

## Long Range Shooting Tip, Introduction to Wind Compensation

By Jim See

One of the biggest hurdles in accurate long range shooting is determining the correct wind hold. What seems easy when watching an experienced shooter can seem very daunting for a new shooter. So we really need to instruct new shooters with logical processes, that they can understand and follow. There is equipment out there that can help a shooter come up with his solution; ballistic calculating weather stations are probably the most popular, yet we need to understand what the calculator is doing to wrap our mind around the process.

### The 2 elements of determining a wind correction

#### Wind speed.

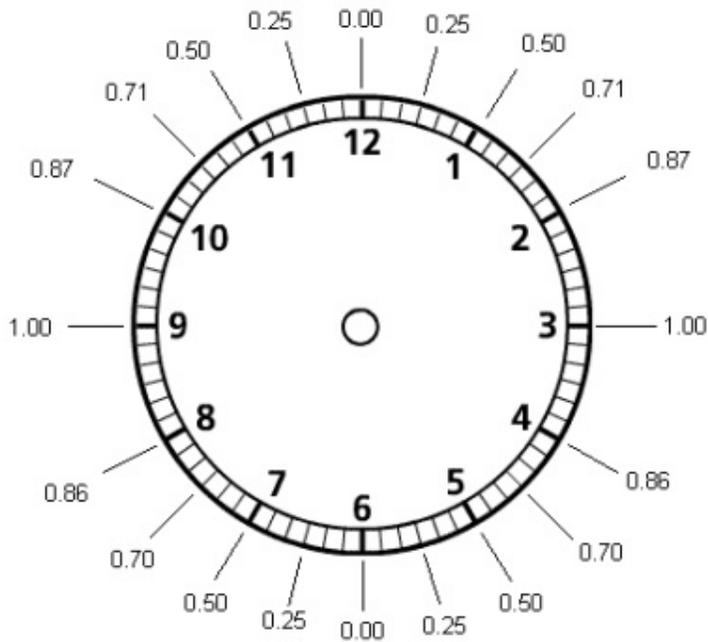
First we need to assign the wind a speed; this is most often done with a wind meter, or in the case of a highly experienced shooter, by feel and observations. A simple and affordable wind meter, like the Caldwell Wind Wizard II, is perfect for a new shooters getting into the sport.



<https://www.btibrands.com/product/wind-wizard-ii/>

## Wind Direction.

Second we need to determine the direction of the wind so we can rate its value on the effect to our bullet in flight. The following wind chart shows how different wind directions affect our firing solution based on the assigned value of a wind from different clock positions. This is based on the shooter firing from the 6 o'clock position to the target at 12 o'clock.



As an example let's say we have a 500 yard shot to calculate, we come up with a speed of say 12 mph, and after consulting our ballistic data, we come up with a full value correction of 1.1 mils. Now we determine that the wind direction is coming in at 10:30 on the clock position. We can create a formula to come up with our hold. ( $1.1 \text{ mil wind} \times .71 = .781 \text{ mil wind correction.}$ )

So in this example, if the wind was coming from 3 or 9 o'clock we would apply a correction of 1.1 mils of wind compensation. Because our wind was coming in from 10:30 we reduce the value by 29% to get a wind hold of approximately .8 mils.

Using the same example, what would our wind hold correction be for the wind at 5 o'clock or 7 o'clock? Easy 50% of our full wind value of 12 mph, or half of 1.1 mils which would equal .55 mils. At this point we are not worried about hundreds of a mil so rounding it up to a .6 hold or down to a .5 hold would be fine.

Ballistic apps and programs will do these calculations for you very accurately, via a smart phone. Ballistic weather stations are also capable of these calculations but their cost is prohibitive for some shooters.

