Getting Started with your Hornady Kestrel 5700 Ballistics Meter

Please note: This guide goes through Ballistics mode not Easy mode.

1) **Install battery and lanyard and turn unit on.**

2) **Go to Ballistics Mode.**

   a) Press the Gear button to open the main menu.   Use the right or left arrow to change Mode to Ballistics.

3) **Calibrate the compass.**

   a) Use the down arrow to navigate to System and press the center button. Navigate to the Compass Calibrate line in the System submenu and press the center button.
   b) Stand the Kestrel on its end, preferably on a table at least 3 feet away from any metal objects.
   c) Press the center button and begin rotating the Kestrel in either direction at a constant speed, counting to between 6-10 seconds per rotation. Rotate at least three times, or until the screen says "Cal Complete".

4) **Set your Latitude.**

   Press the Gear button until you are back to the main ballistics screen. Use the down arrow to scroll to Environment and press the center button. Highlight Lat… and use the left or right arrow to adjust the latitude to match your current location. Your latitude can be found through an internet search.   Alternatively, you can connect to the Kestrel LiNK Ballistics app (Android or iOS) and send your phone's current Latitude directly to the Kestrel.

5) **Create a bullet file.**

   You can create a bullet file directly on the Kestrel or by building a bullet file in the Kestrel LiNK Ballistics application and sending it over to the Kestrel through Bluetooth.   The advantage of

using the application is that there a library full of 4DOF bullet files which have been extensively tested by Hornady and should provide the best results right out of the box. Below is information if you wanted to build the gun on the Kestrel itself.

GUN – Create a gun name that will be identifiable to you when selecting the profile.

MV – Muzzle Velocity. If you have a calibrated chronograph, use it to measure your muzzle velocity. If not, enter your best estimate. You can look for the manufacturer's generic estimate (based on average barrel length) on the ammo box or on the manufacturer's website. Compensations can be made later in this document to account for inexact muzzle velocity entries.

DM/BF – Drag Model / Bullet File. This field is called drag model (DM) if using G1 or G7 standard drag models. However if you instead load a bullet file from the Kestrel LiNK Ballistics app, this field becomes a bullet file and uses Hornady's 4DOF Doppler modeling of the bullet.

BC – Bullet Coefficient. The ballistic coefficient is a ratio of how aerodynamic your bullet is versus the drag model it is being compared against. BC values will be based on the G1 or G7 model. You can find these values on bullet manufacturer's websites although if only 1 value is given, it is typically for a G1 model. The Kestrel LiNK Ballistics bullet library also lists a majority of these values if building a profile in the app. *Please note: if using a bullet file, the BC will show as "---".*

BW - Bullet Weight. Measured in grains or grams, this is usually given as part of the bullet's name. The bullet weight of a 180-grain 0.308 round is 180 grains.

BD – Bullet Diameter. Ensure you are using correct measurements, as the names of many calibers are not accurate representations of the actual bullet diameter (i.e., 30 caliber rounds are actually 0.308", not 0.300").

Rifle/Scope Data – In addition to Muzzle Velocity, additional information about your rifle and scope are needed to calculate a ballistic solution.

ZR/ZA – Zero Range / Zero Angle.   Zero Range is the distance at which your rifle was zeroed. If the rifle is zeroed at longer ranges (200-300 yards) environmental changes cannot be ignored which is why zeroing at shorter distances (100 y or 100 m) is recommended.   If you highlight ZR and press the center button, you can change this value to ZA (Zero Angle). Zero Angle on the other hand is a measure of the angle between the straight line following the axis of the scope and the straight line following the axis of the rifle barrel. This angle is very small and would be difficult to measure directly but the 4DOF ballistics engine can find the angle when provided with environmental data and bullet impact location. Once the solver knows the Zero Angle between your rifle and scope a very accurate solution can be provided regardless of how long the zero range is or how much the weather changes. It is recommended to follow the Cal Zero Angle guide on the Kestrel to find the appropriate value for your rifle/scope.

BH – Bore Height. Also known as Scope Height, this is the distance from the center axis of the scope to the center axis of the barrel. Measuring the vertical distance from the center of the

windage turret to the center of the bolt is an easy way to find Bore Height (just need to be accurate to within ¼").

RT – Rifle Twist. This is the distance along the barrel it takes for the rifling to complete one rotation. If the Rifle twist is not known, it can be measured by pushing a tight fitting patch through the barrel and measuring the distance required for the cleaning rod to make one full rotation.   RTd is the rifle twist direction and can be changed by highlighting RT and pressing the center button. The vast majority of rifles have a right twist (clockwise from the position of the shooter).

Eunit/Wunit – Elevation / Windage Unit. These are the units of measure used in the elevation and windage turrets of the scope.

