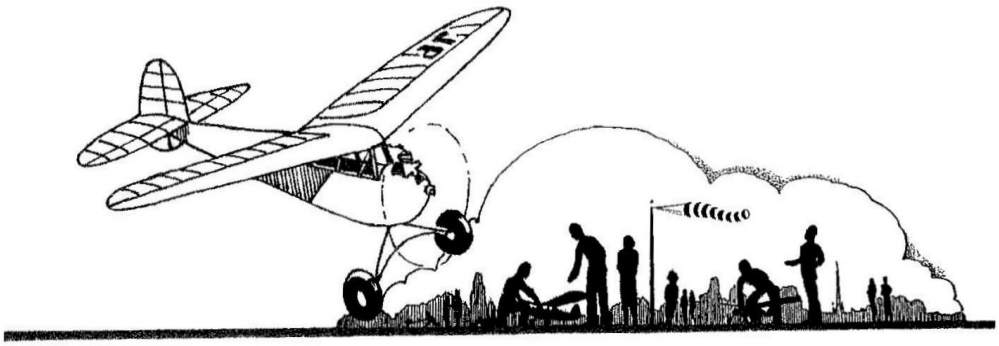


Sticks and Tissue No 123 – February 2017

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/

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

John Taylor's converted to electric power Penumbra a 1956A/2 Osborne design

From Eric Clutton

HI Jim... Regarding the Ohlson .60 powered stunter, Many years ago I built a Dennis Allen BOXCAR and powered it with an OR .60 running on spark and petrol. I always felt it didn't feel safe out there and didn't like climbing it to head height . I removed the Ohlson and replaced it with an OK Super .60, same fuel and prop. Now I could write my name in the sky with it. What a difference ! I have never thought much of the Ohlson .60 since that time but the OKs seem to go on for ever. My 'sell by' date is approaching at 89 and C/L is no longer possible ad I can't chase free flighters so it is now all R/C but they are all really guided free flight models ! I have just had a session of building with foam board but now need a rest from it so I am making an electric powered fuselage for my diesel SHARKFACE and drawing up a 24" span Sopwith Triplane for electric and three channel. I have an SE 5 and Fokker tripe in Foamboard so I am anxious to see the difference in performance ! ERIC.

From Mike woodhouse

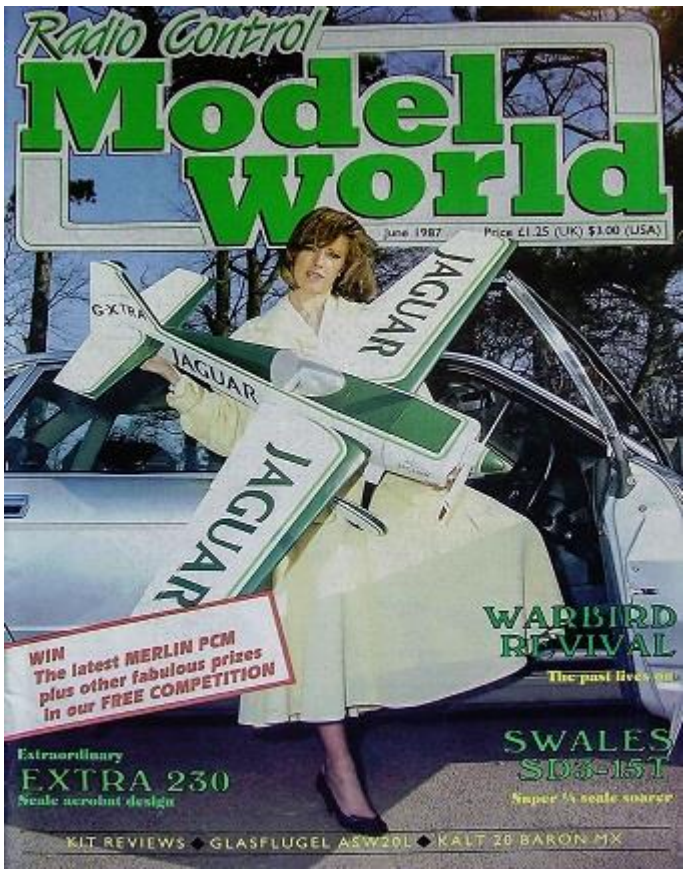
Thanks for the latest issue of Stick & Tissue. What do I find? A much younger me with the Wichita plan. We had lots of fun and a great time with these models back when. The model got me in the team a couple of times. I will have to build another one fine day! Thanks again for all your efforts. It is much appreciated.

Michael Woodhouse
mike@freeflightsupplies.co.uk
http://www.freeflightsupplies.co.uk

From John Maries

Good to see the late Brian LeComber's Jaguar Extra 230, in S&T 122.

Your readers may be interested to know that Roy Garner, a former colleague at Jaguar, produced plans for this Extra 230, and these were published in the June 1987 edition of Radio Control Model World:



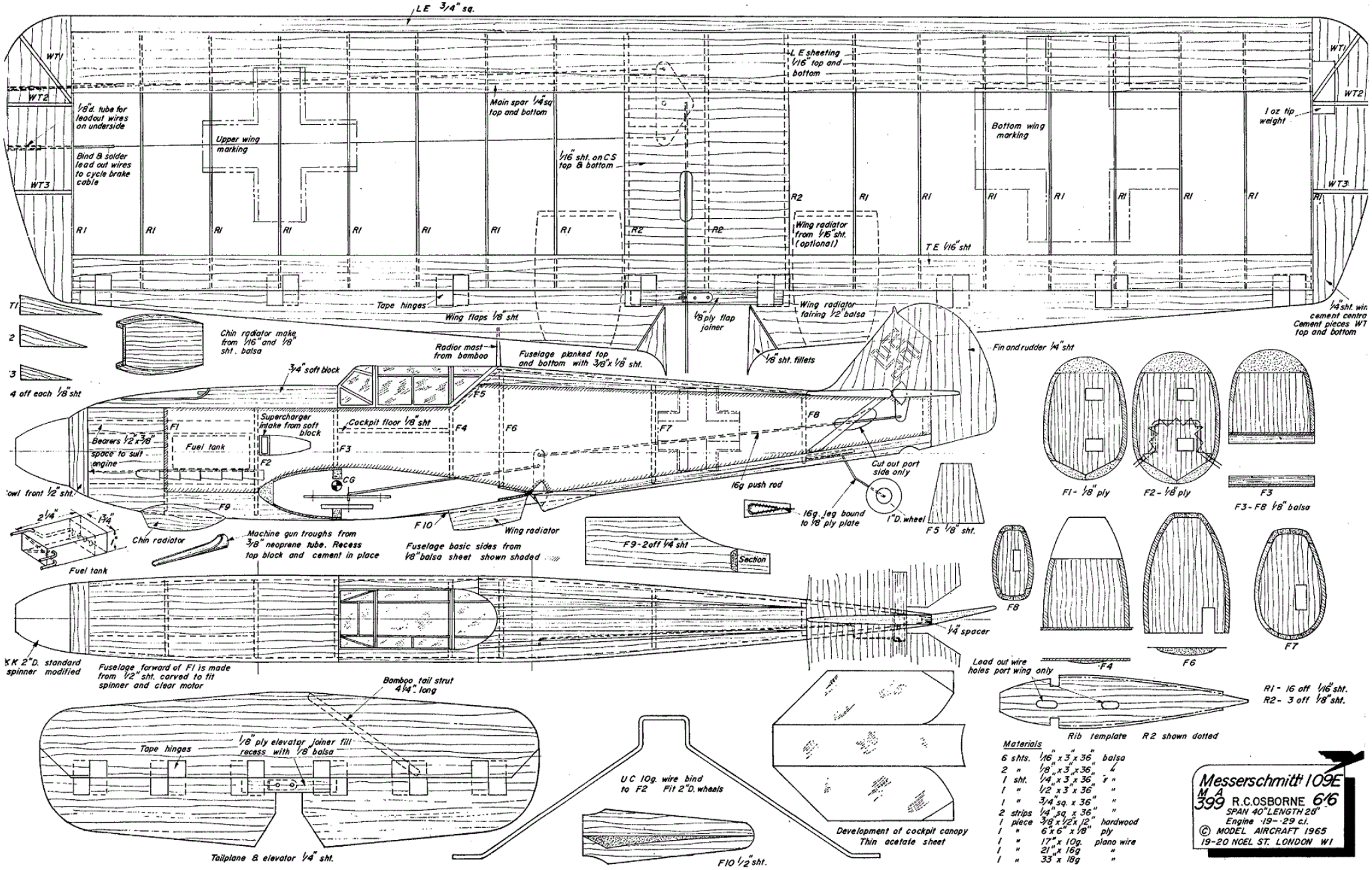
(I should tell you that Amanda did, in fact, have a second leg!).

Prolific model maker, Roy Garner also produced - and had published - plans for Brian's Jaguar Stampe, a couple of years earlier. I recall that an example of the Stampe, in Jaguar colours, hung in a Southampton model shop, for many years.

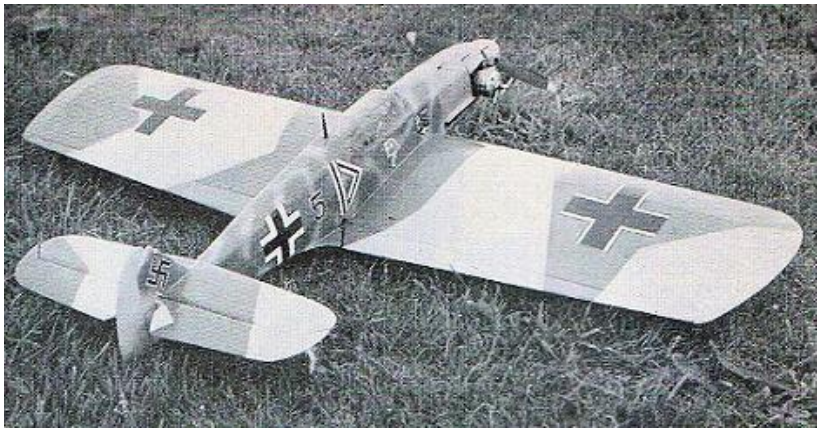
Brian ("Hello, Matey!") was a super bloke, with a fund of amazing stories. His books are great yarns and are much recommended.

Best wishes,

John "XK50"


LE 3/4" sq.
WT1
WT2
WT3
1/8"d. tube for leadout wires on underside
Bind & solder lead out wires to cycle brake cable
Upper wing marking
Main spar 1/4" sq top and bottom
1/16" sht. on CS top & bottom
L E sheeting 1/16" top and bottom
Bottom wing marking
1 oz tip weight
R1
R2
Wing radiator from 1/16" sht. (optional)
T E 1/16" sht
Tape hinges
Wing flaps 1/8" sht
1/8" ply flap joiner
Wing radiator fairing 1/2" balsa
1/4" sht. wing cement centre Cement pieces WT top and bottom
Chin radiator make from 1/16" and 1/8" sht. balsa
Radior mast from bamboo
Fuselage planked top and bottom with 3/8" x 1/8" sht.
1/8" sht. fillets
Fin and rudder 1/4" sht
4 off each 1/8" sht
3/4" soft block
F5
F1
Supercharger intake from soft block
Cockpit floor 1/8" sht
F4
F6
F7
F8
Bearers 1/2 x 3/8" space to suit engine
Fuel tank
F2
F3
CG
F9
Cut out port side only
16g push rod
16g leg bound to 1/8 ply plate
1"D. wheel
F5 1/8" sht.
F1 - 1/8" ply
F2 - 1/8" ply
F3
F3 - F8 1/8" balsa
2 1/4"
1 3/4"
Fuel tank
Chin radiator
Machine gun troughs from 3/8" neoprene tube. Recess top block and cement in place
F10
Wing radiator
Fuselage basic sides from 1/8" balsa sheet shown shaded
F9 - 2 off 1/4" sht
Section
F8
1/4" spacer
F7
F6
F4
Lead out wire holes port wing only
KK 2"D. standard spinner modified
Fuselage forward of F1 is made from 1/2" sht. carved to fit spinner and clear motor
Bamboo tail strut 4 1/4" long
R1 - 16 off 1/16" sht.
R2 - 3 off 1/8" sht.
Rib template R2 shown dotted
Tape hinges
1/8" ply elevator joiner fill recess with 1/8" balsa
Tailplane & elevator 1/4" sht.
U C 10g. wire bind to F2 Fit 2"D. wheels
F10 1/2" sht.
Development of cockpit canopy Thin acetate sheet
Materials
6 shts. 1/16" x 3" x 36" balsa
2 " 1/8" x 3" x 36" "
1 sht. 1/4" x 3" x 36" "
1 " 1/2" x 3" x 36" "
1 " 3/4" sq. x 36" "
2 strips 1/4" sq x 36" "
1 piece 3/8" x 1/2" x 12" hardwood
1 " 6" x 6" x 1/8" ply
1 " 17" x 10g. piano wire
1 " 21" x 16g "
1 " 33" x 18g "
Messerschmitt 109E
MA 399
R.C. OSBORNE 6'6"
SPAN 40" LENGTH 28"
Engine ·19 - ·29 c.i.
© MODEL AIRCRAFT 1965
19-20 NOEL ST. LONDON W1

ME Bf 109e Semi scale stunter for 3.5 – 5cc by R C Osborne Model Aircraft February 1965



Most modellers, I imagine, feel strongly attached to the idea that the more a model resembles a full size craft, the more attractive its appearance. Indeed, many must surely nurse the ambition to construct a super-scale model. The fulfilment of this idea is usually thwarted, however, by the preponderance of forcibly expressed views that such a project will have a lamentable flying performance. Invariably anyone seeking advice on how to begin a correctly outlined model, discovers the first stage is how much to alter the outline to make it fly.

My first attempt at scale was a C/L stunt model—a Mustang. The wings were enlarged, naturally enough and I doubled the tail area just to be safe. I also opted for a P51D variant, which has a dorsal extension to the fin. The model flew very well until an inverted crash completely removed both fin and rudder flown without these, speed increased by about 10 m.p.h., and a much greater line tension was consequently maintained. I am not advocating that line tension can be increased simply by removing the fin from your model, any more than I am impugning the veracity of some expert, well-established and proven approaches to flying model design. What I do believe is that a realistic appearance should be maintained and only alterations necessarily beneficial to the flying performance made (within the limits of practical construction, of course, but this dictated by your choice of prototype).

This model, being designed for aerobatics, is built round the established stunt wing, a necessity of course. The tailplane is seated on top of the rear fuselage, instead of partway up the fin, to achieve the necessary rigidity. The fuselage, fin and rudder are accurately scaled. My observer viewing the plane in flight might well puzzle over his wartime recognition silhouettes, and unfortunately the outlines we must alter do result in a hybrid, compromised by necessity. But the pilot will see a Messerschmitt performing stunts.

Those building the design should have some knowledge of the usual construction methods, but guidance to assembly procedure is given below.

Wings

Ply templates for the ribs are a must. Cut two from 1/8 in. ply and sandwich balsa blanks between them. Assemble the wing completely, including flaps, elevator pushrod and covering. The wing is covered with nylon or silk.

Engine Bearers and Tank

Cut bearers to length and bolt the motor to them. Glue F1 and F2 to the bearers with the tank wedged between. Glue plenty of sheet or block around the tank.

Fuselage

The fuselage is made from 1/8 in. sheet sides, with planking top and bottom, aft of the wing and cockpit, and block elsewhere. Curving the sides is quite easy. Easier still with soft or medium balsa, but use hard balsa for the formers. Finish the sides to the formers to prevent them moving, and bind tape or even string around the sides. Wetting the outside of the sides will facilitate bending. Do it in this order: fit sides to bearer assembly and join sides at rear with spacer. Then add all upright formers, curving sides to fit each one.