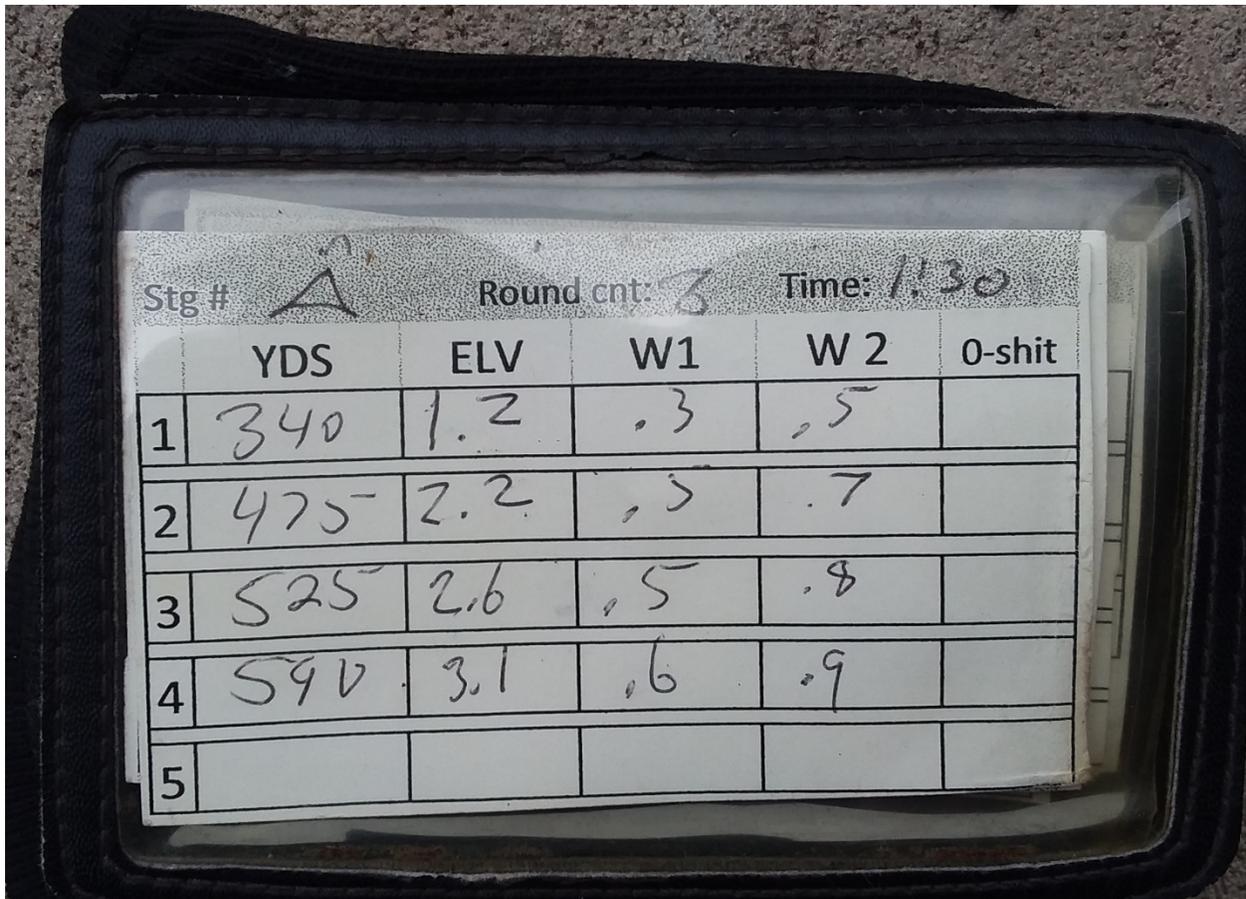
### Application in the field

You might be saying; “wow that takes a minute to figure out!” “How do you apply this to conditions where the wind speed is changing up and down?”

Well in a match shooting situation we need to find the wind high and low value over a period of time, of say 2-3 minutes. If we hold up our wind meter into the wind and get a speed that varies from say 10 mph up to 15 mph we may want to do the calculations for both speeds and write them down on a wrist coach. So as we shoot the stage we can reference the low and high value and apply the correction that best fits the current condition you are about to fire in. This requires you to have a “feel” for the wind and know if you are shooting in the lull or the pick-up. Experience and being aware of your surroundings is the key to being successful, and why the professionals make it look so easy.

