the Shuttleworth Collection at Old Warden, the R.A.F. Museum at Hendon, and from other sources as far away as Canada. Quite a collaborative effort, result of which is now proudly on show at the Fleet Air Arm Museum at Yeovilton in Somerset — well worth a visit for anyone interested in historical aviation.

Model Craft & Country Show - May 28/29/30th

This year's Model Craft and Country Show will be staged over three days of the Spring Bank Holiday at the Royal Agricultural Society's showground at Stoneleigh from Saturday, May 18 to Monday, May 30th, from 10am to 6pm.

Already established as by far the largest modelling event in the Midlands, the Model Craft & Country Show is a series of exhibitions with a major exhibition, and is designed to appeal to the entire family.

Gloster Gladiator restoration work at the FAA Museum, Hovilton. Cyril Tubb (in the foreground), Technical Co-Ordinator, hand stitches fabric to one of the wings of the Fleet Air Arm museum's Gloster Sea Gladiator during restoration work. Behind him Malcolm Bates from Parlock works on the cockpit canopy, and Arthur Frost from Taunton deals with the Bristol Mercury engine.

Last year's 25,000 visitors reported great satisfaction with this concept, because it enabled the whole family to enjoy the aspects of the exhibition that appealed most to them. With free car parking in the car parks immediately around the perimeter of the showground, a day at the exhibition will certainly provide an enormous amount of pleasure and information.

✦ JACK HEADLEY

Maestro of the simplified design technique, and creator of so many plans* which have given pleasure to thousands of aeromodellers, Jack Headley became victim of a heart attack at the early age of 53. Always a keen aeromodeller, Jack went to the U.S.A. in that famous 'brain drain' of aero technicians and became a respected engineer with Northrop in California. The model club there was soon to benefit from his prolific output of scale and semi-scale designs which appeared in their newsletter. His special talent for producing drawings with a natural appeal that disguised the deep considerations for simplicity made him one of our most favourite contributors. In earlier years, a founder of the English Electric club, and member of Blackpool MFC, Jack's modest nature belied his world-wide reputation as a unique creator which endeared him to sports fliers everywhere. Our sympathies go to his wife Pet, and daughters Lisa and Samantha.

**Raven, Midas, Pepe, Slingsby T.53, Slingsby Skylark, Piper Cub, Piper Cherokee, Curtiss Wright Jr. Beagle Pup*

Fokker EIII/EIV References!

Flying scale modellers will snap up the July issue of sister title, *Scale Models*, published on June 3rd.

In this edition there is a special eight-page feature on the WWI Fokker EIII/EIV

monoplane fighter. Included are many exclusive close-up photographs, details of structure, 1/72nd scale drawings, full cutaway of the EIII and a colour plate. Modellers of M A P plane numbers

FSP/551, RC/1124 and RM138, will find these details invaluable

July issue of *Scale Models* costs 80p and in case of difficulty can be obtained from the editorial address.

CONTEST CALENDAR

May 22	1ST ELLIOTT CONTROL LINE RALLY — Carrier, A Teamrace, FAI Teamrace, Good-year (plus Class 2), Speed Venue Marconi Avionics, Rochester, Kent Contact Peter O'Neill Tel Sevenoaks 457899	June 18/19	Woodside, 29 Calderstones Rd Liverpool 18	July 10	CANTERBURY PILGRIMS MFC NEW AIRSHOW . Static Class 2 scale Team Displays or individual, trade flying displays welcome Venue Graveney, Nr Faversham, Kent Pre entry details and forms contact Bas Brazier, 8 Norfolk Rd., Canterbury, Kent Tel 61199
May 22	IVINGHOE SOARING ASSOCIATION 2M EVENT , Venue Eaton Bray, Beds £1 50 plus SAE and frequency to Sean Bannister 12 Beeton Close, Pinner, Middx HA5 4NZ	June 18/19	AEROMODELLERSCALE DAYS , Venue Old Warden, Biggleswade, Beds	July 10	BRITISH CONTROL LINE COMBAT CHAMPS — 3RD ROUND , Venue River Embankment, Peterborough Contact Brian Waterland Tel Market Deeping 343722
May 22	OXFORD MFC F/F RALLY , A 1 Glider Coupe d'Hiver, Chuck Glider, Vintage Rubber (pre-1951, ROG if weather allows) Contest flown in combined rounds of 90 minutes starting at 10am Five flights two minute max apart from Chuck Glider (five flights one minute max, no rounds) NO POWER MODELS ARE TO BE FLOWN Venue Port Meadow, Wolvercote, Oxford, No cars on field, use bathing place car park All competitors must be insured Entry on field £1 for one event, £1 50 for all events, juniors 25p Contact A Crisp, Tel Oxford 53800	June 25/26	SOUTH COAST GALA , Open Rubber, Glider, Power, FAI Events in rounds, mini events in rounds, plus R/C events including R/C assisted vintage Venue Beaulieu, Contact Gary Madelin Tel 0252 516411	July 10	CROOKHAM GALA — Open Rubber Open Glider, Open Power and all-in FAI Five flights with no rounds Start 10am Venue Beaulieu Old Airfield Contact D Cox Tel Ashford (Middx) 51696
May 28/30	BRITISH FREE FLIGHT NATIONAL CHAMPIONSHIPS , Mini Classes 28: Open Classes 29, FAI classes 30 Venue RAF Barkston Heath, Nr Grantham, Lincs Contact SMAE Leicester 5	June 25/26	CROYDON DAWN PATROL — F1A, F1B, F1C (As part of the Southern Gala at Beaulieu) Start 6.00am (cocca 5.45am) Contact N J Beaumont Spring Cottage, Spring Street, Ewell, Epsom, Surrey	July 10	MORLEY & DMAC MICRO/MINI/SILENT VINTAGE EVENT — P30, Wigan 70, Cd H, A 1, Silent Vintage Venue Heath Common, Wakefield, Yorks Contact J Godden Tel 0532 521002
May 29/30	HOLKER HALLSPORTS FLY-IN , Entries to the Secretary, Holker Estates, Cark-in-Cartmel, Grange, Cumbria	June 25/26	NEWTON AYLCLIFFE MFC SPONSORED TWO DAY COMPETITION — F2B Senior, Novice and Junior Sunday entry possible Two rounds per day and fly off subject to entries Venue NewtonAycliffe Sports Complex, camping and caravan facilities Contact Barry Robinson Tel 0325 315215	July 17	SHUTTLEWORTH MODEL GROUP OPEN DAY Free Flight and Control Line plus Stand-off C L Scale competition Venue Shuttleworth Old Warden, Beds 5am to dusk Contact Mick Staples, 11 Whitehill Road, Cambridge CB5 8LT
May 30	THREE KINGS CONTROL LINE FLY-IN Stand-off Scale, Profile Scale Many trophies Silencers and insurance needed Commence on arrival and fly all day Any number of models may be entered Fly for fun is the keynote Venue Old Croydon Aerodrome, Purley Way, Croydon Contact Wal Cordwell Tel 01 764 1661	June 26	RAFMAA SMAE THURSTON TROPHY COMPETITION — F1A F1B F1C 1st round commences 12 00 hours on 25th Champagne progressively fly off for F1A, F1B, F1C on Saturday evening Venue RAF Barkston Heath, Nr Grantham, Lincs Camping allowed on airfield No pre entry RAFMAA and SMAE members only Contact Flt Sgt Baines Tel 033 483 471 Ext 420 (working hours) or 0526 21458 (weekends)	July 17	FREE FLIGHT CLUB CHAMPIONSHIPS Contact Dave Hipperson Tel 01 207 0179
June 5	FINCHLEY & DMAC GALA , Control Line Aerobatics, Novice Aerobatics, Combat (Silencers required for Aerobatics but not for Combat) Venue Giebeldands, Summers Lane, N12 Pre entry £1 Contact Doug Hawkins Tel 01 368 9206	June 26	PETERBOROUGH MFC A COMBAT COMPETITION , Venue River Embankment, Peterborough Contact Brian Waterland Tel Market Deeping 343722	July 17	WHARFEDALE OPEN DIESEL COMBAT COMPETITION , Engines 15 to 19cu No pressure Props 8" 6" Venue Dewsbury, West Yorks Contact Jeff Smith Tel Leeds (0532) 663432
June 5	WALSALL MAC ANNUAL SCALE FLY-IN , Free Flight and Control Line Venue Walsall Airport Contact Peter Taylor, 35 Whitehorn Crescent, Streetly, South Coldfield B74 3SA Tel 021 353 9950	June 26	WHARFEDALE OPEN MINI GOOD-YEAR COMPETITION , SMAE rules but no age limit Venue Dewsbury West Yorks Contact Jeff Smith Tel Leeds (0532) 663432	July 24	FACCT OPEN THERMAL SOARING EVENT , BARCS League event Entry fee £2 + SAE + frequency Venue RAF Weston-on-the-Green, Berks Contact N Webb, The Bugulow 13 East St, Fritwell, Oxon OX6 9PX SMAE members only
June 5/6	SCOTTISH FREE FLIGHT NATIONALS — Saturday F1A, F1B, F1C, start at 12 00pm, competition flown in five rounds Sunday All-in Mini competition and usual three Open events Venue Newbigging Lanarkshire Details and entry forms from Ron Sabej, 53 Rederech Crescent, Hamilton Tel 0698 429170	July 1	NORTHERN AREA SMAE CLUB TEAM CHAMPS , Free Flight Venue RAF Church Fenton, Nr York (SMAE only — restricted parking) Contact John Godden Tel 0532 521002	July 24	SMAE SUMMER SCALE MEETING , Control Line Scale Class 2 + Scale Racing Venue RAF Abingdon Oxon Contact Vic Willson Tel Reading 471964
June 12	4TH SMAE AREA CENTRALISED FREE FLIGHT EVENT Model Engineer Cup-Team Open Glider (I Plugge points), Astral Trophy F1C Power, Coupe d'Hiver Contact SMAE Area Competition Secretaries	July 3	FRIDAY EVENING FAI TEAM RACE , Venue Burtonwood Airfield, Nr Warrington, Lancs Contact before the next event essential Tel Jim Woodside 051 7241442	July 24	NORTHERN AREA FLY-ANYTHING DAY , Venue RAF Church Fenton, Nr York (SMAE members only) — restricted parking) No contests Contact John Godden Tel 0532 521002
June 12	SMAE CONTROL LINE EVENT , FAI Team Race, A Team Race, FAI Aerobatics, FAI Combat, Speed Venue Three Sisters recreation area, Bryn Road, Ashton-in-Makerfield Contact R Horwood Tel Bristol 48769	July 3	ELMBRIDGE CLUB STUNT COMPETITION , F2B and Novice Stunt, at Elmbridge Club Circle, Fairmile Common between Ester and Cobham, Surrey Contact M Radcliffe 01 397-4407 for details	July 31	NOVICE STUNT COMPETITION , Venue Thornes Park, Wakefield Contact B Temporal (Secretary Wakefield MFC), 45 George Street Horbury
June 12	SMAE CONTROL LINE CLASS TWO SCALE , Venue RAF Colerne, Wilts Contact Vic Willson Tel Reading 471964	July 3	SMAE CENTRALISED MINI FREE FLIGHT A 1, A, Cd H, CO., HLG Venue Driffield Yorks (SMAE members only) Contact D Hipperson Tel 01 207 0179	August 7	THERMAL SOARING NATIONALS , Venue Mallusk, Co Antrim
June 18/19	THREE SISTERS CONTROL LINE INTERNATIONAL 1983 , Teamrace, Speed, Aerobatics, Combat all to FAI rules Venue Three Sisters Recreation Area, Bryn Rd, Ashton-in-Makerfield Valuable prizes and medals awarded Details and entry forms J	July 3	WALSALL OLD TIMER R/C ASSIST DAY , The best in the Country Class 1-2-3 Texaco Everyone welcome entry on the day 10am onwards Venue Aldridge Airport, Walsall, W Midlands (M6 Junction 7) Contact J Shelley Tel Walsall 28553	August 21/22	CONTROL LINE NATIONALS , Venue Craigavon Co Antrim
July 5	EZB Novice Expert Pairs (AGM Trophy)	July 9/10	MODELLING WEEKEND , Venue Newby Hall, Ripon, North Yorkshire Competitions, displays of Off-Road model cars, boats, wargaming, model engineering, plastic modelling, helicopter displays etc For further details SAF to R Thorne 22 Chatsworth Place, Harrogate, North Yorkshire	August 21/22	ULSTER RADIO CONTROL CHAMPIONSHIPS , Venue Nutts Corner, Co Antrim
July 6	EZB Novice Expert Pairs (AGM Trophy)	July 9/10	CLAPA CHAMPIONSHIPS FAI CONTROL LINE AEROBATICS , Open Novice Stunt, Open Carrier, Open Scale Members only Venue Essex Showground, Braintree, Essex Contact P Burgess Tel 0376 516881	June 18/19	CONNACHT RADIO CONTROL CHAMPIONSHIPS , Venue Ballycaseymore, Shannon, Co Clare
July 7	EZB Novice Expert Pairs (AGM Trophy)	August 7	Open Film Contest , Humbrol Plate for Season's best flight 35cm Film, Manhattan, Bostonian CO duration, EZB Pairs Final (AGM Trophy), EZB Individual (Houberg Silver Medal), EZB Open 1 2g, £50 1st, £20 2nd, £10 3rd F1D for AEROMODELLER TROPHY	June 26	LEINSTER CONTROL LINE CHAMPIONSHIPS , Venue Blackrock College, Co Dublin
July 8	1st F1D Team Trials (three flights) Houlberg Gold Medal	August 29	Open Film	July 9/10	MIDLAND RADIO CONTROL CHAMPIONSHIPS , Venue Birr Airfield, Co Offaly
July 18	1st F1D Team Trials (three flights) Houlberg Gold Medal	Sept 18	2nd F1D Team Trials (three flights), Houlberg Gold Medal	July 30/Aug 1	LEINSTER RADIO CONTROL CHAMPIONSHIPS , including HOME INTERNATIONAL F3A Event 1983 Venue Fairy house, Co Dublin

INDOOR CONTEST PROGRAMME — CARDINGTON 1983. (Revised dates)

PLEASE NOTE Hangar No. 2 is being re-sheeted and some of the early dates may be cancelled if the work is completed. Ring Laurie Barr — 0628 25595 for status check. Note: The maximum charge per person daily will be £2 and probably £1 or less 11am-7pm each date

June 5	EZB Novice Expert Pairs (AGM Trophy)
June 26	EZB Novice Expert Pairs (AGM Trophy)
July 10	EZB Novice Expert Pairs (AGM Trophy)
July 18	1st F1D Team Trials (three flights) Houlberg Gold Medal

August 7	Open Film Contest Humbrol Plate for Season's best flight 35cm Film, Manhattan, Bostonian CO duration, EZB Pairs Final (AGM Trophy), EZB Individual (Houberg Silver Medal), EZB Open 1 2g, £50 1st, £20 2nd, £10 3rd F1D for AEROMODELLER TROPHY
August 27	Open Film
August 28	2nd F1D Team Trials (three flights), Houlberg Gold Medal
August 29	Novices only, £100 1st prize: EZB contest 1 5g one design (to be published in July A M) (£30 2nd, £20 3rd) Pre-entry details to follow
Sept 18	
October 9	

IAN PEACOCK PRESENTS FOUR NEW DESIGNS FOR PROFILE SCALE FLYING

AS WE SAW last month, there is no shortage of kits for Profile Scale but they are not easy to obtain and the subject matter is often duplicated.

Building from plans with basically simple models of this nature is not in any way difficult, even for the newer or less experienced modeller. The MAP plans range is the finest world-wide and there are many to choose from that quite adequately fit our category. Buy yourself a copy of the Aeromodeller plans handbook (85p + 30p p&p from the Aeromodeller Plans Service) and have a quick browse through to see just what I mean. Unfortunately as Profile Scale is not yet recognised as a category in its own right, the suitable plans are not grouped conveniently together. However, it is not difficult to pick out the good ones. Some, of course, are amongst the older, well established models, and might benefit from the odd update here and there.

Amongst the simplest (and smallest) are a group of electric RTP profile scale models (page 49). The addition of bellcrank, push-rod, etc. and a little bit of ply for the engine bearers would enable, say, a 5cc diesel to produce an excellent small beginner's craft. Amongst the C/L Racer plans — pages 54-55, are several well known designs, well suited to Profile Scale. There are 18-19in. wingspan designed for motors of about 1-1.5cc and larger examples more suited to .15-1.9cu in. size motors. Don't let the supposed 'high technology' of advanced racing classes put you off. These Goodyear and Mini-Goodyear racers are easy to construct and simple to fly. It is of course, not necessary to use highly tuned racing motors, the 'average' sport motor being quite adequate for 'Sunday afternoon' flying. Whilst sometimes not quite perfect as regards scale outline, they are usually accurate enough for our purposes and references to books and magazines devoted to fullsize aircraft racing will show the multitude of bright colour schemes that can be applied to these models.

Regrettably, with the passage of time, some designs are transferred to the illustrated 'X' list of older, less popular types. One of these is an all-sheet ME262 suited to the popular PAW 1.49 diesel or similar. Again structure and flying characteristics



The four motored profile scale designs built from Ian Peacock's plans: Albert Foucault's 'The Horn' light aircraft and the 'Wright Modeler' Sea Fury Supermarine Sea King and Pirelli.

are not difficult and a simple paint job produces an eye-catching model.

As with most profile jobs, the paint finish can be the area of greatest fun and satisfaction. Even simple schemes can be hand-painted with commercial transfers cut down to suit. Airbrushes (or even aerosol cans of car touch-up colours) can produce an even greater authenticity in the finish. Remember that authentic colours and markings, carefully applied, can take the eye of the observer away from the fact that the model has only a 'profile' fuselage.

In a lot of cases, these profile plans are of such well-known aircraft that plastic kits are available from the 'pocket-money-price' manufacturers.

A small outlay on such a plastic kit will enable the builder of the profile version to have authentic colour schemes at his fingertips, not to mention the myriad of small details, lumps, bumps, aeriels, panel lines etc., with which he can improve the final product.



