VORTEX®

RAZOR® HD AMG™

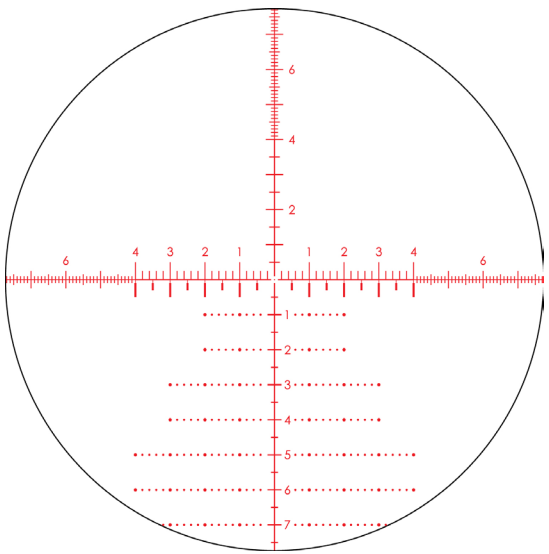
EBR-7B MRAD Reticle

Dual Use: Shooting Tactical / Hunting
US Patent 7,937,879

THE VORTEX® EBR-7B MRAD RETICLE

Designed to maximize long-distance shooting and ranging abilities, the EBR-7B (Enhanced Battle Reticle) is a hashmarked ranging reticle using MRAD based subtension lines for ranging, holdover, and windage corrections.

Ultra-precision laser etching on the glass reticle ensures that MRAD specifications are kept to the tightest tolerances possible. The fine center crosshair subtensions on this reticle were carefully designed to provide the optimum balance between precision aiming and low light visibility.

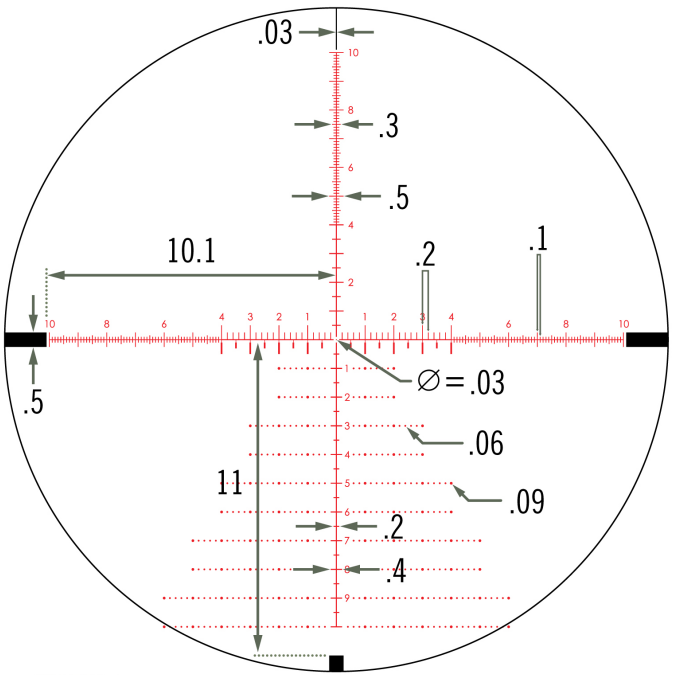


Note: Reticle image shown above is at 24x magnification. Images shown in this manual are for representation only.

MRAD Subtensions

MRAD reticles are based on the milliradian, or MRAD for short. MRAD unit of arc measurements are based on the radian. A radian is the angle subtended at the center of a circle by an arc that is equal in length to the radius of the circle. There are 6.283 radians in a circle and 1000 milliradians in a radian for a total of 6,283 milliradians (MRADs) in a circle. An MRAD will subtend 3.6 inches at a distance of 100 yards or 10 cm at 100 meters. Most riflescopes with MRAD adjustments use .1 MRAD clicks which subtend .36 inches at 100 yards or 1 cm at 100 meters.

