



## Practical Rimfire Rifle – Primer By N.

The purpose of this primer document is to give the reader a little bit of knowledge I have gained while competitively shooting for the last few years. This will not ensure you are a better shooter, only practice and experience will help you do that 😊, but maybe this will help you with some of the small things that I have found make a big difference.

I'll put the bottom-line up front, if you want to become a better shooter there is only one way to do it: **Practice, Practice, Practice**. This is a universal "truth" that I promise any good shooter will agree with. There are a lot of caveats to "practice", but if you are the person that takes the time in the day to practice, you will advance more quickly than those that do not. You never get good at playing an instrument if you only play during a recital. Shooting well requires time and dedication from the shooter. Building the muscle memory and fundamentals of your sport takes time, but pays off when the shot timer goes "BEEP".

**Since this is being given out before a class on .22LR precision shooting my references from here on out will be relating to .22LR precision shooting.**

I'm going to start this off with some questions very new shooters (and some not so new do ask), how do I choose a: rifle, optic, bi-pod, bag, tripod...gear in general that I will need to shoot a .22LR precision match?

The answer to that can vary, but in general if you are not 100% sure you will want to do it, spend as much money as you feel comfortable spending so if you do not like it you are not out too much money.

In NRL22 ([www.nrl22.org](http://www.nrl22.org)) they have a few different divisions you can shoot in: Base class (rifle and optics must have an MSRP of \$1050 or less), Young guns (ages 8-16), Ladies, Air Rifle, Open (this class can do just about anything to their rifle and spend as much as they want). If you are interested in trying to shoot MARS (or NRL) your best option (if you do not already own a .22LR rifle and optic) is find a rifle and optic that fits into the Base class and see if you like shooting .22LR competitions. Also, whether you choose a bolt action or semi-auto is a personal choice, ask questions and pick one that works for you.

Choosing an optic. First decide if you want the optic in milliradians (MILs or mRAD) or Minutes of Angle (MOA). MOA was the standard for years, but more recently most precision rifle style matches have seen a shift to MILs. Honestly, it does not matter which you decide, but do some research and ask for advice if you need it. MILs are the more popular choice in these types of competitions. I shoot in MILs, but that was a choice I made. (Once you pick MILs or MOA, find an optic that has adjustable turrets. For NRL matches the range of targets is only out to 100 yards. For MARS matches targets can go out to 400 yards. So, having an optic that can get you the elevation you need to get out to 400 yards could be important. Again, do some research or

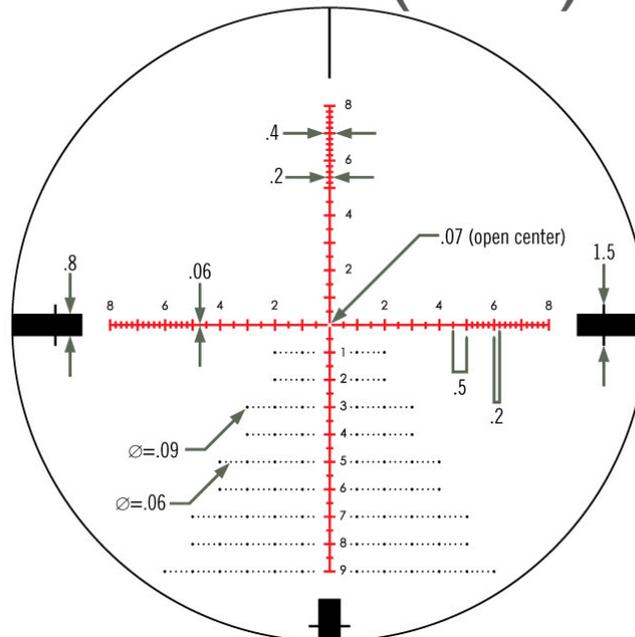


ask advice from people to give you some good options. There are many companies that make decent optics that can do what you need. YouTube has TONS of videos, but it can be harder to find channels where the person has good knowledge 😊. Look in numerous places to find some consensus before making a purchase.

