

# Aero modeller

MAY 1983 75p  
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MODEL  
MAGAZINE



**Heston Phoenix Vintage  
Scale for Rubber Power**

**Profile Control Line  
Scale Feature**

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28-30 May 1983

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MAY 1983

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M. GRAY  
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# Aeromodeller

## Comment

IT SEEMS only a very short time ago that I became involved full time with Aeromodeller; in fact it is over two years ago. This issue is the last one for me, but I hasten to add not the last one I shall be reading, as I am leaving to set up my own business.

I bought my first copy of Aero-

modeller in 1948 and it has always to the present time been an inspiration to me. There are, and I am sure will always be, many criticisms levelled at this magazine, but the fact remains it is the only journal that conveys the strips and tissue news and views of what's happening, plus over the years many hundreds of plans to build from.

I for one hope that the basic aeromodelling skills will survive through the pages of Aeromodeller even

against the powerful modern age we all live in, where the micro chip, robot and computer seem to encroach on every walk of life.

My thanks go to all contributors for the help they have given to me over my period as editor and also my best wishes to all readers of Aeromodeller for their support which I hope they will continue to give to this great little publication.

Colin Rattray

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### ON THE COVER

Don Knight's Heston Phoenix, built from the full size plans published in the 1938 June issue of Aeromodeller. The original design was by Eric Fearnley. See page 220 in this issue. Cover photograph by Colin Rattray

### NEXT MONTH

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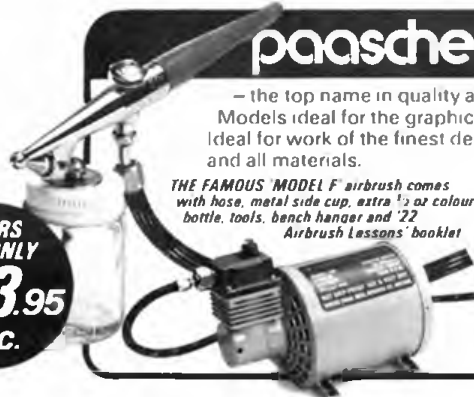
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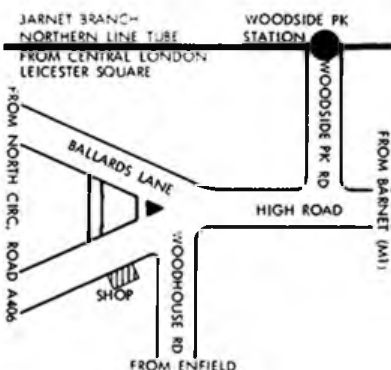
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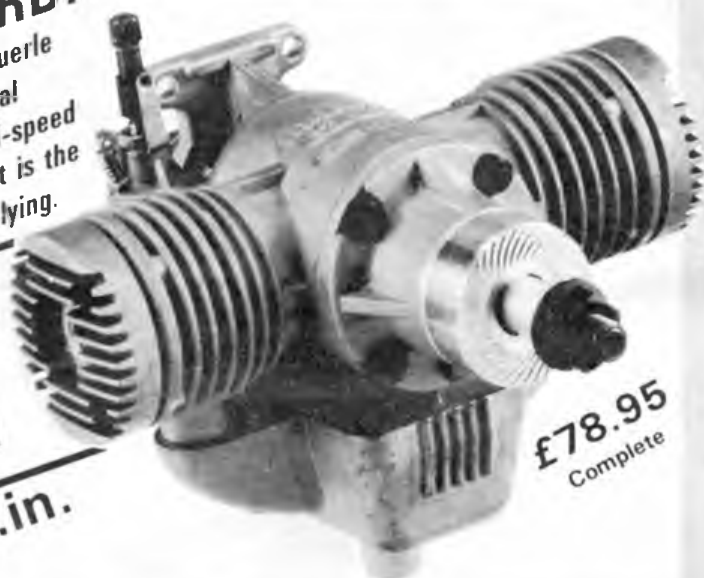
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Janine Rawlins holding the new DPR 'Hyper Cub' a rubber powered, semi-scale, sport model, soon to be on the market.

## SUPERGLOY CHUCKIE CHAMPIONSHIP

DPR Models in conjunction with Supergloy are well underway with their National Junior Chuckie Competition. Preliminary heats have been organised at the following events where DPR will also be holding their Junior Workshops.

**April 30th-May 6th** — Primrose Valley Holiday Week, Filey, North Yorkshire  
**May 28th-29th** — British National F/F Championships, RAF Barkston Heath, Nr. Grantham, Lincolnshire  
**May 29th-30th** — 'Model, Craft & Country Show', Stoneleigh, Kenilworth.  
**June 4th-11th** — Pontins National Model Makers Festival, Hemsby, Nr. Gt. Yarmouth.  
**August 27th-29th** — British National R/C Championships, RAF Barkston Heath, Nr. Grantham, Lincolnshire.  
**September 24th-30th & October 1st-8th** — Pontins National Model Makers Festival, Brean Sands, Somerset.

Additional individual competitions are being organised by schools and clubs, so if you are interested in running one of these heats for youngsters in your area, why not drop David Rawlins a line at Unit 9, The Vanguards, Vanguard Way, Shoeburyness, Essex SS3 9QY.

The winners of all these individual competitions will be invited to take part in the Championship Finals, probably in October/November at Middleton Hall, Milton Keynes, where they will all receive a free kit and T-shirt.

The outright winner will receive the 'Supergloy Chuckie Championship Trophy' and the latest electric powered 'Sirocco'

aeroplane complete with Acoms Radio, provided by Richard Kohnstam Ltd. Second prize is a set of 'Futaba' radio from Ripmax, and third prize is a Piper Cub kit with a Turbo Tank 3000 CO<sub>2</sub> motor kindly provided by Micro-Mold.

## NOTTINGHAM MAC 'SCALE STAFFEL'

This informal event is planned for the 17th July at Old Warden Model Groups Open Day. The event is for rubber or CO<sub>2</sub> scale models. The rules have been designed to make for a fun event rather than a serious competition. The judging will mainly be done by the competitors using a simple 'yes' or 'no' score sheet. Scale documentation for the model should consist of a 3-view drawing of the aircraft and at least one photograph of the full-size machine. Details of the full-size colour scheme in the form of a colour photograph or profile coloured drawing should also be supplied.

For more details contact Chris Chapman at 52 Ryland Road, Dunholme, Nr. Lincoln.

## AUSTRALIAN COMMENT

Way back in December '82 issue when Martyn Cowley reported the U.S. team selection trials for the World Free Flight Champs in Australia, we published the comment that 'the Australian desert in '83 should seem like home turf to the top group of U.S. free-fliers'. Somehow it took an awful long time for that issue to hit the Sydney news-stands, but reaction was immediate when Ivor F. took the trouble to telephone in protest. The site for the World Champs at Goulburn, NSW, is far from being a desert, it is a vast expanse of prime grassland dedicated as a TSR (Travelling Stock Route) and it promises to be the best-ever location selected for the premier events.

Sorry on two counts Australia! Firstly, for the mistaken inference, and secondly for our distributors taking so long to get issues to your Continent.

Maybe they should use our 'Speed Subs' system which enables subscribers to have copies within days of publication in the U.K.

## SCALE CONTEST CALENDAR

April 24	Indoor Scale Nationals, Derby Municipal Sports Centre, Moor Lane, Derby, 11 a.m. - 6 p.m. Peanut, CO <sub>2</sub> , Electric, Open Rubber
May 1	Standoff Line Scale, Croydon
May 17	Spring Gala, Odham F/F Power, Rubber Stand-off
May 22	R/C Stand-off, Merryfield
June 12	R/C and C/L to new F.A.I. Rules, RAF Colerne
July 24	R/C, C/L, F/F, and C/L Racing, RAF Abingdon (awaiting confirmation)
August 27-29	Nationals, Barkston Heath
October 2	R/C, C/L, F/F Southern Gala, RAF Odham R/C (Ripmax Trophy)

## SCOTTISH VINTAGE MEET

Bruce Duncan has organised a Vintage Fly-In to be held on Sunday May 29th at Montrose, about 85 miles north of Edinburgh on the East coast. Apart from vintage competitions, the invitation is also extended to modern scale and free flight modellers who are welcome to fly for fun at this super location.

If you would like to go, give Bruce Duncan a ring on 08287 374 or write to him at Burngrange Farm, Burrelton, Perthshire, Scotland PH13 4PL.

Another project Bruce has been involved in is the production of a new Scottish Aviation newspaper entitled 'Up and Away'. This monthly paper gives details of full-size aircraft that are being restored, reminiscent flying stories, ATC and modelling news. If you would like a copy, send 30p plus a large addressed envelope with a 16½p or 22p stamp on it to: Mark Watt, The Old Schoolhouse, Charleston, Dunfermline KY11 3EE.



Dear Sir,

There are two errors in the March 1983 reporting of the 1983 plenary meeting (p.117/130).

1. p.117 - the scoring system for the F2B aerobatics was NOT changed. This proposal failed to get an absolute majority vote. (Too many abstentions).

2. p.180 - The F2C heat system has NOT been changed. Either a three heat/two best scores system or a two heat-two quarter final-two semi-final system will be proposed this fall. No change is currently recorded.

Laird G. Jackson, MD,  
 FAI, CAIM, Control Line  
 Subcommittee Chairman

Dear Sir,

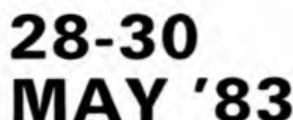
May I appeal through your pages to the electronic geni amongst your readership to invent a little device which I feel might help free flight from being destroyed by its own excellence. This would be an electronic version of the magnet steering used by slope-soaring gliders hooked up to the smaller available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

London NW1.

Peter Lumsden

Aeromodeller





# FREE FLIGHT NATIONAL CHAMPIONSHIPS

There are to be prizes at this year's event in addition to the usual plaques on the field and trophies later at the SMAE Dinner. These prizes will be generated from the forecast profits of the meeting. Their exact



The Junior Kit Contest has been scrubbed and will be run as an event in its own right at Sutton Park on Saturday August 6 — usual rules to apply. This is both to enable more time to go into promotion and hopefully attract a wider field of the right sort of entrants. Further details will be appearing in due course.

Send a stamped addressed envelope to: SMAE (F/F Nats), Kimberley House, Vaughan Way, Leicester LE1 4SE, for entry forms and full details; SMAE members will receive theirs direct and will, of course, be able to compete and camp at a lower fee than non-members. Spectators will again be welcome, and camping will be possible.

# What's Happening?

**SM&E SPRING SCALE EVENT FOR C/L CLASS 2**  
Venue: Old Croydon Airport. Contact: Vic Willson  
Tel: Reading 471964

TYNEMOUTH MAC F/F RALLY F1A (FIVE FLIGHTS, NO ROUNDS), O/R, O/P, COMBINED MINI, VINTAGE RUBBER, MLG Venue: Albermarle Barracks, 15 miles west of Newcastle on B6318, 10am start. Silent flight 11am start. Power Contact Tony Brown, 32 Clayworth Road, Brunton Park, Newcastle on Tyne, NE3 5AB. Tel. 0632 362155

**THREE KINGS FLY-IN C/L STAND-OFF SCALE, PROFILE SCALE.** Many trophies. Silencers and insurance needed. Commence on arrival and fly all day. Any number of models may be entered. Fly for fun is the keynote. Venue: Old Croydon Aerodrome, Purley Way, Croydon. Contact: Wal Cordwell — Tel. 01 764 1661



*Fokker D.VII powered by a Cox .049 glow motor. This model is built from an American Sterling kit and is of all sheet construction.*

## Part 1

The last decade has seen a major change in the approach to scale flying models. Many of the 'difficult' scale subjects, so often considered only possible in the tethered domain of control line, have now been proven eminently practical for the lofty realms of R/C, to the detriment of the C/L scale class. Recent lack of support for C/L scale competitions on a national and

exactly and some of us still turn out such models

## Definition

What then is meant by the term 'Profile Scale'? Well the purist might argue that such a model should represent the 'real thing' in all basic dimensions and areas to within  $\pm$  'X'%, except that the fuselage is only a 'profile', that is — flat — having no

a new plan design, and deal closely with the varying routes along which one might expand. Publishing dates for the series have been carefully and deliberately planned to lead up to *Aeromodeller* All Scale Day at Old Warden on the weekend of 18/19th June. Perhaps this day could mark the start of an upsurge of C/L interest and be the first of many rallies, fun days and get-togethers for the sport C/L enthusiasts. As an aside, that able bunch of control liners, the 3 Kings Club, have featured profile scale in their annual jamboree for a couple of years now, and report a steadily growing interest with great fun being enjoyed by all.

What about it then? Will we see you at Old Warden?

## Starting Points

If one is new to the field or even just short of time the kit model is still the most valid place from which to start. A short while back profile scale control line kits by

# Control Line @ Prof

international front only help to support this fact.

Yet despite this, there is a vast army of control line sport flyers whose prime objective is a simple, cheap, fun-to-fly model, not over-demanding of skills, time or hard-earned pocket money. This is not to say that such modellers are not desirous of an attractive looking model, most would favour the scale approach were it not so complex, time consuming and costly. (Not to mention the attendant heartbreak when the model is damaged or written off).

Profile Scale meets the requirements

resemblance in cross section to the original.

It could equally be argued that such demanding accuracy negates the very idea of the class. I would prefer to consider virtually any 'flat' model (all sheet — though to more complex built-up structures!) that bears a *good visible approximation* to the 'real thing'. After all, for such a class to become widely accepted there is little point in being restrictive from the outset.

In this 3-part series we will consider the various approaches to the subject, produce

several major American companies were freely available in the United Kingdom. America is a country where this category of model is still widely acclaimed. Many of these American kits are still around at the back of model shop shelves just waiting for an upsurge of interest, so go take a look around a few model shops next weekend to see what is available.

David Boarer of Pegasus Models as an example (see small ads. for address). Pegasus import virtually any kit from virtually anywhere if they are asked. However one must bear in mind that the import of single kits can be both costly and time consuming. However David does import batches of kits where the shipping costs are greatly reduced. If, for example, a dozen or so modellers each wanted say, a kit from the Sterling range, David would gather together all the enquiries, perhaps over a month or so, and produce a batch order. Certainly it is worth a phone call to ascertain the current ordering position. Overseas readers of course, will know of their own local supplies.

Like most control models, control line profiles fall easily into three engine sizes

## 1. .049

These are usually around 12in.-18in wingspan and are often all sheet construc-



*Slightly more complex in construction is this P40 Flying Tiger which has a built up wing. This version is powered by an OS20, but the model can be flown on engines up to 0.35cu.in. Note the extremely detailed plan giving step-by-step construction notes for the novice.*

Another all-sheet model from Sterling Kits, a Piper Cherokee powered by a Cox 049 engine. This picture shows how good a scale effect can be achieved, with a carefully done paint job on a very simple model construction.

tion for simplicity and low cost. They may be powered by any of the Cox or Wen-mac engines, many of which have found their way into the junk box over the years. Those of use with a modicum of ingenuity will easily be able to adapt the many surplus .049s left over from broken plastic C/L models.

## 2. .15-.19

This size is probably the best all-round compromise as will be seen as the series unfolds. Two methods of construction are evident. The all-sheet style as with the smaller kits and the composite structure — usually sheet fuselage and tail with conventional, built-up, wings either tissue or nylon covered. Iron-on fabric is also ideal here although one should watch that the wing structure is rigid enough in its own right for many 'iron-ons' (particularly film) impart little of the surface strength provided by doped nylon or tissue. Often



the extra size and weight enables the models to 'stay tight' on the lines over a much wider range of weather conditions. I feel that it is important to consider the weather angle carefully for a great number of modellers have been put off C/L flying (and other aspects too I imagine) due to the failure of their chosen kit in inclement conditions. Regrettably, British weather is such that one must either fly on the

to build but are more time consuming and use more materials (therefore are more costly). However, the larger spans — usually around the 4-4½ ft. mark — offer better performance due to a lower wing loading. Virtually all the kits featuring a .35 or .40 size motor and are simplified stunts having near scale outlines. Line lengths of around 62ft. are typical. Earlier comments about rough weather flying

# ile Scale

## Part One of a three part series by Ian Peacock

models of this size depart from scale wing sections, opting instead for a symmetrical section offering good aerobatic flight performance. In the search for better aerobatics, some kits exhibit the tendency to 'stretch' the wing and tail a little to produce extra area. A carefully chosen and executed paint job however can reduce the overscale appearance.

Whilst many good glow motors abound, the .15-.19 size model is equally at home with diesel motors, and few of us are without a diesel of about this size.

Line lengths of 45-50 feet will suffice and

occasional 'suitable' day or produce good 'rough weather' machines enabling us to fly all year round. Models of the .15-.19 size tend to come out around 3ft.-3ft 6in. wingspan and are no more difficult to build than their small brothers and are often more satisfying to fly.

## 3. .35-.40 and above

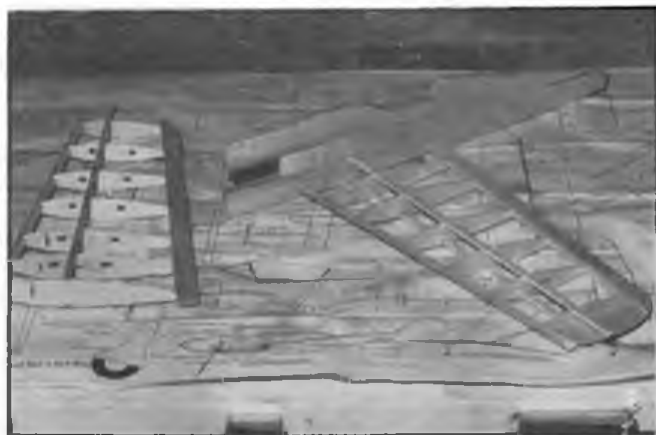
Models of this size are no more complex

apply equally here, for in general the larger the model, the better it can cope with wind and gusty conditions. The more competition orientated amongst us will find that the .35-.40 sized model can be used as an ideal entry into such classes as 'stunt' or 'carrier'. In fact many models from existing classes will fit into the general description of Profile Scale as will be seen next month.