In the Razor HD AMG first focal plane riflescopes, the listed MRAD subtensions of the EBR-7B reticle are valid at all magnification levels. This means the shooter can use the magnification level most appropriate for the situation and still have effective holdover and windage reference marks. This is also extremely valuable in a high-stress situation, as the shooter does not have to remember to set the scope to one particular magnification to get valid holdovers—an action necessary with the more common second focal plane reticles.



EBR-7B MRAD Reticle Subtensions

Ranging

MRAD reticles are very effective for ranging using simple formulas:

$$\frac{\text{Target Size (Yards)} \times 1000}{\text{MRADs Read}} = \text{Range (Yards)}$$

$$\frac{\text{Target Size (Meters)} \times 1000}{\text{MRADs Read}} = \text{Range (Meters)}$$

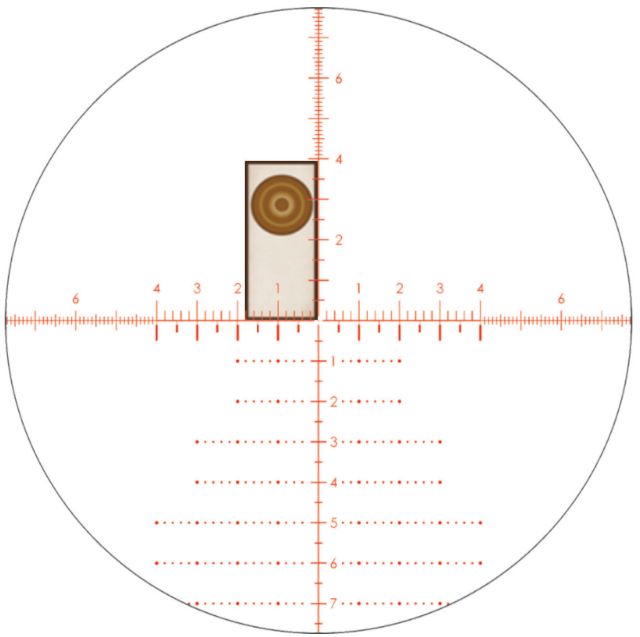
$$\frac{\text{Target Size (Inches)} \times 27.8}{\text{MRADs Read}} = \text{Range (Yards)}$$

To use these formulas, you will need to know the measured size of the target or a nearby object. Using either the vertical or horizontal MRAD scale, place the reticle on the target of known measurement and read the number of MRADs spanned.

Accurate measuring will depend on a very steady hold—the rifle should be solidly braced using a rest, bipod or sling. Once you have an accurate MRAD reading, use any of the listed ranging formulas to calculate distance.

Maximum accuracy in ranging will be obtained by calculating exact MRAD measurements—MRADs should be estimated in tenths if possible.

Example



Ranging a 6-foot target (2 yards) at 4 MRADs yields 500 yards.

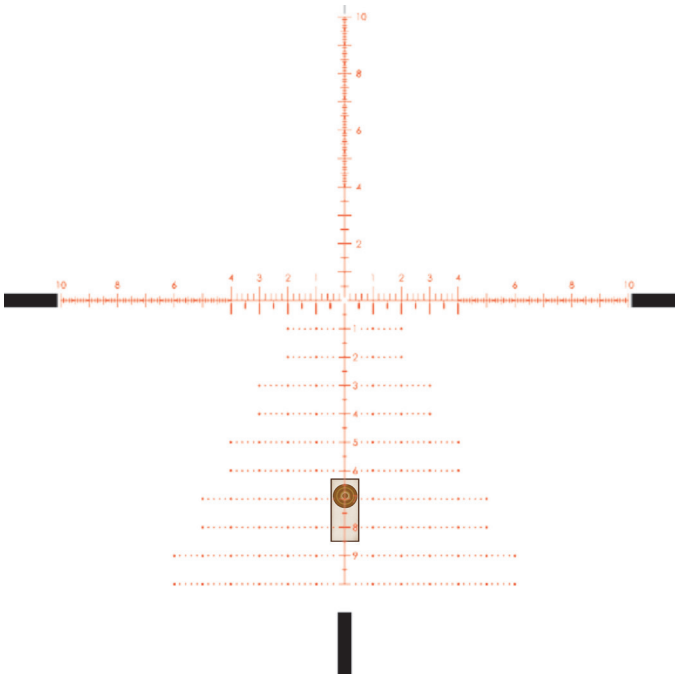
$$\frac{2 \times 1000}{4 \text{ MRADs}} = 500 \text{ Yards}$$

Elevation Holdovers

Once the distance has been calculated using the EBR-7B MRAD reticle or a laser rangefinder, the EBR-7B can be used for rapid holdover correction for bullet drop of the cartridge being used. To get the most benefit out of the EBR-7B equipped riflescope, Vortex Optics highly recommends shooters learn their bullet drop numbers in MRADs.

