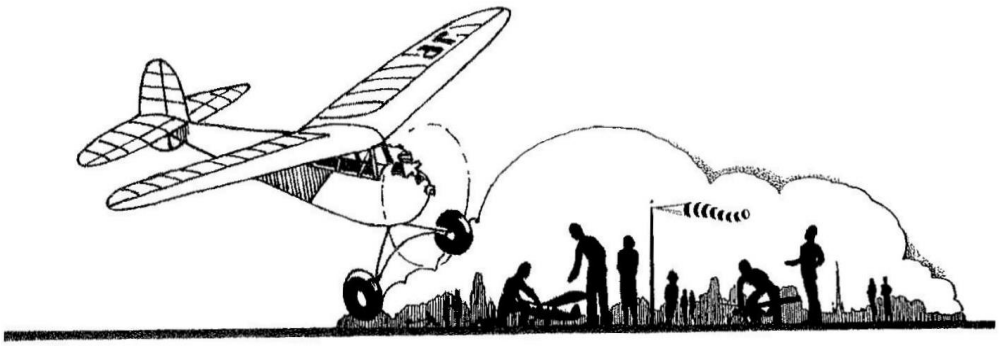


Sticks and Tissue No 146 – January 2019

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.

Beautiful Swiss scenery with Karl Petz's Jena 1 cc powered "Wedgy" photo sent by Peter Renggli

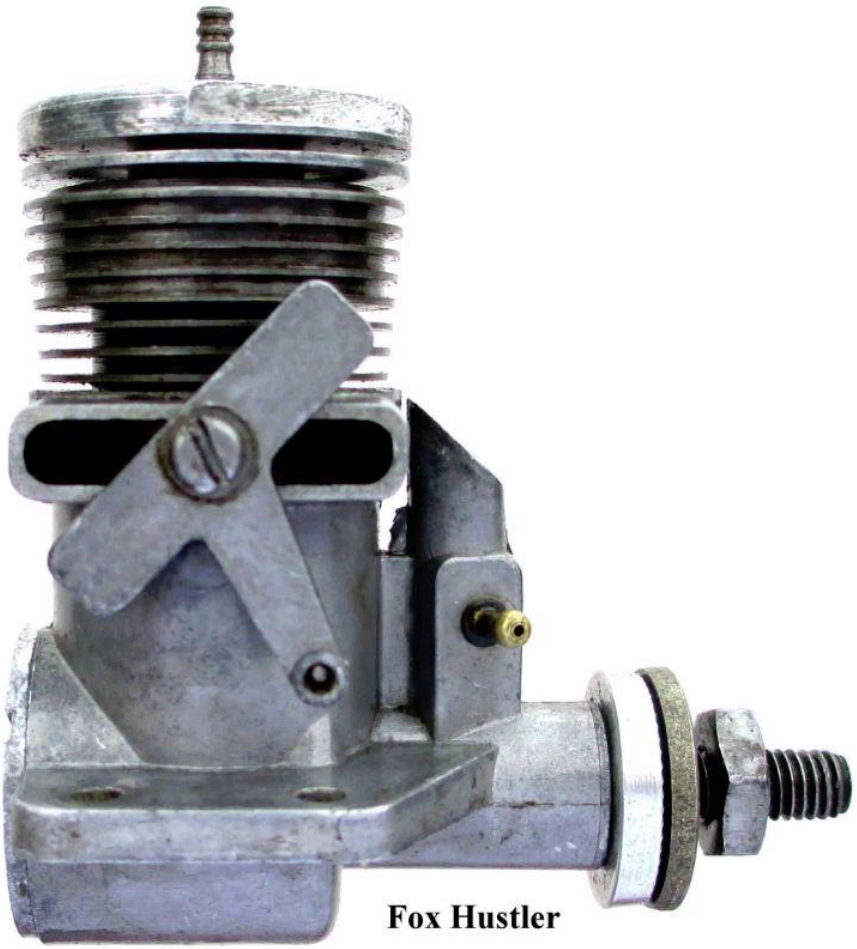
From Bill Wells

Fox Hustler and Fox 10

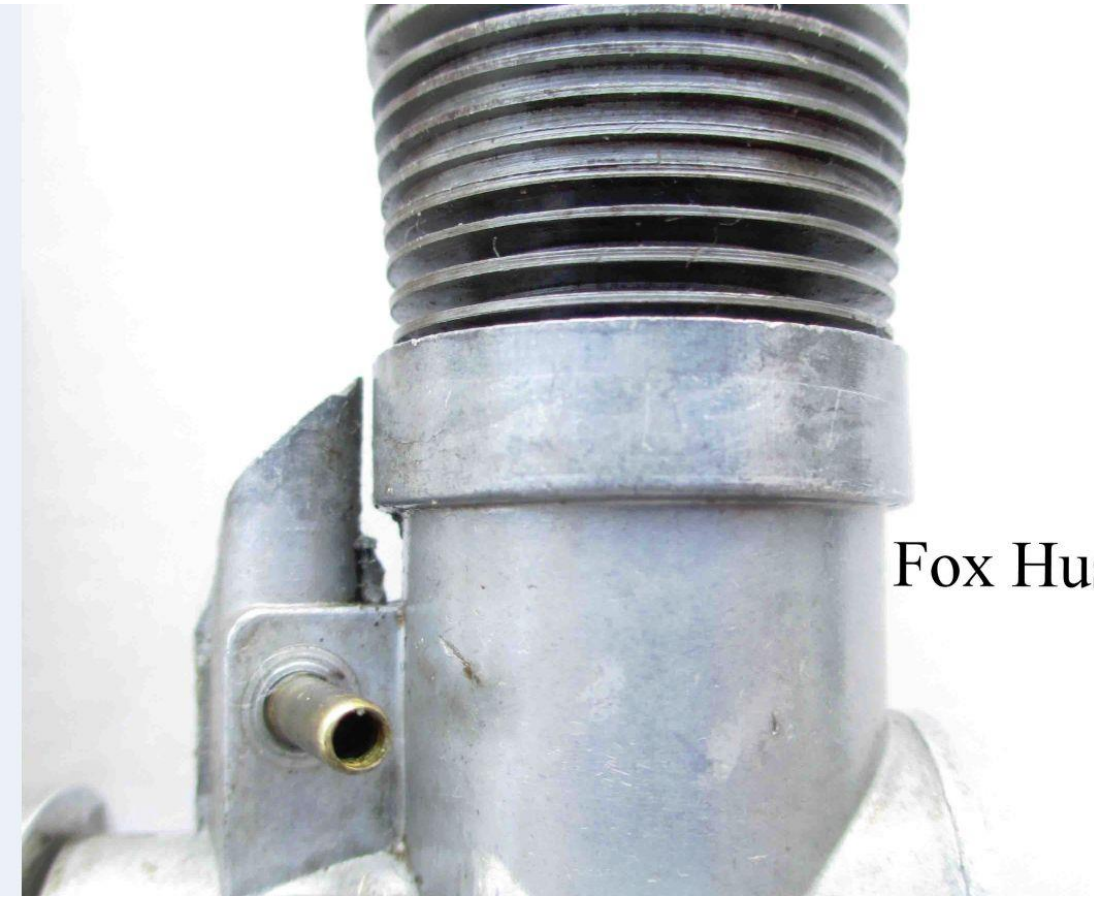
The Fox Hustler followed on from the successful Fox 09, Fox modified some internal components then constructed a completely different style of engine with a front rotary induction, it is a much shorter engine with importantly a single exhaust stack. There was obviously an economy using existing components to produce the new engine. The crankshaft was drilled for a front rotary induction the cylinder piston and con rod were basically from the 09. By swivelling an exhaust plate over the exhaust the speed of the engine could be varied. It was an ideal power source for small models using the new light weight radio gear. The mounting lugs are a substantial part of the crankcase casting and must strengthen it considerably. Nobody seems to understand why the left side lug has a peculiar shape!! The needle valve is angled backwards on the left side but was a bit vulnerable in a crash. It had a screw in back plate and no identifying markings on the crankcase. It seems that the engine was only available as an RC engine although conversion to a C/L mode was not a problem. The support between the two exhaust slits in the cylinder are ported internally a bit like the Cox Babe Bee. The thing is when the cylinder is screwed in place it may be that the ported support is facing the exhaust outlet. This looks very strange as if the exhaust is blocked by the cylinder!! But it is OK because the exhaust slits are in a cavity cast into the crankcase which forms a collector ring leading to the exhaust stack. The Hustler I have is like this, making at first glance it appear that a blocked exhaust isn't quite right!! The swivelling exhaust plate isn't an especially close fit to the exhaust stack. It took a bit of juggling to get the plate to swivel and not foul the test stand. The engine was an easy starter and was quite happy at 11,400 rpm and with the plate fully covering the exhaust it still gave 9000 rpm but the noise fell away dramatically. I figured that with a bit of adjustment I could have got it to slow down a little more. The Hustler was Advertised in the November 1961 Model Airplane News which read 'Amazing! 10 Day Free Trial', 'You test the New "Hustler 10" in your own Models' '$4-95 Factory Direct Price'. Presumably this brought an end to the 09 production as it was a superior engine and was about ½ oz lighter. However in April 1962 the Fox 10 was being marketed as RC or C/L versions. So the Hustler might have been used to test the market as it was only available from November 1961 to April 1962.

The Fox 10 was virtually the same engine as the Hustler. The Crankcase collector ring has 'Fox 10' in raised cast letters on the left side of the engine. The back plate was attached by two screws instead of being screwed in. There is a horizontal flat bar to the full depth of the back plate which supports a centre spigot. To help accommodate the two back plate screws the top edge of mounting lugs have a short raised fillets in the crankcase casting. Towards the end of production and for engines made up from parts there was some variation in back plates. Some were the screw in type. Some crankcases are threaded internally as well as having threaded bolt holes for the bolt on back plates! The needle valve was replaced with a flexible one rather like those seen on some of the Wen Mac Testor McCoy 049 engines. This was a much better arrangement and was less prone to damage. By 1964 the model aircraft world was changing rapidly and the Fox 15 became a more viable option for RC models. The Fox 10 I have is like new, it is any easy starter and runs well. Bearing in mind the short time that the Hustler was in production and Fox 10 possible a bit less than two years I consider I was extremely lucky to get them in the same Auction lot! Many thanks to Bill Mohrbacher President of Model Engine Collectors Association (MECA) who came to my aid as he had written an article from which I was able to extract dates and information for the above.

