

EAGLE BALLISTICS APP
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EAGLE BALLISTICS
The Complete Guide to Precision Ballistics
Understanding the App, Its Technology, and Real-World
Applications
By James Eagleman
MSG (Ret.), U.S. Army

CHAPTER 1 — INTRODUCTION TO EAGLE BALLISTICS

Understanding the Science, Technology, and Innovation Behind Every Shot

Every long-range shot is a test of knowledge, experience, and preparation. Successful long-range shooting involves much more than simply aiming a rifle and pulling the trigger. It requires understanding the many factors that influence a bullet's flight from the muzzle to the target.

Gravity, atmospheric pressure, temperature, bullet velocity, ballistic coefficient, shooting angle, and wind all influence the final point of impact. Even small errors in these measurements can produce significant differences at extended distances.

Eagle Ballistics was developed to bring these factors together into one comprehensive ballistic application, providing shooters with the information necessary to make accurate and informed shooting decisions.

However, Eagle Ballistics was designed to do more than simply calculate elevation and wind corrections.

It was developed to help shooters understand the science behind their ballistic solutions while incorporating advanced technology, including patented wind-reading methods developed through decades of research, observation, and practical long-range shooting experience.

The purpose of this book is to explain not only how to operate Eagle Ballistics but also how the technology works and why each input matters.

THE DEVELOPMENT OF EAGLE BALLISTICS

Throughout my military career and more than four decades of long-range shooting experience, I have studied the relationship between bullet flight, atmospheric conditions, and the practical challenges shooters encounter in the field.

One of the greatest challenges in long-range shooting has always been accurately determining the effects of wind.

Traditional ballistic calculators generally require the shooter to enter a wind speed and direction. The calculator then determines the resulting horizontal correction based on the bullet's ballistic characteristics and flight conditions.

While this approach provides useful information, the greatest challenge often occurs before the wind speed is entered.

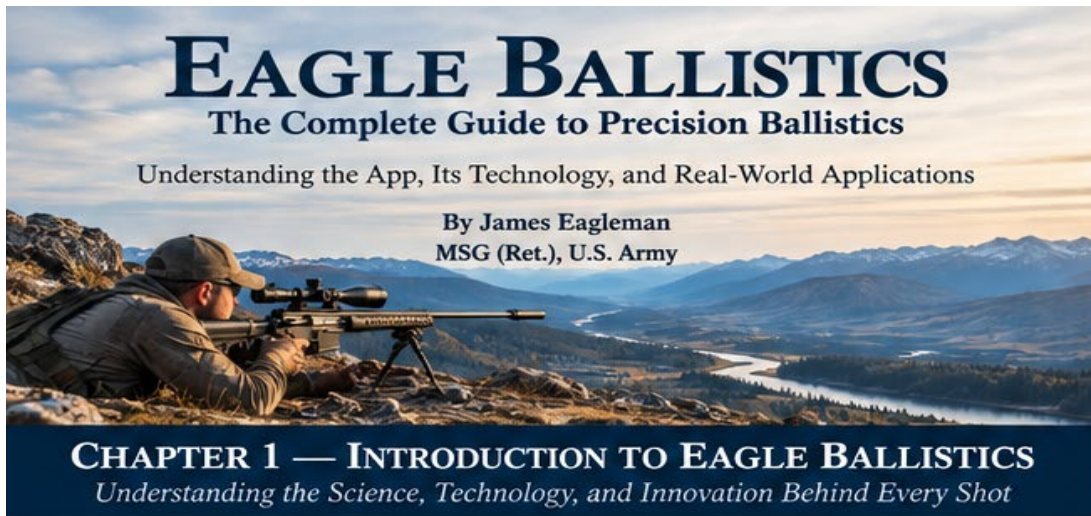
How does the shooter determine the wind the bullet will actually encounter?

Wind conditions at the shooter's position may be significantly different from those encountered along the bullet's trajectory. Terrain, vegetation, elevation changes, atmospheric conditions, and the height of the bullet above the ground can all influence the wind.

These observations became an important part of my research and ultimately contributed to the development of the Eagleman Wind Technique.

The Eagleman Wind Technique incorporates methods of observing atmospheric conditions and interpreting their relationship to bullet flight.

This technology became an important part of Eagle Ballistics.



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Eagle Ballistics • James Eagleman

1

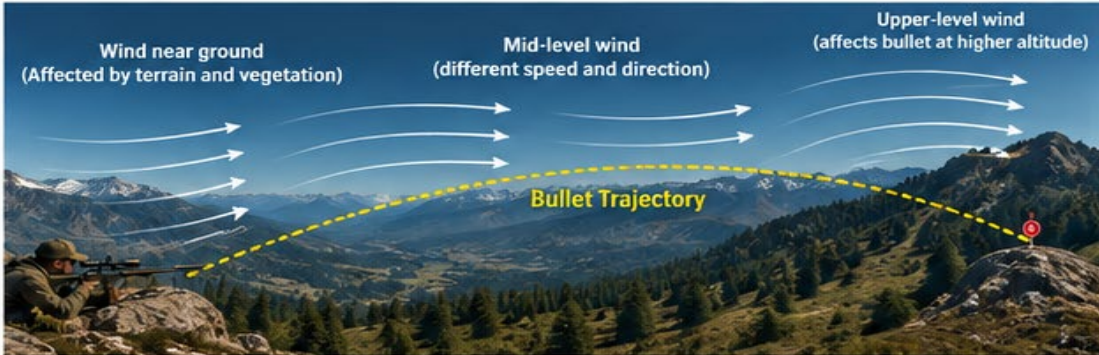
UNDERSTANDING WIND VARIATIONS

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MORE THAN A BALLISTIC CALCULATOR

Eagle Ballistics combines traditional ballistic calculations with advanced environmental measurements, specialized shooting tools, and patented wind-reading technology.

The application is designed to help shooters develop accurate rifle profiles, evaluate environmental conditions, calculate bullet trajectories, and determine appropriate shooting corrections.

MAJOR CAPABILITIES OF EAGLE BALLISTICS

- | | | | |
|---|---|---|--|
|  | 1. Rifle and ammunition profile management. |  | 10. Mirage, rain, and snow wind-reading methods. |
|  | 2. Ballistic coefficient and muzzle velocity calculations. |  | 11. True ballistic coefficient calculations. |
|  | 3. Environmental measurements and atmospheric corrections. |  | 12. Zero Scope Angle Lock. |
|  | 4. Station pressure and geographic gravity calculations. |  | 13. Probability-of-impact calculations. |
|  | 5. Coriolis and Eötvös effect calculations. |  | 14. Bluetooth integration with compatible environmental devices. |
|  | 6. Spin drift and aerodynamic jump corrections. |  | 15. Laser rangefinder integration. |
|  | 7. Maximum ordinate and bullet time-of-flight information. |  | 16. PRS competition tools and multiple-target management. |
|  | 8. Advanced wind-gradient and apex-wind calculations. |  | 17. Rifle profile and competition data sharing. |
|  | 9. Patented wind-reading technology using atmospheric observations. | | |



Each of these features serves a specific purpose. Understanding how they work together is essential to obtaining accurate ballistic solutions.

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Some of the major capabilities include:

1. Rifle and ammunition profile management.
2. Ballistic coefficient and muzzle velocity calculations.
3. Environmental measurements and atmospheric corrections.
4. Station pressure and geographic gravity calculations.
5. Coriolis and Eötvös effect calculations.
6. Spin drift and aerodynamic jump corrections.
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PATENTED WIND TECHNOLOGY INSIDE EAGLE BALLISTICS

One of the most important subjects covered throughout this book will be the patented wind technology incorporated into Eagle Ballistics.

This technology is based on the Eagleman Wind Technique, which I developed and refined through years of studying wind behavior and its effects on long-range bullet flight.

The technology is associated with United States Patent No. 11,415,592 B2, issued August 16, 2022.

Unlike approaches that rely exclusively on estimating wind speed from vegetation or taking a wind measurement at the shooting position, the Eagleman Wind Technique emphasizes observing atmospheric conditions along the bullet's flight path.

The technique incorporates observations of mirage, rain, and snow to help determine wind conditions.

These observations can provide valuable information about wind movement at distances where conventional handheld wind meters cannot directly measure conditions.

Eagle Ballistics incorporates specialized calculations that help convert these observations into wind information used by its ballistic solver.

Throughout this book, we will examine how this technology operates within the application and how shooters can use it in practical situations.

We will also explore the relationship between wind speed, bullet trajectory, maximum ordinate, and the surrounding terrain.

UNDERSTANDING MAXIMUM ORDINATE AND APEX WIND

An important concept in Eagle Ballistics is maximum ordinate.

Maximum ordinate is the greatest vertical height of the bullet's trajectory above the straight line connecting the muzzle and the target.

This point is significant because the bullet may be traveling considerably higher than the shooter's position or the target.

Wind conditions at this elevation can differ from those measured near the ground.

For example, a shooter may measure a wind speed of 5 miles per hour at approximately 6 feet above the ground.

However, if the bullet reaches a maximum ordinate of 30 feet, the wind at that elevation may be stronger or weaker depending on the surrounding terrain and atmospheric conditions.

Eagle Ballistics incorporates wind-gradient calculations that can estimate how wind speed changes with height.

These calculations help shooters evaluate potential differences between surface wind measurements and wind conditions at the bullet's maximum ordinate.

The application also incorporates apex-wind calculations to help evaluate wind conditions associated with the highest portion of the bullet's trajectory.

It is important to understand that the bullet is influenced by wind throughout its flight, not exclusively at maximum ordinate.

The complete wind correction depends on the wind encountered along the trajectory and the bullet's response to those conditions.

Nevertheless, maximum ordinate provides an important reference point for understanding the relationship between bullet height, terrain, and wind exposure.

Later chapters will explain how Eagle Ballistics uses these concepts and how shooters can apply the resulting information.

READING THE ATMOSPHERE

Wind cannot always be measured directly at the location where the bullet is traveling.

This is particularly true when shooting across valleys, ridgelines, open fields, and other areas where wind conditions can vary significantly.

The Eagleman Wind Technique uses visible atmospheric indicators to help evaluate wind movement.

Mirage, rain, and snow can provide information about wind direction and movement when observed under suitable conditions.

Each indicator has characteristics that must be understood.

Mirage can reveal apparent atmospheric movement through the optical system.

Rain can provide visible movement patterns that may help estimate wind direction and speed.

Snow can also provide useful information, although snowflake characteristics and falling speed must be considered when interpreting its movement.

Eagle Ballistics includes specialized features intended to assist shooters in interpreting these observations.

Throughout this book, we will explain the technology behind these functions, the information required, and how the resulting wind estimates are incorporated into ballistic calculations.

These methods are not substitutes for understanding atmospheric conditions. They are tools intended to improve the shooter's ability to evaluate them.

ACCURATE INFORMATION PRODUCES ACCURATE SOLUTIONS

Regardless of how advanced a ballistic calculator becomes, the accuracy of its solution depends heavily on the information entered.

A ballistic solver cannot automatically correct for inaccurate muzzle velocity, incorrect ballistic coefficients, improper scope measurements, or environmental readings that do not represent actual conditions.

The principle is simple: Garbage in, garbage out.

For example, an incorrect muzzle velocity can produce an elevation error that becomes increasingly significant as distance increases.

An inaccurate ballistic coefficient can also affect predicted trajectory and retained velocity.

Incorrect station pressure or temperature measurements can introduce additional errors.

Wind presents an even greater challenge because it can change rapidly and may vary throughout the bullet's flight.

Eagle Ballistics provides tools to help shooters reduce these errors, but the shooter must understand how to obtain and verify accurate information.

This book will explain how to establish reliable rifle profiles, verify ballistic data, and recognize potential sources of error before taking a shot.

UNDERSTANDING THE TECHNOLOGY BEHIND THE ANSWER

One of my primary goals in developing Eagle Ballistics was to provide shooters with a greater understanding of their ballistic solutions.

Many shooters become dependent on the numbers displayed by a ballistic calculator without fully understanding how those numbers were determined.

A ballistic application may indicate that a particular shot requires a specific elevation adjustment and wind correction.

But why?

What caused the elevation correction to change?

How did the atmospheric conditions influence the bullet?

Why does wind speed at different elevations matter?

What happens when the shooting angle changes?

How do Coriolis, Eötvös, spin drift, and aerodynamic jump affect the solution?

These are important questions.

Throughout this book, we will examine the science behind these calculations and explain how Eagle Ballistics applies that information.

The objective is not to turn every shooter into a physicist or mathematician.

Instead, the objective is to provide enough understanding that shooters can recognize when a ballistic solution makes sense and identify possible errors when it does not.

CONNECTING TECHNOLOGY WITH PRACTICAL EXPERIENCE

Eagle Ballistics was designed for practical use in long-range shooting, hunting, and precision rifle competition.

The application combines ballistic calculations with tools intended to simplify the shooting process.

Compatible environmental sensors can provide atmospheric measurements.

Laser rangefinders can supply distance information.

Rifle profiles store the ballistic characteristics of individual shooting systems.

Advanced wind features help shooters evaluate atmospheric observations.

PRS competition features allow shooters to organize multiple targets, shooting stages, wind corrections, and moving-target information.

These capabilities are intended to reduce unnecessary calculations and help shooters concentrate on the shooting process.

However, technology does not replace sound marksmanship fundamentals.

A properly configured rifle, stable shooting position, consistent trigger control, and accurate range estimation remain essential.

Eagle Ballistics is designed to support the thinking shooter, not replace the shooter's knowledge or judgment.

WHAT YOU WILL LEARN IN THIS BOOK

This book will guide readers from the basic setup of Eagle Ballistics through its more advanced features.

We will begin by examining the application interface and learning how to create accurate rifle profiles.

Next, we will explore the ballistic information required by the solver, including muzzle velocity, ballistic coefficient, scope measurements, and environmental conditions.

From there, we will examine the advanced technology incorporated into Eagle Ballistics.

Special attention will be given to the patented Eagleman Wind Technique and the methods used to interpret atmospheric observations.

We will explain how maximum ordinate, apex wind, wind gradients, and environmental conditions relate to the calculations performed by the application.

Additional chapters will cover external device connections, rifle profile management, PRS competition features, hunting applications, and practical troubleshooting.

Real-world examples will be used to demonstrate how the various features work together.

The goal is to provide readers with a complete understanding of Eagle Ballistics, from entering their first rifle profile to applying advanced ballistic calculations in challenging shooting environments.

FINAL THOUGHTS

Long-range shooting is a combination of science, equipment, experience, and judgment.

Modern ballistic technology has made sophisticated calculations available to nearly every shooter.

However, understanding the information behind those calculations remains essential. Eagle Ballistics was developed to combine advanced ballistic science with practical shooting experience and specialized technology.

An important part of that development is the incorporation of the patented Eagleman Wind Technique, which provides additional methods for evaluating wind conditions through atmospheric observations.

Throughout this book, we will examine both the conventional ballistic calculations and the specialized technology that make up Eagle Ballistics.

My objective is not simply to teach you which buttons to press.

I want you to understand why the numbers change, what those numbers represent, and how to recognize when the information is accurate.

When you understand the bullet's flight path, the surrounding atmosphere, and the technology producing your ballistic solution, you become better equipped to make informed shooting decisions.

Eagle Ballistics is more than a ballistic calculator. It is a system designed to bring science, technology, and practical shooting knowledge together.

And understanding that system is where we begin.

CHAPTER 2 — THE DEVELOPMENT AND PURPOSE OF EAGLE BALLISTICS

The Development and Purpose of Eagle Ballistics

The development of Eagle Ballistics did not begin with computer code. It began with decades of long-range shooting experience, military instruction, and a continuous effort to answer one important question: how do we give shooters better information, not just more numbers?

Most ballistic calculators rely entirely on user-entered data. They solve mathematical equations very accurately, but they assume that the inputs perfectly represent the conditions the bullet will encounter.

That is rarely the case.

Early in my own long-range shooting experience, I realized that wind presented the greatest unknown. A ballistic calculator can tell you exactly how much a bullet will drift in a 10-mile-per-hour crosswind, but it cannot tell you whether the wind 400 yards downrange is actually 10.

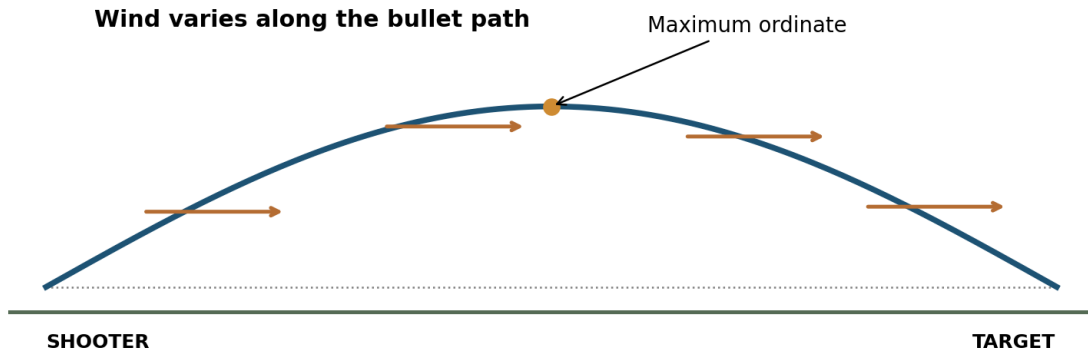


Figure 2.1 — Conceptual bullet trajectory and changing wind along the flight path (not to scale).

That realization led me to begin studying wind in 1988, and that research eventually evolved into the Eagleman Wind Technique, and later into the patented wind-reading technology that is now built into Eagle Ballistics.

Eagle Ballistics was created to bring traditional ballistic science together with advanced environmental analysis and practical shooting tools.

It was designed to help shooters understand not only where the bullet should go, but why it behaves the way it does.

The patented wind technology is an important part of that, but Eagle Ballistics also incorporates many other elements, including Coriolis, Eötvös, spin drift, aerodynamic jump, station pressure, gravity at your location, and advanced wind gradient calculations.

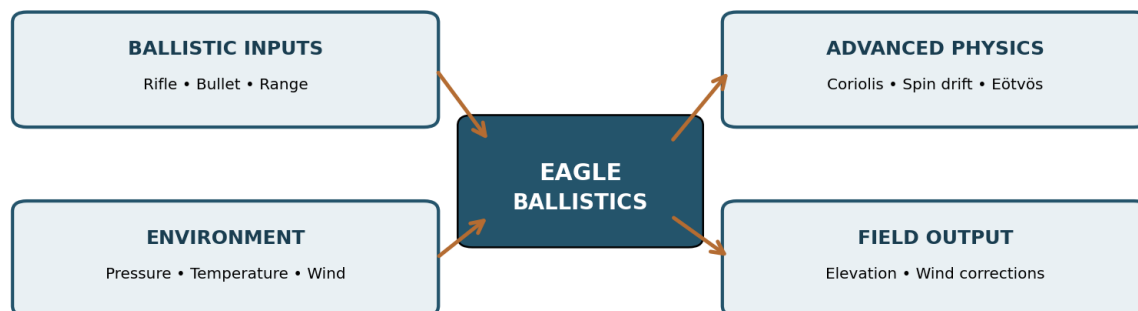


Figure 2.2 — How ballistic inputs, environmental information, and advanced physics contribute to field corrections.

Those features were built with a simple goal: give shooters the right information at the right time in a format that supports decision-making in the field.

In the chapters that follow, we'll look at how each part of the app was designed, why the inputs matter, and how the patented wind technology integrates with conventional ballistics.

Eagle Ballistics was built for the thinking shooter. My intent has always been to provide a tool that supports your knowledge, not replaces it.

That is the purpose behind Eagle Ballistics, and that is what this book will explain.

CHAPTER 3 — BUILDING A RIFLE PROFILE

A Step-by-Step Guide to Setting Up Your Rifle

Introduction

Before Eagle Ballistics can calculate an accurate ballistic solution, it must know the characteristics of your rifle, scope, and ammunition. This information is stored in a rifle profile. Think of the profile as the foundation of the entire ballistic solution: if the foundation is incorrect, the calculations that follow can be affected.

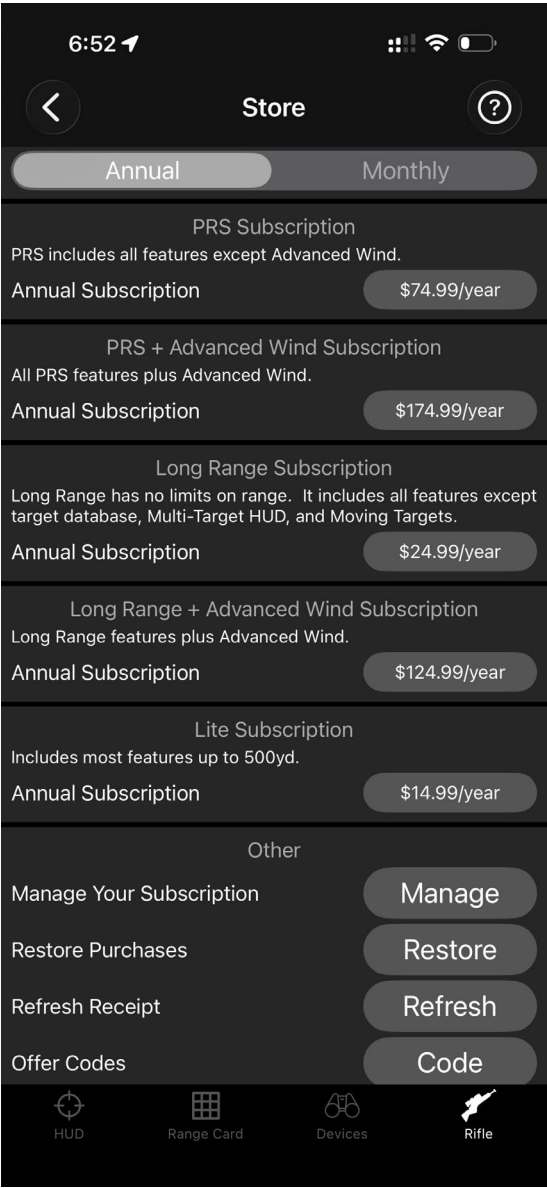
This chapter explains how to install and configure Eagle Ballistics, create a profile, and complete its three main blocks: Rifle and Scope, Bullet, and Zero.

Initial Installation and Permissions

When first installing Eagle Ballistics, allow the permissions requested by the app so supported features can operate as intended. These may include location, motion and fitness, Bluetooth, and other device functions. Location supports geographic calculations such as local gravity and Coriolis effects. Station pressure requires a suitable sensor or data source; permission alone does not measure pressure.

If you decline a permission, some functions may be limited or require manual input. You can review permissions later in your phone settings.

Select a Subscription



Tap the rifle icon in the bottom-right corner, open Settings, and select the shopping cart in the upper-left corner. Choose the subscription appropriate for your shooting.

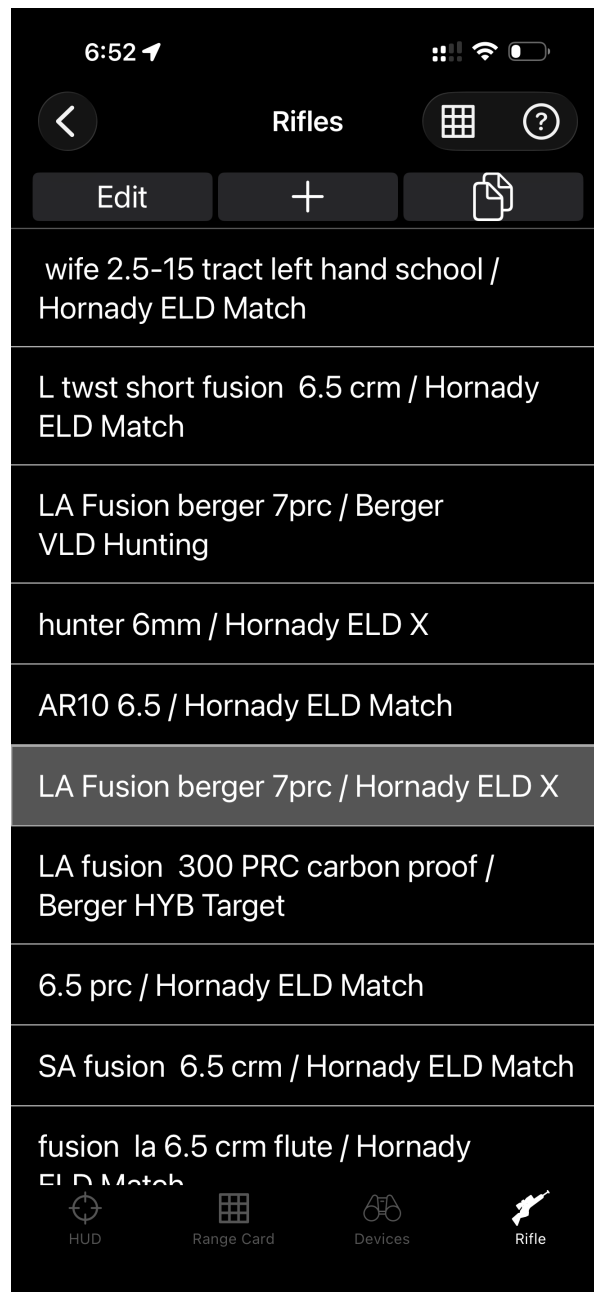
Figure 4-1. Subscription options in the Eagle Ballistics store.

Lite Mode supports basic use to 500 yards. Long Range supports extended-distance solutions within the available ballistic model and velocity data. PRS provides multi-target competition functions. Additional advanced wind subscriptions provide mirage, rain, snow, and Apex Wind features.

After activating your selection, return to the rifle profile page.

Create or Duplicate a Profile

Tap the plus sign (+) at the top of the profile page to add a gun profile. You can create multiple profiles. The overlapping-paper icon duplicates an existing profile, which is useful when one rifle fires several ammunition loads.



A new profile may initially appear as “Unnamed .308.” Select it, then tap the rifle icon in the bottom-right corner again to enter the builder. Choose Advanced Mode to access the complete set of inputs; Basic Mode limits the available fields.

