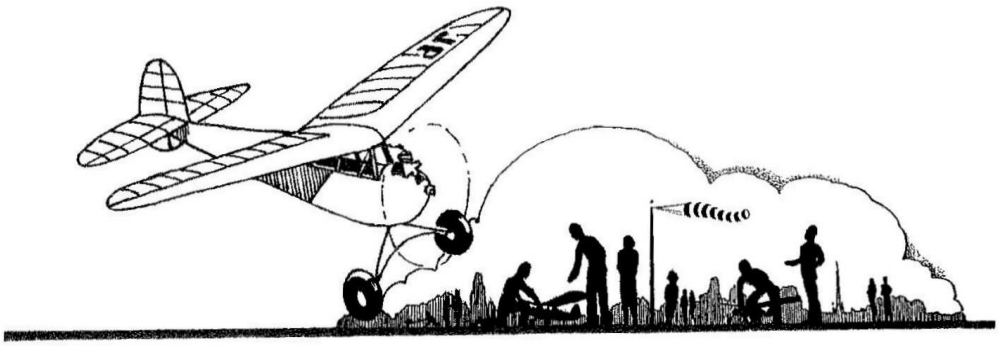


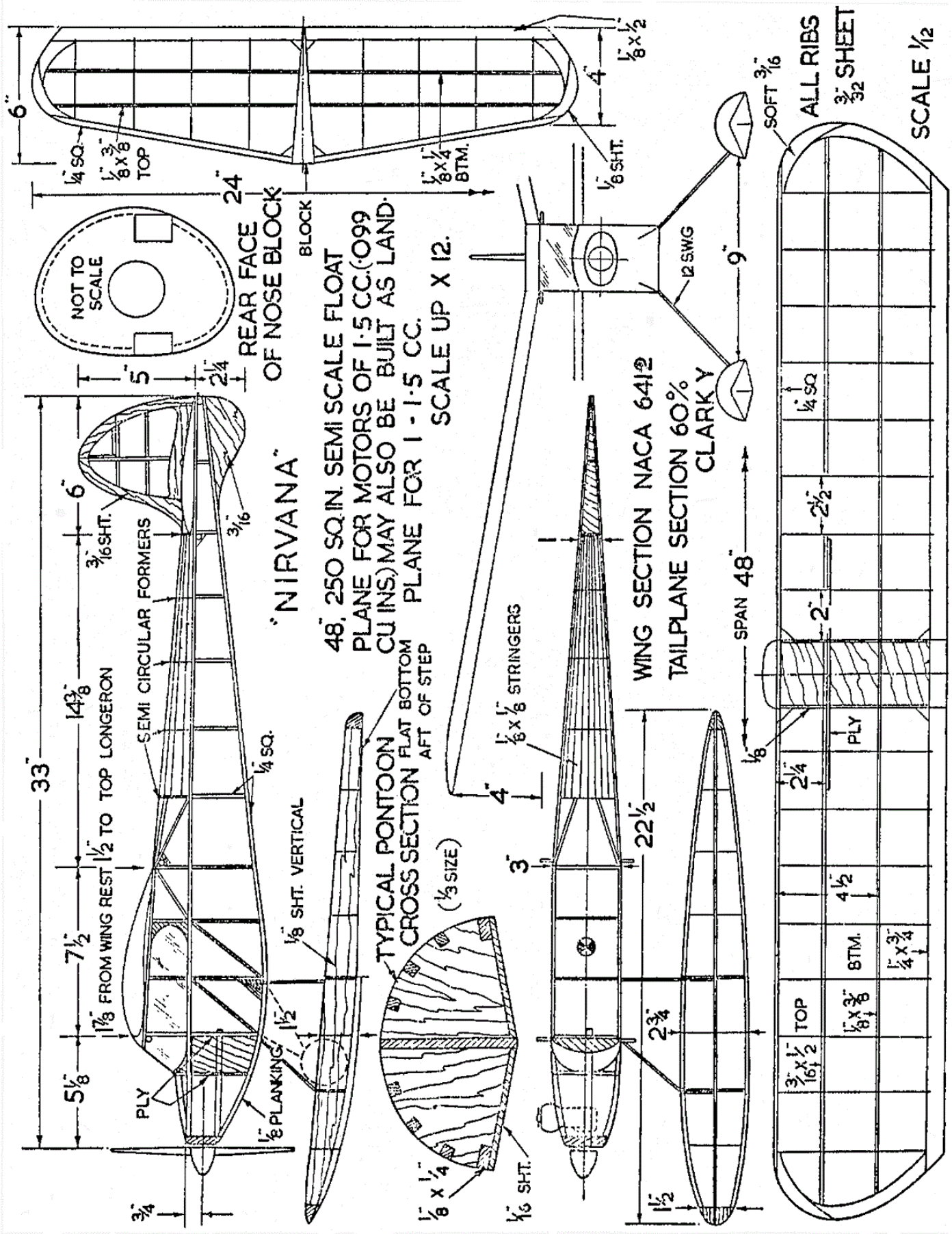
Sticks and Tissue No 147 – February 2019

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.

Typical of a Delta Year! Squadron Leader Laurie Ellis of Debden launching his version of this increasinglypopular wing planform. Model is powered with an Allbon Spitfire I cc. engine, has Clark Y airfoil section and an allup flying weight of 30 ½ ozs. From 1953 Aeromodeller Annual



Nirvana, floatplane, from 1953 Aeromodeller Annual loaned by Terry Burnal

The Mamselle 52 from Richard Farrer

Since my days of entering the Tomboy competitions I have been wanting to build another Vic Smeed design. Having seen the Mamselle at a vintage meeting and fallen in love with that shapely stringered fuselage I found out that Ray Wood had enlarged the plan to 52 inches. I obtained a plan from Traplet together with the accompanying magazine article just a week before they closed down.
Leon Cole supplied a laser cut kit and off I went. It was a most enjoyable build, a nice size, not too big for the bench and not too fiddly for fat fingers. She was fitted out with an electric motor, a Turnigy Prop Drive 28-36 750kv outrunner. Using a 3s battery and turning a 13x6.5 prop the maximum power consumption was 15 amps, well within the capabilities of the motor and the 18 amp esc. With the C of G as recommended and rigged as per plan she went up like the proverbial homesick angel on anything more than tickover. A piece of quarter inch balsa under the trailing edge of the wing cured that and now she gently climbs on half throttle and glides beautifully. All up weight ready to fly is 1160g and she flies for ever on a 2200mAh battery. With that low kv motor and a big prop she is almost silent. I am going to fit a wooden prop to her for this season. Covering is Solartex, again obtained in the nick of time as the company closed down. Graphics are from my local signwriter. All in all an absolute delight. Well done **Vic!**

From Mike Fairgray

Flying Aces Moth 24in span Rubber F/F Cabin model by JH Watters from Aeromodeller - 1987

The original design of the Moth was by Herb Spatz from the 1941 Flying Aces. I have chosen to build J H Watters redrawn plan as it included some modifications.

With the Club holding an open rubber contest this year the Moth was the perfect model. I downloaded a copy of the plan from Outerzone where there are two versions the original and the slightly modified version as published in Aeromodeller. A set of building instructions is also available to download.

Building the Flying Aces Moth.

I first built this model 15 years ago from a Peck Kit. It on it's first flight flew right off the building board. The Peck design deviated from the original by having a balsa covered centre wing section, fill inserts in the fuselage behind the nose and the tail mounting on the fuselage was built up so that the correct amount of incidence was built in whereas the original had a 1/16 block cemented to the rear of the fuselage at the tail mounting point. In addition, the tail was glued to the fuselage the original was held in place by rubber bands. I decided adopt the wing and nose modifications in my build.

The Build

Fuselage

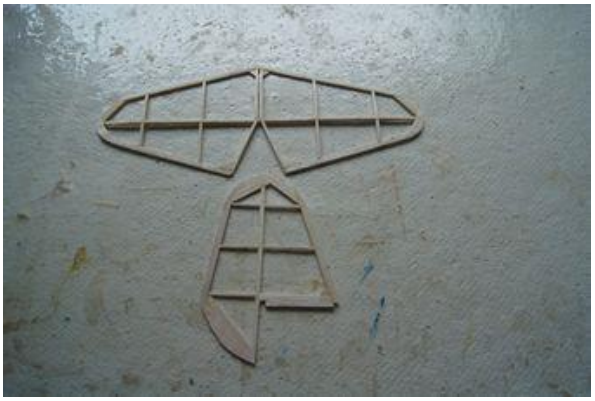
The fuselage is straight forward two sides being joined by cross pieces ending with a box like structure. I cut all the fuselage strips to 1.5x2.0mm with the 2.0mm facing up. This allowed me to sand the structure without going below the 1.5mm square size as stipulated on the plan. I tend to do this for all my models as when producing strips, the thicknesses can vary depending on the density of the balsa as the striping blade passes through. Marking the 1.5mm side with a marker makes sure that I chose the correct size to face upwards.

I do not build the sides on top of each other. To get the correct alignment I use triangular pieces of balsa pined on each side of the strip so when I lift the first side the correct alignment is not lost as it is just a matter of placing the strips between the triangles.
Once the sides are joined I fill in between the sides at the tail to produce a mounting plate set at the correct incidence for the tail to sit on. Using the Peck modification in fill, 1.5mm sheet is fitted behind the nose. The rear rubber attachment point is increased in width 1.5x2mm as the original was a bit narrow, gussets fitted and a hole drilled to fit a 3mm aluminium tube. Finally, a strip of 2.5x3mm balsa is cemented to the fuselage in front of the tail position for the tail to rest against when rubber banded in place.

The nose block is carved from a block of Balsa and locating strips fitted for a snug fit in the front of the fuselage.

Tail and Fin.

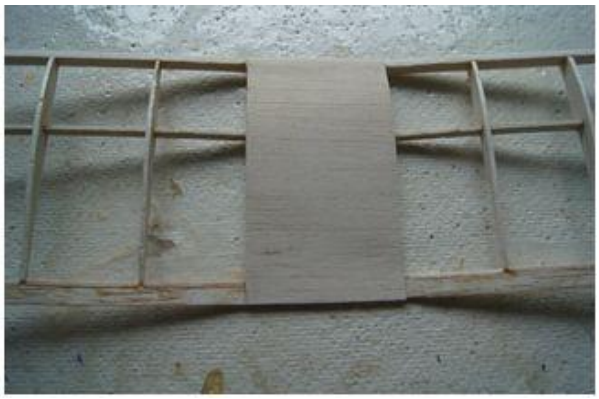
The tail and fin are made as per the plan with the exception of adding an additional centre rib and spacing these apart 1.5mm to produce a space along the centre line of the tail. An additional 1.5mm x 2mm strip is fitted to the bottom of the Fin to slot into the space made in the tail. This makes for a strong joint for the fin and makes it easier to set the fin vertical without pinning and the addition of the added strip fitted to the fin ensures the fin sits at the correct height. There is now a rib on each side of the Fin to attach the covering to when covering the tail.



Wings.

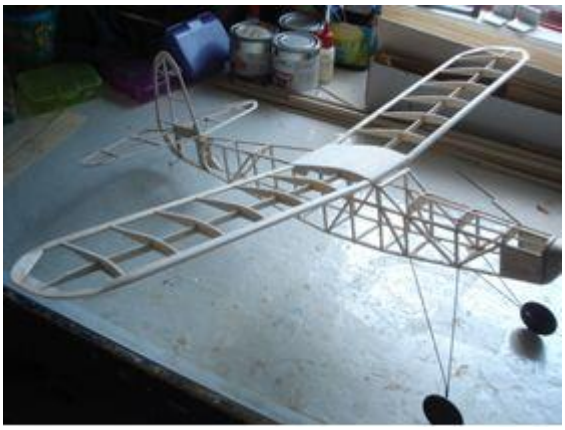
On to the wings. The plan calls for a butt joint between the rib and the trailing edge. I have never liked this method and either cut slots in the trailing edge to accommodate the rib or glue 1.5mm strips between each rib where it meets the trailing edge. I chose to fit the strip as the rib section is very small at the trailing edge. The plan calls for the wing to be built flat and to achieve the correct dihedral crack the wing at the correct position and raise each wing to the correct dihedral. I do not like this method as it makes for a weak joint. The method that I use is to build the wings flat as per

instructions and then cut the leading, trailing edge and spars at the indicated crack point and fit an extra rib angled to achieve the correct dihedral. The new ribs are fitted with gussets. There are now two wing sections and a centre section. The centre section is then covered with 1.5mm sheet as per the Peck modification. The two wing halves are now joined to the centre section.



Undercarriage.

The design of the undercarriage allows for thin wire to be used. This is made from 1mm wire and bound to the attachment points which have been reinforced with gussets.



Covering.

Now the fun part, covering. I chose to use tissue which has one side shiny. My method of covering is to coat the structure where the tissue needs to be affixed with two coats of strong dope. Cut the tissue to size and attach the shiny side out using weak dope pulling the tissue as tight as possible. Once the model is covered a spray with water tightens the tissue further. Final application of weak dope pinning down the tail, fin and wing to keep them true. As a finishing touch I found a photo of a moth on the internet inserted it in a word document and after setting it at the size I wanted printed, cut out and pasted it to the fin.

The tail and wings are attached with rubber bands. Using bands on the tail allows for any trim changes that may be required.

Summary.

This is an easy model to build for the open rubber competition.

Modifications.

1.5mm Infill behind nose.
Additional rib in the tail to provide a slot to accommodate the fin locating strip.
1.5 x 2mm locating strip cemented to the bottom of the fin.
Increase the motor peg mounting to 1.5mm x 3mm and use 2mm diameter tubing.

