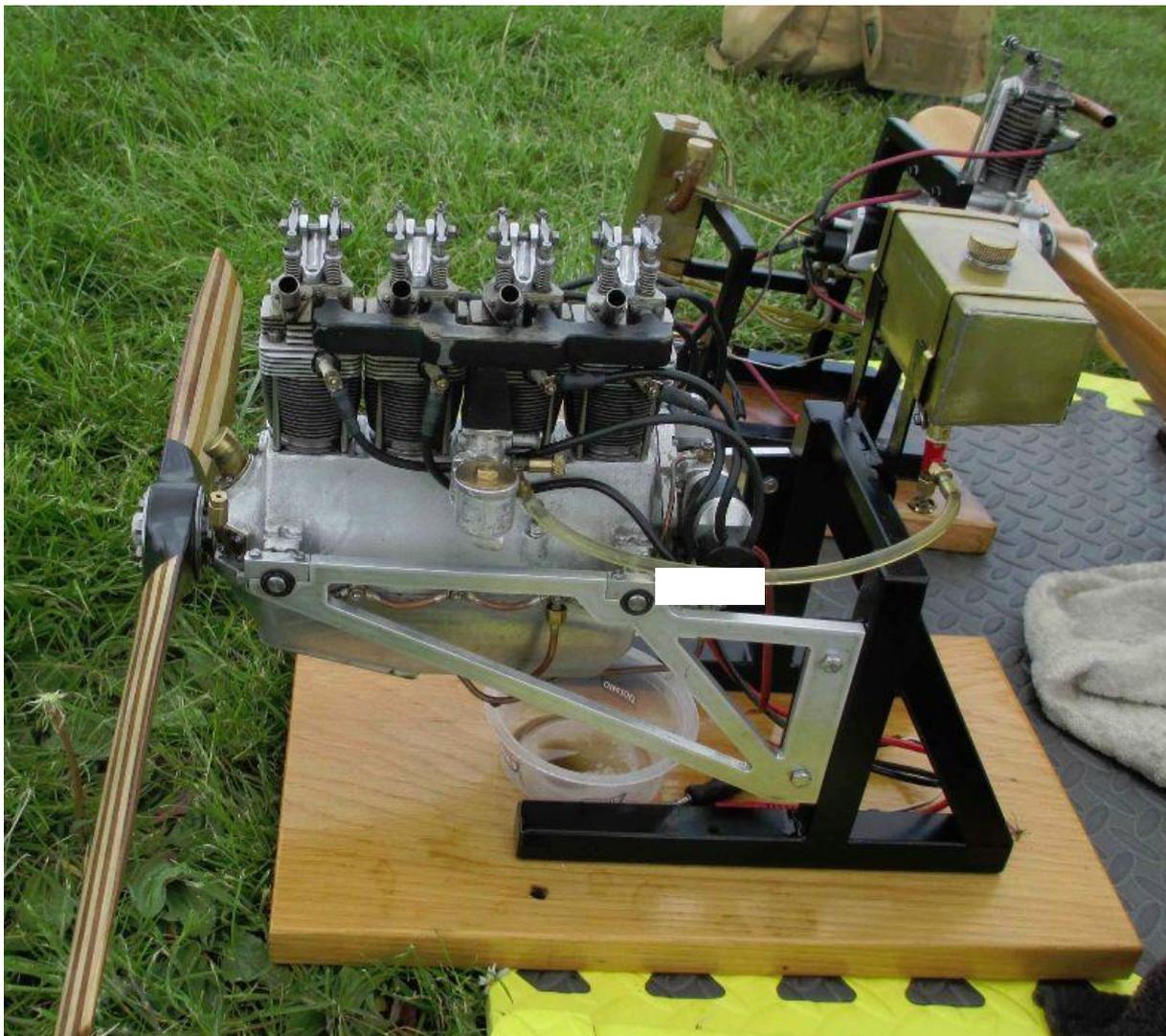


## Sticks and Tissue No 114 – May 2016

If you can contribute any articles, wish to make your point of view known etc please send to or phone 01202 625825 [JamesIParry@talktalk.net](mailto:JamesIParry@talktalk.net) The content does not follow any logical order or set out, it's "as I put it in and receive".

Thanks to Mark Venter back issues are available for download from <http://sticksandtissue.yolasite.com/>

Writings and opinions expressed are the opinion of the writer but not necessarily the compiler/publisher of Sticks and Tissue.



*Photo from Bill Wells taken at Old warden a couple of weeks ago*

## More sad news

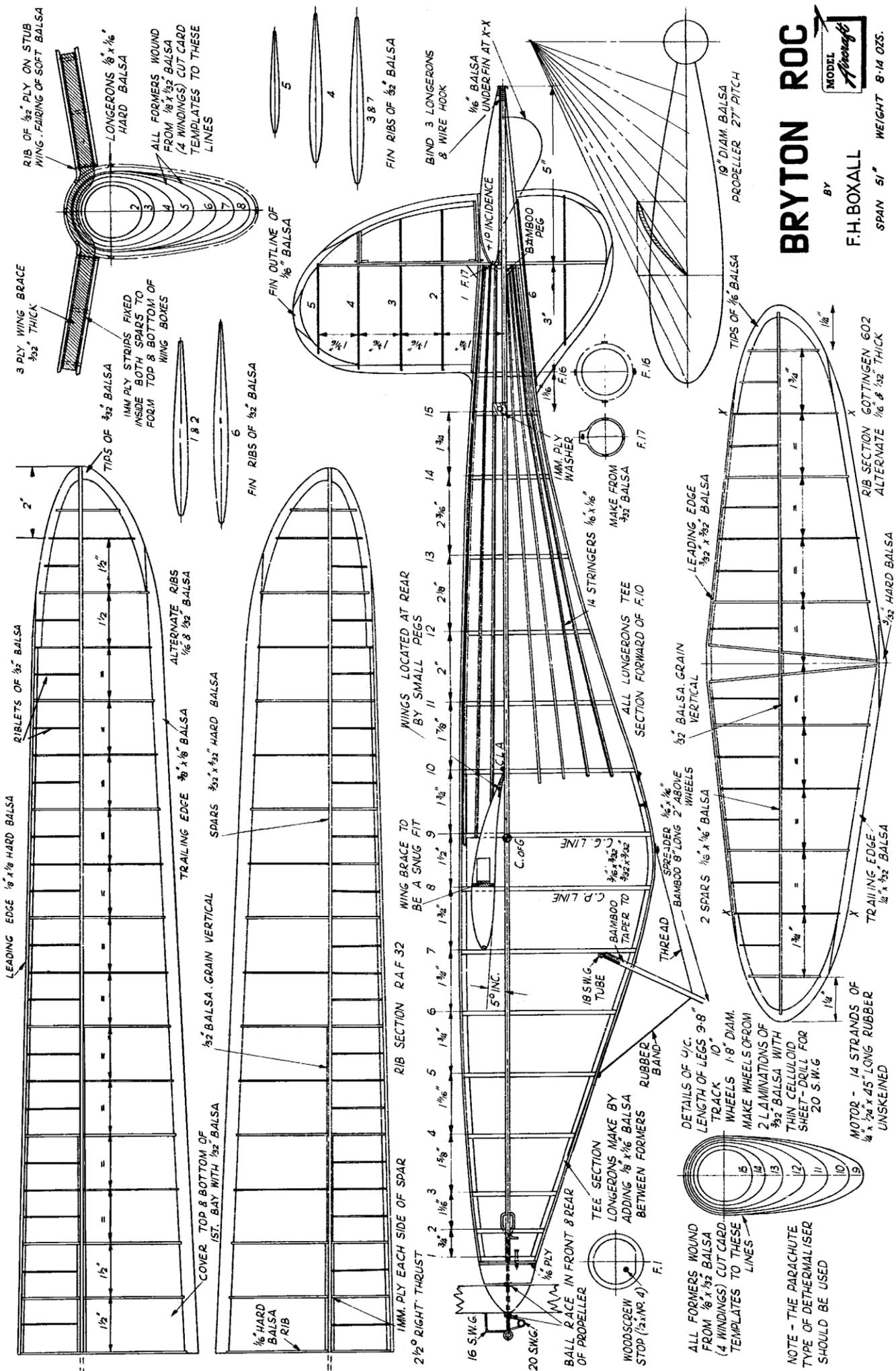
Raynes Park MAC stalwart Malcolm Jagger passed away earlier this week (Writing 27 May). He attended Old Warden a day or two before. Many will have known him for his lovely free flight models built with care and precision. For details of funeral, 16 June, please contact Mike Cummings 02085423100



*Malcolm at Chobham*

## Cocklebarrow and Tomboys please note – Tony Tomlin

Could you if poss. put a note in S+T that on the Cocklebarrow event on 10th August there will be no Tomboy competition as there is a full size air show in the area. Normal Vintage flying is not affected. The other 2 Cocklebarrow 2016 meetings will have Tomboy comps.



