

## Thoughts from the Race Hut.

Captain's star log, Boxing Day 2021.

We often say that we could sail a better race from the Race Officer's Hut, so having watched the two leaders battle it out this Boxing Day I felt moved to make comment on beating into wind. Both were finely matched as they came past the hut through the start gate.

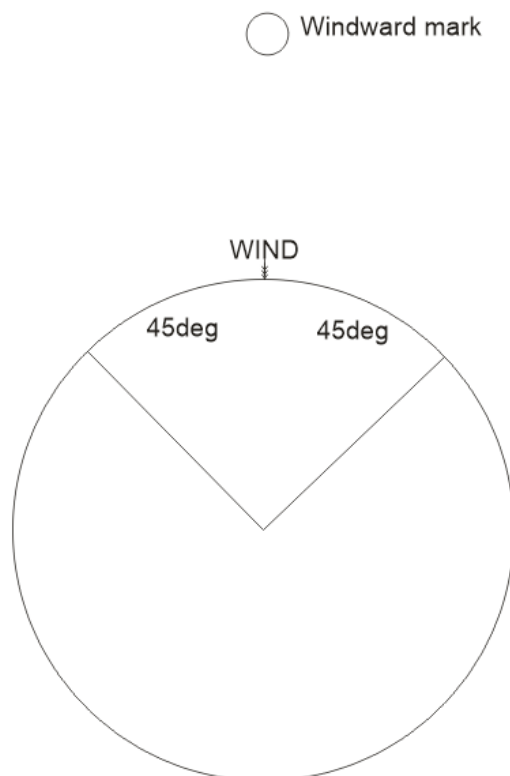
Both then made rather disparate decisions on where to tack up to the windward mark. As it happens there was no change in position as they got to the mark which can often be the case.

We have many options on when to tack when beating up to a windward mark, ranging from staying on one tack until there is no doubt that on going about, we will track down the lay line into the mark, to making many tacks to keep the boat driving up to the mark.

Folklore has it that you can lose a boat length of advantage with each tack so multiple tacks may end up being a disadvantage.

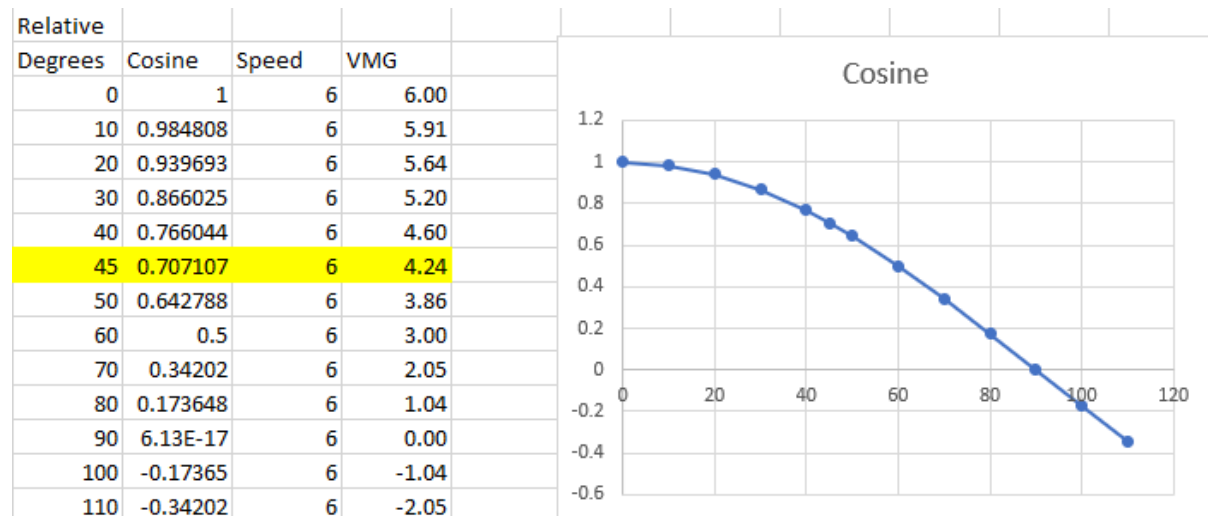
When chasing someone down I often feel that just sitting on their transom will not change the outcome so a well-planned tack may get a lift and the pure joy of coming together at the mark, a boat length ahead, proves you made the correct decision. (Yes, it doesn't always happen)

There are two components for success, boat speed,...i.e. stay where the wind is and avoid wind shadows, and VMG = Velocity Made Good towards the mark. Boat speed and trim is a whole other book, but turning towards VMG here are a few thoughts.



Convention has it that we can achieve up to 45deg off the wind, (and convince ourselves that we can get closer). We also feel that we can tack through 90deg to attack the wind on the other tack. Personally, I think a tack through 110-120deg is good going.

This means that we can never achieve the full boat speed towards the mark when beating directly into wind. Let's say for the case of the thought train that our dinghy can achieve 6kts in a reasonable wind when at 45deg to the wind.



The VMG, if we could point directly at the mark would be equal to the boat speed. When pointing at 90deg to the mark the VMG is zero, (ignoring the effect of leeway which would produce a negative VMG).

This indicates VMG is related to the cosine of the angle relative to the course to the mark.

From the diagram above we can see that even when the boat is doing 6kts through the water the VMG is 4.24kts when the course is at 45deg relative to the mark.

As we proceed on that tack the relative bearing increases, so at 70deg relative the VMG has dropped to 2.05kts.

Looping back to our options earlier :-

- Maintaining a tack until the mark bears 90deg relative (where the VMG has reduced to zero), then tack onto the lay line where we can point directly at the mark and achieve our full boat speed of 6kts into the mark.
- **Or** work the boat on multiple tacks, tacking when the mark bears about 65-70deg off the bow thus keeping a positive VMG.

On the first tack the VMG will vary from 4.24kts with the mark's relative bearing at 45deg to the mark to 2.05kts as we approach the relative bearing of 60-70deg off the mark. On the first tack to the right, on the diagram below the relative bearing is now not 45deg but about 30deg, giving an initial VMG of 5.2kts,...trailing off to 2.05kts. Tack again, same scenario 5.2kts decreasing to 2.05kts. Each leg becomes shorter until on the diagram I've shown the last leg on the lay line to make the mark.

Similarly, at Hide a sharp rounding up as high as you can go beats a leisurely rounding. The rapid rounding up seems to put you in a different airstream that allows for higher pointing that may let you make White in one.

For those of you that didn't get a Rules of Racing book for Xmas, here are a few links in YouTube from the RYA:-

<https://www.youtube.com/watch?v=tFCuwTuW200>

INTRODUCTION TO RACING RULES - Racing Rules Episode 1

<https://www.youtube.com/watch?v=KanGIVzhym0>

THE START – Racing Rules Episode 2 - Backing a Sail, Right of Way, Pin End

<https://www.youtube.com/watch?v=wyOx5TAahw4>

THE WINDWARD LEG – Racing Rules Episode 3 - General Limitations, Obstructions

<https://www.youtube.com/watch?v=BzmP5BMkVgE>

THE MARKS - PART 1 – Racing Rules Episode 4 - Marks and who is entitled to room?

<https://www.youtube.com/watch?v=JQxeasGGr-s>

THE RUN – Racing Rules Episode 5 - When do I have to Sail my Proper Course?

<https://www.youtube.com/watch?v=xMTYEgv8WjE>

THE MARKS - PART 2 – Racing Rules Episode 6 - Marks Masterclass