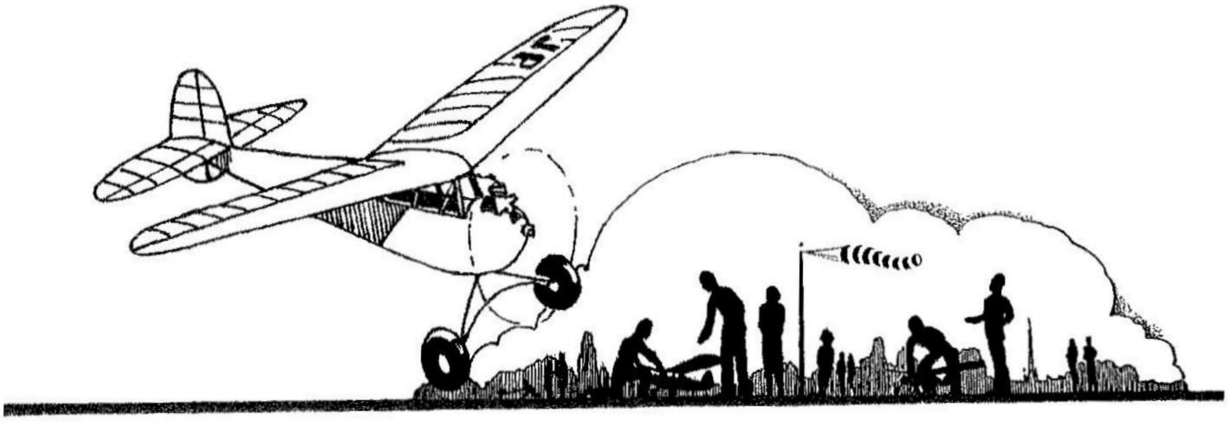
Christmas cards to all readers

From Peter Scott

Mike Cummins's Raynes Park MAC Christmas card

(Mercury Monitor c1949 designed by H J Nichols)



Sticks and Tissue No 179

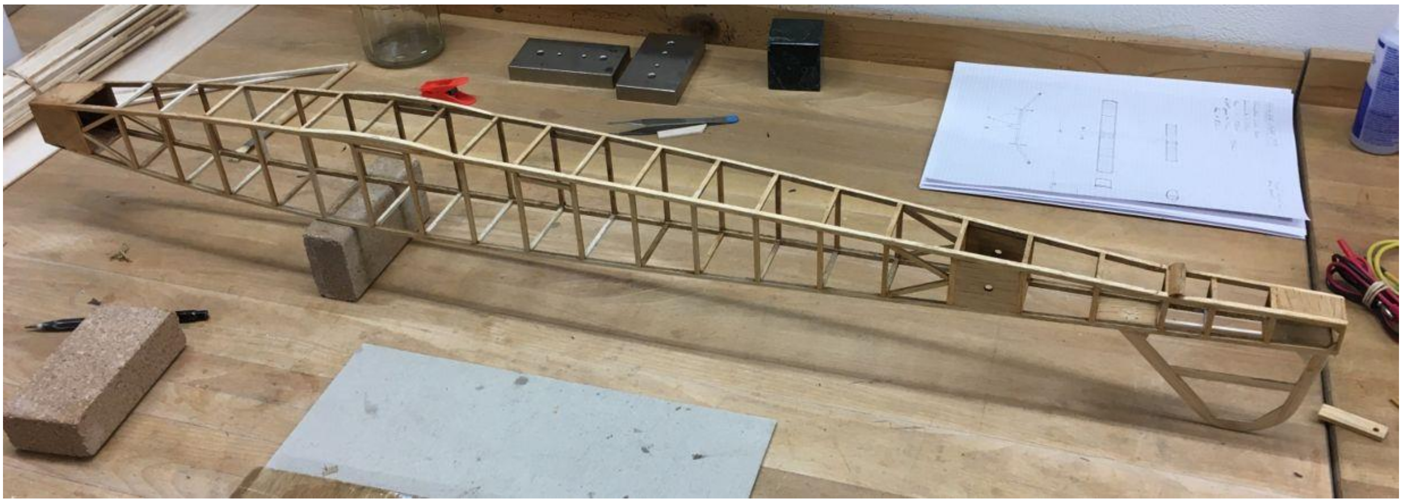
If you can contribute any articles, wish to make your point of view known etc please send to or phone 01202 625825 JamesIParry@talktalk.net The content does not follow any logical order or set out, it's "as I put it in and receive". Thanks to Mark Venter back issues are available for download from http://sticksandtissue.yolasite.com/ Writings and opinions expressed are the opinion of the writer but not necessarily the compiler/publisher of Sticks and Tissue.

From Peter Ziegler**.** Meeting for rubber/CO2 engine models 2023
Blackburn 1912 monoplane with CO2 engine

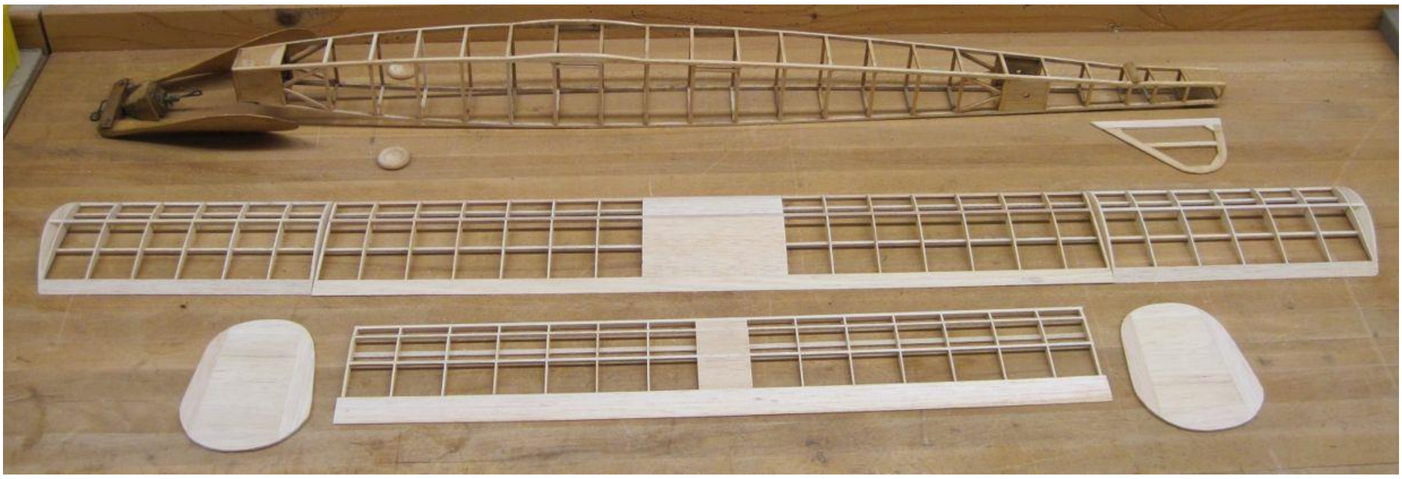
Following a request for further information, photos and drawing for the Wakefield model, Halsach, which has appeared in S&T, Dominique Vultier has very kindly provided the following.

Historic information:
The Model was flown by Traugott Haslach, member of the Team Switerland, at the Wakefield Cup Contest held on July 11, 1952 at Norrköping (Sweden).

