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Cover

Quite the most effective British fighter aircraft of WWI, the SE5a has long been a favourite subject for scale modellers. Bill Dennis designed this one for *Aeromodeller*, with full size plans presented with this issue. Inset is Laurie Barr's Fly-Rod, which sets a new style and new standards in indoor Easy-Bee flying. Again, plans in this issue.

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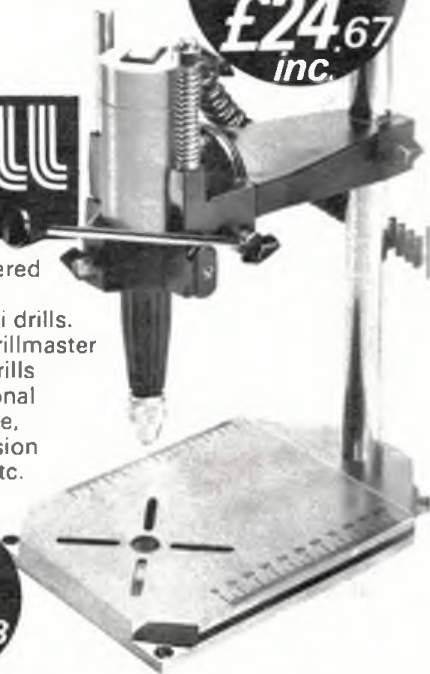
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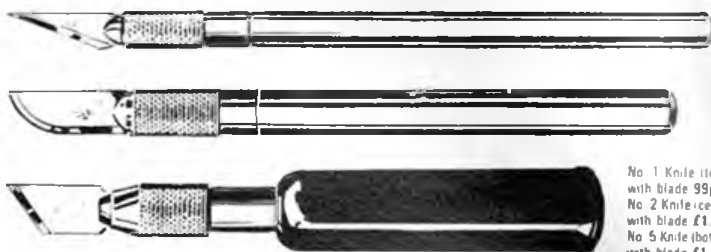


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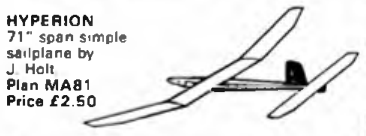
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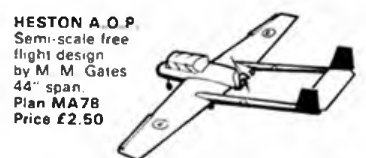
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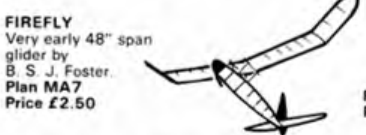
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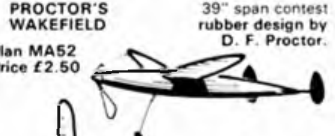
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by Pier Hoff
Plan MA21
Price £2.50



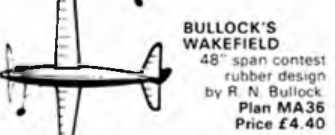
BABY BIPE
19 1/2" span
control line
biplane by
Ron Moulton
Plan MA51
Price £2.50



**BRYTON
R.O.G.**
51" span contest
rubber design
by F. H. Boxall
Plan MA67
Price £2.50



**BULLOCK'S
WAKEFIELD**
48" span contest
rubber design
by R. N. Bullock.
Plan MA36
Price £4.40



SMOOTHIE
44" span
contest rubber
model by
Norman
Standing
Plan MA80
Price £2.50



NOMAD
Simple 43" span
glider by W. H.
Porter
Plan MA10
Price £2.50



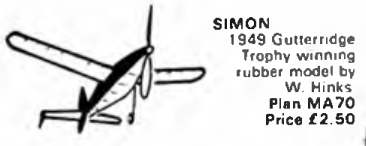
CHAMP
45 1/2" span cabin
free flight
power model
by F. La
Jenuesse
Plan MA25
Price £2.50




ALPHA CON
26 1/2" span
control line
trainer by
Henry J.
Nicholls
Plan MA43
Price £2.50



SIMON
1949 Gutteridge
Trophy winning
rubber model by
W. Hinks
Plan MA70
Price £2.50



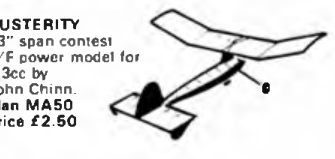
**MANX
QUEEN**
70" span
tailless free
flight power
design by
A. H. Wilson
Plan MA39
Price £2.50



ACE OF DIAMONDS
26" span lightweight
rubber model by
R. A. Twomay
Plan MA76
Price £2.50



AUSTERITY
53" span contest
F/F power model for
1.3cc by
John Chinn.
Plan MA50
Price £2.50



**UPSTAIRS
MAID**
33" span contest
rubber model
by R. J. North
Plan MA38
Price £2.50



BOWDEN HUMMINGBIRD
32" span
sports free
flight power
design by
Col. C. Bowden
Plan MA47
Price £2.50



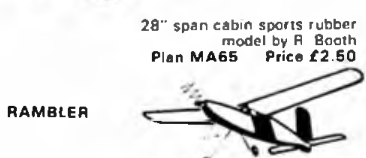
KRUSADER
49" wing
span contest
rubber model
by P. T. Capon
Plan MA20
Price £4.40



COLLECTOR
Rise-off-water
contest rubber
design by Ted
Buxton 28" span
Plan MA26
Price £2.50



RAMBLER
28" span cabin
sports rubber
model by R. Booth
Plan MA65
Price £2.50



ALSO AVAILABLE

Plan No.	Name	Type	Designer	Span	Price
MA1	The "ME" Contest Machine - 1	Rubber Contest	B. J. S. Foster	48	£2.50
MA2	Vanguard	Sailplane	J. S. Davel	35	£2.50
MA3	Yorkshire Pudding	Lightweight Rubber	J. Owen	28	£2.50
MA4	R.T.P. Duration Model	-	R. Rock	20	£2.50
MA5	Dunlet	RTP Speed	H. L. Knott	15	£2.50
MA6	Gutteridge Trophy Winner 1945	Contest Rubber	R. Copland	46	£2.50
MA9	Condoe	F/F Power	T. H. Newell	39	£2.50
MA13	SAM IV	Sailplane	F. A. Mayo	70	£2.50
MA15	Lightweight Duration Rubber	Contest Rubber	J. P. Cuckeridge	34	£2.50
MA16	Harris's 1946 Wakefield	Contest Rubber	G. W. W. Harris	43	£2.50
MA17	Bowden Trophy Winner 1946	F/F Power	A. H. Wilson	77	£2.50
MA18	Petrol Duration Model 1948	Contest Power	Ray Menkes	£52	£2.50
MA19	Go-Hi VI	Sailplane	C. Christensen	30	£2.50
MA22	Ventura	Sailplane	J. R. Thimidis	50	£2.50
MA24	Mascot	Contest Rubber	A. H. Lloyd	31	£2.50
MA27	Century	Sailplane	J. Van Hattum	47	£2.50
MA37	The Wizard	Control Line 1.3cc	R. H. Warring	22	£2.50
MA44	Tops	Rubber Power	A. W. Green	28	£2.50
MA45	World Distance Record Holder	Contest Rubber	B. V. Harman	46	£2.50
MA49	Cherokee	Contest Rubber	R. A. Porter	28	£2.50
MA68	Gullobne	Sailplane	Phil Gulman	57	£2.50
MA69	Tycoon	C/L Stunt	C. E. Mayes	37	£2.50
MA77	The Twister	C/L Stunt	C. A. Bates	28	£2.50
MA82	P-51D Mustang	F/F Scale Rubber	H. Gregory	30	£2.50

SPECIAL OFFER!
to Aeromodeller readers
Orders over £5 — £1 off
Orders over £10 — £2 off
Orders over £15 — £3 off
N.B. - include this coupon with your order.

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MODEL & ALLIED PUBLICATIONS LTD.
P.O. Box 35, Bridge St., Hemel Hempstead, Herts. AM, July '83

Please supply the following Plans

Plan No.	Name	Price
Plan No.	Name	Price
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Total: NAME (Block Capitals)

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Over £5.00 - 60p

Overseas - Accelerated Surface Post:
Up to £3.50 - 80p
£3.51 - £6.50 - 95p
Over £6.50 - £1.25



BUY YOURSELF A SPITFIRE . . . or just hire it! This magnificently restored Supermarine Spitfire Mk. 14 was recently restored to 'zero time' condition and is being offered by Diamond Aviation Ltd. for sponsorship and product promotion, or even outright sale. With the large Rolls-Royce Griffon engine, the Mk. 14 Split is an imposing sight and one we hope to see at air shows in the coming months.

Hope you like it . . .

Here we are then, bigger, brighter more pages and . . . 95! Here is our opening shot with our new style AEROMODELLER. We hope you like the full-size fold out plans for Bill Denis's free flight scale SE5a — it's just the first of a regular series of designs for construction right out of the magazine. Another challenge to scale modellers is contained in the Aircraft Described feature which this month presents drawings for the Japanese Fuji FA-200, a light aircraft just ideal as a scale modelling subject. For control line, radio control or even indoor rubber it's a nice challenge — try it.

We hope Vintage fans will appreciate the Vintage Revival

feature, which this month recommences with plans for A. H. Wilson's 1946 Bowden Trophy winner. Plans for this attractive, parasol wing power model, ideal for R/C assist, is just one of many old Model Aircraft magazine designs which are to be re-introduced to Aeromodeller Plans Service and which will feature in Aeromodeller in the coming months.

The new series — How to start in control line Combat is the first in what we hope will be a regular panel of instructional features on aeromodelling technique — a demand which comes through loud and clear in our recent reader survey.

To those who are often tempted by the fascinating world of indoor flight, but were discouraged by the specialist techniques and special materials involved, we say try Laurie Barr's FLY-ROD, a brand new Easy-Bee design, designed to provide real performance with simplicity — and designer Laurie is presenting his own beginner's Easy-Bee Fly-Rod only contest at Cardington in October. First prize is £100, so dust off that building board NOW!

So what about our Space Modelling feature on page 331? Well, although officially discouraged in UK due to legal niceties which we explain, Model Rocketry is very

much a part of the aeromodelling scene in many countries and officially recognised at FAI level. It is a fascinating subject and no secret that some aeromodellers here enjoy it now. We hope for great things in the future.

And what about Microlight aircraft, eh? Well, this low cost form of full size aviation is so close to aeromodelling and so many microlight enthusiasts have a dual interest between this and aeromodelling that it seems a natural kindred interest — there's a latent pilot in most of us and for most, microlights might be just the most aeroplane we could ever afford to own or fly.

THE

Aero modeller

READERS' SURVEY

What you asked for . . .

● I suggest that original articles be reprinted with re issue of vintage plans. EG Bowden Meteorite. List of materials required with ALL plans

P.M.R. TETBURY

● I suggest more articles about electric power especially for smaller free flight models!

D.H.R. CHELTENHAM

● I suggest items on the mechanical side of modelling i.e. care and modification of engines, free flight timers workings, tanks, undercarriages, bellcrank systems, engine mounts etc.

B.D., BRAINTREE

● I suggest that Aeromodeller should start an informative guide straight through from basic construction to flying as I know how I struggled by myself to start!

T.S. BRIGHOUSE

● I suggest promoting traditional modelling techniques and prove it doesn't have to be radio to be fun! Yet stay ahead on new ideas and techniques

T.J.S. NORTH HUMBERSIDE

● I suggest you add some R/C only aircraft, and you could help scale enthusiasts with details of scale colours and actual aircraft location for detail

T.B. SALISBURY

● I suggest regular (at least one per issue), full page, dimensioned plans as in the much lamented Aeromodeller Annuals instead of so many 'Peanut' types

P.J.A. BINGLEY

● I suggest that more space is given over to introducing the hobby to newcomers instead of 'converting' the converted

T.K. FAREHAM

● I suggest articles on the pioneers and great events of flying and associated models. More money saving gadgets and methods for the youngsters. Some cartoons

P.S. HARPENDEEN

● I suggest less comp. results, more practical articles — engine maintenance, kit reviews, hints, tips, etc.

M.W. READING

● I suggest more free plans but *not* of CL models also less comp. news most modellers not interested

P.H.B. LEICESTER

● I suggest regular articles on how to achieve special effects such as retracting U/C, operating flaps, smoke, bomb dropping, internal silencers etc.

M.C.M. MERSEYSIDE

● I suggest in making the 'Aeromodeller' even better would be to have more scale drawings, and fullsize scale plans for building flying scale models of them

A.B. AYRSHIRE

● I suggest more articles on construction techniques and related information would benefit most modellers

J.C.P. AMERSHAM

● I suggest that films produced by Aeromodeller are needed by County Council Library services for distribution to schools for the benefit of enthusiasts trade and mag.

J.B. TROWBRIDGE

● I suggest that you publish more articles and competitions to encourage the youngsters — they are tomorrow's aeromodellers

G.M. LEICS.

● I suggest less coverage of vintage. That's for 'old' people. More like the one about D. Hipperson this month

J.H.A. CANARY ISLANDS

● I suggest more P30, A1 and CO. stuff, young people do like these small and sound models. F1A, B, C too complicated!

J.K. ELLUND W. GERMANY

● I suggest that the graphics format of the magazine be updated, to uplift the general image of model flying to an unaware public

D.H. BOLTON, LANCS.

● I suggest a regional "where to aero-modellers fly" not club sites but open areas commons, slopes etc.

R.J.H. EPSOM

● I suggest APS includes facsimiles of early pages of A.Ms. Complete facsimiles or reprints of AMs of the 30's would be popular

Competition reports are of interest only to the competitors

L.A.J. HAYLING ISLAND

● I suggest more articles on the practicalities of trimming (e.g. J.O'D. article on VIT power models - Eiton Drews on FAI gliders). In particular I would like to see an article(s) on trimming and rubber mounts etc. for scale models

J.A. BRIDLINGTON

● I suggest that as the 'average' modeller seems to be sports orientated we should have less competition reports and more general features in AEROMODELLER

R.P. CARDIFF

● I suggest more articles to encourage people to fly in contests, like the Experts' Forum ones of the '60s. A massive junior programme via schools and government.

M.H. BEDLINGTON

● I suggest more serious design articles and less rubbishy 'isn't this easy' stuff. A/M was excellent in the early sixties

M.E. LONDON SW4

● I suggest constant emphasis on contest achievements and how to build and fly well. Readers need to see there is an aim to model flying other than killing time

M.D. WEST WICKHAM

● I suggest one page monthly devoted to readers' questions and the answers from a panel of experienced aeromodellers. Many questions are not readily solved from books

D.P.R. WATFORD

● I suggest that you do a 'Ripping Yarns' series. Everybody has at least one good story. That big chase — a record attempt — Triumph against the odds

J.B. ALFORD, LINCS.

● I suggest as much encouragement as possible given to all aspects of electric powered flying in every way, this is environmentally, far more acceptable

M.W.H. CHESTERFIELD

● I suggest that this year you try to be less technical, this will get many young

Aeromodeller

Say it in AEROMODELLER . . .

So we're looking for new material — we're ALWAYS looking for new material! If you have something to say, ideas to pass on for the benefit of other aeromodelling enthusiasts, Aeromodeller is your forum. Use it!

We're particularly looking for how-to constructional information, the kind of down-to-earth info that most modellers always need. We pay too!

Magnet Steering event

Trevor Faulkner, long a stalwart enthusiast for magnet steered free flight will be organising the first British national class F1E event for the newly donated Sheffield Magnet Cup on October 23. This challenging new event for British aeromodellers will be flown from a site capable of accommodating any wind direction and exact venue details and other contest information is obtainable from Trevor Faulkner at 4 Birchitt Close, Sheffield.

Royal Aero Club lapel badge

A new lapel badge has been created for the Royal Aero Club to support an enterprising programme for membership growth. As one of the largest affiliated groups within the Royal Aero Club, SMAE and its members will have the opportunity to distinguish themselves with this distinctive, bright enamelled identification. SMAE members should contact Barry Rolfe, C/O SMAE LTD., Kimberley House, Vaughan Way, Leicester.

New VOYAGER'S fourth great issue

'May the force be with you' could be the subtitle of the Summer edition of New VOYAGER on sale from June 17. To coincide with the UK release of the third Star Wars film, 'Return of the Jedi,' this issue contains a special 16 page Jedi feature which includes *nine* full colour pages. Plus: the first scripts of 'Star Wars' and how to model Boba Fett's Slave I ship from 'The Empire Strikes Back.' All this *and*: a Jedi contest, the Planet Mercury, new space models, video games, home computers, SF conventions and much more in a packed 76 page issue. Price £1.25 or, in case of difficulty, £1.55 from MAP Ltd., PO Box 35, Wolsey House, Wolsey Road, Hemel Hempstead, Herts. HP2 4SS.

SMAE National Junior Kit Contest 1983

This year, SMAE will be running their Junior Kit Contest separately from the British Nationals. Instead, the venue will be Sutton Park, just north-east of Birmingham, one of Britain's oldest sites for free flight model flying. Since 1909, Sutton Park has been used for competitions by the Midland Aeromodelling Club and some of Britain's top experts use the site regularly for trimming and practice.

Ideally timed during the long school summer holidays, the event takes place on Saturday August 6 and is open to all aeromodellers under the age of 16, who can expect to compete for some excellent prizes.

modellers really involved, as the majority of modellers are not specialists

J.A. ABINGDON

●I suggest that you drop either 'RM' or 'RCM&E' and use budget costs thus saved and editorial effort to make Aeromodeller bigger

G.R.K. WARRINGTON

●I suggest facsimile reprints of pages of Vol I Aeromodeller each month to build up early editions on a part work basis for those of us who lack collectors' prices

S.D.R. GUISEBOROUGH

●I suggest regular two-page on SMAE matters — general plus competition e.g. flying site retention activities

D.J.W. SOMERSET

●Contest reports should be much more objective — they are severely weakened by containing too much of the reporter's own, personal, views

M.H. GUISELEY

●I suggest that you put in a more varied selection of fullsize plans

P.M. LEICESTER

●I suggest that the Aeromodeller be presented to us again when it was good. Please study the late 1940's/early 1950's Christmas issues

G.W. PLYMOUTH

●I suggest that modern helicopters be featured once in a while in the Aircraft Described feature, to include at least those available as R/C kits

G.C.G. PORTSMOUTH

●Closer liaison with the SMAE, this should result in contest results appearing quicker, also it would encourage the occasional modeller to join the National Body

S.I. BATH

●I suggest a regular feature on the sport and fun side of R/C. It is still aeromodeller and not everybody wants to buy or can afford the specialist R/C magazines

H.M. FAKENHAM, NORFOLK

●I suggest a series of articles for absolute beginners using a simple rubber powered model with a proper construction as a basis

L.D. RAINHAM

●I suggest you publish a list of clubs (by area giving address of club chairman, if they want new members, and where and when they fly

W.A.S. WESTON SUPER MARE

●I suggest you refer back to April 1959 issue with very interesting Bulldog drawings and 'gen' plus radio to construct

K.T.L. LONDON N20

●I suggest a stronger leaning to free flight, R/C sport and scale including ducted fan and unorthodox. Also more engine tests (non R/C engines) and features

M.E. EPSOM

●I suggest that you take one (or more) models, from the pre-1951 period, monthly, and do a construction, trimming, flying evaluation.

J.W.R. GATESHEAD T & W

●I suggest more full-size plans for age group seven years to 12 years, interest is subdued by difficult plans.

G.G. CO. DURHAM

●I suggest that you concentrate on one "First Class" design each month. Either F/F or C/L. Get P Chinn to do worthwhile engine tests (i.e. competition class motors)

R.C.M. SUTTON COLDFIELD

●I suggest more features to help young modellers achieve success with first few models, thus preventing them from becoming despondent and giving up the hobby

DERBYSHIRE

●I suggest you occasionally reprint articles from past Aeromodellers, stories of fighter aces with associated plans and three-views fired my enthusiasm. Also world class modellers' profiles

T.C.M. FLEET, HANTS

What's On . . .

June 18-19	THREE SISTERS CONTROL LINE INTERNATIONAL 1983. Teamrace. Speed, Aerobatics. Combat to FAI rules. Venue Three Sisters Recreation Area Bryn Road, Ashton in Makerfield. Valuable prizes and medals awarded. Details and entry forms J Woodside, 29 Calerstones Road, Liverpool 18	
June 18-19	AEROMODELLER SCALE DAYS Venue Old Warden, Biggleswade, Beds	July 10
June 18-19	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
June 19	CROYDON DAWN PATROL — F1A, E1B Cdh (As part of the Southern Gala at Beaulieu) Start 6.00 am (cocca 5.45 am) Contact N J Beaumont, Spring Cottage Spring Street, Ewell, Epsom, Surrey	July 10
June 25-26	NEWTON AYCLIFFE MFC SPONSORED TWO DAY COMPETITION — F2B Senior, Novice and Junior Sunday entry possible. Two rounds per day and fly off subject to entries. Venue Newton Aycliffe Sports Complex, camping and caravan facilities. Contact Barry Robinson, Tel (0325) 315215	July 17
June 25-26	RAFMAA SMAE THURSTON TROPHY COMPETITION F1A F1B F1C 1st round commences 12.00 hours on 25th. Champaigne progressive 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 Barnes Tel 033 483 471 Ext 420 (working hours) or 0526 21458 (weekends)	July 17
June 26	PETERBOROUGH MFC COMBAT COMPETITION Venue River Embankment, Peterborough. Contact Brian Waterland, Tel Market Deeping 343722	July 17
June 26	SMAE INDOOR EVENT Contact L Barr, Tel (0628) 25595	July 24
June 26	WHARFEDALE OPEN MINI GOODYEAR COMPETITION SMAE rules but no age limit. Venue Contact Jeff Smith Tel Leeds (0532) 66342	July 24
June 26	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
July 1	FRIDAY EVENING FAI TEAM RACE Venue Burtonwood Airfield, Nr Warrington, Lancs. Contact before the next event essential. Tel Jim Woodside 051 7241442	July 31
July 3	ELMBRIDGE CLUB STUNT COMPETITION F2B and Novice Stunt at Elmbridge Club Circle, Fairmile Common between Escher and Cobham Surrey. Contact M Radcliffe 01 397 4407 for details	August 7
July 3	SMAE CENTRALISED MINI FREE FLIGHT A 1 A Cdh CO. HLG Venue Driffield Yorks (SMAE members only) Contact D Hipperson, Tel 01 207 0179	August 7
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 10 am onwards. Venue Aldridge Airport, Walsall W Midlands (M6 Junction 7) Contact J Shelley Tel Walsall 28553	August 7
July 3	CONTROL LINE 500 LAP GOODYEAR MARATHON (SMAE members only) Venue Dishforth Wakefield. Contact B Temporal, Tel 0924 270690	August 14
July 8	CHUCK GLIDER CONTEST Venue Littleton Road playing fields, Salford Lancs. Contact M C Reeves Tel Rochdale 44999	August 14
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, SAE to R Thorn, 22 Chaisworth Place, Harrogate, North Yorkshire	August 21
July 9-10	CLAPA CHAMPIONSHIPS FAI CONTROL LINE Aerobatics Open Novice Stunt Open Carrier Open Scale. CLAPA Members only. Venue Essex Showground Brain tree Essex. Contact P Burgess Tel 0376 516881	August 27-29
July 10	CANTERBURY PILGRIMS MFC NEW AIRSHOW Static Class 2	August 28-29
	Scale, Team Displays or individual, trade flying displays welcome. Venue Graveney, Nr Faversham, Kent. Pre-entry details and forms contact Bas Brazier, 8 Norfolk Road, Canterbury, Kent. Tel 61199	SEPT 4
	BRITISH CONTROL LINE COMBAT CHAMPS 3rd round Venue River Embankment, Peterborough. Contact Brian Waterland, Tel Market Deeping 343722	
	SMAE INDOOR EVENT Contact L Barr, Tel 0628 25595	
	CROOKHAM GALA — Open Rubber, Open Glider, Open Power and all-in FAI. Five flights with no rounds. Start 10 am. Venue Beaulieu Old Airfield. Contact D Cox, Tel Ashford (Middx) 51696	
	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	
	SHUTTLEWORTH MODEL GROUP OPEN DAY Free Flight and Control Line plus Stand off Control Line Scale competition. Venue Shuttleworth Old Warden Beds. 9 am to dusk. Contact Mick Staples, 11 Whitehill Road, Cambridge CB5 8LT	
	FREE FLIGHT CLUB CHAMPIONSHIPS Contact Dave Hipperson, Tel 01 207 0179	
	WHARFEDALE OPEN DIESEL COMBAT COMPETITION Engines 15 to 19 cu. No pressure. Props 8 x 6. Venue Dewsbury, West Yorks. Contact Jeff Smith, Tel Leeds (0532) 663432	
	1st FID TEAM TRIALS (3 flights) Houlberg Gold Medal. RAF Cardington	
	FACT OPEN THERMAL SOARING EVENT BARCS League event. Entry fee £2. SAE frequency. Venue RAF Weston-on-the-Green Berks. Contact N Wrbb, The Bungalow, 13 East Street, Fritwell Oxon OX6 9PX. SMAE members only	
	SMAE SUMMER SCALE MEETING Control Line Scale Class 2. Scale Racing. Venue RAF Abingdon Oxon. Contact Vic Willson, Tel Reading 471964	
	NORTHERN AREA FLY ANYTHING DAY Venue RAF Church Fenton Nr York (SMAE members only — restricted parking) No contests. Contact John Godden, Tel 0532 521002	
	NOVICE STUNT COMPETITION Venue Thores Park, Wakefield. Contact B Temporal (Secretary Wakefield MFC) 45 George Street, Horbury	
	CONTROL LINE AEROBATICS COMPETITION Venue Thores Park, Wakefield. Contact B Temporal, Tel 0924 270690	
	THREE KINGS OPEN CARRIER SCALE AND PROFILE EVENTS Silencers and Insurance needed. Venue Old Croydon Aerodrome, Purley Way. Contact D Bird, Tel 01 874 6394	
	SMAE CONTROL LINE EVENT FAI Team Race Goodyear A Combat. Novice Aerobatics Speed. Contact R Horwood, Tel Bristol 48769	
	WOODVALE RALLY Venue Woodvale, Southport Lancs	
	SCALE & VINTAGE DAY (SMAE members only — restricted parking) Venue RAF Church Fenton, Nr York. Contact John Godden, Tel 0532 521002	
	SMAE INDOOR EVENT Contact L Barr, Tel 0628 25595	
	SCOTTISH VINTAGE EVENT Scottish aeromodellers will have their own vintage event concurrent with the Aeromodeller Vintage Day on August 21. Site for the event is Newbigging and is open to all Scottish vintage enthusiasts. Further details may be obtained from Bruce Duncan, Burngrange Farm, Burrelton, Perthshire, Scotland PH13 9PL, Tel 08287 374	
	AEROMODELLER VINTAGE DAY Venue Old Warden, Biggleswade Beds	
	CONTROL LINE & RADIO CONTROL NATIONALS Venue Barkston Heath	
	EUROPEAN CHAMPIONSHIPS TEAM TRIALS PART II F1A F1B F1C 7 rounds. Contact Dave Hipperson, Tel 01 207 0179	
	SMAE INDOOR EVENT RAF Cardington (Contact Laurie Barr, Tel 0628 258951)	

PHOTO-PRIZE
with
Fliar Phil
MODEL NEWS

**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. Details if possible should be given about the model and its construction.