# BRYTON ROC



BY  
F.H. BOXALL

SPAN 51" WEIGHT 8-14 OZS.

NOTE - THE PARACHUTE TYPE OF DETHERALISER SHOULD BE USED

MOTOR - 14 STRANDS OF 1/4" x 1/24" x 45" LONG RUBBER UNSKEINED

DETAILS OF 1/4" TRACK 10" WHEELS 1-8" DIAM. MAKE WHEELS OF-ROV 2 LAMINATIONS OF 1/32" BALSAL WITH THIN CELLULOID SHEET - DRILL FOR 20 S.W.G.

ALL FORMERS WOUND FROM 1/8" x 1/32" BALSAL (4 WINDINGS) CUT CARD TEMPLATES TO THESE LINES

WOODSCREW STOP (13xNo. 4)

TEE SECTION LONGERONS MAKE BY ADDING 1/8" x 1/16" BALSAL BETWEEN FORMERS RUBBER BAND

18 SW.G. TUBE

SPREADER 1/8" x 1/16" BAMBOO 8" LONG 2" ABOVE WHEELS

2 SPARS 1/16" x 1/16" BALSAL

LEADING EDGE 1/32" x 1/32" BALSAL

14 STRINGERS 1/16" x 1/16" MAKE FROM 1/32" BALSAL

1/4" BALSAL GRAIN VERTICAL

ALL LONGERONS TEE SECTION FORWARD OF F.10

1/16" BALSAL UNDERFIN AT X-X

BIND 3 LONGERONS & WIRE HOOK

FIN RIBS OF 1/32" BALSAL

WINGS LOCATED AT REAR BY SMALL PEGS

16 S.W.G. BALL RACE IN FRONT OF PROPELLER

20 SW.G. WOODSCREW STOP (13xNo. 4)

1/16" PLY IMM. PLY EACH SIDE OF SPAR

COVER TOP & BOTTOM OF 1ST. BAY WITH 1/32" BALSAL

1/8" HARD BALSAL RIB

1/2" HARD BALSAL RIB

TRAILING EDGE 1/4" x 1/32" BALSAL

SPARS 1/32" x 1/32" HARD BALSAL

TRAILING EDGE 1/8" x 1/8" HARD BALSAL

RIBS OF 1/32" BALSAL

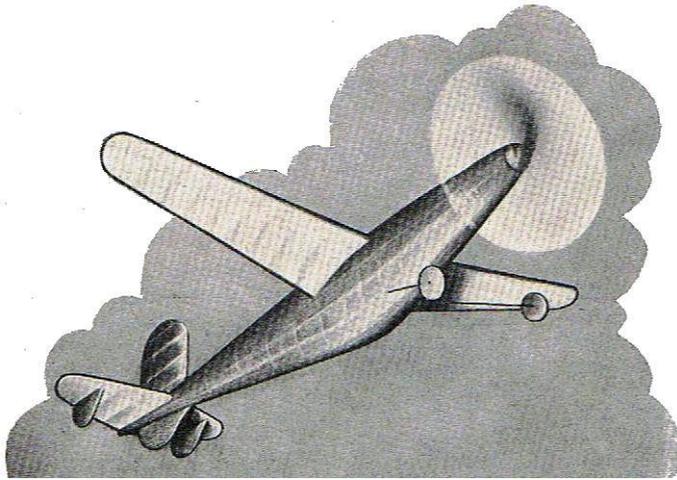
3 PLY WING BRACE 1/32" THICK

RIB OF 1/32" PLY ON STUB WING. FAIRING OF SOFT BALSAL

LONGERONS 1/8" x 1/16" HARD BALSAL

ALL FORMERS WOUND FROM 1/8" x 1/32" BALSAL (4 WINDINGS) CUT CARD TEMPLATES TO THESE LINES

## Bryton Roc Holder of British outdoor rubber and Wakefield Class Records by F H Boxall from Model Aircraft January 1950



This model will not appeal to the flyer who builds his models by the score. There is a fair amount of work in its construction, and careful building will pay dividends on the flying field. After the results of the Fairlop Trials, and of the Wakefield proper, it might well be argued, “why go to all the bother of a fully streamlined job when simple slabsiders are winning?” “Quite so, and it is not for me to say whether the simple slabsider, or the pure “streamliner “ is the best for everyday flying. Many of the experts have written plenty on this subject, and I will leave this touchy subject to them.

The design of this model was based largely on extensive flying with my 1941 design over a period of years. I have used single-blade folders on this old machine, but have decided in favour of large free-wheelers from now on ; my aims were (like all Wakefield designers) to get a good power/weight ratio, a design that would be stable in all weathers, and freedom from structural failures. The deep fuselage is descendent from my 1941 machine, and is used for the same purpose—to counteract the torque of a 19 in. propeller, and to dampen the roll in the glide which results from a large free-wheeler. The high aspect ratio is used to improve the glide on the necessarily high wing loading, and to obtain span, the main correcting force against torque.

### Building

For anyone who has built any form of streamlined model this should present no trouble. The fuselage is, of course, the longest task. I used a 1/2 in. Square obechi jig through the centre of my card templates, but any similar size rigid spar will do.

Pin temporary balsa sheets, cut to the width of the former spacings, to the jig to act as bracings, until the four longerons are set ; these bracing sheets can then be removed and the wing fairings added ; finally all the stringers. The 1/8 in. X 1/16 in. inserts between formers to form the T-section longerons must be added before the stringers, of course. The wing fairings are only small and need only be of very soft balsa as they are faced-up with 1 mm. ply ribs. The rectangle for the wing brace must be cut very carefully, so that the wing-brace is a snug fit. The reason for this cutaway is to be able to slide the wing-brace into place (on its side— then twist upright when central) and not to be able to slide the wing to and fro. The wing position, fore and aft, is fixed, and small bamboo pegs are used to locate the T.E. Care must be taken to see that the angles of incidence on wings are the same. Also ensure that no part of the fairing or fixing protrudes inside to harm the rubber motor; even the arch of the wing brace must be well sanded and left smooth so that a bunched motor will not chafe.

The undercart is of the “The Club Super” type and is used because of its extreme lightness, whilst still being rigid enough for safe take-offs. Once again ensure that nothing in the fixing can harm the motor should it lay low in the fuselage.

The propeller is perhaps the most important component. Carve from really hard balsa, and thin down the blades to the Section shown. Bare weight of the propeller should be 0.7 oz., so carve down to this weight. The propeller shown is intended for perfect weather, but is a little coarse for really rough days. You should carve a similar propeller of 24 in. pitch for such flying. The motor is normally 14-strands of 1/4 in. X 1/24in., 45 in long and is un-skeined; the mechanical type of tensioner being used always.

### Flying

Like all high performance machines, best trim is obtained when the model almost stalls. In fact, the model should stall in a straight glide ; the circle developed by the free-wheeling propeller just takes it off the stall. 2 ½ deg. of right thrust is normally used, and on full turns, the model may do a shallow take off and safe right-hand climbing turns in large circles. The glide may tend to be a right-hand spiral (due to the right-

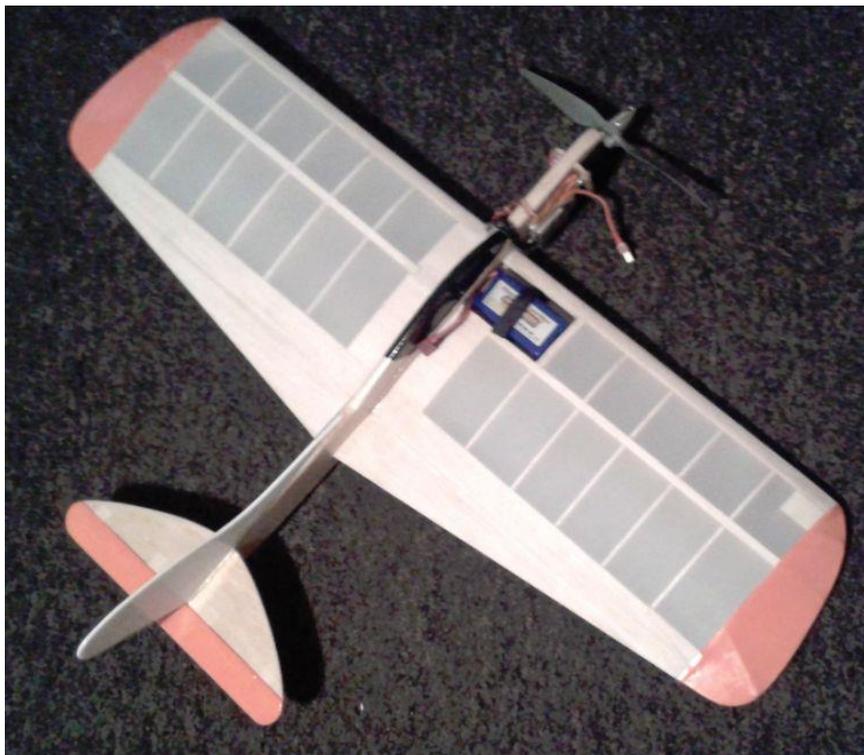
thrust free-wheeler), but small amounts of left rudder will correct this until a large right-hand circle is obtained in the glide.