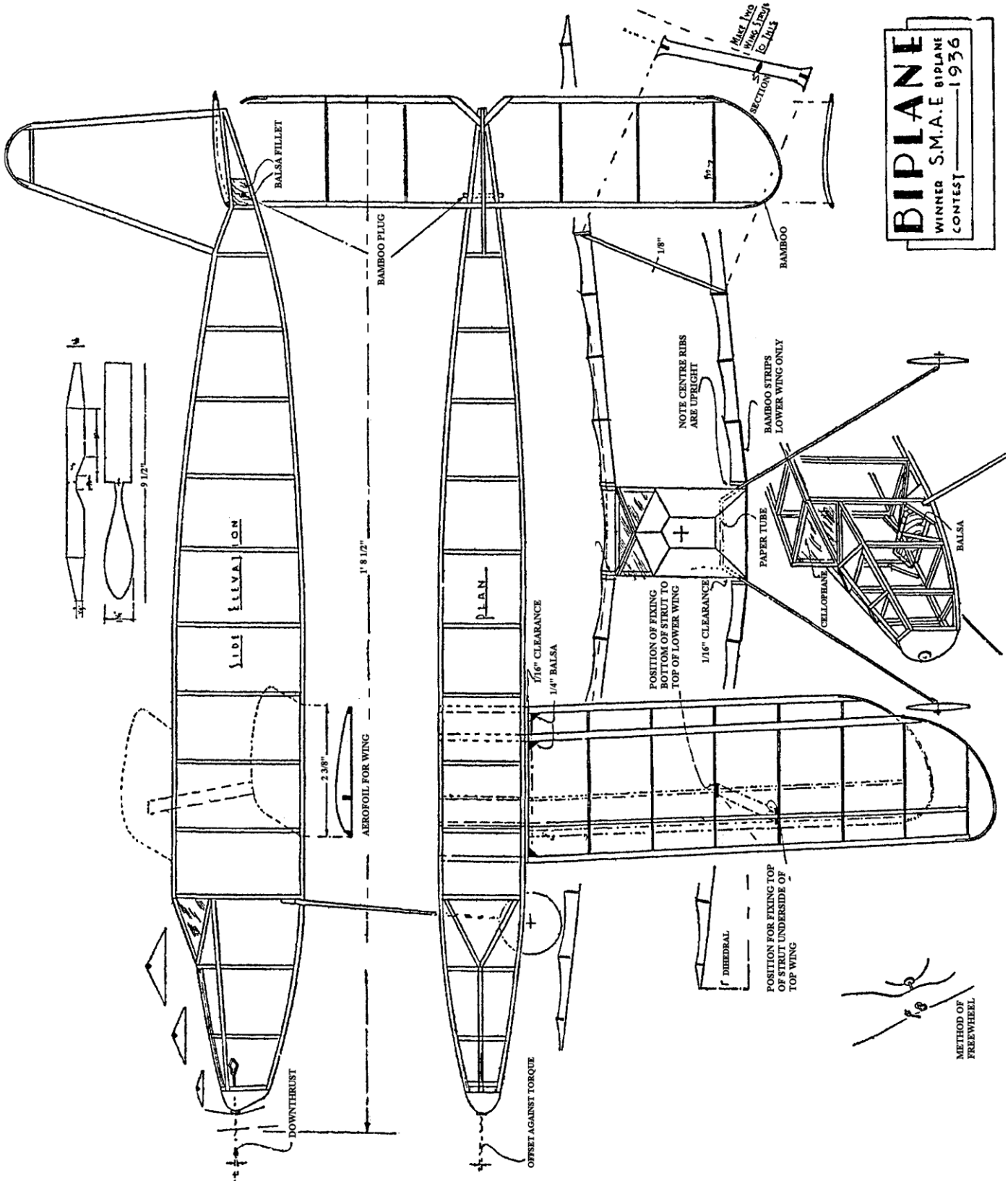
1.5 mm balsa covering the top of wing centre section.
2 x additional wing ribs for the wings set to the correct dihedral angle.
Plastic Propeller.
Use 2.0mm x 1.5mm strip sanded to 1.5mm after fuselage sides have been constructed.

Those unfinished projects.

Why is it that modellers who build from a plan or kit end up with a number of unfinished projects? I must confess that I am one such person!!!. Looking around my workshop I can count 6 models in various stages of construction. Sometimes projects are abandoned due to some part being a little complicated or as in my case I see something which catches my eye and just cannot bring myself to wait until the current project is completed before pinning down the plan, selecting the balsa and picking up the knife. Of course I blame the magazines and web sites for offering up "must build plans" but in reality I must confess this is only part of the problem. Sometimes it is because you have moved on to a different discipline for example free flight to radio control or outdoor models to indoor models. So what becomes of these unfinished models? Some are passed on to others to finish, if you are lucky you may be able to sell them on the internet but unfortunately one or two are sent to the bin. Another area is the hording of kits. I think the same problem occurs as unfinished models. You see something in the shop or on the internet and suddenly it sings out to you "you know you want me so buy me now"!!!. At least kits are a little easier to store than unfinished models but in the end if the kit does not get started in at least a couple of years after buying then it is likely to be confined to a shelf. The selling of older engines and kits on auction sites is growing. This is a little easier to understand. With the introduction of electric and ARF models a lot of modellers have gone the electric way. Even control line models have an opportunity to convert to electric.
It is a sad reality that when a keen modeller passes away someone has to deal with all this equipment and kits which either gets dumped or sold for a fraction of its worth. As can be seen on auction sites on the internet a lot of modelling gear from a deceased estate is appearing more regularly a sign of the times as older true modellers are unable to participate in the hobby or pass on to the flying field in the sky.

So what is the answer? I don't know!! but in my case I took stock of just what I have and started to either sell or make the commitment to at least try very hard to get that unfinished model back on the building board before starting another new project. Some time ago I sold all my Aeromodeller magazines, unwanted kits, engines and other equipment on the NZ site Trademe which allowed me to purchase electric equipment for virtually no cost as the money from the auction paid for it all. I must confess though, I still could not part with a good number of kits which I really know I will never build. However at least I can pull them out now and again to just look inside and dream.

So if you are like me take stock of what you have and be as ruthless as possible and either gift them on or turn into cash that which you have but do not really need to hang on to.



A Model Super-Duration Biplane by S R Crow from Newnes Practical Mechanics January 1937

A Full-size Drawing must be Made or Obtained from the Offices of this Journal, as the Model is built on the Drawing

(Please note dimensions on plan may not be exact only length 1ft 8 ½" is definitely correct. The photo copy I was working from was extremely difficult to read JP)

It is suggested that the fuselage be made of 3/32 in. balsa for normal use, although the original model utilised 1/16 in. balsa.
It can be constructed in the same way as the autogiro fuselage (details of which are given on pages 137 and 138 in last month's issue), with the exception of the built-up nose formers and the additional sections of 1/16in sheet balsa through which the bamboo motor plug goes (see side elevation).
Negative incidence to the tail-plane is built into the fuselage; therefore construct the latter with the greatest care, as a model with the wrong incidence in the tail-plane will perform unwanted aerobatics.

Tail-plane

Pin a length of 1/8 x 1/4 in balsa on to your drawing for the leading edge and then construct the trailing edge (1/8 x 1/16 in balsa) in the sections shown, as grain direction is important. Follow this by placing into position the 7 ribs which have been cut from 1/32 in balsa. Two bamboo strips bent in steam and held in position by pins until dry are cemented on to complete the tail-plane

Fin

For both leading and trailing edges use 1/8 x 1/16 in. balsa with bent bamboo for the tip. A length of 1/16 in. 1/16 in. balsa is cemented across the top of the fin for strength, which being single surfaced, does not require ribs. On taking up the fin outline, cement the trailing edge between the two sides at the end of the fuselage, and the leading edge to the top fuselage spacer.
The detail drawing of the undercarriage will simplify the construction of the latter. Bamboo legs plugged into note-paper tubes will give a detachable unit (see autogiro undercarriage), the wheels also being made by the same method as for the autogiro.
Make an aerofoil template of plywood to the given section and cut 22 ribs of 1/32 in. and 6 of 1/16 in. balsa. The four wing-tip ribs can be made without a template.

Upper Wing

Both wings are made in two halves; this will necessitate tracing and reversing the half shown on the drawing. Lay down the 3/16in. X 1/16 in. main spar and cement on the ribs. The leading edge is made of 3/32 in x 3/32 in. balsa and the trailing edge of in 1/8 x 1/16 in. Bamboo tips bent in steam can now be cemented on.
The centre section of the top wing is made separately, the two wing halves being cemented to it. Dihedral is gained by sloping the two ribs of the centre section slightly inwards.

Lower Wing

This differs from the top wing only in span, as you can see from the drawing.
Build it the same way as the upper wing, but be sure to slope the centre ribs outward slightly to bring them vertical when the dihedral is steamed in (see front elevation).
Bamboo strips, 1/16 in. x 1/16 in. are cemented underneath the leading edge, main spar, and trailing edge. The dihedral is now steamed in. Make two wing struts of 1/16-in. balsa and push them into their respective places. Make sure the wings are true before letting the cement dry.

Nose Block

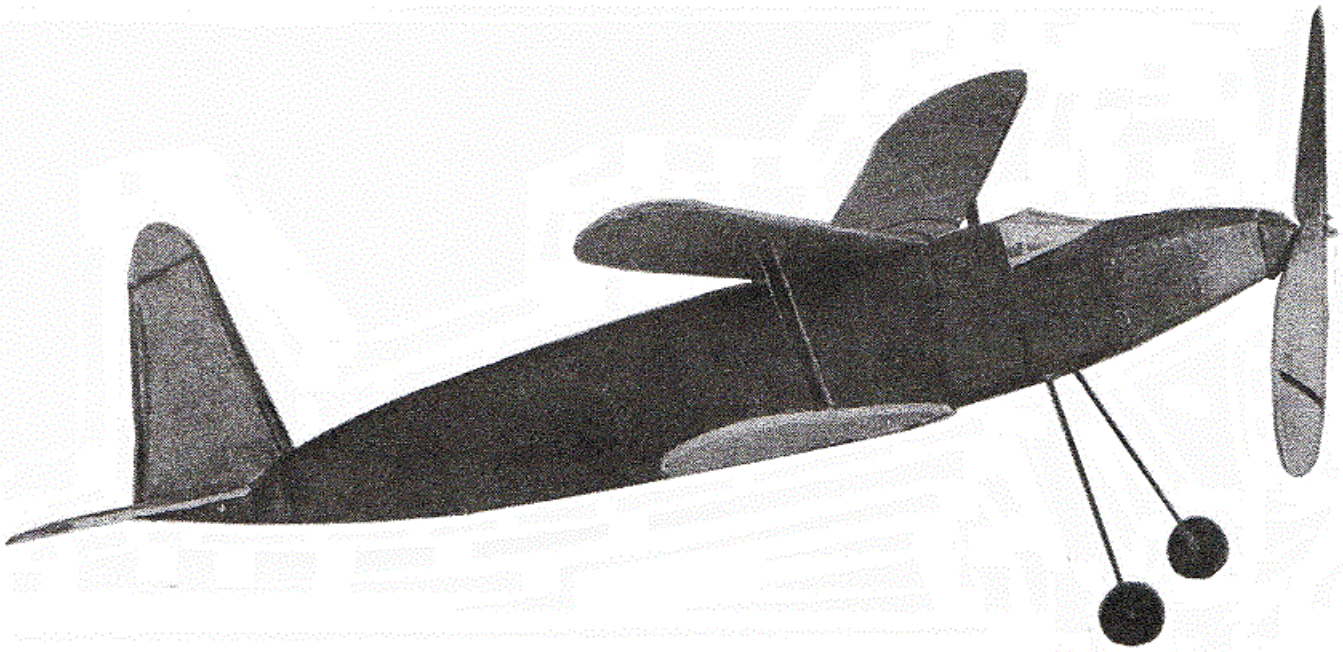
Make the nose block from hard balsa, sanding a finish with fine sandpaper. Before drilling a hole for the brass bush, cement a portion of 1/8-in. flat balsa behind the nose block to keep the latter in position.
18 S.W.G. piano wire is bent to shape for the prop shaft. To make the free wheel, shape the hook end of the shaft and then pass the shaft through the nose block and propeller, bonding the loop in the end with sharp nosed pliers. A ratchet of 20 S.W.G. piano wire held by a pin completes this unit, and the ratchet must be free (see free wheel detail.)

The Propeller

A block of medium-hard balsa, size 9 1/2 in. x l 1/8 in. x 3/4in., is marked as shown on drawing by using a plywood template symmetrical blades can be easily marked. Cut to shape with a fretsaw. Next the blank must be cut as shown on the side elevation of the propeller drawing, carving and finishing being done with a penknife, or spokeshave and sandpaper. The brass bush should be inserted before carving is started.

Covering

Cover the model with superfine tissue, dope or paste being used for adhesive. Stick the paper only round the outline of the fuselage and wings, as this gives it more chance to stretch after steaming. A coat of banana oil is now given to the whole covering of the model. (Coloured papers improve the appearance if the right scheme is used.)



Materials required

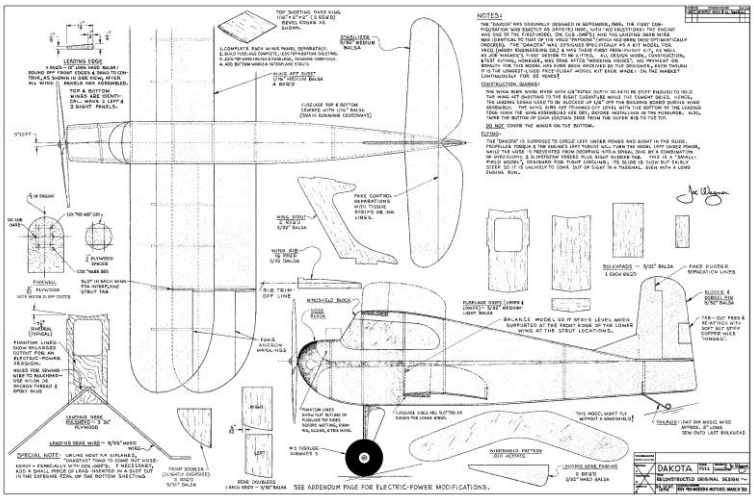
12 lengths of 3 ft x 3/32 in x 3/32 in sq (or if built as original, 8 of 1/16 x 1/16 in and 4 of 3/32 x 3/32 in).
1 length of balsa 1/8 x 1/8 in.
1 blank of 1/16 sheet balsa
1 block medium hard balsa, 9 ½ ins x 1 1/8 in x ¾ in. bamboo.
2 lengths of 3/16 x 1/16 in balsa
3 lengths of 1/8 x 1/16 in balsa
1 block balsa 2 in x 1 in x 1in/(nose block).
1 dozen cup washers
6 in celluloid tubing to take 20 s.w.g.
2 brass bushes to take 16 s.e.g.
2 sheets of tissue for wings
1 tin banana oil
1 tube glue

The following from Den of Den's models

It's the Dakota's (no not that one)
70th Anniversary

Just a reminder that it's the 70th anniversary of the classic FF design by Joe Wagner….here's a quote from the plans text:-

*"The 'Dakota' was originally designed in September, 1949. The first configuration was exactly as depicted here, with two exceptions: the engine was one of the first-model OK Cub .O49's; and the landing gear wire was identical to that of the Veco Papoose (which had been over-optimistically ordered). The 'Dakota' was designed specifically as a kit model for Veco (Henry Engineering Co.) and was their first free-flight kit, as well as Joe Wagner's first design to be kitted. All design work, construction, test flying, however, was done after 'working hours'. No payment or royalty for this model has ever been received by the designer, even though it is the longest-lived free-flight model kit ever made: on the market continuously for 25 years! Construction quirks: The wing ribs were made with 1/4in extra depth so as to be stiff enough to hold the wing aft sheeting to the right curvature while the cement dries. Hence, the leading edges need to be blocked up 1/4in off the building board during wing assembly. The wing ribs are trimmed off level with the bottom of the leading edge when the wing assemblies are dry, before installing in the fuselage. Also, taper the bottom of each leading edge from the outer rib to the tip. *Do not* cover the wings on the bottom. Flying: The 'Dakota' is supposed to circle left under power and right in the glide. Propeller torque and the engine's left thrust will turn the model left under power, while the nose is prevented from dropping into a spiral dive by a combination of gyroscopic and slipstream forces plus right rudder tab. This is a 'small-field model', designed for tight circling; its glide is slow but fairly steep so it is unlikely to soar out of sight in a thermal. Even with a long engine* run.



to

Just the job then to fly in my local meadow and an ideal opportunity to convert the design electric and use a small motor only timer newly designed by Alan Bond at Forge Electronics….and it just so happens it's my 70th anniversary later this year.

Laser Four Stroke Diesels From Jack Hiner

In 2012 I built a Lanzo Airborn scaled to 1600 sq. in. wing area for the SAM electric Limited Motor Run (LMR) event. After some LMR wins I modified the model for the SAM Texaco evet using a PAW .40 diesel. See attached photo below. Actually more like 1629 sq. in. wing area. I also beefed up the airframe so a bit big for the PAW.