Other models from the Aeromodeller range that are eminently suited are scattered throughout the C/L section and 'X' list pages of the catalogue. Two of my favourites are perhaps worth a mention. One is a delightful profile version of the lesser-known but somewhat potent WWII

CONTROL LINE

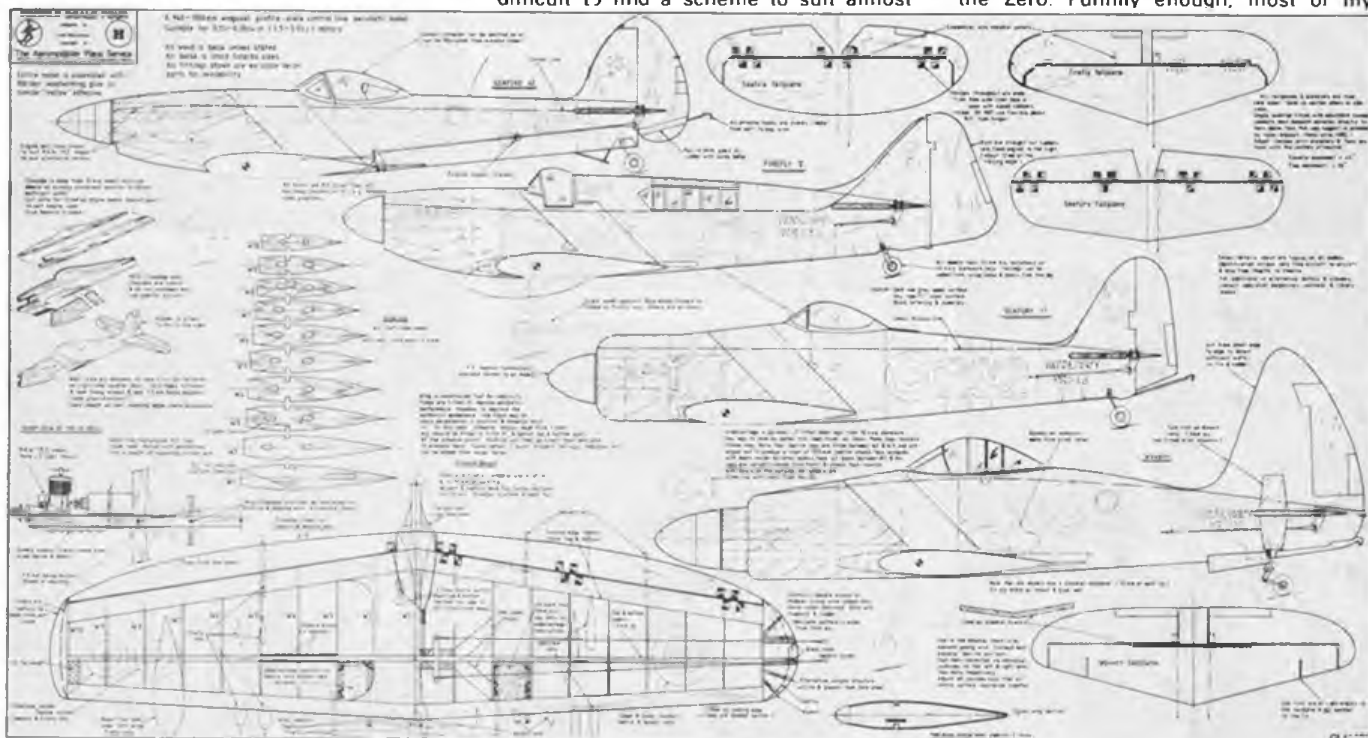
PROFILE SCALE PLANS PART II

fighter, the MARTIN BAKER M85. This model follows traditional profile/stunt structure, having built-up wings of symmetrical section. Wingspan is 26in. and once more suits engines of 1-1.5cc. The original model flew well on an OS10 motor and the plan features full colour scheme details.

The other model comes from one of the most prolific of C/L model designers, Germany's Claus Maikis. His Great Lakes Trainer could really have been made for this category, being some 32in. span and designed around the cheaper 29-35 glo motors. This biplane appeared in so many different colours that it should not be difficult to find a scheme to suit almost

everyone. A/M Plans Handbook catalogues each plan with a number of crosses indicating the 'difficulty factor' or level of experience necessary to build from the plan. Virtually all the plans suited to profile scale carry only one cross, confirming that they are less difficult to build and fly.

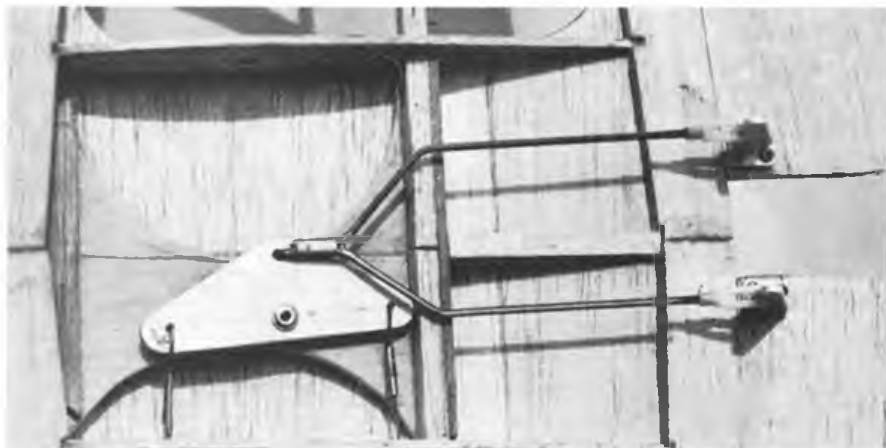
Probably amongst the greatest of influences on my early control line flying was that exerted by H. C. Quek who produced a lot of published plans and in my case has much to answer for. He produced a couple of 40in. span profile stunters, Flying Tiger and Red Dragon that were the stimulus for many derivatives. The Flying Tiger was based on the P-40 and the Red Dragon on the Zero. Funnily enough, most of my



Full size copies of this dye-line printed plan, shown here at 1/10th full size and incorporating FOUR separate designs is available from AEROMODELLER PLANS SERVICE, Model & Allied Publications Ltd., PO Box 35, Bridge Street, Hemel Hempstead, Herts., price £3.95 plus 45p post and packing. (Overseas post 95p) Please quote Plan No. CL/1460 when ordering.



Above: typical wing construction for a profile scale model such as the designs presented here. Note the main undercarriage legs bound to plywood plates. Right: bellcrank assembly and forked drive linkage to wing flaps. Note use of R/C type nylon control horns and adjustable clevises.





FAIREY FIREFLY



FAIREY FIREFLY

Top detail of wing underside, showing the radiator furring at the wing root, undercarriage, dummy guns and wing tank for realism. Second down tailcone, showing fixed tailwheel and linkage to elevator horn. Third down sidewinder motor installation showing Fox 25 motor and tank mount. Note silencer. Above detail showing the control linkage from bellcrank to flap and from flap horn to elevator pushrod. Note nylon horn and adjustable clevises.



SUPERMARINE SEAFIRE



SUPERMARINE SEAFIRE

Top wing underside close-up. Note the dummy radiator and oil cooler, undercarriage and wheel wells painted onto wing surface and dummy exhaust stacks for realism. Second down nose close-up showing engine installation, R/C 'clunk' type plastic fuel tank and undercarriage detail. Third down Seafire flap linkage detail. Pushrod to elevator to elevator connects from flap horn to elevator horn on other side of the fuselage. R/C type nylon horn and adjustable clevises used. Above detail of the tail assembly showing pushrod linkage to elevator. Note the details like tailwheel doors and arrestor hook which adds realism and scale effect.



HAWKER SEA FURY



HAWKER SEA FURY

Top wing underside close-up showing dummy wing-root oil cooler and radiator, main undercarriage. Panel lines help with realism. Second down the flap, elevator linkage, again using R/C type control horn and clevises. Third down engine installation detail, this time using OS motor with silencer. Use of R/C type 'clunk' tank proved entirely practical. Above tailcone detail, again showing those little bits of realism in form of dummy undercarriage doors, arrestor hook and trim tabs. Little details like this make all the difference.



WESTLAND WYVERN



WESTLAND WYVERN

Top centre and rear fuselage detail, showing fully adjustable flap elevator linkage. Note the dummy engine exhaust efflux above the wing root - those little scale details again! Second down: tail-end detail. Note the panel lines, finlets on the elevator and tailwheel doors. Third down: wing underside detail. Note undercarriage and panel-like detail. Above: engine installation - this time a PAW diesel plastic R/C type clunk tank is secured with a substantial metal strap.

models based on his two plans always finished up looking like Hurricanes! Others close to me came up with Me109s, Japanese Tony's and Italian Macchi 202 Folgore. Quek followed up these designs with the Stallion (based on the Mustang) and Wolverine (based on the FW190). These models are fully flapped and have excellent performance on a wide range of motors (mine had everything from an Oliver Tiger to a Merco 35). This superb performance however was obviously much higher on H.C.'s priority list than profile accuracy for they are very much semi-scale in outline. However they still look the part, given a good paint job.

Over the years I must have built a couple of dozen models from these plans (as the tatty state of the drawing now supports) not to mention 'stretched' twin engine versions as will be seen next month in Part III.

When one builds this profusely, one obviously tends to incorporate additions and changes. This is not to say that the original plans are in any way suspect. In fact it is only hindsight brought on by the passage of time that prompts me to offer these tips. Oddly, despite the large range of motor sizes used in this design, the models had little difference in speed. The larger motors tended to impart greater line tension especially in 'over-the-top' manoeuvres, to such an extent that one was tempted to use heavier flying wires. Today's examples of H.C.'s original designs and those from my new plan, fly on standard wire from MODELEC (Model Aircraft Accessories, 19 Felix Avenue, London N8) as reviewed recently in *Aeromodeller*. This brass plated wire is a little thicker than the usual lightweight lines and a little thinner than heavyweight, offering a useful compromise. It is prudent when using wire of this sort to increase the tip weight by 1/2 oz or so to compensate for the heavier weight of the lines.

This month's plan

The plan this month requires little explanation. It represents excellent value for money for it contains not one, but four designs on one sheet. Furthermore there are various options open to the builder and much of this is shown clearly on the plan. Because it is hoped that many less experienced modellers will fancy having a go (even complete novices!) there is a great deal of written advice on the plan - even down to typical colour schemes.

Don't be put off by the large size of the plan and its apparent complexity. They really are simple models to build, the added notes and tips on construction that make it simple tend to clutter up the drawing and make it 'look' complex.

Much of the credit for this plan goes back to H. C. Quek and many of the differences can be used to improve on the older plans. Some points are worth mentioning here.

Undercarriages

For those of you flying over rough grass,

these are better omitted. However, if fitted they are better sited in the wing rather than on the fuselage. Fuselage mounted undercarriage legs 'look' wrong, and remember that 'looks' need to be maintained to draw the attention away from the 'profile.' Furthermore, rigid, wing mounted undercarriages do not tend to 'bounce' on landing like those sited on the fuselage.

Ply doublers

Thin ply doublers either side of the main profile are common on most plans to impart extra strength around the area of the engine bearers. Often this stops too far towards the front and stops 'bluntly.' Better to angle the rear edge and move it further aft. Again the addition of a piece of balsa at the rear of the doubler eases the problem of 'feathering' off the rear edge smoothly into the main profile.

Profile

The fuselage is often simply a piece of 1/2 in. balsa. In my case I have stuck to this for simplicity. However for the more enthusiastic amongst us, consider making a 'frame' of 1/2 in. x 1/8 in. balsa with diagonal bracing and facing both sides with 1/16 in. balsa sheet. Not only is this structure lighter and less 'whippy,' it allows the cunning modeller to 'lose' the pushrod inside.

Tail assemblies

Here too, lamination is not a bad idea. Two layers of 1/8 in. balsa (grain span wise) sandwiching a single layer of hard 1/32 in. balsa (grain chordwise) produces a stronger, stiffer, structure than a single 1/4 in. sheet tailplane. Further, when tapering trailing edges to shape, the 'core' of the sandwich produces a 'clean' edge.

Horn and hinges

In this modern day and age, manufacturing one's own horns from scrap aluminium is bad news. Much better to utilise ready-made nylon items as used by the R/C boys. Hinges however need to be much more free working than those usually found in R/C models. Cloth tape, or sewn hinges, (figure-of-8 fashion) are still the best and cheapest. Flap and elevators will need joiners - use commercial wire joiners for simplicity. If 'extra' scale appearance is required and dihedral is incorporated, remember that each flap needs its own horn and pushrod. This is also true of models whose wing TE is swept (either forwards or back). Similarly, dihedral tailplanes require the same attention!

Finish

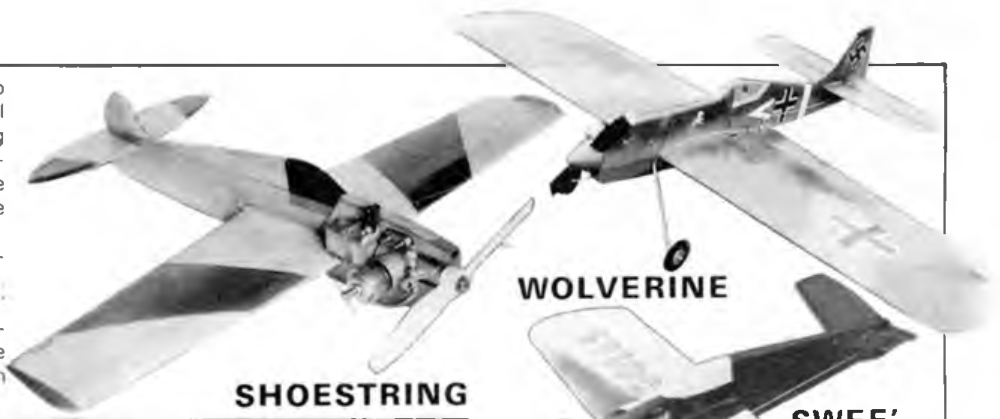
Remembering that the paint finish is everything with a profile model, try to opt for well known and eye catching schemes and remember that the paint finish is only as good as the surface preparation. Tissue, dope and sanding sealer are the age-old method of pre-finishing and the cautious

use of aerosols of car touch-up paint will do for the final colours (don't forget the fuel proofers). More recently, polyester finishing resin has come to the fore and this too produces excellent pre-finish. Of course the judicious use of the airbrush can enhance the overall effect.

Finally this month — don't forget Aero-modeller Scale Days — June 18 and 19. Let's make this a bumper 'Profile Scale' meeting. Who knows, we might even persuade the powers that be to donate a couple of extra prizes for anyone coming up with an 'over the top' model — hint, hint!

Recommended Aeromodeller Plans for Profile Scale

	Plan No	Price		Engine size
Red Dragon	C/L 842X	£2 00	40in wingspan	15cu in - 35cu in.
Flying Tiger	C/L 843X	£2 00	40in wingspan	15cu in - 35cu in
Wolverine	C/L 866	£2 50	40in wingspan	15cu in - 35cu in
Stallion	C/L 865	£2 50	39in wingspan	15cu in - 35cu in
Martin Baker MB5	C/L 1269	£2 00	26in wingspan	1-1.5cc
Great Lakes Trainer	C/L 1389	£2 00	32in wingspan Biplane	29- 35cu in.
Mini Stinger				
Sweet'pee	C/L 1297	95p	19in wingspan Biplane	1-1.5cc
L'il Quicky	C/L 1343	£2 00	28in wingspan Biplane	2.5-3.5cc
Deerfly & Shoestring	C/L 1232	£1 50	18in & 19in wingspan	1-1.5cc
Mike Argander Special	C/L 1194	£2 00	27in wingspan	2.5cc-3.5cc
Grey Ghost & Shoestring	C/L 1034	£2 50	19½in & 28in wingspan	2.5-3.5cc
Old Blue	C/L 1265	£1.50	27in wingspan	2.5-3.5cc
Miss San Bernardino	C/L 1246	£2 50	26in wingspan	2.5-3.5cc
Me262	C/L 1047X	95p		1-1.5cc



SHOESTRING

WOLVERINE



SWEET' PEE



LIL QUICKIE



OLD BLUE



MARTIN BAKER MB5



GREY GHOST



MISS SAN BERNARDINO



RED DRAGON



MIKE ARGANDER SPECIAL



GREAT LAKES TRAINER



FLYING TIGER



MINI STINGER



Me 262



Aero modeller

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PZL WILGA 36
1/12th scale, 36in span for 0.5
0.8cc motors. Stable and attractive
Plan FSP/1178 Price: £2.50



DART PUP
1/8th scale, 44 1/2in span model for 0.8 - 1cc
motors.
Plan FSP/620 Price: £2.00



CESSNA BIRD-DOG
36in span replica for 0.5 - 0.8cc
motors. Pleasing lines, simple
sheet balsa fuselage
Plan FSP/568 Price: £2.50



S.E.5a
1/12th scale 27in span model for
0.5 - 0.8cc motors
Plan FSP/682 Price: £2.50



SOPWITH PUP
1/12th scale, 26 1/2in span replica for 0.5 -
0.8cc motors. Fine accuracy
Plan FSP/750 Price: £2.50



SOPWITH CAMEL
1/12th scale, 28in span model for 0.5
0.8cc engines
Plan FSP/1143 Price: £1.50



SOPWITH TABLOID
1/12th scale, 25 1/2in span model for
0.3 - 0.8cc engines
Plan FSP/810 Price: £2.95



BRISTOL F2B FIGHTER
39 1/2in span for 1cc motors
Plan FSP/1021 Price: 95p



BRISTOL BULLDOG
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AEROMODELLING TECHNOLOGY

Here are a few modelling tips received from readers. If you have any ideas worth telling others, send them in and win a year's free subscription to Aeromodeller?

3-D Turbulator

From Trevor Faulkner

Making a serrated turbulator can be a time consuming business. This simple idea is well worth a try.