This left rudder is also helpful under power. Preventing any tendency to spin in to the right under full power. In my opinion, downthrust need never be used on any model, however well powered, and the longitudinal set-up of this machine ensures that it is not required under any conditions.

### From Terry Paget

Just thought I would let you know, I thoroughly enjoyed my first trip to TH. There was too much wind for my models. Namely a hz supercub and a slightly shortened mini super plus my mini peacemaker and profile veron colt, all electric.

Having said that, I met some obviously dedicated guys Wow what an array of models. I have a now finished kk super 60 With electric power. I may bring it next time to TH.





## From Brian Austin

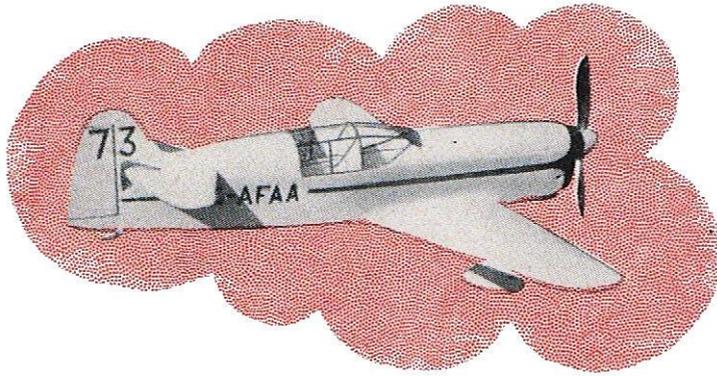
What a surprise to open up the latest S&T and find a full size Cumulus set of pictures in there, after just finishing a 50% version. radio assist for Old Warden May Fly on the 14/15th May. Electric as well,so as to stay clean!!!! Some pictures attached







## Mew Gull control line model by R A Twomey from Model Aircraft March 1949



It is being realised more and more that the future of the scale model lies in control-line flying. Here more than in any other branch of aeromodelling realism and a concours appearance can be combined with good and stable flight. To satisfy the need for such a model the "Mew Gull" was designed, and it has completely fulfilled the hopes of the designer. At the Ampleforth College M.A.C. Annual Exhibition the "Mew Gull" was judged the winner of the

concours d'elegance, although it had made many flights during the preceding four months. It afterwards gave a fine flying display to the crowd of spectators—a striking proof that it is not one of those all too prevalent class of concours winners which are incapable of flying although they go under the name of flying models.

### The Fuselage

This is simpler than it looks, being merely a slab-sided box with semicircular formers added to the top. The first things to make are the two basic slab-sides, shown shaded on the plan. These are of 1/8 in. strip obechi for strength. Now the formers are cut from 1/8 - in. sheet balsa, except formers 1 and 3 which are of 1 mm. ply, and are cemented between the two slab-sides, thus making a trapezium-sectioned box. At this stage the engine bearers and the control-plate are fixed into position. The next stage is to sheet the top of the fuselage with thin strips of 1/16- in. sheet balsa each about 1/2 in. wide. The 1/16in. Strip birch stringers are also added to the cabin. The rest of the fuselage is sheeted later. The noseblock (1/4 in. sheet balsa laminations) is now carved and fitted.

### The Tailplane

This is carved from 1/4 in. balsa sheet. The elevator is cemented to the 3/16 - in. dowel which goes right through the fuselage and is hinged with cloth hinges to the tailplane. The wire control-horn is fixed to the dowel, which thus moves both halves of the elevator. It will be seen that the elevator differs from that used on the prototype model "Mew Gull" (see heading photograph), which had a one-piece elevator necessitating a cut-away through the fin. The present arrangement is a big improvement and it does away with the unrealistic gap in the fin. The fixed portion of the tailplane is now cemented on to the fuselage. The elevator horn is connected to the control-plate by the control-rod. Elevator movement is about 30 deg. up and 30 deg. down.

The fin and rudder may now be cemented in place, the rudder having slight offset to the right.

### The Wings

These are very straightforward, being carved to the section shown, out of 1/2 in. balsa sheet. A 1 mm. ply stay is tongued-in and cemented into position on top of the left wing near the tip. The two wing halves are now joined and ply-braced at the given dihedral angle. Cement to the fuselage after the control wires have been connected to the control-plate. Now the sides and underneath of the fuselage can be sheeted with 1/16 in. balsa. Choking and re fuelling the engine can be done from above when the cowling is removed, but a trap-door may be made on the left of the nose so that the amount of fuel in the tank can be seen. A circular hole should be made underneath the nose for the cylinder head. Finally the wing-fuselage joints are neatly filleted.

### The Undercarriage

The undercarriage wire is shaped and fixed to the wings as shown on the plan, and the "trousers" are built up around the wire. The wheels are made from 1/8 in. and 1/16- in. sheet balsa laminations. The removable part of the engine cowling can now be cut free from the fuselage, the engine fitted, and the laminated balsa spinner cemented to the propeller. The engine has no downrhrust and only one deg. right side-thrust.

### Finish

Sand whole plane and apply three coats of enamel paint, sanding between each coat. For the final lustre one of the good high-gloss finishes may be added. The original colour scheme was cream with dark blue trimmings.

#### Flying

Flying is straightforward. Check C.G. position before test-flights, which can be done on full revs.

Do not use too much down elevator on the take-off, as the nearness of the undercarriage to the C.G. does not permit this. Built and flown carefully the Mew Gull will give hours of enjoyment, but flown not so carefully, it is strong enough to stand up to plenty of rough treatment.

### **From Graham Crawshaw**

Refurb of a KK Pacer I bought cheap off E bay







## From David Lovegrove

My response to Judson Bock Snr. regarding his question in the last issue of S&T about why aeromodelling Brits of a certain age are hooked on small diesels is simple. Ether.

Driving home from a flying session with a diesel-powered model in the back of the car is always accompanied by that captivating aroma. If the fun of flying wasn't enough, the ether fumes alone will put a smile on your face. And much as I love electric, it doesn't have its own unique smell (unless you let the white smoke out of course!).

Judson also mentions Galloping Ghost, which my current obsession. I've just finished my second Veron Robot - the last one was back in 1964 - electric powered and equipped with GG via a Controllaire Ghost actuator. It's about to undergo flight tests. It's earlier stablemate, the own-design Mangled Wot, has a home-brewed rotary type actuator. There was a bit of faffing about with the balance point and the wing incidence to begin with, but with those sorted out, it's a nice gentle flyer.

My chum, John Mellor, has a Phleet Phoot (a Bill Grundy design from the early '60s.) under construction. It'll have a Rand actuator for control, this being allegedly the "guaranteed" route to GG success. Watch this space!

Photo of the Mangled Wot (on the left) and Robot attached.

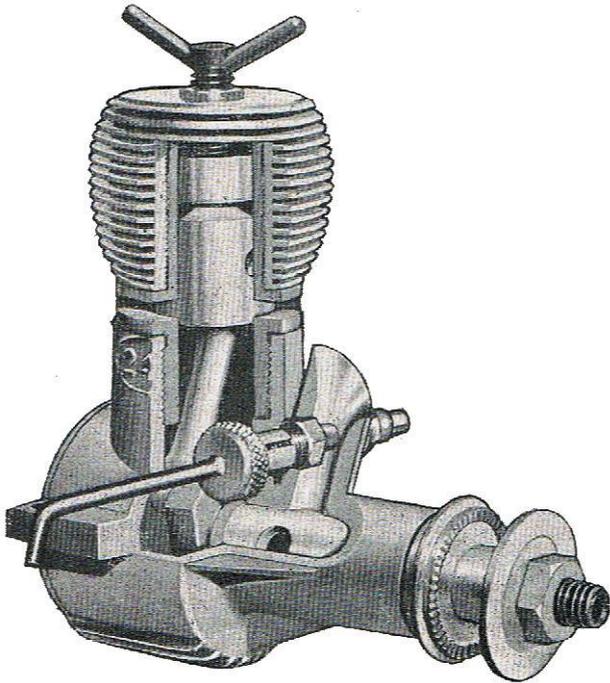
If anyone is interested in learning more about GG and all the other prehistoric forms of r/c, such as "bang-bang" single channel, reeds etc., and their modern incarnations, I can recommend the website

<http://singlechannellersreunited.co.uk/phpbb3/viewtopic.php?f=28&t=197&sid=8c1d1bd77fba3b0ef9a85d0deea153a2>

It's fascinating stuff.



