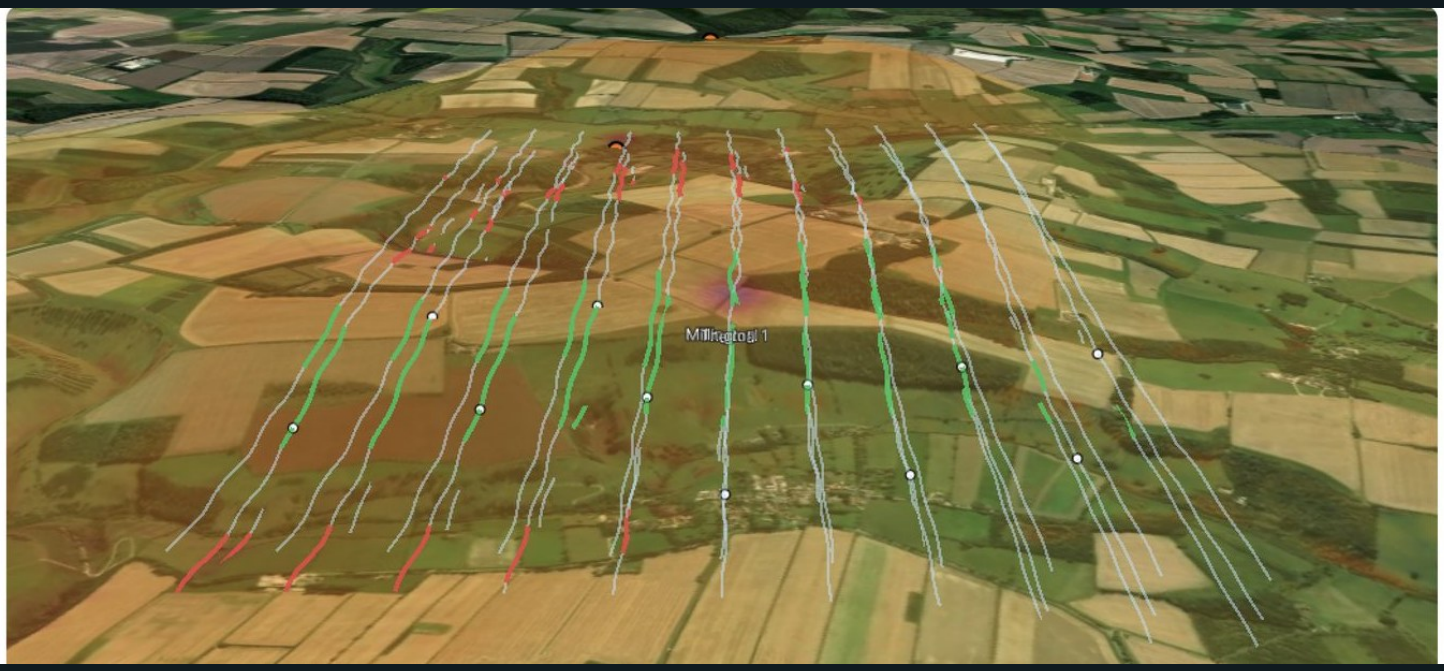
GUIDE · TEST VERSION · NOVEMBER 2026

Club XC Planner

Plan the day. Learn from the flight.



- Forecast map and XC route planner
- Flight analytics and flight comparison
- Thermal trigger map with 3D flythrough
- Rotor and sink view with LiDAR terrain

A planning aid, not a go/no-go tool. Pilot names in screenshots are blurred.

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About this guide

This guide explains what each part of the Club XC Planner does, how it works underneath, how to read what it shows, and where its limits are. It expands on the short posts on the planner's blog. Screenshots come from the test version with real club flights; other pilots' names have been blurred.

The planner runs in a web browser on a phone, tablet or computer. You sign in with your own login, sent to you as an invite link. Nothing needs installing.

> **Read this first.** The planner is a planning aid, not a go/no-go tool. Forecasts are model values; the route planner knows nothing about landing fields, wires, NOTAMs, live conditions or your currency; the thermal and rotor maps are only as good as the data behind them. Look at the sky, read the site guide, check airspace and NOTAMs, and use your own judgement.

SECTION 1

Getting started

Signing in, adding your flights, and the parts of the planner.

Your login

An admin sends you a one-time **invite link** (valid for 7 days). Open it, choose a password of at least 10 characters, and you're signed in. Sign-ins last 30 days on each device. If you forget your password, ask an admin for a new link; there is no email reset.

Your **Account** page lets you change your password, make a **phone key** for the phone app, and **sign out everywhere** if you lose a device.

Adding flights

There are two ways in, and both save the flight to the club planner under your name:

- **From a computer or phone browser**: on *Flight analytics*, tick *Save to the club planner* and drop your .igc files. No app needed.
- **From the phone app**: paste your phone key where the app asks for the planner access code, then use *Send to planner* in the logbook.

You choose who sees each flight: **club** (with your name), **club, anonymously** or **private** (only you). Set a default on your Account page or choose when you upload; see section 10. Only you or an admin can delete your flights. *Load club flights* on the analytics page brings in every flight you're allowed to see.

The pages

Page	What it is for
Home	Your dashboard: add a flight, today's numbers at each site, club stats, longest and recent flights, and links to every tool.
Map	Forecast layers, airspace, sites, the XC route planner, and your flights replayed on the map.
Flight analytics	Numbers from your IGC files: circling, climbs, thermals left early, glide, boundary layer.
Compare flights	Advanced analytics: up to four flights side by side, the lead-pilot view, pointers for next time and a Google Earth export.
Thermal triggers	Climbs traced back to the ground, triangulated into trigger spots, with a 3D flythrough.
Rotor & sink	How the wind flows over a site: ridge lift, sink, turbulence and rotor, in 3D and side-on.
Wind check	How the 12:00 forecast compared with the measured wind at each site, day by day and by wind direction.
Status & credits	Which features are on, locked or used up today, and where the data comes from.

