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# Aero modeller

JANUARY 1981

Editorial director **TONY DOWDESWELL**  
 Graphics **LORNA CULLEN**  
**MODEL DIVISION MAGAZINE**  
 Advertisement director **M. GRAY**  
 Managing Director **RON MOULTON**



## Comment

ARE WE ABOUT to see a movement towards simplification in competition modelling? We wonder!

Take Andrew Crisp's letter on page 15 of this edition for instance. Although it takes issue with one very specific shift in free-flight contest rules, the sentiment expressed is really a plea for simplification.

And it's not an isolated instance. Take Dave Clarkson's appreciation of the Good-year control line racing event at the 1980 Nationals in December edition 'From the Handle'. "More fun, less fear" is Dave's

summation of the move to 2.5cc diesel-only rules, with resultant near doubling of the entry list over the previous year.

Other branches of the modelling hobby seem to be experiencing this desire to 'simplify'. Club 20 pylon racing has been part of the radio control scene for some years, but this theme of simplicity has more recently been extended to Club 20 R/C Aerobatics and Scale. Then in December Radio Control Models & Electronics, the whole principle took a quantum jump into the R/C Car field with the introduction of Formula 8/20, a simplified, less expensive form of 1/8th scale R/C Car Racing.

In the same issue of RCM&E, radio control glider guiders were given a further per-

mutation of the movement for simplicity with Sean Bannister's presentation of a new two metre (78-in. span) Simple R/C glider formula, followed up in the current January edition with plans for a purpose-designed 2 metre R/C Glider design.

Is it all just coincidence, or is there a general movement towards a less sophisticated tone to modelling. Is the popularity of classes like Vintage, Peanut Scale, Electric R.T.P. (on again at this year's Model Engineer Exhibition) — and events like the Aeromodeller Scale and Vintage Rallies the positive proof staring us in the face?

If it means 'more fun' as Dave Clarkson puts it, we're definitely in favour — what do you think?

## Contents

Model & Allied Publications Ltd., 1980 ISSN 0001-9232

Volume 46 No 540

- 14 HANGAR DOOR
- 15 LETTERS
- 15 WHAT'S ON
- 16 WINGLET  
Novices' control line stunt trainer by Claus Maikis
- 18 MAKE YOUR OWN METAL CONTROL LINE TANKS  
The how-to approach by Charles Fritzell
- 21 NAVY CARRIER DECK FLYING  
Conclusion of Stan Perry's instructional feature
- 24 FLYING FLEA CO<sub>2</sub> SCALE  
Full-size construction plan feature by Robin James

- 28 SCALE MATTERS—by Alan Callaghan.
- 30 FROM THE HANDLE  
Control line Racing and Combat news
- 33 TOPICAL TWISTS  
Laugh with Pylonious
- 34 FREE-FLIGHT SCENE  
Technical and contest reports from Dave Hipperson and Bob Bailey
- 37 R/C SPORT FLYER
- 40 CLUB NEWS
- 42 AERO ACES  
Ian Barratt explains how to keep 'em flying with airframe repairs.



Page 16



Page 24

### On the Cover

Ace of the control line aerobatics circle Claus Maikis from West Germany, is the designer of WINGLET, our control stunt trainer, produced to give novice aeromodellers of all ages a tough, simple-to-fly aircraft with which to practice the control line aerobatic art. Full plans feature in this issue

### Next Month

Martin Simons begins a short series on Practical Aerodynamics which explains why models react the way they do. Look also for a feature on propeller carving for rubber models and plans for a 1/12th scale free-flight scale model of the Supermarine Sparrow parasol wing light aircraft.

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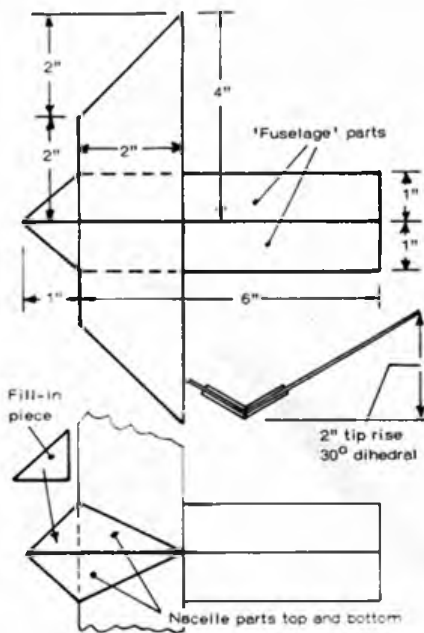
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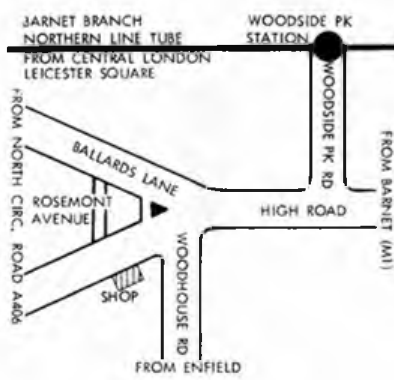
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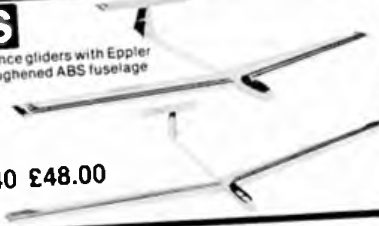
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# BUDGET GUIDE TO RADIO

NOW is definitely the time to BUY radio! The pound is strong and prices have never been lower. (They cannot do anything but go up in the near future!). But here you have to be careful. The here-today, gone-tomorrow cut-price imported radio (often with no real back-up service — it would not pay!) is simply a waste of your money. A complete radio outfit will be your biggest single cost with an R/C aircraft — so you want it to be an *investment*.

That means a *QUALITY* outfit — and just as a Nikon or a Hasselblad camera costs more than a lesser make, you can expect to pay more. But there are possibilities of substantial savings, which will be explained later. You also want guaranteed *PERFORMANCE* (with full servicing available in this country) — and above all *RELIABILITY*. That's very important with aircraft. With these qualities in mind, there is one brand name which rates right at the top of any modeller's shopping list:

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## RIPMAX FUTABA

from 2-channel for gliders to 4- or 5-channel for 'full house'. AND whichever L-Series Drycell Combo you buy, you can EASILY CONVERT IT TO ALL-NICAD WORKING YOURSELF at any time later (a complete Conversion kit costs £24).



Now here's another way of SAVING INITIAL COSTS with your future requirements in mind. Suppose you only need a 2-channel outfit for your present model. Your next models may need 3, or 4 — or even 5 if you are really ambitious! Does that mean you will have to buy a new outfit? Not at all. Decide on the Combo which will meet your anticipated needs for the future — and ONLY THE NUMBER OF SERVOS YOU ACTUALLY REQUIRE at the present time. A typical servo costs £11.00, so each servo you 'save' in this way reduces your INITIAL COSTS by £11.00.

Remember, too, L-Series Combos are part of the whole Ripmax-Futaba system and accept ANY M-Series Servos. That can be important when selecting the most suitable servos for a model which you want to fit with retracts, for instance. With certain servos, or for operating more than 3 servos, we would, however, recommend Nicad conversion.

Still want to cut costs to a minimum with your *first* venture into radio control? Then settle for a glider or power model with just elevator and rudder, and don't hesitate. BUY a 2-channel L-Series outfit (£44 complete with two servos). A QUALITY OUTFIT you can always use as a 'spare' later on. It will give you reliable service for years (and an excuse to build more 'quickie' radio models!).

Make friends with your local model shop. He can help you decide which Combos — and servos — are best for your requirements — and your pocket!



Set your sights on the Ripmax-Futaba M-Series Combos, if you can afford a little extra. The most proven Combos in the world. And all-Nicad working from the start ('though the '2' does have an all-drycell option). Choose from the Twin-stick and Steerwheel 2, or the deluxe transmitters in 3, 4- and 6-channel versions. Check these prices. ALL OUTSTANDING VALUE FOR MONEY. 2-ch. Combo £70.50; 3-ch. Combo £91.00, 4-ch. Combo £95.50; 6-ch. Combo £105.50. Combos the expert R/C modellers recommend — and use themselves.



The 4- and 6-channel M-Series Combos are also available in FM versions, with re-styled transmitters, professional type trim controls, etc. Combos with that EXTRA superiority in performance. Naturally they do cost a little more, but surprisingly little extra for the 'professional quality' they represent. Worth checking on if you are aiming for the top.



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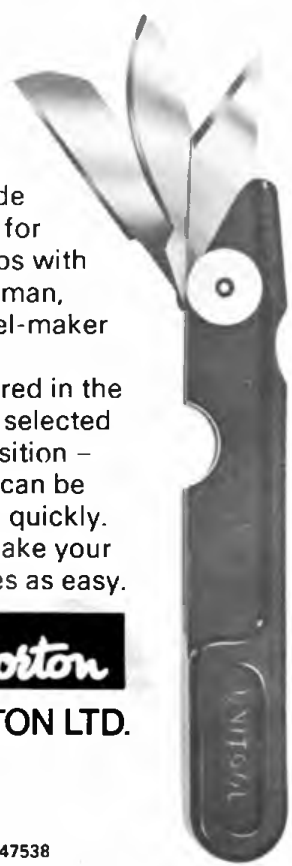
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## Rotorcraft Competition

The Royal Aeronautical Society Rotorcraft Section has announced details of their 1982 competition for Rotorcraft (Helicopter) duration. The aim of the contest is to produce a remotely controlled (model) rotorcraft capable of sustaining controlled flight over a 10m x 10m sq for maximum duration. The only restrictive specification is that the rotorcraft must not exceed a maximum take-off weight with fuel of 5 kgs. At present the world record for model helicopters stands at 3 hours 35 minutes and 6 seconds. Officials of the RAES Rotorcraft Committee believe that with research, this record could be trebled, maybe even quadrupled.

Backed by full size helicopter manufacturers, operators and the aircraft industry the Mini Rotorcraft Competition carries a first prize of £1,000 for the longest flight duration plus a secondary prize of £500 to be Rotorcraft judged to show the greatest ingenuity. The object of the exercise is clearly to evolve new techniques in model helicopter design leading to greater efficiency of rotors, controls and engine management. There are no restrictions on the use of commercial equipment, but it is obvious that a serious contender will have to apply considerable thought and research into rotor blade design, power/weight ratios and fuel consumption in order to achieve competitive success.

Who knows? The writer may well produce an extraordinary new development with subsequent industrial applications? For competition regulations, entry form and



details send to the Secretary (Mini Rotorcraft Competition), The Royal Aeronautical Society, 4 Hamilton Place, London W1V 0BQ.

## Socking it to 'em

On Tuesday October 28 approximately 1,000 children and teenagers were shown the extent of leisure and sports activities available in the Cardiff area, reports our R/C columnist Chris Pinchbeck.

This exhibition was instigated and arranged by South Wales Constabulary 'D' division in conjunction with the South Wales County Council's Area Community Tutor for the Gabalfa district, as a result of repeated complaints from the younger generation that they were bored with nothing to do. Local clubs and societies were asked to display their particular wares in an effort to persuade teenagers that their leisure time could be better spent. It was the first time that such an exhibition had taken place and our hobby was well represented by static and action displays from South Wales Radio Control Society, local car and boating clubs, and RW Radio Models.

BBC Television, Cardiff Broadcasting

Company and the South Wales Echo provided press and news coverage.

## 'Tuesday Call' for modellers

BBC Radio 4's regular 9 a.m. 'Tuesday Call' phone-in programme will have some special appeal on January 6 when Bob Symes-Schultzmann, creator of the successful BBC TV series 'Model World', will be in the radio studio when the 'Tuesday Call' subject will be models and model making.

To the best of our knowledge, it is the first time ever of a radio phone-in programme taking modelling as a theme and should be well worth listening to. If you feel like asking a question, be ready as soon as the Studio telephone lines are open.

## RTP at the Model Engineer Exhibition

Just in case you missed our announcement last month, Electric RTP flying is back again in force at this year's Model Engineer Exhibition.

RTP flying will take place in the central auditorium of the Wembley Conference Centre on Monday, Tuesday and Wednesday, January 5, 6, 7, 1981 from 11 a.m. to 7 p.m., and all will be most welcome to fly their models during these sessions. The

## Lost Friends

### Hefin Davies

For over 30 years the D-C engine range has influenced sport modelling in this country, and overseas. There can't be many who haven't ever used a Dart, Merlin, Spitfire or Sabre and moreover, fitted them in the D-C test stand or flown models using the D-C adjustable control handle. Now it is our sad duty to announce that the creator of these 'Quickstart' engines, Hefin Davies, is no longer with us. He died after a brief illness on November 14th, in the Isle of Man where his purpose built factory has made so many thousands of the popular engines. Hefin started at Barnoldswick, Colne, with the D-C 350 and his move to Douglas enabled him to establish an ideal plant, then supported by many Rolls Royce contracts. Much later, he sold off all the light engineering and used the proceeds to acquire the world's best in centreless grinding equipment. Improvement in manufacturing enabled him to make diesels which no longer required selective fitting

a process which had been the reason for the failure of many other factories around the world. Nowadays the 'Quickstart' range is unique, not only for its length of service to modelling but also as one of the few remaining sources of the sports diesel engine. It is a fitting monument to the man who has introduced so many thousands into powered model planes and boats. Our sympathies go out to Anne, and her two daughters in their loss.

### Monte Malherbe

South Africa lost one of her greatest characters during October when Monty Malherbe was killed in an air accident. Outspoken, a gifted organiser, campaigner, and innovator Monty was a control line pioneer and free flight enthusiast when we first met him. An unbridled enthusiasm to 'spread the word' led Monty into owning a shop — in fact a chain of 'Jix Hobbies' shops in S Africa's largest Cities. With the arrival of R/C, Monty became a lone campaigner, flying solo for his country as a one-man team. Then as team manager and eventually a World Championship organiser he brought South Africa to the forefront. Typical of Monty's enterprise was his arrangement for Bob Palmer and Howard Bonner to demonstrate their



Monte Malherbe seen during the 1971 World R/C Champs at Doylestown, U.S.A., where he managed the South African team.

skills during '57 in a tour of South Africa, with a stopover in London for flying at Woburn Abbey. The influence of those demo's advanced the state of the art by years in a matter of weeks. Monty will be sorely missed by his many friends around the world who join us in extending sympathy to Vicki and their son.

Left: South Wales Radio Control Society's show-and-tell display at Cardiff Leisure and Sport Exhibition presented by South West Constabulary Police. Right: 50th Model Engineer Exhibition at Wembley has received a better-than-ever entry in the model aircraft categories. Here are just some of the models expected at the Show.



Wembley auditorium stage is approximately 60ft by 60ft, but the maximum line length will be in the order of 20ft. We will be using Harry Butler type equipment as currently marketed by Messrs. Keil Kraft. MAP will provide a trophy for the best Junior and Senior scale model flown on each of these three days.

On January 8, 9 and 10, 1981 RTP flying

will also feature, but alternate with demonstrations of 1/12th scale R/C cars.

### Risky business

Anticipation of the 35 MHz frequency band for aircraft use has led to a situation where operators are in breach of condition 1 in the MAP accident protection plan. This

requires models to be flown in compliance 'with any statutory enactment or instrument, bye-law or regulation.'

Until the Home Office authorises use of other frequencies, operation is only permitted and insurable on the 27 MHz and 458-459 MHz bands. Insurers have already stated that illegal operators will prejudice the protection of cover for others.



Dear Sir,

I have just learned, by an extremely circuitous route, of the decision of the Free Flight Sub Committee of the SMAE to reduce the motor run allowed in Open Power Competition from ten to seven seconds in 1981. This, to my mind, is both logical and disastrous. Logical, because it brings it neatly in line with 1/2A and FAI International F1C classes which both have similar motor run times, disastrous because it would eliminate the beginner in free flight power flying.

As it stands now, the average modeller, who perhaps does not specialise in power flying, but likes the occasional dabble, can build a simple relatively inexpensive model, which, although not causing Messrs Screen and Smith and the like to lose any sleep, will make the three minute maximum of the current ten second run and stand a reasonable chance of catching a thermal in the fly-off.

With the proposed shorter run he will not have to build models equipped with flood-offs, brakes, VITs and flaps, not to mention the necessity of having at least a noisy hot 40 or hard to get Ross up front. Still I suppose this is 'progress', but it's hardly progressive if a rule change causes the number participating in the sport to decline, as I am sure will happen.

What is needed is a class with a less intense approach and a wider appeal to bring contest power flying back to the popularity that it enjoyed, say, 20 years ago, when numbers were on a par with glider entries. The answer is simple. Have a diesel only class with a ten second motor run, and ban all gadgetry other than motor squash off from a standard timer and the usual d/1. If the boys-with-big-ideas insist in using Nelsons or Bugles then they'll have a hard time trimming without auto rudders or variable incidence tailplanes!

Plenty of good designs exist like the 'Dixielander' and the 'Dream Weaver' which fly well in their own right and would make a good basis for personal development.

What do the fliers think? Why don't we give it a try in 1981?

Summertown, Oxford

Andrew Crisp



December 21, 1980

NE AREA SMAE INDOOR MEETING EZB, IHLG, SCALE 10am-3pm, Venue: Spennymoor Recreation Centre, Contact: Jeff Anderson, Tel Stokesley 711200 Venue A

December 26, 1980

CROYDON/CHOBHAM CHILLER A2 A1 1/2 coupe D'river, Venue B - Chobham Common, 10 a.m. start, Contact: Martin Dilly 01-777-5533

January 11, 1981

N.A. INDOOR MEETING 1 2gm EZB, IHLG, RUBBER, SCALE 10.30am-6pm, Venue: Colne Valley Leisure Centre, Slaithwaite, Nr. Huddersfield Contact: D Davitt Tel: 0532 675433 Venue C

January 18, 1981

"FALCONS" 70 WIGAN 70, HLG - 10am start Venue 3 Sisters Site, Contact: Russell Peers, Tel Crewe 60893, Venue D.

February 1, 1981

NE AREA SMAE INDOOR MEETING EZB, IHLG, SCALE, 10am-3pm, Venue: Spennymoor Recreation Centre, Contact: Jeff Anderson, Tel Stokesley 711200 Venue E

February 8, 1981

SOUTH EAST AREA INDOOR MEETING EZB, HLG, PEANUT, CO: OPEN SCALE RUBBER, Venue Crawley Leisure Centre 12.00-6.00pm Contact: J Dolding, 22 Loxwood Walk, Ifield, Crawley, Sussex RH11 0HY Venue F.

February 15, 1981

GRANTHAM & DIST MAS SCALE RTP CONTEST, Venue Smeley's Canteen, Spalding Contact: Gerry Gibbons, 11 Apeldorn Gardens, Spalding SAE Venue G.

March 1, 1981

NA INDOOR MEETING EZB, IHLG, SCALE 100-7.00pm, Venue: Colne Valley Leisure Centre, Slaithwaite, Nr. Huddersfield Contact: Bernard Hunt, Tel Huddersfield 862353 Venue H.



On MoD property, model aircraft may ONLY be flown by FULL SMAE members or contest entrants. All SMAE members (Associates and Juniors) and their families are welcome as spectators, and non members may be admitted by prior arrangement with contest director. For SMAE membership details Tel: 0533-58500.



# WINGLET

Here's an ideal tough control line stunter for novices by the maestro **CLAUS MAIKIS**

WHEN CLAPA ANNOUNCED its design competition, I wiped the latest framework off my table and started to draw that super design which should revolutionise model flying in general and aerobatics training in particular. The outcome was a small aeroplane with prime consideration on easy and fast construction.

In these plastic parts assembly times, building a complicated balsa framework can be quite frustrating for our modelling recruits. The design should feature as few parts as possible, parts easy to buy or to make, easy to assemble. No special materials, sizes or building methods are used. I even neglected elegant appearance and good flying characteristics. Almost any beginner model (with a built up wing) can do loops, so round manoeuvres were all that we required. When you are learning stunts, you are probably more concerned in completing a manoeuvre at least one foot above the ground, than in receiving a ten point score. I had a friend build the Winglet for his young son. He finds the airplane extremely stable, so the young pilot doesn't need all his concentration on flying level. So far he has managed some crashless flights with soft landings and even a few loops. That's what the airplane was intended for.

Construction of this model can be easily seen from the plan. Since also a pure beginner should be able to build the model, some helpful hints are given. Ribs are made by the sandwich method which includes all ribs. The three middle ribs will get a cutout for the bellcrank bearer. After joining the leading edge parts and rough shaping of the nose section, the wing is assembled using fast drying PVA glue. While it is drying, the

elevator is made and completed. Now the fuselage is assembled. I prefer polyester resin which is mixed with hardener so that it will cure in about five minutes. Since gluing areas of the side doublers are large, air drying glues will need many hours to set, more than my patience allows. The slot for the elevator is cut very carefully so that the elevator fits exactly horizontal. The wing is added to the fuselage first, using PVA glue. Instantly, it is secured with tooth-picks, which are glued with fast drying polyester or epoxy glue. This way you can continue construction without waiting. Again, check wing for right angle horizontally and vertically. Now add tail, fin, tail skid and undercarriage. This is fixed with

wire retainers, or easily sewed with a short piece of control line cable. At last the fuselage top is added. Now the control unit is made, installed, and checked for proper function, but then removed for finishing the airframe.

