



Newsletter

No.35: December 2023

Welcome to your Newsletter

This is the final newsletter of 2023. Many thanks to all the members and prospective members who have contributed articles over the year. Although unsolicited feedback from members is limited, it is heartening that when members do comment, it is generally very positive, so on that basis, we will continue to produce the newsletter regularly next year.

In this edition: entertaining and informative articles from members, a brief update from the flying field for October and November and news from BMFA Scotland.

In response to interest, early next year we hope to provide details about training and testing days at the Club for those who wish to progress their skills and qualifications. A further suggestion is to have a one-off issue dedicated to technical articles, perhaps including some articles from previous issues. Does this seem like a good idea?

Please let me know of anything you would like to see included in forthcoming newsletters. All feedback and contributions are welcomed. Remember to play your part and if anything interesting (or even better, funny) happens whilst you are visiting the flying field then drop me an email (with pictures) for the Activities at the Field section.

Members are particularly interested in how you got into the hobby, what planes you have owned, technical expertise etc...

Send any newsletter related matters and articles to me at: neilgrayson@sky.com

Club Business

Application for Grant

The application for a Club Training Grant which was submitted to the SAA to purchase a multi-use charger to use with our on-site generator was successful. The charger and its associated leads are stored in the box with the generator.

It has been suggested that a charging point could be created using solar power which would be a useful addition to the club. One idea would be to trickle charge a lead acid battery from a solar cell

and then use that to charge LiPo and NiMh batteries. If anyone has any knowledge or ideas of how we could accomplish this at a reasonable cost please contact a member of the committee. I now know of at least two retired electrical engineers amongst the membership!

BMFA Scotland (Area 15) Inaugural AGM

Held on 22nd November 2023 via Zoom, this was immediately followed by an Ordinary (monthly?) meeting.

Bill McDiarmid attended on behalf of KRMFC and provided the following report.

“There is a standing invitation to each affiliated club to send one voting representative – other members of the committee were busy or unavailable so I volunteered. There were reps from 12 clubs in attendance (out of around 25 total affiliated Scottish clubs to BMFA). As well as the club reps, there is a group of Officers – chair, secretary, treasurer etc but it was clear from the way the meeting was run that they want the clubs to take part and vote on key decisions. Also, Andy Symons from BMFA HQ was in attendance to give guidance to a newly-formed region. A rep from both Glenrothes and Balbedie were also there, so good local representation.

The main business of the meeting was to appoint all the officers, including some posts which had not been filled. As well as Brian Donohoe as chair (a former Labour MP so well used to meetings!) they wanted a Vice-Chair, and Alistair Sutherland from Clyde Valley Fliers agreed to step forward. I know Alastair from the seaplane events so I was happy to second his nomination on behalf of KRMFC.

The BMFA has given BMFA Scotland region £600 this year for admin, plus more if we make a case. BMFA Scotland has asked for an additional £1140.

There was only one contested position – British Drone Flyers rep, one candidate was Michael Williamson of Fife drone flyers (on YouTube as “RC DUDE FPV UK”). Although he wasn’t elected on to the committee, he agreed to join to assist Graham Norris who was elected (helicopter flyer as well as drones).

The AGM was closed and the Ordinary meeting began. The main business was a discussion about expenses for examiners travelling to far-away sites to conduct BMFA tests. Not concluded but a topic for future meeting.

One other point – a mention of the ‘collaboration’ with SAA. It looks like a full merger has stalled. SAA Insurance is now provided by BMFA, so if you join both you’re paying twice for this. There’s talk of allowing BMFA and SAA examiners to administer the tests of the other organisation, but it looks like both organisations will continue in Scotland for the present.”

Upcoming Events in Scotland

The UK Youth Rocketry Challenge (UKROC) Scotland Regional Final will be held at KRMFC on Tuesday 23rd April 2024.

Member Articles

Aerials by *Ian McLuckie*

I've been with the Club about two years now and I have seen dozens of crashes. I've seen servos fail, engines stop, wings come off, ESCs catch fire, catastrophic fuel depletion and, of course, lots of pilot errors. Other than pilot errors, diagnosing a technical fault from a pile of debris is very difficult. Seldom does the pilot blame the computer-controlled communications system but I've often heard '*It just stopped responding*'. Some pilots can point to parts of the surrounding fields where comms problems are *thought* to occur... and an active 2.4GHz smartphone in your pocket might not be a good idea.