So far no mention has been made of

*Left: The P40 Flying Tiger's Wing. Note the strong wing tip construction, capable of taking a few hard landings. Below: the complete structure ready for covering. This is the stage at which to check CG position, add tip weight to wing and make sure the control linkage works freely.*





British kits. Well, there have been a few over the years, most of which sadly, are no longer with us. The only British manufacturer still making kits is Cambria. Although largely into R/C models, this Mid-Wales based company produce three excellent kits which meet the definition of this category to perfection. The models depict the Hawker Hurricane and Fw190 and Mustang and should be available from your friendly neighbourhood model shop at quite a modest price. In terms of engine size they fall midway between the .049 and .15-.19 size models, being ideally suited to the PAW 1.49 or similar. Structurally they have

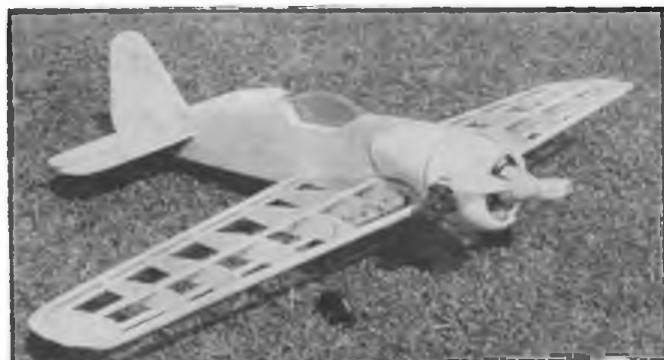
*This FW190 is one of a pair of models available from Cambria, the only UK firm who produce profile scale controlling kits. These kits have well detailed plans, simple structure, and ABS moulded cowls.*

solid sheet fuselage and tails with conventional built up wings. Unusually for profile models, the kits contain vac-formed ABS plastic 'cheeks' that fit either side of the nose of the fuselage, considerably enhancing the looks of the model, if slightly departing from the true definition of 'profile'.

Like most kits, the Cambria models show camouflage details and markings on the plan and include an attractive set of transfers. Whichever route is chosen, the

profile scale model may be decorated to produce an eye-catching finish (in fact these models tend to rely a bit more on the finish than some other categories. It might even be argued that a profile model, properly painted, can create the 'illusion' of a real scale model — proven fact at Aeromodeller Scale day some years ago, when from a distance a judge was convinced (largely by the paint job I feel) that my model was *not* a profile. So get out your airbrushes and go to town.

# Control Line Profile Scale



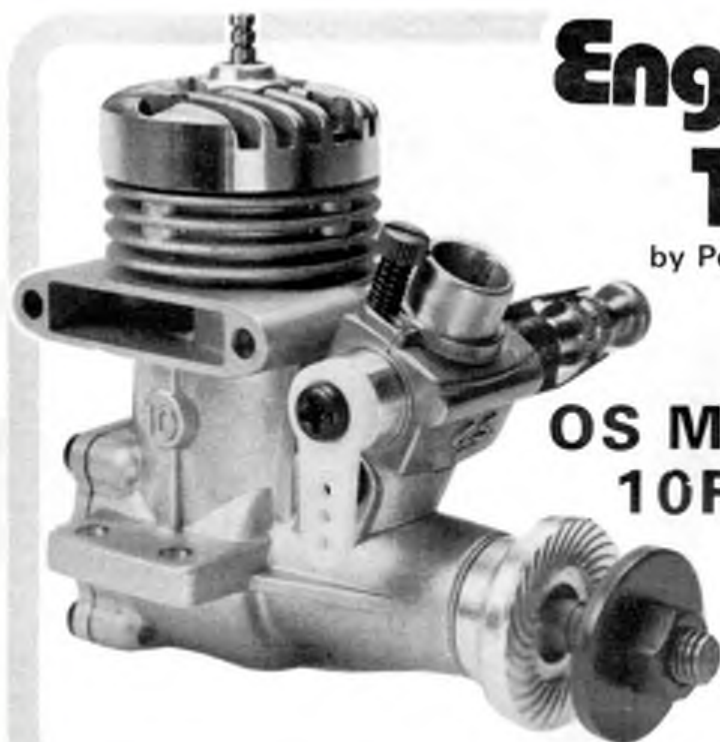
*The Cambria FW190 showing from completed structure to finished model. Note how the moulded cowls give the effect of a full structured model and of course considerably enhanced by the well done paint job.*

## Next Month:

We delve into the realms of MAP plans to find a myriad of ideas old and new. Some hints and tips and several update ideas based on practical experience. PLUS — a new Profile Scale plan featuring four models on one sheet. Meanwhile — remember Aeromodeller Scale Day — 18th and 19th June — let's make it *the* day for Profile Scale!







# Engine Test

by Peter Chinn

## OS MAX 10FSR

pin on circular crankweb with crescent counterweight. 6mm bore gas passage led from rectangular 9mm long valve port. Machined aluminium alloy prop driver keyed to flat on front end with shim steel washer fitted between driver and crankcase nose to prevent wear when electric starter is employed or when engine is used with pusher prop.

**Piston and connecting-rod assembly:** Flat crown, deflectorless, lapped cast-iron piston with fully floating 3.5mm tubular hardened steeludgeon-pin fitted with PTFE pads. Machined high-duty aluminium alloy connecting rod, 23.5mm between centres, with plain eyes and oil hole at lower end.

**Cylinder-liner:** Steel investment casting, having thick (2.3mm) wall containing cast-in transfer passages and located by narrow annular seat in bottom of surrounding cylinder casting. Seat narrowed at three points to allow smooth entry to transfer passages. Single unbridged exhaust port, flanked by angled main transfer ports with upwardly inclined third port diametrically opposite exhaust.

**Cylinder-head:** Machine finished, pressure diecast aluminium alloy finned cylinder head with 2.6mm wide squish-band surrounding small central chamber. Head secured to cylinder casing with four 2.5mm Philips head screws. Single 0.2mm soft aluminium gasket.

**Carburettor:** Barrel throttle type with pressure diecast aluminium alloy body and ground brass throttle barrel, with adjustable nylon throttle lever on right side. Barrel retained by adjustable throttle stop screw. Nickel plated needle valve assembly on left side with jet tube protruding into throttle barrel, giving nominal choke area of 10sq. mm, but adjustable to vary choke area between approximately 8sq. mm and 11.5sq. mm (depending on whether maximum suction or maximum power is required by screwing the jet assembly in or out).

**Silencer:** OS 761 pressure diecast aluminium alloy expansion chamber type. Volume 16ml. Tailpipe i.d. 4.8mm. Outlet are 18sq. mm. Silencer attaches directly to exhaust duct with two long (22.5mm) 2.5mm Philips screws.

### TEST CONDITIONS

**Running time prior to test:** Approximately 1 hour.

**Fuels used:** (i) 75 per cent methanol, 25 per cent castor oil (running in), (ii) 72 per cent methanol, 23 per cent castor oil, 5 per cent nitromethane (tests 1 and 2), 37 per cent methanol, 23 per cent castor oil, 40 per cent nitromethane (test 3).

**Glowplug used:** OS No. 8 platinum element, 1.5 volt.

**Silencer used:** OS 761 expansion chamber type.

**Air temperature:** 13°C.

**Barometric pressure:** 772mm (30.4in) Hg.

**Relative humidity:** 70 per cent.

### TEST RESULTS

**Power output, gross (40 per cent nitromethane):** 0.275bhp at 18,000rpm.

**Power output, gross (5 per cent nitromethane):** 0.240bhp at 18,000rpm.

**Power output, net (with silencer, 5p.c. NM):** 0.225bhp at 17,500rpm.

**Torque, gross (40 per cent nitromethane):** 17.5oz in at 11,000rpm.

**Equivalent b.m.e.p.:** 64lb sq in.

**Torque, net (with silencer, 5p.c. NM):** 15oz in at 10,500rpm.

**Equivalent b.m.e.p.:** 55lb sq in.

**Specific output, gross (40p.c. NM):** 156bhp/litre.

**Specific output, net (w/sil., 5p.c. NM):** 128bhp/litre.

**Power/weight ratio, gross (40p.c. NM):** 1.03bhp/lb.

**Power/weight ratio, net (w/sil., 5p.c. NM):** 0.69bhp/lb.

**MANUFACTURER:** OS Engine Mfg. Co. Ltd, Osaka 546 Japan.

**U.K. Distribution & Service:** OS Products Ltd, Brunswick Industrial Park, Brunswick Way, New Southgate, London N11 1JL.

### SPECIFICATION

**Type:** Single-cylinder, glowplug ignition, Schnuerle-scavenged, two-stroke with shaft rotary valve and side exhaust. Crankshaft supported in bronze bushed main bearing. Throttle-type carburettor.

**Bore:** 13.44mm (0.5291in).

**Stroke:** 12.40mm (0.4882in).

**Swept Volume:** 1.759cc (0.1074cu in).

**Stroke/bore ratio:** 0.923:1.

**Measured compression ratio (full stroke):** 9.0:1.

**Measured compression ratio (exhaust closed):** 6.7:1.

**Measured port timing:**

Exhaust period 146°

Transfer period 124°

Third port period 108°

Rotary-valve opens 35° ABDC

Rotary-valve closes 48° ATDC

### Checked weights:

121gm — 4.28oz (less silencer)

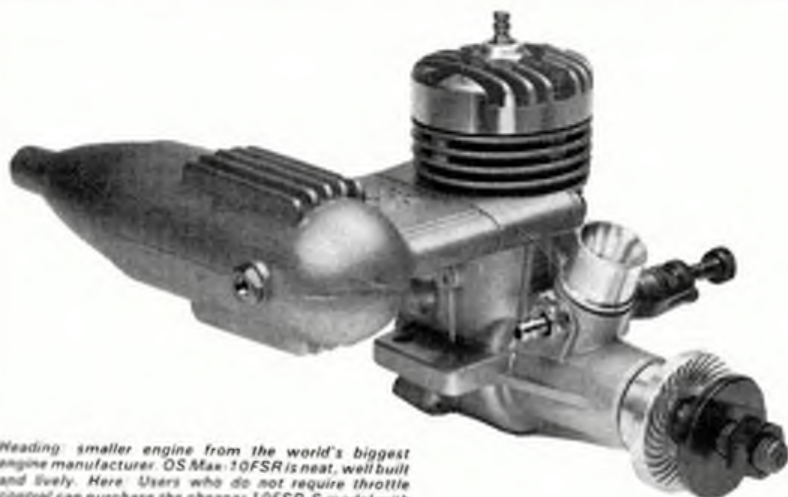
149gm — 5.25oz (with OS-761 silencer)

### GENERAL STRUCTURAL DATA

**Main casting:** Pressure diecast aluminium alloy comprising crankcase, front housing and full-length finned cylinder casing with beam mounting lugs and 8.5mm i.d. intake boss. Cast in phosphor bronze main bearing bush. All joint faces machine finished.

**Crankcase backplate:** Pressure diecast aluminium alloy fitted with paper gasket and four 2.5mm Philips head screws.

**Crankshaft:** One piece, hardened and ground with 9mm o.d. main journal and 4mm solid track.



Heading: smaller engine from the world's biggest engine manufacturer. OS Max 10FSR is neat, well built and lively. Here, Users who do not require throttle control can purchase the cheaper 10FSR-S model with standard venturi and needle-valve.



The O.S. engine range currently numbers over 50 different models and variants in both two-stroke and four-stroke types, the largest and most expensive being a 20cc twin-cylinder four-stroke, the splendid FT-120 'Gemini' model. At the opposite end of the size and price scale is the 1.76cc Max-10FSR two-stroke dealt with here; a neat little engine that is aimed at newcomers to the hobby and at those who favour smaller or lighter types of models.

The suffix letters 'FSR' denote that this is a front induction, Schnuerle-scavenged motor. It is supplied complete with an OS-761 silencer and is fitted with a throttle type carburettor but, for control-line enthusiasts and others who do not need a throttle, it is also available with a simple venturi insert and spraybar assembly and is then designated Max-10FSR-S.

As one might expect of a motor that is appreciably smaller than other current O.S. Schnuerle scavenged units, the 10FSR is a somewhat simpler design than its bigger brothers. It uses a bronze bushed main bearing, a lapped ferrous piston/cylinder assembly and a simple carburettor without a separate idle mixture adjustment. Instead of having its transfer passages formed in its

main casting, these are actually contained within the cylinder liner itself. This has been achieved by making the cylinder liner from a steel casting, the walls of which are thick enough to accommodate the transfer and third port passages without the need of corresponding channels in the wall of the surrounding aluminium casing. An unusual feature is that the liner is rotated in the casing so that the exhaust port is relocated about 40 degrees to the rear. This has the advantage of leaving a continuous vertical wall surface, fore and aft, uninterrupted by ports, against which the piston's fully-floating gudgeon-pin can bear by means of pads, thereby eliminating the complication of circlips.

Owners of early versions of the Max-10FSR may care to note that these had a slightly different cylinder-liner. Current examples, including the model featured in this report, have a longer cylinder liner and, to accommodate this, these later models have an internally modified crankcase. *These parts are not interchangeable.* Early models with the short (24.5mm) liner can be identified by the maker's code letters: FA, FD or GY, which are stamped on the machined underside of one of the mounting lugs. The appropriate O.S. part numbers for

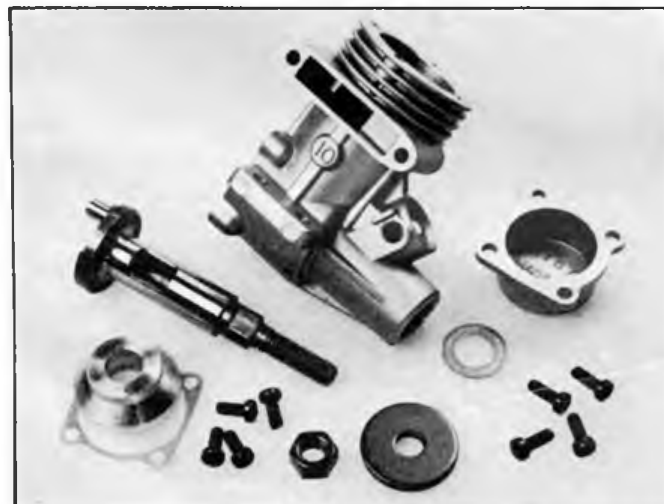
these are 21101007 (crankcase) and 21103001 (cylinder/piston assembly). Engines carrying any other code letters, with the exception of 'GS', are of the later type and the correct part numbers for these are 21101016 (crankcase) and 21103010 (cylinder/piston assembly). The very small number of engines carrying the letters 'GS' may be of either type and it will, in this case, be necessary to measure the length of the cylinder liner (24.5 or 26.0 mm) in order to identify it.

## PERFORMANCE

Since the Max-10FSR is intended for beginners as well as for more experienced modellers, the O.S. company has taken the trouble to provide an instruction leaflet that conducts the newcomer through the basic operating procedure by means of a ten-point starting drill. If he still has difficulty, he can then refer to a subsequent section which lists the symptoms of possible errors in handling and the corrective action necessary.

In fact, we found the 10FSR very easy to handle. As with most small engines, any reluctance to start is more likely to be caused by over-priming than under-priming. For the very first start from cold, the best procedure, we found, was to inject a small prime through the plug hole, after checking the plug for 'glow' (adjust lead length or rheostat for bright red or orange-red glow). Having opened the needle-valve, slightly, from the running setting and sucked the fuel up to the carburettor, it was then found that the engine would start within two or three flicks of the prop. Warm restarts were generally 'first flick', without choking the intake, provided that the fuel delivery tube to the carburettor was full and the throttle was set in the idle position. A single choked flick of the prop was the only preliminary required for a quick restart with the throttle open.

The 10FSR was pleasantly docile as regards handling characteristics. It could be safely hand started on the smallest practical prop sizes with no tendency to



Left: engine's wide exhaust duct conducts gases from port in rear right quarter of cylinder. Shaft is counterbalanced. Below: on right, Max-10FSR carburettor with, below, needle valve and venturi of 10FSR-S model. OS-761 silencer is supplied with both engines.



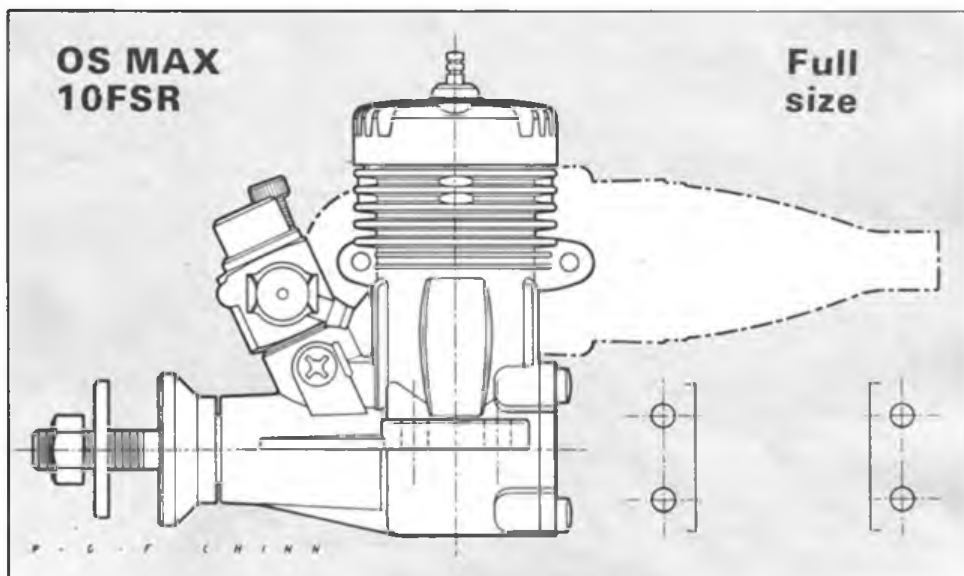
'backfire' or abruptly snap round and bite the fingers of the operator.

The engine ran happily on a wide variety of fuel mixtures, both commercial and 'homebrew'. For initial running-in, we used a straight 3/1 mixture of methanol and castor-oil and a 7½ × 3¼ Bartels epoxy-glassfibre prop. After a quick spot-check on rpm early in the running-in process, it was found that the engine picked up over 1,000rpm in the space of 30 minutes' running time. A switch was then made to 5 per cent nitromethane fuel prior to embarking on the actual testing.

