

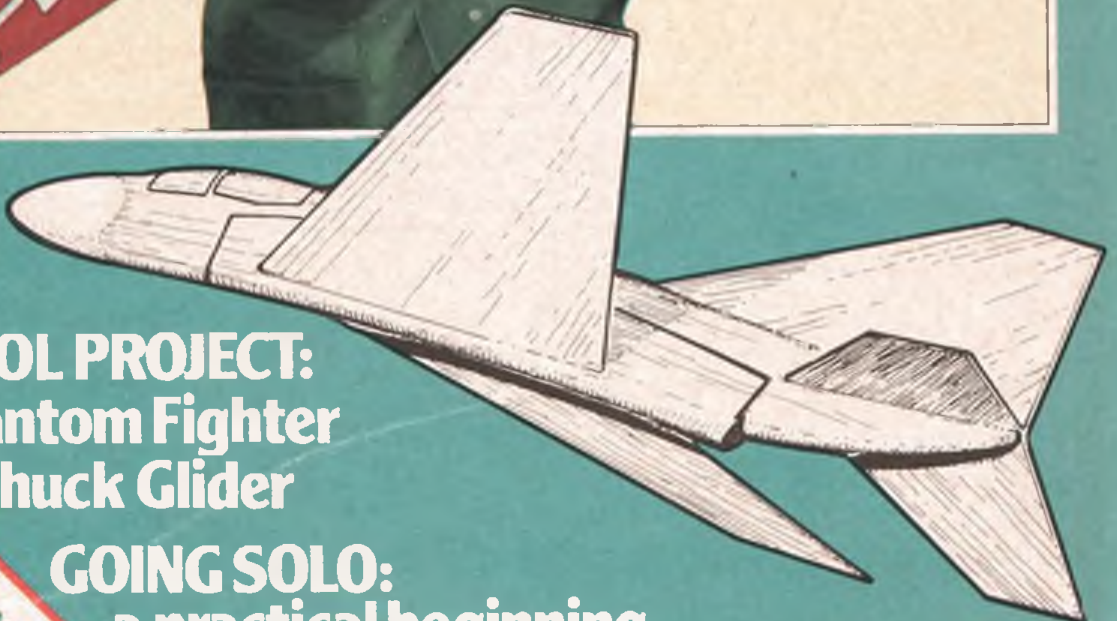
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AERO MODELLER

May 1984

Volume 49
Issue No. 580

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Cover

The De Havilland 34 has caught many a scale modeller's eye, this magnificent model by Bill Dennis shows just what can be achieved by following his articles on scale modelling in Aeromodeller. Model is held in the safe hands of Siobhan Brookman.

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HANGAR DOORS

Tissue update . . . update

In March *Aeromodeller* we favourably reviewed some coloured tissue now being imported by *The Balsa Cabin*. We implied that *Modelspan* was no longer available, this is true of the coloured variety, but is certainly *not true* of white *Modelspan*. White *Modelspan*, both lightweight and heavyweight has been and will be available for the foreseeable future.

In addition, *Henry J. Nicholls Ltd.* have discovered (?) that they still have quantities of yellow *Modelspan* in both grades (see Classifieds for their address).

Days out in May . . .

Two major events are worth considering visiting this May. The first on Saturday and Sunday 12th and 13th May is the Sandown Park Model Symposium, Exhibition and Display. Organised by Elmbridge Model Club, the venue is Sandown Park Racecourse, Esher, Surrey and will include model trade stands with many of aeromodelling's household (workshop?) names. Not only aircraft but cars, buggies, railways and boats will all be there. The range of displays — headed by an appearance by Hanno Pretner, three times World Aerobatic Champion — should have something for everyone. Gates open at 8.30 a.m. Exhibition Halls at 9.30 a.m. Admission: Adults £2.50; Children (5-16) and O.A.P.'s £1.50. See the advertisement elsewhere for special family tickets.

The second May event is over the Spring Bank Holiday

weekend May 26th - 28th and is the 1984 Model Craft and Country Show at the Royal Showground at Stoneleigh near Kenilworth, Warwickshire. The Royal Showground covers a very large area giving ample room for displays and demonstrations covering all types of modelling, together with one of the largest craft shows in the country. Model planes, cars, boats and railways, all are catered for here — with six halls containing trade stands, practical demonstrations and model exhibits to mention but a few. Admission: Adults £2.00; Children and O.A.P.'s £1.00. Open 9 a.m. to 6 p.m. daily.

1984 British Nationals for Free-Flight

After major problems of airfield availability, this year's Free-Flight Nationals will be run by the S.M.A.E. at RAF Barkston Heath, near Grantham, Lincs., from May 26th to 28th, the Spring Bank Holiday weekend.

As well as being the biggest model flying event in the world in terms of entries, the 37th National Championships are a showcase for current developments in the sport. Non S.M.A.E. members will be welcome as spectators and, with 17 events to watch, are sure to enjoy their weekend; camping will, again be available on the site.

Cost for spectators at the gate:
Non S.M.A.E. members: £1.50 (under 16: 75p); Cars and passengers £4.00. **S.M.A.E. members:** £1.00 (under 16: 50p); Cars and passengers: £3.00; Coaches £15.00.



Castle Brake Caravan Park run by long time aeromodeller Alan Parker is next door to one of our long standing or should we say "gorse stabbing" free flight sites . . . see *Take a Break*.

For full details of the Nationals, send a large stamped addressed envelope to:

National Details,
 S.M.A.E., Kimberley House,
 Vaughan Way, Leicester.

Closing date for your entries is May 5th and camping permits at the cheap rate.

Take a break at Brake

Ideally situated near the seaside of South Devon, is Castle Brake Caravan Park with easy access to Paignton Zoo, Powderham Castle, Cricket St. Thomas Wildlife Park AND *Woodbury Common*. So family outings with built in flying site, what more could you ask for? Castle Brake might well be the place to be for Bristol and West's Woodbury Weekend May 11th, 12th and 13th. The contest opens on Saturday evening with a 'Champagne' event for Open Rubber, Power, Glider and Vintage Rubber followed by a barbeque and prizegiving at the Caravan Park. More comps follow on Sunday (see *What's On*). Caravans are 6 berth and are only £14 for the two nights (£5 per extra night) . . . please don't spill your dope on the carpets! See their 'ad' in this issue

National Free-Flight Championships Programme

Saturday, May 26 — 10 a.m.

British Airways Trophy	A/1 Glider
Hales Trophy	1/2A Power
308 Trophy	Coupe d'hiver Rubber
Sparklets Trophy	CO2 Power
HLG Trophy	Hand-Launched Glider

Sunday, May 27 — 10 a.m.

Thurston Cup	Open Glider
Model Aircraft Trophy	Open Rubber
Sir John Shelley Cup	Open Power
Frog Junior Cup	Combined R/P/G (under 16)
Womens' Cup	Combined R/P/G
Lady Shelley Cup	Tail-less
Jubilee Cup	Vintage

* * *

CO2 Scramble Sponsored HLG (approx. 5 p.m.)

Monday, May 28 — 6 a.m.

(Events below flown in rounds; timetable at control)	
Ronytube Cup	F1A Glider
Fred Boxall Trophy	F1B Rubber
Eddie Keil Memorial Trophy	F1C Power

Wanted . . . Money

The Free-Flight Team Support Fund is now off and running; treasurer is Mike Woodhouse and cheques should be made payable to 'F/F Team Support Fund', and sent to him at 12 Marston Lane, Eaton, Norwich, Norfolk NR4 6LZ. This is a fund entirely separate from the *SMAE* and intended solely to ease the financial burden of both entry fees and travel costs borne by those taking part as the British team in European and World F/F Championships.

Wanted . . . Team Manager

Applications are invited for the post of team manager of the British team competing in the European Free-Flight Championships at Livno, Yugoslavia

Aeromodeller



Left: one aeromodeller who likes to get up there with the birds is John Bridge - in his micro-light - a Typhoon wing with special trike undercarriage. Below is an air shot John took last year of Woodvale '83 . . . no prize for spotting someone in the crowd?



from August 27th to September 2nd.

It is unlikely that any financial assistance will be available from the SMAE and potential team managers may wish to assess their chances of getting some form of sponsorship prior to applying. Please apply in writing before April 30th to Trevor Faulkner, Chairman, F/F Technical Committee, 4 Birchitt Close, Bradway, Sheffield S17 4QJ.

Help . . .

Sometime in the past, near or distant we do not know, some naughty, rotten stinker 'got at' Aeromodeller's archives and purloined — yes stole (!) — some pages from May and June, 1946 Aeromodellers . . . the only copies we have. Should any kind person have spare copies (yes, I know that's wishful thinking, but we could always use the photocopier . . . Ed.) we would very much like to hear from them . . . Alternatively if you should see pages 363 - 366 or pages 415 - 418 laying around . . .

Team Race Silver Jubilee

This year is the Silver Jubilee of the Wharfedale 1000 class 'B' Team Race. Last month's 'From the Handle' gave a potted history of the event and also some helpful hints on how to go about building your entry for 12th August. There's even rumours of there being a Vintage section too (might suit me . . . Ed.). Sadly nowadays, to run and promote what should be a prestigious event is not an exercise to be taken on lightly . . . it also costs money! The event is probably one of the oldest running entries on

the contest calendar — why not make its Silver Jubilee a real 'special' . . . enter, donate or sponsor . . . extra prizes would not only be most welcome, but in turn may encourage a larger entry.

R.A.F. Waddington — Its History

Despite the fact that RAF Waddington first opened as a Service aerodrome in November 1916, and subsequently became the longest serving bomber station in the World in 1982, when it completed 56 years, its history has never been properly recorded. In an attempt to correct this omission, the Station Commander has asked that every effort is made to trace the station history back as far as possible.

Waddington began life as a training station for the Royal Flying Corps, closing on 31 December 1919. It re-opened on 25 October, 1926 as the home of No. 503 Special Reserve Squadron, later to be called No 503 (County of Lincoln) Squadron. Thus began 56 years of bomber flying.

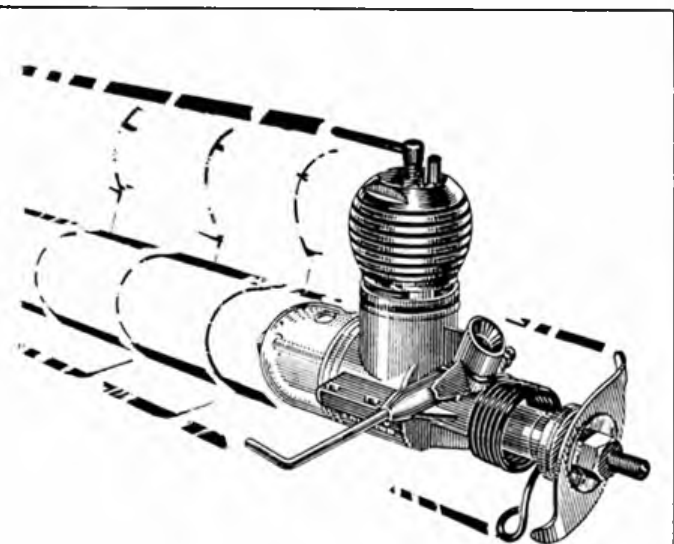
The plan is to produce a large illuminated record of the station, incorporating photographs, manuscript, paintings and any such memorabilia that comes to light. In due course, if the product appears marketable, there may well be an effort to have it published. Any item that is loaned, will be duly cared for and returned to the owner with minimum delay.

If you have anything that may be of interest please contact: Headquarters, Operations Wing, Royal Air Force, Waddington, Lincoln.

What's On . . .

April 21, 22	SMAE F/F EASTER MEETING OPEN AND FAI G/R/P Venue Barkston Heath Contact: Trevor Faulkner, 4 Birchitt Close, Bradway, Sheffield S17 4QT	June 2, 3	Sabey, 53 Rederech Crescent, Hamilton Entry £1 per event (50p Juniors) Pre-entry preferred ROTHWELL AERO MODEL SOCIETY, VINTAGE SCALE AND SPORTS FLY-IN Venue Nostell Priory, Nr Wakefield. Contact: J Webster, 9 Cautley Drive, Killinghall N Yorks HG3 2DJ SAE for details and entry forms
April 22	F3B LEAGUE EVENT (EUROPEAN CHAMPIONSHIPS TEAM TRIAL) Venue Southern venue Contact: Geoff Dallimer, 36 Farthing Drive, Leichworth, Herts Tel: 04626 78745	June 3	F3B LEAGUE EVENT (EUROPEAN CHAMPIONSHIPS TEAM TRIAL) Northern venue Contact: Mike Proctor, 8 Church Rise, Holby, Yorkshire Tel: (0904) 489386
May 5	F3B LEAGUE EVENT (EUROPEAN CHAMPIONSHIPS TEAM TRIAL) Venue Cranwell Contact: Norman Mitchell, 159 Windsor Drive, Wigginton, York Tel: 0904 760991	June 3	SMAE CONTROL LINE MEETING — F2B, F2C, SPEED, GOODYEAR A & A COMBAT, AT/R, CARRIER, NOVICE AEROBATICS Venue Hullavington Contact: Bob Horwood Tel: 0272 48769
May 5, 6	SCALE WORLD CHAMPIONSHIPS TEAM TRIALS, R/C, C/L Venue RAF Elvington Contact: Vic Willson Tel: 0734 471946	June 3	INDOOR — UNIVERSAL CONTESTS AND FUN FLYING Venue Cardington Contact: B Hunt Tel: (0484) 862353
May 6	SMAE MINI/VINTAGE F/F MEETING A1, Cd/H, A, HLG, CO., SOP, VINTAGE Venue North Luffenham Contact: Trevor Faulkner, 4 Birchitt Close, Bradway, Sheffield S17 4QT	June 3	SMAE — SLOPE SOARING F1E Venue Sheffield Contact: T Faulkner, 4 Birchitt Close, Bradway, Sheffield
May 6	SMAE CONTROL LINE MEETING — F2B, F2C, SPEED, AT/R, B T/R, A COMBAT, CARRIER, GOODYEAR, NOVICE AEROBATICS Venue Barkston Heath Contact: Bob Horwood Tel: 0272 48769	June 3	YORK RALLY: SCALE AND VINTAGE FLY-IN, FREE STYLE AEROBATICS, F3B LEAGUE EVENT Venue RAF Church Fenton Contact: D Smith Tel: 0904 34281
May 6	2ND ROUND CLASS 'A' BRITISH DIESEL COMBAT CHAMPIONSHIPS Venue Barkston Heath Contact: B Waterland Tel: 0778 343722	June 3	THREE KINGS C/L SPORTS AND VINTAGE DAY Venue Old Cropton Aerodrome Contact: Derek Bird Tel: 01-874 6394 Fly for fun special prize for best vintage (pre-1955) Silencers and insurance compulsory
May 6	TONBRIDGE OPEN THERMAL SOARING EVENT (BARCS LEAGUE) Venue Leigh Park Farm, Nr Tonbridge, Kent Contact: K. Miller, 18 Bounds Oak Way, Southborough, Tunbridge Wells, Kent £2 Pre entry, frequency and alternate plus SAE	June 3	WALSALL MAC FREE FLIGHT SCALE DAY INCLUDING VINTAGE F/F, RUBBER, POWER CO. Venue Walsall Airport, Greenacres Entrance Contact: Geoff Spencer Tel: 021-558 3676 No pre-entry, everybody welcome
May 12, 13	BRISTOL AND WOODBURY WEEK-END Sat Champagne Event for OR, OP, OG, Vintage Rubber Sun OR, OG, OP, 'All-in' FAI, Vintage Precision, Venue Woodbury Common Contact: Elton Drew, 2 Downfield Close, Alveston Bristol BS12 2NJ Tel: Thornbury 415082	June 9, 10	RAFMAA/SMAE THURSTON TROPHY COMPETITION F1A, F1B, F1C Mini events on 10th Venue RAF Barkston Heath Contact: Brian Baines, 2 Church Walk, Meirham, Lincs LN4 3HP Camping on airfield Sat night pre-entry £1 50 per event with SAE
May 12, 13	SANDOWN PARK MODEL SYMPOSIUM EXHIBITION & DISPLAY Venue Sandown Park Racecourse, Esher, Surrey	June 9, 10	KING'S CUP AIR RACE FOR ALL TYPES OF STAND OFF SCALE Venue Birchwood Park, Warrington Contact: Arthur Searl Tel: Parbold Zoo Simple rules — fly for fun competition
May 13	PANDAS VINTAGE MEETING Venue Pontefract Racecourse Contact: Dave Ashton Tel: 0532 861434	June 10	SMAE 4TH AREA MEETING — F/F, O/G (Team + Plugge); F1C (Astral Trophy) Cd/H Venue Local area venues Contact: Area Comp Secs or SMAE 0533 58500
May 13	THREE KINGS FLY-IN — C/L STAND OFF SCALE, PROFILE SCALE Venue Old Cropton Aerodrome, Contact: Wel Cordwell Tel: 01-784 1661 Silencers and insurance compulsory	June 10	THREE SISTERS '500' GY only Venue Three Sisters Contact: Tom Millar Tel: 0204 56890
May 19	"MODEL 84" MODEL EXHIBITION — ALL TYPES OF MODELS Venue Hurst School, Baughurst, Tadley, Hants Contact: K Searle Tel: Tadley 2264 Organised by Air Training Corps No 2403 (Aldermaston) Squadron Flying field and pool (electric only) and room for cars — all modellers welcome	June 10	SMAE SCALE CONTEST, R/C, C/L, CO., F/F Venue Amesbury Contact: Vic Willson Tel: 0734 471946
May 19, 20	'INDOOR' — 2nd F1D TRIALS Venue Cardington Contact: Laurie Barr Tel: (0628) 25595	June 10	NORTH LONDON RADIO CONTROL MFC — SCALE DAY Venue North London MFC — Baldock Contact: R Barley Tel: 04427 4737 Snacks available, prizes, entry fee £1 00
May 20	CONTROL LINE SPEED COMPETITION — ALL CLASSES Venue Old Parade Ground, Piddington, near Bicester Contact: Dick McGladdery Tel: 01-994 6320	June 10	AEROMODELLER SCALE DAYS Venue Old Warden Contact: Aeromodeller Tel: 0442 41221
May 20	SMAE 3RD AREA MEETING, F/F, F1B (Weston Cup & Plugge), O/P (White Cup), O/G Venue Local area venues Contact: Area Comp Secs OR SMAE (0533) 58500	June 17	INDOOR — 'FLYROD' 2g E2B NOVICE/EXPERT Venue Cardington Contact: Laurie Barr Tel: (0628) 25595
May 20	SMAE SPRING SCALE COMPETITION R/C ONLY Venue Merryfield Contact: Vic Willson Tel: 0734 471946	June 17	OXFORD NFC RALLY, A1, Cd/H, HLG, VINTAGE RUBBER, All flown in rounds Venue Port Meadow Contact: Andy Crisp, 30 Portland Road, Summertown, Oxford
May 26, 27, 28	BRITISH F/F NATIONALS MOST F/F CLASSES Venue Barkston Heath Contact: SMAE Kimberley House, Vaughan Way, Leicester Closing date for pre-entry May 5	June 17	WAKEFIELD 500 GOODYEAR MARATHON Venue RAF Dishforth Contact: Brian Temporal Tel: 0924 270690
May 26/27, 28	1984 MODEL CRAFT & COUNTRY SHOW Venue National Agricultural Centre, Stoneleigh, Kenilworth, Warwickshire Contact: Mary White, Argus Specialist Exhibitions Ltd, Barkhamstead, Hertfordshire HP4 3EY Tel: (04427) 73291	June 22	FRIDAY EVENING FAI T/R Venue Three Sisters Contact: Jim Woodside Tel: 051 724 1442
June 2, 3	SOUTH COAST GALA — F/F OPEN AND FAI G/R/P Venue Beaulieu Contact: G Madelin, 51 Vesey Close, Farnborough, Hants	June 24	WHARFEDALE OPEN MINI GOODYEAR — SMAE RULES BUT NO AGE LIMIT AND OPEN MODELS Venue Dewsbury, West Yorkshire Contact: Jeff Smith Tel: Leeds (0532) 663432
June 2, 3	SCOTTISH FREE FLIGHT NATIONALS, Sat F1A, F1B, F1C Sun MINI, OR, OP, OG Venue Weston Farm, Newbigging, Carnwath, Strathclyde Contact: Ron	June 24	A COMBAT COMPETITION Venue The Embankment, Peterborough Contact: B Waterland Tel: 0778 343722
		June 24	BLACKBURN & DMAC SCALE/NEAR SCALE OR UNUSUAL MODEL RALLY Venue Pleasington playing fields — Blackburn Contact: Ray Stott, 18 Adelaide Street, Crawshaw Booth, Rossendale, Lancs BB4 8PW

Yes . . . even without a propeller this engine's on the move. Dav Cal producers of some of our favourite engines are moving . . . new address, The Loop, Woodbourne Lane, Douglas, Isle-of-Man. Their sole distributors in the UK are J. Perkins, 92-96 Greenwich High Road, London SE10.





IN THE MERRY month of May Fliar Phil rejoices in the sights, sounds and scents of the countryside. The sight of an aerobod with rubber motor fully wound — the purring (?) sound of engines — and the 'delicate' scent of diesel and glo-fuel! Bootiful! But to business and let us take a peek at this month's 'bootiful' photos.

Photo 1

Long-time readers of *Aeromodeller*, present ones, and indeed aeromodellers everywhere, will remember with respect and admiration, the name of D. A. Russell — one of aeromodellings truly 'greats.' In *Aeromodellings Hall of Fame* his place is secure. Fliar Phil is most grateful to Keith Harris of Nottinghamshire, for his vintage model of D.A.R.'s 'Vulcan' (an A.P.S. plan). Originally powered with a *McCoy 49*, it now has an *Ohlson 60*. A free-flight model, Keith is contemplating a conversion to R/C.



Photo 2

A fine model of a P51D 'Mustang' (built from a Brian Taylor design) by Brian Hubbard of Kent. Has *Skyleader 5* channel radio. A word of appreciation must go to George Elsegood for his excellent photography. Certainly one of the finest 'Mustangs' F.P. has seen.

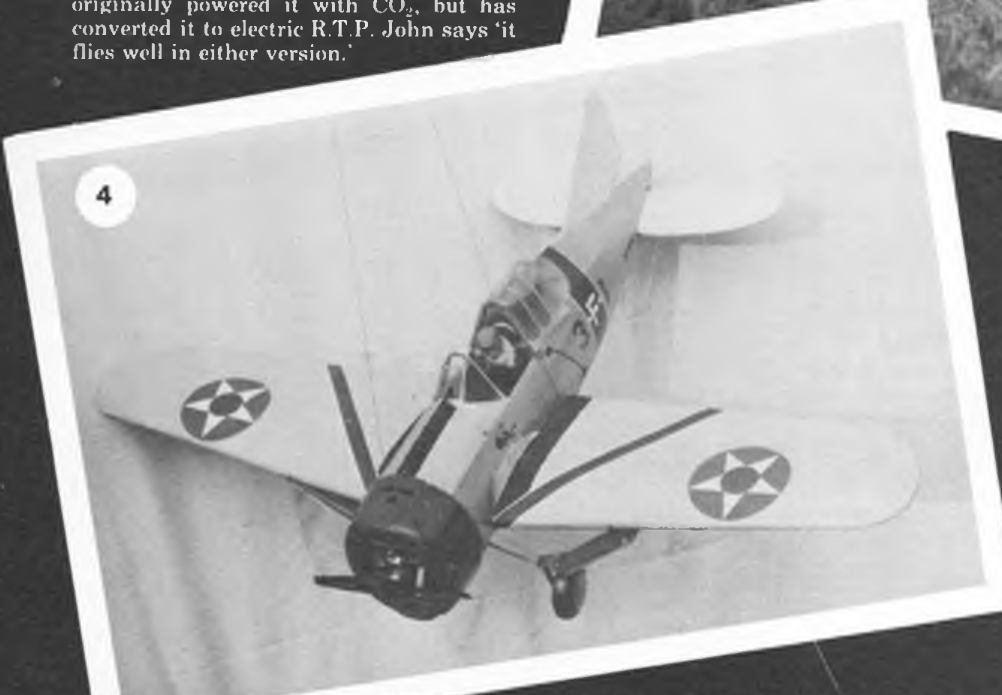
Photo 3

From a WWII 'Mustang' to a WWI *Fokker 'Eindecker'* of 22in. span. Most realistically photographed, it comes from John Watters of Manchester. A sheer delight to the eye, it also flies well. From an A.P.S. plan John originally powered it with CO₂, but has converted it to electric R.T.P. John says 'it flies well in either version.'



Photo 4

Based on a scale enlargement of M.A.P. plan MA/367, is this well built, and decorated, *Brewster 'Buffalo'* F2-A1 three-line control model. The photo comes from Mr. Spriggs of Spalding, Lincs. Span 56in. *Merco 61* power, 4 1/2 lb weight. Pre-war U.S. Navy colour scheme. Although the real *Brewster 'Buffalo'* was not the success it was hoped to be, Mr. Spriggs model, albeit rather sensitive has two years 'hairy' flying to its credit.



WINNER



6



5

Photo 5 Winner

Bearing in mind that the 'scale buffs' have had a goodly share of the 'limelight' in this feature, Fliar Phil was delighted to receive this 'fine portrait' of a real old favourite, first introduced over 30 years ago. The model is none other than the *Keil Kraft 'Southerner 60.'* Powered by a *Frog 2.5cc* diesel, it even sports *K.K. airwheels!* — it was built and photographed over 30 years ago, by Colin Read of Coventry. Great model, great photo and a delightful whiff of nostalgia! F.P. is sending you this month's camera Colin. Congrats!

Photo 6

Every line of the *North American A3J-1 'Vigilante'* has a menacing look about it, well displayed in this photo. The model was built by Mr. P. Thomson (a member of the *Elgin Modellers*) who hails from Moray, Scotland. No data was supplied with the photo, but F.P.'s thanks go to Mrs. Thomson for a most impressive photograph.

Photo 7

This 66in. span '*Buccaneer*' is indeed a versatile model. Peter Bull of Kilkenny, Ireland informs Fliar Phil it has interchangeable floats or wheels. With floats, water take-offs are good, AND Peter adds, "it will take-off from *wet grass!*" Power, *Merco 35RC*, Fleet 3-ch. R. C. Weight 5 1/2 lbs.

Summer is 'a coming in.' Fliar Phil hopes your photos will continue to be 'a coming in!'

7



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.

F1A GLIDER TECHNICALITIES

as seen at the 1983 World Free Flight Championships in Australia, by Martin Cowley.



