

First Race Debrief

GPS track from gun to finish on September 2, 2026, read for tacking and gybing efficiency and for how well the boat responded to wind oscillation upwind.

Racing **6:41 PM – 7:40 PM** 59 min, start to finish 4 Hz GPS log · 14,141 fixes Center 40.1939°N, 82.9628°W

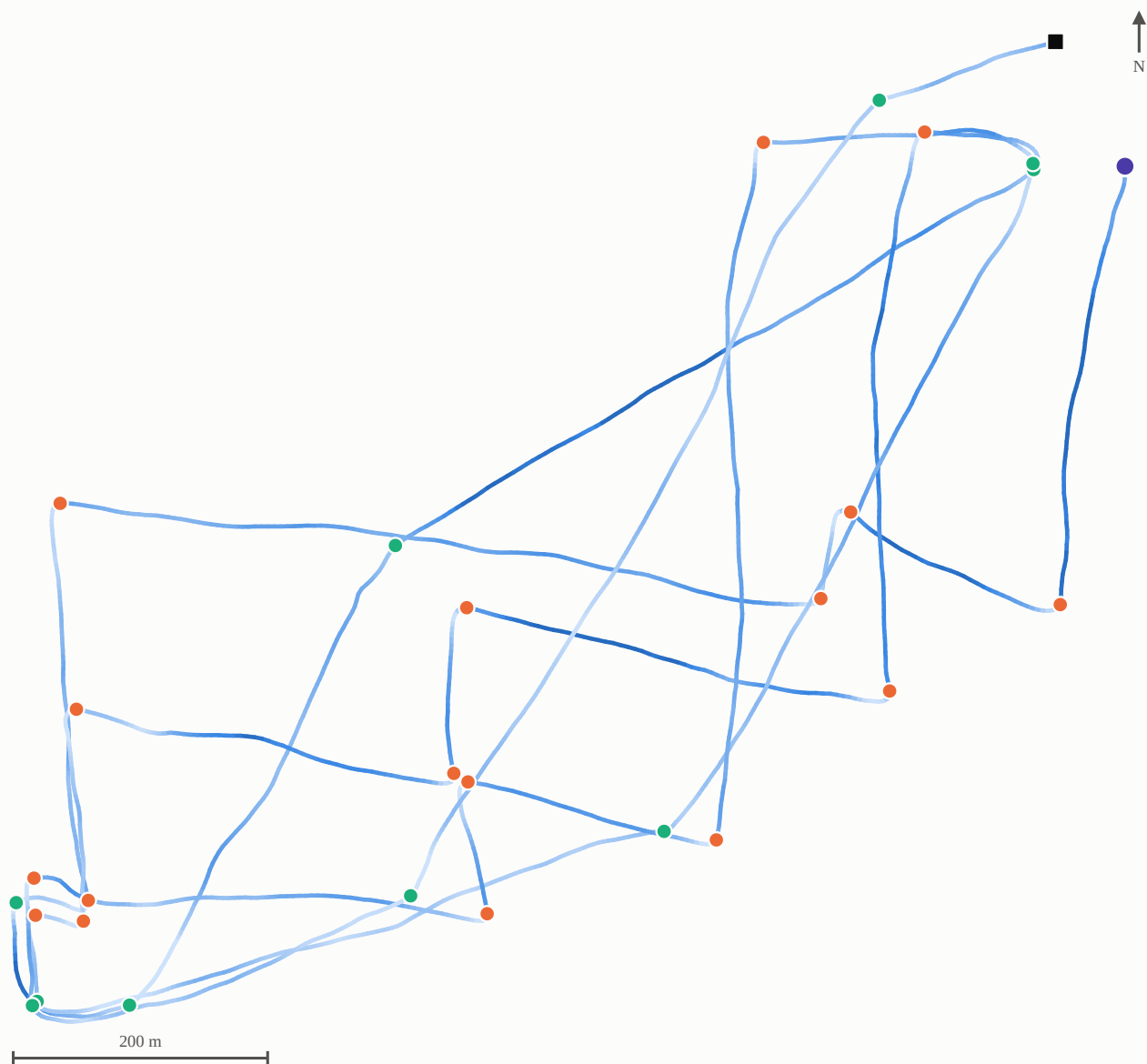
DISTANCE 4.5 nm over ground	AVG SPEED 4.6 kt max 6.3 kt	TACKS 17 19.7s median recovery
GYBES 10 7.8s median recovery	AVG SPEED LOST / TACK 35 % vs 9.4% per gybe	LONGEST BOARD 5.7 min no maneuver