As one might expect of its more modern Schnuerle-scavenged design, the Max-10FSR proved to be a great deal more powerful than earlier O.S. engines of similar swept volume, such as the crossflow-scavenged Max-10. Typical prop rpm recorded on mild (5 per cent nitro) fuel, with the standard silencer fitted, included 11,400rpm on an 8 × 4 Robbe glassfibre-nylon prop, 12,400 on an 8 × 4 Cox glassfibre-nylon, 12,500 on a 7½ × 4 Zinger maple, 13,200 on a 7 × 4 Zinger maple, 15,000 on a 7½ × 3¼ Bartels glassfibre-epoxy and 16,500 on a 7 × 3½ Bartels glassfibre-epoxy.

One of the more gratifying aspects of the tests was the surprisingly modest power loss attributable to the OS-761 silencer. Clearly, this is very well matched to the characteristics of the Max-10FSR. As the performance graph shows, it had a negligible effect on the engine's maximum torque. Only when the engine approached the very peak of its power curve, was there a discernible loss. In terms of prop revolutions, the reduction was of the order of only 200-300 rpm on the prop sizes most likely to be used.

The power available on mild fuels is, obviously, fully adequate for most purposes, but where the user may wish to raise output over the whole rpm range, the use of a 'racing' grade mixture will contribute a useful increase. Our findings indicated that such fuels do not noticeably raise the bhp peaking speed. Instead, there



is a marked increase in brake mean effective pressure, as a result of which the engine is substantially faster on all props. Among the actual prop rpm recorded (less silencer) on 40 per cent nitromethane, were 11,400 on an 8 × 4 Zinger maple, 12,400 on an 8 × 4 Robbe glassfibre-nylon, 13,500 on an 8 × 4 Cox glassfibre-nylon, 13,750 on a 7½ × 4 Zinger maple, 16,200 on a 7½ × 3¼ Bartels glassfibre-epoxy and 17,600 on a 7 × 3½ Bartels glassfibre-epoxy.

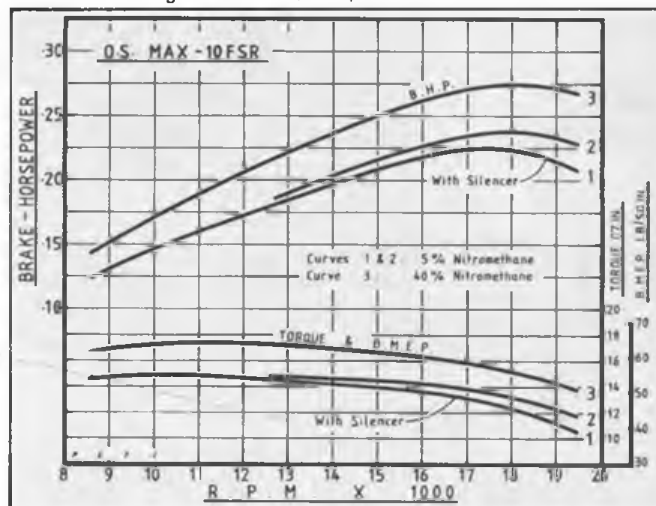
The maximum gross power output recorded on 40 per cent nitro of 0.275bhp is, of course, very good indeed. Running qualities of the Max-10FSR, on both mild and hot fuels, were also good. The engine held steady speeds, showing little or no tendency towards loss of power as it warmed up, and vibration levels were modest.

The throttle worked surprisingly well. We say 'surprisingly' because, alone among O.S. carburetors, the 10FSR's carb has no provision for adjusting the mixture strength

at idling speeds, although it does have a measure of automatic compensation built-in to prevent the mixture from becoming too rich at idling speeds. Above the throttle barrel, the carburettor inlet is bored 5.5mm, whereas, below it, it is reduced to 4.8mm. This has the same effect as a notched barrel: the tendency for crankcase depression to draw too much fuel as the throttle nears the closed position is counteracted by the admission of extra air. On test, the Max-10FSR idled quite happily as low as 2,600rpm on an 8 × 4 Cox nylon prop, rising to 3,200 on the 7½ × 3¼ Bartels glassfibre-epoxy. Recovery to full throttle was reliable and mid-range control was very good.

No problems of any kind were encountered with the Max-10FSR and, completely dismantled at the conclusion of the tests, the engine was found to be in excellent condition. The No. 8 glowplug survived the entire test programme, including a series of high speed runs of up to 21,000rpm.

Below: distinctive feature of 10FSR is its thick-walled cast steel cylinder liner with integral Schnuerle ports and passages.



# SCALE MATTERS

by Alan Callaghan

## Crawley Indoor Meeting

The annual pilgrimage to this regular meeting which caters very well for scale enthusiasts proved to be a most enjoyable day. One of the largest collections of indoor scale models yet seen in the UK proved once more that this really is the one aspect of free flight scale modelling where the interest lies. If our weather was generally better, perhaps things would be different, but at the moment, it is the indoor model that creates the greatest area of interest without any doubt.

The most outstanding model in Open Rubber Scale, and probably of the meeting, was Roy Ashby's Sopwith Schneider seaplane which we have seen before at Crawley. Built to the same scale as Nick Peppiatt's CO<sub>2</sub> Tabloid at 633mm (25in.) span, Roy's model looks so much bigger due to the enormous floats. Many experienced fliers would have qualms about flying such a large model in anything

*Robin James' CO<sub>2</sub> winning Blackburn Improved Type I was very new and pristine but flew well after much trimming. Spans 22in. and weighs 34 grams.*



other than a Cardington shed, but doubts were soon dispelled as Roy confidently handlaunched the model on many flights.

After much previous trimming he had reverted to a prop (Peck Plastic) of finer pitch than originally used, but even this combined with the four strands of  $\frac{3}{16}$ in. FAI rubber 580mm (23in.) long does not yet provide enough power for take off from the drop off dolly undercarriage. The model weighs only 70gm (2½oz.) and can do 30 seconds or so in a most attractive slow and sedate manner. Landings on the large floats were no problem on the polished floor. Second place in Open Rubber went to C. Strachan's Baby Ace which put in some smooth flights to show that there is always a chance for the simpler subjects provided that they are built neatly and flown well.

Butch Hadland's CO<sub>2</sub> convertible Lacey tied for third place with a model (which I unfortunately missed) by A. Butterworth. In a similar vein Butch's latest but unflown subject is a 1:12 scale Fike which is also capable of the quick change routine. Being brand new, the model has yet to demonstrate its paces.

CO<sub>2</sub> scale was something of a disappointment on the whole and could have been more interesting if only a few more other models flown during the allotted session had returned official flight scores.



*Right: some of the best Peanut flights of the day were by Graham Collins, RAFMAA, with his Bristol Scout. Model weighs 12 grams, typical flight time, 37.0 seconds. Has won three other events. Left: hardworking Don Diprose and Bill Blake were faced with an enormous judging task as this small section of their tables shows. Below: Terry Knight of Crawley was flying this Davis DA-2A built from Model Airplane News plans in Peanut Scale. Showed great potential and averaged 36 seconds flight times.*







*Cedric de la Nougeradue's unique smaller than Peanut Mustang is covered with airmail paper with all details and markings applied before fitting to the airframe. Most realistic.*

John Blagg's amazing peanut-sized Breda Pensuti triplane was originally built for rubber power but has since been converted to CO<sub>2</sub>. Previous problems with C.G. location due to a virtually non-existent nose moment arm seem to have been overcome in one move by the change in powerplant, and the triplane surprised many with its repeated successful flights. John is to be congratulated on his determination and perseverance with getting this most challenging of subjects to fly so well as a free flight model.

Of all the official CO<sub>2</sub> entries, only two people, Robin James and Butch Hadland managed to have qualifying flights judged. As Robin had made two separate entries with his Eastbourne and new Blackburn Monoplanes, these together with Butch's Lacey were sufficient to make up the three placings necessary to indicate that some kind of contest had taken place! The scores showed clearly that marking was very close and Robin managed to take both first and second, no less. His large Eastbourne now sports a Czech Modela CO<sub>2</sub> motor which was not giving its best performance on the day. Butch took third place, alone this time, with the Lacey.

The Peanut event must have set a new record in entry numbers, with no less than 43 names appearing on the results board

and 86 official recorded flights having been made. Even this number represents only a small portion of the true total number of Peanut flights made during the day.

With such an enthusiastic response and great amount of effort put in by fliers, it seems a pity that only a handful of these models will have a real chance of winning anything. Not only this, every one of these models was carefully judged statically right down to the final placing, which represented a vast amount of hard work for the judges. There would seem to be two ways of making this situation more equitable to fliers and judges alike, if a similar response were to occur in the future.

Firstly, assuming that a corresponding number of prizes could be made available the entire entry could be divided into separate categories such as: WWI, WWII subjects, Pioneer, Between the Wars, Modern Lightplane, etc., much as it is in US contests. Prizes or plaques could be guaranteed for the winner of each class, and to second and third placings if funds allow. It would mean that more people could come away with having achieved something worthwhile as more chances would be available. At the same time the best super-detailed and the best super-flying models would not automatically dominate the entire event as each would only be eligible for one category.

The alternative would do much to improve flying standards and ease the judges workload at the same time.



*Left: Doug Sheppard from South Bristol is now an SMAE Scale Committee member, here gives us a look at his Peanut Scale Halton Minus, a very carefully researched model. Right: in the background Robin James' semi-scale Eastbourne Monoplane is powered by a Modela CO<sub>2</sub> motor, placed second. Foreground shows a CO<sub>2</sub> powered Grumman Avenger, builder unknown. Below: Derek Knight was told to stop flying his Hawker Hunter until he pointed out with great restraint, that the model was Peanut Scale and entered in the contest.*



Qualifying times could be introduced for contest flights, as they are in CO<sub>2</sub> and Open Rubber, which are always far less well supported. A 15 second minimum would be a reasonable starting point, but 20 seconds would be better whenever numbers are as high as on this occasion at Crawley. Only the models that had made over these times would be accepted for judging. Study of any Peanut results board will reveal that this will knock out a sizeable proportion of the entry at the flying stage, but the judges would have more time to spend on other models. It may seem unfair to those who have travelled a long way to enjoy a meeting and partake of a spot of competitive fun, but it should be borne in mind that these are meant to be *flying* models. There is nothing wrong in hoping to improve standards whenever it is possible, and the workload on the judges should be considered if they are to remain happy volunteers.

Certainly, a high entry is very encouraging financially for all sports centre meetings, and equally healthy for the continued development of the hobby. With a few simple changes in the way events are organised we may be able to achieve a broader spread of satisfied customers each time.

Apart from the contest element, the Crawley meeting provides an ideal opportunity for a newcomer to indoor scale to see at close quarters a great variety of models and to meet their builders. It is a most amenable place to renew acquaintances and keep up with the latest developments amongst the best models. Why not make a date for 1984? Someone may be watching out for you!

## Crosswinds

The latest issue, No. 65, of the above titled journal of the Cleveland Free Flight society is a bumper 30-page volume devoted to racing aircraft as a change from the more usual military subjects.

This quarterly publication is painstakingly

*Roy Ashby's Sopwith Schneider impressed everyone with its steady flight characteristics. This very large model weighs 2½oz and can manage 30 seconds from handlaunch.*



ly produced on a voluntary basis, and this one contains three-views of the well-known Cosmic Wind and Minnow series of air racers, together with full-size plans for flying models as well as a wealth of carefully compiled background material on these types. Editors of 'Crosswinds' use published material from many sources but the whole beauty of the exercise is to have it all gathered together in one folder which makes an ideal documentation file. Together with this information on the racers is a full breakdown of the Third Flying Aces Nationals results which makes very interesting reading. Some of the following statistics give an indication of the

true strength of non-R/C Scale interest that abounds in the USA: FAC Rubber Scale — 55 entries; FAC Peanut Scale — 48 entries; GHQ Peanut Scale — 26 entries; Jumbo Scale — 24 entries; Golden Age Mass Launch — 28 entries; Thompson Trophy Race — 12 entries; plus no less than six other categories equally well supported. Details of the American Air Race Society are included together with a list of available 3-view drawings and photos of many subjects.

This magazine is highly recommended reading and enquiries should be sent to: TRW Inc., 23555 Euclid Avenue, Cleveland, Ohio 44117, U.S.A.

*Right: Free flight man Martin Dilly tries his hand at Peanut Scale with this Bill Hannen designed Farman airliner. Below: John Blagg with his CO<sub>2</sub> powered Breda-Pensuti Triplane. Model was originally built as Peanut scale but flies much better as CO<sub>2</sub>.*



DESIGNED 24 years ago as the Trener, which was adopted by the Czech Air Force for elementary training, the Zlin Akrobat evolved from the original wooden prototype into the current potent all-metal specialised aerobatic machine.

Powered by a 160hp Walter Minor engine, the aircraft has frequently represented the Eastern bloc countries in the World Aerobatic Championships and has also been used by the British team in this event. At least 18 variants were entered in the 1970 Champs, a sure indication of the popularity of the aircraft.

The latest versions were built as Akrobat Specials with only one seat and it is one of these that our model represents.

## CONSTRUCTION

The plans in this magazine are full-size and ready to use. Our original model was built exactly to the plan as published and flew perfectly first time out. All you need to start building the model are a sharp modelling knife, a few pins and a tube of balsa cement. Medium grade balsa wood should be chosen for all parts, soft wood will land you with a constant repair job and hard grades will result in a 'clunker'.

Use tracing paper to transfer the shape of

the dotted lines and that the plastic propeller bush is put in at a five degree down-thrust angle.

The tailplane is pushed through the slot at the rear of the fuselage and glued in place, making sure that it is square to the fuselage when the model is viewed end-on. This also applies to the fin and dorsal fillet which are cemented to the top of the fuselage. The completed tail unit should then be true and square as shown by the diagram on the plans. Insert the wing assembly into its slot and before gluing in place, check that the wings make an equal angle on both sides and that they, too, are lined up with the tail surfaces like the little rigging diagram illustrates.

A Peck Polymer plastic propeller, shaft and plastic nose button can be used (These items are available from SAMS or the Modellers' Den who advertise in Aero modeller). Don't make a mistake and put the propeller on the wire prop shaft backwards, the front of the hub has small step moulded in, this acts as a freewheel. Finally make a hook for the rear end of the rubber loop and glue it securely in place, covering with nylon tape and well glued, to be certain it won't pull out when the motor is wound up.

shown on the plan. Tie a length of thread to the head of the pin and suspend the model from it. Push small nails into the nose until the Zlin hangs straight and level. Modelling clay can be used instead of nails but which ever you use, balance carefully making sure the model is really level.

Point the nose into the wind if there is one and push, don't throw the model, with the nose pointing slightly downwards.

It should glide gently straight forwards. If it swoops first up then down, it is stalling and should have a little more weight added to the nose.

If the model dives, remove some of the weight. The Zlin should glide straight, if it turns to the left or right, this may be due to warps so check for these and gently bend the rear edge of the fin until the flight path is straight.

Now you can try some powered flights. Wind the prop clockwise about 100 turns and again launch gently, releasing the propeller a second or so before launching the model.

# ZLIN AKROBAT

## By P.A. Shepherd

the components to the balsa sheet and make a start by cutting out all the parts so that you finish up with a home-made pre-cut kit and before assembling the bits and pieces mark all the panel lines and control surface lines with a ball point pen. It's easier to decorate when the wings etc are flat. Take care that the grain of the wood is in the same direction as shown on the plan.

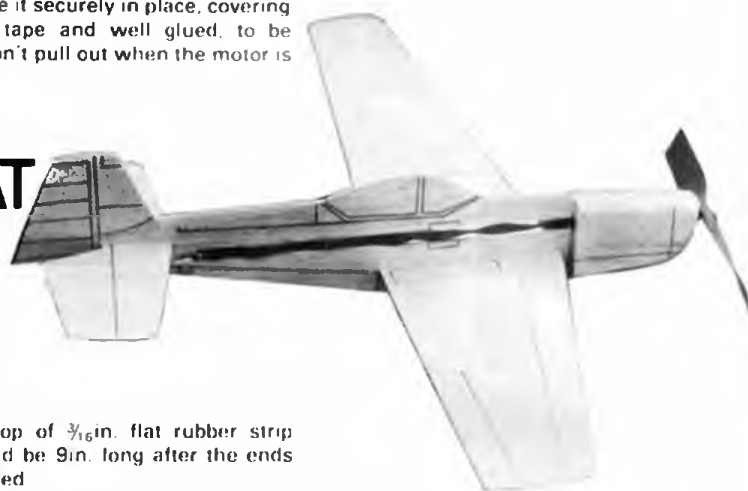
Join the wing panels, first holding one down on a flat board using weights and butting the other up to it after raising the tip 2in by supporting on a block of scrap wood. Leave the wings then to allow the cement plenty of time to dry. Next the 1/8in thick fuselage can have its cowling cheeks added. Note that these are hollowed out to

## FLYING

Fit the loop of 3/16in. flat rubber strip which should be 9in. long after the ends have been tied.

Better flight times will result if the rubber motor is lubricated. Small tubes of special rubber lubricant can be bought from the previous mentioned suppliers. Position the knot at the rear hook, this keeps it from flapping around as the motor unwinds.

Now carefully balance the model as follows. Push a pin into the top edge of the fuselage directly above the black arrow



The original Zlin climbed away straight and then turned as it glided in for landing.

As you gain confidence, increase the number of turns up to about 250. At this our model climbed gently at first then began to climb much steeper as the speed increased until it did a beautiful realistic stall turn and then went into a long glide.

We hope you get as much fun out of your Zlin as we did.