Left: Matt Gewain's tow hook installation. Note Herejsi style rudder delay slider toward rear of tow hook plate which controls zoom launch. Spring with long wire released by timer.

missed the max on the 7th and 8th rounds, when the lift was very weak. But the ability to fly more tactically, may have made it possible to locate stronger lift".

"One thing for sure, circle towing in the high winds gave a competitor many chances to get into trouble and drop a flight. Many outstanding glider flyers dropped a max because of the wind".

The Champion

The new World F1A Glider Champion Matt Gewain is only the second American to win the title since Nordic became a championship event way back in 1946. The first being Gerry Ritz in 1959.

Matt has been a leading free-flyer in Florida, where he is now living and all three team members come from the same state. Like the other two Florida flyers, Matt's models feature much use of carbon fibre reinforcement. This material is now becoming very desirable for reinforcing wings to make strong light structures able to withstand the enormous loads imposed during zoom launches.

Pre-cured carbon fibre is the easiest form to use for modellers and is now available mail order from F1A team mate Jim Bradley, 1337 Pine Sap Road, Orlando, FL 32817, USA, or from *Twin-K*, distributors to model shops in the United States. These sheets of uni-directional pre-cured fibres are .008-.010 in. thick and can easily be stripped into small widths suitable for capping spars. Thick cyanoacrylate glues work best, or slow cure epoxy. Matt used a *Dremel* motor tool with router attachment to let carbon fibre strips into the trailing edge (TE) on his models, as well as reinforcing the leading edge (LE) and centre sheeting.

Matt says his earlier 'Pacer' models developed spanwise shear cracks in the centre panel sheeting, until he incorporated a carbon fibre shear web. This comprises two layers glued at 45° to each other under the balsa sheet. His main spar is a massive 1/4 in. x 1/4 in. spruce, tapering to 1/8 in. x 1/16 in. at the dihedral breaks to save weight.

Matt's models only use one large diameter steel wing joiner rod, with the TE of each wing half taped to a wing mount on the fuselage. This allows each side of the wings to be adjusted in incidence independently, in order to adjust the zoom launch transition to glide.

He describes his trimming thus:

"I shim under the wing TE with 1/16 in. ply and vary rudder delay to get lateral trim. My models use an Ivan Herejsi style timer delay rudder, which I set so I can hear it click just before the model rolls out from the zoom into the glide overhead".

"I change C.G. (balance point) position by moving nose weight to change pitch trim during zoom — forward to get the model to pitch up higher and improve stall recovery and back to get a flatter less loopy zoom".

Matt continues "I would like to commend all the Australians who put together a fine World Championships and thank the US team members and supporters, who were an essential part of success."

"My most significant problem, was that I kept breaking the tail boom on my windy weather model after D.T. landings on windy practice days. So, I had to fly my best thermal model, which was trimmed for calm to moderate winds through the whole World Championships. Consequently through most of the windy rounds, I picked the thermals from the ground and verified the lift with one or two circles on the line before release".

"If I had flown the windy weather model, which has less performance, I may have

Below: Yugoslavian hook operated Saelig timer start, as used by Mirko Karanovic. Spring to start timer also used to balance hook in forward position.

Paul Lagan

Another exceptional performance at this Free Flight World Championships for Paul Lagan, now an Australian national. He was 4th in F1B in 1979 then 3rd in F1A in 1981 and now 2nd again in F1A in 1983 — quite a record!

Although he flew an 'AL-29' and a 'Robin' in the contest, his most interesting model is his new 'Big Apple'. It is named after the models that inspired its design — Lee Hine's latest *Big Max*, Andres Lepp's *AL-29* and -33, the German *SPL* design and his own initials *PL*. Paul says this new model has 10-15 seconds advantage over his others in calm air and with better conditions expected for the 1985 Championships in Yugoslavia, many others may try this approach.

"I honestly thought Burgos was as close as I'd ever get to an F1A win", says Paul "and I'm still a little surprised with my result at Goulburn. Even so, I still shudder when I think of my fly-off, because I should have done a lot better." Paul says he will be unable to make the trip in 1985 to Yugoslavia, which is a great pity. "I may have another go in 1987 but for now, I'm enjoying my other pastimes." We all hope you make it Paul!



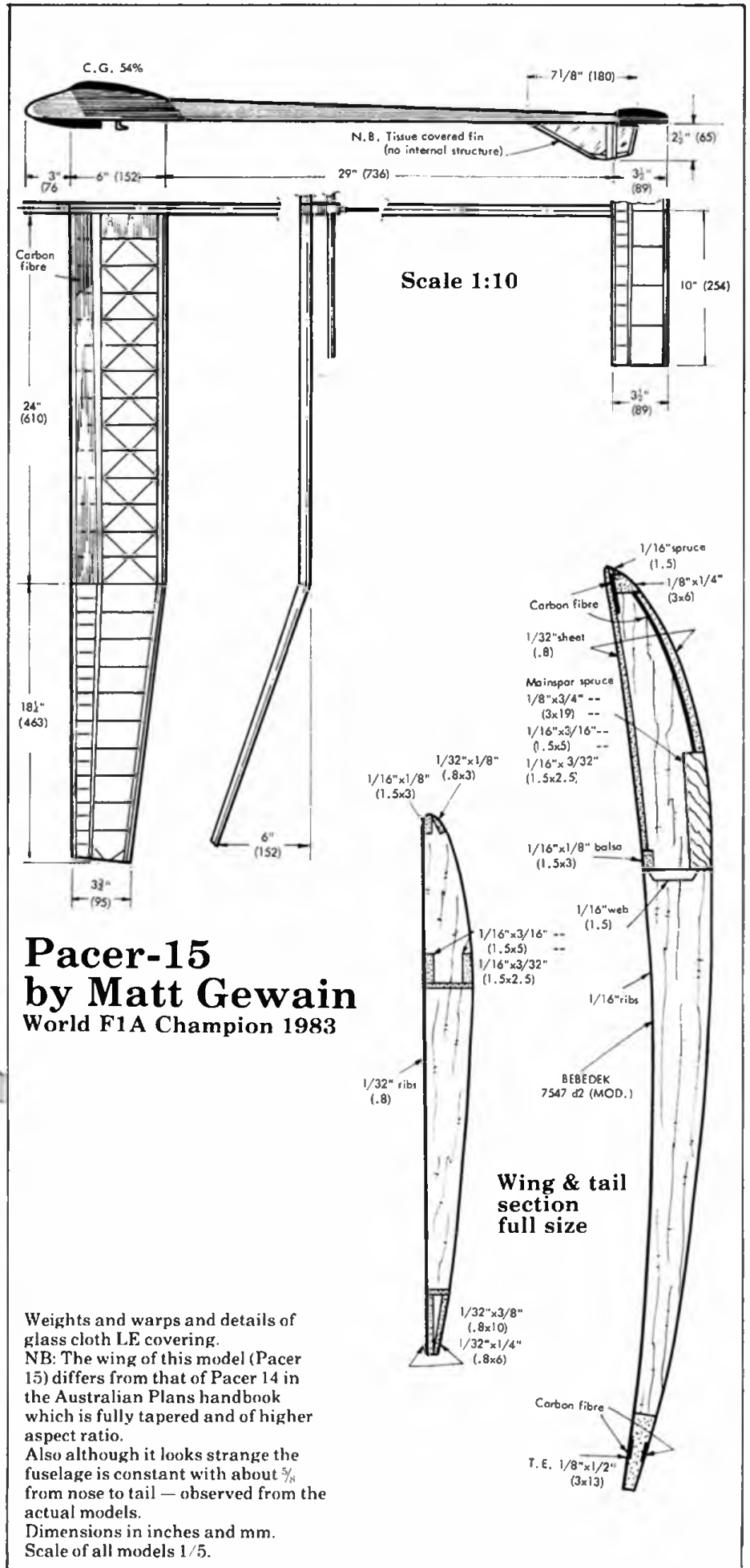
Tow Line Style

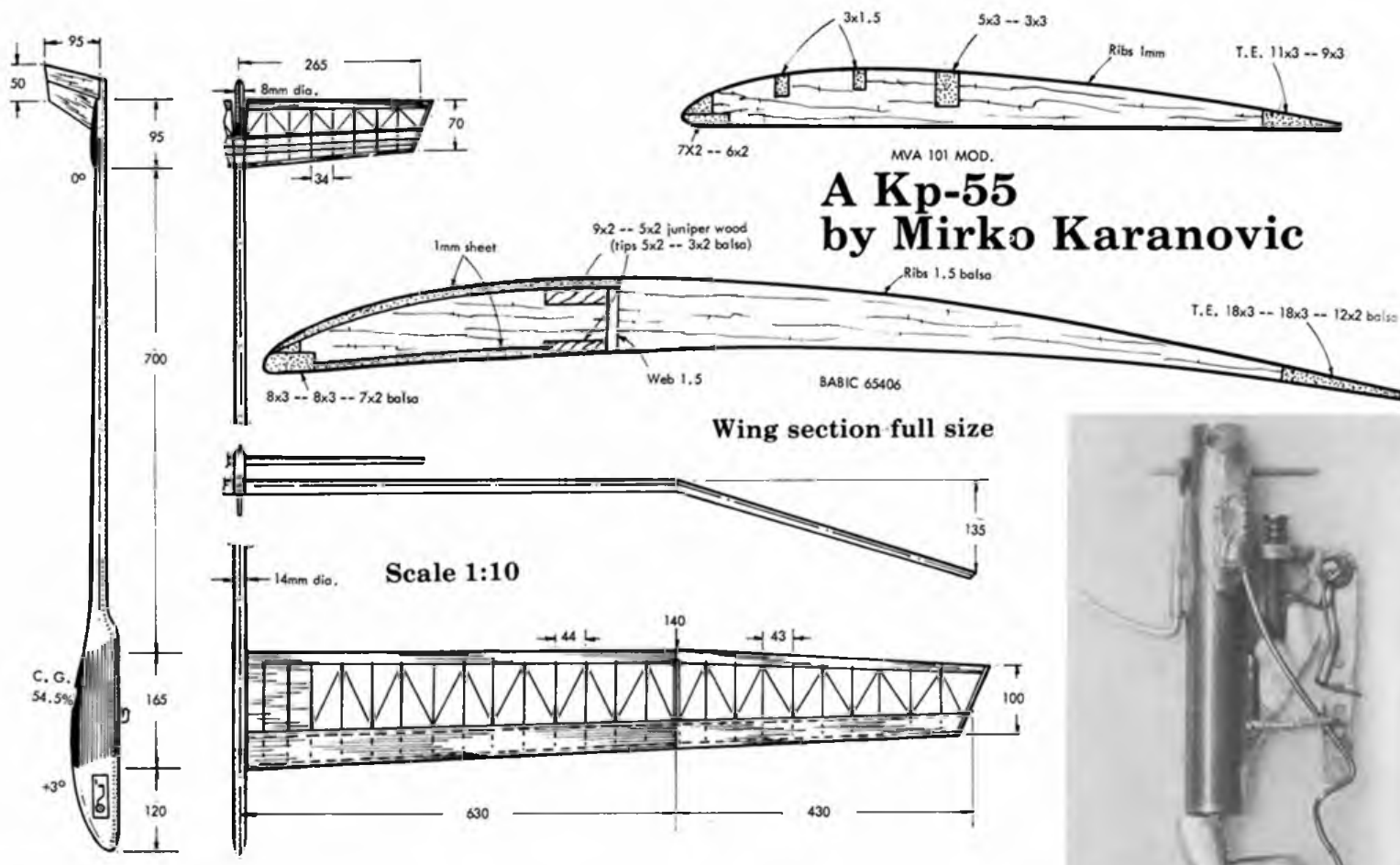
Towing an F1A glider using only the line, minus the winch, is becoming a universal style. Many flyers prefer pulling line in 'hand over hand' while running, as a quick and easy method of controlling their towline without the bother of using a winch — which can be prone to troublesome tangles reeling in and out.

But the real advantage to towing without a winch comes at the moment of releasing the model. Accelerating the glider towards the top of the tow to zoom release into a climbing turn to gain additional height, has long been a favourite tactic. Now when the flyer also releases his end of the towline, greater launch height can be achieved. The flyer no longer needs to grab a wasted handful of slack line prior to release to make the model come off the line. Another benefit comes when a flyer gets into difficulty while towing. If only using a free line, he can release his end to save a tangle or prevent the model diving and take an attempt. If a flyer ever releases the winch he is penalised with a zero score under the 'no throwing the winch' rule.

It was surprising however at the Australian F/F Championships to see just how many flyers showed poor towline style.

Right: neat slotted tailplane and rearward fin on Karanovic's model.



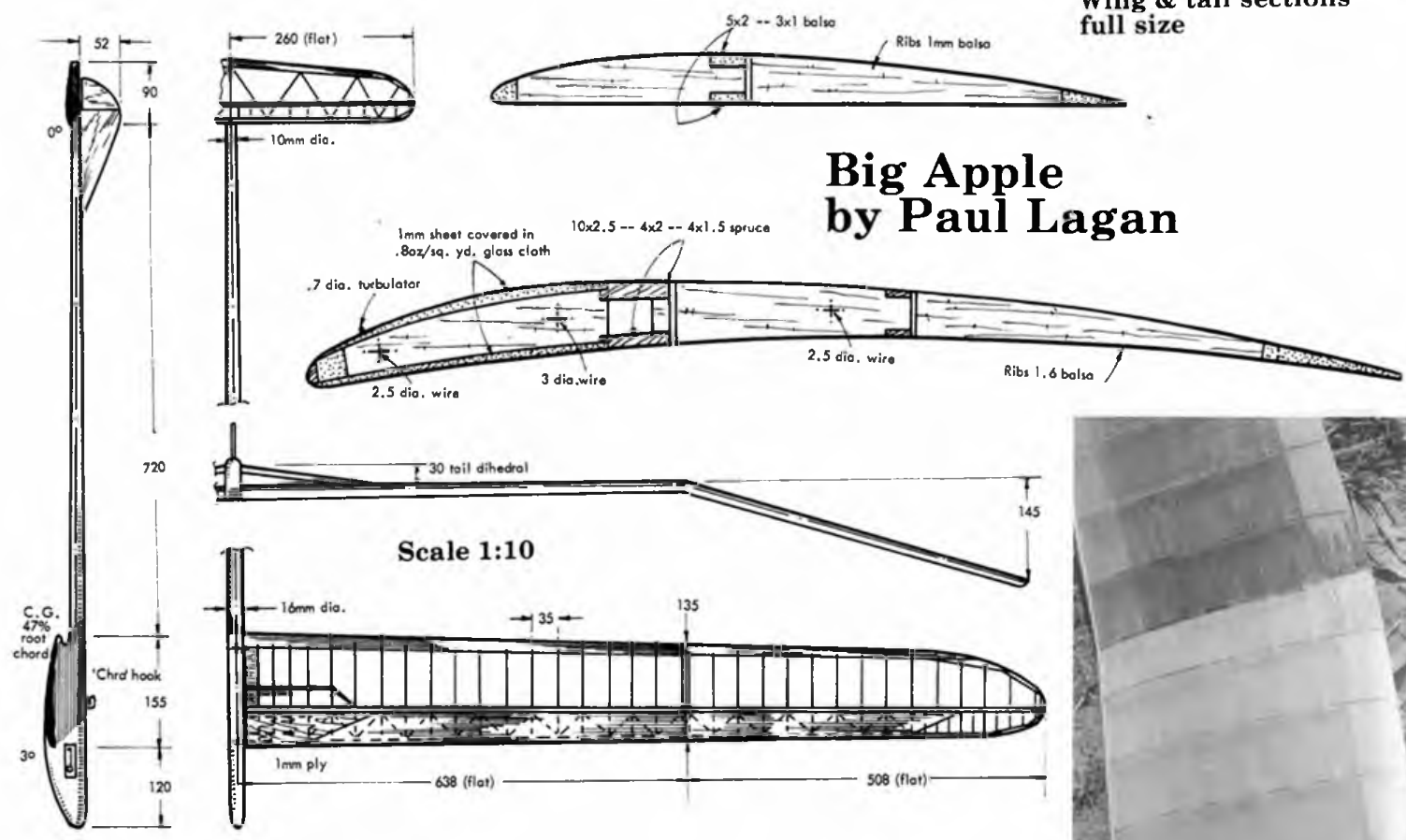


A Kp-55 by Mirko Karanovic

Wing section full size



Wing & tail sections full size



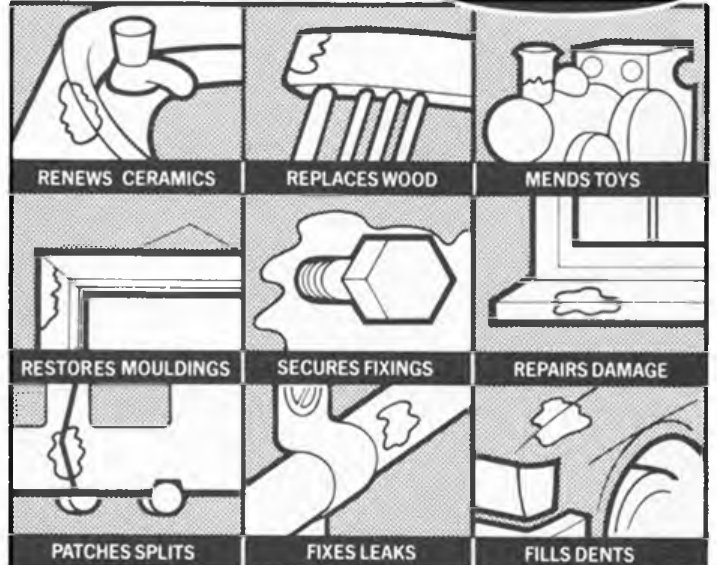
Big Apple by Paul Lagan





Permanent, Strong

SETS IN MINUTES



AND MUCH, MUCH MORE

Available in two sizes from D.I.Y. and motor accessory outlets.

To accelerate their model overhead, many chose to haul-in handfuls of line to speed up the glider, instead of positioning the model first, to then be accelerated by a fast sprint. Those wasted yards of towline would negate any zoom launch advantage the model might achieve. The Chinese, for example, showed good form by running with the end of the line held high at arms length just before releasing their end of the towline — that could give 6-7 feet above the ground. With the sinking speed for an F1A glider of about 1ft./sec., a good zoom of 15 to 20 feet, translates to maybe 15 to 20 seconds gained. Plus it is fair to assume, under higher tension than the 2kg pull used to check the length of the line originally, that the towline itself will have stretched an extra 10-15 feet. So it is easy to see that good towline style in releasing the model can pay off with significantly higher flight time, irrespective of the individual's model.

Timer Start Set-ups

What a releasable towline requires however, is a towhook to model set-up that allows the line to fall away freely, without

Top far left: simple timer start mechanism on Chinese models used to activate KSB type timers.

Above: loudest models on the field were Japanese who used miniature electric buzzers - see battery and hatch. Note on/off timer switch cover to keep out dirt - nice detail!

Below far left: interesting model by Paul Sahi, Finland, uses homemade carbon fibre tubes plus carbon fibre cap strips on ribs. 3mm fishing thread invigorators span ribs before covering.

Below: Jim Bradley's excellent new circle tow hook, available mail order from Florida complete with wires for timer start and auto rudder and adjustable towhook plate.

Repair, construct and mould in FASTGLAS



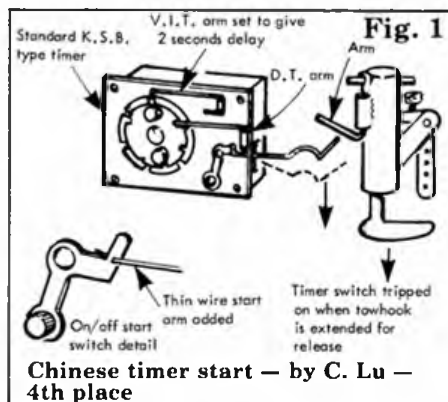
Make your own Glassfibre Reinforced Plastic (GRP) at home - the quick and easy way with FASTGLAS. GRP is strong, permanent, weather proof, will bond to most materials and can be made to any shape or size. FASTGLAS kits and accessories have 1000's of D.I.Y. and hobby uses, and are available from motor accessory and D.I.Y. outlets.

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Chinese timer start — by C. Lu — 4th place

hang-ups. The big problem area now becomes how to start the timer. The old pin and line system just won't work because the flyer having let go of his end of the line can no longer tug on it to pull out the pin! Most flyers using a latch type towhook now have some type of timer start mechanism (Figs. 1, 2), which is not operated until the tension in the towline, just before zoom, opens the latch.

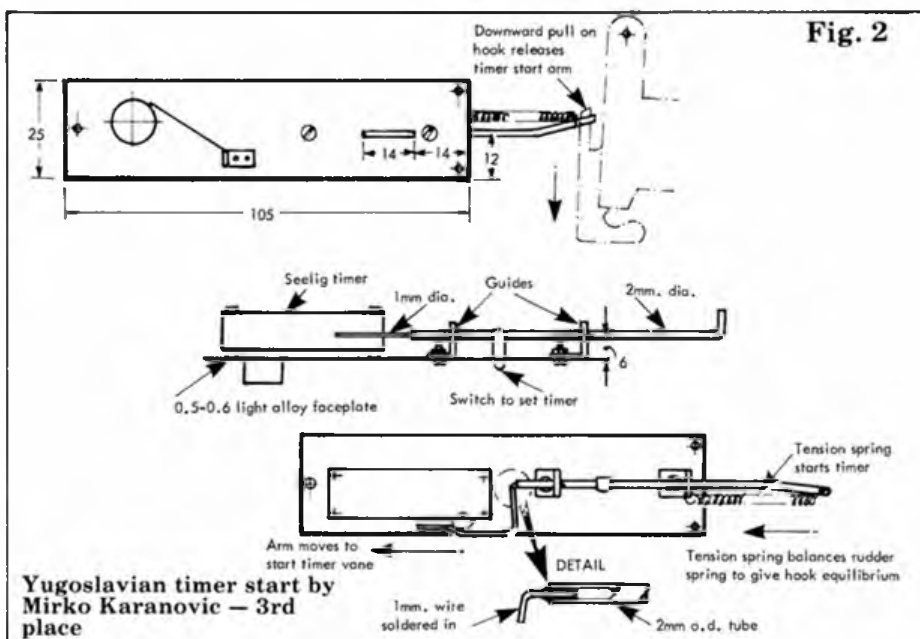
But another problem arises, especially when flying in windy conditions as in Australia. What happens, if a gust of wind unexpectedly unlatches the towhook! Simply put, the timer will now already be running and as it will probably be set close to the 3 minute maximum, the flyer is almost compelled to release immediately whether he wants to or not, as the timer is already running down, in order that he will not now DT short.

Electric Timers

Fortunately the new electric timers provide the solution to all these problems and also to the risk of a model flyaway should the competitor release the line without starting the timer, or having his line cut during a line cross with another flyer.

Electric timers are set up to be continually running down during the tow. Every time the flyer pulls on the towline a micro-switch resets the clock to a full 3 minutes. Now it doesn't matter if the hook gets unlatched in a gust, because further pulls on the towline will still reset the timer. At least the flyer has the option to continue towing, albeit straight only, to increase his chances of still making a good score in lift.

Two excellent electronic timers are available for F1A gliders. One is from top F1A flyer Thomas Koster, unfortunately not present at the 1983 Championships. Thomas' timers cost \$55 including battery and start switch, with trickle charger an

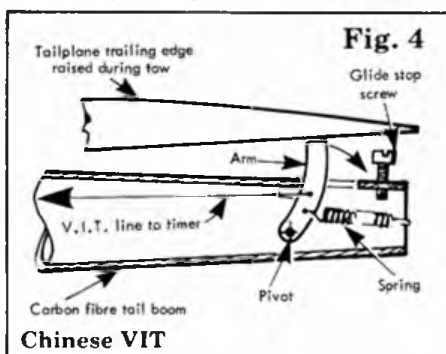


Yugoslavian timer start by Mirko Karanovic — 3rd place

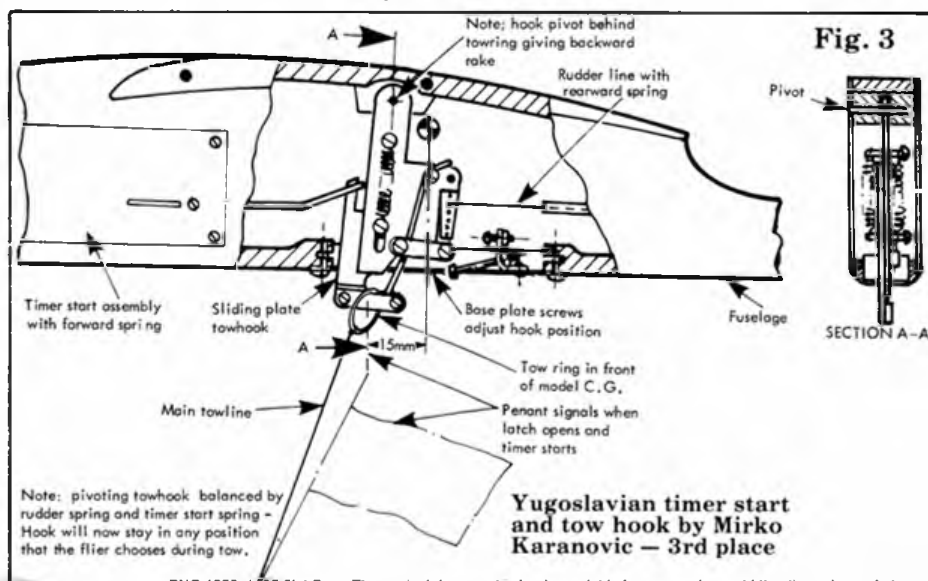
extra \$30 from Koster Digital, P.O. Box 54, DK-3400, Itillerod, Denmark. The other electric timer is made in California by Ken Bauer, his units, when available, sell for about \$30 with no accessories.

More Electronic Goodies

Convenience and reliability will surely force a major swing over to electric timers. But now the model has a battery on board, other options present themselves. Many competitors at the Australian Championships used miniature buzzers to help locate models down-wind, notably the Dutch and Japanese teams. Others, like Australia's Vin Morgan used small radio transmitters which emit a signal that can be tracked with a receiver carried by the retriever. Vin explained his gadget at the F F Symposium held during the Championships. But... this device may be illegal in some countries.



Chinese VIT



Yugoslavian timer start and tow hook by Mirko Karanovic — 3rd place

Towards the Ultimate?