Assembly

First glue the incomplete fuselage to the wings, threading pushrod through formers. Add tailplane, plank fuselage top and bottom and glue fuselage blocks in place. Finally glue on fin, rudder and cockpit.

As the wing fits under the fuselage and the tail on top, it is advisable to strengthen all these joints with nylon soaked in cement.

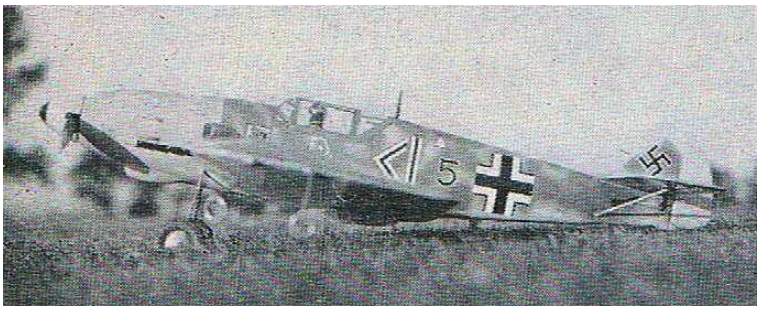
Finishing

The usual colour scheme was pale blue undersurfaces and fuselage sides, with upper wing and tail surfaces light and dark grey. The fuselage top and halfway down the sides was dark grey mottling on light grey. The only way to achieve this is by spraying. (A hand spray costs a little over l0s.) Against this sombre

background the white-lined black crosses stand out remarkably well and the whole effect can look very dramatic. Trouble taken at this stage pays ample dividends. The original model illustrated had the mottling covering all the sides; the nose being mottled light and dark yellow and the tail and spinner plain yellow. Assuming you have a reliable engine, the next most important item is the fuel tank. This cannot be overemphasised. No matter how efficient the motor, its performance is entirely at the mercy of the fuel flow. Use a tank you know will give a smooth run. The plan has details of one tank design which functions very well if made up properly. A baffle is definitely an advantage. Also, do not have the vents protruding from the top or bottom of the fuselage. This is asking for damage to the fuselage and tank ii you land it roughly. Lastly, ensure that the control system works freely.

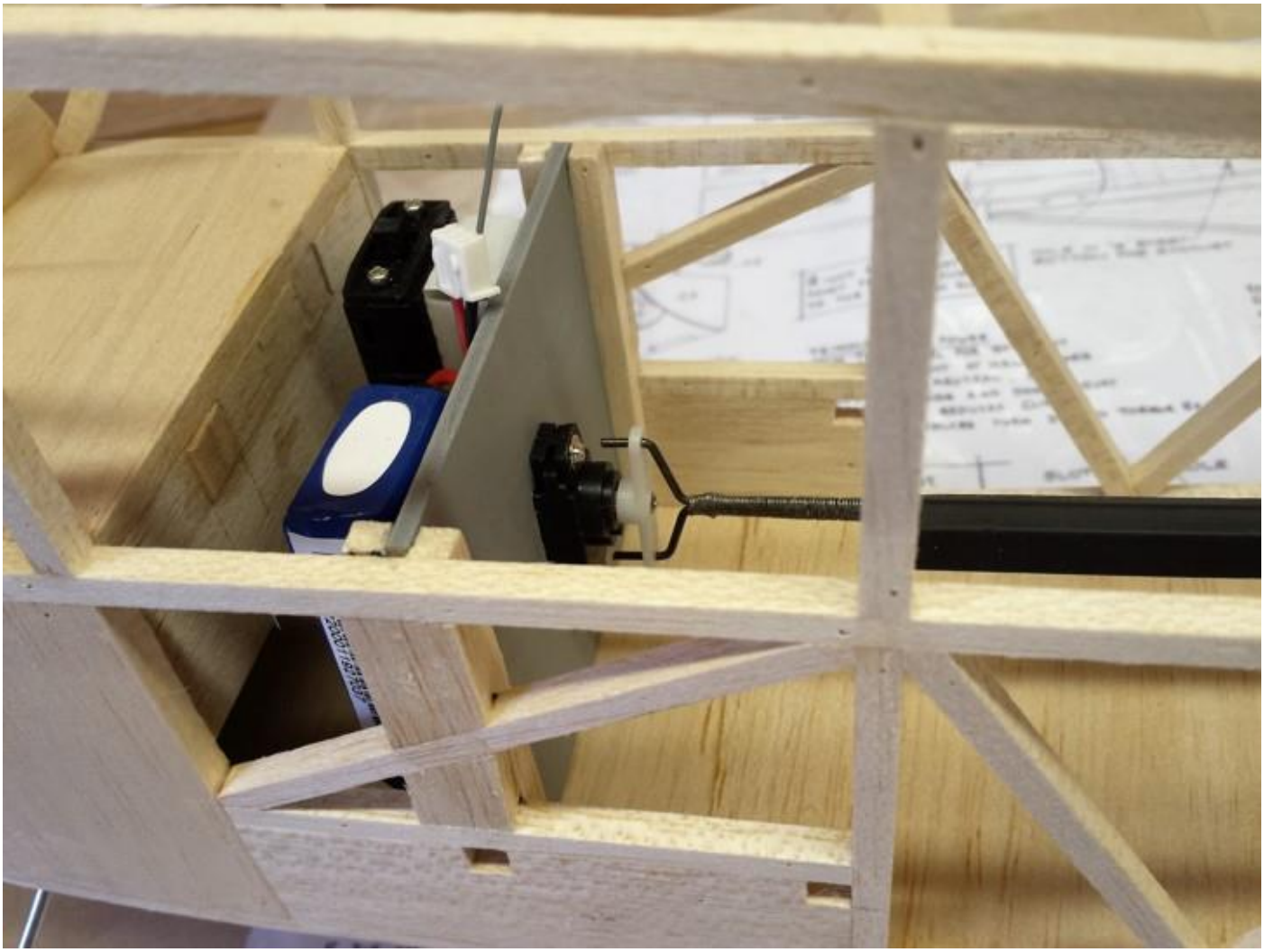
Flying

Really this could be headed: "How you want it to fly," to which there are actually two approaches. The first is speed stunting. It will be noticed that the L.E. radius is small, and in fact the wing section shown is conducive to fast flying. Fit a 6 in. pitch prop to suit the motor, and set it to run as fast as possible. Stunting at high speed with a model this size is exhilarating, and the increased line tension makes for positive control. Alternatively, you can make the 'plane behave more sedately by fitting a finer pitch prop and rounding the L.E. more bluntly. Remember this is a stunt model first and a scale model second. Flying should be a pleasure with this design, and providing care is exercised with all the gluing, it is vastly stronger than most other models of its class.



From Martin Briggs

Your mail coincided with the completion of my first single channel model build for over 50 years. Its a Mercury Matador, built from a Ben Buckle kit I bought last year. I've covered it in a diesel-proof polyester film because its powered with an Irvine Mills 1.3, one of the nicest handling diesels I know of. Control is by rudder only, with a torque rod currently driven by a small servo, but that is mounted on a plate which can easily be adapted for an Elmic escapement at a later date. With the radio installation you see here, the C of G came out exactly on the advised point (33%). Looking forward now to one of those nice (rare), crisp January days.



From Alan Bond

Alan Bond, designer of the popular E-Zee range of timers for control-line, electric and ic free flight models has sent details of a new electric free flight timer that has been developed for the needs of E36 competition models that are not met by the electric free flight 'sport' timer the E-Zee EFF2, currently marketed by Dens Model Supplies.

The specification, functionality and packaging were all guided by John Thompson the SAM1066 Chairman and experienced contest flier. In comparison with the EFF2, smaller size and weight were desirable and the unit needed to be accommodated within the fuselage with just the push button and LED showing through a ply mounting plate affixed to the timer on short stand-offs. The power setting potentiometer was not required as only full power is used and neither were the motor soft start and run down required. A maximum motor run time of 20 seconds was specified but unlike the EFF2 the time period requires to be set to a resolution of 0.1secs.

For competition use, the timer operation was altered so that the motor starts upon pressing the button but the timing period doesn't begin until the button is released. Should the button be released but the model not launched, pressing and holding the button again will reset the timing period back to zero.

The most important feature missing from the EFF2 was the capability to interface to an RDT system as it was becoming increasingly clear that in the near future competition directors (on behalf of the flying site owners) are likely to require RDT systems be fitted as a condition of entry. Thus, to simplify the timer operation (for the user) unlike EFF2 there is no provision for the user to alter the timer's (fail-safe) 5 minute DT period as flights can be terminated when required by RDT intervention. Should a dangerous launch occur, John considered it would be useful if the RDT system could be used to first kill the motor and then at a later, safer time (for the model) be used again to operate the DT servo and this idea has been incorporated.

The DT servo is plugged into the timer and the RDT receiver plugs into a further connector on the timer to receive its power and to transfer its trip signal for processing by the timer. A further feature added was the capability to reverse the direction of operation of the DT servo to suit the user's installation. After much experimentation an improved user interface has been developed for setting the user configurable parameters, the success of which was largely due to adopting the use of a bi-colour LED.

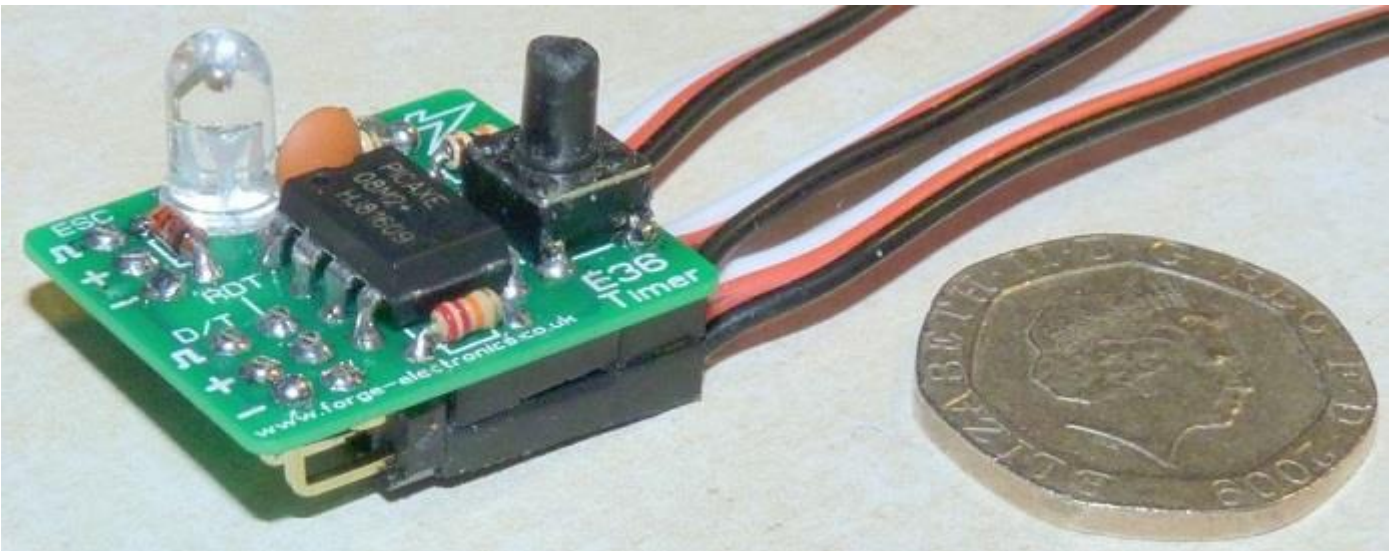
Key Features:

- *at switch on the unit reports its current motor run period*
- *motor run user adjustable 0.1 to 20secs in 0.1sec increments (longer periods available upon request)*
- *RDT Compatible - Aeris & LeoBodnar 'Host Timer' systems supported*
- *'homebrew' RDTs using conventional RC receivers supported via an in-line adaptor module*
- *RDT system capable of aborting motor run as well as tripping the DT servo*
- *5 minute fail safe operation of DT servo in event of RDT malfunction (other periods available upon request)*
- *option to reverse direction of rotation of DT servo*

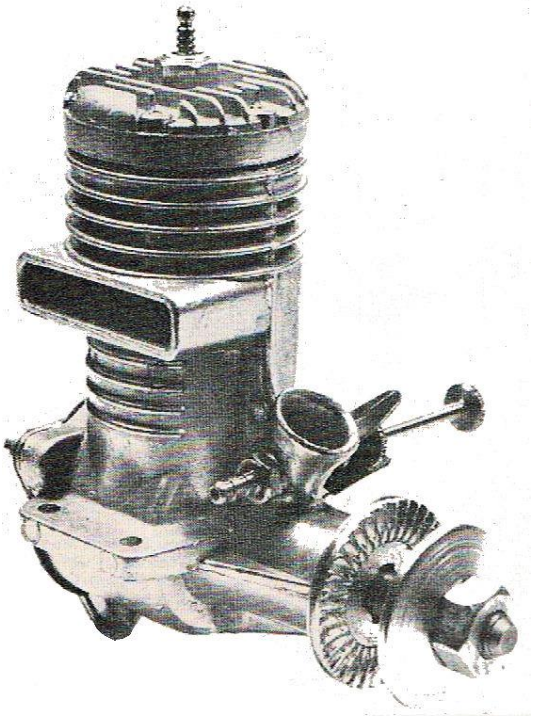
With several packaging and functional options to choose from, these timers are made to special order and are thus supplied directly from Forge Electronics rather than via the usual outlet at Dens Model Supplies. The timer retails at £22.50 which includes free first class signed-for postage within the UK.

More details on the Forge Electronics website http://www.forge-electronics.co.uk/index.php/aircraft/e36-comp-timer from where the detailed instruction leaflet may be downloaded.

A further version of this competition timer adapted for use with ic power follows soon.



FOX 35 STUNT Perennial favourite of control-line aerobatic flyers all over the World From Aero Modeller December 1967

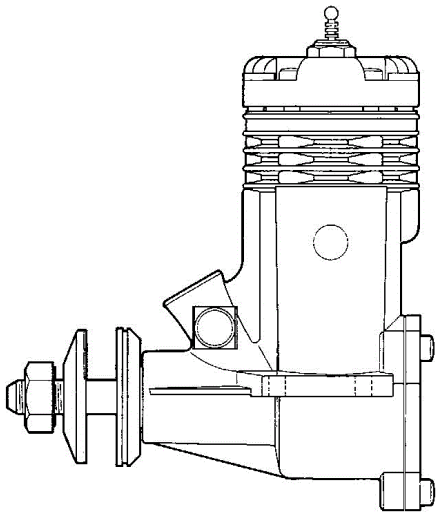


OF all the model aircraft engines manufactured at the present time, none has been so closely identified with a specialised class, and for so many years, as the American Fox Stunt 35. In the world of control-line aerobatics, the Fox 35 is the automatic choice of the majority of American modellers while, in any international contest, Fox 35s can be expected to power more models than any other make of engine.

The first Fox 35 actually appeared in 1949. Within a couple of years it had been adopted by most of the top American stunt flyers and, since that time, its popularity for C/L acrobatic work has never been seriously threatened. There are now other good C/L stunt motors but modellers have learned to trust the Fox 35. It is not the most powerful stunt 35, nor is it the most well finished, but it is light, reliable and has proved, conclusively, its suitability for the job in hand.

The engine on which we are reporting here is the current 1967 model. Few, if any, of the original Fox parts have remained unaltered in some way since the original version was introduced eighteen years ago, but the basic design of the engine has, nevertheless, remained much the same.

Essentially, it is a very simple design and, excluding assembly screws and gaskets, it contains only sixteen parts. The main component is the pressure diecast body unit which comprises the crankcase, the finned cylinder casing and the main bearing housing with its integral bronze bushing. The bearing length is quite short and the intake to the shaft type rotary valve is close to the crankcase.



