

First Focal Plane and Second Focal Plane Optics

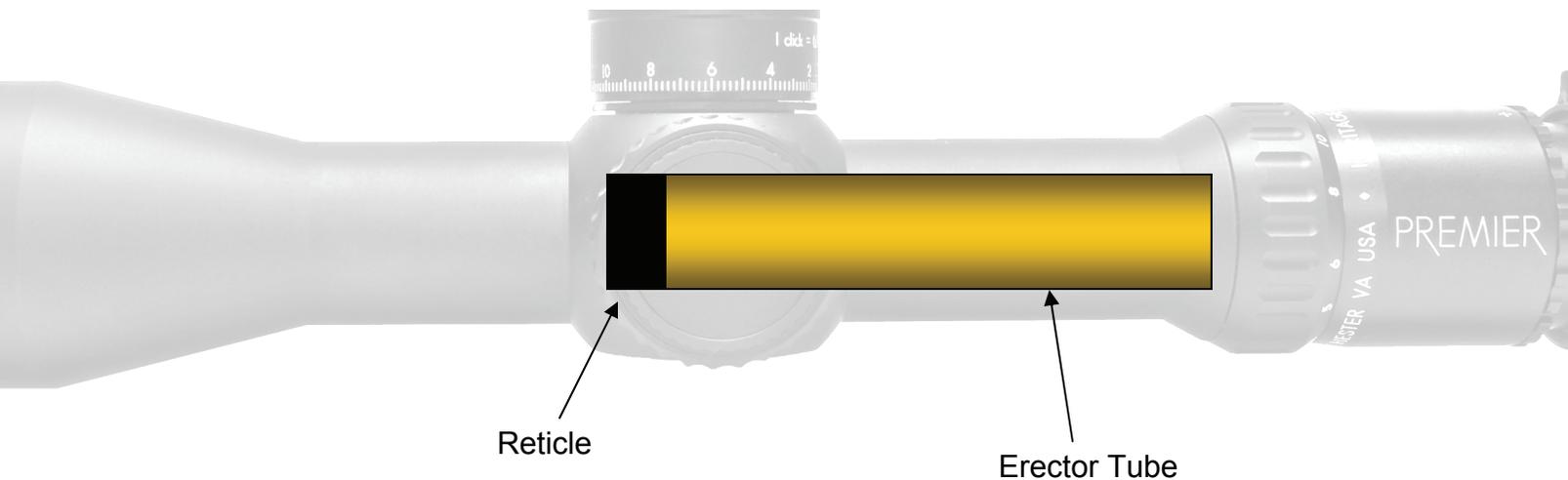
Most modern variable powered riflescopes will have the reticle installed in one of two ways, in the first focal plane or the second focal plane. Now, there are one or two manufacturers that have scopes with reticles in both focal planes but this is more the exception than the rule. The focus of this article though will be the differences between FFP and SFP reticles and what that means to the shooter.

First Focal Plane:

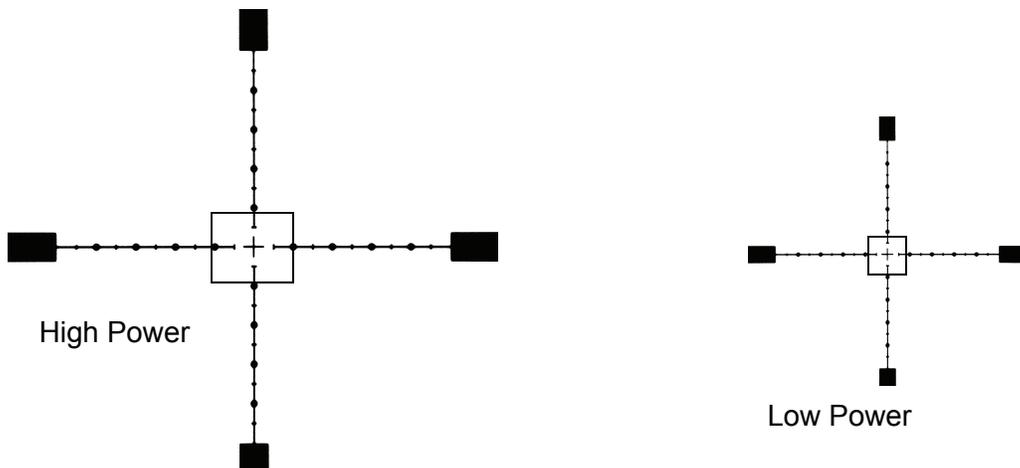
First focal plane optics are fairly common with many European manufacturers however that is not so much the case with some American optics companies. It wasn't until just recently that some of the larger names in the American optics industry began to offer scopes with first focal plane reticles. Part of the reason is that this method is costly and time consuming from a production and design stand point.

First focal plane optics have the reticle installed towards the front of the erector or forward of the lenses that help control the magnification range of the scope. What this means is that as that scope goes through its magnification range the reticle will appear to change size, becoming thinner or thicker depending on the magnification. The reticle isn't actually changing size but is in fact maintaining its size relative to the target image in the scope meaning that its subtensions stay the same. With the subtensions staying the same throughout the magnification range range estimation, trajectory compensation, and zeroing can be performed on any power greatly increasing the scopes utility.

