

# Firebirds Model Club

*Newsletter* September 2014

Welcome to the firebirds club newsletter see below for a clickable table of content headings.

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## Committee News

Here's the latest from the committee room.

## Poplars Flying Times

I've been asked to include the flying times in the newsletter as a handy reminder so here they are.

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
13:00-18:00 QF	13:00-18:00 All		13:00-18:00 All	13:00-21:00 QF	10:00-14:00 All	10:00-13:00 All
18:00-21:00 All						

## Trophies

Would those of you that received club trophies at last year's Christmas do, please hand them in by November. Ideally, give them to Russell but any committee member will take them and hand them to Russell later.

## Posts

Apart from the posts behind the flight-line, all the fixed posts at the Poplars flying site have now been replaced with short removable posts. This will hopefully reduce the number of plane-meets-post incidents.

Metal sockets (Metposts) have been driven into the ground and the new posts just plug into them. The rope has been stapled top the top of each post. If you are the last one on site, please ensure that all the posts are stood in their sockets so that the perimeter rope is in place.

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## **Pitts Model 12 15e ARF**

The following model is offered for sale, which formerly belonged to the late Ray Brown. It's an E-Flight Pitts Model 12, apparently not distributed in the UK.

If anyone wants it, either Chris at the model shop ([c\\_midgley@sky.com](mailto:c_midgley@sky.com)) or Geoff Griffiths can put them in touch with Ray's daughter Jan.



Message from Jan:

"We have one model left which my Dad was anxious to keep when he was alive but feel it really needs a good home now and we would like to be advised on the best way to sell for the best price of course.

I can do no better than give you these links; it is the exact model -

<http://www.e-fliterc.com/Products/Default.aspx?ProdID=EFL2550>

<http://www.horizonhobby.com/products/pitts-model-12-15e-arf-EFL2550>

All we have is the model, nothing else, and Mum isn't sure what's in it. She seems to think it has a motor, servos, and receiver (whatever they may be!)

No speed controller (whatever that may be) and no batteries. It is the 40" one, we have the manual as well. Dad said, so there must be something in it but we couldn't see.

I also attach some pics. Hopefully this will all give you enough info to give us an idea about its value and where we could sell it.

Nick Moss - Director of Ripmax - seems to think around £80

I don't want to transport it around too much, being fragile. People could see it here at my flat in Southsea if they wanted to, or I could bring it to your shop? Open to suggestions really."



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## Hamble Flying Site Trial

This trial started on 2<sup>nd</sup> August but I just thought it would be good to mention the site rules again in this month's newsletter. It would also be helpful if you could keep a note of how often you've tried the site and what your experience was like. We intend to put out some kind of feedback questionnaire to get some idea of usage and opinion of the site. The results from that will determine whether it will be worth continuing.



## Hamble Flying Times

Every day 10am until 9pm or sunset (whichever comes first).

## Site Rules

- The safety of other playing field users and their property is paramount.
- Pilots are strongly advised to have someone with them to give warning of anybody wandering into the flying area, especially during take-off and landing.
- Pilots must follow BMFA Guidelines and Safety Codes.
- All the Firebird Model Club's General Rules Safety Guidelines (as amended in August 2013) apply except that:
- No I/C models are permitted.
- There will not be a peg board. Therefore, 35MHz pilots must liaise with each other to ensure there are no frequency clashes.

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- There will be no fixed flight line or pits area. Pilots must agree the most suitable location and orientation depending on the weather and what other activities are taking place on the playing field.
- No flying must take place over the out of bounds areas which include the Junior School, main road, car park, play park, skateboard park and any playing fields in use at the time.
- No more than 4 models may be flown at the same time.

## Down at the Field Farm

We finally had our barbeque on the 23<sup>rd</sup> August. It was a fairly quiet affair with only about 8 members turning up but we had a great time.

Mike had kindly mowed a decent sized patch for us on the runway, which as luck would have it turned out to be perfectly cross-wind.

Here is a picture of the pits area, which was to one side of the runway



There were three or four full-size take-offs and landings. When this happened, we landed, moved our kit to the edge of the runway and then retired at a safe distance into the adjacent harvested field.

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Here is a picture of a Robin taxiing up ready for a take-off. I had thought that this was



just a late model Jodel (because of the distinctive dihedral wing tips) but this similarity is down to the fact that one of the Robin's designers had previously been responsible for the Jodel designs.