The induction passage through the shaft is thereby kept short and so helps to keep the volume of the primary compression chamber small. As a very large diameter induction passage is not really necessary in a stunt engine, a 7/16 in. crankshaft journal diameter is quite adequate. The moderate area valve port is timed to open at 45 deg. ABDC and to close at 45 deg. ATDC. The shaft has a full disc web with crescent counterbalance.

The cast-iron piston is typical of medium size Fox engines. It is quite light, with a flat crown and straight baffle, a small diameter gudgeon-pin and an internal annular rib above the bosses. The machined connecting-rod has an offset shank to clear the crankshaft counter weight. Strangely, however, the crankcase backplate clears the crankpin by about 1/16 in. more than it needs to do, which clearly contradicts one's initial impression that efforts have been made to maintain maximum primary compression. The backplate itself is attached to three lugs on the crankcase, spaced at 120 degrees which provide a means of radially mounting the engine should this be preferred.

The leaded steel cylinder liner is a slip fit in the main casting and is located in the usual way by a flange at the top, where it is clamped in position by the cylinder head which is secured with six screws. The head is a shallow wedge pattern with a glowplug boss protruding slightly below the head surface. The liner contains one exhaust port and one transfer port, of moderate area, the transfer occupying only about 100 degrees of the cylinder circumference. The ports are timed to remain open for 132 degrees (exhaust) and 118 degrees (transfer).

The short air intake has a 9/32 in. throat diameter, no separate venturi insert being used. The needle-valve assembly is of the spraybar type, the latter having a diameter of 0.130 in. A heavy, plated steel prop driver is

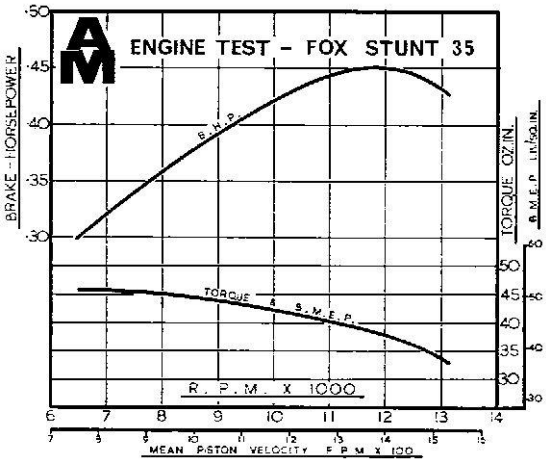
employed. This engages four lands on the prop-shaft length just in front of the main journal. A substantial steel retaining washer and a hexagon nut complete the propshaft assembly.

Performance

One has only to see Fox 35s in the hands of stunt experts to note that generally they are easy starters. Our test model was no exception and responded, quickly to the orthodox starting drill of an exhaust prime when cold and a couple of choked preliminary flicks when hot. We were also happy to find that it did not require an unduly lengthy running-in period. We gave our motor eight two-ounce tanks of fuel at a rich four-stroke, before beginning to lean it out. Within an accumulated running time of one hour it would maintain a steady optimum two-stroke setting without slowing down. A further full hour of running time was then logged before performance tests were started.

We used both our standard test fuel containing 5 per cent nitromethane and the maker's recommended Fox Superfuel which has a similar or slightly lower nitro-methane content. There was little or no difference in the recorded power output on these two mixtures. On the popular 10 x 6 size stunt prop, speeds ranged from 9,700 r.p.m. on a Power-Prop wood to 10,300 r.p.m. on a Tornado nylon. Other prop speeds included 8,000 on an 11 X 6 Top-Flite wood, 9,400 on an 11 x 5 Top-flite wood, 11,000 on an 11 X 3 Top-Flite wood and 11,400 on a 10 X 4Tornado nylon.

On the cradle dynamometer, maximum torque was realised at 7,000 r.p.m., reaching a figure of 46 oz. in., equivalent to a b.m.e.p. of 52 lb/sq. in. which is reasonable for an engine of this type on a fuel of 5 per cent nitro rating. The torque curve declined at a very steady rate as load was reduced and resulted in a maximum output of 0.45 b.h.p. at between 11,500 and 12,000 r.p.m.



Running was even and fairly smooth except when the Fox was overloaded (i.e. propped for speeds between 7,000 and 9,000 r.p.m.) which produced more vibration. Under normal conditions, with a 10 X 6 or 10 X 5 prop, the engine ran extremely well. The only fault we had to find with our particular motor, in fact, was that the needle- valve was a bit slack in its threads. Since the Fox needle is not actually a needle form, but is a parallel rod with a chisel flat on one side only, this caused slightly erratic response when it was being adjusted, but the engine ran perfectly steadily once the correct adjustment had been established.

Control-line stunt engines are not, of course, rated solely on power output and 0.45 b.h.p. is not exceptional, these days, for a motor of nearly 5.8 cc. However, taking into account the fact that the Fox weighs less than 6 1/2 oz. (no more than some .19 class engines) this b.h.p. is actually very good on a power/weight ratio basis. Power/Weight Ratio (as tested): 1.12 b.h.p./lb. Specific output (as tested): 78 b.h.p.f litre.

SPECIFICATION

Type: Single cylinder air-copied, loop-scavenged Iwo-Stroke cycle, glowpiug Ignition. Crankshaft type rotary-valve induction. Bronze bushed main bearing.

Bore: 0.800 In. Stroke: 0.700 in.

Swept Volume: 0.3519 cu. In. = 5.767 cc.

Stroke / Bore Ratio: 0875 : 1

Weight: 6.4 oz. (less silencer)

General Structural Data

Pressure diecast aluminium alloy crankcase /cylinder-block / front housing unit with cast-in bronze main bearing bush and drop-In unhardened steel cylinder liner. Detachable pressure diecast aluminium alloy crankcase backplate secured with three screws. Case-hardened steel counterbalanced crankshaft with 0.437 in. dia. journal. 0.312 In. bore gas passage and 0.187 in. dia, solid crankpin. Lapped Meehanite piston with baffle and 0.153 In. dia hardened tubular gudgeon-pin with brass pads. Machined duralumin unbushed connecting-rod. Pressure diecast aluminium alloy cylinder head with recessed .0101 in. soft aluminium gasket and secured with six screws. Machined steel prop driver. Brass spraybar type needle-valve assembly. Beam mounting lugs. Provision for 3-point bulkhead mounting.

TEST CONDITIONS
Running in prior to test: 2 hours.
Fuels used: (a) 5 per cent pure nitromethane 25 per cent Duckham's Racing Castor-oil. 70 per cent ICI Methanol.
(b) Fox Superfuel.
Glowplug used: Fox 'Glowmaster' long reach platinum fillament, as fitted.
Air temperature: 46 deg. F. (8 deg. C)
Barometer: 29.2 In. Hg.
Silencer type: Nil

From Jörgen.

Hi James sending you some Pictures of my Red Zephyr covered in 15 grams Polyspan and up fronta Red fin 0,5 tbr fi all up weight is 360 grams kit fromMicro rc models . And last is the bare bones of a Frog 45 from Belair and up front I will put my brand new Twin fin tbr boxer still have to make a suitable cowling.

From John Ralph

Hi James , the photos and splendid video by Brian Cox, in the Dec, (No 121) issue of S&T. of his ED MK II has prompted me to send you a little article I wrote a few years ago for our local Club Magazine.

A few words about this club will not come amiss in S&T since it was set up in 1993 under the name " CORNISH VINTAGE AEROMODELLERS " (CVA) to cater mainly for free flight enthusiasts. Our members are spread all over Cornwall from myself near Lands End, to Plymouth.

Our first get together was on Bodmin Moore but that did not last long since " Friends " of said Moore objected to the odd large RC models seen flying and ALL flying there was banned ! Since then most local events have been at Perranporth when sea breezes allow.

I was fortunate enough to have a flying site on my doorstep for over twenty years which permitted me to fly FF and RC.when weather permitted, just by walking a few hundred yards! Age and a move to Penzance has left those years just a happy memory. Anyway ,back to the present!

Indoor flying has been a regular for CVA at various venues since the start and is currently being run in St. Austell (See BMFA Calendar for dates etc.)

The club was helped to grow and become competitive " UP COUNTRY " by the setting up of SAM 1066 by David Baker and the near quarter of a century of splendid vintage FF meetings at Middle Wallop plusregular attendance at Woodbury when those events were in full swing. Some members still stay competitive by entering the Area meetings and The FF Nat's .

We have a splendid club magazine called " WITHOUT FEATHERS " (See attached PDF of the XMAS issue.) which has been edited (and sometimes written !) five times a year since 1994 by Ron Marking . Ron is still very competitive in several vintage classes plus he has staid abreast of ELECTRIC FF which we both became involved in at the start (1999).

Anyway , back to the ED's ! I wrote a piece in our " Feathers Mag. " a few years ago and Brian Cox's video reminded me of it so I got Ron to dig out the issue with it in and send it to me . I have attached the latter plus a few photos which I have just taken of my " Mystery ENGINE ". I have also taken a few relevant shots of my old ED MK II box which I have used to store bits in for the last 70years along side the box in which the sale ED COMP SPECIAL came in . That's the one marked £4-17-6 on the side.

I hope you can piece together the above suitable for S&T ,I think a few of the " OLD TIMERS " will find it of interest.

Finally I will indulge myself in a bit more nostalgia relevant to the above tale :-

Not long after I bought my ED MKII in 1947,haven taken a long time to save the £4-4-0 needed , I set to and designed a model for it based on the " BLACK MAGIC " which had recently appeared in AEROMODELLER. My version was a bit " boxier " than the " BM " but at 60in wing span was a fair bit for a thirteen year old to come up with. I only have a few photos of my various own designs of the time but luckily I do have a photo of said cabin model .It is not very good photos but sufficient can be seen of the model and the proud owner (me !!). The model flew well but the engine was difficult to start being inverted like the " BM ".

I soon tired of its lumbering flight characteristics and sold it on to a fellow " Gloucester & Cheltenham Club " member. I wanted a hot machine like a " BANSHEE " or a HELLS ANGLE " as competition flying was the way for me . It has been ever since ; but that's another story or " stories " that have emerged as the years have rolled by.

Best wishes to all my friends out there in " Nostalgia land " . John Ralph.

Did ED Box Clever In 1948? A Diesel Engine 'Who Dun It' JOHN RALPH

I was lucky enough recently, while browsing around a local auction room, to come across a somewhat battered ED MkII engine box, just like the one I have had since I was a schoolboy.

Sadly my box has lain empty for half a century so my pulse quickened a little when I picked up the auction item and felt the weight of 'something' within. Removing the elastic band holding 'The lot' together I carefully lifted the lid to reveal- an engine! However it was not the one I had expected. Instead of the MkII of my youth, with its unique penny slot compression adjuster, this ED was the follow up COMPETITION SPECIAL.

My initial disappointment evaporated quickly when I examined the engine closer and realised what good condition it was in. Further it even had its paperwork in the form of an instruction booklet and a guarantee card and fuel mixture spec. Now I am not a model engine collector or wheeler-dealer but I do have quite nostalgic feelings regarding such items if I owned similar ones in my youth. So having decided it would be nice to own an ED again I left a modest bid on the engine.

A couple of days later I phoned the auction rooms and was pleased to hear I had secured it. Having got my 'bit of nostalgia' back home and in my den I started to take a closer look at it. On the face of it I was simply lucky enough to own again an ED COMPETITION SPECIAL in excellent condition but there were a few 'loose ends' here.

Why was the engine in an ED MkII box?
Why were the instructions for a MkII?
Why was the front of the crankcase stamped MkII?
Why was the engine stamped N1216/7C when the guarantee card was numbered N1212/7C?

Simple answers no doubt occur to you vintage engine sleuths bargain hunters but wait - there is more. Written clearly in pencil on the side of the box was the original price! £4/17/6 in ‘old‘ money. This is important since ED MkII’s when introduced in March I947, were £4/4/- (or four Guineas!} and were still that price when in December I947, ‘The Competition special appeared. The price of the latter? - £4/17/6! This indicates to me that my new (old) engine belongs in the box it came with. I think ED shipped some early COMP SPECIALS in the MkII boxes and maybe also included MkII instructions but I could be wrong! That still leaves the engine number miss match. Perhaps this was a simple mix up with cards or a miss written card at ED’S or maybe a card switch in a model shop. Who knows?

All very intriguing don’t you think?

Perhaps you have a ‘COMP’ SPECIAL with ‘MkII’ stamped on the front and maybe it came in a MkII box? If you have a COMP SPECIAL’ with N1214/7C on it, I’ve got your guarantee card! Mind you it was only for 6O days so you’re 55 years too late if you have broken it!!

CORNWALL VINTAGE AEROMODELLERS

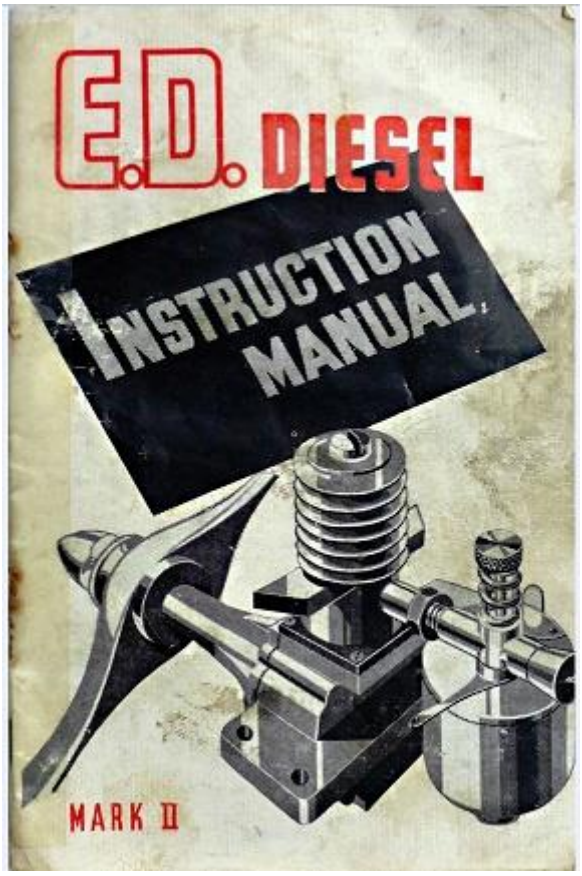
Without Feathers

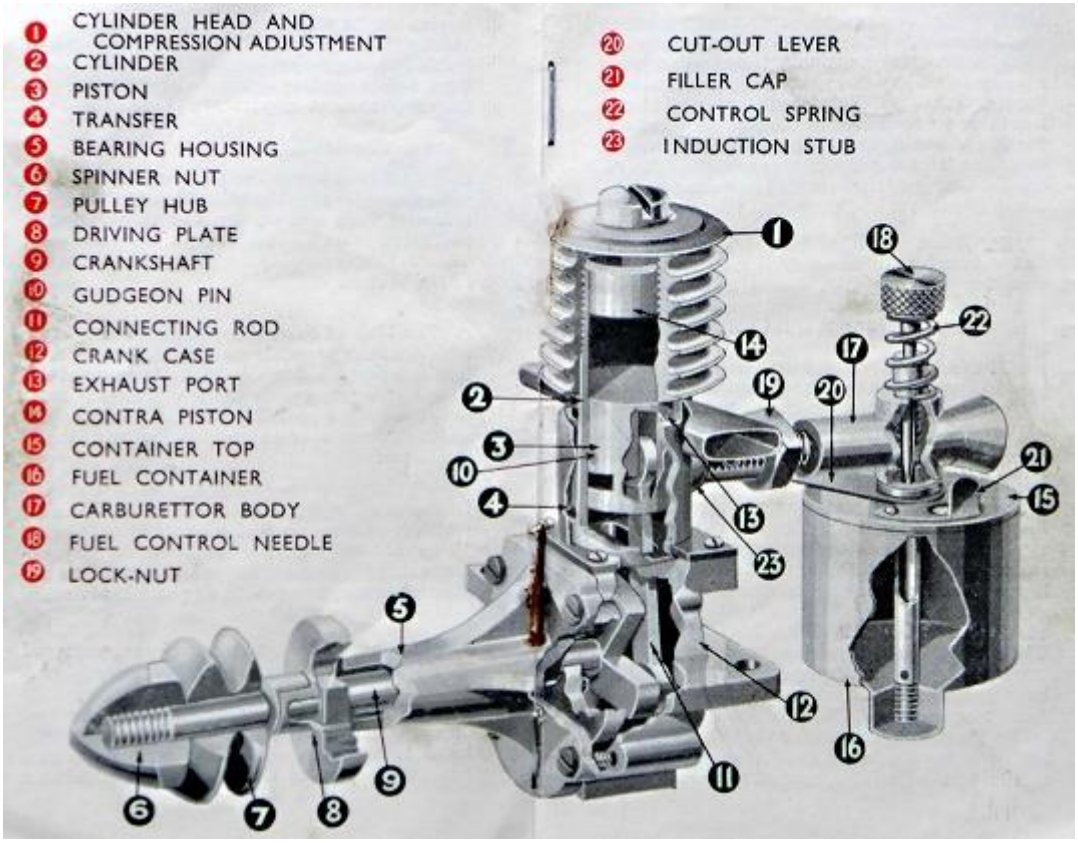
Number 118 December 2016


DIESEL
MARK II
DIESEL
MARK II


E.D.
DIESEL
MARK II


E.D. DIESEL
INSTRUCTION MANUAL.
MARK II
GUARANTEE N/214/?c
This engine is guaranteed against defects in material and workmanship for 60 days from date of purchase. Engine must be returned to factory for examination if claim is made under this guarantee. If found to be defective, replacement or repair of parts will be made at no charge. This guarantee is void unless E.D. Diesel Fuel or recommended fuel mixture is used, or any foreign matter is allowed to enter cylinder unit.
Repairs to engines damaged by tampering will be made at nominal factory cost.
ELECTRONIC DEVELOPMENTS (Surrey) LTD.,
18 Villiers Road, Kingston-on-Thames,


