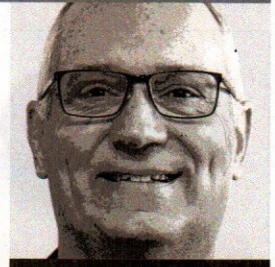


## Concluding a study of .22 ammunition for long-range rimfire shooting.



DAVE EMERY

## GO LONG! (PART 2)

IN THE JULY 2023 ISSUE, Part 1 of "Go Long!" was published wherein I discussed the technical considerations for shooting .22 Long Rifle (LR) ammunition at long range. I discussed ammunition performance and what level of performance is required to be successful in competition with smallbore firearms and ammunition at distances beyond 100 yards. In this article, I will describe the equipment available to specifically shoot .22 LR at distance. The good news is that there are rifles and scopes available that perform very well, yet still affordable. We can do a lot of shooting with .22s for what one 20-round box of centerfire ammo costs, and .22 LR ammunition has become easier to find.

### GUNS & GEAR

If you're even a causal shooter, you may already have a scoped smallbore rifle. This would certainly be enough to start experimenting with long-range shooting. Several gun companies are getting on board with the long-range .22s, too, and many offer entry level guns that are purpose-built to do this. The Ruger Precision Rimfire, for example, is a chassis system with an adjustable stock (\$619, [ruger.com](http://ruger.com)). The Ruger American Rimfire Long-Range Target (\$739, [ruger.com](http://ruger.com)) features a speckle-painted laminate wood stock with an adjustable cheekpiece, length of pull, a steel bedding block and a heavy barrel. Both rifles feature the same action and barrel.

Savage also offers such rifles with the semi-automatic A22 and bolt-action B22. Precision models range from \$659 to \$949 ([savagearms.com](http://savagearms.com)). CZ sells its 457 Varmint in a chassis starting at \$1,149 and a Manners carbon-fiber stock version for \$1,315. Of course, if you're feeling flush you could opt for the Voodoo V-22, which starts at \$2,500 for one in a KRG Bravo chassis. For this article, I selected Ruger's American Rimfire Long-Range Target.

You'll be more successful with a scope featuring a parallax adjustment, target-type turrets with at least 50 MOA of elevation adjustment, and an MOA- or mil-based reticle with windage hold-offs. With a parallax-adjustable scope, it should be focused to read mirage and estimate wind drift. Often, you will not have time to adjust the scope for a wind hold. You'll want to dial a base wind

correction and hold off for rapid wind changes. The \$99 scopes some of us put on our rifles may work to start, but they'll quickly become limiting. Fortunately, there are a number of very good scopes that fill most requirements for less than \$500. The Bushnell Engage 4-16x44mm retails for \$415, for example. Leupold's VX-Freedom line is a great option ranging from \$399 to \$499. Leupold also offers a 4-16x40mm featuring parallax adjustment and its Tri-MOA reticle for \$499. Vortex sells its 4-12x40mm Diamondback Tactical with VMR-1 reticle and parallax adjustment for just \$380. All of these scopes should work well for shooting .22s far, and they won't break the bank. Using a rifle you already own, too, and upgrading the scope is a way to get serious and keep costs down.

A simple Kestrel ([kestrelballistics.com](http://kestrelballistics.com)) or similar weather station that provides temperature and atmospheric pressure is needed for trajectory solver inputs. You want what the Kestrel gives you, which is station atmospheric pressure, not the National Weather Service corrected-to-sea-level pressure. The help of a spotter on a spotting scope is the best way to monitor what the wind is doing and to correct for wind drift.

### AT THE RANGE

Test your favorite scope and determine what the click values really are and how well it repeats. Remember, 1 MOA is 1.09 inches at 100 yards and .55 inch at 50 yards.

To explore what can be done without spending a down payment for a pickup, I topped the Ruger with Bushnell's Engage 4-16x44mm scope. I also tested Leupold's VX-Freedom 4-12X with side focus to compare the two scopes' repeatability and click values. It was easy to adjust the stock to fit comfortably, and mine had a crisp trigger pull of 3¾ pounds. The rifle also came with a 20 MOA rail to maximize the range of elevation adjustment.

The Bushnell scope was clear and the reticle was easy to see and use. There were positive elevation click-adjustments. The turrets could be pulled up to adjust and pushed down to secure the final adjustment setting. Nifty.

RUGER AMERICAN RIMFIRE LONG-RANGE TARGET, .22 LR, MSRP: \$739





A Kestrel 4000 NV Ballistic Meter was used throughout the author's evaluation. (This model is discontinued.)



A Leupold VX-Freedom 4-12x40mm with CDS elevation turret and side focus performed exceptionally during the tracking test. \$500



Bushnell's Engage 4-16x44mm provides lockable turrets and parallax adjustments at a reasonable price. \$415

Leupold's VX-Freedom, on the other hand, had very sharp imaging. The Tri-MOA reticle was uncomplicated and easy to use. The CDS turrets required a small Allen wrench to loosen or tighten the set-screws in the turret to allow adjustment and lock the turret. Both scopes advertised .25-MOA of adjustment.

I tested each scope by zeroing at 50 yards using CCI Competition Pistol Match 40-grain ammunition. I fired a

shot and adjusted the scope 20 MOA, then fired again. I also adjusted down 20 MOA to the original zero and repeated this test three times while shooting two groups at base zero and plus-20 MOA. I measured from the center of each group to calculate the actual click value. To observe how well the scopes repeated, I measured the two groups' elevation sizes as compared to the groups fired with the zero fixed. The Bushnell scope produced click values of .255 MOA; quite good. In the repeatability test, the Bushnell's elevation group sizes grew by 66 percent, indicating the repeatability of the Engage did not repeat as well. The Leupold scope produced click values that came out to .232 MOA; a little off, but we can compensate for this if we know what the value is. Repeatability for the Leupold was spot on; it produced the same group size at both elevation settings as the fixed-zero's elevation group size.

