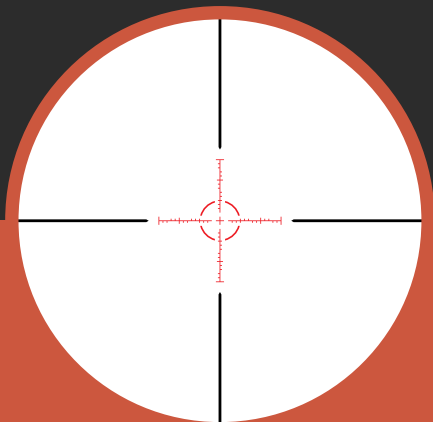




ATSR16 SFP IR MOA

Midas BTR GEN2 HD Riflescope

SECOND FOCAL PLANE

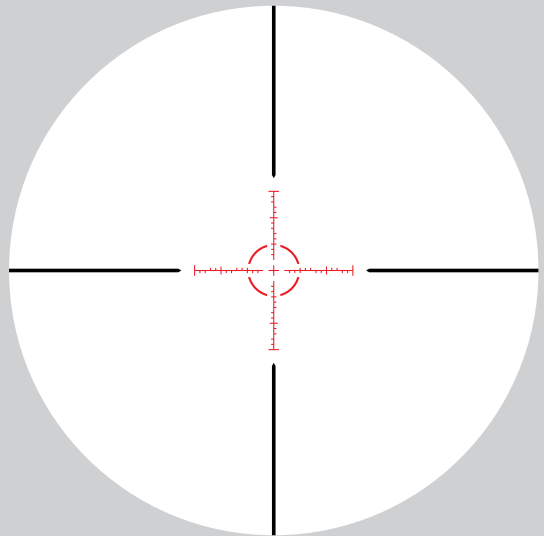


RETICLE MANUAL

THE ATHLON® ATSR16 SFP IR MOA RETICLE

ATSR16 SFP IR MOA reticle has a large illuminated circle that allows the shooter to super impose a target to make a quick shoot. The illuminated center circle is in 20 moa diameter with a 4 moa center cross and 2 moa hash mark increment extended to 30 MOA at four directions. The unique design of the 2 moa hash mark increments offers a clear reading for holding over your targets.

Application: Short and Mid Range Hunting and Tactical application

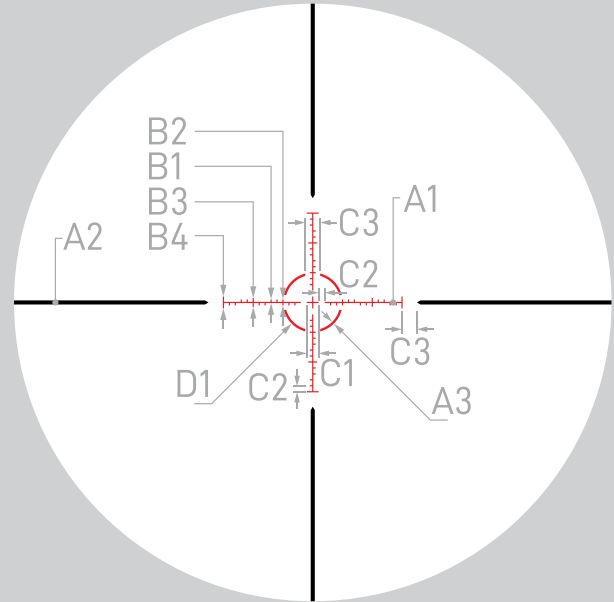


RETICLE SUBTENSIONS

The ATSR16 SFP IR MOA reticle is based on the minute of angle, a unit of angular measurement, usually shortened to moa. A "moa" is defined as "one minute of an angle". As a full circle has 360 degrees, and each degree is composed of 60 minutes (60'), thus there are 360 (degrees) x 60 (minutes) = 21,600 minutes in a circle. Since there are 360 degree in a circle, we can get 360 degree/21600 minutes = 0.016667 degrees/minute. If the target is 100 yards (3600 inches) away, we can use a formula, $3600 * \text{TAN}(\text{RADIANS}(0.016667))$, to get 1.047 inches which means 1 moa equals to 1.047 inches at 100 yards. Many people just round down the 1.047 inches to 1 inch @100 yards. If you are using metric system, formula $10000\text{mm} * \text{TAN}(\text{RADIANS}(0.01667))$ gets you that 1 moa equals to 29.1mm @100 meters.

The ATSR16 SFP IR MOA reticle is located at the second plane which stays in between erector tube and ocular lens. The size or the appearance of a second focal plane reticle does not change when you try to zoom in or zoom out, however the relative ratio between reticle and your target changes all the time because your target appears bigger or smaller when the magnification changes.

The subtensions of a second focal plain reticle and ranging capability are only accurate at certain magnification and due to this nature, the subtensions of the reticle are only valid at 6x for 1-6x24 scope.



