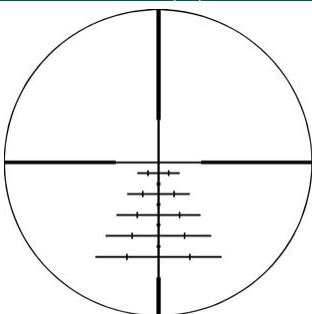


BRH(I) / BRX



RETICLE



SWAROVSKI  
OPTIK

## General Information:

Congratulations on your purchase of a SWAROVSKI OPTIK Rifle Scope with the BRH(I)/BRX Reticle System. These reticles were designed primarily for long range shooting and to take the guesswork out of how high to hold over a game animal or target by utilizing the marker bars or dots below the main horizontal crosshair. The BRH(I)/BRX Reticle will also compensate for wind drift by use of the wind posts or ends of the marker bars for aiming. These features eliminate the need for making turret adjustments to your rifle scope.

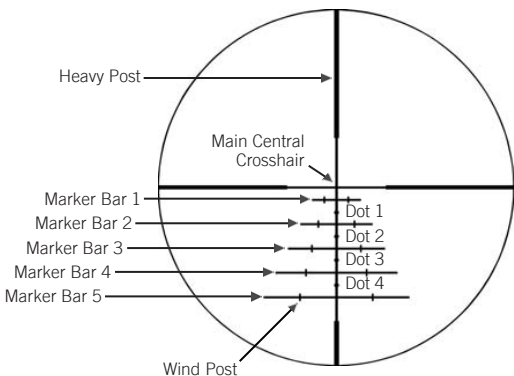
The BRH(I)/BRX Reticles have exactly the same distances between the bars and dots. They are essentially the same except for reticle thickness.

BRX Reticle: Fine dimensions designed for Target/Varmint shooting.

BRH(I) Reticle: Standard dimensions offering better low light visibility for big game hunting.

The chief benefit of the BRH(I)/BRX Reticle is the simplicity of the system and ease of use. A good quality range finder is the fastest method to determine the distance to the target for the most accurate results with the BRH(I)/BRX Reticle. You may also determine range with the reticle explained later in this manual (see page 9).

The BRH(I)/BRX system is supported by 50 factory ballistic decals, a selection chart with approximately 500 factory loads that can be used in conjunction with these decals, and 5 blank decals that can be customized to your factory load, reload, or preferred zero distance by using the BRH(I)/BRX Ballistic Calculator on our website at **[WWW.SWAROVSKIOPTIK.COM](http://WWW.SWAROVSKIOPTIK.COM)**.



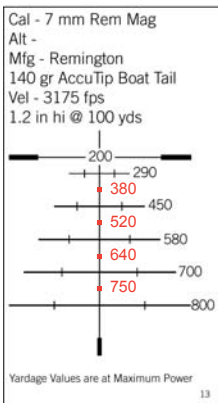
## The BRH(I)/BRX is Simple to Use:

You're on an antelope hunt. You are using a rifle in 7 mm Remington Magnum.

1. Your range finder shows the pronghorn is 447 yds away.

2. Look at your decal for the load you are using.

3. Look through the scope and hold the 2<sup>nd</sup> marker bar down where you want the bullet to hit, and fire.



Set up is simple and easy. Find your factory load from the Ballistic Decal Selection Chart with this manual, match your load to the appropriate decal number and sight in at 200 yards. Grab your range finder and you're ready for any reasonable long distance shot.

## Sighting in Distance:

The zero or sighting in distance for the BRH(I)/BRX system is based on a 200 yard zero on the main central crosshair. This zeroing distance has always been favorable for long range hunting

cartridges. In most instances, you will only be between 1 and 2 inches high at 100 yards with a 200 yard zero. If you wish to zero your reticle at 100, 250, 300 yards/meters or any other distance, there is no reason you can't. Simply access the BRH(I)/BRX Ballistic Calculator at **[WWW.SWAROVSKIOPTIK.COM](http://WWW.SWAROVSKIOPTIK.COM)**. Enter in the appropriate ballistic information (ballistic coefficient and velocity being the most important), desired zero setting and enter the resulting downrange values of the marker bars and dots on the blank decals provided.