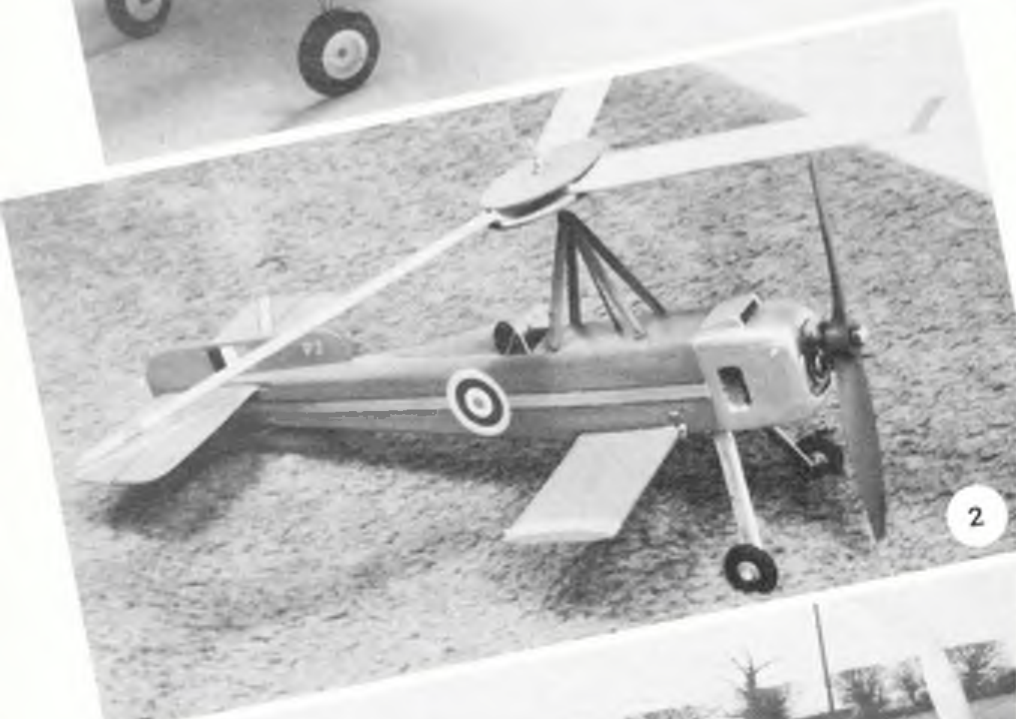
Send all entries to:
Aeromodeller Photo-
prize Feature,
PO Box 35, Wolsey Road,
Hemel Hempstead, Herts.
HP2 4SS.

Photos will be returned
after publication.

FLIAR PHIL is of the opinion that the witty aerobod who said, "Aeromodelling is a great hobby — but is rarely 'plane sailing'" — had something. Building and trimming models can certainly abound with unforeseen problems. However the master modellers in this month's selection have overcome all difficulties. Let us meet them.

Photo No. 1

Introducing 'Pinocchio'. Built from plans scaled up from the Aeromodeller Annual of (would you believe) 1949! This appealing 'oldie' complete with wire undercarriage, struts and rubber bands. (Fliar Phil loves 'em all!) comes from John Walden of Basingstoke. D.C. Merlin powered. John



Aeromodeller

says, "It is a beautiful flyer". Dramatic lighting shows it off well too John.

Photo No. 2

Now for something completely different! A 'Whirly-bird' from Keith Heselden in Kent. Currently interested in auto-gyro's, Fliar Phil read Keith's notes with added interest. An RTP model, all sheet construction. Rotor span 15 in 12v motor with reduction gear Keith says "Performance somewhat 'hair-raising!'" Good on you Keith for 'having a whirl'.

Photo No. 3

Fliar Phil quotes from Peter Leavesley's letter from Norfolk, "An elderly model now, but it impresses the local lads". Well Peter, your APS Zlin 226A semi-scale stunter

pictured against that Norfolk landscape, impressed FP. Weight 43oz. Power Silenced Merco 35. Plastic film covered.

Photo No. 4

Herewith, Fliar Phil's "short photographic course"! Take a stunning model of a Lysander, adding a background of Oxford Airport. Result. A photographic masterpiece. Mr. B. Harvey from Oxford has passed the course with honours! His 'Lizzie' spans 60in., engine 2.5cc. An AERO-MODELLER staff design. This month's worthy winner.

Photo No. 5

This photo from Mr. G. Spencer of West Midlands, proves to Fliar Phil's satisfac-

tion that rubber powered scale models can still more than hold their own against all the opposition! It is a Kawasaki K-8B Japanese seaplane of 40in. span, featuring 'stick and tissue' construction. Plans by one of America's experts, Bill Noonan. Very nice!

Photo No. 6

A fine racing aircraft, few Comper Swifts had Gypsy engines, but all the nostalgia of the Swift is captured in this photo which 'flew' air mail from the USA. Jim Algar in California, USA gives the models 'vital statistics'. Weight 4.4oz. span 36in. Power six strands of 1/16 in. rubber.

Photo No. 7

It is always exciting for Fliar Phil to receive an 'own design' model for this feature — and what could be more excitingly 'out of the rut' than this twin engine canard named B.B.C.4? By Bob Brown of Berks., it is his fourth in a series of highly successful canards. Span 54in., length 44in., weight 4 1/2 lb. Power is two O.S. 10's. Control is by Fleet Custom III R C.

Photo No. 8

The touch of the artist is revealed in this photo of a Cessna 'Bird Dog' as it climbs away, against silhouetted trees and a fine cloudscape. Submitted by Mr. Poucher of Cheltenham, details are span 36in., powered by a Mills .75cc. Built from Eric Fearnley's APS plan.

Well that's it for this month. So let's raise our glasses and drink to another 'photo-treat' next month. Fliar Phil hopes you will join him then. Cheers!

RAY MALMSTRÖM



Ian Peacock concludes his thoughts, on this form of super sport flying fun.

LIKE ALL aspects of model flying, Profile Scale really starts to take off when one progresses beyond the kit and plan stage and starts 'designing one's own'. Unlike many aspects, however, the simplicity of this type of flying model is such that one is not so put off by the thought of branching out on one's own.

Designing one's own model is a stage to which many of us aspire, but for which there are far more doodles on scrap paper than actual finished designs. Many are put off by the complexity of all that aerodynamics and stuff which they feel is best left to the experts.

However, of all the forms of model flying, this category must surely be the easiest place to start. As I mentioned last month, despite purchasing at an early age Mr. Quek's excellent plans, none of my models actually came out looking like the Zero or the P-40! My 'design' approach was not to alter any of the points that really matter. Things like major dimensions, surface areas and even basic structure. I simply 'played around' with the outline of the fuselage and maybe the wing tip shape until the desired result was achieved. The best way to do this without ruining your plan is to tape it to the lounge window (assuming that you have a window big enough!) with the plan facing outwards toward the sunlight. Choose a bright day — this system doesn't work too good when it is dull and overcast.

The sunlight will show through the plan sufficient for one to see the major parts of the drawing. Using a soft pencil, mark onto the rear of the plan the position of the engine, wing and tailplane. With these established, the outline of the 'new' fuselage can be 'freehanded' in using a scale three view (try the MAP Plans Service range in Plans Handbook No. 5) or good sideview photograph. Obviously one is limited in just which subjects can be superimposed in this manner. One is also in a bit of a cleft stick as regards profile accuracy and may well have to 'adjust' the shape by eye until it looks more or less right.

Similarly, adjustments to the tailplane outline can be made to bring it more into line with its chosen subject. If tailplane outlines are seriously different, endeavour to get the proportions to produce roughly the same areas as that of the original: i.e. if more leading edge taper is needed, try to increase the root chord and decrease the tip chord equally such that the area remains unchanged. Wing tips and the taper of the flaps (if fitted) can be 'doctored' in the same manner but it is usually best for your first attempt at this technique to leave the wing shape and structure as it is, except for moving the undercarriage into the wing if desired. Once satisfied that changes of this nature really work, it is possible to progress further and introduce greater changes moving toward the model whose outward shape and profile dimensions are correct.

Another useful short cut is to use 'real scale' model aircraft plans, i.e. those with proper built-up three dimensional fuselages. There are a good number of non-profile scale plans available that can be reasonably adapted. Consider a 'real scale' *Junkers Ju87 Stuka* as an example — (Aeromodeller plan FSP C1.675). At 34in. wing span it would be ideal for a 2.5cc or 3.5cc motor. The trick here is to produce the wings more or less as shown on the drawing but cut the fuselage as a profile from the plans sideview. Working, say in 1/8in. thick balsa sheet, the wing, tail and engine positions are



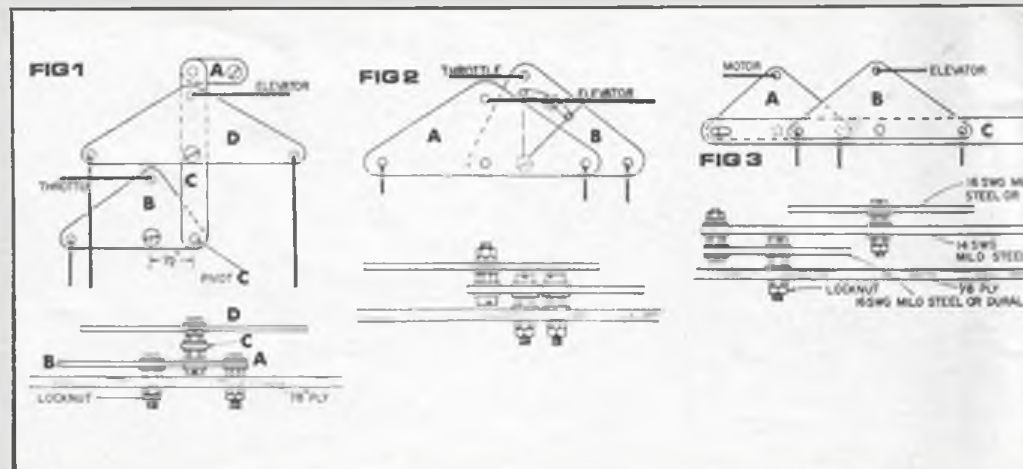
marked out, 1/8in. sq. engine bearers slotted in 1/8in. ply doublers etc. In fact use only the plan for outline and the now 'established' profile technique for construction.

Free flight and radio control scale plans can also be adapted but it is necessary to re-appraise the incidence angle of the wing. Freeflight and radio control models tend to have their wings set at a positive angle to the direction of flight whereas for control line flight, most models are set up to have engine thrust line, wing and tail incidence all at 0°. It is best to reduce the incidence angle (even to a little bit positive if zero-zero frightens you) or you will need a goodly amount of down elevator to maintain level flight.

Once firmly established as an exponent of Profile Scale there are many exciting avenues that are open to us. First of all is the thought of more than one engine. Again the very simplicity of structure renders twin (and more) engine subjects only marginally more complex than the single engine varieties. Clearly the fuselage profile remains largely unaltered, although the ply doublers may often be omitted as there are no longer any engine bearers to support. Engine nacelles may be considered to be just 'short' fuselages, having engine bearers, ply doublers etc. etc. Such thinking many years

ago led me to 'scratch' my favourite Quek design and produce two twin semi-scale profile models, the *D. H. Mosquito* and the *ME 110* (plan Nos. C/L.1168 and C/L.1169 respectively each priced £3.60 + 45p p&p). Wing span was increased from around 40ins. to around 50ins. to accommodate the 8ins. diameter propellers either side of the fuselage. Wing structure remained unaltered and the fuselage and tailplane free handed as already described. Perhaps in retrospect, these outlines could have been more accurate but none can argue that they look well and fly just like their single engine forebears — surprise, surprise!

Powered by a couple of Oliver Tiger 2.5cc diesels, both models were capable of full aerobatic flight and on one engine (inboard one please!) all the 'round' manoeuvres are still possible. As with all multi-engine control line models, one should start and run the righthand or outboard engine first. With equal size fuel tanks, the outer engine will then quit first, affording single engine safety and avoiding the embarrassing situation of having the model turn in towards you!! During one of the earliest Aeromodeller Scale Days, both models were flown in one circle (one in the expert hands of Mick Reeves who can still turn the odd circle or two). Furthermore that doyen of



Control Line



control line scale, Albert Briggs was also flying a twin at the same time and place. The sight and sound of three twins orbiting in the same bit of airspace was truly staggering — and never a line tangled. The reliability of modern motors, whether diesel or glow plug, makes multi-engined operation a doddle (providing that one applies the usual common sense rules) and opens up a multitude of two and four engined possibilities. Profile models from Aeromodeller 'scale' plans are a good start, see Plans Catalogue pages 98-100 of plans handbook No. 1 for incentive! Those with long memories may well remember the Novelty competition that used to be held in the evening at the Nationals. Do you recall the fellow who turned up with a few sheets of balsa, glue, coloured ball pens and four(!) Cox .020 Pee Wees. He proceeded to build and fly a profile, all sheet Boeing B-17 Flying Fortress-Profile Scale Control line and all before the advent of the super glues! Of such heady stuff is nostalgia made!!

Who will be first, one wonders, to turn up at Old Warden with a profile Dornier DoX with twelve of those tiny Cox motors?

Of course there are many weird and exotic aeroplanes that can be modelled in this way and once one has realised the ease with which they can be designed, built and flown,

the sky really is the limit!

For would-be designers, the books and magazines are full of 3-view scale drawings. Again, MAP Plans Handbook No. 5 — price 85p + 30p p&p is your best reference source, with over 400 types listed.

Scaling these up to a suitable size is not difficult for only the basic outline is what is really necessary. Simple enlarging exercises using graph paper as had been covered so often within this magazine (and others) will usually suffice. For those amongst us looking for greater accuracy of outline (and all the surface detailing as well!), the photographic technique is a great deal better, although to be fair, it can be a lot



Far left: amazingly wide choice of scale subjects in this line-up of profile scale models made by members of the Three Kings Club - Schneider trophy racer, even!
Left: the J. Roberts Flight control three-line handle and two styles of accompanying bellcrank unit. System currently available through Michaels Models.

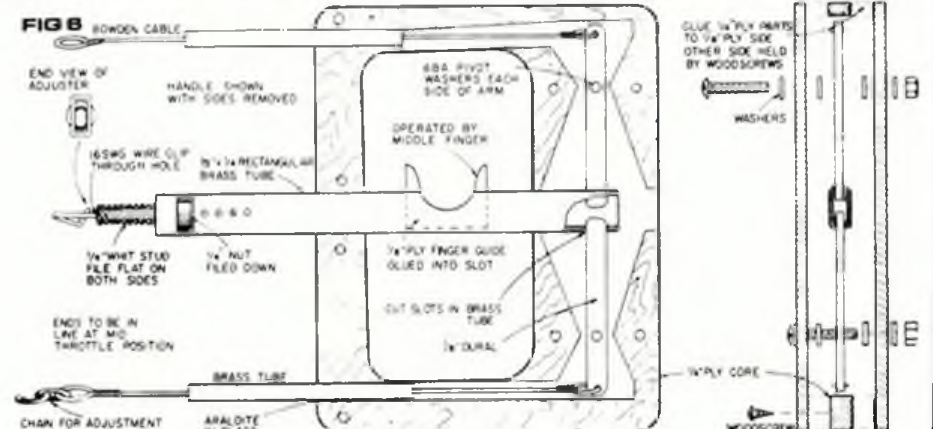
more costly. Many reprographic people can produce blown-up copies from which to work. A cheaper way still, yet retaining the accuracy of photo-enlargement makes use of that modern teaching aid, the overhead projector. Here the basic 3-view say at 1/72nd scale, is photocopied onto transparent copy (size for size). Many photocopy shops can now do this quite cheaply. Simply lay this transparent copy onto the overhead projector — shine it on the wall to focus at the correct size, pin or tape a large clean sheet of paper to the wall and draw round the image — quick, simple and effective.

I use the overhead projector at the village school but evening institutes, many factories with apprentice or other training facilities and even local libraries have such units that can be used.

Apart from the exoticism of multi-engined models, the other major avenue of exploitation is multi-control-lines. Apart from the two used for the main control, a third line (and sometimes more) can be utilised to provide auxiliary functions. Probably the most common is that of the throttle control. Many good modern motors can be obtained in the radio control throttled version and a third control line can be used to operate this throttle. The ability to sit there ticking over,

taxi, take off and land again, opens a new chapter in this aspect of flying. There is only one major proprietary unit suitable for this operation. Known as the *Roberts Flight Control System*, it consists of a double, floating bellcrank and a matching handle. The bellcrank is available in either an upright or inverted construction to suit the individual and the handle has a trigger control to operate the third line. Obviously some care needs to be taken when making up the three lines to get them exactly the same length. Roberts units are available from specialist shops (try Michaels Models who advertise this issue) but they are not stocked by everyone. As an alternative, one can quite easily make ones own. Many years ago a dead simple system was published by Mick Reeves (yes, it's him again) and details are included here.

In Fig. 1 an extremely simple unit is shown consisting of two bellcranks, B for throttle and auxiliary operation, and D in conventional form for elevator control. Note that bellcrank B is so shaped that the dimension from the leadout wire to the pivot is double that from the main pivot to pivot C. Bellcrank D is mounted on member C just as any bellcrank is mounted to a normal ply mounting plate, allowing free but not sloppy movement. C is then attached to A and B in



PROFILE SCALE



Some interesting examples of profile scale designs. Top left: Westland Whirlwind twin by Derek Bird of Three Kings Club for two P.A.W. 149 motors. All sheet, but non-aerobatic. 2nd left: twin Grumman Tigercat is capable of aerobatics. 3rd left: Japanese Kawanishi by Bernard Sexton of Three Kings uses 3-line control. Aerobatic on O.S. 19 R/C. Below: really original - Macchi MC72 by Geoff Burkett uses 3-line control. P.A.W. 19 power. Floats have piano wire runners for take-off, sparks and all! 2nd right: Heinkel UHU twin from Broadlands Club, Norwich, fully aerobatic on two 35 motors. Bottom right: the author's Hawker Hurricane.



a similar manner and these are in turn mounted to the usual plywood plate. The operation is straightforward, when the third line operates B, member C complete with the elevator bellcrank is moved in an opposite direction, thus maintaining a compensating force on the lines at all times. Elevator movement is unaffected. The simplest possible unit, shown in Fig. 2, dispenses with members A and C completely but does affect the elevators slightly, dictating fairly slow movement of the throttle. The elevator bellcrank A is simply mounted on B, and in turn complete is attached to the mounting plate. To avoid distortion and still operation a guide slot is shown cut in B. A normal 6BA bolt in the mounting plate, with the bolt head holding B down, should avoid any such problems. Accurate work is essential here to ensure a good sliding fit. Another simple mechanism again using flat components is shown in Fig. 3. Two normally shaped bellcranks A and B (note size differential) are used in conjunction with a compensating bar C. Bellcrank (throttle) A is bolted to the plywood mount as usual as is the compensating bar (with bellcrank B previously fitted) at opposite end. Bellcrank A and bar C are now bolted together again allowing for free movement. Operation in

this case of the throttle bellcrank in turn acetates the compensating bar to move the elevator bellcrank in the opposite direction. In terms of expense the three line handle is the most costly item. The following designs should do much to alleviate this. Both are by Mick Reeves, the second being the same or very similar to the one he used at Old Warden in July 1968. The practicability of this unit will be borne out by anyone who watched the Seawind in action at that meeting, but for ultimate simplicity by Fig. 5 is practical workable answer. The actual handle could either be of ply or hard wood bolted to a frame of 1/4 in. duralumin. Slots for the adjusting nuts are cut with a file and hacksaw and 1/4 in. diameter holes drilled into the ends, extending from 1/4 in. beyond the slot to allow for a reasonable range of movement. Flats can be filed on two 1/4 in. Whitworth studs and the main frame squeezed at the ends in a vice to avoid the studs rotating when they should not. The adjusting nuts are added through the slots with a simple ratchet, if desired. To complete the unit a curtain ring (spark-plug washer shown) is required to operate the third line. Finally, Fig. 6 shows the unit which is used by the designer. From 1/4 in. ply and 1/4 in. ply the core and sides are

fretted, whilst the throttle control arm is of brass tubing squeezed to a 1/4 in. x 1/4 in. rectangular shape. Slots are cut in this to engage the pivoted duralumin arms (take care that these are long enough not to disengage on full movement) holding the elevator wires, and an adjuster (see Fig. 5) is fitted to the other end. The middle is shaped for finger operation. 'Araldite' the brass tube line guides in position, and the finger guide to the throttle arm and assemble the unit. Note that only one side is glued to the core, the other being held in place by woodscrews allowing access for maintenance. All that remains is to paint these handles, there is no reason why they should not last for a long time. Other peripherals can also be triggered from the extra line — retractable undercarriage, bombdropping, to name but two. It doesn't take a genius to work out a suitable system and it is obvious from the Carrier event that suitable jiggling of the system can operate flaps and arrester hook. Even quite complex subjects can come out to be simple to do.

So — get to it, and let's make Aeromodeller All SCALE DAY a day to remember for PROFILE SCALE — June 18th and 19th.

Write



In

Views expressed here are those of the individual correspondents, and not necessarily condoned or supported by AEROMODELLER.

Aeromodeller gets a Rocket!

Dear Editor,

Thank you for mentioning the existence of our Association in last month's AEROMODELLER 'Heard at the Hangar Doors' section. I would like to comment on your assertion that Model Rocketry is 'illegal'. There is no specific law which prohibits the launching of a model rocket (or rockets of the firework type, or November the fifth would not exist as we know it), any more than there is a law prohibiting the firing of a bow and arrow. Both obviously have to be done in a responsible manner so as not to cause harm to others and one of the reasons for forming the BSMA was to see that the hobby was regulated, with our members adopting a common-sense safety code, such as that used in the USA and Canada.

The problem of legality arises with the 1875 Explosives Act, as all types of rocket are defined within the Act as 'Explosives'. It is illegal to manufacture any explosive device without a licence from the Explosives Inspectorate Department of the Home Office and in approved and inspected premises. This is all very understandable and we are distinctly opposed to individuals making their own chemical propellants. We would like our members to be able to purchase factory made propellants (less powerful than the largest firework rockets one can buy), to fly models they have built. However, the Home Office have maintained for many years that the insertion of a rocket 'motor' into a model constitutes 'the manufacture of a rocket' and consequently 'the manufacture of an explosive'.

To the best of our knowledge no-one has ever been prosecuted for flying a model rocket, so their interpretation of the law has never been tested. We are at present obtaining Counsel's opinion on the matter. The Home Office have been able to prevent the development of the hobby, which is recognised by the Federation Aeronautique Internationale as an International Sport, by refusing

to allow the importation of US-manufactured model rocket motors. We hope that later this year we will be obtaining legally manufactured British propellant motors and in the meantime will be attempting to get the Home Office to modify its obstructive attitude.

In fact, we would maintain that their attitude increases the likelihood of explosive accidents, particularly to teenagers, if their enthusiasm for model rocketry obliges them to experiment with dangerous chemical mixtures because they cannot obtain safe, factory-made, propellants. It is important to emphasise that it is a very safe pastime. In the USA, where over 175 million rockets have been flown in the past 20 years, there has not been a single serious accident. Members of the US National Association of Rocketry have US\$2-million insurance cover provided — we cannot even get a quotation for cover in this country because of the 'illegal' slur which will continue until the authorities allow the hobby to be enjoyed in this country, as it is around the World. This September, the World Space Modelling Championships, are going to be held in Poland. Many countries from East and West will be competing there, and I am glad to say, a small British team will be showing the flag.

*Ditchling, Sussex. Paul Clark,
(Chairman, British Space
Modelling Association).*

*If model rocketry interests you,
see the introductory feature on
page 331 of this issue — Ed.*

Where are they now?

Dear Sir,

Since my return to flying fields in 1978 I have often had occasion to wonder what became of the members of my old club, the Belper & District MA&EC, latterly known as the Duffield and District MA&EC.

May I ask the courtesy of your letters column to direct any of them who are still modelling to get in touch with me. If the response justifies it, some sort of reunion might perhaps be on the cards.
*Redcliffe-on-Trent,
Nottingham. Tony Brookes*



Indoor 'copter fun

Dear Sir,

You may be interested to know that prior to your republication of the Christmas 1957 rubber powered helicopter (AEROMODELLER, January 1983), Nottingham MAC had decided to have an indoor competition featuring this design.

The contest was held on the last Wednesday evening in January in the room we use at Basford Hall Miners Welfare. The event proved to be a light-hearted affair. Standard rubber bands were 'free issued' in an attempt to handicap our indoor brigade. This had little effect on Mike Hetherington, who won with a flight (best of five) of 6.8 seconds. After the event, Mike set a 'record', using some of his peanut rubber, of 10.5 seconds.

It was discovered during trimming that the helicopters were more stable with the rotor at the bottom, so a further competition was held for 'inverted' flights. Whilst maximum times did not improve dramatically, the general standard did.

Rick Grainger, the polystyrene expert, as usual was different and brought along a 'poly' twin contra-rotating rotor semi-scale model. Unfortunately it wasn't successful upright or inverted. It all helped however to provide an entertaining evening for all.

New members are welcome to come along any Wednesday evening. Main club interests are indoor, with a local sports hall hired once a month on a Sunday afternoon, control line with a strong aerobatic bias,

and free flight including rubber scale. Running against current trends, Nottingham MAC has a minimum number of radio flyers, who are well served by a number of 100% clubs in the area.

*Nottingham. Reg Lowe,
(Nottingham MAC)*

*Note: Prospective members may
contact Nottingham MAC via
Reg Lowe at 49 Commons
Close, Newthorpe, Nottingham
NG16 2BU.*

Electronic whir and hick!

Dear Sir,

May I appeal through your pages to the electronic genii amongst your readership to invent a little device which I feel might help free flight from being destroyed by its own excellence. This would be an electronic version of the magnet steering used by slope-soaring gliders hooked up to the smaller available servo and switched on and off by timer. It would operate best at the end of the flight in lieu of a dethermaliser. Combined with a little down elevator, it should enable most models to fly out of most lift upwind to a reasonably low velocity landing within the airfield perimeter. Open rubber models might use it best in the climb; a long slow ascent into wind combined with a circling glide might well increase duration for the limited space downwind, and I think we are all agreed that the space down wind is limited!
London NW1 Peter Lumsden

IT'S IN THE nature of every aeromodeller to dream and for me the dream started even before the days of the Mills diesel engine and practical radio control. The three foot span rubber powered models of those days took me on many a flight of fancy.

The dream of the very small, lightly loaded aircraft capable of flying with a very small powerplant is as old as the fantasy of flying itself. Santos Dumont was a pioneer with this aim in mind with his *Demoiselle* of 1907 and in Great Britain, serious efforts were made to perfect such ultralight designs, encouraged by the Lympne Trials of 1923/26. These trials were the spur for many legendary aircraft like the winner of 1923 *English Electric Wren*, also the DH53 *Humming Bird*, the *Avro Avian*, *hawker Cygnet* and the delightful *A.N.E.C. Missel Thrush*.

With the explosion of interest in light aviation in the 20s and 30s, attention was concentrated on the design of more conventional aircraft to meet the requirements of two seats and the larger popular engines of the time. However, the dream was not forgotten and many courageous designs were built to explore new avenues. Some of the more radical designs such as Henry Mignet's *Flying Flea* demonstrated the shortcomings of the state of the art by a series of unfortunate accidents.

In America, the design of very lightweight aircraft such as the *Dormoy Bathub* (an overgrown man-carrying model if ever there was one) followed conventional aircraft layouts but a common limitation of the designs during this period was the lack of suitable engines and of matching the available engines to an efficient propeller combination. It was well understood that a small propeller running at very high speed was both noisy and inefficient and a successful solution to this problem was demonstrated by the development of a series of *Pobjoy* engines featuring an integral reduction drive gearbox to the propeller. Perhaps the most famous application was the successful *Comper Swift* racing monoplane which can still be seen flying at airshows today. The advantages of such a drive system have more recently been appreciated by model engine manufacturers.

Intervention of the war meant that aircraft designers' priorities were turned to military requirements so further developments had to wait.

