

Sticks and Tissue No 134 – January 2018

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 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/>

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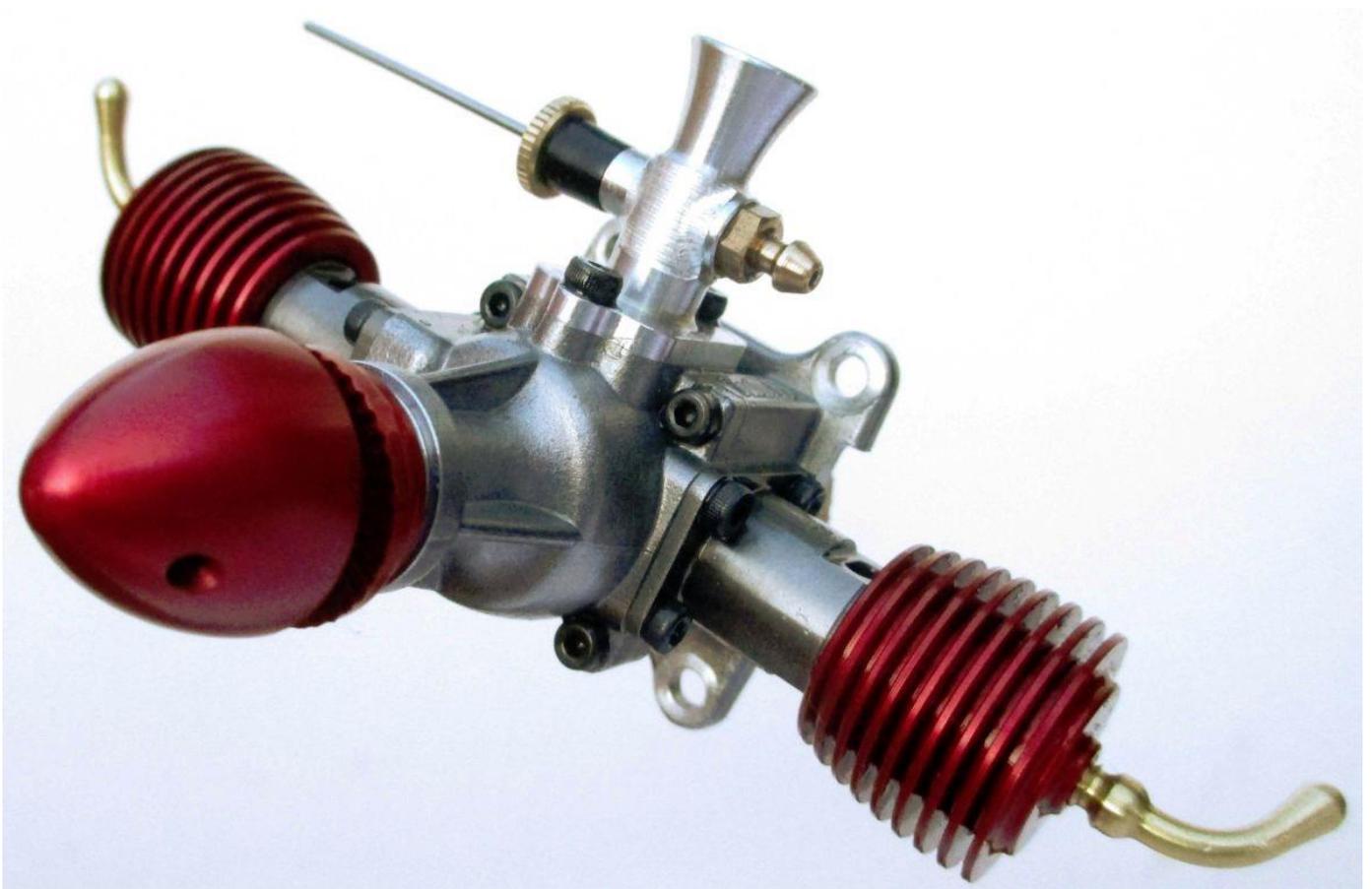
Photos from Peter Renggli taken by Urs Brand and Urs Rindisbacher of the MG-Bern

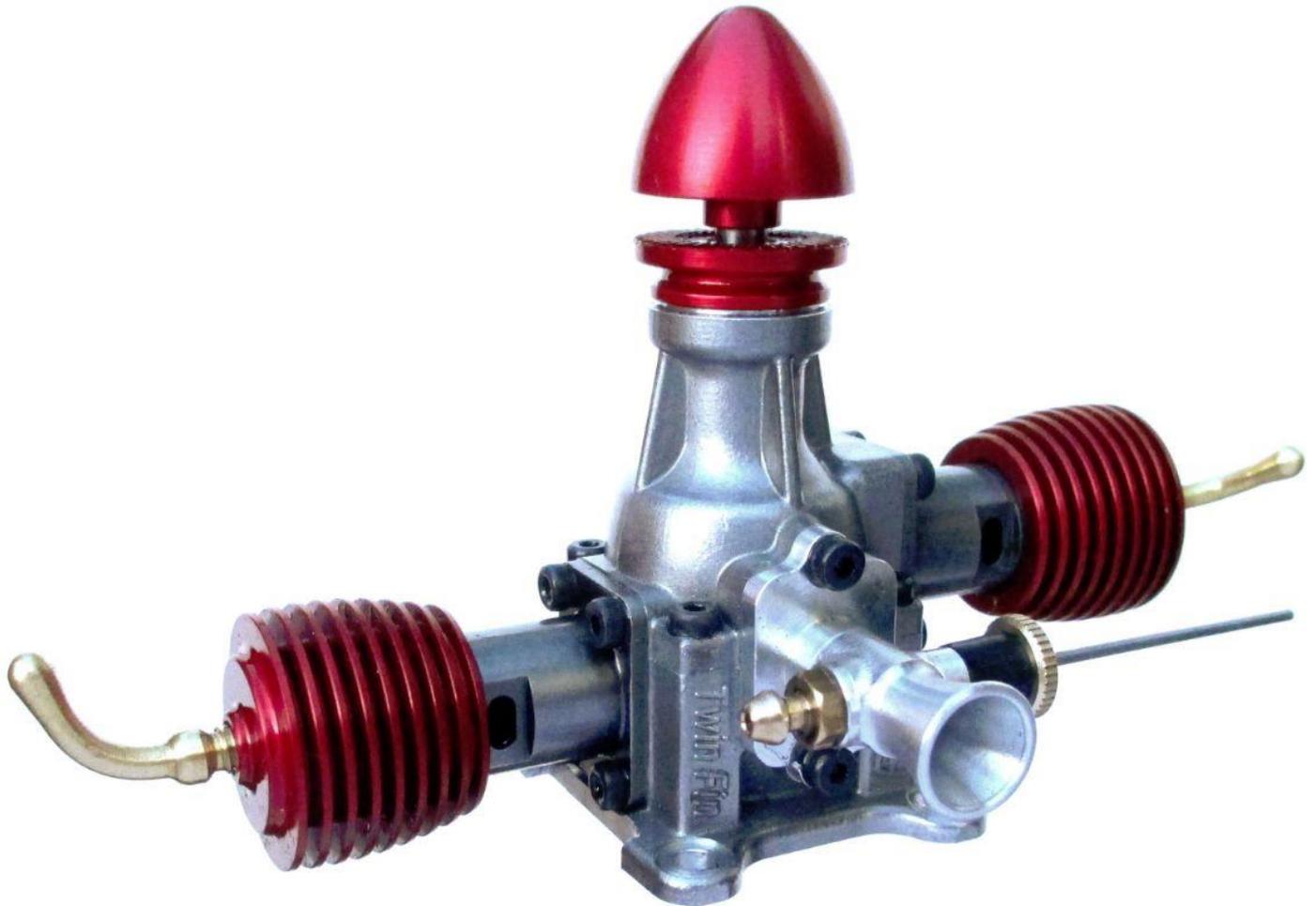
From Jörgen

About the Twin Fin according to Alex Phin was I probably the first to fly the Twin Fin In my Frog 45 from Belair It was almost ready then the Twin arrived just had to change the cowl and it flies great and sounds well to



As an addition last month's article by Bill Wells I omitted to include two more photos of the Twin which was bit of a blunder on my behalf so I belatedly include below





North Cotswolds MAC 2018 Fun Fly

The North Cotswold MAC's Fly For Fun 2018 will be held on August 11th and 12th at Far Heath Farm, Moreton-in-Marsh, Glos.

We'll be running all our regular features and the models chosen for our Designer's Events this time will be:

On the Saturday - the Keil Kraft Super 60

On the Sunday- designs by the late Dereck Woodward (we're revisiting this one as the first time we ran it, the event was hit by bad weather).

In both events, models of any size, variation and power will be welcome.

Gray

From David Lovegrove

I'm attaching a few photos of the latest iteration of my "Mangled Wot" Galloping Ghost - controlled model. It's recently been updated because its predecessor, "Mangled Wot Mk. 1" suffered a whoopsy during the course of an otherwise unremarkable flight, when my patent safety/arming device failed in flight. This was an XT60 plug, connecting the LiPo to the ESC via a matching socket epoxied into the fuselage side. It fell

out. This was the second time this had happened; the first time it was just annoying, no damage other than a broken prop. Second time, not so lucky. Broken fuselage, deemed not worthy of repair.

The effect of the plug falling out was twofold:

1) the model was deprived of power and guidance and

2) with no power to drive it, the actuator's torque rod was pulled back to neutral by the centring spring. That means neutral rudder and full "Down" elevator, and has only one outcome. I've scrapped that idea now.

Luckily, the original wings and horizontal stabiliser survived pretty well unscathed, so the "Mark 2" essentially comprises just a new fuselage and fin. In re-vamping the fuselage, I took the opportunity to make it a bit more user-friendly by junking the unnecessarily complicated bolt-on wing: lucky bands now do the job. Battery Installation has also been simplified. All in all, much better and she flies very nicely too.

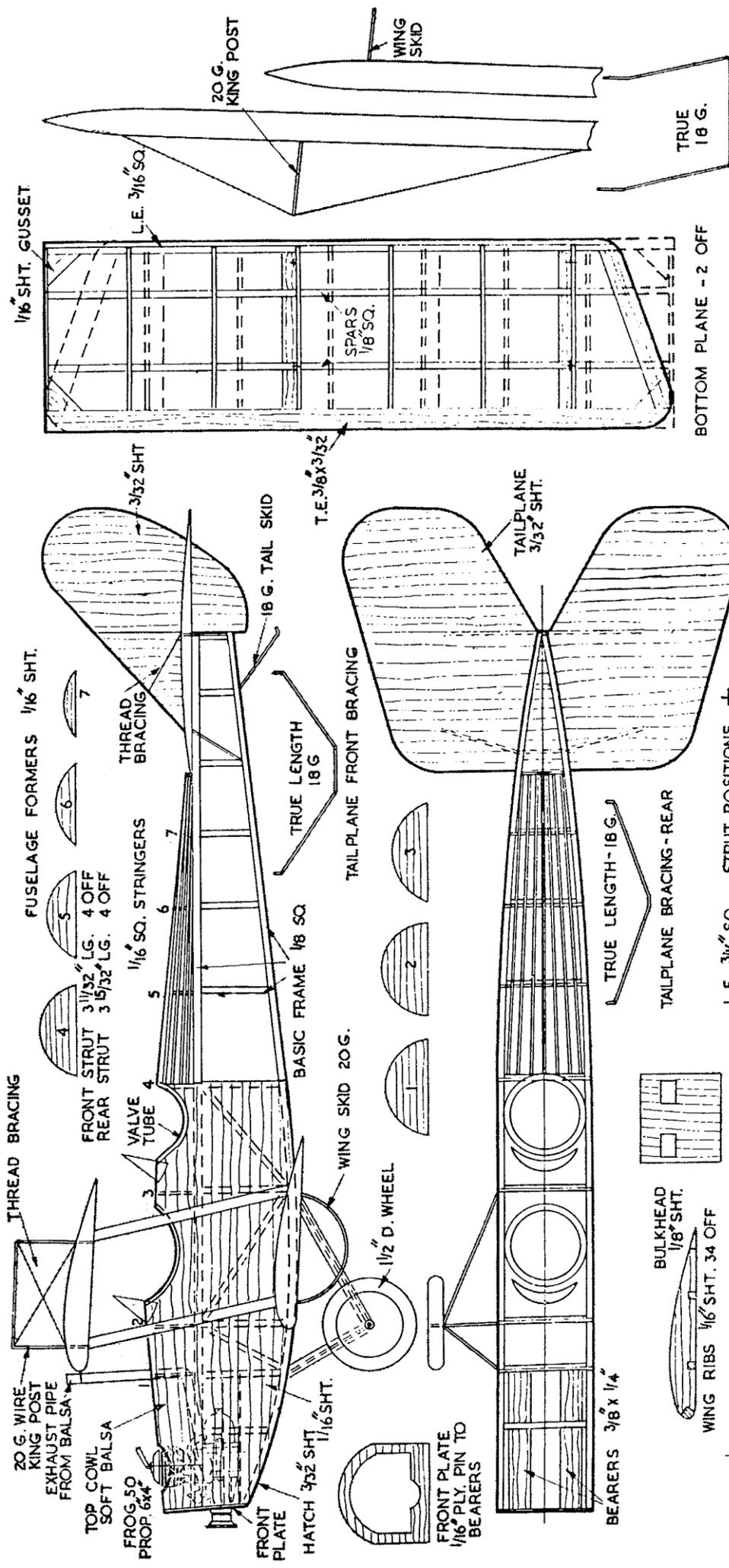
Somewhat to my amazement, fellow S&T contributor and flying colleague Mike (Spike) Spencer has expressed an interest in building his own version of the MW2, and, having access to sophisticated computery things, has offered to convert my scruffy working drawings (on top-quality B&Q lining paper) into something more up-to-date and presentable. When he's done, various components, such as sets of laser-cut ribs for the tapered-planform wing will be easily reproduceable. Again, because he can, he's also engaged in producing his own bespoke version of the electronic device for converting "normal" proportional signals into GG-Speak. I'm looking forward to being the guinea-pig test pilot i.d.c..

