

Using the iBike power meter and iBike3 Software to Improve Racing Tactics

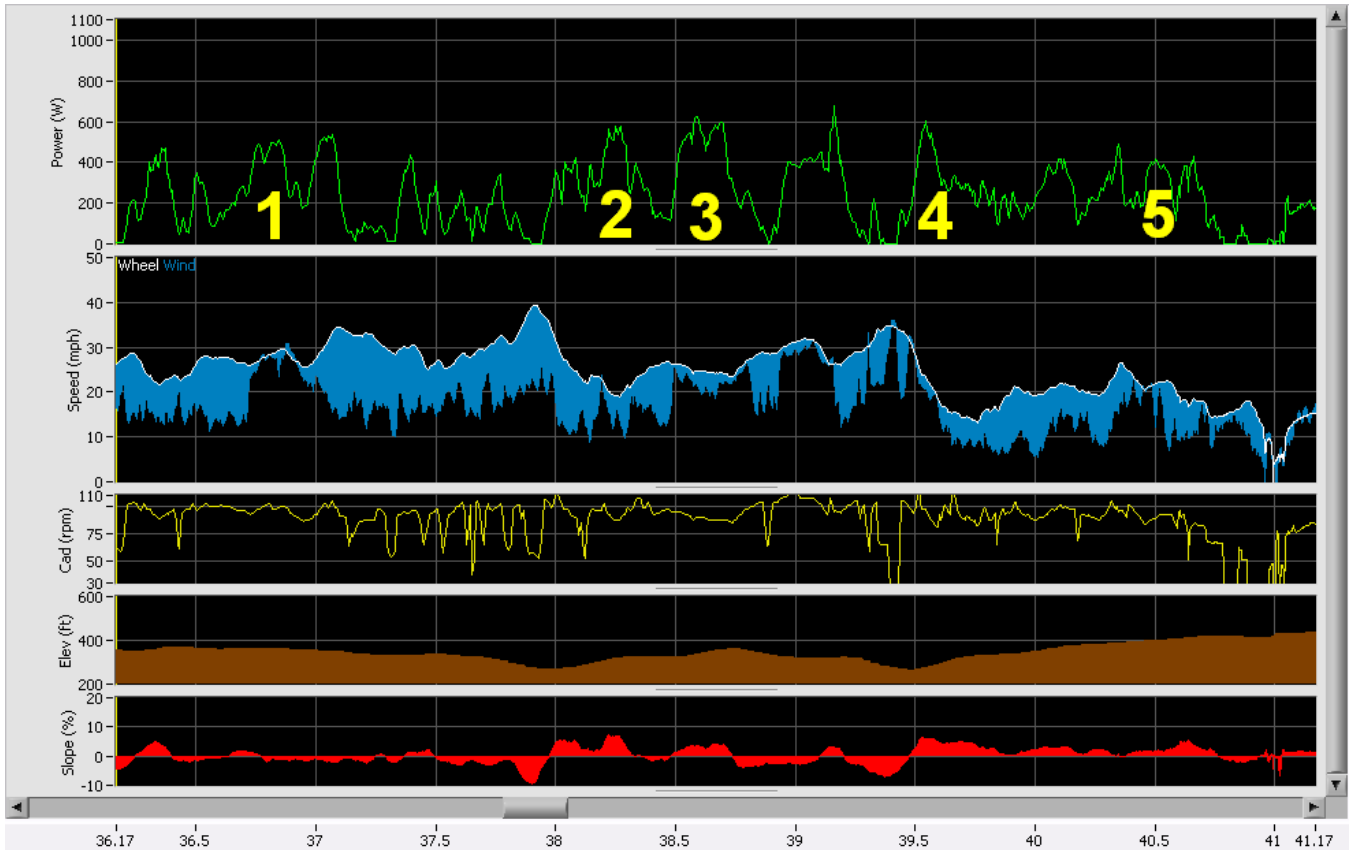
By Boyd Johnson, Professional cyclist and USA Cycling Certified Coach

I use my iBike Aero (iAero®) power meter in the local Winter Bike League here in Greenville South Carolina. These are weekly training rides, held on Saturdays throughout the winter. They are moderate paced rides (about 19-21 mph average) that gradually build up in distance with the last one being about 5.5 hours. There generally are over 140 cyclists on each of these group rides.

