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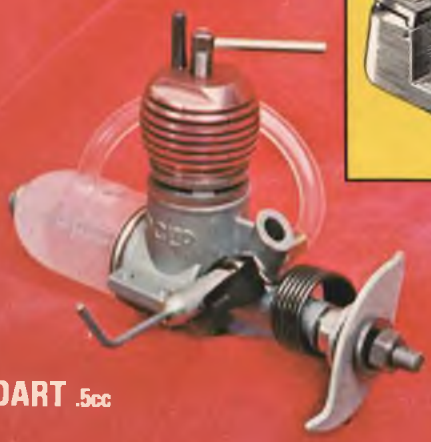

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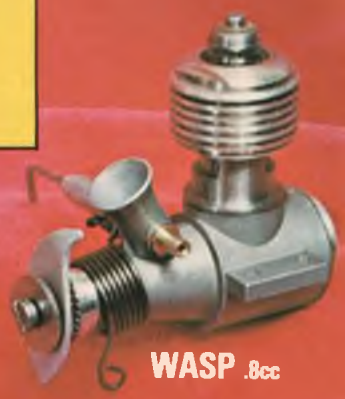

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Aeromodeller

APRIL 1979

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MAP **HOBBY MAGAZINE**

Comment

NEWS OF NUMEROUS specialist interest groups being formed can only be taken as a healthy development for the model flying movement. Under the overall fellowship of a National body, the SMAE, to look after the general needs and protection of our sport, who better than the enthusiasts themselves to understand and administer their particular requirements. But there is one group of model flyers so specialist and so cohesive that it is by definition unable to form its own interest group. The Newcomer, the novice, the beginner, the junior – tomorrows modeller. Whatever their classification, whatever their ultimate interest, their need is the same; help, information and encouragement. They can never organise their own events or cater for their own needs. It is up to the established specialist interest groups, and the local model clubs, to ensure their cause is not overlooked to ensure the future of the movement. The finger can be pointed at many areas of model flying that are apparently not attracting new blood. It's the classic chicken and egg situation, where there are few newcomers their needs are not met, leading to still less in the future. Even the events specifically organised for Novices often suffer from half-hearted organisation or lack of publicity. If you recognise a ring of truth in such statements then you will recognise the need for action. We must be one of the few sports not to offer some form of recruitment, coaching or training programme. Most modellers rely on being self-taught, that's why so many give up. So a plea to all established modellers to make special provisions for tomorrows modellers when planning future activities.

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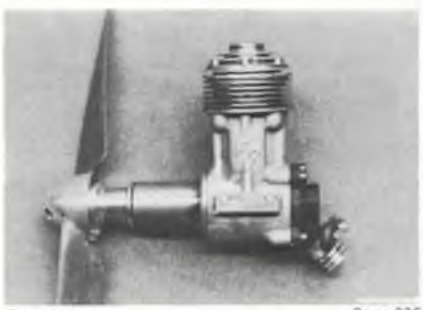

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On the Cover

Winner of the Bristol Cup at the 1979 Model Engineer Exhibition this superbly detailed Control Line Bristol Bulldog II was built by Mick Staples over a period of 9 months. The scale model spans 1140mm weighs 1.75kg and is powered by an OS40, controlled by means of a third line to the throttle. Congratulations to Mick of Cambridge on the very realistic effect of metal panelling and the fine dummy Bristol Jupiter radial engine. The undercarriage is sprung with telescopic struts and of course, that clockwise rotating propeller is true-scale – replaced for flying. Who said Control Line Scale was dead?

Next Month

Full size pull out plans for British Team member John Cooper's 80 inch wingspan F1A glider, a sensible all weather design. Aircraft described features the Fournier RF4, the design chosen and modelled by new R/C Scale World Champion Mick Reeves. More fascinating details of the workings of diesel engines as World Team Race Champion Rob Metkemeijer continues the FMV story. Aero Aces Flying Start prepares flying equipment and helps you select a flying site. Plus all the latest news and views on Free Flight, Control Line and Radio Control modelling. On sale April 16th.

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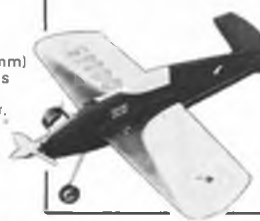

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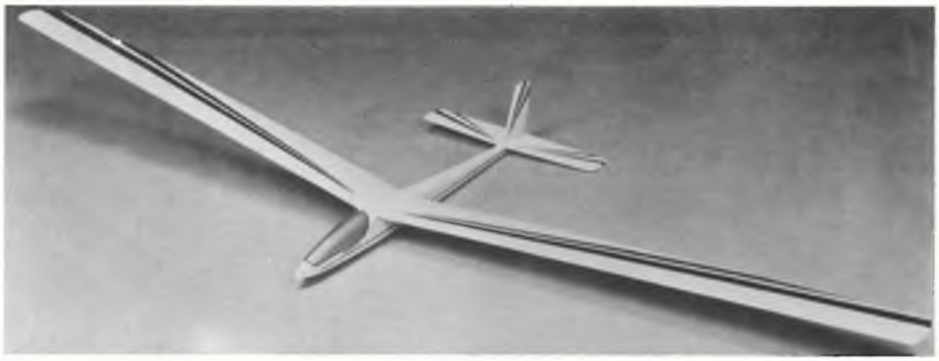

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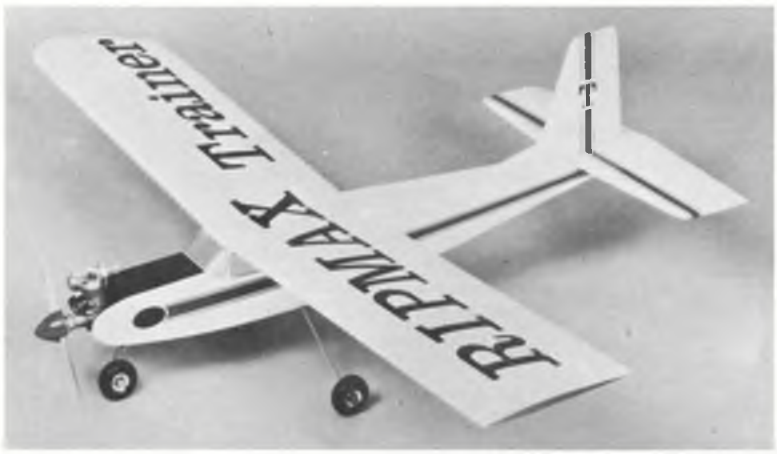

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Hangar Doors

Two fine models of the 1938 design 'Cloud Airmaster' pictured in the Bedfordshire snow, prove that even this year's harsh winter has not prevented model flying activity. The two models built to ¼ rds scale powered by Mills 1.3s were built by Peter Fisher and John Kemp and illustrated the growing resurgence of interest in Vintage models.

A MODEL HOLIDAY

Model enthusiasts of all ages and levels of experience are being offered a fabulous week's holiday from May 5th-11th at the beautiful seaside resort at Primrose Valley, Yorkshire. The venue offers a wide variety of facilities, from sandy beaches and a cliff top R/C slope soaring site, to superb R/C powered and Control Line sites. The Leisure Caravan Park offers luxury chalets, lots of fun for the kids with roller skating, skateboarding, indoor heated swimming pool and evening entertainment includes discos, bands, cabarets and bars. For further details write to Leisure Caravan Parks Ltd., 25 St Stephyn's Chambers, Hemel Hempstead, Herts.

PONTINS

Brean Sands is once again the venue for Pontins National Model Makers Festival for two weeks, from September 29th to October 6th, and October 6th to 13th. For the past two years thousands of families have enjoyed these modelling events. Once again a whole range of activities are offered; aircraft, boats, locos, with manufacturers and leading experts on hand to give advice and information. For further details contact: Brean Sands Holiday Village, Burnham-on-Sea, Somerset.

SANDOWN SYMPOSIUM

The Elmbridge Model Club are holding their fourth Trade and Model show on 12th and 13th May at the Sandown Park Racecourse, Esher, Surrey. A major attraction of the show each year is the almost non-stop two day flying display with many top modellers and trade display teams performing before the large crowds seated in the racecourse stands. Radio Controlled power and glider models are flown and Control Line stunt and combat are flown in the paddock area. Trade stands offer all manner of kits, engines and accessories, in what is one of the largest model flying shows of the year.

MODELAIR 79

News of another Aeromodelling Exhibition, this time in Norwich organised by the local club. Exhibits will cover the full spectrum of model aircraft construction, and throughout the exhibition there will be regular demonstrations of Electric Round the Pole flying. Weather permitting, Radio Control and Control Line demonstrations will be flown all day on Saturday. The exhibition is open from April 19th-21st at Heartsease Youth and Community Centre, Norwich.

SOARING COSTS

For the benefit of our many readers who enjoy full size gliding by attending courses advertised in our classified pages, we would like to correct an error in our March edition. The price quoted for a 5 day course with the Northumbria Gliding Club *includes* tuition fees.

1978 INDEX

To speed your search for articles printed in last year's Aeromodellers a full cross-referenced index is now available for the 12 issues of Vol. 43 1978, price 50p from Aeromodeller, PO Box 35, Bridge Street, Hemel Hempstead, Herts.

POSTAL EVENT

Another global Free Flight challenge has been issued by the Clube de Voo Livre Aerobu of Brazil for F1A, F1B and F1C models. The event is for three man teams, comprising one flyer in each of the three FAI classes, and can fly on any weekend in April. Each competitor to score five 3 minute maximums, then continues with 1 minute increment flyoffs until a flight is dropped. All clubs interested in entering should send their scores together with all available information on temperature, wind etc. to Andre C. Gomide, Clube de Voo Livre Aerobu, Rua Lidia, Coelhos 02035 – Sao Paulo, Brazil.

OBITUARY
ARTHUR EDWARD JONES
1884-1979

First SMAE Secretary, First specialist model shop proprietor and Senior Fellow of the SMAE.

After a long illness, Arthur Jones passed away peacefully on Sunday. A Fellow of the Society of Model Aeronautical Engineers, he had been its first Secretary, a post which he fulfilled for some 3 years from 1922. His interest in aviation had been stimulated by activity of the pioneers during the early years of this century. He joined the Kite and Model Aeroplane Association in 1914 and later the London Aeromodels Association. He became a partner in a shop at 97 New Oxford St. where he introduced model aircraft and their accessories for sale. Towards 1930 A. E. Jones became the sole owner of the shop and he was one of the first to sell balsa wood and to distribute the first petrol engine of any potential for model aircraft use – the 'Improved Atom Minor' designed by Edgar Westbury.

During the ten years up to 1934, A. E. Jones organised many model flying meetings mainly at Sudbury, Wimbledon Common and Parliament Hill Fields, and indoor flying meetings at the Horticultural Hall in London. He was also the Secretary of the Model Aircraft Club in the early 1930s.

His active connection with the SMAE and TMAC continued until 1936 when he had closed his shop and moved to Bournemouth. He had hoped to re-open in Bournemouth but ill-health and the intervention of World War II prevented this.

The last occasion at which Arthur Jones was able to attend was the reception held at the United Services Club on the 22nd of November 1972 to mark the Golden Jubilee of the SMAE when he was presented to HRH the Duke of Edinburgh and from him, received his Fellow's Certificate.

The passing of Arthur Jones, doyen of the SMAE, is a sad occasion. He will be remembered not only through his many services to the sport of model aviation particularly during its formative years, but also because of his immaculate dress and his tolerance and great kindness to others; he was one of nature's gentlemen.

Alwayn Greenhalgh

Letters

VINTAGE NATIONALS ANYONE?

Dear Sir,

Having attended three Vintage rallies last year (Old Warden, Halton and our own Cotswold RCS Old Timer) I have been giving some thought to the possibility of a National R/C Assist Vintage event. From the support at the above mentioned Rallies, I would imagine that such an event would be well supported provided that it is not too formal.

I would suggest that to be eligible the models would have to have been available as a kit or published design at least twenty-five years previous to the date of the competition, and if required by the judges, some proof of dating be made by the competitors, e.g. dated plan, or magazine advert with the date on it. I say 'If required' as some designs are well known but others may be perhaps borderline cases. One need not, however, be too pedantic about it.

The competition proper I would suggest be split into static and flying – as in Scale. The static judging would consider workmanship, finish, ingenuity of R/C mods i.e. utilising the original structure where possible for control surface hingeing etc, and the use of appropriate accessories and engine. I use the word 'appropriate' and not 'vintage' deliberately. I would consider a replica engine e.g. Indian Mills, spark converted glow etc, as appropriate as genuine vintage engines for a particular project may not be available for a prospective entrant at that particular time. Genuine vintage airwheels will probably have perished rubber and would therefore be unusable but the use of say, Trexler or DU Bro pneumatics would be appropriate. Those of us fortunate enough to own suitable vintage engines would not therefore be in a position of advantage over those who would like to 'Fly vintage' but who may be put off by the non-availability of a vintage engine.

The flight section of the competition would consist of a simple pattern – the *OLD* overhead figure-of-eight with the intersections at 90° over the transmitter, a rectangular circuit, an optional touch-and-go, and a spot-landing on nominated time. As to the number of functions to permit for the radio I cannot be really be certain – I would suggest perhaps that three (i.e. rudder, elevator, throttle) be the standard. Any functions in excess of three would be subject to a 5% penalty per function, whilst those models using less than three gain a 5% bonus per function. Each competitor would make two flights, the highest flight score being added to the static for the overall competition score.

Scaling up or down would be permissible with no penalties incurred but perhaps the standard size plan should be provided for comparison for static judging.

These are my suggestions and I would be very pleased to hear from the rest of you fellows with your ideas. If we can get something concrete flying fairly quickly we could possibly stage this type of event at the 1979 Nationals. I might even be persuaded to help in the organising if there is sufficient support.

Finally a 'Thank You but . . .' It was nice to see my Scorpion in the Old Warden report in the *Aeromodeller*, pity you got my surname wrong.

Stonehouse, Glos. *Mike Whittard*

Send us your views and we will pass them on to Mike.

Dear Sir,

As a reader of Aeromodeller since October 1955 I was pleased to see the revamped Aeromodeller for Jan. '79 with its return nearer the old format containing both scale and flying model plans.

Amongst my collection of Aeromodellers I've been lucky enough to acquire some early ones including a 1945 set. I notice the 'Grand scale plans from this period are not listed in your Scale Drawings list. Is there any chance of reissuing such plans especially where they may be of interest to flying scale modellers eg BAM Swallow Feb '45, Vickers Vulcan March '45, Heston Phoenix April '45, Austin Whippet May '45 and so on? In exceptional cases an aircraft still exists, like the Swallow at Shuttleworth, but generally these are aircraft which have gone for ever. You may have reservations about the accuracy of some of these drawings but you could comment on any doubts you have. At least they would be a starting point if anyone wanted to attempt more detailed or more accurate plans.

Lastly, could I query if the MAP Insurance which I have for my model flying covers against accidents whilst kite flying? Back in the summer I had a kite string break and the free kite trailed its string across a road with the string held up in the air by the fence it was trailed over. Could have been dangerous to a cyclist or motorcyclist and possible damaging to a car or larger vehicle. Would MAP Insurance have covered me if anything had happened that involved a claim? I've enclosed an SAE for a reply on this matter but it may be of general interest to readers following your kite article in the November issue.

Huntingdon, Cambs. R. E. Bail

Some of the very early scale drawings of full size machines are no longer available from our current Scale Drawings list, which incidentally currently includes some 450 aircraft. However, photostat copies of original articles are always available for specific requests.

Regarding the MAP insurance, a kite is not a model. Modellers Accident Protection insurance is valid only for those model aircraft, cars, boats, locomotives and traction engines specifically mentioned in the policy, which does not include kite flying. Other groups of models not covered by the insurance include jet or rocket models and giant size models, and modellers who wish to pursue such activities are recommended to seek alternative insurance cover.

Dear Sir,

I have just received back an A.2 glider of mine which Mr J. Woodhouse of Sutton on Derwent near York found in October 1978 in Sutton Wood. The model is almost undamaged. The tissue covering is more or less intact and apart from fading and warps, and there is little sign that it has been out. What is more, the DT Timer (previously lubricated with WD-40) still works.

The remarkable part of all this is that this model was lost in the fly-off of the open glider event run by York MAS at the Vintage and Pannett meeting at Elvington in the summer of 1977.

Rochdale, Lancs. *Mike Reeves*

Dear Sir,

I like the look of the new Format, and it's good news that you will be covering R/C aspects of sport flying. I'm sure that it's wanted, especially now that so many more people have reverted to nice old types that behave like real models should!

Somerton, Somerset James Pely-Fry

What's Happening?

March 18th
1st F/F AREA CENTRALISED *F1A (KMAA - PLUGGE) O/P* (FROG SENIOR) *O/R*. Venue: Local Area. Contact: Mike Fantham, Tel: 01-736 7163.

April 1st
TYNEMOUTH T/R RALLY *FAI & GOODYEAR* **Venue: A** Albemarle Barracks, special pass required. Contact: R. Wilson, Tel: Newcastle 881127.

April 1st
2nd F/F AREA CENTRALISED *F1C (HALIFAX + PLUGGE) O/R (GAMAGE) O/G*. Venue: Local Area. Contact: Mike Fantham, Tel: 01-736 7163.

April 8th
ODIHAM SPRING GALA *O/G, O/R, O/P, CO₂ & ELECTRIC SCALE, R/C FLY-FOR-FUN & HELICOPTER* **Venue: B**. Odiham. Contact: Norman Couling, 7 The Green Walk, Willingdon, Eastbourne.

April 8th
RTP SCALE FLY-IN Up to 20ft lines **Venue: C**. George Farmer Secondary School, Spalding. Contact: John Ashmole, Tel: Holbeach 370973.

April 15th
1st CL AREA CENTRALISED *F2B, F2C, ½A T/R, ½A COMBAT, MUFFLED SPEED* **Venue: D**. Cosford (P). Contact: Bob Horwood, Tel: 0272 48869.

April 15th/16th
TWO DAY CENTRALISED *Sat: O/R, O/G, O/P. Sun: F1A, F1B, F1C* **Venue: E**. Cottesmore. Contact: Mike Fantham, Tel: 01-736 7163.

April 16th
3 KINGS OPEN DAY *NOVICE STUNT & CARRIER (.40CU IN, 60FT LINES, No scale points)* Trophies to 3rd, Silencers compulsory. **Venue: F**. Old Croydon Aerodrome. Contact: A. Fritz, Tel: 01-767 4128.

April 22nd
INDOOR DURATION *EZB, MAN, IHLG* **Venue: G**. Cardington. Contact: Bob Bailey, Tel: 0438 723642.

April 22nd
ELMBRIDGE C/L COMP *F2B, NOVICE STUNT* **Venue: H**. Fairmile Common, Esher. Contact: Martin Radcliffe, Tel: 01-397 4407.

NEW ANNOUNCEMENTS

April 22nd
TYNEMOUTH F/F RALLY *O/G, O/R, O/P, COMBINED FAI, COMBINED MINI, HLG (No Rounds)* 10am start. Venue: Albemarle Barracks. Contact: Alan Jack, Tel: Cramlington 714773.

April 29th
ST. ALBANS GALA. *O/G, O/R, O/P. F1A, F1B, F1C. No Rounds ½A, A1, CdH, HLG.* Venue: Bassingbourn. Contact: John Fletcher, Stevenage (0438) 68731.

May 6th
2FSA SCALE MEETING. *Informal flying plus Rubber Scale Kit Comp (Keils & Veron)*. Venue: Chobham Common. Contact: Bill Dennis, 27 Wheble Drive, Woodley, Reading.

May 6th
ELLIOTT SPRING RALLY. *OPEN SPEED, F2B, F2C, GOODYEAR, ½A TR, ½A COMBAT.* Trophies, Diplomas and refreshments. Contact: Pete O'Neil, Tel: Sevenoaks 57899.

May 13th
BROADLANDS STUNT & CARRIER CIRCUS. *OPEN, NOVICE & JUNIOR STUNT, CARRIER (INCLUDING .04 PROFILE)*. Silencers essential 10am start. Venue: Earlham Park, Norwich. Contact: J. Bailey, Tel: 0603-868135.

July 15th
ELLIOTT CONTEST *F2C GOODYEAR, ½A TR, ½A COMBAT CARRIER PROVISIONAL*. Contact: Pete O'Neil, Tel: Sevenoaks 57899.

A full calendar of model flying events for 1979 appeared on page 145 March Aeromodellers. In order to comply with requirements for any event held on an MoD airfield, ONLY SMAE MEMBERS will be admitted. Contact Membership Secretary Mary Horwood, Tel: 0272-48869.

BROADSIDE

1/2A TEAM RACER

by Jim Woodside

½A TEAM RACING is an attractive event, quite as exciting as FAI but much less demanding on the pocket. One of the best available engines, the Oliver 'Cub', is British, and still costs only about £20. However, the event has been in the doldrums in recent years. The time seems right to ginger up interest in 1.5cc racing especially in these noise sensitive days. So come on beginners (and experts with ancient models). Could I also ask organisers to include more of these events in future planning?

'Broadside' was built by Peter Sutherland and myself during the winter of 1975/76 and it has proved a competitive design, being powered by Don Howarth and George Copeman modified Cubs. My thanks to Mike Broadbent for the drawing – hence the composite name.

HARDWARE

ENGINE PANS: limited numbers from Jim Woodside, 15 Heathfield Road, Liverpool 15, Price £2.20.

ACCESSORIES: Fuel Stop, glass cloth, quickfill finger valves, wheels from North West Model Supplies, 5 The Harridge, Shawclough Road, Rochdale. Send sae.

PROPS: 5¾ x 7½in ½A Prop from Tribe Bros, 87 Spurrell Avenue, Bexley, Kent. Send sae.

ENGINES: John Oliver Engineering, 250 Ringwood Road, Ferndown, Dorset. Deposit with order.

TUNING: George Copeman, 15 Heol Cefn On, Lisvane, Cardiff, send an sae for details.

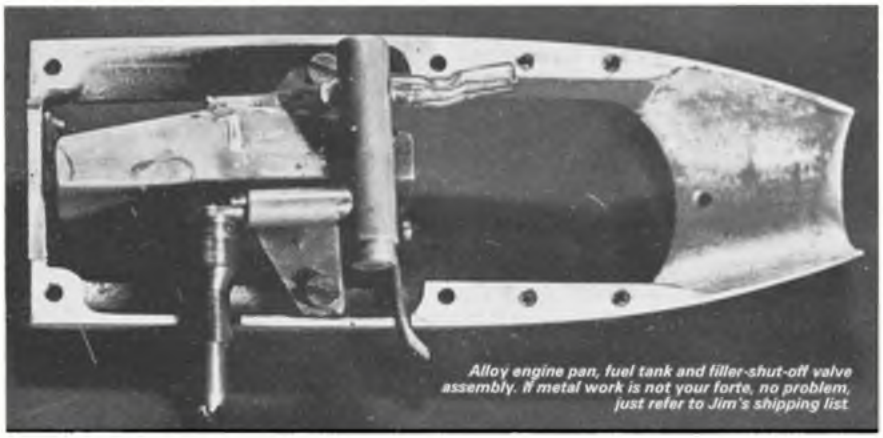
CONSTRUCTION

Begin with the engine pan, either from a casting or aluminium plate about 6mm thick. In either case, make sure that the engine face is flat by using a glass plate onto which 'wet and dry' paper is taped. Start with 120 grade, finish with 320. Lighten carefully. Tap 6BA for engine and 8BA for hold down to model.

Make up the tank as shown. I have always found the *Turtle* tank to give excellent engine runs without being sensitive to position. If you have the equipment, make up a fuel stop as drawn and solder to tank base. This Malcolm Ross design is reliable, light and compact. You could use a tube crusher on the style of *Sweeter* FAI model (Aeromodeller June 1976).

Construct the under carriage box and leg. The amount of swing gives bounce-free fast landings. Further details can be found p.586 October 76 Aeromodeller.

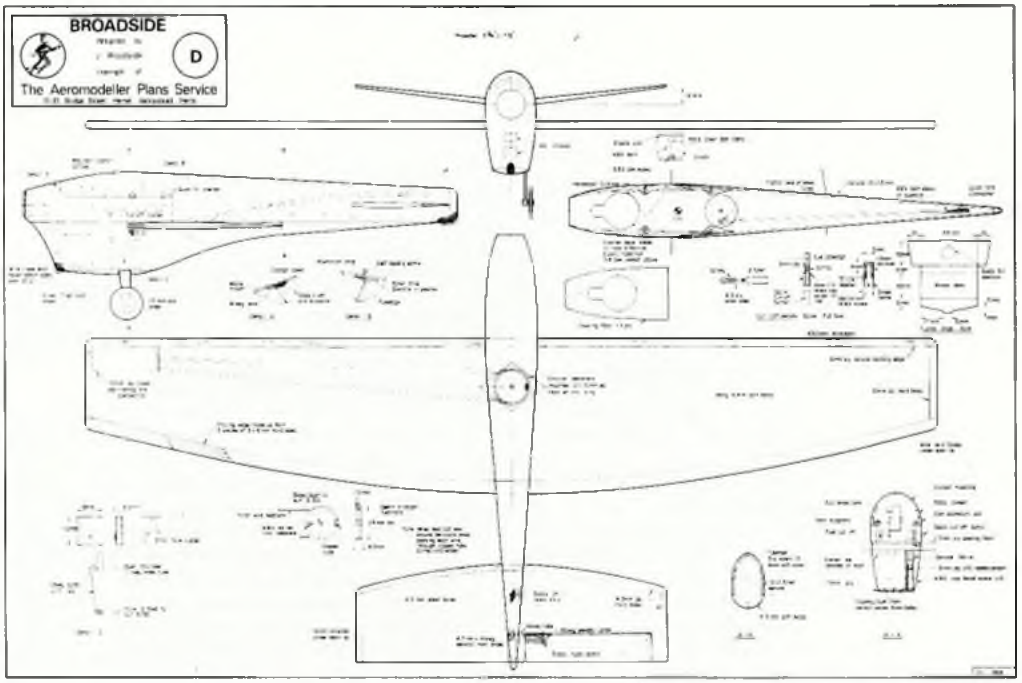
Finally, make the circular bellcrank and the elevator horn. Use silver solder wherever possible and certainly on the elevator. The use of hard solder and brass seems the permanent answer to tank leaks and general failures. You now have a kit of hardware bits. Do not be afraid to change any of the parts to suit your own preferences and experience.



Alloy engine pan, fuel tank and filler-shut-off valve assembly. If metal work is not your forte, no problem, just refer to Jim's shipping list

WING

Choose a medium to light straight grained 6 x 100mm sheet of balsa and cut out the basic outline. Note this is 12mm less than the full span. Cut the hardwood leading edge to full span. Try to find a piece with even and horizontal grain. Take three lengths of 3 x 6mm hard balsa, cut to length for trailing edge. Now, using PVA glue, start to glue up the wing blank. Put a film of glue on leading edge with grain horizontal, and a film of glue on front edge of balsa blank, then bring both together remembering that hardwood leading edge overhangs by 6mm each tip, working quickly make a sandwich of the three 3 x 6mm trailing edges. Curve them around the edge of the wing blank and tape the whole thing with sellotape. Leave to dry. Cut out hole for bellcrank and then a wedge in the inboard wing for the lead-outs – see 'Classic Clarkson Quickies' in the Control Line Aeromodeller Special. Fit the lead out tubes and glue this back in place, leaving the centre section square, carve and sand wing to a symmetrical section. Add wing tips. Cut through channels near wing tip for line connectors – the link from fishing swivels are ideal. Let in a



Above: ***Oliver Cub installed in pan showing exhaust primer pipe running from overflow T junction through circular flange on crankcase.*** Right top: ***Inside of engine cowling shows venturi intake, shut-off reset button and pan fixing holes.*** Middle: ***Air inlet and exit positions in cowl.*** Bottom: ***Latest modifications include extra cooling slots cut into pan and cowling at nose and to rear of canopy.***

Full size copies of this 1/6th scale reproduction are available as plan CL/1364 price £1.10 plus 20p postage. Export orders obtainable from appointed agents price £2.50 plus 25p postage ($4.40) or direct by post (add 50% to order value for air mail) from Plans Service, PO Box 35, Bridge Street, Hemel Hempstead, Herts, HP1 1EE.