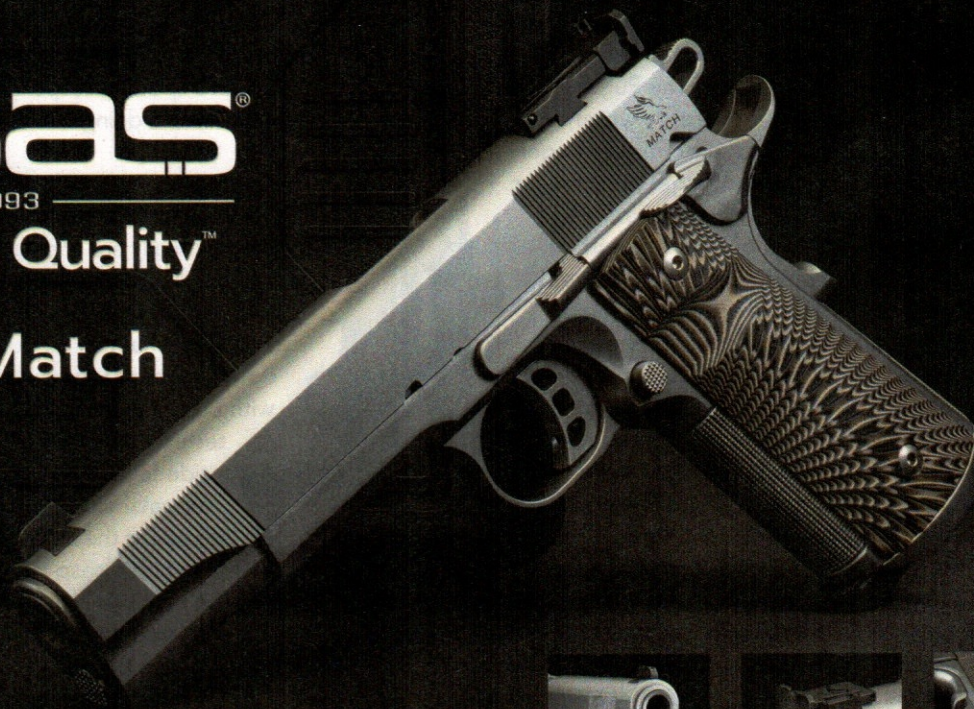
I went through the testing process described in "Part 1" by shooting at 50 yards to narrow the number of loads

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available to test. I then fired the best five at 100 yards. At 100 yards, I tested the CCI Pistol Match, Green Tag and Mini Mag, as well as Federal's AutoMatch and Remington Subsonic Rimfire. Results are shown in Table 1.

Table 1 is a continuation of the shooting results table published in Part 1. Both the CCI Match loads shot well. They both produced the smallest groups at 50 and 100 yards, and low extreme spreads (ES). The subsonic CCI Clean had a good ES number, but the group size was large for 50 yards. CCI Mini Mag didn't seem to have much going for it at 50 yards, but it performed well at 100. It consistently shot three to four bullets in a tight group with a flier. It would be a good candidate to apply the techniques I detailed in my March 2023 column "Consistency," measuring and sorting rimfire ammunition. The Federal Auto Match load almost grouped but had fliers. The Remington subsonic load shot well at 100 yards, but the high ES was worrisome, producing elevation stringing at longer distances. Any kind of a cross wind opened up these 100-yard groups. Wind conditions at 100 yards were nearly calm with an occasional small gust. To shoot rimfire well at long range, you'll be forced to read and keep up with the wind. I recommend CCI's Pistol Match, Green Tag and Remington Subsonic loads for this rifle.

If money is not a concern, there are match loads available from Eley (eleyammunition.com) and Lapua (lapua.com) that tend to perform better than those tested here.

RUGER AMERICAN LONG-RANGE RIMFIRE

Table 1

LOAD	VEL. (FPS)	ES (FPS)	50 YARDS		100 YARDS	
			BEST GROUP (IN.)	AVG. GROUP (IN.)	BEST GROUP (IN.)	AVG. GROUP (IN.)
CCI Green Tag 40-gr. LRN	1,047	29	1	1.08	1.9	2
Federal AutoMatch 40-gr. LRN	1,170	71	1	1.52	2.81	3.37
CCI Pistol Match 40-gr. LRN	1,064	34	1.18	1.22	2	2.15
Remington Subsonic 40-gr. CPHP	1,000	105	1.19	1.6	1.44	2.06
CCI Clean 40-gr. LRN	1,173	47	1.94	2.16	—	—
CCI Mini Mag 36-gr. CPHP	1,229	80	2	2.03	2.13	2.29
Remington Golden	1,183	87	2	2.34	—	—
CCI Clean Subsonic 40-gr. LHP	1,074	16	2.19	2.47	—	—

Note: Groups fired from a Ruger American Rimfire Long-Range Target equipped with a Bushnell Engage 2.5-10x44mm riflescope. Velocity was measured by LabRadar.

However, they can retail for as much as \$50 for a box of 50 rounds. I tried to limit this evaluation to loads that offer reasonable performance at an affordable price.

**LAST ROUND**

Shooting .22s at long range is great for learning new shooting techniques and keeping your skills up. Using some of the evaluation techniques and equipment-selection advice that I've described in these articles should give you a productive start to making smallbore precision a cost-effective, fun and rewarding endeavor. **MA**

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