WLMAC Newsletter April 2021

Editor – Felix Scicluna

A local Pickeridge Farm area resident has been independently flying his E-flite Opterra at the field for some time and has now applied to Join WLMAC and is looking forward to flying as part of a "proper" club.

Please see the very end of Newsletter for some member items for sale.

Welcome to our April Newsletter – Welcome to our April Newsletter, backstage it has been a very active inactive month, if you get the drift? We have had unwelcome visits at Harefield, from two different parties (Paraglider team and Quad biker's), whilst our Field Marshall has been making sure the field is all shipshape and ready, by organising a mini work-party to fill in rabbit holes and by cutting/ rolling the field. Graham and myself have built 4 new benches to replace the worn-out ones. Our Pickeridge Farm planning application is in progress with a number of letters from supporters and equally a number from concerned objectors. Filming at Stockers is about to commence again. Andy Blackburn has written an article about the difficulties of sourcing a new plane kit during this unusual period. Tony B has also written an article about getting your IC starting aids ready for the return to our patch. We have two projects this month, one from a new member who has come up with great idea for a homespun field generator for our batteries and Kevin Lambi has sent in a quad rocket project. Most importantly, we are back flying again from the 29th March, but please all remember to follow the strict COVID advice, the last thing we want is another lockdown. Happy landings!

Parish Notices

Quad bikers break into Harefield – Sunday 28th March, Mat reported that there had been a Quadbike incursion to several farms and also to our field. Richard Orr of Stockers Farm advised us that they had come through onto farm, he called the Police and alerted Colin and Mat. Roy was then asked to attend by Mat with Graham Nye who owns the land inside our site on the left. It appears the gates had been forced open (not sure by whom, possibly by the Police or the bikers). Graham got there first but heard quad bikes heading up to Harefield via Springwell Lane, they found the gates open and soon after the police drove out towards Harefield. The gates were ok apart from a bent drop bolt and the chain/combi lock had disappeared (Roy went back Monday but couldn't find it). The gate was left secured with the keyed padlock and Mat went back on Monday and replaced the combination lock and chain. Luckily, although it was evident that the quad bikes had been on the patch and in the pit area, damage to the field was minimal due to the prompt action of the Committee and the Police.

Un-invited visitors at Harefield- A number of members noticed on the field webcam 4 people who had trespassed onto our field with a Paraglider, during the latest lockdown. It was assembled and took to the sky for at least a couple of flights. On the first occasion the police were informed but they were unable to get there. On the second occasion they were spotted, this time the police did respond but the unauthorised visitors had left just before they arrived. Obviously, if they turn up again while we are there, politely advise them that they are not permitted on the site at any time.

Filling the rabbit holes –And there were lots, in the last few days of lockdown we went out with the shovels and topsoil getting ready for the big return to flying.

Field marshall Tony B,myself and Behind the camera chairman Mat filling as many Rabbit holes as possible.

First Day back after lockdown 29th March – A blustery cloudy morning with just 4 members returned to fly, we took our buggies as an alternative due to the wind and it was nice to be out there in the fresh air. By the afternoon two more members came to fly and the wind calmed down.

Colin Just finished running in his Saito 150 ready for the maiden flight of his Black Horse Turbo Beaver.

Tony Mark and Graham with their buggies out of moth balls, ready for their first day back after lockdown

New Benches for Harefield – Graham and myself have been busy during the lockdown constructing restraint benches. They have been built using the BMFA plans with 6" x 2" treated timber. Let's hope they are as successful as the ones we are using now.

Pickeridge Farm- The period for being able to write to the planners with any support or objection is nearing its end and actually finishes once the planning officer has completed his report, which should be soon. He intends to visit the site with Mathew and the intention is to demonstrate a typical plane, buggy and possibly a heli', so he can see what's actually involved.

There have been a number of people writing in supporting the proposed plan and also a number of objections from others with understandably genuine concerns for their neighbourhood, along with a local councillor who has taken an interest, so the planning decision will now almost certainly take place following a planning committee meeting scheduled for June, it can't be any earlier due to local council elections in May.