## **Decal Choice and Usage**

Every cartridge has its own unique trajectory. Some trajectories are virtually identical among the thousands of cartridges in existence. SWAROVSKI OPTIK has taken hundreds of these virtually identical trajectories and matched them to Factory Ballistic decals that are supplied with every BRH(I)/BRX Reticle scope. Any one decal can be thought of as a template trajectory for the many other cartridges listed in the accompanying Ballistic Decal Selection Chart. The cartridge listed at the top of one of the 50 decals is an example for that specific cartridge listed of the downrange values listed on the decal, but this trajectory may be virtually identical to many other cartridges.

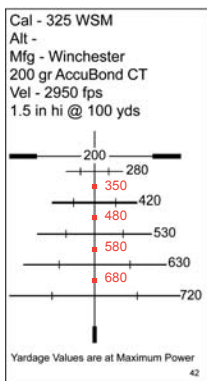
Your chosen factory cartridge may already be one of decals provided and you may simply use that one. If your cartridge is not one of the factory supplied decals, refer to the Decal Selection Chart on the inside cover of this manual. Once you have found your cartridge, look across the row to the far right to see the decal number that corresponds with the trajectory of your chosen cartridge. Keep in mind that in many instances the appropriate decal number will be of a different cartridge or caliber.

For example, say the cartridge you are using is a 300 Winchester Magnum manufactured by Federal with a 165 gr Nosler Partition bullet with a muzzle velocity of 3050 feet per second. This is how that cartridge is listed in the Ballistic Decal Selection Chart:

Cartridge: 300 Winchester Magnum  
Brand: Federal  
Bullet Weight & Type Velocity: 165 gr Nosler Partition  
3050 fps  
B.C.: 0.409  
Decal No.: use #42, 325 WSM

Locate decal number 42 (see below) for a 200 gr 325 WSM cartridge:

This 200 gr 325 WSM decal is the decal you will use for your 165 gr 300 Win Mag load as it has virtually the identical trajectory. Write in 300 Win Mag 165 gr next to the letters “Alt” on the decal. (Alt = alternate cartridge with same ballistic path). The decal is designed to be applied to your rifle in a convenient location where it can be referred to easily.



### Recommendation:

It is strongly recommended that you use a “sharpie” or marker to now block out the caliber designation on your appropriate decal if it is a different caliber than the rifle you are using. Although it is just common sense, this small effort may prevent someone from trying to chamber the wrong cartridge in your rifle. The manufacturer line, the bullet weight line and the velocity line should also be blocked out.

To demonstrate how the BRH(I)/BRX system works combining similar trajectories, the following is an example of the cartridge's (165 gr 300 Win Mag & 200 gr 325 WSM) exact downrange "Marker Bar & Dot" values, calculated in a standard atmosphere\*, and how they are rounded for the decal:

<b>165 gr 300 Win Mag</b>	<b>200 gr 325 WSM</b>	<b>Rounded value for 325 WSM decal</b>
Zero - 200 yds	Zero - 200 yds	Zero - 200 yds
Bar 1 - 282 yds	Bar 1 - 282 yds	Bar 1 - 280 yds
Dot 1 - 354 yds	Dot 1 - 351 yds	Dot 1 - 350 yds
Bar 2 - 419 yds	Bar 2 - 415 yds	Bar 2 - 420 yds
Dot 2 - 478 yds	Dot 2 - 475 yds	Dot 2 - 480 yds
Bar 3 - 533 yds	Bar 3 - 530 yds	Bar 3 - 530 yds
Dot 3 - 583 yds	Dot 3 - 583 yds	Dot 3 - 580 yds
Bar 4 - 631 yds	Bar 4 - 632 yds	Bar 4 - 630 yds
Dot 4 - 676 yds	Dot 4 - 680 yds	Dot 4 - 680 yds
Bar 5 - 717 yds	Bar 5 - 724 yds	Bar 5 - 720 yds

\* A Standard Atmosphere for these ballistic calculations is:  
 0 feet / meters altitude or Sea Level  
 59 degrees F or 15 degrees C  
 78% Relative Humidity  
 29.92 inches of mercury / Barometric Pressure

Changes in the atmospheric condition can change trajectories, most notably very high altitudes. Other factors that can change the ballistic data are changes in velocity due to barrel length or slight variations in actual bore diameter.

