

The Folly Flyer

The Newsletter of Aylesbury & District Model Flying Club

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July 2007

Freestyle Aerobatics Competition
Robert Adkins - 1st, Martin McIntosh - 2nd & Alan Johnson - 3rd.



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CONTACTS

Chairman	-	Mick Stiff	(01296) 415997.	
Secretary	-	Andy Bloxham	(01296) 487104.	e-mail:- andybloxham4124@yahoo.co.uk
Treasurer	-	Bob Playle	(01442) 825693.	
Training Officer	-	Richard Ginger	(01296) 688030.	
Newsletter Editor	-	Mike Smart	(01296) 658142.	e-mail:- ferrari1@gotadsl.co.uk
		Fax:	(01296) 651522.	
Safety Officer	-	Julian Clements	(01296) 748859.	
Competition Secretary	-	Peter Dunnett	(01296) 334708.	

WEBSITE:- www.admfc.co.uk

FLYING TIMES

Folly Farm - Tuesday, Thursday & Saturday - 10am - 8pm. Sunday - 9-30am - 5pm.
Bank Holidays 10 am - 5pm. Electric, rubber and gliders may be flown at any time.

CLUB SHOP

'Meanad' add-on silencers	-	£5.	-	Ring Mike Smart.
Transfers	- Sheet of three	£1.	-	Ring Bob Playle.
Training Videos	- for hire to club members.		-	Ring Bob Playle.

TRAINING

Fixed wing training takes place every Saturday and Sunday afternoon at Folly Farm between 2pm and 5pm **by appointment only with the duty instructor**. Please ring the duty instructor by 7.30pm Thursday for the following Saturday or by 7.30pm Friday for the following Sunday.

Please note *NO TRAINING* indicates that a Club Competition takes place that day. Telephone me beforehand if you wish to take a chance on the time available afterwards. **RG**

7 July	Paul Thorne (613870)	8 July	Robert Adkins (07792 511887)
14 July	Bob Playle (01442 825693)	15 July	NO TRAINING
21 July	Andy Bloxham (487104)	22 July	Mick Stiff (415997)
28 July	Robert Adkins	29 July	NO TRAINING
4 August	Mike Smart (658142)	5 August	Richard Ginger (688030)
11 August	Bob Playle	12 August	NO TRAINING
18 August	Richard Ginger	19 August	NO TRAINING
25 August	Paul Thorne	26 August	Andy Bloxham
1 September	Mike Smart	2 September	NO TRAINING
8 September	Bob Playle	9 September	Peter Dunnett (334708)
15 September	Robert Adkins	16 September	NO TRAINING
22 September	Paul Thorne	23 September	Mick Stiff
29 September	Mike Smart	30 September	Richard Ginger

THE NEWSLETTER

The newsletter is produced by Mike Smart, 85-87, Quainton Road, Waddesdon. Aylesbury. Bucks. HP18 0LP.

The Club Newsletter is a forum for all members and material for publication is invited, however the Committee do not necessarily subscribe to views expressed by contributors.

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EDITORIAL

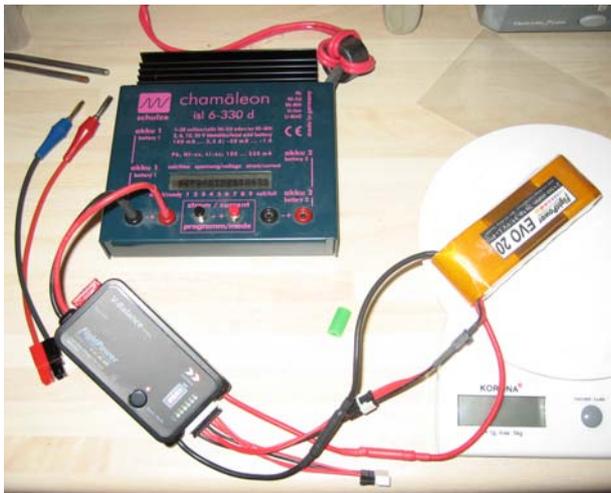
Best wishes go to Ivan Bartlett, who I'm afraid, has had another stay in hospital. As always, I'm sure everybody joins me in wishing you a speedy recovery.

Balancing Lipos - Pt 2

OK, I bought one of the Flightpower V Balancers and managed to get a conversion lead, so it will fit the old style packs as well. This can be used in line while charging or stand alone to balance the pack while not on charge.