In an age of increasing use of thermister lift detection, why not install one in a towline glider, wired directly to the retrieval buzzer. Such an electronic Nordic would allow the flyer below to monitor the air he is towing through by listening to the rising and falling pitch of the buzzer — which is easily audible 164ft. below on the ground. In marginal conditions this extra input of information may help confirm the centre of the thermal which the flyer has located with his electric circle tow glider!

Too Windy?

As new Champion Matt Gewain pointed out, many good flyers were unable to cope with the high winds in Australia with their conventional circle tow models. As things turned out, a simple straight tow model would have been more suitable for such conditions. The high wind speed would lift models straight to the top of the line and once overhead the gliders would enter an unwanted circle as the rudder kicked over.

Yugoslavian Hooks

Only teams like the Yugoslavians, seemed to have complete mastery of the conditions, using the original Issaenko concept where the timer start spring in front balances the auto rudder spring at the back. Now the hook is in equilibrium fore and aft. If the hook is pulled forward for straight tow it stays there allowing the model to kite overhead. Only when the model flies upwind, or the flyer runs back, and pulls backwards on the line, does the hook swing back to initiate a circle. This gives the flyer much better control of his glider because he can now select the exact moment he wishes the model to begin to circle — most important, especially in windy weather.

Sharp eyed readers will notice that this tow hook set-up (Fig. 3) no longer requires 'forward rake' with the pivot point ahead of the tow ring attachment point. This would give too stable a hook and the flyer may not be able to pull it back into the circle mode. Instead the Yugoslavian hook has 'backward rake' basically an unstable hook, stabilised by the balanced pull of the timer start and auto rudder springs. This set-up worked well for all the Yugoslavs, including Karanovic who placed 3rd.

SHOP TALK

NEW MODEL HOBBY PRODUCTS REVIEWED

Speed syringe . . .

No, not a new product for those misguided people who wish to shorten their lives! *Mac-Bond* is a twin syringe epoxy adhesive applicator, rather a mouthful and not cheap at about £1.45 . . . but *very* convenient for the model/flight box out on the field. Setting time is in the order of 7 - 10 minutes and one must also remember that the twin syringe system gives an accurate 'mix' every time and is quite economical in use, as you can make up just the amount you need very quickly. *Mac-Bond* is distributed by *MacGregor Industries* and should be available in your local model shop.

Fly-weight metal

Getting a realistic metal finish on an airplane can be a heartbreaking exercise, so this offering from *Coverite* although not the final answer may well help in a number of cases. *Micafilm* is a lightweight heat-shrink plastic film that does not have a heat sensitive adhesive coating. *Balsarite* (the adhesive) is applied to the structure and the *Micafilm* ironed on after a few minutes. *Micafilm* has a shiny surface on one side and a 'fabric finish' on the reverse, the 'fabric' side accepts paint readily. In this case, where the prime finish is not unlike shiny aluminium, the reverse side does not exhibit such a metallic effect — but then who uses woven aluminium anyway. If you are looking for a metallic finish check out *Micafilm* — it might be just what you want. Price per 65in. x 28in. sheet £5.10.

Almost instant gliders

Robbe are very well known in the modelling field, producing some remarkable radio control kits both for air and water. We have just received two interesting free-flight gliders which are extremely simple and quick to construct. They are the 'Astro', 1450mm wingspan, with an area of 24.1dm² and the 'Fantra', 720mm wingspan and 7.6dm² area. Both have all sheet flying surfaces with wings featuring a Jedelsky



Two additions of *Micro Mold's* range of available *Modelhob* gliders, above the A1 class *Mistral* 44in. span and right: 'Escuela' for two channel R/C.



type construction. Both have pod and boom fuselages with a nicely formed plastic pod, the 'Astro' having an aluminium alloy tail boom and the 'Fantra', spruce. The 'Astro' fits neatly into the A1 class albeit a little on the heavy side, so if you are not yet confident enough to build the conventional glider, why not build 'Astro' and then have a crack at one of the Mini comps? Both models have an *excellent* instruction booklet and *Robbe* are to be commended on the thought that has gone into these kits. *Robbe* certainly take aeromodelling very seriously and to encourage young people to take up the hobby have special bulk packs containing 10 kits, aimed at schools, youth groups, Air Training Corps, etc. Needless to say the bulk packs offer quite a saving over individual kit prices. Recommended retail prices are: 'Astro', £13.54 and 'Fantra', £7.53. Distributors are *Cougar Craft*, Woodmead Road, Holmbridge, Huddersfield HD7 2UX.

well in or out of competitions. The second kit is the 'Escuela' (I wonder what the translation is?) and is just the thing with which to relax on a lazy, hazy summer's day. Two metres wingspan and intended for two-channel radio control. Area, 40dm² and all up weight should be around 1100 grams. What is so interesting with the 'Escuela' is that it has plastic ribs, there must be a slight weight penalty, but all have lightening holes and 'weighed in the hand' do not feel too heavy. Unlike previous kits using plastic ribs these are intended for use with balsa cap strips — elsewhere construction is conventional. Instructions are supplemented with a number of photographs and although at present you need to speak Spanish to read them, translations will be included shortly. Prices: 'Mistral' £7.15, 'Escuela' £25.75.

Charge in the right direction . . .

Flair Products of Blunsdon in Wiltshire have just sent us one of their latest useful electrical accessories . . . a mains charger for lead/acid batteries. Like many of today's electrical products that are so useful it comes as a black plastic housing, roughly 8cm x 6cm x 6cm complete with integral 13A three-pin mains plug. This provides a very neat package with no mains lead to trip over. Just connect the two wires (length 1.5m) to your lead/acid cell, plug into 230v mains and 'hey presto' your battery is on charge. The unit is switchable for 2v, 6v or 12v output, so should cover the needs of nearly everyone. Recommended charging time for a flat battery is two hours per battery ampere hour i.e. an 8Ah battery fully recharged in 16 hours. This implies a charging rate of about 1/2-amp which is not enough to harm the cell if it has reached the fully charged state so there is no worry about overcharging. With one of these around there can be no excuse for flat batteries . . . The unit is double-insulated and also has a thermal fuse cut-out. Altogether simple and easy to use and costs £8.95.

Two more floaters

Micro-Mold, distributors of the Spanish *Modelhob* kits have two additions to their glider range, both interesting for different reasons. First the 'Mistral' an A1 of conventional construction, pod and boom fuselage and 1130mm wingspan. It is interesting primarily because it is yet *another* A1 class glider kit, of which there are at present quite a few available (*Aeromodeller* will be reviewing several, including the 'Mistral' in a few months). All the wood looks good and the diecutting cannot be faulted, altogether a straightforward kit which should perform

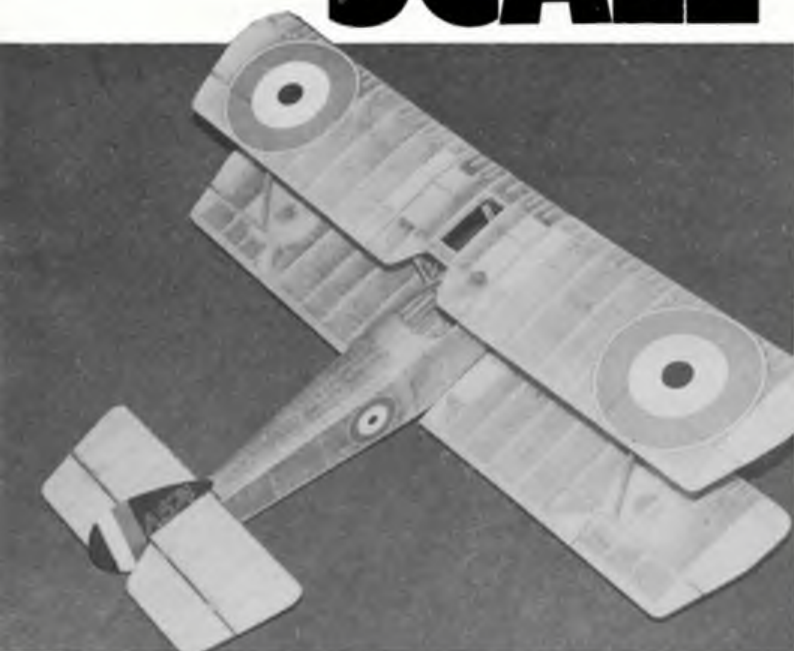


Two highly prefabricated kits from *Robbe*, above 'Fantra' the smaller of the pair at 28in. span and right the 'Astro' A1 class, at 57in. wingspan.



BEGINNERS SCALE

Part V. Finishing and flying, the last of the present series by Bill Dennis



Left: the fin lettering on the Sopwith 'Pup' was done with white Trimfilm, with the black filled in with a Rotring pen. Below: a comparison of this photo of John Coker's Kittyhawk with the earlier view of the similar Me109, shows what can be achieved with a skillful paint job over a simple structure.

Take a well filled brushful and lay it on the silk quickly and smoothly, with as few strokes as possible. It may seem a little thick, but it evaporates down to a thin layer, revealing the silk texture again. Matt dope and silver cover quite well and two coats should suffice. Gloss is not so easy and can take many coats to cover, with the danger that surface detail is lost. After my experience with the DH34, I realised I should have given it a preliminary coat of matt red to cover, after which one or two coats of gloss would have been adequate.

Markings

Roundels are the easiest of all, but you will need a large pair of spring bow compasses. It is important that these have elbow joints in the arms so that the pen can be arranged vertically, no matter how wide the compass is spread, or what the 'terrain' is like. The dope will need thinning to a runny consistency.

When you have found the exact centre of the roundel, stick on a couple of pieces of

WITH the model covered, make sure that there are no hairy edges and that all balsa sheeting has been adequately sealed. Go over the metalwork with some tissue soaked in thinners to remove all grease.

Cellulose colour dopes are still the best way to paint a Free-flight scale model unless you are using a glow motor, which you shouldn't be! A Free-flight model is prone to unorthodox landings and sooner or later it will need repairs to the covering. Repairs involve patching with tissue, silk and dope in the usual way and if you have painted the model with enamel, followed by fuel-proofer, the application of dope on top will result in the finish wrinkling and turning into a nasty mess. It can be done, with care, but it is difficult to get an invisible mend. The advantage of cellulose is that it is resistant to diesel fuel, especially a mineral oil-based home brew, so does not need proofing. As a result, repairs are a much easier task. Another advantage is that it dries very quickly.

There have to be disadvantages of course and the first is availability. Humbrol have discontinued their range of gloss colour dopes, although I believe Titanine are still producing colours. An SAE to H. Marcel Guest of Riverside Works, Collyhurst Road, Manchester M10 7RU will bring a list of matt and gloss dopes. The price of the dope is reasonable but postage is high, so it helps for a group to get together, or else collect in person. I believe that matt dope is made by adding a 'matting agent' to gloss dope. I don't know what this is but if anyone out there with paint expertise can let us know, it would be very useful. The other disadvantage of dope is that the application of one colour over another — especially light on dark — will soften the base colour and allow the two to leach together, i.e. white on red becomes pink. This happens when trying to paint roundels over khaki green for example, the way round it in most cases is to paint the light colours first, adding the main scheme afterwards. An alternative is to put



Right: a great deal of care is needed to accurately reproduce lettering. In this case, Letraset should yield the appropriate styles and sizes, and is easily modified by scraping with a pointed blade when in place.

on the base colour and then paint on the insignia in enamel.

I do not possess an airbrush but have always found a brush perfectly adequate for applying colour dope. Invest in a good quality sable, about 1/2 in. - 3/4 in. flat and take care of it. A cheap brush is worse than useless since you will be forever picking hairs out of wet dope. Before starting in earnest, take a fine brush and paint into any narrow gaps, for instance elevator and aileron hinge lines. Having done this, you can concentrate on continuing your smooth brush strokes from leading to trailing edge.

tape to take the point and draw in the red, white and blue rings with no overlap. Finally, do a ring of khaki, or whatever is the camouflage colour. Use a small brush to dope each colour up to its appropriate ring and then fill in with the large flat one.

Crosses, lettering and other insignia will all need to be carefully drawn on your plan and then transferred to the model. Take time to get the proportions right — civil markings are notoriously difficult, particularly on rudders. With a good side elevation photograph you can work out the proportions relative to rib positions, rudder chord, etc.



Left: Eric Coates Blackburn White Falcon on a fly-past, and looking very realistic.

Far left: the weight table on the author's DH34 is an example of the use of Letraset. Left: the wing registration on the author's Puss Moth was done without documentation and was subsequently found to be grossly wrong - beware!

When you think you've got it right, it helps to have a fresh pair of eyes look it over for mistakes you have overlooked.

How do we get the markings onto the model? I've tried many methods — painting freehand, masking tape, film, homemade transfers, etc., all with varying degrees of disaster. With masking especially, I always seem to get a ridge of paint when I have to apply several coats. Perhaps it would be better if I had an airbrush.

I now use one of three methods, depending on the size of the markings to be done. For large figures, say over 2in., the method described by Alan Callaghan in September 1983 *Aeromodeller* is best. To re-cap, a card template is cut to the exact shape and lightly taped in place. If the lettering is black, the outline is drawn on with a Rotring pen and filled in with enamel using a small brush. For colours, I make the templates from 1/16in. ply and sand a chamfer onto the edges, enabling me to do the outline with a spring-bow pen filled with colour dope. If you find you cannot get on with using dope, enamel will be alright, since it is unlikely to get too fuel soaked on the wings and rear fuselage.

For smaller letters, Charlie Newman gave

me a tip about a product called *Trimfilm*, used by 'solid' modellers, available from *Hannants* of Lowestoft. This is simply sheets of solid colour transfer approximately 2in. x 6in. The insignia is traced onto the reverse paper face — back to front of course — and cut out with a sharp knife and straightedge. In this way you can try the letters in place before committing yourself. The film is very thin, even showing the texture of the underlying silk, and yet is opaque to the extent that underlying red does not show through white film. The only disadvantage is that it is fragile to handle. The instructions refer to various solutions to be used, but I have not found any of these necessary. The transfer is dipped — not soaked — in water and allowed to soften. It is essential to wet the surface to be decorated, otherwise the transfer will stick firmly where you first put it and any attempt

to move it will result in fragmentation. (How about using slightly diluted washing-up liquid to wet the surface — Ed.).

Finally, for very small lettering, such as weight tables, use dry transfer lettering such as *Letraset*, which is available in a huge range of styles. It is horribly expensive but there is no simple alternative.

The last task to be done is to fuel-proof inside the engine bay. In fact, I like to smear on a thin layer of *Araldite*, making sure there are no little gaps around undercarriage fittings, etc. for fuel to run into.

Trimming

There are several important checks to be carried out before venturing onto the flying field. If these are done properly you will increase your chances of having the model fly 'straight off the drawing board'. With the model fully assembled and rigged, check all the flying surfaces for alignment and warps. Ensure that any rigging wires are tight enough to do their job but not so tight that they are pulling the wings out of shape, or distorting the dihedral. There will probably be some wing warps, particularly on a thin winged biplane and the most common one is wash-in at the ailerons. As we will be trimming for slow flight in a wide circle, small warps are not critical, especially if they are equal on both panels but avoid excess wash-in on the starboard panels as this will spin the model in to the left. The relative incidence of the port and starboard panels can be checked by eye, by sighting from behind. The actual incidence needs measuring to a datum line but both of these should have been checked during construction. There is not much that can be easily done to correct such faults short of taking the fuselage apart, at least if you know the fault is there, you will know why the model is not flying!

Warps on the tail surfaces are not to be tolerated if you cannot remove them, build new components. At best you will have a model that flies an unpredictable pattern.

The next thing to check is the balance point. I have read theories about Centre of Gravity (C.G.) positions but I don't think that pin-point accuracy is necessary on a scale model. What is important is that it is well forward — say 25% back from the leading edge on a monoplane. If the model

A view of the Pup prior to trimming, still minus pilot, gun and engine.



has a small tail, or short tail moment, a forward C.G. will help to suppress a stalling tendency and improve penetration in wind. I have to admit that I locate my C.G. relative to the wheels, in order to try and get a good take-off but I shall come to that later. Above all, no matter how much lead it takes, get the balance point *right*.

Having got the model potentially air-worthy, do a few test runs on the engine, to see that it starts, runs evenly throughout a tankful, and for how long. Nothing can be worse than to get to the field and have to start fiddling with an engine. With such distraction, you tend to do silly things when the motor eventually runs, like launching on full power with right rudder. Finally, include a precautionary degree or so of downthrust and 1° of right sidethrust for a short nose, 2° for a longer nose.



Above: the Puss Moth being test glided. Take care to always launch the model on an even keel. Right: the Sopwith 'Pup' after being brought down from the tree by rocks. Note that although the ribs have gone, the spars remain intact!



To the Field . . .

In addition to the usual toolkit, take a selection of different propellers, which are a useful trimming aid; a notebook and pencil and finally a ruler, and straightedge for measuring rudder and elevator deflections.

It goes without saying that the wind is light and your field free of obstructions (see later!) and is covered with long grass. Do a few test glides to see if anything is amiss. A scale model is more heavily loaded than any other type of Free-flight model, with more drag, resulting in a relatively fast glide and high rate of sink. Due to its configuration it may also be difficult to hold for launch. Under these circumstances it is very easy to misread a poor launch for a stall or dive, so repeat several times before changing anything. Using a gentle slope will give the model more 'air time' to settle down.

Do not proceed to power flights until you are sure you have eliminated any stalling. A stall on glide for a scale model has a nasty habit of building up into a series of zooms. How often does *your* model pull out at the bottom of a stall and come to a smooth stop in the long grass, rather than pull up again into a final nose-cruncher? Similarly, only a wide turn should be tolerated, preferably to

the left. Ideally you should be going on to the next stage with the rudder and elevators at zero deflection but whatever the angle is, *record* it in the notebook.

If all the previous checks have been carried out properly, nothing too awful should happen under power. Make the first flights with the propeller on back to front since this is a more reliable way of reducing thrust than trying to slow the motor. If you have been playing with the motor for a while, clean the oil off your hands and the fuselage, since a heavy model can slip from your grasp on launch.

With enough fuel for 15-20 seconds run, launch the model straight into any wind, with the wings level and the nose pointing at the horizon. I'm convinced that many scale modellers do so little flying that they do not know how to hand-launch and they will throw the model up into the air or down at the ground without knowing it. The speed at which you launch will come with experience but suffice it to say that few scale models will gently float from your hands. I prefer to stand still and launch, rather than run along, since you can lose control that way. If the model slowly balloons up with its nose level and then pancakes into the ground, you probably launched too slowly.

What did the model do? With the prop reversed, the ideal pattern is a long glide, either straight or slightly left. As with the glide, repeat a couple of times before making adjustments but eliminate any stall or right turn with thrustline adjustments before increasing power.

Carry on with the prop the right way round and the motor slowed down by opening the needle, or under-compressing, whichever gives the most consistent run. By now the model should be climbing to sufficient altitude to see what the glide is really like. If the power trim is nearly correct, then it is permissible to make minor adjustments to the rudder and elevators but beware especially of tightening up the glide into a spiral. The ideal pattern is a wide left/left . . . *never* let the model fly to the right under power.

If you have chosen your subject well, it should not be long before you get that exhilarating first perfect flight. The only total failures I have had, involved aeroplanes with very small fin/rudders, giving directional instability. On one flight the model will turn in to the left, the next one to the right. The cure? — preferably build another aeroplane, or enlarge the rudder.

If your flying field has an area of tarmac, or you wish to enter contests, then you will want to try take-offs. A rise off ground (R.O.G.) flight is always more satisfying than a hand-launch. It goes without saying that the model should be properly trimmed, especially with regard to stalling, since a take-off will exaggerate any such tendency. Lubricate the axles and give the model a few test pushes along the runway. It may run straight but if it veers left as often as right, it should be OK.

With enough fuel for a 30 second run, release — don't push the model pointing dead into or slightly to the right of the wind. If the model runs straight and true and takes-off perfectly, you can congratulate yourself. Otherwise one of two things may happen:

1. The model runs straight with its tail in the air and eventually tips onto its nose. This happens because either the C.G. is too close to the axles, or the model has been trimmed with too much down-elevator. Re-trim!
2. The model veers around with the tailskid glued to the floor, possibly ground looping into the bargain. This can be more difficult. If possible, move the C.G. forward to within 1in. of the axle. If it is already there, you may find the model tips onto its nose while ground looping!

This behaviour on the DH34 had me foxed for a while, but we eventually decided that the relatively small fin/rudder was being blanked off by the bulky fuselage and was not giving the model any direction at the slow initial take-off speed. Since I had plenty of power in hand, I simply put on a large propeller which blew more air past the fuselage and on to the rudder. Re-trimming with the C.G. slightly *further* forward and the elevators flat eliminated nosing over.

The moment of truth . . .

And the 'Pup'? Flying weight turned out at 27oz. and the C.G. seemed reasonable without ballast. However, a few test glides revealed a severe stall which could not be cured with elevator, so some lead was added to move the balance point to an inch behind the axle. This produced an acceptable glide, so it was on to the low power flights.

Both Charlie Newman and Eric Coates had independently suggested that there may have been problems of lateral stability with the 'Pup' but I am happy to report that the model flew well with only a tweak of right rudder to open out the left turn.

Unfortunately, I was not able to fine-tune the trim because I put the model 20 feet up in an impossible tree! With no ladder, ropes or small boys around, I had to resort to hurling large stones and it took about 15 hits before the model came down.

However, I was amazed at how little damage was done. Whilst nearly all the ribs had been knocked out of one wing panel, all the spruce spars remained intact. I have no doubt that a 'knock-off' model would still be up there, while an all balsa structure would have been reduced to confetti.

Well that wraps up this short series which I hope has encouraged some more activity in Free-flight scale. As I said in the first article, the best way to improve your technique is to come to a rally or contest and look around and ask questions. Also, it would be nice to see a new name on the Superscale trophy!

Going Solo

Part 2 Solo I Glider

a practical approach for the beginner
with Trevor Faulkner

IF YOU BUILT and flew the small glider described last month you should have a pretty good idea of the effects on flight-pattern simple adjustments produce. Because of the light weight and small size, most if not all of your trimming and testing will have been done indoors; in fact, only in the calmest and driest conditions is a model of this nature usable outside.

Larger and heavier models cope with a variety of less favourable conditions. They will be waterproofed, ('doped'), be of a more rugged construction so that they can be more easily handled in windier conditions, have 'crash-proofing' features, (really 'damage-limiting' rather than any form of guarantee against crashes) and employ a wider range of materials and construction techniques.

This month's model is a step towards the type of design which aims to perform well even in testing conditions. You will notice some features with which you are already familiar, particularly the sheet construction and the wing mount. In addition, measurements are marked directly onto the wood, so the plan carries dimensions for transfer to the balsa. It introduces cambered surfaces, a built-up box fuselage, D/T, (de-thermaliser), rib-making, a little wire-bending, and the technique of mixing and applying dope.

Tools

(a) Measuring and marking

This gradual increase in complexity means that a few more tools are needed, although nothing unusual is required. For Marking-out a *rule* is required. For measuring purposes any type will suffice but it makes sense to have a steel version which can double up as a cutting edge. Don't be tempted to use the thin 'whippy' sort of folding rule; its lack of depth makes it dangerous, as the knife can slip over the edge. 12in. is the minimum length, a two-foot job is ideal.

A tri-square is invaluable for established modeller and beginner alike. The writer prefers the small version sold for metal-working use; a blade length of 3in. is usually adequate. If cash is short, a set square or postcard will do but won't give the accuracy required with the same ease of use.

Keep looking out for anything which will act as a good straight edge. Sometime in the future you'll come across sheet stock which has a curved edge. Then you'll start checking every sheet you get and a long, true edge is needed for this. But for now, you'll need to be able to draw straight lines about 2ft. 6in. long and so long as the drawn line is straight, your steel edge can be used in 'instalments' when cutting.

A very soft pencil, (6B) or a fine fibre pen will mark balsa without scoring. You may

manage with a biro . . . but only light pressure should be used.

(b) Cutting

As mentioned last month, any thin blade can serve but when using a straight edge, a handle, (as on a modelling knife), gives greater control than the stiff back of a single edge razor blade. Fine-pointed blades are ideal for light cutting, so don't worry about a range of shapes yet.

Ply and thicker strip should be cut with a saw. A fret saw will cut both, a 'razor saw' should only be used on balsa. At a pinch, a section of hacksaw blade can be used for cutting strip to size. The saw I use most often is a 'Piercing Saw', sold for jewellers and silversmiths. Like a small fret saw, it takes the same and finer blades and is easier to control.

(c) Sanding

Removing excess wood to shape or smooth its surface is an essential technique so simple that at first sight it doesn't require description. Unfortunately, the 'to-and-fro' method which seems natural is generally unsuitable for balsa. Two things must be right. First, the grade of paper, and second, its support. For balsa, *coarse* is about 80

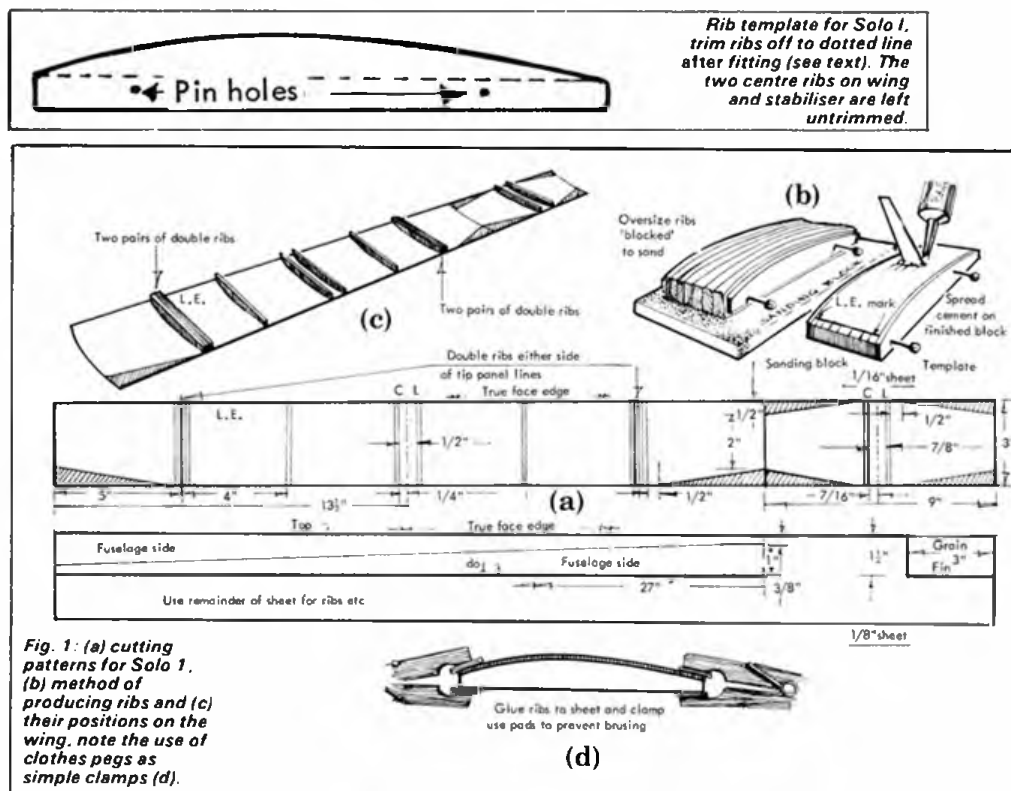
Grit, *medium* about 200 Grit and *fine* about 360. The branded papers have grit sizes printed on the back. Although we are using the term 'Sand-paper' this is very imprecise. Don't be put off if you're shown 'Garnet-paper' or 'Wet-and-Dry' . . . they all work, have the same gradings and uses.

