MIDLAND GLIDING CLUB

FLYING THE LONG MYND SINCE 1934

GLIDE ANGLE

90 this year

MIDLAND GLIDING CLUB MAGAZINE
APRIL 2025 EDITION

NOTES FROM THE EDITOR

2025 is not only a year to celebrate the 90th anniversary of the Midland Gliding Club's founding but it is also a year of change. We have some new equipment either here on site (MYN) or about to arrive (electric buggies); important management roles have new members at the helm (Andrew Sherrington as treasurer and Andy Rands as CFI); and a new caterer (Jessica Harding who is introduced in this issue) has taken over our kitchen.

The club's forward-looking strategy is also coming into focus. A big thank you to all who have contributed but especially to deputy chair John Young for guiding the process. Reacting positively to change is crucial if we are to continue enjoying our sport for the next 90 years.

As we get into the swing of the upcoming season this edition of *Glide Angle* provides both inspiration for our (hopefully) ambitious upcoming flights and useful information to help navigate some of the club fleet's new equipment. We had some consistent wave over the past winter and Richard Bennett recalls a great wave flight that he enjoyed with Dave Crowson a few years ago. Julian Fack reminds us how lucky we modern pilots are with the reliable, and easy to use, flight recording kit our gliders now have. Martin Howitt also takes us back in time to 1974 when he combined his sport with his professional life in using the humble (but incredibly useful) K-13 in an aeronautical research project. John O'Reilly describes the electronic conspicuity equipment that is now standard across the club fleet. To close this edition there is a last word from our great friend Eddie Humphries, about a beautiful book he read and enjoyed last year.

Rob Kronenburg,
communications@midlandgliding.club

SAVE THE DATE

DATE	TYPE	
26-27/04/2025	Event	National ‘Women Go Gliding’ weekend at MGC
24-30/05/2025	Event	VGC UK National Rally at MGC
16-24/08/2025	Event	Task Week

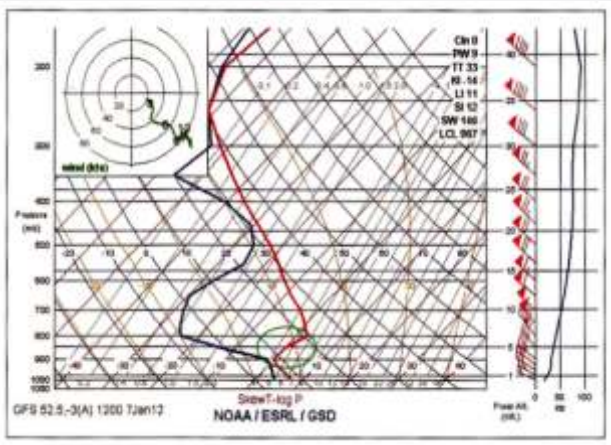
Welsh Wave

One day back in January 2012, wave was forecast all along the Welsh Borders and pilots from Shobden, Talgarth and, of course, the Long Mynd had to have a go. The story of the day is told in great detail in the April/May issue of *Sailplane and Gliding* that year. This excerpt by Richard Bennett recounts one of these great flights from our club which offer a tantalising possibility in the right conditions.

On the 7th January, Dave Crowson and I launched from the Mynd in our syndicate Duo Discus and soared the ridge for about 45 minutes. For the first half hour, we were not entirely sure that the wave was there and definitely had no inkling that it was strong. We struggled to make contact, but at cloud base things improved considerably. The lift steadied until it was 4-6kts over Bishop's Castle. After climbing to 9,000ft we headed west. Now we could see that the wave bars were well formed and pretty obvious. Each jump west used up approximately 4,000ft with 10kts+ sink. The upwind/crosswind jumps took us past Welshpool, over the Powys windfarm and then on to the west coast at Barmouth. Here I saw something that I have never seen before. On the top of a lenticular, there were a series of perfectly formed cloud waves, exactly like the ocean waves that can be seen in Hawaii. The wave bars were well formed so we had no worries about 'dropping out'. We flew parallel to the coast heading north, passing over Trawsfnydd. The gaps now had begun to close, but the lift was still good. The plan was to get to Snowdon. However, the cloud cover there was 8/8. We looked upwind to see that the wave was already set up over the sea and was possibly being set off by the Llyn peninsular.