Did it work? Well I'm pleased to say, yes it did! One of my FlightPower 2150mA 3S packs has always been a bit 'down' on the others, but I hooked the V-Balance up in line while I charged it, went flying and hey presto! - its now up to par with all the others!



Here it is hooked up to the Schulze Chamaleon and charging (sorry the flash wiped out all the pretty coloured lights). Not cheap I suppose at £32-95p, but if it saves you just one medium sized pack, its worth its money. (It comes with a full set of leads to suit the new type connectors). The conversion lead (£1-95p) I bought was a 3S type (there are others for higher cell counts) and this also works for 2S.

Reviews - Anyone else?

As you will read, there are three reviews in this issue. Anyone else fancy reviewing a kit or ARTF that they have built or assembled recently? How about redressing the balance with a review of an I.C model?

The advantage of a review by one of our members is that firstly, you get an honest opinion and secondly you can ask them all the detail you want to know when you see them at the field.

I saw at least two new models at the scale competition, one of which won - how about it Phil and Richard?

Rescuing Lipos

Yes, I'm sorry, this is rapidly becoming a Lipo newsletter, but you may find this of interest and it may save you some money.

If you have left a Lipo pack connected to a speed controller by accident, you will find that the speed controller has discharged it down to 3 or 4V total and the Lipo charger will not charge it. Normally you should never discharge them much below 3V per cell!

In the Beacon Newsletter, I read that someone had suffered this misfortune and subsequently connected the Lipo pack to a NiCd peak detector charger at 1A constant current for one hour. Hey presto, the voltage crept up to 12V and on connecting it to the Lipo charger, it proceeded to charge normally. The pack has since operated normally.

Someone in the Club also suffered this misfortune and instead connected the pack to a 12V gel cell for a short while, with the same result.

I am taking no responsibility for passing on this advice and I would make it clear that you try it at your own risk. If you do try it, you must undertake it in a safe area (preferably outside) and you must watch the pack continuously in the process!

And Finally.....

The newsletter is a bit like buses, you don't see one for ages and then two come along! Well there was a good turnout to the Freestyle Aerobatic Comp and I thought I would strike while the iron was hot, so to speak. (By the way Robert, I didn't use the headline that your 'friends' suggested—you will have to ask them what that was).

Chris and Alan have kindly reviewed two excellent offerings from Precision Aerobatics and I have put something together on the Hyperion Sniper, which is a good aid to learning 3D or pattern, before you move on to the former types.

This is all very well of course, if you can find some dry weather in the next few weeks!

Hyperion Sniper Mini Review

by Mike Smart

- Span 1000mm
- Length 1100mm
- Flying Weight 395 - 445 gms
- Motor used - Hyperion Z2213/20
- Prop used - APC 9" x 4.7" & 10" x 3.8"
- Lipo used - 740 to 1500 mA 3S
- Servos used - four JP Naro
- ESC used - Jeti 18 Advance
- Receiver used - Futaba R606FS 2.4 GHz
- Kit price - £42-95p from Robot Birds



Intro

Whilst the Blade is a great model for learning 3D (which I would always recommend) it is rather flexible and struggles with a little wind. The Sniper however is larger with an aerofoil sectioned EPP wing and a very stiff EPP fuselage. It has Depron tailplane and elevators and removable U/C. Unfortunately, it comes with the ubiquitous aluminium rod for reinforcing the wings and fuselage, but this is easily replaced with 1.5mm carbon rod or 0.5 x 3mm carbon flat.

It is known as the Super Zoom in the USA and is made in the Czech Republic for Hyperion by Hacker Model Production and was designed by F3A Indoor/Outdoor pilot David Kyjovsky. (Watch out for the forthcoming Flash from the same designer).



In the box

The photo is of the Super Zoom, but the Sniper is identical other than the colour scheme. As you will see, you get a pair of EPP wings, EPP profile fuselage with EPP side stiffeners, Depron tailplane & elevators, EPP rudder, EPP wheel spats and U/C fairing, wire U/C, wheels, instructions and linkages and fittings.

The ailerons are part of the wings and have a tough EPP hinge which is very durable. The elevators are hinged with excellent tape provided and the rudder has a rod pinned hinge.

