

More Tips for Precision Rimfire Rifle

Thoughts from Match Director Mike Charness



It's been about a year and a half since we started our Precision Rimfire Rifle (PRR) series, and I'm still really enjoying it... and I've seen my skills improve over that time. I've also improved my equipment, but more on that later. I'm now pretty consistently able to score in the top third among our competitors in each class, and I thought I'd write down what I've learned, in hope that it will help and encourage some of our other shooters that are working to continuously improve. As a reminder, I had been shooting precision centerfire competitions for about 15 years, and hosting matches for 14 of those years. A lot of what I learned from other shooters during those centerfire years has been applicable to precision rimfire, but there are certainly some nuances in PRR that weren't there in centerfire.

TRIGGER TIME. There is no substitute for getting out to the range and practicing! The more you shoot, the better you'll become. There are a number of things to work on when you're not under the time pressure of a match environment. You want to learn to be able to "call" your shots, which means you already *know* when the rifle came off of your intended point of aim when you pull the trigger... for example, you "felt" it go off center and aren't surprised that the shot went high and left. The rifle is constantly moving a bit with your breath and heartbeat and natural tremor of your hands. You need to work on taking up the slack of the trigger, resting a moment, hold your breath and finally squeeze enough to activate sear release at just the right time. Of course, that's easier with a lighter trigger than what comes with most factory rifles. A trigger with a light or adjustable pull can make a huge difference in your ability to do that. Some modern rimfire rifles already come with an adjustable trigger, such as the CZ 457, or the Kidd 10/22. For some others, you can just swap springs instead of changing out the entire trigger.

While at the range, figure out how your rifle performs with different holds. Some of my competition rimfire rifles do best when being held firmly against the shoulder, while others will make tighter groups if I let the rifle freely slide back in the rests without much (or any) support from my shoulder. However, I have to also keep in mind that the preferred hold generally changes when I use a bipod front rest instead of my benchrest style.

Another thing to work on at the range is adjusting to wind conditions. Those little 22LR bullets are affected by any wind more than you'd initially think. I now use at least one wind flag when shooting rimfire, and I usually use two. Even just a streamer on a stick will do. You'll notice that sometimes the wind in the middle of the range is different than what's closer to the target stands, and that difference may be velocity, direction, or both, and it's constantly shifting. I'm still learning to adjust my shooting for the wind, but I'm getting better at it. Sometimes you'll need to adjust your point of aim to account for wind shift, but often you can just wait a minute or so for the wind to slow down or even to stop long enough to get in several shots. It definitely takes practice and awareness.

SHOOTING FROM THE BENCH. As those who have been shooting with us know, most of our matches are shot from a bench, making what we're doing more similar to benchrest than to F-Class style, and that's by design. Many of our local group (including me) are senior citizens, and we find it easier and more comfortable to

shoot from a bench than to be getting up and down from a prone (ground) position. Being semi-benchrest allows us a lot of flexibility in equipment choices that we can tailor to our personal comfort. If you want to improve your shooting, *consistency* is an important part of what you strive for. To contribute to that consistency, even though a variety of seating options are provided at the range, I really suggest you bring your own, and use it every time. I like to use a drum-style “throne” which is well-padded and is easily adjusted for height. My current one is a Gibraltar 9800-series, but there are many to choose from in different price ranges... I started out with a \$30 one that I ordered off of Amazon. Being able to adjust the seat height and then lock it in at a height you find most comfortable ensures that you will be able to have your arms and elbows comfortable on the bench every time you shoot, and your ammo and/or magazines be in easy reach when you’re reloading.

Another major element of consistency at the bench will be your rifle rests. At most of our matches, you’ll see that the most common front rest is an adjustable front bench style 3-leg rest, such as a [Caldwell Rock BR](#), which is what I started out with. I now have a [SEB Mini](#), which I ordered after a local shooter offered to let me try his, but it’s still just a fancy 3-leg rest and I know that I could probably get the same scores using my old Caldwell. There’s also nothing wrong with using a good quality bipod, either tactical style or F-Class style; national-level matches have been won using bipods. It’s a matter of personal preference unless overridden by match rules. For a rear rest, most of our shooters use an “eared” heavy benchrest rear bag such as from Caldwell, Edgewood, or Protektor. When I got my SEB front rest, I decided to change from my [Protektor rear bag](#) to a *mechanical* rear adjustable rest, and you’ll now see several of our PRR shooters using something similar. An adjustable rear rest is usually aluminum with a Delrin piece for the stock to ride on, and adjusts your rifle’s elevation and windage position by moving the *rear* of your rifle stock, just as you’d more typically adjust the front of your stock with a benchrest type front rest. I personally find it more accurate (and quicker) to adjust sighting position from the rear than reaching forward to the front rest, or fiddling with a bag at the rear. Examples of mechanical rear rests commercially available are the ABRA ([Auto Bench Rest Association](#)) and the Precision Quest/HoleShot (available through [Killough Shooting Sports](#) where I got mine, or direct from [PQP](#)), but you’ll see that we have shooters at our matches using home-made versions too. Or there’s an even more exotic (and pricey) one from [TargetShooting Inc.](#)