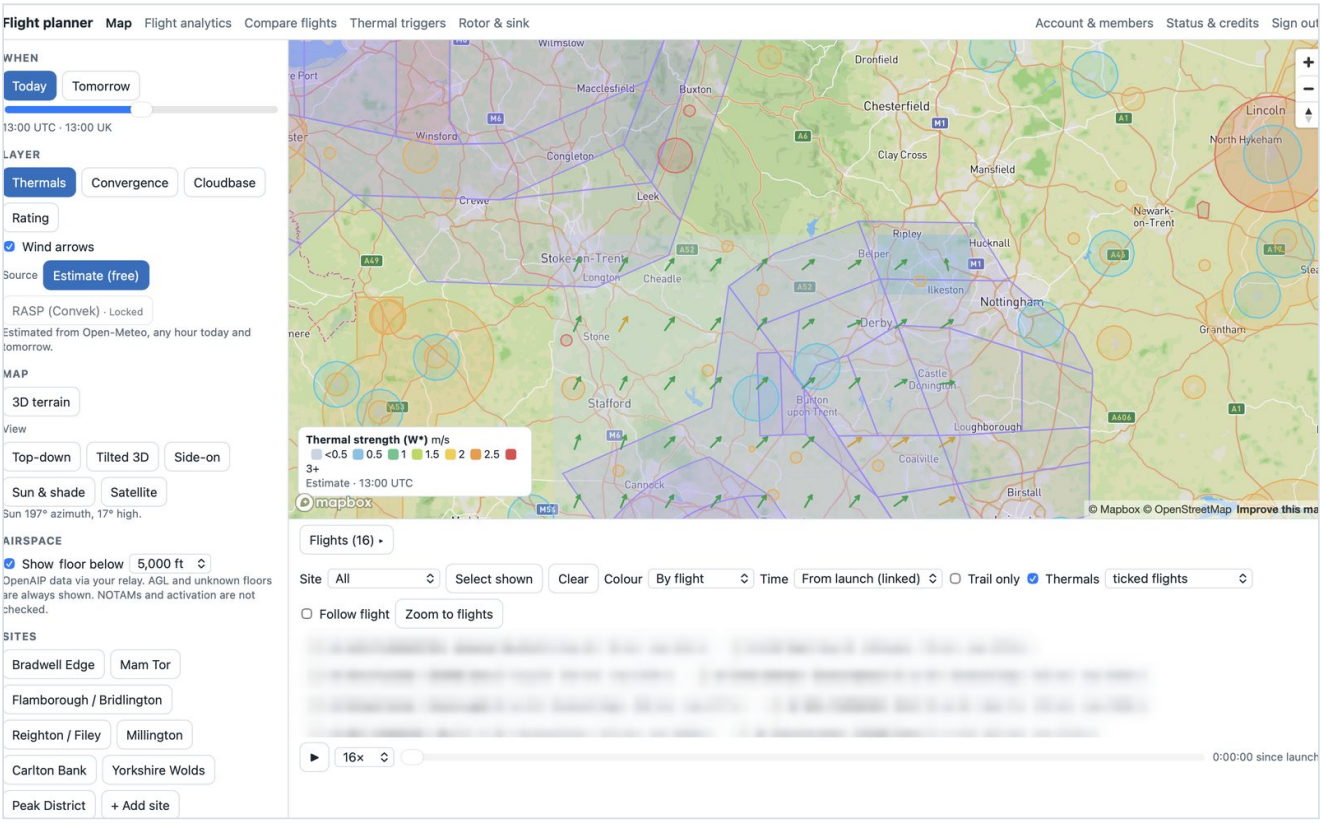
Locked and "used up" buttons

Some data costs money or has daily limits. If a feature isn't available, its button says **Locked** (not set up, or the plan doesn't include it) or **Used up today** (the daily allowance is spent; it resets at midnight UTC). Clicking it explains why, and the page falls back to the free option. For example, RASP forecasts fall back to the free Open-Meteo estimate.

SECTION 2

The forecast map

Is it a flying day, and where will it work best? The map puts the forecast, wind, sun and airspace in one place.



Thermal strength (W*) at 13:00 over the Peak District and Midlands, with wind arrows. Purple outlines are airspace with a floor below the chosen height (5,000 ft here). Coloured circles are thermals from loaded flights.

Choosing the time

Pick **Today** or **Tomorrow** and slide through the hours. The label shows the time in UTC and UK time. Watch the day build through the late morning, peak in the early afternoon and fade.

Forecast layers

Layer	What it shows	How to use it
Thermals	Forecast thermal strength (W*) in m/s, from under 0.5 to 3+.	Under 1 m/s is usually local soaring at best; 1.5 m/s or more starts to look like an XC day.
Convergence	Where low-level winds meet and push air upwards.	Lines of convergence can give long streets of lift, and sometimes early overdevelopment.
Cloudbase	Forecast cloudbase height.	A higher base gives more working height and longer glides.
Rating	An overall day rating combining strength and height.	A quick first look across a wide area.

Wind arrows show the forecast wind. **Sun & shade** shows which slopes are lit at the chosen hour (handy for picking a launch or an early climb), and **Satellite** shows woods and fields. **3D terrain** with **Top-down**, **Tilted 3D** and **Side-on** views helps you read the shape of the land.

Where the forecast comes from: RASP and the free estimate

RASP (Regional Atmospheric Soaring Prediction) is the soaring forecast many UK pilots already use. It runs a detailed weather model on a fine grid (about 4 km here) and turns it into what pilots care about: **thermal strength** (W*), **boundary-layer height** (how high thermals go), **cumulus cloudbase**, **convergence**, and an overall **day rating**.

The planner gets real RASP grids from **Convek**. When it's available, choose *RASP (Convek)* as the source on the map or in the route planner to see today's RASP thermal strength, cloudbase and convergence at 10:00, 13:00 and 16:00 UTC. The route planner then uses the RASP level and keeps the free model's hour-by-hour shape and winds. If your planned area is off the RASP grid (about 1° by 0.6°), or the plan or allowance refuses, it falls back to the estimate and says so.

The **free estimate** comes from **Open-Meteo**'s weather models. It covers any hour of today and tomorrow but on a grid of tens of kilometres, so treat it as the general picture and RASP as the detail. RASP grids cost money and share a small daily allowance across everyone, so the RASP button may show *Locked* or *Used up today*.

Airspace

UK airspace comes from **OpenAIP** and is filtered by its floor: choose *Show floor below* (for example 5,000 ft) to see only what could affect you. Floors given as height above ground, or unknown, are always shown, to be on the safe side. Click an area for its class, floor and ceiling.

> **Airspace.** NOTAMs and activation of temporary airspace are **not** checked. OpenAIP is community data and can be incomplete or out of date. Always check the official chart and NOTAMs before an XC.

Sites

Buttons jump to known sites (Bradwell Edge, Mam Tor, Flamborough/Bridlington, Reighton/Filey, Millington, Carlton Bank, Yorkshire Wolds, Peak District). Positions are approximate, for finding the place on the map only. **+ Add site** adds your own by latitude and longitude, kept in your browser.

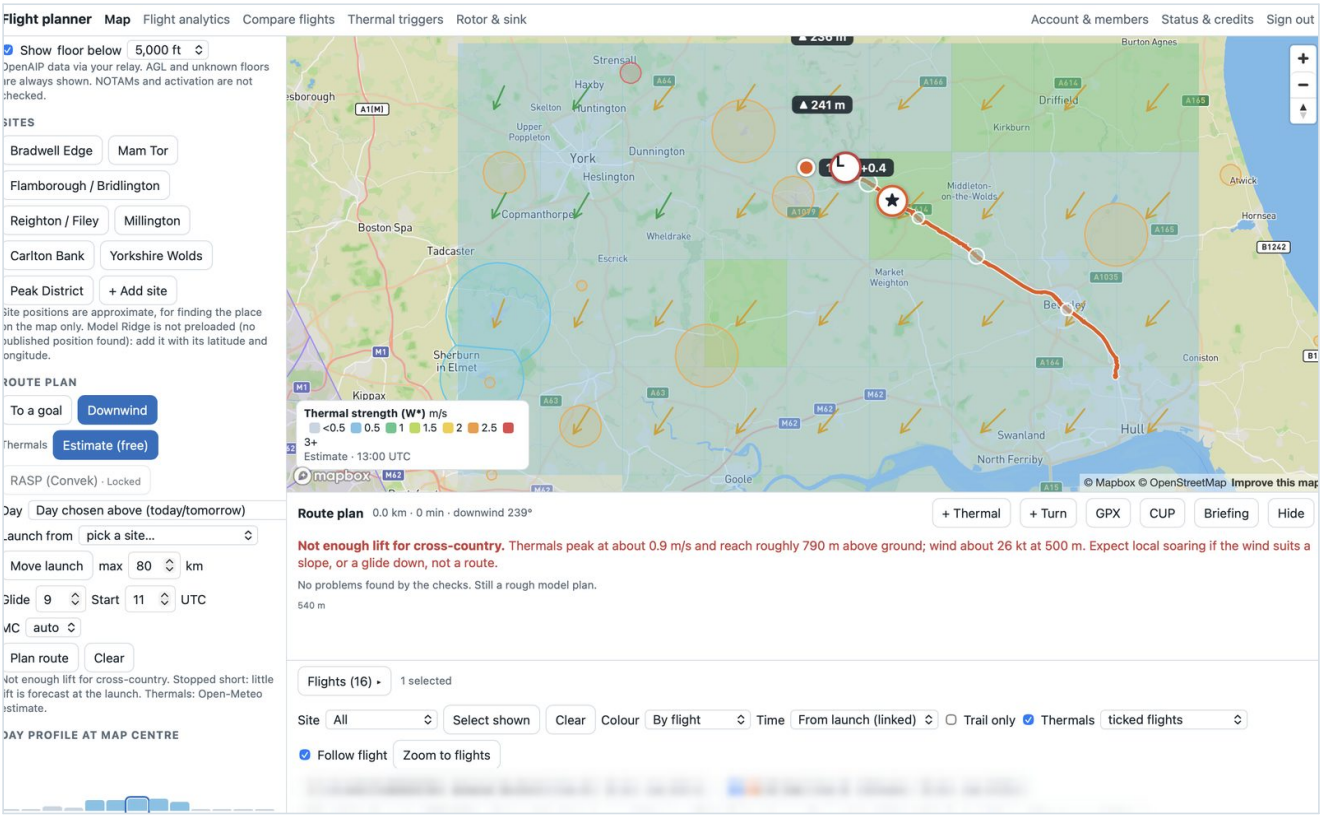
Day profile at map centre

Under the side panel, a strip shows the forecast through the day at the centre of the map, with the five strongest cells nearby. It's a quick way to see when the window opens and closes.