0.8mm ply cover. Let in 2mm ply bellcrank mount. If you are experienced enough, you can taper the wing to 3mm at the tips.

TAIL

Cut blank in 4.5mm medium balsa, add leading edges and tips. Sand to section, again leaving centre section square. Cut out elevator and clearance for horn and joiner. Now score centre line with razor saw and lift one tip by 25mm and tack with rapid epoxy. Later reinforce with cloth and glue. Fit and hinge elevator.

FUSELAGE

Bolt two strips of hardwood to pan. Fill in nose section with block. Carve to shape. Add 1.5 x 12mm spruce strips to complete crutch. Add cowling floor in 1.5mm ply. Using soft sheet make up bottom of model. Carve air inlets and exhaust duct. Note venturi has separate intake. Let in undercarriage box, using epoxy glue. Reinforce with glass cloth.

With pan in place, tack glue top sheeting in place and sand to shape. At this stage mould the cockpit by pulling heated celluloid over the model. Wear gloves for this. Cut free the canopy. Add ply faces, hollow and fit cockpit.

ASSEMBLY

Split fuselage into crutch, top and bottom blocks. Using epoxy glue wing and tail to crutch, ensuring that all is square. Fit control system and check for free movement. Do not forget to attach a piece of cable to the rear end of the push rod to be used to trigger the fuel stop on down elevator. Glue on bottom block. Check clearances around cylinder head, engine lugs etc. Add top block making sure controls stay free. Fit tank and cut clearances for filler valves etc. Set fuel stop to operate on 10° down elevator.

FINISH

The original was tissue covered. Humbrol matt black was used to paint the fuselage with Tufkote as fuel proofer. However, you may like to try lightweight glass cloth. K&B and Humbrol epoxy paints or Tufkote are all excellent resins. Simply lay an appropriately trimmed piece of cloth over the model and paint on. Rub off ragged edges with 'wet and dry' when cured. Really easy with fuel proofing built in.

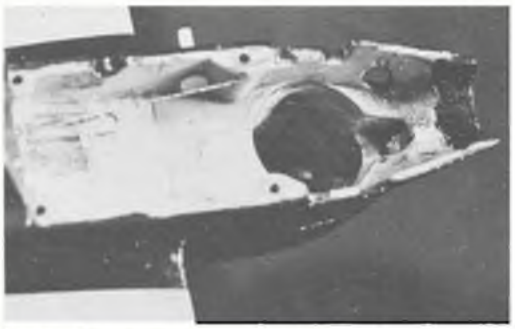
FLYING

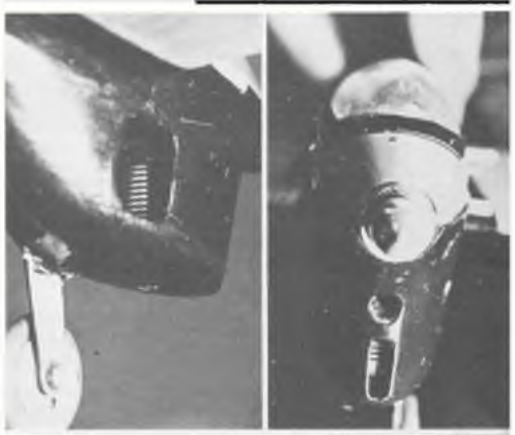
Use a close spaced handle, lines 50mm apart. Single strand lines on the Red Keil Kraft card are the right gauge but lightweight stranded cable will suffice for practice. Balance on or near the leading edge.

The fuel I have used for the last year has been Castrol M 20%, Ether 35%, Paraffin 45% and nitrate 1.5% added. I find this gives better warm up characteristics and cool engine runs.

Props have usually been thinned and trimmed FAI, usually those damaged on windy days! About 5¼in seems right on diameter. Pitch is around 7½in. Thin the hub to ¼in and taper blades to suit. 40 laps is not too hard to obtain – remember this saves a stop in a final if not in the heats.

There are no real secrets in racing, nor are 'super' engines needed. Reliable equipment and good teamwork is more important. Read (re-read) Rob Metkemeijer's article of October 1973. See you at the circle.





THIS MONTH:

Check out your model: Alignment, Balance and Controls

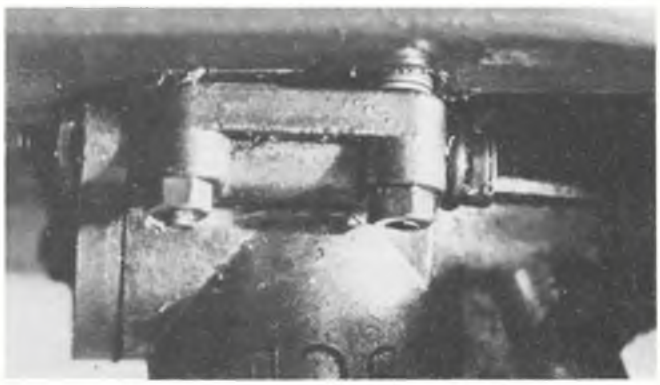
TWO LESSONS have revealed themselves over the past month's work with my volunteers who are building their first control line model. One lesson I rather expected and the other one I had completely forgotten. The fact that took me by surprise is how long it takes a beginner to build his first model! I thought this series of features would be far too slow because construction would be finished in a week or ten days. Here we are, over two months later and not one of the guinea pigs has finished their model!

What is more disturbing is that most of those nearing completion will not fly, unless certain corrections are made. If left to their own devices my young friends would have taken to the flying field a model that even a World Champion would not have had the skill to fly. No wonder this hobby loses so many new recruits who try to start up on their own! It highlights how much easier learning is if one can form or join a club. You will not only be able to share valuable experience and knowledge, but also strike up some very lasting friendships. "Flying Start" is for raw beginners so I will slow down the gallop to the flying field and spend some time describing how to check out a model before even leaving the house. Assuming you have a viable engine/model combination let us look at the main areas which need to be checked.

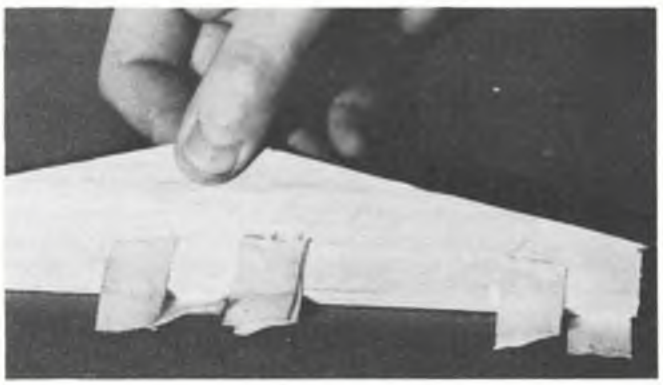
1. Airframe accuracy;
2. Engine alignment;
3. Freedom of controls;
4. Control range and sensitivity;
5. Centre of Gravity position.

AIRFRAME ACCURACY

Control line trainers are quite forgiving in this area and it is fair to say that if you cannot *see* anything wrong with the naked eye it is OK. Use the plan as your guide and sight the model from all angles. The only serious blunder made here has been by David. He made a mess of the original body and has had to make a new one out of a sheet of ⅛in balsa. The fin of the old one looked slightly offset so he tried to copy the angle on the new one; he got it the wrong way. Many control line models need some, or all the fin offset to help keep the lines tight, ie, the model must try to turn away from the pilot. The fin should either be straight or have the trailing edge slightly offset to the right, never to the left. (as seen from the rear)



Engines are usually mounted sideways in Control Line models with the cylinder head always on the outside of the circle. A couple of washers under the front lugs will give some side thrust to ensure the lines stay tight, slack lines result in loss of control and inevitable crash.



Cotton tape strips are used to hinge the elevator. Start by gluing them to the tail plane alternating above and below, before bending strips across the hinge line and adding the elevator. Avoid dope or paint on hinges from stiffening controls.

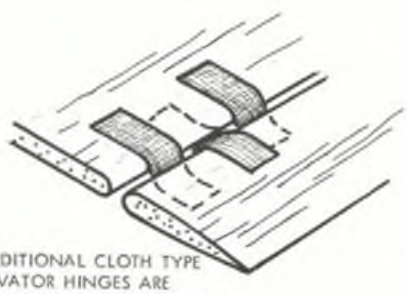
ENGINE ALIGNMENT

This can also be checked to sufficient accuracy for our requirements with a practiced eye but small faults are quite difficult to spot. The engine of a control liner must *never* point up (upthrust) or down (downthrust) or to the left (sidethrust). It can be helpful to have the engine pointing outwards to maintain line tension set the propeller horizontal and measure back to the leading edge. A washer or two on each of the two front bolts between the engine and the bearers will do the trick for a side winder. Loosening the engine and holding it to the right whilst retightening usually puts an upright engine correct. If your upright engine is still pointing in (to the left) then the only answer is to enlarge the holes in the bearers.

FREEDOM OF CONTROLS

This problem has already cropped up on the first three models with controls installed. In the case of Robin it was a misunderstanding of the plan. He is using fairly common tape hinges supplied in the kit but had not realised that they need to pass through the hinge slot and not be laid over one side of the hinge joint.

Ian's plan called for a more unusual and simple hinge with tape laid only along the

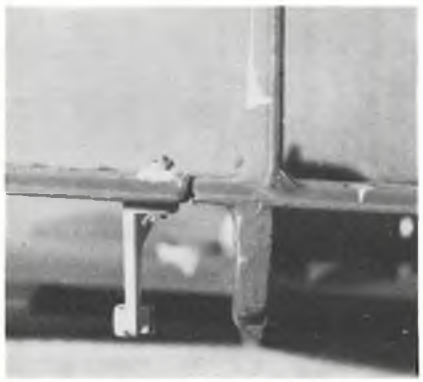


TRADITIONAL CLOTH TYPE ELEVATOR HINGES ARE EASILY JAMMED IF DOPE OR PAINT STIFFENS THE CLOTH

ALTERNATIVE SEWN HINGE PERFORMED AFTER PAINTING ALLOWS CONTROLS TO REMAIN FREE MOVING

The controls must move easily.

top of the hinge joint. Unfortunately his efforts to keep the paint out of the bit that needs to bend did not work very well. Consequently when the dope hardened it had gone solid and the elevator is far too difficult to move. The remedy is fairly simple and Ian will be cutting off the present hinge tape and sewing the joint instead with a sailmaker's stitch. Anything which hinders the absolutely free movement of the controls over their required range **MUST** be put right. The necessary work might include trimming away some of the structure, bending some of the wire controls or even moving the bell crank if it has been mounted too near another component. Ray is making a built-up wing model and he has had to make a new pair of leadouts from thinner wire because they were sticking in the guide tubes on the wing tips, alternatively larger bore leadout tubes (1/8in diameter) could have been fitted.



Elevator should be horizontal with tail plane when bellcrank is at neutral. Note rudder offset on fin to right at trailing edge to turn model out of circle keeping lines tight.

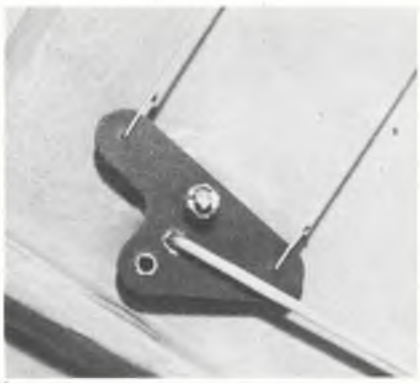
CONTROL RANGE AND SENSITIVITY

The range of movement needed to control a good trainer is quite small. In most cases 10° up and say 5° down will be sufficient and 20° up with 10° down will give a margin for error. To have more movement is just asking for trouble on this type of plane. For a rather odd club contest I designed and built a .35cu in 90mph 'trainer' type plane for my 12 year old son to fly. When I was test flying the thing, the controls became disconnected (I am ashamed to say). Although I had no control it flew perfectly straight and level until the tank was empty. It demonstrated to me that a well balanced and checked out model will fly itself most of the time. Too much control movement is often the cause of accidents. Providing you keep sufficient range of movement of controls you should try to reduce 'sensitivity' for trainers as much as possible.

By sensitivity, I mean how much movement is necessary at the control handle to get the desired 20° up and 10° down. The *more* movement of the handle needed the *less* sensitive the control will be and the better it is for a learner. On the aeroplane there are a number of ways to alter the sensitivity of the controls. You may need to go through the actions to see what I mean.

There are times when more than 20° up and 10° down is needed such as in aerobatics and very windy weather but neither apply to your first flights – or at least they shouldn't.

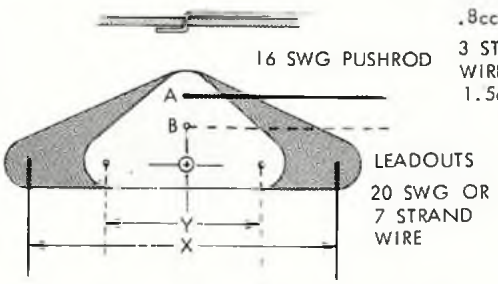
In the diagram I have shown the names of each part of the control system and the places where you might be able to adjust the sensitivity of your plane's controls.

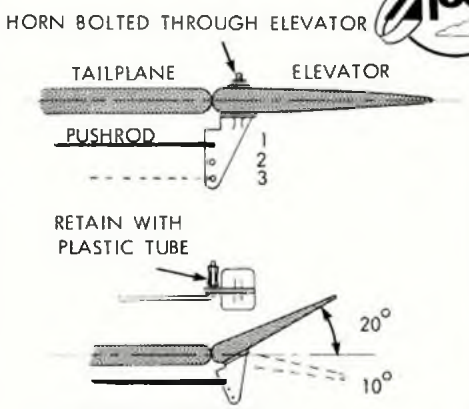


Pushrod fixed to bellcrank with Z bend allows removal for adjustment, inner hole reduces sensitivity for learning. Double locknut essential on bellcrank pivot bolt.

THE BELLCRANK: The distance between the leadouts (X & Y) is governed by the size of the bellcrank bought or supplied but it is worth remembering that small bellcranks with close leadout spacing (distance X are *more* sensitive than the larger ones with wide spacing (distance Y).

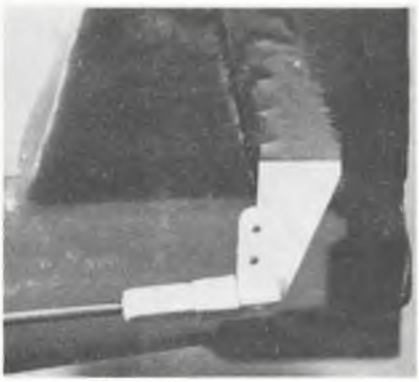
With push-pull rod positions in the bellcrank (A & B) the controls are *more* sensitive with a larger leverage (A) than when fitted closer in (position B).





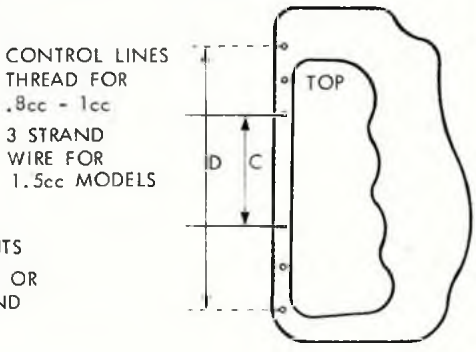
THE CONTROL HORN

The elevator control horn shows the push-/pull rod going to the hole nearest the hinge (1) and this will give the *most* sensitive control. To make this model control system less sensitive and easier to fly, move the push/pull from position (1) to either (2) or (3), or alternatively from position A to B at the bellcrank. The leadouts are already in the least sensitive position.



Plastic R/C type elevator horn and pushrod connector allows on-the-field adjustments, lower hole position shown reduces control sensitivity for first flights.

THE CONTROL HANDLE: Some control handles make it possible to adjust sensitivity by using various control line positions. With the lines close together (spacing C), the controls will be the least sensitive and probably best for a learner. The outer holes (spacing D) produce greater line movement for any handle movement increasing sensitivity.



You may fit an engine of a different weight.

CENTRE OF GRAVITY POSITION

Now we come to the biggest single factor which will affect how easy your model is to fly. The position of the balance point. You will need to find out where it is in both directions; front to back and tip to tip.

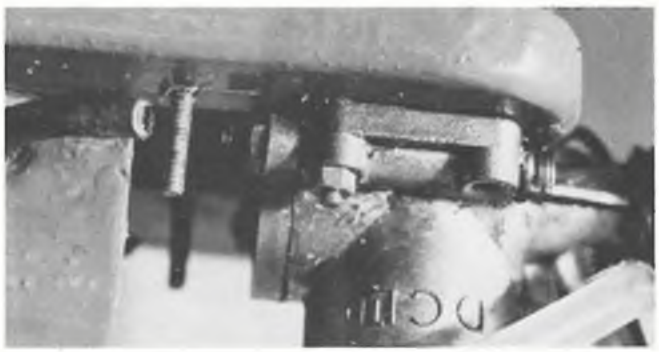
The plan will usually show you where it should be "fore and aft". Most small trainers need to balance about ¼in or so behind the leading edge. In addition the outside wing must be heavier than the inside to balance the weight of the lines etc, otherwise the model will tend to fly into the circle resulting in slack lines, loss of control and the inevitable crash! By balancing the model on your fingers or by hanging it by two pins you can get a good idea where the plane balances. If you really want to know where the *exact* balance point is then here is how to find it. If you hang a model up by any single point and let it swing free, the centre of gravity is always somewhere directly below the suspension point. This means that if we hang up the model and draw an exactly vertical line on the model using a free hanging plumb line we know the C of G is on that line. All we need to do then is to hang it up by another point, draw the new vertical line and where the two lines cross is the exact C of G. To further check the position the process can be repeated by hanging the model using three or even four points, all of which shall intersect at the same C of G position.

Some judgement may still be needed because the plumbline does not always pass close to the model to allow you to draw an accurate line.

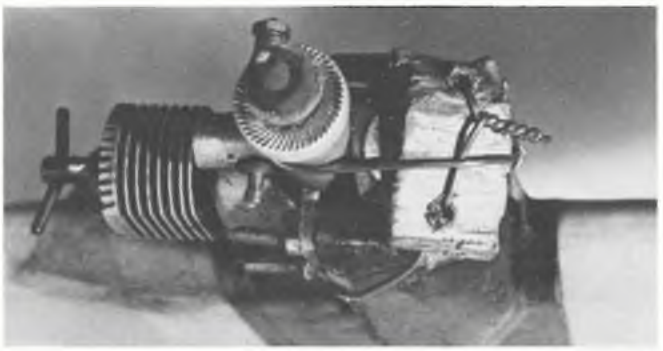
Most trainers need to have a C of G half an inch back from the leading edge of the wing and half an inch to the right of the centre line.

Get someone to help you find the balance point.

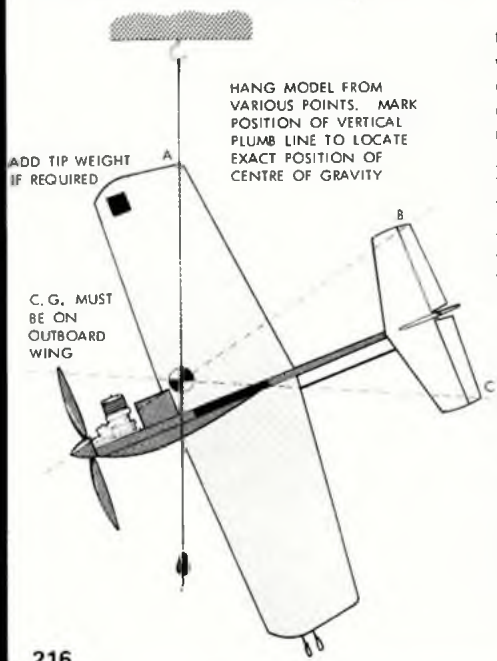
the front with a short nose there is less leverage. Quite small changes of C of G position forward need enormous weights. I have strapped a pair of pliers to the front of a tailheavy model to get it to fly right. By far the easiest way is to move the engine forward.



Tail heavy models will not fly and may need the engine moving forwards to correct balance. Use original front bolt through rear lug hole and fit extra bolts at front. Move fuel tank forward also to give correct feed.



Not an elegant solution but drastic measures may be required to achieve balance if motor cannot be moved forward. Fix weights firmly with wire or bolts. Model previously uncontrollable flew perfectly after this modification.



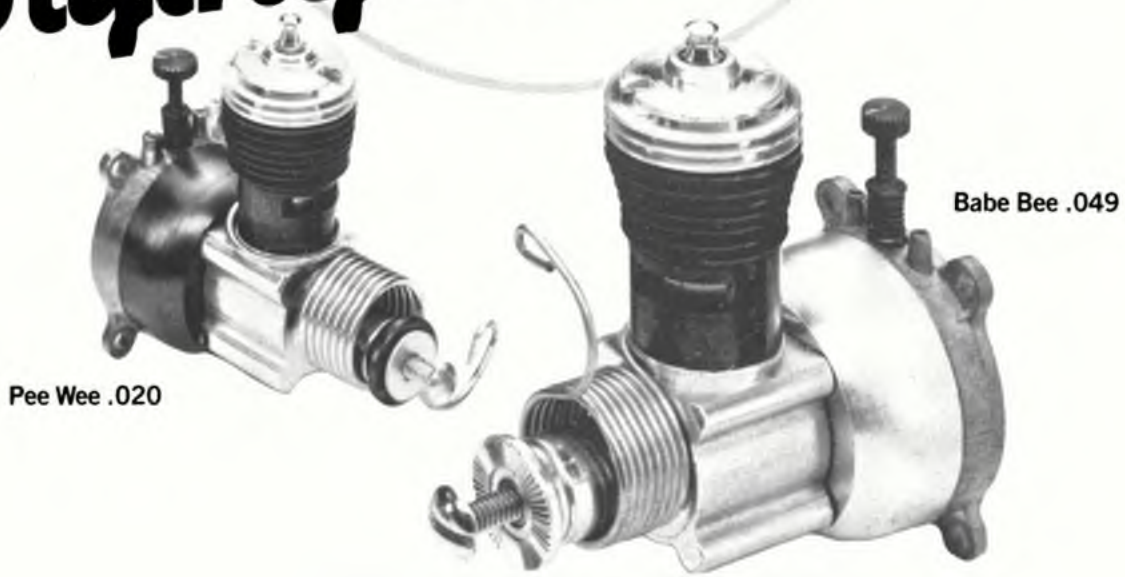
When you have satisfactorily located the balance point what can you do if is wrong and why is it wrong? When the designer built and flew the prototype you can bet your boots it was OK. The problem is your model is not an exact replica of the prototype. Your engine is no doubt a different type and may be lighter or heavier than the original. Your wood might be slightly different in weight and you will no doubt have put on a finish of a different weight. So you can see that if you are unlucky you may need to make some corrections. If the outboard wing is not heavier than the inboard one then epoxy a metal weight on the wing tip of sufficient size to correct the balance. If the C of G is too far forward this probably won't affect the flight of the model although you can add some weight under the tailplane. Putting a small nut and bolt through the fuselage below the tailplane is the easiest way although inserting and sticking a small weight makes a neater job. Tail heaviness is the most serious problem and the most difficult to cure because at

On some models this can be very tricky to do but it is essential if a good flying performance is to be obtained. It is a good idea to remove the engine and try it with the original front engine bolts through the rear engine lugs, and drill extra front bolt positions further forward. One further point, if you move the engine a significant amount – remember also to move the tank. If the tank is much more than about 1in behind the engine you might find the engine will stop through fuel starvation when the plane is launched.

I will leave you to check out your model on all these important points. If any of them is wrong don't waste your time going to the flying field until you have put it right as you are certain to bring back a bag of balsa bits instead of a model.

Next month I will be dealing with making up the lines and handle, hints on flying field procedures and selecting a good flying site.

Flying Starts Here!



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Free Flight Scene

Dave Hipperson reports....

As link man with the Army at Bassingbourn I learn that the Sports Council are holding their AGM at Bassingbourn Barracks this year, to allow the officials to look around the extensive facilities whilst there. This is the *entire* Council and not just the Eastern Area! The Army have kindly invited me to run a meeting for freeflighters to show their stuff on this day. They believe – quite rightly – that it will be the easiest way for the Army to illustrate what happens on their 'drome and may be beneficial to future negotiations between the SMAE and the Sports Council in regard to cash assistance and supply of further venues.

I am to organise a straightforward FAI event in the usual Sunday fashion. The date being 12th July means things will feel different, as this is a **Thursday!** I will approach fliers to lay on some 'set piece' demonstrations when the 100 or so Council officials do their tour. If all goes according to plan, a good percentage of these will turn up at our remote corner. It would be very nice for a few people to be on hand to talk to them individually, show them and let them handle models, explain what goes on and if the conditions are sensible, make demonstration flights. It is the sort of thing that will work best if arranged in a casual and friendly way.

Contests running at the time will continue uninterrupted – so have no fear if all you want to do is to compete. All Free Flight fliers are welcome to participate.

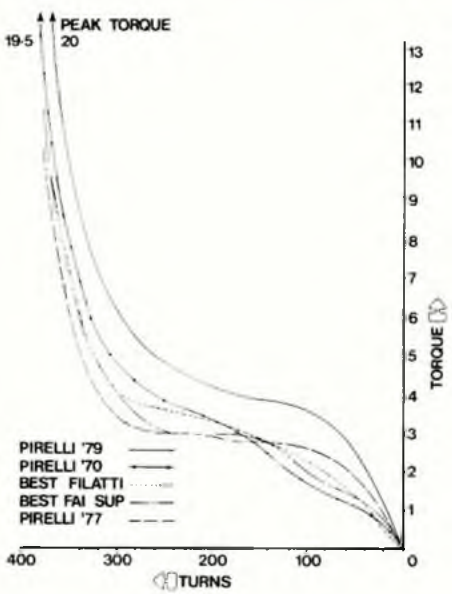
NEW PIRELLI

Deterioration in quality of rubber supplies seems to have been reversed momentarily at least. My sample is taken from a batch (bought from Ian Dowsett) only days after its arrival in the Country. It is a darker grey than we had been expecting but shows itself the familiar brown and slightly translucent when wet or lubed. I have made up several motors from the 1lb hanks and lengths are working out very consistently suggesting that its cross sectional area is less variable than the earlier rubber. What is more, it is the 'expected' cross section, in other words very close to 1mm by 6mm.

I have tested my sample. Using 10gram pieces as per previous article in July 77 issue. This is where things get interesting. The graph and the table say it all! This rubber of mine – and let us hope it doesn't deteriorate through the batch – is of a very high standard indeed. In fact it far out-performs anything tested last year. What is more the rubber possesses none of those 'beastly' characteristics like being very thick, difficult to knot or most of all giving high peak torque and dropping away fast on the run-down. In fact it has quite the most steady output that I have ever handled.

motor length	11¼"	12"	12¼"	12½"	12¾"
Turns					
400				19.50	
390			19.25	14.50	20.00
380			15.00	12.00	15.00
370		18.50	13.00	11.25	13.00
360		14.50	11.00	8.75	11.00
350		12.50	9.50	8.00	9.75
340		11.00	8.00	7.00	8.25
330		9.25	8.00	6.50	7.75
320		8.50	7.50	6.00	7.25
310		7.50	7.00	5.75	6.50
300	15.00	7.50	6.50	5.75	6.00
290	11.75	7.00	6.25	6.00	5.50
280	10.50	7.00	6.00	5.50	5.50
270	10.00	6.50	5.75	5.00	5.25
260	9.00	6.00	5.75	4.75	5.00
250	8.50	6.00	5.50	4.50	4.75
240	8.00	6.00	5.25	4.50	4.75
230	7.50	5.50	5.00	4.50	4.50
220	7.25	5.50	5.50	4.25	4.50
210	7.00	5.50	5.25	4.25	4.25
200	7.00	5.50	5.00	4.25	4.25
180	7.00	5.00	5.00	4.25	4.00
160	6.50	5.00	5.00	4.00	4.00
140	6.00	5.00	4.75	4.00	4.00
120	6.00	4.75	4.75	3.75	3.75
100	5.50	4.50	4.50	3.50	3.50
80	5.25	4.00	4.25	3.25	3.25
60	4.50	3.50	3.50	2.75	2.75
40	4.00	3.00	3.00	2.00	2.00
20	2.50	1.75	1.75	1.50	1.25
0	0	0	0	0	0

A typical 10 gram piece started out as 11.25in long when made into a motor of six strands. After running in (torque figues as per low wind-ups on the chart) it had stretched a little. Columns 2, 3 and 4 show harsh treatment as repeated wind-ups were conducted at five minute intervals or less. The figures for the curve are from the last column after a 30 minute rest period. Up until now 400 actual turns has proved to be a practical ceiling for such a length sample. However I reached this without too much trouble on many occasions and there are no signs of nicks or fraying yet. I believe it might be possible to go beyond this. Even at these turns it is obvious that we can expect a considerable increase in potential still air times when using the stuff. It's most annoying to think that by now you probably have some too!