SUBTENSIONS IN MOA

A1	A2	A3	B1	B2	B3
0.4	1.38	0.75	1	2	3
B4	C1	C2	C3	D1	
4	4	2	5	20	

DISTANCE RANGING

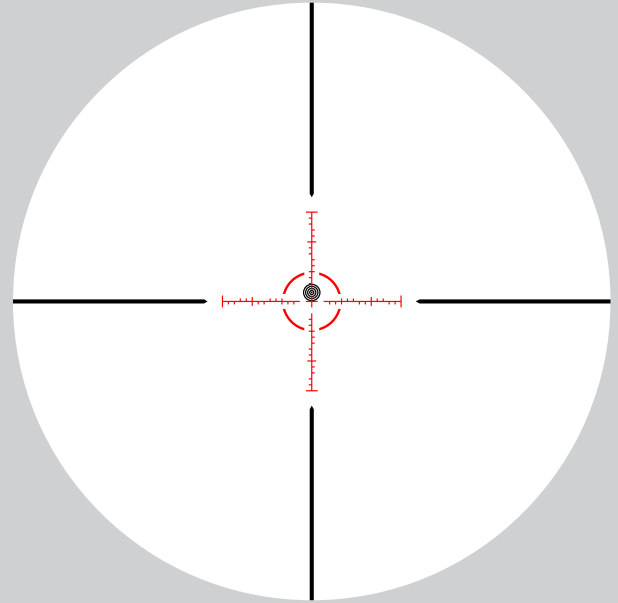
Equations for ranging distance to a target using moa

$$\frac{\text{Height of Target (Inches)} \times 100}{\text{MOA Reading on Reticle}} = \text{Distance to Target (Yards)}$$

$$\frac{\text{Height of Target (CM)} \times 34.4}{\text{MOA Reading on Reticle}} = \text{Distance to Target (Meters)}$$

As the height of target and moa reading on the reticle are two key variables in this equation, you have to get an accurate value for those two as much as possible. First all you want to put your rifle on a steady rest so you can get an accurate reading of the target height on the reticle. If needed using the smallest measurement on the reticle to get the most accurate readings. Second use your best knowledge on the height of the target, such as 72 inch high fence or 45 inch shoulder high of white tail deer, to give a value of the target height. Once you got the reading on reticle and your estimate of the target height, you can just simply use above equations to calculate the distance to your target.

EXAMPLE



Reading a 3-foot target (36 inches) at 6 moa gives 600 yards

$$\frac{36 \text{ inches} \times 100}{6 \text{ moas}} = 600 \text{ yards}$$

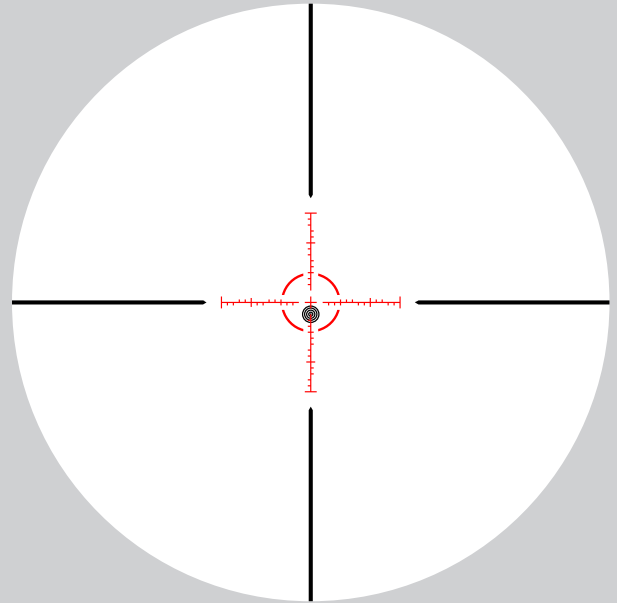
HOLDOVER FOR COMPENSATING BULLET DROP

To be able to use the elevation holdovers effectively, you have to know the distance to your target and bullet trajectory (bullet drop in inches or moa). Since many bullet ballistic charts highlight bullet drops in inches and 1moa equals to 1.047 (rounded down to 1 inch) at 100 yards, 2 inches at 200 yards, and 10 inches at 1000 yards, etc, we can use those to calculate the holdover position in moa on this reticle.

For example, under no wind condition, if you knew your target is at 300 yards and your ammo has a 12 inch bullet drop at that distance, you want to use 4 moa holdover point. Here is how you got the 4 moa: since 1 moa equals to 1 inch x 3 =3 inches at 300 yards, and then 4 moa equal to 4 x 3 inches =12 inches at 300 yards, you want to hold the 4 moa drop point to compensate the 12 inch bullet drop.

To achieve ultimate precision, it is always a better idea to develop your own D.O.P.E (Data of Previous Engagement)chart so that you can refer back to it for specific bullet drop compensation under different ambient environment and weather condition.