You will be able to adjust for different atmospheric conditions or muzzle velocities by using the BRH(I)/BRX Ballistic Calculator on the SWAROVSKI OPTIK website at **[WWW.SWAROVSKIOPTIK.COM](http://WWW.SWAROVSKIOPTIK.COM)**.

## **Rifle Scope Magnification and its Effect on Downrange Point of Impact Values:**

**Please be aware that the downrange values of the marker bars and dots are at the rifle scope's maximum power.** If the scope is on a lower power than maximum, the bars and dots will indicate distances **further** away than what the decal indicates, resulting in a shot that will go over the intended impact point.

This happens because the reticle is in the 2<sup>nd</sup> focal plane. The distances between the bars and dots of the BRH(I)/BRX Reticle are calculated at the scopes maximum magnification, in inches at 100 yards and in centimeters at 100 meters. A change in magnification will change the effective dimensions of the distance between the bars and dots. When the magnification is lowered, everything in the field of view is getting smaller in size, but the bars and dots below the main crosshair are staying the same size. Lowering the magnification has the effect of increasing the distances between the marker bars and dots.

**This does not indicate the scope must be on maximum magnification at all times while hunting.** The main central crosshair value where you have zeroed your scope, 200 yards for example, will never change (over a horizontal plane) regardless of the magnification because it is in the exact center of the optical axis. In most instances, if you have a shot out to 250 yards, the scope can be on any magnification while using the main central crosshair for aiming. If you have a long shot where you need one of the Marker Bars or Dots, remember to place the scope on its maximum magnification.

There are many more cartridges in existence than are included in the Ballistic Decal Selection

Chart included with this instruction manual. If your cartridge is not one of them, ballistic information can be obtained from ammunition or bullet manufacturers web sites or catalogs. This information can then be entered into the SWAROVSKI OPTIK Ballistic Calculator on our website at **[WWW.SWAROVSKIOPTIK.COM](http://WWW.SWAROVSKIOPTIK.COM)**.

## **How to use the BRH(I)/BRX Marker Bars / Wind Posts to Compensate for Wind**

The Marker Bar lengths and Wind Posts of this reticle are designed to compensate for wind drift of any given cartridge. The two leading factors that affect downrange wind drift are the Ballistic Coefficient (B.C.) of the bullet and Wind Speed. The ballistic coefficient of a bullet is a number assigned to it by the manufacturer, based on the bullet's shape, that helps determine how well the bullet will travel through air and resist wind. For most commonly used hunting bullets, ballistic coefficients range from approximately 0.200 through 0.600. Generally, the higher the number, the better the bullet's ability to resist wind drift. You will find ballistic coefficient values for cartridges listed in the Ballistic Decal Selection Chart.

The following illustrations are a general guide using the Marker Bar lengths and Wind Posts of the BRH(I)/BRX Reticle:

If the wind is blowing from left to right, use the marker bars / wind posts to the right of the vertical post to compensate.

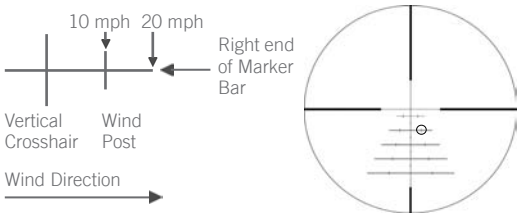
If the wind is blowing from right to left, use the marker bars / wind posts to the left of the vertical post to compensate.

An easy way to remember is to hold the reticle into the direction the wind is coming from.



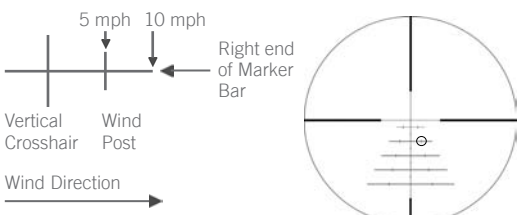
**For bullets with an approximate B.C.\* value of 0.500 (wind blowing from left to right)**

From the central vertical post to the end of the marker bar, will compensate for a 20 mph (32 kmh) 90 degree crosswind. The wind post in the middle of the marker bar will compensate for a 10 mph (16 kmh) 90 degree crosswind.