After 1945 the private pilots were satisfied by the glut of 'G.I. Bill of Rights' aircraft such as the *Aeronca Chief* and *Piper Cub* in America and in the UK the licence-built *Taylorcraft Auster*. French enthusiasm was released like a cork from a bottle as Roger Draine and M. Joly created their *VW* powered *Turbulent* and *Bebé*. Hundreds of amateurs followed their lead, and to support them the *Ultralight Aircraft Association*

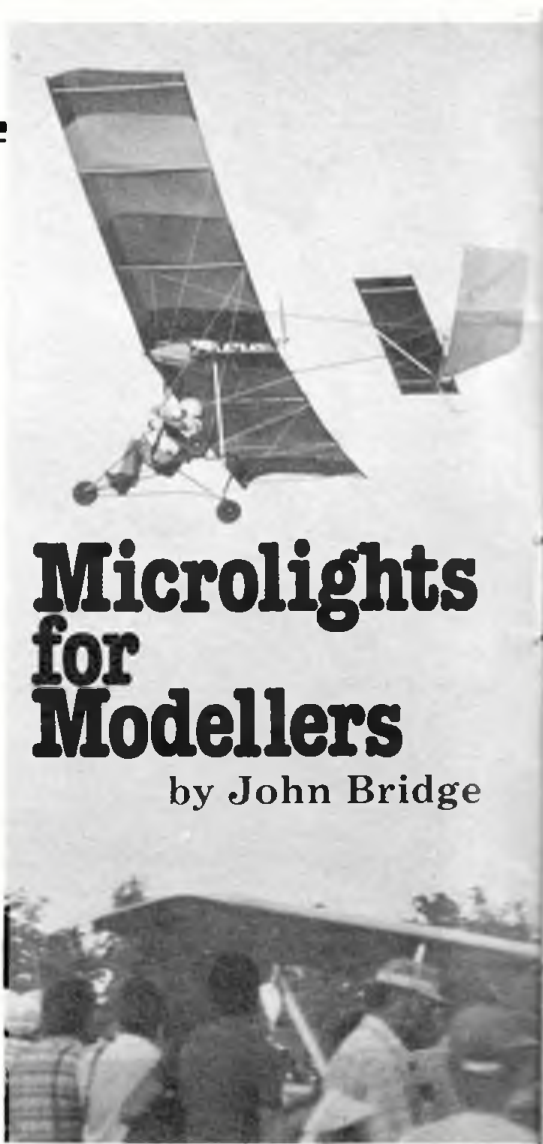
(ultimately the *Popular Flying Association*) was formed and in America the *Experimental Aircraft Association*.

Onward to the 60s and 70s, the American trend towards ever smaller, although conventional aircraft was made possible by the availability of small and more efficient outboard or chainsaw engines.

At about this period, the revived sport of hang-gliding was becoming better established and it was very interesting to see the different approaches to design and development on both sides of the Atlantic.

In Britain, the basic design of Francis Rogallo's flexwing concept was being constantly refined with dramatic improvements in performance. The Rogallo wing was not overlooked by aeromodellers and a powered flexwing designed by *AEROMODELLER* staff was flying at the British Nationals long before its full-size counterpart. However in America, hang-glider designers tended to favour more traditional aircraft construction methods using wing ribs and spars producing quite a rigid airframe. These very lightweight gliders were controlled by a variety of methods some using tip dragging rudders — conventional tails, weight shift and sometimes a bewildering combination of the various systems. Some of these designs, in particular the tail-less biplane *Icarus* and the *Easy Riser* bore a resemblance to the experimental designs of Otto Lillienthal (who was renowned not only as one of the first to build and fly a hang-glider but was also probably the only one to build a hill to fly it from).

These modern counterparts, although sometimes presenting problems of transport and rigging had a very good performance



Microlights for Modellers

by John Bridge



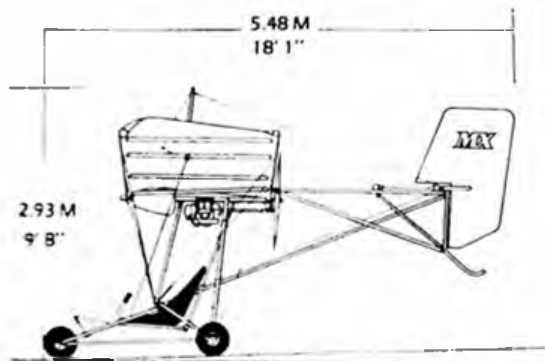
Above and far left: the prototype *Tiger Cub* being prepared for a demonstration flight at Barton Airport for the *Popular Flying Association* rally. Left the author tries the *Tiger Cub* for size. This is one of the many individual aircraft that will be featured in subsequent articles.

Aeromodeller

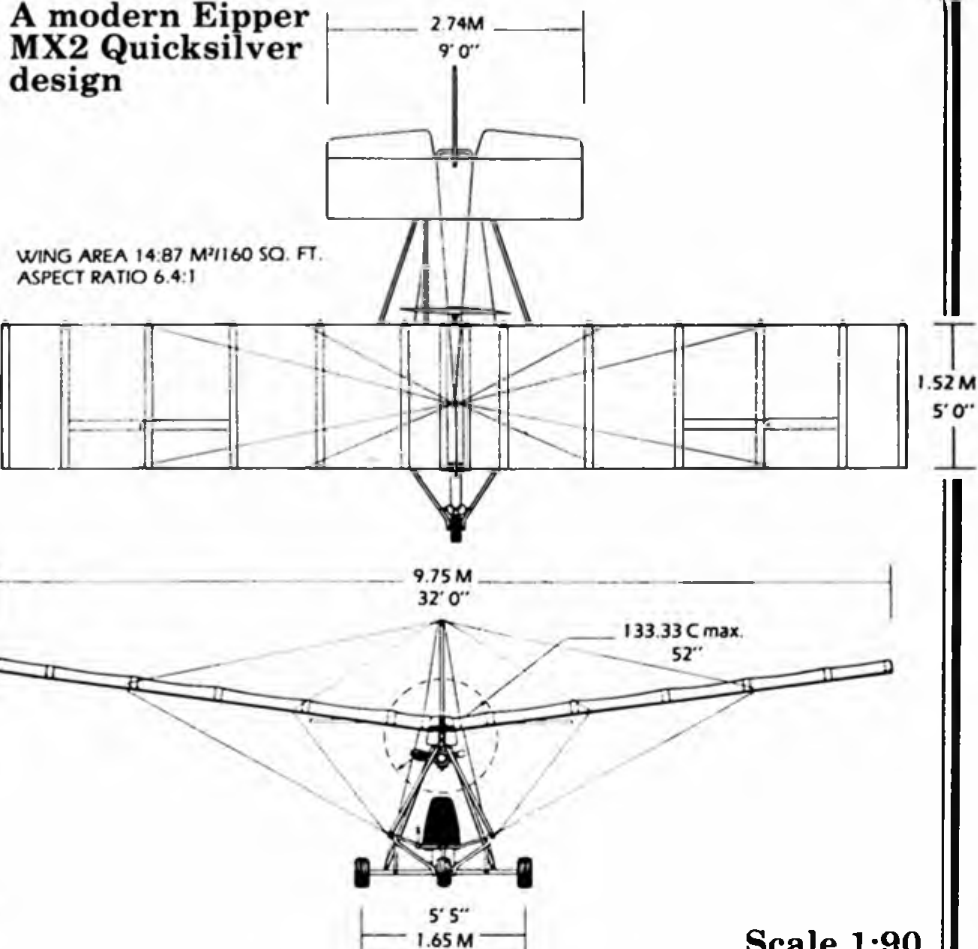
and it was only a matter of time before John Moody fitted the Easy Riser with a McCulloch 101 Go Cart power unit making it independent of any slope site. The Micro-light had been born.

Meanwhile the idea of powering the flexwing hang-glider had not escaped the attention of the pioneers on this side of the Atlantic.

Early attempts consisted of a simple addition to a standard hang-glider of an engine with extension propshaft mounted on the keel tube above the pilot's head and directly driving a small pusher prop. Although this system worked well in the hands of an expert, it was fraught with pitch instability problems associated with the high thrust line. In addition, foot launched take-offs and landings could be dangerous in anything but ideal conditions. It is therefore not surprising that this layout was never developed beyond the experimental stage even though some records were



A modern Eipper MX2 Quicksilver design



established with the prototypes.

During these early days, (only five years ago!) powerplants were fitted in every conceivable location in an attempt to improve the power-on pitch stability but still retaining the original foot launched hang-glider layout. These machines were noisy with their direct drive propellers. Their climb angle also left something to be desired and consequently they were usually flown from hang-glider launch sites.

All these problems were solved by a completely radical approach. Lowering the thrust line not only brought about positive power-on pitch stability, but also made room for a much larger propeller to match a reduction drive. This produced a quieter and more efficient drive system and the problems of foot launching were solved by

the fitting of an undercarriage with foot operated steering while a comfortable seat for the pilot completed the design — the trike had arrived. Improvement of the performance of this layout was such that the first trikes could operate with fuel for a couple of hours flying from any reasonably flat surface with an engine of only 160cc.

It was inevitable that these activities would attract the attention of the aviation authorities on both sides of the Atlantic and it is interesting to see how their proposed legislation influenced the trends in designs.

In America, the foot launched rule effectively established a new category of aircraft to be known as Ultralights, requiring no registration or licence for the pilot to fly them. As this rule only required it

to be possible for the aircraft to be foot launched, it allowed them to be normally operated from a wheeled undercarriage. This produced some bizarre design features in order to comply, such as trap doors in the bottom of fuselages for the pilot to stick his legs through. Many designs could only be foot launched into a very strong wind and the rule even applied to seaplanes (water skis perhaps?). This certainly inhibited American designers who continued to improve their designs based on the original powered semi-rigid hang-glider such as the Eipper Quicksilver, the P-fledge Mitchell wing, Weedhopper and Easy Riser. These ill conceived rules have recently been dropped to make way for a whole new generation of American Ultralights.

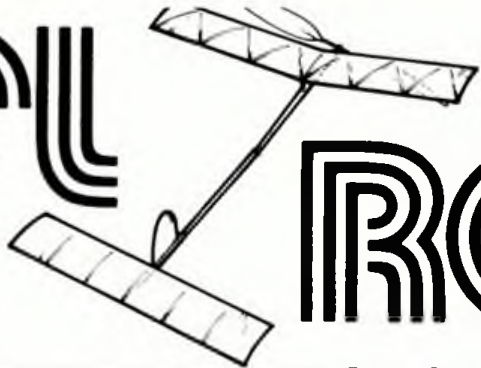
Whilst in Britain many trikes were being flown unregistered and by unlicensed pilots, it was realised that firm guidelines would eventually come from the authorities. Negotiations between the British Microlight Aircraft Association and the Civil Aviation Authority avoided some of the pitfalls of the early American restrictions. However, most microlight fliers realised that in the interest of safety, aircraft design, engineering standards and pilot proficiency standards would have to be established.

Several of the American designs were being imported or being built in the UK. Some used traditional building methods and others modern composite materials mainly foam core — glassfibre-carbonfibre and epoxy resins. This, coupled with advance work on British flexwings designed specifically for use with power trikes and the continued improvement in engine performance meant that the scene was set for the next phase. But more about that later . . .

Left, Mitchell B-10 wing currently under construction by Alan Dommett. More details of this in future issues. Wing construction is almost typical of aeromodelling techniques.



FL



by Laurie Barr

ROD

Come in from the cold and enjoy the pleasure of indoor flying with this brand new EASY BEE design.

Enter Laurie's grand
NOVICES
FLY-ROD
EZ-B
CONTEST

1st prize £100
2nd prize £30
3rd prize £20

Open to all novices — free pre-entry before August 24 1983. Send SAE to L. G. Barr, 4 Hastings Close, Bray, Berks, giving your SMAE membership number and your daytime and evening phone number(s). To join SMAE, send also £12 senior, £5 junior (up to 18 years) or £7.50 associates. As the SMAE is the model fliers' 'union' you are strongly advised to take full membership for the future of our sport!

*Novices: unplaced in first three in any nationally advertised indoor contest for EZB or Microfilm before October 9, except AGM Trophy events.

NB Use of Cardington is subject to administrative changes, repairs etc. Phone check 0628 25595 for update. A share charge is made for all participants using the Airship Shed, limited to £2, but probably £1 or less.

Introduction

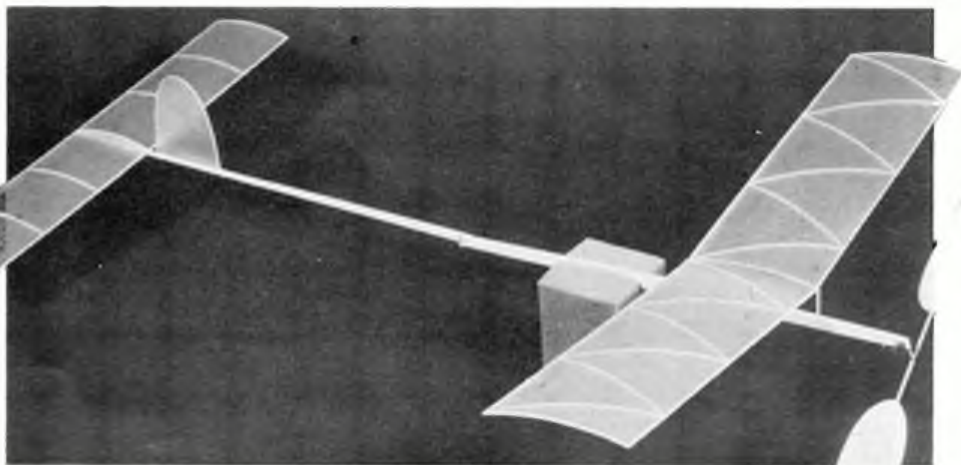
Easy-Bee, or EZ-B, has too frequently been regarded as a misnomer. These models may be simple and loads of fun for small hall flying; but when the turns go up for top performance it's so often another story as the extra torque plays havoc with the trim. However, that's now all past history. Arrival of the long model with wings built strong and flat has produced a model that's very simple to fly, stable and trim tolerant. Their flying qualities make up for the slight extra weight. So don't be put off by 'extreme' looks of Fly Rod. Very light wood is only really critical in its motor stick and tail boom, which are the two heaviest pieces of wood structure. For the rest, look for sound/

For general adhesive, use the specially formulated Micro-X cement, preferably applied a blob at a time, with a glass or metal hypodermic syringe, or a toothpick. Balsa cement skins quickly to form 'dry' joints and if used in excess, say — where the ribs join the spars, you might glue the structure to the jig! If the 'blobs' are large and uneven, the contraction of the cement can distort the ribs.

When cutting or stripping straight or tapered spar stock, I prefer to use a heavy metal straight edge or steel ruler. The wood to be cut is placed at a slight angle on soft 1/4 in. x 3 in. wide balsa sheet so that when the tip of the cutting blade penetrates through the cut item into the soft balsa underneath, the grain pulls the blade onto the straight edge and not away from it. To cut a tapered main spar, look at the edge of the sheet blank and if it is not dead straight, then re-cut it. Rub a candle along both sides of the wing and tailplane jig outline edges to prevent adhesion during construction. Now — ready to start?

Construction

The motor stick is cut from 1/4 in. quarter



light wood at your hobby shop, take a diet scale or similar that weighs in divisions of one gram, and check weigh your sheets of 1/4 in. to equal 14.9g 3/32 in. = 11.15g, 1/16 in. = 7.59g, 1/32 in. = 3.8g.

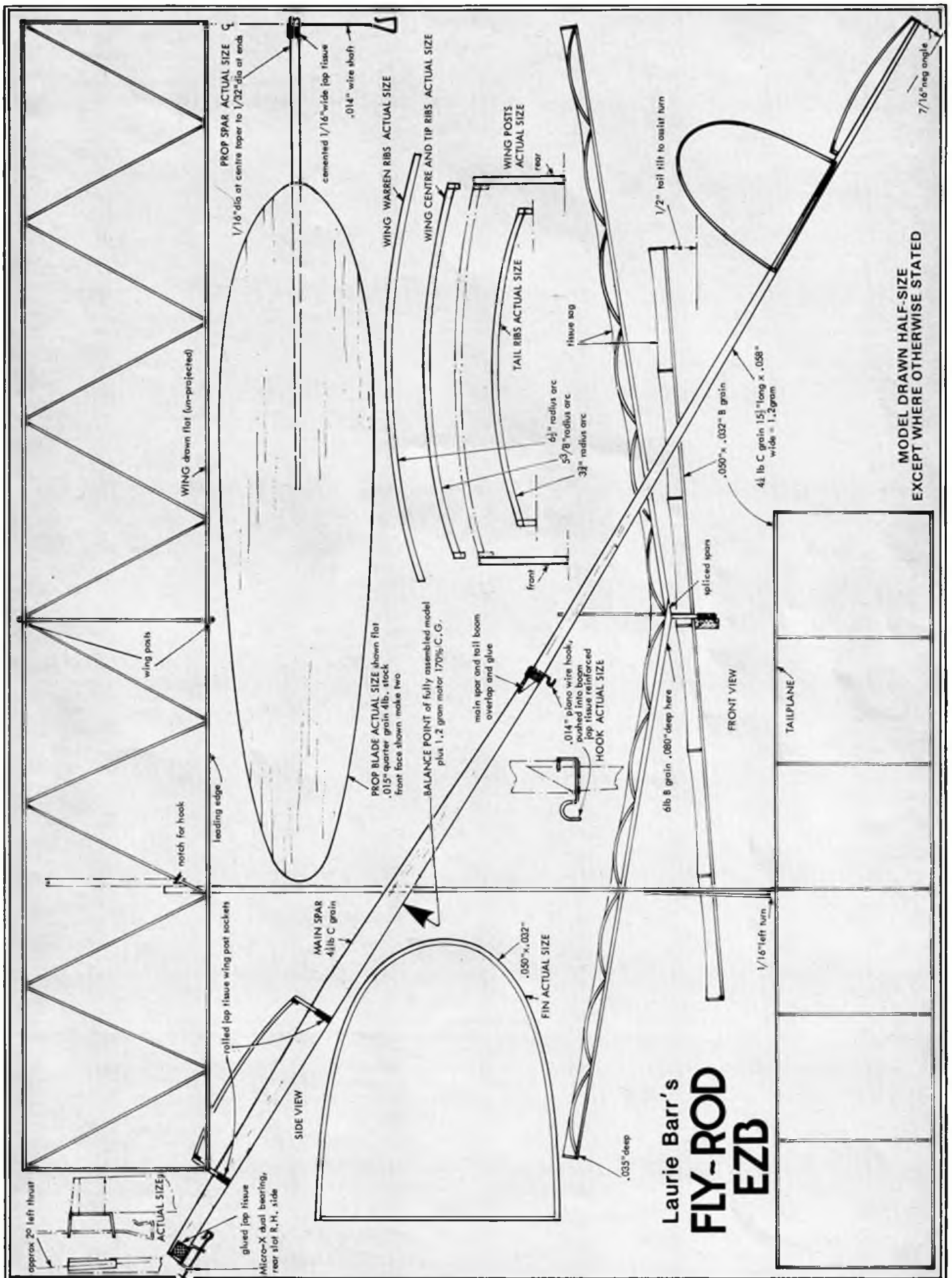
Before we start to make Fly Rod, it's best to prepare a few things by laying the sheet of condenser paper over a flat newspaper then using a fine water spray at approximately 3ft. distance, wet the sheet very sparingly and allow to dry. It should then look like 'onion skin' airmail paper. It is necessary to do this, so that if the finished model is eventually subjected to damp, or large changes in temperature, the 'popped' surface of the paper, takes up the contraction and does not warp the flying surfaces. Remember — never pull the covering tight, just lay it on naturally to avoid warps.

To adhere the condenser paper to the frame, 3M photo mount adhesive in an aerosol can is recommended. Do not spray directly at short range. Spray a 'mist' at approximately 18in. distance and pass the structure through the 'mist'. The adhesive stays tacky for a long while and you have plenty of time to apply the covering. In some circumstances saliva would stick paper to the structure. This gives an idea of just how little adhesive is actually necessary! Covering and adhesive can account for approximately 50 per cent of the total weight of wing and tail, even done sparingly!

grain sheet of 4 lb/cu.ft. stock. (To be 4 1/4 lb/cu.ft. density, a 36in. x 3in. x 1/4 in. sheet should weigh .525oz or 14.9 grams). Enlarge the drawing x2, and cut to shape then lightly sand the edges to take off the sharp corners. Using a minimum amount of epoxy, secure the double (dual) Micro X thrust bearing. Check its rear slot for a click fit making sure that you sit it with 2° (approx.) left sidethrust, then add the cemented tissue reinforcement.

Bend the .014in. piano wire rear motor hook, press it into the motor stick in the position shown, and add two pieces of reinforcing tissue, one wrapped around the end of the stick, and the other over the top of the hook and down each side. The finished motor stick, less wing tubes should weigh .0220oz (.6237 grams). Cut the tail boom from 3/32 in. quarter grain sheet of 4lb/cu.ft. stock (36in. x 3in. 1/2 in. should weigh .393oz. or (11.14 grams). Lightly sand its edges.

Cut a 1/8 in. ply or plastic rudder outline template. Strip a piece of .032in. to .024in. wide 'A' grain approximately 6in. long, wet the strip thoroughly in saliva to make it temporarily adhere to the template! and hold one end using a tape and tissue 'Elastoplast.' Bend the strip, around the rudder outline template, slowly using enough pressure to keep it against the former. Anchor the other end with another 'Elastoplast.' Allow time to dry then add the straight joiner at



the bottom from the same stock as the fin outline. When set, remove from the template and cement to the left side of the tailboom with $\frac{1}{16}$ in. offset. Uncovered, it should weigh .008oz (.227 grams). Cover the fin with condensor paper and trim the surplus tissue with a new sharp blade.

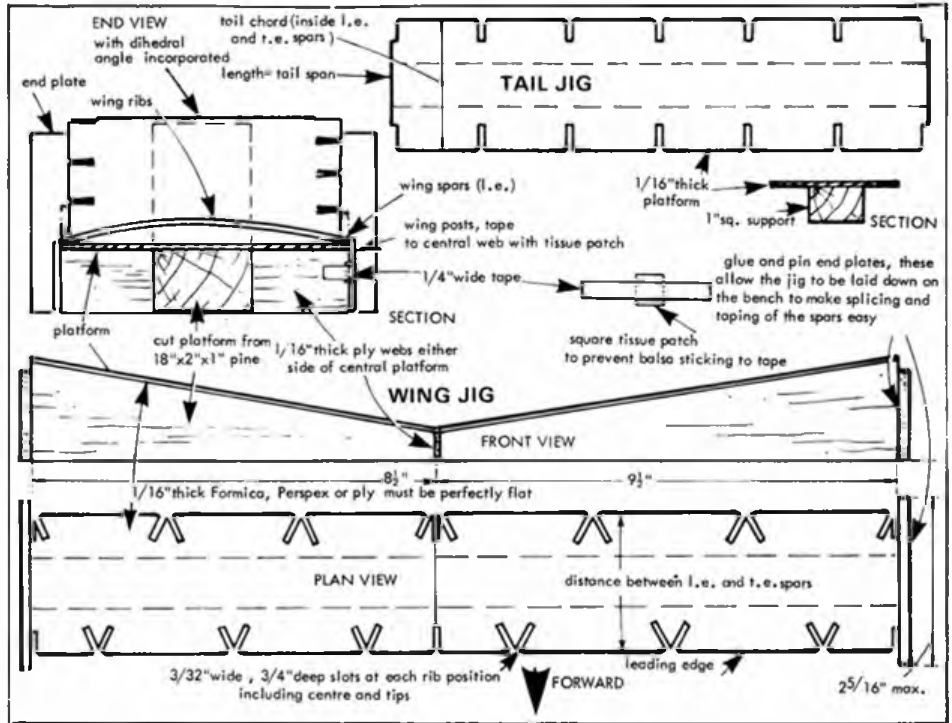
Cement the tailboom to the side of the motor stick and hold with a springclip ensuring $\frac{1}{16}$ in. negative incidence at extreme rear and $\frac{1}{16}$ in. left turn on the fin. Hold the motor stick along the straight edge of the building board, to measure the right deflections.

Wing construction

To cut a tapered leading or trailing edge spar first make sure the edge of the blank sheet of $\frac{1}{32}$ in. (.032 in.) 6lb 'B' grain balsa is precisely straight. Mark off the spar length plus $\frac{1}{4}$ in. for safety. Using a micrometer or finely divided ruler (and optical aid?) mark the width of .080 in. at one end and .035 in. at the other, by inserting the pointed end of a broken carbon blade into the spar blank, having previously drawn the tip across a dark coloured felt tip pen. This leaves a clearly defined mark at each end, across which the straight edge can be accurately placed and the tapered spar cut. All spars should be cut the same way, noting that the right half wing spars are shorter than those on the left panel.

Make up a number of $\frac{1}{16}$ in. tape and tissue 'Elastoplasts' by unreeling 18 in. of tape, pinning one end to the bench and leaving the main roll attached, dangling with the sticky side up.