There is no doubt that the 2.4 GHz system most of us use, is highly reliable. Secure comms using frequency hopping, a penetrating 130 mm wavelength radio signal from a miserly 160 milliwatt radiated power transmitter, is remarkable. But it can, and does fail. Unfortunately, the systems are so complex most of us, if not all, have no chance of 'fixing' a sealed radio receiver microprocessor. The receiver innards are so small you need a microscope, and the same goes for the transmitter.

But, the receiver aerials per se can sometimes be under our control so we can at least get that right, no aerial reception - no flying...if you have external aerials that is, but even then...!!

I am using the word aerial rather than antenna because the latter is American English although Marconi used *l'antenna centrale* in 1895 when he set up a tent pole to hold up a wire...that was after Mr. Hertz invented the aerial in 1888 based on Scottish physicist James Maxwell's mathematical electromagnetic equations.

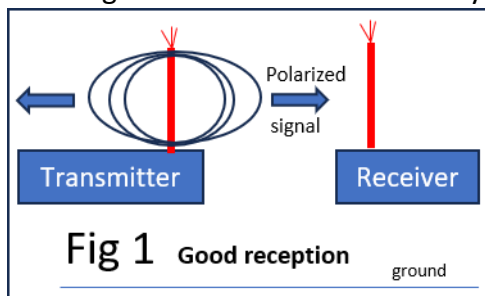
So, what is an aerial? Nothing more than a bit of wire, tube, or plate. Our own RC aero receiver units seem to come with - a) no external aerial wires, b) one aerial wire, c) two aerial wires of the same length, sometime long, sometimes just stubs d) two aerial wires of different lengths e) multiple interconnected receivers with an assortment of aerial wires, and there might be more.

For **a)** above, Texas Instruments developed Spektrum's no wire aerial system and there are others. You will need a Patent Agent to get to the bottom of that, so that's out certainly in this article, but these internal aerials will only be strips of copper on the printed circuit board, electronically tuned. There is no magic, Paul Daniels stuff does not exist in electronics.

There are dozens of good videos on the internet about our aerials so it is easy to pick up the fundamentals. Our own radio band of 2.402 GHz to 2.835 GHz has a full wavelength of 130 mm or so. They say that traditionally we use an aerial which is $\frac{1}{4}$ wavelength, about 30 mm. It seems to suit the physics in terms of inductance and capacitance of the front end tuned circuit. The aerial cable from our receivers looks like coax cable. The shiny uncovered bit at the end is a $\frac{1}{4}$ wavelength. The whole coax can be cut back or extended a bit, so long as the bare shiny wire is kept the same length because that is the aerial which is directly connected to the receiver's tuned circuit. The coax outer is a kind of 'earth' and covered in plastic insulation. There are variations to this. Different lengths, some shorter some longer, are compensated by internal electronics but the receiver is still looking for a $\frac{1}{4}$ wavelength signal. With these very small receivers with no external wires, I often wonder if they are working with $\frac{1}{8}$ th wavelength. Sometimes the outer coax is $\frac{3}{4}$ wavelength but that seems not to be so important. Bear in mind that these receiver aerials also act as transmitting aerials for telemetry, so compromises must be expected.

There seems to be unanimous agreement that the 'shiny wire bit' must be kept straight and fixed down. It should be set inside a straw or heat-shrink. External to carbon-fibre is a must and kept away from fuel tanks, engines and cable harnesses by 50 mm, some manufactures say 75 mm. All Club members already know this, it's teaching your granny to suck eggs stuff, I suppose. But there is more.

Electromagnetic radiated waves are polarized. There is also a magnetic wave transmitted with 90 degrees opposite polarization but that is not for us this time. For the best comms see Fig 1, for the worst see Fig 2. The diagrams are for illustration only. Immediately, you can see that, in Fig 2, the signal is almost lost. The



same applies to horizontal aerials.

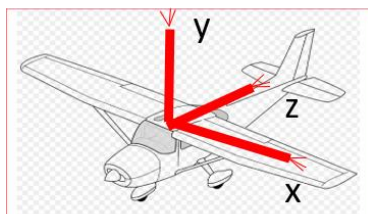
The receiver usually hangs in there but only because the electromagnetic waves get bounced and reflected all over the place. They say these waves are like a lighthouse light which is switched on all the time... not much light comes out the top. They also say these waves like to reflect off water and cause problems...Loch Leven is, of course, the sole exception!