**For bullets with an approximate B.C.\* value of 0.250 (wind blowing from left to right)**

From the central vertical post to the end of the marker bar, will compensate for a 10 mph (16 kmh) 90 degree crosswind. The wind post in the middle of the marker bar will compensate for a 5 mph (8 kmh) 90 degree crosswind.



\* Many B.C. Values can be found in the "BRH(I)/BRX Decal Selection Chart" sheet insert with this manual

## **Ranging with the BRH(I)/BRX:**

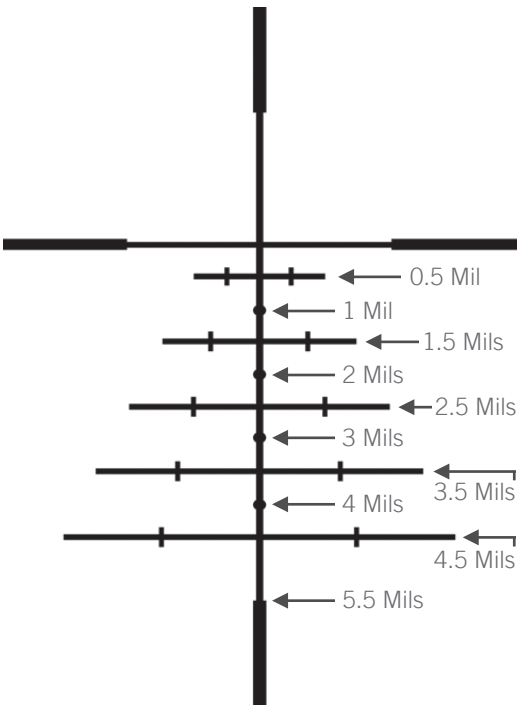
A good quality rangefinder such as the SWAROVSKI OPTIK LG 8x30 is recommended for measuring targets at unknown distances for use with the BRH(I)/BRX Reticle. If a rangefinder is not available, the reticle can be used for estimating distance to the target.

The distance between the bars and dots of the BRH(I)/BRX Reticle is calibrated in a measurement called Mils so that the reticle can be used for ranging. "Mil" is short for the word Milliradian, a unit of measurement. A Milliradian (or Mil) is usually described as 1 yard (36 inches) at 1000 yards, or 1 meter (100 centimeters) at 1000 meters. At 100 yards, or 100 meters,  $1/10^{\text{th}}$  the distance, 1 Mil = 3.6 inches @ 100 yards or 10 cm @ 100 meters. It is a linear measurement that gets increasingly wider as the distance increases, or closer together as the distance decreases.

Each increment of a bar or dot, from the main horizontal crosshair downward, represents a distance in 0.5 Mil increments at the rifle scopes maximum power. The distance between the 5<sup>th</sup> Bar and the top of the lower vertical heavy post is 1 Mil giving a total of 5.5 Mils to work with for ranging purposes (see chart below). Note: Because the BRH(I)/BRX Reticle is in the 2<sup>nd</sup> focal plane, the magnification must be on the highest power in order to properly estimate range with the reticle.

## BRH(I)/BRX Increment Subtensions:

	English in. low at 100 yds @ max power	Metric cm. low at 100 m @ max power	Mils
Bar 1	1.8 in	5 cm	.5 Mil
Dot 1	3.6 in	10 cm	1 Mil
Bar 2	5.4 in	15 cm	1.5 Mils
Dot 2	7.2 in	20 cm	2 Mils
Bar 3	9.0 in	25 cm	2.5 Mils
Dot 3	10.8 in	30 cm	3 Mils
Bar 4	12.6 in	35 cm	3.5 Mils
Dot 4	14.4 in	40 cm	4 Mils
Bar 5	16.2 in	45 cm	4.5 Mils
Top of Lower Vertical Post	19.8 in	55 cm	5.5 Mils



One measurement you must know beforehand to accurately range with a Mil system Reticle is the size of the target you are shooting at. The formula for using is as follows:

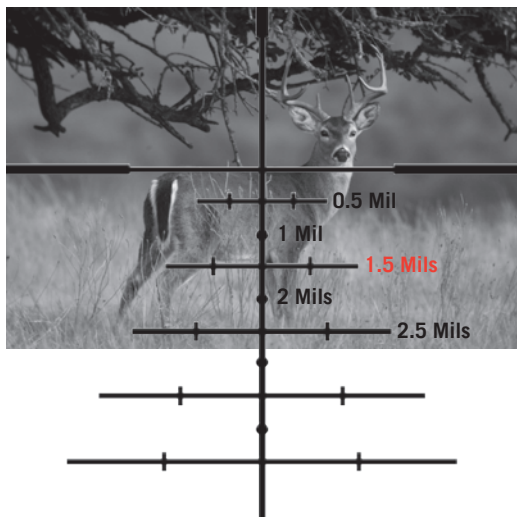
$(\text{Height of the target in Yards} \times 1000) \div \text{Height of the target in Mils} = \text{Range to the target in Yards}$

or

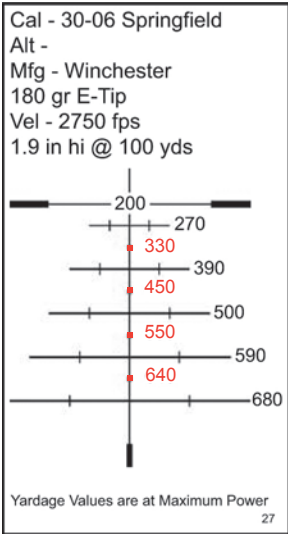
$(\text{Height of the target in Meters} \times 1000) \div \text{Height of the target in Mils} = \text{Range to the target in Meters}$

Example: Your target is a whitetail deer. Known (average) chest depth is 18 inches. 18 inches is  $\frac{1}{2}$  yard or 0.5 yards. You put the horizontal crosshair on top of the deer at the shoulder. Looking down the reticle, the bottom of his 18 inch chest lines up with the 2<sup>nd</sup> Bar of the BRH(I)/BRX Reticle, or 1.5 Mils.  $0.5 \text{ yards} \times 1000 = 500$ .  $500 \div 1.5 \text{ (mils)} = 333 \text{ yards}$ .

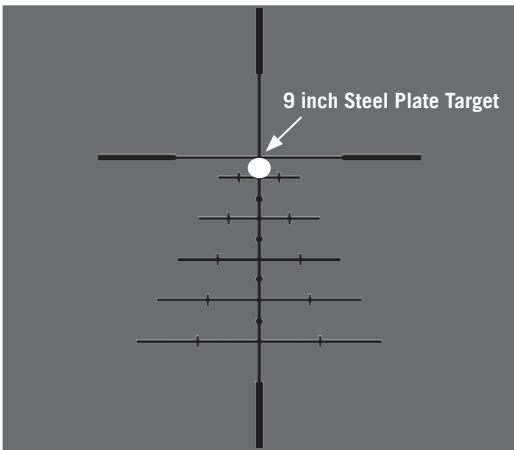
Metric – 18 inches = 0.5 yd = .4572 m  
 $0.4572 \text{ meters} \times 1000 = 457.2$   $457.2 \div 1.5$   
(mils) = 304.8 (305 meters)  
305 meters = 333 yards



After determining 333 yards with the reticle, if you were using a Win 30-06 Sprng 180 gr E-Tip (Decal #27), or any cartridge that requires a #27 decal, your hold point would be the 1<sup>st</sup> dot down, 330 yards.



Now let's take a different example. You are going to be shooting on a course of fire that has only 9 inch circular steel plates set at unknown distances. 9 inches is  $\frac{1}{4}$  of one yard [36"  $\div$  9" = 0.25 yards]



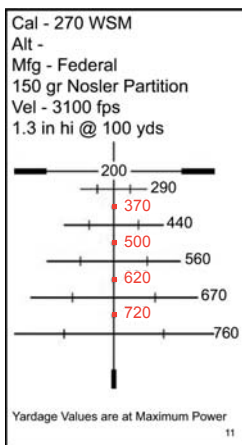
Steel Plate Target: With horizontal crosshair at the top of the plate, the bottom of the plate appears to touch marker bar 1, or 0.5 Mil.  
(Target size in yards)  $0.25 \times 1000 = 250$ .  
 $250 \div 0.5 \text{ Mils} = 500 \text{ yards}$

If you are using this same Win 30-06 180 gr E-Tip, or a Cartridge requiring Decal #27, use the 3<sup>rd</sup> bar to hold this 500 yard shot.