The rough diagram below shows reticle placement in a first focal plane optic. Note its forward position in the erector.



Below is an example of what the reticle would look like while looking through a FFP optic on high and then low power. Even though the reticle appears to get smaller or thinner, it is in fact staying the same size relative to the target.

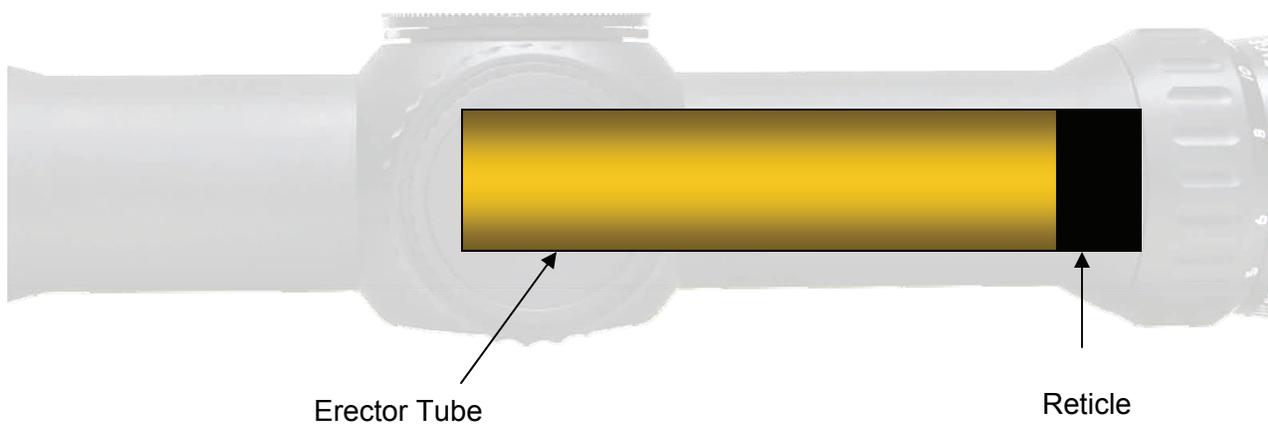


Second Focal Plane:

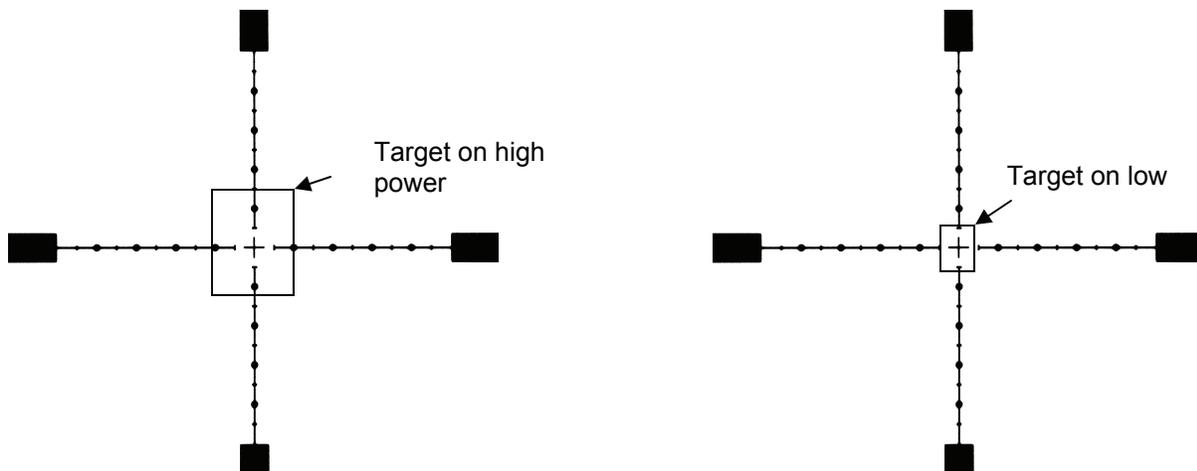
Optics with second focal plane reticles are more prevalent in scopes from American manufacturers as well as those from overseas because of their ease of manufacture and use. Optics with reticles in the first focal plane will most often be found in scopes designed for general purpose or hunting applications.

In a second focal plane optic, the reticle is installed towards the rear of the erector, past the lenses that help control the magnification of the image. This means that the scopes' reticle will appear to stay the same size relative to the shooter throughout its magnification range. Since the reticle isn't changing size relative to the target, the reticle subtensions are only good for range estimation and trajectory compensation at one spot along the magnification range, typically on the highest power.

The rough diagram below shows the reticle placement in a second focal plane optic. Note its position at the end of the erector.



Below is an example of what the reticle would appear to look like when looking through an optic with a second focal plane reticle on both high and low power. Note that at both ends of the magnification range, the reticle appears to stay the same size.



There are many pros and cons to each method of reticle placement however it is up to the individual user to decide which one is best suited to their application and their checkbook. However most professional shooters and civilian shooters alike have begun to turn to FFP reticles for the increased utility in a variety of situations.