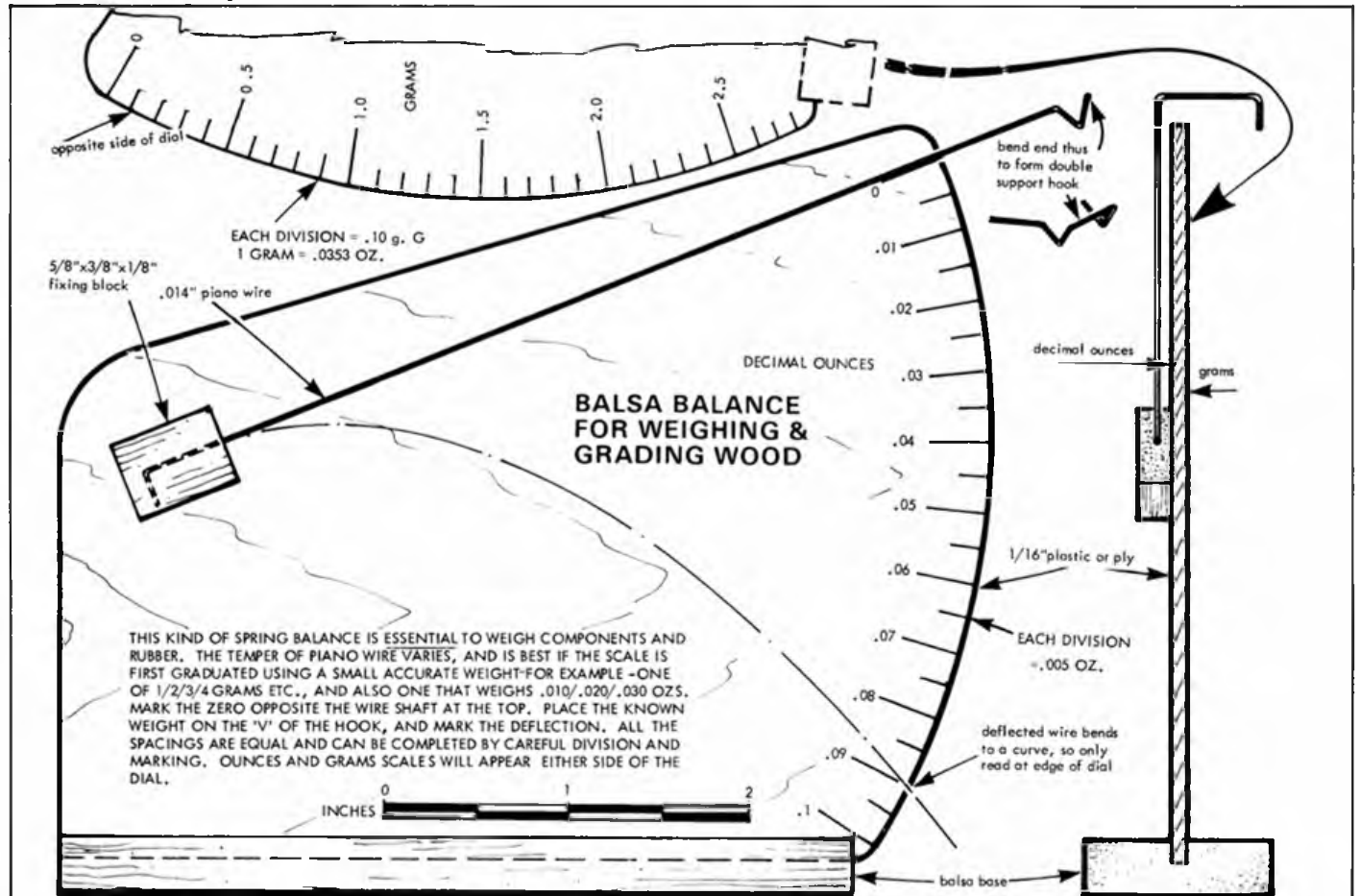
Precut a number of $\frac{5}{16}$ in. square jap tissue pieces, moisten the tip of a finger, to pick up and position at 2 in. intervals down the length of the $\frac{1}{16}$ in. wide tape. Cut and separate the 'Elastoplast,' so the tissue

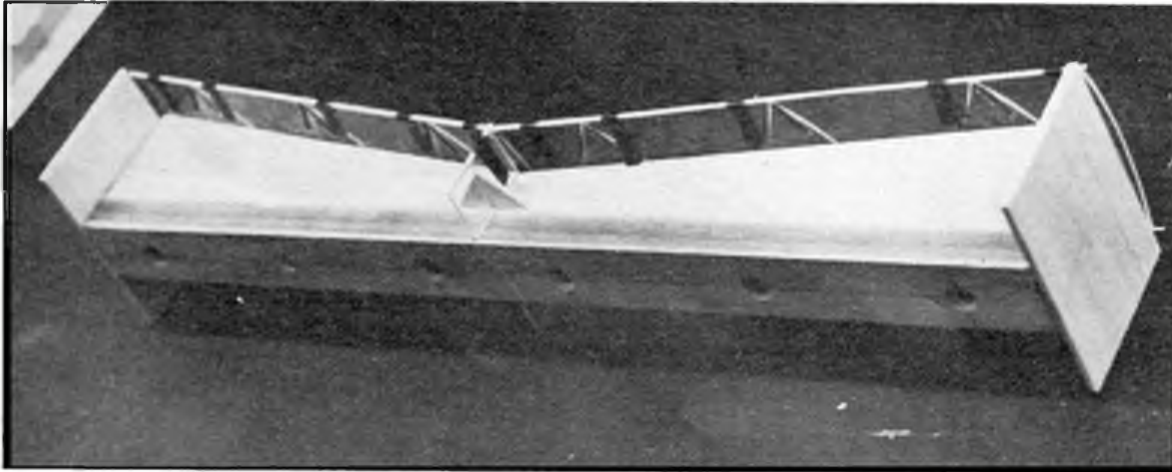


squares are in the centre of each piece and have ready within easy reach by lightly fixing to bench.

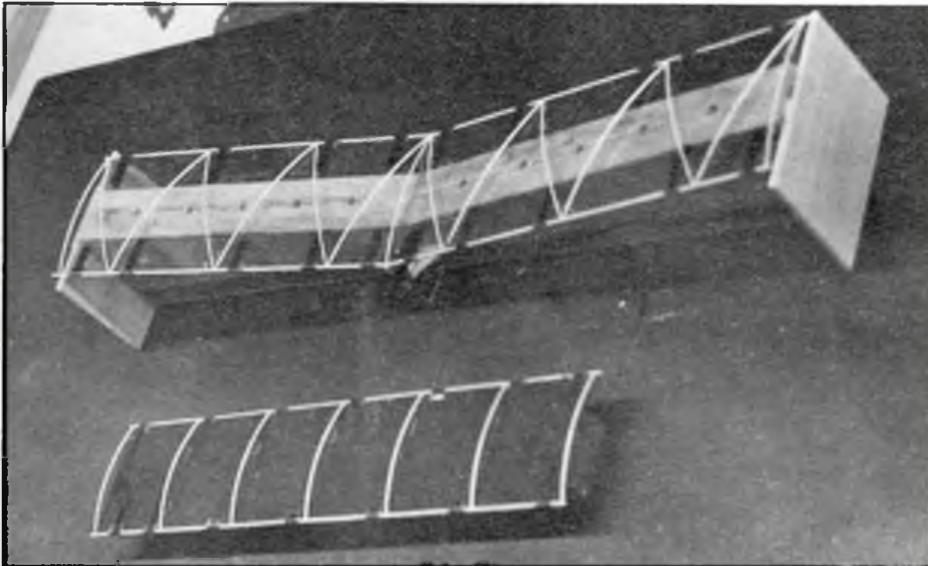
Place the wing jig on its side so the edge on which the spar is to be fastened is facing upward. Rub candle wax across the jig edges to prevent permanent adhesion during building. Hold the tapered spar in place with the 'Elastoplast' making sure the tissue square insulator covers the spar to prevent the tape from adhering. Position the 'elastoplasts' next to each wing position, splicing and cementing the spars at the centre.

Cut the three straight ribs for the tips and centre, using a hard plastic template with a $5\frac{3}{4}$ in. radius and also the diagonal ribs, with a second template of $6\frac{1}{2}$ in. radius. All ribs are cut from $\frac{1}{32}$ in. 4lb balsa sheet, approximately .040 in. (1.0mm). Either cut the ribs from sheet of the required length from leading edge to trailing edge, allowing enough extra to cater for the diagonally trimmed ends, or, cut the ribs well over-length and then cement the ribs at one end only, allowing excess to overhang the spars. When the cement is set, cut the ribs (above





Left: the wing jig on edge, showing the incorporated dihedral. Laurie's prototype platform is in transparent plastic and its position is not at first obvious but rest assured that wing structure is sitting on flat assembly plates. Jig can be used over and over for future models. See the sketches. Below left: Fly-Rod flying surfaces in position on their jigs waiting for the cement to dry. Once the jigs have been made, assembly time is fast. Sticky tape retainers hold the structure to the jigs.



fitting the parallel $\frac{1}{8}$ in. \times .045 in. (12mm) spars.

Propeller

Cut a pair of blades (one on top of the other) using a stiff card template of the blade profiles as drawn.

Acquire a tin, or oven proof jar long enough to accommodate the blade length, and between 4 in. to 6 in. dia. Mark the angle on the tin, wet the blades *separately* and put one on top of the other to ensure exact match of the twist. Place the blades on the tin along the diagonal line (see sketch) and lightly hold in place with very thin elastic bands, or wet sewing cotton thread.

Place upright on a middle shelf in the oven at approximately 350° for ten minutes (15 minutes if the oven is cold). Remove and allow to completely cool before removing the bands, to ensure they stay twisted.

Cut the prop spar from medium hard $\frac{1}{8}$ in. sq. Sand the tapers in while the spar is still square, then sand each corner till uniformly octagonal, then spin the spar with fingertips inside a folded piece of fine abrasive paper. Any sanding down the length should be done *away* from the hand holding the spar to avoid it buckling and breaking!

Shaft

Bend the 'square' ended .014 in. wire as shown and cut shaft to length, de-burr and round the end. Push through at dead centre and cement to the spar, making sure the end of the crook is situated over and against the spar, so that the anti clockwise (viewed from front) force of the rubber motor will force it *into* the spar and not away from it! Reinforce with a thin strip of Jap tissue.

While still wet, slide the shaft wire into the hole on the jig and locate each end of the spar into a shallow notch on the centre line of the two innermost blade angle templates. Using the card outline template and aligning the centre line with the spar, mark on each blade angle template, the exact position the blade should adopt when glued. Put a thin line of cement along the spar where the blade touches and pin the blade in place, (do one blade at a time) it may be necessary to retain the blade against the spar with fingers when drying, as the under-camber and twist tends to hold it off the spar (paper clips or sprung 'bobby' pins, can also be used).

Leave in the jig overnight to ensure it is fully dry. Then remove, press on the Teflon washer and bend the hook to the shape shown. Don't be tempted to bend with a round end, as the rubber motor will creep up the hook! It's not easy to bend the hook after



Essential accessories, the home-made weighing scale and optical magnifier for fine reading and also to aid the assembly of small dimension components.

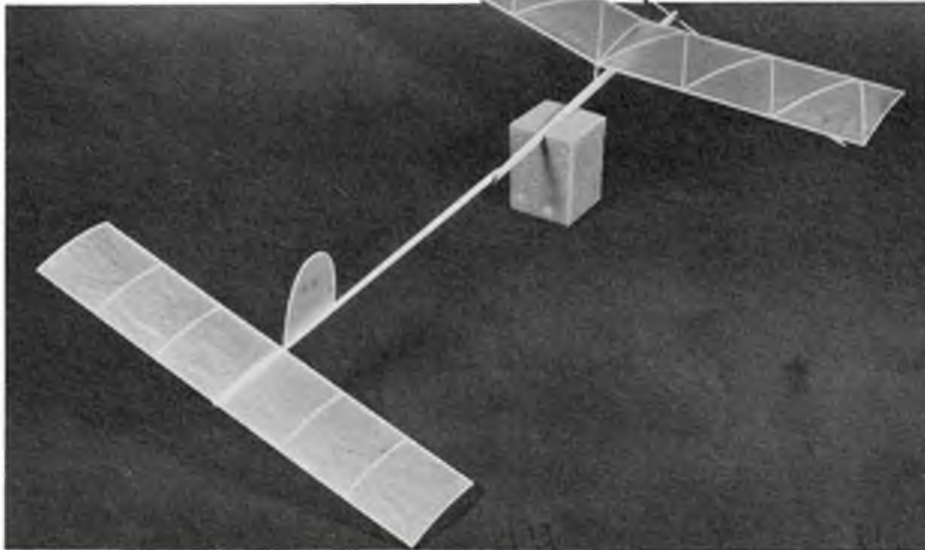
the spar) to length in position and then cement the loose end.

Wing posts are made from $\frac{1}{8}$ in. sq. medium hard balsa. Ream one end into a burr free 16g internal dia., brass tube and check for fit into the tissue tubes, then fit onto the centre of the jig using an 'Elastoplast' and cement to the spars, making sure both posts are upright!

Tissue sockets are prepared by first cutting a 3 in. long piece of 16g piano wire, which is de-burred, rounded off at one end. Cut a piece of jap tissue 1 in. long and $\frac{1}{8}$ in. wide. Polish the piano wire with fine 'wet and dry,' cement the tissue all over, place along the wire on one edge and roll the wire

across the tissue along the bench to form a tube. Push the tube off the wire mandrell immediately, using a thumbnail. Provided the cement is thin enough, the tube will come off easily. When dry (overnight), cut the tubes to length by replacing on the wire and cutting with a rolling motion. Meanwhile the wing can be removed from the jig and set aside in a safe place.

The tailplane is built in the same way as the wing, except that it has no dihedral and the rib template has a 3° in. radius. A 1 in. sq. stiffener on the underside allows the jig to be placed on the edge of the workbench with the spar face uppermost. This facilitates



Laurie's prototype Fly-Rod rests on a block of foam. The very simple structure makes it an ideal introduction for the newcomer to indoor techniques. Very generous cash prizes are being awarded for the competition in Cardington Airship Shed on October 9, using this specially prepared design.

construction, but this is the only convenient way to ensure the shaft is truly vertical and exactly angled the same for both blades (if you see an indoor model 'wagging' in flight, it's caused by unequal blade pitches). Practice bending the hook on some spare wire, until you have acquired the knack.

Covering

Cut an oversize piece of the pre-shrunk condensed paper, lay flat on the bench, spray the top surface of the structure to be covered sparingly with 3M spray adhesive.

Drop the tailplane (cambered side down!) onto the paper and with the lightest possible touch, roll chordwise back and forth so that the condenser tissue is in contact all over. Turn over and while still flat on the bench, trim with a new, sharp, blade. Any tissue not properly stuck can be gently pressed down between finger and thumb, but don't pull along the spars.

Wings are covered in separate pieces for each panel using the same technique except the tissue should be placed exactly on the edge of your workbench with the length running away at right angles. It is most important that both wings are unwarped, so don't try to pull the tissue to remove wrinkles. Practicing a 'dry-run' with the rolling motion will obviate any problems! When you spray the 3M adhesive it will cover both sides of the wing (mask the wing posts!), but when you cover the second panel, it will be necessary to brush on a line of adhesive over the centre rib which is by now covered by the first piece of tissue.

Final assembly

Having cut the wing post tubes to length, fix to the motor stick in position, with a thin film of five minute epoxy. Make sure they are flat against the stick and are the correct distance apart ($3\frac{1}{16}$ in. centre to centre). When dry, sand the ends of two 3in. long pieces of straight $\frac{1}{16}$ in. sq. round and slide into the tubes and view from the front to ensure the tubes are not twisted. If they are out of alignment, when you fit the wing, it will adopt an unwanted twist.

Position the fuselage at right angles to the bench and lay the tailplane in place, you may have to pack the left side to give the required ($\frac{1}{2}$ in.) tailplane tilt. It's a good idea to leave one of the 3in. long, dummy posts in place, to assist this alignment. When the tilt is correct, cement the LE and TE of the tailplane to the tailroom. It is helpful to the flying characteristics if you include approximately $\frac{1}{16}$ in. wash-in on the right hand side (as viewed from the front) of the tailplane

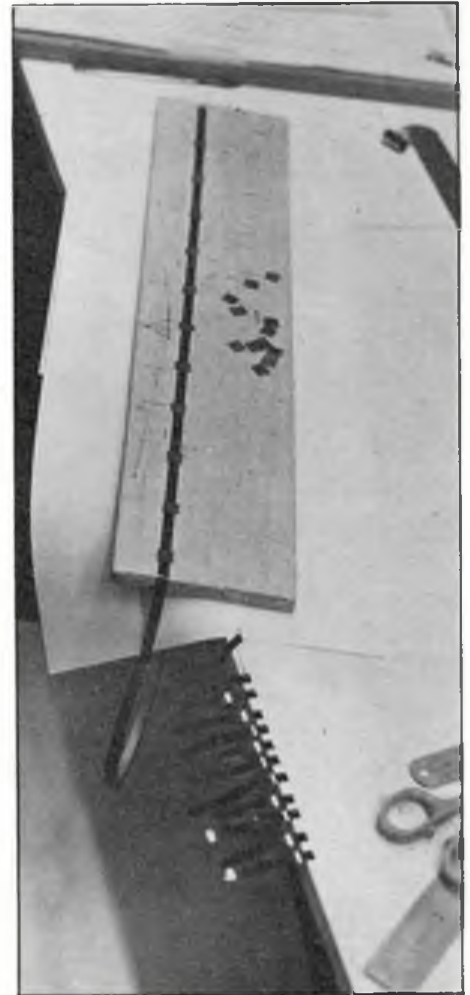
leading edge. This also includes the opposite warp in the left hand side of the tailplane.

When dry, lift off the bench and fit wing into place in the tubes, checking the wings are still unwarped. Any twist can be taken out by re-gluing one of the tissue tubes (be careful you don't also cement the wing post!). Thread the prop hook through the front hole on the bearing and 'click' the shaft into the hook slot. Put the complete model onto a scale and check it weighs not less than 1.7 grams. Phew — it's all in one piece, at last!

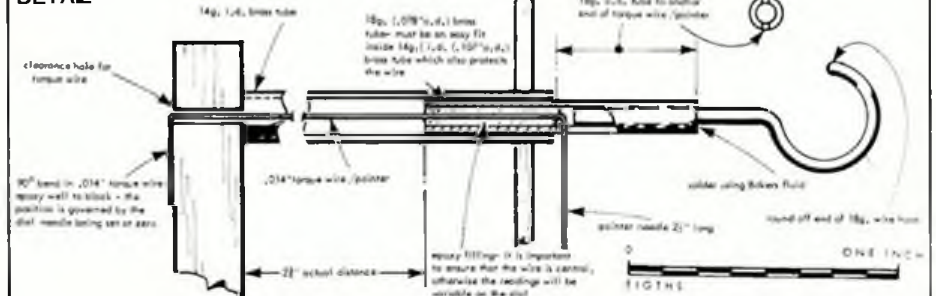
Check the balance point on the model with 1.2g of rubber (it will balance approx. $\frac{3}{16}$ in. behind the position shown without the motor).

Trimming/flying

Indoor flyers wind their motors on a 'stooge' which holds the winder captive at one end indicating the torque levels on a graduated dial. The sketches show the layout and how the pointer indicates torque by stretching the motor five times its own



TORQUE INDICATOR DETAIL



Approximate sizes of weights (#b/cu.ft.)

	Decimal ounces	Grams
Tail plane uncovered (spars .032in. 6lb. ribs .032in. 4lb)	.00325	.09213
Tail plane covered	.00625*	.17577*
Wing uncovered (spars .032in. 6lb. ribs .032in. 4lb)	.00800	.22680
Wing covered including $\frac{1}{16}$ in. dia. $\times \frac{1}{2}$ in. long wing posts	.01615*	.45785*
Motor stick ($\frac{1}{16}$ in. $4\frac{1}{2}$ lb 11in. long — $\frac{3}{16}$ in. deep centre, tapered to $\frac{1}{16}$ in.)	.02000	.56700
Motor stick (complete with dual bearing and rear hook)	.02200*	.62370*
Tail boom and covered fin ($\frac{1}{16}$ in. $4\frac{1}{2}$ lb 12in. long $\times \frac{3}{16}$ in. taper to $\frac{1}{16}$ in.)	.01070*	.30334*
Prop complete with .014in. piano wire shaft (blades .015in. quarter grain 4lb. spar $\frac{1}{16}$ in. 5lb)	.01100*	.31185*
	.06610oz*	1.8725*

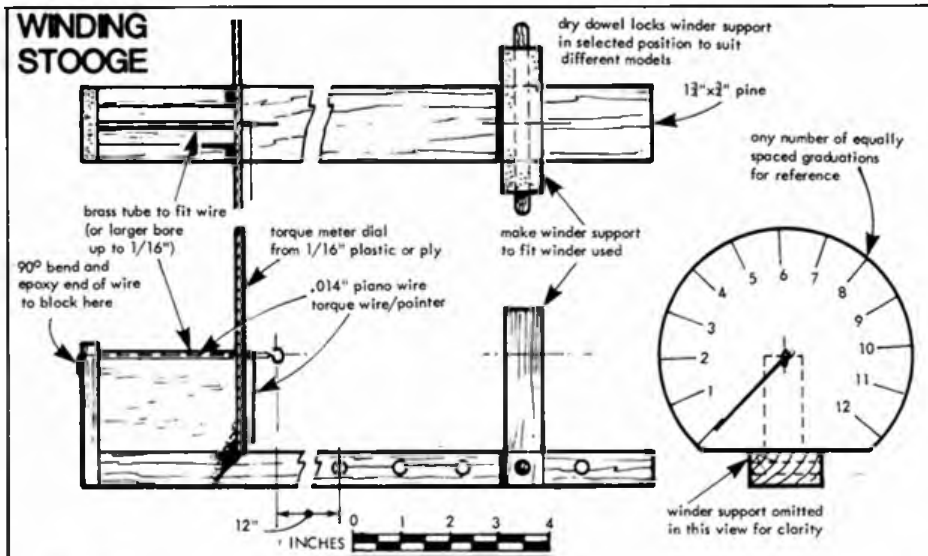
Note: * Total weight of original model. For contest the minimum weight required is 2.0 grams.

CUTTING LIST

- 1 off 18in. \times .032in. 4lb quarter (c) grain (ribs)
- 1 off 18in. \times .032in. 6lb B grain (spars)
- 1 off 18in. \times $4\frac{1}{16}$ in. C grain (motorstick and tailboom)
- 1 off 18in. \times .015in. C grain (prop blades)
- 1 off 18in. $\times \frac{1}{16}$ $\times \frac{1}{16}$ in. 5lb (wing posts and prop spar)
- 1 off 18in. .014in. piano wire (prop shaft, rear hook and scale)
- 3 off Teflon thrust washers
- 1 sheet condenser paper
- 1 off dual bearing
- 60ft. .058in. FAI supplies rubber. (Total cost £10.67 approx). 15 $\frac{1}{16}$ in./0.058in. Weights 1.2g.

EXTRA ITEMS

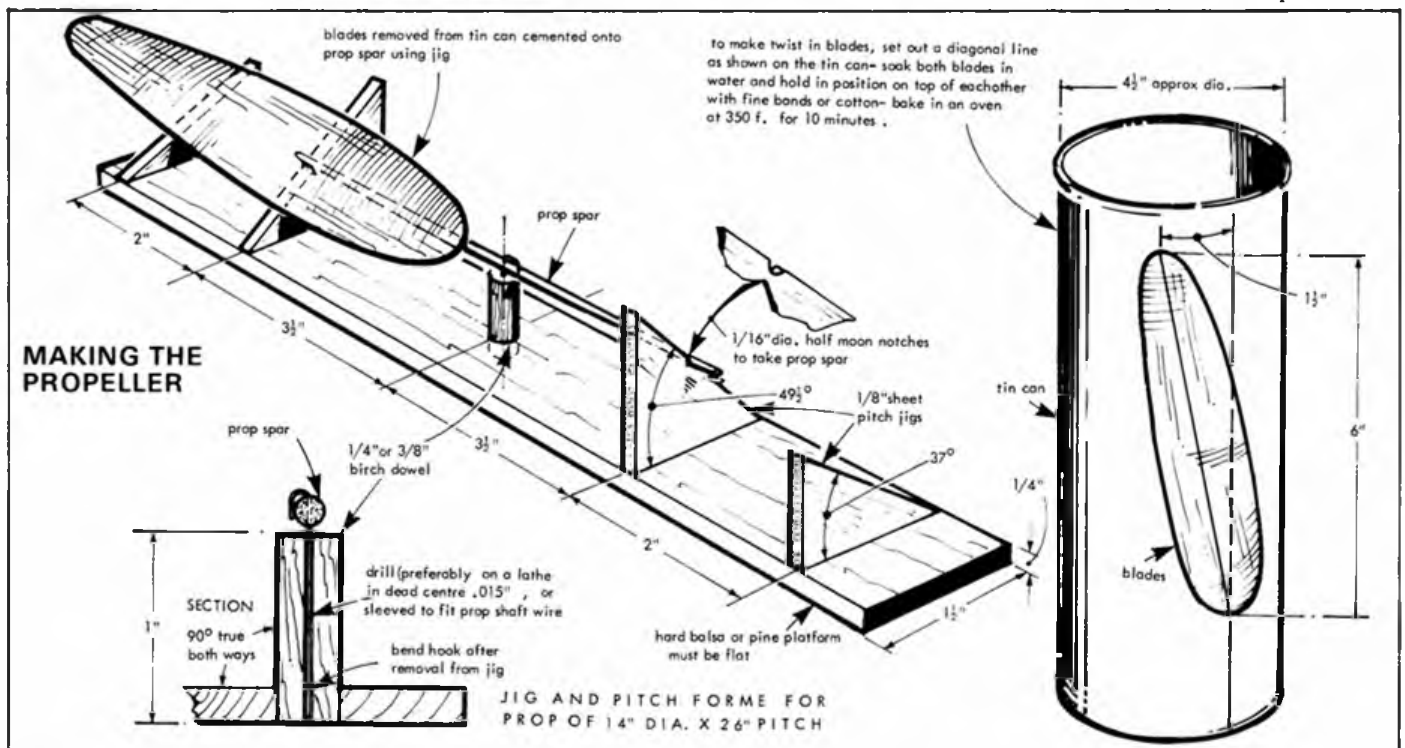
- Micro-X cement
- Rubber lubricant
- 'Grab' tissue brush-on adhesive (or 3M spray)
- Apart from the dual bearing and .015in. prop blade balsa provides sufficient material to build two or three models!
- A complete kit of selected wood of the correct sizes and weights is available from:
- SAMS Models
- 2 The Drive
- Blackmore End, Wheathampstead,
- Herts. (Tel. 0438 832011)



length and putting on 50 per cent turns before slowly coming in to rest in the jig at 100 per cent. Always note the torque levels on a memo pad before transferring the motor to the model, prop end first.

To test fly, wind 400 to 500 turns and on launching, the model should fly level, or climb. It should turn in approx. 25ft. dia. circles and if it stalls, simply push in the front wing post, or conversely if it dives, raise the front post in its tissue tube. The turning circle is best adjusted at a larger hall and certainly at a meeting where comparison of the flight pattern can be made with others. Adjustments may be done to the side thrust and then to the fin offset.

Progressively increase the turns by 200 at a time. Each launch should show a smooth pattern with steady climb at maximum turns (approx. 1900) and provided it is properly trimmed the Fly-Rod will climb steeply without stalling or diving. Long models usually do not require any backing off turns to relieve the initial power burst



unless there is an obvious desire not to hit the roof.

Best torque/turns usually come at the fourth wind (assuming you have rested it for at least one hour between winds). Contests are won by whoever gets the most turns the motor will accept and the model can efficiently use in flight.

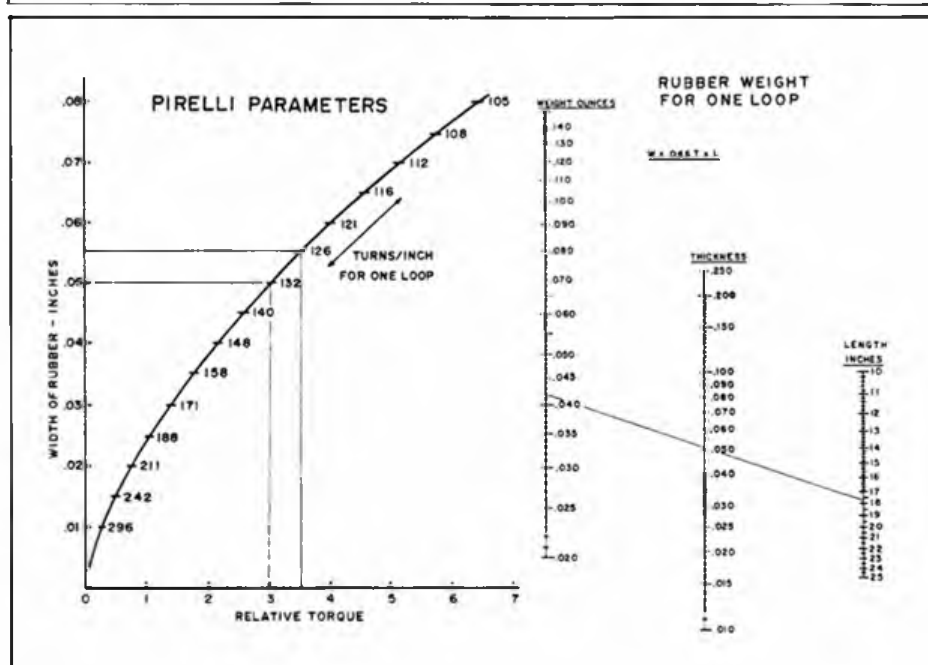
Best contest flyers spend lots of time practising winding and noting turns and torque attained.

The notebook of number of turns, and launch torque for given length and weight of rubber on each flight is an essential accessory for future reference.

Fly Rod would be very competitive if built on the same jigs to the 1.2g rule. This can be achieved by reducing the size and weight of all components (except the prop) by approx 15 per cent and covering in tough microfilm (like neat Humbrol clear dope microfilm!). After the elation of discovering the delights of indoor flight with Fly-Rod, go on to find it is so much easier (and cheaper!) to cover with microfilm, which is tougher than you might think!