[Metric – 9 inches = 0.23 meters.  
 $0.23 \times 1000 = 230$ .  
 $230 \div 0.5 \text{ mil} = 460 \text{ meters}$   
(460 meters = 500 yards)]

Example: Same 9" Steel Plate Target - Different Hold Point

If you were using a Federal 270 WSM 150 gr Nosler Partition (Decal #11), or any cartridge that requires decal #11, after determining the range is 500 yards using the reticle, hold on the 2<sup>nd</sup> dot down.



Calculating this math quickly in the field is usually impractical. In

a case like this where you know you are shooting at only 9 inch plates it will help to predetermine the math and make up a quick reference chart.

0.25 mil = 1000 yards  
0.50 mil = 500 yards  
0.75 mil = 333 yards  
1.0 mil = 250 yards  
1.25 mils = 200 yards  
1.50 mils = 167 yards

Mil Charts, such as the ones below, can also be very handy in the field for estimating distance. These charts are in perforated card form in the back of this instruction manual.

### Examples of Charts located in the back of the Instruction Manual.

**Mil Table for Objects in Inches**

Inches		9	12	15	18	21	24	27	30	33	36
Target Size (yds)		.250	.333	.417	.500	.583	.667	.75	.833	.917	1
MIL 0.5		500	666	834	1000	1166	1334	1500	1666	1834	2000
MIL 1		250	333	417	500	583	667	750	833	917	1000
MIL 1.5		167	222	278	333	389	445	500	555	611	667
MIL 2		125	167	209	250	292	334	375	417	459	500
MIL 2.5		100	133	167	200	233	267	300	333	367	400
MIL 3		83	111	139	167	194	222	250	278	306	333
MIL 3.5		71	95	119	143	167	191	214	238	262	286
MIL 4		63	83	104	125	146	167	188	208	229	250
MIL 4.5		56	74	93	111	130	148	167	185	204	222
MIL 5		50	67	83	100	117	133	150	167	183	200
MIL 5.5		45	61	76	91	106	121	136	152	167	182

**Mil Table for Objects in Centimeters**

Centimeters		10	20	30	40	50	60	70	80	90	100
Target Size (m)		.10	.20	.30	.40	.50	.60	.70	.80	.90	1
MIL 0.5		200	400	600	800	1000	1200	1400	1600	1800	2000
MIL 1		100	200	300	400	500	600	700	800	900	1000
MIL 1.5		67	133	200	267	333	400	467	533	600	667
MIL 2		50	100	150	200	250	300	350	400	450	500
MIL 2.5		40	80	120	160	200	240	280	320	360	400
MIL 3		33	67	100	133	167	200	233	267	300	333
MIL 3.5		29	57	86	114	143	171	200	229	257	286
MIL 4		25	50	75	100	125	150	175	200	225	250
MIL 4.5		22	44	67	89	111	133	156	178	200	222
MIL 5		20	40	60	80	100	120	140	160	180	200
MIL 5.5		18	36	55	73	91	109	127	145	164	182

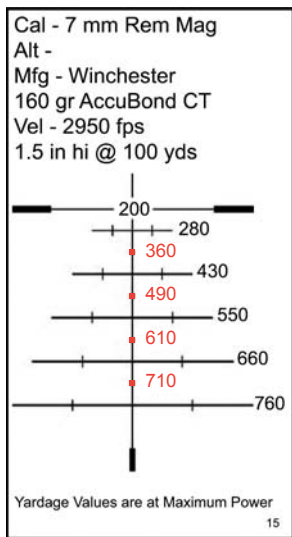
### Shooting at Steep or Severe Angles:

This process of compensating for an angled shot can easily be done with a push of a button from the EL Range binocular from SWAROVSKI OPTIK. If you don't own the EL Range binocular, then be sure to stop by your local SWAROVSKI OPTIK Authorized Dealer to give it a try.