Assembly

Assembly is undertaken using thin and medium cyano with foam friendly cyano or epoxy for the tailplane and elevators (Depron) and is basically a couple of evenings work for the dedicated. Its a case of gluing the fuselage side stiffeners in place and reinforcing them with carbon rod, gluing the wings together and reinforcing them likewise with carbon rod and gluing them in their slot in the fuselage. The tailplane similarly glues in a slot and the rudder attaches with an aluminium rod through epoxy board hinge brackets. The U/C springs into a slotted wooden block glued in the fuselage and is removable. The motor screws to a wooden former assembly with built-in side thrust, glued in the nose. The kit recommends a single aileron servo in the centre of the wing, but I fitted a servo in each wing as the EPP hinges are quite stiff and I wanted fast aileron response. The wheels are CNC cut from black epoxy board and the U/C fairings and spats are glued to the wire.

I abandoned the spats and fairings after a couple of flights and fitted slightly larger foam tired spoked wheels. I also chose to mount the battery on the side of the fuselage rather than cut a hole as suggested, simply because I tend to use packs of different sizes and weights.

Flying

Well does it fly? - It will take off and land, even on our patch! I am not as experienced in 3D as my illustrious fellow reviewers, but I can tell you that it is a very capable and accurate model that you can fly 3D or pattern with.

It is relatively easy to hover, aided no doubt by the long tail moment, knife edge is easily accomplished with the large rudder and in my case there is next to no coupling (more later). It will perform knife-edge loops, elevators, harriers etc. and in Robert's hands, rolling circles. I haven't tried a blender with it, but I believe it is probably stiff enough to do this. I suggest that you put a Velcro strap around the battery, as I have already had this become detached a few times in violent manoeuvres. However, credit to the Sniper, it was safely flown into a landing with a Lipo hanging by its wires beneath!

A few of you reading this have flown my model, so you know what its like. There are now at least four of these in the Club, I believe.

If you want an introduction to 3D or just an electric aerobat, I can thoroughly recommend it and as I have already mentioned, it will handle a reasonable amount of wind so it is more useable than a shockie.

One last point, various people who have the Sniper/Super Zoom have posted comments on RC Groups regarding landing approaches and degrees of coupling in knife edge and I am convinced that the variations are related to the aileron incidence. As there is no full wing section at the fuselage, you have to line the aileron neutral position by eye. Based on the position of the leading edge of the wing section, I think that the aileron trailing edge should line up with the underside of the fuselage side stiffener and this is where mine is set. Clearly, if you have a little up or down aileron when set at 'neutral' the wing section is modified and will behave differently.

My favourite pack on this model is the Hyperion Lite Storm 950mA 25C, although Chris Vaughan rates the new Lite 1200 FlightPower pack. Whichever pack you use, if it is one of the smaller sizes such as 800mA, it will need to be at least capable of 20C discharge as the Z2213/20 motor draws around 14A static with the 9 x 4.7 prop and more with the 10 x 3.8 prop.

Overall verdict - Highly recommended and great fun!

Dislikes - The smell of the paint! (the joke at the field is that it's lead-based, stolen from the Skoda factory!)

An idiots guide to Lipo's and their safe use

I don't profess to be an expert on the subject, but in view of the number of questions I get from members, I thought I would jot something down on paper, based on my experiences to date.

A few basics

- Only ever charge Lipos using a dedicated Lipo charger.
- Never discharge them below 3V per cell.
- Only use them in conjunction with a speed controller that has Lipo support.
- Never charge them unattended or above 1C (1 x capacity).
- Don't leave them connected to the speed controller overnight or longer - they will go flat.
- Don't discharge them at a greater rate than their discharge capacity (C).
- If they are punctured in a crash or become swollen, they should be safely disposed of.
- If you use gold plated bullet connectors, insulate exposed connectors with silicone tube in storage.
- Balance the cells for optimum performance.

My experience with using Lipos for 2 or 3 years now, has been that, despite the horror stories you may have heard, they are perfectly safe if used and treated in the correct manner. They offer quite outstanding performance for electric models on a power to weight basis, used in conjunction with brushless motors. The current breed of 3D aerobatic models just wouldn't be possible without the advent of Lipos and brushless motors.

So how do you use them and what size do you need for your model? Well you can buy model/motor/Lipo packages, but I'm afraid we have already seen a few of these at the field and to be honest, some of them have motor/speed controller/Lipos that are just not matched properly and will result in at least one of the elements failing after a few flights.

The bad news if you are serious about electric flight and you want to prolong the life of your batteries, you need a good charger, something like a Schulze Chamaleon, a Watts meter and a Lipo balancer.