Though these are billed as training rides, during each ride there are “hot spot” sprints, designated areas where we race for a town line sign; the top 5 places earn points that are tallied up throughout the winter. So, in addition to providing a great way to get in long base miles in the winter, these rides offer the additional benefit of honing racing tactics during the Hot Spots.

One of the most important benefits of using the iBike in group rides is after-the-ride analysis with the iBike 3 software. With the iBike 3 software you can actually see exactly where you were drafting, and when and for how long you were pulling during the ride, making it possible to analyze your race performance in completely new ways. Were you feeling tired after three hours? How much time did you spend pulling? Did you make the breakaway in a race, but were dusted at the end? Did your watts output die-off at the end of your pull, indicating that you were getting tired? Were you resting long enough between pulls? Looking at your iBike’s ride file you can see exactly these kinds of things, and more. *This kind of tactical analysis has never been available before the iBike.*

For instance, let’s look at the first Hot Spot of the group ride, where we’re all racing for one of our designated town line “sprint signs”, located at mileage 40.8 in the graph below. In the 4 miles before this sprint finish sign there were all kinds of racing tactics occurring in this attack zone. In the graph on the top I’ve numbered 5 different places of interest:



The power graph (green) at the top shows power in Watts vs. distance, in this case from mile 36.17 to 41.17. There are also four other iBike measurements shown. Immediately below the watts graph is a graph showing bike speed (white) and opposing wind speed (blue); the next graph shows cadence (yellow); the 4th graph shows elevation (brown); and the bottom graph shows hill slope (red). The iAero also records Heart Rate but to keep the analysis focused I elected not to show the heart rate graph.

No other cycling computer provides the depth of data of the iBike. As I'll show you, when iBike ride data is looked at after the ride, using the (free) iBike 3 software, it's possible to gain very interesting insights about the success and failure of racing tactics.

#1. As we enter the attack zone at mile 36.17, you can see from the white bike speed line of the second graph you can see that we're going along at a pretty good clip, about 26 mph. The blue, wind speed "icicles" hanging below the white bike speed line are unique to the iBike; the icicles show the magnitude of the wind speed *opposing* the rider at every point of the ride. The longer the icicles, the *less* the opposing wind speed is; for example, at mile 36.17 my bike speed is about 28 mph but the wind speed opposing me is only about 16 mph.

As we all know from our experiences in group rides, the drop in wind speed is real in the pace line and happens because the riders in front are blocking the wind, making the opposing wind in the draft of significantly lower intensity. So, *wherever there are blue icicles hanging from my white bike speed line, I'm in the draft.* When the blue line is even with the white line, or even above it, that means wind speed

is comparable or above bike speed. *When there are no icicles it means that I'm at or off the front of the pack, pulling into the wind.*

So, with this amazing (and unique to the iBike) wind speed/bike speed graph, *I can tell precisely where, and for how long, I am drafting and where and for how long I am in the lead, pulling everyone else.*

At the far left of the graph, at mile 36.1, you can see blue icicles hanging from my bike speed (white), so I was sitting in. Then, at about mile 36.7 I took my turn at the front of the pace line; my wind speed jumps to my bike speed and the icicles disappear because I was in the lead position.

Knowing where I'm in the lead and where I'm in the draft allows me to quantify the watts difference between being in the pace line and being in front. For example, from mile 36.1 to mile 36.7, where I was in the draft, I was producing an average of 100-150 watts (top graph, green line). However, when it was my turn to pull, from mile 36.7 to mile 37.0, there were times I was pushing close to 500 watts.

This is a great illustration of why interval training is so important! Furthermore, looking at this particular ride file quantifies what *intensity* of interval training I needed to achieve in order to compete with this caliber of racers.