Denham aerodrome which had previously written to our Chairman with their consent for us to fly in their FRZ up to 400', subsequently sent in an unexpected letter of objection to the planning office. This was swiftly followed by the CAA and BMFA getting involved and a virtual meeting took place on the 24th March with all parties agreeing that permission can be given. A "Memorandum of Understanding", will be agreed and once signed Denham will retract their objection. As with our rules at Harefield, we will also include any advice received from Denham that is specific to Pickeridge. Obviously, the rules for Pickeridge will have to be tweaked to suit the specific site conditions anyway, a draft version has been prepared as part of the planning application but until we start actually flying there these can't be developed.

Reading through some of the other objections, it is clear that some of them are based on misinterpretation of our activities and our models which is a pity but as we are now allowed to meet others outdoors and as we had planned before the lockdown, we can soon look to arrange to meet with anyone that is interested to do demonstrations have a chat etc.

A positive, from all of the interest our application has generated, is that we've received a lot of new applications for membership, including a few from local residents who have apparently been flying at Pickeridge unnoticed for quite some time but are now looking forward to flying as part of a "proper" club.

Following the recent easing of the lockdown, we can start flying there under the 28 day planning rule, this as soon as the MoU is signed and once Suez complete their gas reclamation maintenance works which are almost done, so shouldn't be too long.

Filming at Stockers farm update- Filming is about to re-start at Stockers on 7th April. It is expected that filming will continue for the foreseeable future and further arrangements will certainly continue, if it suits us. Again, it is very unlikely that any filming will take place at weekends. We have also stipulated no interruptions on Wednesday afternoons, so as not to affect any of our mid-week training sessions

Post lockdown preparation by Tony Bloomfield - It's me again, been a long time since I wrote a few words on IC engines, this time it's about glow starts and after run oil.
So, it's about 4-6 months since we needed to start our engines and I hope we all put some after run oil in them? First job is to cycle the glow start it's an item that we all leave in the flight box and forget them, so a few cycles before we need to use it will do it the world of good. With oil in an engine, it will be hard to start especially if the glow start is not at 100%. What I do if I have oil in an engine that has not been run for a while is flush it out before I try to start it, put some fuel in the carb wiggle the prop a few times and then turn the engine upside down and let the fuel run out of the carb. Just a short one this month, hope it helps!
Happy landings boys and girls.

Sourcing a new model, some advice from Andy Blackburn- For a number of reasons I decided that I wanted to reward myself with another nice, properly-sized ARTF warbird that will fly with a bit of authority, and that I could assemble in a couple of weeks - I have a second-hand OS 120 which would be the perfect warbird power source.

After some lengthy research including re-reading all the reviews, I decided on the Seagull Yak 3U Steadfast. However, when I did an Internet search it transpired that there wasn't one to be had throughout the entire UK; not only that, but most other ARTF Warbirds are out of stock as well - the only ones that seem to be available are the ones that not many people actually want.

I emailed the importer (J Perkins) to ask when they thought they might have a new shipment from the manufacturer in Vietnam, who said that the expected delivery date is likely to be June/July, but when I talked to a couple of people at a couple of well-known model shops somewhere in the south of England, some interesting things came to light:

1. As a result of the Pandemic, Shipping Container prices (that is, the cost to get a Shipping Container from the far east to the UK) have risen by a factor of about 2.5; this is enough to increase prices in the shops significantly and whilst some importers have ordered product and have put their prices up to cover the increased shipping costs, some importers have taken the view that the product wouldn't tolerate the price increase, so they're waiting until the Shipping Container prices reduce before placing an order from the manufacturer.

2. The far-east has been affected by Coronavirus (unsurprisingly) so it's taking the manufacturer longer to fill an order.

3. The expected delivery date of June/July might change if the Shipping Container prices do not start to return to more reasonable levels.

4. Finally, the factory has no stock on hand, each ARTF kit is made to order. This means that if you can't find one of the earlier Seagull kits (e.g. Mew Gull, Sea Fury, etc...) it's not because the factory has stopped making them, it's because the Importer (J Perkins in this case) has decided - for whatever reason - not to import them...

So it looks as though I'll have to postpone instant gratification until much later this year - it's back to the olden days, when you had to make things yourself!

