

Leek & Moorland Model Gliding Association

<http://www.lmmga.co.uk/>

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Sorry about the December's Newsletter being late but unfortunately I spent the biggest part of December as a guest at The Royal Stoke University Hospital. Still, better late than never so they say.

However, it's not too late to wish you all a Happy New Year so here's wishing you all the very best for 2015

Just a reminder that if you pay your 2015 subs before 31st Feb they are only £8. After February they are £10 ~ The reasoning for this is that sometimes members wait until they see Keith Rathbone on the slopes before giving him their subs. Sometimes it's been over half way through the year before they've seen him. As a BMFA affiliated club, we have to guarantee that **all** our members have BMFA insurance or the club itself loses its indemnity. (The club itself has no insurance) That is the reason Keith (the club) will not accept your subs without first seeing your BMFA membership ~ If you delay paying your subs, the club doesn't know whether or not you have insurance

Front Cover

Fingers and toes crossed ~ cheeks clenched:- Pat Kennelly gets ready to give Eddie his freedom for the first time ~ Will he soar with 2¾ pounds of lead stuck up his nose or will he simply give up the ghost and bite the dust???

BUILDING A FIBREGLASS LOST FOAM VENEER WINGED ALPHA JET

by Peter Garsden



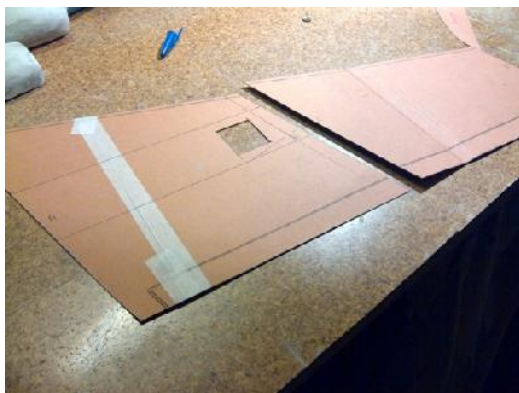
Taken on the Orme at the PSS Event

I decided last summer that I would have a go at a new building method to me - the lost foam fibreglass mould idea. This means making a foam core, sanding it shape, covering it with fibreglass, then dissolving the foam inside with acetone leaving the fibreglass shell. It would be a challenge if nothing else. I had read about it on the PSSA website and it seemed a good idea for the complex

shape of a Jet.

I went onto the PSSA Website and looked at the plans page which gave me a link to Paul Janssen's site - <http://www.pjmodelclassics.be/>. He is Belgium and has some connection with the Air Force. He writes better English than me and is very helpful. He has a range of plans which are mainly lost foam with veneer foam wings all PSS style. I chose the Alpha Jet because he said it was very aerobatic, and had good momentum - I later proved him to be right. It is after all the French equivalent of the Red Arrows Hawk.

If you want to see all my build photos, they are in a slide show



Wing templates to cut out Shapes 4

on the Model Build section of the LMMGA website, together with series of other model build photos, mainly by Mark Ollier.

First of all I had to make a hot wire cutter – this is covered in another article on the subject. Secondly I had to make a variable current transformer to power the hot wire. I actually made two hot wire cutters, a long 50 inch version, which was actually underpowered with a 12v transformer - I need to swop it for a 24v version - and a short 30 inch cutter which is what I used. Lots of parts from Ebay and a short while later and I was in business. The hot wire is needed for cutting not only the blue foam wings, but also the outlines of the fuselage.



Fuselage and jet shapes with templates

The plan and canopy arrived. There is not much to it in view of the construction method, but it is accompanied by instructions which helpfully explain the steps. First of all I decided to cut out the foam for fuselage and wings. I bought a huge block of Blue Foam for £30 off Ebay.

Next I used carbon paper (not easy to find these days) under the plan and over the carboard - I used scrap files from the office. I marked the position of formers, fin, and tailplane cut outs etc to help later. I then cut out the templates easily with scissors.



Next I set about cutting the blue foam to the right shapes for the templates. I found that an Irwin fine toothed Pullsaw which cuts on the pull rather than the push saw cut was absolutely superb for slicing up the foam to very accurate shapes. I then pinned both left and right

views to the block. You can just see the centre lines on the templates which must line up with the centre lines on the block which I drew on to get it square. You can see that one does the jet moulds separately to the fuselage.