Since the EBR-7B reticle is scaled in MRADs, it is an easy job to quickly select the correct drop reference line once the shooter knows their bullet drops and windage/lead corrections in MRADs. If the shooter prefers to dial come ups for bullet drop using the elevation knob, knowing bullet drops in MRADs will allow for much faster adjustments as the MRADs can be quickly read on the elevation knob.

Example



6.7 MRAD correction for 800-yard shot. No wind.

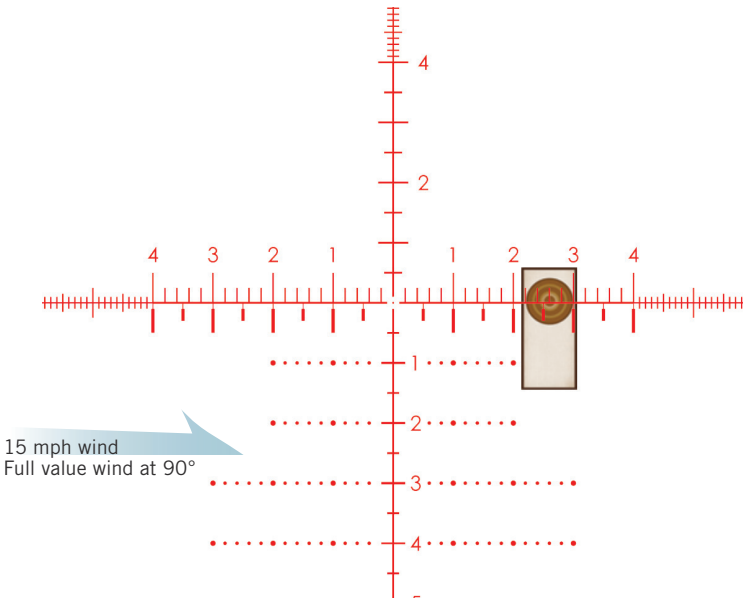
Windage and Moving Targets

The EBR-7B reticle is highly effective when used for wind and moving target leads. Using the reticle for windage and moving leads will require thorough knowledge of your weapon system's ballistic performance under varying conditions and experience in reading wind strengths and target speeds. As in bullet drops, it is imperative the shooter learn the particular weapon's windage/moving target corrections in MRADs.

Basic windage correction on center crosshair

When dialing elevation come ups, the center horizontal crosshair will be used for windage or moving lead corrections.

Example

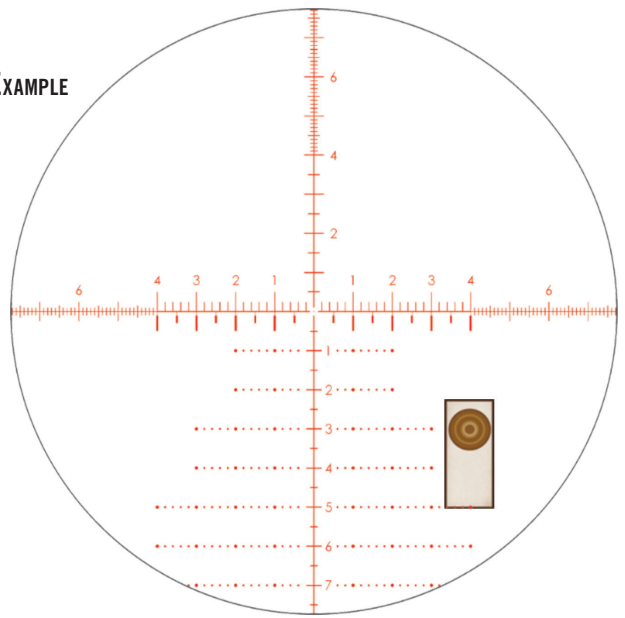


2.6 MRAD correction for 15 mph wind at 700 yards. Elevation already dialed into turret.

Basic windage correction using drop line on reticle

When using the reticle for elevation correction rather than dialing, the MRAD marks on the center horizontal crosshair can still be used to help visually reference windage corrections.