## Elfin 2.49 from Model Aircraft September 1951

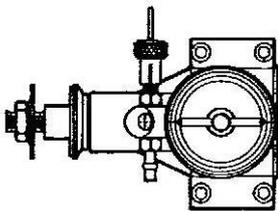


Since its introduction two years ago, the Elfin 2.49 has probably accumulated more competition successes than any other British engine during the same period. Favoured for its light weight, high power output and easy handling, the 2.49 has consistently placed high in power-duration events, accompanied by such constantly reappearing names as Marcus, Gorham, Wyatt, etc. ; in stunt it has been almost the only "A" class engine to offer serious competition to the bigger classes, while, in Class II speed, it has been unassailable.

Although the original Elfin, a radial mount engine, weighed only 3 3/4 oz., the beam mount model which, last year, succeeded it, weighs even less and is even more compact. According to our tests, the 1950/51 models do not quite equal the b.h.p. output of the 1949 model, which was outstanding in this respect, and, although some allowance must be made for the fact that, of three engines tested, the 1949 engine (which had been used a great

deal and with some success in 1949 contests) had possibly reached the peak of its performance, test figures would appear to bear out the findings of some competition enthusiasts who continue to pin their faith in the earlier model in preference to the current production engine.

Strictly, the 1949 engine was fractionally over 2.5 c.c. Calculations on the maker's bore and stroke measurements give 2.503 c.c., which, however, it may be argued, does not place the engine outside Class A and Class II limits since the S.M.A.E. Handbook gives the lower limit of the following classes as - 2.51 c.c. The present engine is well within the class limits set by both the S.M.A.E. and F.A.I., being 2.469 c.c.



Although the two engines are basically of the same type in that they are both annular-ported shaft-valve diesels, they are, in fact, two quite distinct designs, virtually all the component parts being different.

Externally, the engines differ in the shape of the crankcase and system of mounting. The air intake is now placed above instead of below the main bearing and the cylinder head and barrel are of a different design. Less obvious are the changed bore and stroke of the current models, giving a slightly higher stroke/bore ratio.

### Specification (Current Model)

Type : Single cylinder, air-cooled, two-cycle, compression-ignition. Rotary-valve induction through hollow crankshaft. Annular exhaust and transfer porting with supplementary sub-piston air induction. Conical piston crown.

Swept volume : 2.469 c.c. (0.1507 cu. in.).

Bore : 0.554 in. Stroke : 0.625 in.

Compression Ratio : Variable.

Stroke/Bore ratio : 1.528 : 1.

Weight : 3.4 oz.

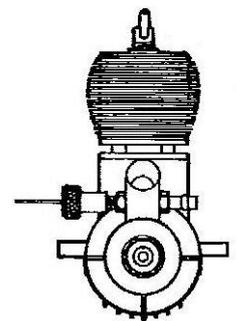
General structural data: Pressure die-cast crankcase with removable back-plate.

Cylinder-liner of nickel-chrome steel, threaded into crankcase and with screwed-on finned barrel / head.

Cast-iron piston. Duralumin connecting-rod.

Nickel-chrome steel crankshaft running in cast-iron main bearing.

Beam type mounting lugs. Spray-bar type needle-valve assembly.



### Specification (1949 Model)

Type : As for current model, above.

Swept volume : 2.503 cc (0.1527 Cu. in.).

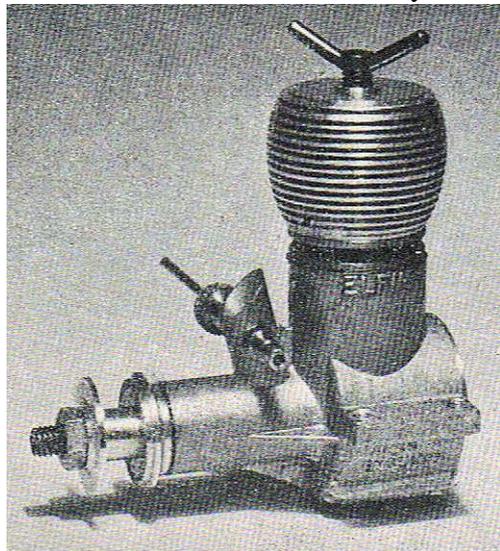
Bore : 0.560 in. Stroke: 0.620 in.

Compression ratio: Variable.

Stroke/bore ratio ; 1.107 : 1.

Weight: 3.75 oz.

General structural data : Aluminium main casting comprising crankcase and main bearing housing with four-point bulkhead mounting plate and removable rear cover. Nitralloy crankshaft running in cast-iron main bearing. Hardened steel cylinder threaded into crankcase. Meehanite piston. Duralumin connecting-rod. Turned aluminium finned cylinder barrel/head. Spray-bar needle-valve assembly.



#### Test Engine Data

Total time logged: 1951 engine, 1 hour; 1949 engine : 50 hours (approx.).

Fuel used: (both engines) : Mixture of equal parts kerosene, ether s.g. 720, and castor-oil, B.P., plus 2 per cent. amyl-nitrate, as specified by the manufacturer.

#### Performance

The first test, that of the engine, was under taken nearly two years ago on behalf of the manufacturer, the results, at the time, being considered startling and causing more than one raised eyebrow at the high b.h.p. figure recorded. The figure of 0.24 b.h.p. was, of course, very much higher than that which had been previously published for a 2.5 c.c. engine. Ample proof, however, that production 2.49's were giving power outputs near to, or equalling this figure, was obtainable in the superior speeds of Elfin 2.49 C/L

models in competition with other 2.5 C.C. types. Even a modest increase in the speed of a model requires a substantial improvement in power output, of course, since the speed at which an airscrew can be turned varies with the cube of the power available.

The engine owes its high performance, firstly, to the exceptionally high torque developed, and, secondly, to the shape of the torque curve which allows the peak b.h.p. to be realised between 12,000 and 12,500 r.p.m.

Both engines started readily and priming with fuel through the exhaust ports to obtain a start from cold, preferred by the early engine, was not found to be essential with the current models, which gave quick starts following a couple of preliminary choked flicks. Both engines are very easy to handle in view of the high standards of performance shown.

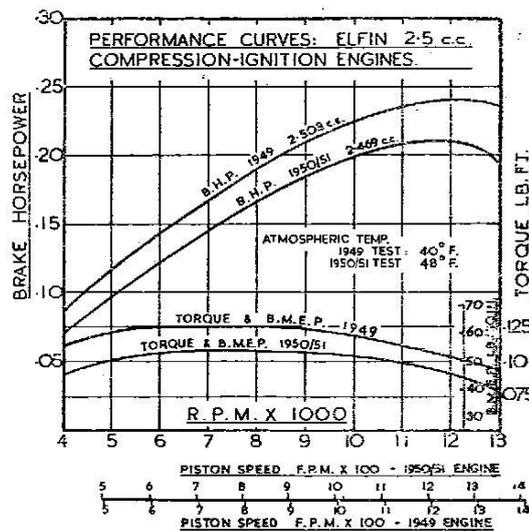
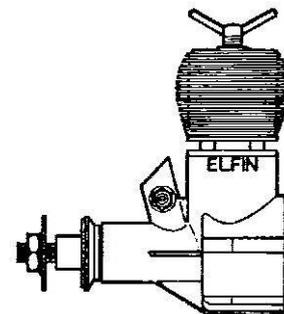
The 1950 and 1951 engines did not show quite such high torque values as the radial-mount 1949 model, although torque developed, as is indicated by the good b.m.e.p. equivalent, is still above average. The maximum b.h.p. realised was 0.21 at 12,000 r.p.m.

Some power loss with warming up was shown, both by the current model, which had only a nominal run-in period of one hour, and by the 1949 engine which had reputedly done some 50 hours' work.

It should be remarked, however, that this tendency, commonly encountered in the bench testing of diesels, is normally less evident under flying conditions.