Hot Wire Cutting

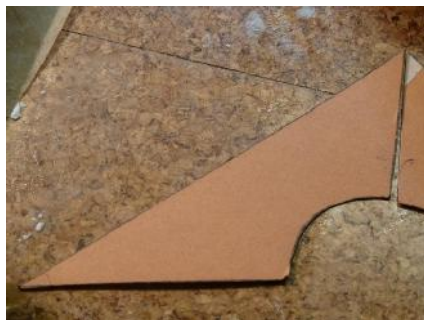
This is where you need two people.

Keith kindly offered to help. You must either mark out numbered steps on the template - better when doing the wing, or shout out where you are so you both cut at the same speed. The fuselage is not critical as it is going to be sanded to shape anyway, but the wing supports are important. A very good article by Ivan on this subject appears on the club members only website.



One then rounds off the corners of the block using a rough sandpaper blocks and/or the Irwin - dust everywhere but not fine enough to get on your chest like balsa.

When you are happy with the size and shape (there are templates on the plan) - I didn't really take enough off the sides round the nose, and couldn't quite work out how the canopy fitted - then you have to wrap the whole thing with brown parcel tape - I used a heatshrink iron as well to assist and melt the glue - wrinkles aren't a problem here - and you can use Solarfilm but tape is just as good and cheaper. The tape insulates the fibreglass from the foam. One then gives it a

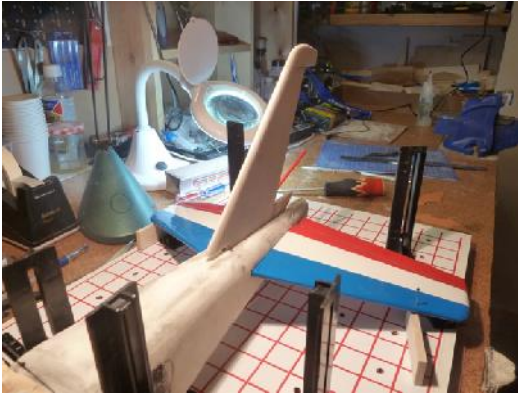


Tailplane angle template

generous coating with bees floor wax - I bought some special removal mould removal wax from Easy Composites - www.easycomposites.co.uk but it is not really necessary.

Fibreglassing the Fuselage

I made a jig to hold the fuselage off the bench with a nail and a wood support at each end, so I could spin the fuselage round when applying the fibreglass cloth. One can cut the fibreglass cloth into 2 inch strips then wrap it round the fuselage. Alternatively you can cut two sides, a top and bottom as per film covering. It is easier to attach the cloth to the fuselage with spray contact



adhesive. This stops the cloth from slipping when you apply the resin. One applies 2 layers of 160gm/sq metre cloth followed by 1 layer of 80 sq metre cloth. What I did wrong was not dab off the excess epoxy resin. Thus the fuselage ended up heavier than it should have done. I also applied some carbon tape/toes under the wings in stressed

areas, and in the nose. The plan recommends cutting off the cloth and applying a balsa nose, but I managed to round it off in glass cloth.

Once the epoxy was dry, I sanded it down with a circular disc on my drill - I have now bought a Proxxon (like a Dremmel but German and arguably better) sander which is brilliant. I then made a mixture of epoxy and microballoons and applied it all over as a final layer. When dry I sanded it down to create a smooth final



Xilica Powder & Millet Fibreglass 1

surface.

Next – the messy bit – one can see how I left some exposed parcel tape for the wing cut out and the canopy. One then makes a hole in the tape, and, armed with a bucket to take the goo, pores in acetone slowly. The foam just dissolves before your eyes. What I didn't appreciate was that the edges of the fuselage were razor sharp and cut me. The acetone then soaked in causing a stinging sensation. Why I wasn't wearing rubber gloves I will never know. You are then left with a hollow fuselage. The next challenge is to peel off the brown parcel tape from inside. With it comes some goo. What a mess.

It is quite common to end up with one or two weak bits where the glass hasn't quite covered and local reinforcement by way of carbon tows or glass sheets is necessary.

I then marked the positions of and glued in, the formers, and the wing retaining bolt plate. As the fuselage is fibreglass made with epoxy I thought that epoxy resin would be a good fixative – wrong – one needs to add some milled fibreglass bits or some powder Ripmax supply called Xilica – works a treat. I used it after the wing retaining plate had disconnected itself from the fuselage side twice. It hardens the glue to make the surface tension more similar to the hardness of the fibreglass – I think!