E.D. DIESEL
INSTRUCTION MANUAL
MARK II


1 CYLINDER HEAD AND COMPRESSION ADJUSTMENT
2 CYLINDER
3 PISTON
4 TRANSFER
5 BEARING HOUSING
6 SPINNER NUT
7 PULLEY HUB
8 DRIVING PLATE
9 CRANKSHAFT
10 GUDGEON PIN
11 CONNECTING ROD
12 CRANK CASE
13 EXHAUST PORT
14 CONTRA PISTON
15 CONTAINER TOP
16 FUEL CONTAINER
17 CARBURETTOR BODY
18 FUEL CONTROL NEEDLE
19 LOCK-NUT
20 CUT-OUT LEVER
21 FILLER CAP
22 CONTROL SPRING
23 INDUCTION STUB


WARNING!
Use Only Recommended Fuel Mixture:
1 Measure — Castor Oil
1 Measure — Paraffin Oil
1 Measure — Ether

DMFG a few snaps when flying has been possible

What with weather and work I haven't been able to get out and do much flying. I've a few models all ready including my Veron Combi from a few years ago, new rubber and patience. Mended my Lola after wind blew it into everything possible that would damage it and several other things I've put together.
Here's the snaps of last two get togethers.

Brian Beacham's model sitting on his runway ***Stewart Hindle's Mercury Viper converted to electric***

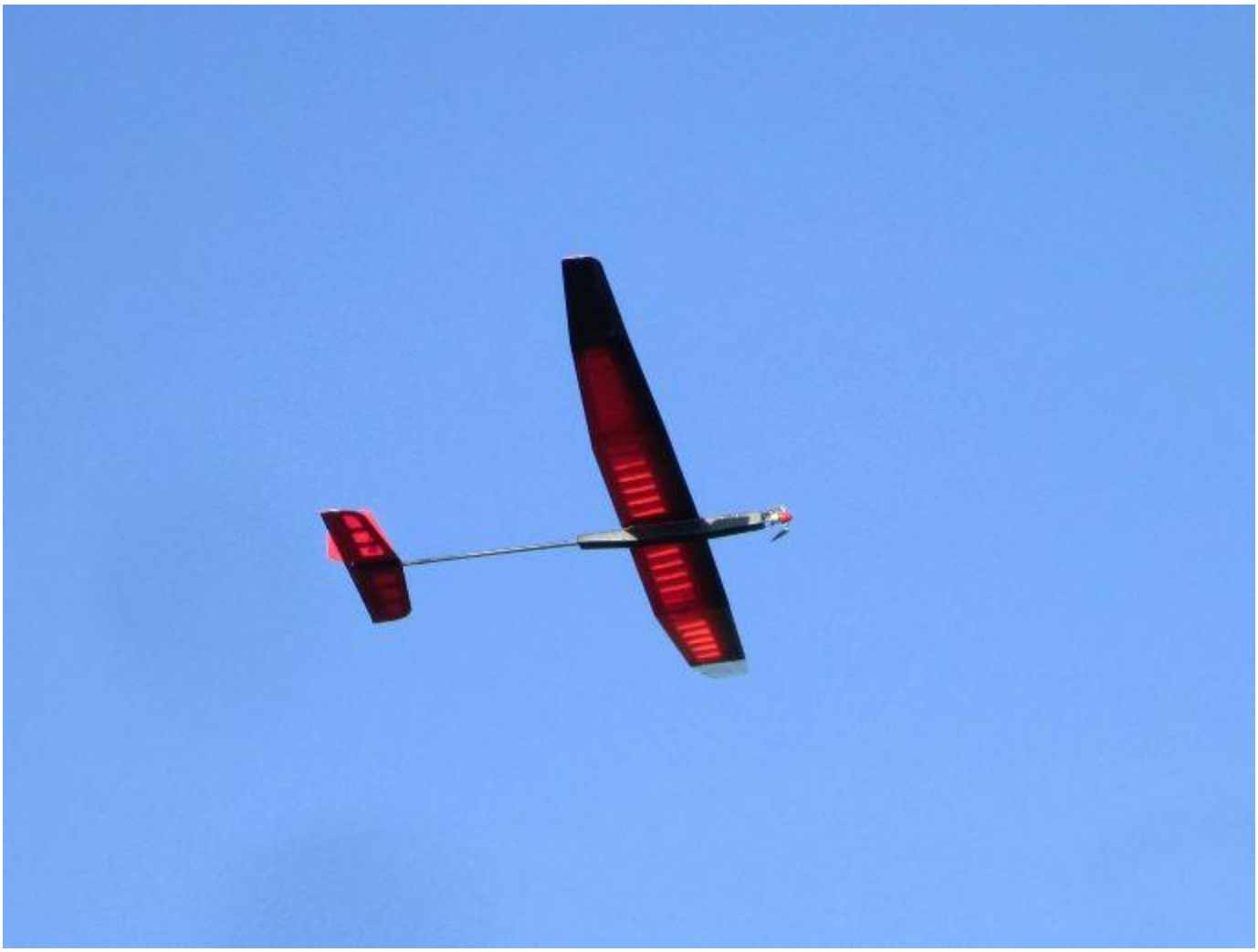
John Taylor's Halfax Jevelin

Another shot of John's Penumbra

Chris and Cox powered Tomboyezer

Another of Chris's ezers all ship shape Bristol fashion

Tomboyezer gliding



Peter Rose's new competition od model

Peter Rose looking pleased with new competition model

Chris holding up his Lancer?

From Spike Spencer

NEWS FROM THE SOUTH OXFORD NOSTALGISTAS
[*or, "A Flock of Swannees"*]

Hi James

With a promising forecast for 16 Feb, David Lovegrove, John Mellor, Geoff Bremner and Mike Spencer decided to cast off the Winter gloom and get some airborne time in a friendly farmer's field somewhere near RAF Benson. We had all been developing various models over the hibernation months and, although some had already been maidened, there was still much trimming to be done. It was also the first chance to compare notes over some Retro Tx conversions we had done, guided by the innovators to be found on www.singlechannellersreunited.co.uk
After a rather misty start and Mike's delayed arrival resulting from a blockage on the A34 at Winchester, the sky cleared and the sun actually treated us to an appearance with gentle breezes.

The cars disgorged a total of 14 models, all of which were airborne at some time during the morning. Offcuts of packing went in and out of wing seats and those models that needed trimming duly received the necessary attention. The end result of all this activity was that we all had a grab of each others transmitters and models and all flew a mixture of Propo, Reeds, Galloping Ghost and 'Bang-Bang' s/c. A heady mixture of model and divers control systems and all very nostalgic. Even better, nothing was damaged.

This could have been a "Name the Model" competition but in the picture above there are:

Three Swannees; One Propo/Reeds. One GG. One Propo (more on these below)

Two T-Trays; Both Propo

Two Chatterboxes; One with G/Ghost

Wagtail

Privateer; Propo and Reeds

Doohickey

Simplex

Tinker (Propo and s/c)

Two MilliWots

Swannees

George Stringwell placed an article in S&T Issue 116 describing this John Bowmer design and we had been aware of its attractive lines since appearing on the singlechannel Forum and in pictures from last year's Retro events at Pontefract. David Lovegrove had already built (and lost) one at Cocklebarrow last year and had enjoyed it so much that he quickly started another. Mike had originally intended to build either a "TIMBER" or FLEA-FLI but the Swannee was more attractive, so the Bowmer design was subjected to the CAD programme and a set of card templates were quickly cut on a 'friendly' laser.

Wing setup: David's first Swannee (GG) had given him few trimming troubles but a strong Pitch-up tendency was first associated more with the lack of down Elevator inherent in the GG control system. Although apparently identically built, his second one did seem to be more problematic in that area, requiring a marked reduction of the plan Decalage. That original may have been appropriate for a genuine fixed IC power and s/c Rudder only subject but the Speed/Pitch coupling seemed rather extreme for other forms of control. Because of this, Mike decided to refine the flat-bottomed plan aerofoil to an Eppler 207 (13%) semi-symmetrical for 'normal' Propo and Reeds flying. It was when Mike's version was maidened, showing similar excessive Speed/Pitch coupling tendencies that we started to compare notes more closely. As with David's, Mike's version needed a large wad of packing over the wing LE to reduce the rigging angle and stop a strong Pitch-up when power was applied. The session at Benson refined that trim and when the models returned home the rigging angles were carefully measured. It turns out that with the wing Chord parallel to the fuselage Datum (top surface), and recognising the plan's negative Tailplane angle (minus 1°) the resulting Decalage retains more appropriate positive Pitch stability while allowing good controllablity. Whereas before the available power range required almost full down Elevator at times, the reduced Decalage setting brought this trim within the normal authority of the trim levers throughout the speed range. With a steep Dive test, the model still cheerfully returned to level flight without pilot intervention. If building this model again, we would advise rigging the wing (Chord line) at 1° positive with the tailplane set at zero. Mike also concluded that the additional complexity of the E207 aerofoil made little difference to the handling and so the original plan's simple wing construction should be retained for speed of building.

Power: All three Swannees have a cheap 'cooking' outrunner motor capable of around 150W. All our experiences have been similar in that this model heartily dislikes excess power. Mike initially flew with a 3S 1300 LiPo and 7x4

Composite picture of Mike's Swannee underarm launch (@6oWPP)

prop that generated up to 150W but was set to use only 100W. It was very quickly established that even this was overpowered.

Subsequent flights benefited from a lighter 2S 950 battery and the same prop which when measured, set the power at about 60W Max which proved more than adequate to achieve a quick takeoff from rough grass. The flight cruise throttle setting equated to a power level of a measly 15 to 20 Watts. With this genteel setup the 16oz. model achieves over 10 minutes gentle cruising around plus a few landings and takeoffs. The next day Mike flew a few more sorties at his home site to finesse his underarm hand-launch to enable continued operation at some of the Vintage flying sites where the ground can be tricky for small wheels.

By the next Cocklebarrow Farm meeting there will be at least one more Swannee taking to the air. No doubt John's will incorporate all the lessons learned and prove to be just as good as the previous three (eventually) became.

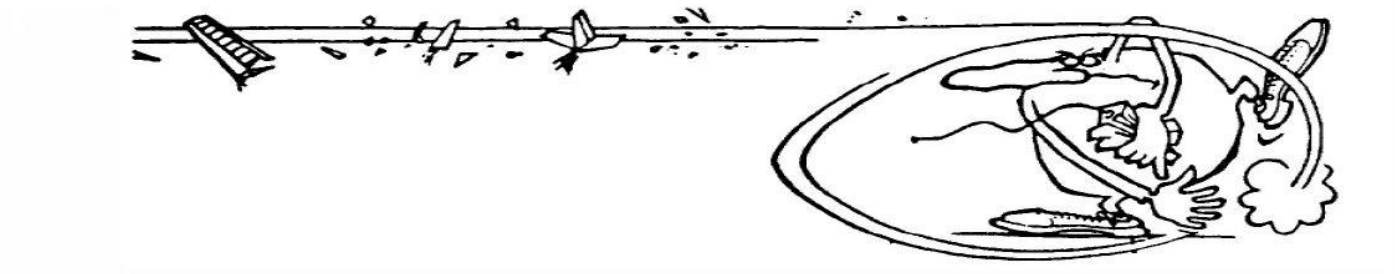
(Nostalgia in spades) - Retro Tx conversions:
Horizon (David) McGregor Digimac 3 (Geoff) and RCS10 Reeds (Mike)