EXAMPLE



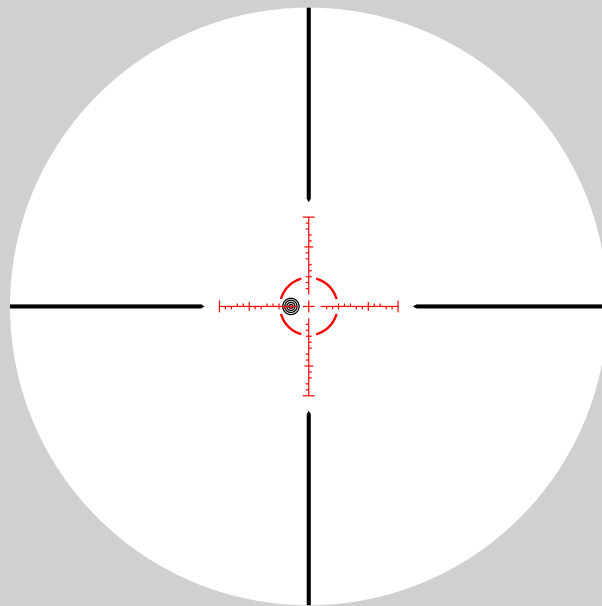
4 moa /12 inch holdover for a target @ 300 yards out. No wind.

HOLDOVER FOR WIND CORRECTION AND MOVING TARGET

The ATSR16 SFP IR MOA reticle has 2 moa markings increment both vertically and horizontally from the 4 moa center cross which can help you set your holdover positions to compensate wind correction and hold the lead for a moving target.

The flying time of a bullet, the velocity and direction of the wind and the "slippery-ness" of the bullet expressed in BC (Ballistic Coefficient) determine your holdover for wind correction. Once again you have to understand the impact of those three factors on your bullet's flying path in terms of inches or moa and calculate how much holdover you have to hold, and then finding the corresponding holdover position on the reticle is a much easier task to accomplish.

EXAMPLE

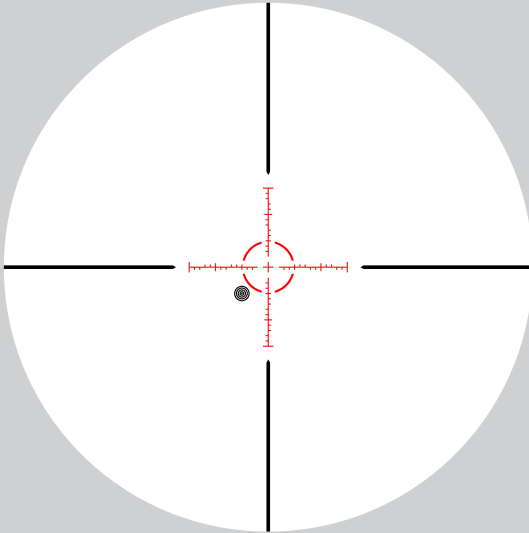


6 moa wind correction for 10 mph wind from right to left @ 600 yards. Elevation turret has been dialed up to compensate bullet drop, just simply use center horizontal cross line to holdover for wind correction

USE VISUAL CROSS POINT FOR WIND CORRECTION AND BULLET DROP

As an alternative, you can use a virtual cross point formed by hash marks on both horizontal and vertical cross lines to holdover bullet drop and wind correction.

EXAMPLE

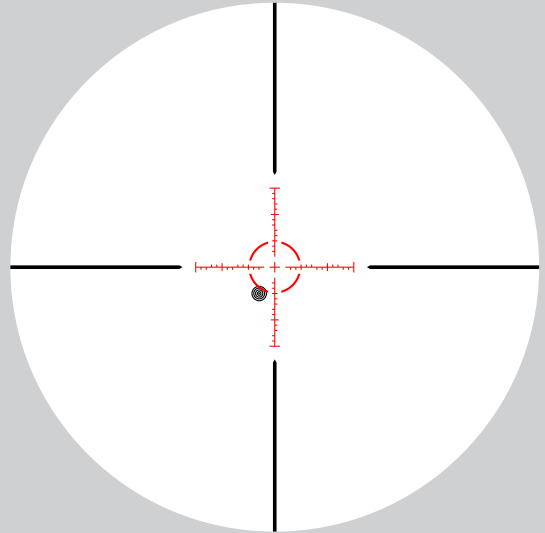


Use 10 moa for 60 inch bullet drop for a target @ 600 yards, 10 moa wind correction for 20 mph wind from right to left.

HOLD LEAD CORRECTION FOR A MOVING TARGET

Distance to your target, moving speed of your target, bullet flying time, wind direction are the key factors that determine how much holdover you need to hold for a moving target. As a rule of thumb, you always hold the lead for the net distance of your target moved (add or subtract holdover for wind correction) during the time span your bullet traveled.

EXAMPLE



5.9 moa lead holdover for a moving target traveling at 2 mph from left to right @ 600 yards. Bullet flight time is 1 second during which the target traveled 2.94 feet. No wind.

THE ATHLON GOLD MEDAL LIFETIME WARRANTY*

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