We climbed up to 15,000ft near Capel Curig and had some stunning views of Llyn Cowlyd - pity Snowdon was in cloud.

However, the cloudscape more than made up for this as it was just simply 'bloody marvellous!' It was tempting to hang around a bit longer and try for more height, but time was getting on and we were not certain of the conditions back at the Mynd. Just before 15:00 we decided to head for home. With a tailwind of 50kts, we were back in a flash - taking just 20 minutes to cover 85km (255km/h) - unbelievable, not bad for a plane with no engine!



The sounding (see photo courtesy of *Sailplane and Gliding*) for Bishop's Castle at noon indicates the red line showing an inversion between approximately 3,500ft and 6,500ft (circled in green) and the wind barbs on the right showing wind direction roughly constant and speed increasing with height to 75kts at 20,000ft.

Richard Bennett

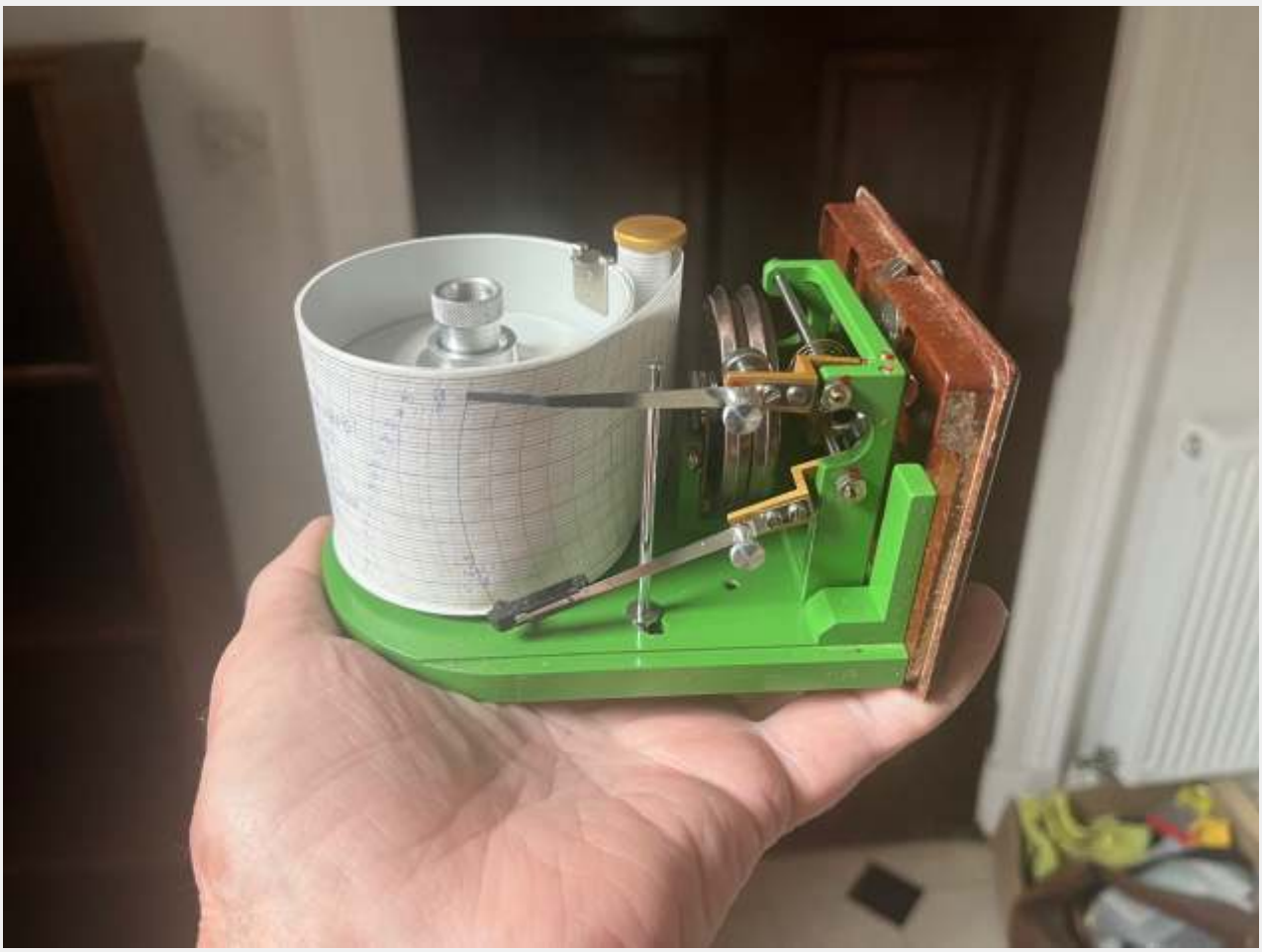
Gliding Competitions before GPS, how did that work?