Later I installed a Laser .75 four stroke diesel. The Laser is massive at least 13 ounces heavier than the PAW. With heavier motor mount and prop more like a pound heavier. So I made a hatch at the rear of the fuselage to install ballast for proper CG. Flown for sport with 16/5 wood prop. The Laser is close to 30 years old.

A couple years back I purchased a Laser .80 four stroke diesel. About the same weight as the older .75 diesel. I installed the new Laser on the test stand with 16/5 wood prop to get familiar with the engine. I always do this and do not fly the engine until I know it well on the test stand. I then installed the .80 on the big Airborn.

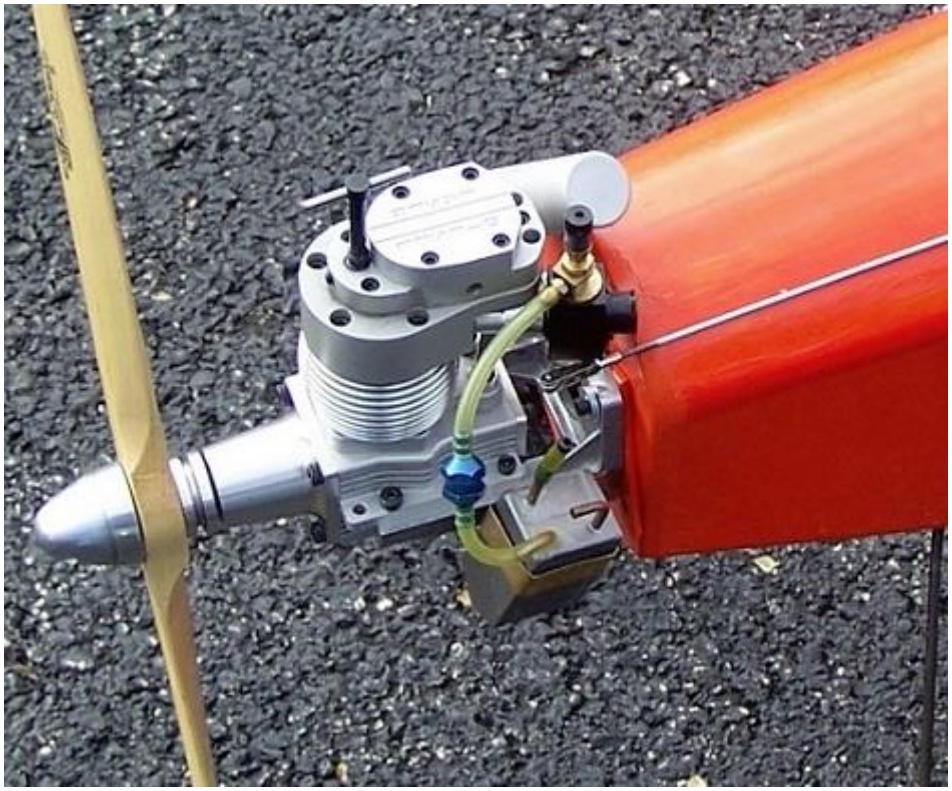
January 2019 the first flight of the Airborn with the .80 were made at the Eloy, Arizona SAM contest in the Texaco event. A larger prop was used with Aerodyne four stroke diesel fuel. Jon at Laser recommends 15% oil four this four stroke diesel. Winter at home so when warm weather returns I need to test various props for improved performance.

Airborn PAW Texaco 40

Laser .75 Test Stand And Airborn 16/5 Wood Prop

Airborn Laser Eloy 2019

Laser .80 FS Diesel



Laser .80 FS Diesel Texaco Laser .80 16/5 Wood Prop For the .80 I had to move the Uni-Flowfuel tank to other side of fuselage. Used the same O. S. four stroke motor mount for the .75 and .80 diesels. Black hose attached to muffler keeps model free of oil. This photo with black hose last month in Arizona SAM contest

The following is from Practical Mechanics August 1934, photo copies were taken by Keith Derbyshire several years ago and given to me. The magazines are now "gone". As of great interest I hope you enjoy however several that will appear in next months whilst readable have bits missing JP

Petrol-Driven Model Aeroplanes by Capt. C E Bowden R.A.S.C.

A description of some interesting experiments with Petrol Model Aeroplanes. Up to date there have been seven since 1932. All these models have certain characteristic features, but for the sake of interest and experiment they have been of different types.

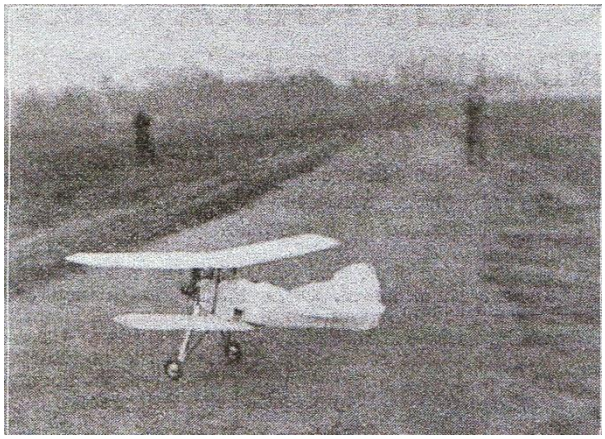


Fig 1. The Kanga taking off with the tail up and one wheel just off the ground

As this is the first time that I have had the pleasure of writing for Practical Mechanics, my name will no doubt be unknown to many readers. Perhaps I had therefore better introduce myself by giving a short history of what led up to these models. Before the war, when I built rubber models, I watched with great interest Mr. Stanger's two petrol models produced in 1914. These models may be said to have been the first successful petrol models.

However, the war intervened, and it was not until 1932 that I got into touch with Mr. T. Edgar Westbury, and he converted an old 28 c.c. two-stroke engine that had been used in a model speed boat. It was very heavy, but produced an excellent thrust. It weighed 3 3/4 lb., less ignition gear. I then produced the biplane "Kanga," which on its first officially observed attempt flew for 71 seconds, thus beating the Stanger record of 51 seconds set up eighteen years before.

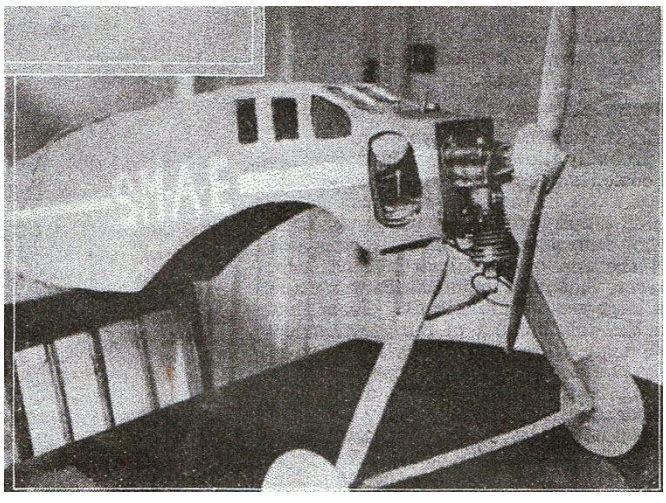
The flights with "Kanga" proved to me that the modem model petrol engine was quite up to the job, but that there were a lot of minor snags to be overcome before the whole model could be made reliable. After a certain amount of discussion Mr. Westbury set about producing a really light petrol engine of 15 c.c. The "Atom Minor" was the result, and was running in three months. This famous little engine is a two.stroke of 14.2 c.c. and weighs 1 lb. 3 oz. with elektron propeller, and may be said to be the successful forerunner of all the light 15 c.c. petrol engines now produced for model aeroplanes.

For this engine I designed a very simple and robust, but ugly, model called the "Bee," that could be quickly packed up and placed in a car in sections. This model on its first day out, in a heavy wind, put up the record 86 seconds officially observed. However, it suffered from carburation troubles.

Fig 4. The Bee climbing in right hand circles

A Record Breaker

The "Bee," after a number of successful flights at various places, won the 1933 Sir John Shelley Power Cup and set up a record of 8 minutes 42 seconds out of sight. The model actually flew for 15 minutes, until the 2oz. of fuel carried ran out. It then glided down from about 1,000 ft. into a school building. I followed below in my car, but the official timekeepers had to remain at the start to comply with existing regulations.



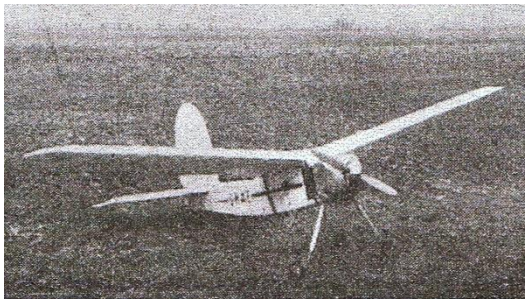
At the time, of writing this record still stands unbeaten. I then built a better looking low wing model called the "Gull" or " P.3" of the series. This aeroplane had an oval fuselage. It flew a fair number of times but was not a 'success, due to insufficient lateral stability and the tendency 'to damage because of the too rigid wing fixing. The model has now been scrapped and a new low wing cabin monoplane has risen in its stead.

As most people know, a successful low wing model aeroplane is far harder to design than a high wing.

Then followed a small biplane called “Roo.” built to see how small a model could be produced for an “ Atom Minor engine.
The next model was a speed model and finally a new advanced: simple type high wing model for the 1934 Power Competition, and the designs for a petrol flying boat for 1935.
I will now give a description of the main features of each model with photographs which I hope will be of interest to readers and possible serve as useful data to

Fig 7. The drone without engine cowling. Note the fuselage for low wing location.

those newcomers to petrol who are thinking out their first petrol model.
The “Kanga”
The description of this model is given in the past tense, as it was recently scrapped, after having given all the information desired of it. Nevertheless it is an interesting model to study, as it started the ball rolling and makes an excellent subject for comparison with later models.
The model was a biplane and weighed approximately 10 lb. It was fitted with modified “Wall” two-stroke engine, of 28 c.c., weighing 3 1/2 lb. with propeller.
The top wing was 7-ft. span and 10-in. chord, whilst the bottom wing had a span of 6ft.and chord l0ins. The top wing had less dihedral angle than the bottom. Both wings had a modified RA F. 34 Section, with reflex trailing edge, chosen for its stability. This section has the disadvantages of being rather fast however. This section was also used on my second model, the “Bee.” But recently I have developed a section of my own which is also stable but much slower. This has a decided concave under-surface and is of the thick type. The fuselage was 3 ft. 9 in. long.
The original propeller was of wood, and, strangely enough, lasted quite a long time. However, I eventually had castings made in elektron. These cost about 3s. each and are practically unbreakable. Propeller diameter



22 in. There was a complicated clock device fitted which, after any desired time, throttled down the engine to a slow running step on the carburettor, so that the model was assisted on its glide. In fsct it slowly flew into land.
A Perfect Landing
An arm projecting just forward of the under-carriage was connected to a forward ignition switch. Thus when the model flew slowly down with the engine just ticking over, as soon as this arm

Fig 3. The Bee after a forced landing

touched the ground the engine was completely switched off. The Pathé Film Company made a film of this model in flight, and the film depicts the sequence of events on landing excellently.
However, since then I have simplified the operations considerably, as will be seen in the descriptions of subsequent models.
The flying speed of the model was about 20 m.p.h., which was rather high. The model, nevertheless, had quite a slow glide with engine just firing. The undercarriage was of split type and somewhat similar to full size practice, the main legs being telescopic and internally sprung. These legs were made of duralumin tube.
The engine mounting was a duralumin spider with four legs bolted up to a forward bulkhead of three-ply wood.
It was found that this bulkhead used to collapse, due to the heavy weight of the engine. It was therefore strengthened by an aluminium tray (see description of the next model). This method of mounting was very strong but rather heavy, and in my latest models I have further improved the method. It is practically essential in a petrol model, if one desires the minimum of trouble, to mount engines so that there is flexibility in the event of a crash. I found that the spider bent rather than the engine.

Fig 2. The Kanga in full flight

More economical and therefore desirable. The ignition gear was somewhat involved on both this model and the present record holder, the "Bee." 1 have, however, simplified this for 1934 at the expense of several ounces more weight, which I have saved in other ways in the machine. A Westbury 8 oz. Non-trembler Coil was used with a Delco Remy 1 oz condenser. A two-way switch was incorporated in the wiring, and also the forward switch already
mentioned. The wiring alone weighed 4oz!
A 4 oz pocket flash lamp battery of the flat sort, with a voltage of 4 1/2, was installed in the machine and kept in place by rubber bands. An accumulator of large capacity, on the ground, was plugged into two sockets for starting up and warming up the engine in order to conserve the energy of the small flash lamp battery.
Just prior to a flight the ignition was switched over to the flash lamp battery and the plugs of the accumulator withdrawn. The throttle was opened up and the clock brake lever released, the length of flight having been previously set on the clock, and the model was released.
All these operations had to be carried out in a very short space of time and under the great excitement of the unknown! Two special wheels and tyres were made for me by the Dunlop Rubber Co., weighing 4 oz each, and perhaps the greatest factor in the original success of this model was that the whole affair was designed to collapse if it hit anything unduly hard on landing.
To this end the two main planes were kept in position by stout rubber bands (model aeroplane elastic) and were able to be slid along the fuselage to allow for correct c.g. position, or to be knocked off in the event of a crash.
The Tail Plane and Fin
These were also kept on by rubber bands. All these components were kept on just sufficiently firmly to resist the air pressure at maximum speed. I have followed out this system in all my petrol models except in the ease of the "Gull," which may be said to have been a failure because of departure from this principle. I have noticed that all the successful petrol models produced by other people since "Kanga" have similar ideas incorporated. The few rigidly constructed models have given a great deal of trouble, and in most cases the constructor has come down to some detachable device eventually. One has to remember that there is a much greater weight in a petrol model to be stopped when it hits an obstruction.
There are several other important points also to be considered
(1) The wing loading must be light (not even 1 lb. per square ft.) so that flying speed is not excessive.
(2) Automatic stability, with exaggerated stabilising areas, must be sought after more than in a light model, for naturally the weight of a petrol model requires a longer time to change direction when righted.
(3) Any type of wire or strut bracing will be likely to become deranged after a bad landing, and thus upset one's calculations for the settings for the next flight. Cantilever construction is therefore most desirable.
(4) It is not advisable to construct a petrol model too lightly, but, on the other hand, weight has to be carefully considered in each detail. Experience soon teaches one exactly what will be required in any part to resist ordinary heavy landings. Of course one cannot legislate for the extraordinary, and yet produce a model sufficiently light to fly well.
The "Bee"-
As a result of the experience gained on "Kanga," a smaller and lighter model, the
Sorry this is where the photo copies finished JP