## MATERIALS LIST

12in x 3in x 1/8in medium balsa sheet  
30in x 4in x 1/8in medium balsa sheet  
5in x 2in x 1/8in soft balsa sheet  
5/16in dia plastic propeller  
Plastic nose bearing  
3in of 1/8in dia music wire  
1in x 1/8in nylon tape  
One tube of balsa cement

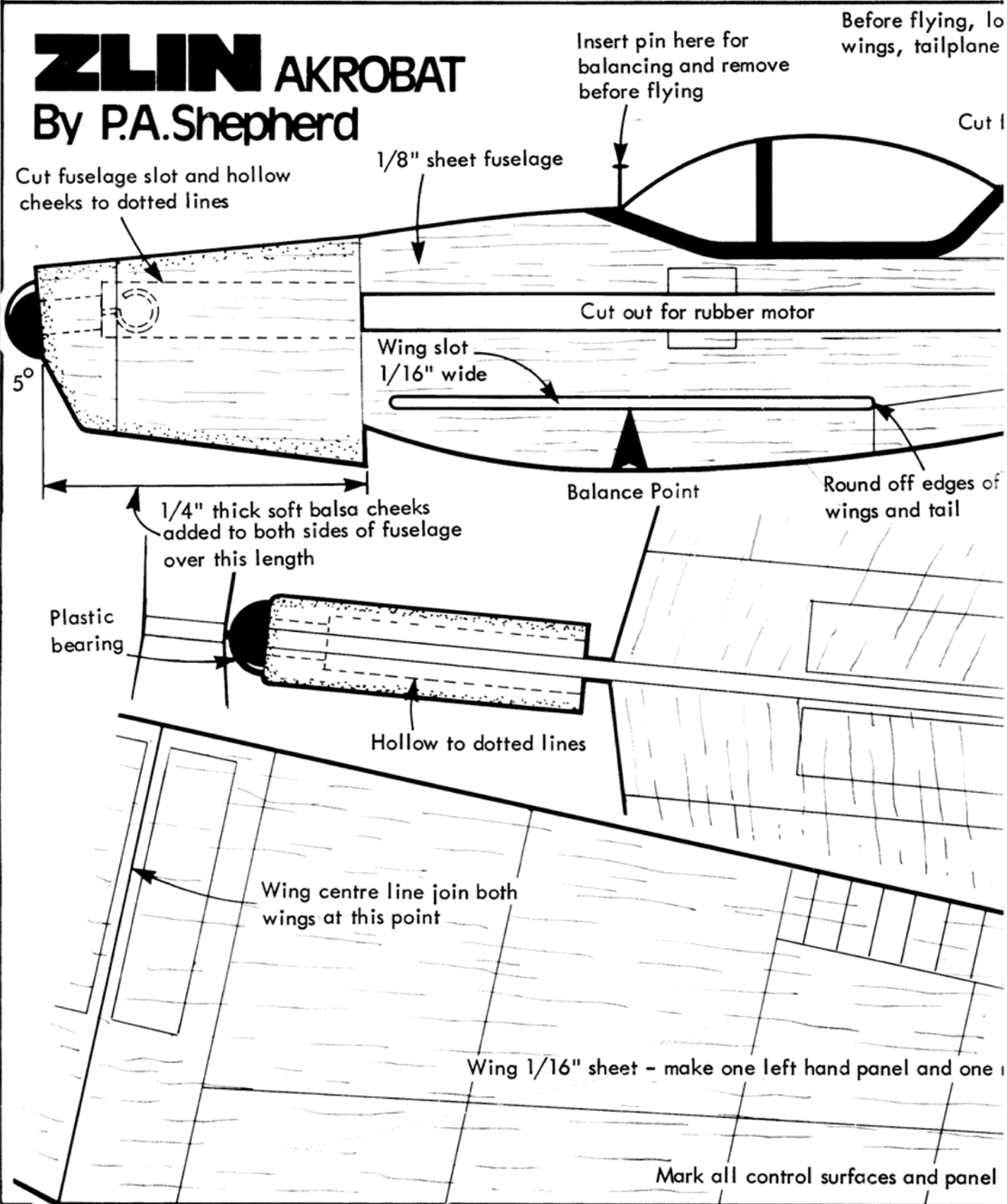
## TOOLS REQUIRED

Modelling knife  
Straight pins  
Small pair of pliers  
Flat building board about 24in x 6in x 1/2in  
Ball point pen  
12in steel ruler

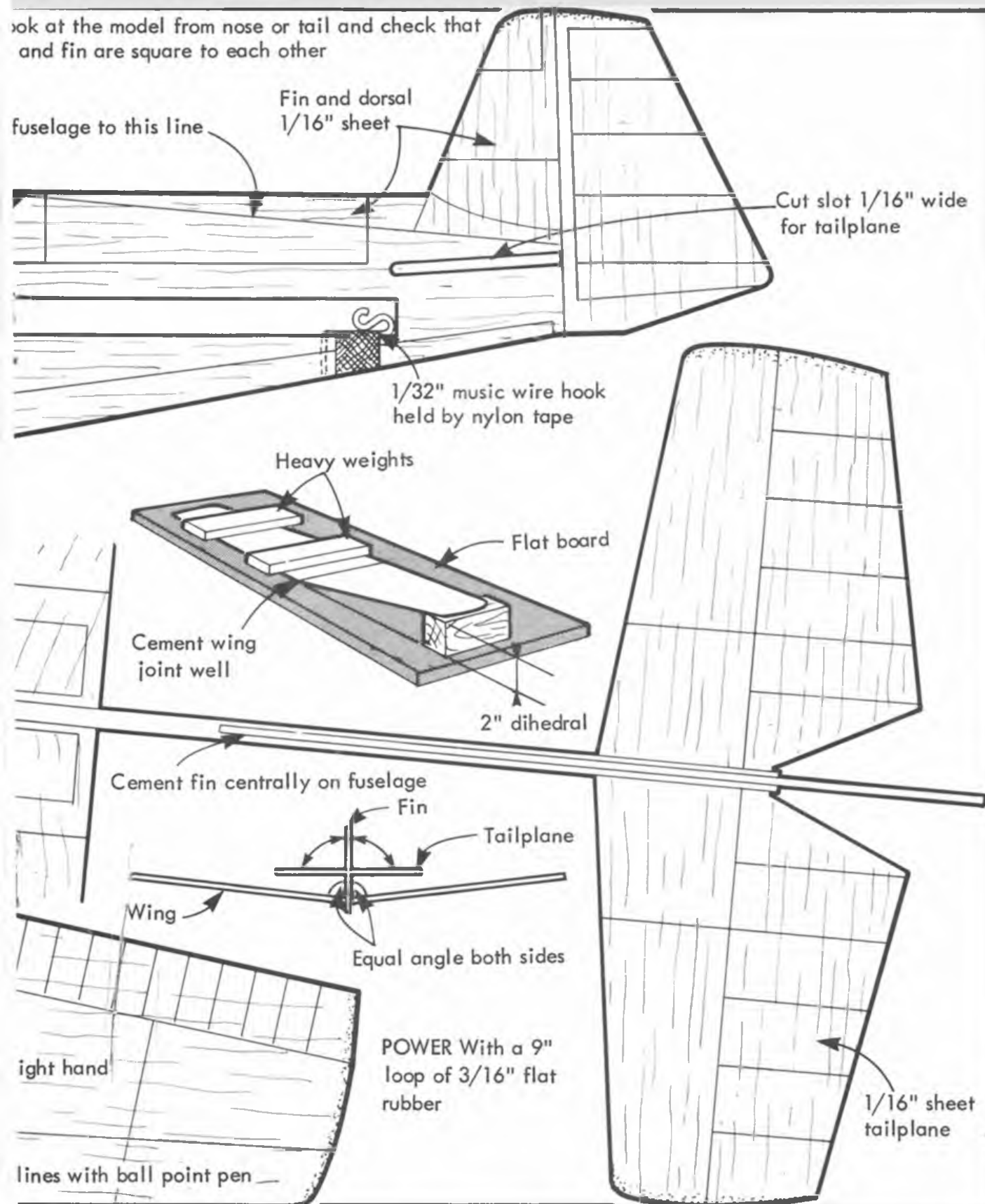


# ZLIN AKROBAT

By P.A. Shepherd







# Aeromodeller

## PHOTO PRIZE FEATURE

Fliar Phil has just ordered some more 'high-octane midnight oil.' He has been burning so much, happily going through all the excellent photo's you have so kindly sent him. Now to business, and let us meet this month's magnificent men and their (model) flying machines.

### Photo 1

We will 'splash' out with our first photo. Something pretty rare on the aeromodel-

## HOW TO WIN A COSINA SLR CAMERA

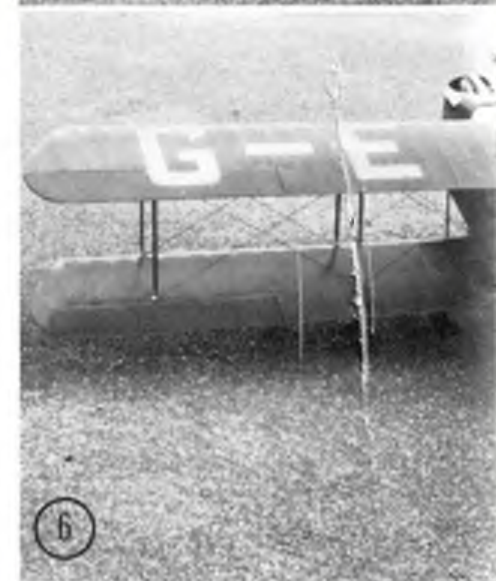


All entries should be good quality black and white or colour prints. Your name and address should be on the back of the print. As many details as possible should be given about the model and its construction. Send all entries to: Aeromodeller Photo Prize Feature, PO Box 35, Wolsey House, Wolsey Road,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

ling scene — a flying boat! Even contemplating building one needs courage, but to get it to fly well also, as Mr. Yea of Devon has done, *is really something*. Details: span 36in., weight 7oz, DC Dart .5cc powered. The 'recovery vehicle' is incidentally — a canoe!

### Photo 2

All the qualities in a model which make it beg to 'get upstairs' are portrayed in this photo from Colin Hollingsworth of North Humberside. It is an Armar 'Gorion' (an RM plan by D. Tapsfield). Span 80in. gets its kick from a Webra 61, and sense of direction from four channel R/C.



### Photo 3

Always a 'scale buffs' favourite — the Hurricane. This 'action shot' by Keith Miller of Kent shows B. Gordon's R/C Hurricane landing, 'dead stick' F.P. himself was 'involved' with Hurricanes in WWII. Good camera work Keith!

### Photo 4

There's no doubt the Germans built classic lines into the Pfalz D11a. Here's a beautiful model replica fitted with four channel R/C by Jim Worden. Mr. Gelder of Cumbria, in this fine photo, has done more than justice to it. Fiar Phil's congratulations to you both.



### Photo 5

A freezing misty morning and an SE5a stands ready for the dawn patrol. Hard to believe it is a model isn't it? Fiar Phil has seen some pictures of SE5a's — but this photo from Peter Morrell of London, tops the lot. Completely detailed — even the exhaust is functional. Power is an OS 80, control by four channel R/C. Get ready to receive this month's camera, Peter!

### Photo 6

Bill Dennis of Reading wrote that Fiar Phil might like to use this photo of his latest job — a 51in. span DH34 with an ED 246 racer up front. F.P. certainly *wants* to use it. Bill. Fine model, and photo. Fiar Phil will be with you in spirit during its test flights. Good luck.

### Photo 7

A real vintage model. If you can't identify it (Fiar Phil couldn't!) it is a scale model of the Waldo Waterman Gosling racer of 1921. Built by Bernard Sexton of Surrey utilising for many parts, materials used in the real aeroplanes. Thanks for saying F.P. does not seem to have aged — however his 'other half' is somewhat grey around the top knot. Bernard!





Full size Heston Phoenix, powered by a Gipsy VI engine



# Heston Phoenix

VINTAGE SCALE

Designed by  
Eric Fearnley  
(1938)

**This slightly revised version by Don Knight was made from full size plans published in the July 1938 issue of Aeromodeller**

## *From the original designer, Eric Fearnley*

I am of course excited about you re-publishing the Heston Phoenix design which I did when 16 years old, though a little startled that I am now genuine 'vintage'. I have no objection to the mods proposed, as I was not then a veteran designer, and do not claim any great feat at the drawing board. It so happens that a friend recently was kind enough to send me photocopies of the original article and drawings in the 1938 AERO-MODELLER.

Still in my wallet, believe it or not, I have found a paper (yes, paper) negative of the actual model. I took the picture on a box Brownie camera, resting on books, and stopped down to the smallest hole, lit by a single 100 watt bulb in a table lamp. The enclosed print was made by copying the paper neg. with a Linhof 4x5 camera loaded with bromide paper. The original camera cost 10/- (50p) and the Linhof about 1,000 times as much! I think I was a better actual builder then than now. My interest was stimulated by Charlie Lutman of the Model Shop in the early 1930s at Newcastle. He must have owned one of the first completely model aircraft shops in the country. His standard of building would shame the Nationals winners of today, and I tried in vain to match his superb finish. I think I have had an inferiority complex ever since, mainly because I was inferior. I met him again about 25 years later, and he recognised me at once. My pocket money was enough to buy half a sheet of 1/16th and a small tube of cement a week, and that's how the Heston was made, but how pleasant life was compared to today!

The publication of the Phoenix design was instrumental in getting me my first job away from home, when I went to Barwell, Leicester to design small scale models for the hobby branch of Burgess Products on the recommendation of D. A. Russell, editor of AEROMODELLER then, until the war. Some of the designs I later did for Aero

Kits Sheffield were on sale in the U.S.A. as collectors vintage items quite recently. The boss at Aero Kits was killed in Singapore, the business folded, and I went into photography after the war and returned to amateur status, but I cannot help having the odd design published to satisfy my ego. I have had six designs published in the U.S.A., the last being the DH4 which was described in the vintage planes magazine there as

being very accurate.

I still fly my radio scale models almost every week and I had a very fast Mustang which I said proved I was not too old to fly — then I pranged it, however it was radio failure so I don't count that.

Thank you for writing to me, and I hope the plans are well received. It would make a very nice radio model for when I get senile.

Eric

The original model built by Eric Fearnley in 1938.





you can't overcome.

Starting with the fuselage, cut out and pin down the keel. Then cut out two sets of half formers and glue one set to the keel. Add the stringers and allow to dry thoroughly. Remove the half fuselage, glue the formers on to the other side and complete the stringers, making sure as you do so that the fuselage remains straight. Fill in between the stringers at the nose with soft  $\frac{1}{8}$  in. sheet and sand smooth. I should use some extra sheet around the rear motor peg fixing and I also sheeted in between the stringers where the tailplane is eventually to be glued.

The wing is straightforward enough. I used four laminations of  $\frac{1}{32}$  in. sheet to replace the  $\frac{1}{16}$  square bamboo at the wingtips. Hard balsa is needed for the main spar to overcome the tendency of the wing to curve upwards when covered. You might even try a slightly deeper spar.

The tail is simplicity itself. All the ribs and spars are made from fairly light  $\frac{1}{2}$  in.  $\times$   $\frac{1}{16}$  in. sheet and sanded to a streamline shape when dry. One word is the key to the back end of almost all scale models — lightness.

Do not be put off by the thought of having to carve your own prop. It is quite easy if you take the trouble to cut an accurate blank. Use hard straight grained balsa for prop and nose block. You need a piece 10 in.  $\times$   $\frac{1}{2}$  in.  $\times$  1 in. If you like you may laminate it from  $\frac{1}{4}$  in. sheet. Mark out the blank as shown. (It

is easier to drill the hole for the prop shaft at this stage while the block is square) and cut it out as carefully as you can. Cut away the back of the blade first so that it has about  $\frac{3}{32}$  in. of undercamber. Then turn your attention to the front and thin the blade down so that you produce a nice smooth airfoil. Round off the tips and start to smooth the whole thing down. At this stage make sure that the prop balances exactly by lightening the heavy blade. This is most important — nothing looks worse than a model with an unbalanced prop shaking so much it is just a blur. Drill the nose block so that you have  $3^{\circ}$ - $4^{\circ}$  downthrust and a couple of degrees of right thrust built in. Commercial thrust washers are available but I have found that those little nylon wheels from old-fashioned curtain runners serve very well. Look in the cupboard under the stairs — you are bound to find some! Only the type with mini ball races are any good.

I had the wings of my model 'knock-off' to save damage and make it easier to transport. The wing is located by two short  $\frac{1}{16}$  in. dowels that slot into brass bushes in the wing roots. A band passes through an aluminium tube in the fuselage and over a small hook under each wing holding them both in place. A similar arrangement holds the struts to the stub wings with a band passing from a hook underneath over the strut to another hook on top and then to the

undercarriage. The outer ends of the struts attach to the wing with press studs stolen from my wife's work box. The whole system seems to work well.

When you come to fit all these bits of acetate to the cabin go along to your model shop and buy some R/C modeller's P.V.A. type glue. My life has been transformed by this miracle invention after years of trying acetone, dope, cement, cyano, etc. Even the cat stays in the same room now when I am doing windscreens!