AMMUNITION. Rimfire rifles are ammunition sensitive. Even comparing two rifles of the same make and model, you’ll find that a particular rifle will shoot better with one brand of ammunition than another. It goes even further than that, and a rifle will often shoot particular production lots of ammo within a brand and type better than others. Generally, rimfire ammo intended for competition use will be more consistent (there’s that word again), which means that groups will be tighter because manufacturing tolerances for the bullet, brass and powder are tighter and the resultant velocity and travel will have the least variation, and fewer unexpected (and unpredictable) “flyers”. Unfortunately, these days it’s not as easy or cheap as it used to be to just buy and try a box of each of ten different 22lr ammo types, but it’s still worth doing if you’re serious about getting the best scores your rifle can produce! I’ve tried match variants of Wolf, RWS, SK, Eley, Lapua, and others. Of five 22LR rifles that I have used for competition, one prefers SK Standard, one prefers Eley Match, one Lapua Midas +, and two prefer Lapua Center-X. In cold winter weather, the rifle that normally likes Eley Match does better with the less expensive Eley Contact!

Both Eley and Lapua offer ammo testing services. You can send your rifle to one of their test centers and they will test at least ten different types and/or lots of ammo to see which performs best in your gun. It is then up to you if you wish to purchase that ammo through them. The Eley/Killough test center requires a minimum purchase of half a case -- five bricks—while the Lapua test centers require purchasing at least one full case. I’ve used the Lapua Test Center near Mesa Arizona and it was a good experience. [Click here for a video](#) that shows what they do – quite interesting.

CLEANING. There are a lot of opinions about cleaning a rimfire competition rifle, ranging from “after every session” to “never”. My own experience is that performance does degrade when a rimfire rifle gets dirty enough. I keep a spreadsheet for each match rifle, and that helps me see at a glance if/when accuracy has fallen off, and how many shots it has had through it since the last thorough cleaning. I bought a [Teslong rifle borescope](#), and I’ve seen that after enough shooting, my rifles will form a carbon ring in front of the chamber, which can not only affect accuracy, but also require more warm-up shots before point of impact stabilizes. I also look at the lands (barrel rifling grooves) to see if the edges are crisp or if they’re starting to fill in with residue from powder and lead. I mostly follow the cleaning regimen suggested by the founder Mike Bush of Voodoo Gun Works. You can see his video [here](#) and an article by Voodoo’s Greg Roman [here](#). I personally only rarely run a “deep clean” on the full barrel, but I do soak and scrub the chamber and the area just forward of it with [BoreTech C4](#) whenever I see a carbon ring forming, and I put a dry patch down the barrel fairly often (using a [Patch Worm](#)) to clean out the wax residue I see via the borescope. When I *do* use a cleaning rod in one of my bolt guns, I use a bore guide to prevent chamber damage.

TUNING. Once you’ve settled on the ammunition that your gun “likes”, if you want to go further, you can tune your barrel to usually get even better performance out of it. Mechanical barrel tuners do the same thing for rimfire ammunition that you do when developing custom loads for centerfire shooting. At matches, you’ll see some rifles that have a tuner attached to the end of the barrel. The tuner is a metal adjustable weight, allowing you to “tune” the barrel so that the bullet ideally exits the muzzle when the barrel is at an oscillation peak. This minimizes the barrel position difference between a slightly slower bullet and a slightly faster bullet, reducing vertical spread. A tuner has more of an effect on longer barrels. Threaded tuners are available if you already have a threaded barrel, or as clamp-on types if you do not. Most of my competition rimfire rifle barrels are threaded, so I can move a single tuner between them, adjusting the setting to the particular rifle-ammo combination, though I don’t actually use a tuner on all of my rifles... some don’t seem to need it. Still, tuners can make a great shooting rifle even better.

Another element of “tuning” is what you can do for your rifle with a torque wrench, which is often an overlooked element that can improve your rifle’s consistency. This kind of tuning involves torquing the rifle’s action screws to different values, and then shooting groups to see the effect. Tuning the screws, like a mechanical barrel tuner, affects the harmonics, but in a different way. Your rifle has either one or two screws holding the action in the stock. I have to admit that I don’t always do this on my rifles, but here’s the technique: Starting at the manufacturer’s recommended torque, shoot a 5- or 10-shot group. Then try lightening the torque value by 5 inch-pounds and shoot another group and compare (I happen to use a Wheeler “F.A.T.” torque wrench – and I use it for torque on my scope mounts too -- but there are many brands to choose from). Repeat this until you get down to around 15 inch-pounds of torque, and then put your action screws back to the values that produced the best group sizes. Afterwards, you can even go a step further and adjust the front and rear action screws (presuming you have two) with separate values, and see if your rifle does best with their values the same, or with one lighter or heavier than the other.

