

GLIDEPATH



The Journal of Wessex Soaring Association. January 2021
BMFA Club No 2759

From the Editor

Welcome to the first Glidepath of 2021, though unfortunately it is a case of another year, another lockdown. I am though pleased to say that this edition contains a variety of articles. There are a couple of features on building new models though with very different techniques. While Frank Bayes describes his latest 3-D printed creation, Richard Docketty has been doing a bit of good old fashioned balsa-bashing constructing a kit from the 1980's. Geoff Collins describes some trials and tribulations he has suffered revamping an old model and its motor, while Dave Camp describes some modern full size glider designs which he suggests might be a good candidate for a (semi) scale model. These modern gliders do have a some very impressive capabilities, though I suspect they come with an impressive price tag to match.

I am sorry to say that Father Christmas did not bring any modelling goodies this winter, but what I did get was a desk which has enabled me to set up a home-office in the spare room, thereby freeing up the dining room for its true purpose, namely the build and repair of models .

From the Chair

Hi all and welcome to 2021. I am sure everyone is hoping that the situation can be controlled, and we can soon resume our normal fun.

In the meantime it is a good idea to check through your gear, cycle NiMh batteries, make sure LiPos are on storage voltage and generally check airframes etc. I have been making a new wing joiner for one of my slope soarers as the one I made originally is not really up to the task.

Recently I sent round an email asking all to log into their BMFA account and indicate that they have read article 16, which amongst other things this is the clause that exempts us from the 400' height limit rule. If anyone needs help please ask.

Plans for 2021

Hopefully things will return to some kind of (new) normal soon. Slope fly-ins are likely to continue as the first Sat/Sun with the second Sat/Sun in the month as fall back. I will be sorting out a calendar for this year's E Soaring events based on the usual 3rd Sunday with the 4th Sunday as fall back.

Winter Warmer

Obviously as things stand this is impossible, however it occurred to my optimistic side that it MAY be possible to hold something later in the year (Summer Sizzler/Autumn Eatout ?) so watch this space !

Picnic Site Closed

I have just heard that the Picnic Site, which is one of the public slope soaring sites in the Purbecks, has been closed off by the MOD. I am not sure why, but will update you if I hear anything else.

Slopeside by Pete Carpenter

What we believe to be the situation on each slope is as described below, however it is not always possible to contact every landowner each month and we have no wish to pester them. For Sallowcliffe and OXO please take extra care when parking, and do not drive down past the brow of the track in wet conditions or you may get stuck. If in doubt, walk onto the field and track first to check! Please use your own common sense and apply the countryside rules. Therefore if things look different at a site, particularly if it involves crops or livestock, please do not enter and contact me on pete.carpenter12@gmail.com or 01722 328728.

- 1) Winklebury (W to NE wind) - Available.
- 2) Norrington Down (S to SW wind) - Available.
- 3) Donkey Valley (SE wind) - Available.
- 4) Swallowcliffe (NW to NNE wind) - Available. No access into the field, fly from the slope side of the fence.
- 5) Quarry (W to WNW wind) - Available. Access to the slope must be via the Stony Down / Berwick St John route only. Launching and landing from the slope face is OK, but the slope is perfectly flyable from the Berwick St John field. You may encounter some paragliders as they also have permission from the farmer to fly there. In this case it is best to have a friendly chat with them and see if you can agree separate airspaces for models and paragliders.
- 6) Oxo (WNW to NW wind) - Available.
- 7) Horses/Barbara's Field (WNW to NW wind):- Available.
- 8) Daltons 1&2 (NW to NNW wind) - Available.
- 9) Crockerton (NW to NNW wind) - Available subject to rules in slope guide.
- 10) Death Valley (SW wind) - Not Available
- 11) Berwick St John (SW wind), Stony Down (ESE to SE wind) - Available. Code on gate padlock is 5823 . Please do not over fly the parked cars on your landing approach at Stony Down.
- 12) East Bowl (NEE to E wind) - Available. There is a gate with a keycode, which is 7850. The shepherd is Mr.Fletcher (red Toyota pick-up) and he has asked that anyone parking on the track put a little note on the dashboard of their car, letting him know that they are a WSA member.

There are also a number of public slope sites, particularly in the Purbecks that anybody can fly from. A list of these is maintained on [Christchurch Club's website](#) so please have a look there for details.

Flat Field Update

If you are the first to arrive at Chalbury go to the green box in the farm yard.