A Luscombe Silvaire put in an appearance during the day too. There are seven of these beauties in various states of airworthiness at Roughay. Mike even has consecutive registration numbers for some. I think I remember seeing G-AKUJ, G-AKUK and G-AKUL.

The next picture shows the Silvaire taxiing past our gaggle of models after touchdown.



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On the model front, Rob had turned up with an Acrowot and his H9 Toledo. The Toledo as always was great to watch.

Roger flew several models including one of his control-line planes.

Terry B flew his Junior 60 and a foamy high winger but was a bit thwarted by the strength of the wind. The Junior 60 sadly suffered some heavy damage when hit by a strong gust on take-off. It's now repaired and flying again.

John H had some smooth flights with his big HobbyKing Extra but left his Taylorcraft on the ground. It was a bit too windy to risk the Taylorcraft.

Bob Farr put in some impressive flights with his little Spitfire and sporty Samba.

I saw Dave fly a light weight foam jet style plane with a pusher prop but the wind got up just a bit too high for him to continue.

I brought along my newly built Hobbyking Zlin 50L, my 30cc Petrol Extra and my FW190 (which didn't fly that day). The Zlin was getting pushed about a bit but my big Extra was fine. I may do a future Fly Past article on my build and flight experience with the Zlin.

During the day, we also had the opportunity to chat to one of Mike's employees who expressed an interest in Joining Firebirds. He'd recently bought a second-hand trainer and was seeking help and advice on the setup.

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Mike had laid out a number of the aircraft he either owns or is working on so we could have a look around. It made for a nice little museum trip.

Here for example is an Andreasson BA-4 biplane. This is a tiny little sports biplane (I would guess the wingspan was about 18ft or so). Looks like a nice subject for scale eh?

Towards the end of the day, Mike had a quick flight in one of the Jodels. At the end of this flight, he signalled his intention to do a landing approach.

Normally, overflying the model pits area in this way would warrant a reprimand but he just got cheers.



## Safety Matters

No Safety Matters this month but safety still matters, so be careful out there.

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## Fly Past

This month's Fly Past features an article written by John H. on selecting an electric power setup for your model.

### **Selecting Electric Power Setups**

With the continuing trend towards cheaper and more powerful brushless motors, Electric Power (EP) is becoming more attractive as an alternative to Internal Combustion (IC). However, to the uninitiated, there can appear to be a bewildering array of motors (size and kV numbers), batteries (voltage/cell count, capacity and 'C' ratings) and speed controllers, all of which must be matched to an appropriate propeller to maximise performance and efficiency. This article provides a description of my approach to selecting a power setup for an EP model and will hopefully help others who may be thinking about taking their first steps with EP.

### Power

Where to start? The first thing to consider with any new EP model is the amount of power we want our setup to produce. We are looking for a setup that will provide adequate performance without being greatly overpowered for our needs which would just lead to us spending most of the time on low throttle with a resultant loss of efficiency. There is a rough 'rule of thumb', based on the type of aircraft/style of flying and the expected model flying weight that can help us here. The following table gives some approximate power ranges for different aircraft that I have found to provide a good starting point.

<b>Model Type or Flying Style</b>	<b>Example</b>	<b>Power Range in Watts (W) per pound (lbs)</b>
Trainer/Powered Glider/Scale Light Aircraft/Vintage	Mentor, Habicht, Cub, Junior 60	60 - 100
Sports/Scale Warbird/Bi-Plane	Wot4, Mustang, Gemini	80 - 120
Aerobatic/Pattern Ship/Warm Liner	Yak 54, Angel, Blaze	120 - 200



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3D Aerobatic	Shock Flyer, AddictionX	150 - 250
Hot Liner/Pylon Racer	Speedy, Nemesis	200 - 300+

As an example, let's look at my Hyperion Extra 260. This is an aerobatic 1370mm (54 inch) wingspan model with an intended flying weight of around 2.25kg (5lbs). Referring to the third line of the table above, we can calculate the power should be in the range of 600W (120W/lbs times 5lbs) to 1000W (200w/lbs times 5lbs). Lets pick a power in the middle of the spectrum and go for **800W**.

## Flying Speed

The next consideration is how fast we want the model to fly. Obviously we want to fly faster than the stall speed of the aircraft with enough on tap to fly in an appropriate style for the aircraft. Again, we can apply a 'rule of thumb' as shown in the following table. Generally, the bigger the model the faster we may want to fly so small models will be at the lower end of the spectrum and large models at the upper end.