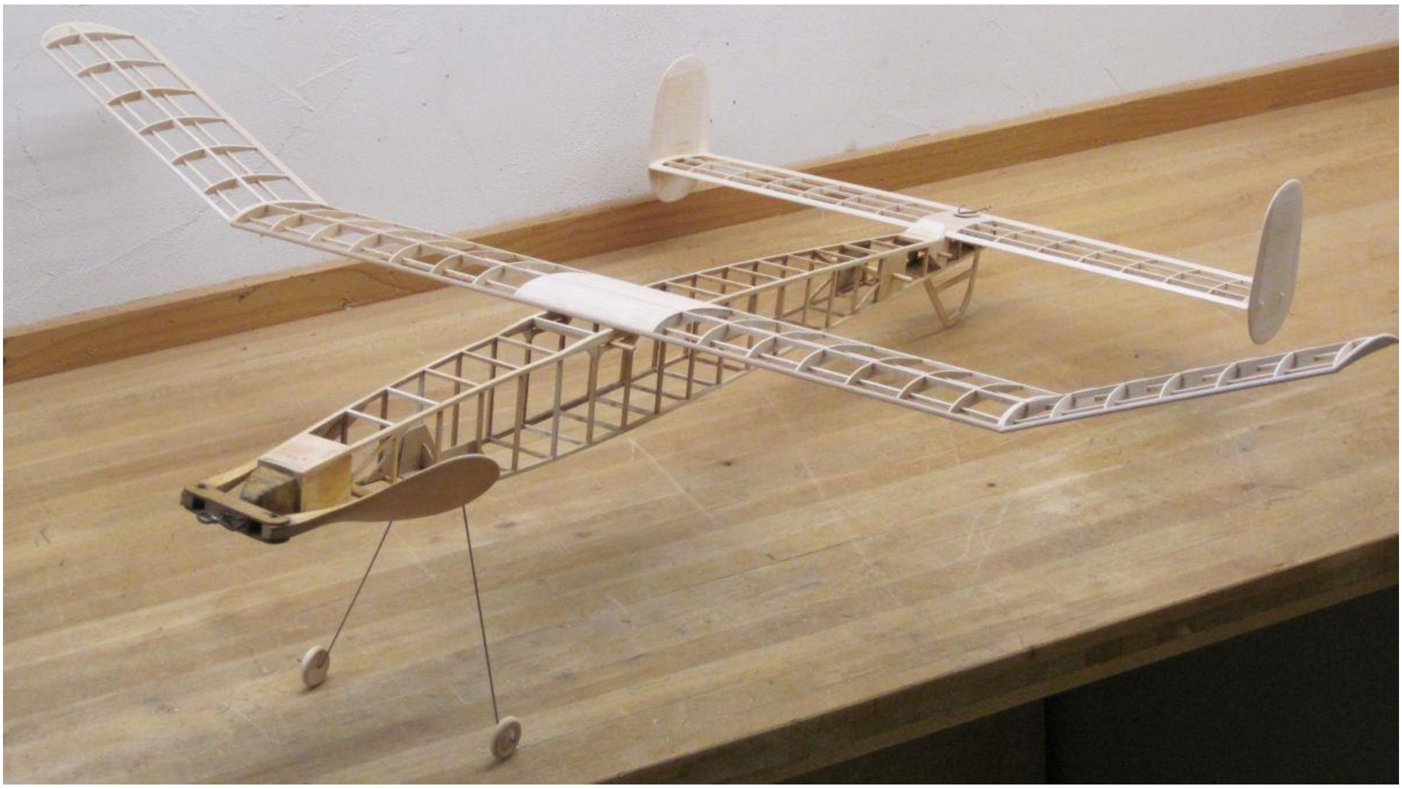
Halsach, the remains



Halsach, restored fuselage



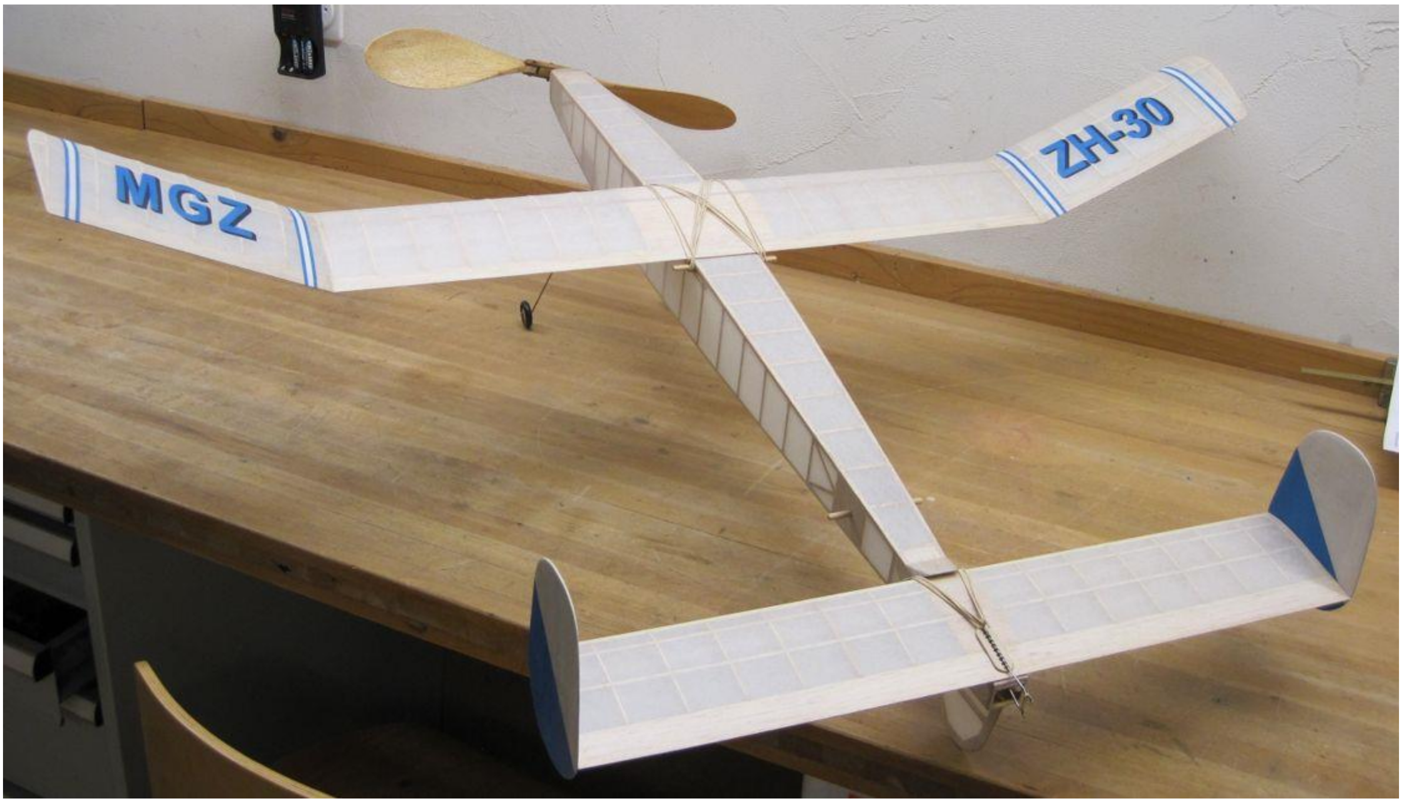
Halsach, all components



Halsach, airframe

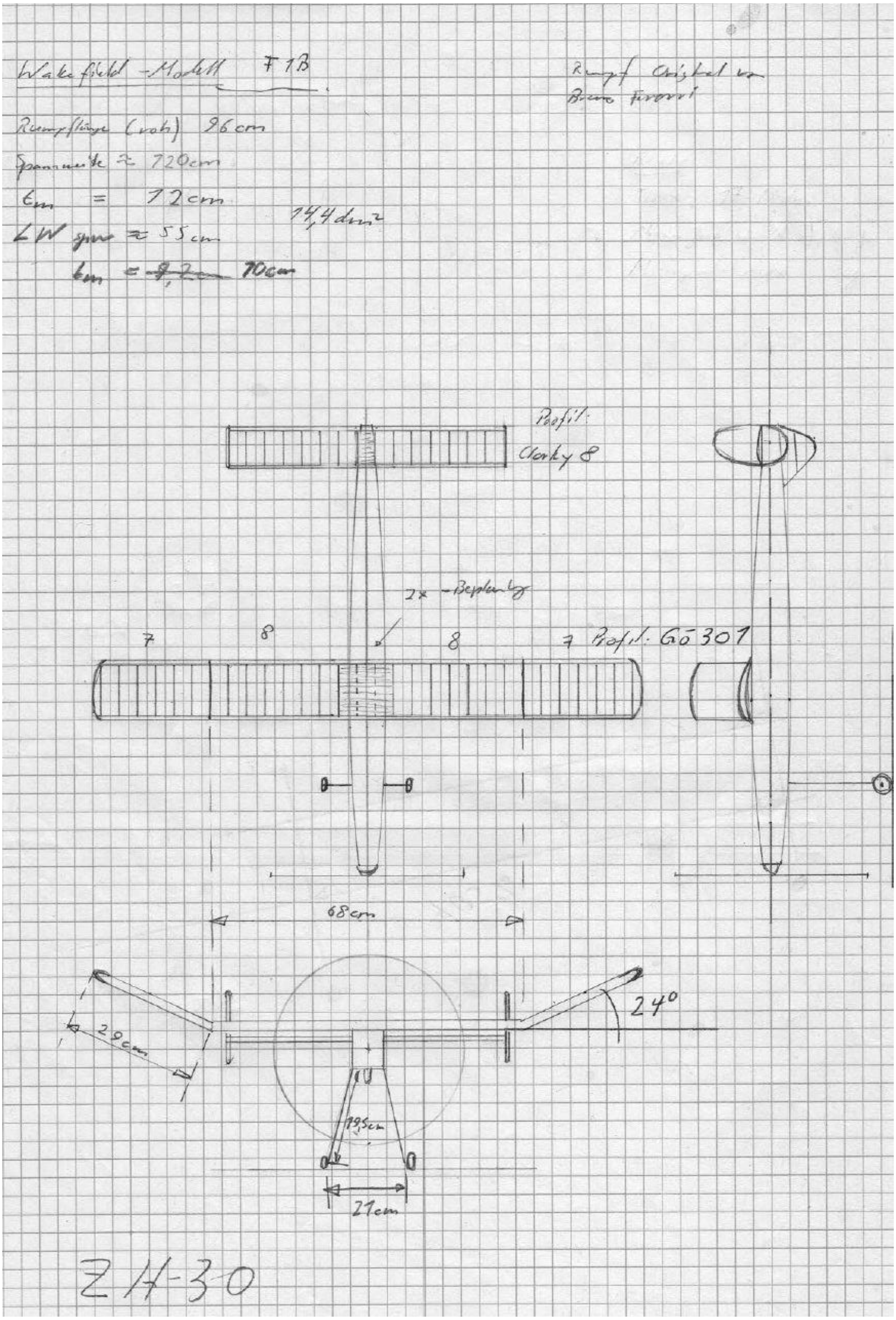
Halsach, coloring paper for Letters

Haslach, The most beautiful work on the model



Haslach, Done

Haslach, inflight



Haslach Sketch

Essex Flying Group
BMFA Centenary Delta Dart
Indoor Duration Event (2023)
By Mark Harper

I am very fortunate to belong to a fantastic group of like-minded aeromodellers, who enjoy building & flying all types of traditionally constructed model aircraft. Together, we form the members of the fully BMFA affiliated "Essex Flying Group".

We are a small group & are lucky to be able to hold our monthly club nights in a small church hall in Chelmsford.

To make the most of this facility & have a bit of fun, we try to hold an annual low-key indoor duration event. Over the years this has included, small hand launched/catapult gliders, Ikara Butterflies, paper aeroplanes & entry type 35cm rubber models etc.

During 2023, we ran an event for the rather attractive looking BMFA centenary version of the ubiquitous "Delta Dart" rubber powered model.

A quantity of kits was purchased from the BMFA & most members built a model to join in the fun.

All models had to be constructed and covered from the wood & paper covering supplied in in the kit. No modifications were allowed, other than lightening the propeller & using smaller section rubber to restrict performance to suit our hall.

Essex Flying Group members with their "Centenary Delta Dart" models.

Flights for this event were made throughout the year at our monthly club nights. Each flyer's best 3-flight times were submitted at the end of the year to decide the winner.

The top 3-Place flyers (above) were as follows:

1st Place:	**Chris Hutchinson (middle)**	**best 3-flight total: 1 min 47.60 sec (average 35.87 sec)**
2nd Place:	**Rob Sandison (left)**	**best 3-flight total: 1 min 34.77 sec (average 31.59 sec)**
3rd Place:	**Barry Spouge (right)**	**best 3-flight total: 1 min 08.79 sec (average 22.93 sec)**

The BMFA Delta Dart is based on an American model designed by Frank Ehling. It is an extremely easy to build beginners rubber powered model & was not intended to be an indoor duration model.

In view of this, the flight times achieved are a credit to those that took part & reflect the time & care spent trimming their models for optimum duration in the confines of our low ceiling hall.

I have to say that we were all pleasantly surprised by the performance potential of these little models.

Next year (2024), our club night event is going to be a "no-touch" indoor rubber duration contest. There will be no restrictions on model type, size or weight, but flight times will be terminated as soon as the model touches either the walls, ceiling or floor.

In the past this has proven to be quite a performance leveller, but as with all indoor flying, lighter models will have an advantage. So, the idea is to hopefully encourage members to build accordingly.

The FROG 100 MK 1 by Bill Wells

Without the references to Adrian Duncan's article on Early Frog Engines I may still be trying to get my FROG 100 going. Adrian's articles are absolute gems if you're trying to research a particular engine. I would recommend going to his website for information.