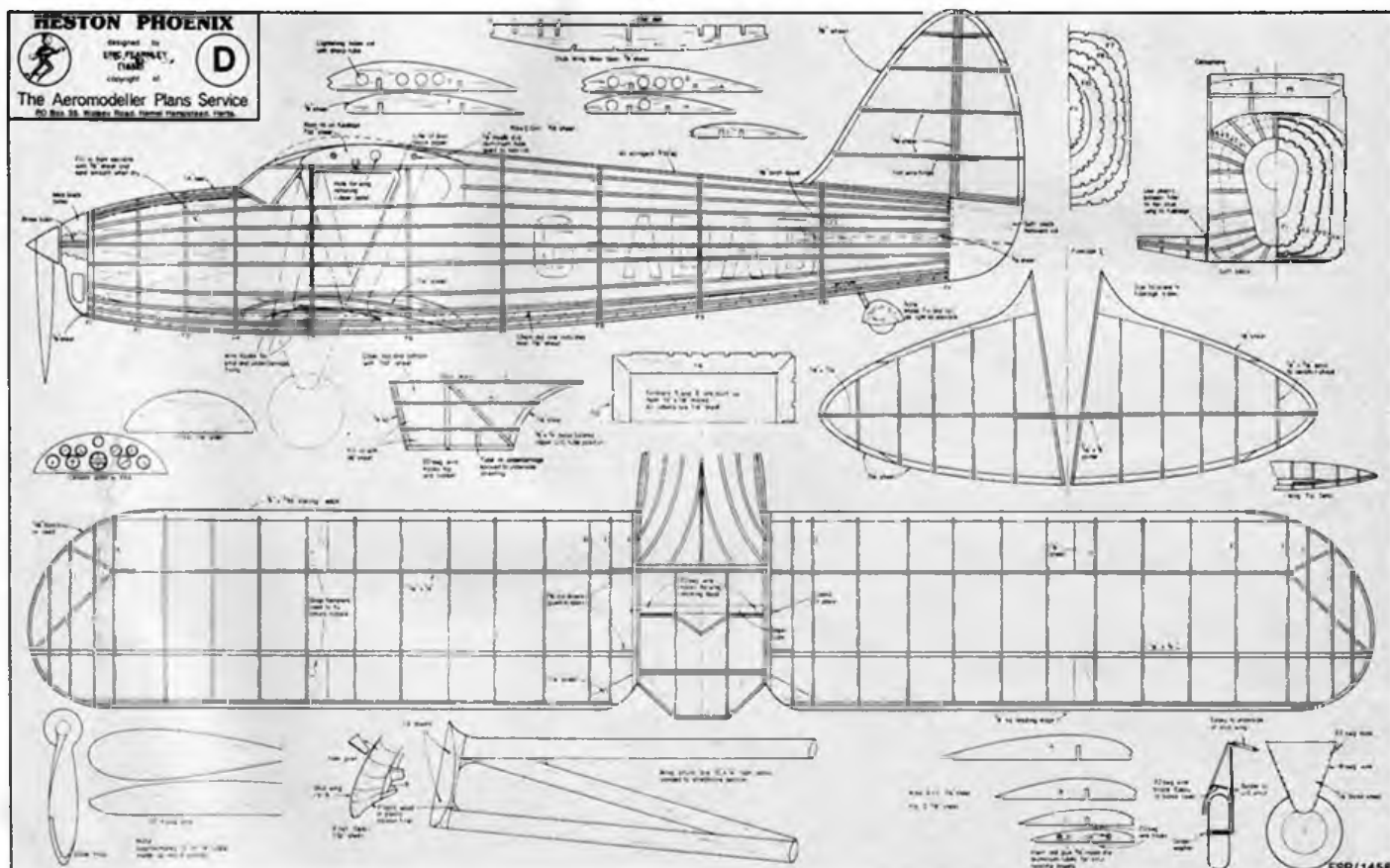
Flying should present no problems. With a c of g about  $\frac{1}{3}$  chord, test glide with about 20 winds on the motor. Cure any tendency to stall with more nose weight. Increase winds, gradually adding downthrust if stalling develops on power. Aim at a nice gentle right hand climb.

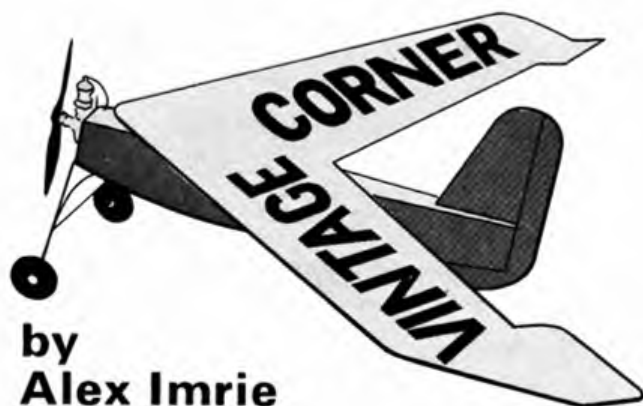
My model weighs 5  $\frac{1}{2}$  ozs with 6 strands of  $\frac{1}{4}$  in. rubber. Remember — keep it light, but not at the expense of strength where it is needed.

Rubber strip can be obtained from suppliers who advertise in these pages.

Come on chaps, let's see a few more scale rubber powered models about. It really is one of the most satisfying and demanding facets of aeromodelling.

*The plan reproduced here to 1/5th scale is available from the Aeromodeller Plans Service, PO Box 35, Wolsey House, Wolsey Road, Hemel Hempstead, Herts HP2 4SS as Plan No. FSR 145B, price £2.00 plus 45p postage and packing*





## by Alex Imrie

### Family effort

There were three modellers in the Harris family, father Gilbert G. Harris and his two sons Frank and GWW. The following brief account of their activities has been compiled from notes supplied by GWW whose work will not be unknown to vintage enthusiasts, since between 1944 and 1949 he had seven designs published in the pages of *Aeromodeller* and one in *Model Aircraft*. In addition he contributed articles on power modelling and jet propulsion and was also a very successful competition flier. Mr Gilbert G. Harris of Farnborough was an avid model maker, and as a youth of 17 years of age his aircraft activities included the design and construction of a 10 foot wingspan canard model powered with a home-made flat twin compressed air engine, which flew successfully as early as 1910.

After World War One his interests turned to model speedboats and he designed and built a successful hydroplane powered by flash steam. As early as 1922 he started to investigate the possibilities of small internal combustion engines to power his boats. He did this by modifying the strut mounted windmill driven air compressors of the Rotherham type (used to pressurise the fuel systems of early aircraft) that he obtained from the scrap heap on Farnborough aerodrome where he was employed as a foreman fitter. By the mid-1920's he had succeeded in producing two 15cc 4-stroke engines with overhead valves. This was some achievement at the time when one considers that Edgar Westbury had only just completed his Atom I, a giant of 52cc with flywheel ignition for Nick Comper's CLA 3 Minor. With these

*Right: G. W. W. Harris with his Goliath, a 9ft. span semi-scale model of the Taylorcraft Auster I, powered by a 10cc petrol engine made by his father. Plans for this model are still available from Aeromodeller Plans Service.*



*While 'Pa' Harris watches, Frank Harris makes an adjustment to the tail-unit of Flamingo II, the machine that he flew into second place in the 1934 Sir John Shelley competition with a time of 3 minutes 42.5 seconds*

engines Mr. Harris powered his very successful hydroplanes named Vagabond I and II which won international acclaim in 1927 and 1928 respectively.

As can be imagined both the Harris boys were keen modellers, air-minded, no doubt because of their father's association with fullsize aviation, and had been building gliders and rubber-driven models from an early age. GWW had already won a rubber-driven ROG competition when in about 1924 he saw his first petrol-driven model. This was a beautifully built 9 feet wingspan

monoplane with a single-surfaced wing that used an early Bonn-Mayer engine suitably lightened and modified. It was the work of three employees at Farnborough who were members of the Royal Aircraft Establishment Model Aircraft Club, and although GWW never saw the model actually fly, it fired his ambition to build a model aeroplane with a real engine.

By late 1928 more sophisticated motors of around 30cc were being used on the water, and GWW was given the first redundant 15cc boat motor by his father, and he immediately made a 10 feet wingspan model for it. This was a complete failure because of problems with the covering material. Available funds did not

*Below left: attractive shoulder wing model by G. W. W. Harris named 'Igo-Too' that was designed to succeed Miss Farnboro'. Completely cowled Rocket 46 petrol engine cooled via louvres. Right: this Ohlsson 60 powered 8ft. span cabin model caught on take off, was entered unsuccessfully by G. W. W. Harris in the 1947 Bowden International Contest.*



run to the amount of silk required to cover such a large airframe and the paper that he used for this purpose did not even stand up to the strain of ground running the engine! He abandoned the project but Frank collected the pieces and used them to build a 12 feet wingspan model that he named Flamingo. This was covered with a form of greaseproof paper, and in an attempt to strengthen the covering Frank wound linen thread around the mainplane in geodetic fashion and glued one inch wide strips of paper over the threads. One good flight was obtained before the covering failed as before and Frank too was forced to discontinue petrol model experiments. It should be noted that up to this time the brothers had never used dope on any of their models.

One can well visualise the keenness that must have been generated in that household for modelling, when frequent visitors were enthusiasts like Edgar Westbury, Gems M. Suzor and R. O. Porter. The last named was the Honorary Secretary of the Farnborough Model Boat Club, and it was due to his very great kindness and generosity that a large parcel of silk arrived at the Harris home one day. In no time Frank had rebuilt Flamingo and real petrol model flying could at last be embarked upon.

Although Frank had the misfortune to be both deaf and dumb he was a most active modeller, his 12 feet wingspan petrol models included Flamingo I to IV using the 15cc engines and the Irene series which were powered by home-made 8cc 2-strokes. GWW built a similar series of petrol models of 10 feet wingspan, naming his variety Prometheus. He used the ex-boat 15cc 4-stroke OHV engines in models I to III, while Prometheus IV used a 12cc 2-stroke of his own construction. GWW had been encouraged to make this engine from the views expressed by the visiting enthusiasts already mentioned, they all considered that at that time the 2-stroke would be the better engine for model aircraft use.

The cost of these early power models was very low since everything was home-made, the possible exceptions being the sparking plugs, these were usually scrounged full-size KLG Mini light aero-engine plugs. All these machines had propellers made from sheet aluminium and were started by a hand operated drill brace engaging in a starter dog on the end of the crankshaft. In the 1934 Sir John Shelley competition Frank flew Flamingo II into second place while GWW was 5th with Prometheus III.

*Below: Geoff Clarke with his Frog Jupiter at Odiham during last year's Southern Gala, an attractive design that Pat Tranfield rescued from the dustbin!*



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and these placings encouraged the brothers to engage in other pre-war power competitions.

An example of Prometheus IV is fortunately still with us! Around 1975 when GWW was preparing to move house following the death of this father, he found one of his old building boards in the loft with the brittle remains of the working drawings of Prometheus IV still attached. In a fit of nostalgia he set to work to build a replica, with plywood from tea chests and deal from the local DIY shop, he built the complete airframe for under £16. GWW still had the original 12cc 2-stroke engine, and he handed the lot over to Jack Frost on the condition that Jack finished the job and flew it. The main difference between this machine and the original is that the current aircraft is covered with nylon. For the last five years Jack has managed to get this large model airborne for us every summer. Long may he continue to carry the Harris banner with this machine and his two fine flying examples of Miss Farnboro.

A great deal more requires to be told.



*Above: Jack Frost launches Prometheus IV on Biggles-wade Common, this large strut braced parasol is a slow steady flyer (see text). Left: close-up of Prometheus IV, showing the 12cc petrol engine made in 1934 by Gil Harris.*

especially about GWW's postwar activities and it is hoped to do this in a future issue, in the meantime the following is a list of GWW designs that are still available from MAP.

'GH20' Wakefield described June 1944 ... Aeromodeller Plans Service  
'GH20' Wakefield described June 1944 ... D. 217 Price £2.00 + 45p p&p.  
'Little Vagabond' described March 1945 PET 136 Price £2.00 + 45p p&p.  
'Igo' Glider described January 1945 ... G/222X Price £2.00 + 45p p&p.  
'GH27B' rubber glider described January 1948 D/281X Price £2.00 + 45p p&p.  
'Goliath' semi-scale Auster I described February 1949 RC/312 Price £3.95 + 45p p&p.

The current issue of Aeromodeller Plans Handbook No. 1 does not list 'Dude' described September 1945 or 'Miss Farnboro' described July 1947, but drawings for these two power models must be around.



*Regular flyer at all vintage meets, Jack Frost launching his Frog 350 diesel powered Miss Farnboro at Old Warden during the storm conditions on last year's Vintage Day.*



## Service with a smile

Ben Buckle's 1983 catalogue is to hand and its 34 large pages contain a great deal to whet the appetites of vintage fans. Not only are 150 plans of vintage, old timer and classic models listed and illustrated but there are details of complete vintage kits and sets of ready cut ribs.

Throughout its pages runs the theme of helpful advice, which all beginners will appreciate. The articles on covering under-cambered wings, selection of the correct engine, thermal soaring as applied to old timers and the Ben Buckle Method of learning to fly radio control vintage, all contain information that is easily absorbed and should result in total success. It is worth noting that Ben spent a considerable time last year teaching beginners the R/C art and the article is based on this experience. The results were exceptionally good and thus the method is passed on with every confidence.

There are full details of the Ben Buckle Old Time Plan Service sponsored Texaco or fuel allotment duration competition for radio controlled models designed prior to 1st January 1951. Competitors will fly at venues in different geographical locations in June, July and August, and this can only result in even more vintage activity than is currently sweeping the aeromodelling movement. In this hard competitive world Ben's approach is like a breath of fresh air, once again one must say, every vintage

*Small models are popular! This reduced size 'Scram' made by John Kemp is powered by a sub-miniature diesel of only 375cc, the handiwork of craftsman Les Saxby.*



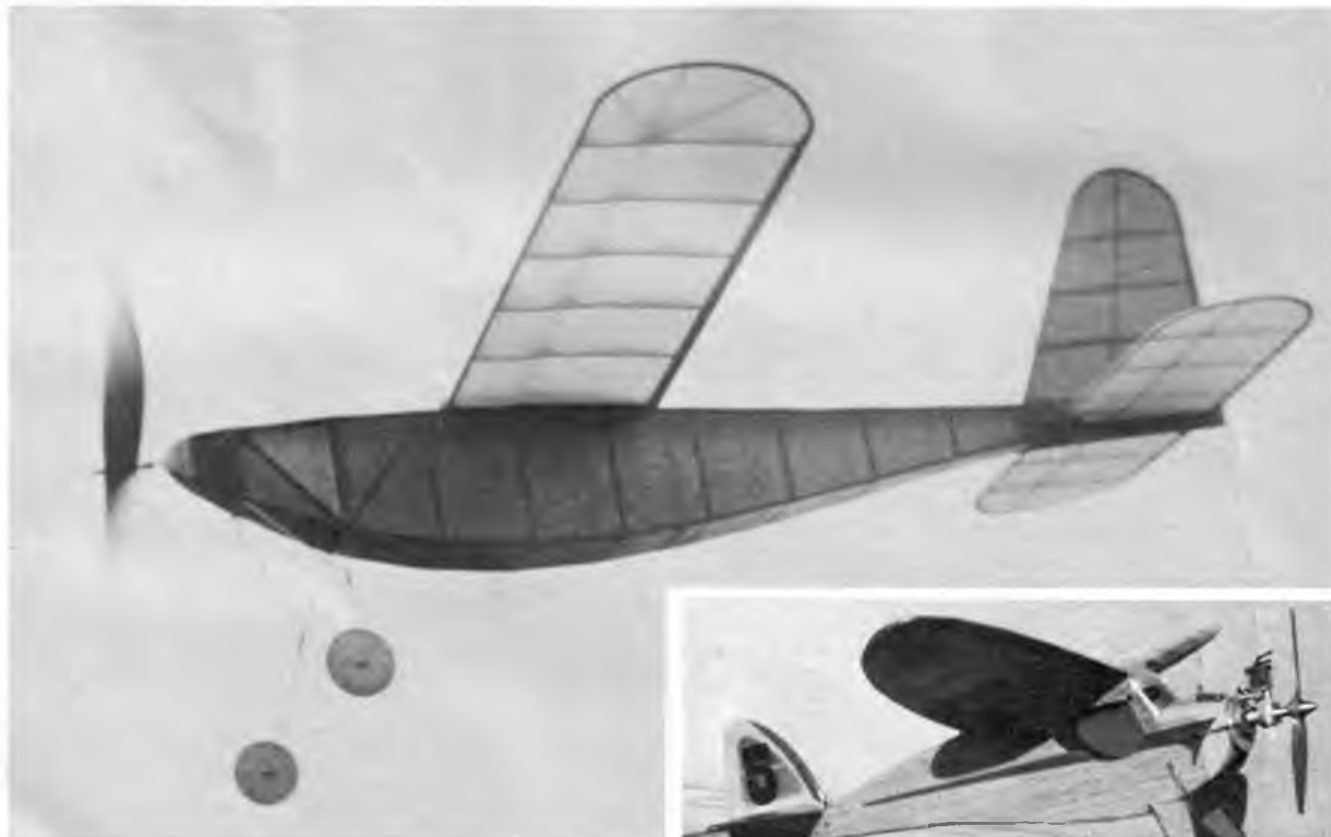
enthusiast should have a copy. The price is a mere 50p (post free), from Ben Buckle Old Time Plan Service, 9 Islay Crescent, Highworth, Wilts. SN6 7HL.

I am always astonished to find 'duff gen' in compilations by true enthusiasts, and Ben does not escape Scot free! Four flying scale model designs are wrongly credited. The Gladiator and BA Eagle were by Cy Finegold and A. Cruickshank respectively, while the TK 2 and the Curlew were the work of C. F. Compton.

## Readers' comments

Geoff Clarke writes that the 'mystery ship' that I could not identify shown in the March 1983 issue is a 'Beep Jeep'

designed by Eric Fearnley that was described in Model Aircraft September 1957! He also identifies the engine as an ED 3.46, so there! Eagle-eyed Geoff spotted that the propeller on Pat Tranfield's Jupiter shown in the same issue, was the 'wrong way round'! It is felt that a short explanation might be in order. Most model aeroplane propellers operate anti-clockwise when viewed from the front, in other words, to use a vintage expression, they are Right Hand Tractors. The reason that Pat's Jupiter propeller is a Left Hand Tractor is that Pat had suitable paddle-shaped blades surplus from a scale model of the Focke-Wulf 190 that he had made in the course of his professional model-making occupation. These were carved in Lime and fitted the



Above: Peter Russell obtained this nice flying shot of his Condor Clipper at Old Warden last year. Plans for this and other interesting Vintage models are available from the designer, Phil Smith. (See current Classified Advertisements). Right: Ernst Schlachter of Switzerland is a Bowden fan, and he built this 23in. span 'Midget' from a photograph and a few scanty dimensions using the well known Bowden building techniques. Model is powered by a Pfeiffer diesel of 6cc.





bill very nicely and were used to make up the two-bladed propeller that flies the model well, albeit with different flight characteristics from a model with a conventional propeller.

My comments on the authenticity of vintage models in the past have urged Mike Beach to take up his pen, his interesting letter contains much food for thought and excerpts follow:

"The problem has arisen because of the natural creativity of modellers and their desire to improve on existing designs, certainly the gorgeous models you see at meetings, fitted with radio control, modern 4-stroke engines and superb finishes are true masterpieces, but they are NOT vintage models. They are an extension of the builders' desire to improve and there is nothing wrong with that. The vintage hobby is based on the desire to encapsulate a period of time, and we have chosen pre-1951, this is the basis and heart of the whole thing. If you want to fly a vintage model and relive this period just use the materials that were available at the time ... it may not be sensible, it may be difficult, but in effect, you have frozen the time into your chosen period. The whole

thing is simple, you either want to fly vintage or (for want of a better expression), 'vintage sport'. Vintage would be everything as it used to be and vintage sport', whatever you feel like — the key being that all materials used in the vintage model must have been available pre-1951. This neatly defines just what a vintage model is and also allows the vintage modeller perhaps more leeway to exercise his creativity.