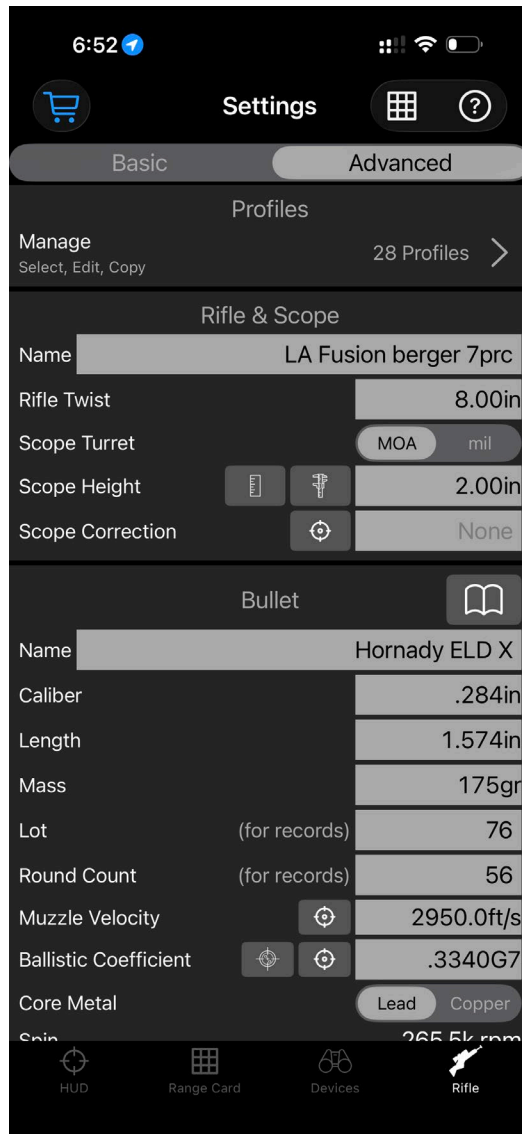


Figure 4-3. Advanced profile settings and rifle inputs.

Block 1 — Rifle and Scope

Enter a clear rifle name. For barrel twist, use a positive value for right-hand twist and a negative value for left-hand twist. Choose MOA or MIL to match your scope adjustments.

For scope height, tap the built-in ruler. Place the phone beside the rifle and align the top measurement line with the center of the

scope and the bottom line with the center of the firing pin hole in the bolt. For a first focal plane scope, the recommended measuring position is toward the middle-front portion of the scope; for a second focal plane scope, toward the middle-rear portion. The goal is the true optical-centerline-to-bore-centerline distance.

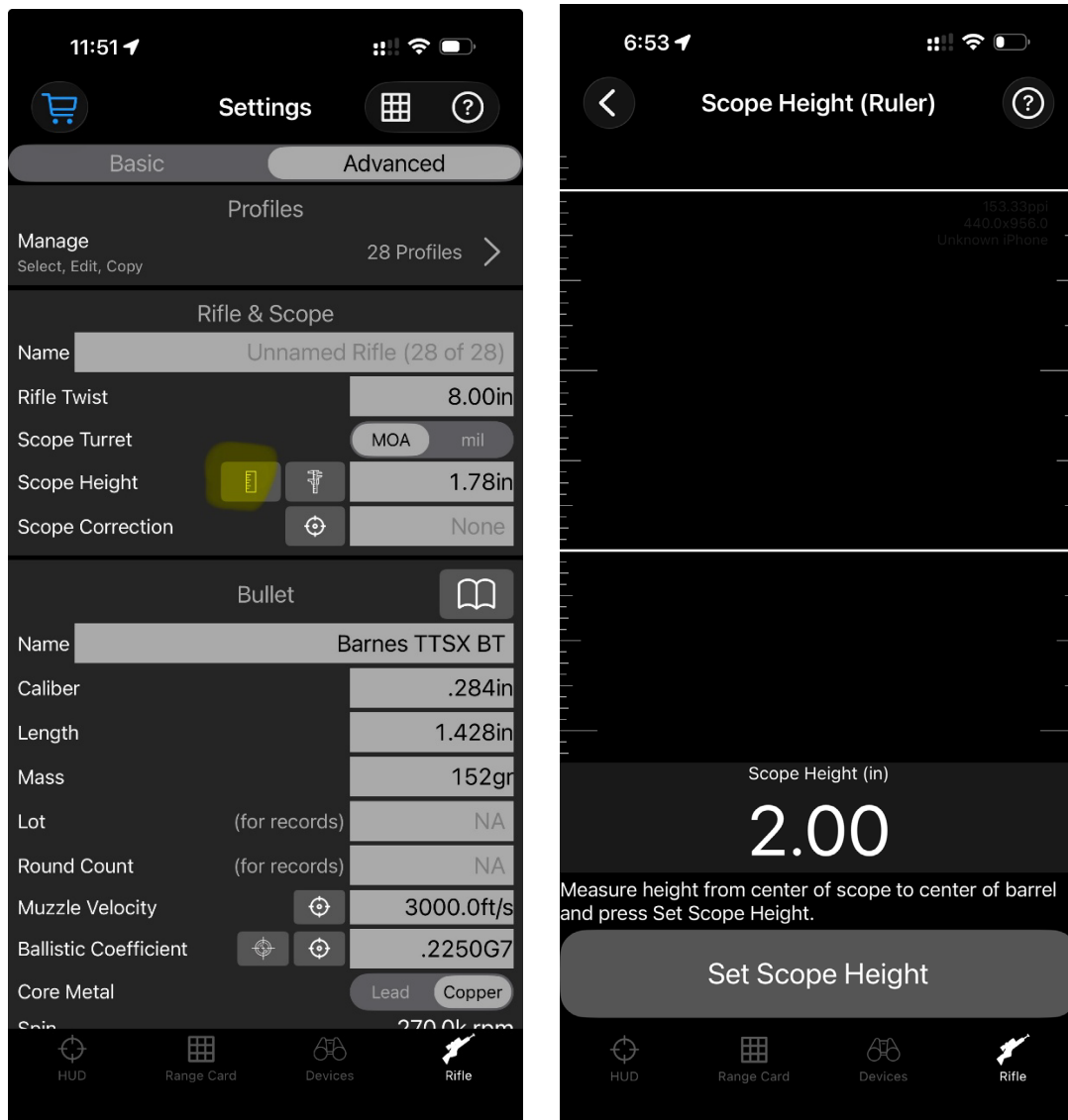
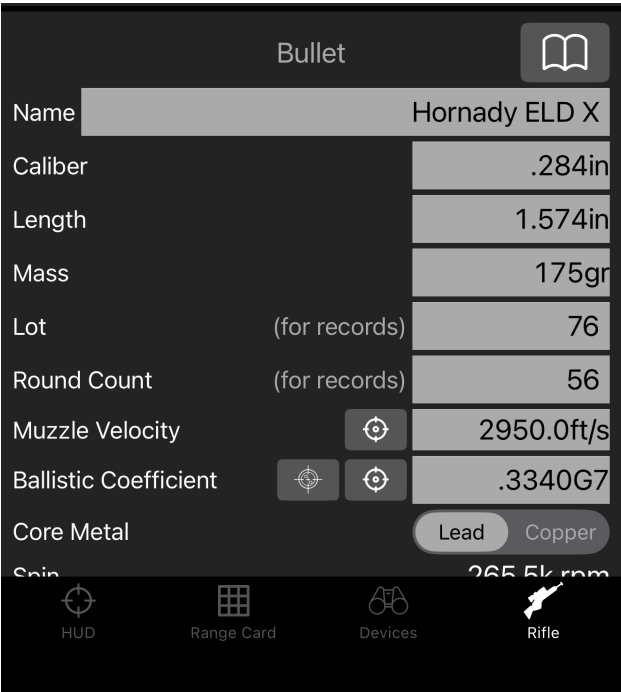
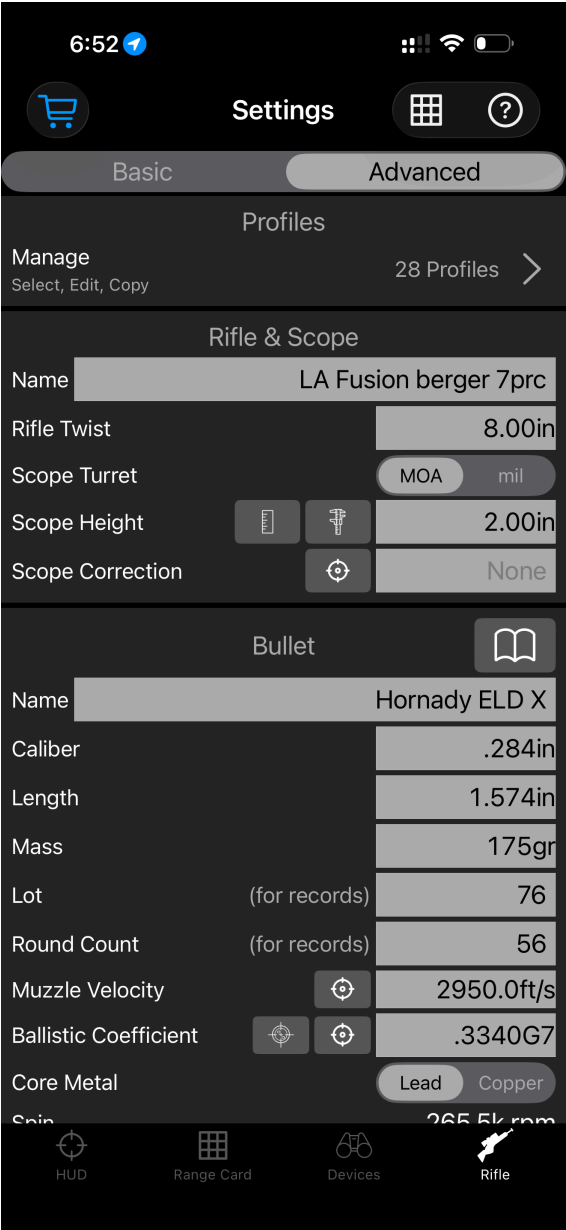


Figure 4-4. Built-in scope height ruler.

Next enter the Scope Correction Factor, which represents how closely the scope tracks its indicated adjustments. Eagle Ballistics includes a calculator for this measurement. The full scope-tracking procedure will be explained in a dedicated chapter.

Block 2 — Bullet Information



Tap the book icon to open the built-in bullet library. Select the bullet manufacturer—not automatically the ammunition manufacturer, since ammunition brands may load another company's bullets. Choose the caliber diameter, then the bullet weight and type, and tap OK.

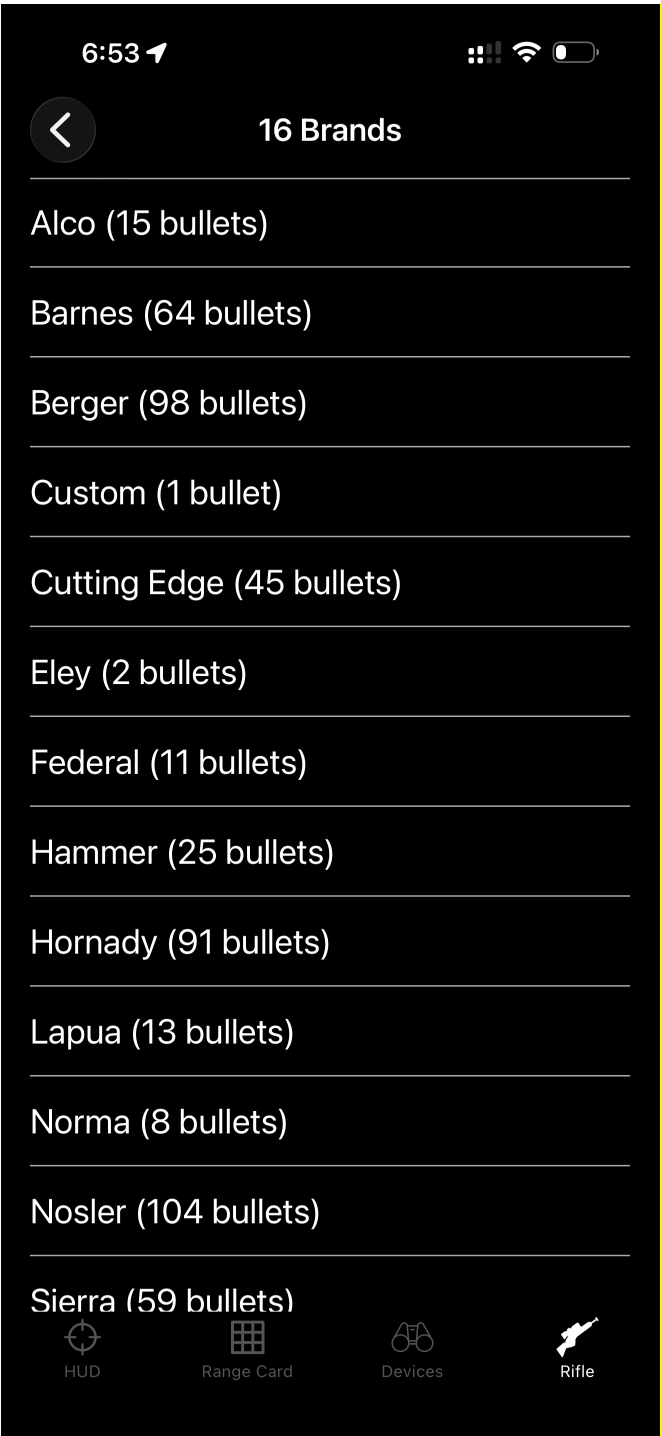


Figure 4-5. Bullet manufacturer library.

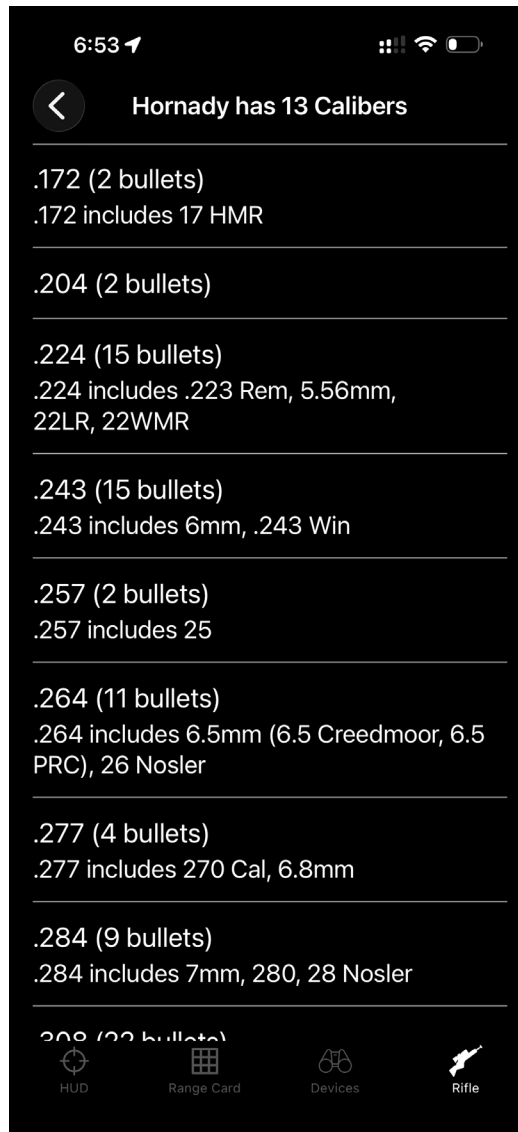


Figure 4-6. Select the bullet diameter within the manufacturer library.

The library populates available bullet information, including diameter, length, weight, ballistic coefficient, and nominal velocity.

The screenshot shows the 'Bullet' entry screen in the Eagle Ballistics app. The interface is dark-themed with white text. At the top, the title 'Bullet' is centered, with a book icon on the right. Below this, various fields are listed for data entry:

- Name: Hornady ELD X
- Caliber: .284in
- Length: 1.574in
- Mass: 175gr
- Lot: (for records) 76
- Round Count: (for records) 56
- Muzzle Velocity: 2950.0ft/s (with a target icon to its left)
- Ballistic Coefficient: .3340G7 (with two target icons to its left)
- Core Metal: Lead (selected) Copper
- Spin: 265.5k rpm

At the bottom, there are four icons with labels: HUD, Range Card, Devices, and Rifle. An orange arrow points to the Muzzle Velocity field, indicating where to enter the actual chronograph result.

Replace the nominal velocity with your actual chronograph result.

I recommend a minimum of five shots to obtain an average muzzle velocity.

After you enter actual velocity

Eagle Ballistics calculates bullet rotational speed (RPM) and gyroscopic stability. The app highlights RPM above 300,000 in yellow and flags stability below the preferred 1.6 threshold. A factor of 1.5 may work in some circumstances, but 1.6 is my preferred long-range margin. These are application caution thresholds, not universal bullet-failure or stability guarantees.

6:53

Settings

Rifle & Scope

Name LA Fusion berger 7prc

Rifle Twist 8.00in

Scope Turret MOA mil

Scope Height 2.00in

Scope Correction None

Bullet

Name Hornady ELD X

Caliber .284in

Length 1.574in

Mass 175gr

Lot (for records) 76

Round Count (for records) 56

Muzzle Velocity 2950.0ft/s

Ballistic Coefficient .3340G7

Core Metal Lead Copper

Spin 265.5k rpm

Gyroscopic Stability 1.707

Zero

Zero Range 100yd

HUD Range Card Devices Rifle

Figure 4-7. Rifle, scope, bullet data, spin and stability indicators.

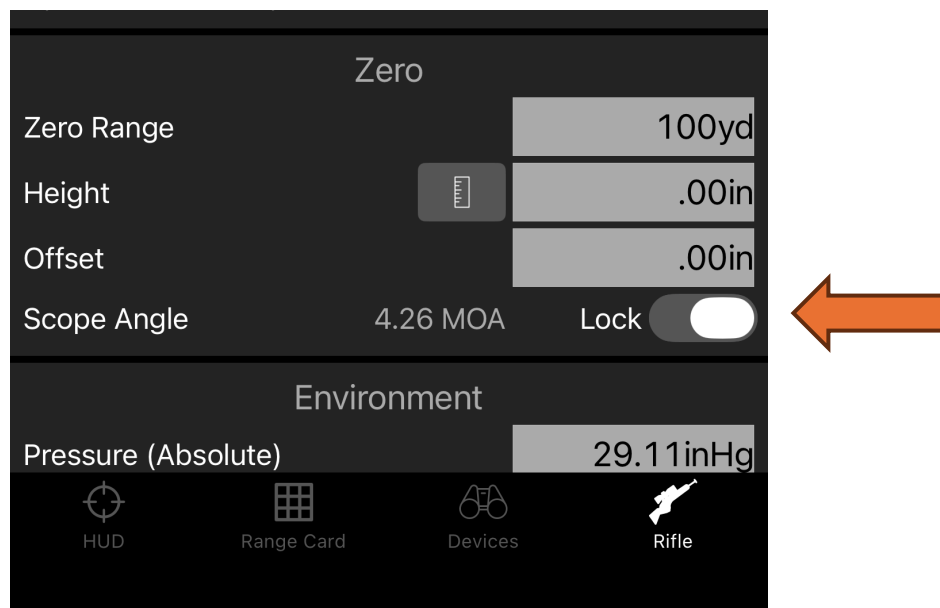
Finally, use the crosshair or circular icon beside the ballistic coefficient to open the True Ballistic Coefficient calculator. We will cover the full truing procedure in another chapter. Once the verified coefficient is entered, the Bullet block is complete.

Block 3 — Zero

Enter the actual Zero Range at which the rifle was sighted in. Zero Height records any vertical difference between the point of aim and the center of the group; Zero Offset records horizontal error. For example, if the rifle groups one-quarter inch high at 100 yards, record that measured height rather than pretending the zero is perfect.

Use the app's ruler against the paper target to measure the displacement. If the rifle has a perfect zero, leave the corresponding height and offset at zero. Eagle Ballistics incorporates the measured zero error into subsequent solutions.

Once the rifle, bullet, and zero data are correct, activate Zero Scope Angle Lock. A separate chapter will explain this feature and when the lock must be refreshed after profile changes.



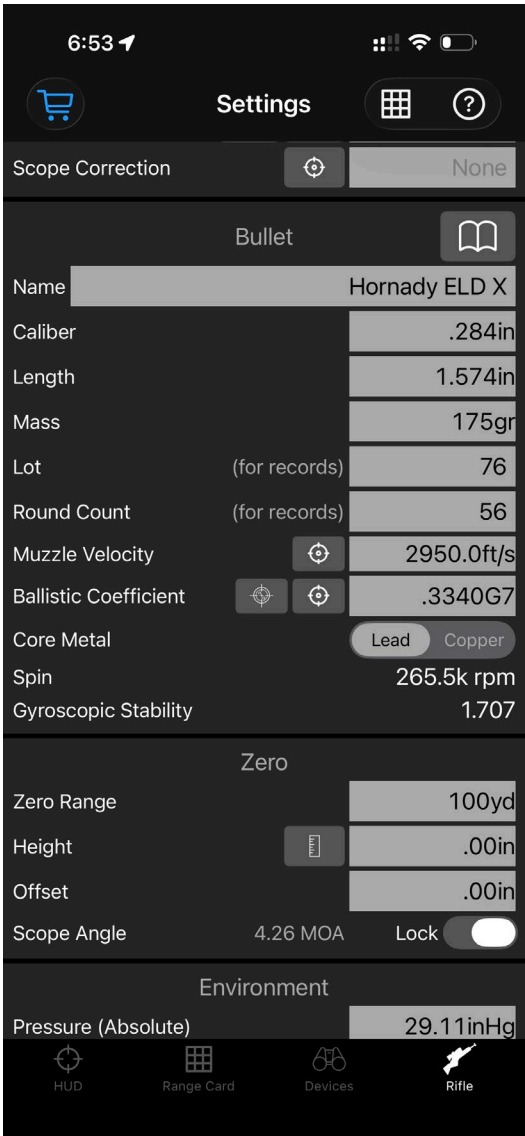


Figure 4-8. Zero settings and Scope Angle Lock.

Final Profile Review

Before using the profile, confirm the rifle name, twist rate and direction, MOA/MIL selection, scope height, scope correction factor, bullet details, chronographed muzzle velocity, RPM and stability indicators, ballistic coefficient, zero range, zero height, zero offset, and Zero Scope Angle Lock.

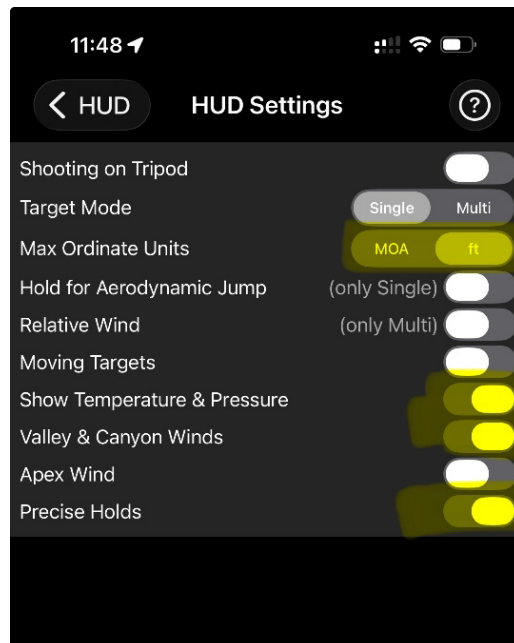
Accuracy begins with the profile. Measure rather than estimate, verify your information, and take the time to build a dependable foundation for every ballistic solution.

CHAPTER 4 — SETTING UP THE HEADS-UP DISPLAY

From your completed gun profile, tap HUD in the bottom-left corner. On the HUD, tap the gear icon in the upper-left corner to open settings.

- Turn on “Show Temperature Pressure.”
- Turn on “Valley and Canyon Winds.”
- Change the Maximum Ordinate display unit from MOA or MIL to feet.

Tap Back to return to the Heads-Up Display. These settings make the environmental information and maximum ordinate easier to review during the truing procedure.



Step 2 — Set Inclination and Azimuth

On the HUD, press Inclination and Azimuth with your thumb. If prompted, allow camera access. Aim the camera at the target

you intend to shoot and tap “Set Both.” This sets the shooting inclination and azimuth used by the app. Verify the values if the phone’s compass may be affected by nearby metal or equipment.

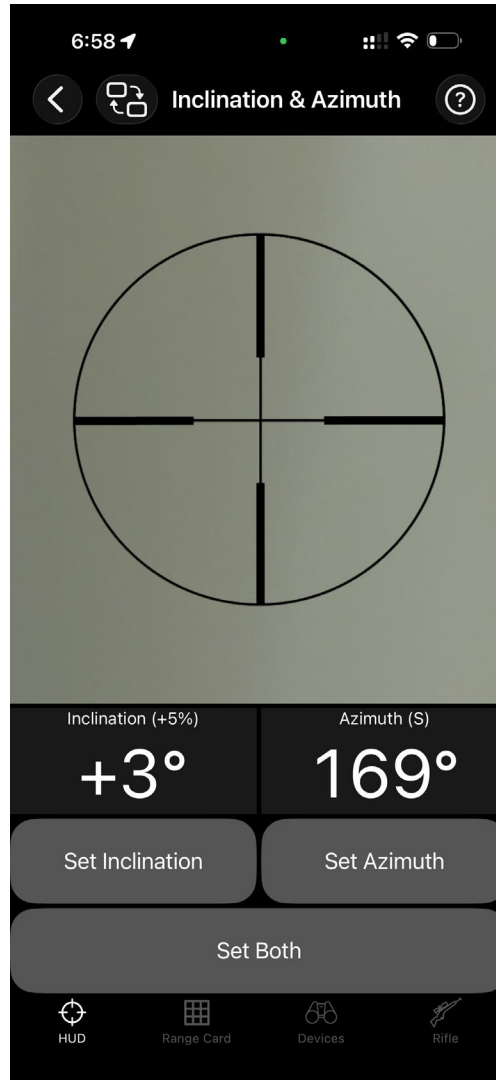


Figure 5.3 — Inclination and azimuth measurement screen.