Most of us stand in the field and hold our transmitters horizontally with the transmitter aerial horizontal, pointing to the aeroplane. That is the worst possible aerial orientation. It seems odd, perhaps a bad habit, so I checked it out. Was the transmitter aerial plastic housing wide enough to take a horizontal $\frac{1}{4}$ wave wire? No. Rather belatedly, I have discovered that my Spektrum DX6e aerial can be pulled up to the near vertical position, and...horizontal aerials are available (see below). So next time at the field the aerial will be raised. Or will it? What is constant is that when you are flying, you will face the aeroplane and you will, to some extent point the



transmitter at the aeroplane, so is a vertical transmitter aerial any better? Only if the aeroplane aerial is also vertical... but that is never constant.

The aeroplane or helicopter turns through three axes, so how do we always make sure an aerial is positively available to the transmitter signal? A $\frac{1}{4}$ wave wire laid out

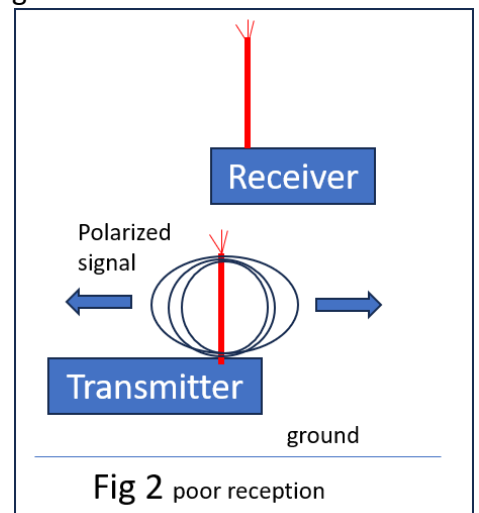


fore to aft, another port to starboard and a vertical one would be ideal (see below). A three wire, three axes aerial receiver might exist but I have not seen one on the internet. The compromise seems to be two wires with one in the horizontal plane and one in the vertical plane say Z and Y. I think I prefer this to a receiver with no external wires or with one wire, but Club Members have been flying all these variations successfully for years.

Please note that a two-wire system must be laid out correctly or cross polarization might occur, that is potentially fatal.

One internet contributor did note that for bigger aeroplanes, remote additional receivers can be used. They simply plug into a master receiver and are located around the aeroplane but no more than about 900 mm away from the master. With each receiver having two aerials, good reception should be assured over the X, Y and Z planes.

The electrical engineers amongst us will already be saying '*how can a receiver have two aerials?* That does not work on a TV, you get picture ghosting. They will know that each aerial will receive the same wave (digits) at very slightly different times. One aerial will pull the signal down to the microprocessor chip, then an identical signal will arrive a few microseconds later from the second aerial to another chip pin. It is worse with three remote receivers giving potentially eight identical signals arriving at different times. I don't know how that is resolved. I do see that the aerial wires go straight into the 'receiver chip'. Sometimes there are components external to the chip to help with static etc. but that is all. My guess is that the chip switches between the inputs selecting the strongest signal. Given that these receivers cope



with frequency hopping, signals arriving every microsecond, **and** transmitting telemetry signals when required, it is clever stuff.

I am off to sort out my aerials. But, alas, my AR 630 has no aerial wires, and worse, it must be located near the aeroplane's centre of gravity for the gyros and accelerometers to work correctly. That location is right behind the fuel tank and engine. When the aeroplane flies towards you for landing, the receiver is fully blanked out, and the transmitter aerial is pointing towards it...a worst-case scenario. My Mascot experienced this and took the 'failsafe option' shutting down the engine, slightly turning the rudder and crashing, which it was supposed to do. That is why I investigated aerials.

This is turning out to be quite an interesting hobby, if you don't weaken.

Interesting and informative YouTube channels: -

- 1) "Are you damaging your receiver antenna?" by *Joshua Bardwell*
- 2) "Antenna theory: The FrSky receiver antenna puzzle (part 1)" by *RC Model Reviews*.

Free Access to RCM&E & Other RC Magazines by Kevin Scott

If you are already a member of the Perth and Kinross Library (<https://www.culturepk.org.uk/libraries/>) then you can get free access to a number of Radio Control magazines (and a lot of other interesting magazines as well). If you are not already a member it is a free service and you can either join online at (<https://www.culturepk.org.uk/libraries/joining/>) or by going into one of the libraries. I would recommend the latter as you will get a physical membership card and it saves a lot of hassle when you want to borrow a book.