Despite the strong feeling against competitions in the vintage scene, it would probably help if definite rules were laid down, and some contests planned for the future. This would at least clarify the situation and enable modellers to plan just what they wanted to do. Incidentally there is another aspect of this problem worth commenting on, and this is the desire of some modellers (myself included) to build models as they would have done before 1951. This includes materials, engines and our own designs. I think that this will come to be recognised as a perfectly acceptable form of vintage modelling."

Mike goes on to say that he would be happy to denote a trophy for this class of model. Now does Mike mean new designs? If he does, the name of his game is 'Vintage Style' as has already been commented on in these pages, and a good example of this type of model is Vic Smeed's 'Miss 38' described in February 1982 *Aeromodeller*. The mention of competitions is interesting and this is really the hub around which the rules (as drawn up by SAM in USA) revolve.



Above: Arthur Fox built this 7ft span R/C 'Scream' and powered it with an Enya 40 four-stroke, just take a good look at that structure. Below: Noel Barker's 8ft span Miss Philadelphia VI, its 10cc twin-plug Super Cyclone petrol engine silenced by the time switch, floats in to land. There is something majestic about the flight of large models that hooks one forever once experienced!

## SAM AUSTRALIA

John Tidey writes from 9/15 Ranclaud Street, Merewether, New South Wales 2291 to tell us that he is the National Secretary of a newly formed Chapter down under and would welcome any letters from vintage enthusiasts. Although their numbers are small at present, they plan to hold their first SAM Australia Nationals this year and the sight and sound of vintage models in the various events, is the best possible advertisement and is bound to swell their membership. Good on you Digs!



In UK until now (except in SMAE vintage) our competition organisers have paid little or no attention to any rules, the emphasis being on flying for fun. However, serious vintage competitions will require rules, but there is no need for alarm, no one intends to suppress the enjoyment by imposing these.

Remember last year's Jackdaw and Junior Achilles events run by SAM 35 at Old Warden on Vintage Day? Plenty of fun there.

Right: Ron Raddon (left) applies some body English to the fin of his Megow's Flying Quaker assisted by Pat Tranfield. Ron, who never stopped making Vintage type models, often pulls an old airframe from the rafters and fits R/C to get airborne again. This Quaker is 25 years old!



# Free Flight Scene

## Crawley Indoor 6/2/83

Bob Bailey reports

This meeting is at present the only one of its type to be held regularly in the South of England and as such attracts a large attendance. The only thing which prevents an even larger attendance is its location with 'the smoke' in the way; this rules out participation by those who live close to the Northern events.

This year on arrival in the hall, we found that curtains had been put around the walls and which would, to some extent block off the spectator balconies and get rid of some of the dreadful drift across the ceiling. This did happen for a short time, but the curtains were soon opened up and by the time the first event (EZB) got under way, the drift was back.

**EZB** This event was first on the agenda again despite recommendation on previous occasions that it be held later on in the day when the air might possibly have been more settled. With less than two hours in which to launch all required flights, the event was somewhat rushed and this was reflected in the scores. Because of the warm air, it was surprisingly easy to get too high, hit the ceiling and get whisked across by the 'jetstream' to hit the wall on the other side and lose a lot of potential flight time. The entry was large (25) with a variety of models, the most extreme being Ron Green's with a 27in. long fuselage and an 18in. span tail and microfilm covered. Although it looked very good, he had no luck with the drift and failed to score a high time.

On the other hand, Graham Neil, who had made a lot of progress at Cardington last year in the expert/novice EZB contests had a good model which, I believe, was covered in silver Microlite and a slow revving prop. He managed to pick the right bit of air, was reported to have hit almost everything and recorded a magnificent 10:59 which was so far ahead of the next best flight that with a reasonable back up flight, he was able to win fairly comfortably. Congratulations! My best flight was a no touch 9:11 but all my other flights hit the far wall too high up to steer. Scraping the model off the curtains helped to retrieve some flight time to give me second place. Barry Wade who has flown consistently well took 3rd.

It is a pity that this venue, which is otherwise excellent is bedevilled with this drift problem, which makes the EZB event something of a lottery.

**HLG** This followed immediately after EZB (no rest for the duration men yet) and

attracted a large entry of 22. After about 15 minutes trimming, the contest got under way with two circles in the approved manner. As usual, the Upstart layout dominated. Mick Molton who won last years event had unfortunately broken his best model and the substitute wasn't quite so good. With only six flights to count, there wasn't much margin for error, so consistency of flight pattern was essential. Ron Green flew his ultra light weight (3.8g) model (which is lighter than anyone else's and is almost unbeatable), to what is, for him, a fairly modest total of 72 sec. which was enough to win. I flew a somewhat heavier model (5.2g) to take second with Mick Molton 3rd.

Many people were flying models which are far too heavy for the site; apart from it being too easy to hit the ceiling with a heavy model, there is no substitute for low wing loading provided that reasonable altitude can be obtained. A light model (up to 7 grams) is needed and with a large wing, carbon fibre reinforcement is essential to stop the whole thing from blowing to bits when launched. These models do have to be thrown really hard, but because of the lack of a finger grip, behind the wing, the action is different from outdoor models and takes some getting used to.

The scale entry was large (over 40 in Peanut) and produced a lot of very good flying, and as always much appreciated by the public. A fuller report appears on page 222.

Once again, our grateful thanks to John Dolding and the South East Area for a very well run contest which was much enjoyed and appreciated by all who came; it was well worth the trip.

### Results

**EZB** 25 entries

1. Graham Neil 10.9 + 8.03 = 19.02
2. Bob Bailey 8.20 + 9.11 = 17.31
3. Barry Wade 6.39 + 7.18 = 13.57

**HLG** 22 entries

1. Ron Green 36.1 + 35.9 = 72.0
2. Bob Bailey 31.7 + 34.2 = 65.9
3. Mick Molton 31.9 + 31.2 = 63.1

### Hints and tips

A long time since I have produced any — sorry! I have had requests from several quarters recently to include some practical help on troubleshooting and what to do if things don't work out according to the instructions! I will start the ball rolling with but one item that I have been reminded of recently. Please write in or 'phone me with any particular problems that haven't, for example, been covered by the literature that you have seen.

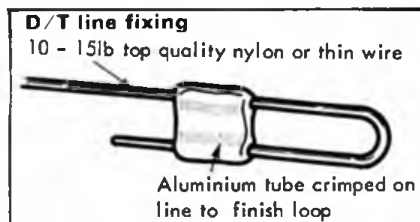
### Dethermalisers (D/T's)

A rather necessary device which has got to be 100% reliable otherwise you may never find out what went wrong! Some of the problems and pitfalls that I have seen myself over the years are:

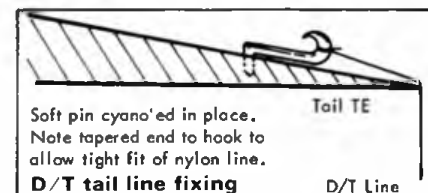
D/T works but the model comes down in

a ghastly nightmarish manoeuvre e.g. tip over tip which almost invariably causes unnecessary damage, like knocking a wing tip off. This is caused by the tail tip angle not being enough (less than 30°) or the tail skewing on its mount (one tip in front of the other) or by the tail tipping more than 90°. The latter happens when the D/T fuse has burnt through the piece of thread that acts as the tip angle retainer. Sounds obvious, but it isn't until you have had it happen yourself or seen it happen to someone else! The way to stop the tail from skewing is to ensure that it is positively located against leading edge stops and that the retaining bands cannot pull the leading edge over the stops. Cut notches in the stops to do this; the diagram shows one way of doing this which I favour.

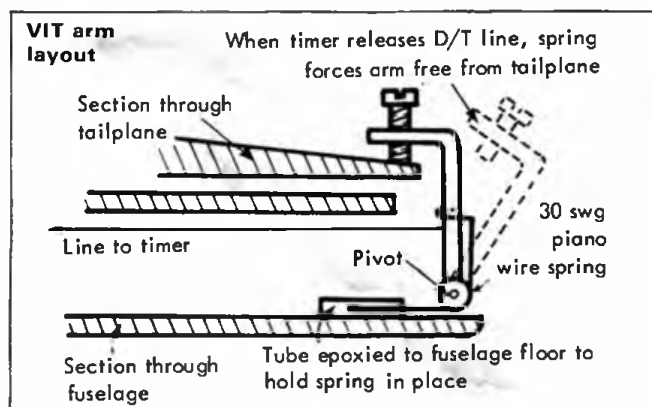
The stops must be made of very hard balsa or spruce and be really well glued on; otherwise they will soon get knocked off and will rapidly wear away. D/T lines (and auto rudder or VIT) should be made from wire or top quality nylon (mono or multifilament) the stuff that is different colours in different places must be avoided like the plague! I recommend 10-15lb for the smaller power models (1/2A) and gliders and up to 50lb for F1C and bigger models. Loops can be made by crimping aluminium tube onto the line.



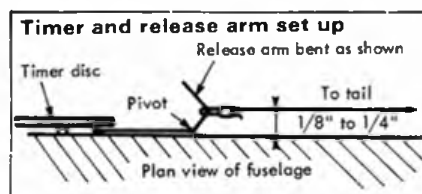
Aluminium tubing can be used to provide the D/T angle stop and is easy to set up. To fix the line on the tail, I use a soft pin with the end bent over and tapered; this allows a loop made from nylon line to be a tight fit and which can be pushed on. If the fit is good, it cannot slip off.



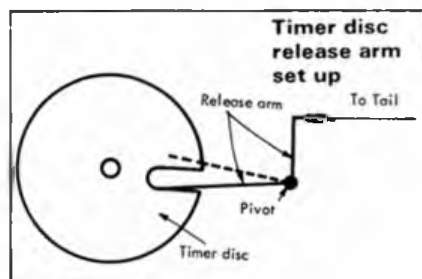
If the D/T is actuated by retracting a VIT arm, this arm must be retracted positively i.e. it must be free to rotate easily and pull out of the way with a 'snap'. I don't like using elastic bands to do the job; they can be overlooked, will perish and the D/T will fail. Coil springs made from 30 swg wire are bad on power models; the vibration from the engine will cause them to break from metal fatigue. The 30 swg wire can be used to make a spring like a hairpin, which retracts the arm and seems to be completely reliable.



At the timer end, make sure that the line is held at some distance ( $\frac{1}{8}$  in. or more) from the release arm pivot; bend the arm as shown, and it will work every time. If this  $\frac{1}{8}$  in. -  $\frac{1}{4}$  in. distance is not maintained, the line tension will be unable to rotate the release arm and will not come off the timer — result another possible cause of D/T failure.



Still on the timer, another trick that can happen is with use, the release arm will tend to rotate to the dotted position and the slot in the disc will not release the line. It sounds impossible, but I have had it happen to me (once only) and was lucky to miss the lift! Bend the arm down a bit so that the slot can move past the arm position. Long may your D/T's continue to work 100%.



## HOTTA

No — it's not a new form of programmed tail or wing movements for control of a free flight model!

**HOTTA** stands for Help Our Team to Australia and it is the brainchild of a dedicated enthusiast who feels that something should be done to help the nine who are going to represent UK at Goulburn. To emphasise his point, he opens a HOTTA fund with a £10 donation which we have passed to the Treasurer of SMAE to hold in a special account.

The facts are simple. The SMAE covers

the entry, accommodation and feeding costs. Some funds are available through the SMAE Team Travel fund; but the exceptional cost of the flight to Australia (twice that of anything previous) will be at least £680. This has to be met by the contestant.

All receipts from HOTTA will be shared equally over the nine fares.

As our first donor says "all active members of the Free Flight Community will chip in at least £5 — no more than the petrol cost for a day at Barkston or Beaulieu. Could any free-flyer find it in his heart not to contribute?"

Send donations to HOTTA Fund c/o Aeromodeller. All donations will be acknowledged before they are lodged with the SMAE Treasurer. C'mon lads, let's fly that flag!

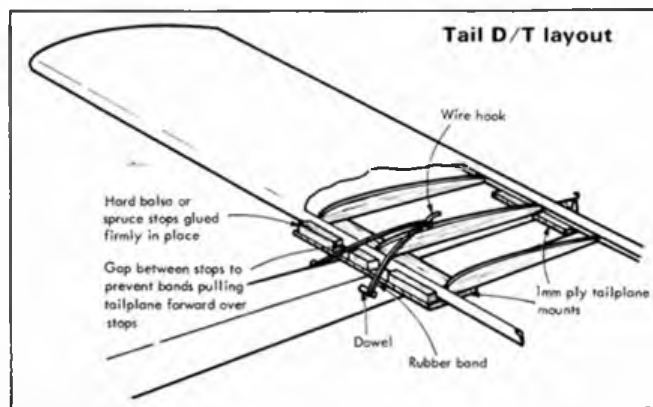
## Barkston Dave Hipperson reports

During the winter the completion of the 'Compound' on the North West edge of Barkston Heath has been a cloud hanging over the use of this premier site. We can now report that contact has been established with personnel on guard duty inside, anyone having a model in the compound should approach the contest director for the day who will be able to collect them at intervals at his discretion. As far as climbing over the fence is concerned anyone doing this may well lose more than his model and will undoubtedly lose everyone the aerodrome — **DON'T**.

## The Grantham Grand Prix, Barkston 27/2/83

The host club were not so lucky with the weather this year with a considerable breeze, particularly at the start. However sun and impressive lead crystal engraved glassware prizes encouraged plenty to enter. The stunted 2.20 max should have been easy but many cut it very close and a number actually had to re-enter. By half-way through the day, increasing cloud gave a slight wind veer and rain in earnest which put paid to further entries and even demoralised some with quite respectable totals to give up. Perhaps it was a fear of risking models so early in the season.

The more enthusiastic continued — Falcons club in particular who finished with nearly all its members in one flyoff or



another. In combined FAI — a very much non-power field — local man Mike Coomes had read the weather well to dash in his flights before the rain. However his haste had cost him some score and soon Gary Madelin who had started with a dropped flight was within striking distance. Eventually he continued through the worst part of the day making no more mistakes to emerge well ahead with a considerable total. Phil Uden was runner-up with a fine climbing Wakefield that only came badly unstuck in the middle of the day with a 40 second flight.

All the Open events went to flyoffs or appeared that they would until John Cooper's last max was disallowed on the grounds that it had been taken from downwind of the launch line. John was rather unlucky here as he had asked Phil Ball, the CD, if to fly from a location off to one side and slightly downwind of the line was acceptable and was under the impression permission had been granted. There had been a genuine misunderstanding and now the event was over it was not even possible for him to be allowed a re-fly. A jury was formed and briefed in a most businesslike manner and their consequent decision to overturn the flight was a pity for John but the only fair decision.

Only two of the three qualifiers to the Open Rubber flyoff had returned in time; Mark Croome being unlucky with a late last flight that maxed but was impossible to find despite clear fields downwind. Mark's models are hardly small, this one fluorescent orange and 400 sq.inches should have been visible on the ground for miles but it was never found. This compounded Mark's misery of a trimming fly-away the weekend before at North Luffenham due to a dt failure on his newest and biggest model yet, complete with timer activated 'gradual' VIT! So the showdown was between clubmates Carter and Dilks, the latter using models equipped with wings much influenced by Chester Lanzo both in section and construction. He was first away but the better air was waiting for Carter who might actually have not been airborne so long — he certainly didn't travel so far — but disappeared downwind less rapidly than his rival.

The Open Power flyoff produced simultaneous launches from Screen and Peers, both a little off pattern in different ways but that was to be expected in the now very blustery wind. After short runs Stafford held his climb height advantage and clocked a little more time than Russel before he went OOS. Harris flew a few minutes later knowing that 3 minutes odd would be plenty. The high climb from his red and white 40 model used every second of the run and although rolling a little too much left coincided its motor cut with the perfect moment for a smooth transition. The event was all but over from the top of the climb.

There was a useful delay whilst the glider Jury was in session and then a prizегiving

where Phil Ball distributed the glassware from the welcome lee of Mike Coome's caravan. The event had been successful and friendly despite the difficult weather.

## Results

### Open Glider (29 entries) (2:20 x 3)

1. G. Madelin	Crookham	7:00
2. M. Gregory	Freebird	6:32
3. J. Williams	Freebird	6:28

### Open Rubber (12 entries) (2:20 x 3)

1. J. Carter	Falcons	7:00 + 3:16
2. T. Dilks	Falcons	7:00 + 2:58
3. M. Croome	Grantham	7:00

### Open Power (8 entries) (2:20 x 3)

1. P. Harris	Birmingham	7:00 + 3:07
2. S. Screen	Birmingham	7:00 + 2:40
3. R. Peers	Falcons	7:00 + 2:01

### Combined FA1 (16 entries) (2:20 x 5)

1. G. Madelin	Crookham	11:36
2. P. Uden	Crookham	9:24
3. B. Nicholson	Liverpool	8:26

## SMAE Experimental Fly-In, Nth. Luffenham 20/2/83

If any part of the 'experiment' was an undisputed success then it was the very running of an SMAE event this early in the year. Empty fields, no leaves on the trees and typical February cold calm conditions. The aerodrome seemed far more accommodating than had been rumoured although regulars were quick to point out that it, 'never blows in the right direction usually!' Certainly adjacent woods, hills and reservoirs could make for an exciting time in the wind.

Despite the glider event necessitating the cutting of precious towlines to 35m, it attracted far the most entries. Rubber fliers had a three flight Coupe d'hiver during the day which provided enough flights to sort the men from the boys, many rediscovering that cold motors take fewer turns and return less power than usual. Gerry Ferer seemed to master the conditions and Ian Davitt just dropped a little on one flight, his usually consistent Dad doing much worse but at least having less longeron trouble than of late!

Overall Power entries were up mainly because of the addition of a new 'Slow' class which excluded the use of any moving surfaces. The modern models got on with it from a 7 sec. run and a 2 minute max which proved much too easy. A 5 sec. run may have made it more realistic. The Slow models were more in step but even they managed a three way flyoff. This was taken by Maurice Gilmore with an OS Max 15 powered 300 sq. inch airframe trimmed to a fast spirally climb. It produced a creditable 3 minute final flight. In the conventional Power category Peers' ancient Woodpecker which had been looking very good all day, clinched it with 5 minutes plus despite his being unhappy with the short run trim.