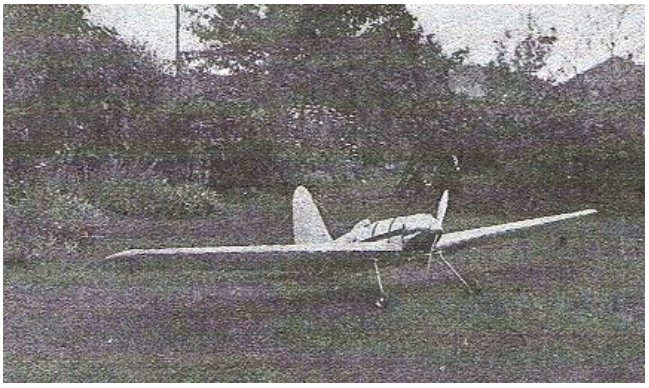


Fig 5. The Gull low wing monoplane

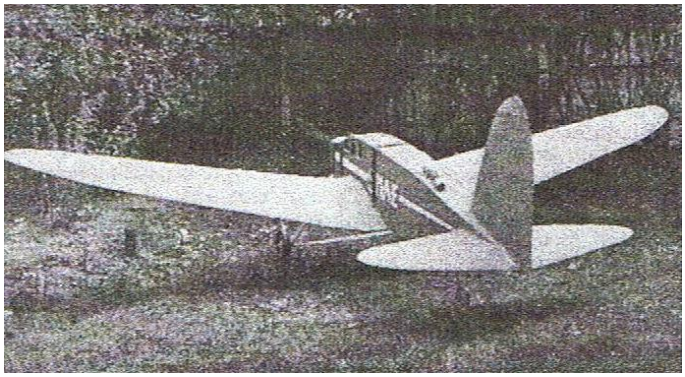
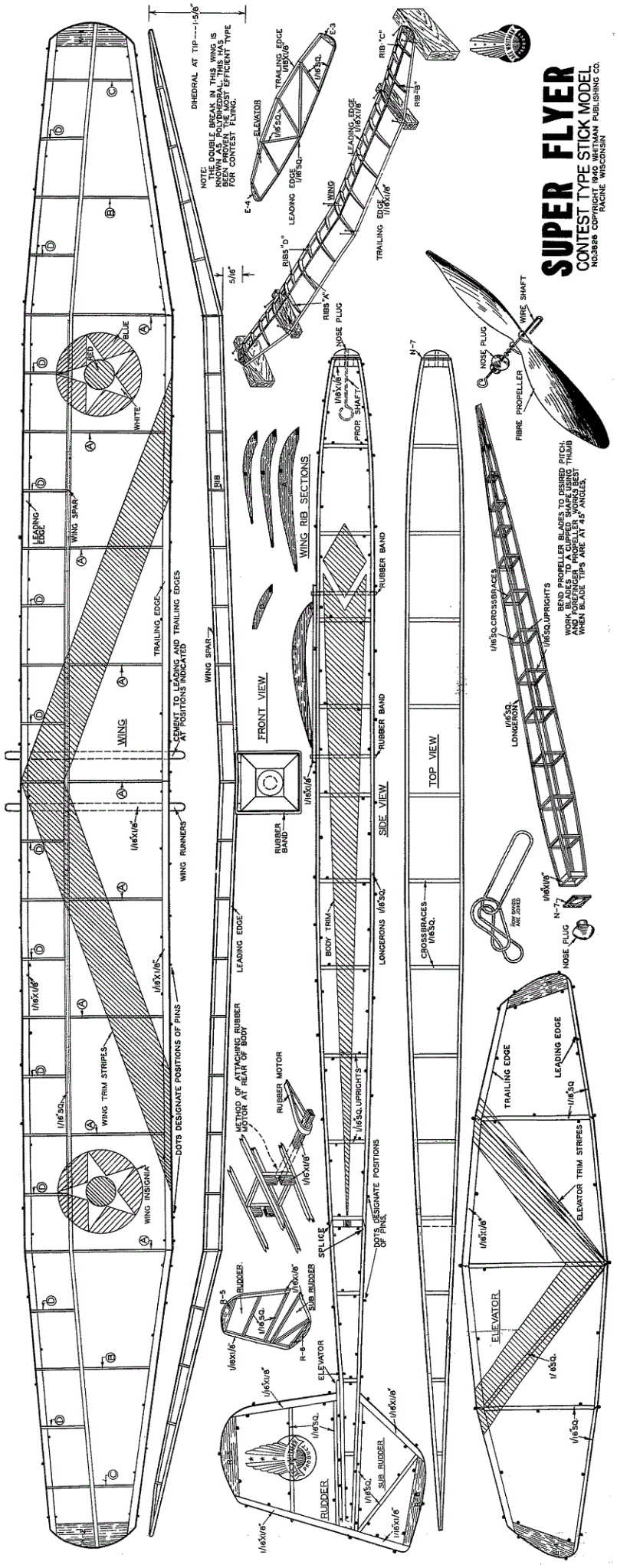


Fig. 6 The Drone low-wing cabin monoplane



Another blunder with my inclusion of plans

This plan was kindly sent to me by Frank Schwartz in the States in approximately 2014. I spent ages trying to get permission to include and chased around several companies all of whom knew nothing of this plan and copyrights. At this stage I decided to put in S&T as there were no further avenues to pursue that I knew of. Anyway I thought I had included but as it turned out I hadn't so sincere apologies to Frank. So many years later here the plan is. I had to remove superfluous marks etc on the copy (all the marks which appear on plans make the actual file enormous) and have ended up with this if anyone requires the copy of the original please let me know. JP

From Bill Wells

Here is my offering for Feb S&T. I thought that a firm that only made two engines would be simple to write something short about!! Fifty pages of excellent reporting from Adrian Duncan, put an end to that preconception. So if anyone is interested a full account of Rivers engines it is available on Adrian's website. That keeps my writing to a minimum!!

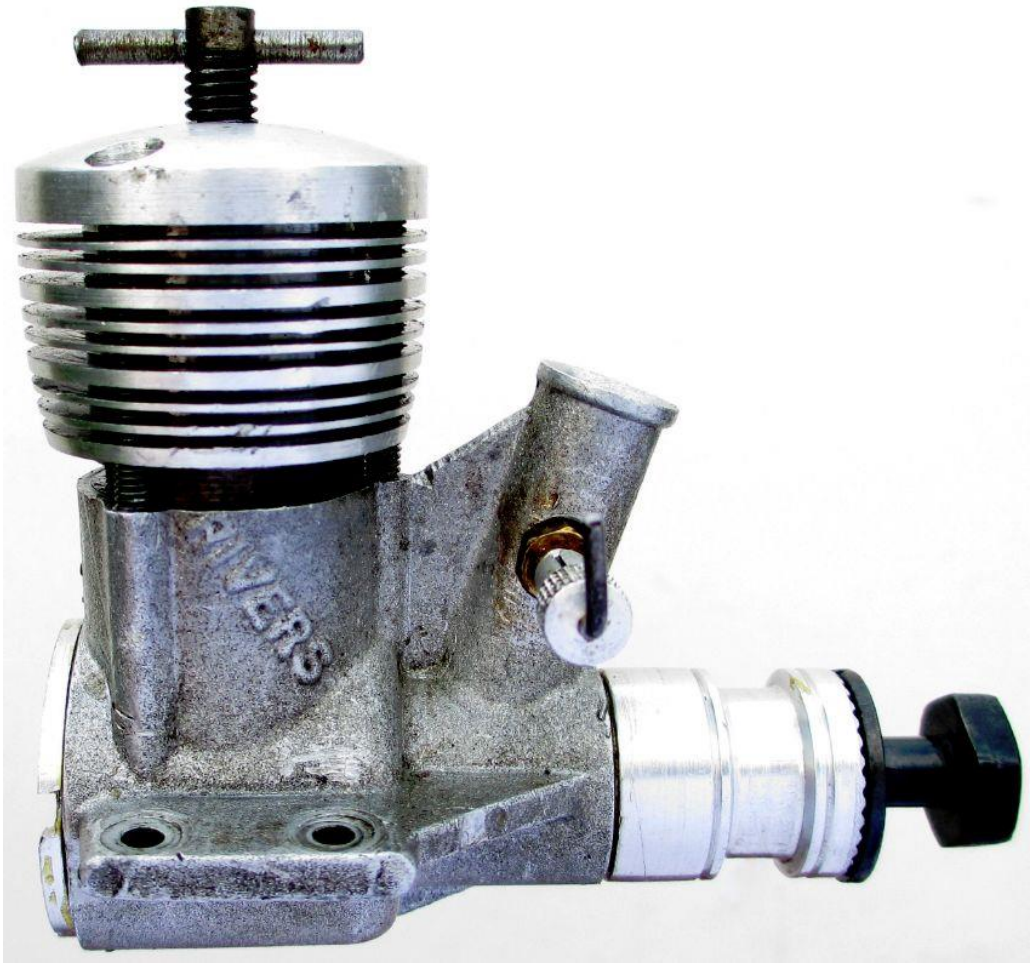
Rivers Silver Arrow MkII

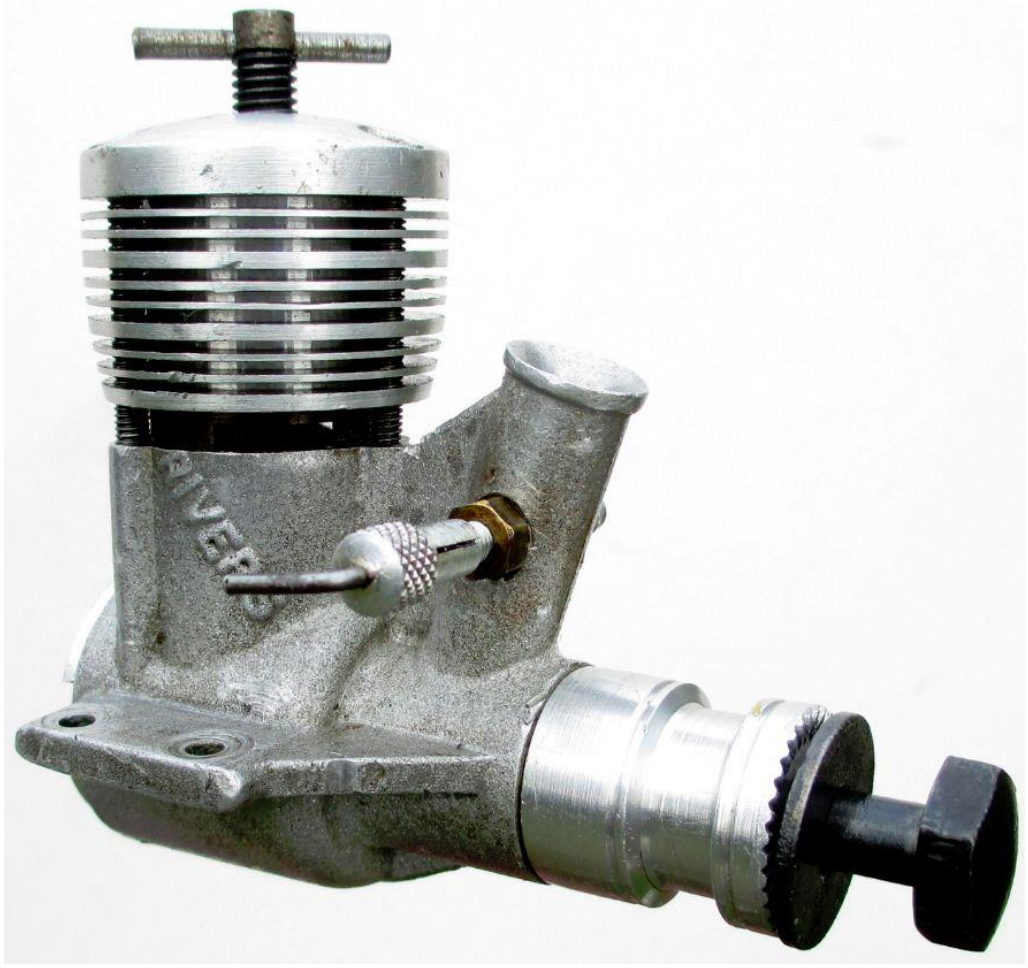
Rivers basically made two engines the Silver Streak 2.5cc and the Silver Arrow 3.5cc. As with most engines, both were improved as time went by so there is a MK 1 and Mk II version. In the case of the Arrow there was a significant change of crankshaft size which must be considered as a second type of the engine and is commonly referred to as a Mk II although 'New and improved version' seems to have been the official designation! The original Arrow had some crankshaft breakages, put down to bad heat treatment. When a second version was brought out it had a larger diameter crankshaft, a propeller bolt instead of a threaded shaft end, a lock nut was installed as compression screw locking device. However the cylinder head on my engine shows no witness marks from a locking nut so perhaps this was a series before the locking nut was a standard fitment. There were other small changes to the Mk II as time went on. I have deliberately over simplified the Rivers engines as a comprehensive article on the History of them has been written by Adrian Duncan and is available on the internet.

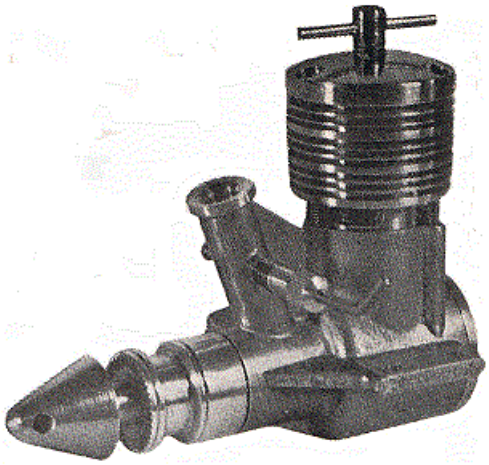
http://modelenginenews.org/index.html

Click engines, click finder, Drop Down to 'Rivers Engines'

The Arrow had front and rear roller bearings which were not supported in a cage but utilised very accurately machined crankshaft and crankcase housing with metal spacers between the rollers to keep them in line. It was definitely a very well made high performance engine designed for control line combat. Although it was a successful combat motor its weighed well over 7 ozs (7.25 for my engine) which made tight manoeuvres difficult when up against lighter engines that were coming on to the market. Considering the extra accurate machining required for the bearings it is not surprising that the Rivers engines were expensive compared with contemporary engines. The higher cost and a change in the combat rules which excluded the 3.5cc engines finally made the Arrow an unattractive motor. Some Arrows were made, down sized to 19 cu.in. for the American market. Rivers made engines from 1959 to October 1963 although stocks were still being advertised in January 1964. Today Rivers engines are sort after by collectors as they are relatively rare because of the short period of manufacture. Guessing from the serial number I think my engine was made about 1962. Not the pristine unused in box collectors engine, it has been 'Used'. Showing signs of storage for some years it surprised me by starting easily and running well which is not bad for a 57 year old engine! Just turning the crankshaft by hand (no prop) it felt velvet smooth. I would say my only problem was the short Tommy Bar on the compression screw. More leverage would have been a great advantage!!







Rivers 3.5 from Aero Modeller July 1960

The second production engine to appear from A. E. Rivers Ltd., follows very much the design pattern established by their 2.5 c.c. "Silver Streak", yet is essentially an entirely new engine throughout and certainly not a "bored out" version of the 2.5. They have aimed at—and achieved—top performance of any 3.5 c.c. size diesel—and at the same time produced an outstanding engine in several other respects.

Many large diesels tend to get a bit "brutish" to handle, often run rough and do not develop anything like the specific power output of, say, a good 2.5 or even a 1.5. The "Silver Arrow" is the complete exception.