See you at Cardington!

Laurie Barr



Your Full Size plan feature



S.E.5a

THIS MODEL WAS designed for and built by a friend of someone who was a relative beginner to scale modelling. The main criteria were that it should be quick and easy to build with a good flying performance. The basic outline is accurate, which means that with a little extra detailing, it would be suitable for contests. The prototype did in fact win free flight scale at the Southern Gala. The size of the model was chosen to suit the engine available — a 1cc ME Heron. As such it is sufficiently large to cope with breezy conditions, but not so large that it will not bounce in a crash. A radio control version should be perfectly feasible with the lightweight systems now available.

Fuselage

Cut the $\frac{1}{16}$ in. sheet sides and add the $\frac{1}{16}$ in. ply doublers with epoxy. Glue the pre-drilled bearers to the sides at the correct angle. The centre section wires are now bent to shape. Note that they are attached to the fuselage and wings indirectly via brass tubes, which give a valuable degree of flexibility. Glue these to the relevant formers and then join the sides using F1-F4. The sides are cracked at F4 to enable the rear fuselage to be joined at F9 without curvature. Reinforce the weak spot with a triangular fillet. Add the rear formers and cross pieces, followed by $\frac{1}{8} \times \frac{1}{16}$ in. stringers. Realism can be improved here by shaving each stringer to a knife edge, so that a scale thickness shows through the covering. Plank the front fuselage with $\frac{1}{16}$ in. sheet. The top cowl is simply shaped from aluminium and held in place with a press stud soldered to a square of tin plate and in turn epoxy glued to a thick F2. The lower cowling is also from aluminium with cooling slots and held in place by four small screws.

Wings

All four wing panels and two centre sections are similar. They are designed so that the mainspars and trailing edge can be pinned direct to the board without packing. The wings and ailerons are built together, then separated for covering. The rear spar has to be built up at the aileron with a strip of $\frac{1}{8} \times \frac{1}{16}$ in. Ensure that the lower centre section ribs fit either side of the fuselage.

Tail surfaces

These are from stiff $\frac{1}{16}$ in. sheet, which

Bill Dennis presents this 832mm span scale free flier for 1cc motors

must be sufficiently strong to retain the aluminium hinges. Represent rib position by heavyweight tissue rib tapes.

Rigging the centre section

This part is usually glossed over, even in beginners designs, but unless the wings are rigged accurately, the model will, in Eric Coates' immortal words, be 'doomed'.

The wings are mounted on 14swg wire dowels which run through brass tubes on wing and centre section. Note, they are free to rotate in these tubes, giving flexibility in a crash. Bend the wires to 3° dihedral (with the tube in place) and glue to the centre section spars. It is best to use spots of 5-minute epoxy at this stage, so that a mistake can be corrected. When all is satisfactory, finish with epoxy glue.

Make oversize holes in the wing root ribs and glue the wing tubes in place while assembled onto the centre section and propped up to the correct dihedral. When set, check that port and starboard incidences are the same.

Cut slots in the lower fuselage for the leading edge and spars and glue the centre section in place at the incidence show. Use strips of $\frac{1}{16}$ in. square balsa marked in pencil to check the distances of leading and trailing edges from the top of the fuselage side against the plan and balsa props to position the top centre section and wings correctly, and then glue the centre section tubes to the spars.

Covering

I recommend you cover the open structure with silk and tissue. Cover first with lightweight tissue and give two coats of 60/40 clear dope thinner. As supplied, silk has a hard starchy finish which must be removed by squeezing the silk in warm water and ironing dry. Each panel is then laid dry over the tissue and dope brushed

through — give three coats, adding rib tapes from $\frac{1}{16}$ in. wide tissue before the last. Fabric lacing on the fuselage can be easily represented by cutting strips of heavy-weight tissue on which you have sown a zig-zag pattern with a sewing machine.

Decorating

Cellulose dope is best and is not attacked by fuel if you mix your own using mineral oil (e.g. Castrol GTX). The great advantage is that it is compatible with clear dope when repairs are being made. Matt dope is available from HMG Limited, Riverside Works, Collyhurst Road, Manchester, in tins of up to 1 litre. A mix of red and green will give an acceptable shade of PC10, or khaki green, but check the shade you have mixed in daylight rather than under artificial light.

Where applying white markings in dope, do these first, otherwise the green will show through. Use a pair of spring bow compasses filled with thinned dope to apply the roundels, filling in between the rings with a brush. Leave the underside clear doped, but streak on some dirty thinners.

The model is rigged with control line wire. Make a loop at one end around the interplane strut hooks, and solder a bent pin hook to the other end. Attach this to a hook on the wing root with a small band.

Trimming

Spend some time getting a flat straight glide. With a model of this size it is easy to mistake a bad launch for a stall or dive. Try to use a gentle slope to get more time in the air.

Commence power flights with the prop on backwards, adjusting down and sidethrust, but using as little rudder as possible. Don't be satisfied with a fast but flat flying pattern.

Conclusion

If you feel you may want to enter a scale contest with this model, then I suggest you get hold of the AEROMODELLER 3-view, (Plan Pack No. 2694 price £1.50 + 45p p&p), plus some photos of the machines at Old Warden or the RAF Museum and add as much detail as you can — as long as it doesn't weigh anything. Best of all, pay a visit to the aircraft as this is the best way of absorbing its atmosphere and hence create realism in the model.

AIRCRAFT DESCRIBED



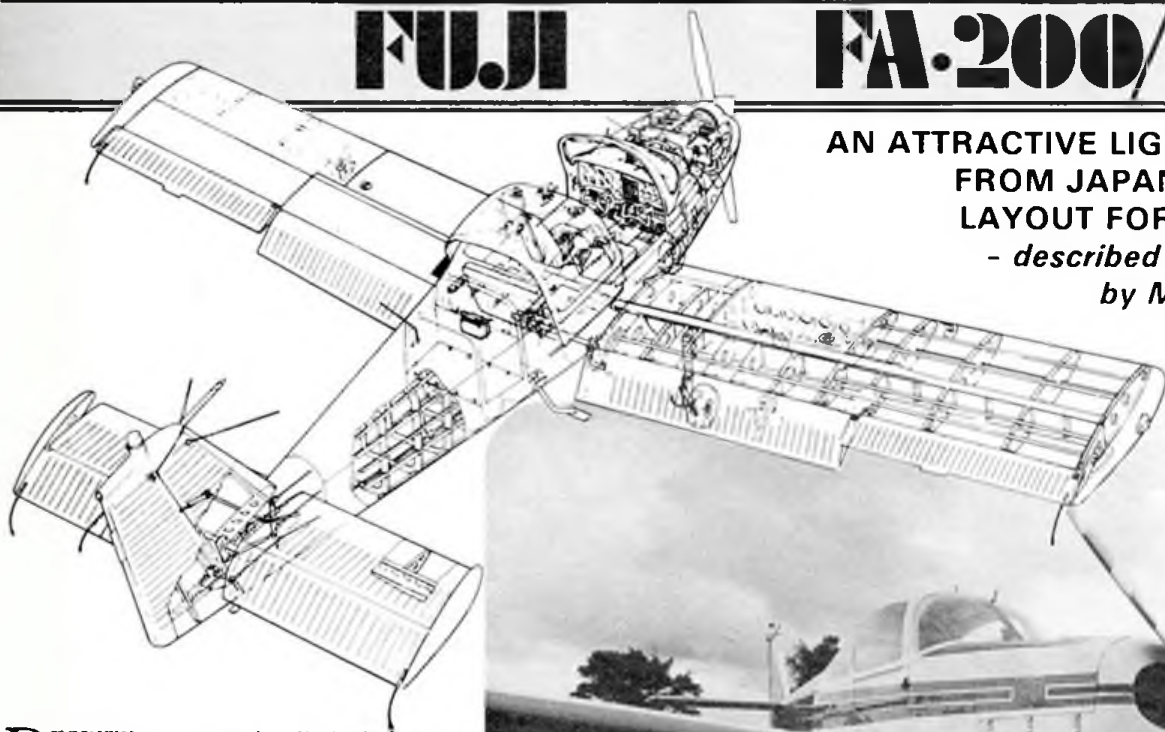
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FUJI

FA-200/180

AN ATTRACTIVE LIGHT AIRCRAFT FROM JAPAN WITH IDEAL LAYOUT FOR MODELLING

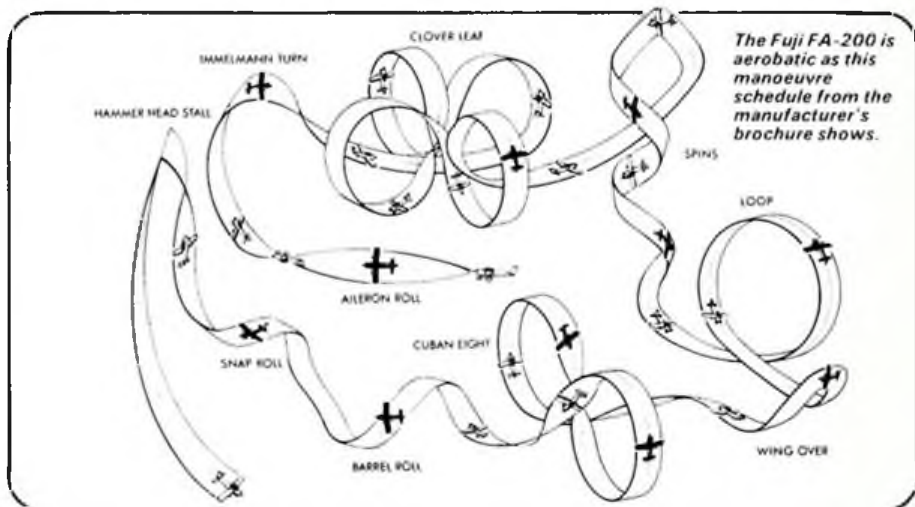
- described and illustrated by MIKE JERRAM



DESPITE a severely limited home market, the Japanese aircraft industry — like so many more of that country's industries — has been successful in exporting light aircraft. Fuji Heavy Industries, long-time licence manufacturers of Cessna L-19 Bird Dogs, Beech T-34 Mentors and Bell helicopters for the Japanese forces, began work in 1964 on the design of their indigenous civil light aircraft, known as the Fa-200 Aero Subaru, named after the six stars in the constellation of Taurus which represent the six companies merged to form Fuji.

The prototype made its first flight on August 12 1965 and received Japanese Civil Aviation Bureau certification the following March. Series production began in the spring of 1968, with three versions being developed: the FA-200-160 with a 160hp Lycoming O-320-D2A engine, the FA-200-180 with 180hp O-360-A5AD, and the FA-200-180A0 with the same engine but driving a fixed-pitch rather than constant speed propeller. A Short Take-Off and Landing variant, the FA-203S, did not proceed beyond the prototype stage.

At first glance the Fuji FA-200 appears to be little more than an Oriental Piper Cherokee or Beech Sundowner, but it differs from its American look-alikes in being fully-aerobatic in two-seat configuration and having a rugged structure stressed to +6g



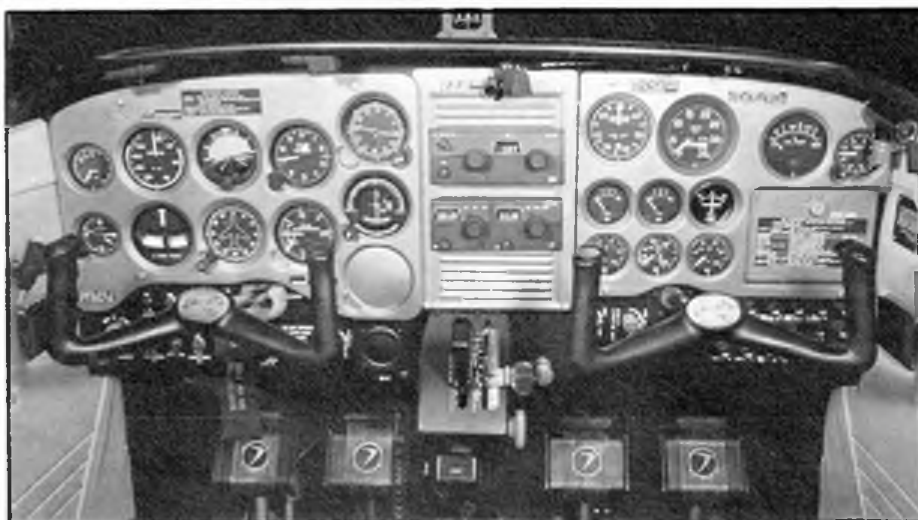


Specifications

Span: 9.17m (30ft. 10½in.)
 Length: 8.17m (26ft. 9½in.)
 Height: 2.59m (8ft. 6in.)
 Empty weight: 650kg (1,434lb)
 Maximum gross weight (normal): 1,138kg (2,510lb)
 Maximum gross weight (aerobatic): 940kg (2,072lb)
 Engine: (FA-200-180) Lycoming O-360-A5AD flat-four, 180hp
 Propeller: Two blade McCauley B2D34C53/74E-0 constant speed
 Maximum speed: 128kt
 Cruise: 75 per cent power 120kt
 Rate of climb: 1,100ft./min.
 Range, 45min reserves 490nm
 Service ceiling 19,200ft.
 G limits +6g, -3g



Top: shades for the 'breakfast patrol' - Fuji 200 slips in low past the trees! Above: wing underside detail showing the main undercarriage, and the flap hinge line. Above right: the Fuji 200 tail cone - note the 'inverted' horizontal tailplane airfoil section distinctly visible. Right: for those thinking in terms of the ultimate in scale modelling detail, here is the Fuji 200 cockpit instrument panel.



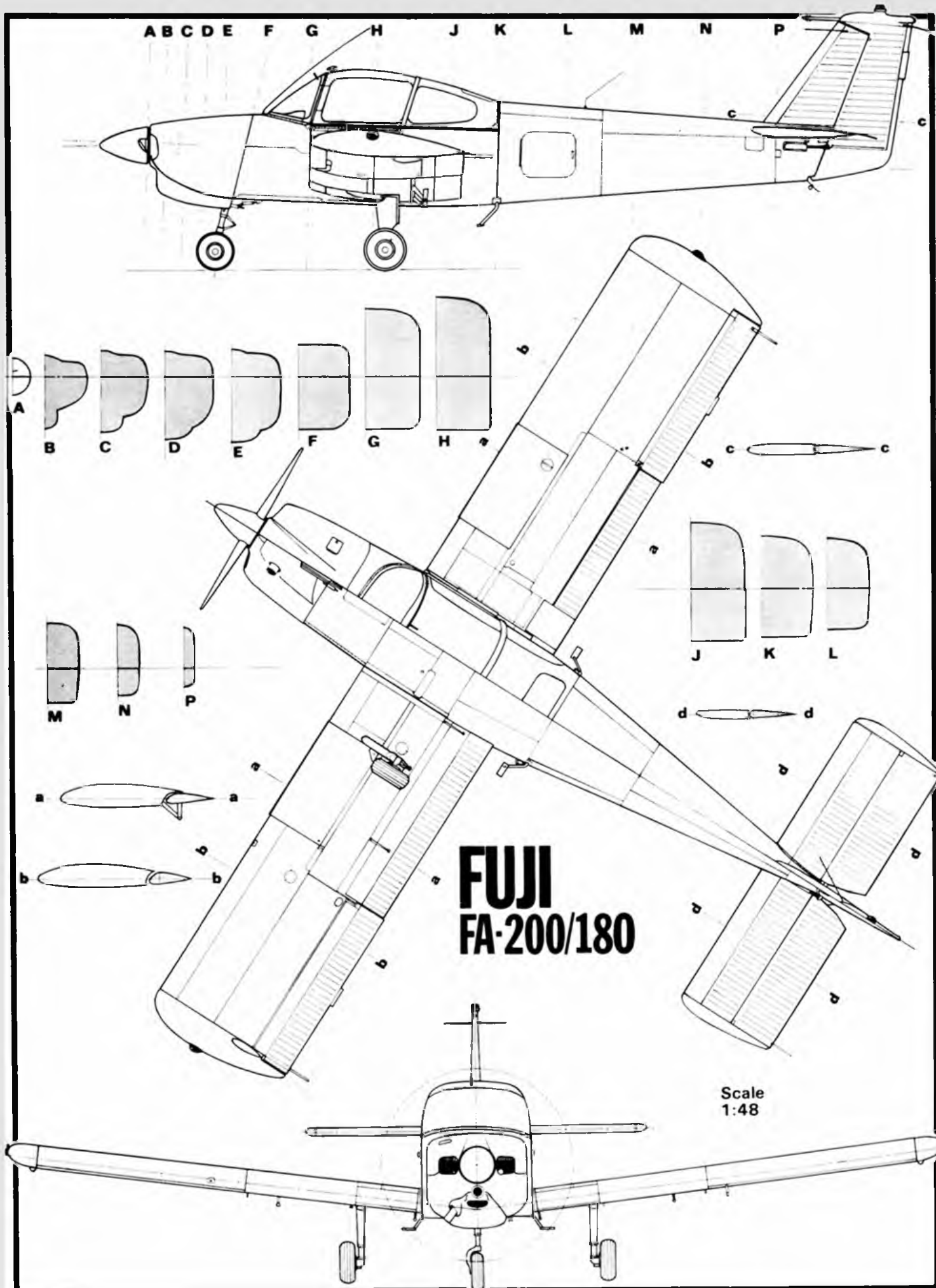
and -3g which reflects the manufacturer's long experience in building military trainers. The all-metal semi-monocoque fuselage houses a full four-seat cabin topped by a large one-piece sliding canopy providing easy over-wing entry and excellent cockpit visibility to front, sides and rear. Two optional skylight windows in the roof provide upward vision for aerobatics. The Cherokee-style wing is all-metal with a one-piece extruded spar and incorporates a pair of easily removable fuel tanks of 43 gallons total capacity which can be withdrawn from the structure for maintenance by undoing a number of screws and taking out the forward wing skinning. Frisé type ailerons with individual trim tabs and single-slotted flaps are provided. The all-metal tail surfaces feature prominent external stiffeners, the horizontal stabiliser being of conventional fixed tailplane and elevator design rather than the all-moving American 'stabilator' type and has an unusual airfoil

section, flat on top and convex on the undersurface.

The Fuji FA-200 is unusual among popular four-seat touring aircraft in offering full aerobatic capability, combining adequate cross-country cruise and payload capability with an opportunity for more exuberant aviating with only the two front seats filled and as such it has proved popular with flying schools and clubs. Best

known among the professional flight schools which have bought Fujis is Oxford Air Training School at Kidlington, which uses a fleet of FA-200s for advanced aerobatic instruction of Commercial and Private Pilot Licence students.

The FA-200 remains in limited 'as required' production. To date more than 300 have been built, more than half of which have been exported, particularly to Europe.



How to make a start in Control Line



THIS ARTICLE is aimed at the modeller who has learned to fly control line but has never taken part in a competition.

So many people are frightened to go on into competitive flying, feeling that they are not good enough or cannot afford the very expensive 'hot' motors necessary for most classes. This is not the case with Diesel Combat and many people are missing a tremendous amount of enjoyment. We feel that diesel combat is a logical step for most people to start competition flying, as anyone who can reasonably competently fly a sports control line model can fly a combat model. For a minimum outlay you can enter a competition class of flying and have great fun. So many classes in our hobby have become the preserve of the expert, and those with a very deep pocket (witness Goodyear).

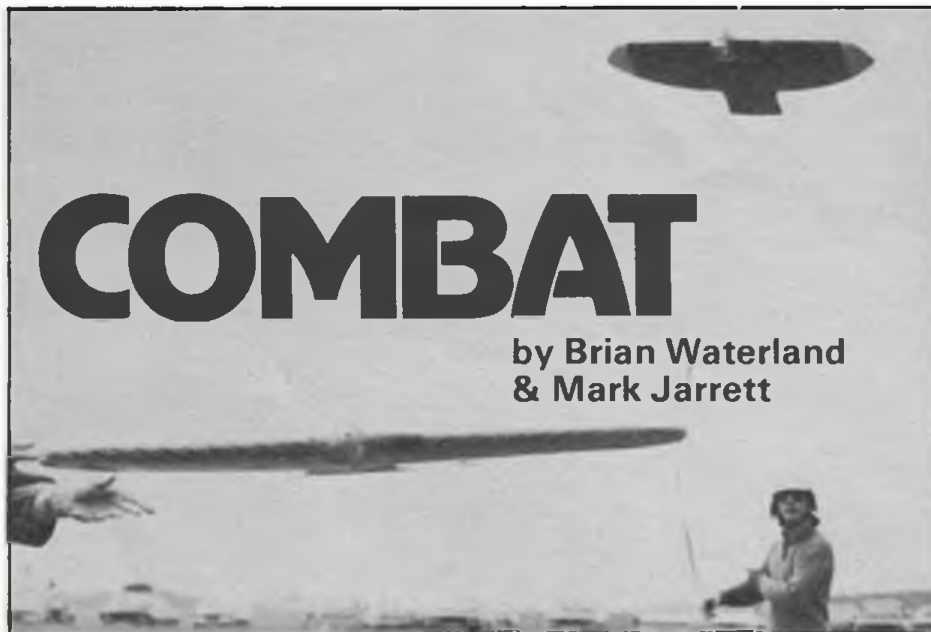
Class 'A' (Diesel) Combat is still very open. Anybody with a good PAW 19, or equivalent, can hold their own. The 1981 European Champion, Ray Sibbald, used a PAW to great effect in one of the early 1982 Peterborough Class 'A' Diesel Combat competitions.

Pilot ability

So how skilled do you have to be as a control line pilot to fly combat? You must be able to fly straight and level and loop. It is desirable to be able to figure eight and if possible to hunt (outside loop) — see Fig. 1.

Don't worry that you may be up against an 'expert'. Experts find raw beginners very difficult to fly against, since they often do something quite unexpected and this levels the odds a little. The important thing is to have a go and get some combat experience!

You don't get anywhere perpetually standing on the sidelines.



COMBAT

by Brian Waterland & Mark Jarrett

Join a club

While it is possible to go competition flying as a 'loner' it is much easier as a member of a club. Alas, there are a lot of radio control only clubs, who can be less than sympathetic to control line fliers. If you can find a club with members who already fly combat then that is ideal, but not essential. You will still learn a lot from the other members and hopefully find someone to be your pit crew and also someone to practice against.

Insurance

Before ever flying it is important that you have third party insurance, for example the M.A.P. insurance scheme. Alternatively, the club may have its own insurance scheme.

Choice of a model

There is no doubt that combat wings have progressed a long way since *Unlimited*, *Razor Blade*, *Warlord*, etc. For the last three years running, the British Diesel Combat Championships have been won by Neil Gill's design 'Revolution'. This is your plan this month and forms an ideal model with which to start, it being robust, easy to fly and very manoeuvrable.

With regard to covering the model, most experienced fliers use *Solarfilm* (or equivalent) since it is very light and quick to apply. It does, however, split very easily in the event of a crash and for this reason we recommend the beginner to use nylon or heat-shrink fabric like the new *Solartex*.

Choice of Equipment

Engine

Get the best possible motor you can afford. Remember, engines up to 3.5cc capacity are eligible. Ball race motors are preferred and steer clear of the 'antique' motors. If you cannot get hold of an Oliver Tiger (any mark) MVVS or Super Tigre 19 then the PAW 19 will suffice.

If you are using a PAW, make sure you fit a competition (two hole) spraybar (Fig. 2) and a needle valve protector, so that if you hit the ground when inverted, you don't bend or break the spraybar (see Fig. 3).

Having selected your motor, preserve its life by running it on a suitable fuel, 20% oil for a fully run-in ball race motor (e.g. Model Technics D 3000) or 25% oil for a fully run-in plain bearing motor (e.g. Model Technics D 2000).

To prevent dirt going into the carburettor throat, most flyers fit a short (one inch) length of rubber tubing onto it. If you hit the ground this tubing bends backwards over the inlet covering the hole and prevents the ingress of dirt. Unfortunately you cannot fit this modification easily on a PAW.

Propeller

The most popular propeller used on Oliver Tigers is a *Tornado* 8in. x 6in. clipped to 7½in. x 6in. (see rules). Remember to boil your propellers in an open pan of water for half an hour or so before using them. This takes out the moulding stresses and cuts down on the number of breakages.

Fuel Tank

The fuel tank used almost universally is

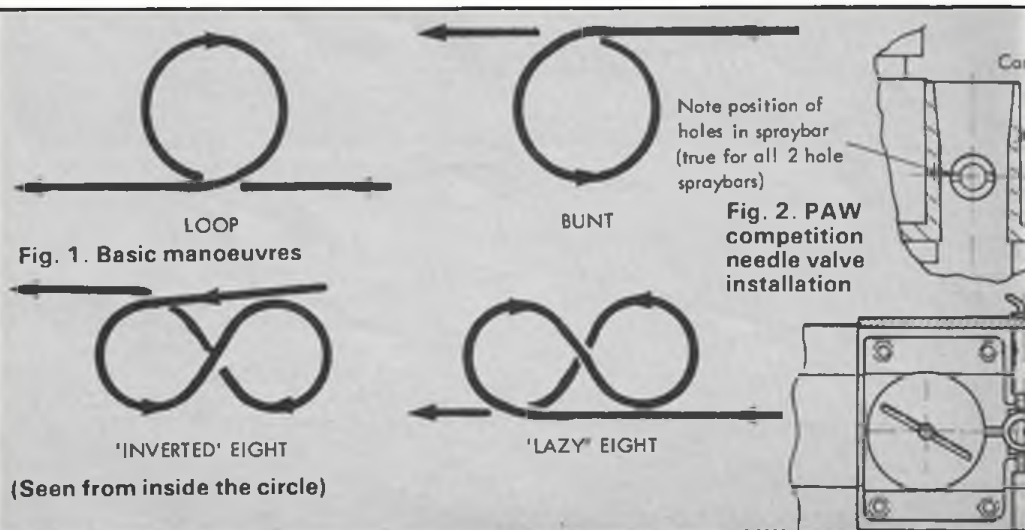


Fig. 1. Basic manoeuvres

Fig. 2. PAW competition needle valve installation

(Seen from inside the circle)



the mustard tin type with one vent, as shown on the plan. This tank is filled via the engine feed pipe and *not* by pointing the nose of the model up and venting through the engine carburettor. This latter method is used by some Club 20 radio combat fliers, for reasons best known to themselves.

Lines

Three strand (Lightweight Laystrate) steel lines are used fixed to the model (and handle) with either fishing swivels (with the swivel part removed), split rings or Sullivan line connectors. (See Fig. 4).

It is important these connectors are covered (particularly at the handle end) to prevent your opponent's lines getting caught in them. Most people use the thick 1/8 in. - 3/16 in. dia. silicone rubber tubing sold for connections between engine exhausts and silencers (Fig. 4).

If you use a cast alloy control line handle, remember to saw off the spike, since this is a hazard to your opponent and not permitted (see Fig. 4).

Should you let go of the handle, for whatever reason, while your model is still airborne you will be disqualified. In fact, in a line tangle the handle can be torn from your grip. It is, therefore, preferable to use a safety wrist strap, as used by FAI Combat fliers. This strap can be made from braided nylon, a bootlace or even string and is looped around the wrist.

Safety Hat

Get yourself a safety hat. An old crash helmet will suffice but is rather heavy. A better choice is a building site safety hat

with a chin strap or a canoeist's helmet. Your pit crew will also require safety hats.

Setting Up the Model

Go out and fly your model and get totally familiar with it.