A piece of 16 swg steel sheet approximately 2½ in. x 1½ in. is required. A serrated edge ¼ in. v cut along one long edge. This is then heated and when hot enough to char balsa, it is pressed along the wing leading edge. A guide should be taped in place along the leading edge to ensure alignment with each successive application.

The steel pattern is held with pliers and is allowed to cut into the balsa sheet to its thickness approximately 1.5mm.

The wood should be clear doped before and after the operation.



Fabric Lacing

From Bill Dennis

The traditional way of representing the lacing which held the covering on the fuselage of aircraft together, involves sticking pins in the longeron and winding thread around them. This always struck Bill Dennis as being extremely tedious. A much easier method was described by Tony Creedy (now in Australia). Simply take a sheet of heavyweight tissue and sew a zig-zag line on it with a sewing machine. This is then cut into a narrow strip which is doped in place — very realistic.

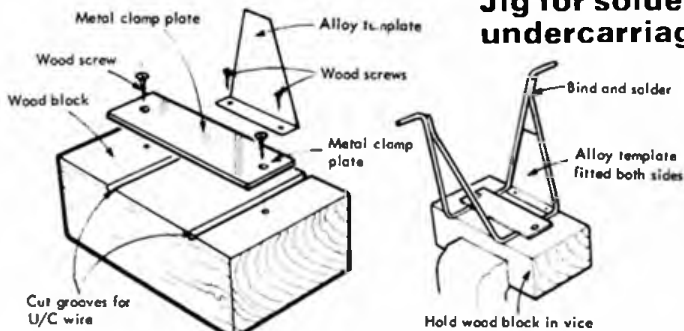
Lozenge Camouflage

From Bill Dennis

Models of German aircraft finished in lozenge camouflage always attract admiration, but probably more in recognition of the patience required rather than the realism. The lozenge effect was of course, usually achieved by the use of printed fabrics, but this is represented on models by simply painting the pattern onto the covering. While this can look acceptable in the air, the effect close-up is less so. The fact that the colour is painted on, rather than being part of the fabric, is very obvious and can be downright gaudy.

The pattern is drawn on the tissue with soft pencil and the model covered in the usual way. Fill in with colour dope, making sure you have toned down the shades by mixing in some grey. The model is then covered with white silk which has been dyed grey using diluted fabric dye. This gives a realistic impression of the colours being part of the fabric, rather than painted on top.

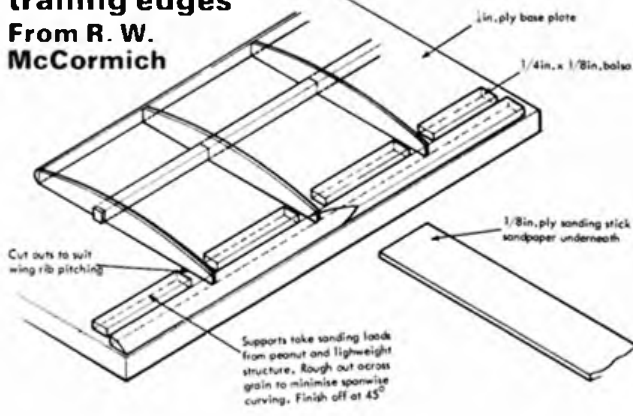
Jig for soldering undercarriage joints



From Eric Marsden

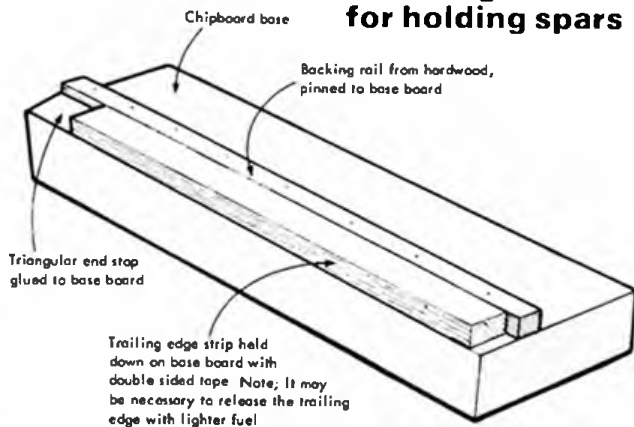
Sanding Jig for Peanut trailing edges

From R. W. McCormich



Set for planing trailing edge strips

Shooting board for holding spars



Sliced wing ribs

From M. J. Woodhouse

Hardwood ribs

At the 1977 World Championships in Denmark, along with others of the British Team, I was privileged to examine the

Russian A/2's and Wakefields. One feature that impressed me was the type of wing rib they were using being, in several cases very thin and cut from hardwood. Hardwood ribs are obviously much stronger than balsa and less likely to distort. I live in fear of the camber in my wings changing

due to the strain imparted by the tissue. Hardwood ribs might well alleviate this fear.

The problem is obviously what wood and how to cut out up to 100 ribs for an A/2 wing without going mad! The choice of timber was made with the help of the very interested owner of a small specialist timber yard. The best timber, taking into account strength, weight and ease of working, seemed to fall between either lime or poplar.

Approximate weight equivalents against medium balsa:

Balsa	1.00
Pine	3.33
Poplar	3.33
Lime	3.75
Ply	6.67

The extra weight of poplar or lime is thus not prohibitive but how to cut the ribs from a large block of timber?

1. Take a piece of timber about 2in. thick and of sufficient surface area for a number of wing ribs
2. Draw on the face of the timber a number of rib outlines around a template.
3. Cut out the wing rib shapes on a band saw, sand smooth
4. Set the saw fence to the thickness of the required rib, say $\frac{1}{16}$ in., check the result on a piece of scrap and adjust as necessary.
5. Cut the ribs then in bacon slicer fashion
6. A quick rib with glass paper and a pile of very strong professional ribs is the result. It takes less time than laboriously cutting out umpteen balsa ribs around a template and they are more accurate

Balsa Ribs

If hardwood ribs do not appeal, how about balsa ribs of tapered thickness? The thickness of sheet used to cut ribs from is dictated by the strength required by thinnest part of the section, the trailing edge. Why not transfer, if possible, some of the wood to this area away from the leading edge? It can be done with a little waste of timber.

1. As for the hardwood system, cut out balsa on the saw in 2in. thick wing ribs and sand smooth
2. Make a jig out of ply as drawn to push the block between the saw fence and the blade
3. Set blade to required clearance and push block through, the taper will force the block across the blade and vary the rib thickness
4. Turn over the block and cut off the waste unless you want the thickness at the leading edge instead!

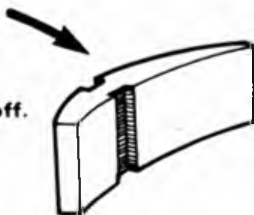
So you have a choice of two methods, or the two types could be combined, balsa for main construction and hardwood for the highly stressed areas at wing centres and dihedral joints

In conclusion I would like to thank John Davey whose professional skill and advice on woodworking was invaluable

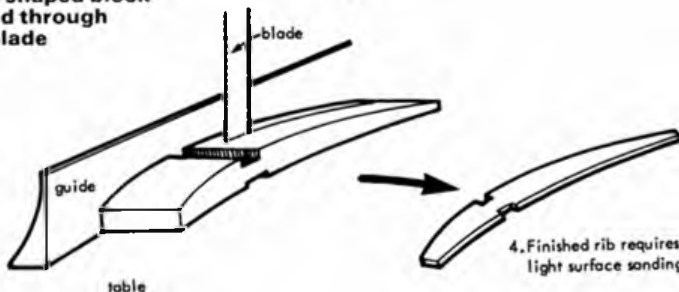
1. Block marked out with rib outlines



2. Ribs cut out from the block, saw cuts sanded off.



3. Rib shaped block passed through saw blade



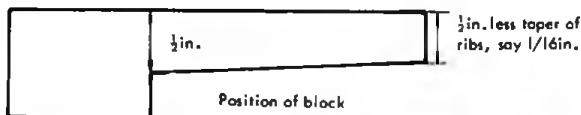
4. Finished rib requires light surface sanding

Tapered wing ribs

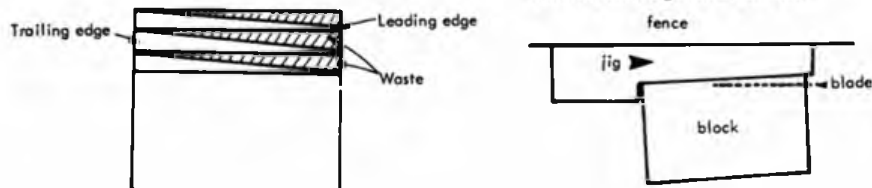


Thin danger area, liable to warp either up or down

1. Jig used to push block through saw blade



2. Jig used to push block through saw blade



Vintage Corner

Alex Imrie's

Aerofoil Sections

Vintage modellers do not usually experiment with aerofoil sections, we build models using the section shown on the plan, since to depart from this would be interpreted as a non-authentic modification. Modern model aerofoil sections are much more efficient than the majority of vintage ones and it might interest the reader to know something of how these evolved. Their story belongs to the vintage period, since between 1936 and 1943 several modellers, using different approaches, were all able to confirm that the old thin sections as used on single surface model wings of long ago, were not as primitive as they appeared to be.

One of the first to appreciate this was Gerry Ritz, who called his findings 'scientific', but really used the 'cut and try' approach and would have liked to have had wind tunnel tests verify his practical results. But this facility was not available to him at the time. He wrote an interesting article in the November 1936 issue of Popular Aviation from which the following excerpts are taken:

"... when you use a large plane aerofoil section on a slow flying model, there is much more of a change in the profile drag than there is in the induced drag/lift ratio, and the thicker the section, the more pronounced the effect will be... at model speeds the airfoil will not 'cut' the air as it would at higher speeds... a good streamline for models would have the nose more pointed in order to avoid undue head resistance, and the slower the model's speed, the more pointed the section... we want to keep the airfoil as thin as structural consideration will permit, in order to decrease the profile drag by minimising the amount of air that must be displaced in moving the airfoil through the air. Working

toward the lowest head resistance possible, choose the best mean camber for your type of model and using it as a median line, superimpose the upper and lower surfaces at equal distances from it... for an airfoil with a high lift coefficient, use a maximum camber of .09 of the chord, working down towards a camber of .05 of the chord for an airfoil with about the best L/D possible."

In searching for a method of construction that would provide sufficient torsional strength in the elliptical wing plan form that he favoured while using these very thin aerofoil sections, Ritz evolved a sparless, wide leading and trailing edge structure, and a number of rubber-driven models were built using this feature, which became known as the 'Ritz-Wing'. So Gerry Ritz was on the right track, and the fine performance of his models showed it!

It is not known whether any power models were made at the time utilising this knowledge, but later the following year Leon Schulman produced a deep-bellied model of 54in wingspan with a similar wing using an aerofoil section labelled as 'Modified McBride 8-7', this being based on a popular indoor wing section. The model was named 'Single Wheel Trojan' since it had a monowheel landing gear and was powered by the Trojan petrol engine. It was described in the 1938 Zaic Yearbook and the name TAMBE marked on the plan is an abbreviation for the old Brooklyn club 'The Airplane Model Builders Exchange'. This model was to appear in plan form again when it was described in the November 1938 issue of Model Airplane News, but then it sported a two-spar wing using a 'Modified Grant M2-10' aerofoil section. One wonders (and maybe Leon Schulman will tell us) whether the different wing and the change of name to 'Skyscraper' were

made to ensure that there would be no friction between publishers over copyright claims for this model?

A TAMBE club motif also appeared on the 'Skyscraper' plan and early in 1939 a new club was formed in Brooklyn which adopted this name. Many of the members of 'The Skyscrapers' club were ex-TAMBE boys and included such well-known modellers as Carroll Moon, Herbert Friedlander, Sal Taibi, Gordon Murray, Maurice Schoenbrun and Leon Schulman. In the first issue of the short-lived Journal of International Aeromodelling (April 1939) Leon Schulman wrote: "... I'm still experimenting with airfoils and am reaching a conclusion that an airfoil that is the shape of a flat board is equally efficient, if not more so, than the usually accepted foils such as the Eiffel 400, RAF 32, and similar types. This particular airfoil that I have in mind is very flat and thin and gives a ship a much faster and steeper climb than other airfoils, as well as a much flatter glide — which is important with contest models."

Gordon (Scotty) Murray was a devotee of the 'Ritz-Wing' concept, and his 44in wingspan model 'The Answer', which was described in the August 1940 issue of Model Airplane News is probably the best known vintage model to use this feature. Scotty, who was killed flying Spitfires in 603 Squadron from Malta in 1942 admitted that 'The wing was the secret of the entire ship'.

While Gerry Ritz, Leon Schulman and others were making the practical experiments in America that have been briefly touched upon, modellers in other countries were doubtless doing the same thing, but these advanced thinking modellers suffered from the complete lack of wind tunnel data on aerofoil sections carried out at Reynold's Numbers applicable to model flight. In Germany, Alexander Lippisch, who is best known as the designer of the Messerschmitt 163 rocket fighter of World War Two, was always a very keen aero-modeller. He too had appreciated the problem and it was this knowledge that had caused him to use bird-like wing sections on his successful rubber and petrol-engined ornithopters in 1937/1939. In his search for suitable data Lippisch found that as many as 300 different aerofoil sections had been tested at Reynold's Numbers approximating to the mid-model values, in the first German wind tunnel at the Modellversuchsanstalt (MVA) at Gottingen under Professor L Prandtl between 1913 and 1917. These reports, classified as 'Secret' at the time had only been published in limited numbers and

Practical comparison testing between Gottingen 417A and MVA 123 in Vienna in 1948 marked the beginning of the development of the many excellent high performance aerofoil sections to emerge in the early 1950's (see text)



a) Göttingen 417A, one of the five sections used in the Schmitz' study



b) 'High Performance' section designed by Gerry Ritz in 1936



c) 'Ritz Wing' section used on 'The Answer' in 1939/40



d) Section evolved by Leon Schulman in 1938/39



e) MVA 123, one of the six sections selected by Lippisch from the 1913/17 data



Chill Ritting took up the Schmitz design whose name of 'Trojan' was later replaced since Chill used a PMA unit instead of the original Trojan Petrol engine



Left double sized Keil Kraft Kits 'Scorpion' by Peter Elmer of Cardiff shows well the spars, wide rib spacing and diagonal rib bracing in the wing structure. Above Ken Hinton's 'Answer' no spars in that 'Ritz-Wing', but ribs are spaced only 1in apart over the completed wing panels. The 'Answer' was kitted in USA as the 'Bay Ridge Topper' in 1940.

were not at all well known to modellers Lippisch selected some suitable sections that were incorporated into models and the improved performance over models using the then conventional sections was immediately obvious. The aerofoil section which possessed the most outstanding aerodynamic characteristics was MVA 123, and although this thin section had been initially intended for use in externally braced structures, Lippisch suggested that wings using this section could be made sufficiently rigid by careful modellers using special constructional methods. Although Gerry Ritz and others had already done this on similar thin sections using balsa, it must be remembered that in Germany at this time hardwood was mainly used in model construction.

It was another German, Franz Wilhelm Schmitz, who 'spilled the beans'. An engineer and school teacher who specialised in model aerodynamics, he had been aware of the physical differences between model (and bird flight, in whose realm the model aeroplane lay) and full-size flight for a long time. At his own instigation he commenced a detailed study on the subject in 1937, authorised by the then German Education Ministry, using data from the modified wind tunnel at the State Engineer School in Cologne. This work which was the first scientific study into the behaviour of aerofoils at Reynold's Numbers related to model aircraft won Schmitz the Ludwig-Prandtl Prize in 1941, and his book, *Aerodynamik des Flugmodells*, caused quite a stir when it was published in 1942.

Schmitz showed mathematically and proved by exact experiment, that in model work a turbulent boundary layer was required. Conventional sections with their fat rounded leading edges did not give a smooth airflow over the whole of the upper surface, it was shown that the airflow was highly unstable and would not follow the upper camber, but break away started at the point of deepest camber even at small angles of attack. On the other hand, the sharp noses of the thin bird-like wing sections produced a turbulent boundary layer that did not so easily break away and this was helped by the almost flat rear section of the upper surface.

Modellers were not slow to try out these 'new' ideas in practice now that Schmitz had supplied the true explanation of this phenomenon and it is considered that his original work led to the development of the aerofoil sections produced by George Benedek, Sigurd Isaacson, Erich Jedelsky and many others used in current high performance models.

In 1946 Keil Kraft Kits produced their 'Scorpion' power model which was an exact copy of 'The Answer' except for the

wing, which was a single spar structure using a conventional aerofoil section. This raises an interesting thought that warrants practical experiment. Who will be the first with their model of 'The Answer' or 'Scorpion' to do comparative tests with each type of wing? Although Keil stated that the 'Scorpion' was "the result of many months of design work and actual flying tests", was the 'Scorpion' name and different wing yet again means of avoiding infringement of copyright?

Stentorian

During 1943-44 while serving in the Royal Air Force, Phil Smith, who anticipated that he would continue his model business of 'Normac' after the war, designed a nice looking high wing monoplane of 6ft wingspan. In a recent letter he recalls

"Every design owes much to others and mine embraced many good features that had appeared in Ben Shereshaw's models described in pre-war issues of *Model Airplane News*. The wing section, best described as a 'zip zip' section, was based

The other 'Stentorian' in the first British SMAE Radio Control Contest at Fairlop in 1949. Wildcat 5cc diesel powered model named 'Tele Commander 1' about to be hand launched by P. Wallace of Barnes.



Don Baker's 'Stentorian' kit opened after 33 years stored at the back of the wardrobe! Nothing had deteriorated even the transfers were perfectly useable. (See text)





Above the Stentorian assembled, note the 'Bailey-Bridge' type of fuselage construction and the fact that the undercarriage legs are much shorter than those of the original model (see text) Right Phil Smith of Bournemouth patiently waits his turn to fly in the 1947 Bowden Trophy with his beautiful yellow and black prototype 'Stentorian'



on the Kovel-Grant (KG) slow speed-high-lift aerofoil employed by Maxwell Basset and others. An undercambered section, which on parallel chord proved to be a real floater, but which in tapered wing form, tended to incur a slight Dutch Roll there is nothing spectacular about the model designwise, except that all longerons are laminated and the fuselage built like a Bailey-bridge (Sir Donald Bailey had been Vice-President of the Bournemouth MAC for a while)!"