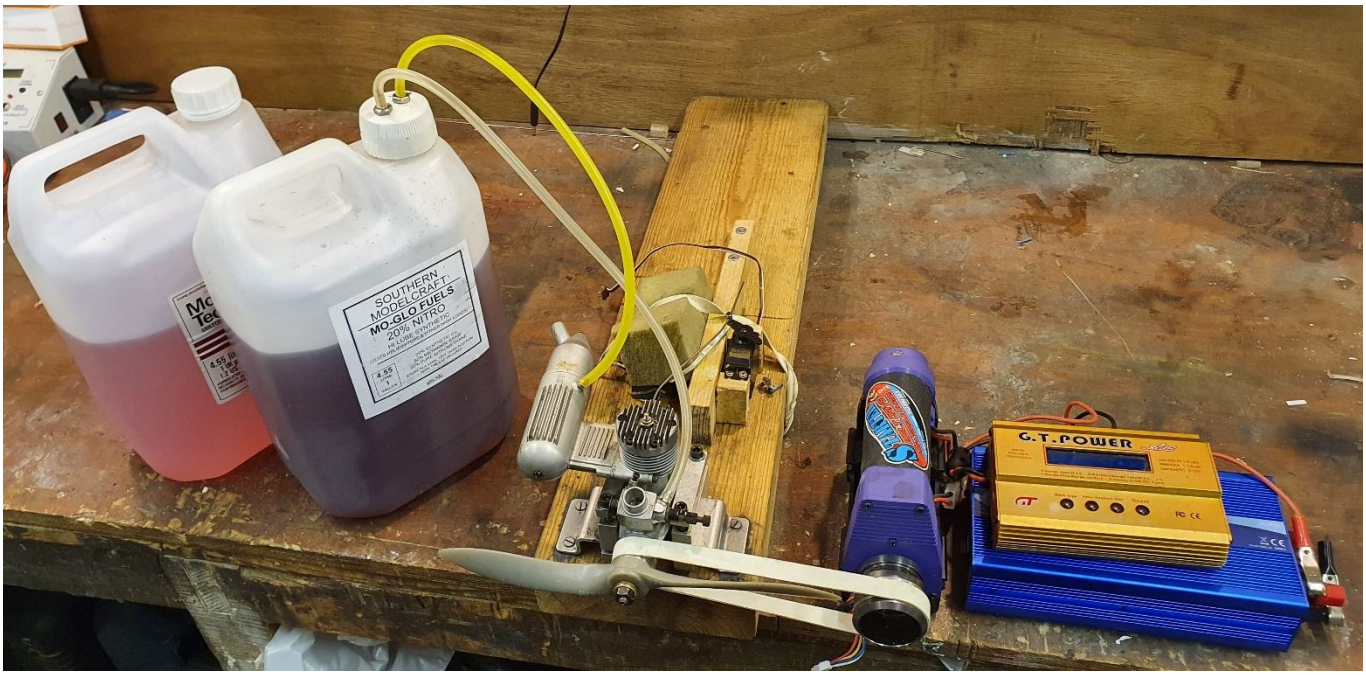
In the meantime, if there's a kit/ARTF that you fancy, you might as well email the importer to ask when it's likely to be in stock; it won't do any harm, and if you've

expressed an interest in it they'll be more likely to order a few examples of whatever it is that you want.

Rgds A.

Projects

Making use of a spare IC engine- If you have a spare IC engine needing to be used, one of our members has been thinking about ways to aid our hobby. Hopefully, the picture below is self-explanatory. It is assumed that by keeping the rev's as high as possible and really having the engine screaming then it may be able to nearly charge a small battery. The fuel consumption it obviously going to be quite high but we need to continue to promote quiet electric flight and this has this has the potential of making an excellent field charger for these eco-friendly models. If anyone needs further advice regarding this then please contact me and I can provide detailed spec's.



Kevin Lambi's Quad rocket - First of all, an apology…this will be a lengthy and probably somewhat boring article if you're not very interested in multi rotors, but I hope it will give some insight in the technology for the build.

In the February 2021 newsletter I announced the lockdown build of a “Quad Rocket” ….which essentially is a quad copter in the shape of a rocket and the direction of the propellers will be pushing instead of lifting. The reason for building the quad rocket is pure speed and nothing else.

To complete the quad rocket build I needed to 3D print the design which I acquired from a free 3d printing community site called thingverse.com.

With the new 3D printer bedded in and a couple of hundred hours of printing under its belt, I started printing the parts needed for the Quad Rocket and as you can see from the parts display picture, I thought I would have spares and also attempt to mix and match colour because although a black quad rocket would look cool, but if I prematurely came down in the long grass it might be a little hard to spot!