Incidentally, to illustrate just how far things have moved on over the decades, at a flying gathering at our local field just before Christmas, a couple of younger members were intrigued by the incessantly flapping tail surfaces of the MW2 and another Galloping Ghost model (a Phleet Phoot) flown by our chum John Mellor. I can see why those young gentlemen - of a mere 50 years of age or so - would find this baffling. Their huge, terrifying, aerobatic helicopters and gigantic petrol-powered aerobats weren't even a pipe dream when GG was in its pomp in the early nineteen sixties. My explanation probably didn't do much to clear the fog but when the models were in the air, they could see that GG does the business!

Probably the bit that would have made most sense was my assertion that it was just for fun. Why else would you want to turn the clock back over half a century?

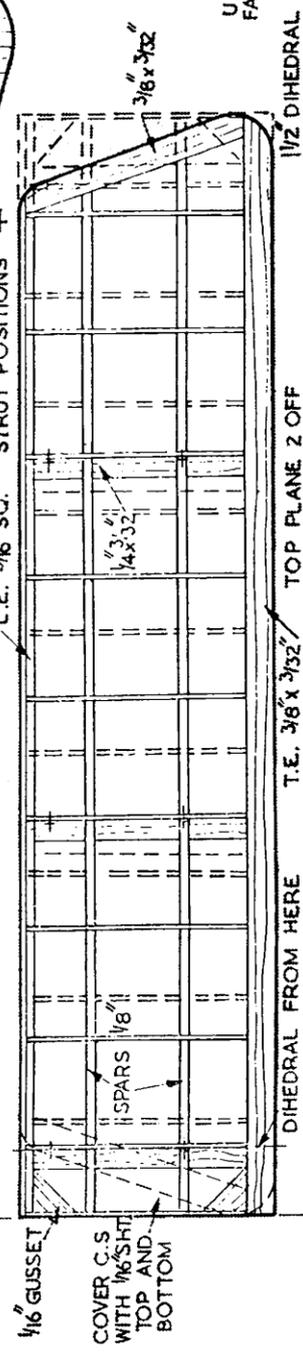
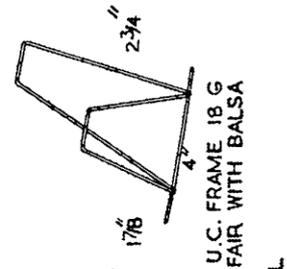






C.S. STRUTS .2 OFF
 BIND & CEMENT TO TOP

CURTISS
JENNY
 M.A. 197 P.M.H. LEWIS 3/16
 SPAN 29" LENGTH 18"
 COPYRIGHT MODEL AIRCRAFT
 19 - 20 NOEL ST. LONDON, WI



Curtiss Jenny free flight scale for .5 cc from Model Aircraft October 1954 by P M H Lewis



Many pilots of the Great War remember the Curtiss Jenny with its 90 h.p. Curtiss OX-5 V8 motor as the aircraft on which they learnt to fly. It was in use at both British and American schools and continued to be flown on barnstorming tours in the U.S.A. for many years, providing thousands of first flights and exhibitions of wing walking and aerial trapeze acts. The span was 43ft. 9 in., length 27 ft. 1in. and top speed approximately 70 m.p.h.,

all-wood construction being used with fabric covering.

The original model is powered by a Frog 50.

The Fuselage consists of 1/8 in. sq. hard balsa. Two frames are built on the side view, one above the other. When dry, separate them with a razor blade and join with cross pieces, working from the rear towards the nose. 18 g. wire centre-section struts are now bound and glued in place together with the undercarriage vees which are shaped from one piece of wire. Add the tailplane struts and tailskid also from 18 g. wire. The semi-circular 1/16 in. sheet formers are next cut and cemented in position and faired with 1/16 in. sq. stringers, 3/8 in. X 1/14 in. hardwood bearers are drilled and bound with thread to prevent splitting. Cement them in position to accommodate the motor in use, the rear ends passing through slots in the 1/8 in. sheet bulkhead. The fuselage from the nose to the rear cockpit is covered with 1/16 in. sheet, a soft block being shaped and hollowed out to cover the top of the motor bay. 1/16 in. ply front plate is pinned and glued to the bearers and the space below the motor bolts filled with a piece of 3/32 in. sheet hinged with tape to provide access for mounting. The centre-section struts are faired with 3/32 in. sheet and the 18 g. axle bound and soldered to the vees.

Wings. Pin the 3/16 in. sq. leading edge and 3/8 in. x 3/32 in. shaped trailing edge in place for the top wing which is built in one piece. The two spars consist of 1/8 in. sq. hard balsa. The required number of 1/16 in. sheet ribs should now be cut and cemented in their respective positions. The wing tips are of the same material as the trailing edge. 1/4 in. X 3/32 in. braces are fitted as shown to accommodate the interplane struts and the centre section is covered above and below with 1/16 in. sheet. Crack the wings outboard of the centre-section and set and glue for correct dihedral, fitting corner gussets to strengthen the Joints. Port and starboard lower wings are completed in the same way, the root ribs being set for dihedral angle. In addition, 1/4 in. sq. blocks are fitted to take the interplane struts.

Tail Unit. Horizontal and vertical tail surfaces are cut from 3/32 in. sheet to the outline shown and are then sanded to streamline section. If necessary, butt-joint to obtain the required width of sheet, the grain running as shown.

Covering. The entire model is covered with heavy weight tissue and water-sprayed. When dry, three coats of clear dope are applied. All upper and side surfaces are then given one coat of matt green dope, the under surfaces of wings, fuselage and tail being left in the natural colour or cream-coloured. Red, white and blue roundels are placed above the upper and below the lower wings and on each side of the fuselage together with red, white and blue stripes on the rudder, blue forward and red aft.

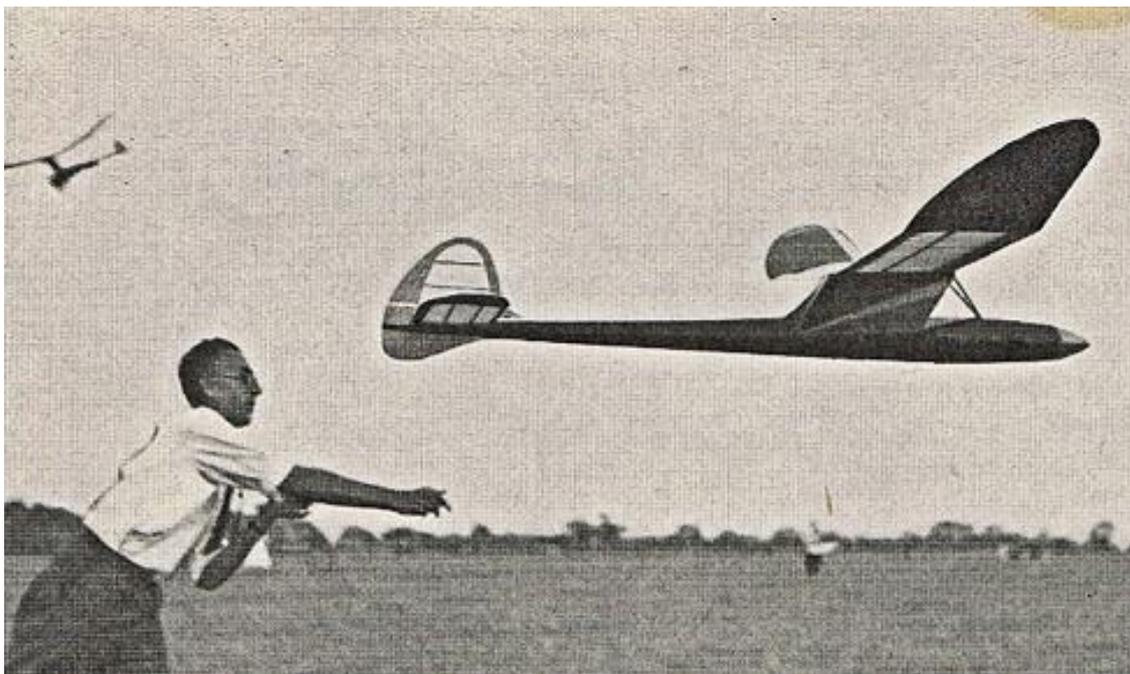
Assembly. The Jenny is now ready for assembly and the tail surfaces are first glued in place, followed by the top wing and then the lower wing panels. When thoroughly set, cut the interplane struts to length and point the ends. They are now firmly cemented in position. The 1 1/2 in. dia. celluloid wheels are retained by a soldered washer and the nose forward of the centre-section struts is



covered with tin foil glued on. Rubber valve-tubing is fitted round the cockpit edges and celluloid windshields slotted into the top decking. Bracing wires are represented with dark grey shining thread suitably tensioned. 20 g. wire wing tip skids and kingposts are pressed into the struts and the exhaust pipes and engine details are added with balsa. The motor is bolted in place and a 6 in. X 4 in. propeller fitted. Flying. Add weight to the nose or to the tail as indicated by gliding tests over long grass and adjust power flights with down- and side-thrust as require in conjunction with the rudder.