OPEN RUBBER

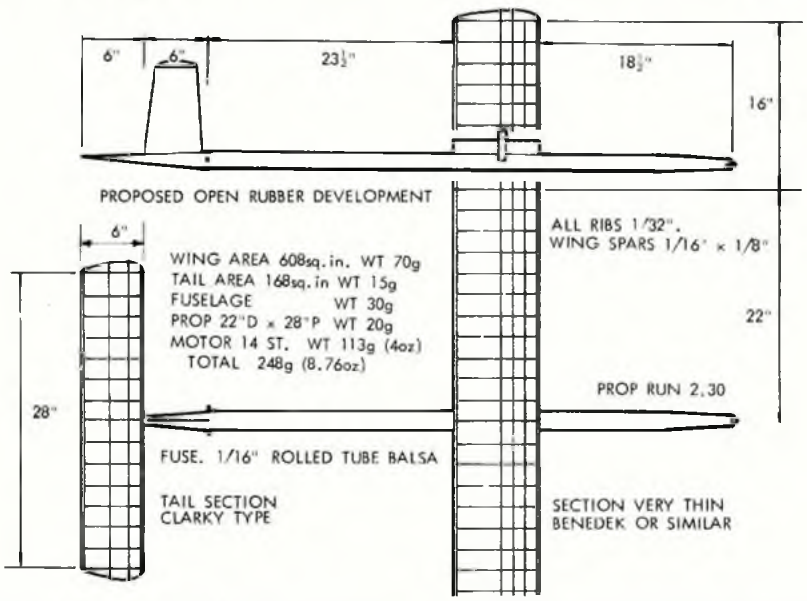
With rubber supplies in a healthier state perhaps this is an opportune moment to discuss effective methods of consumption.

I am running a single Open Rubber event at Bassingbourn on Sunday 21st October. In fact it will be **'The Open Rubber'** event. As far as can be envisaged, it will be to conventional rules as far as model specifications are concerned; but the day will probably be split up into periods or rounds with an increasing max – something attainable no matter how good the weather – towards the end. This will consist of four flights with a fifth unlimited flight at the end of the day for those that have qualified.

However, what will be of particular interest will be the fact that there will be considerable prizes – both cash and goods. How about starting building one now?

State of the Art aeroplanes follow one of two distinct approaches. There is the medium to small airframe with a wing around Wakefield size or perhaps as big as 250sq in in some cases but built sensibly with an enormous amount of rubber. This approach is favoured by Russell Peers and of course John O'Donnell and closely approaches what you had to fly to the old Wakefield rules. Today the weight distribution tends to be 3–3½oz airframe and 5–6oz rubber. On the other hand, the alternative approach is a light model and much less rubber. Perhaps a little bigger at 250–300 and built down to 3½oz using between 3 and 4½oz of rubber.

On paper it would appear that the former idea has much to commend it and should produce the higher times most closely approximating to the old idea of the



ideal set-up being a motor of twice the weight of the airframe it powers. However in practice it seems that the best examples of both theories seem remarkably evenly matched.

The former idea has the disadvantage of an expensive and angry motor undoubtedly pre-tensioned to squeeze it into the fuselage. Because of its high wing loading it is hardly likely to have an excellent glide but the motor and prop arrangement if balanced carefully can produce a very long *and* powerful run.

On the other hand, a larger model with less rubber and therefore more lightly loaded, will out-glide the above every time. Most people using this configuration tend to plump for safety and go for a short run from the small motor to be sure of climbing. This is nearer to my approach but still far from ideal. It does however consume rather less rubber!

John O'Donnell and I were able to make an interesting direct comparison of our approaches last year when both making a flight at the same moment in the Caton Trophy at Elvington. He using his distinctive highly powered arrangement and I flying a rough weather 310sq in model with 4½oz rubber. As we both stalled virtually in formation after about 15 seconds it was obvious that we were in a powerful hole. However as John stresses, his long and powerful run was able to fight it and he maxed – just. Mine wallowed badly and was still quite low when the prop folded but nearly glided out of trouble to not quite max. That round went to the highly powered theory.

My approach for performance – and this is not always the same type of model that I use for comp flights – is a 310sq in wing of thick Davis section with the airframe weight between 3¼ and 4oz and using 4½oz of rubber arranged in a motor that comes out about 54in long. It must be remembered that there are two limiting factors when deciding upon a motor no matter what size the airframe. Sixteen strands or its equivalent cross section is about the practical limit to wind efficiently and the nose to rear peg dimensions must be less than your wrist to wrist measurement with arms outstretched. This presupposes that you intend using a winding tube as it is the removal of this item after winding which becomes impossible for one person if this dimension is exceeded.

The motor is arranged to run off through a Wakefield size prop 22in dia by 28in pitch approx usually helical with a little extra tip washout. This creates a run of two minutes give or take 15secs depending on exact length of the motor. It doesn't produce a particularly fast climb after the initial burst but they glide excellently and I reckon are good for 7mins. In flyoffs so often the result is decided upon by what use the model makes of the air it is gliding in. I had an illustration of this last year when making the flyoff in the Gamage Cup. As you may remember this was untypical weather and the South of the country had very calm and warm conditions a few hours before sunset. I launched to an indifferent climb and then seemed to settle on top of a bubble of air skimming over the surface of it and losing no height at all for over 5mins. The model eventually landed at a little less than 10mins. During the flight a number of other open rubber models were launched under the same patch to climb through it and past mine and then glide down past it again a few minutes later. Their sink rates were not quite low enough for the 'bubble' to stop their descent altogether as had been the case with mine. They simply slowed a little and then continued to sink.

Another advantage of the long gentle run is trim consistency. Obviously the more slowly the airframe is dragged through the air the less effect warps or small trim changes will have on the pattern. I use a similar theory with the Coupes and Wakefields but with Open Rubber you stand to gain much more. Flyoffs models have to be reliable as they won't get so many airings per season, particularly if you have a selection. I can assemble any one of mine and know that it will be spot on trim and this is essential, for the decision as to exactly which one to fly is often taken at the very last moment as conditions can change quickly. I don't think I have made a check flight before a flyoff for years!

Until recently, the only gap in my collection was a super-light model for those very rare dead calms when a 7mins flight lands back at your feet. These aren't common but it was thought that two or three a year was enough reason to build a model. It has been flown but proves very difficult to handle. The proportions are similar to the conventional 310 models but by very careful wood selection and reducing structure wherever possible it has been possible to bring the airframe weight down from the usual 3.75oz to 2.25oz! This structure reduction has allowed a corresponding motor weight reduction to 3½oz once again made up to 54in. Running off through a slightly smaller than usual prop, I estimate to have a motor run of 3mins. I reckon that the length of a motor run should approximate to one third of the expected total still air duration. Hence nearly a minute run for Wakes, 45 seconds for Coupes and working on the same theory this super light model should do 9 minutes. We shall see – but it certainly climbs on 1/10 winds – that is as far as I have got!

As far as hardware is concerned it practically goes without saying that I don't recommend auto surfaces – neither would I use a Montreal stop – they fall out of the fuselage too often if the motor goes slack. Think how many times you have seen that happen. There is nothing more reliable than the simple screw into the back of the noseblock and a coil wire spring to hold against the motor tension. This way I can get a typical bent-wire-hub prop assembly down to 20–22grams and have confidence when using motors a foot longer than the fuselage, that nothing embarassing is going to happen. I have found it advisable to have the stops adjusted so that it retains plenty of runs however – if the blades are revolving too slowly when they fold I have discovered that they catch on the fuselage in the wrong place. This is because their centrifugal force is insufficient to hold them out properly but they continue to revolve. A mis-fold can be nearly as detrimental to the glide as the whole assembly hanging out. This doesn't apply to round fuselages of course.

FUTURE DEVELOPMENTS

For a direction towards the ultimate performance model without the problems I have encountered with difficult super light structures we could do worse than take a look at the last few years of Coupe d' Hiver development. In calm conditions at least a 250sq in model weighing only a couple of ounces performs amazingly well (2:20 still air) on only 10 grams of rubber! It would be an interesting development to perhaps leave the motor at 3½–4oz and increase the wing area in the same ratio as the typical large Coupe power to area relationship. We finish up with a wing the size of a cricket pitch. However very slow glides are not necessarily low sink glides. Therefore it would be useful to give some consideration to reducing drag as much as possible. No longer would the fuselage be needed for visibility so that could be slimmed or even replaced by a light 1/16 tube unit which is incidentally a very light way of keeping the wing and tail apart as per Mike Thomas's *Predator* of a few years ago. The wing section would best be a well proven thin low drag profile not dissimilar to those currently fashionable on the large Coupes. Very high aspect ratios would be best avoided both from a strength/lightness consideration as well as trim consistency. A starting off point may be as per illustration. Remember however, there is a limit to just how good a glide can be. We have known for some time that a sink rate of 1ft per sec for a conventional two surface wing flying outdoors is virtually unobtainable although it has been claimed on occasions, therefore climb height must not be forgotten altogether. It is very much a case of diminishing returns as you approach the ultimate. Interesting, and certainly more scope for development than anywhere else. Remember that they are doing 40 minutes indoors – surely we can get nearer this than 7?

AREA INDOOR MEETING

Report by Jim Moseley

To meet the evident interest in low ceiling indoor flying the Northern Area SMAE booked the Pudsey Civic Centre for a meeting on January 14th and was rewarded by good support from both local flyers and those from farther afield who braved icy conditions to attend.

Under a clean ceiling of some 20ft, flying quickly commenced to a tight schedule of practice and contest periods and it became apparent that quite substantial drift was present at higher levels, it being noticeable that by the end of the day the higher duration times had been made by models making use of no more than 2/3 of the height available. As the day progressed the hall became very warm despite the heating having been switched off as soon as the organisers arrived, and this led to severe warping problems for many EZBs, Henry Tubbs and John O'Donnell being hardest hit with wings or tailplanes that warped to such an extent upon being taken from the box that flying became impossible and neither were able to record official times.

Scale, with 14 entries, was quickly away and a preponderance of Peanuts were overshadowed by the larger 'Lacey M10' of Butch Hadland which established a clear lead despite early problems in matching power and turning circle to the confines of the hall. John O'Donnell followed in a worthy second place with an immaculate 'Fike E', followed by Steve Philpott with an 'Antoinette' modelled after the variation used in the "Magnificent Men . . ." film.

HLG followed fast and furious with Steve Philpott in the money once again with first place from 12 entries, totalling 44.05 secs, and achieving a new hall record of 23.7 secs, closely followed by Roy Roberts (Wigan) with 42.85, barely ahead of junior Graham Davitt who scored 42.6 secs.

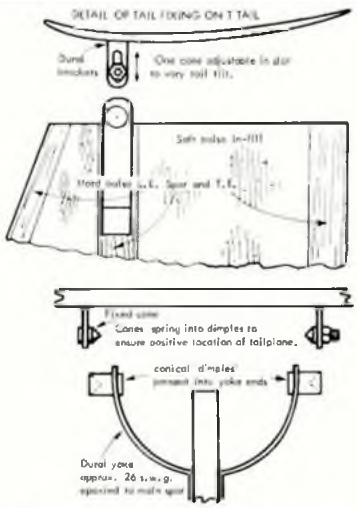
The relative calm of EZB followed, again with a dozen entries, and it rapidly became apparent that the contest lay between Derl Morley and Bernard Hunt, with the former recording 9:03 and 8:25 for a winning 17:28 total, with Bernard scoring 16:41 for second place, though returning high time of the meeting with 9:33 from a 0.7gr model using 0.4gr rubber – a 0.5gr model in his box unfortunately was not aired on this occasion. Fellow Huddersfield club member John Blackburn followed into third place with 14:11. Hard luck story of the contest was that of Butch Hadland who dropped a bottle of rubber lubricant into his box wiping out four models and eight propellors, leaving him but one model with which to place 6th.

At the end of the day thanks are due to all those who attended, whether to fly or spectate, to Ron Firth who presented a shield on behalf of 'Model Aeroplane Gazette' for annual presentation in Scale, also to Ripmax, Gloy, Solarbo, Humbrol, Sherwoods of Leeds, and MAP who contributed to the prize list, and Dennis Davitt the organiser.

RESULTS: HLG(15 entries) (Best 2 from 8) 1. S. Philpott 20:35 + 23:70 = 44:05, 2. R. Roberts 21:65 + 21:20 = 42:85, 3. G. Davitt (Jun) 21:00 + 2:70 = 41:70. **Flying Scale Rubber** (14 entries) 1. B. Hadland (Lacy M10), 2. J. O'Donnell (Fike Model E), 3. S. Philpott (Antoinette). **EZB** (10 entries) 1. D. Morley 8:25 + 9:03 = 17:28, 2. B. Hunt 7:08 + 9:33 = 16:41, 3. J. Blackburn 6:11 + 8:00 = 14:11.

Indoor flyers at Pudsey. Left: ***Roy Roberts from Wigan 4th in EZB.*** Middle: ***Graham Davitt from Leeds, top Junior.*** Right: ***Bernard Hunt from Huddersfield took hall record with 9:33 flight but placed 2nd overall.***

Rene Butty flew this extreme layout glider at the 1978 British Nationals, notching up five maxes before dropping a flight. The combination of a very forward CG position with the minute inverted tail produces a highly stable model, and allows remaining area saved to be used on larger wing. Many other new ideas are incorporated in this Swiss design as explained in the text. Right: *Springy Clips give T tail mount on fin, and pivot for DT, with knock-off facility*



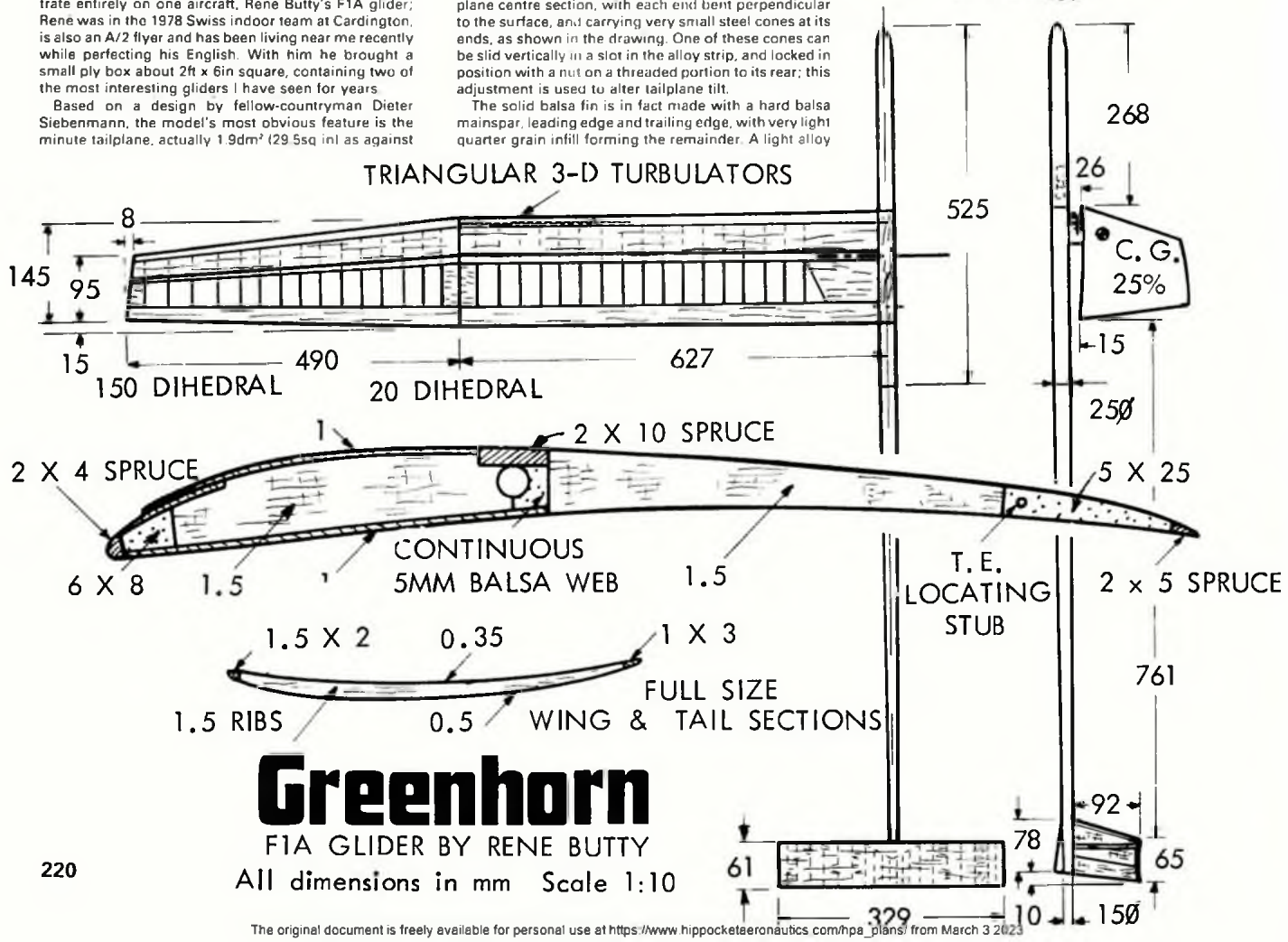
Martin Dilly reports....

BUTTY'S A/2

My part of this month's Free Flight Scene will concentrate entirely on one aircraft, Rene Butty's F1A glider; René was in the 1978 Swiss indoor team at Cardington, is also an A/2 flyer and has been living near me recently while perfecting his English. With him he brought a small ply box about 2ft x 6in square, containing two of the most interesting gliders I have seen for years.

Based on a design by fellow-countryman Dieter Siebenmann, the model's most obvious feature is the minute tailplane, actually 1.9dm² (29.5sq in) as against 4.5dm² (70sq in) used by typical British A/2s. T-mounted on top of a solid balsa fin, this tailplane at first appears to be built from a rather nice sheet of quarter grain 2mm balsa; closer inspection shows that it is built up with 1.5mm hard balsa ribs, 0.35mm balsa lower skin and 0.5mm top, plus a leading and trailing edge spar! Instead of the normal ply mount with bands holding the tailplane down onto it, a light alloy strip is epoxied into the tailplane centre section, with each end bent perpendicular to the surface, and carrying very small steel cones at its ends, as shown in the drawing. One of these cones can be slid vertically in a slot in the alloy strip, and locked in position with a nut on a threaded portion to its rear; this adjustment is used to alter tailplane tilt.

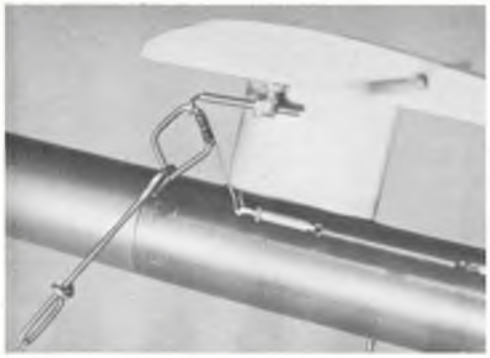
The solid balsa fin is in fact made with a hard balsa mainspar, leading edge and trailing edge, with very light quarter grain infill forming the remainder. A light alloy

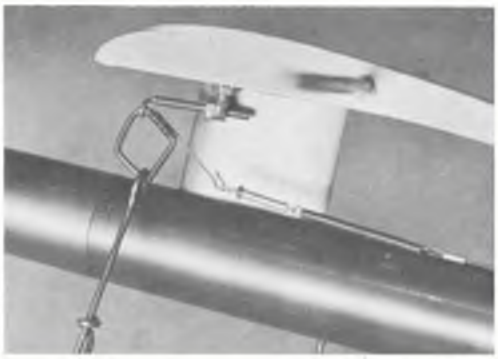


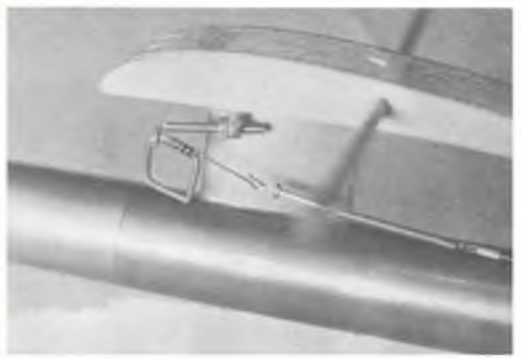
Greenhorn

F1A GLIDER BY RENE BUTTY

All dimensions in mm Scale 1:10







yoke is epoxied to the fin spar and carries conical steel female 'dimples' at each end, into which the cones on the tailplane pop, the springiness of the yoke providing enough 'give' to retain the tailplane in flight but to allow it to pop off on impact. A rubber band on the centre-line stretched to a pin on the fin leading edge provides pop-up tension.

The tailplane airfoil is highly undercambered, or perhaps one should describe it as 'uppercambered', for the thing is put on upside-down! This enables the cg to be at 25% instead of about 55% as is normal on more orthodox gliders, the downwards lifting tailplane meaning that more area can be put into the wing, giving greater efficiency, a similar approach is used with the current generation of man-carrying high-performance gliders.

The fuselage consists of a rolled 1.5mm balsa boom, spiral wound with tissue, and flexi-jointed to an anodized light alloy tubular front end, which encloses a stripped-down Seelig timer, covered by a tight-fitting, slide-on nose section, and into which is epoxied a narrow-chord streamline sectioned alloy pylon. A second version of the aircraft has the front spring anchorage of the flexi-joint attached to a stub tube, which is locked into the outer part of the fuselage by a set screw, enabling the whole joint assembly to be easily slid out for adjustment. The spigot locating the front and rear halves of the joint is about ¼in deep.

The towing system is interesting: attached to the underneath of the stub centre section onto which the wing halves plug, is a threaded outrigger, so the point of tow is offset to the left (Rene's aircraft is set up to glide left). A free-hanging diamond-shaped tow ring of 1.5mm steel wire is suspended from this outrigger by one of its corners; its position fore and aft, as well as laterally, can be varied by slackening the nuts which locate its hanger on the outrigger. The ring is broken on the opposite corner to its point of suspension, this break remaining normally closed due to the springiness of the steel wire; the auto-rudder line is attached to the rear-facing corner of the ring.

The towline fitting consists simply of a question mark-shaped hook, which is hung onto the lower, split corner of the ring on the model. A separate line holds the timer off, and pulls the two-position rudder stop to let the rudder move to a tight circle tow position.

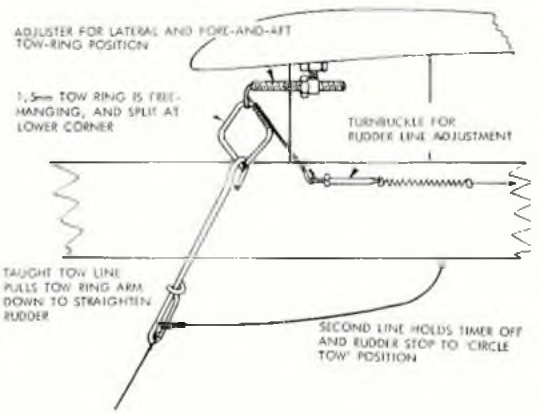
On tow the tension of the towline pulls the diamond ring forward, tightening the auto-rudder line to pull the rudder against its straight tow stop; releasing the line tension lets the rudder spring pull the ring back as the rudder moves over to let the model circle on tow. Increasing the line tension to 2.8kg (6.2lb) forces the split ring open and lets the hook drop off.

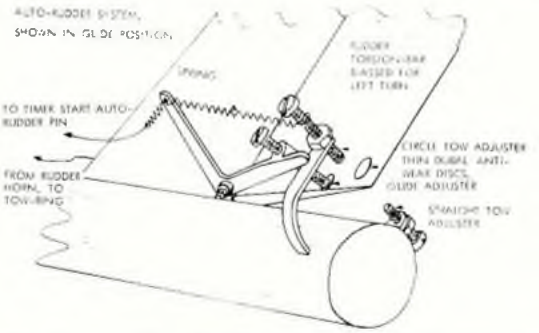
Operation of the rudder is shown in the diagram. Not shown is the rudder horn, on the far side of the view, since Rene's model turns left. A stranded steel line connects this to the diamond-shaped tow ring, to pull the rudder straight when tension is applied to the towline. A secondary stiff nylon line attached to the towline holds the timer in the off position and also pulls the floating rudder stop forward against the spring, so the adjusting screw carried on it meets the fixed yoke holding the circle tow adjusting screw. This yoke prevents further movement of the floating stop, and in the tow position the glide adjuster screw is thus pulled clear of the rudder, which is torsion bar biassed to the left. The rudder therefore meets the circle-tow adjuster screw when line tension is reduced. Aluminium alloy discs about ¼in diameter prevent the screw ends from denting the balsa and altering trim settings.

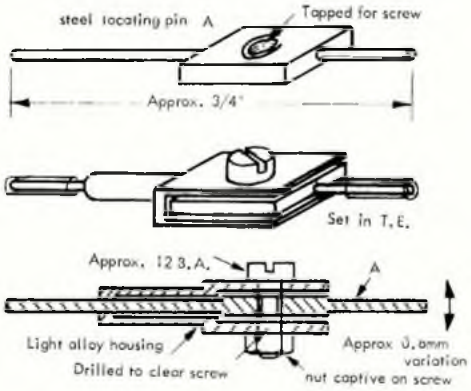
When the model is released from the line the floating stop arm is pulled rearwards by a spring until its rear end meets the fixed yoke; the adjuster screw it carries is then nearer the rudder than the screw on the fixed yoke, and determines the glide turn. Straight tow rudder position is fixed by a stop screw on the other side of the aircraft; a spring in the line to the tow-ring prevents the rudder being over-stressed against this stop during straight tow. All screws are fitted with lock nuts, to prevent vibration during transport and handling from altering the settings.

The wing is in four parts, which not only makes transport simpler, but reduces the likelihood of damage and enables the washout of the panels to be altered for trimming. The centre joiner is a singlepiece of 4mm steel wire, with wire trailing edge locator stubs; tip joiners are 30mm lengths of 2.6mm o.d. stainless steel tubing with a .03mm wall thickness which fits into suitable tubing in the panels, which are faced with 1.5mm ply root ribs. A short wire stub about 5mm long locates the trailing edge of one tip panel and one panel at the centre section, but inner panel and tip washout on the wing on the inside of the turn can be adjusted via a stub which can be raised or lowered in the facing rib by about 0.8mm. This adjustment is made by a screw in the surface of the wing, which in effect bends the stub within an oversize tube, as shown in the drawing.

