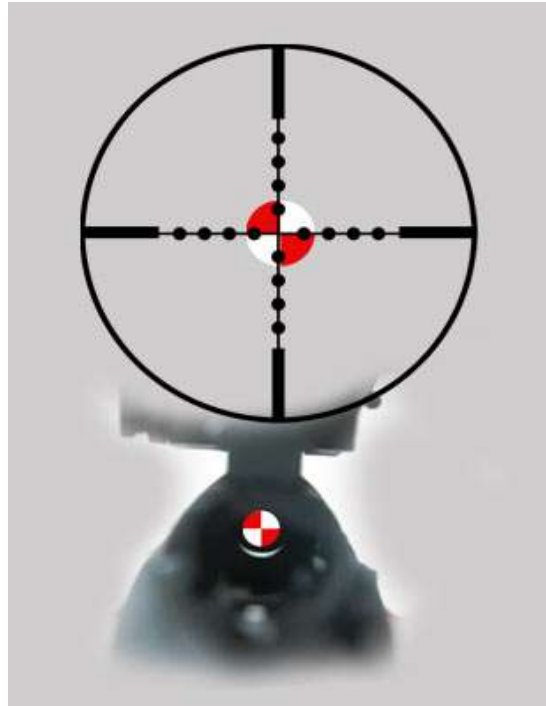


MOUNTING AND ZEROING RIFLESCOPES FOR SERVICE RIFLE SHOOTING

By Marcus O'Dean



Tightening Scope Screws

First up, when you tighten any scope-related screws, do so like you would when tightening car wheel nuts. Go back to front and side to side in small increments, so pressure is exerted evenly over the receiver and scope.

Mount Bases. If you have separate mount bases and scope rings, it pays to degrease the top of the receiver and apply a very thin smear of nail polish to most of the top receiver surface where the bases will sit. Also, place a very small amount on the thread of the base screws, before you screw the bases onto the receiver. BEWARE! Mount screws may differ in length and foul bolt operation if put in the wrong holes. So complete the above step once before you apply nail polish to ensure you get it right.

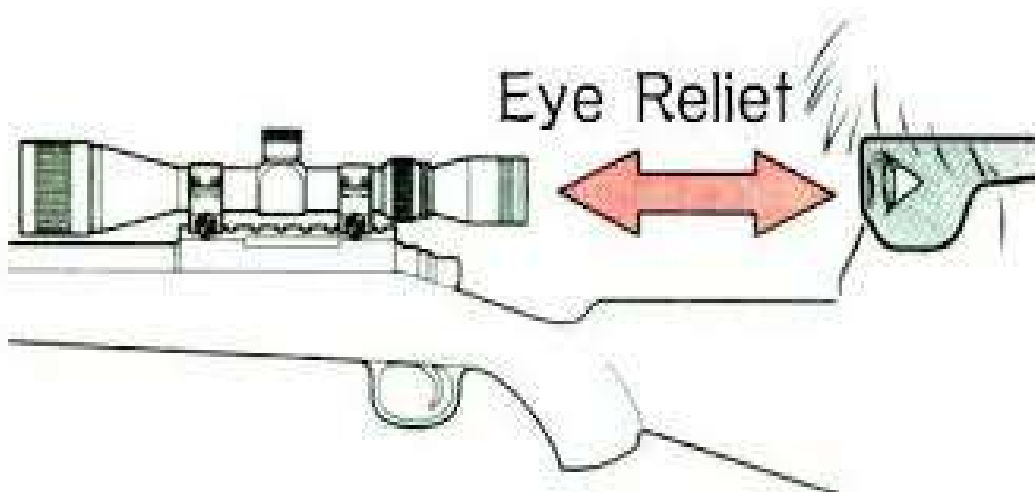
Depending upon the size of the screws, you will need less or more force – it pays to have a torque driver and to use the manufacturer's recommended pressure when tightening the screws.

Ring Screws. First a caution – if you overtighten ring screws you run the risk of crushing the scope tubes over delicate internal assemblies that will at the least make your scope ineffective or at the worst, irreparably damage it. Take it easy and get a torque driver.