The problem with buying engines at an Auction is there are too many of them on display which limits the time spent examining those that you actually end up buying. I bought a FROG 100 only to find it didn't have much compression, the flats that turn the prop drive had been filed off of the crankshaft and there were other irritating minor problems. The following year I bought what at first glance appeared to be a clean FROG 100, but it turned out to be a real bag of frogs. The second engine had compression but wouldn't run! The crankshaft had a right-hand thread and, in my ignorance, I assumed that perhaps it was a later model. The carburettor body was 'T' shaped and screwed into the bearing casting of the crankcase, the thimble of the needle screwed directly onto the 'T' body. Both engines were put aside for some years until the Covid Lockdowns gave me time to re-assess them. The FROG lOOs had 2BA Left Hand threaded crankshafts. Only the earlier 175 petrol engine had a Right-Hand thread!!! The 175 also had as 'T' body screw in venturi. Examination of the crankshaft showed it was timed 180 degrees out, made for a carburettor like the 175 under the crankcase. Problem solved rotate the front bearing 180 degrees!! Checking the crankshaft, it only had a very small part of intake aperture that lined up with the venturi. The photo shows part of the bearing obscuring what can be seen of the crankshaft intake. That is irrelevant as the screw in venturi (used on the 175) covers the small area obscured by the bearing. I think someone tried to combine an early 175 petrol engine with parts from a later 175 and a Frog 100. This was confirmed by the rust camouflaged cam for the make and break on the back of the steel prop drive.

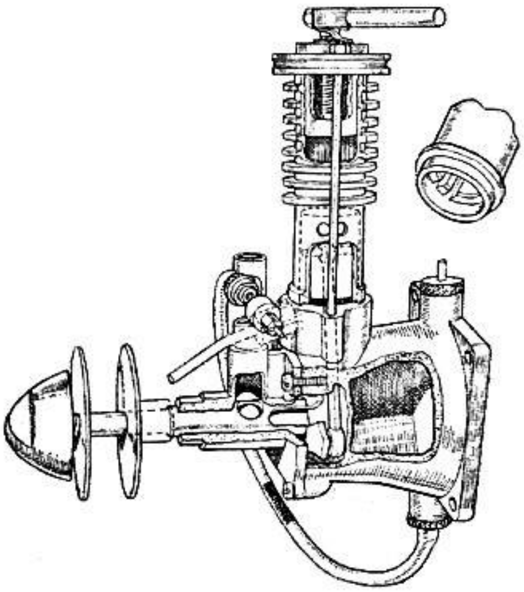
At this point the best parts from both engines were combined to make one good engine. Because the remaining crankshaft no longer had a square or flats to engage in the prop drive, I made a split taper collet and a modern type alloy prop drive. I cut a taper in the old prop drive so that it fits on the engine but it is of the alloy type and a bit the worse for wear. For actually running the engine I used my homemade prop driver. Then although the engine would start the surface carburettor was so worn the needle just didn't track into the orifice on the far side of the venturi which had a rather large hole for the needle to rattle around in. I made up a new surface carburettor and then had a runner.

To start, suck in a couple of times, back off the compression about 3/4 of a turn and flick over several times until suddenly the fuel seems to arrive over the top of the piston, there is a click as the contra piston assumes its new position! Then small compression adjustments until it runs, gradually increasing the compression to keep it running till the normal running compression is established. This engine (parts) are pushing 74 years old and I assure you that when you reach that age things don't work so well as they did years earlier. This isn't a high revving engine and bearing in mind its age I used a 9x4 KK nylon prop and was happy to let it run continuously at 5,000 rpm. The fuel I had to hand was made up for a very small engine, high castor oil and ether content. A mix with a bit more paraffin in it might have given better results. I had it running for a short while at 5,600 but it seemed happier running slightly rich and with more even running at 5000 rpm.

The FROG 100 MK 1 engine is sometimes described as a Stove Pipe or bicycle spoke engine. The head is held down by two tensioned 8BA studs which in turn holds the cylinder in place. The contra piston seals the cylmder not the head! This idea of studs holding down the head and cylinder isn't unlike some full-size aero engines. The head also houses the 1/4 inch 32 TPI (glow and spark plug thread) compression screw. The contra piston is overly long which makes stroke appear to be longer than it actually is! With such a tall cylinder held by two studs there is a huge risk of breaking something in a collision with the ground. Later models had the rear of the fuel tank mounting flange made thicker which reduced the chances of impact damage to the tank / crankcase. Bore is .375" and the stroke .55" making the swept volume just under 1cc.

This engine weighs 3.3 ozs. It could easily be equipped with a fuel cut off for free flight operation. A sprung loaded plunger is fitted inside the top air vent. The plunger is physically held up by the timing device so that when the timer releases the plunger the spring pushes it into the taper of the fuel outlet orifice. The engine looks good and is a quiet runner. These engines come tip at auction from time to time, finding a good one after years of attrition might not be so easy. The good news is that later models the MKII, RG16O and 180 had a lot of common parts which is in sorne ways a good thing for availability of spares. The bad news you might end up with a 'spare parts' engine. Being a relatively small object the number that must have been thrown away due to Widow's trash syndrome must have been high. In conclusion,bearing in mind all the bits I made for this engine to get it running again, was it worth it? As far as I am concerned the answer is YES!!

From Aeromodeller June 1948



As these series of tests proceed it becomes increasingly evident that considerable benefit to the Aeromodelling community can accrue from the co-operation of specialists working along scientific lines. This is apparent from the results obtained with the propellors specially designed by Mr. P. R. Payne for each engine tested. BHP figures are first obtained by Mr. Sparey, after which Mr Payne takes over, and designs an airscrew to take advantage of the maximum h.p. output of the engine. The amazing results of this scientific approach are evident from the Static Thrust graphs obtained.

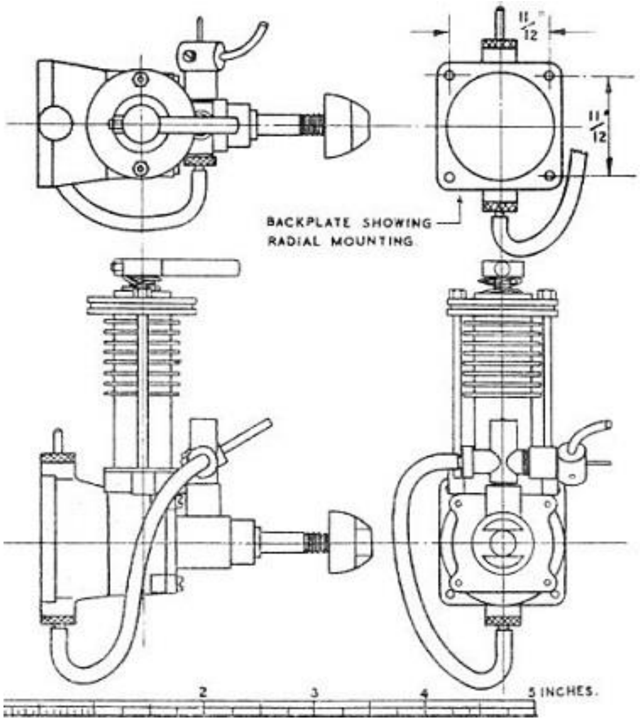
TEST

EngIne : Frog 100 1 cc.
Fuel : Mills Diesel Fuel (2 parts fuel, 1 part Ethyl Ether).
Starting: Hand starting was used throughout. Engine was run inverted which is the maker's recommended position. As with all gravity fed carburettors, there is a tendency to open the needle valve too much, with consequent liability to flood the engine. Once, however, the correct position is found, the engine starts easily both when hot and cold. No cut-out is incorporated.

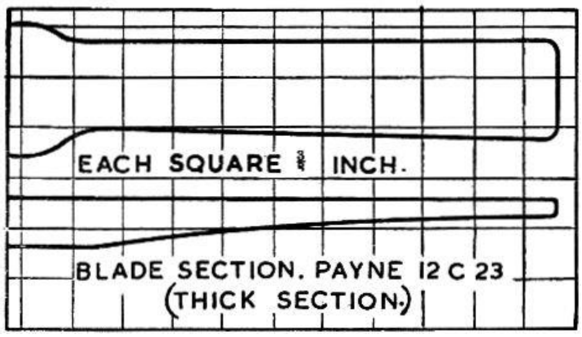
Running: Runs well and steadily over a wide speed range. and shows a flexibility unusual with diesel engines. This simplified testing greatly, as a large range of constant speeds could be attained. This is not of great practical value, however. as the bhp, falls rapidly with decrease in revs, per minute.
B.H.P. - As is normally the case, power rises steeply with increase in revs, from .0145 b.h.p. at 2,800 r.p.m. to a maximum of .0575 b.h.p. at 8,100 revs. This maximum figure for b.h.p. may be considered exceptional for as engine of this capacity. Beyond 8100 r.p.m. the power falls off steeply, so that at 10,000 r.p.m. the power output is .042 b.h.p. This was the maximum speed at which the engine was tested.
Static Thrust. - Using the maker's standard propellor a maximum throat of 10 ozs. was Obtained at 5,750 r.p.m. while at 4,500 r.p.m. the thrust was 7 ½ ozs. This steep decline in thrust as the revs, decrease is characteristic of most internal combustion engines.

A remarkable increase in thrust was obtained when using the Payne airscrew, as the graph shows a maximum Static Thrust output of 15 ozs. at 9,000 r.p.m. At 7,500 r.p.m. the thrust was 12 ozs. but below this speed the load was insufficient for consistent running. There is also no object in taking static thrust tests at obviously inefficient engine speeds.
it is interesting to note that the Payne airscrew delivers its greatest thrust at a point beyond the maximum power output of the engine. This suggests that a slight modification of propellor design, so that maximum thrust could coincide with maximum power output, might yield yet better results. The engine, however, showed no signs of distress when run at 9,000 r.p.m. for long periods.
As we go to press we learn that improvements have been made to the cylinder head and carburettor assembly.