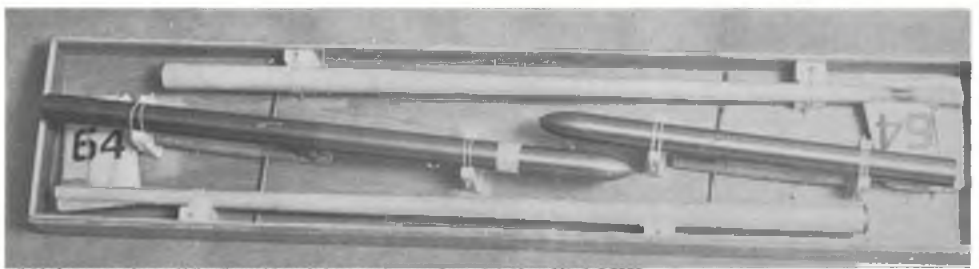
The wing structure is unusual to British eyes; the leading edge box spar is built separately, the rear halves of the ribs being added to it later. No lower mainspar as such is used, but a tapered spruce upper spar takes compression loads, and a thick web of 5mm balsa under it runs continuously the length of the panel, instead of being in short lengths between ribs. 1mm balsa forms the top and bottom of the box, with 8mm balsa between the two sheets at the leading edge, with 2.5 x 3mm spruce butted up to the front of the assembly to form the extreme leading edge and give protection against dents. The upper skin is actually made in two parts, overlapped, giving a stepped effect until the separate triangular '3-D' turbulators are glued in place. A gloss finish is applied with thin epoxy paint.





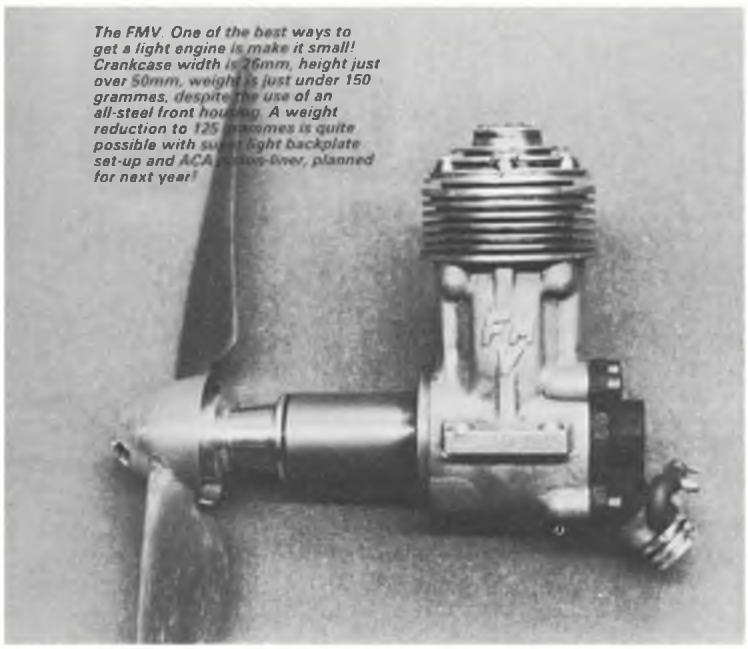


Top: ***Another unique feature, this diamond shaped circle towhook is simplicity itself. Left view shows tension on towline bringing tow ring arm down, pulling Auto-Rudder line tight to straighten rudder.*** Centre: ***Slackening the towline, the tow ring arm is pulled up by the tension in the Auto Rudder line as the rudder swings over to circling position.*** Right: ***Towline is released by snapping through broken corner, a second line starts timer and releases auto rudder glide arm (middle right) to readjust rudder for glide.*** Bottom right: ***finally a view of two fuselages strapped to the lid of Rene's model box, quite remarkable models.***



Sweet Victory
THE FMV STORY

By Rob Metkemeijer & Enrico Flores



The FMV. One of the best ways to get a light engine is make it small! Crankcase width is 26mm, height just over 50mm, weight is just under 150 grammes, despite the use of an all-steel front housing. A weight reduction to 125 grammes is quite possible with super light backplate set-up and ACA piston-liner, planned for next year!

Winning Brothers Rob & Bert Metkemeijer after the Woodvale final.

First part of a unique account of the detailed development of the diesel engine which won the 1978 World Team Race Champs.

INTRODUCTION

The design and construction of the FMV took place from November 1976 until just before the 1978 World Championships and must be considered as a synthesis of ideas arising from quite a few years of teamrace-experience and espionage. Flying experience taught us that we needed: A fairly powerful and economical engine and, far more important, one that would *GO* under all circumstances. A teamrace engine is only useful for the number of laps it can run at top speed, and its capability to withstand wrong – especially lean – settings, and heavy races.

The once, and maybe still, superior Russian engines (Onufrienko, Krasnorutsky, Maslov) were never more powerful than good Bugls or Rossi's, they were just built into excellent models and had an amazing capability to withstand any setting in any type of race. Some Bugls Mk I and Mk II and many Rossi's were probably more powerful, yet generally incapable of completing a race if set for maximum speed and economy, being very prone to sudden seizures. So a 'good' setting on these engines was a safe one, slightly rich and undercompressed, but slower, with possible problems of range,

With the 'discovery' of the Nelson 15D motor in the second half of 1977 it was clearly shown that contests could be won with an engine, not any faster than the opposition, but far more consistent. Its consistency in a race, rather than its power, impressed us deeply and we realized that Henry Nelson was on the right path. We must admit that it wasn't very easy to find out the reason of its superiority. Moreover we had already lost two years, because in 1975 we had been so stupid as to judge this engine only by its appearance.

DISTINCTIVE FEATURES OF A TEAMRACE ENGINE

A teamrace engine, is the only type of competition model-engine where power as well as fuel consumption matter. As everybody knows, diesel engines have a good reputation for economy, and that is why they are used in this racing class. Engines with a low fuel consumption get very little internal cooling from the fuel, so they are at the mercy of air cooling from outside.

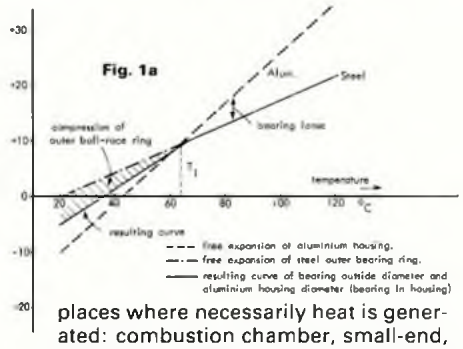
In all other types of competition engines small mechanical imperfections are remedied by simply opening up the needle, and therefore never overcome. With TR-engines this solution is not acceptable, even the best compare unfavourably with big diesels with respect to specific fuel consumption.

As every TR-mechanic knows there are settings with more compression and less fuel which make the engine run faster for a short while . . . and then a sudden stop follows, caused by rise of internal temperature and friction and consequent pre-ignition. Because in competition flying the running conditions of TR-engines are very close to this limit we are convinced that TR-engines can teach us a great deal more than any other type of engine about the existing mechanical and thermal problems.

This, and the following articles, will describe general mechanical principles and thermal considerations on model engine construction and the way they were applied to the FMV. Hereby we trust that the persons concerned with model engines achieve a deeper understanding of them and will hopefully become able to recognize and solve the problems they encounter,

Our approach can be summarized as follows:

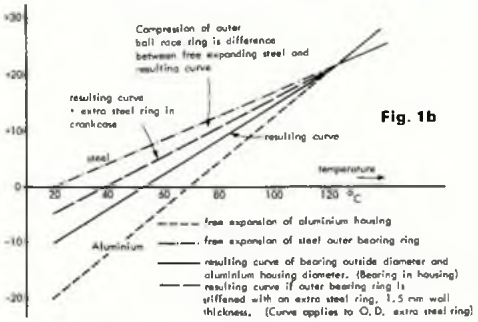
- Prevent local sources of friction, and thus heat. (Excessive friction and heat are generally generated by vibration, wrong tolerances or deformation, wrong material combinations and lack of lubrication.)
- Give cooling and lubrication to those



THERMAL EXPANSION OF ALUMINIUM HOUSING VS STEEL OUTER BEARING RING

Fig. 1a
Alum. housing made 0.01mm smaller than bearing OD at 20°C. (Wall thickness of steel ring 1.3mm, wall thickness of alum. housing 4mm). At 20°C, the ball race outer ring is compressed 0.005mm. Below 65°C the bearing has an interference fit, above 65°C the bearing comes loose.

Fig. 1b
Alum. house made 0.02mm smaller than bearing OD at 20°C. At 20°C, the ball race outer ring is compressed 0.02mm, (too much for normal clearance bearings). If an extra ring of steel is applied, the relative stiffness of the alum. housing is decreased. At 20°C, the ball race outer ring is compressed 0.005mm, as in Fig. 1a, but an interference fit exists up to 120°C.



places where necessarily heat is generated: combustion chamber, small-end, big-end, ball-races, piston and cylinder.

– Try to stabilize the system in such a way that, at rising temperature, friction in all moving parts does not increase (right material choice with regard to thermal expansion co-efficient is extremely important. If by thermal deformation friction is increased, temperature will locally rise more, giving more thermal deformation etc. and the engine seizes).

With the limitations of all existing TR-diesels on the mechanical side, we think it is absolutely useless to do a lot of research in 'tuning' the engines by means of improved gasflow, as long as too much fresh gas is not wasted during the filling of the cylinder. Quite a few experiments on cylinder timings and the shaping of ports taught us that you'll find all kinds of differences, but never a significant change in *efficiency* of the motor. The reason being that timing is a factor of power more than a factor of efficiency. The only important factor is the differences between transfer and exhaust timing in the cylinder, which should not be less than 18°.

For a Schnuerle scavenging layout all exhaust timings between 125° and 150° and many different portshapes seem to work.

Rotary valves opening at 45°±15° A.B.D.C. and closing 50°±15° A.T.D.C., all worked well.

Experiments showed, that it is always possible to compensate for the above mentioned variations by changing propeller and/or venturi.

THE BOTTOM END

The bottom end of the motor (crankcase, crankshaft and bearings and induction system) forms the basis of the engine, and a look at most commercial engines shows that this part is largely underestimated. In teamrace however the necessity of improved construction is clear, because motors are simply falling apart there.

CRANKCASE AND BEARINGS

One of the most serious problems in conventional motors, with ball bearings in an aluminium case, is that because of the different expansion coefficients of thermal expansion between aluminium and steel, the fit of the outer bearing ring in the case gets looser with rising temperature. The order of magnitude of this effect is 0.015mm every 75°C of temperature rise. (See fig. 1a and 1b.)

This constant 'hammering' and a turning moment will thus make the bearing outer ring creep around, ruining the housing. Before this happens, the strong influence of mechanical load on engine temperature will produce the very well known popping run followed by a sudden seizure.

Many TR-flyers recognized this problem and quite a few solutions were seen.

Jim Plaunt, for instance, used three set screws to prevent the rear race from moving in his 1976 Rossi RV.

A same type of solution was seen in one of Maslov's engines. He used a 0,6mm diam. key between bearing and house.

Both solutions affect the roundness and/or stiffness of the outer ring and must be considered as not ideal, (See fig. 2a and 2b.)

A far better solution is to Loctite the bearing at 100°C into the crankcase (use Loctite bearing fit with activator and do it quickly!). This method was quite widely used by us in Mk I and Mk II Bugls, and usually lengthened the life of an engine for a while. The only problem with this method comes if you must change bearings!

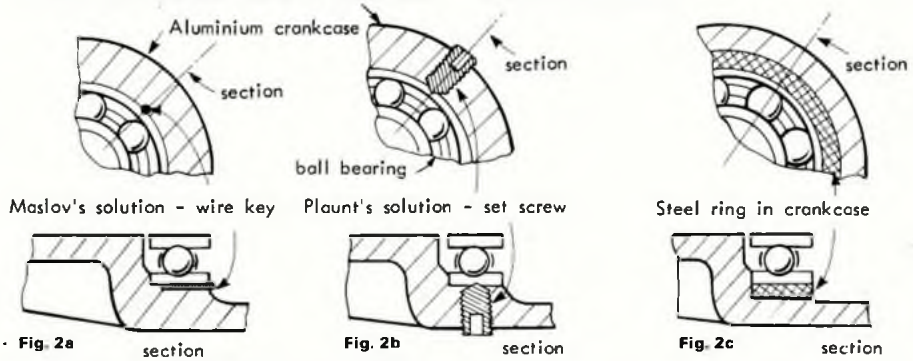
Some Russian engines showed steel rings shrunk and maybe also glued into the crankcase. This system at least solves the above mentioned problem of replacement of bearings, but the combination of aluminium case and a shrunk-in steel ring has a resulting thermal expansion coefficient somewhere in between aluminium and steel, so the problem is only half solved (see fig. 2c and 1b).

One of the best solutions to the problem comes from Henry Nelson. He simply uses a very strong interference fit (~0.025mm), which will stand temperatures up to ~150°C before the bearing comes loose. Normally crankcase temperatures will be under 100°C.

However, a few conditions have to be fulfilled.

Firstly the material of the crankcase has to be able to stand a relative high stress at room temperature. Secondly, bearings of a special high clearance type are needed to compensate for the compression of the outer bearing ring at lower temperatures. At higher temperatures, the bearings will run with quite some play, both radial and axial, which up to a point won't necessarily be a big disadvantage. However, replacing bearings at room temperature will give slightly decreasing interference fits, and requires special tools. Replacing them at temperatures above 110°-150°C, which is necessary without having to apply force, will ruin the bearings. (Advice: let Henry do it: he knows how it's got to be done.)

The solution that we think is best was firstly shown by Krasnorutsky – the all steel front housing.



SYSTEMS FOR PREVENTING BEARING ROTATION.

We tried them first in Mk I Bugls and the effects were quite amazing compared with the (worn out) original aluminium front housing: no sudden and unexpected seizures anymore at healthy sounding settings! Fig. 3 shows the principles of the FMV front housing, a screwed-in type, developed after a good look at Krasnorutsky's 1977 engine.

The front housing is Loctited (Loc-tite hot retaining compound+activator) at 50°C into the crankcase, which means that above 50°C no change in interference fit of the main ball-race exists. The interference fit of the front race is not affected by rising temperature of the engine. The fit we use is about 0.001-0.003mm of interference for the rear race and 0.000-0.001mm for the front race, more interference means loss of play in the bearing. This means they can be put in with a (strong) human thumb or soft hammering with a piece of wood.

Getting the ballrace housings to size is an extremely accurate job, not helped by

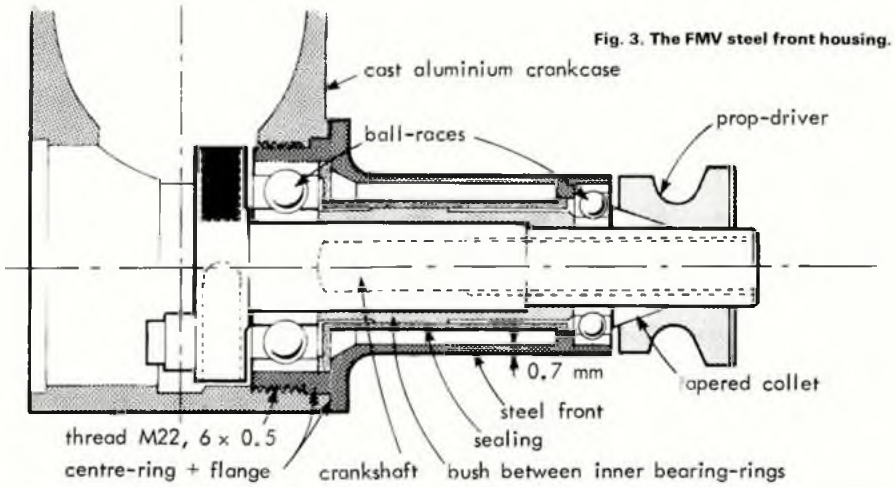


Fig. 3. The FMV steel front housing.

our deformable, normal-clearance, bearings. With high-clearance bearings more interference could be used and the relative accuracy of the house becomes less critical, but we still can't get these bearings in our sizes (8 x 19 x 6 and 7 x 14 x 3,5) without ordering large numbers.

THE BEARINGS AND THE SHAFT

Since both shaft and inner bearing ring are normally made out of steel, no thermal expansion problems occur. However it is of high importance that the inner ring is prevented from creeping, and wearing the shaft.

In all commercial engines the inner ball-race ring is retained on the shaft by a more or less heavy interference fit, or worse, by a sliding fit (Rossi, Super Tigre, K & B).

A tight fit, like in the Nelson, makes putting the shaft in and out a specialists job (same advice as before!) and it also calls for high-clearance bearings.

Bearings with normal-clearance won't accept interference fits of more than 0.001-0.002mm interference on the shaft without loosing their play.

Sliding fits on highly stressed TR engines will cause all sorts of distortion and vibration problems, increasing friction and eventually ending up with a cold forged, oval shaft.

In quite a few cases we found remarkable, if temporary, improvement just Loctiting the shaft to the bearings!

In the FMV the construction shown in fig. 3 is used. A bush is clamped between the inner-rings of the bearings by tightening the prop nut which prevents both inner-rings from turning. For this reason we can easily use a non-hardened shaft (material DIN 100 Cr 6, En 31 (GB), E 52100 (USA), the same as our front housing and bearings), with 0.001-0.002mm interference fit on the bearings. This bush is quite common in 'real' full-size machinery and has been used for many years in Russian TR-motors. It can be adjusted to such a length that the bearings are set to give the desired axial play to the shaft.

AXIAL AND RADIAL PLAY OF THE SHAFT

Apart from turning, the crankshaft can and probably will move or vibrate in axial and radial directions. These vibrations are directly induced by the ignitions of the engine and are strongly influenced by the play of the ballraces. They will increase the friction, heat generation and wear of the bearings.

In ball bearing technique, it is normal to control the play of bearings by 'preloading' them. This means, that in the case of a shaft supported by two bearings, both axial and radial play are controlled by setting the inner and outer rings at slightly different distance (see fig. 4 and fig. 5).

Our bearings when new, have an axial play of 0.06-0.08mm. We found this a little too much, causing setting and overheating problems as well as fast wear of ball bearings. By shimming, we make the bush between the inner rings about 0.03mm shorter than the distance between the outer rings, resulting in 0.03-0.05mm axial play. This seems to be a good compromise and will stay constant over a large temperature range in an all steel set-up.

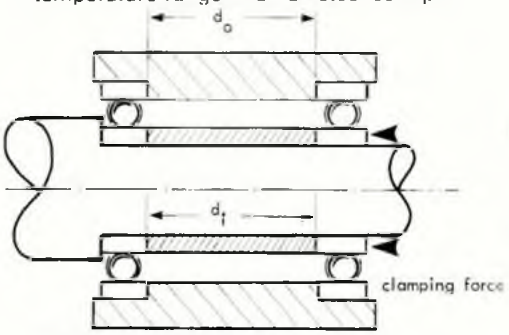


Fig. 4. Preloading ball bearings
If $d_i = d_o$, axial and radial play is equal to that of one ball-bearing (0.08mm in our case). If d_i is chosen smaller than d_o, axial and radial play is decreased. If, as in our case, $d_i = d_o - 0.08$ no play remains.

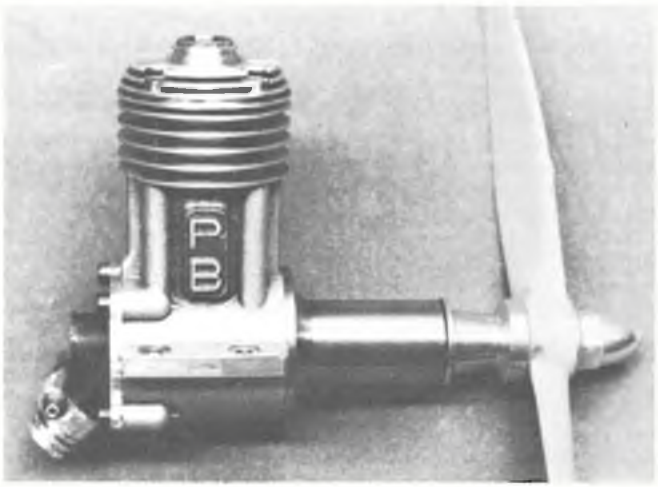
The reasons that no less play can be used safely, are the following:

- During running the inside of the motor (shaft) will always be warmer than the outside (front housing) simply because there's cold air outside and there's no other way for the generated heat to go. Therefore the inner ring is expanded and radial play (being around 0.003mm in our case) will decrease by 0.001mm with every °C rise of temperature difference. This effect, helped by a too well cooled front housing, committed quite some bearing ravages in our Rossi front-exhaust, the test-bed for many experiments with steel front housings. That's why in the FMV model direct cooling to the front housing is prevented by using a spinner (see fig. 16).
- Play is necessary to allow the shaft to bend during ignition. Calculations show that about 0.4° rotation at crankpin location occurs.

With an aluminium front housing controlling radial play by means of axial preloading is nearly impossible. This is because the bearing play induced by the radial expansion of the house will be much greater than the play reduction due to the lengthening of the house for a given temperature variation.

Setting a preload for running temperature will ruin the bearing when the engine is cold. In well fitted engines, like the Nelson, preloading is controlled by the interference fit of the bearings and the different expansion of the crankcase and the shaft, just giving the right radial and axial play at running temperature. (See fig. 5.)

Continued next month



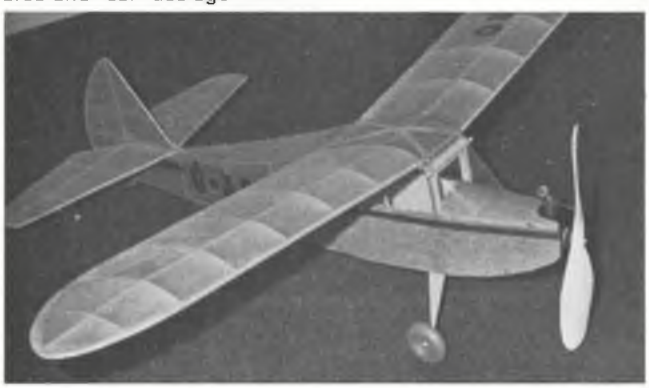
Applying the knowledge in this article to a Bug! Mk II produced this result, using aluminium head, hard chromed high expanding steel liner, steel front housing (screwed in) and Nelson K & B type induction. These modifications gave the engine a completely different character, it even sounds like a Nelson!

AN ATTRACTIVE 550mm SPAN CO_2 SPORTSTER By R. PRESTON

A new design with a familiar shape. The increasing popularity of the CO_2 motor brings a new lease of life to the favourite cabin monoplane layout, suitably scaled down and built as light as possible. The rechargeable gas bottle fits enclosed inside the fuselage but remember to allow slots for air to circulate around the cylinder to prevent freezing. Hollow plastic wheels (off an old Sleek Streak) help keep weight low and extra tissue trim adds colour without penalty. You can probably build Bluebird from the contents of your scrapbox, so give this little model a try and put some fun into your modelling.

AFTER BUYING a Telco CO_2 engine and installing it in a couple of kits modified to suit, I came to the conclusion that what I really needed was a purpose built model to make the best use of this wonderful little engine. What I wanted was a nice looking model that was simple to make and light in weight so after some doodling, *Bluebird* was born and a sweet little flyer she has turned out to be; its low cost and quick building make it ideal as a first CO_2 model.

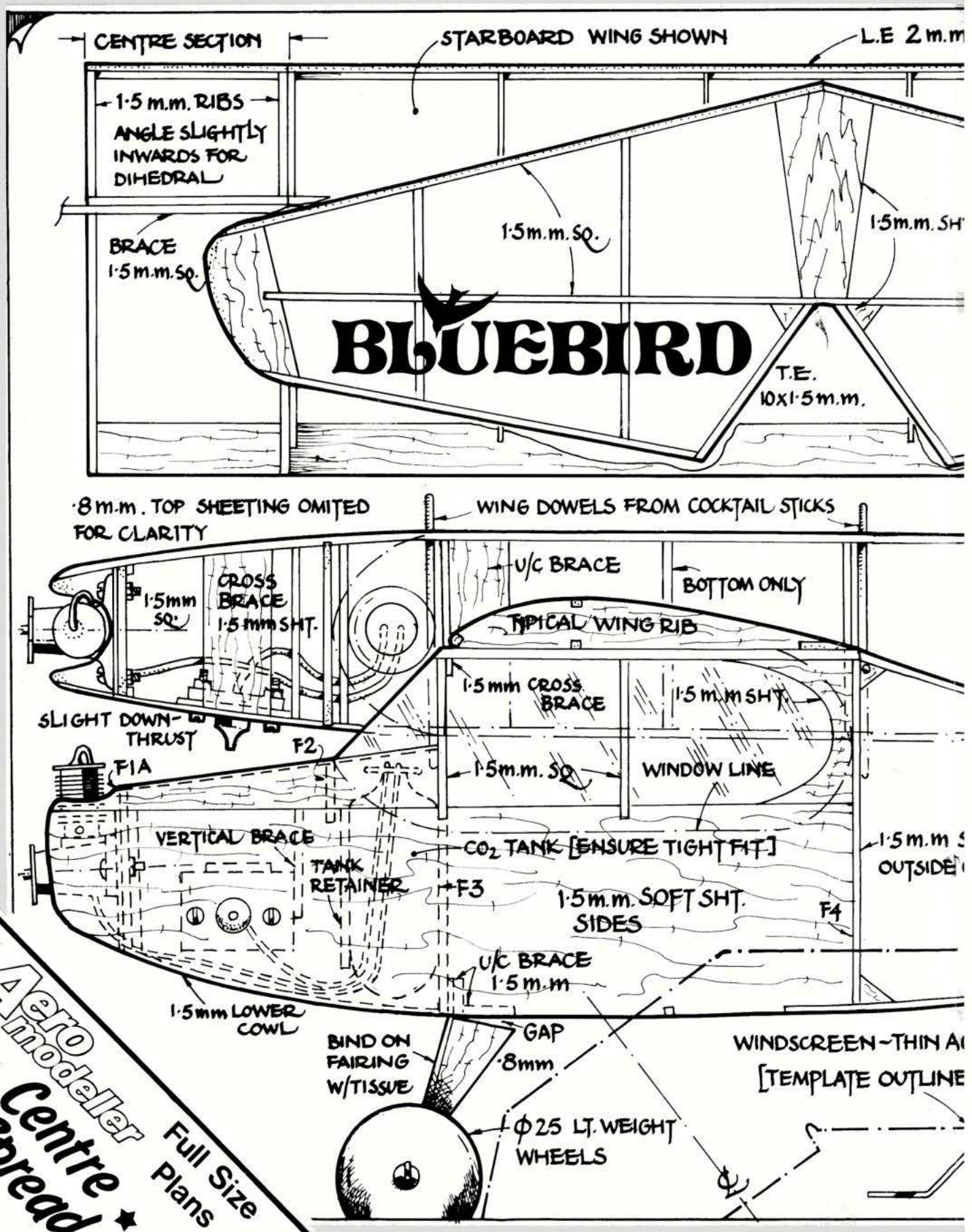
Start with the fuselage by cutting out the 1/16in sheet cockpit sides and pinning one of them to the plan. Next, select your four main longerons from fairly hard 1/16in square and pin them down to the plan in the usual way. Do not put the pins through the longerons but position them each side. Add the 1/16in square uprights and allow it all to dry; when it is dry, build the other side over the top of the first. When you are quite sure this is dry remove it all from the plan and separate the two sides with a thin blade. Glue F3 and F4 into position on one side and when dry, glue the other side on to the formers, making sure everything is square. When dry, pull the tail end together and glue, hold together with a peg until dry. Glue into position F1 and F2 plus all the cross braces in the nose area and rear fuselage.

