



# BULLET FLIGHT

## manual

**A ballistic computer designed to provide quick solutions in the field**

On the main screen, you can select a rifle/ammo profile and opt to predict a bullet path. You can also edit profiles, change options, use utilities, or get information.

To enter a new profile select **New** and fill in the fields. Select Save when done. You can alter profiles with the **Modify** button.

You may enter data into either the Imperial or Metric field, and the other unit will be updated automatically. If you enter a value that is too high or too low, the field may automatically change to a common value. Consider this a hint to change the field once more to a value that is reasonable. Most fields are self-explanatory but if you have questions please contact us before use. Here are some fields that need special attention:

For scope clicks, put in how many MOA (minutes of angle) the bullet impact will change for each scope click. Note that there are two fields - one for H (horizontal) and one for V (vertical). Some scopes, but not many, have different settings for each turret. Also note that the value of 0.344 works for metric scopes that have 1cm at 100m clicks. Alternatively, if you have a metric scope, you may enable direct mRad input from the options screen.

For BC (ballistic coefficient), the ICAO G1 drag-function is the most common and what nearly all makers use (Sierra and Barnes uses Metro values but they have been converted to ICAO values for the included bullet database). If you wish to use a BC from a company which uses Metro values, you should convert it by multiplying it by 0.982 before use.

The app accepts G1, G7, or G8 ballistic coefficients. You may specify them, for example, by entering G1 or G7 (or simply 1 or 7) into the Drg field. G7 is best for long-range boat-tail bullets provided you have the correct G7 value to use. If you only have a singular value, place it in the first field, and make sure the other fields (including the Fps fields to the right) are set to 0. If you have more values, start at the top and work down - and ensure that the additional fields are set to 0. Note that the purpose of the Fps fields are to give the velocity threshold that will decide if the next-higher or next-lower BC is used.

The Temp, Pressure (barometric pressure at mean sea level), Angle, Altitude, and Relative Humidity fields are for the sight-in conditions. This information will later be used to compensate for the sight-in values. You may go to the Options screen and turn on Metric if you prefer to see these fields in SI units. If you had previously (in this same running of the app) had automatically downloaded local weather information, it will be offered for use on this screen by a pop-up alert.

When you are satisfied with your data, edit the profile name at the top and select **Save**. If the profile name is already in use, that profile will be updated. If it is not in use, a new profile will be created.

The **Remove** button will erase a profile, and the **Cancel** button will revert to the main screen and not save anything.

Now in more detail, from the main screen, you may select a stored profile and select **Calculate Ballistics** or **Calculate Simple**. For the first button, a number of fields will appear, and as you change values, the results will update. Anything you place in these fields will be saved for the next time you return to this screen. They will also be saved and used on the **Calculate Simple** screen and if you later want to calculate an actual BC from the **Utils** screen.

The Range-field is the distance to the target. The Temp is the current temperature. Pressure requires the barometric pressure at MSL (mean sea level) as reported by a weather station. Local air density will then be calculated once you put in your altitude. If you are not sure what to enter for any value, picking something out of range will often automatically put in a reasonable value for your consideration, but please verify that this is what you would like to use. Angle is the angle of the rifle's barrel from -90 to +90 degrees. 0 means that you are shooting level. You may press and hold the GET button to use the mobile-device to read the angle. Releasing the button will lock in the result. Note that the automatic get will generally not return more or less than 45 degrees because it switches modes depending on the orientation. If you are not getting the angle you desire, please enter it manually. Wind may be entered in O-Clock or degree format, depending on what you selected on the options screen. It is the direction that the wind is coming from. Wind Angle is 90 degrees for a cross wind, 0 degrees is toward the rifle, and 180 degrees is downrange.

The output will show the predicted bullet impact above or below the LOS (line of sight) in inches or cm (change the units from the **Options** button on the main screen. The second output value is the height in MOA or mRad (milliradians) above or below the LOS (also depending on the setting under **Options**). The third value is how many clicks to adjust your scope from zero (this refers back to when you set up the amount that MOA changes per scope click). Below that is the windage output. This will update based on the wind-speed and direction you entered. Finally, the lowest display will estimate velocity and energy at the target using units as configured from the Options screen. **Time** is estimated flight time from the rifle to the target and may help you with predicting how much to lead the target based on its speed. If you had previously (in this same running of the app) had automatically downloaded local weather information, it will be offered for use on this screen by a pop-up alert.

If instead you had pressed the **Calculate Simple** button, you will have less information to enter to allow for use under stress. This screen is best to use once you are in position, as environmental conditions typically do not change. Rather than a text-box to enter range, there is a large selection wheel. The wheel allows for entry using yards or meters, depending on what you have set on the **Options** page. Wind velocity is still settable with a text-box but wind direction is only settable from the full calculate page. It is important to note that the environmentals, including wind angle and other settings such as rifle angle, are still being used – so make sure that they match the current conditions. The output values on this page work just as they do on the full version except that the numerals are larger. If you had previously (in this same running of the app) had automatically downloaded local weather information, it will be used on this screen without further notice.

The **Utils** screen allows you to predict bullet stability, select a bullet profile, calculate an actual BC, or automatically get weather from a local station. Bullet stability is predicted with the Don Miller formula. This is much more reliable than Greenhill's twist calculator. You should look for a stability factor of 1.2 or greater, with 1.5 or above being very stable and suitable for use with sound suppressors. Please note that slower velocities and colder temps will make your bullet less stable, so please calculate for the worst conditions you may encounter (perhaps 0 degrees F).

To select a bullet profile, choose that option and select the desired bullet. Later when you create a new weapon profile, or modify an existing one, you will be offered the option of using the previously-selected bullet.

To calculate a BC, you need the muzzle velocity and the velocity and down-range distance. You must put in local weather conditions so that this BC can be corrected to standard ICAO values. If you had previously (in this same running of the app) automatically downloaded local weather information, it will be offered for use on this screen by a pop-up alert.

The final option allows one to automatically download current weather. For automatic weather gathering, you generally must have an iPhone which is GPS equipped, though under some conditions an iPod with network connectivity may work. When you select to acquire weather, you must wait for it to return a value or time-out. This may take as long as 30 seconds. Because your location is transmitted to a non-secure Internet service, you may wish to not use this option if your current location is confidential.

The **Options** screen allows you to turn Metric/SI units on or off, enable the range-wheel on the Simple screen to be in Meters, turn mRad on or off, and to consider Spin Drift (the tendency for a bullet to drift to the right due to aerodynamic effects). Right-hand-twist is assumed so if you have a rare left-hand-twist barrel please disable this. Metric Scope allows for direct input of scope turret values in mRad, and Wind Drift in Degrees changes the way you specify wind from the O'Clock format to degrees.

Note that many manufactures have BC data available from their website. Also note that while we made our best effort to provide a reliable solution, there is no guarantee of any specific results so please spend time to verify the results against printed ballistic charts before using this application.

If you have questions please email [bulletflight@knightarmco.com](mailto:bulletflight@knightarmco.com)  
Please report reproducible bugs so they may be fixed.

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