The whole model is sanded carefully. The fuselage gets a few coats of sanding sealer. Each coat is sanded with 320 paper. Choose your own method of covering, iron on coverings are quite adequate for this type of model (I don't want to make my elbow malady even worse). Paint the fuselage at least once with a fuel proof lacquer. After installing control units, engine, tank and wheels, check centre of gravity. If this is your first control line model, fix the push-

*Right everything where you can get at it! Simple motor and tank installation on profile fuselage of WINGLET makes servicing easiest possible. Note the muffler on the OS Max 15 motor - always use one*



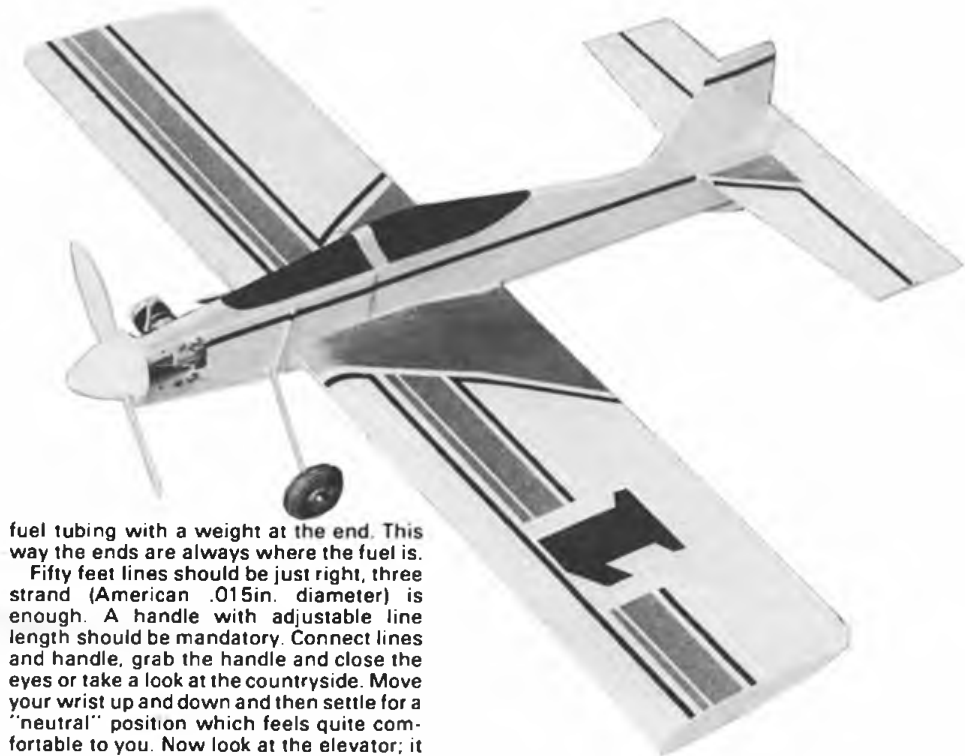
*Below worm's eye-view of WINGLET, ready for action. Note the control bellcrank mounted on the bottom of the wing - where you can get at it for adjustment.*





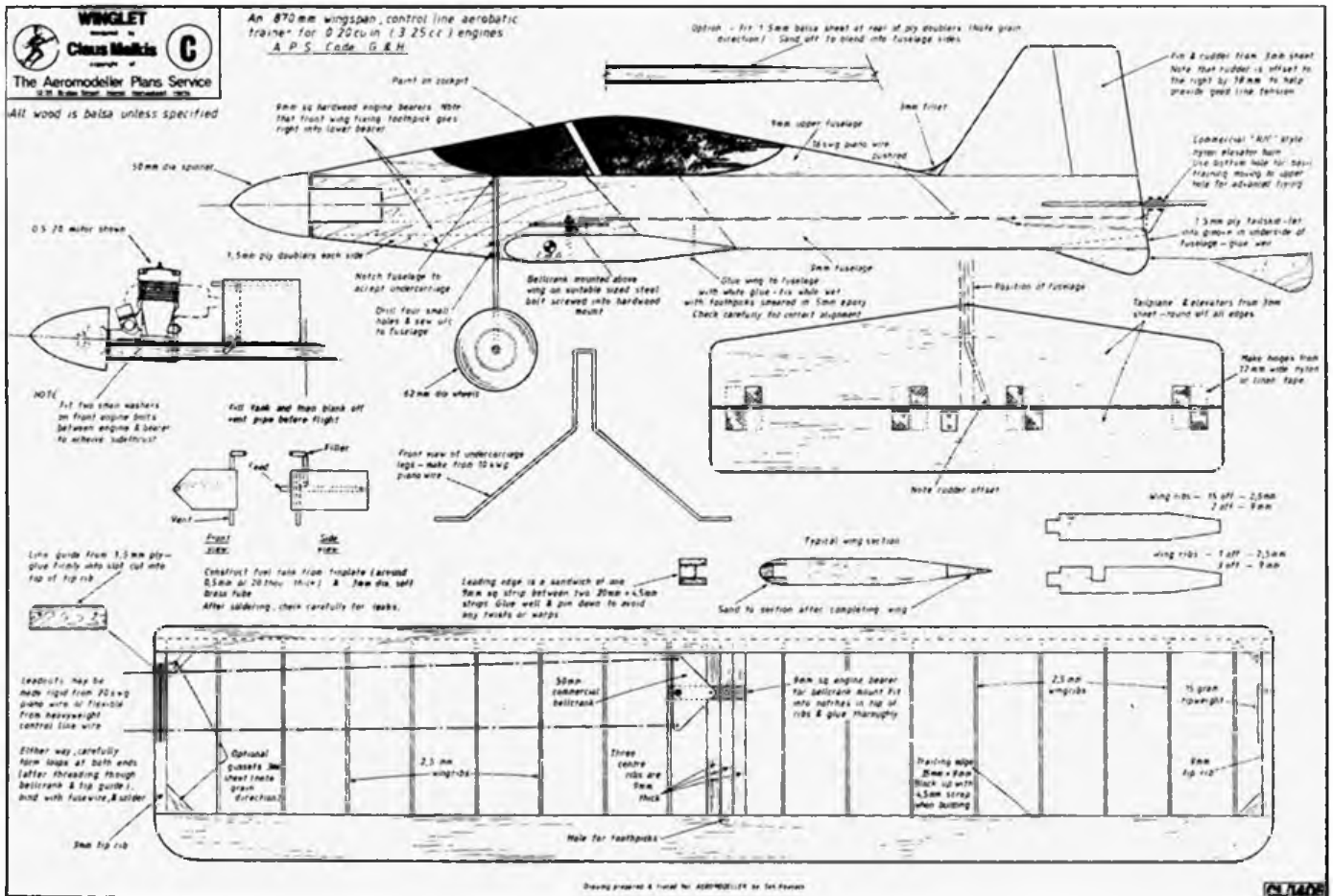
rod at the bottom hole of the elevator horn (longest moment arm). This will reduce the elevator movement, making for a very docile trainer. When you have got used to the model and/or want to try some manoeuvres, you need more elevator travel. Put the pushrod into a hole nearer to the middle of the horn.

As this craft is no lightweight, you will probably need a healthy engine. A sport 19 or 25 would be the best choice. Use an 8 x 6 plastic prop with not too narrow blades, or take a 9 x 6 prop and reduce the diameter. If you have problems with the engine run, it is usually the tank. While the 'uniflo' system is well known for a long time, manufacturers don't seem to have heard of that. The tank is the only 'special' tank item used with this airplane. Since bad engine runs can cost a model, this modification is highly recommended. Most commercial tanks have three vents the feed pipe, the refuelling pipe (which runs from outside top to inside bottom of the tank), and the overflow (from inside top to outside bottom). Remove the refuelling pipe. Bend an 1/8 in. diameter copper or brass tube according to sketches. This tube should end at medium height near the outboard side of the tank. The other end should be above and inwards of the tank walls. Location of the inner end is not very critical, but take your time and try to find correct location "in the darkness." After fuelling the tank, the overflow pipe MUST be sealed, otherwise the tank doesn't work. You will have the same setting from beginning to end of flight. It's possible to use RC plastic tanks too. The feed pipe and uniflo pipe is flexible



fuel tubing with a weight at the end. This way the ends are always where the fuel is. Fifty feet lines should be just right, three strand (American .015in. diameter) is enough. A handle with adjustable line length should be mandatory. Connect lines and handle, grab the handle and close the eyes or take a look at the countryside. Move your wrist up and down and then settle for a "neutral" position which feels quite comfortable to you. Now look at the elevator; it should be neutral too, otherwise adjust your handle. Don't forget all those necessary items which are needed for flying (as I usually do). If you have a short memory, make a check list. This might also include a camera — and a big bottle of glue.

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# METAL CONTROL-LINE TANKS

Charles Frizell tells how to make

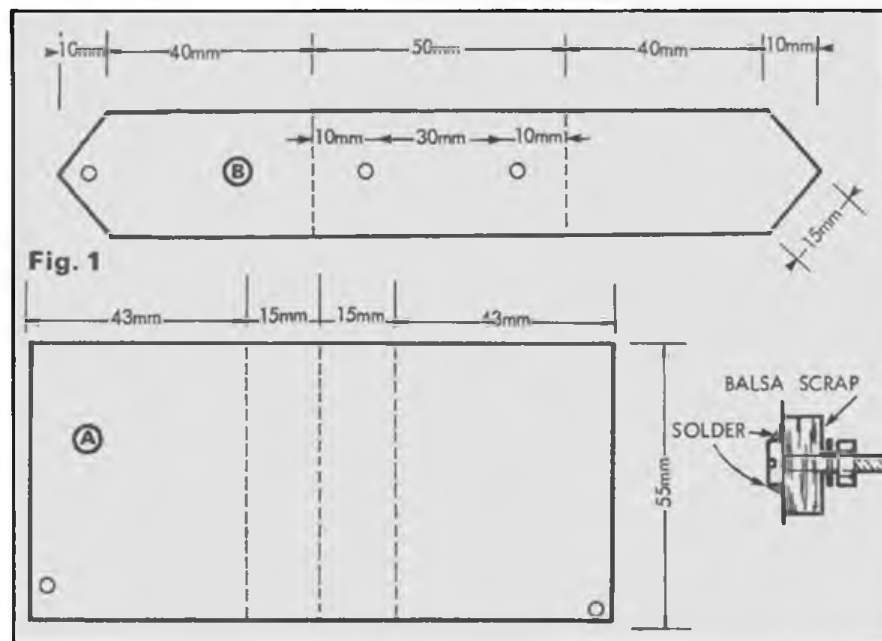
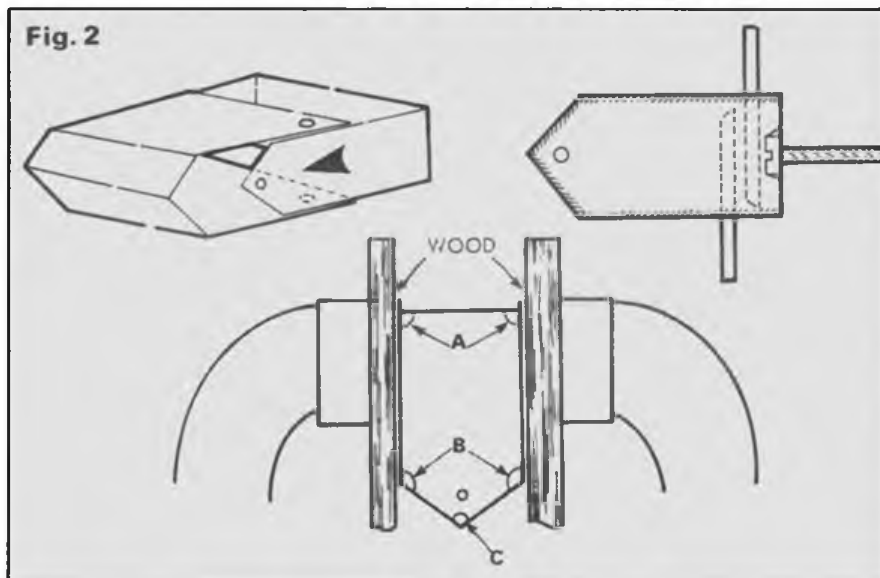
POSSIBLY YOU HAVE ALWAYS bought your tanks ... and tried to live with the problem of their not being *exactly* what you wanted, or, if you already make your own, you may find a few new ideas. Making one's own tanks is really a great deal easier than it appears, provided you have the correct tools and materials.

You will need the following items:

**Thin tinfoil.** I have found that empty gallon oil tins are among the best sources of this.

**Good solder.** The only really successful type is that sold for electrical work. This comes on a reel in various diameters and alloys. Rosin cored 1.5mm ( $\frac{1}{16}$ in) diameter 60-40 tin-lead is my favourite.

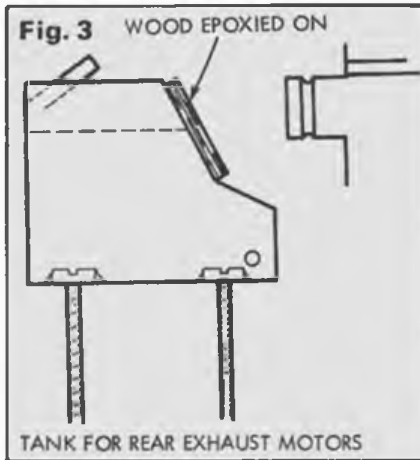
**For the fuel pipes** you will need copper tubing. One can get  $\frac{1}{8}$ in O.D. copper tubing from motor accessories shops, where it is sold for oil pressure gauge lines. This is so far superior to the normal thin walled brass tubing that I'm amazed never to have seen it on sale in model shops. It can be bent into acute angles with no fear of kinking.



**A good electrical soldering iron.** To try and use a naked flame is an extremely unrewarding business! I use a 'Weller' 60 watt temperature controlled iron, but any similar type will do. 60 watts is, however, about the smallest that you can use.

The first type of tank to be described will be a small type suitable for use on a profile aeroplane such as the 'Peacemaker'. Cut the two pieces of tinfoil as shown in Fig. 1. The exact dimensions will depend on your needs, but note that part A overlaps part B by about 2mm all the way around. Drill the holes for the fuel pipes and the mounting bolts now, and file the rough edges flat. This prevents metal particles floating around inside your finished tank. Now clean the paint off the metal using emery cloth. Be sure to get ALL the paint off, as the solder will not stick where paint remains, and you will have a leaky tank.

Bend the metal to shape in a vice. (Fig. 2). It is better to put the side which was painted inside, as the tin plated side will not only look better, but also won't rust. Put the two brass 4 BA bolts through their holes, with a piece of  $\frac{1}{8}$ in scrap balsa packing on the outside. Put washers on the then nuts, doing them up firmly. Solder the bolt heads

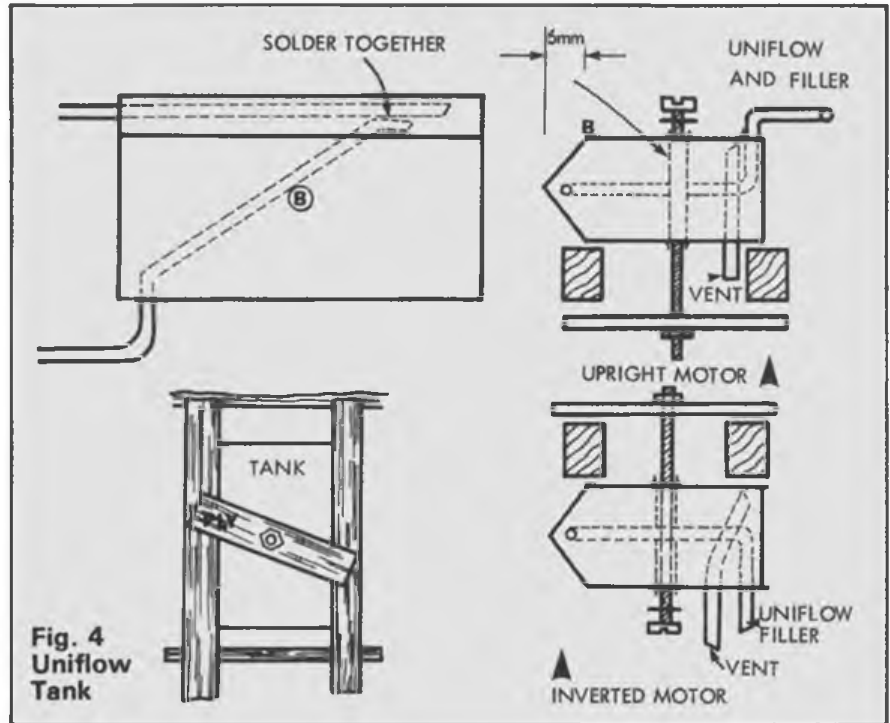


securely on the inside of the tank, making sure that the solder has flowed evenly, and that all parts are well wetted. Clean the flux residue off, using thinners or methylated spirits.

Now fit part A into part B. It may be necessary to trim the metal slightly in order to get a good fit all round. Clamp the parts lightly between the jaws of a vice, using wooden spacers either side. This is to prevent the heat from the soldering iron being dissipated into the vice. Spot solder the two parts together at the points marked A, B, and C. I also like to solder the end of the feed pipe to the outer shell. If you do this, it must of course be done first.

The seams are now soldered up while the tank is still in the vice. Next, the pipes are installed and soldered in. Don't forget to clean the copper tubing with emery or a file where it will be soldered. Also, cut the ends of the tubing at an angle and clean off any burrs. This enables you to push the tubing right in without any danger of blocking the end of the pipe.

To test your tank, connect the vent pipes to each other with fuel tubing. Connect another piece to the feed pipe, blocking the end with a 6BA or 3mm bolt. Hold the tank three or four inches below the surface of a basin of hot water for a minute or two, watching for bubbles. If any do appear, re-solder and then re-test. After testing fill the tank half full with thinners or fuel and



shake to dissolve all flux residue left inside. Drain the tank and then re-test, as the cleaning will remove any particles of flux which just *may* have been blocking a small hole.

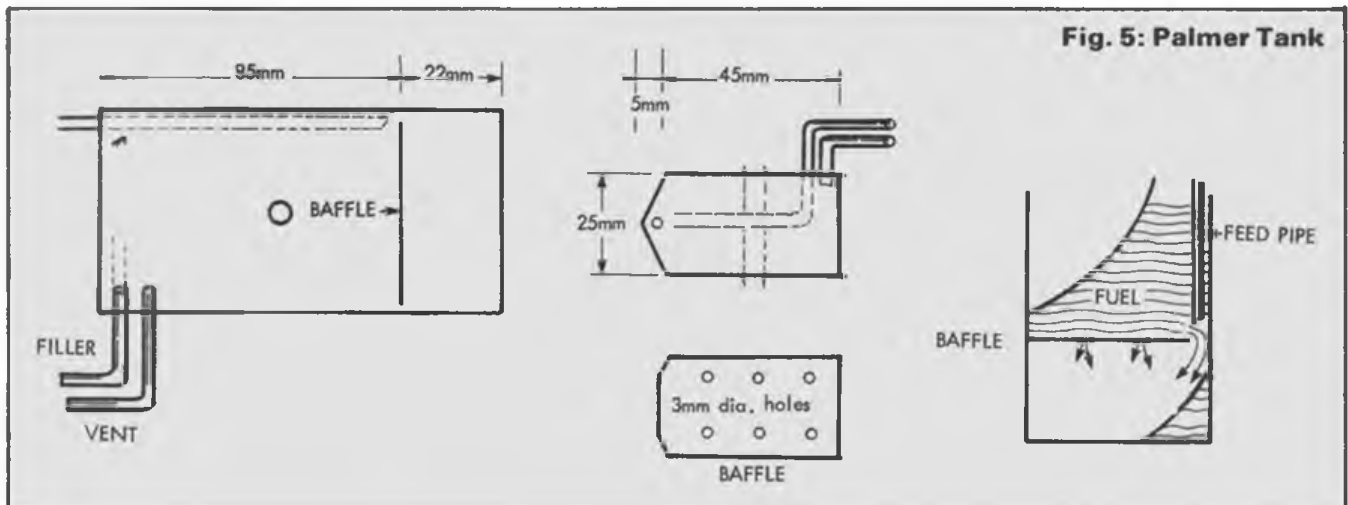
You now should have a tank which is both strong and easy to mount. I still have one of these in service which I made in 1962! For rear exhaust motors such as the Rossi, it's not difficult to make a special tank to fit behind the motor. Glue a piece of 1/8in balsa to the tank with epoxy where the exhaust impinges on the tank. (Fig. 3). It's not necessary to paint the wood, but I don't like the idea of superheated diesel fuel.

### Uniflow Tanks

The tank just described is 'just an ordinary tank'. In the uniflow system, there is only ONE vent open in flight. The end of this vent should terminate as near as possible to the

fuel feed pipe. This is to ensure that the fuel head remains more or less constant as the fuel is used up. The effective head is only the difference between the vent and feed pipe ends, giving a far more constant motor run. This system is shown in Fig. 4. The normal vent pipe is left open while filling, then closed with a short piece of blocked fuel tubing before starting the motor. Both the uniflow vent pipe and the feed pipe should be soldered to each other and the tank wall, to prevent their vibrating in flight.

Also shown is, in my opinion, the best method of mounting stunt tanks in a fuselage. A piece of brass tubing with an inside diameter of about 4mm (B) is soldered so that it passes right through the centre of the tank. A long 3mm bolt then passes through the tank and screws into a blind nut epoxied to the centre of a strip of 3mm plywood. This piece of ply is long



enough not to be able to rotate fully in the space above the bearers. To mount the tank, one merely rotates the screw so that the ply swings into place and is stopped from rotating further, then the screw is tightened as necessary. The inherent springiness of the ply gives a firm, vibration free mounting, with no fear of the bolt coming loose. With this method, one can change tanks in a matter of minutes. Also, one can move the tank laterally or fore and aft to get the best possible motor run.