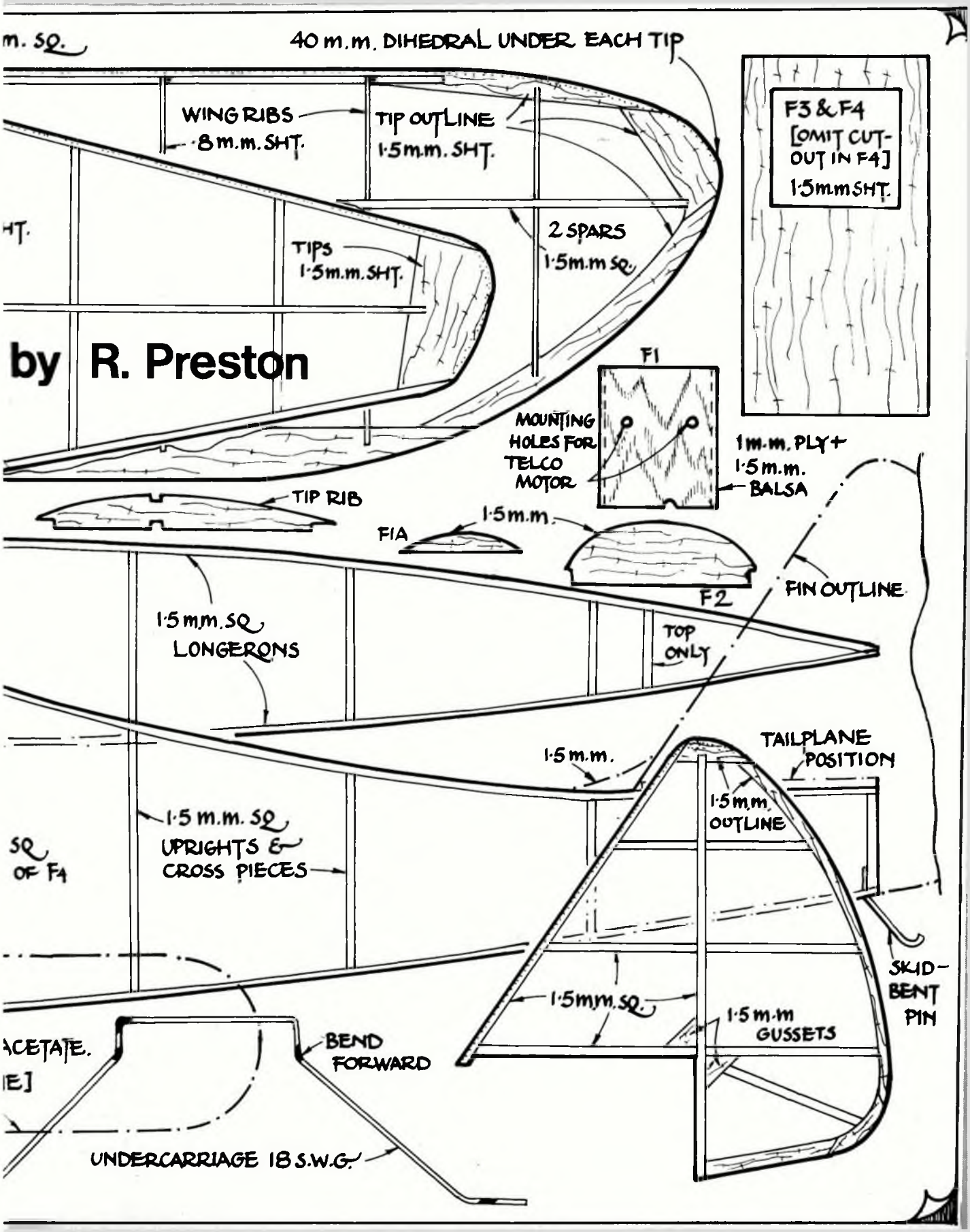


Complete the fuselage by adding undercarriage, wing dowels, charger ply backing and 1/32in sheet cowling glued into position. The lower engine cowl is optional and the CO_2 tank is a push fit between the formers. This allows the engine tank and charger valve to be fitted and removed quite easily. Put the fuselage to one side to admire, and then start on the wings which are straight forward.

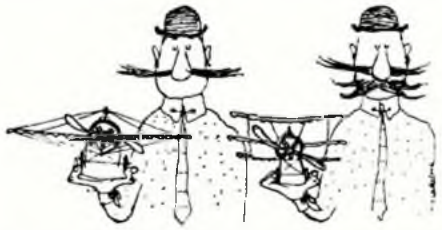
Use hard mainspars but keep the wing ribs and wing tips light by using softer wood. When both wing panels are complete pin the centre section to the plan making sure the ribs are set at the required angle to give the correct dihedral angle. Glue each wing LE and TE to the centre section ribs propping up the wing tips until the whole wing is dry. Now cut a 1/16in square slot behind the main spar in the centre section and glue in a 1/16in square hard brace.

The fin and tailplane are made from medium density 1/16in square and built directly over the plan as usual. Sand off the whole airframe lightly to remove any bumps or glue and cover the structure with lightweight tissue and give no more than one coat of thinned clear dope making sure there are no warps by steaming straight over a kettle. Keep decoration to a minimum for maximum performance. The prototype used a cut down Tern 6in plastic propeller which has given it a good performance but you can experiment with different props and engine speeds, that's one of the beauties of these little engines. When trimming, have the engine running at low revs as this reduces the drag caused by a stationery prop on the glide after a short power burst. The tailplane TE can be bent to aid trimming; try to trim for a large circuit and don't forget your name and address, and running shoes. *Bluebird* is very stable and will fly in windy conditions quite well, due to its ability to weathercock,so get building and have some fun flying.





SCALE MATTERS



by Alan Callaghan

AEG G11 by Mike Hetherington as mentioned in text. Model has full lozenge camouflage and markings applied by a mixture of methods. Weighs 15 grammes! Twin Rubber power.

COLOUR FINISHING

Following my mention of a very interesting twin-engined rubber scale model seen at the Indoor Scale Nationals at Derby Sports Centre last October, Clive Hotham has kindly forwarded a photograph of this unique subject. The model is a German AEG GII, was built by Mike Hetherington, and at approximately 18in span this complex airframe weighs a remarkable 15grams. The intricate lozenge camouflage and markings were applied to a sheet of Jap tissue before attachment to the model. The tissue is pre-shrunk with dope, and the lozenges painted on using water colour paints. Markings such as the crosses are applied using poster colour paint which is much more dense than water colours, and rib tapes are drawn on in ink. This is quite an unusual combination of media and obviously has worked very well on Mike's model. I have used poster colours myself on one model some time ago, but found that they smudge rather easily from most normal handling due simply to skin moisture. A simple cure is to very lightly overspray any areas of this paint with a 25/75 per cent mixture of clear dope/thinners to seal the surface. If the poster paint is thoroughly dry before spraying no adverse affects, due to moisture remaining in the paint, should occur.

The details of the AEG were provided by Clive's father, Barrie, who also mentions that a regular group of fliers are still having monthly three-hour meetings at the Chilwell sports hall and they will welcome any new members. If you live in the Nottingham area and are interested, Barrie will be pleased to provide details if you ring him on Mansfield 34127.

MAP RULES

A couple of months ago I brought up the subject of scale rules and their markings. The SMAE has now decided that it is no longer necessary to provide a scale rule for use with your documentation in scale competitions. This seems rather an odd move since the degree of accuracy of a model when checked even cursorily with a scale ruler cannot be disputed, it's either right or it's wrong. This means that accuracy will now be checked solely by the 'eyeball' method, and much more will depend solely on the judges' opinions and abilities, which, quite naturally, will vary a great deal. I would be very dubious of anyone who would claim to be able to spot, consistently a 10 per cent increase in tailplane area, or a wing wrongly located to the tune of nine inches on a 1:12 scale model simply by looking at it alongside a scale drawing to a much smaller size. I think this alteration will tend to lower rather than raise standards, and probably will make scoresheets much more open to contention than they should be.

Whether this change will affect you or not, you still need to use scale rules to build your model in the first place, and did you know that a useful set is available from MAP? Neither did I! This set was drawn by Peter Spence and was published in *Scale Models* December 1971. It consists of a set of sixteen scales ranging from 2x to 12x working simply by a multiplication factor. Very clearly printed, all they require is to be cut out and pasted onto card or, better still, very thin plywood, to make a very convenient aid to your drawing/building board. APS Drawing U/1142, price 50p.

BUILDING BOARD PROGRESS

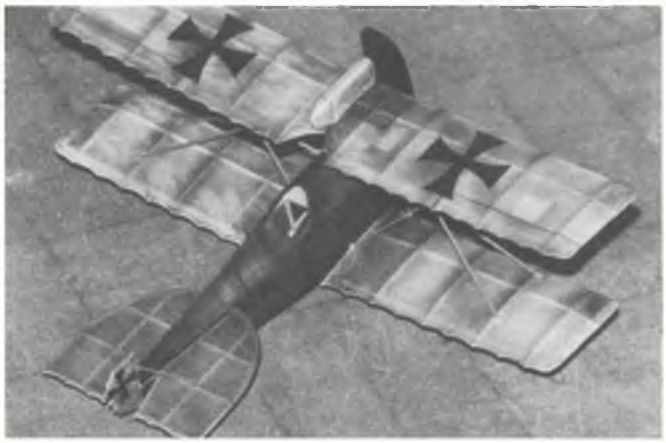
Unless something very special is being built for a particular meeeting on a rushed schedule, I think its true to say that most people overlap their building projects and rarely finish one model at a time before starting something else. This always seems to be the most enjoyable way of working since one then has much more time to thoroughly complete each small stage of building instead of keeping an eye on the clock and in consequence probably overlooking something vital. The fact that scale modellers usually work in this way is due not only to the reason that their models normally take longer to build than other types, but also because enthusiasm can suddenly run riot when one discovers a previously obscure subject that immediately seems to have all the features thought necessary to a good flying type. For some time I have been looking for a cabin monoplane to build as a simple indoor open rubber scale subject but was unable to decide on a subject that was structurally simple and for which I could get enough information such as a three-view plus colour scheme to make it worth tackling. I wanted something that was quite clean aerodynamically without too many struts and braces, and preferably with spats, since they always seem to make any subject look better, as well as very fractionally (at this sort of scale) cutting down drag.

The subject I settled on is the Polish RWD5, which has a fully cantilevered wing without any struts, an inverted in-line engine giving a high thrust line thus allowing a large airscrew with good ground clearance, a neatly faired undercarriage,

and a simple colour scheme of silver with black letters on the chosen subject, SP-AJU.

The model was built very quickly while enthusiasm ran high, and in the clear tissue state as photographed the total weight is roughly 10 grams without the scale hardwood prop which was actually made for another model but by chance is to the same scale. The entire fuselage is built from basswood and for its size and weight is one of the stiffest I have yet built. Wingtip and tailplane outlines are of laminated basswood, and the wing has two sheet spars set on edge, the front one being of soft 1/16in balsa and the rear one of light 1/32in. Ribs are sliced from light 1/32in sheet. The spats are built up from extremely soft balsa and in order to achieve a very smooth surface to simulate metal the following method was used.

After rough shaping, the surfaces were sanded using 400 wet and dry paper used dry. Each spat was then wedged onto a piece of scrap balsa and simply dipped into a tin of full-strength dope and hung up to dry. This was then sanded again using the same 400 paper and the operation repeated about four times. Most of the surface dope was taken off at each sanding, and only the deepest grain indentations filled in the process. The final dipping leaves a complete coat all over and the grain is completely sealed with a film of dope to a constant thickness, and a super-smooth surface at a negligible weight penalty is the result. The difference between this method and either brushing or spraying is that the thickness of each coat is much more even, and it certainly seems to take fewer coats to thoroughly seal the grain.



Hausa-Brandenberg, sprayed with ink — looks as though it has just arrived from the Western Front! Excellent effect was achieved by modeller who did not identify himself to photographer Clive Hotham.

MAKING CANOPIES?

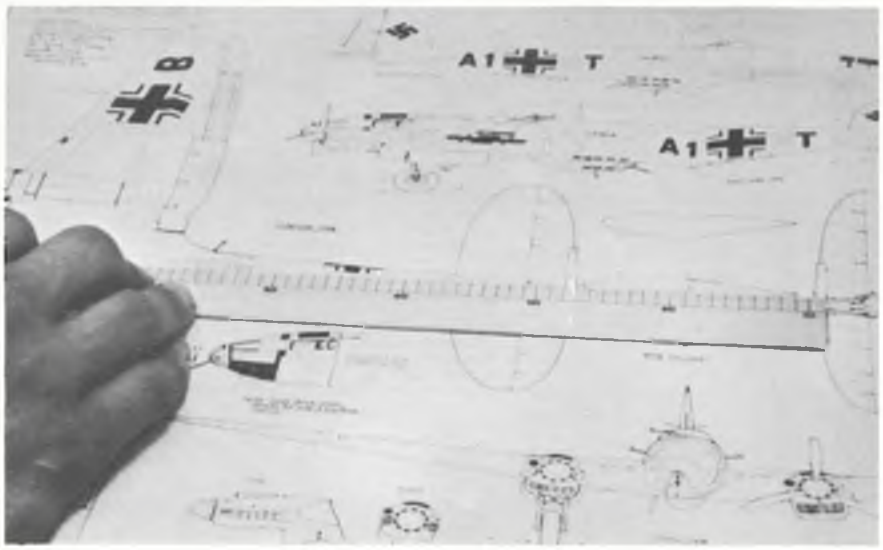
One of the problems of building super-light scale models is finding a really suitable clear plastic film for any cockpit or cabin glazing. Most readily available celluloid sheet is much too thick and heavy for models less than roughly two feet wingspan and so other alternatives have to be found. Fortunately, there are dozens of potential sources in the way of gift packaging, display box type food cartons, toy boxes, etc, and it is almost certain that the usual weekly shopping basket will contain some kind of wrapping or container that will yield something suitable. One of my monthly bills used to come in a window envelope with crystal clear film incorporated of less than 1 thou thickness, but alas no more! It is necessary to experiment with different glues on your chosen piece, but there are very few films that cannot be held in place with either dope, epoxy, cyanoacrylates, or a clear contact cement such as Bostik or Cow Gum. Not all these plastics can be moulded to shape however, so if you are considering building an ultra-light model try to choose a subject on which any cabin glazing can easily be fabricated from flat sheet.

DIARY DATES

To help to keep your diary well-stocked in 1979 it is worth mentioning a few dates already settled for scale meetings,

The '2FSA' association hope to have a few more dates arranged for their fly-ins at *Chobham* following the success of last year's meeting, and Bill Dennis advises that the first one will be on Sunday *May 6th*. Remember, these are not contests, but informal get-togethers where everyone with a flying scale model, or an eye for the same, will be welcome. SMAE FF Scale meetings include *RAF Odiham* on *April 8th*, and again on *September 23rd*. Bill also emphasizes that although these events are officially called contests, there is usually both time and opportunity for a fair bit of sport flying (scale, that is) during the day when the weather is kind. Even if you don't enter, you're invited along together with a model, and may be cajoled into thinking that it's more fun to join in!

A new event on the calendar is a two day meeting organised by Witham MAC to be held at the *Essex Showground* on *July 7th* and *8th*, where *CL Scale* will be featured amongst other CL events. The contests will be on the Sunday whilst Saturday may



A finished scale ruler in use on a plan. In this example the plan is 1/7nd scale as referred to in text and the ruler in use is 6x in order to determine the dimensions for a 1/nth scale model. Each division read off the ruler then represents one inch on the enlarged model plan. One advantage of having a range of 16 scale rulers as provided is that one can make a quick assessment of various enlargements to arrive at the desired size. For example, if one needed a 48-inch wingspan, then one finds the ruler on which 48 fits nearest to the span on the plan which has to be enlarged.

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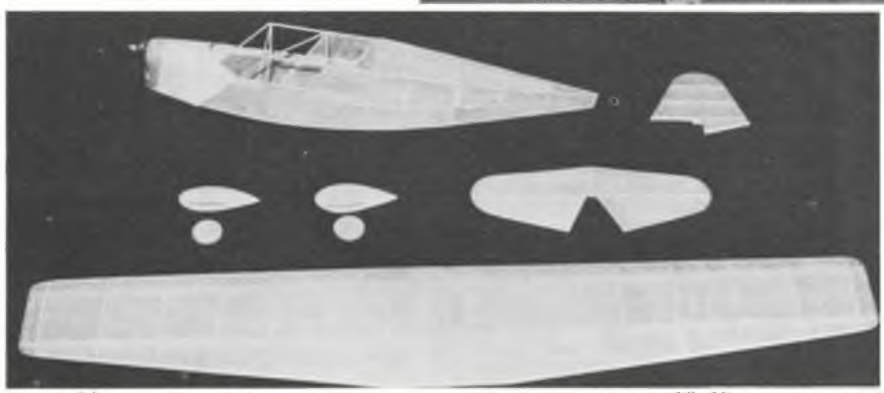
SCALE MATTERS

CONTINUED FROM PAGE 230

Right: ***inexpensive set of letter scales as described in text. Capacity 750 grammes in very clearly marked divisions. Author's CO_2 powered Udet Flamingo shows the strain!***

Below: ***indoor rubber scale RWD5 by author. 19½in span weighs 10 grammes as shown in component form. Basswood used extensively throughout.***



be used for practice and overnight camping arrangements can be made. Still on CL Scale, this will also be a main feature of the Three Kings Open Day on *September 9th* at *Croydon*, and where some quite nice prizes will be there for the earning. Hopefully an FF event will also be staged and the spoils may also spread to this.

Now where's that top-secret plan you've been coveting?

* * *

SCALES MATTER

What is a photograph of a set of scales doing in this column, you may well ask. A simple transposition of the letter "s" in the title of the column makes the answer self-evident to those who like to work to fine limits in their building techniques and keep a careful record of the weights of the various components that go to make up the complete model. Most people are aware that one piece of balsa may weigh up to four or six times as much as another piece of exactly the same size, and it is not too difficult to spot these extremes when holding such pieces one in each hand. There is, however, a very broad middle ground where such differences are not so easy to detect, but where if the pieces of wood were to be carefully weighed before selection a saving of 10–15 per cent might be achieved in the finished model, a saving almost always worth having in any kind of scale model. It is not necessary to use an elaborate and expensive set of scales since extreme accuracy of measurement is not required in most cases. The laboratory balance type of machine is of more use to the indoor duration flyer, but the simple letter scale shown is one of the most useful I have seen that is suitable for most modelling needs. It is made by *Waymaster,* and is the model *475 KL* which has a range of 0–750 grams in 5 gram increments. Imperial equivalents are 0–26.8 oz is steps of slightly more than ⅛ oz. The price is around £6.50 at most good stationers or office equipment suppliers. There is available a large range of letter and parcel scales of greatly varying capacity and price, but this one has a very clearly-marked scale that is easy to use and it is one of the least expensive. An interesting little exercise to try is to place a newly-doped wing on the scale and then watch it slowly lose weight. It's not magic, but simply the dope solvents evaporating. Now if you'd carefully weighed those pieces of wood before assembling them into the wing, you would not now be wishing that the solvents would carry on evaporating just that little bit longer!

ELECTRIC ROUND THE POLE FLYING

by DEREK FARMAN

A most realistic Landing approach as Mark Newlands' Etrich Taube appears to float over the tree tops during some outdoor flying.

OVER THE PAST THREE MONTHS I have tried to outline the basic principles of Electric RTP and how to extend skills beyond the stage of glue three pieces of balsa together – add an engine – stand back and watch it fly. In this final article I would like to conclude the process by suggesting some of the wide range of possibilities offered by this mode of aeromodelling.

SCRATCH BUILDING SCALE MODELS

Ron Moulton's book 'Scale Flying Models' (available from MAP price £1.75) adequately describes methods of scale drawing so I will not dwell on 'how' but rather which model to choose. My personal preference is for flying aeroplanes that can only be flown with the greatest difficulty, free flight or control line. Hence my preoccupation with fragile, highly detailed pre First World War flying machines.

RTP scale offers a wide field for development. The main guideline is the relation between motor output and model size. The biggest motor – a geared Johnson 333 will fly lightly built biplanes up to 32in span and monoplanes up to 36in with a little power to spare. Depending on size of the originals, 1/12, 1/16 or 1/24th are generally suitable scales. Multi engined aircraft are no problem with no starting difficulties and so long as the motors are mounted in series. A good example is this battered little 1/48th scale Handley Page 0/400 that completed a simulated historic flight at Stalham School of 13½ hours with 10 minute breaks every two hours to change motors (only 4 motors were used and not one burned out!)

Two mid flight shots from a past ME Exhibition, Bristol Gunbus above and Handley Page 0-400 below illustrate the realism of RTP scale.

You will be amazed, that by adhering to the golden rule 'light is beautiful' just how much accurate detail you will be able to incorporate into an RTP model. There is no need to increase the original's tail areas or even to slyly increase dihedral angles. A multiplicity of struts, wires, guns, cockpit/pilot detail and authentic colour schemes are all possible. Ducted fans work beautifully to power 'jets' so quite literally the sky's the limit.

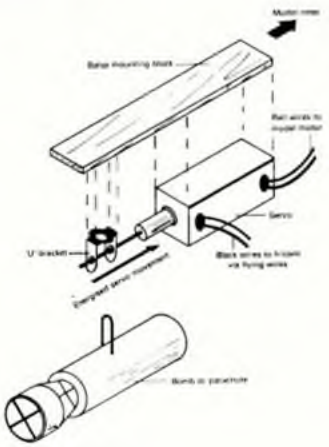
INLINE ENGINED MODELS

In my previous articles I have referred solely to radial engined models which permit push fit motors. But what of inline types – Spitfires, Me109s etc. where the nose is too small to permit push fitting? The answer is simple. Use a motor with an extension shaft. Apart from suiting the slim nose, by building such a motor further back into your model you will automatically move back the centre of gravity, preventing nose heavyness.

RETRACTING UNDERCARRIAGES

This realistic feature need not remain the sole property of designedby PeterRadio Controlled buffs. Thanks to the following set-up Riedan of Camberley, fore and aft as well as sideways retracts are possible. Do however, bench test your system thoroughly before installing it into your prize model.

BOMB DROPPING & INFLIGHT ELEVATOR CONTROL, CROP DUSTING ETC.

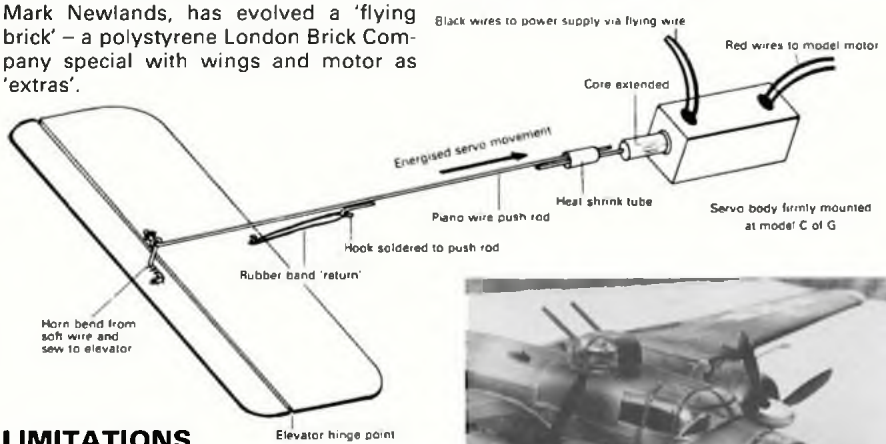


Above: ***Immaculate air-brushed finish on this twin engine De Havilland Mosquito, note tether hook.*** Right: ***Denmark's Ib Lyngkilde's Lockheed Starfighter over 3ft long powered by a single Mabuchi 26D.***

These working functions are all possible by employing such a lightweight servo as that available from Harry Butler Models and hooking it up as follows:

ADDITIONAL POSSIBILITIES

Apart from scale models, Carrier Deck Landings, Speed and Aerobatic machines are all open to further development. Novelty machines can also prove a light-hearted diversion. Jette Lynkilde's 'Snoopy's Flying Dog Kennel' (*Aeromodeller* April 1977) has brightened up many a fly-in while one of my ex-pupils Mark Newlands, has evolved a 'flying brick' – a polystyrene London Brick Company special with wings and motor as 'extras'.



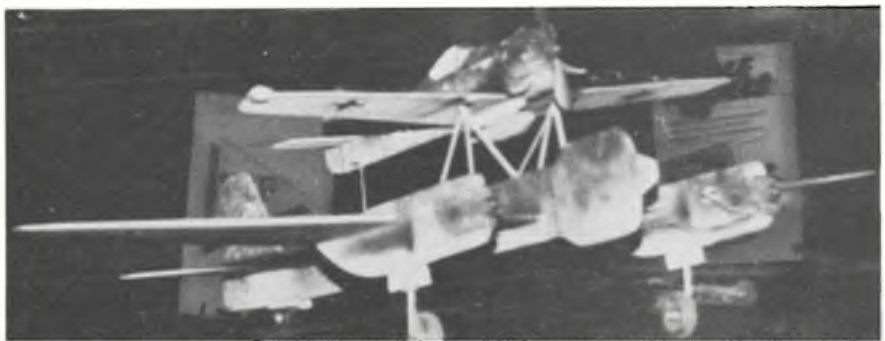
LIMITATIONS

In spite of its great flexibility, RTP like any other flying system naturally has its limitations. Line length must be related to power output, props to motors, motors to model size. Outside flying is possible – power being provided by car batteries but due to their relatively light weight, the models are at the mercy of even gentle winds unless a sheltered spot can be found at the right time of the year – warm summer evenings are ideal. However, if the desire to fly outdoors is your ambition, why not fly control line anyway? The great strength of RTP is the virtues of silence and cleanliness which make it the ideal indoor activity. After all, how many other branches of aeromodelling can still operate in the midst of gale force winds, snow storm or torrential rain?

CONCLUSION

At best, this series of articles will have introduced readers not just to basic RTP but its vast range of possibilities. Further information can be obtained from Harry Butler's catalogue; back copies of *Aeromodeller* (April 1974, September 1975); 'Electric RTP' by Peter Bullivant (available from MAP, price 00p) myself c/o The Stalham School, Brumstead Road, Stalham, Norfolk or my forthcoming book 'RTP for Schools' (publication date to be announced soon). Many suitable plans can be obtained from MAP Plans Service, and Model Design & Draughting, 4 Martian Way, Hemel Hempstead, Herts.

In conclusion I hope that I have provided some food for thought and even have persuaded members of the aeromodelling fraternity that RTP is not just something to keep club interest alive on cold winter evenings but a fully-fledged branch of the hobby in its own right.



Above left: ***Close up of this Mitchell B-25 converted to RTP from a commercial kit illustrates the considerable detail possible with indoor electric flying.*** Left: ***Very ambitious profile double of Me 109 mounted on top of a Junkers 88 for in flight separation.*** Above: ***Pete Goulstone's converted Keil Kraft Fairey Swordfish makes a perfect carrier deck landing, note arrester hook trip wire.***

Trevor Faulkner explains

How to Laminate Spiral Wound Tapered Fuselage Booms

THE BENEFITS OF laminated types of construction are considerable. From the viewpoint of the modeller they possess desirable structural stability (ie warp resistance), good strength/weight characteristics, great resistance to longitudinal or latitudinal breakage (due to the opposing grain directions involved), are capable of accommodating quite complex double-curvature forms, and finally, are extremely satisfying to produce.

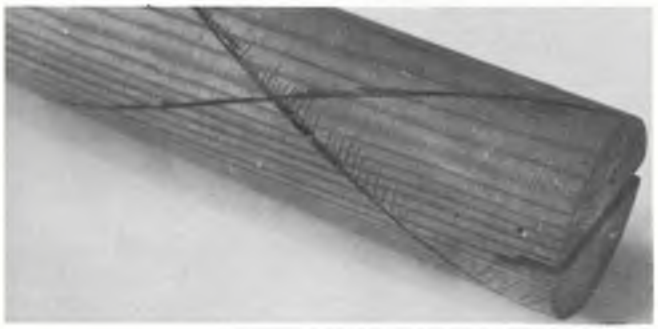
The writer has had opportunity to observe the comparative merits of spiral as opposed to conventional all-sheet construction in models of eight or ten years of age. There is no doubt in my mind of the superiority of the former method, as no example of distortion has evidenced itself.