With all the parts printed it was on to the electronics…for that I would need:

4 x 1408 3300kv (4S) motors
1 x 45A 4-in-1 ESC (4 x 45A escs on one board which is 6s capable)
1 x flight controller – the main computer of quad copter that controls the flight.
1 x mini video transmitter (VTX)
1 x starlight (very low light) nano camera
1 x 50v 1000uf Low ESR Capacitor. This is used to reduce electronic noise of the flight controller and VTX
1 x 2.4 receiver
1 x GPS
1 x 6S 550mAh Battery

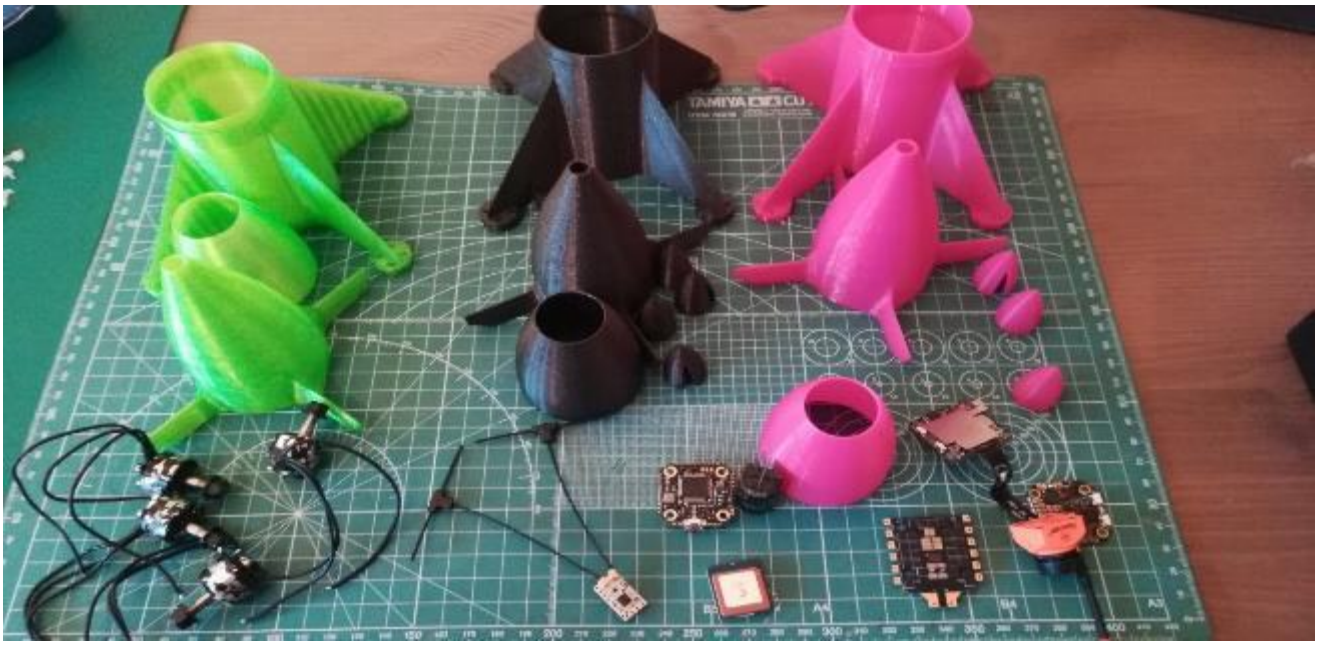


Fig 1 Full parts layout

With any build I like to dry fit the parts before committing solder to anything. For me to dry build its making sure everything fits on the model and ensuring that I have chosen the right screws and stand off's for the flight stack (ESC, flight controller, VTX and receiver) and have the right screw lengths for the motors because I don't want them to be touching the bindings of the motor.

The first problem that I came across was the design and size of the ESC. From first view I knew that once I soldered the 14AWG battery wires there is not enough room to fit below the main body section of the rocket to the battery. Additionally, it also appeared that I would not be able to fit the bottom part of the rocket with the battery wires in the way. So much for mixing and matching the colours!