Shooting at angles uphill or downhill does affect trajectories. Most hunters that have taken shots at relatively steep angles have found that the bullet went over the back of their quarry. Ballistic trajectories are normally determined over a horizontal plane. If you take that horizontal plane and put it at an angle, the gravitational forces on the bullet act over a "shorter" plane, meaning less bullet drop, even though the "straight-line" distance is the same.

Specific Example: You are using Decal #15 (7 mm Remington Mag 160 gr AccuBond Ct) as shown on Page 15.

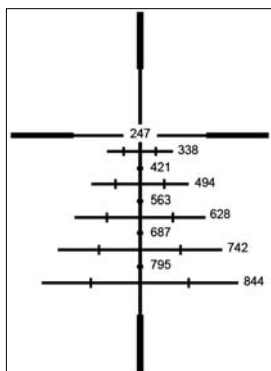
Ballistics are determined over a flat, horizontal plane. But occasionally, a shot may present itself at a relatively severe angle.



You have ranged a shot to an animal at 350 yards, but at a  $35^\circ$  angle, up or down. Many would erroneously think that using dot 1, showing a 360 yard distance is the appropriate hold point. But at this  $35^\circ$  angle, this hold point will most likely result in a miss with the bullet going over the back of the game animal.



This is what happens to the downrange Bar/Dot values when the rifle barrel is raised/lowered 35° in this case:



Using that 1<sup>st</sup> dot would accommodate for a 420 yard shot at this 35° angle. In this case, you should use the first bar, now showing a value of 338 yards, for that 350 yard, 35° angled shot. Also, notice that at this 35° angle that

the 200 yard Zero has changed to a 247 yard Zero. Practically speaking, it is difficult to determine angles in the field. The “Rule of Thumb” - at relatively steep angles, Go Up, to the next bar or dot and hold there.

### **Tips for Using the BRH(I)/BRX Reticle System:**

- The BRH(I)/BRX system will allow the shooter to accurately make shots at very long distances. Please be aware of the limitations of your cartridge and your own abilities. Generally, deer size game needs 1000 ft lbs minimum and elk size game needs 1500 ft lbs minimum of remaining bullet energy to cleanly harvest. Please check your cartridge manufacturer’s energy figures for maximum ethical ranges for your cartridge being used for the game you are hunting.
- Once the proper decal for your rifle/cartridge is determined, if the decal’s caliber is different from your rifle, block out the caliber on the decal and write in the proper caliber next to “Alt”. This may very well prevent a wrong cartridge from being chambered in your rifle.

## BRH(I)/BRX Subtensions for BRH(I)/BRX

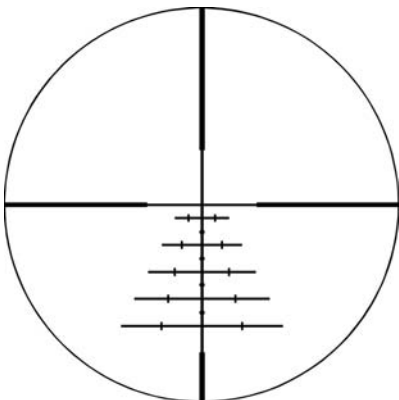
The distance between the marker bars and dots for BRH(I)/BRX for all models are as follows:

English		Metric		
Inches low at 100 yds		cm. low at 100 m		
@ max power		@ max power		Mils
Bar	1.8 in	Bar 1	5 cm	0.5 Mil
Dot 1	3.6 in	Dot 1	10 cm	1.0 Mil
Bar 2	5.4 in	Bar 2	15 cm	1.5 Mil
Dot 2	7.2 in	Dot 2	20 cm	2.0 Mils
Bar 3	9.0 in	Bar 3	25 cm	2.5 Mils
Dot 3	10.8 in	Dot 3	30 cm	3.0 Mils
Bar 4	12.6 in	Bar 4	35 cm	3.5 Mils
Dot 4	14.4 in	Dot 4	40 cm	4.0 Mils
Bar 5	16.2 in	Bar 5	45 cm	4.5 Mils