Model Aviation 1950 photos

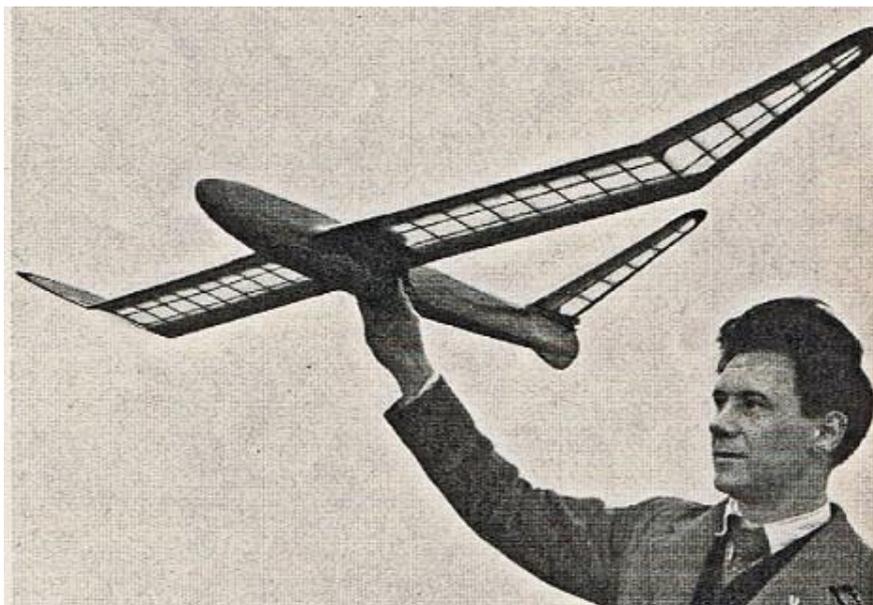
Whilst looking through the magazine my eyes were caught by these photos which I liked so much I thought I'd include in S&T



H Crouch of the Croydon Club launches his 84" span glider. Model was scaled up from the popular Fugative design. Wing section appears to be almost flat



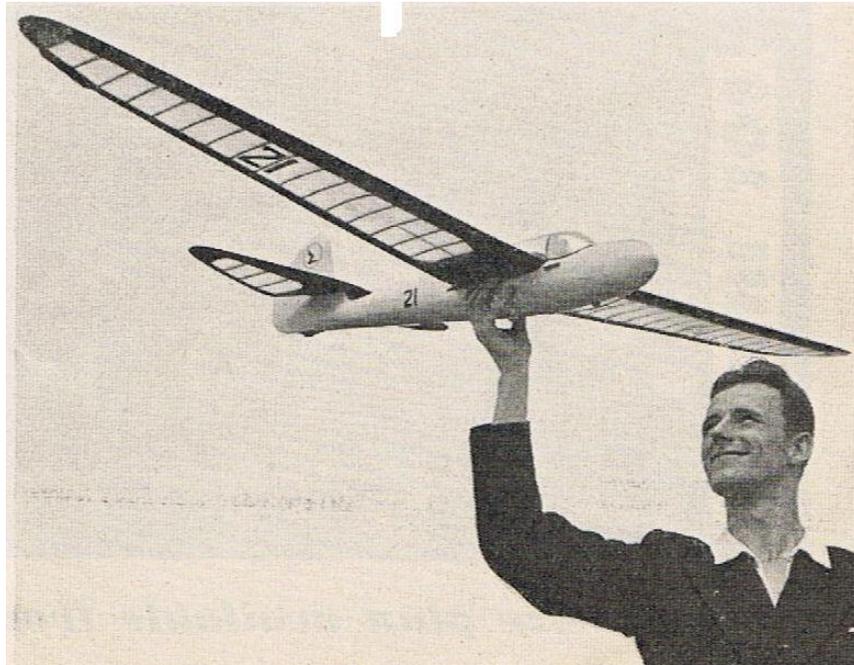
T S Nachtmon of Poland designed this beautiful 60" glider. Wings plug into the completely planked fuselage



Tom Hindell of Battersea and his Nordic A-2 class design. Mid wing gliders of this type are comparatively rare.



John Cox of Northern Heights releases Ron Teasall's 72" span model. Photo was taken at Fairlop on a windy day early this year. I particularly liked this photo as Ron Teasall is still an active aeromodeller with Wimborne MAC.

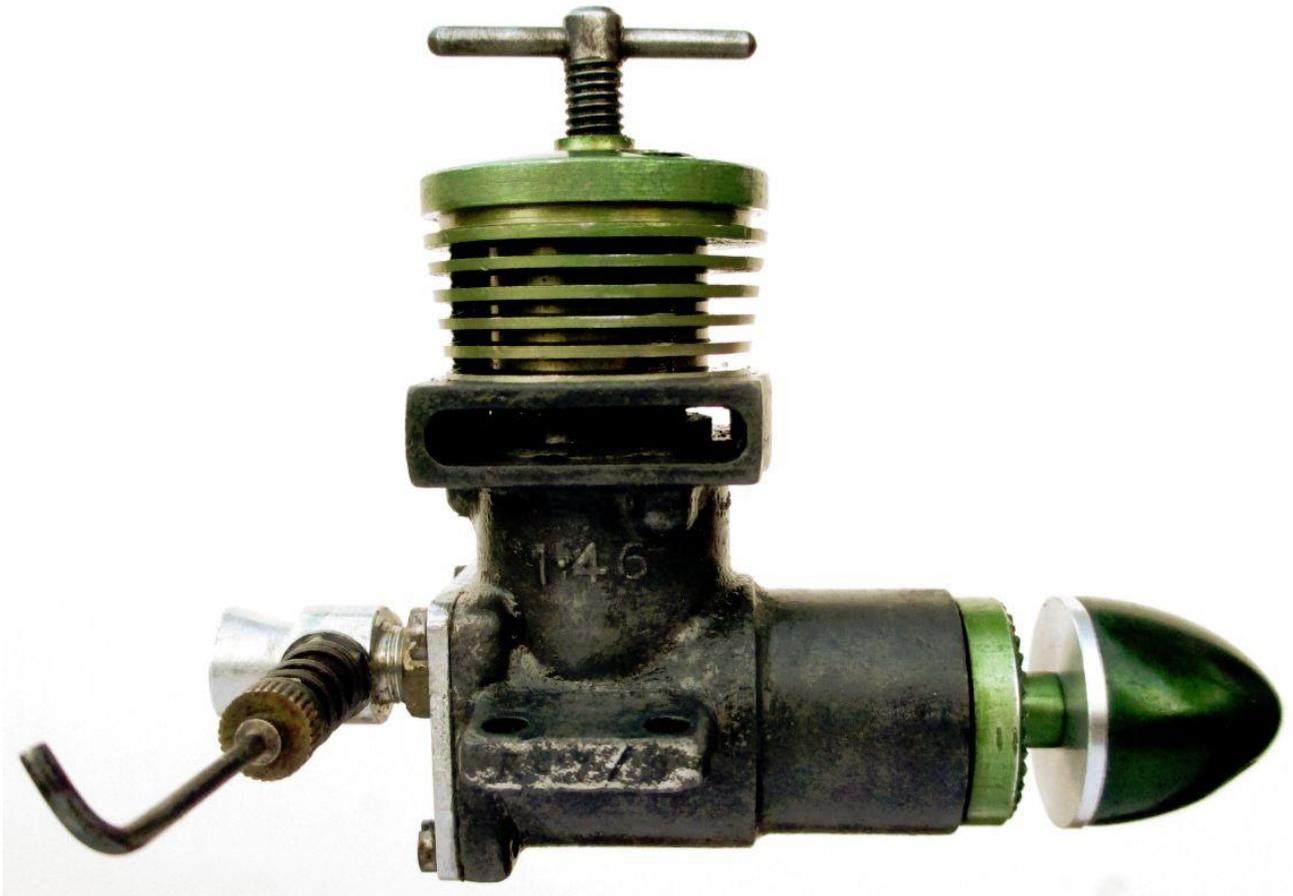


Another good looking Polish design. F M Fryc entered this 80" span semi scale in the Concours at last All Herts Rally

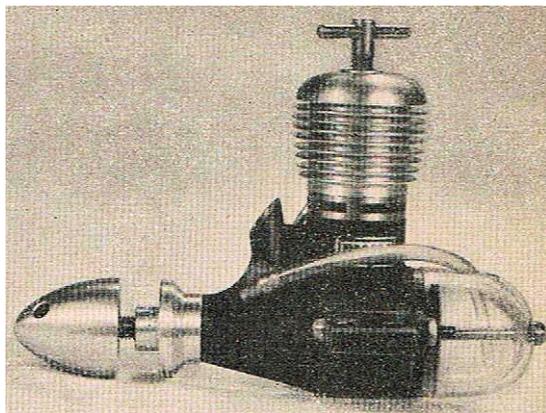
From Bill Wells

More years ago than I like to admit to I passed a Newsagents on my walk to and from school. Yes in those days children were expected to walk to and from school as 4 x 4s had not been invented!! The shop owner was obviously interested in model aircraft as a few model engines and models were on display along with other hopeful sales. Times were hard and shop keepers sold whatever they could. As was the custom the door was set back giving display windows either side so that more goods could be displayed. There amidst the models close to the door was a brand new ED Fury. Although I knew very little about model engines it had great appeal with its distinctive Green head and spinner. I kept looking at it, hoping, but eventually it wasn't there anymore. A few years latter in 1962 I bought a new ED Super Fury for £3-19-6 (£3-97½). Fifty five years on and I finally got an ED Fury at an Auction.

The Fury has a reed valve so it will run in either direction. It looks a little bit like a small ED Racer. Albeit with a green anodised head, prop drive and Spinner. Having said that by special order a green finned Racer was also available with a reed valve! I don't think this particular engine has had a lot of use, it starts easy and runs very well. The Super Fury has a Disc valve and the early blue head ones were without exhaust stacks. Later models had plain heads, but had exhaust stacks as presumably silencers were easier to fit. The Super Fury had a cotton real prop drive and a sleeved prop nut.
E D Fury MkI



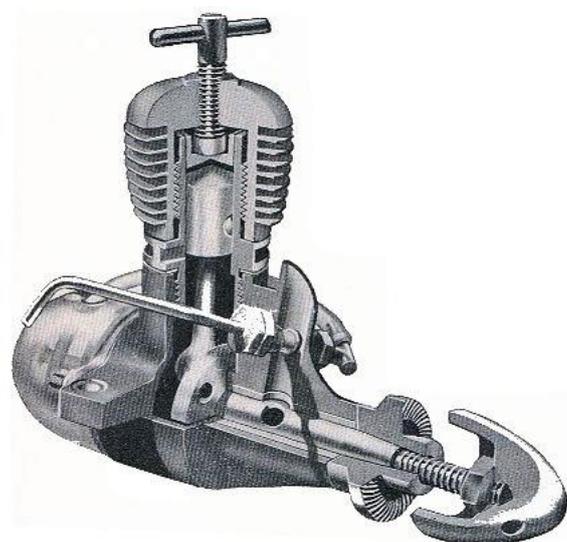
B.W.M. 250D 2.46 cc diesel from Model Aircraft May 1955



The German B.W.M. 2500 is an orthodox, shaft-valve, annular port diesel in the popular 2.5 c.c. class. B.W.M. stands for Berliner Werkstätten für Modellmechanik, the original title of the concern which, now trading under the name of Manfred Cocking, produces this unit. The 2500 has come into use in Germany during the past two years and was briefly described in MODEL AIRCRAFT shortly after its first appearance. It is also being exported to various countries and was recently the subject of a favourable write-up in our American contemporary, Model Airplane News.

In general, the technical aspects of the design are not such as to greatly excite attention : as we have said, the B.W.M. is of conventional layout, but it is a sensibly arranged motor of pleasing appearance and, it would seem, with no marked vices. It starts quickly, handles easily and runs well over a useful range of speeds.

The engine is assembled around a well-finished crankcase casting which, as with most engines of this type, combines the main bearing housing, carburettor intake and lower part of the cylinder barrel. The front



housing is provided with a bronze bearing, 1 in. long and of 8 mm. bore, to take the crankshaft journal. On the test engine there was a fair amount of clearance in the main bearing but this was not such as would lead to undue loss of crankcase compression or excessively dirty running.

The crankshaft is machined in one piece and has a disc web with a 4.5mm. dia. crankpin. It has two 3 mm. dia. lightening holes drilled either side of the crankpin which, however, do not completely balance the shaft

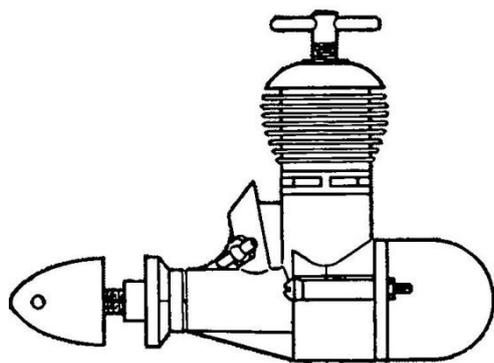
The shaft is terminated in a 6 deg. tapered section to which a strong aluminium prop drive collet is accurately mated. The shaft is tapped for a 5 mm. brass stud which is screwed into a nicely shaped spinner and locked with a hexagon nut.