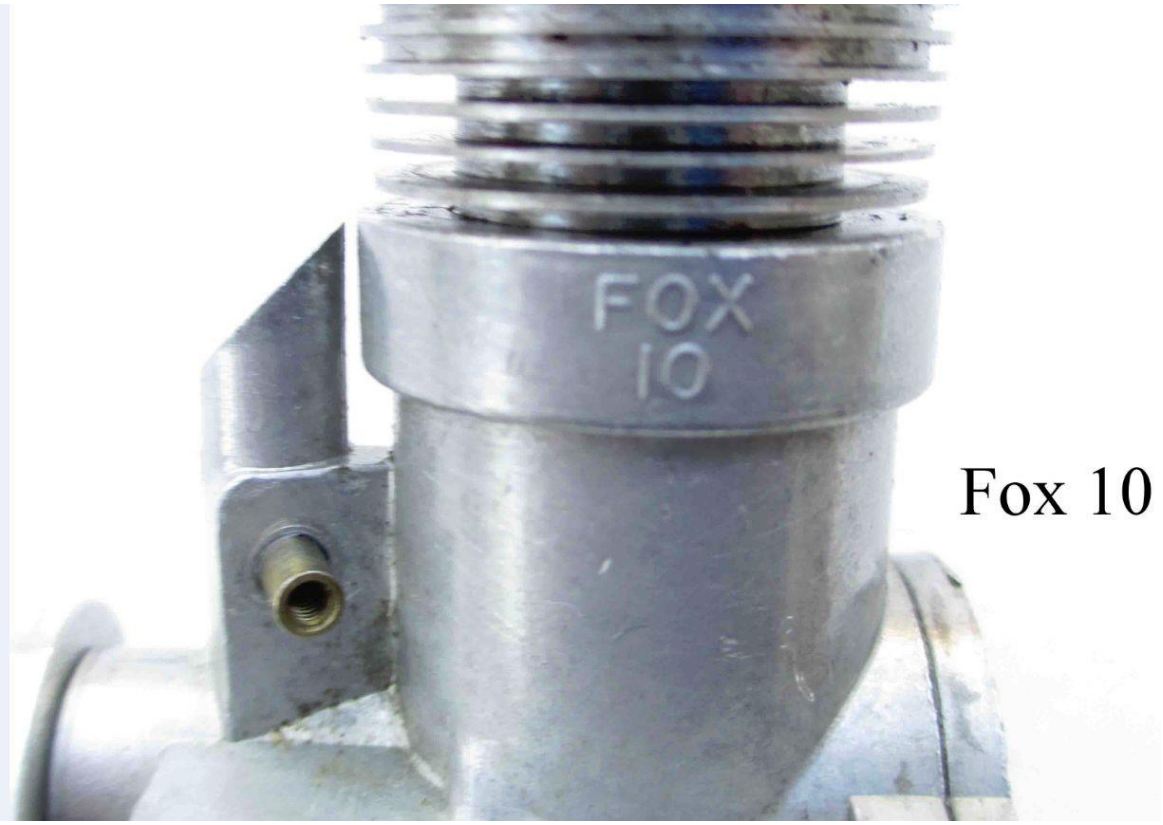
Photos next page


Fox Hustler

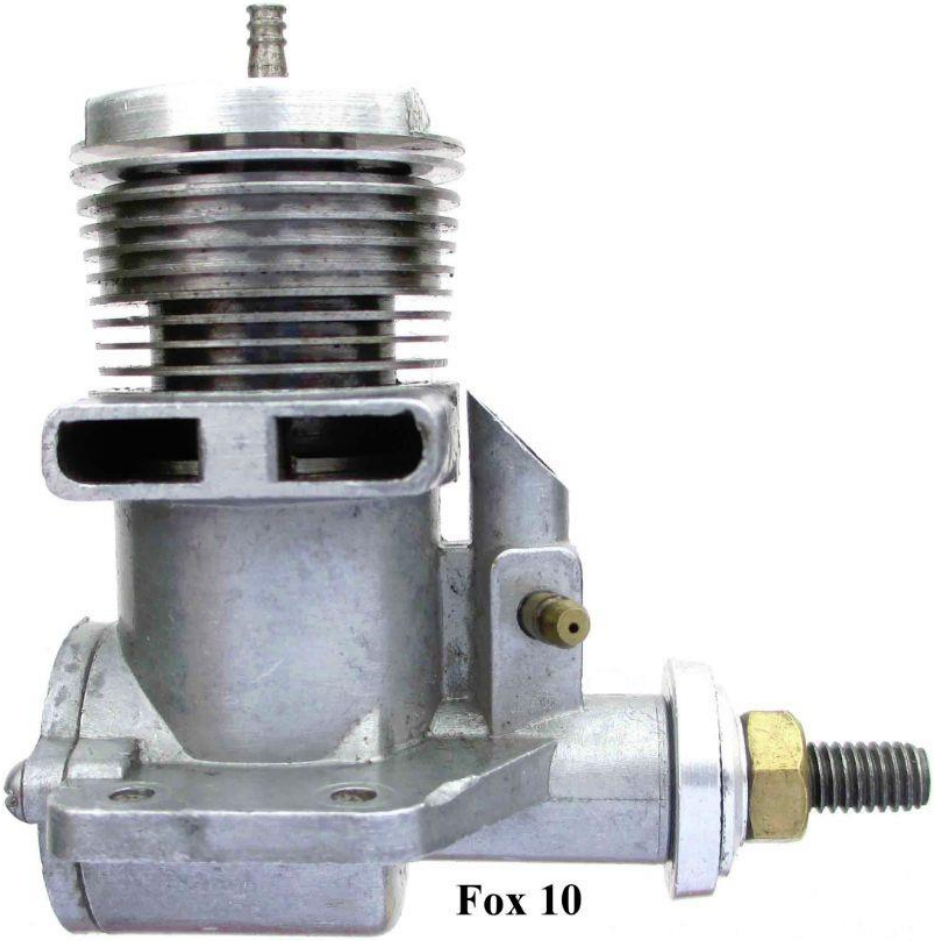

Fox Hustler



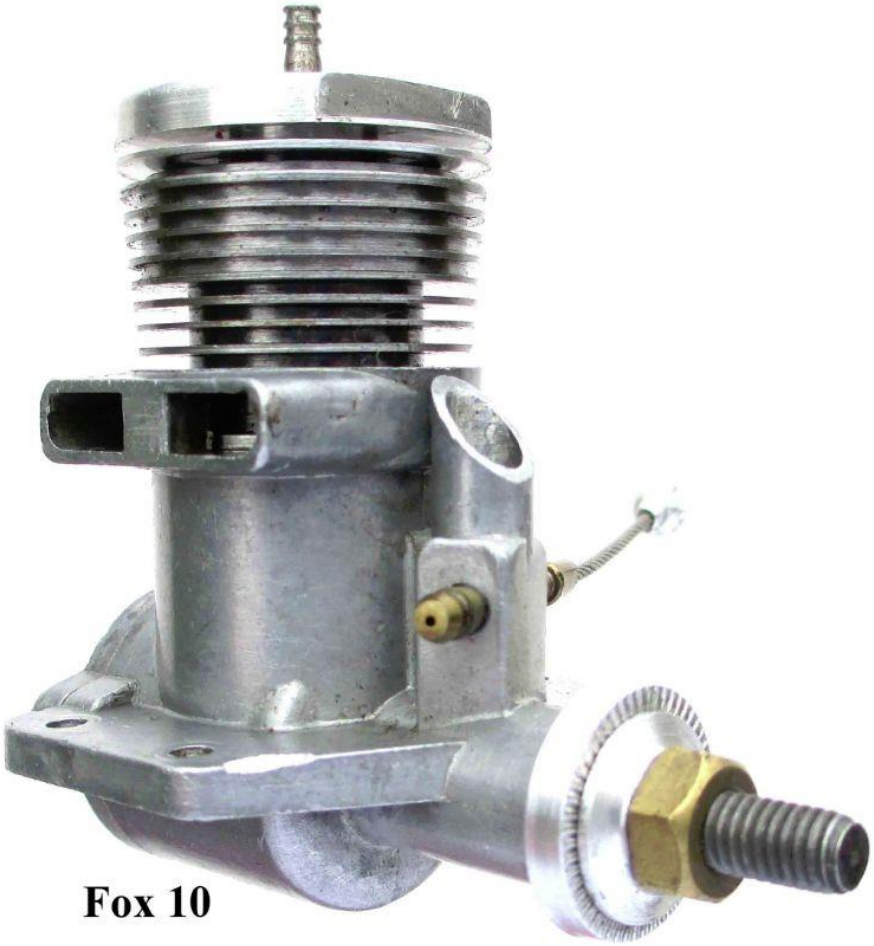
Fox Hustler



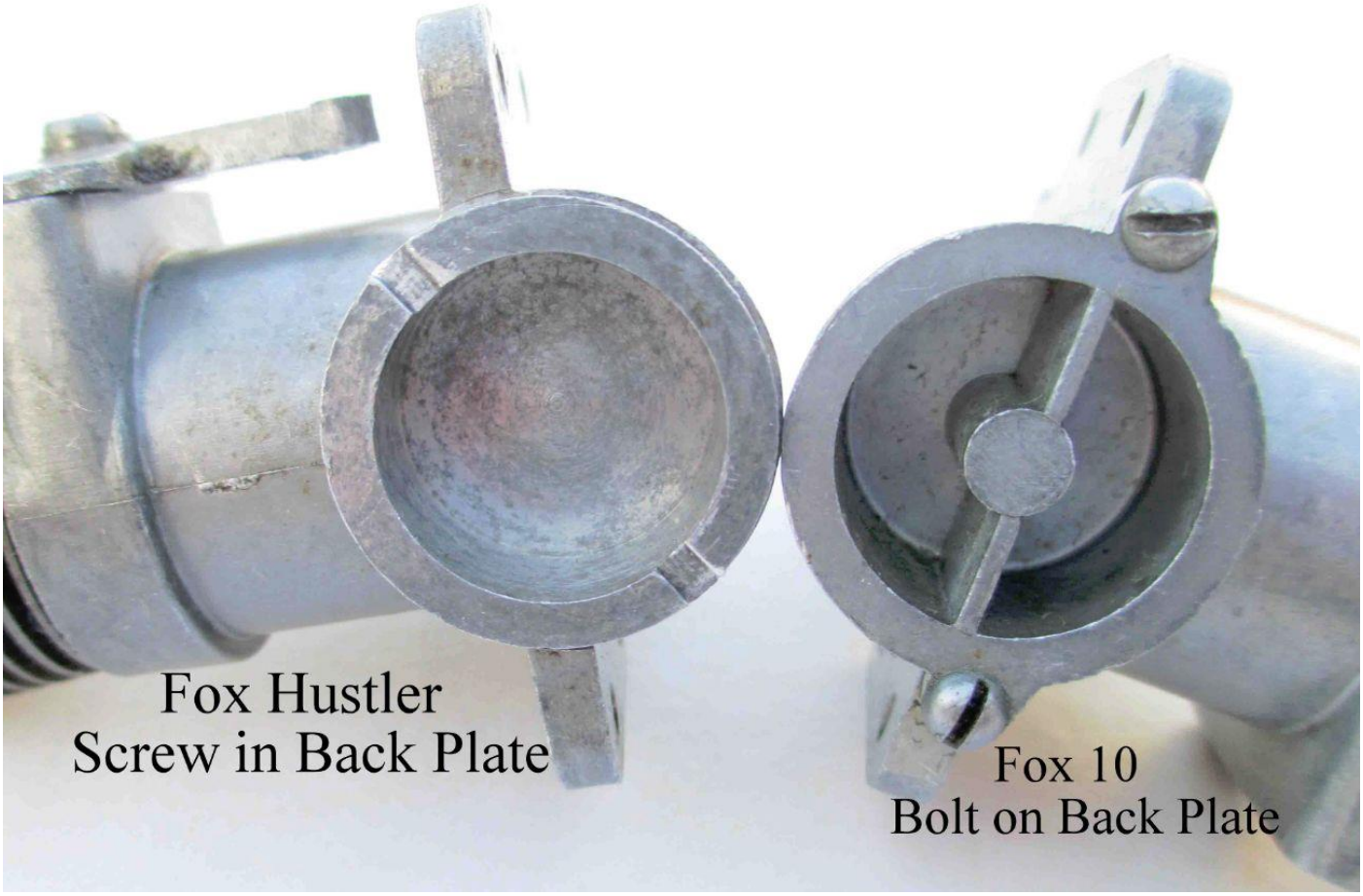
Fox 10

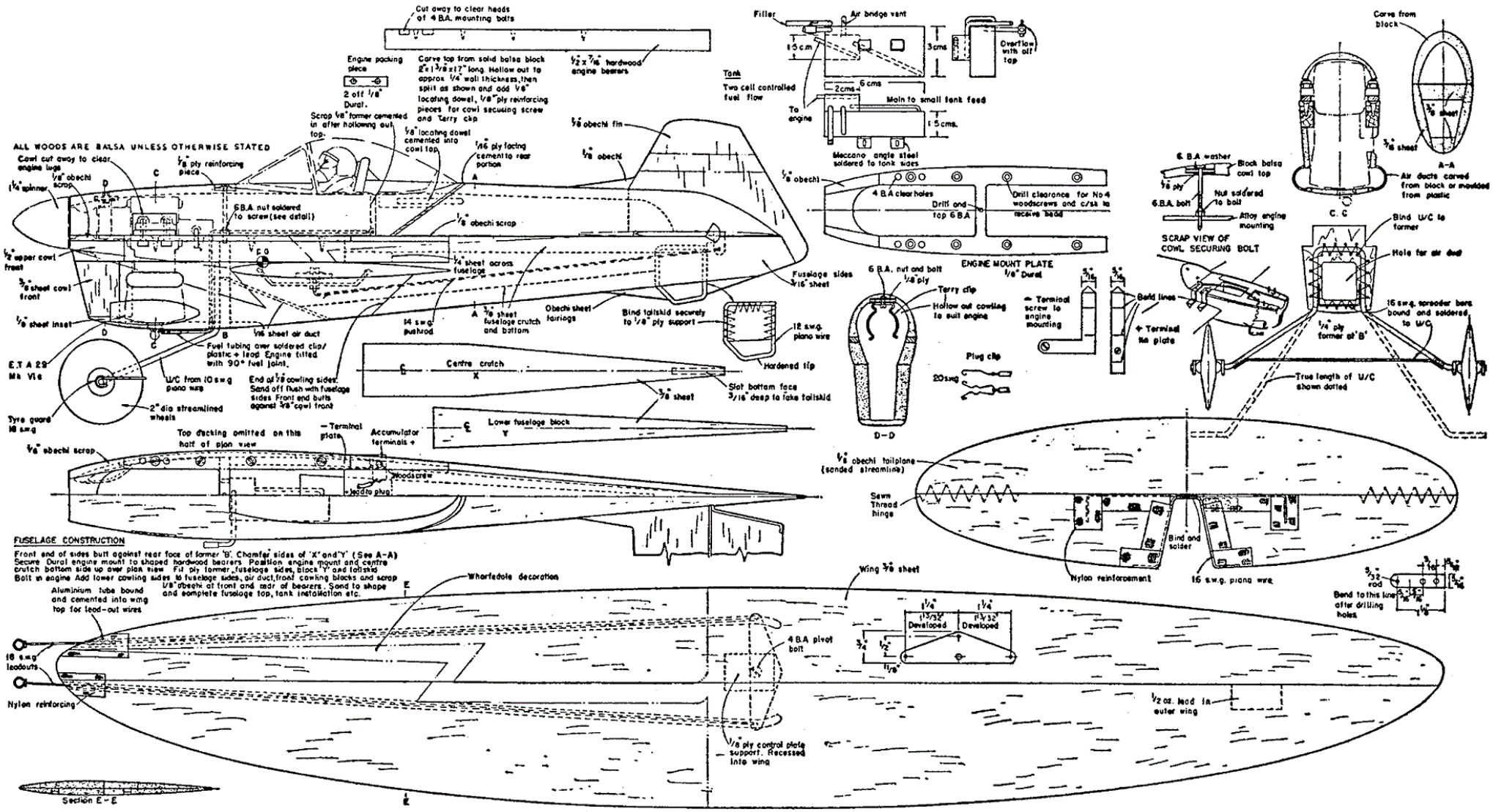


Fox 10



Fox 10

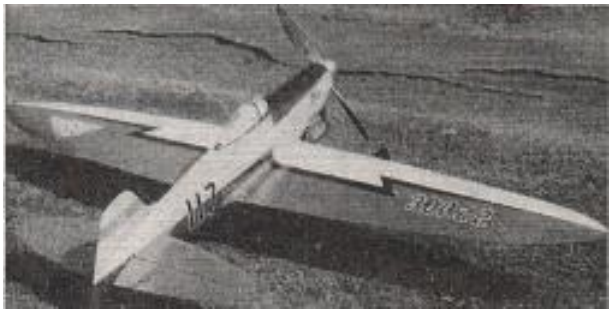

Fox Hustler
Screw in Back Plate
Fox 10
Bolt on Back Plate


ALL WOODS ARE BALSA UNLESS OTHERWISE STATED
Cut away to clear heads of 4 B.A. mounting bolts
Engine packing piece
2 off 1/8" Dural.
Carve top from solid balsa block 2"x1 3/8"x12" long. Hollow out to approx 1/4" wall thickness, then split as shown and add 1/8" locating dowel, 1/8" ply reinforcing pieces for cowl securing screw and Terry clip
1/2"x 7/16" hardwood engine bearers
Scrap 1/8" former cemented in after hollowing out top.
1/8" locating dowel cemented into cowl top
1/16" ply facing cemented to rear portion
1/8" obechi fin
1/8" obechi
Cowl cut away to clear engine lugs
1/8" ply reinforcing piece
1/8" obechi scrap
1 1/4" spinner
6 B.A. nut soldered to screw (see detail)
1/8" obechi scrap
1/2" upper cowl front
3/8" sheet cowl front
1/8" sheet inset
1/4" sheet across fuselage
1/8" sheet fuselage crutch and bottom
14 s.w.g. pushrod
1/16" sheet air duct
Obechi sheet fairings
Bind tailskid securely to 1/8" ply support
Fuselage sides 3/16" sheet
12 s.w.g. piano wire
Hardened tip
Fuel tubing over soldered clip/plastic + lead. Engine tilted with 90° fuel joint.
E.T.A 29 Mk VIa
U/C from 10 s.w.g piano wire
End of 1/8" cowling sides. Sand off flush with fuselage sides. Front end butts against 3/8" cowl front
2" dia streamlined wheels
Tyre guard 18 s.w.g
Centre crutch
Slot bottom face 3/16" deep to take tailskid
3/8" sheet
Lower fuselage block
Top decking omitted on this half of plan view
Terminal plate
Accumulator terminals +
Woodscrew
Lead to plug
1/8" obechi scrap
FUSELAGE CONSTRUCTION
Front end of sides butt against rear face of former 'B'. Chamfer sides of 'X' and 'Y' (See A-A) Secure Dural engine mount to shaped hardwood bearers. Position engine mount and centre crutch bottom side up over plan view. Fit ply former, fuselage sides, block 'Y' and tailskid. Bolt in engine. Add lower cowling sides to fuselage sides, air duct, front cowling blocks and scrap 1/8" obechi at front and rear of bearers. Sand to shape and complete fuselage top, tank installation etc.
Aluminium tube bound and cemented into wing top for lead-out wires
Whorledale decoration
Wing 3/8" sheet
10 s.w.g leadouts
Nylon reinforcing
4 B.A pivot bolt
1/8" ply control plate support. Recessed into wing
1/2 oz. lead in outer wing
Section E-E
Filler
Air bridge vent
Tank
Two cell controlled fuel flow
To engine
Main to small tank feed
Overflow with off tap
Meccano angle steel soldered to tank sides
1/8" obechi
4 B.A clear holes
Drill and tap 6 B.A
Drill clearance for No 4 woodscrews and c/sk to receive head
ENGINE MOUNT PLATE 1/8" Dural
6 B.A. nut and bolt 1/8" ply
Terry clip
Hollow out cowling to suit engine
D-D
Terminal screw to engine mounting
Terminal tie plate
Bold lines
Plug clip
20 s.w.g
Carve from block
3/8" sheet
A-A
6 B.A washer
Block balsa cowl top
1/8" ply
6 B.A. bolt
Nut soldered to bolt
Alloy engine mounting
Air ducts carved from block or moulded from plastic
C-C
SCRAP VIEW OF COWL SECURING BOLT
Bind U/C to former
Hole for air duct
1/4" ply former at 'B'
16 s.w.g. spreader bars bound and soldered to U/C
True length of U/C shown dotted
1/8" obechi tailplane (sanded streamline)
Sewn Thread hinge
Bind and solder
Nylon reinforcement
16 s.w.g. piano wire
Developed
Bend to this line after drilling holes

Ken Long's Dalesman Class B team racer from Aero Modeller July 1960

In order to give the reader some idea of how the development of this model has been approached, a short
history of its career will provide a guide for young enthusiasts who may be wishing to examine the possibility of class B team racing with a view to serious competition flying.
For a number of years members of the Wharfedale Club have been interested in Class B team racing, but it was not until 1958 that a measurable degree of success was achieved.
With the advent of the ETA 29 Mk. V came the first "Dalesman", this combination together with the newly developed two-cell tank system, produced a Class B model which up to that time had no equal in the North. Final times of 8 mins. for 10 miles were easily attained even with the necessity of five pit stops.
In February, 1959, development of the engine had produced an increase in the possible lappage that could be expected and the time for the 10-mile race was reduced to 7 : 40. At this point the record of the "Dalesman" models was introduced, fitted with a standard ETA 29 Mk. VI, this model proved to be faster than the original, giving a speed of 105 m.p.h. on its maiden flight. As the crew became more familiar with the new model and the motor began to come on to peak power the speed increased to 108 m.p.h. This performance was sufficient to enable the model to win at the Woodford rally of that year.