We must also remember that it is possible for the wind direction to change as well. If we were shooting in a tail wind that was switching from 5:30 to 6:30 we could miss either right or left at any given moment when holding the center of the target. Under this circumstance we need to use every trick we have to determine the wind direction with every shot.

An example of a data card in a wrist coach from a recent match.



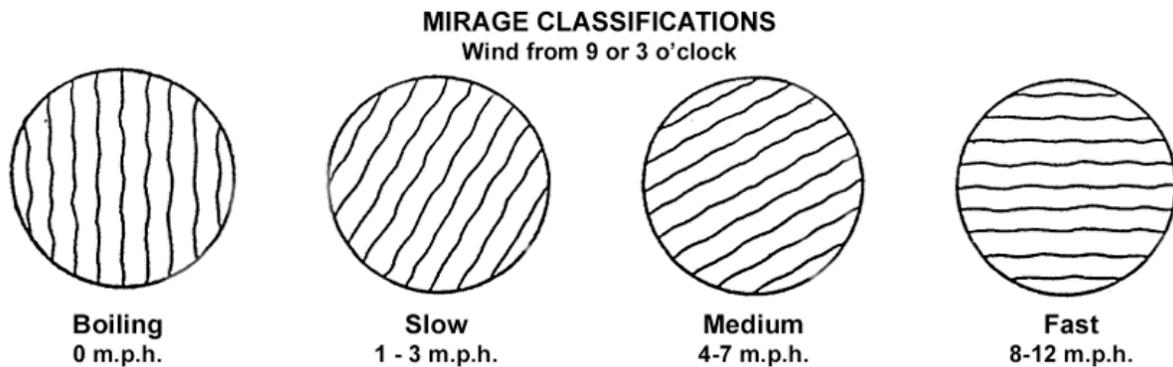
Stg #	YDS	ELV	W1	W2	0-shit
1	340	1.2	.3	.5	
2	475	2.2	.5	.7	
3	525	2.6	.5	.8	
4	590	3.1	.6	.9	
5					

## Mirage, the perfect wind indicator?

Mirage is heat waves that we can see moving in our optic when looking at a target, with experience, you can gather crucial information about the wind speed and direction when studying mirage. In the head or tail wind situation it is critical to see mirage in determining the wind correction the second you break the trigger.

We will be able to see mirage best on days when the sun is out and there is a temperature inversion from the ground to the air. A bare dirt field or mowed hay field will show mirage better than a brushy hillside because the sun will be able to heat the ground better than it can heat dense green foliage. Knowing this you sometimes need to search for the best place to look.

Mirage will lie to you based on where you are seeing it and the terrain features. If you are shooting in uneven terrain with hills and gullies you may feel the prevailing wind traveling right to left, but a target up against a hillside will have mirage going left to right. This is usually caused by the wind being funneled around an obstacle, and must be something you are aware of or it will result in a miss if you rely only on mirage.



We can also determine the speed of the wind by how the mirage is flowing; the above chart is a basic illustration of that. I suggest that if you want to become familiar with reading mirage that you go out and first practice with a spotting scope. Pick a sunny day and scan the area for mirage, it might be easy to see coming off a road surface, a shingled roof, or bare ground. If you point your spotter into the wind you will see a boil coming at you, if you pan to the right you will see what left to right mirage looks like. Study it and in time your eye will learn to pick it up and define its direction much easier. Remember that once wind speed increase to above 12 mph mirage gets difficult to see as the air turbulence washes it away.

### **Other indicators of wind direction**

Natural wind readers can judge many winds to within 1 mph by feel and observations. These shooters are highly in tune with their surroundings and pay attention to things like; grass movement around the target, movement of tree branches, impact dust kicked up by bullets that hit dirt, and mirage. If you are a new shooter learning wind and using a wind meter pay attention to your surroundings as the wind picks up and lets off and see the results on your wind meter. This will help you to better judge conditions by feel and observation.

Well I hope this helped, it was the very basic approach to compensating the wind and will get you started in the right direction.

*Bio; Jim See has been shooting competitively and building custom rifles since 2008, he owns Elite Accuracy LLC and continues to shoot precision rifle matches, instructs in competition training classes and build custom rifles.*