Contemporary glider pilots may not realise how fortunate they are with all the electronic gizmos in the cockpit which make recording our flights so convenient (and reliable). Here Julian Fack describes the fun that pilots of the past had with their various flight recorders.

These days, verifying what a glider pilot has achieved during his or her flight is easy: just download the log and there it is; all the info you could need. Did the glider cross the start line on time? Did it reach the turn points? When did it cross the finish line and was it high enough? Did it encroach any airspace and was the engine used?

Things were different in the past. Not too long ago I was present at the first big competition to use loggers, which was the World's in New Zealand in 1995. It was there I helped Dave Ellis of Cambridge Instruments install Model 10 loggers in all the gliders. Long before that, in the 1920s and 30s, the first competitions were based on duration, but that had to stop when pilots started ridge flying for whole days, overnight, and even longer! Other competitions were based on height gain. However, as soon as thermal flying (and variometers) started to emerge cross country tasks became possible. These were originally downwind dashes, with a land out miles from the starting point. One regular run from the Mynd was 300k to Great Yarmouth, tasked straight across Birmingham,which was possible then before Birmingham airport airspace appeared. Before WWII there were even downwind dashes across the Channel. Starting from northern clubs like Camphill and Sutton Bank, gliders could end up in France!

When gliders' performance into wind improved, closed tasks became possible, which required some form of verification.



One way was to send out observers in cars with deckchairs and binoculars to sit at the turn points. At that time a popular tactic was known as 'trailer racing' where the crew with trailer would drive round the course in case the pilot landed out, the idea being that they could derig quickly (particularly if this happened on the first leg) and return to the club to start again. This gave rise to the current rule that you can have a re-light but only if you land back, and not at all if you use your motor.

Proof of continuous flight was by barograph, which continued right up to the GPS era. For those too young to have come across a barograph, it consists of two parts (see the photos). There is a drum similar in size to a soup tin, and a scriber or pen connected to an aneroid capsule via a hinged arm. The drum had a foil or paper wrapped round it and was driven by a clockwork motor. The pen or scriber moved according to atmospheric pressure and marked the paper or foil, showing a continuous graph of the altitude.

Barographs were a bit of a faff. You had to smoke a foil (over a smoky candle), install the foil and get an Official Observer (OO) to seal the whole thing with brown paper tape, signed by the OO over the glue join in the tape, then install it in the glider and make sure the clockwork was going properly. This was required for every competition or badge flight. You then had to find an OO to inspect it after landing.

The next development was the use of cameras, usually a pair of cheap point and shoot film cameras, mounted on the cockpit rail, to photograph the start line and every turn point, which required the organisers to develop the film and analyse all the photos after the pilot got back before briefing the next morning. This major workload often ran late into the night. It was refined when cheap cameras arrived with a time stamp feature, where the time was imprinted on the negative. To synchronise the camera clocks, the first photograph had to be the organiser's clock before take-off, and a second photo of the glider fin number to identify the pilot, and the last photo was another one of the fin after landing.