SECTION 3

The XC route planner

A suggested thermal-hopping route with speed to fly and arrival heights, and a straight answer when the day isn't good enough.



A downwind plan from near York on a weak day. Instead of drawing a hopeful line, the planner says "Not enough lift for cross-country", gives the numbers behind it, and suggests local soaring or a glide down.

Setting up a plan

- **Launch**: pick a site, or choose *Move launch* and click the map.
- **To a goal** (click the goal on the map) or **Downwind**, which flies with the forecast wind aloft up to a maximum distance (80 km by default).
- **Glide**: your wing's glide ratio (9 by default). **Start**: launch time in UTC. **MC**: MacCready setting, or *auto* to use the forecast climb.
- **Thermals**: *Estimate (free)* or *RASP (Convek)* if available.

Then press **Plan route**.

How it plans

The planner builds a thermal forecast on a grid around the route (strength, top and cloudbase, hour by hour). It scores likely **trigger spots** (ground facing the sun, convex ground such as spurs) and shows the best as orange dots for 13:00 UTC; triangles mark the highest summits. It then searches for climbs that make the most progress, and checks every glide against **terrain** and **airspace floors**. Airspace floors given as height above ground, or unknown, are treated as starting at the surface.

Reading the plan

The route is split into waypoints: **launch**, **thermal**, **turn** and **goal**. For each leg you get:

- **Speed to fly** (MacCready theory, using the forecast wind at glide height) and the expected **ground speed**.
- **Wind** on the leg and **arrival height** at the next point.
- A **profile** under the map: terrain, glides in blue, climbs in orange leaning downwind with the forecast wind, and a dashed line joining the thermal tops. The sawtooth is the climb-and-glide pattern; the dashed line is the net progress.

Warnings turn red for a low arrival, terrain in the way, airspace, or finishing after the lift ends.

When the day isn't on

Poor days are called out in plain words (*not enough lift*, *poor*, *moderate* or *good*) from the forecast thermal strength and height, rather than leaving an empty map.

Editing and exporting

Drag any point to move it; right-click to remove it; use **+ Thermal** or **+ Turn** and click the map to add one, or switch a point between thermal and turn. The legs are re-checked straight away. **GPX** exports the route and waypoints (it imports into the phone app), **CUP** exports waypoints for flight instruments, and **Briefing** gives a text summary.

Planning a day you've already flown

In **Day**, pick one of your stored flights. The planner sets the launch, start time and goal (your farthest point) from that flight and uses Open-Meteo's archive of past model forecasts for the date. Your real track is drawn as a black line, with a comparison of distance, time and height. If you flew with a Vector vario, the wind, netto and vertical air it measured that day are shown beside the forecast. It's the best way to learn how far to trust the forecast at your sites.

> **Limits.** The route planner is a heuristic, not a validated XC planner. Thermal strength comes from a coarse model, trigger spots are a rule of thumb, and it knows nothing about landing fields, wires, NOTAMs, airspace activation, live conditions or your skill. Use it to think about a day, never as a reason to launch or to carry on.

SECTION 4

Where to find thermals

Before the day and in the air, the question is always the same: where's the next climb? This section brings together everything in the planner that helps answer it.

Where to look	What it shows	When it helps
Thermal strength cells (map)	Forecast W* by the hour, from RASP or the free estimate.	Choosing the day, the window and the general direction.
Convergence (map)	Where low-level winds meet and push air upwards.	Spotting lines of lift, and areas likely to overdevelop.
Cloudbase (map)	Forecast cumulus base.	Knowing your working height and how far you can glide.
Sun & shade (map)	Which slopes face the sun at the chosen hour.	Early and late climbs, and choosing which side of a hill to work.
Trigger-spot dots (route planner)	Sun-facing, convex ground (spurs, knolls) scored along the route, for 13:00 UTC.	Where to head on each leg.
Thermal circles and hotspots (flights on the map)	Every climb from loaded flights, sized by gain and coloured by climb; all flights at a site together.	Seeing where climbs keep happening at a site.
Triangulated trigger spots (thermal triggers)	Ground where climbs from different pilots, days and winds point back to.	Learning a site's reliable triggers for a given wind.
Places worth checking (thermal triggers)	Ground like the trigger spots so far, with no climbs pointing at it yet.	New spots to try on a similar day.
Thermal plumes (rotor & sink)	Where the model expects thermals to rise from the terrain for the chosen wind.	Seeing how wind and ground shape the climbs near a hill.
Unworked lift (compare flights)	Places you flew through 1 m/s or more for 25 s or more without turning.	Learning which climbs you're passing up.

Putting it together

Start with the forecast to choose the day and the window. Use sun and shade, cloudbase and convergence to decide where the lift is likely to be best. In the air, head for sun-facing spurs and the club's known trigger spots, and look for cumulus forming above them. After the flight, check the unworked lift to see where you missed climbs, and add your flight so the trigger map gets better for everyone.

> **Good to know.** These are pointers, not promises. Thermals depend on the day, the wind, cloud shadow, ground moisture and timing. Watch the sky, the birds and other gliders, and always keep a safe landing option within reach.

SECTION 5

Flights on the map

Replay flights together on the map, coloured by climb, height or speed.

Below the map, the **Flights** bar lists every stored flight. Tick flights to draw them, filter by site, and colour them **by flight**, **climb rate**, **altitude** or **speed**. Press play to replay them on a shared clock, from launch or by clock time for flights on the same day, with a moving marker and a height and climb label for each flight, plus an altitude chart. In 3D terrain view the tracks are lifted to their flown height.

Highlights

Marker	Meaning
★ Highest climber	The biggest single climb among the ticked flights.
▲ Excellent climb	2 m/s or more, sustained for 80 m or more.
◎ Excellent turn circle	Tidy, well-centred circles.
≡ Consistent climb	A steady climb rate through the thermal.

Thermal circles (PureTrack style) mark where each climb happened, sized by height gained and coloured by average climb; click one for details. *All shown (hotspots)* overlays every flight at the site. These thresholds are a first guess and may change with feedback.