<b>Model Type or Flying Style</b>	<b>Target Flying Speed (mph)</b>
Trainer/Powered Glider/Scale Light Aircraft/Vintage	30 - 50
Sports/Scale Warbird/Bi-Plane	40 - 70
Aerobatic/Pattern Ship/Warm Liner	50 - 80
3D Aerobatic	25 - 50
Hot Liner/Pylon Racer	80 - 100+

For the example Extra 260, it is a mid-size aerobat so a target speed of around **65mph** should be about right.

## Thrust

Next we want to consider how much thrust we need from our setup. Although a model may well fly with a thrust of around 20% to 30% of the model's flying weight, we probably want a bit more than this to allow for the resistance on our grass strip when taking off and also to provide the option of 'powering out' in the event of a go-around, tip stall, etc. For easy aerobatics, we will want the thrust to be at least 100% of the model's flying weight.

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For the Extra, let us aim for a thrust of 150% of the model so we should be able to fly unlimited verticals. This gives a thrust of 2.25kg times 1.5 = **3.38kg** (7.5lbs).

## Propeller Diameter

Next we must look at the maximum size of propeller that the model can accommodate. This is done by measuring the distance from the prop centre line to the ground with the model at a level attitude. We will want to take a bit off this measurement to allow for grass, uneven ground and the potential for a nose down attitude when taking off or landing.

For my Extra, the measured distance is 9 inches so taking off 2.5 inches as a safety margin gives a maximum prop radius of 6.5 inches and a diameter of **13 inches**. Generally we will want to use the biggest prop that we can as this will be most efficient, as long as we can maintain clearance and don't end up with a prop that looks ridiculously over/under scale. The exception comes where we are going for all out speed where we might choose a smaller, faster spinning prop.

## Battery Voltage

The final consideration is the battery voltage (or cell count). We may find our airframe has been designed with a particular battery size in mind. If not, we need to decide on the best battery based on available space, cost and availability (we may already have a battery that we want to use). The voltage will directly influence how much current we will need to pull to achieve the power we are aiming for. The required current is calculated by dividing the power (in Watts) by the voltage (in Volts) to give the current (in Amps). For the Extra 260, we can calculate the current we would pull for a range of different nominal battery voltages:

On a 2s LiPo (7.4V) we will pull 800W divided by 7.4V = 108 Amps

On a 3s LiPo (11.1V) we will pull 800W divided by 11.1V = 72 Amps

On a 4s LiPo (14.8V) we will pull 800W divided by 14.8V = 54 Amps

On a 5s LiPo (18.5V) we will pull 800W divided by 18.5V = 43 Amps

On a 6s LiPo (22.2V) we will pull 800W divided by 22.2V = 36 Amps

Generally, we will want to limit the current to a reasonable value as more current equals more heat and therefore requires a bigger (and more expensive) ESC to handle this heat. Limiting current to a maximum of around 60A is a good starting point as 60A speed controllers are relatively small and inexpensive and most of the commonly used battery connectors (Deans, XT60, EC3, etc.) are rated to around this current. We always have the option of increase our battery voltage (cell count) to reduce current draw for a given power. This is why high power setups (hot liners, large models) often use high cell count batteries (6s and above).

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For the Extra, we will limit ourselves to a **4s** LiPo battery with a nominal voltage of **14.8V** as this will give us a manageable current of 54A.

We now have all the information we need to go and look for a motor and prop combination for the Extra that gives around **800W** of power, **65mph** pitch speed, **3.38kg** of thrust using a **13 inch** propeller and a **14.8V** 4s battery.

## Finding a Set Up that Works

There are a number of ways we can now find a suitable EP setup:

1. We could go and buy a range of motors, batteries, propellers and measure the results using a Watt meter, thrust gauge and tachometer - but this will be expensive!
2. We could use a software calculator (such as Castle Creations' Flight Calculator [http://www.castlecreations.com/support/flight\\_calculator.html](http://www.castlecreations.com/support/flight_calculator.html)) to do the testing for us - but this can still be confusing to a new comer and is subject to calculation error.
3. We can make use of motor manufacturer's test data - recognising that some manufacturers may bend the truth a little to make their products stand out from the competition!