Phil joined Veron in 1946 and built the prototype which was powered with the Stentor 6cc petrol engine, hence the name 'Stentorian'. He entered it in the 1947 Bowden Trophy, and although he did not win, his model was described at the time as 'one of the best built machines in the field of 54 entries'. The 'Stentorian' was then kitted by Veron and proved extremely popular, it was, of course, a free flight model, but was especially suited for conversion to radio control which was then beginning to become popular. Phil Smith modified the prototype for this purpose using an Ohlsson Gold Seal petrol engine and Mercury-Cossor radio working an actuator which he says, "resembled the movement from a grandfather clock!" modellers may remember seeing this model at Old Warden on the 1981 Vintage Day, where it appeared in its final biplane form.

The 'Stentorian' won the first British SMAE R/C Contest at Fairlop in 1949 flown by 'Chuck' Doughty and Ted Kendrick of Birmingham, using modified Mercury-Cossor radio equipment operating a home-made 'Rudevator'. This was a revolving

cranked vane, which freely rotated in the slipstream, but which could be stopped in any one of four positions by radio pulses to give control. It was operated in this case, by Doughty kneeling on the ground beside the large heavy transmitter operating the keying button on the top.

On the day of the competition, held under high wind conditions, Doughty's model, a much flown veteran, was one of nine machines that actually scored points. 14 entrants attempted flights out of the total field of 42 entries. 'Chuck' used a Forster 29 engine in the competition but later changed to the more powerful ED Hunter of 346cc. There was another 'Stentorian' amongst the fliers that day, and this, powered by a Wildcat 5cc diesel engine used ECC radio operating a normal rudder tab, was built and flown by P. Wallace.

Occasionally over the years one would see a 'Stentorian' at a flying meeting, possibly the best known being Dennis Bryant's beautiful example. It is expected that the number of 'Stentorians' will increase now that the designer, Phil Smith of 32 Verwood Crescent, Southbourne, Bournemouth, BH6 4JE is offering a three sheet set of full-size plans for £5.00 postage paid.

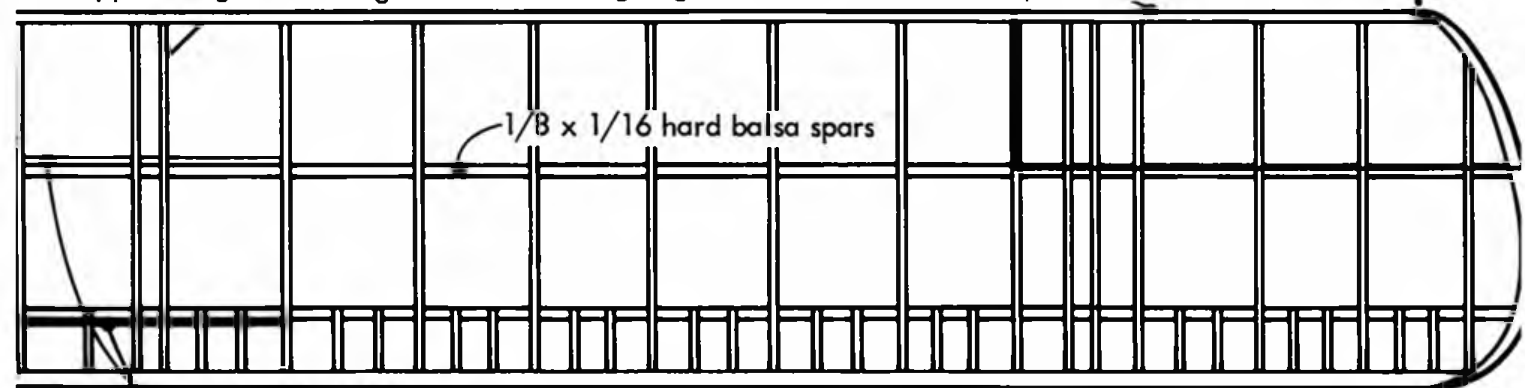
Another R/C Stentorian is currently flying, and the kit from which this model was built was won by Don Baker of Solihull

as a prize in a 20 seconds power competition in 1948. Although at that time he was beginning to experiment with early R/C using valve radio operated rudder only, Don decided to become more proficient before tackling the 'Stentorian' and placed the kit in the wardrobe cupboard. Thirty-three years later, having only had spasmodic bouts of modelling in the interim, he dusted off the old kit, and found that age had not affected it in any way. The model was built and fitted with an old ETA 29 glowplug engine and three channel radio control installed. Don decided to cover the model with nylon and decorated it with blue and yellow from commercial spray cans, and added original NGA, ABA and SMAE transfers. First flown in October last by Colin Maxfield, the Secretary of the 'Heart of England' club, the model turned out to be slightly under-powered. It was, however, a most satisfying sight in the air and it is intended to re-engine the machine with a more powerful vintage engine. Single lift struts were fitted, a precaution obviously thought necessary to counter excessive 'g' which is all too easy to apply when manoeuvring at present day R/C speeds. We look forward to seeing this model and other 'Stentorians' at Old Warden on this year's Vintage Day on August 21st, maybe Phil Smith will bring along the prototype again?

Below close up of nose showing the engine room hatch in the open position over the ETA 29 glowplug engine and the attractive original transfers (see text)



of upper wing with 'cling film' Trailing edge from 3 laminations of 1/64" veneer



balsa 1mm ply dihedral braces

TAKING UP AEROMODELLING again after a long absence, I was horrified to discover how scarce flying fields were and how small the available few were.

Having built a modified version of Ken McDonough's all sheet Triplane for O2O power it seemed a natural for shrinkage to the smaller and much more flexible CO₂ motors. Trimmed down to low revs on a calm evening it is a delight to watch a small scale model performing at near scale speed. This model is as near scale construction as is possible though the riblets are not essential.

Wings

The wings are made in the conventional manner but there are possible problems with wing rib construction. The small size of the rib requires some very nifty work with a scalpel round a metal template.

Make a template of the wing rib from

brass or aluminium sheet. Select 1/32 in. soft for the riblets and medium hard sheet balsa for the complete ribs. If you wish, sand the 1/32 in. sheet down a little but use sharp sandpaper as the idea is to remove balsa and not compress it. Cut out extra rib blanks to allow for wastages.

When all the rib blanks are cut, pin down a strip of 1/4 x 1/8 in. and join a shorter 1/4 x 1/8 in. strip at right angles. Glue in batches of ribs pushing them firmly up to both pieces of 1/4 x 1/8 in. Put a weight on top of the ribs to stop the pressure pushing the ribs up. Glue more 1/4 x 1/8 in. strip at other end and side to frame all the rib blanks together. Sand the complete assembly to produce a smooth profile top and bottom. When making up the rib pack, be sure to mix the differing hardnesses of balsa as all soft at one end can cause a taper.

If you have a saw bench cut the spar slots with the ribs still clamped together. You can of course use a hand saw for this job, but be

careful not to cut too deep. Push two lengths of wing spar into the rib block and sand the leading and trailing edges square. Separate the ribs and use as normal. The trailing edge is laminated from three sheets of 1/64 in. veneer and is sliced and then mounted so that the glue lines are vertical to the plan. This gives a very stiff T.E. and avoids that ugly trailing edge warping. If you wish to use larger section balsa for the T.E., adjust the wing rib template accordingly.

Fuselage

Fuselage construction is normal box and former method and should present no problems. It helps to pin down the centre section struts unsanded and complete fuselage side in the normal manner. When making the second side over the top of the first, place a spacer in between the cabane struts so as to get the two struts flush with the outside of the fuselage halves.

The lower wing position pieces are laminated round three wing ribs pinned to a board. Sand the centre section struts before you assemble fuselage sides; also fill grain.

Covering sheet can be grain filled and sanded before gluing to model.

Tailskid is formed by laminating thin strips of veneer round a curve and sanding to shape — be warned! Balsa skids break and are awkward to replace. The extra weight of veneer is worth it.

Rear deck stringers and side panel stringers are made from 1/32 in. soft balsa offered up to the fuselage and then cut and trimmed to shape before gluing on.

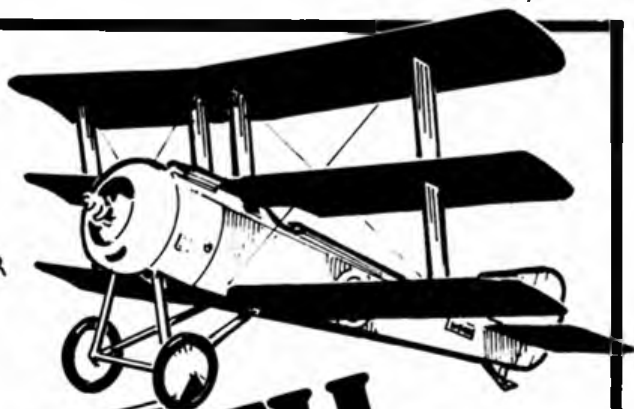
Fin and Tailplane

Fin and tailplane should present no problems but be sure that the fin laminations are wet or steamed before bending round former. Use light balsa and keep weight as low as possible.

Undercarriage

Epoxy 18swg aluminium tube to rear of front bulkhead and front of front lower wing spar before covering. Bend undercarriage

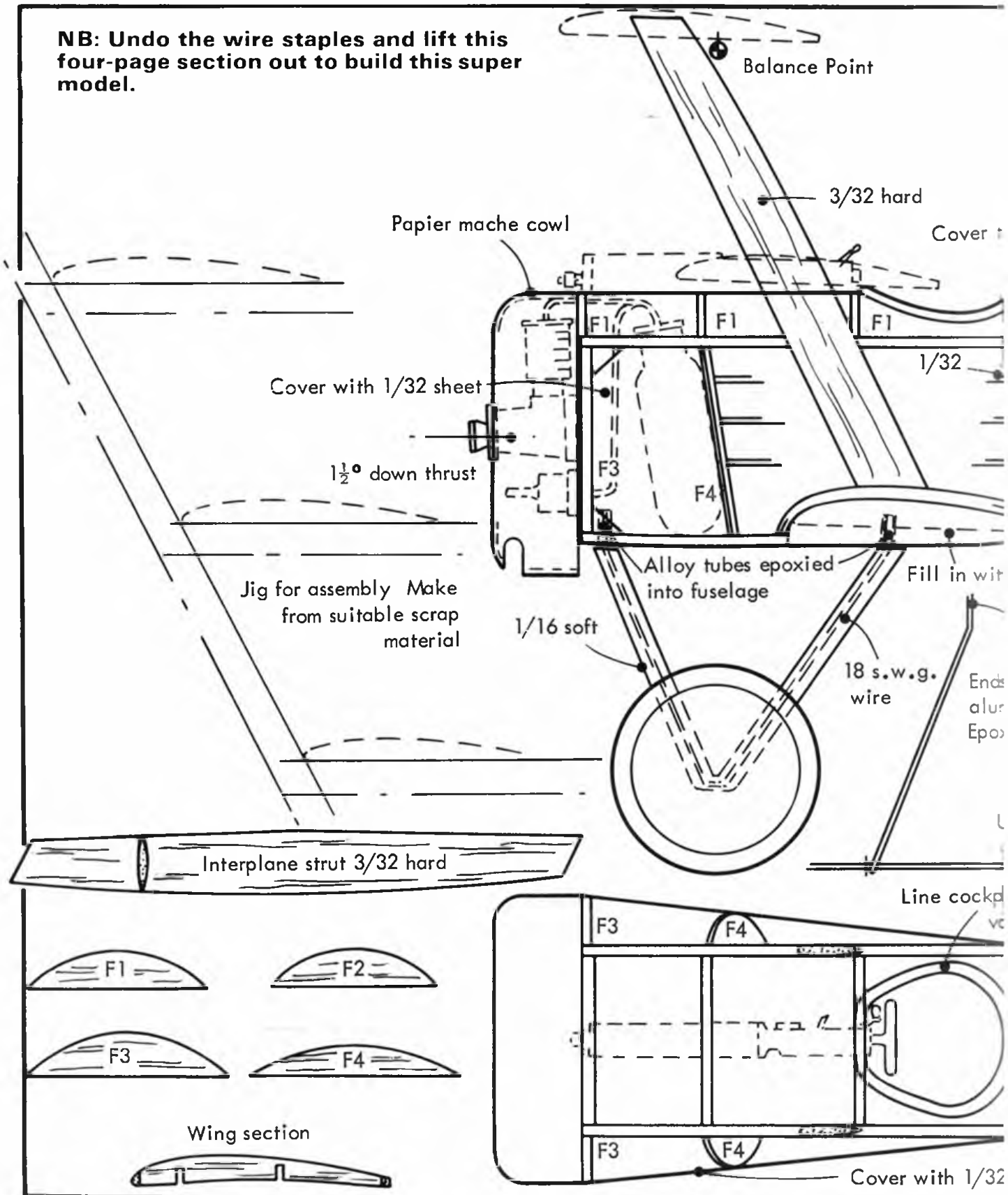
TRY THIS
GREAT LITTLE
WWI PERIOD
SCALE MODEL
FOR CO₂ POWER

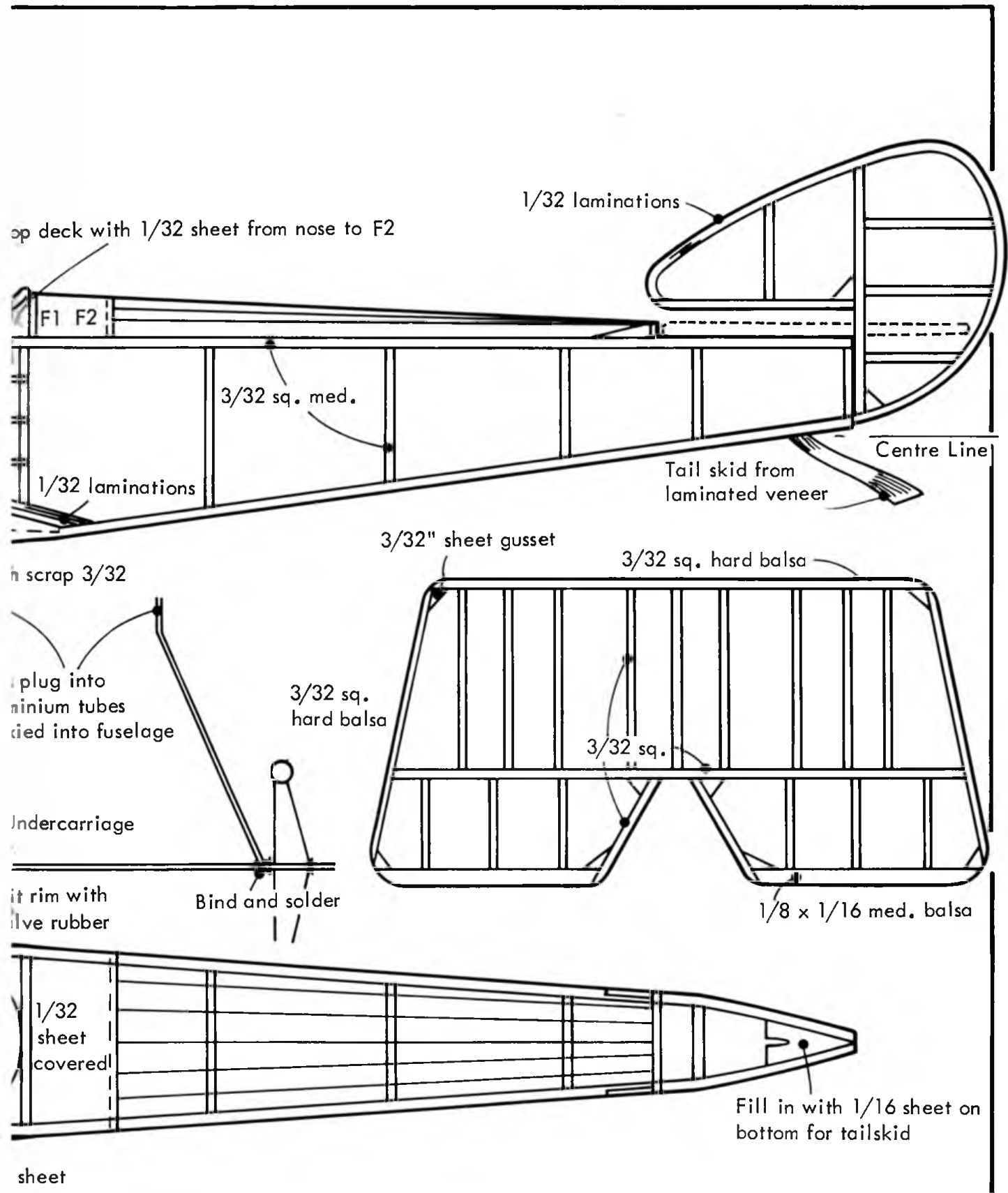


**SOPWITH
TRIPLANE**

By J. R.
Latham

NB: Undo the wire staples and lift this four-page section out to build this super model.





Upper and Lower Wing

Cover Centre section

Aileron line

Ribs from 1/32" sheet

1/32 sheet laminations

Soft 3/32 sa.
Leading edge

3/32" sheet

1/16 sht.
semi-rib

3/8" dihedral at tip - all wings

Middle Wings

1/16 sht.
semi-rib

wire to shape and bind and solder axle. Remove undercarriage and fit joining strips; I use slotted 1/16 in. soft sheet epoxied into place and then filled and sanded, trim joining strips to length, then epoxy undercarriage into tubes. While undercarriage is off the model, cover the bottom of fuselage and lower wing centre section

Wheels

Cut a 1/8 in. soft balsa disc slightly over-size. Epoxy a length of 18swg brass tube into the centre hole ensuring that the disc spins true. Leave some of the tube protruding at each end. Epoxy triangles of obeche veneer or thin balsa to make the spokes. When dry clamp end of tube in drill chuck or lathe and sand disc true and spokes smooth. Cover wheel with Jap

tissue and dope well. The tyre is made from rubber tube joined with cyano adhesive and lightly epoxied to the wheel disc. A better fit is obtained by sanding a groove into the wheel disc.