### Palmer Tanks

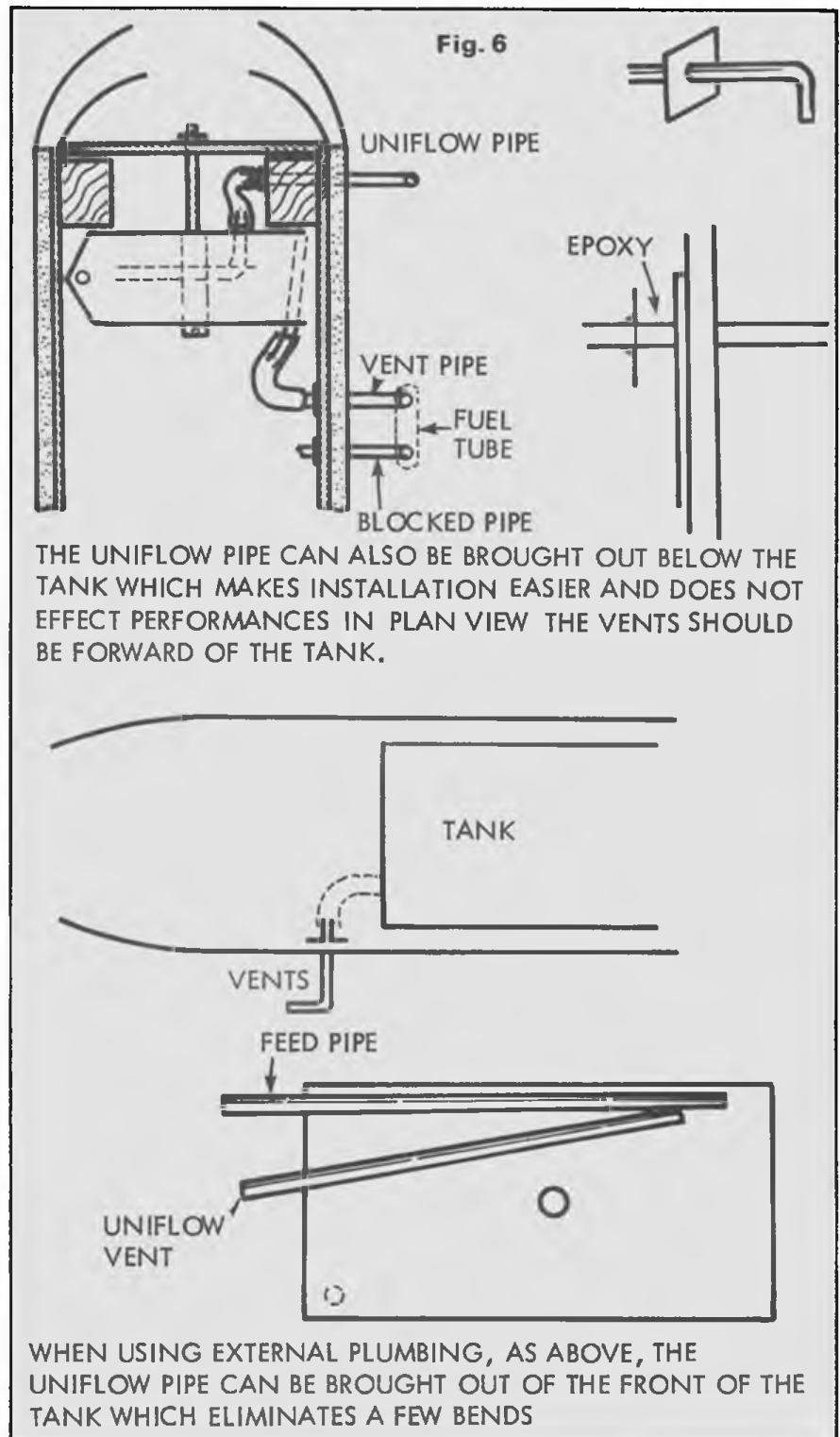
This system uses a baffle in the tank in order to *deliberately* alter the fuel head, and thus the motor speed. It was designed by Bob Palmer to achieve a 'two speed' motor run, the motor running rich in level flight then changing to lean in the manoeuvres. This tank is shown in Fig. 5. The fuel feed pipe finishes about  $\frac{1}{8}$  in in front of the baffle. The fuel feed pipe finishes about  $\frac{1}{8}$  in in front of the baffle. (*Aeromodeller*, January 1958, p29).

When the model accelerates, i.e., full 'up' or 'down' fuel rushes past the end of the baffle. The venturi effect causes a lower pressure at the end of the fuel pipe, which in turn means less fuel is sucked into the motor. This leaning out speeds the motor up to a fast two stroke. The position of the feed pipe with respect to the baffle can only really be determined by experiment ... another good reason for quickly detachable tanks. But don't forget that with this type of tank there is always some unused fuel left at the end of a flight. One can of course use the uniflow vent system with this type of tank, where it does work very well.

The 'plumbing' to and from the tank can sometimes create problems, especially if the tank is removable. A method which I use is shown in Fig. 6. Short lengths of copper pipe (about 25-30mm long) are soldered through a small square of tin, about 10mm from one end. These short lengths of pipe are pushed through holes drilled in the side of the fuselage. Smear epoxy on the pipe and the tinplate, which will give a fuelproof seal when the pipe is in place. The external part of the pipe can be bent forwards at right angles, so that the open end faces into the airstream. An extra tube, which has been sealed closed with solder can be used with uniflow tanks. The vent pipe is connected to the blind pipe by a short 'U' of fuel tubing. The plumbing to and from the tank internally is done with black fuel tubing.

### Pressure Tanks

These are built in pretty much the same way as any ordinary tank, but take special care to eliminate ALL leaks. Not only will the tank not function correctly if there are leaks, but fuel will literally spray out of any crack. The pressure in the tank when using direct crankcase pressure is surprisingly high, and most tanks tend to swell from this pressure. It is therefore a good idea to use a central tube through the tank to stiffen it. With pressure systems it is vitally important that the pressure feed pipe is at all times above the level of the fuel ... otherwise raw fuel is forced back down the pipe and into the motor if it stops before the fuel is finished. Some use a small chamber on the top of the tank into which the pressure line feeds. Some sort of non-return valve would be a good idea, but I



have yet to see one commercially available.

As a last word, don't be tempted to make your tanks from very thin or weak material such as brass shimstock. This will only lead to problems as the tank walls move with the motor vibration and the joints eventually crack. Also, it can lead to bad fuel frothing problems. I remember John Dixon showing

me some photographs when I was in U.K. in '75. These were of the fuel in a transparent 'speed' tank under various levels of vibration. In many of the pictures the tank was full of nothing but froth! Some sort of resilient mount may thus be a good idea, though I have not found it necessary on a normal stunt plane.

# The late Stan Perry outlines the technique of this specialist but fascinating control line class



# NAVY CARRIER FLYING

## Part 2 — Conclusion

### Flying

The following covers two aspects, general considerations and discussion of special techniques, the general considerations being as follows:

#### GENERAL CONSIDERATIONS

(a) A competition flight consists of a high speed run followed by a low speed run, with an approach and landing on the carrier. The model must not be in contact with the ground (representing the sea) at any stage of the flight. There are five typical stages when the hazard of landing in the 'sea' is highest:

- (i) Immediately after T.O. when the model may drop as it leaves the deck,
  - (ii) Engine cut-out at any point other than when within gliding reach of the deck,
  - (iii) Near-stall occurring during low speed flight,
  - (iv) During the approach to the landing by touching down just before reaching the deck, and
  - (v) On an overshoot following a missed hook-up.
- (b) The flight is an attempt when released for take-off but is not official until the signal for commencement of the low speed run is made. This means that the whole of the high speed run is in the attempt sequence and thus allows an abort should the high speed run be not satisfactory, right up to the stage of setting the model into the low speed stage.
- (c) Maximum height of 20ft., during timed runs, with timing starting and finishing at the stern of the carrier, except for take-off when it is the release of the model.
- (d) Whipping not allowed, as for Team Racing practice.
- (e) Give clear signals to the carrier controller.
- (f) Approach penalties of 5 marks off for every missed approach are commenced after the first full lap after signalling the landing phase.

#### SPECIAL FLYING TECHNIQUES

Some of these are not so special, just common sense within the framework of the rules. They range from simple tips to some analytical considerations.

##### (a) POSITIONING THE MODEL

Always adjust the pilot's mat to suit your own flying stance, do not assume that the previous pilots' position will suit you. Check the mat

position at two stations, one, the most important, with the model in the middle of the landing wires area, and then at the opposite end of the deck to cover the take-off run.

##### (b) TAKING-OFF

The semi-instinctive tendency to commence take-off with full up elevator should be deliberately resisted as this can result in too low an acceleration to take-off within the deck length, with the resultant sagging off the deck into the 'sea' before flying speed has been generated. It can also lead to a wing-over directly from take-off with the usually, resultant crash. Take-off with level elevators for the best chance, remembering that the deck is very smooth and offers a minimum of rolling resistance so there is little tendency to peck the propeller into the deck. A further tip is to avoid the instinct to haul the model off the deck as this usually ends up by pulling the model over the inside edge of the deck, with the resulting crash. If the model will not get off the deck within the length available, it is not adequate for this kind of flying.

##### (c) THE HIGH SPEED RUN

Many models do not achieve their full potential in the high speed run. The most prevalent reason is that motors lean out in the take-off surge and the resultant first one or two laps are then comparatively slow. Further, heavy models can take 10 or 11 laps to build up their top speed but only the first seven are timed so keeping the model light and ensuring that the motor operates at peak power all the time at full throttle pays dividends.

Immediately after take-off, the model should be flown with the hands close to the chest, this avoids possible whipping accusations, and further, unlike Team Racing, the pilot can pivot during flying thus keeping the circle radius to the minimum. It is also advisable to take a few paces away from the carrier immediately after T.O. so that in the event of an engine-cut there is no fear of hitting the carrier on the landing run. Fly as high as the rules permit i.e. at just under 20ft., as a further aid to reducing the flight circle diameter. It can be shown that flying as high as the rules permit can result in a more than 3% increase in timed speed, this translated into a typical high & low speed model could mean 4 extra points in the speed differential and this nearly compensates for one missed approach.

##### (d) THE LOW SPEED RUN

For the low speed runs the pilot should make sure that he has



Left with flaps and arrestor hook deployed. Alan Fritz's Fairey Barracuda. Note tuned pipe to K&B 40 motor. Below. Profile Scale models are popular for Carrier Deck event. Seen here top to bottom are Grumman Bearcat, Douglas Dauntless, Short Seamew and Hawker Sea Fury.

settled the model into a stable flying pattern as this part of the flight can contain certain flying difficulties, especially in gusty weather. Remember that the flight is not official until the low speed run has been signalled, so within the limits of fuel capacity of the model there is time to settle down into the low speed flight pattern. This also applies if the configuration of the model has been changed ie. flaps and hook lowered by application of down elevator, as this manoeuvre of course has firstly, fairly violently interrupted the flight path, and when the change is completed, a changed attitude of model is usually involved. Take full advantage of the 6ft., pilots circle by walking around the inside edge with the flying arm at full stretch to increase the flying circle diameter as much as possible, and fly at the lowest height allowed by the rules. All this can give more than a 5% reduction in recorded low speed worth another few points. Altogether flying both the low and high speed runs to best advantage can show an increase of up to 10 points in the speed differential phase of the flight, well worth having.

The Bilston Club carrier fliers have developed a low speed technique whereby an undulating flight path is flown between the allowable high and low height limits, and, although this produces an inelegant flight path, can be theoretically shown as capable of producing a reduction of recorded low speed of as much as 10%. The flight path should show, as a practical limit, one maximum height and one minimum height per lap, usually with the high point into wind, and the low at the down-wind side. Once again, this for a typical model, allied with the optimum high speed pattern, can result in a useful extra 16 points or so in the speed differential phase compared with flying the least optimum pattern throughout.

#### (e) THE APPROACH AND LANDING

Here, it is important to remember that every missed approach, after signalling the landing phase, loses 5 points, and its is no use executing a perfect landing on the 21st approach as the penalties cancel out the landing points. Therefore take time to settle down to the landing phase, even to the extent of carrying out a couple of dummy approaches before signalling the commitment to landing. It is important that the pilot makes sure that he has positioned himself on the pilots mat; a perfect approach and flare-out 8ft., to one side of the carrier contains no profit, especially if the model goes outside the carrier and the control lines foul the island. Two kinds of landing approaches are practised, these being the 'CREEPER' and the 'SUDDEN DEATH' types and there is justification for each kind.

The 'CREEPER' is the technique of flying around the circle at low speed at or slightly above the height of the carrier deck such that the dangling arrestor hook will pick up the wires achieve the desired arrested landing. In passing it is worthy of note that the SMAE carrier deck rules do not require an arrested landing to qualify for marks, but only a landing on the deck. The creeper technique works but it is a good model that will fly steadily at slow speed 14 or 15 inches above the ground. Furthermore, very good judgement is required to get the height correct before seeing the carrier as a height reference. The normal human reaction time and angle of lateral vision is such that there is only about 2 seconds advance direct sight of the carrier before landing, and this is a very short time in which to adjust the height of the model accurately. Experience shows that most pilots chicken-out on the height at the last second and increase height just enough to completely miss the wires.

This is usually followed by a grim determination not to chicken-out the next time and then proceed to fly the model into the end of the deck, usually resulting in damage to the model and a bounce over the

wires, thus still no pointsworthy landing is achieved.

The "SUDDEN DEATH" arrival technique is quite different. For this, the lap preceeding the landing is flown at slow speed at about 10 to 15 feet up and when the carrier is sighted, the model is deliberately aimed down at the stern of the carrier. Just before impact, considerable up elevator is applied and usually the model will assume the landing attitude as it arrives amongst the arrestor wires. Obviously sturdy undercarriages are needed for this but a much less precise adjustment of flight path is required in the last 2 seconds of the approach. By and large, the sudden death technique seems to achieve more successful arrested landings than does the creeper approach.

One last point, do not pull back on the control lines at the point of touch-down as this will almost invariably drag the model over the inside edge of the carrier. Once the model is into the wires, it must be allowed to find its own path down the deck to a halt. Remember that the landing is marked according to the final stationary position, not on the quality of the arrival into the arrestor wires.

### The SMAE Competition Rules

It should be observed that the published rules do not require that a landing must be made on the carrier, and in fact under rule 16.4, a model which has a very wide speed range capability can achieve sufficient points, together with scale points, and without even attempting a landing, rack up a higher score than a model of lesser speed range which achieves a genuine arrested landing after several missed approaches. It has however been interpreted throughout HMS Flycatcher usage that any flight including an arrested landing shall rate higher than any not achieving a landing on the deck regardless of the points scored, and all competitors to date have accepted this.

### Summing Up

This form of competition flying is very challenging and, despite the apparently damaging usage, the models survive quite well. The magic ton-up high speed combined with a score of 500 plus has not yet been achieved in one flight but each has been achieved individually. Suitable plans for proven models are available and armed with average flying skill together with the techniques given here a new competitor can achieve good results very quickly.

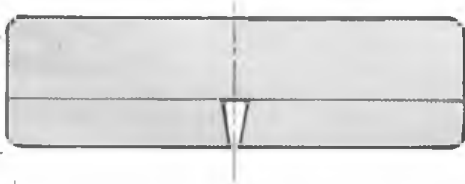
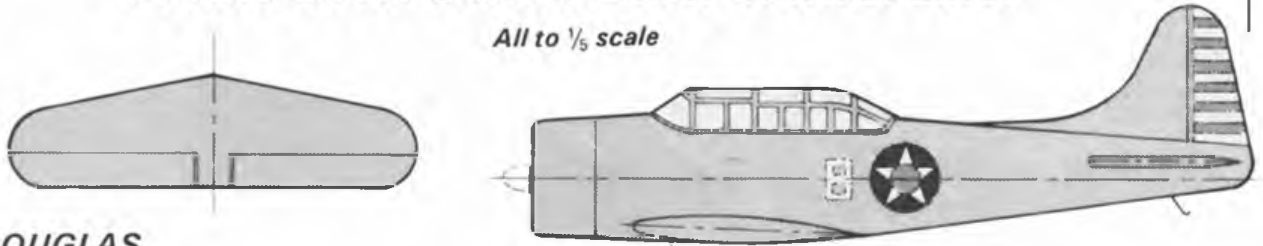
Since writing this feature Stan Perry succumbed to a heart attack. His dedication to modelling was typified by his last article which was written to encourage more participation in Carrier Flying.



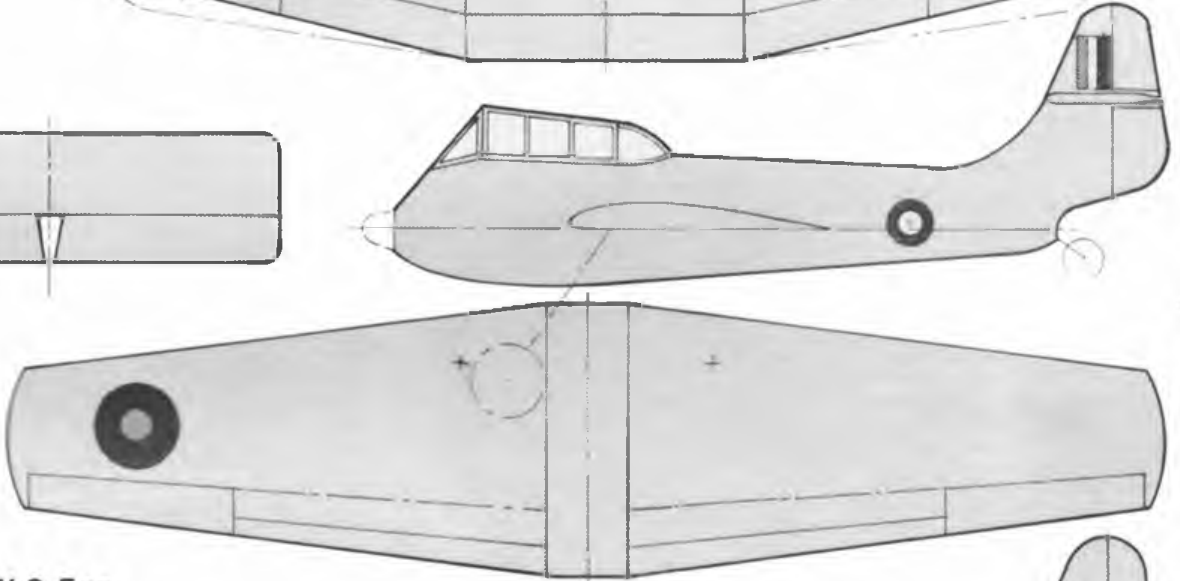
# Profile Scale Carrier Deck Control Liner

All to  $\frac{1}{5}$  scale

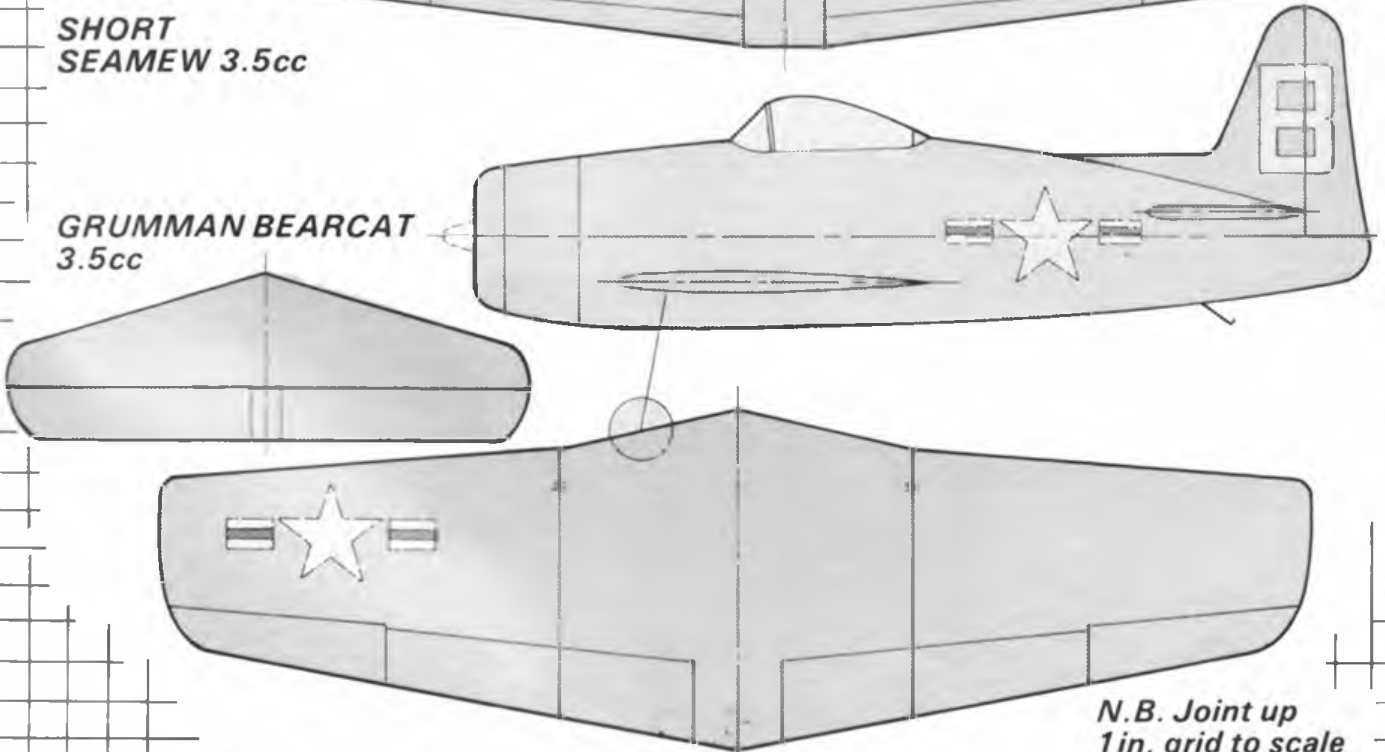
**DOUGLAS  
DAUNTLESS**  
3.5cc



**SHORT  
SEAMEW** 3.5cc



**GRUMMAN BEARCAT**  
3.5cc



**N.B. Joint up  
1 in. grid to scale  
- models to full size**

# FLYING FLEA

A 1/15th Scale  
Mignet Pou du Ciel  
by ROBIN JAMES



THE FLYING FLEA has always been considered a fascinating subject for modelling, perhaps because of its compact size and unusual shape, or perhaps because when you actually see one it looks just like a scaled-up model! The French name Pou du Ciel actually means 'sky-louse'. Flying Flea is a delicate mistranslation.

The designer, Henri Mignet, had an irresistible urge to fly, but he began with almost no knowledge of aircraft or engineering. He learned all he knew through his experiments and was not influenced much by fashions in aircraft design. With a wingspan of 17 feet and a length of 12 feet, the Flying Flea was designed to be the minimum aircraft necessary to get into the air.

In those days the spin was still a killer, and the Flea was designed to be — and indeed was — completely spin-proof. Using a high wing and dihedral, and a low centre of gravity, the only lateral control is the rudder, connected to the joystick. The pitch control is a little more doubtful, though. The entire top wing rocks, pivoting on a  $\frac{1}{4}$ " bolt (which is in fact quite strong enough), and is controlled by a mechanical linkage from the joystick.

The only other control is a lawn-mower type control for the engine, fixed to one of the struts in front of the windscreen. The 'instrument panel' is completely bare! Monsieur Mignet had created a truly simple aeroplane. Engine cowlings, he believed, were much too difficult to make, and not necessary anyway. He demonstrated his machine in public on many occasions, and is even reported to have flown the Channel in it.