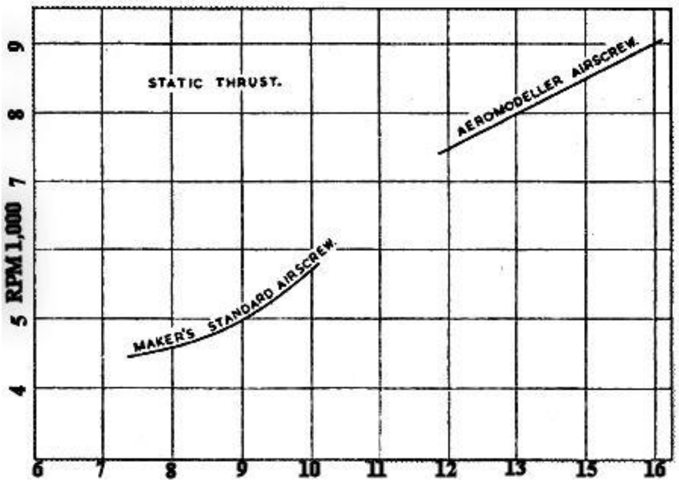
GENERAL AND CONSTRUCTIONAL DATA
Name. Frog 100.
Manufacturers' Name and Address. International Model Aircraft, Moorden Road, Merton, SW19. 'Phone No. Liberty 1041.
Retail Price. 60/— with airscrew.
Delivery. Ex stock.
Spares Service. Comprehensive (manufacturers and agents).
Type. Compression ignition" diesel" 2 Cycle, rotary valve induction.
Specified Fuel. Equal parIs by volume of ether meth diesel fuel oil and lubricating oil (XL.) etc.
Capacity. I cubic centimetre. .061 cubic inches.
Weight, bare 3.125 ozs.
Compression Ratio. 12—l to 20—1.
Mounting. Radial, upright or inverted.
Recommended Airscrew. Free flight 9" diameter 5 pitch. Control-line, 8" diameter 8" pitch.
Recommended Flywheel. l ½" diameter, weight 2 ¾ 0zs.
Tank. Integral with crankcase, capacity 9c. cms
Bore. .375"
Stroke. .55"
Cylinder. Mechanite, honed. Ports, two sets of exhaust and transfer ducts. Method of attachment, spiggotted to crankcase with two holding down bolts through head.
Cylinder Head. Aluminium die-casting. Finned, with two holding down bolts.
Contra Piston. Meehanite, centreless ground, adjusting screw and lever.
Crankcase .Aluminium die casting,
Piston. Meehanite, centreless grooed. flat-top.
Connecting Rod. Forged hyduminium.
Crankpin Bearing. Plain.
Crankshaft. Machined from solid.
Main Bearing. Meehanitc, plain, drilled for valve.
Little End Bearing. Plain (silver steel gudgeon pin).
Crankshaft Valve. Rotaiy shaft (case hardened mild steel).
Special Features. Fully controllable from tick-over to maximum revs. High power to weight ratio. Special two-way adjustment is incorporated for needle valve. A cut-out is available at extra cost.



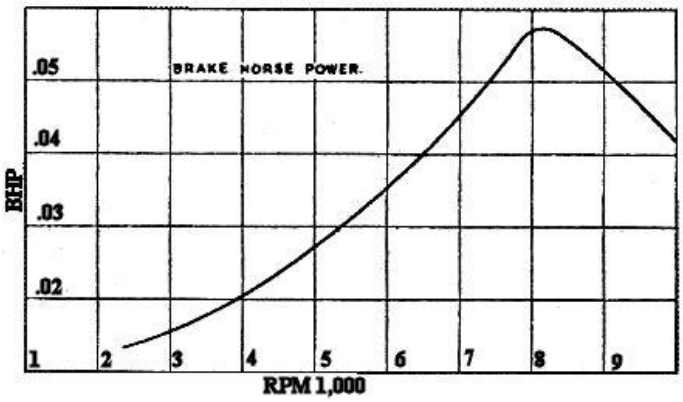
11/12"
11/12
BACKPLATE SHOWING RADIAL MOUNTING.
2
3
4
5 INCHES.



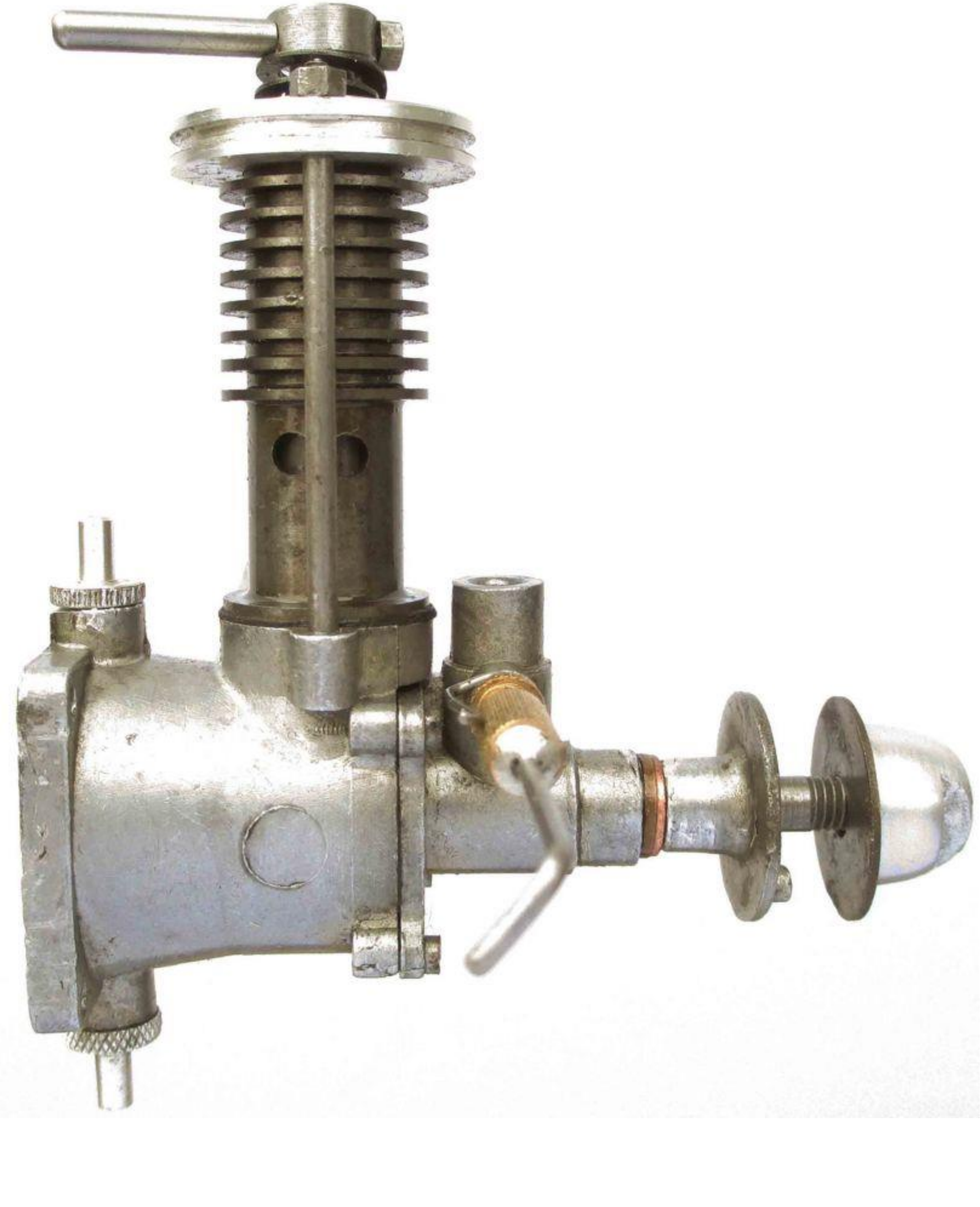
EACH SQUARE INCH.
BLADE SECTION. PAYNE 12 C 23
(THICK SECTION.)

