



Davis 3120

## Using Your Masthead Fly Apparent vs True Wind

One of the first things I do when I get to the docks is look up at the top of someone's mast to see which way the wind is coming from. It is almost instinctive for me – I don't think to do this, it is just a habit. What I am looking at is the masthead fly – the wind vane which indicates wind direction, that virtually every sailboat has at the top of her mast. The masthead fly, or spar fly, can be an extremely valuable tool in many situations. In this month's article we will examine many of these uses.

Before we dive into its uses, let's look at the masthead fly itself. Most consist of an arrow that swivels, so that it always points toward the wind, like a wind vane on a barn. Most have two additional rods with small squares at the end of them. These rods are normally adjusted to line up with the arrow when the boat is sailing close-hauled. It is really a simple device – but very useful.

The first use that comes to mind is when we are preparing to leave the dock. It is a good idea to look up at the masthead fly to see where the wind is coming from. This will tell us what the wind is going to do to the boat once the

mooring lines are cast off. And, for that matter, it will help tell us which lines to cast off first. The same is true when returning to the dock – a quick glance at the masthead fly when nearing the slip will provide needed information about the impending docking.

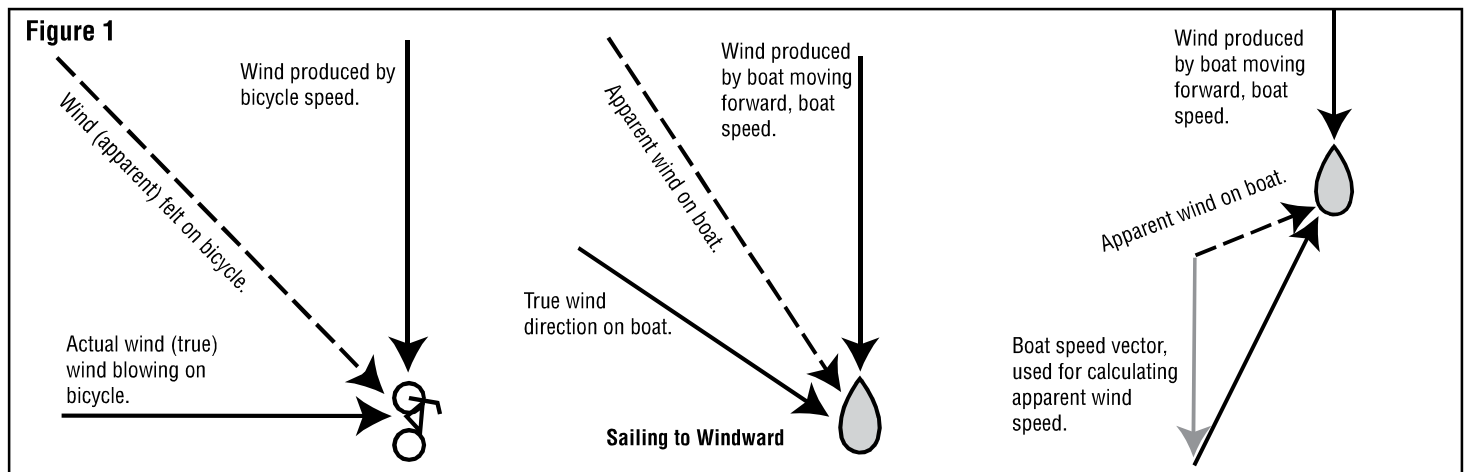
The next usage that comes to mind is when we raise the mainsail and need to have the boat headed into the wind. Here the helmsperson uses the masthead to steer – keeping the arrow pointing directly toward the bow. This brings the wind straight down the boat and allows the main to go up without catching a batten in the lazy jacks, etc. On boats with furling mains this is not as necessary, but it is still helpful to have the boat headed close to the wind.

Before we get into masthead fly usage while sailing, there is one very important concept we need to discuss – true wind versus apparent wind. *True wind is the direction the wind is blowing relative to fixed objects.* It is the wind direction someone standing on a dock would sense. *Apparent wind direction is where someone standing on a moving boat would sense wind to be coming from;*

and the direction the masthead fly will indicate.

