Many long range shooters are interested in learning how to use a mil-dot type of reticle for range estimation. This is a standard block of instruction in Ranger Firearm Instruction’s 2 ½ day long range precision rifle classes; where we also instruct naked eye techniques. What I have learned from watching students in classes, and from my own personal experience, is at the end of a weekend of range estimation we are almost always a bit more accurate then when we started the weekend of training. I believe my observations of shooters and personal experiences are spot on, especially since getting good at mil-dot range estimation requires practice, practice, practice!

The single best way to get good at any range estimation technique is to get out and practice. If you live in an urban area, the next time you go to the mall or Home Depot, park far away from the building’s entrance. Exit your car and estimate the range to the front door and then attempt to walk a fairly straight line to the door while using your pace-count to get the actual distance.

It’s not practical to keep your long gun with you and mil-dot range the entrance to Home Depot. There are two training tools I would like to share that will allow you to practice range estimation with a mil-dot reticle. The first training aid is the Shooter Ready software and the second is a scaled unknown distance (UKD) target range you can create and put in your back yard.

The Shooter Ready software can be reviewed and purchased at the following website: [http://shooterready.com/](http://shooterready.com/) I’ve included a snapshot of one of the ranges in Illustration 1. The software will tell you the target dimensions. You simply choose your reticle, line it up to the target however you prefer, read the mils and then perform the calculation to get the range to the target. Of course, this software offers many other features, including tutorials on ranges estimation and ballistics, as well as shooting movers, and much more. It’s a great reference and training aid for long gunners and in the absence of actually performing these tasks I highly recommend Shooter Ready.

The next training aid is the scaled UKD target range. By applying some very basic math skills we can build a 1000 yard range (or any distance for that matter) in our back yard. I have used this training tool with plenty of success training soldiers in the Scout/Sniper platoon where I am a Squad Leader. Hey, even soldiers don’t always have access to land for training. Sometimes, all they have is the motor pool, which is where the training in Illustration 2 was done. The Soldiers in this picture are mil-dot ranging targets; however, the targets are only 50 yards, and 75 yards away. Yet, they are scaled representatives of targets ranging from 400 – 800 yards away.

To build a scaled UKD target range you will need a few items. Here is the list of materials I used (see Illustration 3): ¼” foam board, ruler, calculator, and a knife. That’s a pretty simple and inexpensive materials list. You will also need to know how big the yard or field is you will be placing the scaled range.
Now for the math... Here are the values that you will want to understand:

Actual Distance (AD) – This is the actual distance from your point of observation to your scaled target line.
Simulated Distance (SD) – This is the distance you are simulating.
Target Dimensions (TD) – These are the known dimensions of your targets.
Target Dimensions (scaled) (TDS) – Using basic math, we will determine these values. These will be the dimensions you cut your scaled targets to.

We will apply the above variables to the following equation:

\[(AD \times TD) / SD = TDS\]

To help make this clear, let’s run through an example. My backyard is only 75 yards long; however I would like to simulate a 20” x 40” E-type Target Silhouette at 800 yards. The width of my scaled target would be \((75 \times 20) / 800 = 1.875”\). The height of my scaled target would be \((75 \times 40) / 800 = 3.75”\).

Now, all I have to do is grab the foam board and cut out a profile 1.875” x 3.75” and place this scaled target 75 yards away. If I properly mil-dot range this target at 75 yards, I would determine its range to be 800 yards. Be sure to use the original target dimensions in your range estimation calculation.

How far you take this idea to maximize training value is really limited only by your imagination. You can camouflage the targets and practice target detection and then range them. You could set up different target lines like shown in Illustration 4. You could exercise to get your heart rate up and then build a position and range estimate. You could perform your range estimation at dusk or dawn in limited visibility. The possibilities are really endless.

One user beware comment I have is that if your back yard is really short, say only 25 yards. You will want to ensure your optic can adjust parallax to that short of a distance.

In closing, I want to reinforce that nothing beats getting out and doing range estimation for real. Real conditions are rarely perfect. Sometimes the sun will cause glare in your optic. Sometimes there will be mirage making it hard to clearly see your target’s profile. These real world conditions are best understood and practiced in the real world. However, in the absence of having access or time to get to your real world training site, you now have a couple of good alternatives to keep your skills up.
Final Example:
I’m interested in practicing range estimation with a mil-dot reticle in my back yard. My back yard is 100 yards long and I would like to simulate a 18” x 22” target 525 yards away, but at my 100 yard back yard distance.

Here are the values I will need to plug into the range scaling equation:
AD=100 yards
SD=525 yards
TD=18” x 22”

For the width of the scaled target I would have:  \((100 \times 18) / 525 = 3.4”\)
For the height of the scaled target I would have:  \((100 \times 22) / 525 = 9.7”\)

After cutting out my target to look similar to an E-Type silhouette and placing it 100 yards out my back door, I grab my scope and measure it in the reticle (see Illustration 5).

To determine the range to target in yards, I’ll use the following range estimation formula:
\((18 \times 27.77) / 0.95 = 526 \text{ yards}\)

As a check, I’ll also range estimate using the height of the target:
\((22 \times 27.77) / 1.2 = 509 \text{ yards}\)

Averaging the above two estimates, I would estimate the range at 517 yards.

If you liked this article, or have any suggestions, shoot me an email.

Regards,

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