One track in this file. The upload contains a single continuous GPS/SOG/COG log — not two boats. Everything below describes your boat only; if you meant to compare against the winning boat's track, that data isn't in this spreadsheet, so send it over and I'll fold in a side-by-side.

Trimmed to the gun-to-finish race. The GPS log actually runs 5:18:38–7:47:54 PM — dock time, a long pre-start warm-up (including some hard tacking practice), the race itself, and a bit of sailing afterward. Everything below is cut to the race you reported: **start 6:41:04 PM, finish 7:39:59 PM**, 58 minutes 55 seconds. That drops 16 maneuvers that happened before the gun and 2 after the finish from the tack/gybe stats — including the roughest stretch of tacking in the whole file, which turns out to have been pre-start, not the race.

01 The track

Position colored by boat speed — darker blue is faster. Orange dots mark tacks, aqua dots mark gybes, in the order they happened.

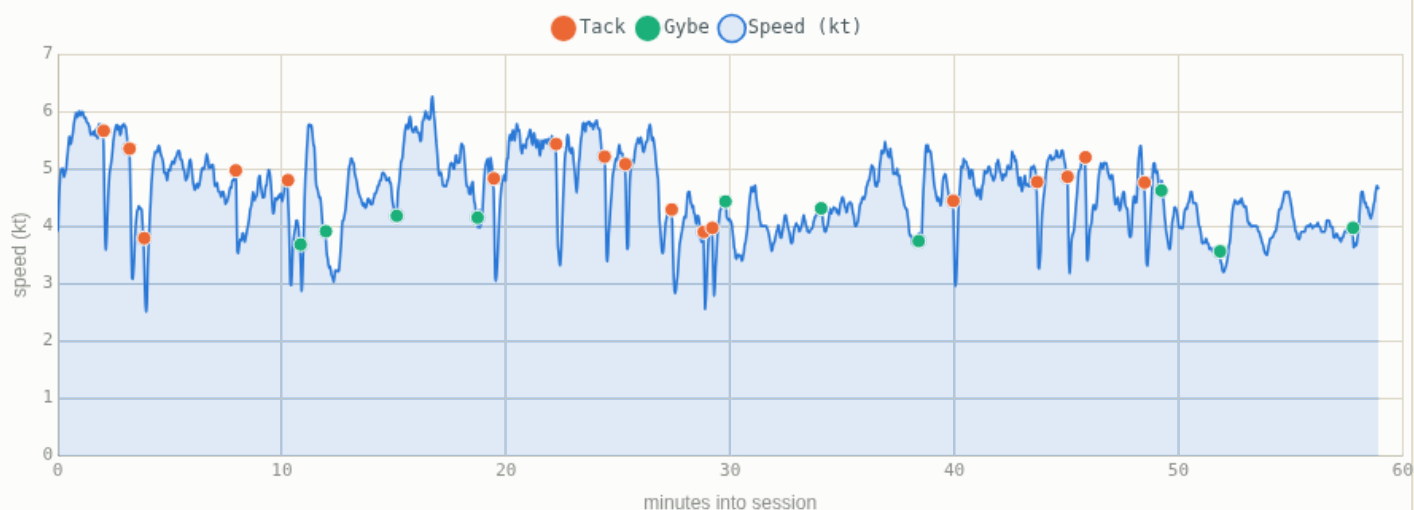


speed, slow → fast tack gybe start finish

02 Speed over time

Boat speed from the start gun to the finish. Each dip lines up with a maneuver — the depth and width of the dip is the cost of that tack or gybe. Hover to inspect any point.