Supporting the sandpaper can be done with the fingers — particularly when light pressure on curved surfaces is necessary. In the majority of cases, the abrasive should be wrapped around a block, (cork, scrap wood, or similar) or, even better, secured firmly to the material. The thing to avoid is the loose edge of paper which can catch and tear thin sheet. All my sanding blocks have the paper *glued* to them with contact, (rubber), adhesive.

Experience will lead to preferences but give this 'simple' process due thought.

(d) Wire forming and cutting

This model uses 20 swg wire, an easy gauge to bend as required given a pair of fine-nosed pliers, (preferably round section). These have flat surfaces near the hinge which will grip sections needing to remain straight. What they won't do is cut the wire. For this a good pair of side-cutting pliers are necessary, with a supplementary pair of cutting slots adjacent to the joint. Good tools



of this type are expensive, cheap ones don't last, so why not buy a small medium file and use that for cutting at first? (It will also be useful in its intended role, too).

(e) Drilling

A hand drill with a chuck capacity up to $\frac{1}{4}$ in. can be regarded as a standard requirement. If your household hasn't got one and pocket money is scarce, it is possible to get by in the early stages by using a bradawl or fine screwdriver and then spinning a twist drill of the correct size between the fingers to enlarge this 'pilot' hole. This is a temporary measure only, so do aim to get the right tool as soon as possible. It's an investment anyhow... even non-modellers drill holes!

8p for the $\frac{1}{16}$ in. using your beam balance. (This is light-medium wood). The $\frac{1}{16}$ in. should flex fairly easily across the grain to give a $\frac{1}{2}$ in. 'bow' with little pressure. *Ensure that the grain of this piece in particular runs absolutely parallel with the sheet edges.*

Choose a couple of light, straight-grained strips $\frac{3}{16}$ in. sq. and test as shown last month. Buy a piece of $\frac{1}{8}$ in. dowel, (or beg a Kebab skewer of the same diameter), a piece of ply, 0.8mm ($\frac{1}{32}$ in.) about 6in. square. (Your dealer may not be willing to cut this size but may have strips of longer, narrower stock available. In this case, check that the grain of the outer laminates runs the length of the piece.)

You will soon get into the habit of keeping a scrap-box for oddments of material.

kitchen roll paper, pour a little dope onto an old saucer or tin lid, dip and wipe the dope on with the wad.

If you are using a brush, then when you have finished doping, pour some thinners into another screw-topped jar and wash out the brush immediately. Wipe dry and finally wash it with soap and water. Purchase of a brush has not been mentioned as an ideal type for doping (the only sort worth having) is quite expensive; at this stage of your modelling career, it's important not to break the bank. 'Buy in haste, repent at leisure' holds true in this as in many other activities.

When the first side has dried, note its shape. If it has curved more than $\frac{1}{8}$ in. and the dope has dried rapidly, add a few more drops of Castor oil to the mix. Treat the reverse side and allow to dry. Any curve will probably remain, as the addition of extra oil has diminished the shrinking power of the mix. Don't worry. Each surface is due for a second coat and will tend to equalise. Before re-doping, the dried sheet should be lightly sanded to remove the slight roughness — 'raised grain' — now detectable. A square, (4in. or so) of fine grade paper is stroked lightly along the sheet. Little pressure is required and your fingers will tell you when the sheet is smooth enough. *No wood is removed at all.* Now re-dope as before; work quickly as dope contains a very active solvent which doesn't take long to soften the first layer.

After both sides have been treated and the sheet is dry, sand lightly again, place on a flat surface and weight down with anything handy for 24 hours — paper-backs are fine as they don't leave marks on the sheet.

During this time, preparations can be made for fuselage construction and the wing and stabiliser ribs completed. Mark out the $\frac{1}{8}$ in. sheet as shown, making sure that the edge you work from is straight. With a firm grip on your metal straight-edge, make a first light cut. Repeat the stroke until the sheet is cut through, then move along the marked line cutting an extra 6in. or 9in. at a time. Check that the straight-edge doesn't move and don't try to complete a two-foot cut in one sweep — at least until you're very skilled.

Keep all the offcuts; they're used for the fin, stab mount and the ribs. Using the PVA (white) glue you used on the 'Trim Trainer' (last month's model), attach two $\frac{3}{16}$ in. sq. strips to one of the fuselage sides. Note that PVA is useless on doped surfaces and this design has been chosen to introduce you to the different properties of this and balsa cement. The illustrations show the sequence and the use of your building board. When the strips are securely glued, remove the pins and glue the remaining side in place. Keep the whole job on the 'board' overnight, so ensuring a warp-free fuselage.

Now turn your attention to the wing ribs. Mark out two patterns on your ply sheet, (or, even better, on a scrap of formica slightly oversize. Pin them together and sand down to give an identical, correctly-shaped pair of templates. Separate them and using one pattern complete with two pins inserted, draw round its perimeter to mark out an oversize rib complete with two small pin-holes on your $\frac{1}{8}$ in. sheet. (Mark the pin-holes clearly after taking off the template as they're easily overlooked). Mark out 14 ribs by this method, then carefully cut them out leaving about $\frac{1}{32}$ in. or so extra around the

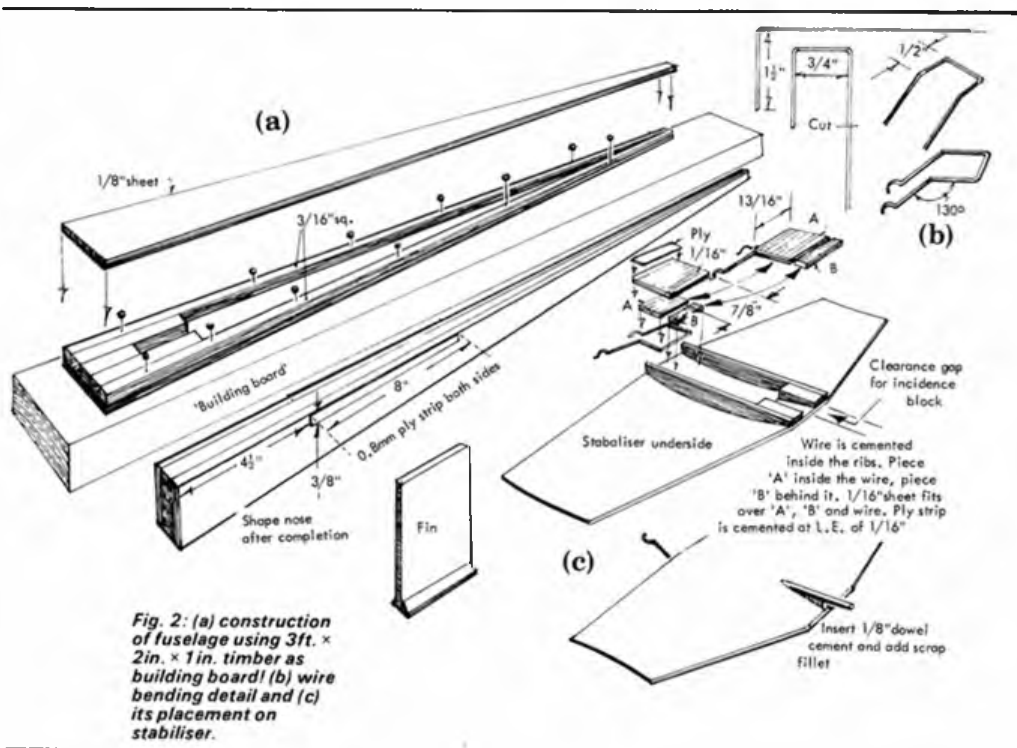


Fig. 2: (a) construction of fuselage using 3ft. x 2in. x 1in. timber as building board! (b) wire bending detail and (c) its placement on stabiliser.

(f) Odds and ends

The application of a little imagination will reveal many useful bits of equipment in the normal domestic environment. Clothes pegs, pins, brushes, paper, card, hardboard, expanded polystyrene... all prove very handy at some time or other. For now, you will need clothes pegs and pins, something to protect your working surface, a couple of jars with screw tops, scrap lead or solder for weight, and a simple 'building board'. A drawing board is usually quoted as ideal, as is a flat sheet of chip-board or thick ply to which a sheet of insulating board has been fastened. Doesn't sound much like an item for the 'odds and ends' column, does it? The reason is that, for this month's model, given a flat surface to work on, a strip of 2in x 1in. x 36in. deal is the only 'building board' required. Do check that the 2 x 1 is true, not only straight but not twisted, or 'in winding' as the term goes.

Wood selection

By contrast with the quarter grain sheet used last time, we need two straight-grained sheets, one $\frac{1}{16}$ in. thickness, one $\frac{1}{8}$ in., both 3in. x 36in. Weight about 4p for the $\frac{1}{16}$ in.,

Modellers are inveterate hoarders and it is easier if you develop a simple system right from the start.

Other materials

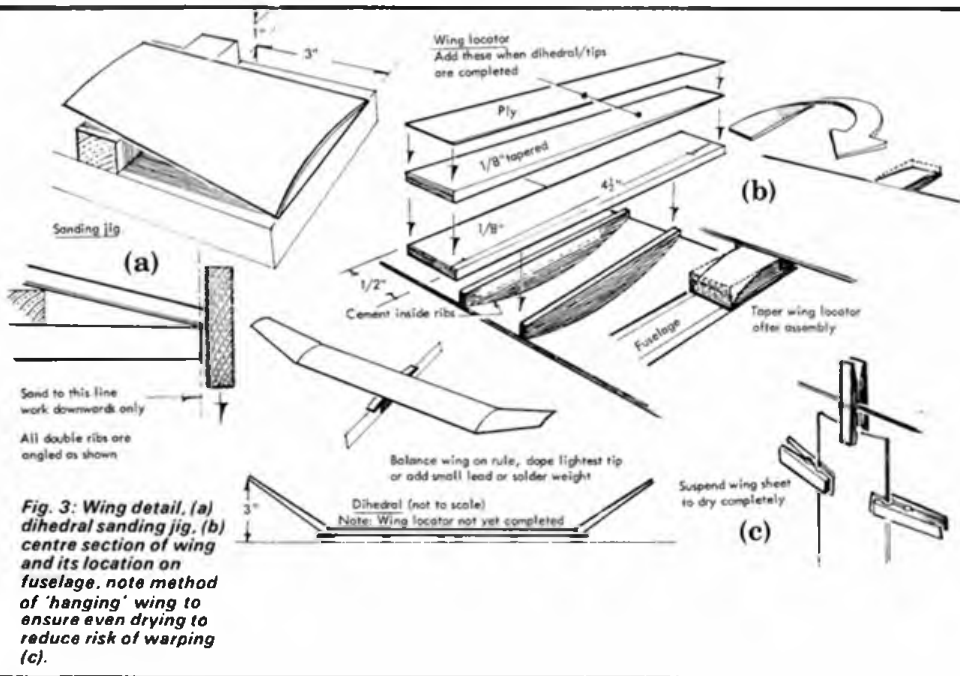
A length of 20swg wire, a can of clear dope, a small bottle of Castor Oil, a can of thinners and a tube of balsa cement complete our list. Now a start can be made.

Doping

Pour about $\frac{1}{2}$ in. of dope into a small screw-top jar. Add an equal quantity of thinners, and 6-8 drops of Castor Oil. Mix this well. Label the jar '50-50 PLUS C. OIL' or words to that effect. This mix is *not* used for tissue shrinkage and we don't want any confusion when covering future models. The addition of the Castor Oil inhibits the shrinking effects of the dope.

Solo I... Construction

The $\frac{1}{16}$ in. sheet will be doped before marking out. If you can borrow a soft paint-brush, about $\frac{1}{2}$ in. wide, use this to apply an even layer of the 50-50 mix quickly, without working the brush backwards and forwards. Stroke in one direction. If you can't borrow a brush, roll up a wad of



outline.

Take seven of the ribs and slip them individually onto the pins projecting from the template. Then complete the sandwich with the other template. Hold them as shown and sand the underside. Then hold firmly onto a flat surface and sand the top and the ends so that the ribs match the patterns exactly. Squeeze a little balsa cement onto the curved upper surface of the rib pack, and spread it over with a scrap of wood.

This is called *pre-cementing* and is the way to make the strongest joints with this adhesive.

Now remove your ply templates and treat the remaining seven ribs in the same way. Mark the leading edges (L.E.) of all the ribs.

Select 8 ribs and glue them in pairs to produce four ribs $\frac{1}{16}$ in. thick.

Let us assume that the $\frac{1}{16}$ in. sheet is now dry. Mark it out as shown and at each rib position, spread a thin layer of cement. Note where the L.E. appears and begin to cement the ribs in place, holding the sheet in contact with clothes pegs (wooden pegs with flat jaws are best, in any case, a pad of card between peg and balsa will reduce bruising).

All the rib L.E.'s must be facing the sheet L.E., and be as perfectly positioned as possible. The entire sheet will now need to dry, and is best suspended as shown. This helps to avoid warps.

Back to the fuselage. Add the two 0.8mm strips (see drawing) in identical but opposite positions. These will act as hardwearing parts of the wing seat and hold the wing dowels securely. Add the stab incidence wedge and the stab platform, checking that this will just fit inside the stab ribs. Cut out the fin and add two triangular 'fillets' to its base cut from $\frac{3}{16}$ in. square scrap. Before cementing this assembly to the fuselage, check that its base is *flat* and that it will stand vertically on a flat surface. Make sure that it lines-up with the centre of the $\frac{3}{16}$ in. strip when in position.

Mark centres and drill holes (starting each one from the ply side so that they meet in the middle) to take the wing dowels.

Bend the wire component for the stab, and carefully separate the stab from the wing. (A

flexible strip of material such as your thin ply can be used to guide the knife). Remember to cut lightly and repeat the cuts to do the job without splitting the sheet. Now part the wing tips from the centre panel and, using your sanding block, prepare the dihedral joint angles. This is easy if you keep your block vertical and it's worth making up the jig shown from scrap timber, (NOT balsa!)

Cement the tips in place, pinning through the ribs to hold and checking that the sheet top is perfectly joined. The tapered tip automatically gives the 'washout' required and should be equal on each tip.

Cut a ply strip $4\frac{1}{2}$ in. long exactly the width of the fuselage, (should be $\frac{1}{2}$ in.). Cement this to a matching tapered piece of $\frac{1}{4}$ in. and to another $4\frac{1}{2}$ in. \times $\frac{1}{2}$ in. \times $\frac{1}{4}$ in. These fit between the centre ribs of the wing to form the locating component which secures wing to the fuselage, as on the first model.

Study the reinforcing and locating additions to the stab and instal them with balsa cement, those at the L.E. holding the double wire hook in place.

Final touches

Give the fuselage two coats of your dope mix, using a cheap 'paint-box' type of brush to get around the fiddly bits if you had to use paper for your previous dope application. Remember the bits of un-doped wood, (tips and taper-cuts on wing and stab) and the ribs. Its a good idea to trim all the wing ribs as shown. The extra size gave the strength required when gluing and clamping with the pegs. Now it's not needed. Then dope the ribs with two thin coats, working quickly to avoid dissolving the cement joints. Balance the wing on the centre of the locator, as shown, adding a little weight to the lighter tip. A small sliver of lead is ideal, and can be cemented to the extreme tip.

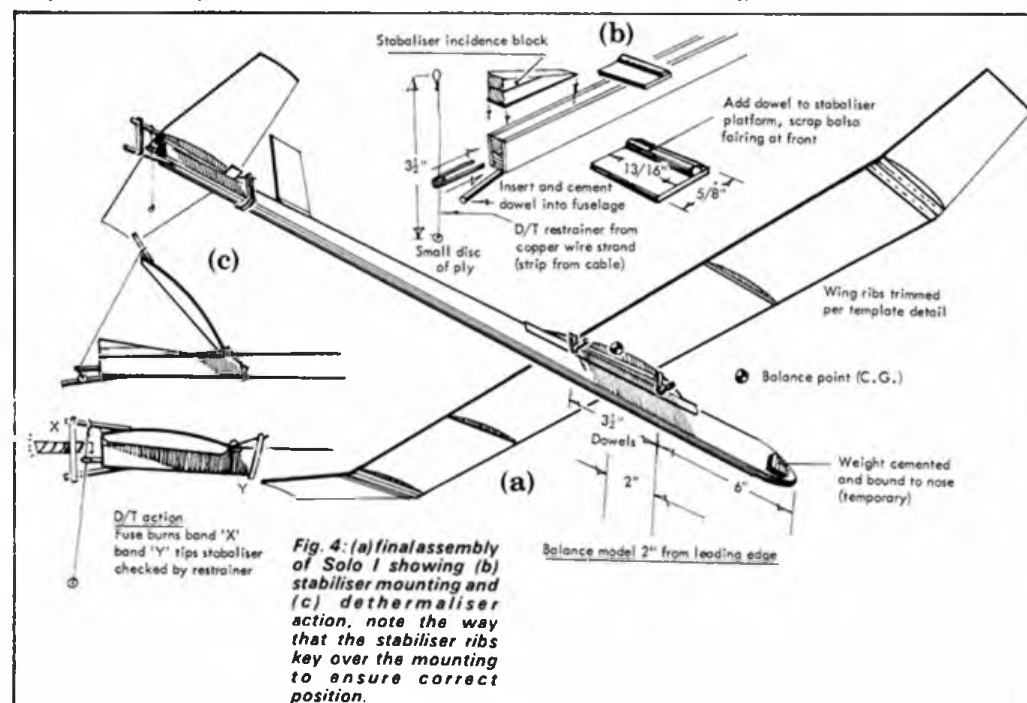
Assemble the model, checking that the stab is at 90° to the rudder. If it's not, add a sliver of ply on the low side of the stab mount and re-check. Then check the wing centre panel is parallel with the stab, and add a thin slice of 0.8mm ply to adjust if required (this may even need to be sanded down for final accuracy. Proceed slowly and get it right... it matters!) Add lead weight to the nose, until the model balances at a point 2 in. back from the wing L.E.

The D/T restrainer is made from a strand of copper wire (the same stuff as the hinges on the 'Trim Trainer') or a length of nylon fishing line. Check the function of the D/T, as per drawing and you're ready to test.

Testing

This is carried out by hand gliding outdoors on a *calm* day. This model flies faster than your 'Trim Trainer' but the principal is the same... launch smoothly, aiming at a spot about 10 yards ahead. Adjust the glide by adding to or taking away from the stab. incidence-block. Work systematically.

In the coming months, we'll deal with fitting an auto-rudder and tow-hook and building a tissue-covered wing and stab, which will fit the fuselage of this model.





The ACE Team

**Trainer, Racer or Stunter a
control line model for
everyone by Dave Cowburn.**

THE ACE TEAM provides the builder with a choice of model that ranges from trainer to club racer or with an extended wing, a stunt trainer.

The original model was designed to meet the specification for club racing as formulated by Humberside MFC (rules on page 253) the object being to produce attractive, easy flying models which can give close, exciting racing under normal club conditions on a grass site and be equally suitable for use at flying displays. (It is felt that models which are used regularly on the club field are going to be much better for display use than 'Specials' which are only brought out once or twice a year and with which the pilot is, therefore, unfamiliar!)

The resulting models have proved to be very successful and versatile, as, with minor alterations they can be built as trainers or sports-stunt models as well as the original racers. Details are included on the plan for all three versions:

- (1) Trainer with 2.5cc engine
- (2) Racer with 3.5cc engine
- (3) Stunt Trainer (extended wing)

In the past the 3.5cc class of engine was justifiably popular for control-line flying. The introduction of a general 2.5cc limit for FAI competitions led to the regrettable decline of this class of engine but thanks to the Radio Control car and boat fraternity the 3.5cc motor is once again receiving the attention of the engine manufacturers it deserves. Now, with 'Club-20', these motors are readily available in a form appropriate to Control-Line use and there is now a wide choice of engines very suitable for club flying. The club racers presented here are designed to exploit this class of engine on the average club site. The reasonably large wing area will absorb the power of a 'hot' 21 without speeds becoming excessive, while the safe glide and low landing speed makes for comfortable handling in normal club or display use. Control Line Club-20 could open

up a whole new branch of the sport, just as Radio Control Club-20 has for the 'Wireless' fraternity so why not *Circulate With the ACE Team*.

The model shown in the plans has been developed from two previous racers and draws heavily on established 'Goodyear' and 'Combat' practice. Four prototype models have been built in the preparation of the plans, a trainer with a PAW 2.49, two racers, one with an STX 21 'Club-20' and the other with a 3.5cc Oliver and finally a stunter using an OS 'Max' 25. All were built 'to the plans' and all fly well, despite the wide range of engine types and resulting variation in balance points (Centre of Gravity) — a very tolerant model which, with suitable choice of engine/version, should appeal to all Control-Line pilots from novice to expert.

Adhesives

Briefly three general types spring to mind, epoxy, PVA and balsa cement. Probably the most versatile for this model would be PVA (except where specified otherwise) this does not have to be mixed and has a reasonable setting time allowing positioning of components — particularly useful when bonding two or more long sections together such as the wing leading and trailing edges and the fuselage core.

Construction step by step

(1) Bond the 12 × 4.5 mm spruce spine to the 12 × 25 mm balsa fuselage core.

(2) Bond the 12 × 4.5 mm spruce to the 9 × 37 mm balsa for the wing trailing edge.

(3) Bond the three balsa strips to form the wing leading edge.

Leave the above assemblies clamped, pinned and/or taped for 24 hours to dry thoroughly.

(4) Cut out ribs, gussets, tips (glue on edge strips) tailplane, fin/skid, etc.

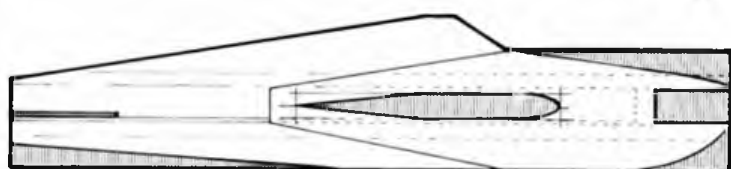
(5) Assemble wheel box (epoxy) and centre section unit, bolt the bellcrank between 3mm ply plates (see section), then cut slots in 6mm ribs to suit.

(6) Prepare the fuselage core to correct width to suit bearer spacing of engine being used. Add bearers (note short section of bearer material at front of core between bearers) and 12mm balsa fill in pieces. Plane up wing trailing edge while this assembly dries.

(7) Laminate up rest of fuselage from 12 and 25 mm strip incorporating the under-carriage box. Bind with adhesive tape and leave under weights to dry flat. (Sandwich between boards with newspaper to soak up the glue which will ooze out.)

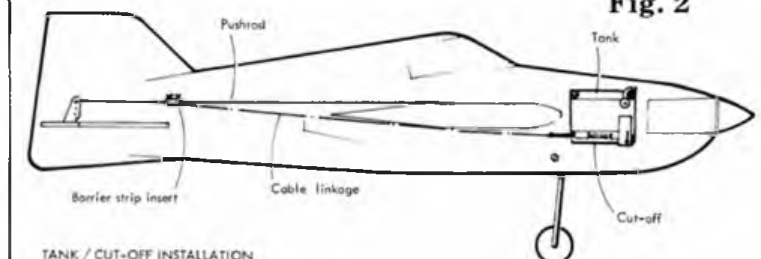
(8) Make a dry assembly of the wing over the plan, arranging suitable packing for the trailing edge (Stunter wing is extended by one rib-bay at each side, increasing span by 150mm). Mark lead-out positions on 'Port'

Fig. 1



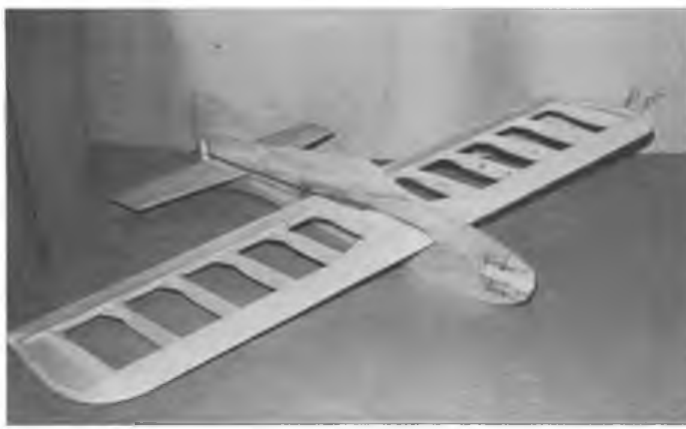
Marking - out fuselage blank

Fig. 2



TANK / CUT-OFF INSTALLATION

Right: the finished framework of the stunt trainer version of the ACE Team, note gusseted wingribs and extra panel on each wing.



ribs. Note the alternative sweep on the lead-outs depending on version being built. Disassemble and drill lead-out holes, elongating those in the inner ribs with a 'rat-tail' file to allow for the swing of the bellcrank. Reassemble wing, fitting lead-outs (double heavyweight 'Laystrait') and lead-out tubes (short sections of plastic tube — R/C 'snake' outer — epoxied to underside of tip) and check for full and free movement of controls. When satisfied, glue all components in position.

(9) 'Clean up' balsa core of fuselage and add 0.8mm ply sides. Hold with adhesive tape to prevent slipping (I should have shares in sticky tape!) and clamp or weight carefully until glue sets.

(10) Add over-length push-rod to bellcrank (retain with Zed bend) and fit centre-section sheeting. Epoxy tip-weight into leading edge recess near outboard tip and add gussets. When dry, plane and sand leading edge to shape, blending into the wing-tips.