I then marked the position of the fin and tailplane with a Sharpie permanent marker which shows well on fibreglass. I cut out the holes with my Handy Proxxon Dremmel tool.



A ball joint and cup. It works well

As the wing retaining plate had disconnected itself from the fuselage side twice. It hardens the glue to make the surface tension more similar to the hardness of the fibreglass – I think!



At this point I lined up the wing and tailplane to make sure they were aligned. I have shown a template I made out of cardboard to check the angle of the anhedral tailplane. Naturally I covered the tailplane and fin, leaving a gap of bare balsa for gluing before fitting and glueing with Xilica powder reinforced epoxy.

Not much else left to do – fit the servo tray in the fuselage, and the 9g servos in the wings. With hindsight the non-metal servos are not robust enough, but as this is a high wing model with a deep fuselage, I might just get away with it. The plan shows a conventional balsa connection rod for the twin



elevators with a v formation of threaded rods coming out of the fuselage. I was worried that because of on the control horn. Hence I fitted a ball joint and cup. It works well.

To recreate the jet pipes at the rear of the jet I painted lemonade bottle tops black and adhered them. The jet assemblies were attached using a microballoon epoxy mix.

The Canopy

I quite enjoyed painting the two jet pilots which I got from Pete's Pilots on Ebay – I had to cut them down. I made the seat supports and instrument binnacle out of blue foam. Easy to carve and sand to shaped. I made the balsa base, and glued it together. I reinforced it with some thin fibreglass cloth at the join which is a little weak. I



Veneer attached before trimming

cut out some instruments from a freebie with RCM&E Mag. I glued the pilots down, and set to work on the canopy cover. I should have solatrimmed the pieces on with hindsight but ended up spending ages masking off the canopy lines and giving them several coats of acrylic white gloss.



Fuselage side, I did with a cardboard template

The Wing This follows conventional veneer foam techniques. Because of its shape, it consists of 5 sections, a centre section, and two panels each side. Keith and I cut out the wing sections which are very thin using plywood top and bottom templates at root and tip, marked from 1 to 10, so we could make sure each of us was cutting at the same speed.

As the plan is from a few years ago and showed a central servo with two torque rods. This would have worked but I wanted to put a servo in each wing so I could have airbrakes as well. I was concerned that the inner wing panels would be weakened by the hole for the servo, so reinforced the foam panels with carbon tows and epoxy microballoons.

I had to join the 3 inch veneer sheets together with cryano, then used Copydex to adhere them to the foam.



Bottle top for Jet Exhaust

To join the wings together and make it anhedral a template is provided. Fibreglass bandage is used to reinforce all joints. I also decided to reinforce the joint between the outer

panels and the balsa tip with thin fibreglass cloth and resin.

To join the ailerons I used an angled top silicone hinge with a 2mm gap which works well. I bought some Graupner gap filling clear tape, which adheres to the wing and stretches over the aileron. It seals the gap left underneath the wing to create the aileron hinge. I also bought some servo arm plastic aerodynamic covers, all of which help the model's slipperiness through the air – not that it needs it. Initially I also hinged the tailplanes the same way but the hinge kept coming off on impact – with it being anhedral it gets quite a lot of hammer. So I abandoned the silicone and used diamond tape instead.

I covered the whole model in solarfilm which adhered well to the hard fibreglass surfaces. I gave the veneer a coat of balsaloc first which helped. It required quite a lot of patience in view of the red/white/blue layout. The lux blue was absolutely right for the French Aerobatic Team colours. I first marked the lines with a black Sharpie, applied the white, and one could see the black line to line up the red and the blue pieces. The zig zag line on the fuselage side, I did with a cardboard template

Flying

The recommended weight according to the plan is 890 grams – mine is 1150 grams – about 1/3 heavier than recommended – no ballast needed?

The throws were set up as per plan – I subsequently increased the elevator – see below.



The Gate Maiden flight

The plan showed the battery just in front of F2 (rear of canopy in front of wing). When I came to balance it on the suggested C of G, it needed the battery further forward behind F1 and a bit of weight. When I subsequently flew it, this made the

model way too nose heavy, so I moved the battery back to the suggested position and removed the weight. This is now OK – so either the C of G is wrong, or the way you balance swept wing anhedral wings is different ie the balance line follows a line parallel with the leading edge of the wing as it sweeps back (I have looked at forums and the maths of it all seems way beyond me).