Let us use the third of these options and have a look at a motor manufacturer's website to find some test data that meets our needs. I like to use Scorpion Power's website (<http://www.scorpionsystem.com/catalog/motors>) as they publish full test data for all of their motors. Their S22, S30 and S40 series motors are good for small (under 1kg), medium (1kg to 2.5kg) and large (above 2.5kg) sized models respectively. Below is an example of the tables that Scorpion publish on the website and guess what - this appears to give us a combination that meets our needs for the Extra!

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Scorpion SII-3026-710 Motor Propeller Data									
Motor Wind 9-Turn Delta		Motor Kv 710 RPM/Volt		No-Load Current I <sub>o</sub> = 1.56 Amps @ 10v		Motor Resistance R <sub>m</sub> = 0.022 Ohms		I Max 60 Amps	P Max (3S) 1000 W
Outside Diameter 37.5 mm, 1.476in.		Body Length 51.7 mm, 2.035 in.		Total Shaft Length 80.5 mm, 3.169 in.		Shaft Diameter 4.98 mm, 0.197 in.		Motor Weight 205 gm, 7.18 oz	
Prop Manf.	Prop Size	Input Voltage	Motor Amps	Watts Input	Prop RPM	Pitch Speed	Thrust Grams	Thrust Ounces	Thrust Eff. Grams/W
APC	10x10-E	14.8	37.47	554.5	9,030	85.5	1446.1	51.01	2.61
APC	11x5.5-E	14.8	27.43	405.9	9,573	49.9	2033.4	71.73	5.01
APC	11x7-E	14.8	32.18	476.3	9,271	61.5	2140.3	75.50	4.49
APC	11x8-E	14.8	35.86	530.7	9,189	69.6	2072.9	73.12	3.91
APC	11x8.5-E	14.8	38.32	567.1	8,994	72.4	2096.3	73.94	3.70
APC	11x10-E	14.8	44.53	659.1	8,796	83.3	1904.2	67.17	2.89
APC	12x6-E	14.8	36.50	540.2	9,160	52.0	2596.5	91.59	4.81
APC	12x8-E	14.8	45.16	668.4	8,769	66.4	2315.6	81.68	3.46
APC	12x10-E	14.8	52.52	777.3	8,335	78.9	2389.6	84.29	3.07
APC	12x12-E	14.8	58.60	867.2	8,085	91.9	2193.3	77.37	2.53
APC	13x4-E	14.8	31.10	460.2	9,408	35.6	2544.9	89.77	5.53
APC	13x6.5-E	14.8	49.29	726.5	8,343	52.6	3095.6	109.19	4.25
APC	13x8-E	14.8	53.12	786.1	8,358	63.3	3005.6	106.02	3.82
APC	13x10-E	14.8	65.24	967.0	7,592	71.9	2029.9	92.77	2.72
APC	14x7-E	14.8	59.47	880.1	8,026	53.2	3456.5	121.92	3.93
APC	15x4-E	14.8	49.03	725.6	8,528	32.3	3666.7	129.34	5.05

This shows that a **Scorpion SII-3026-710** motor and **APC 13x8-E** prop combination on a **14.8V 4s** battery produces 786 W of power (versus the 800W we specified), 63mph pitch speed (versus the 65mph we specified) and 3.01kg of thrust (versus the 3.38kg we specified), so should be close enough to what we want.

Now, we could stick with the Scorpion motor identified and that would give us a perfectly good set up, the only problem being that Scorpion motors are a little on the pricey side - the SII-3026-710 is going to cost us around £100! What we can do instead is cheat and find an equivalent motor from another manufacturer. What do we mean by equivalent? Well, what we want is a motor that spins at a similar speed (the kV or RPM/Volt figure - in this case 710kV) and has a similar current handling ability. The weight of the motor actually approximates to its ability to handle current as more weight = more copper windings = more current handling, so any motor weighing around **205** grams with a kV of around **710** should do us. For my Extra, that is exactly what I did and found that the **Turnigy SK3 4240** (£20) from HobbyKing is a good substitute with a weight of 195 grams and a kV of 740.

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## Battery Capacity and 'C' Rating

The final part of the jigsaw is to work out the capacity and 'C' rating of the battery that we are going to use. The capacity is measured in milliamp hours (mAh) and tells us how long the battery will last on a full charge. The bigger the capacity, the longer the flight time but that comes with a corresponding increase in weight. We will usually want the biggest battery we can fit whilst keeping within the specified flying weight of the airframe. For my Extra, once all of the other components were taken into account, I found I could afford a battery weighing up to around **475 grams**. The closest 4s battery I could find was a 4s 4000mAh which came in at 465 grams.