Cowling

This is made from papier mache. Find or make a suitable former, cut strips of newspaper with the forward edges slit closely. Using heavy duty wallpaper paste, wrap the former with paper, brushing the slit edges over the front curvature. Do not try to do the whole cowling in one go. Offer it up, sand off high spots and apply more paper as required. Do not sand until thoroughly dry. Finally dope and sand until smooth, when the finishing colour can be applied.

Cover the entire model in Jap tissue

using green for the upper surfaces and white for the lower, water or steam shrink. Apply one coat of thin dope 50/50 or two coats of very thin dope. Spray or hand paint to correct colour scheme. The model should weigh in at less than two ounces.

Test fly over long grass. Don't worry about a flat glide as the model has a glide like a brick, but trim out any stalling or turning tendency. Set the CO₂ motor to its lowest power setting and adjust down and sidethrust to give a suitable flight pattern. With the twelve of these models that I have built so far, I have used all sorts of flight patterns and it is very forgiving. There is one thing to beware of. If the model descends in a diving spiral, use the rigging wires to increase the dihedral slightly, or reduce the fin area.

ENGINE NEWS

by
Peter Chinn

Left: new Cipolla Master 2.5 Combat Special from Italy, shown here with standard cylinder-head for use with fuel containing up to 40 per cent nitromethane. Below: parts of Cipolla 2.5 showing hefty shaft, thick-walled liner and choice of cylinder-heads, standard bowl-and-squishband type (centre) and integral element trumpet type (right). Bottom: Cipolla main casting, based on that of current 3.5 and 4cc models, is of sturdy proportions. Venturi is peripheral jet type.

Cipolla Combat-Special

The recent successes of Cipolla engines in international competitions — for example, second place in the 1982 FAI World Teamracing Championships and first place in the *Gran Turismo* class of the Italian R/C Car Championships — have focused attention on this Italian make which, hitherto, has not attracted a great deal of attention in the UK.

In fact, Cipolla engines first appeared in 1972, beginning with the Cox-inspired 1.5cc Cipolla Junior glowplug engines, an illustrated description of which was contained in the November issue, that year, of *Aeromodeller*. After the Junior had been in production for several years, the Cipolla brothers introduced the first of the present 'Master' series of engines. This was offered in two models, the 3.95cc Master-4 R/C engine and a reduced bore 3.50cc version, the Master-3.5, for R/C cars. The Master series has since been developed to include a 2.5cc model in a choice of three versions, a standard model, a throttle-equipped version for radio-control and a C/L combat version. It is one of the latter that we have lately been examining.

The Master-2.5 Combat-Special is of the AAC or Al-Chrome type; that is to say, it has a ringless aluminium piston running in an aluminium cylinder liner that has a chromed bore. The engine's body casting, comprising crankcase, front housing and cylinder casing, is produced from the dies used for the current 3.5cc and 4cc models. Consequently, it is of robust proportions for a 2.5cc motor and accommodates both a thick-walled cylinder liner and a hefty crankshaft.

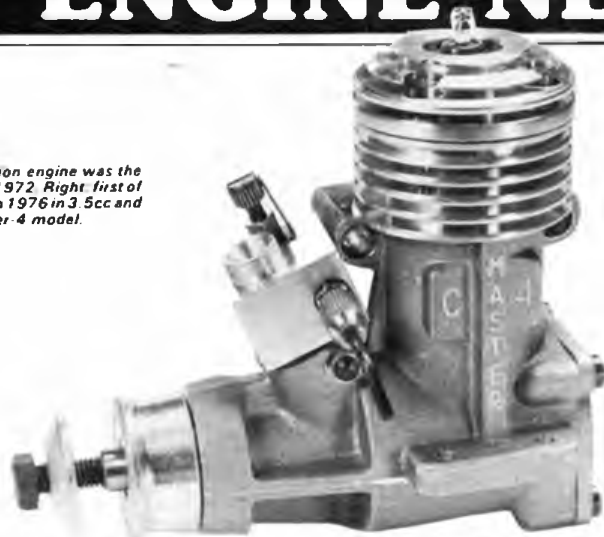
The Master-2.5 has the 'standard' 15 x 14 mm bore and stroke, i.e. the bore is 1.0mm less than for the Master-3.5 and 2mm less than for the Master-4. This has enabled a thick (2.5mm) cylinder wall to be used which is helpful to gas flow through the angled ports of the engine's Schnuerle-scavenging system. The ports consist of a single unbridged exhaust port on the right side, flanked by single transfer ports, fore and aft, that are angled slightly upward, as



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Left: Cipolla brothers' first production engine was the 1.5cc Junior model introduced in 1972. Right: first of the Cipolla Master series appeared in 1976 in 3.5cc and 4cc versions. This is an early Master-4 model.



well as towards the left side of the cylinder with its upwardly inclined third port. The three inlet ports are individually fed by suitably shaped channels in the surrounding casting.

The crankshaft has a 12mm o.d. main journal, bored 8.6mm for the gas passage, a pressed-in 4mm dia. crankpin and a 7mm o.d. front end that is internally threaded for a separate prop retaining stud. The shaft runs in a 12 x 24 mm 10-ball steel-caged bearing at the rear and a 7 x 19 mm 8-ball shielded bearing at the front. It has an 11.2mm long rectangular valve port that is timed (according to our measurement of the engine examined) to open at 35 degrees after bottom dead centre and to close at 57 degrees after TDC. Mixture is drawn from a nicely shaped machined aluminium venturi insert that is held in place in the intake boss by a tangential needle-valve assembly. Fuel is fed into the venturi through four peripheral surface jets and, since the venturi has an unobstructed 7mm i.d. throat, giving a 38.5 sq. mm choke area, its delivery obviously has to be pressurised. The manufacturer recommends pressurising the fuel tank from an untimed crankcase nipple or, alternatively, the use of a pen bladder type tank.

The cylinder head does not plug into the cylinder bore: instead, it fits on top of the flange of the suitably shortened cylinder liner. Actually, two types of head are available. The standard head has a bowl-and-squishband combustion chamber and takes a conventional long reach glowplug. The optional head has a narrower squishband (2mm instead of 2.5mm) surrounding a screw-in insert with trumpet shaped chamber and integral glow element *a la* Cox.

These heads are intended for use on methanol/nitromethane/castor-oil fuels, the standard head with a high nitro content (40 per cent) blend and the special head with a 10 per cent nitro mix. Interestingly, Alberto Cipolla specifies only 10 per cent lubricant (Castrol M) in each mixture.

Fitted with two 0.10mm copper cylinder-head gaskets, the standard head has a combustion chamber volume of approximately 0.21ml which gives a nominal (full stroke) compression-ratio of approximately 9.5:1. It was not practicable to measure the combustion chamber volume of the special head because of its integral glowplug.

Incidentally, it would be risky to be dogmatic about the true effective compression ratio of the engine because the top edge of the piston is chamfered and the piston does not, therefore, begin to seal the cylinder until its crown is some way above the top edge of the exhaust port. The chamfer begins at a point 1.5mm below the crown of the piston and reduces the piston o.d. at its top edge (which is also slightly rounded) by approximately 0.2mm.

This blurring of the point at which gas flow can be said to be cut off, also complicates the matter of establishing the engine's effective port timing. Of course, the same thing, but to a lesser degree, can happen with engines having conventional piston rings (as distinct from Dykes ringed pistons) or convergent cylinder bores (the Cipolla bore, in fact, is approximately .002in. smaller at the top) and it is our usual practice to allow for up to 2 or 3 thou. clearance between the top of the port and the edge of the piston when checking port timings.

In these circumstances, the exhaust period of the Master-2.5 could be said to be between 152 and 160 degrees of crank angle and the transfer and third port periods between 134 and 140 degrees.

Being based on the current Cipolla 3.5-4cc model, the Master-2.5 is, as already noted, a robustly constructed engine by normal 2.5cc standards — which is certainly no disadvantage for a combat motor. The hefty main casting has good solid mounting lugs and a sturdy front end with thick, full-depth, vertical and horizontal webs. A large diameter prop driver, recessed to fit over and protect the front

bearing, is mounted on the 7mm dia. front end of the crankshaft by means of a brass split tapered collet and the prop is retained by a replaceable M5 x 0.8 screw with hexagon head. The engine needs a 30mm bearer spacing, weighs 178gms (6.28oz.) with the standard head or 174gms (6.14oz.) with the special head.

So far as we are aware, Fratelli Cipolla have not issued any specific performance ratings for the Combat-Special but it certainly looks quite promising.

Super-Tigre news

Super-Tigre importer Mick Wilshere has sent along a couple of ST intake venturis for a look-see. One is a special lengthened venturi for the X.15 Combat engine with its own tangent needle-valve assembly. A standard Super-Tigre R/C type cotter pin and nut are used to hold the venturi in the X.15's intake boss. The venturi has a 4mm i.d. throat and is unrestricted thereby giving a 12.6mm effective area. The tangent spraybar discharges through a single jet.

The other venturi is for Super-Tigres having a 14mm intake boss, such as the venerable crossflow-scavenged ST.60 R/C. This engine makes a very good control line stunt motor, being light, powerful and flexible. Replacing the R/C version's Mag-V carburettor, the stunt venturi is a multi peripheral jet type. It has six jets spaced around a 5mm choke that reduces the choke area to 19.6sq. mm from the 30sq. mm effective choke area of the Mag-V carb with 4mm spraybar as fitted to the ST.60 R/C. The new stunt venturi is held in place by a tangent mounted Super-Tigre long type spraybar assembly and this feeds fuel into an annular channel surrounding the neck of the venturi and through which the six jet holes are drilled into the carb throat. Mick Wilshere can supply control line flyers with the engine ready converted for stunt use.

Incidentally, Mick has a comment on a remark that we let slip in last October's

VS - ENGINE NEWS - ENGINE



Left: Cipolla 2.5 fitted with special two-part cylinder-head having integral glow element and intended for fuels of up to 10 per cent nitro content. Right: latest version of the 5cc O.S. Wankel motor is the new 'PI' model featuring peripheral intake porting.



AEROMODELLER concerning the O.S. double-ended glowplug/propnut spanner. He writes: "About the O.S. special spanner. The standard $\frac{1}{4}$ in. UNF nuts in common usage don't fit the O.S. It's only the O.S. version of the $\frac{1}{4}$ in. UNF that fits".

Mick was quite right to bring this to our attention. We should have pointed out that this very useful tool, while fitting all standard glowplugs, does not fit every $\frac{1}{4}$ in. UNF propnut, but only those that are 10mm AF (across flats), although it does cover rather more engines than O.S. models alone. Checking on just a few of the motors most readily to hand while these words are being written, we find, for example, that it fits the $\frac{1}{4}$ in. UNF nuts of all the Bernhardt HB range from the 21 to the 61 models, the B&C 61 and certain Thunder-Tiger motors, plus the various engines that use a 6mm thread, including the Saito 30, 40 and 45, the G-Mark 30 Twin and 5-cylinder radial and all the medium sized Enyas. However, remember that standard nuts for $\frac{1}{4}$ in. Unified threads are nominally $\frac{1}{4}$ in. (0.4375in.) AF, although this dimension can vary quite a bit, for example 0.428in. (K&B), 0.430in. (Super-Tigre, OPS); 0.434in. (Irvine, HP, Webra) and 0.439in. (Fox).

Mick Wilshere raised another point in the same letter, to wit, differences in AF sizes for sparking plugs versus glowplugs, and remarked, "I don't ever remember the size changing, but perhaps the original brass top KLG had a different AF size in those days".

Actually, there have been several different AF sizes for $\frac{1}{4}$ -32tpi plugs since they first appeared in America more than 40 years ago. For example, the Champion V2 long-reach sparking plug had a $\frac{3}{8}$ in. width AF and this dimension also applied to the VR-2 long-reach racing plug. However, the short-reach V3 was made smaller with a $\frac{7}{16}$ in. AF hexagon.

This latter was the size subsequently adopted in 1947 by Ray Arden when he introduced the first glowplugs, in both long and short reaches. Most of the other glowplug manufacturers followed suit, with the exception of Champion who stuck to the $\frac{3}{8}$ in. body for their excellent long-reach VG-2 glowplug which, externally, closely resembled the V2 sparking-plug, including its white ceramic insulator.

In the UK, however, there was some divergence from this pattern. The very good 'brass knob' KLG 'Miniglow', for example, had a $\frac{3}{4}$ in. AF body (i.e. just under

$\frac{11}{32}$ in.), a size inherited from the KLG 'Mini' sparking plug and shared with the Lodge equivalent. Several years later, KLG manufactured three rather neat plugs which were sold under the Davies-Charlton 'Quickstart' label but these, for some obscure reason, had yet another non-standard size body, of 0.330in. AF.

In other words, there have been at least four different hexagon sizes for $\frac{1}{4}$ in. glowplugs. This is further expanded if one includes some of the glowplugs that appeared from Eastern Europe in the aftermath of the glow engine's appearance in the West, although most East European plugs have the standard $\frac{1}{4}$ in. AF hexagon. This (7.94mm) is so close to an 8mm size as to make them nominally the same so far as spanner sizes are concerned. Interestingly, nearly all East European motors — Russian included — have the $\frac{1}{4}$ -32 extra fine thread that has been used ever since $\frac{1}{4}$ in. plugs first appeared in the United States, the most notable exceptions being the 6mm plugs used by the Czech MVVS motors.

New O.S. Wankel

The first major change to the 5cc O.S. Wankel engine (still the world's only rotary piston engine in production) since its introduction 13 years ago, is seen in the new 'PI' version that has recently been released. This has a peripheral inlet port rather than the frontal port used by the original model. It is slightly more compact due to the fact that it dispenses with the former version's separate aluminium cooling ring and depends, instead, on tapered radial fins that are part of the rotor housing.

The earlier type O.S. Wankel (featured in our 'Engine Test' series in the December 1972 issue of AEROMODELLER) was extremely smooth running, very quiet and quite powerful. The latest model is claimed to share the earlier model's virtues but to offer considerably more power. A report will follow in due course.



Special intake venturis for Super Tigre. Small one is for X15 Combat engine. Larger one is for conversion of ST60 to C-1 stunt use.

BASIC CONTROL LINE EQUIPMENT

by Dave
Clarkson

I was lucky when it came to the production of my pit box for I found a scrap packing case that was made from low quality 5mm thick 3 ply wood. Despite the really low quality material (believe me, it was truly rubbish ply) a very satisfactory and strong box resulted, no doubt because of its inter-locking design, all glued construction and modest size. If you are not similarly lucky in 'finding' suitable plywood, a trip to your local DIY warehouse or wood merchant should produce a piece of 4 to 6mm thick 3 ply low quality plywood for not much money, a piece about 600 x 600mm is all you need. My piece of 'scrap' plywood was 600 x 500mm which I marked out using a set-square and pencil as follows, and then cut up using a tenon saw, and further cutting and shaping using a tenon saw and a fretsaw was done on the 'centre' and 'divider' boards.

Dave Clarkson's fully fitted out pit box. Note the compartmentalised arrangement to suit fuel can, tools etc., the control line wire reel on the end of the box and the glow plug holder.

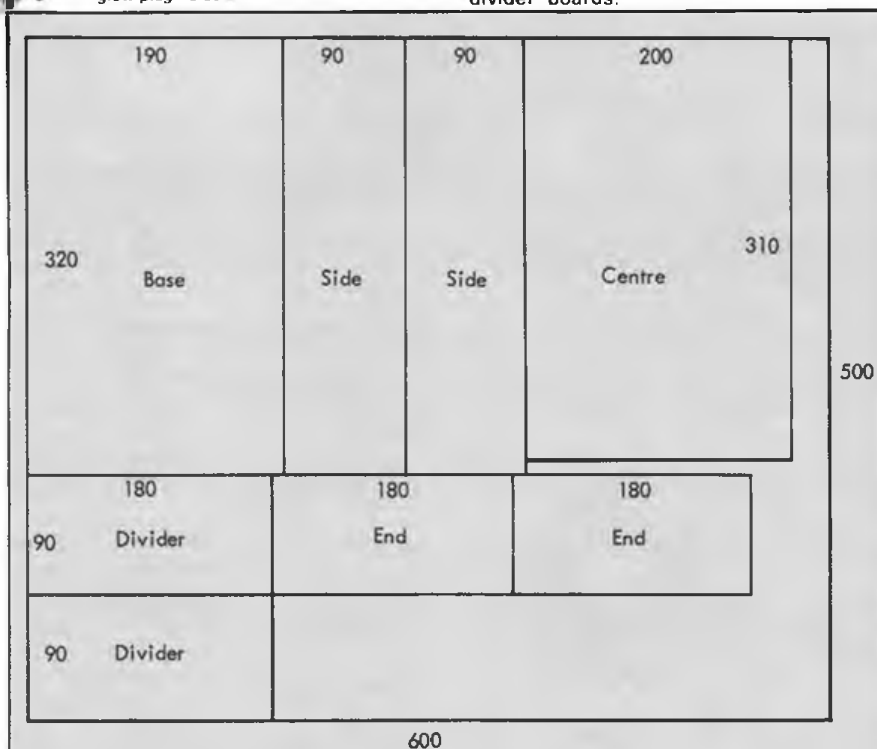
PART 2

The Pit Box

There will be many of you who regard a pit box as being far from essential. However it has been my experience that the quickest way of losing pliers, screw-drivers, spanners, props, glow-plugs, lines, handles, fuel bottles and all of the rest of your flight equipment on the flying field is to have nothing suitable to put them in. Some people make do with cardboard boxes or plastic shopping bags but these develop holes amazingly quickly or otherwise deteriorate rapidly and so cannot be considered to be satisfactory except as a very temporary measure. A pit box is the only answer.