1. The field number is shown on the small plate on the box front . LEAVE THAT WHERE IT IS.
2. Remove the large red plate from inside the box and place it on the box front. It indicates the WSA are on site.
3. Also take the required equipment out of the box and to the flying field, i.e peg board, bungees etc.
4. If it is an event where you are expecting a large number of people take the corresponding field number out of the box and place it on the fence hook at the road entrance to the drive. There is no need to put the number on the hook if you are flying there alone or with just a few other people
5. The last to leave the site, ensure everything is replaced in the box, including the red plate and number on hook if used, but LEAVING THE FIELD NUMBER INDICATOR ON THE BOX FRONT.

Be aware of the field condition, e.g. after rain. Do NOT leave wheel spin marks. If in doubt, park off the lane outside the field. Leave space for farm traffic.

Be aware of footpaths across the fields, Do not launch if walkers are on the paths. Do not launch if horse riders are nearby.

No low flying over power lines. **No flying over farm buildings and the cottage, AT ANY HEIGHT, or immediately upwind of the farm complex.**

Fly SAFELY at all times. Especially launching and landing. Do not launch over cars and do not approach a landing over other flyers, fly a proper circuit.

Report any problems to the flat field rep, Doug Bowmann.

Model and Motor Refurbishments by Geoff Collins

I recently revamped my OPEN no 2 model as it had a problem after overstressing the wing, so I took it to the shed to look at the cause of the wing starting to fail aft of the spar. There were two possible reasons of failure, which came first I leave you to decide. The wing was subjected to extreme banking and elevator inputs which possibly caused a twist at the joint and flutter that I could hear. The rear of the wing broke on the ribs around an opening for cables. The balsa here was light and not really up to the stress caused by high twist load. The spar and forward part of the wing were fine, but I trying to save weight so fitted carbon cap strip on the root rib but not the immediate ribs going out. This is something I normally have as most of my planes can be described as "chunky", but sometimes there are exceptions to the rule. I replaced the defect ribs and skinned the surface of the panels with very thin epoxy sheet that I had salvaged from Bill Longly. I also increased the size of the rear pin and added intermediate flaps plus two more servos, making a total of six in the wing.

Now you can see this is all weight to carry aloft, but I can only think that I had a fairly competitive plane last year, however for this year we will have to wait and see. My thanks to Alan for help in the six servos set up and to Nigel who came up with a solution to getting the most out of a wing having the least wagging bits. This was noted and I will campaign an Electric Eliminator which has been having ongoing repairs for the last few years after a plastic clevis gave up under the "ping" off the line and a subsequent tent peg landing in the field upwind.

So to the saga of yesterday. All started well as I programmed the Eliminator and started props runs. The first prop did not draw enough Watts, so I increased the prop size and got up to 28 Amps. I then rummaged through the prop box and found some Aeronauts props blades which I put on leading to pulling 35 Amps before there was a loud screeching sound and the prop came off. Fortunately there was no damage within the shed; now normally this would be done outside but rain and wanting to complete the plane meant I broke a golden rule. On finding the prop I was surprised to find the shaft and assembly had left the hub, now that should not happen.

I removed motor and found there was no circlip groove on the shaft, the circlip that was there, was on the front of the motor can but only a flat ground on the rear of the shaft. So maybe the shaft had been turned round so the circlip was now at the rear of the can and the shaft protruding was insufficient to hang a prop off. So I had another look at going back to the original set up which meant I had to remove a cooling back plate which had been lock-tightened in, so three very small screws took a long time to remove. Someone else had obviously tried and opened up the socket drives, so out came the soldering iron and with a bit of hot/cold treatment out they came, exposing the rear of the can. Two grub screws should have been here, but had never been fitted as the anodising was untouched and there was no locking cement. I fitted the grub screws but still was not happy about the shaft staying put, but that is how they had made the motor.

I reassembled everything and it ran up all fine but then a bright idea crossed my mind; rare I know but it does happens now and then. I rummaged round the junk box and found a Axi motor that had had water in it, so I whipped the shaft out and exchanged it into the Fly Fly motor as being a longer shaft it will increase the surface area for the prop to clamp on and mean the prop could not be pushed back down the shaft and foul the bulkhead. However best of all there is a circlip on the rear of the shaft so it can not pull through the can. I added two grub screws to lock the can to the shaft so now all well. I hope that when you buy second hand planes you always check for problems. This motor was a bonus as people often sell planes with motors in, at just about the same as without, so the motor is almost a freebie but could have come at a cost. One lesson I learnt was NEVER STAND IN FRONT TURNING PROPS as you never know what is going to happen.