1) MIL – Miliradian
2) TMOA – True Minute of Angle (typically written as MOA) where 1 MOA equals 1.047" at 100 yards.
3) SMOA – Shooter's Minute of Angle. This is less frequently used but 1 MOA equals exactly 1 inch at 100 yards.
4) Clck– A user settable value representing the angle adjustment made by each "click" or detent of the turret when turned.
5) Inch - A straightfoward method of determining drop based on the amount of inches the bullet drops.
6) CM - A straightfoward method of determining drop based on the amount of centimeters the bullet drops.

Eclck/Wclck – Elevation/Windage Click Setting. If Euint or Wunit are set to clik, the Kestrel will provide solutions indicating the number of "clicks" the turret needs to be turned to dial the solution. The percent of a full Mil or MOA represented by each "click" of the turret must be set by the user. For example, if you know your turret is 1 click per 1/4 MOA, set the Eunit/Wunit to clicks and set the Eclck/Wclck to 4/MOA. This means every 4 clicks equals 1 MOA or 1 click = 1/4 MOA.

6) **Capture Target Information.**
   On the main Ballistics screen, scroll to Tgt…. and press select. Input information about each of the following target variables.

   a) **TR** – Target Range**.** This is the line of sight range to the target. Use the left and right arrow to adjust the value.
   b) **DoF** – Direction of Fire. Measured in degrees or hours from North, this value can be manually inputted or captured automatically.
      i. Capturing Direction of Fire – To capture DoF automatically, enter the DoF submenu and select Capture. While pointing the back of the Kestrel towards the target and holding the Kestrel vertically, press the select button.
   c) **Ideg –** Inclination angle is the angle above or below the horizon to the target.

Pro Tip: You can also highlight TGT on the main ballistics screen and press the red button in the top center. TGT will become T-> and then you can point the back of the Kestrel at the target and press the red button again to capture the direction.

6) **Capture Wind Information.**

On the main Ballistics screen, scroll to Wind… and press select. You will need to input three attributes of the wind manually or do an automatic capture.   It is important to keep the Kestrel high above the ground and pay attention to the terrain around you that may put you in "dirty" or unrepresented air. If you can tell that the downrange wind conditions along the path of the bullet, take those into account when applying a wind hold but remember the wind at the gun will typically have the strongest impact on the flight of the bullet.

   a. **WD** – Wind Direction. Measured in degrees or hours from the direction of fire, this variable can be input manually or captured automatically together with the other wind variables when making a capture. *Please note: wind direction is relative to the DOF and not an absolute value; therefore if your DOF is at 180 degrees (6 o'clock) and have an East wind (90 degrees / 3 o'clock), this value will show as a West wind (270 degrees / 9 o'clock) on the Kestrel.*
   b. **WS1 –** Average Wind Speed. This variable can be input manually or captured automatically together with the other wind variables when making a wind capture.
   c. **WS2 –** Maximum Wind Speed. This variable can be input manually or captured automatically together with the other wind variables when making a wind capture.
      i. **Capturing Wind Automatically –** To capture all the wind values together automatically enter any of the submenus for WD, WS1 or WS2 and select Capture. Next, point the back of the Kestrel directly into the prevailing wind and while holding vertically, press the select button and hold your position for at least 5 seconds, then press select to end the capture. You can take as long of a wind sample as you would like but 5 seconds should be the minimum amount.

Note: Remember, because the wind direction (**WD**) is relative to the direction of fire (**DoF**), if you change your direction of fire, you need to update the inputs for both **DoF** and **WD**.

Pro Tip: You can also highlight Wind on the main ballistics screen, point to the back of the Kestrel into the prevailing wind and press the red button in the top center. Wind will become W->. Take as long a wind sample as you would like and press the red button again. Wind values and direction would then be captured. If you do not press the red button a second time, the Kestrel will be capturing real-time wind values which is useful if mounting the Kestrel in a vane mount.


7) **Capture Environmental Data.**

The Kestrel monitors real-time environmental data and constantly updates the 4DOF solver. Please note that you should <u>never</u> have to adjust anything in Weather Mode such as REF ALT or

REF BARO. The Kestrel will provide accurate weather information for the 4DOF solver at all times, wherever you travel.

From the main Ballistics screen, scroll down to **Enviro…**and use the left or right button to ensure Live is shown as the option. When set to **Live**, the ballistics engine will continually pull in new environmental data and update the solution accordingly. It is recommended to expose the Kestrel to ambient airflow by waving it back and forth for several seconds. If you are going from extreme temperature shifts (e.g., air conditioned truck to very hot range) please allow more time for the Kestrel to reach equilibrium.   Once you are satisfied with the environmental capture, we typically tell customers to change Enviro to Lock.   If the Kestrel is placed on a hot, black mat or has direct sunlight hitting the thermistor, the temperature can artificially raise so that is why locking is recommended. Repeat this process any time conditions change dramatically or about every 30 minutes to update to current conditions.