SPEED OVER GROUND (KT)



03 Tacks & gybes

A maneuver is scored from the moment the turn starts to the moment speed recovers to 90% of what you were carrying beforehand. That recovery time, not the turn itself, is what a tactical tack costs you.

Tacks

17 detected

Median recovery	19.7 s
Fastest / slowest	9.8 s – 59.5 s
Median speed lost	34.9%
Typical turn angle (COG)	~90–120°

Gybes

10 detected

Median recovery	7.8 s
Fastest / slowest	0.0 s – 38.5 s
Median speed lost	9.4%
Typical turn angle (COG)	~22–115°

Five of those gybes are deep, small-angle ones — as little as 22° of course change — that a plain turn-rate detector misses entirely; see [how they were found](#) below.

TIME	TYPE	TURN	PRE-SPEED	MIN SPEED	LOST	RECOVERY
6:43:07 PM	tack	+98°	5.7 kt	3.6 kt	37%	19.8 s
6:44:16 PM	tack	-118°	5.3 kt	3.0 kt	43%	59.5 s
6:44:55 PM	tack	+77°	3.8 kt	2.5 kt	35%	9.8 s
6:49:00 PM	tack	-93°	5.0 kt	3.5 kt	30%	44.0 s
6:51:20 PM	tack	+122°	4.8 kt	2.9 kt	39%	44.0 s
6:51:54 PM	gybe	-74°	3.7 kt	2.8 kt	23%	6.0 s
6:53:02 PM	gybe	-36°	3.9 kt	3.2 kt	19%	38.5 s
6:56:11 PM	gybe	+22°	4.2 kt	4.1 kt	1%	0.0 s
6:59:48 PM	gybe	-115°	4.2 kt	3.9 kt	6%	0.5 s
7:00:31 PM	tack	-75°	4.8 kt	3.0 kt	38%	16.0 s
7:03:18 PM	tack	+102°	5.4 kt	3.3 kt	39%	21.7 s
7:05:28 PM	tack	-93°	5.2 kt	3.4 kt	35%	19.7 s
7:06:23 PM	tack	+113°	5.1 kt	3.5 kt	31%	10.8 s
7:08:27 PM	tack	-117°	4.3 kt	2.8 kt	34%	26.0 s
7:09:53 PM	tack	+117°	3.9 kt	2.5 kt	36%	10.8 s
7:10:16 PM	tack	-109°	4.0 kt	2.8 kt	30%	11.8 s
7:10:51 PM	gybe	-82°	4.4 kt	4.1 kt	9%	14.5 s
7:15:07 PM	gybe	-43°	4.3 kt	3.9 kt	10%	9.5 s
7:19:28 PM	gybe	-70°	3.7 kt	3.7 kt	1%	4.2 s
7:21:01 PM	tack	-89°	4.4 kt	2.9 kt	34%	12.5 s
7:24:45 PM	tack	+93°	4.8 kt	3.2 kt	33%	14.8 s
7:26:07 PM	tack	-107°	4.9 kt	3.2 kt	35%	22.8 s
7:26:55 PM	tack	+109°	5.2 kt	3.3 kt	36%	33.2 s
7:29:33 PM	tack	-95°	4.8 kt	3.3 kt	32%	16.8 s
7:30:18 PM	gybe	-77°	4.6 kt	3.8 kt	19%	32.8 s
7:32:55 PM	gybe	-39°	3.6 kt	3.2 kt	10%	11.0 s
7:38:51 PM	gybe	+31°	4.0 kt	3.6 kt	9%	1.8 s



Best tack: 7:06:23 PM

A 112° turn recovered to 90% speed in **10.8 s**, losing just 30.7% of a 5.08 kt entry speed — your benchmark for what a clean tack looks like this race.