(11) Prepare tailplane, joining stunter elevators with 'U'-shaped piece of 14swg wire and sew elevator(s) to stabiliser with terylene thread (Kite line) in a herring-bone figure of eight pattern to form a hinge. Add 0.8mm ply plates to cover joiner and reinforce horn mount.

(12) While fuselage blank is still 'square' carefully mark out wing slot. Note that the bottom flat surface of the wing should just touch the spruce spine (fig. 1). Carefully cut out the wing slot and file out to fit the wing closely. *It is most important that the wing, engine, and tail be fitted at 0° to the datum for a model which will 'groove' well.* Cut tailplane slot and drill for engine and undercarriage bolts while fuselage is still flat.

(13) Mark on profile of fuselage, cut and sand to shape.

(14) Mark vertical centre-line round tail of fuselage and saw slot for fin/skid. Dry fit this unit and plane, sand down the rear of the fuselage to blend into this unit. *Do not cut into the spruce spine.* Feather edges of ply doublers.

(15) The wing may now be permanently fitted. (Racer or trainer wing having previously been covered with *Solartex* — strongly recommended!) Mark a pair of lines round the wing at the fuselage position and use these as a guide for 'square' fitting. Key the area of the joint by pricking through the *Solartex* with a pin. Slide the wing almost into position then spread epoxy over the marked joint area. Push the wing fully home and 'knife' extra epoxy into the joint to seal any gaps.

(16) Add tailplane and fin, fairing the latter into the fuselage with soft scrap balsa. There is no fin off-set on any version, the model relying on speed for line tension.

(17) Temporarily fit the engine, bedding down onto 3mm thick alloy plates and fitting the bolts through from the inboard side of the model, the nuts being above the engine lugs. When satisfied with the installation epoxy the bolts and plates to the model.

(18) Add 12mm cheek cowl, blending into the wing root and spinner. Block in between bearers round the crankcase.

(19) Adjust length of push-rod and fit to elevator horn. Note that the cut-off line on the racer passes from the tank, under the wing (fig. 2) (fit a short tube 'fairlead' where this rubs the wing) and is soldered to a section of 'terminal strip' on the push-rod for adjustment of the cut-off point. This must be fitted before the end of the push-rod is bent to fit the elevator horn!

(20) Reinforce the area around the wing leading edge and cheek cowl junction with nylon and epoxy. Treat the tailplane/fuselage junction similarly. (These areas being prone to 'stress cracking').

(21) Dope tissue onto all bare wood (except wing of stunter) and apply clear dope or sanding sealer, sanding between coats, to give a satisfactory base for the colour finish — probably 5 or 6 thinned coats and a couple on the *Solartex*.

(22) The prototype models were finished with car 'touch-up' sprays as follows:

(i) Blow over with white primer (just enough to mask most of the wood grain) and inspect for any holes, blemishes, pock marks, etc., which escaped the tissue and dope stage.

(ii) Rectify these blemishes with appropriate filler (*Fine Surface Polyfilla* is good for this ... Ed.), rub down and re-prime where necessary.

(iii) Cover stunter wing with *Solarfilm* and mask off before finishing fuselage.

(iv) Build up colour finish with several light coats to avoid runs. (I keep the spray can nozzles in a jar of thinners rather than wasting propellant clearing the jet as suggested in the spray can instructions.)

(v) Decorate with appropriate transfers and paint in the cockpit.

(vi) Leave a couple of days to dry thoroughly then fuel-proof with *Tuf-cote* or *Rustings 'Plastic Coating'* (available from the better DIY stores).

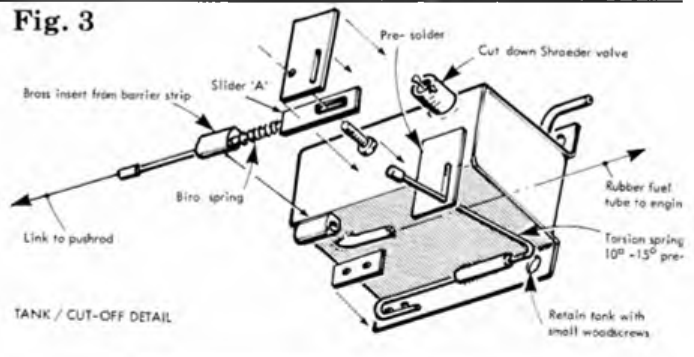
(23) Fit engine, undercarriage, tank and link up the cut-off with *Laystrait*. Adjust cut-off, by shifting terminal strip on push-rod, to 'fire' at 10° to 15° down elevator.

Flying

If this is your first attempt at control-line you would be well advised to enlist the aid of an experienced pilot for your first flights. Let him take off and fly a few laps before taking control while he 'covers' your hand on the handle. If you cannot find an expert then be careful! Check everything twice — Up is up, etc. — and that when the model is held at shoulder height by an assistant and you 'point at it' with the handle, the elevator is at neutral. When completely satisfied that everything is OK start the engine and tune to a good, even power output — slightly rich and compression a little 'soft' i.e. peak out then back off ¼ to ½ turn on needle and compression. Have your assistant hold the model back with the nose tracking slightly out of the circle, pick up the handle and take up the slack in the lines with arm held out straight. (Be prepared to step back a few paces on release to keep the lines tight while centrifugal force builds up.) Hold in a little 'Up' elevator and signal release! As the model climbs away, feed in a little 'Down' to prevent the 'plane zooming over the top of the circle. Level out and point your arm, keeping the wrist stiff, where you want the model to go. If it has been built straight it should 'sit in the groove' and fly out the tank (as the tank shown on the plan is good for 4/5 minutes it may be best to only partially fill it for first flights!). When the motor cuts, just hold the model level and it will land itself. To avoid dizziness, concentrate on the model and try to ignore the background. Fly in an open space so you do not see too many trees, buildings, etc., whizzing past.

Continued on page 253

Fig. 3



Right: cut-off detail, slider 'A' is pulled back on 'down' elevator releasing torsion spring to squash fuel feed tube. Below left: component parts of stunt trainer prior to final assembly. Below right: comparison of wing sizes on the two basic versions, stunter above, racer below.



BEING ABLE to carve a good propeller is what makes a 'rubber modeller' and you will need a good assembly to let it work properly. Ready-made fully machined propeller assemblies are commercially available... far better make it yourself and take a pride in it's successful construction!

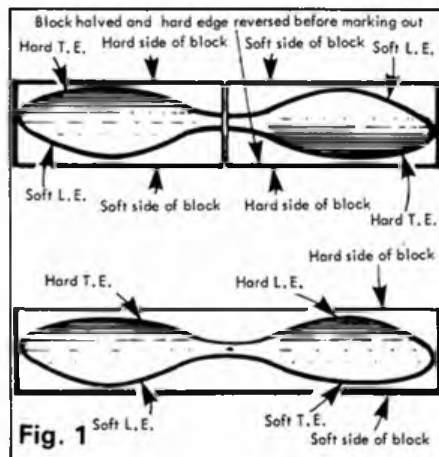
No special tools are necessary to make a propeller, it can all be done with a sharp knife and sandpaper. The first thing is to choose a block of wood. For an Open Rubber model this is preferably as light as you can find. It is often cheaper to buy the 12in. long off-cuts found for sale in most model shops. You may find one of large enough cross-section to make the whole propeller, otherwise, buy two, this is better than buying an 18in. length as the grain of the wood can often be arranged more usefully if two pieces are joined together.

The final steps to getting this novice's Open Rubber model into the air — explained in detail by Bob Wells

Part 2

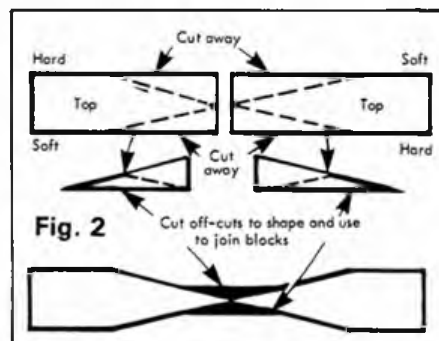
BO-JESS

Normally a block of balsa will not be of consistent density across its section and you will have one soft trailing edge and one soft leading edge which makes the propeller impossible to balance and worse, causes unequal flexing in the two blades. By joining two pieces together, the densities can be balanced out to give similar blades (Fig. 1).



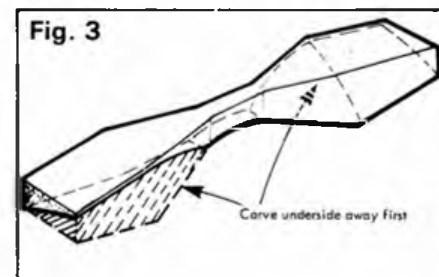
This arrangement will give more evenly matched blades and using the harder wood at the *trailing edge* will stiffen the thinner part of the blade section and reduce the weight of the thicker leading edge.

If using two pieces of block, they should be assembled as in Fig. 2. Having got a block,

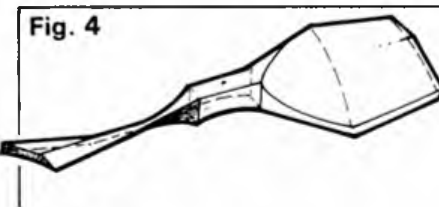


mark it out as shown on the plan. Take care with the marking out as the accuracy of the propeller depends on it. I like to use a fine ball-pen for marking and when carving is complete, the lines should still be visible, thus confirming accuracy.

Carve out the marked block shape and then start forming the blades by carving

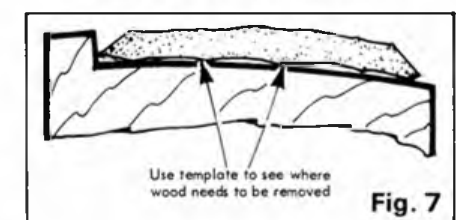
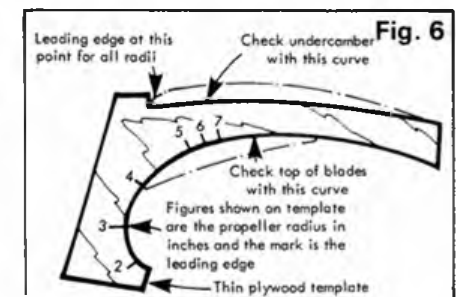


away the *back* of the block (Fig. 3). Carve blades only to within about 1½in. of the middle of the propeller at this stage. Carve the underside of the blades flat and use coarse sandpaper in a circular motion to reduce the bumps and form a *little* undercamber. Now carve away the top leaving the blades about ¼in. thick and you should now



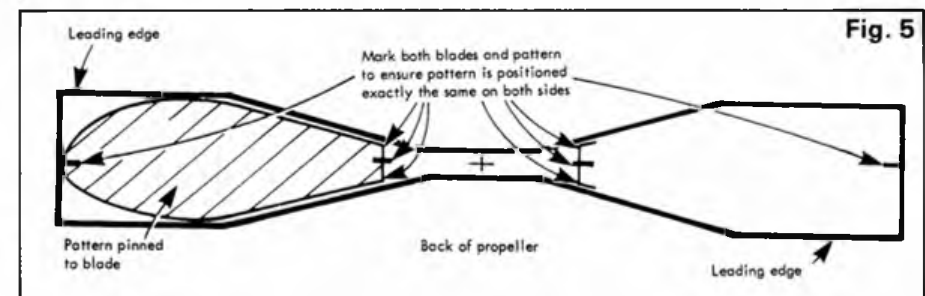
have something beginning to look like a propeller (Fig. 4).

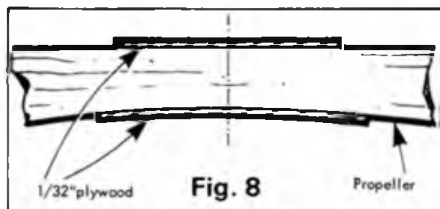
The next thing to do is make a template for the propeller blade sections. The pattern shown on the plan enables all parts of the blade to be checked (Fig. 5). Now make a pattern for the propeller blades and being very careful to get it in the same position on



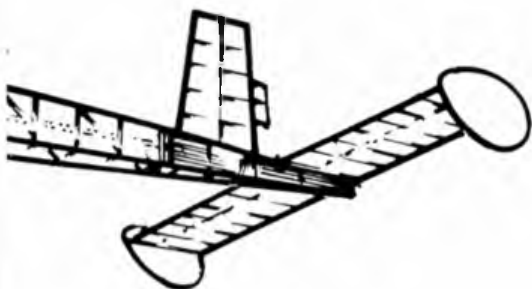
each side, mark the outline of the blade shape on the *back* of the block (Fig. 6), the blades may now be carved to shape. Using the template, the underside of the blades are sanded to their final shape (Fig. 7).

Use the template frequently until the

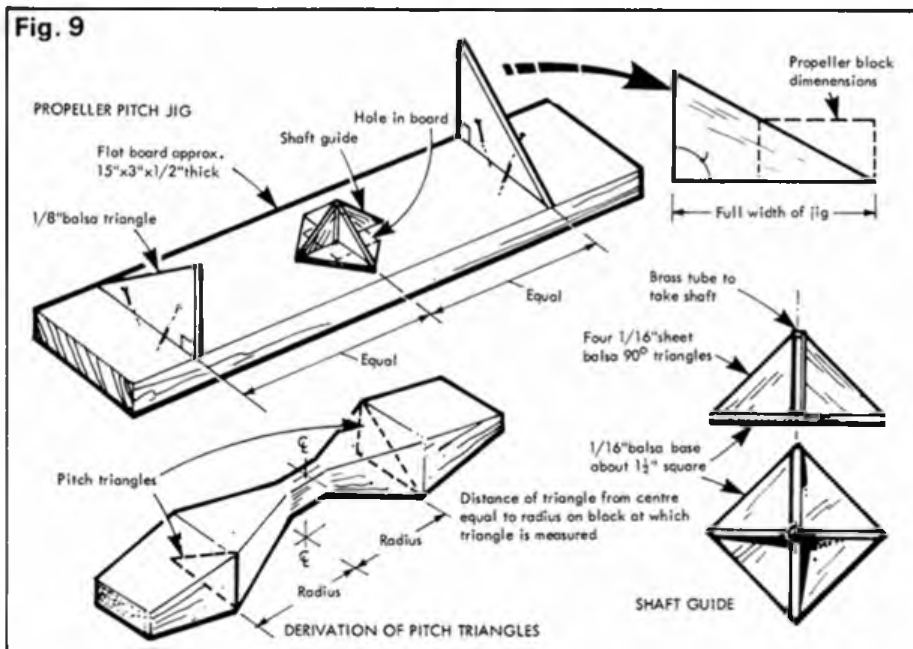




blade conforms to the curve all the way along. When the underneath is properly shaped, cut out the two ply hub facings and glue in place (Fig. 8). Bind in place (old rubber strip is good for this) until dry.



It is now necessary to make another simple jig. This one is absolutely essential. It is not possible to make an accurate propeller without it. Fortunately it is very simple to make! (Fig. 9). Make this jig as accurately as you possibly can. If you intend to make more rubber models in the future you will find it invaluable for all propellers. (With all-wire folding propeller assemblies, simply use the noseblock in place of the shaft guide to check that everything is accurate). Make a hole through the centre of



the propeller, a little oversize for 16swg brass tubing, cut a length of tube and slip into the propeller. Cut a length of 16swg piano wire, a few inches long, place in the shaft guide of the jig and slip the propeller over it (Fig. 10).

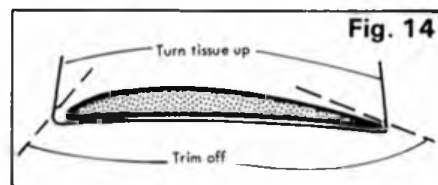
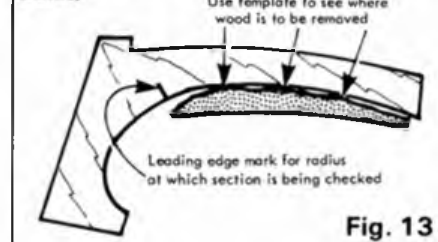
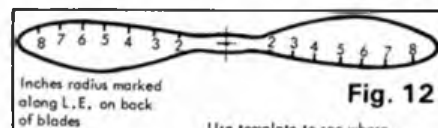
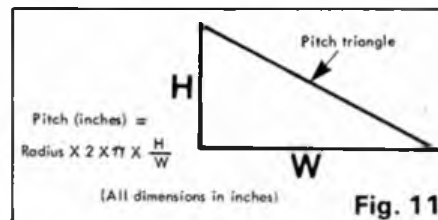
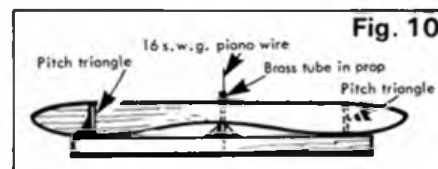
The propeller blades should now rest on the triangles. It may be found that the leading edge of one blade does not touch and the trailing edge of the other is clear of the triangle by the same amount. It may also be found that with the blades touching both triangles, the shaft guide does not sit squarely on the base of the jig. In either case,

the angle of the tube through the propeller must be adjusted, enlarging the hole as necessary until everything seats properly.

If it is found that the propeller blades do not match the triangles, i.e. either both leading edges clear of triangle or both trailing edges clear, then something is wrong. Either the block was the wrong size, the marking out incorrect, the triangles have the wrong angle, or the triangles are at the wrong distance from the centre. If on checking you find that it was one or both of the first two then there is nothing you can do about it! It means that you now have a propeller of different pitch to that intended. Make fresh triangles until they fit the propeller and then find out what pitch you have carved. The calculation is easy (Fig. 11). If the pitch is between 28 and 34 inches then it will be suitable, if not ideal. Outside these limits, it is too small or too large.

Having got the propeller to sit nicely on the jig you can now glue the brass tube in position. Use epoxy and if you have had to make the hole a bit big, use pieces of balsa or dust as a filler. Put it all back on the jig until dry, then file the brass tube flush with the ply facings. Now you can finish the blades. Blend the underneath into the hub, not making the blades too thin near the middle, when satisfied with the back of the blades, finish the top.

Mark the radius at 1in. intervals along the blades, best done with very soft pencil on the back of the blades (Fig. 12). Now using the section template frequently, carve and sand the tops of the blades until the template fits at every point (Fig. 13). Leave the leading edge about 1/16in. thick and the trailing edge about 1/32in. at this stage.



first go, apply more dope and work in with fingers until it does. While working the tissue onto the blade, turn the overlap over the edges (Fig. 14). When the dope is dry, trim off the surplus leaving the tissue stuck on the leading and trailing edges. Cover the tops of the blades similarly so that the tissue finishes overlapping and double covers the edges.

The propeller then only needs a couple of coats of 30/70 dope/thinners to finish. A check can now be made on the static balance. Hold a piece of wire horizontally, slip the propeller on it and give it a spin. When the propeller comes to a halt, it should do so gradually without running back. It does not necessarily stop horizontally, but if one blade runs back and settles at the bottom, it is obviously heavier. Try giving the lighter blade a few more coats of dope. If this will not balance the propeller then don't worry, it is not that important unless the blades are wildly different, which is unlikely.

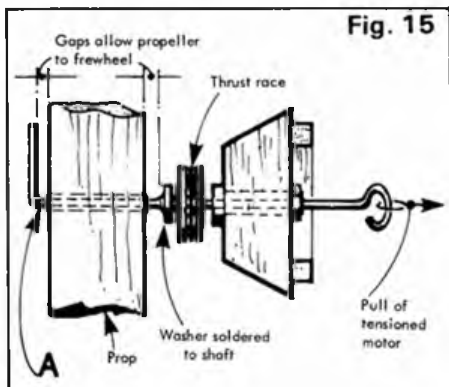
Propeller Assembly

There are many ways of making a free-wheeling propeller assembly. The one shown on the plan is neat, reliable and does not rely on soldering to make it work. The soldering shown on the assembly for the motor is necessary to prevent the hook on the motor 'climbing' up the shaft, if you can't get on with soldering, thread binding and epoxy may be substituted.

The most usual fault on a freewheel assembly is that when the motor is run down, the tensioning turns are such as to pull the shaft back and jam the propeller against the turned over end of the shaft. This prevents the propeller freewheeling on

the shaft as it tends to turn the shaft and wind-up the motor backwards. This it does for a while but the motor soon becomes too tight and everything stops, followed by the model diving into the ground!

This is usually overcome by soldering a washer to the shaft between the propeller and the thrust bearing (Fig. 15) so that no matter how hard the motor hook is pulled back, the propeller always has a little movement backwards and forwards on the shaft. The soldering of this washer must be very good, as it takes quite a force. It must be done as the shaft is being bent. This either means bending the propeller end of the shaft over last and if pliers are inserted at 'A', an undesirable gap will result. Alternatively this end can be bent first which means bending



the motor hook last with the noseblock in place. This usually results in either a long length of shaft extending behind the noseblock or damaging the noseblock as you try and bend the hook close to it.

On the assembly shown on the plan, a brass wheel collet (sold in most model shops) is used instead of the soldered washer. This means that the motor hook can be bent first, the shaft inserted through the noseblock, the thrust race, brass collet and propeller slipped onto the shaft in that order, then the end of the shaft bent over. With the collet screw loose, the shaft can be pulled forward as far as it will go, the end bent over and then the shaft pushed back. The collet position can then be adjusted and the screw tightened.

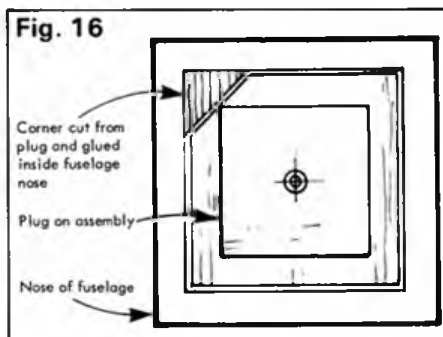
You now have a working propeller assembly. Points worth noting are to leave the noseblock rough until all the wire bending is finished, then shape and sand it. Make the nose plug last after everything else is finished.

It is nice if the shaft is straight through the noseblock, but it doesn't matter if it is not. The model will certainly want some side or down-thrust during trimming so if the shaft is obviously not straight, make sure that you position the assembly on the model so that the shaft points to the right or downwards.

When you have got it all right way round, mark the nose assembly in some way so that you can't put it in the wrong way round. I print 'TOP' on mine in large letters. Alternatively cut a corner off the nose plug and glue it inside the nose of the model. (Fig. 16).

The freewheel clutch shown is again simple, the only point worth making is that it is easier to make the tube/wire assembly before fixing to the propeller. If one blade is still lighter than the other, fix it to the light one!

The propeller is taken off the rubber motor for winding so it is necessary to make an-

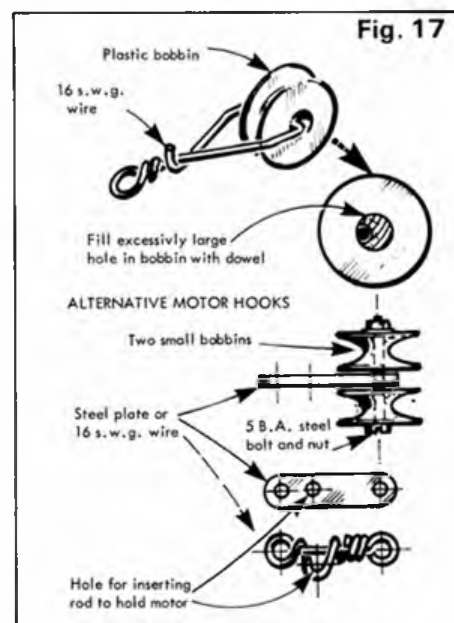


other hook for the rubber motor. That shown on the plan is the one I have been using for years. The rubber motor end is in the shape of an 'S' (a backward 'S'), the other end fits on the winder and when wound, on the propeller assembly. The 'S' hook is the best way found so far of preventing a wound motor from creeping round the shaft. The next best is a bobbin or even two bobbins.

If you try bending the hook shown, make sure it is bent exactly as shown or else it will all spring open in use. The main point to watch is that the ring in front will fit both the propeller assembly hook and your winder hook. It should fit the propeller assembly snugly, but don't make it too small for the winder! (I use a 12swg hook on the winder).

If you have not tried it before, you may have difficulty getting the neoprene tube on the hook. If you do, don't be tempted to try thin rubber tubing; it wears through too quickly. The trick is to hold the hook in a vice by the winding loop, smear all the wire with soap and keep the neoprene softened with a match flame. Not enough to turn it black and melt it, just enough to soften it; it will go on fairly easily.

If you don't get on with bending the hook try an alternative (Fig. 17). If you have now arrived at a suitable hook, you just need a motor peg and rubber motor. Use a decent size of motor peg, 3/16 in. or 1/8 in. diameter thick walled aluminium tube or rod is about right and have it long enough to extend about 1/2 in. each side of the fuselage.



Rubber Motor

Use whatever rubber you can get. *F.A.I. Supplies* is fairly easy to get and cheaper than *Pirelli* but it gives its best power in hot

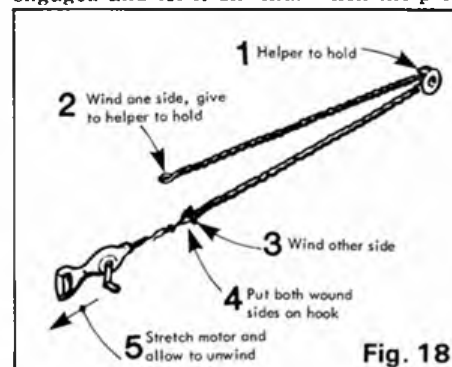
weather. *Pirelli* is more difficult to get, but has slightly better power characteristics especially when cold; it does tend to break though when the air warms up!

Use somewhere between 100 and 120 grams made up to a length of 45 to 55 inches. (14 strands 6mm x 1mm *Pirelli*, 12 strands of 1/4 in. wide *F.A.I.*) and when made up bind one end with a rubber band.

Lubricate the motor after you have arranged it into strands, this saves a lot of handling of messy rubber. Use either castor oil or a mixture of equal weights green soft soap and glycerine. Remove excess lubricant that remains after you have rubbed it well in. Any excess will only get thrown off onto the inside of the fuselage so remove it with a paper towel.

Pre-tension the motor by dividing it into two, in the case of a 14-strand motor one side will be 6 and the other 8 strands. Wind each side to about 3 turns per inch of motor length, put the two sides together on the hook and allow to unwind while stretching it at the same time. (Fig. 18). You will now have a pre-tensioned motor just a bit longer than the distance between the noseblock and the motor peg. If it is not longer, stretch it fairly tight, release and it should have become a bit longer. If not you have too many tensioning turns so unwind it all and do it again with less turns.