Does it bunt the same radius as it loops? (if you don't like doing bunts you can learn this piece of information from the shape of the 'lazy' eights). Assuming you have equal up and down elevator deflection, correct the turning circle by adding more up or down thrust on the engine; by slotting the mounting holes in the engine bearers, *not*

British Diesel Combat Rules

1. Engine capacity 2.5cc to 3.5cc diesel only.
2. Engines must turn a commercial 8in. dia x 6in. pitch propeller cut down to a minimum of 7 1/2 in x 6in.
3. Engines must run on suction feed only.
4. Propeller spinners, if fitted, must not be pointed.
5. Line length 52ft. 3in. ± 3in. from centre of handle to the centre line of the propshaft.
6. Handle and line links should not have anything protruding which could snag on an opponent's lines.
7. One model allowed per bout.
8. Two pit men allowed per pilot. However, in bad weather conditions a third pit man may be used as a streamer holder only.
9. Pit crew must wear safety hats throughout the bout. The pilot must wear a safety hat if he leaves the centre circle for any reason.
10. The centre pilots' circle shall be 10ft 0in. diameter.

the engine lugs! (see Fig. 3).

Moving the model's balance point back by adding weight to the tail will help your model turn tighter (but make it more touchy and tricky to fly).

If your model has the nasty tendency of going slack on the upwind leg and rolling up the lines, then check the model for warps by sighting the wing from the trailing edge. Remove the warps by the gentle application of heat while twisting the wing against the warp. Adding some tip weight will help maintain line tension.

Should your model shudder round the loop (or bunt) when full elevator is applied then you have too much elevator area or elevator deflection. Move the push rod up the elevator horn and/or cut down the elevator area.

You aren't entering the Gold Trophy for Control Line Aerobatics, so try flying 'scribble' in the sky. This will help you when you get into that inevitable tight spot in a bout and don't know if you have enough room to bunt safely or even where the ground is!

Incidentally many experts hold the handle horizontal for both forward and inverted flight. Try it.

Get your pit crew totally familiar with your model and engine. It is amazing how an otherwise good starting engine can suddenly become recalcitrant when you are in the one minute warm up period!

The Rules

Before entering a competition you should be thoroughly conversant with the rules. You will have enough problems on the day without trying to remember what you are required to do.

The following are the Peterborough Model Flying Club Rules under which the British Diesel Combat Championships are run and which have been adopted by many other clubs.

Competition Organisation

Competitions are run on a knock out

11. Bouts shall be four minutes duration plus a one minute warm up period.
12. Engines may be left running at the end of the warm up period.
13. After take-off opponents must fly apart and level until centre judge signals the start of combat.
14. Rule 13 applies each time a combatant returns to the air during a bout.
15. Whilst opponent's model is on the ground, the other entrant must fly high and level (except in a line tangle).
16. A pilot shall be awarded one point per second airtime and 100 points per streamer cut.
17. Removing the knot in the string counts as a cut.
18. Bouts within 10 points shall be re flown.
19. Streamer shall be 10ft. long crepe paper by 1in. wide attached with 6ft. of cord.
20. Other Rules as per FAI Rules.
21. Judges decisions are final.
22. Proof of valid insurance is required.

basis. Winners of the first round bouts go on to the second round. Losers in the first round fly again in a losers' round. Winners of this round also go into the second round. Thus everyone gets at least two bouts. A defeat in the second and succeeding rounds puts you out of the competition.

If there is a low entry, or the organiser feels he has the time, then he may decide to run a '2 life' system, under these rules more bouts are flown, since you are not eliminated until you have *lost* twice. In other words defeat in the second or successive rounds does not automatically put you out. This system is normally abandoned at the quarter or semi-finals to avoid reflies, etc.

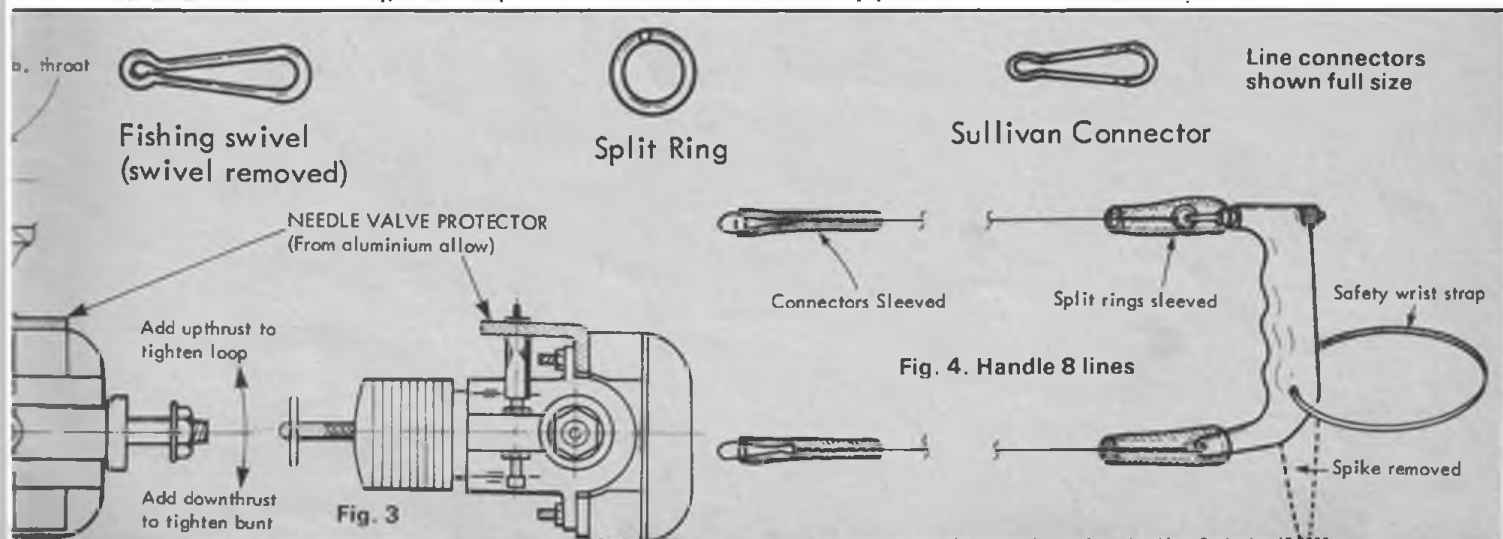
Whichever system is adopted the organisers will probably have to hold eliminators or give byes, in order to level up the numbers, so be prepared to fly an unscheduled bout.

Sportsmanship

It is an unfortunate fact there are those modellers who do not accept the judges' decision graciously. It is a thankless task running a competition, try not to make the organisers' job any more difficult.

Next Month

In next month's issue we will cover the preparations you should make before the competition; what to do on the day of the competition; your first competitive bout; offensive and defensive flying and the 'post mortem' on your bout.



Vintage or not?

The fact that many participants of the hobby have taken refuge in the vintage camp is now causing some unnecessary confusion and threatening to split up what should be a united movement. There are several reasons for this and it is hoped that the following might help to cause students of the various schools to 'live and let live' for the good of the aeromodelling hobby generally.

It appears that the bulk of aeromodellers are not aware of what the word 'vintage' implies as far as model aeroplanes are concerned. If they are relative newcomers to the hobby, these modellers can only learn if they are given the right information. This has been one of the aims of *Vintage Corner* ever since its inception, however, it is easy to read and forget, so the reader is asked to think about these:

... always try and abide by the original design, otherwise is there any point in following the vintage line?

... let's keep the modification state to a minimum, occasioned possibly only by the lack of original materials.

... when there is too much divergence from the original, the model should be classed as 'vintage style' ... a popular sport activity, but it would be incorrect to label it as vintage.

... making changes ... if we are not careful here we will rob these old designs of the very features that create their magic.

Does any of that sound familiar? It should do, since all are excerpts taken from different *Vintage Corners* from last year, so it has all been said before.

True vintage is possibly the easiest application. All one needs to do is to obtain an original plan of the selected model, follow the building instructions, using the materials specified, as near as present day supply permits, fit an appropriate engine and go out and experience model flying as it used to be.

In the UK, if we are to retain the name of vintage for our efforts, we must ensure that the model was designed, kitted or plans published before January 1st 1951. This is in keeping with SMAE thinking, whose regulations are accepted, since it is the



Frog Powavan (builder unknown) seen at Old Warden. This 48in. span model of unusual configuration is powered by a Frog 180 diesel which, it was claimed gave a climb rate of over 2,000ft./min. Kit appeared in 1950, was of super quality, highly prefabricated and cost 25/- (£1.25)

governing body for the sport in this country. For competition work, both the SMAE and the SAM Rule Books list minor modifications that can be made to designs and the reader is directed to these sources if he feels that he must take advantage of official guidelines. Now, this is a pretty simple business and absolutely clear cut, it affords us a vast range of models of all types to choose from that will give unlimited enjoyment, but, there are flies in the ointment!

The competition-minded modellers, endeavour and succeed in modifying these fine old designs by incorporating present day techniques. This can consist of widespread use of new materials, installation of more powerful motors and making major structural changes. These modellers will not accept that their modernisation of vintage designs is creating completely different models out of them. If their efforts are extensive enough, the models that they end up with, are, what has become known as Vintage Style.

Now, don't get me wrong, this branch of the hobby is extremely popular, and I venture to suggest that the bulk of vintage modellers patronise this approach. I personally consider the operation of models that

have reached this stage to be a form of sport flying, very enjoyable and interesting, but for reasons mentioned above, *not* true vintage.

In the past, true vintage adherents were sometimes shouted down by the 'modification brigade', who accused the vintage men of making things difficult and thereby driving away some enthusiasts, especially beginners. Need I say yet again

that true adherence is an absolute 'piece of cake' and easier by far than the dedicated work put into their models by the performance-seeking enthusiasts. There is obviously a need to cater for both schools of thought and I am of the opinion that the whole matter will sort itself out with the appearance of competitions. SAM 35 regularly hold a number of these and even more are due to be held this year, but I cannot see true vintage models flying for very long in competition against models incorporating non-authentic features that give them performance advantages. Undoubtedly, this could lead to both 'open' and 'true' vintage competitions, but unless the true vintage enthusiasts make a determined stand, they are liable to be swept under by the performance-at-any-cost-merchants.

Another approach might be to penalise any departure from the original design, in a sort of handicap allowance that might even the score, but unless this is most expertly done, it can lead to a great deal of friction. SAM 35 has long maintained the 'Fly for Fun' approach, but recent events show that even this body is beginning to realise that some rules are necessary for competition,



Left: Mike Beach, who donated the Fireball Trophy for the Aeromodeller Vintage Day event, bends over his fine replica of Ron Moulton's Voetsak. RGM with Voetsak really started control-line in this country with the demonstration flying that he undertook during 1947. Above: radio-controlled, four-stroke powered Keil Kraft Falcon in action at Old Warden. Presently popular, plans are available from Ben Buckle Old Time Plan Service. Above right: judged to be the most representative power model of last year's Vintage day and awarded the Keil Trophy, F. Hawke's Super Buccaneer flew well in the stormy conditions. Right: Keith Harris did what we all dream about. Some years ago he found this dusty old Dennyplane in an attic, complete with De Luxe version of the Dennykite Airstream petrol engine! Far right: Peter Russell's Arkansas Traveller, control-line speed trainer. Powered by a McCoy 60, this 30in. span model from 1947 can do 100mph! Since ignition timing is fixed at fully advanced, a mechanical starter is necessary.

and competitions would seem to be required to sustain interest. In fact, SAM 35 has gone 'all vintage' in their thinking for the forthcoming *Earl Stahl Trophy*. This will be a duration event for any Earl Stahl designed flying scale rubber-driven low-wing model that was described in *Model Airplane News* during the early 1940s. No additional documentation or scale adornment is required, but models must be built to the original plans, the only variations that will be allowed concern amount of rubber used and that a commercial plastic propeller may replace the original carved wooden one. This is a step in the right direction and what is bound to follow will be rules to make the C. Rupert Moore, Danny Sheelds and other events more even tests of modelling skill. It is expected that these rules will be simple and few at first, but eventually will be expanded to ensure good competitive events. (Softlee, Softlee, Catchee Monkey!)

It is possibly fitting to quote yet another

Vintage Corner excerpt, this one from January 1982. "... as the movement grows, and competitions become more commonplace, it will be necessary to segregate the classes of model, and rules will be needed. Human nature being what it is, in the competitive atmosphere that will then prevail, it will be the entrants themselves who will demand rule enforcement."

SAM 35 Competitions

As mentioned earlier in this column the number of these continues to grow and more details are now to hand. The 1950 *Wakefield Competition* for the R. N. Bullock Cup presented by members of that fine old Northern Heights club, will already have been flown off at the Nationals by the time this appears in print, and possibly the *Brigadier Trophy* as well. The last named is an R/C event for models of the *Berkley Brigadier*, and its origin in the Glasgow area was described in the SAM 35 Yearbook by Bob McGill. Models are flown for maximum duration on a two minute engine run, two channel radio and engine capacities of up to 1.5cc comprise the other maximums. Plans for this model are available from Dave Baker and a trophy has been presented by Ron Prentice. Whether or not this event was also flown off at the Nationals, a similar competition might be held at Old Warden on Vintage Day, with a possible reduction in engine run time to one minute.

Also planned to be flown off at Old Warden on Vintage Day this year on 21 August are the following:

The *Junior Achilles Competition* is a duration event of three rounds for both versions of this popular Keil Kraft Kits design. Run by Alan Wiggs and prizes will be awarded. The *C. Rupert Moore Memorial Trophy* is for models of Jackdaw II, qualifying flight, followed by three rounds, the winner will be the competitor with least percentage error. The *Danny Sheelds Twin-Pusher Trophy* is open to all twin-pusher

designs. Winner will be last man down following simultaneous launch. This year winding of motors will mark the start of the competition, so competitors must be on the flight line in time or may suffer a penalty if they have to release an under-wound model. The *Earl Stahl Trophy* has already been commented on, amongst types eligible are Curtiss P-40, Airacobra, Me109, Hurricane, Spitfire, MiG 3, Blackburn Skua, Vultee Vanguard, Mustang, Caudron C-371, Caudron 'Cyclone', and Curtiss Scout. Plans for these models are available *free*. The trophy will consist of a plated solid brass model of the Hawker Hurricane fighter. The *C. A. Rippon Trophy* is a duration event for any of the six variants of the Cruiser Pup.

The *John Haggart Memorial Trophy* was bequeathed to SAM 35 with a full set of rules. Briefly this is a precision competition aiming at a total flight time of 60 seconds ROG, for power models designed prior to December 1948. Ideally, advance notice of entry is desired and a suitable application form containing the original rules (which were published in the first *Vintage Corner* in May 1981 *AEROMODELLER*) is available and will be sent on receipt of an SAE from the writer at 66 Tuffnells Way, Harpenden, Herts. AL5 3HG, or from Dave Baker. Following a visit to Colonel Bowden, the late John Haggart drew up the rules for this event, which was seen at the time as a replacement for the old Bowden Trophy. It will be interesting to see how enthusiasts cope this year and it is the expectant desire of the writer that the competition will be well supported.

Fireball Trophy and other Aeromodeller awards

Although the control-line model gets little mention in *Vintage Corner*, I am well aware of the recent increase in interest in this aspect of modelling and ask readers with news and photographs to send them in. We will most certainly use this material. The *Fireball Trophy* has been held at Old Warden on Vintage Day for some years now and it is expected that this year's competition will be even better supported than in previous years. Additionally, the usual awards will be made for most representative models in various classes. It certainly looks like being a very full day, let's hope that the usual Old Warden ridge of high pressure prevails to give us good weather conditions, since last year's gale

Arthur Rodaway's 42in. span parasol model designed by Bill Krecek and described in the 1938 *Zaic Yearbook*.



VINTAGE CORNER

provided enough fresh air to last us for a long time to come! You still have over two months in which to complete that 'dream ship'. We would like to see it, so bring it to Old Warden on 21 August.

German tail-less

There has always been a lot of interest in tail-less designs and although we had our own specialists in this country, the tail-less fever really caught on in Germany and many rubber, power and glider examples of models of this configuration emerged before 1945. Arthur Oswald of Stuttgart had been particularly interested in tail-less models since about 1936, doubtless inspired by similar machines made by Warmbier, Schmidberg, Armes and Adenau. However, his own early attempts suffered acute stability problems and he undertook a serious study of the subject. He learned about aerofoil sections with almost stationary centres of pressure and his models, although now perfectly stable, flew at quite high speeds and their durations were far less than those of orthodox models.

Adopting thin heavily cambered bird-wing type aerofoils on models of normal configuration, he was amazed with the flat glides and low sinking speeds that resulted and he knew that he would have to develop a reflex section for tail-less use with these characteristics if he was to improve the durations of his models.

Before he could try out his newly found ideas in practice, he was drafted into the Wehrmacht and it was the updating of the German model requirements and introduction of new classes of models in

January 1943 showing him that there was no record holder listed in the new tail-less sailplane towline class, that spurred him into action.

Using what little spare time a German army private soldier had at that time, he designed a suitable tail-less model and cut out all the wing ribs in his barrack room. He built this machine while on his first leave in March 1943. He had managed to obtain some balsa, and this was used with pine in the construction of the 1.80 metres span design which weighed 530 grams. Success was immediate and the model carried out many flights of up to six minutes duration using an 80 metre towline. Following a thorough overhaul, this model known as 'AO-S10' achieved 17 minutes 55 seconds OOS on 25 August 1943 and this was to remain the German record for this class of model until the introduction of new regulations and classes of models after the war.

Bill Warner in the USA built an example of the 'AS-S10' and modified it by using plugin wings, auto rudder, moveable tow hook and fuse-triggered pop-out spoilers in the vertical stabiliser. He covered the model in red silk and says, "Reflexed airfoil and sweepback on the curve provided a barrel of laughs when trying to cover . . ."

More vintage plans

As readers can see from page 297 of this issue, a number of old 'Model Aircraft' plans have recently come to light. Some of these have been sought after for a long time and include beauties by leading modellers of the

time. A glance down the list reveals names like C. E. Bowden, Ron Warring, Bob Copland, van Hattum and P. F. Capon, who are all fortunately still with us and others who have passed on like Alex Wilson, R. N. Bullock and Fred Boxall.

Apart from the creations of these modellers, all of the designs are bound to be built in numbers, and I am sure that we will soon see a high percentage of them at our model meetings. It is not easy to forecast what will be the most popular design, but it is no secret that many free-flight power men are just itching to get their hands on the plans for Cloud-Dozer, a 70in. span pylon model for 10cc petrol engines by R. V. Bentley, who used to write the 'Gas in General' column in the early issues of 'Model Aircraft'.



Above: John Partridge carries his Junior 60 (ED Competition Special motor) and his Performance Kits version of the pre-war Cloud Elf (Mills 1.3) after a flying session at Old Warden. Left: fine example of Eros from Aeromodeller Plans Service which was described in Jan. '48 Aeromodeller. This 3 lb. 84in. span beauty was designed for the Sparey 5cc diesel by John Coasby, but also used the 5cc Norton and 4.4cc Kemp diesels. (Plan PET/280 price £4.40 + 45p if it takes your fancy).



Left: original oil painting kindly donated by the late C. Rupert Moore has now been more suitably frame mounted and adorned with the winners' shields that cater for its annual competition up to and including 1991. Right: Bill Warner and his AO-S10 1943 towline sailplane with which he won the 1982 Northrop Flying Wing Contest at Mile Square flying site, Los Angeles, California (see text).



What is SPACE MODELLING?

IT is the Space-Age hobby that combines skill, science and sport in the building and flying of lightweight model rockets. This rewarding, educational and exciting pastime is enjoyed from pre-teens to retirement age in many countries throughout the world. Up to the present time its development in Great Britain has been prevented by official obstruction, a situation the British Space Modelling Association expects to remedy soon.

The models are constructed from light card tubes, balsa wood and plastic. Only minor metal parts being allowed. The rockets are propelled by small solid fuel 'engines' which are factory made to precise specifications in a variety of sizes. Models vary in weight from a few grams to a maximum of 453 grams (with a maximum propellant weight of 113 grams.) They are electrically ignited from nearby and at the end of each flight the 'engine' ejects a parachute or streamer so that the rocket can be recovered safely and flown again. Rocket engines can also be used to launch glider-type models.

The adoption of a sensible safety code has made the hobby very safe and in the USA where over 175 million rockets have been flown in the past 20 years, there has not been a single serious accident. Also, the availability of factory made components has removed the temptation to attempt the making of dangerous chemical propellant mixtures at home, especially by adventurous teenagers.

There are a wide variety of types of model, from a simple snap-together kit to a complex multi-stage scale rocket. Basic aerodynamic principles must be followed and there is scope for learning the principles involved in full-scale space craft, enabling the modeller to predict performance.

There are a variety of competitive events such as parachute, streamer and glider duration, altitude and scale detail, each in a class related to engine size.

The hobby enjoys an international following and is recognised by the FAI (Federation Aeronautique Internationale), which oversees the competition regulations and World records. There have been four World Championships, the last being held in the USA in 1980, while the next is in 1983.

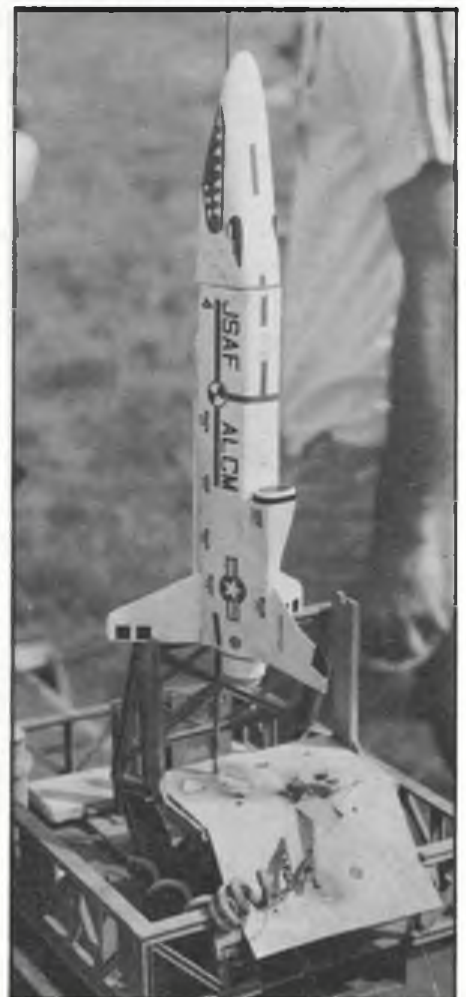
Space Modelling knows no political barriers and competing countries include Canada, Australia, Great Britain, West Germany, Spain, Bulgaria, Poland, Yugoslavia, Czechoslovakia, USSR and the USA. In many countries it is an integral part of the school sciences programmes, and its worth in encouraging Space Sciences is recognised.

The term Space Modelling also encompasses non flying static space modelling, particularly for those modellers interested in fantasy modelling and Science Fiction special effects modelling.

The British Space Modelling Association is now being formed to promote and establish the hobby in Great Britain. If you are interested, please write, sending a SAE to Paul Clark, 15 High St., Ditchling, Sussex.

Top Paul Clarke's scratchbuilt 1/20th scale Ariane launches at 1980 World Space modelling champs. USA in Scale Altitude event Second down British Model Rocketeers enjoy a public demonstration of the hobby. Third left Paul Clarke's 1/50th scale model of Ariane 01 Bottom near right making final adjustments to the piggy back glider mounted to this Canadian Condor model Bottom far right US manufactured cruise missile kit model on the launch pad

July 1983



FREE FLIGHT SCENE

Dave Hipperson reports

Pete Harris' Open Power design . . . Dave Hipperson

Already this season the model here has won a couple of notable Open Power flyoffs. It is particularly interesting for a number of reasons. It is hardly huge, 660 square inches of wing and a virtual flat bottom wing section coupled with a K&B 40 would usually be a recipe for hairiness. Nevertheless, Pete's model seems consistent and usually exhibits a very safe, if fast, turn spiral in ten seconds.

The all up weight is 31oz and the assembled model has a very aft CG for a variable-incidence-tailplane equipped model. Actually Pete admits that it has glided well enough to max with the VIT stuck in the power setting! Certainly the power-to-glide incidence change must be small.

The configuration follows the current popular trend to set the wing at zero in relation to the thrust line and let the tail settings look after decalage. It also uses a minimum of warps — only 1/16" in. wash out

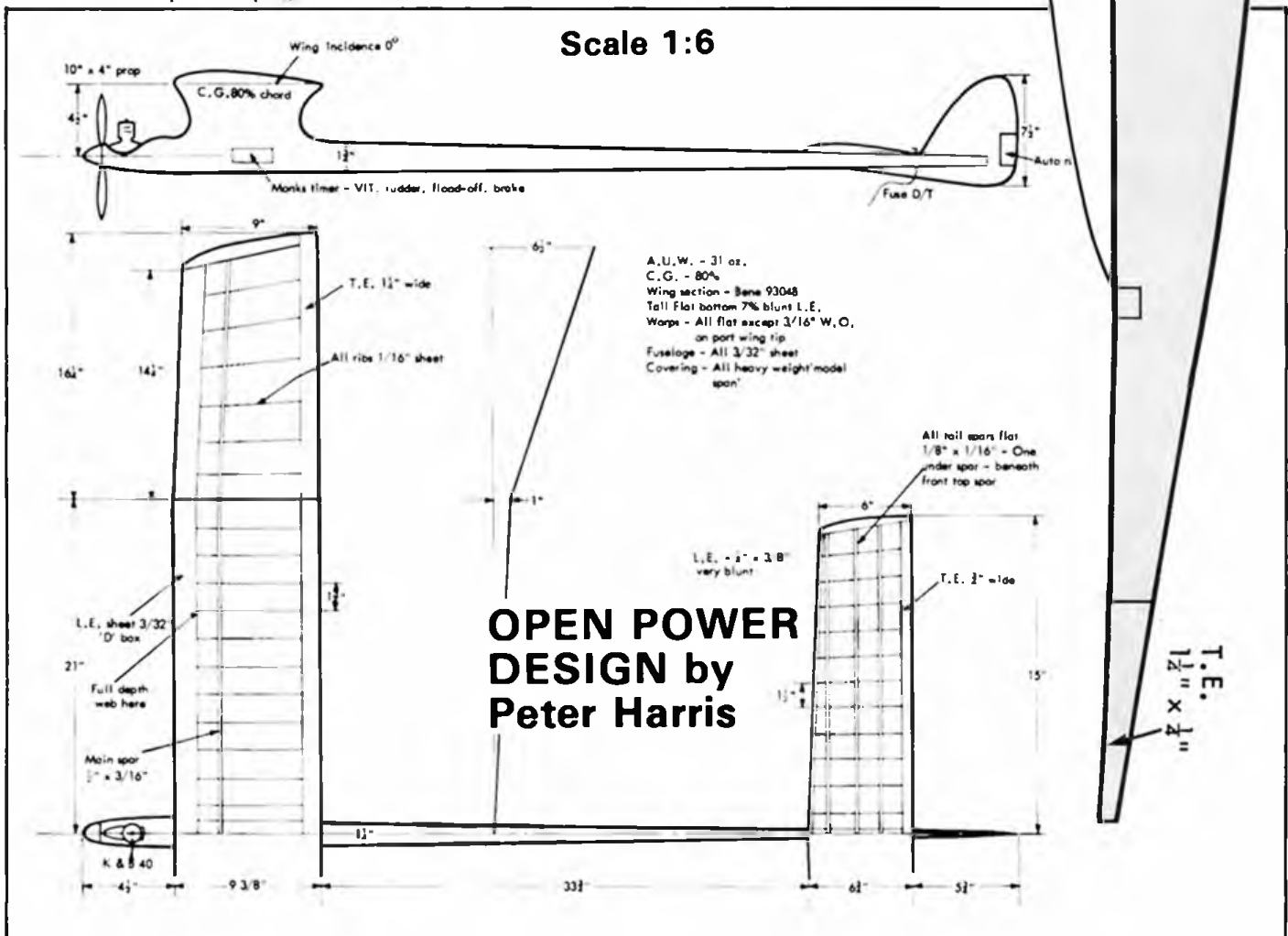
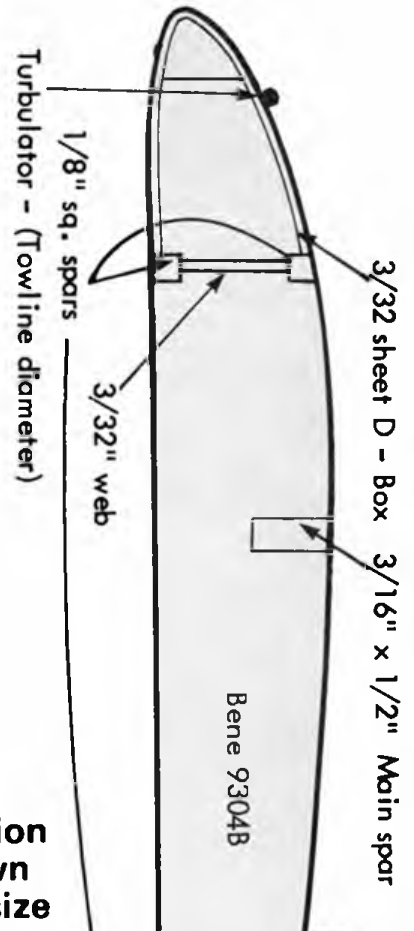
on the port tip for a slight left roll tendency. The taper on the tips and tailplane has an effect here too. The same ribs are used throughout but they are slewed towards the tip. This effectively gives a thicker section towards the tip and guards against tip stalling thus doing away with the necessity for wash-out.