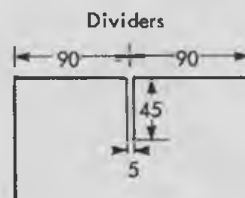
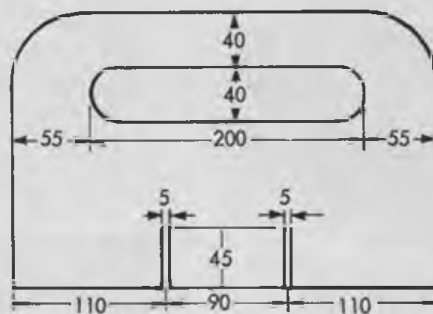
In most R/C magazines one can find adverts for commercially produced pit boxes of luxurious quality and equally luxurious prices but I guess that one of the things that differentiate R/C addicts from the C/L variety is that we are mean! Making-your-own is definitely the thing in C/L where avoidable expense is concerned and for me the pit box comes into this category.

Side view of the pit box. Note the carrying handle, glow plug holder and the control line handle clipped on the right hand end.



Note all dimensions in mm

Above: mark-up layout of panels for cutting from a 500 x 600mm plywood sheet.



Note all dimensions in mm

Finally all edges were sanded smooth and square using coarse sand paper wrapped around a wooden block. Assembly was done in the following order using PVA type glue and lots of sticky tape to hold things in position whilst the glue dried.

Construction

1. Glue dividers into centre-board at the inter-locking slots. Make sure bases of centre-board and dividers are at exactly the same level. Use sticky tape to hold dividers square to centre-board.
2. Glue centre-board/dividers assembly to base ensuring that wall thickness projections of base beyond the edges of the centre-board and dividers are uniform.
3. Glue ends to centre-board and base ensuring that wall thickness projections of base beyond the end edges are uniform and that the ends are square to the base and centre-board.
4. Glue sides to ends, dividers and base.
5. Sand down all projecting edges, then sand all sides smooth, then sand the centre-board top edge and hand-hole round at their edges. Finally paint all over inside and outside with at least 2 coats of polyurethane paint, preferably in eye-catching colour.

Painting the box is important to proof the box against both water and fuel. An all PVA glued box made from low quality plywood will quickly fall apart if allowed to become water or fuel logged, and there is water and fuel aplenty on the average flying field! A bright colour is a great aid in locating your box on the flying field and also in giving your box personal identity.

You will see that a six compartment box results, that has a handle and has very convenient dimensions. Of course, the exact dimensions of the box will be dictated by the dimensions of the piece of wood you can find. However, one much larger or smaller than the box described here is not advisable, as you will see, mine holds all that you could need for a day's flying. What is vital in laying out your box is, to be precise in marking out and cutting, and not to forget about the necessary over-laps.

As you will see, my box has added various customising items to hold glow plugs, a plug spanner, a handle and line reel with the lines connected thus enabling rapid running out of a spare set of lines when required, and a 'stop' indication board for racing purposes. Further customising will no doubt occur as the need arises, for example the conversion of one of the compartments into a battery box with a removeable lid incorporating lead terminals and an ammeter.

The line reel

With Matty Sullivan's 'Pylon Brand' moulded plastic line reels available as separate items at a reasonable price, it is hard to recommend an alternative for this

item that is excellent. However, it has been my experience that you can never have enough line reels — my present stock is more than a dozen — and this can become an expensive item. The alternative is to make your own. Not to use line reels at all is just not on, for trying to reel and store lines on an old tin-can or even worse, on a cardboard 'Laystrate' type reel will inevitably lead, sooner or later, to a damaged set of lines. Line care is essential to successful control line flying for replacing lines is expensive and to use damaged lines is foolish in the extreme.

To make your own line reels is simplicity itself for all that is needed is some 3mm plywood, a scrap orange box, a fret-saw, some sandpaper, a 4BA or larger nut, bolt and washers and an electric drill. The construction procedure described below involves the use of a compass but if you cannot lay your hands on one of these, a quick raid into the household crockery and glassware will produce items around which you can draw suitably sized circles onto your wood (for example a saucer for the sides and a teacup for the core). Whatever you use, a core diameter of approx. 80mm is ideal for most purposes and to match the core, sides of about 20mm greater diameter are best.

Construction

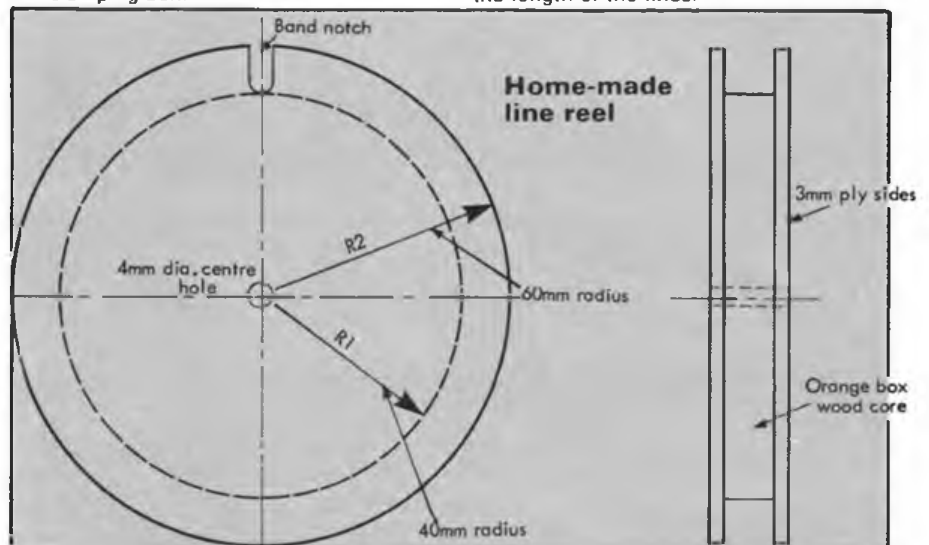
1. Select suitable materials. The core contributes little strength to the reel so low quality scrap wood like that recovered from an orange box can be used. The sides give the strength so 3mm ply is best although hardboard can be used.
2. Draw 2 approx. 100mm diameter circles on the sides materials and 1 approx. 80mm diameter circle on the core material; do not forget to mark the centres of these circles. Fret out these circles leaving a small margin around the marked circles. Drill the centre holes 4mm diameter or otherwise to suit your clamping bolt.



The central line storage reel is simply made up from two large diameter plywood discs and a more substantial thickness centre spacer. Centre drill the discs and be sure that the joint is sealed so that the wire cannot be trapped between the discs.

3. Bolt together using a 4BA or larger nut, bolt and washers the two sides. Mount in the chuck of an electric drill and, securely holding the drill, spin the discs and sand their outside diameter circular and uniform, using coarse sandpaper held around a wooden block. Repeat for the core.
4. Apply PVA type glue to both sides of the core and add the sides using the nut, bolt and washers to centre and clamp these items together whilst the glue sets.
5. Fret out the band notch and then paint the reel on all surfaces with a highly visible coloured paint.

Reels like this cost very little to make and are more than adequately strong for a reasonable life. Reels are items very often lost on the flying field, usually in the grass somewhere. Painting your reels a really bright and eye-catching colour is an essential aid to finding them when temporarily lost. You can never have enough line reels, make at least half a dozen — you will be glad you did. It is a good idea to fix a self-adhesive paper label on the side of each reel bearing a description of the length of the lines.



Aeromodeller PHOTO PRIZE FEATURE

WIN A COSINA SLR CAMERA



All entries should be good quality black and white or colour prints. Your name and address should be on the back of the print. As many details as possible should be given about the model and its construction. Send all entries to: Aeromodeller Photo Prize Feature, PO Box 35, Wolsey House, Wolsey Road, Hemel Hempstead, Herts., HP2 4SS. Photos will be returned after publication.





Photo 1. Every now and again a photograph combines a beautiful model with the beauty of flight. Keith Thomas of Somerset has achieved this difficult combination in his photo of Ken Merritt's 'Minimoa'. Built to a scale of 1/5, a span of 126in and weight of 10lb complete with radio control. Has many contests to its credit and is from Ken's own plans. For superb composition and excellent sharpness in what is a fast action shot, this is our June winner.

Photo 2. The Arrow Active was a shapely racing biplane, circa the 1930s. This exciting aeroplane comes to life again in model form, with this superb R/C model by Richard Hawke. One fifth scale, it spans 57 1/2 in. Terry Badis of Kent sent this imposing photo. Nostalgic note: FP's first scale model was of an 'Active' — built from a *Keelbild* Kit. Anyone remember them?

Photo 3. Introducing 'Fantail' Fliar Phil feels this is an excitingly 'different' model. It is an 'own-design' pusher (and pushers are rare birds). An efficient creation of George Stringwell of Cheshire, who also took the photo. Span 36in, power Cox T0049, foam wing covered with film. Micron radio, weight 22oz. George's originality almost 'pushed' him into this month's winning spot. Good for you George!

Photo 4. Fliar Phil was most impressed with this Piper Cub fitted with floats by Mr P. Street of Tyne and Wear. Solarfilm covered, power Enya 15, floats — veneer and foam. A real flyer — and looks it! Nice photo too, Mr Street.

Photo 5. Surely no scale enthusiast can fail to admire (and no doubt envy — as FP does!), this unbelievably realistic Gloster Gladiator by Mr Kilburn of Lancs. Built from the APS plan (FSP 719 price £2.50 + 45p p&p) and designed by Fliar Phil's old friend Doug McHard. Scale is 1in to 1ft, silk covered and modified to represent the prototype. Power is an AM10.

Photo 6. Jeff Anderson of Bridlington sent FP this fine photo of Reg Boor's indoor Puss Moth. Beautifully hand painted finish, with a span of 22in. A superb indoor flyer and Fliar Phil can quite believe it!

Ray Malmstrom

After a real feast provided by this month's 'tasty' photos, Fliar Phil admits to a slight attack of 'photographic indigestion'! However a large tot of 75 per cent proof 'rubber lubricant' (?) worked wonders — so join him in giving the once-over to this month's feast of aeromodelling goodies.





Free Flight Scene

recovered at dawn. If determination alone won contests . . . Remember if you don't fly you can't win — almost the Falcons motto.

A2 — Glider, FIA KMAA Cup (76 entries)

1 J Cooper	Biggles	14 50
2 A Crisp	Biggles	14 46
3 G Madelin	Crookham	14 37
4 R Pollard	Tynemouth	14 05
5 G Levey	NYFFG	12 36

Open Power — Frog Senior Trophy (14 entries)

1 R Peers	Falcons	9 00 - 3 20
2 M Hargreaves	Leeds	9 00 - 1 11
3 D Scott	Morley	9 00 - 0 R

Open Rubber — no trophy (31 entries)

1 T Dilks	Falcons	9 00 - 3 55
2 J O'Donnell	Whitefield	9 00 - 3 40
3 P Ball	Grantham	9 00 - 3 29
4 D Hipperson	Grantham	9 00 - 3 21
5 J Anderson	NYFFG	9 00 - 2 59

2nd SMAE Area Centralised March 26 Dave Hipperson

Most areas reported rain for at least part of the day — usually the beginning and many venues experienced a complete wind direction reversal at some point. Everywhere it was very cold.

Winners in both FAI Power for the Halfax Trophy and Open Glider came from Everleigh. This time Bailey and Bond topped F1C with very close scores reflecting dropped first flights and Williams the only man to max out in Glider not needing his modest fly-off.

A glance at the top Rubber times flying for the Gamage Cup would suggest some sort of freak occurrence. Not quite. Once again all the top placers flew at Barkston, actually the same line-up as the 1st Area meeting plus Peers competing in Rubber rather than Power this time. He in fact flew first and contacted the leading edge of a firm patch of lift but popped out of it at the end of the climb and descended quite fast but from an enormous height. Ball flew two or three minutes later and contacted the same patch a little way through the climb. At prop fold he was still not as high as Peers but the large slow gliding model used the lift to better effect and continued to gain height on the glide until the lift petered out dumping him a little short of quarter hour and a mere couple of miles downwind. The owner was under the model the whole time cycling on a road that conveniently ran directly downwind. Later flights fared less well as the breeze had picked up again and the lift gone.

Open Glider — No trophy (33 entries)

1 C P Williams	Richmond	9 00 - 2 01
2 J Cooper	Biggles	8 35
3 P Fairman	MFFG	8 10
4 G Madelin	Crookham	8 09
5 M Gregorie	Freebird	8 02

Open Rubber — Gamage Cup (23 entries)

1 P Ball	Grantham	9 00 - 10 44
2 R Peers	Falcons	9 00 - 7 58
3 J O'Donnell	Whitefield	9 00 - 6 02
4 D Hipperson	Grantham	9 00 - 5 40
5 T Dilks	Falcons	9 00 - 5 05

FAI Power — FIC Halfax Trophy (18 entries)

1 J Bailey	Biggles	14 37
2 P Bond	Anglia	14 35
3 S Screen	Birmingham	14 17

Easter Meeting . . . Barkston Heath . . . April 3/4, '83 . . . Dave Hipperson FAI Day

There have been some quite appalling Easter Meetings in the past especially when the holiday falls early in the year. Snow quite often arrives with strong blustery winds. The forecast ran true to form this year but no one expected quite what happened. The fall that covered Barkston Heath the night before FAI day was more reminiscent of mid-December. The event commenced under a perfect blue sky, a light breeze and 2in. of soft snow — blinding!

Considerably more entered than had been anticipated, although F1C is very much on the decline. It took a little while for flyers to settle down with most mistakes coming in the early rounds over the rapidly *Below: George Foster right on form — assisted here by Brian Baines. Right: Dave Greaves, placed fourth in the F1B*



1st SMAE Area Centralised March 13 . . . D. Hipperson

Visibility was the problem all over the country at this meeting. On top of that a stiff, if not unflyable breeze prevailed virtually everywhere too. The Midlands had the best weather with all winners coming from either Barkston or North Luffenham. The Southern sites were very wet but still not enough to deter Crisp at Everleigh and Madelin at Beaulieu putting together useful totals in glider for 2nd and 3rd places. Cooper — the overall winner, flew at Luffenham. There were flyoffs in Power and Rubber mostly at Barkston. Here, visibility which had been patchy all day was hopeless for a flyoff and bad enough to prompt Tony Smith to leave for home after completing a full score in Power, confident that the winning flight could not be made at Barkston. Peers then proved this wrong by topping the results with a five minute flight that vanished into the murk at a little over 3:00. The top four in Rubber placed in the reverse order to which they flew, suggesting the murk cleared a little as the flyoff progressed. A number of models were lost to timekeepers well up.

Russell Peers' power flight had landed in the top of a very large tree and he and his Falcons team mates worked into the night at freeing it to no avail. There was nothing for it but for Russell and one hand-picked member of Falcons to camp out in the car under the tree until morning. Conveniently the wind during the night brought it into lower branches and it was successfully

evaporating snow and in the unreliable lift/sink patches that such wet ground is prone to give-off. The top three in Wakefield all dropped a few seconds at this stage then continued to the finish with no more mistakes.

Glider produced a full score however, with Pete Williams taking his second 1st of the year closely followed by Bill Colledge whose only mistake came in the tricky early conditions. Power might have made a flyoff had Baggott not gone wrong on the last flight, which left Stafford Screen alone at the top. By the close, the wind had died away almost completely and considerable enthusiasm was shown for a hastily arranged Champagne fly-off in Rubber and Glider. This took the form of a progressive max starting at 4:00 which maintained interest better than a single unlimited flight. It also turned out far better suited to the conditions as there was a large patch of gentle lift for both classes enabling a number of flyers to max — seven in glider and four in rubber, from the original entry of more than thirty. In glider the 2nd Flight going for a 5 min max was taken by almost a minute margin by Fantham who has shown in the past that he is at his best in calm conditions. Rubber was less exciting as by the time they flew the lift had gone and models were dumped rather short of their still air potential. Greaves made up for a frustrating 4th in the main event earlier by

The heavens often proved too much for Ivan Taylor's Wakefields. A number of flights starting with half loops.

topping this. Half the entry money went to the Team Travel Fund, the remainder forming a substantial cash prize for the winners, both of whom generously re-donated these too and therefore the Fund benefitted to the tune of £34 and everyone got a chance at pretending they were in a fly-off after knocking themselves out of one in the official event earlier!

Open Day

Entries showed the same trend away from Power on this day too. A rather too easy 2:30 max guaranteed flyoffs this time after a reasonable day with the odd shower, bright periods and a modest westerly wind. The open retrieval country downwind could certainly have accommodated a three minute max perhaps even more in Rubber and Power.

Conditions began to alter dramatically about an hour before the flyoffs at 6:15pm. Minute-by-minute, the breeze was slackening and on the hooter for the glider round it was almost calm but certainly not liftless as the top times illustrate.

Power was dominated by the large 40cu.in. models of Harris and Payne the former already having seen successful action this year at the Grantham Grand Prix. Trevor Payne's distinctive fluorescent green and white model had a tidy climb to average altitude and then a very slow descent particularly in the latter stages.

By the start of the Rubber fly-off, it was very calm indeed to the extent that only one model would leave the 'drome and that not the winner's! Those who flew early did so probably not believing the calm would last. Carter and Cooper producing high climbs and under Carter, Ball launched his biggest taper wing model. Hipperson flew an almost untried super light model — had a number of motors shed strands and then a longeron collapse at full turns. Hasty but effective repairs by Chris Edge delayed the launch until perhaps five minutes after Ball. The climb was spectacular but Ball had been airborne for an incredible 9:25 and had not left the 'drome.

Hipperson's model had the height and the glide to equal that and perhaps it did but hangars just off the 'drome obliterated its final circuit and the timekeepers — of which by this time there were many — had to clock off a little short. An exciting and unexpected finale to a better-than-average Easter Meeting. If anything is to be learned, it is that if you always believe the weather forecast, you could finish up missing the best contests.

As a footnote to Power flyers who stay at home, they should be reminded that in the SMAE Handbook, Council have the authority to call any SMAE event with less than ten entries null and void — let alone present plaques for it. Beware!