Thus the 'Flying Flea' craze caught on. Home constructors everywhere began building them. Sadly, the Flea turned out to have one fatal habit; once you got into a screaming dive there was no way of pulling out. (When you pull back on the stick, the T.E. of the top wing approaches the L.E. of the rear wing from above and at high speed the slot effect gives a large increase in lift on the rear wing). After a couple of fatal accidents, the 'Flying Flea' was banned. Many examples still exist in museums, such as Old Warden.

Scale structure is used throughout this model, including scale rib-spacing and scale linkages. Even the rubber band suspension is scale — the full size uses bungee rubber. The model is very stable in flight — perhaps more stable than the full size. The 1/15 scale used gives a moderate wing loading and does not require full power from the motor. It is stable enough to cope with turbulence, but not so fast that the flying speed is unrealistic. The all-up weight of the original is  $\frac{1}{4}$  oz or 35g.

The 'Flea' will do a beautiful take-off from a smooth surface, running along with the tail wheels off the ground for a few feet before lifting and climbing gently away.

## Construction

Remember the lighter you build it the better it will fly, and the less likely it is to be damaged in a crash. It pays to choose your wood carefully. You will need less than one sheet each of  $\frac{1}{32}$  light and  $\frac{1}{16}$  light balsa. Balsa cement is not suitable for such light structures as it shrinks and will warp the structure. Use PVA for wood and UHU or similar for the plasticard components. Lay a thin polythene sheet over the plan when building the wings and fin.

## Wings

Cut out spars, and ribs, and assemble TE and LE separately flat over the plan. Slot the TE for the ribs. Then with the main spar and rear spar raised with  $\frac{1}{32}$ " packing, add the ribs of the flat centre section, i.e. 9 ribs for the top wing or 4 ribs for the rear wing. Allow to dry. The remainder of the wing is built two ribs at a time as follows. When the preceding section is dry, lift the wing from the plan and crack the LE and TE carefully at the dihedral break. Lay the wing over the plan again, with  $\frac{1}{32}$ " packing under the next section of spar, then add the next two ribs. Continue in this way to the tips, adding panels to alternate sides. Add the short sections of  $\frac{1}{16}$  sq. spar to the rear wing, again setting it  $\frac{1}{32}$ " up from the lower surface. The quickest way to build the wings is to tack the entire wing together with cyanoacrylate and then carefully apply PVA to all joints using a fine paintbrush.

Where rigging is to be attached, strengthen the spars and build them up to surface level with scrap  $\frac{1}{32}$ " balsa. There are 4 points on the rear wing and 5 on the top wing. Where the rear wing attaches to the fuselage, the spars are built up to surface level with  $\frac{1}{32} \times \frac{1}{16}$  balsa.

Sand the wings carefully to remove all lumps and to shape the leading and trailing edges. Use a strip of fine sandpaper stuck to a piece of  $\frac{1}{2}$ "  $\times$   $\frac{1}{8}$ " balsa.

## Fin

Cut the ribs from  $\frac{1}{32} \times \frac{1}{8}$ , cutting to length over the plan and then shaping the ends and adding the cut-out for the spar. Cut out all the other parts, then pin one  $\frac{1}{32}$ "  $\times$   $\frac{1}{4}$ " spar to the plan and assemble the rest of the fin over it. The ribs lie flat on the plan and the outline is packed up  $\frac{1}{32}$ ". Finally sand carefully to section.

## Fuselage

Cut out the sides and formers, joining the parts flat over the plan where shown, and add the three  $1/16$  sq reinforcements to the inside of the fuselage sides. Pin the bottom to the building board, and add F2 and the sides, gluing only the parallel portion initially. When the glue is dry, complete the rear, working towards the end, adding the  $1/16$  sq. cross pieces and tail post. When this is dry, complete the nose in a similar fashion, with F1 and the top front. Assembly of the fuselage is much quicker and easier using cyanoacrylate. Carefully sand the structure smooth all over.

## Covering

The wings, fin and fuselage are covered in lightweight tissue before assembly. The wing must be covered in strips, with a join at each dihedral break, and another at the tip rib. Give the flying surfaces 2 coats of 50:50 dope/thinners and the fuselage three coats.

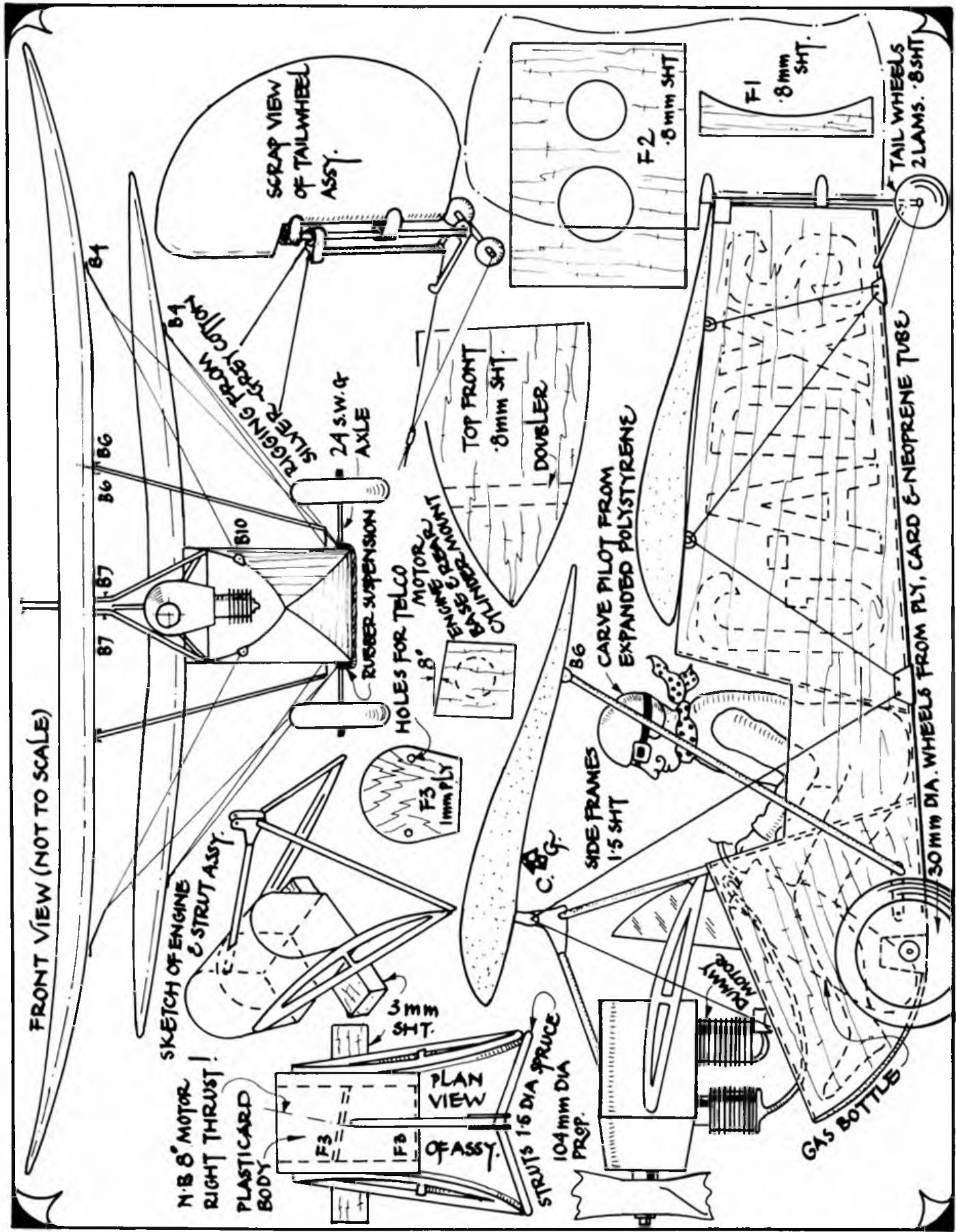
## Colour Scheme

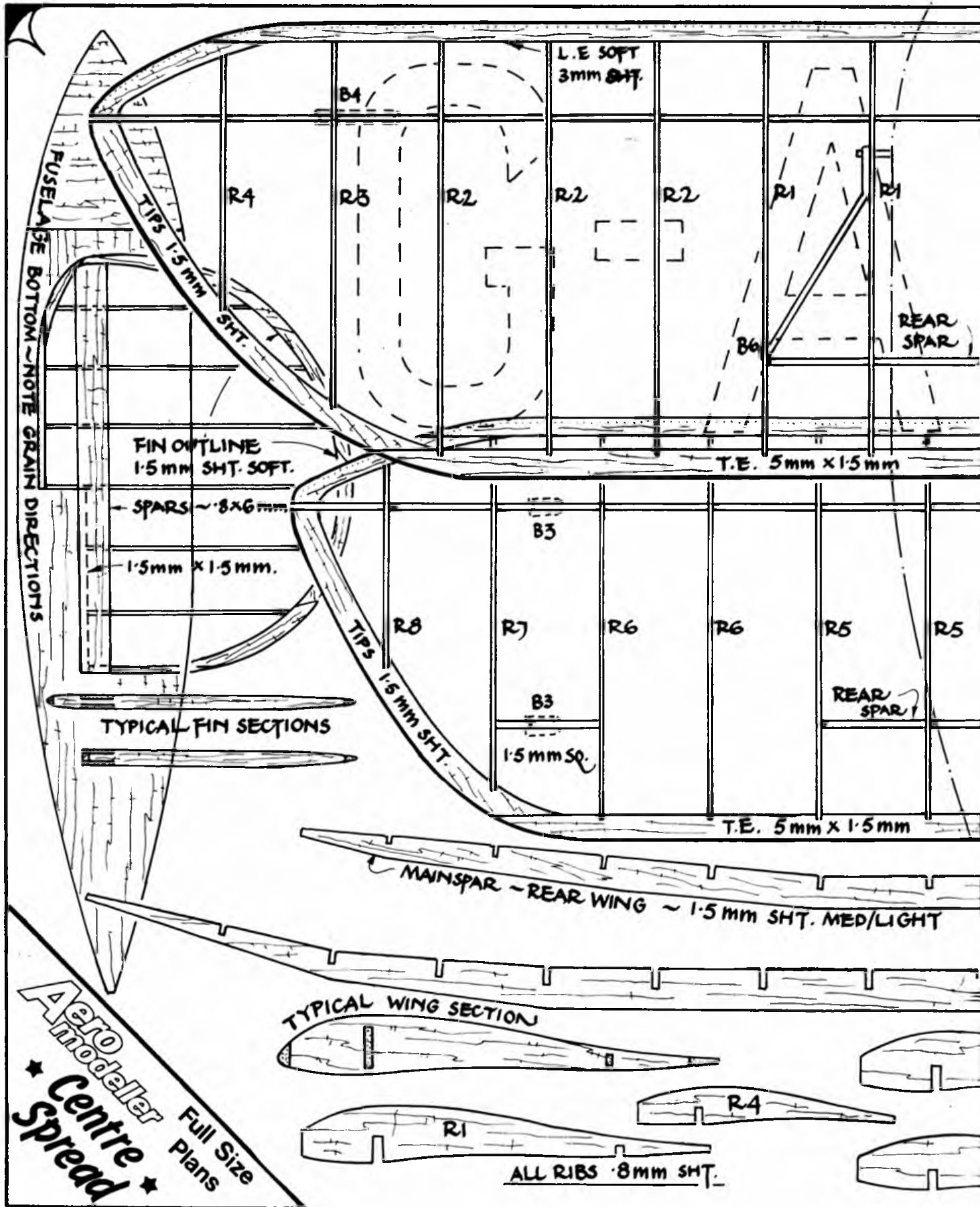
G-ADXS is doped silver all over, with black lettering and pillar box red trim on the fin and for the cockpit interior. Use Humbrol enamel paint rather than colour dope, as it is much lighter.

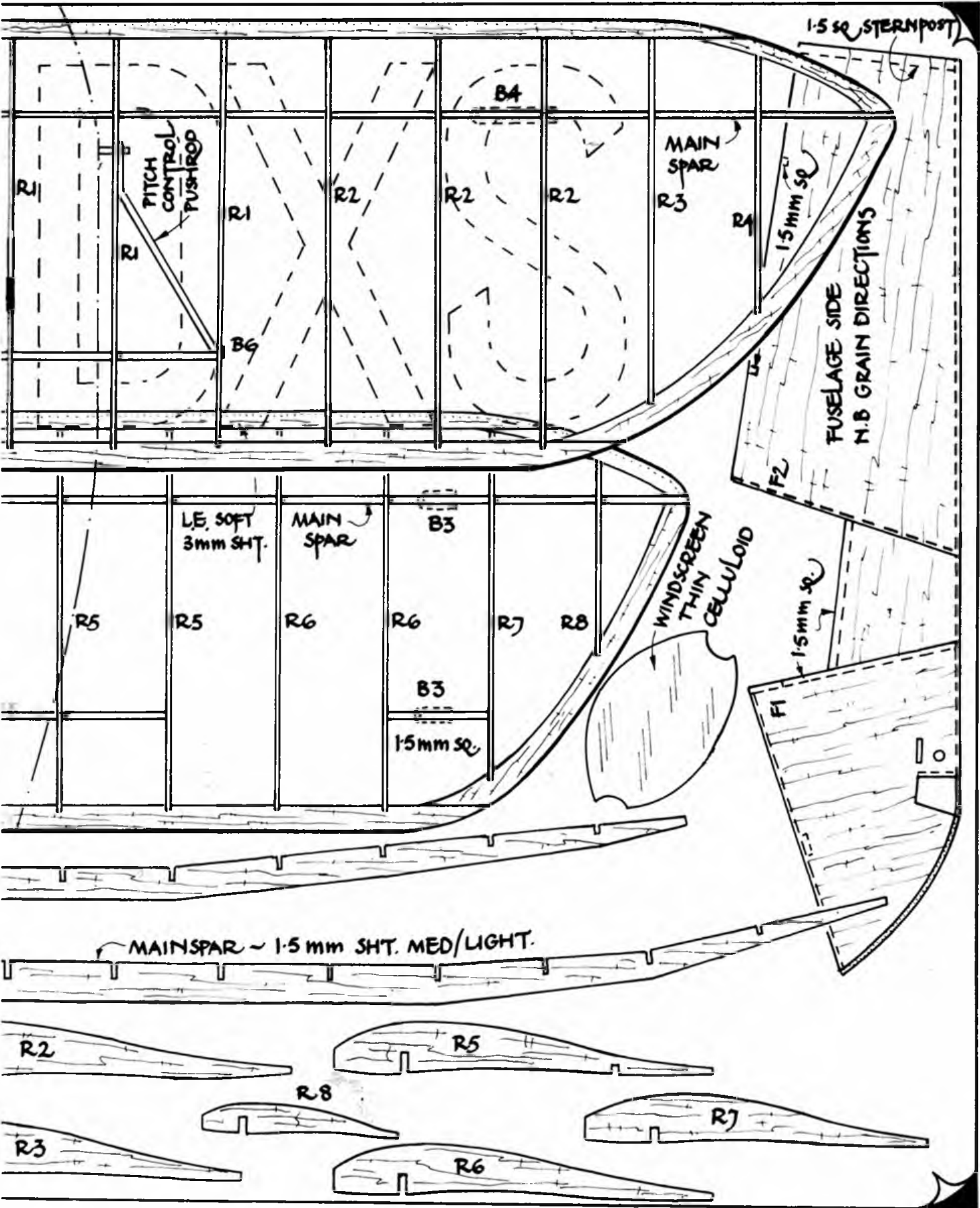
Continued on page 32

Aeromodeller









## A new scale kit

The American firm of *Flyline Models* continues to be rather unique amongst kit manufacturers in that they are constantly bringing out new designs in small scale models for outdoor flying that have a particular appeal to the Free Flight scale modeller. Colonel Hurst Bowers' range now extends to eighteen models with the introduction of his latest subject, the *Farman Moustique*. Two of the range are sports models it must be added, but even one of these, the *Quaker Flash* is a scale model of a vintage design dating from 1937 by Paul Karnow.

The *Moustique* will be familiar to anyone interested in indoor flying during recent years since several have appeared built from the Peanut design by Bill Hannan. In fact the Flyline kit is based upon scale documentation provided by Bill, and his three-view proof of scale drawing together with a list of colour schemes is included on the plan for this much larger model. At 1000mm (39" approx.) span the model is basically designed for lightweight radio control using either a *Cannon* or an *Ace* system as detailed on the plan, together with a Cox .049 motor. As a result of this the fuselage is quite strongly built around the cockpit area with rather more plywood being used than would be necessary in a purely free-flight design. The intended flying weight is 17oz including radio gear and around 12-13oz without. If the design were to be reworked for a small diesel such as a DC Dart, the weight could easily be kept below 10oz but several quite fundamental alterations to the fuselage would be necessary to achieve this.

The materials in the kit are generally of very good quality. Some of the stripwood for spars and stringers was rather soft, especially for a radio model, but this is only a small point. The wings have scale rib spacing and the fuselage is fully braced diagonally so that even with very light wood being used, a strong and rigid structure can be achieved. The use of heavy materials does not necessarily make for a stronger model, but creates more dead weight and spoils flight performance.

It must be said that there are no die-cut parts at all in this kit — not an encouraging feature to your average modern radio model flyer if other manufacturers' adverts are anything to go by. So the old traditional skills will be required for the cutting of all shaped parts including the plywood ones.

# SCALE MATTERS

by Alan Callaghan



Mart Stonelake's Control line Boeing B-29 Superfortress in action for the *Scale Matters* camera. Fine flyer with combination of Oliver and PAW motors.

The old traditional job satisfaction comes free though! No covering materials are provided, which may seem a bit odd, but many people like to apply their own favourite type of covering in lieu of kit materials anyway so the omission is not a serious one. Parts are included for a dummy "Ava" flat-four engine using "Williams" cylinders — a nice touch, and wheels from the same source are detailed on the plan although a pair of simple turned wooden ones come with the kit. All the necessary hardware and rigging wires are provided together with two sheets of transfers.

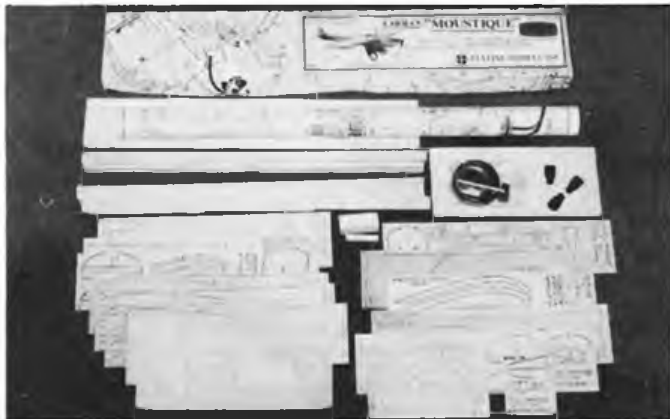
The model appears to be quite an accurate reproduction apart from the slightly increased dihedral which is easily remedied of course, and works out at 1:8 scale despite what it says on the box label! It *could* be built and flown free flight using a Cox engine if some downthrust and side-thrust is built into the motor mount — two degrees in each direction would be a reasonable starting point — and the wing design easily lends itself to being made "knock-offable". The plan shows a one-piece model. Glowplug motors are simply not popular amongst UK FF Scale builders brought up on Mills 75s, Darts, and Merlins, etc., but perhaps a dieselised Cox using one of the Davis conversion kits would be a reasonable compromise without having to replace the radial engine mount with normal bearers.

The "Moustique" is a very attractive proposition as a kit. It's an unusual subject, accurately designed, and has virtually ideal proportions as a flying model. Aimed mainly at the 1/2A Radio flyer looking for a simple scale model it's a good choice, yet the FF enthusiast has a very good chance of producing (with a little ingenuity if he's a diesel fan) an extremely reliable model. The price is £14.50 and it is available by post from "Flyline Models" main importer, The Modellers Den, at Bath. "Flyline's" current range includes many American lightplanes of various types and size such as the *Bellanca Skyrocket*, *Velie Monocoupe*, *Curtiss Robin*, *Fairchild 22*, *Howard DGA*, plus others. It will be interesting to see what the next subject will be.

## Some New Models

Regular readers will remember our August column featuring a new control-line version of the *Boeing B-29 Superfortress* by Mart Stonelake. A few weeks after the appearance of the article, Mart was able to bring the model to Croydon Aerodrome where it was possible for me to get some photos of it in flight over some smooth tarmac. Control-line multi-engined models are extremely difficult to operate over any other kind of surface since they usually require quite a long ground run to reach their basic airspeed before lift-off. Prior to this occasion the *B-29* had already been test-flown at the Elmbridge Model Club's excellent site at Fairmile Common near Esher.

A few changes had been made to the powerplants since the August description, and the model was ready to fly with two throttled Oliver Tiger diesels in the inboard nacelles with another Oliver and a PAW fitted outboard. The fuel system is arranged so that the two outer motors cut first due to their smaller tanks, and the model can be throttled down to land on the inboard motors. It can be throttled in flight, of course, to reduce airspeed slightly with all four motors running. The inboard motors also have shut-off valves fitted which are triggered by two hanging wires that move when the model touches down on landing. These are visible in the accompanying photograph. As the model does not feature brakes, some alternative method of stopping



Spread of components from the Flyline Models Farman "Moustique" kit as reviewed above. The Flyline range from USA is currently available in this country from The Modellers Den at Bath.

the landing run was thought necessary and this is a very simple and effective way of doing it. After touchdown there is still enough momentum to carry the model round almost one full lap on the ground after the motors have cut.

Following a very quick start with the aid of an electric starter and with a really splendid noise the *Superfortress* was in the air quite smoothly although it was being flown in very turbulent air. The throttles worked extremely well being rare to find in use on diesels, and the ample power took the 72" span model round at quite a respectable pace. Even without a retractable undercarriage, flaps, and dropping bombs, a model such as this is an impressive sight in full flight as well as being quite a thrill to fly.