Pete sets great store by the very blunt tail leading edge entry too. He reckons this tends to give a safer less critical set-up. It would certainly appear that the model is consistent. Now approaching its fourth contest season, Pete reckons he must have been building it around the time of that auspicious Everleigh Nats when he took first in Open and 1st A. Obviously laid down in a good year!

The Open Rubber Trophy '83

After venue difficulties in '82, the Open Rubber Trophy is to be staged again this year at Barkston Heath on September 18. Starting at 10am and with maxes fixed on the day and hopefully increasing flights will be in rounds. Additionally there will be a single flight 'Champagne Fly-off' towards the end of the day, entry for which will be on the field. Prizes are coming in from the trade already and a substantial amount is anticipated.

Entry to D. Hipperson, 35 Anthony Road, Boreham Wood, Herts., WD6 4NF, Seniors



£2, Junior £1. Please enclose two SAEs for confirmation of entry and return of latest information just before the event and a full results list soon after. Closing date for pre-entries will be September 9 but field entries will be accepted at double fee.

Gerry Le Vey reports

Northern Area Pannett Trophy Meeting RAF Church Fenton, April 17, 1983

This was the first Free Flight Contest to be held at Church Fenton since the ban on taking cars onto the airfield came into force, but due to good weather, plus the goodwill of those competing, no real problems arose. The 'Organisation' stayed downwind in the car park. Whilst the variety of conveyances to take models and fliers upwind was reminiscent of 30 years ago with small wheels on model boxes tied to the back of bikes, and sundry other sorts of trailers being pressed into service.

I am afraid that by staying downwind I missed all the action, but flying conditions seemed very good in the morning, and maxes were harder to find in the afternoon.

As usual the glider entry for the Jack Kay Memorial Trophy was the highest and eight made it to the fly off.

John Cuthbert towed alone for some time before finding a very nice patch of air and a winning time of 7:08, well ahead of Phil Owens, who also found his own air with 5:37 just behind was John Carter with his large 'open' glider which did not look in good air. But refused to come down, and made 5:30.

The power entry for the Pannett Trophy was disappointing in numbers, but produced a magnificent fly-off between Tony Smith, Russell Peers and Julian Hopper, who all landed in the same field only a few yards apart. Tony flew first, slightly off pattern, but into very good air for 8:01. Russell's familiar model climbed well and after a good transition, managed 7:56. Julian Hopper had the best climb both for pattern and height. But not the best air this time and had to settle for third place with 7:05. Tony Rushby of Cleemar also reached the fly-off with a 1/4A model but was out-gunned by the 'Big Stuff' and scored 2:56.

Terry Dilks (Falcons) won Vintage with the only perfect score, though he was kept waiting by Dennis Davitt (Leeds) who flew in the last few minutes of the contest and dropped just six seconds.

There were two junior performances to note for the future. In Vintage, Angus Tennant of Timperley, flying in his first contest with a Mick Farthing Lightweight did two maxes and 1:51 to take third place

Results	
Jack Kay Memorial Trophy — Open Glider	
23 entries, 21 flew — 8 in Fly-off	
1 J Cuthbert	Grantham 9 00 + 7 08
2 P Owens	Liverpool 9 00 + 5 37
3 J Carter	Falcons 9 00 + 5 30

Northern Area Vintage Trophy	
14 entries — 31 flew	
1 T Dilks	Falcons 9 00
2 D Davitt	Leeds 8 54
3 A Tennant	Timperley 7 51

Pannett Trophy — Open Power	
10 entries 7 flew	
1 A Smith	B Ae 9 00 + 8 01
2 R Peers	Falcons 9 00 + 7 56
3 J Hopper	Freerbirds 9 00 + 7 08

Top Junior	
V King, Morley, Glider	8 06

and in Glider, V. King of Morley, also in his first contest flew a 'Nova' built from a kit and did two maxes plus 2:06 — both very good efforts indeed.

I would like to thank all fliers for their acceptance of the restrictions posed by the RAF and their generosity in supporting a raffle for the Free Flight Team travel fund — cheque for £23.00 has been sent to HOTTA!

Martin Dilly reports

1982 NFFS Symposium

The 1982 National Free Flight Society Symposium Report, traditionally presented at the US Nationals, is again full of useful material on all aspects of free flight. As just a small sampler, Køster writes on digital timers, Sugden on folding propellers for F1C, Wantzenriether on Wakefield dynamics, White on rubber, Thompson on A/2 wings, and Selamat and Pressnell on turbulators for the Benedek 6356h airfoil. Max Hacklinger's 1962 milestone lecture on indoor techniques is reprinted in full and there are the usual NFFS To Ten Model features. In all, the 25 articles make the '82 Sympo Report a must for anyone interested in finding out more about model flying: copies are available in the UK from Free Flight News, 8 Blenheim Court, Farnborough, Hants., GU14 7DS, at £6.50 each, including inland postage. A few copies of the 1981 Report are still available at £5.50, which is also what a years' subscription to Britain's only free-flight specialist newsletter will cost you.

A Køster Electronic Timer for Gliders

Hot on the heels of Tom Køster's programmable electronic F1C timer, described in the September 1982 F F Scene, comes a more orthodox and less expensive electronic timer for gliders. Weighing 34.5 grams complete with rechargeable batteries, this new timer could also be of interest to Wakefield fliers.

Two miniature rotary switches — one for minutes and one for seconds — permit settings in six second increments up to nine minutes 54 seconds and a single charge of the battery is sufficient for about 400 timer runs. The timer only takes a high current drain at the end of its run, when the solenoid that retains the D/T line is briefly energised to release it. It is certainly one of the smallest and neatest so far on the market, with dimensions of 66 x 18mm for the face-plate, and a timer depth of 14mm.

For glider flyers a useful feature is that the timer re-sets to zero whenever the start switch is pushed and starts to count down to D T time when it is released. Used with a swinging arm circle tow-hook, this zeros the timer with the hook in the straight tow position and lets it run when the model circles, is released if the towline breaks. Price of the timer with battery is \$5.00 + \$1.50 postage from Tom Køster Digital Timers, Postbox 54, DK300 Hillerød, Denmark.

F.I.A. Power — the Winds for Change?

At the December 1982 CIAM meeting in Paris, at which proposals on contest rule changes were among the matters discussed by the delegates from 30 nations, one trend came across strongly. The majority of proposals concerning free-flight were aimed

at reducing the performance and limiting the distance covered by aircraft. Although most were rejected — and even in Britain some people still seem unaware that there is a serious flying field problem — F1C performance in particular were generally thought to be most in need of reduction.

Any rule change that would make existing aircraft obsolete, even in several years' time, seems unreasonable, so for this reason a reduction in engine capacity would be out. Although few compared with members involved in gliding or car racing, F1C flyers often have upwards of £1,000 invested in engines alone and they are hardly likely to welcome a 1.5cc engine limit, even if manufacturers were to respond by producing suitable motors.

Reducing the engine run is clearly one way out, but timekeeping inaccuracies would be even more critical than they are with seven seconds. A total engine running time of say, 35 seconds spread over seven flights would at least give more tolerance on individual flights, at least until the seventh one. A minimum propeller diameter has been suggested as a means of bringing down the rpm, as well as being easy to check, but the initial reduction in climb would probably be overcome by gearing. However at the CIAM meeting two nations, Sweden and the USA, both came up with another way to limit power output — by restricting the air intake diameter to a 3mm maximum for any engine under 2.5cc.

Tests on Rossi and AD 15 engines running on 7in x 2in propellers showed an rpm drop from 26,000 with a normal intake to 18,400 with the 3mm restrictor in place, which is a 50% reduction in thrust. This intake restrictor would favour smaller capacity engines and the USA suggests that engine runs could be increased to 10 seconds, which would reduce the problem of over-runs. The resulting decrease in noise, the majority of which comes from sources other than the exhaust, would of course still leave or even increase the difficulty of deciding exactly when an engine has stopped.

Carbon Composite tubes

In the 11 years since the first Ronytube appeared on the free-flight scene, Ron Pollard has built the range up to seven glass-based tubes, ranging from hand launched glider size to R/C glider and F1C types. Several of these, like the Wakefield motor tube and the Viktor Tchop glider boom are especially produced for the needs of free-flight.

Recently, Ron has had some Tchop-pattern booms made in carbon fibre, or graphite if you come from the other side of the Atlantic. While a stiffness increase of several hundred per cent was achieved for a 20% weight rise, the uni-directional lay-up led to longitudinal splitting in a few cases. Now these problems have been overcome with a composite carbon fibre and glass construction, which involves an extra rolling stage during manufacture. Four of the most popular Ronytubes are now available with this extra stiffness, containing about 50% carbon. Standard A 2 tubes are £6.50 each, Tchop-pattern ones are £7.20, with £1.50 post and packing for any quantity; A 1 tubes are £3.20 and hand-launched glider ones £1.40, both with 50p postal charge for any number. Full details can be had from Ron Pollard at 23 Ivy Road, Newcastle-on-Tyne NE6 4PU.

The Yulon Story

When control-line flying started to catch on in Britain, in the late nineteen-forties, it was the prospect of being able to make a model perform aerobatics that appealed to the majority of modellers who took up this new kind of model flying. There was not much interest in speed; combat and team-racing had not yet been invented and few were inclined to risk destroying (crashes were frequent, to say the least) all the effort put into building a scale model. Remember, in 1947, it was an achievement just to be able to fly a control-liner and, as late as 1948, budding stunt flyers were still asking each other 'Have you looped yet?'

It was 1948, in fact, that saw the introduction of the Gold Trophy for C/L stunt at the British Nationals. This attracted more spectators than any other event and among the contestants were such modelling world 'names' as Dennis Allen, Ron Moulton and Henry Nicholls. This first 'Gold' was won by Peter Cock of Southampton, flying a simple little profile-fuselage model powered by a modest E.D. 2cc diesel. Dennis Allen was a close second. Ron and Henry, as one recalls, had engine troubles in the final, which put them out of the running.

The following twelve months saw a vast increase in stunt activity throughout the country and an entry of well over the hundred competitors in the 1949 Gold Trophy which, incidentally, was judged by Messrs Moulton and Nicholls. It was won by Brian Hewitt of Birmingham, flying a lightweight model powered by a new 5cc glowplug engine called a 'Yulon 30'.

No one who ever saw (or, more likely, heard) a Yulon perform, during that period, is likely to forget it. Yulons were not immensely powerful, even by 1949-50 standards, but they were very light, which meant that they could be put into very light airframes (flying weights of around 18-20 oz were usual) producing very lively performance and, with their 360 degree porting (no silencers then, of course) they made an awful lot of noise, especially by comparison with the popular small diesels of that era. Just how far the howl of a Yulon could travel was amusingly demonstrated to us one quiet summer evening in 1951 when, towards the end of a stunt session by Frère John Chinn, two breathless youngsters from a local prep school burst through the hedge, having run the best part of two miles across country in pursuit of the magic sound. After gazing wide-eyed at an admittedly pretty competent performance, one was moved to hesitatingly enquire: 'I say, I suppose neither of you happens to be Brian Hewitt by any chance?' Hats were definitely too small to be worn that night.

By that time, Brian Hewitt had scored his second Gold Trophy win and his two models, the boxy original, now called *Stunt King*, and the 1950 midwing streamliner, the *Stunt Queen*, had both been kitted by Keilkraft but, unfortunately, the days of the Yulon were numbered. A government decision to impose a hefty purchase-tax on model goods (hitherto believed to have been exempt on educational grounds) was upheld in the courts after a two-year delay and this suddenly presented the U.K. model industry with some crippling back taxes. The Yulon Engineering Company and many other small firms were obliged to withdraw from

the model trade and devote their energies to more profitable pursuits. In the case of Yulon, this meant the manufacture of medical equipment instead of model engines.

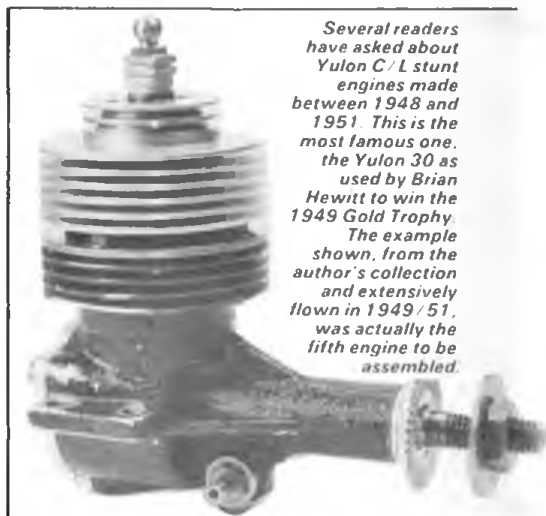
Yulons were in production for three years, during which time four models were produced. The name 'Yulon' was derived from Yule and Long, the original partners in the Yulon Engineering Company of Northfield, Birmingham. Norman A. Long designed the engine and both partners were, themselves, active control-line stunt modellers.

Re-examining the Yulon 30, today, is an interesting exercise. It was designed at a time when 360 degree porting was becoming popular and when most manufacturers were striving to keep weights as low as possible. Its crankcase was a very light gravity casting, in DTD-424 aluminium, with a long tubular front end, below which, close to the crank chamber, there was a short intake to the rotary-valve port. The crankshaft, of rather spindly appearance by present standards, had a journal diameter of 0.345in. (8.76mm) and a 0.220in. (5.6mm) dia. tubular crankpin on a small counter-balanced web. The shaft had a 6.5mm dia. gas passage, fed from an oval rotary-valve port and was unusual in that it had an all-over hard-chrome plating. This worked well with the plain unbushed main bearing. Our original 30, one of the very first production models, had a lot of running in two stunt models over a two-year period and the shaft was still an excellent fit at the end of this time.

Cylinder porting consisted of a ring of twenty-four tiny circular exhaust ports, almost like postage stamp perforations, completely encircling the cylinder and, below them, eighteen similar holes forming the transfer ports. Externally, dividing the two port bands, was a wide flange by which the cylinder was attached to the crankcase and which left a 2mm wide annular transfer passage between the o.d. of the cylinder and the i.d. of the surrounding casting. The lapped, flat-crown piston was of Mechanite and had its lightweight, tubular gudgeon-pin placed very high in order to maintain a reasonable conrod length (1.8 x stroke) while keeping the engine as squat as possible. The cylinder was secured to the crankcase with four hexagon head screws and was externally threaded, above the flange, for a screw-on one-piece aluminium finned jacket and head. The backplate was fitted with three hexagon head screws.

On test, our original Yulon 30 produced an output of 0.32 bhp at just over 12,000 rpm, running on straight methanol/castor-oil fuel, and 0.37 bhp at nearly 13,500 rpm when running on a 25% nitro fuel. The engine always handled well and, despite its lightweight construction, the only part that required replacement during quite a strenuous working life was the conrod.

When the Yulon 30 was announced in March 1949, it was priced at £6.15s. (£6.75), which sounds pretty cheap by today's standards. In fact, it was rather more expensive than most other motors at that time and, when the big Lines Brothers organisation announced, for 1950, what appeared to be a competitor, in the shape of the 5cc Frog 500 glowplug motor, at the incredibly low price of £3.15s, the Yulon company responded with a new model, the Yulon 29 at just under £4. As things turned out, this drastic price cut was probably not a good move, commercially, as the Frog, although quite a decent engine, failed to make its mark as a stunt motor and most stunt enthusiasts would probably have been content to continue to pay a little more for the Yulon, anyway, especially after Yulon's second successive Gold Trophy win, this time with the new 29, in 1950.

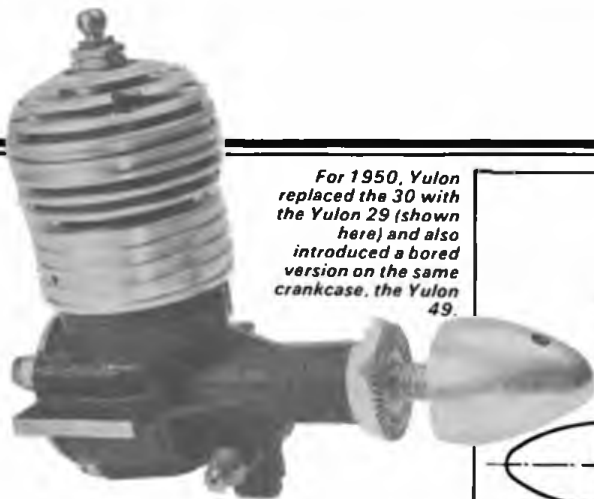


Several readers have asked about Yulon C/L stunt engines made between 1948 and 1951. This is the most famous one, the Yulon 30 as used by Brian Hewitt to win the 1949 Gold Trophy. The example shown, from the author's collection and extensively flown in 1949/51, was actually the fifth engine to be assembled.

Mystery Corner!

Can anyone identify this vintage spark-ignition engine? Believed to be of Continental origin.

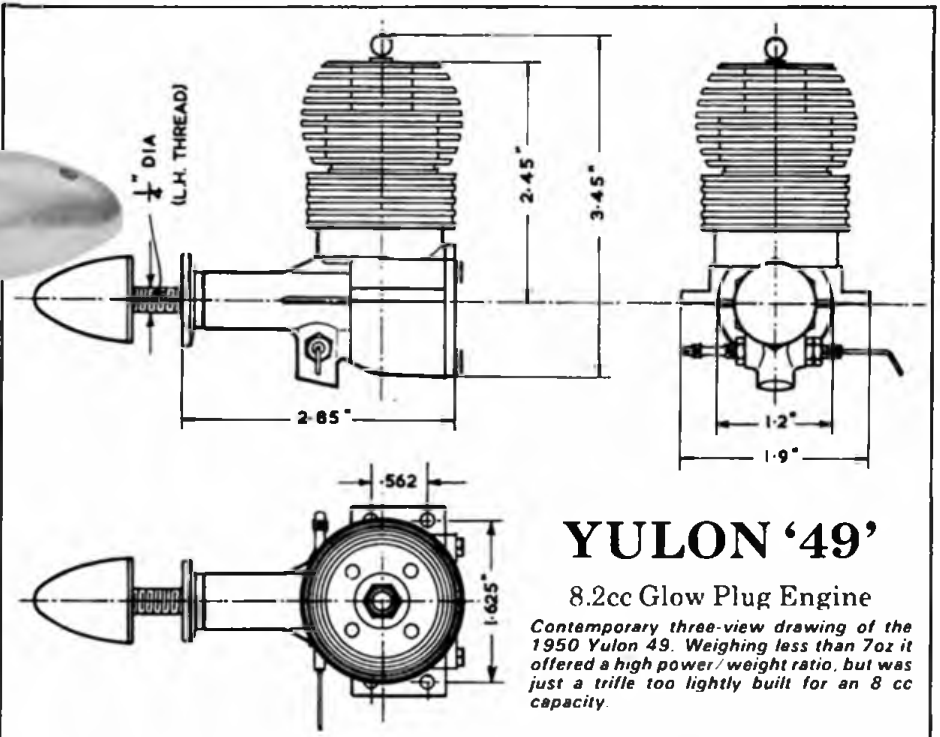
The PK Z-12, a new diesel that is to be offered through Performance Kits stockists.



For 1950, Yulon replaced the 30 with the Yulon 29 (shown here) and also introduced a bored version on the same crankcase, the Yulon 49.

The 29, readily identified by a new cylinder jacket, was generally similar to the 30 but had the cylinder flange secured with a deep ribbed ring screwed over the upper part of the crankcase. The engine also had a separate aluminium alloy prop stud, with a left-hand thread, screwed through from the inside of the shaft and locked in place with the prop driver. The 29 had a slightly smaller nominal bore and stroke than the 30 (0.743 x 0.687 in., instead of 0.746 x 0.691 in.) bringing it within the .30 cu.in. limit (0.298 cu.in.) effective in some overseas countries.

The weight of the 29, 0.2 oz more than that of the 30, was still remarkably low at 5.8 oz. Even more remarkable was the 49 model,



YULON '49'

8.2cc Glow Plug Engine

Contemporary three-view drawing of the 1950 Yulon 49. Weighing less than 7oz it offered a high power/weight ratio, but was just a trifle too lightly built for an 8 cc capacity.

The final Yulon, the Eagle 29 of 1951. Based on the 29 crankcase casting, it dispensed with the black 'crackle' finish and used an entirely new cylinder assembly.



announced at the same time as the 29. Based on the 29 bottom end, this had the cylinder bore increased to a rather massive 0.960 in. — i.e. more than a McCoy 60 — to give a stroke/bore ratio of only 0.716:1 and a swept volume of 0.497 cu.in. or 8.15cc, yet it still weighed less than 7oz. Clearly, its almost two-thirds larger swept volume would be unlikely to give a two-thirds increase in power but, on test, our motor came within 10 per cent of this target at 0.55 bhp at 11,800 rpm and, with a power/weight ratio of nearly 1.3 bhp/lb, set something of a record for stunt engines. However, although it cost only slightly more than the 29, the 49 was never a very popular engine and one always felt that it was just too light and that one day something would burst. It did. Ours, loaned to a friend, decided to show how well the 'postage stamp perforations' would work in flight: the cylinder suddenly took off skywards, leaving the bottom half, model attached, to coast earthwards.

Yulon's last engine, the Eagle, introduced early in 1951, dispensed with the traditional Yulon multiple ports. Instead, it had four large exhaust ports placed 90 degrees apart

with, between them, four deep internal flute type transfers ports, a basic system, incidentally, that was subsequently used by a number of successful high-performance diesels. The cylinder, machined from EN.36 steel, had integral fins, was externally threaded to screw into the crankcase and internally threaded at the top for its screw-in aluminium head. The crankcase casting was similar to that of the 29, but dispensed with the black crackle paint of the previous models and was left in a plain aluminium finish. Weight was slightly up at 6.1oz.

Regrettably, the Eagle never had much of a chance to prove itself in competition as, not long after its introduction, the Yulon company gave up model engine manufacture for the reasons previously stated. On test, however, the engine had appeared promising and ours bettered the 30 and 29 so far as power was concerned, with a peak output of 0.42 bhp at 14,200 rpm on nitro fuel.

So ended the Yulon story. A few years later, Norman Long made some experimental 2.5cc twin ball bearing disc-valve contest diesels and, for a while, contemplated getting back into model engine manufacture, but eventually had to give up the idea due to other business commitments. While the experiments lasted, however, we had the task of carrying out tests on prototypes of an engine that would have been known as the Nalon Viper. But that is another story that will have to wait for another day.

P.K. Z-12

Peter Fisher of Performance Kits (now relocated in the Isle of Man) has sent along a photo of the 'P.K. Z-12' diesel that should be available from Performance Kits stockists at about the time these words appear in print. Based on a D-C crankcase, the engine is presumably made by Dav-Cal (successors to Davies-Charlton) in the Isle of Man, but is exclusive to Performance Kits, hence the 'P.K.'. Unfortunately the information issued on the engine, thus far, is rather

scanty, but we gather that it is of 1.2cc swept volume (putting it between the D-C Spitfire and Sabre) and has the additional niceties of a machine spinner-nut, brass 'handles' to the compression-screw and needle-valve and an anodised crankcase.

Irvine tuned pipes

Of interest to control-line speed enthusiasts and other is a range of high quality tuned expansion-chamber exhaust systems, for engines of up to 10cc, now being offered by Irvine Engines Ltd. Suitable for use with these (or, for that matter, with other makes of tuned pipes) Irvine is offering an immense selection of adaptors or, as Irvine quite correctly calls them, 'header pipes'. (This is American usage but is preferable to 'manifold' which, strictly speaking, should only refer to a pipe or chamber connecting two or more ports or cylinders.)

The header pipes are available for both side exhaust and rear exhaust engines and in several different patterns. At present they cover, naturally, all the Irvine range of engines, plus most of the appropriate 2.5cc — 10cc engines from HP, K&B, OPS, O.S., Rossi, Super-Tigre, Webra and others.

Both the pipes and the headers are very well made and finely finished.

Mystery engine

M. L. Peake of Bilston, West Midlands, has sent along some photos of a vintage petrol engine that was acquired a few months ago by a member of the Bilston club and which no one locally has been able to put a name to. We are slightly ashamed to say that we cannot identify it either but, possibly, one of this column's readers might be able to do so. Our guess is that it is of Continental origin and was made just after the Second World War. There is just a chance that it could have been made immediately before the war — say 1939 — but, judging by what one can see in the photograph, of its design and construction, 1946-48 is a more likely period.