OPTICS. I talked about optics in my first installment. In our *Sporter* category, like similar categories in NRL22, PRS, ARA and other competition series, there is a limit on the dollar value of your rifle-plus-optic. Some “value” variable optics that will generally keep you under our MSRP limit depending on your rifle, are the Vortex Diamondback Tactical FFP 6-24x (very popular among our *Sporter* shooters), the Arken SH4 6-24x, the Swampfox 5-30x, the Athlon Argos BTR G2 8-34x, and the Monstrum G3 8-32x FFP, but there are plenty of other options. I personally have experience using the first four mentioned. The glass on these is quite good – though not what you’d find on a \$2000 scope – and certainly adequate at our 50-yard and 100-yard shooting distances and target sizes. Among fixed magnification choices, I use a Weaver T36. I have several of them

here, but they're no longer in production, so the Sightron SII 36 would be in that same style, quality and price range. These have a clearer sight picture at high magnification than the variable power scopes in that price range. Of course, in our *Semi-automatic* and *Match/Unlimited* classifications, you can use whatever scope you want – the sky (and your wallet) is the limit. I suggest one that can zoom to 24x or more if you've got older eyes like mine. I personally prefer FFP (first focal plane) hash-marked reticles, but some of my scopes are SFP because of other features that I wanted or price at the time. With my rifles that have variable power scopes, I like to set up at low power, and then zoom in to near maximum magnification during shooting as long as the mirage (heat wave distortion) isn't bad. Whatever scope you use, you'll find it advantageous if it has parallax/focus that goes down to at least 25-yards, not just 50 yards, since we (and other disciplines) sometimes have targets that close. 1/4 MOA clicks (*subtends*) are fine, since one click is a tight 1/8" at our common 50yd distance and an even tighter 1/16" at 25 yards.

ON MATCH DAY. Be organized... it will cause you less stress. For each gun I shoot, I have enough *pre-loaded* magazines needed for the full series of targets, plus allowance for sighters, laid out on the piece of carpet I put down on the shooting bench, ready to go so I don't have to break concentration to reload. I also suggest that you have a timer in front of you during a match; even though most matches give you more than enough time to shoot the target series, you'll find that with an occasional glance at your timer, you'll usually slow down, and a slower pace means you'll take more time setting up the shot, working on your breathing, or waiting for better wind conditions. Of course, use the same seat and rests that you practice with between matches.

MY RIFLES. People are often curious to know what I'm shooting and why, so here it is. As you know from my previous writing, I started with a [CZ 457 At-One](#), and I still use it in the *Sporter* classification. Shortly thereafter, I bought a Ruger American Rimfire Target rifle (a [model 8366](#)) so I'd have a second competition sporter to shoot. My wife wanted to buy me another competition rifle for my birthday, and I picked a 10/22 from [Clark Custom](#). Now that I had rifles to use in Sporter and Semi-Auto, and knowing that I was really into this Precision Rimfire thing, I started looking into a *Match/Unlimited* class rifle. Should I buy a used classic, like a Winchester 52 or Remington 37, or something newer? Research showed that a current favorite for winning national-level rimfire matches were rifles from [Vudoo Gun Works](#). After about a month of more research and thinking about it, I put in an order for a Vudoo V22-R/Three-60 Ravage/Ridgeback, and it was delivered about five months later. I put a Vortex Golden Eagle scope on it, and the combination has been an awesome performer once it got close to 500 rounds through it to break it in -- I was actually rather disappointed with it right out of the box, but contacted Vudoo's creator/owner Mike Bush, and followed his suggestions for break-in and cleaning, and now it's fantastic. About a year later, my wife saw a friend's "chassis" gun, and asked "Why don't you have one like that?" As a result, I now have an [Anschutz 1710 HB](#), which I'm still breaking in. It is fitted with an old Nightforce BR scope that I already had here on a centerfire rifle that I don't shoot much anymore. My latest Sporter acquisition is another CZ 457, this time an MTR model, which I put in a [KRG Bravo chassis](#) since I don't care for the shape or feel of the large factory CZ MTR wood stock. It's topped with a Vortex Diamondback 6-24x scope, keeping it compatible with our *Sporter* competition classification. I've also bought another Vudoo, this newer one a V22-S (single-shot), scoped with another Golden Eagle.

KEEP IN MIND... as I've said before, you don't necessarily have to be as into it as I've gotten, nor have to spend big bucks to end up with a rifle you'll enjoy for match shooting. Consider starting off with a rimfire rifle you already have, but also consider adding a gun to your collection that you specifically want to use for match purposes. Either way, don't let the fact that there will be better shooters with better equipment out there get in your way... expect to have fun while improving your skills with whatever your chosen or available equipment may be!