Several months ago I featured a couple of short constructional detail notes on the control-line *Miles Satyr* that I was building at the time. The model is fully completed now but still awaits its first test flight. Those notes (p. 161, March issue) were concerned with building ultra-fine trailing edges on the model's flying surfaces in an attempt to more closely simulate the real thing than can be achieved with more usual methods. The use of the very thin plywood base has worked very well on the tailplane and aileron surfaces, the T.E. strips coming out at  $\frac{1}{16}$ " wide tapering to  $\frac{1}{32}$ " edge thickness. These scale up to  $\frac{3}{8}$ " and  $\frac{3}{16}$ " respectively on the fullsize aircraft. As the real aircraft no longer exists to check with for total accuracy the sizes are somewhat speculative but seem to be about average when compared to other subjects. No distortion occurred on the tailplane or ailerons but the lower wing T.E. could not cope with the shrinkage of the covering materials which were Jap Silk on top of lightweight Modelspan. The reason for this is that the forward edge of the plywood strip was built unsupported (Fig. 1) and the section was simply not rigid enough. The answer is to butt another small spar against the front edge of the plywood (Fig. 2) to effectively form a shallow I-beam structure. An alternative is to run the plywood right up to the rear spar on a two-spar wing, but this would use more material than is strictly necessary and would only be practical where very light weight is not a prime concern. (Fig. 2). On the subject of weight, the *Satyr* tips the scales at 64oz., which includes four ounces of dummy engine based on a glass-fibre crankcase and cast resin cylinders and rocker covers, etc., plus roughly ten ounces of real engine — a

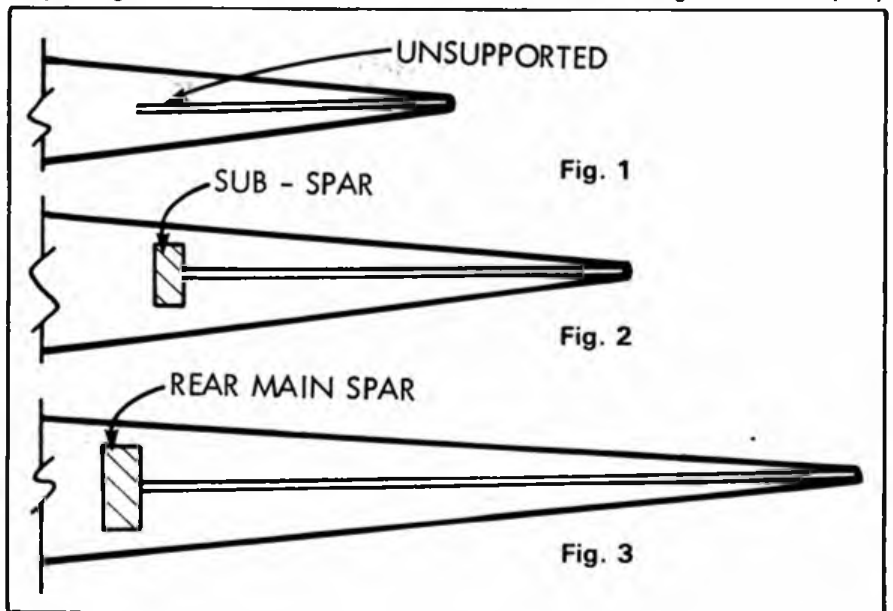


Free Flight Austin Whippet from APF  
plans (No. ESP748DA, price £1.70), built  
by reader A. R. Greenwood of Warrminster  
using (Dagb) 1/2" spanline motor

Super Tigre 46 — together with exhaust collector stub and a large separate internally mounted expansion chamber. These various bits and pieces have made the model nose-heavy to a noticeable degree but keep the engine nice and quiet.

In the next column I will cover the method of painting the red/white checkerboard

and silver scheme together with the awkward fuselage registration letters, but in the meantime I thought that a note about the actual photograph may be of interest. The biggest problem in photographing a model such as this outdoors is in achieving sufficient depth of field in which the model and the chosen background are in equally



Our Columnist's Control line scale Miles Satyr, now complete, but still unflown. 42" span model is Super Tigre 46 powered and weighs 64ozs. Colour scheme red/white checkers, red upper wing and tail, with remainder silver doped. Come on Alan, it looks right, so it should fly right!



sharp focus. In order to fill the viewfinder one has to be close to the model, yet with a typical modern 35mm camera with the lens stopped down to f16 the depth of sharp focus will only range from about five to about fifteen feet. The camera used for this particular shot was a very old folding Zeiss Nettar roll-film model which gives negatives 6cm x 9cm in size and which has a lens that will stop down to beyond f64. At this setting the depth of field is enormous and for the picture the lens was focussed at six feet yet the buildings in the extreme background are still quite acceptably sharp. Cameras such as this can still be bought for about twenty pounds from specialist camera shops, although prices do tend to vary a fair bit.

# FROM THE HANDLE

CONTROL LINE NEWS



## RACING

by Jim Woodside

### Filler Systems for Team Racers

The last couple of years has seen the general acceptance of the so-called 'multi-valve'. These normally include the functions of filling the tank, priming the engine via the exhaust stack and stopping the engine. At least one available example also incorporates a metered venturi prime. Such little marvels were once the prized possession of the engineering types in T.R. Fortunately several examples are currently available via specialist shops and suppliers.

**VIZ**  
**PAUL SCHIPPERS** At present Paul is producing two distinct systems, each with its own matching finger valve — a Metkemeyer type — designed and used by the man; this valve is mounted between engine and tank. It incorporates metered exhaust and venturi primes — kit also

includes the exhaust prime nipple which incorporates a needle valve. Complicated but well made, it needs to be used with the special matching male finger valve.

**b. Kaul type** — this is a simpler type designed to solder to the base of the tank. In the fill position, the feed to the needle valve is closed to prevent flooding through the venturi. A primer outlet is provided which can be connected to the exhaust. Again a matching finger valve can be bought. This type is available in two versions to suit either front intake engines or Nelson type engines. Michaels' Models are stockists.

### P.E.C. Engineering Valve

This finely made valve comes from Denmark and can be ordered in styles to fit all available racing 2.5cc diesels. The design incorporates several O-ring seals. The valve was used by the Geschwendner-Mau team at the 1980 World Championships. Weight is 8gms. Cost is US\$50. State type of engine with order to P. Edslev-Christensen, Hertzvej 61, 8230 Aabyhøj, Denmark.

**DORANT VALVE** again seen at Czeszochawa, this valve is of Hungarian origin. It is made in Delrin, very light and again available for most popular engines. Do. ant used this design on his 3.36 model. Price is 50DM. It might be wise to write before placing an order to Dorant Vilmos Fabrik, Nyiregyhaza, Oszolo ut 148, H4400, Hungary.

### Australian Valve

Examples of this Hutton Oddy design are sometimes offered for sale. However blueprints of the design as used by the Perkins Albritton team are available from Shadow Racing for \$2 + postage. Shadow Racing, 1100 S.E. 28th St., Ocala, Florida 32670, U.S.A.

Happy filling!

### Shadow Racing

Walt Perkins has passed on some information about his thinking, and products for FAI Team Race. More of this in later months but for now just two things. Firstly, his model as flown at the World Champs 1980 is an original design. Just as soon as I have a copy of the 'Shadow Wing' plan I will be able to review both it and the Smith 'Flying Thing'. Secondly Walt is starting to produce a newsletter a la Henry Nelson prosaically called 'Gator Tales' — alligators are quite common in Florida so we hear. Editions contain the latest information and a full price list of Shadow products. Cost per year is \$2.50 for USA and Canada, \$7 for Australia \$5 and for the rest of the globe. Send funds to Shadow Racing, 1100 S.E. 28th St., Ocala, Florida 32670, USA.

### Cipolla Team Race 2.5D

After their very promising beginning at the 1979 European Champs, Cipolla engines appear to be another





Far left: the Hungarian Dorant valve - made in Delrin, light and available to suit most relevant engines. Left: Edslev P.E.C. valve, from Denmark, available to suit all racing 2.5cc diesels. Below: diagram of the newly prepared 'Three Sisters' purpose-made control line site at Ashton in Makerfield. An inaugural International Control Line event is anticipated for May '81.

source of good team racing diesels. Several examples are now in the UK and I now have obtained one with an ABC liner set.

The engine can come with an excellent multi-valve system (can also be purchased separately) and a superb purpose-made pan, milled from solid bar. Delivery is quick which is reassuring if you are looking for a motor to use for 1981!

## Goodyear Team Race Rule Changes

The Council of the SMAE on the 6th September approved the following rule changes. The rule changes are motivated by safety reasons and were proposed by the Midland Area. They are to be effective from 1st January 1981 (with appropriate re-expression for application as rules, I hope — RGM).

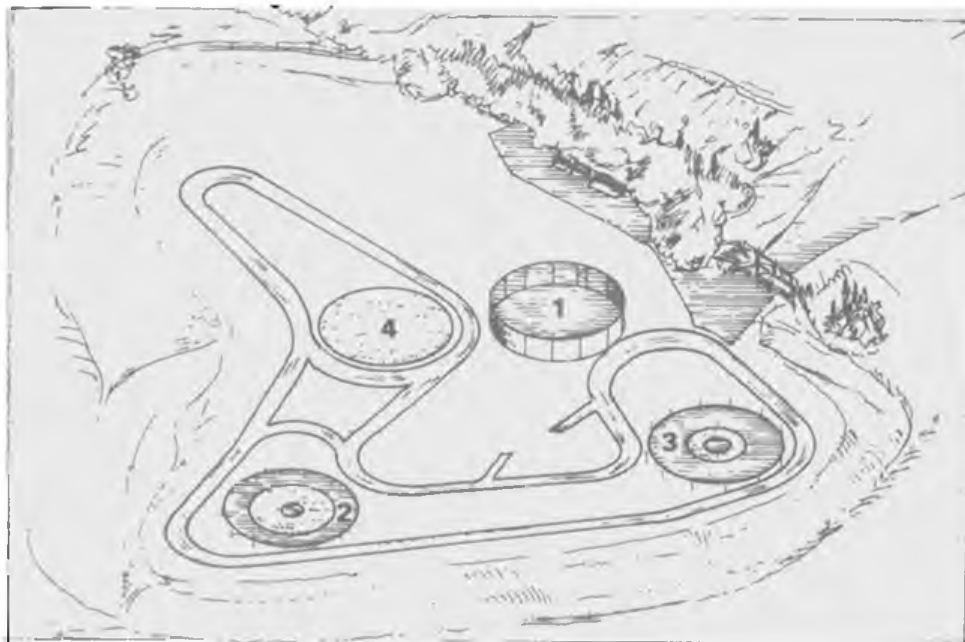
1. Rule 4.7.2d After the first sentence add 'Oil coolers may be omitted from the fuselage profile'.

2. Rule 4.7.4.2p 'That the use of T-bar compression screws, OR compression adjustment screws which have a forward facing projection of a cross-sectional area of less than 8mm<sup>2</sup> be banned'.

The basis of both proposals is to limit or prevent injury to pitment caused by sharp thin plywood or metal projections. The use of Allen key compression adjusters is the simplest answer to the new rule 4.7.4.2p.

Far left: the Paul Schippers Matkemeijer valve seen here with exhaust prime nipple. Partially disassembled unit is shown immediate left. Bottom far left: the Kaul type standard filler valve also by Schippers. Below left: Schippers finger valves, including Matkemeijer type. All available from Michaels Models.

Below: winners of the 10th Northern Area Goodyear Marathon event, Church Fenton, September 21, the Allcock Chambers team, with Nelson engine model which topped a field of 16 teams.



## 10th Northern Area Goodyear Marathon

For this 'anniversary' event, twenty two teams turned out at Church Fenton on the 21st September. Sixteen teams recorded a score in this race which is run for one hour with twenty compulsory stops. Seventy five laps per tankful is obviously almost essential to be in contention.

Eventual winners John Allcock and Frank Chambers have been dogged all year with variable settings in 100 lap races. In fact they had four setting changes in the first fifteen minutes but then were never challenged for the lead.

The exception to the rule were second placers Stubbs/Schofield who had 28 stops with their Rossi R.V. In third place were John Horton and Don Haworth using their unusual and finely built 'Wild Turkey' DIRT in the needle of the ST X15D slowed their 100 mph progress — they were in 1st place up to twenty minutes.

The first Marathon in 1971 was won by Bill Cooke and Roy Everitt using an Oliver Major to cover 1069 laps. The record has risen steadily ever since but it is interesting to note that on only two occasions was a glow motor able to take the event. My thanks to John Horton for his usual detailed results.

Results	Laps	Stops	Engine
1. Allcock/Chambers	1419*	22	Nelson
2. Stubbs/Schofield	1305	28	Rossi RV
3. Horton/Haworth	1282	20	ST X15 (Haworth)

\*New event record

## Three Sisters International Control Line Site, Ashton in Makerfield

It hardly seems credible but after years of wishing, hoping and planning a full specification control line site is

now nearing completion. Our heartfelt thanks for this must go to Derek Leigh. In recognition of his efforts Derek has been awarded the Arthur Mullett Memorial Trophy for 1980 by the SMAE. Almost as a one man crusade Derek Leigh raised £1,000 through a STOCKIST CLUB raffle and then went on to persuade MANCHESTER GREATER COUNCIL to spend £40,000 on our addition!

Once the basic groundworks are completed, local modellers will paint in the circle markings, erect net fences and construct a Jury tower on the edge of the main circle. In the near future, an electronic lap counting and timing system for team race will need to be constructed. If any reader can help with design and components — especially in regard to the illuminated displays, their help would be warmly received. Offers can be channelled through this column c/o the Editor.

THREE SISTERS is situated at ASHTON IN MAKERFIELD, which is midway between Manchester and Liverpool. It has links with the M.62 and M.6 motorways which should make for easy access for most competitors. The site is multiple purpose with facilities for go-kart racing, model boats, cross-country running. Happily it is designated a 'noisy sports' area, it is remote from houses and shielded by being built inside the scooped out centre of an old coal tip.

The site plan shows the four circles being built. No. 1 is a permanent fenced concrete circle which will take all classes of control line models.

No. 2 & 3 are tarmac rings with tarmac centres. No. 4 is grassed for combat.

Circles 2, 3 & 4 are built inside the go-kart track, which will be used as a line park on control line race days.

The first domestic use of the area will be for one of the Centralised Meetings of 1981.

## Three Sisters Control Line International

To inaugurate the facility in style, an international for F2A, F2B and F2C has been planned for the May Bank Holiday 1981 — 23 and 24th May. This date will have been presented to the FAI by December for ratification. It is hoped a large Continental entry will attend to christen the site in style.

## Cylinder Chroming Service

Malcolm Ross has located an excellent source of chroming for cylinder liners. Approximate cost is £7 per unit although this can be reduced if a number of items can be sent in one batch.

Interested parties can contact Malcolm at 8 Birchall Avenue, Culcheth, Warrington, Phone Culcheth 6610.

FROM THE HANDLE



Site of the 1st Belgian F2D Combat International at Genk has a long association with the aeromodelling movement including in 1963, the World Control Line and R/C Championships. The white outlined circle closest to the hangar is slightly domed and gave R/C pilots a big problem in 1963 champs - if you missed the spot on landing, the model just kept on flying as it passed the crest!

# COMBAT

## 1st BELGIAN F2D INTERNATIONAL report by Pete Jayes

As can be seen from the aerial shot of the contest site, taken on the morning of the contest, the facilities at Limburgse Vleugels - Genk are superb. The club site at present consists of two tarmac-covered team-race and speed circles, totally enclosed by permanent safety fences. These were built for the 1963 "Criterion of Aces" European Championships and were re-tarmaced last year, as were the two control line stunt circles. There is also a large R/C patch (not shown in the photo) which is tarmac-covered and approx 200 metres in diameter. At present the club are preparing two new grass combat circles with concrete pilot area, but these were not in use for the contest. However, the circle used was more than adequate. Other improvements on the 1980 calendar

include a new club house, which is now almost completed, with showers, toilet facilities, and a bar!

On arrival, the British pilots - Pete Tribe, Paul Vallins, Tim Bartram and Pete Jayes - found the facilities available most refreshing, particularly having travelled overnight from London. Another British competitor, Tony Frost (based in Germany with the British Army), was already there. Having decided to "go it alone" he found his pit crew problems solved when we arrived.

Considering the facilities available, the total entry of 26 was perhaps a little disappointing. Hopefully the photograph will whet the appetites of other fliers. Of the 26 competitors there were 5 from the UK, a staggering 12 from Germany including the only female competitor, 5 from Belgium and 4 from Holland. Also present were two familiar faces from the Dutch combat internationals: Rob Olyven and Mariske Van Geyerbesk, helping run the contest.

Flying commenced at 2 o'clock on Saturday afternoon in brilliant sunshine which lasted throughout the competition. Most pilots were again using Super Tigre G20/15s in foam models with Rostis mainly used by the Germans.

The contest was run strictly to current FAI rules which resulted in many pit crews being penalised solely for not

leaving the inner circle before making necessary adjustments - something so easily forgotten in the heat of the moment, but a rule which is important from the safety angle alone.

The first round saw the demise of 6 of the German fliers, which evened out the odds between countries more favourably. Paul Vallins (GB) made a disastrous mistake by leaving the pilot's circle during the 4 minutes, having mistakenly assumed he had "blown it", only to discover he had won. Paul's action resulted in automatic disqualification. P. Jayes (UK) was next to be eliminated having initially led on cuts against Pieter Roelandt of Belgium in the opening stages but fell foul of ground time penalties due to a loose spray-bar assembly.

By 5 o'clock on Sunday evening it was time for the final rounds, Pete Tribe flying Belgian Ronny Van De Maele, resulting in a victory for Pete Tribe. Second semi-final was Tim Bartram v Pete Willmer of Germany. Tim lost this to place a very respectable fourth, resulting in a final between Pete Tribe (UK) and Pete Willmer of Germany. After a hectic four minutes of high-standard flying from both pilots, Pete Tribe emerged the winner of the First Belgian International event. The final was followed by a prize-giving in a freak rain storm which did not seem to bother anybody. First prize was a very acceptable Supre Tigre G20/15, also a small prize was given to the pit crew for the winning pilot. Bottles of wine were also dispensed to the Dutch contingent who helped run the contest. These were presented by Claes Tielemans, Chairman of Limburgse Vleugels - Genk. Our thanks go to Fons Beckers and all the members of the club which made the meeting a fairly-run and enjoyable event.

**FINAL RESULTS:** 1st Pete Tribe (Cosmos UK), 2nd Peter Willmer (Germany), 3rd Ronny Van de maele (Belgium), 4th Tim Bartram (Cosmos UK), 5th Peter Rucker (Germany), 6th Tony Frost (UK)

## FLYING FLEA

CO<sub>2</sub>



Continued from page 24

### Engine and framework

This is not too difficult as long as you follow the order shown on the plan. Make all the components first, and then build the assembly over the plan. Glue the dummy cylinder in position and then add the windscreen and engine to the fuselage. Now is the time to install the CO<sub>2</sub> motor, before the wings are in position.

The right thrust looks excessive but is in fact necessary. A piece of foam plastic pushed into the nose holds the gas bulb in position, wedging it back against the dashboard. There is no convenient strong point for mounting the filler nozzle, so it is best left hanging out from the side of the cockpit. Complete both cylinders and paint them matt black. Paint the engine and struts silver. The dummy cylinder is very similar to the real one, and they appear identical once

painted black. I keep getting enquiries about twin cylinder CO<sub>2</sub> motors.

Cut the propeller down to size, round off the tips, and paint it brown. The CO<sub>2</sub> motor is quite content to run on a smaller propeller since full power is not needed. The engine cowling is made from soft block, given 2 coats of sanding sealer and painted silver.

### Final assembly

Add all rigging brackets to the fuselage and wings, and also fit the pulleys for the rudder linkage. Paint all of these silver. The lettering is also added at this stage. These are made as transfers, cut out from sticky labels with three coats of matt black paint on the sticky side. Glue the rear wing to the fuselage and add the rigging, from silver grey cotton.

The rudder and tailwheel are held with three brackets and the wire support. Glue with UHU at this stage, as this will allow slight movements for trimming. The rudder cable is made from the same silver grey cotton.

Now for the top wing. Hold the wing in position with the pivot pin (made from a pin) which is itself retained by a blob of balsa cement on the end. Install the pitch control rod and arms, and the pushrods. Again, glue with UHU at this stage, to allow trimming adjustments later. Set the wing to the approximate angle shown on the plan. The rigging for the top wing is made from four separate lengths of silver grey cotton. Tie a single knot and leave them overlong initially. Carefully pull them tight one at a

time, checking the wing for squareness as you go. When you are quite satisfied that the wing is on straight, seal the knots with a drop of glue and trim the cotton to length.

The undercarriage is held with a rubber band passing over the axle under the fuselage. Complete the model with a pilot made from polystyrene foam and painted.

### Flying

Choose a clam day and a field with long grass for test flights. Check again that the wing incidence is as shown on the plan and that the rudder is straight when viewed from the front, in line with the wing fixing bolt.

This type of model has a poor glide, and so initial flights are best carried out using low power, to reduce the rate of descent. Start with very low power, and as trimming proceeds, gradually increase the power until a gentle climb is achieved.

Adjustment in pitch is made using the pitch control mechanism, by altering the angle of the pitch control arms (the should only be glued with UHU at this stage). Rudder adjustments may be accurately gauged by sighting along the wing pivot bolt.

Trimming is not critical. The 'Flea' is very stable and can be made to turn left or right under power. When the model is trimmed, lock the control surface positions using a drop of cyanoacrylate on the appropriate joints.

Try an ROG if you get the chance. You need a tarmac surface and still or light wind conditions.



## Flight of Youth

Put together, two items of news, which recently caught my eye, would seem to throw a disturbing light in the state of model flying today. One was of an old age pensioner building his first radio model, and the other of a model flyer returning to the fold after an absence of twenty-five years. It is not so much that we model flyers are getting thin on the ground so much as thin on top. What might be mistaken on the flying field for a release of bubbles is nothing more than a flurry of grey heads at the launching point. Altogether it seems we are a race of middle aged and elderly playboys, and some might even say that our obsession with toys is a symptom of second childhood. The top model flyer is no longer the ambitious young man full of zest, flair and progressive ideas, but some doddering

would be sympathetically received, particularly in Radio circles. They did stress, though, the importance of a proper psychological approach to the elderly. It would be imprudent, for example, to continue to refer to model boxes as 'coffins', and, as the senior citizen is likely to be a bit tetchy about his eyesight, do not complain to vehemently if he times a passing Jumbo Jet out of sight in mistake for your model.

All this geriatric model flying has its effect on the structure of the model club. Many clubs have long since abandoned their junior sections, and are reluctant to dish out free subs to Old Age Pensioners as this would soon send the club broke. This state of affairs may have something to do with the change that has come over our young people in the last twenty years or so.