When it is the right length, put it in the model, wind on about 100 turns, hook on the propeller, make sure the freewheel clutch is engaged and let it unwind. When the pro-



PELLER stops the motor should be tight enough so that the noseblock is held positively in place yet the propeller can knock out of place on landing to prevent it being broken. Test this by knocking the end of one propeller blade, gently at first, and see if the noseblock pops out of the fuselage — it should do. If not, re-make the motor with less tensioning turns. When happy with the motor, put the wings and tail on and see where the model balances. Anywhere between 3 1/2 in. and 4 in. back from the wing leading edge will be satisfactory. If the balance point is outside these limits, either the propeller or the tailplane must be excessively overweight. Short of replacing the offending unit with a new one, the only thing to do is add ballast at tail or in the noseblock, wherever appropriate.

Having got the balance point right and made sure that the wing and tail line-up both on plan view and from the front you are now ready to start test flying.

Hold into wind and make sure the propeller freewheels smoothly; the slightest breeze should turn it. Hand-gliding with a freewheel propeller always seems a bit strange but try to pretend the propeller isn't there. Get the model to glide smoothly with a slight turn to the right adding packing under

(Continued on page 253)

Aeromodeller

FREE FLIGHT SCENE

Dave Hipperson reports

The Open Rubber Trophy — 1984

This year's event is scheduled for 29th July and will be at Beaulieu Heath. The venue has been chosen because a mid-summer date was required and with crops being critical at this time it had to be a non-agricultural area. We are indebted to the Southern Area for the loan of their precious and extensive flying site.

The programme will include more than usual and advance arrangements are to be slightly different. Pre-entries are being taken now and the cut-off date for pre-entry is June 29th — one clear month in advance of the contest. The reason for this early entry requirement is that the organisation is not able to underwrite any substantial loss such as made last year. Neither are they prepared to run it with what they consider to be a sub-standard prize list. It will therefore be necessary for at least 50 pre-entries to have been received by the cut off date otherwise the event will be *cancelled* and all monies refunded. Additional to the main event and to be run *no matter what* will be a Champagne flyoff late in the day for Open Rubber models, entry on the field and as an additional attraction to the ever growing Vintage following, there will also be a Vintage Wakefield event. This will be open to all Wakefield models built to the pre '51 Wakefield rules, originals or own designs. Entry for this will also be on the field. There will be three flights with the only stipulation being that the first flight be made during the first round of the main event. The other two may be made at any time before the close of the contest.

All flying will start soon after 10am and this first round will be at least 90 minutes long. The Open Rubber Trophy class will then be subject to decreasing length rounds and an increasing maximum. The Wakefield event will be run to 3 minute maxes. Remember pre-entry is necessary only for the Open Rubber Trophy itself and will entrants please enclose two SAEs for return of final contest information and then results soon after the event.

Pre-entries to: *D. Hipperson, 35 Anthony Road, Boreham Wood, Herts. WD6 4NF.* Seniors £2.50 and Juniors £1. On the field entry will be available at double this rate but you are reminded that we require 50 pre-entries at least. Field entry for Vintage + Champagne will be £1.

Both SMAE and SAM members will be welcome to fly in any or all of the events. Pre-entry for the main event only by *June 29th.*

SMAE Winter Open Meeting — Nth. Luffenham — 19.2.84

Attendance was healthy for this season opener but participation thin, considering

Right: Derek Taylor flew this attractive design to 4th in Open Rubber at the February SMAE meeting.



the drift never exceeded 15 and often dropped to nearer 10 mph. Actually there was something rather unusual deterring fliers and many didn't discover it until too late. Those confidently chasing long flights that had cleared the aerodrome buildings — thought at first to be the main hazard — suddenly came face to face with the vast expanse of Rutland Water stretching right across their downwind line! As if that wasn't enough the widest section — the far bank of which was not even visible — coincided precisely with the downwind track line and was set to claim any flights over 4 minutes! Prompt D/T's in neutral air would bring models down short but the danger was aggravated by regular patches of very powerful lift. In one of these the model was assured a watery grave. It was hardly surprising that many fliers stopped abruptly after one sight of the lake. Many models were lost and others seriously damaged by well intentioned boat owners trying to fish waterlogged airframes from the middle of the lake.

Phil Ball had the ideal combination of performance and consistency with his Vintage 'Hi Ho' to rattle off three high climbing flights before the dangerous lift started and comfortably eclipse Hipperson's 'Lanzo' after its unlucky first flight and eventual demise in the lake.

Open and Slow Open Power split the field in this discipline but encouragingly showed the new class producing the higher standard of flying and closer finish! Not to belittle Peers' impressive full score in the unrestricted class. He was also adept at aiming around the lift; all three flights D/T'd safely just outside the 'drome. By contrast runner-up Pete Lumsden with a somewhat lesser total from his *TD .09* powered, scaled up, *APS 'Swift Half'* was still searching the far bank of the lake — some twelve miles drive away — late into the evening, with more success for others than himself.

Fielding took top place in the Slow category with another perfect score closely chased by Steve Philpotts *AM35* powered

own design. Steve had been most unfortunate earlier, after a good start in Vintage with his trusty 'Pylonius', to have this stamped on by an angry golfer! Numerous entrants in the new power class opted for diesel and hence two extra seconds run. It was fine nostalgia to hear again their characteristic howl and stutter on cut off and of course that unmistakable smell. It even brought out George Fuller.

Where the power events had avoided a fly-off, glider did not and neither did rubber although this was somewhat confused by one of the two participants, Gaunt, not returning his card after the last flight. He was not available at the start of the advertised flyoff period and this left the Contest Director no option but to ready Ball, the other qualifier, in case Gaunt returned with card and model. The card eventually did return but the flier didn't so Phil was assured of a 'fly over' and rather stylishly took the opportunity for a full turns proving flight with his promising vintage 'Bernstein Challenger'. Then, what should have been a token hop, turned into a 3 minute plus flight after fuse failure. The model fortunately descending on land, when it so easily could have gone further, into the lake!

The glider final rounded off the day with Cordes producing a disappointing 1:30 leaving local man Cooper towing for some time whilst struggling slightly with a left tendency, put down to the model's argument earlier with the side of a hangar. His release coincided with stable but neutral air and he topped his opponent by nearly a minute — then hit the same hangar again!

No one could blame Trevor Payne for the wind direction and in the circumstances he had made the best of a difficult day. It was rather a pity however that he hadn't been given the plaques to award!

Results

Open Glider (20 flew)

1. J. Cooper	Biggles	9:00 + 2:24
2. A. Cordes	Birmingham	9:00 + 1:32
3. J. Bailey	Biggles	8:03

Open Rubber (12 flew)

1. P. Ball	Grantham	9:00 + 3:33
2. P. Gaunt	Leeds	9:00
3. C. Strachan	Biggles	8:51

Open Power (5 flew)

1. R. Peers	Falcons	9:00
2. P. Lumsden	St Albans	7:29

Vintage (7 flew)

1. P. Ball	Grantham	8:41
2. D. Hipperson	Grantham	7:58
3. A. Crisp	Biggles	7:12

Slow Open Power (5 flew)

1. S. Fielding	Morley	9:00
2. S. Philpott	Biggles	8:01
3. P. Watson	Avondale	6:44

**Grantham Grand Prix —
26/2/84 Barkston Heath**

Encouraged no doubt by its now regular appearance on the Winter calendar, as much as by the reliable organisation and prizes the Grantham Grand Prix attracted a considerable attendance. The weather did nothing to help however, running all too true to forecast with a moderate northerly, bringing low cloud, poor visibility and regular long showers of fine sleet drizzle. Not surprisingly in such conditions glider seemed the most popular and produced some high scores particularly in the case of John Bailey. He came very close to a perfect total with his A2 in combined FAI and hence topped this class by a comfortable 90 secs. Perhaps the slight patches of lift that were there were best detected with a glider on tow.

The Open Rubber fliers were obviously actively avoiding the lift with such a low cloud base and despite a rule allowing timekeepers to follow their charges, some models were lost in the murk before the max. O'Donnell was one such whose last rubber flight vanished at 2:40 even to his timekeeper half way across the 'drome. The wind reduced towards afternoon but brought with it worse visibility so Power fliers who had not flown early were at a disadvantage. Monks, with two maxes, made his third flight under a very dark sky. A slightly flat left rolling pattern, left the model safely below the cloud and in good enough air for a max whereas Peers similar tactics found poor air. He had however already flown very effectively with his long slim Wakefield in FAI and collected a 2nd place for his efforts. All his flights in this class having been taken very quickly in the morning, with little or no thermal detection. His total representing a very impressive performance from a reliable model.

At the end of the day, timer mobility was extended to the flyoffs! An unprecedented step but at least it kept all those involved warm. Only Open Rubber needed a flyoff and apart from Dilks who spun in, all qualifiers made respectable flights but in a variety of styles. Croome, first to release climbed away slowly but for well over 2½ minutes of prop run on his 400 sq. inch model compared with Carter who gained height fast and was out of sight, to upwind observers at least, long before the prop folded. Ian Davitt, in perhaps the best air of the three but with an almost fog coloured model, climbed away steeply in quite tight left hand circles. It was unusual to then have to wait for the return of the timekeepers before results could be finalised.

Very handsome engraved glasses were distributed to the winners with cash to runners up. On top of this a trophy had been constructed and appropriately named for HLG and similarly a very delicate plinth mounted metal Dream Weaver was awarded to the Open Power winner, Ray Monks. This award — the Arthur Percival Trophy — being in honour of the man who had for such a long time been a corner-stone of the Grantham Club until his death last year.



Top right: The Percival Trophy to be awarded annually for Open Power at the Grantham Grand Prix. Silver Dream Weaver even correct down to geodetic construction. Above: Ian Davitt prepares for flyoff in Open Rubber at Grantham Grand Prix. Placed 2nd - note reverse pitch on left handed prop to complement left hand climb and glide.

**Grantham Grand Prix —
Barkston Heath 26.2.84 —
Results****Open Glider (15 flew)**

1. M. Dilly	Croydon	8:52
2. P. Owens	Liverpool	8:11
3. B. Baines	RAFMAA	7:55

Open Rubber (9 flew)

1. J. Carter	Falcons	9:00 + 4:55
2. I. Davitt	Leeds	9:00 + 4:25
3. M. Croome	Grantham	9:00 + 4:21

Open Power (4 flew)**For Arthur Percival Trophy**

1. R. Monks	Birmingham	9:00
2. S. Screen	Birmingham	8:24
3. R. Peers	Falcons	8:00

Combined FAI (11 flew)

1. J. Bailey	Biggles	14:48
2. R. Peers	Falcons	13:13
3. J. Cuthbert	Grantham	12:01

HLG (6 flew) for Bill Fall Trophy

1. M. Page	Grantham	3:57
2. M. Bennis	Grantham	2:59
3. A. Ball	Grantham	2:40

**Free Flight Results Analysis
— an addition**

We would like to correct the results table on page 125 of Free Flight Scene March issue to the effect that there is another contestant at 19th equal. Chas Plant of Darlington scored 5 points with his 2nd place in A1 at the 5th Area meeting in windy

conditions at Driffild and then went on to win the CMA Cup for Open Glider at the even windier Northern Gala. We must apologise for omitting his name but we are of course delighted that people check this table so carefully and hold it in such high regard!

**Martin Dilly
reports****Free-Flight Rubber Speed**

A class that has been flown at the U.S. Nationals for many years, but has never been tried in Britain is rubber speed. With the shortage of flying sites suitable for normal duration contests this might be a good way to encourage at least some form of competition on the smaller flying fields near cities. Dare one say that rubber speed would be an event that could share a site with the ropes, tents, stakes and Tannoy circus of the R/C and C/L Nats? The rules used by the Illinois MAC require the aircraft to take-off from a table and to be timed over a 200 foot course; the course is 100 feet wide and the aircraft must stay within it during the timed run, during which not more than one roll is permitted! No dimension of the aircraft may be over 36in. Another set of rules used in the USA sets a maximum wing loading of 4 ounces/100sq.in. and prohibits propellers with a diameter of more than one third of the wingspan.

Because a speed aircraft must use its power for speed in a straight line, rather than random aerobatics, stability is important. Most of the successful US aircraft have large fins in order to stay within that 100-foot course width and all-sheet construction is popular. Among the propellers used are the 6 $\frac{1}{2}$ in. *Kaysun* and the 6in. *Testors*, both plastic — to withstand sudden arrivals. It would be fairly simple to mould something more efficient with carbon fibre and epoxy, certainly far easier than the current crop of F1C propellers. Over here it might be worth looking at the plastic prop now supplied in 'Ajax' kits — the one that puts the centre of gravity so far forward compared with the balsa propeller the model was designed to fly with 35 years ago!

Charlie Sotich's 'Dash Dip', which seems like a good starting point for experiments, used a *Testors* prop, powered by 4 strands of 6mm and 2 of 3mm *Pirelli*; another of Charlie's designs used a 7-inch propeller and 1.4 ounces of 6mm *Pirelli* made up into an eight strand motor to drive it. This model has a 24in. wingspan and was 34 $\frac{1}{2}$ in. long; it used a take-off dolly to reduce drag and had an airspeed of 50.5m.p.h. Forward C.G.s are essential and range between 6% to 30%. Jim Lewis's 'Quail', another 50m.p.h.

model, has an 84sq.in. wing, $\frac{3}{4}$ oz. of *Pirelli* turning a 6 $\frac{1}{2}$ in. *Kaysun* prop, and a Warren girder motor tube with $\frac{1}{32}$ in. sheet top and bottom.

The current world record, one of six FAI model records held by the Chinese, is a cool 156.79km/hr, or 97.4 m.p.h. The flyer was Sun Yi, of Szechuan province, where the interestingly spicy food comes from; his approach was rather different from the Americans' but the FAI record rules are rather different, too. Hand-launching is allowed, and the course is 50 metres, there is no restriction on rolling the model as the model goes through. There is a surface loading limit, though; this must be between 12 and 50gm/dm² for free-flight, Sun Yi's was 45.67. No doubt the hand-launch would have helped but the Chinese aircraft used 120 grams of rubber to turn a 210 x 350mm propeller — that's an 8 $\frac{1}{2}$ x 13 $\frac{3}{4}$ in., with an airframe weight of 128 grams.

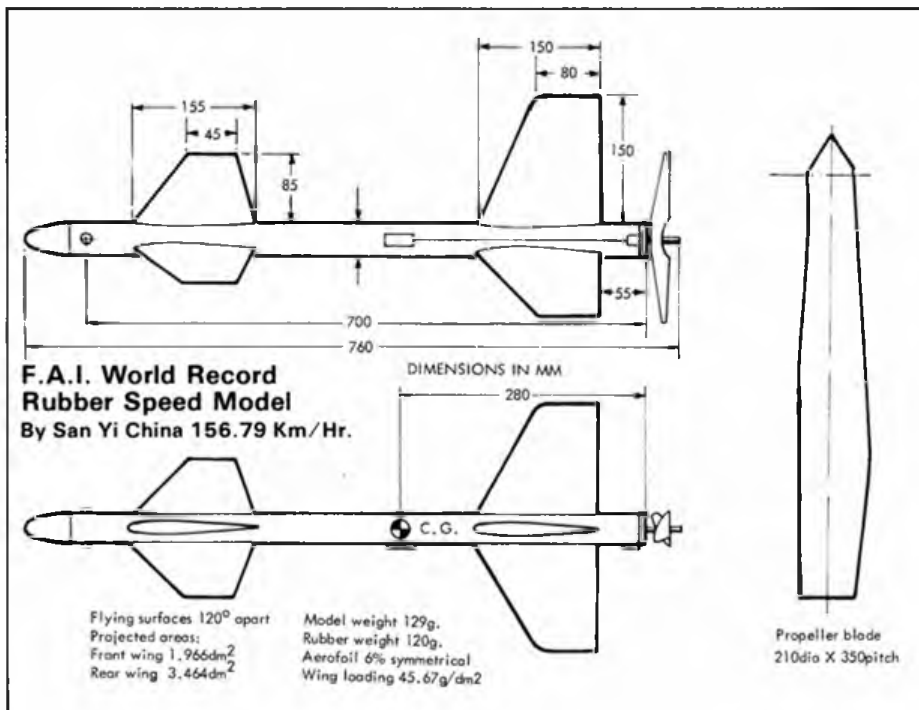
Unlike a previous world record holder, Petras Motekaitis of the USSR, Sun Yi used a single pusher propeller; the Soviet model had a prop at each end and either it or a very similar one currently holds the rubber helicopter record of 114km/hr, since, with what are in effect two rotors, it presumably qualifies as eligible for either class.

The drawing of the Chinese model shows some sort of excrescence on the fuselage side, apparently linked with a line to another similar one; although one can only guess at this, it could possibly be some sort of launching strop or propeller delay mechanism. I certainly would not want to be the one whose fingers were releasing 4 ounces of rubber hooked up to an 8in. prop.

Like any sort of competitive model flying, rubber speed looks like a fun event; what is needed is for a club to run an event or two, preferably using existing rules, rather than trying to invent some new ones, and preferably in conjunction with another contest where people will be able to see what is involved.

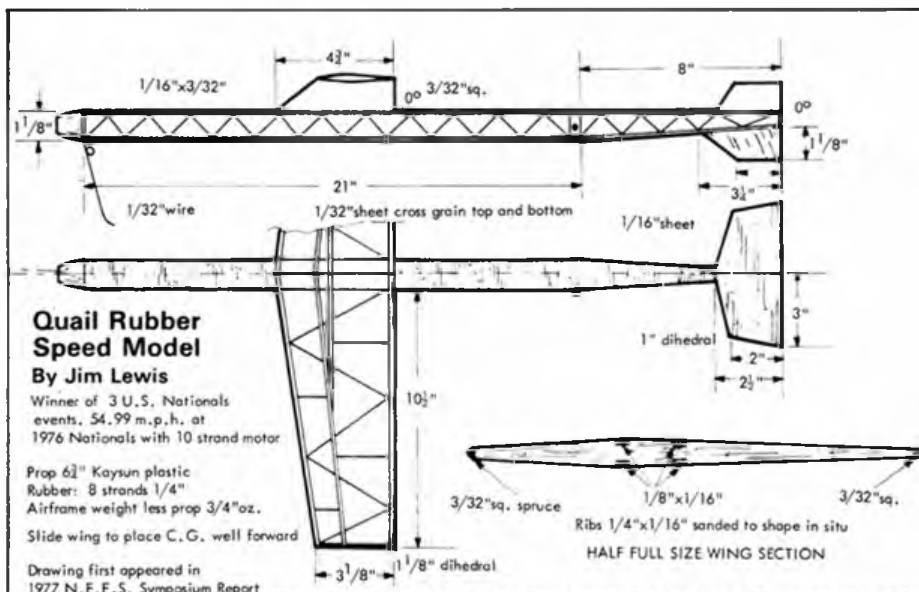
Timing can be as simple or complex as you like. The Chinese record used a sight recording oscilloscope, two aerial photographic guns, digital frequency meters and various other bits of electronic measuring equipment, apparently to record the model's crossing the start and finish line on cine film, which also showed the output from a signal generator. You may prefer to use two stopwatches. Timekeeper A starts his as the model crosses the start line; timekeeper B, at the other end of the course, starts his as the model crosses the finish line. They then both meet and stop their watches simultaneously; the difference in time is the time the model took to cover the course. With the US 200-foot course the speed is then 136.3636/Time in secs.

The r.p.m. figures that are achieved with rubber speed propellers are fairly startling; Jim Lewis, writing in the 1977 National Free-Flight Society Symposium Report, mentions that he winds his 10 strands of 6mm *Pirelli* to 300 turns and gets a 2.5 second power run from it. I make that 7,200 r.p.m., so a good bearing for the shaft is probably quite important.



An Indoor Class for Club Evenings

The newsletter *Sandpaper*, from the Southampton club, I think, though this is not mentioned on the masthead, described an ultra-simple indoor class that might encourage those who don't know, to discover that contest flying is fun. Provisional rules, suggested by Derek Knight are as follows: Models must be made from sheet balsa only, with no tissue covering or open framework. Maximum wingspan is 24ins., and the model must stand freely on three points and rise off the ground. There is no restriction on rubber power or props.

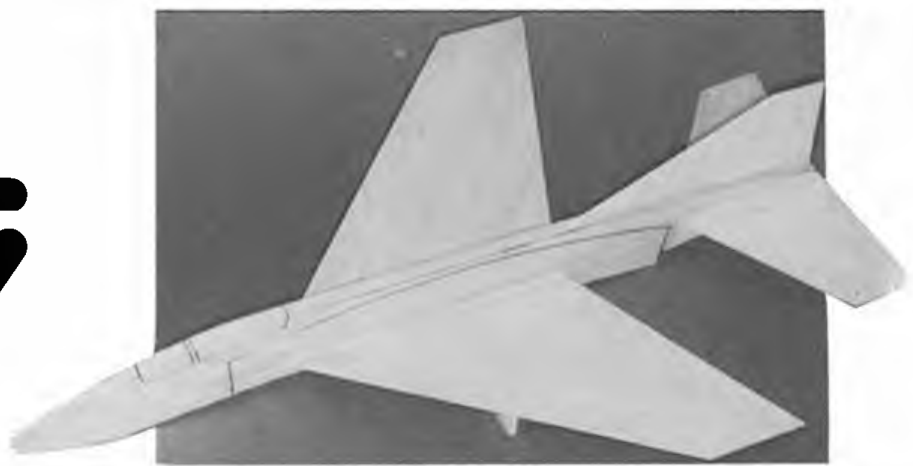


Silver Soldering Without Tears

Another tip I picked up from the same newsletter was one to prevent the annoying tendency of water-mixed silver solder flux to spit, jump and bubble as you warm the joint and start to melt the powder flux onto the metal surface. Lots of bubbling like this prevents the flux melting into the nooks and crannies of the joint and also prevents the silver solder from flowing in to replace it. Try using methylated spirit instead of water when you mix the paste. In any case I always play the torch very gently onto the work at first so as not to boil the flux too fast, but this meths idea looks very sensible.

SCHOOL CHUCKY

A simple all sheet glider used as a school project 'down under' by Bob Greaves



BOB GREAVES is Australian and is an Art Teacher in Victoria, 'down under'. This model was designed originally to give school children a practical exercise in mathematics, together with some basic science of flight and then to provide a practical experience in craftsmanship.

With the continual rise in cost of teaching materials economy of construction and conservation of materials was also a factor in the design. The 'Phantom' may be made simply by tracing the various components onto the balsa and cutting them out, or the shapes for wings and tailplane may be constructed either directly on the wood or on thin card (to be used as templates) using a rule and protractor. This latter method may be favoured if the model is to be a school project. It provides a good practical purpose to the understanding of accurate measurement and the plotting of angles using the proverbial 'school protractor'. The model flies well and could certainly inspire pupils with the desire and incentive to follow the project through to a successful conclusion. Why not ask *your* teacher if the 'Phantom' could be part of your school syllabus?

Materials

One 3ft. length of 1.5 x 100 mm balsa will provide enough balsa for two sets of wings/tailplane/fin, etc., and although one sheet of 6mm x 75 mm balsa will give you two

fuselages it is more economical in the long run to use 100mm stock as you will then either (1) have enough wood for five fuselages, or alternatively (2) have a useful piece left over, if only building two!

PVA glue is strongly recommended although quick setting epoxy can be used to advantage if you are in a hurry.

Fine sandpaper, Plasticine and a few pins completes the check list unless the various shapes are to be geometrically 'constructed' in which case you will need a good rule, a protractor and a pencil with a *sharp* point.

Construction

Start by marking out all parts onto thin card or direct onto the wood to be cut: fuselage on 6mm thick balsa; all the rest on 1.5mm. Probably the easiest way is to carefully trace the outlines using a soft pencil, then turn the tracing over and draw over the outline on the reverse side, you can obtain a faint but clear outline on your card or wood.

Alternatively you can follow the inset pattern shown on the plan and using the dimensions and angles given construct a copy, again either directly on the wood or onto card to produce the necessary templates. You may now use these outline templates to either cut round or preferably draw round and cut out the resulting shape

using a steel rule or something less likely to be cut by your modelling knife. If you are using the latter method at school, perhaps you could persuade your teacher to make a master drawing on clear celluloid so that you can lay it over yours as a check... before you start cutting!

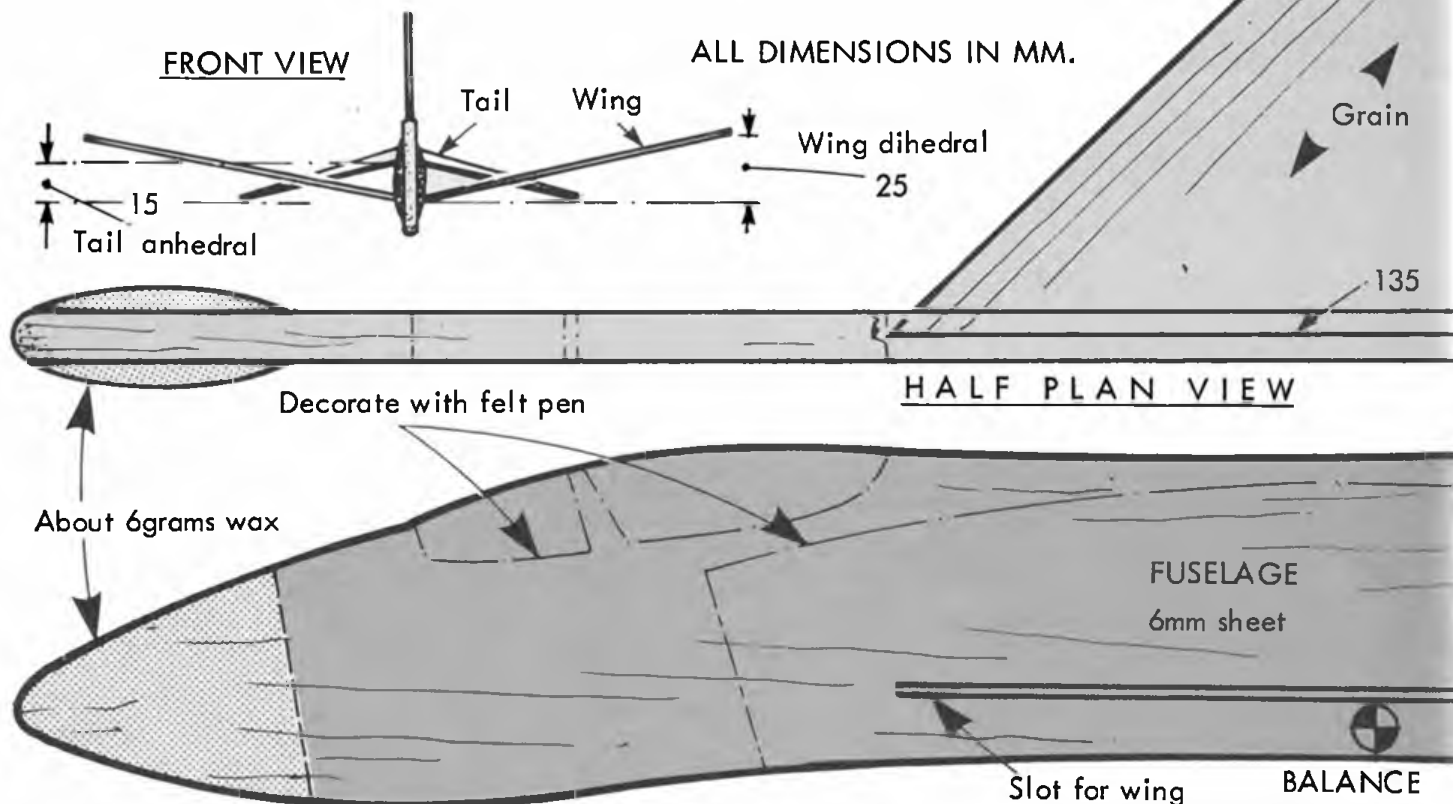
Use a sharp craft or modelling knife and cut using a rule as a guide. Cut slowly and carefully on a cutting board. Cut the fuselage free hand but do not try and cut through the whole 6mm the first time. Make repeated cuts until you are through. Cut the slots for the wings and tail *very* carefully and make sure that the blade is at right angles to the wood. Lightly sand all edges before gluing.