Optics mounts are important as well. Not all are created equal 😊. If your rifle has an optic rail (usually a 6" long rail on top of the receiver to mount an optic) try to get one with a 20 MOA or 30 MOA cant (all optic mounts are measured in MOA of cant so do not look for one in MILs haha). For .22LR shooting we need a lot of elevation to get out to 400 yards. If your rifle does not have a canted optics rail you can buy optics mounts that have cant built into them. Please ask for help if you are not sure what you need. Better to buy what you want (and need) then have something that is not ideal.

The scope reticle is a very personal preference. Different people like different styles. Christmas tree style reticles are popular now (see below). I'd recommend finding a first focal plane (FFP) optic that has a reticle with 0.5 or .02 mil subtensions (for a MIL optic) or one that has 1 MOA subtensions (for an MOA optic). Subtensions are the small lines in the optic that correspond to elevation and windage. See the graphic below, the small red lines are the subtensions. (don't worry about the other information on the graphic, I just wanted you to know what subtensions look like 😊). The only type of reticle I would not recommend is a MIL-DOT reticle. They were a very popular military "Sniper" optic, but for this type of shooting they are not ideal. If you already have one, please do not hesitate to try it and see if it works. It 100% can work, but if you are new to the sport, I would not look for a MIL-DOT optic (personal opinion).

## Vortex EBR-2 (MIL)





Magnification is important, but I would say if you have a magnification factor that goes to x15 that will be more than enough to 99% of the shooting you'll do when starting. 99% of the shooting I do in NRL or MARS is at X6-X15 power. The only time higher magnifications are helpful is when sighting in and shooting very small targets like matchsticks. Scopes that go from x20-x30 are most common.

When it comes to finding a bi-pod, shooting bags, or other gear my recommendation is to wait to buy a lot of that gear and go shoot a few matches. Cheaper bi-pods are usually not amazing, but there is no reason to buy a \$100-\$400 bi-pod if you are not too sure that you'll like this type of competition. Find one that fits on your rifle and is not too expensive (at first). When you get to a match ask other competitors their thoughts. Ask to try their shooting bags (most shooters will let you since they are mostly a great group of people), ask people to try their equipment and gear if you think you'd like it. I have spent more money on the years for bags and shooting gear that is collecting dust since I did not have the experience to know what I wanted before I bought it. haha.

Okay, so now we are going to assume you have a rifle, optic (and optic mount), and bi-pod. From this point I am going to make this more of a bullet points of things to think about or research. They are important things, but since I do not want this to turn into War and Peace and 400 pages, the internet is your friend 😊. There are copious videos from experienced shooter on a lot of these topics; Brain Litz, National Shooting Sports Foundation (NSSF), etc. Do research, ask for help from experienced shooters, get contact information from shooters so that you can ask questions, or maybe they can take you shooting and help you out. Most people are willing to help if asked.

#### Mounting your optic:

- Make sure you set the optic up so you have a full view and no "shadow" in when you look through it.
- Once mounted, do a **tracking test** (Brain Litz has a good video on this)
  - o Ensures the optic is level and tracks correctly when level.

#### Picking Ammo:

- There are LOTS of .22LR ammo types and manufacturers. Test different types and brands and see which your gun likes.
  - o There can be variance from ammo lot to ammo lot, so always test ammo lots to verify muzzle velocity (MV) and how they group.
- It is very helpful to have a chronograph to when picking ammo. These can be expensive, so I recommend going to the range with a friend who has one. Chronographs measure the ammo's speed. Having ammo with a consistent speed out of your barrel is key in this sport.
  - o Know your ammo's speed is also critical in calculating it's trajectory over long distances (DOPE)



### Zeroing your Rifle:

- Most of the people zero their rifles at 50 yards. That seems to work well for most. I zero at 25 yards, but I am the exception more than the rule. I did it since shooting NRL22 our closest distance is usually 25 yards, but a LOT of NRL22 shooters zero at 50 yards and do well. I recommend NOT zeroing at 100 yards for .22LR rifles. I would say to start at 50 yards and see if that works for you starting out.