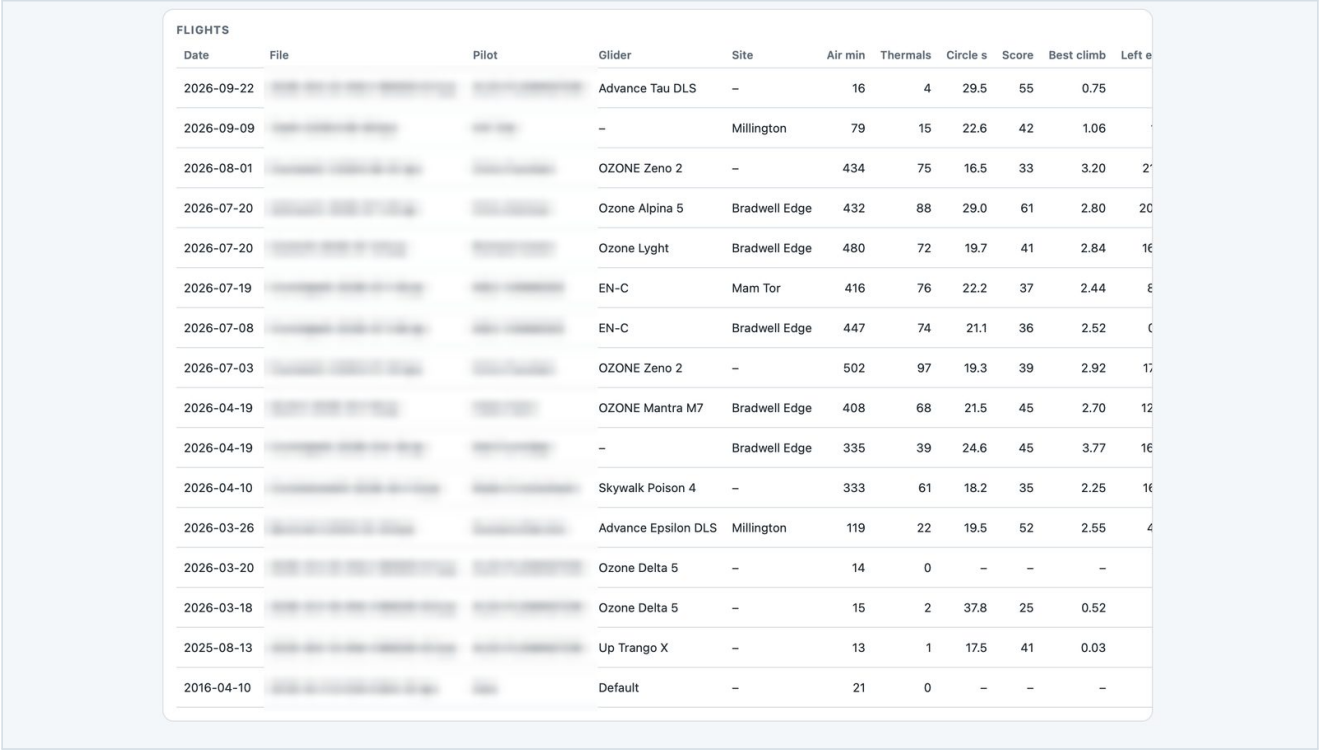
SECTION 6

Flight analytics

What your IGC file says about how you climb, circle and glide.

Adding flights

Drop .igc files on **Flight analytics**. Each file is read in your browser; with *Save to the club planner* ticked it is also stored on the server under your name. If a file has no pilot or wing name (some instruments just say "PARAGLIDER"), fill in *Pilot for files with no name* and *Wing for files with no name*, or use **Edit names** on the flight afterwards. Only the take-off position and date are sent to Open-Meteo, to look up the forecast boundary-layer height for that day.



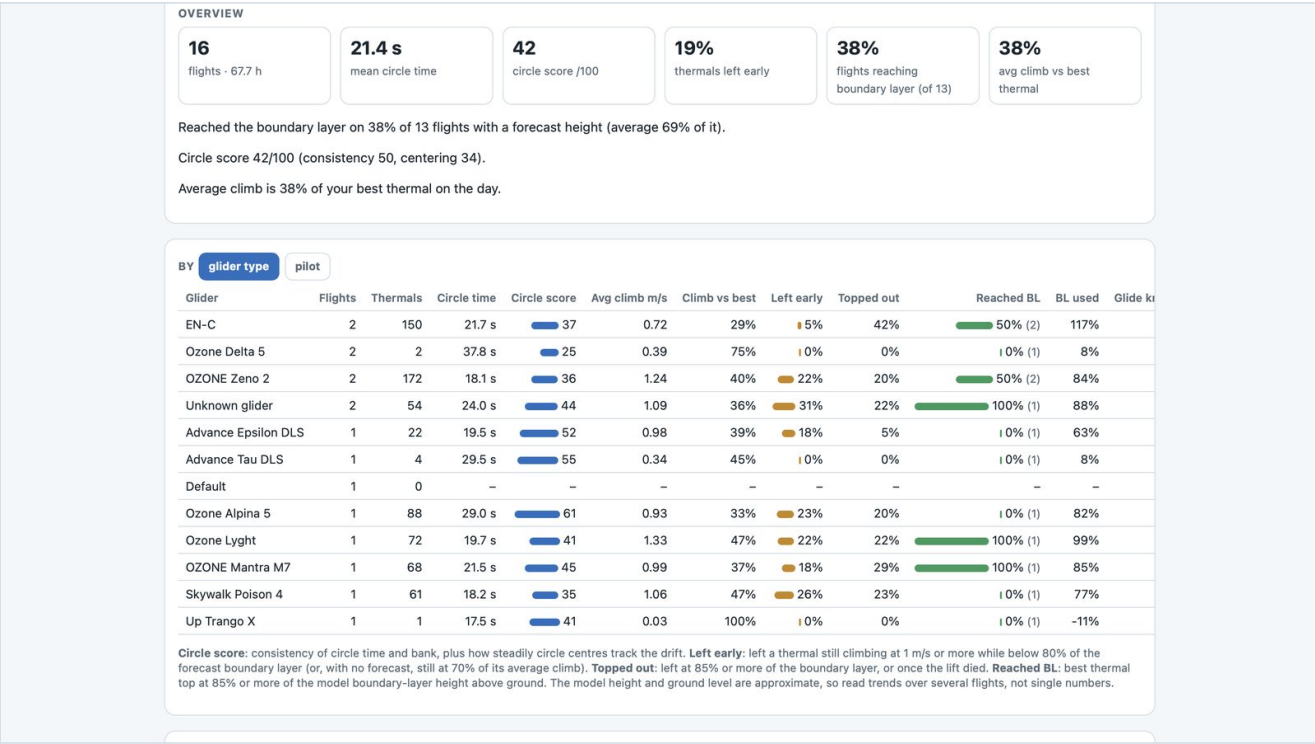
FLIGHTS

Date	File	Pilot	Glider	Site	Air min	Thermals	Circle s	Score	Best climb	Left e
2026-09-22	[redacted]	[redacted]	Advance Tau DLS	–	16	4	29.5	55	0.75	
2026-09-09	[redacted]	[redacted]	–	Millington	79	15	22.6	42	1.06	
2026-08-01	[redacted]	[redacted]	OZONE Zeno 2	–	434	75	16.5	33	3.20	2
2026-07-20	[redacted]	[redacted]	Ozone Alpina 5	Bradwell Edge	432	88	29.0	61	2.80	20
2026-07-20	[redacted]	[redacted]	Ozone Lyght	Bradwell Edge	480	72	19.7	41	2.84	16
2026-07-19	[redacted]	[redacted]	EN-C	Mam Tor	416	76	22.2	37	2.44	8
2026-07-08	[redacted]	[redacted]	EN-C	Bradwell Edge	447	74	21.1	36	2.52	0
2026-07-03	[redacted]	[redacted]	OZONE Zeno 2	–	502	97	19.3	39	2.92	17
2026-04-19	[redacted]	[redacted]	OZONE Mantra M7	Bradwell Edge	408	68	21.5	45	2.70	12
2026-04-19	[redacted]	[redacted]	–	Bradwell Edge	335	39	24.6	45	3.77	16
2026-04-10	[redacted]	[redacted]	Skywalk Poison 4	–	333	61	18.2	35	2.25	16
2026-03-26	[redacted]	[redacted]	Advance Epsilon DLS	Millington	119	22	19.5	52	2.55	4
2026-03-20	[redacted]	[redacted]	Ozone Delta 5	–	14	0	–	–	–	
2026-03-18	[redacted]	[redacted]	Ozone Delta 5	–	15	2	37.8	25	0.52	
2025-08-13	[redacted]	[redacted]	Up Trango X	–	13	1	17.5	41	0.03	
2016-04-10	[redacted]	[redacted]	Default	–	21	0	–	–	–	

Each flight: date, wing, site (matched from the take-off within 4 km), airtime, number of thermals, mean circle time, circle score and best climb. Names blurred.