F1A (42 flew)

1	C P Williams	Richmond	15 00
2	B Colledge	Birmingham	14 51
3	J Cuthbert	Grantham	14 40
4	D Thompson	Croydon	14 33
5	S Philpott	Biggles	14 23

F1B (23 flew)

1	I Kaynes	Croydon	14 52
2	L Burrows	C M	14 42
3	G Foster	RAFMAA	14 38
4	D Greaves	B&W	14 12
5	G Sharp	Croydon	14 10

F1C (6 flew)

1	S Screen	Birmingham	15 00
2	J Bailey	Biggles	14 44
3	R Baggott	Birmingham	14 14

Champagne Flyoff

F1A (23 flew)

1	M Fantham	Richmond	4 00 - 4 34
2	M Gregorie	Freebird	4 00 - 3 46
3	J Cooper	Biggles	4 00 - 3 42

F1B (11 flew)

1	D Greaves	B&W	4 00 - 2 49
2	M Duce	Liverpool	4 00 - 2 23
3	A Wells	Anglia	4 00 - 2 18

Open Glider (29 flew)

1	A Le Vey	NYFFG	7 30 - 6 37
2	M Dilly	Croydon	7 30 - 6 16
3	J Carter	Falcons	7 30 - 3 46
4	G Le Vey	NYFFG	7 30 - 3 04
5	R Sheen	Nantwich	7 30 - 2 57

Open Rubber (17 flew)

1	P Ball	Grantham	7 30 - 9 25
2	D Hipperson	Grantham	7 30 - 9 11
3	J Carter	Falcons	7 30 - 6 08
4	J Cooper	Biggles	7 30 - 4 59
5	A Gibbs	Birmingham	7 30 - 4 44

Open Power (7 flew)

1	P Harris	Birmingham	7 30 - 7 48
2	T Payne	Biggles	7 30 - 6 02
3	S Screen	Birmingham	7 30 - 5 31

From the Handle with Jim Woodside

Propeller Pitch Gauge

Several months back I asked if anyone had an idea for a pitch gauge which measured directly in degrees. The reason behind this is the disagreement found when various makes of direct reading pitch gauges are used to quote the pitch distribution of different racing props. It must be admitted that the problems in making accurate direct reading gauges is considerable. The only answer seemed to revert to a simple and accurate gauge using degrees. Thanks to Scots enthusiast Huw Lorimer for the chance to inspect his prop gauge. Below is my version which cost a princely 50p to make.

The basis is a 180° degree protractor. The one I used was a P 1 bought at WH Smith for 25p. Cut through the scale on the right side at about 55°. Cut the base 1/4 in. to the left of the pivot point. Carefully drill a small hole through the pivot. I used a 1.8mm drill and tapped the hole 8BA. Using some stiff clear perspex, cut the cursor as in Fig. 1.

Next step is to make the base of the gauge. The illustrated version was made in perspex. The base is 3/16 in. thick and the pieces glued to the top with tensol cement are 1/8 in. thick. These came free from my works technicians! I can see no reason why the base could not be in timber. Measure the thickness of your protractor with a micrometer and note the reading. This will determine the thickness of the spacer bars. As my protractor was 2.2mm thick, the bars were cut at 7.8mm width to give 10mm

Fig. 2 — Chart of prop pitches suitable for ATR, F2C & Goodyear

Radius in mm	Pitch	5	1/4	1/2	3/4	6	1/4	1/2	3/4	7	1/4	1/2	3/4	8
20	45.3	46.7	48.0	49.3	50.5									
30			36.5	37.8	40.0	40.1	41.2	42.3	43.3					
40					31.2	32.3	33.3	34.3	35.3	36.2				
50					25.9	26.8	27.7	28.6	29.5	30.4	31.2			
60					22.0	22.8	23.6	24.5	25.3	26.0	26.8			
70					19.1	19.8	20.6	21.3	22.0	22.7	23.4	24.1	24.8	
80					16.8	17.5	18.2	18.8	19.5	20.1	20.8	21.4	22.0	
90					15.1	15.7	16.3	16.9	17.5	18.0	18.6	19.2	19.8	

increments in the radial distances from the hub. Note that the upper end of the base has a wide strip to give a distance of 20mm to the first station plus some extra material to give a strong location to the prop carrier. Drill a hole to take the prop carrier — 4BA clearance in my case.

Find or make the prop raising pedestal. Both faces should be parallel. 10mm length should be about right. The cone nut, which centres the prop, was bought in the form of a Micro-Mold prop balancer — 25p for this in my local friendly shop.

Assemble all the parts and check for operation. I had to trim the upper base edge of the protractor to a shallow angle to give clearance below the prop blade.

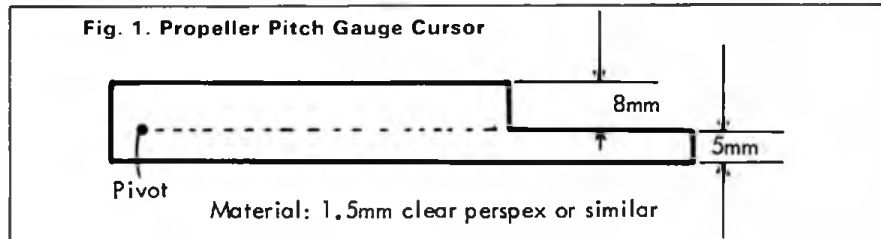
The chart (Fig. 2) gives most of the pitches used in 1/2 A, F2C and Goodyear. If you need to work out any extra ones, use the formula:

$$\tan \theta = \frac{Pr}{2}$$

where $\tan \theta$ is desired angle, r = radial distance from hub, and P = pitch of blade at station r (decided beforehand).



Above left: the prop balancer baseboard made up from layers of perspex. Note the hole top left for the prop carrier. Top centre — the prop carrier made up in part from a Micro-Mold propeller balancer. Modified protractor with cursor in place is in centre of picture above the pitch read-off chart.



Note: it will be necessary to first convert pitch measured in inches to mm before applying formula if you follow the pattern of the chart.

My thanks to glider flyer Phil Owens and his tame computer. These F/F types can come in useful sometimes.

Good luck with your construction if you decide to build one. Remember to true-up the rear face of the prop so that the blades lie parallel with the base and that each blade reads approximately the same angle before commencing any reworking.

Comment

Whether we like it or not, there is a mood of change around the team-race world and nowhere is this more clearly seen than in the CIAM meetings of the FAI. It is therefore important that those involved in racing get themselves involved in the politics of governance. Many rule changes are in the air. Do we want or need them? Over the next few months I would like to initiate a

forum of discussion on FAI team race and related events like speed and combat. I know that this magazine is read widely outside the UK and I would appeal to all readers to think about the comments and direct their conclusions to their FAI delegates, or this column.

In the March '83 column, I mentioned the introduction of the 5cc tank rule for 1984 and gave it favourable acceptance. However I would now like to withdraw this tacit endorsement and state that I think the rule to be foolish and ineffective. Feedback which I have received, seems to indicate that delegates had firm opinions (i.e. not favourable) about the introduction of 1.5cc engines into FAI classes but had little informed attitude to the tank proposal. The pressure was for change and 5cc is a change. I may have to eat my words but I think the choice of 5 is wrong as it will encourage the same speeds as at present obtainable at a competitor's level of skill while increasing the number of pitstops — always the most dangerous part of a race.

The control line sub-committee of the CIAM has been charged to come up with proposals to limit speed and noise. More of the former later in both this column and in later editions. On the second I wish to state that I think we need to vigorously oppose this motion. Now this is not blind beggar thy neighbour but is based on these premises.

(1) Objections to noise are not primarily based on volume but on dislike. In short, no matter how low we fix the dB level, it will have very little effect upon any complaints received. The experience of R/C models, in part, bears this out.

(2) F2C is already mostly flown on non-noise sensitive sites like Three Sisters, etc.

(3) The introduction of silencers may lead to using tuned exhaust systems in an event which is already suffering from an excess of required engineering skills.

Probably the first line of attack will be to again raise the 1.5cc engine. The time may well have come when the various FAI classes need different engine capacity rules which are tailored to the need.

At this point it might well be worth while looking at a letter from well-known Italian speed and team race expert Pietro Fontana, which is reproduced in part below. Reviewing the changes from the December CIAM, Pietro conjectures that some of the rules favour personal motivation and as such interfere with the concept of sport available for all (if ever it was).

The main problem was to reduce noise and speed. Having examined the various categories the conclusions were:

Combat: noise but not speed;

Speed: no problem with noise or speed. The pipe reduces the noise sufficiently and the models are easily flown even by pilots of average ability;

T.R.: Speed is the problem in three-up traffic, especially as the average of pilots is now 32!(sic).

Solutions

In the Italian Aero Club we are concerned to widen participation. This means that we must not vary the rules to suit the opinions of the few dedicated specialists as this will only isolate and finally destroy control line aeromodelling.

Our intention is to motivate more young people into aeromodelling and for this both the organisation should be simplified as well as the level of technical competence reduced to accessible levels.

On a world wide scale the figures for participation make painful reading yet control line is supported by the developing nations and it is a duty to provide encouragement. The way to do this is to make participation easier. The solution to this is not the 1.5cc engine. It is more difficult to handle and would mean the death of F2A and F2C except for the few elders who are at present flying at 12 seconds and 18 seconds for 10 laps.

Specifics:

F2D Combat:

1. limit the size of the model;
2. no tank pressurisation;
3. minimum prop. dimensions;
4. engine 2.5 or perhaps 3.5;
5. line 0.35 or 0.4 mm.

This should encourage commercialisation of parts and models and hence development amongst youth (where combat was always strongest).

F2A Speed:

1. leave everything as it is OR
2. adopt the 3.5cc engine which is now widely available through the car racing scene. They are cheap and powerful. Increase lines to 17.7m. Speed could still be flown in F2B circles.

F2C Teamrace: the main need is to increase the time taken to complete a race by making pit stops less quick and airspeed lower. Hence

1. eliminate pressure refuelling;
2. no cut-off devices;
3. no re-fuelling valves;
4. widen model cross section;
5. increase line diameter to 0.35mm.

Finally, should 1.5cc engines be adopted, at least four years notice be given to allow competitors and manufacturers to tool up for the new hardware".

Thanks to Pietro Fontana for his stimulating ideas. I have material to hand from Walt Perkins, Henry Nelson and Derek Heaton. Your comments will be most welcome and I can promise you a fair hearing.

Rules for FAI, F2C and Provisional Diesel Combat

The SMAE control line sub-committee has available copies of the rules for the above two categories. These contain all of the present rule changes, of which there have been many in F2C in the last two years. These are, I suggest, essential to all

interested competitors. A pack of both sets of rules will be sent upon receipt of 50p and a stamped self-addressed envelope to: Bob Horwood, 21 Burghley Road, St. Andrews, Bristol 6.

Novice Team-Race Contest

In recent times the SMAE has introduced a number of contest categories aimed at being attractive to the novice newcomer. These classes are 1/2A Combat, Diesel Combat, Mini Goodyear and Class II Goodyear. The sub-committee for control line have taken the bold step of putting on a contest for these vents; the date will be 11th September and the venue will be the Three Sisters Recreation Site. Sounds like an ideal way to test the water. How about some of you 'experts' turning out for the day to give help and advice.

To those of you who may have built a model but are still not in the SMAE, then could I encourage you to join the SMAE. Details, forms and rules covering all these classes are available from the Secretary, SMAE, Kimberley House, Vaughan Way, Leicester. The fees for a calendar year membership are: under 18 years, £5; 18-plus, £12.

Obituary: Juan Miguel Canals

Well-known Spanish team race enthusiast Juan Canals died in hospital on 11th December 1982 after a short illness. I am sure that you will join me in extending the sympathy of the fraternity to Juan's wife and family and also to his friend and team-mate, Luis Grav.

The team of Canals-Grav will be best remembered as one of the few to beat four minutes using a Rossi diesel — quite an achievement. Lately the same team held the Spanish F2C record at 3.35, this time using a Nelson AAC.

Rule Clarification: Class II Goodyear

The general rules governing Goodyear stipulate that normal T-bar compression screws be substituted or modified to remove the T-bar. Normally competitors opt for an Allen headed bolt or grub-screw. However the Class II rule forbids engine modifications! The sub-committee apologise for this contradiction and advise that the compression screw on your PAW 2.5, etc., be changed to an Allen head variety but that the original thread diameter and pitch should be retained.

Correction — F2C rules for 1984

It would appear from the recently published minutes of the December 1982 CIAM meeting that the rule change bringing about the three round system was not passed. This may re-appear later this year but for now I am advised that the old system of two rounds plus semis will remain in force. More news as it appears will of course be published.

SCALE MATTERS

by Alan Callaghan

WWI Aero — Scale Special

'WWI' Aero is a magazine devoted to aircraft of the period 1900-1919 and is published in the USA under the joint editorship of Leonard Opdycke and Wally Batter. It is aimed mainly at historians, fullsize aircraft builders and restorers, but at the same time it has a strong bias towards the needs of scale modellers from all disciplines. Unlike most magazines catering for a similar mixture of interests, WWI Aero concerns itself with the finer details of fullsize aircraft construction in the kind of areas that are usually not covered by articles of a general nature on aircraft types. The depth of this coverage is this magazine's great attraction and it obviously has a strongly enthusiastic readership.

Issue No. 92 is the second 'Scale Special' to be produced with slightly more material than usual aimed at modellers. A neatly laid out and professionally produced edition, it runs to 82 pages containing, amongst other things, a real fund of information on early aircraft instruments from both Allied and German subjects. Large and very clear sketches and diagrams are included showing dial faces, hand/pointer shapes, as well as sections through the instrument rim/glass junctions which are ideal for those using a lathe to make instrument bodies. For models of 1:8 scale and above, this information is extremely useful and techniques are outlined on how to go about making instruments at this kind of scale.

An article on seat belts and harnesses from a Pfalz DIII and a DH4, each with drawings, covers an area often overlooked on a good model. Accurate three-views of a Scarff ring, the Foster gun mounting on a SE5a, a picture spread of details from a fullsize flying Sopwith Snipe replica, and three views of a 180hp Mercedes engine are only a few of the other features that are worth having in your library. Most interesting is a long list of back issues dating as far as October 1971 together with a brief resume of contents and all of these are still available either as originals or as photocopies.

If early aircraft are one of your main interests then it is well worthwhile becoming acquainted with this magazine. A yearly subscription will bring five issues of the regular journal and the third Scale Special is due out in December 1983. The issue reviewed costs \$5.00 US (UK customers should add more for postage), and the first Scale Special is still available at the same price. Enquiries and orders can be sent direct to World War I Aeroplanes, 15 Crescent Road, Poughkeepsie, NY12601, USA, to be certain of a copy. Alternatively some of the specialist aviation bookshops that advertise in the aviation press may already have stocks.

Documentation

Sometimes it may be the case that the wealth of detailed information found in magazines such as WWI Aero just does not exist on the particular type of aircraft which may interest you. The fullsize aircraft may no longer exist, the people concerned with its construction are no longer with us and very little information was ever published even though the subject may never have been anything like a top-secret project.

This was more or less the situation that faced John Blagg when building his remarkable Italian Breda-Pensuti triplane. Why then, try to model such an obscure type? Firstly, the fullsize aircraft was unique in having a wingspan of 13ft. and could be modelled at 1:12 scale as a nice coincidence for Peanut scale; secondly, it



The latest Scale Special by the producers of WWI Aero Magazine contains a wealth of detail that will be useful to scale modellers.

was a triplane — all other things being equal in Peanut scale, a triplane scores more marks; thirdly, it was simply an interesting challenge not only to make a flying model but to hunt out as much information as possible on one of the most obscure aircraft imaginable. With the latter as the main motivation, John began when the original idea came from a simple Peanut plan in a 1978 model magazine. Fairly quickly, a reasonable three-view was obtained from the files of an American modelling friend, but then began the task of finding photos that matched the drawings, together with an authenticated colour scheme. During this period, it emerged that

more than one version was originally produced, the prototype being a Caproni-built machine and as is usually the case, the photos seemed to be of one version and the drawings of the other.

John's further researches involved the libraries of several museums, the Patent Office, the usual historic aviation magazines, the Royal Aeronautical Society, the Italian Embassy, many individuals from England, USA, Italy, Malta, as well as much thumb-numbing leafing through seemingly relevant books and magazines. Altogether this involved the writing of 17 letters of which three drew no response, and was spread over a period of almost two years, as were many telephone calls. In considering whether all this effort was worthwhile for the sake of a small model, John concludes that to him it was the difficulty of the challenge that was enjoyable. Finally, he wrote to Aeromodeller and got all he needed by return of post! During this period he made many new acquaintances and learned a bit of history in the process. To cap it all, the model was lately converted from rubber to CO₂ power and the result is a most unique model that now flies far better than it ought to according to one's initial prejudices against models of such ungainly appearance. Like Mark Hinton's Santos Dumont 14bis, it probably flies better than the real aircraft ever did!

There are dozens of other obscure ultralight aircraft that would make ideal flying scale models given the right approach to building. If you are looking for something really unique, do not be put off easily by the fact that all the information needed is not readily available from the most easily accessible sources. Research can be as interesting and rewarding as building and flying, and you may even unearth a really unique subject that would make an interesting contribution to the flying field.

Control Line Scale

Inspiration in choice of model can come from many sources and it was a rather sombre occasion that sparked off the urge to build a new model for Wal Cordwell in late 1982. Wal is one of the keenest members of the SVAS and attends virtually every fullsize flying display at Old Warden Aerodrome. It was at a flying meeting during last year when the crash occurred that destroyed the beautiful DH Fox Moth G-ACEJ. Wal had long before this intended to build a model of this particular subject at some time and so with little else on the building board it seemed that a start should be made on a C/L Class II version. Only when the model was virtually completed did Aeromodeller coincidentally publish Dave Hope-Cross' superb plan to the same 1:8 scale for his New Zealand registered Free Flight scale version (March 1983). The C/L model was built as a one-piece structure though still small enough even at this scale to be easy to transport without too much trouble. Power comes from an Enya .40 equipped with an exhaust collector stub linked to a specially made silencer and scale tailpipe. References were taken from MAP three-view drawings as well as the *Flight International* special paperback on De Havilland compiled by Richard Riding.

