

Farnam Method of Defensive Shotgun and Rifle Shooting Errata

In instructing Defensive Rifle for as long as I have, I sometimes forget the reasons for doing things in a certain way. With that in mind, I would like to rectify several mathematical overstatements in the main text which are there because I applied touchstone range procedure instead of precise mathematics. None of the following is particularly critical to the art of fighting with a rifle at “urban ranges,” but I want to be sure everything is explained adequately herein.

(1) It is routine on the range that, for sighting-in purposes, the span subtended by a minute of angle be inflated moderately, so that characteristic over-corrections during the sighting-in procedure (particularly when paper targets are viewed at long distances through spotting scopes) can be avoided. Hence, in the text, the minute-of-angle subtended span at one hundred meters is listed as 3.7cm or 1.5 inches. The actual figure is 2.7 cm or 1.1 inches. The text figures have been inflated by forty percent for the above reasons. If you use the figures in the text, they will work just fine, and the whole process will actually go more smoothly than it would have otherwise, but listed below are the exact figures for reference.

The unexaggerated (literal) table of one-minute subtended spans is:

20m	50m	100m	200m	300m	400m	500m
5.7mm	1.4cm	2.7cm	5.7cm	8.6cm	11.5cm	14.4cm
1/4 in	1/2 in	1.1 in	2.2 in	3.4 in	4.5 in	5.7 in

(2) For the rifle shooter, units of angular measurement are, unfortunately, a melange of confusion. There are three separate units which are sometimes used, but they are rarely identified precisely. They are all kindred, but not identical. There is a “minute” of angle (sometimes called a “mil”), a “mil” of angle (also called a “mil”) and a milliradian of angle (often also called a “mil,” adding to the confusion). The unit in most common use is a minute of angle, but it is often confused with the other units. A single “minute” of angle is the sixtieth part of a single degree of angle, and there are, of course, 360 degrees, or 21,600 minutes, in a full circle.

A “radian” is a unit of angular measurement such that a single radian is the angle that results when the radius of the circle is exactly equal in length to the span of the circle’s circumference cut by the angle. There are, therefore, 2 Pi radians in a complete circle. It works out so that a single radian of angle is equal to 57.296 degrees. A single “milliradian” (the thousandth part of a radian) is therefore equal to 3.44 minutes of angle.

A “mil” of angle (often used in artillery calculations) is a separate unit of angular measurement. A single mil is 1/6400 of a complete circle, so it is close, but not identical, to a milliradian. In summary, in a complete circle there are 21,600 minutes, 6283.2 milliradians, and 6,400 mils. Therefore, one minute of angle is equal to .29 milliradians and .30 mils. At one hundred meters, a single minute of angle subtends, as noted before, 2.9cm (1.1 inches). At the same range, a single milliradian of angle subtends 10cm (3.9 inches), and a single mil of angle subtends 9.8cm (3.6 inches).

The milliradian unit is used with some “mil-dot” scopes. The mil unit is used with others. Each dot in the reticle represents a milliradian of angle in some cases, a mil of angle in others, and some number of minutes of angle in still others. If one is using a scope equipped with a “mil-dot” reticle or any reticle with dots in it, they should check to see which angular unit is actually represented by the dot(s).

To most defensive riflemen, none of the forgoing is especially consequential, as we are using rifles equipped with iron sights or low-power scopes with a conventional reticle, and the degree of accuracy we require makes all of this largely insignificant, but there it is anyway.