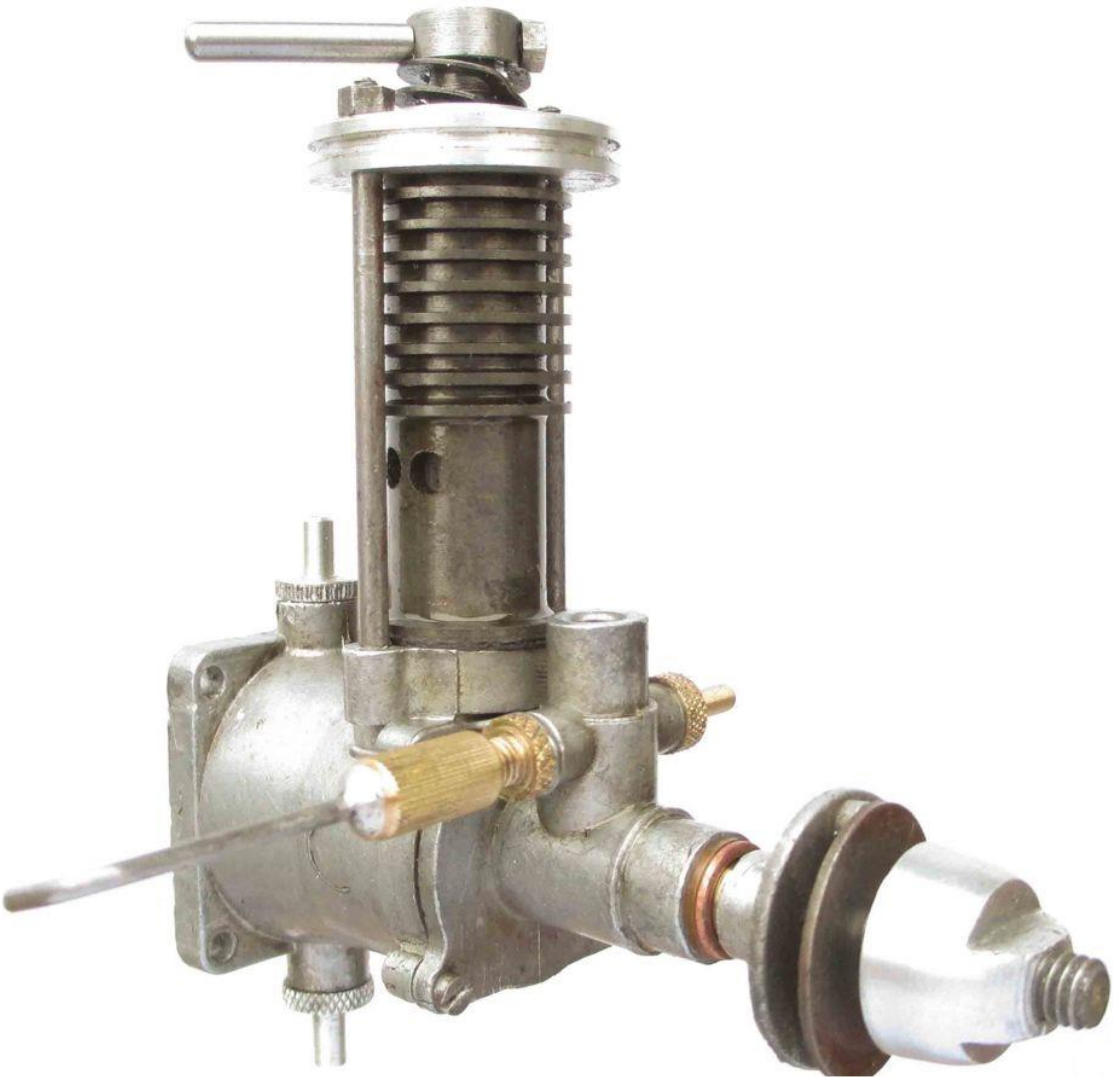


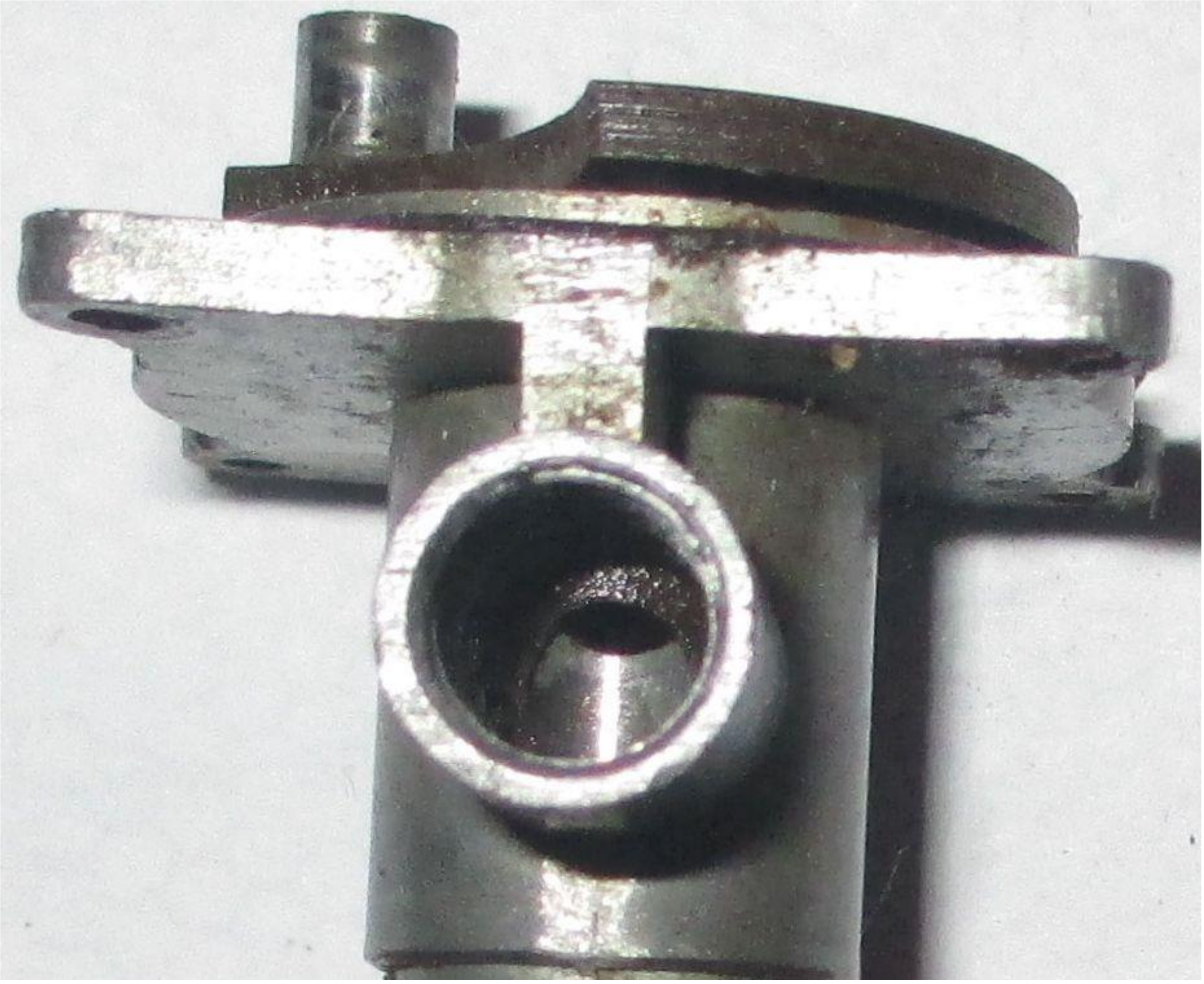
STATIC THRUST.
AEROMODELLER AIRSCREW.
MAKER'S STANDARD AIRSCREW.
RPM 1,000
9
8
7
5
4
6 7 8 9 10 11 12 13 15 16



BRAKE HORSE POWER.
BHP
.05
.04
.03
.02
1 2 3 4 5 6 7 8 9
RPM 1,000







From Peter Ziegler

Meeting for rubber/CO2 engine models 2023

gummimotor.ch held two successful meetings this year at the airfield "Gheid" in Olten. The first on August 5 with 16 participants, the second on October 21 with 15 participants. Both meetings were lucky with the weather. It rained until early in the morning, only to dry up and clear up before the start.

There was no wind for many hours until the early afternoon. The windsock hung limply down. So after the welcome, the tables were soon set up and the airplanes brought to the preparation area. There was no time to lose, because the weather could change at any time and thus wind could start...

After the lunch break the sun came out both times and with it the wind freshened up temporarily, but was still flyable for the larger models. Lighter models were nevertheless strongly displaced and with others the thermal brake was activated, in order to prevent a flying away. At the August meeting this led to the fenced area on the south side with its trees exerting a great attraction on the models. But all models could be recovered without any problems, because the key to the area was available. There was no damage during these rescue operations.

While some well-known participants were missing (George, Andreas...), new colleagues showed up and also old acquaintances found their way to Olten. Bruno, who surprised with his models made of Depron, or Nicola with the 80 years old hull of a model of his father. This is now being rebuilt by him as a replica. In the end, we again had a wide mix of interesting models and participants at both meetings, with lots of flying and chatting among like-minded people.