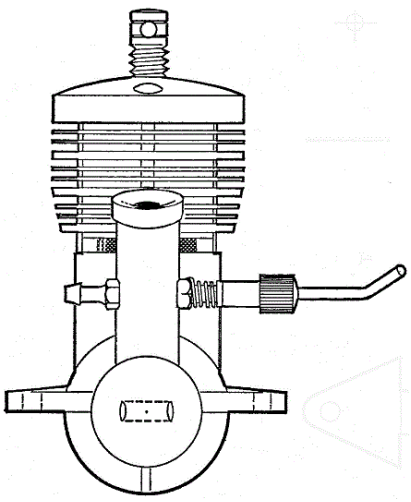
Its specific power is almost identical with the "Streak", it is most remarkably easy to handle and starts without the least trouble and, whilst not without some marked vibration at the upper end of the r.p.m. range, is definitely a high speed engine—more like a glow motor in this respect, in fact. Peak power was measured as just a shade over .38 B.H.P. at 15,500 r.p.m., whilst maximum torque is developed around 9,000 r.p.m.

Running characteristics are somewhat unusual. The "Arrow" is completely non-sensitive to compression setting as regards running, and to the needle valve. It will start and run with either (or both) of these settings way off tune, but these have to be adjusted quite closely for maximum performance. Having established these settings you can virtually leave them alone for restarting on a choke and prime, hot or cold.

The effect of running on reduced compression is not the usual diesel "miss" but quite smooth four-stroking and it needs a little patience to find the best combination of needle and compression for any given propeller load. Running is then most consistent and speeds can be pushed up to beyond 16,000 r.p.m. on propeller loads without any signs of distress. The "Streak" is undoubtedly happiest running above 12,000 r.p.m., but the power curve is quite shallow showing that an excellent output is available over a wide range of speeds. At the lower end it is beating 3.5's which peak at moderate speeds— and then carrying onto open up the margin of performance still further.

At the lower speeds, running does deteriorate. Below about 7,500 there is a tendency to develop resonant vibration with a marked fall off in torque. Also fuel is blown back out of the intake. This lack of smoothness applies to two-stroke running, however. Four-stroking at speeds down to 5,000 r.p.m., running is still smooth. Whilst one does not normally run a diesel four-stroking, this is significant because the throttle control unit supplied as an "extra" does appear to work on the principle of converting two-stroke running into four-stroke running, rather than the more usual method of varying the mixture and/or blanking off the exhaust.

The throttle is a simple plunger sliding in a barrel drilled with a number of perforated holes. The barrel screws into the centre of the crankcase cover (this hole being sealed with a brass screw on the engine, as supplied). Pulling the plunger outwards opens and air enters into the crankcase via the holes in the barrel, with an immediate response from the engine. Full open, the r.p.m. figure is reduced to approximately 50 per cent. Pick-up is instantaneous if the plunger is pushed in, i.e. the mixture appears unaltered so that there is no "hesitation" whilst the engine clears or adjusts itself to different speed running.



A surprisingly simple unit, the speed control should appeal particularly to radio control enthusiasts. Its only limitation is that it extends backwards from the engine and needs a clearance space of some l 3/4 in. behind the crankcase and in line with the centre to be accommodated.

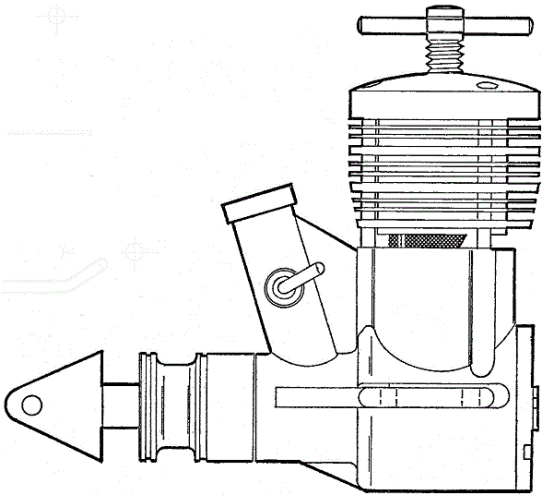
Timing follows very much the same as with the "Silver Streak" although the (shaft) induction port closes somewhat later to ensure that a full crankcase charge is achieved each revolution. This late closing is responsible for the blowback at 8,000 r.p.m. or lower, but the "Arrow" would, of course, not normally be called upon to run at such speeds. There is no blowback at higher speeds and the

efficiency of the timing is reflected in the high running speeds which can be achieved—and this has been arrived at by careful and prolonged development work. Transfer is via three passages milled on the outside of the cylinder under the flange opening into large (3/16 in. diameter) ports which are angled sharply to overlap the exhaust.

The cylinder has a particularly generous wall thickness and the same o/d top and bottom. The crankcase casting is counter-bored to a depth of approximately 1/16in. to accommodate the cylinder flange bringing the bottom of the exhaust ports level with the top of the casting. The cylinder is attached by three screws passing through the jacket into the crankcase casting. These screws, 6BA size on the original production models, have now been increased to 5 BA size. The jacket itself is machined from dural with characteristic "Rivers" finning.

The piston is of Meehanite, ground and honed, with a conical top. Gudgeon pin is .182 in. diameter press fitted. Connecting rod is machined from light alloy, the big end bearing being drilled with an oil hole on the upper side for "splash" lubrication. The contra piston is again of Meehanite, ground and honed to size. The large diameter compression screw is hollow.

The crankshaft on the test engine is essentially the same as that employed on the 2.5 c.c. "Silver Streak", but with an increased throw. The same unique roller bearing is also employed, running in a hardened bearing sleeve inserted in the crankcase casting. Excellent running characteristics and high speed performance are again complete proof of the efficiency of this bearing, which offers a particular advantage over twin ball races in that the front and rear bearings, as assembled, must be perfectly inline. With ball races, slight errors in assembly are always possible, with consequent increase in bearing friction. Thus although rollers have inherently more friction than balls, we would say that the roller races as used in the Rivers design have a similar performance to a first grade ball race, probably better at high speed.



The crankshaft assembly has recently been extensively modified and all current production motors incorporate this change. The alteration consists of increasing the journal diameter of the shaft from .350 in. to .406 in. and dispensing with a threaded shaft end in favour of a screw-in bolt, O BA size. The propeller driver locates on a taper ground on the shaft. The result is a substantial increase in shaft strength (and an 85 thou' wall thickness of shaft over the journal length) to obviate breakage experienced with some of the early production engines. Breakages, where they have occurred, have been largely confined to a particular batch of the original (smaller diameter) shafts which were rather too hard, The same roller-race bearing assembly is, of course, retained, but now employing eight rollers and eight spacers in each set. The same larger diameter shaft (with a reduced throw) is employed on the Mark II version of the 2.5 c.c. "Silver Streak".

Other material specifications and manufacturing technique and tolerances, follow "Silver Streak" production (see Aeromodeller, April 1959 review). The 3.5 c.c. "Silver Arrow" is made to the same very high standard throughout, with a considerable amount of individual attention given to each engine. As with the "Streak" a tuned version of the "Arrow" is also available for those modellers wanting that "little extra' in performance that counts on the contest field, although the standard model appears to be out on its own as regards 3.5 c.c. diesel performance and could probably give several larger motors a good run for their money.

As supplied new, the "Silver Arrow" is not set up very tight, but it does need a considerable amount of careful running-in time to free up properly and develop maximum performance. A total of five hours running-in is a satisfactory—and even necessary—requirement, although actual time will vary with individual engines, and also on the manner in which the engine is run in.

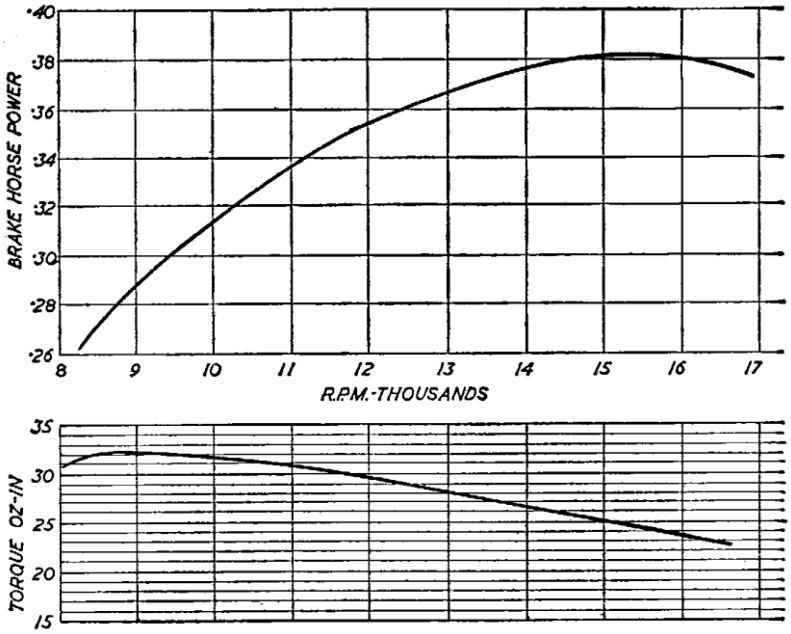
The bearing can "take it" so an initial running in period at quite a low speed is recommended—say on a 12 x 4 propeller to hold the revs down to the 3-7,000 figure. Propeller sizes can then be progressively increased— e.g. an 11 x 4 and l0x 6 followed by a 9 x 6 Frog nylon— before attempting to really open the engine up on a finer pitch propeller. It is well worth running this engine in properly and not attempting to short-cut the process (in fact, there is no short cut which will give the same effect as proper running in).

Summarising, we can only repeat that the "Silver Arrow" is a first class engine in every respect—excellent

performance, very easy to handle, and extremely well made. Until challenged by a new engine it should be about the top engine for combat—and it packs the power needed for radio control models. The throttle is a most useful extra for radio and a tank pressurization system is available for control line. With this, a nipple replaces the brass plug in the crankcase, coupling directly to the tank vent. To provide a sealed tank which can also be filled easily, A. E. Rivers also produce a vent valve which can be accommodated on any standard metal tank, allowing a nozzle to be inserted for filling but sealing as soon as this is removed.

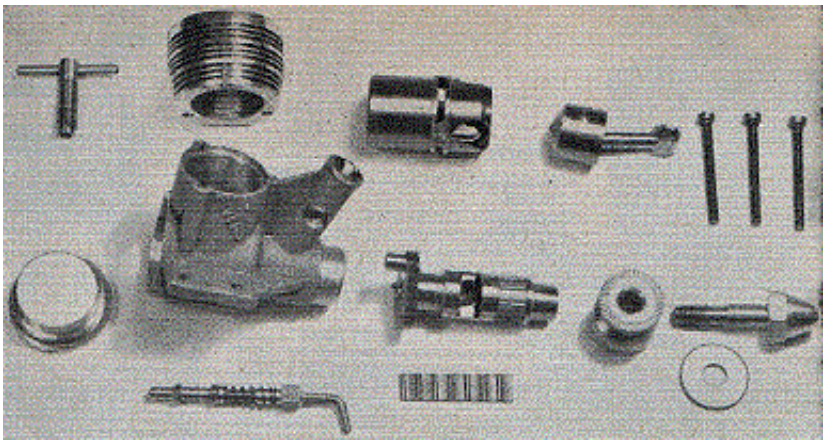
PROPELLER—R.P.M. FIGURES

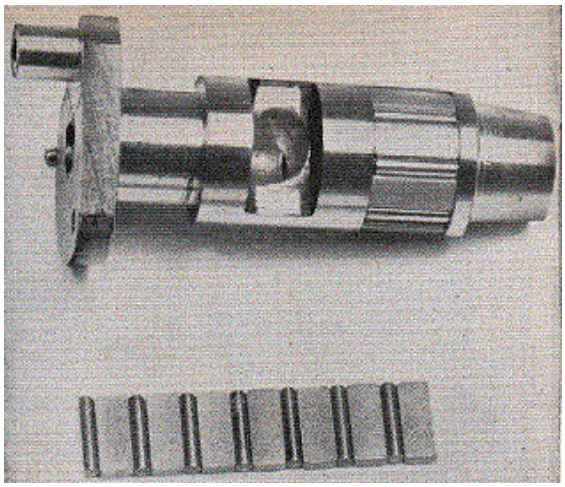
dia. x pitch		r.p.m.
10 x 6	Frog nylon:	10,200
9 x 6	Frog Nylon	11,900
8 x 8	Frog Nylon	9,200
8 x 6	Frog Nylon	12,800
8 x 5	Frog Nylon	13,600
12 x 4	Trucut	7,500
11 x 4	Trucut	9,400
10 x 8	Trucut	7,600
10x4	Trucut	10,000
9 x 4	Trucut	12.900
8x6	Trucut	12,100
8 x 4	Trucut	15,200
10 x 6	Stant	9,000
9x6	Stant	11,000
9x5	Stant	11,000
9x4	Stant	12,400
8x4	Stant	15,100



Test Fuel: Mercury No. 8
AEROMODELLER Plans Service Power Coding J.

Silver Arrow components including the cylinder with large transfer ports.





The unique Rivers shaft design with its large intake port and double roller bearings. In this view of the Arrow shaft, the rollers and spacers have been removed from the rear seat and are displayed below

Specification

Displacement: 3.46 c.c. (.211 Cu in.).
Bore: .647 in:

Stroke: .642 in.
Weight: 7 1/8 ounces.
Max. power: .382 B.H.P. at 15,500 r.p.m.
Max. torque: 32 ounce-inches at 9,000 r.p.m.
Power rating: .11 B.H.P. per c.c.
Power/weight ratio: .054 B.H.P. per ounce.
Material specification
Crankcase: light alloy gravity die casting
Cylinder: hardened steel, stress relieved
Cylinder jacket: dural, turned
Piston: Meehamte, ground and honed
Contra-piston: Meehanite, ground and honed
Crankshaft: 85-ton steel, hardened on journals, tempered on crank pin and threaded length
Bearing sleeve: hardened steel
Bearings: rollers (sleeve and rollers forming an integral twin roller race assembly)
Connecting rod: DTD) 363 duraI
Spray bar assembly: brass. 4 B.A.
Prop. driver (hub): machined from dural

Manufacturers: A. E. Rivers, Ltd., 15 Maswell Park Road, Hounslow, Middlesex.
Price (Including Purchase Tax). £6 5s. 8d.

From Peter Renggli

For the Story : The Czech Model + BAT + i write a short introduction. With some associated Pics of course.(Above)
So the story becomes more understandable.
Here is my introduction to Stanley`s Stembera Story. I sent it to you on Jan. 16 at 15:22

How two Czechian Antique Models found their way to Switzerland.

Heinz lives in the mountains in the Bernese Oberland. A welcome guest at all Model –Meetings. Always friendly and helpful. With great enthusiasm he took part on our

„ Antikflugtag „ every year. His models were characterised by an exceptional quality and earned warm applause and great admiration.

His profession as a builder and restorer of church organs was the base for his excellent craftmanship.

One day Heinz showed me a small foto and asked me to help him in the search for the pictured model. Following the consultation of many foto-reports throughout Europe

I found what we looking for by the Czech antique modelers. The people around Stanley Stembera and Jaromir Pipek were very pleased that we Swiss Oldtimer`s

showed interesst to their flying legends. They told us, that from the „West“ hardly any request fort this Czech cultural heritage arrived. A pity really.