It is possible to make the slot for the rudder by repeatedly running a biro along the centre line until a depression about 3-4 mm is made.

Assembling

Glue the rudder in first. Make sure that it is vertical when viewed from the front.

Glue the wings into position. Place a



matchbox under each wing tip to achieve the correct dihedral (see the front view on the plan). Pin them to the fuselage from underneath until the glue dries.

The tailplane has an anhedral angle, i.e., it bends downwards or the opposite way to the wings (again, see the plan front view). Check that each side is symmetrical.

Balance

Add approximately 6gms of Plasticine to the nose — place a pin vertically into the fuselage above the balance point (marked \emptyset on the plan). Hold the pin head lightly between your finger and thumb. The aircraft should balance. Add or subtract Plasticine until balance is achieved.

Flying

Test glide by gently throwing the glider forward as you would throw a dart (but with less force).

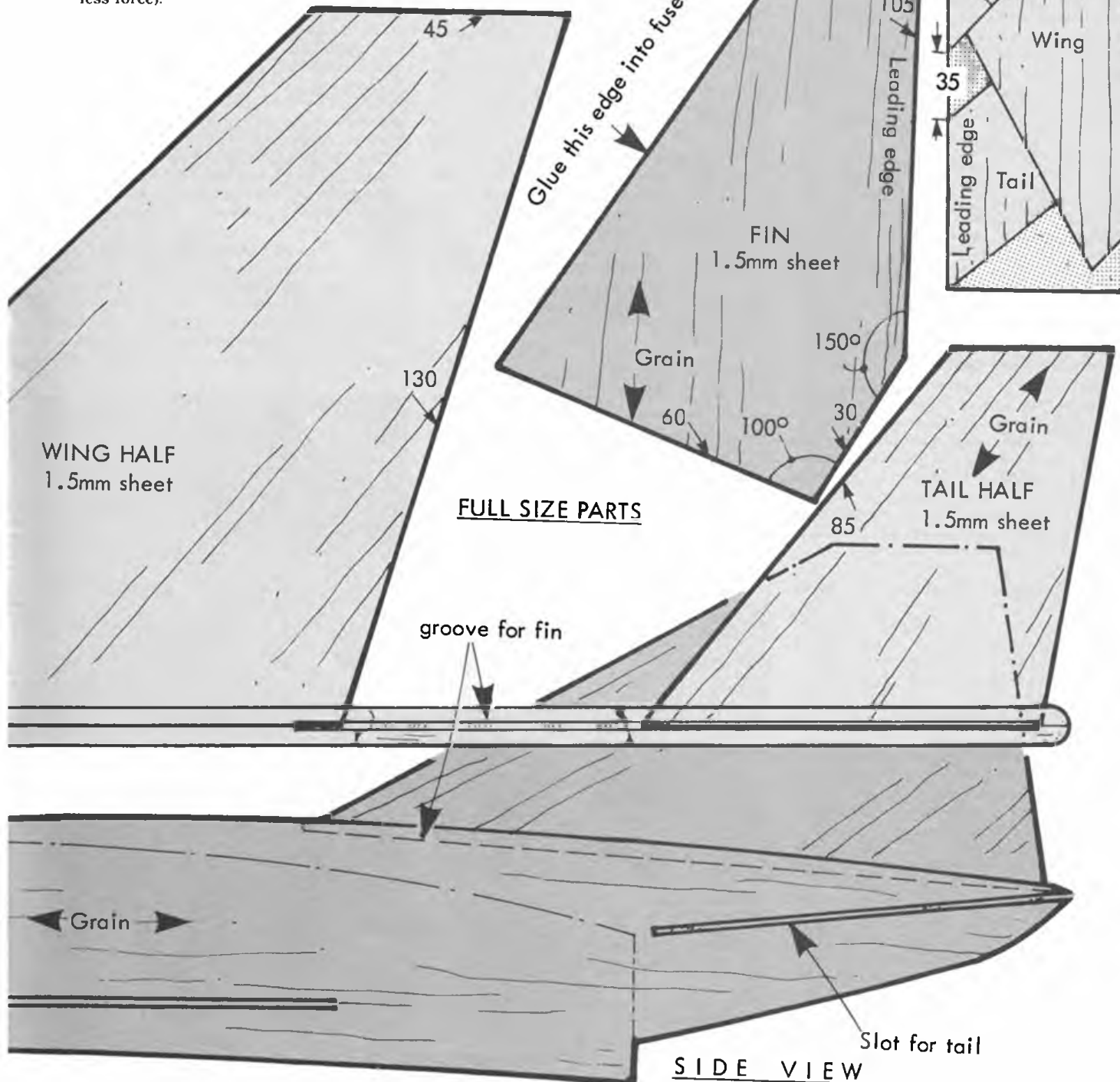
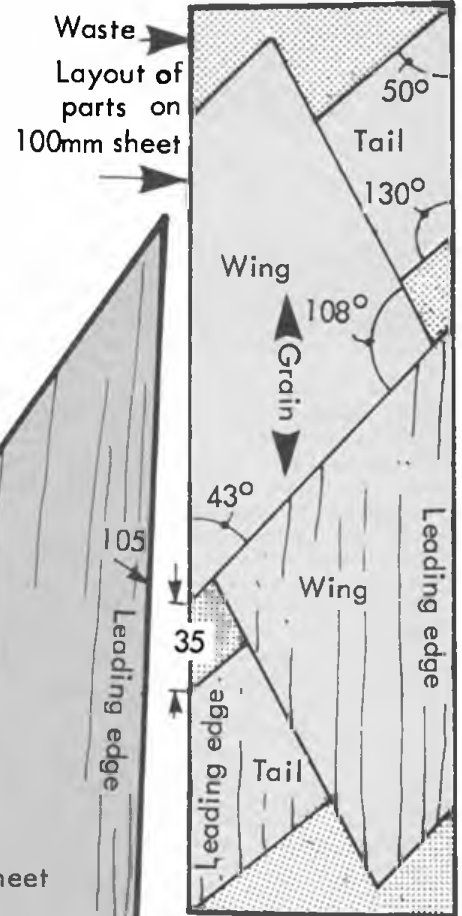
A long flat glide should result.

If it dives, reduce the weight or bend up the trailing edge of the tailplane slightly. This is best done by holding close to the mouth and breathing gently but steadily onto the wood whilst gently bending it in the direction you want the trim change. If it stalls, add more weight.

For full flights, launch the glider with a cricket bowling motion into the wind.

It is possible to achieve altitudes of 20-30 metres and distances of 50-80 metres in gentle wind conditions.

Do not paint the model — this will make it too heavy. However, it can be decorated with felt tipped pens.



FROM THE HANDLE

RACING with Jim Woodside

1984 Australian Nationals

F2C Teamrace, 4th January. Held at Scheyville near Sydney. Thanks to Theo Georgiadis I can give the results of F2C held on a day of light winds and 28°C (do I hear envious sighs from the Brits.). Sadly the results do not make for good reading apart from the winner's heat race. In 1978 the Australians were the 'surprise' team of the Woodvale World Championships. The root of this success, which gave fastest heat and second team place, lay in the dedication of the teams Oddy-Reichardt and Georgiadis-Prior. Hutton Oddy came to the 1977 European Championships to learn; I had the pleasure on that occasion to act as proxy pitman. By the following summer the Australians were on a par with most Europeans. By the way, Hutton Oddy is now back in the U.K. to undertake three years research in Cambridge. It will be good to see his face at domestic competitions — any pitmen seeking a first rate pilot can make contact through this writer.

Anyway, back in Australia I believe the lack of competition edge means falling standards. The equipment is, I know, first rate and so the lack of keen racing opportunities must be at the root of the problem. We are lucky to live in Western Europe where top-class contests keep all hands up to the mark. I hope my Australian friends take these remarks in the spirit that are intended — constructively. I must admit to having no answer to the problems posed by the enormous distances to be covered when travelling to a meet.

Results: 12 teams. 7cc tanks. All teams used Nelson 15D.

	Heat	Semi	Final
1. Wilson Lumsden	3:45	3:48	8:03
2. Fitzgerald Bros.	5:38	4:05	8:26
3. Georgiadis-Prior	3:56	4:01	8:29

Grantham Grand Prix . . . 26th February, 1984

Australian Hutton Oddy could well be forgiven for thinking that the British have finally given up all claims to sanity. Accustomed to flying in at least the mid-twenties centigrade, here were near zero temperatures. Notwithstanding, there was a good turnout for this first meeting of the year. Both Goodyear and F2C were flown in the vilest conditions I can remember. Only competition starvation can explain why 'grown' (?) men will stand in sleet and rain for 'fun' (?). Even now two days after the contest one of my fingers is still numb from the cold.

Congratulations and thanks are due to Dave Campbell, Graham Howard and Roger James for organisation.

Goodyear saw a crop of new models built to good standards — Catlow-Jephcott had a squadron of 'Ole Blues', painted in seemingly contradictory white. Dave

Clarkson's '84 model is still powered by a pressure fed Rossi Mk II now fitted with a chrome-plated crank. Airspeed was about 20.2 seconds/10 laps. Unfortunately the con-rod began to seize during the final, effectively ensuring Dave and Ed. Needham a third place. Winners were Bob Horwood and Tim Andrews, while Ron Thorpe and Alan Pegg took second place — some consolation for a 750 mile round trip from Argyle.

Twelve teams entered F2C with one or two new pairings around, amongst which were Martin Sladdin with Malcolm Ross. Times reflected the conditions with both Heaton-Woodside and Wilson-Gardner topping the qualifiers with 3:53's. In the final Ian Gardner achieved a superb setting which never missed a beat to come home first by a comfortable margin over the other two teams. Bad luck story of the meeting concerned Don Haworth and John Horton who had both lines snap, letting their FAI racer go 'free-flight'. By 'Murphy's law' this terminated on some distant concrete with the usual results.

Results

F.A.I. Teamrace - 12 entries

1. Wilson Gardner	Tynemouth	3:53.8	7:44
2. Heaton Woodside	Sharston	3:53	8:25
3. Sladdin Ross	Novocastria	4:09	9:22

Goodyear T.R. - 10 entries

1. Andrews-Horwood	Bristol	4:17	9:03
2. Pegg-Thorpe	Hamilton	4:22	9:15
3. Clarkson-Needham	Stockport	4:29	52 laps

1/3 A Teamrace was a victim to the weather, which was a pity since there were two new engines to be seen. One of these was Ed. Needham's extensively rebuilt *Sesqui* (I believe the case is original!). The other was a 1.5 built by Tony Eifflaender of the P.A.W. company. This is a bar stock special and it should be interesting to note its progress.



The latest version of the Danish BG engine, development of the late Paul Bugl's 15D. This is the version used to power the 'Klotzbug' - sketch plans of which appeared in December 1983. The case is stronger than the earlier versions with eight head bolts used to minimise distortion. Sadly the engine is no longer on sale to the public as the Danish enthusiasts could not find reliable production facilities.

CONTROL LINE NEWS

Teamrace Activity in Scotland

Elsewhere in this issue I have touched on the problem that long travelling distances present to racers. While the Australian dimension dwarfs the U.K.'s, Scotland still has an air of remoteness to all but far north of England competitors. Scot's enthusiast Ron Thorpe is determined to encourage local participation and 'lure we sassenachs' north of the border.

In order to build up interest Ron has wisely decided to concentrate on Goodyear T/R in general and Class II Goodyear in particular. At the moment the maximum price for an engine, which *must* be plain bearing, is £19 + VAT. This reasonable sum has attracted a goodly number of club fliers to 'have a go'. To further lower the temperature and keep the fun element high the Class II events will not count towards the League table points system — no incentive here for experts to go points grabbing. These same experts are however cordially invited to give the benefit of their experience in encouraging the next generation of Control-line racers.

The following contests will be held at Newhouse which is just off the M8 and easily accessed from the M74. Enter Scotland via M6 motorway, following the signs until it becomes the A74, then eventually the M74 towards Glasgow. Leave the M74 at Junction 5, which lies just North of the town



of Hamilton. At the bottom of the motorway exit there is a roundabout, take the third exit — signposted A725, Coatbridge/Edinburgh. Follow this dual carriageway until it ends, go straight on over the motorway flyover then immediately turn right, signposted A8 Edinburgh. Follow this route for approximately two miles, then take left onto B799 signposted Newhouse.

At the 'T' junction at the foot of the hill, turn right. At the next 'T' junction turn right again, following Newhouse signs and cross the flyover which takes you over the A8 dual carriageway you have just left. Over the flyover, take left into 'Newhouse Industrial Estate', go straight through the first roundabout, straight through the second roundabout, the flying site is 200 yards on the right in the 'S.D.A. car park'.

May 20:	G.Y.	Class II	½A
June 17:	G.Y.	Class II	F2C
August 12:	G.Y.	Class II	½A
Sept. 9, 16:	standby dates		

No entry fee will be charged for Class II, although the others will be £2 Seniors and £1 Juniors. I wish Ron Thorpe and his partner Alan Pegg success in this venture. They will be pleased to send full details of directions, locations, rules, etc., including late weather reports. Can you say 'no' to such keenness? Phone: Alan Pegg on 0698 884554 or Ron Thorpe on 0698 885516. Address: 4 Argyll Gardens, Larkhall, Strathclyde.

Before leaving the subject of Class II Goodyear the S.M.A.E. Control-line subcommittee have asked me to emphasise that the engine price limit is the current retail on January 1st of the year of the competition. So it is no good dragging out your 1965 Oliver Tiger (cost £6.10s.0d. — remember real money?) even if the eagle-eyed Contest Director fails to notice the ball-races!

The following should clear up the matter:

(1) Motors—4.7.4.2.a. add—The motor must also be suction fed and plain bearing. It should be currently available from a model shop having a recommended retail price of not more than £19.00 plus V.A.T. on January 1st of the year of the contest. No modifications excepting choke diameter and replacement of the needle valve are allowed. The original induction type must be retained, i.e. if originally fitted with a spray bar, a spray bar must be retained.

Chrome Plating Service

Bob Oge, who is in the U.S.A. F2°C Team, is offering a hard porous chroming service.

Briefly this is:

- Chroming and honing to fit piston

	Steel	Brass (ABC)
.049 — .40	\$15.00	\$17.50
.41 — .90	\$20.00	\$22.50
 - O.S. engines with nickel plated sleeves: strip nickel and chrome/hone \$25.00.
 - Addition of chrome to an AAC sleeve to regain piston fit \$15.00.
 - Chroming of parts:

wrist pins, discs, drums	\$ 5.00
crankpins	\$10.00
crankshafts	\$10.00
alloy backplate bearing face	\$10.00
- All prices quoted are in US\$ and do not include postage. Payment by International Money Order.



Bene Rodrigues Filho, Brazilian champion stuntmaster sent us this picture of one of his stunts, interesting to see the influence of Stan Cack's 'UNO' described last month.

Bob guarantees a two week turnaround from receipt of goods which must be accompanied by payment in advance: Bob Oge, 34W 883 S. James, St. Charles, Il. 60174, U.S.A.

It is perhaps worth mentioning that the addition of hard porous chrome to parts can have highly beneficial effects in our two stroke racing engines. These are: longer life oil retention on the surface of moving/bearing parts and reduced friction.

Glass-fibre and carbon racing props

Two bulky envelopes arrived in the same post, each containing examples of racing props. The first was a nicely made version of the now, F.A.I. 'standard' prop: the 1980 Metkemeijer. This is produced by Ed Needham and costs £2.50 for a glass polyester moulding. Also available is a 160mm x 175mm Goodyear propeller. Dave Clarkson and Ed's Goodyear performances in 1983 commend this. Orders to: 100 Lowfield Road, Cale Green, Stockport, Cheshire.

The second packet contained props from long established modeller Ron James. Ron is a professional modeller and has been making props for some fifteen years. He has now decided to expand his range. Two series will be of interest to ½A and Goodyear enthusiasts.

Tornado Plasticote types:

6 x 6, 6 x 7, 6 x 8, 7 x 7, 7 x 7, 7 x 3½, 7 x 5 Thin hub variety

7 x 5, 7 x 6 (Taipan) Thick hub variety.

Prices: Glass Carbon

6in. diameter £1.25 £2.50

7in. diameter £1.50 £3.00

Postage: add 50p per order in U.K. Extra for overseas.

Orders to: Visionregal Models, 21 Rochester Crescent, Hoo, Rochester, Kent ME3 9JH.

Ron James props will be available at Goodyear contests from Scots enthusiast Ron Thorpe.

On a more serious note Ron would like to draw our attention to poorly made props. He has recently witnessed several failures attributable to insufficient fibres and unsuitable resin. Last year I had a blade shed from one of my FAI racers and consider myself lucky that the damage was restricted to the model not me. The message is clear if you are attempting to mould props. Read up on Jim McCann's recently reprinted articles on making props. Invest in some scales capable of weighing the ratios of 60:40 fibre: resin ratio by weight. Lastly (and this applies to any prop). *Keep your face away from the spinning prop disc.*

Wing pressing — a clarification

An article on covering team racer wings with glass cloth and epoxy resin appeared

in the March edition. Having read this in print I think one or two points need clarification.

- the quantity of 12cc used for each side is a total mix of resin plus hardner.
- this quantity is a generous measure for one side of an FAI sized flying wing — 10cc is in fact quite sufficient. Reduce the amounts pro rata for smaller areas such as ½A, or conventional wing/tail models.

If you have any problems, please write care of the 'Aeromodeller'.

Wanted

Your correspondent is desperate (you said it... Ed.) for a Frog 180 cylinder fins casting — please phone Jim on 051-724 1442.

SPEED with Dick McGladdery

Speed Review

Towards the end of last season, the 21N class was developing into a closely fought contest between Frank Chambers of Bilston and Dave Brewin of Feltham. At the Nationals, Dave set a new class record of 151.25m.p.h. on his first outing with his 21 model, but then Frank trumped him with a 152.7. This gave Frank and Dave second and third respectively in the Handicap. Dave got back on top at the 3rd London Area meet at Bicester shortly afterwards, setting another record of 153.4m.p.h., which still stands. Frank and Dave used sharply contrasting formulas for their models. Frank's is generally conventional, being symmetrical upright in planform powered by a K&B21 on mini-pipe and bladder or crankcase pressure. Dave, on the other hand, opted for an FAI-style sidewinder assymetric and used a tuned pipe and suction fuel system, however he concurred in choice of the K&B21 for motive power.

This year, Frank can no longer fly in 21N, having disqualified himself by having won a Novice event back in '82 but we hope to see him campaigning this year in the F21 class, which is basically an identical specification. Dave Brewin can enter either Novice or Formula, and it is hoped that Graham Bryant will take up the cudgels and avenge Bilston's honour. Graham flies a similar model, etc. to Frank, but had a lot of trouble with his old fuel system last year. Hopefully, this will now be sorted out, and with a propylene oxide fuel, he might get the novice record back for Bilston. Then, maybe, we can persuade Dave that propylene really is good for motors...

VINTAGE CORNER

WITH ALEX IMRIE



Left: catch 'em young! The West German contest sponsored by the UHU adhesive company and run by the German Aero Club now entering its 30th year has been a highly effective nationwide scheme that has introduced large numbers of youngsters to the hobby. Right: two youthful enthusiasts from Basingstoke await their turn at the take-off point during the Reading Rally in 1947. Can anyone identify the type of model?



Youth and Vintage

Flagging interest in aeromodelling by the younger generation is a real worry to people whose aim it is to keep the hobby well populated. Over the years (yes, this column has now been running for three whole years!) I have mentioned the junior vintage modeller, in the hope that readers might have been tempted to introduce younger members of their families to this branch of aeromodelling but very few juniors appear to be joining our ranks. The problem is a general one but once beginners have been attracted to any branch of aeromodelling, I am sure that the vintage bug will eventually appeal to a good number of them. It follows that each and every one of us should try and generate interest for any form of aeromodelling within the youngsters. It is not easy, there are just too many distractions for them nowadays but if we can only get them to sit down long enough to build a simple model aeroplane that will fly, that age old magic 'I made it myself, might still work as it did in the old days and the young builders could belong irretrievably to the hobby.

Bill Northrop, writing recently in the American magazine *Model Builder* looked at this problem in some depth, his concern was that the industry was not looking ahead with respect to the future and was not working to attract new generations of youngsters, (the industry's future customers) into the hobby as permanent aeromodellers. He used a good parallel, in that, in the 1930s a *Brown 'Junior'* engine was out of reach of most young enthusiasts but that the majority of youngsters could still be involved in the hobby via the cheap *Megow* and *Comet* stick and tissue kits. These were available in department, hardware, drug, five and ten cent, and hobby stores all over the country "... that any kid and his bike could get to." Currently the major attraction for those who can afford it is the 'inexpensive' R/C trainer, while sadly, for the majority of the other would-be enthusiasts, the modern counterpart of the cheap stick and tissue kit is almost unobtainable. A few makes linger on but generally, these are not as simple as the old *Megow/Comet* kits, and they are much more widely scattered. Many of today's so

called 'model shops' do not even stock anything of this nature, in any case, ask for such stuff and you will be regarded as a freak! Bill says "... years ago a youngster could discover modelling on his own, and could afford to get his feet wet, no matter what his financial level." He also has this to say about that craze of plastic ready-to-fly control line model ('Pukie Ukie') "... the greatest setback to model aircrafting ever created." The lack of model airmindedness, is not really a new problem, over the years there have been schemes and competitions to generate this amongst the younger generations, our own Ron Moulton looked at many of these in an interesting article in the 1965/66 *Aeromodeller Annual* titled 'Catch 'em Young', and started off by saying "... the most worrying concern has been that there are too few junior flyers around." RGM went on to review what had been done up to 1965 by many countries, including Austria, Czechoslovakia, Finland, Germany, Israel and Switzerland, with marked success, commenting favourably on the German Aero Club scheme for 'Der kleine UHU' glider. Some six or seven years ago there was an influx of the 'Hi-Flier' series of stick and tissue models into this country, the smaller variety costing about £1.20 could honestly be said to have been the modern

counterpart of the pre-war 10 or 15 cents American kit, but despite the large numbers imported, they did not appear to make any impression on our aeromodelling scene. In fact, I well remember one large London store taking ages to sell their stock, despite making drastic price reductions. Remembered too is the *AMA 'Dart'* designed by Frank Ehling, I managed to get some youngsters to build and fly them but I cannot report complete success, since none of them continued permanently with the hobby! However, I like to think that perhaps some seeds were sown that might yet cause one or more of my *ab initio* builders to return to the hobby. The British equivalent of the *AMA 'Dart'*, the *BBC 'Hawk'*, also did not appear to make the mark that was expected of it, what went wrong?

Ron Moulton suggested that the lack of aeronautical inclination by the 1965 generation was possibly due to the fall-off in

Ron Randall from Coventry built this attractive orange and black 'Dorland' 35in. span semi-scale model from 1946. One of the lesser known designs from the Aeromodeller staff, the model formed the basis of a nationwide competition which culminated at the third British National Model Aircraft Exhibition (see text).





Diane Humphreys with her 'Boehle Giant' 14ft. span power model. Diane who is now a full member of SAM 35, hopes to have the 'Giant' ready for flight by this year's Vintage Day meeting.

the full-size aircraft industry with less types of exciting aircraft appearing annually. Twenty years on we are still faced with this lack of airmindedness, what of the future? According to the 'Catch 'em Young' article, the core of the aeromodelling hobby in 1965 belonged to an age group spread over the years between 1940 and 1956 when there was stimulated aviation activity in these islands. A high proportion of present day vintage modellers come from this core, in 20 years time their numbers will have dwindled drastically and the movement will be dependent on both the airmindedness of the younger generation and on the action taken by the model aircraft industry to promote an aeronautical inclination or awareness via their products which must be within the reach of as many youngsters as possible.

Readers' letters

Dorland

Ron Randall of Coventry sent the accompanying photo of the 'Dorland' and rightly comments, that this attractive little model, is not as popular as might be expected. He goes on to say: "It may be that it tends to be overshadowed by 'Jackdaw', very much its ancestor I feel and very much more in the limelight due to the competition at Old Warden each year. Or it may be because 'Dorland' was not published in reduced plan form in *Aeromodeller* and people just did not know what it was like unless they actually sent for full-size plans. Certainly it is quite a 'fussy' little model as far as its structure is concerned. There is quite a lot of it considering you only finish up with something little bigger than an 'Ajax'. However, I quite enjoyed building it and hope that the results may be of interest to the readers." This 35in. span semi-scale model was designed by the *Aeromodeller* staff in 1946 and a full description of it appeared in the September issue of that year. The prototype was said to have done 71 secs. on 600 turns in far from ideal conditions. However, the design was used to foster a nationwide model competition where winning models of flying competitions in 12 areas of the country were later exhibited at the third British National Model Aircraft Exhibition at Dorland Hall. I am sure that the only thing required to bring this model into the limelight is the mention of a 'Dorland' competition. How about it SAM?