Retro Transmitters

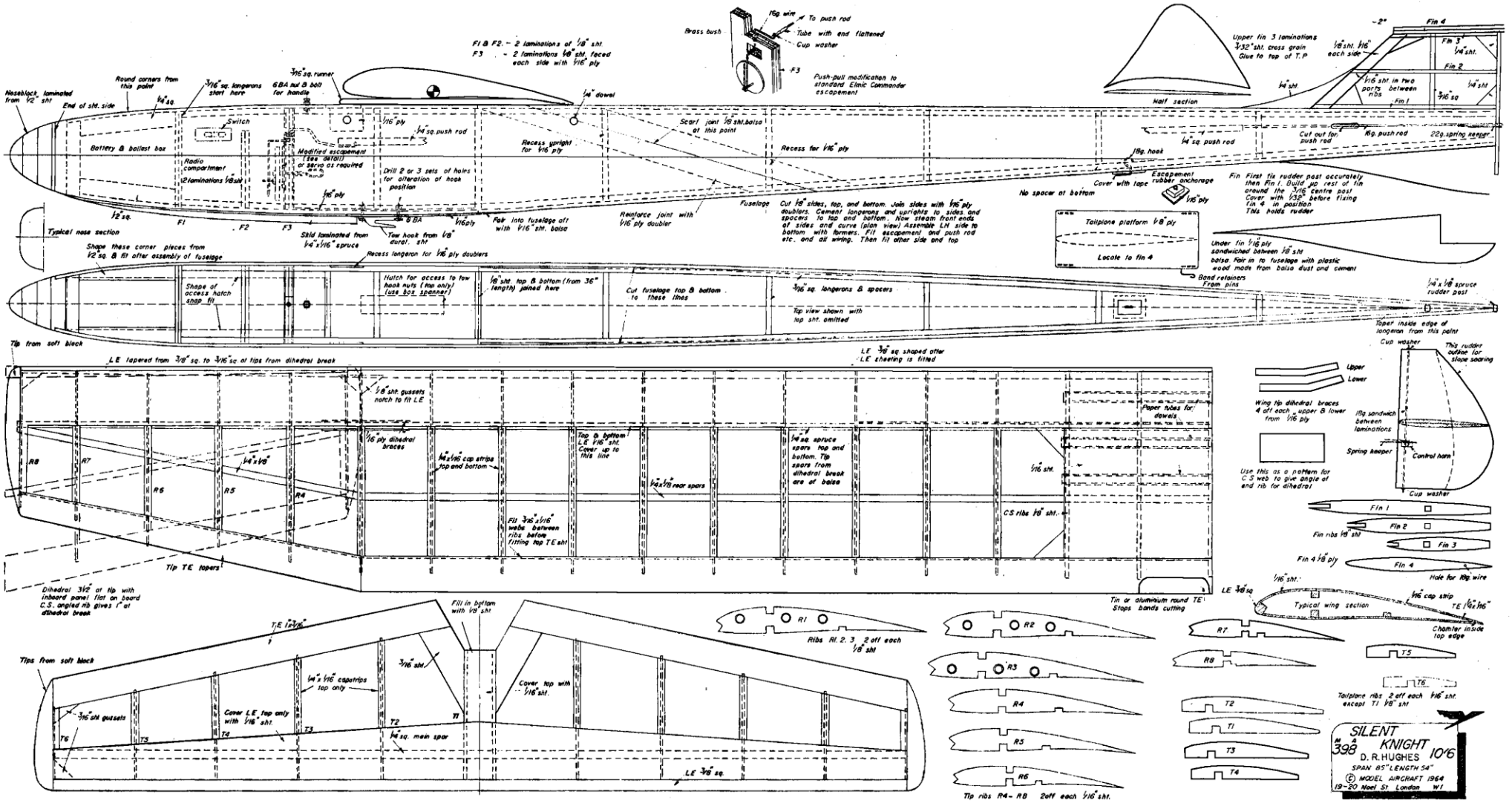
A significant part of the day's business was to flight test David's Horizon 2.4GHz conversion, incorporating s/c functions, and to let everyone have a play with Mike's RCS10 Reeds conversion, flying in the big Privateer. These Tx have all been built with close support and encouragement from Phil Green (see the s/c Retro website link above). The setup in the Privateer has an "Onboard Buddy System" where the Master RF link is provided by a standard 2.4GHz Futaba Tx and Rx combination. By setting a switch on that Tx, the model transfers chosen functions (R,E,T) to an alternative Rx (also in the model) which is bound to the Student Tx. By this means, completely different systems from different manufacturers can be flown with no Tx to Tx wires and the Student Tx can be any type or even on any legal frequency. Another advantage of this setup is that unproven receivers and their matching transmitters can be subjected to an airborne Actual Range Test; if contact is lost, the Master Tx automatically takes control again. By this means, everyone was able to refresh their 45+ year old lever-twitching Reeds skills. Deepjoy ! A 1960s period Aerobatic airframe is next on the Bucket List for the Reeds setup.

Spike

Feb 2017

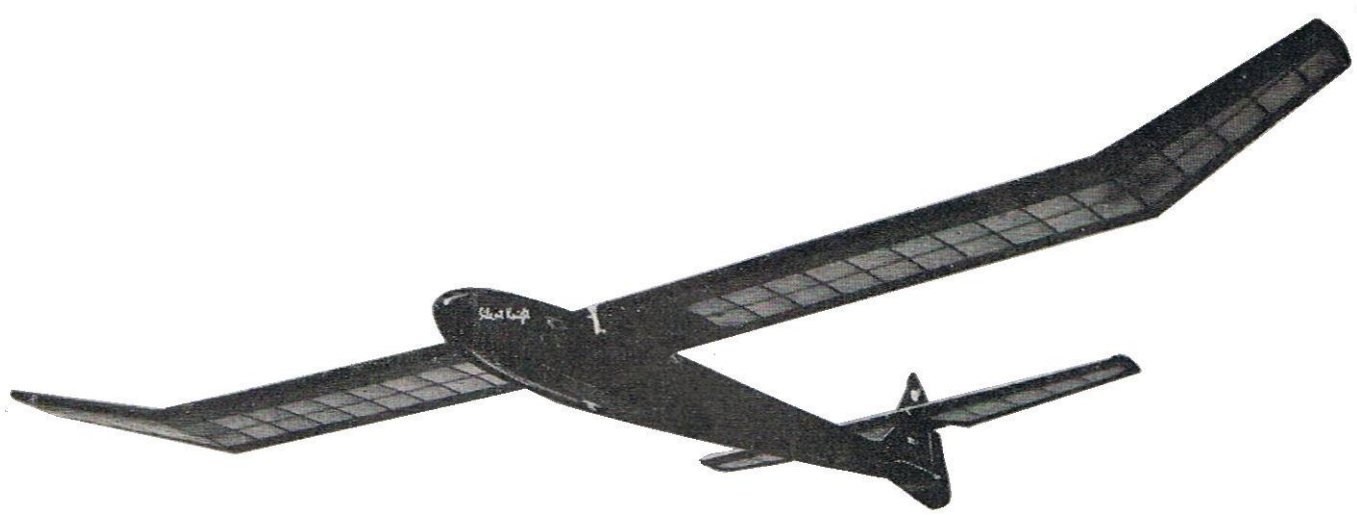


Hand launching - An ancient but perishable skill


Nose block, laminated from 1/2" sht
Round corners from this point
End of sht. side
1/4" sq.
3/16" sq. longerons start here
3/16" sq. runner
6BA nut & bolt for handle
Switch
Battery & ballast box
Radio compartment
12 laminations 1/8" sht
Modified escapement (see detail) or servo as required
1/16" ply
1/4" sq. push rod
Drill 2 or 3 sets of holes for alteration of hook position
1/4" dowel
Recess upright for 1/16" ply
Scarf joint 1/8" sht. balsa at this point
Recess for 1/16" ply
Fuselage
Cut 1/8" sides, top, and bottom. Join sides with 1/16" ply doublers. Cement longerons and uprights to sides and spacers to top and bottom. Now steam front ends of sides and curve (plan view) Assemble LH side to bottom with formers. Fit escapement and push rod etc. and all wiring. Then fit other side and top
Reinforce joint with 1/16" ply doubler
Fair into fuselage aft with 1/16" sht. balsa
Tow hook from 1/8" dural. sht
6BA
1/16" ply
Skid laminated from 1/4" x 1/16" spruce
Recess longeron for 1/16" ply doublers
1/2" sq.
Typical nose section
F1
F2
F3
Shape these corner pieces from 1/2" sq. & fit after assembly of fuselage
Shape of access hatch snap fit
Hatch for access to tow hook nuts (this only) (use box spanner)
1/8" sht. top & bottom (from 36" length) joined here
Cut fuselage top & bottom to these lines
3/16" sq. longerons & spacers
Top view shown with top sht. omitted
1/4" x 1/8" spruce rudder post
Taper inside edge of longeron from this point
Tip from soft block
LE tapered from 3/8" sq. to 3/16" sq. at tips from dihedral break
LE 3/8" sq. shaped after LE sheeting is fitted
1/8" sht. gussets notch to fit LE
1/16" ply dihedral braces
1/4" x 1/16" cap strips top and bottom
Top & bottom LE 1/16" sht. Cover up to this line
1/4" x 1/8" rear spars
1/4" sq. spruce spars top and bottom. Tip spars from dihedral break are of balsa
1/16" sht.
Fill 3/16" x 1/16" webs between ribs before fitting top TE sht
C.S. ribs 1/8" sht.
Paper tubes for dowels
R8
R7
R6
R5
R4
Tip TE tapers
Dihedral 3 1/2" at tip with inboard panel flat on board C.S. angled rib gives 1" at dihedral break
Tin or aluminium round TE Stops bands cutting
Fill in bottom with 1/8" sht
T.E. 1 3/16"
Tips from soft block
3/16" sht.
1/4" x 1/16" capstrips top only
Cover top with 1/16" sht.
3/16" sht gussets
Cover LE top only with 1/16" sht.
1/4" sq. main spar
LE 3/8" sq.
T1
T2
T3
T4
T5
T6
Ribs R1, 2, 3 2 off each 1/8" sht
R1
R2
R3
R4
R5
R6
Tip ribs R4 – R8 2 off each 1/16" sht.
R7
R8
Tailplane ribs 2 off each 1/16" sht. except T1 1/8" sht
Upper fin 3 laminations 3/32" sht. cross grain Glue to top of T.P.
Half section
Fin 4
Fin 3 1/4" sht.
Fin 2
Fin 1
1/8" sht. 1/16" each side
1/16" sht in two parts between ribs
1/4" sq. push rod
Cut out for push rod
16g. push rod
22g. spring keeper
16g. hook
Escapement rubber anchorage
Cover with tape
No spacer at bottom
1/16" ply
Fin First fix rudder post accurately then Fin 1. Build up rest of fin around the 3/16" centre post Cover with 1/32" before fixing Fin 4 in position This holds rudder
Tailplane platform 1/8" ply
Locate to fin 4
Under fin 1/16" ply sandwiched between 1/8" sht balsa. Fair in to fuselage with plastic wood made from balsa dust and cement
Bond retainers from pine
Upper
Lower
Wing tip dihedral braces 4 off each upper & lower from 1/16" ply
Use this as a pattern for C.S. web to give angle at end rib for dihedral
16g sandwich between laminations
Spring keeper
Control horn
Cup washer
This rudder outline for slope soaring
Fin 1
Fin 2
Fin 3
Fin ribs 1/8" sht
Fin 4 1/8" ply
Hole for 16g wire
1/16" sht.
LE 3/8" sq.
Typical wing section
1/16" cap strip
T.E. 1/4" x 1/16"
Chamfer inside top edge
SILENT KNIGHT
M.A. 398
D. R. HUGHES
10/6
SPAN 85" LENGTH 54"
© MODEL AIRCRAFT 1964
19-20 Noel St. London W1

Silent Knight and RC slope soaring glider by Dave Hughes from Model Aircraft December 1964

That slope-soaring is still a “minority interest” is, I am sure, due to the relatively small number of known soaring sites, and the fact that not every would-be enthusiast is keen to travel perhaps fifty miles for an afternoon’s pleasure flying.
Silent Knight, therefore, was designed to bridge the gap between the power-model and the out and out slope-soarer, in that it can be tow launched on your local flying ground. This will enable you to get the feel of R/C gliding and —who knows ?—maybe make you think that 100 mile round trip to the nearest soaring site may be worth while after all.



Tow launch
What a joy it is to be able to make directional corrections whilst the model is being towed up! In a light breeze, you can hover her overhead, or zig-zag up wind to “feel out” patches of lift. Spot landings, too, can be great fun; you get more time to judge the approach on the one hand, but, on the other, you find unexpected patches of lift on the way—which makes it all the more interesting— the glider being so much more sensitive to it than a power job.
Slope-soaring
Of course, to serve this dual purpose, Silent Knight has to be fairly lightly loaded, (the original is 11.2 oz. per sq. ft.) and this means that it is not capable of real “ridge soaring” in a high wind, as are the more specialised and highly loaded pure “soarers.’ It does mean, however, that one can get many hours of wonderful, relaxed “lift-sniffing” in “marginal lift” conditions, while the more heavily loaded boys are sitting around waiting for the breeze to stiffen.
Construction
Although large, Silent Knight has been kept simple and unsophisticated, with plenty of room inside for the “works.” (Even so, she looks quite elegant in the air.)
Fuselage: The length of this unit necessitates the scarf jointing of the 1/8 in. sheet sides, reinforced with 1/16in. ply doublers as shown on the plan. The nose portions of the sheet sides and bottom are best steamed to take the required curves prior to assembly. Note that the sheet top and bottom have the grain running length-ways—not the usual crossways. After the 3/16 in. square longerons and spacers have been cemented to the sheet parts, assemble the left-hand side to the bottom, with the formers.
Now you can install the escapement, pushrod and all the wiring. The escapement used on the original is a modified “Commander.” The simple wire yoke gives very satisfactory “push/pull’ action but, of course, there is now a push/pull version of the “Commander” available which, although it takes up a little more room, obviates the need for “building in” your escapement. Or, of course, you may prefer an electric servo.
The nose portion of the fuselage is strengthened with 1/2 in. square in the ballast and battery bays as shown. A hardwood noseblock can be used if desired, but I prefer to laminate from soft 1/2 in. sheet.
If you are unlucky enough to fly back into the hillside, this takes the shock, rather than having the fuselage sides split open. Also, it can easily be patched up or replaced.

Now the remaining fuselage side and the top decking can be cemented in position. I find this method of working produces a true fuselage much more easily than the “orthodox” way, of first joining the two sides and then applying top and bottom. The fuselage bottom is pre-shaped to accurate plan view and cannot be distorted to give a “banana” effect even if the sheet sides are not well matched. It also makes for much easier installation of wiring and mechanical parts.
The original has a built-in aerial, added along the top longeron before top sheeting is fixed.
Fin:
It is important to have this component really strong, as, of course, it supports the tailplane. Note the spruce rudder post and 1/8 in. ply top rib, followed by the 1/8in, ply tailplane platform. Make sure these two are exactly at —2 deg. incidence as plan. The rudder on the original was smaller (shown dotted on plan) but has been enlarged to provide that extra bit of agility for turning an asset when she is coming downwind back towards the slope! Smaller movement should be used for tow-launching, however, to avoid over-correcting, on the line.
Wing and tailpiane: These are quite conventional—” old fashioned” constructional methods being used and needing no further description. The wing seats on the 3/16 in. square runners atop the fuselage, which will give correct incidence. If you have built that tailplane platform accurately, no packing should be necessary with the c.g. as shown. Hand launch to check surfaces for trueness, adjusting directional trim as necessary and you are ready for a tow-launch. If you are anxious to get rid of some of that surplus avoir du pois acquired from two or three years of radio’d spot-landings, you can tow her up yourself, but it’s not recommended. For one thing, your transmitter aerial whips about too much as you run! Much easier to get someone else to tow the model while you stand by and keep her nice and straight on the line for a 100 per cent, overhead release. The 3/16- in. escapement rubber will safely take 600 turns. 1 have found that the average half-hour flight uses around four hundred, but if you intend flights of much longer than this you should obviously fit a motorised actuator.
Now, get out the towline, find a couple of helpers and enjoy a nice quiet day’s flying. Always bear in mind, however, that the real enjoyment of flying from a slope must be experienced before too long!

HOT NEWS! SAM 35 DATES FOR YOUR DIARY

We're delighted to announce that SAM 35 has been granted permission to hold two Vintage Model flying events this Summer and Autumn at Middle Wallop - Europe's biggest grass airfield!

The dates are June 11 and October 8, both Sundays, and everyone - SAM 35 members and non-members alike - is welcome, subject to the conditions set out below.

The emphasis will be on fly-for-fun and, in addition to RC ,we plan to have control-line flying - full details will follow in SAM Speaks. Brian Lever intends to CD a BeeBug Bash (details and rules on the Home page at sam35.org). More classes may be added.

Entry to the airfield* is from 9.30 am and there will be a Pilots' Briefing at 10 am.

Throughout the discussions, it has been clear that the MOD's H&S regime is now far tighter than ever before, hence we need to take particular care to ensure safe flying. Please therefore take note of the following conditions:

- **NO BMFA "A" OR "B" CERTIFICATES ARE NEEDED. HOWEVER, ALL FLYERS WILL BE REQUIRED TO REGISTER THEIR TRANSMITTERS AND MODELS AND SHOW A CURRENT BMFA MEMBERSHIP CARD - NO CARD, NO FLY!**
- **2.4GHZ RADIO EQUIPMENT IS TO BE USED EXCLUSIVELY**
- **THERE WILL BE RANDOM SPOT-CHECKS TO VERIFY CORRECT FAILSAFE OPERATION. PLEASE ENSURE THAT YOU AND YOUR MODELS ARE READY FOR THIS!**

- **THE MAXIMUM NUMBER OF MODELS AIRBORNE AT ANY ONE TIME WILL BE RESTRICTED TO FIVE**

The Museum of Army Flying will levy their usual charge at the gate* (probably £5 PER PERSON - TBC) for entrance to the airfield. ***Note also that when you reach our site on the airfield, there will be a further charge of £5 per person. This is to help defray the cost of our Licence. The only exceptions will be wives and partners.***

*** DIRECTIONS TO THE ENTRANCE GATE:**

From either direction on the A343 Salisbury to Andover road, at the northern end of the camp take the Kentsboro Road, signposted to Danebury Hill Fort.