The cylinder liner is a straight forward radial port pattern of the Arden type. It has four exhaust ports and four transfer grooves on the inside wall. The liner is flanged above and

below the exhaust ports and screws into the crankcase with a gasket under the flange. The piston is of a decidedly heavy design and has a conical top to which the contra-piston is matched. The connecting rod is turned from dural and the gudgeon pin is pressed into the piston. The fit of the connecting rod bearings was very good on the test unit as received.

Unfortunately, the connecting rod eyes, though reamed parallel to each other, were not at right-angles to the rod, thus resulting in the rod not running in a truly vertical plane of motion. Some slight loss of power and more rapid wear of big and small-end bearings would be expected from this misalignment, although it must be admitted that somewhat casual attention to connecting rod bearings and alignment appears to be rather prevalent among model engine manufacturers and the B.W.M. is by no means the first example we have experienced of a conrod being out of alignment.

Port areas are generally as one would expect on an engine designed for general purpose, rather than ultra high performance work. As is a feature of the standard Arden cylinder port arrangement, the exhaust period is lengthy (approximately 140 deg. of crank angle) while the transfer is somewhat, more restricted due to the transfer ports being entirely below the exhaust belt. The rotary valve opens approximately 70 deg. After bdc and closes fairly early at 20 deg. after tdc, although, in fact, the crankcase remains open to sub- piston supplementary air induction for a further 20 deg.



A highly practical feature of the 250D is the needle valve assembly which is inclined 22 deg. upward and 23 deg. rearward to bring the adjusting stem well clear of the propeller disc. The excessively acute turn which the fuel line would normally have to take due to this sharp inclination is avoided by the use of a special right-angled fitting.

A well shaped cylinder barrel with nicely turned cooling fins screws over the top part of the liner and is surmounted by a tee type compression lever. The crankcase rear cover is deeply recessed and is secured by two long screws passing through from the front of the crankcase. It has a tapped centre lug for the attachment of a transparent plastic fuel tank. Externally, the B.W.M. is attractively finished, having a black crankcase and bright alloy prop driver, spinner and cylinder barrel.

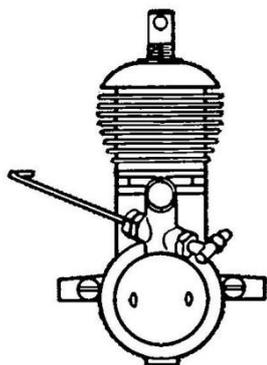
Specification

Type : Single cylinder, air cooled, two - stroke cycle, compression ignition. Shaft type rotary valve with sub-piston supplementary air induction. Circumferential exhaust and transfer porting with conical top piston.

Swept Volume : 2.463 C.C. (.1503 cu. in.).

Bore : 14 mm. (.5512 in.). Stroke : 16 mm. (.6299 in.).

Compression Ratio : variable.



Stroke/Bore Ratio : 1.143

Weight : 4.6 oz. (with tank).

General Structural Data

Diecast aluminium alloy crankcase and main bearing housing with separate rear Cover.

Screw-in cylinder liner of chrome-nickel steel. Phosphor - bronze main bearing.

Crankshaft machined in one piece from chrome-nickel, steel. Separate, brass, airscrew retaining stud.

Machined alloy prop driver fitting on crankshaft taper. Machined duralumin connecting rod with plain bearings.

Fully machined alloy finned cylinder barrel screwing on to liner. Inclined,

spraybar type needle-valve assembly with right-angle nipple and positive needle adjustment. Detachable transparent plastic fuel tank.

Beam type mounting lugs.

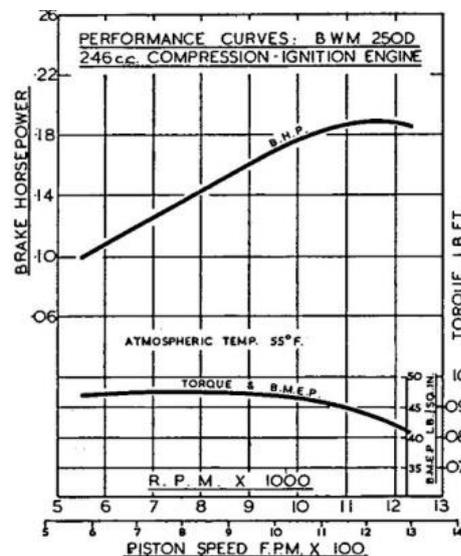
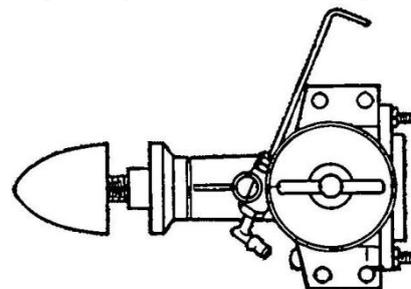
Test Engine Data

Running time prior to test : 1 ½ hours.

Fuel used : 40 per cent. Ether BSS. 579, 30per cent. Castrol "R," 30 per cent. Shell Royal Standard kerosene, plus 2 per cent. Amyl nitrate.

Performance

Initial impressions of the handling of the B.W.M. were favourable in that the engine started easily and without recourse to priming and without the control settings being critical. The fact that the mixture strength range for starting is quite wide will be evident when it is mentioned that initial starts were made with the needle opened nearly four turns instead of the recommended two turns. This did not become apparent until, in efforts to weaken the mixture, it was discovered that, when screwed hard down, the needle valve remained nearly two turns open. This was quickly readjusted by slackening the locknut on the needle valve body and it was then found that the best running setting was approximately 1 ½ turns open. Response to compression control was good and although the contra- piston was a little difficult to move downward when the engine had warmed up, this, rather surprisingly, quickly returned to a lower setting if the lever was slackened back. On dynamometer test the B.W.M. did not quite come up to the makers claim of .23 b.h.p. at 12,000 r.p.m. As will be seen from our performance graph, the maximum output realised, at a slightly lower peak, was .19 b.h.p. The maximum torque (equivalent to a b.m.e.p. of 47 lb. / sq.



in.) was realised at 7/8,000 r.p.m. and a most useful and economical performance is delivered in the 8,000/19,000 r.p.m. bracket.

The general running characteristics of the 250D were found to be entirely satisfactory, being free from excessive vibration, and no signs of stress were exhibited on inspection after test. A 9 in. X 5in. propeller is suggested for general F/F work, while an 8 in. X 8 in. is suitable for most C/L applications.

Power/Weight Ratio : (as tested— less tank) .676 b.h.p./lb. Specific Output : (as tested) 76 b.h.p. / litre.

Dear Friends, Aeromodellers, and ex-Aeromodellers. Nick Sloan.

I need your advice.

I still have in my possession the remains of an ancient model aircraft, built by one Barrington Budd in around 1908, which I rescued from a house in Sheffield in the sixties. The main attraction in the contents of the house were two Scott Motor-Cycles from the early twenties, and a couple of Barrington two-stroke cars, which we at first thought to be Scott Sociables.

I have conserved this model, and the accompanying plans, for well over fifty years, not because I really want them but because they need careful conservation and I haven't been able to find a suitable keeper to take over; somebody who would appreciate this survivor from the past, and at least preserve it, or maybe put it on display in a little museum possibly.

As I am shortly moving into a far smaller house, the need to pass this model and the accompanying plans onto a worthy recipient is becoming more urgent. I would not want to entrust it to the Post Office as it is too fragile, but would welcome the right person who could collect it.

Attached are a few pics. of the model, along with the plans, and a letter I wrote to James Parry giving as many details about the machine and it's acquisition.

So, it's over to you; any ideas of a suitable trustworthy recipient?

*56, Brampton Close,
Wellingborough,
Northamptonshire.
NN8 5XG.*

Tel: 01933 – 674046.

Tel (Mob.): 07731780953.

Dear Mr. Parry.

It was with great pleasure and interest that I read, or am reading if I'm honest, issue No.97, Dec.2014 of your S&T newsletter, forwarded to me by my good friend Brian Marshall. I didn't know that he was into model aircraft of the period you cover, mainly knowing him through our mutual passion for Scott motor-cycles.

My last active aeromodelling was when fellow members of the Vintage Sports Car club around the Harrow area of north London found that we had all had a common interest in aeromodelling in our youth. We decided to have a one model competition at Northwick Park, near Harrow, with the Keil Kraft Senator being the chosen kit. It all went off very well, but the proposed follow up competition using the 'Aeromodeller Plans Service' Ornithopter Flap Happy never materialized, a step too far perhaps.

In your newsletter you invite contributions, and I thought that maybe your readership may find an early model I have had for many, many years of interest.

I think that this model is probably a unique survivor of the aeromodelling scene well prior to the First World War. In the sixties, it must have been, I had been invited to inspect the contents of a large Victorian House in Sheffield, which still relied on only gas lighting, neat stacks of gas mantles being on the mantlepieces of each room. The owner, J. Barrington Budd, had recently died, and the house was to be quickly cleared, modernized and converted into apartments or flats. He, along with late brother Eric, had been an enthusiast for all things mechanical, and both were particularly keen on Scott motorcycles in

the early twenties, carrying out many 'improvements' to their own machines over the years.

They both must have been born around the mid eighteen-nineties, and Barrington at least, was an ace hoarder, a trait with which I can well sympathize. I don't think he had ever thrown anything away, and evidence of his whole life was there, from early board books, Pretty Peeps, and Buster Browns school days of the late eighteen nineties, through Chatterbox and Boys Own annuals of the early nineteen hundreds, to Crystal sets, still with cats whisker, and the main subject of this letter, a packet, still in fairly good condition, of Model Aeroplane plans with which to build three types of aircraft. It had been issued by Percival Marshall & Co. in around 1909, I think; although it is difficult to be precise over the exact date, and contained in it, along with five large drawings, each 28" x 20", was a booklet of instructions. On the front was a somewhat fanciful drawing of the three models flying over the meadows, and superimposed upon it, a photograph of a modeler, possibly Mr. Twining, and dressed rather formally, about to launch one of them. Written on the packet, in ink is: (signed) Alfred Eric Budd. March 27th /10.

Remarkably the model which had been built to these plans was also still there, but would never fly again, being a mite fragile from having dried out, cracked and warped quite a lot over the years. It had been built, according to the instruction booklet, using Beech for the mainframe, and American Whitewood for the flying surfaces, held together mainly by 'Seccotine' and minute tapered hardwood pegs, which must have worked quite well, as most were still present.

In the instruction booklet is a table listing the 'Notable Flights' of full sized aircraft over the last two years. It begins with one on the 11th of November 1906 by M. Santos Dumont at Paris when he covered 230 yards and took 21 seconds, and ends with a far longer trip by a Mr. Wilbur Wright at Le Mans on the 30th of December 1908, when he covered 77 1/3 Miles, taking 140 Minutes, and 23 Seconds.

It is interesting, I think, that although the booklet is entitled 'Model Aeroplanes – How to build and fly them' Mr. Twining has taken the opportunity to review the state of the full size aircraft designs then available, how they could be improved in his opinion, and in addition to forecast how they would develop in the future. I have picked out some of the observations of Mr. Twining, which I found of interest.

The booklet starts in the manner of an ancient manuscript with an illuminated capital, pointing out that all the flights recorded in the table have been attained abroad, sadly noting that little activity in the field of flying is happening in Britain.

It does admit that an exception is the army aeroplane of Mr. Cody, but follows with less than faint praise stating that 'even this may be considered at the time of writing, but a qualified success, for there are still several points in regard to which room for improvement may be found, as no one knows better than its inventor'. It continues: 'Several machines it is understood are designed and one or two have been built; but they have not yet flown, so they have yet to show what they are capable of'.

Mr. Twining also hoped that 'the designs for these three little aeroplanes – two of which at least are models of practical machines – may arouse or revive some latent interest in the mind of the reader and thereby induce him to join in the work of experimenting with the object of improving on the present successful types of machines, and of evolving new types'.

He then went on to outline the sort of improvements he had in mind stating: 'With existing types the question of automatic balance, both longitudinal and lateral should be settled in such a way that disasters, such as that which befell Orville Wright in America last Autumn, when Lieutenant Selfridge, a passenger on the machine was killed, would be rendered impossible. Reliability of motor equipment may be attended to with possibly a division of the source of power into a number of smaller units. Improved construction generally of frameworks and planes, resulting in the latter in greater efficiency and less weight. Improved screw propellers. Improved methods of leaving the earth, methods involving less powerful motors, since it is well known that to maintain flight far less power is required than is absorbed in rising from the ground'.