Although essentially high-speed types, both models were found to run evenly at low speeds, despite a sharp decline in torque at below 5-6,000 r.p.m. The new type was particularly flexible at low speeds, although it was noticed that this model vibrated rather more freely than the old model at higher revs., between certain speeds.

Response to contra-piston adjustment was good and a wide range of speeds were possible, especially under fairly heavy



loads, using the compression lever. The new Vee pattern lever is comfortable in use and a marked improvement on the old type. The needle-valve on both engines was found to be positive without being too sensitive and would hold its setting securely at all speeds.

Power/weight ratio, 1949 engine (as tested) : 1.02 b.h.p./lb.

Power/weight ratio, 1951 engine (as tested) : 0.99 b.h.p./lb.

Power/displacement ratio, 1949 engine (as tested) : 95.88 b.h.p./litre.

Power/displacement ratio, 1951 engine (as tested) : 85.05 b.h.p./litre.

## From George R. Vale.

I was much taken with the Interstate Cadet and have penned a few lines about the C.G. etc.

### Interstate Cadet

I liked the look of George Stringwell's Interstate in Sticks 102. However his experience with the C.G. made me wonder what had happened to necessitate such extreme treatment. I dusted off my abacus to see if I could figure it out.

I needed a plan view of the Cadet, and fortunately found two on line. The clearer one herewith is an Earl Stahl 28" span model, and shows both scale and enlarged outlines of the tail feathers. It agrees with the other plan I found, which is of the full-size.

On either plan the scale tailplane area is about 16% of the wing area, and the moment arm is an ample 2.7 wing chords (L.E. to L.E.).

My abacus reckoned that the C.G. should be at 35% of chord. So why did George need to move it so far forward?

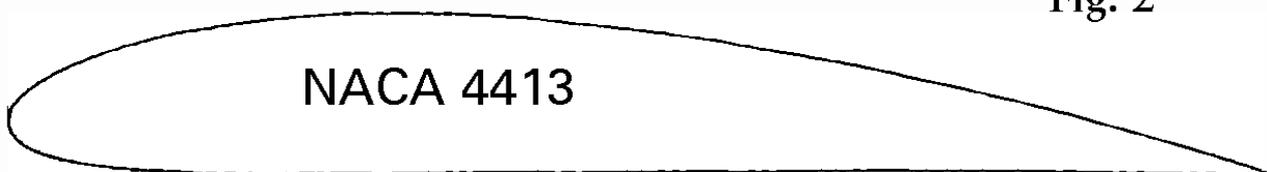
I suspect the reason lies in the aerofoil sections used. The full-size Cadet used NACA 23013, which has about 1.8% camber. What the model used is not listed, but it appears to be NACA 4413 (fig.2), with 4% camber. This change of camber would give about a 2 degree increase in the aerodynamic incidence of the wing.

So I suspect that the model ended up with a substantial up elevator trim compared to the full-size, equivalent to 2° on the wing incidence.

This would be fine for free flight, where we want a model to float around at the slow end of its speed range. But for R/C we want to be able to cruise at a reasonable speed under power in level flight. And for this we need a trim close to what the full-size would use.

So I'd bet my dope brush that George could move his model's C.G. back to around 35% chord, provided he adjusts the elevator pushrod to give a bit more 'down' with the stick neutral. It would probably fly a bit better thanks to the weight reduction, and be less prone to nosing over.

Fig. 2

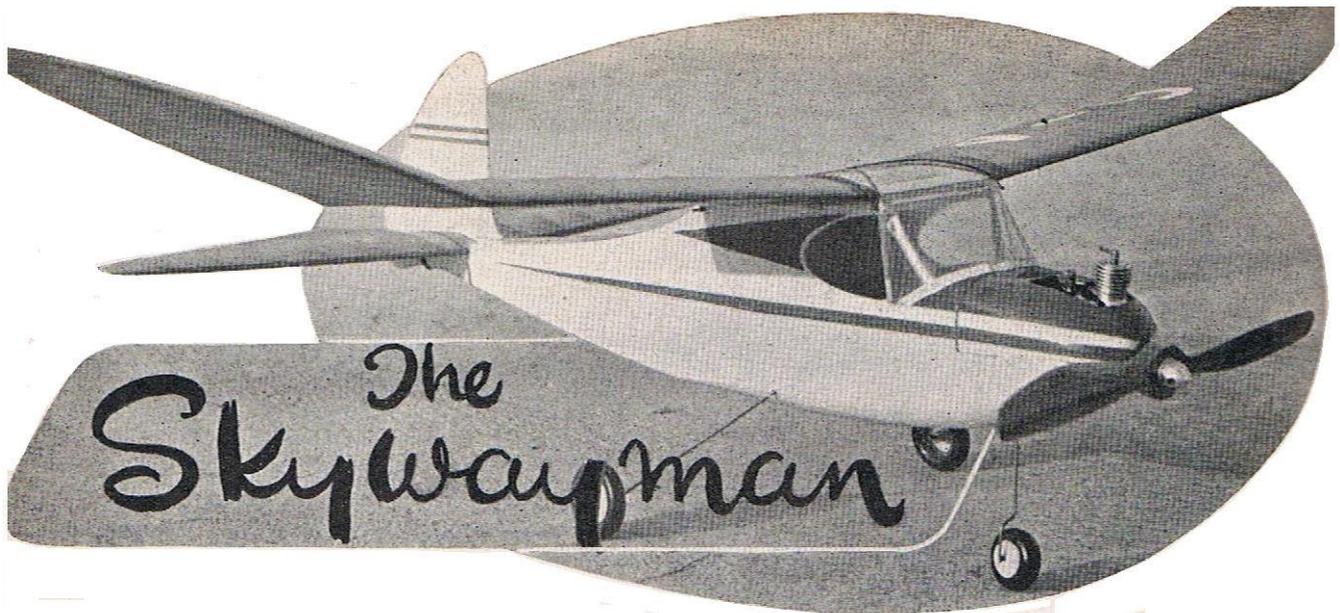








## Skywayman by R A Parker 30" FF model from Model Aircraft October 1951



The Skywayman is a tough little airplane intended expressly for sport flying. It will take all the knocks you can give it and then some!! The Kalper .32 diesel supplies all the power necessary for a zippy climb, in fact, we found that a fair degree of downthrust was needed to check that upwards spiral, hich, for once, was just what we did not want.

### Fuselage

Cut out all formers, and where balsa and ply laminations are required use Durofix, and dry under pressure. Bend undercarriage parts from 18 s.w.g., these being bound to the formers with thread, followed by a liberal coat of Durofix. Cut two fuselage sides from 1/16 in. sheet, sanding to 1/20 in. thick, add 1/8 x 1/16 longerons and uprights not forgetting to make one left hand and one right hand side. Assemble fuselage, checking accuracy with set-square. Taper engine bearers to ensure correct downthrust, cement in bearers and check line up. Add 1/32 in. sheet cabin floor, then lightly cement in position the soft block which will complete the lower fuselage contour. This block should be carefully carved and sanded until the curves flow nicely, then prise it off lightly and hollow to about 1/8 in. wall thickness, cement it back on again, this time for good. Add top and bottom fuselage sheeting, pre-sanding all wood. Block in around the nose, carving and sanding to the shape shown on the plan. Keep the edges of the detachable cowl as clean and sharp as possible.

### Wing

Make two identical rib templates from 1/16 in. Ply and sandwich rough rectangles of 1/16 in. balsa between them. Curve the resulting block to conform to the templates. Cut slots for spars. Next shape leading edge, mainspar and trailing edge—these should be slotted where required, dihedral angles correctly cut, and dihedral keepers cemented in position. Assemble the wing, one panel at a time, flat on the plan. Watch for unwanted warps and allow each panel to dry thoroughly before removing from board. Add leading edge sheeting, sanding the wood first, of course. Sheet latter half of centre section and cover the front portion with clear acetate sheet as shown on plan.

### Tail Unit

The tailplane is built flat on the plan, pinning down leading edge spar and trailing edge, then add curved tip portions. The ribs are simply 1/4 in. x 1/16 in. strip cut to the correct length and slotted to receive the spar. Cement ribs in position and when completely dry remove from plan and gently sand ribs to shape, using a sandpaper block. The fin is cut from soft sheet and cemented between the tailplane root ribs. Use a set square to ensure accuracy.

### Finish

The original Skywayman possessed a reasonable degree of finish which enhanced its appearance and increased durability, but remember that all colour doping must be confined to the fuselage to avoid an excessive increase in weight.