The job then got worse as the power supply cables from the windings were very long, so I cut them back. I found the copper wires were coated in lacquer so not conducive to soldering. I scraped the coating off as much as possible and resoldered the connector back, but not sure if I did the right thing in cleaning them. Maybe there is some other method I should have used, but it runs and I will give it 30 secs runs outside when the sun comes out.

See you at the field soon I hope, with lots of planes to test fly as well.

Cambrian Miri 120 Glider - A Blast from the Past by Richard Docketty

Some members of a certain vintage might remember that back in the early 1980's the Cambrian Models Company had a rudder/elevator glider called a Miri. It was quite an attractive design of its time which came in different wingspans; a 100inch foam veneered wing and a 120inch built up wing version. There might also have been a larger version at 148inch; I am not sure but the decals suggest there was. Anyway a couple of years ago I was offered a completely unbuilt kit of the 120inch version for a reasonable price; it would have been rude to refuse.

So there I was, another plane to build but other priorities like flying etc. meant it was consigned to gather dust at the back of the workshop where it stayed until another Lockdown 2 loomed late in 2020. No flying allowed of course, nothing in the fleet needing repairing (or had been repaired already), wife not chasing me for chores/DIY so it was time to take a closer look at the Miri kit and do some research. It appeared this plane was quite well liked in its day, but had a couple of reported 'foibles' which might be addressed with a bit of modern jiggery-pokery. Firstly it was a pod and boom model and the boom was made of aluminium tubing which after a few landings had a tendency to 'deform' affecting the tail section incidence if not bent back true. The second, more positive, report was it sometimes steadfastly refused to land preferring to float on and on.

Modification one was to replace the aluminium tube with a carbon fibre one. It was pretty easy to find one that slipped into the aluminium tube in the fuselage once the old boom had been cut off. Modification two was to see if it were possible to introduce a set of airbrakes. As it turned out the wing depth was enough to accommodate a set of brakes that I had been waiting to put in something for ages, but more about them later. After some discussions with 'those who know more about these things than I', and as winching/bungee launching is not as popular as it once was, it was decided to experiment with adding a tow release. It might work, it might not, but considered worth a try if towing was done right would mean the plane would not be consigned to slope work only. There was a further modification idea I toyed with namely converting the Miri to an aileron model, but I abandoned this idea pretty quickly as the angle of the wing connecting rods was pre-set in the fuselage and the wing just did not allow enough room for them when the dihedral was reduced.

The kit itself appeared to be complete and most of the wood was in reasonable condition with only a few sheets needing to be replaced. As was the case with kits from that era, all of the ribs were just ink stamped onto balsa sheeting; no pre-cut or laser cut pieces here. My prowess (or lack of) with a scalpel blade was clearly going to be tested. The kit utilised the usual vac formed (blue) acetate canopy plus vac formed ABS plastic parts for the canopy floor, radio tray, and fairings for the tail section. The radio tray and tail fairings were discarded in favour of a bespoke radio installation and contoured balsa sheeting for the tail. Also replaced were the Bowden cables as 35+years stuck in a box had taken its toll on them.

I will not bore you with the ins and outs of making the wings as they were traditional in design; three spars, D box section etc. Luckily the air brake modules were an exact fit between the ribs and easily glued to the sheer webs without modification. These are modular airbrakes from Radio Sailplanes so I think they could be close to being the same vintage as the Miri. The wing requires one module per foot of wingspan so five were fitted per wing.. Each module has its own rise and fall mechanism which is connected to the next



module by piano wire and finally to a control servo. The modules 'blade' is an interesting design as it includes a 'finger' above the main blade ; it will be interesting to see just how effective they are in practice.

To provide electrics for the airbrake servos it was necessary to cut access holes in the fuselage wing through into the cabin section to take the servo wires and multiplex plug. This was done after the multiplex connectors had been fitted into the wing root ribs and everything aligned before committing the epoxy to the wing root and hot glue to the fuselage wing fairing. A quick whiz around with a soldering iron and all wires were connected up and airbrake servos tested. Wings were then sheeted in the usual way. The covering was a mix of clear for the open sections and yellow Solartex for the sheeted sections which had worked well on a previous build.



Wings done, it was time to tackle the boom and tail section. Cutting off the old boom and epoxying the new one in place was easy enough, making sure the glue did not reach the Bowden cables. As the tailplane design expected an aluminium boom, it was necessary to retain a small length of the aluminium which was epoxyed in place at the end of the new boom. So far so good, except the ABS fairings were not at all a good fit so they were discarded in favour of some nifty profiling using scrap sheet balsa sanded to shape. The design allows for the complete tailplane and stabiliser section to be removed from the tailplane in one piece, being held in place by a single locating pin and screw, so I added an extra screw just to make sure. The tail section was covered in the same way as the wings with a combination of Solartex and clear covering.