He then gets a bit carried away, having been impressed by some past Science Fiction, saying: 'Regarding new types of machines, there appear to be few inventors working at what is known as the helicoptere or vertical suspension screw type of machine. It was this pattern that Jules Verne chose for his "Albatross" in the stirring romance "The Clipper of the Clouds" and it is with the Helicoptere that the inventor Edison has been credited with prophesying the final solution of the problem of air conquest will be solved. The vertical screw machine will have this great merit, namely that no large tract of land

will be required on which to make an initial run, since it will be possible to rise vertically into the air in the same way as a balloon'. 'The aeroplane will be a cheaper machine than the motor car both as regards first cost and expense of running, but there is this obstacle to the aeroplane coming within reach of the man in the street, namely the cost of housing accommodation and land for use as an aerodrome'.

'There appear to be two classes of machine required, one which any suburban householder may possess and be able to use without the necessity of travelling miles by train to the aerodrome or starting ground, and the other a flyer which may be classed in the same category as omnibuses and used for public conveyance. That the day will come when passenger travel will be conducted through the air there is every possibility, but its probability must not be hampered by our being satisfied with the present form of machine, thereby allowing the art to resolve itself into a sport for the enjoyment of the fortunate few. There must be necessarily be a vast difference between the successful machine of say, Wilbur Wright and a passenger carrying aerobus, or between any of the existing machines and a small one which the ordinary individual may take to pieces or fold up and store at home, using it in much the same way as one would a bicycle'.

The next few pages are devoted to the techniques recommended in making the various models, but then he starts to compare the models with actual full sized aircraft, trying hard not to criticize any particular layout of specific makes. For example: 'No.1 machine is of the box-plane type and may very well be said to be a modified model of Santos Dumont's No.14 bis, with which he made his record flight. No.2 machine is of the double-deck open plane type, and this as well as No.3, somewhat resembles the machines of the Brothers Wright, although I may say neither type is copied from the aeroplanes of either the famous Aviators but are the result of a long series of experiments made by the author; they have been evolved from forms of machines very different, the writer having commenced under the firm belief that it was not correct practice to put the smaller plane in front, but that the principle of the Voisin machines used by M. Delagrangé and Farman was correct, viz., that the main planes should be leading, not trailing. Of course, it is not presumed that the principle of the Voisin machine is wrong; it simply came about that the form of the writer's experimental models changed from that shown in the drawings, and the writer now prefers that the main planes should be at the rear'.

From this I gather that the models shown are now obsolete in the views of Mr. Twining, replaced by designs with the main plane at the rear. The booklet ends with another table, giving details of the various flights which the models achieved; the longest being 150 feet with model No.2. using 150 turns on the 'pure rubber' elastic band.

I still have the model and the plans packet, not being really sure quite what to do with them, but until I do decide I will preserve them as best I can.

As I have mentioned previously, the builders were waiting to pounce on the house in Sheffield, and the feeling I got was that all the precious contents of the house would be quickly dumped in to several skips, rather than being lovingly sorted through as we would have wished.

The chief reason for going to the house was the report that it housed, as well as the two Scott motorcycles, a couple of Two-Stroke cars, which I earnestly hoped would be Scott Sociables. As it turned out they were something far more rare in the shape of two prototype Barrington light cars, produced by Barrington Budd in the late twenties/early thirties, and powered by his own three cylinder two-stroke engine, which was tested by the 'Autocar' on June the 6th 1930 housed in an Austin Seven car. Unfortunately they got no further than the prototype stage, but Barrington had not changed from his early promise of being a first rate hoarder, and everything to do with the cars was still intact. Apparently full scale drawings of the chassis were still pinned to the wall of the attic room, but crumbled when we tried to remove them, but all the casting patterns for the engine, plus unmachined casings still remained, as did share certificates, headed paper of the Barrington Car Company, and many new proprietary items from Lucas, Sankey, Dunlop, and Burman.

With time fast running out, I called for assistance to my good friend Dr. Piers Blakeney-Edwards who found a large van, and drove through the night from Cheddar to Sheffield, to help rescue at least some of the treasures. We managed to save both Scott motorcycles, and both Barrington Cars with all their production paraphernalia, plus most of the books, and of the course the model with its plans.

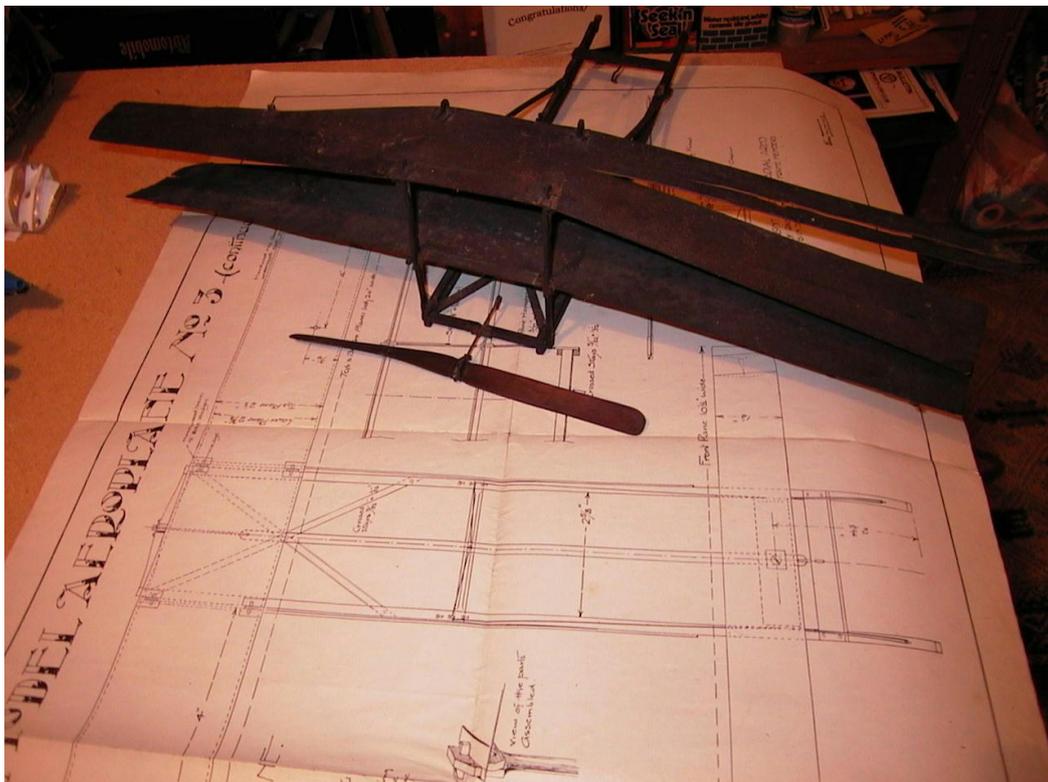
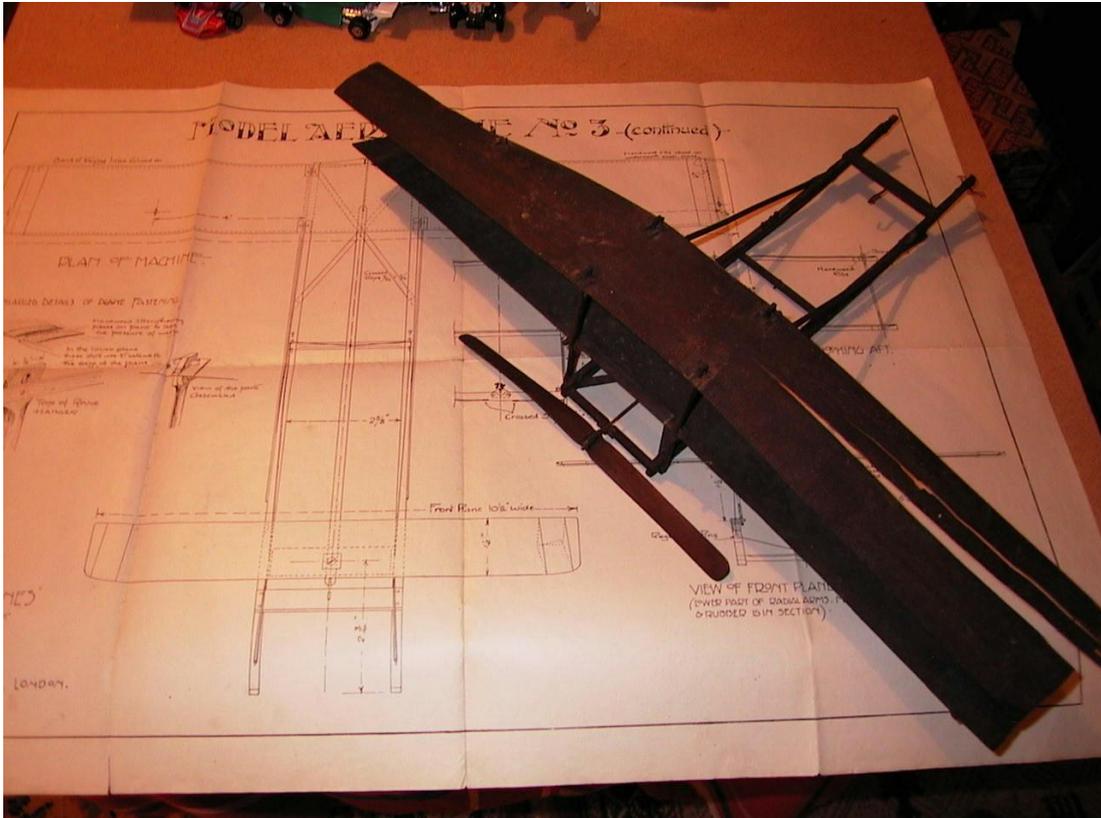
The only other connection to aircraft was a small snapshot of Amy Johnson standing

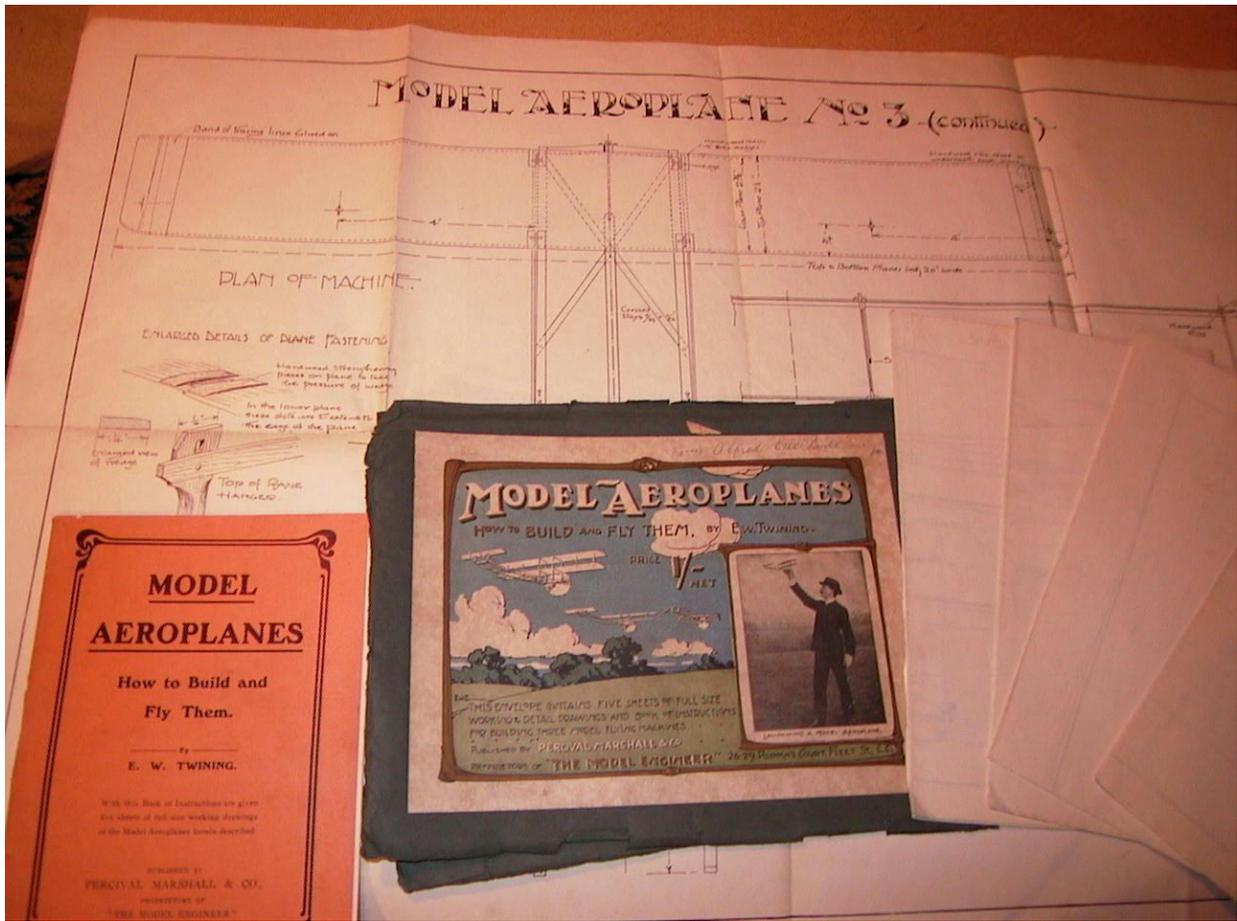
alongside one of the prototype Barringtons, but I have no idea whether she was at all connected with the car company.