After approximately 3/4 mile, at a gentle right-hand bend, look out on the right for a SAM 35 sign which will direct you onto a single-track road. FROM HERE ON, PLEASE EXERCISE EXTREME CAUTION!

Follow the SAM 35 signs.

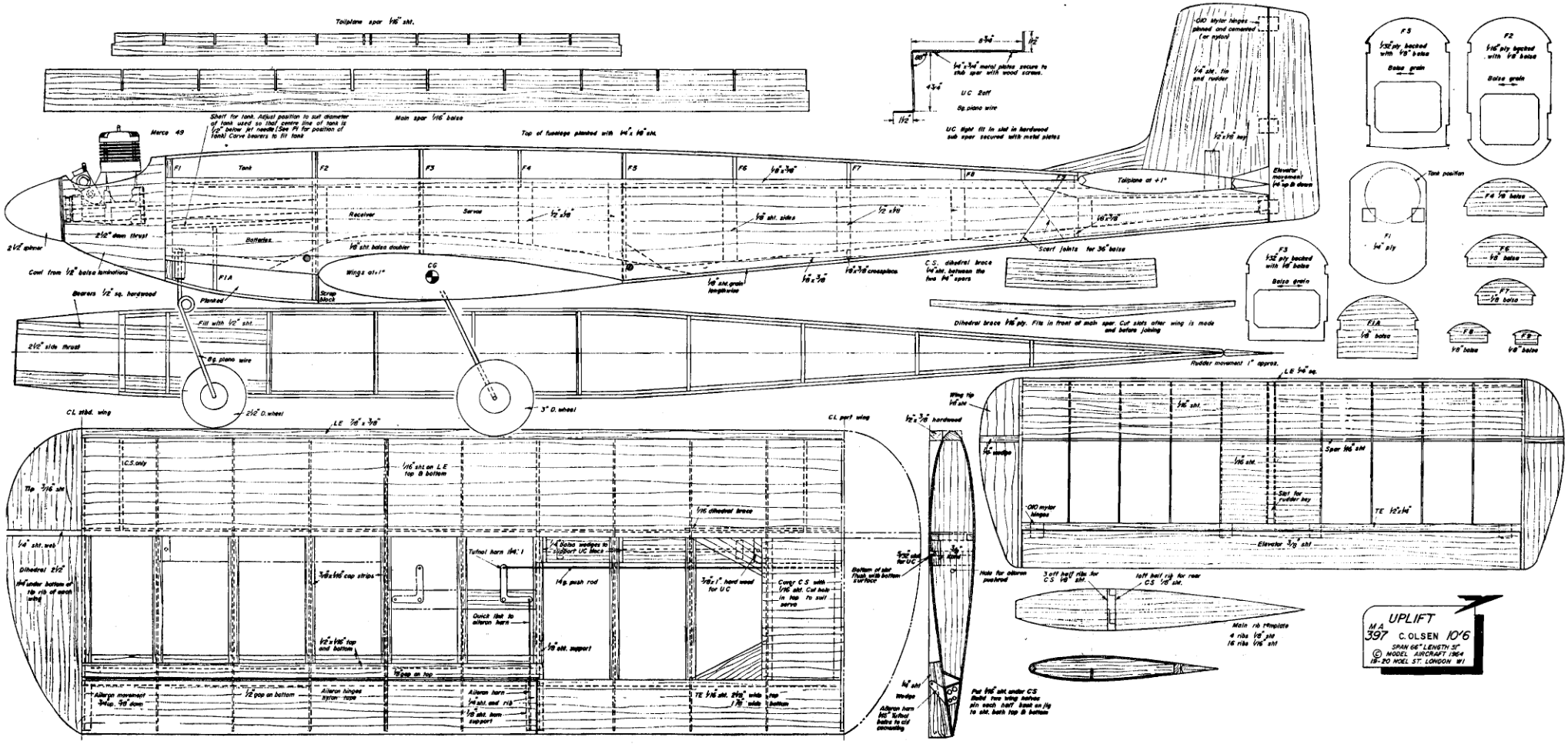
AS YOU REACH THE PERITRACK ON THE AIRFIELD, TURN ON YOUR HAZARD WARNING LIGHTS AND RESTRICT YOUR SPEED TO 20 MPH.

Turn RIGHT at the peritrack and proceed to our site at the North-East end of the airfield.

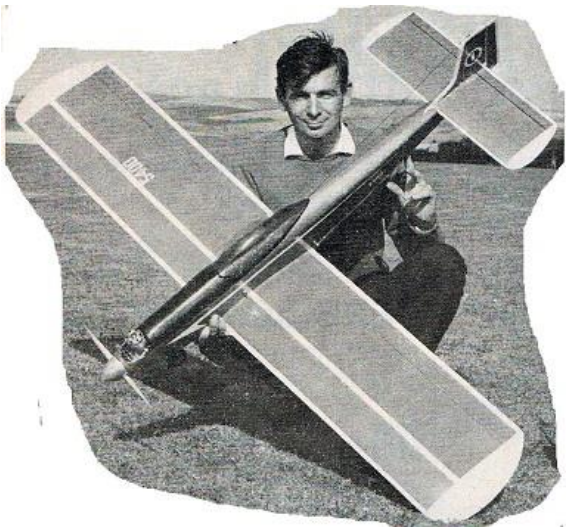
****

That's all. If you have any questions, please ring David Lovegrove on 01491 200558 or email dflovegrove@hotmail.com"

"Under the terms of our Licence, freeflight is not permitted and please also note that the airfield authorities do not allow dogs on the site". Pop it in under the section starting "The emphasis will be on Fly-for-fun . . ."


Tailplane spar 1/16" sht.
Main spar 1/16" balsa
Merco 49
Shelf for tank. Adjust position to suit diameter of tank used so that centre line of tank is 1/2" below jet needle (See P) for position of tank) Carve bearers to fit tank
Top of fuselage planked with 1/4" x 1/8" sht.
F1
Tank
F2
F3
F4
F5
F6
F7
F8
1/8" x 3/8"
Tailplane at +1"
Elevator movement 1/4" up & down
1/2" x 1/16" key
Receiver
Servos
1/2" x 1/8"
1/8" sht. sides
1/2" x 1/8"
1/8" x 3/8"
2 1/2" spinner
2 1/2" down thrust
Batteries
1/8" sht. balsa doubler
Wings at +1"
CG
Scarf joints for 36" balsa
Cowl from 1/2" balsa laminations
F1A
Strap block
1/8" sht. grain lengthwise
1/8" x 3/8"
1/8" x 3/8" crossbraces
C.S. dihedral brace 1/4" sht. between the two 1/4" spars
Bearers 1/2" sq. hardwood
Planked
Fill with 1/2" sht.
2 1/2" side thrust
Eg. piano wire
Dihedral brace 1/16" ply. Fits in front of main spar. Cut slots after wing is made and before joining
Rudder movement 1" approx.
2 1/2" D. wheel
3" D. wheel
C.L. stbd. wing
LE 3/8" x 3/8"
C.S. only
1/16" sht. on L.E. top & bottom
Tip 3/16 sht
1/4" sht. web
Dihedral 2 1/2"
1/4" under bottom of tip rib of each panel
3/8" x 1/16" cap strips
Tufnol horn (1/4:1)
1/4" balsa wedges to support UC block
1/16 dihedral brace
14g. push rod
3/8" x 1" hard wood for UC
Cut out C.S. with 1/16" sht. Cut hole in top to suit servo
Quick link to aileron horn
1/2" x 1/16" top and bottom
3/8" sht. support
1/8" gap on top
1/2" gap on bottom
Aileron movement 3/4" up 3/8" down
Aileron hinges nylon tape
Aileron horn
1/4" sht. end rib
1/8" sht. horn support
TE 1/16" sht. 2 1/2" wide top 1 3/8" wide bottom
C.L. port wing
1/2" x 3/8" hardwood
Wing tip 1/4" sht
1/4" wedge
Bottom of sht flush with bottom surface
3/8" x 1/4" sht for UC
Hole for aileron pushrod
1/4" sht
Wedge
Aileron horn 1/16" Tufnol bolts to old pattern
Put 1/16" sht. under CS (bolt two bing bolts pin each half back on jig to sht. both top & bottom
LE 3/8" sq.
1/16" sht.
1/4" wedge
1/16" sht.
Spar 1/16" sht
Slot for rudder key
TE 1/2" x 1/4"
.010 mylar hinges
Elevator 3/8 sht
3 off half ribs for C.S. 1/8" sht.
left half rib for rear CS 1/8" sht.
Main rib template
4 ribs 1/8" ply
16 ribs 1/16" sht
.010 mylar hinges phased and cemented (or nylon)
1/4" sht. fin and rudder
1/4" x 3/8" metal plates secure to stub spar with wood screws.
UC 2off
Eg. piano wire
UC tight fit in slot in hardwood sub spar secured with metal plates
F5
1/32" ply backed with 1/8" balsa
Balsa grain
F2
1/16" ply backed with 1/8" balsa
Balsa grain
Tank position
F1
1/4" ply
F3
1/32" ply backed with 1/8" balsa
Balsa grain
F4 1/8" balsa
F6 1/8" balsa
F7 1/8" balsa
F1A
1/8" balsa
F8
1/8" balsa
F9
1/8" balsa
UPLIFT
MA 397 C. OLSEN 10'6
SPAN 66" LENGTH 35"
© MODEL AIRCRAFT 1964
18-20 MOEL ST. LONDON W1

Uplift by Chris Olsen a low wing multi design from Model Aircraft November 2964



Most articles of this sort seem to start with a statement as to how long the model has been in the process of development, then proceed to give a dissertation on the various novel features and why they make the model a world beater. The image often left in the mind of the reader is that of a brilliant engineer with slide rule, wind tunnel data, etc., drawing up completely detailed plans before he starts building, followed by a meticulous development programme to prove the design. Usually, nothing is farther from the truth! Most aeromodellers, in my experience, try an idea—usually that of someone else—then, having found an effect, try to explain it—often quite incorrectly. Many models are built without drawing any plans, or doing any more calculations than to check wing areas and so on. If the resultant model is successful, it is due to the fact that the designer—I use the term in its loosest sense—has a lot of experience and/or a reliable intuition. In case anyone who reads this is now getting hot under the collar, I should point out that these remarks apply to myself as much as anyone. Up flit flew five years before any drawings, other than reference sketches, existed and it is only for the purpose of this article that a lot of blood, toil, alcohol and sweat were put into preparing the accompanying plans.

The name Uplift applies to a series of low-wing models with similar areas and moments, rather than to one fixed design. This series started life back in 1959, when there was a lot of controversy about the advantages of low and shoulder wings. The initial experiment was simply to put a standard 18 per cent. Uproar wing on the bottom of the "box," instead of the top, the idea being that the only way accurately to evaluate the low wing configuration, was to make an identical model to Uproar in respect to areas, moments, weight, etc., with the wing on the bottom. The resultant model was unsatisfactory only in that the undercarriage was too far back, so that it had a tendency to nose over on landing. Apart from this, there was little to choose between either layout. However, since the Uproar was a more familiar model and somewhat simpler to build (no wheels in the wing) it was decided to drop the Uplift idea for the time being. The belief that low wing models rolled better was proved to be unfounded and I have had no reason to change this opinion since.

The next low wing model was built in 1961 as a result of about one year's cogitation on the Zurich World Championships, with the Voltswagon particularly in mind. Incidentally, it has since been agreed that it was Bob Dunham's piloting ability, rather than the model, which caused the impressive result.

Anyway, a model not dissimilar to the Voltswagon was built, with a 10 per cent. symmetrical wing with 2 : 1 taper ratio. This and another similar model, were reasonably satisfactory, but showed that their sharply tapered wings had nasty characteristics, particularly near the stall.

By this time, Uproar had been considerably improved and was superior to the low wing models flown at that time. It was not until 1962 that, after a lot of deep thought and some brain washing, it was decided to make a low wing model for the Kenley World Championship. That version was virtually identical to the one presented here, except for an inverted engine; the message had finally penetrated that judges seemed to prefer pretty models! This model was quite satisfactory but, unfortunately, had an argument with a bush at over 100 m.p.h., an efficient method of reducing an airframe to scrap without damaging radio or motor, so back to the—inevitable by this time—Uproar.

Development

The same version was further developed in 1963, via a series of prangs, in an attempt to arrive at Genk with a low wing model. However, providence again interfered and, after writing off three models in the three weeks before I departed, guess what model I arrived in Belgium with ? It was only after a protracted effort last winter, when three identical Uplifts were built in order to get out of a rut, that I eventually managed to fly in a contest with a low wing model.

The result of this six year saga is that over this period of time, about ten low wing models were built and flown. From this quite a lot of information on the subject was gained; this has resulted in the model presented here. The main advantages of a low wing model, in the present type of competition, appear to be:

improved inverted flight for obvious reasons; better stall turns due to the rudder only being effective in the yaw plane; less “wandering” in outside manoeuvres (which is difficult to correct) and the neutral stability which makes it tend to stay in any attitude in which it is put.
Against these advantages, low wing models are difficult to spin and require more concentration when flying.
Design Detail
Parallel chord wings are used for their simplicity and ease of duplication. Although tapered wings look nicer, at the moment they appear to have no particular advantage for multi stunt flying and I have a wing jig for making 66 in. x 12 in. x 15 per cent. wings. Conventional ailerons are used as I do not particularly like the action of strip ailerons, nor am I convinced that they are a lot easier to build than the type used here.
The wing section used started life as NACA 0015, but this presented difficulties in spinning due to excess stability, so a bit was carved off the template to make a sharper entry at the leading edge. This seems to have had the desired effect of making consistent spins possible, without making far too much instability in the pitch plane; the only problem being that the glide was vastly improved, which can be embarrassing in calm weather. With this type of aerofoil section it is possible to do steep turns at low airspeeds, stretch a glide, and take off in a stalled condition without having a pile of wreckage on your hands. The upright engine mounting is used for simplicity in starting, adjustment and cowling. All the models since 1961 have used a Merco 49 and 61. The 49 is entirely adequate for most purposes, unless the all up weight is over 6 1/2 lb. All the models to date have weighed less than 6 1/4 lb. The Merco 61 makes for a “bomb” and vertical climbs of several hundred feet are possible. This is quite nice but, with the extra speed, “us old men” have trouble with our reactions. It is possible in a 6 lb. model with a 49 to do 14 vertical rolls and four or five consecutive vertical 8’s from the bottom up. The latest model has dispensed with rubber bands in favour of Cam-Locks, which have the advantage of always ensuring that the wing is in the same place and only about five seconds to put on—a boon to the flyer impatient to pick up the wreckage!
The radio compartment should have ample room for all but the more old-fashioned relay receivers. To date the model has only been flown with reeds but, contrary to some opinions, I can see no reason why any fairly well designed model should not fly equally well with either reeds or proportional equipment.
Construction
This should present few problems for anyone with experience of model building. However, it is not a suitable subject for a newcomer to radio models.
The structure is designed on the assumption that once a flyer has got out of the novice stage, there are only two types of prang that normally occur, the “heavy landing and the total write-off. It is almost impossible to make a model to withstand the latter, as the weight factor tends to become exponential. However, this model is quite strong enough to withstand all airloads and the occasional cartwheel.
Fuselage: This is based on two 1/8 in. sheet sides 42 in. long. 1f you cannot get 4 ft. long sheet it will be necessary to join the sides where marked on the plan, with 1/8 x 3/8 in. doublers horizontally and 1/8 X ½ in. doublers vertically. The main formers are made up from a balsa and ply sandwich stuck with contact cement to prevent warping. This appears to be lighter and more rigid than balsa or ply alone. The curved top of the fuselage is planked with 1/8 x ¼ in, balsa strip, an old fashioned method but light and strong. There is no reason why block should not be used for this if you like carving and have a serf to clear up the mess.
The engine bearers are 1/2 in. sq. hardwood, preferably mahogany. This method provides a solid base for the cowling and I think makes a more solid mount for the engine. The cowling is made up from 1/2 in. sheet balsa both top and bottom, and, after carving to shape and sanding, both inside and outside are coated with either epoxy or polyester resin, to strengthen and fuelproof it. The fuel tank is built in because if it is in the right position and of good quality, there should be no reason to remove it. If, however, it- has to be taken out a hole can be cut in the bulkhead in front of the wing even after the model is finished.
The downthrust and sidethrust, both 2 1/2 deg., are built in by angling the bearers during construction. The fin and stabiliser are self-explanatory except for the ¼ x 1/2 in. sheet, which keys the fin to the stabiliser and which goes right through it. The V’ cut-out in the fin and fuselage was considered the simplest method of getting a one- piece elevator and dispenses with a complicated yoke.
Wing:

Warped wings are the most common cause of poor performance in stunt models and for this reason are best built on an accurate jig. However, it is not difficult to make a simple jig on your drawing board, from which a straight wing can be obtained if care is taken—particularly in joining the two halves, as it is possible to get them at different angles. The blocks which hold the main undercarriage are best made of maple, mahogany or pine, not brittle woods like oak or beech. The slot is best cut with a circular saw, if access to one is not available the u/c can be bolted on the outside with alloy clips. The wing is completed and sanded, then the ailerons are cut out and the sheet added. Set up all the linkages before cutting out the ailerons. After the wing is sheeted a hole will have to be cut in the top surface for the servo, the sie and shape depending on the servo.