Tapered Booms

A suitable waxed mandrel is necessary. Given access to a wood-turning lathe, the production of this component is simplicity itself. Nevertheless, careful planing of a tapered blank in a V-block, followed by thorough sanding to shape will produce an adequate piece. It is advisable to allow plenty of time (say, 24 hours) for any glue-resistant layer such as wax to become well-assimilated by the blank. One reliable method is to coat the wood with a layer of linseed oil prior to applying a final coat of wax. The oil will penetrate the pores of the wood and defy the efforts of the adhesive to glue the whole job solid once laminating has started. After the oil is absorbed, a coat of furniture polish or the type of wax separator used in GRP lay-ups completes the proofing process.

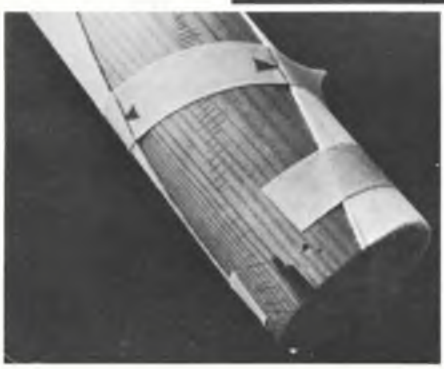
The lower end of the boom mandrel must then be marked with two lines drawn at the angle of the intended spiral laminations. These are necessary for two purposes, (a) the calculation of the strip width to be used, and (b) to act as a guide and reminder of the angles at which these strips must be laid. Successive layers are wound in opposing directions and it is not unknown for two sets of strips wound in the same direction to be produced absent-mindedly!

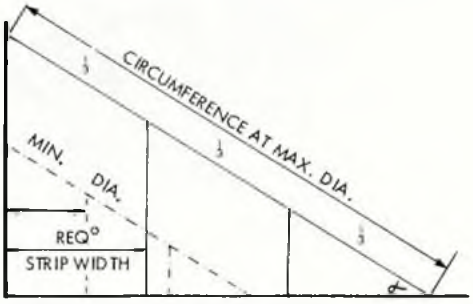
The calculation of the strip width is easy to follow. The circumference of the thickest section of the former is measured by wrapping and marking a paper strip at this point. This dimension is then used as the hypoteneuse of a right-angle triangle, one angle of which is that of the inclination of the marks on the boom related to the centre-line. The hypoteneuse is divided into the number of parts (usually three or four) equal to the intended number of laminating strips in one layer. These divisions are then projected onto the base of the constructed triangle, thus indicating the reduction in the width of strip necessitated by the twist involved. The narrow end of the former is measured so that the smallest part of the strips to be used may be calculated in exactly the same way.



A mandrel of the required size is needed on which to form the balsa tube. Broom handles, billiard cues or specially turned blanks are all suitable. The chosen angle of spiral is marked in opposite directions along the mandrel which is then coated with linseed oil and wax to prevent balsa from sticking on the mould.

Right: *strips of wood soaked in water are wrapped along the mandrel at the chosen angle of spiral and held in place with soft wide bandage until dry.* Below: *balsa strips are replaced and held with tape and the remaining gap measured at perpendicular to strip edges.* Below right: *final strip cut to size is fitted in place.*





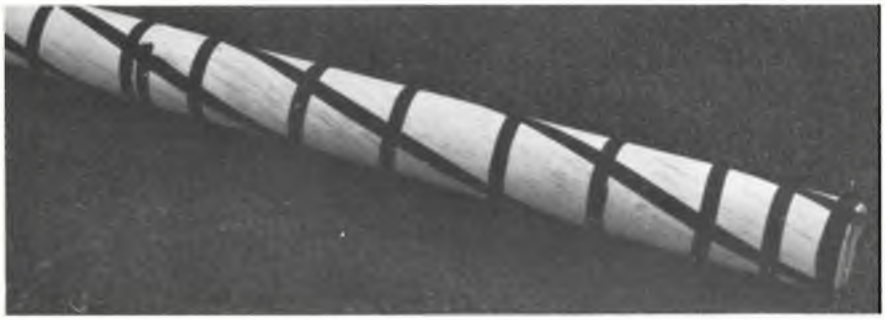
∠ = ANGLE OF STRIP TO CENTRE LINE
(FOUR STRIPS REQUIRE 4 DIVISIONS OF HYPOTENUSE)

Finally, the length of strip required may be worked out numerically as it is greater than the overall length of the part to be made in the exact ratio of the hypoteneuse of the above triangle to its base.

One strip less than the required number is cut from straight-grain flexible sheet balsa. Strips may be any thickness according to the curvature required, but to get a 'feel' for the job it is advisable to start with 1/32in sheet.

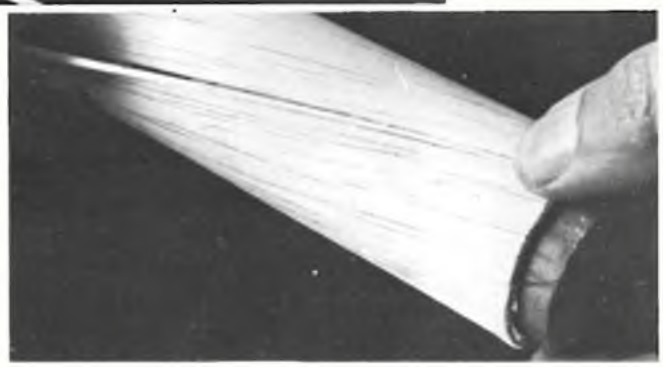
These strips are soaked in (preferably hot) water for about five minutes, and then wrapped around the former, whilst being

Right and below: ***strips of tissue soaked in adhesive are used to band the tube together at regular intervals and also to seal the joints between balsa strips along the length of the boom. As the tissue dries it helps pull the joints together.***



Right: ***The inner tube is removed from the mandrel and the outer strips are formed wet, spiralling in the opposite direction. Once dry they are test fitted around the inner layer and the remaining gap again measured.***

Left: ***Final strip is cut to fill gap and the outer layer is glued around the inner layer bound in place with bandage until dry. Any remaining gap due to shrinkage when drying can be measured and matching thin strips of balsa cut.***



Right: ***final fitting of a thin sliver of balsa to fill any remaining gaps in the outer lamination.***

held at the degree of twist indicated by the marks previously mentioned. The ideal method of holding strips in position is to bandage them using either crepe or ordinary bandage about 1½in or 2in wide. This will produce a great deal of pressure over the whole surface area of the job, and avoid indentations whilst so doing.

The dried strips will be found to have assumed the shape of a rather attentuated helter skelter, and may then be assembled on the former preparatory to measuring the exact dimensions which the final strip will require to be. The latter is then cut, soaked and wrapped as were its fellows, and allowed to dry.

The completed layer of strips is then manipulated into the correct positon on the former and held temporarily by narrow strips of masking – or sellotape.

Strips of heavyweight tissue, approximately ½in wide are cut and pasted around the balsa strips. The adhesive should be compatible with that to be used in the main gluing process. The writer chose to use a mixture of heavyweight wall-paper paste and PVA 'white' glue, which bonds well with the unadulterated PVA glue used in the rest of the work.

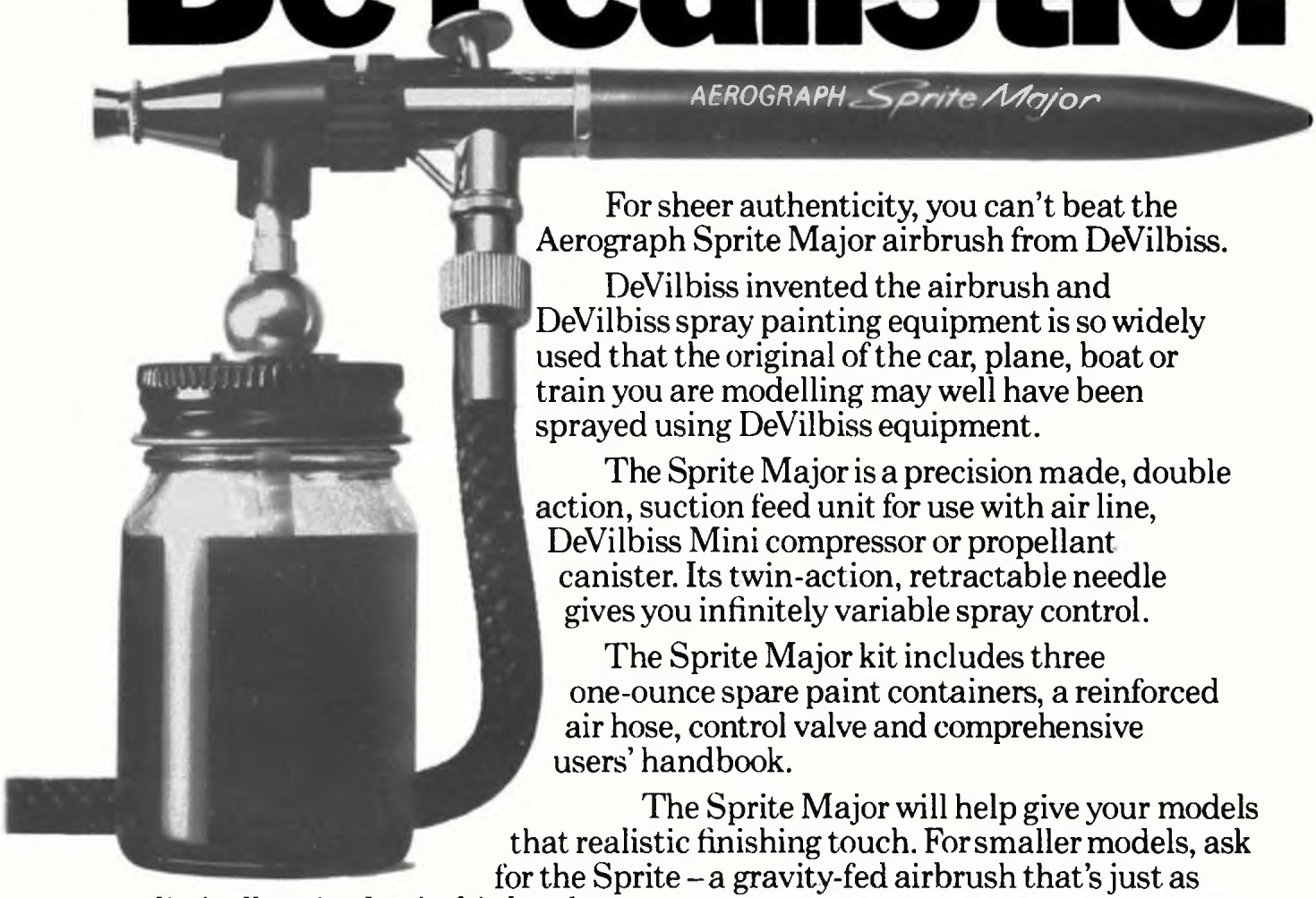
After the circumferential strips of tissue are dry (shrinking and tightening the balsa strips as they do). the masking-tape originals are removed. Further tissue is employed, spirally wrapped, to cover the joint of each strip with its neighbour.

When the whole lot is thoroughly dry, this initial layer can be removed from the boom. Any reluctance to separate can usually be overcome by using a 'rolling-pin' technique, to roll the assembly back and forth on a resilient surface (eg carpet). The whole sequence is then repeated using strips a little wider then the originals, which are soaked and bound (but in the opposing direction) to the mandrel. NOTE: The first layer is removed to avoid the danger of the wet strips loosening the tissue ties responsible for keeping this layer intact.

The new strips are removed from the former after drying, and then assembled upon the first balsa layer so that their final component might be measured. This is then soaked, wound, allowed to dry, and then removed from the former.

Now everything is ready for the final assembly. The first layer is replaced on the former and glue applied to the first foot or so of the thick end. The new layer of strips is placed in position, bandaged for a short way until further glue needs to be applied to the next length of the inner layer. Glueing and bandaging in turn continue until the whole unit is secure. Should any adhesive seem to have escaped and appear likely to glue the bandage to the outer layer of strips, it is possible to unwind the bandage, wipe the outside of the balsa, with a damp cloth, and then re-bandage the unit without detriment to its complete amalgamation as a laminated component.

Be realistic.



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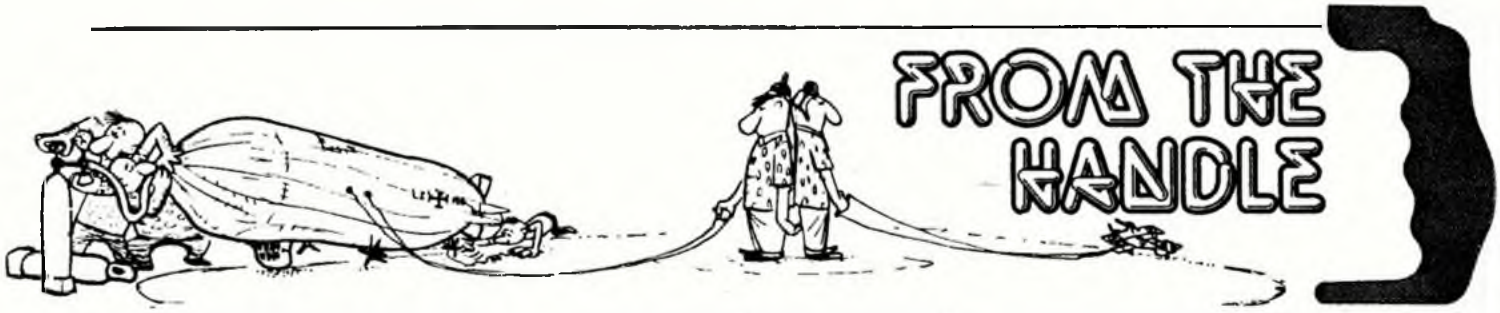


COMBAT FLYERS' ASSOCIATION

Other than the British dominance of the World Championships, 1978 must surely represent the lowest ebb reached by combat in England. Competitions were so few and far between that it was impossible to plan any kind of programme, events were cancelled at the last moment for no good reason and others so unpublicised that often the first one heard of them was the results.

The British National Championships which not so long ago would have had an entry of over 128 was held over three days in glorious weather and had a pitiful 40 or so entries of whom perhaps four were serious contenders and this is still the most prestigious competition in FAI combat.

In addition to all this many of the top fliers announced their retirement from the sport whilst no new talent has been discovered. There is an air of decay around the combat circles and prompt action must be taken to arrest this decline. With most of the, shall we say, more experienced fliers gathered to provide the judging team for the World Championships it was generally agreed that some sort of combat fliers' association is required to assert the necessary influences in the correct places to return combat to the right direction. The only problem here of course is who is going to give up the necessary time and effort to get the movement going, when he should be practising or developing next year's equipment.

Combat fliers as we all know, are very competitive individuals, we are not usually natural organisers, but instead often the sharpest critics of those who are. Having spent much time looking for the right person to start the Combat Fliers Association, and having failed, we have decided to rely on that Old English custom – the PRESS GANG. I shall handle the day-to-day running and public relations aspects until membership is large enough to hold elections. Vernon Hunt offered assistance, so he will look after aspects concerning FAI. Neil Gill and the Peterborough club will look after the cheap diesel power championship soon to be announced, henceforth from this day to be known as British Combat and Dave Harrison and the Cosmo lads will look after ½A Combat.

Frank Smart has designed the emblem and other fliers who have indicated their willingness to assist will be hearing from me in the near future.

We have a very ambitious programme for our first year, as we will be running championships for two classes of combat with trophies for the overall winners at the end of the year. Our newsletter *Line Job* will be published and, by the end of the year when membership levels for the following year can be accurately forecast we should be able to offer insurance, specific to our members' needs and covering events held overseas. Most combat fliers are not insured when they leave Dover and so far have been lucky that our friends overseas have not read the small print on their cards.

SMAE

The Combat Fliers Association is not being set up to compete with or replace the SMAE, although it will not be compulsory for our members to join that body. Rather, we hope to augment their service to aeromodelling. At the moment there is one active combat flier on the control line sub committee and he is doing an excellent job for us, however the SMAE at the moment has no direct line to the thoughts of the combat fliers as it has to speed and team race and that is a serious omission. (I will explain my own personal thoughts on the SMAE in the editorial of *Line Job* at a later date.)

Membership

Membership fees will be 50p for the first year, this to cover mailing costs etc. of the newsletter. Membership is open to all, and each year there will be two or perhaps three free memberships for those who have brought the greatest credit to British combat, i.e. World, European and British champions. Tee shirts and Transfers will be available shortly at reasonable prices.

So there we are. The answer is now in your hands, combat could and should be one of the best supported events in Aeromodelling, and is certainly the only category that could genuinely be termed a sport. All we have to do is arrest the decline in interest, rid ourselves of the loutish image unfairly attributed to us in the past, divest ourselves of the men playing with toy aeroplanes, the impression sometimes given, and we would be left with an exciting sport capable of supporting itself and with unlimited potential. But to do this it is necessary for *you* the flier to join this association so that together we can put something back into our sport. Letters etc. please to: Jim Carolan, 261 Daniells, Welwyn Garden City, Hertfordshire.

PETERBOROUGH CLASS A DIESEL COMBAT RALLY

The weather was fine with a slight breeze, in fact ideal for combat, with the exception of the cold!

Flying began at approximately 11.00, with the familiar sound of 'Olivers' burbling in ones ears. The delay was to allow distant travellers to arrive. At the start there were 36 entries with many interested spectators (Mick Tiernan and Jim Carolan to mention a few).

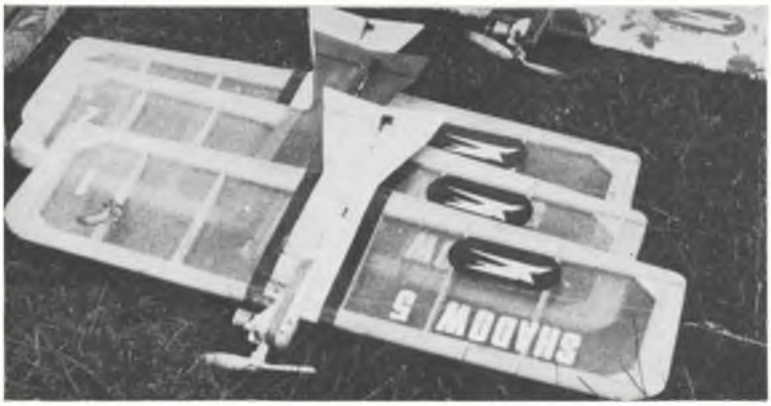
The first round saw some excellent flying with S. Malone beating Vallins and B. Waterland's 10 year old Dominatot literally smashing its way to victory over D. Benfield. The restrictions of one model per bout gave the novices more of a chance of winning, making the contest that more interesting. Owing to the lack of time there was a limited losers round, which understandably caused some aggravation, but it was necessary to ensure the competition finished before dark.

The Semies saw an excellent bout between S. Turner and Stitson with Stitson using all the circle to avoid S. Turner's repeated attacks. Stitson eventually going through to the final. P. Tribe and N. Gill never really got going, owing to N. Gill suffering from a bad motor run despite the desparate attempts from the pit crew. The fly-off for third, saw some excellent flying with three cuts each by N. Gill and S. Turner with N. Gill winning by a close margin on ground time.

The final was flown between P. Tribe and Stitson with Stitson flying well to win and so ending a very enjoyable day. Prizes were kindly donated by M. Simms of Downham R/C Model Shop.

It was obvious with the number of entries and spectators that there is considerable interest shown in a slow class 'A' Diesel/Combat. In fact, discussing this with Tiernan, Malone and Carolan, it was suggested that our club in conjunction with others should run some more class A Diesel Competitions throughout the year, with trophies at the end of it. Our club is prepared to undertake running at least six competitions throughout the year to give people more of an incentive to prepare, build and develop models, knowing that it is not just for a one-off competition, perhaps we could have a slow diesel competition at the NATS, run parallel with the fully 'blown' FAI combat? I certainly think it would be as popular, or more popular, than the current FAI class.

½A winners from the host club at Peterborough were Neil Gill 3rd, Steve Turner 1st with Marc Harrison 2nd.



Above: ***Currently one of the most promising ½A combat models, Neil Gill's Shaddow Mk. 5. Much favoured by fellow Peterborough clubmates the design took the top two places at last years Nationals.*** Right: ***Junior finalists Mansfield and Runacres with prizes from trade sponsorship. Soggy wing looks like leaky fuel tank problems.*** Below: ***Pitstop action from Jarrett and Mansfield as they restart Window's ASP Spirogira.***

RENEGADE COMBAT RALLY

A good entry of 21 managed to make the haul to the first Renegade Combat Rally, the Wharfedale lads helped in the smooth running of the contest and sponsors, Veron, Humbrol, Swan Morton, Solarbo and Powermax who donated such wonderful prizes. The contest started at 11.30am in very windy weather which remained with us all day making good accurate combat almost impossible. The first round saw few surprises except four out of the six fliers using diesels (mainly Olivers) winning their bouts!

The second round saw most flyers settling down to the windy conditions and many more cuts were taken. The youngster Gregory took two good cuts against Edwards in a fast and furious bout to head into the quarter finals. Mick Tiernan however lost to G. Norfolk on ground time each flier taking one cut. Mick hastened to add that he was flying diesels (and under the influence of dinnertime alcohol). Paul Landels beat John Horton taking two cuts but having spent nearly two minutes on the ground due to the fact that his diesel would not start!

The quarter finals saw Malone and Willance through with no problems, a surprise however when Norfolk's diesel beat Spink's glows even after stalling into wind on several occasions. Landels and Heasman had a ding dong bout; Heasman coming out the victor two cuts to one with no flyer having ground time.

Trevor Heasman and Steve Malone became the finalists with their victories over Norfolk and Willance respectively. The first final saw both flyers into action from the start, both taking one cut each in a cut and thrust bout. However after a mid-air collision, Trevor's lines were snagged by Steve's first set and the centre Marshall awarded a re-fly. The re-fly saw Steve's model up first, Trevor's trailing by a few seconds. A great bout followed Steve taking two cuts to Trevor's one and with having only thirteen seconds ground time which included two model changes to win the first Renegade Combat Rally, the trophy, a £5 balsa voucher and a decanter of sherry.

RESULTS: 1. S. Malone. 2. T. Heasman. 3. Norfolk and Willance.

SOUTHEND DIESEL COMBAT RALLY

It looks as though the old style of Class 'A' Combat is making a comeback, as this event attracted no less than 17 entries, most people flying Oliver powered Titans or Vertigos of various shapes and sizes. A surprise for the Southend Club was the arrival on the scene of the Cosmo Club from Crayford, Kent, otherwise known as SLACK (South London Area Combat Kings), bringing with them none other than Peter Tribe. Other clubs in attendance were Chelmsford MAC and Feltham.

Flying started early in the day, due to the number of entries, and it was evident that the strong winds were taking just as many tolls on the models as the mid air collisions were. Two circles were run at the same time – ½'A' Combat in one and 'A' in the other. The ½'A' event attracted just as many entries and kept the organisers busy throughout the day.

'A' combat bouts worthy of mentioning were mostly in the 3rd round and semis. Vince Hawtree of Southend was eliminated when B. Wade's model chopped his tail, resulting in a tangled pile of wreckage after Vincent's model hit the deck. Alan Corbet of Southend put up a very good effort against Pete Tribe and it was the only time that Pete seemed to get just a little bit concerned, as his ground time was notching up after crashing his first model. Pete's pit crew were quick with the spare and he went on to win the bout.

One other memorable bout was the clash between Simon Putt of Southend and Dave Harrison of SLACK.

Here was a real beginner to combat flying drawn against an experienced FAI combat pilot and the flying skills displayed by *both* pilots were amazing. Simon just did not want to be beaten but in the end he just had to give in. Well done Simon – maybe next time!

Dave Clark of the new formed Chelmsford Club flying a KK Gazelle also did well to clinch a third place in the ½'A' Combat.

RESULTS: Slow 'A' Combat 1. P. Tribe (SLACK), 2. D. Harrison (SLACK), 3. R. Edwards (Feltham), 4. B. Wade (Chelmsford). **½'A' Combat** 1. P. Tribe (SLACK), 2. R. Herbert, 3. D. Clark (Chelmsford), 4. D. Harrison (SLACK).

PETERBOROUGH ½A RALLY

Having been blessed with a sunny day the competition was underway by 10.30am with a good turnout of 34 entries, including four women flyers who proved to many that they are no walk-over at this sport.

The safety aspect was well catered for with two roped off circles being used and helmets being compulsory.

Engines used varied considerably with PAWs, EDs, Frogs and MEs all being used. Needle guards seemed to be universal and the three best models appeared to be N. Gill's *Shadow*, M. Thorpe's *Tango* and M. Harrison's *Willy Willy*.

Round one began with some exceptional flying with a good bout between 1978 Nats champion Steve Turner and Marc Harrison 1977 Nats champion, Steve Turner emerging victorious. Another fair bout followed between B. Malton and Bob Rendall resulting in an impressive win for Rendall. Worthy of note is the bout between Helen Thorpe v Mick Page, well known free flight flier. Here the lady contingent showed its form with Helen beating Mick two cuts to nil, leaving three out of four women still going strong!

Round two saw Steve Turner winning by only a small margin suffering from motor trouble for the whole bout. Next, a real nail-biter between I. Jacobs and S. Stonelake resulting in a refly which Ian Jacobs marginally won. Then a husband/wife duel between Liz and Neil Gill resulting in a win for Neil (Phew!) Rob Rendall returning from the loser's round was drawn against M. Jarrett to produce an excellently matched bout with Rendall winning only after a hard fight. The rest of the round continued successfully with Mick Thorpe winning by an impressive three cuts, after a controversy over the number seen by the judges and his wife Helen also winning two cuts to one against P. Scatliffe (that got the lads worried!)

Now to the quarter finals and Steve Turner still with motor trouble but emerging victorious over I. Jacobs. The next bout was a real goodie between Neil Gill and Rob Rendall with Neil maintaining his superiority to win two cuts to nil. M. Thorpe again won comfortably although destroying his model, leaving him only one left, and the last bout saw the exit of his wife Helen to Marc Harrison by two cuts to one.

By the semis there were no lady fliers left but they had left their mark. Three of the four semi finalists were from Peterborough. The first bout matched this year's two Nats finalists Neil Gill and Steve Turner with Steve's motor now sorted out and performing well. A mid-air collision resulted, and Steve was through to the finals. The other semi was between Mick Thorpe and Marc Harrison with Mick sadly losing on ground time due to motor trouble.

The third and fourth flyoff was flown first with a really exciting duel between club mates Neil Gill and Mick Thorpe. Initial motor trouble was soon ironed out and then a mid-air collision occurred and Neil won on ground time.

Unfortunately as is often the case, the final was an anti-climax Marc Harrison having major motor problems, giving Steve the bout on ground time alone.

A Junior Comp was also flown for those 14 years old or younger and proved very successful with eight entries. Bouts were generally evenly but A. Mansfield proved to be generally a better pilot producing two convincing wins to reach the final. This was between Runacres and Mansfield and proved better than the senior final with good flying and near misses all through from which Andy Mansfield was victorious.

Prizes were many and varied and were as follows: Seniors 1st PAW1.49 and Trophy, 2nd PAW1.49, 3rd £5 cash voucher. Juniors 1st Minilord Kit, 2nd ½gall Diesel fuel. Thanks must go to Downham R/C Models and Oliver Carleys for the donation of the prizes.

Last but by no means least all our thanks must go to the ladies who between flying, fed us with 'hot-dogs', hamburgers, sandwiches, drinks and sweets which kept us all from collapse due to starvation. This was typical of the high standard of organisation by members of the Peterborough MFC which produced a most enjoyable event; watch that contest calendar for news of their next Rally.

RESULTS. Senior Comp. 1. St. Turner (Peterborough MFC), 2. M. Harrison (CATS), 3. N. Gill (Peterborough MFC), 4. M. Thorpe (Peterborough MFC). **Junior Comp.** 1. A. Mansfield (Peterborough MFC), 2. A. Runacres (Peterborough MFC), 3. S. Timperley (Grantham), 4. C. Morgan (Peterborough MFC).

SPEED
by Gordon Isles

AN APPROACH TO COMPETITION SPEED FLYING

Gordon Isles' sincere view of preparing oneself for serious competition.