By the time of the '59 Nationals, both the machinery and crew were on peak form. At this meeting the performance had risen to 113 m.p.h. for 30 laps, a creditable show which took the model to third place in the "Davis Trophy Class B".
After this meeting the engine was rebuilt by the manufacturers after which the model secured a performance which we have yet to surpass namely 115 m.p.h. for 35 laps. The model conforms to the engine manufacturer's recommended method of engine mounting and thus produces a racer of very rigid structure. When choosing the wood for this model, be sure to select medium hard balsa for the wing and main fuselage sides (3/8 in. and 3/16in. respectively). If the model is constructed correctly, fatigue failures will not occur, tests have shown that the design limit speed is around 130 m.p.h. and all components are sufficiently strong to take the model up to this speed without structural failure should at any time engine development produce the necessary power.
After close inspection of the plan it will be realised that this is no beginner model in regard to building, although it flies like a trainer and with very little alteration, it would be possible for junior enthusiasts to build and fly a model based on this design. While many of the features shown are conventional practice in Class B design, there are a few ideas which considerably improve the racing characteristics of this model. For example, the angular cut for the removable engine/tank cowling, which distributes landing stresses with a less drastic change in section than could be achieved with a vertical cut. Also, note the special positioning and construction of the U/C which has saved many a race by completely eliminating the possibility of prop. Breakage on rough landings and in line tangles. The use of simple tin plate electrical terminals provide for the use of any type of accumulator connections to be used and dispenses with the need to standardise on a particular plug and socket (which are usually heavy and cumbersome to say nothing of being difficult to install correctly).
The operating efficiency of the model is enhanced by the removable cowl top. This provides access to all the main working parts except the control system, this is constructed entirely of steel and thus requires no maintenance other than periodic lubrication. The rear fuselage is so designed as to provide a large "second moment of area", this ensures that there is sufficient strength to eliminate failure during landing. The wing is of simple sheet construction and is designed to maximum allowable aspect ratio (8 : 1 under S.M.A.E. rules) and of elliptical planform together with a high speed symmetrical section. This combination gives the

highest lifting efficiency together with the lowest induced drag value. By use of the elliptical planform, it is possible to clean-up the wing tip which usually creates a great deal of wing drag.
Drag at the wing and tail roots and the inside of the engine cowl and exhaust duct is reduced by the use of leather and plastic wood fillets to streamline the airflow over these sections.
The model should be given a high gloss finish, with the final coat being of H.M.G. fuel proofer. This should be allowed to mature for at least 110 hours to make sure that the surface cannot be penetrated by hot racing fuels.
The performance of the "Dalesman" will depend to a large extent on the engine/prop, combination which is used. The Tornado 8 x 8 is recommended but this is not essential. If a Tornado is not used than a reworked "Stant" 8 x 9 will usually give very good results.
Fuel recommended for the engine will vary with changes in climatic conditions and availability of a particular constituent. Basically the aim should be to produce something similar to the following:
30 per cent. Nitro Methane
5 per cent. Nitro Benzene
20 per cent. Castor Oil
45 per cent. Methanol
The methane content should be varied to suit compression ratio and the other conditions as mentioned above. The final decision must be taken by the operator.



Attractive decoration on the red, black and white prototype (see cover) adds much to the appearance of this prototype.

Photograph above illustrates the basic construction system with the engine seated upon a Dural plate over the top of a hardwood crutch. Details of the Chicken Hopper type tank are included on the full-size plan


AERO MODELLER
JULY 1960
SPECIAL RACER FEATURE
WORLD R/C RECORD STORY
2/-

Photos sent by Peter Renggli taken at the 2017 MG Bern Antik Flugtag. Photos by Urs Brand and Peter Ziegler