It was then time to fit out the fuselage with the radio gear and that tow release. Tow release first. I like the Multiplex barrel type tow release and opted to fit this under the nose rather than right in the middle so as to keep the original profile of the Miri's nose. A short length of brass tubing was added to the front of the release and shaped to match the nose and the whole thing epoxyed in place. A small mg servo was installed as close to the tow release as possible while still having the battery as far forward

as possible. Rudder and elevator servos were fitted, cables cut to length and connectors added. Servos manually trimmed and tested with a servo tested and then again via the transmitter once the receiver had been installed.

The fuselage pod was then rubbed down and masked up ready for painting. I used Ford Yellow spray can from Halfords, which was a close match to the Miri's original colour scheme, and the fuselage hung up out of the way while the paint cured. Decals time. I had decided to use the original set of (water transfer) decals supplied with the kit so imagine my disappointment in finding out the only thing holding them together was the backing card. Once immersed in water they just ripped and fell apart; well they were very old so a plan B was needed. A quick search found the font used by Cambrian for the Miri was Bauhaus 93. Another bit of jiggery-pokery with Word and some vinyl sheet and I had some alternative graphics for the wing and side flashes for the pod. All of a sudden I had a finished aircraft ready to go flying, only it could not due to the continued Lockdown. It is a real shame not being able to maiden the Miri at the moment, or fly anything else, but I suppose there is always another build to have a go at while I wait. Hmmm that AngelWings Prandtl Flying Wing looks interesting....

Eclipson EGW-80 by Frank Bayes

The photo below is of my latest half finished project, which now makes five models in similar stages of completion. This one is a 3D printed Eclipson EGW-80 which was designed for EDF Power, but I will use it as a slope soarer. The design files set me back £12 and the plastic filament cost about £4. Wingspan is 30" and weight so far 415 grams (*I like the mix of imperial and metric units , Ed*)

I have 3D printed it at the thin filament setting of 0.4mm single skin and have covered it in thin glass fibre cloth using Ronseal water based varnish. This seems very strong and is light in weight. The previous model I made using this method, the 3D printed Proteus slope soarer flying wing, has survived several bumpy landings and a couple of cartwheels so I think it will be OK.

I have to make a new tip for the nose and a rear streamlined cone to finish. The original design has a nose that is a long lethal spike, so after consulting with health and safety I will change this to a rounded soft style.

This is the fifth half done model I now have; two slope soarers, two E-gliders, and one power mode. The plan is that by the beginning of March, I will have five models in the same state, so that all that is required is to fit the electrics.