Open Rubber was a one flight affair and a number commented that they would not travel far just to fly once. The fair weather held despite forecasts of increasing wind

and this flight was a good test particularly as most flew together. Again the difficulties with rubber in near freezing conditions were evident as a third place score of under 5 minutes emphasises. Highest climbs came from Carter, Peers Ball and Gibbs the latter having insufficient glide and visibility to stand a chance in the winter conditions. Peers suffered from a very poor glide too, the model appearing almost to shallow dive. This left Carter and Ball at similar altitudes but with Ball's old faithfully 360 sq. inch, now recovered in more visible red and black, making better use of the air later in the flight. As these two models left the drome at about 6 minutes there was little in it. Then Ball's d'ted and at almost the same instant Carter's flew into the top of an 80ft. tree. Carter had launched first and took it by 17 secs over Phil who could have won it comfortably without the d't that had brought him down perilously close to trees he was well set to fly over.

Last flyoff was Glider — five had qualified. Fantham launched into what appeared good air. As his model approached Gregory waiting on the ground he too towed and released a little to the left and contacted an even better patch whilst Mike's model mysteriously sank for under 2 minutes. Bamford had towed in and Gilmore had flown early and recorded a mediocre sub 90 secs but after all he had been in both Power flyoffs already. Cordes flew last with a very useful zoom release into dead air to place only 6 seconds behind Gregory.

The SMAE had donated £50 worth of prizes for this 'experimental' and the cash had been very effectively converted into expensive looking glassware by the Contest Director. This and the usual plaques were donated to an almost complete crowd as the timing was such to allow flyoff participants a sufficient gap to return.

## Results

### Open Glider (2 mins x 3 from 35m line) (25 entries)

1. M. Gregory	Freebird	6:00 + 2:21
2. A. Cordes	Birmingham	6:00 + 2:15
3. M. Fantham	Richmond	6:00 + 1:46
4. M. Gilmore	Grantham	6:00 + 1:26
5. T. Bamford	Birmingham	6:00 + 0:00

### Open Rubber (One unlimited flyoff at 3:15pm) (10 entries)

1. J. Carter	Falcons	6:43
2. P. Ball	Grantham	6:26
3. I. McDonald	Biggles	4:48

### Open Power (2 mins. x 3 from 7 secs run) (10 entries)

1. R. Peers	Falcons	6:00 + 5:47
2. S. Screen	Birmingham	6:00 + 4:25
3. R. Baggott	Birmingham	6:00 + 3:46

### Coupe d'hiver (2 mins x 3) (10 entries)

1. G. Ferer	Leicester	6:00
2. I. Davitt	Leeds	5:39
3. G. Sharp	Croydon	5:35

### Slow Open Power (2 mins x 3 from 7 secs run) (8 entries)

1. M. Gilmore	Grantham	6:00 + 3:06
2. D. Scott	Morley	6:00 + 2:44
3. J. Godden	Leeds	6:00 + 2:11



Mark Croome releases his huge Open model in the Rubber flyoff. Incorrectly seated wing had the model back down but very gently in less than a minute. Not a happy start to the season for Mark — the model he lost earlier was even bigger than this! Below: Power winner at the Grantham Grand Prix — Pete Harris about to launch in the flyoff.





# BASIC CONTROL LINE EQUIPMENT

by Dave Clarkson



## PART 1

THIS ARTICLE COVERS the basic items of equipment every control line flier needs to go flying. Items such as lines, fuel and the model are not included. Whilst more or less satisfactory commercial handles, reels and fuel bottles are available from most model shops, many people prefer to make their own. The following sections discuss the requirements for such items and suggest how they may be constructed cheaply and satisfactorily.

If there is one thing that differentiates the successful control line flier from the 'also rans', it is the use of adequate basic equipment. To prove this for yourself, go to any big competition and see what the winners use. You will see very little in the way of 'make-do' equipment, instead you will see a lot of custom-built handles, proper line reels, pit boxes and even custom-built and fitted boxes in which to store and transport the models. The reason is that successful modellers spend their time flying and not dealing with the 'hassle' of inadequate

equipment. The same logic applies to Sunday flying down at the local field.

More flying, less frustration is the aim here and I hope that I help you to achieve that.

### The Handle

The basic requirements for a control handle are that it must be strong, small in size, light in weight and fit your hand like a glove. In addition, in my view it is essential that it is adjustable. This last point is important for no matter how hard you try, it sometimes occurs that a particular model needs a bit of 'up' or 'down' control to keep it flying level. This may be caused by misaligned flying surfaces or motor thrust, or because the leadouts from the model don't quite project equally at neutral elevator, or (and quite frequently) your two flying lines are not precisely the same length. Of course you can hold the handle with a bit of permanent 'up' or 'down' bias to compensate for such imperfections but

maybe sometimes you forget and a crash results, or maybe the unnatural hand position makes flying uncomfortable. A much more satisfactory solution is to adjust the line connector projections from the handle.

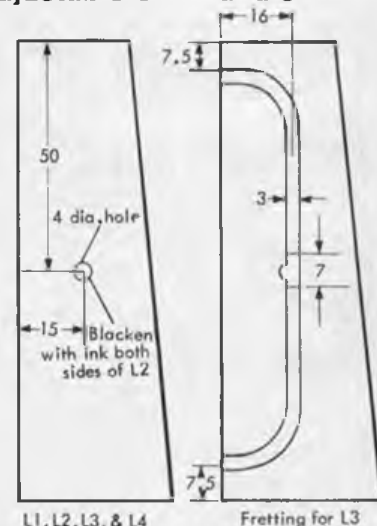
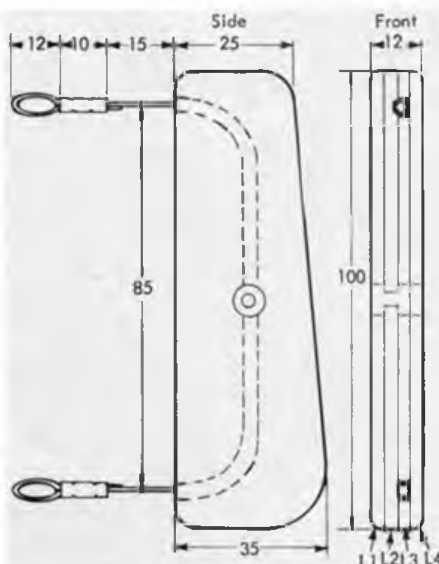
The requirements of smallness, lightness and fit I describe really mean that the handle must 'feel' good, bearing in mind that you will be using it to fly a model and not (for example) to hold onto a road drill. 'Feeling' good means a custom fit and this is where a commercial handle cannot always oblige for every individual's hand is different. The handle grip itself should not be so thin that it feels as though it might cut your hand or so thick that you cannot easily grasp it. Finally the handle surface should be smooth so that it feels good against your skin.

All of these considerations resulted for me in a wooden handle (for a nice feel) with a just-four-fingers leadout separation of 85mm, a thickness of 12mm and adjustable position leadouts from strong cable. Its design and construction is illustrated in the sketches here. For racing purposes, a just-two-fingers leadout separation version has also been made, and both versions are illustrated. Do not forget that each person's hand is different, so you must measure your own flying hand to arrive at the exact leadout separations to be used. This is particularly important when making a handle like a racing handle where a narrow leadout separation is desired.

### Construction

1. Cut from 3mm ply 4 off pieces (L1, 2, 3 & 4) to outline. Drill 4mm dia. hole in all four pieces precisely in location. Fret out from L3 tubeways 3mm wide. Mark with ink on both sides of L2 around hole.
2. Using waxed 4BA bolt as centering guide through holes, glue L1 & 2 together. Then glue onto L2 surface L3

### Adjustable C/L Handle



Above: the complete home-made adjustable handle. Right: the diagrams give dimensions which are a guide only. It is worth making a card shape that suits your own grip and then making adjustments to the design as necessary.

components. Epoxy into groove in L3 surface suitably curved and trimmed 3mm OD brass tubes leaving 7mm gap between ends at centre hole location. Sand L3 surface flat and, retaining 4BA bolt for centering, glue in place L4.

3. Remove 4BA bolt and counter-bore hole 7mm dia from both sides until black colouring of L2 surface on both sides is just exposed. Re-wax and re-insert 4BA bolt from L4 side. Fill recess around bolt L1 side with epoxy and run cleaned 4BA nut down bolt, screwing bolt to pull nut fully into recess. Smooth nut projection to L1 surface with epoxy.

4. Remove 4BA bolt and clear glue and wood particles from exposed guide tube ends inside handle from L4 surface using pin. Carve and sand exterior of handle to give comfortable fit to hand. Paint handle suitable eye-catching colour.

5. Insert bicycle 3 speed cable through guide tubes in handle. Trim cable to length and make-up connector loops by crimping on 3mm OD brass tubes. Re-insert 4BA bolt from L4 side and trim bolt projection.

Simply by slackening with a screwdriver, the 4BA bolt and thereby unclamping the lead-out cable, the cable can be re-positioned in the handle by pulling on the appropriate leadout to give the precise adjustment desired. Retightening the 4BA bolt will 'freeze' the leadouts in this position.

For maximum strength, the 3mm ply used should be of the highest quality — I used aircraft quality 5 ply birch plywood. Similarly for strength the handle laminations should be held tightly together whilst the laminating glue (a PVA type for maximum bond strength) is drying — I used sticky tape to hold the laminations in position with respect to each other and 2 G-clamps to clamp them together. The result is a handle of considerable strength.

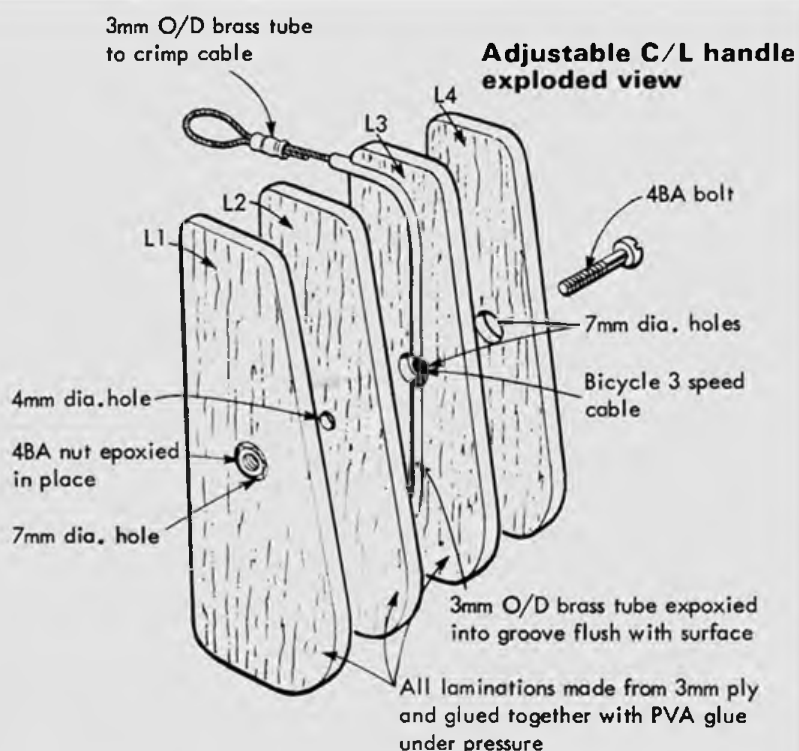
A potential weak point of this type of handle is the possible failure of the leadout cables where they emerge from the handle, caused by fraying against the ends of the brass tube guides. Routine inspection of the leadouts at these points is essential and immediate replacement of the cable is necessary if fraying is noticed.

For maximum comfort, lengths of rubber fuel tubing should be pushed over the leadouts to leave only the connector loops exposed. These lengths of tubing will stop abrasion of your fingers by the cable and crimped loop tubes.

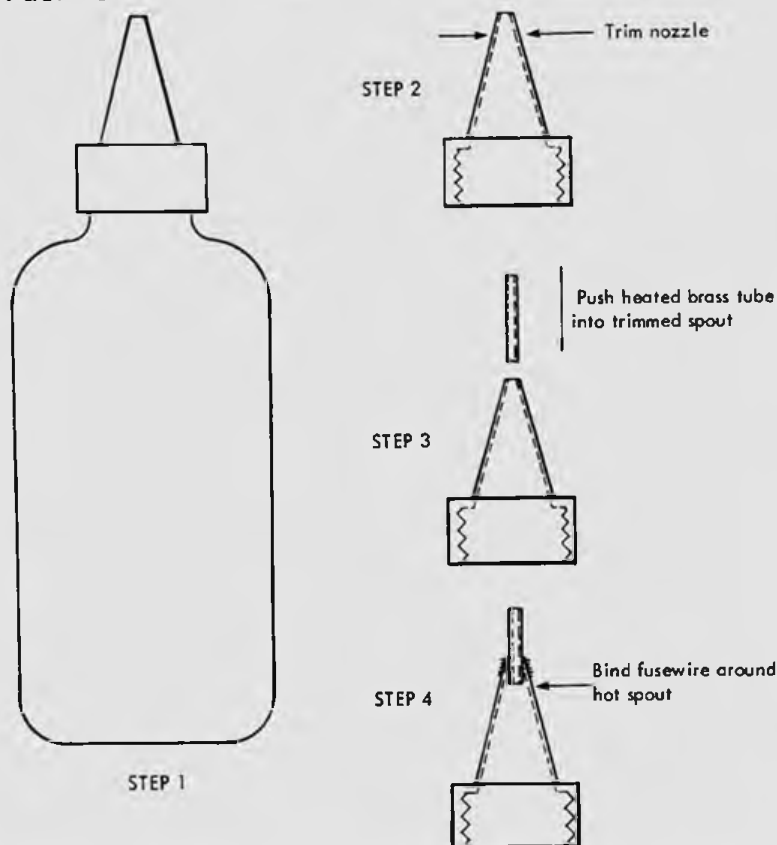
Painting your handle a really eye-catching colour is a good idea to enable it to be located easily when lying in the grass on the flying field.

## The Fuel Bottle

These days, everyone uses a squeeze bottle to fuel their model, or should do. Trying to distort a metal can sufficiently to get



## Fuel Bottle construction



fuel through a metal spout into your fuel tank is not a task for mortals and the advent of plastic bottle has made it unnecessary. Fortunately in these days of 'packaging', many kitchen, food, toilet and cosmetic articles are packaged in plastic bottles. Look around the house and you will find somewhere a plastic bottle with a large, spouted, removable cap and with a capacity of between 200 and 500ml. or gm. It may contain tomato sauce, hand-cream, washing-up liquid or any one of a multitude of things, but the chances are that one will be found. Wait until empty and then confiscate!

In my experience, a flexible spout on the fuel bottle is most unsatisfactory. After all, you hold the bottle, not the spout, with one hand and the model with your other hand to fuel it. So where is the extra hand needed to hold the flexible spout onto your tank filler? The obvious conclusion is that a rigid spout is best.

The chemicals present in our fuels can attack plastics causing weakening, swelling or cracking in some cases. An indefinite bottle life is therefore unlikely, so plan for this by always looking for suitable bottles around the house and confiscating them when empty

## Construction

1. Find suitable bottle. Persuade Mum, wife to buy identically packaged item so you can have bottle when empty as replacement for your fuel-bottle when you lose or break the original.
2. Trim back spout so hole revealed is 1mm less in diameter than intended filler tube diameter.
3. Trim 3mm OD brass filler tube to length. Heat one end and immediately push into spout.



The complete 'Launching Stooge' with release string wound round the body.



Above: the best stakes are often the most handy items available as shown here with the use of two screwdrivers. Right: model attached and release line running to the centre of the circle.

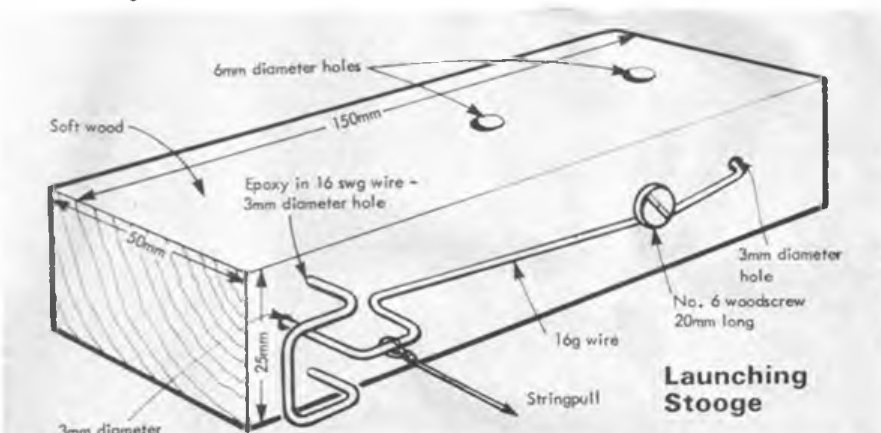
4. Before plastic around filler tube has cooled, i.e. immediately after inserting tube, bind spout with fine fusewire to reinforce/secure joint.

## The Launching Stooge

The ability to go flying on your own is not confined to R/C and F/F flying; you can do it in C/L too provided that you have a launching stooge. The principle of a launching stooge is that it is a device to which you can safely secure your model with its motor running whilst you walk to the middle of the circle to pick up your handle and check the controls and then, having checked that no-one is anywhere near your intended flight circle, be so equipped that you can release the model for take-off. If you fly over mown grass as many of us do, then a launching stooge can be a very simple device indeed. The one described here is for use only on such grass and only with models with an undercart and capable of unaided take-off. A bit limited but, I guess, suitable for most 'sports' flying activities.

My stooge is made from some 16g wire, a 150 x 50 x 25 piece of soft wood, a woodscrew and a length of string. Anything easier or cheaper to make would be hard to imagine and yet it does its job in a totally satisfactory manner. No numbered series of construction steps is given for the construction is so simple as to be obvious from the sketches that follow. Before screwing the trip-wire in place, it is a good idea to paint your stooge in a really bright and eye-catching colour both for waterproofing and for identity on the flying field. The actual dimensions of your stooge are not that critical. What is vitally important is that it holds the model with total security and will not release it unless you give a firm pull on the string.