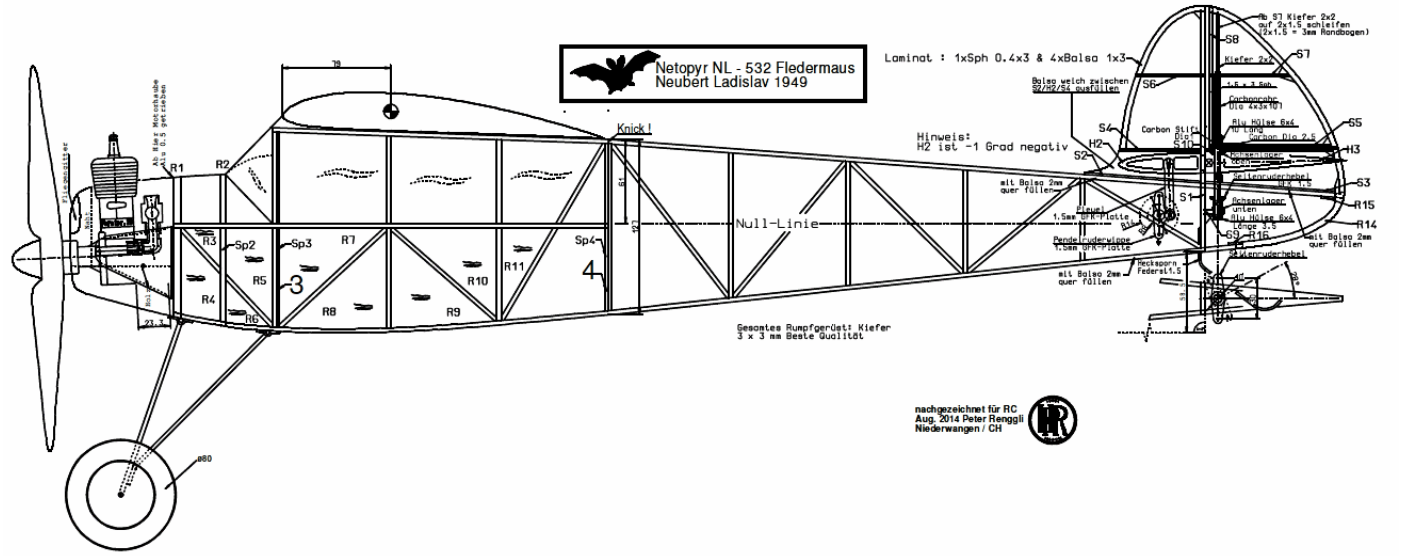
To discover there would be in this country many excellent constructions.

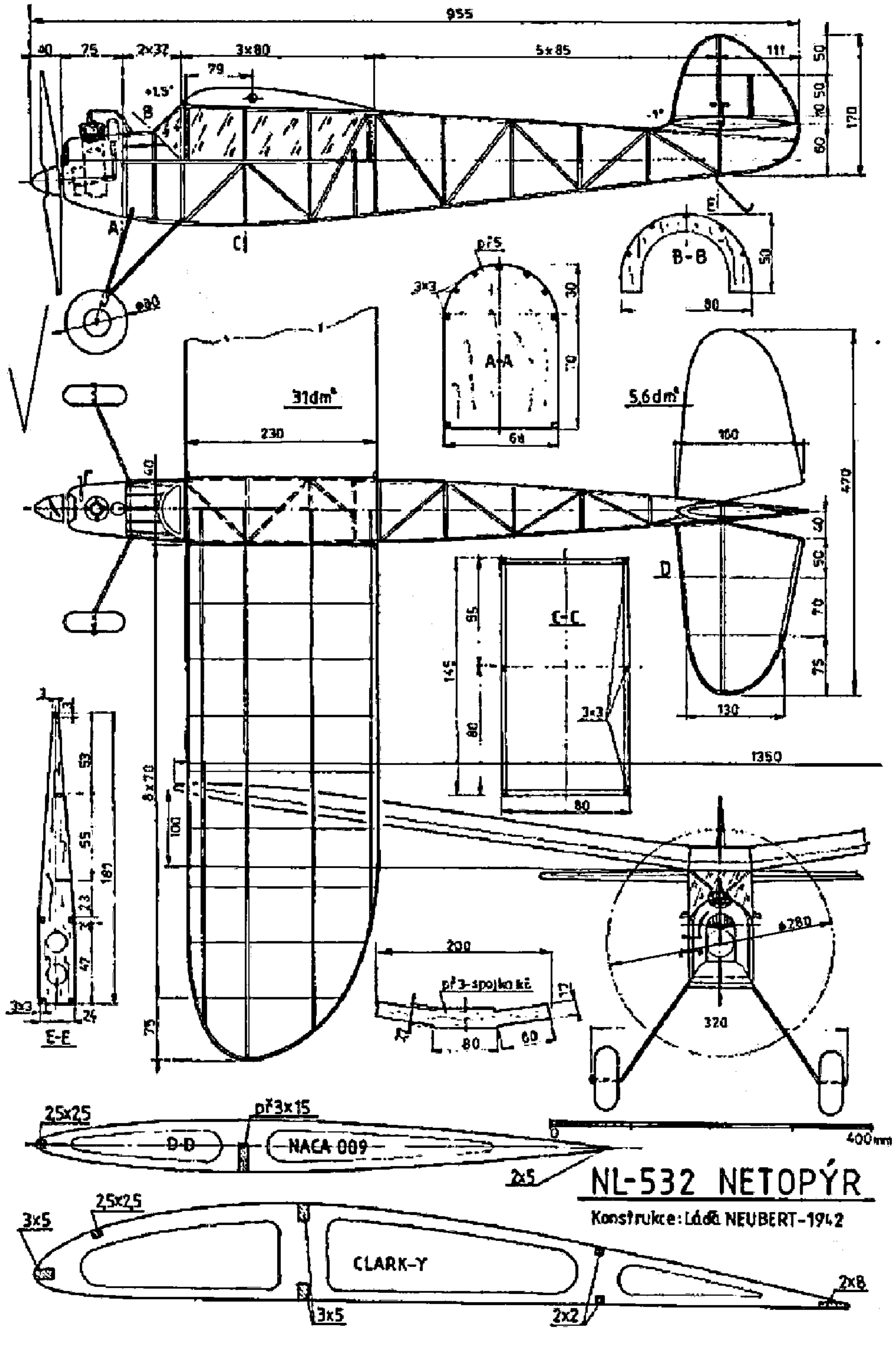
The Czech`s supported us with all the necessary informations. The close cooperation gave us a friendly relationship.

After an intense year, Heinz proudly presented his beautiful NELA 541 B Designed 1942 by Neubert Ladislav

Photo by Jürg Hersiger This pic was taken on the first presentation „Modellflugtag MG-Bern“

A more simpler Model, also designed by the great Neubert Lada in 1943 found my sympathy. I tried to enlarge the Plan oft he „BAT“ or in Czech language „NETOPYR“ but the old paper was too deformed. So switch the PC to full processing power and close to the bacon… Original plan as a background layer on the screen and now working really well as back then when the bred rolls had to be worked hard.





NL-532 NETOPÝR

Konstrukce: Láďa NEUBERT-1942

Stanley was hired as a plan auditor to find any bug.

Apparently he was so excited about the result, that he immediately milled two building kits on his CNC equipment.

And here, dear antique model friends, begins Stanley`s wondrous story of the journey with his beloved wife EVA from Prague to Berne. Just so for control the result, you understand….. Photos by Eva Stembera

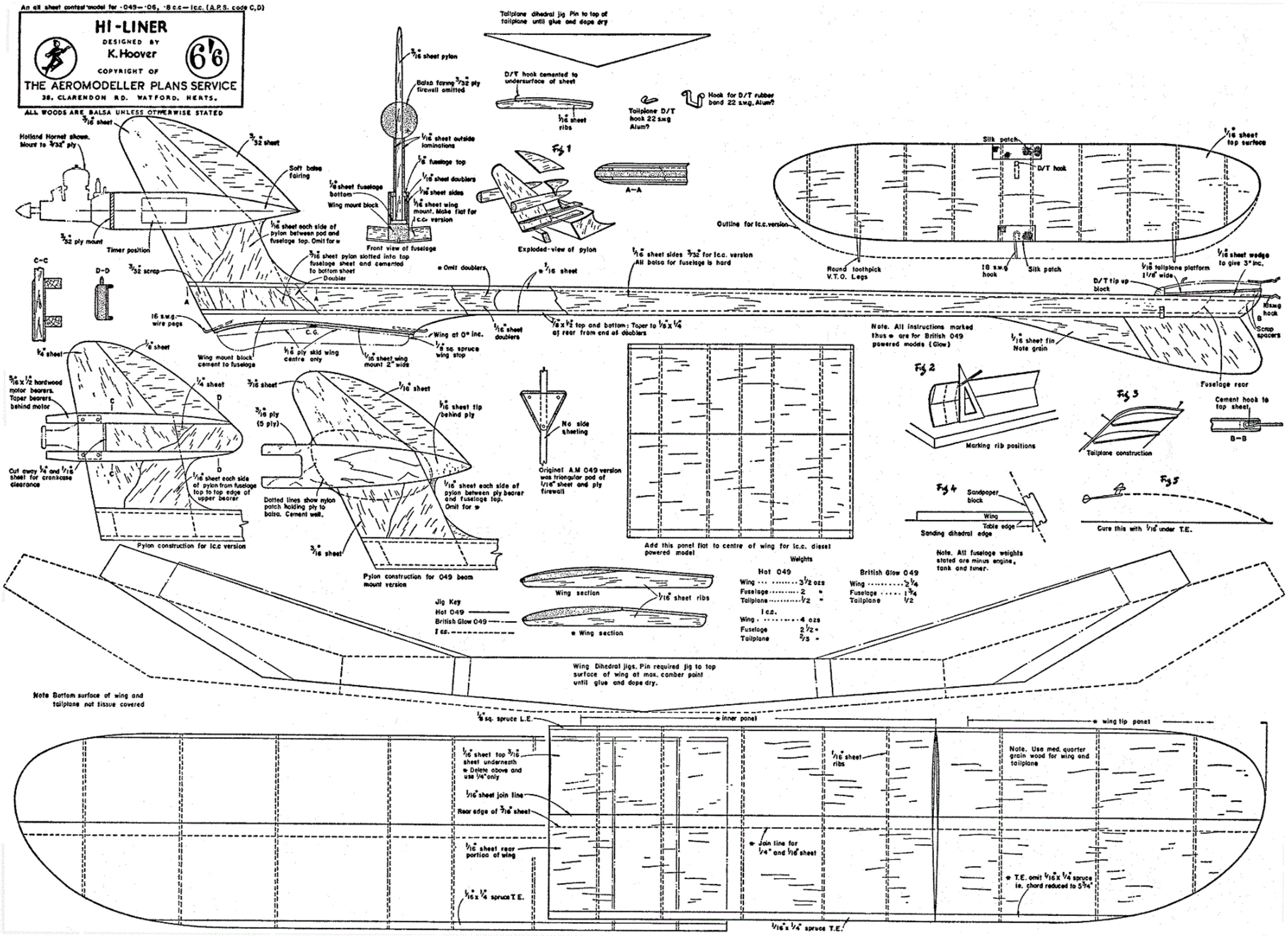
And Heinz was waiting in the mountains above with the „NETOPYR“

I wish you much pleasure Peter Renggli Modellfluggruppe Bern/ Switzerland

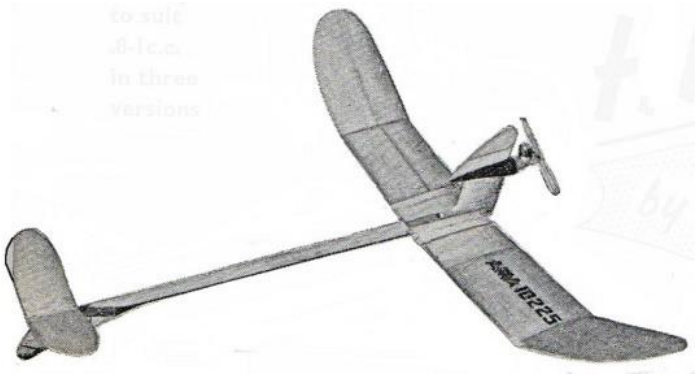
From Richard Barlow in Canada

Just back from Florida where I took these shots of an old friend - Dave Platt - with this beautiful geodetic tailled model called the Raven. He has designed it in a variety of sizes from 1/2A up. It flies as beautifully as it looks. Dave Platt has excelled in the hobby in all classes from team racing, through RC scale, and all types of FF. Dave never designed an ugly model. He well deserves his place in the AMA Hall of Fame.


RAVEN A


An all sheet contest model for ·049—·06, ·8 c.c.—1 c.c. (A.P.S. code C,D)
HI-LINER
DESIGNED BY
K. Hoover
COPYRIGHT OF
THE AEROMODELLER PLANS SERVICE
38, CLARENDON RD. WATFORD, HERTS.
6/6
ALL WOODS ARE BALSA UNLESS OTHERWISE STATED
Holland Hornet shown. Mount to 3/32" ply
3/16" sheet
3/32" sheet
Soft balsa fairing
3/32" ply mount
Timer position
3/32" scrap
16 s.w.g. wire pegs
Wing mount block cement to fuselage
1/16" ply skid wing centre only
1/16" sheet wing mount 2" wide
Wing at 0° inc.
1/8" sq. spruce wing stop
Front view of fuselage
Wing mount block
Exploded view of pylon
Fig 1
A—A
Tailplane dihedral jig Pin to top of tailplane until glue and dope dry
D/T hook cemented to undersurface of sheet
1/16" sheet ribs
Tailplane D/T hook 22 s.w.g. Alum?
Hook for D/T rubber band 22 s.w.g. Alum?
1/16" sheet top surface
Silk patch
D/T hook
Outline for 1c.c. version
Round toothpick V.T.O. Legs
18 s.w.g. hook
1/16" tailplane platform 1 1/16" wide
1/16" sheet wedge to give 3° inc.
D/T tip up block
1/16" sheet sides 3/32" for 1c.c. version All balsa for fuselage is hard
Note. All instructions marked thus * are for British 049 powered models (Glow)
1/16" sheet fin Note grain
Fuselage rear
Cement hook to top sheet
B—B
Fig 2
Marking rib positions
Fig 3
Tailplane construction
Fig 4
Sandpaper block
Wing
Table edge
Sanding dihedral edge
Fig 5
Cure this with 1/16" under T.E.
Note. All fuselage weights stated are minus engine, tank and timer.
Pylon construction for 1c.c version
Pylon construction for 049 beam mount version
Original A.M 049 version was triangular pod of 1/16" sheet and ply firewall
No side sheeting
Add this panel flat to centre of wing for 1c.c. diesel powered model
Weights
Hot 049
Wing 3 1/2 ozs
Fuselage 2
Tailplane 1/2
1c.c.
Wing 4 ozs
Fuselage 2 1/2
Tailplane 2/3
British Glow 049
Wing 2 1/4
Fuselage 1 3/4
Tailplane 1/2
Wing section
1/16" sheet ribs
* Wing section
Jig Key
Hot 049
British Glow 049
1 cc.
Wing Dihedral jigs. Pin required jig to top surface of wing at max. camber point until glue and dope dry.
Note Bottom surface of wing and tailplane not tissue covered
1/8" sq. spruce L.E.
* inner panel
* wing tip panel
1/16" sheet ribs
Note. Use med. quarter grain wood for wing and tailplane
1/16" sheet join line
* Join line for 1/4" and 1/16" sheet
1/16" sheet rear portion of wing
1/16" x 1/4" spruce T.E.
* T.E. omit 1/16" x 1/4" spruce ie. chord reduced to 5 3/4"

A top design from the States to suit .8 – 1 cc in three versions. By Keith Hoover from Aero Modeller July 1961



The Hi-Liner is a radical departure from the conventional free flight power design. Each of the unique
features has grounds in theory and the innovations pay off handsomely where it counts—in performance. Both in the U.S. and on the European Continents, its climb when powered by the Holland Hornet ()49 has been clearly superior to that of other models on the field.