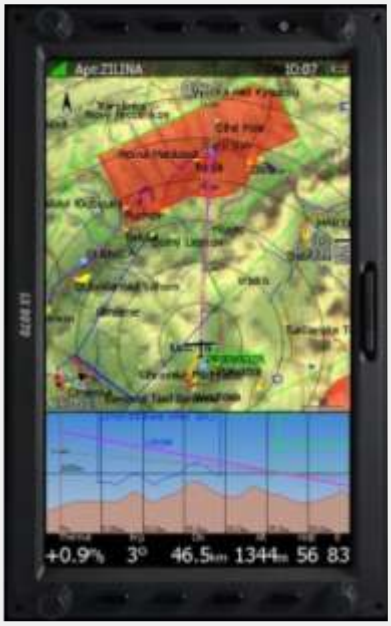
Flying in such a way as to aim the camera correctly towards the turn point was quite an art, you had to use a wingtip as a 'viewfinder'. You can imagine how difficult it was for the organisers to identify a turn point from a poor photo taken at 5000ft and consequently there were many disagreements. This is why most BGA turn points incorporate line features such as roads or railways. For example, Condover near the Mynd is where the A49 crosses the railway. Obviously, unlike today you had to actually turn around the turn points in order to get a photo from the right angle to prove you really did it!

There once was a clever World Championship pilot who managed to hack the camera clocks and make it appear he had won the day. The problem was no other pilots saw him on task, so the even cleverer director arranged a trap without telling anyone. He moved one trailer in the trailer line every minute to create gaps, a sort of coded digital clock, like a big bar code. When the pilot photographed the start line over the airfield the correct time could be read from the trailers and compared with the imprint on the negative. This brilliant solution meant he was 'banged to rights' and sent home in disgrace!

The next development was the electronic barograph, for instance the EW Flight Recorder model B (see photo). This was a huge improvement, just plug it into a printer after landing to produce a spreadsheet of height throughout the flight - though still no location information yet.

Global Positioning Satellite technology completely changed everything, not only making verification easier but also in policing airspace for the first time. To be honest, pilots could be pretty cavalier before GPS, because it was so difficult to avoid airspace using map and compass navigation whilst trying to remain airborne, and who would know? Some of today's instruments can even download the log file by Bluetooth direct from the logger and email the scorer immediately after landing, via the pilot's mobile phone. How things have changed, even in my time!

Julian Fack



Flight Testing an ASK-13 in Ground Effect

In this fascinating article Martin Howitt describes the work he did as an aeronautical engineering student in aviation research involving the practical use of our glider training workhorse, the K-13

From 1970 until 1974, I was an undergraduate apprentice employed by Hawker Siddeley Aviation Ltd., simultaneously studying aeronautical engineering at Salford University. In my 2nd year as a prelude to the ground effect thesis discussed here, I wrote a short article entitled 'Designing for Distance' which covered the development of sailplanes from infancy to the 1970's, with an emphasis on the design criteria employed in the high-performance sailplanes of that era.

1973/74 was my 4th and final year in which I had to complete a practical thesis that would contribute towards my Honours degree. Having just returned in Autumn 1973 from the flight testing of HP Jetstreams at RAE Cranfield, I was inspired to conduct my thesis around glider flight testing. Whilst at Cranfield, I met with Howard Torode (of the Cranfield Institute of Technology, now on the BGA Technical Committee) who provided me with various glider performance flight test reports and introduced me to the Hussenot A22 8 channel photographic trace recorder that was used to record the tests. At that time, ground effect (the aerodynamic interaction between the moving wing and the surface below) was a topic being heavily researched and utilised in such vehicles as the Russian Ekranoplans. My own research following up on US Air Force testing on gliders in the early 1940's, led me to conclude that I had enough information to develop my own flight test programme.

Following discussions with various folks at Doncaster Gliding Club (now Burn, my home club from 1967 until 1975) and my university tutor (Dr R. A. Sawyer) on the feasibility of using a K-13 for the testing, it was agreed that this could make a practical thesis. So it was that I embarked in Autumn 1973 on creating a test bed that could be installed in place of the K-13 rear seat.

THE LOW-DOWN ON AEROPLANES

University student Martin Howitt (pictured here) hopes his ideas for his final-year thesis will get off the ground, but not too far . . .

For Martin, from Marlborough Road, Doncaster, is carrying out research on low-flying aircraft.

His theory is that planes give better performance when they fly closer to the ground, and that pilots could use the effects of the ground to their advantage — for example to save fuel.

Said Martin: "One group of people who might be interested are those still after the £10,000 Kramer prize for man-powered flight — for they have to fly close to the ground."

Martin's research, which is the first of its kind to be carried out since 1940, has already interested experts in America. He has had a letter from the Massachussetts Institute of Technology asking to look at his project.