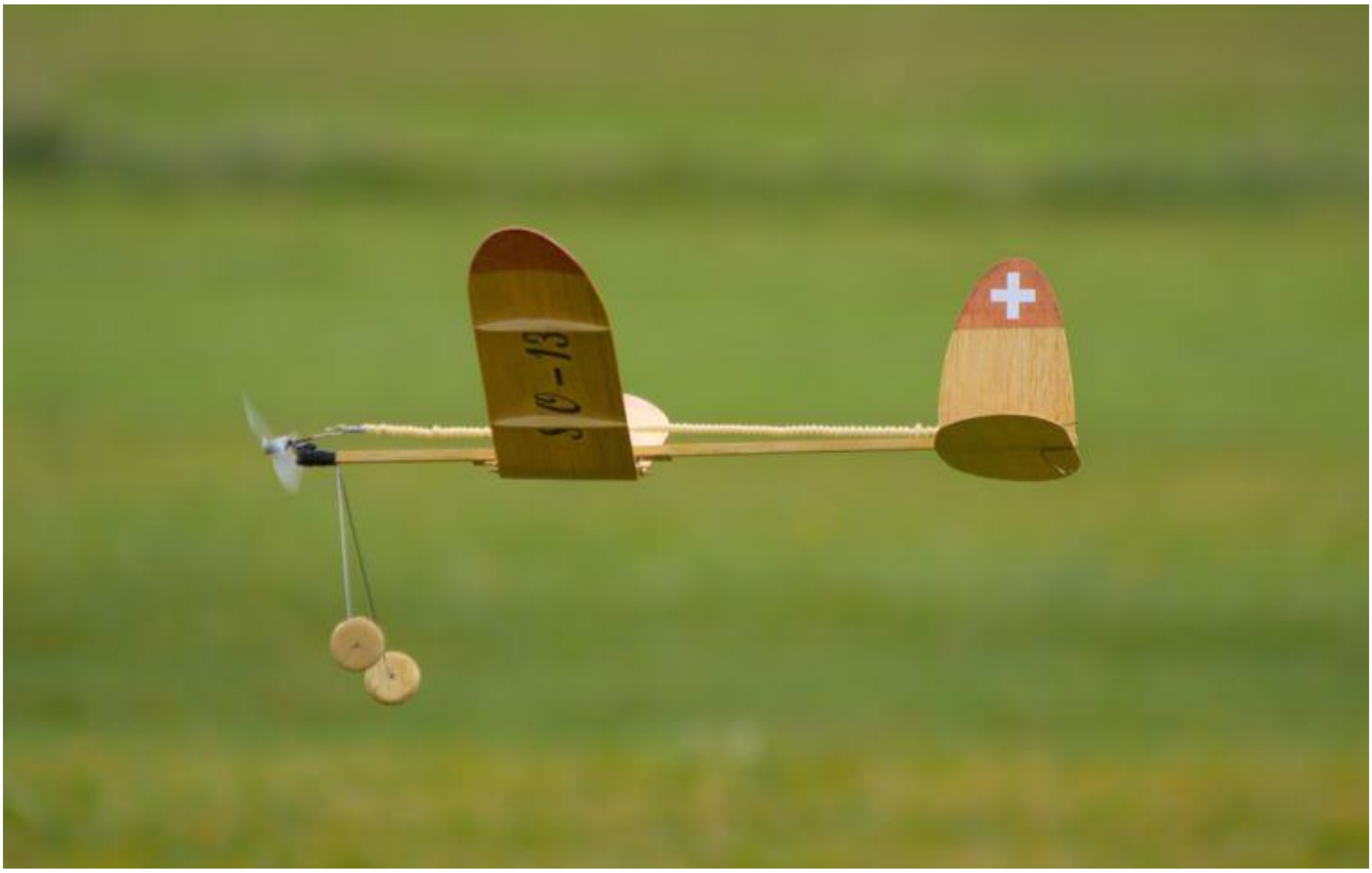
80s old model hull

Activating the thermal brake

Albatros D III

Areonca 7AC Champion

C.B.-6, 80 years old French kit



Cloud Tramp

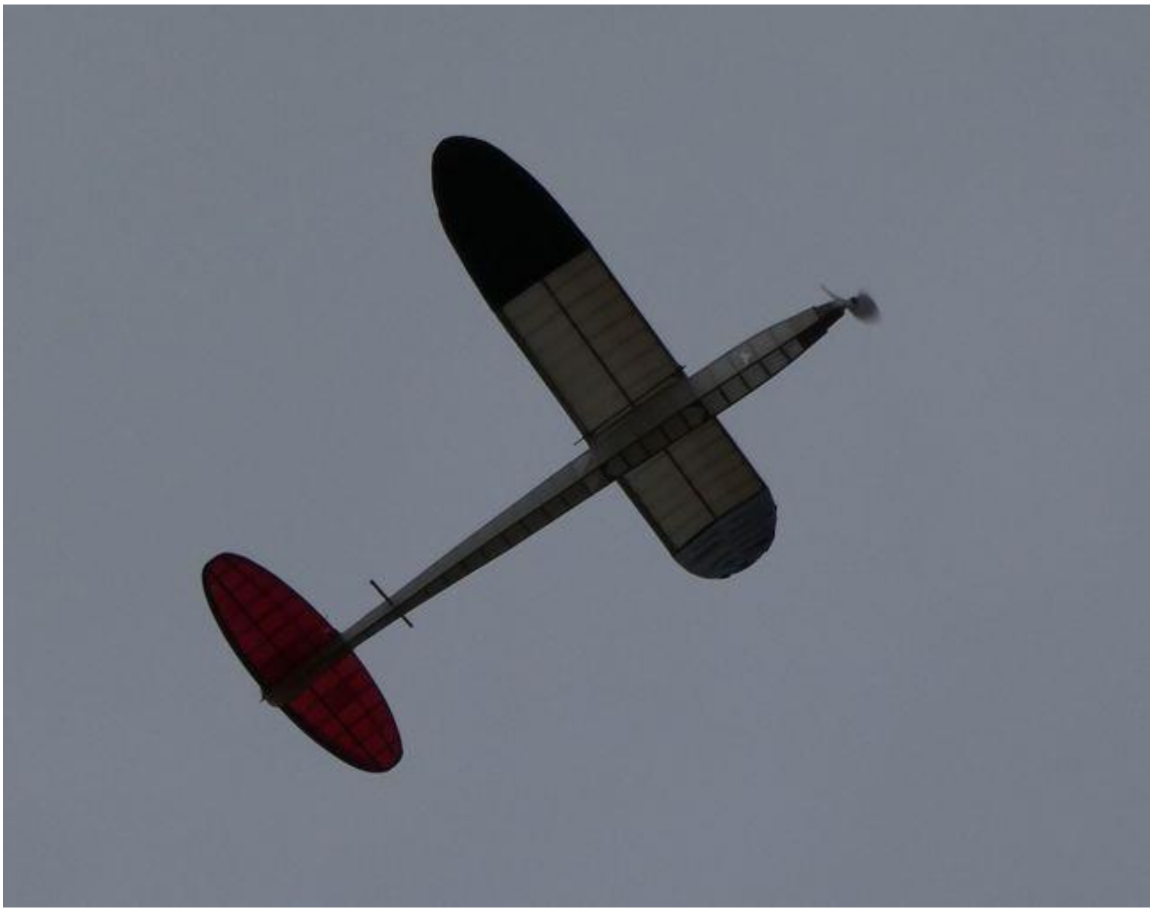
Cozy get together

D-3800 Morane


Depron model (2)