Ernst Dällenbach, Falcon Goldberg

Christian Gafner, Kapitän

Hans-Ulrich Wolf , Cessna 180 Graupner

Ruedi Gerber, Pilot 4

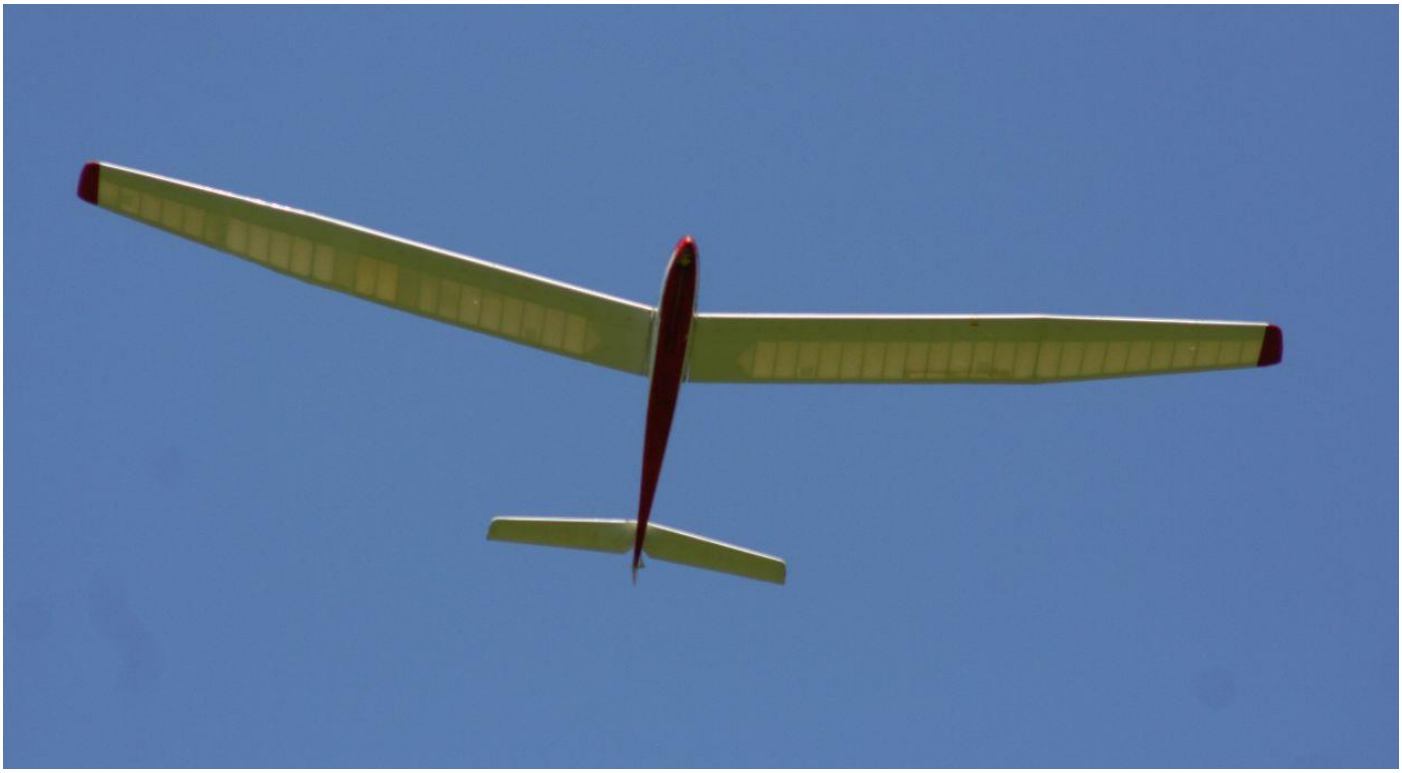
Max Germann, Kapitän


" chérie "
1963


9
1937 Flamingo


1959
Hasl 5

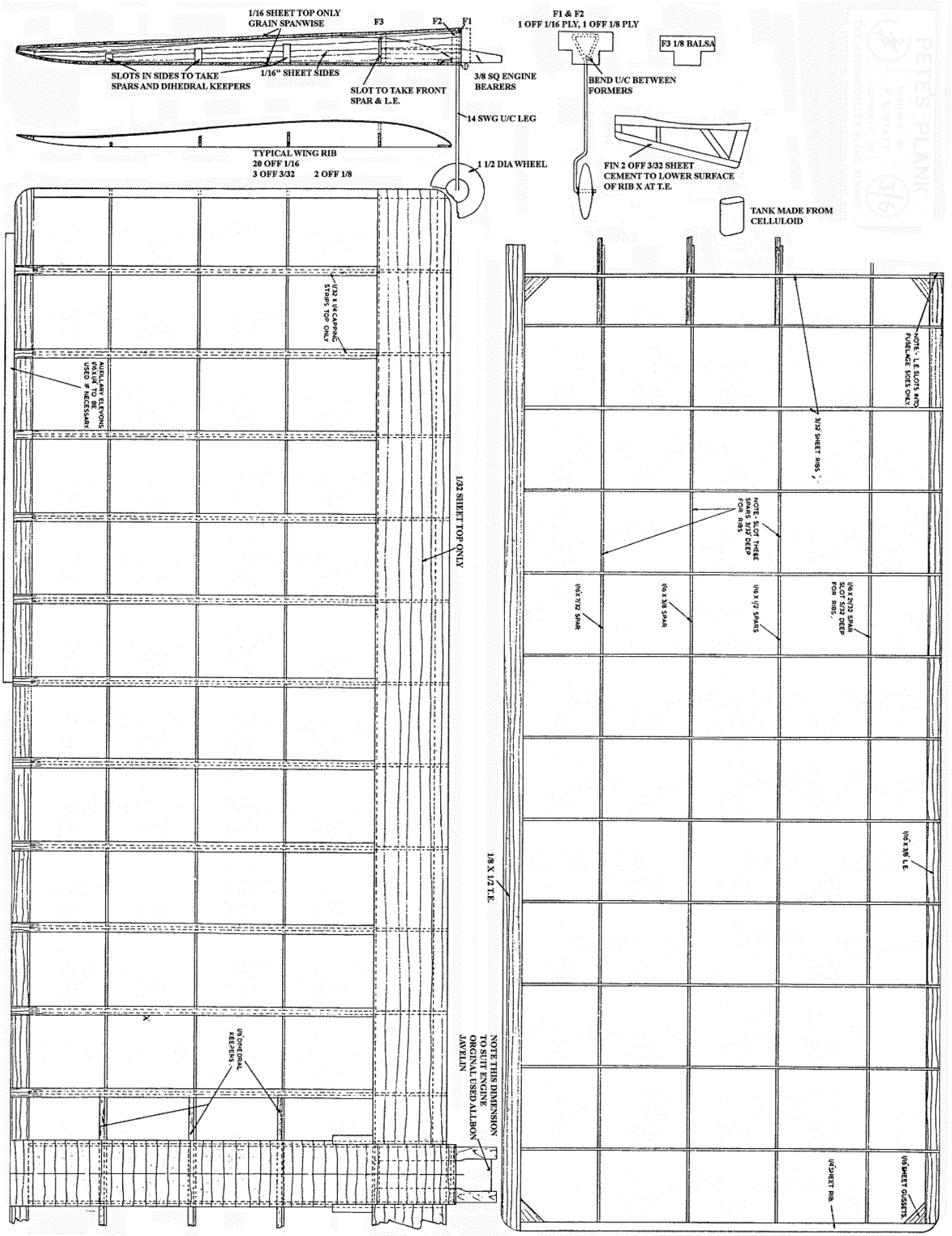

1963
„ Chelrio „




NEX


Flamingo

Karl Petz's "Wedgy", again, showing the Jena 1 cc



Pete's Plank a 54 inch span flying plank from Aeromodeller May 1951

A huge 650 sq. ins. Plank can be judged for size by comparison with designer P. B. Wyatt. Despite the size, Pete motors between E.D. Bee and Allbon Javelin.

The very first model that Peter Wyatt built and flew successfully was the tailless R.F.L.G. 53. There is little doubt that this has given him a good start in aeromodelling, for as current holder of the British record for powered tailless models, and always a leading competitor at power duration contests, Peter Wyatt has become an established expert.

Pete's Plank is the ninth of a series. It established the British record of 2 mins. 15 secs on the 15th October 1950, at his home town, Ipswich. Earlier versions have exceeded 4 mins on 30 seconds motor run, and could easily have been used to try and beat the world's record which allows unlimited motor runs. However, Pete sees little point in such an effort, and is content with this very high performance ninth design.

Incorporating a very novel and necessary d/t, we recommend this design to all tailless enthusiasts as an experiment guaranteed to be successful. Note the absence of sweep-back, and the diminutive elevons. What could be simpler?

Building Instructions

Shape 1/16 in: ply template and cut 20, 1/16 in: ribs, 4, 3/32 in. ribs from medium balsa and 2, 1/4 in. ribs from soft balsa. Pin together and sand to shape. Notch for spars, noting that slots are not as deep as spars. Make spars from 1/16 in. hard balsa and slot for ribs. Assemble ribs on spars at 2 1/4 in. spacing, except for centre ribs which are 1 5/8 in. apart. Place two halves of wing together at correct dihedral angle, and place dihedral braces on spars 2, 3 and 4. Fit 1 1/2 x 1/8 in T.E.

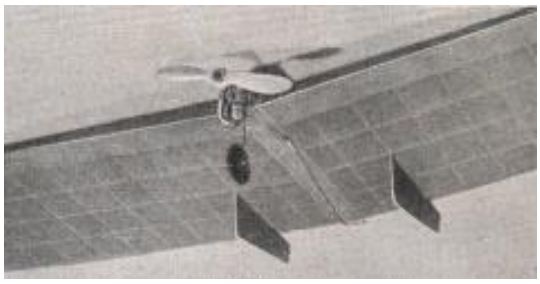
Place 1/16 in. fuselage sides between centre ribs and fit 1/16 x 3/8 in. leading edge. Durofix engine bearers to fuselage sides, blind undercart to F1 and place F1, F2 and F3 in position. Sheet top and bottom of fuselage with 1/16 in. sheet and sheet and cap strip wings with 1/32 in. sheet balsa.

The original plane was covered in heavy Modelspan. After doping, give fuselage, and wing as far as the fins, a coat of banana oil to keep out diesel fuel. Fuselage can be finished off with a Mercury cockpit cover if required.

The engine bearers can be carved to suit the engine. The original had an inverted Javelin 1.49 c.c. diesel with home-made tank formed from a piece of sheet celluloid. The E.D. Bee would also be an ideal power unit.

The fins are added after the wings are covered. They do not tend to get damaged, as the plane turns over in a bad landing. . . .

Trimming

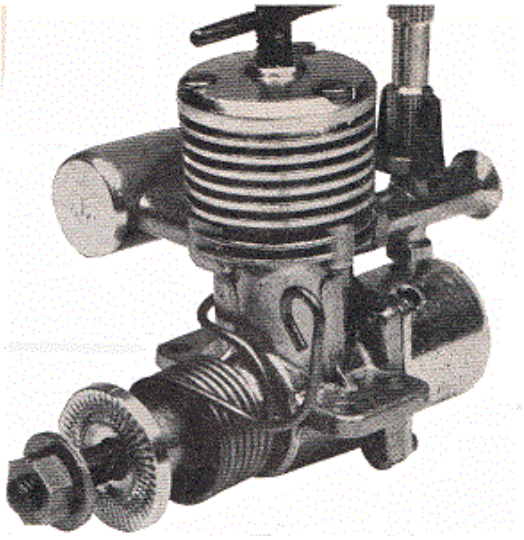


The required downthrust is approximately as shown. No sidethrust was found to be necessary. The plank will very likely be found to be nose heavy and trim is produced by using auxiliary elevons as shown. First fights were made with the engine throttled down; but a reversed prop could have been used. It is better to R.O.G. than hand launch, since on low power there is a tendency for the plank to drop from the hand. A slight left turn on power and glide is safe, there being a tendency to spiral dive to the right. . .

Note .. . . .

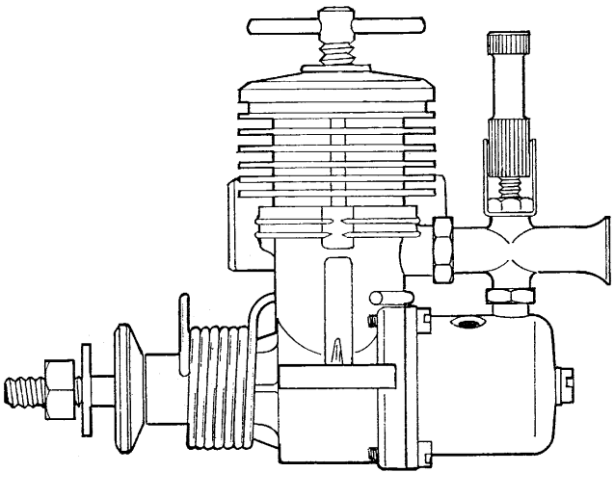
Do not have any hinged trimming tabs which can move unnoticed. All tabs should be well cemented before flying. .

E D Cadet from Aero Modeller June 1963



Developed specifically as a placid, slow-revving sports engine for "Sunday flying", the "Cadet", basically represents a redesign of the series II ED. "Bee". The basic "Bee" crankcase unit has been retained, with minor modifications, but the top end is entirely new and embodies "sideport" induction (or, strictly speaking, three-port or cylinder induction, since the intake port is geometrically at the rear of the cylinder). This is a distinctly old-fashioned arrangement, rarely seen on modem production engines (the Mills .75 is another example of the use of this form of porting, but the Mills layout dates back unchanged from the very first working diesel); and one which most engine designers have forgotten, or at least completely disregarded, in the search for higher specific output. The latter trend has resulted in high-revving engines, which can be quite an embarrassment at times and not always all that efficient on practical propeller sizes for sports flying.

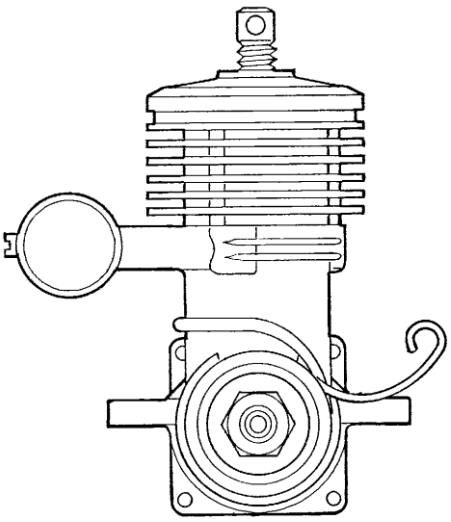
The cylinder-port layout is often maligned because it inherently limits the maximum revs., and thus the maximum B.H.P. figure attainable, whereas it can be just as efficient, or even more so at low and moderate speeds. It is restricted in its "breathing" capacity by its very geometry. All three ports—induction, transfer and exhaust—are cut in the cylinder or liner and timed by the piston movement. Fuel mixture is sucked directly into the crankcase by upward movement of the piston uncovering the intake port. This port must thus be lower than the exhaust port over the whole of its depth, which means in practice, that the time of induction opening is restricted. Hence the porting virtually sets a "maximum speed" limit, above which induction of a complete charge is impossible, regardless of actual port area. What must not be overlooked, however, is that up to this "limiting speed" the torque output possible to achieve can compare favourably with any other type of induction, and may even be better. At the same time fuel consumption may well be better, and also the degree of suction lift attained for easy priming and consistent running under changing attitude.



The "Cadet" is a three-port engine where "restricted" timing appears to have been carried to a degree. Peak power on test we found to be developed at just over 6,000 r.p.m., corresponding very naturally to a very modest B.H.P. figure (.028). The "Cadet" cannot be compared to other engines of similar size on this basis, however. It is the torque output which matters over the speed range, and this approaches typical 1 c.c. sports engine standards at about 6 ounce-inches. The fact that the torque falls off to virtually zero by about 8,000 r.p.m. means that the "Cadet" is not really useable above 6-7,000 r.p.m. Any attempt to make it run faster by fitting a smaller propeller, will simply reduce thrust and power, without appreciably increasing the r.p.m. On the other hand, the "Cadet" will "potter" quite happily at about 3,000 r.p.m. on a large propeller— even a 12 x 4—and develop useful "sports model" thrust over a speed range of about 4-6,000 r.p.m.— speeds at which you can put your fingers in the prop. without suffering much worse than a hard rap! The ideal prop. seems to be an 8 x 4, on which it will run at just about peak revs, both statically and in the air; or an 8 x 5 or possibly an 8 x 6 for control line work. A 9 x 4 would also be a useful size for free flight. On any of these sizes starting characteristics are about best, too.

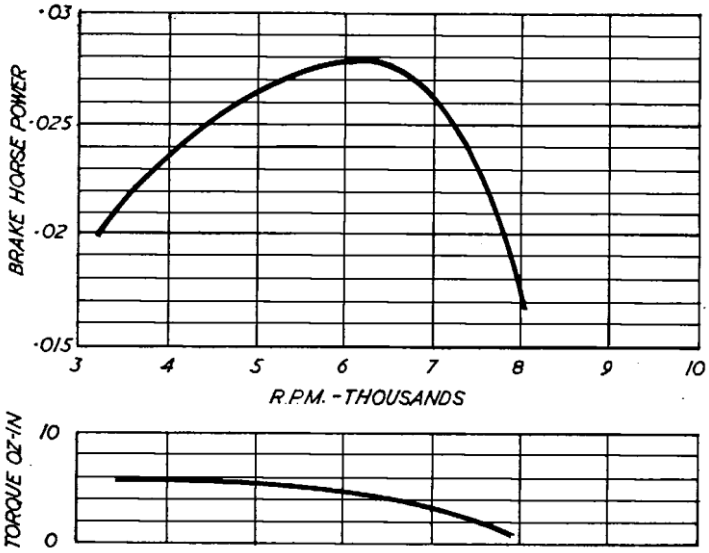
Starting characteristics are reasonable, provided one does not "lose" the compression setting. A three-port diesel does not have the same "feel" or handling characteristics of other types and if over-compressed, will not even fire, let alone start and you simply end up with a flooded engine. So the compression needs to be some where about right for starting. You cannot take the compression up until resistance is felt and back off,

a little at a time to “feel” the best setting. All that this is likely to lead to is complete frustration. To be sure of being within starting range, the compression adjustment needs to be retained within no more than half a turn either way from the last running setting.