SPONSORED

Martin's employers, Hawker Siddeley Ltd., sponsored him to study Aeronautical Engineering at Salford University, and Martin has been working out his theory on paper for four months.

Now he has got down to some practical experimenting and testing at Doncaster Gliding Club.

A German-built KB aircraft has been fitted out with £1,000 worth of equipment, including a special measuring vane, to record the effect of the ground on the plane's flight.

Before going to university, Martin was a member of the gliding club, and first flew solo on his sixteenth birthday.

But the club's instructor, Bob McLean, is doing the flying for Martin's research.

First, I had to construct some equipment at Salford that would make the tests possible:

- an angle iron frame that would mount all the test and recording equipment,
- a 4-foot-long front nose boom that housed an incidence vane (see photo) that would measure incidence and pitch attitude,
- a stick force measuring device.

The installation took place in early December 1973 at Doncaster, with the rear seat and stick being removed and replaced with the angle iron frame secured to the rear seat mounting points and the stick force measurement device inserted in place of the rear control stick. The nose boom was inserted in place of the front tow hook. To measure static pressure away from the influence of the K-13's flight path, tubing was installed through the fuselage and attached to a McDonald trailing cone which extended out about 50 feet behind the glider. The various feeds to the recorder were all connected, and a cable was run to the front seat and attached to a start/stop button that would be used by the pilot to record the tests.

During the cold but calm and clear winter weather in mid-December 1973, the K-13 was finally ready, and the flight testing could begin, under the control of Bob McLean (now McLean Aviation), who was an instructor and tug pilot at Doncaster. The first tests were intended to record the K-13's flight attributes away from ground influence. The K-13 was aerotowed to an altitude of 8000 feet and when stabilised at a variety of speeds throughout the polar curve, the pilot was able to start recording using the start/stop button. All eight of the test parameters were then recorded on to a roll of photographic film.

For the ground effect tests the McDonald trailing cone was removed.

The tests took place over several days and involved the K-13 being aerotowed to about 500 feet at the end of the airfield and released. The pilot would then start the recording and fly down the airfield at differing heights, ranging from 100 feet down to lowest safe flight he could manage. The flight was started at high-speed and, as the air speed dropped the pilot, by increasing pitch, was able to maintain a constant test altitude. After the testing was completed, all the equipment was removed, and the K-13 was returned to normal club duties.

The tests were recorded on a continuous photographic trace which had to be developed before interpretation of the results could begin. This was done during early January 1974, and I was fortunate in being able to use Doncaster Museum's photographic laboratory to process and fix the traces. Subsequently, I had many feet of recording paper to work with. The following few months were back at Salford University, where I spent many hours methodically measuring the traces on a per second basis and recording the measurements in a variety of tables. These were subsequently turned into graphical form to help with the interpretation of the results for which (rather than using my slide rule), I had to purchase my first electronic calculator, a Sinclair Scientific, funded by a huge £30 bank loan - a lot of money for a poor student in those days.

Despite all this meticulous work, the research results were unfortunately inconclusive, and I was unable to demonstrate that as a result of flying close to the ground increases in performance could be obtained. However, my research process was not considered a failure, as it succeeded in demonstrating that University based flight testing could be practically completed. The happy end product for myself was that in summer 1974, I gained a 1st class Honours Degree in Aeronautical Engineering, based primarily on the completed thesis. The project was sufficiently interesting that on the 10th January 1974 the Doncaster Evening Post even wrote it up for my fifteen minutes of fame!

Martin Howett

Burn Gliding Club

FLARM equipment in the MGC fleet

The club is constantly upgrading its training fleet and now all gliders (except the K8) have the benefit of FLARM, and some with much greater functionality than a basic warning system. Here John O'Reilly provides a brief guide to what is now available.

Over this winter Mynd pilots have had the delight of enjoying wave flights, including in the club fleet. It is worthwhile being aware that most of the FLARM systems installed in the club fleet have some capability which is useful when wave soaring. FLARM displays are definitely not the most important instrument on the glider panels, but 'Electronic Conspicuity' (EC) is a relatively new technology to the club fleet, so it is good to get to know what we have, remembering that the electronic conspicuity system is there, as recommended by the BGA, to support a good lookout. This article is not a description of how FLARM works in general; there is plenty of information in manuals and on the internet for that. This is just a description of the FLARM systems fitted in the club fleet operate.