What the numbers mean

Measure	Definition	Reading it
Circle time	Average time for one full turn while climbing.	Very slow circles usually mean you're wide of the core; very fast ones can mean over-banking.
Circle score /100	Consistency of circle time and bank, plus how steadily the circle centres move with the drift (centring).	Higher means smoother, better-centred climbing.
Avg climb	Average climb rate across your thermals, m/s.	Compare like with like: same site, similar day.
Climb vs best	Your average climb as a share of your best thermal that day.	Low values mean time spent in weak climbs when better ones were around.
Left early	Left a thermal still climbing at 1 m/s or more while below 80% of the forecast boundary layer (or, with no forecast, still at 70% of its average climb).	A high percentage is often the quickest gain: stay with good climbs.
Topped out	Left at 85% or more of the boundary layer, or once the lift died.	Using the full height available.
Reached BL	Best thermal top at 85% or more of the model boundary-layer height above ground.	How often you got to the top of the day.
BL used	Average of your best height as a share of the boundary layer.	
Glide km/h	Average ground speed on glides between thermals.	Ground speed includes wind.



The overview across 16 test flights (67.7 hours): mean circle time 21.4 s, circle score 42/100 (consistency 50, centring 34), 19% of thermals left early, the boundary layer reached on 38% of flights, and average climb 38% of the best thermal. Below, the same measures by wing.

Grouping and detail

Switch the breakdown between **glider type** and **pilot**, and filter by pilot, glider or site. **Thermals** on any flight opens a thermal-by-thermal table: time in the climb, number of circles, circle time, gain, average climb, climb rate when you left, exit height above ground and as a share of the boundary layer, and an outcome (left early, topped out, lift died). Low saves, the longest glide ratio and glide speed are listed too.

Vector vario data

If you fly with a Vector vario linked to the phone app, the logs carry true airspeed, netto (the air's own vertical speed) and measured wind. The analysis then shows netto, measured wind and vertical air for each climb, plus a "From your Vector" summary: airspeed in glides, top airspeed, average netto in climbs and measured wind.

Sharing summaries

Export summaries saves the numbers (not the tracks) as a file you can send to a friend; **Import summaries** loads theirs to compare.

> **Reading the numbers.** The boundary-layer height and ground level are approximate model values, so read trends over several flights rather than single numbers.

SECTION 7

Advanced analytics: compare flights

Why one flight went better than another: flights side by side, the lead-pilot view, and plain-English pointers for next time.

Tick up to four stored flights (filter by site first). The page shows XContest-style statistics side by side, with the best value in each row marked:

- Airtime, maximum altitude and gain, maximum climb and sink, tracklog length.
- **Free distance** with up to three turnpoints, and average speed.
- Thermals, circle score, glide, average glide ratio (distance over height lost outside thermals), and thermals left early.
- Height above launch at 20 and 40 minutes, first-thermal gain, circle consistency and centring.
- How often you glided at speed (share of glide time at 40+ and 50+ km/h). With Vector data: true airspeed, netto, measured wind, and *fast in lift / slow in sink*.

Lead pilot

Pick the **lead** (usually you). The table puts you first and shows how each other flight differs, in green or red.

Pointers for next time

Rule-based pointers with the numbers behind each one: get higher earlier, climb faster, tighten or steady your circles, stay in thermals longer, work lift you flew through, glide efficiency, and time spent gliding fast. Things you did well are listed too.

Map, profile and Google Earth

A map shows each track with its free-distance route, thermal circles and **unworked lift**: rings where you flew through lift of 1 m/s or more for 25 s or more without circling. An altitude profile lets you drag a marker along every flight at once, with thermal-strength bars beneath. **Open in Google Earth (KML)** downloads the flights at their flown height with timestamps, optional thermal markers, and an option to line up launch times so flights from different days fly together on Google Earth's time slider.

> **Good to know.** The pointers come from a few flights and simple rules. They're prompts to think about, not coaching. Ground speed includes wind, so don't compare an airspeed row with a ground-speed row.

SECTION 8

Thermal triggers

Where do the climbs at our sites actually start? Each climb is traced back to the ground, and many flights together pin the spots down.

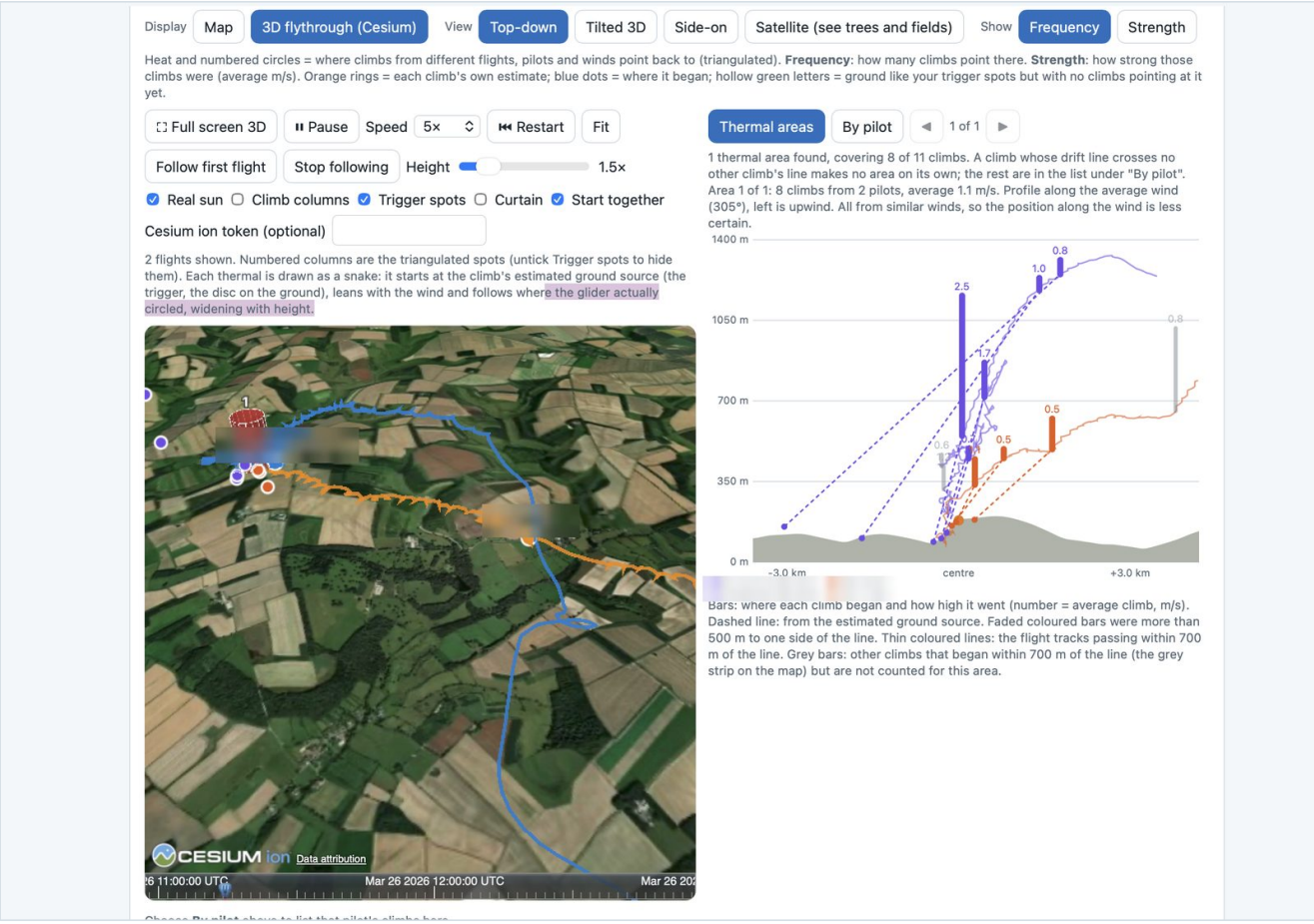
How a climb is traced back

A thermal leans with the wind: by the time you're circling in it at 400 m, it may have left the ground a kilometre upwind. For each climb the planner:

- measures the drift from your own circles (or uses the Vector's measured wind where available);
- estimates how long the air took to rise from the ground to where you entered, from your climb rate plus a typical sink rate (or from netto with Vector data);
- traces the climb back along the drift to the ground it most likely came from;
- reads that ground: which way it faces, how steep it is, whether the sun was on it at that time, its height compared with its surroundings, and its ground cover where the map data has it;
- compares those features with the whole area, so you see which kinds of ground produced climbs more often than chance.