### DOPE Data Apps/Hardware:

- There are many different phone apps that calculate can DOPE (Applied Ballistics (AB), Strellok, BallisticArc, Hornady, Ballistic AE, etc.). Try them and see if they work for your rifle and dope.
  - o .22LR can be tricky with Data apps since most .22LR ammo is subsonic and standard Data apps do not always calculate their drop perfectly. It is most important that you test your rifle and ammo out to the distances you want to shoot and write the data down.
- Kestrel weather meters and integrated ballistic solver are more expensive devices, but they seem to do a better job with .22LR data. I would not recommend a new shooter spend \$400 or more on one, but if you get into the sport look into them as I have found they work better.
  - o If you have a Kestrel you need to look into the Drag Scale Factor (DSF) videos from Todd Hodnett (or Kestrel) to calibrate your data correctly (if needed).

### Data Card Holders:

- There are expensive ones and cheaper ones. Some mount to the rifle, some are armbands. Blue tape works well on clothes and the armbands. Go to a competition and see what people have, look around the internet and see what works. The armbands are pretty inexpensive for a first place to start before anything. I like the Sidewinder Industries Python DOPE card holder that attaches to the rifle.

### Data Books:

- I recommend buying a book that you keep your rifle's data. I have separate books for each rifle I shoot that I write down all my data and things I want to remember. I write down:
  - o Weather conditions, muzzle velocity, dope at various distances, number of rounds I shot, etc.
  - o A note app on your phone or a spreadsheet are also good options.

So now let's talk about you preparing for a match. These are some suggestions I have from good and bad experiences 😊



Dry fire! You should be practicing with your rifle, dry firing weekly (make sure no ammo is in the same room and always verify your gun is EMPTY before dry firing). Practice things that you have had trouble with at past matches, reloading magazines, pressing the trigger evenly and smoothly. If you have props around your house practice using them correctly and getting stable. Practice things you can do safely at home and work on fundamentals to build your skills. Learning to safely move your rifle from one position to another is very important. If you have a semi-auto you must put the rifle on safe and clearly say "SAFE!". If you have a bolt action the bolt must be to the rear when you are moving positions. If you practice this at home you will do it in competition. This is an important thing that can become a safety issue at a competition. I cannot stress enough how important dry practice is and the best part is that it costs \$0 to do it 😊.

- Gun care and maintenance
  - o Oil moving parts, clean the chamber, clean the barrel (not always a must, but make sure it is clear of debris)
  - o CLEAN your MAGAZINES!
    - .22LR ammo comes with a light wax coating (it is good do not wipe it off haha) which get into the magazines and will attract dirt and debris. I have had magazines fail from dirt and have seen LOTS of others do the same.
    - CLEAN your MAGS!
    - Don't OIL your mags. Wipe them down with a clean cloth.
- Gear/Equipment Checklist
  - o I created a printed checklist that I look over and verify I have all the things I need in one spot so that I do not forget anything.
- Matchbook
  - o If the match provides a matchbook before the match print it out.
    - I put it in a ziplock bag in case it rains.
    - Use your data app or hardware to write down your DOPE at the given distances. This way you have something written down.

All of these things are good ideas to make sure you are prepared for a match and that your equipment is ready for the match.

Things to do at the match.

- READ the stage briefs:
  - o Ask questions before to clarify anything that is not obvious.
  - o DON'T forget to pay attention.
    - I have forgotten small things that have led to shooting the stage incorrectly. Write things down so you do not forget. When the shot timer goes "BEEP" you will be surprised how little you may remember haha.
- Planning the stage:
  - o This will come with experience and what gear/equipment you have.