Figure 1 Main body with esc clearly not going to fit

The solution to this problem was to "remix" the 3D design from the original. Because I rarely design things of my own and don't have a license for fusion 360 which is probably the best CAD/CAM tool out there, I opted for a cheaper solution….well ok it is free. Tinkercad.com is run by the same people who make fusion 360 and is completely web based. It has a number of free shapes and quite easy to use once you start playing around with it.

The way I approach a remixed 3D object is to import the original 3D print file and then iteratively changing it by either making a small change to the original and then copy and pasting the updated

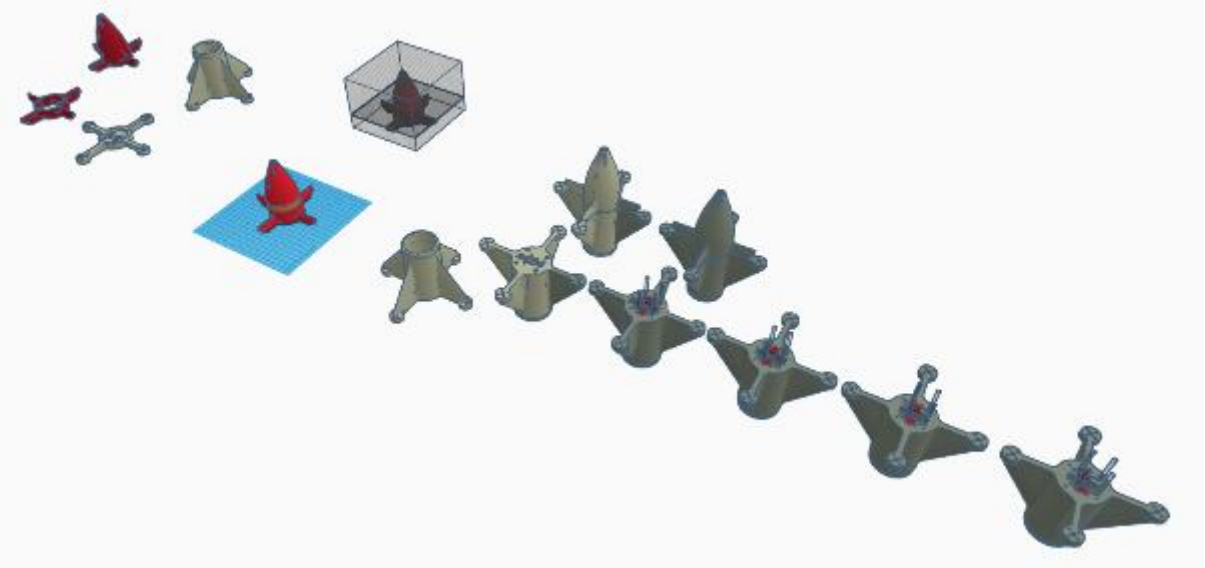


Figure 2 Tinkercad remix designs

design which means I can go back to an earlier version. Additionally, for testing prints I cut away about 80-90% of full object to just leave the functional parts of the design I need to see if it will work which cuts down printing time dramatically and also less waste.

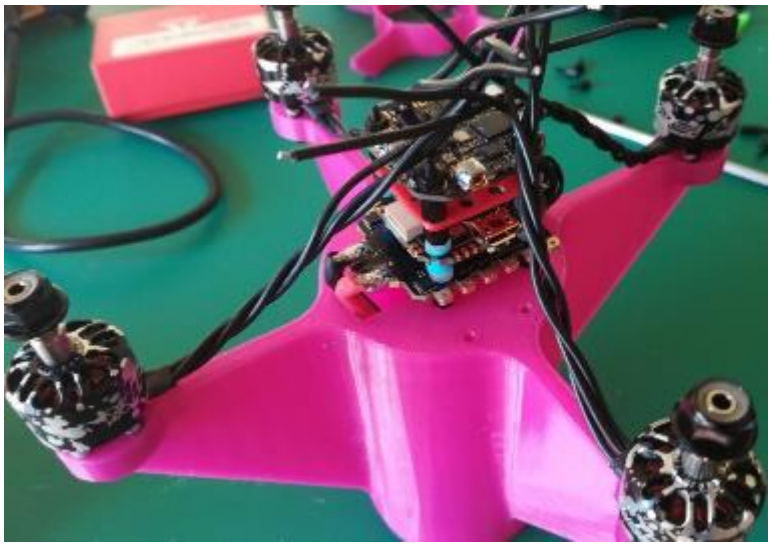


Figure 3 Test of remix design

Figure 4 Remixed design main body with dry fitted components

After about a week of “tinkering” I managed to get the design to fit the flight stack. The main changes to the design were: Main Body (battery, flight stack and motors).