Example



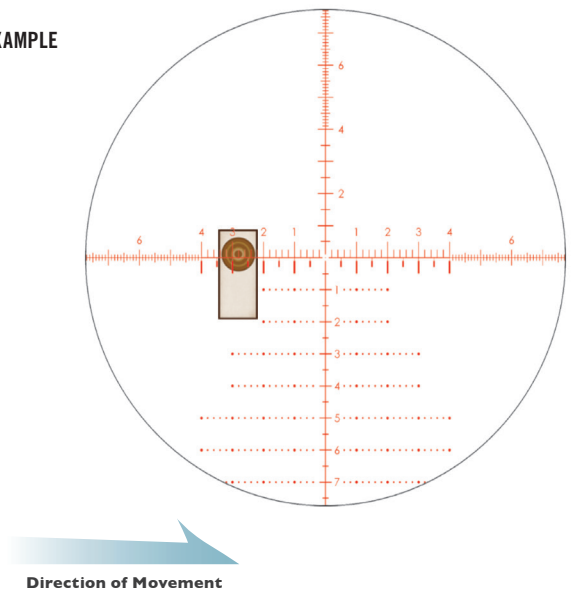
Using 3 MRAD drop line at 500 yards, 4 MRAD correction for 20 mph wind.

Basic moving lead correction

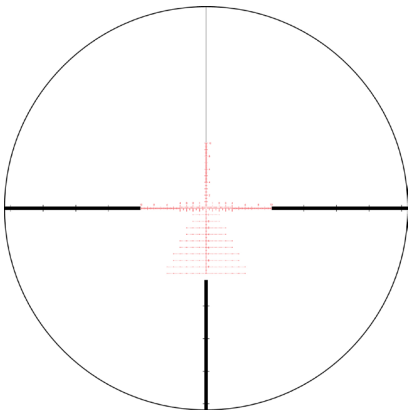
When estimating moving target leads, the MRAD marks on the center horizontal crosshair can be used. Estimating moving leads will require knowing yardage distance, wind speed, moving target speed and total bullet flight times including rifle lock time. Bullet flight times can be roughly calculated based on fps velocities or a ballistic calculator.

Note: Correctly estimating moving leads is very difficult and requires considerable practice and knowledge beyond the scope of this manual.

Example

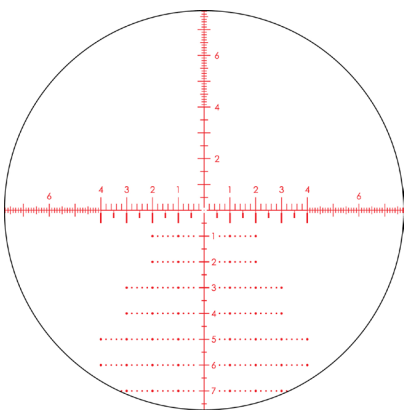


2.74 MRAD correction for a target moving at 3 mph at 800 yards. No wind. Total bullet time of flight from trigger pull is 1.5 seconds during which the target travels 6.6 feet. Elevation already dialed into turret.



EBR-7B MRAD

LOW RESOLUTION



EBR-7B MRAD

HIGH RESOLUTION

VIP WARRANTY

VIP WARRANTY

OUR UNCONDITIONAL PROMISE TO YOU.

We promise to repair or replace the product. Absolutely free.

- **Unlimited**
- **Unconditional**
- **Lifetime Warranty**

Learn more at www.VortexOptics.com

service@VortexOptics.com • 800-426-0048

Note: The VIP Warranty does not cover loss, theft, deliberate damage, or cosmetic damage not affecting product performance.