With the CG further forward my maiden flight was at the Gate in an 8mph wind. A combination of the forward CG and the light wind meant it flew like a brick. The same happened at the Mermaid on a similarly light wind day. I moved the CG a bit further back and flew it in a 35mph wind at Edge Top – it flew, but was thrown around in turbulence. It was still nose heavy so I took out all the weight - I had added about 1.5 ounces taped to the battery – and moved the battery right back to the bulkhead. My best flight yet was at the PSS event on the Orme in March. Many were reluctant to fly in 50mph winds at the edge. I chucked off and it flew like a dream and a rocket. Loads of lift, it was a case of getting it down.

The thin wing section and weight make it fly very fast. The nose can drop in the turn – must be something to do with the swept wing and anhedral angle? The elevator needs trimming properly flat with the tailplane to keep the nose up. The roll rate is electric with those little wings. In the instructions Paul says it specialises in flat spins but I haven't managed anything more than a spiral dive so far. The elevators, I thought could be bigger – if I was building it again, I would enlarge them from about $\frac{3}{4}$ inch strip elevators into about 1 inch widening towards the root. Whilst it will loop, it struggles to do so after a long dive, and needs more than the recommended elevator movement. Even though the ailerons are narrow strip affairs, they are more than adequate.

So on the Orme I had hours of very successful flights and perfect landings. I had coupled up aileron and down elevator on a switch for brakes. It is perfect and brings the model down perfectly for a gentle touch down.

So the conclusion is that you need a good blow and probably a good slope for this to fly at its best, but it is a great agile, nimble, highly aerobatic little

model that, with its 35 inch wing span slips into the car assembled easily with room to spare. You do, however, need a hand span of a large bear to grab the fuselage in a wind for launching with one hand (I have just ordered the R/C Gloves which are at half price (£50) so the extra grip may work)

NB – it would probably take well to an EDF conversion – or indeed an electric motor up front with a folding prop.



“Yours is a lot bigger than mine” Billy Griffiths and Neil Barnett comparing models?



Phil Clarke’s Immaculately built 3.6 metre span (144”) ‘Rhonsperber’

It flies extremely well ~ a real gentle giant of the air .

A sunny day at Edgetop. Good slope and thermal lift made the day. Four of our alleged experts discussing tactics ~ from left Neil Barnett, Ian Webb Scott Ravenscroft and Garry Furnavil



Letters

Ivan,

Here's a question to you and your readers. Do you need to (have to) cycle NIMH batteries. Having looked at several Internet answers, they vary from "never cycle NIMH", to, do it occasionally. If they do need cycling, what would be a suitable discharge amp setting be?

I've always thought that regular 'cycling' of batteries was good from a battery memory point of view and general maintenance.....looks like I may be wrong.

Ian B*Can any of our battery experts help out? ED*

Keith Rathbone received this letter shortly after the Scale Event - ED

Dear Sirs.

I have just received a cheque for £25 - my winnings from the scale competition. As I fly for the love of flying and not for financial gain I hope you wont object if I donate this money to my favourite charity,
Alzheimer UK.

I have to thank you once again for a very enjoyable days flying on the Saturday. It is such a pity that the weather on the Sunday was atrocious.

This is the second event I have attended this year where the weather stopped play. However it was good fun meeting up with some old friends once again and also meeting some new friends. Hopefully I will be in a position to return next year.

Best Regards, Brian Sharp

A very charitable act Brian ... ED

An Eagle Called Eddie part 2



If you remember, in September's newsletter I was helping Pat Kennell to build his model 'Eddie The Eagle'. I had more or less completed most of the build, all that remained to be done was to paint it; (Which Pat's wife did) install the elevator gear and sort out the Centre of Gravity'When I got the painted fuselage back I was pleased to see that Pat had already fitted the outer tube of the push rod and the horn on the elevator. If I

could find an inner plastic tube to fit the outer one, Eddie would be ready to fly in a couple of hours. After a few minutes rummaging in the junk I found a snug fitting inner rod.....

There was so little room from where the outer tube left the rear of the tailplane and the elevator horn that there was not enough room to fit a quick-link so I decided to make a wire 'Z' bend and epoxy it into the inner pushrod.