## Empty Returns

If we modellers are shrivelling up, so, too, are our airfields. At one time we had a bit of an edge in the space war as our movement was popularly thought to be the means of opening up the glorious world of aviation to the air mad youngster. The aeromodeller of today being the top flight aviator of tomorrow, and all that. Just look at all the magnificent examples there were to draw upon, from the Wright Brothers onwards. There was no thought of these heroes of the air building models after the age of fourteen; the general feeling being that they gave up such childish pursuits around the age of nine. But all that is now old hat. The pilot of tomorrow is a silicon chip, and there is about as much glory and adventure in aviation today as in a telly space age game. This has put our special relationship with the aviation authorities very much on the skids. We are now way down the list of airfield contenders, giving way to land yachts, go-carts, parachute towing and anything else that's going.

Not that anyone gets much of a look in these days. All over the country there are hundreds of empty airfields ideally suited for week end activity, particularly model flying, but too bound up with red tape to be used for anything but exercising the C.O.'s dog and a little judicious jogging on behalf of the officers. This is the age of the bureaucrat where you need a five million pound insurance cover to fly a chuck glider on an empty airfield. Bureaucrats work mainly on two principles: If it moves, stop it — if standing still, ban it. They like nothing better than a nice empty airfield upon which to make a nil return in triplicate.

## Rogloidytes

Some people, not given to excessive attitudes, might think that the vintage contest was just a nostalgic bit of fun, more of a playful rummage into the past than a serious vying of model flyers for supremacy on the flying field. Not being a highly committed contest flyer myself I should have thought that if anyone deserved a prize in a vintage competition it was the chap with the model with the most character, and if he himself could sport a fair isle pullover and smarm down his hair so much the better. But what does happen? The beat 'em all at any cost wallahs scour the ancient plans and thumb through the old magazines for the most likely design for today's style of model flying, rig it with a modern d/t and winding up devices, not forgetting to epoxy all its weak points, then fly it according to modern tactical principles in the hope of collecting an up to date plastic plaque.

What's bugging the purist vintage flyer now is the reluctance of those involved in these phoney sort of contests to take the rise off ground rule too seriously. After all the tarmacs the pre-1950 models operated from were all newly laid and smooth, not to mention the take off boards provided, whereas the vintage flyer has to try to get his model to hop off the crumbling runways of today. Even then most r.o.g.-ing models in the past needed a hefty push to get them safely airborne; r.o.g.-ing being sensibly abandoned after the prop and wing tip launching method caused such carnage on the take off area.

# TOPICAL TWISTS



*"Why does Grandpa have better toys than me?"*

old daddy-o with memories of steerage competitions on Wimbledon Common. When a helping hand is put out to him as he clutches feebly at the trophy he says jauntily, "Still life in the old dog yet", and he is already working out various launching techniques he could use from a bathchair.

Concerned about the growing number of pensioners in our midst I wrote to Age Care for guidance. They said that very little could be done for old gentlemen foolish enough to hang around all day on draughty airfields. Little, too, could be expected from the social services at a local level. The meals on wheels people could hardly reach distant airfields without the food getting cold, and the resources of the District Nurse would be overstrained. I did not think, though, that their suggestion of Citizen Band Radio as a means of summoning help

Some may put it down to the zombie-ing effect of pop music and others to the stroboscopic flickerings of the television screen numbing the brain, but either way children and young people are not what they were. For instance, you never see children nowadays playing childish games like top spinning and hopscotch — they are indoors looking at the 'Play of the Month' or 'Coronation Street'. And the young people no longer go for all that old hobby stuff — they are studying like mad during the week and getting stoned out of their minds at the weekend. If they have any approach to the hobby of aeromodelling it is from the back end first. They wouldn't mind having a crack at piloting a helicopter or aerobatic model to pass an idle hour or two, but as for actually building a model, that, in the age of instant everything would be just absurd.

# Free Flight Scene

Left at Bassingbourn Open Rubber Trophy event, Pete Putnam ruined a full score with double zero in round three. Unlucky! Below left, Junior Anthony Ball launches, eyes tight shut and a little left, but it got away O.K. Below right, perfect launch from junior G. Neil watched over by father.



though for at least the first six hours but thankfully it blew in the best possible direction so that the entire length of what used to be Bassingbourn main runway came into play. After that, retrieval, was over numerous and for the most part empty fields — not that this was to save losses altogether.

A steadily increasing maximum had been planned so with this in mind the first round, run off over a full hour to allow for contestants' late arrival, was to be a mere three minute formality. This did not turn out to be the case as immediately people were dropping flights. East Grinstead clubmates Taylor and Grantham both failed by some margin but by persistence later in the day were to make amends for this. Bob Bailey flying a new and very light (73g) version of his distinctive '66 special suffered the indignity of a massive downdraught which brought the model down on the tarmac where it blew along and disintegrated. Julian Hopper tempted out of retirement in Rubber and sportingly entering in conditions for which neither he nor his models were fully prepared scored only 1.32. He discovered most of both prop blades missing when he recovered the model and a search revealed nothing. He was therefore surprised to find them in the grass only a few yards from the launch point when he returned upwind. It appears the model must have touched the grass on its loopy getaway and at this point sheared off the blades. In the circumstances 1.32 didn't seem so bad a flight as the model had only stumps for propellers. However a contact that early should have allowed him another flight!

The second round was flown to a four minute maximum and only seven made it. These included John Fletcher flying his Bailey design presumably built somewhat stronger than the designer's version and although it held together it was never found after this maximum. Tim Gray made amends for an early DT on the first as did Ball, Sharp and Walker who had all already scored 3.00 in the first round. Rain and consequent reduced visibility gave some timekeepers trouble keeping their charges in sight. Dennis Davitt lost time here when his model simply vanished whilst still well up and others flown in the rain went OOS before the maximum too.

The wind was probably at its height at the start of the third round and the decision was taken then to maintain the four minute maximum for the rest of the day as many people had dropped time anyway and a flyoff looked unlikely. Visibility had improved and Tony Grantham broke his run of sub maximums and came back into the contest but Russell Peers — who had already remarked that he should have been entrant No. 13 but the number had not been allocated — dropped an annoying 16 seconds which was to cost him dearly as Ball and Sharp continued their form and maintained full scores. Junior Jonathan Walker also maxed again to total 11 minutes but lost the little Lennox inspired flat bottomed model with which he has done well this season. Although he could not continue he had an unassailable lead in the Junior event as consolation.

The pace of the contest then changed dramatically. Heavy rain set in a few minutes before the start signal for the fourth flight and it was delayed 30 minutes by which time the rain had ceased and so had the wind. From that moment on it remained a virtual flat calm for the rest of the contest which came as a welcome relief for those that had persevered thus far and had already more than a passing acquaintance with the downwind fields. A slight move of control and contestants were winding again as this was



mystery many of us would like to share. A very full length run further compounded the height gain and once again a useful patch of air produced a flight of nearly 5 minutes and the Quickstart Trophy to go with his equally impressive Nats win.

Rubber was last and had six participants. The wind had dropped still further although by this time it was decidedly chilly. Marcus launched first and his distinctive little model was very high in less than 90 seconds leaving those still winding feeling they might have missed the good air. Grantham, Taylor and Walker were away next and in that order. The first and third of them being clearly in lift from the start but Ken Taylor mysteriously missing the good patch completely and falling out in less than four minutes. Ball had been busy collecting his last Co2 flight and was not back until the round had started and therefore flew last but Hipperson had deliberately waited hoping for calmer conditions. What he got was a downdraught which had the model struggling on the power run and it wasn't until it left the drome that it glided out of trouble and into a patch of air which lifted it gently to a couple of hundred feet and held it there for 15 minutes eventually depositing it some six miles away. It stayed in sight for nearly 1 1/2 mins which was enough by some margin to take the Flight Cup.

These proceedings and the considerable distances involved in subsequent chases somewhat decimated the attendance at the prize giving which followed. Light hearted reference to the lack of helicopter interruptions was well received and all in all apart from a little hiccup with cards — over which the contest director was profusely apologetic — the organisations had been on the ball. It would be a nice touch if this event could coincide with more traditional warmer Autumn weather one of these years. The type of hazy calm conditions which made some of the Southern Galas of the '60 so memorable. Where has weather like that gone?

## The Open Rubber Trophy — Bassingbourn 19/10/80

The aim of this event apart from improving the breed of open rubber models has been to create a competitive atmosphere throughout the day by maintaining interest and making it really worth placing as high as possible no matter what the risks. This policy was popular if numbers of entrants were anything to go by but more than that the atmosphere of 'importance' the meeting had was contagious. Over £300 worth of prizes had been assembled from contributions and donations through the trade and despite the very untypical October weather even more people entered than last year. The stiff Westerley made it



*Dave Hipperson reports....*

## Southern Gala ... Odiham ... 5/10/80

Although used comparatively infrequently for Free Flight events there are parts of the countryside around the Odiham aerodrome with which we are becoming very familiar. This is due in most part to the weather's insistence on blowing a South Westerley whenever the Southern Gala is staged and also in part due to the organisation's reluctance to use the full length of the runway but rather opt for a cross corner arrangement which keeps models safely away from buildings but often lands them perilously close to a number of nasty woods.

This year saw a familiar weather pattern with three minute max flights made anytime but at the very start landing outside the drome with few exceptions. As the afternoon progressed the wind rose to 15mph. Fortunately there was no repeat of the model stealing of the previous year — not on the same scale anyway. Five Mini and three Open events gave a full schedule and had attracted a healthy pre-entry. Most remarkable was the stark lack of interest in Open Glider and the consequently modest 8.13 total which won it for Chris Parry who flew hard all day as he was a contender in the SMAE Junior Championships. Scores in the usually lesser Mini events were on the other hand generally high despite the rather tricky turbulent drift unique to this hill top site. Hutchinson took A1 with only full score over Nats winner Foster who recorded 12 seconds less. This score pattern was then repeated in Co2 where Phil Ball topped the lists with a perfect 10.00 mins over Roses 9.48. Phil had had his misfortune on the way to the comp when a loose lid on his roof mounted model box went unnoticed and the resultant gale force draught down the motorway damaged all three of his Open Rubber models. Things improved for him after repairs but not before he very nearly hit the hangers with his big model on a trim flight and then put it over a distant wood on the first comp flight!

Despite the breeze the flyoffs had filled up in both Power classes and Open Rubber and HLG. They were run off from 5pm when it was still light enough, less windy and thankfully without the low cloud that ruined this part of the day last year.

In Power, 40 experts Peers and Hopper made respectable climbs and although launching some distance apart both contacted good air but Hopper had the better of it for a flight of nearly 10 minutes. Perhaps the most startling of the power flyoffs was Fletcher's 1 1/2A flight. This took the form of a perfectly vertical ascent with the wings rolling gently around the fuselage. How he achieves such a consistent and fast pattern even in a 10 mph breeze is a

## Results — Southern Gala, RAF Odiham, 5/10/80

<b>Open Glider</b>	
1 C Parry, Biggles .....	8.13
2 B Bailey, St Albans .....	7.10
3 A Tipper, Lee Bees .....	7.09
<b>Open Rubber</b>	
1 D Hipperson, Croydon .....	9.00 + 11.23
2 A Grantham, East Grinstead .....	9.20
3 P Ball, Grantham .....	8.40
4 J Walker, Birmingham .....	7.24
5 N Marcus, Croydon .....	8.46
6 K Taylor, East Grinstead .....	3.58
<b>Open Power</b>	
1 J Hopper, Stanstead .....	9.00 + 9.57
2 R Peers, Falcons .....	6.10
3 C Parry, Biggles .....	2.07
<b>A 1</b>	
1 A Hutchinson, East Grinstead .....	10.00
2 J Foster, M F F G .....	9.48
3 R Woodruffe, Swindon .....	9.35

<b>Coupe d'hiver</b>	
1 R Miller, Croydon .....	9.30
2 M Bull, C/M .....	8.51
3 R Kenward, Croydon .....	8.43

<b>1 1/2A Power</b>	
1 J Fletcher, St Albans .....	10.00 + 4.58
2 T Payne, Biggles .....	3.44
3 Digby, Croydon .....	10.00 + 1.40

<b>CO2</b>	
1 P Ball, Grantham .....	10.00
2 A Rose, Godalming .....	9.48
3 G Head .....	9.15

<b>H.L.G.</b>	
1 P Davies, Richmond .....	5.00 + 0.47
2 W Houghton .....	5.00 + 0.33
3 R Cummins, B&W .....	4.50

only a 15 minute round and not surprisingly more four minute maximums were scored in this round than either of the previous two. Even the extraordinary monster 600 square inch from Mike Groome flew half respectably. He had been persevering with it all day despite it being hopelessly underpowered for the wind. What was more miraculous was that it suffered no damage apart from some inflicted while winding from the boot of his car. Ivan Taylor too had been having trouble all day with his balsa tube fuselaged models. Gross glide instability terminated the third flight with a perfect vertical spiral into the ground from the top of the power run. The fault was traced to a marginal incidence set-up but he still could not get it completely sorted even in the calm fourth round and got nowhere near his performance of last year. The little model of Davitt maxed comfortably and so did Norman Marcus on this flight but not after some difficulty on the first two of the day, one of which looped in under full power but with insignificant damage. Certainly it was a day for robust models at least until the fourth round. Ken Taylor scored his first maximum of the day and this brought his total up into the top ten as none of his sub maximum flights had been that bad. After substantial damage repairs caused by a mislaunch in round three Tim Gray was well away but DT'd early again to clip another two seconds off his total from a flight that would have maxed easily and the pretty all blue creation from Peter Carter that had found such a good patch for a maximum on

Senior too had he had a model for the last flight

Prizes from Henry J. Nicholls, Loctite, Super Models Derby, Humbrol, Micro Mold, Michaels Models Finchley, Hobby Sport Models and donations from Tim Gray, John Fletcher, Dave Stapleton, Jeff Anderson and the Organisation were distributed at the local hostelry where much use was made of both the open fire and the £20 of free drinks laid out to warm the inside and out

## Northern Gala — Church Fenton — 26/10/80

Boats, at least the man carrying sort are rarely classed as essential kit to the contest free flihter. However at this aerodrome the previous year the difficulties encountered crossing the downwind river Wharfe left such an impression on at least one contestant that this year he came equipped with an inflatable dinghy! The drift was once again towards the river but the forecast gales were delayed and the comparative calm that existed all day took few models close to it. Actually hazards appeared at the upwind end of the drome this time when quite early on Radio Scale 'officials' blocked the top end of the main runway with cars in an attempt to discourage both glider towing and retrieving. Moreover they did so whilst one person was actually towing thereby disturbing a contest flight and they were positively rude to at least one other contestant. Funny, we were always under the impression

that it was both dangerous and forbidden to park vehicles on the runways of operational air stations! Certainly if at least one Northern Area member had been willing to give up a day's flying and turn his full attention to running the Free Flight side of things these 'thugs' might well have been better dealt with

This 1980 Northern Gala — probably the second most important centralised SMAE event of the year — was very much a do it yourself affair to the extent of contestants actually filling their own scores in on the boards at one point. Not the surest way of policing the rule that cards be returned between flights! Poor visibility, the forecast of gales and perhaps a little over-caution led to an immediate decision to reduce the maximum to 2.30. Light drift all day then guaranteed huge, and for the most part, meaningless flyoffs but did allow many people to fly in two or more events despite a closing time of 4pm. Events that didn't require flyoffs not surprisingly included all the Minis the top few in Coupe and A1 putting in most of their flights quite late in the day after finishing useful totals in other events. Ball taking little over half an hour to complete his Coupe flights with a slightly hasty and off trim first flight spoiling his total to let Hipperson in who only flew this class to keep warm before the Open flyoff. However he received so much assistance from Mike Fantham and the Davitt family that he was able to finish his winning total in 40 minutes and without moving from the peri-track — he stayed cold. John Godden took Vintage also with flights



the previous flight mysteriously dropped this flight when the conditions were better!

For the top two it had been a matter of no mistakes and with Walker without a model it was left to Sharp and Ball to fight it out in a flyoff. As retrieval had been no problem on the last round this got underway at 5.30 and in perfect conditions. They wound together and launched simultaneously. They were so close in fact that the models very nearly collided on the first power turn. This launch gave a clear comparison of two different trims on outwardly similar configurations. Both models being flat bottomed sections and around 250sq. in. Ball being unable to fly his usual large model as he was already on his second aeroplane. Both models held good climbs with Ball's turning somewhat tighter and generally flying faster than his opponent. The propeller run was also a few seconds longer and it was this that was to decide it as neither model was in lift and both descended steadily with George's model looking to have the edge on the glide probably by way of its more open turn. As the models neared the edge of the drome it was evident that Ball had the better line and his model was seen down whereas Sharps was clocked off either against or perhaps behind the far buildings. The result was a 34 second lead for Ball and the Open Rubber Trophy for the second consecutive year. Similarly Walker took top Junior for the second time and would have been in a position to scoop at least third in

Top left the winning combination. Phil Ball straps wing on after winding prior to final round max. Top right Mrs Neil holds husband Derek's immaculate model in the lee of car boot. Top centre Peter Carter away to a max just before the rain. Above left Jack North holds for Norman Marcus — Norman's model even smaller than usual. Above centre Phil Ball steadies son Anthony's model in jig while he winds. Above right Mike Groome displays very rigid structure on his 550 sq in. monster.

### Open Rubber Trophy — Bassingbourn — 1980

45 entered, 37 flew, 18 completed four flights	
1 Ball	Grantham 15.00 + 5.54
2 G Sharp	Croydon 15.00 + 5.20
3 R Peers	Falcons 14.44
4 T Gray	St Albans 14.41
5A Grantham	East Grinstead 14.26
6 K Taylor	East Grinstead 14.01
7D Davitt	Leeds 13.43
8 P Carter	Croydon 12.52
9 N Marcus	Croydon 12.35
10 B Rowe	St Albans 12.12
14 J Walker	Birmingham 11.00 (1st Jnr)
17 G Neil	Anglia 8.44 (2nd Jnr)
20 A Ball	7.24 (3rd Jnr)
25 S Dixon	Birmingham 5.37 (4th Jnr)

### Open Rubber Trophy 1980, Sponsors

Henry J. Nicholls	Telco Co2 engine + DT Timer
Loctite	50g Cyno + spray
	20g Cyno + spray + Superglues
Tim Gray	Winder
Super Models (Derby)	Dope, Epoxy, glue + cement
Dave Stapleton	Voucher £10 towards winder
Humbrol	Airbrush
Micro Mold	Co2 model kits
John Fletcher	Two pairs pocket scales
Michael's Models	Voucher £5
Hobby Sports Models	Sweat shirt
J Anderson	Cash towards junior prizes
Organiser	DT Timer, four cans Dope, 50 sheets issue, windmeter + £65 cash

Thanks are due to above and also those individuals who made many of the contacts such as Phil Ball, Mike Coomes and Graham Walker.

made quite late in the day. He started at about 2.30pm with a close flight and a puncture on the retrieval bike! Nevertheless he finished a full score in time flying a 'Dusty' Wakefield sized open rubber model which made its last two maximums with enough in hand to have done three if it had been necessary.

Turbulence had never been a big problem but all day it was noticeable how the air generally improved across the drome and many flights that started poorly cheered up quite a bit after 90 seconds or so. This was presumably due to the upwind trees and bushes but they hardly looked substantial enough to have such a dramatic effect. Several people remarked about this so it was surprising not to see more people flying from nearer the middle of the drome.

Reducing light and returning fine rain rendered the fly-offs a sad anticlimax. Rubber was away first and very soon after the close of the contest it produced a first time SMAE win for veteran Tom Chambers who it will be remembered came so close at the Nationals. He flew about five minutes after the start and in the same air as Dennis Davitt. Both of them contacted a helpful patch from modest climbs and managed to drift somewhat slower than the rest of the pack who disappeared with a 'pop' into the murk at times between three and four minutes which in most cases bore no relation to their actual times. That is apart from Russell Peers who undoubtedly flew a good six minutes plus but launched on the start signal and into a brighter patch. Despite going some distance and quite rapidly he was seen sufficiently long for second place. Phil Ball's big model had a tight initial turn and after stopping to grab his bike Phil thought he saw it wind in. However arriving at his model on the ground in little over a minute he discovered it to be Derl Morley's — a model with a very similar colour scheme. Needless to say by this time Phil's aeroplane had vanished and even the timekeeper was unable to hold it for much over three and a half minutes.

In power things went a little better and flights placed in the correct order if distance flown was anything to go by.

## Results — Northern Gala, Church Fenton 26/10/80

A1	
1 J. O. Donnell, Whitefield.....	9.48
2 J. Ashmole, Grantham.....	8.43
3 S. Phillipott, Whitefield.....	8.33
Coupe d'hiver	
1 D. Hipperson, Croydon.....	9.43
2 P. Ball, Grantham.....	9.07
3 T. Davitt, Leeds.....	8.06
1/2A Power	
1 S. Fielding, Moorley.....	9.31
2 J. Moseley, Leeds.....	7.67
Vintage	
1 J. Godden, Leeds.....	7.30
2 E. Smales, Blackburn.....	7.24
3 D. Hipperson, Croydon.....	7.22

However winner Julian Hopper was still unable to make use of his raft as his model did not cross the river although it must have come quite close.

As I have pointed out before the Northern Area have a reluctance to run events for the SMAE. In the light of some recent and ill considered rule changes and then the SMAE's own disregard of their own rule book this attitude begins to make more sense. Nevertheless it would have improved an enjoyable competition if someone could have overseen the whole day's proceedings and thrown themselves into it with as much enthusiasm as others showed in running the raffie and arranged some form of basic prize-giving to round it off. Perhaps the whole thing was run rather too late in the year for such an important meeting.

## Team selection

The penny seems to have dropped at last, that a certain proportion of the selection system for the Free Flight World Championships Team should be held in the year of the contest itself. Presently we are struggling through a 21 flight schedule much of which has been postponed for a variety of reasons with which you may or may not agree. Whatever your opinions on that you must see the present system as unwieldy and impractical especially when run by a committee. (By the way did you know that the SMAE Rule Book states clearly that team trials be run by the SMAE competition secretary!) However it is run the idea of a final or part selection just before the World Championships themselves recommends itself but the earlier selection needs clarification too.