Step 3 — Enter Range and Wind

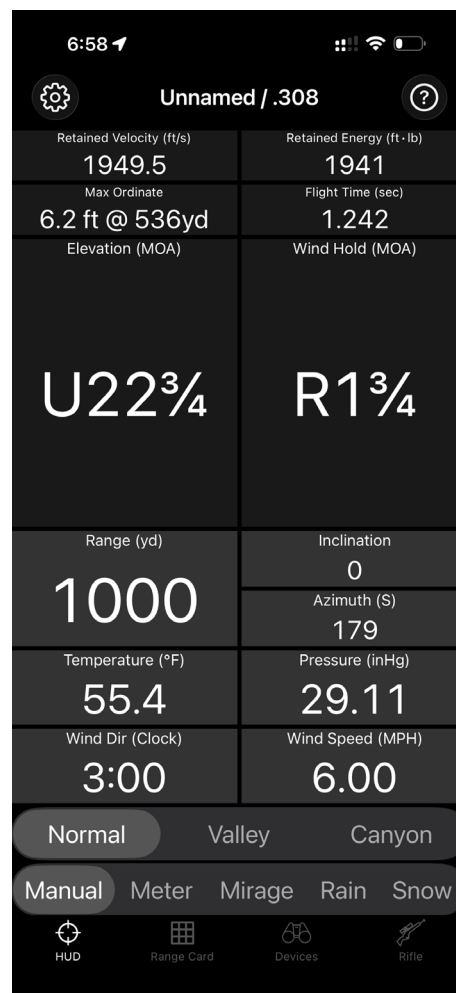
Enter the measured distance to the target where you will true your BC. My recommended minimum is 600 yards. At greater distances, the effects of drag and atmospheric conditions

become more apparent, which helps distinguish the true ballistic behavior from short-range variations.

Enter the current wind speed and direction. Eagle Ballistics uses this information to account for aerodynamic jump. Keep these wind inputs current as conditions change so that wind-related vertical movement is not mistaken for a ballistic coefficient error.

Step 4 — Shoot and Determine Actual Elevation

Read the elevation dial-up displayed by Eagle Ballistics and dial that value on your scope turret. Establish a stable shooting position and fire a minimum three-shot group at the target.



U.S. Patent 11,415,592 B2

Figure 5.4 — HUD elevation, wind, and atmospheric data.

At this stage, do not worry if the group does not land exactly at the point of aim. The initial BC came from the bullet manufacturer and may not perfectly represent the result from your rifle and ammunition combination.

Measure the vertical difference between the center of the group and your point of aim using your scope or target measurements. Adjust the elevation turret up or down and shoot again until the group is on the desired horizontal waterline or centered on the intended aim point.

Record the actual elevation setting on your turret that produced the correct impact at that distance. This is the elevation required by your rifle system under the measured conditions. Use repeatable group centers rather than a single impact when deciding the correction.

Step 5 — Open the True BC Calculator

Tap the rifle icon in the bottom-right corner, return to the Bullet block, and find the crosshair-circle icon immediately to the left of the ballistic coefficient number. Tap it to open the BC calculator.

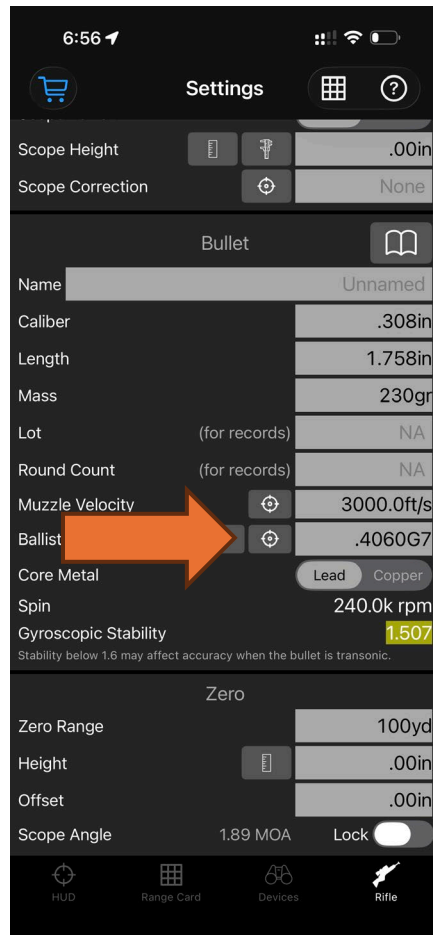


Figure 5.2 — Bullet information and ballistic coefficient controls.

The calculator shows the truing distance, the Elevation Expected from the existing BC, and the Elevation Required. Enter your actual verified turret setting in “Elevation Required.” Eagle Ballistics then calculates an updated ballistic coefficient.

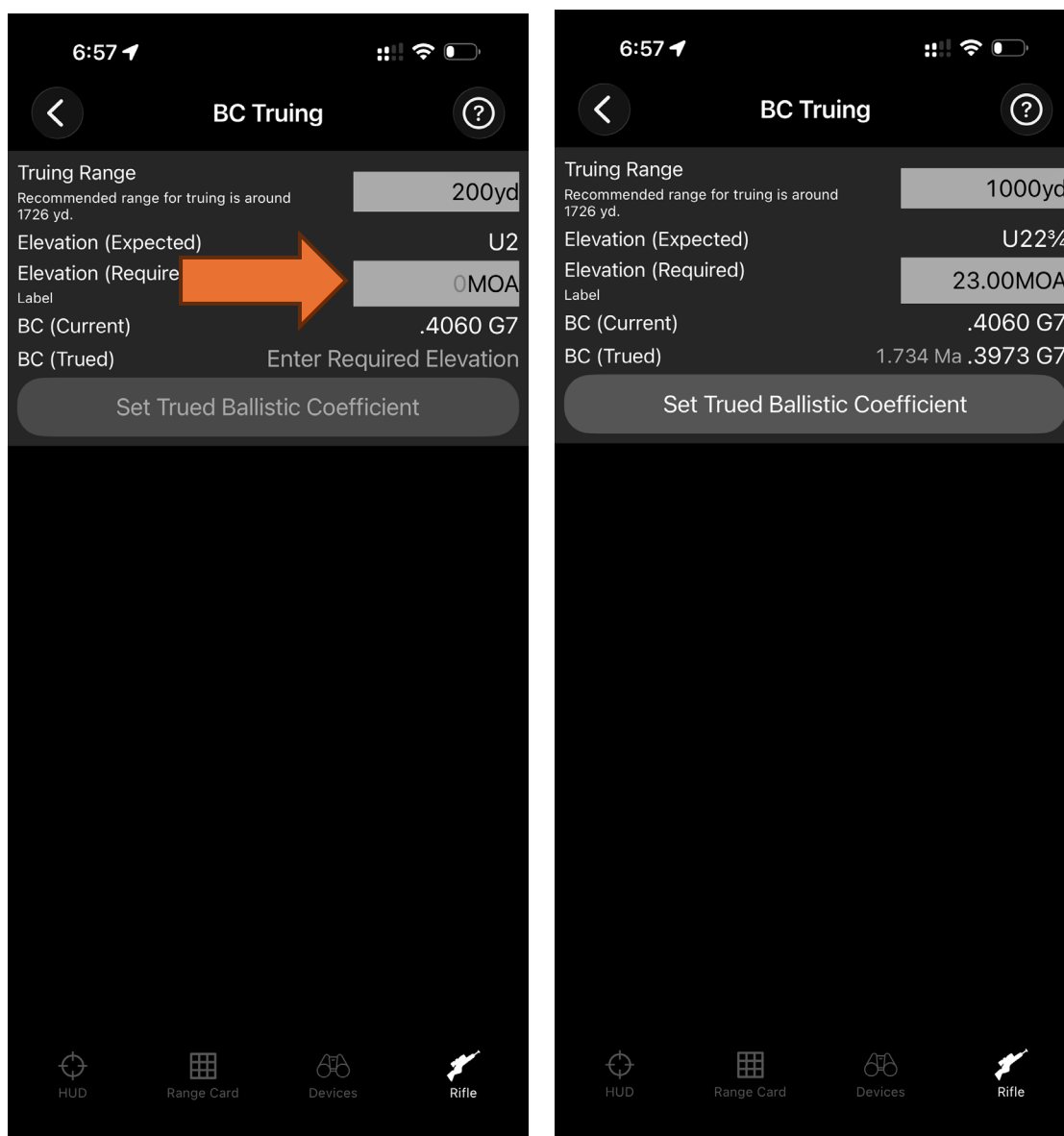


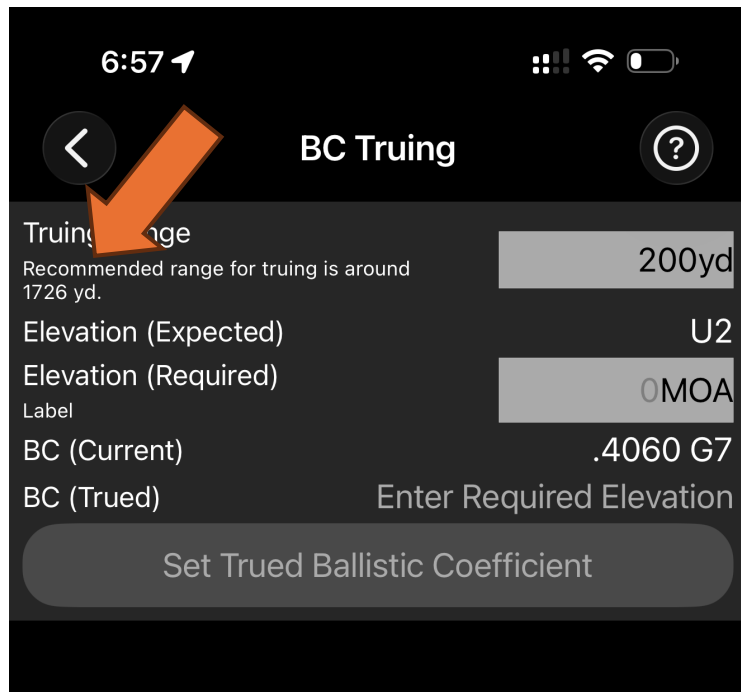
Figure 5.6 — Example BC truing result at 1,000 yards.

Figure 5.5 — BC truing screen before entering required elevation.

You will also see a Mach number associated with the BC calculation. Eagle Ballistics uses Mach information when evaluating ballistic behavior across the bullet's velocity regime.

Understanding the Recommended Truing Range

The calculator also shows a recommended Truing Range. For example, it might suggest approximately 1,726 yards. That does not mean you must true at exactly 1,726 yards.



The recommendation is intended to place the test roughly 15 percent before the transonic region, where drag-related differences become easier to identify while the bullet remains comfortably supersonic. The actual distance varies with the bullet, muzzle velocity, and environmental conditions. A shorter verified range can still be used; my starting recommendation is at least 600 yards.

Step 6 — Verify the New BC Across Distances

After entering the corrected BC, return to the HUD and verify your results on targets at close, medium, and long distances. The goal

is to confirm that the ballistic solution is consistent across the full range, not just at the one distance used for truing.

When the profile, zero, velocity, scope tracking, and environmental inputs are correct, first-round impacts should become more repeatable. If the group centers are consistently off, check the rifle zero first. Also review range measurements, scope tracking, and environmental data before changing the BC again.

Keep a chronograph running during verification when practical, and watch for velocity spikes or unusual variation. Do not chase individual velocity readings, especially with factory ammunition. Use a representative average and look for consistent performance.

Update Wind Conditions During Verification

If the wind changes speed or direction, update those values in Eagle Ballistics before continuing. The app will recalculate aerodynamic jump and its associated elevation adjustment. Otherwise, wind-induced vertical movement can look like an incorrect elevation solution and tempt the shooter to change a BC that was already correct.

Final Thoughts

Truing your ballistic coefficient is a process of measuring actual performance and matching the solver to your rifle. Start with a sound profile and zero, shoot a repeatable group at a known

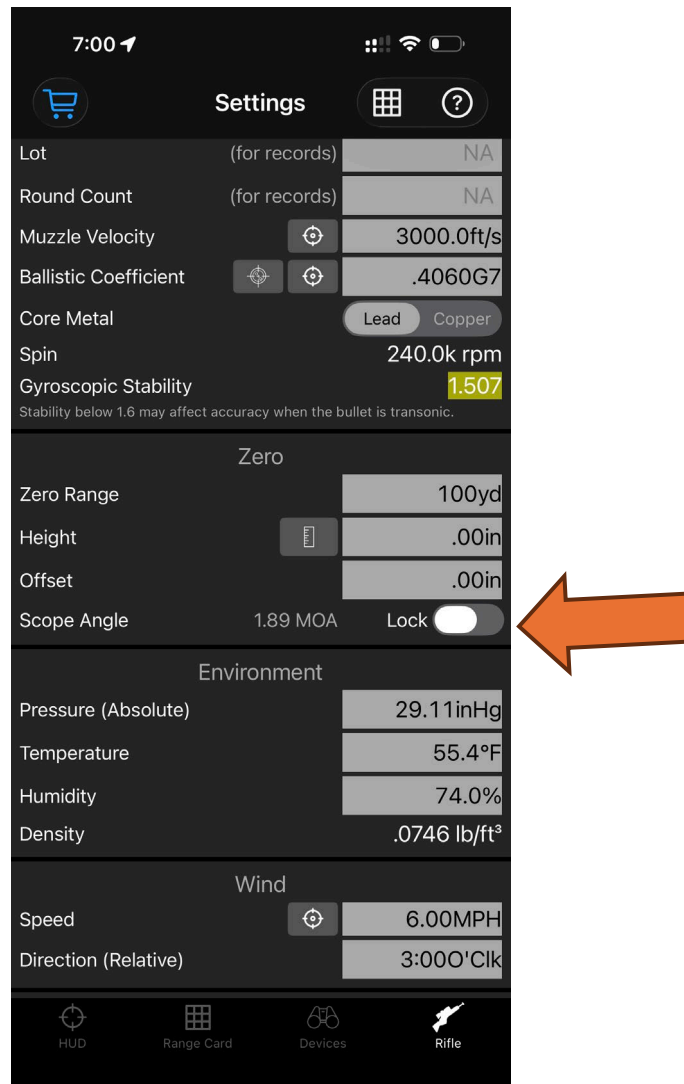
distance, find the actual turret elevation, and enter that value in the True BC calculator. Then verify the solution at several distances while keeping your environmental information current.

Remember: do not chase one shot, one velocity spike, or one wind change. Confirm the group center, verify the zero, and let accurate measurements guide the calculation.

CHAPTER 5 — ZERO SCOPE ANGLE LOCK

Preserving Your Rifle's Zero Across Changing Environmental Conditions

Introduction



Zero Scope Angle Lock is a feature in Eagle Ballistics that preserves the calculated angular relationship between the rifle's bore and the scope's line of sight at an established zero. It provides a consistent reference for calculating firing solutions

when atmospheric conditions change. A properly verified zero and accurate rifle profile are essential before activating the feature.

When to Use Zero Scope Angle Lock

Use Zero Scope Angle Lock when initially building a rifle profile, after changing or reestablishing the rifle's zero, and after updating a verified muzzle velocity. The stored relationship should reflect the rifle's current configuration and ballistic information.

Step 1 — Establish a Proper Zero

Zero the rifle at your selected distance, such as 100 yards, and verify the point of impact. If a perfect zero cannot be obtained, accurately enter the observed vertical zero-height error and horizontal zero-offset error in Eagle Ballistics before locking the scope angle.

Step 2 — Verify Your Ballistic Information

Confirm muzzle velocity, scope height, zero distance, bullet information, and the environmental conditions used at zero. Use a representative chronograph average rather than an isolated velocity reading. Incorrect inputs can produce an incorrect calculated scope angle.

7:00

Settings

Lot (for records) NA

Round Count (for records) NA

Muzzle Velocity 3000.0ft/s

Ballistic Coefficient .4060G7

Core Metal Lead Copper

Spin 240.0k rpm

Gyroscopic Stability 1.507

Stability below 1.6 may affect accuracy when the bullet is transonic.

Zero

Zero Range 100yd

Height .00in

Offset .00in

Scope Angle 1.89 MOA Lock

Environment

Pressure (Absolute) 29.11inHg

Temperature 55.4°F

Humidity 74.0%

Density .0746 lb/ft³

Wind

Speed 6.00MPH

Direction (Relative) 3:00O'Clk

HUD Range Card Devices Rifle

Figure 6.1 — Eagle Ballistics Rifle Settings screen. The Zero section shows Zero Range, Height, Offset, Scope Angle, and the Lock switch.

Step 3 — Activate Zero Scope Angle Lock

Return to the rifle profile and locate Zero Scope Angle Lock in the Zero block. Turn it on after the zero and profile information are correct. Eagle Ballistics uses a reverse ballistic calculation to establish the bore-to-scope angular relationship required by the zero and retains that relationship as a reference.

How Zero Scope Angle Lock Works

The scope's line of sight and the bore axis are not parallel. To place the bullet at the point of aim at the zero distance, the barrel has a particular angular relationship to the sight line. The required trajectory depends on muzzle velocity, the bullet's aerodynamic characteristics, and atmospheric conditions, including station pressure and temperature. Zero Scope Angle Lock calculates and remembers that angular relationship. This serves a similar purpose to remembering the zero atmosphere, but the retained reference is the calculated scope-to-bore angle.

Step 4 — Traveling to a Different Location

Suppose a rifle is zeroed in Michigan and later used in Colorado. Changes in temperature, station pressure, and altitude affect bullet flight. If the rifle's mechanical zero and ammunition performance remain unchanged, the physical bore-to-scope relationship remains the same. Eagle Ballistics can use the locked angle with updated environmental conditions to calculate new corrections. Verify zero at the destination whenever

practical: the lock cannot detect a shifted optic, equipment damage, or an actual mechanical change in zero.

Step 5 — When Muzzle Velocity Changes

When a reliable chronograph average indicates a changed muzzle velocity, enter the new value in the rifle profile. Verify and, if necessary, reestablish the rifle's zero. Then turn Zero Scope Angle Lock off and back on to recalculate the stored reference using the updated information. Do not chase individual velocity spikes, especially with factory ammunition.

Step 6 — When Your Zero Changes

Any time you change the scope adjustment to establish a new zero, the stored relationship may be outdated. Confirm the new zero, check the zero distance and any zero-height or zero-offset entries, and toggle Zero Scope Angle Lock off and back on to refresh the reference.

Common Mistakes

Common errors include activating the lock before confirming zero, changing muzzle velocity without refreshing it, or adjusting the scope and continuing to use an old locked angle. Always verify the rifle's actual zero and ballistic inputs first.

Final Thoughts

Establish your zero, verify your ballistic information, and activate Zero Scope Angle Lock. If the muzzle velocity or zero changes, confirm the updated zero and toggle the lock off and back on. This

keeps the ballistic reference consistent while Eagle Ballistics accounts for changing environmental conditions.

CHAPTER 6 — SCOPE TRACKING AND CORRECTION FACTOR

Measuring Actual Scope Movement and Correcting Tracking Error

Introduction

Your scope may not move exactly the amount indicated by its elevation turret. A small tracking error can grow into a significant difference at long range. Eagle Ballistics provides a Scope Correction Factor calculator to quantify the difference between expected and measured movement.

There are two ways to test tracking: a stationary mechanical test or a live-fire test. In either case, measure the actual target distance from the center of the scope turret, not the muzzle or barrel.

Method 1 — Stationary Mechanical Tracking Test

Secure the scope in a heavy, stable jig so that turning the turret does not shift the scope. You may buy a tracking target from Eagle Ballistics or make one with a ruler, straightedge, and markers.

Measure the exact distance from the center of the elevation turret to the target. A precision laser distance meter, such as the Bosch GLM 400, is useful because a conventional rangefinder may round its reading.

Align the crosshairs with a reference mark. Dial the turret up and down repeatedly through 30 MOA or 10 MIL, as appropriate for the optic. Measure and record the apparent crosshair travel

against the calibrated target. Confirm the scope and jig have not shifted during the test.

Method 2 — Live-Fire Tracking Test

Prepare a long sheet of paper or cardboard with a straight vertical line approximately 36 inches long. Use a level to hang it vertically. A distance of 100 yards is preferred, although shorter distances such as 75 or 80 yards can be used if the target is sized appropriately.

Measure the distance from the center of the scope turret to the target. Aim at the bottom of the line and fire a five-shot group. Without changing your aiming point, dial 30 MOA or 10 MIL of elevation and fire a second five-shot group.

Retrieve the target and measure the vertical separation between the centers of the two groups, rather than between individual holes. Record the actual distance, turret adjustment, and measured separation. Check that the groups follow the vertical line; lateral movement may indicate cant or a tracking alignment problem.

What the Dial Should Move

One minute of angle subtends approximately 1.047 inches at 100 yards. Thus 30 MOA corresponds to about 31.42 inches at exactly 100 yards. Ten milliradians subtend 36 inches at 100 yards.

Expected movement in inches = distance in yards $\times$ 36 $\times$ dialed MIL $\div$ 100, or distance in yards $\times$ 1.0472 $\times$ dialed MOA $\div$ 100. Use the precise measured distance, not the nominal range.

Enter the Results in Eagle Ballistics

Tap the rifle icon in the lower-right corner, open the Rifle and Scope block, and tap the crosshair icon beside Scope Correction Factor.

Enter the measured distance and tap Set. Enter the elevation dialed in MOA or MIL. Review the expected point-of-impact movement displayed by the calculator, then enter the actual movement measured on the target.

For example, at 100.33 yards with 30 MOA dialed, expected movement is approximately 31.52 inches. If actual movement is 31.75 inches, the scope moved slightly farther than expected. The ratio of expected to actual movement is approximately 0.9927, corresponding to the example Eagle Ballistics correction factor of 0.99273. This factor is not the same as the percentage of commanded movement achieved: actual divided by expected is about 100.73%.

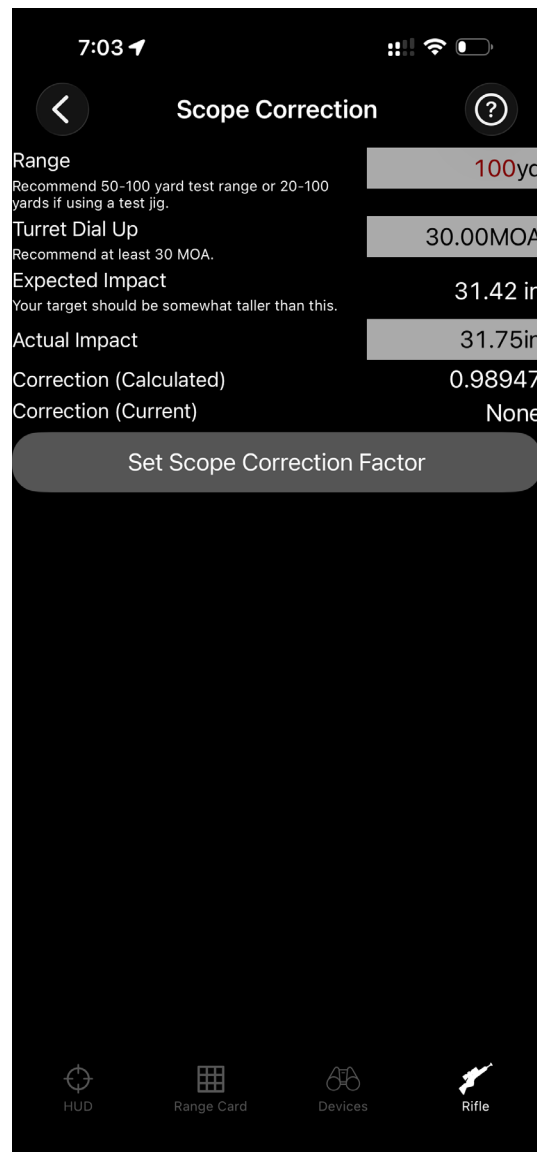


Figure 7.1 — Eagle Ballistics Scope Correction screen showing a 100-yard test, 30 MOA adjustment, and calculated correction factor of 0.98947.

Understanding the Correction Factor

The correction factor helps Eagle Ballistics account for how the individual scope tracks, rather than treating its turret markings as perfectly calibrated. Do not attempt to correct a scope-tracking problem by altering muzzle velocity or ballistic coefficient.

Repeat the test if the groups are unusually large, the distance is uncertain, the target is not level, or the setup moves. The recommended acceptable tracking tolerance has not yet been specified for this chapter and can be added after the author confirms it.

Final Thoughts

Accurate long-range solutions depend on accurate mechanical adjustments as well as correct ballistic inputs. Test the scope, measure the true movement, enter the results in Eagle Ballistics, and verify the correction at distance.

CHAPTER 7 — ENVIRONMENTAL INPUTS AND ATMOSPHERIC CONDITIONS

Automatic Weather Data, Manual Wind, and Connected Wind Devices

1. Automatic Environmental Data Collection

When you open Eagle Ballistics, the app is designed to retrieve temperature and humidity from a nearby available weather station. On supported phones, it also uses the built-in atmospheric pressure sensor to obtain local station pressure. When these sources are available and permissions and connectivity permit, no manual entry is required.

Station pressure is the actual pressure at the shooting location, not sea-level-corrected weather-report pressure. Entering sea-level-corrected pressure as station pressure can cause an incorrect trajectory calculation.

Without cellular data, you can enter temperature and humidity manually or use a compatible device, such as a Calypso WeatherDot, Kestrel DROP, temperature-capable Kestrel wind meter, WeatherFlow device, or rangefinder that transmits temperature. Device capabilities and supported connections vary.

2. Selecting a Wind Measurement Method

On the Heads-Up Display (HUD), select the wind measurement method. Manual Mode and Meter Mode are standard features.

Mirage, Rain, and Snow measurement modes require the Advanced Wind subscription.

Manual Mode: Tap Wind Direction and select where the wind is coming from. Then tap the Wind Speed field to the right and enter the speed.

Meter Mode: Connect a compatible Bluetooth wind meter to supply measurements to the application.

3. Connecting Wind Devices in Meter Mode

Tap the Devices icon, which resembles binoculars. Available Bluetooth devices should begin appearing. Select the device you wish to connect.