The first step is to pick a model that you like and then size the motor, speed controller (ESC) and Lipo to it. Most of the better quality ARTF's can be bought with at least the motor and ESC as part of the package and with clear instructions as to suitable sized Lipos - examples - Multiplex AcroMaster, ExtremeFlight Extra or Yak, SebArt Katana or Sukhoi.

Where do you go if you don't have the package? Well unfortunately, electric flight is not quite as straightforward as I.C. yet, but its getting that way. Whereas you would buy a model for a .40 size glow engine, electric brushless motors come in a whole variety of designations and unfortunately not all manufacturers use the same format. The most common ground is probably the output in watts power and you can use this to judge the suitability for the model. (Contd on Page 8)



What setup to use?

I knew that I wanted to be able to ‘punch out’ vertically out of prop hanging but yet not need a large flight pack and therefore reduce weight. I eventually settled on an eFlite Park 480 out-runner with a 12x6 APC-E prop. I chose 1500 3s1p FlightPower lipo’s because they would comfortably provide the necessary current and a 25A Castle Creations ESC.

I decided to start off with fairly standard Hitec hs-55 servos on all the surfaces as these are cheap at around £7 each if you shop around. I used a standard Cirrus 6ch receiver that cost about £14.

Flying

I decided to ROG for the test flight as then I would have both hands on the sticks. After all pre-flight checks had been completed it leapt into the air with no fuss at all. No trimming was needed and my first impressions were good. The ailerons were very lively but oddly for this type of model the rudder didn’t seem sensitive enough.

Knife edge was possible only at full power and nearly full rudder. This is a shame but it depends what you want from the model. Four point rolls and slow rolls are no problem though. The thrust line was perfect with up lines being true and no rudder correction required. Prop hanging was fairly easy but if it starts to wander you need to be quick to correct with the rudder as it isn’t overly sensitive and will fall out of a prop hang if not careful.

Harriers were rock steady and the model performed the easiest rolling harriers I’ve ever done. The usual rolls were performed with no ‘down’ being needed when inverted which was nice but some rudder helped.

Landing is easier than expected with the model floating in showing no signs of stalling or wing rock. The undercarriage has proven to be excellent considering those of similar models and I have had no trouble taking off and landing on our bumpy patch. Hand launching is a breeze at a little over ½ throttle and vertical possible on ¾ throttle. Full throttle was only used with the nose pointing skywards because I didn’t want to over stress the airframe.

With the 1500mah flight pack, flight times of 15 minutes were achievable but I chose to land after 12 minutes as I didn’t want to bring the voltage too low on my lipos.

Is it any good then?

YES! I would recommend it to anyone who has had any aerobatic experience. If you can do a couple of rolls and a stall turn then you will be more than capable of flying it. It even copes surprisingly well in a wind for a model of its type. I have flown it in a 10mph wind and found it to be quite predictable.

I have found though that the Hitec hs-55’s don’t stand up to the abuse that 3d flying brings with it. I am gradually changing the hs-55’s with metal geared waypoint servos from www.robotbirds.com



If you are after something a little more 'bendable' I would recommend the Hyperion Sniper sold by RobotBirds in the UK. It is the same sort of size but made out of EPP and costs only £42.95 and flies amazingly well. I haven't managed to break mine. . . yet.

An idiots guide to Lipos and their safe use - continued

The most helpful source I have found is RC Groups - <http://www.rcgroups.com/forums/index.php?> Here you will find a whole host of topics and if you can't find a thread discussing what you are looking for, you can post a question.

However, for example, lets look at the Hyperion Sniper, the kit instructions tell you to use a Hyperion Z2213/20 motor http://robotbirds.com/catalog/product_info.php?cPath=56_59&products_id=410. If you look at the specs, you will see that this has a maximum efficient current capacity of 14A and a peak capacity of 18A. You will also see that the stator diameter is 22mm, the magnet length is 13mm and the number of winds is 20 - hence the reference 2213/20. An equivalent would be the AXI 2212/20 or maybe 2212/26 or a Hacker A20-22L.

Having established the maximum current capacity, we can see that an 18A ESC should be OK and in fact I used a Jeti Advance 18-3P ESC in mine.

We now know that we want to draw a maximum current of 18A and realistically in the air unloaded, this will probably be 14A. What battery do we need? Well the kit makes some recommendations and we know from this that we want a 3 cell pack (11.1V).

How about a 900mA 12C pack? - 0.9×12 gives us 10.8A. This will work, but will probably cut out at high throttle because its less than 14A and the battery may not survive that long because it is over-worked.