Last year we saw a man come to championship winning form at the time of the championships but after he had failed to qualify in the trials. Some compensation perhaps that he was at least made team manager. Nevertheless had the final selection been run off later he may well have been in and with a very real chance of winning with the form he was showing. It is this form that is very often a state of mind and not taken into account enough with our present system. Much is made of 'post trials depression'

### Open Glider

1 R. Sheen, Nantwich.....	7.30 + 2.40
2 R. Pollard, Tynemouth.....	7.30 + 2.34
3 S. Beal, C/M.....	7.30 + 2.19

### Open Rubber (11 in flyoff)

1 T. Chambers, Darlington.....	7.30 + 5.03
2 R. Peers, Falcons.....	7.30 + 4.21
3 D. Davitt, Leeds.....	7.30 + 4.13
4 D. Hipperson, Croydon.....	7.30 + 4.01
5 J. O. Donnell, Whitefield.....	7.30 + 3.40

### Open Power (nine in flyoff)

1 J. Hopper, Stanstead.....	7.30 + 5.04
2 R. Moore, Biggles.....	7.30 + 4.16
3 R. Peers, Falcons.....	7.30 + 4.10
4 P. Harris, Birmingham.....	7.30 + 3.47
5 S. Screen, Birmingham.....	7.30 + 3.46

but not much is done to eliminate it. It is a natural lack of enthusiasm that builds up in some qualifiers during the long, sometimes as long as a year, wait before the championships. Any qualifiers, but particularly those that may not have attended any or at least many, championships before, can often feel that the team place is the prize itself and 'now I can relax.' This is understandable but not desirable. Interestingly the converse also applies to those that don't quite make the top three. A couple of our best performances in Wakefield over the past few years have come from people who did not qualify at the trials but were asked at short notice to stand in for someone who couldn't go. Jim Punter in '73 and Ron Pollard in '79. In all points strongly towards a final selection nears the event. Obviously some regard must be made of consistency and performance through the year therefore the entire selection cannot be done at such short notice and so quickly as one event. After the fiasco of hoping to reproduce Spanish conditions at this year's trials it would point to a preliminary selection being made from three or four of our major FAI events of the year preceding the championships.

The best two or three scores for each individual being totalled and a list drawn up. This would take the sting out of organisational decision making. If as is likely one event was blessed with terrible weather. However it would not penalise those that enjoy flying in such conditions and would be prepared to do so on the chance of perhaps another day being worse. Anyway each one of these events would have its own prizes as an incentive as at present and no matter what the weather. This would take the pressure of contest directors who up until now have tended to allow the thought of running a trials date to them rather too much in the way of pigheadedness or on the other hand over reaction towards democracy!

From the totalled results the top third in each event would be automatically invited to compete in a selection trials close to the championships date or at least in the same year. However they would all start even again and no advantage would be brought over from the qualifying rounds — the order or the top third would be immaterial. Now before they could fly they would have to sign any declaration that might be necessary of a team member and also turn up on the day with three suitable specification models — finished. That alone should eliminate a few more! The contest director of technical committee would then be free to run the event for these people in a manner that would — within the limitations of the British climate — approximate to conditions likely to be experienced at the World Championships proper — complete with processing etc. Perhaps the contest director should be able to adjust the rules outside the bounds of a normal SMAE event such as increasing the maximum for at least one calm evening round and holding and cancelling if a real gale blew (over the FAI limit 27mph) or torrential rain fell. At least this way fewer people would be inconvenienced if the event was postponed altogether. If the SMAE don't look closely at a system similar to this one next year then they are mugs. As an example of how much I believe in it, I will volunteer to run that final event if they adopt this system. That's called putting your money where your mouth is — what about it?

*Bob Bailey reports....*

## Cardington '81

As many regular readers will know, to put it mildly, Indoor has had its share of problems in that Cardington has not been available this year for competitions apart from the Nationals held in May and reported in the issue. The main problem that arose (as a nice New Year present) was the request by MOD for Crown Indemnity insurance to the cover of £10-12 million (yes).

One reason undoubtedly was that the people concerned with the insurance had simply no idea what the nature of the activity was. With the help of RAFMAA personnel, the SMAE Executive Council, and careful descriptions (for the public) of the various types of indoor model, indoor flying was recognised as being not such a high risk activity as was thought. After about eight months, the message got through and the insurance requirement was reduced back to the original £250,000.

All was not well however. Before the insurance news was known, another problem arose. Due to Government cutbacks, weekend working on meteorological research at Cardington was discontinued from the beginning of June. The immediate result was the request for us to pay for the service of an RAE employee to supervise. Cost — £195 for a ten hour day! This cost is way beyond the means of 20 odd indoor flyers to meet — hence no shed.

By the time you read this, the Indoor Technical Committee will have staged a demonstration of microfilm in Number One shed for the personnel involved in these negotiations. Aimed mainly as a public relations exercise, it is hoped that the demonstration will pave the way for a solution to this problem. Let us hope that we succeed; if not, indoor flying in this country, particularly in terms of World or International Championships participation, is in danger of extinction.

Some diehard anti-indoor F/F people probably consider this not to be a bad thing, may I remind them that at recent World Championships, the British success has been consistently better than in any other branch of model flying. Team placings — seventh in '72, fifth in '74, second in '76, first in '78 and third in '80.

## Model performance

Why should this be? you may ask. At the recent F/F trials weekend, a discussion was held on the very difficult subject of British World Championship performance and team selection. The point was made (as reported in Free Flight News October, 1980, p85) that the performance of British models, particularly Wakefields, in general, is not up to Continental European standards. This may sound pretty brutal but the fact remains that a model built purely for performance in good weather is unfortunately useless (for several reasons) in the weather that prevails in the UK.

This fact has been painfully emphasised by my recent experience with a new Open Rubber model. Built considerably lighter than anything I had in the middle sixties when I stopped flying open, this model appears to have very high potential performance. It has twice failed to maximise in bad conditions even though apparently not being seriously off trim.

John O'Donnell made the point recently that there is a great deal of difference between performance aircraft and contest aircraft — I for one certainly would not disagree! The main point of this discussion is that one cannot easily develop performance aircraft unless good conditions are available — this means the weather in particular. This puts British Free Flight modellers at a real disadvantage since poor weather prevails.

Development of higher performance aircraft can be encouraged by flying early and late when less lift is around and (and this is most important), raising the maximum to say four minutes for the rounds.

In indoor the situation is very different. Lift undoubtedly does exist in say Cardington because the conditions in there are so easily influenced by the weather, but does not dominate flying as is the case with free flight; ie. a different ball game altogether. Indoor flying is 90 per cent perfor-

mance hence its appeal to the purists. In this respect, we in Britain get conditions which can be as good as anywhere in the world. This together with the chance of checking performance fairly closely means we can be (and are) competitive with anyone.

From this viewpoint, the loss of Cardington is really tragic unless another suitable venue becomes available.

Your indoor technical committee need help both financially (paying for the use of flying sites) and dealing with the problems described above. If anyone can offer suitable suggestions, direct assistance or good fund raising ideas, please contact me (as Chairman until the end of November) at 162 York Road, Stevenage, Herts, SG1 4HQ.

## EZB rule changes

Regular readers of this column will be aware that the indoor technical committee proposed a new set of EZB rules early this year, to take effect from the beginning of November. This corresponds roughly to the start of the regular low ceiling events, most of which take place in the North of England.

Comments/suggestions for amending the rules were requested, there was minimal response in writing and much verbiage (from a few people who shall remain nameless). Discussion took place at technical committee level but the committee members generally felt that the proposed formula was the best compromise between the different views expressed. The formula was designed to make models easier for the beginner to fly but still allow enough room for development.

It has since come to the committee's attention that the Northern Area have unilaterally settled on a set of rules for EZB which are similar if not the same, as the technical committee rules. Not only this, the technical committee was not even consulted! Such action is definitely not in the best interests of indoor flying on a national level — indoor meetings do take place in the South of England! In addition, such action makes the technical committee's job of co-ordinating indoor flying in GB very difficult to carry out; when something is attempted in this direction, what does the committee get — complaints!

FOR THOSE WHO have recently joined our readership it may be as well to recap on articles which have already appeared. Since the beginning of last year, we have advised on the decision making process for which type of model to start with, hints and tips on building, flying, simple aerobatics, and competitions. We then talked about simple servicing of radio gear and conversion from dry cell to nicad operation.

With reference to these latter articles, I am reminded that unless you are confident of your ability to carry out the simple servicing mentioned, the radio gear should be sent to an expert, approved, service agent. If you have a 'glitch' with your gear, do not automatically blame outside forces such as interference; nine times out of ten the problem can be put down to lack of battery power, dirty or loose connections or switch, and loose or binding control linkages and horns. I even heard of someone who was convinced that there was a radio fault, since after a manoeuvre he temporarily lost control. It was eventually found that an insufficient number of rubber bands were fitted thus allowing the wing to move in relationship to the fuselage, thereby constantly altering the incidence. He now uses eight bands and has no further problems.

It should be emphasised that many suppliers offer a nicad conversion for their dry cell sets and that if you feel uncertain about carrying out your own 'modifications', it may well be cheaper in the long run to purchase the standard pack as recommended by the manufacturer.

During the past two months we have reviewed kits for models which were submitted by various manufacturers and agents, and we have so far restrained ourselves from mentioning the *MAP Plans Service*. For the uninitiated this service is advertised in several handbooks, *number four* is the one which lists plans for radio controlled aircraft and it contains details of over 150 models including a photograph of each one. The range covers gliders, training, aerobatic, sports and scale power models. Each plan is star graded to denote complexity and degree of experience required to build the model. Next month we shall consider a number of these models which are felt to be eminently suitable for the novice.

As a prelude to this, it is well if we look at some of the advantages of building from a plan and the techniques which are used. Perhaps the three most important advantages, in no particular order, are cost, choice of design, and choice of material.

Depending on choice, the cost saving can be as much as 50% against a kitted model, but since you have to purchase all the items separately the penalty is convenience. In terms of design there is a very much wider choice from the plans service and all of the models offered are of proven design and flying capability. Kit manufacturers do their best to provide suitably graded wood but it is obviously impossible for them to ensure that every single piece is correctly graded for its designated function.

So, having acquired a copy of *MAP Plans Handbook No. 4*, chosen your model and received the plan, what next? First and foremost study the plan and any instructions or sketches until you fully understand the process of construction. If it is a recent

# R/C

## Sport Flyer

by Chris Pinchbeck



**This month: BUILDING WITH PLANS**



addition to the range, you may well be able to obtain a copy of the magazine which first published the plan; this will be of assistance since the 'building instructions' will appear in the article. Having familiarised yourself with the construction method, it is time to prepare a shopping list of wood sizes, types, and lengths. Do not be afraid of over-buying since any materials left over will form the basis of your own stock. Most, if not all, plans will show the wood sizes but if in doubt a simple measurement will determine the required dimensions. By measuring the length of the components off the plan, you can readily list the wood sizes and number of lengths (the standard length of balsawood is 36 inches and sheet is available in 3in and 4in widths). As mentioned above, it is possible to select the right density of wood for its position or application. Bear the following in mind as a general rule:

High density = strong = hard = heavy  
Low density = weak = soft = light.  
Structural members should be medium to hard (spars, longerons, fuselage uprights).  
Sheet parts should be medium (fuselage sides, ribs, formers).  
Most other parts should be medium to soft.  
Specific parts are recommended as follows:

Leading edge — medium to hard;  
Trailing edge — medium;  
Control surfaces — medium;  
Sheet tailplane and fin — medium to soft;  
Tip blocks — medium to soft.  
Remember to keep the tail light since 1oz of additional weight in the tail of an average

sports model can easily mean up to 4oz of lead in the nose to bring the centre of gravity to the correct position.

Having prepared your shopping list (do not forget the extras, and hardware eg: tank, wheels, wire for undercarriage), take this to your local model shop and carefully select the necessary items. If in doubt ask for the advice of the proprietor but be sure to explain precisely what the part is for, so that he can base his advice on all the relevant facts.

You now have a plan and all the necessary parts. The next stage is to make up your own kit, either by preparing all of the parts before starting or preparing for each assembly as you progress through your building sequence be it wings or fuselage first.

There are several ways of transferring shapes from plan to wood and in fact a combination of methods can be used. I personally prefer the tried and tested carbon paper method where quite simply the plan is positioned over the wood, ensuring that the grain direction is as specified on the plan, a piece of carbon paper is put between plan and wood and the outline traced through. One or two points to watch here. 1. Use either an H pencil or a ballpoint pen for tracing. 2. Use 'handwriting' type carbon paper rather than typewriter grade since this latter material will only give a faint line on the wood. 3. Use drawing pins to secure plan, carbon paper, and wood to the building board to prevent any unwanted movement during tracing. 4. Use a ruler or straight edge wherever possible and when tracing curves 'sketch' them rather than trying to

follow the plan with one continuous stroke.

An alternative is to pin plan and wood to the building board, then take a pin and prick through to leave guide holes in the wood. These are then joined up with pencil liners on a 'dot to dot' principle. The pin holes are positioned at each change of direction and on curves need to be very close together to ensure that the correct radius is outlined.

The third suitable alternative is to photocopy the parts of the plan required, then place these face down on the wood and iron on the outline using a domestic iron (not steam) at a medium to high setting.

I am aware of the fact that some builders cut the shapes out of the plan, temporarily glue these to the wood, then cut round the outline. I would never recommend defacing a plan like this since there is no way

*One handy method of accurately marking the shape of components into balsa when building from plans is to take Xerox copies from the plan. Place the Xerox sheet image side down on the wood and apply pressure and heat at a medium to hot setting with an electric iron. Result - nice accurate image of the component on the wood and ready for the knife work.*



subsequent reference can be made in the event of needing a part for repair work. Quite apart from the aesthetic point of view.

Obviously the next stage is cutting. First and foremost, always use a true metal straight edge wherever possible. A sharp blade or model knife can be used up to about 1/4in thickness, anything above this should be cut by fretsaw or in the case of stripwood, a razor saw. If you do not own a razor saw, a junior hacksaw is a reasonable alternative. Plywood and hardwood should always be cut with a fretsaw as there is the danger of a modelling knife 'skidding' on the harder surface with disastrous results to the fingers and thumbs. It is recommended

that any slots or holes are cut or drilled before cutting out the part and that the piece is cut slightly oversize, then sanded back to the correct dimension. Constant checking against the outline on the plan should ensure a properly fitted component. Time spent at this stage will save perhaps hours of trimming, altering, and adjusting during construction. Any vulnerable tabs or other protrusions can be temporarily reinforced with sellotape during the cutting process.

The above method is true for most parts but where there are six or more identical parts, such as wing ribs, it is as well to use templates. Almost any material can be used for a template provided that it is harder than

the wood being shaped. Light alloy is ideal but I normally use 1/4in birch ply for wing rib templates. It is possible to cut each part individually by using the template as a knife guide. But wing ribs are better prepared by making up two accurate templates, one for the root rib and one for the tip rib, and sandwiching a suitable number of blanks between them before carving to shape. To get the most economic use of your wood, the blanks should be cut to an approximate shape but it is often easier and quicker to cut simple oblongs. The blanks are then sandwiched between the templates and held in a vice for shaping. To prevent the inside blanks slipping, I usually drill two 1/16in holes through the sandwich block and

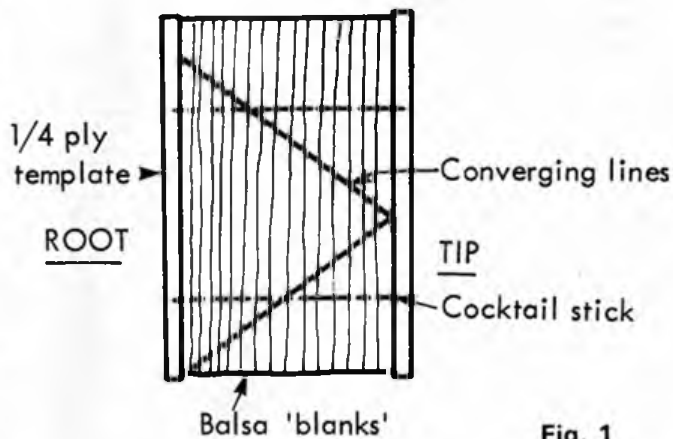


Fig. 1



# PLANS HAND BOOK 4

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pin the whole together by driving in cocktail sticks. these are cut flush with the template so that the assembly can be held in the vice. Initial rough shaping can be done with a fretsaw or razor plane, the final shape is achieved with the use of sanding blocks, coarse, medium and fine. Cut outs for main spars are made with a fretsaw and file and their size and shape checked with a piece of the wood which is intended as the spar. I normally make up two 'sandwiches', one for each panel, and before withdrawing the cocktail sticks to split the pack, mark each 'block' with converging lines (Fig. 1), a different colour for each panel. This ensures that not only are the right ribs used on each side, but that if there is any slight difference in size, the ribs are used in sequence thereby avoiding a sharp contour change along the wing.



This method can be used for constant chord wings and tapered wings provided that in the latter case the exact number of blanks are required and that the spacing of rib stations in the wing is identical. In the

case of a wing which has a constant chord at the root, then changes to a taper in the outer panel two different sandwich blocks for each wing side have to be made.

When all of the cutting out is complete,



Grain direction



End grain



Ply wood



Hidden detail indicated by dotted lines

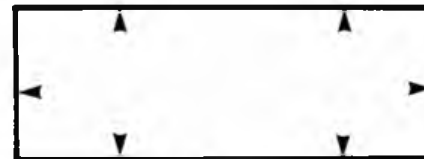


Fig. 2  
Arrow heads clarify outline of component

*The sandwich method of wing rib shaping. Far left upper here rib blanks have been set in a vice between templates and rough shaped. Note the toothpick pegs. Far left lower: the set of ribs, finally shaped. Right: remove templates and pegs and presto, an accurate set of wing ribs ready for use.*



make sure that each part is numbered as per the plan, and that parts for major sub-structures are kept separately in polyethylene bags.

There are a number of drafting signs and conventions used when plans are drawn up and some of these are shown in Fig. 2.

There are several other types of construction material which may be used to good effect and next month we will look at foam and carboard together with suggestions of models to build from the MAP plans.

In the meantime, I would like to hear from any of our readers about their experiences, both good and bad, so that remedies or suggestions can be shared through this column.

# Club News...

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THE FLYING FIELD is a highly prized commodity these days — you could almost say a scarce resource; so when I learn of the loss of one of these valuable assets to the movement — and there have been a number lately — I am deeply dismayed. It does seem that all to often the withdrawal of what has become an accepted amenity is for reasons which are all too insufficient. This gives rise to a great deal of resentment, particularly when it is seen that other activities on the airfield are unaffected. What should not be overlooked is just now dependent a group of flyers are on just one flying field, especially if it is the only one available in the region suited to a particular activity. This is very much true of free flight where the large airfields required are literally hundreds of miles apart.

It does seem wrong that flying field availability should be on the decrease rather than otherwise in a country which is concerned with extending recreational facilities in order to meet the demands of increasing leisure time. Surely, over and above the whims and caprices of local airfield authorities there should be access to some higher power which will give weight to the rights of model flyers as citizen owners and supportive taxpayers of such flying fields.

Roger Brown, P.R.O., and journal editor of the **Northampton M.A.C.**, has sent along the October issue of *'Flying In-formation'*, the heading of which informs us that the club was founded in 1932, when Hawker Harts (presumably), also featured on the heading, were our front line of defence, and when models were still being made from spruce and piano wire. Our first item, too, goes back in time, but not quite that much, just a bare 30 years to an early radio model built by club veteran, Howard Boys. Quite what controls he had on this model we are not told, although in those days they were usually valve jobs with bang-bang escapements. However, with it he got the club's first A Certificate in the S.M.A.E. Achievement Scheme. Still on the old/new theme there is a report on the R/C display given at Holdenby House Crafts and Hobby Fair. Taking off from the billiard table lawn in front of the ancestral home, Trevor Heaseman's pylon racer thrilled the crowd with its tree shaving aerobatics. And a touch of amusement came with Richard Allen's aged Tyro disappearing into the ha-ha. Bemused looks, though, as Snoopy on a dustbin lid disappeared behind the trees (no doubt looking for Woodstock) but cheers when he emerged ten minutes later.

It was a pity that the weather attending upon the **Leicester M.A.C.'s** Gala Day at Arnesby was so dreadful, because it is now known that it was to be the last Gala Day meeting to be held at this popular venue; all flying is to end there on December 31st, noise given as the reason. As pointed out in the club newsletter, so much has been said and written about noise that there is little pertinent comment that can be made, except perhaps to say that complete silence is the only acceptable noise level to some people, and for every genuine complaint there are many mischievous ones from people just looking for trouble. Nevertheless, the quieter our models the less cause for complaint. To more pleasant topics. An indication that more and more R/C power flyers are turning to scale for its special appeal and challenge is given in the thirty or so entries at the *Hucknall All Scale Fly In*, colourfully reported by David Face. For sheer gawpability the super scale model takes some beating. And

any amount of eye popping specimens were on show that day. But all appeared to take a back seat when David Vaughan arrived with his world famous P-51B Mustang (the 'useless' fighter plane that turned out to be a war winner), the detail of which was out of this world — and flew superbly, too, in the strong wind. The Yak of David Face, though, had its moment when it successfully essayed an inverted spin in a well up to standard performance. A few weeks later the Yak was again in action in the club's own R/C Scale competition, which it won in a relatively small entry. Looking for a silly game to pass away that peg waiting time? You make up funny engine phrases like 'Enya old iron' and 'Veco flying every Sunday'.

Still on the subject of scale models we are reminded in the **Three Kings Aeromodeller's** *'Court Circular'* that Dickie Bird, the club comp. sec., won the Knokke C/L Scale Trophy at the Nationals in what was more or less his first try at scale flying. He has a word or two to say about the approach to scale flying in his newsletter column. Very ofputting in his estimation is the possible fate of say, six months of detailed workmanship — one glitch on the flying field and all is gone. But why not, he asks, something on the lines of a Profile Scale event for the less committed model flyer? Only trouble is that the winner is the chap prepared to put in six months hard work even on a profile model. There is a marvellous account in the newsletter of an encounter in 1936 between a Heracles passenger plane from Croydon and the German Airship 'Hindenberg'. It comes from the pen of Capt. P. G. Tweedie, the Heracles pilot and friend of the 3 K's club. The airship, seen from the air at night, was an almost awesome sight 804 feet long and with all lights ablaze. Just to highlight the sort of risks inherent in scale flying, Gary Smith was flying his twin engined 'Invader' on the patch when, like the illfated 'Invader' at Biggin Hill, it just went straight in.