And that's the end of my little tale. As it happened around fifty years ago, and my memory is not what it was, there may be some small errors, but as I still have some of what was saved to remind me of those days, it is basically correct, I think. I hope you find it of interest.

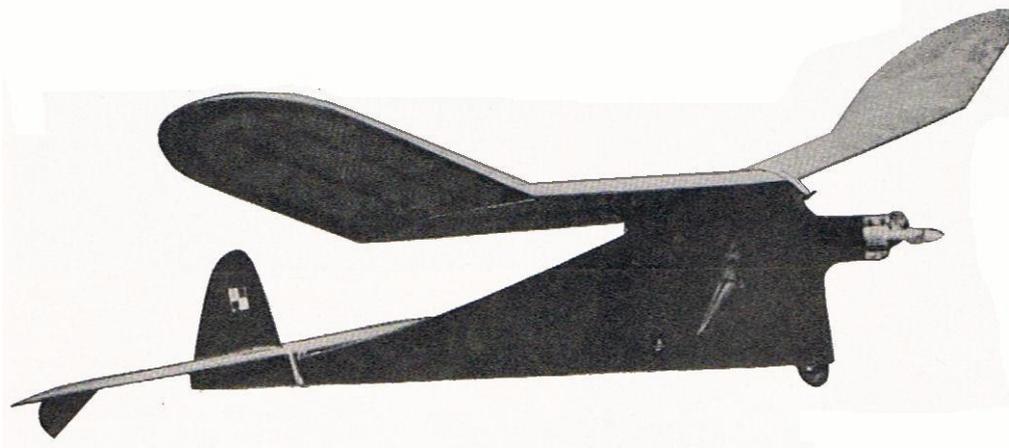
Very Sincerely.

Nick Sloan.





Trolleybus a 2.5cc power duration model by B R Norman from Model Aircraft February 1955



Fuselage

Commence by cutting out all formers from 1/8 in. sheet (F1, 2A, 3A and B, and 4A from hard stock). Face those indicated with 1 mm. ply and leave to set. Continue by cutting out fuselage top decking and master longeron from 1/8 in. sheet and making gussets from scrap.

Select a length of medium

1/2 in. X 1/4in. for the keel member and cut to correct length. Pin down and ensure that it is straight. Next, erect lower halves of the two-piece former (except F2B) and also F7,8 and 9, using a setsquare and the scrap gussets, which are lightly cemented in. When set, add the master longeron and cement on F5A and 6A.

Now cut engine bearers to correct length and chamfer ends to give 10 deg. right thrust. Thread F1, 2A, 3A and 4A onto bearers and cement firmly. Make sure assembly is true and square and then cement in position on top of the master-longeron.

Cement front part of fuselage decking firmly to the top of F3A, 4A and 5A, adding the 1/4 sq. gusset to rear of F5A. When this small gusset is firm, remainder of decking may be cemented in place, the whole assembly removed from the board, and the soft block under the wing LE. (marked B on plan) may be fixed in position.

The monowheel U/C leg is made from 16 g. and the gusset removed from the rear of F3B. Push leg through the bulkhead and into the crutch, and firmly sew, bind, and cement. A 1/4 in. sheet gusset is then fitted; see note on plan.

One side of the fuselage may now be sheeted with 1/16 in. medium. A piece is spliced onto the end of a sheet for this. When the splicing is done, arrange the sheeting on the model so that the splices are at opposite angles. Before positioning the sheet, sand well. When sheeting one side, ensure that frame is not distorted. Having completed sheeting of one side, remove the scrap gussets and sheet remaining side. The sheeting should now be trimmed to size and correct nose contour cut.

The remaining block, "A," 1/4in. sheet nose pieces and 1/8in. sq. rails on top are added, and the fuselage, sanded, covered and doped. Now the wing and tailplane dowels (but not platforms) may be fixed. Fuelproof around the nose well.

Now the D/T box is made. The correct aperture for the box should be carefully cut in the starboard side of fuselage. The box is cemented in position, and the panel removed is then hinged at front end with tape and now forms the door. A fuse or timer, whichever system is preferred, is used to actuate it, and thus release the D/T parachute.

Wings

The lower half of the T.E. is pinned down, with suitable packing under front edge. The rear spar, also with suitable packing, is likewise pinned in position, after which the ribs are cemented in. The tip rib is trimmed down to correct size. Lastly, the top spar and L.E. are added.

Remove the whole structure and add lower half of the tips.

Dihedral is incorporated by cracking and cementing the tips, at the appropriate stations, until they are at 4 1/2 in. The centre of the wing is now cut, bent, and cemented so that 3 in. may be measured under the end of one centre panel. This gives the necessary 1 1/2 in. under the end of each panel.

Pieces of ply, of appropriate thickness, are cemented and damped (clothes pegs make good clamps) each side of the spars at the dihedral breaks. When dry trim to shape. The T.E. and wing tips are now chamfered

and the top halves of these members added, also the leading edge sheeting, which must be pre-sanded. The whole wing is given a final sanding and the gauge strengtheners added where indicated.

The wing platforms and tailplane platforms are now cut. The wing platforms should be cut, bent and cemented, and pinned under the wing centre section to dry, so that they conform to the correct angle. The tail unit is straightforward, although don't forget the 22 g. wire skids under the tip fins, or a sad reduction in fin area will result after the first couple of take-offs!

Flying

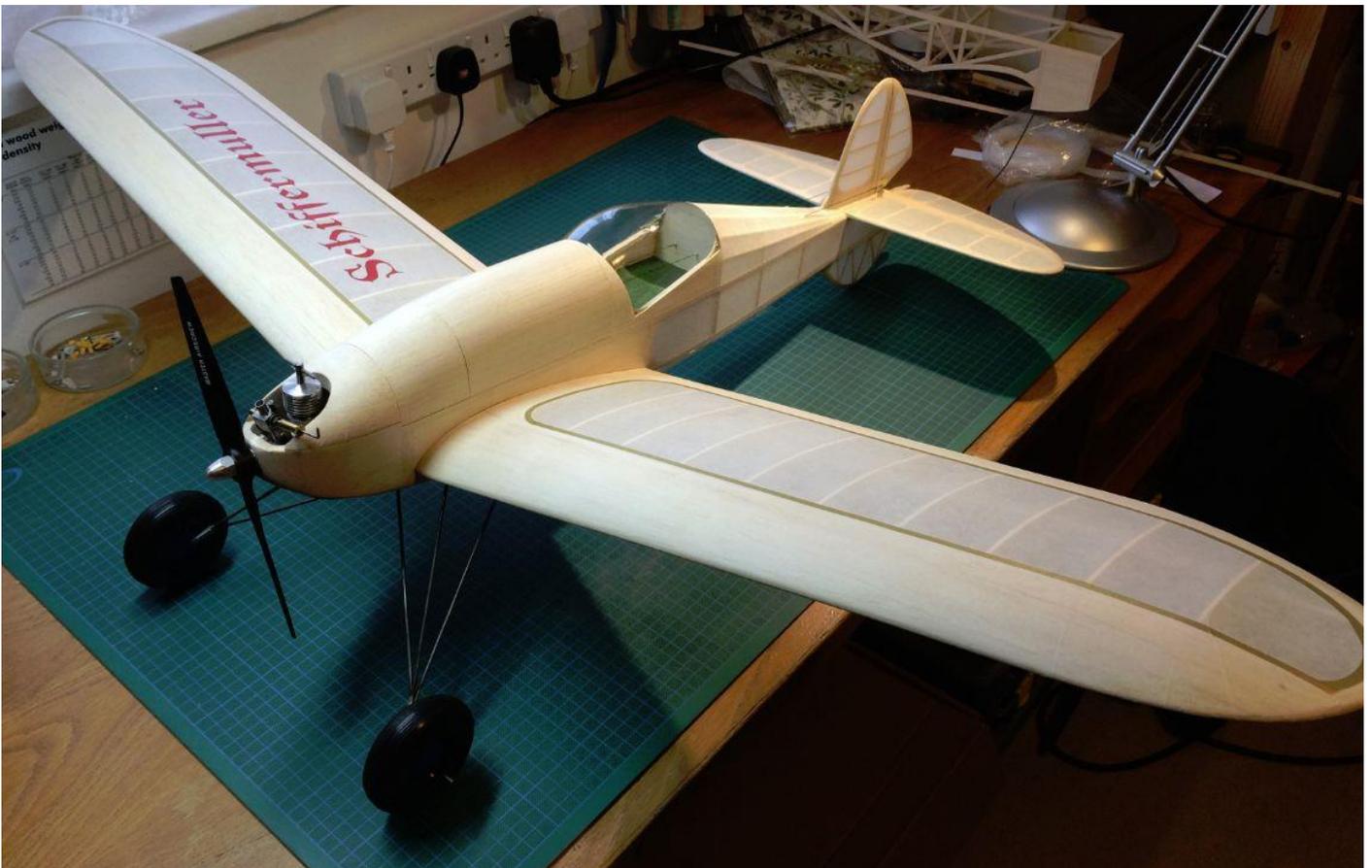
Using an Elfin 2.49, and the rigging indicated, i.e., 10 deg. Right thrust and the rudder offset 1/2 in. to the left, make a few test glides. Aim for a steady glide with no trace of soaring. 'When satisfied, bolt the prop on the wrong way round and using half power and an engine run of 5 or 6 sec. launch gently. Incidentally, I use a Frog 9 X 5 in. prop.

Do not attempt any left turns under power, as it is fatal. Aim at a steady right-handed spiral climb, and glide circles of approximately 200 ft. dia. Any tendency towards inverted climbing may be counteracted by a bit more right thrust.

For R.O.G. purposes the U/C layout is adequate, the machine never yet dropping a wing on take-off. The unstick is very rapid, perhaps three or four yards. When doing an H.L. there is no need whatsoever to push the original (I just let go !).

From Andrew Squires

Schiffermuller is nearly ready for maiden flight, just need to make sure this receiver is 'A ok' before I fit it.



From John Taylor (BMAS)

The Comper Swift was an ultra light plane built in the 1930's. It was 24ft wingspan and powered by a Pobjoy seven cylinder engine. In 1932 this registration no was allocated to Richard Shuttleworth who paid £550 for a brand new aircraft powered by a four cylinder De Havilland Gipsy Major 111. rated at 120 BHP. He entered the 1933 Viceroy Trophy in Delhi. Average speeds of up to 150mph were being achieved. Unfortunately the engine suffered a broken oil feed pipe and he had to land in a dusty village street covering the plane and himself in oil and sand. The plane was shipped back to England and entered in the Kings Cup race. During the race the engine was starved of fuel and made a crash landing at Moulton nr Northampton. The Pilot survived but the aircraft was written off.