There are three aeromodelling magazines that are currently available through the library:

RCM&E – From the current Dec 2023 back to April 2022 (via Libby/Overdrive). It's the one we all know and love so I haven't bothered with a picture!

Model Airplane News (an American equivalent of RCM&E which has been going for 94 years according to the cover – must have been started by the Wright Brothers!) – From current issue back to Dec 2020 (via Libby/Overdrive and PressReader).

Modèle Magazine – Yes, you have guessed it, a French RC magazine. There are some lovely models in it, format again similar to RCM&E with summary tables at the end of each article and a mixture of builds and equipment discussions. I have generally managed to read it with my O grade French - From current issue 851 back to issue 831. (via Libby/Overdrive and PressReader).



There are also a number of aviation magazines such as Aviation History, Flying, Plane & Pilot, Australian Flying, Pilot, Le fana de l'aviation (The aviation fan in English) which could provide reference information for future plane builds.

In terms of general tech reading, there are a vast number of magazines which I won't list here but I thoroughly recommend **The Shed** which is a New Zealand magazine that describes itself as "Aimed at those with a few tools and perhaps a few clues, this is the magazine for real sheddies. Packed with ideas, projects advice and peeks into other people's sheds".

This has articles ranging from restoration projects, custom motor bike builds, CAD software to automating your home.

The library has doubled up a little bit on the applications you can use to get access to these magazines, there are two available - Libby and PressReader.



Libby - The advantage of Libby is it works very well as a phone app and there are also a large number of books in the app as well. It also has a really nice reading mode (more on that later). In many ways it works just like a Kindle. It works equally well on phone, tablet or desktop.

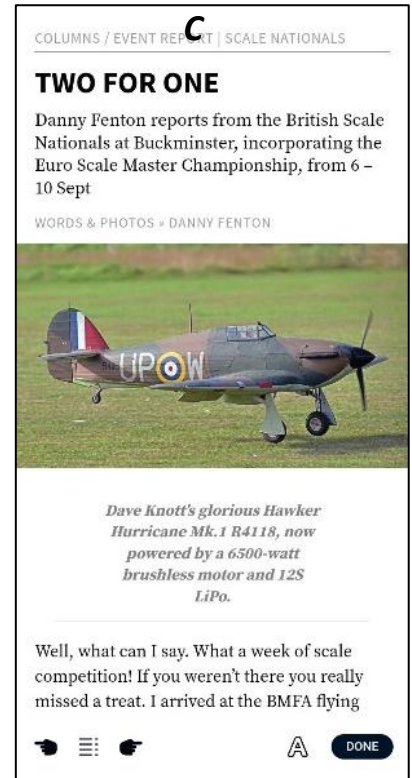
Its only downsides are you can't print any of the pages and there is a limit on how many people can "borrow" a magazine at once, although I have never encountered that as a problem.

Note that RCM&E is only available through this app, it isn't available on PressReader.

The library has some good instructions on accessing it at <https://www.culturepk.org.uk/libraries/digital-e-library/your-digital-library/> .

I have added a little bit more information about how to navigate about it below as the library doesn't cover that.

- A. Initial page view:** You can click on the pages at the bottom to navigate. You can use this to move about the document to see the article you are interested in. If you then click on the main section the navigation information at the bottom will disappear and you will then get a main page view.
- B. Main page view:** If you are on a tablet, this might be perfectly easy to read but a better approach if you are on a smaller screen is to press the article button at the bottom of the page, this will then take you to a reader style view. Alternatively, if you want to go back to the initial page view, press the main article again.
- C. Reader style view:** This is my favourite way of reading articles, it gives a larger size text and nicely formats the whole thing



To exit this mode press the done button at the bottom right of the page and it will take you back to the main page view.

The desktop access through the overdrive website works in a similar way but some of the icons are slightly different but it is straightforward to work it out.

PressReader – The clue to this app is in its name, in addition to reading magazines, it also works like a news aggregator and gives you news of interest. You can also subscribe to newspapers and read them in the same way as magazines and the list is extensive (from the Courier, Scotsman and Daily Telegraph through to the likes of the Wall Street Journal and The Economist). You can also print from this app (on the desktop) - you get a page with watermarks on it but they are quite discrete.

There is an app for this as well but I found it to be a bit slow and memory hungry on my Android phone so I would not recommend that so you are best to stick to desktop.

Again, the library has good info on it and that can be found at <https://www.culturepk.org.uk/libraries/digital-e-library/e-newspapers/>. They also have a video on the same page showing how to navigate about.