A coil spring starter is fitted as standard and is more than powerful for the duty required, wound back no more than one complete turn, If the starter spring is wound back more than one full turn, sooner or later it is going to break. Most owners will probably disregard the starter once they have become familiar with settings and initial adjustment and find that flipping the propeller over is, in fact, quicker and easier. But a starter is a good selling point, and many beginners and “Sunday flyers” like them.

The other good “selling” point is that the “Cadet” is fitted with a silencer as standard. This is a simple expansion chamber one inch long and 1/2in. diameter, which bolts directly onto the exhaust stub. Whilst taking out all the harshness of the exhaust note, it still leaves enough “engine” sound to be pleasing and, incidentally, hear how the engine is running. The necessity for silencing has already been stressed and this is the first British production engine to incorporate such a unit as a standard feature. The effect on performance is quite negligible, r.p.m. being substantially the same on any propeller load whether the silencer is in position, or removed entirely. There is thus nothing to lose and everything to gain by leaving the silencer on. You could even run-in the “Cadet” indoors without the rest of the family complaining of noise—only the fumes! Structurally the “Cadet” embodies a modified “Bee” crankcase unit (an entirely new casting incorporating a boss on the rear of the lower cylinder for the intake tube) with basically the same crankshaft as the “Bee” running in a bronze bush for the main bearing. The cylinder liner is of hardened steel and made a fairly tight fit in the casting, seating on a flange. Lower cylinder walls are approximately 3/32 ins. thick with, two transfer passages scalloped out on the outside, terminating in upward angled drilled holes for the transfer port openings. The exhaust port is a rectangular hole milled through the cylinder wall and below it, and overlapping circumferentially a narrower (in depth) and wider rectangular port for the, intake opening. The rear edge of this latter port uncovers the intake hole in the cylinder unit. The cast iron piston is of plain form with a chamfered top and fully floating 1/8-in. diameter silver steel gudgeon pin. The connecting rod is a light alloy forging with a 9/64-in, big end diameter. Crankcase volume is quite small, the bulk of this space in the casting being filled by the plain (unbalanced) crank disc and back cover “plug” section which extends well into the case. Cylinder assembly is completed by a finned jacket turned from dural which is bolted in position by three screws. The liner is correctly positioned by three small notches in the flange clearing, and corresponding to, the hold-down bolt holes.



The intake tube screws into the boss section on the crankcase unit and is locked with a brass nut. This tube is a pressure die casting with a bellmouth entry and venturi-shaped bore. Throat diameter is quite small and practically the whole area is masked off by the brass spraybar. The latter is of conventional pattern and the fuel pick-up side is extended via a short length of plastic tubing down to the bottom of the tank. The tank is turned from dural and is fitted to the crankcase backplate by means of a central bolt. In view of the deliberately restricted intake timing, the “Cadet” could undoubtedly be “tuned” to some extent by opening up the intake port area. Reworking the liner is not practical, since it is hardened, but for those owners who would like to try a little simple “tuning”, opening up the bore of the intake tube with a drill, should have an

appreciable effect on r.p.m achieved with an 8 x 4 or 9 x 4 prop. Possibly handling characteristics may deteriorate somewhat as a consequence in its original form the needle valve control is completely non-critical —but the cost of the experiment is only a spare intake tube.
Summarising, the "Çadet" is purely and simply a docile sports engine with especial merits for youngster and young beginners who are often put off by the knocks and cuts they can receive from "hotter" engines. It has enough power to fly typical sports f/f model designed for 1 c.c. motors, and the fact that it will not overpower the model will make trimming easier (and the effect of warps less drastic). Its low power may be more of a limitation for control line work where even the beginner soon expects to achieve aerobatic performances.

Data

Displacement: .984 c.c. (.061 cu. in.)
Bore: .437 in.
Stroke: .400 in.
Bare weight (including tankand silencer): 3 7/8 ounces
Max. power: .028 B.H.P. at 6,400 rp.m.
Max. torque: 6 ounce onches at 4,000 r.p.m.
Power rating: .028 B.H.P. per c.c.
Power/weight ratio: .0047 B.H.P. per ounce.
Material Specification:
Crankcase unit: light alloy pressure die casting, bright finish
Cylinder liner: hardened steel
Piston: cast iron
Contra piston: mild steel
Crankshaft: hardened steel
Main bearing: bronze bush
Cylinder jacket: turned dural
Tank: turned dural
Intake tube: light alloy pressure die casting, bright finish
Spraybar assembly: brass
Con rod: light alloy forging
Silencer: 1 in. x 1/2in. diameter with stub exhaust pipe.
Price: £3-3-0

Manufacturers:
Electronic Developments Ltd., Island Farm Road, West Molesey, Surrey.

Propeller R.P.M. Figures

Frog nylon	9 x 6	5,200
K.K.nylon	9x4	5,800
	8x4	6,400
	8x6	5,500
Topflite nylon	9 x 4	5,400
	8x4	6,400
	7x4	7,000

From Jörgen

About carbs I got a mail from Alex Phin hi says he has got rc carbs for all of his Engines one is special to the 0,49tbr and the other one fits all the rest.

New Tools Found from Mike Fairgray

I have attached a short article on a couple of tools that I have found to be excellent for use in the building process.

I came across and article in a magazine covering the various drills that can be used in model aircraft construction. The drilling tool I would not even have considered is the spade bit, for having used these drills in carpentry I know how they can grab and tear the wood on exiting, so what would it do to balsa? I did a couple of test pieces and was very surprised how well it cut the hole. I placed a piece of pine under the balsa and using the drill press on a medium speed slowly pressed down and cut through the balsa into the pine. There was no tearing of the balsa at the exit point as happens with a normal drill bit and the hole only needed a touch-up with sandpaper. As you can see from the attached photo of holes drilled in the elevator and tail the holes are clean cut.

The second tool is a wheel cutter. How often has the tissue or film been torn or a jagged edge has been the result of cutting with a tool using a blade. The wheel always leaves a smooth edge on tissue as well as film. On one side of the wheel cutter, the cutting wheel is set back from the edge of the tool enabling the wheel of the tool to be right against the ruler. It is also possible to cut curves and is great for cutting around a template. This tool is purpose build for crafting and comes in various sizes with replacement wheels available. The more expensive tools allow for the locking of the wheel out of the way when not in use and also locks the wheel in the extended position. These tools are available from outlets selling craft supplies or off the internet.

James Parry's infill

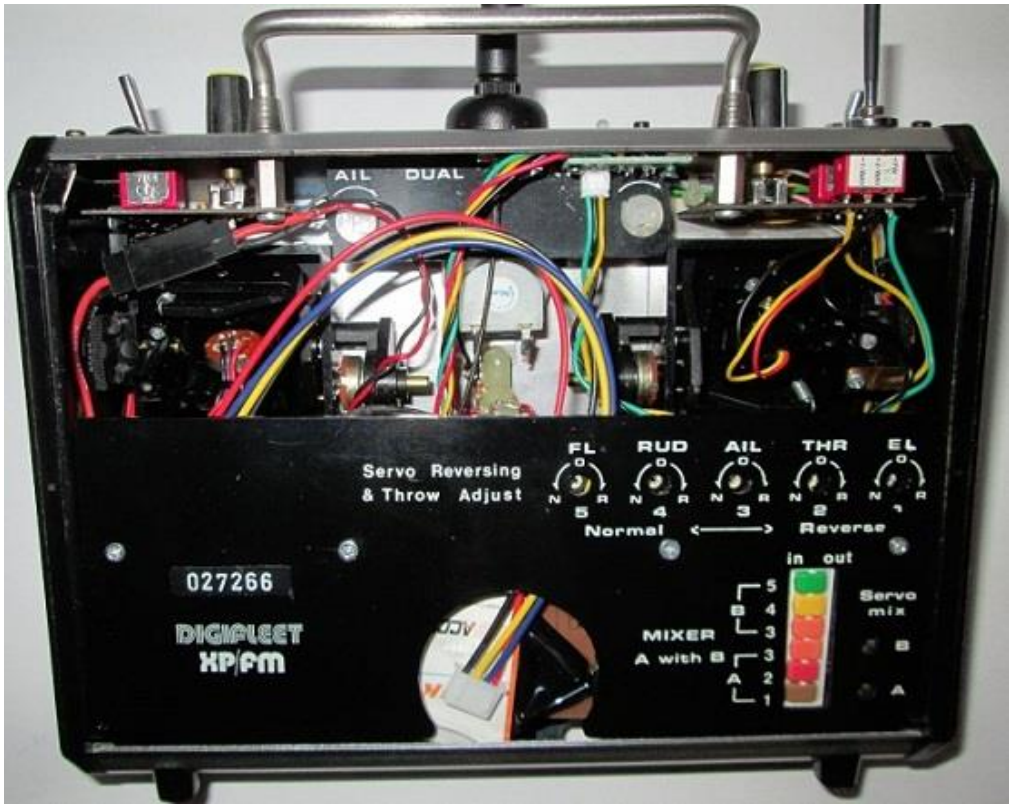
Being short of content this month and in order to fill another page I've included a few do and do not's from very recent personal experience.
First of all the do nots the second will go some way to explaining the first.
If you are outside the UK this will not mean anything to you and goes back a few weeks when Duke of Edinburgh at 97 years old smashed up his car well a car hit his when he was pulling out of a road / drive. There followed opinions as to whether someone 97 should still be driving all the pros and cons being thrown up well my extension of this argument is as follows. Should aeromodellers cease certain activities at 65, the following being on my list:-

1. *Use a soldering iron.*
2. *Allowed anywhere near cyano.*
3. *Permitted to use anything other than a blunt modelling knife.*
4. *Follow written instruction as they never follow them.*
5. *Have draws at head height which easily slide open are not self closing. Any height on second thoughts.*
6. *Keep cellulose thinners on a shelf which is used to store other items, other items seem to become entangled and unstable with quality of being able to move and nudge what they are next to out the way.*
7. *In modelling area have a seat which seems to be able to move on its own, silently.*
8. *Attach things to hooks temporarily using postman's elastic bands. Temporary becomes long term and models gain weight. Rubber decays quite quickly too.*
9. *Walk barefooted in model area, especially when day before a box of pins was dropped.*
10. *While holding two items together when fast setting glue, epoxy is curing, and at same reach for cup of tea.*

Now the dos
Before I bought a Spektrum set a few years ago I had until then used Digifleet equipment from which I had excellent service with no problems and was extremely reluctant to stop using but with advent of 2.4 etc etc. A year or so ago I was on the verge of chucking away all the Fleet stuff I had but having to retrieve it from the loft I never got around to doing.
A few weeks ago I was looking something up on the internet and wandered into a YouTube video showing how to convert a Fleet XP/FM Tx to 2.4. I duly bought the module and installed, the miracle was it worked perfectly. (Thanks are owed to Alan Holmes of Raynes Park MAC for advice and putting me in the right direction). I put a Rx into my Novice set everything up and it flew absolutely flawlessly. So pleased at the result I have bought two more modules to convert a PCM7 and OMEGA. I find the TX, sticks and everything far superior to other equipment, probably because I was returning to where I started R/C.