Aligning Scope Crosshairs

- Set your unloaded, open-bolted rifle on the sandbags and brace it solidly. Find a flat spot on the receiver and lay the spirit level across it to see if the rifle is vertical. If it isn't adjust accordingly.
- Find a straight vertical object, like a plumb door frame and with excruciating care align the vertical crosshair alongside the surface of the object, while referring back to the horizontal spirit level on the horizontal receiver surface..
- Now it's time to tighten your ring screws as recommended before. As you tighten them gradually, keep checking the crosshair alignment as it may alter. Just go gradually.
- If, when you finish and mount the rifle to check the sight picture the crosshair doesn't appear vertical, don't worry, it is. You are crooked, not your scope.



Adjusting Eye Relief

Place the scope as far forward in the mounting hardware as possible while holding your rifle as you would normally shoot. Note that if you are going to target shoot in three positions using a sling, that the in the sitting position, you will probably be somewhat closer to the scope and get some vignetting – it will be a compromise.

Move the scope towards your eye slowly, until you have a full field-of-view. This position should be between 3 and 5 inches from the eye. Keep the scope in this position.

Rotate the scope to place the elevation dial at the top of the scope.

Ensure that the vertical reticle of the scope and the vertical axis of the rifle align, then tighten the ring screws.

Image 1



Boresighting

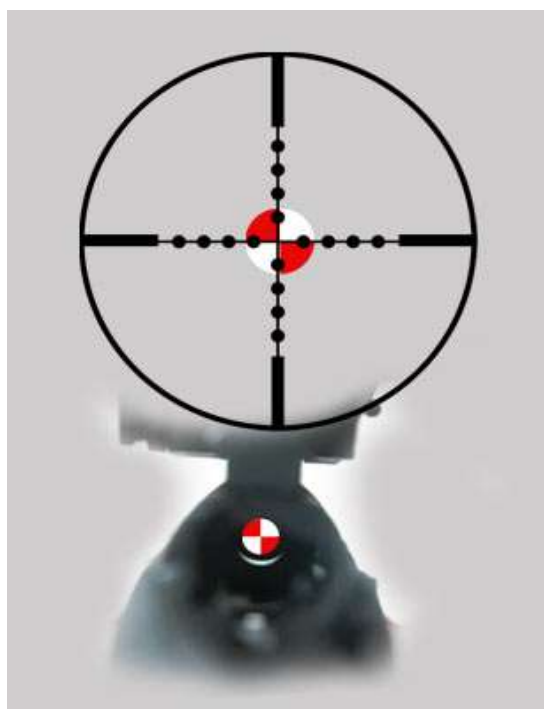
Opening Caution. Never, ever rely on spud-type or laser boresighters which you insert either in the chamber or muzzle to align your scope with your bore; their valid purpose is with rifles you cannot

see through the bore easily, like lever and pump rifles. In my experience, you will likely not get on paper with your first shot at 100 yards. By correctly using the method I describe below, you will be able to get first round hits in the black at up to 300 metres and require only minor adjustments to be correctly zeroed. So here goes.

Zeroing at 100-200 metres.

1. Put your scope-mounted rifle in a cradle or on sandbags on a solid surface or the ground and look through the bore at a distant object with a definite corner, like a rectangular target, or alternatively, at a very small object, like a clay target or top of a flagpole etc. Moving the rifle until the square corner or distant small object is in the centre of the bore's hole. Be certain the muzzle hole is dead-centre in the chamber so you have an image of concentric rings surrounding your target object.
2. Without disturbing the secured rifle, look up through the scope and note the relative positions of the bore and crosshairs. Say that looks like image 1 above. In that case, if you aimed the rifle with the scope at the target you would hit HIGH and LEFT of the target as you would have moved the bore to align the crosshairs. You now have to make them coincide.
3. So now you have to move the scope's reticle to align with the bore. So you need to move the point of impact on the scope's elevation and wind DOWN and RIGHT until the crosshairs are on target with the bore likewise.
4. Most scopes of American or Asian origin nowadays move point of impact using opposite rotation to commonly used aperture sights, like Central sights which move Up and Right by rotation knobs clockwise. So **Clockwise adjustments on most scope turrets move your bullets DOWN and LEFT.**
5. **IN THE EXAMPLE ABOVE** you need to need to **MOVE your POINT OF IMPACT DOWN AND RIGHT**, so you will need to move your top ELEVATION TURRET **CLOCKWISE** and your side WINDAGE TURRET **ANTI-CLOCKWISE** also to bring your bullet closer to the target centre, as illustrated in **Image 2** below.