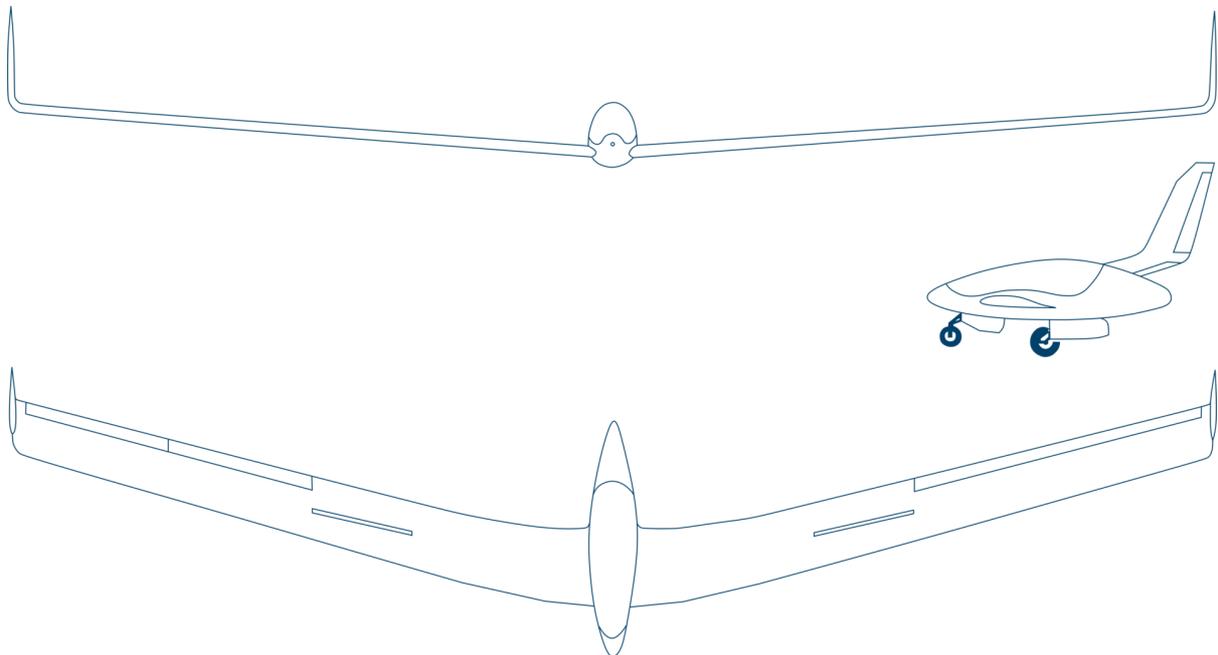


A Subject for Scale ? by Dave Camp

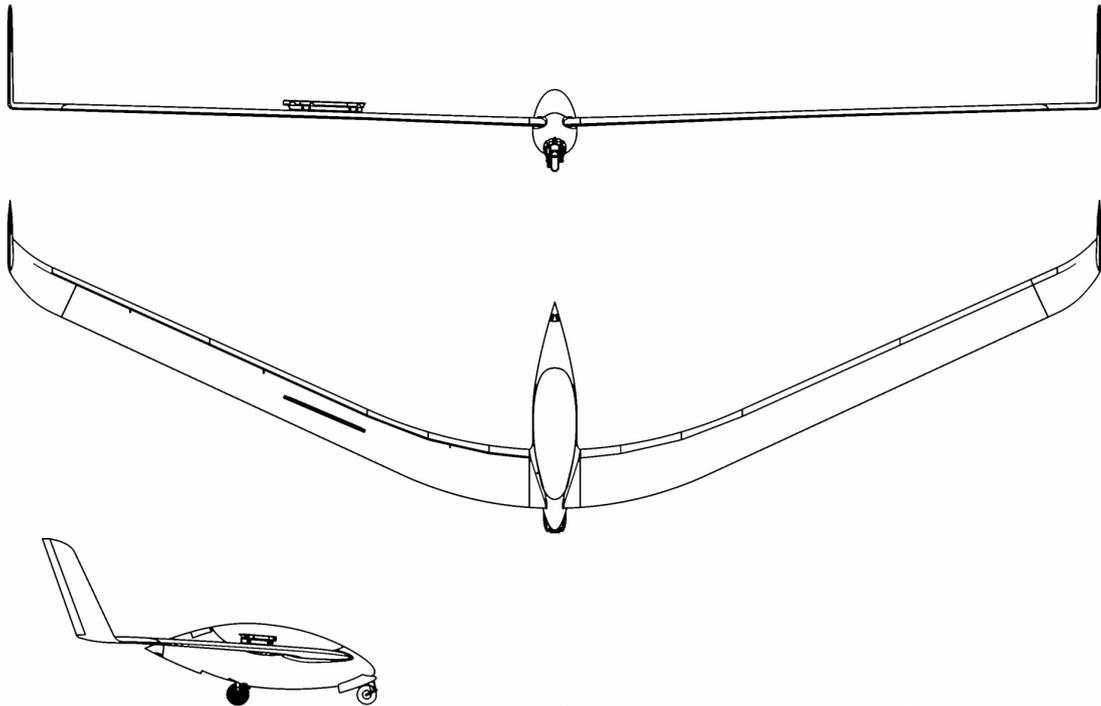
For those with an interest in scale gliders, or maybe just 'look alike' as opposed to purely functional models, the following might be of interest. I have picked up the info from a few internet sources.

Flying Wings. These are still very rare overall in the full-size gliding world , a sort of the 'holy grail' I guess with people hoping for efficiency gains. Of course nothing is 'free' and to date there has not been any design that has shown higher overall performance in all aspects of soaring compared to a conventional design. Well if there had been then it is likely to have been the type adopted, at least for competitions.