Far too little attention has been given by modellers and the press to the ramifications of entering serious speed flying competition. There are, of course, many modellers who enter occasional competitions like the Nationals or a local rally for the fun of it, with little serious hope of success. These modellers (and there are thankfully many of them), fly for the pure fun of it and success is quite a secondary consideration. I am concerned with those who regard competitive aero modelling as a means to achieve a place on the winner's rostrum at national or international levels.

The impression has often been given that if you build a certain model and modify the engine in such and such a way, success is assured. Sadly, this is seldom the case because, important though the model and engine undoubtedly are, they become of secondary importance when compared to the physical and psychological characteristics of the modeller and his attitude which will decide his or her success.

Let me amplify. Consider the modeller who would like to compete in the 10cc speed class. Take myself as an example, I am 5ft 11in and weigh 9stone and am, therefore, very thin with a high centre of gravity.

The pull from a 16oz FAI model flying at 150mph can unbalance me, if my footwork, whilst coming out of the pylon is slightly out of phase. It needs little imagination to realise that a 10cc model weighing at least 40oz and flying in the region of 190mph and, therefore, pulling over 100lb, is (for me) a dangerous and unrealistic proposition.

One can, of course, point to several very successful 10cc flyers whose physique is not bull-like, Mike Billinton being an example. But they started when speeds were not higher than around 150mph and the pull was proportionately less. The intervening years have allowed them to build up a technique and building philosophy that takes their physique into account. Their experience allows them to build relatively light models, which are beyond the capability of the newcomer to the class. It is, of course, true that a newcomer to a competitive class is not going to achieve his full potential immediately and has, therefore, time to establish his own technique. However, if he perseveres, he will in time achieve even higher speeds than are attained at the present time, and it would be a pity to "run out of muscle" just at the moment of greatest success. I would suggest that this has indeed happened and that there are several flyers today who are competing in a class at or beyond their physical limit.

This shows in simple terms one aspect of the relationship between the physical characteristics of the modeller and the class of competition in which he ought to participate. Of even greater importance is the temperament of the competitor and his ability to accept adversity. It is in this area that self-analysis can make an important contribution to one's performance. It must be realised by all would-be champions that when they enter competition they will be competing against people who may have over ten years experience, in many cases over twice that amount. Techniques and equipment are becoming far more refined and complicated and the expertise necessary to obtain ultimate performance far more demanding. At the 1978 World Championships many of the speed model engines, pans and fuel systems looked identical, in fact many were identical. It was only the individual touch, impossible to measure, that separated the top speed flyers from the also rans. Most are men with over ten years' competitive experience. In fact it was once humorously said of one American world championship speed team that between them they had nearly 200 years' experience. Although a slight exaggeration, it does illustrate that would-be competitors should pace themselves in their ambitions and plan a competitive career that might span at least five to ten years.

. . . "several flyers today are competing in a class at or beyond their physical limit" . . .

. . . "of even greater importance is the temperament of the competitor and his ability to accept adversity" . . .

For a novice, this allows him time to learn his craft with a relatively inexpensive engine and then, when the basics have been assimilated, move on to more sophisticated equipment. There is little point in spending considerable sums of money obtaining, for example, a Rumpel tuned Rossi to put into the first speed model only to scatter it over an airfield after less than half a dozen laps because you have not yet learned how to build and fly a stable model. Even after my years' of experience, the first flight of any new model I build is an anxious moment and so a "hack" engine is used, but at least I have learned how to build a model correctly with the CG in the correct place and with the incidences of wing and tail accurately established and I have the confidence that it ought to fly all right. My first plea to our would-be competitor, therefore, is to pace yourself and give yourself time.

This is easier said than done. We all want success tomorrow, not in five years' time and to motivate oneself over such a period requires great enthusiasm, often in the face of many broken models. There will be many occasions when you will want to give up. In the first couple of years it will often take great strength of character to pick up the pieces, go home and rebuild your model for the next competition in a few weeks' time.

Willingness to dedicate oneself and devote whatever is necessary to assure ultimate success is only half the story. One aspect that is too often forgotten by most modellers when they decide to compete for top honours is that they are not only committing their own time to their hobby but also that of their family. Modelling is a time and thought consuming interest. A full competition season may require three new models a year. I remember only too clearly spending, for two or three week stretches, three nights a week till 3 o'clock in the morning in order to keep at least one model in flying condition. Initial tolerance for one's hobby can become something quite different after several years, particularly if due to the very dedication I am advocating, success should come your way. The temptation is to plan one's social life and particularly the summer holidays around the competition calendar. Money magically becomes available for a week-end contest where poverty had been pleaded over a new bedroom carpet.

The risk of introducing family tension is very real. Time is the important ingredient for success and an understanding family is a valuable asset.

One should never underestimate the importance of the attitude of the people surrounding you, be they parents or one's own family, since if they are in opposition to your ambitions it saps the very enthusiasm that is vital for long-term success.

Temperament is not a characteristic that on first appraisal appears to influence one's performance. Modelling is a very sporting hobby and winning and losing are usually accepted with equal good grace, after the initial disappointment has been overcome. Temperament pervades many aspects of the competition day. There are very few competitors who to some extent do not become "screwed up" before they are about to fly. The flow of adrenalin affects different people to a different extent. In itself the adrenalin flow is helpful, since it focuses our awareness, decreases reaction time and generally keys up to give us our best physical performance. But the same functions also have very undesirable side effects. It has been said that just before I am about to fly I could probably lap the circle at 150mph . . . on foot! Be that as it may, I am now aware that no matter how great or small the competition I become very keyed up and no matter how experienced I become, the same physical reactions set in. From experience I also know that whilst preparing to fly I am quite capable of overlooking very simple procedures like tightening a pan screw or putting a propellor on at the correct angle so that when the engine stops the propeller is not horizontal, or not checking whether the plug is glowing.

Nor am I alone in experiencing these tensions which can affect the flying; one very good example concerns the 1977 European Championships at Verviers. In the final round I decided that I would open my fuel needle one eighth of a turn and try to "pull" the engine to bring the engine on tune to the pipe. This didn't work, I did not go into the pylon, and on coming out of the circle, Dave Smith pointed out that I had not put the cross-bar on my handle and that if I had gone into the pylon, my arm could have been pulled straight through! That was a direct consequence of my nervous temperament (as well as lax line check area marshalling). We have all done similar things at one time or another and have simply called them bad preparation. I would suggest that that is over simplifying the situation, and prefer to call it the product of a nervous preparation.

I have evolved a system of preparation that does not eradicate the human errors, but helps to minimise them. Knowing that on a competition day my judgement may be fallible, my model is totally prepared several days before the competition in the peace, quiet and warmth of my own home, free of all competitive pressures. I stress the warmth since handling engine parts requires attention not always possible on a cold wet windy airfield. The model engine and pan are checked, cleaned and assembled and likewise all the equipment. Clothing for both wet and dry conditions and, if necessary, the maps, Passport and insurance cards, etc. are assembled and placed ready to put into the car so that I have the minimum of decisions to have to make on competition day. All I have to do when I arrive at the airfield is to roll out the lines, connect the handle and I am ready to fly.

There are one or two checks I have to make before entering the circle like needle and switch setting, but the object is to cut these to a minimum and leave me to concentrate on flying. Anyone can take off with a poor needle setting, particularly if no practice facilities are available. That is a miscalculation, however, if the engine does not start or runs erratically or for some reason you do not get off the ground, then that is bad preparation and provision should be made in your competition build up.

Gordon Isles at Woodvale discusses a feature of Jurgen Lenzen's World Championship winning flight. In the circle there is naturally rivalry between competitors, but outside the event the over-riding friendship and exchange of information characterises the true spirit of competition. Gordon was disappointed with his own performance, suffering from the effects of the poor weather. Nevertheless, he placed 8th overall as the top British Speed flyer, setting a new British record of 246.5km/h in the process.

. . . "one should never underestimate the importance of the people surrounding you" . . .

A catalogue of one's progress keeps a record of every flight, good or bad, tabulating the engine and propeller used, needle setting, weather prevailing and any other relevant factor. Most competitors do this and it enables one to see a pattern of performance. The most obvious information to emerge is the relative performance of propellers. Apparently identical propellers often perform quite differently and a record of the pitches, blade areas and diameters of each propeller used makes an interesting analysis. For FAI speed models (2.5cc) with their standard fuel, weather conditions can dramatically alter performance.

When not flying, watch the other competitors. There are some fliers who always fly well, Louis Bilat of Switzerland is one. I have never seen Louis fly badly, so an appraisal of his flying, height of pylon, stance, trim of model, is worth making. In a big competition it is sometimes possible to observe the early fliers running motors too rich or lean. This can be useful as an indicator to weather conditions and your own needle setting. The more information you have, the more informed your judgement. You should always make your own decisions and not be over ruled by others' views. You then have only yourself to blame. I have seen World Champions making mistakes like taking off into wind!

Try to attend as many of the European Internationals as possible, either as an observer or preferably a competitor. The top team race competitors have learned a great deal and have been quite successful whilst they have been competing abroad over the last few years. If we could persuade more British entries we would all learn more quickly and thereby raise the standard in the country. Working in isolation is far more difficult than working as a team and a glance at the top teams in the world will reveal the rewards of co-operation. The German team is, of course well known. What is perhaps not so well known is that the Bochum Club from which the German team is often drawn can always call on two or three other fliers of similar potential who fly together regularly. The French team at Woodvale gave an excellent example of what a group of dedicated fliers working together can achieve. There are, of course, several outstanding individuals on the Continent and in the USA, Australia, S. Africa and Canada, but they depend largely upon local facilities and some helpers. Chuck Schuette (USA) and Louis Bilat (SW) are excellent examples.

. . . "modelling is a time and thought consuming interest" . . .

What goals should one aim for? Many would just like to be World or European Champion, but, except for the top half dozen or so competitors, this is an unrealistic *immediate* aim. It comes back to planning a competition time scale. For a beginner, I would advocate consistency, obtaining a timed result at every competition entered, even if this is the slowest in his or her class. I would guarantee this will obtain several results above established fliers who do not succeed in putting in a flight.

Over the past few years I have set myself a speed target to achieve during the year. In 1977 it was 240km/hr and in 1978, 250km/hr. I was fortunate enough to achieve both these targets, though not always *when* I most wanted them. These performances were not good enough to make me a champion, though I was fortunate enough to win the European bronze medal in 1977. My experience to date does not merit a higher position and any future possible success will depend on whether I can continue to find the enthusiasm necessary to motivate myself to do the work necessary; that, and a little luck!

Is it all worth it, all the time, work, disappointment and problems that are part and parcel of a determined pursuit in whatever field, be it athletics, ice skating or modelling? You will have to ask those people fortunate enough to represent our country at the Polish World Championships in 1980. As they march through the streets behind a brass band, with thousands waving banners or see the awe with which they are watched by young children, then I think they will, like myself, answer "yes".

To achieve British Team status is no mean achievement, no matter what form of competition one chooses: to represent ones country is an honour that in itself brings its very own very real satisfaction. Only a fortunate few can hope to compete internationally at Olympic class sports. Age, and the necessity to complete academic studies or earn a living preclude them from most people. Other sports like motor racing, golf or tennis require financial backing. Modelling however is limited neither by age nor financial constraints and is a sport where sheer physical prowess is not a prerequisite. To those people with a competitive instinct it is an ideal sport and one that has made me personally friends all over the world.

To many people even now, modelling may seem a juvenile pastime, it is only to those who are aware of its technicalities that achievement is appreciated; and if you are ever fortunate enough to win a gold medal at an international competition and hear the acclaim of the world's finest competitors in your field as they chant your name, it is at that point that achievement and inner satisfaction is realized, nothing can take that away from you.

So is it worth it, yes, but it is a qualified 'yes'. The winners in 1980 will not simply win because of their engine or model or some technical innovation. They will win because of the years of work they have put in to enable them to have acquired their expertise, the disappointments they have overcome and the way in which they have observed and analysed their own as well as their model's performance. It is the individual who will win.

CARRIER EVENTS

by Derek Bird

A profile model class could be the answer to promote interest in the C/L Carrier Event, although this had been provisionally tried about two years ago for motors up to 3.5cc with not much interest shown. The Americans have found some time ago, that an introduction to the event could be through their Profile Class. This retained the same basic flying techniques and scoring, but models had to be profile and have a minimum wing area of 300 sq in which resulted in an inexpensive and easy to fly model which could be used over grass. Finish was to be in a Navy Colour scheme and motor size restricted to .36 plain bearing. This last requirement has meant a very narrow choice of motor and much argument so that the rules have been relaxed. To avoid this, why not make the motor size up to .40? (Large selection to choose from), and hopefully will make for more interest as it's entries we are looking for.

This approach seems to have found approval with other clubs, so that events to these rules will be run at Three Kings on April 16, Witham MAC on July 8, and at Norwich May 13th and others if interest warrants. This event is not intended to replace Scale Carrier but to provide a Class from which people might graduate to Scale and become a SMAE event in its own right.

Summary of Rules

1. Minimum wing area – 300sq in.
2. Max. motor size – .40.
3. Profile fuselage.
4. Silencer pressure or suction fuel systems.
5. Navy type colour scheme.

SMAE General Carrier Rules to apply. (For additional information see *Aeromodeller Annual 77—78* pages 90-109).

Anyone with comments or enquiries contact Derek Bird, 133 Engadine Street, Southfields SW18, London. 01–874 6394.

TOPICAL TWISTS

by Pylonius
illustrated by Sherry

"Do you sometimes get the feeling you're not wanted?"

H-ALL OFF

A well known modeller, recalling the model flying glories of the past, shocked his younger listeners with the revelation that, at one time, the Royal Albert Hall was available for indoor flying at a modest fee. It seems incredible in these bureaucratic, cost-conscious days, that people now alive could have lived in such a seemingly distant age when friendly indulgence of that sort could be shown to the humble hobbyist. But it was true. Far from suffering from our current objection syndrome the modeller of the Thirties had all doors open to him, even those that led on to the few airfields that were about in those days. Model flying, then, was considered to be anything but a public nuisance, being looked upon as a most edifying activity, much encouraged by educationists and civic bodies. It is true that they were a generation that had not been subjected to the full horror of the all plastic, ready to fly radio model – they only had the Depression and Hitler to put up with. Neither had they been acoustically sensitized. If you had asked them what a decibel was they would have thought it to have been some wild woman in the Bible.

What is so galling for the model flyer today is the wartime legacy of all those obsolete and obsolescent airfields he has been allowed to inherit so sparsely and grudgingly. Each weekend acres and acres of empty fields are rigorously debarred to the aeromodeller on grounds testifying to the inventiveness of the bureaucratic mind if not its tolerance, We now read of the movement losing yet another of these old airfields to which it has grimly clung over the years. It is not that the airfield has acquired some new, particular use, it is only that under certain conditions, albeit extremely remote, an aircraft might need to land on it, and to give some weighing of importance to this issue the free flighters are given the boot, even if the rabbit poachers and the local unofficial adventure playground movement continue to use it very much as before.

GROWING CONCERN

We have all heard of the expanding universe, of the world rushing off into space at a tremendous rate, but now we read of the expanding model, equally rushing off into space at a tremendous rate. What happens is that a smallish power model is sent haring up to a great height whereupon it magically sprouts an extra spread of wing to float it away to whatever glories await at the prizegiving table. This may be ingenious but the ingenuity may not stop at a mere unfolding of packaway wings. For instance, you could have the inflatable model. Up would go an even smaller model, even faster, but would have tucked away a pair of vinyl wings awaiting an inflatory charge of gas or air from some high pressure, miniscule cylinder. And things could be even more scientific, with an even tinier, faster model, carrying nothing more than a sachet of polystyrene pellets together with an activator. What would blossom forth would be a huge plastic blob of a glider, extremely light and highly disposable. By that time the engine, too, would be of plastic, and just as disposable as a one-off hypodermic syringe. Such an engine would be a great contest equaliser as the same standard power unit would be available to all. A model a flight would then become a reality, with all your needs for a day's flying carried in one smallish holdall. And with all those ghostly models floating over the countryside there would be a great boon in UFO spotting.

FIZZLING OUT

Fashions come and go. There has been, for instance, a marked falling off in skateboarding, and, at the same time, a return to power of the CO_2 engine, if engine is not too strong a term for a mere gassy dribble. It is not all that well known that models were being energised by sparklet bulbs way back in the Thirties. But only in the USA I hasten to add. We British were too down to earth in those days to take to such novelties, and, moreover, were you to be seen buying an excessive number of soda syphon bulbs it may have given rise to certain suspicions, and you could well have had a demonstration by the Temperance Society on your doorstep.

Just how long the CO_2 revival will last is a matter of speculation, but there are certain indications that it could soon fizzle out. Already the spark seems to have gone out of electric power which, not all that long ago, was being hailed as the greatest thing since the diesel. And when you look around at the way modern forms of energy are being utilised it would seem that people are winding up rubber motors and pulling up towlines more enthusiastically than ever in spite of all the enticing power pack ads. While the bungees are happily twanging on the flying field the engine power models are making 'angry residents' less apoplectic by decorating the ceiling of the local model shop. Even in the world of Scale where you would think an engine would be needed, it is an almost rubber power only situation, never mind if the models won't fly.

I suppose what people have come to realise is that when you go to the flying field you take along a most versatile and highly adaptable form of power pack – to wit, yourself. If say, you wish to lodge a radio model into the more active layers of air you do not need to fret away at starting a baulky, complaint-invoking engine, you merely have to grab the end of a bungee as you walk over to the launching point. And you can get no end of a lively performance from the minimal muscle power that goes into a few hundred turns on the rubber motor winder. Going even more back to nature you can apply your sinew power in a good old aboriginal fling of a chuck glider. Be warned, though, for we read of a zealot cracking a bone whilst indulging in such ballistic balletics. For one dreadful moment he thought the wings had gone or the fuselage snapped...

Come to think of it, it is quite a gesture – and splendid example – for the model flyer to turn his back on the use of the Earth's rapidly diminishing stock of fossil fuels. And who knows what upper protective layers may be destroyed by releasing CO_2 into the atmosphere. We could all turn green like the little men from outer space.

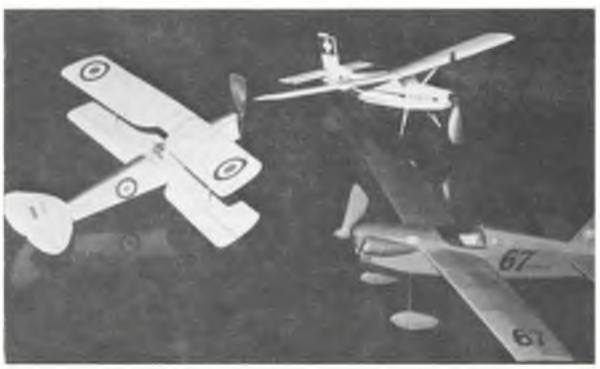
TOY & HOBBY FAIR NEWS

LONDON • NUREMBERG

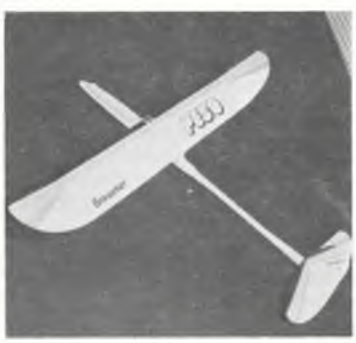
Veron introduced new model kits at the London Toy Fair including the 50in span DH Tiger Moth at left, designed for 3.5-6.5cc motors and three function radio control. Fine addition to their popular range of medium size R/C scale models and certain to be popular. Above: *Veron's Domino 46½in span A1 glider features super-simple construction and is eligible for SMAE Junior Kit contest.*

SIGNIFICANT CHANGE of emphasis to R/C model cars was the dominant feature of the 1979 Trade Fair at Nuremberg, also to a lesser degree at London's Earls Court. But Aeromodelling is not foresaken, albeit radio controlled in almost every form with hardly a new thing for free flight or control line. German manufacturers continue to develop simple gliders, while the UK leads with CO_2, but isn't it time – we wonder – for an enterprising kit company to use latest construction techniques with the new generation rubber to 'catch em young'. So many of today's experts cut their first balsa and made first successful flights with small rubber powered models (and still fly Peanut scale), yet apart from the old faithful designs which are thankfully still available, there's nothing new in the shape of a 30 inch one minute local park flyer.

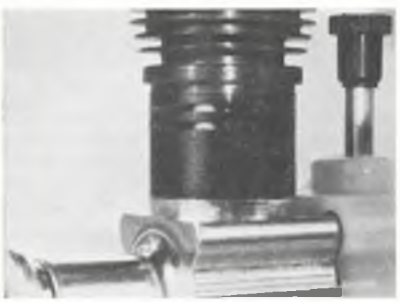
Sophisticated helicopters, quarter scale monsters, and all plastic jet fighters may suit the affluent but they don't do anything to encourage the younger generation.

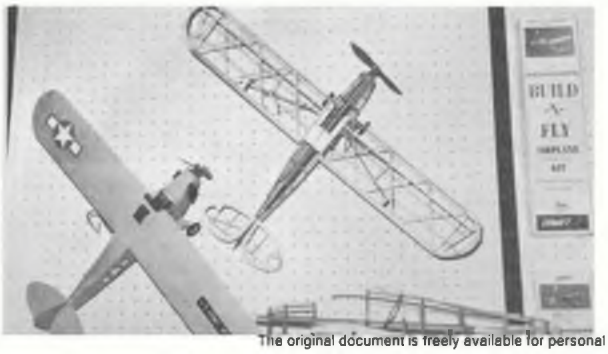


Above right: *seen at both London and Nuremberg, Humbrol's "Kompetitor", functional CO_2 model for Humbrol's new motor.* Above far right: *three from Humbrol's free flight rubber power series are Tiger Moth, Pilatus Porter and FI Racer — others are Fokker Eindecker, Piper Cub Cruiser and Aero Subaru. Neat and simple.*



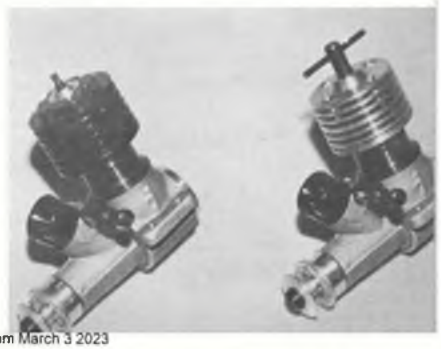
Right: *Graupner's latest introductions seen at Nuremberg included the 32in span Peso, simplest of tow-up gliders with plastic fuselage pod and super simple all-sheet wing.* Far right: *latest offering in Graupner's popular electro-power R/C glider theme is the 90½in span Ultra Fly which can be built as an R/C sailplane for two functional control, or with Graupner's electric power package.*





Above left: *Humbrol's soon-to-be-released CO_2 motor features integrally mounted gas reservoir.* Above: *at Nuremberg, Cox Hobbies showed this styroloam construction semi scale Piper Cub for .049 motors and two channel R/C.* Above right: *Cox .049 range of motors now incorporate flash fire surpressant exhaust porting.*

Left: *classic Comet range of rubber power free flight scalers like this Piper Cub are to be imported from USA by Impulse Toys and Trading Ltd. Range totals 58 models.* Right: *Italian Cipolla range of motors now enlarged with their 1.48cc 'Junior'. Seen here are Junior Competitor Glow and Junior Diesel — to be available through Micro-Mold.*



Peter Chinn's

latest Engine News

The Russian CSTKAM 2.5D, a 2.47cc diesel of interesting design that is better made than most Soviet production engines

A BETTER RUSSIAN DIESEL

Over the years, we have examined quite a large variety of Russian model engines and it has to be said that production motors from the Soviet Union (as distinct from their specialist-built engines used in contests) have, in general, been of rather poor quality. An exception was the KMD-2.5 Schnuerle scavenged diesel first produced in 1975 and described in the April 1976 *Latest Engine News*. This was a fairly complex, twin ball bearing design, featuring rear rotary drum valve induction and rather unusual construction. Of more conventional appearance and simpler design, but also exhibiting notably higher standards than earlier engines, is the CSTKAM 2.5D illustrated here.

Basically, the CSTKAM 2.5D is a plain bearing, shaft rotary valve, variable-compression diesel. It is built around a neatly produced diecast crankcase that includes not only the main bearing and intake boss, but also the full length cylinder jacket complete with machined fins. All fairly conventional. The interesting bit is the engine's drop-in hardened steel cylinder liner which, instead of having conventional ports fed from outer channels, or a fluted lower bore, features two very large parallelogram shaped transfer ports, fore and aft, plus a narrower, vertical slot, diametrically opposite a single exhaust port. The main transfer ports are angled to direct gas away from the exhaust port and the net result of this arrangement is to produce, in effect, a Schnuerle scavenging system. The piston is of cast iron, has a flat crown and is coupled to a machined alloy conrod by a 4mm gudgeon pin retained by wire circlips.

The counterbalanced crankshaft, hardened and ground all over, and running directly in the crankcase material, has a 10mm o.d. journal and a 5mm crankpin. It has a 6.9mm gas passage fed from a wide rectangular valve port that uncovers a very narrow parallel sided slot in the main bearing, which has the effect of prolonging the period that the valve is fully open. Mixture is drawn from a machined aluminium venturi insert with Cox type peripheral jets and a 4.1mm dia choke.

The CSTKAM 2.5D has the "standard" metric 2.5 engine bore and stroke of 15 x 14mm, giving a swept volume of 2.474cc or 0.1510cu in. It weighs a modest 146g or 5.15oz and is claimed to develop 0.34bhp at between 15,000 and 16,000rpm. So far as we are aware, it has not yet been offered for export to western countries.

VINTAGE ENTHUSIASM

Letters continue to be received asking for more space to be devoted to old engines. Many of these requests have arisen out of the "Silhouette" feature. Last month, it may be remembered, we published the names of eight readers who had correctly identified the very early machined-case type Mills 75 and the Kalper .32. However, as a result, seemingly of postal or transport delays during December and January, several more cards arrived after the press deadline and among these, were 100 per cent correct answers from J. B. Mayes of Bristol, Bill Newton of Urmston, Manchester and Maris Dislers of Brooklyn Park, South Australia. Bill Newton who, incidentally, is treasurer of the Urmston DMAC, even managed to quote the issue of *Model Aircraft* magazine (more than 20 years ago) in which photos of both these engines appeared and commented "Thanks for writing a great column in the *Aeromodeller:* the *'Silhouettes'* are a great idea, but let's have some *hard* ones please!"

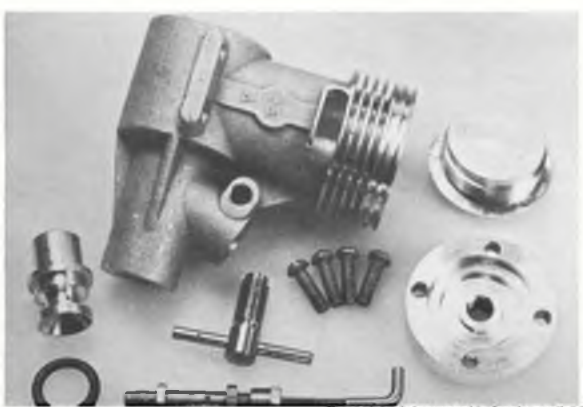
This is not the first time we have been told that the silhouettes are "too easy" so, this month, we have included one that only the most dedicated vintage engine enthusiasts and collectors are likely to be able to identify. Of course, it would be easy to pick a really obscure engine and photograph it at such an angle that its silhouette would be practically unrecognisable so, it should be emphatically stated that no such tricks are resorted to and that all the silhouettes included in this feature are of motors that were commercially available and, at some time, have been illustrated in the model magazines – albeit a long time ago in many cases.

READERS' LETTERS

I was wondering whether it would be possible for you to give me some of the formulae you use for diesel and glow fuels, as the formulae I have for diesel does not seem to get the utmost from the engine.