- Lots of people will shoot it differently, don't try and "over-shoot" the stage. Shoot it at your experience level.
- Shooting the stage:
  - Always watch your muzzle when moving into positions. Do not be in such a rush that you point your gun in an unsafe direction and get disqualified (DQ'ed).
  - When moving positions, if you have a bolt action rifle, bolt back and move. If you have a semi-auto rifle, place the rifle on safe, clearly and loudly say "SAFE!", then move.
  - Try not to throw your equipment (bags, etc.) down on props. This can create a lot of movement in the prop and make it harder to get a steady aim. Be deliberate and try not to rush things.
  - Take your time and do not rush. As a new shooter do not focus on shooting 10 shots. Focus on shooting as many well aimed shots as you can. If you shoot 10 shots quickly and miss you get a 0. If you take your time and shoot 2 shots and get 1 hit, you get 1 point. Only begin to worry about time once you gain experience.
  - Reading wind: This is something that takes a long time to get really good at doing. As a beginner, ask experienced shooters for help and do not take "wind calls" from random people. As most good wind readers will tell you, a wind call of "2 MILs left" is not a wind call. A wind call of "2 MPH left to right" is a wind call. This can only be truly learned through experience. Focus on other skills until you have the experience that bad wind calls are holding you back. It will take a lot of time to learn to read the wind. This is just my opinion, please ask people their thoughts and make your best judgement.
  - Gun malfunctions:
    - Best practice if your gun has a malfunction is to try dropping the magazine and reloading a new one. .22LR ammo is not very rigid and can easily be bent or caught in the receiver. If after trying to reload there is still an issue, drop your magazine and visually check your chamber. Numerous things can happen, but trying to reload 3 magazines will probably not help the situation.
  - Should I dial or do Hold Overs on a stage?
    - As a new shooter, focus on dialing elevation and parallax for your targets.
    - Hold Overs are important on stages with different targets at different distances, but should be focused on when you gain more experience. If you are a new shooter, focus on dialing more than holding over.
    - If you are an experienced shooter, this is something you need to practice since it is important.
- After shooting the stage:



- Make sure your chamber flag is inserted, you have picked up your equipment (bags, magazines (if you reloaded), etc.)
- Keep your rifle pointed in a safe direction and place it in the safe area with other rifles.
- PLEASE....PLEASE take the dope off of your optic before leaving your rifle. I have not done this and really messed things up.
  - Always zero your turrets (meaning turn the turrets back to your original zero (25y, 50y, or where ever you zeroed your rifle)
  - I turn my turrets down until the turret stops moving, then move it back to it's zero. If you only turn the turret back to the number "0" you may not be back to your actual zero.
  - Example: If you have a stage what requires you to dial your elevation turret to 16 MILs. You will rotate your turrets one full turn and then to the number "6" (if you have 10 MILs per revolution). When you are done the stage if you turn the turret back to "0", you will still be at 10 MILs. I have done this haha. Turn your turrets down until it physically stops. That is the best way to ensure you are at your zero and not above that.
- Once you are done with the above stage, reload your magazines, get your DOPE for the next stage. Once you are prepared for the next stage, then you can rejoin your squad and help them if they need it. I have seen people get catch up (I have too) helping someone or the squad and forgotten to prepare themselves and mess up the following stage due to wrote dope dialed on their turrets, wrote data written on data card holder, a magazine that was not fully loaded, etc. Prepare yourself after you are done shooting so that you are ready to shoot the next stage.
- However, if you have time, please help the squad as a spotter, score keeper, etc.. You will learn a lot just watching other how shooters plan and move. And you can also learn about the conditions by spotting hits on the targets. You can see where other shooters are commonly missing, wind signs, changes in wind and just how to find each target.
- Also, write your score down in your matchbook and make notes of things you need to practice on, if your DOPE was correct, things you did well. All of these things will help you when you practice at home and focus on the things you need practice on.

Finally, HAVE FUN!!! It's not all about the points. Enjoy the experience.