First sand the fuselage lightly, then dope on a layer of white Jap tissue or Modeispan; when this has dried out apply a liberal coat of Titanine sanding sealer. Six coats of sanding sealer were used on the prototype, rubbing down after each second coat with fine wet or dry paper. When a flat smooth surface has been obtained the first coat of colour dope can be brushed on, using a 5/8 in. wide brush with soft but springy bristles. Beware of the excessively soft mop brushes, which are worse than useless.

At least six coats of colour dope will be required, again rubbing down lightly after every second coat. Polish the final coat with Brasso metal polish and when this results in a smooth semi-glossy surface, change over to Titanine Hendon Polish W. Use plenty of elbow grease and you will be rewarded by a fine lustre. Finish off with a coat of Simonize car wax.

For decoration you can try a few stripes, but don't overdo it and remember that checkerboard designs tend to destroy the smooth flow of a model's lines.

Wings and tailplane are simply covered in coloured tissue, with three coats of clear dope on the wings and two on the tailplane. Try adding a tiny drop of castor oil to the last coat of clear dope; it will help to prevent excessive taughtening of the tissue.

#### Flying

For trouble free trimming try a calm evening, some longish grass and as much patience as you can muster. First aim for a smooth glide with no suspicion of a stall. Power flights should be made with the motor revved down as much as possible, the Kalper can be slowed down to a surprising degree.

The trim used on the original was left turn under power, changing to right turn on the glide. If you prefer some other set up, the model is stable enough to allow a few experiments.

If you do strike one of those hot sunny days with blue skies and towering cumulus, keep the motor run short and the glide a little steep, for the Skywayman is as sensitive to thermals as a pylon model.

## From Spike Spencer

### AND THEN IT FLEW STRAIGHT OFF THE BOARD (NOT !)

Readers may have seen the articles in previous issues of S&T where evolution of my twice size **T-Tray** (C/L to RC conversion) was described.

“Nostalgia strikes again” S&T No 108, Nov. 2015, Page 40 James Parry’s report of the Tarrant Hinton April fly-in. S&T No 113, April 2016

Now that I have actually tamed and mastered the beast, here is the promised update on its handling characteristics.

#### **(First) Maiden Fright: 28 Nov 2015**

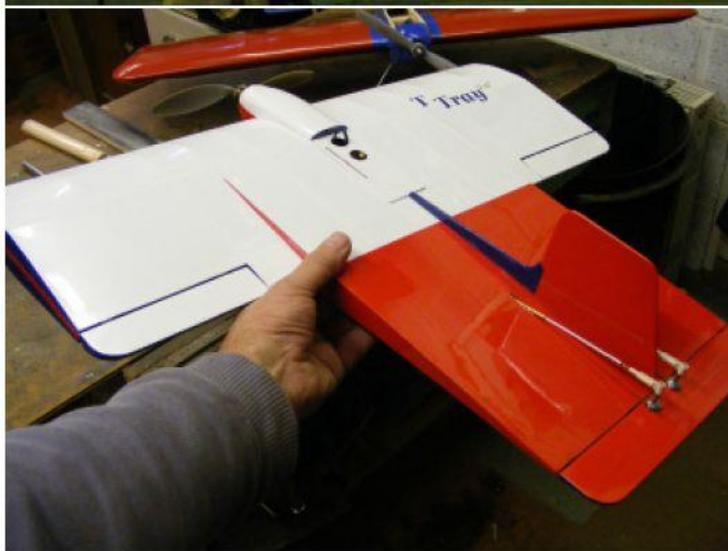
Although the model had been ready to fly for what seemed ages, I had waited a long time for a suitably calm early Winter day, with some long grass. Not surprisingly, when that day eventually came it was cold with no witnesses.

My first problem was to determine the best way to hold and launch the thing. As in James photo taken later at Tarrant Hinton, that was resolved by a gentle grip at the wing TE then, with power applied, a smooth pushoff at about 30° above the horizontal saw T-Tray leave my hand on a remarkably steady line - for about half a second ! It pitched up fairly violently and my quick grab of the Elevator stick soon induced a vicious PIO despite the 65% Exponential already dialled in. The machine cavorted about the sky giving a good approximation of ‘square’ manoeuvres and somehow managed to miss the ground until I closed the throttle fully over a fortunate area of long grass at the edge of the patch. A slow walk to the point of impact allowed me to relax somewhat and I was relieved to see that only the ‘O’ ring prop saver had been displaced.

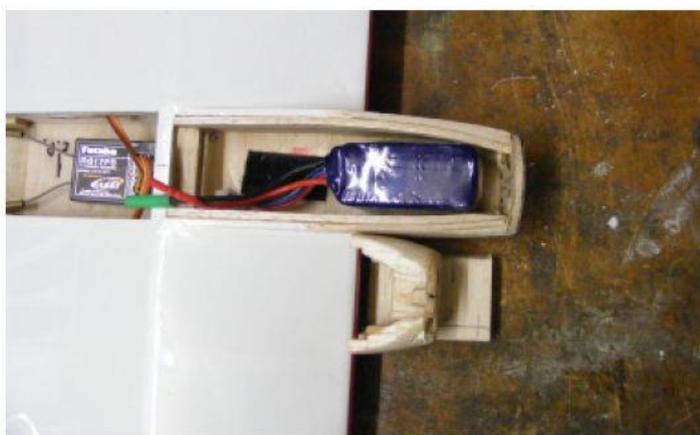
After the adrenaline had subsided, I was able to determine two things; Roll control appeared not to be nearly as twitchy as I had envisaged but the Pitch axis was a big problem. I had originally calculated on the thing behaving as a “Flying Wing” but although the CP was comfortably behind where the cg had nested, it was clear that the after body was not acting as ‘Wing’ area. Consequently I reassessed matters. My previous experience of building flying wings went immediately out of the window and determined to move the cg forward to a more conventional position with respect to the main wing alone and to discount the area of that aft body. Perhaps I should just have believed the cg stated on the original C/L plan ?

Back to the workshop and it was immediately clear that neither the battery could be moved any further forward nor was there any room for Lead. The only way out of that jam was to apply some brutal surgery to the nose and make a significant extension to move things forward.

This butchery managed to move the cg forward enough to improve the handling somewhat.



**Strong spar under there so a safe launch grip position**



**Old nose, new nose**

## Second Maiden Flight

13 December 2015 was another fairly pleasant calm but chilly day for another attempt at controlled flight. The cg had now been moved up to the rear edge of the Mainspar by the nose extension and cramming some sheet Lead into the minimal spaces available alongside the battery. The launch went OK at 30° from the hand. Climb to height was more manageable but remained very 'pitchy'. Elevator control still seemed to be all or nothing. Any manoeuvres were still very 'square' drawing frequent "Ooohs" and "Aaahs" from the spectators !

When a safe height had been achieved, speed was reduced whereupon the pitching tendency abated significantly. Slower flight was easily managed at about 1/3 throttle. It could be made to fly ridiculously slowly and I felt able to explore some more of the Flight Envelope. Behaviour near the stall was benign and it could not be induced to depart. However, even with low throttle settings, when the nose was lowered allowing airspeed to increase, the pitching tendency returned with a distinct urge to tuck under. This "Dive Test" suggested that the cg needed to be taken even further forward so, back to the workshop for more Lead. I was pleased to see on this more extended flight that Roll control was gentle with no handling problems in that Axis.

I could explain some of my difficulty in getting the cg forward by the use of relatively heavy Profilm over the large aft area but was a little disturbed by the changes in Elevator response at different airspeeds. This could be due to some Boundary Layer effects over that large aft body but I would need a lot more air time to come to any firm conclusion. There remains a suspicion that small Elevator deflections are blanked, but only bite when that surface has moved well away from the neutral position so Gurney strips were considered as one possible future modification without more major surgery. (These were later added but to no noticeable effect)

A check on the battery meter showed that this 4 minute flight had only taken 20% from the cells so the motor power and 3S 850Mah battery were quite adequate, promising lively performance once handling could be fixed. Throughout this development, I had regularly consulted my 'Vintage' group of fellow builders and David Lovegrove was kind enough to recheck the cg calculations for me (I hasten to say, with a vested interest as he now owned a set of laser-cut parts for his 36" version). Using the GW formula it said 32% of MAC, i.e. just a gnat's toadger forward of the original plan's mainspar. This assumed a "normal" wing and tailplane layout and (almost) corresponded with where I now had it. Nevertheless, I wanted to make one more significant cg movement to a point definitely forward of the Mainspar to determine if the Pitch instability could be eradicated. A quick way of doing this was to hang lumps of Lead forward of the prop on a CF hoop fixed to the wing tips.