News in the **Hemel Hempstead M.F.C.** newsletter is of the club moving house, as it were. The sports club, which has been their regular meeting centre, is closing down, and the club is making a tentative transfer to Leverstock Community Centre, where they hope to resume their regular club sessions. By way of initiation they put on

## CAPTION CONTEST



*'Who cares about C.B., this outfit operates on 1 Uni-cycle'*

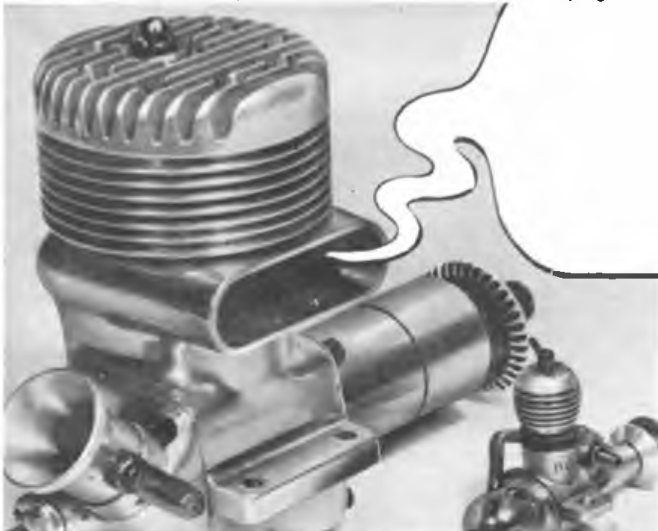
November winner — John Howard, Hitchin, Herts.



a film show of some sixteen years of Farnborough air shows, and made it the occasion for a grand raffle, with a power kit as first prize. Another successful evening was a Do-It-Yourself night, where club members demonstrated their particular skills. It is hoped that other club experts will dispense their knowhow on future occasions. Coming from the clubroom into the open, it seems to be a case of an ill wind blowing etc., for when members found their usual flying field not available, the accommodating farmer gave them the use of a much larger field of smoother terrain. On the other field, they are still sorting out the locks on the gates — all to do with the shutting off of Hogspit Bottom it seems. What a piece of rustic verbiage that is! The newsletter features the longest 'For Sale' list I think I've seen in a club mag. Stacks of bargains in the engine and slightly used radio model line.

From the **South Bristol M.A.C.** newsletter we hark back to September for the type of club meeting that should now be most seasonal: Indoor Free Flight. What was noticeable about this meeting was the improvement shown by members in their delicate art. Chris Coote broke the club record with a 6:51 flight, and Richard Greenslade put in three flights of over four minutes. All good times for a small hall. Coming into its own, too, in these days, is electric r.t.p., where models are getting more and more sophisticated. They now qualify for their own Concours d'Elegance event, which was staged by the club on October 14th. 'Conkers' might not be quite the name of the other game played by club members, which is skittles in the local pub, but it makes a change from all that model flying jazz, particularly when accompanied by chicken and chips.

Generally, the species Junior is not considered so much endangered as virtually non-existent in this Dad's Army of ours, but the editorial in 'Nitro', the newsletter of the **Belfast M.F.C.**, informs us that the species is still very much alive and kicking — a high proportion of members being on the arcadian side of 18 years. Problem is how best to pass on the lore of the older generation to the new, without, perhaps, appearing to be too patronising. Possible scope for talks and discussions at those winter meetings, but no doubt the best place to pass on the knowhow is on the flying field



Humour, it seems, does not always flow like rivers, even when a Caption Challenge like our November edition looks a natural.

In view of the cycle connotation, some reference to R/C activity and the CB scourge was probably inevitable and so it proved to be. Apart from our winner, David Face of Birstall, Leicester captioned it "COME ON, WE'VE GOT TO GET IT RIGHT FOR THE PAUL DANIELS SHOW," while Chris Galloway, Manchester, came in with "I HAD TO CUT DOWN SOMEWHERE IN ORDER TO KEEP FLYING!"

The Wilsons of Stockport, Cheshire, made a bulk family entry from which we selected Mrs. Wilson's "WHEN YOU'VE FINISHED, BILL — DON'T FORGET — PUT THE TAIL WHEEL BACK ON THE SCALE JOB."

P. Bewes of Carnforth, Lancs., came up with "ONE CHANNEL, ONE WHEEL" and also taken by the question of control, Colin Trelaven of Penzance, Cornwall, captioned our scene "QUICK — I'VE GOT FLAPS, I'VE GOT RUDDER, WHERE'S THE SELF-Destruct BUTTON?"

S. S. McEwen of Chapen Cross Anna, Scotland, came in with a tuneful "ONE WHEEL ON MY BIKE AND I'M STILL ROLLING ALONG," while Tim Barrett of Whitby, N. Yorks, captioned the action "THIS ROUND THE POLE IS DRIVING ME AROUND THE BEND!"

Strangely, no-one got anywhere near the original caption when first published in RCM&E back in the mid-sixties, when Peter Holland captioned it "NO — IT'S NOT A MEGACYCLE!"

Why not try winning yourself a year's subscription to *Aeromodeller* by entering this month's Caption Challenge — just send your entries to Aeromodeller, P.O. Box 35, Bridge Street, Hemel Hempstead, Herts HP1 1EE — Results February issue.

where, approachability is the keyword. One result of the build up of junior members is a tendency towards smaller engines, mainly 1.5s. This means more activity in the Mini-Goodyear and 1/2A Combat spheres. And, to help matters along, a plan is included of a nifty little 1/2A Combat model called Genesis — 33. (Six days to build?) This is a flapped design, which any junior could build, given a little instruction on wire bending and linkages.

From *Aeolus*, the newsletter of the **Bambridge Aeromodelling Club** of Northern Ireland, we have a few comments on frequency control. For some odd reason some people even fly with non-matching crystals and pennants. This makes nonsense of the peg board. Other people forget all about the peg. All making for some spectacular crashes, but the implication is obvious: radio flyers must closely discipline themselves, both for their own sakes and others. But to fly radio at all you have first to get over the dreaded 'hurdle'. It is all to do with the loss of confidence that comes with that first crash, and could be the result of insufficient expert instruction. It is like learning to drive a car without an instructor; you go tentatively ahead until you get your first big scare. Properly tutored you will have your nerves under control and the confidence that makes for happy club flying. Just to see what your flying is like two of the club members record the 'how to do it' and the 'How not to do it' through the dispassionate eye of their video cameras.

Another run down of control line contests in the newsletter of the **Wharfedale & D. Aero Club**, with Goodyear and Mini-Goodyear well to the fore. Fourteen teams feature in the Wharfedale Mini-Goodyear League, which can't be bad. Heading the list is the Rothwell/Worfolk team.

A model plane is featured on the illustrated inset heading the newsletter of the **Milton Keynes Model Society**, but nary a mention of anything lighter than a horizontal steam engine in its piston packed pages. I suppose with all these new towns eating up the countryside there is nowhere to fly model planes anyway. It's enough to drive you loco!

Where would you say was the most unlikely place in the world to have a model flying movement? You might venture Sardinia as a possible, but you would be so wrong. Apparently they are not too busy on the island squeezing the little fish into tins to spare the odd hour or two for model flying, for we have from that Mediterranean island quite a sizeable newsletter issued by the *Organizzazione Regionale Sarda Aeromodellistica*. The illustrations reveal quite a profusion of model flying activity, with all types of model dashing around, even free flight. The photographs feature a nifty looking Zlin, R/C power, and a number of nice looking soarers and scale models. This illustrates just how universal model flying has become over the last few decades.

The difference between model flying in New Zealand and over here is that they shiver on their flying fields during the winter months whilst we do it all the year round. Anyway, in the midsummer issue of *South Island News* which has only just reached us (takes such a time by bottle), they are comparing their frosty mornings to the torrid heat of California's Taft airfield. In spite of being tucked away somewhere behind Australia the New Zealanders have always been world conscious in their aeromodelling, although the distances involved and the increasing costs of international participation make for difficulties, particularly, as like us, they do not appear to get state handouts. One thing they are committed to in New Zealand just as we are, is tactical flying. A whole article is devoted to the general impracticability of reading a thermistor meter and circle towing a glider at one and the same time. You can stuff the pole down your trousers, tightening your belt until the meter reaches eye level, but it is not easy to run backwards with a stiff leg. The writer of the article has solved the problem by rigging up a sort of harness. And what does FFONZ stand for? Down, you TV fans, it's the Free Flighters of New Zealand.

The newsletter of the **National Association of Zimbabwe Aeromodellers** reminds us that Zimbabwe is well above sea level, and in the thin air models are something like 15% down on engine power. In such conditions of reduced lift 'scale effect' comes much into the picture, with the small model at a definite disadvantage. I should have thought, though, that the higher temperatures would have had a compensatory effect. A comment, too, in the newsletter of what flying conditions are like down in the Cape, an area known as 'El Cabo Tormentoso'. Called thus because of the winds buffeting the peninsular from both the Atlantic and the Indian Ocean are generally as rugged as the weather. Models flown are mainly of the 'Ugly Stik' variety.

Keep those reports and newsletters rolling.

Clubman

# THIS MONTH: KEEP 'EM FLYING!

**How to make  
those inevitable  
repairs**



HOWEVER WELL a free-flight model aeroplane performs, it is inevitable that damage to its fabric or structure will occur. Without the benefit of some controlling influence from the operator, as with the control-line or radio flyer, the model will seek out the nearest tree, rock or prickly bush on which to attempt a landing. Another frequent hazard of the flying field is the enthusiastic young spectator, who will volunteer to bring the model back. This "fetchermite" will probably trip and fall on the model, or

motors can lead to severe fuselage damage, and power driven models can become unstable due to the build-up of dirt on the oily, uncleaned surfaces in the propeller slipstream.

Obviously, prevention is better than cure, and careful preparation and operation of all model aircraft can help in giving you trouble-free flying. However, you must be prepared for some form of damage, trivial or severe, and this article is intended to give you some pointers on how to deal with it.

plasticene, tissue paper, rubber bands, balsa cement and various sizes of balsa wood, the sections being suitable for the model being flown. Useful additional items include, bandage, transparent adhesive tape, epoxy adhesive, super glue (if you can afford it) and, again depending on the model, rubber lubricant, engine mounting nuts and bolts, fuel tubing, and lead shot.

The commonest type of damage that can occur is a tear in the tissue covering. The smallest tear can simply be rejoined with a



*You're winding away merrily and - suddenly twang - the rubber motor has burst, usually with at least this result to tissue just ahead of the rear motor peg.*



*To repair the damage, completely cut away the entire panel of tissue using a balsa knife with a really sharp blade, coating the framework surface with clear dope.*

pick it up by the flimsiest part, on the assumption that everything that flies has the strength of a Jumbojet.

You, as the flyer, can also be responsible for causing damage to your model. Poor tow launching techniques can lead to collapse of glider wings or a high speed dive into the ground; insufficient care with rubber

A simple repair kit can be put together and taken with you to the flying field, as most accidental damage can be repaired on site. Major repairs should be carried out at home, pinning down the repaired components to the building board while the glue dries. The basic requirements of such a kit comprise a modelling knife, pins,

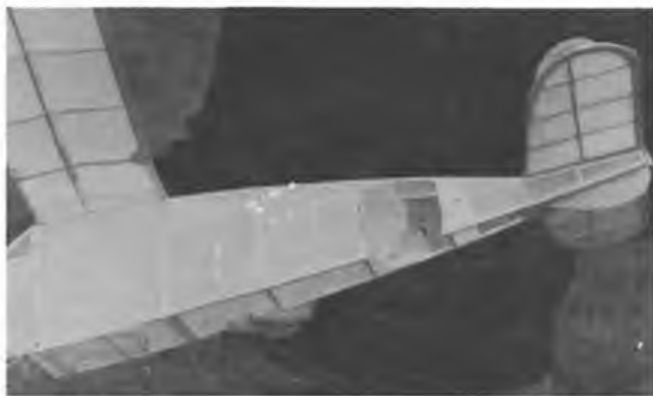
touch of balsa cement, providing the edges can be brought together. Because tissue is under tension due to the shrinking effect of the dope, larger tears tend to pull apart, and often a flap or tissue will curl back. The best repair is to remove the complete panel of tissue, re-cover and dope in the normal way. This is a job for back home, but a temporary



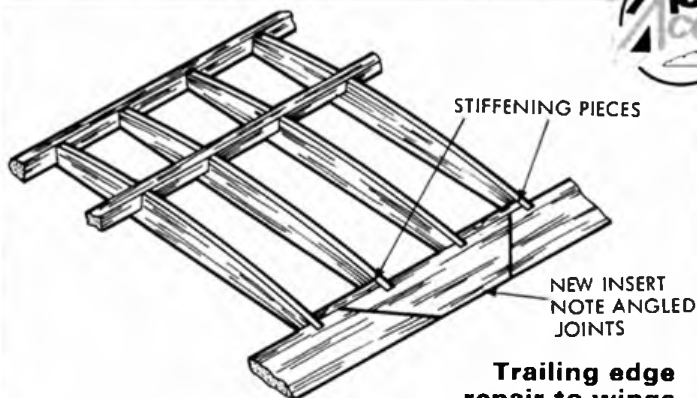
*After dopping the framework edges, apply the tissue patch, again using dope over the edges. Wait for this dope to dry before dopping over the entire tissue patch.*



*For small tears in the tissue, like this one, the panel need not be completely removed - a tissue patch can be doped over to secure the surface.*



*More serious damage around the rear motor peg. Here the lower longeron has been broken and will need replacing.*



### Trailing edge repair to wings

job can be made by cementing a patch of tissue over the tear, or by sealing the tear with transparent adhesive tape. Don't forget that the tissue covering is an important part of the strength of the model, and the damaged area might be carrying quite high loads. A sound repair is therefore essential. Patches of tissues over small punctures can be made almost invisible if the patch is torn, rather than cut, from a sheet of tissue. The resulting ragged edge blends in well with the original covering.

"blushing," that is, the milky white patches that appear in damp conditions.

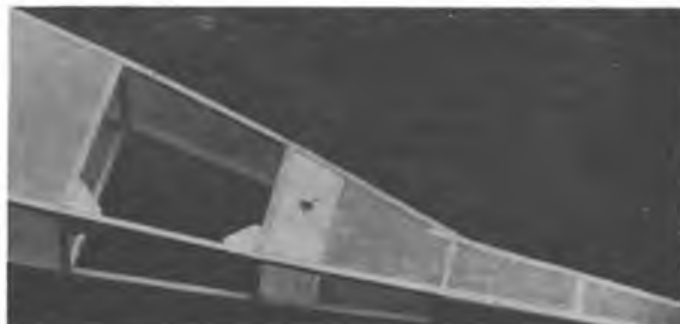
Structural damage to a model can also sometimes be repaired on the flying field. The cyano acrylate "super glues" are very good for making quick, strong joints in balsa wood. Although a small tube appears expensive, only a little is used at a time, so provided the manufacturer's instructions are carried out regarding storage, a tube should last for a season's flying. Balsa cement is the alternative for field repairs,

splint behind the broken member. Badly damaged strip is best replaced by a new length, fitted between the existing structure, and strengthened by bridging strips. Make scarf (angled) joints for greater glue areas. At corners, fit strengthening gussets. Structural repairs of this sort will require the removal of the covering tissue, but with care, the existing covering can be rolled back, and stuck down again afterwards.

Sheet balsa that snaps across the grain



*First job in rejoining that longeron is to tidy up the damage ready to accept a new piece of stringer.*



*A new piece of stringer is trimmed to fit the break exactly, glued in place and reinforced with sheet balsa gussets at the corners.*

and the clear dope makes it transparent. Dope is used as the adhesive, and may be applied over the patch, as it soaks through easily and sticks it down. After drying and shrinking, a further coat may be required on the patch to make the gloss match the original. Doping, of course, must be carried out in a warm, dry atmosphere to prevent

but sufficient time must be left for it to harden off. Some extra stiffening of the damaged component might be achieved by pushing a pin through the two pieces to be joined, but on very small sections, the pin diameter might be relatively too large, and cause further damage to the balsa. In this case, cement a stiffening piece of balsa as a

can be cemented together again, and a length of bandage or several layers of tissue glued over the joint to stiffen it.

Primary structural items, like wing main-spars and fuselage longerons, should be repaired at home. Clamp stiffening pieces of balsa to the damaged lengths, and let them dry thoroughly. Check that the fit of



*A nasty tissue tear at the wing centre section - often caused by a breaking rubber band. Usual repair is to trim out tissue and replace as demonstrated for fuselage.*



*Quick repair to small tissue tears can be achieved on the flying field using balsa cement along the rear line as shown here.*



Nose section of fuselage can suffer badly in a rubber motor breakage. Here, quite apart from tissue splits, a fuselage upright spacer has been broken.



Same fuselage cleaned up, with replacement spacer gusset reinforced and ready to take new tissue covering.

any replacement item is accurate, and not producing any twist in the structure.

Even badly smashed up models can be salvaged. Although a complete rebuild of some part might be necessary, pinned to the original plan, probably the original ribs or formers might be used again. Kit plans often do not show the shape of these items, as they are printed directly on balsa sheet,

the collapse of a wing dihedral joint. Cement the pieces together again, and reinforce the joint on both sides with a layer of bandage. Breaks at dihedral points in built-up wings usually result in the failure of the dihedral keepers. Do not stick these together again, but make new ones.

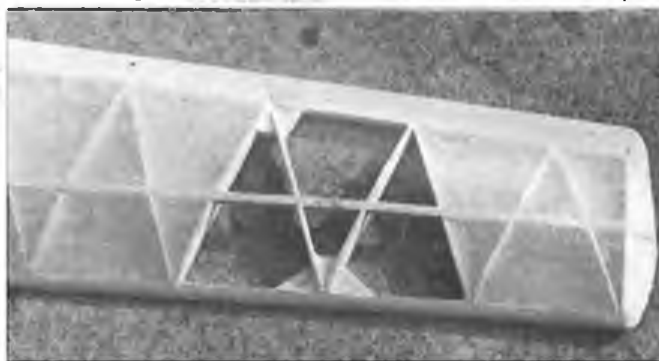
Heavy landings by rubber-driven or engine-driven models can dislodge the

of staining from any part you missed, seal it up.

Although I have been suggesting that repairs to major load-bearing parts should be done at home, mainly because time should be allowed for the glue to harden properly, it might be that you wish to carry out a quick repair on the field. In competitions, for instance, it could be more impor-



Things like fences don't co-exist too well with models. Here in addition to tissue tears, a piece of the wing leading edge has gone and is in need of the treatment drawn below.



Tailplanes, too, catch it on occasions. Here a couple of ribs have been displaced and re-set with gusset reinforcement at both leading and trailing edges.

so that new ones have to be derived from the originals.

The additional weight caused by the repair will only be a small percentage increase, but might affect the balance point of the model, so add ballast to correct as necessary.

All-sheet balsa gliders are more resistant to damage, the commonest failing being

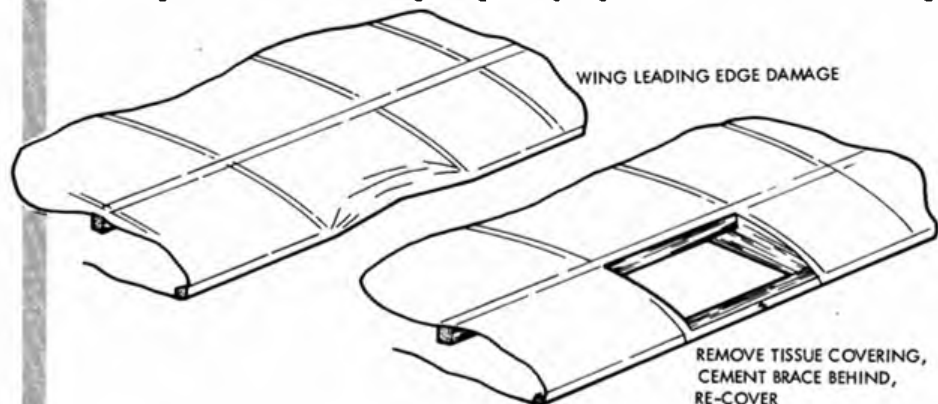
undercarriage fixing. It is unlikely that the binding will have broken, so refit the structure, and stiffen by the addition of gussets in the highly loaded corners.

Exhaust oil from model engines will gradually seep into unprotected wood, which will become soaked and weak. Obviously, complete proofing at the building stage is the answer, but at the first sign

tant to continue flying with a hastily repaired model, rather than have a neater repair made at leisure. Five-minute epoxy adhesive is, as its name implies, quick setting, and can be formed around the broken part to give good support, its hardening time is governed by the temperature, and in winter conditions it can take quite a while to set; if any one has a car handy, put the repaired item inside, or even under the bonnet for some warmth. Prevent the adhesive flowing into the wrong places by building plasticene dams.

However severe the damage to a model may appear, it is always worthwhile attempting a repair. Torn tissue is always worse than it looks, and after removal of the damaged panels, the balsa frame will probably be not so bad after all.

Happy landings.



## Leading Edge Repair

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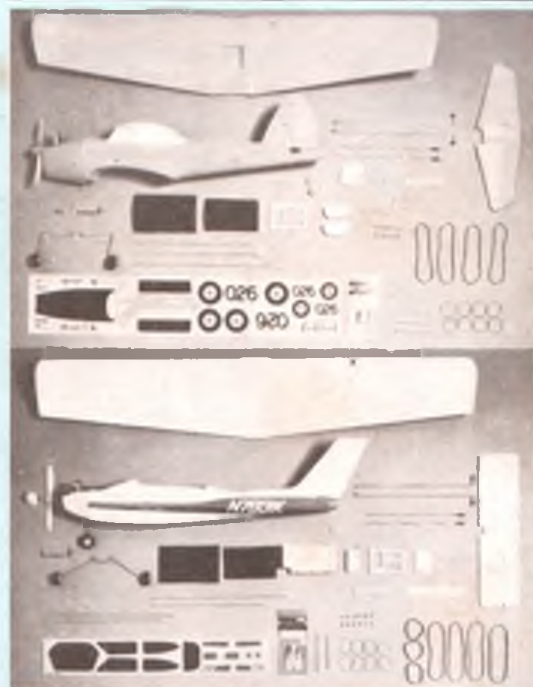


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