The fuselage of the model is skinned in 0.8mm (1/32 in.) plywood and a sprung undercarriage using a twin torsion bar system is used. Covering is nylon and the

model, finished in standard dopes in the colours of G-ACEJ, and fuelproofed with Tufkote, weighs a very reasonable 1475 grams (3lb 4 1/2oz). Tests have been successful and the model proved to be quite lively due to slight tailheaviness on the first flight. A standard Roberts three-line bell-crank and handle system is used for throttle control and no doubt the Moth will be given many an airing at Old Warden and elsewhere during 1983.

Fellow Three-Kings club member, Howard Furness, recently completed an interesting C/L conversion of one of the best APS free flight scale model designs. Christmas 1958 saw the publication of Doug McHard's plan for a 1:12 scale Gloster Gladiator which was a very accurate design closely following the structure of the real aircraft. Howard's version was built using surprisingly few deviations from the original plan although it is built like the Fox Moth as a one piece model and uses a throttled OS Max 35 for power. The wings were built almost as per plan with the exception of the interplane struts and fixings and root ribs. For the strut fixings, two 3.5mm plywood ribs were sandwiched together with short lengths of brass tubing glued between to take the strut ends. The struts were also made from plywood and the wing cells were properly braced using piano wire bound and soldered to wire pins set into the ply ribs. The root ribs were similar plywood versions of the originals and the wings were simply glued to the fuselage mounted dowels used as locating pins in the original knock-off design. The tailplane was reduced to exact scale area and built as per plan but the fin and rudder were given a central core of 1.5mm plywood with ribs built up on either side. This was to withstand the effects of a nose-over landing which even at low speed over grass can do very nasty things to vertical tail surfaces.

The undercarriage was built as standard but using a much heavier gauge of wire, together with a second reinforcing brace behind the main legs — all hidden within the scale fairings, of course. A special silencer was fabricated using silver-soldered copper tubing and all fitted as closely as possible within the cowling. The model was finished in enamels and proofed using a standard polyurethane varnish.

At 812mm (32in.) span the Gladiator makes an ideal subject for .35 power in C/L Scale. Although Howard's model has already made more than one trip to the



flying field, flight tests have yet to take place due to inclement weather. Free flight models are not the only ones that are worth saving for that calm day when conditions are just right.

SCALE CONTEST CALENDAR

July 24th Abingdon (provisional) F/F Power & Rubber, C/L Standoff & C/L Scale Racing

August 27/29th Nationals, Barkston Heath

The event at Abingdon will see the first try-out for the new class for C/L scale models of racing aircraft. The full rules will appear in 'Model Flyer' but briefly, the class is for models of full size racing aircraft in racing livery with motors up to 3.5cc (no size limit on airframe). Speed over 10 laps will be combined with the current static judging schedule.

There are two changes for outdoor rubber scale. A minimum wingspan of 50cm will be applied this year, and will probably be increased to 60cm for 1984. This should encourage the building of more practical flying scale models, more in keeping with the scale of the outdoor environment (Also suits the French Magnette 66 class — Ed.).

The second change is that the duration element of the flying schedule is dropped in favour of the original 'transition to descent' section.

The Scale Technical Committee is currently engaged in a complete revision of the rules for 1984 and this will result in a very much simpler rule book. For example there will be a common static judging schedule for all scale classes except 'peanut'.



Top: Butch Hadland's new Fike is to 1:12 scale and can be converted from rubber to CO by interchanging the nose block. This feature was also used on his well known Lacey. Above: Howard Furness of 3 Kings Aeromodellers built this handsome C/L scale conversion of Doug McHard's free flight scale design. Power is an OS Max 35 with throttle and Roberts control system. Left: Wal Cordwell's 1:8 scale DH Fox Moth for Class II C/L scale in the colours of black, gold and silver. Power is an Enya 40 with throttle using a collector stub and silencer working through scale exhaust.

DAVE DAY'S

SHOP TALK

The latest in products for the modelling scene



WILLIAMS RACER KITS

Plastic kits are, these days, more the province of our sister magazine 'Scale Models.' However these particular kits are produced by well-known modellers Grainer and Larry Williams through their well established Williams Bros. Accessory Company and are distributed in the UK by Flair Products.

Of particular interest are the four large size (1/32 scale) kits of aircraft from the golden era of air-racing, the 1930s. These are of the Gee-Bee R1/R2 racers, the Gee-Bee Model '2' Racer (two variants), the Wadell-Williams Racer (three variants) and the French Caudron Racer (four variants) price £6.68.

TATONE 'MUFF-L-IT' SILENCERS

The Cox 'TeeDee' motors can present problems when it comes to fitting a silencer. One solution for the .049/.051 size engine is the Tatone 'Muff-L-It' available from World Electronics. Two slightly different versions are made to suit the 0.49 or 0.51 size, both costing £8.94.



SMALL NI-CADS

One reason for the general lack of interest in electric powered F/F models in this country is usually stated to be the lack of suitable batteries. Modelcraft, 2 Paigle Road,

Aylestone, Leicester, have available high capacity ni-cads in 'N' and 'AA' sizes, these being of 150mAh and 27mAh respectively. Price £1.25 per cell plus 35p postage for any quantity.



ADD-ON SILENCER

Faced with a club noise limit requirement which required a greater degree of silencing than could be obtained with standard silencers, a Director of Jarvisward Ltd., produced an Add-On silencer to meet the requirements.

This proved so successful that the company is now producing the design for sale. Inlet and outlet pipes are ribbed to retain silicon tubing. Interestingly, an inlet end is marked.

Available from Jarvisward Ltd., 70 Waterhouse Street, Chelmsford CM1 2TZ. Price £8.69 + VAT.



JUBILEE SPECIAL PETROL ENGINE

Based on the well-established Merco 61 two stroke glow-motor, the 'Jubilee Special' from Northern Model Centre (£87.50) is a two-stroke petrol engine for which NMC have produced a new cylinder head, fins, ignition points, cam, etc. As well as supplying a 10mm NGK sparking plug. At the moment, Dunham Engineering ignition components are used, but NMC hope to have their own available shortly.

The motor runs on 20/1 petrol/oil mixture and will swing props up to 16in. diameter

SUPER GLUE SOLVENT

One problem with most types of cyanoacrylate (or 'super') glues is that they work better on human flesh than on most other materials (not surprisingly really since that's what they were invented for).

If you *do* stick yourself to your workbench, make sure that you have some of Hermetite's new super glue remover within reach. This comes in a gel form which is claimed to unstick all known kinds of super glue and is less messy than a liquid solvent.

Hermetite super glue remover costs 80p per tube from Hermetite stockists.



TREXLER WHEELS

Vintage fans will know that Trexler Airwheels, or to give them their full name, Pneumatic Balloon Wheels, have been considered the best available for more years than most of us care to remember.

Over the years, these wheels have occasionally been available in this country from various sources, but rarely for very long. They are now being imported by Northern Model

Centre, 3 Ropergate End, Pontefract, W. Yorks WF8 1JX.

Each wheel consists of a turned wooden hub fitted with a moulded rubber tyre with integral inflation tube. After inflating, the tube is wound around the hub and the end tucked in.

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Aeromodeller

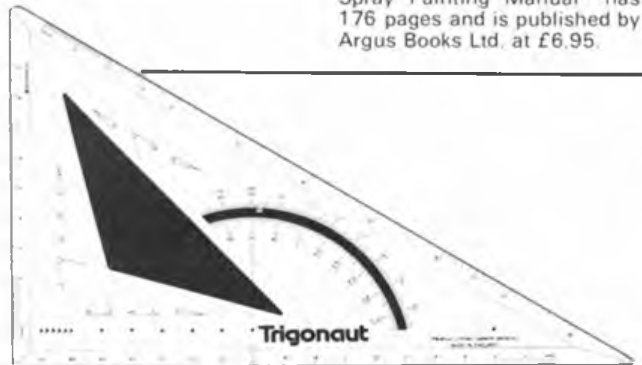


NEW AIRBRUSHING BOOK

Ian Peacock, well known for his articles on airbrushes and spraying, has now written a book entitled "Airbrushing and Spray Painting Manual" which is, in effect, a compendium of all his articles.

The book's main value lies in having in-depth coverage of the whole subject, from a modeller's point of view, in one volume.

Various aspects, including the important one of safety, each have their own chapter, and there are numerous illustrations. "Airbrushing and Spray Painting Manual" has 176 pages and is published by Argus Books Ltd. at £6.95.



THE TRIGONAUT

This one item combines 45°, 60° and 75° setsquares, a pair of compasses, a protractor, and a metal straight edge with metric and imperial rules! All modellers should find this very ingenious device virtually indispensable.

Made of satin finished aluminium, the 'Trigonaut' is supplied with detailed instructions and distributed by Adams Marketing, 5 Angel Lane, Shafesbury, Dorset. Available from W. H. Smith main branches, price £1.99



LITESOLD SOLDERING KIT

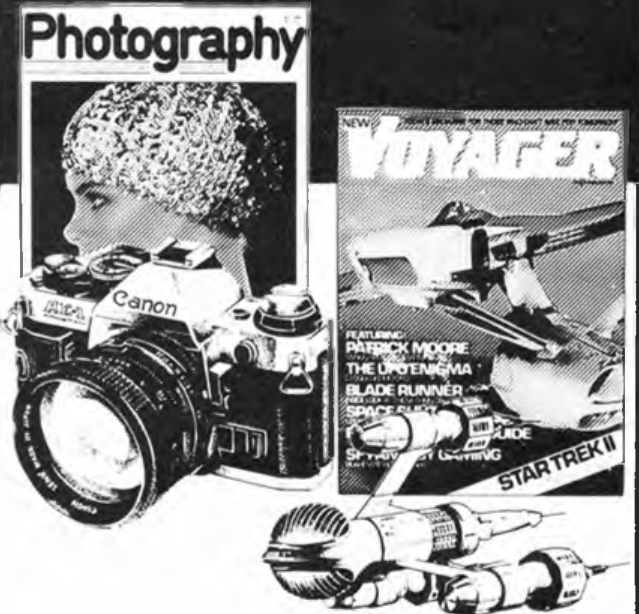
The SK 18 soldering kit from Light Soldering Developments Ltd., 97/99 Gloucester Road, Croydon, CR0 2DN, Surrey, while intended originally for electronics work, is ideally suited to aeromodellers.

Included in the kit is an 18 watt mains powered soldering

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Enclosed in clear PVC wallet, the complete outfit costs £14.55 inclusive from Litesold.

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YEARS AGO IN AEROMODELLER BY DAVE DAY

THE EDITORIAL was entitled 'publicising Aeromodelling' and is even more appropriate today than it was at the time. How to sell aeromodelling to the youth of this country in the face of ever increasing alternatives (it can only be a matter of time before a computer simulation of model flying is available) is a problem which should concern us all.

Thanks to the efforts of SMAE Press Officer, Ken Brookes, April 26th 1958 saw a demonstration of C/L flying given to 70,000 plus youngsters during the Schoolboys International Soccer match at Wembley Stadium. Not only was this well received, but it produced a fee of £100 to be added to the SMAE International Contest Fund.

George Cox's 'Famous Biplanes' series (No. 15) featured the Grumman F3F-2 with details of a specific example — Major Al Williams' 'Gulfhawk 2'. This was complimented on the cover by one of those beautifully tinted black and white photographs which could pass for a colour picture. Included was the usual sketch page which concentrated on engine, strut and undercarriage detail.

A major portion of Hangar Doors was given to an obituary of the great Jim Walker, who died on March 12th. Jim's achievements in modelling would fill several books, yet curiously, the thing for which he is most remembered, the invention of the two-line bellcrank system for C/L, was later ruled by a US court to have been originated by a man named Obie St. Cyr. Nonetheless, Jim's many inven-

tions have influenced modelling worldwide.

'Radio Control Slope Soaring' by Denis Illsley gave a comprehensive coverage of this, then new, subject. In addition there were plans of George Upson's 72in. R/C slope soarer 'Aries' which, by modern standards, looked more like a thermal soarer. To put things in perspective, most designs were rudder only with rubber driven escapements.

Other plans service introductions were 'Cheshire Kitten', a 21in. span C/L stunt model by W. A. Pollard for 0.5cc motors and Walt Mooney's 23in. span F/F 'Luton Minor' (prototype), also for 0.5cc motors.

How many people remember the humble Celspray? This was a simple spray gun using a hand operated rubber bulb to provide pressure, rather like a scent spray. 'Spray that Model' (no *not* by Ian Peacock!) showed how this could be used, with the aid of simple masks to spray a Stuka model.

'Decor Detail' showed 'different' colour schemes applied to six particular full-size aircraft, these being a Bristol F2B fighter, Spitfire XVIIIFR, Fokker DVII, Nieuport XVI, SE5a and Sopwith Camel F1.

'Engine Analysis' No. 48 featured the new ED 1.49 'Fury', a ball-race, reed valve induction engine stated to have 'outstanding handling qualities'. Power was 1315bhp at 14,000rpm.

'Trade Notes' had news of a new ED miniature receiver said to permit light-weight installation in 1cc models. It measured 2½in. x 1½in. x 1½in., weighed 2½oz. and needed 'no more than a pencil and a 22½volt H.T. battery'. A relay and actuator were needed to complete the airborne pack.

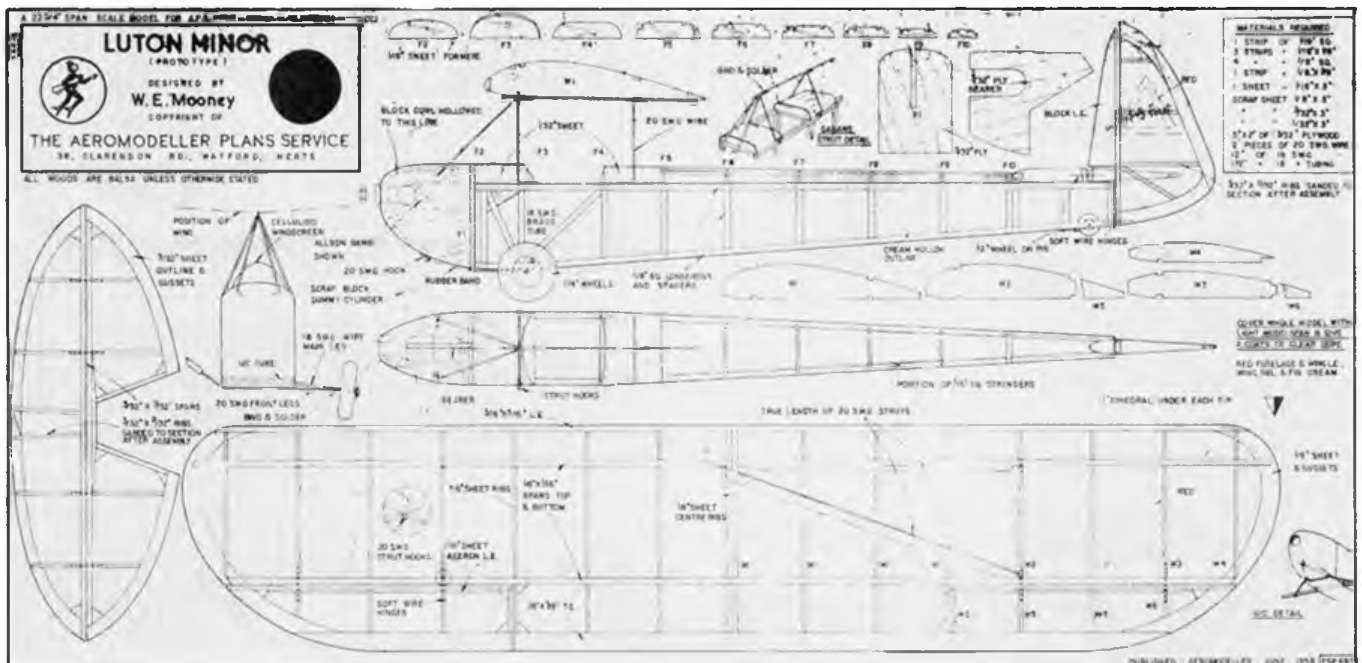
Pendulum operated control surfaces were the subject of 'Aeromodelling Step-by-Step' and numerous systems were shown for rudder, elevators and ailerons. Pendulum controls were quite popular at one time for F/F scale models, but now seem to be largely forgotten.



Coincidentally, 'Gadget Review' showed a system using *one* pendulum to operate all three controls, together with ideas for pop-up tail dethermalisers, folding props, dihedral braces, turbulators and laminated tips.

Finally, a tale from the South African Nats where a Mr. Swartz had his 'Beaver' forced right down to the ground from an almost certain max. by a large crow that repeatedly dived and rocked the model.

This 25 year old design appeared in Aeromodeller June 1958. Full size copies of the quarter scale reproduction of the Luton Minor Prototype, designed by Walt Mooney for 0.5cc motors are available from MAP Plans Service, (PO Box 35, Wolsley House, Wolsley Road, Hemel Hempstead, Herts. HP2 4SS) Plan No. FSP697, price £1.50 plus 45p postage and packing.



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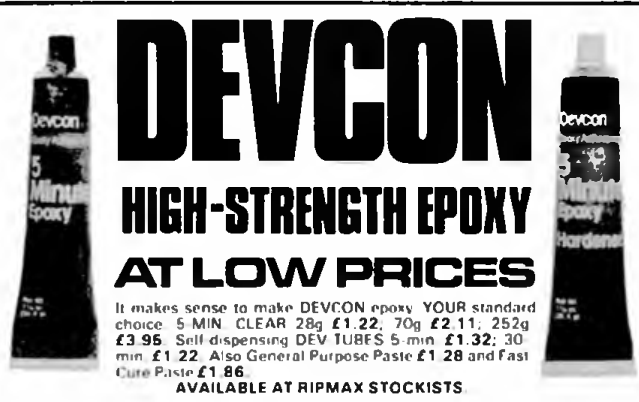
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