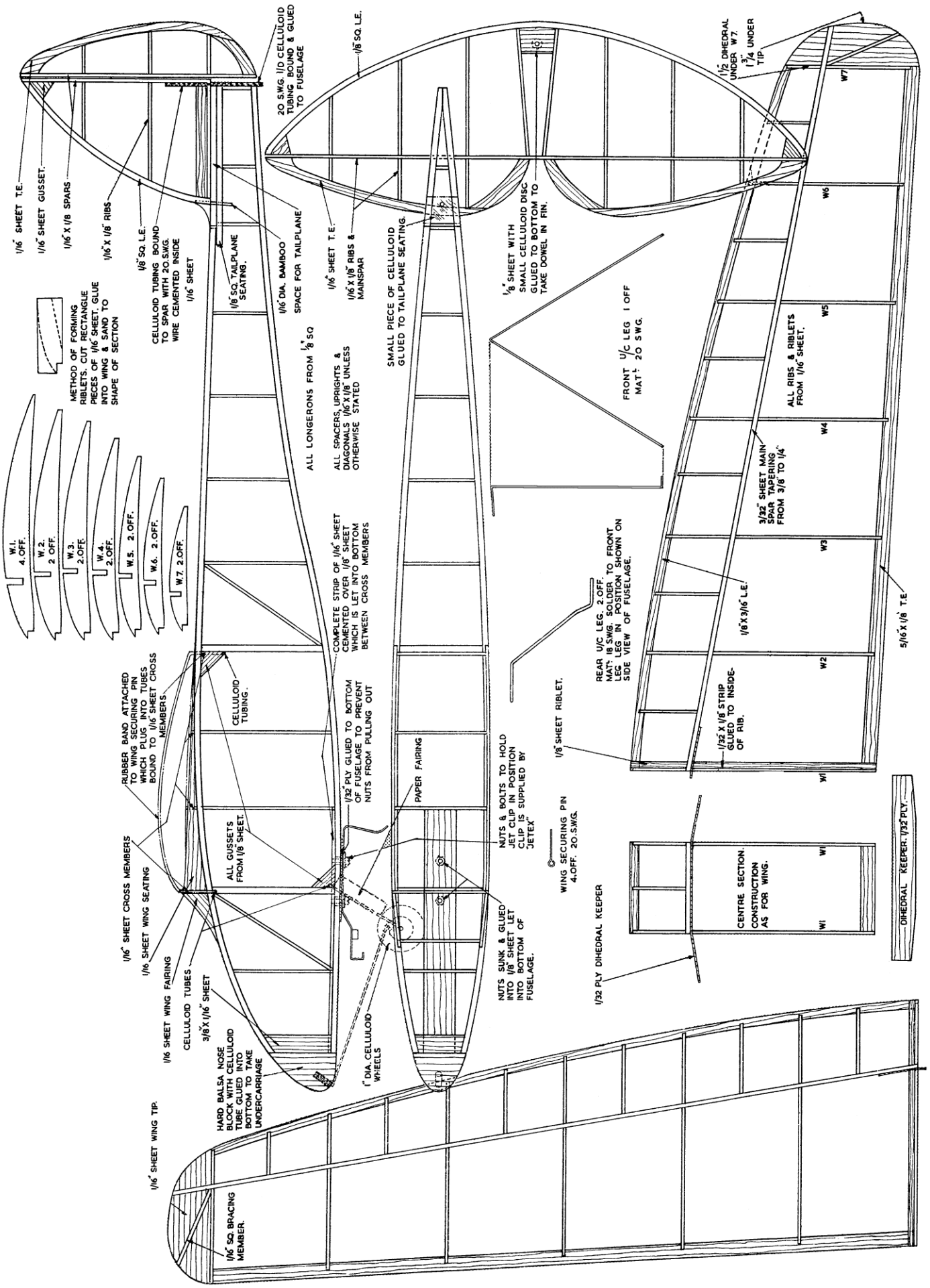
Top of TX showing the bind button and LED to left of the aerial and far left selector switch for telemetry Rx, non-telemetry and firmware update

2.4 aerial the 71 crystal case is fixed in place using double sided tape

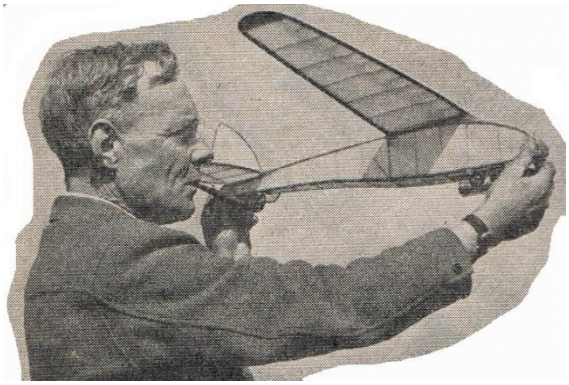


Interior showing additional wiring which now I know all works I'll tidy up. The original 8 nimh battery left side holder has gone and RF board removed and of course original telescopic aerial. Power is now from a 1500 3S Li fe battery which easily fits into the ample space created. Before when in 35 configuration draw was 220 mah it is now about 60 mah. However I have lost use of the power gauge which using Li fe was pretty much useless anyway and also the buddy box connection. Cost with RX, module and battery was £55. Installation simple apart from the don't's mentioned above.

Next page are two Jetex models the first of which looks to be a good prospect, if you don't have Jetex or rapier propulsion, to convert to electric ducted fan and perhaps with light radio to save what could be long walks.
The second model Meteor IV I don't think I'd ever attempt to mak, if I did doubtless many blank pieces of balsa would be wasted and I'd end up with an out of alignment fuselage. Not enough years left I'm afraid. James.



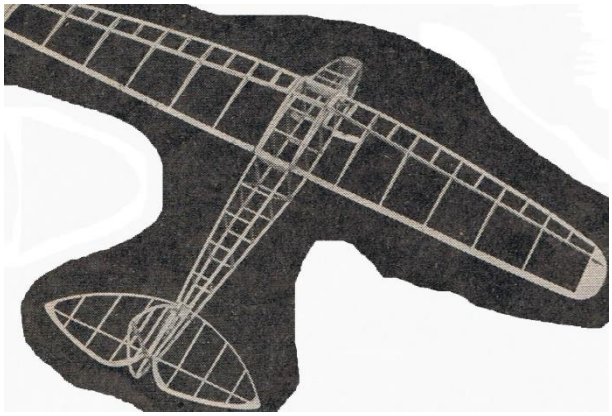
Zephyr a 34 ½" span Jetex powered model by H E Harvey from Aeromodeller June 1948



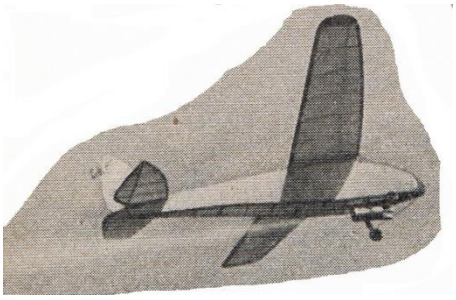
Fuselage. This is a simple slab sider. Build the two sides on the drawing. Next, cut the temporary bulkheads of 1/8th sheet balsa and hold them in place between the fuselage sides with pins at No. 3 and No. 6 cross strut positions. Cement the rear ends of the fuselage sides together, then No. 1 top and bottom crosspieces. When this has been done the fuselage sides will take a natural curve from nose to tail and the remaining cross struts can be fitted. When all are in place and the cement has set, remove the temporary bulkheads and fit normal cross struts. Next, fit the crosspieces and celluloid tubing for the wing attachment pins and undercarriage struts. and finally the wing seating on which the centre section rests.

Mainplane.
This is in three sections, right, left and centre section, cemented together and reinforced at the joints by a hard balsa bridge piece cemented to the rear face of the main spar, and a 20 gauge steel wire strip cemented and bound with tissue to the front face of the trailing edge.

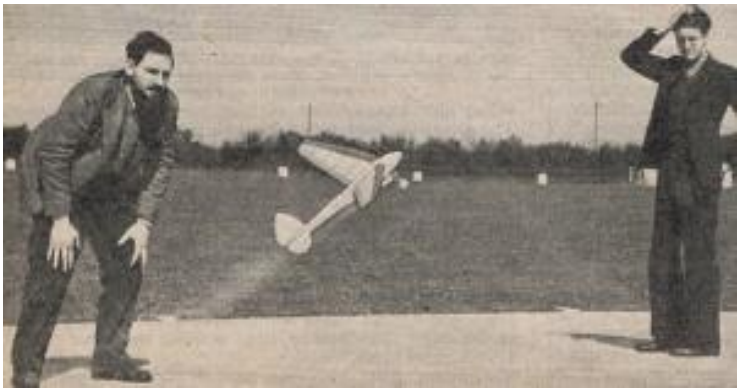
Tailplane.
Build the tailplane on the drawing, as the leading edge is of 1/8th and the trailing edge of 1/16th balsa, place strips of 1/32 sheet balsa between the drawing and the under side of the trailing edge to raise it to the correct position.

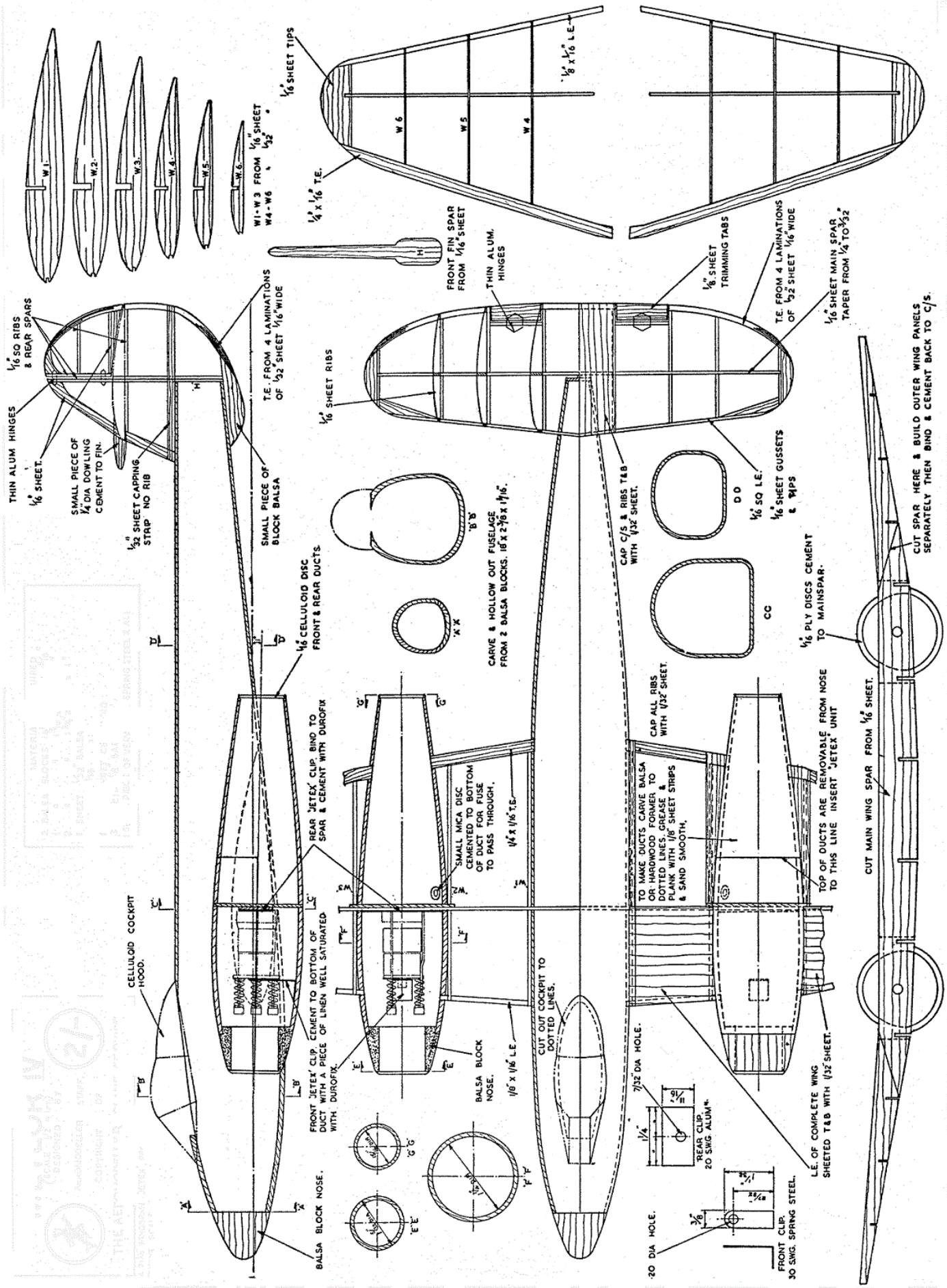


Fin and Rudder.
The fin and rudder are joined by two small sheet brass strips. Build and cover the two units as one, cut through the tissue after doping between trailing edge of fin and leading edge of rudder to allow for rudder adjustment.



Flying.
Trim the model for gliding with the Jetex unit unloaded. The extra weight of the loaded unit and light
down thrust counteracts the tendency to climb too steeply under power. Fine adjustment of downthrust can be obtained by placing thin washers between the Jetex base and the under side of the fuselage.





Meteor IV a 21 ½" span Jetex powered model from Aeromodeller June 1948

A 1/24th SCALE METEOR

The Fuselage.

This is carved from a block of hard balsa measuring 17 7/8* ins. x 2 3/8 ins. x 2 1/8 ins. This is cut vertically in half and temporarily rejoined with a layer of tissue in the joint, this to facilitate separation after the external carving has been completed. The inside is hollowed out, the thickness forward of the C.G. (which is on the main spar) should be 1/8” inch aft of this position the fuselage should be taken down as thin as possible compatible with strength. The two halves may be joined together with Durofix pre-gluing for strength.

Ducts.

A mould should be made to the inside dimensions of the duct shown on the drawing and the duct nose block tacked on with cement. The mould is well greased with petroleum jelly or vaseline and planking is commenced with medium soft 1/8 square balsa. This may be carried out with a casein glue such as” Casco, which should be left to set for 24 hours. When dry make a neat cut around the duct in the spar position, then carefully remove the two halves. Celluloid rings are cut to form a clean edge to the duct orifices also to strengthen these points. Finally attach the mica discs on the duct sides which carry the fuses.

Wing and Ducts.

Cut all spars and ribs to the drawing. The main spar is threaded through the fuselage, lined up and glued securely with Durofix. The two root ribs on either side of the fuselage are glued securely and perfect alignment assured. It should be mentioned that extreme care in building is most essential as the slightest inaccuracy in the structure will prove quite disastrous in flight. The centre section should now be completed with the exception of the sheet covering. The ducts are then fitted, lined np and glued fore and aft of the ply former. The extension planes are built on the board and aligned and glued to the main spar, the main spar spliced joints being covered with tissue saturated in Durofix. The leading edge is then sheet covered with 1/64th sheet balsa.

Tallplane, Fin, Elevator and Rudder.