Triangulation

A single climb only says the source is somewhere back along its drift line, so each climb paints a blurred line on the map. Where lines from different climbs, pilots, days and winds cross, the overlap builds up and pins the spot down. The map shows this as a heat layer and numbered circles, with a **Frequency | Strength** toggle: frequency counts how many climbs point to a spot; strength is their average climb rate. A table lists the top spots with climbs, flights, pilots, average climb, winds seen and wind spread. A spread of 90° or more means lines crossed from different directions, so the spot is well fixed; climbs from one wind direction only give a streak, not a point.



Millington: two pilots' flights from different days (March and September), launches lined up. Column 1 is the triangulated trigger. Right: the side-on profile along the average wind, with each climb as a bar (number = average climb) and a dashed line down to its estimated ground source.

The vertical profile

Beside the map, a side-on profile steps through either **Thermal areas** (the triangulated spots, one at a time) or **By pilot** (one pilot's climbs). Bars show where each climb began and ended, coloured by pilot, with a dashed line from its estimated source. Bars more than 500 m off the profile line are faded; grey bars are other climbs that began within 700 m. The black dashed line and grey strip on the map are exactly what the profile shows.

3D flythrough

Switch the display to **3D flythrough**. It shows the flights behind the current area or climb (up to six) over satellite imagery and the planner's terrain. Each climb is drawn as a "snake": it starts at the estimated trigger on the ground, rises with a slight wobble to where the glider entered, then follows the glider's own smoothed circling up to the top, leaning with the real wind and widening with height. Options include playback speed (5x to 120x), follow a flight, vertical exaggeration, *Real sun* for the actual date and time, *Start together* to line up launches, and full screen.

Filters

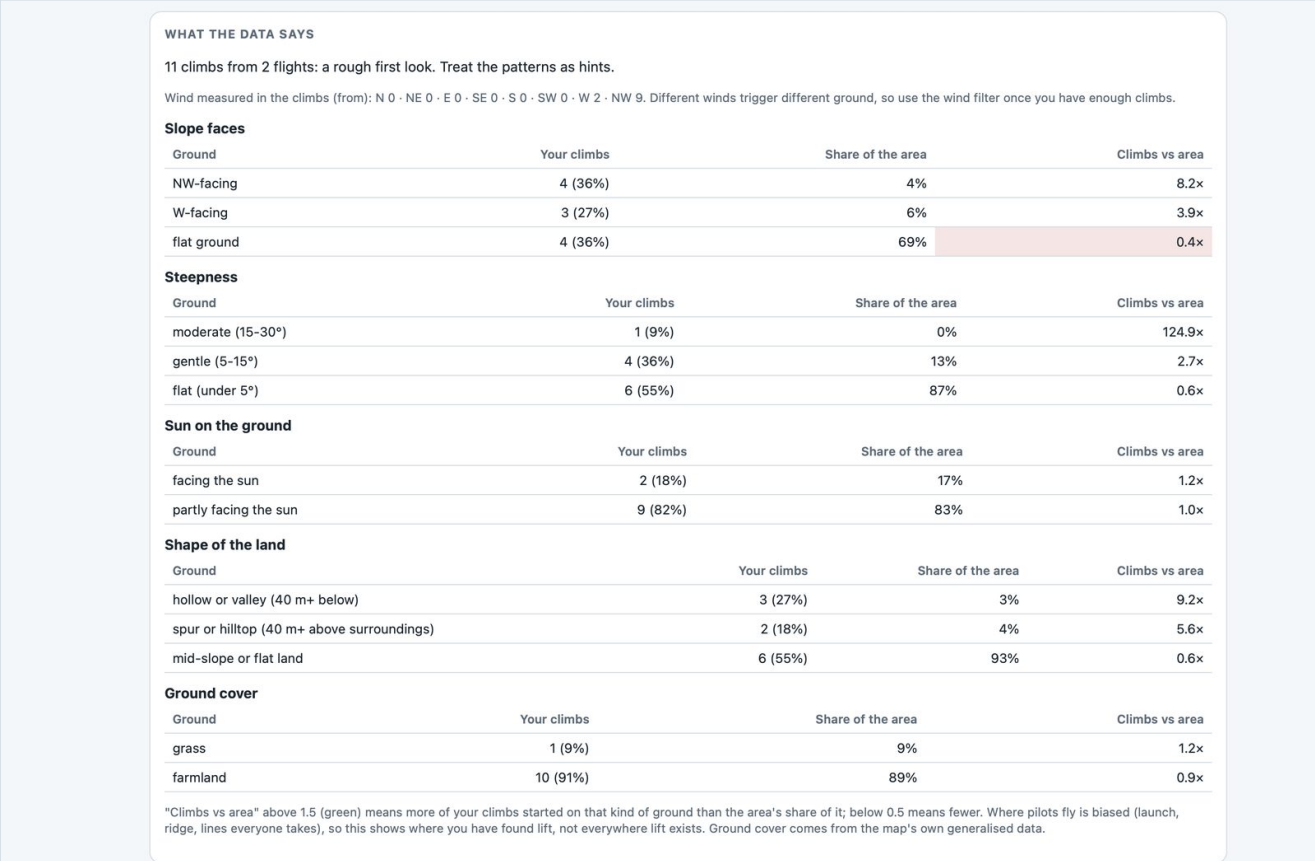
Filter climbs by **wind direction**, **time of day** (UK time), **time of year** (a month range, which can wrap over New Year), **sun height** (degrees above the horizon when the climb began) and **wind strength**. Different winds trigger different ground, so use the wind filter once there are enough climbs. With fewer than 8 climbs, no findings are shown.

A first look at Millington

With **11 climbs from 2 flights** (9 in north-westerlies, 2 in westerlies) this is a rough first look, but it already hints at a pattern:

Ground	Share of climbs	Share of area	Climbs vs area
NW-facing slopes	36%	4%	8.2×
W-facing slopes	27%	6%	3.9×
Hollows and valleys (40 m+ below)	27%	3%	9.2×
Spurs and hilltops (40 m+ above)	18%	4%	5.6×
Gentle slopes (5 to 15°)	36%	13%	2.7×
Flat ground	36%	69%	0.4×
Facing the sun	18%	17%	1.2×

Above 1.5× suggests that kind of ground produced climbs more often than its share of the area; below 0.5× suggests less often.



WHAT THE DATA SAYS

11 climbs from 2 flights: a rough first look. Treat the patterns as hints.

Wind measured in the climbs (from): N 0 · NE 0 · E 0 · SE 0 · S 0 · SW 0 · W 2 · NW 9. Different winds trigger different ground, so use the wind filter once you have enough climbs.

Slope faces

Ground	Your climbs	Share of the area	Climbs vs area
NW-facing	4 (36%)	4%	8.2×
W-facing	3 (27%)	6%	3.9×
flat ground	4 (36%)	69%	0.4×

Steepness

Ground	Your climbs	Share of the area	Climbs vs area
moderate (15–30°)	1 (9%)	0%	124.9×
gentle (5–15°)	4 (36%)	13%	2.7×
flat (under 5°)	6 (55%)	87%	0.6×

Sun on the ground

Ground	Your climbs	Share of the area	Climbs vs area
facing the sun	2 (18%)	17%	1.2×
partly facing the sun	9 (82%)	83%	1.0×

Shape of the land

Ground	Your climbs	Share of the area	Climbs vs area
hollow or valley (40 m+ below)	3 (27%)	3%	9.2×
spur or hilltop (40 m+ above surroundings)	2 (18%)	4%	5.6×
mid-slope or flat land	6 (55%)	93%	0.6×

Ground cover

Ground	Your climbs	Share of the area	Climbs vs area
grass	1 (9%)	9%	1.2×
farmland	10 (91%)	89%	0.9×

"Climbs vs area" above 1.5 (green) means more of your climbs started on that kind of ground than the area's share of it; below 0.5 means fewer. Where pilots fly is biased (launch, ridge, lines everyone takes), so this shows where you have found lift, not everywhere lift exists. Ground cover comes from the map's own generalised data.