Finishing:

The wing is covered with nylon for strength, the fuselage and stabiliser with silk. The control surfaces should be covered with silk or paper or, if you are lazy, sanding sealer. Not being an expert on finishing, my models are usually associated with comments like: "How do you get the dope out of the yard-broom when you have finished ? " I will not dwell on it other than to say that if the bare uncovered framework is smooth you have the basis for a good finish.

Receiver and Servo installation: The radio installation will depend on what type of equipment is used. The receiver compartment should be adequate for most types of commercial receivers, proportional or reed. If you use reeds make sure the reeds vibrate at 90 deg. to the piston in the motor to reduce vibration problems. The servos are mounted on 1/8 in. ply or a PC board screwed to ¼ x 3/8 in. runners cemented to the fuselage sides. The equipment should be arranged so that the c.g. should be within 1/8 in. of the marked position. If it is outside these limits it will be necessary to load the nose or tail.

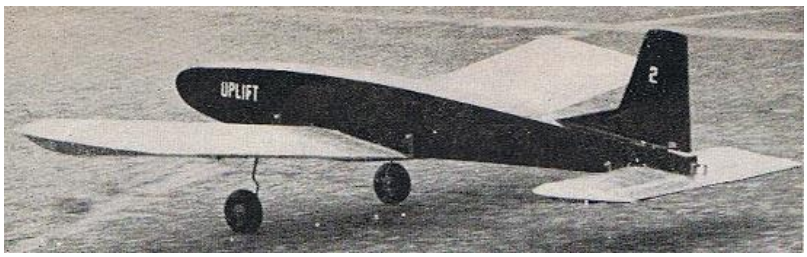
Trimming Out:

This is a very confusing subject and it is not possible to cover it adequately in anything less than a book. However, if the model is built reasonably accurately, this should constitute no great problem, as long as you remember that rudder has similar effect both upright and inverted, but ailerons has opposite effect when inverted. i.e. if the model flies straight in a loop, but drops a right wing at the top of an outside loop, use left rudder or right aileron to correct. If equal amounts are used they will tend to cancel out when upright. Unfortunately, this only holds true for small corrections, if there is a really bad twist it is often simpler to build a new wing. The approximate control surface movements are given on the plan and these will have to be adjusted to comply with personal preference. For a spin it will be necessary to double the amount of up by some means or other. My preferred method involves an extra land on the elevator servo P.C. board, which is switched in when simultaneous rudder and elevator are given.

The elevator trim should be adjusted to give a shallow climb after take off, with a full tank, and a shallow inverted climb on a half full tank. The nose wheel movement has to be reduced to half the rudder movement, either by using a different hole on the servo arm or by means of a reduction arm.

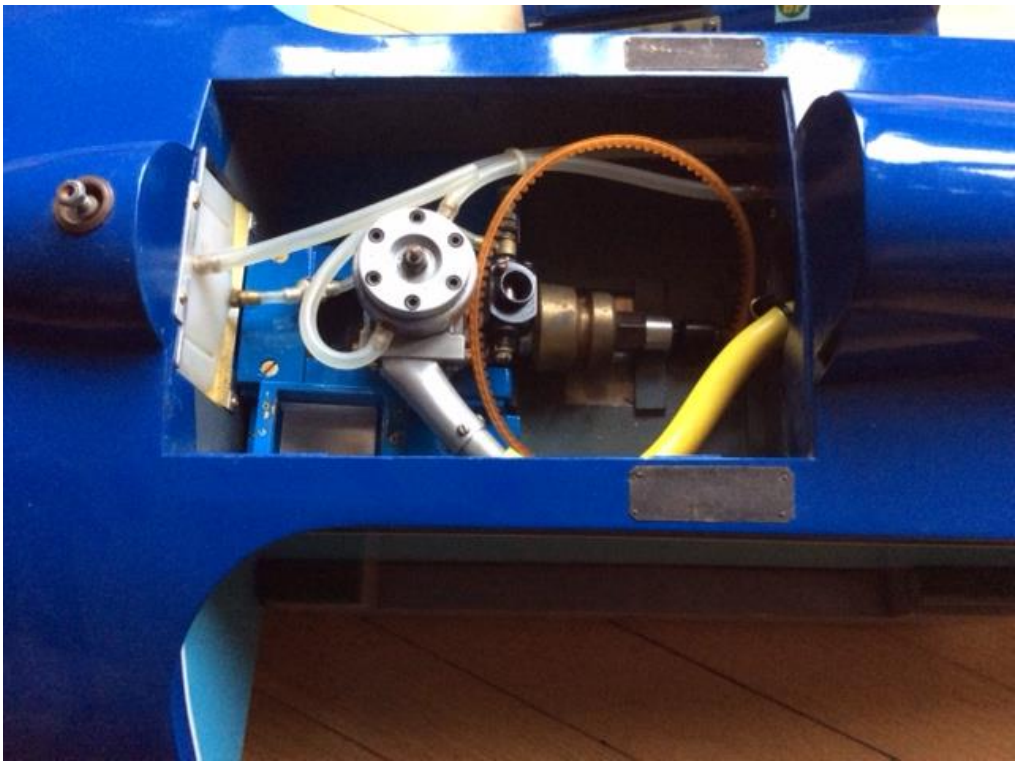
All control surfaces use Du-Bro or I.B.M. quick links for ease of adjustment. Finally, if you build an Uplift you will have a model which can compete on equal terms with most published designs and kits and is probably quicker to build than most—a point to consider if you are competition minded.

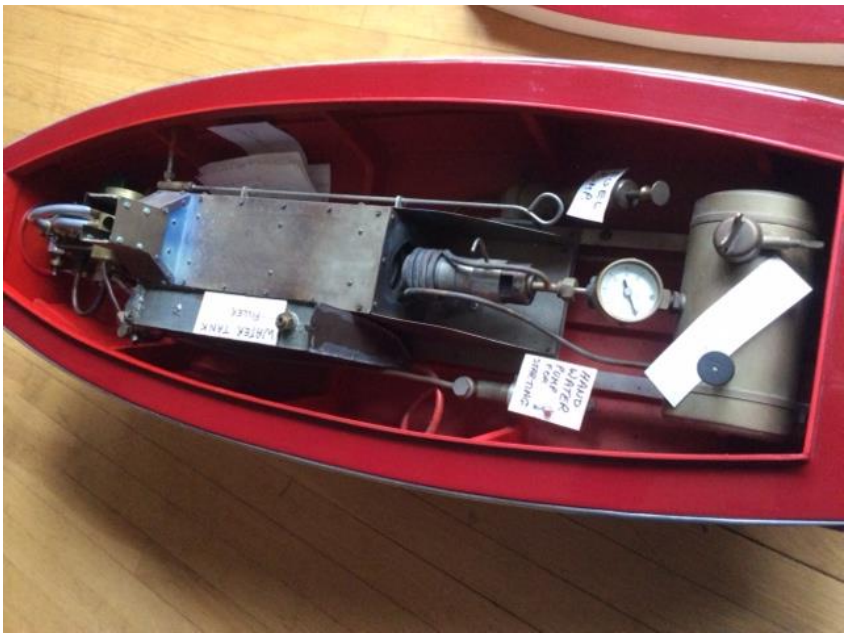
Oh yes, one last point. Do not be taken in by the story attributed to a well-known Californian modeller who, when asked why he had no name and address on his model replied: "Why, if the radio fails it is not going anywhere!" Put your name on this one—it might just fly away given the chance. . . .



From David Bintcliffe

Here are some photos for possible inclusion in the end section of sticks and tissues (the non aero bit)
These show a hydroplane powered by a Meteor 40 glow ,which I bought at Old Warden some years ago...it's beautifully made . But ponds where you can run these if they are not electric powered, are very limited.
The red boat is much more scary being a "flash steam powered straight runner" these appear to run on a mix of petrol and paraffin. (streuth). Its probably worth looking at you tube under flash steam record breakers.....this will certainly scare you ...and make you want to hide behind something solid...a bit like watching an r/c pulse jet being flown!!






FIREBIRD
WL
48

SHOWSCENE by Dave Bishop of DB Sound.

This month's Sticks & Tissue is once again a compilation of shows where I have taken many photographs and one event in particular was the annual visit to the K2 Arena at Crawley at the beginning of February. This is not a show but a sort of free flight fly in with all sorts of disciplines being catered for and it is run on a Sunday by members of the Crawley & District Model Aeroplane Club and the South East BMFA. One member in particular always has greeted me at the door entrance for some 25 years has been the extremely friendly and helpful John Dart and it was he who was presented with a special award to say thank you as he is retiring from the organising of this successful event. The three judges were doing their stuff as usual with Don Coe, James Gordon and Peter Royall using their own specially designed system of points scoring. That technical boffin Keith Wright was busy printing out all of the cracking certificates for the winners on his computer as usual. The free flight indoor ended at 5.30 pm and then a good number of radio controlled aeroplane flyers took the place over for the next two and a half hours. They performed beautifully and looked great.

One of those "must go to" events is the three Modelair "do's" held at Old Warden (again not shows) but they are events that are run annually by Ken and Sheila Shepard with help from a team of model flyers. It has everything there from R/C to free flight, control line flying in all sorts of disciplines that are catered for. It's great to see familiar faces of the "stars" of flying from many years ago there present. There is an excellent line of traders there as well and you will certainly have a chance for a personal chat to the great Aeromodeller editor Andrew Boddington, 'cos without a doubt he will be there with his winning smile and his camera. The gate entrance money has gone up a bit but then hasn't everything? I love the bookshop there and the restaurant as well. And also there are some 50 full size beautiful aeroplanes and vehicles to see inside the quality hangers, which makes it a must to carry a camera. The three dates to diary for Old Warden are May 13 – 14, July 22 – 23 and September 23 – 24 and full camping is available with some R/C electric flying in the evenings if the full size aeroplane activity allows.

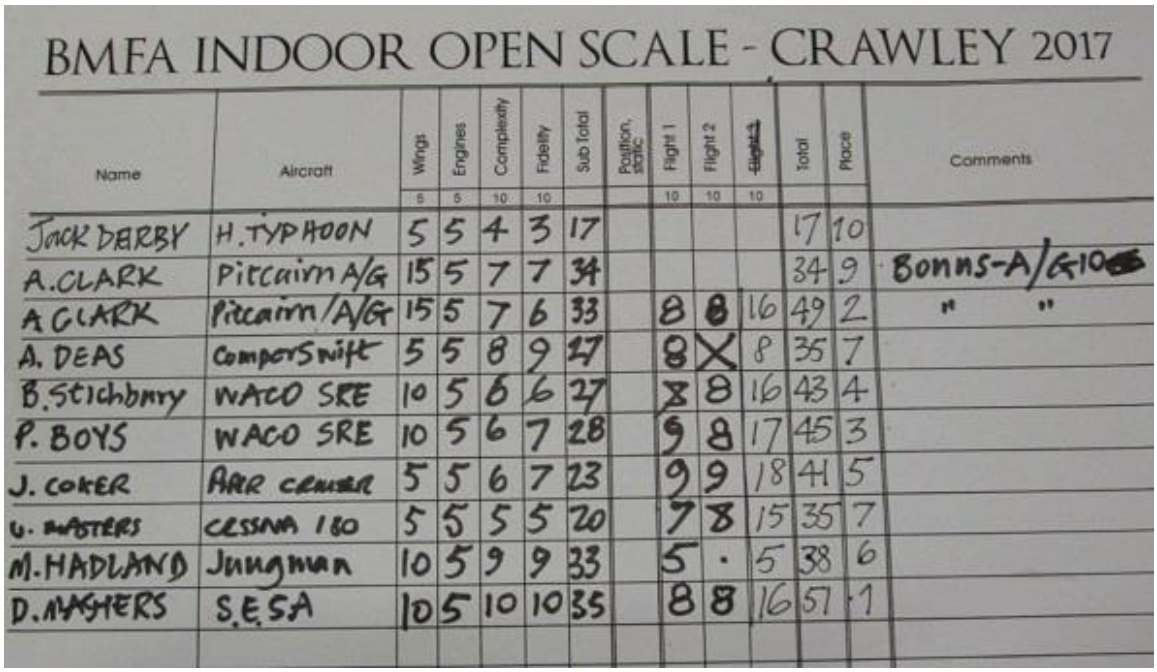
Next show is at Long Marston International on June 3 – 4 with loads of flying allowed in the evenings and another favourite of mine to go to that I presented before retiring for 33 years, is the Wings & Wheels show at North Weald aerodrome June 24 – 25. Jane Stephenson (with her family) ran that show for 30 years and made a cracking job of it as well. I have to give Jane top marks for the best toilets in the show scene as she was insistent on them being cleaned regularly and spotlessly every day of the show. I do hope to get there to see how the next 30 years will go with young family man and top Traplet manager, Tom Stephenson in charge. His father Tony kindly telephoned me on my 86th birthday recently and we had a good catch-up chat as us two we go back a long way. And then there is the Weston Park show on June 16 – 17 – 18 run by Steve Bishop and Peter Whitehead. This show boasts the most traders of the lot so the shopping for bargains can be wonderful fun.

Now one of my best personal memories in this modelling obsession of ours was when in 1948 the British team brought back the Wakefield Trophy from the Americans. The model that made it possible was named Jaguar and it was designed by a clever

gentleman by the name of E (Ted) W Evans. The October edition of the Aeromodeller, (the late Ron Moulton told me that there were well over 62,000 copies sold monthly in those days) had the full story of the whole event that was held in near perfect conditions at Akron Field, Ohio. The winning British flyer was a Northampton modeller named R (Roy) B Chesterton and I loved the design of that Wakefield model straight away. In my Aeromodeller there was a plan of this marvellous machine included with the story of its development as well so I scaled it up to its proper size on wallpaper and built it in a week. I flew it in a competition the following Sunday at Ford aerodrome in dreadful conditions and went like a dream. I lost it later on OOS and I then built a second one. That also flew away and I built a further one at "under 150 square inches" wing/tail area which won 6 sheets of Japanese tissue in a competition. Now the bug has hit me once again for some proper balsa bashing and the birth of yet another Jaguar and this time I will fit a dethermaliser. Now I have a lot of pictures of people with their Jaguar models that show a length of saltpetre string attached to the tail plane that they set light to before they launch them. Despite researching as much as possible I just cannot find any details of what happens when that string eventually burns through whatever it has to operate, if you know what I mean. There are no tail end details for me to fit on my next old fashioned 8 ounce Wakefield model that will bring it down safely after a set time at Old Warden this year. Is there a Sticks & Tissue reader that can be kind enough to help me with this query please? If so could you be kind enough to let me know how you can do it by emailing me on davedbsoud@gmail.com

See you next month and all the best from Dave Bishop of Db Sound.