Some 'field-adjustable' Lead out there had the desired effect and I approached the flying field with the confidence of an airframe that I imagined would be 'over-stable' in Pitch (*Can I hear knowledgeable chuckling at the back there ?*)

After completing this bodge and more waiting, I eventually left work to a mid-afternoon calm with bright sunshine. I zipped across to the flying site and offered the T-Tray to the sky again. The low sun thoughtfully slid behind some low clouds upwind in the distance. Above was blue sky while behind me were dramatic

Cumulus and vivid rainbows over Salisbury. In a short time, I had achieved two launches, two landings and about 10 minutes airborne with no damage.

Although I had an electronically stabilised Rx available, I still wanted to determine the 'raw' handling characteristics.

Although now much more controllable it still showed 'interesting' handling behaviour and is not a machine that I would enter into any demonstration aerobatics event (*unless sparring with other T-Trays*).

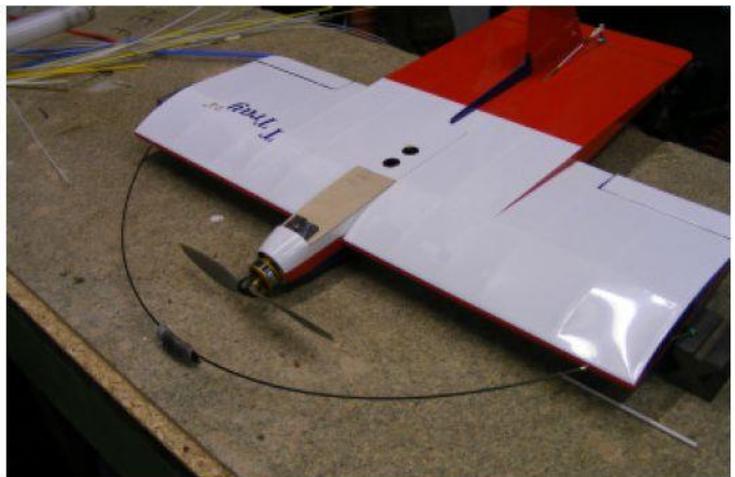
Moving the cg forward to the front edge of the main spar had largely resolved the previous undamped Pitch instability and response to controls had become normal and quite progressive, but read on.

Loops bunts and rolls were flown with no problem while a stall virtually unobtainable; it just gently nods its way across the sky while remaining responsive in Roll. Opening the throttle from that high AoA condition achieves an immediate tight loop. 65W of power gives lively vertical performance. It can be flown ridiculously slowly at high AoA with slight wing rock but no sign of incipient spin. In the 8 to 10 Kt breeze, it was virtually stopped as it landed.

There is inevitably a downside:

At higher speeds, Pitch response is 'odd'. There appears to be no state of neutral stability and it is either slowly (a relative term) pitching Up or pitching Down with no change to the Tx trims. At slow speed (Elevator deflected from centre ?) response is more normal. I suspect this high speed phenomenon is nothing to do with the large amounts of Exponential but more likely to be a control surface masking effect from that large after body. The Elevator has little effect until it is displaced some distance from zero.

By now I was fairly comfortable with the raw handling characteristics, so put the stabilised Rx in for the subsequent



**Extreme measures for cg adjustment**

flights. That seemed like a good idea at the time and the gyros overcame any remaining Pitch deviations. However, I then suffered early motor shutdowns after only 30 seconds of flight. There was some suspicion that the ESC was getting insufficient cooling and was going onto Failsafe so there then followed an extended set of Extreme measures for cg adjustment

bench tests to find the problem. To cut a long story short, the standard Rx was returned to the airframe and the motor/ESC problems went away. I also removed the temporary CF rod 'external cg adjuster' and extended the nose a little more. All ballast is now inside and the flying weight still only 13.5oz.

In this final configuration, I have now had at least four full flights of about 8 minutes airtime each. Checking the cells on landing shows that a fairly energetic flying session uses less than 50% of available power so the 65W powertrain is more than adequate in this little airframe. The high speed Pitch deviation remains but is predictable and controllable (*albeit at "5" on the Cooper-Harper Scale*). No doubt someone out there with a PhD in CFD will be able to tell me what the Bernoullies are doing when they misbehave in this way.

Handling at low speed and quite high angle of attack is gentle with just a little wing rock but it does not depart. I suspect that low-speed Roll control is largely produced by propwash over the Elevons because reducing the power even further just results in sink and loss of Roll authority. A burp of throttle instantly produces the desired movement. It is quite possible that taileron control alone would be adequate.

With the cg in its final position on the front edge of the Mainspar, the Pitch deviation is not seen at low speed but still comes in with a vengeance at high speed so lots of exponential (soft-centre) and small elevator movements are essential or the flight path then gets 'interesting'. "Gosh, it's agile!" was heard from several onlookers who had not seen how tenderly I was moving the sticks with the power taps open.

I can fly it comfortably around at low height and speed in light winds with no problems at all while the most recent flights have been in quite blustery conditions without problem. Hand launch goes straight as a die and landing is easy if the approach is done with a little power. Glide landings are more like a 'plop' onto the ground with a steep angle of approach and little round out possible as the speed washes off rapidly. All very controllable though.



**Original (unsuccessful) short nose version**

**Final stretched nose**

Now the modifications have ended and handling is acceptable, I have completed the cosmetics by building up the missing top deck with a forward cowl to hide one of the lumps of Lead. This carries a 2-D pilot in a suitable pose over the battery/ESC vent holes just behind the wing LE.

Now that my sanity has returned and the Naysayers silenced, I look forward eagerly (?) to David's 36" version. If anyone wants more details of this unconventional C/L to RC conversion, I am sure that James will pass on any queries to me.

Happy landings

**Spike**

## Control line at Wimborne MAC

9 October Sunday

## Cocklebarrow

The dates for Cocklebarrow have been confirmed as 10<sup>th</sup> July; 21<sup>st</sup> August and 2<sup>nd</sup> October.

## From Gray North Cotswolds MAC Fly for fun

Good timing with your mail-just before Xmas, the North Cotswold MAC held our AGM and we fixed the date for the Fly For Fun 2016.

It will be held on the weekend of August 13th and 14th at Far Heath Farm.

As we've done for the past two shows, we'll be holding two informal events within the main show. On the Saturday, we'll be welcoming anything designed by the great Vic Smeed, while on the Sunday, there will be a one design event for Sid King's Cotswold Novice trainer.

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**FLY FOR FUN**

**EVENT 2016**

**AUGUST 13<sup>TH</sup> & 14<sup>TH</sup>**

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## From Richard D Scott

Text as below and attached photos by way of possible contribution to S & T.