"What the data says": each kind of ground's share of climbs against its share of the area.



"Your climbs in pictures": climbs by hour, wind direction, month, height gained, strength and sun height, plus where they started compared with the area.

Places worth checking

Hollow green letters on the map, and a list under it, mark ground that looks like the trigger spots so far but has no climbs pointing at it yet: candidates to try on a similar day.



Candidate spots with position, slope direction and steepness, height compared with surroundings, ground height, and sun on the ground.

> **Limits.** This shows where pilots have *found* lift, not everywhere lift exists: we fly the same lines from the same launches, so the sample is biased. The terrain is bare earth (trees add roughly 10 to 25 m), ground cover comes from generalised map data, and a site needs about 30 climbs before patterns mean much. More flights make it better.

SECTION 9

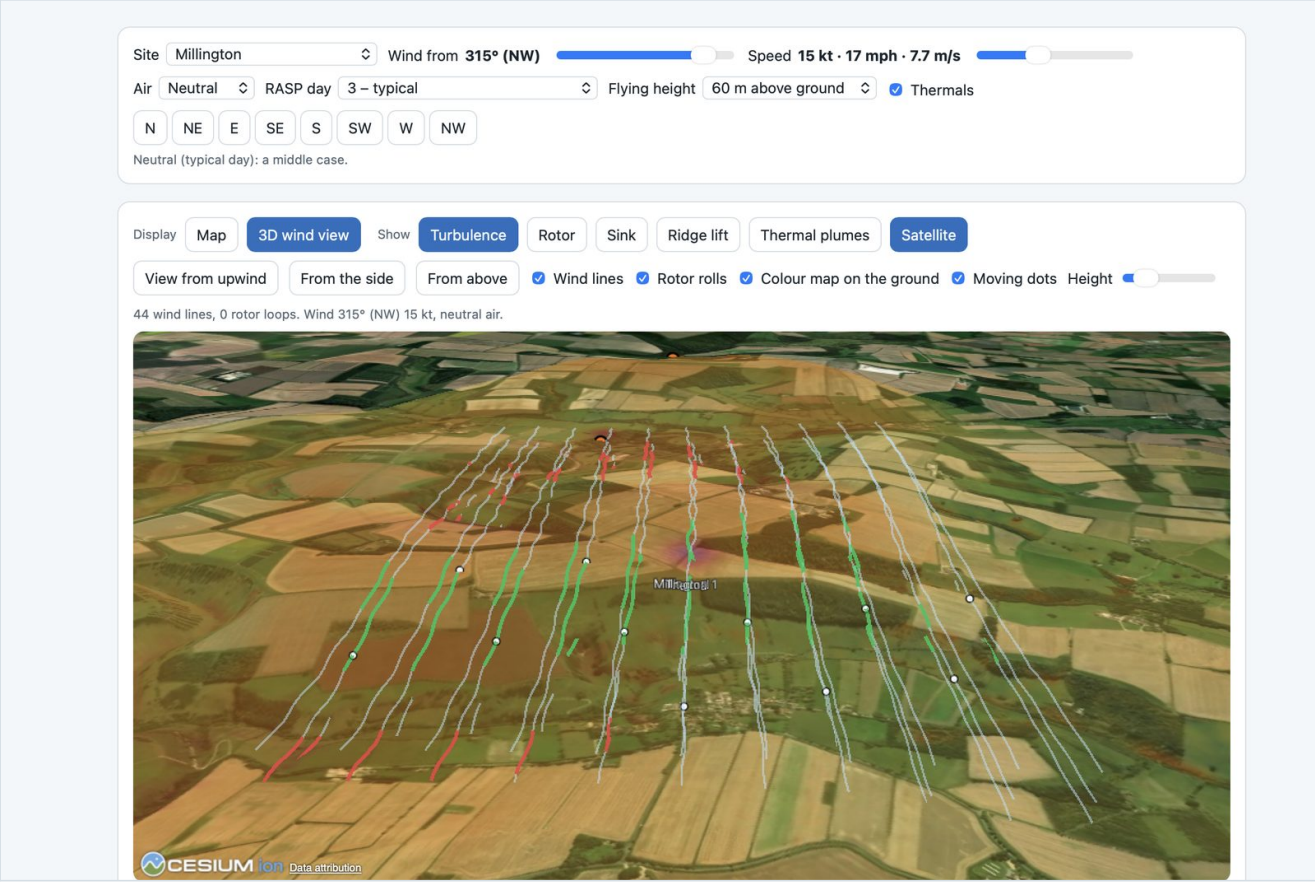
Rotor & sink

Choose a wind and see how the air follows the ground: where it lifts, where it sinks and where it gets rough.

Setting it up

- **Site**, then **Wind from** (slider or N/NE/E… buttons) and **Speed** (shown in knots, mph and m/s).
- **Air**: stable, neutral or unstable. Stable air makes lee effects and rotor stronger; unstable air mixes it up.
- **RASP day**: how active the day is, from 1 (smooth, little thermal activity) to 5 (very active, strong and rough); 3 is typical.
- **Flying height**: 30, 60, 100 or 150 m above ground, the height the colour map is read at; and **Thermals** on or off.

At Millington the model uses the Environment Agency's LiDAR terrain: a 3 m grid within 2.5 km of the hill and a 20 m grid further out. Elsewhere it uses the planner's general terrain tiles.



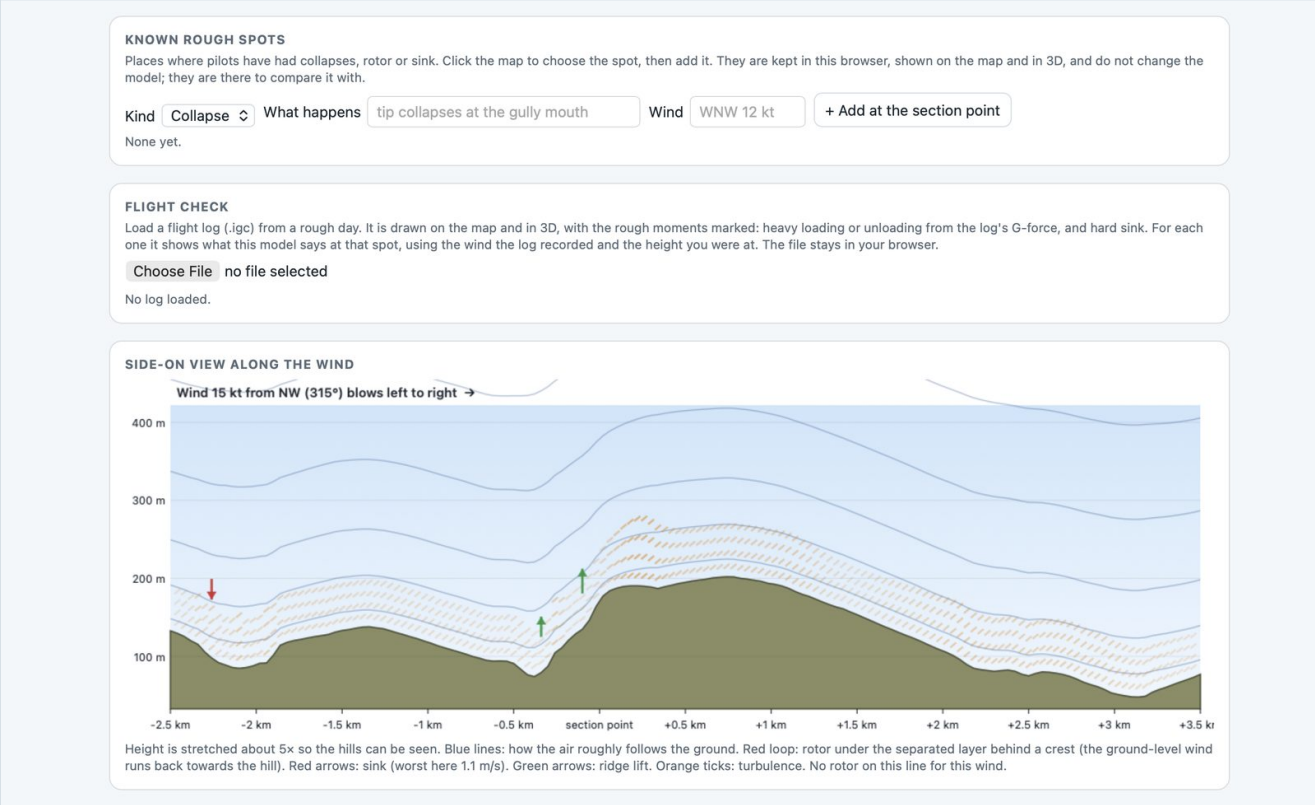
The 3D wind view at Millington in a 15 kt north-westerly, neutral air: 44 wind lines over satellite imagery. Green where the air rises up the face, red where it sinks behind. No rotor loops formed for this wind.