In Germany they have at least three or four universities with aerodynamics/aeronautics within their scope and over the years these have produced a range of different experimental sailplanes. These organisations that are part of the universities are under a generic term 'Akaflieg'. In the late 1980s the Akaflieg Braunschweig produced the SB13, a flying wing of composite design. Some WSA members may remember this being documented by the late Dave Jones in the now defunct 'Silent Flight' magazine. I am pretty sure that Graupner even produced a semi-scale kit for a limited period. The concept had been tested on a 1/3rd scale model, that I gather showed some undesirable characteristics, very sensitive to CG position and readily getting into a spin if stalled. Modifications were (hopefully) made and used in the single prototype. Unfortunately despite quite good performance, the glider still had CG problems and spinning difficulty. I have read that the 'best outcome' was kick-starting ballistic parachute recovery systems for light aircraft ; I believe these are used in some light aircraft and ultra-light designs. The SB13 was tested over a few years and seems to have been retired into a museum. I have added a 3-view below.



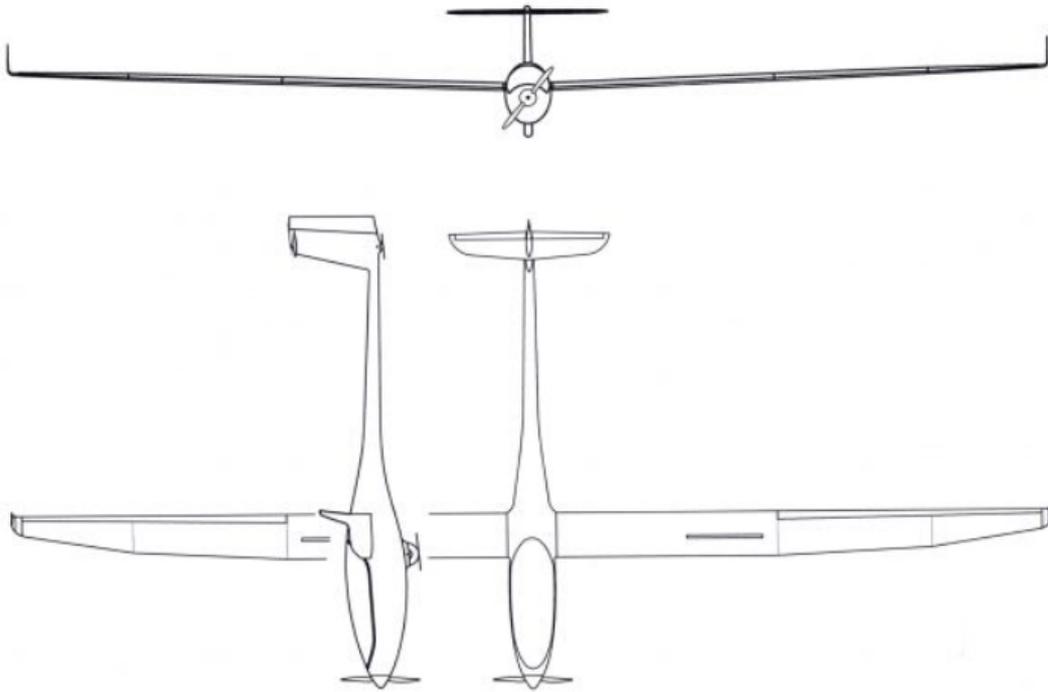
I thought that the flying wing layout had been abandoned, but came across the latest project, the AK-X, this time by Akaflieg Karlsruhe. It is in the early stages of production judging by the information on their web site, and I expect the Covid pandemic has impacted on progress. From the 3-view it looks like a more sophisticated control surface layout is being used with what seems to be at least 5 moveable surfaces per wing half. The mixing of that must be interesting because as is normal with sailplanes this will be mechanical, not electrical. I will be following the progress of this with interest.