May 1984

Boehle Giant

It is always a pleasure to hear from Jack Humphreys of Northampton, whose family churns out large vintage power models with apparent ease. Latest machine from this production line is daughter Diane's 'Boehle Giant' made from drawings that originated with Danny Sheelds who has already built and flown an R/C version. This model was also featured in the Frank Zaic 1937 *Yearbook* and it had caused quite a commotion at the 1936 US Nationals, when, taking advantage of a loophole in the wing area rule, Vernon Boehle entered this 'Baby Cyclone' (6cc ignition) powered 14ft. span model which was quickly named 'Boehle Giant'. Jack tells that the model was built entirely by Diane, except for some help (in the form of soldering lessons) on the landing gear. The machine weighs 5lb. in its rough finish state as shown in the attached photo and it is estimated that following final sanding, nylon covering and motor (glow .35 or .40) installation it will finish up about 11lb. heavier than Vernon Boehle's 1936 original, which was built of lightweight balsa and had many lightening holes in its 18in. chord ribs and topped the scales at 6lb. Jack goes on "... Diane has built a similar radio assist version to Danny Sheelds, since after the initial free-flight test flying she intends to fit a 2-channel system working rudder and throttle ... apart from its size readers might be interested in the material used for the wing and tailplane ribs. These have been cut from foamboard $\frac{1}{16}$ in. thick faced on each side with paper, this is a commercial product used for display

Above right: Henry J. Nicholls with his 'Cloud Chaser' at the Fairlop Power Contests in 1947, winner of third place in the power duration contest. Below: this photograph of Bill Lunn's Premier design 'Pacemaker' was inadvertently edited out of the January issue when a request was made for the loan of drawings of this model. Drawings are still urgently required and will be returned after use.



purposes. Where the foam was exposed on the edges after cutting it was capped with $\frac{1}{16}$ in. balsa strips and a light strong rib has resulted. This rib construction idea came from David Baker who has also used this material in the same manner on the ribs of his double sized 'Powerhouse' ... what with the 'Giant' taking up all the available space, Ann and I have had to make smaller models at a small corner bench ... result six biplanes, 'Pinocchio', *Model Shop* 'Wasp', Bowers' 'Flamingo' from the latest *Zaic Yearbook*, 'Sporty' in both 3/5 scale for CO₂ and full-size (30in.) for small diesels 1 to 2cc, and 'Skybuggy' a 42in. span *Berkeley* kit design." What a family! 'Sporty' is of course Jack's own design which was originally described in February 1950 *Aeromodeller*, plan still available from MAP as PET/367X price £2.10 plus 50p postage.

Howard Boys

In the February issue I mentioned that during the 23rd October meeting at Old Warden I had seen Howard Boys returning from the aerodrome with pieces of his tail-less model under his arm ... he writes to tell us more about that day. "Your report of the meeting at Old Warden on October 23rd makes it look a bit of a tragedy for me. I broke the tail-less model because I had fitted a more powerful motor/prop unit and couldn't handle it. However, that day I flew the



Left: George Whitfield with his nicely built 'Hurricane' at last year's Earl Stahl competition.



Above left: although HJN's 'Cloud Chaser' design was never published, D. M. Barton unearthed information enabling him to build this diesel-powered, rudder-only, radio-assist version seen at Old Warden. Left: Howard Boys with his tailless entry in the 1948 Bowden Contest at Fairlop, although he did not place in this competition, the 1.2cc Foursome diesel-powered flying wing was a consistent flyer and components survive today in use on Howard's experimental models.



Above: ever popular Buccaneer 'Standard' seen at Old Warden last October. This R/C version powered by Saito 30 four-stroke engine was built by Peter Lindlidge. Left: Tony Turner with his D. A. Pavely type model at Old Warden, hopefully the compressed-air event at Warwick Racecourse on June 24 will attract machines like this and Jack Humphreys' 'Tizer-Bomber!'

Acoms electric powered version of my 1950 radio model and it went beautifully. It was a little over elevated, and I circled it to keep the nose down a bit. This yellow model circling in the sunshine against a blue sky, went up to about 300 or 400 ft. and I had to switch the motor off for a while to keep it within bounds. A most memorable flight . . . that was October 23rd for me. I am sorry that you did not see the flight. As a matter of fact I did little flying since most of my time was spent talking to the many modellers who came to speak to me." We look forward to seeing Howard again at the next meeting, he never seems to miss attending, always brings some interesting model, and his 'chin-wags' bring a great deal of pleasure to other modellers.

Us and Them

Denis Fairlie writes with thoughts about R/C and F/F, he says " . . . its a great pity that RCM&E and Aeromodeller had to be separate magazines. Particularly with the F/F boys it has exacerbated a split between R/C and F/F, a sort of 'us and them' attitude. Some, due to the F/F belief, that anything R/C has to be built like a Sherman tank and weigh not less than 8lb. with a minimum lethal speed of 50mph. It just isn't so today. One British gear has 7/8oz. receiver, 1/2oz. servo and 1 1/2oz. 150mA Ni-Cad. So, for proportional rudder only, you can get away with 2 3/4oz. airborne weight. Thus many of those old F/F Aeromodeller plan designs with .75 or .5 diesels can be steered around in a reasonable breeze. What's the advantage in seeing one's F/F vanishing downwind



into a tree? For 3 3/4oz. you can have throttle, elevator and rudder!" I hope that the split will not develop into anything more than a mere difference of opinions! The fact is, that with our weather and shortage of flying sites, almost all power vintage flying is now radio controlled. It is to be hoped that competition officials will be quite firm when judging both static appearance and flying performance, in order that the whole thing does not get away from us and become something divorced from Vintage. It is well enough known that I favour Free-Flight, I do this since I enjoy building and flying authentic vintage models with original petrol engines and have a rural flying field where (hopefully) my unsilenced engine does not cause any problems. However, I

must immediately admit that the amount of flying that I do is much less than the amount that I could enjoy by fitting R/C. Several times each year I am faced with the recovery of models from high trees, if I am lucky: or if unlucky, lose the model and hope that the finder will contact me. Personally I don't find these facets inconvenient, since my power modelling has always been this way.

Help

If this catches the eye of Mr. N. H. Sawyer of King's Lynn whose photo of the Lancashire Model Aircraft Society appeared in the January issue please contact us, since we have mislaid his address.

Engines

The PAW and Super Tigre engines fitted to two of the prototypes are particularly worthy of note: For the beginner the PAW range must be about the best value out. The standard 2.49DS provides plenty of power for the trainer while the 2.49 contest or 19DS will provide a little more 'poke' for racing or stunting. Being diesels, no extra expense is incurred in starting batteries or plugs which can add greatly to costs when first starting. Some people find glow engines easier to start but as all PAWs are test run, all you have to remember is that if the settings have not been too badly mis-adjusted then the motor should run . . . eventually!

The ST X21 'Club-20' used on the prototype racer is proving to be most satisfactory, after 30 minutes bench running with a 9 x 6 propeller it was fitted with a 8 x 6 and bolted to the model. Starting

for its first flight was almost instantaneous and fellow club members timed the model at well over 80mph despite a slightly 'rich' setting and the standard, very quiet, silencer. Compression, even hot, remains good so the signs for club racing in the coming season look good. With an Irvine 'Super Silencer' and 7 x 6 glass filled prop we may touch the magic ton!

Footnote

If you are lucky to have a tarmac site, the wing tips and base of the fin should be protected with wire skids epoxied into place. They are not necessary on a grass site.

Club/Display Racer Rules

Rules

Racing shall broadly follow the rules of racing conduct as set by SMAE for 'Goodyear'.

Line length: 52ft. 4in.

Heats: 100 laps with one compulsory pit stop.

Model:

(i) Shall be of realistic appearance and represent a typical racing aircraft. It need not be true scale but the Contest Director may ask for documentary verification of 'unusual' models.

(ii) Wing area 250sq. in. (16dm²).

(iii) Fuselage depth 5in. (125mm) measured within wing chord.

(iv) Minimum wheel diameter 1½in. (35mm) balloon tyre for grass flying site.

(v) Fuel system atmospheric only.

(vi) Re-fuelling system 'squash bottle' only.

(vii) Engine 'box standard', 3.5cc as per 'Club-20'.

(viii) Fuel cut-off desirable (but not compulsory).

Bo-Jess continued from page 242

the tail for the glide and add a trim-tab to the fin to get the right turn if necessary. Built as shown, both our models so far have needed about an ¼in. packing under the tailplane trailing edge and quite a large trim tab.

When adding packing under the tail, make sure that the tailplane still locates properly. If you need as much as an ¼in. packing, it will be necessary to shape it exactly as the top of the fuselage. (Fig. 19). The trim tab should be braced to the fin so that it never moves. Make the trim tab fairly large, high enough to cover two ribs and about ½in. wide (Fig. 20), set it at 45°. If adjustment is needed, reduce or increase the

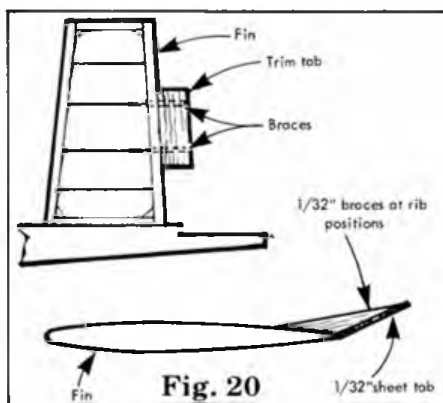
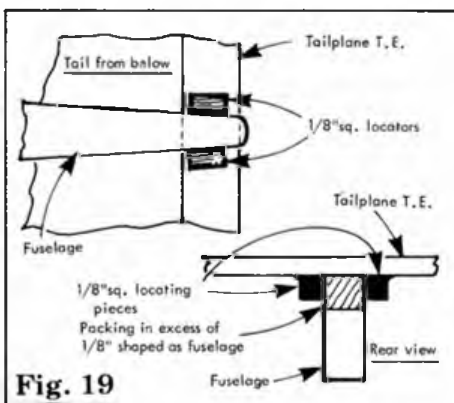
size of the tab. The glide can only be seen from about 50 feet up, so wind on about 100 or 150 turns, put in about ½in. right thrust (left side of noseblock) and launch the model gently. If it stalls under power, keep adding side-thrust until it doesn't. If it turns too tight to the right remove the side-thrust. Stay with low turns until you have got it to climb until the motor runs out and can see the glide properly. The glide should complete a circle in about 20-30 seconds and obviously be flattish. Adjust the trim tab size to get the right circle and alter the packing under the tail as necessary to get the glide flat.

When happy with the glide try a bit more

power, work up in stages of about 100 turns and at each stage check any power stall with more side-thrust. At about 400 turns, the model should start to climb fairly fast and steep. If at this stage the model stalls under power, it may be that some down-thrust is needed. If the climb circle is quite tight and the model stalls because it is trying to go too vertical then try down-thrust. If the model seems to be 'leaning' left when it stalls continue with more side-thrust. Should the model tend to start off in a good climb then suddenly dip the right wing and swoop low, you probably need more washout on the left tip.

Try again with the same number of turns but immediately before launching twist some washout into the tip — quite viciously so the tissue crinkles. If this cures the trouble, the warp will need to be steamed in. Do not try to do this on the field, take it home and do it. However, carry on trimming, just remember to twist the warp in before launching each time! While trimming the climb, keep an eye on the glide. A freewheeling propeller can affect the glide trim if a lot of side-thrust is used, so the glide turn may change as trimming proceeds.

At about 800 turns, the motor run should be about 75 seconds. If less then try a less powerful motor but if more than this and the model climbs steadily you could be onto a winner . . .



RIPMAX
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BALSA

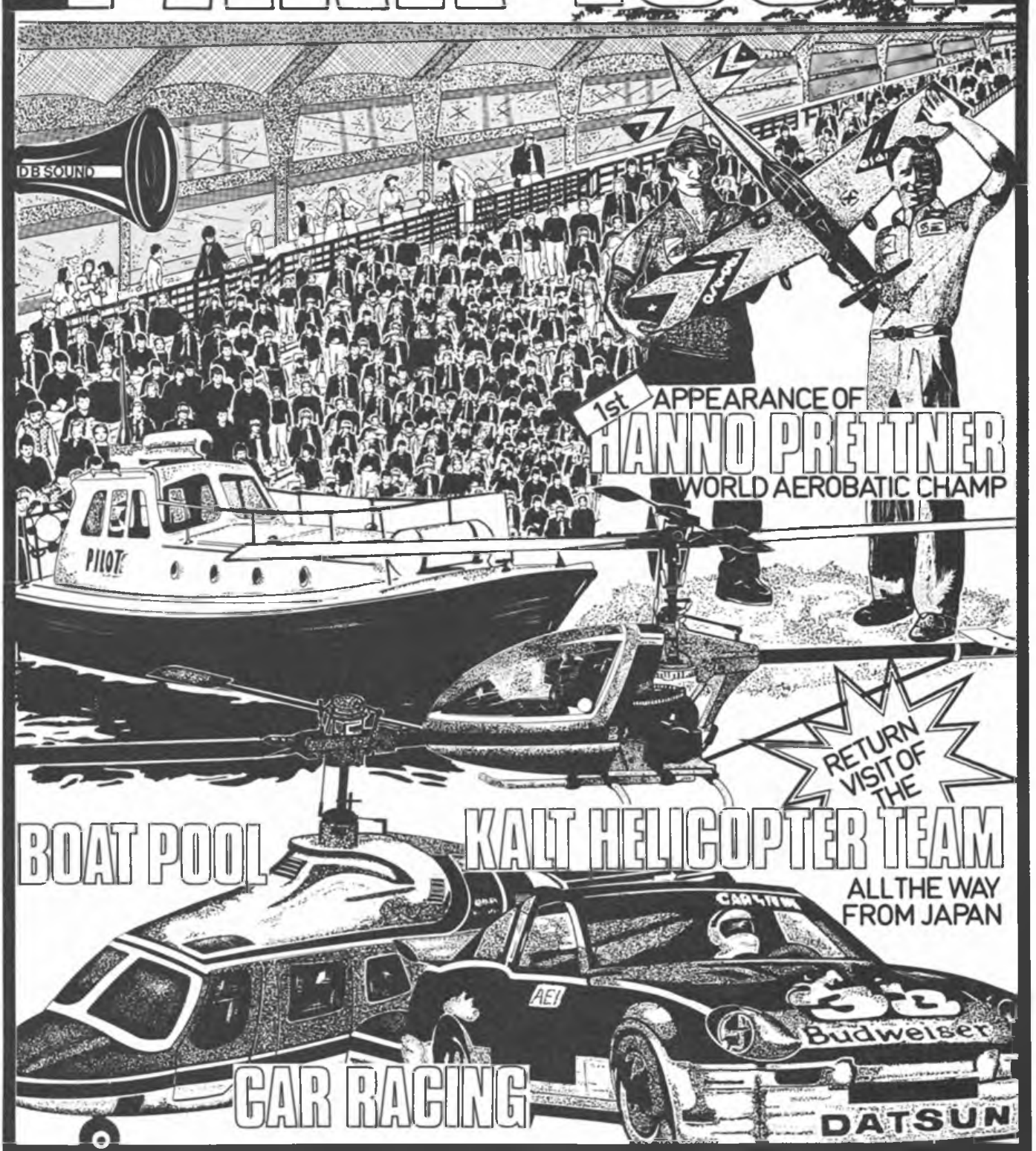
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MODEL SYMPOSIUM, EXHIBITION & DISPLAY

SANDOWN PARK 1984



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The IRVINE design and development team are all active modellers, so perhaps it's no real surprise that when they set to and develop an economy plain bearing, lapped piston motor specially for sports aeromodelling, they produce a surprising performer. Here is a SPORTS 20 motor with a really fine performance for all kinds of aeromodelling. Precision made, it's a HIGH PERFORMER at a LOW, LOW price.



20

WITH THE HOT PERFORMANCE

BLACKHEAD 20 STANDARD £24.95
BLACKHEAD 20 R/C £28.95
Each complete with muffler

Also...
Irvine Sport 25 Stunt. £32.95
Irvine Sport 25 R/C. £37.95
Irvine Sport 30 Stunt. £42.50
Irvine Sport 40 Stunt. £45.50

Ask to see them at your model shop

IRVINE ENGINES LTD.
UNIT 2, BRUNSWICK INDUSTRIAL PARK,
BRUNSWICK WAY, LONDON N11 1JL

Tel: 01-361-1123/4



MICHAEL'S MODELS

Incorporating Racing Sport and Vintage Engines

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Leading Control Line & Vintage Specialists ESTABLISHED 1969

646-648 HIGH ROAD, N. FINCHLEY,
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S/H SUPER TIGRE 20/15 COMBATS

We have acquired a few of the above engines, prices ranging from £17.00 to £19.00 please ring for details.

By the time this advertisement appears we should have in stock a large quantity of new Super Tigre G15 Diesels. See bottom right-hand corner.

NEW BEN BUCKLE VINTAGE KITS

'Flying Quaker' 7ft. span for .40 to .60 engines £42.50
'Trenton Terror' 6ft. span .30-.40 engines an ideal beginners F/F or R/C assist. project £32.50

NEW/BACK IN STOCK ENGINES

New! PAW 35 Std. £37.95
New! PAW 35 R/C £40.25
Pares 2.5 FI Diesel £43.00
KMD 2.5 RV T/R Diesel £43.00
Mills .75 £12.95
Mills 1.3 £13.95
Gilbert .7cc Glow £13.95

STUNT PLAN

Performance kits 'Pinnacle' 54" wingspan for 30-50 size engines. Kind of Nobler shaped with wheel spats. £1.95 each

NEW COMBAT/TEAM RACE/

GOODYEAR ITEMS
Props FAI T/R Metkemeyer
160 x 175 £5.00

G/Y Clarkson 170 x 145 £5.00
Combat Needham 165 x 90 £5.00
(Combat prop balanced + Ready to use other require balancing).
T/R Wheels 14 SWG Hole £3.00
T/R Wheels 12 SWG Hole £3.00
T/R Wheels for Alloy Undercart £3.00
Domed Spinner Nuts 1BA for PAW 1.49 £1.20
Domed Spinner Nuts 6mm for Cippola 2.5 £1.20
Tank Valve for 1/2 A/FAI T/R £5.00
Tank Valve for Goodyear + B T/R £5.00
Self Venting Tank Valve for Pressure Goodyear £7.00
Circular Bellcrank with Housing £4.50
STUNT/COMBAT KITS
'Baron' Stunt fully built up for 3.5cc engines complete with all ancillaries 40" W/S £19.75
'Smousen' Profile Fuz Stunt model for 2.5cc engines fully complete and die cut 40" wingspan £11.25
'Northrop F5 the larger Stunt ship in the modelhob range. Based on the F5 fighter Jet with die-cut parts comes complete with all hardware 54" W/S for .35 to .40 size engines £35.75
'Las Gatas' two foam/balsa flying combat wing kits in one box complete with all hardware W/S 39" for 2.5 engines £13.50
'Warlord' built up combat wing for 3.5 engines £7.99
'Warlord II' foam/balsa combat for 3.5 engines £7.95

OLD JETEX KITS

Space Jet 18" £3.95
Starjet 28" £4.95
Squib £2.50
Sabre £2.95
Venom £2.95
Skyjet £2.95

Quantities on the above kits are strictly limited, so it's first come, first served. Please note: we do not have any Jetex Motors, Fuel or Wick.

TREXLER AIR WHEELS

Size 1 1/4" - 1 3/8" £3.25
2 1/2" - 1 5/8" £3.25
3 1/4" - 1 7/8" £3.85
4 2" - 2 1/8" £3.85
2 1/4" - 2 3/8" £4.85
6 2 1/2" - 2 5/8" £4.85
8 2 3/4" £7.95
9 3" Suitable for R/C £9.10
10 3 1/2" Suitable for R/C £10.45
11 4" Suitable for R/C £11.55

JUST RECEIVED

Super Tigre G20/15 Diesels
..... each £28.95

MAIL ORDER A PLEASURE
EXPORT ORDERS WELCOMED.
POSTAGE: ENGINES 50p; OTHER
ITEMS 10% 50p MINIMUM £2.00
MAXIMUM.



Send 40p in Stamps for new comprehensive list. Refundable with first order.
All enquiries must be accompanied by an S.A.E.
Phone Barclaycard, Access No. for same day service.

Mentmore Model Makers Exhibition

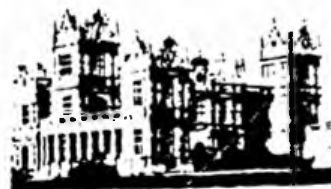
Sunday 6th May Monday 7th May 1984

Opening Times: 10.30am - 5.00pm

MENTMORE TOWERS, MENTMORE, LEIGHTON BUZZARD, BUCKS.

A new show at an unusual venue -

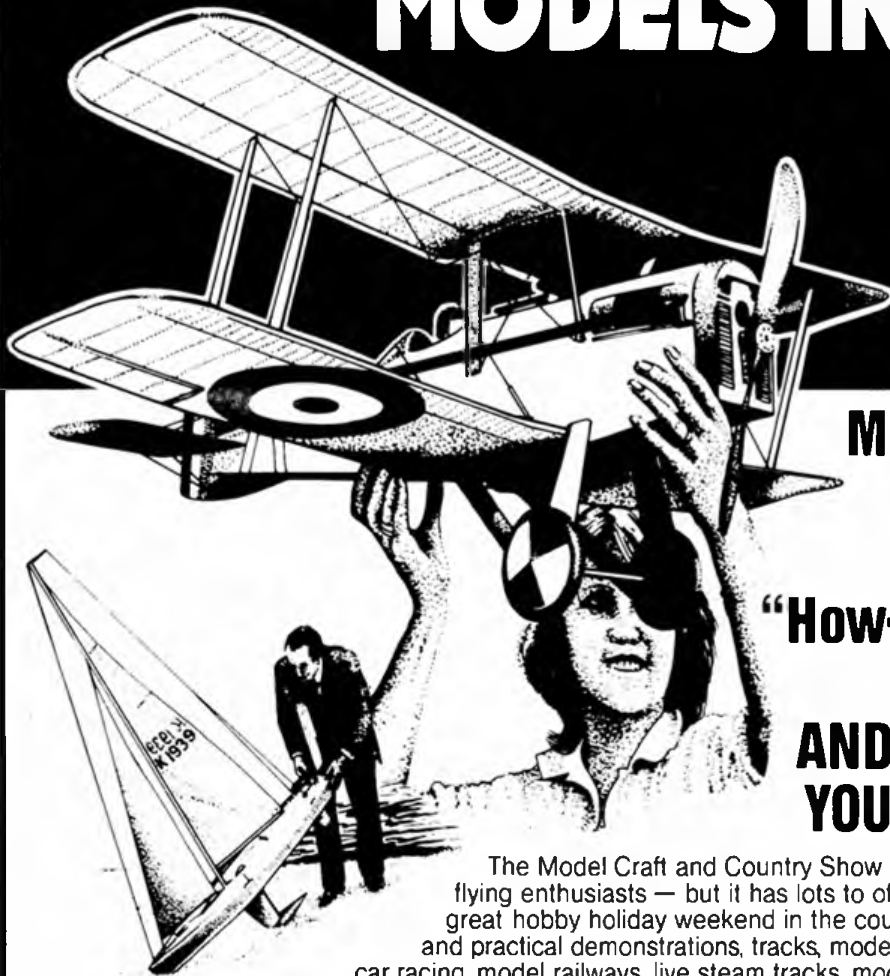
Mentmore Towers is hosting an Exhibition and working display of models - model railways in the Grand Hall, fairground models in the Gold Room etc. Working and static displays of aircraft, cars, etc., all held within the grounds of Mentmore Towers.



Exhibition enquiries to: Jane Spiegel Trade enquiries to: Suzie Cripps Admission: Adults £2.00,
P.O. Box 43, Abingdon, Oxon OX14 2EX. Children (5-16) and OAPs £1.00, Children under 5 free,
Catering and Toilet facilities — Free Car Parking — Gates Open 10.30am Family tickets: 2 adults and up to 4 children £6.00
All other enquiries: Jane Spiegel, PO Box 43, Abingdon, Oxon OX14 2EX Tel: Abingdon (0235) 21873

SEE RADIO CONTROLLED MODELS IN ACTION

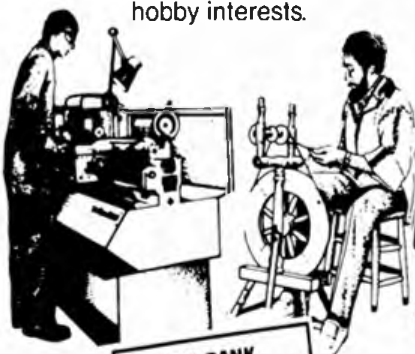
at the Show that shows you how



**Model Flying Displays,
Model Car Racing,
Model Boating,
"How-to" Demonstrations,
Trade Stands,
AND LOTS MORE FOR ALL
YOUR FAMILY & FRIENDS**

The Model Craft and Country Show is a must for all radio controlled model flying enthusiasts — but it has lots to offer the rest of your family too; it's a great hobby holiday weekend in the country. There are 6 halls with trade stands and practical demonstrations, tracks, model exhibits, space models, model flying, model car racing, model railways, live steam tracks, model engineering workshops and instruction and the largest craft show in the country.

This is your chance to enjoy your own hobby and give pleasure to your family and friends at the show which is putting the emphasis on teaching visitors how to get the most from modelling, crafts and many other home hobby interests.



**SPRING BANK
HOLIDAY WEEKEND**

MAY 26TH-28TH

Adults £2 Children & O.A.P's £1

Refreshments, bars, snacks 9 a.m.
- 6 p.m. daily. FREE Car Parking.



**ROYAL
SHOWGROUND
STONELEIGH
KENILWORTH WARWICKSHIRE**

APPENDIX - Links to the plans

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

The ACE by Dave Cowburn

Control line model for everyone

[https://outerzone.co.uk/plan_details.asp?ID=9446 ...](https://outerzone.co.uk/plan_details.asp?ID=9446)

Bo Jess (II part) by Bob Wells

Open rubber model - part 2

[https://outerzone.co.uk/plan_details.asp?ID=9724 ...](https://outerzone.co.uk/plan_details.asp?ID=9724)

School Chucky by Bob Greaves

Simple all sheet glider

[https://outerzone.co.uk/plan_details.asp?ID=13977 ...](https://outerzone.co.uk/plan_details.asp?ID=13977)

Build ACE Control-Line
Trainer, Racer or Stunter
full-size plan
Worth £1

SCHOOL PROJECT:
Phantom Fighter
Chuck Glider

GOING SOLO:
a practical beginning