Now that all the gun, bullet, target, wind, and environmental inputs have been set in the Kestrel, the solution provided on the targeting screen will be based on your environment and shot. Take a minute to familiarize yourself with the values on the screen and how to implement them in your scope. Please note that solutions on the Kestrel's targeting screen are given referencing point of aim, so W 3.20L indicates a change in point of aim is needed 3.20 to the left of the target.
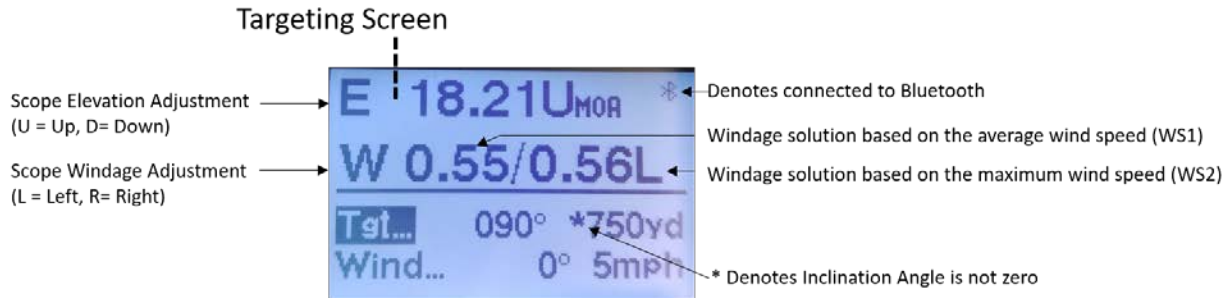
8) **Calibrate Axial Form Factor**

Due to differences in barrel machining, muzzle breaks, propellants and other factors, when the same bullet is fired from different rifles there will be a slight difference in the drag the bullet will experience. The Hornady 4DOF solver assumes the bullet will be fired from an "average" barrel but in reality your rifle may impact the bullet slightly differently. To account for any differences the Axial Form Factor value can be modified to align the output from the solver to what your bullet is experiencing.

From the main Ballistics screen, scroll down to Gun and press the center button. Scroll to the bottom of the Gun submenu and select Cal Axial FF... and press the center button. A step-by-step guide will assist you in figuring out your gun's Axial Form Factor. After confirming your Latitude and Environment, you will want to find a target between 300 and 800 yards. Enter the

range of your target by highlighting the Range… menu item and use the right and left arrows. Select Continue and next point the back of the Kestrel towards the target to capture DOF. After that, point the Kestrel into the prevailing wind and capture the wind for several seconds.

You will notice an Elevation number at the top of the screen. Take a group of shots using this Elevation hold at the range that was specified. Measure the distance (up and down) between center of the target and your group of shots. Adjust the Elevation to match the actual elevation drop.

For example, the above shows an Elevation hold of 18.21 MOA. After shooting, you notice that the elevation drop was 0.5 MOA below center of the target. Therefore the total elevation drop you witnessed was 18.21 + 0.5 = 18.71 MOA.
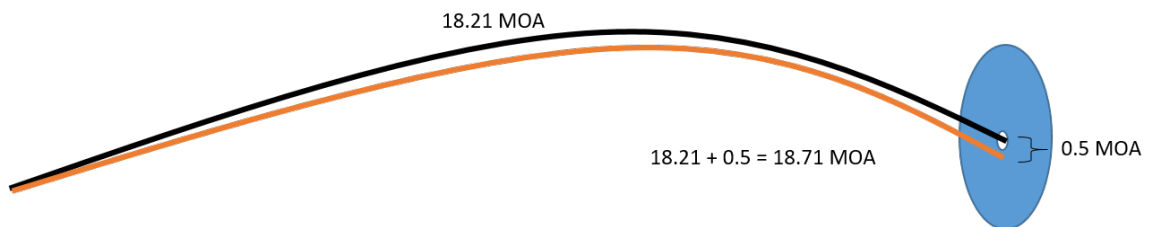
Adjust the Elevation to the drop you actually saw, in this case 18.71 MOA. The Axial FF will change, select Continue to accept this adjustment and your gun profile will be calibrated through the supersonic, transonic and subsonic regions.

Congratulations! You have now calibrated your Hornady 4DOF Kestrel 5700 and will receive accurate solutions at any range, under any weather conditions, and at any altitude without having to adjust your solution.

If you have any questions, please contact techsupport@nkhome.com.