A message from Stuart Houston...

"It is a hobby of mine to collect and restore old engines. If anyone is looking to buy or sell engines or to have engines overhauled (bearings changed etc) then I am happy to discuss the work required. I am also prepared to make them offers for buying or selling old unwanted engines." Stuart's Email Address is: flightsoffancy356@gmail.com

Activity at the Field – October/November

Tuesday 17th October

Neil Grayson and Paul Wasik were at the field today both with Funflys. Neil's is a Funfly bought from SLEC in August 2022 and recently completed. The build article appeared in the last Newsletter. It is powered by an Enya 40SS. Paul's Funfly has an Enya 45 SS upfront, bought in 1994. The Funfly below is the 3rd one he has built and it was bought from the Sussex Model Centre in 2001. Even with postage and packaging and the purchase of 2 10 X 6 props it was still cheaper than Scoonie Hobbies by £5. The model and the engine are his favourite combination to fly but he also enjoys flying his Magnatila, as it is about as relaxing as it gets.



Saturday 4th November

Several KRMFC members went to the Glenrothes Aeromodelling Club's SAA Testing Day today. SAA examiners were there in force (up to three at a time, hunting in a pack, a bit like football's VAR system....), and were not in a mood to pass people. However, thanks are due in any case to the examiners for their time. It was a fun day out and always good to visit other club fields. We were made very welcome by Brian Barclay, the Chair of GAC. If anyone at KRMFC is looking to take a test please let a committee member know and we will get some training days organised for next year and sort out an examiner (BMFA or SAA) as needed.

Saturday 11th November

Ian McLuckie flew his yellow Mascot which he built himself. It was heavily modified, built like a tank so almost twice the intended weight and fitted with a massive engine but it flew, at last!

This is Ian's story of the Mascot:

*The Mascot was built over the winter of 2022/ 2023 from a laser cut balsa kit by **D.B. Sport and Scale** a 59" wing span, high wing trainer.*

It took a good 50 hours to build, some balsa sheets were short but D B sent more. The kit was quite good overall. There was the option of using electric or IC. The plans were comprehensive. I built it almost to the plan but strengthened it here and there. It put on weight as usual.

The engine recommended size was 0.25 to 0.40 cu ins. I had an old second-hand OS surpass 52 - 4 stoke with a 10x6 prop. It should have been powerful enough but it was well past its prime and it turned out that it wasn't powerful enough on the day.

The Oracover was left over from a previous Piper Cub which I built and crashed.

Mike Hill did the maiden flight in June 2023 but it only got about 3 metres in the air before it turned upside down and smashed into the ground. We thought it was a wing tip stall but it turned out to be a faulty aileron servo. I had used old servos from a previous aeroplane. Old servos and old engines don't do well.

The Mascot was always difficult to taxi due to poor alignment of the front tricycle wheel even with oversize wheels for the long grass. So, I converted it into a taildragger which involved heavy internal redesign and my own invented tailwheel assembly which was not successful after field tests. The tailwheel was far too sensitive so it was redesigned and given its own servo. It works well now.

The first flight showed that the engine was a bit underpowered so with the help of Stewart Houston, I bought an OS 55 MAX AS on eBay. It was easy to fit, and it turned out to be excellent. The seller must have been an enthusiast because the engine was in perfect condition with glow plug, exhaust extension and even an Allen key.

The successful maiden flight occurred on the 11th Nov 2023). The overpowerful engine cruised the plane at about 10% - 15% throttle- that was to be expected I suppose. Once I got it into the air the question was how to slow it down for landing but somehow, I got it down in one piece. A successful flight at last!

I used a Spektrum ART 631 receiver which has AS3X and SAFE and my Streetwise GPS Tracker which has SMS messaging... just in case it got lost. With a powerful engine the extra Tracker weight of a few grams was not a problem.

It took from 22 Dec 2022 to 11 Nov 2023 to get it flying, but it was worth it.



Neil Grayson flew his Funfly a couple of times and then searched for Clements small electric Spitfire in the west field with his drone. Nothing was seen and it is unlikely that it would be salvageable as it was lost around 3 weeks ago.

Sunday 26th November

It was an overcast and calm day at the field today but very cold. The cloud cover was quite welcome as it blocked the sun out which can be a problem at this time of year as it hangs low in the sky and makes it difficult to avoid.