- Extending the gap of the main body to fit the flight stack,
- Moving the flight stack screw hole positions to accommodate the extended gap
- repositioned “bottom part” attachment potions screws to accommodate the new bottom part connections.

“Bottom part” of rocket (flight stack cover and antenna outlets)

- Changed the attachment of the bottom part of the rocket to fit 2mm hex nuts instead of just screw attachments.
- Extended the bottom part by 10mm to allow larger gap between the flight stack components with the 50v cap to allow better airflow.

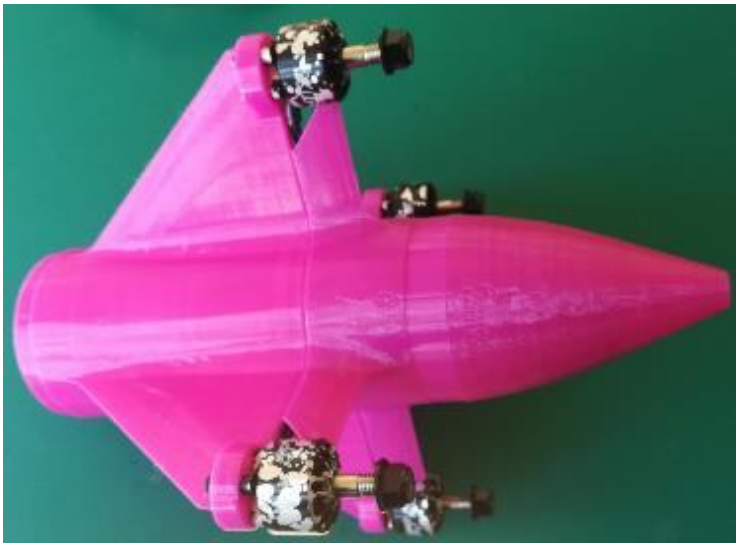


Figure 5 Remixed main body and bottom part attached with stack and 50v cap inside

With everything now seemingly fitting together my next task was to work on the electronics. As I was going to be pushing 25.2V (6S) with motors designed to take only 16.8V (4S) I did not think it was a good idea to just attach to the quad rocket and go as I knew it would end in failure. I decided to find what I had in the shed to make a quad test bench where I could put all of the components to see if I would get any "magic smoke" from anything. The most tricky part of the test bench was mounting the motors but I had some spare carbon and used a dremel to get the mount holes I need.

Figure 6 Test bench with 6S 2200mAh

With the test bench all ready to go, much like setting up a new quadcopter I have to complete the following:

- Setup the flight controller to recognise all the components.
- Make sure the motors are spinning in the right direction.
- Bind the transmitter to the receiver.
- Map the transmitter channels to the flight controller functions.
- Configure the telemetry screens on the transmitter.

If there is interest in the above let me know and I'll drop another article with more detail.

The only problem I had with the setup is that I wired the receiver in wrong but once I realised what I'd done it was an easy fix.

As the motors were designed for 16.8V (4S) I stuck a 1500mAh pack on but since I didn't have any packs with XT30 connectors I had to make a XT60 to XT30 connector first. Like starting up a new quadcopter I started ramping up the power slowly. As expected, the motors performed well and I began to test quick throttle punches and again no problem. Next up was the 6S battery.

Before hooking up the 6S I did some research to make sure I wouldn't burn up the motors as soon as they started up or they wouldn't "De-sync" which is where the motor stops or stutters as they demagnetise. I had to program each of the ESC's to set "DEMAG to high" which compensates for demagnetisation, change the "timing" of the ESC to 23 degrees and "rampup power" to 25%. This configuration should help stop voltage spikes occurring at the ESC and motor. For the 6S test I used my 2200mAh as the I knew if I attempted to max the throttle the amp draw be high. I know that the 550mAh battery that would go into the quad rocket would probably end up being a throw away battery after a couple of attempts.