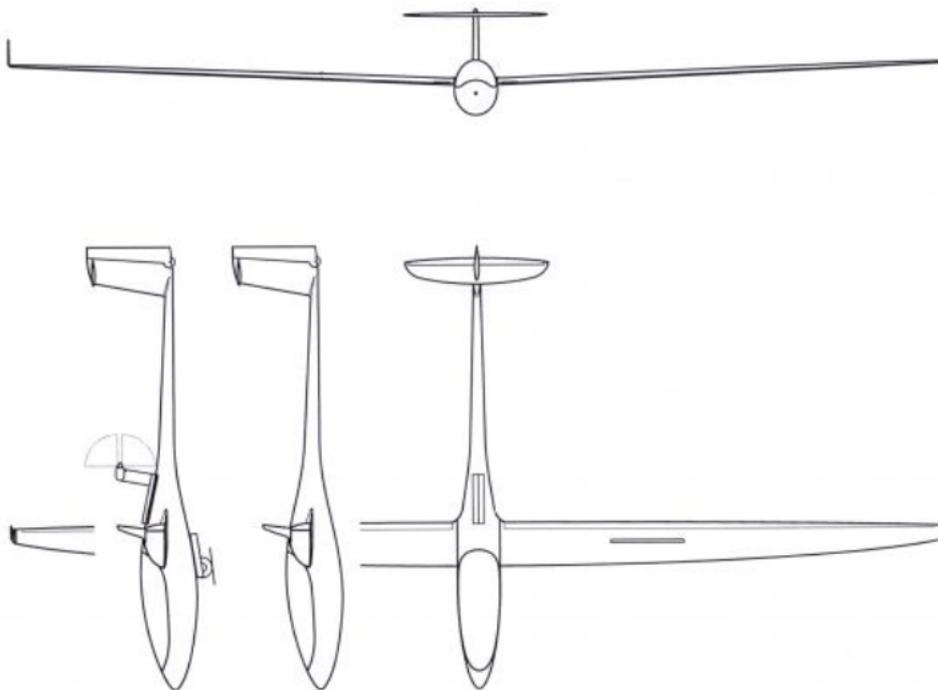
On the conventional design-side I came across a few designs that could easily make for practical $\frac{1}{4}$ scale designs; they are in the recent FAI 13.5 metre class otherwise called 'World Class' gliders. I feel this is an indication of just how advanced full-size gliding has become in terms of efficiency. Not so long ago it was a general rule of 'bigger is better', the 'Eta' with its near 31 metre span giving a glide ratio of 70 but it did suffer in turbulent conditions. More typically I think 15 metre span has been viewed as the minimum for acceptable performance but I gather costs have been spiralling. So the FAI came out with the World Class and from a quick scan of specifications they are achieving quite respectable performance, well beyond what would have been thought of when limited in span. Also of note is the use of electric motors nose mounted to give a safety factor when flying cross-country. I believe that in competition there are penalties applied if the motor is used or maybe just cancellation of the flight score (would seem logical). What this has done is keep costs down in terms of the support needed as there no need to be laying on cars/trailers or aerotows in the event of someone landing away from the starting point. Well none of this is our concern, but having some new designs that could be scaled down for modelling and include a motor is surely of interest.

I have added what the manufacturers claim as the Lift/Drag (L/D) ratio, an indicator of performance. For comparison a typical modern 15m glider has an L/D in the range of 40 – 45. By comparison the vintage wooden Slingsby Swallow glider from 1957, with just over 13m span had a best L/D quoted as 26.

GP 11 Pulse - Nose mounted motor self-launch. L/D 43



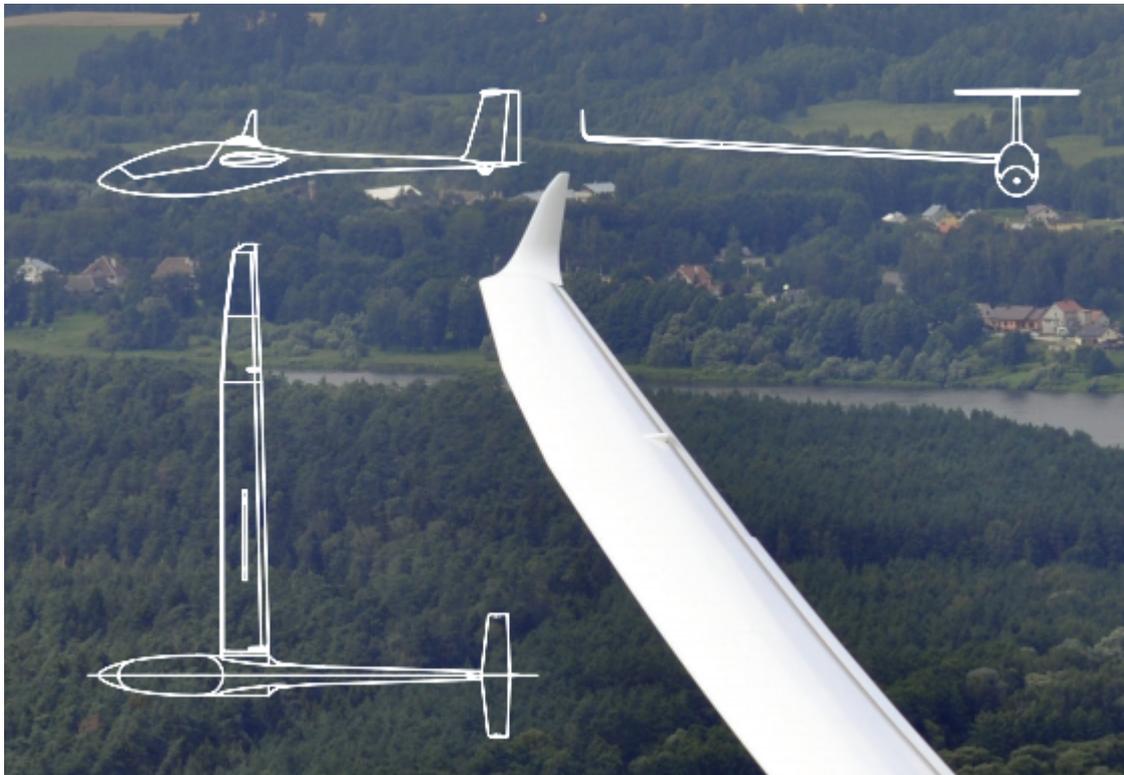
GP 14 Velo – pop up electric self launch. L/D 45