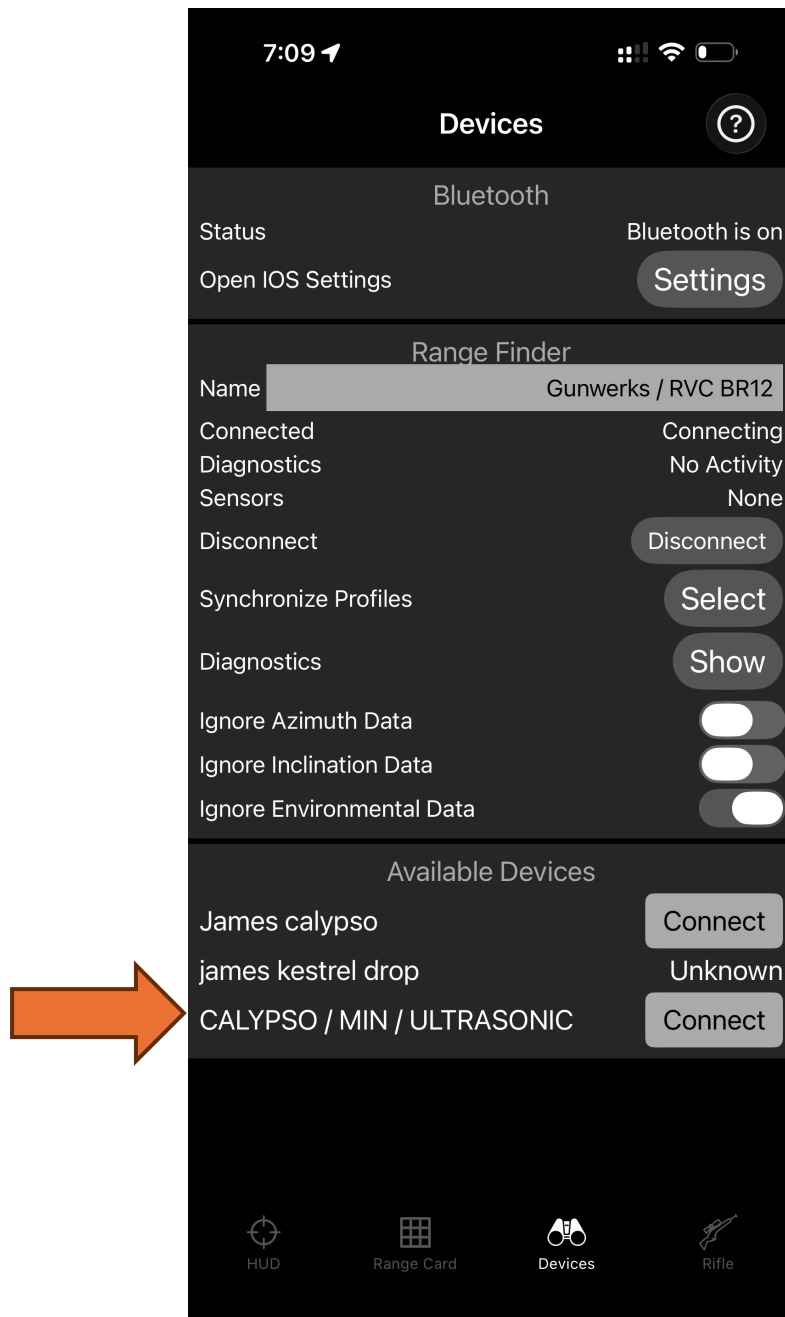


Figure 8.1 — Devices screen showing Bluetooth status, rangefinder settings, and available wind meters.

Calypso Mini ultrasonic wind meter: Select the device, enable Wind Relative to True North, mount the meter on a pole or other stable support, physically align it toward true north, and leave it

stationary. Return to the HUD and select Meter Mode. As wind speed and direction change, the app can update automatically. The intended operating distance is approximately 30 feet; actual Bluetooth range can vary. This is the “set it north and go hunt” approach.

Kestrel wind meter: Compatible models can transmit wind measurements. With a compass-equipped compatible Kestrel and appropriate weather-vane mounting, the system can provide changing wind speed and direction.

WeatherFlow: In the described Eagle Ballistics configuration, WeatherFlow supplies temperature and wind speed; wind direction must be provided separately.

4. Sampling Gusting Winds and Locking the Result

While in Meter Mode, tap Wind Speed. Use the flip-screen control in the upper-left corner to open the sampling timer. Press the timer to begin gathering wind samples; the phone vibrates when sampling starts.

Collect as many samples as desired. Tap Stop, then Set. The sampled wind result transfers to the HUD and becomes locked. Locking freezes the wind value used in the calculation; it does not mean the actual wind has stopped changing.

To resume live readings, tap the orange Lock Wind bar. The app returns to updating wind information from the connected meter.

5. Practical Summary

Eagle Ballistics offers automatic atmospheric inputs, manual entry when needed, and multiple compatible wind-device options. Manual and Meter Modes are standard; Mirage, Rain, and Snow are advanced subscription features.

Choose live wind updates when you want the latest meter reading. Use the sampling timer and Lock Wind when a representative sampled value is more useful. Always verify the source and accuracy of environmental inputs before relying on a long-range solution.

CHAPTER 8 — ADVANCED WIND FEATURES

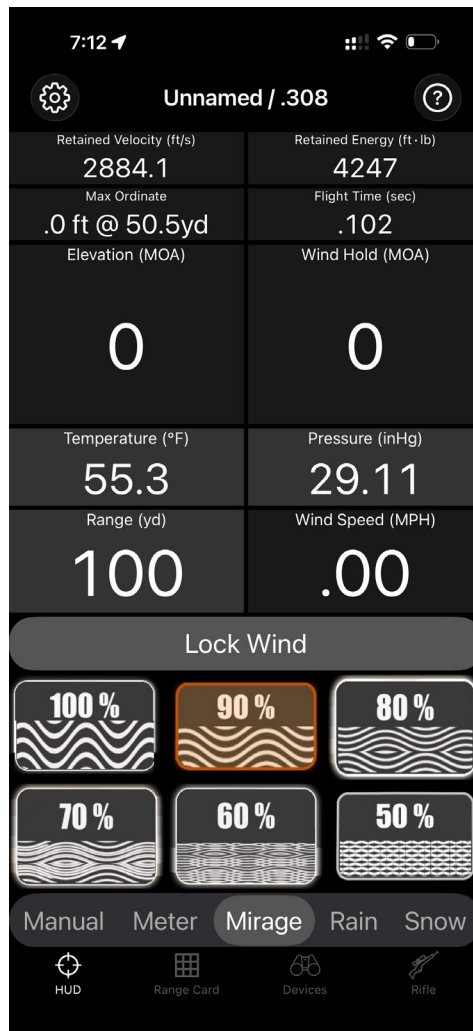
Mirage • Rain • Snow • Apex Wind

Introduction

Eagle Ballistics Advanced Wind provides four methods for estimating wind conditions: Mirage, Rain, Snow, and Apex Wind. Mirage, rain, and snow use the observed angle and classification of atmospheric movement; Apex Wind estimates the wind gradient from a near-ground measurement to the bullet's maximum ordinate.

The observation-based methods are taught as part of the Eagleman Wind Technique. All estimates depend on correct observation and can vary with local conditions.

1 — Mirage Mode



Begin on the Heads-Up Display (HUD) in Manual Mode. Enter the target distance. Tap Inclination and Azimuth, aim the phone camera toward the target, and select Set Both. Complete these steps before selecting Mirage Mode because inclination and azimuth are not visible while Mirage is active.

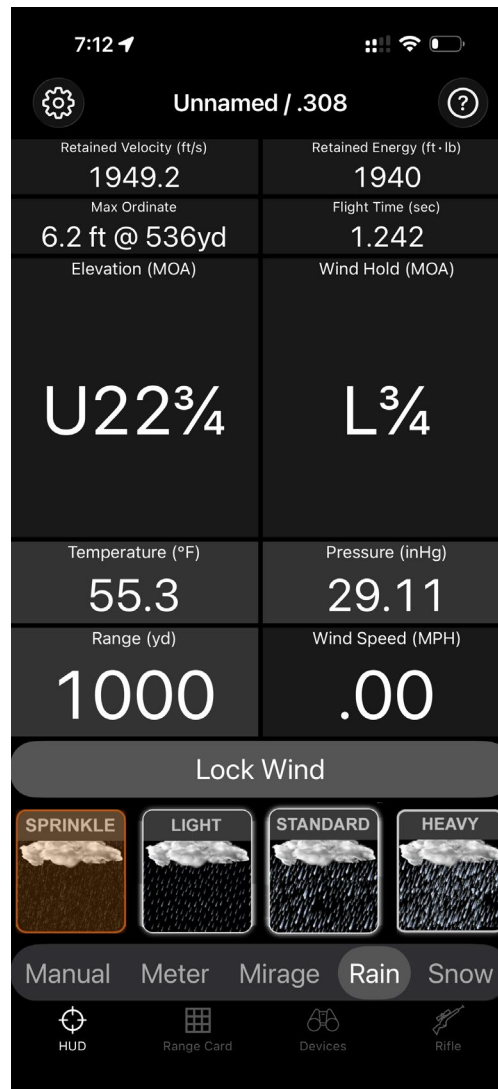
Select the Mirage tab. Six classifications appear: 50%, 60%, 70%, 80%, 90%, and 100%. Sparkling mirage corresponds to the 50%

selection; very large waves correspond to 100%. More detailed visual examples will be provided in the appendix.

Observe mirage through a rifle scope or spotting scope. Hold the phone upright and tilt its straight side edge to match the angle of the observed mirage. Select the classification that best matches what you see.

Eagle Ballistics converts the observation into an estimated wind speed and updates wind hold and aerodynamic jump. Press Lock to hold the result while you prepare the shot. Press the lock control again until the orange lock bar disappears to resume readings.

2 — Rain Mode

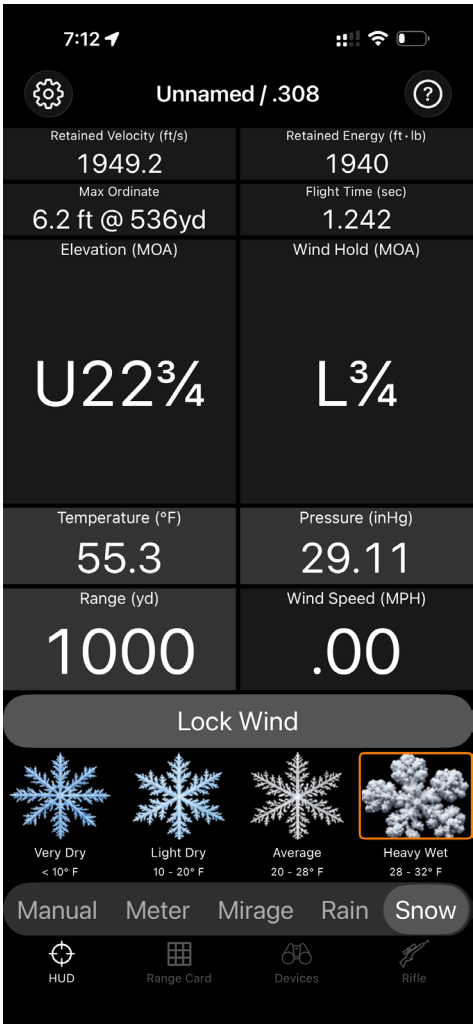


Select Rain on the HUD. Observe the falling rain and choose Sprinkle, Light, Standard, or Heavy.

Hold the phone upright and tilt its straight edge to match the apparent angle of falling rain. Eagle Ballistics uses the chosen rainfall category and angle to estimate wind speed and update wind holds and aerodynamic jump.

Lock the measurement when needed and unlock to take another reading. The appendix will illustrate the rain classifications.

3 — Snow Mode



Select Snow on the HUD. Observe the snowfall and choose the classification that best matches: Light/Dry, Average, or Heavy/Wet.

Hold the phone upright and tilt its side edge to the apparent falling-snow angle. Eagle Ballistics uses the classification and angle to estimate wind speed, wind hold, and aerodynamic jump.

Temperature can help with classification when visual identification is difficult. Heavy wet snow may occur around 28°F to 32°F, but snow characteristics are not determined by temperature alone. Additional author-specified temperature ranges can be added to the appendix.

As with Rain Mode, lock the measurement when desired and unlock it to resume observing.

4 — Apex Wind

Tap the rifle icon in the bottom-right corner and open HUD Settings, or tap the gear icon in the upper-left corner to enter HUD Settings directly. Enable Apex Wind, then return to the HUD.

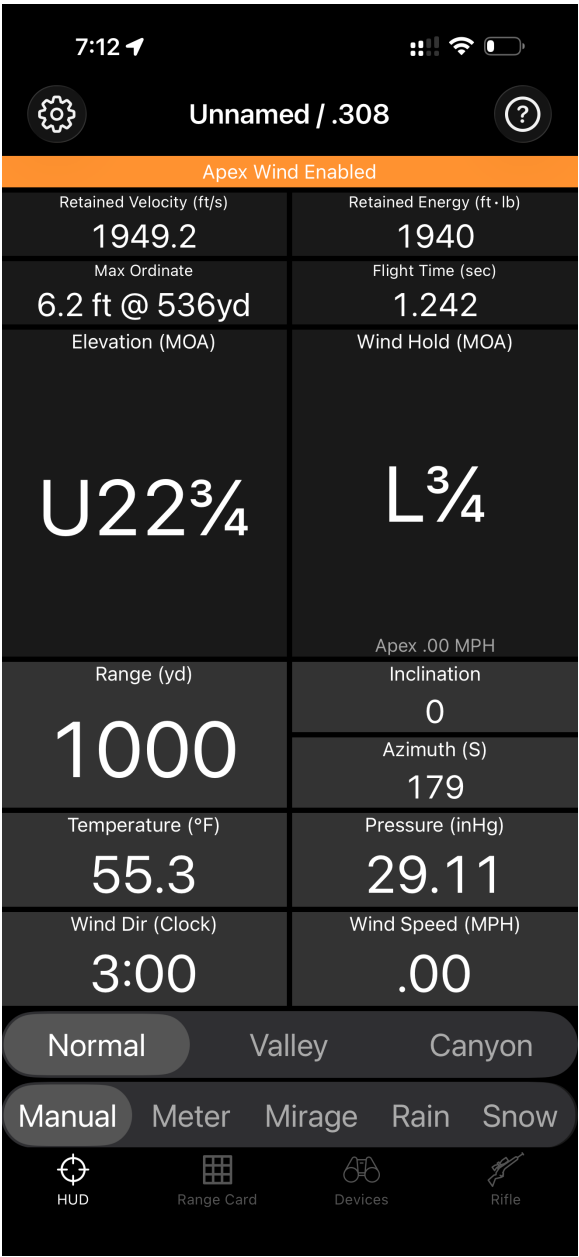
Use Manual Mode or Meter Mode. When enabled, an orange bar at the top indicates that Apex Wind is active. With a connected wind meter, Eagle Ballistics reads the measured wind speed, obtains the bullet's maximum ordinate from its ballistic calculation, and applies a modeled wind gradient to estimate wind speed at that height.

For example, a near-ground meter may read 10 mph while the model estimates a different wind speed higher along the bullet path. The app uses the modeled result for its wind correction.

Actual wind gradients can differ with terrain and atmospheric conditions.

Apex Wind is a fallback when wind cannot be observed directly at maximum ordinate. Mirage, Rain, and Snow modes automatically disable Apex Wind because the Eagleman Wind Technique already aims to assess wind where the bullet travels.

When finished, return to HUD Settings and turn Apex Wind off. Confirm the orange Apex Wind enabled bar has disappeared.

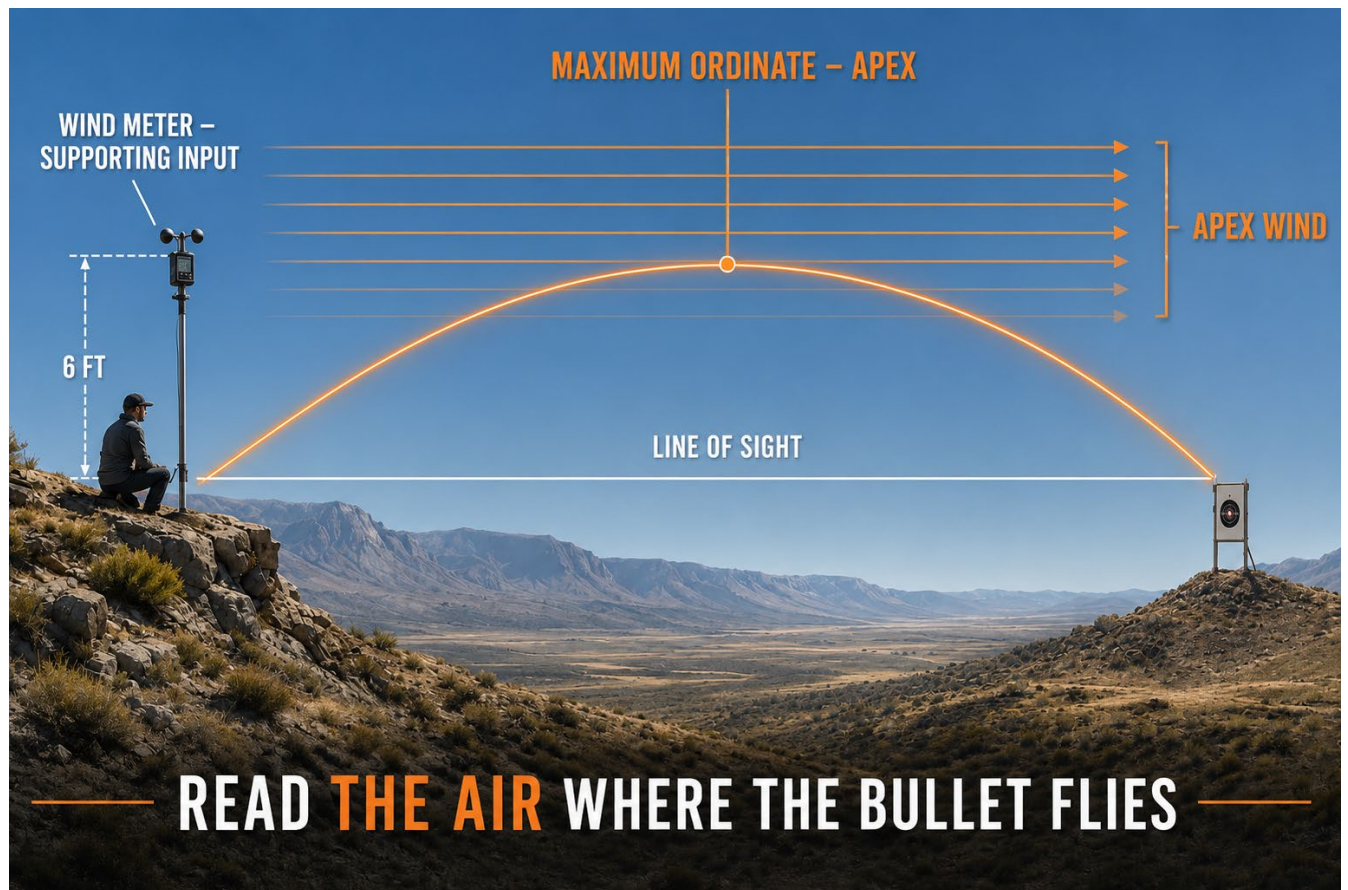


Appendix — Visual Reference (to be added)

Include labeled visual examples for the six mirage classifications, four rain classifications, and snow types. Add any author-confirmed snow temperature guidance. The visual reference is intentionally separate from this chapter draft.

Closing Principle

Use the observation method appropriate to the conditions. When direct atmospheric indicators are unavailable, Apex Wind offers a modeled alternative from manual or meter input. Verify the selected mode and any lock or Apex indicator before relying on the displayed solution.



EAGLE BALLISTICS

CHAPTER 9 — HUD SETTINGS

The Heads-Up Display (HUD) can be customized to show the information and corrections you want to use. From the HUD, tap the gear icon in the upper-left corner to open HUD Settings. Choose only the settings appropriate for the shooting situation.

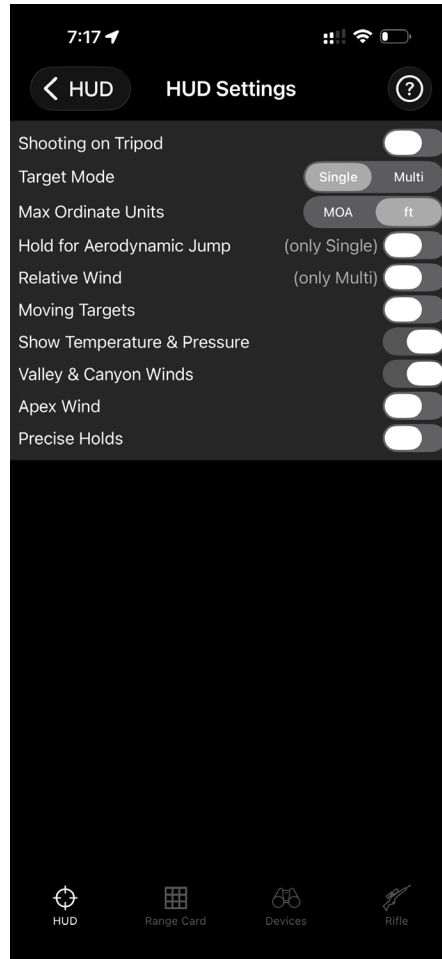
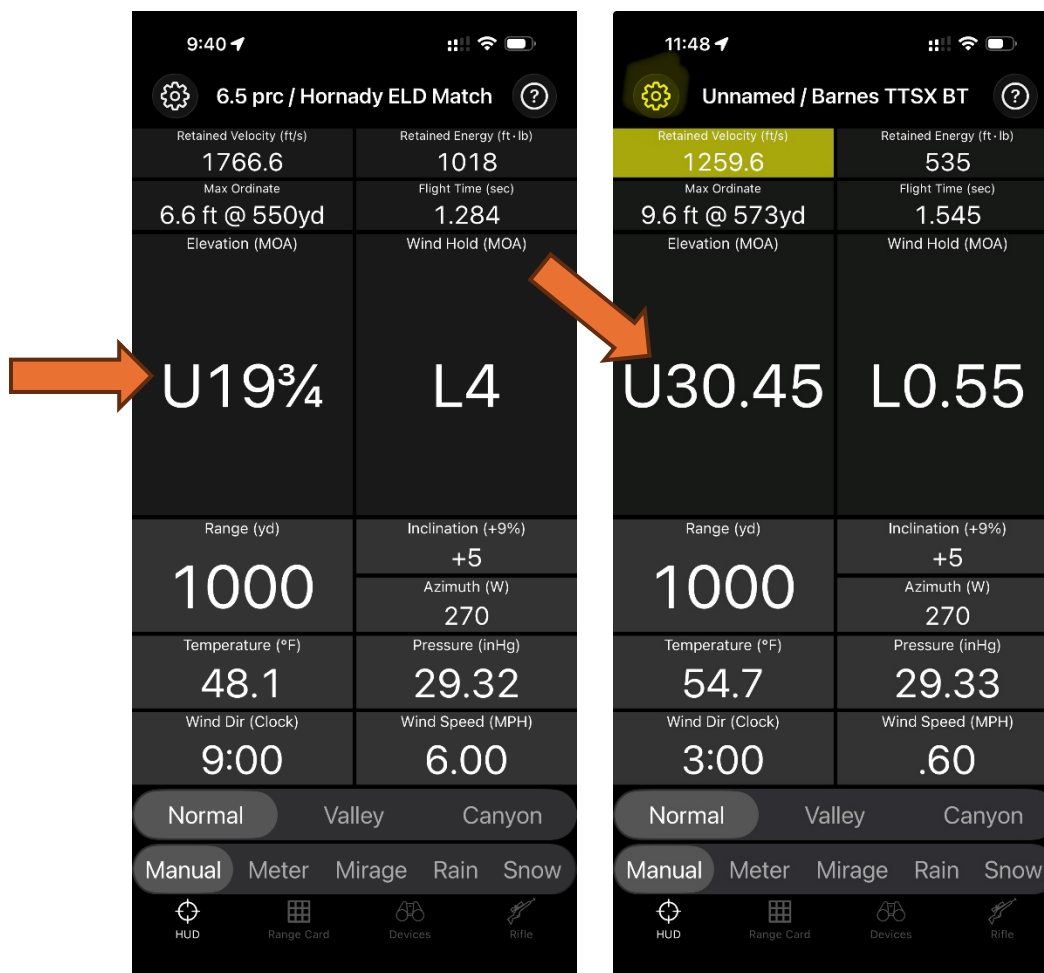


Figure 10-1. HUD Settings screen showing target mode, wind options, and display controls.

Precise Holds

Precise Holds changes the way elevation and wind holds are displayed. When enabled, values can be shown to the hundredth, such as 29.01 MOA. With the fractional display, a hold might appear as 29¼ MOA. This is a display and rounding preference, not a change to the underlying ballistic calculation.



Apex Wind

Apex Wind was covered in Chapter 9. It estimates wind at maximum ordinate using the entered or measured near-ground

wind and a wind-gradient model. Turn it off when it is no longer needed.

Valley Winds

Valley Winds is intended for use with a wind meter when you cannot directly determine the increased wind speed or wind vector caused by compression through a valley. Enable Valley Winds in HUD Settings, return to the HUD, and tap Valley. The feature applies a percentage increase to the calculated wind hold as an estimate of valley wind compression. It is a modeled adjustment, not a direct measurement of the valley wind.

Canyon Winds

Canyon Winds similarly estimates additional wind effects associated with compression between relatively straight canyon walls. It adds a further adjustment to wind hold when selected. As with Valley Winds, this is an estimate and must be used with judgment. Do not use Canyon or Valley Winds with Mirage, Rain, or Snow Mode: those modes are intended to observe atmospheric movement directly.



Show Temperature and Pressure

Use this setting to show temperature and pressure information on the HUD. Confirm the environmental inputs are appropriate for the shooting location. When maximum ordinate is displayed, the recommended unit for this manual is feet.

Shooting on Tripod

Enable Shooting on Tripod in HUD Settings when shooting from a tripod. An orange indicator appears on the HUD while the feature is active. The feature applies an elevation adjustment intended to compensate for possible upward muzzle movement during the short interval before the bullet leaves the barrel, particularly with lighter rifles. The effect depends on rifle, support, and shooting

conditions; it should not be treated as a universal correction. The author describes its use for longer shots, including beyond 600 yards and toward 1,000 yards. Disable the feature when no longer shooting from a tripod.

Moving Targets and Target Relative Wind

Moving Targets and Target Relative Wind are features associated with PRS operation. The HUD also offers Single-Target and Multi-Target PRS modes. Shooters who do not use PRS can leave these settings off; PRS functions will be addressed in their own section.

On-Page Help

Every page in Eagle Ballistics includes a question-mark icon in the upper-right corner. Tap it to open an explanation of the features and controls on that page. This is the quickest way to review what an unfamiliar setting does.