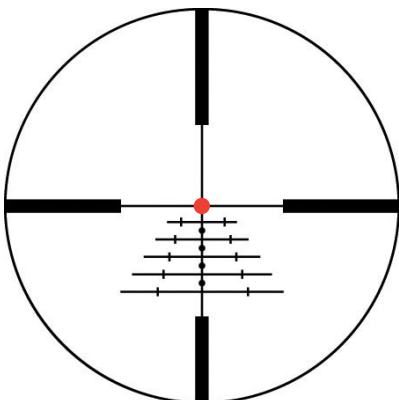
## Length of Marker Bars for all Models at Maximum Magnification

	in at 100 yds	cm at 100 m
Bar 1 Total length of bar	7.2	20
from vertical to left or right end of bar	3.6	10
from vertical to center of wind post	1.8	5
Bar 2 Total length of bar	10.8	30
from vertical to left or right end of bar	5.4	15
from vertical to center of wind post	2.7	7.5
Bar 3 Total length of bar	14.4	40
from vertical to left or right end of bar	7.2	20
from vertical to center of wind post	3.6	10
Bar 4 Total length of bar	18	50
from vertical to left or right end of bar	9	25
from vertical to center of wind post	4.5	12.5
Bar 5 Total Length of bar	21.6	60
from vertical to left or right end of bar	10.8	30
from vertical to center of wind post	5.4	15

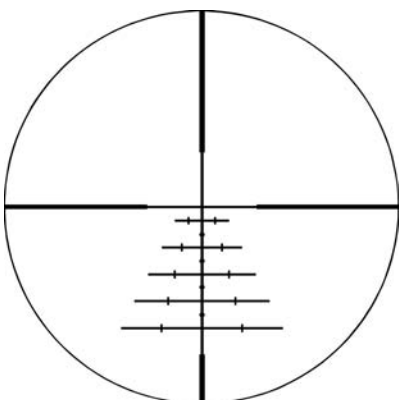
# RETICLES



BRH



BRH-I



BRX

Mil Table for Objects in Inches (English). Cross Reference Mil Size to Target Size in Yards to Obtain Distance to Target in Yards.

Inches	9	12	15	18	21	24	27	30	33	36	
<b>Target Size (yds)</b>	<b>.250 .333 .417 .500 .583 .667 .75 .833 .917 1</b>										
MIL	0.5	500	666	834	1000	1166	1334	1500	1666	1834	2000
MIL	1	250	333	417	500	583	667	750	833	917	1000
MIL	1.5	167	222	278	333	389	445	500	555	611	667
MIL	2	125	167	209	250	292	334	375	417	459	500
MIL	2.5	100	133	167	200	233	267	300	333	367	400
MIL	3	83	111	139	167	194	222	250	278	306	333
MIL	3.5	71	95	119	143	167	191	214	238	262	286
MIL	4	63	83	104	125	146	167	188	208	229	250
MIL	4.5	56	74	93	111	130	148	167	185	204	222
MIL	5	50	67	83	100	117	133	150	167	183	200
MIL	5.5	45	61	76	91	106	121	136	152	167	182

Mil Table for Objects in Cm (Metric). Cross Reference Mil Size to Target Size in Cms to Obtain Distance to Target in Meters.

Centimeters	10	20	30	40	50	60	70	80	90	100
Target Size (m)	.10	.20	.30	.40	.50	.60	.70	.80	.90	1
MIL 0.5	200	400	600	800	1000	1200	1400	1600	1800	2000
MIL 1	100	200	300	400	500	600	700	800	900	1000
MIL 1.5	67	133	200	267	333	400	467	533	600	667
MIL 2	50	100	150	200	250	300	350	400	450	500
MIL 2.5	40	80	120	160	200	240	280	320	360	400
MIL 3	33	67	100	133	167	200	233	267	300	333
MIL 3.5	29	57	86	114	143	171	200	229	257	286
MIL 4	25	50	75	100	125	150	175	200	225	250
MIL 4.5	22	44	67	89	111	133	156	178	200	222
MIL 5	20	40	60	80	100	120	140	160	180	200
MIL 5.5	18	36	55	73	91	109	127	145	164	182

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