The Very High Thrust Line (VHTL) model is now being tried by a few free flight exponents around the world. The Hi-Liner, on the other hand, is a proven veteran of three contest seasons which has always shown good flight characteristics. Its unusual force arrangement utilizes a high motor position on a forward fin for maximum longitudinal and spiral stability. A small tailplane (15 per cent, of wing area) is combined with the long fuselage, and as both tailplane and rudder are positioned low, the power pattern is not unduly affected by turn adjustments. As all incidence is in the tailplane (—3 deg.) with both the ultra-thin wing and motor at O deg., drag is quite low; in addition, these design features provide excellent transition from the "straight up" climb to glide without tricky mechanical means of changing incidence. The low wing is positioned for a good glide, as the tailplane is out of its downwash.

Construction of the Hi-Liner is no less unusual. It is sturdy, resisting warps and punctures. In theory, the all-balsa flying surfaces are quite superior, providing a high lift, low drag airfoil absolutely true for their entire length. The Jedelsky construction method represents a major advance in a wing which embodies the results of research by the "Vienna School" applicable now to power design because of improved VHTL force arrangement. Built up construction of such a thin, highly curved airfoil would be far too complex for most modellers; the Hi-Liner with its Jedelsky wing can be constructed by relatively new modellers who do careful work.

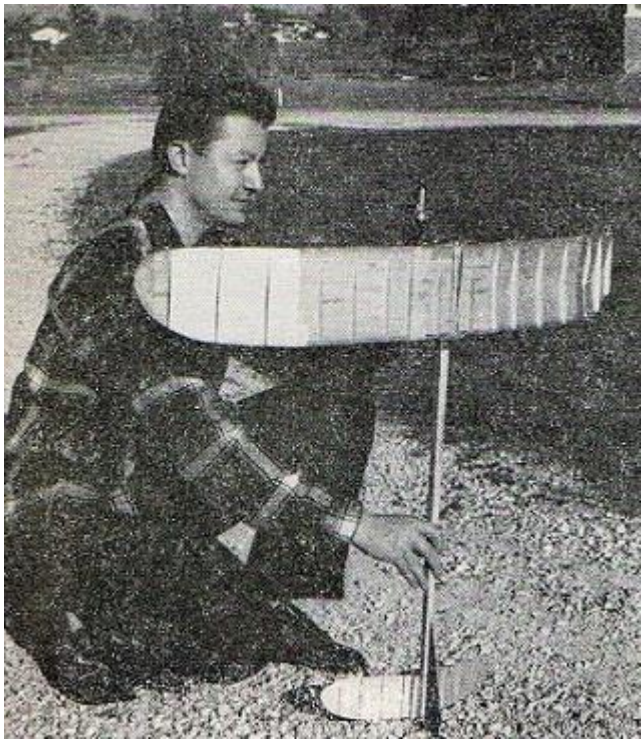
Some advantages of design development in this VHTL series combine in the Hi-Liner. Tip fins on higher aspect ratio (10:1), constant chord wings have been abandoned in favour of a moderate aspect ratio (8 1/2:l) and more aesthetic elliptical tips. The natural "wash-out" in these tips reduces induced drag considerably without loss of strength. The butterfly tailplane and moderate sub-rudder add extra directional stability (look again at an arrow). The box fuselage of hard balsa is stronger than thinner types used earlier while being simpler to repair than a round one.

Construction should present few problems, as it is largely sheet balsa; hard for the fuselage, medium quarter grain for wing and tailplane, and medium hard straight grain for pylon, sub-rudder, ribs, and mounting platforms. The fuselage pylon is explained by figure I on the plan. A somewhat special technique is used to build the laminated wing; it should be made in four sections. The hardwood leading and trailing edges of each section are butt cemented respectively to the 3/16 in. sheet front of the wing and the 1/16 in. sheet back portion. With a small razor blade plane (or, lacking this, a sharp knife and sanding block) curve the upper surface of the 3/16 in. sheet, checking the end cross section against the plan. With model cement, glue the front and rear portions of each wing section together, over-lapping the rear portion on the front correctly (draw a line on the front part to make this easier). Now glue and pin ribs at right angles on the wing's underside; lines may be drawn before assembly or afterward with a right angle triangle as shown in Figure 2. Finally, add the wing leading edge planking either with PVA white glue or a rubber base contact cement (this latter can be sanded and finished at once) ; either of these types of adhesives avoids warping.

The simple, curved plate tailplane is pinned during drying as shown in Figure 3. Dihedral angles in wing and tailplane are sanded in with a block, Figure 4 and centre joints are covered with nylon for strength (don't add nylon to the wing tip joints). With the dihedral jigs shown on the plan, these joints are glued and can dry while wing and tailplane sit simply on a table on the leading edges. Only the tops of the flying surfaces are papered, with bright Jap tissue.

Test Flying

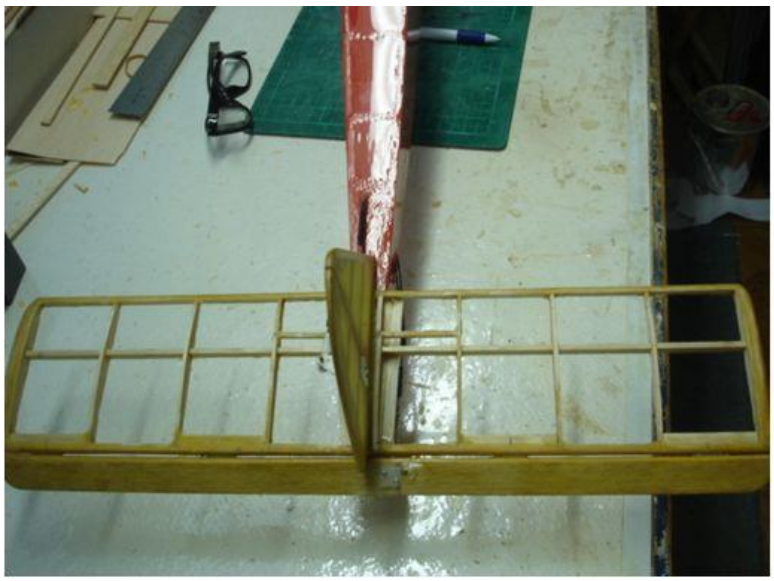
The real point to this design is safety of adjusting a hot aeroplane. With thrust, and fin and pylon set zero zero and the indicated balance position, adjust the glide with a 1/16 extra shim under the rear of the tailplane. This should prevent the only problem which has ever occurred with this series of VHTL designs (Figure 5), a straight out flight, nosing down into the ground. Gradually, after power tests, remove the negative in the tailplane and tighten the glide circle with tail tilt. Climb is dart-like, straight all the way, the angle increasing as greater engine power is used. For best climb-glide transition, a slight climb circle is advisable, perhaps one turn each five seconds of motor run, in the direction of the glide; the preference is right-right. Hope you enjoy your Hi-Liner as much as those of us who are flying them in the U.S.!



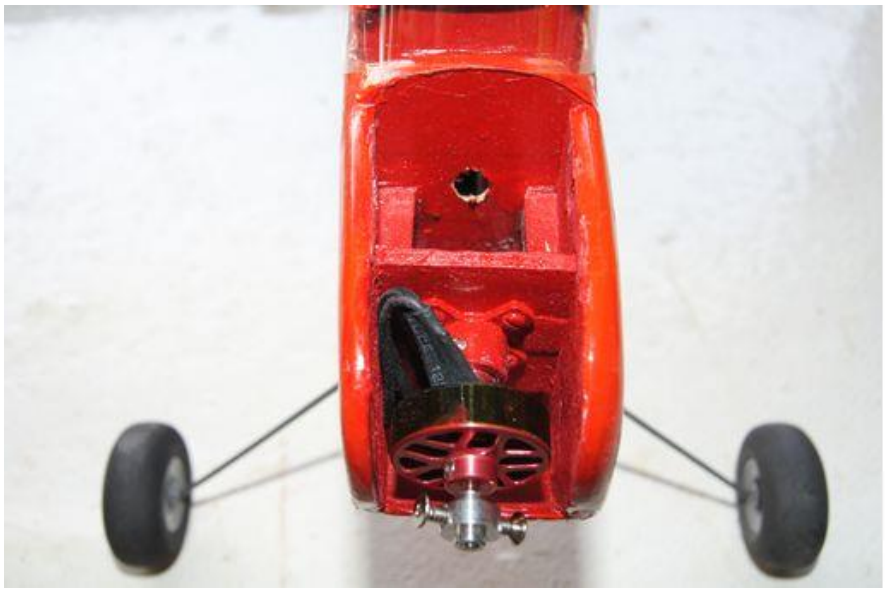
From Mark Fairgray

Oh no not another Tom Boy Build!!!!

Well not really this is a conversion of an existing Tom Boy. After buying Trevor Martin's IC powered Tom Boy I now had two IC Tom Boy's, so the decision was made to convert my RC IC to electric, sell the original Mills and use the money to fund the electrics. After seeking advice as to what electrics required from one of my Club electric expert, I purchased the required items. Now with the motor, BEC and battery sitting on the bench it was time to get to the actual conversion. The original Tom Boy was covered in tissue so I set to on removing it from the model.

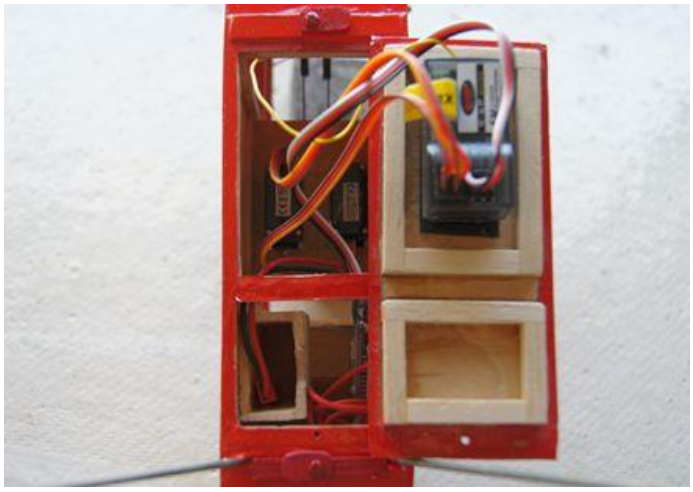


The wing had suffered some broken ribs and was warped so I decided to build a new one.

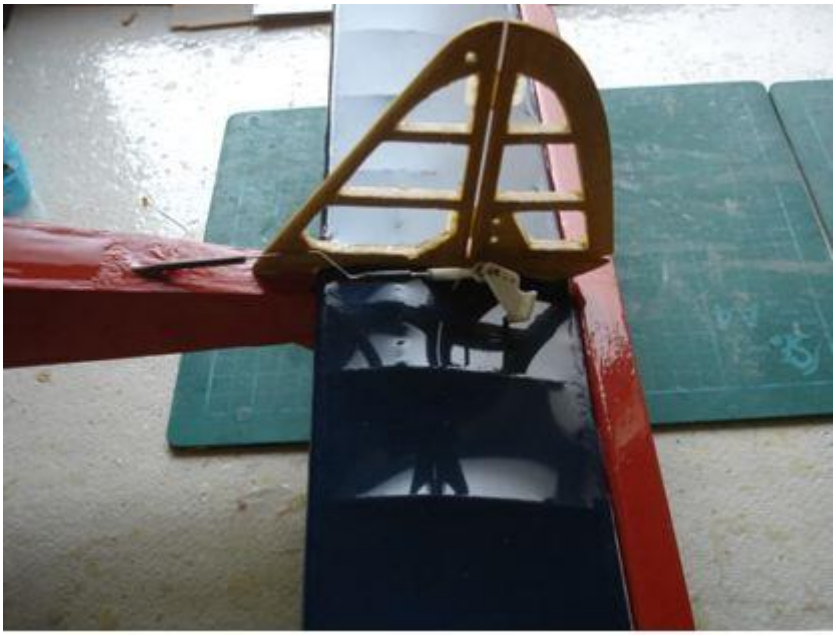


The nose was rebuilt with new cheek sides, bottom and removable upper section to enable access to the wiring. When modifying the nose, I kept the original engine mounts cutting them back as required to allow for the instillation of the motor mounting former to a point that allowed the electric motor to extend from the nose area sufficiently enough to allow the propeller to turn without contacting the fuselage. This also allowed me to keep the original side and down thrusts.

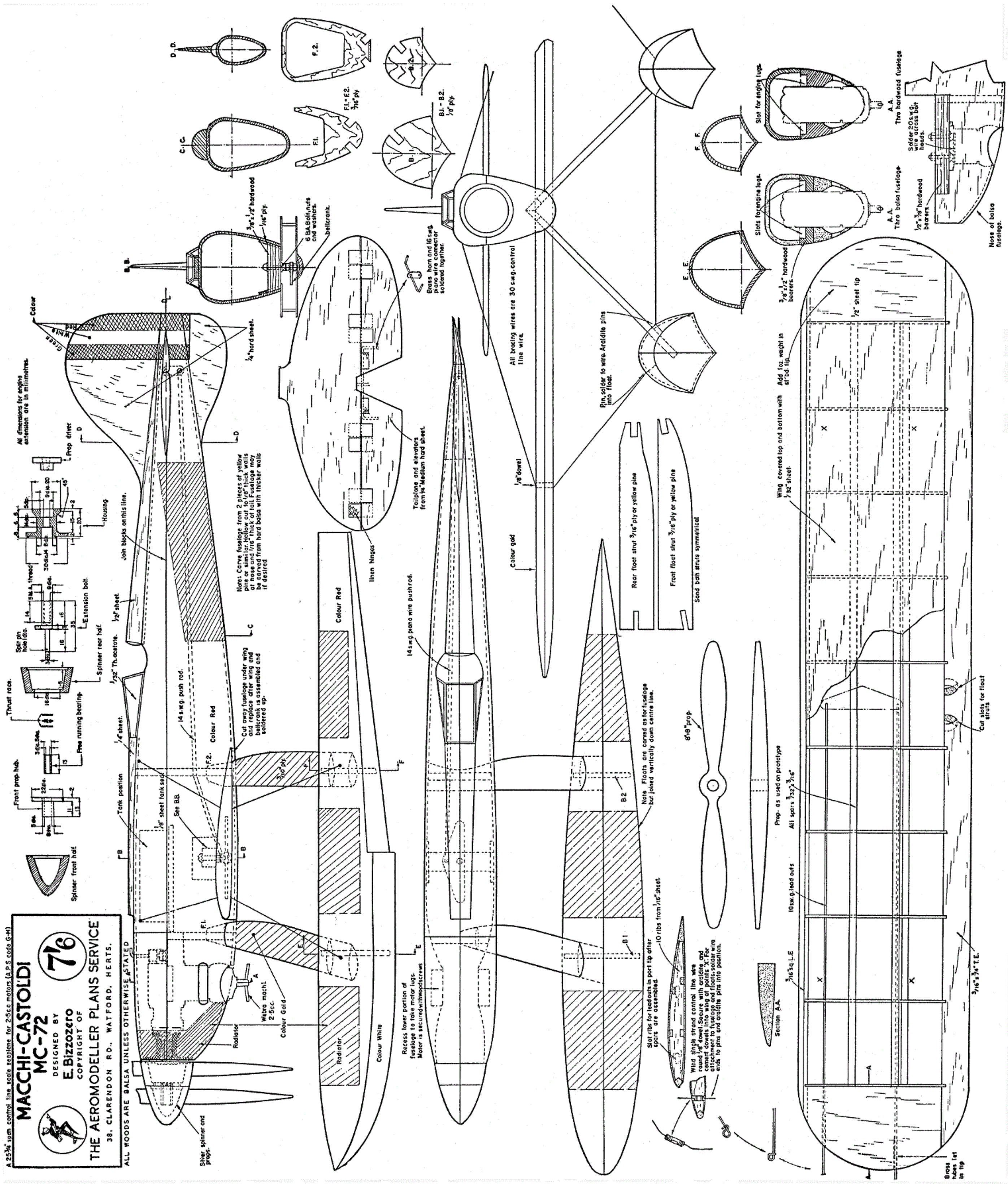
Next was to build in a battery box and BEC mount which is accessed through a thin ply hatch held in place by two lugs on the underside of the fuselage.