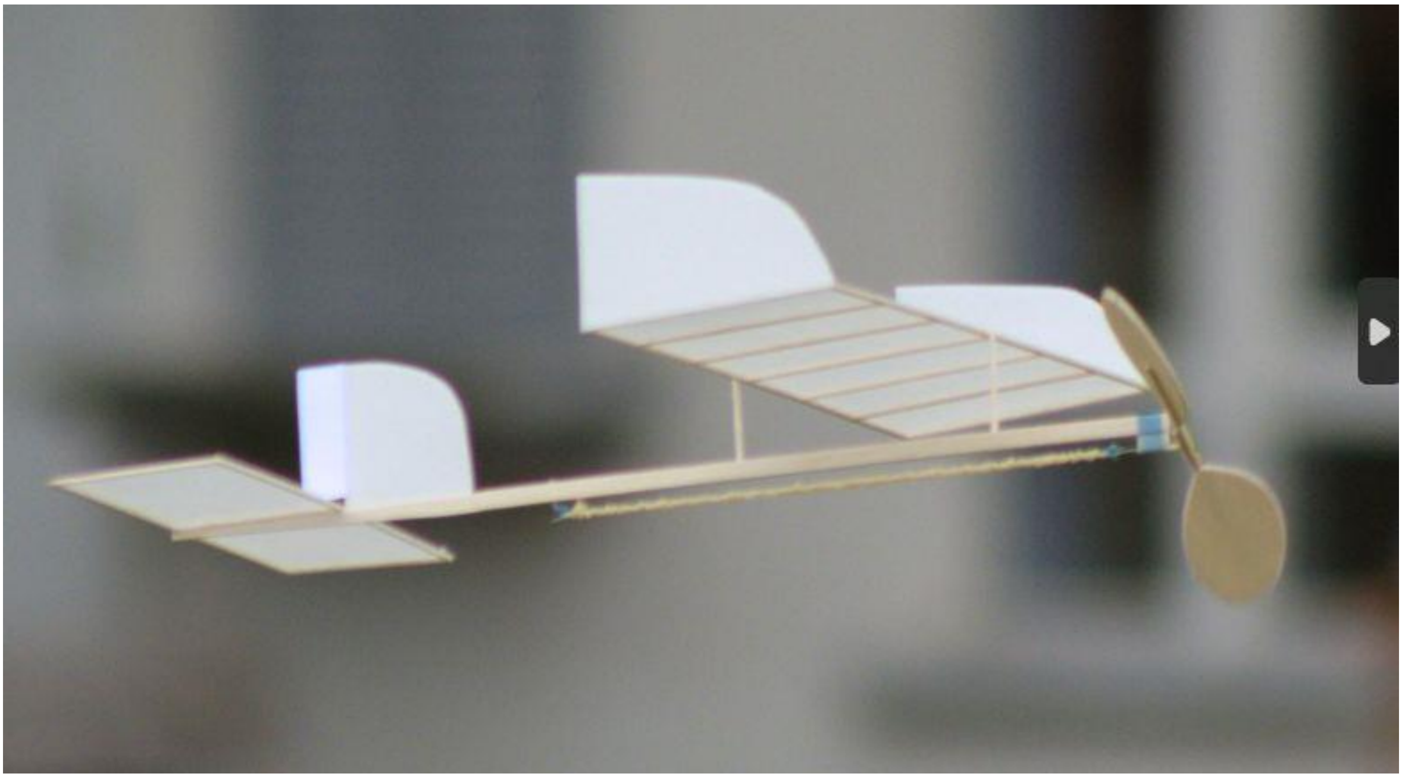
Depron model

Dornier Do-335 Pfeil



Dragonfly P30

EKW C-3603



Hall flight model in outdoor use

Junkers Ju-52 3m

KeilKraft Ace

KeilKraft Contestor


Kiwi P30

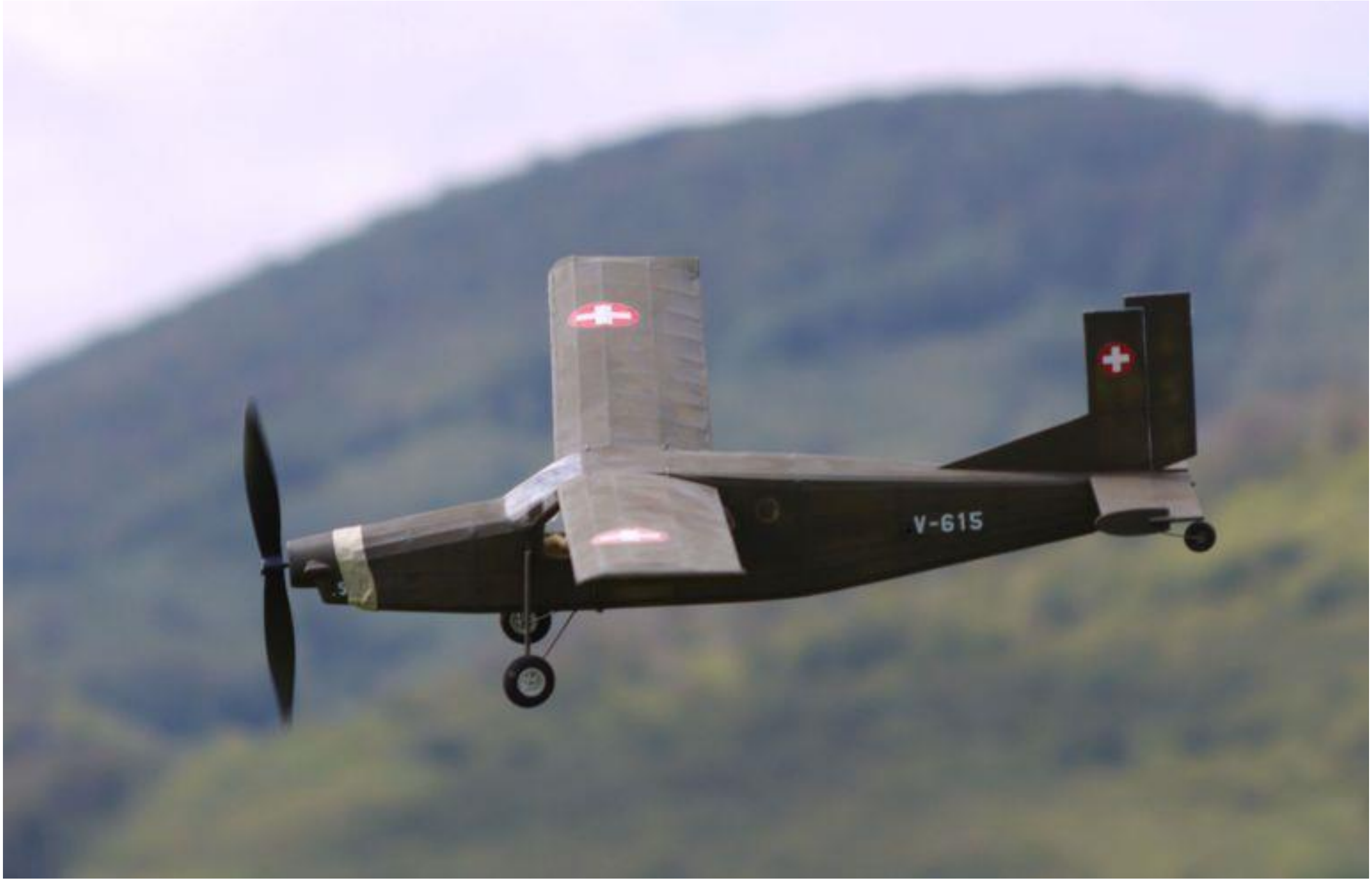

Northrop motorized primary glider

P30 finished model

P-51D Mustang

Participants

Pilatus PC-6 Turbo Porter



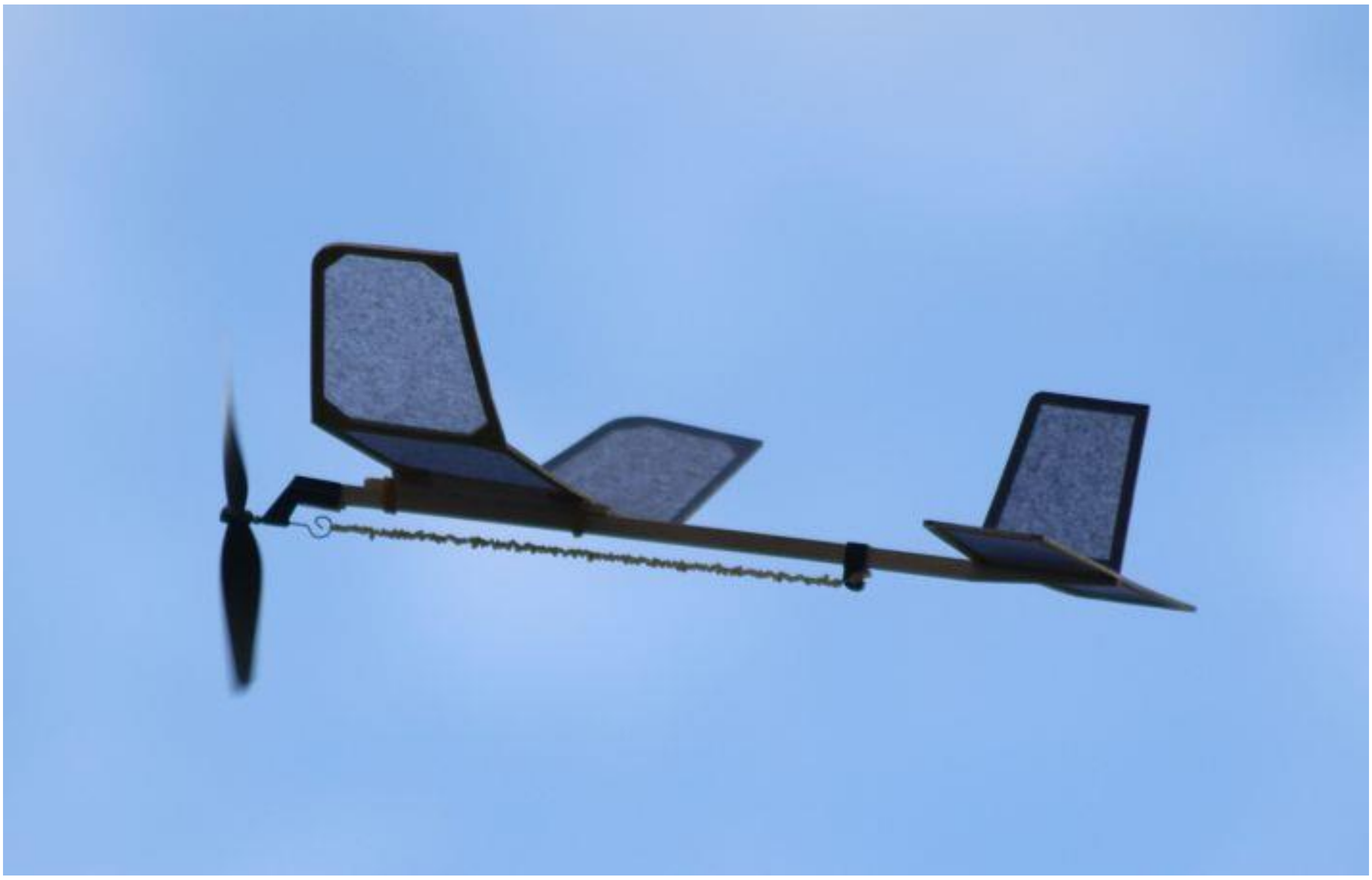
Pilatus PC-6 Turbo Porter_ Swiss Air Force


Piper PA-15 Vagabond

PZL P.24 with CO2 engine


SE-5a

Secundus P30



Simple model with good flight characteristics

Sperry M1

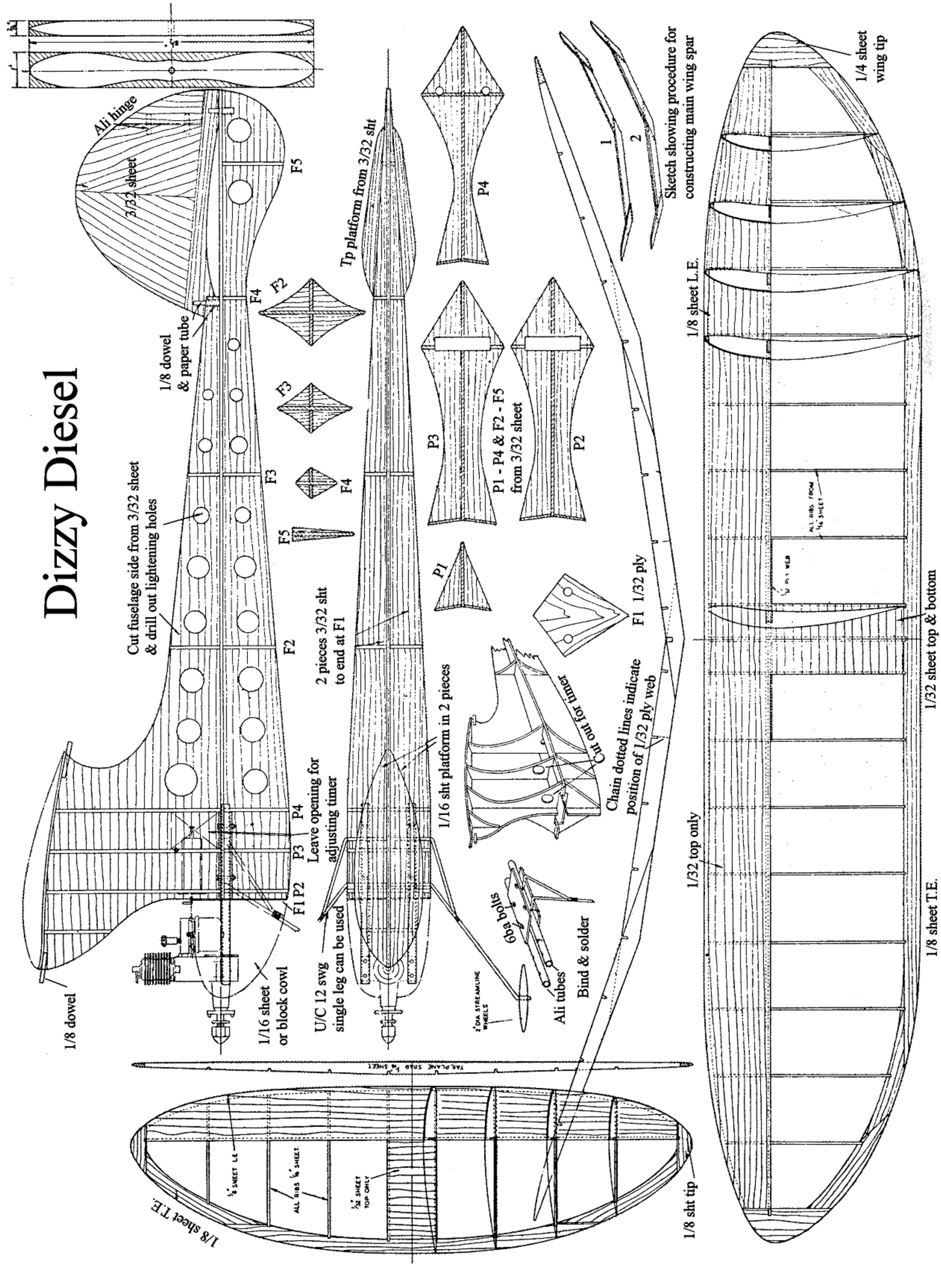
UTE 1937

Wright-Bellanca WB 2

Two photos from John Hammond

From Andy Brough (as a result of Stephen Winkworth's article and email I received regarding John Kemp's death)

I collected 3 of John's planes that he flew when I was with him. I shall restore to flying condition and add radio. I've almost completed the Greater Sunduster Plus that he started but knew he'd never be able to fly. I've put radio in that too plus an OS FS 60 open rocker. The polyester covered wing is the Plus, the Greater is yellow/blue and the standard is yellow/red. Hope to have restored all by spring. Out of interest the silver model on the shelf is Geoff Stubbs MS Hornet also needing restoration.



Geoff Dunmore’s Dizzy Diesel from Aeromodeller December 1947

This model was designed around the popular 1.3 cc Mills Diesel Engine. On commencing the design I decided upon a wing area of 210 square inches with an aspect ratio of approximately six-to-one, and due to its success in America, the wing section selected was N.A.C.A. 6409. The fuselage I decided should be approximately 50 per cent, of the wing span. I also endeavoured to group the main forces, i.e., thrust, lift, drag and weight, as closely as possible. This, the American magazines told me, would help to prevent the model going over onto its back during the climb. With all this borne in mind, and a drawing board in front of me, the result was the " Dizzy Diesel." The engine has not been given any side or down thrust, and this has proved quite satisfactory.

- Construction.

The wing on this type of model must be capable of standing up to fairly high stresses, due to the speed, although possibly the most severe loading is caused through the model turning over on its back after landing.

This is bound to happen when flying over rough ground or in windy weather. The result of this is a sharp blow in the centre of the spar; this is often forgotten when designing a model and is not remembered until the damage has been caused. In designing the main spar it should be borne in mind that the strength at the tips need only be slight to that of the centre section. The width of the spar, therefore, can be reduced towards the tips. In this case it was done by having the inner section 1/8 - in, wide and the outer 1/16 in. wide, the centre being reinforced with 1 m.m. ply. It should also be noted that a much stronger structure will be obtained if all the parts are given a coat of cement and allowed to dry before finally cementing together. The fuselage is built up on the " X " type of structure as used by Leon Shulman on his Banshee. It has the advantage of being simple and quick to build, and ensures correct alignment of the wing and stabilizer while giving a clean and well streamlined fuselage. I mounted the engine on beams, and not, as has been general in this country, a detachable mounting. This was done to minimise vibration. Bearing in mind the possibility of a crash, aluminium tubes were used for the engine bearers ; these bend if any severe load is implied to the engine. The undercarriage also is slightly different, attachment being rigid and fitted direct to the engine bearers. Any heavy landing therefore is transmitted onto the bearers where the weight is fixed ; - i.e., engine, and not as in most cases to the balsa structure.