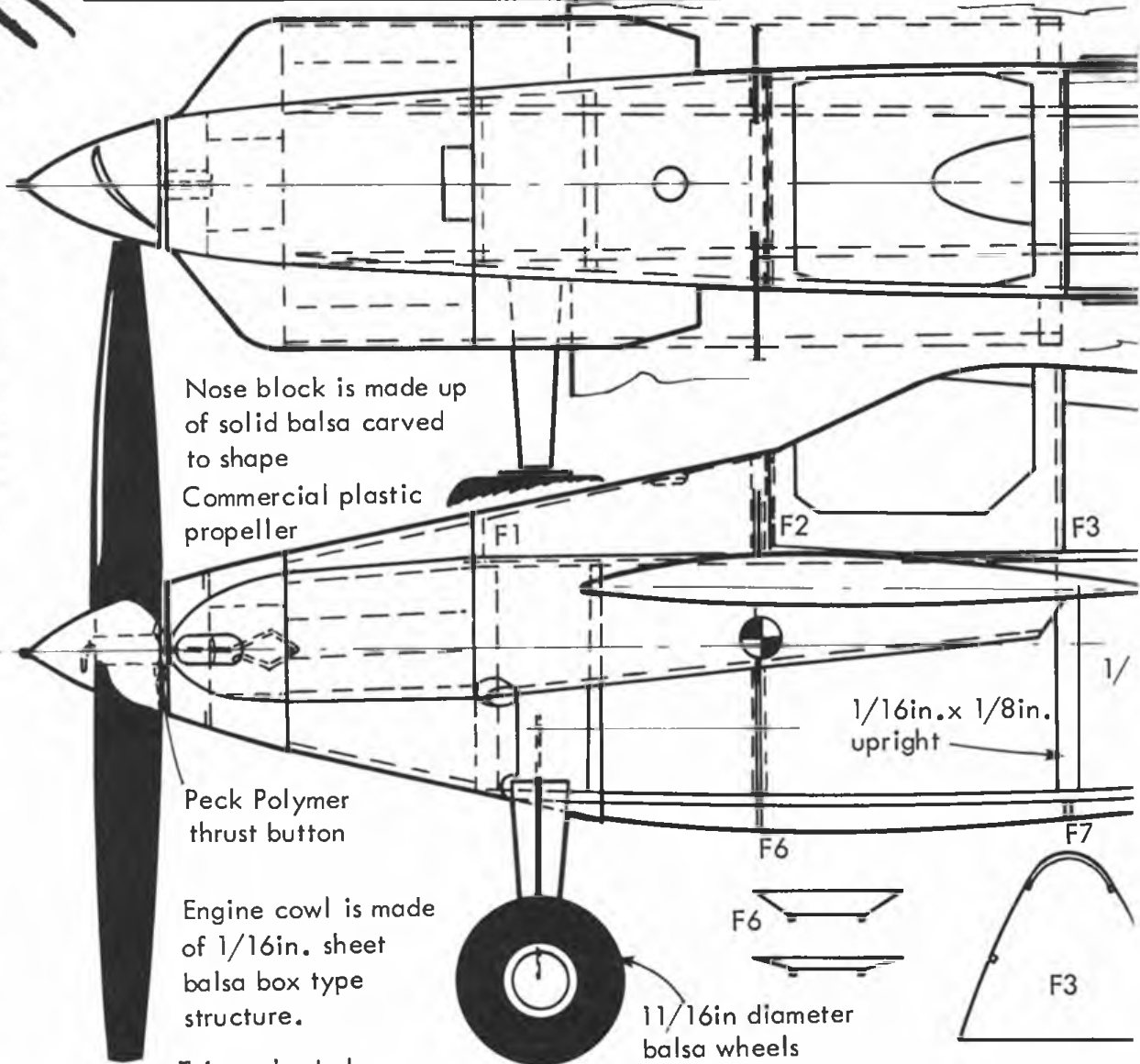
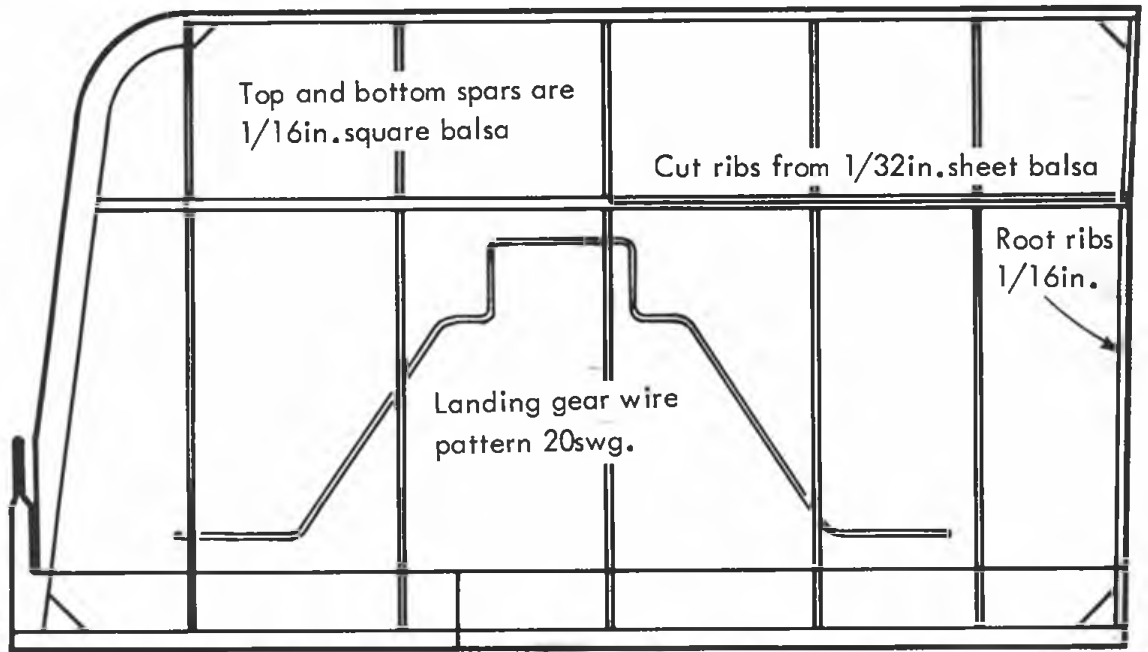
Does anyone recognise it?

Witman V Racer

Matt Moonett

Peanut Scale by

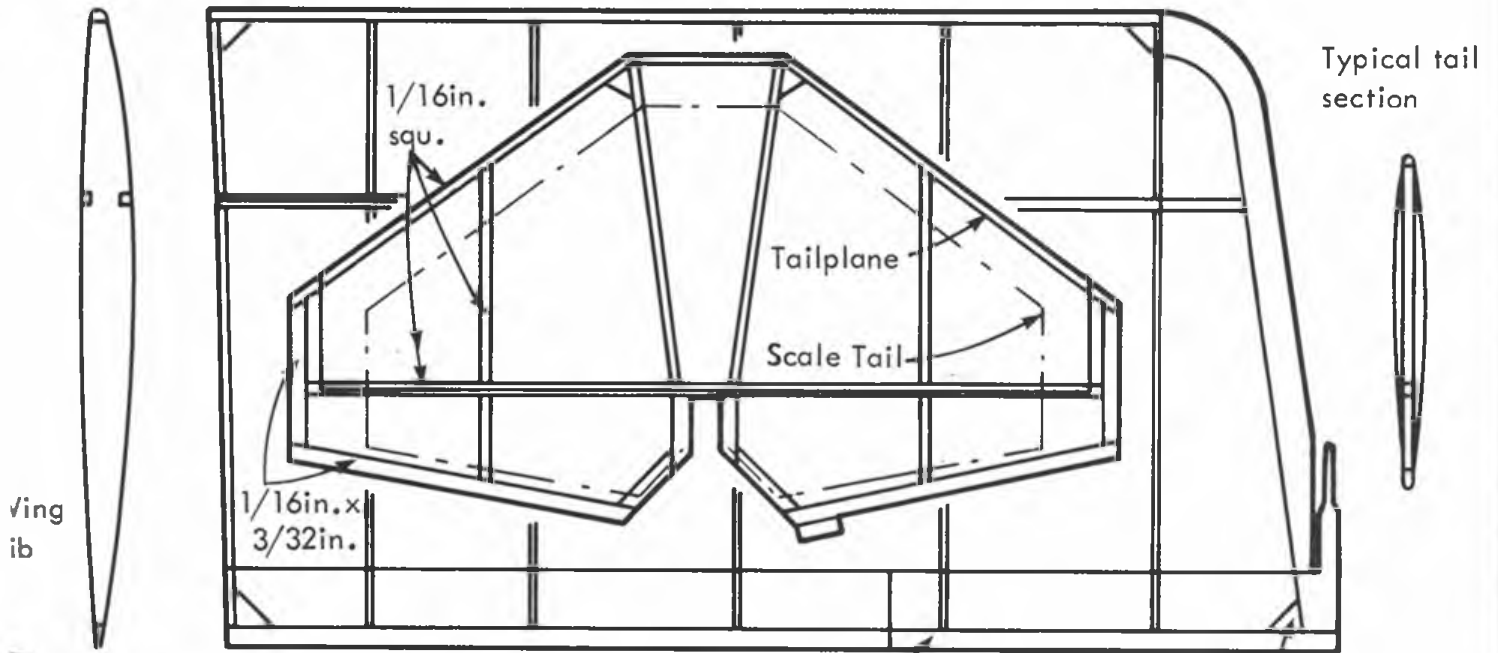
Make the leading edges from 1/16in. x 3/32in. balsa or from 1/16in. diam



All formers 1/

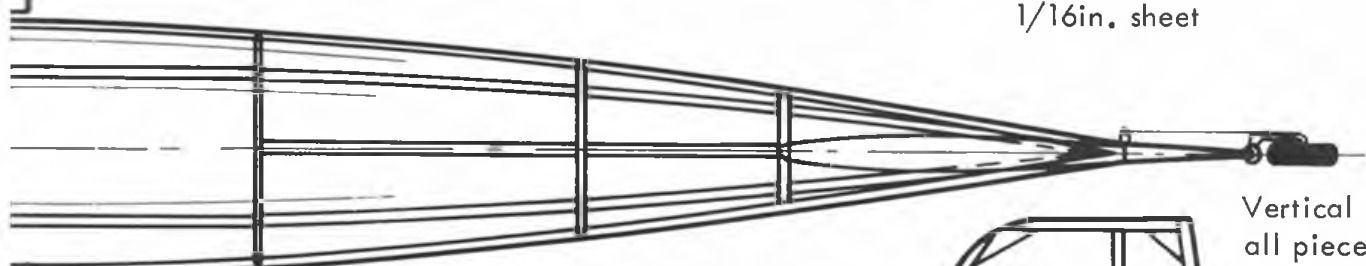
meter birch dowel

Make tips from 1/16in. sheet balsa



Make trailing edges from 1/16in. x 1/8in. balsa

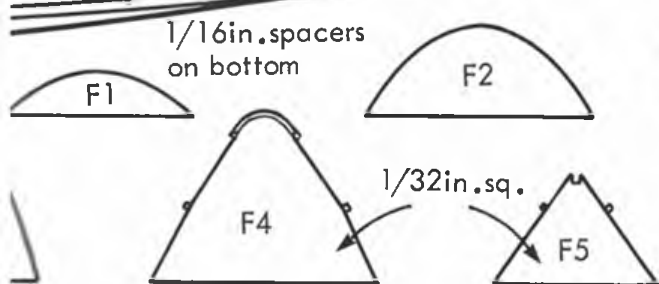
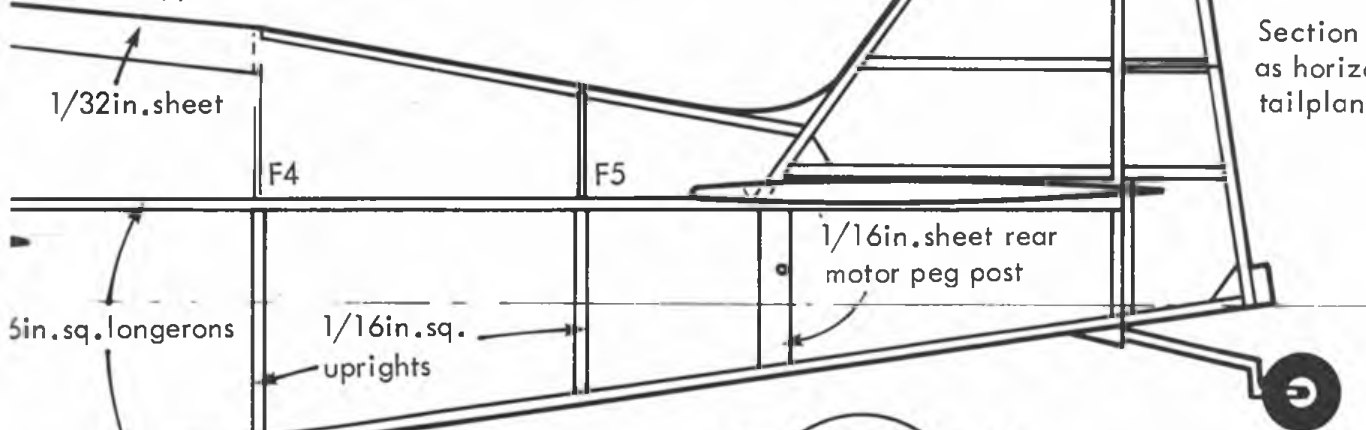
Cut triangular gussets from 1/16in. sheet



Top of cowl just in front of windshield and turtle deck just aft of canopy is covered with 1/32in. sheet

Vertical tail all pieces are 1/16in. sheet

Section same as horizontal tailplane

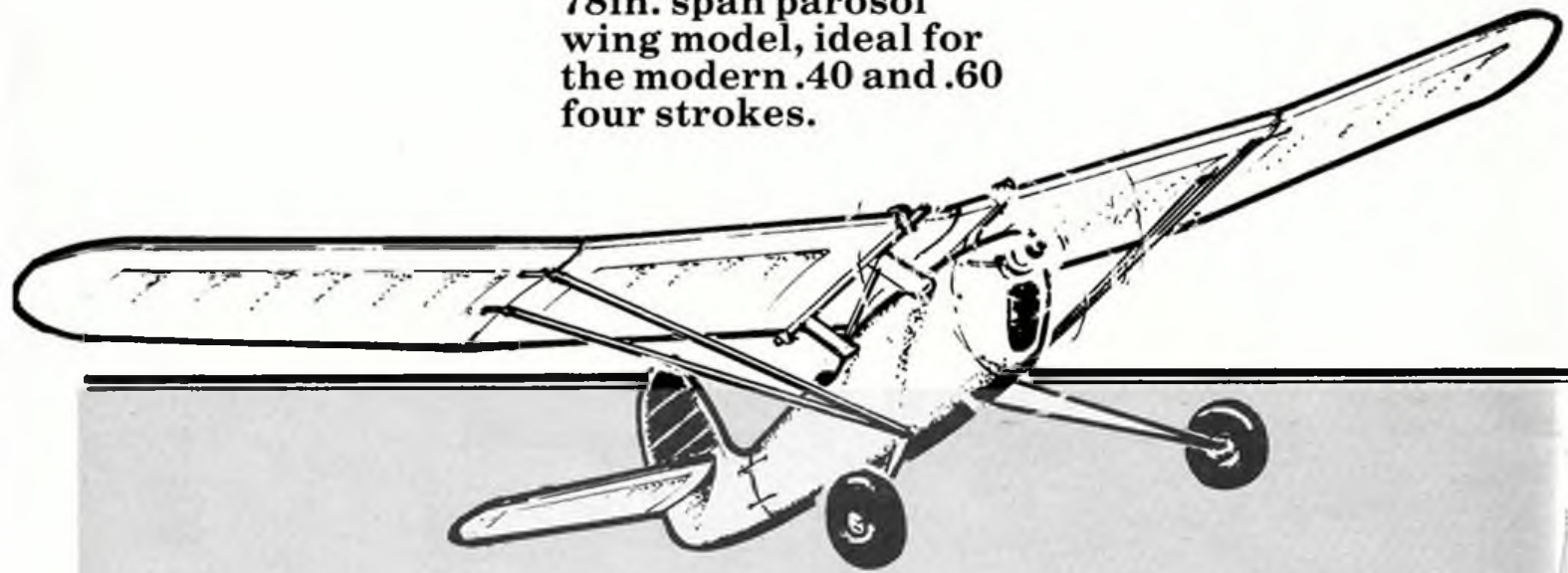


Dihedral: 1/8in under each wingtip

Longerons & stringers 1/16in. square balsa

2in. sheet

78in. span parasol wing model, ideal for the modern .40 and .60 four strokes.



BY A. H. WILSON

JANUARY 1947 edition of MODEL AIRCRAFT magazine introduced A. H. Wilson's 1946 Bowden Trophy winner with a flourish, but presented it as a high winger whereas it in fact adopts the parasol wing layout and is very attractive for all that.

Mr. Wilson's 1946 design was highly successful, taking not only the 'Bowden' in style, but subsequently winning the Bournemouth Reliability contest and placing 2nd in both the Frost Trophy and the Eaton Bray Rally of that year — quite a tour of nostalgia in itself.

Spanning 78in. (1981mm), wing area is approximately 850 sq. in. (dm²) which puts this model firmly in the 'floater' class and a great candidate for Vintage Radio Control using 2-3 function radio.

Originally listed for 9-10cc petrol engines or 5-6cc diesels of the period, Mr. Wilson's elegant design is ideal for the latest breed of .40 four strokes or even .60s.

The interesting bit is the re-discovery of all those early post-war construction techniques — involved yes, but by golly such a lot of airframe for a little material!

The two sheet plan was originally offered at 15 shillings, back in the days of real undiluted British money (!) which makes today's price of £2.50 not a bad bargain.

Construction

The fuselage is constructed from oval formers cut from $\frac{1}{8}$ in. birch three-ply notched for 16 spruce stringers $\frac{1}{8}$ in. square. The tail extremity of the fuselage is built in unit construction with the tailplane and fin detachable. It is held in position on the fuselage by two sets of rubber bands on each side and correctly located by a rectangular ply spigot engaging the similar rectangular aperture in the terminal former of the fuselage proper.

As it is not possible to use a central rod for building up the fuselage, some form of cradle is required to ensure accuracy of the finished structure. This may take the form of a series of blocks of equal height (approximately 5in.) attached to a suitable baseboard and arranged between the formers to support the centre stringers while one half of the fuselage is completely stringered. The fuselage can then be

1946 Bowden Trophy Winner

Although better known for his 'MANX' series of tailless designs, A. H. Wilson's first post-war winner of the Bowden Trophy is at least as interesting.

removed and the remaining stringers fitted.

An alternative method is to make a cradle from a piece of wood about $\frac{1}{2}$ in. thick and 3in. deep, slotted at the correct intervals to accept the formers, which should be a fairly tight fit in the slots. The slots must, of course, be cut to the correct depth to give the accurate fuselage contour. When all formers are accurately located on the cradle the stringers can be applied as far round the fuselage as possible; it is then removed and completed.

The fuselage frame is now completely planked with $\frac{1}{16}$ in. sheet — balsa strips.

A false bulkhead of $\frac{1}{4}$ in. thick three-ply is glued and screwed to the front fuselage former to take the engine mount.

The centre formers of the tail unit extend upwards to form the anchorage for the tailplane spars and the fin attachment tubes. See that the rectangular ply spigot on the face of the tail unit front former is an accurate fit in the aperture in the rear fuselage former and properly aligned to ensure that the tail is parallel with the wing on attachment.

The portions of the tail unit forming the tail end of the fuselage are also planked with $\frac{1}{16}$ in. sheet balsa strips.

The tailplane follows orthodox construction, and should be covered with silk and doped.

The fin is constructed separately and plugs into the paper tubes provided.

The wing mount consists of a cabane structure made from $\frac{1}{4}$ in. square birch struts, with diagonal brace, as shown on the drawing. Note carefully when building that the correct angle of incidence is built in and that the cabane is true and free from warps. Note also that the struts are faired off with $\frac{1}{16}$ in. balsa sheet and that the joints are reinforced with 1mm ply gussets which have their edges sanded to blend smoothly with the struts.

The wing is in three pieces. A parallel centre section with built-in dihedral, and two outer wings attached to the centre section by duralumin tubes and dowels. The outer wings are set at an angle to the centre

section to give a polyhedral angle and they are held in position by rubber bands passing over hooks.

The wings are provided with supporting struts which are anchored to the same hooks and attached to the rear undercarriage struts at their lower end. The wings should be covered in silk and doped.

The undercarriage is straightforward and plugs into duralumin tubes. The struts are fitted at their upper ends with stop washers and wire hooks to take retaining rubber bands passing under the fuselage to those on the other side.

The engine mounting is made from 16 gauge duralumin sheet to the dimensions

given. This will suit most engines and it should be positioned on the false bulkhead in the correct position to give the desired thrust line. This position will, vary with different engines.

All wiring should be carried out with stranded wire in protecting sleeving and all joints should be soldered when possible. The run of the wires will be followed from the wiring diagram given, which is semi-pictorial. The battery is located on its platform by wire hooks passing under the platform and retaining rubber bands, with a soft balsa packing block to keep its terminal strips in contact with the brass contacts on the ply fence.

Vintage Revival



Full size copies of the plan reproduced here to 1/6th scale are available from: Aeromodeller Plans Service, Wolsey House, Wolsey Road, Hemel Hempstead, Herts, HP2 4SS. price £2.50 plus 45p p&p. Please quote Plan No. MA/17 when ordering.

SHOP TALK TALK SHOP

New Veron Miniscale Super Series kits for rubber duration or CO₂ motor power

First announced at the London Toy Fair early this year, *Veron's* delightful new range of four little flying scale model kits should just about be in the shops by the times you read this.

Phil Smith designed these little beauties to suit either rubber or CO₂ motor power and very practical little flying machines they are too.

Types are the high wing *Piper Vagabond* — span 22½in.; *Ryan NYP Spirit of St. Louis* — span 24in.; 26½in. span low wing *Dart Kitten* and 27in. span *Aeronca Collegian*. They're £5.75 each from your model shops.



E.D. Models Pliers

E.D. Models of Birmingham have just introduced these useful pliers/cutters. They are ideal for most light cutting jobs including removal or plastic parts from sprue, white metal cleaning up etc.

The retail at £1.95 plus postage and are available from E.D. Models, 9 Patricia Avenue, Yardley Wood, Birmingham, B14 4ES.



Corrosion inhibitor

Internal corrosion is the enemy of all model aero engines. Corrosion can set in very quickly, even between weekend flying sessions, but is a particular risk in the case of long lay-ups. Glow plug type motors using methanol based fuels are at particular risk and all efforts should be aimed at preventing the problem.

HP KR22 Corrosion Inhibitor from *Ripmax* is an additive to mix into flow fuel in proportions of 10cc per gallon/2cc per litre. The additive is especially recommended for four-stroke motors. Price £1.25 for a 250cc bottle and £2.50.

Keil Kraft Super 60 returns

Although by no means a vintage type, the *Keil Kraft Super 60* design must certainly be one which many who have been involved in radio control from the early 1960's onward will remember with particular affection. Bags of wing area and a nice thick, under-cambered wing section made this a nice n'easy sports flier — the kind of flight performance we can all appreciate at one time or another.

Now this 63in. span model is back, still with 'Keil Kraft' on the box lid, but manufactured by **Ben Buckle**



Kits who have managed to pack a complete set of component parts into a very compact carton.

Formers, wing ribs and other shaped wood airframe components are bandsawn to shape and there is sufficient sheet and strip wood to complete the model. Hardware includes shaped metal under-

carriage blank, adjustable control clevises, fuel tank, control horns, hinges and metal sheet engine mount blank.

For .19-.25 two-stroke motors and .30-40 four-strokes, the Super 60 suits three function R/C, or even just two function without throttle. Price is £32.95



Keep it clean

Nothing worse at the end of a flying session than a nasty, yucky, sticky model to clean down! Exhaust residue, either diesel or glow is always a clean-up problem.

Mick Reeves Models Kleenoff is a spray-on, wipe off cleaner, which is diluted 4:1 with water. It comes in a bottle complete with plunger spray head and costs 99p. Refill bottles are also available, price 75p.



Bits Box

Every modeller has his collection of bits and bobs of handy hardware. These things, stored and hoarded over half a lifetime of aeromodelling eventually come in handy, but by golly, raking them out of a junk box can be difficult.

So folks, why not organise those handy bits and pieces into a compartmentalised plastic cabinet like this nicely planned **BX16** unit from *Ripmax*, price £3.95.



Bondacure One Component Polyester Resin

This new product from 'Bondaglass Voss Ltd.' should have instant appeal to those who dislike using a polyester resin because of having to handle a fairly toxic catalyst or because it produces skin irritation.

Curing is effected by exposure to light, preferably sunlight. A normal light bulb could be used, but will need a longer curing time. The manufacturers claim that an area of 6in. x 6in. will gel in around 20 minutes, on exposure to a 150 watt light bulb at a distance of 8in.

Bondaglass 'Bondacure' is available from hard and DIY shops and costs £3.14 plus VAT per 500g tin.



How noisy?

One of the biggest problems of modern modelling is noise. Complaints about this have precipitated the loss of so many flying fields in recent years and so a worthwhile club investment might well be a **Sound Level Meter**, like the **Reftec SLM 1A** from *Ripmax*.

This compact unit comes in a handy plastic case size 4 7/8 x 2 1/2 x 1 1/8 in. (200 x 64 x 41mm) and, as the operating instructions indicate, can also be used for a number of purposes other than checking the noise level of model engines — like balancing stereo systems — handy eh! Price £22.50 through *Ripmax* agents.

Cambria Kestrel

Mid-Wales Model Manufacturers have just introduced a new glider to their Cambria range of model kits. Called **Kestrel**, this rather cute little 67in. span model is designed for two function radio control, but also has the natural stability to be flown free flight. Boxey fuselage and simple wing construction make this one an excellent product for beginners, who will appreciate the full-length shaped fuselage sides, die-cut ribs, shaped formers, noseblock and tail surfaces.

Very well worth a look next time you're in your local — model shop that is! Price £16.95 — good value!



Hobbypoxy paints

The range of Hobbypoxy paints and adhesives from USA have, from time to time been available in this country, but there has been a lack of continuity which has been frustrating to those who appreciate the quality of these specialist items.

Precision Petite Ltd, 119a High Street, Teddington, Middlesex will now be distributing the line in UK. Hobbypoxy Enamel, for instance, is a two part epoxy paint formulated for covering power. It stays flexible and won't chip, peel or crack — and it can be brushed or sprayed.

Hobbypoxy Custom Metaliser is an additive for the enamel paint range for all who enjoy customising their paint schemes. Any paint job is only as good as the surface underneath

and for surface preparation, the Hobbypoxy range includes Stuff for filling dents and nicks, while Hobbypoxy Undercoaters reveals dents, dips and surface ripples as you sand. Once these flaws are discovered, the cure is Hobbypoxy Filler.

Also available is Hobbypoxy Quick Prep Resin for glass fibre laminating and then there's Hobbypoxy Polyester Filling compound to go with it.

Finally, there's the range of Hobbypoxy epoxy glues, which include Formula 1 with a working time of 15 mins and curing time one hour; Formula 2, a slow setter — 45 min. working/3 hr. cure and Formula 4, the fast one with 4 min. working time, to cure in 10 mins.



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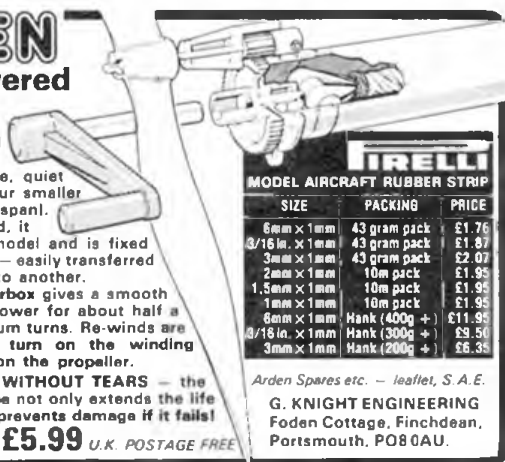
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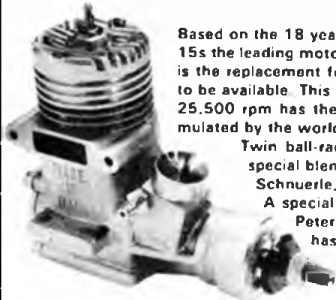
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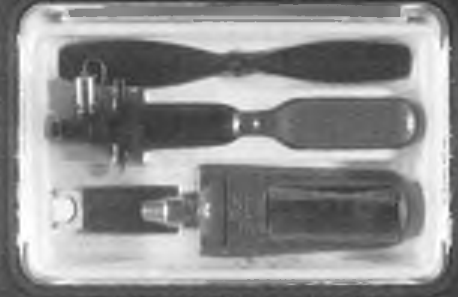


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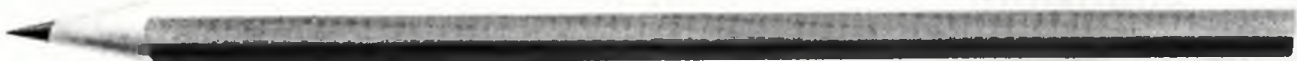


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