The battery 'C' rating is a measure of how much current the battery can deliver. It is expressed as a multiple of the capacity (C) so as an example a 10C battery with a capacity of 4000mAh would be able to deliver 40,000 mA or 40A (4000mA times 10 divided by 1000). We have already calculated the current draw our setup requires so as long as the battery C rating gives more current than this, we should be fine.

For the Extra, I was going to draw around 55A of current, so I calculated that I needed a battery with a C rating more than **13.75C** (55,000mA divided by 4000mA). In practice, LiPo batteries are now all at least 20C so almost any 4000mAh battery should be able to deliver the current I needed.

## Summary

So, I have presented my approach to selecting a power set up that hopefully demystifies the process for anyone thinking of taking the plunge but unsure where to start. The proof of the process is in the flying and anyone who has seen my Extra in the air will know it certainly has all the speed and power needed! The set up I have ended up with in the Extra is:

- Motor: Turnigy SK3 4240 740kV
- Propeller: APC 13x8-E
- ESC: 60A Hobbywing
- Battery: Zippy Flightmax 4S 4000mAh 20C

## External Events

This section details events in Hampshire (or further afield if they are significant events) that might be of interest to club members.

Well there don't seem to be many local events left on the calendar for this year, so this section will be a bit bare for a while.

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## Club Information

This section gives a summary of club services and contact details. Apart from the "Future Club Night Programme" most of the info here is fairly static.

## Future Club Night Programme

### September 2014

The September club night will be an indoor fly at the Hamble club, with an emphasis on vintage models. Bring along old planes, kits, plans and engines for a natter about how modelling used to be when you had hair. I'm sure that if you turn up with a micro heli or some other new-fangled contraption, you'll be most welcome.

### October 2014

Bring & Buy - bring yourself, friends, stuff to sell and wallet.

### November 2014

Balsa brain quiz night. Note that this will be on Friday instead of the usual club meeting on Thursday. There will be a free supper too.

## Cheap Glow Fuel

Fuel is available through the club and supplies are held by the club. All grades of fuel are available to order. Terry holds many other useful items: glo-plugs, propellers, glue, fuel tubing, wing bolts etc.

**Contact: Terry Jacobson on 023 8040 2080 or see him at the field.**

## Club Clothing

A number of items of club branded clothing are available from a local supplier. The current prices are:

Sweatshirts	£14.25
Polo shirts	£12.50
T shirt	£ 8.50
Caps	£ 7.95

All shirts are Fruit of the Loom and available in all sizes up to XXL & most colours. There is also a huge range of quality outdoor wear that can be embroidered with the club logo.

**Contact Justin on 07572 613190, email [windgyber@hotmail.com](mailto:windgyber@hotmail.com) or see him at the field.**

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Our meeting venue is the Hamble Club at this address:

Beaulieu Road  
Hamble  
Southampton  
Hampshire  
SO31 4JL

The entrance to the club is on Hamble Lane, only a short distance from a pub called The Harrier. The club looks like this:

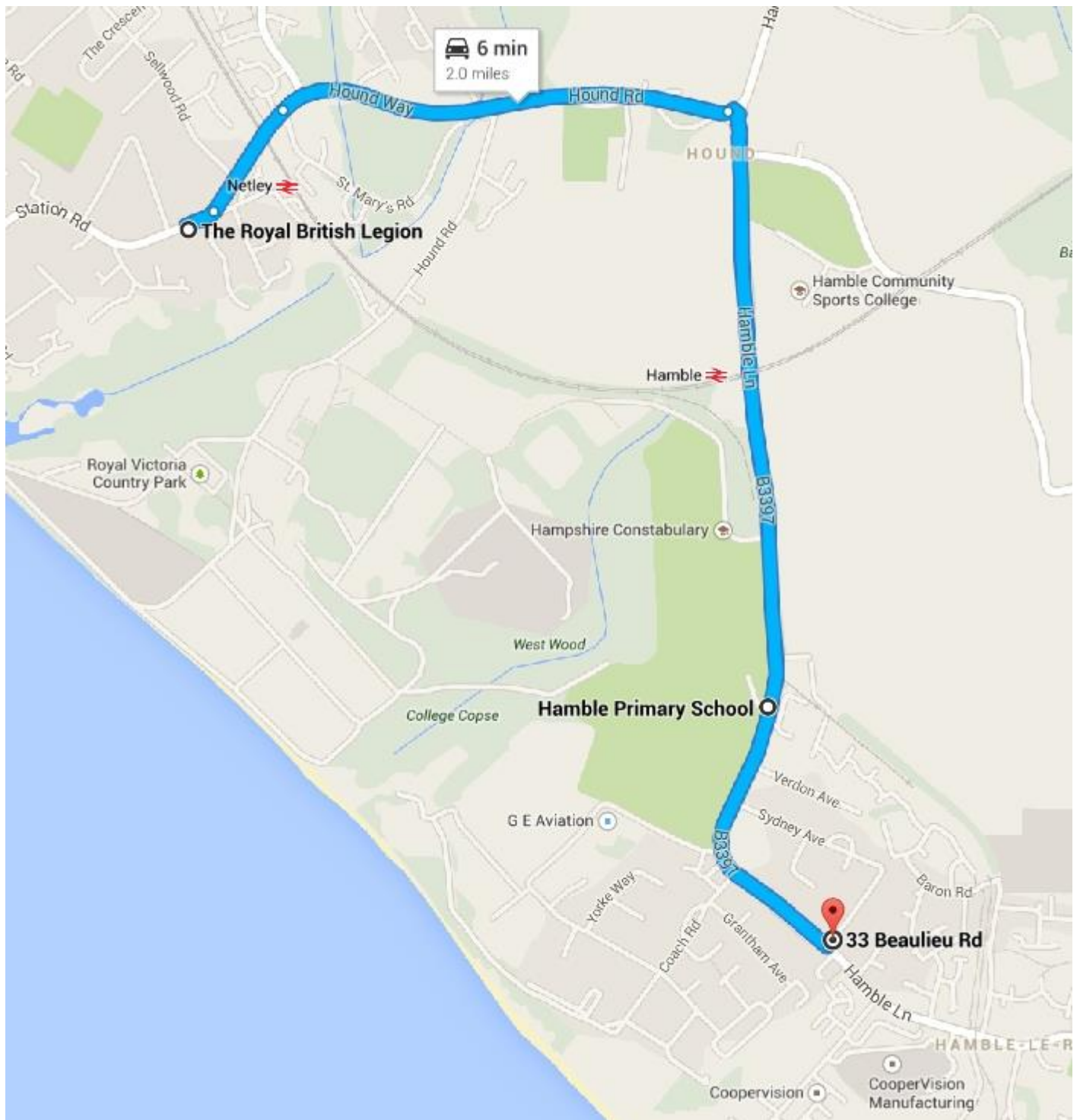


The following page contains a map showing directions from the British Legion to Hamble Club (well actually it's the house just opposite the club because Google maps shows the club as being a fair distance up Beaulieu road, which it isn't).

The map also now includes the location of Hamble Primary School, which is adjacent to a flying site that we will be able to trial in August.

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## Firebirds Club Committee

The following are the contact details for the Committee. Each has given permission for their phone number and email addresses to be included in this Newsletter.

Chairman	Pat Parsons	023 8056 2611	<a href="mailto:patrickparsons.parsons3@googlemail.com">patrickparsons.parsons3@googlemail.com</a>
Vice Chair	Russell Lewis	023 8056 1397	<a href="mailto:russell@pilot1.co.uk">russell@pilot1.co.uk</a>
Treasurer	Paul Adams	023 8069 2729	<a href="mailto:paul.adams10@tiscali.co.uk">paul.adams10@tiscali.co.uk</a>
Secretary	Roger Stanton	01489 784152	<a href="mailto:roger-stanton@sky.com">roger-stanton@sky.com</a>
PRO	Peter Clark	01489 692881	<a href="mailto:psclark911@hotmail.com">psclark911@hotmail.com</a>
Flying Site Rep.	Dave Hoppe	07704 826343	<a href="mailto:davehoppehome@gmail.com">davehoppehome@gmail.com</a>
Safety Officer	Geoff Griffiths	023 9265 5931	<a href="mailto:gcgriffiths@hotmail.com">gcgriffiths@hotmail.com</a>
Membership Sec.	Geoff Scott	023 8039 0013	<a href="mailto:geoffrey.scott100@ntlworld.com">geoffrey.scott100@ntlworld.com</a>



**Remember...**  
**Safe flying is no accident.**