Let's start with what EC systems we have in the club fleet:

- Except for the K8 (CJM) all the MGC club fleet now have FLARM systems installed. Despite some potential confusion about PowerFLARM, none of the club fleet FLARM systems have ADS-B (Automatic Dependant Surveillance – Broadcast) capability or transponders installed.
- FLARMs in MYN, CCW, LUV and FZP are all LxNav PowerMouse units, with igc certified loggers, and FLARMLED+ displays.
- We have standardised new units when we have installed them, but not all the club fleet FLARMs are identical.
- The FLARMs in the K21 (JGE), the 2nd K13 (CCZ) and the Motor Falke (GAO) are older, less sophisticated classic Red

Box/FLARM Eagle/FLARM units, but from a collision avoidance functionality they work the same.

All aircraft have LED+ displays which include distance to target indication, configured at the MGC as nm (nautical miles), whereas the systems in JGE, CCZ and the Falke are more basic FLARM units and have simpler displays without distance.

The LxNav PowerMouse FLARMs, in the new K21 (MYN) is installed a bit differently. Its FLARM Map display on a S80/100D (K21b - MYN) is capable of showing more information, but because the 2-seater club fleet is primarily for instruction that functionality is currently disabled. This is controlled from within the device set-up so please do not change that unless you are an instructor.

In general, FLARM units will come on when the main avionics switch is ON. In the K23 there is a separate FLARM ON-OFF switch, and the MYN FLARM comes on when the S80 is turned on. Although it is difficult to see, the FLARM (PowerMouse) in the new K21b (MYN) is connected to the S80 electronic vario, which adds more, and different, functionality.

During the daily inspection (DI), or when turning on the avionics/FLARM unit before a flight, the display and FLARM units go through a boot-up sequence, which includes a self-diagnostic check. Please check that the FLARM system boots up correctly! If in doubt, ask an instructor.

The FLARM unit turns off when the Power/Avionics/S80 is turned off, but if you want to ensure the logger includes the landing in its trace, leave the FLARM turned ON for a few minutes after landing to allow data to be written to the igc file.

The FLARM units have really good GPS receivers/antennae, together with calibrated barometric pressure sensors, so are ideal for connecting to personal nav systems. If you want to connect a Bluetooth (BT) enabled Nav device to the PowerMouse FLARM units (K21b – MYN, K13 – CCW, K23, Junior) BT is always ON. The nav system device (obviously) needs to be paired to the FLARM, but it does not require any pairing password. The FLARM unit will appear as LXNAV-FPM-(and a 5-digit serial no.)

It is worth noting that the MGC Standard Operating Procedures includes the following:

'**2.13.2. Gliders flying above cloud must be equipped with an operational, working, moving map navigation device and radio**'

This obviously includes a pilot knowing how to use them! If you don't know how to use them, learn how to do it on the ground, with the manual. Trying to do it for the first time in the air is not a sensible idea.

If you need to download a log file after a flight, you will need a USB stick on the K23, Junior, K13 and K21s. Insert the USB memory stick into the panel mounted USB socket (labelled FLARM Data) and turn the FLARM/avionics on. The last 40 flights will be download into the root directory, and the FLARMLED+ indicator will show the igc-file download in progress. After the download procedure is finished, the USB stick can be removed, without turning off the FLARM. Copies of the calibration charts are available from the club office, or they can send a scanned electronic copy.

The FLARM systems were installed for the benefit, and additional safety, of the pilot members. Please get to know how to use them.

John O'Reilly

The Midland Gliding Club Café

There is now yet another reason to head up to the club, even if the weather is a bit… you know! The club catering facility has been taken over by Jessica Harding, a professional baker who has been catering to Salopians with a sweet tooth for the past few years.