D. Smith, Liverpool.

Generally speaking, you are well advised to follow the recommendations given by the engine manufacturer in regard to fuels. However, if you do not have these, a good basic formula for most diesels consists of 30 percent castor-oil, 30 percent technical ether and 40 percent kerosene (ie ordinary paraffin), to which is added 2 percent iso-propyl-nitrate. For glowplug engines, there is an infinite variety of formulae to suit different types of engines and specific operating conditions and the subject is too extensive to be properly covered here. Our basic test mixture is 25 percent castor-oil, 5 percent nitromethane and 70 per cent methanol. With high quality, ball-bearing equipped



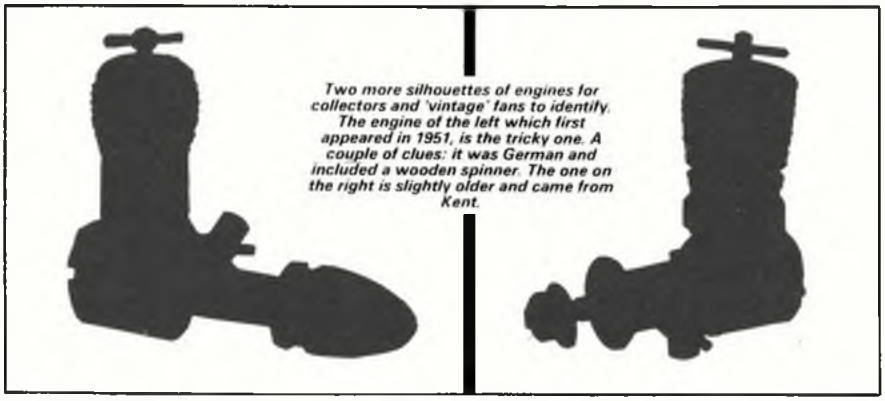
Most notable feature revealed by CSTKAM parts is its large parallelogram shaped angled transfer ports which give Schnuerle type gas flow. Other parts include neat diecast crankcase, ground all-over crankshaft finish and peripheral jet carburettor.

engines, the lubricant content can be reduced to 20 percent after running-in. With engines of under 2.5cc it can be helpful (for steadier running and more power) to increase the nitromethane content to 10–15 percent. For the American "Half-A" (.049cu in or 0.8cc) and smaller engines, the nitromethane content may be further increased to 15–25 percent. The use of these higher nitromethane percentages will generally increase the performance of all glowplug engines but, as nitromethane is very expensive (about 16 times the cost of methanol) it is not usual to employ more than 5 per cent for the larger engines because of high operational costs. The use of too much nitromethane in certain engines designed to run on low nitro (or "no-nitro") mixtures may produce no increase in power and may cause overheating. Again, let the manufacturer's recommendations be your guide.

I would be most grateful if you could clear up a mystery for me: the identity of the glow engine shown in the enclosed colour slides. The engine was given to me sometime between 1958 and 1960 (the summer of 1960 was the last time I indulged in modelling until last spring) but has never been run. There are no identifying marks anywhere on the engine. The owner of my local model shop, who has been building and selling models for more years than he cares to remember, does not recognise it but suggested that it is not home-built as the casting quality is too high.

After all these years absence from the modelling scene I have noticed many changes, some bad, some good. In the 1950s, my main interest was free-flight power and towline gliding. Unfortunately, in my area, there are no facilities for F/F but I have discovered the joys of slope soaring at Ivinghoe and a totally new interest is R/C power boating. In this last context, I must say how reliable glow engines have become. Wanting a 5cc engine for a boat, I bought an OS Max 30 — reluctantly at the time — but I am now delighted with its easy starting and high power output. How different from my last encounters with glow in the middle '50s: difficult starting and a new plug every other flight. However, the greatest change I have noticed is that radio control equipment is reliable and at a price the average modeller can afford.

D. Talbot, Buckingham.



Two more silhouettes of engines for collectors and 'vintage' fans to identify. The engine of the left which first appeared in 1951, is the tricky one. A couple of clues: it was German and included a wooden spinner. The one on the right is slightly older and came from Kent.

Nice to have a letter from someone who returns to the hobby after nearly twenty years and acknowledges the progress that the model industry has made.

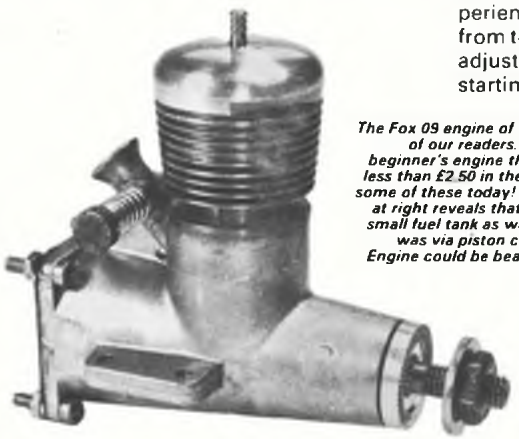
The engine that has been puzzling David Talbot is, in fact, a lesser-known Fox model, designed in 1958 and which came on the market early in the spring of 1959. Having a displacement of .098cu in, it was announced as the "Fox .09", but was also later advertised as the Fox "Rocket 09" identifying it with the other Fox low priced motors of the time, the Rocket 15 and Rocket 35. As our correspondent says, there was no maker's name or any other device to identify the engine as a Fox and it certainly bore little resemblance to any Fox engine made before or since. Add to this the fact that it appeared at a time when imported engines were decidedly less common than now, in the UK and, in any case, was in production for only a short time, and it is not surprising that, today, the Fox 09 is not too well remembered.

In some ways this is rather a pity as it had all the qualifications of an excellent motor for young beginners. We had one on test back in 1959. It was very easy to start and very safe to handle. The rear needle-valve position meant that inexperienced fingers were at a safe distance from the prop, when the engine was being adjusted while running, and its docile starting characteristics removed the risk of a cut finger when flicking the prop. It was also cheap to buy and included an integral fuel tank.

The general design and construction of the Fox 09 was quite unusual but can be easily understood from a glance at the photographs. (Incidentally, these, taken recently, are of the original test engine.) The most unusual feature is the design of the main casting which includes a rear fuel tank and inclined intake leading into the back of the cylinder. The engine is, in fact, of the piston-controlled induction type but, instead of using the traditional "3-port" layout, Fox employed twin opposed induction ports of generous area, fed from an annular chamber formed between the cylinder and the wall of the surrounding casting with its integral carburettor. This allowed the use of a reverse-flow scavenged cylinder, with twin internal transfer flutes and twin opposed exhaust ports. Other up-to-date features of the period included a screw-in machined head with integral glow filament and a hardened skirt steel piston, ball-jointed to a steel conrod.

The best prop for one of these engines is a 7 x 3 or 7 x 4, allowing it to rev in the 11,000-13,000 rpm range static. On test (using, incidentally, a 20 percent nitromethane mixture corresponding with the manufacturer's recommended Fox "Missile Mist" fuel) the maximum power output was reached at 14,000rpm, where a figure of just over 0.11bhp was recorded – not earth-shattering but quite acceptable for a lightweight 1.6cc beginner's engine.

The Fox 09 had a bore and stroke of 0.527 x 0.400in, giving a swept volume of .0982 cu in or 1.608cc.



The Fox 09 engine of 1959 referred to by one of our readers. A very easy to operate beginner's engine that could be bought for less than £2.50 in the UK. We could do with some of these today! Spread of components at right reveals that main casting included small fuel tank as well as crankcase. Intake was via piston controlled cylinder port. Engine could be beam or radially mounted.

Trade Topics

DIP-ER-DO paper stunt planes manufactured by Dipco Products, USA, distributed by Tyelite Ltd., Sunbury on Thames. A most remarkable novelty these little paper planes that fold flat for storage and spring into shape for flying to produce a curved aerofoil wing. Thrown by a wing tip, like a boomerang, with the inboard flap dropped they will fly round the room and return to the hand, or will perform loops or long glides with various adjustments. Supplied in packets of three, most entertaining.

Above: ***Dip-er-do Paper stunt planes fold flat for storage.*** Below ***F/F accessories from P. F. Davies from the left; 3 sizes of motor peg (1-2gm) bobbins small (.3gm), enlongated, medium (.7gm) and large (1.2gm), T bar (3gm), prop shaft bushes and washers, Montreal face plate, prop stop pin, snuffer tube, boom to tube junction (6gm) and end ring for rolled fuselage (1gm)***

CONTROL LINE ACCESSORIES available from Michael's Models. The heart of any CL model is its control system, and Michaels Models is importing some excellent bellcranks from Fox Manufacturing Co., USA, available in small (2 inch) and large (3 inch). These steel bellcranks are fitted with a bushed bearing; simply clamp the bush as tight as possible and the bellcrank remains free, a neat idea. For racing fans a new type of circular bellcrank complete with housing for use with internal leadouts in solid sheet wings. No need for ply plates, just epoxy housing into the wing and chamfer ends of leadout tubes to fit housing. Leadout wire passes round bellcrank groove 1½ times and is retained with brass tube crimped and soldered to fit in slot. Another item for racing fans a 1¼in diameter rubber wheel on an alloy hub, drilled with 5/32in axle hole. When it comes to connecting your model to the lines Fox C/L Connections are available in 3 sizes, small (½A, 1.5cc) medium (FAI, 2.5cc) and large (.35cu in upwards) in packs of four. Also in stock George Aldridge's 'MAGNUM' adjustable Control Line handle moulded in tough nylon in various colours, with 1/16in bowden cable and Knurled grip nut. For Combat flyers there are rubber pacififier fuel tanks with black rubber tubing and alloy tube for connection pieces and in 100cc syringes for filling the high pressure pacififier tanks. And now for the bad news, the 0.6oz per sq. yard glass cloth is no longer available; however the next best thing 1oz per yard cloth is still in stock.

FREE FLIGHT ACCESSORIES from P. F. Davies, a recently announced range of useful hardware. Nylon Bobbins for rubber motors, turned from nylon bar stock are some of the neatest we have seen, available in small (Coupe d'Hiver) elongaged or medium (Wakefield) and Large (Open). For the front of rubber motors on Wake's, a machined alloy Tee-Bar drilled with a 1/8in diameter hole to accept wire peg. Unique offerings, are the turned aluminium fittings for rolled balsa or glass fibre tube fuselages, consisting of motor tube to boom connector, front ends for the nose and Montreal type face plates to take nylon or brass bush. Other items include; aluminium rear pegs with spiggotted ends; Propeller shaft bushes in nylon or brass; DT snuffer tubes; prop stops and turned brass washers 14, 16 and 18 swg. Other goodies are in the pipeline for glider and power models and quotations are given for special one-off work for engines, VITs, Timer extensions, tow hooks, nose assemblies etc. on recept of accurate size requirements, inside and outside diameters etc.

Above: ***Peck Polymers Prairie Bird designed for the US Embryo Endurance rules, should fly well by virtue of light construction.*** Below: ***C/L goodies from the left; 100cc syringe, alum. tube, rubber tube and pacifiers for fuel tanks, circular bellcrank and housing, 1¼in racing wheel, bushed steel Fox bellcranks large and small, 1oz glass cloth, Aldridge Magnum handle with Fox C/L connections, small, medium and large.***

PRAIRIE BIRD, kitted by Peck-Polymers available from the Modellers Den. This model is designed to the new USA EMBRYO ENDURANCE rules for realistic small rubber powered models, not over 50sq in monoplanes or 70sq in biplanes (largest wing 45sq in) tails not to exceed 50% wing area surfaces to be tissue covered. Fuselage volume to enclose a space 1¼ x 1½ x 3in minimum fitted with a free wheeling prop and ¾in diameter wheels. Three flights from four attempts must ROG from a table top launch. Bonuses are given for extra details, windscreens 5 secs, wheel spats 3 secs, and dummy exhaust pipes 1 sec. Prairie Bird, the latest kit from Bob and Sandy Peck fits the Embryo event perfectly. Plan and instructions are clear and well presented, good selection of sheet and strip balsa although parts are not die-cut. Plastic propellers, wire nose plug, wheels etc. are all provided plus a length of 1/8in flat rubber and a sheet of orange tissue. All these add up to a super little model just the job for small field or one model club events. All the parts fit together well, although the optional wheel spats need some care, and some careful sanding or balasting of the propeller will improve the balance.

CLUB NEWS

AN UNEXPECTED PLEASURE during my visit to the Model Engineer Exhibition was the lecture given by leading Indoor model flyer, Reg Parham. For Reg, Indoor flying has been a lifelong interest, going back to the Thirties when microfilm models first put up durations measured in minutes rather than seconds. This small but flourishing branch of the hobby, in which thanks to people like Reg Parham and Laurie Barr, there has been a strong British interest, is now attracting more and more people to its gentle but exacting arts. Immediate competition involvement can be established with the production of a basic EZB type model, going on from local sports halls and gymnasiums, it is hoped, to the wonders of microfilm and the wide open spaces of the Cardington Airship hangar.

In spite of the smallness of the lecture room, Reg ably demonstrated the flyability of the historic line of models he brought along by way of illustration, indicating that any club interested in venturing into Indoor flying with all its unifying possibilities, would not need to look for a hall of tremendous dimensions.

But we come to the great outdoors for our first report, sent in by Reg Uden, PRO of that very energetic free flight group, the **Crookham Contest Modellers.** He informs us that the club has had another successful year with members placing 1st in 9 events, 2nd in 7 and 3rd in 8, a pretty formidable collection of laurels. Top performer was Gary Madelin, a name well known in contest circles. He also earned a second place in the European Championships. Unfortunately he is booked to go farther afield than Europe for the next two years; to Peru, in fact, to build a dam, using, we trust, something stronger than balsa. However, he is optimistic about carrying on his modelling pursuits, and has already despatched building boards and model boxes. The family concern of Pete and John Buskell, were also going great guns during 1978, with John winning the International Sweepette Trophy for indoor Hand Launched Glider, setting up a new British record of 78 seconds in the process. Dad, on his part, took first place in FIC Power at the Nationals. Another temporary absence from the local scene will be that of Bill Simms, who is off to University for several years, but hopes to fly whenever possible. Other items of interest are the club placing of 4th in the Plugge Cup, and the club gala, which was well worth the effort in spite of some appalling weather. *Sec: Fred Chilton, 4 Wynn Grove, Penn Road, Hazlemere, Bucks.*

It is a long way from Crookham in Berkshire to Hamilton in the Strathclyde area of Scotland, but the Free Flight flag is flying just as proudly there according to a report from Ron Sabey of the **Hamilton MFC.** The club also has a strong C/L interest for which there is a site allocated in the Strathclyde Country Park for Saturday morning use. The free flight site is on farmland. We are told the club operates a training scheme for newcomers, presumably for getting the hang of the handle. Monthly competitions are held with the emphasis on sport flying. Current Limbo record is a bare 9 inches,

Alan Beor, once again the winner of the 'Swansea Models and Hobbies Cup' with his Spitfire Mk IX fitted with retracting undercarriage.

and the model didn't go underground. The club has a good record of participation in Free Flight competition, and there are honours, too, in Control Line. Anyone interested in joining the club should contact the Secretary, *Ron Sabey, 53 Rederech Crescent, Hamilton. Tel: 429170.*

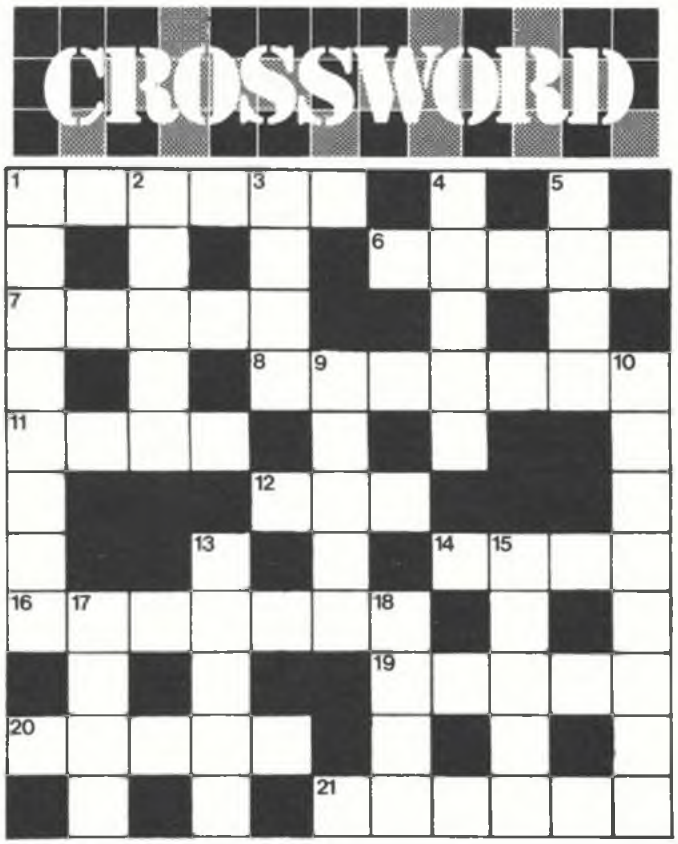
A. M. Vale, PRO of the **Swansea & D. Radio Control Club** allows us to jump to yet another country with his report. The club, which is 80 strong, has the use of a disused RAF aerodrome for power flying, even though it is Sundays only. But what adds charm to the southern Welsh coastal area are the many splendid cliff top soaring sites along the Gower peninsular. Cliff top sites are, of course, one way affairs in that the wind direction needs to be from the sea. A bonus here, though, for it seems the wind comes inland free of turbulence, flattering your model flying no end. The club believes in plenty of competition stimulus for its members, with events held throughout the summer. No one need feel out of it, for there are special contests for the beginners, and so that they might extend themselves as much as possible expert operators stand by to take over if a maneouvre looks like getting out of hand. This has resulted in a clean bill of health so far. Most popular comp is the annual 'Fly-for-Fun', which includes all the fun of the fair like bomb dropping, maximum loops, power and glide etc. There is an increasing interest in scale flying, with Alan Beor very much the man to watch, with his *Spitfire Mk IX.* The local jeweller is said to be getting tired of engraving his name on the Scale Trophy. *Sec: M. Banwell-Clode, 34 Muirfield Drive, Mayals, Swansea, West Glam.*

On the tasteful but impressively headed notepaper of the **Grantham & D MA Society** comes a press release on it's Annual

General Meeting. The extensive list of elected officials reminds us of the amount of organisation that goes into the large, modern club. *Sec: Mr N. Grantham, 115 Fifth Av., Alma Park, Grantham, Lincs.*

A letter from David Verlander, the Hon Secretary of the **Southend Radio Flying Club** also refers to his club's AGM, at which Doug Scott was elected Chairman, and although the committee remains very much as before it was not without some healthy opposition. Club fees have been maintained at the low level of £6 for adults and £3 for juniors, but an entry fee of £20 for adults and £10 for the 16 and 17 year olds has been introduced to bolster club funds for certain projects. One such is the erection of a hut, hopefully, on the club flying field at Two Tree Island, Leigh on Sea. Trouble is, the council will only give this site a temporary designation, though not, we hasten to add, because it disappears with the high tide. The public film show at the Cliffs Pavilion mentioned in these columns some months ago, was a great success, giving a £200 booster to club funds. Two more shows have been arranged for this year, and the one aeromodellers will be interested in is the Air Film spectacular on Tuesday, 5th June. The show starts at 8pm, with bookable seats at £1. Cheaper, though, for block bookings of ten or more. *David Verlander's address is 46 Dawlish Drive, Leigh-on-Sea, Essex SS9 1QX.*

Without doubt this month's most serious news comes in **Northern Area News**. It concerns a change in the status of the Elvington airfield. It is now a standby landing field, and, although a certain amount of Radio and CL is possible on a restricted site, Free Flight, unfortunately, is out. This is quite a blow to the Area as alternative venues are hard to come by. Driffield, the main standby, is heavily proscribed by army restrictions, and the situation altogether is not a happy one. A bit of nostalgia then for the many contest reports of events held at Elvington in the newsletter, particularly the Northern Rally, which attracted a number of top flyers from down south, who had the temerity to snaffle some of the trophies, notably members of the Biggles club, plus a Vintage win by Dave Hipper-



Members of the Stoke-on-Trent based R. J. Mitchell MAC, one club with a proud heritage, crowd round a 13 year old R/C model of a Fairey Flycatcher at one of their exhibition evenings.

son. On the subject of Vintage there seems to be some misunderstanding about the nature of Bob Wells Old Rule Wakefield event, which unfairly puts John O'Donnell in an opportunist light. This was not an event for vintage wakefields, although they were eligible, it was for Wakefields to the pre1953 rules, and John's adaptive approach was the sort of thing Bob intended, although a purpose built model would have been even more welcome.

'Bigger and Better' seems to have been the essence of the Chairman's report for 1978 for the **Leicester MAC.** Membership during the year had expanded to the astonishing figure of 210, of which 171 are seniors. Even the "only 118 SMAE members" represents quite a contribution to the Society. The club covers so much ground, organisationally as well as topographical, that experienced flyers from other clubs are being lured by its enticements. One snag though, there seems to be too much reliance on shaky Wymeswold for power flying, and the Chairman is anxious to see other sites become available. The silent flight situation is, apparently, very much better. The club programme for 1979 is already under way with the first (uncovered) stage of the Winter

CLUES ACROSS

1. Mustang king. (2, 4)
6. Soda siphon engine? (5)
7. Thermal. (5)
8. Jetex port ships hidden goods abroad. (7)
11. Air attack. (4)
12. Card expert? (3)
14. Sticker. (4)
16. Bronco stable. (7)
19. Mexican Piper? (5)
20. Impact makers? (5)
21. Core coverer. (6)

CLUES DOWN

1. Paint sprayer. (8)
2. So sir confused an engine. (5)
3. Uninteresting cylinder size. (4)
4. Kitter over on the Channel coast. (5)
5. Westland Scout loses fashionable element north of the border. (4)
9. Precise cutting tool by the sound of it. (5)
10. Quiet enforcer. (8)
13. Dwelling. (5)
15. Roundabout way to manufacture parts. (5)
17. Yugoslavian light plane. (4)
18. Skyway. (4)

Building Competition competed for by the time we go to press. Winter builders are advised to fit a beer can in the fuselage as an aid to silencing, although I cannot see the reason for this. Perhaps it is to reach those parts etc. We hear a lot about radio interference these days, but not all receivers are similarly affected, we are told. There are a lot of factors involve, but it seems worth while making a few discreet enquiries before buying that attractively priced radio equipment. *Sec: P. Toyne, 1 Sherrard Drive, Sileby, Loughborough, Leics.*

The **Three Kings Aeromodellers'** *Court Circular* which, as a sign of the stringent times in which we live, has lost its attractive cover and drastically slimmed it's content. Discussed in its reduced pages, is the sort of apathy that threatens to put a well-known newsletter out of circulation. It would seem that club members generally are reluctant – to put it mildly – to contribute to a newsletter in any way. This is bound up with a general indifference to club activities, social and otherwise, preferring to do their own thing on the rare occasions they visit the flying field. It is all to do with the lack of zest in this plasticized, handed-on-a-plate age. If only we could return the great spirit and ebullience of the Fifties. But let us not be too despondent, for we read in the newsletter of many a new building project to enliven the 1979 scene. There is talk of a *Cierva Autogyro,* and Dave Wood's re-furbished *Cessna 177* is about to have the covers removed. Then there is a rumour of a pair of *Piper Super Cruisers* from the Sextons, Mike and Bernie, and news too, of a couple of *Sopwith 1½ Strutters.* A word of warning, though: keep 'em on the lines, for there are stories in the newsletter about the way Citizen Band whackies have been shooting down Radio models in an accuracy and abundance that would do justice to a SAM missile battery. *Sec: Dave Woods, 133 Ravensbury Road, Southfields, London SW18 4RY.*

CAPTION CONTEST

The two items which struck me in the **Scottish Aeromodellers' Association** newsletter both concern Radio Control, showing just what the breed have to put up with. First, there is the insurance business, which most of us take for granted, but it can be fraught with all sorts of non-starters. And what encourages you to keep that insurance policy at the ready is the way models are being shot down through all the illicit transmitters which infest the modellers' wave band. Still, there is always Free Flight at Newbiggin, weather and the usual restrictions permitting. Talk here of F/F models flying in rain. But why do models fly so well in soggy skies? What with the weight of water, aerofoil sagging into the shape of a shopping bag, and the loss of all that water displaced air, it should reasonably be a non-flight every time. *Sec: J. E. Glen, 5 Brownhill View, Bonkle, Wishaw.*

Main news in the **South Bristol MAC** newsletter is of what has been happening Free Flight wise on the home patch. Club F/F champion was K. Penny who featured well in the glider contests. The 1979 calendar provides a club night special for every month of the year, including film shows, auctions and RTP flying. *Sec: Gordon May, 4 Burchells Ave, Kingswood, Bristol.*

Looking forward to receiving your reports, photos and newsletters for next month.

Clubman

CROSSWORD ANSWERS

ACROSS: 1. Al Rabe. **6.** Telco. **7.** Riser. **8.** Exports. **11.** Raid. **12.** Ace. **14.** Glue. **16.** Humbrol. **19.** Aztec (developed by Piper USA, as a five seater version of their Apache, introduced 1959). **20.** Evode. **21.** Veneer.
DOWN: 1. Air Brush. **5.** Rossi. **3.** Bore. **4.** Veron. **5.** Scot. **9.** Xacto. **10.** Silencer. **13.** Abode. **15.** Lathe. **17.** Utva (various models used by the Yugoslav Air Force). **18.** Lane.

It would appear that many of our readers have long memories or maybe they have been rummaging through their old back issues of *Aeromodeller*. Our mailbag this month has been full of information about the original photo, but first to recognise SMAE official Max Coote, of Ripmax fame, was Vic Dubery of Walton on Thames who wins a Plans Voucher. But Graham Pugh of Moreton-in-Marsh wins a year's subscription for his caption: "SAILING INTO THE BERMUDA TRIANGLE NOW SIR, NOTHING TO REPORT . . . OH!!" Notable near misses came from: P. Antrobus of Cheshire, "WHITEHALL 1212? TORA! TORA! TORA!" Phil Corfield, New Zealand "SURE GLAD I STUCK TO F/F FRED, THAT'S THE SECOND R/Cer HE'S SHOT DOWN TODAY", Martin Smith of Staines, "HELLO, YES THEY'VE JUST ABOUT DEFUSED IT", and Scale Matter columnist Alan Callaghan suggested "'ULLO GEORGE, SEND THE BILGE PUMP, 'E SAYS THE ENGINES FLOODED". The scene first appeared on the cover of Aeromodeller, October 1952 with D. Murcell assisted by Mr Rabbit, preparing their entry for the SMAE R/C Trophy at the British Nationals held at HMS Siskin where Naval personnel using walkie-talkie sets helped with model retrieving. Captions to our photo left, send to Aeromodeller, PO Box 35, Bridge Street, Hemel Hempstead, Herts. Another year's subscription awaits the winner, results July issue.

SHOP GUIDE

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1·5 m.m. SQ.

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TIPS 1·5 m.m. SHT.

2 SPARS 1·5 m.m SQ.

T.E. 10x1·5 m.m.

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F1

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1 m.m. PLY + 1·5 m.m. BALSA

·8 m.m. TOP SHEETING OMITED FOR CLARITY

WING DOWELS FROM COCKTAIL STICKS

TIP RIB

F1A

1·5 m.m.

F2

FIN OUTLINE

1·5 mm SQ.

CROSS BRACE 1·5 mm SHT.

U/C BRACE

BOTTOM ONLY

TYPICAL WING RIB

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TOP ONLY

1·5 mm CROSS BRACE

1·5 m.m SHT.

SLIGHT DOWN-THRUST

F2

F1A

1·5 m.m.

TAILPLANE POSITION

1·5 m.m. SQ

WINDOW LINE

1·5 m.m. OUTLINE

VERTICAL BRACE

CO_2 TANK [ENSURE TIGHT FIT]

TANK RETAINER

F3

1·5 m.m. SOFT SHT. SIDES

F4

1·5 m.m SQ OUTSIDE OF F4

1·5 m.m. SQ UPRIGHTS & CROSS PIECES

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1·5 mm LOWER COWL

1·5 mm SQ.

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