Slowest recovery: 6:44:16 PM

59.5 seconds to get back to speed after a 118° turn, losing 43.5% of boat speed — the most expensive tack of the race, and part of a three-tack scramble in the first four minutes off the line (see Opportunity 1 below).



Cleanest gybe: 6:56:11 PM

Essentially no recovery time and just 1.0% of boat speed lost on a 22° deep-angle gybe — about as close to free as a gybe gets, and a good sign the deep-running technique itself is solid.

04 Reading the shifts

There's no wind-instrument channel in this log, only GPS course and speed. So headers and lifts are inferred: on a beat, a shift that lets you point higher while holding (or gaining) speed reads as a **lift**; a turn that costs both heading and speed reads as a **header**. During the race your two close-hauled headings held tight — about 281° and 179° COG, each with only ~10° of spread — which bisects to an estimated true wind around 230–235° (WSW), and holding that steady all race is itself a good sign: the axis wasn't wandering, so tacks were reacting to real shifts rather than chasing a moving target.

HEADING OVER TIME (° COG)



Your two beat headings sit about 100–102° apart, and consistently so — this isn't a noisy average, both tacks were sailed within about 10° of their own center all race. A well-trimmed J/24 close-hauled is usually closer to 80–90° tack-to-tack, so a steady 10–20° gap across the board points at sailing a touch low upwind, extra leeway, or current pulling COG away from your actual heading — worth cross-checking against a masthead or compass reading next time out, since it's costing distance on every single beat.

Finding the deep gybes

The maneuver detector in Section 03 flags a turn by how fast and how far the boat's course changes — built for a tack, where the bow swings 80–120° through head-to-wind. A gybe sailed deep, with the boom only crossing a small angle off dead downwind, doesn't trip that filter: several of yours turned through as little as 22°. So downwind legs get a second, different test — using the ~230° wind estimate above,

the reciprocal downwind heading is about 50°, and any point where the boat's course crosses from one side of that line to the other, however gently, is a gybe. That test recovered **5 additional gybes** hiding in the "long board" list below, taking the race total from 5 to **10**.

Long boards — time between maneuvers

Even after the deep-gybe pass above, 8 of the race's 26 boards still ran longer than 2.5 minutes with no maneuver at all — together about 30 minutes, roughly half the race. Long boards aren't inherently wrong (holding a favored shift is exactly the right move) but on a lake where the breeze is "always oscillating," each one is worth a second look.

START	END	LENGTH	NET HEADING DRIFT	AVG SPEED
6:45:05 PM	6:49:00 PM	3.9 min	-0°	4.9 kt
6:53:40 PM	6:56:11 PM	2.5 min	+9°	4.6 kt
6:56:11 PM	6:59:47 PM	3.6 min	-1°	5.3 kt
7:00:47 PM	7:03:17 PM	2.5 min	-20°	5.4 kt
7:11:06 PM	7:15:07 PM	4.0 min	-1°	4.0 kt
7:15:17 PM	7:19:28 PM	4.2 min	-31°	4.5 kt
7:21:13 PM	7:24:45 PM	3.5 min	+8°	4.9 kt
7:33:06 PM	7:38:51 PM	5.7 min	+25°	4.0 kt

05 Improvement opportunities

01 The 6:43–6:45 PM start-line scramble

Your slowest tack of the race (59.5 s, 43.5% of boat speed lost) landed right in the middle of three tacks fired off in under two minutes at 6:43–6:44:55 PM, moments after the 6:41:04 start. That's a classic fight-for-clear-air pattern off the line — worth knowing whether it was a deliberate response to traffic or a rough opening beat, since it's the single most expensive stretch of the race.