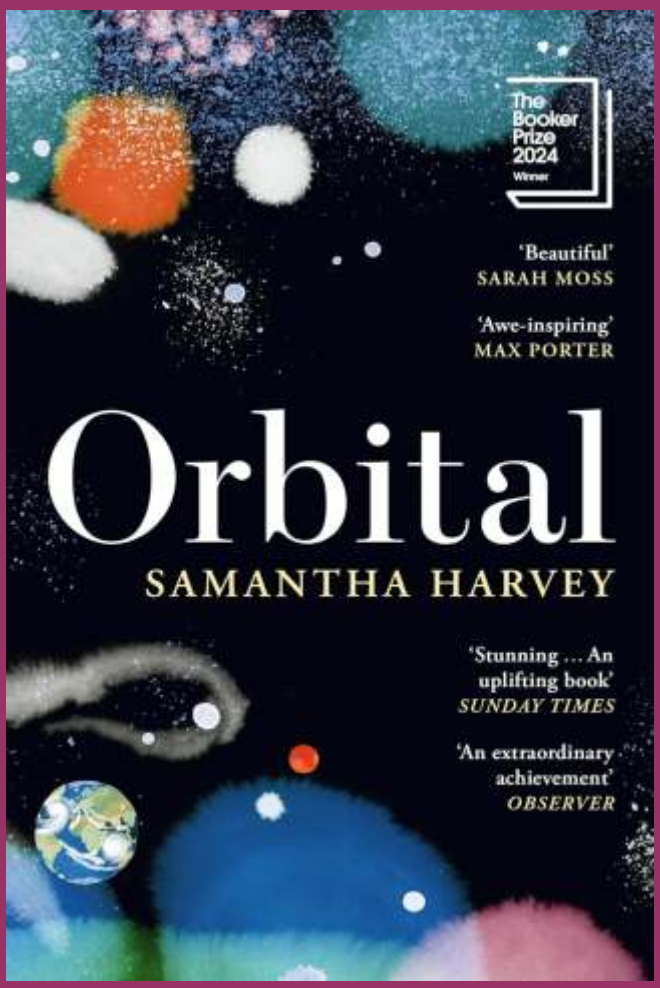
Jessica took up baking full-time during lockdown and is a local, raised in Ratlinghope and now living near the Stiperstones. She has since created a successful business, Shropshire Hills Bakes, providing both standard items like brownies, Victoria sponge, scones etc. and special celebration cakes made to order. Locals may have enjoyed her products from her stall at the regular Saturday market in Ludlow.

Jessica plans to operate the café year-round every day with the help of her mum, friends and her hard-working 10-year-old daughter Rebecca.

Breakfast, lunch and dinner will be on offer most days. As before, the café is open to walkers, paragliders, and others enjoying the Long Mynd, however, MGC members have priority during busy times (please remember to order your lunch or dinner in advance if you can).

The café runs a loyalty card for members' drinks – buy nine, get one free (ask for a card).

There will be occasional special food event nights, sometimes with invited chefs. The first is on 7th June which will be a Caribbean Night. Again, members have priority but please book with Jessica (07828 785 219).



Book Review

The last word in this issue of *Glide Angle* is from our much missed MGC member Eddie Humphries, who prepared this article a few months ago.

Orbital by Samatha Harvey

The 'surly bonds of earth' having been broken once again, the inhabitants of the ISS experience sixteen sunrises and sixteen sunsets in a twenty-four-hour period.

This delightful and unusual short novel is undoubtedly fiction. The author Samantha Harvey, never actually having been into space, explores with great empathy and insight the feelings, emotions and wonderment of four astronauts and two cosmonauts as they both conduct their professional duties and take time to ponder their privileged position.

The plot is simply and extraordinarily a consideration of our planet, watched by a handful of souls as they encounter, amongst a panoply of other emotions, unbridled joy, bereavement, loneliness, home sickness and mission fatigue. The indescribable beauty, majesty, ferocity and in many ways fragility of what unfolds rhythmically beneath them is described in a manner deeply affecting, thoroughly thoughtful and surprisingly prescient.

Orbital is as beautiful as it is profound. It's not a long book, indeed it could be read in a single winter's evening. However, as Kerry McHugh observed

'*The luscious and lyrical language is as close to poetry as it is to prose . . . Orbital is a gift of language*'

and for this reason I encourage you to take your time, immerse yourself in it and enjoy it as much as I did.

Samantha Harvey is the author of five novels, Orbital, The Western Wind, Dear Thief, All Is Song, and The Wilderness, and one work of nonfiction, The Shapeless Unease.

Orbital was the winner of the Booker Prize 2024.

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