Just before I connected the Quick-link at the servo end, I tried to manually operate the elevator. At first I thought the elevator was binding because it took so much effort to push the elevator up. The elevator turned out to be as free as a bird ~ no pun intended ~ the reason it was taking so much effort was its weight but mainly it was the distance from the hinge/Z-bend to the trailing edge; 190 millimetres. 7½ inches (something to do with the moment arm; force/weight and its distance from the axis) I didn't think the servo that Pat had got would be man enough to do the job properly. A Ripmax mini SD 200. There was another snag; because the Z bend in the horn wasn't quite a

suction fit the amount of free slop at the elevator's trailing edge was alarming, it would have been negligible on a normal elevator. I should have seen this coming ~ Must be my age

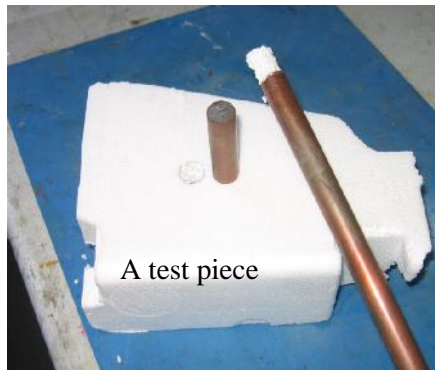
The weight of the elevator was so much that it pushed the servo (SD 200) to a down position when the airborne battery pack was switched off.



Mmmmm - - I wonder how those thick balsa legs and claws will effect the C of G ??

To keep the nose weight to a minimum it is standard practice to get the weight as far forward as possible. Most EPP wings, planks and the like are a problem getting the CG right. If you want to avoid taping lead to the outside of the model. In the past I've bunged a mix of lead-shot and epoxy resin into a hole as near the nose as I could.

However, after a year or so of heavy landings, skimming tops off molehills and pancaking in the stuff that flows from the rear orifice of cows; most foamy's are ready for a recover. When I did this on the first model I recovered, that once solid core of lead-shot and epoxy resin ran through the mushed up EPP foam nose like water.



When Ian Webb and I had a spell at making these types of wings, we decided to do away with the epoxy/leadshot and pour moulded lead into a length of 15mm copper pipe. ~ The above picture is an example of what we did. ~ the sharpened end of a piece of 15mm copper is used as a hand drill ~

it will easily cope with polystyrene, blue foam and EPP ~ the lead filled slug is then temporary placed into the hole to check the CG and if it's right it is glued in position ~

With care, the slug (a bit of calculation needed here) can be used horizontally to reinforce the centre wing brace .

I fitted two of these lead filled copper slugs into Eddie's EPP beak, I managed to get 12 ozs in it . It took another 2 lbs pushed tight up against the front former to get the C of G right — total 2lbs 12 oz Never had a model that needed so much nose weight

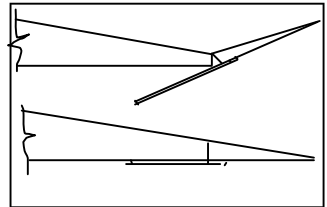
First flight

After a powwow with Pat it was decided to give Eddie a whirl despite the elevator problems. So! It was with a certain amount of trepidation that we stood at the Gate in a 15mph wind with Eddie at the ready. I chose the thickest patch of reed to launch over just in case. I gave Pat the nod and away it went. To my surprise it flew over the reeds as straight as a die and as soon as it hit the lift it started to climb. The aileron/drag plates performed more like a rudder than ailerons; a little sluggish perhaps but it produced quite flat turns.

It levelled off at the top of the available lift around 250 feet and after a few figures of eight across the slope to get the feel of it I decided to try a low pass.

No elevator response!! Eddie kept going backwards and forwards across the slope.as happy as Larry despite the elevator stick bang up to the stop It was reminiscent of the single channel days with only rudder control

I didn't know whether the problem was caused by the weak mini servo or the slop in the linkage or both, but whatever it was, it seemed to be causing the elevator to slipstream at a neutral position. All I knew was that Eddie was content



I bolted the drag-plate to the aileron , thought it would survive landings better than wood screws in balsa

to stop at around 250ft.as long as I was prepared to stir the aileron stick.

I could have gone across the road up towards the trig point and brought it down in the no lift zone but I decided to try the drag plates out by doing a series of rapid left to right turns like we use to do in the rudder only days (single channel). It worked quite well and whether it was by luck or good fortune I managed to get Eddie down in one piece.