3 tacks in under 2 minutes right off the gun

02 Tighten the tacking angle

During the race itself your two beat headings (about 281° and 179° COG) were tight and consistent — only ~10° of spread on each side, so this isn't noise. A genuine tack-to-tack angle wider than the ~80–90° a well-trimmed J/24 should need is worth cross-checking against pointing height, headsail lead, or leeway/current on this lake.

~90–120° observed vs ~80–90° textbook

03 Shrink the average tack

Your fastest tack of the race (7:06:23 PM) recovered to speed in under 11 seconds; the median was almost double that, and two tacks — both right after the start — ran 44–60 seconds. If 10.8 s is achievable once, it's achievable more often; a roll-tack timing drill (rudder input, crew weight transfer, and headsail release/trim synced) is the fastest way to pull the median down.

19.7 s median recovery, best was 10.8 s

04 Review the long boards

A good chunk of race time was spent on boards with no maneuver at all. On a lake where the breeze keeps oscillating, a board that long either caught a genuinely persistent favorable shift (good) or sailed through smaller shifts without responding to them (a tack or gybe you didn't take) — worth a second look either way.

8 boards over 2.5 min during the race, ~30 min combined

05 The deep gybes are mostly clean, but not all of them

Sailing very deep toward the leeward mark makes for small-angle gybes (as little as 22–40° of course change) that a heading-change detector tuned for square-run gybes will miss — five of your ten race gybes were exactly that shape and only showed up once the boat's position relative to the downwind axis was checked directly. Most were excellent (6:56:11 PM lost just 1% of boat speed), but 6:53:02 PM took 38.5 seconds to recover on only a 36° turn — the messiest maneuver of the race relative to how little the boat actually had to turn.

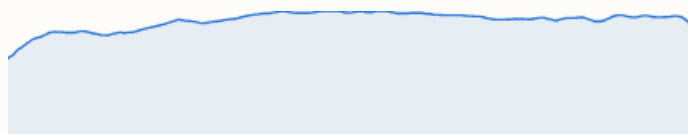
10 gybes total once deep angles are counted · 9.4% median speed lost vs 34.9% for tacks

06 Every leg, zoomed in

The same speed data as Section 02, split into its 26 individual legs so each maneuver's dip and each board's trend is readable at full width instead of compressed into one 59-minute chart. Sampled at roughly 2 Hz — twice the resolution of the full-session view.