Pictures (with most of them ** Taken at the K2 indoor event at Crawley on Feb 5) as follows;



BMFA INDOOR OPEN SCALE - CRAWLEY 2017

Name	Aircraft	Wings	Engines	Complexity	Fidelity	Sub Total	Position, static	Flight 1	Flight 2	~~Flight 3~~	Total	Place	Comments
		5	5	10	10			10	10	10			
JACK DERBY	H.TYPHOON	5	5	4	3	17					17	10	
A.CLARK	Pitcairn A/G	15	5	7	7	34					34	9	Bonus-A/G10
A CLARK	Pitcairn/A/G	15	5	7	6	33		8	8	16	49	2	" "
A. DEAS	Compers Nift	5	5	8	9	27		8	X	8	35	7	
B.Stichbury	WACO SRE	10	5	6	6	27		8	8	16	43	4	
P. BOYS	WACO SRE	10	5	6	7	28		9	8	17	45	3	
J. COKER	ARR CRUISER	5	5	6	7	23		9	9	18	41	5	
G. MASTERS	CESSNA 180	5	5	5	5	20		7	8	15	35	7	
M.HADLAND	Junguan	10	5	9	9	33		5	·	5	38	6	
D.MASTERS	S.E.5A	10	5	10	10	35		8	8	16	51	1	

The special Home Brew score sheet designed by Don Coe at the K2 at Crawley used for recording scale static and flying points.

A

Piper Cub seen at the K" indoor event at Crawley on Feb 5.

A Nice Free Flight rubber scale model **(Crawley)

A Gladiator biplane at **Crawley.

A German biplane**.

A British Biplane ** Crawley.

A electric Piper Cub ** Crawley.

An Avro 504K at **Crawley.

John Dart has been one of the main organisers for 25 years of the SEBMFA and Crawley Clubs annual indoor flying event at the K2 Arena in February seen receiving a trophy and awarded a Long Life Membership for Exceptional Service. A lovely helpful and friendly man.

A superb electric multi-channel R/C P51 Mustang 88 Crawley.

Mr and Mrs Christopher Foss were at the K2 arena at Crawley on Feb 5 this year.

This lovely "Vibes" pair has some of the most beautiful indoor flying models ever seen and they always bring kind gifts of biscuits and cakes with them.

The new "kid on the block" trader is always smiling and helpful especially at Old Warden, here seen at the Crawley indoor event on Feb 7.

James Gordon seen with the huge Westland Lysander scratch built by his late father. James regularly flies his father's Hawker Hurricane at Old Warden with a geared engine. It looks good in the air and sounds great

This is a 4 channel radio controlled Gee Bee Racer by John Neesham.

This picture of the Howard Hughes Spruce Goose and the Queen Mary at long Beach California was sent to me by my old school and aeromodelling buddy, Dave Redden, who emigrated to America and did well. We went to so many aeroplane places when we went to his home to stay.

The best show flyers in the world seen relaxing before each of the magic ten day show I presented at Dubai in 1998.

Peterborough Flying Aces Nationals, Sunday 3rd September 2017 at Ferry Meadows, Nene Park, Peterborough PE2 5UU .

NEW EVENT ! BIG CASH PRIZES ! KK Elf Precision.
Precision flight time contest for the"Elf"model (Super complete kit available from The Vintage Model Company (VMC) or Brian Lever (blever@btinternet.com). Target times posted on the day at control.) Model must use a 6 inch Dia Plastic prop (spares available from VMC)
Note! The Elf is also eligible for the Rubber Ratio Contest (see below).Prizes, kindly donated by The VMC, will be determined by "Elf "Placings in **both** "Rubber Ratio"**and** "Elf Precision"(1st £50,2nd £30, 3rd £20)**. Photo by Aeromodeller of "World Record for Most Elfs"-**12.45pm at Scramble location.
Rubber Ratio: NO MAX. Any rubber powered model with wing span 16"-25" (tip to tip).Flight score is total time in secs (from 3 flights) divided by span in inches. **Cash Prizes** for "Elf" models! See above.

SCALE MODELS - NOTE! All scale models, except Masefield entries, are judged for accuracy, workmanship and flight profile. Please bring the plan or, if scratch built, the 3 view.

Open Rubber Scale- Any scale rubber model, to which Masefield-type bonuses will be applied. No flight judging, just duration plus bonuses. Please present model to control for processing.
Open CO2/Electric Scale "Stand off" scale judged against plan/ three view plus judged flight profile of launch/flight/landing. Any C02 motor/tank permitted.
Kit Scale ANY rubber powered kit model up to 36"span. Model judged against kit plan plus judged flight profile.Cash Prizes,donated by The Vintage Model Company, for highest placed VMC models
Jetex/Rapier Authentic Scale Judged against model plan/three view and judged flight profile.
Jetex/Rapier Profile Scale Judged against model plan/three view and judged flight.

P-20. 20"span and length. Max 8" plastic prop, 6 gram motors (may be external)
Cloud Tramp 5 flights NO MAX. (best and worst times discarded, and the remaining 3 times totalled. Note! If fewer than 5 flights logged the best and worst are still discarded.
Tailless Rubber Duration: Max span 30" (tip to tip). Max rubber 10gm, Prop 9.5" max dia. commercial plastic. (may be modified.) No inflight movable surfaces except DT)
Frog"Senior"Rubber Duration (for plan http://www.houseoffrog.co.uk or PMFC see below
Catapult Glider: Catapult, max 2 grams rubber on a 6" max handle. This equates to a 280mm length of 3/16" rubber tied into a single (140mm) loop. Any model permitted.
TableTop Precision Precision flight time event for Rubber models which must Rise off Table.
36 inch Hi-Start Glider; Any glider up to 36"span launched by the supplied "Hi start" bungee. Also includes a prize for best performance of a **SCALE** glider (proof of scale reqd.)
Best Unorthodox: Must be seen to fly (by either Scale Flight judge)
Rubber Scramble: 20 minutes, use any rubber powered model that qualifies for one of the above events. Competitor must both wind and launch but may use a retriever.
Flying Swarm Mass launch for any non electric model that is eligible for one of the day's competitions. Last model down is the winner.
Young Flying Aces; Prizes for 3 best Juniors (Junior **-** 17 years or under on 31/08/17)
World War One Tribute event: Until 2018 we will award a prize for the best scoring model of a **WW1 combat aircraft** flown in any of the scale competitions.

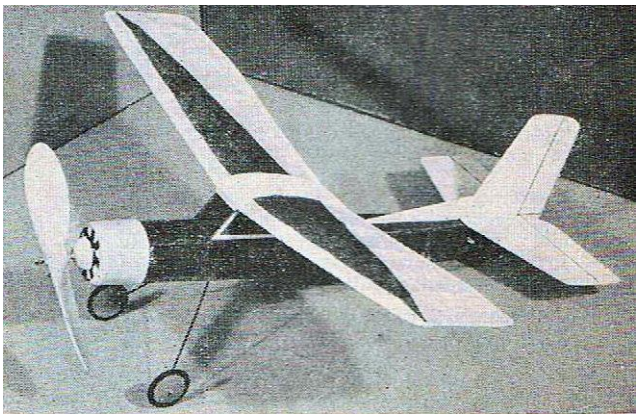
Prizes for 1st place: **Scrolls** for 1st, 2nd and 3rd.:: **Raffle** Including Kits donated by The Vintage Model Company.
Note: this is a Free Flight event: strictly no Radio Control: Proof of Insurance required for all flyers.
Revel in the special atmosphere created at this unique event.: Discounted parking. Toilets, café, and Park Visitors Centre. For more details of events visit the Peterborough MFC Website at www.peterboroughmfc.org **OR** contact Brian Waterland on 01778 343722 (07717 461000 on the day)

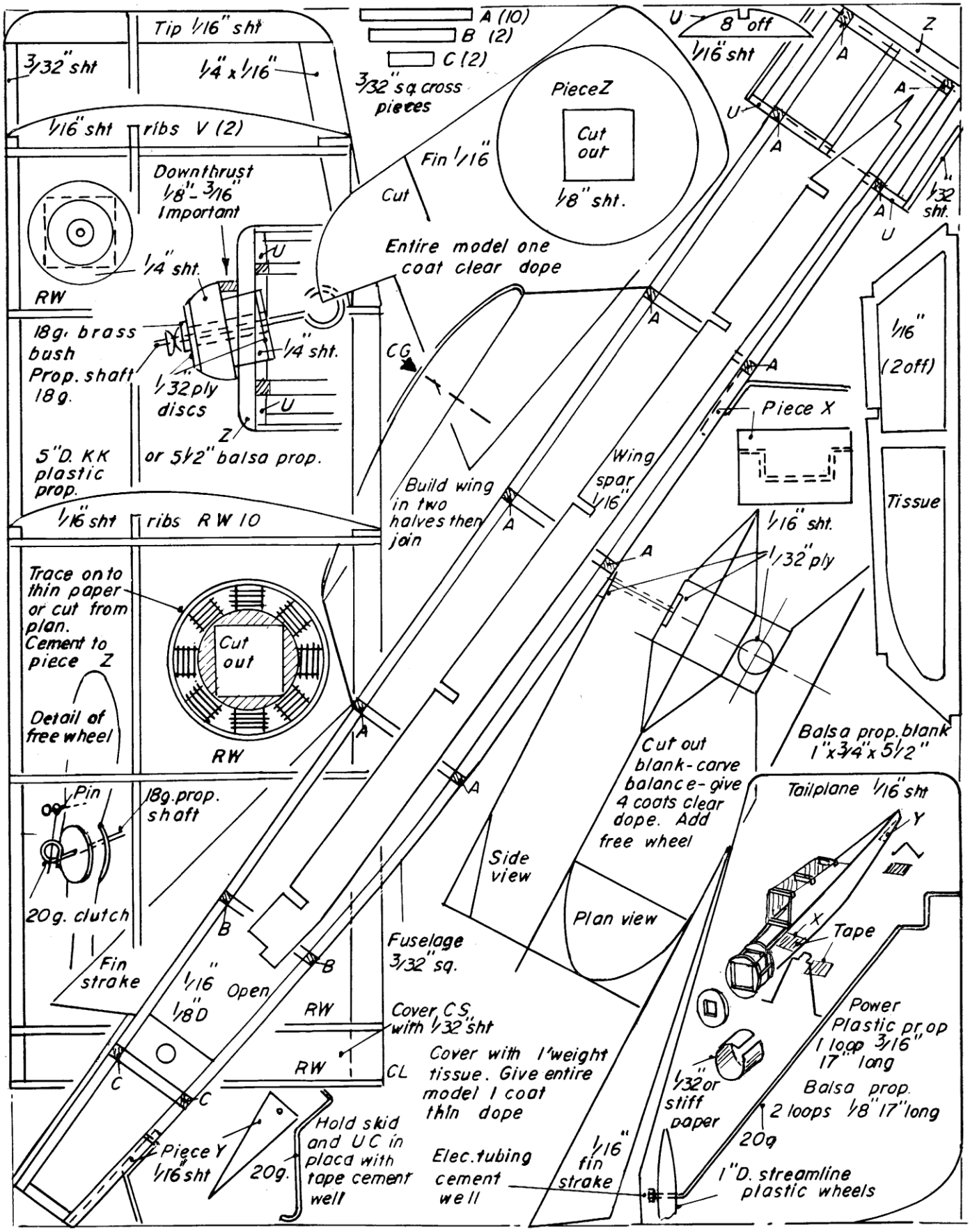
North Cotswold MAC – August event from Gray

The North Cotswold MAC have set the dates for our 2017 Fly For Fun show for August the 12th and 13th. We'd like to extend an invitation to all our regular guests and new visitors to join us at our site at Far Heath Farm near Moreton-in-Marsh, Glos.
We will be running all our regular attractions, including off-the-peg sport R/C flying, control line and small field freeflight.
Our Designers' Events this time are going to be:
On the Saturday, any model designed by the great Ray Malmström, in any form and any size + R/C conversion. Then on the Sunday, Chris Foss's legendary Wot4 design in any version and any form including ARTF's and foamies. Informal judging and prizes in both events.

Ray Malmstrom's Model'n Tip A STICKY PROBLEM

Some modern kits include plastic parts (scale accessories, cowlings, etc.). Balsa cement is often suggested for cementing plastic to balsa wood. Balsa cement, however, is not always the best adhesive for this particular job. To be much surer of a plastic to balsa joint use Evo-Stik or Araldite. Evo-Stik needs pressure for adhesion, and Araldite joined parts need pinning as it takes quite a long time to harden, but you will produce a much more permanent joint. Full directions for use are included with these adhesives.
With Mini Master featured here, however, balsa cement will be just the job. Mini Master is a " duration-type " model with a difference. It features a radial engine, giving it that real plane" look. Into the bargain it flies like a homesick angel! All you need is on the plan. Build and balance carefully. Only a very small amount of nose or tail weight should be needed. Just a word about the props. A 5 in. dia. commercial plastic prop will fly your Mini Master fine—but if you want to get into the big-time take a night off and carve and sandpaper a 5+ in. dia. balsa prop (details on plan), and fit a simple free-wheel. Durations will really go up. On test on a damp evening my own Mini Master was clocking 45 secs. Maybe you can top the minute with this pocket-size 16 1/2 in. span full-of-go midget. Drop me a card do Model Aircraft" if you do. Have a ball and join the Mini Master Minute Men! Looking forward to hearing from you.—R.M.




Tip 1/16" sht
3/32" sht
1/4" x 1/16"
1/16" sht
ribs V (2)
Downthrust 1/8" - 3/16" Important
1/4" sht.
RW
18g. brass bush
Prop. shaft 18g.
1/32" ply discs
1/4" sht.
U
Z
5" D. KK plastic prop.
or 5 1/2" balsa prop.
1/16" sht
ribs RW 10
Trace on to thin paper or cut from plan. Cement to piece Z
Cut out
Detail of free wheel
RW
Pin
18g. prop. shaft
20g. clutch
Fin strake
1/16" Open
1/8" D
B
C
Fin 1/16"
Cut
A (10)
B (2)
C (2)
3/32" sq. cross pieces
Piece Z
Cut out
1/8" sht.
Entire model one coat clear dope
CG
Build wing in two halves then join
A
Fuselage 3/32" sq.
RW
Cover CS with 1/32" sht
RW
CL
Cover with 1 weight tissue. Give entire model 1 coat thin dope
Piece Y 1/16" sht
20g.
Hold skid and UC in place with tape cement well
Elec. tubing cement well
1/16" fin strake
Side view
Plan view
Wing spar 1/16"
Piece X
1/16" sht.
1/32" ply
Cut out blank - carve balance - give 4 coats clear dope. Add free wheel
U
8 off
1/16" sht
Z
A
1/32" sht.
1/16" (2 off)
Tissue
Balsa prop. blank 1" x 3/4" x 5 1/2"
Tailplane 1/16" sht
Y
X
Tape
Power Plastic prop 1 loop 3/16" 17" long
Balsa prop. 2 loops 1/8" 17" long
20g
1/32" or stiff paper
1" D. streamline plastic wheels

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Regards,

Leon Cole
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