When Neil Grayson arrived at midday there was about 5 cars parked there which was a pleasant surprise as he expected to be there on his own. Neil Gourlay was helping Rohan to fly (Rohan was there with his grandad). Anna and John Mitchel were there flying Anna's Cub.

Bill McDiarmid got his Tundra in the air and for a few minutes there were three small, electric high-wingers in the air at the same time.

Tom Roberts was trimming out his new (to him) helicopter.

However, most members were just packing up and soon departed leaving Billy Wilkie, Tom Roberts and Douglas Fulton. Tom and Douglas weren't flying but had just come down to see what was happening. Billy Wilkie has now returned to the club after a year away and has two great helicopters and a swanky new transmitter. Welcome back Billy!



Billy Wilkies Helicopters and New Transmitter.

Kevin Scott arrived at the field, a potential new member. He has experience with control line from his youth but he now wants to start flying radio control. He currently flies a drone and already has his CAA Operators ID. After his visit to the field and watching the action in the air he says that he will apply to join KRMFC.

Neil flew his Funfly but had to land as it was far too cold. Two flights were completed with his Rookie glider as it was possible to wear gloves whilst flying with that due to its slow nature but that was enough!

Billy was setting up his larger helicopter and tried to explain about banks, governors, collective pitches etc... but it went over Neil's head so he left him to it and went home. Perhaps this could be the subject of a newsletter article?

Web Links and Shops

Some useful links below. If you can suggest any other shops or websites, please send me the details.

Model Shop Leeds - www.modelshopleeds.co.uk/

Wheelspin Models - wheelspinmodels.co.uk. Free postage for orders over £100

Sussex Model Centre - www.sussex-model-centre.co.uk

The Vintage Model Company - www.vintagemodelcompany.com

Kings Lynn Model Shop - www.kingslynnmodelshop.co.uk

Scoonies - www.scoonie-hobbies.co.uk. Don't bother with the website. Visit the shop in Kirkcaldy. 87 St Clair St, Kirkcaldy KY1 2NW. Tel No: 01592 651792

Dens Model Supplies - www.densmodelsupplies.co.uk. Excellent for spares for vintage Cox engines.

Hobby King - hobbyking.com/

WestonUK – www.westonuk.co.uk Good value fuel in large quantities. Over 20 Litres (4 Gallons) gives you free postage.

ACCU – www.accu.co.uk. Excellent for bolts, screws and washers. Will take requests for bespoke items.

RCM&E - [RCM&E Home Page](#). The website of the best aeromodelling magazine. If you have a question the forum is bound to have an answer.

RC Thoughts - <https://www.rc-thoughts.com/> Finnish website of Tero Salminen. Phoenix Simulator Downloads and updates.

RC World - www.rcworld.co.uk. Located in South Wales between Cardiff and Newport. Stock values on each product are displayed which reflect what are physically in stock, not held at a supplier's warehouse. Derek Grater has used and recommends.

Carbon Copy - [Carbon Copy \(carboncopyuk.com\)](http://Carbon Copy (carboncopyuk.com)). Located in Stevenage. A wide selection of Carbon and Fibreglass parts. Ideal for undercarriages, cowlings and canopies.

Just Engines - <https://www.justengines.co.uk/>. Located in Shaftesbury, Dorset. A wide range of engines and spares. If you can't find what you want on the website send them an email or call.

SLEC Manufacturing (Sun Lane Engineer Company) - [SLEC UK Ltd](#). A good range of accessories but also a large range of balsa and hardwoods. Also available is a laser cutting and CNC milling service.

Component Shop - [Home page \(componentshop.co.uk\)](http://Home page (componentshop.co.uk)). Based in North Wales. A great range of batteries, leads and electronics.

Here's a link to the glider field weather station data at Portmoak gliding club which is just a few miles east of our field. It gives a lot of information including wind, temperature and air pressure. [Portmoak Weather Station](#)

Who's Who

KRMFC current committee members are:

Tom Wilson – Chairman

Neil Grayson – Secretary

Mike Hill – Treasurer

Bill McDiarmid – Committee Member

Jim Walsh – Committee Member

Neil Gourlay – Committee Member

Bob Gadd – Honorary Committee Member

Current Members of KRMFC

We are currently approximately **48** in number

It is planned to post an up-to-date members list in the next newsletter.

A membership application form can be found [here](#).

Contacting the Committee

An email address has been created for members to contact the Committee about Club matters. If you have any questions, suggestions or general comments, then please send them to the following email address:

KRMFCcommittee@gmail.com