Leg 01

6:41:04 PM – 6:43:07 PM



123s 5.5 kt avg +4° drift

Leg 02

6:43:27 PM – 6:44:16 PM



49s 5.6 kt avg +18° drift

Leg 03

6:45:05 PM – 6:49:00 PM



235s 4.9 kt avg -0° drift

Leg 04

6:49:44 PM – 6:51:20 PM



96s 4.6 kt avg -11° drift

Leg 05

6:52:00 PM – 6:53:01 PM



62s 4.8 kt avg -102° drift

LIFT RIDDEN

Leg 06

6:53:40 PM – 6:56:11 PM



151s 4.6 kt avg +9° drift

Leg 07

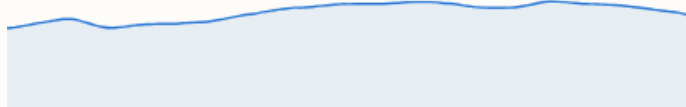
6:56:11 PM – 6:59:47 PM



216s 5.3 kt avg -1° drift

Leg 08

6:59:48 PM – 7:00:31 PM

43s 4.7 kt avg -117° drift **LIFT RIDDEN****Leg 09**

7:00:47 PM – 7:03:17 PM



150s 5.4 kt avg -20° drift

Leg 10

7:03:39 PM – 7:05:27 PM



108s 5.5 kt avg +1° drift

Leg 11

7:05:47 PM – 7:06:23 PM



36s 5.2 kt avg -19° drift

Leg 12

7:06:34 PM – 7:08:27 PM



113s 4.9 kt avg -0° drift

Leg 13

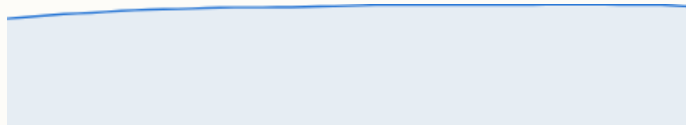
7:08:53 PM – 7:09:53 PM



60s 4.2 kt avg +3° drift

Leg 14

7:10:04 PM – 7:10:16 PM



12s 3.9 kt avg -19° drift

Leg 15

7:10:28 PM – 7:10:51 PM



23s 4.2 kt avg +12° drift

Leg 16

7:11:06 PM – 7:15:07 PM



241s 4.0 kt avg -1° drift

Leg 17

7:15:17 PM – 7:19:28 PM



251s 4.5 kt avg -31° drift

Leg 18

7:19:32 PM – 7:21:01 PM

88s 4.7 kt avg -35° drift **LIFT RIDDEN****Leg 19**

7:21:13 PM – 7:24:45 PM



212s 4.9 kt avg +8° drift

Leg 20

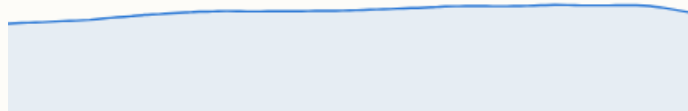
7:25:00 PM – 7:26:06 PM



66s 5.1 kt avg -7° drift

Leg 21

7:26:29 PM — 7:26:54 PM

25s 5.0 kt avg +12° drift **LIFT RIDDEN****Leg 22**

7:27:28 PM — 7:29:33 PM



125s 4.7 kt avg -15° drift

Leg 23

7:29:50 PM — 7:30:18 PM



28s 4.8 kt avg -8° drift

Leg 24

7:30:51 PM — 7:32:55 PM

124s 4.0 kt avg -17° drift **HEADER HELD****Leg 25**

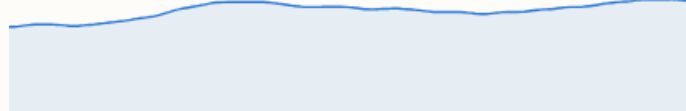
7:33:06 PM — 7:38:51 PM



345s 4.0 kt avg +25° drift

Leg 26

7:38:53 PM — 7:39:58 PM



66s 4.3 kt avg +0° drift

METHOD NOTES

Source: single onboard GPS log, 4 Hz (t, lat/lon, SOG, COG) — one boat, no wind instrument, no mark positions. The full log runs 5:18:38–7:47:54 PM; everything here is cut to the reported start (6:41:04 PM) and finish (7:39:59 PM), which drops about 75 minutes of dock time, pre-start sailing, and warm-up tacking beforehand and roughly 8 minutes of sailing afterward. Heading and speed are smoothed with a ~2.25 s centered window to cut GPS jitter before detecting turns. Maneuvers are found two ways: a primary pass flags any turn where the smoothed turn rate holds above 6°/s and the net heading change is $\geq 45^\circ$ (catches tacks and square-ish gybes), then a second pass looks specifically at downwind legs for smaller course changes ($\geq 15^\circ$) that cross the estimated dead-downwind line — catching deep-angle gybes the first pass is built to miss. Tack vs. gybe is inferred from speed loss and turn geometry (tacks stall through head-to-wind and lose noticeably more speed; gybes stay powered up) — not measured directly, so a couple of borderline events are judgment calls rather than certainties. "Recovery time" runs from the start of the turn to the first return to 90% of the pre-maneuver speed. Wind axis and lift/header calls are likewise inferred from the geometry and speed of the track, not measured — treat the wind-shift read as directional, not instrument-grade. Distance and speed are over ground, so current or leeway on this lake will nudge both numbers slightly from boat speed through the water.