Closing Guidance

HUD Settings allow each shooter to configure the display and optional corrections for the current conditions. Before shooting, confirm that only the intended settings are enabled, especially those that change the calculated solution.

CHAPTER 10 — HUD UPPER QUADRANT AND BALLISTIC READOUTS



Figure 11-1. Eagle Ballistics HUD showing trajectory, target geometry, atmospheric conditions, and wind inputs.

The upper quadrant of the Eagle Ballistics Heads-Up Display (HUD) brings together the information needed to understand the

current ballistic solution. Rather than switching between screens, the shooter can review target geometry, atmospheric conditions, wind, trajectory, and bullet performance in one place.

Range, Inclination, and Azimuth

Range is the measured or entered distance to the target.

Inclination is the upward or downward angle of the shot. Azimuth identifies the direction toward the target. These values help establish the geometry of the shot and support applicable ballistic corrections.

Pressure and Temperature

The HUD shows atmospheric pressure and outside temperature used by the ballistic calculation. Check that the values represent conditions at the shooting location. Actual station pressure should not be confused with sea-level-corrected pressure.

Wind Speed and Wind Direction

Wind speed and wind direction appear in the upper quadrant. Depending on the selected mode, they may be entered manually, received from a compatible meter, or estimated from the advanced wind features. Wind direction refers to where the wind is coming from.

Left or Right Wind Hold and Elevation Dial-Up

The wind hold shows the horizontal correction for the shot, left or right as appropriate. The elevation dial-up shows the vertical

correction needed for the target distance. Display precision can be adjusted in HUD Settings as described in Chapter 10.

Retained Velocity — Especially Important for Hunting

Retained velocity is the estimated bullet speed at the target, after velocity has been lost during flight. This is one of the most important HUD values to review before a hunting shot.

The author describes a yellow warning when the calculated retained velocity falls below the velocity needed for the selected bullet to function on impact. Treat the warning as a reason to reassess the shot. Bullet expansion and terminal performance depend on the specific projectile and its manufacturer-stated operating limits; a warning is not a guarantee of performance above the threshold.

Retained Energy

Retained energy is the estimated kinetic energy remaining when the bullet reaches the target. It provides another reference point for understanding bullet performance at distance, but energy alone does not establish whether a projectile will expand or perform as intended.

Maximum Ordinate: Height and Distance

Maximum ordinate identifies the highest point of the bullet's trajectory relative to the line of sight, together with the distance at which that point occurs.

For example, if the HUD displays a maximum ordinate of 9.3 feet at 560 yards, it means the bullet's trajectory reaches its highest point, 9.3 feet above the line of sight, approximately 560 yards from the shooter. These values are particularly useful when evaluating the Eagleman Wind Technique and Apex Wind.

Time of Flight

Time of flight is the estimated time between the bullet leaving the muzzle and reaching the target. This is especially important for hunting because an animal can move while the bullet is in the air.

Before taking a shot, consider whether the animal is stationary and likely to remain still throughout the bullet's flight. Even a small movement during a longer flight time can change the impact location. Do not assume an animal will remain stationary simply because it has stopped moving momentarily.

Putting the HUD Information Together

Before a shot, review the distance, inclination, azimuth, pressure, temperature, wind speed and direction, elevation dial-up, and wind hold. For hunting, give special attention to retained velocity, retained energy, maximum ordinate, and time of flight.

The HUD presents a calculated solution based on the information entered or measured. The quality of that solution depends on accurate rifle-profile data, environmental inputs, and sound judgment in the field.

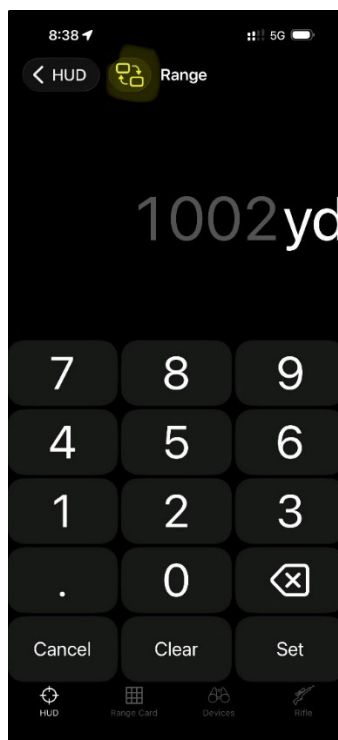
CHAPTER 11 — MEASURING AND RANGING ANIMALS

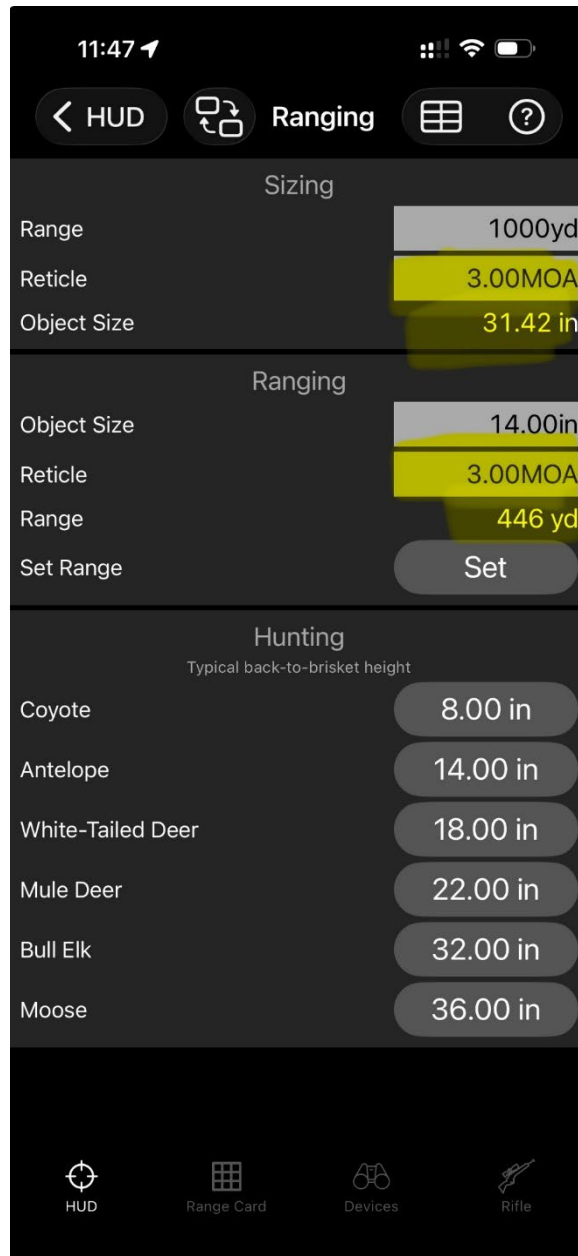
Using the Eagle Ballistics HUD

Eagle Ballistics provides two related tools: Sizing, which estimates an animal's dimensions when distance is known, and Ranging, which estimates distance when an animal's dimensions are known or reasonably estimated. Both tools use angular measurements made through a scope reticle.

Opening the Sizing and Ranging Tools

From the Heads-Up Display (HUD), tap Range. In the upper-left corner, select the icon that resembles two television screens. This is the Flip Screen control. The alternate screen provides a Sizing block and a Ranging block. Throughout Eagle Ballistics, this two-screen symbol identifies a Flip Screen control.





Eagle Ballistics Ranging screen — Sizing, Ranging, and hunting animal-size presets.

1 — Sizing an Animal When Distance Is Known

Use Sizing when you know the distance and want to calculate the physical size of a feature on the animal, such as antler width. If a

compatible rangefinder is connected, the range may populate automatically. Otherwise, enter the known distance manually.

Look through the scope and measure the feature using the reticle in MOA or MIL, making sure the selected unit matches the measurement. Enter the angular measurement and press Set to obtain the estimated physical dimension.

Example — Elk antlers: At 950 yards, suppose the measured antler width from the drop tine to the back scratchers is 5.5 MOA. The approximate calculated width is 54.72 inches. This estimate depends on a correct distance and accurate reticle measurement.

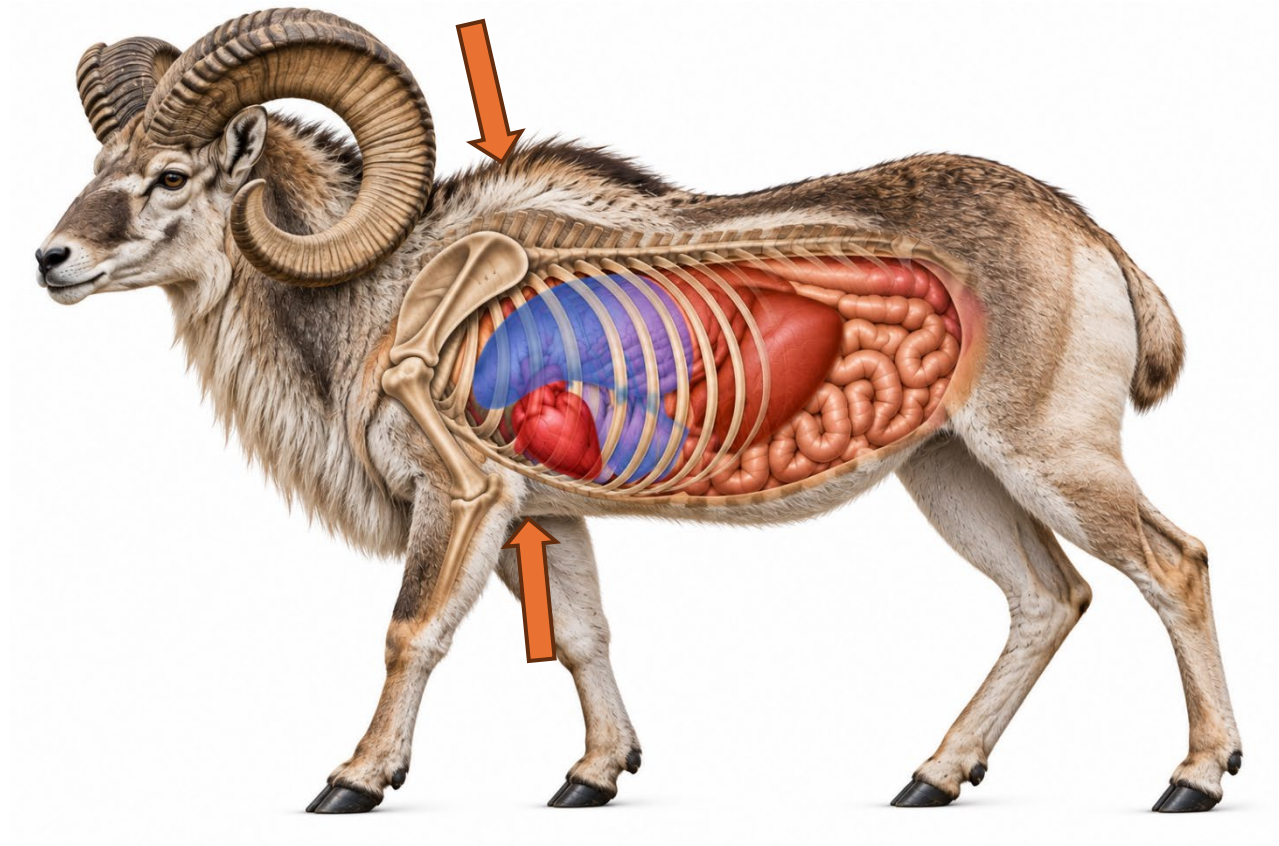
2 — Ranging an Animal When Its Size Is Known

Ranging works in reverse: begin with a known or estimated physical dimension, then measure how large it appears through the reticle. You may enter the animal's dimension directly or use the Hunting presets as a starting estimate.

For a body-height measurement, look through the scope and measure from the brisket or belly near the front leg up to the back. Enter the known or estimated size and the measured MOA or MIL, then press Set. The estimated range transfers to the HUD, where the corresponding elevation dial-up and other ballistic values are shown.

Example — Mule deer: Suppose the deer measures about 22 inches from brisket to back and spans 3 MOA in the scope. The

estimated distance is approximately 700 yards. Press Set, return to the HUD, and review the range and calculated dial-up.



Why Accurate Measurements Matter

These methods use angular geometry. The distance or size result is only as accurate as the physical dimension assumed and the angle measured. Animals vary considerably in body size, posture, and antler shape. A rough estimate can produce a substantial range error, especially at long distances. Use a verified laser rangefinder whenever available, and do not rely on an uncertain estimate for a shot.

Returning to the Normal HUD

When finished with Sizing or Ranging, tap Range again and use the Flip Screen icon to return to the normal Range display. This restores the familiar HUD control layout for the next operation.

Quick Reference

Sizing: known range + measured reticle angle → estimated size.

Ranging: known or estimated size + measured reticle angle → estimated range.

Always confirm the angular unit, press Set to apply the result, and use Flip Screen to return to the normal display.

CHAPTER 12 — CONNECTING A RANGEFINDER

Connecting a compatible rangefinder allows Eagle Ballistics to receive ranging and sensor information directly. The process is straightforward, and you can choose which information the rangefinder is allowed to provide.

Connecting the Rangefinder

1. On the Eagle Ballistics app, open Devices by tapping the binoculars icon.
2. Wake up the rangefinder by pressing its fire button.
3. When the rangefinder appears in the device list, tap Connect.
4. Wait a few seconds for the available sensors to populate. If the sensors do not appear, range an object with the rangefinder to initiate a reading.

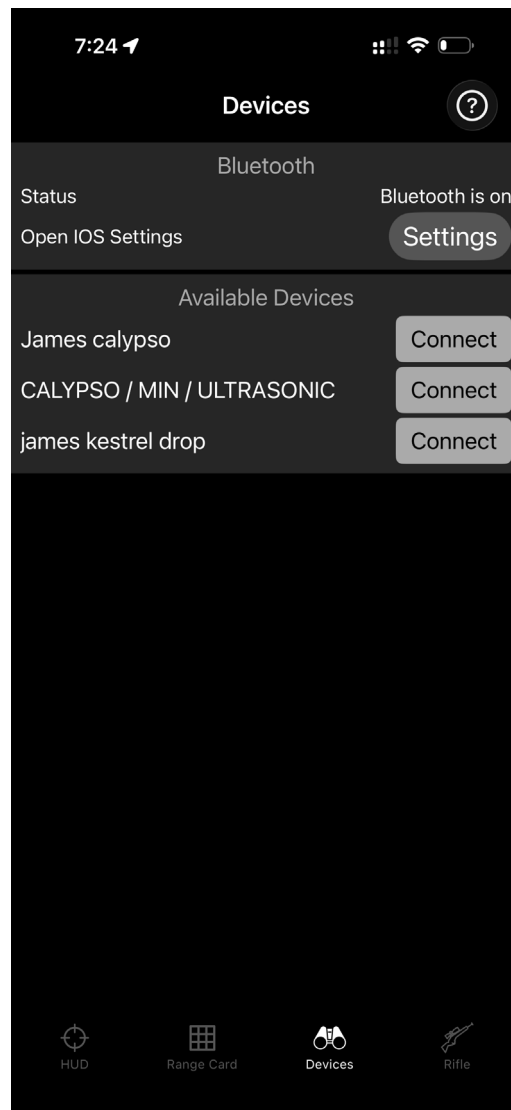


Figure 13-1. Devices screen showing Bluetooth status and available devices with Connect buttons.

Choosing Which Sensor Data to Use

After connecting, decide which readings the rangefinder should send to Eagle Ballistics. The app allows you to ignore selected data, including azimuth, inclination, and environmental information.

Pay particular attention to temperature. If the rangefinder is inside an air-conditioned building, heated shoot house, or hunting blind, its temperature may not represent the outdoor air through which the bullet will travel. In that situation, choose to ignore the rangefinder's environmental readings and use the app's outside-temperature source instead.

When the rangefinder and shooting environment are the same, you may allow the rangefinder to supply temperature. Confirm that any environmental readings being used reflect actual shooting conditions.

Using the Connected Rangefinder on the HUD

5. Return to the HUD after connecting and choosing your sensor settings.
6. Range a target with the rangefinder.
7. Watch the HUD update with the readings that you have allowed the rangefinder to send. Depending on the device and enabled sensors, these can include range, compass direction (azimuth), inclination, and temperature.

Once connected, the rangefinder and Eagle Ballistics work together so you do not have to manually enter each new range. Any sensor category set to Ignore will not be used as an input from that rangefinder.

Sending Rifle Profiles to a Tract Rangefinder

When using a compatible Tract rangefinder, you can send rifle profiles from Eagle Ballistics to the device. The rangefinder holds up to five profiles.

8. Return to Devices and make sure the Tract rangefinder is awake and connected.
9. Tap Select.
10. Check the box beside each rifle profile you want to send. Select up to five profiles.
11. Tap Sync.
12. Wait for the confirmation, which reports the number of profiles synced—for example, “1 profile synced” or “5 profiles synced.”

Important: Match the Rifle Profiles

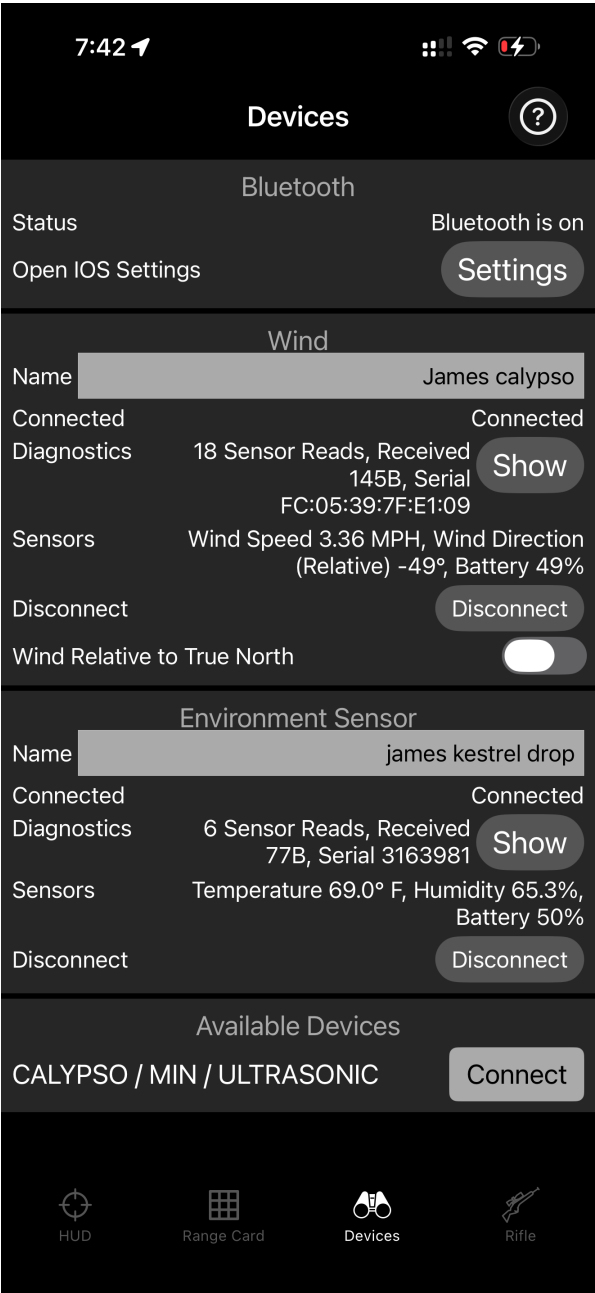
Before using the ballistic solution, make sure Eagle Ballistics and the rangefinder are both set to the same rifle profile. If the two devices have different active profiles, their displayed ballistic data may not match.

Final Check

Confirm that the rangefinder is connected, the desired sensors are enabled, unwanted environmental readings are ignored, and the active rifle profile matches on both devices. The rangefinder is now ready to work with the Eagle Ballistics HUD.

Device Connections

Connecting Multiple Devices



Example: Devices screen showing a connected Calypso wind meter and Kestrel WeatherDROP environmental sensor.

Eagle Ballistics supports up to three connected devices at the same time. For example, you can connect a compatible rangefinder, a weather device, and a wind meter. This allows you

to use several tools together while hunting or shooting on the range.

Weather Device Priority

When a dedicated weather device, such as a WeatherDROP, is connected, Eagle Ballistics automatically gives that device priority as the source of weather information. Keep this in mind when using multiple devices: atmospheric readings may come from the connected weather device rather than another instrument.

Flexibility in the Field

Using multiple connected devices provides flexibility. A rangefinder can supply target distance, a weather device can provide atmospheric conditions, and a wind meter can help measure wind. Together, these devices make it easier to gather the information needed for a ballistic solution without relying on a single instrument.

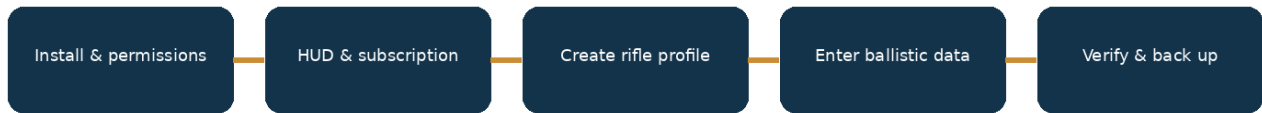
Important Note

Before shooting, verify that the app is receiving the intended readings from your connected devices and that the displayed conditions are current.

CHAPTER 13 — GETTING STARTED AND BC TRUING

Step-by-Step Initial Setup and Ballistic Coefficient Truing

EAGLE BALLISTICS | GETTING STARTED



BC truing workflow: confirm conditions → record actual elevation → True BC → verify closer

Use confirmed group centers and check all units before adjusting a profile.

This chapter explains how to install the app, configure a rifle, true its ballistic coefficient (BC), and verify the results before field use.

1. Download and open Eagle Ballistics

13. Install Eagle Ballistics on your phone and open it.
14. Allow the permissions requested for the features you intend to use, particularly location and compatible device access. Location, sensor, and online-weather availability can vary by phone and connectivity.

2. Configure the Heads-Up Display (HUD)

15. From the HUD, tap the gear icon in the upper-left corner.
16. Enable the features you want to use or display, then return to the HUD.

3. Choose your subscription

17. Tap the rifle icon in the bottom-right corner.
18. Tap the shopping-cart icon in the upper-left corner.

19. Review the available subscriptions and purchase the one that provides the features you need.

4. Select or create a rifle profile

20. Tap the rifle icon and open Rifle Profiles.
21. Choose an existing profile (for example, .308 Winchester) or tap + to create another.
22. Name the new profile so you can identify the rifle and load.

5. Build the rifle profile

23. Tap the rifle icon again to access the rifle configuration.
24. Complete the Rifle, Scope, Bullet, and Zero blocks. Enter the rifle parameters, scope height and turret units, bullet data and muzzle velocity, and zero information as applicable.
25. Review every value and unit before continuing.

6. Prepare for supersonic BC truing

26. Return to the HUD and enter the target distance.
27. Verify the compass direction of fire and the shooting angle.
28. Enter the crosswind speed and direction and verify environmental conditions.
29. Choose a suitable target preferably beyond 600 yards, while the projectile is still clearly supersonic. Do not use the transonic region for initial supersonic BC truing.

7. Shoot and record actual elevation

30. Use the elevation correction shown on the HUD to engage the target at a safe, established range.

31. Determine the actual elevation adjustment, in MOA or MIL, needed to center the impact at that distance. Use a confirmed group center rather than a single unexplained shot when possible.

8. True the ballistic coefficient

32. Tap the rifle icon at the lower-right of the HUD.
33. Find the Truing control next to Ballistic Coefficient.
34. Enter the actual elevation adjustment in MOA or MIL required to center the impact.
35. Tap True BC to calculate the corrected ballistic coefficient.

9. Verify at another distance

36. Select a closer target and enter its distance on the HUD.
37. Verify current conditions and apply the displayed elevation correction.
38. Compare the observed group center with the predicted point of impact. If the results disagree, recheck profile data, zero, measured distance, and conditions before making further corrections.

10. Back up and use your profile

39. Once the profile has been verified, save a backup using the rifle-profile QR code feature. There is no separate Save button for routine profile edits.
40. Back up the profile again after meaningful changes to ammunition, muzzle velocity, scope configuration, zero, or BC.

41. With the rifle profile verified, the HUD is your primary interface for range, wind, direction, angle, and ballistic corrections.

Final note

Accurate inputs and careful verification are essential. A BC-trued profile is a starting point for reliable predictions, not a guarantee of impact. Always follow safe range procedures and verify changes before relying on a correction.

Eagle Ballistics — Advanced Ballistics Made Simple.

CHAPTER 14 — OPERATING FROM THE HUD

Final Notes — Everything in One Place

Once you have built your rifle profiles, configured your devices, and enabled the necessary permissions, the Eagle Ballistics Heads-Up Display (HUD) becomes your primary control center.

There is no need to continually navigate through different settings or screens while shooting. Everything you need for normal ballistic calculations can be accessed directly from the HUD.

What You Can Do from the HUD

- **Target Range:** Manually enter target distance or receive range information from a connected rangefinder.
- **Compass Direction:** Enter or update the direction of fire.
- **Angle Compensation:** Enter or receive inclination for uphill and downhill shots.
- **Wind Speed:** Enter wind speed manually or use a connected wind meter.
- **Wind Direction:** Enter wind direction using the clock system.
- **Mirage, Rain, and Snow:** Select the appropriate wind-reading mode to estimate wind speed from observed conditions.
- **Environmental Conditions:** View and update temperature and atmospheric pressure.
- **Terrain Conditions:** Select Normal, Valley, or Canyon as appropriate.

- **Ballistic Information:** View elevation adjustment, wind hold, retained velocity, retained energy, maximum ordinate, and flight time.
- **Moving Targets:** Enter mover speed and view the calculated lead.

Designed for Simplicity

Eagle Ballistics was designed to minimize the time a shooter spends navigating through an application. Once your rifle is properly configured, you can concentrate on observing conditions, ranging the target, making corrections, and taking the shot.