The model is 4ft span [1/6th full size]. The model was mainly built by Roy Tiller as rubber powered with a twin skein motor. When the model was given to me I replaced a lot of the very light balsa with some stronger balsa and strengthened the wing tips and reinforced the undercarriage and wing fixing. The covering is Polyspan with two coats 50/50 dope, thinners and a spray coat of B&Q painters touch satin white. The spray paint only added 24gms to the weight. AUW came out at 25 ozs giving a wing loading of 10 ozs/sq ft. Power is from a 1450 Kv brushless motor running on a 2200 2s lipo. This set up gives 70 watts of power while drawing 10amps on an 8x6 prop. The model is radio guided and flies very well.



Ken Merryfield's FLYING BANJO Single channel 26" diameter wing Radio Modeller December 1966

Many modellers will have seen Ken Merryfield's unusual model at the rallies during the past two years. Following its consistent successes in single channel events, he was besieged with demands for the plans. In fact, he actually produced a limited run of kits but found that this was rather too much like hard work! Radio Modeller acquired the drawings for this novel and very aerobatic model—and hope this will relieve the designer of what was threatening to become something of a Frankenstein monster.



The off-beat shape of Flying Banjo gives it an almost unbreakable airframe. It can be flown consistently in every kind of weather as, trimmed correctly, it has excellent penetration and stability. Developed over a number of years, and in a variety of sizes, the 2.5 to 3.5c.c. version presented here seems to be the optimum. In the development, an eye was kept on cost, and about 30s. pays for all the airframe materials.

An O.S. .19 glow motor is shown on the plan, but any 2.5 to 3.5c.c. diesel or .15 to .19 glow motor will fly the model nicely. The escapements used in all the Banjos have been Elmic "Conquests"—this being the "bang-bang" type of flyer.

Special lock-jig system

The construction is fully detailed in the picture-strip featured on the plan, but just a special word about the basic fuselage crutch. The ply shapes drawn include special lugs. When the parts are cut out, the fuselage

doublers slip behind the lugs at the front of the thick ply engine plate, and can then be bent round this so that the lugs at the sides fit through the rectangular slots provided for them. In fact, the whole assembly will hold together quite happily without any glue—but it's not suggested you do it this way! Do check the thickness of the ply you use for the engine plate, however, as this can vary, and you may have to adjust the depth of the slots in the doublers accordingly, to achieve a nice and snug fit.

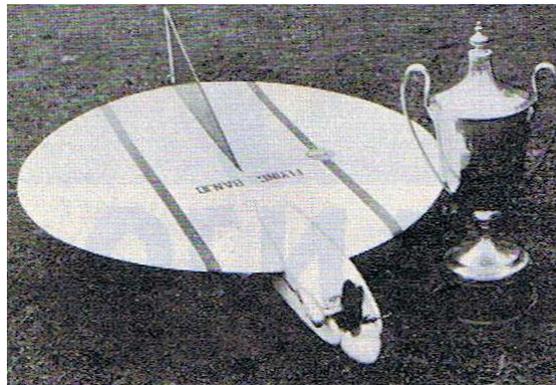
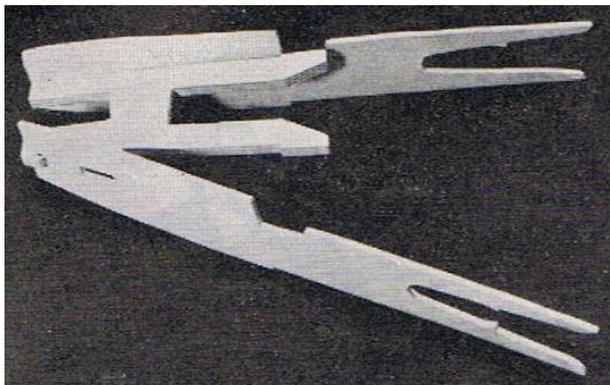
Trimming and flying

The flying habits of the Banjo are quite different from the usual "cabin" type of radio model, so take heed and don't let it catch you out. The steering is most positive, so to start with use only 5 deg. Rudder throw which will give adequate control for general flying around. When you feel you have sufficient experience in handling the model, increase the throw gradually up to a maximum of 10 deg. It is most important that you start this way with Flying Banjo and it will also be found helpful to trim the model to fly in a gentle left hand circle, as there is no provision for elevation trim. The C.G. position is of prime importance, as the basic flying characteristics are determined by this. With the C.G. in the position shown on the plan, the model will fly with a slightly nose-up attitude and medium speed. This is the trim I usually use, the reason being that when the model is not receiving signals, it flies at this medium speed because of its attitude. When rudder is applied, the nose drops and the speed increases, producing the desired clean manoeuvres. Do not hold on to your signals. The length of signal shouldn't be more than ½ sec. at the very most for all manoeuvres except a spiral dive, so try not to over-control.



With the C.G. further forward the model flies very fast indeed, but you will need a vast amount of airspace and range for your manoeuvres as, in this condition, it takes a long time to pull out of certain attitudes. Put the C.G. behind the recommended position and the model flies inverted!

Attention to these various points will ensure a successful model that is thrilling to fly and will attract attention wherever it goes.



Above: the interlocking ply doublers and engine plate. Note how the doublers slot in behind lugs in the engine plate and are then pulled round so that the rear lugs snap into the slots in sides and top. Below: the original with the 'R.A.F. Flying Review' Trophy which it won at this years Northern Heights Gala.

From John Mellor

The attached picture shows my winter building project for this winter. I took David Lovegrove, Mike Spencer and Geoff Bremner to RAF Hendon for a day out to celebrate a certain birthday – not 40th. In the inevitable shop I espied several of the “Vintage Model Co” small scale models for rubber power. I have had much success with an 18” ABC Robin which has had many flights in winds up to 6 or 7 m.p.h. so I wondered if I could convert one of these VMC models for radio (REM).

Anyway I purchased the kit and got stuck in. The kit and instructions were brilliant but, of course, not for electric radio. The wood was excellent quality as was the laser cutting and the PVA adhesive provided and the flying surfaces fell together. The fuselage was more difficult as I had



to extensively modify it to get the radio gear in. I finally got it finished this week with some help from David Lovegrove getting the pushrods sorted (I had got close to giving up by now). The equipment used is the same as in my Robin – a Parkzone P 51 motor/gearbox assembly with an AR6410 – like rx. and servo block – available from Micron Radio Control. The battery is a 1S x 175 mAh by Overlander which gives well over 10 minutes run in the Robin.

I covered the model in the tissue provided using 50% PVA/water mix to fix and 50% dope/thinners to seal and I am fairly pleased with the result. All told it has taken the best part of 3 months to finish and has tested my eyesight and finger dexterity. Had I build it for rubber power as designed I’m sure the build time would have been halved. All the detail trim will not be added until I have flown it when we finally have a calm dry day.

Hope this might be of interest.







Bristol Boxkite Hansruedi Zeller's father











Showscene, from Dave Bishop.

One of my many show pals is Jim Perkins and we go way back many years in time to the Sandown Park shows run by the Elmbridge club. Sandown Park was a very special place and at one time there were two shows taking place. One of them was Sandown and the second was a few miles away at Kempton Park both of them specialising in all sorts of modelling. At times it was quite difficult because I presented both of them and there were some stories about that the management side of things were not as good as might be expected. But I did meet a super set of chaps in both camps and both shows made money on their attendances of income with plenty of customers coming through the gates. Also it seems to me on reflection, that there was an awful lot more money about in those days and ordinary people were able to buy a house. Nowadays that is almost impossibility. Jim Perkins was friendly with everybody and (in those days he could drink anyone under the table and still be sober as a judge and a good conversationalist.

The offspring of Jim is Michael Perkins and it was good to see him recently as a special guest of Robert and Alistair Newman at the Avicraft's Model show evening on Friday January 19, at Chatterton Road Bromley. Michael brought with him some very nice gifts and "goody bags" for all of the many invited modellers who attended the event. Not only all of that but there some super raffle prizes as well that Emily of the Croydon Club (who now works at Avicraft) gave free raffle tickets to everyone. Asked "what was the evening all about" Michael replied, "we've known Avicraft for some 40 years now, so tonight is all about trying to connect with the customer, not using the Internet, and we have come along to support the event. Rob has sent out invites to all of the local clubs and here's the result with many modellers of all sorts of disciplines, attending. We have also brought a few items to show what they are all about, including some raffle prizes and mainly, to speak to the customers. We have recently introduced all of the DPR kits from way back and now we are the European agents for DPR. There are "Chuckie's, Concords, Gnats, Ivory Gull and Rare Birds. We are going to produce more R/C DPR kits and we are producing more Avicraft kits, Panics and all the rest of the typically Avicraft ARTF designs." Asked what was their (Perkins) bestselling models the reply was "the Piccolo helicopter and the CSM Simulator, both British made products that we sold all around the world. Helicopters are making a comeback" he said. "Both Mum and Dad are now retired and live abroad during the winter time." Michael was asked about Quad Copters and he said "they were no longer interested in them" which was different when recently I had words with David Ashby the editor of RCM&E when I had a technical query about such craft. That "DA editor man" sure knows his stuff. Summing up the evening spent at Avicraft, I must say that it was a superbly organised event and the idea of meeting such a well-known friendly person as Michael Perkins was our pleasure.

There was some terrific flying by a whole lot of Sevenoaks Model flyers on Saturday afternoon January 20 at the Charles Darwin School in Biggin Hill. I have been a continuous member of that club since October 4 – 1958 and the flying site is one of the best and beautifully kept up to scratch by a super committee and helpers. It was nice to be greeted by the new chairman Charles Dennis who introduced me to his strapping son Charlie. Charles pointed out that his father had the name Chas and his father was named Charles. (I think I have got that right). The father/son combo were flying quad copters LXR priced £35 all up, with such super control and he told me that he had had many thousands of flights with his one. Clive Hastie was there with a Chinese Banggood kitted Tiger Moth that took him 3 weeks to build. All that was left to do was cover it. Clive also had another scale kit awaiting covering as well which was a SE5. Some modeller that man. There was another father/son combo names Mark and Jack and what those two guys had done with building microelectronics had to be seen to be believed. And a kind Martin Frost let me have a stir on his sticks with a super lightweight all lit up slow flying Night Vapor that simply poodles about the circuit for ages. All great fun, and thank you, Martin.

Show Dates for this year 2018.

By the time you will be reading this months Sticks & Tissue Internet magazine the K2 BMFA ' Crawley clubs Indoor event at Crawley would have taken place on Sunday February 4 starting at 11 am till 4pm. The 32nd Wings & Wheels show at North Weald aerodrome is being staged on 23rd & 24th June - 2018 at North Weald Airfield, Essex, CM16. The three Modelair Old Warden events are on May 12 -13 - May fly. July 21 – 22 –Scale and September 22 – 23 which is the Festival of Flight. And finally (the news has certainly spread) that DB Sound will be back commentating at the far side of Wales (Scolton Manor) near Haverfordwest in August for a two day charity show in aid of the Wales Air Ambulance. Those people are great modellers and they can sing like Billy-o. See you there? May I also thank so many wonderful kind friends on Facebook who wished me a happy birthday last Sunday January 28.



Always at the Modelair Old Warden events is young Matthew Barden who is the 10 years old son of the famous Evolution Models company Gavin. His super kits include the Equaliser, Fusion, Enigma Bipe and the (pictured) Vintage 100 complete with a Saito 100 engine. There's come junior 60 involved there somewhere.

A regular Trader and engine genius at Old Wardens Modelair events is world famous Mike Clanford seen here with a Three Kings control liner Brian Green that I first met some 60 years ago.





Good to see him back at work at Old Warden's Modelair show was my late (David) best mates son Andrew Boddington, and two wonderful workers there.



A free flighter and retired senior airline captain with thousands of full size air hours in his log book, is Rick Morris with his Shoofly.



It's called the "look of love" by Janine and David Rawlings. Some wavelength those two are on.



A very nice couple in the free flight assist area at Modelair Old Warden with a Pirate and a Pushycat.