A Modification::

The elevator mini-servo was replaced with a Hitec HS-625MG which had an output torque of 5.5 kg.cm so it said on the box ~ the plastic inner and outer pushrod was replaced with a 6mm carbon rod and the plastic horn on the elevator was replaced with a large ball link ~ in all, a vast improvement There was no slop in the elevator and the bigger servo was definitely the boss man .



The next outing was at Edgetop and from the launch Eddie was on his best behaviour. I found it an easy model to control and yes the elevator had authority. No it wouldn't do an inside or outside loop but have any of you ever seen a real eagles do that? I think it will be capable of flying in a fair range of wind speeds maybe not in marginal conditions with all that nose weight.

In all it flew for about an hour and half and during that time I did some low passes so that



Alan Percival could take a few pictures.

It's the first time I've flown a model with drag plates; seemed to work OK producing nice flat turns. It can still tip stall if you don't watch out for those sharpish downwind turns in a strong wind and the drag plates are no substitute for ailerons when it comes to picking a wing up pretty sharpish on a landing approach.



However, as long as you give plenty of time/space to line it up on the approach it has no problem with perching. With a bit of luck, Pat should get many hours of fun flying with this somewhat novel model.

A Brief AGM Report for 2014

Apologies received from

Keith Hooker, Eric Mawman, Derek Illsley, John Vaughan, Dave Gains, Neil Tricker, David Fillingham, Mick Forey, Terry Simpson, Mick Bussey.

There were 28 members present ~ Ivan Bradbury thanked them all for coming.

Officers Report

Sec Treasurer: Keith Rathbone handed out copies of this year's accounts and explained all relevant points including the cost of setting up and printing the our new credit card type membership cards (copies of the accounts can be obtained from Keith on request)

Safety Officer: Ivan said on behalf of Stuart Howard (on holiday) that there hadn't been any problems reported this year, in particular, there had been a marked absence of reported low passes too close to the flightline.

Comp Sec: Mark Ollier said that with a combination of bad weather and poor turn

outs over the last few years; there had been several occasions when so few had turned up that there was not enough bodies to run an event. ~ only 3 turned up on one occasion. He therefore thought that with the 'Two Day Scale' event plus the RAFMAA event there would be enough competitions for 2015 ~ If there was enough interest in having another event, we could get in touch short notice with members via the internet. This was agreed

Editor: Much of this year's newsletter content had come from the members which was good news because it made for a much more rounded newsletter. Please keep sending it in ~ Your photographs, letters, article, opinions etc. The number of members receiving copies by email was on the increase year on year but there was still over 30 hard copy being sent by post

Re-election of Officers: No one wished to put their name forward for office and with no club competitions being run next year Mark Ollier stepped down as Comp Sec. ~ Ian Webb was asked to be a second safety officer along with Stuart. He agreed.

AOB

Keith and Ivan gave a report of a meeting they had with 'Staffordshire Wild Life Trust' (SWLT) on behalf of the LMMGA. ~ The SWLT are the new Lease Holders of the Roaches ~ We gave a brief history of model flying on the Roaches ~ how long we'd flown there ~ the area we flew from we also pointed out that there was no evidence that model flying had caused damage to fauna or flora over all that time. Etc. They gave us a sympathetic hearing and said that one of their main briefs was to protect the wild life on the Roached. However, they said they couldn't see flying RC model gliders from the road side would do any harm and until it was proved otherwise we could continue flying there.

NOTE:: *The site we fly from is on the NE~E corner close to the track down to a house called 'Roachend' there is only a few roadside parking spaces and the site is on a sharp bend. If modellers cause any danger or obstruction to other road users through bad parking we could be in danger of losing this site. We do have permission to park on the track down to 'Roachend providing we don't block the exit. **The owner is a paramedic and needs a quick exit.** Please use this facility if necessary. One more thing! The Roaches, like on all our other moorland sites; we only have permission to fly model gliders and electric gliders with folding propellers*
Ed.

It was asked: With the advent of 2.4 GHz was there still a need to insist on the club rule of no split sites flying at the Mermaid (Pool and Gate) ~ it was agreed that the rule should remain as long as there were members still using 35 MHz transmitters

Ivan reminded member that there was a club rule saying that in very strong winds members should always seek assistance with their pre-flight checks and launching models.

Meeting Ended



This is a picture of the Mermaid Pool, it was taken by Mark Ollier earlier this year

**Wishing you all a good 2015
Good Lift ~ Good Landings
And Remember ~ Please Fly Safely**