As the R/C servos and controls were already fitted it was now on with the covering. I decided to cover the fuselage with Solafilm and the wing and tail with Litetex which is a very light shrink film. Litetex needs to be shrunk using the iron as the heat gun is too hot and tends to over shrink the film which comes slack if reheated such as left in the sun. The hardest thing about covering the model with film was having to work around the attached tail, fin and control cables. Things just keep getting in the way making it awkward to work around them with the iron. Another problem which manifested itself was the covering glue reacting with the doped tissue left on the trailing and leading edge of the rudder and tail. This caused wrinkling where it attached to these areas. This did not affect the overall shrinking of the film but looked a little untidy.



Finally, new glazing and the electric gear was fitted. I visited one of the Club's electrical expert with the model for him to check over the electrics to ensure all was fitted correctly and performed as they should. I will be using my existing FM radio equipment and as most flyers in my club use the latest 2.4Ghz radio equipment there should be no frequency clashes. Now there is no excuse not to fly the model so when time allows it's off to the Club's flying site for its first test flight.

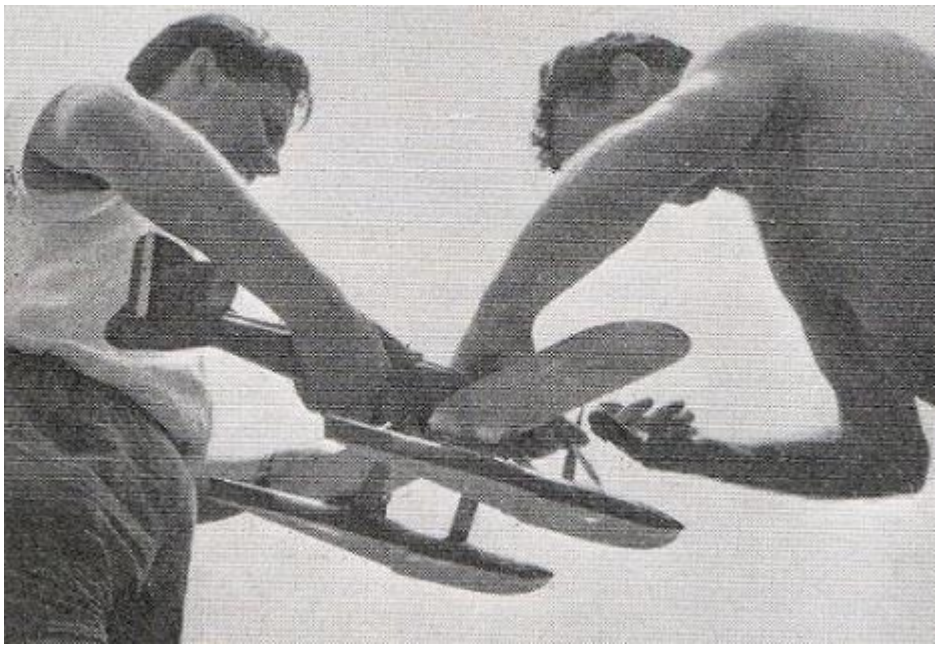


Macchi-Castoldi MC-72. A thrilling scale control line floatplane for 2.5 cc. By Ettore Bizzozero from Aeromodeller May 1961

On June 2nd, 1933, Italian pilot Warrant Officer Francesco Agello flew the Macchi-Castoldi Mc-72 four times over 3 Km. on Lake Garda, to average a then breathtaking speed of 440 m.p.h. This speed made

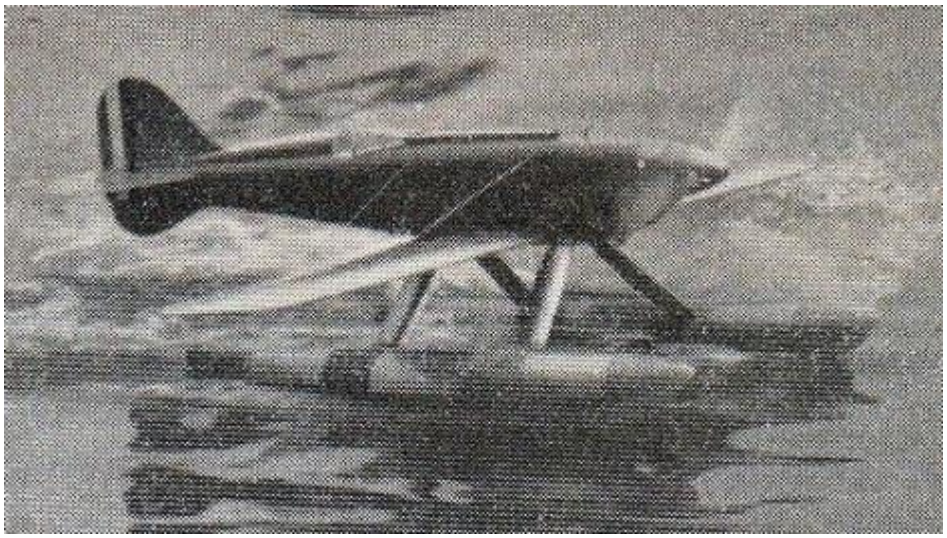
official at 440.7 in 1934 was not exceeded for six years and then by a landplane. Few people realise however, that to this day, that aircraft still holds the world speed record for floatplanes.
Italian modeller Ettore Bizzozero, has produced this miniature MC-72 for a Webra Mach I diesel of 2.5 c.c.

His clever counter-rotating airscrew and choice of engine are variables which can be changed and for any modeller wanting to try his hand at fast scale control lining this is the bird to build!
The fuselage can be constructed either from hard balsa or from yellow pine, depending on the builder's preference. The original yellow pine fuselage is made in two halves—top and bottom, dividing along the datum line. Note that the fairings on the upper half are superimposed later. Lightly cement the two block halves together and carve the external shape, using templates as a guide to accurate carving. Sand smooth and part the two halves so that the inside of the fuselage can be hollowed out to 1/16in. walls. Make a close study of the nose portion of the fuselage to understand the internal contours where the engine is integrally mounted. Particular attention must be paid to this part of the lower half, the mount being slotted to take the motor lugs, to achieve the required housing for the engine intended for installation. Now make up the bellcrank pivot block from 3/8in. x 1/2in. hardwood, complete with pivot bolt, cement it in position and reinforce with 1/16in. ply keepers. If the fuselage is to be constructed from hard balsa, a wall thickness of 1/8in. is desirable and separate hardwood engine bearers will be necessary, fitted into the fuselage as shown on the plan detail. Use a good strong glue for this job.



Shape and notch the 3/4in. 1/16in wing T/E and pin in position over the plan packing up from the plan with scrap 3/32in. going likewise for the two lower 3/32in. x 3/16in. spars. Cement the wing ribs in position and then the 3/16in. square leading edge (sanded to correct contour later).
Cut out the wing tips from 1/2in. sheet, drill to take the brass tubes for the lead-outs and burn through with 16 s.w.g. wire for lead-out clearance, sand to section and cement to the wing. Bind in the 1oz. tip weight.
Cover the upper surface with medium hard 1/32in. sheet, slotting at the centre section for the elevator push rod. Do not sheet the undersurface. Remove the wing from the plan and cement to the cutaway portion in the lower half of the fuselage. Thread the 18 s.w.g. wire control line lead-outs down the wing securing them to the bellcrank with soldered cup washers on the underside
and bolt the bellcrank to the pivot bolt. Position the push rod and link up to the bellcrank securing again with cup washers.
Cut out the tailplane and elevator from 1/4in. sheet balsa. Sand to section and secure the elevator horn assembly to the elevator taping the tie bar to the two elevator halves, but as yet, allowing the horn to swing freely on the bar in unsoldered state. Tape the elevator to the tailplane ensuring free and smooth movement of the control surface. Insert the push rod through the elevator horn, retaining with a cup washer soldered in

position and then cement the whole tailplane assembly to the lower fuselage. Neutralise the bellcrank and the elevator and solder the horn to the tie bar. The under surface of the wing may now be sheeted, again with 1/32in. sheet balsa, after which the underwing fairing is replaced.
Cut and shape the floats struts from 3/16in. ply, bevelling the top ends to butt together at their apex in the fuselage. Cement into the fuselage ensuring that the apex provides a strong joint.
The two floats can now be carved in the same manneras the fuselage, either from yellow pine or balsa, using the same wall thicknesses, but the two blocks are joined on the vertical centre line instead of the horizontal datum line. Carve and hollow in the same manner as for the fuselage, and fit the float bulkheads to the inboard half of each float. Cut a slot in each of the inboard halves, insert the float struts to interlock with the bulkheads using plenty of cement. Add the outboard halves of the floats.
Cut the fin and underfin from 1/4in. sheet, shape and cement the underfin in position. Next stage is to construct the contra-rotating airscrews assembly. Those with lathe facilities will note that the special extension bolt has a spindle at its front end. Onto this spindle a Wakefield type thrust race is fitted, then a free running bearing. Over this goes the front (free wheeling) propeller hub, retained with a circlip or split pin. Mount the engine, then 30 c.c. T/R tank on its 1/8in, sheet seat, boxing round with scrap balsa. The upper fuselage with fitted fin and cockpit fairing, can now be cemented in position and is given a further sanding.



The wire brace can now be fitted and great care must be taken to ensure an accurate and taut rigging. Start by winding 30 s.w.g. C/L wire round the dowels to fit in the wing. Cut holes in the wing and insert the dowels, so that the two wire ends of each dowel extend from top and bottom of the wing. The other ends of the wires are inserted into the fuselage and floats by means of pins, each wire being soldered to a suitably shortened pin secured with Araldite. Inter-float wires are separate pieces secured by pins.
Airscrews are 8in. x 8in., carved from beech, but if the builder prefers, commercial props of similar size can be used. (The clever idea is that one flicks both props together and the front one free-wheels after it changes rotation.) The model can now be finished, firstly by sealing the whole airframe with sanding sealer until a hard smooth surface is obtained. Apply the red and gold colour scheme in thin coats until the colours cover the wood evenly. Lastly, fit the windshield and coat over all with clear lacquer protective or fuel proofer.
During the take-off run, there may be a tendency for the motor torque to sink the inboard (left) float. Tip weight and rudder off-set are used to counteract this, but it may be found desirable to refrain from taking up line tension (40ft. lines were used by Ettore) until the model has begun to build up speed. 80 m.p.h. was recorded by the prototype model, and as the pictures show, it is a beauty well-worthy of extra effort in construction.

Cocklebarrow dates 2019 from Tony Tomlin

Please see below the dates for the 2019 Cocklebarrow Vintage R/C events

Sunday 7th July,
Sunday 18th August,
Sunday 29th September

Please email pjt2.alt2@btinternet.com or tel:02086413505 for further information if required.

Signposted from Aldsworth Glos. on the B4425 between Cirencester/Burford and off the A40 between Northleach and Burford [follow SAM 35 signs].
All types of R/C up to 1969 sport flying no competitions.
BMFA insurance essential [A certs. not required]

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.

Shilton flying group 2019 fly in dates

May bank holiday vintage fly in May 26th + 27th

e soar glider fly in July 13th + 14th

autumn vintage fly in Sept 07th + 08th

Hope to see you there, regards Boycott and Nick

Boycott Beale bealekraft@outlook.com

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 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 Specification

Wingspan - 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

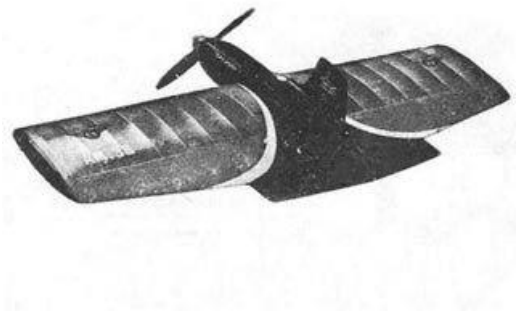
Quirky looking design by GR Woollett published in Aeromodeller January 1954
43in span suits 1.3cc size motors. Tricycle undercarriage and low wing, looks semi-scale and makes a pleasant change from the usual high wing cabin job.

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**

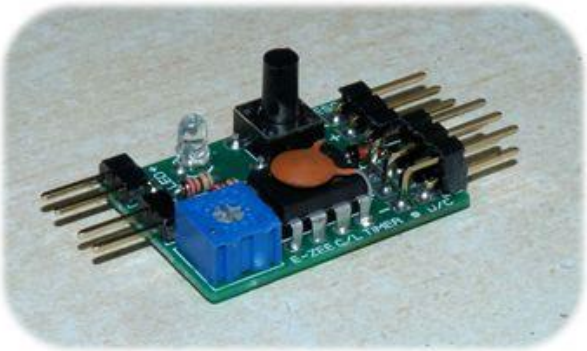
Regards,
Leon Cole
Belair Kits
Tel: +44 (0)1362 668658
www.belairkits.com
Follow us on Facebook https://www.facebook.com/pages/Belair-Kits/1448177428736984

Dens Model Supplies

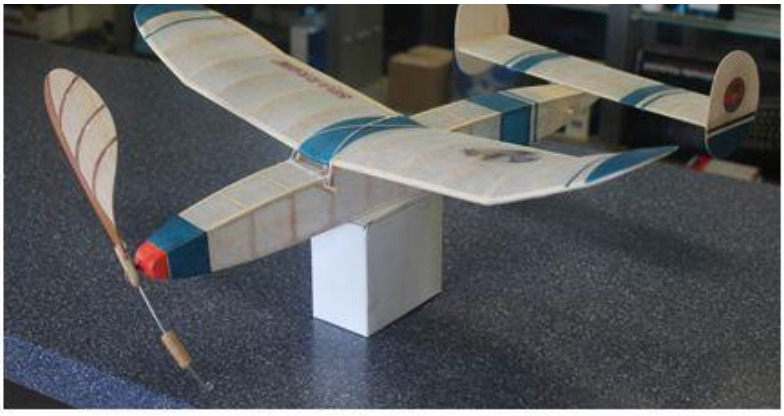
Traditional CL Kits including the ACE + Plug & Play Electric CL Starter Kit….just add glue and a battery !!

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