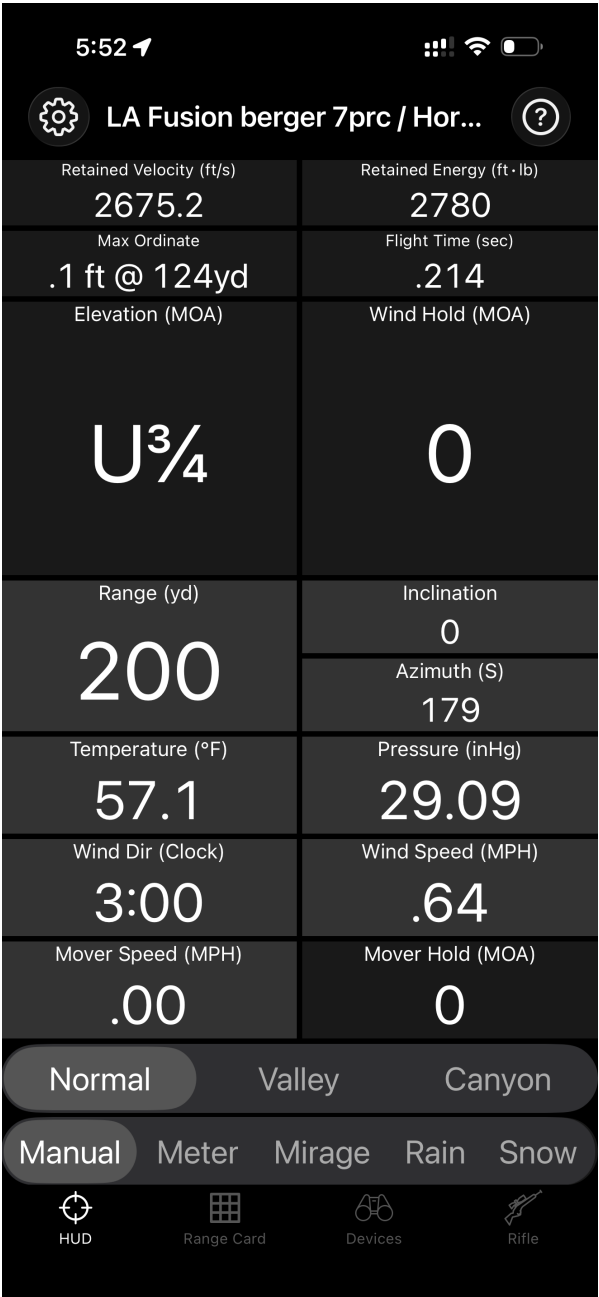
The HUD is your one-stop location for operating Eagle Ballistics in the field.

Final Thoughts

The purpose of Eagle Ballistics is to combine advanced ballistic calculations with a simple, practical interface. The mathematics may be complex, but operating the application should not be.

Set up your rifle, verify your data, and let Eagle Ballistics handle the calculations.

HUD Screen Reference



Eagle Ballistics Heads-Up Display — example screen.

CHAPTER 15 — LOCATION SERVICES AND BALLISTIC CALCULATIONS

A self-contained ballistic solver with automatic location and environmental inputs.

Overview

One of the most important setup steps in Eagle Ballistics is allowing the permissions the application needs, especially location access. Eagle Ballistics is designed to gather critical information automatically, reducing manual entry and helping the shooter concentrate on the target.

EAGLE BALLISTICS
INSTRUCTION MANUAL

Location Services — Why They Are Important

A self-contained ballistic solver with automatic location and environmental inputs.

- GPS LOCATION**
With location services enabled, Eagle Ballistics determines latitude and longitude using satellite navigation and other available methods.
- MAGNETIC DECLINATION**
Eagle Ballistics uses your location to account for the difference between magnetic north and true north in its calculations.
- GRAVITY AT YOUR LOCATION**
Gravity varies slightly with latitude, elevation, and other geographic factors. The app accounts for gravity at your location.
- AUTOMATIC WEATHER**
When internet access is available and Online Weather is enabled, Eagle Ballistics can retrieve temperature and relative humidity.
- STATION PRESSURE**
The app can use a supported phone barometric sensor. Station pressure is the actual atmospheric pressure at your location, rather than a value corrected to sea level.
- CORIOLIS & HEMISPHERE COMPENSATION**
Eagle Ballistics uses latitude and direction of fire to calculate Earth-rotation effects. The app automatically handles Northern and Southern Hemisphere conditions.
- WORKS WITHOUT CELL SERVICE**
Once your rifle profiles and essential data are configured, Eagle Ballistics can calculate solutions without cellular service. A phone's GPS may still operate without service (it can take longer to obtain a position). Enter weather manually or use a compatible connected weather device when offline.

Eagle Ballistics — Advanced Ballistics Made Simple.

Automatic Location and GPS Information

With location services enabled, the phone can determine latitude and longitude using satellite navigation and other available location methods. Eagle Ballistics uses location information in calculations involving magnetic declination, local gravity, and the effects of Earth's rotation.

Magnetic Declination

Magnetic declination is the angular difference between magnetic north and true north. Grid north can differ from both depending on the mapping coordinate system. Knowing the location helps Eagle Ballistics account for compass direction in its ballistic calculations.

Automatic Weather and Station Pressure

When internet access is available and Online Weather is enabled, Eagle Ballistics can retrieve temperature and relative humidity. For station pressure, the app can use a supported phone barometric sensor. Station pressure is the actual atmospheric pressure at the location, rather than a value corrected to sea level.

Operating Without Cell Service

Once rifle profiles and essential data are configured, Eagle Ballistics can calculate ballistic solutions without cellular service. Online weather requires an internet connection, however. Without service, enter weather information manually or use a compatible connected weather device. A phone's GPS may still operate without cellular service, although obtaining a position can take longer.

Gravity at Your Location

Gravity varies slightly with latitude, elevation, and other geographic factors. Eagle Ballistics accounts for gravity at the location as part of its calculations.

Coriolis and Hemisphere Compensation

Eagle Ballistics uses latitude and direction of fire to calculate Earth-rotation effects. In places such as New Zealand or South Africa, the app recognizes negative Southern Hemisphere latitude. The horizontal Coriolis contribution changes direction relative to comparable Northern Hemisphere conditions, depending on the firing direction. The app handles this through its calculations rather than requiring a manual hemisphere switch.

Why Permissions Matter

Location permissions allow Eagle Ballistics to obtain geographic information needed for these corrections. Weather access and supported sensors supply additional atmospheric information. Allow the appropriate permissions and verify that the displayed inputs are accurate before shooting.

CHAPTER 16 — MAPPING AND DROPPING A PIN

Purpose

When a compatible rangefinder is connected to Eagle Ballistics, ranging an animal or target automatically records a pin for its calculated location. This can help you return to the area after a shot, particularly when an animal falls in tall grass, thick cover, or unfamiliar terrain. You do not have to manually place the initial pin.

Select a Mapping Program

42. Tap the Rifle icon in the bottom-right corner of Eagle Ballistics.
43. Find the Other settings block.
44. Choose Google Earth or MIL GPS as your mapping program.

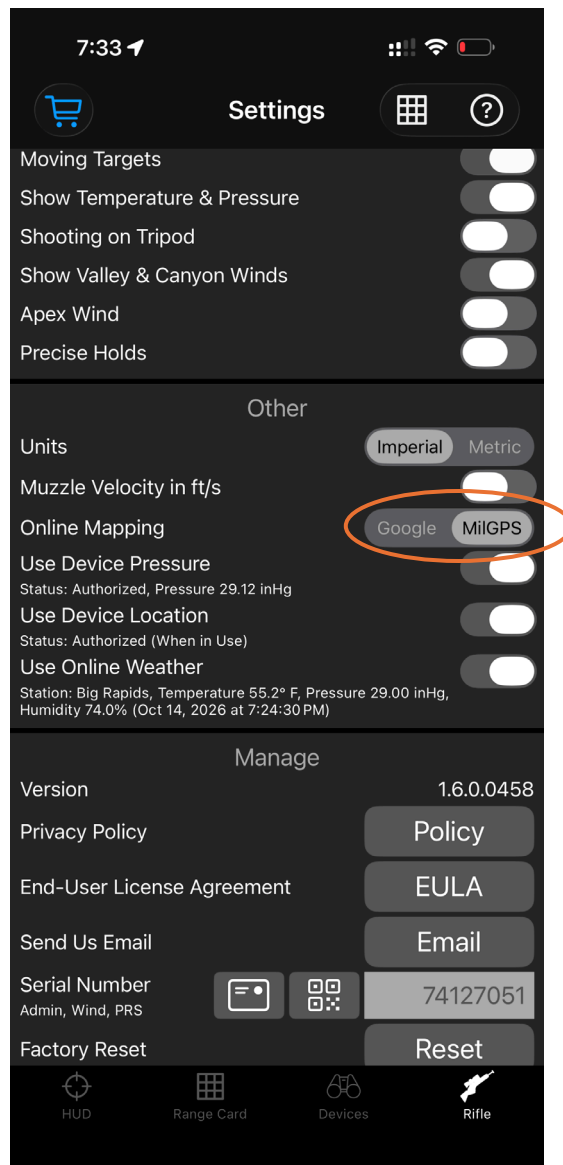


Figure 1. Settings: choose the mapping service under Other.

MIL GPS is a separate download that uses military grid coordinates and map sheets.

View the Recorded Target Location

45. With the compatible rangefinder connected, range the animal or target. Eagle Ballistics automatically records its calculated location.

46. Tap the Rifle icon in the bottom-right corner and scroll to the Target block.

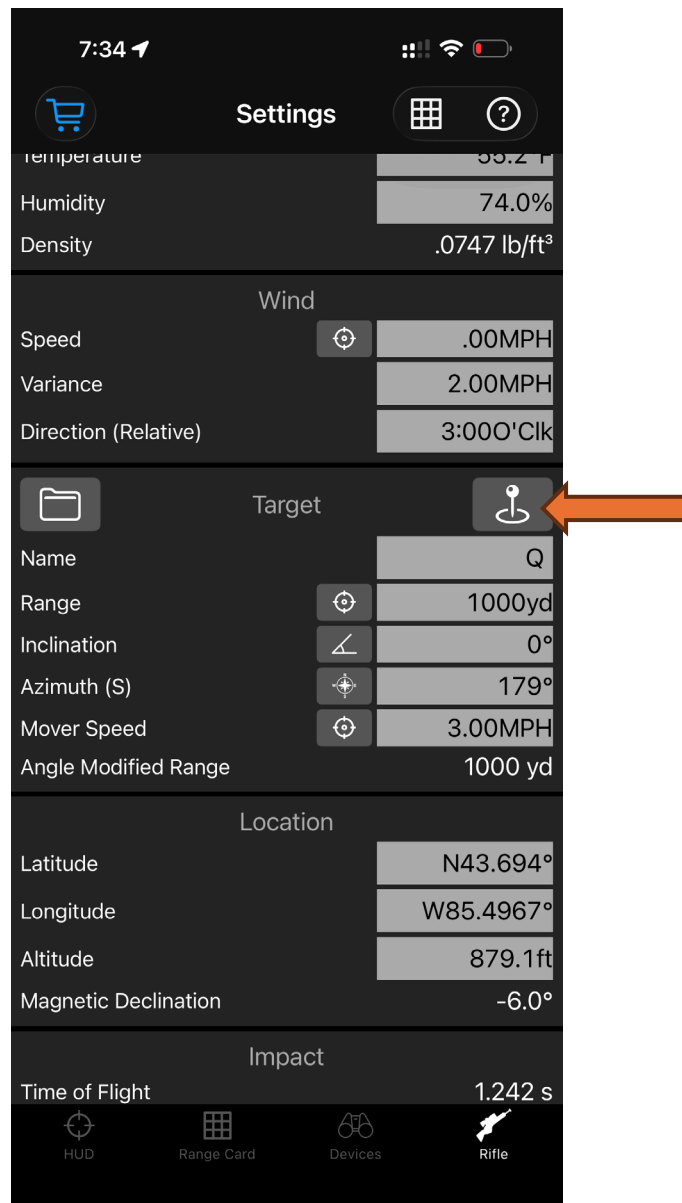


Figure 2. Target information, including range, azimuth, and location.

47. Tap Drop Pin. The selected mapping program opens.
48. Choose Show on Map to display the pin.
49. Use the map to navigate toward the marked area.

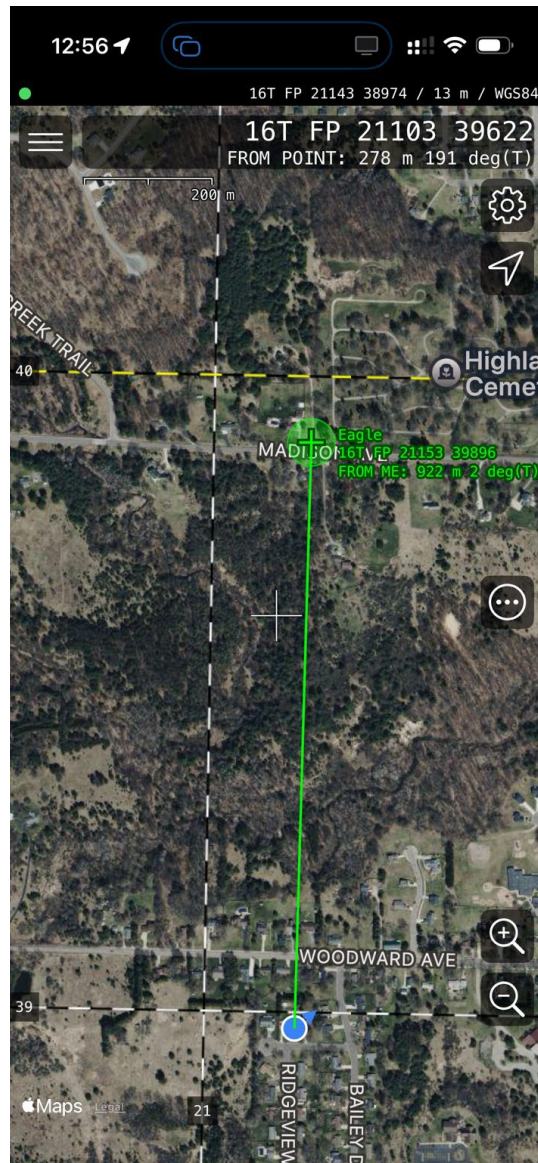


Figure 3. MIL GPS map displaying a marked location and navigation line.

Important Notes

The pin marks an estimated target location, not a guaranteed exact position. Its accuracy depends on the rangefinder measurement, directional information, and device location data.

Verify the area and follow safe, lawful recovery practices in the field.

Quick Reminder

Range the target first. Then open Rifle → Target → Drop Pin → Show on Map. The app records the pin automatically when the connected rangefinder ranges the target; the Drop Pin command opens it in your selected mapping program.

CHAPTER 17 — EXTREME LONG RANGE MULTI-BC TRUING

When shooting extreme long range, Eagle Ballistics supports multi-BC (ballistic coefficient) truing. This feature allows shooters to true ballistic coefficients separately in the supersonic, transonic, and subsonic regions of bullet flight.

Subscription Requirement

Multi-BC truing for extreme long range shooting requires the Eagle Ballistics PRS subscription.

How Multi-BC Truing Works

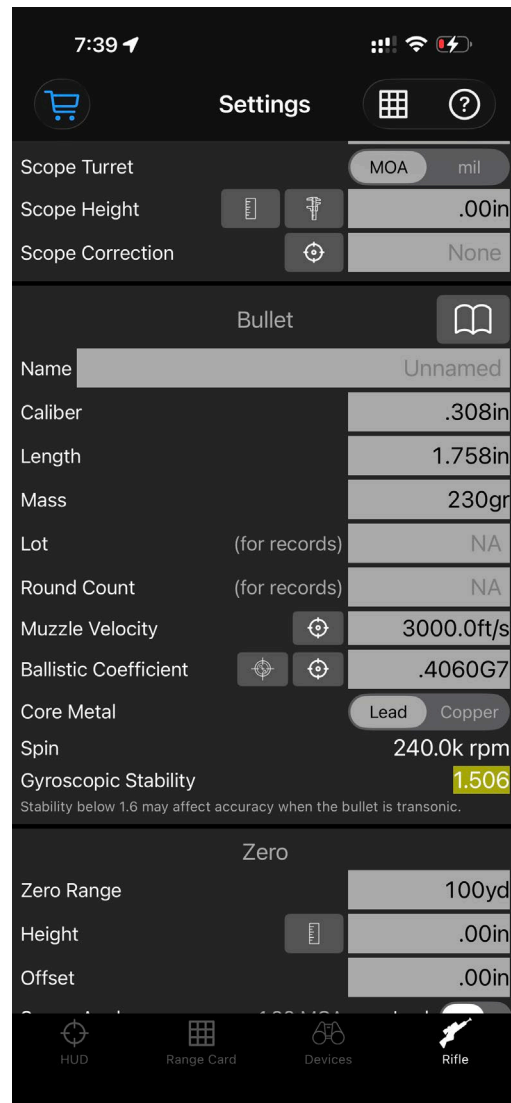


Figure 1. Rifle profile settings: bullet information, muzzle velocity, ballistic coefficient, and zero inputs.

The ballistic coefficient can change as the projectile slows and passes through different Mach-number regions. Eagle Ballistics allows separate BC truing for the supersonic, transonic, and subsonic regions so the ballistic solution can account for these changes over extreme distances.

Truing in the Correct Flight Region

- Supersonic: True the BC using a shot distance where the projectile is in the supersonic region.
- Transonic: The projectile must be in the transonic region before the app permits transonic BC truing.
- Subsonic: The projectile must be in the subsonic region before the app permits subsonic BC truing.

The app will not permit truing a transonic or subsonic BC using a shot that does not meet the corresponding flight-region criteria.



Figure 2. Multi-BC Truing screen showing the flight-region tabs, recommended range, required elevation, and stored BC values.

Why It Matters

At extreme ranges, using a single BC across the entire flight may not adequately represent changes in projectile drag. Multi-BC truing gives the shooter a way to refine the ballistic prediction as

the bullet transitions through supersonic, transonic, and subsonic flight.

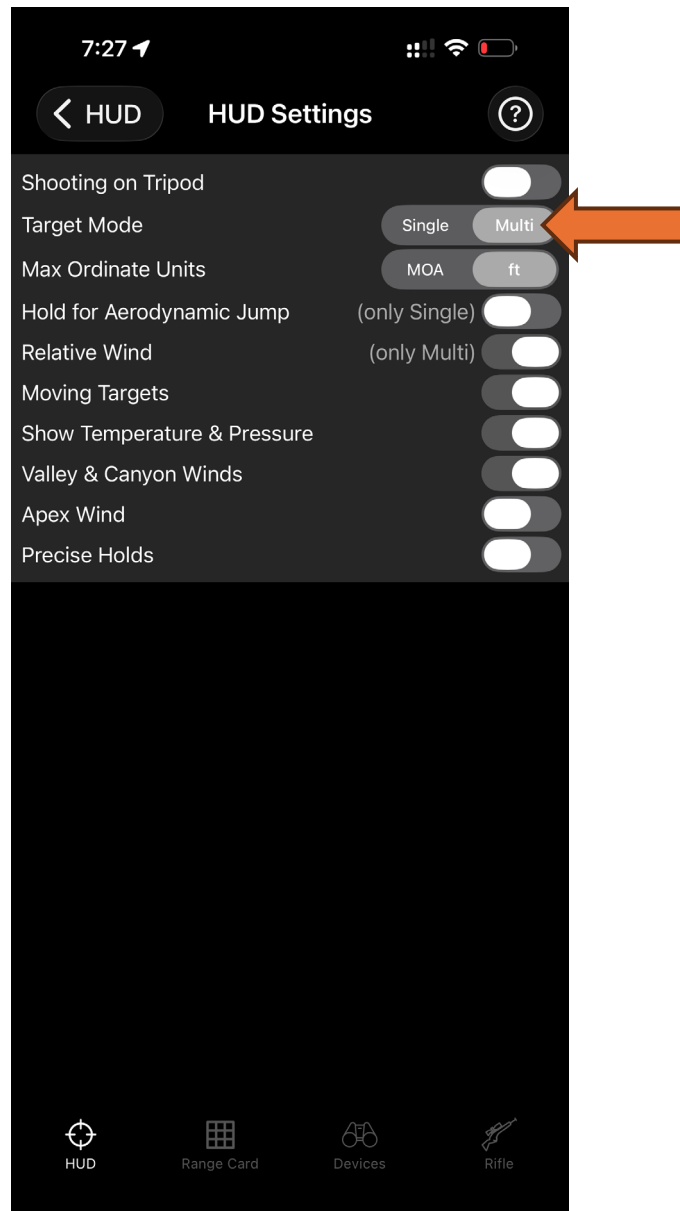
Note: Accurate truing depends on reliable range, muzzle velocity, environmental inputs, and observed impact data.

CHAPTER 18 — PRS AND MULTI-TARGET MODE

EAGLE BALLISTICS | USER INSTRUCTION MANUAL

PRS Mode organizes match stages, multiple targets, wind tools, moving-target calculations, and squad sharing in one HUD. The steps below follow the app controls described for this manual.

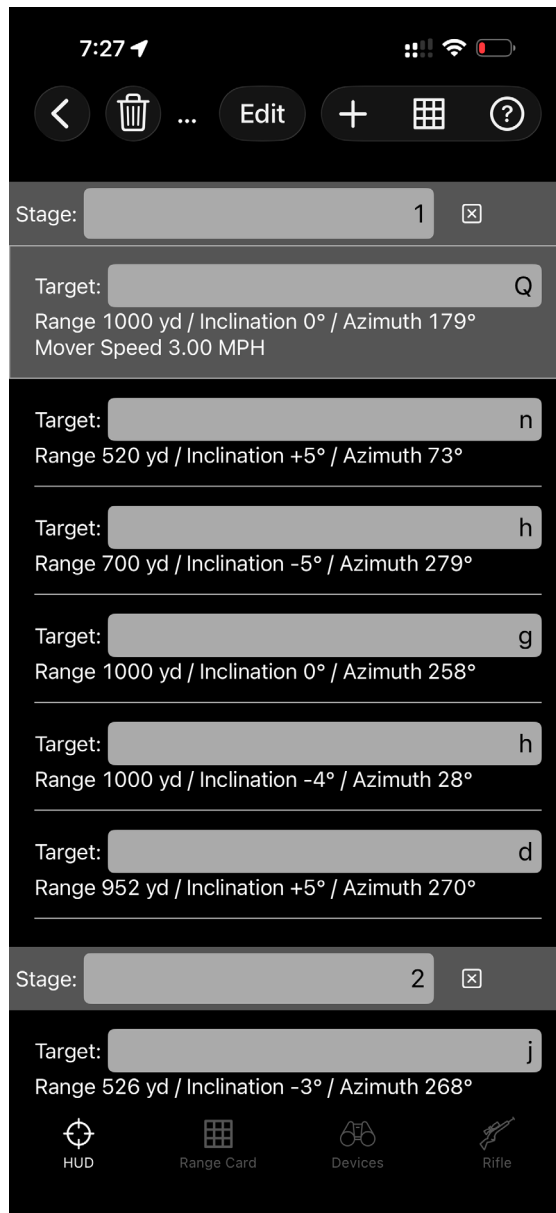
1. Turn On PRS Mode



HUD Settings: Multi-Target Mode, Relative Wind, and Moving Targets.

50. From the HUD, tap the gear icon in the upper-left corner to open Settings.
51. Turn on PRS Mode. For stages using them, also enable Relative Wind and Moving Targets.
52. Return to the HUD. PRS Mode initially displays one stage with one target.

2. Create and Name Stages



Stage editor: add stages and review the targets assigned to each stage.

53. Tap the folder icon in the upper-left corner.
54. Tap the plus sign to add stages until you have the number needed for the match.
55. Use the folder view to number or name each stage.

56. Return to the HUD. Swipe left to move between stages and swipe back to review previous stages.

3. Add and Configure Targets

Target	Q	n	h	g	h	d
Range	1000yd	520yd	700yd	1000yd	1000yd	952yd
Incline	0°	+5°	-5°	0°	-4°	+5°
Azimuth	179°	73°	279°	258°	28°	270°
Elev	U22¾	U9	U14	U23	U22¾	U21½
High	0	0	0	0	0	0
Hold	L¾	L¼	L½	L¾	L¾	L¾
Low	L1½	L¾	L1	L1½	L1½	L1½

Temperature (°F)	Pressure (inHg)
55.2	29.12

Wind Dir (Clock)	Wind Variance (MPH)	Wind Speed (MPH)
3:00	2.00	.00

Normal	Valley	Canyon
Manual	Meter	Mirage
	Rain	Snow

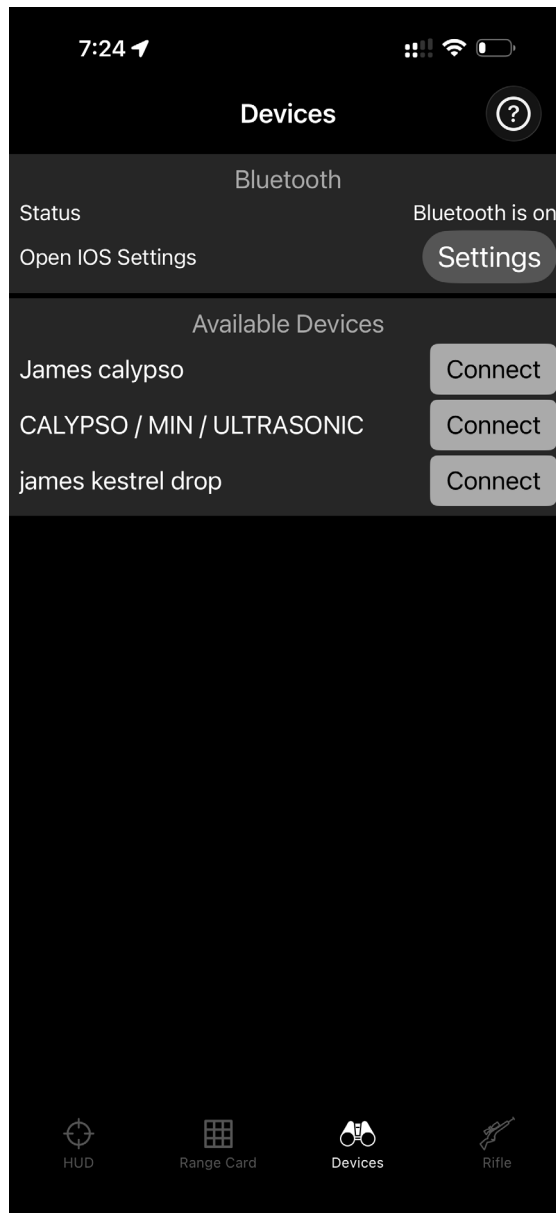
HUD	Range Card	Devices	Rifle
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Six-target PRS HUD showing range, incline, azimuth, elevation, and wind holds.