How about a 1000mA 15C pack?, which will give us $1 \times 15 = 15A$ - This is OK, its more than 14A, but only just, so you are going to be working it quite hard.

I used a Hyperion 950mA 25C pack which gives $0.95 \times 25 = 23.75A$, well within our requirements and the battery is not worked too hard at all, therefore you should get a good life out of it.

What propeller, well you can be guided by the kit instructions, but in my case I asked a few questions on RC Groups and studied the thread on the Sniper and ultimately I used an APC Slow Fly 9" x 4.7", although I also tried an APC 10" x 3.8" Slow Fly. With all this connected up with the Watts meter in line, it draws 14A static or around 17.5A with the larger prop. We have a conservative power of $14A \times 11.1V = 155$ Watts and initially off of a full charge, probably $12.6V \times 14A = 176$ Watts, which is fine for this model.

So there you have it, a very brief explanation I'm afraid, of a very in-depth subject, but hopefully it has given you some idea. Electric flight, particularly for 3D aerobatics is still very much a case of experimenting to get the best results and as Lipos are relatively expensive, you don't want to over-cook too many! I strongly recommend that you use the better quality Lipos, motors and ESC's - as they say, buy cheap, buy twice!

Mike Smart.

Precision Aerobatics Katana MD – Review by Alan Johnson

Introduction

Last spring I bought my first small electric aerobatic model the Extreme Flight Extra, 45in span. It was the smallest model I'd bought since 2001 having since then enjoyed the generally better flying performance and aesthetics of the larger models. The quality of the build and flying characteristics of the EF Extra were a revelation to me. It looked good (even to scale!), it flew well, it was light, it assembled easily (a couple of nights to get in the air) and it was reasonably cheap. On top of this being electric it was extremely convenient and hassle free to take to the flying field and get into the air, and the selling point to my wife, being electric it would reduce our carbon footprint!



Hot on the heels of this there are now a wealth of electric models in this size and to this standard, all made in China (the country, not the porcelain!). They are of extremely good performance due to their good design, lightweight, and the huge advances of electric power trains. In my own experience these 2lb electrics really do have many of the qualities of their much larger TOC competition winning models (which PA already enjoy a pedigree of producing). Precision Aerobatics (PA) launched the Katana Mini last year with great success and after 18 months of work (they say) released the larger Katana MD (MD = 'Medium') at the end of last year. After reading a lot of good feedback on the model and the amount of work PA put into it I couldn't resist the purchase.

Specifications

The Katana MD is available from Als Hobbies and PA direct in Australia. With a very good exchange rate at the moment ordering from overseas can work out surprisingly cost effective.

Wing span:	1170mm/ 46"
Length :	1140mm/ 44.9"
Weight :	Approx 965g 34oz
Wing Area:	500 sq.in
Wing Loading:	Approx 9.77oz/sq.ft
Servos:	4 Micro servos 1.5kg/cm torque (I used Waypoint W-092MB 9.2g MG BB Servo @ £15 each, from Robotbirds)
Power Train (mine, 'half inched' from the EF Extra)	Air Boss 35A ESC + Torque 2818T/900 + Thunder Power Pro Lite 2100mAh 3S1P LiPo, 13x6 APC E prop
Price (kit only):	£90 approx, direct from Australia
Power train cost :	should cost another £100 approx. Other motor options are: <input type="checkbox"/> 0 Hyperion Z-3019/12 <input type="checkbox"/> 1 Hacker A30-16M <input type="checkbox"/> 2 PA Thrust 30 Essentially any 900kV 100g outrunner motor. Should cost no more than £40-50.
Links :	http://www.precisionaerobatics.com/product_item.aspx?prodID=1104

Building

Well...there isn't any. Ok, just a little. It took me two nights to build it is extremely easy and all fits together very well without modification. I built the kit exactly to specification as detailed in the instructions which were exemplary with good pics and diagrams (good old ozzies prove the old convict rehabilitation programmes worked!). The wings are two-piece, and are already complete only requiring a nylon fixing bolt to be CA'd into the root rib. You may want to change this fixing method, its fiddly, and well, just sucks! The stab and fin just need alignment and gluing into the tail. Don't make my mistake and discover you need to hinge the one piece elevator afterwards but cant get it in behind the fin post once the stab is glued in. The

elevator needs to go in at the same time as you glue in the stab, just don't hinge it until after the stab is aligned and glued.