These are of straightforward construction and require little explanation. Tailplane ribs are of 1/16th sheet and trailing edges of rudder and elevators are of laminated balsa using a casein glue. All hinges are of very thin tinplate or aluminium.

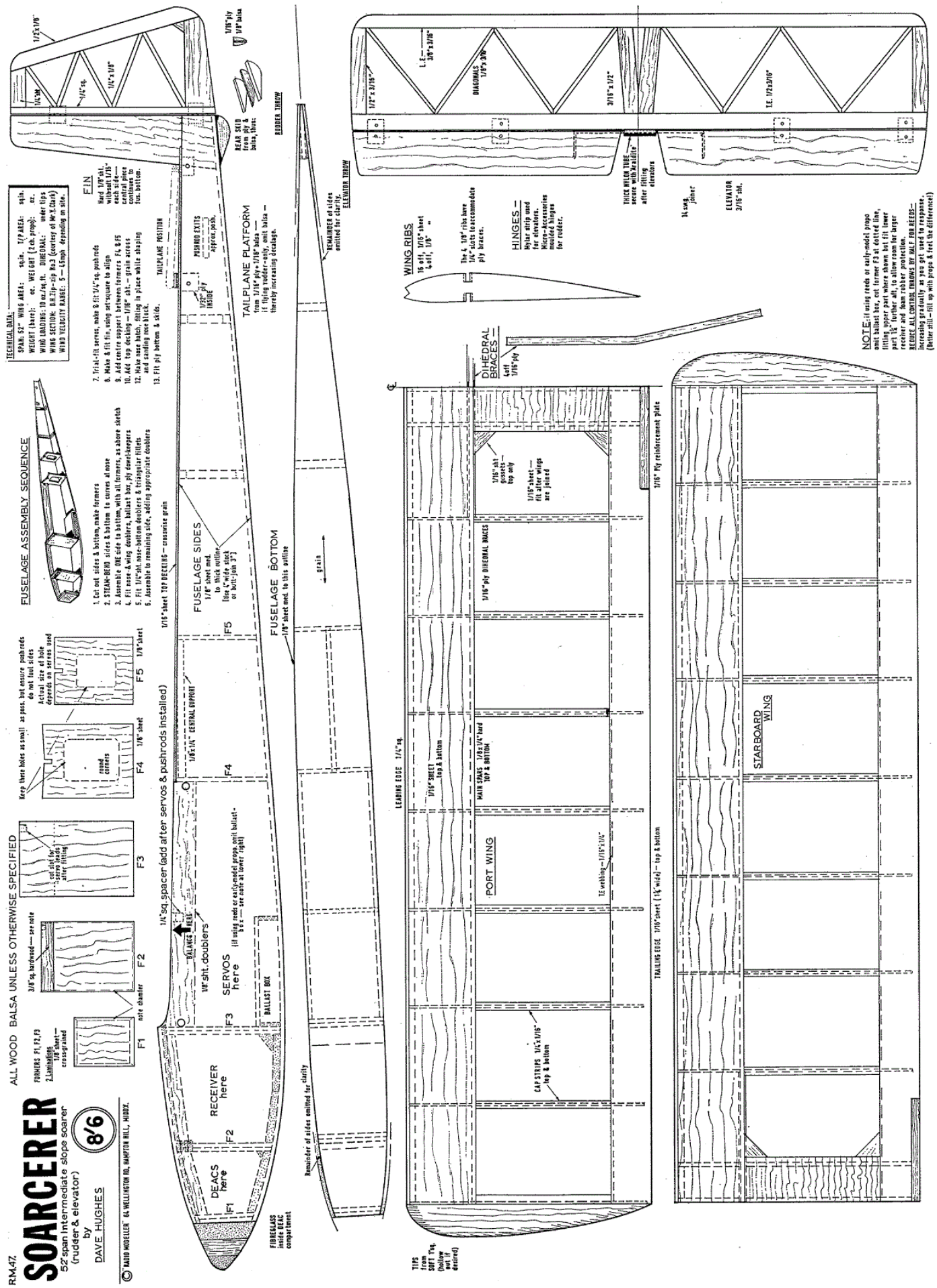
Fitting the Jet clips. This job has to be done extremely accurately and to ensure perfect alignment two card templates axe cut to fit In the front and rear duct orifices. In the centre of each is drilled a hole to take a piece of steel rod or straight dowelling. This is used as a jig for perfect alignment of the two metal clips.

Finishing.

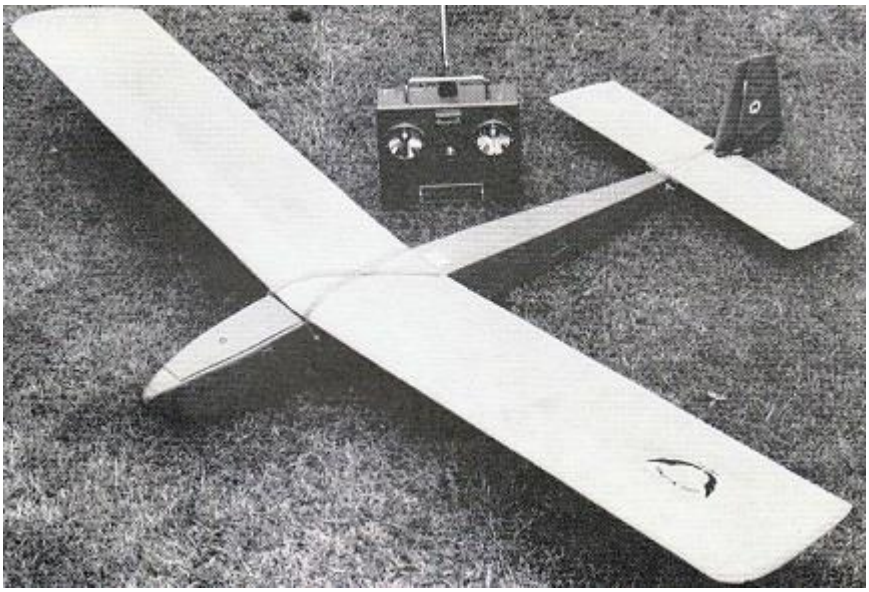
The model is covered in rag tissue with the exception of the fuselage. Water spray and apply two coats of 50-50 thinners, dope and colour trainer yellow.

Flying.

Long grass is most essential for preliminary trimming. First see that the C.G. is over the main spar and with all controls set at neutral try a glide, trim until the glide is flat. A word of warning, the glide is very fast therefore good launching is essential. Flying is a two man job. One person lighting the fuses, which come through the mica disc on the duct sides, the other actually launching. Do not launch the model until your assitant reports that both jets are expelling satisfactorily.



Soarcerer by Dave Hughes 52” span slope soarer from radio Modeller October 1969



The background story of Soarcerer really began with my experimental single channel Friday Knight prototype, as described in the June 1967 issue of R.M. The Mk. I version had plain "vee" dihedral (10deg) which, with the relatively large fin and small rudder, did not give a fast enough response or tight enough turn. Mk. II (R.M. Plan No. 16) featured a polyhedral wing which gave satisfactory turns with this fin/rudder set up, though still not enough for any violent manoeuvres. The next model, I decided, was to have a tiny fin—no more than a "post" to hang the rudder onto—and a huge, Slingsby-type rudder. To accommodate the full depth rudder, operated by a push-pull rod from a motorised actuator, rather than the S.K.'s torque rod, the underslung tailplane was replaced by one on top of the fuselage, in front of the fin—the overall fuselage length being increased by a couple of inches or so to maintain the same wing / tailplane moment arm. The original vee dihedral wing was used. This set-up certainly showed promise though, with the purely "Friday Knight" and "Soarcerer" tail ends, side by side for comparison. "bang-bang" rudder operation of a single channel actuator, it was somewhat twitchy and quite violent in response. Just at this point, I acquired my first proportional outfit and became pre-occupied with larger and heavier soarers, so Soarcerer was put aside in the loft, with all those other discarded models that I "might fly again one day, you never know."

This year has produced more hot, almost windless days, at the slope, than I can remember for a long time. I began to tire of carrying my 5 ½ lb Big Eagle to the top, to read only 5 or 6mph on the wind meter (BE. will remain aloft in about 8mph once up—but to launch it into anything less than 10 would be grossly unfair—besides meaning just another climb). So my thoughts turned once again to Soarcerer and I retrieved it from the sooty coolness of the loft, and built for it a new tailplane, complete with elevator. I then fitted my Staveley proportional gear. With receiver, Deac and two of the four Kraft servos, the all-up flying weight was just

27oz., making the wing loading around 10 oz./sq. ft.—not exactly a thistle-downer, but pretty lightly loaded for a sloper.

The weather, on the following Sunday, did not get up to its usual perverse tricks and provide a howling gale. It just continued sunny and almost windless, so first flights were not delayed.

Flying

I must admit that I was rather taken aback by the lively control response and, over-controlling, stalled Soarcerer and made it wallow about like a wounded pheasant for the first few minutes, until I began to realise that very gentle pressure on the sticks was all that was required for guidance—not violent movement—this came later when I had her weighed up.

Watch that stall, therefore; the "breakaway" is quite sudden and can take you unawares, because the model will float along quite gaily on two whiffs of nothing, but pull the stick just that little bit too far back and—womp !—there she goes—though recovery is easy and quick if you have quick reflexes.

Once you've got used to this, though, you can forget it, except that the sharp stall is undoubtedly responsible for Soarcerer's lovely spin, which it will always do "to order". (In fact, with the failsafe feature on the

Staveley gear, I have, in effect, a “spin switch”— just switch off the Tx and the servos go to full travel (as it happens “up” and “right”) and the model spins. I don’t really recommend this, however, (certainly not if anyone else is on the air— you’ll probably just get down elevator!) and I reserve it for my party piece.
Manoeuvres . . . Having flown the model in light breezes for a few sessions, and become used to varying amounts of control movement, I put it up in a 15-20mph wind, with some slight misgivings. But I needn’t have worried, Soarcerer really relished this and made height very fast. Just “leaning” on the elevator produced good penetration without too much loss of height. I have, in fact, now flown Soarcerer in winds of up to 45mph when she still coped very well. The only hazardous parts of flying in these conditions are launching and landing!
There were times, usually relatively near the slope, when it could be observed that, on feeding in “down” to get penetration, the model would simply sink (bearing out, once again, Chris Bashford’s points on ballasting, and I have incorporated a ballast box, as will be seen on the plan). However, once away from the slope this effect was not nearly so pronounced.
Let’s try throwing her about, now that getting height is no problem. Whack over the rudder—and a nice roll over and a “reversal” is easily attained. What about a roll-off-the-top? Half loop and slam on rudder—well . . . she did roll out, but about 45deg off heading—try again, that’s better, but you put the rudder in a bit early and nearly slowed the model up too much. Again, dive for speed—half loop- and-a-bit-more—now rudder—yes much better, I can see this is just a matter of practice and timing.
Rolls. Well, if she’ll hall-roll, maybe she’ll do the whole thing. Yes! With just rudder you get a very barrelly roll, but a roll nevertheless. With some practised co-ordination pumping in the down- elevator, you can get a much less barrelly—though still hardly “axial” roll, and I have managed three or four consecutive ones, again wandering off heading, but again the potential is there, with practice. You have to get the “down” in early—about when the model is on its side—and pull in some “up” as soon as it is round again on its other side. I’ve found that a more steady sort of roll can be done “Slow roll” fashion—with a long, shallow dive and putting in about half total rudder travel instead of full as for a barrel roll.
It’s great fun trying all these things, and there’s seemingly no end to the variations one can achieve by different amounts of control movements, timing and different amounts of preliminary dive.
Inverted flying. It was when doing one of these rolls, into wind, that I accidentally discovered Soarcerer’s inverted flying properties. Now, with a flat bottomed section and all that dihedral and positive incidence, one simply would not expect this to be possible, but it’s not only possible, it’s downright easy.
I find it easier to keep Soarcerer flying around inverted than either of my “aerobatic” aileron models! In anything like a good breeze, it will actually climb inverted for prolonged periods. It’s only when you push the stick too far forward and reduce the model’s inverted flying speed, that it will do a sort of inverted stall, and fall off. As I said, it was while practising rolls that I discovered this property. I rolled the model without having dived sufficiently for speed —and then slowed it up by over doing the “down”, whereupon the model just hung there into wind, upside-down—I could not get it to continue its roll! Which way?
Here the old business of “why does the rudder work the opposite way round when the model is inverted?” crops up. (Yes—you just steer it round with the same lateral stick movements as when upright). This is definitely a question of dihedral, angle of attack etc., which is probably why the model will “hesitate” when slowed down (i.e. has the wing’s angle of attack increased)—but I don’t intend to get involved in theoretical discussions on this point—I just enjoy the fact that it is so!
Outside loop. In the preamble, we mentioned “bunts” or, more correctly, outside loops. Well, Soarcerer will do them. I have done one. Only one, because I have only tried one. Yes, it did it the first time of asking but I was expecting to hear a loud crack of breaking mainspar at any moment, and have refused to push my luck further with a wing that was, after all, only built for “sedate” single-channel flying. If you want to do outside loops, I suggest you use birch mainspars. My one and only bunt was done as follows. After getting the model to a good height, it was turned downwind, then down eased in, until on about 3/4 of full stick movement it was tucking under. At about “eight o’clock” more “down” was eased in until, at about “ten o’clock” full control was on. Elevator was neutralised, of course, on arrival at “12 o’clock”.
Spin This is really clean, no particular care being necessary over the entry. Just bung on full up elevator and full rudder, and she’ll go. Neutralise, and she takes exactly half a turn to stop—so always neutralise with the model pointing towards the slope—it will then finish into wind. (Well—maybe you’d better try this at

height first —duplicates may not be identical in this respect to the original!) A rather pretty effect is attained by doing three turns to the left and then slamming the rudder over full opposite, when Soarcerer hesitates briefly and proceeds to carry on spinning in the opposite direction.