Image 2



Notes:

1. Do not be afraid to give big adjustments, like a quarter of a whole revolution, rather than creeping along in clicks. If you make a few gross corrections which go past your target centre upon firing, it is easy to come back.
2. When your shots are close to the desired place on the target, start to fire groups of two to three shots to confirm group centre and make fine adjustments from there. Many scopes exhibit “reticle lag”, meaning that the next shot after adjustment may not go where subsequent shots do, due to the erector spring inside the scope having to catch up. You can partially eliminate this by adjusting a few clicks past the desired adjustment and winding back those two clicks before firing to eliminate backlash.

Maximum Point Blank Range

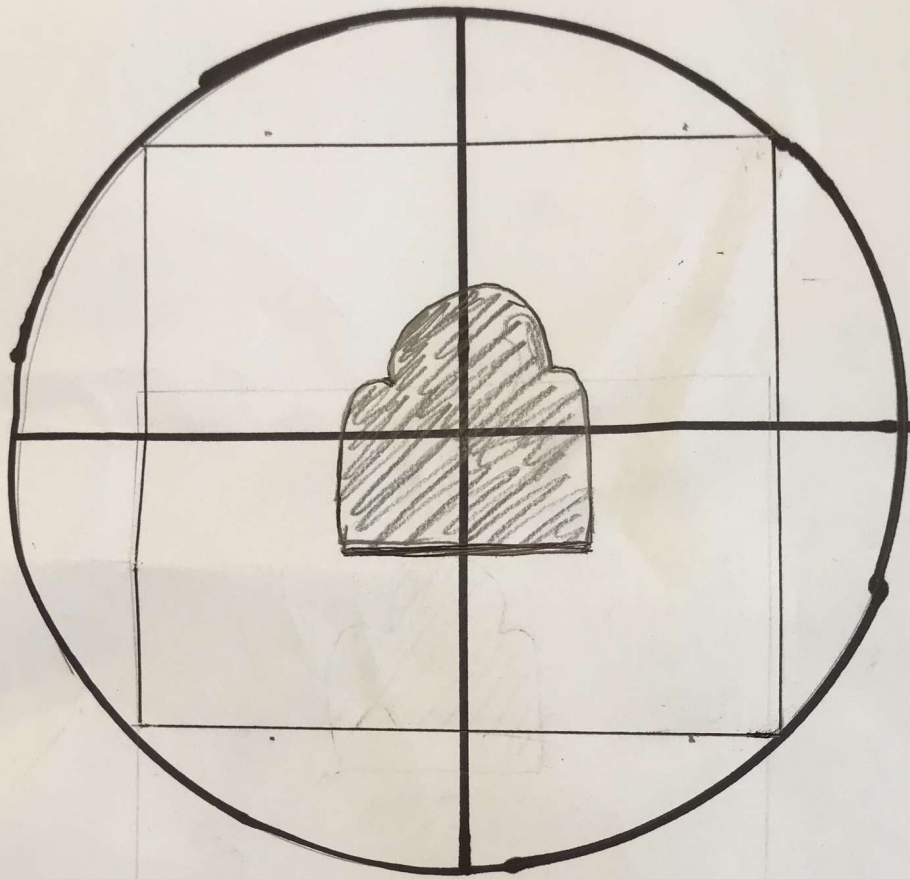
If you typically shoot a normal sporting rifle calibre, like .308, .223 etc, you can get a workable single zero to land your shots in the 12-inch bullseye from 100, 200 and 300 metres, by zeroing to hit three-inches high at 100 metres. Then you will be close to 3-inches high at 200 metres and about 5-6-inches low at 300 metres, requiring slight aim corrections and not fiddling with adjustments.

ZEROING AT 300 METRES

To get in the black at 300 metres with your first shot, cyclonic winds not being present on the day, you will get in first shot if you **BISECT THE BORE WITH THE TOP HORIZONTAL SURFACE OF THE 4-FOOT TARGET** and **PLACE THE CROSSHAIR ON THE TARGET CENTRE**.

To get back to 100 metres come back down 5 Minutes of Angle on your elevation setting – with 1/4-Minute clicks this means 20-clicks **CLOCKWISE**. Here is a diagram to assist on the next page.

Crosshairs Centred



BORESIGHTING AT 300 METRES



Bore Bisected