57. On the HUD, tap to the right of the first target to add another target. Continue until you have the targets needed, up to six on a stage.
58. Alternatively, tap at the far right to populate the stage with six targets.
59. Swipe to the next stage and repeat for its targets.
60. Tap a target to enter its name.
61. Tap the target's range field to type its distance manually.
Enter the target angle and direction of fire using the available target fields.
62. Review the target details before beginning the stage.

Each stage can have its own target layout and target information. Enter the actual distances, angles, and directions for the match rather than assuming targets on different stages are identical.

4. Mirage, Rain, and Snow Wind Reading



Devices screen: available Bluetooth wind and weather instruments for environmental input.

Mirage, rain, and snow wind-reading features remain available in PRS Mode, just as in Single-Target Mode. Select the appropriate wind-reading feature and tilt the phone to match the observed atmospheric angle. The displayed calculated wind speed changes

as the phone tilts. This lets you assess wind without leaving PRS Mode.

5. Relative Wind

7:27

Stage: 1

Target	Q	n	h	g	h	d
Range	1000yd	520yd	700yd	1000yd	1000yd	952yd
Incline	0°	+5°	-5°	0°	-4°	+5°
Azimuth	179°	73°	279°	258°	28°	270°
Wind Rel	3:00	6:30	11:30	12:30	8:00	12:00
Elev	U22¾	U9	U14	U23	U22¾	U21½
High	0	L½	L½	L½	L1½	L¾
Hold	L¾	L¼	L½	L¾	L¾	L¾
Low	L1½	L¼	L¼	L¾	0	L¾
Mover Speed	3.00					
Mover Hold	6¼					

Temperature (°F)

55.2

Pressure (inHg)

29.12

Wind Dir (Clock)

3:00

Wind Variance (MPH)

2.00

Wind Speed (MPH)

.00

Normal

Valley

Canyon

Manual

Meter

Mirage

Rain

Snow

HUD

Range Card

Devices

Rifle

Relative Wind HUD: wind clock direction is adjusted for each target azimuth.

U.S. Patent 11,415,592 B2

Relative Wind reduces the need to manually reset the wind clock direction for every target when the targets have different directions of fire.

63. Enable Relative Wind in Settings.
64. On the HUD, press and hold near the bottom of the target you want to use as the wind-direction reference.
65. Two orange blocks appear, confirming that target is the reference.
66. Set the wind direction for the reference target. As you move to other targets, Eagle Ballistics adjusts the relative wind direction according to each target's direction of fire.
67. When finished, press near the bottom of the reference target again. The orange blocks disappear.

Example: Five-Target Stage

Suppose Target 1 has wind coming from the 10:30 position. Select Target 1 as the reference, indicated by the two orange blocks. When you move to Target 2 and the remaining targets, the app updates the relative wind direction using the targets' directions of fire. You do not need to enter a new wind clock position on every target.

Relative Wind changes the wind direction relative to the line of fire; it does not mean the physical wind itself has changed. Confirm that the target directions of fire and the initial wind reference are correct.

6. Moving Targets

Method A: Known Target Speed

When the moving target's speed is known, enter the mover speed in miles per hour (MPH). Eagle Ballistics uses the entered speed with the target and ballistic information to calculate a lead.

Method B: Determine Speed with the Timer

68. Tap the center of the target in the light-gray area to open the moving-target timer.
69. If you cannot see the timer, tap Flip Screen in the upper-left corner.
70. Look through your scope and use the reticle to observe the moving target.
71. Tap Start. The phone vibrates, allowing you to begin timing without looking back at the screen.
72. Count the amount of target travel through the reticle in MOA or MIL.
73. Tap Stop and enter the observed angular travel.
74. Eagle Ballistics uses the travel, elapsed time, and target range to calculate the target's speed in MPH, which can then be used for the moving-target lead.

For accurate results, use the correct reticle units and target range, and measure the movement over the same time interval shown by the timer. Verify the lead before firing.

7. Clear One Stage or the Entire Match

Clear Targets on One Stage

75. Navigate to the stage you want to clear.
76. Tap the Delete button on that stage.
77. The targets on that stage are cleared; other stages remain available.

Delete All Stages and Targets

78. Open the folder view.
79. Tap the Delete button in the folder.
80. This clears the stages and their target information for the match.

Check which delete control you are using before clearing information. A stage-level delete and the folder-level delete affect different amounts of data.

8. Share Match Stages with a QR Code

One squad member can build the match stages and share them with other Eagle Ballistics users, avoiding repeated manual entry.

81. Tap the folder icon.
82. Tap the nine-squares icon near the upper-right corner.
83. Select the QR Code option to display the code for the stage information.
84. To share remotely, take a screenshot and text the QR code to a squad member.

85. To share in person, have another shooter scan the QR code using Eagle Ballistics.

86. The receiving app imports the shared stages and target information.

After importing, each shooter should verify the stages, target ranges, angles, and directions and confirm their own rifle profile and ballistic settings. Sharing target information does not replace verifying a shooter's individual setup.

9. Before You Shoot: Final PRS Checklist

- Confirm the correct rifle profile and current environmental inputs.
- Verify every stage name and target range, angle, and direction.
- Confirm wind source, wind speed, and wind direction.
- If using Relative Wind, confirm the orange reference markers are on the intended target.
- If using a mover, verify the entered or measured target speed and lead.
- Confirm the correct stage is displayed before engaging targets.

Chapter Summary

PRS / Multi-Target Mode combines stage setup, up to six targets per stage, atmospheric wind reading, Relative Wind, moving-target speed and lead calculations, stage clearing, and QR code squad sharing. Build the stages once, verify the target information, and use the HUD to move efficiently through the match.

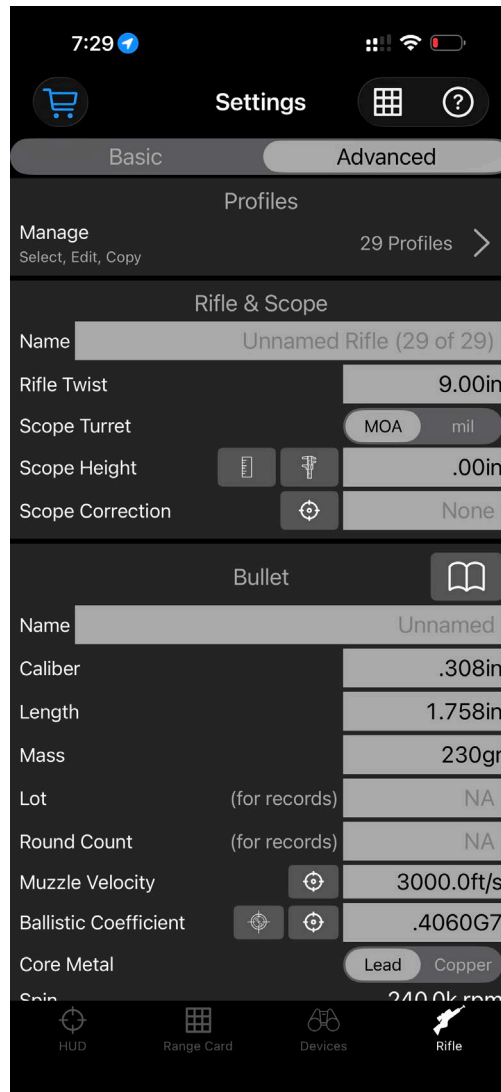
CHAPTER 19 — SAVING AND RESTORING RIFLE PROFILES

Eagle Ballistics provides two ways to back up rifle profiles using QR codes: save every rifle profile together, or save and share an individual rifle profile. There is no separate Save button for this process. As you make changes to your rifle profiles, it is highly recommended that you periodically create updated QR-code backups.

Option 1 — Save All Rifle Profiles

87. Tap the rifle icon in the bottom-right corner.
88. At the top of the screen, open the Profiles tab to display all your rifles.
89. Tap the nine-squares icon in the upper-right corner.
90. Select QR Code.
91. Take a screenshot of the QR code and save it to your phone's Photos. You can also email the screenshot to yourself.

Organization tip: Create an email folder named “Rifle Profiles” and store updated QR-code screenshots there for safekeeping.



Rifle profile settings: review the rifle, scope, and bullet information.

Option 2 — Save or Share One Rifle Profile

92. Open your rifle list and select the rifle you want to save or share. The selected rifle will be highlighted in gray.
93. Tap the rifle icon in the bottom-right corner to open the selected rifle's information.
94. Tap the nine-squares icon.
95. Select QR Code.

Rifle & Scope	
Parameter	Value
Name	N/A
Rifle Twist	9.00 in
Scope Height	.00 in
Scope Correction	1
Scope Turret	MOA

Bullet	
Parameter	Value
Name	N/A
Caliber	.308 in
Length	1.758 in
Mass	230 gr
Lot	N/A
Round Count	N/A
Muzzle Velocity	3000.0 ft/s
Ballistic Coefficient	.4060 G7
Bullet Spin (Calc)	240.0k rpm
Gyroscopic Stability (Calc)	1.506

Zero	
Parameter	Value
Zero Range	100 yd
Zero Height	.00 in
Zero Offset	.00 in
Angle Lock	Off

Environment	
-------------	--

Profile summary: verify the information before exporting.

96. Take a screenshot of the QR code, save it to Photos, or email it to yourself or another Eagle Ballistics user.



Export Rifle: QR code for transferring a rifle profile.

Restore Profiles from a QR Code

If you change phones, reinstall Eagle Ballistics, or need to recover your profiles, use a QR-code image you previously saved.

97. Open the saved QR-code image in your phone's Photos.
98. Press and hold the center of the QR code with your thumb.
99. Choose "Open in Eagle Ballistics" when that option appears.

100. Eagle Ballistics will import the rifle profile information contained in that QR code. A QR code saved for all rifles restores the collection; a code saved for one rifle restores that individual profile.

Recommended Practice

Create a fresh QR-code backup whenever you make meaningful changes to your rifle profiles. Keep a copy in Photos and another in your email Rifle Profiles folder, so you can recover your information if your phone or app becomes unavailable. After importing, review your rifle profiles to confirm the information is correct.

CHAPTER 20 — SETTINGS OVERVIEW

Eagle Ballistics Instruction Manual

The Settings section provides ballistic information, diagnostics, HUD options, measurement units, mapping and weather controls, and application management information.

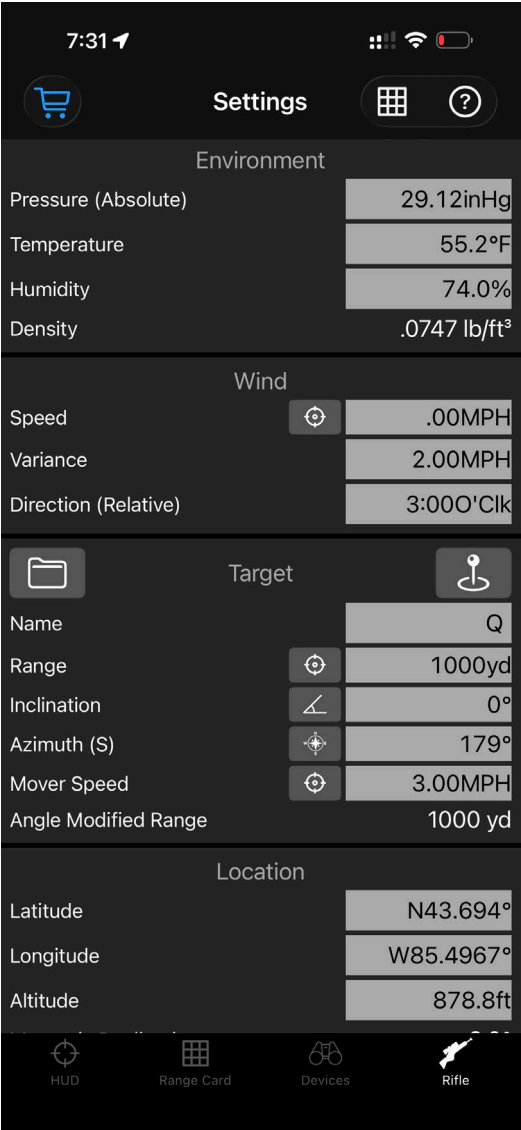


Figure — Environment, wind, target, and location settings

Impact Information

Time of Flight: Elapsed time for the bullet to reach the target.

Retained Velocity: Bullet velocity at the target.

Retained Energy: Remaining bullet kinetic energy at impact.

Slope Angle: Incoming bullet angle relative to the target.

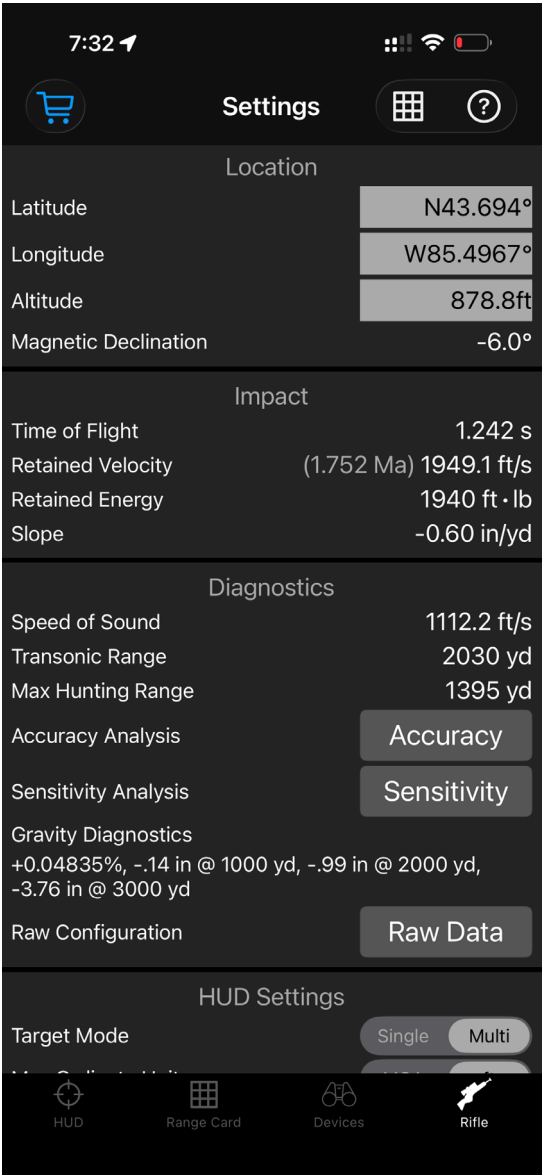


Figure — Location, impact information, and diagnostics

Diagnostics

Speed of Sound: Speed of sound under the current atmospheric conditions.

Transonic: Information about the bullet entering the transonic region.

Maximum Hunting Range: The app's calculated maximum hunting range.

Accuracy Analysis: Explained in a separate chapter.

Sensitivity Analysis: Explained in a separate chapter.

Raw Configuration / Raw Data: Underlying configuration and ballistic data.

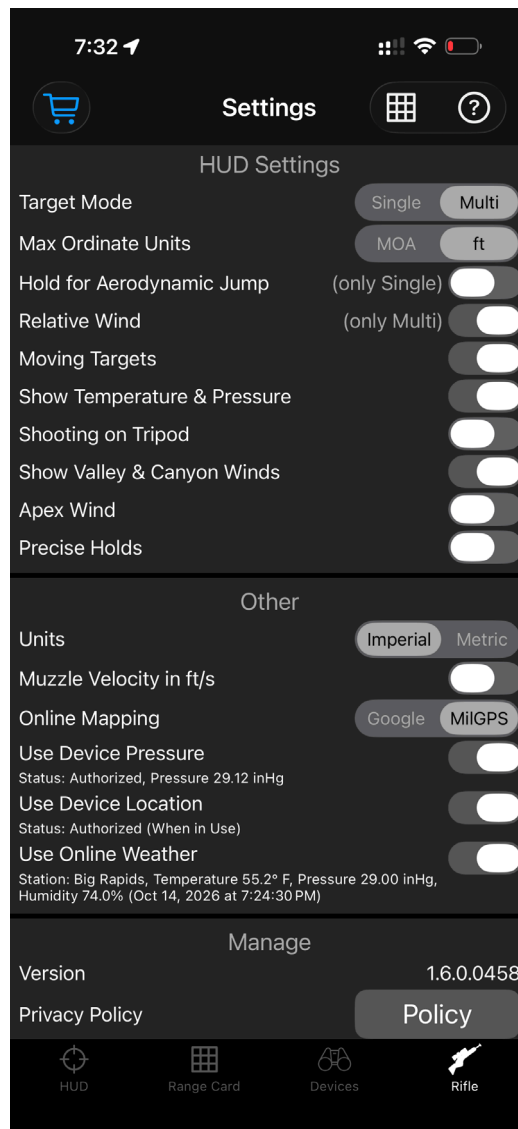


Figure — HUD settings and measurement preferences

HUD Settings

HUD options: Provides the same settings available from the gear icon in the upper-left corner of the HUD.

Units

Imperial or Metric: Select the preferred measurement system.

Muzzle Velocity: Even when using Metric units elsewhere, muzzle velocity can be displayed in feet per second (FPS).

Online Mapping and Device Settings

Online Mapping: Available choices currently include Google Maps and MIL-GPS.

Device Location: Enable to allow use of device location information.

Use Online Weather: Enable to allow online weather information. Device Location and Use Online Weather should both be turned on.

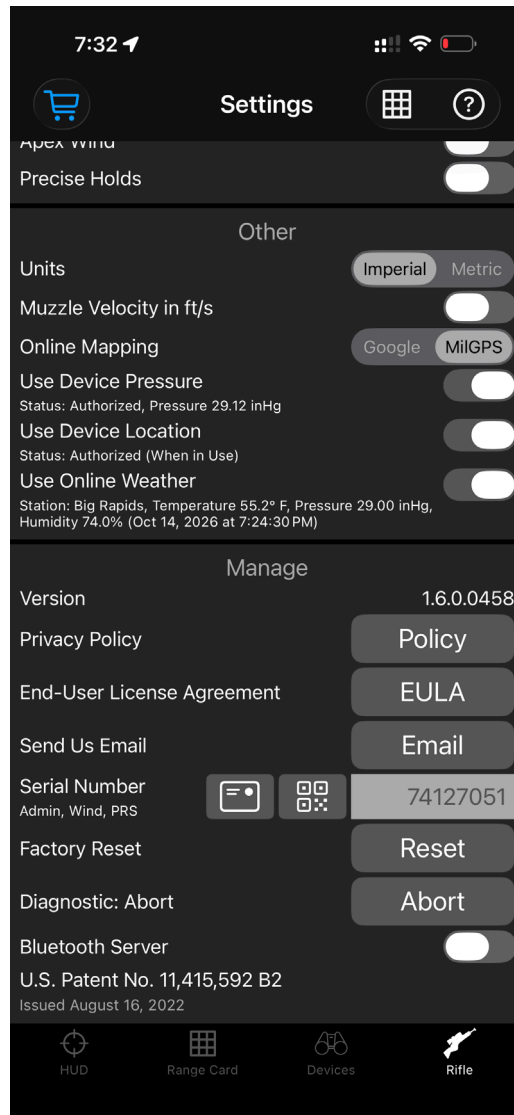


Figure — Device services and application management

Manage

Serial Number: Displays the application serial number.

Privacy Policy: Opens the privacy policy.

End User Agreement: Opens the end user agreement.

App Version: Displays the installed application version.

Factory Reset: Reserve for situations where the app has stopped working. Back up all rifle profiles before considering a factory reset.

Important: Back Up Rifle Profiles

Save rifle profiles as QR codes and retain screenshots in Photos or email. This is especially important before a factory reset or when changing phones. See the chapter “Saving and Restoring Rifle Profiles” for the complete procedure.

Chapter Summary

Settings provides access to impact data, diagnostics, HUD controls, units, mapping, location and weather preferences, and management information. Keep profile QR-code backups available in case the application must be restored.

Eagle Ballistics Instruction Manual

CHAPTER 21 — BUILDING A RANGE CARD

Eagle Ballistics lets you generate standard range cards, wind cards, detailed ballistic reports, and compact labels for your rifle stock. These references use the information in your selected rifle profile.

Creating a Range Card

First, use the Heads-Up Display (HUD) to set the maximum distance for the range card. For example, enter 1,000 yards.

101. At the bottom of the screen, next to HUD Settings, tap Range Card.
102. Choose the distance interval: 10 meters, 10 yards, 25 yards, 50 yards, or 100 yards.
103. Eagle Ballistics generates the range card to the maximum distance selected on the HUD.

7:36   

Range Card   

Range	Path	Path	Drift	Drift	Velocity	Energy	TOF
yd	in	MOA	in	MOA	ft/s	ft·lb	s
0	.00	-	.00	-	3000.0	4596	.000
25	+.37	D1½	+.01	0	2970.8	4507	.025
50	+.50	D1	+.02	0	2941.8	4419	.050
75	+.38	D½	+.04	0	2912.9	4333	.076
100	+.00	0	+.07	0	2884.1	4247	.102
125	-.64	U½	+.11	0	2855.4	4163	.128
150	-1.55	U1	+.15	0	2826.9	4081	.155
175	-2.72	U1½	+.21	0	2798.5	3999	.181
200	-4.18	U2	+.27	L¼	2770.3	3919	.208
225	-5.92	U2½	+.34	L¼	2742.2	3840	.235
250	-7.94	U3	+.41	L¼	2714.2	3762	.263
275	-10.26	U3½	+.50	L¼	2686.4	3685	.291
300	-12.89	U4	+.59	L¼	2658.7	3609	.319
325	-15.82	U4¾	+.69	L¼	2631.2	3535	.347
350	-19.06	U5¼	+.80	L¼	2603.9	3462	.376
375	-22.62	U5¾	+.92	L¼	2576.7	3390	.405
400	-26.51	U6¼	+1.05	L¼	2549.7	3319	.434
425	-30.74	U7	+1.18	L¼	2522.8	3250	.463
450	-35.30	U7½	+1.33	L¼	2496.1	3181	.493
475	-40.21	U8	+1.48	L¼	2469.5	3114	.524
500	-45.48	U8¾	+1.65	L¼	2443.2	3048	.554

Interval 1 10 25 50 100

Range Wind Detailed Label

 HUD  Range Card  Devices  Rifle

Range tab — trajectory, drift, velocity, energy, and time of flight.

Wind Card

Select Wind Card to produce a reference focused on wind holds at the chosen distances.

7:36

Range Card

Range: 1000 yd				
	Left-to-Right		Right-to-Left	
Wind	Elev	Wind Hold	Elev	Wind Hold
MPH	MOA			
0	U22 ³ / ₄	L ³ / ₄	U22 ³ / ₄	L ³ / ₄
½	U22 ³ / ₄	L1	U22 ³ / ₄	L½
1	U23	L1	U22 ³ / ₄	L¼
1½	U23	L1¼	U22 ³ / ₄	-
2	U23	L1½	U22 ³ / ₄	-
2½	U23	L1¾	U22 ³ / ₄	R¼
3	U23	L2	U22 ³ / ₄	R½
3½	U23	L2	U22 ³ / ₄	R¾
4	U23	L2¼	U22 ³ / ₄	R1
4½	U23	L2½	U22 ³ / ₄	R1¼
5	U23	L2¾	U22 ³ / ₄	R1½
5½	U23	L3	U22 ³ / ₄	R1¾
6	U23	L3¼	U22 ³ / ₄	R2
6½	U23	L3½	U22 ³ / ₄	R2¼
7	U23	L3¾	U22½	R2½
7½	U23	L4	U22½	R2¾
8	U23	L4¼	U22½	R3
8½	U23¼	L4½	U22½	R3¼
9	U23¼	L4¾	U22½	R3½
9½	U23¼	L5	U22½	R3¾

Range

Wind

Detailed

Label

HUD

Range Card

Devices

Rifle

Wind tab — wind holds and elevation corrections for both wind directions.

Detailed Ballistic Information

Select Detail for a more comprehensive report of the projectile's flight. This view includes impact information, horizontal offset, vertical offset, muzzle velocity, and other ballistic information calculated by the app.

7:36

Range Card

Muzzle	
Spin	240.0k rpm
Stability	1.506
Flight	
Time of Flight	1.242 s
Max Ordinate	6.2 ft
Max Ord Range	536 yd
Impact	
Retained Velocity	1949.0 ft/s
Retained Energy	1940 ft·lb
Retained Mach	1.752 Ma
Vertical Offset	
Scope Position	.00 in
Scope Rise	19.81 in
Gravity	-259.08 in
Eötvös	.03 in
Aerodynamic Jump	.00 in
Tripod Effect	.00 in
Total	-239.23 in
Horizontal Offset	
Offset	.00 in
Spin Drift	5.03 in
Wind Deflection	.00 in
Coriolis	2.25 in
Total	7.27 in

Range

Wind

Detailed

Label

HUD

Range Card

Devices

Rifle

Detailed tab — flight, impact, vertical and horizontal offset calculations.

Rifle-Stock Label

Select Label to create a compact reference suitable for printing and placing on the side of a rifle stock. The label includes right-wind and left-wind information.