-Fuselage.

First of all reproduce the fuselage outline on a sheet of 3/32nd medium grin balsa, Cut out the outline and lightening holes as required. Two or three sheets can be cemented together to give the required size. Next, cut the plan outline from 3/32nd sheet and cement to side elevation. Formers for the wing mount and the triangular gussets are now fitted. The wing platform is made from 1/16 in. medium hard sheet, the grain running fore and aft. Fit paper tubes to take fin dowels, dowelling for wing and stabilizer retaining bands and 22 s.w.g. piano wire skid to tail.

Lastly, attach flight timer in fuselage. A small door can be made to give access to timer valve.

-Wing.

-Cut ribs, as shown on drawing, from soft medium 1/16 in. sheet balsa. The main spar is built up in sections from 1 / 16 in. medium hard straight balsa and reinforced in centre with 1 mm. ply. Care should be taken when fitting ribs to spar to see that correct alignment is attained. Next, cement in trailing edge, leading edge and tips, which are made from soft 1/4 in. sheet balsa. Finally, cover the top surface of the leading edge with 1/32 in. sheet balsa.

-Stabilizer.

The construction is the same as that of the wing, but with a single-piece spar.
-Fin.
The fin is built up from 3/32 in. sheet; this is made from three sections to give maximum strength and anti-warp properties (see drawing). The rudder is attached by thin aluminium strips. The fitting of two 1/8in. dowels to correspond with the tubes in the fuselage completes the fin.
-Enqine Mount and Undercarriage.
Two lengths of 1/4 in. aluminium tube are cut and drilled to take the engine bolts and undercarriage legs, etc. Cut two lengths of 12 s.w.g. piano wire for undercarriage. Insert undercarriage wire in corresponding holes in aluminium tubes and bend undercarriage legs to suit. Two plywood plates, 1/16 in. thick (see drawing), are cut and drilled to take the four 6 B.A. bolts at the back of the engine mount. Then bolt these two plates on either side of the tubes as shown. Thin copper wire is then bound round the undercarriage legs to form stops where they enter the tubes. This unit can now be fitted into the fuselage. The front former (1 mm. ply) is now slipped over the front of the tubes and stuck to the front of the fuselage. This keys the engine mount in position.
-Cowling.
This can be made from soft balsa sheet cemented directly to the fuselage. A soft balsa block can be used to give the required curvature at the front. A small hole should be left at the bottom of the cowl to allow surplus oil to drain off.
-Engine Installation. -
The engine is bolted down by four 6 B.A. bolts, the heads of which are connected together by soldering short lengths of piano wire between slots in the head. These are then inserted from underneath the aluminium engine bearers, small thin fibre washers of a smaller bore than the bolt are forced on and screwed down to prevent the bolts falling out. The engine can now be placed in position and the retaining nuts are tightened up by means of a box spanner. A short length of thin wire is attached to the lever of the flight timer arid the arm of the engine cut-off.
-Covering and Finishing. .
The wings and tail are covered in Jap tissue with the grain running from tip to tip : this is important as it helps to stop the wing warping as the tissue tightens most along the grain. Cover the lower section of the wing first and make sure the tissue has stuck to the under camber. If white photo paste is used, clear dope should be run along the edge of the rib before water spraying to ensure that the tissue does not pull away from the ribs. The fuselage is covered with the grain running around the body. The pylon requires a little more care and is best done by cutting strips of tissue approximately 1 in. wide and sticking to the front and rear of the pylon, allowing approximately 1/8 in. overlap.
A little clear dope should then be run along the joint before water spraying. The whole model is then given one coat of clear dope, a second coat can be applied to the fuselage if desired. The fin and cowling are colour doped. The original model was covered in orange, with blue trimmings.
-Propeller.
This is the most important part of the model. If the pitch is too low then the model is reduced to a slow forward speed, which naturally gives only a slow climb. On the other hand, if the pitch is too great the engine will not be able to turn it over sufficiently fast (the engine does not produce its maximum B.H.P. power until maximum revs, are obtained). We have therefore to make a compromise between the two. This is best done by deciding upon a given pitch and reducing the blade area and diameter until the required revolutions are obtained. (A speed indicator is useful for this purpose. These can be obtained for about 7s. 6d., and used in conjunction with a stop-watch, give fairly accurate readings.) In the case of the Dizzy Diesel " the best results have been obtained with a propeller of 8 in. diameter and 6 in. pitch. This should be carved from a heavy wood to help the flywheel action, and the thickness of the blade being kept to a minimum to reduce the resistance of the propeller while revving.
-Flying.
The flying of this type of machine requires a little different technique to that required of the more orthodox model. The relation between the wing and stabilizer, i.e., longitudinal dihedral, if altered

to any great extent will cause the model to loop when under full power. Trimming therefore should be carried out as follows. First test-glide the model, over long grass for preference. If it has any nose-down tendency this should be counter acted by a little weight in the tail. Similarly, if the model stalls, counteract this by weighting the nose and not by altering the setting of the wing or stabilizer. Having checked the glide, power flights can now be attempted. An engine run of approximately 10 seconds and a full tank of fuel should be given. If a small quantity of fuel is used there is a danger of the engine cutting directly the model starts to climb, and the consequent dropping of the nose to attain gliding angle might cause a crash. The model, when launched under power, should have a very steep climb. If there is any tendency for the model to go over on its back and loop, then the positive incidence on the stabilizer should be slightly increased until a vertical climb is obtained. Down-thrust should not be used for this purpose.

After the initial flights, the time switch should be set permanently to 20 seconds (the maximum allowed in S.M.A.E. competitions).

If these instructions are carried out there should be no trouble. All three models so far built have been pleasure to fly, as they recover very quickly from a stall, even when the engine cuts at the top of a vertical climb. The best flight to date was made by Steve Lacey, with time of 331 secs. o.o.s. Under non-thermal conditions the model is capable of an average flight of 80—100 secs., providing the weight does not exceed 11 1/2, ozs. all up.

A single-wheel type can be built and has a first-class performance, but is not quite so crash-proof as the two wheeler when landing and should not be attempted by the beginner.

Greetings from Holland. Mayfly 2023   From Ton Van Munsteren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Tomboy


saté


KeilKraft


KK
BANTAM


INVADER


Topsy
-MODELL
RC


EAGLET
3
Topsy


3


COMET


TAXI
Graupner


SIMPLEX


Tomboy
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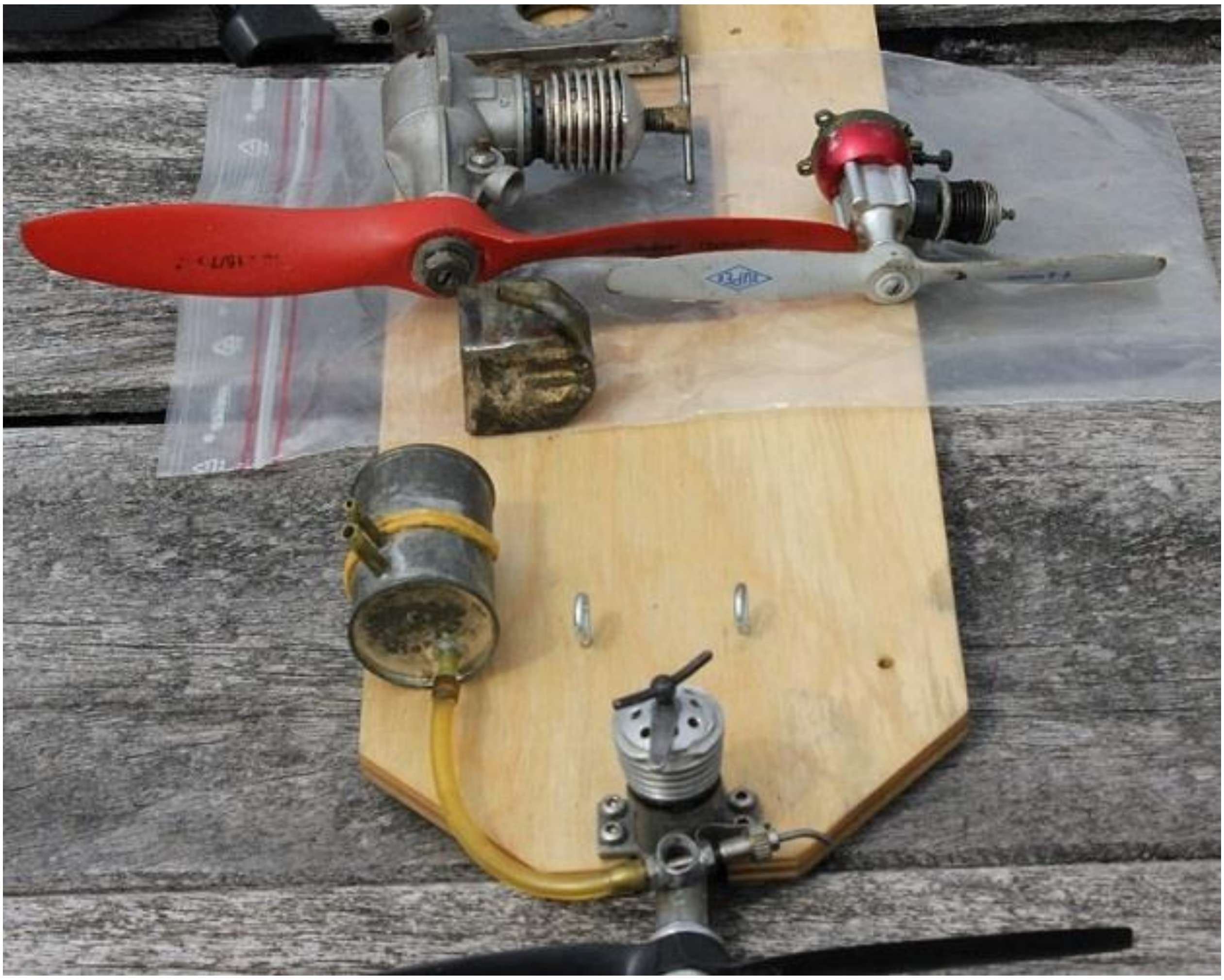


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NC 87803


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