Servos are installed in the wing halves (ailerons), under the canopy (rudder) and in the side of the fuz just ahead of the stab (elevator). For 3D throws you will need to use the longest of standard arms that come with the servos. In the kit is a carbon arm extension for the rudder that screws and glues over standard arms that come with your servos. The rudder loop is light Kevlar thread that doesn't stretch, very nice. The linkage of carbon rods and z-bends as per specification may not suit everybody but is the lightest linkage, with no slop, and can be setup to work without radio sub-trim for good symmetrical geometry.



The 'Fusion' technology is neat. I should say immediately that it isn't an ecological radioactive waste free way of generating power with small amounts of Uranium in the model. I had hoped it might be. Nuclear power might have cut down on the cost of LiPo's! It's actually some genius marketing managers bright idea for branding a mix of about 20% carbon fibre laminate and rod throughout the model to reduce the amount of wood material required. It really does get the weight down!

PA do suggest that as a consequence of all the carbon in the fuz it might be better routing the antenna for the receiver out through the side of the fuz and along the wing. Since the wings are detachable this sounded like it was

going to be a pain and untidy. So I decided that having had prior experience of routing the antenna inside the fuz and trailing out the back in models with far more carbon this should work just fine. I can confirm at the extremes of range the radio (Futaba R148DP 1024PCM 35MHz) worked flawlessly.

The spats are always a bit of an issue on small models like this as grass and bumps over 1cm high will pull and tug on any mounting method you use for them, eventually causing failure. Therefore a mounting technique that has a great deal of inherent flexibility works best. I used the PA suggested method of two self-tappers (not so flexible), plus, the Mike Smart method of a blob of silicon sealer (very flexible). It seems to work, ok. I used a similar technique on the Extra and its spats lasted a year before I chucked them (along with any static scale points I might have won!).

Conclusion

Well it was hardly a surprise that this model flies exceptionally well. I was most interested in how it compared with the EF Extra and how well it would cope with varied wind conditions, always the smaller lighter models Achilles heel. The Extra is superb and will do all the manoeuvres you are able to throw at it. My only small disappointment with the Extra was its lack of any glide capability (you need power on for landing or it comes down with a bit of a thump), a tendency to tip stall and excessive wing rock in harriers and its instability in prop hangs.

These were the first things to try with the Katana. I have so far been unable to get it to tip stall in any manoeuvre harrier or otherwise, it is rock stable. It glides like a good trainer and is a doddle to fly and land in winds from zero to 20mph. It is accurate, knife edges without coupling and with great predictability. I have a grass stained left wing tip to prove it! Despite its extremely light wing loading it handles wind exceptionally well and remains sharp and accurate. The only thing I could find about the Katana I didn't like as much as the Extra was the inverted flat spin, the extra does it beautifully flat and you can get it to almost stop descending. The Katana's is a bit more 'nose in' but with a bit of opposite aileron it flattens out quite nicely.

The PA Katana MD is a great model. With low rates its good for precision aerobatic routines and general easy flying. With high rates it will 3D with the best of them. No doubt there are other electrics like it, perhaps even as good, but I haven't seen one perform better. I would have no reservations in recommending the model to anyone with better than novice flying skills, confident they wouldn't be disappointed. Expect a Katana LG ('Large) from PA any time soon...

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<http://www.smart.nildram.co.uk>



A sneak preview of a couple of the models at the Peter Hales Scale Competition



CLUB DIARY

Club Meetings are held on the second Monday of each month at the Rivets Sports & Social Club, Whitehead Way, Mandeville Road, Aylesbury. 7.30pm for 8pm.

July 29th	10am	Folly Farm -	Aerobatic Competition
Aug 12th	10am	Folly Farm -	Electroslot 3
August 13th			NO CLUB MEETING
Aug 19th	10am	Folly Farm -	100" Glider Competition
August 26th - 28th			THE NATIONALS
September 2nd	10am	Folly Farm -	Open Glider Competition
September 10th	7.30pm	Rivets -	TBA
September 16th	10am	Folly Farm -	Daryl Hooper Open Glider Competition
October 7th	10am	Folly Farm -	Les Edwards 100" Glider Competition
October 8th	7.30pm	Rivets -	Ali Machinchy of Als Hobbies takes us through his flying experiences, assisted by one or more of his EXOTIC models - NOT TO BE MISSED!!!!
October 14th	10am	Folly Farm -	Electroslot 4
November 12th	7.30pm	Rivets -	Bring & Buy Sale.
December 10th	7.30pm	Rivets -	AGM.