I started slow to begin with and everything seems to be going well, stopping after a few seconds at different throttle levels. Then I decided to gun it for a 3-5 second burst at 100%. After what I think was 2 seconds I saw a flame appear from one of the motors and cut throttle. A quick look at the motor saw that the copper windings had turned black and the rather warm motor bell confirmed I probably killed the motor. I checked the other motor and the copper windings showed signs of intense heat but still seemed to function. The ESC itself appeared to be ok and the core of the battery was getting warm which tells me that the 550mAh battery is not going to last long. I was also glad it was a nice cold day of 7c. After checking the transmitter telemetry, I noticed that I was not getting a current draw so would need to investigate that. Diagnosing why the motor blew I narrowed it down to a couple of things. 1) Although I should not be pushing so much voltage it could of just been a duff motor from a batch or I did not clean the carbon motor mounts properly before use and carbon dust got into the motor. Anyways that day I ordered another 4 motors of the same brand, 4 motors of a different brand, another 6s 550mAh battery and voltage spike absorber.

Figure 7 Disassembled motor that produced flam

2 Days later I get all of the new parts and I take another look at the original youtube l 6s speed run with the quad rocket and noticed that the youtuber was flying around between 20-30% throttle and then then gunned it to 100% for a couple of seconds…also the motors he was using 3500kv motors and I was using 3600kv motors which prompted me to go back to the drawing board and do stuff math.

I took a look at the data sheet of the motor and it's maximum amp rating on a 4S motor will be 15.36 amps so I divided that by 4 (per cell) to get 3.84 amps per cell(ish) [4.v]. Then multiplied that by 6 to 23.04 amps per motor(ish). In theory the ESC would cover that and that seemed to proved by how cold it was during my first test. But really need to get the current meter working on the ESC to see if my theories are correct.

Next was to work out unloaded rpm or a motor. For each 1V passed through the 3600kv motor will be the rpm. This means:

- A fully charged 4S battery at 16.8V for the 3600kv motor can produce 60,480rpm unloaded.
- A fully charged 6S battery at 25.2V for the 3600kv motor can produce 90,740rpm unloaded.
- A fully charged 6S battery at 25.2V for the 3500kv motor can produce 88,200rpm unloaded.

So, with the possibility of burning the motors again I've decided to set a maximum throttle for each run but will not go to 100% throttle. This is achieved by a setting in the flight controller (computer as it were)

- Throttle limit at 75% will give me 68,040 rpm unloaded (7,560rpm higher than a 4S battery at 100%)
- Throttle limit at 85% will give me 77,112 rpm unloaded.
- Throttle limit at 98% will give me 88,906 rpm unloaded.

Figure 8- Flight stack soldered up and ready to go

With the voltage spike absorber and a fresh set of motors installed it was time to put everything together. In theory should not be a problem because the dry fit worked and also, I will shorten the motor wires to the length of the frame…originally I did think I would probably be reusing them, so no need to cut the wires but after the test bench they will be throw away or testing motors.

The finishing touches to the quad rocket was to attach the camera. I needed to print the camera frame, attach the camera and then glue the frame into the cone. I did this by using liquid tape. Lastly for the camera was get the onscreen display info I need for testing.

A quick battery placement, camera cone on, props facing the right way, motor cones attached with hot glue and the quad rocket is ready for the first few test flights.

Will report back to let you know how I got on.

Figure 9 - Top down with GPS on top

Figure 10 - Side view with GPS on top.

All events cancelled due to Covid, events table left open for reference in the event of lockdown being lifted soon.

Events

Date	Event	Location	Description
Thursday April	Club meeting	Uxbridge Golf Club	The Balsa bash
Thursday May	Club meeting	Uxbridge Golf Club	Skills night
Sunday 13 June (Sat 12 practice)	BMFA	Harefield	BMFA scale day
Wednesday June	Club Meeting	Harefield	BBQ at the field
Saturday July	Work party	Harefield	Prepare the site for Fun day
Sunday 1 July	Fun Day	Harefield	Annual family Fun Day
Wednesday August	Club Meeting	Harefield	BBQ at the field
Wednesday September	Club Meeting	Harefield	BBQ at the field
Thursday October	Club Meeting	Uxbridge Golf Club	Guest speaker
Thursday November	Club Meeting	Uxbridge Golf Club	Quiz night
Thursday 9 December	AGM	Uxbridge Golf Club	Membership renewals
Thursday 9 December	Christmas Meal	Uxbridge Golf Club	Partners are welcome but are required to pay full price of meal