7:36

Range Card

		Wind (MPH)											
		Left-to-Right						Right-to-Left					
Range	Dial Up	5	4	3	2	1	0	1	2	3	4	5	
yd		MOA											
50	D1	-	-	-	-	-	-	-	-	-	-	-	-
100	0	L $\frac{1}{4}$	L $\frac{1}{4}$	L $\frac{1}{4}$	-	-	-	-	-	-	-	-	-
150	U1	L $\frac{1}{4}$	L $\frac{1}{4}$	L $\frac{1}{4}$	L $\frac{1}{4}$	-	-	-	-	-	R $\frac{1}{4}$	R $\frac{1}{4}$	
200	U2	L $\frac{1}{2}$	L $\frac{1}{4}$	L $\frac{1}{4}$	L $\frac{1}{4}$	L $\frac{1}{4}$	-	-	-	-	R $\frac{1}{4}$	R $\frac{1}{4}$	
250	U3	L $\frac{1}{2}$	L $\frac{1}{2}$	L $\frac{1}{4}$	L $\frac{1}{4}$	L $\frac{1}{4}$	-	-	-	R $\frac{1}{4}$	R $\frac{1}{4}$	R $\frac{1}{4}$	
300	U4	L $\frac{3}{4}$	L $\frac{1}{2}$	L $\frac{1}{2}$	L $\frac{1}{4}$	L $\frac{1}{4}$	L $\frac{1}{4}$	-	-	R $\frac{1}{4}$	R $\frac{1}{4}$	R $\frac{1}{2}$	
350	U5 $\frac{1}{4}$	L $\frac{3}{4}$	L $\frac{3}{4}$	L $\frac{1}{2}$	L $\frac{1}{2}$	L $\frac{1}{4}$	L $\frac{1}{4}$	-	-	R $\frac{1}{4}$	R $\frac{1}{4}$	R $\frac{1}{2}$	
400	U6 $\frac{1}{4}$	L1	L $\frac{3}{4}$	L $\frac{1}{2}$	L $\frac{1}{2}$	L $\frac{1}{4}$	L $\frac{1}{4}$	-	-	R $\frac{1}{4}$	R $\frac{1}{2}$	R $\frac{1}{2}$	
450	U7 $\frac{1}{2}$	L1	L $\frac{3}{4}$	L $\frac{3}{4}$	L $\frac{1}{2}$	L $\frac{1}{4}$	L $\frac{1}{4}$	-	R $\frac{1}{4}$	R $\frac{1}{4}$	R $\frac{1}{2}$	R $\frac{1}{2}$	
500	U8 $\frac{3}{4}$	L1 $\frac{1}{4}$	L1	L $\frac{3}{4}$	L $\frac{1}{2}$	L $\frac{1}{2}$	L $\frac{1}{4}$	-	R $\frac{1}{4}$	R $\frac{1}{4}$	R $\frac{1}{2}$	R $\frac{3}{4}$	

Wed Oct 14 19:36:26 2026

Range
Wind
Detailed
Label

HUD
 Range Card
 Devices
 Rifle

Label tab — compact range and wind-hold reference for printing.

.22 Rimfire Range Cards

For .22 rimfire shooting, the range card supports smaller intervals, down to 1-yard increments. This is useful when targets are placed at closely spaced distances.

Printing and Sharing

The upper-right corner provides a question-mark icon for information, a print icon to print the selected card or report, and a share icon (a box with an arrow) to send it by text message or email. You can also email a copy to yourself for later reference.

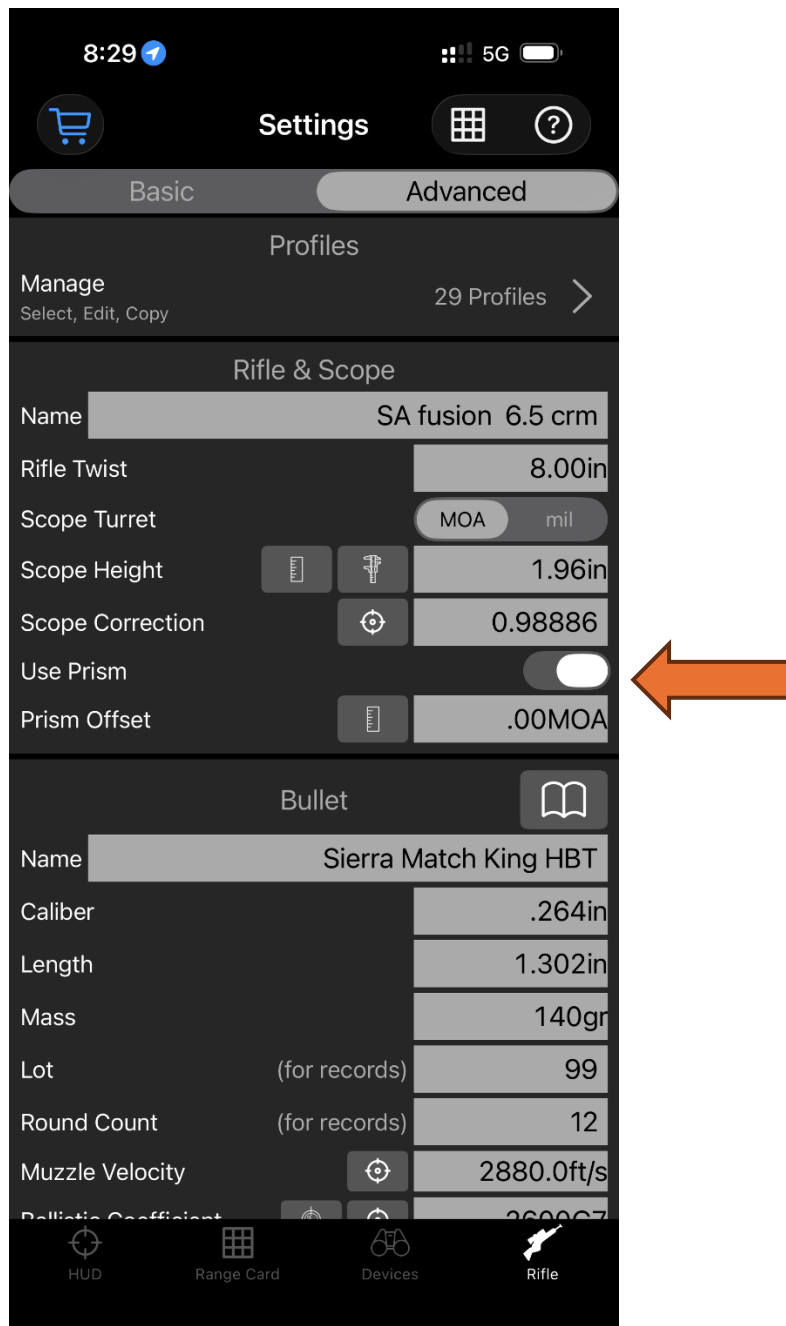
Before Using a Printed Card

Confirm the correct rifle profile, ammunition information, and applicable shooting conditions before relying on a printed range card. Regenerate the card when relevant ballistic inputs change.

CHAPTER 22 — PRISM OFFSET FEATURE

Add a **PRISM** button to the Eagle Ballistics HUD.

When the shooter selects PRISM, a small window opens with the following options:



PRISM SETTINGS

- Prism ON / OFF
- Prism Offset: Enter value
- Units: MOA or MIL
- Calibrate Prism
- Save

How It Works

The shooter enters the prism correction, such as 99 MOA, 41 MOA, or 14.4 MIL.

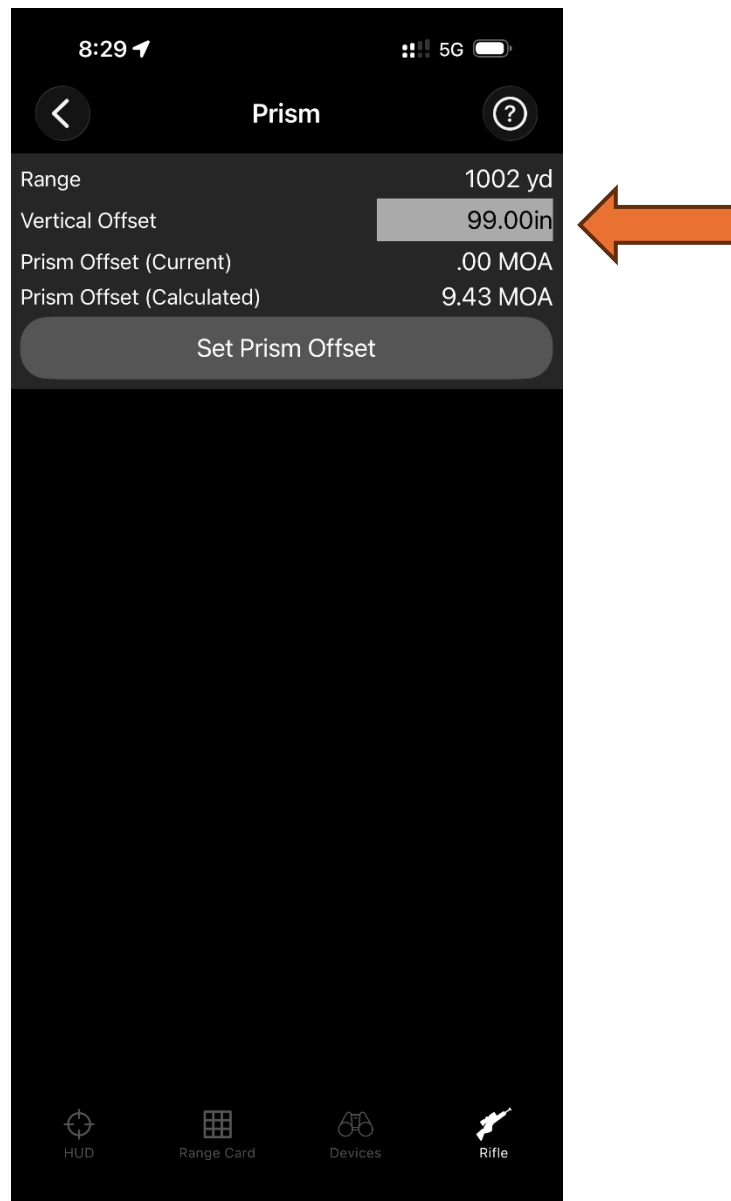
When PRISM is turned ON, Eagle Ballistics automatically subtracts the prism correction from the normal elevation dial-up.

Example:

- Normal elevation: 120 MOA
- Prism correction: 99 MOA
- New elevation displayed: 21 MOA

When PRISM is turned OFF, the app returns to the normal elevation solution.

Calibrate Prism



The shooter can enter the actual measured correction instead of using the manufacturer's stated value.

1. Zero the rifle normally without the prism.
2. Install the prism without changing the scope turrets.
3. Measure the vertical difference between the normal and prism point of impact at a known distance.

4. Enter the measured distance and vertical difference into Eagle Ballistics.
5. The app automatically calculates the prism correction in MOA or MIL.

Calibration formula:

$\text{MOA} = \text{Vertical difference in inches} \div (\text{Distance in yards} \times 0.01047)$

$\text{MIL} = \text{Vertical difference in inches} \div (\text{Distance in yards} \times 0.036)$

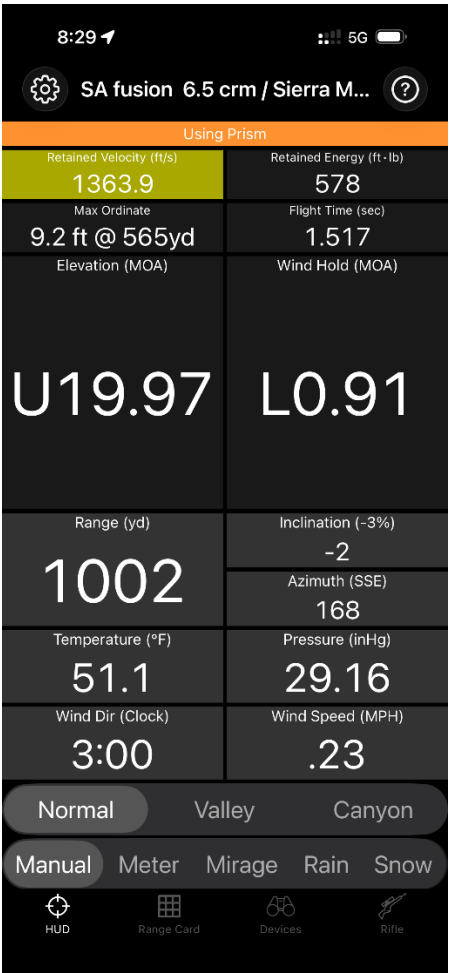
For large prism offsets, use an appropriately shifted aiming point or another safe calibration method so shots remain on the target backstop.

Important

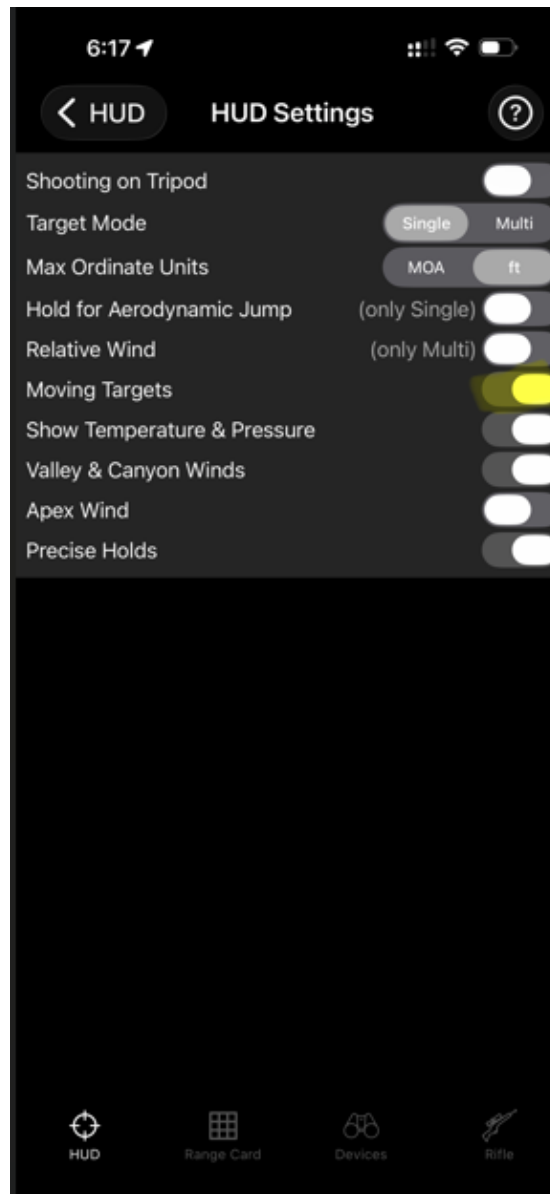
The PRISM feature must not change the rifle's original zero, muzzle velocity, BC, or Zero Scope Angle Lock.

It only adjusts the final elevation displayed on the HUD.

The HUD should display **PRISM ON** whenever the correction is active.



CHAPTER 23 — Mover Tool



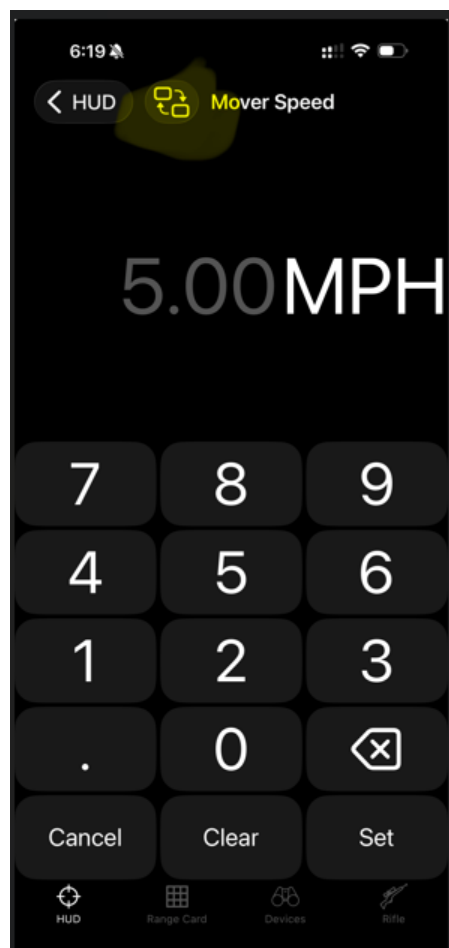
How to Use the Moving Target Tool in Eagle Ballistics

The Eagle Ballistics Mover Tool calculates the lead required to engage a moving target using the target's speed, distance, and the bullet's time of flight.

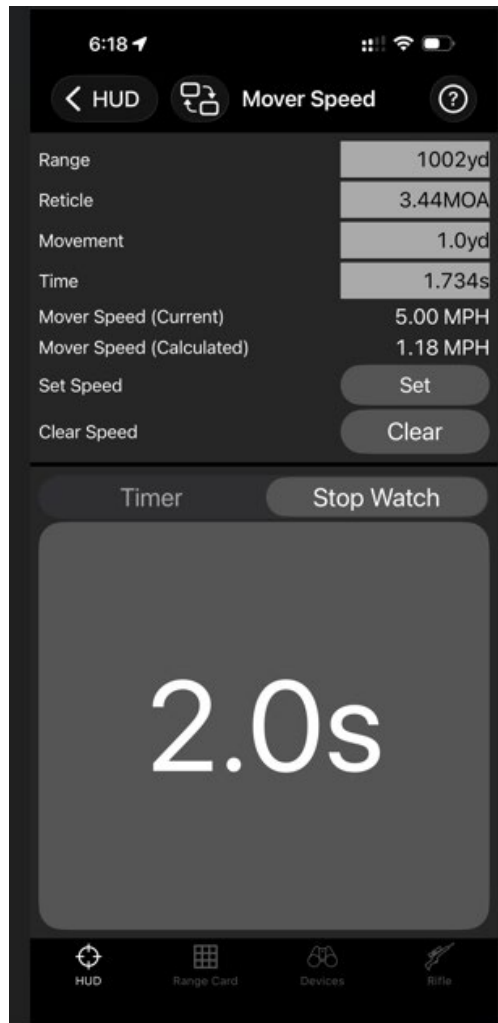
Step-by-Step Instructions

- 1. Open Eagle Ballistics and select your rifle profile.**
- 2. Enter or range the distance to the moving target.**
- 3. Open the Mover Tool.**
- 4. Enter the target's movement speed in miles per hour (MPH).**
- 5. Read the calculated moving-target lead in MOA or MIL, depending on your selected settings.**
- 6. Apply the lead in the direction the target is moving.**
- 7. Account for the wind correction separately when determining your final hold.**

Using the Flip Screen Timer



- 1. Open the flip-screen timer feature.**
- 2. Use the timer to follow the moving target's travel cycle.**



3. Observe when the target reaches the desired MOA or Mil Mark in your Scope.
4. Use the timing information to anticipate the target's next movement.
5. Reverse the lead direction when the target changes direction.

Important Notes

- Faster targets require more lead.

- **Longer bullet flight times require more lead.**
- **Left-moving targets require left lead.**
- **Right-moving targets require right lead.**
- **Wind correction must also be considered.**
- **Confirm target speed and distance before starting the stage.**

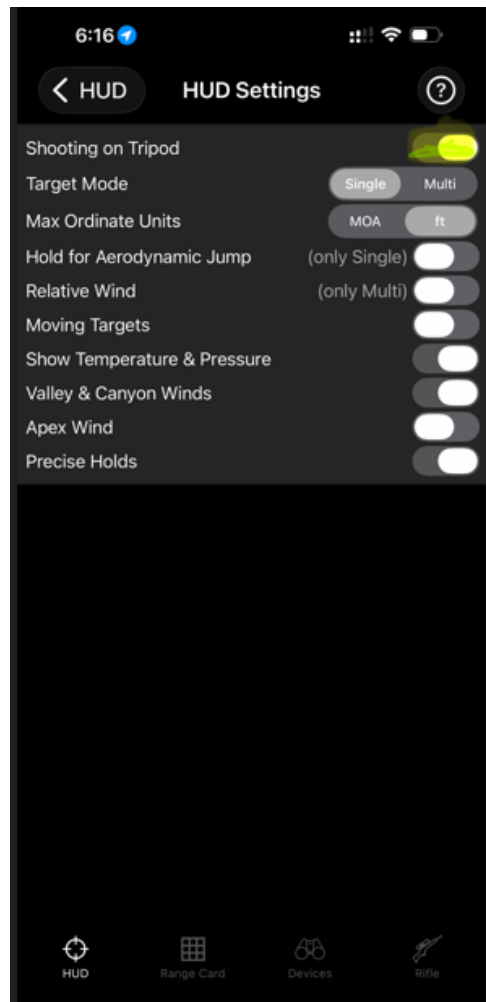
The Mover Tool allows the shooter to obtain moving-target lead directly from Eagle Ballistics without manually calculating target movement during bullet flight.

CHAPTER 24 — Tripod Tool

How to Use the Tripod Tool in Eagle Ballistics

The Eagle Ballistics Tripod Tool is designed to help compensate for the effects of muzzle flip when shooting lightweight hunting rifles from a tripod.

Step-by-Step Instructions



1. Open **Eagle Ballistics**.
2. Go to **Settings**.
3. Turn on **Shooting Off of Tripod**.

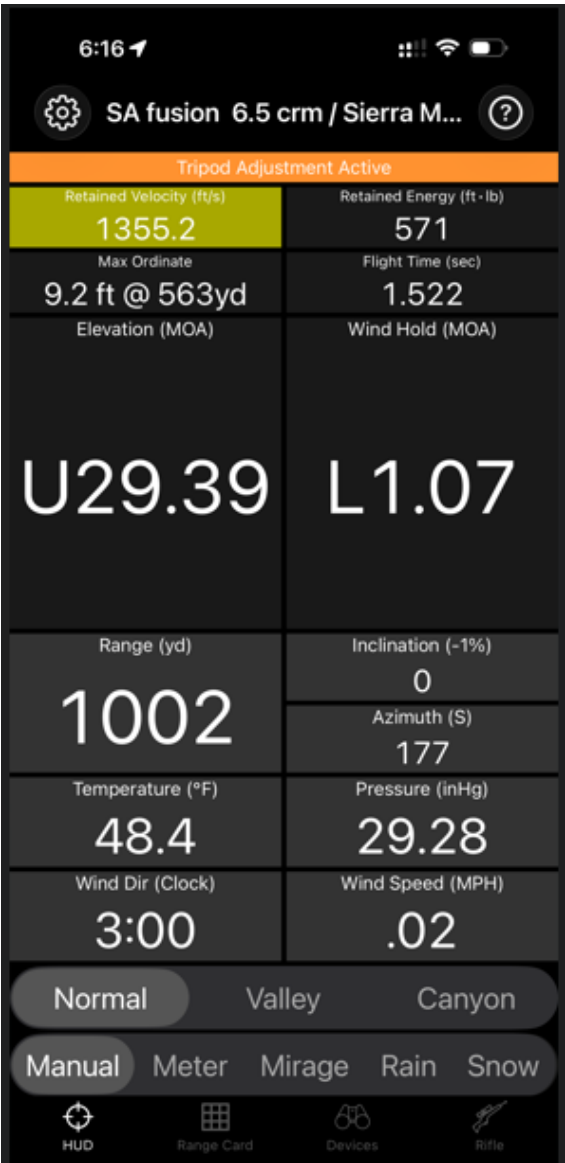
U.S. Patent 11,415,592 B2

4. Eagle Ballistics will automatically deduct the appropriate amount of MOA or MIL from the elevation correction when shooting at distances greater than 600 yards.
5. The adjusted elevation correction will automatically appear on the HUD.

Important Notes

- The Tripod Tool is designed primarily for lightweight hunting rifles fired from a tripod.
- The correction does not activate until the target distance exceeds 600 yards.
- The tool automatically reduces the elevation correction to help compensate for the muzzle flip effect.
- An **orange bar appears across the top of the HUD** to remind the shooter that the Tripod Tool is turned on.
- Turn off **Shooting Off of Tripod** when no longer shooting from a tripod.

The Tripod Tool allows shooters to account for the effects of muzzle flip without manually adjusting their elevation corrections.



Note: Connecting ENDO Glasses to Eagle Ballistics

ENDO Glasses display the information shown on the heads-up display (HUD). Connect the glasses to Eagle Ballistics just as you would any other Bluetooth device, following the normal device-pairing process.

Once the glasses are connected, continue using Eagle Ballistics as you normally would with a compatible wind device, such as a Calypso Mini or other wind meter.

Return to the HUD and select the **Meter** tab. You will then be able to see live wind updates and any aerodynamic jump adjustments to your dial-up displayed directly on the glasses, allowing you to monitor changing conditions without looking down at your phone.

Continue looking through your rifle scope while wearing the glasses. When the displayed data updates, you can see the changes immediately in your field of view.

Important: When you see the data flash on the glasses, it indicates that a wind update has occurred. This allows you to recognize changing wind conditions while keeping your attention on the target and your scope.





About the Author

1SG/MSG (Ret.) James Eagleman served 26 years in the U.S. Army as a Sniper and Master Instructor. He was an Honor Graduate of the U.S. Army Sniper School and a graduate of the U.S. Army Sniper Training Course conducted by the 5th Special Forces Group.

Eagleman began developing the Eagleman Wind Technique in 1988 and refined it throughout his military career and more than forty years of long-range shooting experience. His instruction is known for turning difficult ballistic concepts into field-ready methods that shooters can understand, practice, and apply.

He later served as Director of Shooting Instruction for Gunwerks Long Range University and founder of the Eagleman Long Range School trained at Barbour Creek shooting school for 8 years and has trained military personnel, law-enforcement professionals, hunters, and civilian long-range shooters. His work has appeared on Long Range Pursuit, Precision Hunting TV, Spiritual

Adventure Outdoors, The High Road with Keith Warren, and in numerous articles, blogs, and instructional videos.

James Eagleman is the founder and CEO of Eagle Ballistics, advanced ballistic software designed for precision shooting and long-range hunting. His patented wind-reading work brings together maximum-ordinate observation, mirage, rain, snow, terrain, and application-based tools to help shooters make more confident wind calls.

Contact and Training

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EagleBallistics.com • EaglemanLongRange.com

Continue Your Long-Range Shooting Education

The journey to mastering long-range shooting doesn't end with this book—it begins on the range.

Join James Eagleman's Long-Range Shooting Course and learn the Eagleman Wind Technique through hands-on instruction, real-world scenarios, and proven field methods.

Register Today

EaglemanLongRange.com

or register directly at LongRangeLR.com

Scan the QR code below to register instantly:

Eagle Ballistics

Built on Experience. Proven in the Field

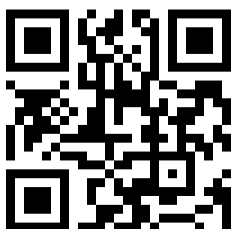
Continue Your Long-Range Shooting Education

Learning doesn't end when you finish this book, it begins on the range.

Join James Eagleman's Long-Range Shooting Course and sharpen your wind reading, mirage interpretation, ballistics, and long-range shooting skills through practical instruction.

Training Registration

<https://LongRangeLR.com>



Apple App Store – Eagle Ballistics



Google Play – Eagle Ballistics



Eagle Ballistics

Built on Experience. Proven in the Field.

U.S. Patent 11,415,592 B2