Map and 3D wind view

Show any of **Turbulence**, **Rotor**, **Sink**, **Ridge lift**, **Thermal plumes** and **Satellite**. In 3D, **wind lines** trace the flow over the hill (green rising, red sinking, pale blue level), **rotor rolls** show rolling air under the lee of a crest, **moving dots** drift along the lines to show direction, and a colour map can be laid on the ground. Lines are pushed away from shoulders and drawn into gullies, more so on stable days. View from upwind, from the side or from above.

Side-on view along the wind

Click the map and you get a slice through the hill along the wind (the black line on the map), stretched about 5× vertically so the shape shows. Blue lines show how the air roughly follows the ground; green arrows mark ridge lift; red arrows mark sink, with the worst value given; orange ticks mark turbulence; red loops mark rotor under the separated layer behind a crest, where the ground-level wind runs back towards the hill.



Side-on along a 315° wind at 15 kt. Ridge lift on the windward face, sink of up to about 1.1 m/s in the dip upwind, and turbulence in the lee. No rotor on this line for this wind.

Known rough spots

Record places where pilots have had a collapse, rotor or sink: choose the kind, describe what happens ("tip collapses at the gully mouth"), note the wind ("WNW 12 kt") and add it at the section point. They're kept in your browser and shown on the map and in 3D. They don't change the model; they're there to compare it with.

Flight check

Load an IGC from a rough day. It's drawn on the map and in 3D with the rough moments marked: heavy loading or unloading from the log's G-force (where the instrument records it; otherwise only hard sink is marked) and hard sink. For each one, the page shows what the model says at that spot, using the wind the log recorded and the height you were at. The file stays in your browser.

> **Limits.** This is a simplified airflow model, not a wind tunnel or a CFD run. Real rotor depends on stability, gusts, trees, buildings and thermals that it doesn't capture. Use it to understand a site's shape and to talk about it, not to decide whether conditions are safe.

SECTION 10

Accounts, privacy and data

Who can see what, and where the data comes from.

Accounts

- Each pilot has their own login. Admins invite pilots, send password-reset links, and can switch an account off (which signs it out at once and stops its phone key) or remove it. Flights stay when an account is removed.
- Passwords are stored scrambled (hashed), never in plain text. Sign-ins are rate-limited to slow down guessing.
- Your **phone key** is shown only once; making a new one stops the old one working.
- Admins can also switch services on or off (RASP, Mapbox, airspace, weather on the day), paste the Convek key or Mapbox token, and set up the club's site groups, all on the Account page. Keys are never shown back, only their last four characters.

Your flights and who sees them

Choice	Who sees the flight	What they see
Club, with my name	Every signed-in member	The flight with your name.
Club, anonymously	Every signed-in member	The flight with no name: pilot, co-pilot, glider ID and competition ID are removed from the file they get, comment lines are dropped and the file is renamed. It still counts towards the thermal map and club stats.
Private: only me	Only you	Nothing. Club admins can't see it either.

Set your default on the **Account** page, choose when you upload (home page or Flight analytics), and change or delete any of your flights under **My flights**. Whoever runs the server, using its owner code, can still reach every stored file for backups and moving servers. Flights you only load in your browser, without saving to the club planner, stay in that browser. Known rough spots, extra sites and display settings are also kept in your browser.

Anonymous means no name anywhere in club views, including your own home page, so you can safely hold other pilots' flights. Your Account page and My coach still show you the name in the file.

My kit

My kit keeps your photo, your wings (with a photo, EN class and certified weight range, and which one is current) and a log of your weight and all-up weight. Each new flight is stamped with your current wing, or the one you pick when uploading, and the weight that applied on its day, so My coach can show where you sat in the wing's range. You can change the wing for any flight. Only you see your kit and photos.

AI coach notes

When the club has switched it on, **Analyse my flying** on My coach asks an AI (Claude, from Anthropic) to read the numbers from your recent flights, the weather on those days and your kit, and write notes on your thermalling, how you used the conditions, and a few things to try next time. Only numbers are sent, never names, tracks or files. It can be wrong and never sees you fly, so treat it as pointers to talk through with an instructor or club coach, not instruction or a go/no-go call.

Joining and usage

New pilots can join from the blog for a monthly or yearly subscription paid through PayPal; invited members are free. Club admins see simple usage counts per member (sign-ins, uploads and which pages are opened each day), never what you do on a page or your private flights.

My coach

My coach is your own page: flights, hours, distance and flights a month, a map of your tracks, trends in climb rate, turn circle and circle score, and a feed of your flights. Each flight shows distance, time, total climb and highest point, its thermalling numbers, the **weather on the day** at take-off while you flew (wind and gusts, wind at about 1500 m, boundary layer, an estimated cloudbase and low cloud, from Open-Meteo's archive of past forecasts) and, when it was saved that day, **RASP that day**. The coach's notes compare your numbers with your own history and the club's, and suggest one or two things to try. They come from GPS tracks, so treat them as pointers, not instruction.

Where the data comes from

Source	Used for	Terms
Open-Meteo	Free forecast estimate, the home wind table and the weather on the day for each flight	CC BY 4.0; free API for non-commercial use
Convek	RASP grids and "RASP that day" (when switched on)	Daily allowance on the server
OpenAIP	UK airspace	Free for non-commercial use, with credit
Mapbox / OpenStreetMap	Maps and satellite imagery	© Mapbox © OpenStreetMap contributors
AWS Terrain Tiles	Ground heights for routes, triggers and 3D	Public open data
Environment Agency	Millington LiDAR (Composite DTM 2022)	Open Government Licence v3
CesiumJS	3D views	Apache 2.0

SECTION 11

Honest limits and feedback

What to keep in mind, and how to help make it better.

Limits to keep in mind

- Forecasts are model values with a coarse grid; the real sky can be very different.
- The route planner is a heuristic: it doesn't know landing fields, wires, NOTAMs, temporary airspace or live conditions.
- Airspace floors given as height above ground, or unknown, are treated cautiously, but OpenAIP data can be incomplete.
- Analytics depend on GPS logs and a model boundary layer; read trends, not single numbers.
- Trigger maps reflect where pilots have flown, on bare-earth terrain, and need many climbs per site.
- The rotor model is simplified and doesn't capture gusts, trees, buildings or thermals.
- This is a test version. Some parts have not yet been tried against every live data service.

Feedback that helps most

- Flights from your sites, especially on days with good climbs, and on rough days for the flight check.
- Where a number or pointer looked wrong for a flight you remember well.
- Where the forecast or route plan was far off on a day you flew.
- Rough spots you know about, with the wind at the time.
- Anything confusing: wording, layout, or missing features.

> **Fly safe.** The planner is a planning aid, not a go/no-go tool. The sky, the site guide, airspace, NOTAMs and your own judgement come first.