I have done quite a number of spins of 20 or so (my own record to date being 40 turns, from the proverbial great height!) and have noticed that at No. 14 the model seems to "shift gear" and spin more slowly, gradually building up speed again, if allowed to continue. T should be interested to know if anyone else finds this, or has experienced a similar pheno menon with other models.

Construction

This is essentially simple and is all covered in the notes on the plan. Control surface deflections are also indicated. The method of building the fuselage is as used for Weekender and Friday Knight and is one I have always found very satisfactory in producing a symmetrical, true, structure. The sequence is detailed on the plan, but use conventional methods if you prefer.

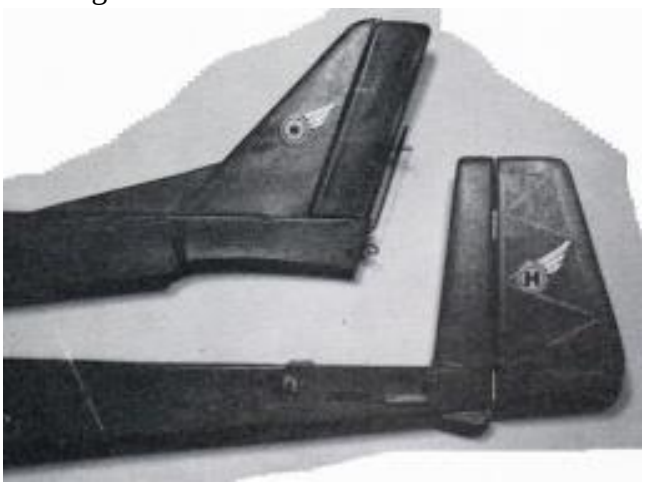
I covered the fuselage, fin and rudder in lightweight Modelspan tissue doped on, and the wings and tailplane in heavyweight Modelspan. Unless you fly over gorse or stubble fields, nylon just isn't necessary, and will put up the weight unjustifiably.

Summary

There is a great deal to be said in favour of the small light model (apart from the fact that it will fit in the Mini, without taking the wings off!) If one is obliged to do slope-side landings in awkward places, for instance, this small model is so agile that you can "sit it down" with very little forward speed in places you wouldn't go near with a heavier job. While ideal for mini propo gear, there is room for "standard" Orbit servos, or even Bonner reed servos if that's what you happen to have. It'll go on rudder-only too, of course—but believe me, without elevator you're missing 80 per cent of the fun!

Postcript

Thinking there might be no limit to this model's versatility, I tried fitting the 7 ft span wings from my original Silent Knight in order to "have a go" at the thermal soaring meeting. It performed well, from the slope, getting practically into the clouds on "nothing"—but proved just about unmanageable on the towline. After three abortive attempts we finally got it into the air safely, when again, it performed well. In the actual contest, a stronger bungee was used, the model yawed violently and the wings (or, rather, the joining dowels) folded! Ah, well, I much prefer slope soaring and, anyway, with 7ft. wings it looked ridiculous!



"Friday Knight" and "Soarcerer" tail ends, side by side for comparison.

Raynes Park MAC Website by Alan Holmes

The Raynes Park MAC has been without a website for some time due to the loss of use of the host we were using. Having now found a suitable new host the website is up and running again. You can find the site at www.raynesparkmac.co.nf
I have added some new material and more will be added in due course. The current issue of "Sticks and Tissue" can once again be viewed there.

North Cotswolds MAC August event from Gray

I'm pleased to announce that the North Cotswold MAC's Fly For Fun 2019 event will be held on Aug 10th and 11th at Far Heath Farm, Moreton-in-Marsh. This will be a special one, as we will be celebrating the club's 70th anniversary.

We'll be holding two special events alongside our regular programme, with informal judging and prizes - on the Saturday for Vintage and Nostalgia models and on the Sunday, 21st century designs only!

We'd be very grateful if you could give this an early mention in S&T when you can. I'll send further details after the Xmas mayhem has subsided.

FLITEHOOK

Indoor Free Flight Meeting
West Totton Centre, Hazel Farm Road, Totton, Southampton, SO40 8WU

Contact: Tel. 02380 861541
E-mail flitehook@talktalk.net
Café on Site

Flyers £8 Juniors & Spectators Free Flyers must be BMFA Members Sundays 10.00a.m. to 4.00p.m.

2019
10th February 2019
10th March 2019
14th April 2019

Waltham Chase Aeromodellers

INDOOR F/F MEETING

Waltham Chase Aeromodellers, in association with South Hants Indoor Flyers, are pleased to announce the continuation of the Indoor F/F Meetings held at the Main Hall at **Wickham Community Centre, Mill Lane, Wickham, Hants PO17 5AL.** These meetings will be held on the following dates:

Tuesday, 2nd. October 2018
Tuesday, 6th. November 2018
Tuesday, 4th. December 2018
Tuesday, 8th. January 2019
Tuesday, 5th. February 2019
Tuesday, 5th. March 2019
Tuesday, 2nd. April 2019
Tuesday, 7th. May 2019
Tuesday, 4th. June 2019
Tuesday, 2nd. July 2019

All meetings will run from 7.00 p.m. to 10.00 p.m. The Main Hall at Wickham Community Centre is particularly suitable for indoor free flight models of all types, with a ceiling free of obstructions. Tables and chairs will be available in the hall, the organisers are always grateful for assistance with moving furniture. A hot drinks machine is available on site.

Admission to the meetings will be £5 for fliers and £1 for spectators, whilst accompanied children will be admitted free. Junior fliers will be charged as adult spectators. Fliers will be required to show proof of insurance.

No R/C models may be flown at these events.

Flitehook, who carry a large stock of indoor models and accessories, will attend many of the meetings.

Waltham Chase Aeromodellers look forward to welcoming all indoor F/F fliers to these events.

For further details please contact:

Alan Wallington, "Wrenbeck", Bull Lane, Waltham Chase, Southampton, Hants.
(Tel. 01489 895157)

(e-mail: alan@wcaero.co.uk)

or see our web site: www.wcaero.co.uk

KK Scorpion - 44" cabin model

Ref: ot-kkscop

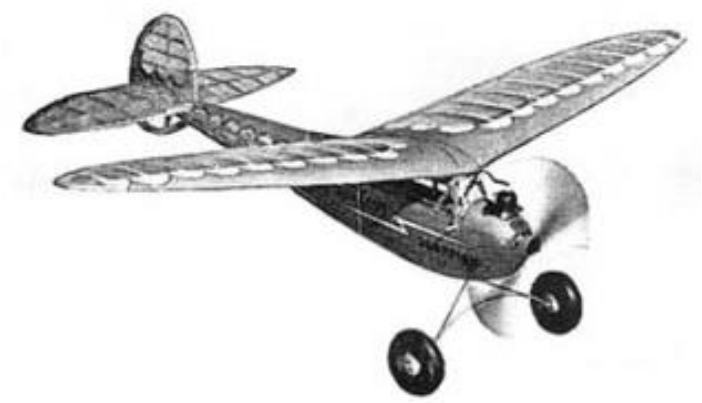
Parts Set for the attractive Keil Kraft Scorpion. Includes all the shaped balsa and plywood parts required to build the basic airframe, including bulkheads, formers, wing ribs, shaped trailing edge for wings and tail. Shaped outlines for fin and rudder, sub fin, cowl cheek sides, dihedral braces, gussets, plus many smaller items.

Builder to add their own stripwood and covering.

Full size plan included.

KK Scorpion Specification
Wingspan - 44 inches
Suitable for 1.3 to 2.5cc engines or conversion

RRP: £55.00 Inc VAT
Price: £55.00 Inc VAT
60.50 USD | 65.11 EUR



Super Scorpion - 66" cabin model Parts Set

Ref: ot-kksupersco

Parts Set for the attractive Keil Kraft derived Super Scorpion. Includes all the shaped balsa and plywood parts required to build the basic airframe, including bulkheads, formers, wing ribs, shaped trailing edge for wings and tail. Shaped outlines for fin and rudder, sub fin, cowl cheek sides, dihedral braces, gussets, plus many smaller items. ncludes plan, which shows RC Assist conversion. Builder to add their own stripwood and covering.

KK Super Scorpion SpecificationWingspan - 66 inches

Suitable for 3.5cc engines or conversions
Price: £75.00 Inc VAT
82.50 USD | 88.79 EUR

Air Trails Sportster Cabin Model

Ref: ot-airtrsport

Air Trails Sportster by Ben Shereshaw from Air Trails 1939 - 46in span Cabin model. Parts Set includes all shaped balsa and plywood parts to complete the airframe, such as fuselage sheeting, bulkheads, formers, wing ribs, tip shapes for wing and tail/fin, wing joiner boxes, plus many smaller parts. Includes full size plan

Price: £55.00 Inc VAT
60.50 USD | 65.11 EUR

Linnet Parts Set 43" span

Ref: ot-linnpk

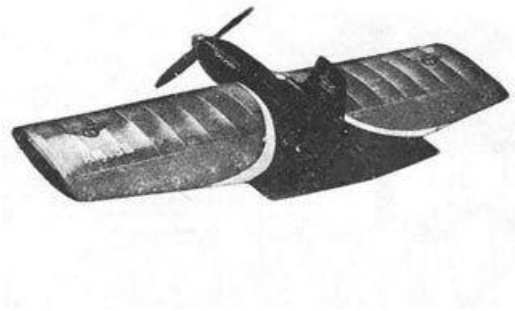
Quirky looking design by GR Woollett published in Aeromodeller January 1954
43in span suits 1.3cc size motors. Tricycle undercarriage and low wing, looks semi-scale and makes a pleasant change from the usual high wing cabin job.

Part Set includes all the laser cut balsa and plywood parts, such as cowl cheeks, fuselage sheet, formers, bulkhead, LG mount, shaped gussets, fin outlines, wing and tailplane tips, wing ribs, sub fin, wing seat, plus many smaller items.

Parts fit original Aeromodeller plan which is not included - shown for reference only. Builder to supply stripwood and covering to complete basic airframe.

Mercury Toreador CL Parts Set

Ref: ot-kktore



Parts Set for the **Mercury Toreador** model. Suitable for Stunt or Combat. Laser cut parts will save you hours of tedious cutting and include fuselage sides, fuselage top & bottom in one piece 1/2" balsa, bulkheads, formers, fin/rudder, wing tip shapes, wing ribs with additional tab to allow the symetrical wing to be built on a flat board without packing each rib, bellcrank mount, spinner ring, shaped trailing edge and elevator.

Also includes **full size plan, and canopy, vac-formed in clear plastic.**

SpecificationsWingspan - 36 inches, weight around 20 oz and suitable for 2.5 to 3.5cc engines (AM35 shown on plan). Builder to supply small amount of stripwood to complete.

Price: £50.00 Inc VAT
55.00 **USD** | 59.19 **EUR**

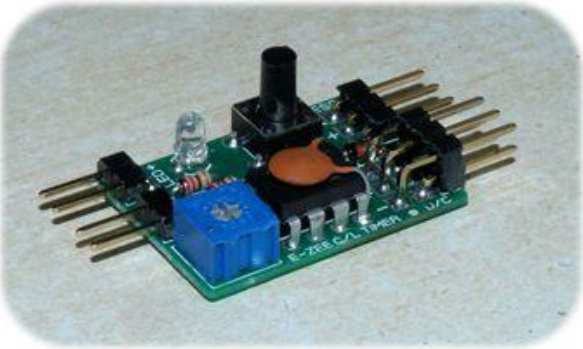
Regards,
Leon Cole
Belair Kits
Tel: +44 (0)1362 668658
www.belairkits.com
Follow us on Facebook https://www.facebook.com/pages/Belair-Kits/1448177428736984

Dens Model Supplies

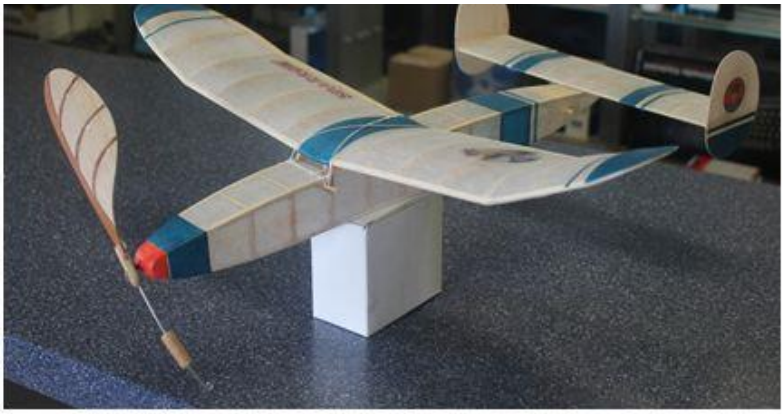
Traditional CL Kits including the ACE + Plug & Play Electric CL Starter Kit….just add glue and a battery !!

Tinplate CL tanks….Bellcranks, Lines, Handles, Cloth Hinge Tape, Leadouts etc

Cox Engines & Spares



Electronic Timers for CL & FF



Laser Cut - High Quality FF & RC Kits