If a boat is not moving, true and apparent are equal – for example, a docked boat's masthead fly will indicate the true wind direction. But once a boat starts to move the two can quickly become different. Let me demonstrate: pretend you are riding a bike and there is no wind. If you start to ride you will feel wind (caused by your movement) coming from directly in front of you. Now pretend there is wind coming from your left side at 10 MPH. If you start to ride at 10 MPH your motion will generate wind from the front. The net effect of both winds will be an 'apparent' wind coming from 10:30 on the clock and it will be 'blowing' at 14.1 MPH.

Figure 1 shows some examples. The apparent wind direction is indicated by the dashed arrows, wind produced by vessel/bicycle speeds are the solid arrows pointing straight down at vessel (bicycle) and the true winds (actual wind direction) are the solid arrows pointing at vessel/bicycle in these examples. Note that wind speeds are proportional to length of the arrows and apparent winds will be stronger than the true winds when going to weather and slower than true wind when sailing downwind. We can explain apparent wind using the vector math most of us were taught in middleschool. Hint: to calculate the exact apparent wind, put the true wind and vessel speed vectors head to tail to find the apparent wind vector (see the downwind example where I left

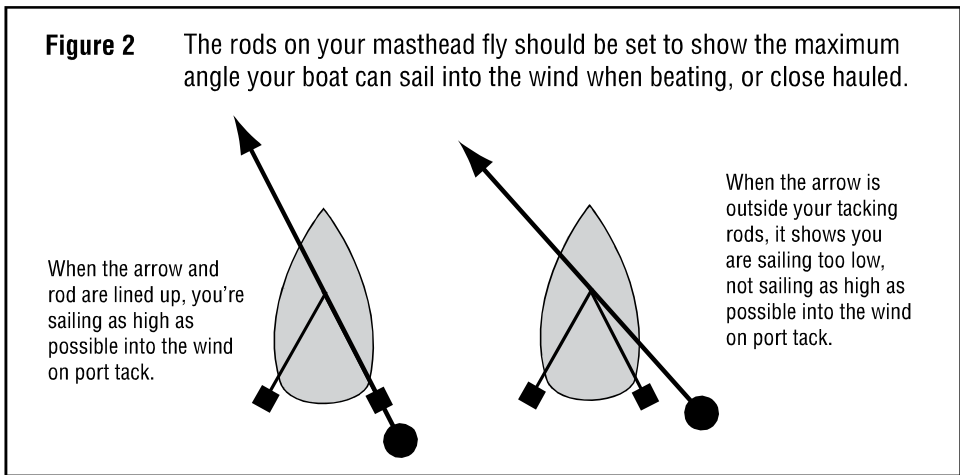


in a shadow of the boat vector at the end of the true wind vector). And one final note, there are two times when a moving boat's masthead will point toward the true wind: when going directly toward the wind and directly downwind.

Now that we understand apparent wind, and that this is what the masthead indicates when the boat is moving, let's look at the first use of the masthead while sailing. If you are sailing close-hauled, as close to the wind as you your boat can, your masthead should look like the left diagram in Figure 2. If it looks like the right diagram, then you have fallen off too much, or sailing to low. This is easy to do when the sun is on the windward side of the jib making the outside telltale hard to see.

The next usage revolves around reaching. Here the masthead can give a good indication of where to set the sails (especially on a broad reach where the main should be perpendicular to the apparent wind).

This also brings to mind one of my favorite questions – where does the masthead fly point on a beam reach? Most sailors talk in terms of apparent



wind, so if your arrow is pointing directly abeam, most sailors will say it's a beam reach, when in fact the wind is abaft (behind) the beam. Does it really matter? Not really – just be aware that if you are sailing with the apparent wind abeam you are really sailing somewhat downwind.

The last use for a masthead when sailing revolves around downwind sailing. In this situation the masthead is used like telltales are when going to windward – to steer the boat. In fact, when sailing directly downwind or wing-on-wing the helmsperson should

pay closer attention to the masthead than they do telltales due to the danger of accidentally jibing.

One final use is while anchoring or mooring – it is a good idea to approach into the wind unless there is an over-riding current.

As you can see the masthead fly can be a very useful instrument. Hopefully some of this information will prove helpful.

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