The stooge is secured to the ground by pushing two medium sized screwdrivers through the two holes in the top of the stooge into the ground: even more suitable would be two 150mm long round nails. Make sure the nails or screwdrivers are really firm in the ground otherwise disaster could result.



# COVERITE -MICA FILM- -MICA FILM-

**The latest state of the art in iron-on film that looks like rag tissue, is light and very strong.**

## COVERITE MICA FILM

There are many types of iron-on covering films available and many people will obviously ask "What is different about 'Micafilm'?" In fact there are several differences. It is very light and very strong, as may be immediately gathered from the briefest examination.

Closer examination reveals that it is supplied without the adhesive film commonly associated with iron-on coverings. This is one reason why it is lighter, since adhesive is only applied where you need it. Another benefit is, the film can be applied with either surface outermost.

heat-actuated adhesive similar in consistency to sanding sealer, which is brushed on to the structure before covering.

The degree of heat needed to activate 'Balsarite' is lower than that needed by most iron-on films, whereas the temperature required to shrink 'Micafilm' is somewhat higher. Despite this, there does not seem to be any tendency to 'pull' the adhesive during shrinking.

Like most new materials, there is a definite 'knack' to be acquired, particularly during the shrinking. Initially there is much more shrinkage down the grain than across it (the grain runs down the length of the roll). This is generally due to insufficient



long-term stability of the material and therefore, its suitability for free flight models. However, it is possible to remove, and introduce, warps by simply twisting the structure and then applying a hot iron to the surface. A warp in the rather large, very thin, 'Powerhouse' tailplane was removed in this manner and it is still straight.



This is where things become more interesting, since the two surfaces are quite different in texture. One side looks like a rather coarse rag tissue, although actually composed of strands of mica fibre which have enormous strength. The other side has a semi-glossy translucent surface, which looks remarkably like clear doped tissue. With the fibrous side outermost, the surface can be painted with dope, epoxy, etc. The other surface is fuelproof and needs no finishing.

For adhesion, use is made of another Coverite product, 'Balsarite,' which is a

heat being applied, but it does help to keep the material as taut as possible across the grain during covering.

For initial experiments, the tail unit of a Golden Era kits Taibi 'Powerhouse' was covered with yellow 'Micafilm' (film side out) and results were such that the remainder of the model will be covered with the same material.

As previously mentioned, the surface resembles clear doped coloured tissue, but it would have to have been applied by a superb modeller!

It is difficult at this stage to assess the

*Above: the Balsarite being painted to areas of the structure where adhesion of the covering is required. Left and below: ironing on the film. Note how the toe of the iron is used to seal edges.*



The weight of coloured 'Micafilm' is quoted as a mere 1½ oz./sq.yd., while the clear (actually translucent white) film is claimed to be even less at ¾ oz. sq.yd. Anyone fancy a puncture-proof rubber model?

Micafilm is available in rolls 29in wide x 65in long at £4.35 for clear or £5.10 for coloured. Colours available are red, white, blue and yellow. Clear film weighs ¾ oz per sq.yd., coloured film weighs 1½ oz per sq.yd. It is manufactured by Coverite, distributed by Flair Products and available from model shops.



MAIN SUBJECT THIS MONTH was one still dear to many people's hearts — the De Havilland 'Racing Comets'. With the continued restoration of the surviving example by the Shuttleworth Trust still very much in the balance, it is interesting to read Ron Moulton's story of the aircraft's origins in 'The Racing Comets'.

De Havilland produced three aircraft in just eight months at a reputed cost of £30,000. Purchasers of the aircraft paid a 'mere' £5,000 which in real money terms, is probably several times the amount so far spent on the restoration.

More indoor flying was featured in a report of the Indoor Nationals at the Manchester Corn Exchange. This was the heyday of the O'Donnell brothers and John managed to acquire first in the tissue covered class (9mins. 7secs.), fifth in microfilm (8mins 5secs.), and third in Chuck Glider (32.8secs.), while Hugh won Chuck Glider with a new British record of

'Aircraft in Service' No. 5 by Ron Moulton and G. A. G. Cox featured the English Electric 'Canberra' B(1)8 with a 1/72nd scale drawing occupying the magazine centre-spread.

At the other end of the scale, 'Aircraft Described' No. 92 by P. L. Gray covered the 'Albatros CIII' and another turn of the page revealed W. I. Barrett's simple method of applying lozenge pattern camouflage — just right for your Albatros model.

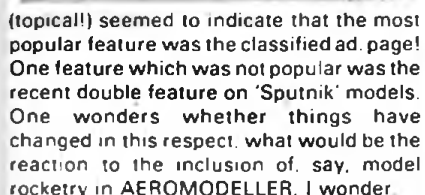
Another example of this type of camouflage appeared in 'Decor Detail' in the shape of a Linke Hofmann R-1 bomber with an enormous expanse of fabric on its very deep fuselage. Also shown were black and white striped Sopwith 'Camels' and multi-hued Douglas 'Invaders'.

In the 1950s, most of the best model aircraft motors came from the USA, one such being the Fox 29X (later developed into the rather more famous 36X) tested in 'Engine Analysis' No. 47. Bearing in mind the fact that it was not intended to be an out-and-out racing motor, power was fairly high for a loco-scavenged glow motor of the period, at 465bhp at 14000rpm on 20% nitro fuel.

Also tested was the Fox 29R, which was intended for speed flying. Power here was 61bhp at 17500rpm on 50% nitro. For comparison, a modern Schnuerle-ported motor of this size might be expected to produce around 1.5bhp at 25000+rpm on straight fuel.

The radio control articles in this issue dealt with 'Selective escapements and cascade systems' and 'Now build this selective escapement', both by C. C. Badger. As previously noted, R/C at this period was more an exercise in ingenuity than electronics.

### Initial results of the Readers Survey



There was an almost universal plea of 'Bring Back McGillicuddy' (Hear! Hear!)

In "Club News" there was a small mention of the Lancing & DMAC members attending the Beaulieu Rally 'with one of those Spanish car control models'. This would probably have gone unnoticed were it not for the fact that the builder, Rolie Lelliott, wrote to me after mentioning the original Spanish model in the January issue. Rolie, who is now completely handicapped, sold the model some years ago, but has sent along a photo of the model and his Morris with wind-down windscreen (an essential requirement!)

Full size plans of the  
SIESTA reproduced here  
to 1/5 scale are available  
as Plan No G 696X  
from Aeromodeller Plans  
Service, PO Box 35,  
Wolsey House, Wolsey  
Road, Hemel  
Hempstead, Herts. HP2  
4SS. price £1 50 plus  
45p post and packing

**MATERIALS REQUIRED:**

- 1 sheet 4 in.  $\times$  36 in. - 48 in. medium balsam or 2 sheets 3 in.  $\times$  36 in.
- 1 sheet 3 in.  $\times$  36 in. medium balsam
- 1 sheet 3 in.  $\times$  36 in. medium balsam
- 1 block 2 in.  $\times$  12 in. - 12 in. hard balsam
- 1 dowel 1/2 in. diameter - 24 in. spruce, or birch
- 16 1/2 in.  $\times$  1/4 in. - 48 in. medium balsam 2 in.  $\times$  1/4 in. - 48 in. medium balsam
- 1 piece 1/2 in.  $\times$  1/4 in. ply (not gum)
- 2 sheets lightweight dope
- 1 length of 20 SWG gauze wire
- 1 short length of 1/4 in. dia. dowel

DAVE  
DAY'S

# SHOP TALK

The latest in products for  
the modelling scene

## ENGINE CASTINGS FROM DOWN UNDER

Leading Australian model aero engine designer/manufacturer, Gordon Burford, is making available a series of diecast crankcases and some of the components for home constructors. Further details can be obtained from Mr. G. Burford, 86 Terney drive, Currumbin, QLD 4223, Australia.



Vintage enthusiasts will relish this diecast crankcase for the American 'Deezil' engine, the first of a series which Gordon Burford intends to reproduce.



## BEN BUCKLE CATALOGUE

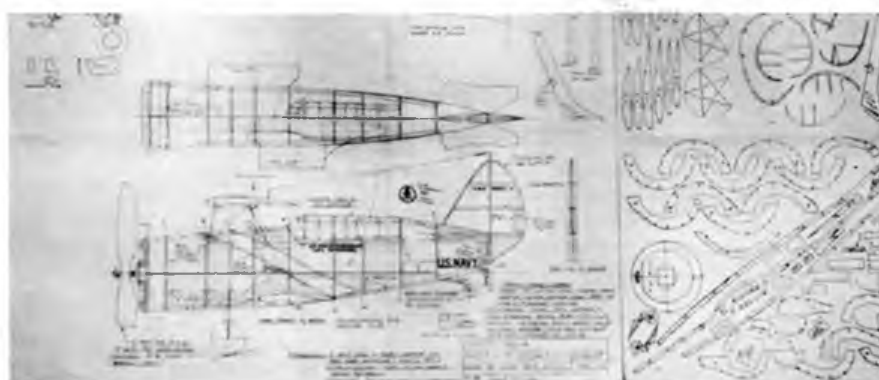
The 1983 edition of the Ben Buckle Old Time Plans Service catalogue, 149 vintage plan designs listed, plus seven vintage kits.



The casting set for a competition quality 2.5cc team race or combat diesel with quite definite physical similarities to certain individual products out of the USSR. Gordon Burford says that it is just the thing for keen modellers waiting to have a go with their Myford ML7 lathes. Cost is 30 Dollars Australian.



Competition rear exhaust glo plug engine castings with integrally cast Schnuerle porting, plus backplate and cored piston casting, should be specially attractive for free flight. Cost is 20 Dollars Australian. These castings are to top manufacturing standards and are ideal engineers' projects.



## RUBBER SCALE PLANS

David Diels, PO Box 101, Woodville, Ohio, 43469, has a large selection of plans available for rubber scale models in Peanut, Walnut (18in. max. span) and larger sizes. Currently there are 23 Peanut, 8 Walnut and one large design available, most of them being lesser known modelling

subjects such as the Fairey 'Spearfish', Northrop 'Pioneer', Northrop P-61 'Black Widow' (yes, in Peanut!), Fairey 'Fulmar', Macchi C202 'Folgore', etc.

Peanut plans range from US\$1.25 to US\$2.00, Walnut from US\$2.00 to US\$3.25, while drawings for a 27in. span Westland 'Whirlwind' cost US\$4.00.

## INDOOR MODEL SUPPLY KITS

A new range of kits from Indoor Model Supply, Garberville, California, is being imported by St Albans Model Supplies. Six kits are available, these being as follows: **Three Easy to Build Gliders.** Contains plans and wood to produce three different 12in. span chuck gliders with an average weight of 4gm.

**Yard Birds.** Two different all-sheet rubber powered models using plastic props (ex-'Sleek Streak') each 12in. span.

**2 Parlor Coptors.** 12in. dia. all-sheet helicopters capable of flights up to 2 minutes. Includes Pirelli rubber.

**Penny Plane.** A beginner's indoor model of 18in. span. Kit includes condenser paper covering, selected ultra-lite balsa and Pirelli rubber. Eight-minute flights are claimed.

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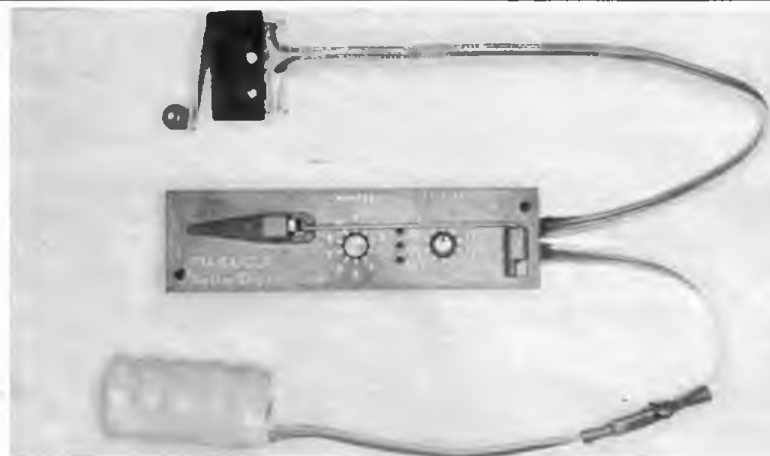
Prices for the above are dependent on current exchange rate; contact SAMS for up-to-date figures.



## AIRCRAFT PAINTINGS

Suitable for framing and hanging in your workshop or living room, these prints of the late Peter Cockerill paintings are available from Standard Games and Publishing Ltd., Arlon House, Station Road, Kings Langley, Herts., either singly or as a set.

The subjects are listed simply as Pfalz (W.1), Albatross (sic) (W.2), Bristol Fighter (W.3), and SE5 (W.4). Size approximately 14in. square. Price £1.75 singly, or £6.00 per set.



## KOSTER DIGITAL TIMERS

A feature of the last two World F/F Championships have been the programmable electronic timers used by Denmark's Thomas Køster. Now a similar timer, designed primarily as a D/T timer for F1A gliders, is available from Køster Digital, P.O. Box 54, DK-3400 Hillerød, Denmark.

The device has two ten-position rotary selector switches to select 0-9 minutes, and 0-54 seconds, giving a total range of 0-9 mins. 54secs. in six second steps. Between the switches is a charging socket for the nickel cadmium battery which

provides the power source. A micro-switch is supplied which can be connected to a circle-tow hook so that the timer automatically starts on release or in the event of a line break.

Dimensions of the timer unit are 66 x 18 x 15 mm and total weight of timer, battery and switch is a mere 35gm. Accuracy is claimed to be better than 0.001 per cent. The front plate is a plastic moulding which can be supplied in white, red or black. Price: Timer, complete with battery and start switch US\$55. A suitable trickle charger can be supplied, price US\$30 (state 110v or 220v).

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May 29th & 30th, Holker Hall & Park, Cark-in-Cartmel, Grange, Cumbria.

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Telephone: (044-853) 328

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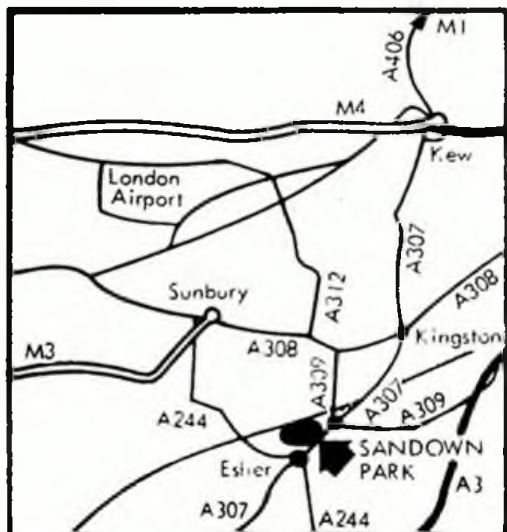
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The Course Secretary, Tremearne,  
Breaage, Helston, Cornwall.  
Tel: Helston 62294



**8th YEAR**

# THE WORLD FAMOUS SANDOWN PARK MODEL SYMPOSIUM AND EXHIBITION ESHER, SURREY

**8th YEAR**

**SATURDAY 14th & SUNDAY 15th MAY — 10 a.m. - 7 p.m.**

**REFRESHMENTS — BARS — AMPLE PARKING**

The largest Trade Exhibition and Display of **working** Models in EUROPE if not the World — No other Exhibition has so many Manufacturers-Distributors & Importers to the Model Trade under one roof. Continuous Displays by the Trade of their products — Radio Controlled Aircraft, Helicopters, Boats, Cars, and many other items new this year — Display Teams, Control Line demonstrations, Car Racing, all this takes place within the grounds of Sandown. Most of the outside displays can be seen from under cover. For the first time in Europe, the Kalt Helicopter Display Team from Japan.

**INDOOR TRADE HALL 31,000sq. ft.** — Exhibitors to date: Morris & Ingram (Badger), Watford Model Centre, Clive Hall Models, Mike Sharman Models, Sun Lane Engineering Co., Tri-Plane Models, World Engines, Stewart Aviation, Dave Nieman Models, Leicester Model Centre, Ripmax Models, Flair Products, C & W Electronics, Micro-Mold, Sussex Model Centre, Edmond Model Products, Fleet Control Systems, Graham Engineering, Beatties of London (Railways) Southern Model Craft, Bruce Engineering, MacGregor Industries, Slough Radio Controls, Model Flight Accessories, Miniature Tool Co., Avicraft Ltd., Soar Ahead Sailplanes, Model & Allied Publications, Henry J. Nicholls, Jim Davis Models, Galaxy Models, Kaycee Distributors, Pegasus Models, Stagg Models, Viking Models, Pat French Models, A.B.C. Models, Chris Foss Designs, Ramsey Engineering, Skyleader Radio Control, Sailplanes International, Bowmans Models, Morley Helicopters, Wolf Automodelling, Lesro Models, Maritime Models, Fan Jets, Balsa Cabin, Tommy Harris Models, Wallingford Model Centre, E. Gales (London) Ltd., Harden Associates (Powermax), Carpenter & Howlett, Richard Kohnstam, Howard Blackwell, Hydratex, R.D.M.S. Tools, Model Avionics, D.P.R. Models, Chevremont Publishing (Skyplane) Cotswold Controls, Irvine Engines, O.S. Engines, Electronic Developments, G.M. Cole, Windsor Models — plus others.

## **ADMISSION**

Adults £2.50. Children 5 to 16 years old & O.A.P.s £1.50.  
Under 5 Free.

Party Rates and Family Tickets (2 Adults + 4 paying children £6.50) in advance only S.A.E. From G. Hazlewood, 46 Wrens Avenue, ASHFORD, Middlesex. Telephone: Ashford 43022.

## **HOW TO GET THERE**

**BY CAR:** Sandown is off the A307 (Old A3) London to Portsmouth Road, and is easily reached from the M3, via the A308 & A309. From the M1 via the North Circular Road A406 to Kew Bridge, then A307 via Kingston to Esher.

**BY BUS:** Green Line 715, Red Buses — 215, 218 & 219.

**BY RAIL SPECIAL B.R. DISCOUNT.** 20% reduction on production of B.R. Ticket. Esher Station open both days. Free bus service from Esher Station.

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By P.A. Shepherd