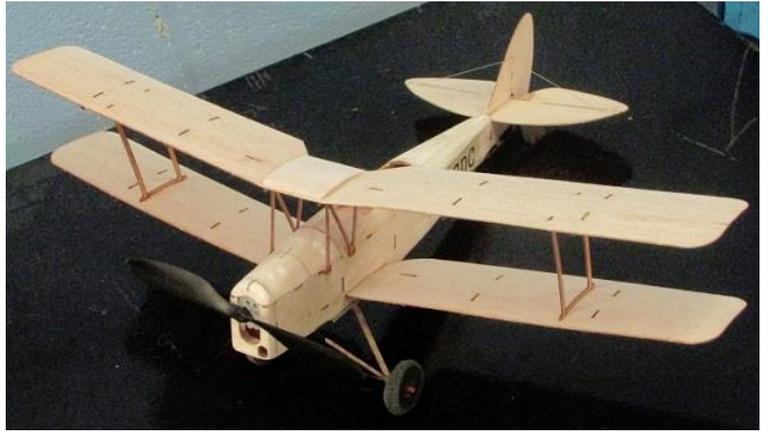
The Sevenoaks clubs chairman Charles Dennis with his son Charlie and their quad copters.



A cracking chap seen at the Sevenoaks indoor meeting is Martin Frost and his Night Vapor.



Clive Hastie brought this SE5 that he built in three weeks to show everyone at the Sevenoaks Indoor meeting at Biggin Hill.



Another of Clive Hastie's scale models the Tiger Moth



Part of the obliging and friendly team that looks after the R/C flight line at Old Warden's Modelair events are James Gordon, Evolutions Models - Gavin Barden and his son Matthew and Roger Godley.



Seen at Avicraft's model shop evening was the MD - Robert Newman and Perkins genial director - Michael Perkins.



A group with Alistair Newman (bottom on the picture) along with Michael Perkins and jet show flyer Steve Brett.

Cocklebarrow dates for 2018 are confirmed as:

8th July

19 August

30th September

For more details contact Tony Tomlin pjt2.alt2@btinternet.com

SHILTON VINTAGE (FLY IN)

BLACKWELL FARM

Saturday 26th May 27th Sunday 27th May 2018

Details and directions for the Shilton Vintage meet on 26th and 27th May 2018.

Flying all day Saturday and Sunday.

Caravans and camping available, water on site and port-a-loo.

BMFA members only. Proof of Insurance required.

The Bar-be-cue will be running on Saturday evening from 7 p.m. Bring your sausages and burgers and enjoy an evening with like-minded people.

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You will need to pre-book your pitch as we are limited to 10 caravans only. The site will be well sign posted with **SAM35**. Post code **OX18 4AP**

Caravans/Camping £10.00 for weekend

Flying £5 per pilot.

Local facilities are available in Carterton 3 miles away.

CONTACT: Nick Blackwell Tel: 01285 657610 (evening only)

Email: nick@nickblackwell.co.uk

OR Boycote Beale Tel 01993 846690

Email: bealekraft@outlook.com

Directions:

By road from the north:

Follow the A40 to Burford, at roundabout take the A361 toward Swindon, at junction for Cotswold Wildlife Park turn left onto Hen and Chick Lane. Follow lane until it bears left, here turn hard right and take the track until it ends, this is the airfield.

By road from the south

From Swindon take the A361 to Lechlade and Burford. 3 miles before reaching Burford at junction for Cotswold Wildlife Park turn right onto Hen and Chick Lane, then as above.

Middle Wallop

Event is for SAM type radio assist plus Control Line

Herewith dates for Middle Wallop

| | |
|-----------|-----------------|
| Sunday | 25 March |
| Sat & Sun | 4 & 5 August |
| Sat & Sun | 8 & 9 September |
| Sat & Sun | 6 & 7 October |

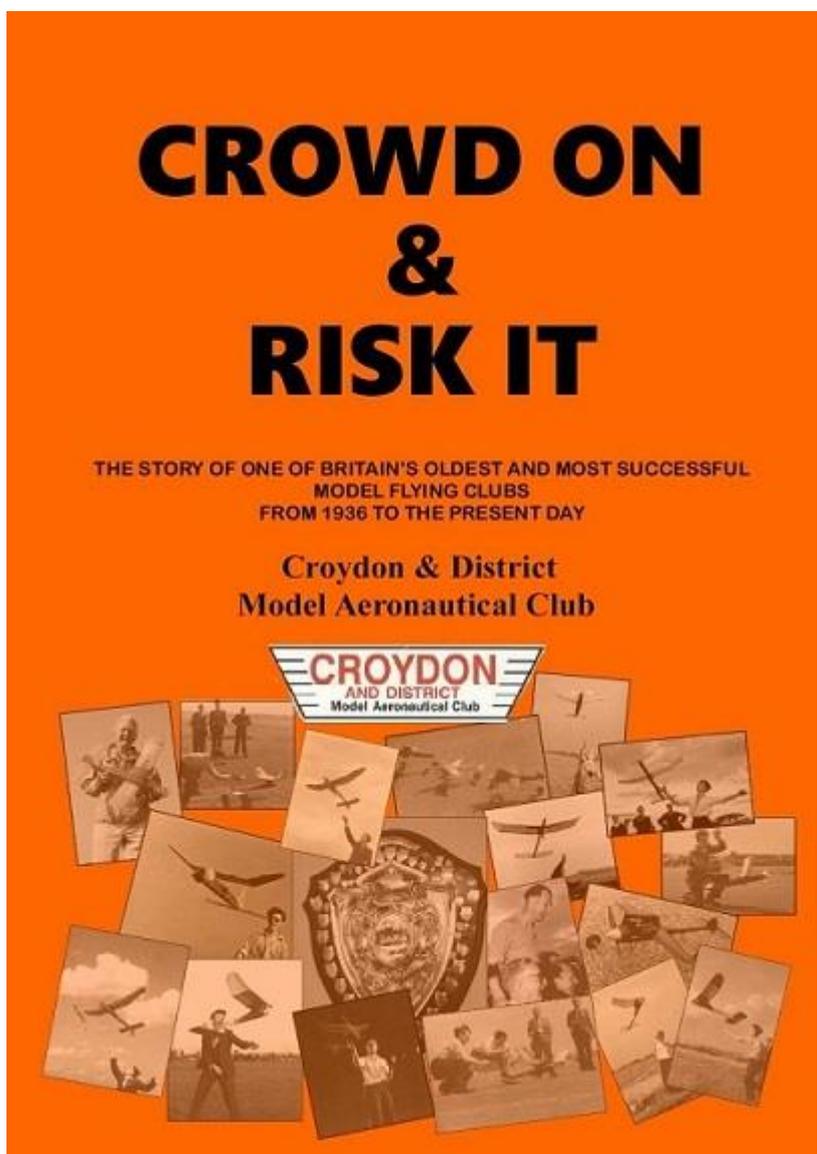
Event coordinator Bill Longley tasuma@btconnect.com

CROWD ON & RISK IT

This is the story of one of Britain's oldest and most successful model flying clubs, Croydon & District MAC, from 1936 onwards. The club contributed much over the years to aviation, both model and full size, and the late Keith Miller compiled its history till around 1960. Now this up-dated 73 page version of the club's history, copiously illustrated with many previously unpublished

photos, takes the Croydon club's saga up to the present day. Contributions by past and present members vividly capture the heyday of free-flight, with almost weekly contests at Chobham, Epsom or Bassingbourn. 53 designs by Croydon members have appeared in the model press and 24 of its members have represented Great Britain in World on European Championship teams. Several have gone on to notable careers in aerospace. Crowd On & Risk It covers all this and more.

Just £8.00 by PayPal or cheque
Contact Martin Dilly
(martindilly20@gmail.com),
phone/fax 020 87775533 or write to 20,



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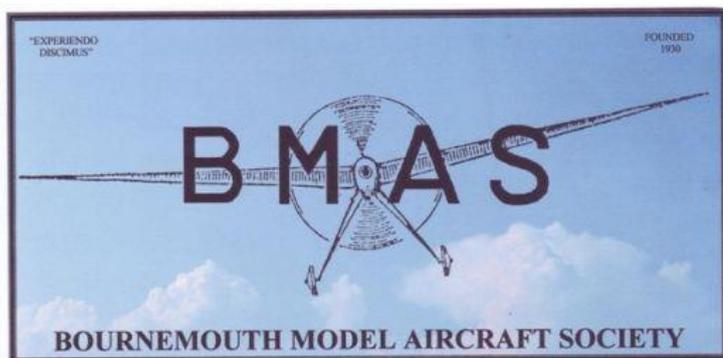
2017

10th September 2017
8th October 2017
12th November 2017
10th December 2017

Friday 29th December 2017
10.00a.m. to 4.00p.m

2018

Sundays 10.00a.m. to 4.00p.m.
14th January 2018
11th February 2018
11th March 2018
8th April 2018



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ALL FLYERS MUST HAVE BMFA INSURANCE FLITEHOOK NORMALLY IN ATTENDANCE
Adult Flyers £5 Spectators £1.50
CONTACTS: JOHN TAYLOR 01202 232206

All dates are Tuesdays

23 January
27 February
27 March
24 April
22 May



Small Electric Scale

Belair Kits are very pleased to have commissioned renowned scale designer, Peter Rake to produce a range of small electric scale models.

Wingspans are typically around 36 inch (1m) and all suit the economical 400 brushless motors and

mini servos. All airframes are of traditional all wood construction and no mouldings are required. Each aircraft has been thoroughly flight tested and are all proven fliers.

Call Belair on 01362 668658 or visit their online shop at www.belairkits.com

[Here are just three of the growing collection see all the others on our website](#)



DH82 Tiger Moth - small electric scale range

Ref: res-dh82

We are very pleased to add the DH82 Tiger Moth to our small electric scale range - a truly iconic aircraft.

Our Tiger Moth is designed to 1.23": 1ft with a wingspan of 36 inches. It suits 150 watt brushless setups with 2 cell lipoly batteries and three channel control - ESC, Rudder and elevator.

Designed exclusively for Belair Kits by Peter Rake, this model is a proven flier and quick to build. Its size means it can be left in one piece and fits in even small cars.

The parts set includes many sheets of graded balsa and plywood sheets, accurately laser cut, plus a three sheet plan and build manual.

Model Specifications

36 inch wingspan for 150 watt brushless motors, 2 cell lipoly batteries and small electric radio - ESC, Rudder and Elevator.

Price: £70.00 Inc VAT 77.00 USD | 82.87 EUR



Albatros DV - 39" electric scale parts set

Ref: res-ald5

Our Albatros is modelled at 1.31"/1' with a wingspan of 39.3 inches. Designed by Peter Rake exclusively for Belair, the model is fully CAD designed and features laser cut parts. Construction is straightforward and features modern methods.

Includes balsa, plywood and basswood parts for fuselage sides, formers, bulkheads, wing ribs, trailing edges with rib slots cut, outlines for all flying surfaces, interplane struts, tail skid, fuselage crutch, tail skid, plus

smaller handy parts. Fuselage is built on central crutch system.

Specifications of the Albatros DV

39.3 inch span, scale 1.31"/1' for small electric power setups of around 150W. 4 channel radio required - ESC, rudder, aileron, elevator and rudder. Full size 3 sheet plan with constructional guide included

Price: £70.00 Inc VAT
77.00 USD | 82.87 EUR

Pietenpol Air Camper - Electric scale 45"

Ref: res-piet

Parts set and plan for the original 20's American homebuilt - **Pietenpol Air Camper**.

Our model is traditional all wood construction and features a multi sheet plan and accurate laser cut parts. Formers, fuselage sides, wing ribs, trailing edges, landing gear mounts, cowl parts plus many smaller parts are included. Builder will need to supply their own stripwood and covering.



Specifications

**45 inch span for 400 size brushless setups. 4 channel control - ESC, rudder, elevator and ailerons.
Scale 1.5":1ft**

RRP: £60.00 Inc VAT
Price: £70.00 Inc VAT
77.00 USD | 82.87 EUR

Regards,
Leon Cole
Belair Kits

Tel: +44 (0)1362 668658

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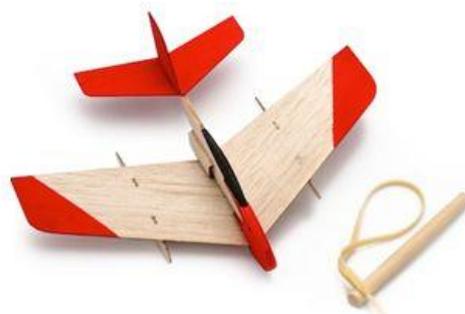
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