### MODEL SHOP MEMORIES

I thought that 'S&T' readers might be interested (or should that be amused?) by these 'then and now' photographs taken fifty years apart of myself with two different examples of Bill Dean's 'Bandit'. The black and white photograph was taken at my parents' house when I was eleven years old and this was my first power-model. The colour image is me as a rather more mature sixty-one year old and was taken this May not more than half a mile away in my brother Peter's garden (more of Peter later). Actually, the current 'Bandit' was built around eight years ago and is now a little battle-scarred having been flown fairly regularly over the intervening years, so it is no longer quite as pristine as it appears in the 'just completed' photo! There is a link between the pictures, apart from it being the same model-design. Both the original kit & engine combo and the later model's engine came from the same model shop – the late-lamented R F Austin of Southbourne, Bournemouth. The original Keil Kraft kit and the engine were Christmas presents from my parents in 1965. I can still remember excitedly going to Ron's shop with my father just before the big day and selecting both the model kit and the brand new A-M 15 (second series, with the white nylon tank) and being given helpful advice by Ron, who I can't ever recall seeing without a soggy fag in his mouth and who I remember in particular for saying 'yis' (it never seemed to come out as 'yes!'). This was a real model shop of the old school, stacked to the gunwales with enticing kits and all sorts of modelling paraphernalia and right up until the time of the shop's closure in (I think) the late 1990's you could be sure that they would be able to oblige with even the smallest of items – like tiny cup washers for example! Ownership of the shop in due course passed to Peter Sparrow (who kept the original trading name) and over the succeeding years, and especially when I was employed and earning reasonable money, I spent many a happy Saturday morning browsing (and all too often buying!) modelling goods from Peter. I believe that Peter – who could regularly be seen out and about in his bright red Jeep – moved to France after the shop was sold, but I may be wrong. Peter was also known for producing the excellent 'Air Art' transfers depicting engine-manufacturer's logos. I still have a large number of these and one day will be putting one of his nice 'Powered by H.P.' decals on that great-looking Rich Brand R/C aerobatic design 'Spitpanzer' which I have always promised myself. The original 'Bandit', which I built during the School Easter holidays in 1966, had red tissue fuselage and yellow tissue wings. Predictably, it was vastly over-powered by the A-M, but it flew well until ultimately being consigned to the funeral-pyre. The current model, built from the Ben Buckle kit, is also vastly over-powered with its Indian Mills 1.3. Foolishly, I only recently got rid of the 1.3's box (with nice R F Austin sticker showing Peter's Jeep) as I needed it to post an engine sold on eBay having at the time run out of all other suitable packaging. Thinking about it, there is yet another link here. The Indian Mills had for many years been installed in one of my favourite models, a Modelcraft 'Hornet' (still available as an 'Easybuilt' kit and well-recommended – I have two of these kits 'in stock'). This particular 'Hornet' had also been purchased from Austin's Model Shop, as an airframe only, minus engine. Some while later when I was flying it at Middle Wallop, the builder was re-introduced to 'his' model, having himself lost it on an earlier occasion at MW in a 'fly away'. Peter Sparrow later told me that it had been brought to his shop by some young lads who (so it became apparent), had clearly recognised the value of the engine (an original Mills, so I was told by the builder) when they found the model and had either kept the engine, or more likely sold it. When I built the second 'Bandit', I substituted a really nice original Mills 1.3 of my own in the (by then re-covered) 'Hornet' – my thinking being that if I was to lose the 'Bandit', then at least it would only be the Indian engine that had been 'sacrificed to The Great God Of The Forest' (as my father used to say about the trees in the New Forest - which admittedly did, and still do, seem to have a sort of magnetic attraction to free flight models!). With a nice touch of irony, it was of course the 'Hornet' that was subsequently lost – never to be found – complete with the lovely original Mills. The blue and white 'Bandit' is a fine flier, but these days I more often than not fly Bill Dean's larger – and still supremely elegant – 'Southerner', which I am seen launching at Middle Wallop a couple of years ago in the final photograph. My brother Peter (well known as a something of a spark-ignition engine 'expert' and as an occasional columnist in 'Aeromodeller' and contributor to 'S & T') gifted this model to me a few

years ago as he had run out of storage space. Built to Peter's usual immaculate standard, this really is a wonderful flying machine and is ideally matched to the venerable first-series Frog 249BB which pulls it aloft in fine style. The glide is nothing short of magnificent. Thanks bruv!





### **Showscene by Dave Bishop of DB Sound.**

We arrived at Old Warden on the Friday afternoon to be ready for the first weekend (May 14-15) of the three planned Modelair events organised by Ken and Sheila Sheppard, to be greeted by the most horrendous wind one doesn't want to experience at any event. It meant turning the caravans 90 degrees reference to the runway so that awnings could be erected without the whole shebang blowing away. Gradually over the weekend the wind subsided and it turned out to be the "normal" OW super flying weekend for all of the many sorts of aeromodelling disciplines of modellers' that came along to fly there. And they were there in plenty and with the restaurant being filled with those partaking in the "full English" from the excellent restaurant from 9am onwards before the airfield was cleared for us to go to our respective areas to meet up and fly our models.

Ken's friendly voice could be clearly heard announcing on the PA system from time to time, giving guidance as to where and what was taking place over the whole airfield. There was another voice on the PA who was so loud that I thought the loudspeakers were going to explode. Being in the PA business all of my life, I did enquire if anyone knew where the volume control was on the amplifier situated by the control tower, with the reply that "they had been told not to touch anything!" Such a pity because the late Haydn Warren APAE \*(who designed the first PA system used at Old Warden and many other airfields) would have been horrified to witness such an excellent system being so treated.

I put up a pair of DB Sound loudspeakers so that occasional information could be given on the R/C flightline and had a few sessions of talking to the audience stationed there with their deck and fishermen's chairs. One of the events that proved very popular with many people there was the children's building and flying session in the free flight area situated at the left hand end of the airfield. The resultant applause by a generous crowd of spectators was well warranted as each youngster built and then flew their models (supplied by Noel Cole of Belair) with the best duration being the winner. Control Line was once again very popular as was many R/C assist models mostly electric powered nowadays and it's good to see the many Keil Kraft Veron and other manufacturers of way back 50's models originally powered by rubber and now with lightweight radio gear and a rudder control. Gliders were being towed up and then flying beautifully as always do there.

I had a great "Mayfly" weekend as always and it's a "must go" to event as there is so much to see including the chat with so many aeromodelling "greats". They are all there and there is no snobbishness with any of them, well not that I have found anyway.

The 2016 Showscene for DB Sound is as follows; June 4 - 5 at Long Marsdon a Traplet Publications sponsored event with some of the best show pilots from around the world demonstrating the latest and greatest aeroplanes ever. June 17 - 18 -19. Weston Park annual show at Telford where everyone meets everyone. Bring along a model as there is flying in the evening. June 25 - 26 Wings & Wheels at North Weald aerodrome and I'll be there with my microphone to say goodbye to Jane Stephenson after so many years of her organising excellence but we have been assured that the show will go on which is very good news. Sadly there is no flying after the day show at this event but there is very good entertainment laid on for everyone during the evenings. There is the biggest market to see on the Saturday which sells almost everything you could wish to buy. July 23-24 Old Warden Scale weekend and there is full camping also. September 24-25 and the last Old Warden's Modelair event with the Festival of Flight and the special "Vic Smeed" memorial day plus anything and everything Vintage. Belair will be at Old Warden and he will have all of the Vic Smeed models that will fit the bill for you to build before the third and final for 2016, Modelair event.

October 1-2 Ragley Hall this event replaces "Weston Park in the Dark" show and will be run by Steve Bishop and his team.

\* APAE stands for the Association of Public Address Engineers.

Pictures attached all taken at Old Warden .



*Neil Tidy at Old Warden with a very old Flair Hannibal.*



*Three "old timers" scaled up Junior 60's ish and now they are called "Vintage 100".*



*A very nice Sid King design Maule, built and flown by flight line helper, Brian Taylor from Bodiham.*



*Gavin Barden with his latest winning kitted Equaliser club racer with his son William. This could be the cheapest RC Model aeroplane ever kitted.*



*John Bennell from High Wycombe with his Keil Kraft Cadet converted glider and nowadays a Thunder Tiger kit.*



*A great group relaxing with their excellent Warbirds line-up.*



*The "boss" of Modelair at Old Warden Ken Sheppard with his three electric motored Italian job on its first test flight. He had his hands full with some porpoising*



*One of the showscecne's best flyers is Mark Hinton who arrived at Old Warden with his home built Morgan twin cylinder 3 wheeler car. Quite priceless I understand.*



AeroNaut have re-issued some of their vintage Control Line kits.....as you can see from the pictures the designs are a bit vintage continental, but I like them.....the Roby is 25" span for 1 – 1.5cc.....the Meteor 39" span for 2.5cc.....the Matador 40" span for 3.5cc.....and the Komet 54" span for 5-6cc...the Roby and Meteor have flaps

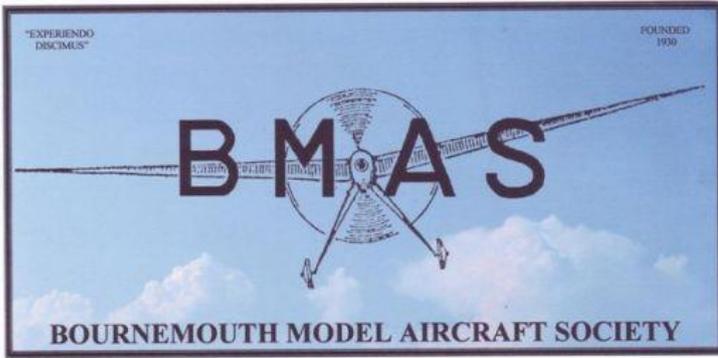
They all date from the mid to late 50's....the Golden Age of CL.....typically Continental, the plans are a work of art as are the box lids.....there is a surprising degree of pre-fabrication with most major parts die cut or pre-shaped.....construction is a mix of balsa, obechi, ply and hardwoods.....some hardware is included but usually in the form of DIY bellcrank, tank and horns etc which have to be made from the

basic materials supplied.....there are English instructions and some white modelspan type tissue.....these kits are a real treat for the experienced builder and the prices are keen as well....here's what a customer had to say:-

Kits arrived this morning, what lovely models.....Really unusual and classically vintage, the Meteor is very stylish and the Roby is a little funky.....I think they will sell well once word spreads, they are really good value for money

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