I did my turn in front between mile 36.7 and mile 37.0, then went about 12 riders back and sat in for a mile. This is where you see many blue wind speed icicles hanging from the white bike speed line. When in the draft my wind speed is about $\frac{1}{2}$ my bike speed and I am in a good drafting location. Notice, however, that there are a few places between miles 37.5 and 37.8 where the wind speed spikes up towards the white line (the icicles become shorter). Where the wind spikes up it was because I got a little sloppy about my position and wandered out of the good draft. If you look at the watts graph for this same area you'll see that my watts shoot up about 100W the two times I wandered out of the draft. *This is energy I wasted needlessly*, and looking at the ride file reminds me that I need to stay focused on my riding even when sitting in the pace line.

#2. If you look at the slope line in the bottom graph (red) just before mile 38.0, you can see that the slope line goes positive; the graph shows we were going uphill on about a 6% grade. Here again, *the ability to see how steep the hills are, and for how long the big slopes occur, is unique to the iBike.*

At mile 38.2 you'll notice my watts jump substantially. What happened was that somebody got to the front and went really hard trying to break away from us. I was sitting about 4th position in line, so I was still getting the draft, but when the breakaway happened I needed to stay with the 3 riders in front of me so I wouldn't get dropped in the peloton behind the breakaway. It's hard to win a sprint if you are having to constantly bridge back to the leaders, so I piled on 600W watts to stay with the breakaway. Once the hill was over at mile 38.3, I was able to reduce my power output back to a relatively relaxed 200W.

#3. Once I had a moment to recover at under 200W (between mile 38.3 and 38.5), you'll notice at mile 38.5 my wattage jumps to over 400W and stays there for a while. Also, you can see that my wind speed equals my bike speed, meaning that I was now on the front. What happened? After recovering a bit at the end of the previous climb, *I attacked*. Attacking just after the top of a hill is a great tactic to use because everybody else is tired; when you attack at times like this, nobody will want to chase you down (I peaked at 700W at mile 39.2!). In fact, I had one only rider go with me, all the way till the '4'.

The jags in the blue wind speed icicles show the places where I was drafting and the other cyclist was pulling, and periods where I was pulling and he was drafting.

#4. I wish this Hot Spot zone had a better ending for me, but the truth is I attacked too early for this sprint; we were 1.5 miles from the sprint finish line when my attack began. Right at the '4' is where I gave one last-ditched effort to stay off the front of the group; you can see where my watts spike to over 600W. Unfortunately we hit another uphill at mile 39.5 and I just didn't have the legs to keep away from the hard charging pack behind me. The pack caught me at mile 39.6 (wind speed drops below bike speed).

And then, as soon as I was caught, there was a counter attack; unfortunately, that was the move that got away and won the sprint.

It's always a temptation—and a danger—to do a lot of hard cycling at the earlier stages of a ride. My ride file shows that I had way too many “high power” excursions earlier in the ride and that I done too much work and too early. The more patient riders stayed in the pack and were able to take advantage of my mistakes when the finish line was near.

#5. This is where we still had about a quarter of a mile left to the sprint sign, and I was hoping for a miracle. I had been sitting in the pack for a brief moment, and the riders who had attacked were not that far up the road. I got to the front and pulled again at mile 40.4 (400W), but my legs were just too tired. I had to accept the fact that I had messed up the timing on this Hot Spot and would not be winning this sprint.

Although I did not win the sprint, because of the iBike data and the iBike 3 software I was able to look at this ride file afterwards and see *what* I did wrong, *when* I made my mistakes, and *why* I was wrong. Next time I will have a completely different set of tactics.

As you can see, using the iBike power meter provides the racer with a wealth of information, not only during the race (power, speed, distance, heart rate) but also *after* the race. Displaying together the iBike's wind speed, bike speed, slope, elevation, and power data makes it possible for the cyclist to identify when and where his moves (and others) occur, to analyze the success (or in this case; failure!) of race tactics, and to learn *how* to change those tactics to improve in future races.