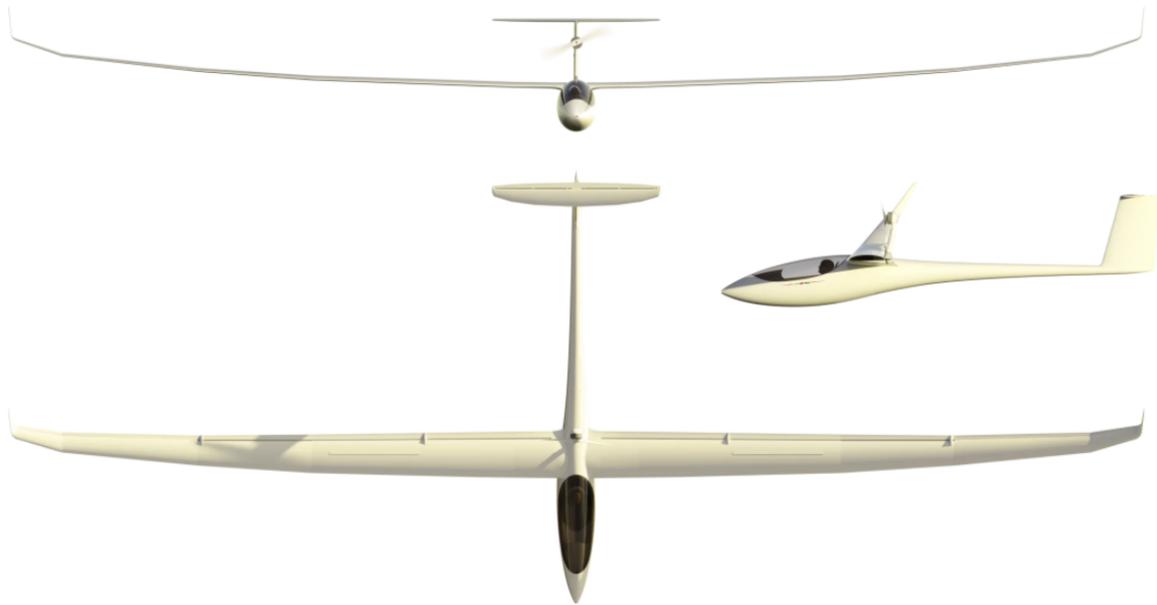
Silent 2 Electro – no 3-view available. L/D 40



Mini LAK – L/D 45



Finally to one the highest performing designs – from South African Jonker Sailplanes – the JS3 Rapture; 18M span, optional pop up jet or electric motor. L/D 56



Calendar

Sorry but the crystal ball has become rather murky again

Contacts

The committee members for 2021 are;

Chairman- Martin Burr, 01202 773144, martinburr9@gmail.com

Secretary - Bill Ebdon, 01258 861612, bill.ebz@gmail.com

Treasurer and Member Secretary- Alan Butterworth, 07905 765634, ajbutterworth16@gmail.com

Glidepath Editor – Roger Crickmore, 01929 550680, roger.crickmore@btinternet.com

Flat Field Representative – Doug Bowman, 01202 416664, dougbowman@hotmail.co.uk

Slope Representative – Pete Carpenter, 01722 328728, pete.carpenter12@gmail.com

Slope Deputy– Mike Sims, 01722 326550, mike.sims1@sky.com

Flat Field Competition Director – Martin Burr, 01202 773144, martinburr9@gmail.com

Member without Portfolio - Nigel Bennett 01258 861863, nigelcbennett@googlemail.com